

**WOOD BUFFALO ENVIRONMENTAL ASSOCIATION  
MONTHLY AMBIENT AIR QUALITY MONITORING REPORT  
MARCH 2022  
REPORT HISTORY**

Original report release data: April 29, 2023

Revised report release date: August 30, 2023

**Revision 1 – Submission of H<sub>2</sub>S data and Revision of TRS data at Patricia McInnes.**

The Patricia McInnes air monitoring station (AMS06) collected H<sub>2</sub>S data from January 3, 2023, to June 12, 2023, but it was reported as TRS. On August 30, 2023, the data was resubmitted as H<sub>2</sub>S to the Electronic Transfer System (ETS) and the TRS data was revised. The monthly report cover letter, station summary, network summary, and calibration report contained within have been revised to reflect the change.



**WOOD BUFFALO  
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Wood Buffalo Environmental Association

# MARCH 2023 MONTHLY CALIBRATION REPORT

CONTINUOUS MONITORING

August 30, 2023

Revision 01

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 2023**

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

April 29, 2023



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                          |                 |                  |
|-------------------|--------------------------|-----------------|------------------|
| Station Name:     | Bertha Ganter-Fort McKay | Station number: | AMS01            |
| Calibration Date: | March 13, 2023           | Last Cal Date:  | February 1, 2023 |
| Start time (MST): | 15:30                    | End time (MST): | 18:20            |
| Reason:           | Routine                  |                 |                  |

### Calibration Standards

|                        |                   |     |                   |                   |
|------------------------|-------------------|-----|-------------------|-------------------|
| Cal Gas Concentration: | 49.19             | ppm | Cal Gas Exp Date: | February 23, 2025 |
| Cal Gas Cylinder #:    | CC486642          |     |                   |                   |
| Removed Cal Gas Conc:  | 49.19             | 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:    | 5609              |

### Analyzer Information

|                |              |                    |              |
|----------------|--------------|--------------------|--------------|
| Analyzer make: | Thermo 43i   | Analyzer serial #: | JC1501301448 |
| Analyzer Range | 0 - 1000 ppb |                    |              |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.998801     | 1.000943      | Backgd or Offset: | 19.0         | 19.4          |
| Calibration intercept: | -0.333078    | -0.132808     | Coeff or Slope:   | 0.891        | 0.897         |

### SO<sub>2</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| as found span             | 4918                          | 81.3                        | 799.9                               | 795.0                              | 1.006   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----  |
| high point                | 4918                          | 81.3                        | 799.9                               | 801.2                              | 0.998   |
| second point              | 4959                          | 40.7                        | 400.4                               | 399.2                              | 1.003   |
| third point               | 4979                          | 20.3                        | 199.7                               | 200.2                              | 0.998   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----  |
| as left span              | 4918                          | 81.3                        | 799.9                               | 800.3                              | 1.000   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.000   |

|                          |        |                   |        |               |       |
|--------------------------|--------|-------------------|--------|---------------|-------|
| Baseline Corr As found:  | 794.80 | Previous response | 798.65 | *% 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. Adjusted span only.

Calibration Performed By: Rene Chamberland





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

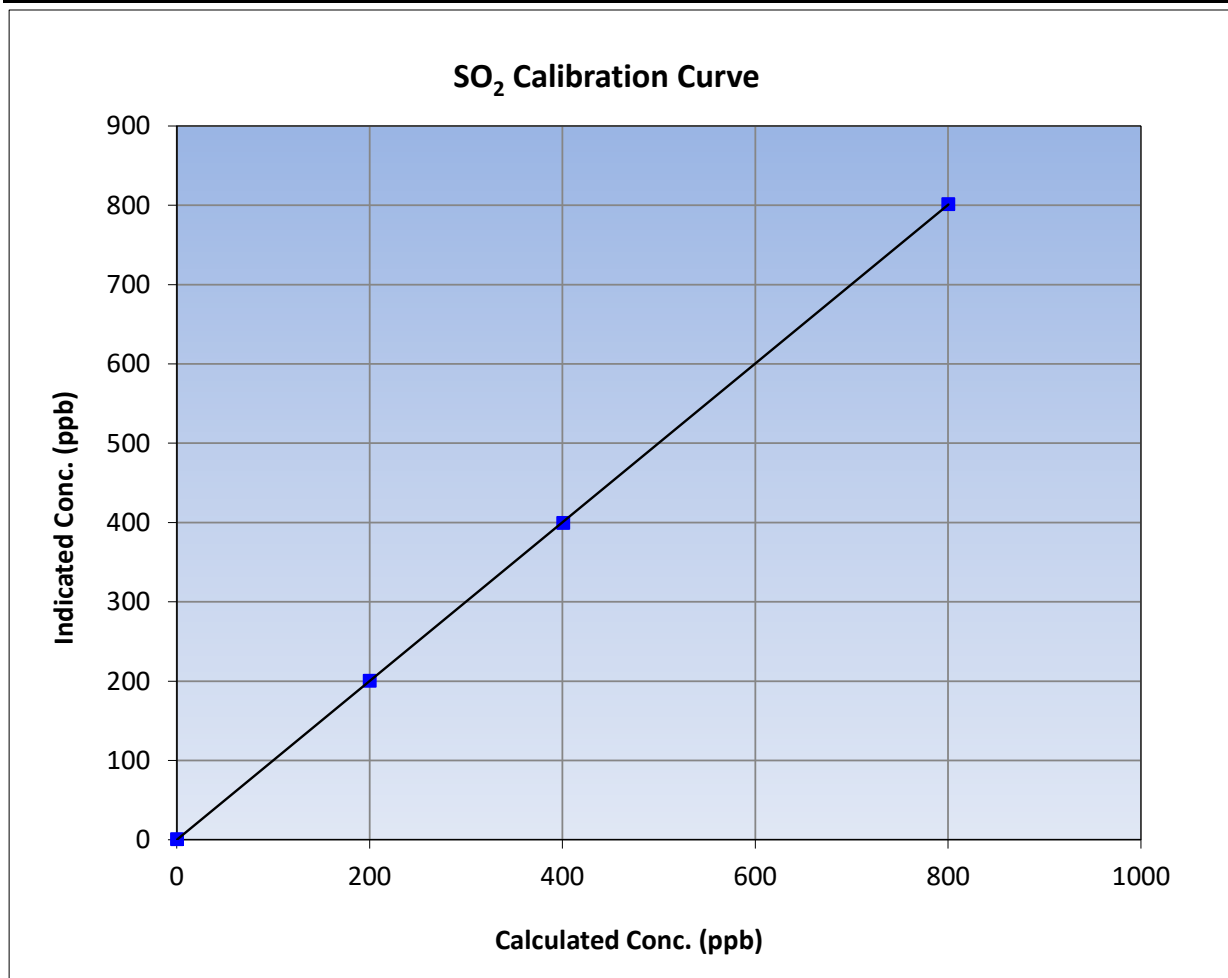
Version-01-2020

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | March 13, 2023           | Previous Calibration: | February 1, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 15:30                    | End Time (MST):       | 18:20            |
| Analyzer make:    | Thermo 43i               | Analyzer serial #:    | JC1501301448     |

### Calibration Data

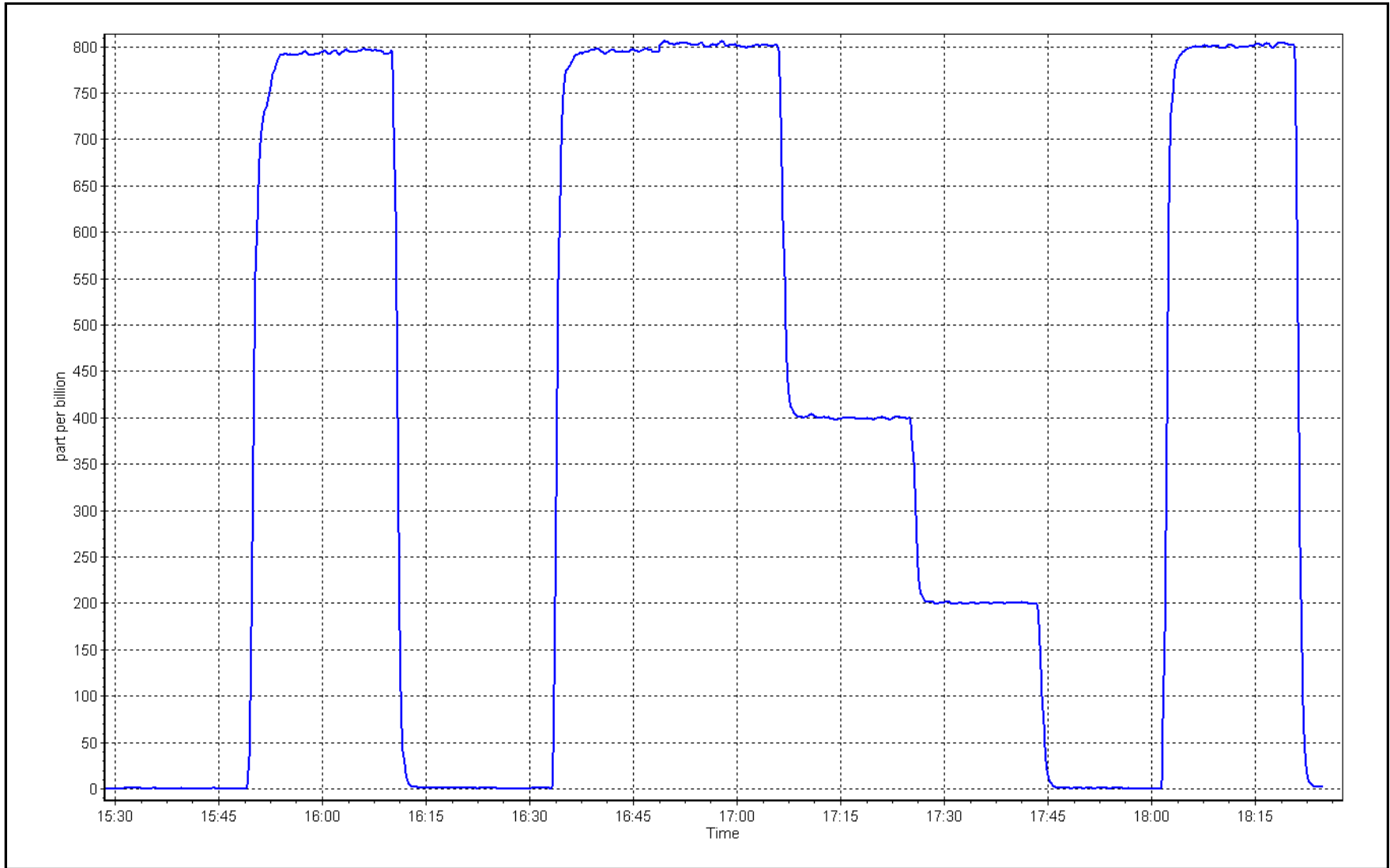
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient | 0.999992  | ≥0.995      |
| 799.9                               | 801.2                              | 0.9984                    |                         |           |             |
| 400.4                               | 399.2                              | 1.0031                    | Slope                   | 1.000943  | 0.90 - 1.10 |
| 199.7                               | 200.2                              | 0.9977                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -0.132808 | +/-30       |



SO2 Calibration Plot

Date: March 13, 2023

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 13, 2023           | Last Cal Date:  | February 13, 2023 |
| Start time (MST): | 9:58                     | End time (MST): | 15:33             |
| Reason:           | Routine                  |                 |                   |

### Calibration Standards

|                        |                   |     |                   |                    |
|------------------------|-------------------|-----|-------------------|--------------------|
| Cal Gas Concentration: | 5.10              | ppm | Cal Gas Exp Date: | September 16, 2024 |
| Cal Gas Cylinder #:    | <u>CC511749</u>   |     |                   |                    |
| Removed Cal Gas Conc:  | 5.10              | ppm | Rem Gas Exp Date: | N/A                |
| Removed Gas Cyl #:     | <u>N/A</u>        |     | Diff between cyl: |                    |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 3565               |
| ZAG Make/Model:        | Teledyne API T701 |     | Serial Number:    | 5609               |

### Analyzer Information

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

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.995507     | 1.000364      | Backgd or Offset: | 2.30         | 2.27          |
| Calibration intercept: | 0.059999     | 0.439997      | Coeff or Slope:   | 0.919        | 0.919         |

### 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----   |
| as found span         | 4921                          | 78.4                        | 80.0                                | 79.0                               | 1.013  |
| as found 2nd point    | 4960                          | 39.2                        | 40.0                                | 39.5                               | 1.013  |
| as found 3rd point    | 4980                          | 19.6                        | 20.0                                | 19.9                               | 1.005  |
| 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                              | 4921                          | 78.4                        | 80.0                                | 80.3                               | 0.996   |
| second point                            | 4960                          | 39.2                        | 40.0                                | 40.7                               | 0.983   |
| third point                             | 4980                          | 19.6                        | 20.0                                | 20.6                               | 0.971   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 1.0                                | ----  |
| as left span                            | 4921                          | 78.4                        | 80.0                                | 79.4                               | 1.007   |
| SO2 Scrubber Check                      | 4919                          | 81.3                        | 813.0                               | 0.0                                | ----  |
| Date of last scrubber change:           | December 17, 2021             |                             |                                     | Ave Corr Factor                    | 0.983   |
| Date of last converter efficiency test: | efficiency                    |                             |                                     |                                    |   |

|                          |      |                 |          |               |          |
|--------------------------|------|-----------------|----------|---------------|----------|
| Baseline Corr As found:  | 79.0 | Prev response:  | 79.69    | *% change:    | -0.9%    |
| Baseline Corr 2nd AF pt: | 39.5 | AF Slope:       | 0.986934 | AF Intercept: | 0.060001 |
| Baseline Corr 3rd AF pt: | 19.9 | AF Correlation: | 0.999995 |               |          |

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

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

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## TRS Calibration Summary

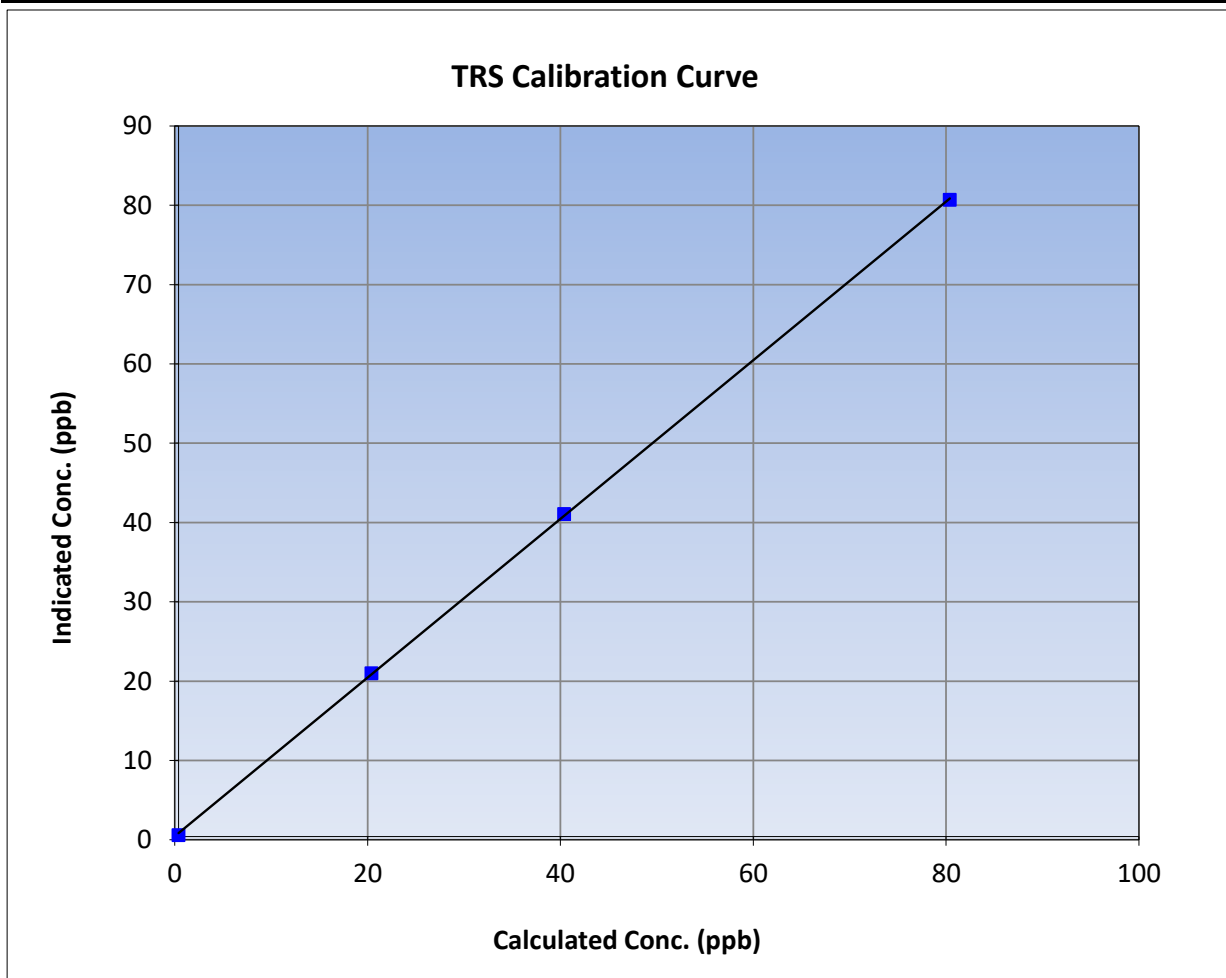
Version-11-2021

### Station Information

|                   |                          |                       |                   |
|-------------------|--------------------------|-----------------------|-------------------|
| Calibration Date: | March 13, 2023           | Previous Calibration: | February 13, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01             |
| Start Time (MST): | 9:58                     | End Time (MST):       | 15:33             |
| Analyzer make:    | Thermo 43i-TLE           | Analyzer serial #:    | 1218153461        |

### Calibration Data

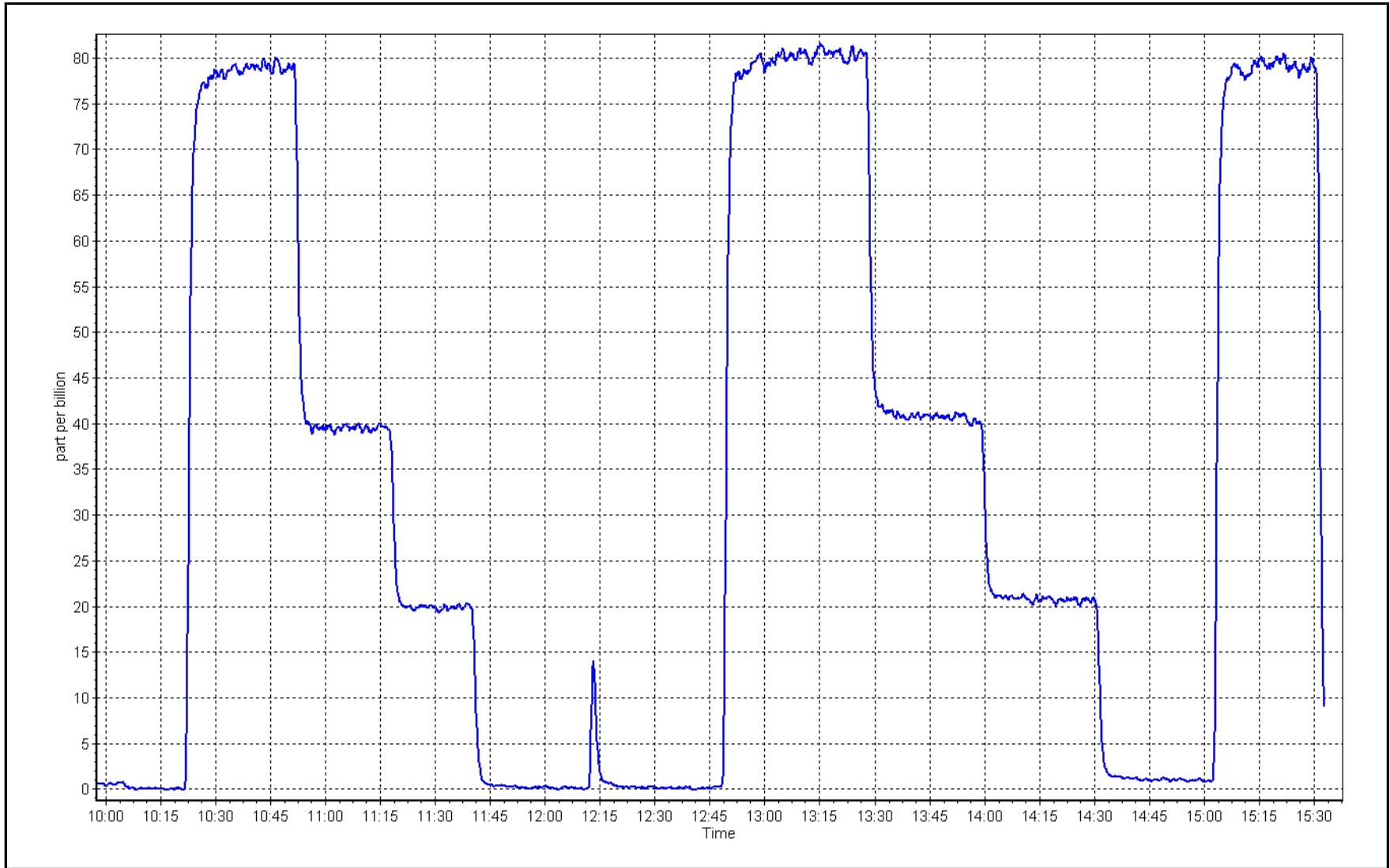
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999952 | ≥0.995      |
| 80.0                                | 80.3                               | 0.9962                    |                         |          |             |
| 40.0                                | 40.7                               | 0.9828                    | Slope                   | 1.000364 | 0.90 - 1.10 |
| 20.0                                | 20.6                               | 0.9708                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.439997 | +/-3        |



TRS Calibration Plot

Date: March 13, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Bertha Ganter-Fort McKay      Station number: AMS01  
 Calibration Date: March 13, 2023      Last Cal Date: February 13, 2023  
 Start time (MST): 9:58      End time (MST): 15:33  
 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: 5609

### Analyzer Information

Analyzer make: Thermo 43iQTL      Analyzer serial #: 1200326167  
 Converter make: Thermo Converter      Converter serial #: N/A  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.996946     | 0.996518      | Backgd or Offset: 1.95 | 1.94          |
| Calibration intercept: | 0.361624     | 0.401597      | Coeff or Slope: 1.014  | 1.014         |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4921                          | 78.4                        | 80.0                                | 79.7                               | 1.005  |
| as found 2nd point    | 4960                          | 39.2                        | 40.0                                | 40.3                               | 0.995  |
| as found 3rd point    | 4980                          | 19.6                        | 20.0                                | 20.3                               | 0.990  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| high point                              | 4921                          | 78.4                        | 80.0                                | 80.1                               | 0.999   |
| second point                            | 4961                          | 39.2                        | 40.0                                | 40.3                               | 0.992   |
| third point                             | 4980                          | 19.6                        | 20.0                                | 20.3                               | 0.985   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.6                                | ----  |
| as left span                            | 4921                          | 78.4                        | 80.0                                | 79.1                               | 1.011   |
| SO2 Scrubber Check                      | 4919                          | 81.3                        | 813.0                               | -0.2                               | ----  |
| Date of last scrubber change:           | March 21, 2022                |                             |                                     | Ave Corr Factor                    | 0.992   |
| Date of last converter efficiency test: | efficiency                    |                             |                                     |                                    |   |

Baseline Corr As found: 79.6      Prev response: 80.09      \*% change: -0.6%  
 Baseline Corr 2nd AF pt: 40.2      AF Slope: 0.994559      AF Intercept: 0.299997  
 Baseline Corr 3rd AF pt: 20.2      AF Correlation: 0.999964

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

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

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

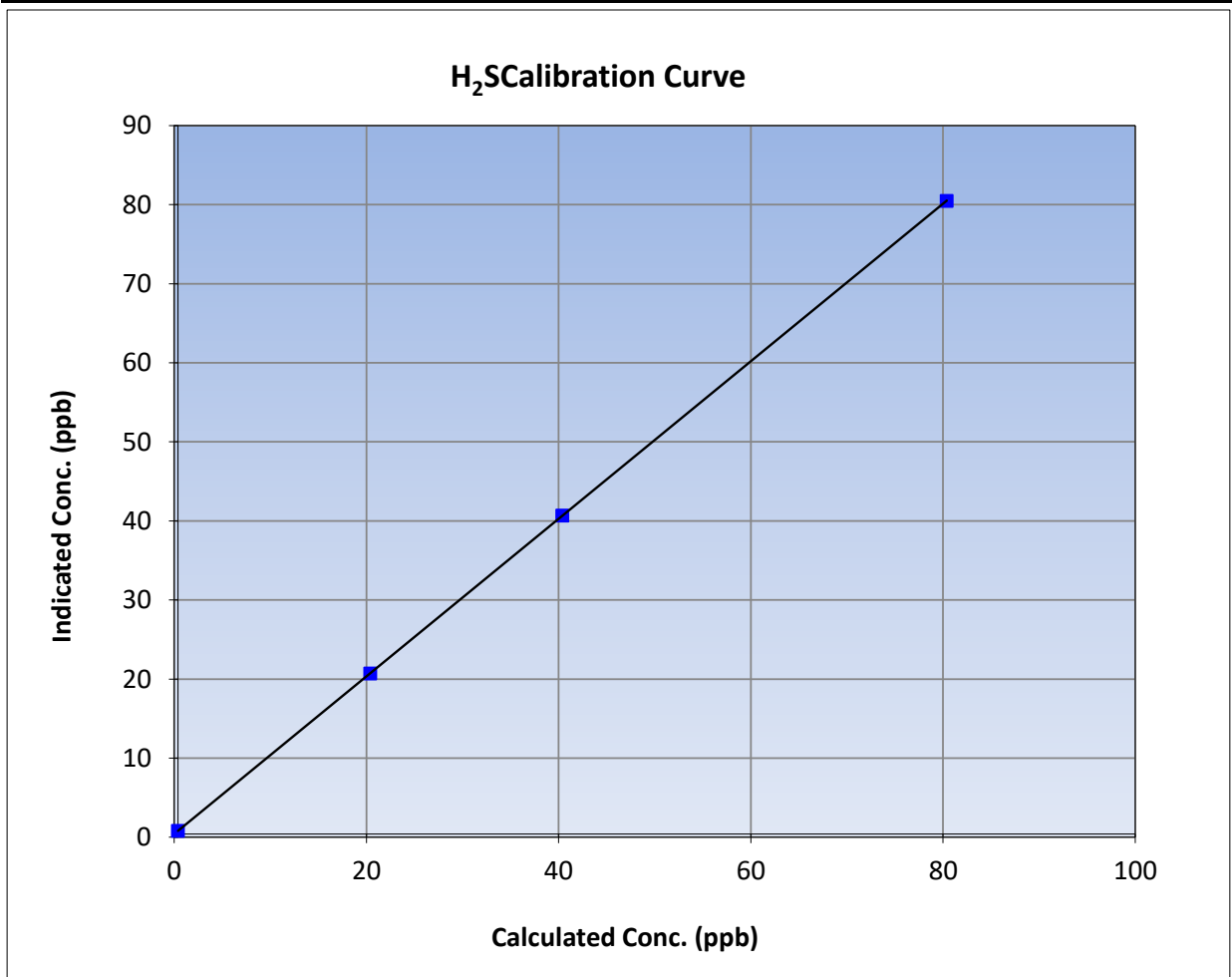
Version-11-2021

### Station Information

|                   |                          |                       |                   |
|-------------------|--------------------------|-----------------------|-------------------|
| Calibration Date: | March 13, 2023           | Previous Calibration: | February 13, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01             |
| Start Time (MST): | 9:58                     | End Time (MST):       | 15:33             |
| Analyzer make:    | Thermo 43iQTL            | Analyzer serial #:    | 1200326167        |

### Calibration Data

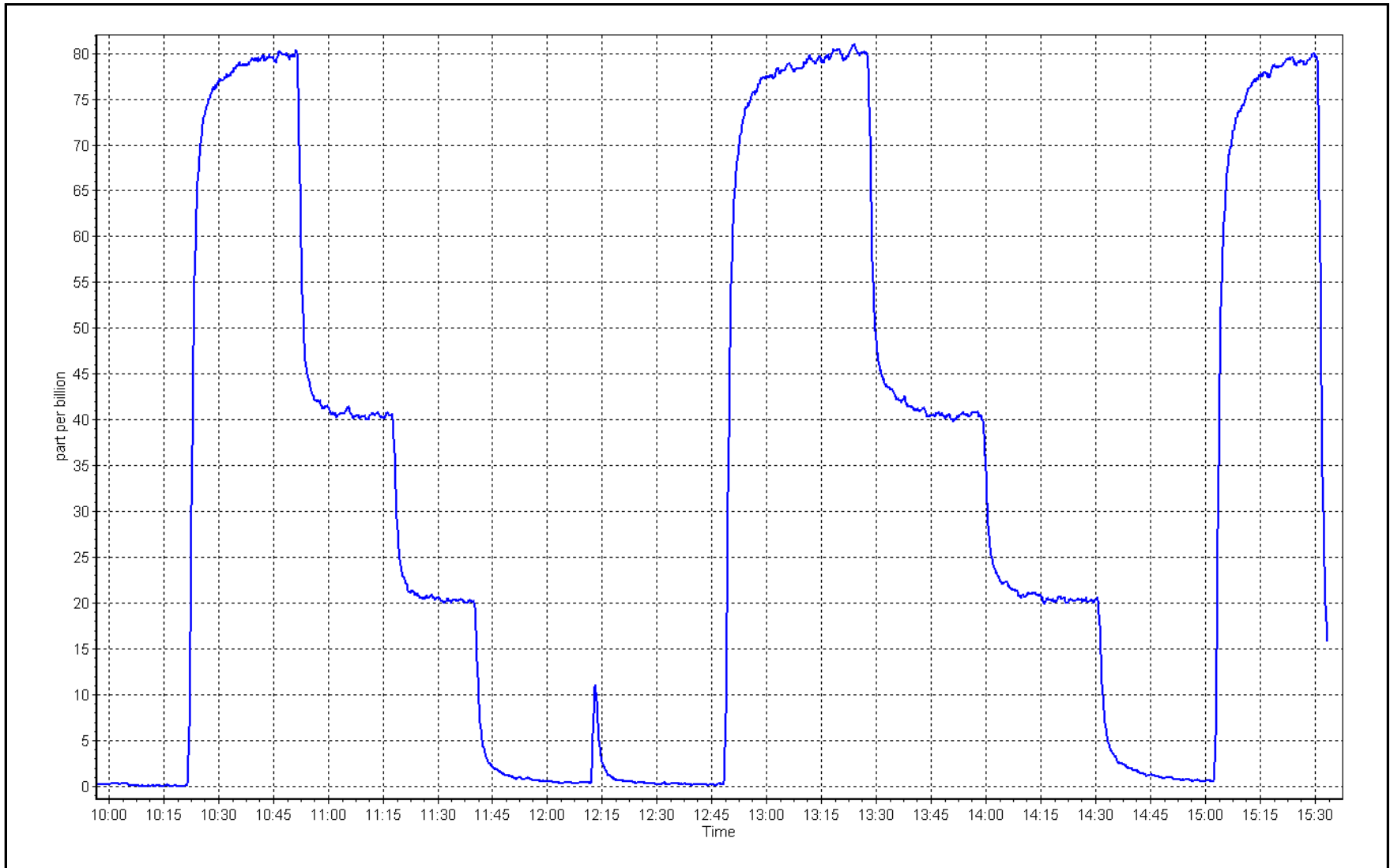
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.4                                | ----                      | Correlation Coefficient | 0.999999 | ≥0.995      |
| 80.0                                | 80.1                               | 0.9987                    |                         |          |             |
| 40.0                                | 40.3                               | 0.9923                    | Slope                   | 0.996518 | 0.90 - 1.10 |
| 20.0                                | 20.3                               | 0.9851                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.401597 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: March 13, 2023

Location: Bertha Ganter-Fort McKay







# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                          |                 |                  |
|-------------------|--------------------------|-----------------|------------------|
| Station Name:     | Bertha Ganter-Fort McKay | Station number: | AMS01            |
| Calibration Date: | March 13, 2023           | Last Cal Date:  | February 1, 2023 |
| Start time (MST): | 15:30                    | End time (MST): | 18:20            |
| Reason:           | Routine                  |                 |                  |

### Calibration Standards

|   |                   |                             |                   |
|---|-------------------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC486642          | Cal Gas Expiry Date:        | February 23, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 497.7 ppm         | CH <sub>4</sub> Equiv Conc. | 1063.1 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.6 ppm         |                             |                   |
| Removed Gas Cert:                           | NA                | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 497.7 ppm         | CH <sub>4</sub> Equiv Conc. | 1063.1 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.6 ppm         | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |                   | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | Teledyne API T700 | Serial Number:              | 3565              |
| ZAG make/model:                             | Teledyne API T701 | Serial Number:              | 5609              |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1180320040 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.52E-04     | 2.64E-04      | NMHC SP Ratio:  | 5.06E-05      |
| CH <sub>4</sub> Retention time: | 14.4         | 14.4          | NMHC Peak Area: | 181561        |
|                                 |              |               |                 | 166551        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4918              | 81.3                 | 17.29                | 16.20               | 1.067                      |
| 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                 | 17.29                | 17.32               | 0.998                      |
| second point          | 4959              | 40.7                 | 8.65                 | 8.62                | 1.004                      |
| third point           | 4980              | 20.3                 | 4.32                 | 4.32                | 0.998                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4918              | 81.3                 | 17.29                | 17.35               | 0.997                      |

| Average Correction Factor |       |                 |       | 1.000                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 16.20 | Prev response   | 17.19 | *% change -6.2%                            |
| Baseline Corr 2nd AF:     | NA    | AF Slope:       |       | AF Intercept:                              |
| Baseline Corr 3rd AF:     | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4918              | 81.3                 | 9.19                 | 8.46                                       | 1.087                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| high point                | 4918              | 81.3                 | 9.19                 | 9.22                                       | 0.998                      |
| second point              | 4959              | 40.7                 | 4.60                 | 4.60                                       | 1.000                      |
| third point               | 4980              | 20.3                 | 2.30                 | 2.31                                       | 0.993                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4918              | 81.3                 | 9.19                 | 9.24                                       | 0.996                      |
| Average Correction Factor |                   |                      |                      |  | 0.997                      |
| Baseline Corr AF:         | 8.46              | Prev response        | 9.14                 | *% change                                  | -8.0%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4918              | 81.3                 | 8.09                 | 7.74                                       | 1.046                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4918              | 81.3                 | 8.09                 | 8.11                                       | 0.998                      |
| second point              | 4959              | 40.7                 | 4.05                 | 4.02                                       | 1.009                      |
| third point               | 4980              | 20.3                 | 2.02                 | 2.01                                       | 1.004                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4918              | 81.3                 | 8.09                 | 8.11                                       | 0.998                      |
| Average Correction Factor |                   |                      |                      |  | 1.004                      |
| Baseline Corr AF:         | 7.74              | Prev response        | 8.05                 | *% change                                  | -4.1%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.995861     | 1.001736      |
| THC Cal Offset:             | -0.022506    | -0.010696     |
| CH <sub>4</sub> Cal Slope:  | 0.996625     | 1.001692      |
| CH <sub>4</sub> Cal Offset: | -0.014967    | -0.013161     |
| NMHC Cal Slope:             | 0.994978     | 1.001763      |
| NMHC Cal Offset:            | -0.007938    | 0.002265      |

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

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## THC Calibration Summary

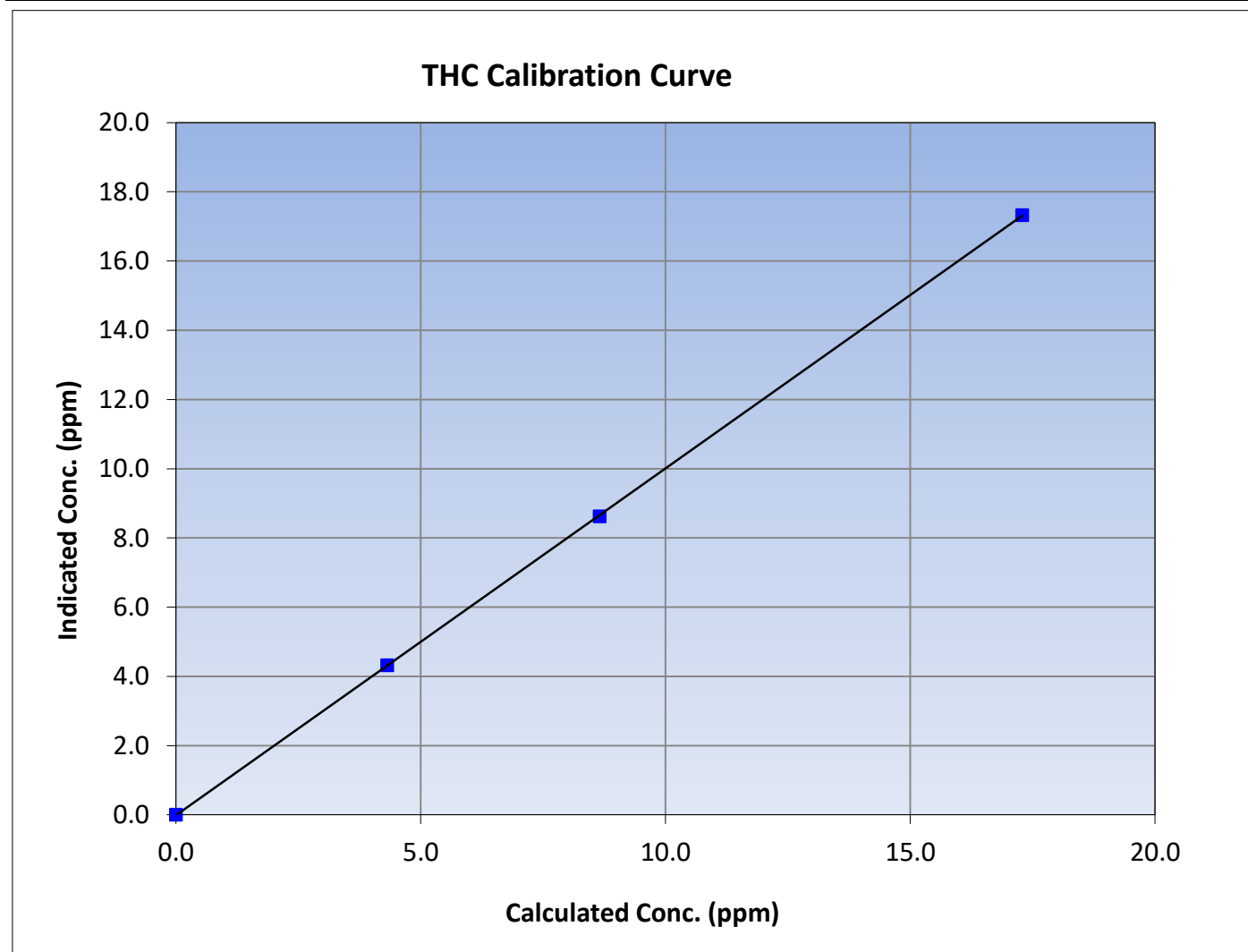
Version-01-2020

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | March 13, 2023           | Previous Calibration: | February 1, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 15:30                    | End Time (MST):       | 18:20            |
| Analyzer make:    | Thermo 55i               | Analyzer serial #:    | 1180320040       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999988  | $\geq 0.995$  |       |          |             |
| 17.29                               | 17.32                              | 0.9979                    |                         |           |               |       |          |             |
| 8.65                                | 8.62                               | 1.0039                    |                         |           |               | Slope | 1.001736 | 0.90 - 1.10 |
| 4.32                                | 4.32                               | 0.9982                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.010696 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

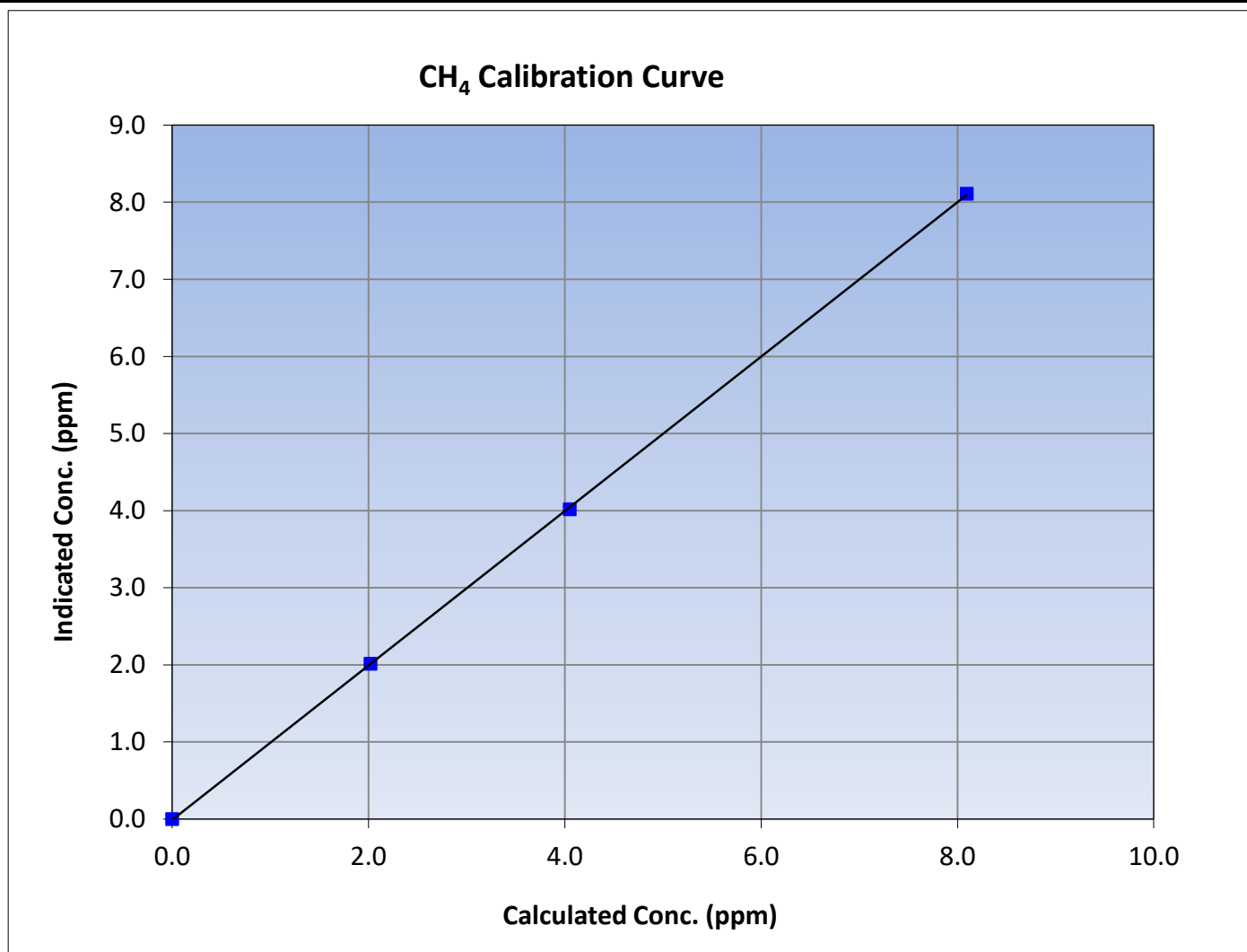
Version-01-2020

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | March 13, 2023           | Previous Calibration: | February 1, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 15:30                    | End Time (MST):       | 18:20            |
| Analyzer make:    | Thermo 55i               | Analyzer serial #:    | 1180320040       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999968  | $\geq 0.995$  |
| 8.09                                | 8.11                               | 0.9982                    |                         |           |               |
| 4.05                                | 4.02                               | 1.0085                    |                         |           |               |
| 2.02                                | 2.01                               | 1.0043                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 1.001692  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.013161 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

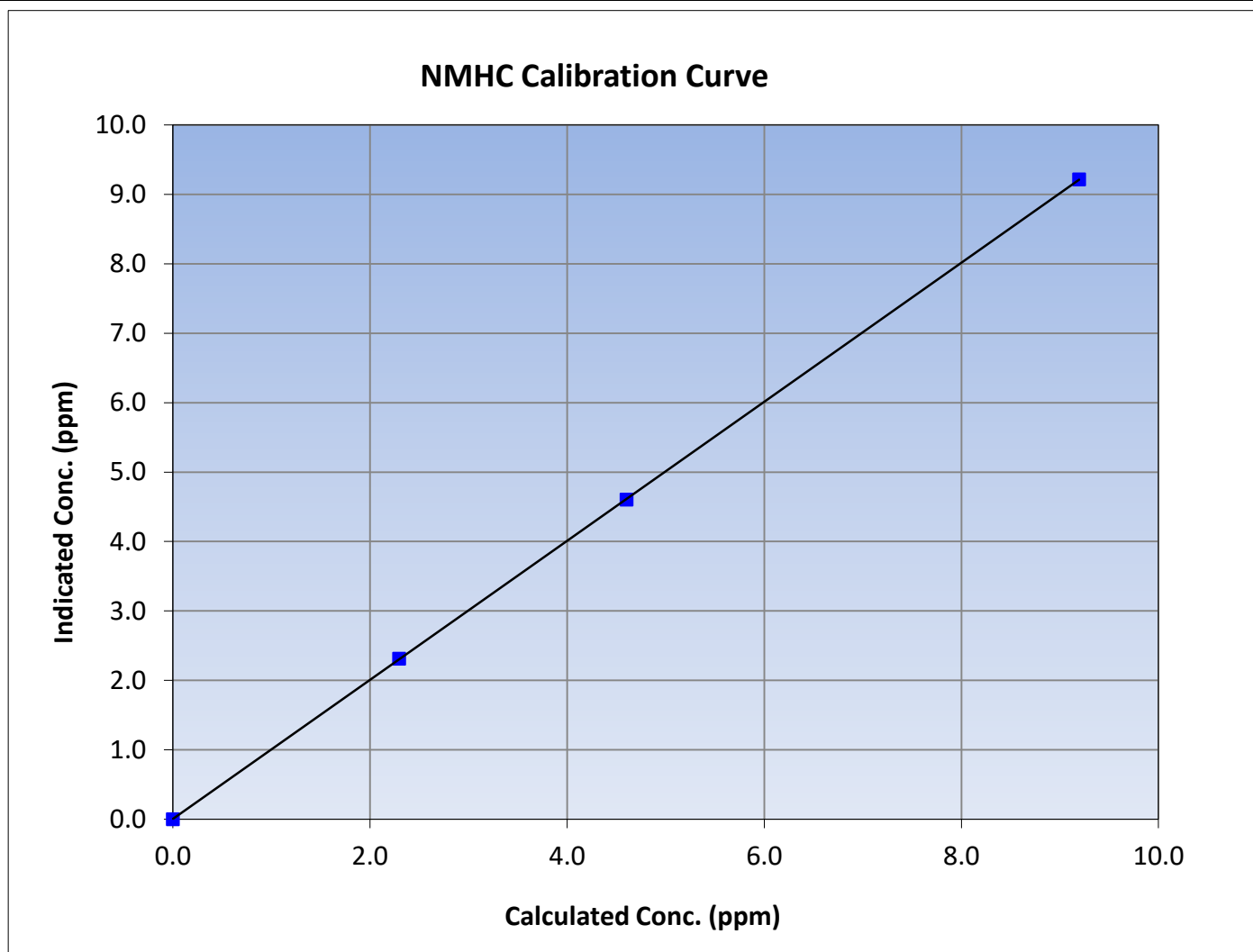
Version-01-2020

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | March 13, 2023           | Previous Calibration: | February 1, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 15:30                    | End Time (MST):       | 18:20            |
| Analyzer make:    | Thermo 55i               | Analyzer serial #:    | 1180320040       |

### Calibration Data

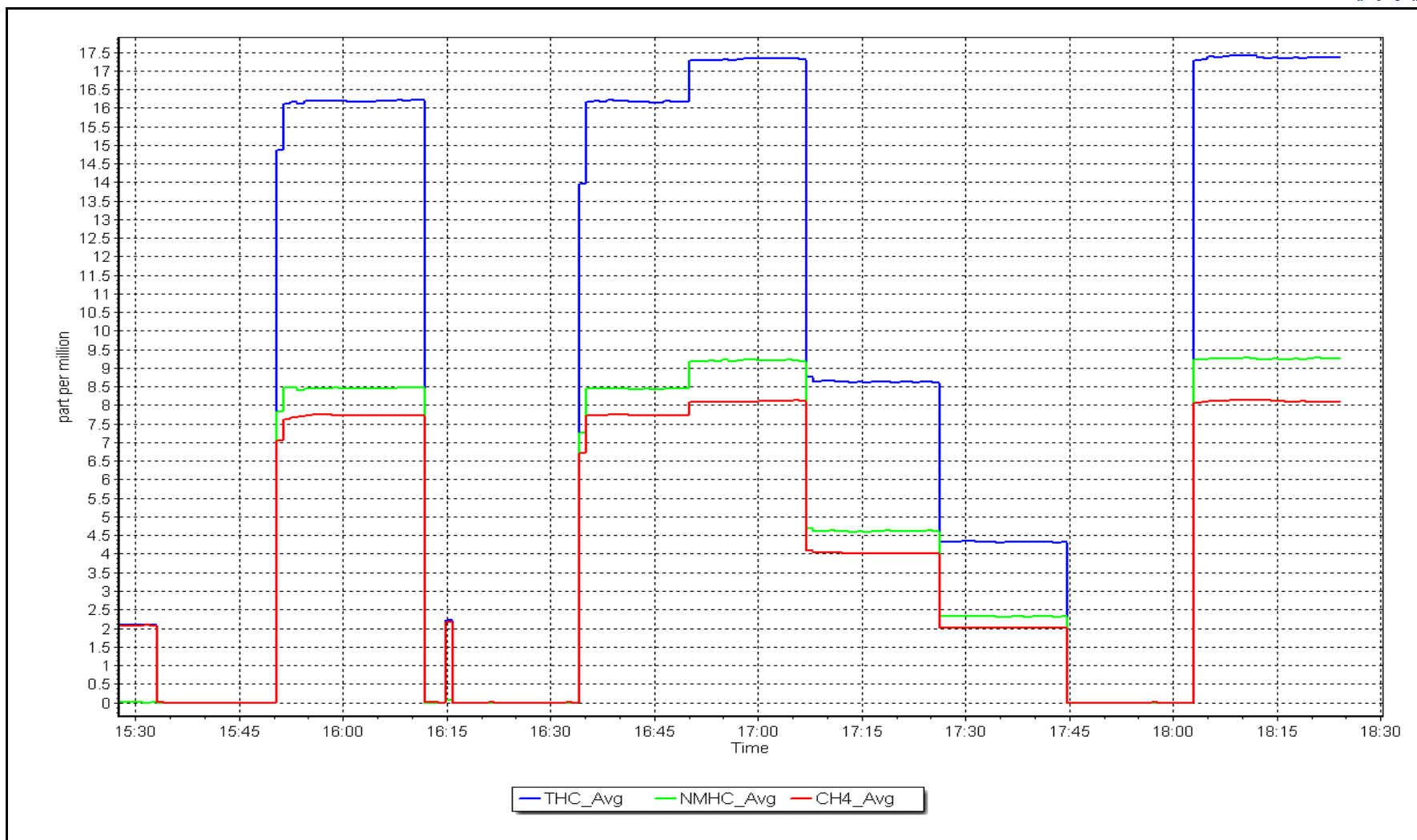
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999995 | $\geq 0.995$  |       |          |             |
| 9.19                                | 9.22                               | 0.9977                    |                         |          |               |       |          |             |
| 4.60                                | 4.60                               | 1.0001                    |                         |          |               | Slope | 1.001763 | 0.90 - 1.10 |
| 2.30                                | 2.31                               | 0.9929                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.002265 | $\pm 0.5$     |       |          |             |



# NMHC Calibration Plot

Date: March 13, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Bertha Ganter-Fort McKay      Station number: AMS01  
Calibration Date: March 3, 2023      Last Cal Date: February 2, 2023  
Start time (MST): 10:39      End time (MST): 15:36  
Reason: Routine

### Calibration Standards

NO Gas Cylinder #: T2Y1P9L      Cal Gas Expiry Date: December 11, 2023  
NOX Cal Gas Conc: 50.84 ppm      NO Cal Gas Conc: 50.04 ppm  
Removed Cylinder #: NA      Removed Gas Exp Date: NA  
Removed Gas NOX Conc: 50.84 ppm      Removed Gas NO Conc: 50.04 ppm  
NOX gas Diff:      NO gas Diff:  
Calibrator Model: Teledyne API T700      Serial Number: 3565  
ZAG make/model: Teledyne API T701      Serial Number: 5609

### Analyzer Information

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

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.440        | 1.458         | NO bkgnd or offset:  | 6.8          | 6.9           |
| NOX coeff or slope: | 0.990        | 0.990         | NOX bkgnd or offset: | 6.9          | 7.0           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 194.8        | 196.0         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.997218     | 0.999171      |
| NO <sub>x</sub> Cal Offset: | 0.060000     | -0.060000     |
| NO Cal Slope:               | 0.998701     | 1.000071      |
| NO Cal Offset:              | -0.400000    | -0.880000     |
| NO <sub>2</sub> Cal Slope:  | 0.997388     | 0.998181      |
| NO <sub>2</sub> Cal Offset: | -0.442888    | -0.132907     |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | 0.2                                   | 0.0  | ----  | ----   |
| as found span             | 4920                      | 80.0                        | 813.4   | 800.6                                  | 12.8  | 803.7  | 788.4                                 | 15.5   | 1.0121  | 1.0155   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.4  | 0.3                                   | 0.1  | ----  | ----   |
| high point                | 4920                      | 80.0                        | 813.4   | 800.6                                  | 12.8  | 812.8  | 800.3                                 | 12.5   | 1.0008  | 1.0004   |
| second point              | 4960                      | 40.0                        | 406.7   | 400.3                                  | 6.4   | 406.5  | 399.2                                 | 7.3  | 1.0005  | 1.0028   |
| third point               | 4980                      | 20.0                        | 203.4   | 200.2                                  | 3.2   | 202.4  | 197.9                                 | 4.4  | 1.0047  | 1.0114   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.4  | 0.2                                   | 0.2  | ----  | ----   |
| as left span              | 4920                      | 80.0                        | 813.4   | 388.4                                  | 425.0   | 809.6  | 385.1                                 | 424.4  | 1.0047  | 1.0087   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0020  | 1.0049   |

|                      |                             |                |  |                                  |                         |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 803.5 ppb | NO = 788.2 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -1.0% |                      |
| Previous Response    | NO <sub>x</sub> = 811.2 ppb | NO = 799.2 ppb |  | *Percent Change                  | NO = -1.4%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                             | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|---|--|---------------------------------------|---|--|--|--|
| as found GPT zero                             |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O <sub>3</sub> )       | 796.5                                      | 384.3                                 | 425.0   | 424.4  | 1.0014   | 99.9%  |
| 2nd GPT point (200 ppb O <sub>3</sub> )       | 796.5                                      | 594.2                                 | 215.1   | 213.9  | 1.0056   | 99.4%  |
| 3rd GPT point (100 ppb O <sub>3</sub> )       | 796.5                                      | 697.0                                 | 112.3   | 112.1  | 1.0018   | 99.8%  |
| 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<sub>x</sub> Calibration Summary

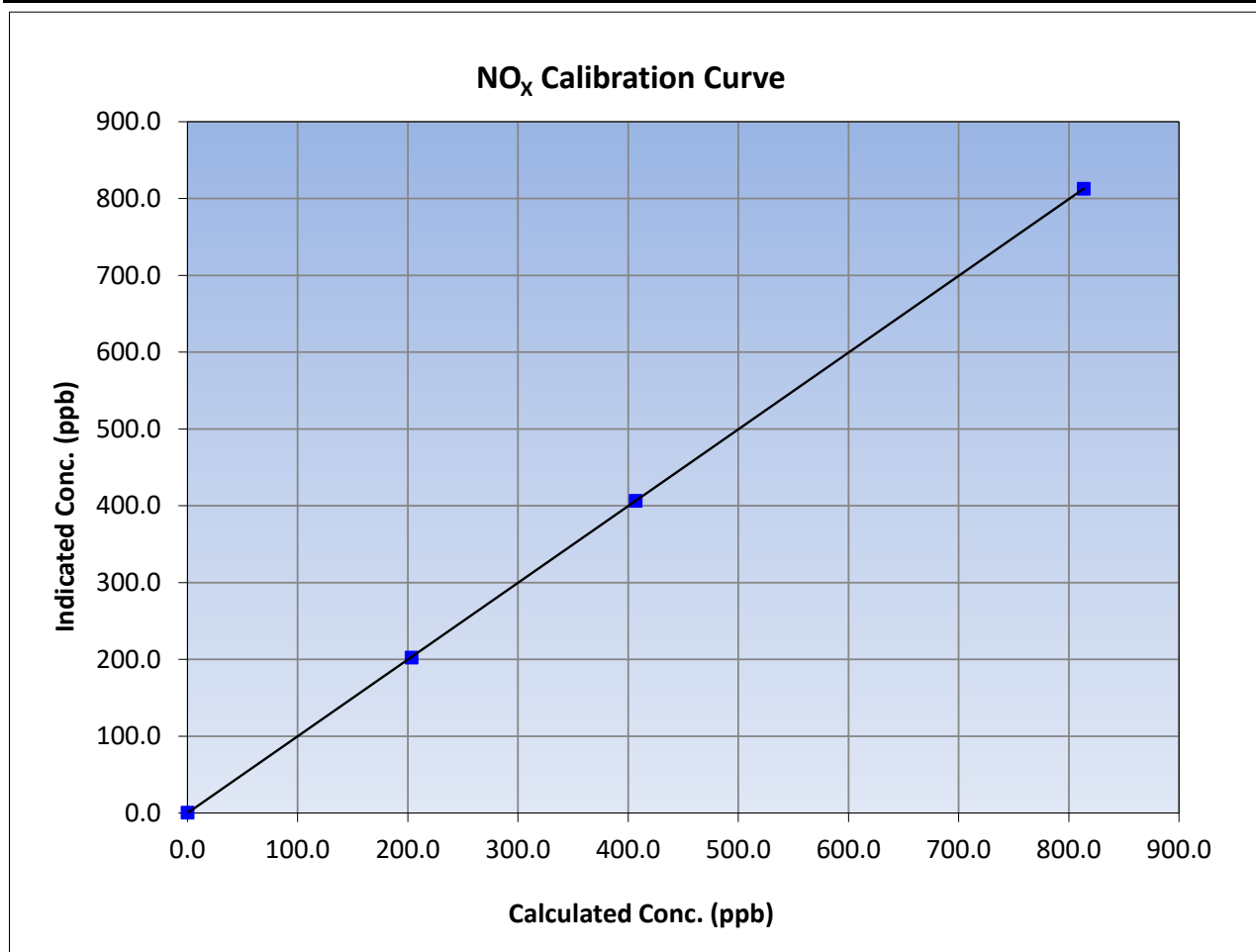
Version-04-2020

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | March 3, 2023            | Previous Calibration: | February 2, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 10:39                    | End Time (MST):       | 15:36            |
| 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                                 | 0.4                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 813.4                               | 812.8                              | 1.0008                    |   |                                |
| 406.7                               | 406.5                              | 1.0005                    |   |                                |
| 203.4                               | 202.4                              | 1.0047                    |   |                                |
|                                     |                                    |                           | 0.999998                                      |                                |
|                                     |                                    |                           | 0.999171                                      |                                |
|                                     |                                    |                           | -0.060000                                     |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

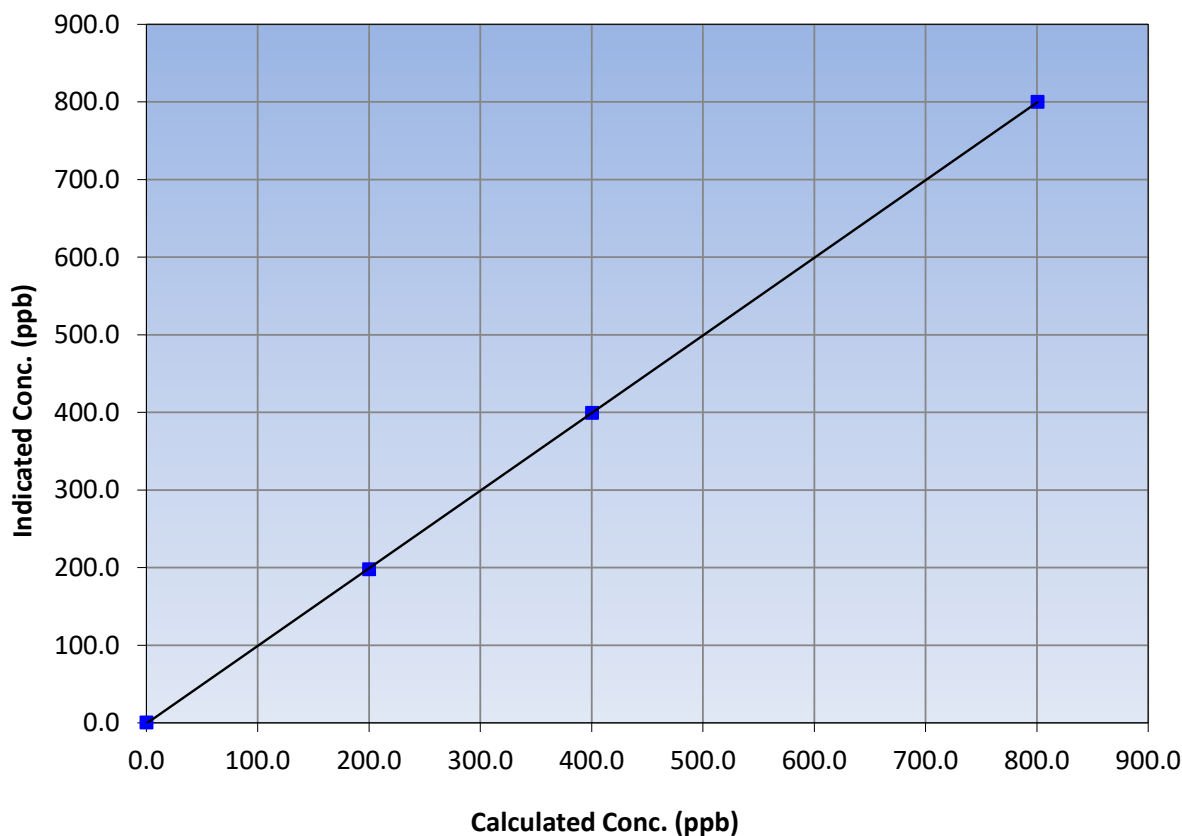
### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | March 3, 2023            | Previous Calibration: | February 2, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 10:39                    | End Time (MST):       | 15:36            |
| Analyzer make:    | Thermo 42i               | Analyzer serial #:    | 1218153357       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.6                               | 800.3                              | 1.0004                    |   |                                |
| 400.3                               | 399.2                              | 1.0028                    |   |                                |
| 200.2                               | 197.9                              | 1.0114                    |   |                                |
|                                     |                                    |                           |   |                                |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

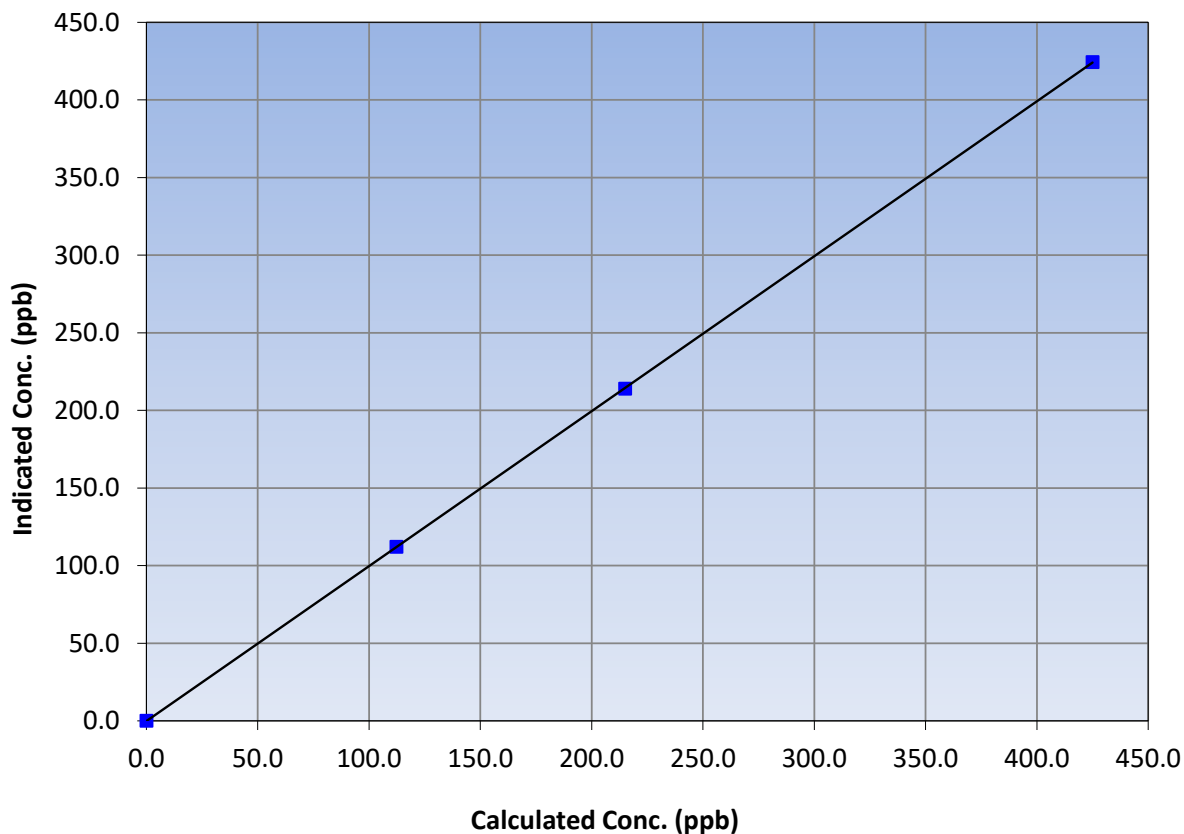
### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | March 3, 2023            | Previous Calibration: | February 2, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 10:39                    | End Time (MST):       | 15:36            |
| Analyzer make:    | Thermo 42i               | Analyzer serial #:    | 1218153357       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | ≥0.995    |             |
| 425.0                               | 424.4                              | 1.0014                    |                         |           |             |
| 215.1                               | 213.9                              | 1.0056                    |                         |           |             |
| 112.3                               | 112.1                              | 1.0018                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 0.998181  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.132907 | +/-20       |

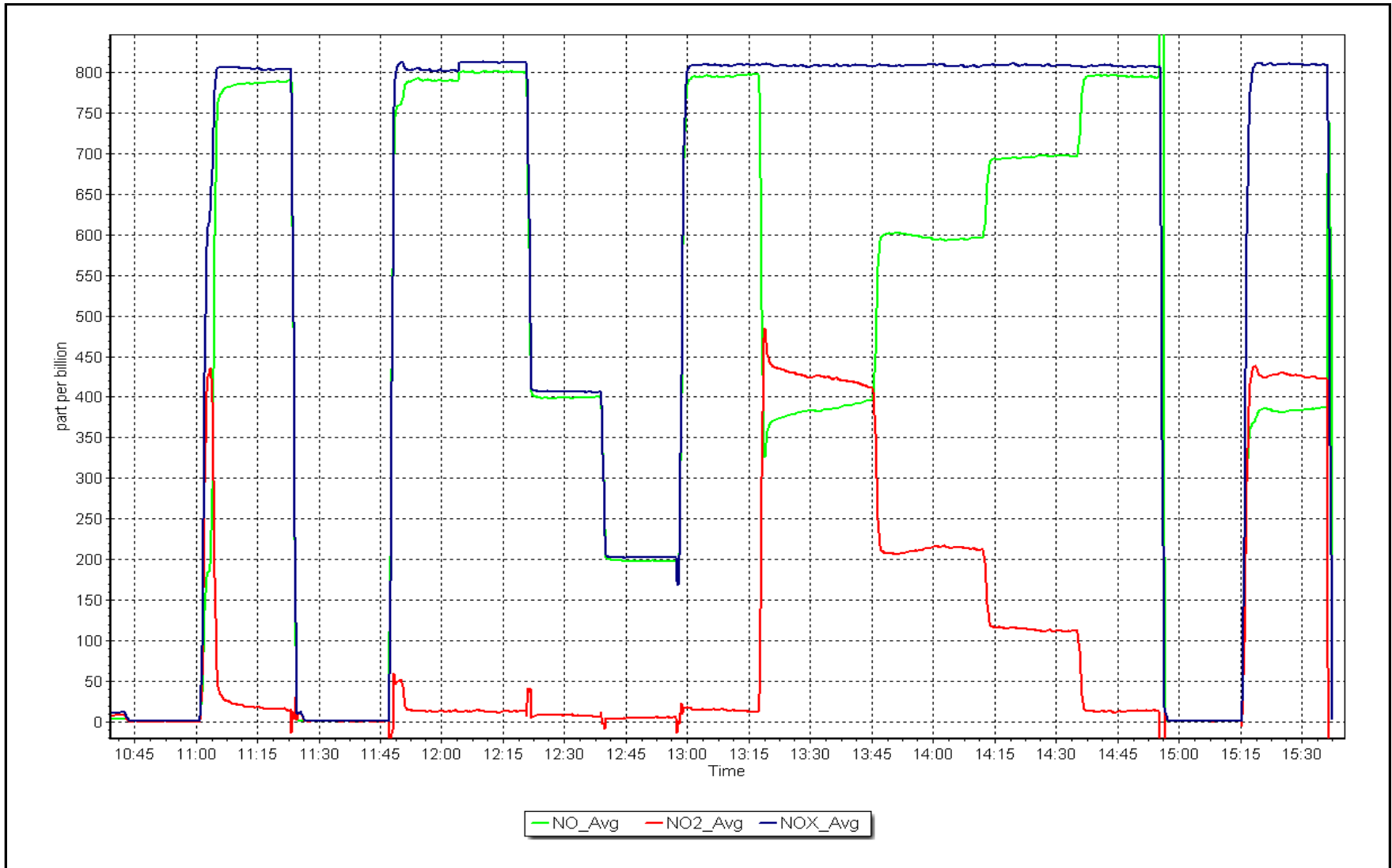
**NO<sub>2</sub> Calibration Curve**



# NO<sub>x</sub> Calibration Plot

Date: March 3, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Bertha Ganter-Fort McKay      Station number: AMS01  
 Calibration Date: March 1, 2023      Last Cal Date: February 8, 2023  
 Start time (MST): 11:28      End time (MST): 14:20  
 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: 5609

### Analyzer Information

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

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 1.000086     | 0.999829      | Backgd or Offset: | 2.4          | 2.5           |
| Calibration intercept: | 0.760000     | 0.780000      | Coeff or Slope:   | 1.016        | 1.025         |

### O<sub>3</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                       | 0.0                           | 0.0                                 | 0.3                                | ----  |
| as found span             | 5000                       | 855.5                         | 400.0                               | 398.3                              | 1.004   |
| as found 2nd point        |                            |                               |                                     |                                    |   |
| as found 3rd point        |                            |                               |                                     |                                    |   |
| calibrator zero           | 5000                       | 0.0                           | 0.0                                 | 0.3                                | ----  |
| high point                | 5000                       | 855.5                         | 400.0                               | 400.3                              | 0.999   |
| second point              | 5000                       | 738.6                         | 200.0                               | 201.5                              | 0.993   |
| third point               | 5000                       | 649.2                         | 100.0                               | 100.9                              | 0.991   |
| as left zero              | 5000                       | 0.0                           | 0.0                                 | 0.3                                | ----  |
| as left span              | 5000                       | 855.5                         | 400.0                               | 401.0                              | 0.998   |
| Average Correction Factor |                            |                               |                                     |                                    | 0.994   |

|                          |       |                   |       |               |       |
|--------------------------|-------|-------------------|-------|---------------|-------|
| Baseline Corr As found:  | 398.0 | Previous response | 400.8 | *% change     | -0.7% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:         |       | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation:   |       |               |       |

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

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

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

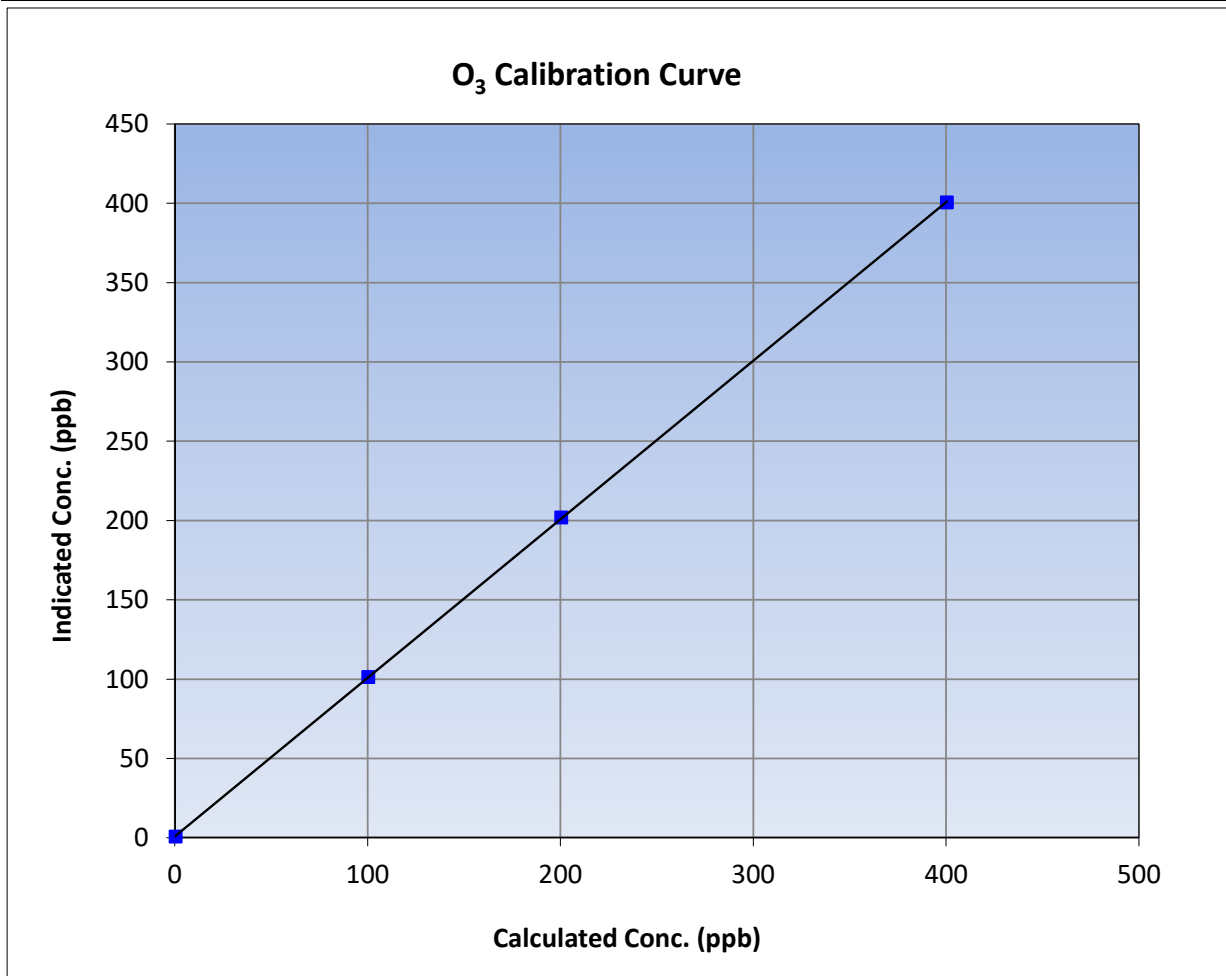
Version-01-2020

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | March 1, 2023            | Previous Calibration: | February 8, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 11:28                    | End Time (MST):       | 14:20            |
| Analyzer make:    | Teledyne API T400        | Analyzer serial #:    | 1107             |

### Calibration Data

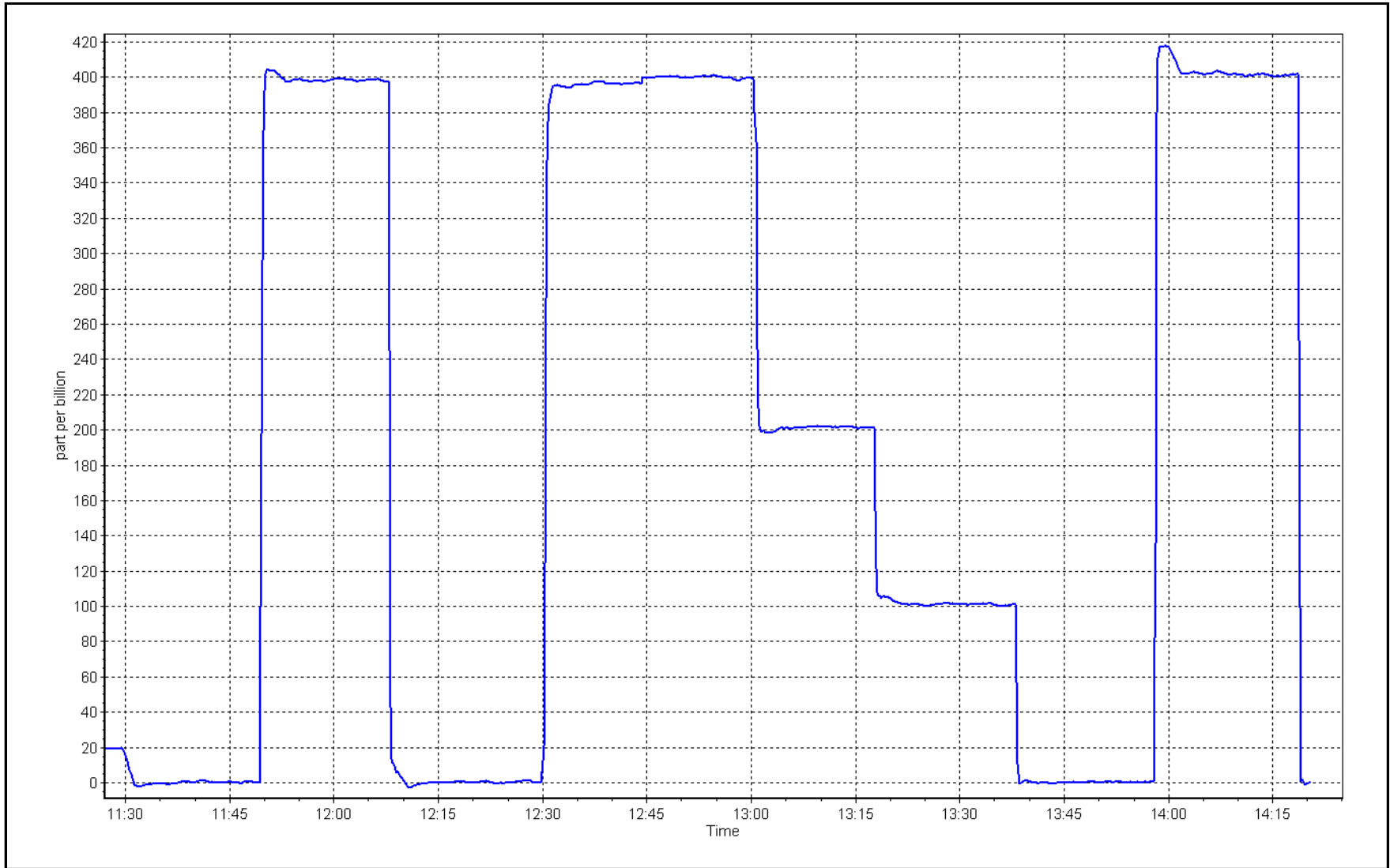
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient | 0.999989 | ≥0.995      |
| 400.0                               | 400.3                              | 0.9993                    |                         |          |             |
| 200.0                               | 201.5                              | 0.9926                    | Slope                   | 0.999829 | 0.90 - 1.10 |
| 100.0                               | 100.9                              | 0.9911                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.780000 | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: March 1, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Fort McKay - Bertha Ganter      Station number: AMS 01  
 Calibration Date: March 30, 2023      Last Cal Date: February 16, 2023  
 Start time (MST): 11:13      End time (MST): 14:17

Analyzer Make: API T640      S/N: 306  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Delta Cal      S/N: 1450  
 Temp/RH standard: Delta Cal      S/N: 1450

### Monthly Calibration Test

| Parameter  | As found | Measured | As left | Adjusted                 | (Limits)     |
|------------|----------|----------|---------|--------------------------|--------------|
| T (°C)     | -2.9     | -2.4     | -2.9    | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 733.5    | 734.1    | 733.5   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.03     | 5.00     | 5.03    | <input type="checkbox"/> | +/- 0.25 LPM |

Leak Test:      Date of check: March 30, 2023      Last Cal Date: February 16, 2023  
 PM w/o HEPA: 13.2      PM w/ HEPA: 0      <0.2 ug/m3

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

Inlet cleaning :      Inlet Head

### Quarterly Calibration Test

| Parameter     | As found | Post maintenance | As left | Adjusted                 | (Limits)     |
|---------------|----------|------------------|---------|--------------------------|--------------|
| PMT Peak Test | 9.5      | 11               | 11      | <input type="checkbox"/> | 10.9 +/- 0.5 |

Post-maintenance leak check:      PM w/o HEPA: 13      w/ HEPA: 0  
 Date Optical Chamber Cleaned:      March 30, 2023  
 Disposable Filter Changed:      March 30, 2023      <0.2 ug/m3

### Annual Maintenance

Date Sample Tube Cleaned:      August 31, 2022  
 Date RH/T Sensor Cleaned:      December 19, 2022

Notes:      Flow, temperature and pressure verified. Leak check passed. Optical chamber cleaned. Disposable filter changed. PMT peak test within limits post maintenance, no adjustments made. Inlet head cleaned.

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 8, 2023            | Last Cal Date:  | February 15, 2023 |
| Start time (MST): | 10:59                    | End time (MST): | 14:22             |
| Reason:           | Routine                  |                 |                   |

### Calibration Standards

|                        |                   |     |                   |                  |
|------------------------|-------------------|-----|-------------------|------------------|
| Cal Gas Concentration: | <u>3040</u>       | ppm | Cal Gas Exp Date: | December 1, 2028 |
| Cal Gas Cylinder #:    | <u>ALM042207</u>  |     |                   |                  |
| Removed Cal Gas Conc:  | <u>3040</u>       | ppm | Rem Gas Exp Date: | NA               |
| Removed Gas Cyl #:     | <u>NA</u>         |     | Diff between cyl: |                  |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 3565             |
| ZAG Make/Model:        | Teledyne API T701 |     | Serial Number:    | 5609             |

### Analyzer Information

|                 |                   |                    |      |
|-----------------|-------------------|--------------------|------|
| Analyzer make:  | Teledyne API T300 | Analyzer serial #: | 3520 |
| Analyzer Range: | 0 - 50 ppm        |                    |      |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.001201     | 1.002977      | Backgd or Offset: | -0.012       | -0.012        |
| Calibration intercept: | 0.093816     | 0.109828      | Coeff or Slope:   | 0.991        | 0.996         |

### 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as found span             | 4933                          | 66.7                        | 40.6                                | 40.9                               | 0.993   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                | 4933                          | 66.7                        | 40.6                                | 40.7                               | 0.997   |
| second point              | 4966                          | 33.3                        | 20.2                                | 20.7                               | 0.980   |
| third point               | 4983                          | 16.7                        | 10.2                                | 10.3                               | 0.990   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span              | 2960                          | 40.0                        | 40.5                                | 40.2                               | 1.010   |
| Average Correction Factor |                               |                             |                                     |                                    | 0.989   |

|                          |       |                 |       |               |      |
|--------------------------|-------|-----------------|-------|---------------|------|
| Baseline Corr As found:  | 40.72 | Prev response:  | 40.70 | *% change:    | 0.1% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:       |       | AF Intercept: |      |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation: |       |               |      |

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

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

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## CO Calibration Summary

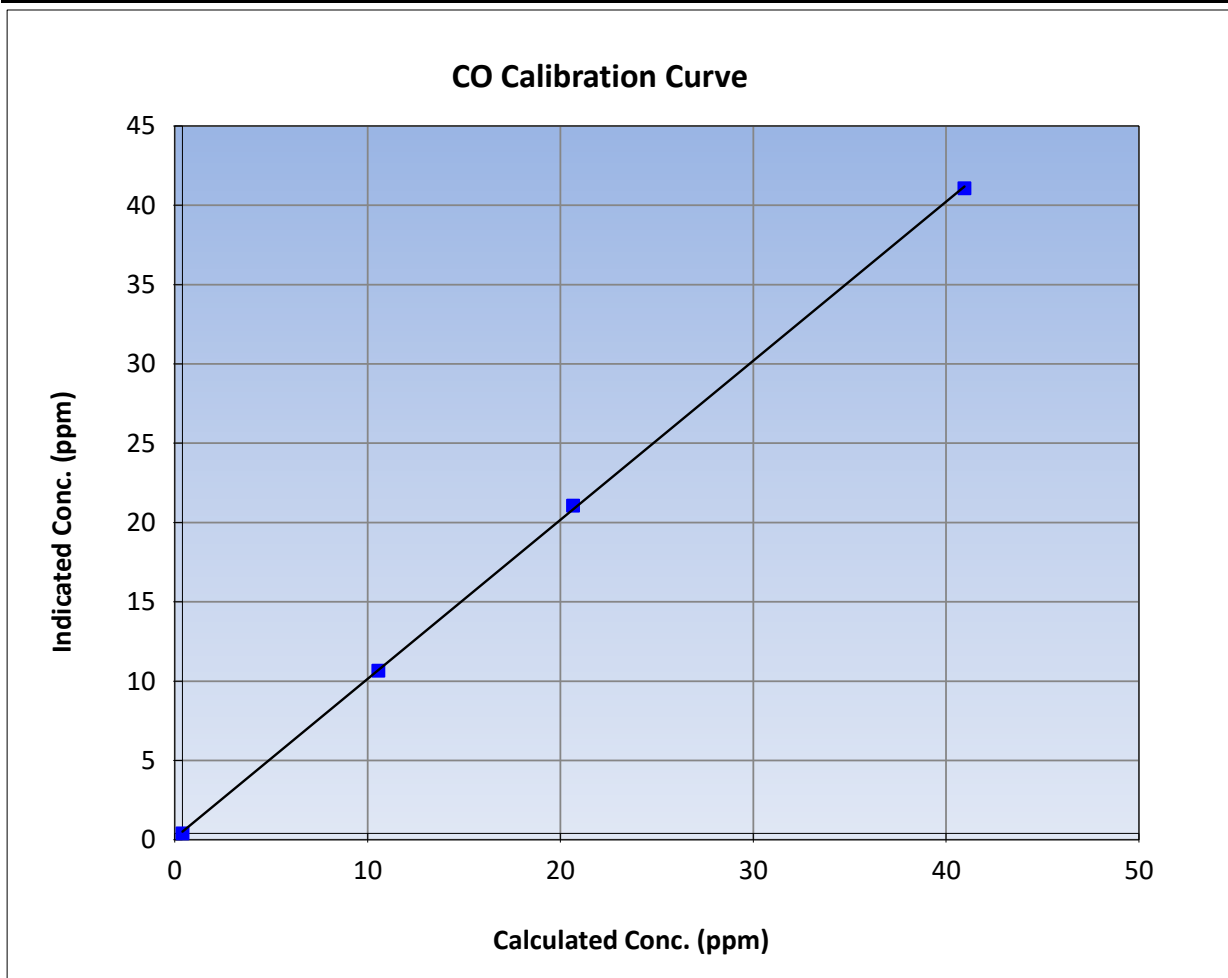
Version-01-2020

### Station Information

|                   |                          |                       |                   |
|-------------------|--------------------------|-----------------------|-------------------|
| Calibration Date: | March 8, 2023            | Previous Calibration: | February 15, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01             |
| Start Time (MST): | 10:59                    | End Time (MST):       | 14:22             |
| Analyzer make:    | Teledyne API T300        | Analyzer serial #:    | 3520              |

### Calibration Data

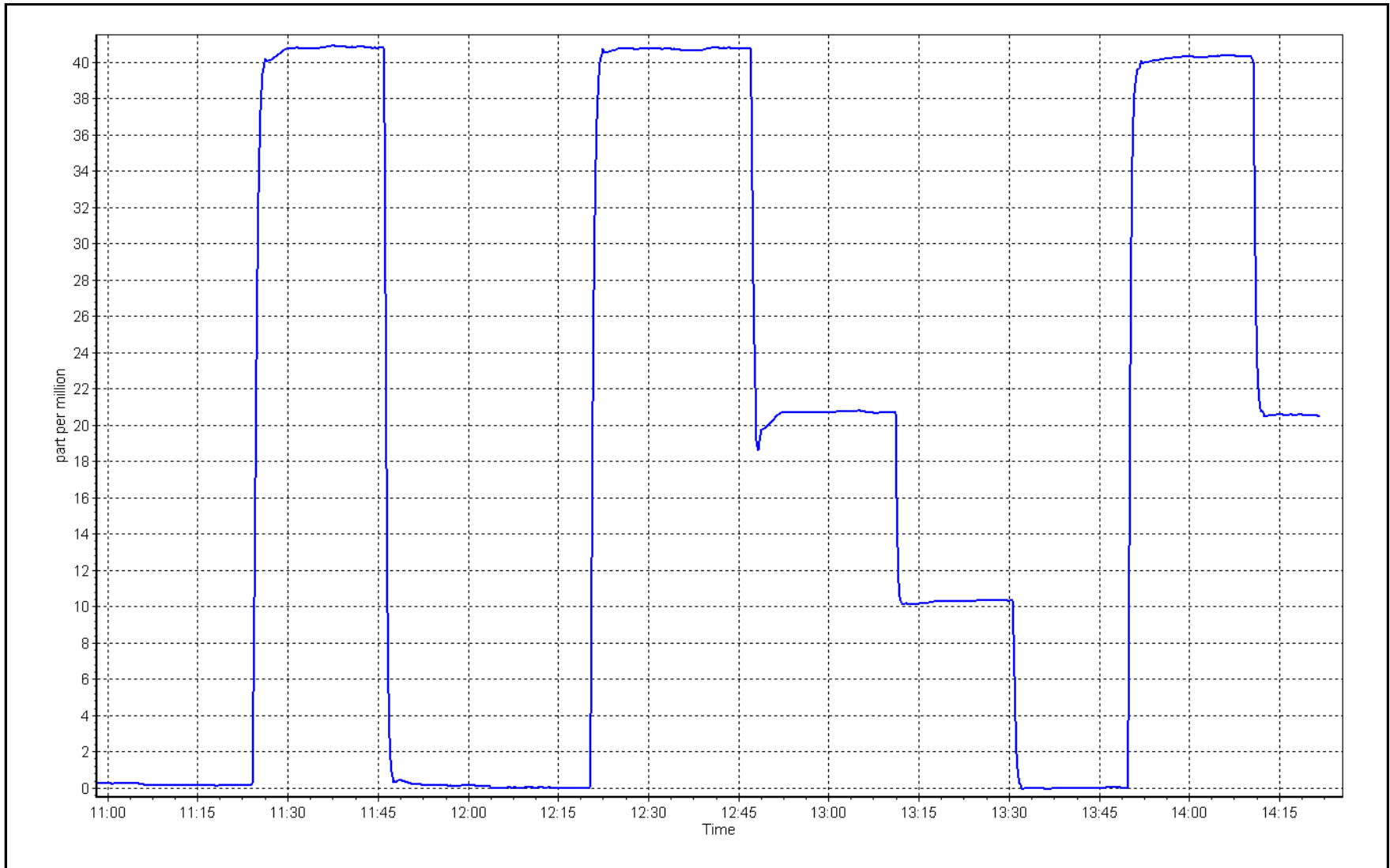
| Calculated concentration<br>(ppm) (Cc) | Indicated concentration<br>(ppm) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |               |
|--|---------------------------------------|------------------------------|-------------------------|---------------|---------------|
| 0.0                                    | 0.0                                   | ----                         | Correlation Coefficient | 0.999903      |               |
| 40.6                                   | 40.7                                  | 0.9972                       |                         |               | $\geq 0.995$  |
| 20.2                                   | 20.7                                  | 0.9796                       | Slope                   | 1.002977      |               |
| 10.2                                   | 10.3                                  | 0.9897                       |                         |               | $0.90 - 1.10$ |
|  |                                       |                              | Intercept               | 0.109828      | $\pm 1.5$     |



CO Calibration Plot

Date: March 8, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## CO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                          |                 |                  |
|-------------------|--------------------------|-----------------|------------------|
| Station Name:     | Bertha Ganter-Fort McKay | Station number: | AMS01            |
| Calibration Date: | March 7, 2023            | Last Cal Date:  | February 7, 2023 |
| Start time (MST): | 10:47                    | End time (MST): | 14:38            |
| Reason:           | Routine                  |                 |                  |

### Calibration Standards

|                        |                   |     |                   |                  |
|------------------------|-------------------|-----|-------------------|------------------|
| Cal Gas Concentration: | 60,200            | ppm | Cal Gas Exp Date: | December 1, 2028 |
| Cal Gas Cylinder #:    | <u>ALM042207</u>  |     |                   |                  |
| Removed Cal Gas Conc:  | <u>60,200</u>     | ppm | Rem Gas Exp Date: | NA               |
| Removed Gas Cyl #:     | <u>NA</u>         |     | 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    |                        |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <b>Start</b> | <b>Finish</b> |                   | <b>Start</b> | <b>Finish</b> |
| Calibration slope:     | 0.999874     | 1.002067      | Backgd or Offset: | 0.037        | 0.037         |
| Calibration intercept: | -5.820000    | -4.460000     | Coeff or Slope:   | 0.883        | 0.880         |

### CO<sub>2</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 3000                          | 0.0                         | 0.0                                 | -0.3                               | ----  |
| as found span             | 2920                          | 80.0                        | 1605.3                              | 1617.9                             | 0.992   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 3000                          | 0.0                         | 0.0                                 | -0.2                               | ----  |
| high point                | 2920                          | 80.0                        | 1605.3                              | 1606.1                             | 1.000   |
| second point              | 2960                          | 40.0                        | 802.7                               | 798.4                              | 1.005   |
| third point               | 2980                          | 20.0                        | 401.3                               | 393.0                              | 1.021   |
| as left zero              | 3000                          | 0.0                         | 0.0                                 | -0.4                               | ----  |
| as left span              | 2960                          | 40.0                        | 802.7                               | 785.7                              | 1.022   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.009   |

|                          |         |                 |         |               |      |
|--------------------------|---------|-----------------|---------|---------------|------|
| Baseline Corr As found:  | 1618.20 | Prev response:  | 1599.31 | *% 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 the inlet filter after as founds. Adjusted span only.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## CO<sub>2</sub> Calibration Summary

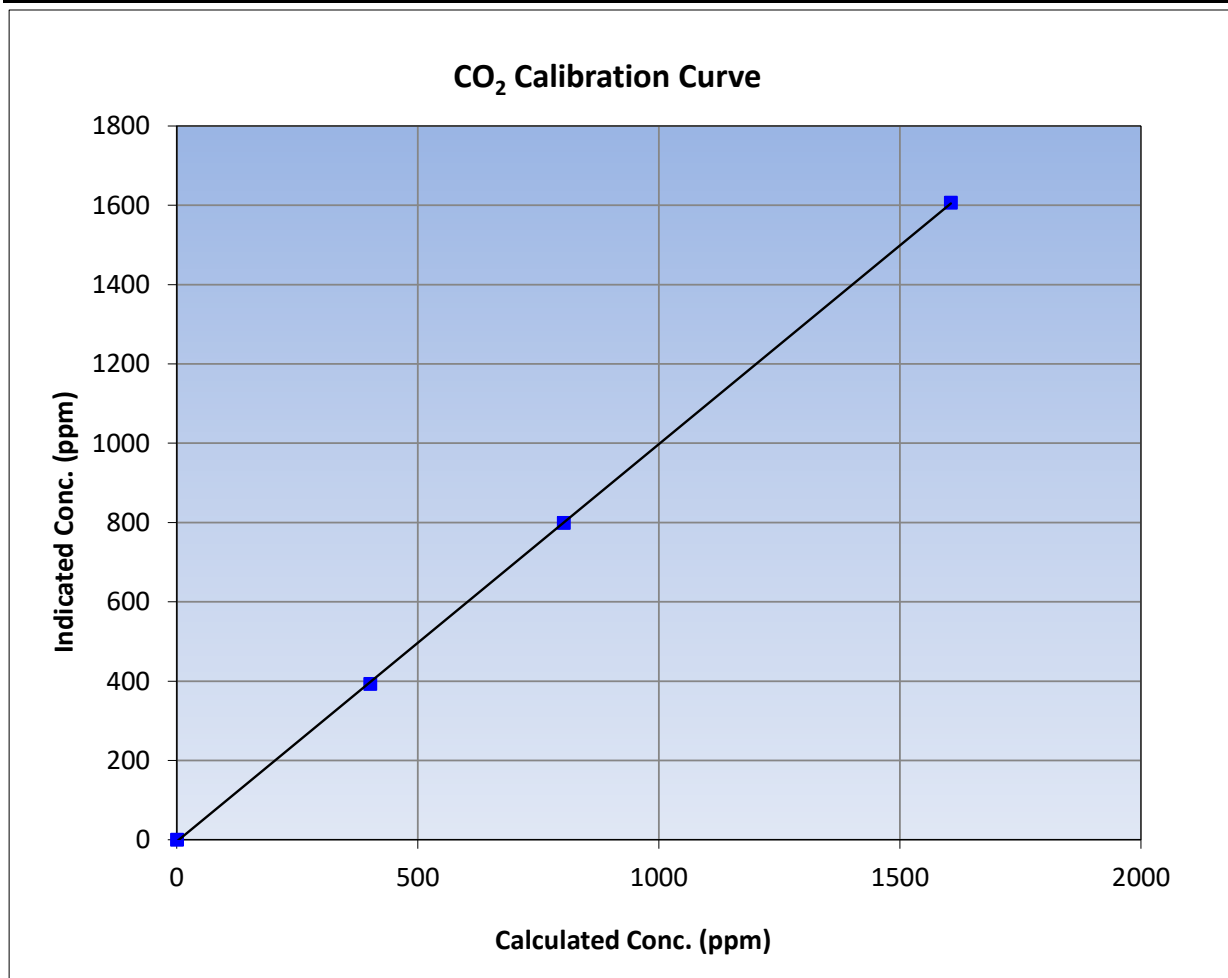
Version-01-2020

### Station Information

|                  |                          |                      |                  |
|------------------|--------------------------|----------------------|------------------|
| Calibration Date | March 7, 2023            | Previous Calibration | February 7, 2023 |
| Station Name     | Bertha Ganter-Fort McKay | Station Number       | AMS01            |
| Start Time (MST) | 10:47                    | End Time (MST)       | 14:38            |
| Analyzer make    | Teledyne API 360         | Analyzer serial #    | 442              |

### Calibration Data

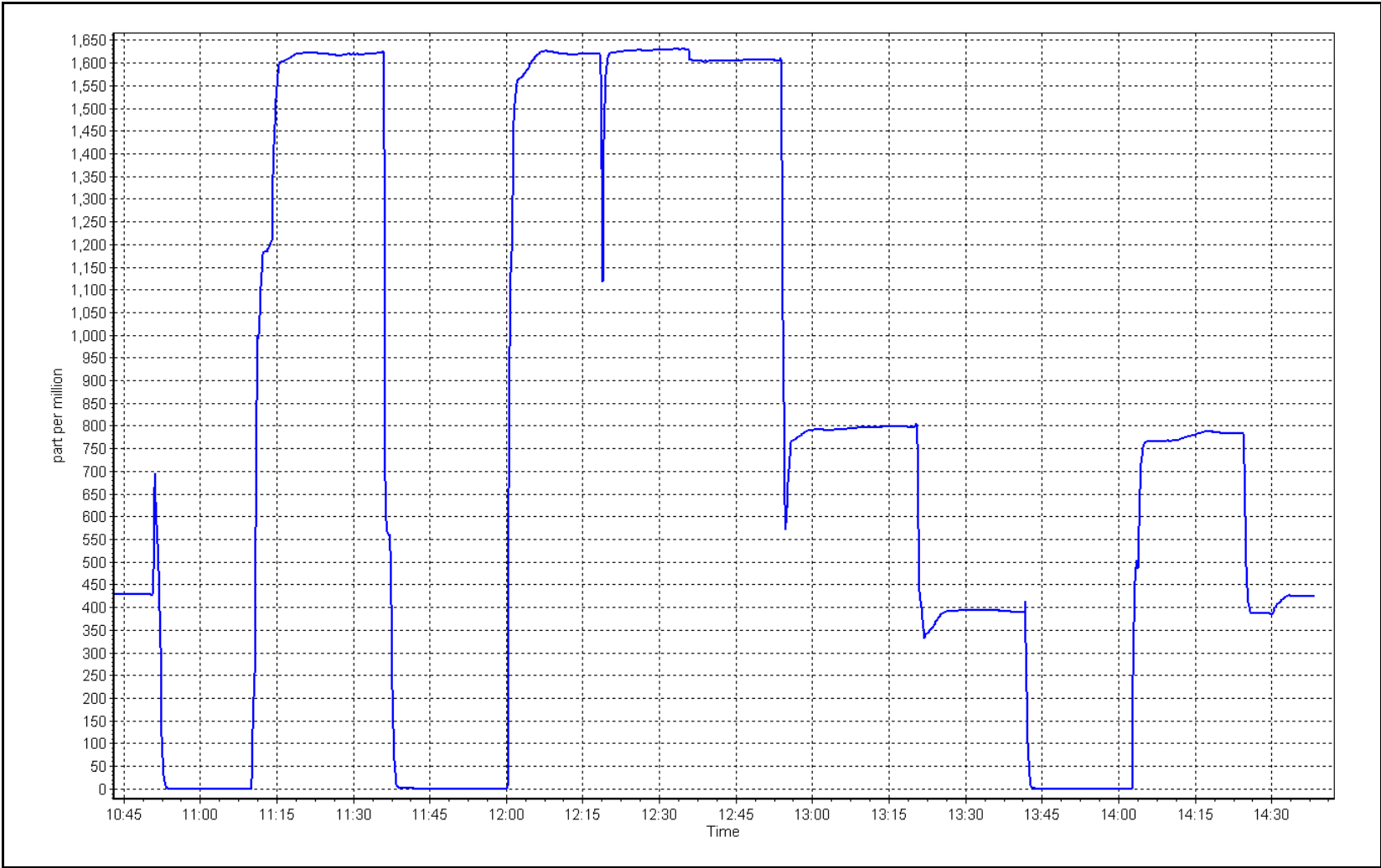
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.2                               | ----                      | Correlation Coefficient | 0.999967      | ≥0.995      |
| 1605.3                              | 1606.1                             | 0.9995                    |                         |               |             |
| 802.7                               | 798.4                              | 1.0053                    | Slope                   | 1.002067      | 0.90 - 1.10 |
| 401.3                               | 393.0                              | 1.0212                    |                         |               |             |
|                                     |                                    |                           | Intercept               | -4.460000     | +/-10       |



CO<sub>2</sub> Calibration Plot

Date: March 7, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## TN - NO<sub>x</sub> - NH<sub>3</sub> Calibration Report

Version-11-2021

### Station Information

|                   |                          |                 |                   |
|-------------------|--------------------------|-----------------|-------------------|
| Station Name:     | Bertha Ganter-Fort McKay | Station number: | AMS01             |
| NOX Cal Date:     | March 30, 2023           | Last Cal Date:  | February 17, 2023 |
| Start time (MST): | 10:04                    | End time (MST): | 15:15             |
| NH3 Cal Date:     | March 30, 2023           | Last Cal Date:  | February 17, 2023 |
| Start time (MST): | 15:35                    | End time (MST): | 20:02             |
| Reason:           | Routine                  |                 |                   |

### Calibration Standards

|                   |                   |     |                     |                   |
|-------------------|-------------------|-----|---------------------|-------------------|
| NOX Cal Gas Conc: | 50.84             | ppm | NO Gas Cylinder #:  | T2Y1P9L           |
| NO Cal Gas Conc:  | 50.04             | ppm | NO Cal Gas Expiry:  | March 3, 2028     |
| Removed NOX Conc: | 50.84             | ppm | Removed Cylinder #: | NA                |
| Removed NO Conc:  | 50.04             | ppm | Removed cyl Expiry: | NA                |
| NOX gas Diff:     |                   |     | NO gas Diff:        |                   |
| NH3 Cal Gas Conc: | 72.93             | ppm | NH3 Gas Cylinder #: | CC281298          |
| Removed NH3 Conc: | 72.93             | ppm | NH3 Cal Gas Expiry: | February 28, 2023 |
| NH3 gas Diff:     |                   |     | Removed Cylinder #: | NA                |
| Calibrator Model: | Teledyne API T700 |     | Removed cyl Expiry: | NA                |
| ZAG make/model:   | Teledyne API T701 |     | Serial Number:      | 3565              |
|                   |                   |     | Serial Number:      | 5609              |

### Analyzer Information

|                                    |                           |
|------------------------------------|---------------------------|
| Analyzer model: Teledyne API T201  | Analyzer serial #: 808    |
| Converter model: Teledyne API T501 | Converter serial #: 824   |
| NH3 Range (ppb): 0 - 2000 ppb      | Reaction cell Press: 5.20 |
| NOX Range (ppb): 0 - 1000 ppb      | Sample Flow: 468          |

|                  | <u>Start</u> | <u>Finish</u> |                 | <u>Start</u> | <u>Finish</u> |
|------------------|--------------|---------------|-----------------|--------------|---------------|
| NO coefficient:  | 0.833        | 0.828         | TN coefficient: | 0.828        | 0.828         |
| NOX coefficient: | 0.834        | 0.829         | NO bkgnd:       | -11.017      | -0.727        |
| NO2 coefficient: | 1.000        | 1.000         | NOX bkgnd:      | -10.278      | 0.384         |
| NH3 coefficient: | 0.854        | 0.911         | TN bkgnd:       | -4.631       | 2.561         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.000885     | 1.002051      |
| NO <sub>x</sub> Cal Offset: | 0.380000     | -1.360000     |
| NO Cal Slope:               | 0.999215     | 1.003626      |
| NO Cal Offset:              | -0.780000    | -1.700000     |
| NO <sub>2</sub> Cal Slope:  | 0.999881     | 1.006842      |
| NO <sub>2</sub> Cal Offset: | 0.372129     | -0.842838     |
| NH3 Cal Slope:              | 1.010718     | 1.004604      |
| NH3 Cal Offset:             | -8.022555    | -2.552362     |
| TN Cal Slope:               | 1.015098     | 1.007959      |
| TN Cal Offset:              | -7.787324    | -2.846246     |



# Wood Buffalo Environmental Association

## TN - NOX - NH<sub>3</sub> Calibration Report

Version-11-2021

### 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)<br><i>Limit = 0.95-1.05</i> | NH3 Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|----------------------------------|---------------------------|-----------------------------|--|---|---|---------------------------------------|--|--|--|---|
| as found zero                    | 5000                      | 0.0                         | 0.0                                    | 0.0                                     | 0.0                                     | 1.6                                   | 3.8                                    | -2.2                                   | ----   | ----  |
| as found NO                      | 4920                      | 80.0                        | 813.4                                  | 813.4                                   | ----                                    | 824.0                                 | 826.4                                  | -2.4                                   | 0.987  | ----  |
| calibrator zero                  | 5000                      | 0.0                         | 0.0                                    | 0.0                                     | 0.0                                     | -0.1                                  | 0.0                                    | -0.1                                   | ----   | ----  |
| high NO point                    | 4920                      | 80.0                        | 813.4                                  | 813.4                                   | ----                                    | 814.8                                 | 815.0                                  | 0.0                                    | 0.998  | ----  |
| NO/O3 point                      | 4920                      | 80.0                        | 813.4                                  | 813.4                                   | ----                                    | 808.0                                 | 808.8                                  | -0.9                                   | 1.007  | ----  |
| as found NH3                     | 3413                      | 86.4                        | 1800.6                                 | ----                                    | 1800.6                                  | 1819.1                                | ----                                   | 1813.1                                 | 0.990  | 0.993   |
| new NH3 cyl rp                   |                           |                             |  |   |   |                                       | ----                                   |  |  |   |
| first NH3                        | 3413                      | 86.4                        | 1800.6                                 | ----                                    | 1800.6                                  | 1819.1                                | ----                                   | 1813.1                                 | 0.990  | 0.993   |
| second NH3                       | 3452                      | 48.0                        | 1000.2                                 | ----                                    | 1000.2                                  | 989.9                                 | ----                                   | 987.2                                  | 1.010  | 1.013   |
| third NH3                        | 3476                      | 24.0                        | 500.1                                  | ----                                    | 500.1                                   | 506.9                                 | ----                                   | 505.7                                  | 0.987  | 0.989   |
| <b>Average Correction Factor</b> |                           |                             |  |   |   |                                       |  |  | <b>1.0025</b>  | <b>0.9984</b>   |

Corrected As found    TN = 822.4 ppb    NO<sub>x</sub> = 822.6 ppb    NH3 = 1815.3 ppb

Previous Response    TN = 817.9 ppb    NO<sub>x</sub> = 814.5 ppb    NH3 = 1811.9 ppb

NH3 Previous Converter Efficiency = 85.4%

NH3 Current Converter Efficiency = 91.1%

\*Percent Change    TN = 0.5%

\*Percent Change    NO<sub>x</sub> = 1.0%

\*Percent Change    NH3 = 0.2%

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







# Wood Buffalo Environmental Association

## TN Calibration Summary

Version-11-2021

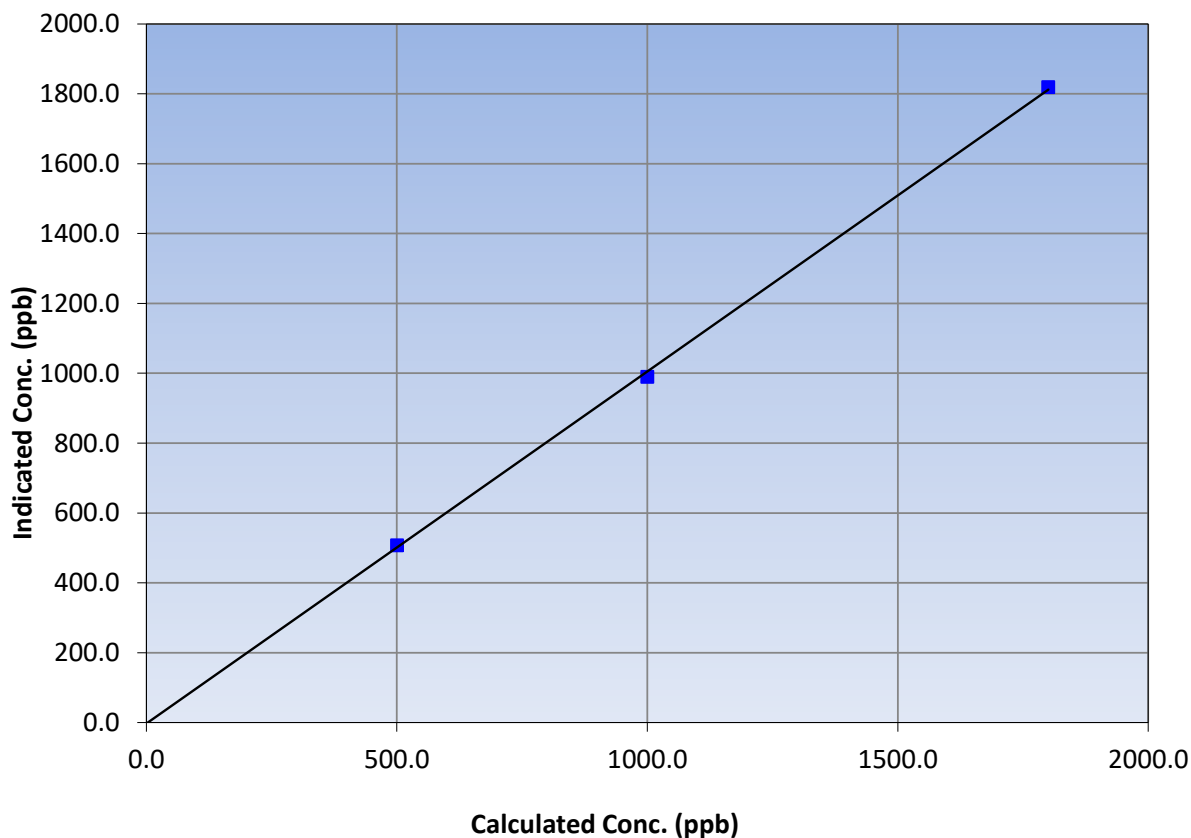
### Station Information

|                   |                          |                       |                   |
|-------------------|--------------------------|-----------------------|-------------------|
| Calibration Date: | March 30, 2023           | Previous Calibration: | February 17, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01             |
| Start Time (MST): | 10:04                    | End Time (MST):       | 15:15             |
| Analyzer make:    | Teledyne API T201        | Analyzer serial #:    | 808               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 1800.6                              | 1819.1                             | 0.9899                    |   |                                |
| 1000.2                              | 989.9                              | 1.0104                    |   |                                |
| 500.1                               | 506.9                              | 0.9866                    |   |                                |
|                                     |                                    |                           | 0.999819                                      |                                |
|                                     |                                    |                           | 1.007959                                      |                                |
|                                     |                                    |                           | -2.846246                                     |                                |

**TN Calibration Curve**





# Wood Buffalo Environmental Association

## NH<sub>3</sub> Calibration Summary

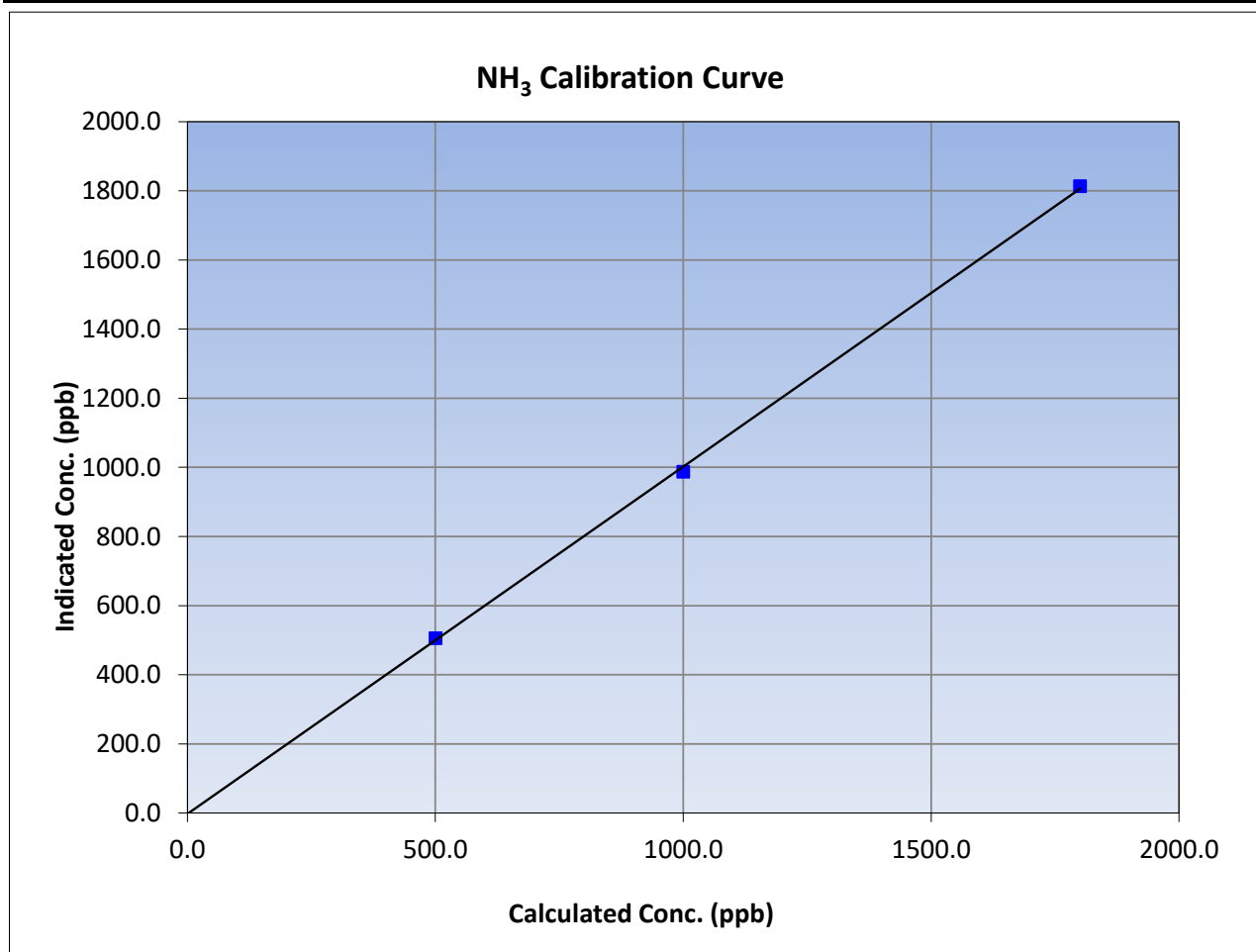
Version-11-2021

### Station Information

|                   |                          |                       |                   |
|-------------------|--------------------------|-----------------------|-------------------|
| Calibration Date: | March 30, 2023           | Previous Calibration: | February 17, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01             |
| Start Time (MST): | 10:04                    | End Time (MST):       | 15:15             |
| Analyzer make:    | Teledyne API T201        | Analyzer serial #:    | 808               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 1800.6                              | 1813.1                             | 0.9931                    |   |                                |
| 1000.2                              | 987.2                              | 1.0132                    |   |                                |
| 500.1                               | 505.7                              | 0.9889                    |   |                                |
|                                     |                                    |                           | 0.999825                                      |                                |
|                                     |                                    |                           | 1.004604                                      |                                |
|                                     |                                    |                           | -2.552362                                     |                                |





# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

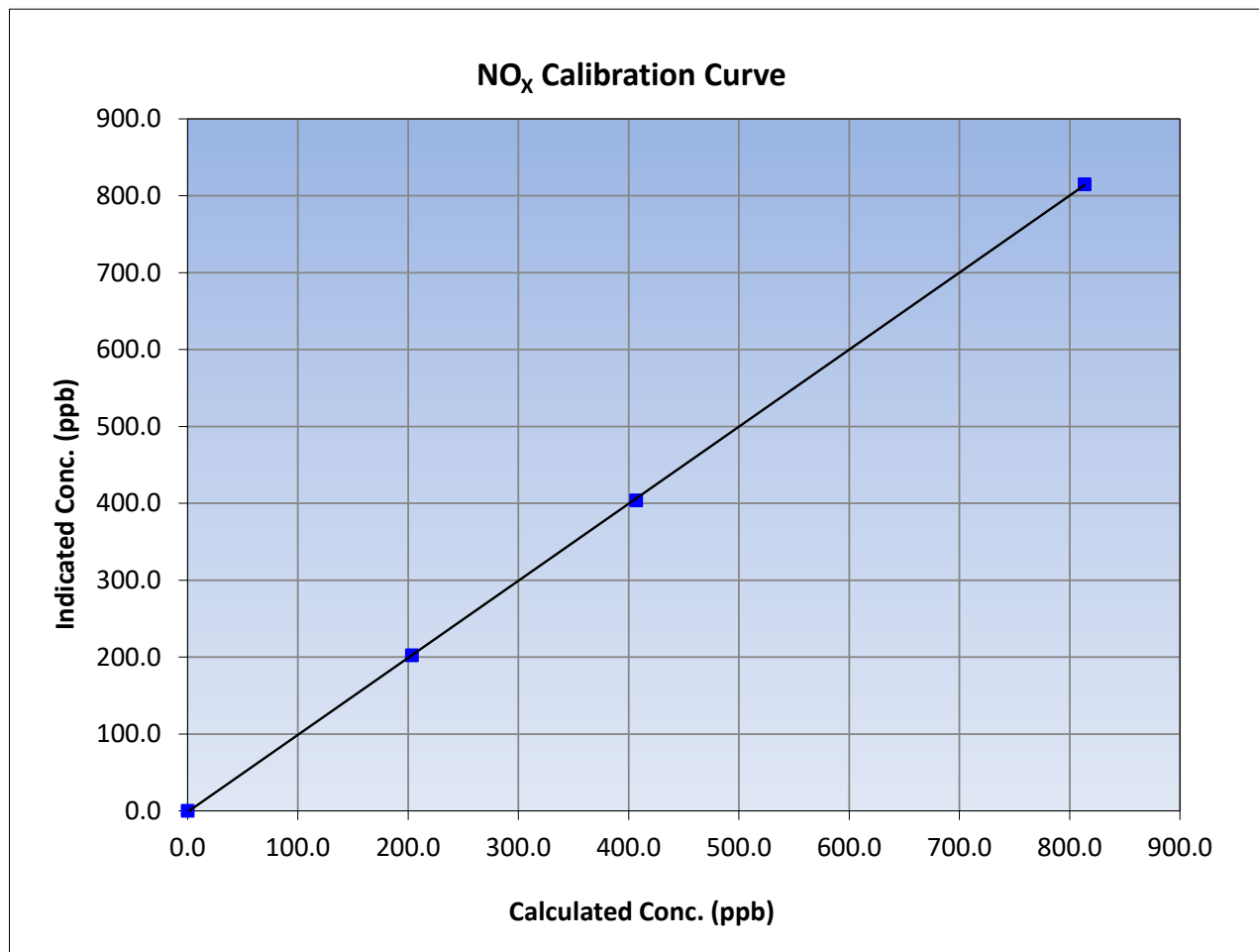
Version-11-2021

### Station Information

|                   |                          |                       |                   |
|-------------------|--------------------------|-----------------------|-------------------|
| Calibration Date: | March 30, 2023           | Previous Calibration: | February 17, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01             |
| Start Time (MST): | 10:04                    | End Time (MST):       | 15:15             |
| 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                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999975  | ≥0.995      |
| 813.4                               | 815.0                              | 0.9981                    |                         |           |             |
| 406.7                               | 403.8                              | 1.0072                    | Slope                   | 1.002051  | 0.90 - 1.10 |
| 203.4                               | 202.2                              | 1.0057                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -1.360000 | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-11-2021

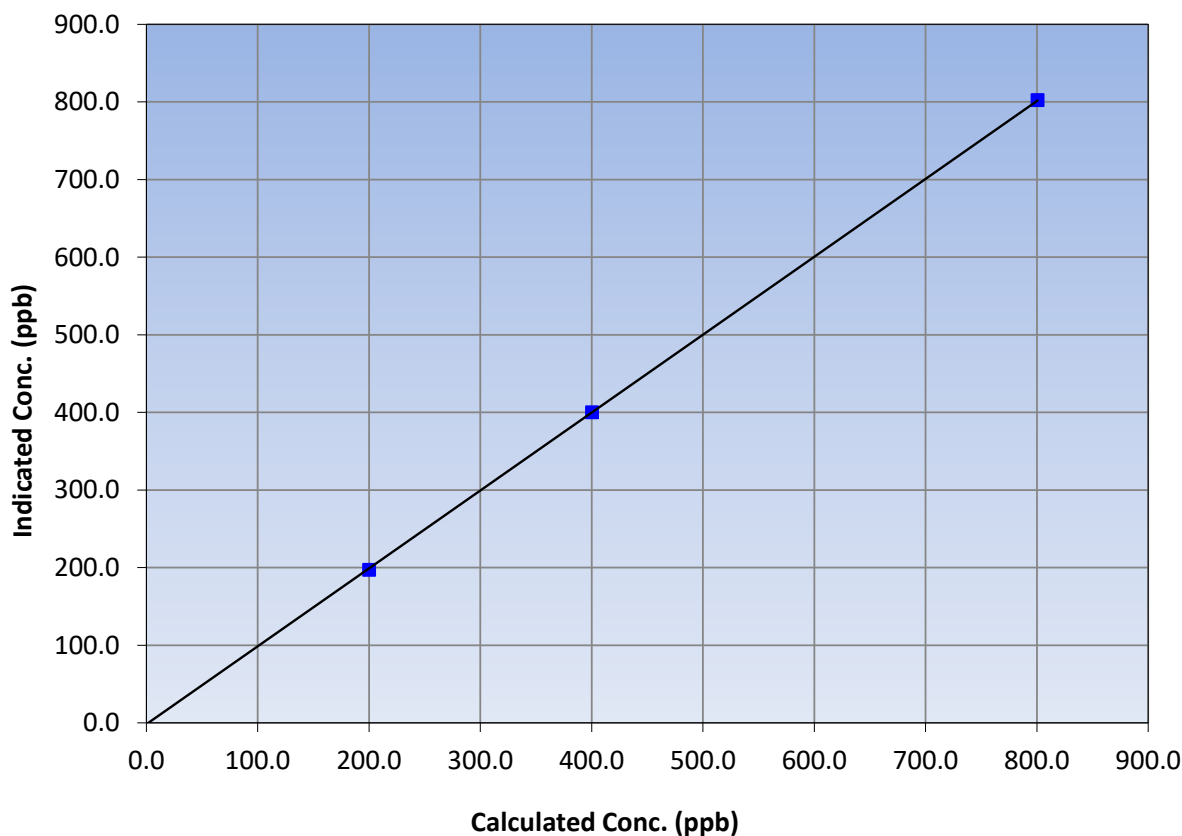
### Station Information

|                   |                          |                       |                   |
|-------------------|--------------------------|-----------------------|-------------------|
| Calibration Date: | March 30, 2023           | Previous Calibration: | February 17, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01             |
| Start Time (MST): | 10:04                    | End Time (MST):       | 15:15             |
| Analyzer make:    | Teledyne API T201        | Analyzer serial #:    | 808               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999980      | ≥0.995      |
| 800.6                               | 802.4                              | 0.9978                    |                         |               |             |
| 400.3                               | 400.0                              | 1.0008                    | Slope                   | 1.003626      | 0.90 - 1.10 |
| 200.2                               | 197.1                              | 1.0155                    |                         |               |             |
|                                     |                                    |                           | Intercept               | -1.700000     | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-11-2021

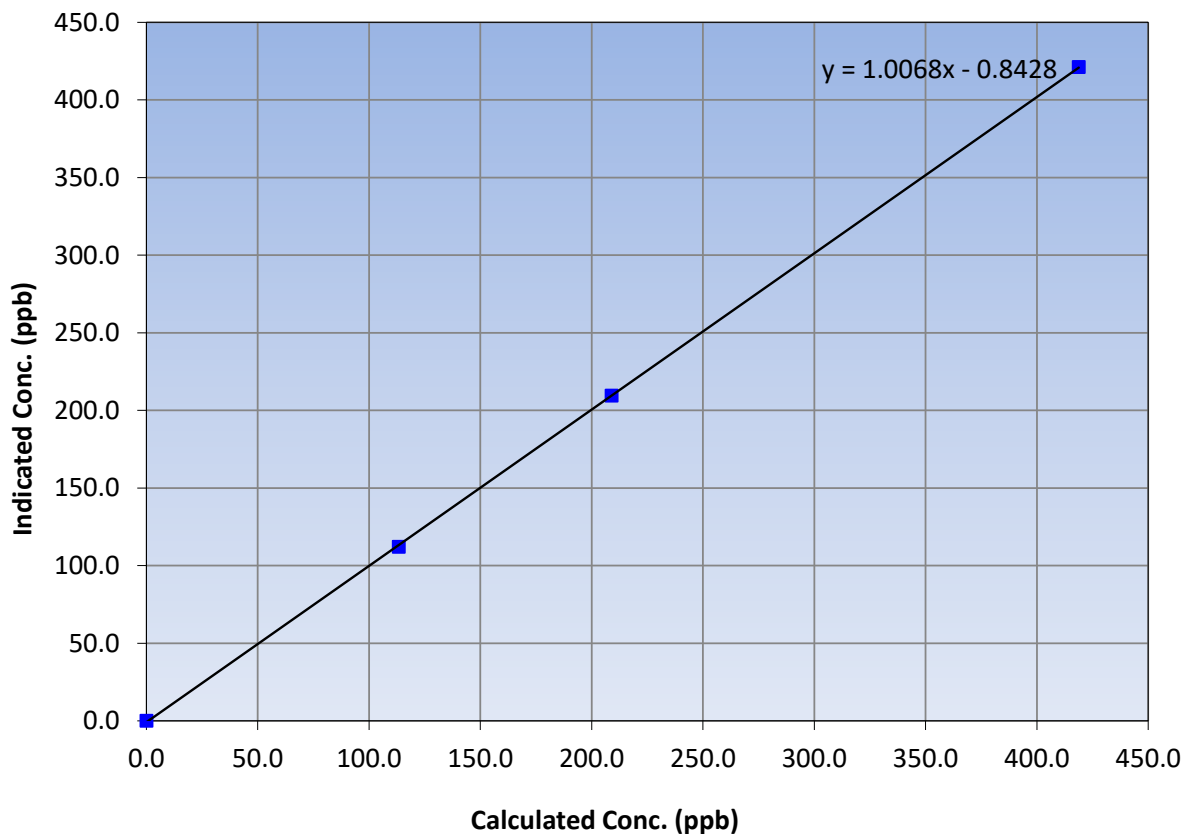
### Station Information

|                   |                          |                       |                   |
|-------------------|--------------------------|-----------------------|-------------------|
| Calibration Date: | March 30, 2023           | Previous Calibration: | February 17, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01             |
| Start Time (MST): | 10:04                    | End Time (MST):       | 15:15             |
| 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                                 | 0.1                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 418.8                               | 421.2                              | 0.9943                    |   |                                |
| 209.0                               | 209.5                              | 0.9976                    |   |                                |
| 113.4                               | 112.1                              | 1.0116                    |   |                                |
|                                     |                                    |                           |   |                                |

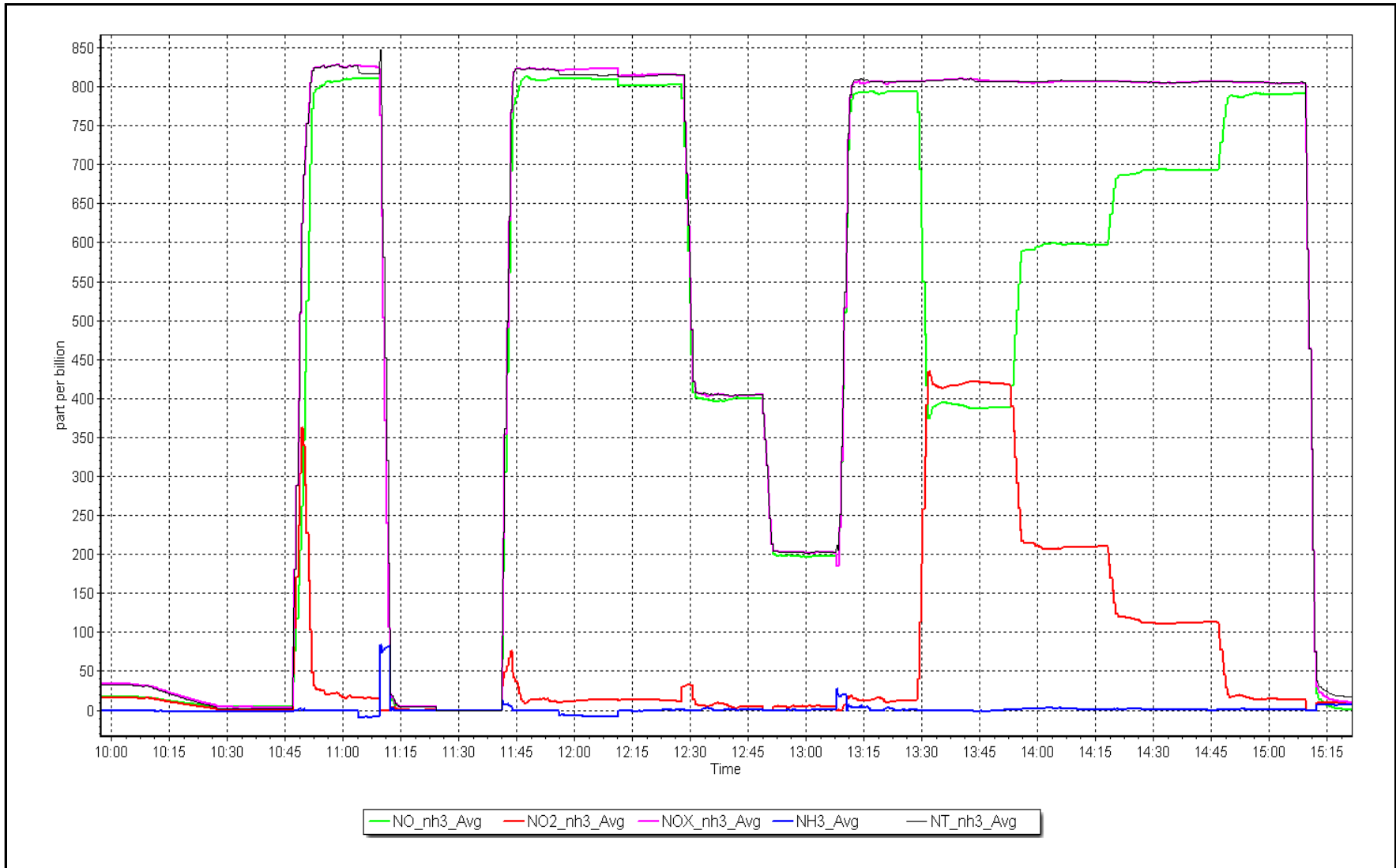
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: March 30, 2023

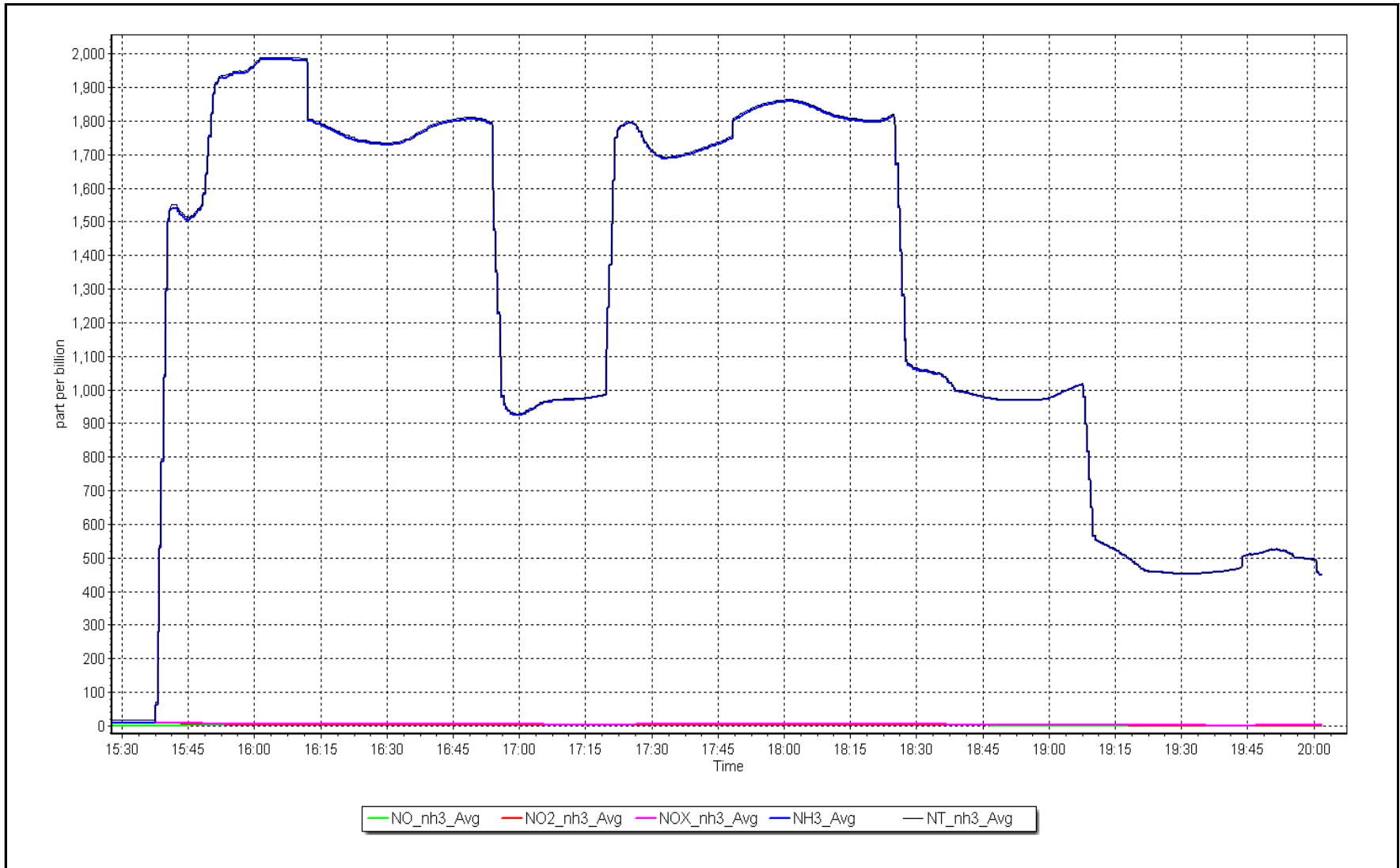
Location: Bertha Ganter-Fort McKay



# NH<sub>3</sub> Calibration Plot

Date: March 30, 2023

Location: Bertha Ganter-Fort McKay







# Wood Buffalo Environmental Association

## TN - NO<sub>x</sub> - NH<sub>3</sub> Calibration Report

Version-11-2021

### Station Information

|                   |                          |                 |                   |
|-------------------|--------------------------|-----------------|-------------------|
| Station Name:     | Bertha Ganter-Fort McKay | Station number: | AMS01             |
| NOX Cal Date:     | March 31, 2023           | Last Cal Date:  | February 17, 2023 |
| Start time (MST): | 9:35                     | End time (MST): | 14:10             |
| NH3 Cal Date:     | March 31, 2023           | Last Cal Date:  | February 17, 2023 |
| Start time (MST): | 14:30                    | End time (MST): | 17:00             |
| Reason:           | Maintenance              |                 |                   |

### Calibration Standards

|                   |                   |     |                     |                   |
|-------------------|-------------------|-----|---------------------|-------------------|
| NOX Cal Gas Conc: | 50.84             | ppm | NO Gas Cylinder #:  | T2Y1P9L           |
| NO Cal Gas Conc:  | 50.04             | ppm | NO Cal Gas Expiry:  | March 3, 2028     |
| Removed NOX Conc: | 50.84             | ppm | Removed Cylinder #: | NA                |
| Removed NO Conc:  | 50.04             | ppm | Removed cyl Expiry: | NA                |
| NOX gas Diff:     |                   |     | NO gas Diff:        |                   |
| NH3 Cal Gas Conc: | 72.93             | ppm | NH3 Gas Cylinder #: | CC281298          |
| Removed NH3 Conc: | 72.93             | ppm | NH3 Cal Gas Expiry: | February 28, 2023 |
| NH3 gas Diff:     |                   |     | Removed Cylinder #: | NA                |
| Calibrator Model: | Teledyne API T700 |     | Removed cyl Expiry: | NA                |
| ZAG make/model:   | Teledyne API T701 |     | Serial Number:      | 3565              |
|                   |                   |     | Serial Number:      | 5609              |

### Analyzer Information

|                  |                   |                      |      |
|------------------|-------------------|----------------------|------|
| Analyzer model:  | Teledyne API T201 | Analyzer serial #:   | 808  |
| Converter model: | Teledyne API T501 | Converter serial #:  | 824  |
| NH3 Range (ppb): | 0 - 2000 ppb      | Reaction cell Press: | 5.20 |
| NOX Range (ppb): | 0 - 1000 ppb      | Sample Flow:         | 466  |

|                  | <u>Start</u> | <u>Finish</u> |                 | <u>Start</u> | <u>Finish</u> |
|------------------|--------------|---------------|-----------------|--------------|---------------|
| NO coefficient:  | 0.828        | 0.850         | TN coefficient: | 0.828        | 0.850         |
| NOX coefficient: | 0.829        | 0.854         | NO bkgnd:       | -0.727       | -1.529        |
| NO2 coefficient: | 1.000        | 1.000         | NOX bkgnd:      | 0.384        | -1.049        |
| NH3 coefficient: | 0.911        | 0.937         | TN bkgnd:       | 2.561        | 3.877         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.002051     | 1.003400      |
| NO <sub>x</sub> Cal Offset: | -1.360000    | -1.540000     |
| NO Cal Slope:               | 1.003626     | 0.999800      |
| NO Cal Offset:              | -1.700000    | -1.960000     |
| NO <sub>2</sub> Cal Slope:  | 1.006842     | 1.014549      |
| NO <sub>2</sub> Cal Offset: | -0.842838    | 0.808984      |
| NH3 Cal Slope:              | 1.004604     | 0.996086      |
| NH3 Cal Offset:             | -2.552362    | -1.322705     |
| TN Cal Slope:               | 1.007959     | 0.999769      |
| TN Cal Offset:              | -2.846246    | -1.287257     |



# Wood Buffalo Environmental Association

## TN - NOX - NH<sub>3</sub> Calibration Report

Version-11-2021

### 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)<br><i>Limit = 0.95-1.05</i> | NH3 Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|----------------------------------|---------------------------|-----------------------------|--|---|---|---------------------------------------|--|--|--|---|
| as found zero                    |                           |                             |  |   |   |                                       |  |  |  |   |
| as found NO                      |                           |                             |  |   |   |                                       |  |  |  |   |
| calibrator zero                  | 5000                      | 0.0                         | 0.0                                    | 0.0                                     | 0.0                                     | -0.1                                  | 0.0                                    | -0.1                                   | ----   | ----  |
| high NO point                    | 4920                      | 80.0                        | 813.4                                  | 813.4                                   | ----                                    | 815.0                                 | 816.0                                  | -1.1                                   | 0.998  | ----  |
| NO/O3 point                      |                           |                             |  |   |   |                                       |  |  |  |   |
| as found NH3                     |                           |                             |  |   |   |                                       |  |  |  |   |
| new NH3 cyl rp                   |                           |                             |  |   |   |                                       |  | ----                                   |  |   |
| first NH3                        | 3413                      | 86.4                        | 1800.6                                 | ----                                    | 1800.6                                  | 1800.3                                | ----                                   | 1793.6                                 | 1.000  | 1.004   |
| second NH3                       | 3452                      | 48.0                        | 1000.2                                 | ----                                    | 1000.2                                  | 996.3                                 | ----                                   | 992.7                                  | 1.004  | 1.008   |
| third NH3                        | 3476                      | 24.0                        | 500.1                                  | ----                                    | 500.1                                   | 498.5                                 | ----                                   | 496.5                                  | 1.003  | 1.007   |
| <b>Average Correction Factor</b> |                           |                             |  |   |   |                                       |  |  | <b>0.9981</b>  | <b>1.0062</b>   |

Corrected As found    TN =    NA    ppb    NO<sub>x</sub> =    NA    ppb    NH3 =    NA    ppb  
 Previous Response    TN =    NA    ppb    NO<sub>x</sub> =    NA    ppb    NH3 =    NA    ppb

\*Percent Change    TN =    **NA**  
 \*Percent Change    NO<sub>x</sub> =    **NA**  
 \*Percent Change    NH3 =    **NA**  
 \* = > +/-5% change initiates investigation

NH3 Previous Converter Efficiency = 91.1%  
 NH3 Current Converter Efficiency = 93.7%





# Wood Buffalo Environmental Association

## TN Calibration Summary

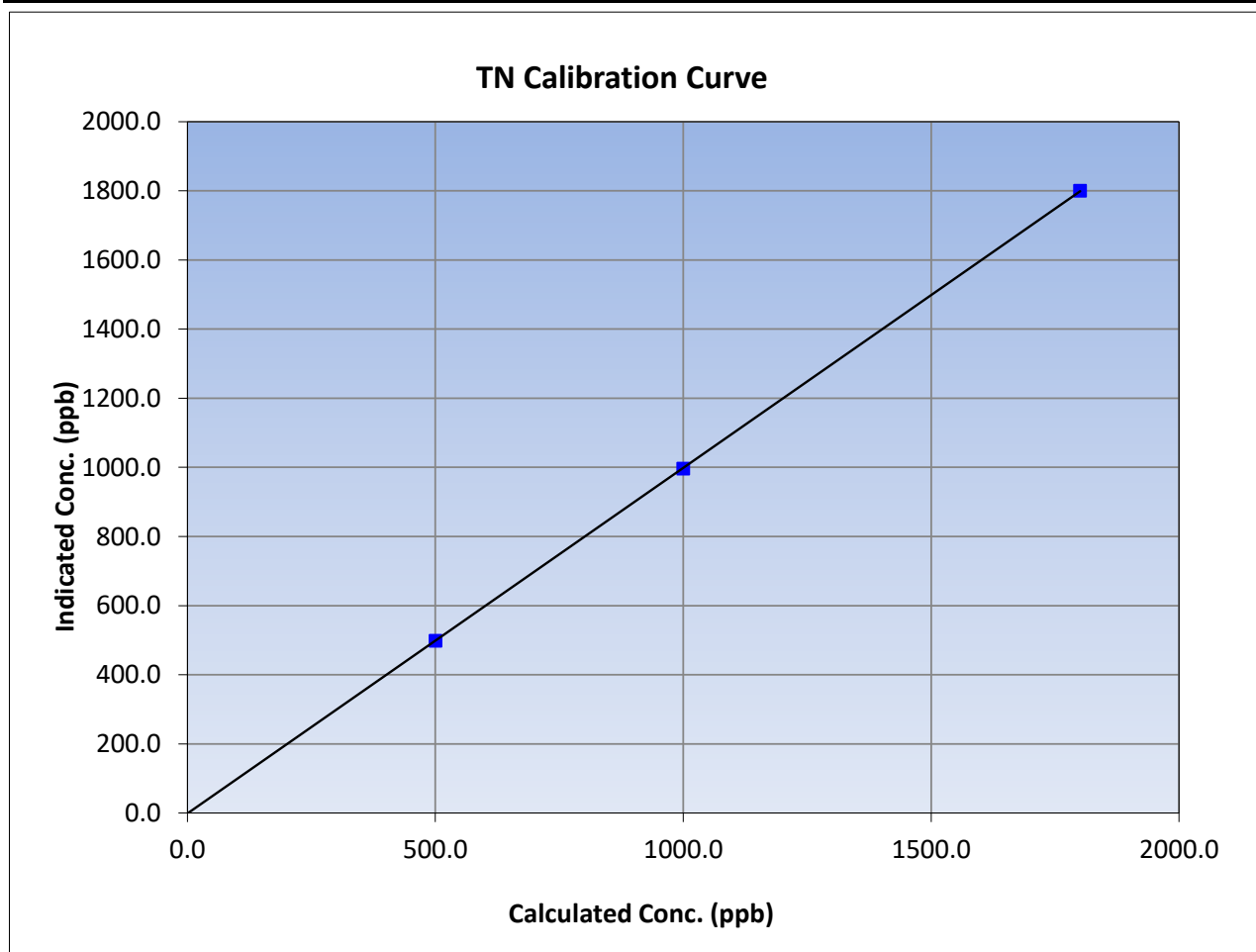
Version-11-2021

### Station Information

|                   |                          |                       |                   |
|-------------------|--------------------------|-----------------------|-------------------|
| Calibration Date: | March 31, 2023           | Previous Calibration: | February 17, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01             |
| Start Time (MST): | 9:35                     | End Time (MST):       | 14:10             |
| Analyzer make:    | Teledyne API T201        | Analyzer serial #:    | 808               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | ≥0.995        |             |
| 1800.6                              | 1800.3                             | 1.0002                    |                         |               |             |
| 1000.2                              | 996.3                              | 1.0039                    |                         |               |             |
| 500.1                               | 498.5                              | 1.0032                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.999769      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -1.287257     | +/-20       |





# Wood Buffalo Environmental Association

## NH<sub>3</sub> Calibration Summary

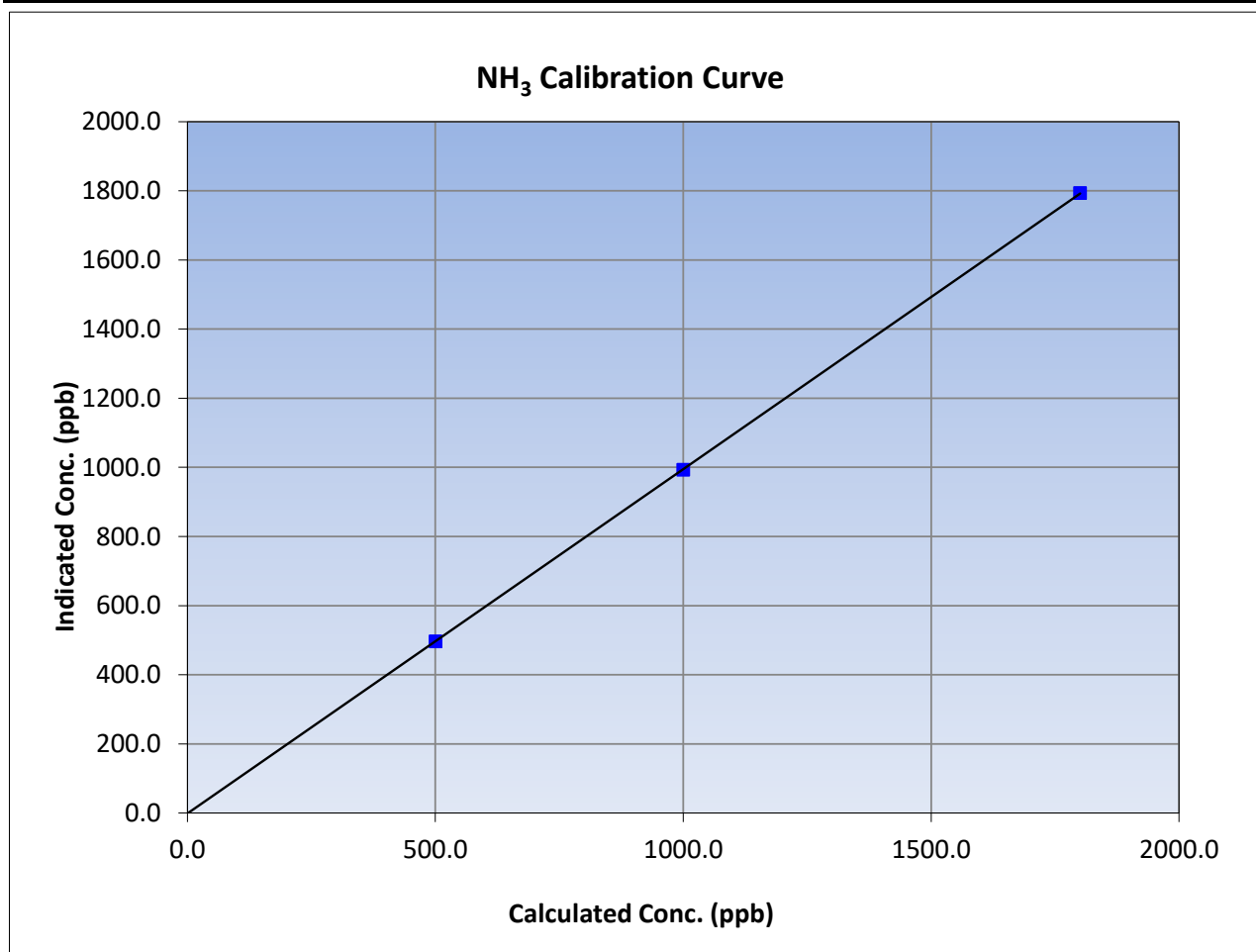
Version-11-2021

### Station Information

|                   |                          |                       |                   |
|-------------------|--------------------------|-----------------------|-------------------|
| Calibration Date: | March 31, 2023           | Previous Calibration: | February 17, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01             |
| Start Time (MST): | 9:35                     | End Time (MST):       | 14:10             |
| 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                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999995  | ≥0.995      |
| 1800.6                              | 1793.6                             | 1.0039                    |                         |           |             |
| 1000.2                              | 992.7                              | 1.0075                    | Slope                   | 0.996086  | 0.90 - 1.10 |
| 500.1                               | 496.5                              | 1.0072                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -1.322705 | +/-20       |





# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

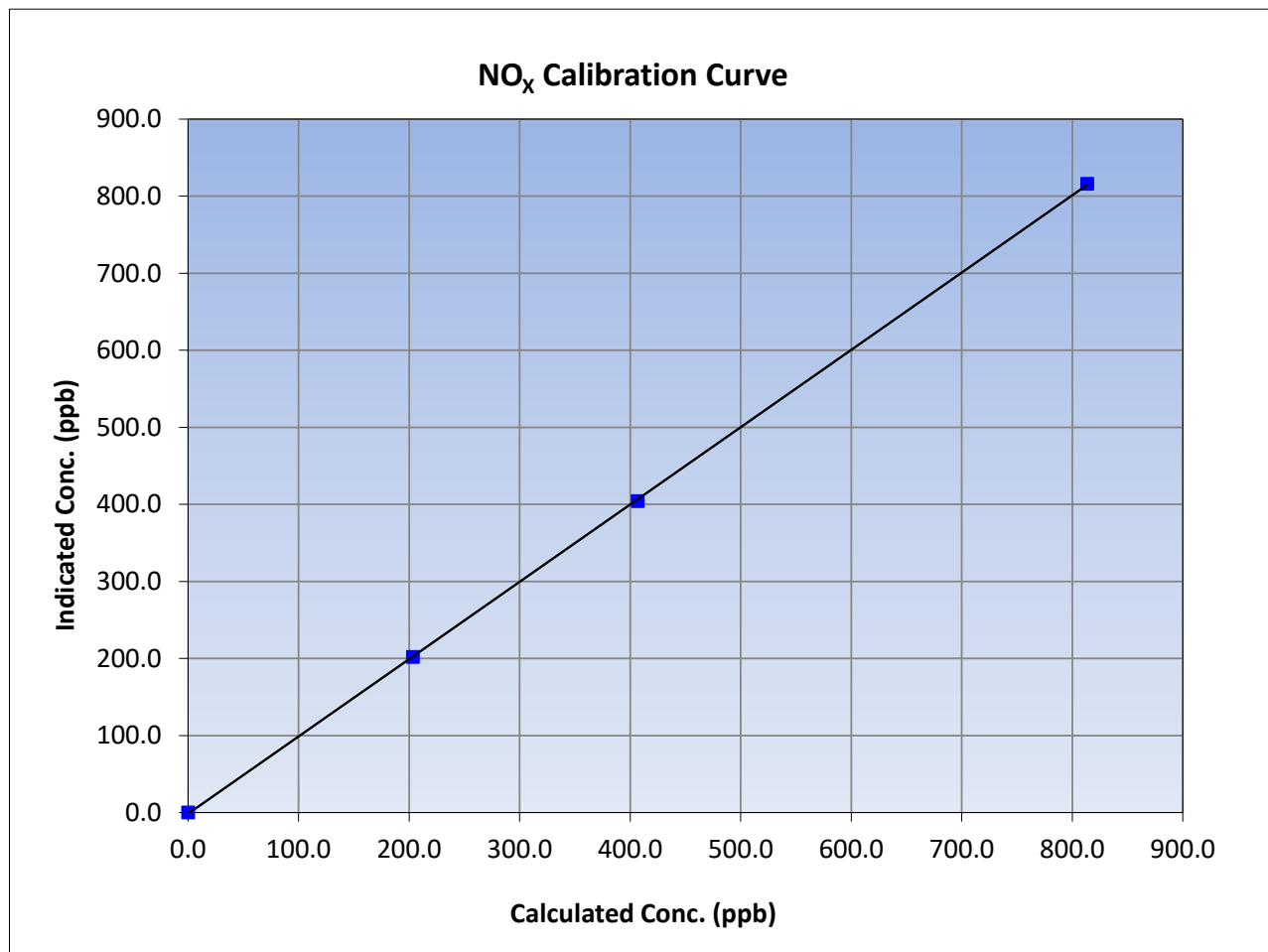
Version-11-2021

### Station Information

|                   |                          |                       |                   |
|-------------------|--------------------------|-----------------------|-------------------|
| Calibration Date: | March 31, 2023           | Previous Calibration: | February 17, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01             |
| Start Time (MST): | 9:35                     | End Time (MST):       | 14:10             |
| Analyzer make:    | Teledyne API T201        | Analyzer serial #:    | 808               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 813.4                               | 816.0                              | 0.9969                    |                         |               |             |
| 406.7                               | 404.1                              | 1.0065                    |                         |               |             |
| 203.4                               | 202.1                              | 1.0062                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 1.003400      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -1.540000     | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-11-2021

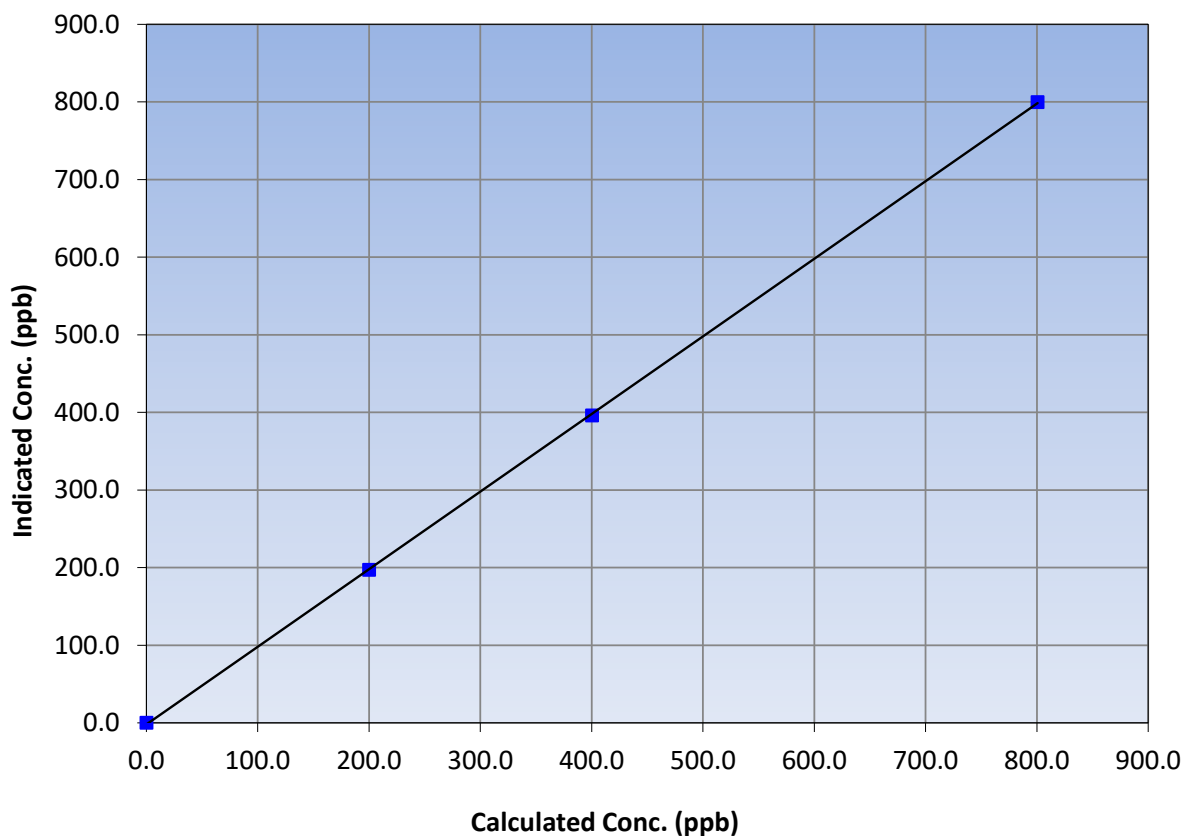
### Station Information

|                   |                          |                       |                   |
|-------------------|--------------------------|-----------------------|-------------------|
| Calibration Date: | March 31, 2023           | Previous Calibration: | February 17, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01             |
| Start Time (MST): | 9:35                     | End Time (MST):       | 14:10             |
| Analyzer make:    | Teledyne API T201        | Analyzer serial #:    | 808               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 800.6                               | 799.9                              | 1.0009                    |                         |               |             |
| 400.3                               | 396.1                              | 1.0107                    |                         |               |             |
| 200.2                               | 197.0                              | 1.0160                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.999800      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -1.960000     | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

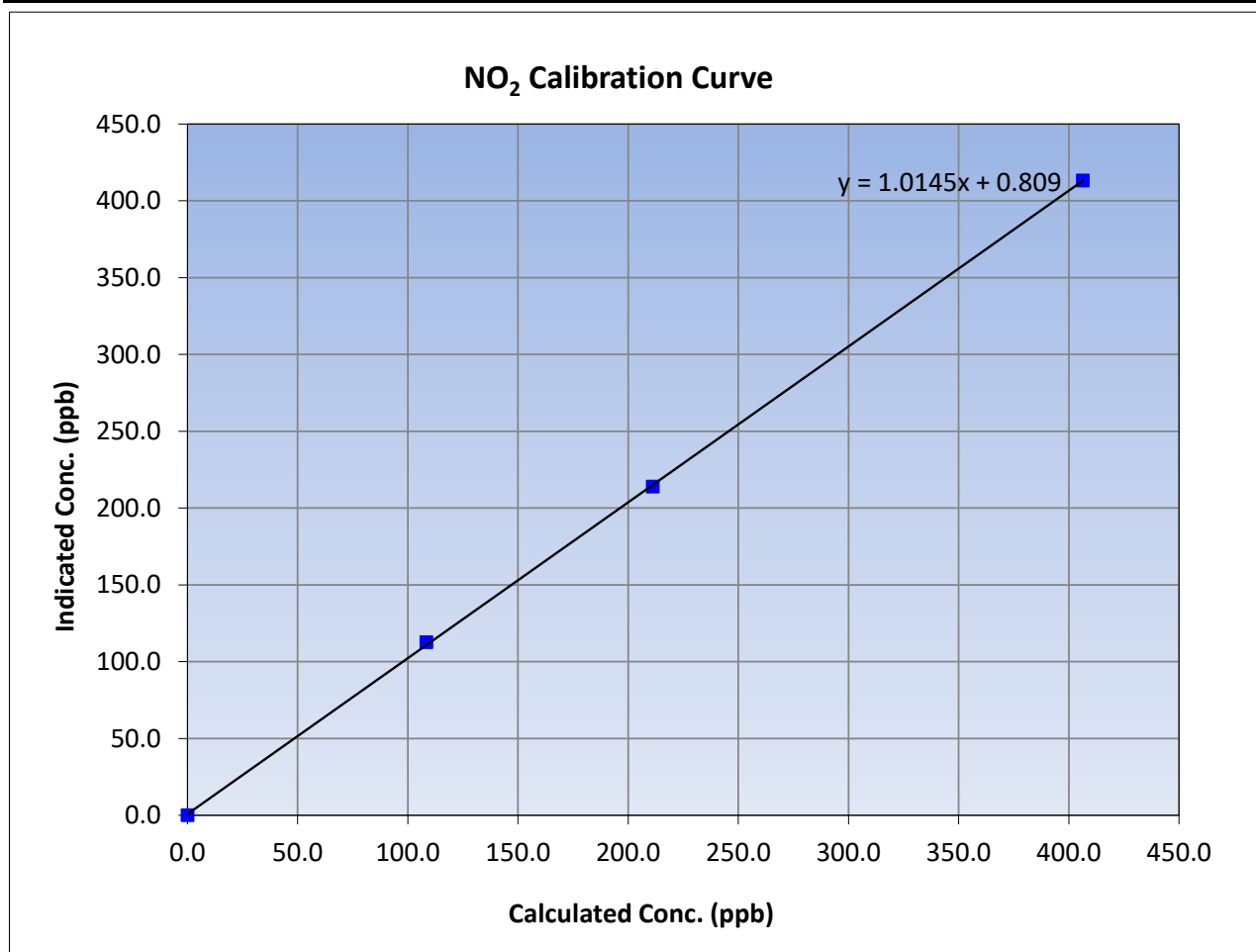
Version-11-2021

### Station Information

|                   |                          |                       |                   |
|-------------------|--------------------------|-----------------------|-------------------|
| Calibration Date: | March 31, 2023           | Previous Calibration: | February 17, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01             |
| Start Time (MST): | 9:35                     | End Time (MST):       | 14:10             |
| 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                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 406.4                               | 413.2                              | 0.9835                    |   |                                |
| 211.2                               | 214.0                              | 0.9869                    |   |                                |
| 108.5                               | 112.7                              | 0.9627                    |   |                                |
|                                     |                                    |                           | 0.999945                                      |                                |
|                                     |                                    |                           | 1.014549                                      |                                |
|                                     |                                    |                           | 0.808984                                      |                                |

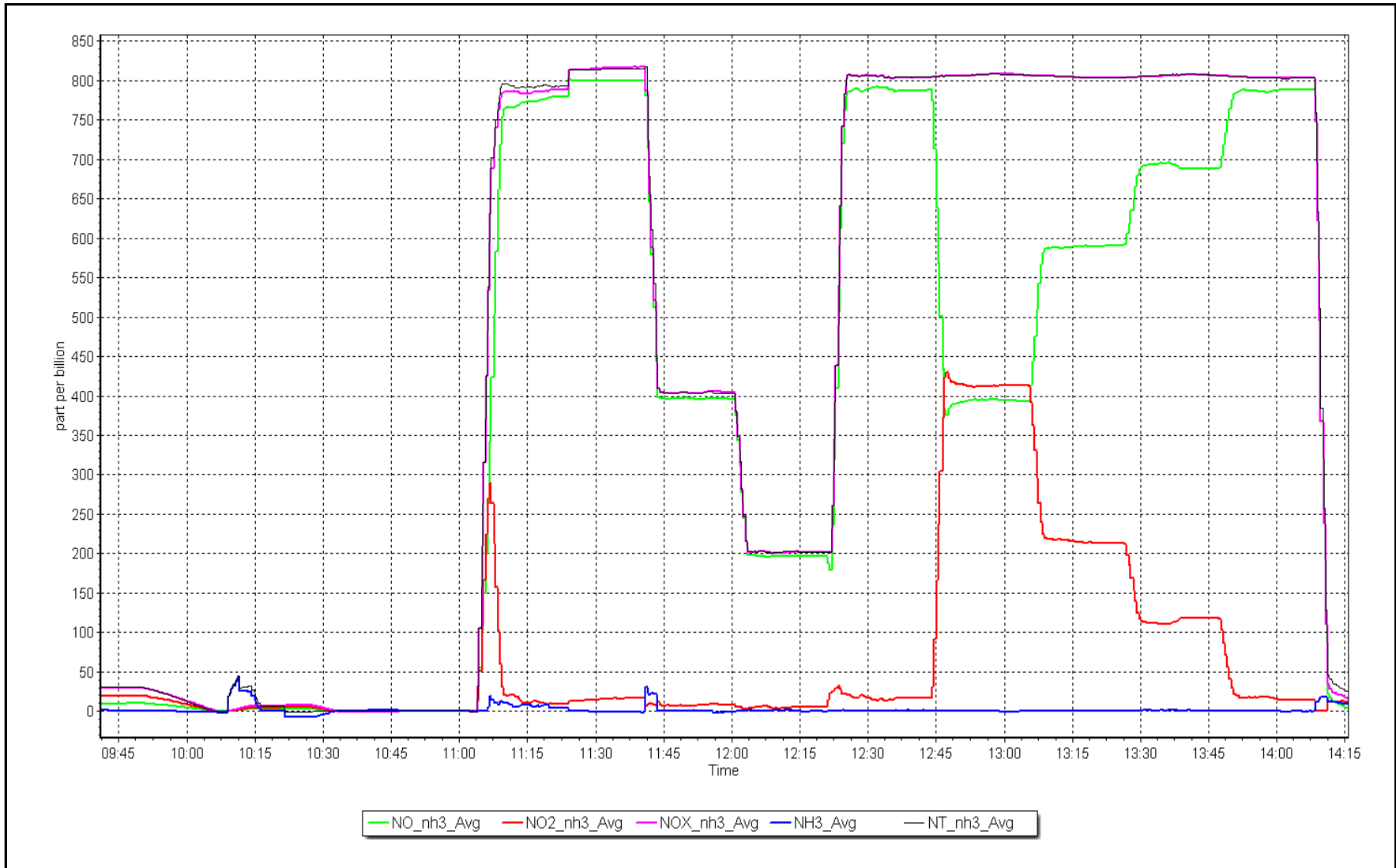




# NO<sub>x</sub> Calibration Plot

Date: March 31, 2023

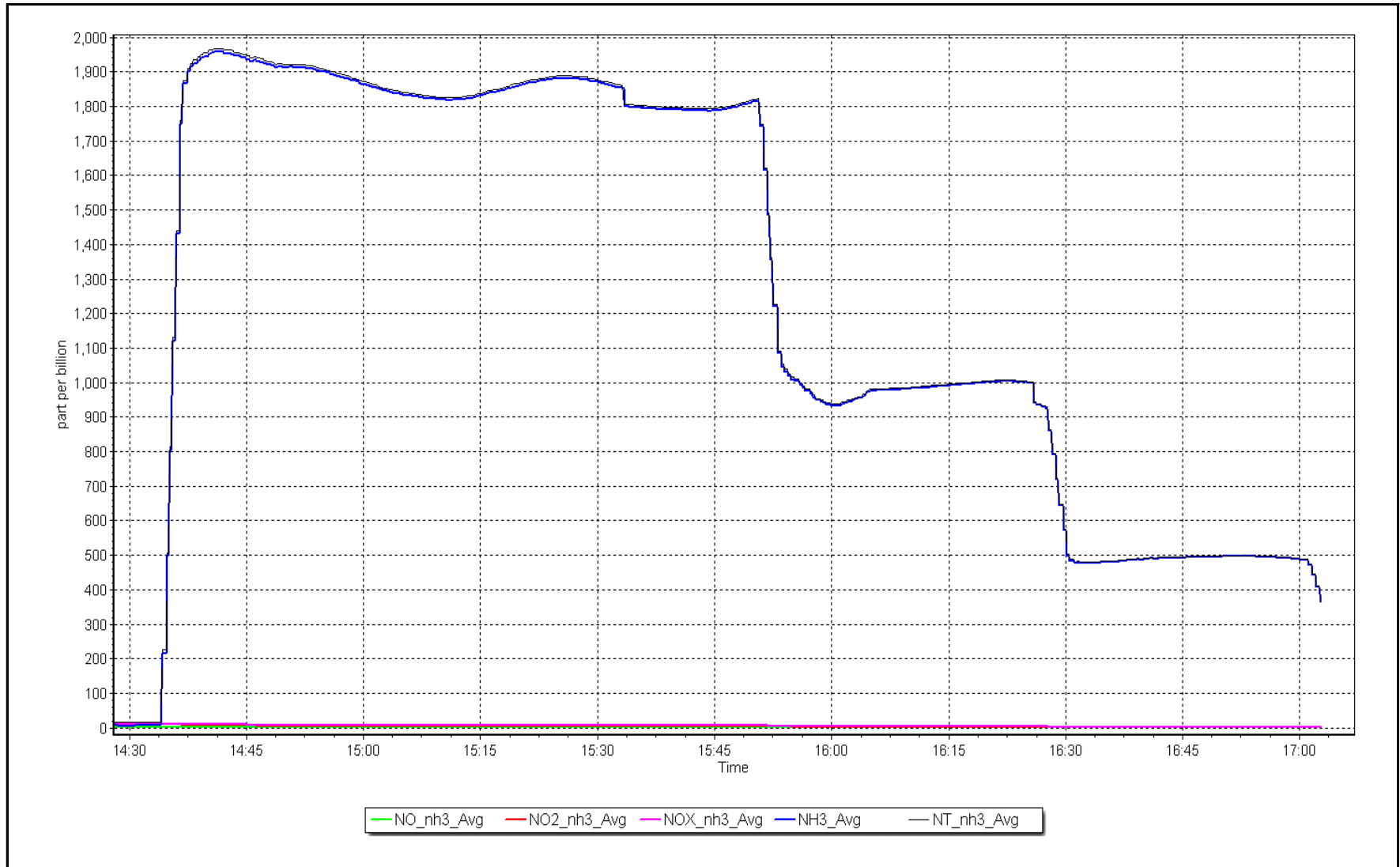
Location: Bertha Ganter-Fort McKay



# NH<sub>3</sub> Calibration Plot

Date: March 31, 2023

Location: Bertha Ganter-Fort McKay





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS02 MILDRED LAKE MARCH 2023**

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

April 29, 2023



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |               |                 |                  |
|-------------------|---------------|-----------------|------------------|
| Station Name:     | Mildred Lake  | Station number: | AMS02            |
| Calibration Date: | March 8, 2023 | Last Cal Date:  | February 8, 2023 |
| Start time (MST): | 9:53 AM       | End time (MST): | 12:58            |
| 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:    | 5608            |

### Analyzer Information

|                |              |                    |              |
|----------------|--------------|--------------------|--------------|
| Analyzer make: | Thermo 43i   | Analyzer serial #: | JC1404901075 |
| Analyzer Range | 0 - 1000 ppb |                    |              |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.002695     | 1.002096      | Backgd or Offset: | 17.9         | 18.0          |
| Calibration intercept: | -0.144667    | -0.984595     | Coeff or Slope:   | 0.827        | 0.811         |

### SO<sub>2</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| as found span             | 4920                          | 80.2                        | 801.6                               | 817.9                              | 0.980   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | -0.1                               | ----  |
| high point                | 4920                          | 80.2                        | 801.6                               | 803.1                              | 0.998   |
| second point              | 4960                          | 40.1                        | 400.8                               | 399.3                              | 1.004   |
| third point               | 4980                          | 20.0                        | 199.9                               | 199.1                              | 1.004   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span              | 4920                          | 80.2                        | 801.6                               | 802.9                              | 0.998   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.002   |

|                          |        |                   |        |               |      |
|--------------------------|--------|-------------------|--------|---------------|------|
| Baseline Corr As found:  | 817.50 | Previous response | 803.66 | *% change     | 1.7% |
| Baseline Corr 2nd AF pt: | NA     | AF Slope:         |        | AF Intercept: |      |
| Baseline Corr 3rd AF pt: | NA     | AF Correlation:   |        |               |      |

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

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

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

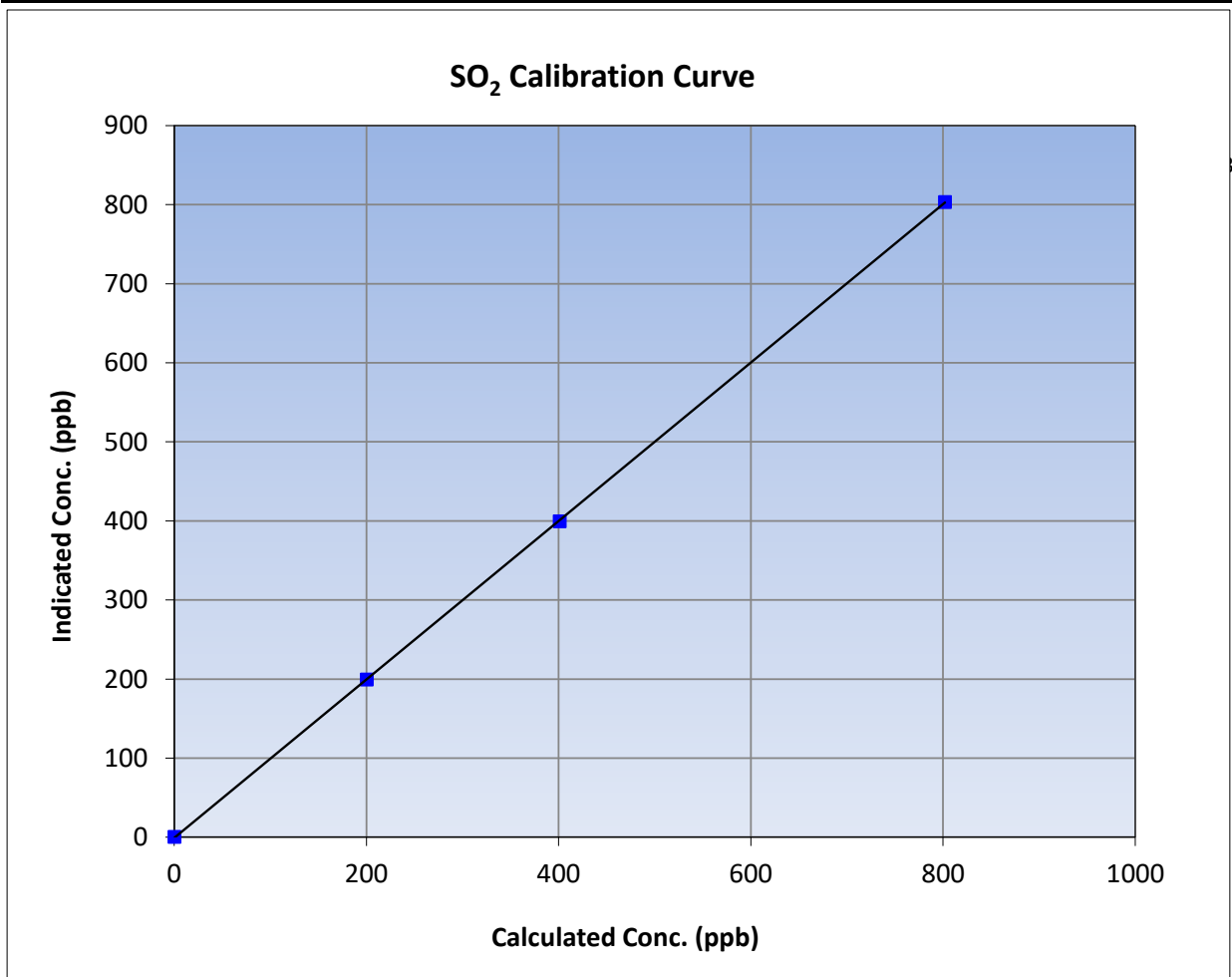
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 8, 2023 | Previous Calibration: | February 8, 2023 |
| Station Name:     | Mildred Lake  | Station Number:       | AMS02            |
| Start Time (MST): | 9:53          | End Time (MST):       | 12:58            |
| Analyzer make:    | Thermo 43i    | Analyzer serial #:    | JC1404901075     |

### Calibration Data

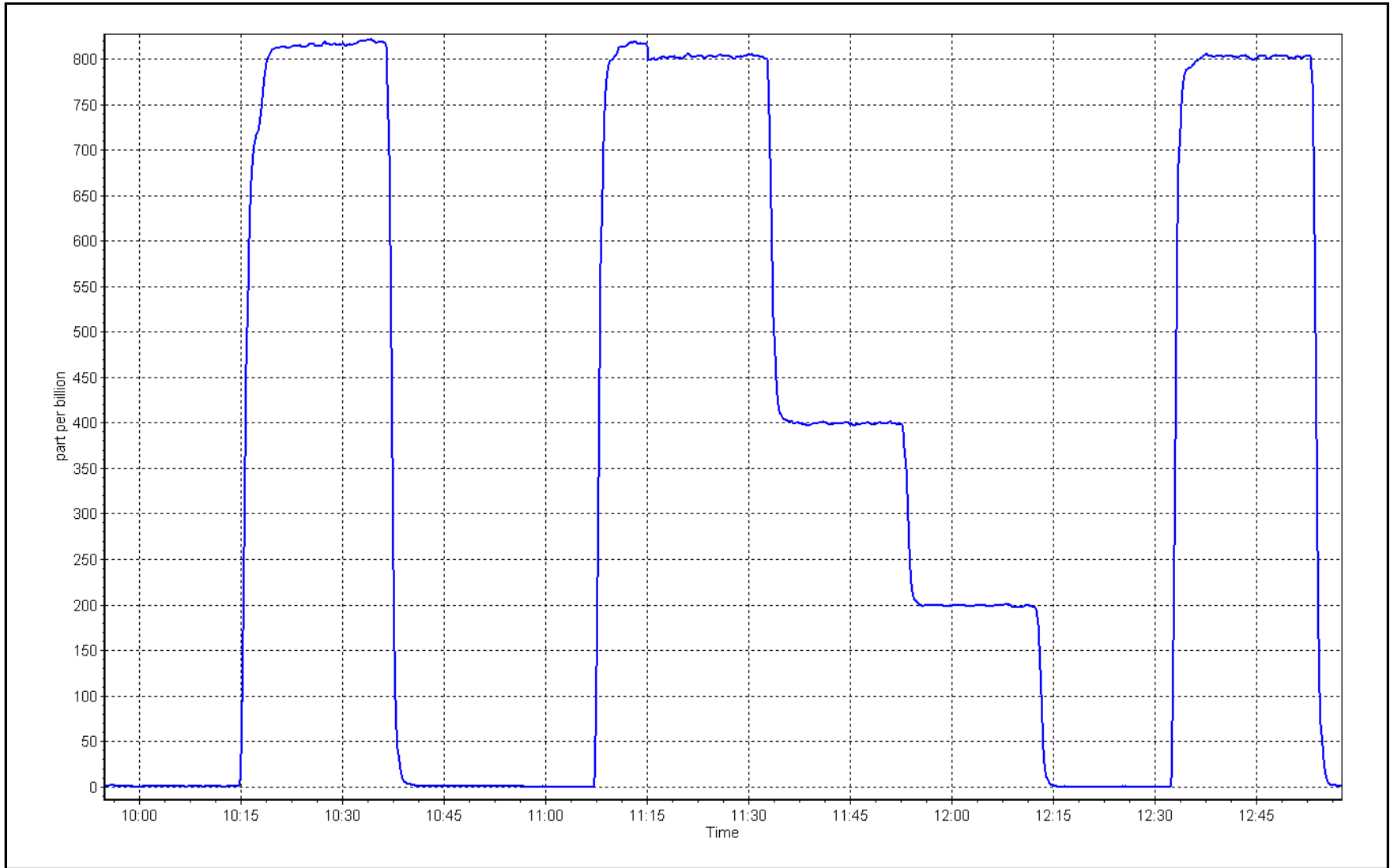
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999991  | ≥0.995      |
| 801.6                               | 803.1                              | 0.9982                    |                         |           |             |
| 400.8                               | 399.3                              | 1.0038                    | Slope                   | 1.002096  | 0.90 - 1.10 |
| 199.9                               | 199.1                              | 1.0041                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -0.984595 | +/-30       |



SO2 Calibration Plot

Date: March 8, 2023

Location: Mildred Lake





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Mildred Lake      Station number: AMS02  
 Calibration Date: March 16, 2023      Last Cal Date: February 6, 2023  
 Start time (MST): 9:45      End time (MST): 12:45  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.29 ppm      Cal Gas Exp Date: January 4, 2025  
 Cal Gas Cylinder #: CC345191  
 Removed Cal Gas Conc: 5.29 ppm      Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA      Diff between cyl:  
 Calibrator Make/Model: API T700      Serial Number: 1185  
 ZAG Make/Model: API T701      Serial Number: 5608

### Analyzer Information

Analyzer make: Thermo 43iQTL      Analyzer serial #: 12113311966  
 Converter make: Global G150      Converter serial #: 2022-198  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.993964     | 1.007251      | Backgd or Offset: 1.83 | 1.83          |
| Calibration intercept: | -0.059204    | 0.000807      | Coeff or Slope: 0.844  | 0.844         |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | -0.1                               | ----   |
| as found span         | 4924                          | 75.6                        | 80.0                                | 81.4                               | 0.981  |
| as found 2nd point    | 4962                          | 37.8                        | 40.0                                | 40.8                               | 0.978  |
| as found 3rd point    | 4981                          | 18.9                        | 20.0                                | 20.1                               | 0.990  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                              | 4924                          | 75.6                        | 80.0                                | 80.5                               | 0.994   |
| second point                            | 4962                          | 37.8                        | 40.0                                | 40.5                               | 0.988   |
| third point                             | 4981                          | 18.9                        | 20.0                                | 20.0                               | 1.000   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span                            | 4924                          | 75.6                        | 80.0                                | 81.6                               | 0.980   |
| SO2 Scrubber Check                      | 4920                          | 80.2                        | 802.0                               | 0.0                                | ----  |
| Date of last scrubber change:           | 12-Sep-22                     |                             |                                     | Ave Corr Factor                    | 0.994   |
| Date of last converter efficiency test: |                               |                             |                                     |                                    | efficiency  |

Baseline Corr As found: 81.5      Prev response: 79.45      \*% change: 2.5%  
 Baseline Corr 2nd AF pt: 40.9      AF Slope: 1.019824      AF Intercept: -0.139184  
 Baseline Corr 3rd AF pt: 20.2      AF Correlation: 0.999986

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

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

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

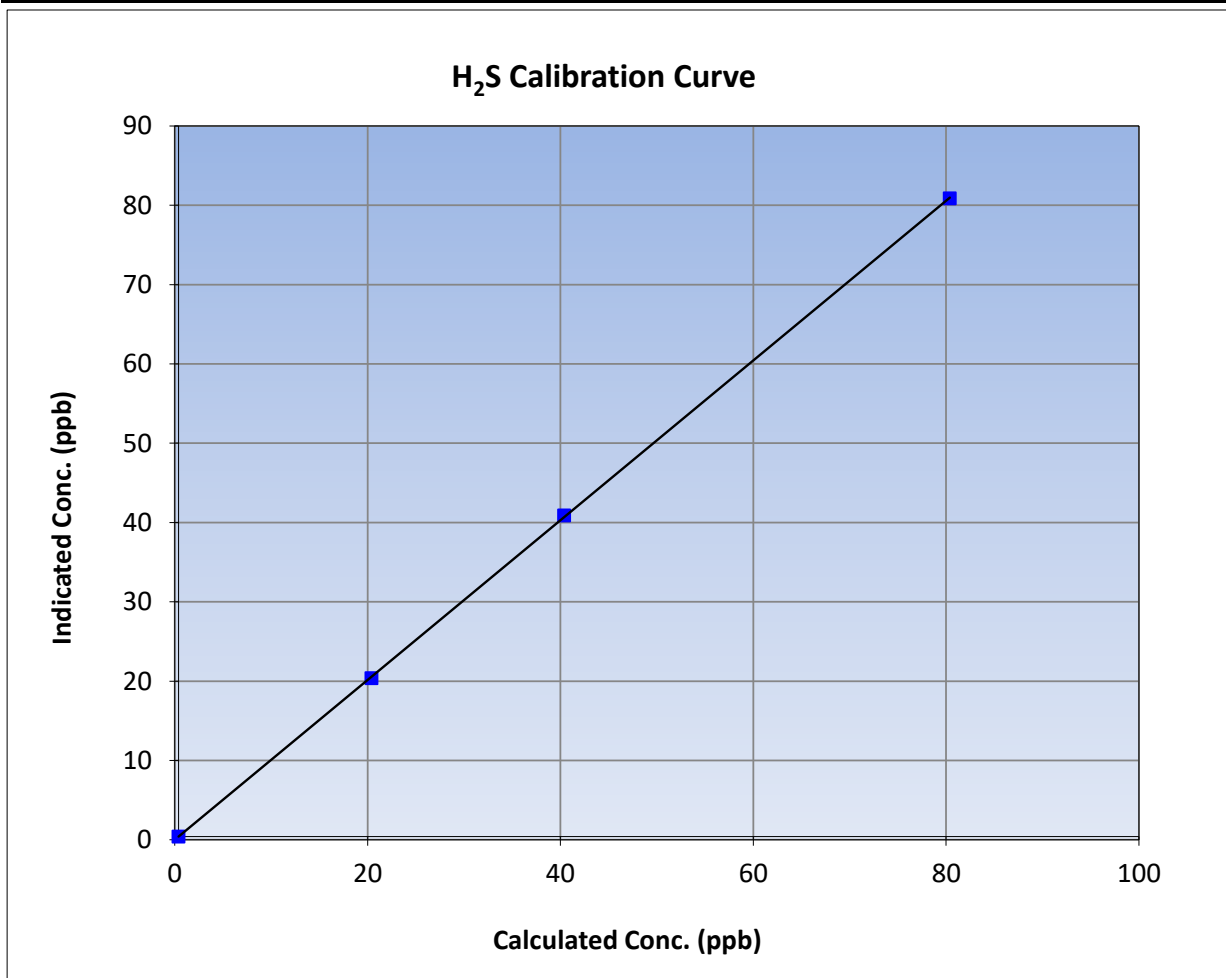
Version-11-2021

### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 16, 2023 | Previous Calibration: | February 6, 2023 |
| Station Name:     | Mildred Lake   | Station Number:       | AMS02            |
| Start Time (MST): | 9:45           | End Time (MST):       | 12:45            |
| Analyzer make:    | API T700       | Analyzer serial #:    | 1185             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999980 |             |
| 80.0                                | 80.5                               | 0.9937                    |                         |          | ≥0.995      |
| 40.0                                | 40.5                               | 0.9875                    | Slope                   | 1.007251 |             |
| 20.0                                | 20.0                               | 0.9998                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.000807 | +/-3        |

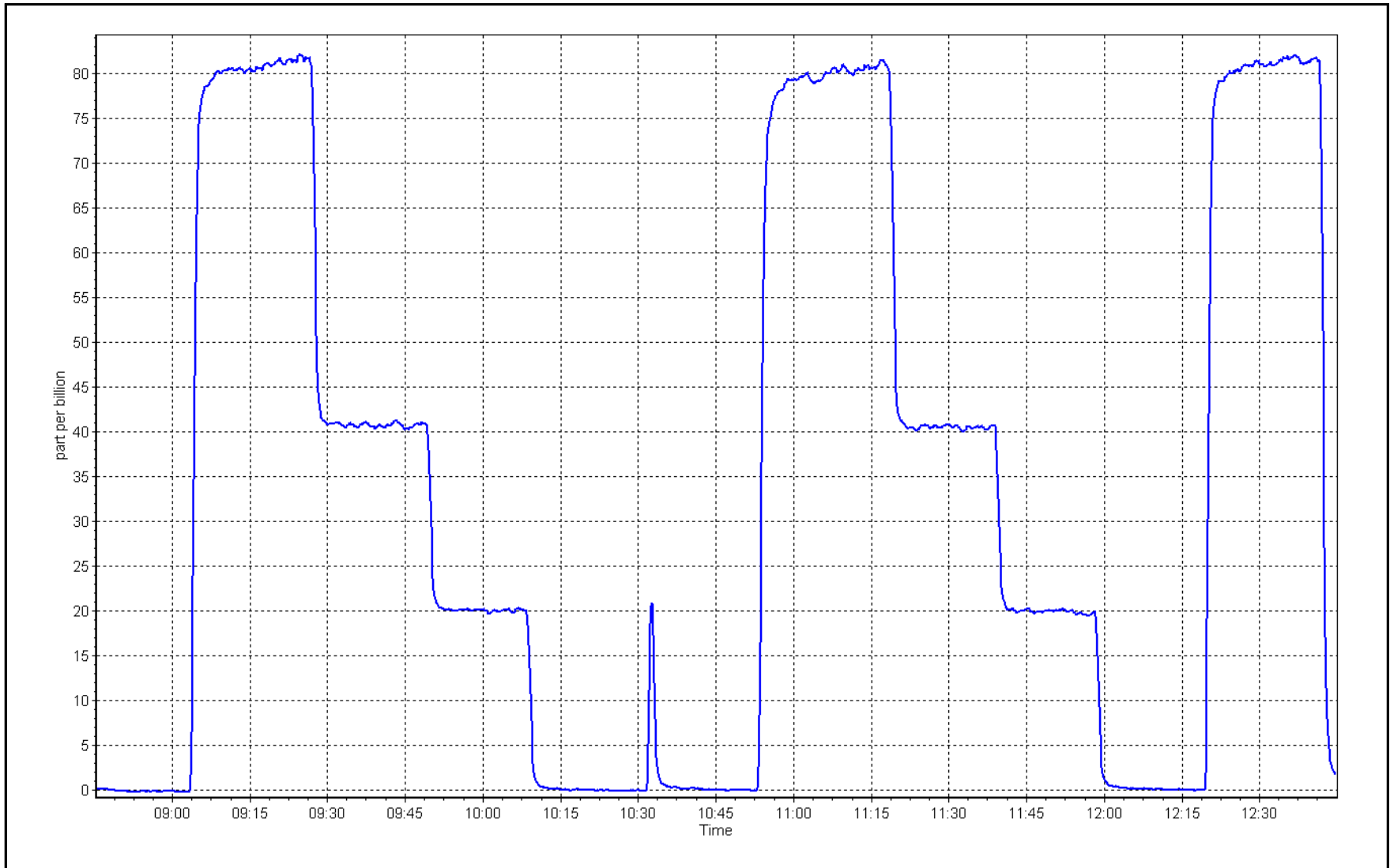




H<sub>2</sub>S Calibration Plot

Date: March 16, 2023

Location: Mildred Lake





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-06-2022

### Station Information

|                   |               |                 |                  |
|-------------------|---------------|-----------------|------------------|
| Station Name:     | Mildred Lake  | Station number: | AMS02            |
| Calibration Date: | March 8, 2023 | Last Cal Date:  | February 8, 2023 |
| Start time (MST): | 9:53          | End time (MST): | 12:58            |
| Reason:           | Routine       |                 |                  |

### Calibration Standards

|   |                   |                             |                 |
|---|-------------------|-----------------------------|-----------------|
| Gas Cert Reference:                         | CC501209          | Cal Gas Expiry Date:        | August 12, 2024 |
| CH <sub>4</sub> Cal Gas Conc.               | 500.2 ppm         | CH <sub>4</sub> Equiv Conc. | 1048.6 ppm      |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 199.4 ppm         |                             |                 |
| Removed Gas Cert:                           | NA                | Removed Gas Expiry:         |                 |
| Removed CH <sub>4</sub> Conc.               | 500.2 ppm         | CH <sub>4</sub> Equiv Conc. | 1048.6 ppm      |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 199.4 ppm         | Diff between cyl (THC):     |                 |
| Diff between cyl (CH <sub>4</sub> ):        |                   | Diff between cyl (NM):      |                 |
| Calibrator Model:                           | Teledyne API T700 | Serial Number:              | 1185            |
| ZAG make/model:                             | Teledyne API T701 | Serial Number:              | 5608            |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1180320038 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |          |
|---------------------------------|--------------|---------------|-----------------|---------------|----------|
| CH <sub>4</sub> SP Ratio:       | 2.80E-04     | 2.84E-04      | NMHC SP Ratio:  | 4.43E-04      | 4.45E-04 |
| CH <sub>4</sub> Retention time: | 14.4         | 14.6          | NMHC Peak Area: | 198634        | 197833   |
| 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span             | 4920              | 80.2                 | 16.82                | 16.79               | 1.001                      |
| 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                | 16.82               | 1.000                      |
| second point              | 4960              | 40.1                 | 8.41                 | 8.37                | 1.005                      |
| third point               | 4980              | 20.0                 | 4.19                 | 4.15                | 1.010                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span              | 4920              | 80.2                 | 16.82                | 16.87               | 0.997                      |
| Average Correction Factor |                   |                      |                      |                     | 1.005                      |

|                       |       |                 |       |  |      |
|-----------------------|-------|-----------------|-------|--|------|
| Baseline Corr AF:     | 16.79 | Prev response   | 16.79 | *% change                                | 0.0% |
| 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.2                 | 8.80                 | 8.83                                       | 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              | 80.2                 | 8.80                 | 8.79                                       | 1.000                      |
| second point              | 4960              | 40.1                 | 4.40                 | 4.39                                       | 1.001                      |
| 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                 | 8.83                                       | 0.996                      |
| Average Correction Factor |                   |                      |                      |  | 1.001                      |
| Baseline Corr AF:         | 8.83              | Prev response        | 8.79                 | *% change                                  | 0.4%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.2                 | 8.02                 | 7.96                                       | 1.007                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.2                 | 8.02                 | 8.02                                       | 1.000                      |
| second point              | 4960              | 40.1                 | 4.01                 | 3.97                                       | 1.010                      |
| third point               | 4980              | 20.0                 | 2.00                 | 1.96                                       | 1.019                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.2                 | 8.02                 | 8.04                                       | 0.998                      |
| Average Correction Factor |                   |                      |                      |  | 1.010                      |
| Baseline Corr AF:         | 7.96              | 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

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.999735     | 1.000469      |
| THC Cal Offset:             | -0.023917    | -0.025314     |
| CH <sub>4</sub> Cal Slope:  | 0.999431     | 1.001069      |
| CH <sub>4</sub> Cal Offset: | -0.023056    | -0.023053     |
| NMHC Cal Slope:             | 1.000064     | 0.999791      |
| NMHC Cal Offset:            | -0.001060    | -0.002261     |

Notes: Changed inlet filter and N<sub>2</sub> cylinder after as founds. Adjusted span.

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## THC Calibration Summary

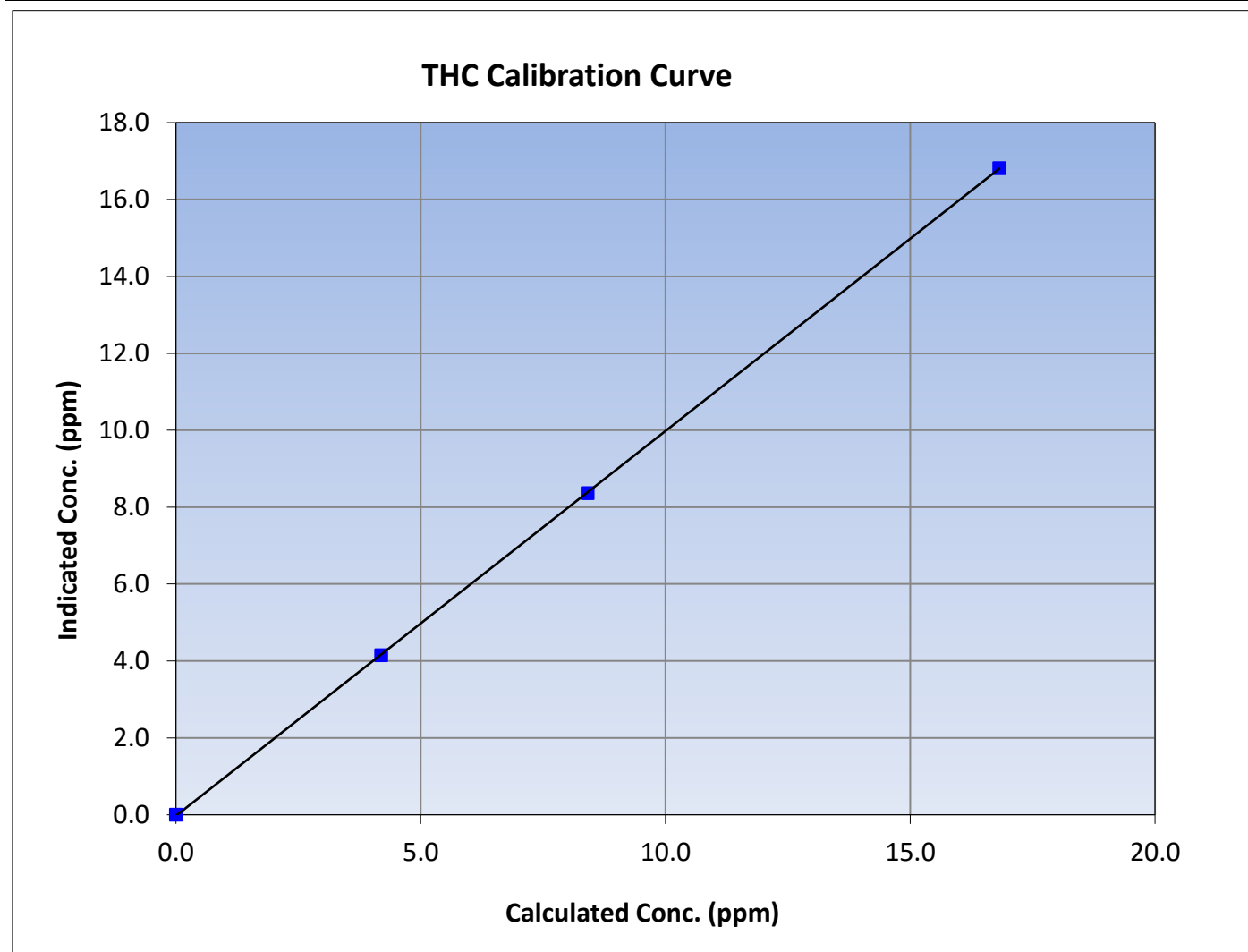
Version-06-2022

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 8, 2023 | Previous Calibration: | February 8, 2023 |
| Station Name:     | Mildred Lake  | Station Number:       | AMS02            |
| Start Time (MST): | 9:53          | End Time (MST):       | 12:58            |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1180320038       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999989  | $\geq 0.995$  |       |          |             |
| 16.82                               | 16.82                              | 1.0001                    |                         |           |               |       |          |             |
| 8.41                                | 8.37                               | 1.0050                    |                         |           |               | Slope | 1.000469 | 0.90 - 1.10 |
| 4.19                                | 4.15                               | 1.0104                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.025314 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

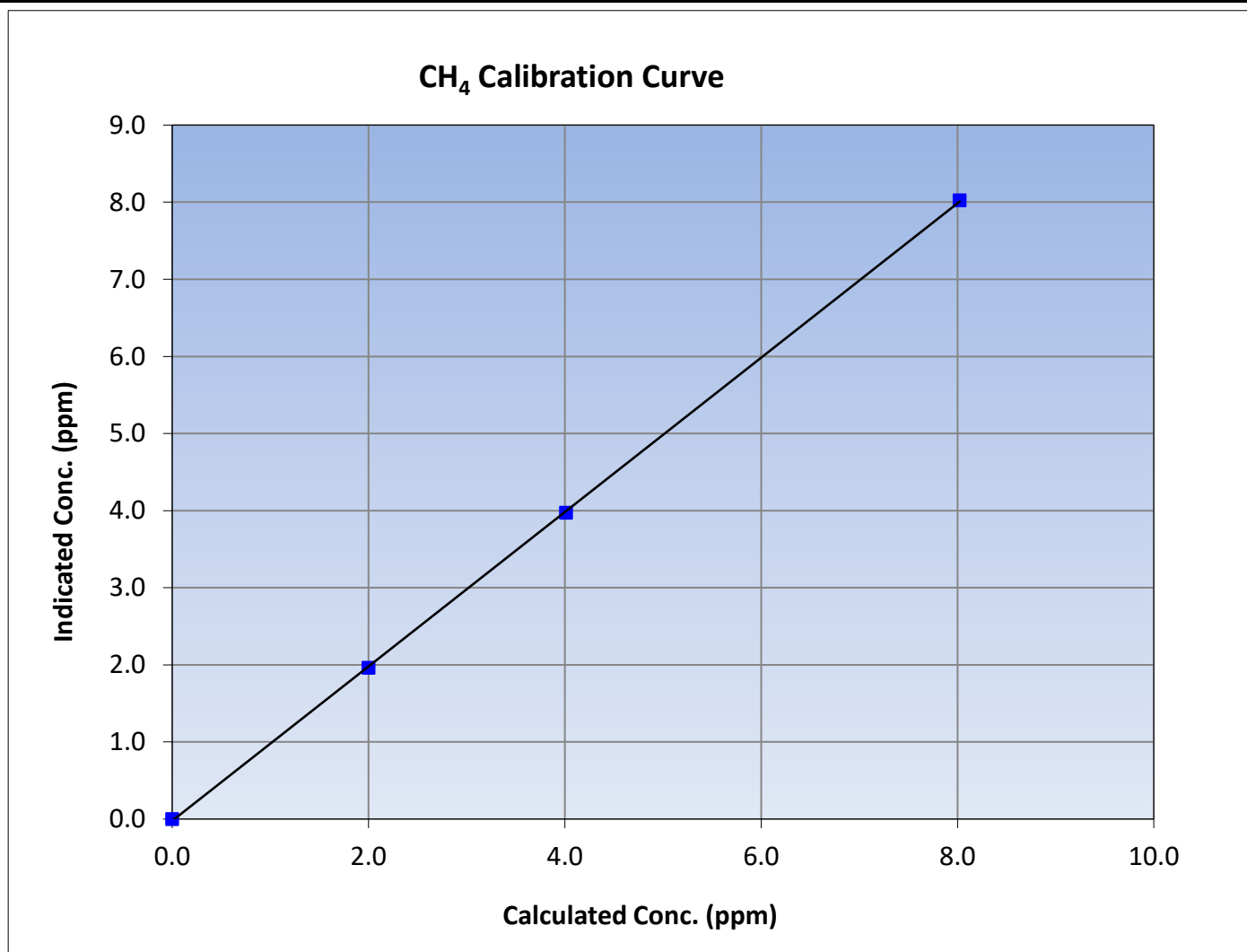
Version-06-2022

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 8, 2023 | Previous Calibration: | February 8, 2023 |
| Station Name:     | Mildred Lake  | Station Number:       | AMS02            |
| Start Time (MST): | 9:53          | End Time (MST):       | 12:58            |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1180320038       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999959  | $\geq 0.995$  |
| 8.02                                | 8.02                               | 1.0000                    |                         |           |               |
| 4.01                                | 3.97                               | 1.0100                    |                         |           |               |
| 2.00                                | 1.96                               | 1.0193                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 1.001069  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.023053 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

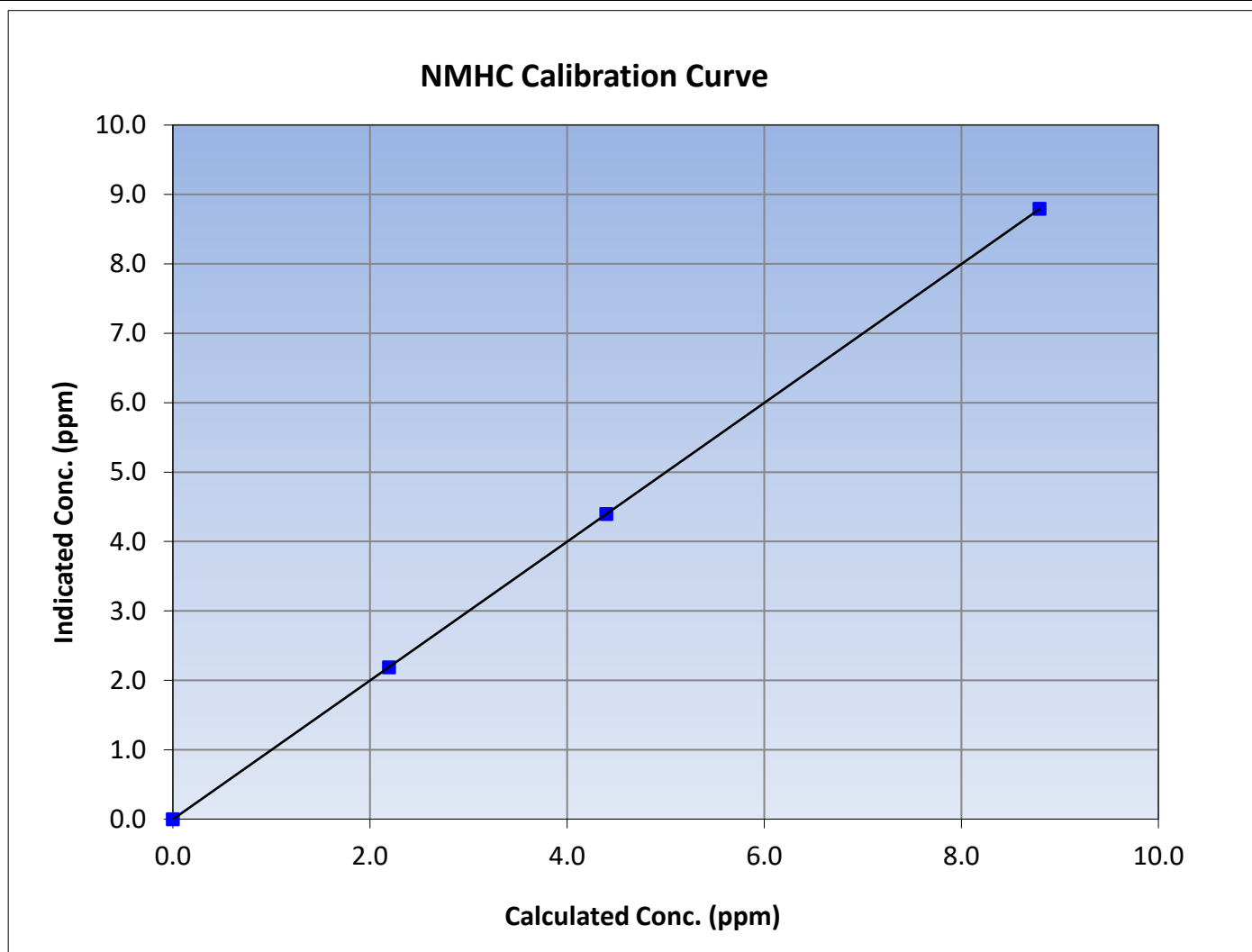
Version-06-2022

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 8, 2023 | Previous Calibration: | February 8, 2023 |
| Station Name:     | Mildred Lake  | Station Number:       | AMS02            |
| Start Time (MST): | 9:53          | End Time (MST):       | 12:58            |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1180320038       |

### Calibration Data

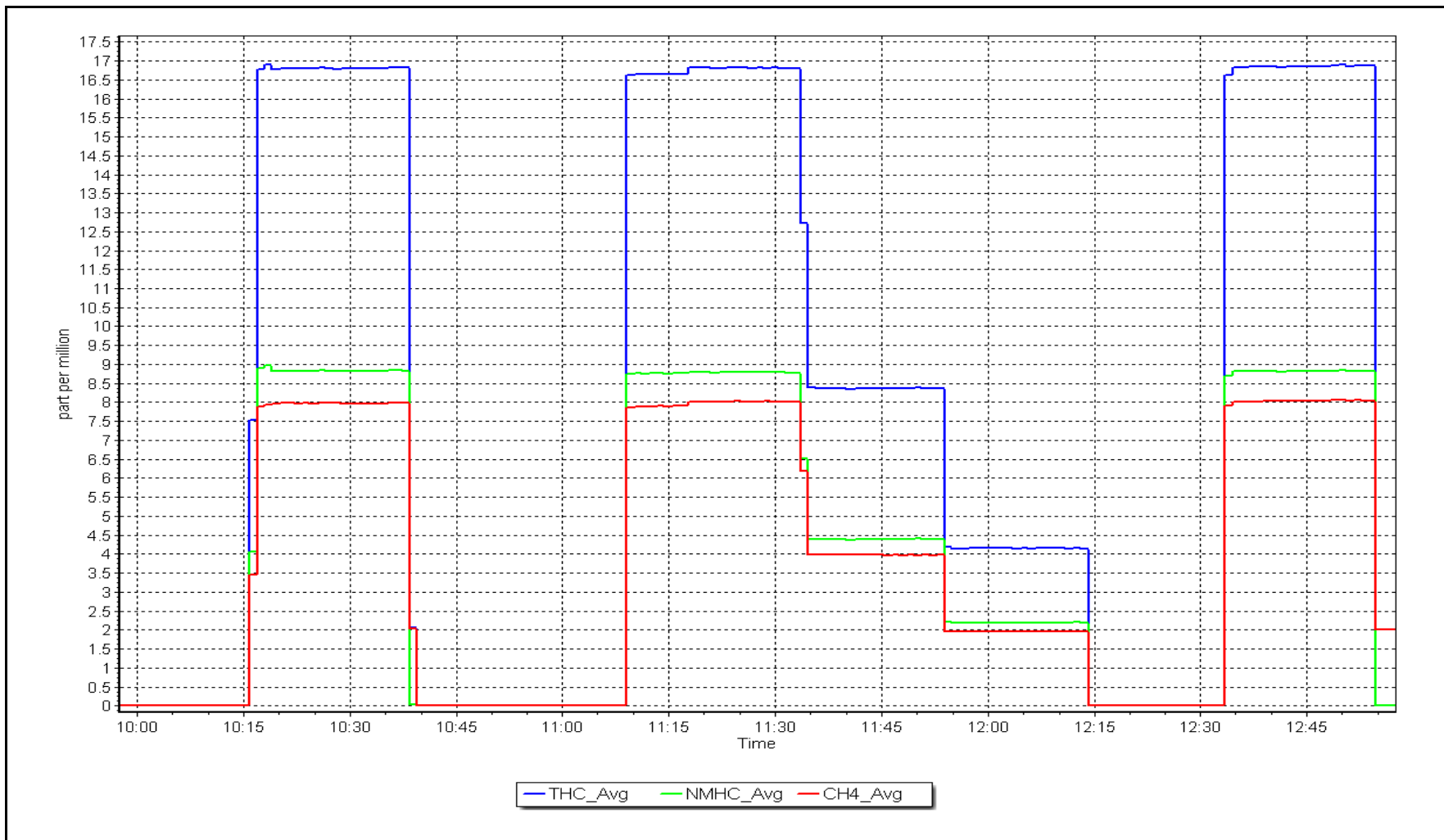
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 1.000000  | $\geq 0.995$  |       |          |             |
| 8.80                                | 8.79                               | 1.0004                    |                         |           |               |       |          |             |
| 4.40                                | 4.39                               | 1.0008                    |                         |           |               | Slope | 0.999791 | 0.90 - 1.10 |
| 2.19                                | 2.19                               | 1.0025                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.002261 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: March 8, 2023

Location: Mildred Lake





## **WOOD BUFFALO ENVIRONMENTAL ASSOCIATION**

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS04 BUFFALO VIEWPOINT MARCH 2023**

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

April 29, 2023







# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                   |
|-------------------|-------------------|-----------------|-------------------|
| Station Name:     | Buffalo Viewpoint | Station number: | AMS04             |
| Calibration Date: | March 28, 2023    | Last Cal Date:  | February 10, 2023 |
| Start time (MST): | 6:30              | End time (MST): | 9:25              |
| Reason:           | Routine           |                 |                   |

### Calibration Standards

|                        |          |     |                   |                   |
|------------------------|----------|-----|-------------------|-------------------|
| Cal Gas Concentration: | 50.02    | ppm | Cal Gas Exp Date: | September 9, 2028 |
| Cal Gas Cylinder #:    | CC470284 |     |                   |                   |
| 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:    | 3808              |
| ZAG Make/Model:        | API T701 |     | Serial Number:    | 5611              |

### Analyzer Information

|                |              |                    |              |
|----------------|--------------|--------------------|--------------|
| Analyzer make: | Thermo 43i   | Analyzer serial #: | JC1327300932 |
| Analyzer Range | 0 - 1000 ppb |                    |              |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.998701     | 0.996516      | Backgd or Offset: | 21.5         | 22.1          |
| Calibration intercept: | 1.140000     | -0.920000     | Coeff or Slope:   | 0.869        | 0.869         |

### SO<sub>2</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| as found span             | 4920                          | 80.0                        | 800.3                               | 794.6                              | 1.007   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | -0.3                               | ----  |
| high point                | 4920                          | 80.0                        | 800.3                               | 796.7                              | 1.005   |
| second point              | 4960                          | 40.0                        | 400.2                               | 398.2                              | 1.005   |
| third point               | 4980                          | 20.0                        | 200.1                               | 197.4                              | 1.014   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span              | 4920                          | 80.0                        | 800.3                               | 797.8                              | 1.003   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.008   |

|                          |        |                   |        |               |       |
|--------------------------|--------|-------------------|--------|---------------|-------|
| Baseline Corr As found:  | 794.20 | Previous response | 800.42 | *% 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 Adjusted.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

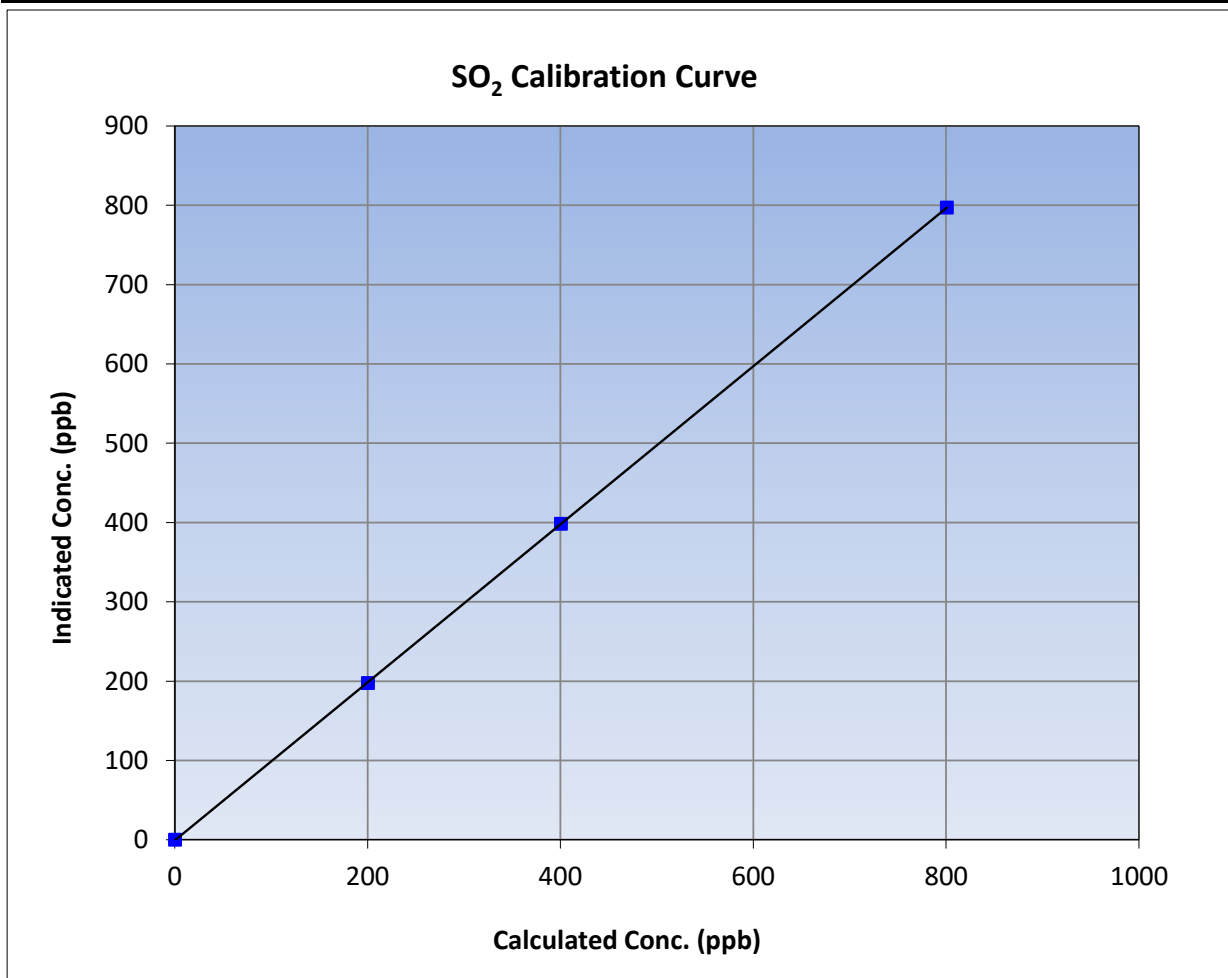
Version-01-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 28, 2023    | Previous Calibration: | February 10, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04             |
| Start Time (MST): | 6:30              | End Time (MST):       | 9:25              |
| Analyzer make:    | Thermo 43i        | Analyzer serial #:    | JC1327300932      |

### Calibration Data

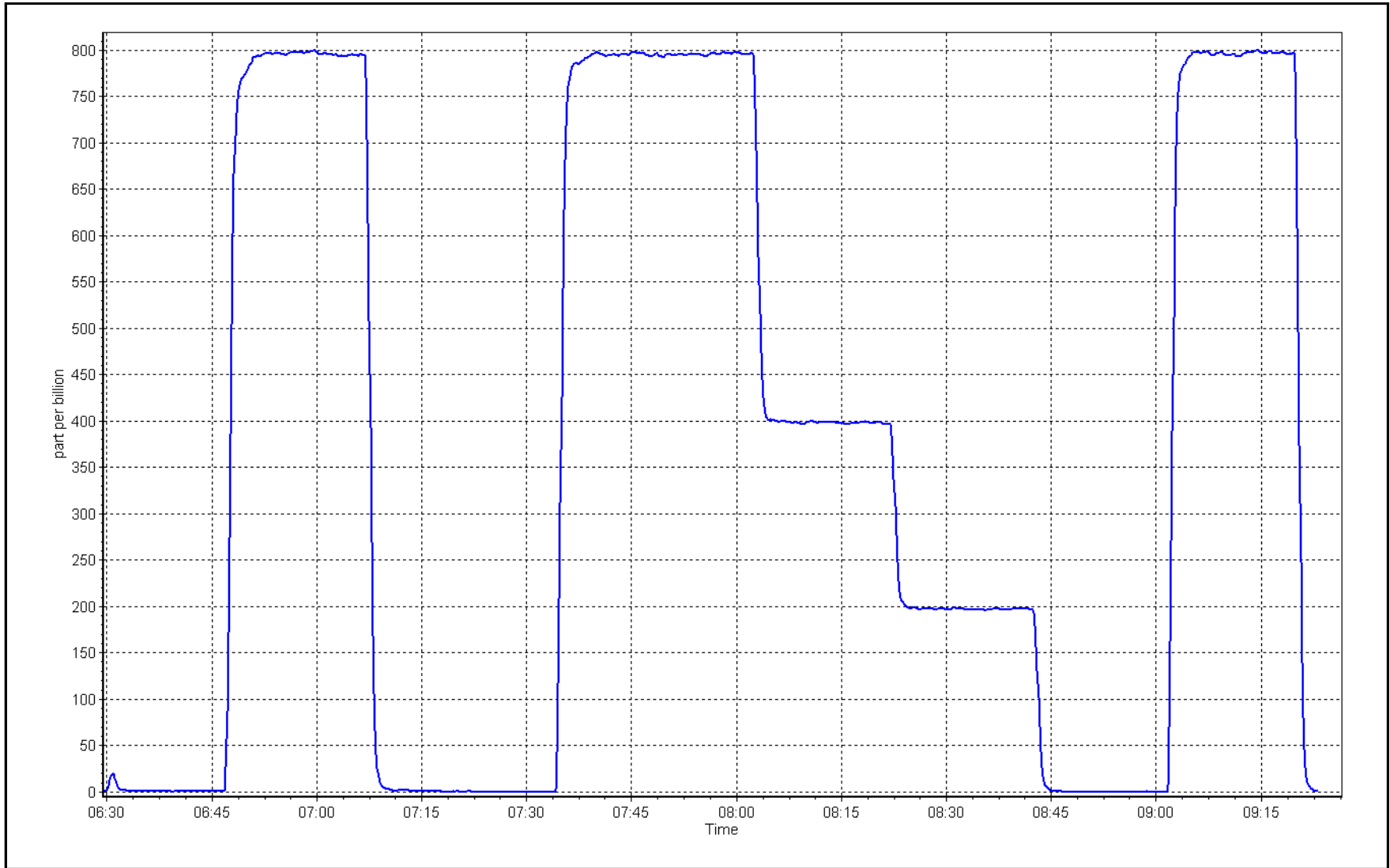
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | -0.3                                  | ----                         | Correlation Coefficient | 0.999995      |             |
| 800.3                                  | 796.7                                 | 1.0045                       |                         |               | ≥0.995      |
| 400.2                                  | 398.2                                 | 1.0049                       | Slope                   | 0.996516      |             |
| 200.1                                  | 197.4                                 | 1.0136                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | -0.920000     | +/-30       |



SO2 Calibration Plot

Date: March 28, 2023

Location: Buffalo Viewpoint





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Buffalo Viewpoint      Station number: AMS04  
 Calibration Date: March 8, 2023      Last Cal Date: February 15, 2023  
 Start time (MST): 8:50      End time (MST): 12:30  
 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: January 4, 2025  
 Removed Gas Cyl #: CC345266      Diff between cyl:  
 Calibrator Make/Model: API T700      Serial Number: 3808  
 ZAG Make/Model: API T701H      Serial Number: 362

### Analyzer Information

Analyzer make: Thermo 450i      Analyzer serial #: 1336160094  
 Converter make: NA      Converter serial #: NA  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 1.001200     | 0.995796      | Backgd or Offset: 18.7 | 18.7          |
| Calibration intercept: | 0.162167     | 0.201944      | Coeff or Slope: 1.080  | 1.080         |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----   |
| as found span         | 4926                          | 74.1                        | 80.3                                | 80.6                               | 1.000  |
| as found 2nd point    | 4963                          | 37.0                        | 40.1                                | 40.7                               | 0.993  |
| as found 3rd point    | 4982                          | 18.5                        | 20.1                                | 20.0                               | 1.018  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| high point                              | 4926                          | 74.1                        | 80.3                                | 80.3                               | 1.000   |
| second point                            | 4963                          | 37.0                        | 40.1                                | 40.0                               | 1.003   |
| third point                             | 4982                          | 18.5                        | 20.1                                | 20.0                               | 1.003   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| as left span                            | 4926                          | 74.1                        | 80.3                                | 81.0                               | 0.992   |
| SO2 Scrubber Check                      | 4920                          | 80.0                        | 800.0                               | -0.2                               | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    | 1.002   |
| Date of last converter efficiency test: |                               |                             |                                     | efficiency                         |   |

Baseline Corr As found: 80.3      Prev response: 80.58      \*% change: -0.4%  
 Baseline Corr 2nd AF pt: 40.4      AF Slope: 1.001624      AF Intercept: 0.222271  
 Baseline Corr 3rd AF pt: 19.7      AF Correlation: 0.999944

\* = > +/-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<sub>2</sub>S Calibration Summary

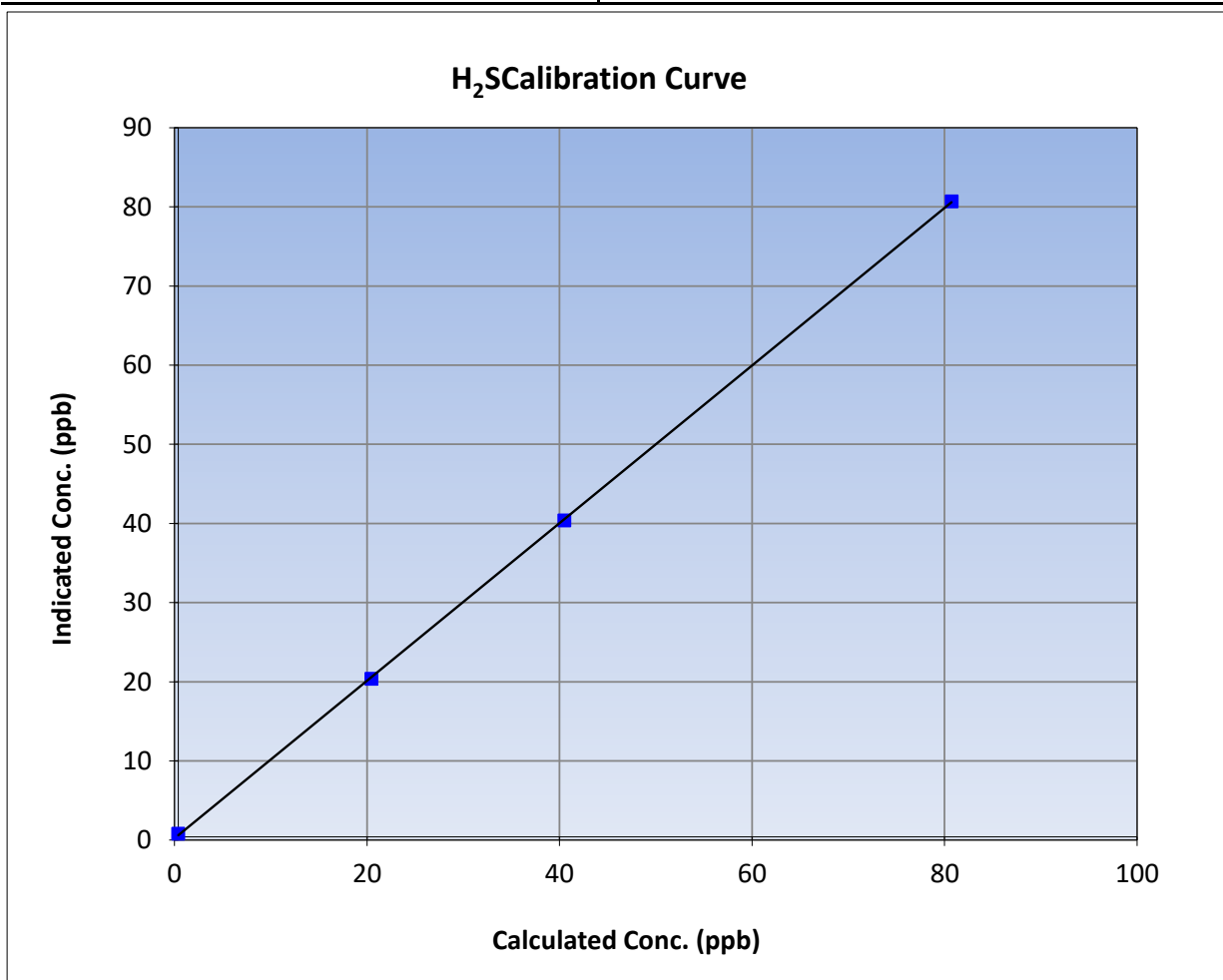
Version-11-2021

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 8, 2023     | Previous Calibration: | February 15, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04             |
| Start Time (MST): | 8:50              | End Time (MST):       | 12:30             |
| Analyzer make:    | Thermo 450i       | Analyzer serial #:    | 1336160094        |

### Calibration Data

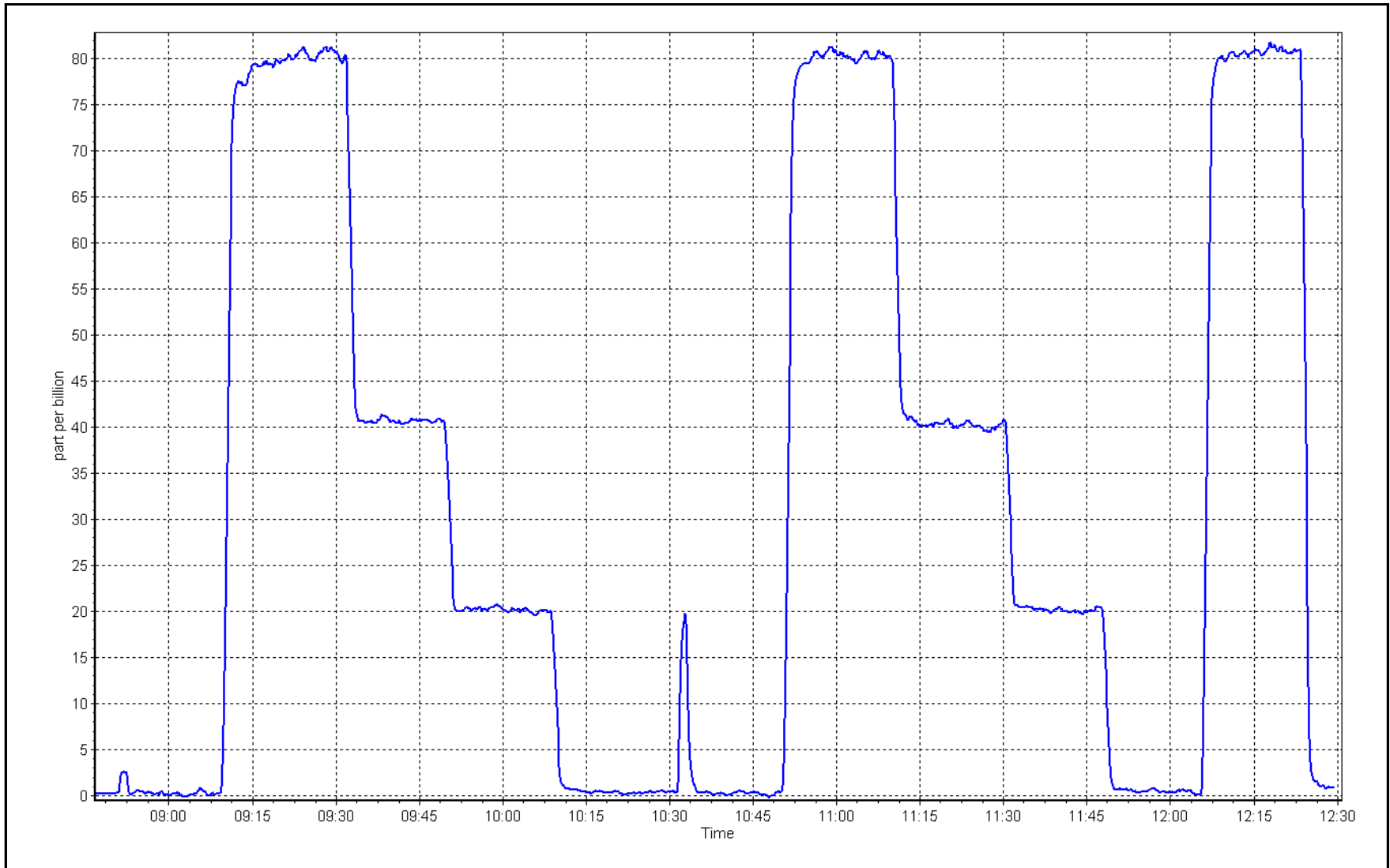
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.4                                | ----                      | Correlation Coefficient | 0.999971 | ≥0.995      |
| 80.3                                | 80.3                               | 1.0003                    |                         |          |             |
| 40.1                                | 40.0                               | 1.0027                    | Slope                   | 0.995796 | 0.90 - 1.10 |
| 20.1                                | 20.0                               | 1.0026                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.201944 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: March 8, 2023

Location: Buffalo Viewpoint





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                   |
|-------------------|-------------------|-----------------|-------------------|
| Station Name:     | Buffalo Viewpoint | Station number: | AMS04             |
| Calibration Date: | March 28, 2023    | Last Cal Date:  | February 10, 2023 |
| Start time (MST): | 6:30              | End time (MST): | 8:45              |
| Reason:           | Removal           |                 |                   |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC470284  | Cal Gas Expiry Date:        | September 9, 2028 |
| CH <sub>4</sub> Cal Gas Conc.               | 497.8 ppm | CH <sub>4</sub> Equiv Conc. | 1062.9 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.5 ppm |                             |                   |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 497.8 ppm | CH <sub>4</sub> Equiv Conc. | 1062.9 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.5 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | 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 | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.070E-04    | 3.190E-04     | NMHC SP Ratio:  | 6.120E-05     |
| CH <sub>4</sub> Retention time: | 13.6         | 13.6          | NMHC Peak Area: | 147690        |
|                                 |              |               |                 | 141169        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4920              | 80.0                 | 17.01                | 16.75               | 1.015                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4920              | 80.0                 | 17.01                | 17.02               | 0.999                      |
| second point          | 4960              | 40.0                 | 8.50                 | 8.33                | 1.021                      |
| third point           | 4980              | 20.0                 | 4.25                 | 4.10                | 1.037                      |

|                       |       |                 |       | Average Correction Factor                  | 1.019 |
|-----------------------|-------|-----------------|-------|--|-------|
| Baseline Corr AF:     | 16.75 | Prev response   | 17.01 | *% change                                  | -1.5% |
| 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                                       |                            |
| as found span         | 4920              | 80.0                 | 9.04                 | 8.85                                       | 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              | 80.0                 | 9.04                 | 9.00                                       | 1.005                      |
| second point          | 4960              | 40.0                 | 4.52                 | 4.46                                       | 1.014                      |
| third point           | 4980              | 20.0                 | 2.26                 | 2.21                                       | 1.023                      |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                  | 1.014                      |
| Baseline Corr AF:     | 8.85              | Prev response        | 9.03                 | *% change                                  | -2.0%                      |
| Baseline Corr 2nd AF: | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF: | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span         | 4920              | 80.0                 | 7.96                 | 7.90                                       | 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              | 80.0                 | 7.96                 | 8.02                                       | 0.993                      |
| second point          | 4960              | 40.0                 | 3.98                 | 3.87                                       | 1.029                      |
| third point           | 4980              | 20.0                 | 1.99                 | 1.88                                       | 1.059                      |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                  | 1.027                      |
| Baseline Corr AF:     | 7.90              | Prev response        | 7.99                 | *% change                                  | -1.1%                      |
| Baseline Corr 2nd AF: | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF: | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.004640     | 1.002691      |
| THC Cal Offset:             | -0.080000    | -0.098000     |
| CH <sub>4</sub> Cal Slope:  | 1.011594     | 1.010302      |
| CH <sub>4</sub> Cal Offset: | -0.070000    | -0.078000     |
| NMHC Cal Slope:             | 0.999400     | 0.996366      |
| NMHC Cal Offset:            | -0.006000    | -0.024000     |

Notes: Removal Due to third point being 6% low. Span was adjusted, before finding out third point was low.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## THC Calibration Summary

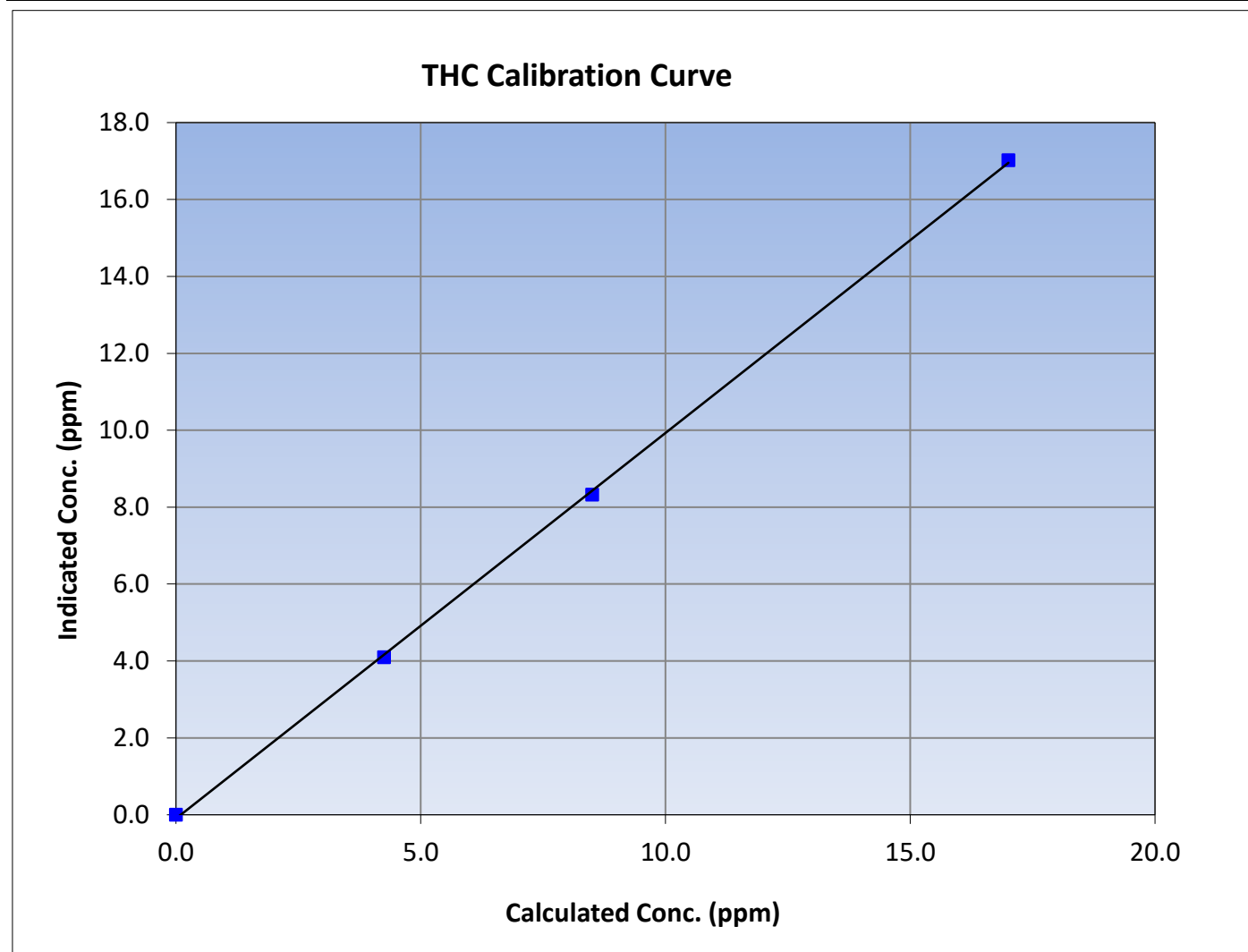
Version-01-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 28, 2023    | Previous Calibration: | February 10, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04             |
| Start Time (MST): | 6:30              | End Time (MST):       | 8:45              |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1426262594        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999825  | $\geq 0.995$  |
| 17.01                               | 17.02                              | 0.9992                    |                         |           |               |
| 8.50                                | 8.33                               | 1.0208                    |                         |           |               |
| 4.25                                | 4.10                               | 1.0370                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 1.002691  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.098000 | +/-0.5        |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

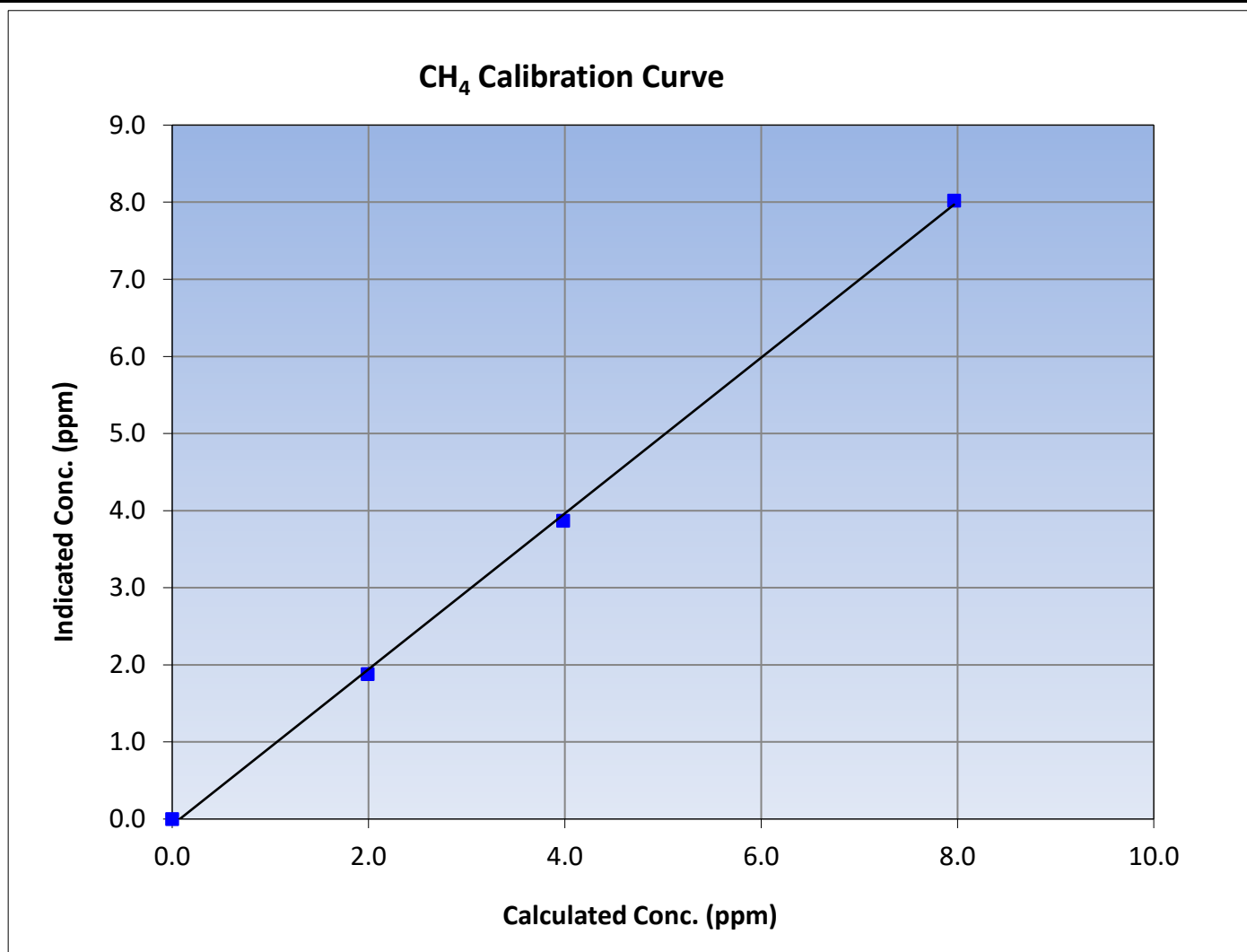
Version-01-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 28, 2023    | Previous Calibration: | February 10, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04             |
| Start Time (MST): | 6:30              | End Time (MST):       | 8:45              |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1426262594        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999512  | $\geq 0.995$  |       |          |             |
| 7.96                                | 8.02                               | 0.9931                    |                         |           |               |       |          |             |
| 3.98                                | 3.87                               | 1.0290                    |                         |           |               | Slope | 1.010302 | 0.90 - 1.10 |
| 1.99                                | 1.88                               | 1.0591                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.078000 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

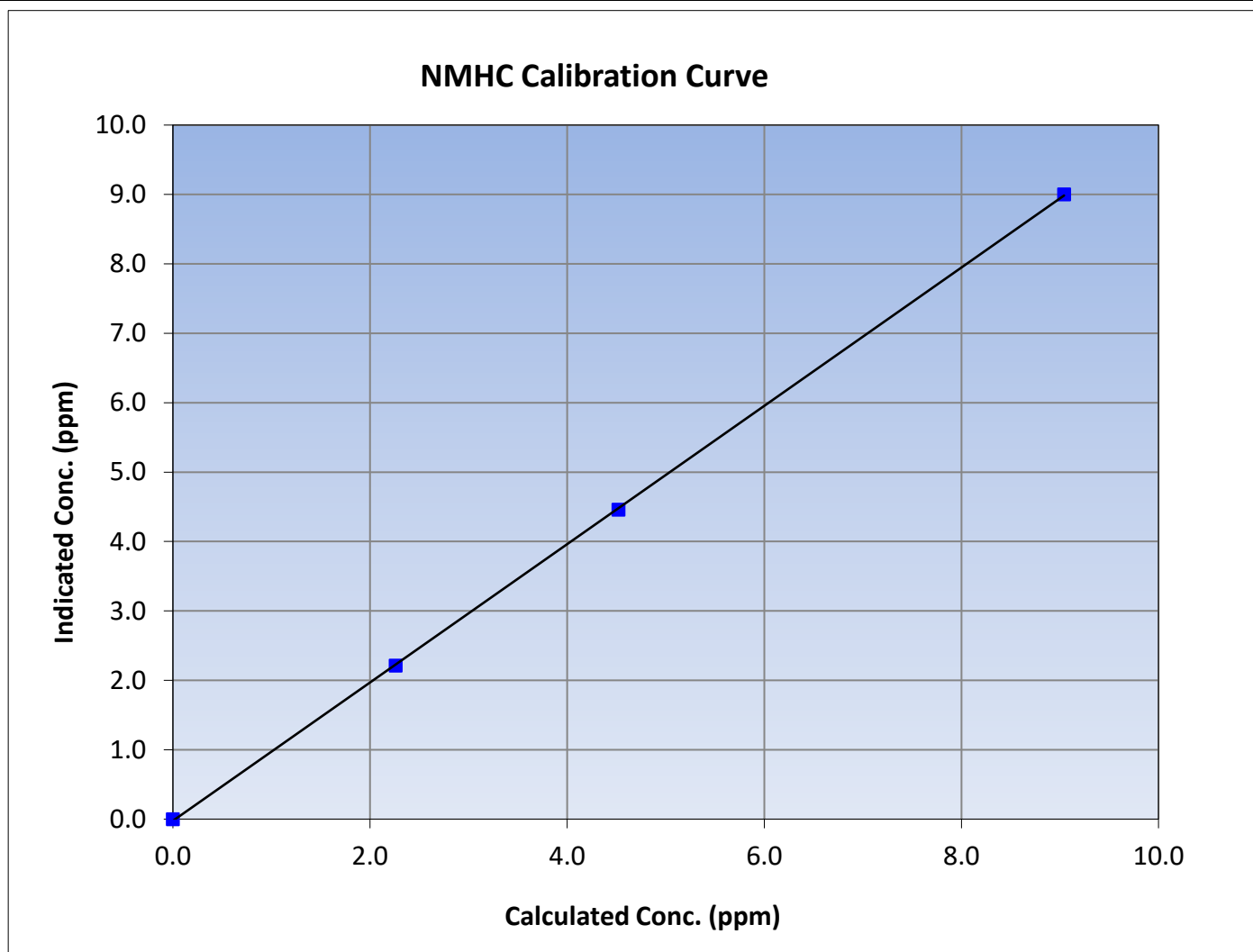
Version-01-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 28, 2023    | Previous Calibration: | February 10, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04             |
| Start Time (MST): | 6:30              | End Time (MST):       | 8:45              |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1426262594        |

### Calibration Data

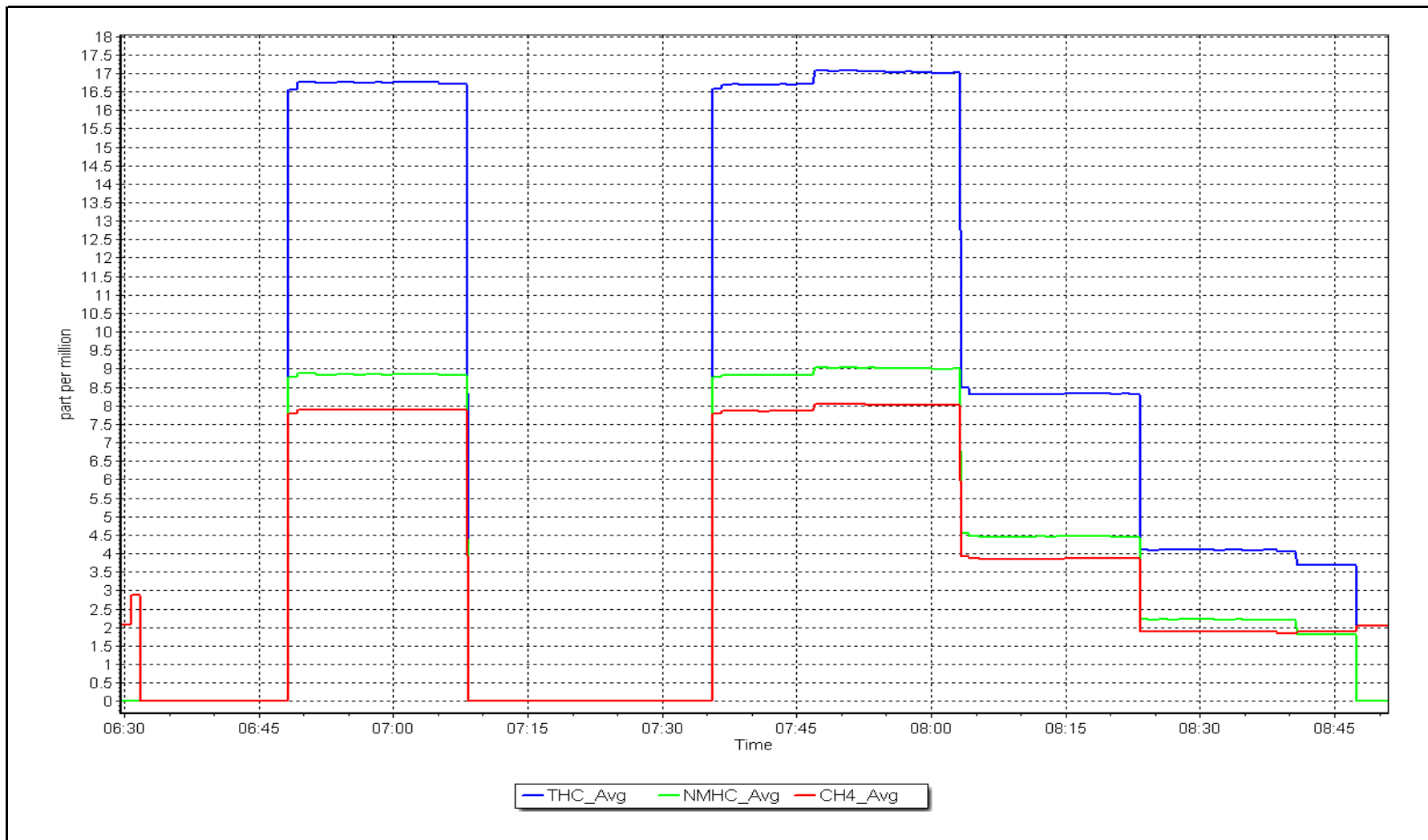
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999965  | $\geq 0.995$  |       |          |             |
| 9.04                                | 9.00                               | 1.0047                    |                         |           |               |       |          |             |
| 4.52                                | 4.46                               | 1.0137                    |                         |           |               | Slope | 0.996366 | 0.90 - 1.10 |
| 2.26                                | 2.21                               | 1.0229                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.024000 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: March 28, 2023

Location: Buffalo Viewpoint





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |       |
|-------------------|-------------------|-----------------|-------|
| Station Name:     | Buffalo Viewpoint | Station number: | AMS04 |
| Calibration Date: | March 29, 2023    | Last Cal Date:  |       |
| Start time (MST): | 8:24              | End time (MST): | 10:37 |
| Reason:           | Install           |                 |       |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC470284  | Cal Gas Expiry Date:        | September 9, 2028 |
| CH <sub>4</sub> Cal Gas Conc.               | 497.8 ppm | CH <sub>4</sub> Equiv Conc. | 1062.9 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.5 ppm |                             |                   |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 497.8 ppm | CH <sub>4</sub> Equiv Conc. | 1062.9 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.5 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 3808              |
| ZAG make/model:                             | API T701  | Serial Number:              | 362               |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1222762077 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       |              | 1.860E-04     | NMHC SP Ratio:  | 3.820E-05     |
| CH <sub>4</sub> Retention time: |              | 12.0          | NMHC Peak Area: | 236627        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| 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                 | 17.01                | 17.00               | 1.000                      |
| second point          | 4960              | 40.0                 | 8.50                 | 8.50                | 1.000                      |
| third point           | 4980              | 20.0                 | 4.25                 | 4.22                | 1.008                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4920              | 80.0                 | 17.01                | 17.07               | 0.996                      |

|                       |    |                 |    | Average Correction Factor                  | 1.003 |
|-----------------------|----|-----------------|----|--|-------|
| Baseline Corr AF:     | NA | Prev response   | NA | *% change                                  | NA    |
| Baseline Corr 2nd AF: | NA | AF Slope:       |    | AF Intercept:                              |       |
| Baseline Corr 3rd AF: | NA | AF Correlation: |    | * = > +/-5% change initiates investigation |       |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| 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                 | 9.04                 | 9.04                                       | 1.000                      |
| second point              | 4960              | 40.0                 | 4.52                 | 4.51                                       | 1.002                      |
| third point               | 4980              | 20.0                 | 2.26                 | 2.24                                       | 1.009                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.0                 | 9.04                 | 9.04                                       | 1.000                      |
| Average Correction Factor |                   |                      |                      |  | 1.004                      |
| 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 |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| 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                 | 7.96                 | 7.97                                       | 0.999                      |
| second point              | 4960              | 40.0                 | 3.98                 | 3.99                                       | 0.998                      |
| third point               | 4980              | 20.0                 | 1.99                 | 1.99                                       | 1.001                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.0                 | 7.96                 | 8.02                                       | 0.993                      |
| Average Correction Factor |                   |                      |                      |  | 0.999                      |
| 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

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              |              | 1.000205      |
| THC Cal Offset:             |              | -0.012000     |
| CH <sub>4</sub> Cal Slope:  |              | 1.000832      |
| CH <sub>4</sub> Cal Offset: |              | 0.000000      |
| NMHC Cal Slope:             |              | 1.000411      |
| NMHC Cal Offset:            |              | -0.010000     |

Notes: Removed 55i not linear. Install calibration. Use zero chromatogram to NO. Span adjusted.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

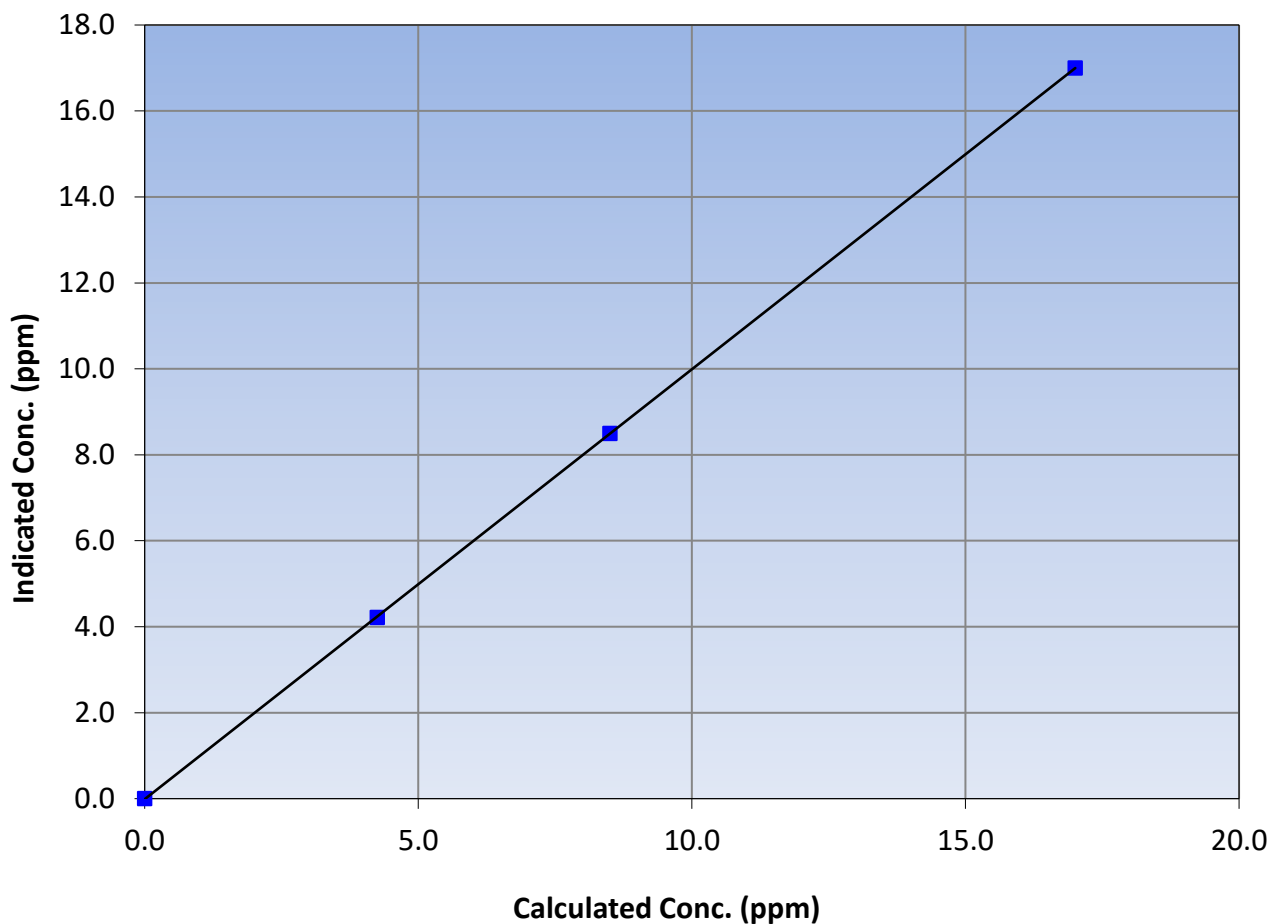
### Station Information

|                   |                   |                       |            |
|-------------------|-------------------|-----------------------|------------|
| Calibration Date: | March 29, 2023    | Previous Calibration: |            |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04      |
| Start Time (MST): | 8:24              | End Time (MST):       | 10:37      |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1222762077 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |           |           |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-----------|-----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999996 | $\geq 0.995$  |           |           |             |
| 17.01                               | 17.00                              | 1.0004                    |                         |          |               |           |           |             |
| 8.50                                | 8.50                               | 1.0004                    |                         |          |               | Slope     | 1.000205  | 0.90 - 1.10 |
| 4.25                                | 4.22                               | 1.0075                    |                         |          |               | Intercept | -0.012000 | +/-0.5      |

### THC Calibration Curve







# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

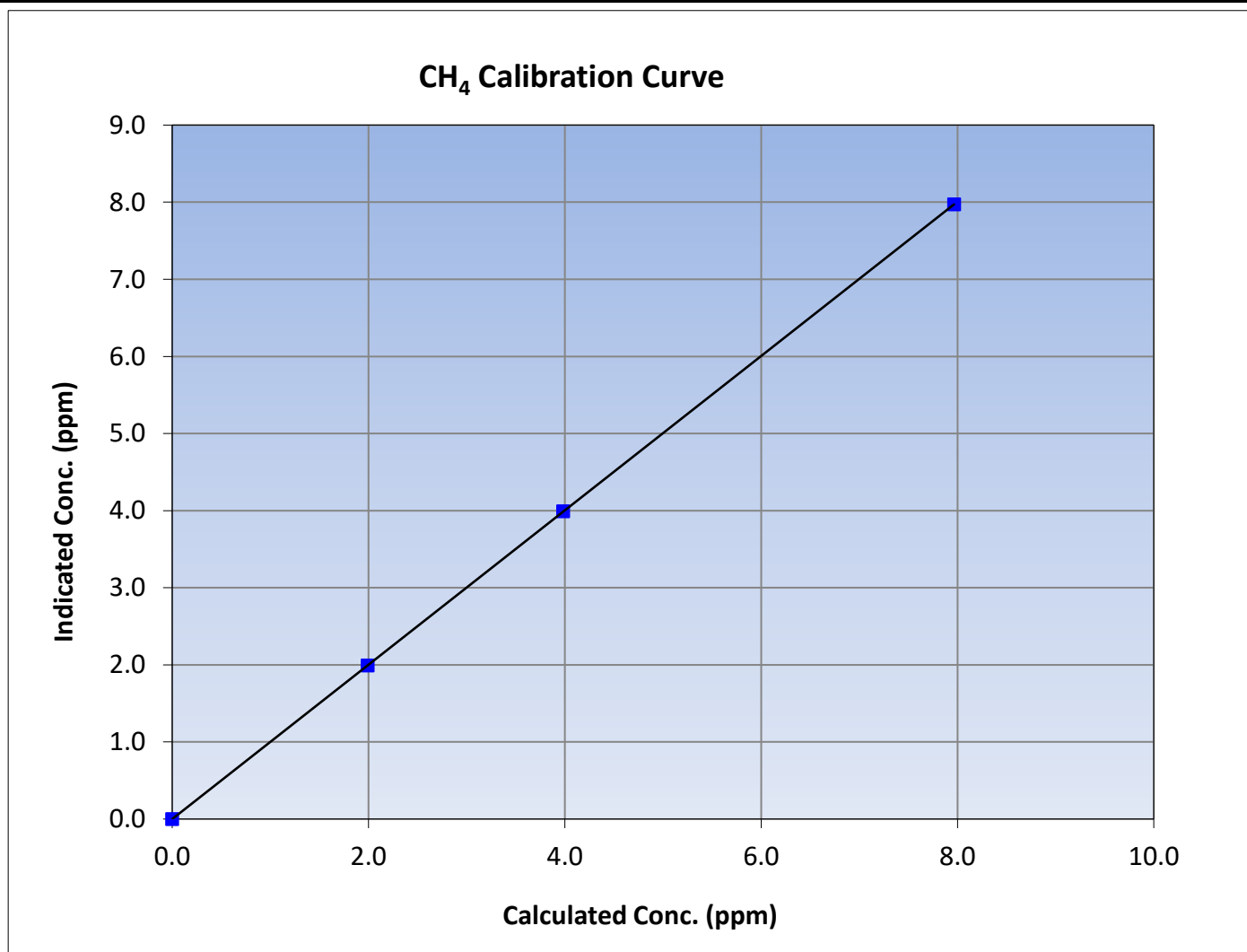
Version-01-2020

### Station Information

|                   |                   |                       |            |
|-------------------|-------------------|-----------------------|------------|
| Calibration Date: | March 29, 2023    | Previous Calibration: |            |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04      |
| Start Time (MST): | 8:24              | End Time (MST):       | 10:37      |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1222762077 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999999 | ≥0.995        |
| 7.96                                | 7.97                               | 0.9993                    |                         |          |               |
| 3.98                                | 3.99                               | 0.9981                    |                         |          |               |
| 1.99                                | 1.99                               | 1.0006                    |                         |          |               |
|                                     |                                    |                           | Slope                   | 1.000832 | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | 0.000000 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

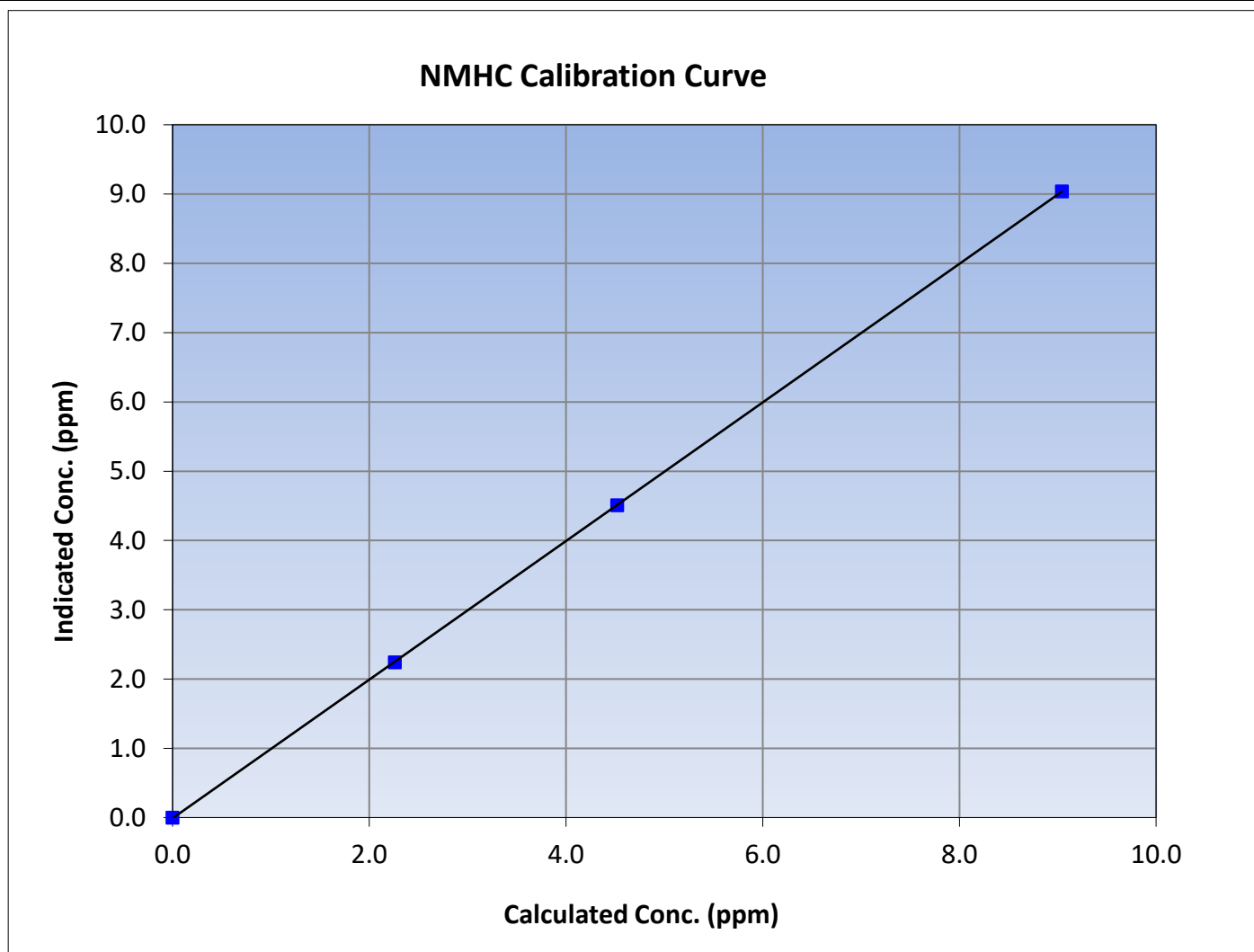
Version-01-2020

### Station Information

|                   |                   |                       |            |
|-------------------|-------------------|-----------------------|------------|
| Calibration Date: | March 29, 2023    | Previous Calibration: |            |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04      |
| Start Time (MST): | 8:24              | End Time (MST):       | 10:37      |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1222762077 |

### Calibration Data

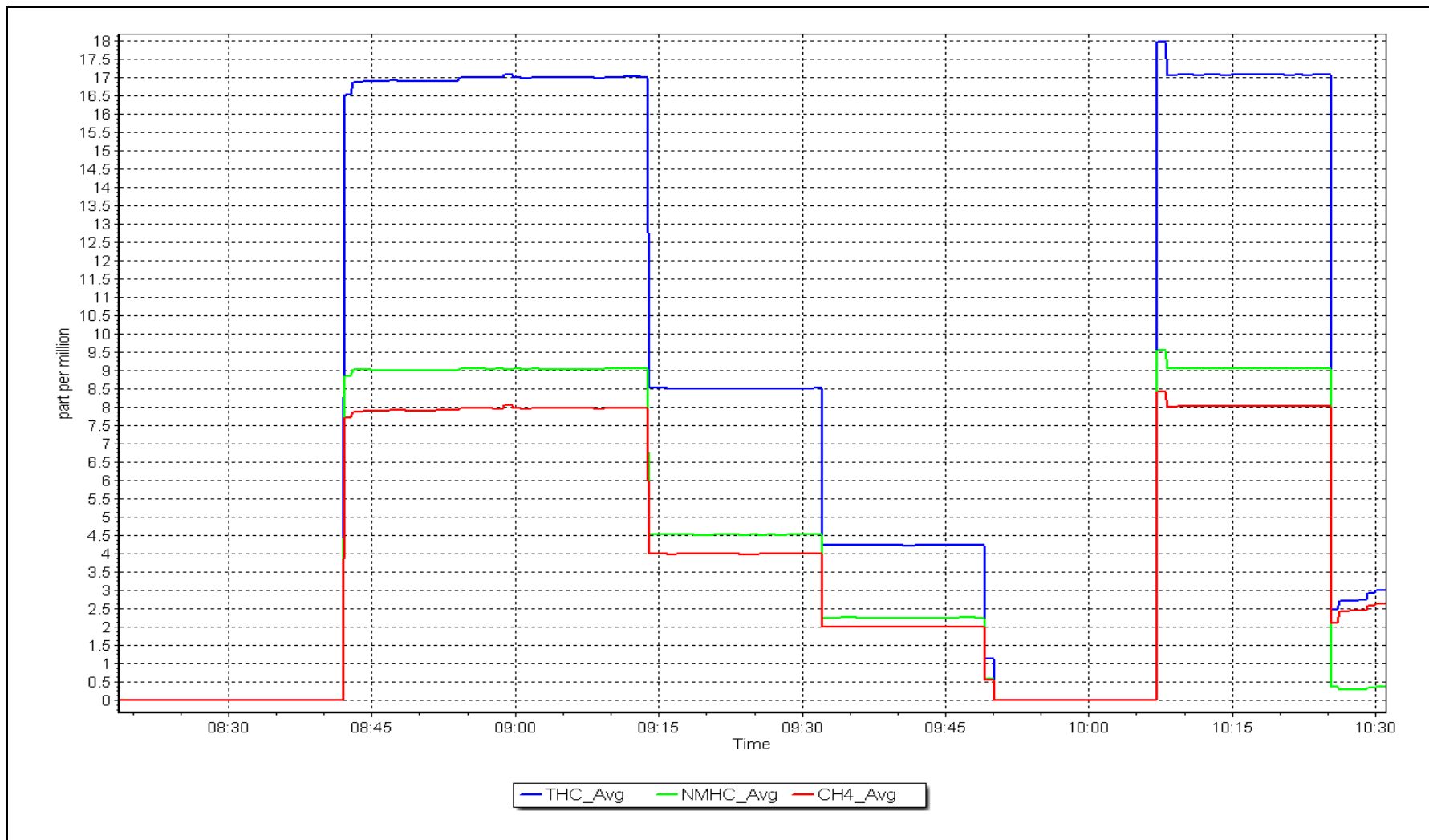
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999994  | $\geq 0.995$  |
| 9.04                                | 9.04                               | 1.0002                    |                         |           |               |
| 4.52                                | 4.51                               | 1.0024                    |                         |           |               |
| 2.26                                | 2.24                               | 1.0092                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 1.000411  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.010000 | +/-0.5        |



NMHC Calibration Plot

Date: March 29, 2023

Location: Buffalo Viewpoint





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Buffalo Viewpoint  
Calibration Date: March 3, 2023  
Start time (MST): 8:07  
Reason: Routine  
Station number: AMS04  
Last Cal Date: February 14, 2023  
End time (MST): 12:49

### Calibration Standards

NO Gas Cylinder #: T36RH1F  
NOX Cal Gas Conc: 51.16 ppm  
Removed Cylinder #: NA  
Removed Gas NOX Conc: 51.16 ppm  
NOX gas Diff:  
Calibrator Model: API T700  
ZAG make/model: API T701  
Cal Gas Expiry Date: August 18, 2023  
NO Cal Gas Conc: 50.91 ppm  
Removed Gas Exp Date: NA  
Removed Gas NO Conc: 50.91 ppm  
NO gas Diff:  
Serial Number: 2445  
Serial Number: 362

### Analyzer Information

Analyzer make: API T200  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 723

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 0.998        | 0.998         | NO bkgnd or offset:  | -9.0         | -2.1          |
| NOX coeff or slope: | 0.992        | 0.992         | NOX bkgnd or offset: | -9.0         | -1.7          |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 7.3          | 7.6           |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.000759     | 0.998743      |
| NO <sub>x</sub> Cal Offset: | 0.966826     | 0.546857      |
| NO Cal Slope:               | 1.004151     | 1.004711      |
| NO Cal Offset:              | -0.053156    | -0.973240     |
| NO <sub>2</sub> Cal Slope:  | 0.994427     | 0.992216      |
| NO <sub>2</sub> Cal Offset: | -0.612933    | 0.603575      |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 4.5  | 3.4                                   | 1.2  | ----  | ----   |
| as found span             | 4922                      | 78.1                        | 799.1   | 795.2                                  | 3.9   | 799.2  | 797.1                                 | 2.1  | 0.9999  | 0.9976   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.3                                   | -0.2   | ----  | ----   |
| high point                | 4922                      | 78.1                        | 799.1   | 795.2                                  | 3.9   | 798.6  | 798.8                                 | -0.2   | 1.0006  | 0.9955   |
| second point              | 4961                      | 39.1                        | 400.1   | 398.1                                  | 2.0   | 399.7  | 397.8                                 | 2.0  | 1.0009  | 1.0008   |
| third point               | 4981                      | 19.5                        | 199.5   | 198.5                                  | 1.0   | 200.8  | 197.6                                 | 3.1  | 0.9935  | 1.0047   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.0                                   | 0.0  | ----  | ----   |
| as left span              | 4922                      | 78.1                        | 799.1   | 366.2                                  | 432.9   | 799.2  | 363.5                                 | 435.8  | 0.9999  | 1.0074   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9984  | 1.0003   |

|                      |                             |                |  |                                  |                         |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 794.7 ppb | NO = 793.7 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -0.8% |                      |
| Previous Response    | NO <sub>x</sub> = 800.7 ppb | NO = 798.4 ppb |  | *Percent Change                  | NO = -0.6%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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)       | 796.4                                      | 367.4                                 | 432.9   | 429.6  | 1.0077   | 99.2%  |
| 2nd GPT point (200 ppb O3)       | 796.4                                      | 582.3                                 | 218.0   | 217.7  | 1.0014   | 99.9%  |
| 3rd GPT point (100 ppb O3)       | 796.4                                      | 689.5                                 | 110.8   | 111.1  | 0.9973   | 100.3%   |
| Average Correction Factor        |  |                                       |   |  | 1.0021   | 99.8%  |

Notes:

No maintenance done. Zero adjusted.

Calibration Performed By:

Melissa Lemay



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

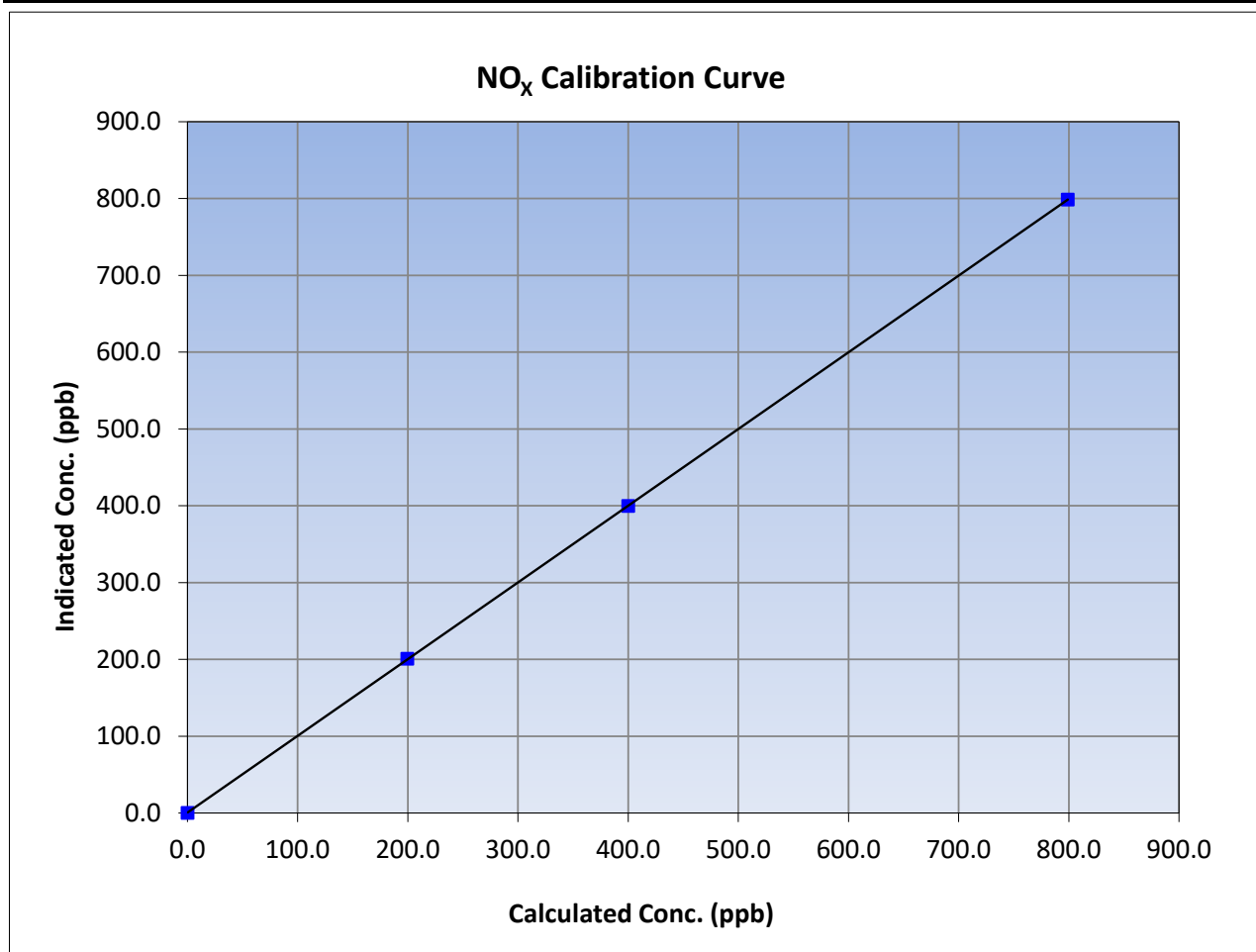
Version-04-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 3, 2023     | Previous Calibration: | February 14, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04             |
| Start Time (MST): | 8:07              | End Time (MST):       | 12:49             |
| Analyzer make:    | API T200          | Analyzer serial #:    | 723               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | ≥0.995   |             |
| 799.1                               | 798.6                              | 1.0006                    |                         |          |             |
| 400.1                               | 399.7                              | 1.0009                    |                         |          |             |
| 199.5                               | 200.8                              | 0.9935                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 0.998743 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.546857 | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

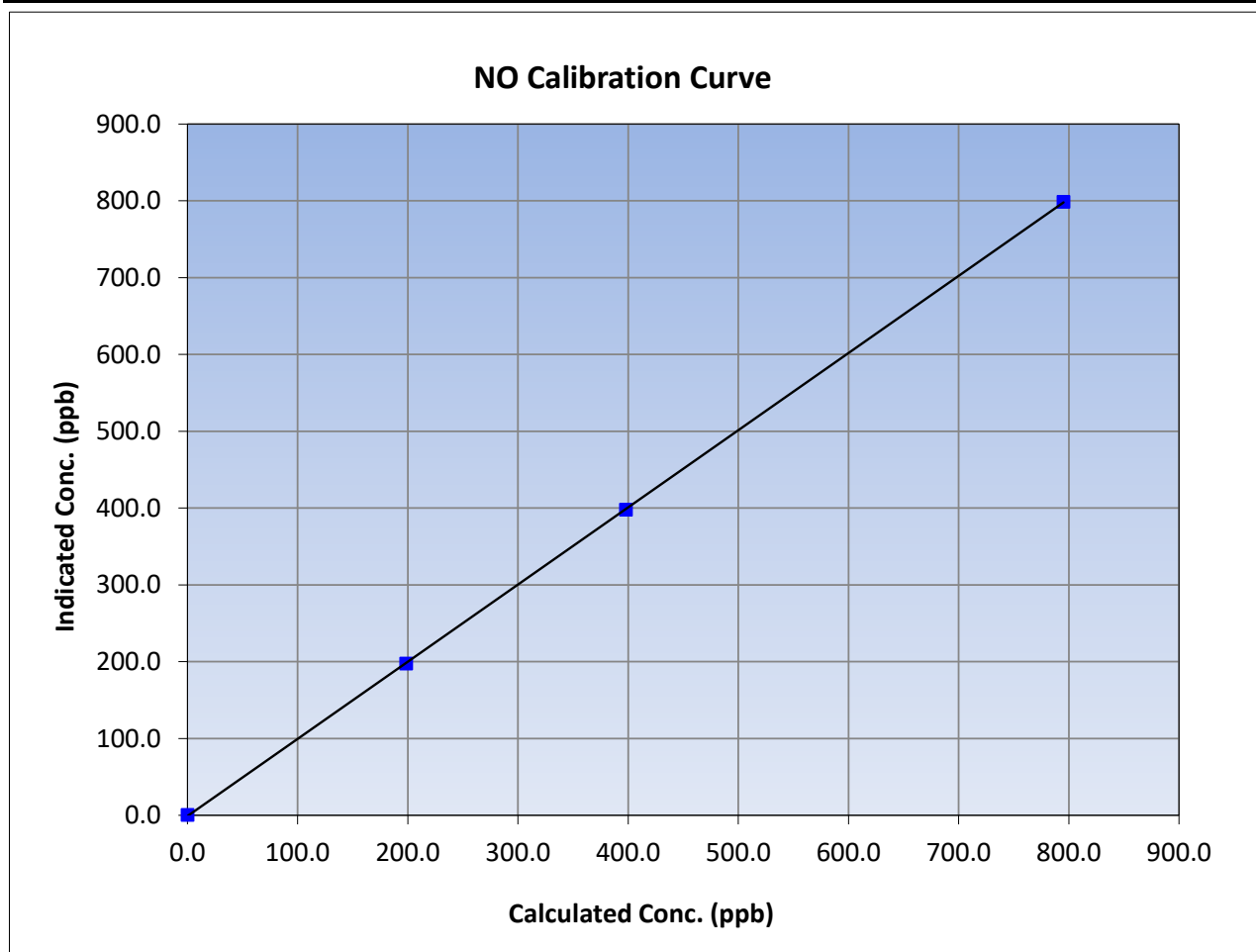
Version-04-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 3, 2023     | Previous Calibration: | February 14, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04             |
| Start Time (MST): | 8:07              | End Time (MST):       | 12:49             |
| Analyzer make:    | API T200          | Analyzer serial #:    | 723               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 795.2                               | 798.8                              | 0.9955                    |   |                                |
| 398.1                               | 397.8                              | 1.0008                    |   |                                |
| 198.5                               | 197.6                              | 1.0047                    |   |                                |
|                                     |                                    |                           |   |                                |





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

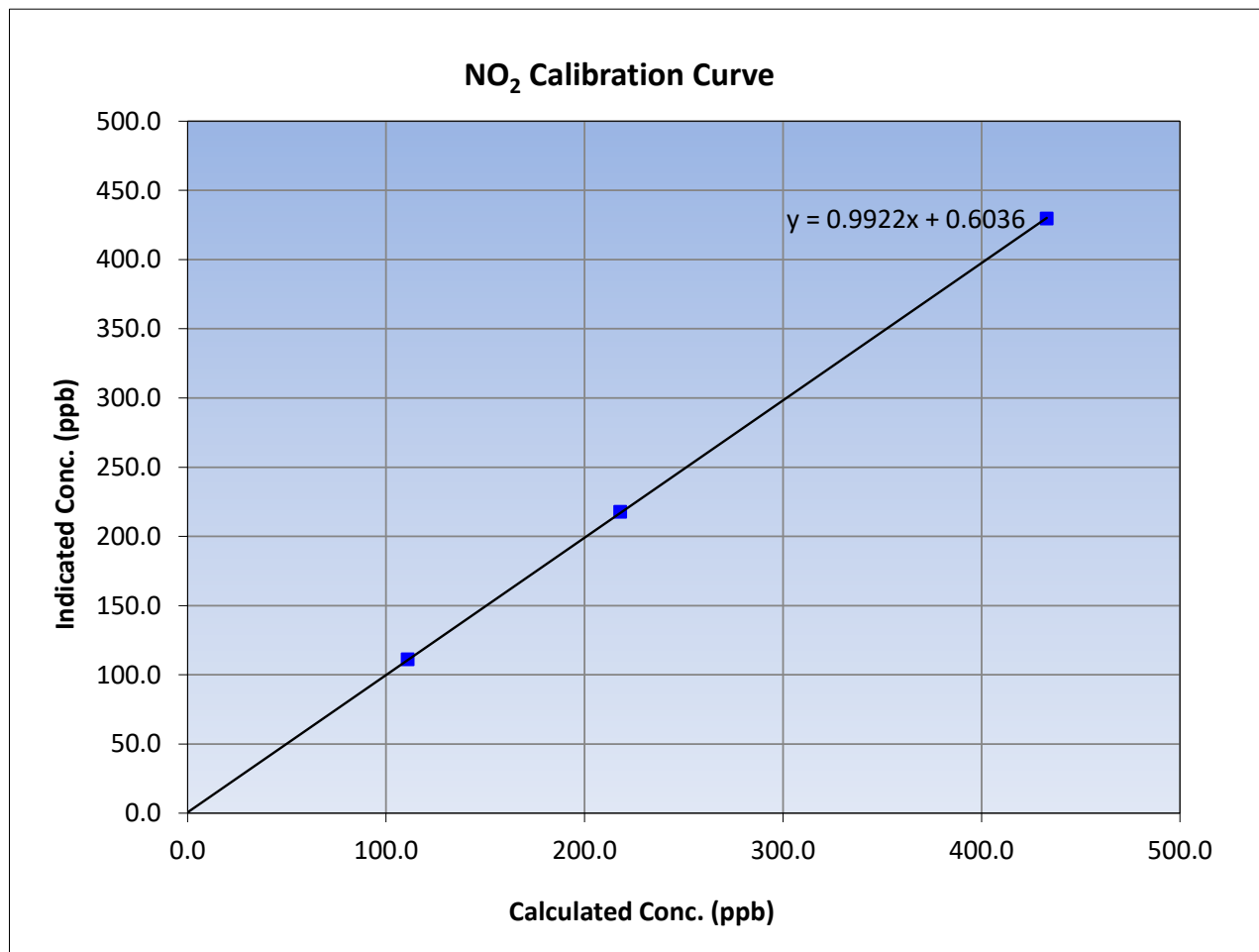
Version-04-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 3, 2023     | Previous Calibration: | February 14, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04             |
| Start Time (MST): | 8:07              | End Time (MST):       | 12:49             |
| Analyzer make:    | API T200          | Analyzer serial #:    | 723               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.2                               | ----                      | Correlation Coefficient | ≥0.995        |             |
| 432.9                               | 429.6                              | 1.0077                    |                         |               |             |
| 218.0                               | 217.7                              | 1.0014                    |                         |               |             |
| 110.8                               | 111.1                              | 0.9973                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.992216      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.603575      | +/-20       |

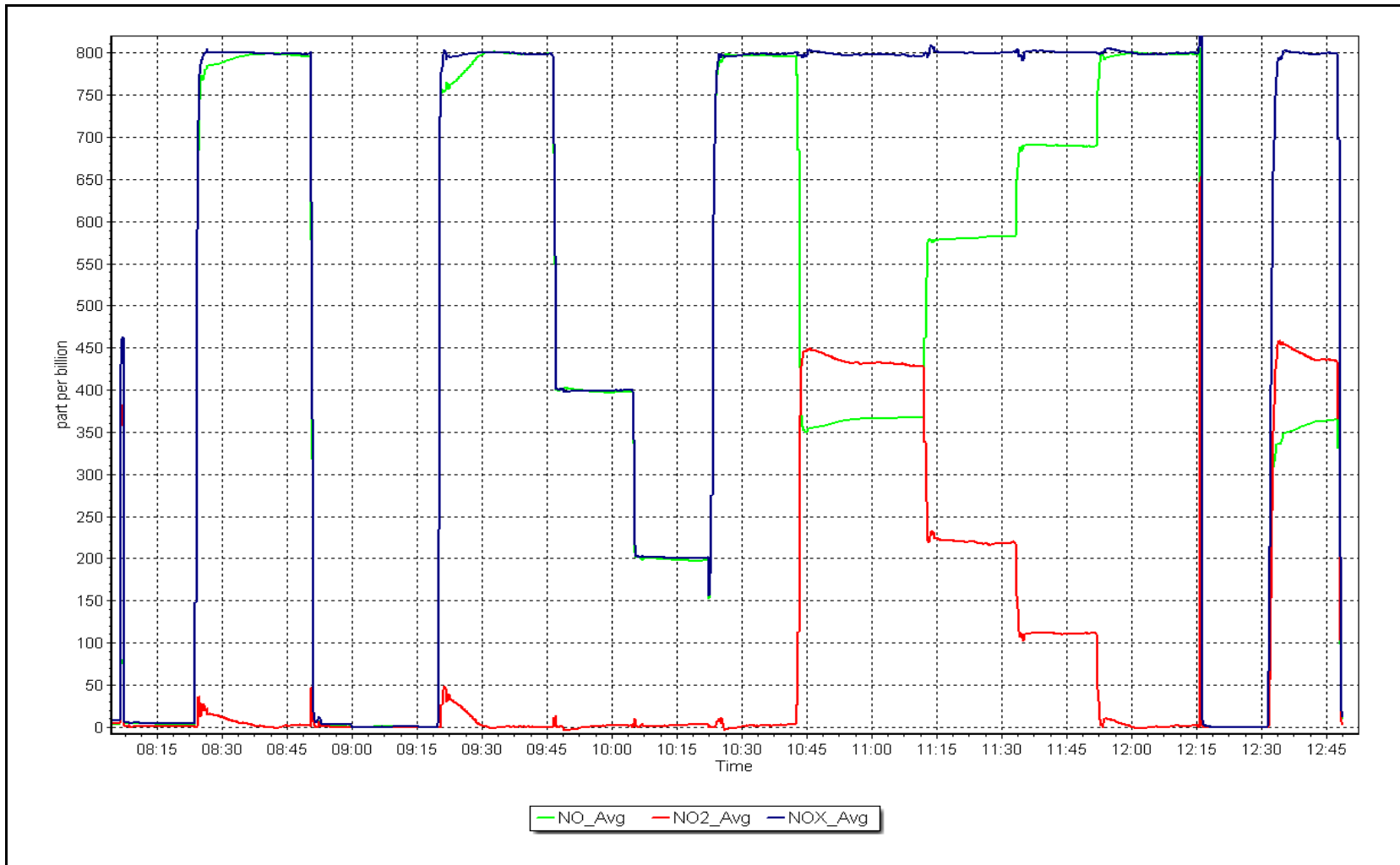




NO<sub>x</sub> Calibration Plot

Date: March 3, 2023

Location: Buffalo Viewpoint





# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Buffalo Viewpoint      Station number: AMS04  
 Calibration Date: March 6, 2023      Last Cal Date: February 10, 2023  
 Start time (MST): 7:14      End time (MST): 8:35  
 Reason: As Found

### Calibration Standards

O3 generation mode: Photometer  
 Calibrator Make/Model: API T700      Serial Number: 2445  
 ZAG Make/Model: API T701      Serial Number: 362

### Analyzer Information

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

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.988657     |               | Backgd or Offset: | -3.3         | -3.3          |
| Calibration intercept: | 3.560000     |               | Coeff or Slope:   | 1.065        | 1.065         |

### O<sub>3</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|--------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero      | 5000                       | 0.0                           | 0.0                                 | -0.2                               | ----  |
| as found span      | 5000                       | 1158.5                        | 400.0                               | 382.2                              | 1.047   |
| as found 2nd point | 5000                       | 915.0                         | 200.0                               | 194.9                              | 1.026   |
| as found 3rd point | 5000                       | 784.5                         | 100.0                               | 99.9                               | 1.001   |
| calibrator zero    |                            |                               |                                     |                                    |   |
| high point         |                            |                               |                                     |                                    |   |
| second point       |                            |                               |                                     |                                    |   |
| third point        |                            |                               |                                     |                                    |   |
| as left zero       |                            |                               |                                     |                                    |   |
| as left span       |                            |                               |                                     |                                    |   |

|                           |  |  |  |
|---------------------------|--|--|--|
| Average Correction Factor |  |  |  |
|---------------------------|--|--|--|

|                          |        |                   |          |               |          |
|--------------------------|--------|-------------------|----------|---------------|----------|
| Baseline Corr As found:  | 382.4  | Previous response | 399.0    | *% change     | -4.3%    |
| Baseline Corr 2nd AF pt: | -187.3 | AF Slope:         | 0.953257 | AF Intercept: | 2.380000 |
| Baseline Corr 3rd AF pt: | -95.0  | AF Correlation:   | 0.999784 |               |          |

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

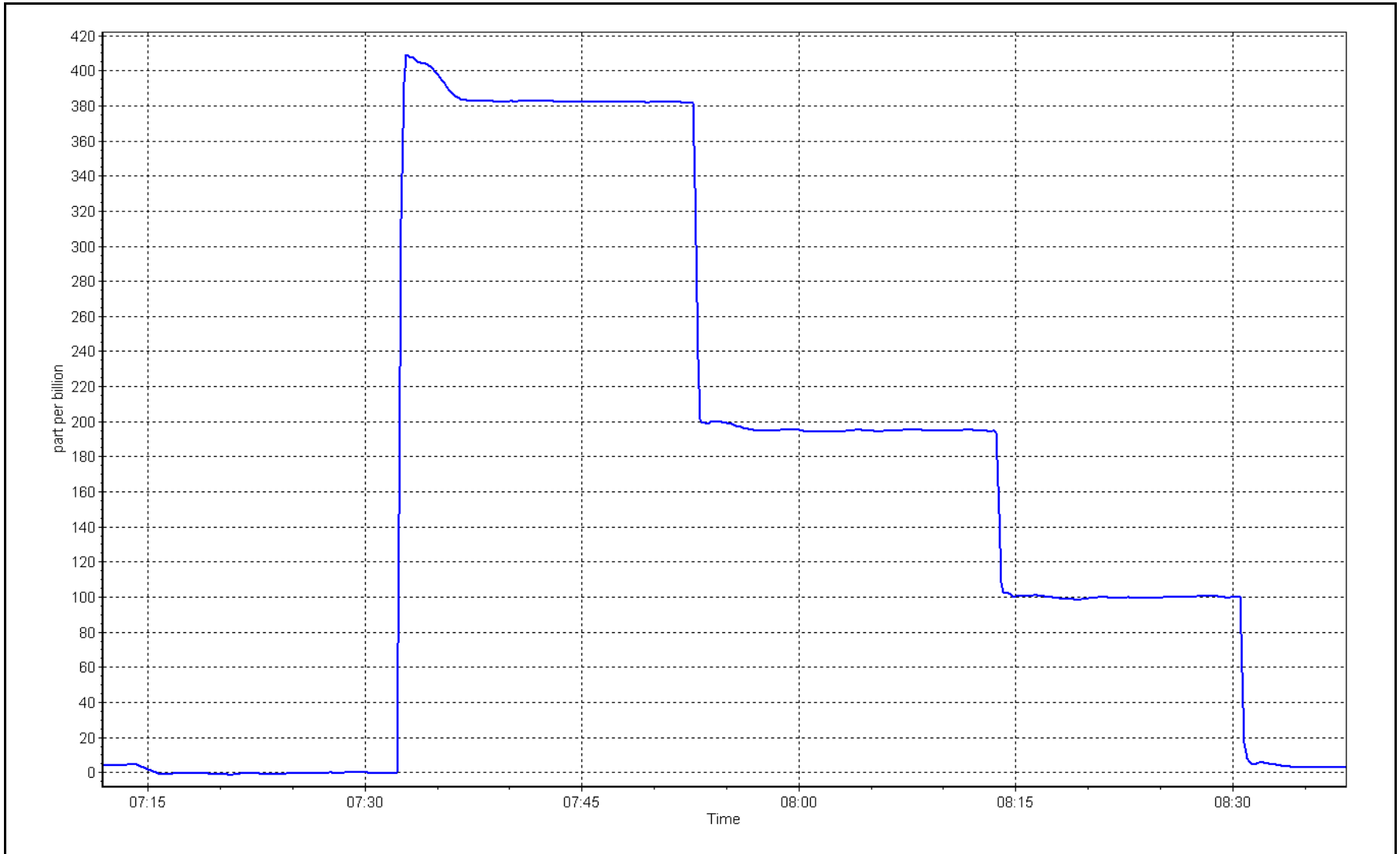
Notes: As founds done with the station calibrator. Station calibrator not working properly. Analyzer maintenance- Lamp changed, Leak check passed.

Calibration Performed By: Melissa Lemay

O<sub>3</sub> Calibration Plot

Date: March 6, 2023

Location: Buffalo Viewpoint





# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Buffalo Viewpoint      Station number: AMS04  
 Calibration Date: March 7, 2023      Last Cal Date: March 6, 2023  
 Start time (MST): 9:20      End time (MST): 11:39  
 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

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.988657     | 0.996114      | Backgd or Offset: | -3.3         | -5.3          |
| Calibration intercept: | 3.560000     | 1.880000      | Coeff or Slope:   | 1.065        | 1.178         |

### O<sub>3</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             |                            |                               |                                     |                                    |   |
| as found span             |                            |                               |                                     |                                    |   |
| as found 2nd point        |                            |                               |                                     |                                    |   |
| as found 3rd point        |                            |                               |                                     |                                    |   |
| calibrator zero           | 5000                       | 0.0                           | 0.0                                 | 0.3                                | ----  |
| high point                | 5000                       | 970.8                         | 400.0                               | 399.6                              | 1.001   |
| second point              | 5000                       | 806.0                         | 200.0                               | 201.7                              | 0.992   |
| third point               | 5000                       | 697.0                         | 100.0                               | 103.2                              | 0.969   |
| as left zero              | 5000                       | 0.0                           | 0.0                                 | 1.2                                | ----  |
| as left span              | 5000                       | 971.2                         | 400.0                               | 399.2                              | 1.002   |
| Average Correction Factor |                            |                               |                                     |                                    | 0.987   |

|                          |    |                   |    |               |    |
|--------------------------|----|-------------------|----|---------------|----|
| 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: Station calibrator was replaced. Analyzer maintenance- Lamp changed, Leak check passed. Span adjusted.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

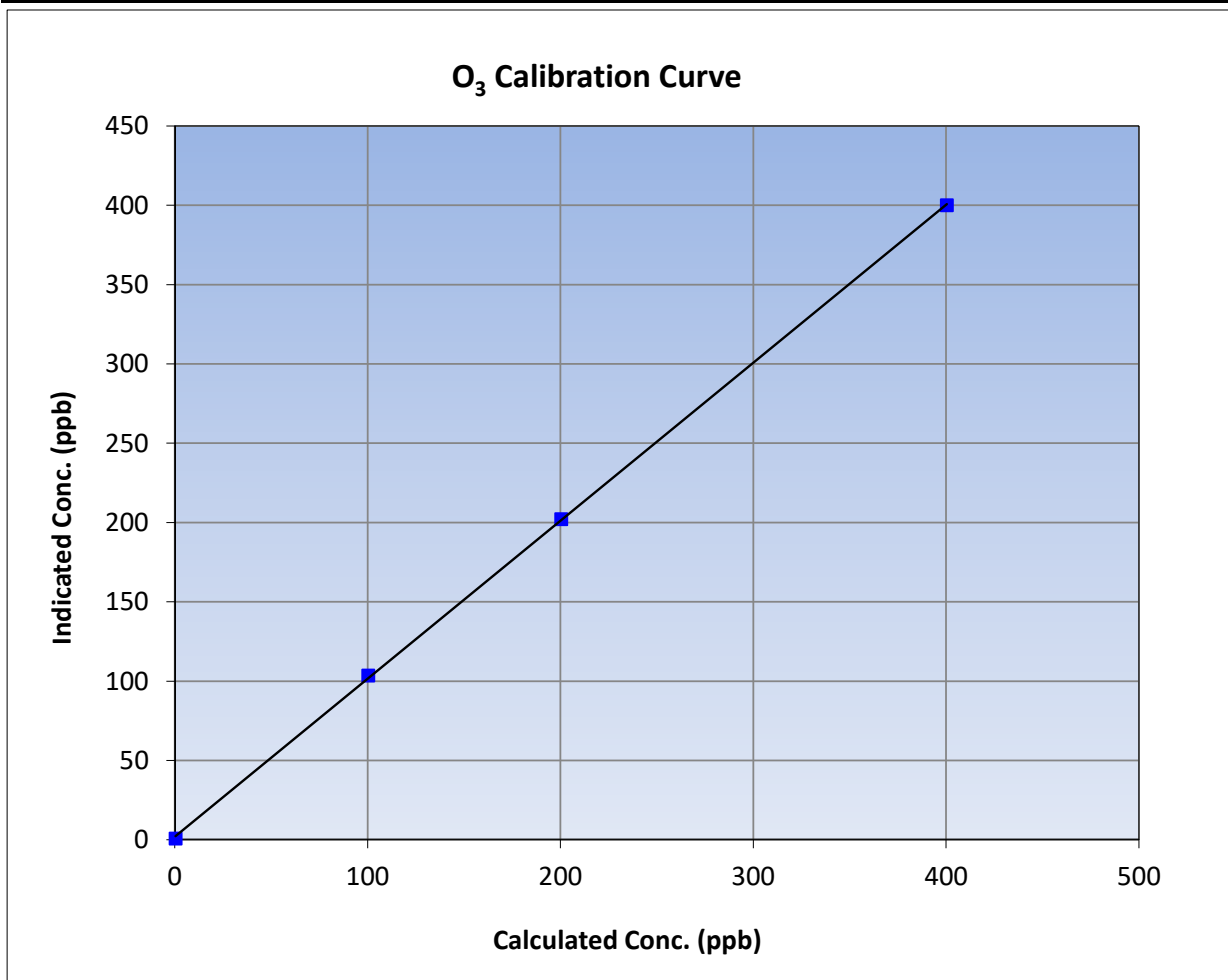
Version-01-2020

### Station Information

|                   |                   |                       |               |
|-------------------|-------------------|-----------------------|---------------|
| Calibration Date: | March 7, 2023     | Previous Calibration: | March 6, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04         |
| Start Time (MST): | 9:20              | End Time (MST):       | 11:39         |
| Analyzer make:    | API T400          | Analyzer serial #:    | 2961          |

### Calibration Data

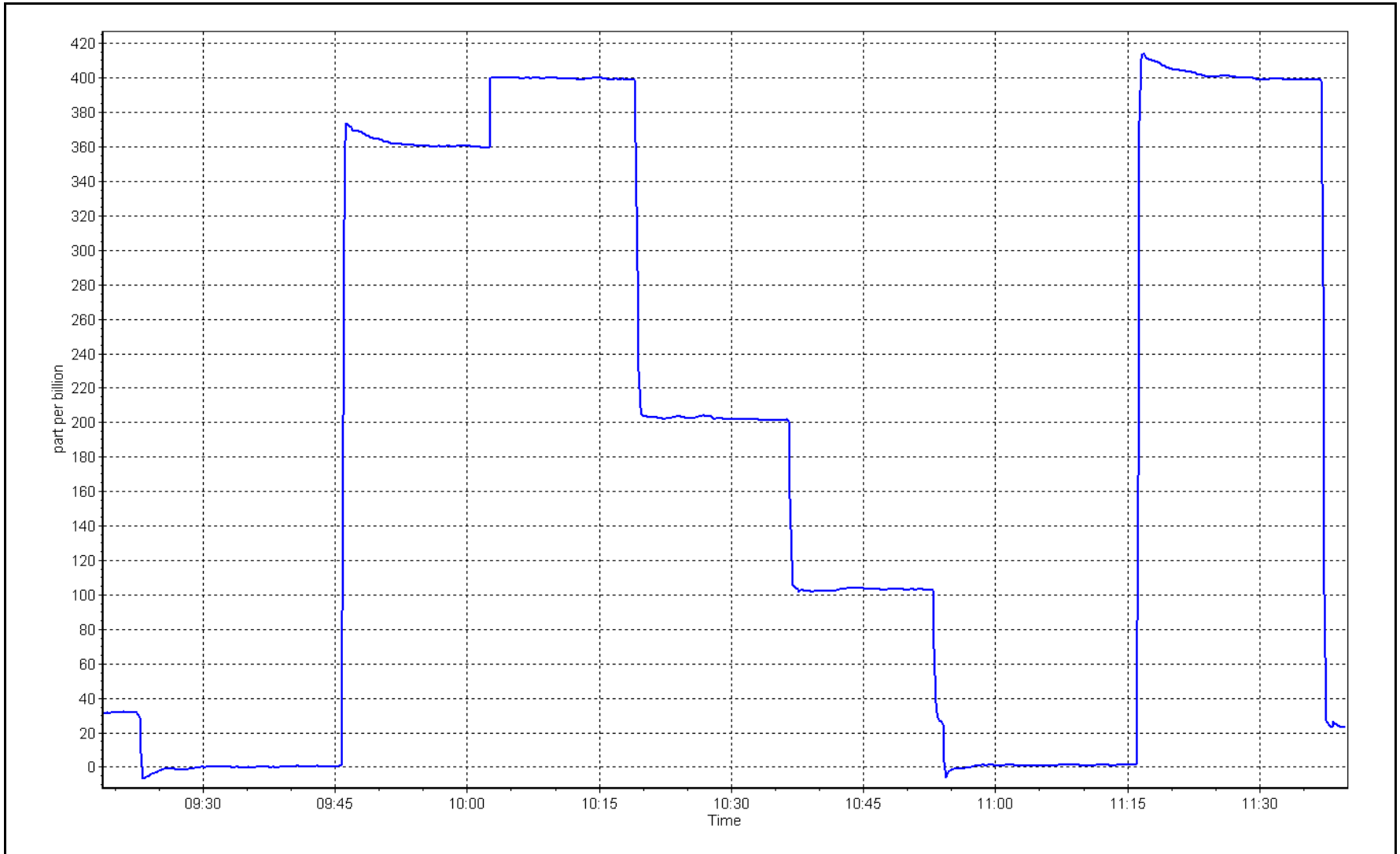
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient | 0.999927 | ≥0.995      |
| 400.0                               | 399.6                              | 1.0010                    |                         |          |             |
| 200.0                               | 201.7                              | 0.9916                    | Slope                   | 0.996114 | 0.90 - 1.10 |
| 100.0                               | 103.2                              | 0.9690                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 1.880000 | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: March 7, 2023

Location: Buffalo Viewpoint





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Buffalo Viewpoint Station number: AMS 04  
 Calibration Date: March 28, 2023 Last Cal Date: February 15, 2023  
 Start time (MST): 9:26 End time (MST): 10:33

Analyzer Make: API T640 S/N: 844  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: AliCat S/N: 228085  
 Temp/RH standard: AliCat S/N: 228085

### Monthly Calibration Test

| Parameter  | As found                             | Measured                                | As left | Adjusted                 | (Limits)     |
|------------|--------------------------------------|---|---------|--------------------------|--------------|
| T (°C)     | -11.4                                | -11.5                                   | -11.4   | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 736.3                                | 738.1                                   | 736.1   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5                                    | 4.8                                     | 5       | <input type="checkbox"/> | +/- 0.25 LPM |
| Leak Test: | Date of check: <u>March 28, 2023</u> | Last Cal Date: <u>February 15, 2023</u> |         |                          |              |
|            | PM w/o HEPA: <u>5</u>                | PM w/ HEPA: <u>0</u>                    |         |                          | <0.2 ug/m3   |

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

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter                     | As found | Post maintenance      | As left        | Adjusted                 | (Limits)     |
|-------------------------------|----------|-----------------------|----------------|--------------------------|--------------|
| PMT Peak Test                 | 10.5     | ---                   | 10.5           | <input type="checkbox"/> | 10.9 +/- 0.5 |
| Post-maintenance leak check:  |          | PM w/o HEPA: _____    | w/ HEPA: _____ |                          |              |
| Date Optical Chamber Cleaned: |          | <u>March 28, 2023</u> |                |                          | <0.2 ug/m3   |
| Disposable Filter Changed:    |          | <u>March 28, 2023</u> |                |                          |              |

### Annual Maintenance

Date Sample Tube Cleaned: September 15, 2022  
 Date RH/T Sensor Cleaned: September 15, 2022

Notes: PM10 was showing readings once in a while before cleaning, then a steady 30ug/m3 after cleaning. PM2.5 was showing no readings before cleaning, after cleaning was showing readings. Leak check failed after cleaning. Pump at 80%. This is the removal Calibration.

Calibration by: Melissa Lemay



# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Buffalo Viewpoint      Station number: AMS 04  
 Calibration Date: March 29, 2023      Last Cal Date:  
 Start time (MST): 6:29      End time (MST): 7:09

Analyzer Make: API T640      S/N: 322  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: AliCat      S/N: 228085  
 Temp/RH standard: AliCat      S/N: 228085

### Monthly Calibration Test

| Parameter  | As found                             | Measured             | As left | Adjusted                 | (Limits)     |
|------------|--------------------------------------|----------------------|---------|--------------------------|--------------|
| T (°C)     | -4                                   | -3.85                | -4      | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 728.6                                | 729.9                | 728.6   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5                                    | 4.95                 | 5       | <input type="checkbox"/> | +/- 0.25 LPM |
| Leak Test: | Date of check: <u>March 29, 2023</u> | Last Cal Date: _____ |         |                          |              |
|            | PM w/o HEPA: <u>5.9</u>              | PM w/ HEPA: <u>0</u> |         |                          | <0.2 ug/m3   |

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

Inlet cleaning :      Inlet Head

### Quarterly Calibration Test

| Parameter                     | As found              | Post maintenance | As left        | Adjusted                 | (Limits)     |
|-------------------------------|-----------------------|------------------|----------------|--------------------------|--------------|
| PMT Peak Test                 | 10.4                  | ---              | 10.4           | <input type="checkbox"/> | 10.9 +/- 0.5 |
| Post-maintenance leak check:  | PM w/o HEPA: _____    |                  | w/ HEPA: _____ |                          |              |
| Date Optical Chamber Cleaned: | <u>March 28, 2023</u> |                  |                |                          | <0.2 ug/m3   |
| Disposable Filter Changed:    | <u>March 28, 2023</u> |                  |                |                          |              |

### Annual Maintenance

Date Sample Tube Cleaned: September 15, 2022  
 Date RH/T Sensor Cleaned: September 15, 2022

Install Calibration.

Notes:

Calibration by:      Melissa Lemay





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS05  
MANNIX  
MARCH 2023**

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

April 29, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

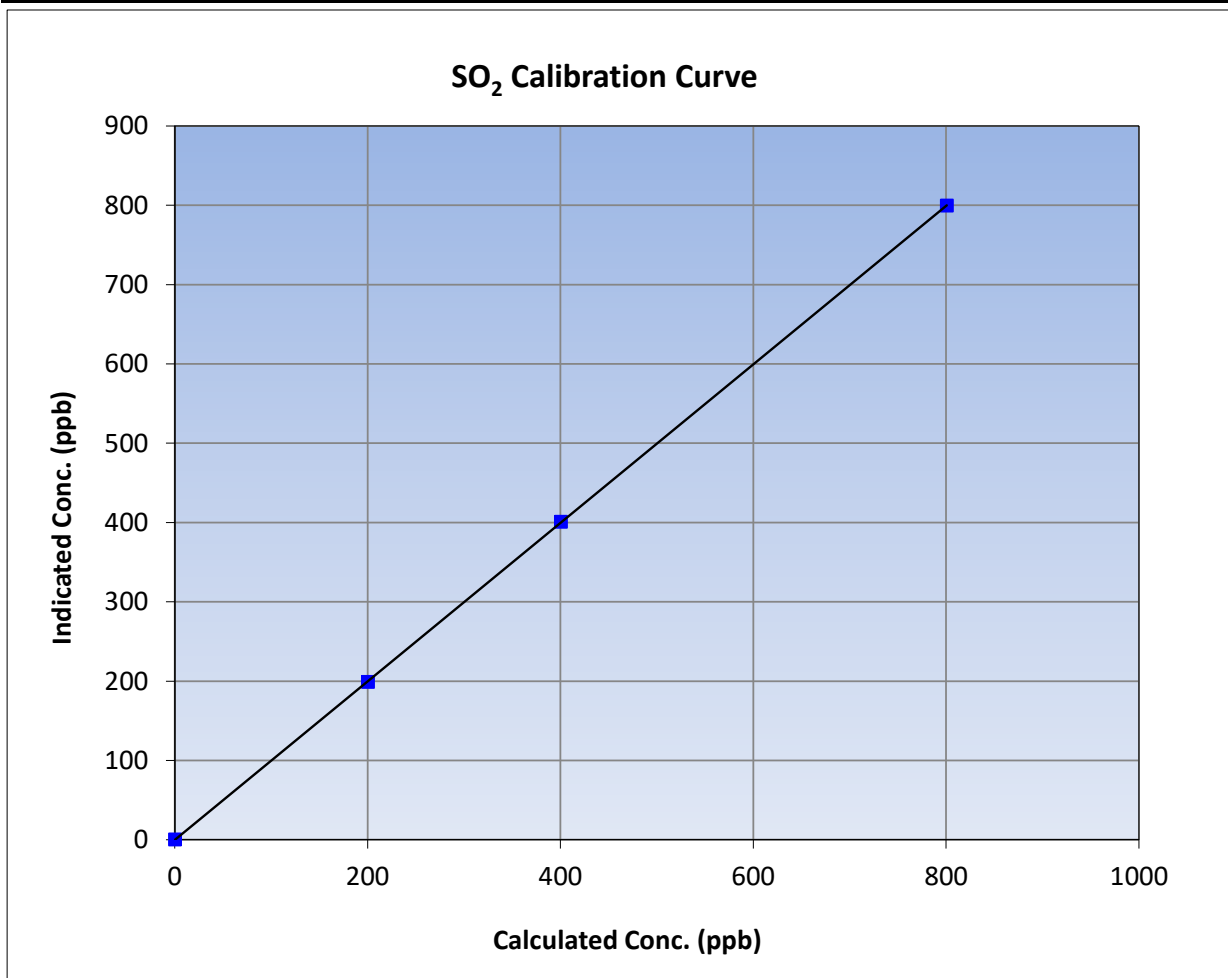
Version-01-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 2, 2023 | Previous Calibration: | February 21, 2023 |
| Station Name:     | Mannix        | Station Number:       | AMS05             |
| Start Time (MST): | 10:34         | End Time (MST):       | 14:43             |
| Analyzer make:    | Thermo 43i    | Analyzer serial #:    | 1008841399        |

### Calibration Data

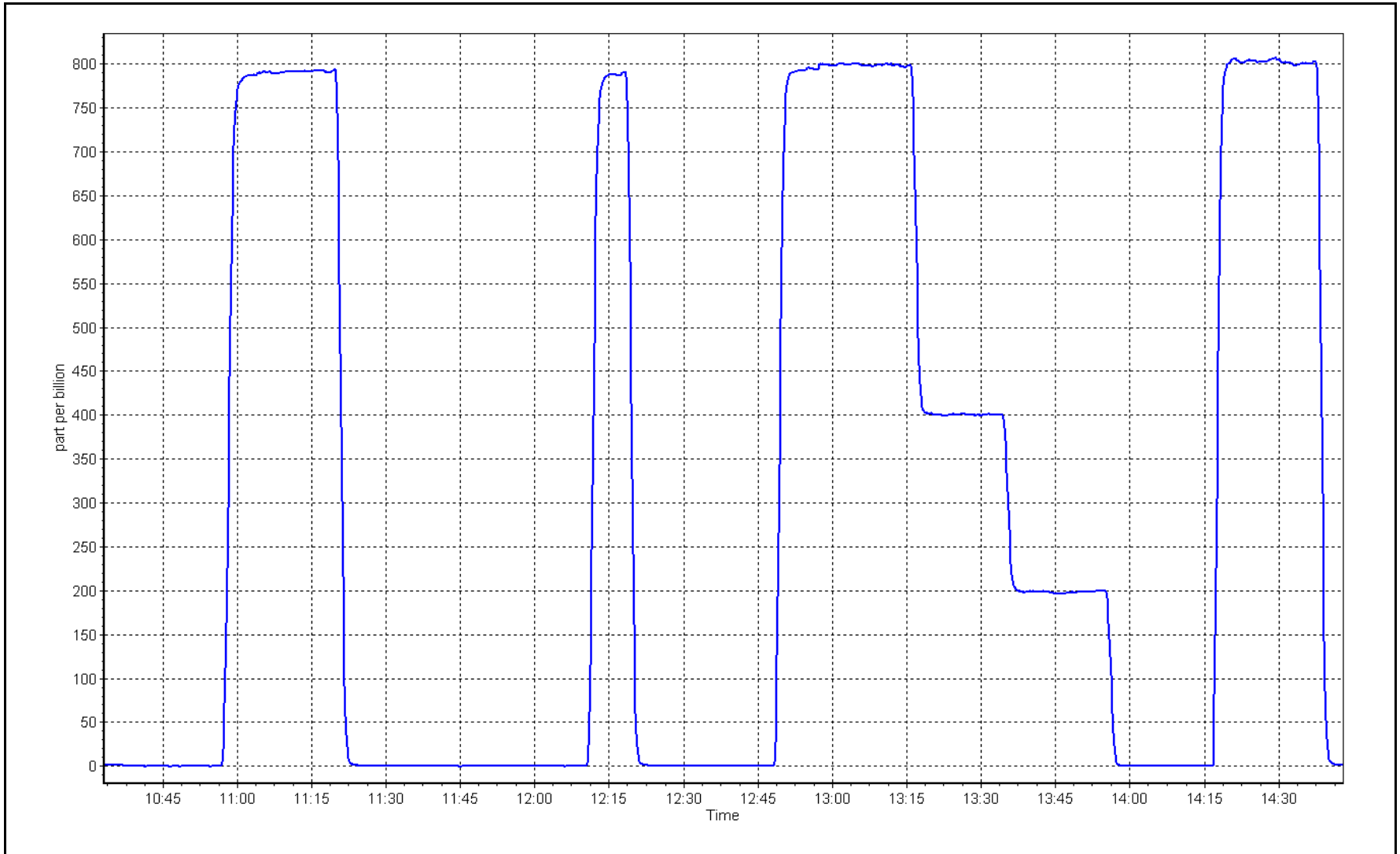
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.1                                   | ----                         | Correlation Coefficient | 0.999994      |             |
| 800.3                                  | 799.4                                 | 1.0012                       |                         |               | ≥0.995      |
| 400.2                                  | 400.5                                 | 0.9992                       | Slope                   | 0.999400      |             |
| 200.1                                  | 198.6                                 | 1.0075                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | -0.280000     | +/-30       |



SO2 Calibration Plot

Date: March 2, 2023

Location: Mannix





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Mannix Station number: AMS05  
 Calibration Date: March 15, 2023 Last Cal Date: February 15, 2023  
 Start time (MST): 8:52 End time (MST): 13:37  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 4.92 ppm Cal Gas Exp Date: February 9, 2024  
 Cal Gas Cylinder #: EY0002433  
 Removed Cal Gas Conc: 4.92 ppm Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA 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 #: 1203169745  
 Converter make: Global Converter serial #: 2022-196  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.998613     | 0.988329      | Backgd or Offset: 2.09 | 2.07          |
| Calibration intercept: | 0.220652     | 0.380632      | Coeff or Slope: 0.822  | 0.822         |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----   |
| as found span         | 4919                          | 81.3                        | 80.0                                | 79.0                               | 1.015  |
| as found 2nd point    | 4960                          | 40.7                        | 40.0                                | 40.1                               | 1.004  |
| as found 3rd point    | 4980                          | 20.3                        | 20.0                                | 20.2                               | 0.999  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----  |
| high point                              | 4919                          | 81.3                        | 80.0                                | 79.4                               | 1.007   |
| second point                            | 4960                          | 40.7                        | 40.0                                | 40.0                               | 1.001   |
| third point                             | 4980                          | 20.3                        | 20.0                                | 20.2                               | 0.989   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| as left span                            | 4919                          | 81.3                        | 80.0                                | 80.0                               | 1.000   |
| SO2 Scrubber Check                      | 4920                          | 80.0                        | 800.0                               | 0.0                                | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    | 0.999   |
| Date of last converter efficiency test: |                               |                             |                                     | efficiency                         |   |

Baseline Corr As found: 78.8 Prev response: 80.10 \*% change: -1.7%  
 Baseline Corr 2nd AF pt: 39.9 AF Slope: 0.984332 AF Intercept: 0.420538  
 Baseline Corr 3rd AF pt: 20.0 AF Correlation: 0.999953

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

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

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

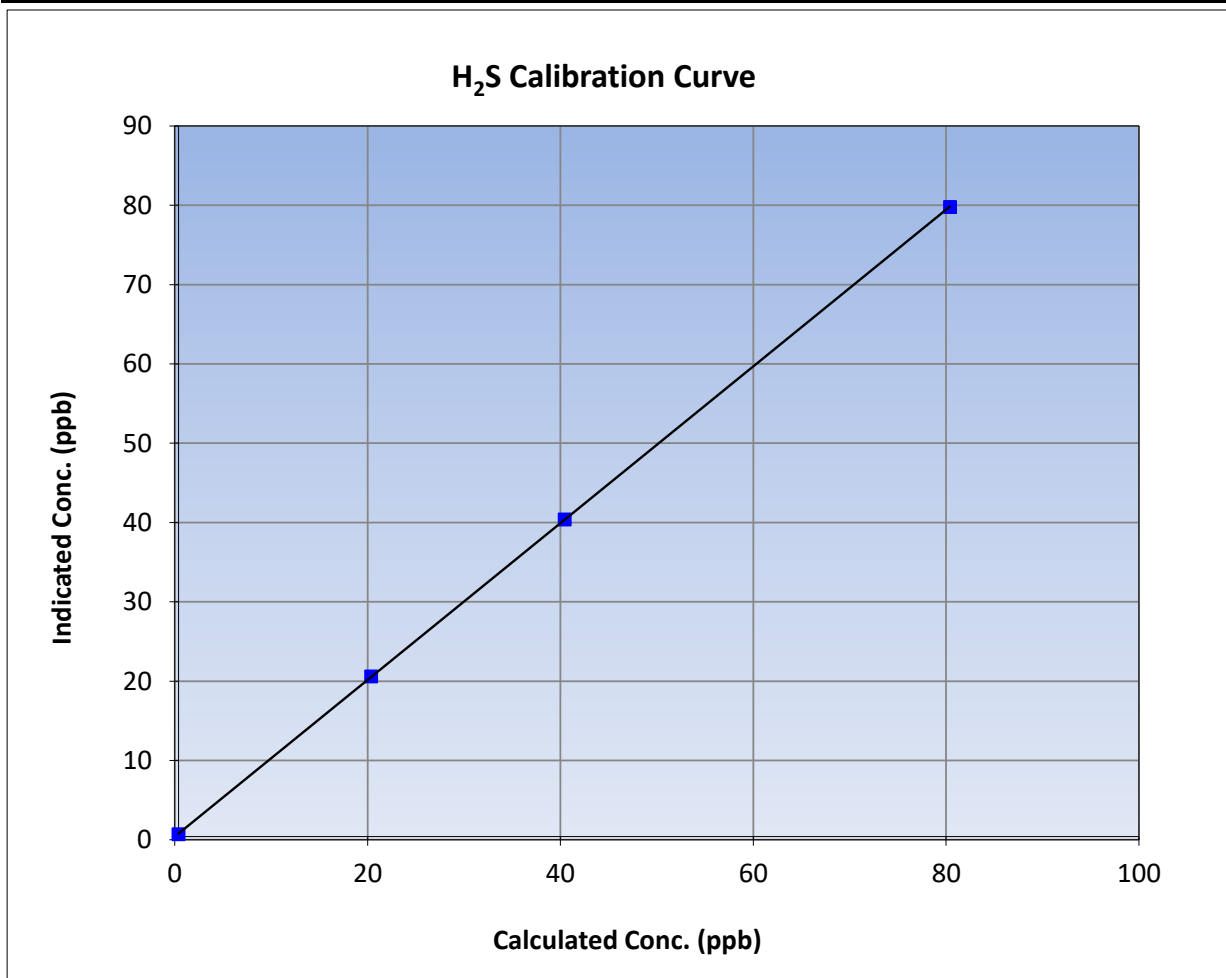
Version-11-2021

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 15, 2023 | Previous Calibration: | February 15, 2023 |
| Station Name:     | Mannix         | Station Number:       | AMS05             |
| Start Time (MST): | 8:52           | End Time (MST):       | 13:37             |
| Analyzer make:    | Thermo 43iQTL  | Analyzer serial #:    | 1203169745        |

### Calibration Data

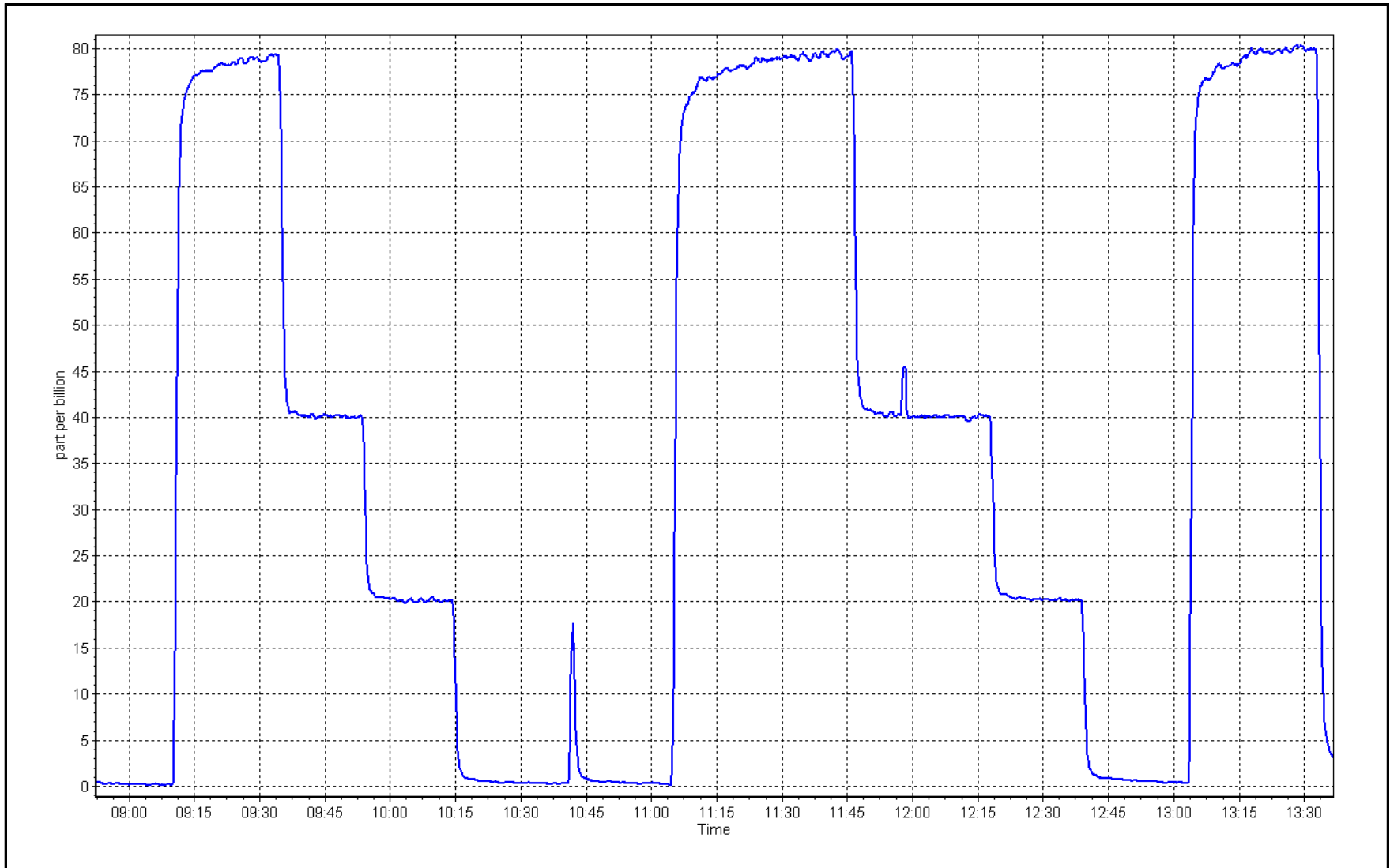
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient | 0.999995 |             |
| 80.0                                | 79.4                               | 1.0075                    |                         |          | ≥0.995      |
| 40.0                                | 40.0                               | 1.0011                    | Slope                   | 0.988329 |             |
| 20.0                                | 20.2                               | 0.9888                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.380632 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: March 15, 2023

Location: Mannix





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |               |                 |                   |
|-------------------|---------------|-----------------|-------------------|
| Station Name:     | Mannix        | Station number: | AMS05             |
| Calibration Date: | March 2, 2023 | Last Cal Date:  | February 21, 2023 |
| Start time (MST): | 10:34         | End time (MST): | 14:43             |
| Reason:           | Routine       |                 |                   |

### Calibration Standards

|   |           |                             |                  |
|---|-----------|-----------------------------|------------------|
| Gas Cert Reference:                         | XCO268098 | Cal Gas Expiry Date:        | January 12, 2029 |
| CH <sub>4</sub> Cal Gas Conc.               | 504.9 ppm | CH <sub>4</sub> Equiv Conc. | 1076.6 ppm       |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.9 ppm |                             |                  |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         |                  |
| Removed CH <sub>4</sub> Conc.               | 504.9 ppm | CH <sub>4</sub> Equiv Conc. | 1076.6 ppm       |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.9 ppm | Diff between cyl (THC):     |                  |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                  |
| Calibrator Model:                           | API T700  | Serial Number:              | 621              |
| ZAG make/model:                             | API T701H | Serial Number:              | 832              |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1152430011 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.56E-04     | 2.58E-04      | NMHC SP Ratio:  | 4.36E-05      |
| CH <sub>4</sub> Retention time: | 15.00        | 15.00         | NMHC Peak Area: | 209913        |
|                                 |              |               |                 | 203233        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4920              | 80.0                 | 17.23                | 17.06               | 1.010                      |
| 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                | 17.23               | 1.000                      |
| second point          | 4960              | 40.0                 | 8.61                 | 8.61                | 1.000                      |
| third point           | 4980              | 20.0                 | 4.31                 | 4.29                | 1.003                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4920              | 80.0                 | 17.23                | 17.29               | 0.996                      |

| Average Correction Factor |       |                 |       | 1.001                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 17.06 | Prev response   | 17.17 | *% change -0.6%                            |
| 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80                   | 9.15                 | 9.01                                       | 1.015                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80                   | 9.15                 | 9.15                                       | 0.999                      |
| second point              | 4960              | 40                   | 4.57                 | 4.59                                       | 0.996                      |
| third point               | 4980              | 20                   | 2.29                 | 2.30                                       | 0.996                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80                   | 9.15                 | 9.22                                       | 0.992                      |
| Average Correction Factor |                   |                      |                      |  | 0.997                      |
| Baseline Corr AF:         | 9.01              | Prev response        | 9.12                 | *% change                                  | -1.3%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.0                 | 8.08                 | 8.05                                       | 1.004                      |
| 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                 | 4.02                                       | 1.005                      |
| third point               | 4980              | 20.0                 | 2.02                 | 2.00                                       | 1.012                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.0                 | 8.08                 | 8.07                                       | 1.001                      |
| Average Correction Factor |                   |                      |                      |  | 1.006                      |
| Baseline Corr AF:         | 8.05              | Prev response        | 8.05                 | *% change                                  | 0.0%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.997356     | 1.000262      |
| THC Cal Offset:             | -0.010200    | -0.006600     |
| CH <sub>4</sub> Cal Slope:  | 0.997864     | 0.999646      |
| CH <sub>4</sub> Cal Offset: | -0.012000    | -0.011800     |
| NMHC Cal Slope:             | 0.997020     | 1.000469      |
| NMHC Cal Offset:            | 0.000600     | 0.005800      |

Notes: Sample inlet filter changed after as founds. Zero chromatogram was used. Span was adjusted.

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## THC Calibration Summary

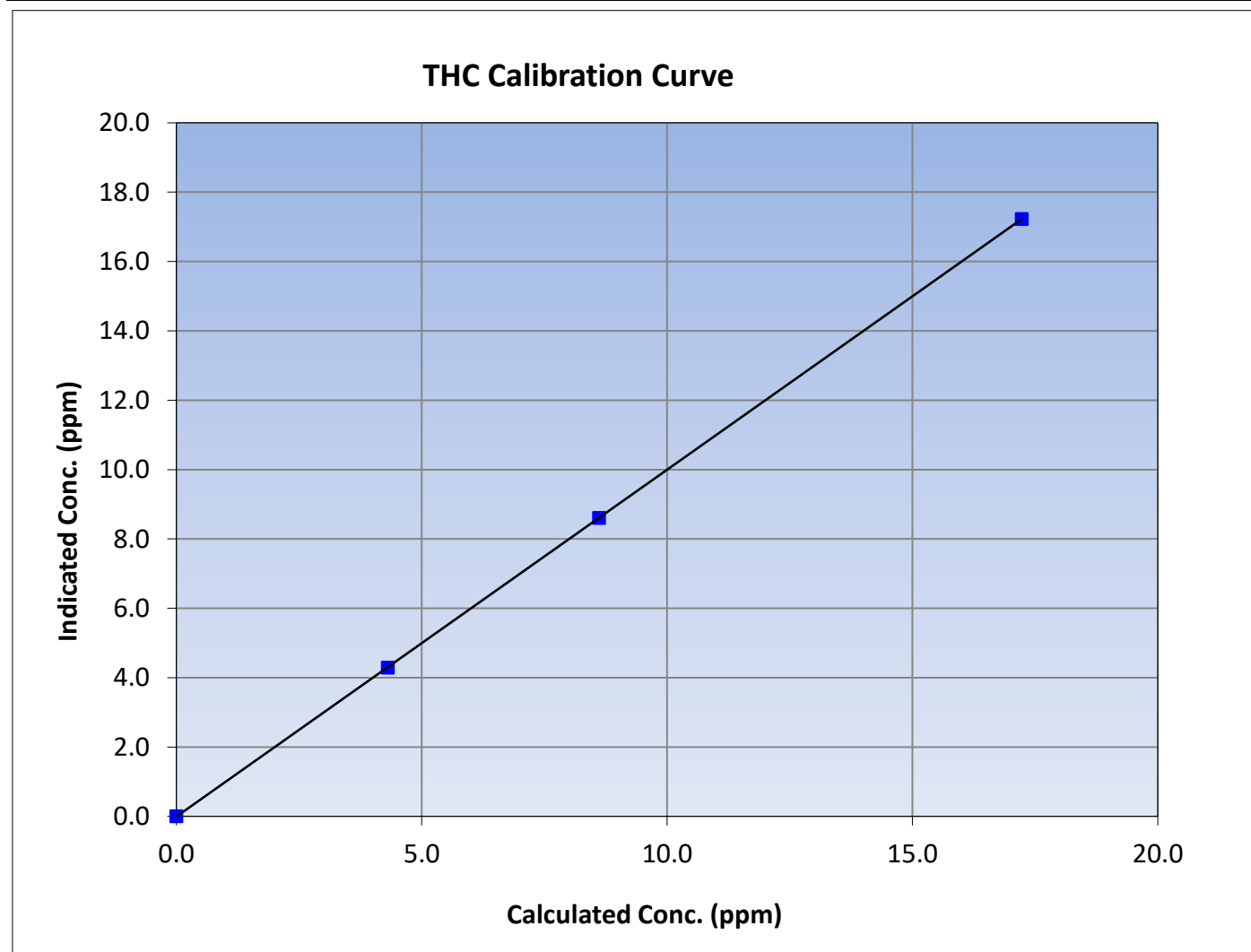
Version-01-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 2, 2023 | Previous Calibration: | February 21, 2023 |
| Station Name:     | Mannix        | Station Number:       | AMS05             |
| Start Time (MST): | 10:34         | End Time (MST):       | 14:43             |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1152430011        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999999  | $\geq 0.995$  |       |          |             |
| 17.23                               | 17.23                              | 1.0000                    |                         |           |               |       |          |             |
| 8.61                                | 8.61                               | 1.0005                    |                         |           |               | Slope | 1.000262 | 0.90 - 1.10 |
| 4.31                                | 4.29                               | 1.0034                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.006600 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

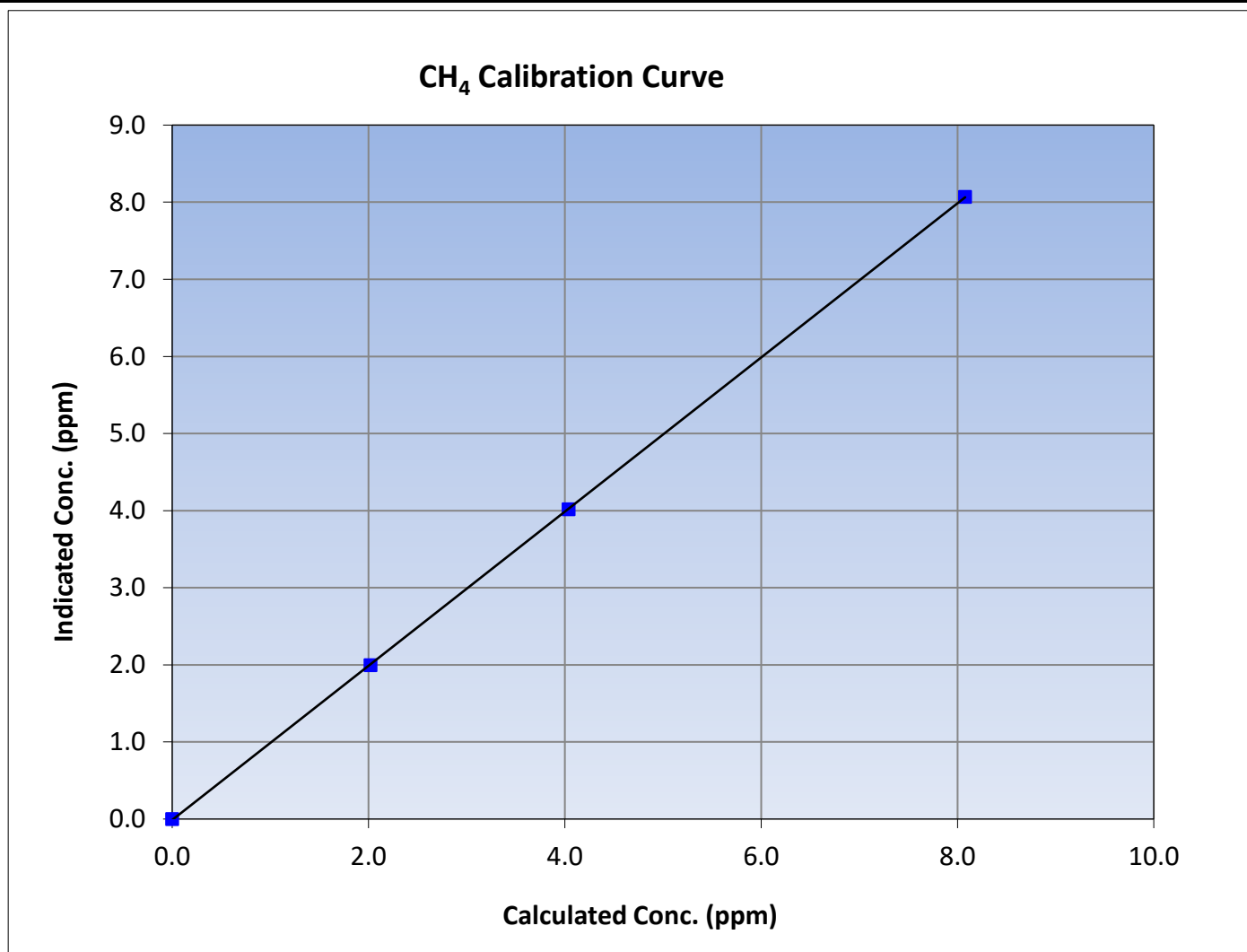
Version-01-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 2, 2023 | Previous Calibration: | February 21, 2023 |
| Station Name:     | Mannix        | Station Number:       | AMS05             |
| Start Time (MST): | 10:34         | End Time (MST):       | 14:43             |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1152430011        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999990  | ≥0.995        |       |          |             |
| 8.08                                | 8.07                               | 1.0010                    |                         |           |               |       |          |             |
| 4.04                                | 4.02                               | 1.0050                    |                         |           |               | Slope | 0.999646 | 0.90 - 1.10 |
| 2.02                                | 2.00                               | 1.0118                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.011800 | +/-0.5        |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

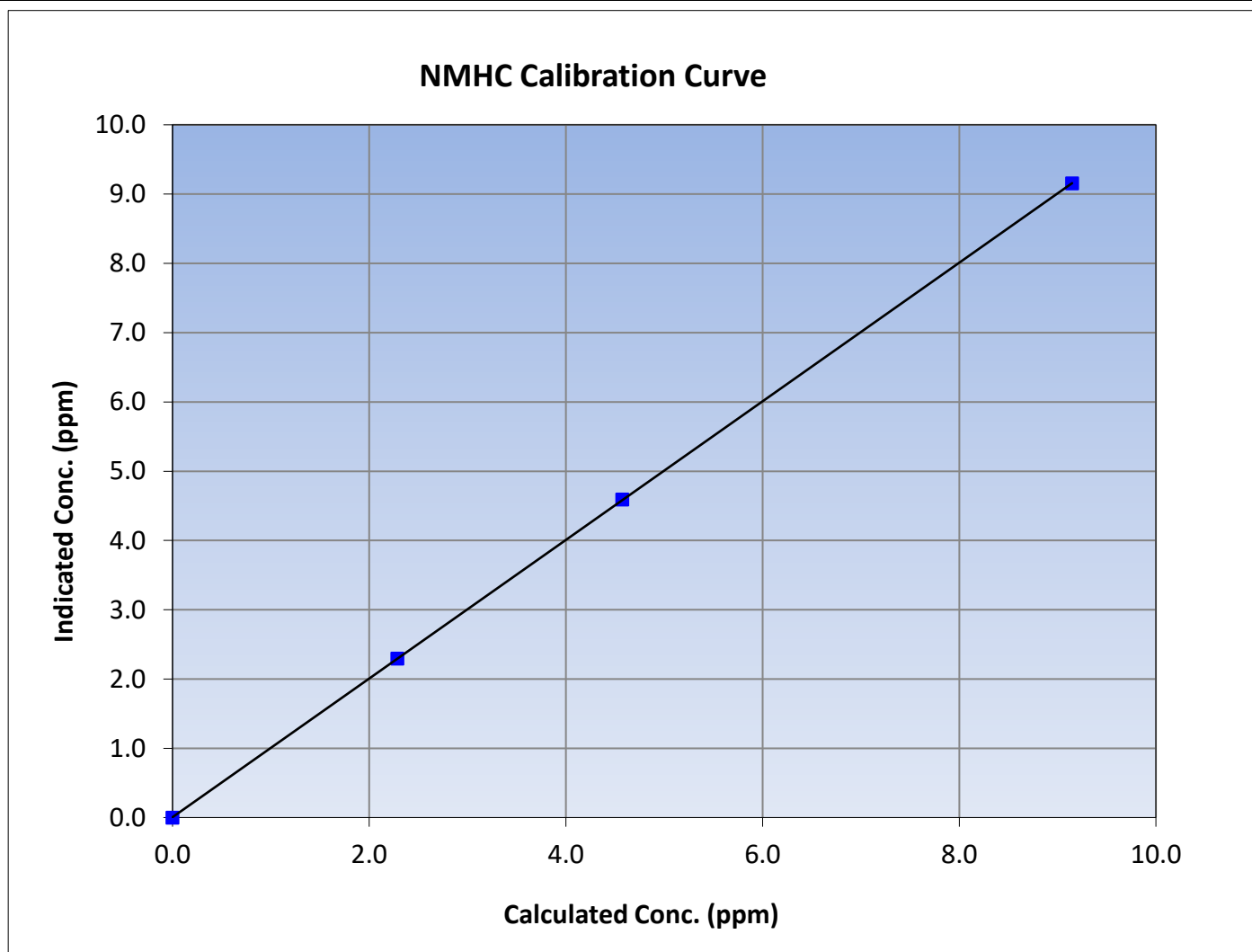
Version-01-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 2, 2023 | Previous Calibration: | February 21, 2023 |
| Station Name:     | Mannix        | Station Number:       | AMS05             |
| Start Time (MST): | 10:34         | End Time (MST):       | 14:43             |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1152430011        |

### Calibration Data

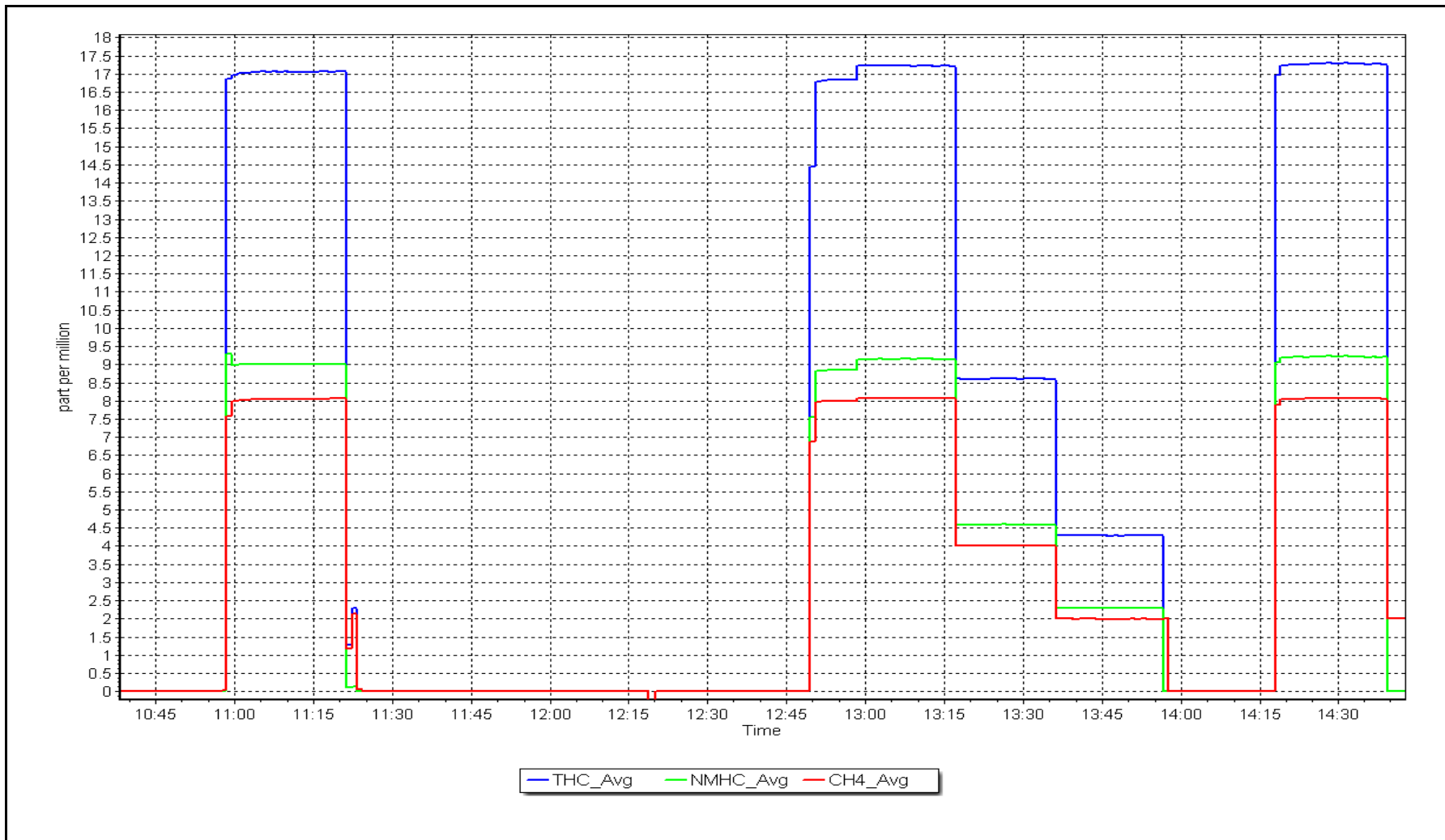
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999997 | $\geq 0.995$  |
| 9.15                                | 9.15                               | 0.9994                    |                         |          |               |
| 4.57                                | 4.59                               | 0.9965                    |                         |          |               |
| 2.29                                | 2.30                               | 0.9960                    |                         |          |               |
|                                     |                                    |                           | Slope                   | 1.000469 | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | 0.005800 | +/-0.5        |



NMHC Calibration Plot

Date: March 2, 2023

Location: Mannix





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                |                 |               |
|-------------------|----------------|-----------------|---------------|
| Station Name:     | Mannix         | Station number: | AMS05         |
| Calibration Date: | March 10, 2023 | Last Cal Date:  | March 2, 2023 |
| Start time (MST): | 9:30           | End time (MST): | 10:56         |
| Reason:           | Maintenance    |                 |               |

### Calibration Standards

|   |           |                             |                  |
|---|-----------|-----------------------------|------------------|
| Gas Cert Reference:                         | XCO268098 | Cal Gas Expiry Date:        | January 12, 2029 |
| CH <sub>4</sub> Cal Gas Conc.               | 504.9 ppm | CH <sub>4</sub> Equiv Conc. | 1076.6 ppm       |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.9 ppm |                             |                  |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         |                  |
| Removed CH <sub>4</sub> Conc.               | 504.9 ppm | CH <sub>4</sub> Equiv Conc. | 1076.6 ppm       |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.9 ppm | Diff between cyl (THC):     |                  |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                  |
| Calibrator Model:                           | API T700  | Serial Number:              | 621              |
| ZAG make/model:                             | API T701H | Serial Number:              | 832              |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1152430011 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.58E-04     | NA            | NMHC SP Ratio:  | 4.50E-05      |
| CH <sub>4</sub> Retention time: | 15.00        | NA            | NMHC Peak Area: | 203233        |
|                                 |              |               |                 | NA            |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| 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                | 17.42               | 0.989                      |
| second point          |                   |                      |                      |                     |                            |
| third point           |                   |                      |                      |                     |                            |
| as left zero          |                   |                      |                      |                     |                            |
| as left span          |                   |                      |                      |                     |                            |

|                       |    |                 |    | Average Correction Factor                  | 0.989 |
|-----------------------|----|-----------------|----|--|-------|
| 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         |                   |                      |                      |  |                            |
| as found span         |                   |                      |                      |  |                            |
| as found 2nd point    |                   |                      |                      |  |                            |
| as found 3rd point    |                   |                      |                      |  |                            |
| new cylinder response |                   |                      |                      |  |                            |
| calibrator zero       | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| high point            | 4920              | 80                   | 9.15                 | 9.39                                       | 0.974                      |
| second point          |                   |                      |                      |  |                            |
| third point           |                   |                      |                      |  |                            |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                  | 0.974                      |
| 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 |                            |

### CH<sub>4</sub> Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| 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                 | 8.03                                       | 1.006                      |
| second point          |                   |                      |                      |  |                            |
| third point           |                   |                      |                      |  |                            |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                  | 1.006                      |
| 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

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.000262     | 1.011204      |
| THC Cal Offset:             | -0.006600    | 0.000000      |
| CH <sub>4</sub> Cal Slope:  | 0.999646     | 0.993637      |
| CH <sub>4</sub> Cal Offset: | -0.011800    | 0.000000      |
| NMHC Cal Slope:             | 1.000469     | 1.026827      |
| NMHC Cal Offset:            | 0.005800     | 0.000000      |

Notes: Low dilution pressure caused insufficient air supply which affected the instrument baseline and zero-span sequence. Was not able to generate as founds due this issue. Replaced the Zero Air Generator.

Calibration Performed By: Karan Pandit

NMHC Calibration Plot

Date: March 10, 2023

Location: Mannix







# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                 |                 |               |
|-------------------|-----------------|-----------------|---------------|
| Station Name:     | Mannix          | Station number: | AMS05         |
| Calibration Date: | March 16, 2023  | Last Cal Date:  | March 2, 2023 |
| Start time (MST): | 9:33            | End time (MST): | 11:15         |
| Reason:           | Cylinder Change |                 |               |

### Calibration Standards

|   |           |                             |                  |
|---|-----------|-----------------------------|------------------|
| Gas Cert Reference:                         | XCO268098 | Cal Gas Expiry Date:        | January 12, 2029 |
| CH <sub>4</sub> Cal Gas Conc.               | 504.9 ppm | CH <sub>4</sub> Equiv Conc. | 1076.6 ppm       |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.9 ppm |                             |                  |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         |                  |
| Removed CH <sub>4</sub> Conc.               | 504.9 ppm | CH <sub>4</sub> Equiv Conc. | 1076.6 ppm       |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.9 ppm | Diff between cyl (THC):     |                  |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                  |
| Calibrator Model:                           | API T700  | Serial Number:              | 621              |
| ZAG make/model:                             | API T701H | Serial Number:              | 832              |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1152430011 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.58E-04     | NA            | NMHC SP Ratio:  | 4.50E-05      |
| CH <sub>4</sub> Retention time: | 15.00        | NA            | NMHC Peak Area: | 203233        |
|                                 |              |               |                 | NA            |

### THC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as found span             | 4920              | 80.0                 | 17.23                | 17.45  | 0.987                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| high point                | 4920              | 80.0                 | 17.23                | 17.44  | 0.988                      |
| second point              |                   |                      |                      |  |                            |
| third point               |                   |                      |                      |  |                            |
| as left zero              |                   |                      |                      |  |                            |
| as left span              |                   |                      |                      |  |                            |
| Average Correction Factor |                   |                      |                      |  | 0.988                      |
| Baseline Corr AF:         | 17.45             | Prev response        | 17.22                | *% change  | 1.3%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         | 5000              | 0                    | 0.00                 | 0.00   | ----                       |
| as found span         | 4920              | 80.0                 | 9.15                 | 9.41   | 0.972                      |
| as found 2nd point    |                   |                      |                      |  |                            |
| as found 3rd point    |                   |                      |                      |  |                            |
| new cylinder response |                   |                      |                      |  |                            |
| calibrator zero       | 5000              | 0                    | 0.00                 | 0.00   | ----                       |
| high point            | 4920              | 80.0                 | 9.15                 | 9.40   | 0.973                      |
| second point          |                   |                      |                      |  |                            |
| third point           |                   |                      |                      |  |                            |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                            | 0.973                      |
| Baseline Corr AF:     | 9.41              | Prev response        | 9.16                 | *% change  | 2.7%                       |
| Baseline Corr 2nd AF: | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF: | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### CH<sub>4</sub> Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as found span         | 4920              | 80.0                 | 8.08                 | 8.03   | 1.006                      |
| as found 2nd point    |                   |                      |                      |  |                            |
| as found 3rd point    |                   |                      |                      |  |                            |
| new cylinder response |                   |                      |                      |  |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| high point            | 4920              | 80.0                 | 8.08                 | 8.04   | 1.005                      |
| second point          |                   |                      |                      |  |                            |
| third point           |                   |                      |                      |  |                            |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                            | 1.005                      |
| Baseline Corr AF:     | 8.03              | Prev response        | 8.06                 | *% change  | -0.4%                      |
| Baseline Corr 2nd AF: | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF: | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.000262     | 1.012133      |
| THC Cal Offset:             | -0.006600    | 0.000000      |
| CH <sub>4</sub> Cal Slope:  | 0.999646     | 0.994875      |
| CH <sub>4</sub> Cal Offset: | -0.011800    | 0.000000      |
| NMHC Cal Slope:             | 1.000469     | 1.027373      |
| NMHC Cal Offset:            | 0.005800     | 0.000000      |

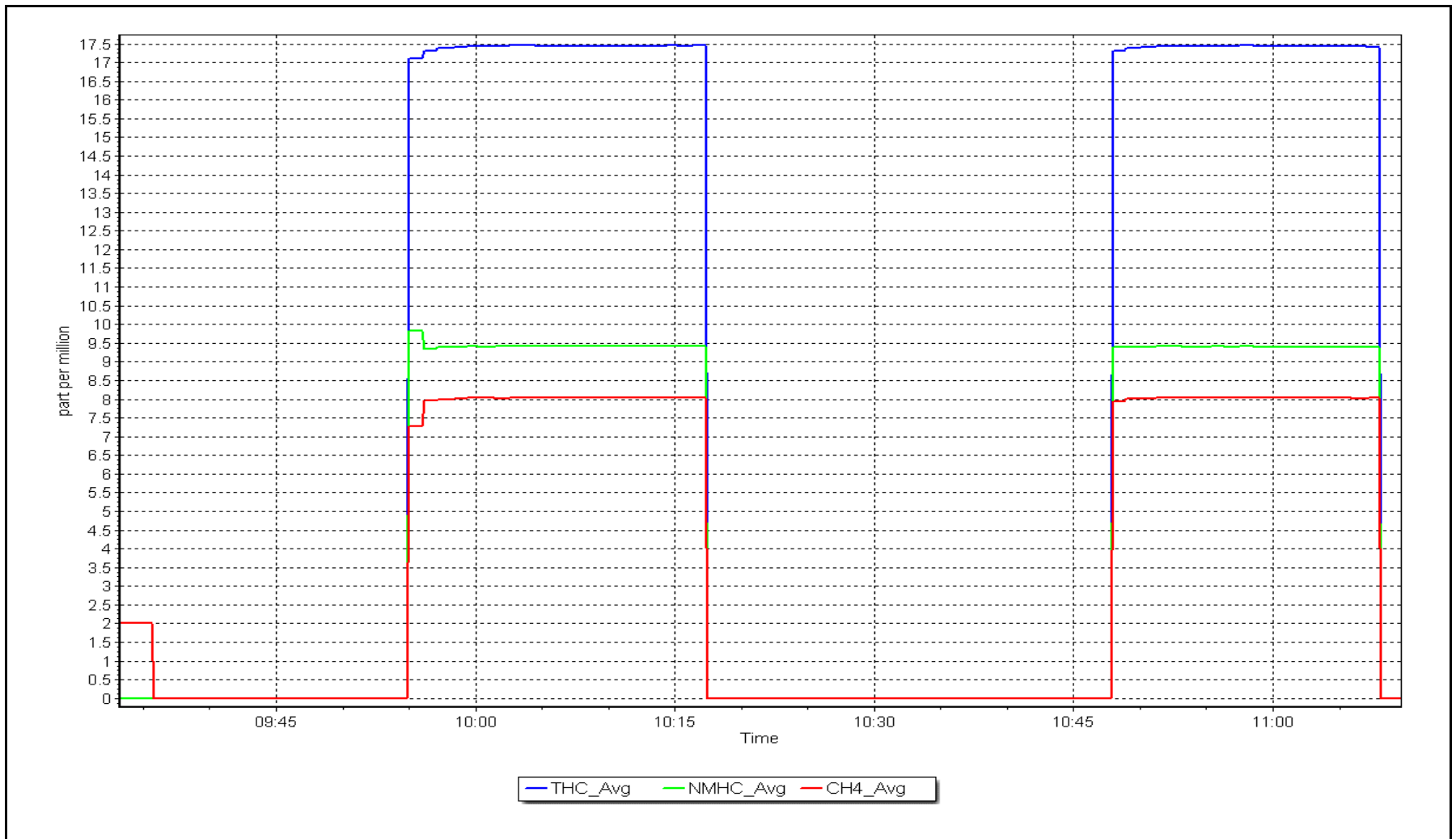
Notes: Nitrogen cylinder changed after as founds.

Calibration Performed By: Karan Pandit

NMHC Calibration Plot

Date: March 16, 2023

Location: Mannix





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS06**  
**PATRICIA MCINNES**  
**MARCH 2023**

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

August 30, 2023

Revision 01





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

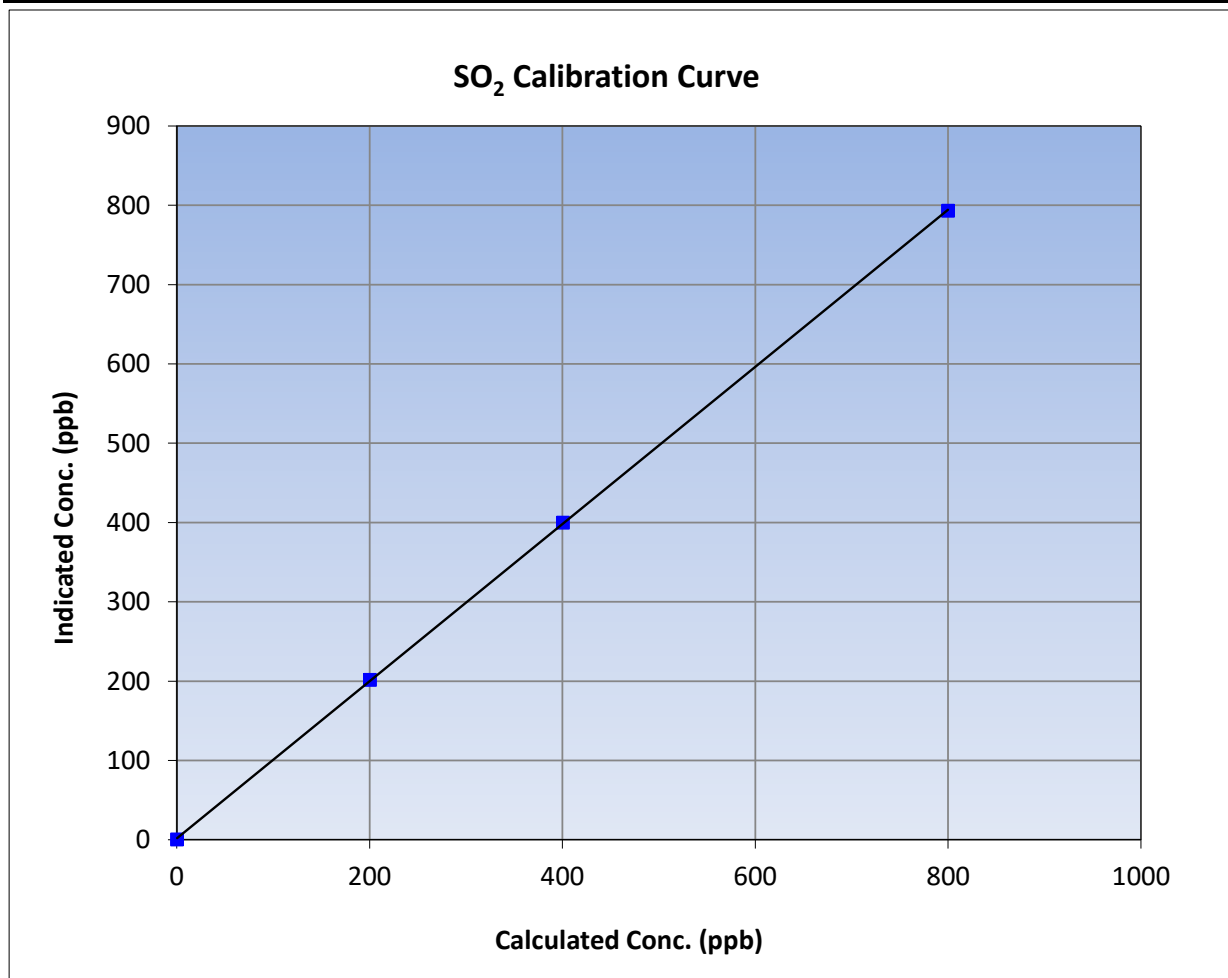
Version-01-2020

### Station Information

|                   |                  |                       |                   |
|-------------------|------------------|-----------------------|-------------------|
| Calibration Date: | March 13, 2023   | Previous Calibration: | February 16, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS06             |
| Start Time (MST): | 9:37             | End Time (MST):       | 13:59             |
| Analyzer make:    | Thermo 43i       | Analyzer serial #:    | 1160290013        |

### Calibration Data

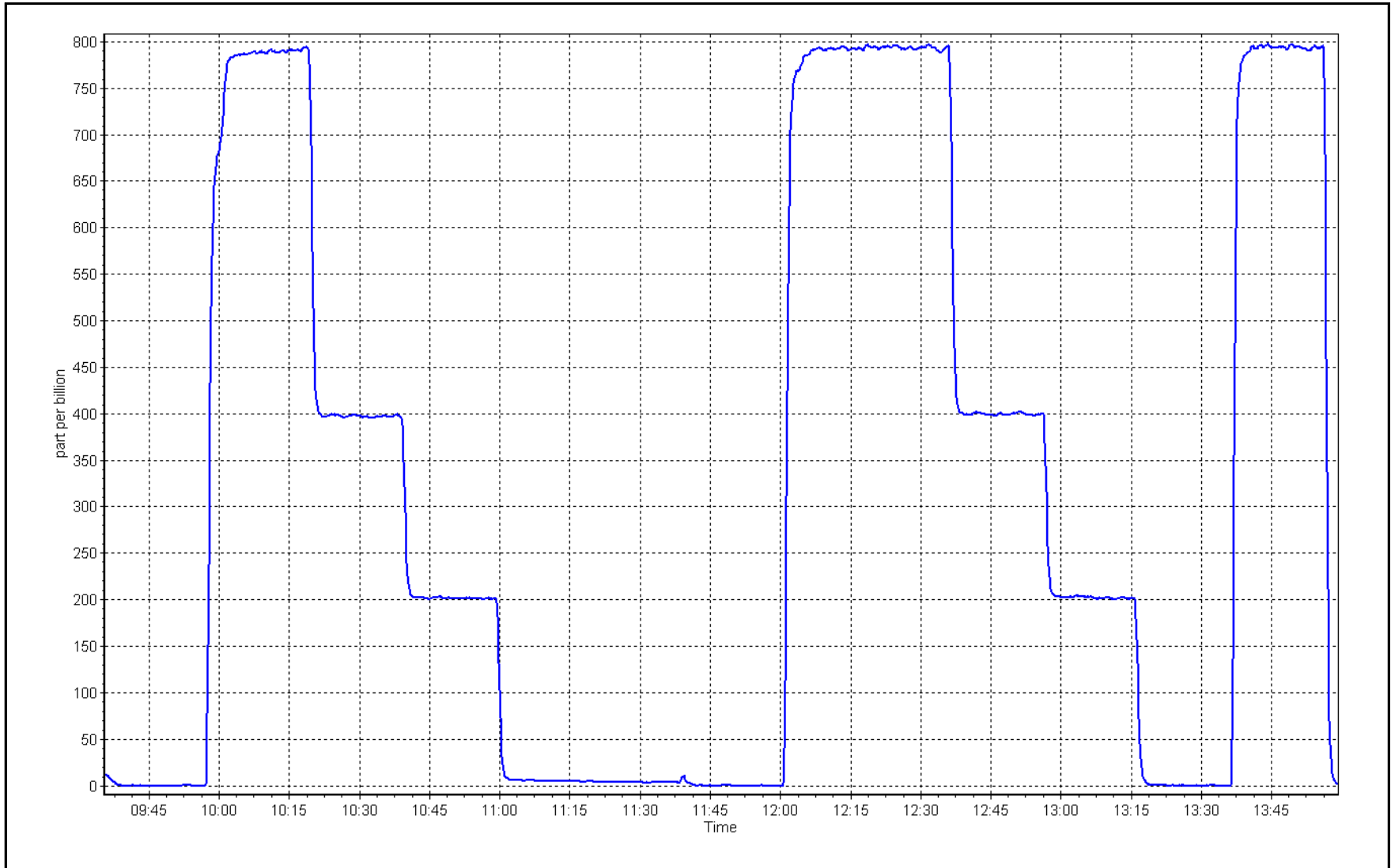
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999977 | ≥0.995      |
| 799.5                               | 792.9                              | 1.0083                    |                         |          |             |
| 400.2                               | 399.7                              | 1.0013                    | Slope                   | 0.991070 | 0.90 - 1.10 |
| 200.1                               | 201.3                              | 0.9941                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 1.621614 | +/-30       |



SO2 Calibration Plot

Date: March 13, 2023

Location: Patricia McInnes





# Wood Buffalo Environmental Association

## H2S Calibration Report

Version-11-2021

### Station Information

Station Name: Patricia McInnes Station number: AMS 06  
 Calibration Date: March 15, 2023 Last Cal Date: February 6, 2023  
 Start time (MST): 8:55 End time (MST): 13:18  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.38 ppm Cal Gas Exp Date: March 2, 2023  
 Cal Gas Cylinder #: EY0000809  
 Removed Cal Gas Conc: 5.38 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 H Serial Number: 689

### Analyzer Information

Analyzer make: Thermo 43i TLE Analyzer serial #: 1218153358  
 Converter make: Global G150 Converter serial #: 2022-195  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.990341     | 0.997060      | Backgd or Offset: 1.82 | 1.84          |
| Calibration intercept: | 0.217319     | 0.257193      | Coeff or Slope: 1.049  | 1.070         |

### 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----   |
| as found span         | 4926                          | 74.3                        | 79.9                                | 77.6                               | 1.030  |
| as found 2nd point    | 4963                          | 37.2                        | 40.0                                | 39.2                               | 1.021  |
| as found 3rd point    | 4981                          | 18.6                        | 20.0                                | 20.0                               | 1.001  |
| new cylinder response |                               |                             |                                     |                                    |  |

### 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)<br><i>Limit = 0.95-1.05</i> |
|--------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero    | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point         | 4926                          | 74.3                        | 79.9                                | 79.9                               | 1.001   |
| second point       | 4963                          | 37.2                        | 40.0                                | 40.2                               | 0.996   |
| third point        | 4981                          | 18.6                        | 20.0                                | 20.4                               | 0.981   |
| as left zero       | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| as left span       | 4926                          | 74.3                        | 79.9                                | 79.8                               | 1.002   |
| SO2 Scrubber Check | 4920                          | 80.3                        | 803.0                               | 0.0                                | ----  |

|   |                   |                 |       |
|---|-------------------|-----------------|-------|
| Date of last scrubber change:           | December 20, 2021 | Ave Corr Factor | 0.992 |
| Date of last converter efficiency test: |                   | efficiency      |       |

Baseline Corr As found: 77.6 Prev response: 79.39 \*% change: -2.3%  
 Baseline Corr 2nd AF pt: 39.2 AF Slope: 0.968755 AF Intercept: 0.297750  
 Baseline Corr 3rd AF pt: 20.0 AF Correlation: 0.999932

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

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

Calibration Performed By: Max Farrell





# Wood Buffalo Environmental Association

## H2S Calibration Summary

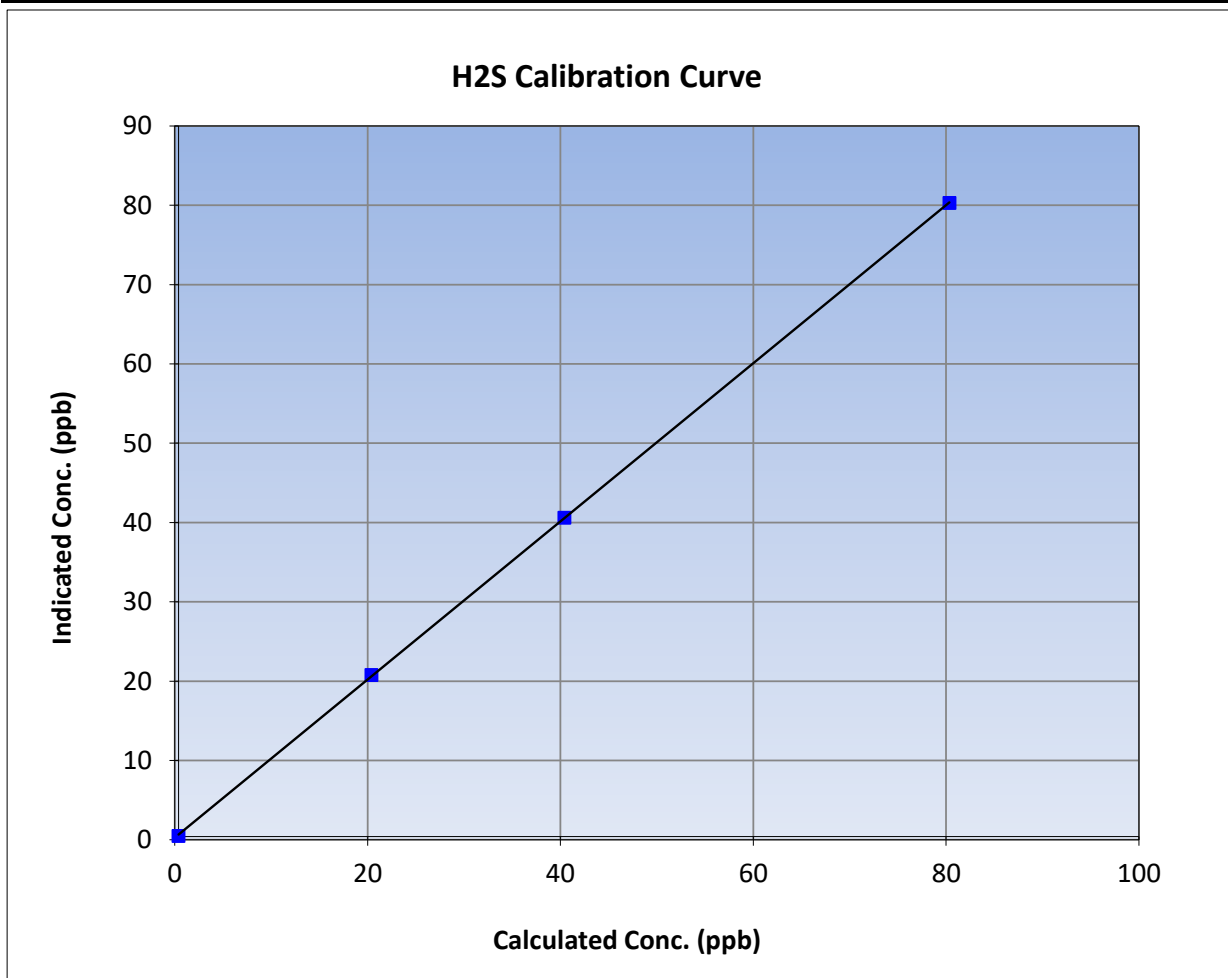
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 15, 2023   | Previous Calibration: | February 6, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS 06           |
| Start Time (MST): | 8:55             | End Time (MST):       | 13:18            |
| Analyzer make:    | Thermo 43i TLE   | Analyzer serial #:    | 1218153358       |

### Calibration Data

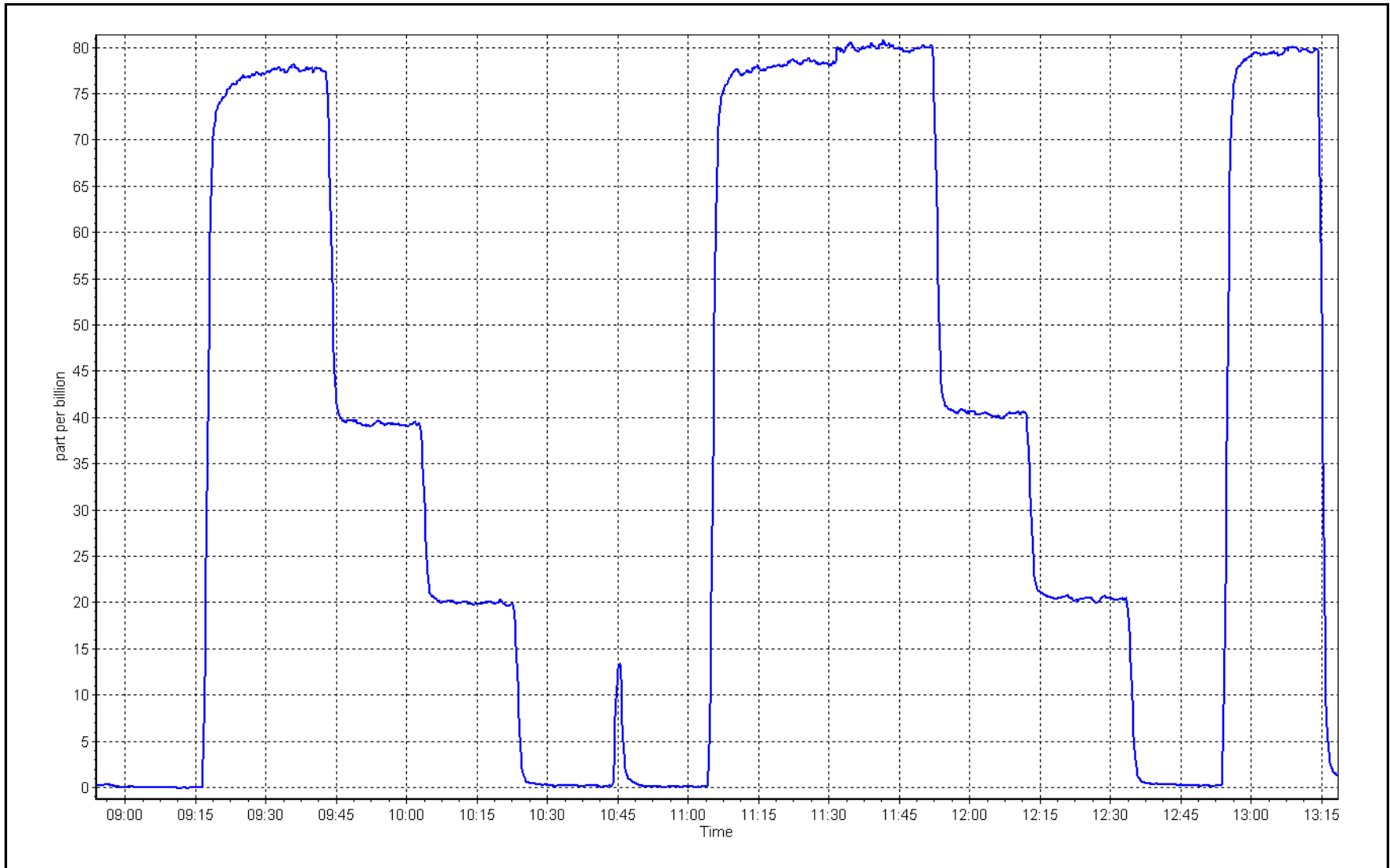
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | 0.999981 | ≥0.995      |
| 79.9                                | 79.9                               | 1.0005                    |                         |          |             |
| 40.0                                | 40.2                               | 0.9957                    | Slope                   | 0.997060 | 0.90 - 1.10 |
| 20.0                                | 20.4                               | 0.9811                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.257193 | +/-3        |



H2S Calibration Plot

Date: March 15, 2023

Location: Patricia McInnes





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                   |
|-------------------|------------------|-----------------|-------------------|
| Station Name:     | Patricia McInnes | Station number: | AMS06             |
| Calibration Date: | March 13, 2023   | Last Cal Date:  | February 25, 2023 |
| Start time (MST): | 9:37             | End time (MST): | 13:59             |
| Reason:           | Routine          |                 |                   |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | AAL070632 | Cal Gas Expiry Date:        | September 9, 2024 |
| CH <sub>4</sub> Cal Gas Conc.               | 501.6 ppm | CH <sub>4</sub> Equiv Conc. | 1066.2 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.3 ppm |                             |                   |
| Removed Gas Ref.                            | N/A       | Removed Gas Expiry:         | N/A               |
| Removed CH <sub>4</sub> Conc.               | 501.6 ppm | CH <sub>4</sub> Equiv Conc. | 1066.2 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.3 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 3566              |
| ZAG make/model:                             | API T701  | Serial Number:              | 261               |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1180320037 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.26E-04     | 3.33E-04      | NMHC SP Ratio:  | 5.79E-05      |
| CH <sub>4</sub> Retention time: | 14           | 14.0          | NMHC Peak Area: | 156880        |
|                                 |              |               |                 | 154840        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4920              | 80.3                 | 17.12                | 16.91               | 1.013                      |
| as found 2nd point    | 4960              | 40.2                 | 8.57                 | 8.45                | 1.015                      |
| as found 3rd point    | 4980              | 20.1                 | 4.29                 | 4.26                | 1.007                      |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4920              | 80.3                 | 17.12                | 17.15               | 0.998                      |
| second point          | 4960              | 40.2                 | 8.57                 | 8.57                | 1.000                      |
| third point           | 4980              | 20.1                 | 4.29                 | 4.32                | 0.992                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4920              | 80.3                 | 17.12                | 17.16               | 0.998                      |

|                           |       |
|---------------------------|-------|
| Average Correction Factor | 0.997 |
|---------------------------|-------|

|                       |       |                 |          |  |          |
|-----------------------|-------|-----------------|----------|--|----------|
| Baseline Corr AF:     | 16.91 | Prev response   | 17.13    | *% change                                  | -1.3%    |
| Baseline Corr 2nd AF: | 8.4   | AF Slope:       | 0.986971 | AF Intercept:                              | 0.006195 |
| Baseline Corr 3rd AF: | 4.3   | AF Correlation: | 0.999995 | * = > +/-5% change initiates investigation |          |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / 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             | 4920              | 80.3                 | 9.07                 | 8.99                                       | 1.008               |
| as found 2nd point        | 4960              | 40.2                 | 4.54                 | 4.51                                       | 1.007               |
| as found 3rd point        | 4980              | 20.1                 | 2.27                 | 2.27                                       | 1.002               |
| new cylinder response     |                   |                      |                      |  |                     |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00                                       | ----                |
| high point                | 4920              | 80.3                 | 9.07                 | 9.08                                       | 0.999               |
| second point              | 4960              | 40.2                 | 4.54                 | 4.55                                       | 0.997               |
| third point               | 4980              | 20.1                 | 2.27                 | 2.29                                       | 0.990               |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                |
| as left span              | 4920              | 80.3                 | 9.07                 | 9.08                                       | 0.998               |
| Average Correction Factor |                   |                      |                      |  | 0.996               |
| Baseline Corr AF:         | 8.99              | Prev response        | 9.08                 | *% change                                  | -0.9%               |
| Baseline Corr 2nd AF:     | 4.5               | AF Slope:            | 0.991315             | AF Intercept:                              | 0.006759            |
| Baseline Corr 3rd AF:     | 2.3               | AF Correlation:      | 0.999997             | * = > +/-5% change initiates investigation |                     |

### CH<sub>4</sub> 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                 | 8.06                 | 7.92                                       | 1.017               |
| as found 2nd point        | 4960              | 40.2                 | 4.03                 | 3.94                                       | 1.023               |
| as found 3rd point        | 4980              | 20.1                 | 2.02                 | 1.99                                       | 1.013               |
| new cylinder response     |                   |                      |                      |  |                     |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                |
| high point                | 4920              | 80.3                 | 8.06                 | 8.07                                       | 0.998               |
| second point              | 4960              | 40.2                 | 4.03                 | 4.02                                       | 1.003               |
| third point               | 4980              | 20.1                 | 2.02                 | 2.03                                       | 0.994               |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                |
| as left span              | 4920              | 80.3                 | 8.06                 | 8.07                                       | 0.998               |
| Average Correction Factor |                   |                      |                      |  | 0.998               |
| Baseline Corr AF:         | 7.92              | Prev response        | 8.05                 | *% change                                  | -1.7%               |
| Baseline Corr 2nd AF:     | 3.94              | AF Slope:            | 0.982351             | AF Intercept:                              | -0.000765           |
| Baseline Corr 3rd AF:     | 1.99              | AF Correlation:      | 0.999986             | * = > +/-5% change initiates investigation |                     |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.000813     | 1.000848      |
| THC Cal Offset:             | -0.008055    | 0.007935      |
| CH <sub>4</sub> Cal Slope:  | 1.000524     | 1.001093      |
| CH <sub>4</sub> Cal Offset: | -0.008597    | -0.000603     |
| NMHC Cal Slope:             | 1.001070     | 1.000428      |
| NMHC Cal Offset:            | 0.000542     | 0.009337      |

Notes: Completed multipoint as founds due to H2 generator requiring routine maintenance. Adjusted the span only.

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## THC Calibration Summary

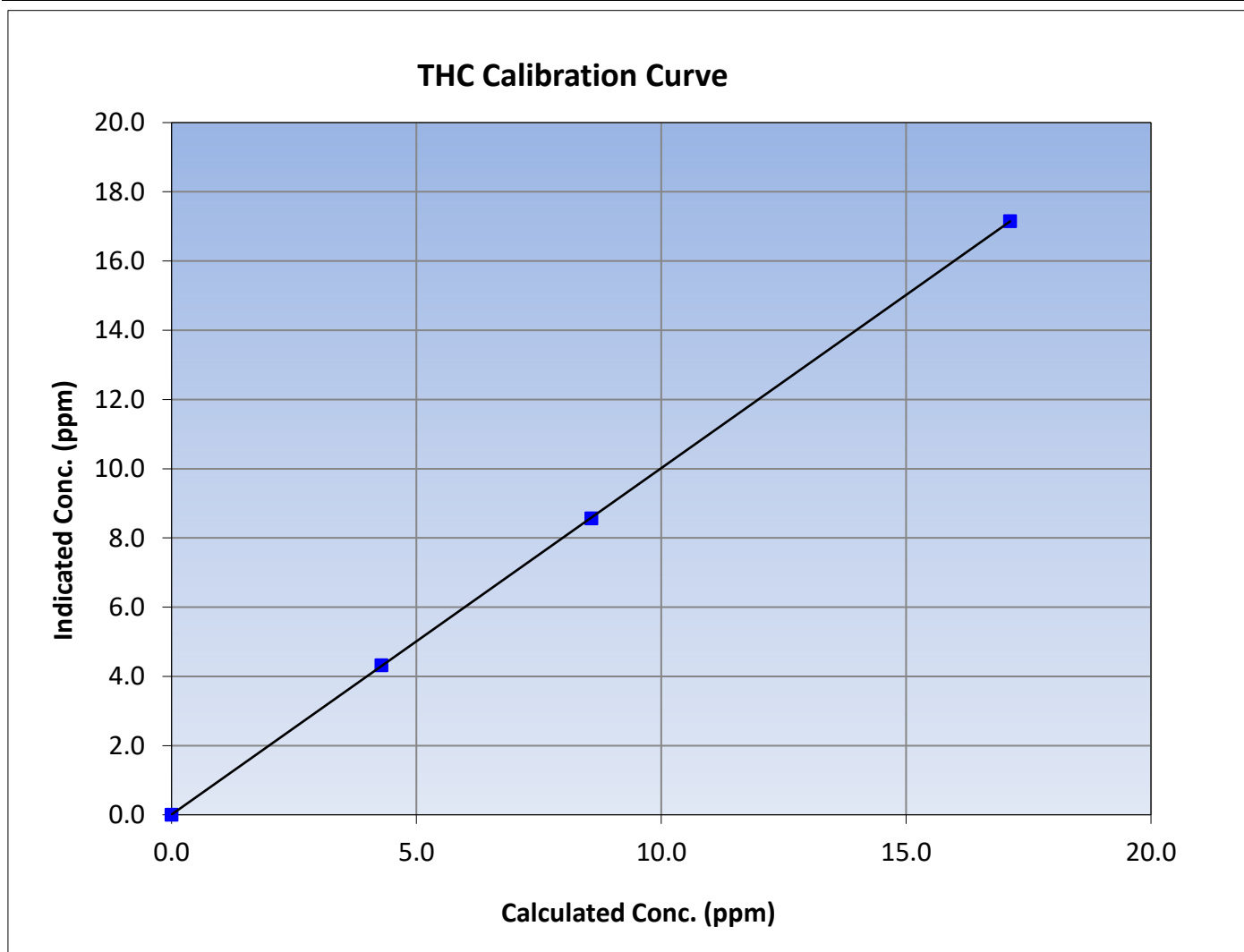
Version-01-2020

### Station Information

|                   |                  |                       |                   |
|-------------------|------------------|-----------------------|-------------------|
| Calibration Date: | March 13, 2023   | Previous Calibration: | February 25, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS06             |
| Start Time (MST): | 9:37             | End Time (MST):       | 13:59             |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1180320037        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999994 | $\geq 0.995$  |       |          |             |
| 17.12                               | 17.15                              | 0.9985                    |                         |          |               |       |          |             |
| 8.57                                | 8.57                               | 1.0005                    |                         |          |               | Slope | 1.000848 | 0.90 - 1.10 |
| 4.29                                | 4.32                               | 0.9919                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.007935 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

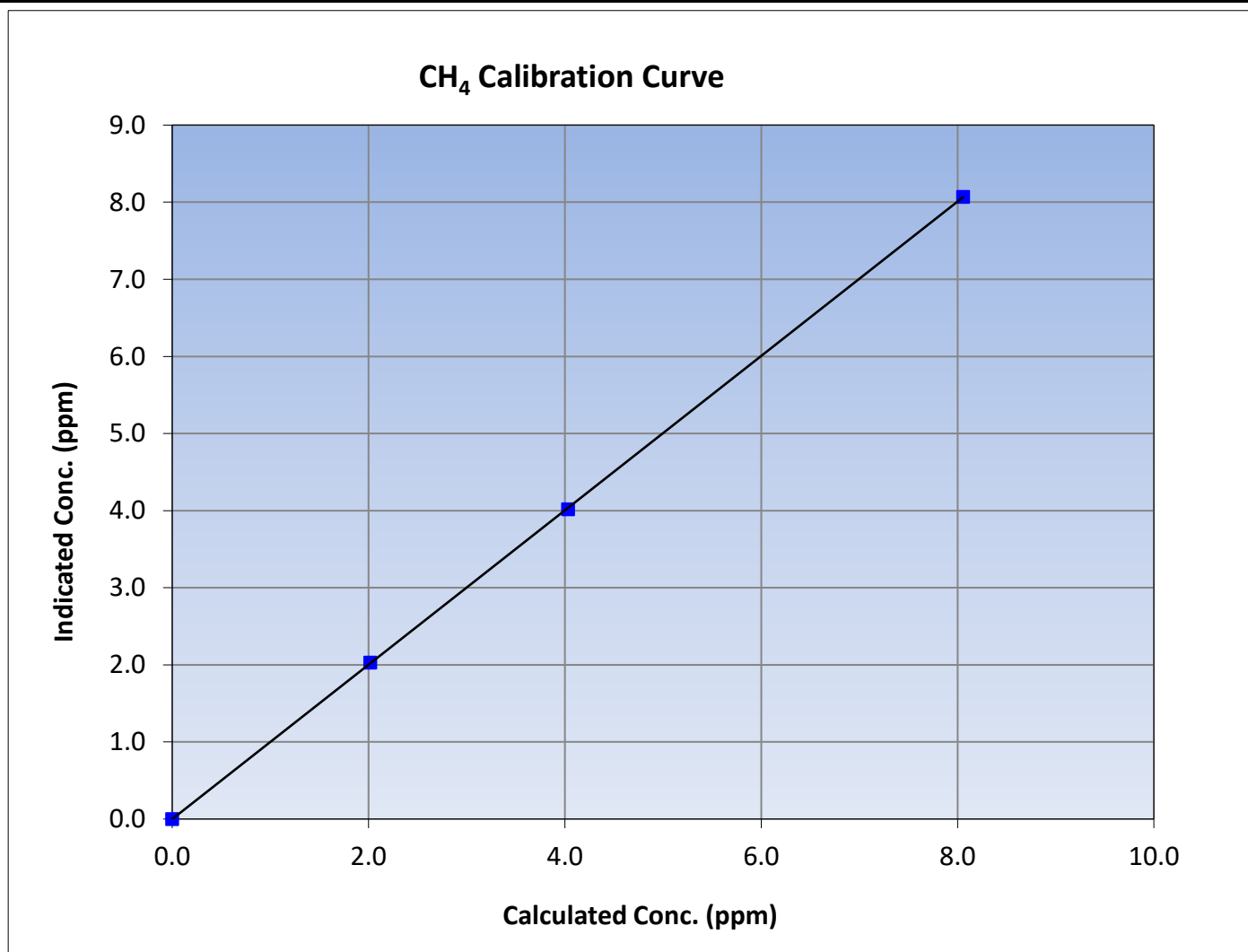
Version-01-2020

### Station Information

|                   |                  |                       |                   |
|-------------------|------------------|-----------------------|-------------------|
| Calibration Date: | March 13, 2023   | Previous Calibration: | February 25, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS06             |
| Start Time (MST): | 9:37             | End Time (MST):       | 13:59             |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1180320037        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999987  | $\geq 0.995$  |       |          |             |
| 8.06                                | 8.07                               | 0.9982                    |                         |           |               |       |          |             |
| 4.03                                | 4.02                               | 1.0034                    |                         |           |               | Slope | 1.001093 | 0.90 - 1.10 |
| 2.02                                | 2.03                               | 0.9938                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.000603 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

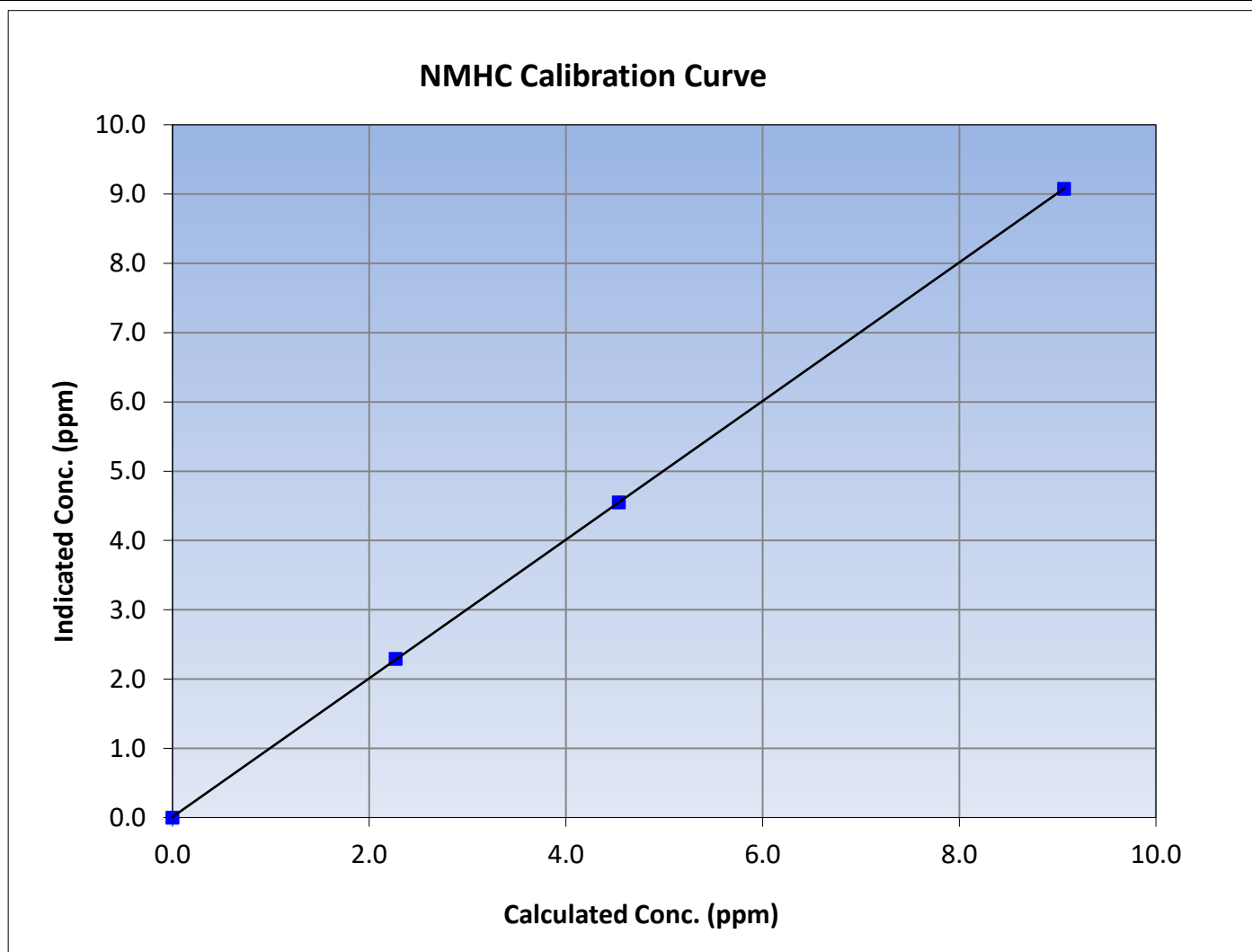
Version-01-2020

### Station Information

|                   |                  |                       |                   |
|-------------------|------------------|-----------------------|-------------------|
| Calibration Date: | March 13, 2023   | Previous Calibration: | February 25, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS06             |
| Start Time (MST): | 9:37             | End Time (MST):       | 13:59             |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1180320037        |

### Calibration Data

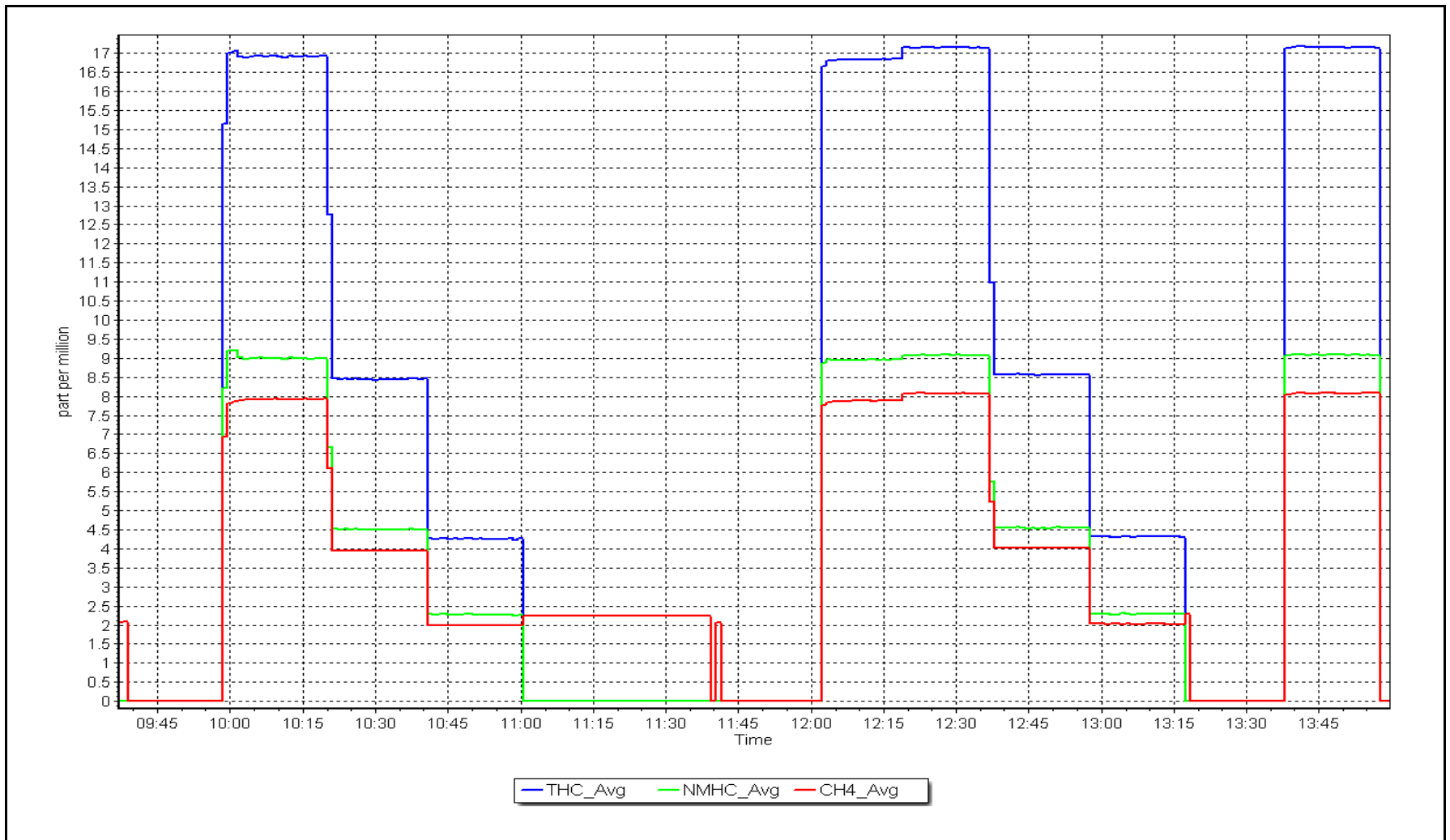
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999995 | $\geq 0.995$  |       |          |             |
| 9.07                                | 9.08                               | 0.9989                    |                         |          |               |       |          |             |
| 4.54                                | 4.55                               | 0.9974                    |                         |          |               | Slope | 1.000428 | 0.90 - 1.10 |
| 2.27                                | 2.29                               | 0.9902                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.009337 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: March 13, 2023

Location: Patricia McInnes







# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                |
|-------------------|------------------|-----------------|----------------|
| Station Name:     | Patricia McInnes | Station number: | AMS06          |
| Calibration Date: | March 24, 2023   | Last Cal Date:  | March 13, 2023 |
| Start time (MST): | 8:53             | End time (MST): | 10:20          |
| Reason:           | Cylinder Change  |                 |                |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | AAL070632 | Cal Gas Expiry Date:        | September 9, 2024 |
| CH <sub>4</sub> Cal Gas Conc.               | 501.6 ppm | CH <sub>4</sub> Equiv Conc. | 1066.2 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.3 ppm |                             |                   |
| Removed Gas Ref.                            | N/A       | Removed Gas Expiry:         | N/A               |
| Removed CH <sub>4</sub> Conc.               | 501.6 ppm | CH <sub>4</sub> Equiv Conc. | 1066.2 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.3 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 3566              |
| ZAG make/model:                             | API T701  | Serial Number:              | 261               |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1180320037 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.33E-04     | 3.33E-04      | NMHC SP Ratio:  | 5.86E-05      |
| CH <sub>4</sub> Retention time: | 14           | 14.0          | NMHC Peak Area: | 154840        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span         | 4920              | 80.3                 | 17.12                | 17.15                                      | 0.998                      |
| 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                | 17.13                                      | 1.000                      |
| second point          |                   |                      |                      |  |                            |
| third point           |                   |                      |                      |  |                            |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                  | 1.000                      |
| Baseline Corr AF:     | 17.15             | Prev response        | 17.15                | *% 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.3                 | 9.07                 | 9.13                                       | 0.993                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.3                 | 9.07                 | 9.11                                       | 0.995                      |
| second point              |                   |                      |                      |  |                            |
| third point               |                   |                      |                      |  |                            |
| as left zero              |                   |                      |                      |  |                            |
| as left span              |                   |                      |                      |  |                            |
| Average Correction Factor |                   |                      |                      |  | 0.995                      |
| Baseline Corr AF:         | 9.13              | Prev response        | 9.08                 | *% change                                  | 0.6%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.3                 | 8.06                 | 8.02                                       | 1.004                      |
| 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                 | 8.06                 | 8.02                                       | 1.004                      |
| second point              |                   |                      |                      |  |                            |
| third point               |                   |                      |                      |  |                            |
| as left zero              |                   |                      |                      |  |                            |
| as left span              |                   |                      |                      |  |                            |
| Average Correction Factor |                   |                      |                      |  | 1.004                      |
| Baseline Corr AF:         | 8.02              | Prev response        | 8.06                 | *% 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

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.000848     | 1.000481      |
| THC Cal Offset:             | 0.007935     | 0.000000      |
| CH <sub>4</sub> Cal Slope:  | 1.001093     | 0.995569      |
| CH <sub>4</sub> Cal Offset: | -0.000603    | 0.000000      |
| NMHC Cal Slope:             | 1.000428     | 1.005175      |
| NMHC Cal Offset:            | 0.009337     | 0.000000      |

Notes:

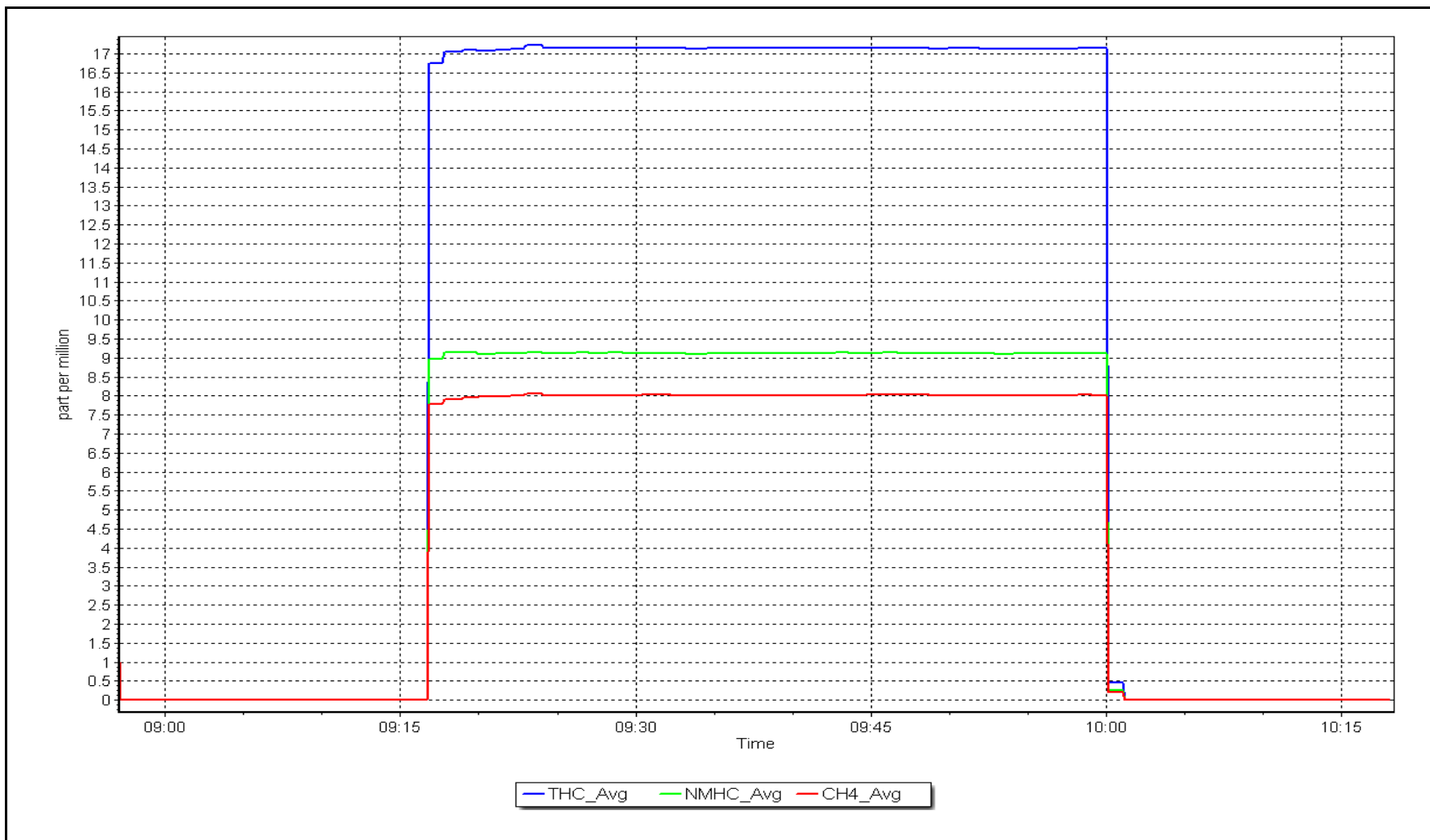
Cylinder change.

Calibration Performed By: Sean Bala

NMHC Calibration Plot

Date: March 24, 2023

Location: Patricia McInnes





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Patricia McInnes  
Calibration Date: March 7, 2023  
Start time (MST): 9:33  
Reason: Routine  
Station number: AMS06  
Last Cal Date: February 2, 2023  
End time (MST): 14:21

### Calibration Standards

NO Gas Cylinder #: T26D9MR  
NOX Cal Gas Conc: 52.51 ppm  
Removed Cylinder #: N/A  
Removed Gas NOX Conc: 52.51 ppm  
NOX gas Diff:  
Calibrator Model: Teledyne API T700  
ZAG make/model: Teledyne API T701  
Cal Gas Expiry Date: August 18, 2023  
NO Cal Gas Conc: 51.98 ppm  
Removed Gas Exp Date: N/A  
Removed Gas NO Conc: 51.98 ppm  
NO gas Diff:  
Serial Number: 3566  
Serial Number: 689

### Analyzer Information

Analyzer make: Thermo 42i  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 1172750022

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 0.818        | 0.818         | NO bkgnd or offset:  | 3.2          | 3.2           |
| NOX coeff or slope: | 0.996        | 0.996         | NOX bkgnd or offset: | 3.8          | 3.8           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 155.1        | 155.1         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.004307     | 0.993329      |
| NO <sub>x</sub> Cal Offset: | 2.260596     | 2.240132      |
| NO Cal Slope:               | 1.003971     | 0.991966      |
| NO Cal Offset:              | 1.260503     | 1.559980      |
| NO <sub>2</sub> Cal Slope:  | 1.009891     | 1.003238      |
| NO <sub>2</sub> Cal Offset: | 0.497022     | 1.111866      |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.4   | 0.0                                   | -0.5   | ----  | ----   |
| as found span             | 4923                      | 76.9                        | 807.6   | 799.5                                  | 8.2   | 805.4  | 792.5                                 | 12.9   | 1.0027  | 1.0088   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.2                                   | -0.1   | ----  | ----   |
| high point                | 4923                      | 76.9                        | 807.6   | 799.5                                  | 8.2   | 803.4  | 793.9                                 | 9.6  | 1.0052  | 1.0070   |
| second point              | 4962                      | 38.5                        | 404.3   | 400.2                                  | 4.1   | 404.8  | 399.3                                 | 5.6  | 0.9988  | 1.0024   |
| third point               | 4981                      | 19.2                        | 201.6   | 199.6                                  | 2.0   | 204.9  | 200.9                                 | 4.0  | 0.9841  | 0.9935   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.3                                   | -0.3   | ----  | ----   |
| as left span              | 4923                      | 76.9                        | 807.6   | 389.9                                  | 417.8   | 801.2  | 384.2                                 | 417.1  | 1.0080  | 1.0147   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9960  | 1.0010   |

|                      |                             |                |  |                                  |                         |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 805.8 ppb | NO = 792.5 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -0.9% |                      |
| Previous Response    | NO <sub>x</sub> = 813.3 ppb | NO = 803.9 ppb |  | *Percent Change                  | NO = -1.4%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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)       | 791.9                                      | 382.3                                 | 417.8   | 419.6  | 0.9956   | 100.4%   |
| 2nd GPT point (200 ppb O3)       | 791.9                                      | 587.1                                 | 213.0   | 215.3  | 0.9891   | 101.1%   |
| 3rd GPT point (100 ppb O3)       | 791.9                                      | 690.1                                 | 110.0   | 112.7  | 0.9756   | 102.5%   |
| Average Correction Factor        |  |                                       |   |  | 0.9868   | 101.3%   |

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

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

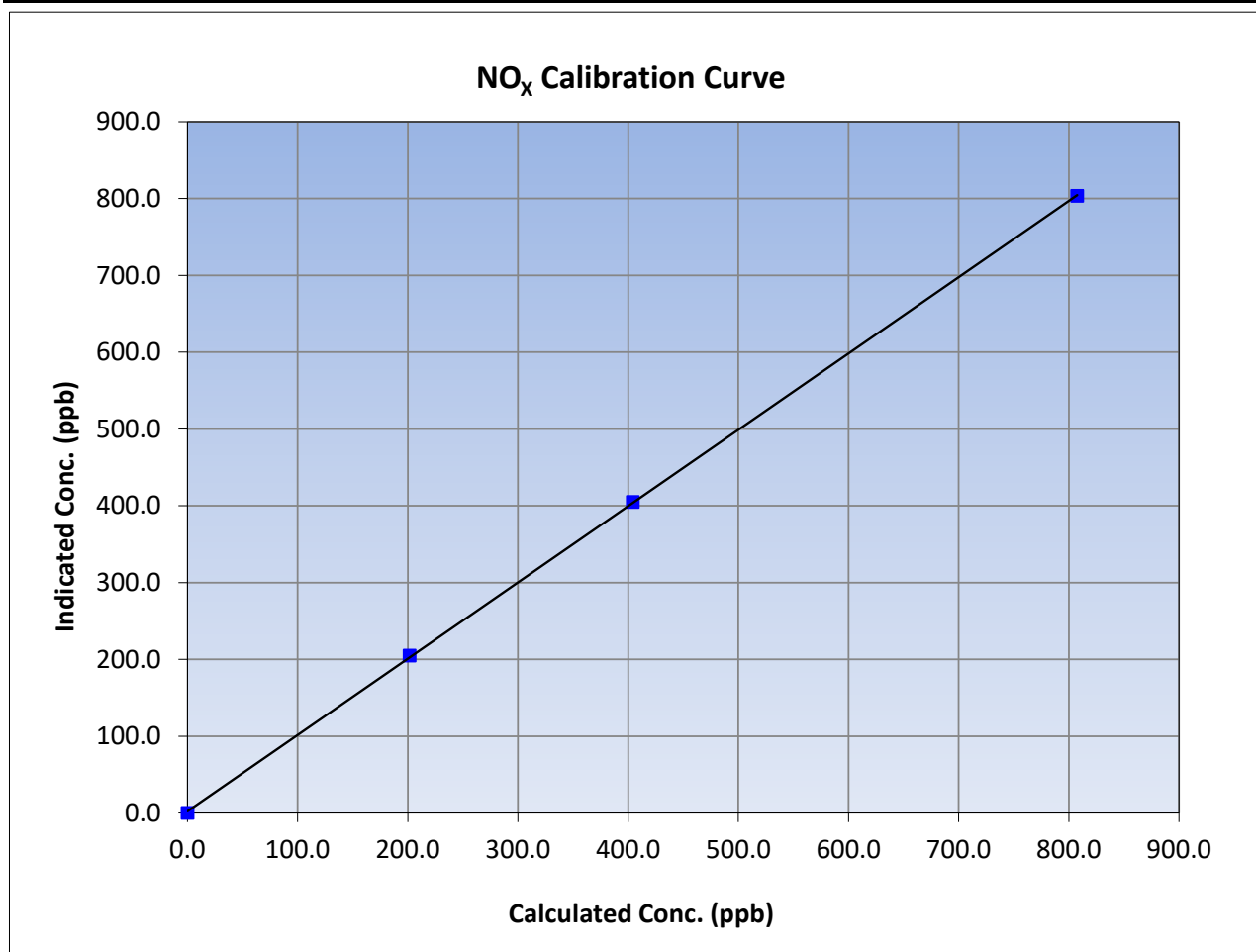
Version-04-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 7, 2023    | Previous Calibration: | February 2, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS06            |
| Start Time (MST): | 9:33             | End Time (MST):       | 14:21            |
| 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 | ≥0.995   |             |
| 807.6                               | 803.4                              | 1.0052                    |                         |          |             |
| 404.3                               | 404.8                              | 0.9988                    |                         |          |             |
| 201.6                               | 204.9                              | 0.9841                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 0.993329 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 2.240132 | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

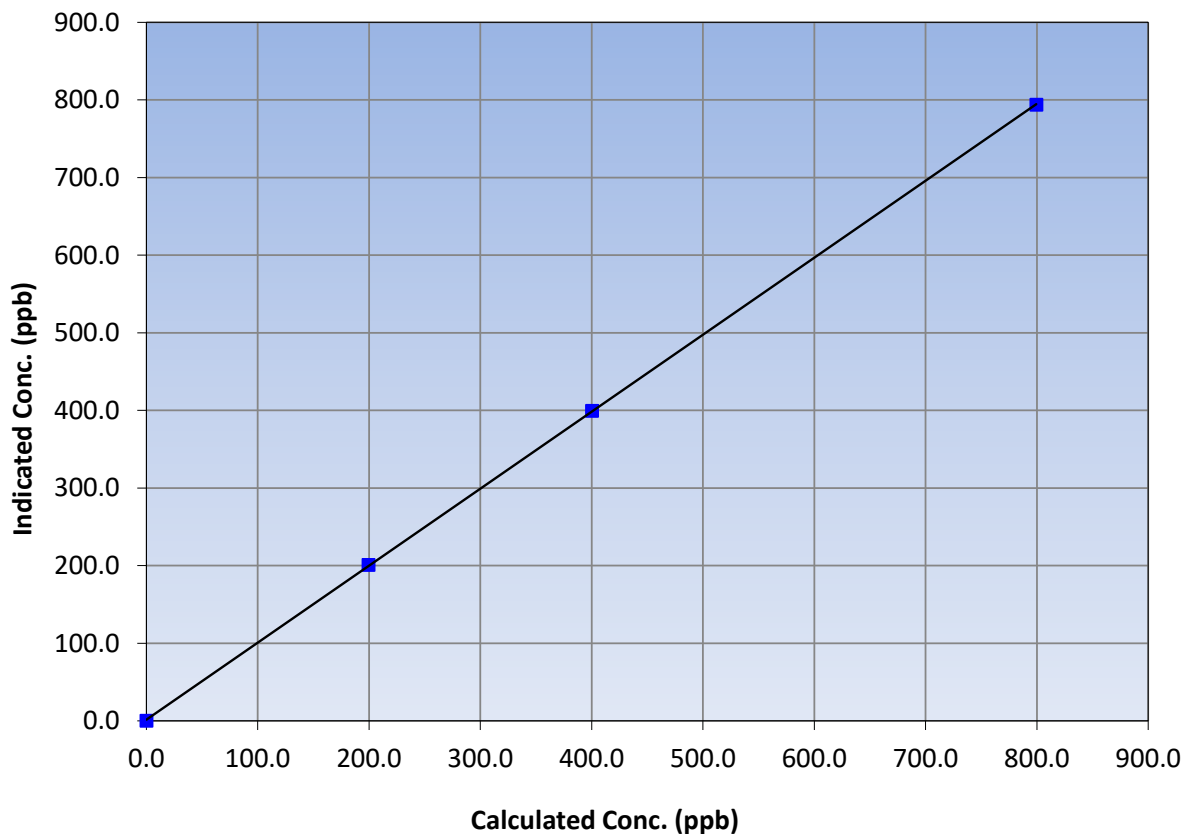
### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 7, 2023    | Previous Calibration: | February 2, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS06            |
| Start Time (MST): | 9:33             | End Time (MST):       | 14:21            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1172750022       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | ≥0.995   |             |
| 799.5                               | 793.9                              | 1.0070                    |                         |          |             |
| 400.2                               | 399.3                              | 1.0024                    |                         |          |             |
| 199.6                               | 200.9                              | 0.9935                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 0.991966 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 1.559980 | +/-20       |

NO Calibration Curve





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

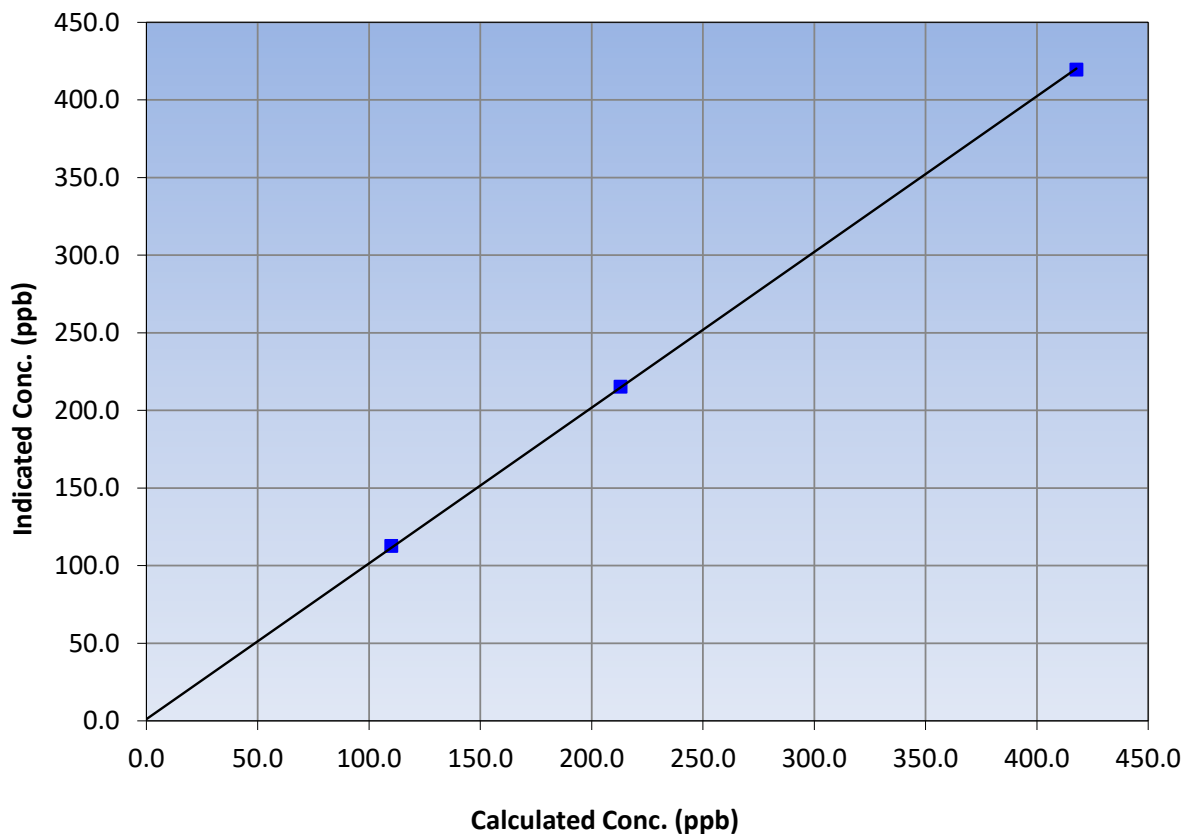
### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 7, 2023    | Previous Calibration: | February 2, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS06            |
| Start Time (MST): | 9:33             | End Time (MST):       | 14:21            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1172750022       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |             |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |             |
| 417.8                               | 419.6                              | 0.9956                    |   |                                |             |
| 213.0                               | 215.3                              | 0.9891                    |   |                                |             |
| 110.0                               | 112.7                              | 0.9756                    |   |                                |             |
|                                     |                                    |                           | Correlation Coefficient                       | 0.999960                       | ≥0.995      |
|                                     |                                    |                           | Slope   | 1.003238                       | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept                                     | 1.111866                       | +/-20       |

**NO<sub>2</sub> Calibration Curve**





NO<sub>x</sub> Calibration Plot

Date: March 7, 2023

Location: Patricia McInnes





# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Patricia McInnes      Station number: AMS06  
 Calibration Date: March 9, 2023      Last Cal Date: February 8, 2023  
 Start time (MST): 11:10      End time (MST): 14:11  
 Reason: Routine

### Calibration Standards

O3 generation mode: Photometer  
 Calibrator Make/Model: API T700      Serial Number: 3566  
 ZAG Make/Model: API T701H      Serial Number: 689

### Analyzer Information

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

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 1.005057     | 1.005771      | Backgd or Offset: | -1.2         | -1.2          |
| Calibration intercept: | 1.240000     | 0.940000      | Coeff or Slope:   | 1.019        | 1.019         |

### O<sub>3</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                       | 800.0                         | 0.0                                 | 0.2                                | ----  |
| as found span             | 5000                       | 1303.0                        | 400.0                               | 402.5                              | 0.994   |
| as found 2nd point        |                            |                               |                                     |                                    |   |
| as found 3rd point        |                            |                               |                                     |                                    |   |
| calibrator zero           | 5000                       | 800.0                         | 0.0                                 | 0.2                                | ----  |
| high point                | 5000                       | 1303.0                        | 400.0                               | 402.8                              | 0.993   |
| second point              | 5000                       | 966.5                         | 200.0                               | 202.7                              | 0.987   |
| third point               | 5000                       | 794.3                         | 100.0                               | 102.1                              | 0.979   |
| as left zero              | 5000                       | 800.0                         | 0.0                                 | 0.4                                | ----  |
| as left span              | 5000                       | 1303.0                        | 400.0                               | 404.6                              | 0.989   |
| Average Correction Factor |                            |                               |                                     |                                    | 0.986   |

|                          |       |                   |       |               |       |
|--------------------------|-------|-------------------|-------|---------------|-------|
| Baseline Corr As found:  | 402.3 | Previous response | 403.3 | *% change     | -0.2% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:         |       | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation:   |       |               |       |

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

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

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

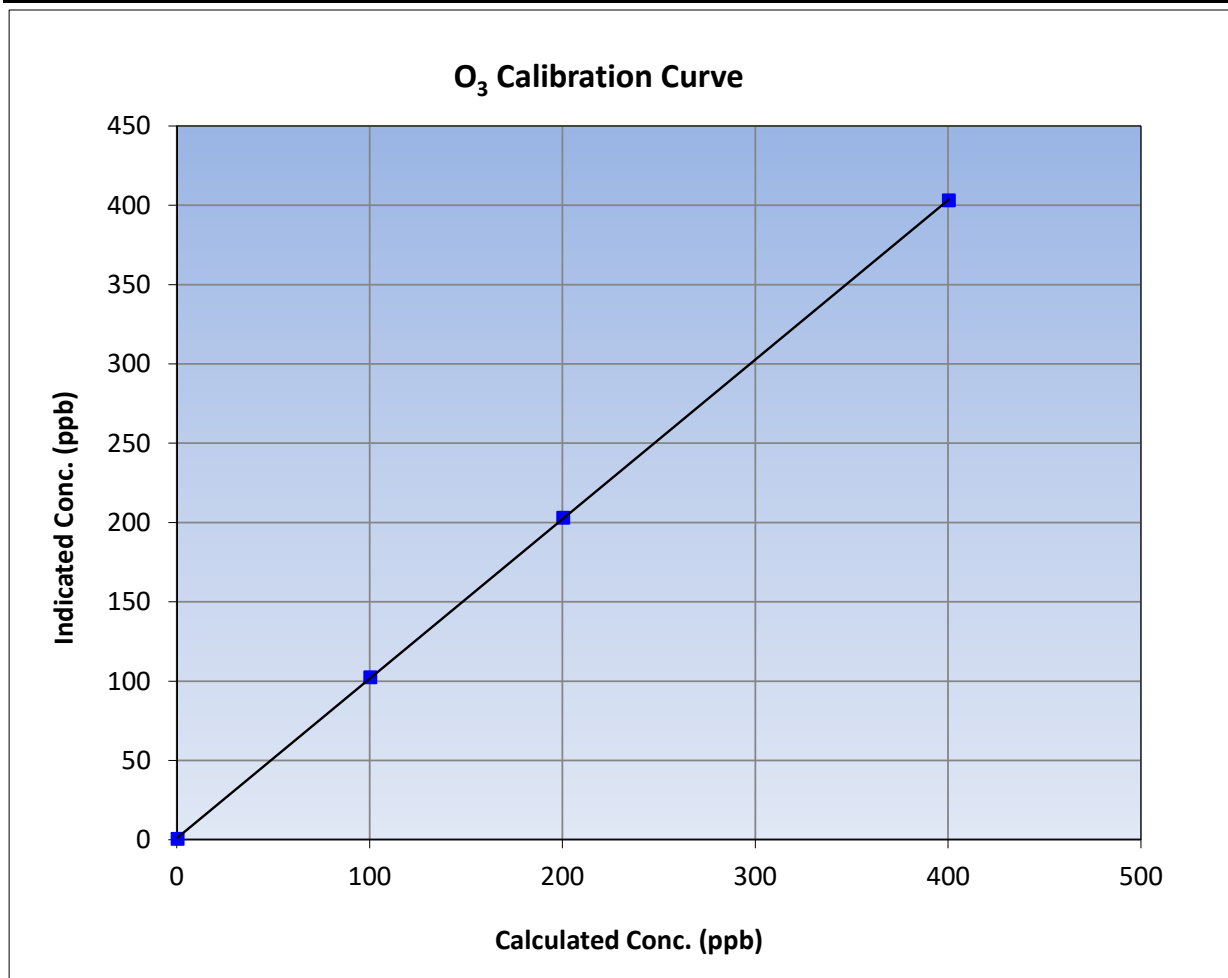
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 9, 2023    | Previous Calibration: | February 8, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS06            |
| Start Time (MST): | 11:10            | End Time (MST):       | 14:11            |
| Analyzer make:    | Thermo 49i       | Analyzer serial #:    | 1300156234       |

### Calibration Data

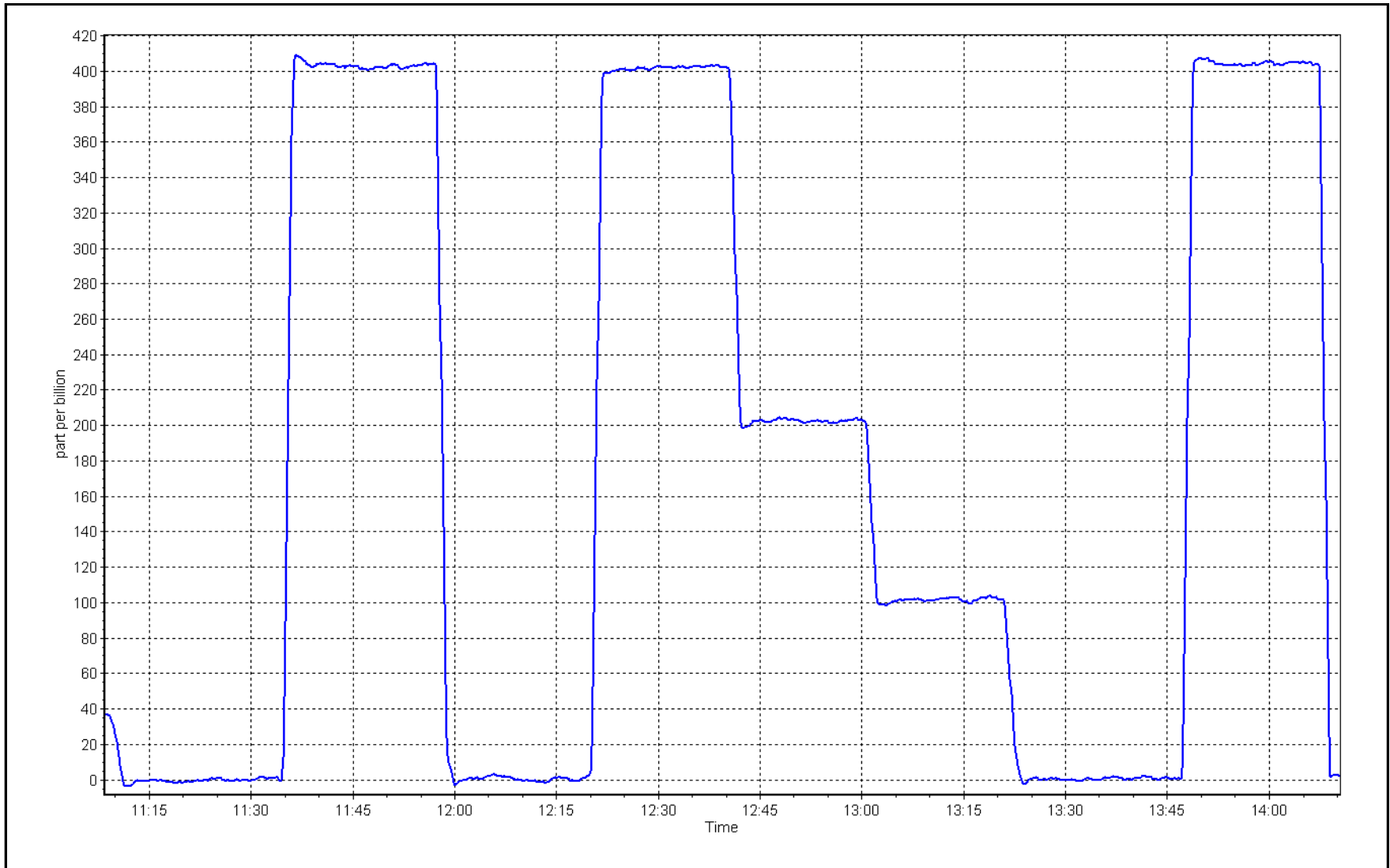
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999984      |             |
| 400.0                               | 402.8                              | 0.9930                    |                         |               | ≥0.995      |
| 200.0                               | 202.7                              | 0.9867                    | Slope                   | 1.005771      |             |
| 100.0                               | 102.1                              | 0.9794                    |                         |               | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.940000      | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: March 9, 2023

Location: Patricia McInnes





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Patricia McInnes      Station number: AMS 06  
 Calibration Date: March 15, 2023      Last Cal Date: February 16, 2023  
 Start time (MST): 13:50      End time (MST): 14:17

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

Flow Meter Make/Model: Delta Cal      S/N: 628  
 Temp/RH standard: Delta Cal      S/N: 628

### Monthly Calibration Test

| Parameter  | As found                             | Measured                                | As left                 | Adjusted                 | (Limits)     |
|------------|--------------------------------------|---|-------------------------|--------------------------|--------------|
| T (°C)     | -8.4                                 | -7.5                                    | -8.4                    | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 727.8                                | 725.5                                   | 727.8                   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5                                    | 5.14                                    | 5                       | <input type="checkbox"/> | +/- 0.25 LPM |
| Leak Test: | Date of check: <u>March 15, 2023</u> | Last Cal Date: <u>February 16, 2023</u> | PM w/o HEPA: <u>9.4</u> | PM w/ HEPA: <u>0</u>     | <0.2 ug/m3   |

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

Inlet cleaning :      Inlet Head

### Quarterly Calibration Test

| Parameter                     | As found | Post maintenance       | As left        | Adjusted                 | (Limits)     |
|-------------------------------|----------|------------------------|----------------|--------------------------|--------------|
| PMT Peak Test                 |          |                        |                | <input type="checkbox"/> | 11.3 +/- 0.5 |
| Post-maintenance leak check:  |          | PM w/o HEPA: _____     | w/ HEPA: _____ |                          | <0.2 ug/m3   |
| Date Optical Chamber Cleaned: |          | <u>January 9, 2023</u> |                |                          |              |
| Disposable Filter Changed:    |          | <u>January 9, 2023</u> |                |                          |              |

### Annual Maintenance

Date Sample Tube Cleaned: August 28, 2020  
 Date RH/T Sensor Cleaned: August 28, 2020

Notes:      PMT Peak test completed in January. Leak check passed. No adjustments made.

Calibration by:      Max Farrell



# Wood Buffalo Environmental Association

## TN - NO<sub>x</sub> - NH<sub>3</sub> Calibration Report

Version-11-2021

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Patricia McInnes | Station number: | AMS 06           |
| NOX Cal Date:     | March 8, 2023    | Last Cal Date:  | February 7, 2023 |
| Start time (MST): | 9:25             | End time (MST): | 14:00            |
| NH3 Cal Date:     | March 8, 2023    | Last Cal Date:  | February 7, 2023 |
| Start time (MST): | 14:30            | End time (MST): | 16:05            |
| Reason:           | Routine          |                 |                  |

### Calibration Standards

|                   |          |     |                     |                 |
|-------------------|----------|-----|---------------------|-----------------|
| NOX Cal Gas Conc: | 52.51    | ppm | NO Gas Cylinder #:  | T26D9MR         |
| NO Cal Gas Conc:  | 51.98    | ppm | NO Cal Gas Expiry:  | August 18, 2023 |
| Removed NOX Conc: | 52.51    | ppm | Removed Cylinder #: | N/A             |
| Removed NO Conc:  | 51.98    | ppm | Removed cyl Expiry: | N/A             |
| NOX gas Diff:     |          |     | NO gas Diff:        |                 |
| NH3 Cal Gas Conc: | 73.9     | ppm | NH3 Gas Cylinder #: | CC430800        |
|                   |          |     | NH3 Cal Gas Expiry: | January 7, 2023 |
| Removed NH3 Conc: | 73.9     | ppm | Removed Cylinder #: |                 |
| NH3 gas Diff:     |          |     | Removed cyl Expiry: |                 |
| Calibrator Model: | API T700 |     | Serial Number:      | 3566            |
| ZAG make/model:   | API T701 |     | Serial Number:      | 689             |

### Analyzer Information

|                  |              |                      |      |
|------------------|--------------|----------------------|------|
| Analyzer model:  | API T201     | Analyzer serial #:   | 152  |
| Converter model: | API T501     | Converter serial #:  | 147  |
| NH3 Range (ppb): | 0 - 2000 ppb | Reaction cell Press: | 5.70 |
| NOX Range (ppb): | 0 - 1000 ppb | Sample Flow:         | 531  |

|                  | <u>Start</u> | <u>Finish</u> |                 | <u>Start</u> | <u>Finish</u> |
|------------------|--------------|---------------|-----------------|--------------|---------------|
| NO coefficient:  | 0.853        | 0.823         | TN coefficient: | 0.851        | 0.822         |
| NOX coefficient: | 0.855        | 0.824         | NO bkgnd:       | -0.1         | -0.1          |
| NO2 coefficient: | 1.000        | 1.000         | NOX bkgnd:      | 0.0          | 0.0           |
| NH3 coefficient: | 0.951        | 0.951         | TN bkgnd:       | 0.0          | 0.0           |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.994899     | 0.999337      |
| NO <sub>x</sub> Cal Offset: | 2.960281     | 1.041887      |
| NO Cal Slope:               | 0.994939     | 0.997013      |
| NO Cal Offset:              | 1.319966     | 2.119639      |
| NO <sub>2</sub> Cal Slope:  | 0.993439     | 0.993721      |
| NO <sub>2</sub> Cal Offset: | 1.205483     | -1.386593     |
| NH3 Cal Slope:              | 0.998917     | 1.005985      |
| NH3 Cal Offset:             | 8.375709     | 7.240605      |
| TN Cal Slope:               | 1.004451     | 1.011422      |
| TN Cal Offset:              | 8.831802     | 7.102178      |



# Wood Buffalo Environmental Association

## TN - NO<sub>x</sub> - NH<sub>3</sub> Calibration Report

Version-11-2021

### Dilution Calibration Data

| Set Point                        | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated TN concentration (ppb) (Cc) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NH <sub>3</sub> concentration (ppb) (Cc) | Indicated TN concentration (ppb) (Ic) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NH <sub>3</sub> concentration (ppb) (Ic) | TN Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NH <sub>3</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|----------------------------------|---------------------------|-----------------------------|--|---|---|---------------------------------------|--|--|--|---|
| as found zero                    | 5000                      | 0.0                         | 0.0                                    | 0.0   | 0.0   | 0.8                                   | -0.1   | 0.9  | ----   | ----  |
| as found NO                      | 4923                      | 76.9                        | 807.6                                  | 807.6   | ----  | 838.4                                 | 835.4  | 3.1  | 0.963  | ----  |
| calibrator zero                  | 5000                      | 0.0                         | 0.0                                    | 0.0   | 0.0   | 0.7                                   | -0.4   | 1.1  | ----   | ----  |
| high NO point                    | 4923                      | 76.9                        | 807.6                                  | 807.6   | ----  | 809.4                                 | 808.3  | 1.2  | 0.998  | ----  |
| NO/O <sub>3</sub> point          | 4923                      | 76.9                        | 807.6                                  | 807.6   | ----  | 804.1                                 | 803.3  | 1.0  | 1.004  | ----  |
| as found NH <sub>3</sub>         | 3415                      | 85.3                        | 1801.0                                 | ----  | 1801.0  | 1824.2                                | ----   | 1814.8   | 0.987  | 0.992   |
| new NH <sub>3</sub> cyl rp       |                           |                             |  |   |   |                                       | ----   |  |  |   |
| first NH <sub>3</sub>            | 3415                      | 85.3                        | 1801.0                                 | ----  | 1801.0  | 1824.2                                | ----   | 1814.8   | 0.987  | 0.992   |
| second NH <sub>3</sub>           | 3453                      | 47.4                        | 1000.8                                 | ----  | 1000.8  | 1024.7                                | ----   | 1019.0   | 0.977  | 0.982   |
| third NH <sub>3</sub>            | 3476                      | 23.7                        | 500.4                                  | ----  | 500.4   | 518.8                                 | ----   | 516.1  | 0.965  | 0.970   |
| <b>Average Correction Factor</b> |                           |                             |  |   |   |                                       |  |  | <b>1.0011</b>  | <b>0.9814</b>   |

Corrected As found    TN = 837.6 ppb    NO<sub>x</sub> = 835.5 ppb    NH<sub>3</sub> = 1813.9 ppb

Previous Response    TN = 820 ppb    NO<sub>x</sub> = 806.4 ppb    NH<sub>3</sub> = 1807.5 ppb

NH<sub>3</sub> Previous Converter Efficiency = 95.1%

NH<sub>3</sub> Current Converter Efficiency = 95.1%

\*Percent Change    TN = 2.1%

\*Percent Change    NO<sub>x</sub> = 3.5%

\*Percent Change    NH<sub>3</sub> = 0.4%

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



# Wood Buffalo Environmental Association

## NO<sub>x</sub> - NO - NO<sub>2</sub> Calibration Report

Version-11-2021

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated TN concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated TN concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|--|--|---------------------------------------|---------------------------------------|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0                                    | -0.1   | 0.4                                   | 0.8                                   | ----  | ----   |
| as found span             | 4923                      | 76.9                        | 807.6   | 799.5                                  | 807.6                                  | 835.4  | 824.9                                 | 838.4                                 | 0.9667  | 0.9692   |
| new NO cyl rp             |                           |                             |   |  |  |  |                                       |                                       |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0                                    | -0.4   | 0.1                                   | 0.7                                   | ----  | ----   |
| high point                | 4923                      | 76.9                        | 807.6   | 799.5                                  | 807.6                                  | 808.3  | 798.0                                 | 809.4                                 | 0.9991  | 1.0018   |
| second point              | 4962                      | 38.5                        | 404.3   | 400.2                                  | 404.3                                  | 403.1  | 402.7                                 | 408.0                                 | 1.0030  | 0.9939   |
| third point               | 4981                      | 19.2                        | 201.6   | 199.6                                  | 201.6                                  | 205.8  | 202.8                                 | 208.7                                 | 0.9798  | 0.9842   |
| Average Correction Factor |                           |                             |   |  |  |  |                                       |                                       | 0.9940  | 0.9933   |

|                      |                |                             |                |                 |                        |
|----------------------|----------------|-----------------------------|----------------|-----------------|------------------------|
| Baseline Corr As fnd | TN = 837.6 ppb | NO <sub>x</sub> = 835.5 ppb | NO = 824.5 ppb | *Percent Change | TN = 2.1%              |
| Previous Response    | TN = 820 ppb   | NO <sub>x</sub> = 806.4 ppb | NO = 796.7 ppb | *Percent Change | NO <sub>x</sub> = 3.5% |
|                      |                |                             |                | *Percent Change | NO = 3.4%              |

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

### GPT Calibration Data

| O3 Setpoint (ppb)          | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------|--|---------------------------------------|---|--|--|--|
| as found zero              | ----                                       | ----                                  | 0.0   | -0.5   | ----   | ----   |
| calibration zero           | ----                                       | ----                                  | 0.0   | -0.5   | ----   | ----   |
| 1st GPT point (400 ppb O3) | 798.2                                      | 378.1                                 | 428.3   | 425.0  | 1.0077   | 99.2%  |
| 2nd GPT point (200 ppb O3) | 798.2                                      | 586.4                                 | 220.0   | 215.7  | 1.0197   | 98.1%  |
| 3rd GPT point (100 ppb O3) | 798.2                                      | 688.9                                 | 117.5   | 115.1  | 1.0204   | 98.0%  |
| Average Correction Factor  |  |                                       |   |  | 1.0159   | 98.4%  |

Notes: Changed the inlet filter after as founds. Adjusted the NO<sub>x</sub> span only.

Calibration Performed By: Max Farrell





# Wood Buffalo Environmental Association

## TN Calibration Summary

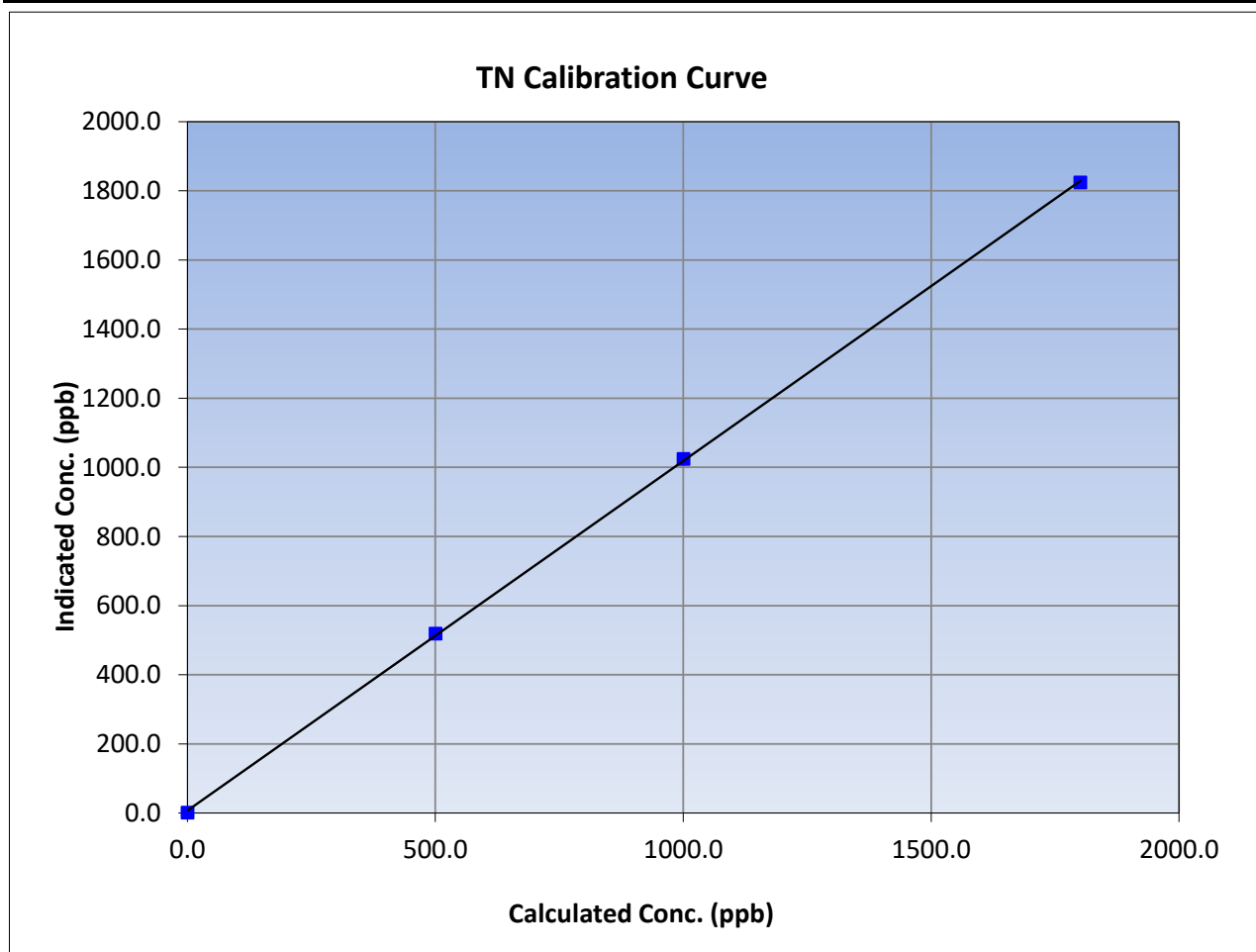
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 8, 2023    | Previous Calibration: | February 7, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS 06           |
| Start Time (MST): | 9:25             | End Time (MST):       | 14:00            |
| Analyzer make:    | API T201         | Analyzer serial #:    | 152              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.7                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 1801.0                              | 1824.2                             | 0.9873                    |                         |               |             |
| 1000.8                              | 1024.7                             | 0.9767                    |                         |               |             |
| 500.4                               | 518.8                              | 0.9646                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 1.011422      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 7.102178      | +/-20       |





# Wood Buffalo Environmental Association

## NH<sub>3</sub> Calibration Summary

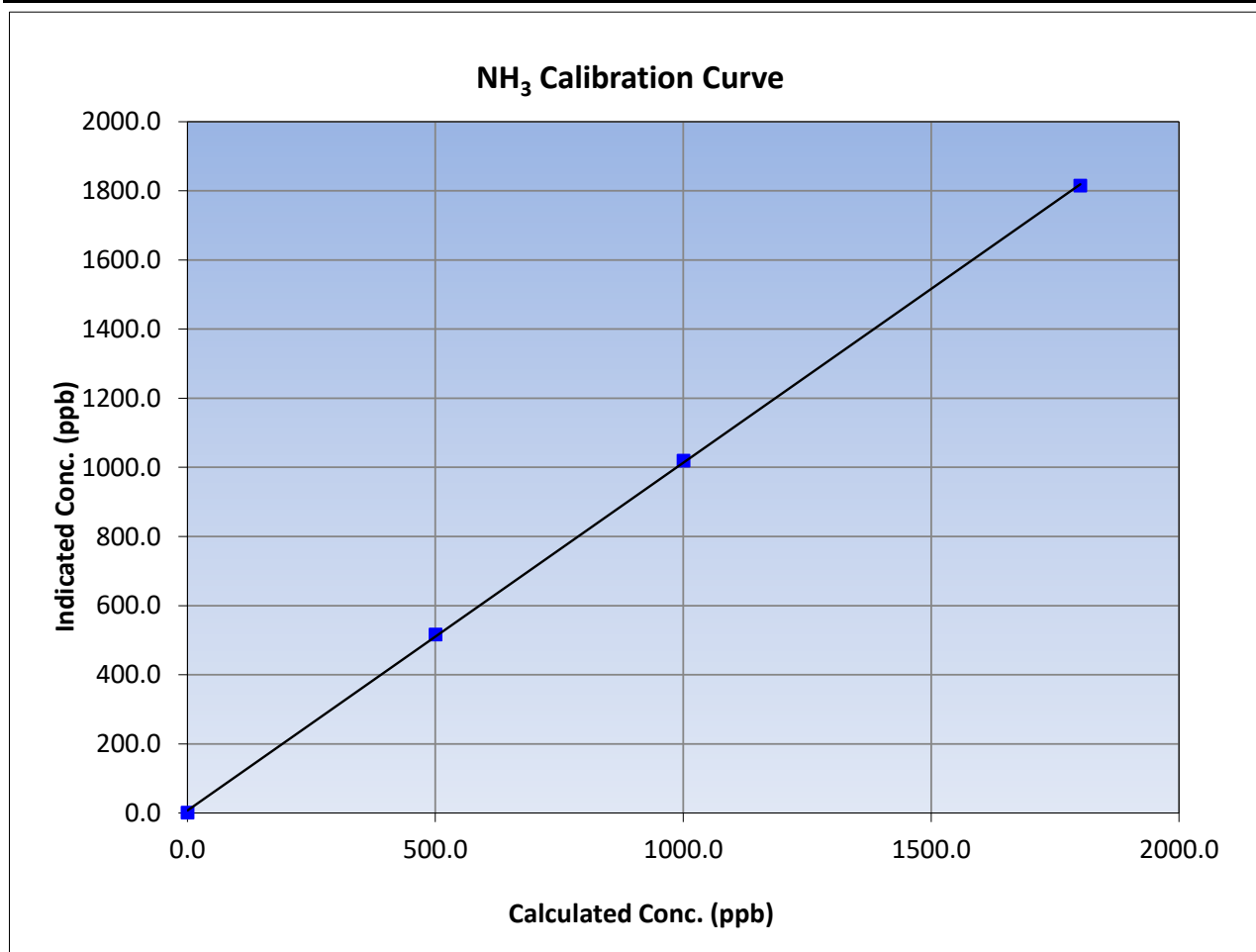
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 8, 2023    | Previous Calibration: | February 7, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS 06           |
| Start Time (MST): | 9:25             | End Time (MST):       | 14:00            |
| Analyzer make:    | API T201         | Analyzer serial #:    | 152              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 1.1                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 1801.0                              | 1814.8                             | 0.9924                    |   |                                |
| 1000.8                              | 1019.0                             | 0.9822                    |   |                                |
| 500.4                               | 516.1                              | 0.9696                    |   |                                |
|                                     |                                    |                           |   |                                |





# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

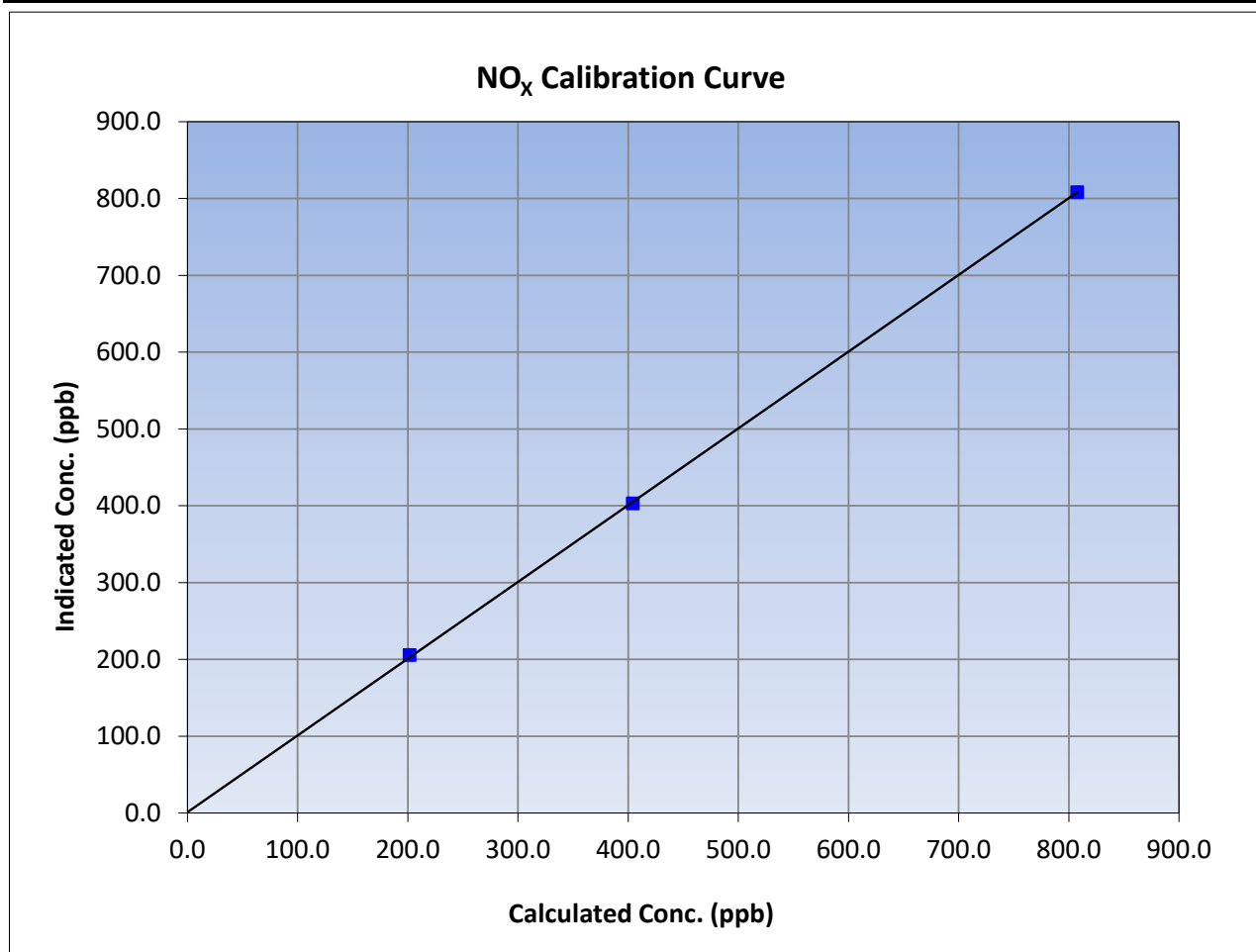
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 8, 2023    | Previous Calibration: | February 7, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS 06           |
| Start Time (MST): | 9:25             | End Time (MST):       | 14:00            |
| Analyzer make:    | API T201         | Analyzer serial #:    | 152              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | -0.4                               | ----                      | Correlation Coefficient | ≥0.995   |             |
| 807.6                               | 808.3                              | 0.9991                    |                         |          |             |
| 404.3                               | 403.1                              | 1.0030                    |                         |          |             |
| 201.6                               | 205.8                              | 0.9798                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 0.999337 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 1.041887 | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-11-2021

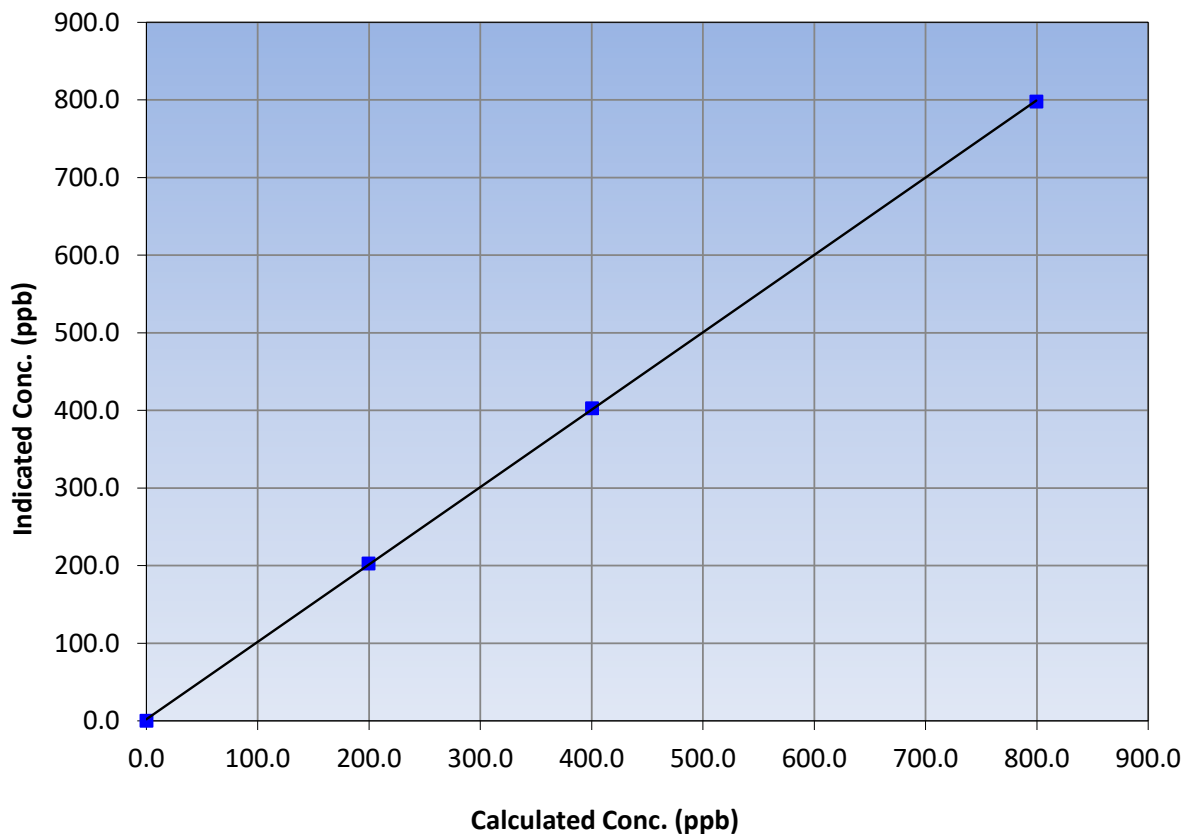
### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 8, 2023    | Previous Calibration: | February 7, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS 06           |
| Start Time (MST): | 9:25             | End Time (MST):       | 14:00            |
| Analyzer make:    | API T201         | Analyzer serial #:    | 152              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | ≥0.995   |             |
| 799.5                               | 798.0                              | 1.0018                    |                         |          |             |
| 400.2                               | 402.7                              | 0.9939                    |                         |          |             |
| 199.6                               | 202.8                              | 0.9842                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 0.997013 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 2.119639 | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

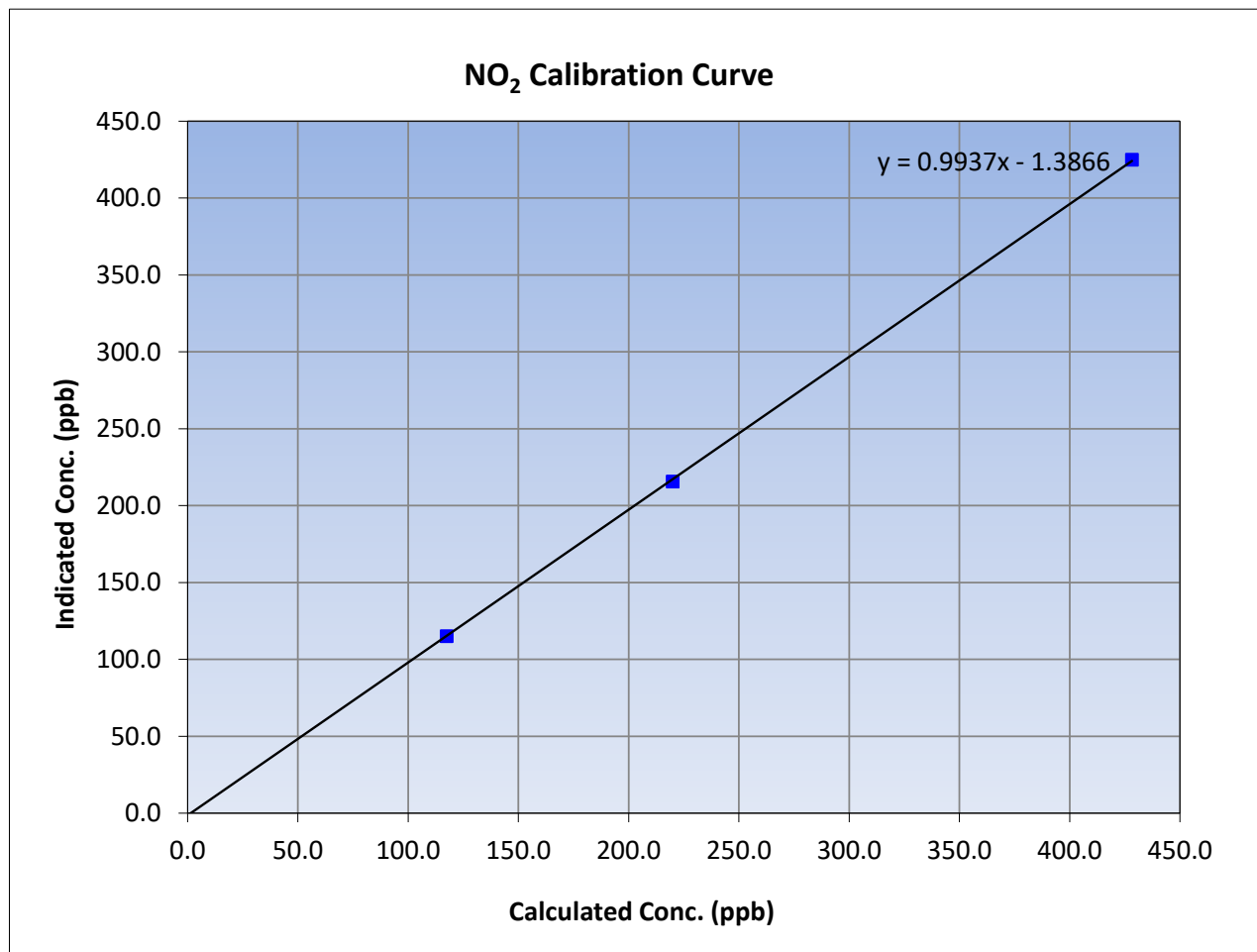
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 8, 2023    | Previous Calibration: | February 7, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS 06           |
| Start Time (MST): | 9:25             | End Time (MST):       | 14:00            |
| Analyzer make:    | API T201         | Analyzer serial #:    | 152              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | -0.5                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 428.3                               | 425.0                              | 1.0077                    |   |                                |
| 220.0                               | 215.7                              | 1.0197                    |   |                                |
| 117.5                               | 115.1                              | 1.0204                    |   |                                |
|                                     |                                    |                           | 0.999962                                      |                                |
|                                     |                                    |                           | 0.993721                                      |                                |
|                                     |                                    |                           | -1.386593                                     |                                |



NO<sub>x</sub> Calibration Plot

Date: March 8, 2023

Location: Patricia McInnes



NH<sub>3</sub> Calibration Plot

Date: March 8, 2023

Location: Patricia McInnes





## **WOOD BUFFALO ENVIRONMENTAL ASSOCIATION**

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS07 ATHABASCA VALLEY MARCH 2023**

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

April 29, 2023







# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

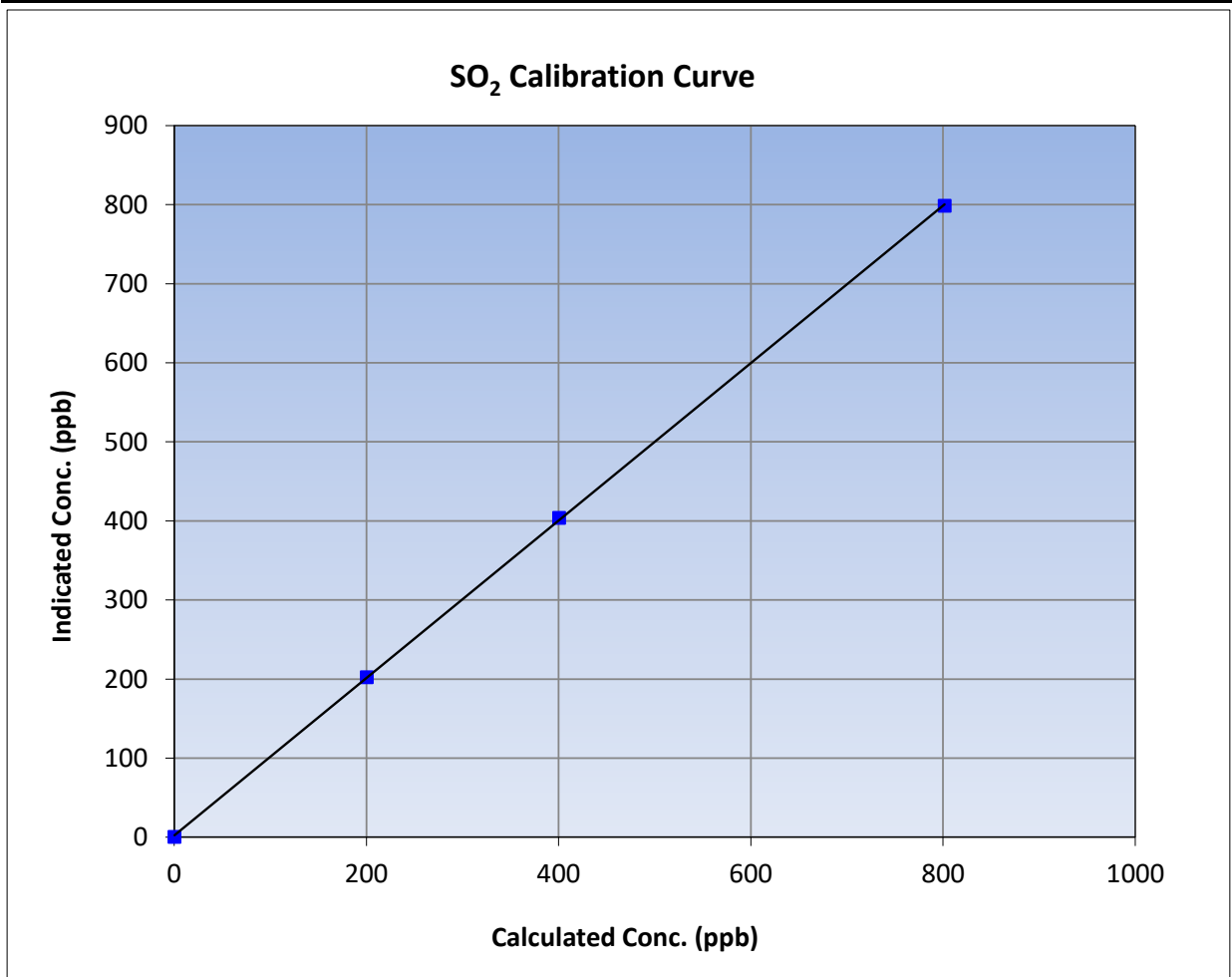
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 9, 2023    | Previous Calibration: | February 1, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 10:56            | End Time (MST):       | 13:35            |
| Analyzer make:    | Thermo 43i-LTE   | Analyzer serial #:    | 1507864683       |

### Calibration Data

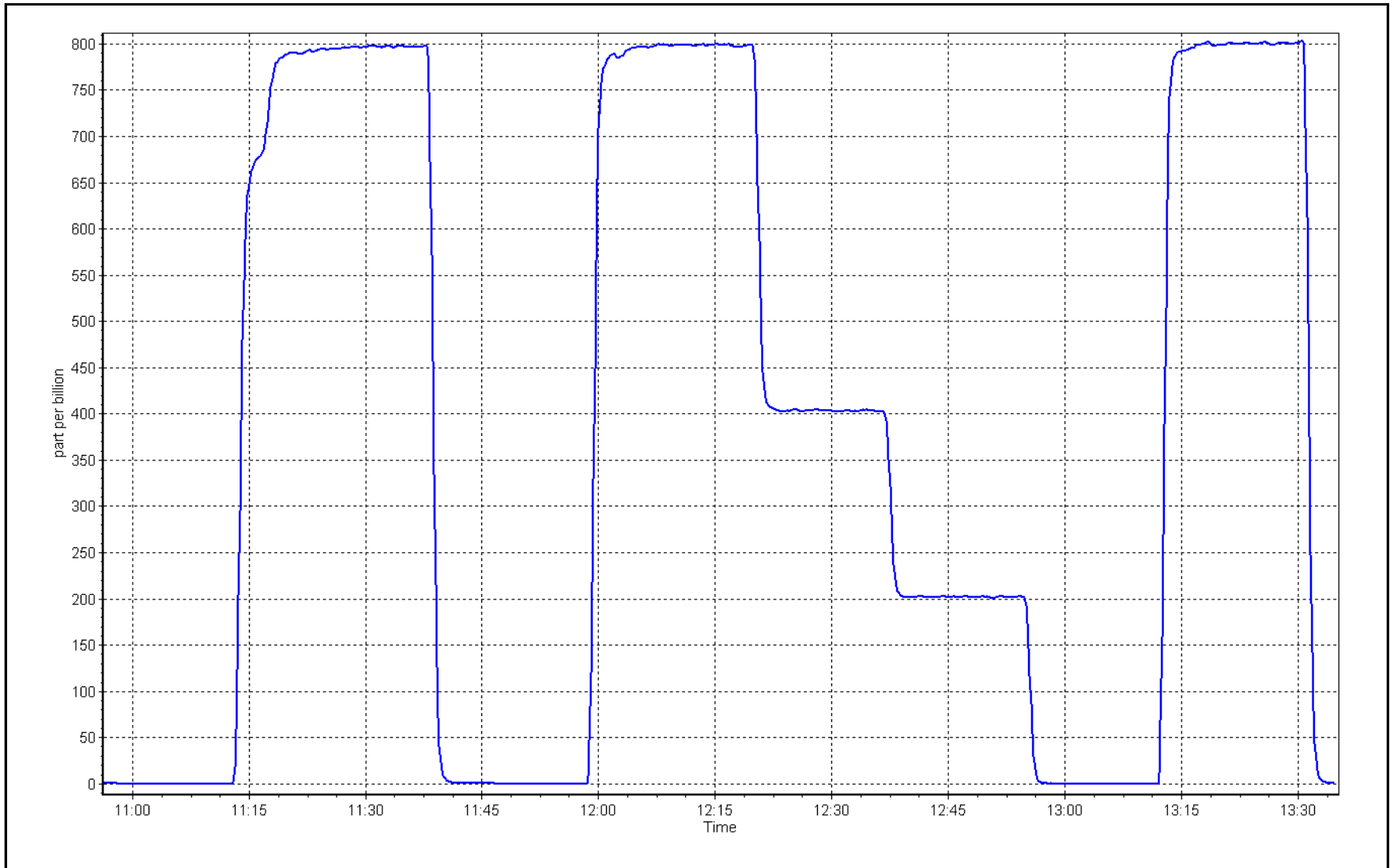
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | 0.999957 | ≥0.995      |
| 801.2                               | 798.4                              | 1.0035                    |                         |          |             |
| 400.2                               | 403.4                              | 0.9919                    | Slope                   | 0.995896 | 0.90 - 1.10 |
| 200.1                               | 202.1                              | 0.9899                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 2.083550 | +/-30       |



SO2 Calibration Plot

Date: March 9, 2023

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 13, 2023      Last Cal Date: February 6, 2023  
 Start time (MST): 7:52      End time (MST): 11:54  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 4.94 ppm      Cal Gas Exp Date: February 9, 2024  
 Cal Gas Cylinder #: EY0002277  
 Removed Cal Gas Conc: 4.94 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

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.988807     | 0.993485      | Backgd or Offset: 2.33 | 2.20          |
| Calibration intercept: | 0.421592     | 0.081597      | Coeff or Slope: 0.886  | 0.841         |

### 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----   |
| as found span         | 4918                          | 81.6                        | 80.6                                | 84.5                               | 0.954  |
| as found 2nd point    | 4959                          | 40.8                        | 40.3                                | 42.2                               | 0.955  |
| as found 3rd point    | 4980                          | 20.4                        | 20.2                                | 20.9                               | 0.964  |
| 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                              | 4918                          | 81.6                        | 80.6                                | 80.2                               | 1.005   |
| second point                            | 4959                          | 40.8                        | 40.3                                | 40.2                               | 1.003   |
| third point                             | 4980                          | 20.4                        | 20.2                                | 19.9                               | 1.013   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span                            | 4918                          | 81.6                        | 80.6                                | 79.6                               | 1.013   |
| SO2 Scrubber Check                      | 4921                          | 79.2                        | 800.2                               | -0.1                               | ----  |
| Date of last scrubber change:           | 25-Feb-22                     |                             |                                     | Ave Corr Factor                    | 1.007   |
| Date of last converter efficiency test: | April 22, 2022                |                             |                                     | 98.5% efficiency                   |   |

Baseline Corr As found: 84.5      Prev response: 80.15      \*% change: 5.2%  
 Baseline Corr 2nd AF pt: 42.2      AF Slope: 1.048907      AF Intercept: -0.098313  
 Baseline Corr 3rd AF pt: 20.9      AF Correlation: 0.999992

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

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

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## TRS Calibration Summary

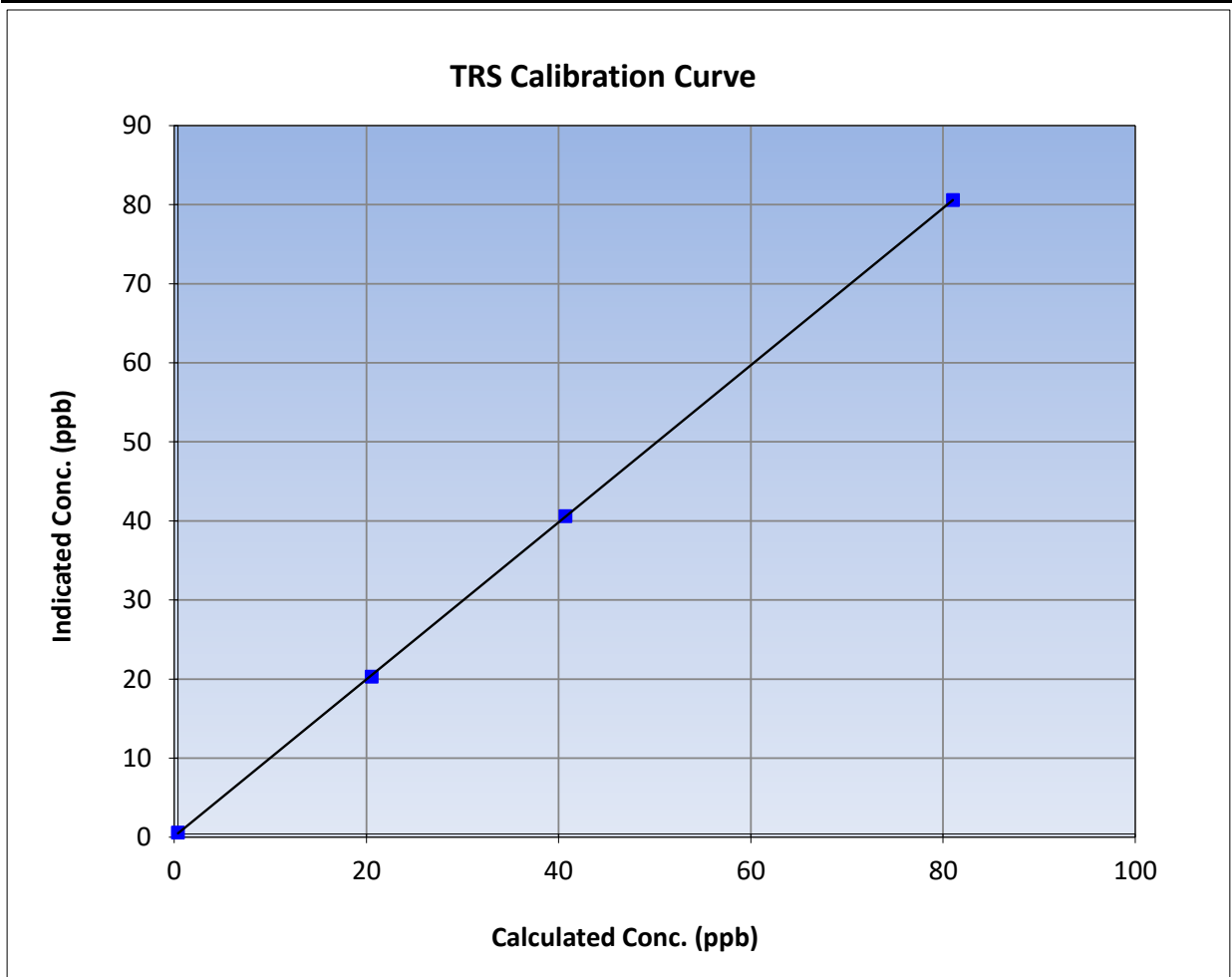
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 13, 2023   | Previous Calibration: | February 6, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 7:52             | End Time (MST):       | 11:54            |
| Analyzer make:    | CDN-101          | Analyzer serial #:    | 551              |

### Calibration Data

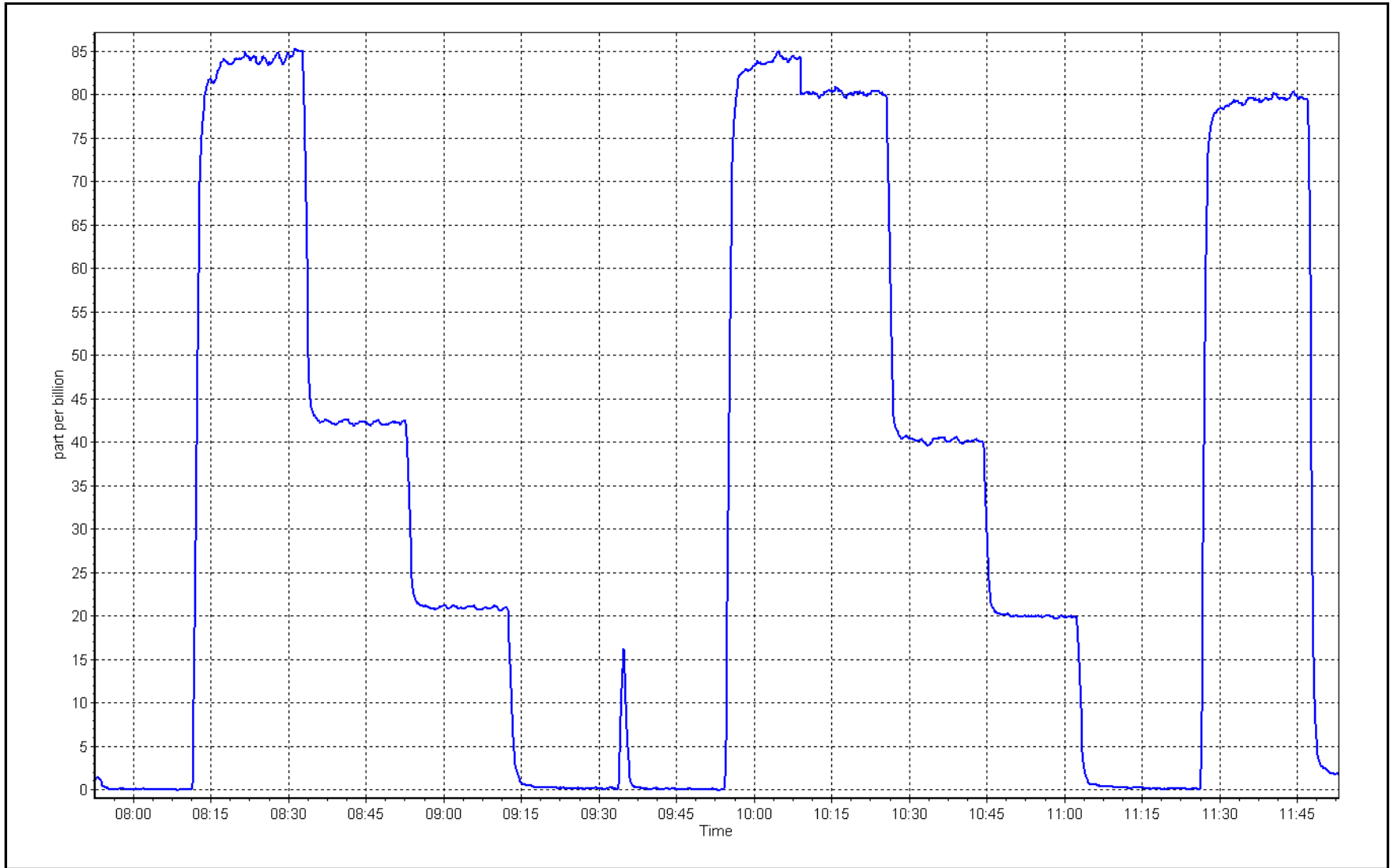
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999983 |             |
| 80.6                                | 80.2                               | 1.0053                    |                         |          | ≥0.995      |
| 40.3                                | 40.2                               | 1.0028                    | Slope                   | 0.993485 |             |
| 20.2                                | 19.9                               | 1.0127                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.081597 | +/-3        |



TRS Calibration Plot

Date: March 13, 2023

Location: Athabasca Valley





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Athabasca Valley | Station number: | AMS07            |
| Calibration Date: | March 9, 2023    | Last Cal Date:  | February 1, 2023 |
| Start time (MST): | 10:57            | End time (MST): | 13:34            |
| Reason:           | Routine          |                 |                  |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC282115  | Cal Gas Expiry Date:        | December 29, 2028 |
| CH <sub>4</sub> Cal Gas Conc.               | 501.2 ppm | CH <sub>4</sub> Equiv Conc. | 1075.1 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 208.7 ppm |                             |                   |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 501.2 ppm | CH <sub>4</sub> Equiv Conc. | 1075.1 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 208.7 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | 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 #:           | 1317958219 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>            | <u>Finish</u> |
|---------------------------------|--------------|---------------|-------------------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 0.000270     | 0.000270      | NMHC SP Ratio: 4.42E-05 | 4.42E-05      |
| CH <sub>4</sub> Retention time: | 13.4         | 13.4          | NMHC Peak Area:         | 205840        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4921              | 79.3                 | 17.05                | 17.01               | 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              | 79.3                 | 17.05                | 16.97               | 1.005                      |
| second point          | 4960              | 39.6                 | 8.52                 | 8.48                | 1.004                      |
| third point           | 4980              | 19.8                 | 4.26                 | 4.27                | 0.997                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4921              | 79.2                 | 17.03                | 16.98               | 1.003                      |

|                       |       |                 |       | Average Correction Factor                  | 1.002 |
|-----------------------|-------|-----------------|-------|--|-------|
| Baseline Corr AF:     | 17.01 | Prev response   | 17.16 | *% 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4921              | 79.3                 | 9.10                 | 9.14                                       | 0.996                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4921              | 79.3                 | 9.10                 | 9.12                                       | 0.998                      |
| second point              | 4960              | 39.6                 | 4.55                 | 4.57                                       | 0.995                      |
| third point               | 4980              | 19.8                 | 2.27                 | 2.30                                       | 0.988                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4921              | 79.2                 | 9.09                 | 9.12                                       | 0.997                      |
| Average Correction Factor |                   |                      |                      |  | 0.994                      |
| Baseline Corr AF:         | 9.14              | Prev response        | 9.16                 | *% change                                  | -0.2%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4921              | 79.3                 | 7.95                 | 7.87                                       | 1.010                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4921              | 79.3                 | 7.95                 | 7.86                                       | 1.011                      |
| second point              | 4960              | 39.6                 | 3.97                 | 3.91                                       | 1.015                      |
| third point               | 4980              | 19.8                 | 1.98                 | 1.97                                       | 1.008                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4921              | 79.2                 | 7.94                 | 7.86                                       | 1.010                      |
| Average Correction Factor |                   |                      |                      |  | 1.011                      |
| Baseline Corr AF:         | 7.87              | 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

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.004980     | 0.994780      |
| THC Cal Offset:             | 0.021918     | 0.013474      |
| CH <sub>4</sub> Cal Slope:  | 1.006293     | 0.988322      |
| CH <sub>4</sub> Cal Offset: | -0.000176    | -0.000211     |
| NMHC Cal Slope:             | 1.004211     | 1.001323      |
| NMHC Cal Offset:            | 0.018094     | 0.012086      |

Notes: No Maintenance or adjustments done.

Calibration Performed By: Melissa Lemay





# Wood Buffalo Environmental Association

## THC Calibration Summary

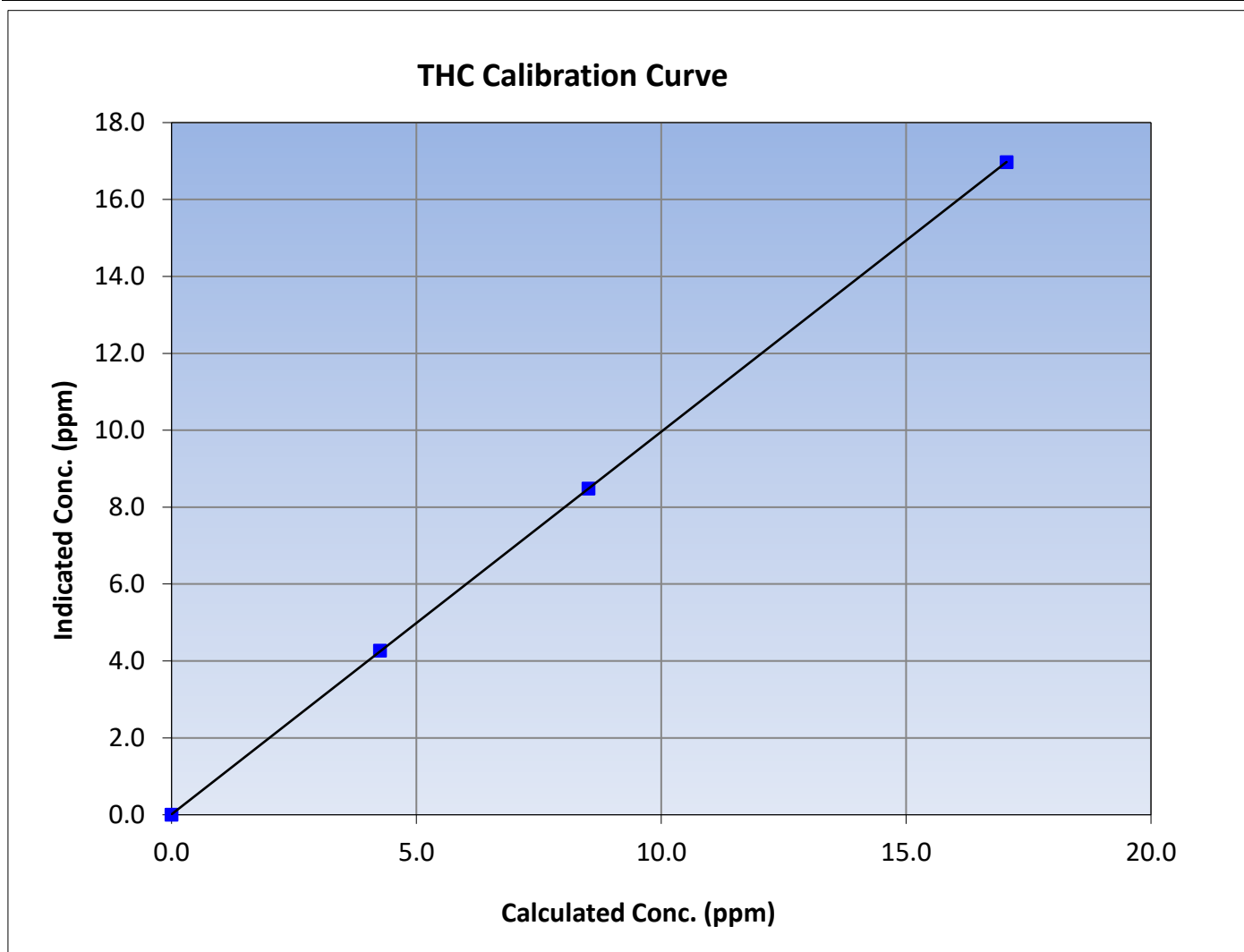
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 9, 2023    | Previous Calibration: | February 1, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 10:57            | End Time (MST):       | 13:34            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1317958219       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999996 | $\geq 0.995$  |       |          |             |
| 17.05                               | 16.97                              | 1.0046                    |                         |          |               |       |          |             |
| 8.52                                | 8.48                               | 1.0042                    |                         |          |               | Slope | 0.994780 | 0.90 - 1.10 |
| 4.26                                | 4.27                               | 0.9971                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.013474 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

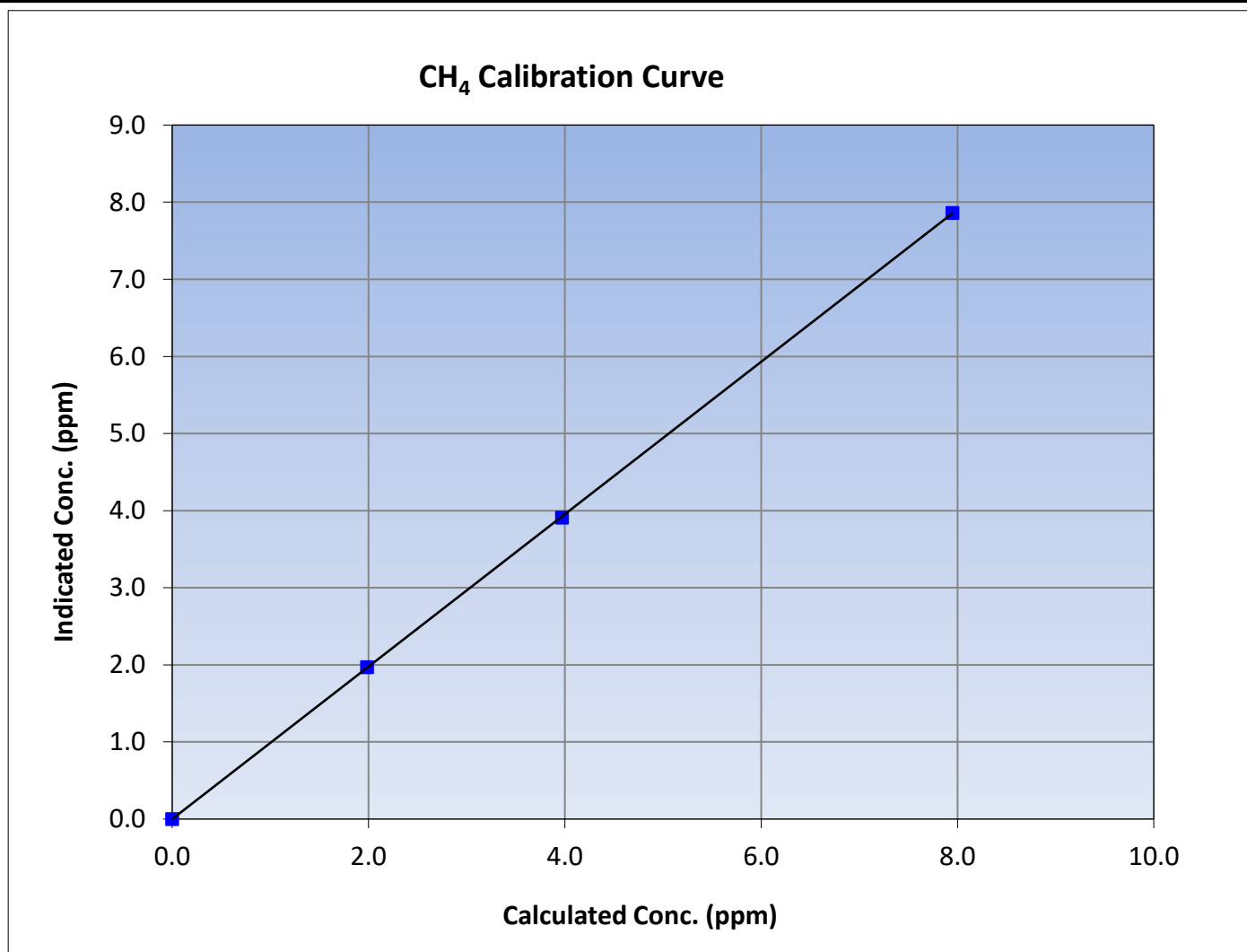
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 9, 2023    | Previous Calibration: | February 1, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 10:57            | End Time (MST):       | 13:34            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1317958219       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u>      |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|--------------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999992  | <b>≥0.995</b>      |
| 7.95                                | 7.86                               | 1.0113                    |                         |           |                    |
| 3.97                                | 3.91                               | 1.0153                    |                         |           |                    |
| 1.98                                | 1.97                               | 1.0075                    |                         |           |                    |
|                                     |                                    |                           | Slope                   | 0.988322  | <b>0.90 - 1.10</b> |
|                                     |                                    |                           | Intercept               | -0.000211 | <b>+/-0.5</b>      |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

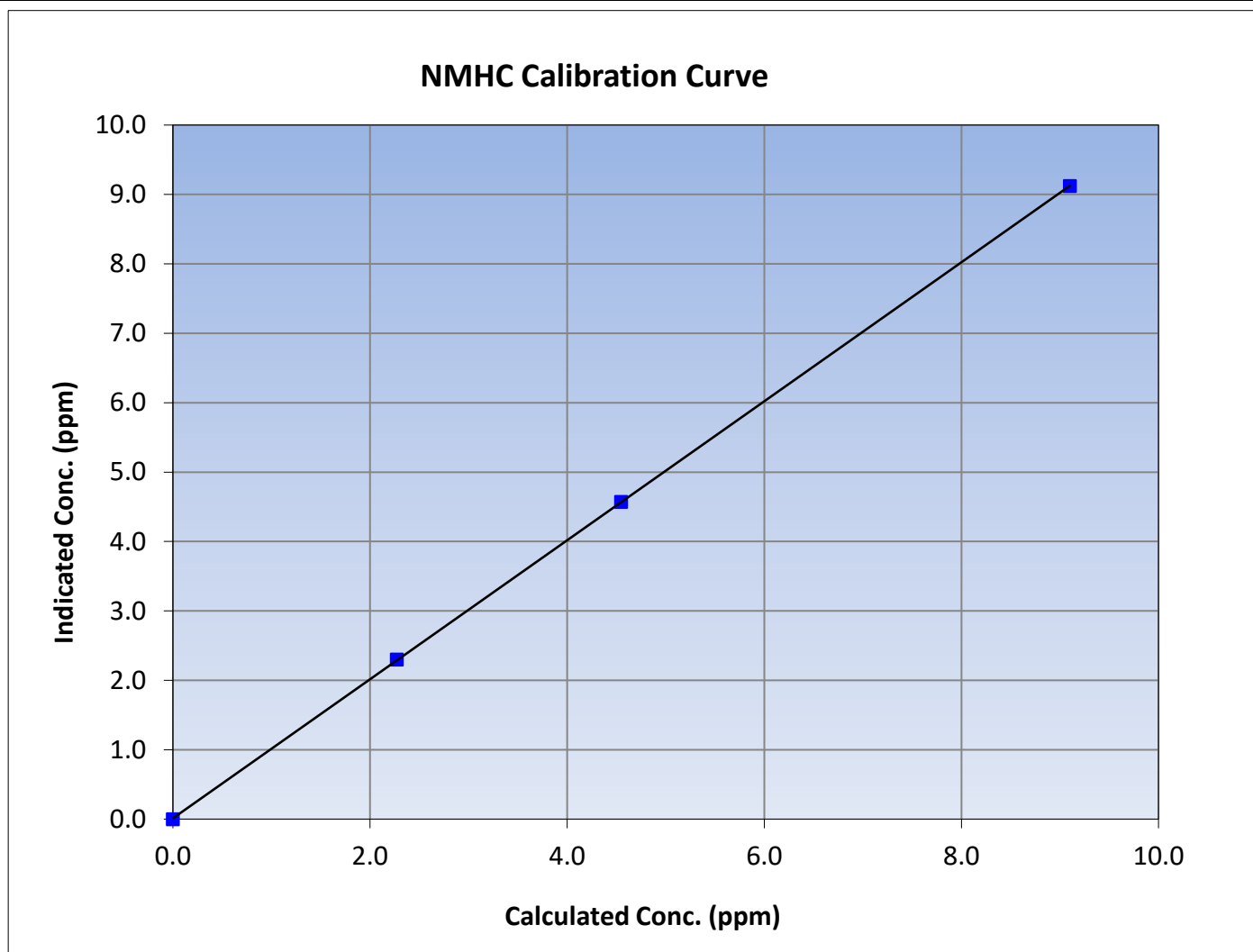
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 9, 2023    | Previous Calibration: | February 1, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 10:57            | End Time (MST):       | 13:34            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1317958219       |

### Calibration Data

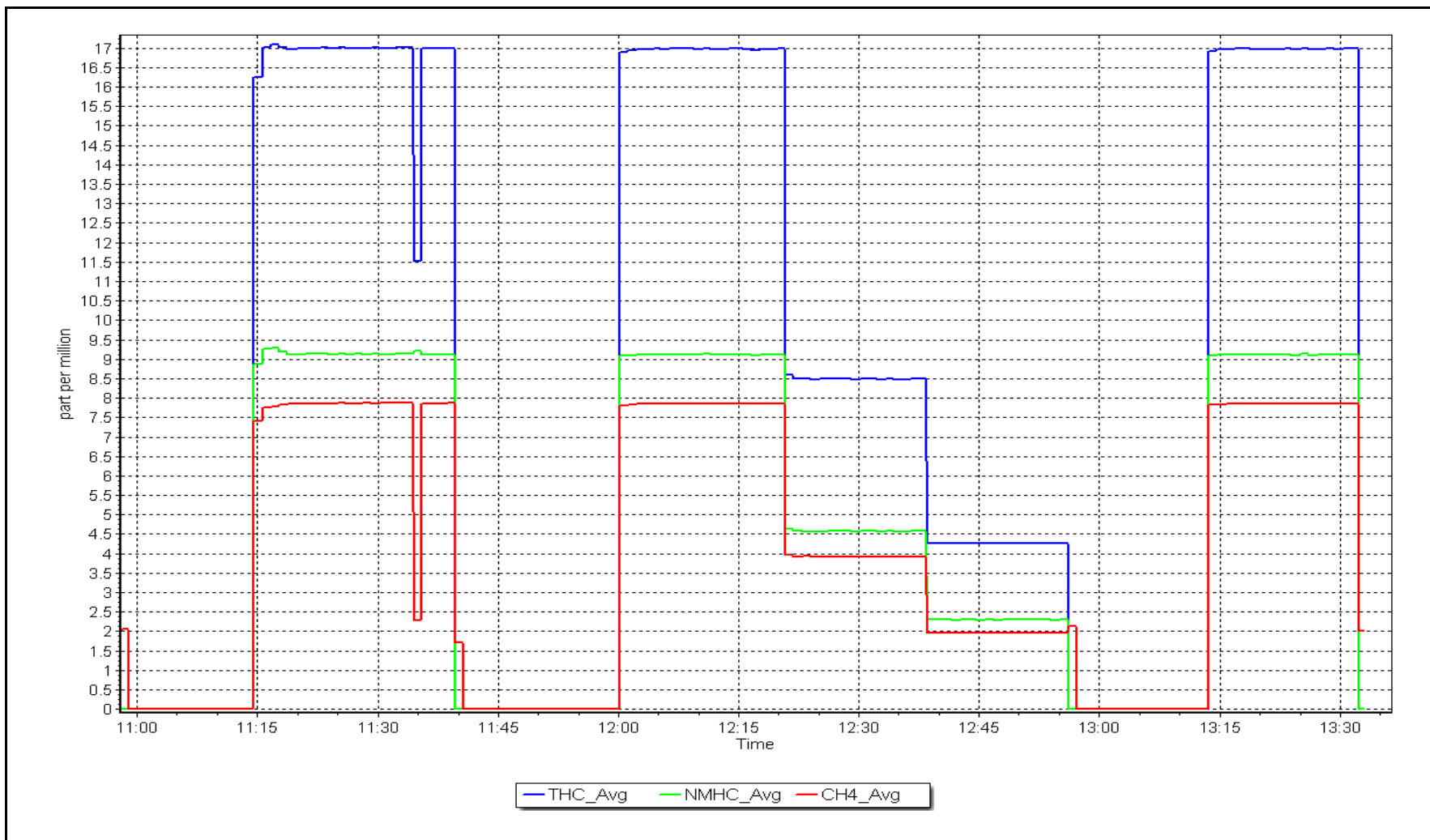
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999992 | $\geq 0.995$  |       |          |             |
| 9.10                                | 9.12                               | 0.9980                    |                         |          |               |       |          |             |
| 4.55                                | 4.57                               | 0.9947                    |                         |          |               | Slope | 1.001323 | 0.90 - 1.10 |
| 2.27                                | 2.30                               | 0.9882                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.012086 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: March 9, 2023

Location: Athabasca Valley







# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span         | 4921              | 79.3                 | 9.10                 | 8.98                                       | 1.014                      |
| as found 2nd point    |                   |                      |                      |  |                            |
| as found 3rd point    |                   |                      |                      |  |                            |
| new cylinder response |                   |                      |                      |  |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point            | 4921              | 79.3                 | 9.10                 | 8.97                                       | 1.015                      |
| second point          |                   |                      |                      |  |                            |
| third point           |                   |                      |                      |  |                            |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                  | 1.015                      |
| Baseline Corr AF:     | 8.98              | Prev response        | 9.13                 | *% change                                  | -1.6%                      |
| Baseline Corr 2nd AF: | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF: | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span         | 4921              | 79.3                 | 7.95                 | 7.76                                       | 1.024                      |
| as found 2nd point    |                   |                      |                      |  |                            |
| as found 3rd point    |                   |                      |                      |  |                            |
| new cylinder response |                   |                      |                      |  |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point            | 4921              | 79.3                 | 7.95                 | 7.76                                       | 1.024                      |
| second point          |                   |                      |                      |  |                            |
| third point           |                   |                      |                      |  |                            |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                  | 1.024                      |
| Baseline Corr AF:     | 7.76              | Prev response        | 7.86                 | *% change                                  | -1.2%                      |
| Baseline Corr 2nd AF: | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF: | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.994780     | 0.981205      |
| THC Cal Offset:             | 0.013474     | 0.000000      |
| CH <sub>4</sub> Cal Slope:  | 0.988322     | 0.976278      |
| CH <sub>4</sub> Cal Offset: | -0.000211    | 0.000000      |
| NMHC Cal Slope:             | 1.001323     | 0.985508      |
| NMHC Cal Offset:            | 0.012086     | 0.000000      |

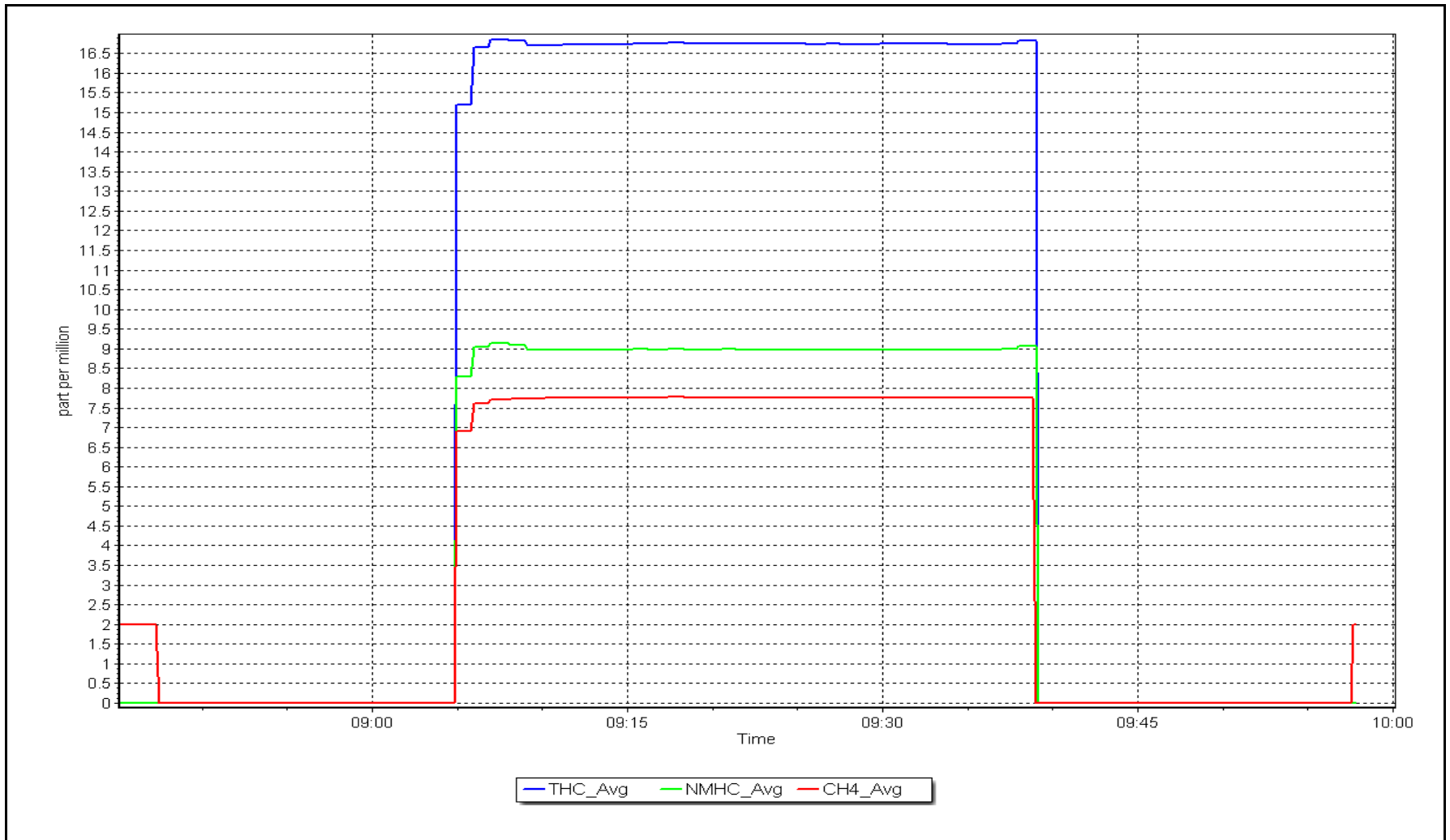
Notes: Hydrogen cylinder changed.

Calibration Performed By: Melissa Lemay

NMHC Calibration Plot

Date: March 31, 2023

Location: Athabasca Valley





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Athabasca Valley Station number: AMS07  
Calibration Date: March 10, 2023 Last Cal Date: February 7, 2023  
Start time (MST): 7:40 End time (MST): 12:10  
Reason: Routine

### Calibration Standards

NO Gas Cylinder #: T2Y1KA4 Cal Gas Expiry Date: November 30, 2023  
NOX Cal Gas Conc: 50.92 ppm NO Cal Gas Conc: 49.92 ppm  
Removed Cylinder #: NA Removed Gas Exp Date: NA  
Removed Gas NOX Conc: 50.92 ppm Removed Gas NO Conc: 49.92 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

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.048        | 1.048         | NO bkgnd or offset:  | 7.3          | 7.3           |
| NOX coeff or slope: | 0.995        | 0.995         | NOX bkgnd or offset: | 7.5          | 7.5           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 201.9        | 197.9         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.991039     | 0.997475      |
| NO <sub>x</sub> Cal Offset: | 1.157178     | 1.358498      |
| NO Cal Slope:               | 0.991042     | 0.997406      |
| NO Cal Offset:              | 0.933204     | 1.054447      |
| NO <sub>2</sub> Cal Slope:  | 1.000742     | 1.001683      |
| NO <sub>2</sub> Cal Offset: | 0.457636     | 0.681681      |





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.1   | -0.1                                  | 0.0  | ----  | ----   |
| as found span             | 4920                      | 80.2                        | 816.7   | 800.7                                  | 16.0  | 817.5  | 799.6                                 | 17.9   | 0.9991  | 1.0014   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | 0.1                                   | 0.1  | ----  | ----   |
| high point                | 4920                      | 80.2                        | 816.7   | 800.7                                  | 16.0  | 815.1  | 798.8                                 | 16.3   | 1.0020  | 1.0024   |
| second point              | 4960                      | 40.1                        | 408.4   | 400.4                                  | 8.0   | 410.3  | 402.0                                 | 8.3  | 0.9953  | 0.9959   |
| third point               | 4980                      | 20.0                        | 203.7   | 199.7                                  | 4.0   | 205.0  | 200.4                                 | 4.6  | 0.9936  | 0.9964   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.1                                   | -0.1   | ----  | ----   |
| as left span              | 4920                      | 80.2                        | 816.7   | 398.9                                  | 417.8   | 820.6  | 397.4                                 | 423.3  | 0.9953  | 1.0037   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9970  | 0.9982   |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 817.6 ppb | NO = 799.7 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 0.9% |
| Previous Response    | NO <sub>x</sub> = 810.6 ppb | NO = 794.4 ppb |  | *Percent Change                  | NO = 0.7%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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)       | 797.1                                      | 395.3                                 | 417.8   | 419.0  | 0.9972   | 100.3%   |
| 2nd GPT point (200 ppb O3)       | 797.1                                      | 599.1                                 | 214.0   | 215.1  | 0.9951   | 100.5%   |
| 3rd GPT point (100 ppb O3)       | 797.1                                      | 699.2                                 | 113.9   | 115.6  | 0.9856   | 101.5%   |
| Average Correction Factor        |  |                                       |   |  | 0.9926   | 100.7%   |

Notes:

No maintenance or adjustments done.

Calibration Performed By:

Melissa Lemay



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

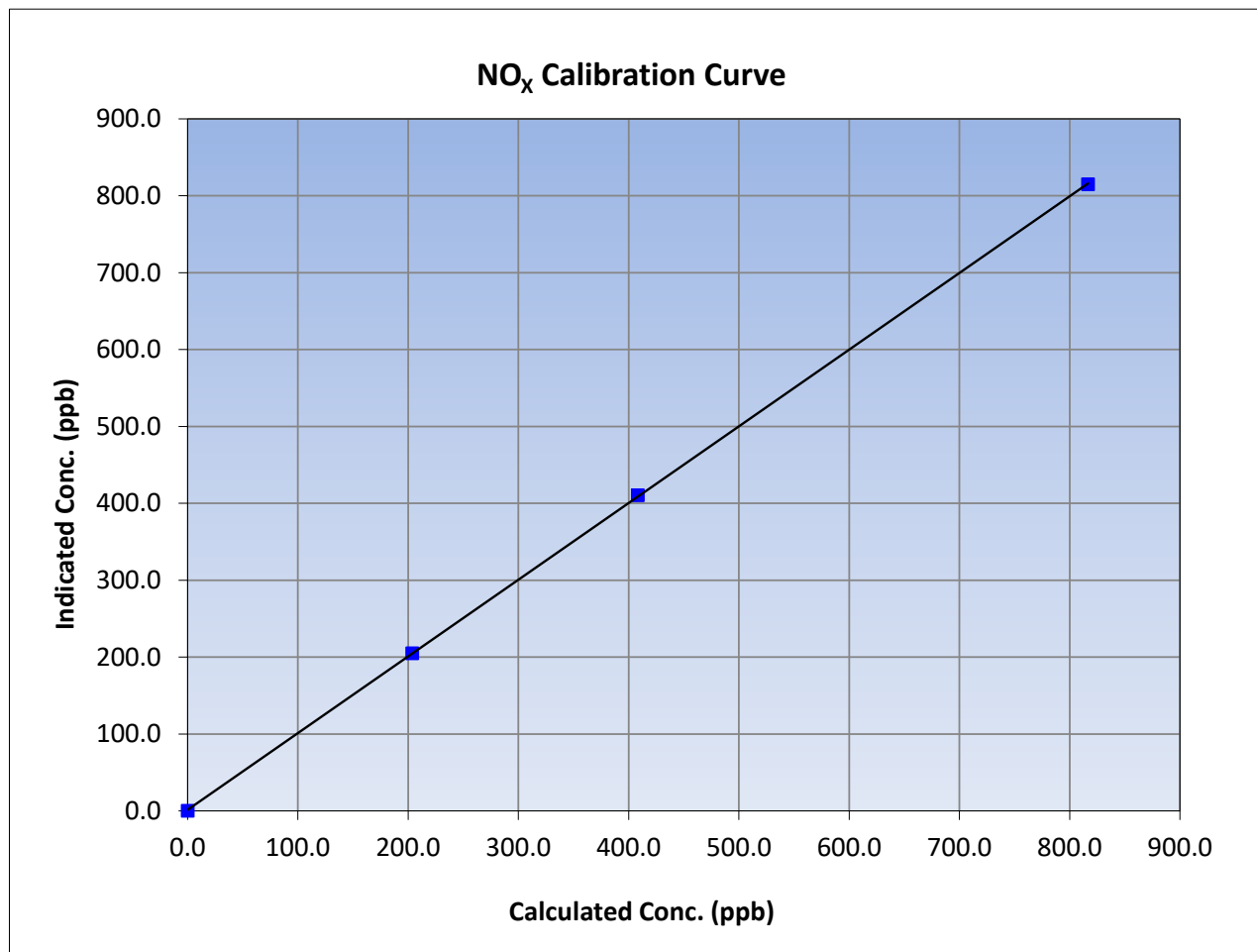
Version-04-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 10, 2023   | Previous Calibration: | February 7, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 7:40             | End Time (MST):       | 12:10            |
| 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                                 | 0.2                                | ----                      | Correlation Coefficient | ≥0.995   |             |
| 816.7                               | 815.1                              | 1.0020                    |                         |          |             |
| 408.4                               | 410.3                              | 0.9953                    |                         |          |             |
| 203.7                               | 205.0                              | 0.9936                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 0.997475 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 1.358498 | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

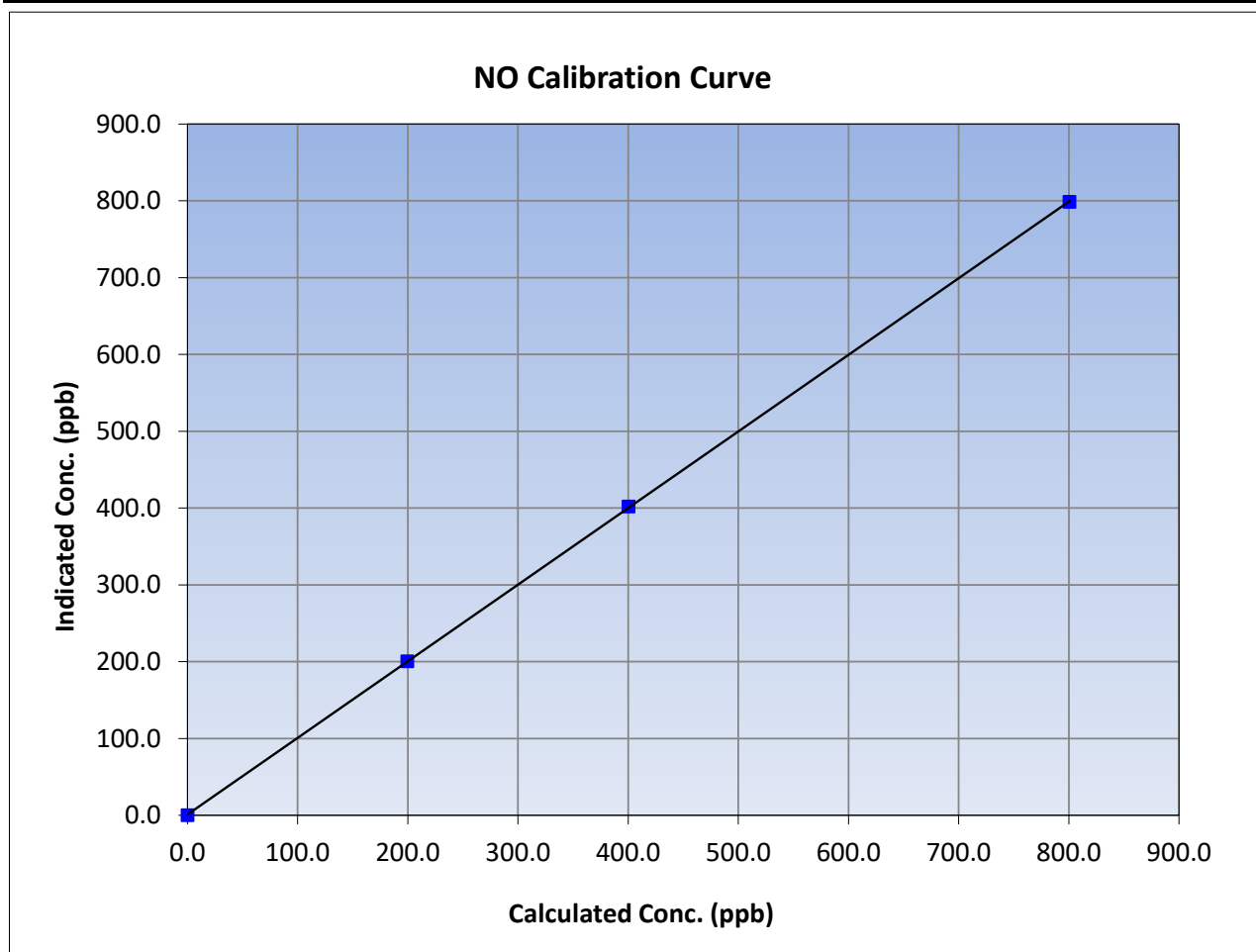
Version-04-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 10, 2023   | Previous Calibration: | February 7, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 7:40             | End Time (MST):       | 12:10            |
| 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 | ≥0.995   |             |
| 800.7                               | 798.8                              | 1.0024                    |                         |          |             |
| 400.4                               | 402.0                              | 0.9959                    |                         |          |             |
| 199.7                               | 200.4                              | 0.9964                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 0.997406 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 1.054447 | +/-20       |





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

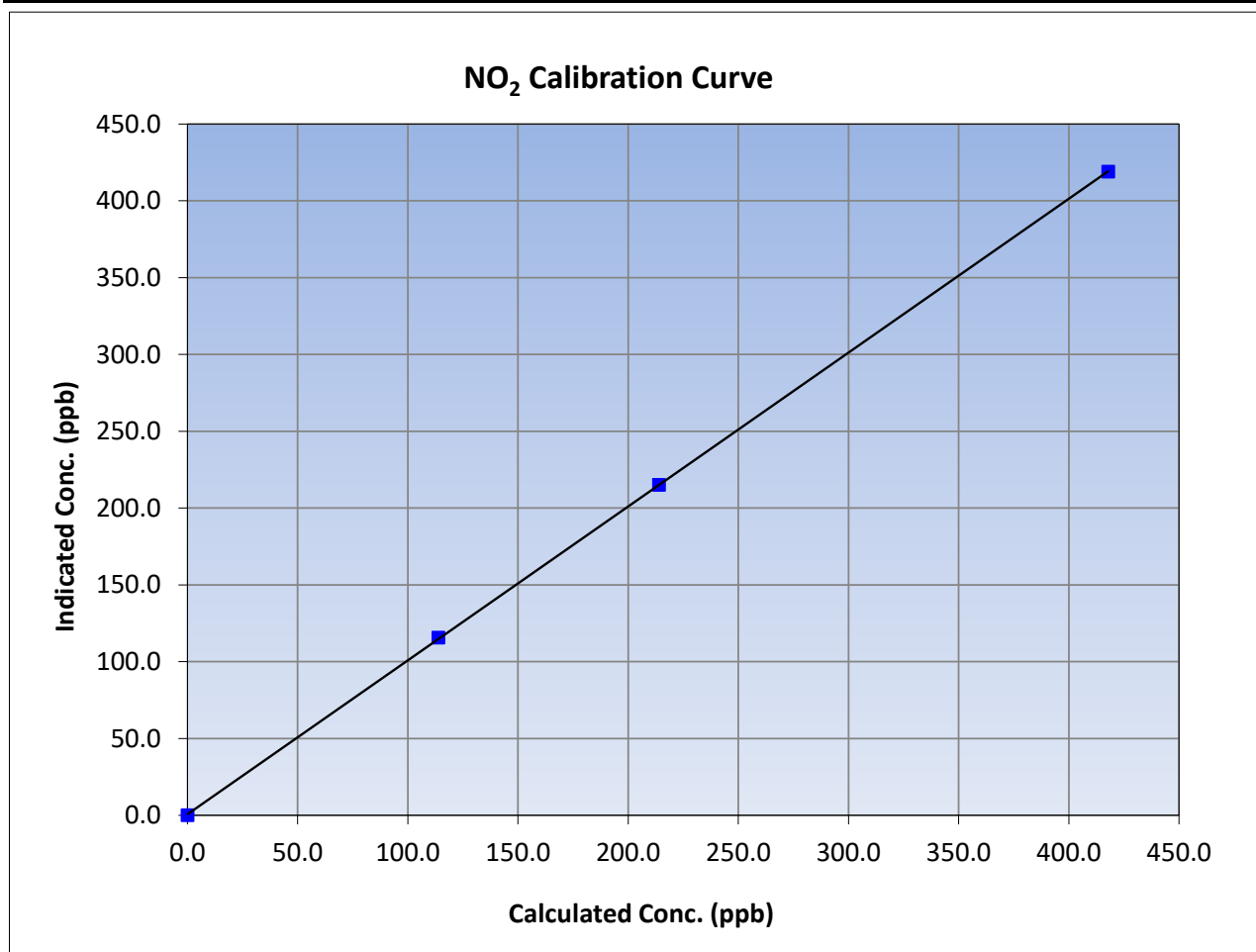
Version-04-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 10, 2023   | Previous Calibration: | February 7, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 7:40             | End Time (MST):       | 12:10            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1160120024       |

### Calibration Data

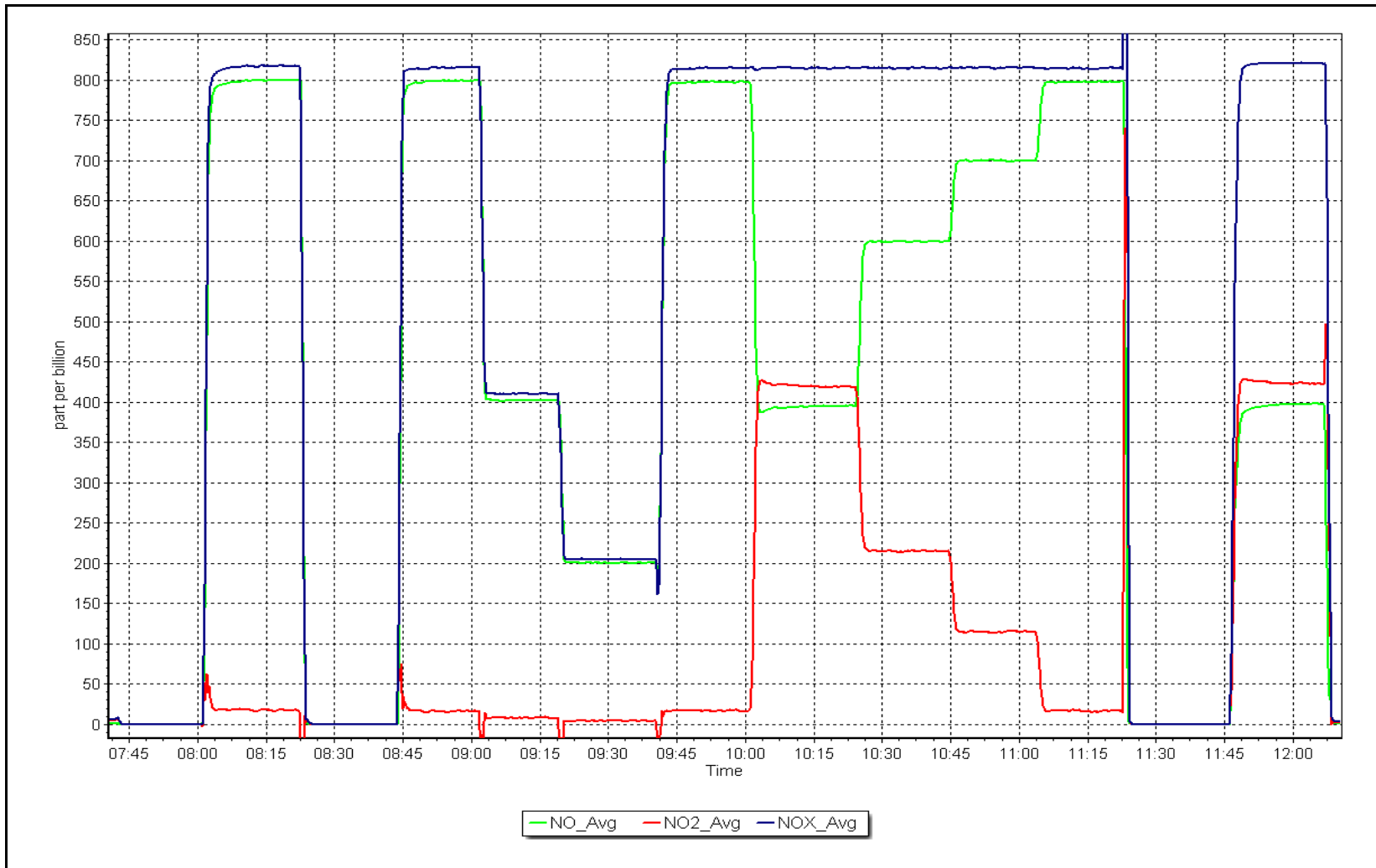
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 417.8                               | 419.0                              | 0.9972                    |                         |               |             |
| 214.0                               | 215.1                              | 0.9951                    |                         |               |             |
| 113.9                               | 115.6                              | 0.9856                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 1.001683      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.681681      | +/-20       |



NO<sub>x</sub> Calibration Plot

Date: March 10, 2023

Location: Athabasca Valley





# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Athabasca Valley      Station number: AMS07  
 Calibration Date: March 9, 2023      Last Cal Date: February 8, 2023  
 Start time (MST): 7:22      End time (MST): 10:23  
 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 #: 1507964700  
 Analyzer Range 0 - 500 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.995429     | 0.994371      | Backgd or Offset: | -0.6         | -0.6          |
| Calibration intercept: | 1.600000     | 2.260000      | Coeff or Slope:   | 1.119        | 1.170         |

### O<sub>3</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                       | 0.0                           | 0.0                                 | 0.1                                | ----  |
| as found span             | 5000                       | 1383.2                        | 400.0                               | 388.9                              | 1.029   |
| as found 2nd point        |                            |                               |                                     |                                    |   |
| as found 3rd point        |                            |                               |                                     |                                    |   |
| calibrator zero           | 5000                       | 0.0                           | 0.0                                 | 0.5                                | ----  |
| high point                | 5000                       | 1383.7                        | 400.0                               | 398.9                              | 1.003   |
| second point              | 5000                       | 1022.2                        | 200.0                               | 202.7                              | 0.987   |
| third point               | 5000                       | 843.8                         | 100.0                               | 103.0                              | 0.971   |
| as left zero              | 5000                       | 0.0                           | 0.0                                 | 0.1                                | ----  |
| as left span              | 5000                       | 1380.2                        | 400.0                               | 396.8                              | 1.008   |
| Average Correction Factor |                            |                               |                                     |                                    | 0.987   |

|                          |       |                   |       |               |       |
|--------------------------|-------|-------------------|-------|---------------|-------|
| Baseline Corr As found:  | 388.8 | Previous response | 399.8 | *% change     | -2.8% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:         |       | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation:   |       |               |       |

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

Notes: No Maintenance done. Span adjusted.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

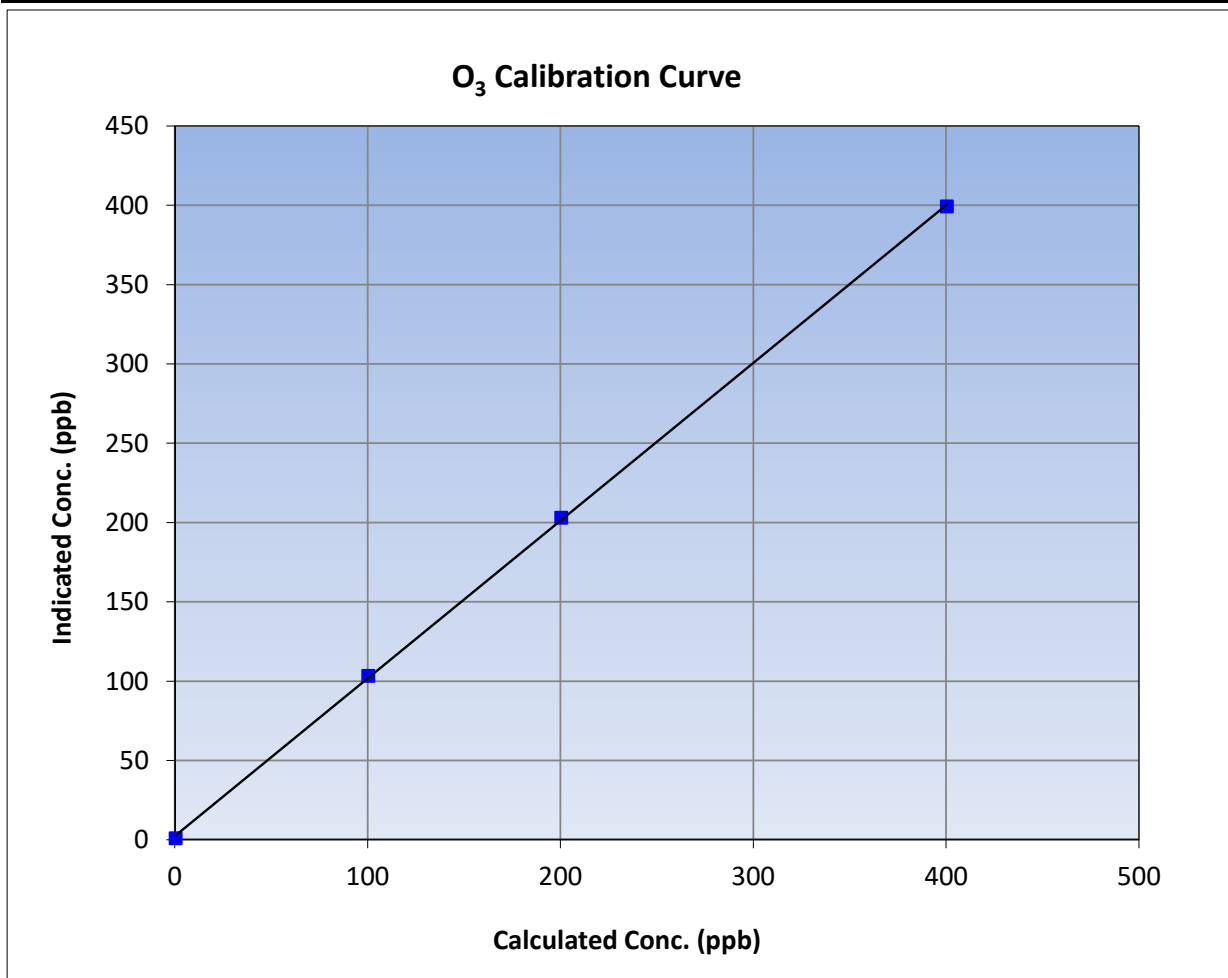
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 9, 2023    | Previous Calibration: | February 8, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 7:22             | End Time (MST):       | 10:23            |
| Analyzer make:    | Thermo 49i       | Analyzer serial #:    | 1507964700       |

### Calibration Data

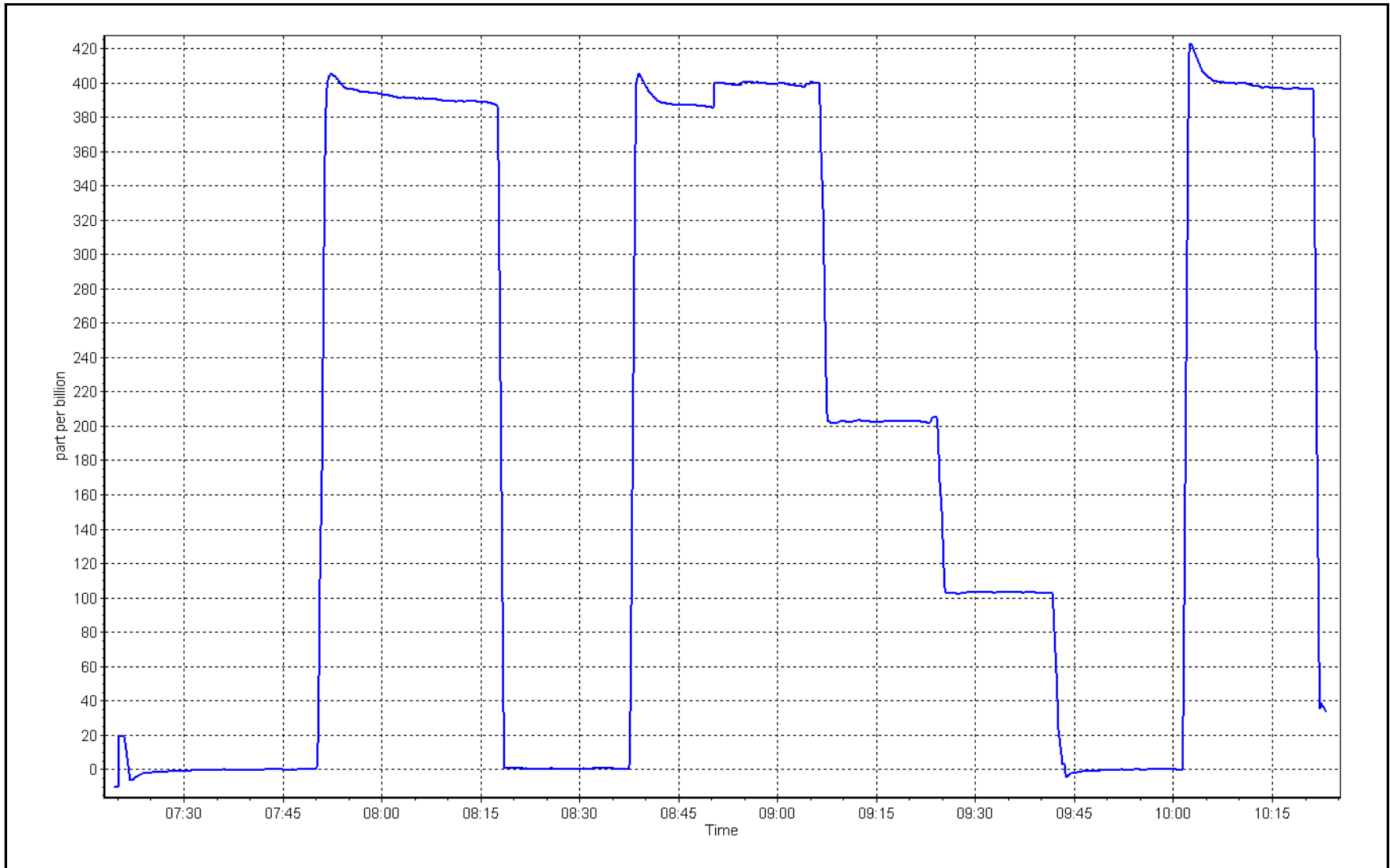
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.5                                   | ----                         | Correlation Coefficient | 0.999902      |             |
| 400.0                                  | 398.9                                 | 1.0028                       |                         |               | ≥0.995      |
| 200.0                                  | 202.7                                 | 0.9867                       | Slope                   | 0.994371      |             |
| 100.0                                  | 103.0                                 | 0.9709                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | 2.260000      | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: March 9, 2023

Location: Athabasca Valley







# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Athabasca Valley Station number: AMS 07  
 Calibration Date: March 31, 2023 Last Cal Date: February 1, 2023  
 Start time (MST): 8:21 End time (MST): 8:43

Analyzer Make: API T640 S/N: 645  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Alicat FP-25BT S/N: 388753  
 Temp/RH standard: Alicat FP-25BT S/N: 388753

### Monthly Calibration Test

| Parameter  | As found                             | Measured                               | As left | Adjusted                 | (Limits)     |
|------------|--------------------------------------|--|---------|--------------------------|--------------|
| T (°C)     | -3.9                                 | -3                                     | -3.9    | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 733.9                                | 732.6                                  | 733.9   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5                                    | 5.17                                   | 5       | <input type="checkbox"/> | +/- 0.25 LPM |
| Leak Test: | Date of check: <u>March 31, 2023</u> | Last Cal Date: <u>February 1, 2023</u> |         |                          |              |
|            | PM w/o HEPA: <u>7.7</u>              | PM w/ HEPA: <u>0</u>                   |         |                          | <0.2 ug/m3   |

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

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter                     | As found | Post maintenance        | As left        | Adjusted                 | (Limits)     |
|-------------------------------|----------|-------------------------|----------------|--------------------------|--------------|
| PMT Peak Test                 |          |                         |                | <input type="checkbox"/> | 10.9 +/- 0.5 |
| Post-maintenance leak check:  |          | PM w/o HEPA: _____      | w/ HEPA: _____ |                          |              |
| Date Optical Chamber Cleaned: |          | <u>February 1, 2023</u> |                |                          | <0.2 ug/m3   |
| Disposable Filter Changed:    |          | <u>February 1, 2023</u> |                |                          |              |

### Annual Maintenance

Date Sample Tube Cleaned: December 5, 2022  
 Date RH/T Sensor Cleaned: December 5, 2022

Notes: No adjustments done. Head cleaned.

Calibration by: Melissa Lemay





# Wood Buffalo Environmental Association

## CO Calibration Summary

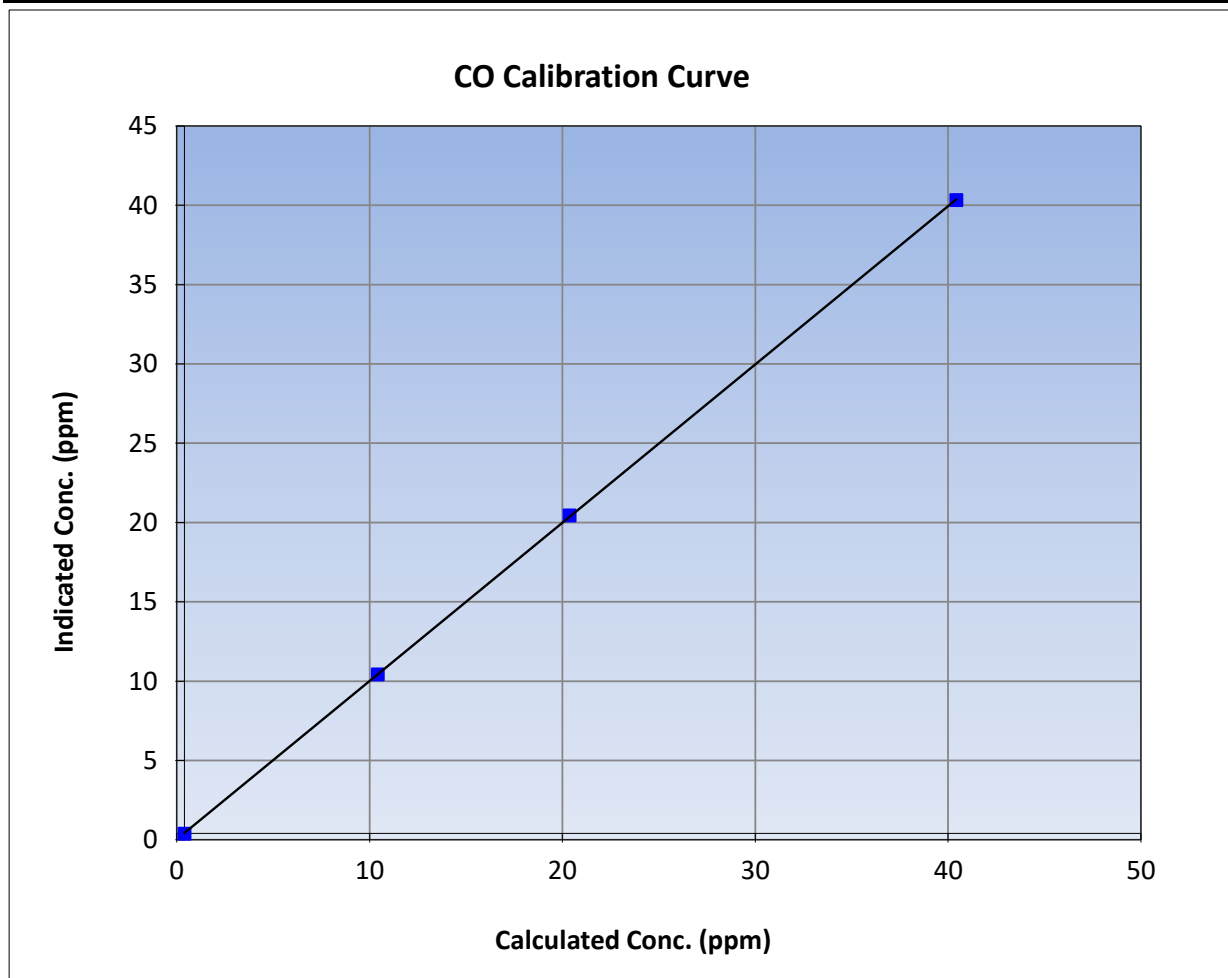
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 14, 2023   | Previous Calibration: | February 8, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 8:44             | End Time (MST):       | 11:48            |
| Analyzer make:    | Thermo 48i-LTE   | Analyzer serial #:    | 1408761381       |

### Calibration Data

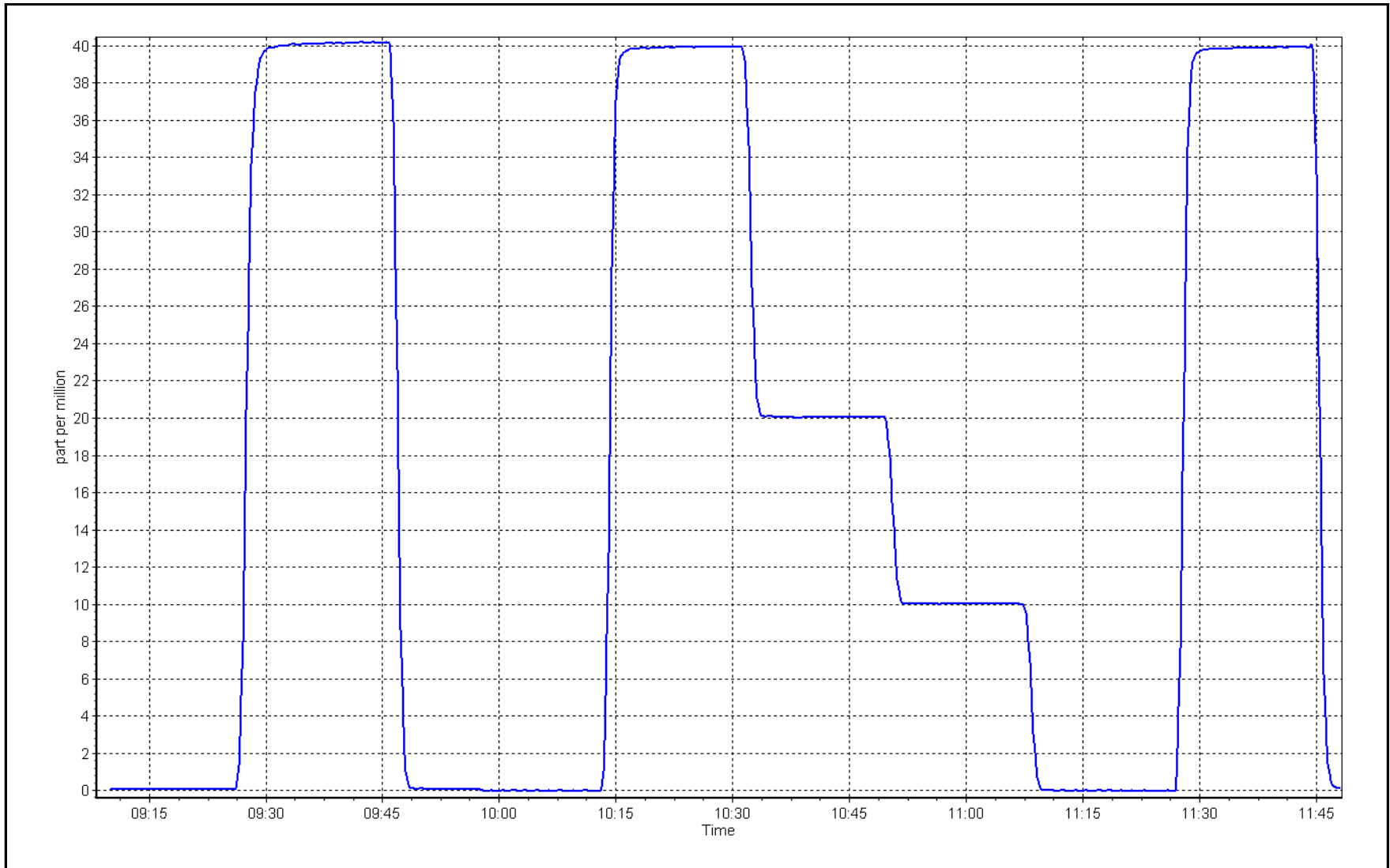
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999988 | ≥0.995      |
| 40.0                                | 39.9                               | 1.0023                    |                         |          |             |
| 20.0                                | 20.1                               | 0.9964                    | Slope                   | 0.998030 | 0.90 - 1.10 |
| 10.0                                | 10.0                               | 1.0001                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.026535 | +/-1.5      |



CO Calibration Plot

Date: March 14, 2023

Location: Athabasca Valley





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS08 FORT CHIPEWYAN MARCH 2023**

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

April 29, 2023



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                |                 |                   |
|-------------------|----------------|-----------------|-------------------|
| Station Name:     | Fort Chipewyan | Station number: | AMS08             |
| Calibration Date: | March 13, 2023 | Last Cal Date:  | February 10, 2023 |
| Start time (MST): | 10:22          | End time (MST): | 13:08             |
| 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:    | 260             |

### Analyzer Information

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

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.996661     | 0.998816      | Backgd or Offset: | 1.32         | 1.27          |
| Calibration intercept: | 1.336570     | 0.356495      | Coeff or Slope:   | 1.006        | 0.981         |

### SO<sub>2</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as found span             | 4920                          | 80.3                        | 800.4                               | 815.6                              | 0.981   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----  |
| high point                | 4920                          | 80.3                        | 800.4                               | 800.2                              | 1.000   |
| second point              | 4960                          | 40.2                        | 400.7                               | 399.3                              | 1.004   |
| third point               | 4980                          | 20.1                        | 200.4                               | 201.4                              | 0.995   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span              | 4920                          | 80.3                        | 800.4                               | 782.3                              | 1.023   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.000   |

|                         |        |                   |        |           |      |
|-------------------------|--------|-------------------|--------|-----------|------|
| Baseline Corr As found: | 815.50 | Previous response | 799.05 | *% change | 2.0% |
|-------------------------|--------|-------------------|--------|-----------|------|

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

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

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

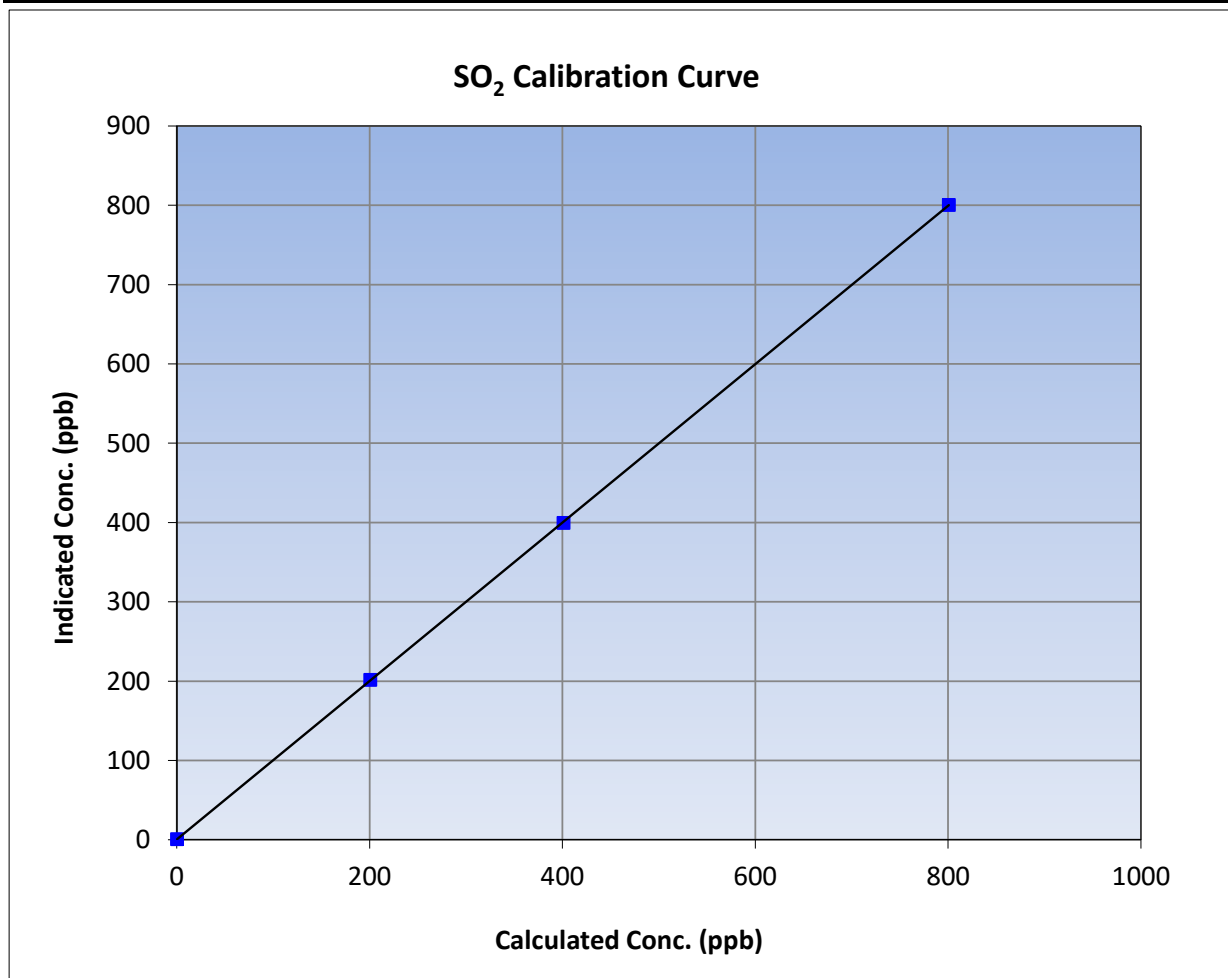
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 13, 2023 | Previous Calibration: | February 10, 2023 |
| Station Name:     | Fort Chipewyan | Station Number:       | AMS08             |
| Start Time (MST): | 10:22          | End Time (MST):       | 13:08             |
| Analyzer make:    | Thermo 43i-TLE | Analyzer serial #:    | 1136451241        |

### Calibration Data

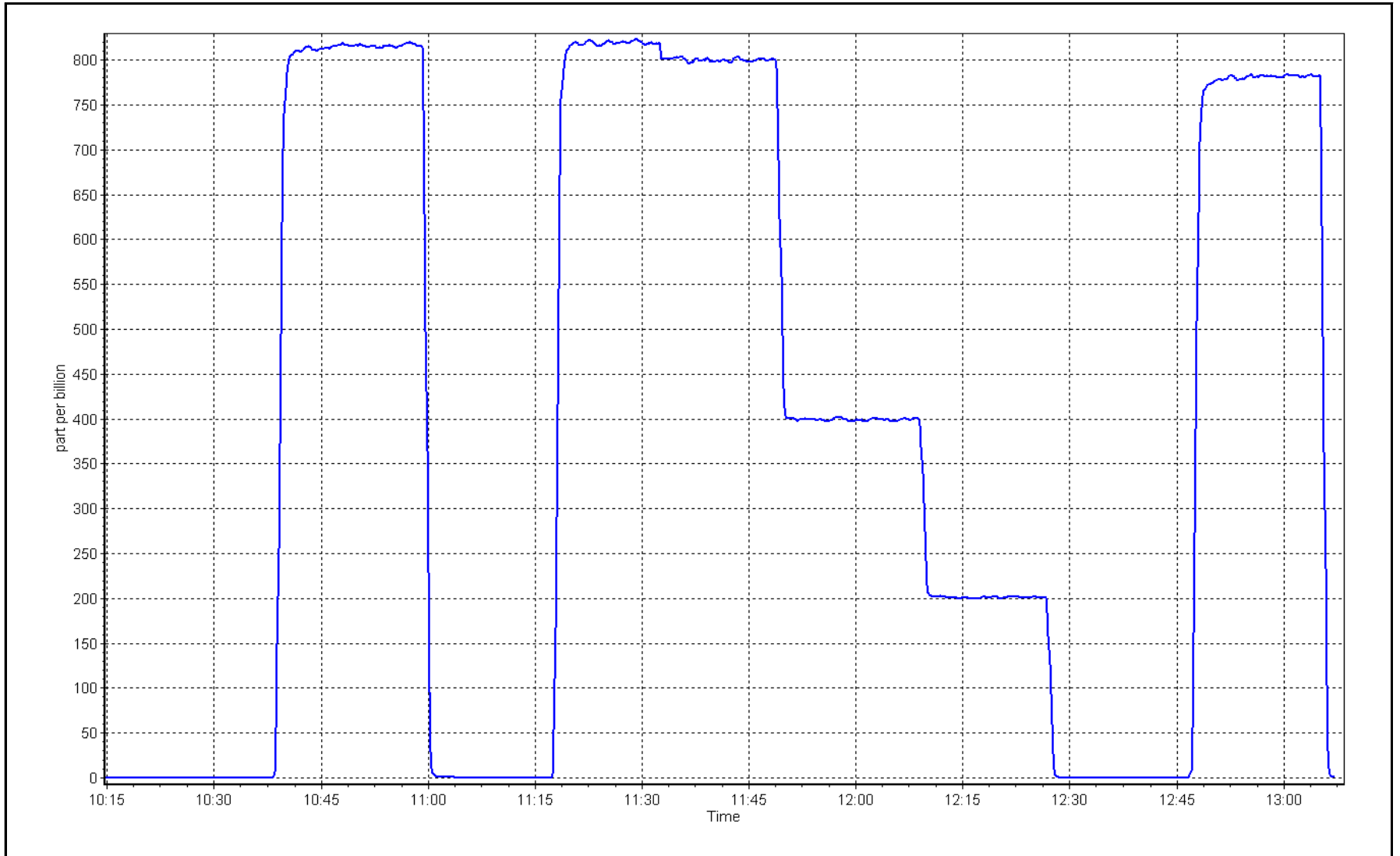
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.3                                   | ----                         | Correlation Coefficient | 0.999992      | ≥0.995      |
| 800.4                                  | 800.2                                 | 1.0002                       |                         |               |             |
| 400.7                                  | 399.3                                 | 1.0035                       | Slope                   | 0.998816      | 0.90 - 1.10 |
| 200.4                                  | 201.4                                 | 0.9948                       |                         |               |             |
|  |                                       |                              | Intercept               | 0.356495      | +/-30       |



SO2 Calibration Plot

Date: March 13, 2023

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 12, 2023 Last Cal Date: February 10, 2023  
 Start time (MST): 11:41 End time (MST): 16:35  
 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: 260

### Analyzer Information

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

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 1.000139     | 0.995571      | Backgd or Offset: | 1.43         | 1.37          |
| Calibration intercept: | 0.058837     | 0.018651      | Coeff or Slope:   | 0.743        | 0.717         |

### 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----   |
| as found span         | 4920                          | 80.5                        | 80.0                                | 81.6                               | 0.981  |
| as found 2nd point    | 4960                          | 40.2                        | 40.0                                | 41.1                               | 0.972  |
| as found 3rd point    | 4980                          | 20.1                        | 20.0                                | 20.4                               | 0.979  |
| 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point                              | 4920                          | 80.5                        | 80.0                                | 79.7                               | 1.004   |
| second point                            | 4960                          | 40.2                        | 40.0                                | 39.8                               | 1.004   |
| third point                             | 4980                          | 20.1                        | 20.0                                | 19.8                               | 1.009   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span                            | 4920                          | 80.5                        | 80.0                                | 77.6                               | 1.031   |
| SO2 Scrubber Check                      | 4919.7                        | 80.3                        | 803.0                               | 0.0                                | ----  |
| Date of last scrubber change:           | March 7, 2022                 |                             |                                     | Ave Corr Factor                    | 1.006   |
| Date of last converter efficiency test: | March 15, 2022                |                             |                                     | 100.7% efficiency                  |   |

|                          |      |                 |          |               |          |
|--------------------------|------|-----------------|----------|---------------|----------|
| Baseline Corr As found:  | 81.6 | Prev response:  | 80.08    | *% change:    | 1.9%     |
| Baseline Corr 2nd AF pt: | 41.1 | AF Slope:       | 1.020278 | AF Intercept: | 0.079245 |
| Baseline Corr 3rd AF pt: | 20.4 | AF Correlation: | 0.999976 |               |          |

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

Notes: Sample inlet filter changed after as founds. Scrubber check completed after calibrator zero. Adjusted the span only.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## TRS Calibration Summary

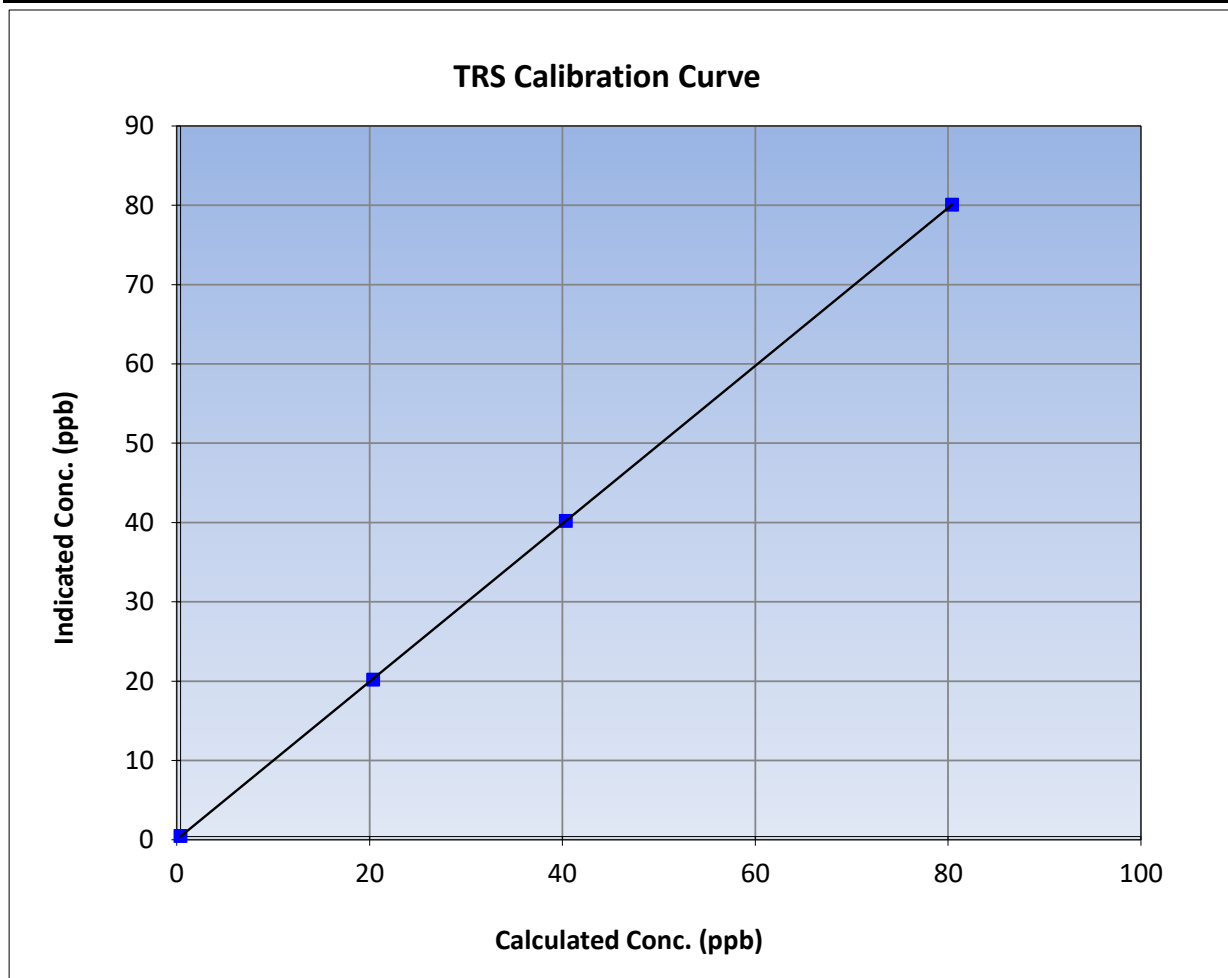
Version-11-2021

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 12, 2023 | Previous Calibration: | February 10, 2023 |
| Station Name:     | Fort Chipewyan | Station Number:       | AMS08             |
| Start Time (MST): | 11:41          | End Time (MST):       | 16:35             |
| Analyzer make:    | Thermo 43iQ-TL | Analyzer serial #:    | 1203169744        |

### Calibration Data

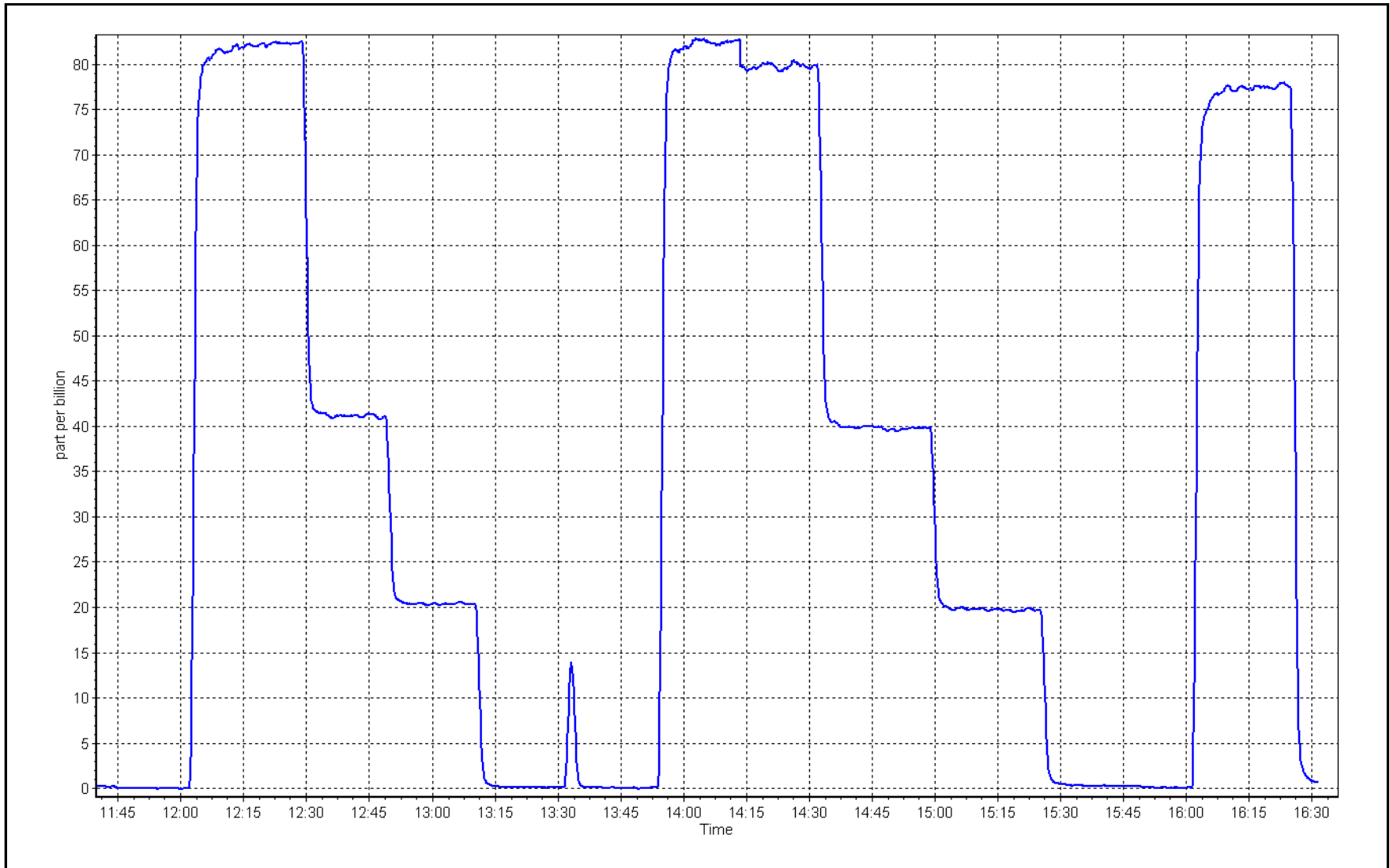
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | 0.999994 | ≥0.995      |
| 80.0                                | 79.7                               | 1.0039                    |                         |          |             |
| 40.0                                | 39.8                               | 1.0039                    | Slope                   | 0.995571 | 0.90 - 1.10 |
| 20.0                                | 19.8                               | 1.0090                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.018651 | +/-3        |



TRS Calibration Plot

Date: March 12, 2023

Location: Fort Chipewyan





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Fort Chipewyan  
Calibration Date: March 13, 2023  
Start time (MST): 7:00  
Reason: Routine  
Station number: AMS08  
Last Cal Date: February 6, 2023  
End time (MST): 12:23

### Calibration Standards

NO Gas Cylinder #: CC363447  
NOX Cal Gas Conc: 48.80 ppm  
Removed Cylinder #: NA  
Removed Gas NOX Conc: 48.80 ppm  
NOX gas Diff:  
Calibrator Model: Teledyne API T700  
ZAG make/model: Teledyne API T701H  
Cal Gas Expiry Date: February 2, 2024  
NO Cal Gas Conc: 48.80 ppm  
Removed Gas Exp Date: NA  
Removed Gas NO Conc: 48.80 ppm  
NO gas Diff:  
Serial Number: 3252  
Serial Number: 260

### Analyzer Information

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

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.844        | 1.882         | NO bkgnd or offset:  | 6.9          | 7.9           |
| NOX coeff or slope: | 0.993        | 0.995         | NOX bkgnd or offset: | 6.9          | 8.1           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 252.6        | 256.6         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.986463     | 1.000657      |
| NO <sub>x</sub> Cal Offset: | 2.200000     | 0.680000      |
| NO Cal Slope:               | 0.990518     | 1.001428      |
| NO Cal Offset:              | 1.180000     | 0.260000      |
| NO <sub>2</sub> Cal Slope:  | 0.996180     | 1.016898      |
| NO <sub>2</sub> Cal Offset: | -1.402288    | 0.900918      |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 2.6  | 2.6                                   | 0.0  | ----  | ----   |
| as found span             | 4918                      | 82.0                        | 800.3   | 800.3                                  | 0.0   | 787.2  | 788.3                                 | -1.1   | 1.0167  | 1.0152   |
| 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                        | 800.3   | 800.3                                  | 0.0   | 801.3  | 801.7                                 | -0.3   | 0.9988  | 0.9983   |
| second point              | 4959                      | 41.0                        | 400.2   | 400.2                                  | 0.0   | 400.8  | 400.7                                 | 0.2  | 0.9984  | 0.9987   |
| third point               | 4980                      | 20.5                        | 200.1   | 200.1                                  | 0.0   | 202.4  | 201.3                                 | 1.1  | 0.9885  | 0.9939   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.2   | 0.0                                   | -0.2   | ----  | ----   |
| as left span              | 4918                      | 82.0                        | 800.3   | 423.2                                  | 377.1   | 796.2  | 411.1                                 | 385.1  | 1.0052  | 1.0295   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9952  | 0.9970   |

|                      |                             |                |  |                                  |                         |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|
| Corrected As found   | NO <sub>x</sub> = 784.6 ppb | NO = 785.7 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -0.9% |
| Previous Response    | NO <sub>x</sub> = 791.7 ppb | NO = 793.9 ppb |  | *Percent Change                  | NO = -1.0%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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                                      | 413.3                                 | 377.1   | 383.4  | 0.9836   | 101.7%   |
| 2nd GPT point (200 ppb O3)       | 790.4                                      | 599.2                                 | 191.2   | 197.1  | 0.9701   | 103.1%   |
| 3rd GPT point (100 ppb O3)       | 790.4                                      | 696.1                                 | 94.3  | 97.1   | 0.9712   | 103.0%   |
| Average Correction Factor        |  |                                       |   |  | 0.9749   | 102.6%   |

Notes:

Sample inlet filter changed after as founds. Adjusted the zero and span.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

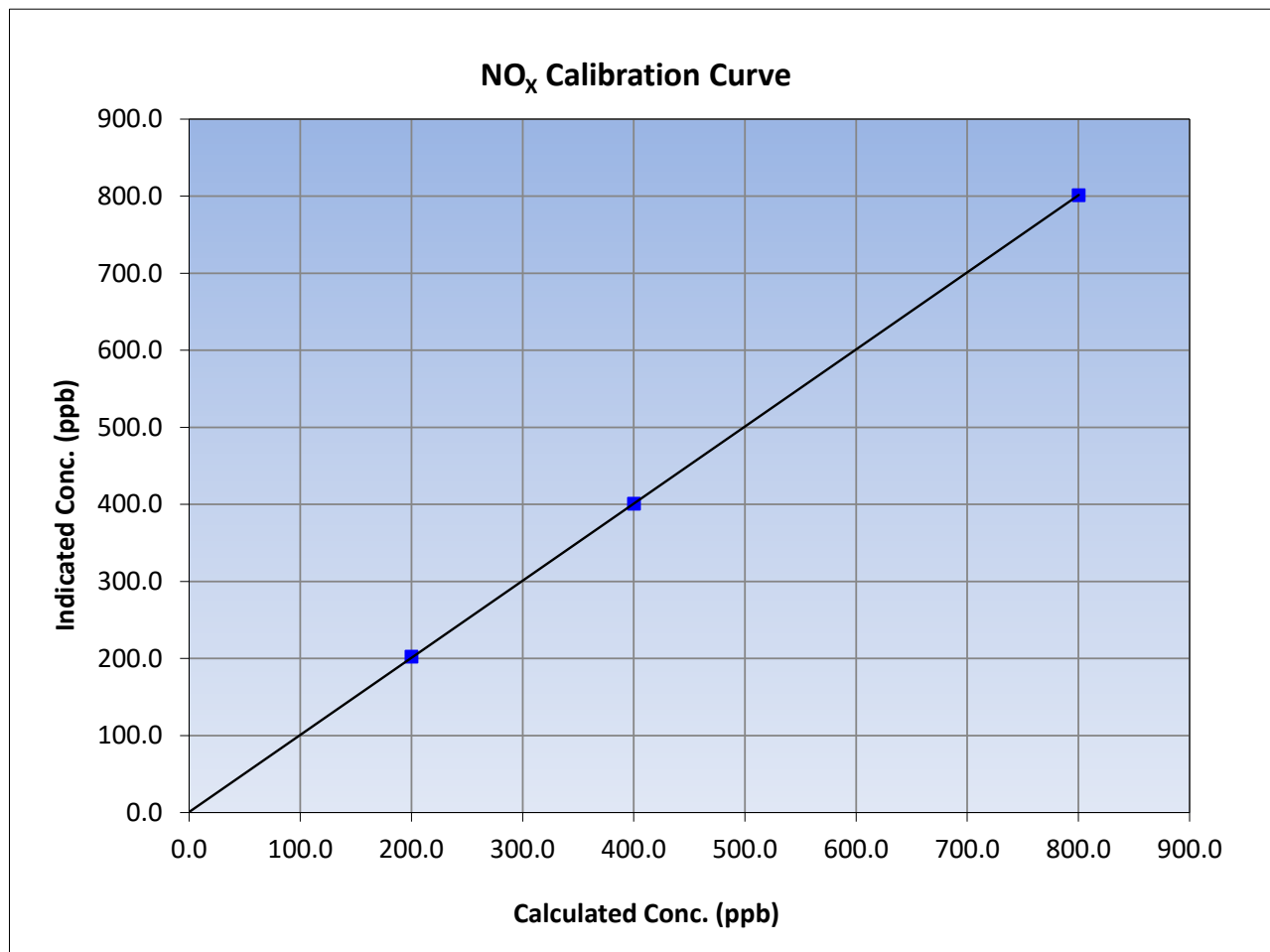
Version-04-2020

### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 13, 2023 | Previous Calibration: | February 6, 2023 |
| Station Name:     | Fort Chipewyan | Station Number:       | AMS08            |
| Start Time (MST): | 7:00           | End Time (MST):       | 12:23            |
| 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                                 | -0.3                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | 0.999990<br>1.000657<br>0.680000<br>≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.3                               | 801.3                              | 0.9988                    |   |  |
| 400.2                               | 400.8                              | 0.9984                    |   |  |
| 200.1                               | 202.4                              | 0.9885                    |   |  |





# Wood Buffalo Environmental Association

## NO Calibration Summary

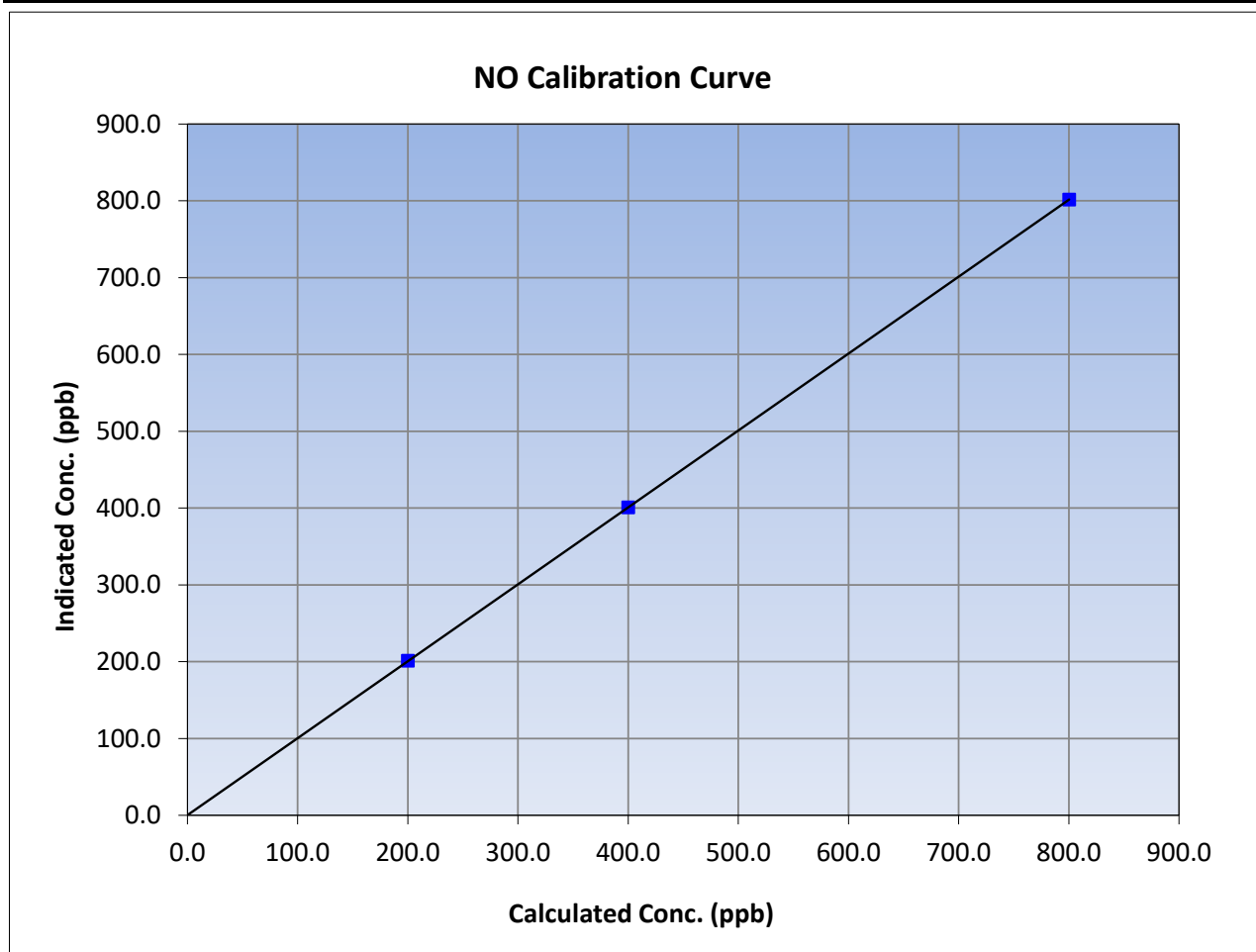
Version-04-2020

### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 13, 2023 | Previous Calibration: | February 6, 2023 |
| Station Name:     | Fort Chipewyan | Station Number:       | AMS08            |
| Start Time (MST): | 7:00           | End Time (MST):       | 12:23            |
| 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<br>Slope<br>Intercept | $\geq 0.995$<br>0.90 - 1.10<br>+/-20 |
| 800.3                               | 801.7                              | 0.9983                    |   |                                      |
| 400.2                               | 400.7                              | 0.9987                    |   |                                      |
| 200.1                               | 201.3                              | 0.9939                    |   |                                      |
|                                     |                                    |                           |   |                                      |





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

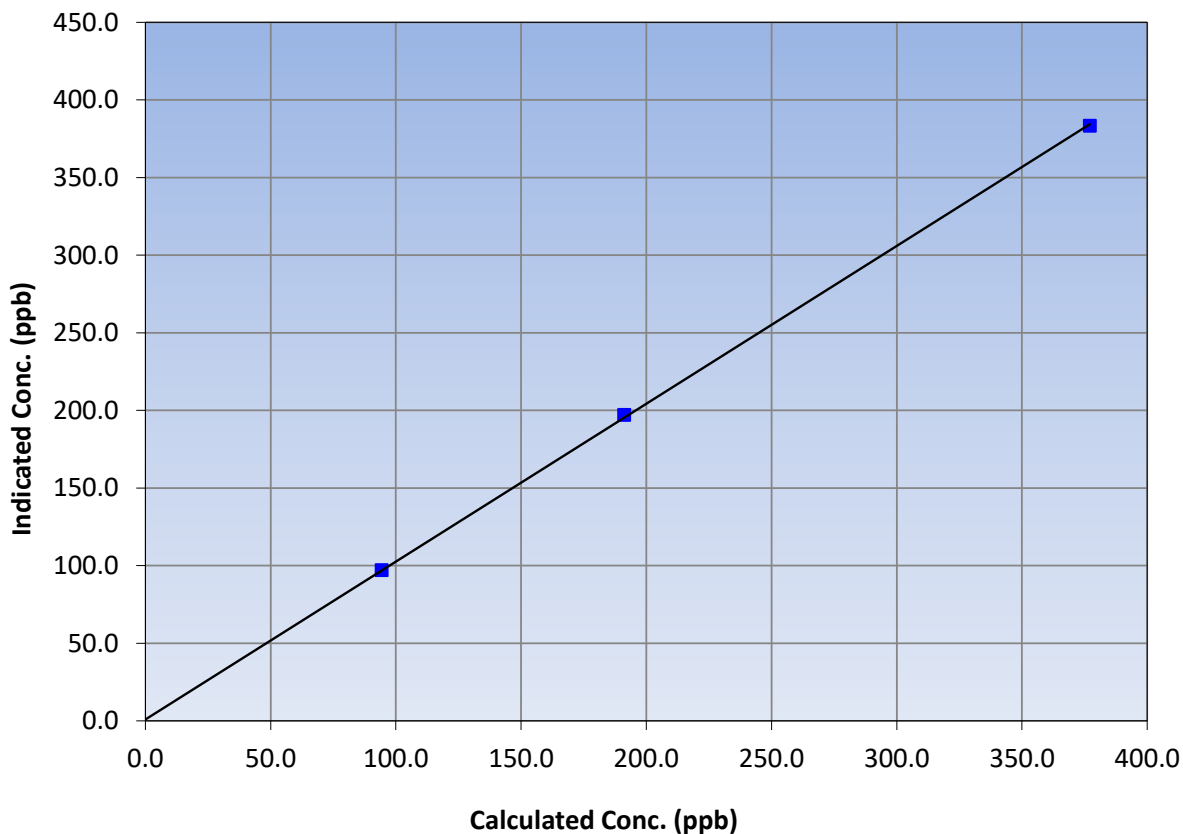
### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 13, 2023 | Previous Calibration: | February 6, 2023 |
| Station Name:     | Fort Chipewyan | Station Number:       | AMS08            |
| Start Time (MST): | 7:00           | End Time (MST):       | 12:23            |
| 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                                 | -0.2                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 377.1                               | 383.4                              | 0.9836                    |   |                                |
| 191.2                               | 197.1                              | 0.9701                    |   |                                |
| 94.3                                | 97.1                               | 0.9712                    |   |                                |
|                                     |                                    |                           |   |                                |

**NO<sub>2</sub> Calibration Curve**

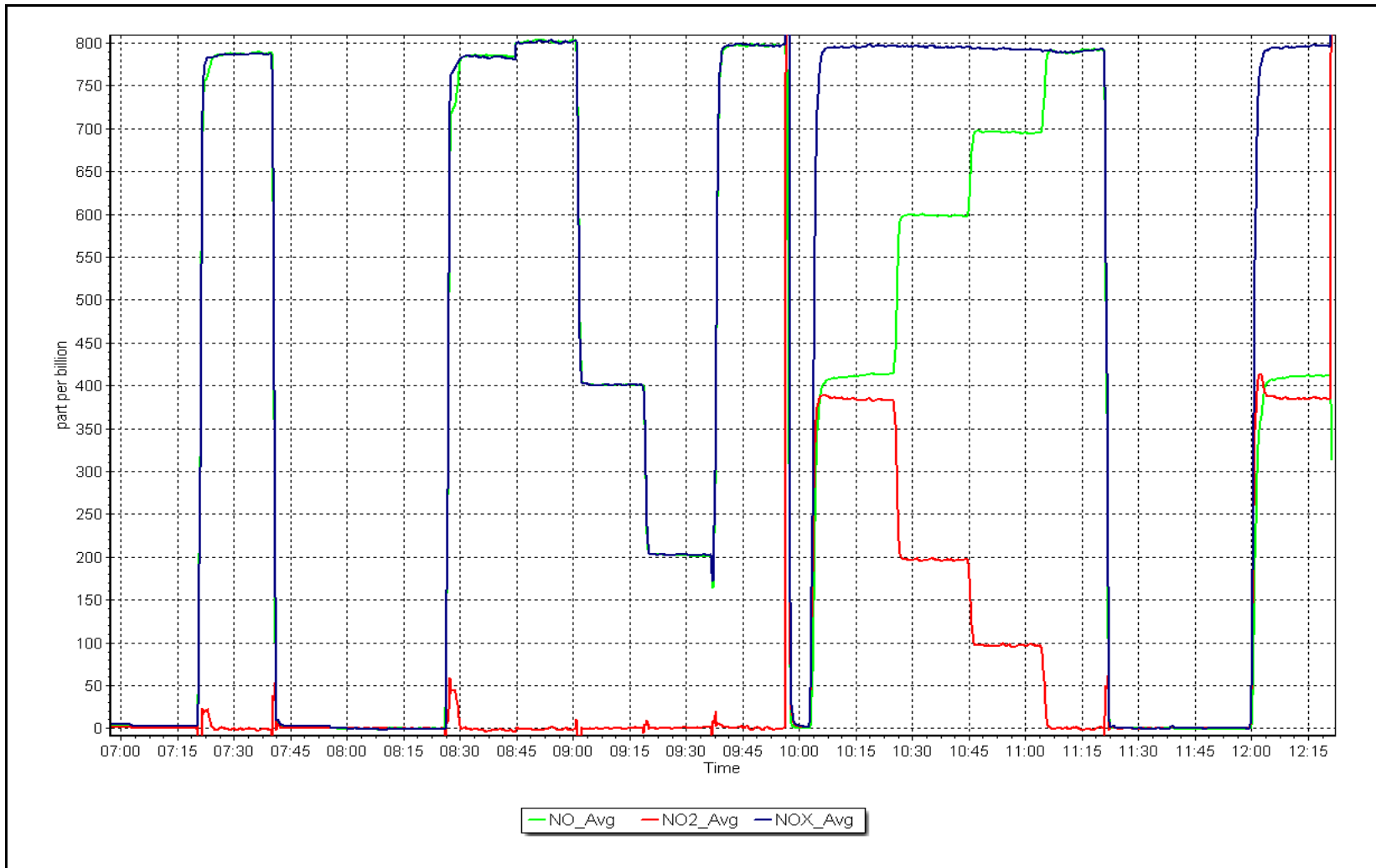




NO<sub>x</sub> Calibration Plot

Date: March 13, 2023

Location: Fort Chipewyan





# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Fort Chipewyan      Station number: AMS08  
 Calibration Date: March 13, 2023      Last Cal Date: February 6, 2023  
 Start time (MST): 13:05      End time (MST): 15:48  
 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: 260

### Analyzer Information

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

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 1.007143     | 1.002171      | Backgd or Offset: | -2.0         | -2.0          |
| Calibration intercept: | -0.600000    | -0.880000     | Coeff or Slope:   | 1.036        | 1.036         |

### O<sub>3</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                       | NA                            | 0.0                                 | 1.1                                | ----  |
| as found span             | 5000                       | 963.6                         | 400.0                               | 400.8                              | 0.998   |
| as found 2nd point        |                            |                               |                                     |                                    |   |
| as found 3rd point        |                            |                               |                                     |                                    |   |
| calibrator zero           | 5000                       | NA                            | 0.0                                 | 0.5                                | ----  |
| high point                | 5000                       | 961.7                         | 400.0                               | 400.6                              | 0.999   |
| second point              | 5000                       | 810.3                         | 200.0                               | 199.1                              | 1.005   |
| third point               | 5000                       | 701.3                         | 100.0                               | 97.8                               | 1.022   |
| as left zero              | 5000                       | NA                            | 0.0                                 | 0.4                                | ----  |
| as left span              | 5000                       | 963.3                         | 400.0                               | 401.3                              | 0.997   |
| Average Correction Factor |                            |                               |                                     |                                    | 1.009   |

|                          |       |                   |       |               |       |
|--------------------------|-------|-------------------|-------|---------------|-------|
| Baseline Corr As found:  | 399.7 | Previous response | 402.3 | *% change     | -0.6% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:         |       | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation:   |       |               |       |

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

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

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

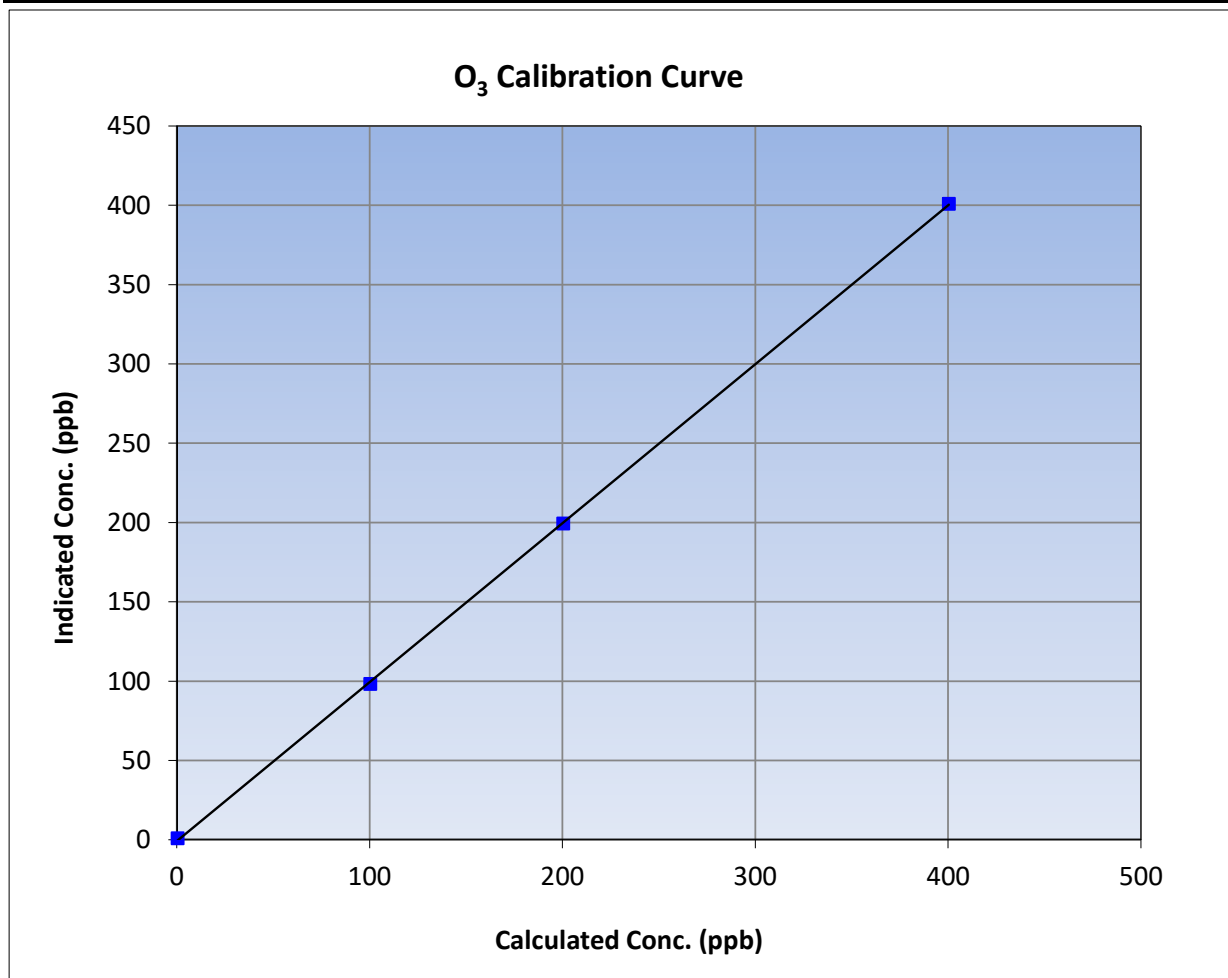
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | March 13, 2023    | Previous Calibration: | February 6, 2023 |
| Station Name:     | Fort Chipewyan    | Station Number:       | AMS08            |
| Start Time (MST): | 13:05             | End Time (MST):       | 15:48            |
| Analyzer make:    | Teledyne API T400 | Analyzer serial #:    | 3872             |

### Calibration Data

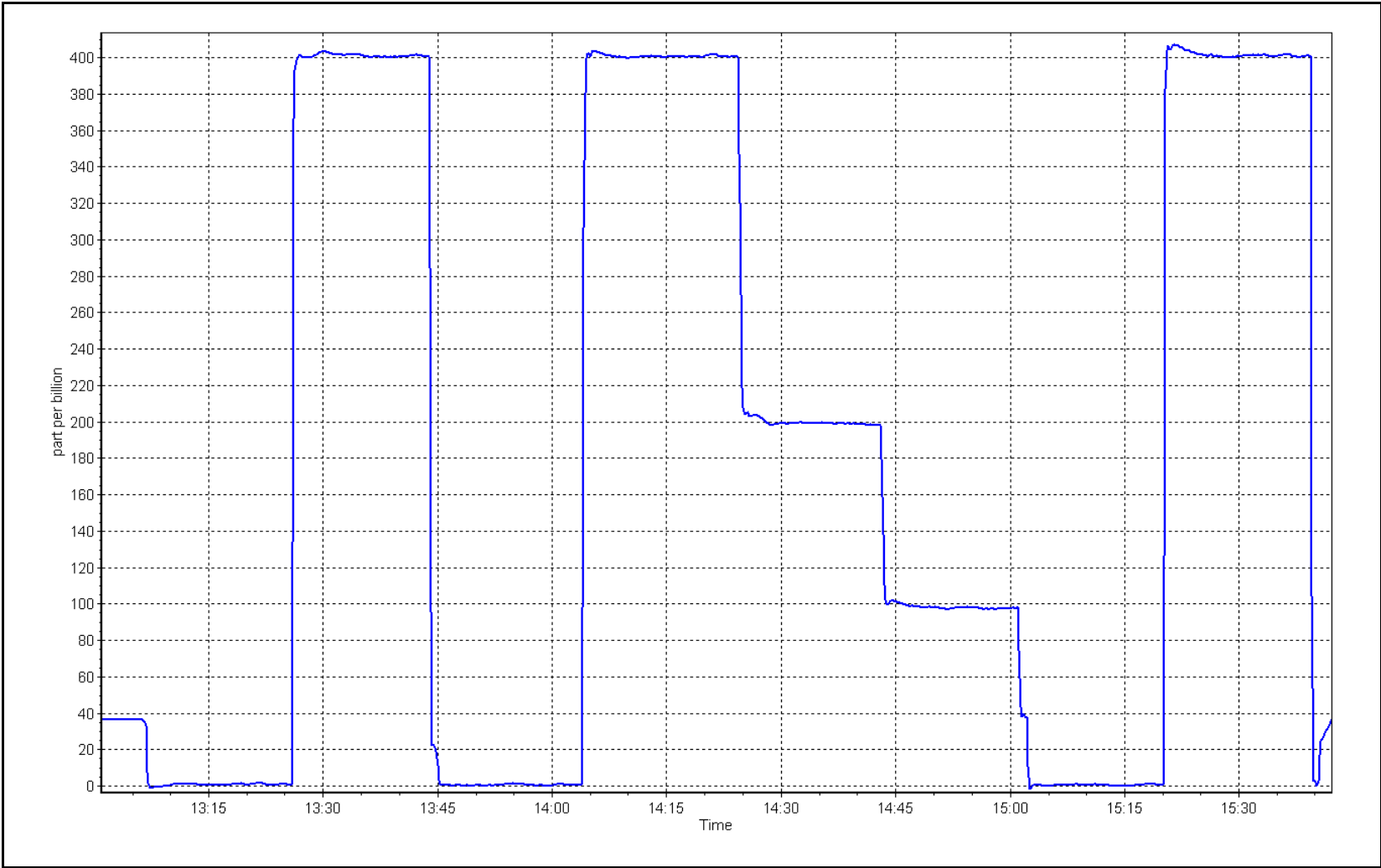
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits      |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-------------|
| 0.0                                 | 0.5                                | ----                      | Correlation Coefficient | ≥0.995      |
| 400.0                               | 400.6                              | 0.9985                    |                         |             |
| 200.0                               | 199.1                              | 1.0045                    | Slope                   | 0.90 - 1.10 |
| 100.0                               | 97.8                               | 1.0225                    |                         |             |
|                                     |                                    |                           | Intercept               | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: March 13, 2023

Location: Fort Chipewyan



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# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Fort Chipewyan Station number: AMS 08  
 Calibration Date: March 13, 2023 Last Cal Date: February 15, 2023  
 Start time (MST): 9:43 End time (MST): 11:24

Analyzer Make: API S/N: 216  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Delta Cal S/N: 1212  
 Temp/RH standard: Delta Cal S/N: 1212

### Monthly Calibration Test

| Parameter  | As found                             | Measured                                | As left                 | Adjusted                 | (Limits)     |
|------------|--------------------------------------|---|-------------------------|--------------------------|--------------|
| T (°C)     | -18.9                                | -18.5                                   | -18.9                   | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 741.0                                | 739.6                                   | 741.0                   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.01                                 | 4.98                                    | 5.01                    | <input type="checkbox"/> | +/- 0.25 LPM |
| Leak Test: | Date of check: <u>March 13, 2023</u> | Last Cal Date: <u>February 15, 2023</u> | PM w/o HEPA: <u>5.4</u> | PM w/ HEPA: <u>0.0</u>   | <0.2 ug/m3   |

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

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter                     | As found | Post maintenance        | As left             | Adjusted                 | (Limits)     |
|-------------------------------|----------|-------------------------|---------------------|--------------------------|--------------|
| PMT Peak Test                 | 11.0     | 11.2                    | 11.2                | <input type="checkbox"/> | 11.3 +/- 0.5 |
| Post-maintenance leak check:  |          | PM w/o HEPA: <u>8.4</u> | w/ HEPA: <u>0.0</u> |                          | <0.2 ug/m3   |
| Date Optical Chamber Cleaned: |          | <u>March 13, 2023</u>   |                     |                          |              |
| Disposable Filter Changed:    |          | <u>March 13, 2023</u>   |                     |                          |              |

### Annual Maintenance

Date Sample Tube Cleaned: July 14, 2022  
 Date RH/T Sensor Cleaned: July 14, 2022

Notes: Pump changed after leak check. Optical chamber cleaned. No adjustments made.

Calibration by: Karan Pandit



# Wood Buffalo Environmental Association

## CO Calibration Report

Version-01-2020

### Station Information

|                   |                |                 |                   |
|-------------------|----------------|-----------------|-------------------|
| Station Name:     | Fort Chipewyan | Station number: | AMS08             |
| Calibration Date: | March 13, 2023 | Last Cal Date:  | February 14, 2023 |
| Start time (MST): | 7:12           | End time (MST): | 12:05             |
| Reason:           | Maintenance    |                 |                   |

### 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:    | 5272             |
| ZAG Make/Model:        | API T701H |     | Serial Number:    | 197              |

### Analyzer Information

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

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <b>Start</b> | <b>Finish</b> |                   | <b>Start</b> | <b>Finish</b> |
| Calibration slope:     | 0.983508     | 0.998892      | Backgd or Offset: | -0.013       | -0.014        |
| Calibration intercept: | 0.322926     | 0.030961      | Coeff or Slope:   | 0.987        | 0.996         |

### 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.21                               | ----  |
| as found span             | 4933                          | 66.7                        | 40.4                                | 40.7                               | 0.993   |
| as found 2nd point        | 4967                          | 33.3                        | 20.2                                | 20.6                               | 0.978   |
| as found 3rd point        | 4983                          | 16.7                        | 10.1                                | 10.4                               | 0.975   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                | 4934                          | 66.7                        | 40.4                                | 40.4                               | 1.002   |
| second point              | 4967                          | 33.3                        | 20.2                                | 20.3                               | 0.993   |
| third point               | 4983                          | 16.7                        | 10.1                                | 10.1                               | 1.004   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span              | 2960                          | 40.0                        | 40.4                                | 39.4                               | 1.026   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.000   |

|                          |       |                 |          |               |          |
|--------------------------|-------|-----------------|----------|---------------|----------|
| Baseline Corr As found:  | 40.48 | Prev response:  | 40.08    | *% change:    | 1.0%     |
| Baseline Corr 2nd AF pt: | 20.4  | AF Slope:       | 1.001720 | AF Intercept: | 0.266590 |
| Baseline Corr 3rd AF pt: | 10.2  | AF Correlation: | 0.999965 |               |          |

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

Notes: Peaked the IR source and changed the sample inlet filter after as founds. Adjusted the zero and span.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## CO Calibration Summary

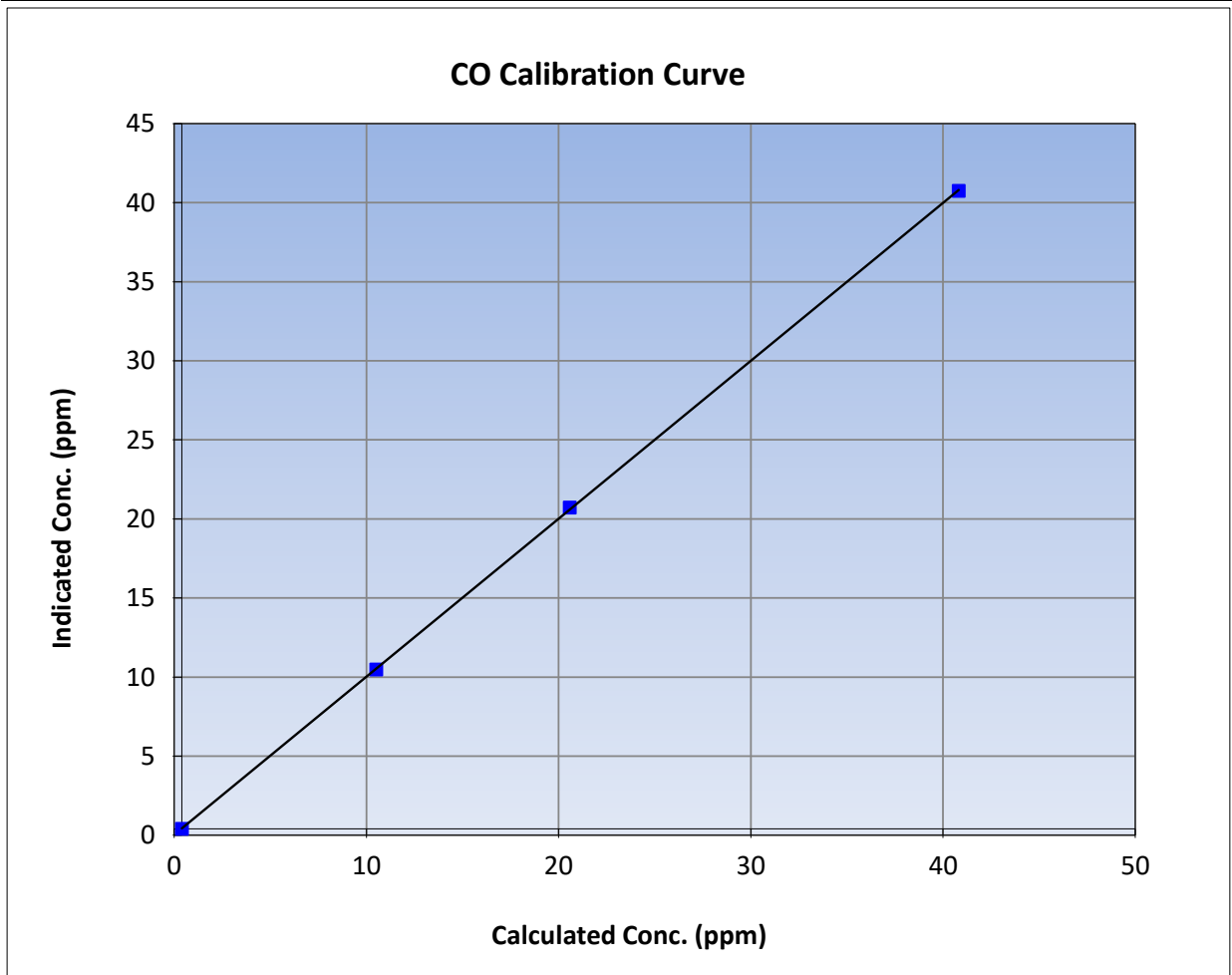
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 13, 2023 | Previous Calibration: | February 14, 2023 |
| Station Name:     | Fort Chipewyan | Station Number:       | AMS08             |
| Start Time (MST): | 7:12           | End Time (MST):       | 12:05             |
| Analyzer make:    | API T300       | Analyzer serial #:    | 3505              |

### Calibration Data

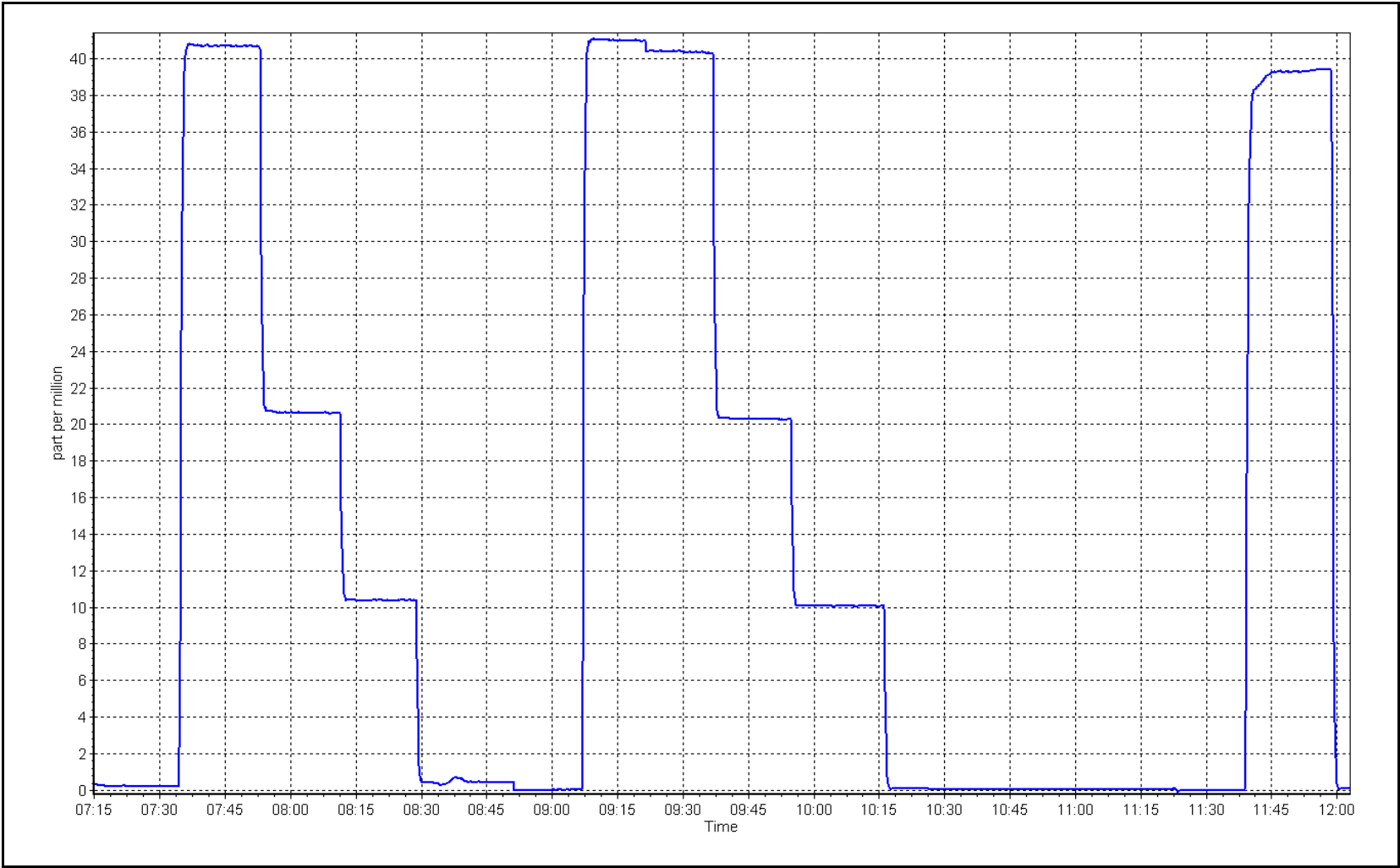
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |               |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|---------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999973      |               |
| 40.4                                | 40.4                               | 1.0016                    |                         |               | $\geq 0.995$  |
| 20.2                                | 20.3                               | 0.9931                    | Slope                   | 0.998892      |               |
| 10.1                                | 10.1                               | 1.0040                    |                         |               | $0.90 - 1.10$ |
|                                     |                                    |                           | Intercept               | 0.030961      | $\pm 1.5$     |



CO Calibration Plot

Date: March 13, 2023

Location: Fort Chipewyan







# Wood Buffalo Environmental Association

## CO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                |                 |                   |
|-------------------|----------------|-----------------|-------------------|
| Station Name:     | Fort Chipewyan | Station number: | AMS08             |
| Calibration Date: | March 12, 2023 | Last Cal Date:  | February 15, 2023 |
| Start time (MST): | 11:46          | End time (MST): | 15:55             |
| 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:    | 5272             |
| N2 Gen Make/Model:     | NG 5000           |     | Serial Number:    | 771048318        |

### Analyzer Information

|                                  |                        |
|----------------------------------|------------------------|
| Analyzer make: Teledyne API T360 | Analyzer serial #: 289 |
| Analyzer Range 0 - 2,000 ppm     |                        |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.006830     | 0.998937      | Backgd or Offset: | 0.019        | 0.006         |
| Calibration intercept: | -1.740000    | -4.820000     | Coeff or Slope:   | 1.011        | 1.018         |

### CO<sub>2</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 3000                          | 0.0                         | 0.0                                 | 0.9                                | ----  |
| as found span             | 2920                          | 80.0                        | 1605.9                              | 1626.3                             | 0.987   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 3000                          | 0.0                         | 0.0                                 | -0.1                               | ----  |
| high point                | 2920                          | 80.0                        | 1605.9                              | 1605.8                             | 1.000   |
| second point              | 2960                          | 40.0                        | 802.9                               | 782.6                              | 1.026   |
| third point               | 2980                          | 20.0                        | 401.5                               | 399.7                              | 1.004   |
| as left zero              | 3000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span              | 2960                          | 40.0                        | 802.9                               | 779.8                              | 1.030   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.010   |

|                          |         |                 |         |               |      |
|--------------------------|---------|-----------------|---------|---------------|------|
| Baseline Corr As found:  | 1625.40 | Prev response:  | 1615.09 | *% change:    | 0.6% |
| Baseline Corr 2nd AF pt: | NA      | AF Slope:       |         | AF Intercept: |      |
| Baseline Corr 3rd AF pt: | NA      | AF Correlation: |         |               |      |

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

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

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## CO<sub>2</sub> Calibration Summary

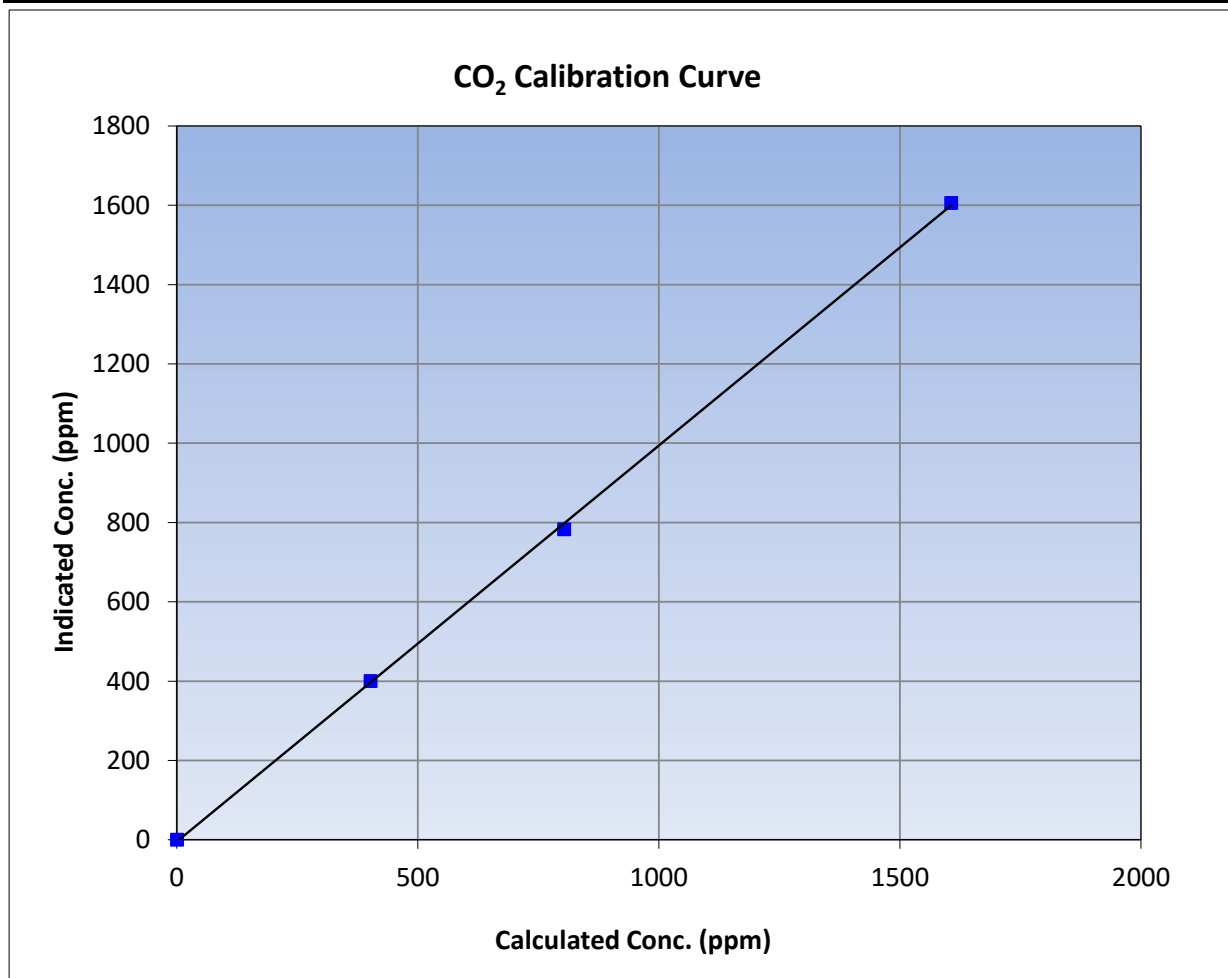
Version-01-2020

### Station Information

|                  |                   |                      |                   |
|------------------|-------------------|----------------------|-------------------|
| Calibration Date | March 12, 2023    | Previous Calibration | February 15, 2023 |
| Station Name     | Fort Chipewyan    | Station Number       | AMS08             |
| Start Time (MST) | 11:46             | End Time (MST)       | 15:55             |
| Analyzer make    | Teledyne API T360 | Analyzer serial #    | 289               |

### Calibration Data

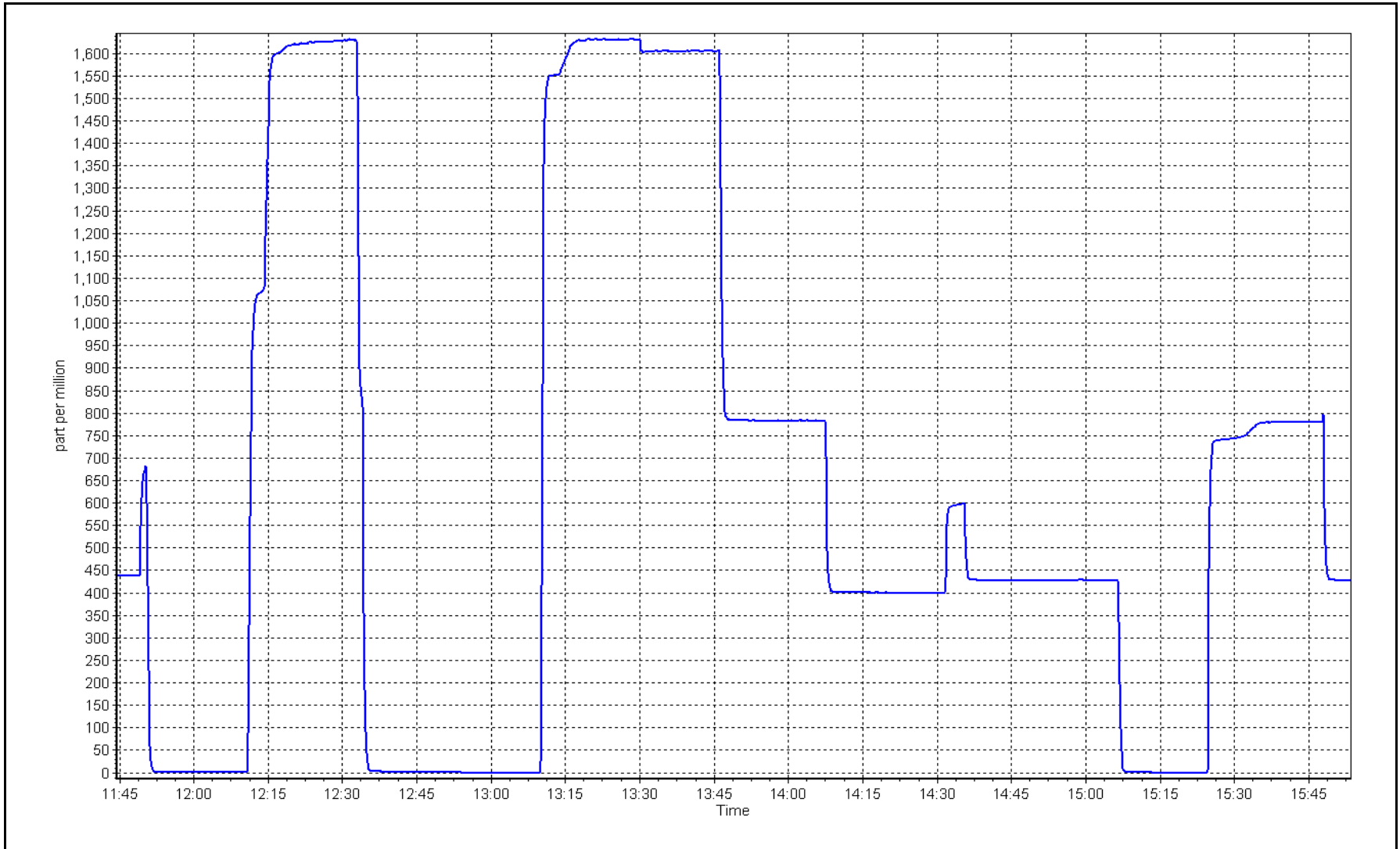
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999793      | ≥0.995      |
| 1605.9                              | 1605.8                             | 1.0000                    |                         |               |             |
| 802.9                               | 782.6                              | 1.0260                    | Slope                   | 0.998937      | 0.90 - 1.10 |
| 401.5                               | 399.7                              | 1.0044                    |                         |               |             |
|                                     |                                    |                           | Intercept               | -4.820000     | +/-20       |



CO<sub>2</sub> Calibration Plot

Date: March 12, 2023

Location: Fort Chipewyan





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS09 BARGE LANDING MARCH 2023**

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

April 29, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

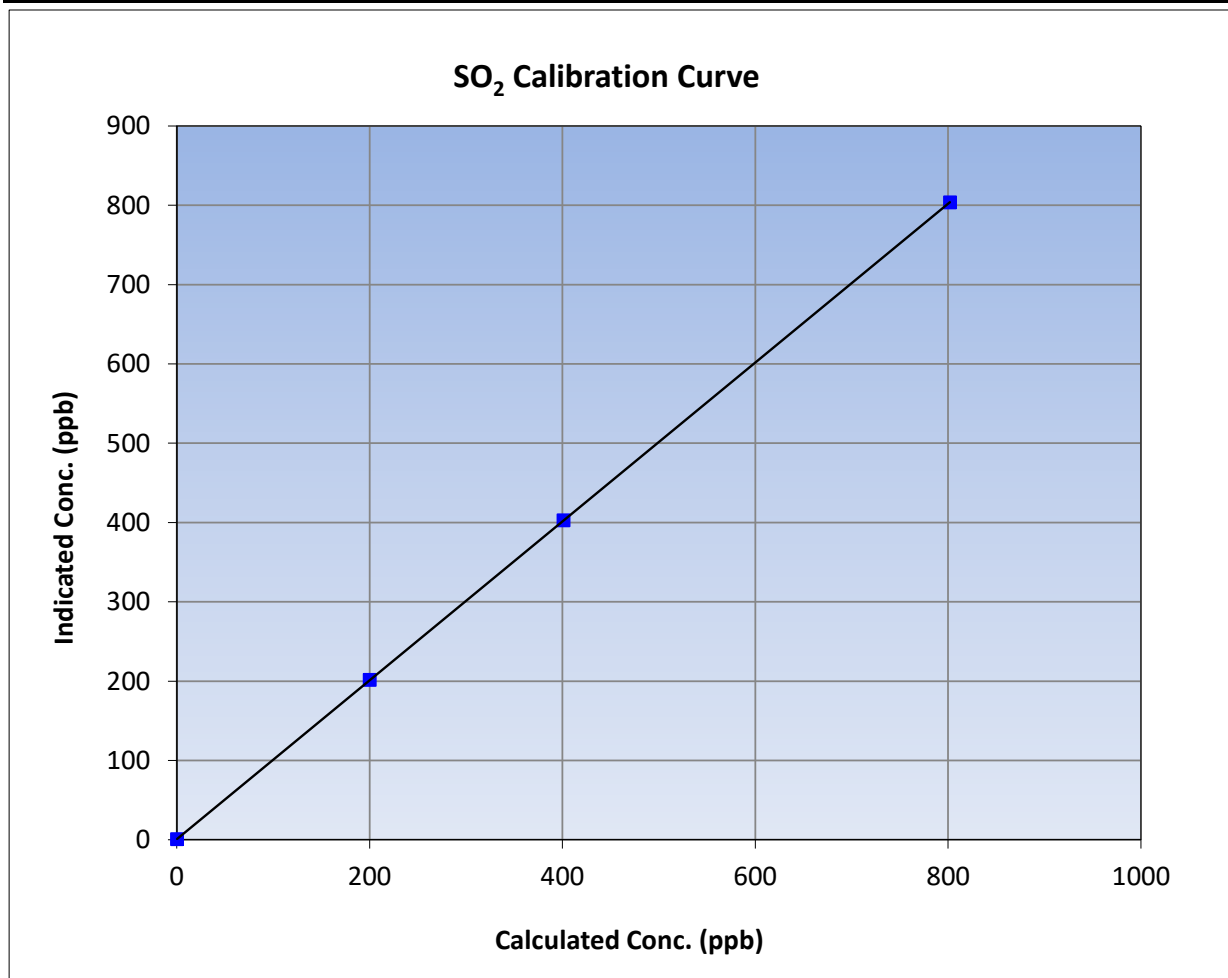
Version-01-2020

### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 10, 2023 | Previous Calibration: | February 3, 2023 |
| Station Name:     | Barge Landing  | Station Number:       | AMS09            |
| Start Time (MST): | 10:58          | End Time (MST):       | 14:05            |
| Analyzer make:    | Thermo 43i     | Analyzer serial #:    | 1118148498       |

### Calibration Data

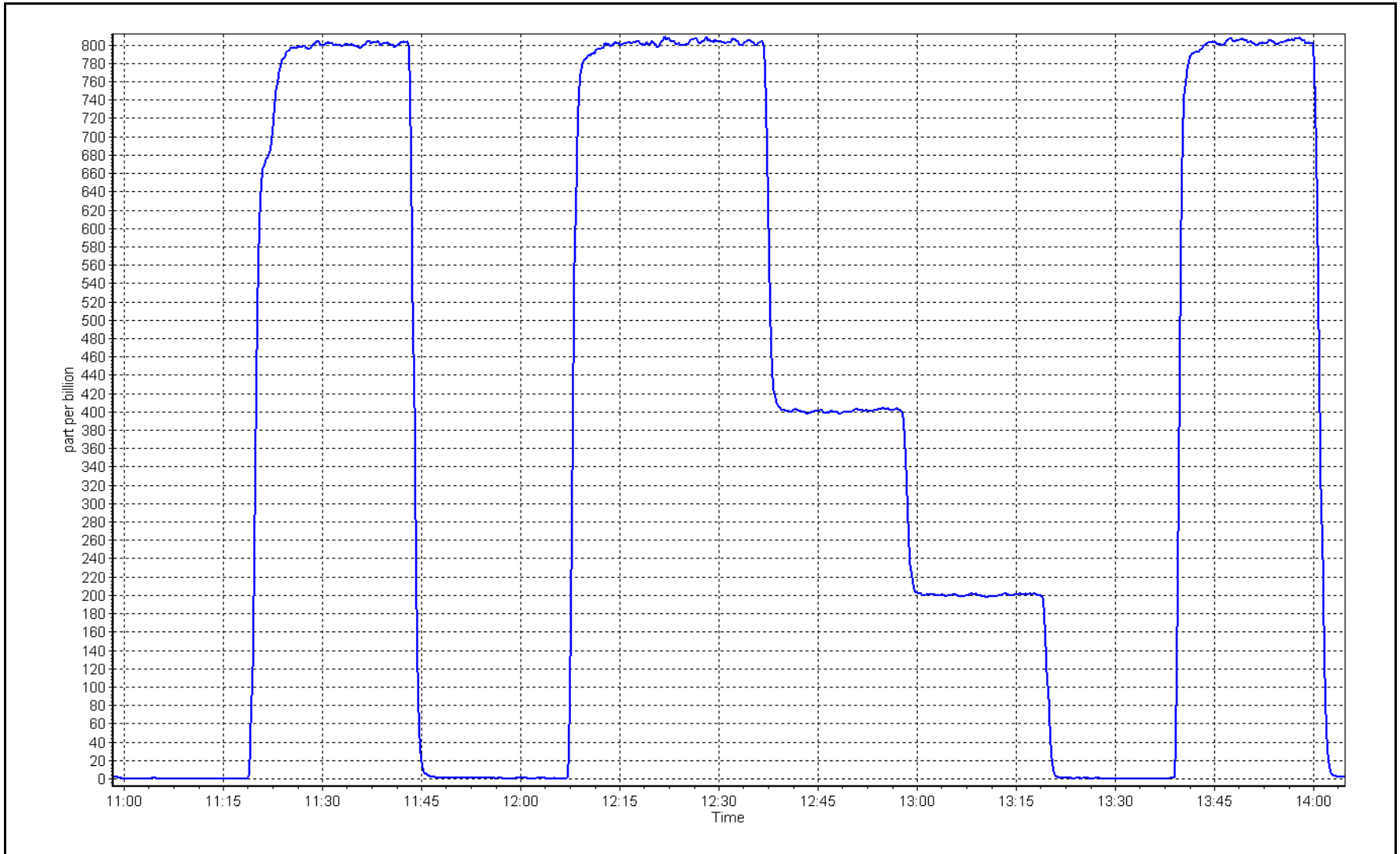
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient | 0.999999 | ≥0.995      |
| 801.5                               | 803.3                              | 0.9977                    |                         |          |             |
| 400.8                               | 402.3                              | 0.9962                    | Slope                   | 1.001709 | 0.90 - 1.10 |
| 199.8                               | 201.1                              | 0.9937                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.631572 | +/-30       |



SO2 Calibration Plot

Date: March 10, 2023

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 23, 2023      Last Cal Date: February 28, 2023  
 Start time (MST): 9:07      End time (MST): 13:47  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 4.87 ppm      Cal Gas Exp Date: September 2, 2024  
 Cal Gas Cylinder #: EY0002346  
 Removed Cal Gas Conc: 4.87 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

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 1.003148     | 1.006146      | Backgd or Offset: 2.65 | 2.76          |
| Calibration intercept: | -0.000990    | 0.019102      | Coeff or Slope: 1.094  | 1.130         |

### 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----   |
| as found span         | 4918                          | 82.1                        | 80.0                                | 77.5                               | 1.032  |
| as found 2nd point    | 4959                          | 41.1                        | 40.0                                | 38.7                               | 1.034  |
| as found 3rd point    | 4979                          | 20.5                        | 20.0                                | 19.2                               | 1.040  |
| 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                              | 4918                          | 82.1                        | 80.0                                | 80.5                               | 0.993   |
| second point                            | 4959                          | 41.1                        | 40.0                                | 40.2                               | 0.996   |
| third point                             | 4979                          | 20.5                        | 20.0                                | 20.2                               | 0.989   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span                            | 4918                          | 82.1                        | 80.0                                | 80.3                               | 0.996   |
| SO2 Scrubber Check                      | 4920                          | 80.2                        | 802.0                               | 0.0                                | ----  |
| Date of last scrubber change:           | 28-Feb-23                     |                             |                                     | Ave Corr Factor                    | 0.993   |
| Date of last converter efficiency test: |                               |                             |                                     |                                    | efficiency  |

Baseline Corr As found: 77.5      Prev response: 80.21      \*% change: -3.5%  
 Baseline Corr 2nd AF pt: 38.7      AF Slope: 0.969709      AF Intercept: -0.080930  
 Baseline Corr 3rd AF pt: 19.2      AF Correlation: 0.999995

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

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

Calibration Performed By: Braiden Boutillier





# Wood Buffalo Environmental Association

## TRS Calibration Summary

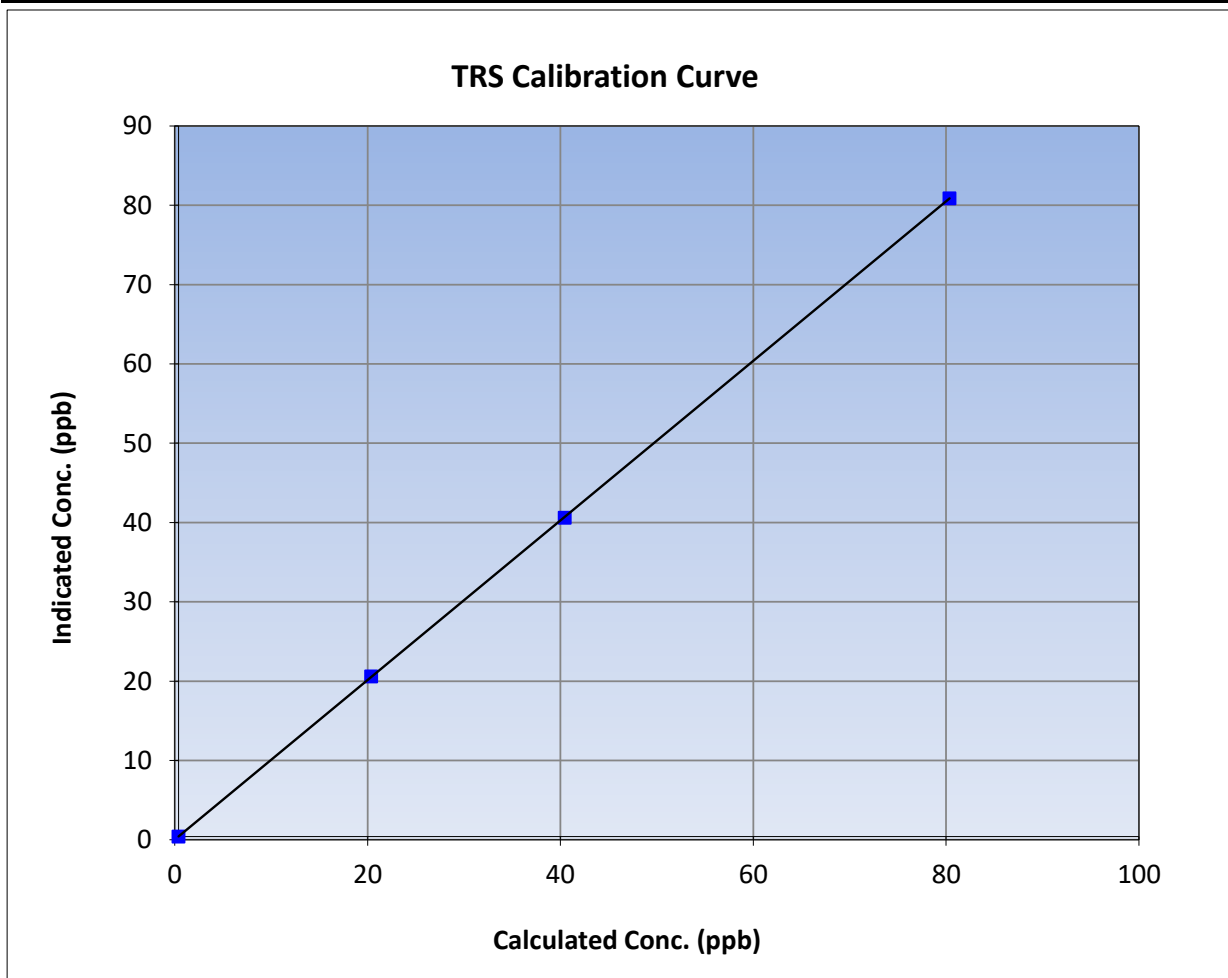
Version-11-2021

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 23, 2023 | Previous Calibration: | February 28, 2023 |
| Station Name:     | Barge Landing  | Station Number:       | AMS09             |
| Start Time (MST): | 9:07           | End Time (MST):       | 13:47             |
| Analyzer make:    | Thermo 43i-TLE | Analyzer serial #:    | 1331259320        |

### Calibration Data

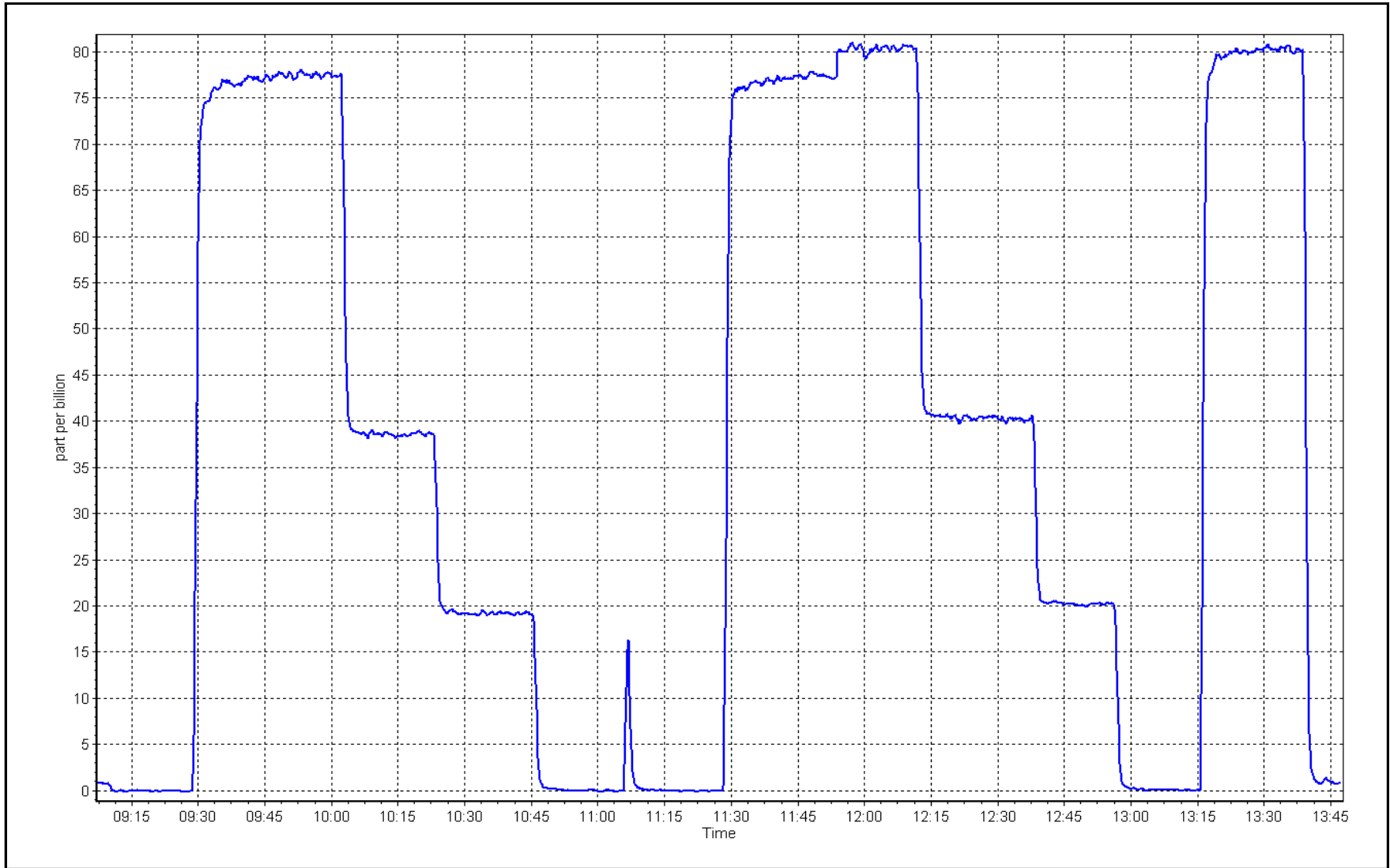
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999995 |             |
| 80.0                                | 80.5                               | 0.9933                    |                         |          | ≥0.995      |
| 40.0                                | 40.2                               | 0.9958                    | Slope                   | 1.006146 |             |
| 20.0                                | 20.2                               | 0.9886                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.019102 | +/-3        |



TRS Calibration Plot

Date: March 23, 2023

Location: Barge Landing





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                |                 |                  |
|-------------------|----------------|-----------------|------------------|
| Station Name:     | Barge Landing  | Station number: | AMS09            |
| Calibration Date: | March 10, 2023 | Last Cal Date:  | February 3, 2023 |
| Start time (MST): | 10:58          | End time (MST): | 14:03            |
| Reason:           | Routine        |                 |                  |

### Calibration Standards

|   |           |                             |                 |
|---|-----------|-----------------------------|-----------------|
| Gas Cert Reference:                         | CC151285  | Cal Gas Expiry Date:        | January 5, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 497.6 ppm | CH <sub>4</sub> Equiv Conc. | 1067.1 ppm      |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.1 ppm |                             |                 |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA              |
| Removed CH <sub>4</sub> Conc.               | 497.6 ppm | CH <sub>4</sub> Equiv Conc. | 1067.1 ppm      |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.1 ppm | Diff between cyl (THC):     |                 |
| Diff between cyl (CH <sub>4</sub> ):        |           | 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 #:           | 1170050131 |
| THC Range (ppm):  | 0 - 100 ppm |                              |            |
| NMHC Range (ppm): | 0 - 50 ppm  | CH <sub>4</sub> Range (ppm): | 0 - 50 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 1.99E-04     | 2.03E-04      | NMHC SP Ratio:  | 4.28E-05      |
| CH <sub>4</sub> Retention time: | 12.2         | 12.6          | NMHC Peak Area: | 213327        |
|                                 |              |               |                 | 212383        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4919              | 80.2                 | 17.12                | 16.69               | 1.026                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4919              | 80.2                 | 17.12                | 17.11               | 1.000                      |
| second point          | 4960              | 40.1                 | 8.56                 | 8.50                | 1.007                      |
| third point           | 4980              | 20.0                 | 4.27                 | 4.23                | 1.010                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4919              | 80.2                 | 17.12                | 17.12               | 1.000                      |

|                       |       |                 |       | Average Correction Factor                  | 1.006 |
|-----------------------|-------|-----------------|-------|--|-------|
| Baseline Corr AF:     | 16.69 | Prev response   | 17.10 | *% change                                  | -2.4% |
| 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.0  | ----                       |
| as found span             | 4919              | 80.2                 | 9.14                 | 9.07                                       | 1.008                      |
| 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                 | 9.14                                       | 1.000                      |
| second point              | 4960              | 40.1                 | 4.57                 | 4.55                                       | 1.003                      |
| third point               | 4980              | 20                   | 2.28                 | 2.27                                       | 1.002                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4919              | 80.2                 | 9.14                 | 9.14                                       | 0.999                      |
| Average Correction Factor |                   |                      |                      |  | 1.002                      |
| Baseline Corr AF:         | 9.07              | Prev response        | 9.08                 | *% change                                  | -0.1%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4919              | 80.2                 | 7.98                 | 7.63                                       | 1.047                      |
| 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                                       | 1.001                      |
| second point              | 4960              | 40.1                 | 3.99                 | 3.95                                       | 1.011                      |
| third point               | 4980              | 20.0                 | 1.99                 | 1.95                                       | 1.020                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4919              | 80.2                 | 7.98                 | 7.98                                       | 1.000                      |
| Average Correction Factor |                   |                      |                      |  | 1.011                      |
| Baseline Corr AF:         | 7.63              | Prev response        | 8.02                 | *% change                                  | -5.2%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.001427     | 0.999991      |
| THC Cal Offset:             | -0.043961    | -0.027960     |
| CH <sub>4</sub> Cal Slope:  | 1.007423     | 0.999623      |
| CH <sub>4</sub> Cal Offset: | -0.020126    | -0.022149     |
| NMHC Cal Slope:             | 0.996127     | 1.000225      |
| NMHC Cal Offset:            | -0.024834    | -0.005211     |

Notes: Changed sample inlet filter after as founds. Calibrated span to adjust CH<sub>4</sub> RT, no dipping in signal

Calibration Performed By: Ryan Power



# Wood Buffalo Environmental Association

## THC Calibration Summary

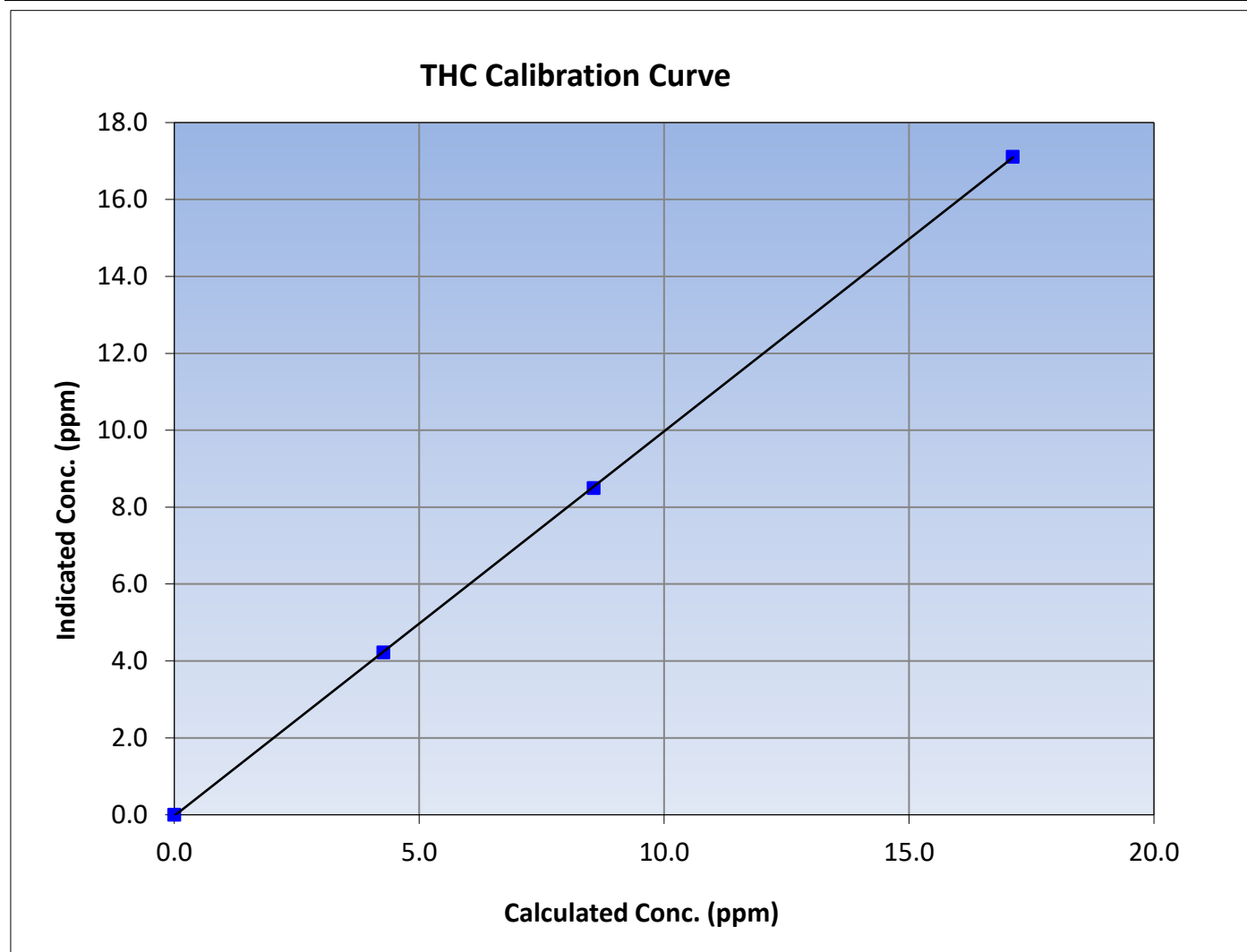
Version-01-2020

### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 10, 2023 | Previous Calibration: | February 3, 2023 |
| Station Name:     | Barge Landing  | Station Number:       | AMS09            |
| Start Time (MST): | 10:58          | End Time (MST):       | 14:03            |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1170050131       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999984  | $\geq 0.995$  |       |          |             |
| 17.12                               | 17.11                              | 1.0004                    |                         |           |               |       |          |             |
| 8.56                                | 8.50                               | 1.0073                    |                         |           |               | Slope | 0.999991 | 0.90 - 1.10 |
| 4.27                                | 4.23                               | 1.0101                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.027960 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

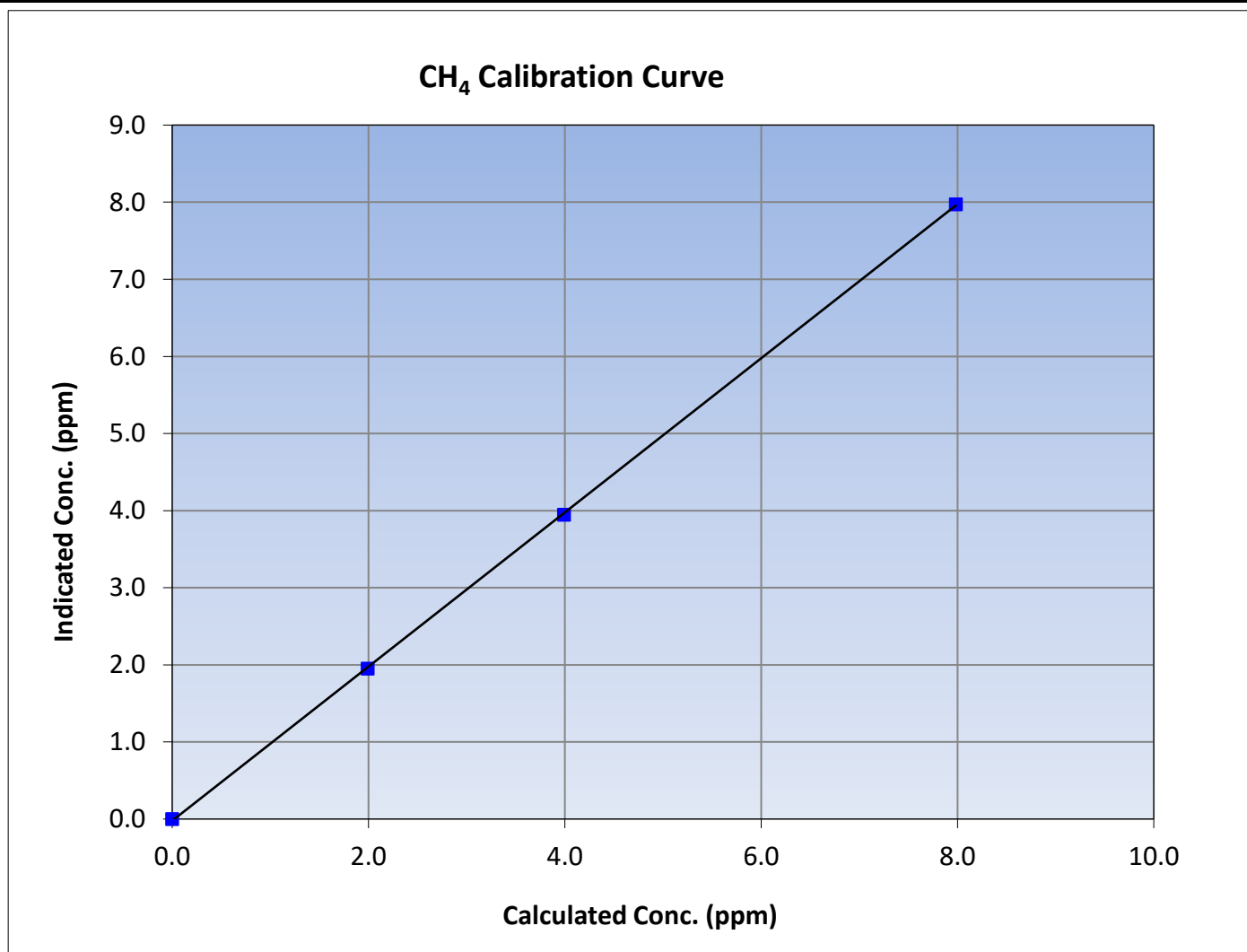
Version-01-2020

### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 10, 2023 | Previous Calibration: | February 3, 2023 |
| Station Name:     | Barge Landing  | Station Number:       | AMS09            |
| Start Time (MST): | 10:58          | End Time (MST):       | 14:03            |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1170050131       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999960  | ≥0.995        |
| 7.98                                | 7.97                               | 1.0014                    |                         |           |               |
| 3.99                                | 3.95                               | 1.0113                    |                         |           |               |
| 1.99                                | 1.95                               | 1.0197                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 0.999623  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.022149 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

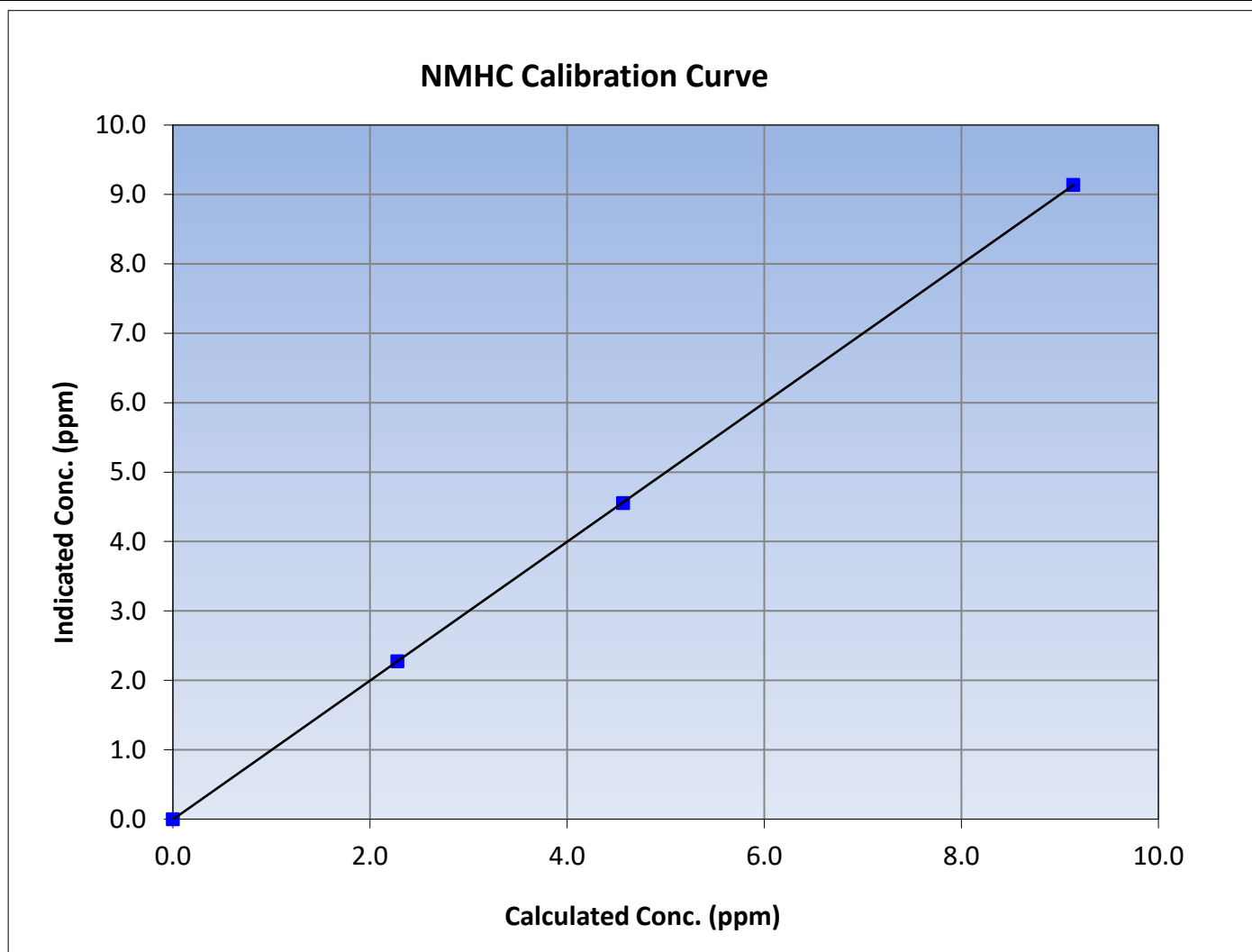
Version-01-2020

### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 10, 2023 | Previous Calibration: | February 3, 2023 |
| Station Name:     | Barge Landing  | Station Number:       | AMS09            |
| Start Time (MST): | 10:58          | End Time (MST):       | 14:03            |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1170050131       |

### Calibration Data

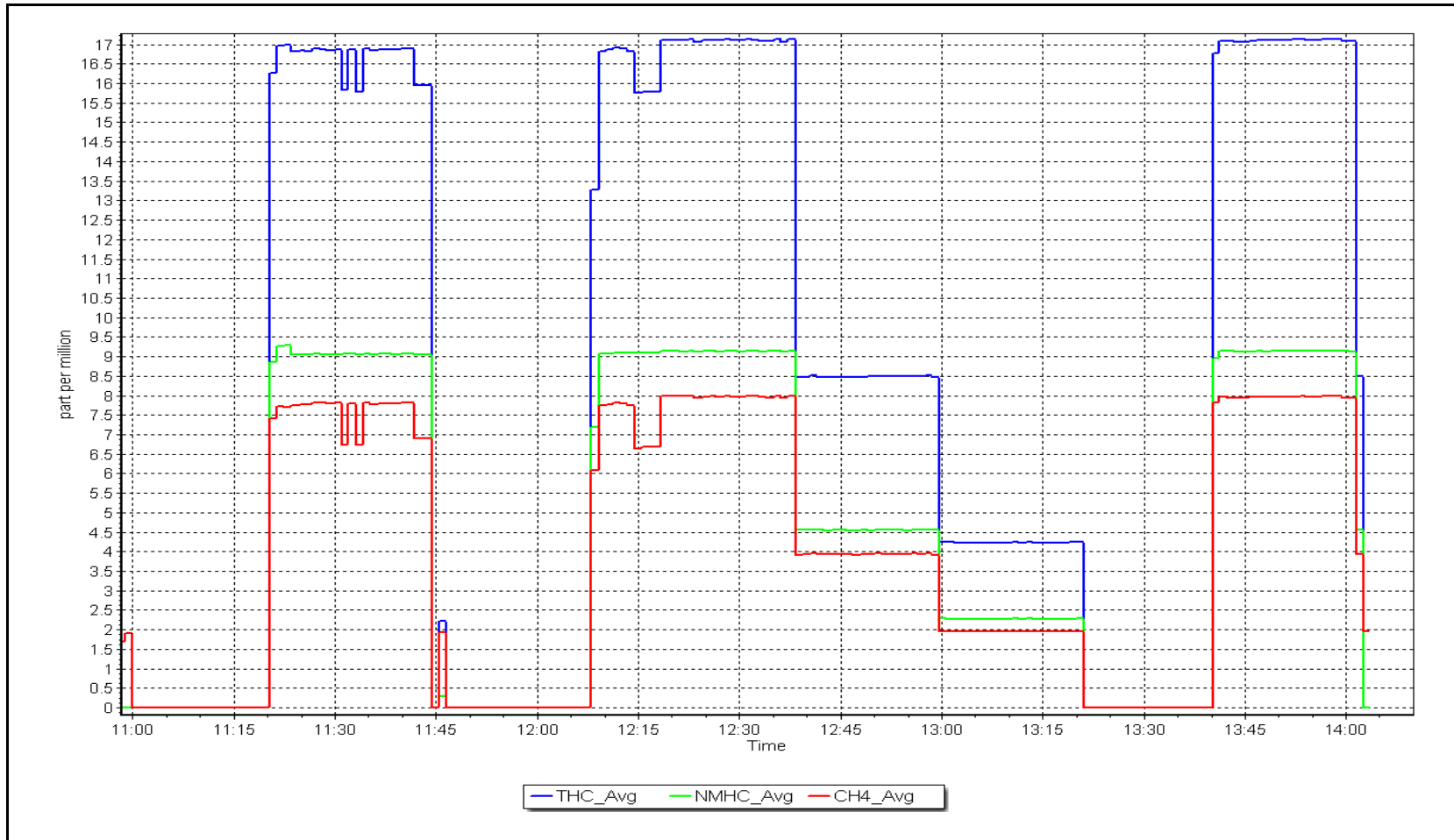
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999996  | $\geq 0.995$  |       |          |             |
| 9.14                                | 9.14                               | 0.9997                    |                         |           |               |       |          |             |
| 4.57                                | 4.55                               | 1.0034                    |                         |           |               | Slope | 1.000225 | 0.90 - 1.10 |
| 2.28                                | 2.27                               | 1.0018                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.005211 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: March 10, 2023

Location: Barge Landing







# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                |                 |                |
|-------------------|----------------|-----------------|----------------|
| Station Name:     | Barge Landing  | Station number: | AMS09          |
| Calibration Date: | March 20, 2023 | Last Cal Date:  | March 10, 2023 |
| Start time (MST): | 8:10           | End time (MST): | 12:16          |
| Reason:           | Maintenance    |                 |                |

### Calibration Standards

|   |           |                             |                 |
|---|-----------|-----------------------------|-----------------|
| Gas Cert Reference:                         | CC151285  | Cal Gas Expiry Date:        | January 5, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 497.6 ppm | CH <sub>4</sub> Equiv Conc. | 1067.1 ppm      |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.1 ppm |                             |                 |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA              |
| Removed CH <sub>4</sub> Conc.               | 497.6 ppm | CH <sub>4</sub> Equiv Conc. | 1067.1 ppm      |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.1 ppm | Diff between cyl (THC):     |                 |
| Diff between cyl (CH <sub>4</sub> ):        |           | 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 #:           | 1170050131 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.03E-04     | 2.16E-04      | NMHC SP Ratio:  | 4.30E-05      |
| CH <sub>4</sub> Retention time: | 12.6         | 13.0          | NMHC Peak Area: | 212383        |
|                                 |              |               |                 | 208794        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.02                | ----                       |
| as found span         | 4919              | 80.2                 | 17.12                | 16.55               | 1.034                      |
| as found 2nd point    | 4960              | 40.1                 | 8.56                 | 7.90                | 1.083                      |
| as found 3rd point    | 4980              | 20.0                 | 4.27                 | 4.08                | 1.046                      |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4919              | 80.2                 | 17.12                | 17.10               | 1.001                      |
| second point          | 4960              | 40.1                 | 8.56                 | 8.49                | 1.008                      |
| third point           | 4980              | 20.0                 | 4.27                 | 4.24                | 1.007                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4919              | 80.2                 | 17.12                | 17.08               | 1.002                      |

| Average Correction Factor |       |                 |          | 1.005                                      |
|---------------------------|-------|-----------------|----------|--|
| Baseline Corr AF:         | 16.53 | Prev response   | 17.09    | *% change -3.4%                            |
| Baseline Corr 2nd AF:     | 7.9   | AF Slope:       | 0.964242 | AF Intercept: -0.081318                    |
| Baseline Corr 3rd AF:     | 4.1   | AF Correlation: | 0.999323 | * = > +/-5% change initiates investigation |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.0  | ----                       |
| as found span             | 4919              | 80.2                 | 9.14                 | 9.11                                       | 1.003                      |
| as found 2nd point        | 4960              | 40.1                 | 4.57                 | 4.5  | 1.006                      |
| as found 3rd point        | 4980              | 20.0                 | 2.28                 | 2.26                                       | 1.008                      |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4919              | 80.2                 | 9.14                 | 9.13                                       | 1.001                      |
| second point              | 4960              | 40.1                 | 4.57                 | 4.55                                       | 1.004                      |
| third point               | 4980              | 20                   | 2.28                 | 2.28                                       | 0.999                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4919              | 80.2                 | 9.14                 | 9.11                                       | 1.003                      |
| Average Correction Factor |                   |                      |                      |  | 1.001                      |
| Baseline Corr AF:         | 9.11              | Prev response        | 9.13                 | *% change                                  | -0.3%                      |
| Baseline Corr 2nd AF:     | 4.5               | AF Slope:            | 0.997337             | AF Intercept:                              | -0.007421                  |
| Baseline Corr 3rd AF:     | 2.3               | AF Correlation:      | 0.999996             | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.02                                       | ----                       |
| as found span             | 4919              | 80.2                 | 7.98                 | 7.44                                       | 1.073                      |
| as found 2nd point        | 4960              | 40.1                 | 3.99                 | 3.24                                       | <b>1.232</b>               |
| as found 3rd point        | 4980              | 20.0                 | 1.99                 | 1.82                                       | 1.094                      |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4919              | 80.2                 | 7.98                 | 7.96                                       | 1.003                      |
| second point              | 4960              | 40.1                 | 3.99                 | 3.95                                       | 1.010                      |
| third point               | 4980              | 20.0                 | 1.99                 | 1.96                                       | 1.016                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4919              | 80.2                 | 7.98                 | 7.97                                       | 1.002                      |
| Average Correction Factor |                   |                      |                      |  | 1.010                      |
| Baseline Corr AF:         | 7.42              | Prev response        | 7.96                 | *% change                                  | -7.2%                      |
| Baseline Corr 2nd AF:     | 3.22              | AF Slope:            | 0.924642             | AF Intercept:                              | -0.097893                  |
| Baseline Corr 3rd AF:     | 1.80              | AF Correlation:      | 0.994383             | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.999991     | 0.998949      |
| THC Cal Offset:             | -0.027960    | -0.021159     |
| CH <sub>4</sub> Cal Slope:  | 0.999623     | 0.997790      |
| CH <sub>4</sub> Cal Offset: | -0.022149    | -0.015750     |
| NMHC Cal Slope:             | 1.000225     | 0.998962      |
| NMHC Cal Offset:            | -0.005211    | -0.001412     |

Notes: CH<sub>4</sub> channel dipping. Actuator and pump changed. Zero and Span adjusted.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## THC Calibration Summary

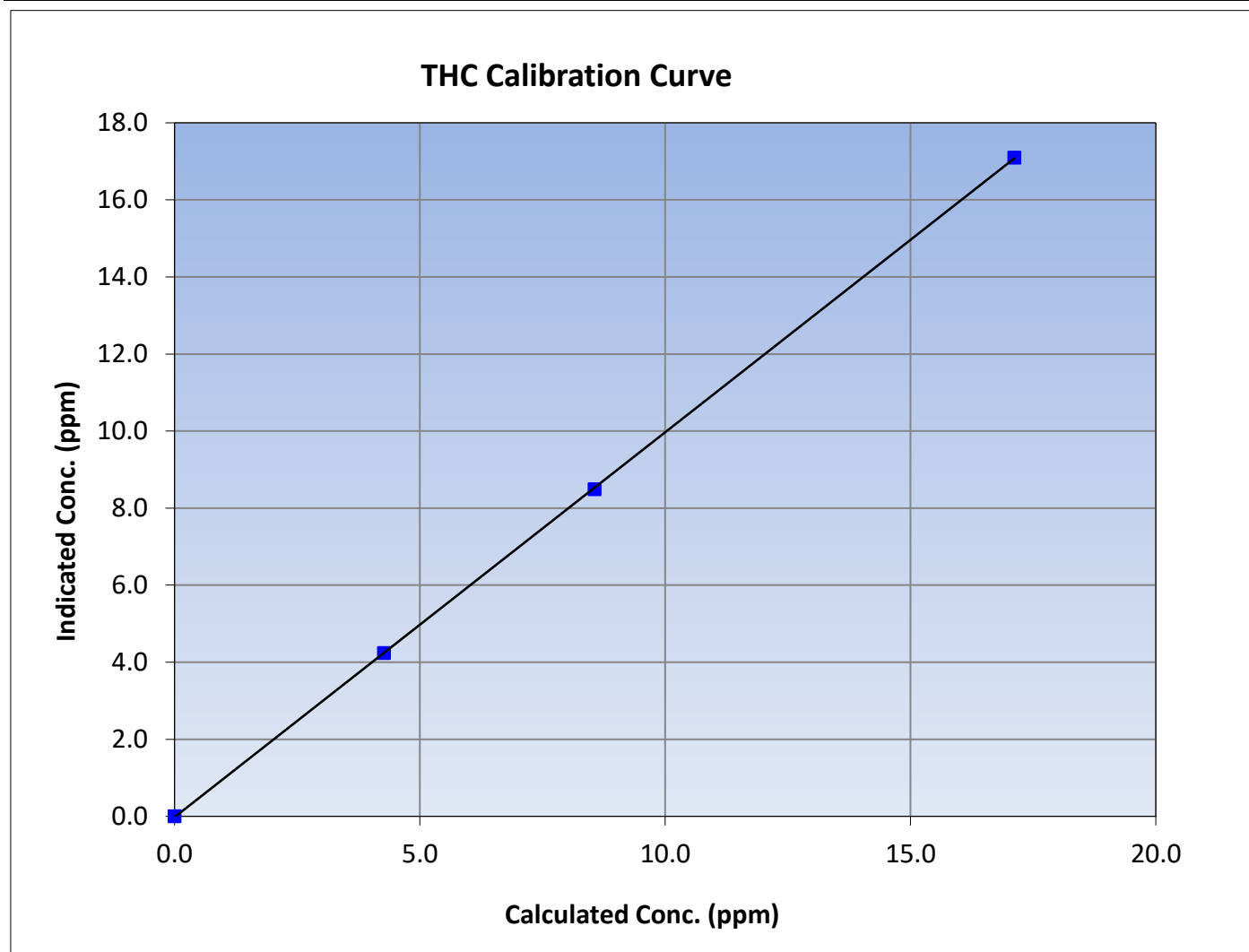
Version-01-2020

### Station Information

|                   |                |                       |                |
|-------------------|----------------|-----------------------|----------------|
| Calibration Date: | March 20, 2023 | Previous Calibration: | March 10, 2023 |
| Station Name:     | Barge Landing  | Station Number:       | AMS09          |
| Start Time (MST): | 8:10           | End Time (MST):       | 12:16          |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1170050131     |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999986  | $\geq 0.995$  |       |          |             |
| 17.12                               | 17.10                              | 1.0011                    |                         |           |               |       |          |             |
| 8.56                                | 8.49                               | 1.0080                    |                         |           |               | Slope | 0.998949 | 0.90 - 1.10 |
| 4.27                                | 4.24                               | 1.0067                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.021159 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

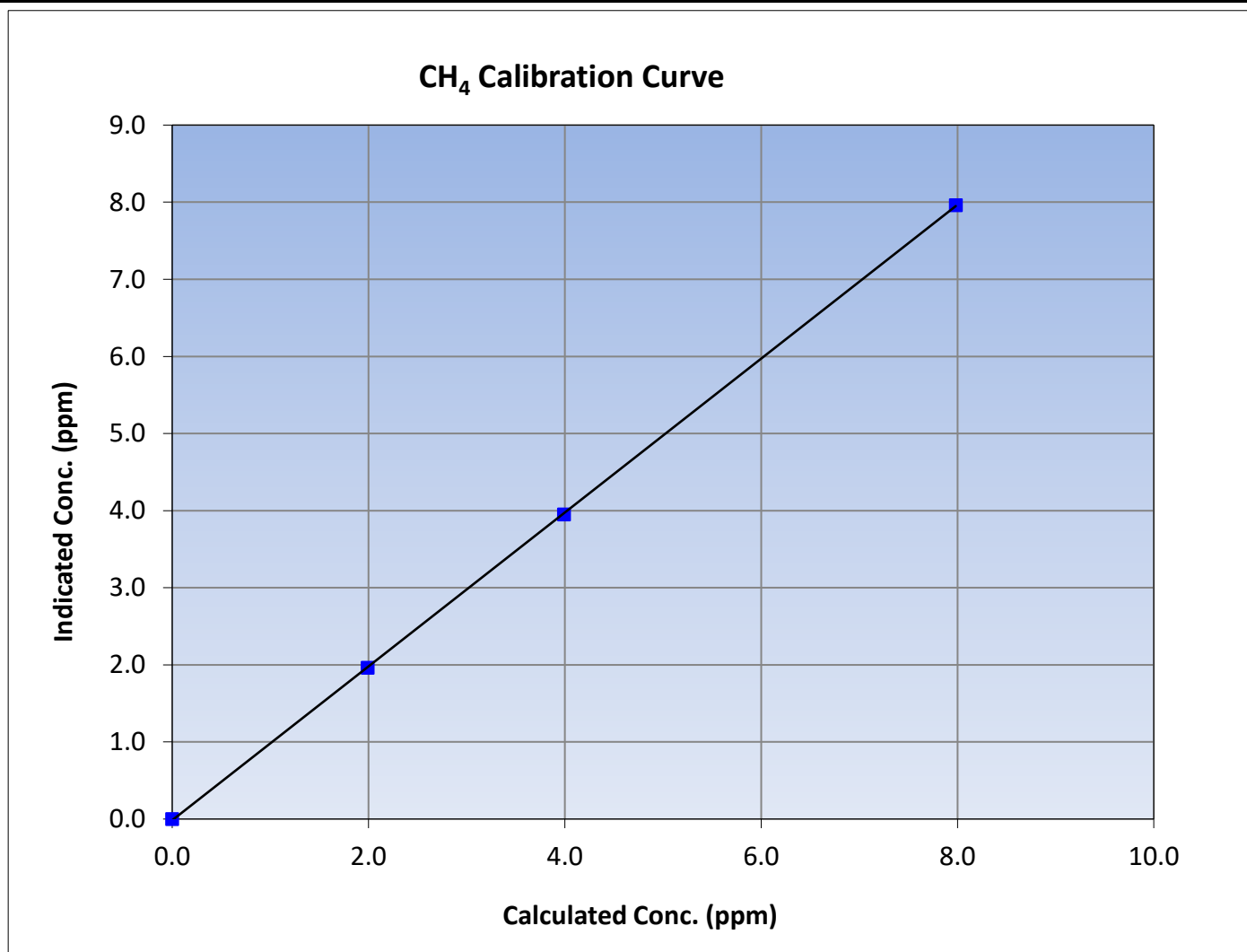
Version-01-2020

### Station Information

|                   |                |                       |                |
|-------------------|----------------|-----------------------|----------------|
| Calibration Date: | March 20, 2023 | Previous Calibration: | March 10, 2023 |
| Station Name:     | Barge Landing  | Station Number:       | AMS09          |
| Start Time (MST): | 8:10           | End Time (MST):       | 12:16          |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1170050131     |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999979  | ≥0.995        |
| 7.98                                | 7.96                               | 1.0029                    |                         |           |               |
| 3.99                                | 3.95                               | 1.0103                    |                         |           |               |
| 1.99                                | 1.96                               | 1.0155                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 0.997790  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.015750 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

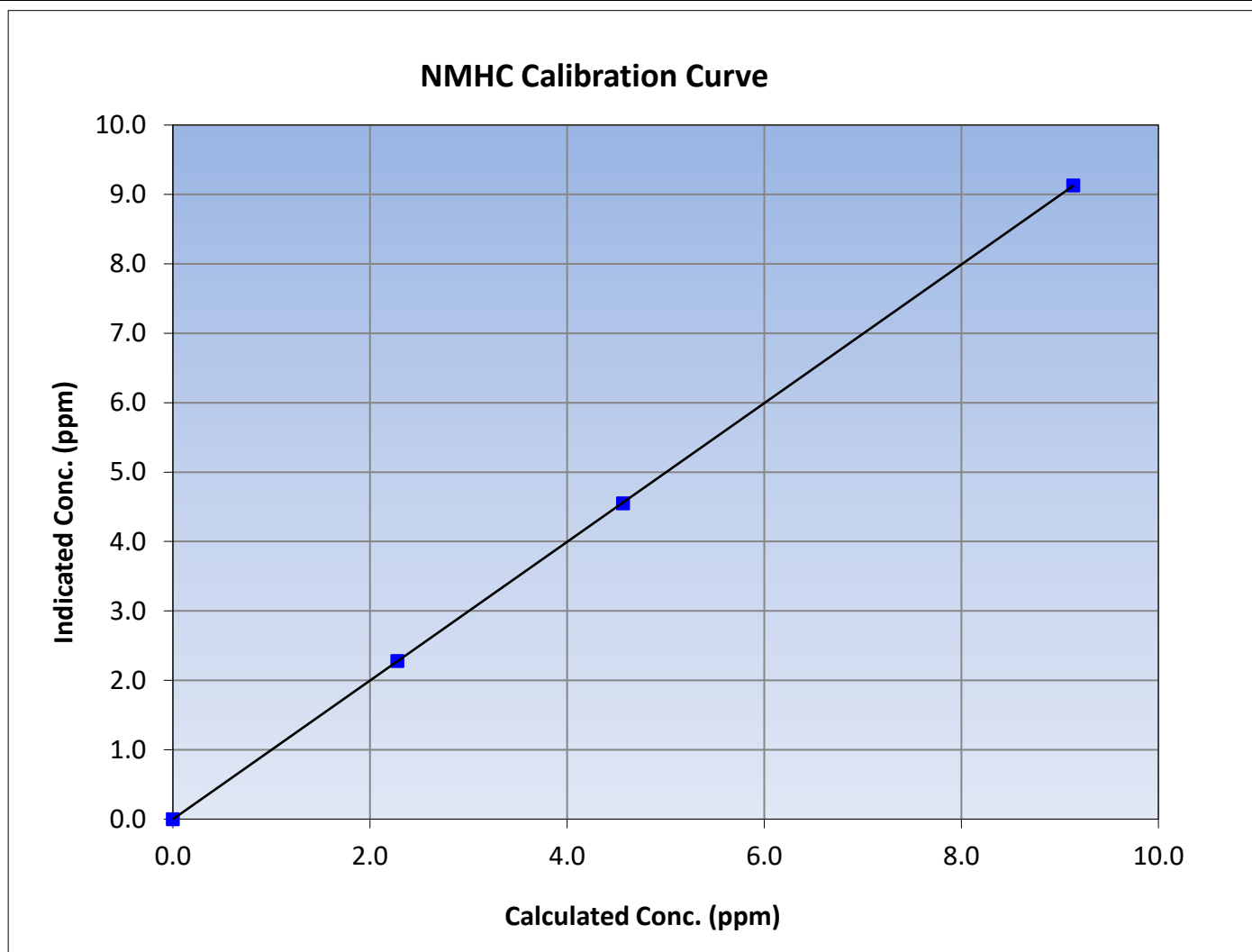
Version-01-2020

### Station Information

|                   |                |                       |                |
|-------------------|----------------|-----------------------|----------------|
| Calibration Date: | March 20, 2023 | Previous Calibration: | March 10, 2023 |
| Station Name:     | Barge Landing  | Station Number:       | AMS09          |
| Start Time (MST): | 8:10           | End Time (MST):       | 12:16          |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1170050131     |

### Calibration Data

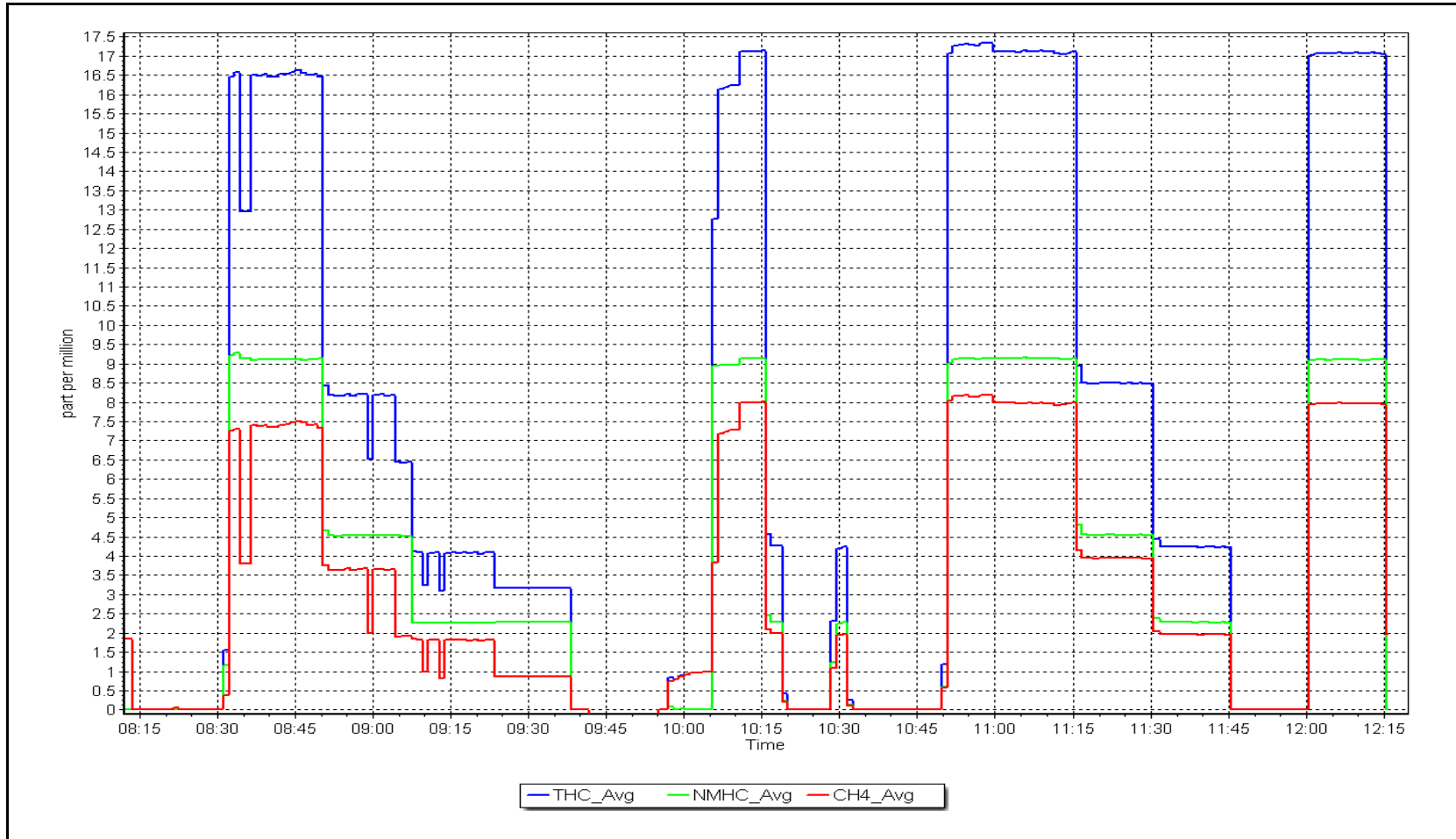
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999996  | $\geq 0.995$  |
| 9.14                                | 9.13                               | 1.0007                    |                         |           |               |
| 4.57                                | 4.55                               | 1.0038                    |                         |           |               |
| 2.28                                | 2.28                               | 0.9992                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 0.998962  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.001412 | +/-0.5        |



NMHC Calibration Plot

Date: March 20, 2023

Location: Barge Landing





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                |                 |                |
|-------------------|----------------|-----------------|----------------|
| Station Name:     | Barge Landing  | Station number: | AMS09          |
| Calibration Date: | March 28, 2023 | Last Cal Date:  | March 20, 2023 |
| Start time (MST): | 10:37          | End time (MST): | 16:45          |
| Reason:           | Install        |                 |                |

### Calibration Standards

|   |           |                             |                 |
|---|-----------|-----------------------------|-----------------|
| Gas Cert Reference:                         | CC151285  | Cal Gas Expiry Date:        | January 5, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 497.6 ppm | CH <sub>4</sub> Equiv Conc. | 1067.1 ppm      |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.1 ppm |                             |                 |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA              |
| Removed CH <sub>4</sub> Conc.               | 497.6 ppm | CH <sub>4</sub> Equiv Conc. | 1067.1 ppm      |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.1 ppm | Diff between cyl (THC):     |                 |
| Diff between cyl (CH <sub>4</sub> ):        |           | 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 #:           | 1193585649 |
| THC Range (ppm):  | 0 - 100 ppm |                              |            |
| NMHC Range (ppm): | 0 - 50 ppm  | CH <sub>4</sub> Range (ppm): | 0 - 50 ppm |

|                                 |              |               |                 |               |
|---------------------------------|--------------|---------------|-----------------|---------------|
|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
| CH <sub>4</sub> SP Ratio:       |              | 2.49E-04      | NMHC SP Ratio:  | 4.79E-05      |
| CH <sub>4</sub> Retention time: |              | 15.2          | NMHC Peak Area: | 190949        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| 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            | 4919              | 80.2                 | 17.12                | 17.09               | 1.002                      |
| second point          | 4960              | 40.1                 | 8.56                 | 8.52                | 1.004                      |
| third point           | 4980              | 20.0                 | 4.27                 | 4.28                | 0.998                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4919              | 80.2                 | 17.12                | 17.10               | 1.001                      |

|                       |    |                 |    | Average Correction Factor                  | 1.001 |
|-----------------------|----|-----------------|----|--|-------|
| Baseline Corr AF:     | NA | Prev response   | NA | *% change                                  | NA    |
| Baseline Corr 2nd AF: | NA | AF Slope:       |    | AF Intercept:                              |       |
| Baseline Corr 3rd AF: | NA | AF Correlation: |    | * = > +/-5% change initiates investigation |       |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| 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                | 4919              | 80.2                 | 9.14                 | 9.13                                       | 1.001                      |
| second point              | 4960              | 40.1                 | 4.57                 | 4.56                                       | 1.002                      |
| third point               | 4980              | 20                   | 2.28                 | 2.30                                       | 0.993                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4919              | 80.2                 | 9.14                 | 9.13                                       | 1.001                      |
| Average Correction Factor |                   |                      |                      |  | 0.998                      |
| Baseline Corr AF:         | NA                | Prev response        | NA                   | *% change                                  | NA                         |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| 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                | 4919              | 80.2                 | 7.98                 | 7.96                                       | 1.003                      |
| second point              | 4960              | 40.1                 | 3.99                 | 3.96                                       | 1.007                      |
| third point               | 4980              | 20.0                 | 1.99                 | 1.98                                       | 1.004                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4919              | 80.2                 | 7.98                 | 7.98                                       | 1.001                      |
| Average Correction Factor |                   |                      |                      |  | 1.005                      |
| 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

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              |              | 0.997787      |
| THC Cal Offset:             |              | 0.002047      |
| CH <sub>4</sub> Cal Slope:  |              | 0.996643      |
| CH <sub>4</sub> Cal Offset: |              | -0.003745     |
| NMHC Cal Slope:             |              | 0.998523      |
| NMHC Cal Offset:            |              | 0.006592      |

Notes: Replaced after a failed nightly span, the baseline also drifted to around 1 ppm THC. Adjusted window timings and span, used new zero chromatogram.

Calibration Performed By: Braiden Boutillier





# Wood Buffalo Environmental Association

## THC Calibration Summary

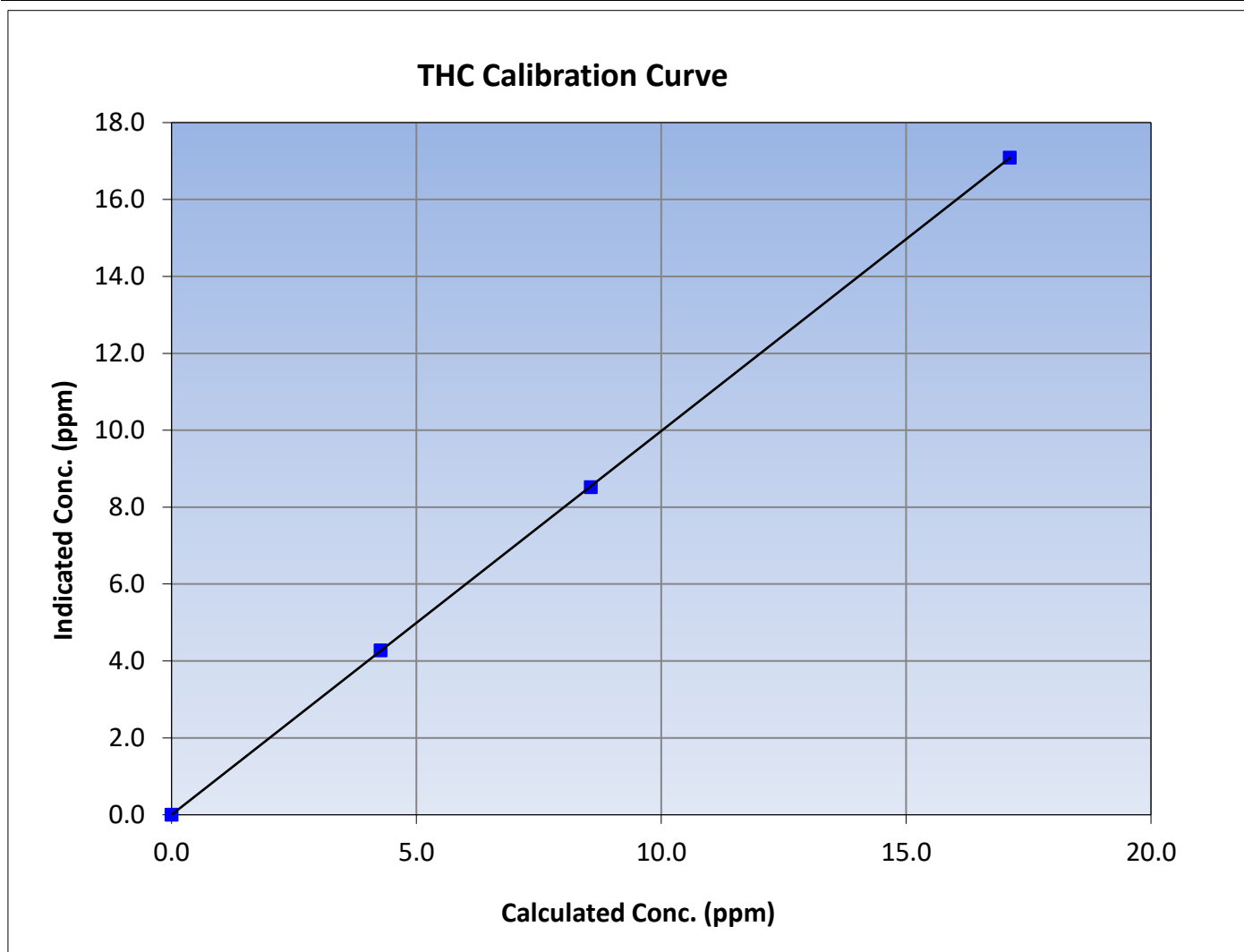
Version-01-2020

### Station Information

|                   |                |                       |                |
|-------------------|----------------|-----------------------|----------------|
| Calibration Date: | March 28, 2023 | Previous Calibration: | March 20, 2023 |
| Station Name:     | Barge Landing  | Station Number:       | AMS09          |
| Start Time (MST): | 10:37          | End Time (MST):       | 16:45          |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1193585649     |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999995 | $\geq 0.995$  |       |          |             |
| 17.12                               | 17.09                              | 1.0017                    |                         |          |               |       |          |             |
| 8.56                                | 8.52                               | 1.0045                    |                         |          |               | Slope | 0.997787 | 0.90 - 1.10 |
| 4.27                                | 4.28                               | 0.9978                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.002047 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

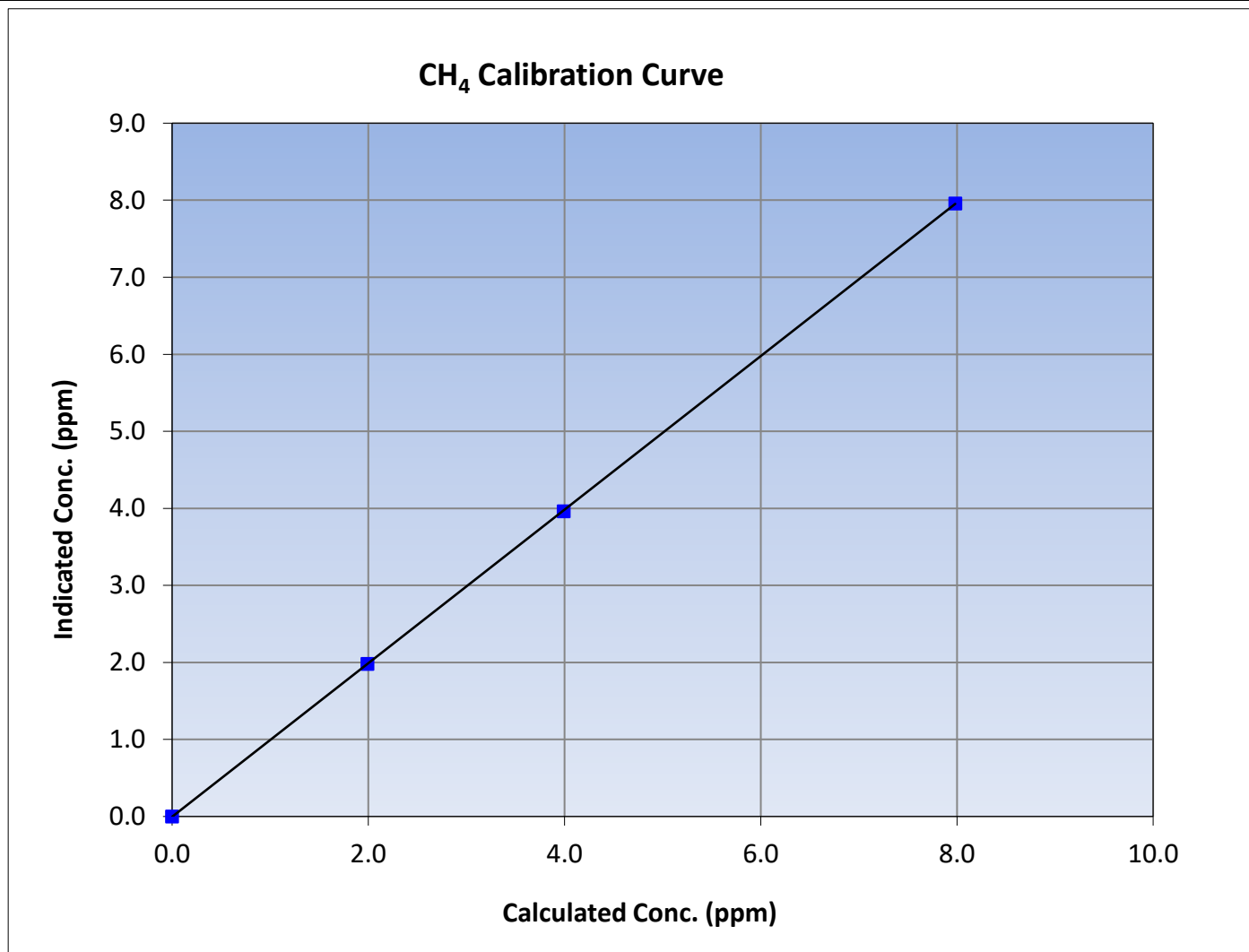
Version-01-2020

### Station Information

|                   |                |                       |                |
|-------------------|----------------|-----------------------|----------------|
| Calibration Date: | March 28, 2023 | Previous Calibration: | March 20, 2023 |
| Station Name:     | Barge Landing  | Station Number:       | AMS09          |
| Start Time (MST): | 10:37          | End Time (MST):       | 16:45          |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1193585649     |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999996  | ≥0.995        |
| 7.98                                | 7.96                               | 1.0032                    |                         |           |               |
| 3.99                                | 3.96                               | 1.0070                    |                         |           |               |
| 1.99                                | 1.98                               | 1.0042                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 0.996643  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.003745 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

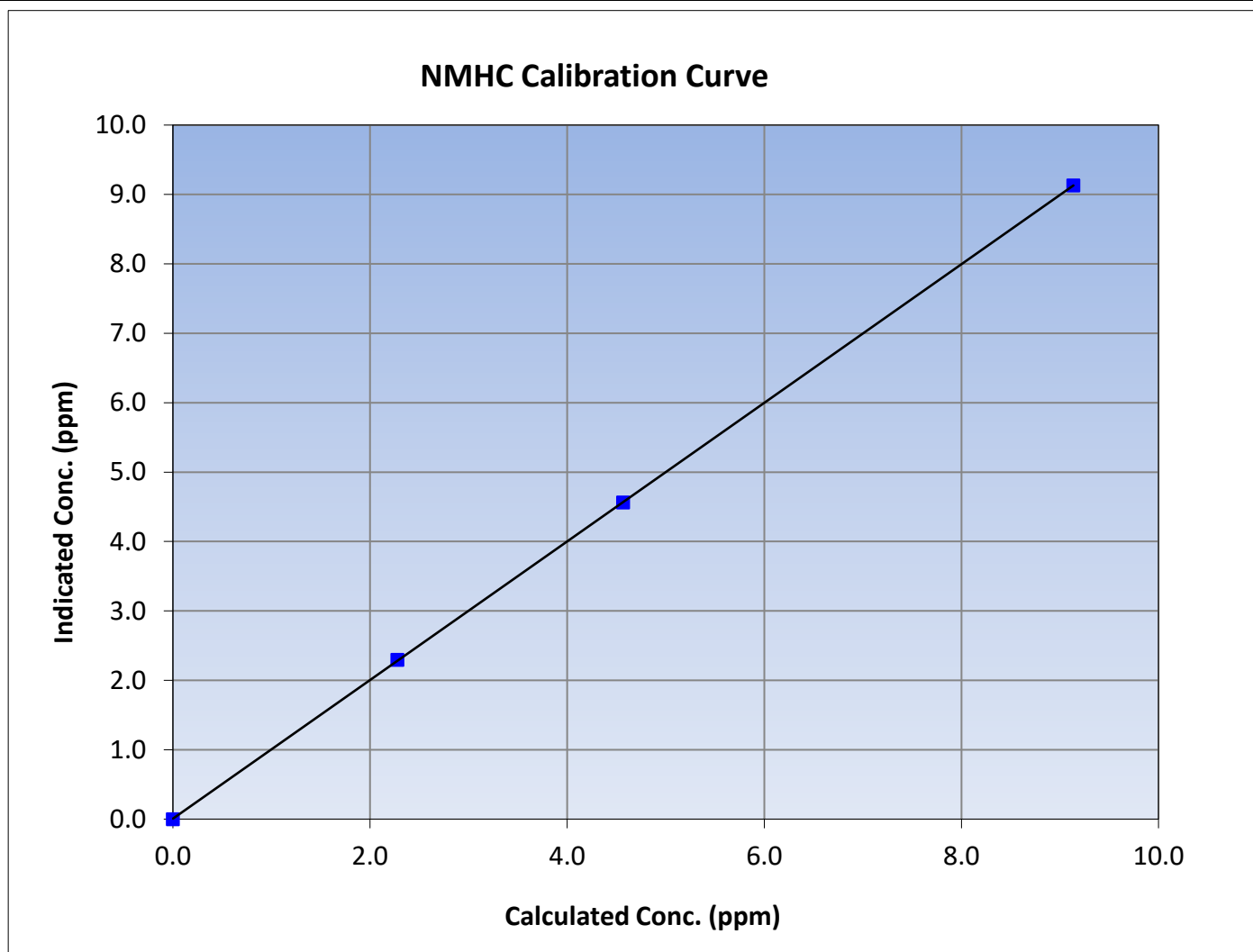
Version-01-2020

### Station Information

|                   |                |                       |                |
|-------------------|----------------|-----------------------|----------------|
| Calibration Date: | March 28, 2023 | Previous Calibration: | March 20, 2023 |
| Station Name:     | Barge Landing  | Station Number:       | AMS09          |
| Start Time (MST): | 10:37          | End Time (MST):       | 16:45          |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1193585649     |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999994 | $\geq 0.995$  |       |          |             |
| 9.14                                | 9.13                               | 1.0007                    |                         |          |               |       |          |             |
| 4.57                                | 4.56                               | 1.0016                    |                         |          |               | Slope | 0.998523 | 0.90 - 1.10 |
| 2.28                                | 2.30                               | 0.9926                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.006592 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: March 28, 2023

Location: Barge Landing





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Barge Landing  
Calibration Date: March 15, 2023  
Start time (MST): 9:45  
Reason: Routine  
Station number: AMS09  
Last Cal Date: February 22, 2023  
End time (MST): 15:12

### Calibration Standards

NO Gas Cylinder #: DT0036634  
NOX Cal Gas Conc: 50.00 ppm  
Removed Cylinder #: NA  
Removed Gas NOX Conc: 50.00 ppm  
NOX gas Diff:  
Calibrator Model: API T700  
ZAG make/model: API T701  
Cal Gas Expiry Date: January 28, 2024  
NO Cal Gas Conc: 49.70 ppm  
Removed Gas Exp Date: NA  
Removed Gas NO Conc: 49.70 ppm  
NO gas Diff:  
Serial Number: 3812  
Serial Number: 4888

### Analyzer Information

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

Analyzer serial #: 1426262593

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.146        | 1.175         | NO bkgnd or offset:  | 10.3         | 10.5          |
| NOX coeff or slope: | 0.996        | 0.995         | NOX bkgnd or offset: | 10.3         | 10.6          |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 179.2        | 175.2         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.998455     | 0.998241      |
| NO <sub>x</sub> Cal Offset: | 0.648644     | 0.748819      |
| NO Cal Slope:               | 1.000928     | 1.000056      |
| NO Cal Offset:              | -0.732611    | -0.352413     |
| NO <sub>2</sub> Cal Slope:  | 1.000063     | 1.001921      |
| NO <sub>2</sub> Cal Offset: | -1.156786    | -0.892005     |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.1   | -0.1                                  | 0.0  | ----  | ----   |
| as found span             | 4919                      | 80.5                        | 805.1   | 800.3                                  | 4.8   | 787.0  | 781.9                                 | 5.1  | 1.023   | 1.023  |
| 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                | 4919                      | 80.5                        | 805.1   | 800.3                                  | 4.8   | 804.0  | 800.0                                 | 3.4  | 1.001   | 1.000  |
| second point              | 4959                      | 40.2                        | 402.1   | 399.7                                  | 2.4   | 402.7  | 399.6                                 | 3.1  | 0.998   | 1.000  |
| third point               | 4979                      | 20.1                        | 201.0   | 199.8                                  | 1.2   | 201.9  | 198.7                                 | 3.2  | 0.996   | 1.006  |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.1  | 0.1                                   | 0.0  | ----  | ----   |
| as left span              | 4919                      | 80.5                        | 805.1   | 450.4                                  | 354.7   | 799.3  | 445.0                                 | 354.3  | 1.007   | 1.012  |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.998   | 1.002  |

|                      |                             |                |  |                                  |                         |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|
| Corrected As found   | NO <sub>x</sub> = 787.1 ppb | NO = 782.0 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -2.2% |
| Previous Response    | NO <sub>x</sub> = 804.5 ppb | NO = 800.3 ppb |  | *Percent Change                  | NO = -2.3%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 794.5                                      | 444.6                                 | 354.7   | 354.9  | 1.000  | 100.0%   |
| 2nd GPT point (200 ppb O3)       | 794.5                                      | 664.2                                 | 135.1   | 133.8  | 1.010  | 99.0%  |
| 3rd GPT point (100 ppb O3)       | 794.5                                      | 728.8                                 | 70.5  | 69.2   | 1.019  | 98.1%  |
| Average Correction Factor        |  |                                       |   |  | 1.010  | 99.1%  |

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

Calibration Performed By: Braiden Boutilier



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

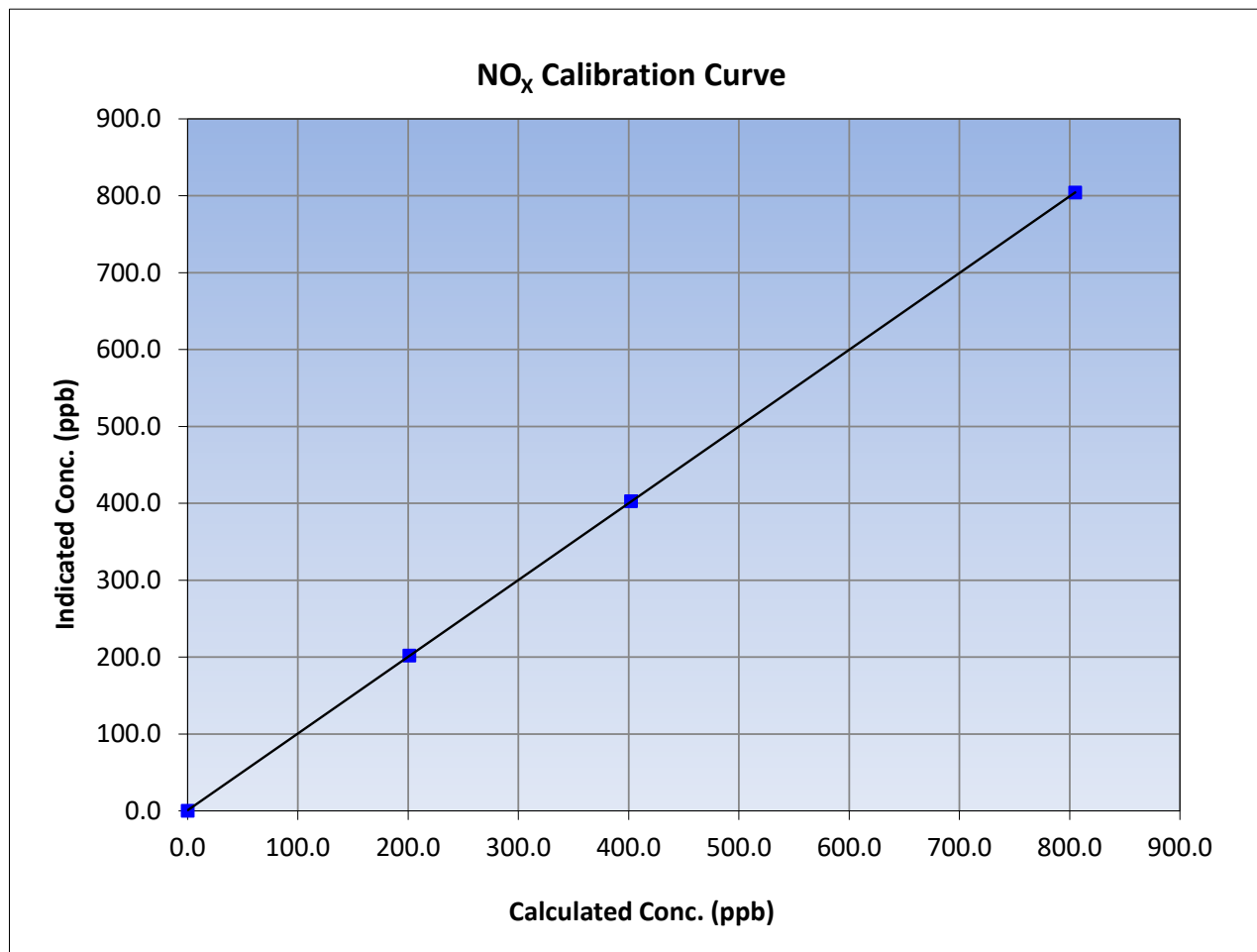
Version-04-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 15, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Barge Landing  | Station Number:       | AMS09             |
| Start Time (MST): | 9:45           | End Time (MST):       | 15:12             |
| 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 | ≥0.995   |             |
| 805.1                               | 804.0                              | 1.0013                    |                         |          |             |
| 402.1                               | 402.7                              | 0.9984                    |                         |          |             |
| 201.0                               | 201.9                              | 0.9957                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 0.998241 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.748819 | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

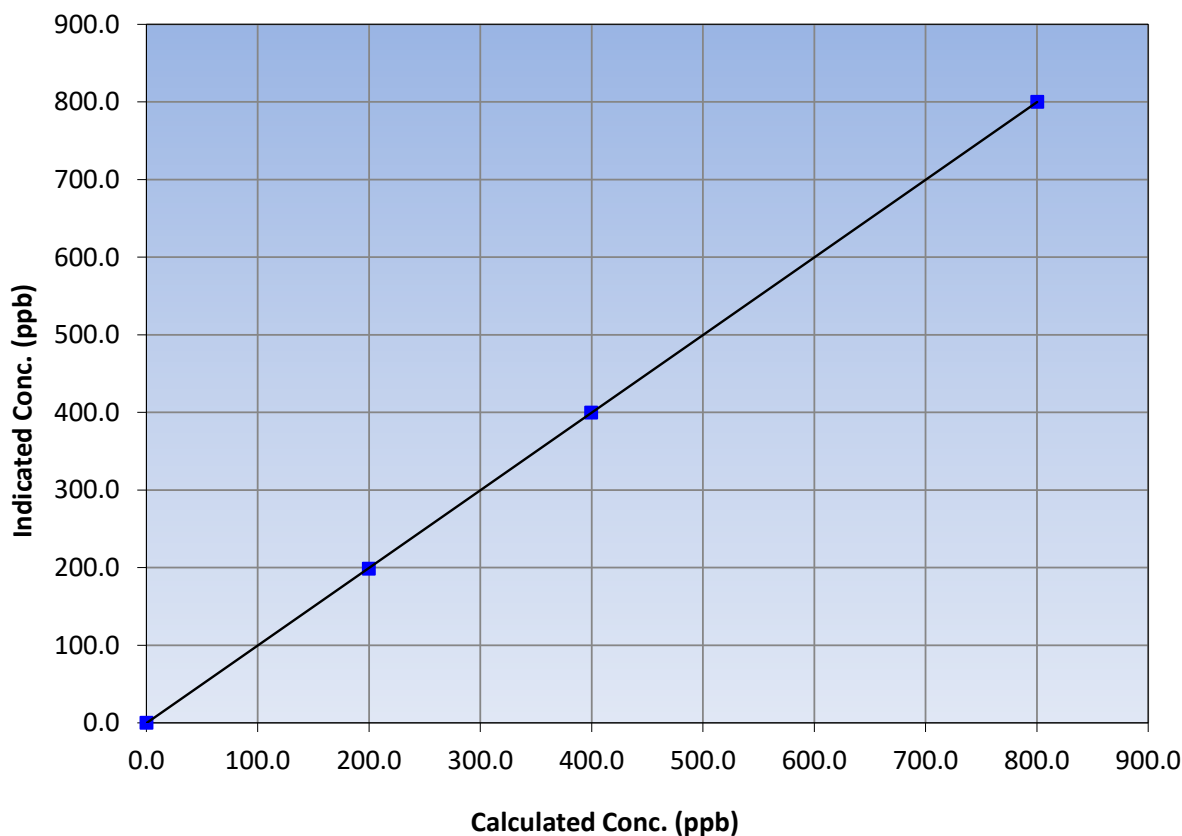
### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 15, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Barge Landing  | Station Number:       | AMS09             |
| Start Time (MST): | 9:45           | End Time (MST):       | 15:12             |
| 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<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.3                               | 800.0                              | 1.0003                    |   |                                |
| 399.7                               | 399.6                              | 1.0001                    |   |                                |
| 199.8                               | 198.7                              | 1.0057                    |   |                                |
|                                     |                                    |                           | 0.999997                                      |                                |
|                                     |                                    |                           | 1.000056                                      |                                |
|                                     |                                    |                           | -0.352413                                     |                                |

**NO Calibration Curve**







# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

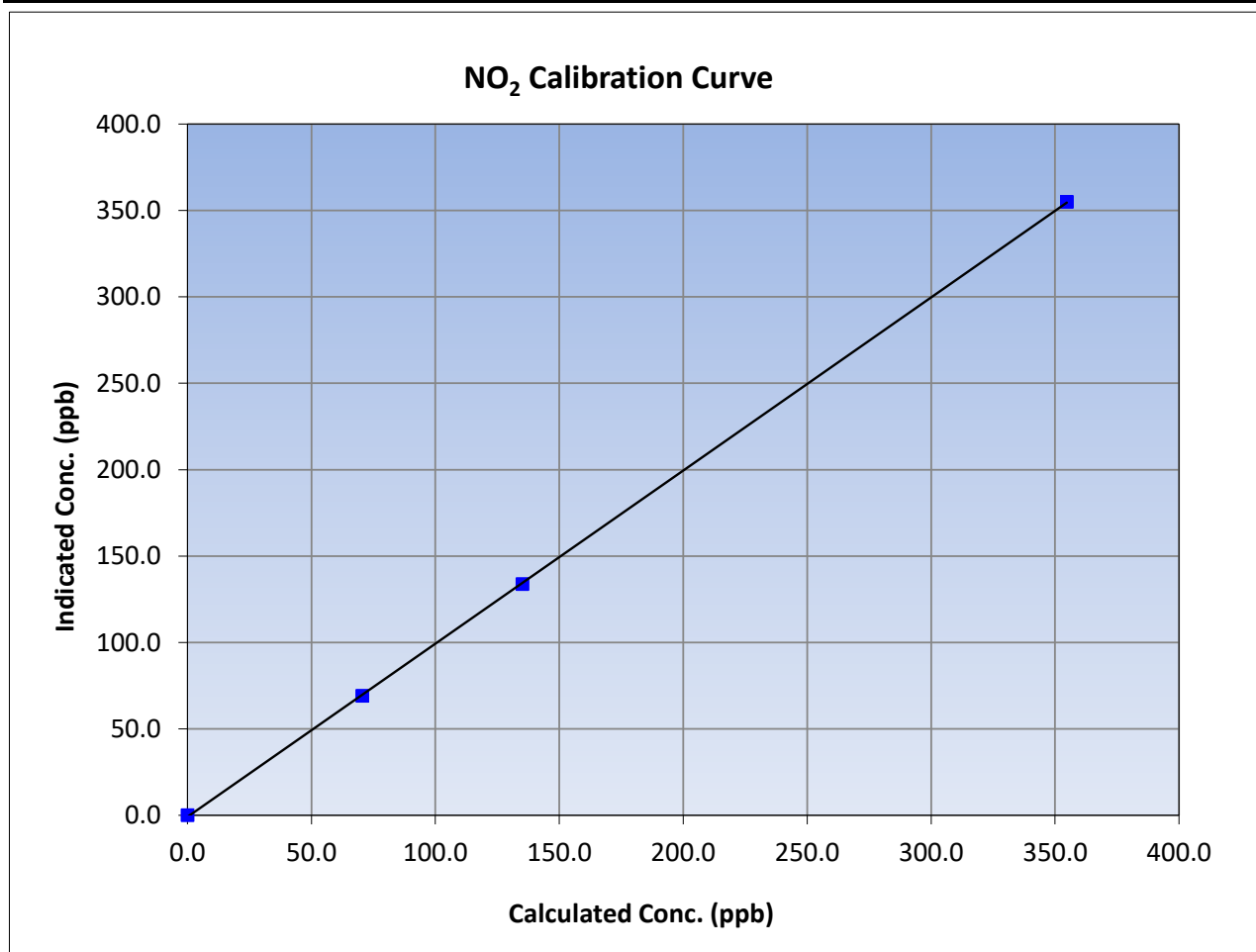
Version-04-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 15, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Barge Landing  | Station Number:       | AMS09             |
| Start Time (MST): | 9:45           | End Time (MST):       | 15:12             |
| Analyzer make:    | Thermo 42i     | Analyzer serial #:    | 1426262593        |

### Calibration Data

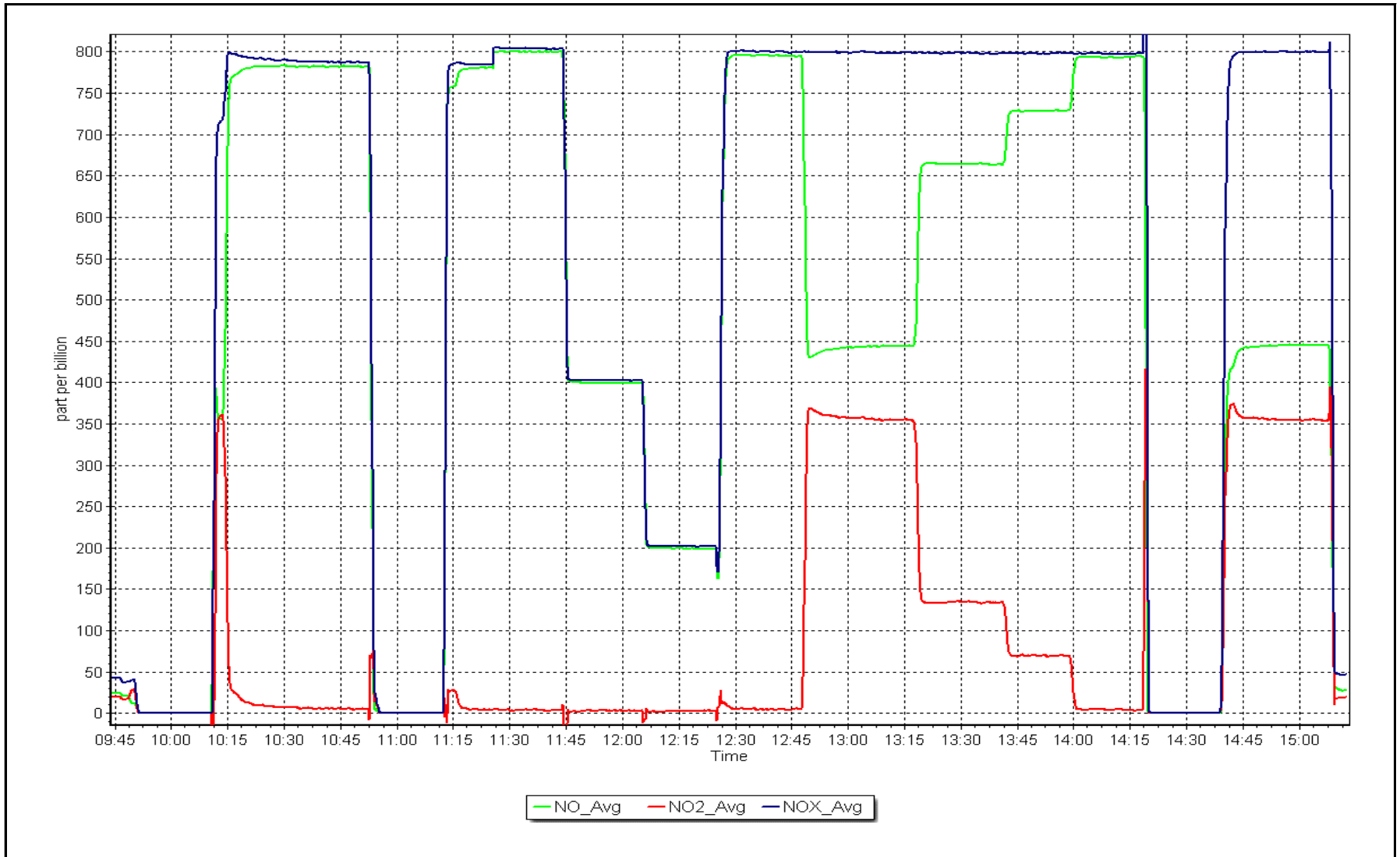
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | Limits |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|--------|-------|----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999975  | ≥0.995 |       |          |             |
| 354.7                               | 354.9                              | 0.9995                    |                         |           |        |       |          |             |
| 135.1                               | 133.8                              | 1.0099                    |                         |           |        | Slope | 1.001921 | 0.90 - 1.10 |
| 70.5                                | 69.2                               | 1.0192                    |                         |           |        |       |          |             |
|                                     |                                    |                           | Intercept               | -0.892005 | +/-20  |       |          |             |



NO<sub>x</sub> Calibration Plot

Date: March 15, 2023

Location: Barge Landing







## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS11 LOWER CAMP MARCH 2023**

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

April 29, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

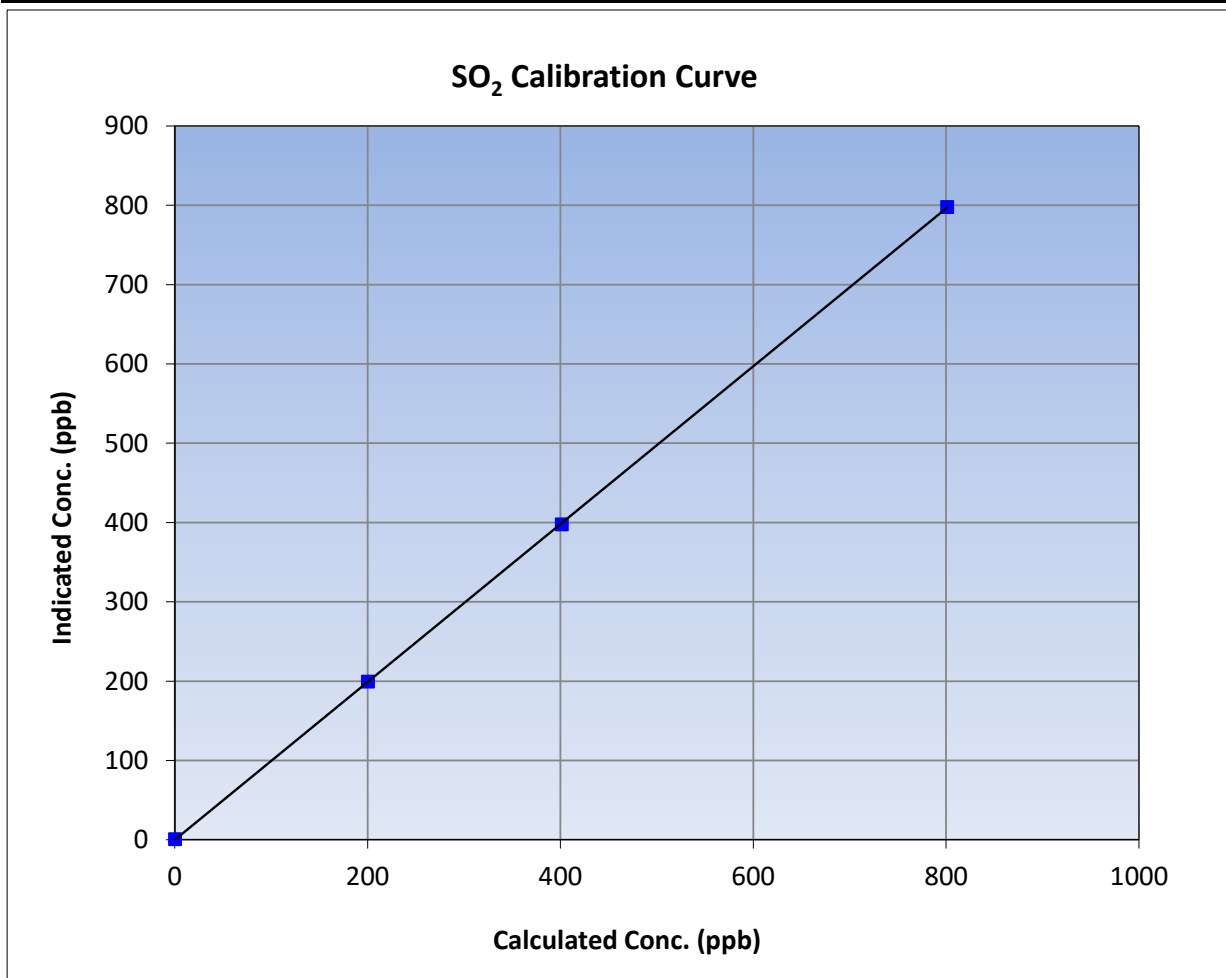
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 7, 2023 | Previous Calibration: | February 7, 2023 |
| Station Name:     | Lower Camp    | Station Number:       | AMS11            |
| Start Time (MST): | 10:53         | End Time (MST):       | 14:06            |
| Analyzer make:    | Thermo 43i    | Analyzer serial #:    | 100841398        |

### Calibration Data

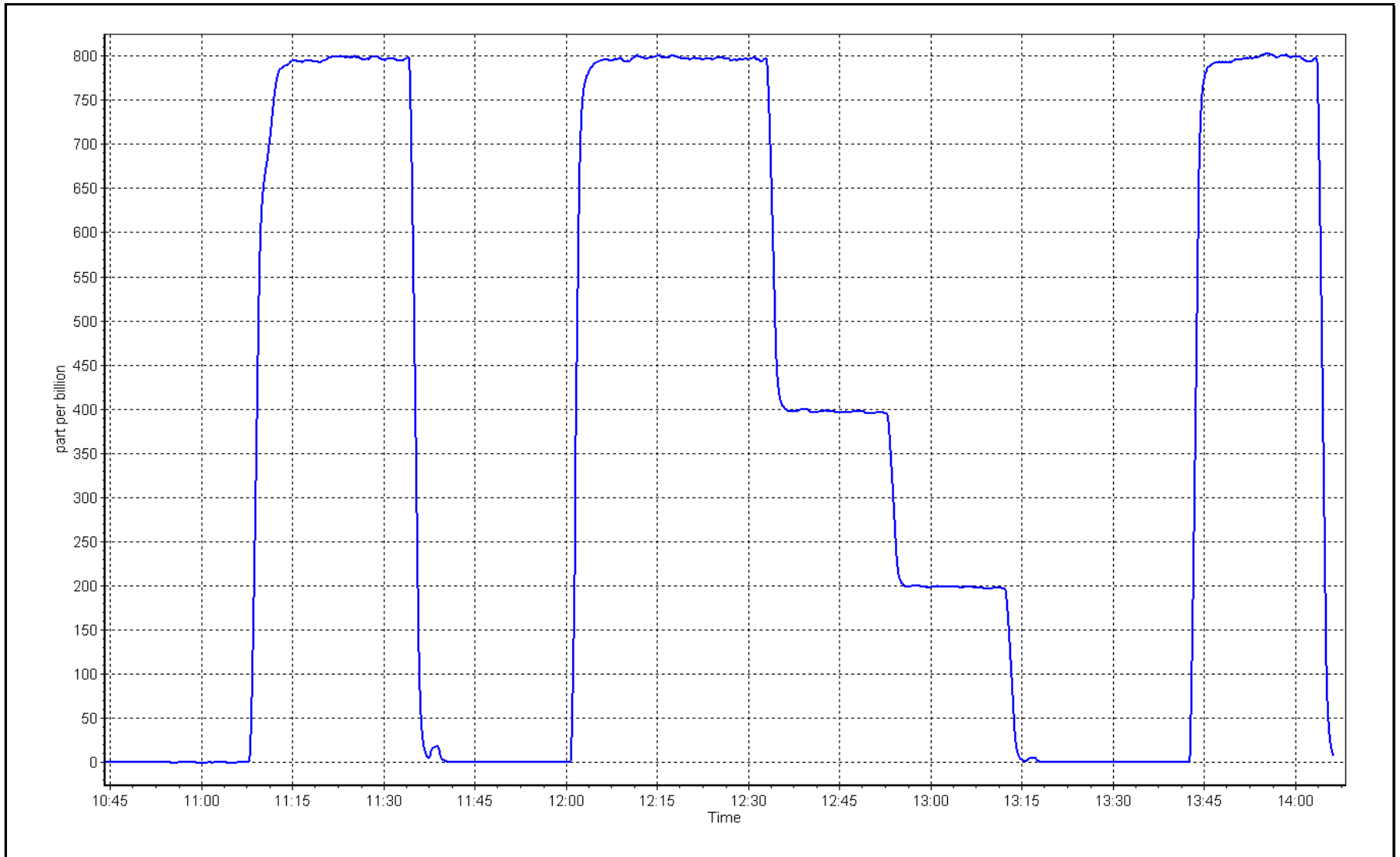
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.4                                   | ----                         | Correlation Coefficient | 0.999989      |             |
| 800.8                                  | 797.6                                 | 1.0040                       |                         |               | ≥0.995      |
| 400.9                                  | 397.2                                 | 1.0094                       | Slope                   | 0.995374      |             |
| 199.9                                  | 199.1                                 | 1.0042                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | -0.208611     | +/-30       |



SO2 Calibration Plot

Date: March 7, 2023

Location: Lower Camp





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Lower Camp      Station number: AMS11  
 Calibration Date: March 28, 2023      Last Cal Date: February 8, 2023  
 Start time (MST): 9:47      End time (MST): 16:03  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.429 ppm      Cal Gas Exp Date: January 4, 2025  
 Cal Gas Cylinder #: CC501097  
 Removed Cal Gas Conc: 5.429 ppm      Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA      Diff between cyl:  
 Calibrator Make/Model: API T700      Serial Number: 3807  
 ZAG Make/Model: API T701H      Serial Number: 196

### Analyzer Information

Analyzer make: Thermo 450iQ      Analyzer serial #: CM20080003  
 Converter make: NA      Converter serial #: NA  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.997193     | 1.026375      | Backgd or Offset: 14.0 | 13.9          |
| Calibration intercept: | 0.454865     | 0.532956      | Coeff or Slope: 1.043  | 1.043         |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----   |
| as found span         | 4926                          | 73.6                        | 79.9                                | 79.2                               | 1.014  |
| as found 2nd point    | 4963                          | 36.8                        | 40.0                                | 40.3                               | 1.001  |
| as found 3rd point    | 4982                          | 18.6                        | 20.2                                | 20.1                               | 1.025  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| high point                              | 4926                          | 73.6                        | 79.9                                | 82.4                               | 0.970   |
| second point                            | 4963                          | 36.8                        | 40.0                                | 41.9                               | 0.954   |
| third point                             | 4982                          | 18.6                        | 20.2                                | 21.2                               | 0.953   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 1.7                                | ----  |
| as left span                            | 4926                          | 73.6                        | 79.9                                | 80.2                               | 0.997   |
| SO2 Scrubber Check                      | 4919                          | 81.1                        | 811.0                               | 1.7                                | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    | 0.959   |
| Date of last converter efficiency test: |                               |                             |                                     | efficiency                         |   |

Baseline Corr As found: 78.8      Prev response: 80.15      \*% change: -1.7%  
 Baseline Corr 2nd AF pt: 39.9      AF Slope: 0.987574      AF Intercept: 0.416680  
 Baseline Corr 3rd AF pt: 19.7      AF Correlation: 0.999922

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

Notes: Changed the 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<sub>2</sub>S Calibration Summary

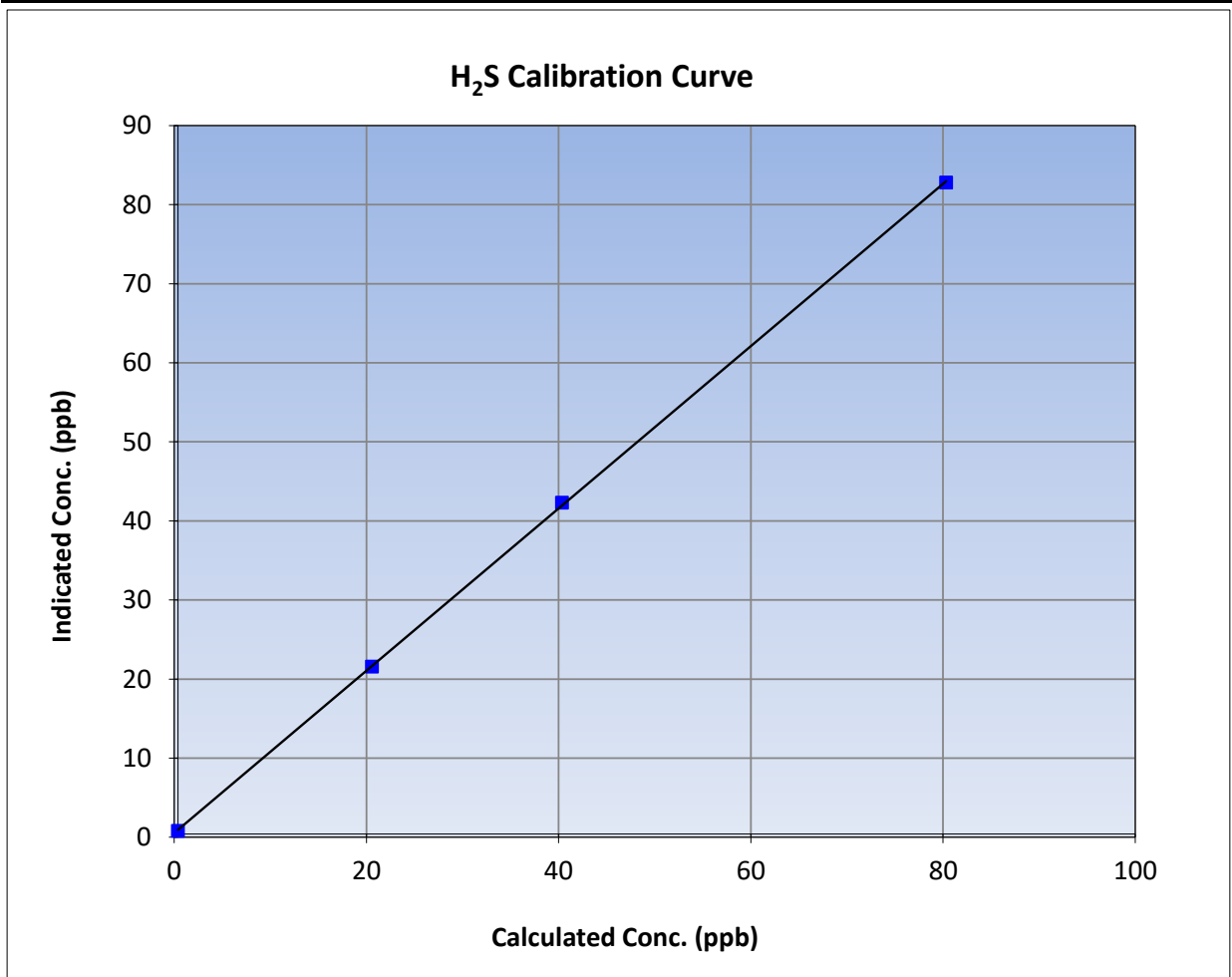
Version-11-2021

### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 28, 2023 | Previous Calibration: | February 8, 2023 |
| Station Name:     | Lower Camp     | Station Number:       | AMS11            |
| Start Time (MST): | 9:47           | End Time (MST):       | 16:03            |
| Analyzer make:    | Thermo 450iQ   | Analyzer serial #:    | CM20080003       |

### Calibration Data

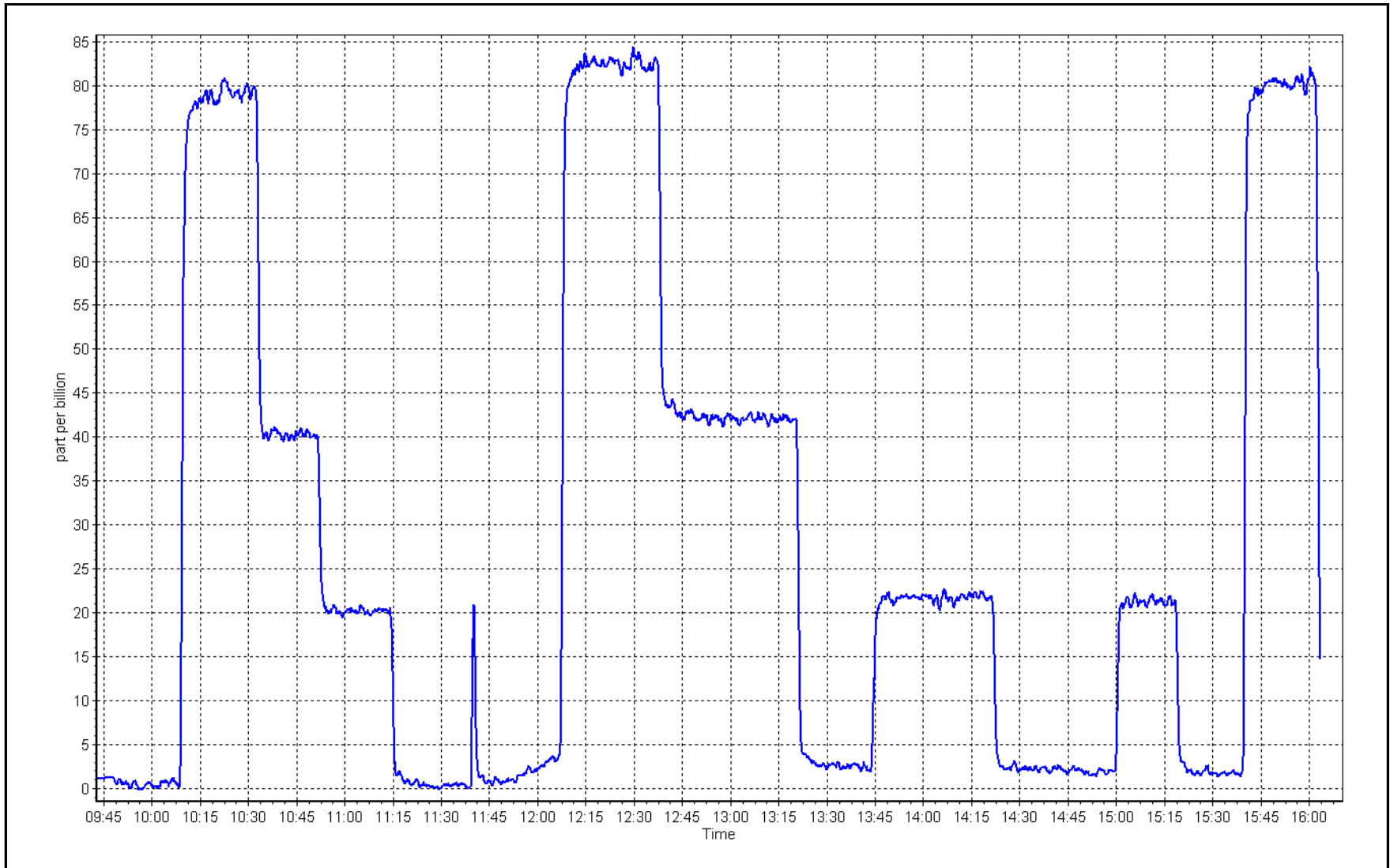
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.4                                | ----                      | Correlation Coefficient | 0.999953 |             |
| 79.9                                | 82.4                               | 0.9699                    |                         |          | ≥0.995      |
| 40.0                                | 41.9                               | 0.9537                    | Slope                   | 1.026375 |             |
| 20.2                                | 21.2                               | 0.9525                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.532956 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: March 28, 2023

Location: Lower Camp





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |               |                 |                  |
|-------------------|---------------|-----------------|------------------|
| Station Name:     | Lower Camp    | Station number: | AMS11            |
| Calibration Date: | March 7, 2023 | Last Cal Date:  | February 7, 2023 |
| Start time (MST): | 10:53         | End time (MST): | 14:06            |
| Reason:           | Routine       |                 |                  |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC2216    | Cal Gas Expiry Date:        | February 23, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 502.0 ppm | CH <sub>4</sub> Equiv Conc. | 1067.1 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.5 ppm |                             |                   |
| Removed Gas Cert:                           |           | Removed Gas Expiry:         |                   |
| Removed CH <sub>4</sub> Conc.               | 502.0 ppm | CH <sub>4</sub> Equiv Conc. | 1067.1 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.5 ppm |                             |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (THC):     |                   |
| Calibrator Model:                           | API T700  | Diff between cyl (NM):      |                   |
| ZAG make/model:                             | API T701  | Serial Number:              | 3807              |
|   |           | Serial Number:              | 196               |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1505164381 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.09E-04     | 3.02E-04      | NMHC SP Ratio:  | 5.97E-05      |
| CH <sub>4</sub> Retention time: | 14.0         | 13.8          | NMHC Peak Area: | 153551        |
|                                 |              |               |                 | 156599        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4919              | 81.3                 | 17.35                | 17.71               | 0.980                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4919              | 81.3                 | 17.35                | 17.32               | 1.002                      |
| second point          | 4959              | 40.7                 | 8.69                 | 8.62                | 1.008                      |
| third point           | 4980              | 20.3                 | 4.33                 | 4.30                | 1.007                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4919              | 81.3                 | 17.35                | 17.42               | 0.996                      |

| Average Correction Factor |       |                 |       | 1.006                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 17.71 | Prev response   | 17.41 | *% 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4919              | 81.3                 | 9.19                 | 9.35                                       | 0.983                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4919              | 81.3                 | 9.19                 | 9.16                                       | 1.004                      |
| second point              | 4959              | 40.7                 | 4.60                 | 4.56                                       | 1.010                      |
| third point               | 4980              | 20.3                 | 2.29                 | 2.28                                       | 1.008                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4919              | 81.3                 | 9.19                 | 9.22                                       | 0.997                      |
| Average Correction Factor |                   |                      |                      |  | 1.007                      |
| Baseline Corr AF:         | 9.35              | Prev response        | 9.19                 | *% change                                  | 1.6%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4919              | 81.3                 | 8.16                 | 8.37                                       | 0.975                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4919              | 81.3                 | 8.16                 | 8.16                                       | 1.000                      |
| second point              | 4959              | 40.7                 | 4.09                 | 4.06                                       | 1.007                      |
| third point               | 4980              | 20.3                 | 2.04                 | 2.03                                       | 1.006                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4919              | 81.3                 | 8.16                 | 8.20                                       | 0.995                      |
| Average Correction Factor |                   |                      |                      |  | 1.004                      |
| Baseline Corr AF:         | 8.37              | Prev response        | 8.22                 | *% change                                  | 1.8%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.004951     | 0.998030      |
| THC Cal Offset:             | -0.022988    | -0.019190     |
| CH <sub>4</sub> Cal Slope:  | 1.008833     | 1.000126      |
| CH <sub>4</sub> Cal Offset: | -0.014688    | -0.010089     |
| NMHC Cal Slope:             | 1.001278     | 0.996404      |
| NMHC Cal Offset:            | -0.007900    | -0.009301     |

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

Calibration Performed By: Mohammed Kashif



# Wood Buffalo Environmental Association

## THC Calibration Summary

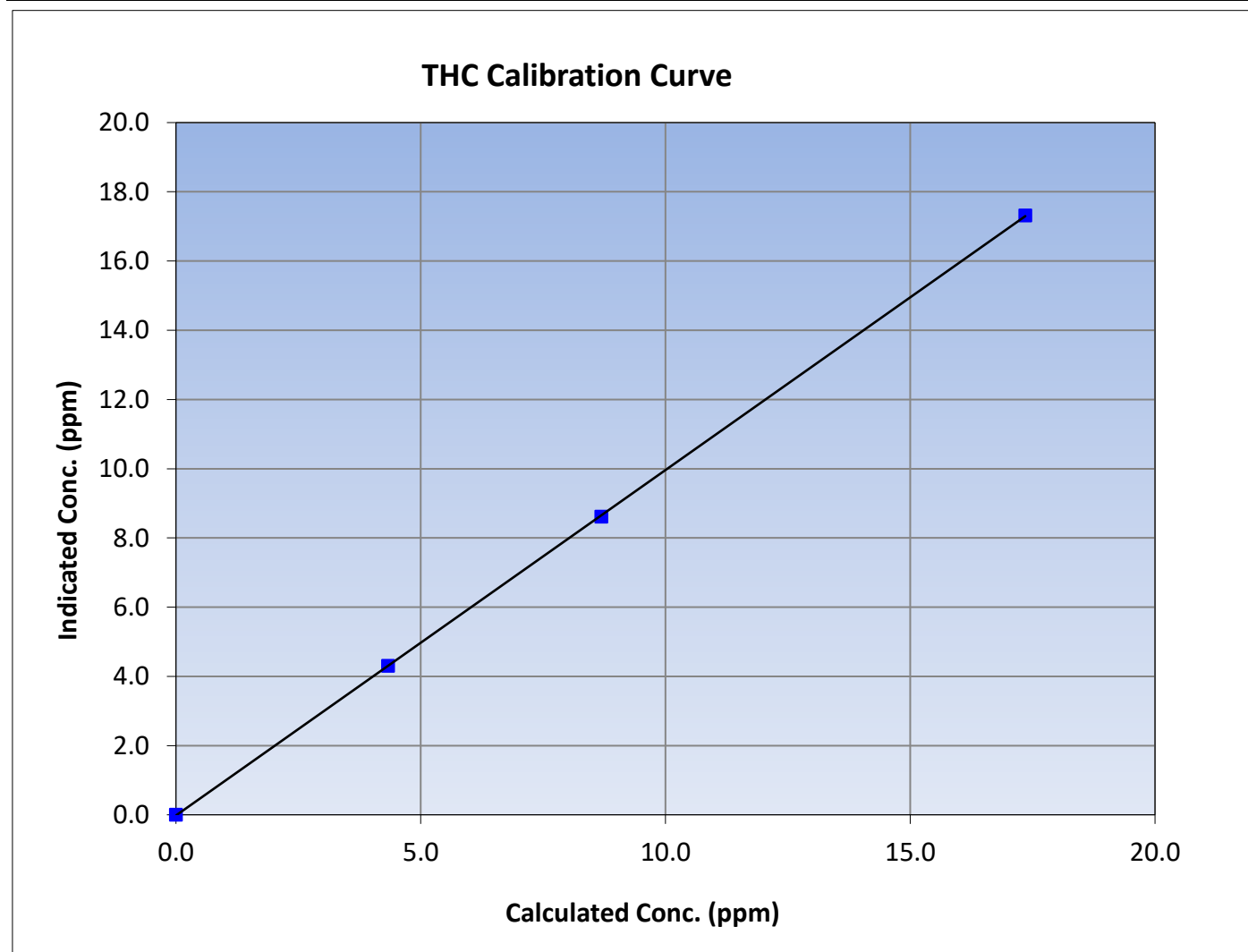
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 7, 2023 | Previous Calibration: | February 7, 2023 |
| Station Name:     | Lower Camp    | Station Number:       | AMS11            |
| Start Time (MST): | 10:53         | End Time (MST):       | 14:06            |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1505164381       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999988  | $\geq 0.995$  |       |          |             |
| 17.35                               | 17.32                              | 1.0020                    |                         |           |               |       |          |             |
| 8.69                                | 8.62                               | 1.0082                    |                         |           |               | Slope | 0.998030 | 0.90 - 1.10 |
| 4.33                                | 4.30                               | 1.0070                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.019190 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

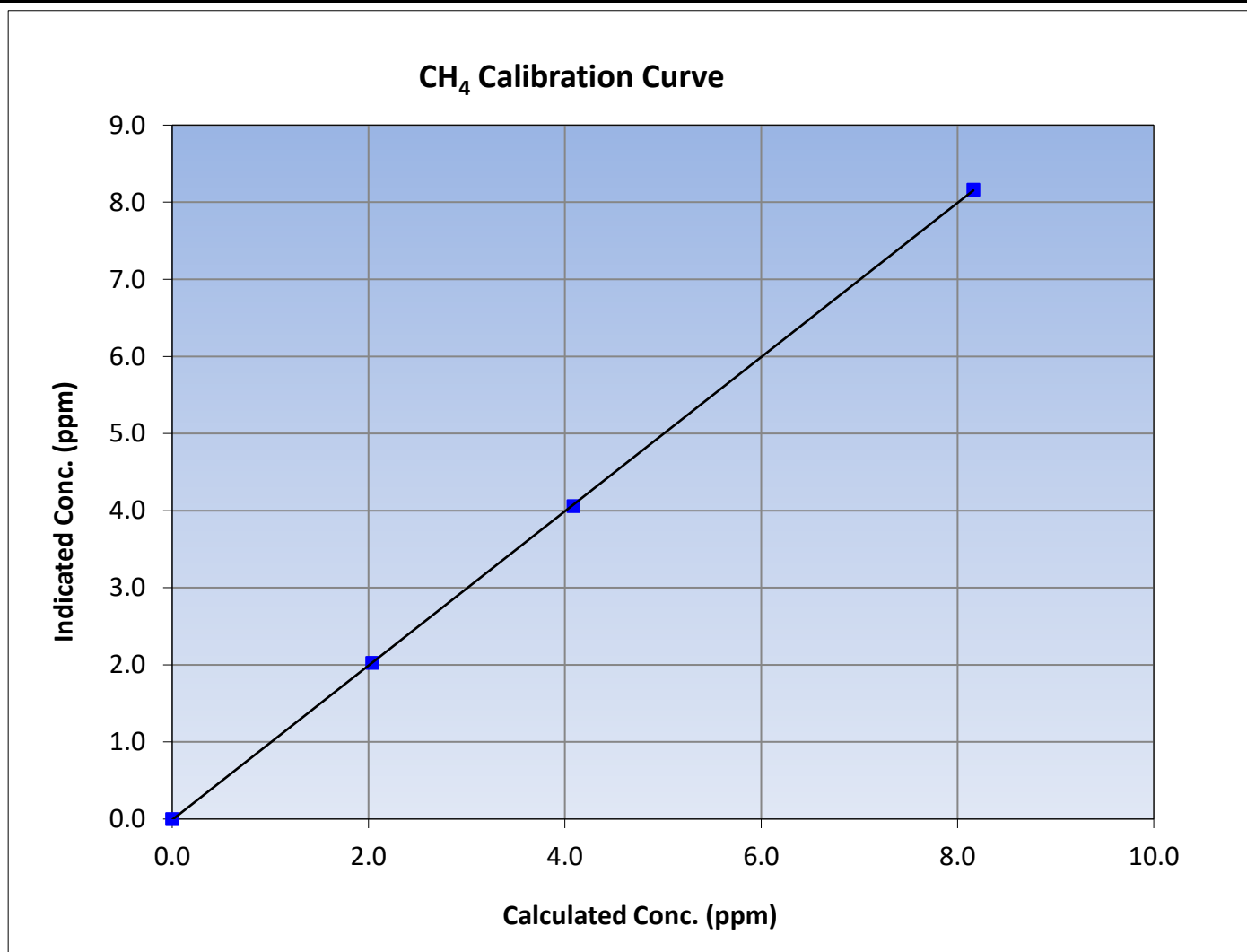
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 7, 2023 | Previous Calibration: | February 7, 2023 |
| Station Name:     | Lower Camp    | Station Number:       | AMS11            |
| Start Time (MST): | 10:53         | End Time (MST):       | 14:06            |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1505164381       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999987  | $\geq 0.995$  |
| 8.16                                | 8.16                               | 1.0000                    |                         |           |               |
| 4.09                                | 4.06                               | 1.0065                    |                         |           |               |
| 2.04                                | 2.03                               | 1.0059                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 1.000126  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.010089 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

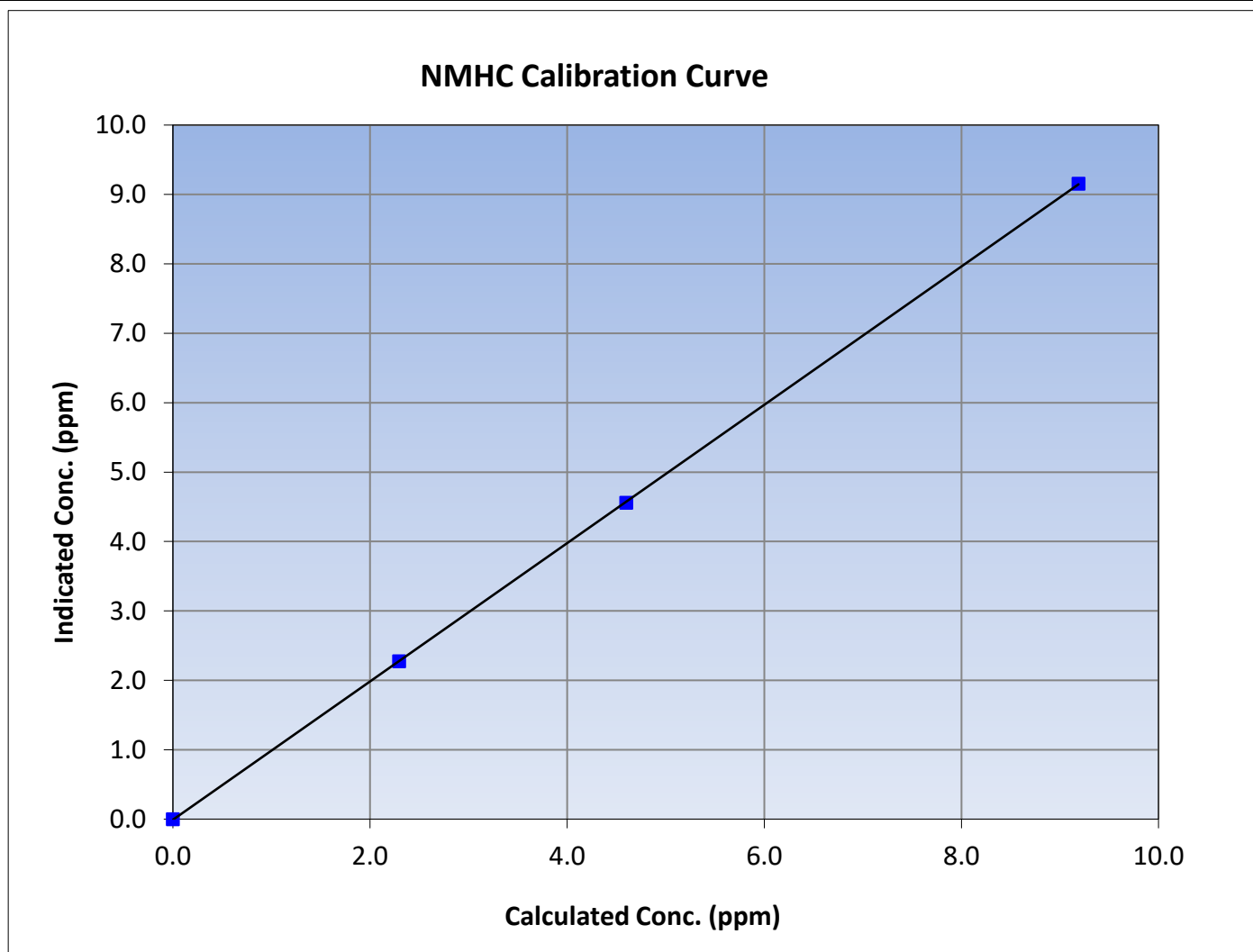
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 7, 2023 | Previous Calibration: | February 7, 2023 |
| Station Name:     | Lower Camp    | Station Number:       | AMS11            |
| Start Time (MST): | 10:53         | End Time (MST):       | 14:06            |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1505164381       |

### Calibration Data

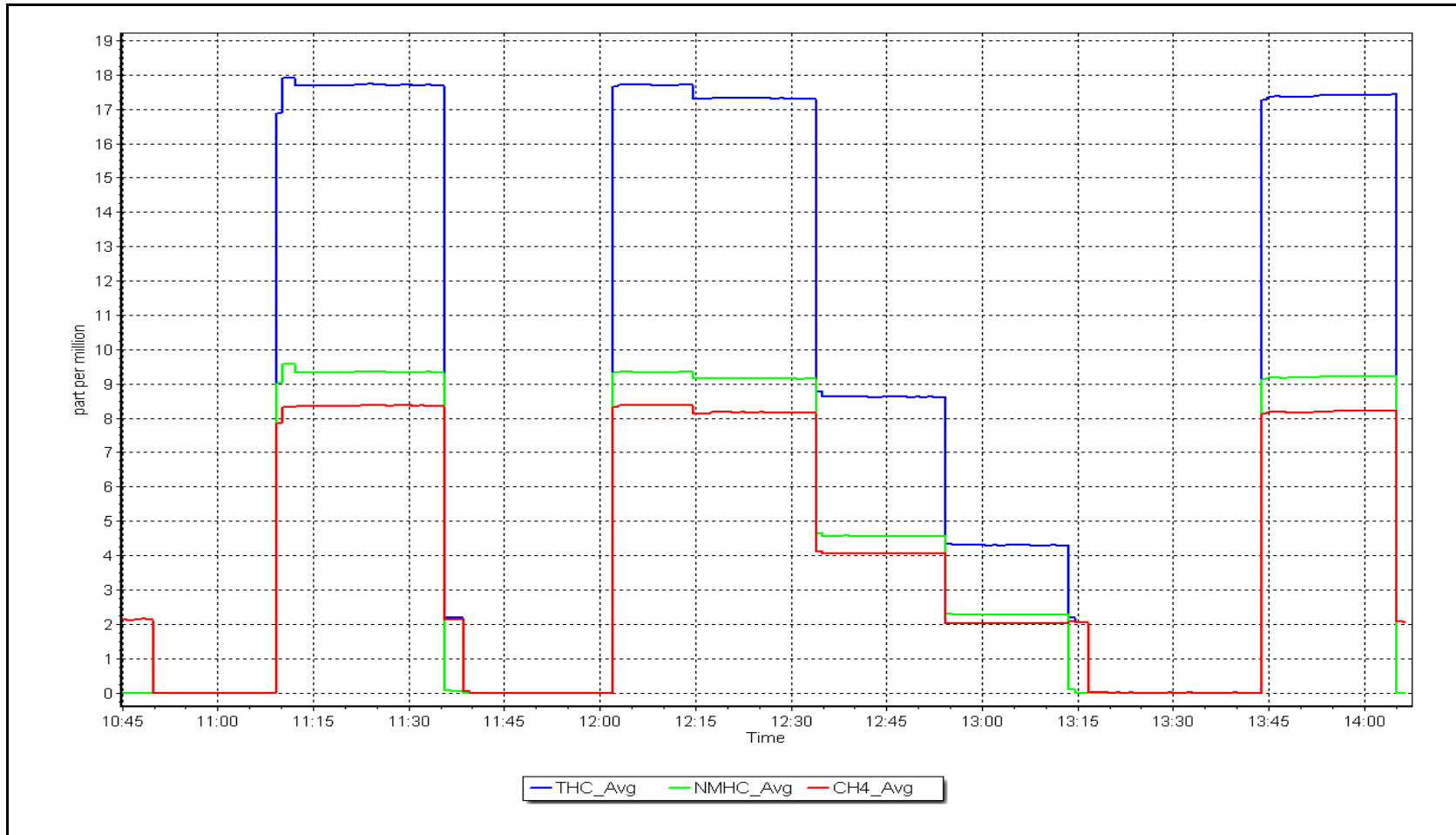
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999990  | $\geq 0.995$  |       |          |             |
| 9.19                                | 9.16                               | 1.0036                    |                         |           |               |       |          |             |
| 4.60                                | 4.56                               | 1.0095                    |                         |           |               | Slope | 0.996404 | 0.90 - 1.10 |
| 2.29                                | 2.28                               | 1.0080                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.009301 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: March 7, 2023

Location: Lower Camp







## **WOOD BUFFALO ENVIRONMENTAL ASSOCIATION**

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS13 FORT MCKAY SOUTH MARCH 2023**

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

April 29, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

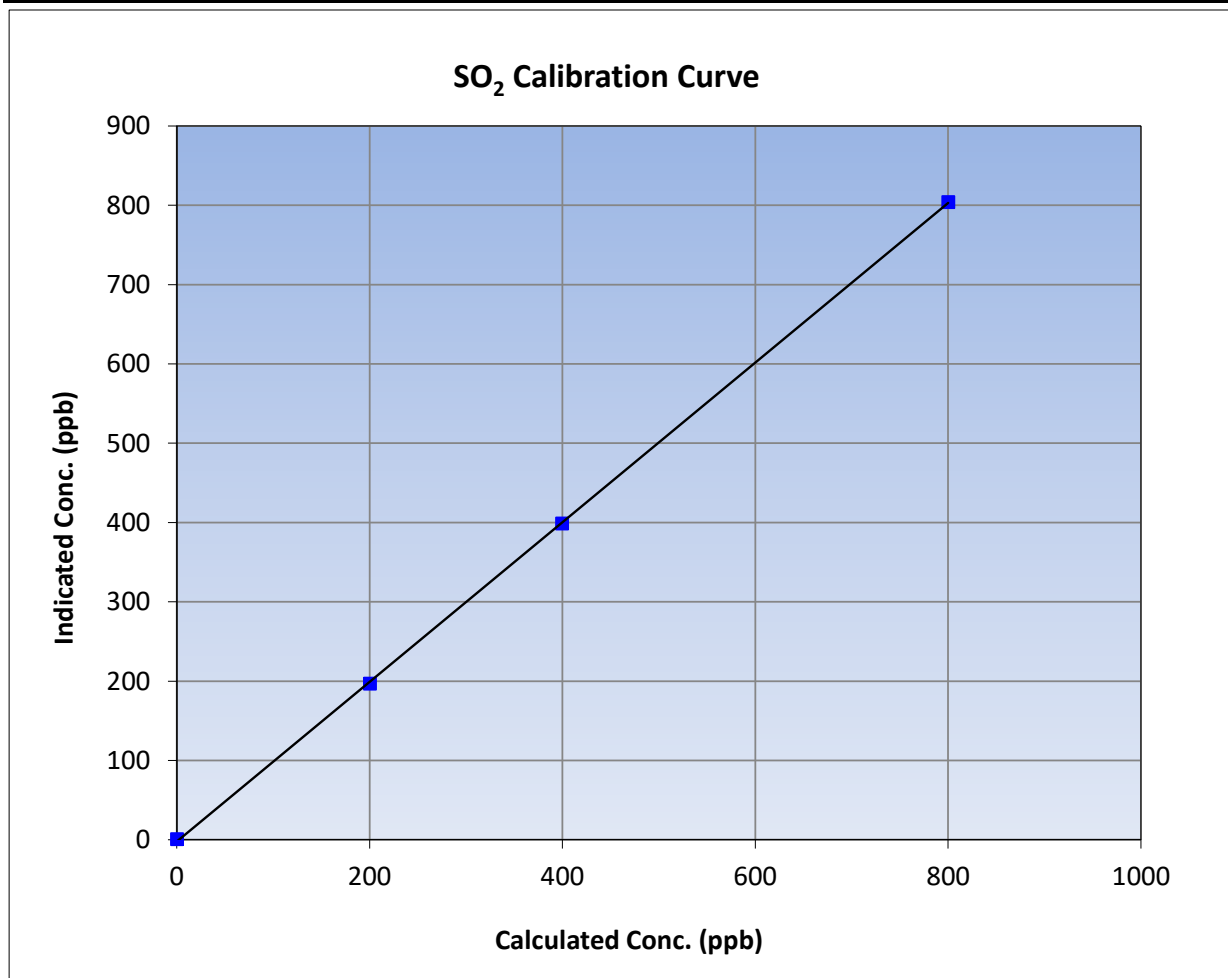
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 2, 2023    | Previous Calibration: | February 2, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS13            |
| Start Time (MST): | 10:07            | End Time (MST):       | 16:10            |
| Analyzer make:    | API T100         | Analyzer serial #:    | 599              |

### Calibration Data

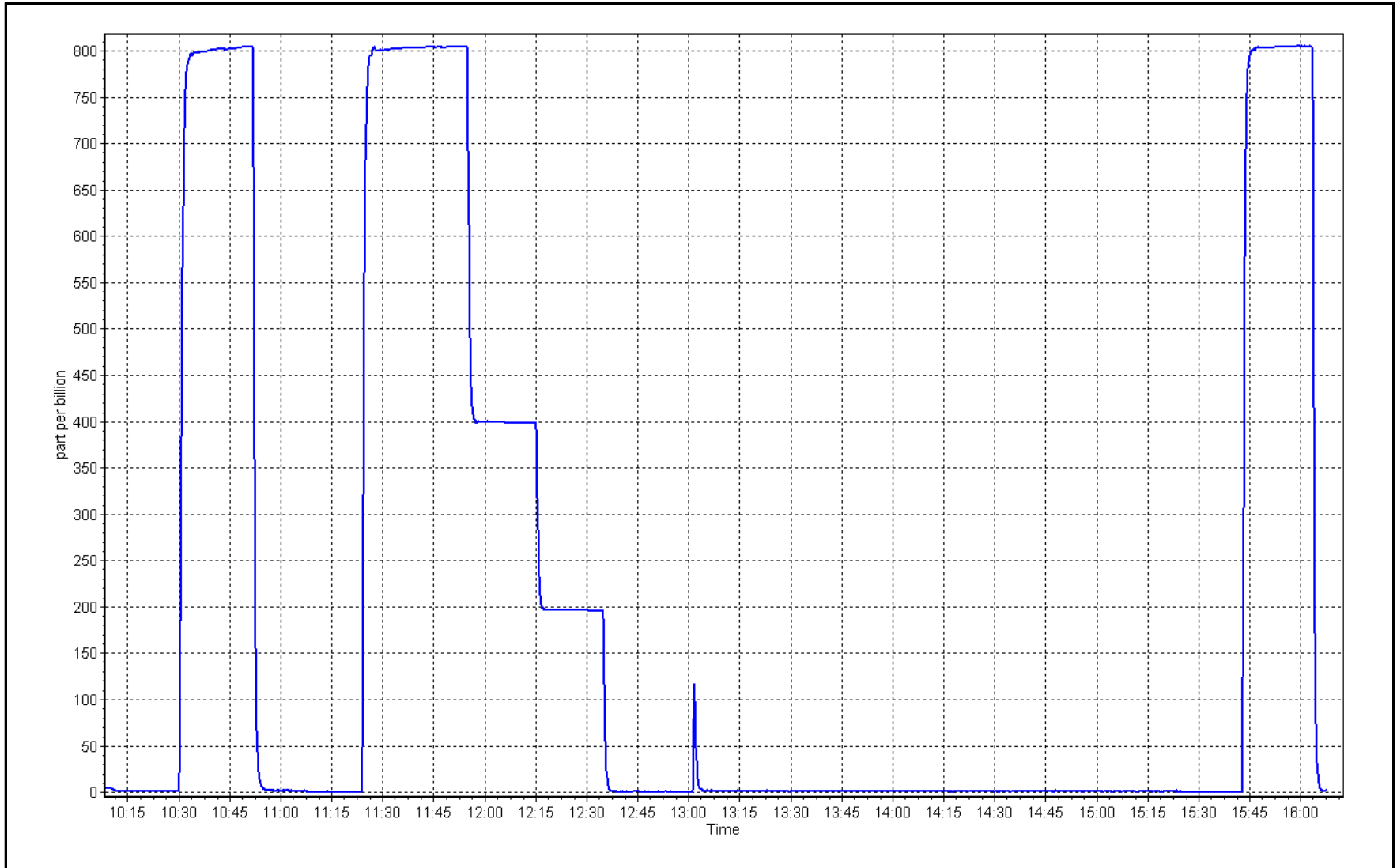
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient | 0.999952  | ≥0.995      |
| 799.7                               | 803.8                              | 0.9949                    |                         |           |             |
| 399.3                               | 398.6                              | 1.0018                    | Slope                   | 1.006516  | 0.90 - 1.10 |
| 200.2                               | 196.4                              | 1.0193                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -2.298208 | +/-30       |



SO2 Calibration Plot

Date: March 2, 2023

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 1, 2023      Last Cal Date: February 7, 2023  
 Start time (MST): 9:43      End time (MST): 14:15  
 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:  
 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

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 1.002489     | 0.987178      | Backgd or Offset: 3.69 | 3.69          |
| Calibration intercept: | -0.082182    | 0.057822      | Coeff or Slope: 1.120  | 1.120         |

### 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4925                          | 75.5                        | 80.6                                | 79.2                               | 1.019  |
| as found 2nd point    | 4962                          | 37.7                        | 40.3                                | 39.4                               | 1.025  |
| as found 3rd point    | 4981                          | 18.9                        | 20.2                                | 19.4                               | 1.046  |
| 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                              | 4925                          | 75.5                        | 80.6                                | 79.7                               | 1.012   |
| second point                            | 4962                          | 37.7                        | 40.3                                | 39.8                               | 1.012   |
| third point                             | 4981                          | 18.9                        | 20.2                                | 19.8                               | 1.019   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| as left span                            | 4925                          | 75.5                        | 80.6                                | 79.8                               | 1.010   |
| SO2 Scrubber Check                      | 4921                          | 79.1                        | 791.0                               | 0.0                                | ----  |
| Date of last scrubber change:           | 20-Mar-20                     |                             | Ave Corr Factor                     |                                    | 1.014   |
| Date of last converter efficiency test: | NA                            |                             | efficiency                          |                                    |   |

|                          |      |                 |          |               |           |
|--------------------------|------|-----------------|----------|---------------|-----------|
| Baseline Corr As found:  | 79.1 | Prev response:  | 80.74    | *% change:    | -2.1%     |
| Baseline Corr 2nd AF pt: | 39.3 | AF Slope:       | 0.982925 | AF Intercept: | -0.142149 |
| Baseline Corr 3rd AF pt: | 19.3 | AF Correlation: | 0.999954 |               |           |

\* = > +/-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

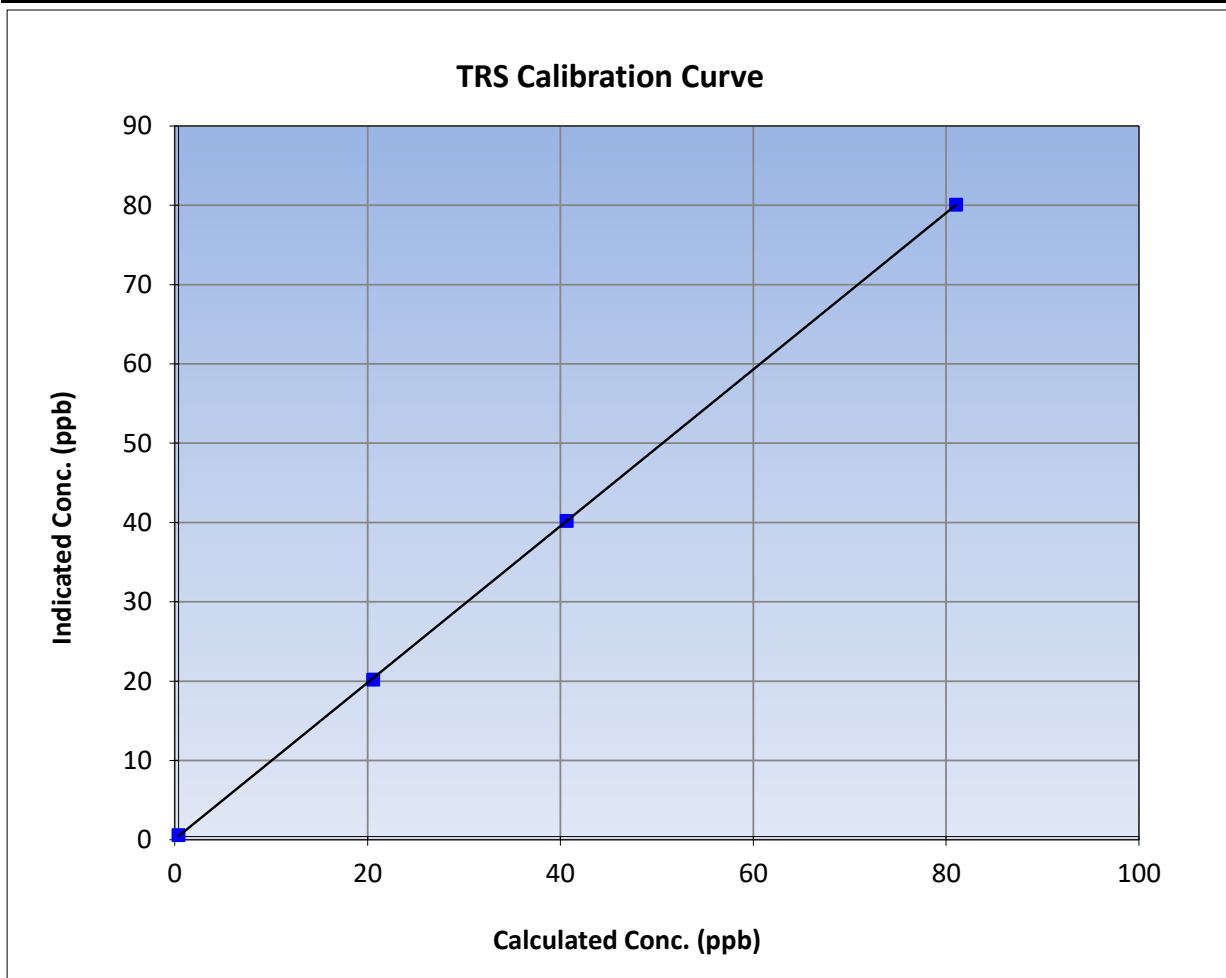
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 1, 2023    | Previous Calibration: | February 7, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS13            |
| Start Time (MST): | 9:43             | End Time (MST):       | 13:36            |
| Analyzer make:    | Thermo 43i TLE   | Analyzer serial #:    | 1180540017       |

### Calibration Data

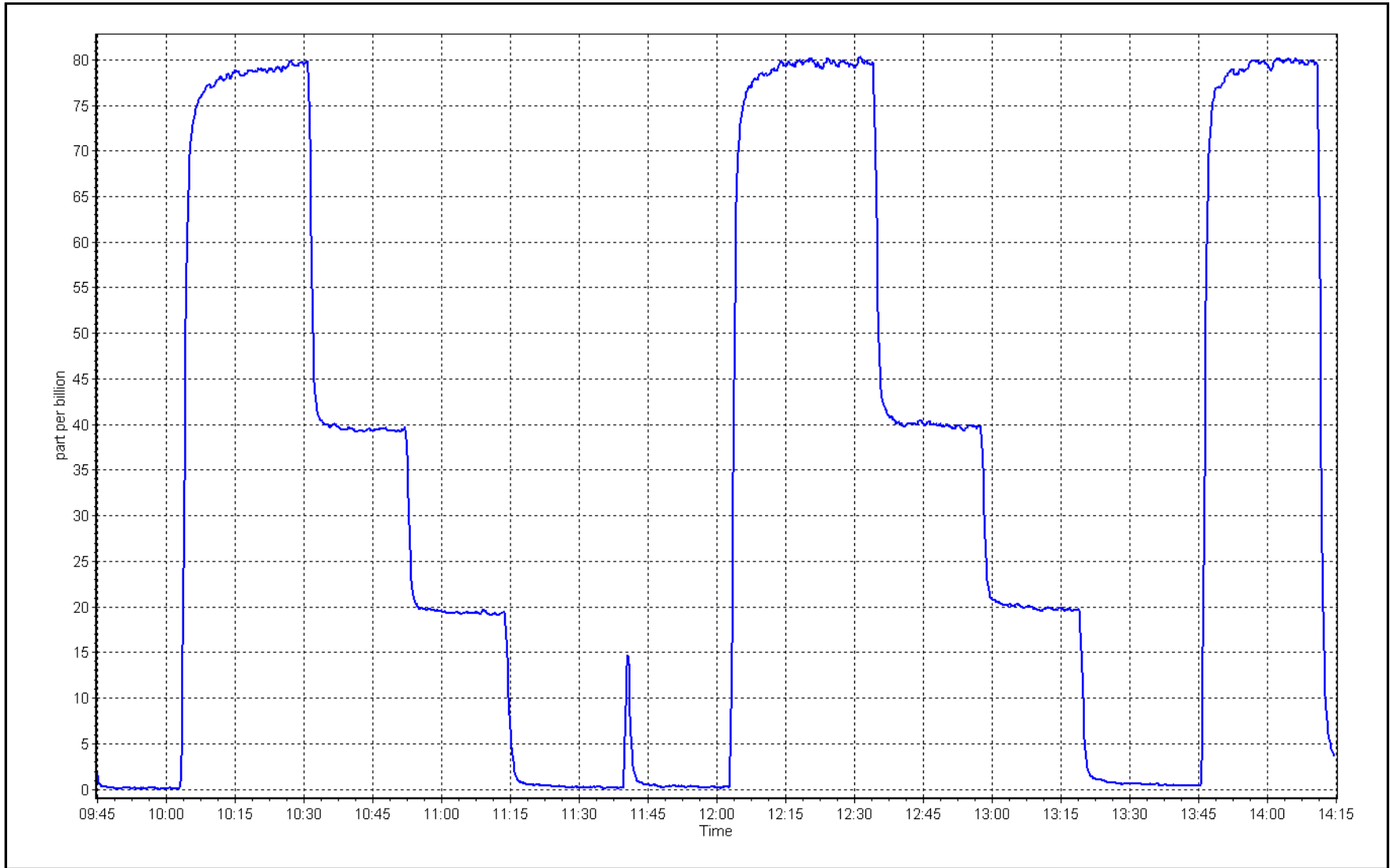
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999984 |             |
| 80.6                                | 79.7                               | 1.0116                    |                         |          | ≥0.995      |
| 40.3                                | 39.8                               | 1.0117                    | Slope                   | 0.987178 |             |
| 20.2                                | 19.8                               | 1.0195                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.057822 | +/-3        |



TRS Calibration Plot

Date: March 1, 2023

Location: Fort McKay South





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Fort McKay South | Station number: | AMS13            |
| Calibration Date: | March 2, 2023    | Last Cal Date:  | February 2, 2023 |
| Start time (MST): | 10:07            | End time (MST): | 16:10            |
| Reason:           | Maintenance      |                 |                  |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC260812  | Cal Gas Expiry Date:        | December 29, 2028 |
| CH <sub>4</sub> Cal Gas Conc.               | 503.6 ppm | CH <sub>4</sub> Equiv Conc. | 1077.5 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 208.7 ppm |                             |                   |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 503.6 ppm | CH <sub>4</sub> Equiv Conc. | 1077.5 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 208.7 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 2448              |
| ZAG make/model:                             | API 701   | Serial Number:              | 1117              |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1152430012 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.39E-04     | 2.39E-04      | NMHC SP Ratio:  | 4.69E-05      |
| CH <sub>4</sub> Retention time: | 12.0         | 12.0          | NMHC Peak Area: | 193720        |
|                                 |              |               |                 | 193333        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4921              | 79.1                 | 17.05                | 16.85               | 1.012                      |
| 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                | 17.07               | 0.999                      |
| second point          | 4961              | 39.5                 | 8.51                 | 8.35                | 1.019                      |
| 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                | 17.06               | 0.999                      |

|                           |       |
|---------------------------|-------|
| Average Correction Factor | 1.019 |
|---------------------------|-------|

|                       |       |                 |       |  |       |
|-----------------------|-------|-----------------|-------|--|-------|
| Baseline Corr AF:     | 16.85 | Prev response   | 16.98 | *% change                                  | -0.8% |
| Baseline Corr 2nd AF: | NA    | AF Slope:       |       | AF Intercept:                              |       |
| Baseline Corr 3rd AF: | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |       |





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / 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              | 79.1                 | 9.08                 | 8.88                                       | 1.023               |
| as found 2nd point        |                   |                      |                      |  |                     |
| as found 3rd point        |                   |                      |                      |  |                     |
| new cylinder response     |                   |                      |                      |  |                     |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00                                       | ----                |
| high point                | 4921              | 79.1                 | 9.08                 | 9.10                                       | 0.998               |
| second point              | 4961              | 39.5                 | 4.53                 | 4.47                                       | 1.015               |
| third point               | 4980              | 19.8                 | 2.27                 | 2.21                                       | 1.027               |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                |
| as left span              | 4921              | 79.1                 | 9.08                 | 9.08                                       | 1.000               |
| Average Correction Factor |                   |                      |                      |  | 1.013               |
| Baseline Corr AF:         | 8.88              | Prev response        | 9.04                 | *% change                                  | -1.8%               |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                     |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                     |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF Limit= 0.95-1.05 |
|---------------------------|-------------------|----------------------|----------------------|--|---------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                |
| as found span             | 4921              | 79.1                 | 7.97                 | 7.97                                       | 0.999               |
| 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                 | 7.97                                       | 1.000               |
| second point              | 4961              | 39.5                 | 3.98                 | 3.89                                       | 1.023               |
| third point               | 4980              | 19.8                 | 1.99                 | 1.89                                       | 1.053               |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                |
| as left span              | 4921              | 79.1                 | 7.97                 | 7.99                                       | 0.997               |
| Average Correction Factor |                   |                      |                      |  | 1.025               |
| Baseline Corr AF:         | 7.97              | Prev response        | 7.94                 | *% 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

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.002074     | 1.003410      |
| THC Cal Offset:             | -0.104181    | -0.099393     |
| CH <sub>4</sub> Cal Slope:  | 1.003774     | 1.003172      |
| CH <sub>4</sub> Cal Offset: | -0.056196    | -0.058596     |
| NMHC Cal Slope:             | 1.000594     | 1.003631      |
| NMHC Cal Offset:            | -0.047785    | -0.040597     |

Notes: Changed the inlet filter after as founds. Enabled and captured a new zero chromatogram, and adjusted the span. Enabled use flat baseline as well. Maintenance to be continued next day.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## THC Calibration Summary

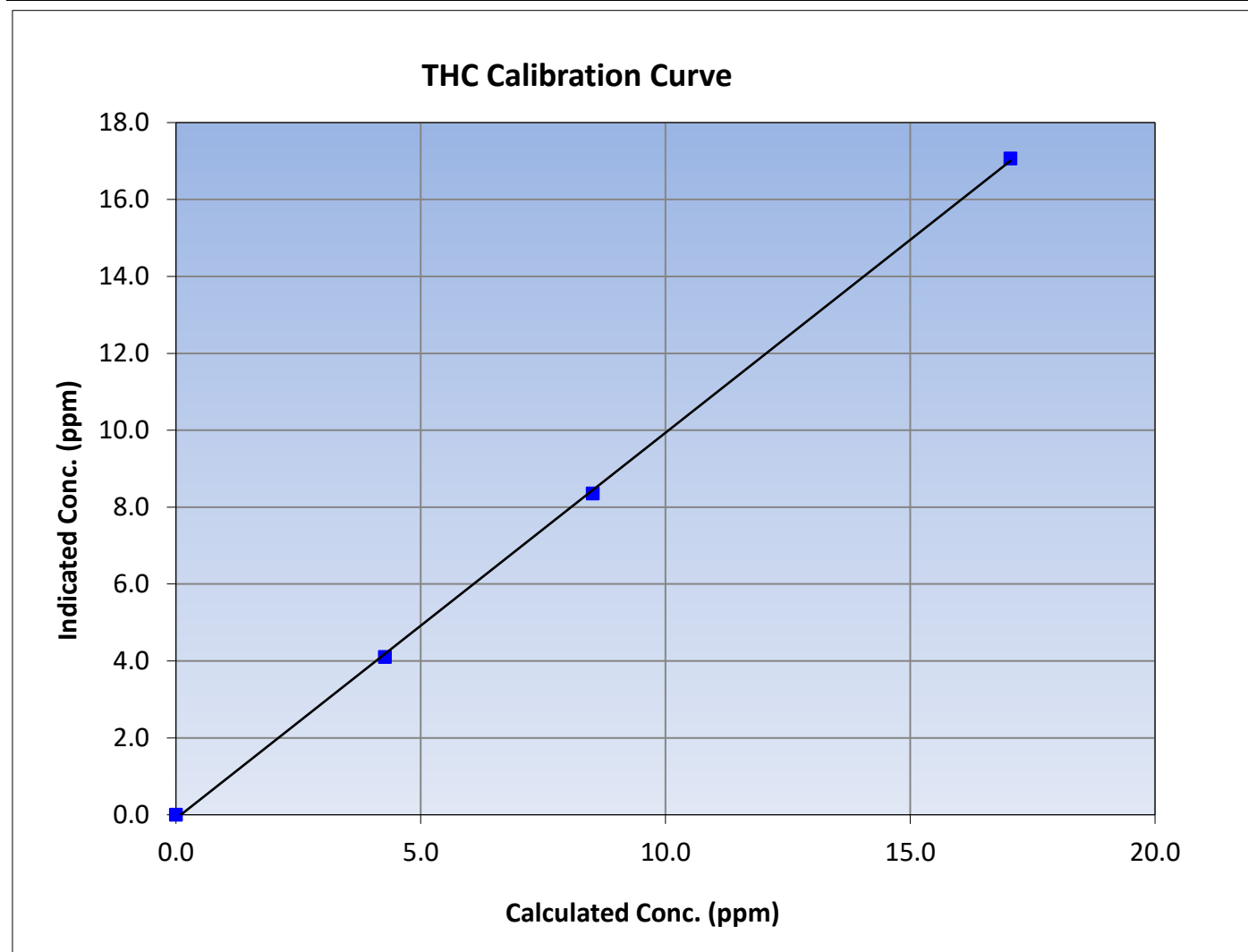
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 2, 2023    | Previous Calibration: | February 2, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS13            |
| Start Time (MST): | 10:07            | End Time (MST):       | 16:10            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1152430012       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999832  | $\geq 0.995$  |       |          |             |
| 17.05                               | 17.07                              | 0.9988                    |                         |           |               |       |          |             |
| 8.51                                | 8.35                               | 1.0189                    |                         |           |               | Slope | 1.003410 | 0.90 - 1.10 |
| 4.27                                | 4.11                               | 1.0387                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.099393 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

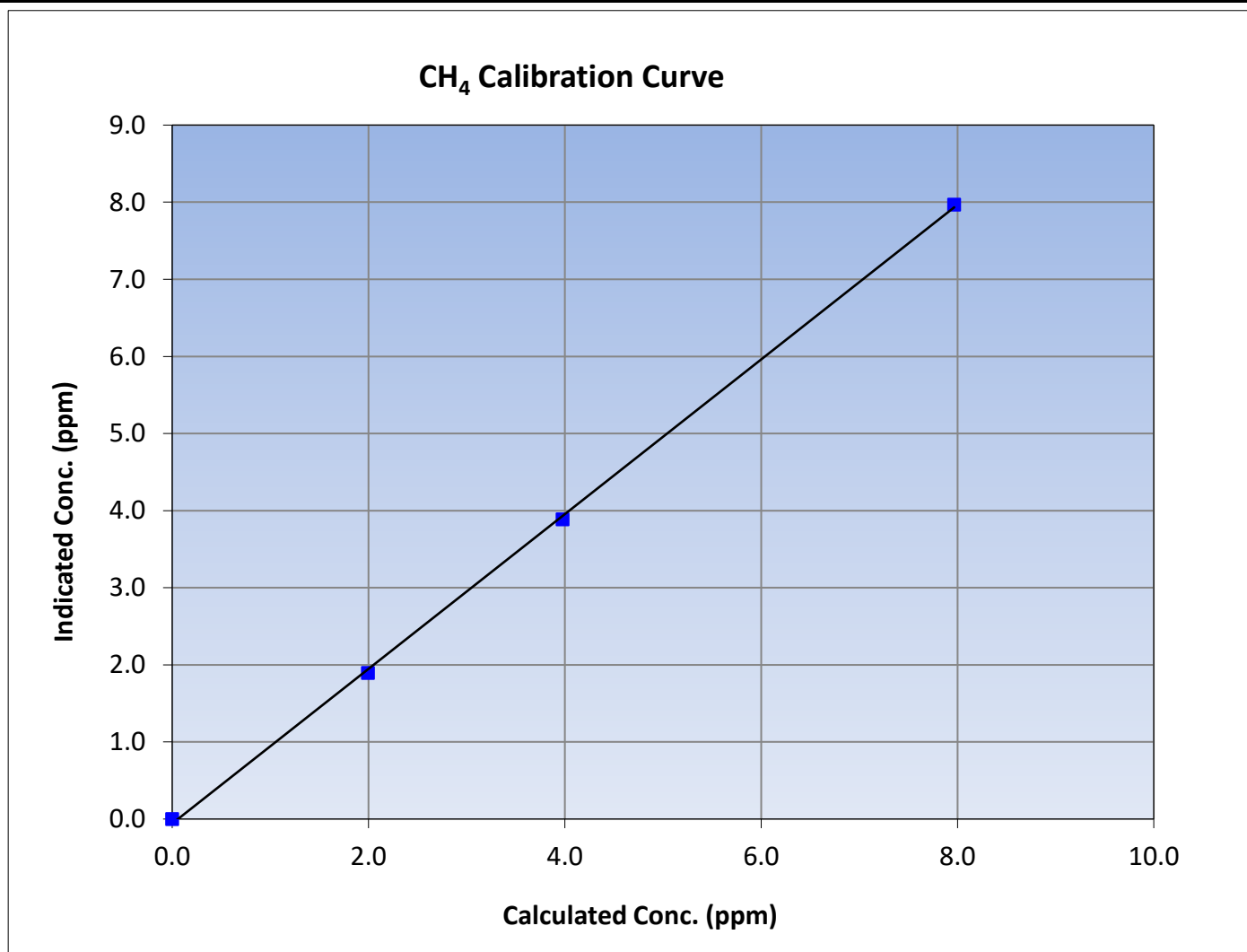
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 2, 2023    | Previous Calibration: | February 2, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS13            |
| Start Time (MST): | 10:07            | End Time (MST):       | 16:10            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1152430012       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999743  | ≥0.995        |       |          |             |
| 7.97                                | 7.97                               | 0.9998                    |                         |           |               |       |          |             |
| 3.98                                | 3.89                               | 1.0234                    |                         |           |               | Slope | 1.003172 | 0.90 - 1.10 |
| 1.99                                | 1.89                               | 1.0530                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.058596 | +/-0.5        |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

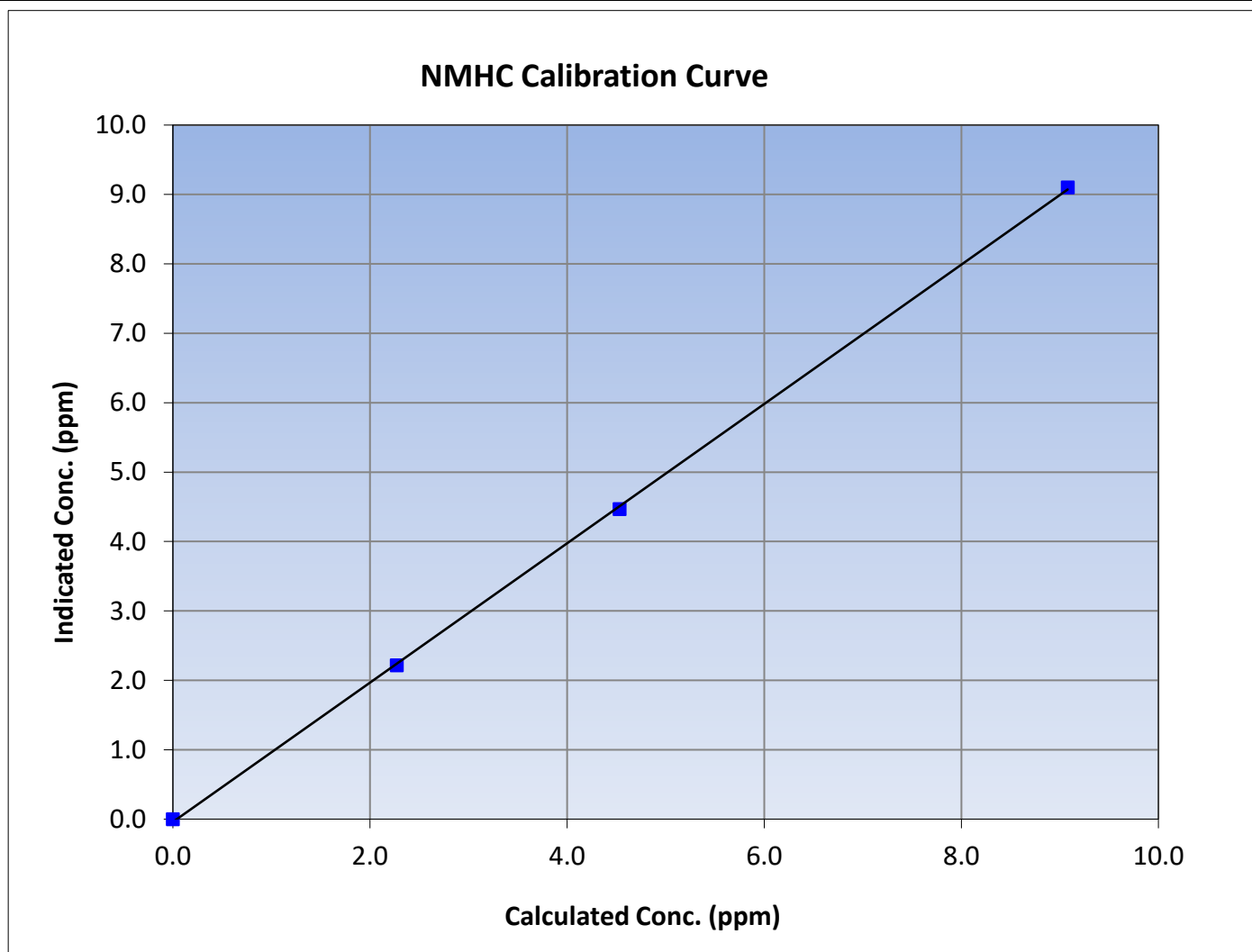
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | March 2, 2023    | Previous Calibration: | February 2, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS13            |
| Start Time (MST): | 10:07            | End Time (MST):       | 16:10            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1152430012       |

### Calibration Data

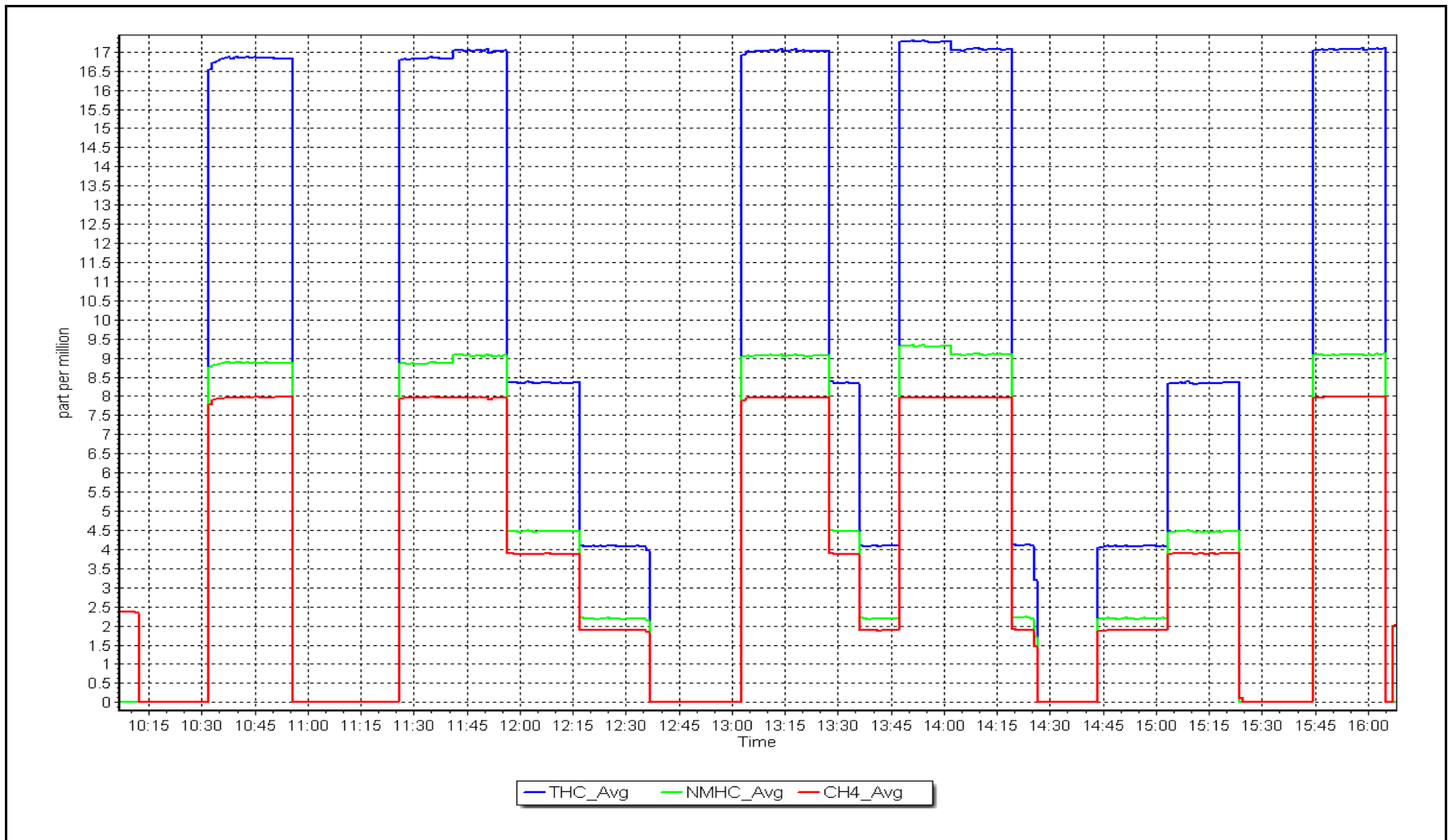
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999894  | $\geq 0.995$  |
| 9.08                                | 9.10                               | 0.9978                    |                         |           |               |
| 4.53                                | 4.47                               | 1.0147                    |                         |           |               |
| 2.27                                | 2.21                               | 1.0266                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 1.003631  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.040597 | +/-0.5        |



NMHC Calibration Plot

Date: March 2, 2023

Location: Fort McKay South





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |               |
|-------------------|------------------|-----------------|---------------|
| Station Name:     | Fort McKay South | Station number: | AMS13         |
| Calibration Date: | March 3, 2023    | Last Cal Date:  | March 2, 2023 |
| Start time (MST): | 10:12            | End time (MST): | 10:53         |
| Reason:           | Removal          |                 |               |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC260812  | Cal Gas Expiry Date:        | December 29, 2028 |
| CH <sub>4</sub> Cal Gas Conc.               | 503.6 ppm | CH <sub>4</sub> Equiv Conc. | 1077.5 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 208.7 ppm |                             |                   |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 503.6 ppm | CH <sub>4</sub> Equiv Conc. | 1077.5 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 208.7 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 2448              |
| ZAG make/model:                             | API 701   | Serial Number:              | 1117              |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1152430012 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.39E-04     | 2.39E-04      | NMHC SP Ratio:  | 4.70E-05      |
| CH <sub>4</sub> Retention time: | 12.0         | 12.0          | NMHC Peak Area: | 193333        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4921              | 79.1                 | 17.05                | 17.18               | 0.992                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       |                   |                      |                      |                     |                            |
| high point            |                   |                      |                      |                     |                            |
| second point          |                   |                      |                      |                     |                            |
| third point           |                   |                      |                      |                     |                            |
| as left zero          |                   |                      |                      |                     |                            |
| as left span          |                   |                      |                      |                     |                            |

|                       |       |                 | Average Correction Factor |  |
|-----------------------|-------|-----------------|---------------------------|--|
| Baseline Corr AF:     | 17.18 | Prev response   | 16.98                     | *% change 1.2%                             |
| 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|----------------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero                    | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span                    | 4921              | 79.1                 | 9.08                 | 9.19                                       | 0.988                      |
| as found 2nd point               |                   |                      |                      |  |                            |
| as found 3rd point               |                   |                      |                      |  |                            |
| new cylinder response            |                   |                      |                      |  |                            |
| calibrator zero                  |                   |                      |                      |  |                            |
| high point                       |                   |                      |                      |  |                            |
| second point                     |                   |                      |                      |  |                            |
| third point                      |                   |                      |                      |  |                            |
| as left zero                     |                   |                      |                      |  |                            |
| as left span                     |                   |                      |                      |  |                            |
| <b>Average Correction Factor</b> |                   |                      |                      |  |                            |
| Baseline Corr AF:                | 9.19              | Prev response        | 9.04                 | *% change                                  | 1.6%                       |
| Baseline Corr 2nd AF:            | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:            | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                        | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|----------------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero                    | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span                    | 4921              | 79.1                 | 7.97                 | 7.99                                       | 0.998                      |
| as found 2nd point               |                   |                      |                      |  |                            |
| as found 3rd point               |                   |                      |                      |  |                            |
| new cylinder response            |                   |                      |                      |  |                            |
| calibrator zero                  |                   |                      |                      |  |                            |
| high point                       |                   |                      |                      |  |                            |
| second point                     |                   |                      |                      |  |                            |
| third point                      |                   |                      |                      |  |                            |
| as left zero                     |                   |                      |                      |  |                            |
| as left span                     |                   |                      |                      |  |                            |
| <b>Average Correction Factor</b> |                   |                      |                      |  |                            |
| Baseline Corr AF:                | 7.99              | Prev response        | 7.94                 | *% change                                  | 0.6%                       |
| Baseline Corr 2nd AF:            | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:            | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.002074     |               |
| THC Cal Offset:             | -0.104181    |               |
| CH <sub>4</sub> Cal Slope:  | 1.003774     |               |
| CH <sub>4</sub> Cal Offset: | -0.056196    |               |
| NMHC Cal Slope:             | 1.000594     |               |
| NMHC Cal Offset:            | -0.047785    |               |

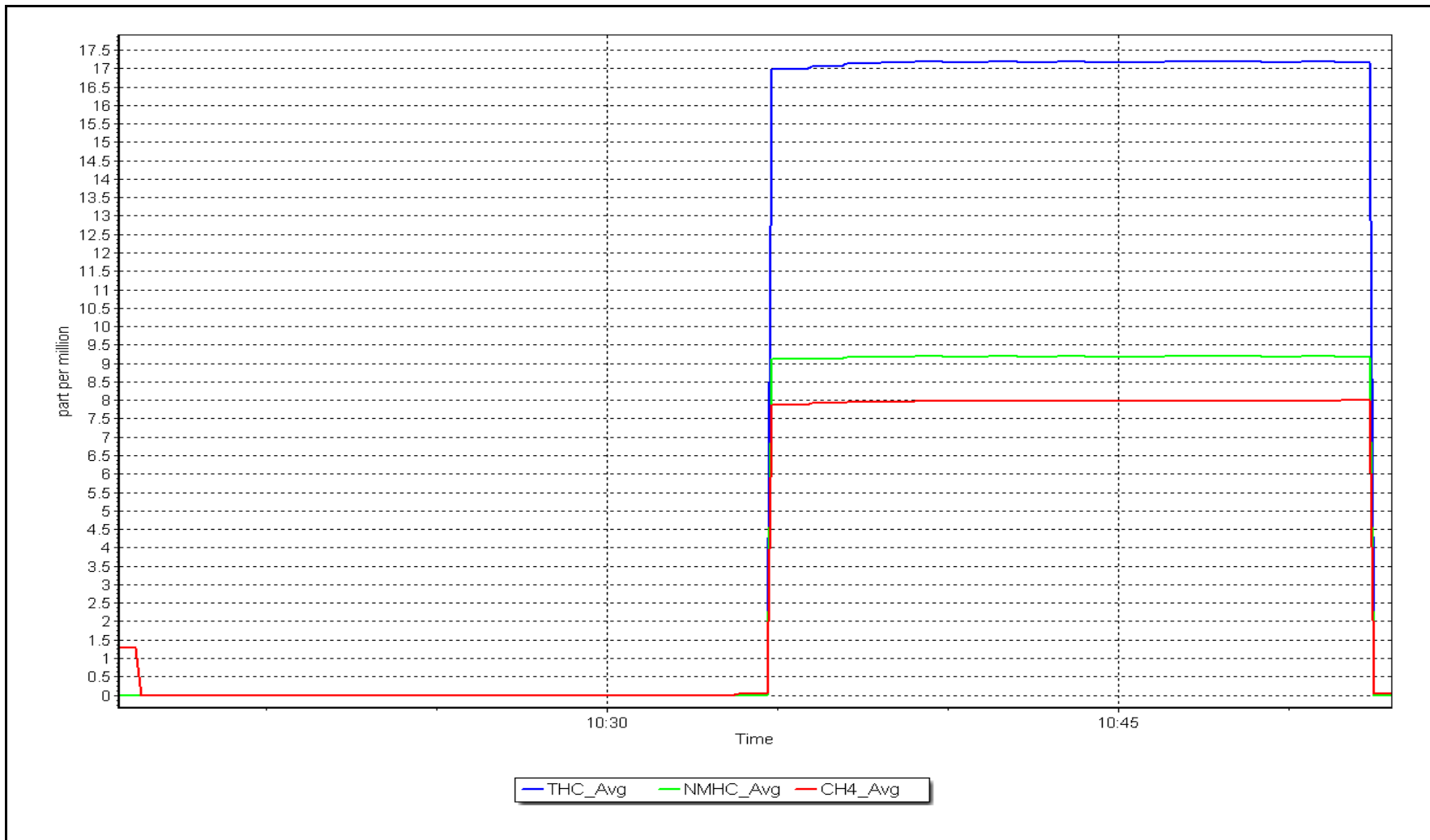
Notes: Removal calibration. Just zero and span to validate yesterday calibration/maintenance.

Calibration Performed By: Sean Bala

NMHC Calibration Plot

Date: March 3, 2023

Location: Fort McKay South







# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |               |
|-------------------|------------------|-----------------|---------------|
| Station Name:     | Fort McKay South | Station number: | AMS13         |
| Calibration Date: | March 3, 2023    | Last Cal Date:  | March 2, 2023 |
| Start time (MST): | 11:08            | End time (MST): | 15:19         |
| Reason:           | Install          |                 |               |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC260812  | Cal Gas Expiry Date:        | December 29, 2028 |
| CH <sub>4</sub> Cal Gas Conc.               | 503.6 ppm | CH <sub>4</sub> Equiv Conc. | 1077.5 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 208.7 ppm |                             |                   |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 503.6 ppm | CH <sub>4</sub> Equiv Conc. | 1077.5 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 208.7 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 2448              |
| ZAG make/model:                             | API 701   | Serial Number:              | 1117              |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1170050130 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | NA           | 2.16E-04      | NMHC SP Ratio:  | NA            |
| CH <sub>4</sub> Retention time: | NA           | 12.8          | NMHC Peak Area: | NA            |
|                                 |              |               |                 | 5.11E-04      |
|                                 |              |               |                 | 177635        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         |                   |                      |                      |                     |                            |
| as found span         |                   |                      |                      |                     |                            |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4921              | 79.1                 | 17.05                | 17.10               | 0.997                      |
| second point          | 4961              | 39.5                 | 8.51                 | 8.42                | 1.011                      |
| third point           | 4980              | 19.8                 | 4.27                 | 4.13                | 1.034                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4921              | 79.1                 | 17.05                | 17.20               | 0.991                      |

|                       |    |                 |    | Average Correction Factor                  | 1.014 |
|-----------------------|----|-----------------|----|--|-------|
| 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             |                   |                      |                      |  |                            |
| as found span             |                   |                      |                      |  |                            |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| high point                | 4921              | 79.1                 | 9.08                 | 9.13                                       | 0.995                      |
| second point              | 4960              | 39.5                 | 4.53                 | 4.50                                       | 1.007                      |
| third point               | 4980              | 19.8                 | 2.27                 | 2.21                                       | 1.027                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4921              | 79.1                 | 9.08                 | 9.16                                       | 0.991                      |
| Average Correction Factor |                   |                      |                      |  | 1.010                      |
| 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 |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             |                   |                      |                      |  |                            |
| as found span             |                   |                      |                      |  |                            |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4921              | 79.1                 | 7.97                 | 7.98                                       | 0.999                      |
| second point              | 4960              | 39.5                 | 3.98                 | 3.92                                       | 1.016                      |
| third point               | 4980              | 19.8                 | 1.99                 | 1.91                                       | 1.042                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4921              | 79.1                 | 7.97                 | 8.03                                       | 0.992                      |
| Average Correction Factor |                   |                      |                      |  | 1.019                      |
| 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

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | NA           | 1.005694      |
| THC Cal Offset:             | NA           | -0.086175     |
| CH <sub>4</sub> Cal Slope:  | NA           | 1.003875      |
| CH <sub>4</sub> Cal Offset: | NA           | -0.046747     |
| NMHC Cal Slope:             | NA           | 1.007142      |
| NMHC Cal Offset:            | NA           | -0.039766     |

Notes: Install calibration. First CH<sub>4</sub> 3rd point was failing 5.6%. Do a zero chromatogram and use zero chromatogram. Noticed that the alarm for Detector and filter temperature is on/off. Readjust it to 175° C and it clears off the alarms. Adjusted span.

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## THC Calibration Summary

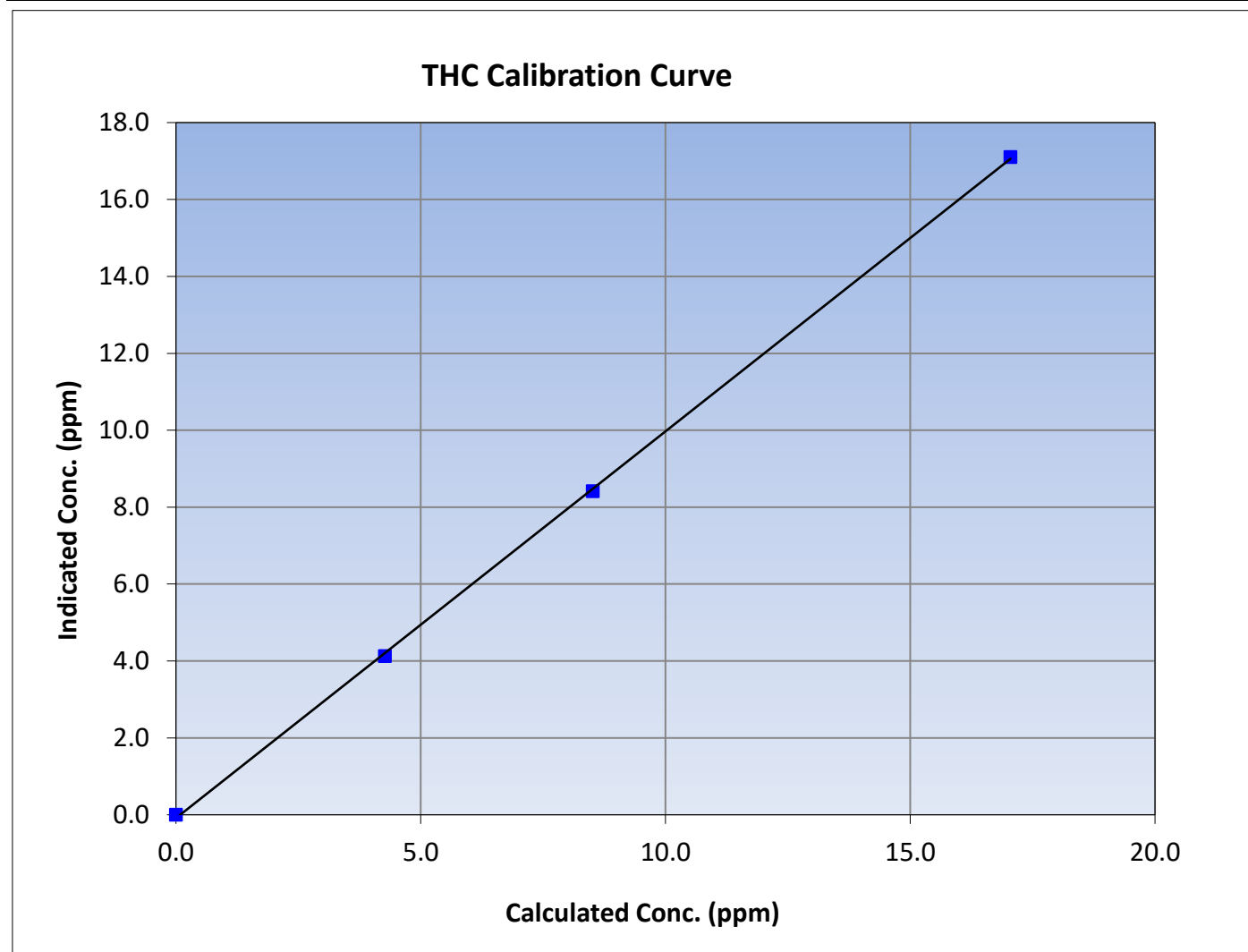
Version-01-2020

### Station Information

|                   |                  |                       |               |
|-------------------|------------------|-----------------------|---------------|
| Calibration Date: | March 3, 2023    | Previous Calibration: | March 2, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS13         |
| Start Time (MST): | 11:08            | End Time (MST):       | 15:19         |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1170050130    |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999883  | $\geq 0.995$  |       |          |             |
| 17.05                               | 17.10                              | 0.9966                    |                         |           |               |       |          |             |
| 8.51                                | 8.42                               | 1.0110                    |                         |           |               | Slope | 1.005694 | 0.90 - 1.10 |
| 4.27                                | 4.13                               | 1.0340                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.086175 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

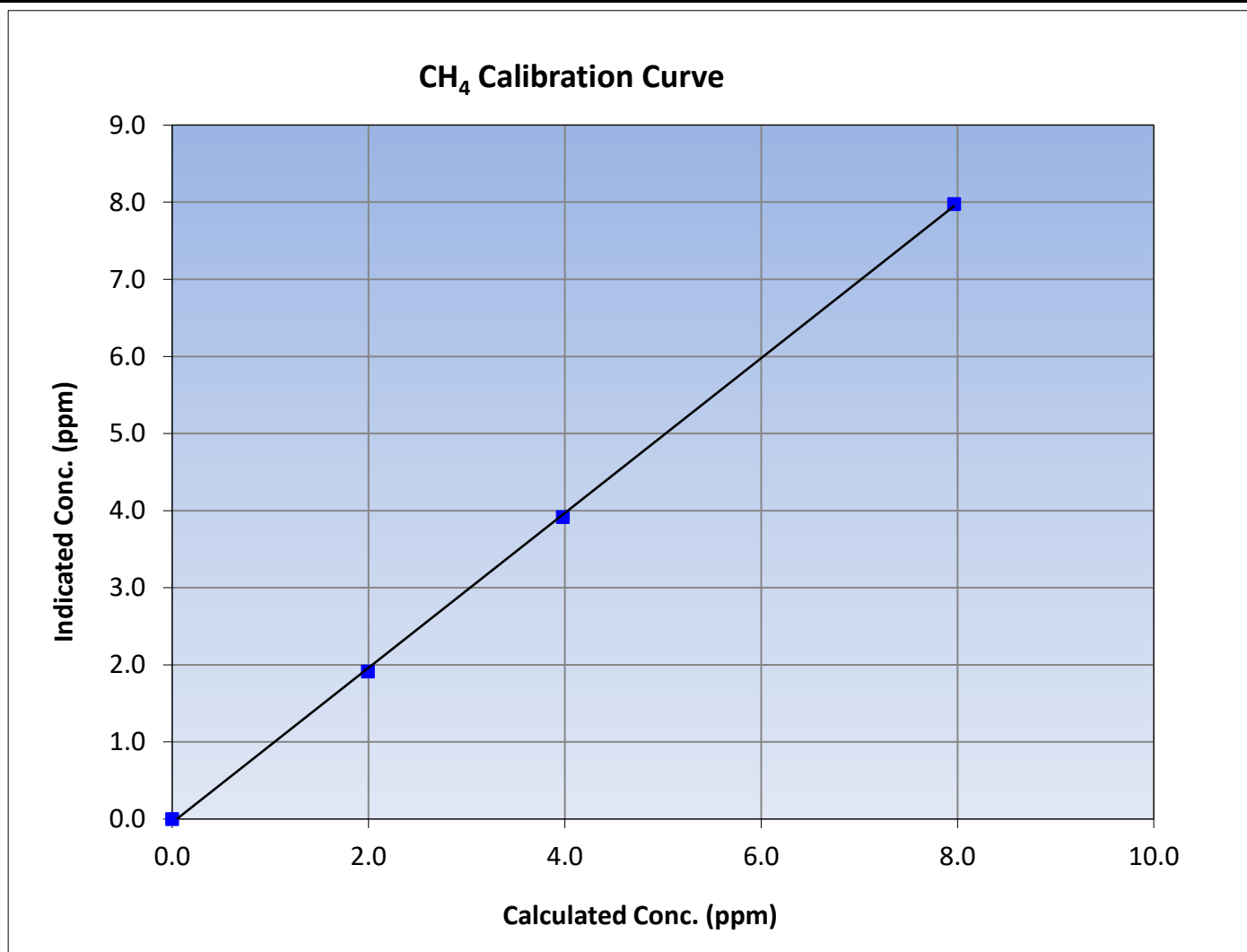
Version-01-2020

### Station Information

|                   |                  |                       |               |
|-------------------|------------------|-----------------------|---------------|
| Calibration Date: | March 3, 2023    | Previous Calibration: | March 2, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS13         |
| Start Time (MST): | 11:08            | End Time (MST):       | 15:19         |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1170050130    |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999841  | ≥0.995        |       |          |             |
| 7.97                                | 7.98                               | 0.9987                    |                         |           |               |       |          |             |
| 3.98                                | 3.92                               | 1.0160                    |                         |           |               | Slope | 1.003875 | 0.90 - 1.10 |
| 1.99                                | 1.91                               | 1.0420                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.046747 | +/-0.5        |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

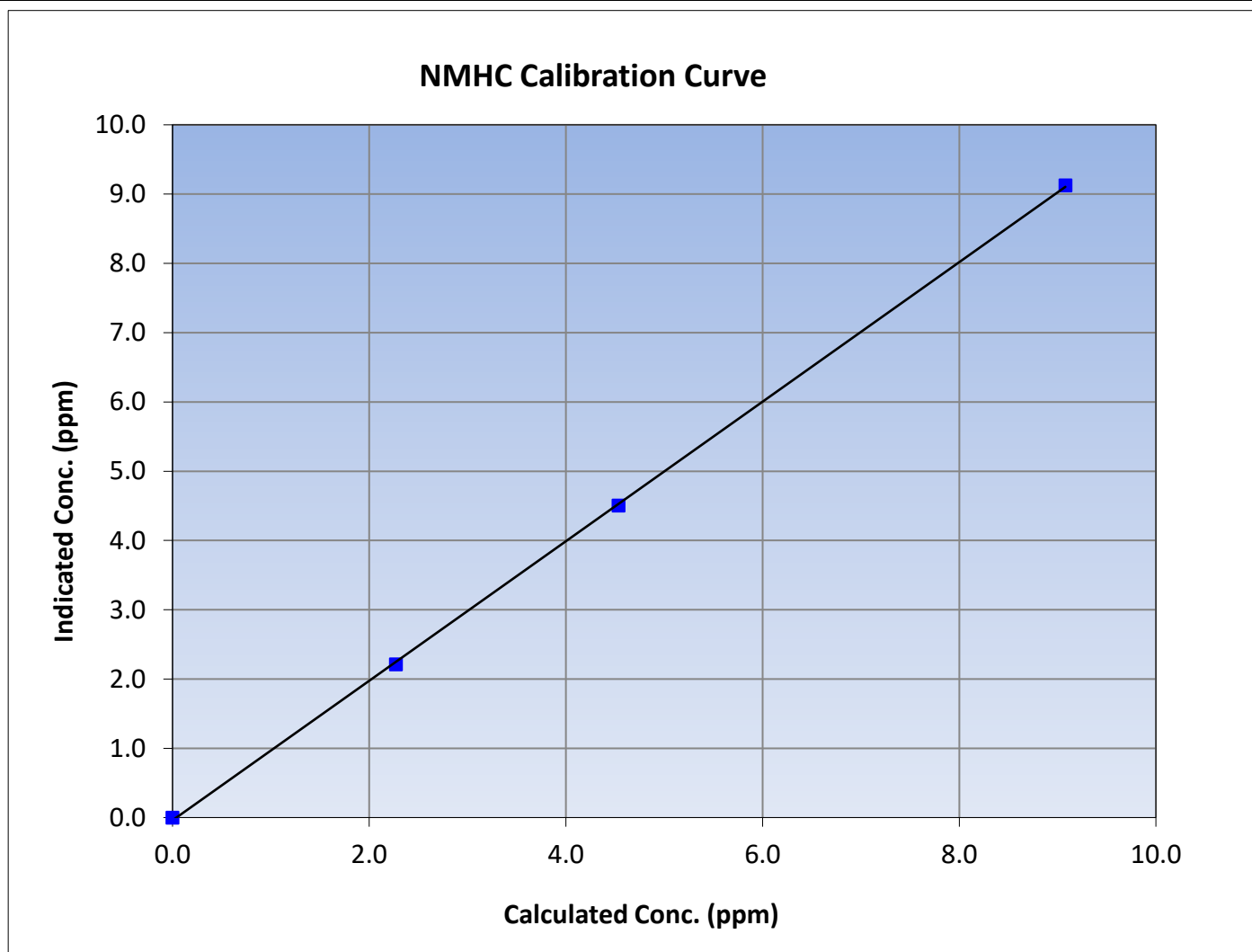
Version-01-2020

### Station Information

|                   |                  |                       |               |
|-------------------|------------------|-----------------------|---------------|
| Calibration Date: | March 3, 2023    | Previous Calibration: | March 2, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS13         |
| Start Time (MST): | 11:08            | End Time (MST):       | 15:19         |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1170050130    |

### Calibration Data

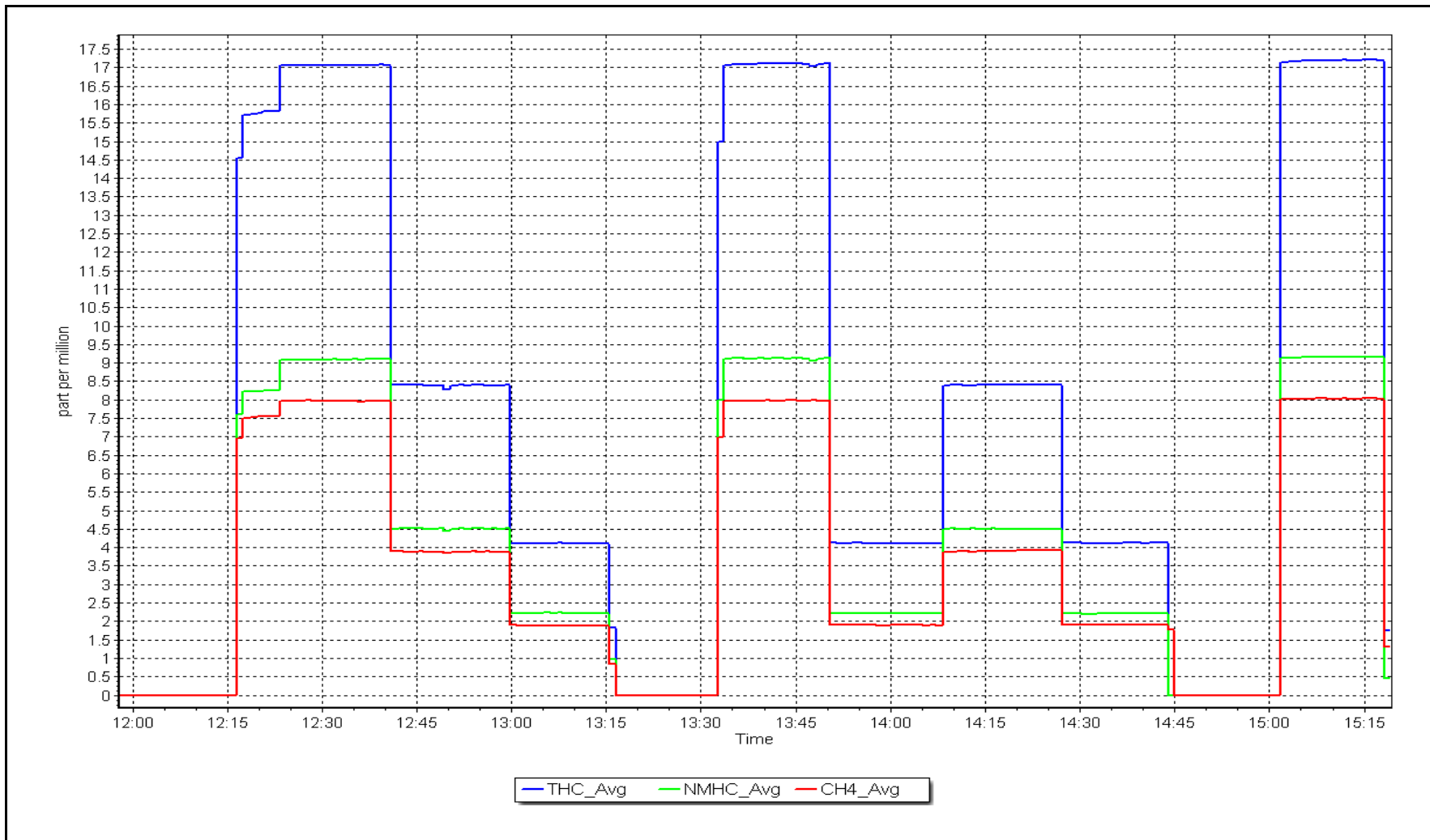
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999913  | $\geq 0.995$  |       |          |             |
| 9.08                                | 9.13                               | 0.9949                    |                         |           |               |       |          |             |
| 4.53                                | 4.50                               | 1.0072                    |                         |           |               | Slope | 1.007142 | 0.90 - 1.10 |
| 2.27                                | 2.21                               | 1.0270                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.039766 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: March 3, 2023

Location: Fort McKay South







# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.2   | -0.2                                  | 0.0  | ----  | ----   |
| as found span             | 4919                      | 81.1                        | 826.9   | 800.0                                  | 26.9  | 823.1  | 794.6                                 | 28.5   | 1.0046  | 1.0067   |
| 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                | 4919                      | 81.1                        | 826.9   | 800.0                                  | 26.9  | 825.7  | 800.4                                 | 25.3   | 1.0014  | 0.9994   |
| second point              | 4960                      | 40.6                        | 413.9   | 400.4                                  | 13.5  | 410.4  | 396.9                                 | 13.5   | 1.0085  | 1.0089   |
| third point               | 4980                      | 20.3                        | 207.0   | 200.2                                  | 6.7   | 202.4  | 194.3                                 | 8.1  | 1.0226  | 1.0305   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.1   | -0.1                                  | 0.0  | ----  | ----   |
| as left span              | 4919                      | 81.1                        | 826.9   | 379.9                                  | 447.0   | 836.8  | 381.6                                 | 455.2  | 0.9881  | 0.9954   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0108  | 1.0129   |

|                      |                             |                |  |                                  |                         |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 823.3 ppb | NO = 794.8 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -0.1% |                      |
| Previous Response    | NO <sub>x</sub> = 824.0 ppb | NO = 798.7 ppb |  | *Percent Change                  | NO = -0.5%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 795.0                                      | 374.9                                 | 447.0   | 446.2  | 1.0018   | 99.8%  |
| 2nd GPT point (200 ppb O3)       | 795.0                                      | 583.1                                 | 238.8   | 237.8  | 1.0043   | 99.6%  |
| 3rd GPT point (100 ppb O3)       | 795.0                                      | 688.9                                 | 133.0   | 132.2  | 1.0062   | 99.4%  |
| Average Correction Factor        |  |                                       |   |  | 1.0041   | 99.6%  |

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

Calibration Performed By: Sean Bala





# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

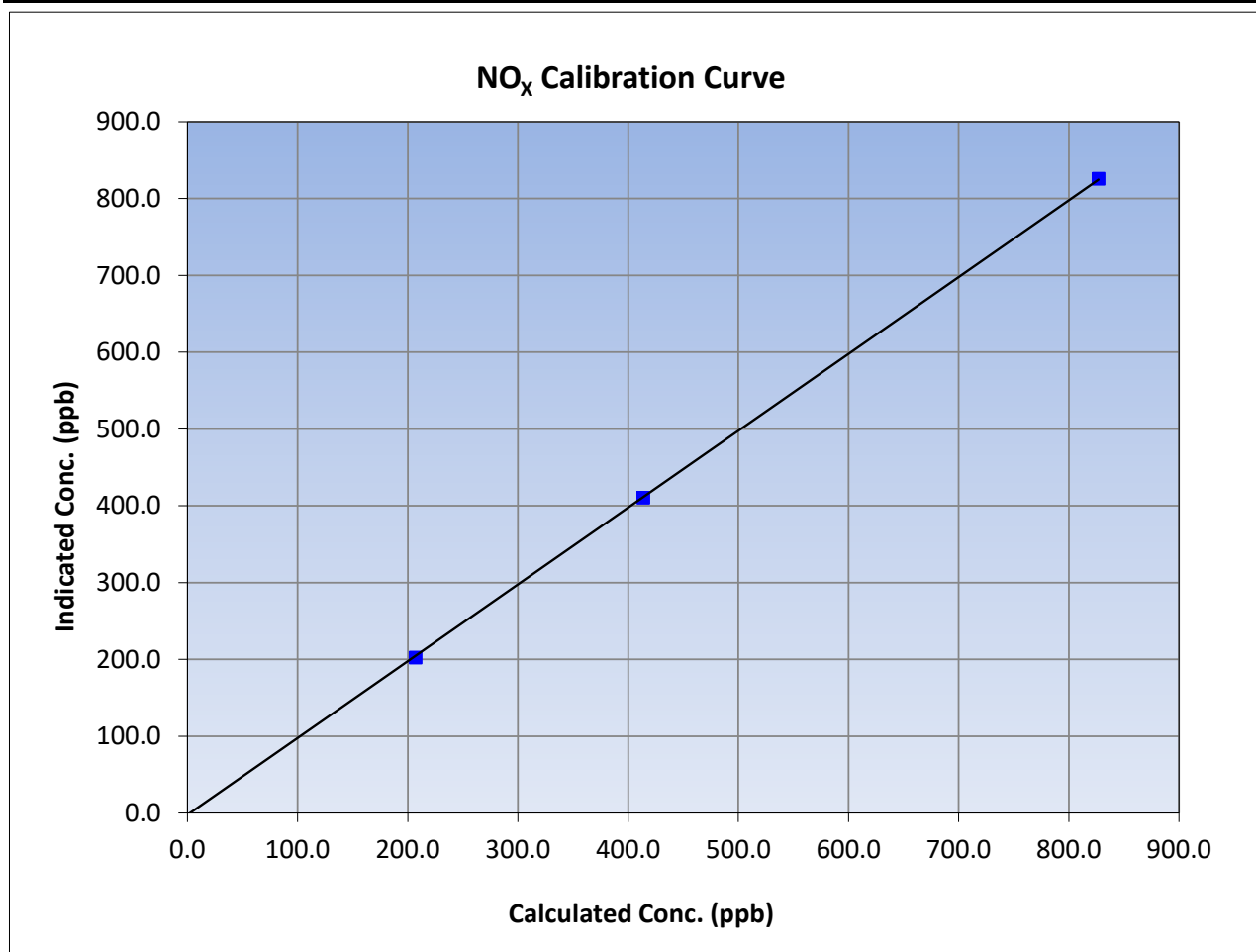
Version-04-2020

### Station Information

|                   |                  |                       |                   |
|-------------------|------------------|-----------------------|-------------------|
| Calibration Date: | March 23, 2023   | Previous Calibration: | February 10, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS 13            |
| Start Time (MST): | 8:20             | End Time (MST):       | 12:59             |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1410661329        |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | ≥0.995        |             |
| 826.9                               | 825.7                              | 1.0014                    |                         |               |             |
| 413.9                               | 410.4                              | 1.0085                    |                         |               |             |
| 207.0                               | 202.4                              | 1.0226                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 1.000036      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -2.351272     | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

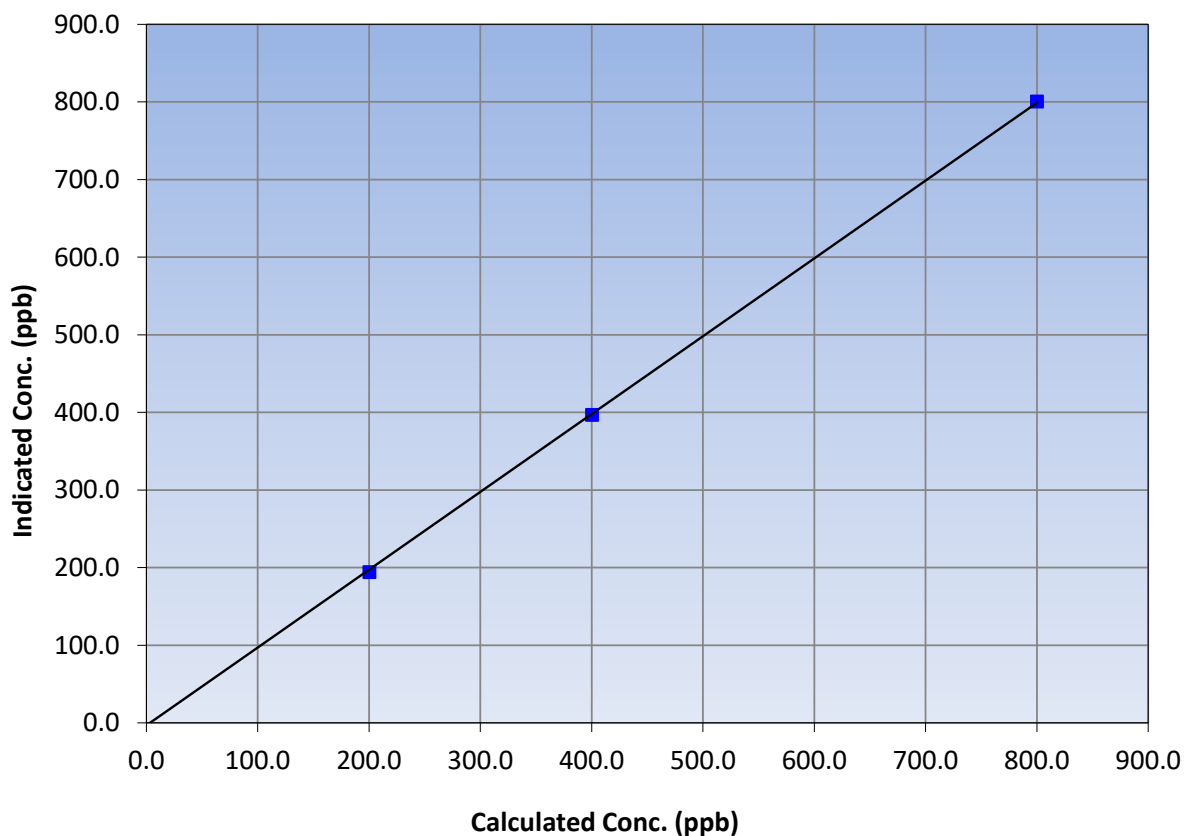
### Station Information

|                   |                  |                       |                   |
|-------------------|------------------|-----------------------|-------------------|
| Calibration Date: | March 23, 2023   | Previous Calibration: | February 10, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS 13            |
| Start Time (MST): | 8:20             | End Time (MST):       | 12:59             |
| 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 | 0.999930  | ≥0.995      |
| 800.0                               | 800.4                              | 0.9994                    |                         |           |             |
| 400.4                               | 396.9                              | 1.0089                    | Slope                   | 1.002705  | 0.90 - 1.10 |
| 200.2                               | 194.3                              | 1.0305                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -3.225164 | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

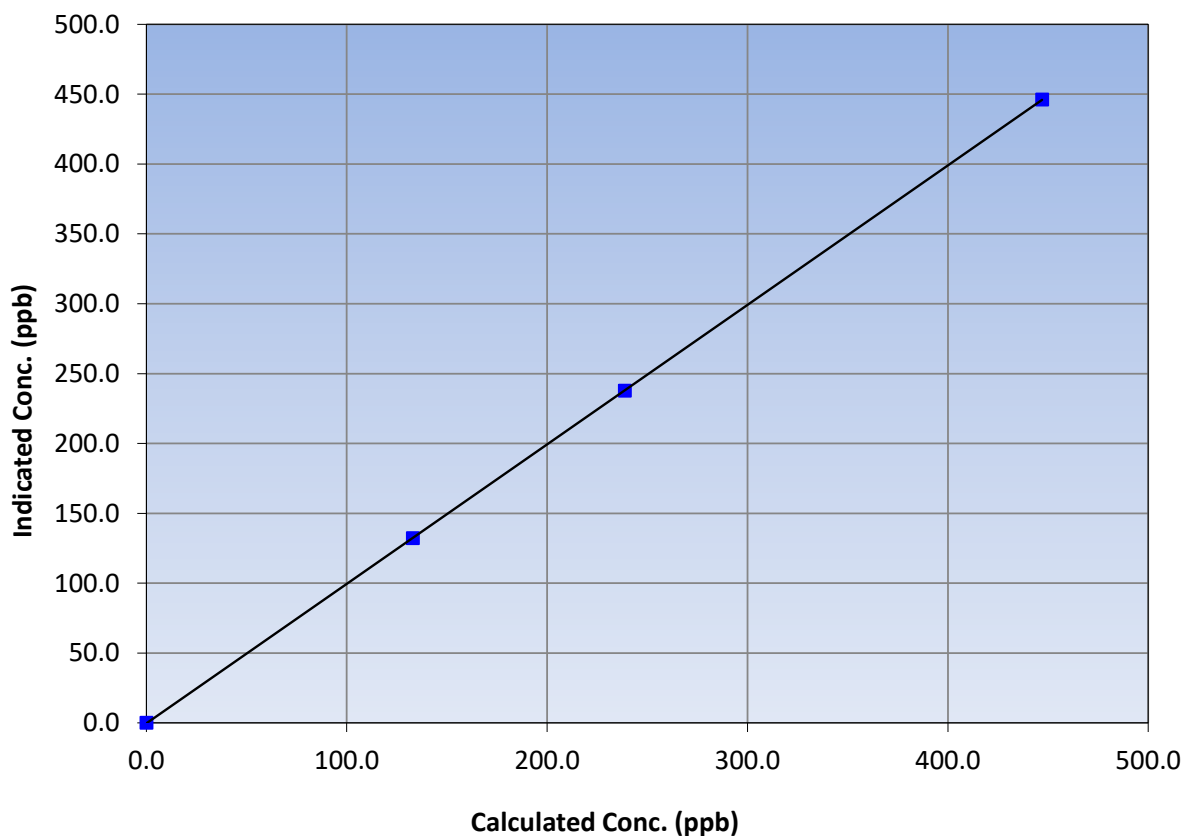
### Station Information

|                   |                  |                       |                   |
|-------------------|------------------|-----------------------|-------------------|
| Calibration Date: | March 23, 2023   | Previous Calibration: | February 10, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS 13            |
| Start Time (MST): | 8:20             | End Time (MST):       | 12:59             |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1410661329        |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 447.0                               | 446.2                              | 1.0018                    |   |                                |
| 238.8                               | 237.8                              | 1.0043                    |   |                                |
| 133.0                               | 132.2                              | 1.0062                    |   |                                |
|                                     |                                    |                           | 0.999997                                      |                                |
|                                     |                                    |                           | 0.998357                                      |                                |
|                                     |                                    |                           | -0.332208                                     |                                |

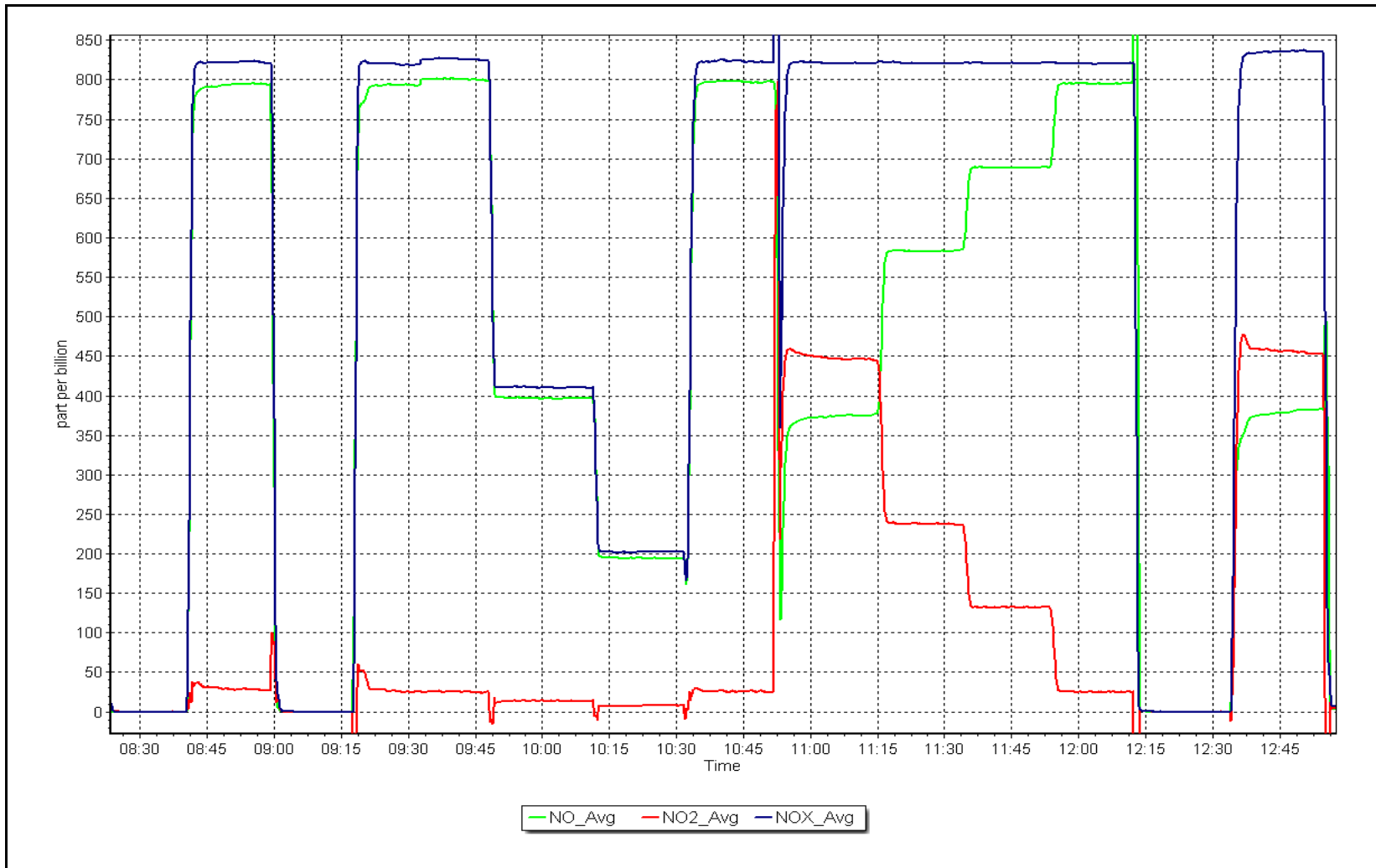
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: March 23, 2023

Location: Fort McKay South





# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Fort McKay South      Station number: AMS13  
 Calibration Date: March 22, 2023      Last Cal Date: February 3, 2023  
 Start time (MST): 8:54      End time (MST): 12:20  
 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

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.997629     | 0.997886      | Backgd or Offset: | 2.7          | 3.7           |
| Calibration intercept: | 1.040000     | 0.320000      | Coeff or Slope:   | 0.962        | 0.964         |

### O<sub>3</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                       | 0.0                           | 0.0                                 | -0.1                               | ----  |
| as found span             | 5000                       | 969.9                         | 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                       | 980.6                         | 400.0                               | 399.1                              | 1.002   |
| second point              | 5000                       | 838.0                         | 200.0                               | 200.4                              | 0.998   |
| third point               | 5000                       | 735.3                         | 100.0                               | 100.6                              | 0.994   |
| as left zero              | 5000                       | 0.0                           | 0.0                                 | -1.0                               | ----  |
| as left span              | 5000                       | 979.1                         | 400.0                               | 400.8                              | 0.998   |
| Average Correction Factor |                            |                               |                                     |                                    | 0.998   |

|                          |       |                   |       |               |       |
|--------------------------|-------|-------------------|-------|---------------|-------|
| Baseline Corr As found:  | 399.1 | Previous response | 400.1 | *% change     | -0.2% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:         |       | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation:   |       |               |       |

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

Notes: Changed inlet filter after as founds. Zero adjusted.

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

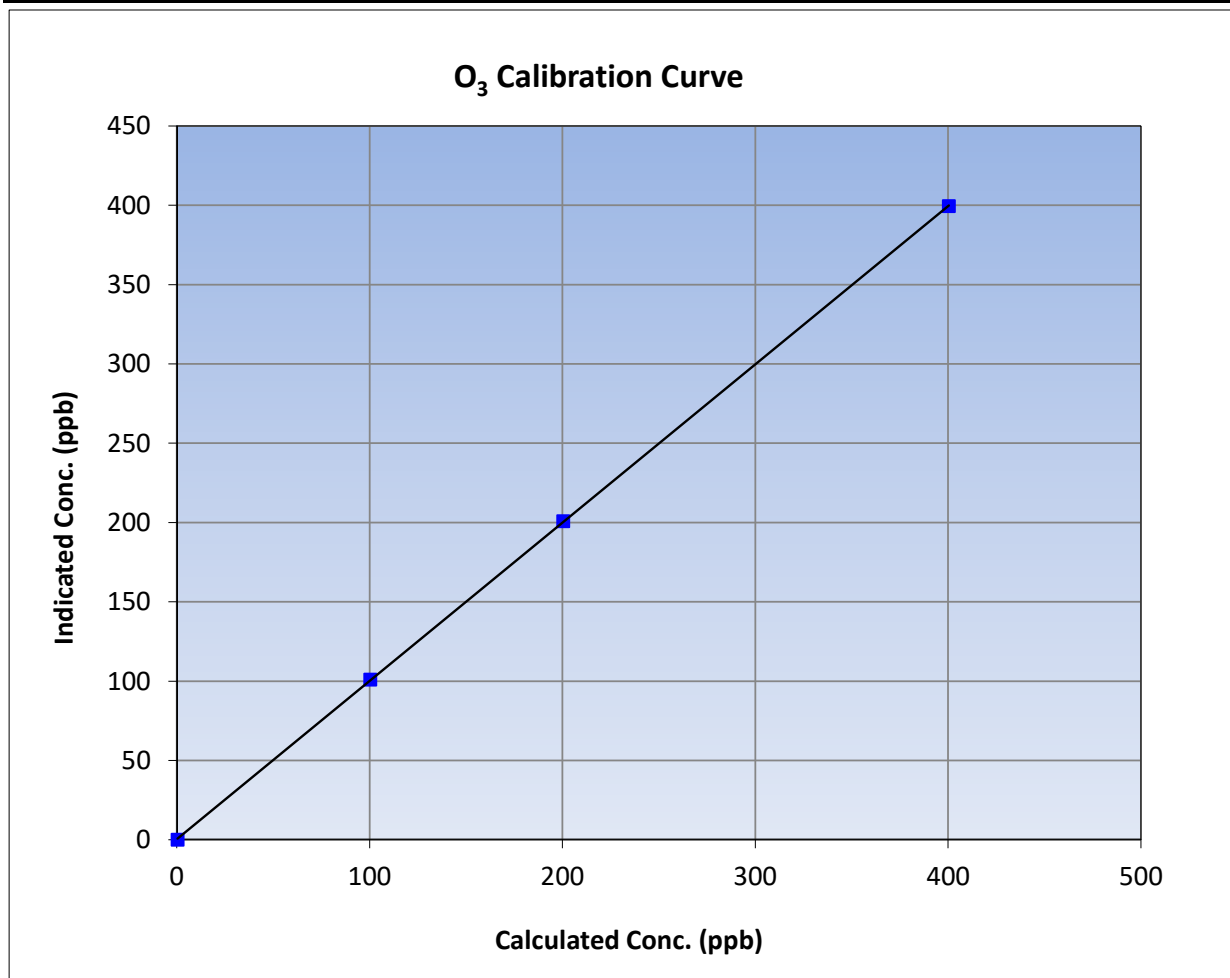
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | March 22, 2023    | Previous Calibration: | February 3, 2023 |
| Station Name:     | Fort McKay South  | Station Number:       | AMS13            |
| Start Time (MST): | 8:54              | End Time (MST):       | 12:20            |
| Analyzer make:    | Teledyne API T400 | Analyzer serial #:    | 3871             |

### Calibration Data

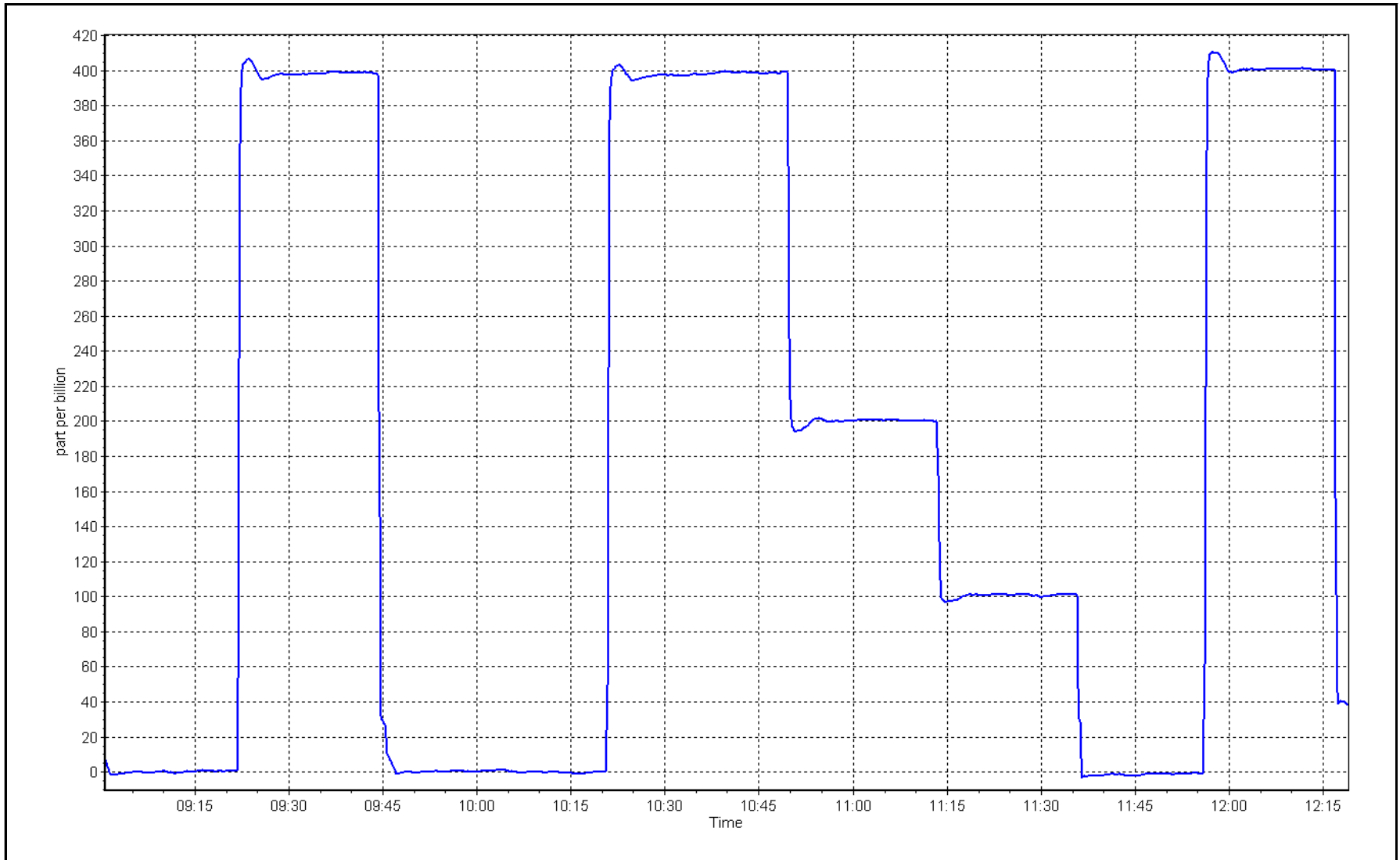
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.3                               | ----                      | Correlation Coefficient | 0.999988      | ≥0.995      |
| 400.0                               | 399.1                              | 1.0023                    |                         |               |             |
| 200.0                               | 200.4                              | 0.9980                    | Slope                   | 0.997886      | 0.90 - 1.10 |
| 100.0                               | 100.6                              | 0.9940                    |                         |               |             |
|                                     |                                    |                           | Intercept               | 0.320000      | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: March 22, 2023

Location: Fort McKay South





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Fort McKay South      Station number: AMS 13  
 Calibration Date: March 22, 2023      Last Cal Date: February 16, 2023  
 Start time (MST): 9:34      End time (MST): 11:32

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

Flow Meter Make/Model: Delta Cal      S/N: 141229  
 Temp/RH standard: Delta Cal      S/N: 141229

### Monthly Calibration Test

| Parameter  | As found                             | Measured                                | As left | Adjusted                 | (Limits)     |
|------------|--------------------------------------|---|---------|--------------------------|--------------|
| T (°C)     | -7.3                                 | -6.9                                    | -7.3    | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 729.5                                | 729.1                                   | 729.5   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.01                                 | 5.02                                    | 5.01    | <input type="checkbox"/> | +/- 0.25 LPM |
| Leak Test: | Date of check: <u>March 22, 2023</u> | Last Cal Date: <u>February 16, 2023</u> |         |                          |              |
|            | PM w/o HEPA: <u>7.2</u>              | PM w/ HEPA: <u>0.0</u>                  |         |                          | <0.2 ug/m3   |

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

Inlet cleaning :      Inlet Head

### Quarterly Calibration Test

| Parameter                     | As found | Post maintenance         | As left             | Adjusted                            | (Limits)     |
|-------------------------------|----------|--------------------------|---------------------|-------------------------------------|--------------|
| PMT Peak Test                 | 10.9     | 11.1                     | 10.7                | <input checked="" type="checkbox"/> | 10.9 +/- 0.5 |
| Post-maintenance leak check:  |          | PM w/o HEPA: <u>29.1</u> | w/ HEPA: <u>0.0</u> |                                     |              |
| Date Optical Chamber Cleaned: |          | <u>March 22, 2023</u>    |                     |                                     | <0.2 ug/m3   |
| Disposable Filter Changed:    |          | <u>March 22, 2023</u>    |                     |                                     |              |

### Annual Maintenance

Date Sample Tube Cleaned: \_\_\_\_\_  
 Date RH/T Sensor Cleaned: \_\_\_\_\_

Notes:      Inlet inspected and cleaned. Pump was replaced as well.

Calibration by:      Sean Bala





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS14  
ANZAC  
MARCH 2023**

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

April 29, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

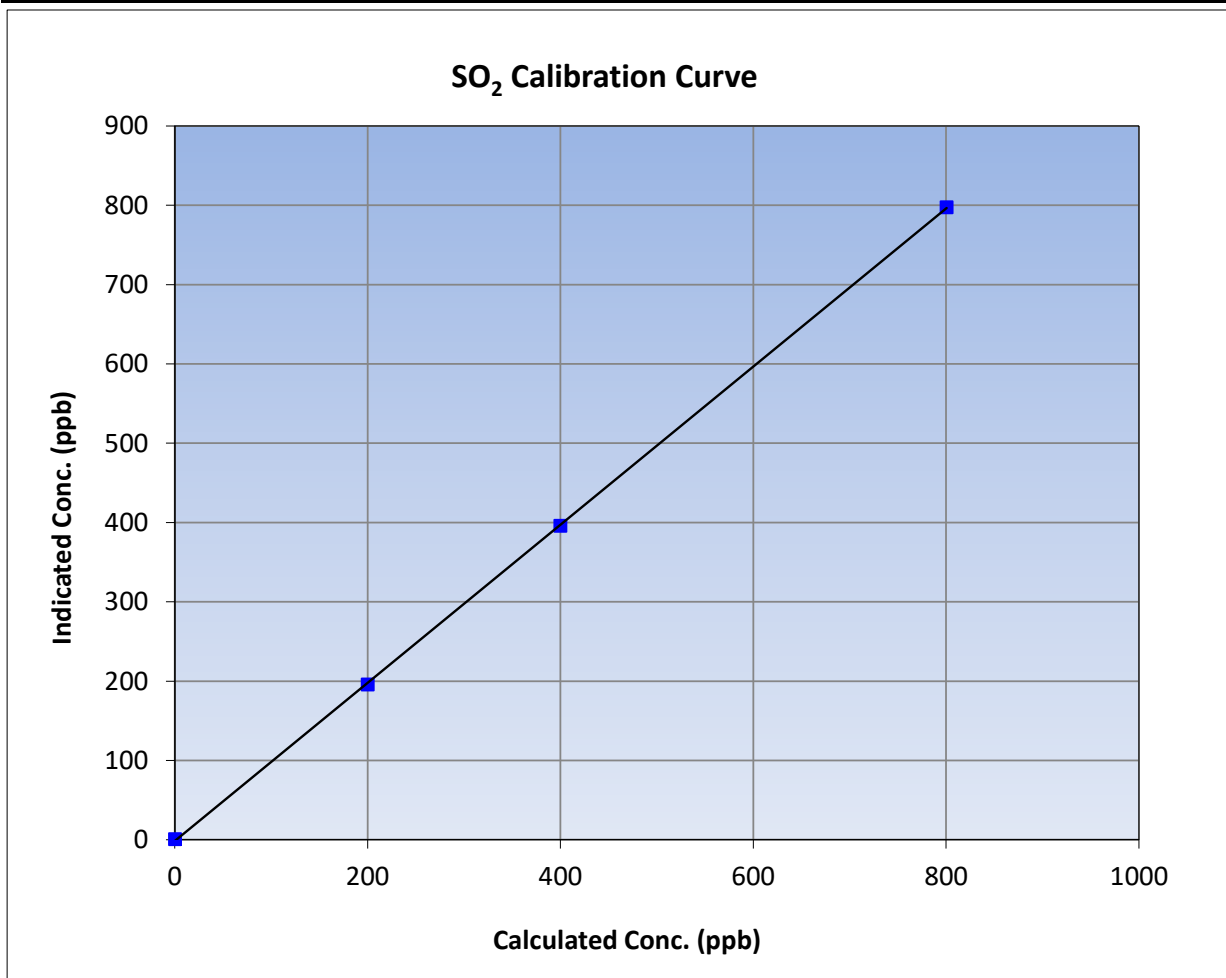
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 17, 2023 | Previous Calibration: | February 21, 2023 |
| Station Name:     | Anzac          | Station Number:       | AMS 14            |
| Start Time (MST): | 6:45           | End Time (MST):       | 9:16              |
| Analyzer make:    | Thermo 43i     | Analyzer serial #:    | 0710321322        |

### Calibration Data

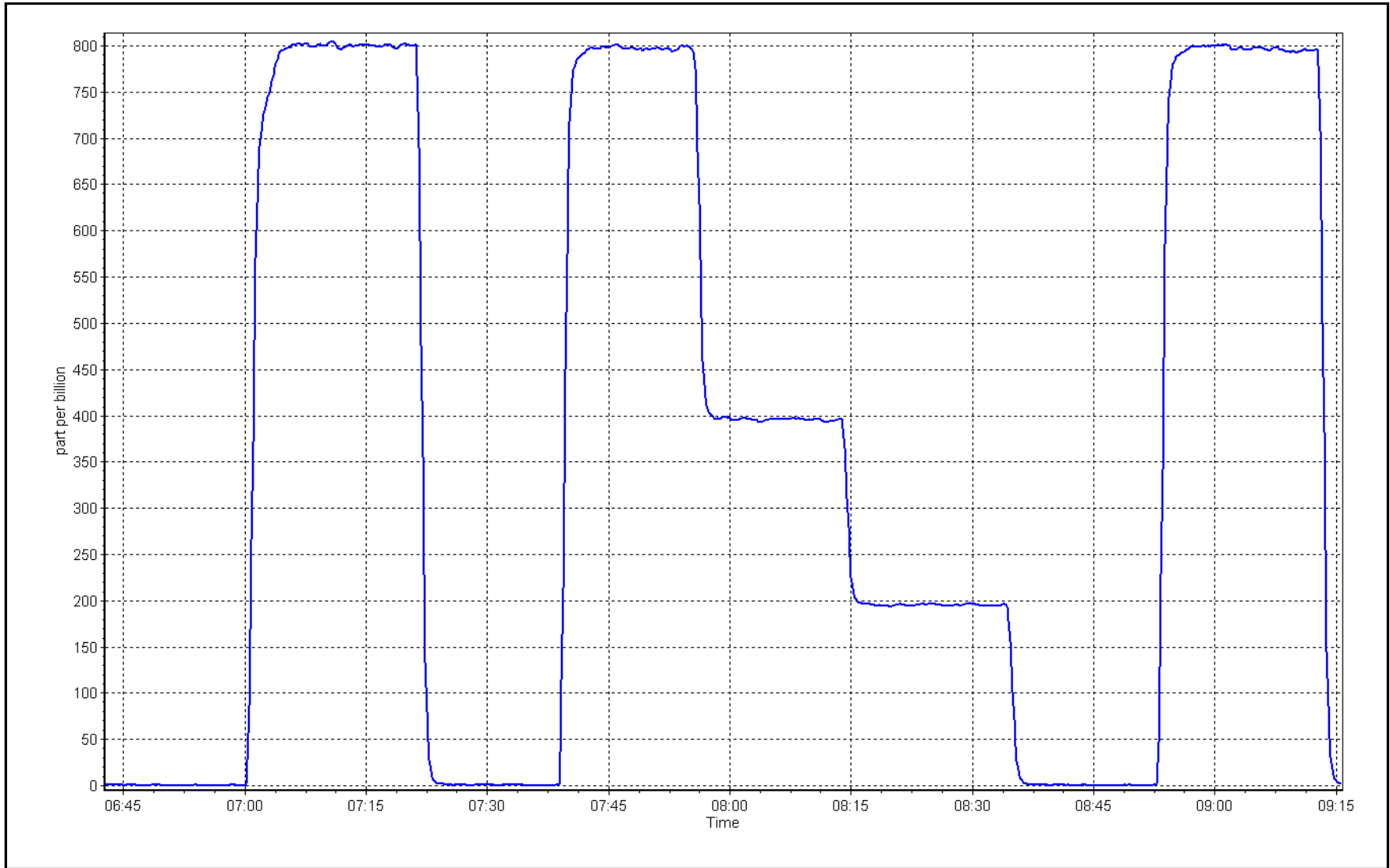
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.5                                   | ----                         | Correlation Coefficient | 0.999967      |             |
| 800.2                                  | 797.3                                 | 1.0036                       |                         |               | ≥0.995      |
| 399.6                                  | 395.5                                 | 1.0104                       | Slope                   | 0.997012      |             |
| 199.8                                  | 195.6                                 | 1.0215                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | -1.625104     | +/-30       |



SO2 Calibration Plot

Date: March 17, 2023

Location: Anzac





# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

Station Name: Anzac Station number: AMS14  
 Calibration Date: March 1, 2023 Last Cal Date: February 3, 2023  
 Start time (MST): 8:49 End time (MST): 12:51  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.38 ppm Cal Gas Exp Date: February 3, 2023  
 Cal Gas Cylinder #: EY0000859  
 Removed Cal Gas Conc: 5.38 ppm Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA Diff between cyl:  
 Calibrator Make/Model: API T700 Serial Number: 5252  
 ZAG Make/Model: API 701H Serial Number: 357

### Analyzer Information

Analyzer make: Thermo 43i-TLE Analyzer serial #: 1180540019  
 Converter make: CD Nova CDN-101 Converter serial #: 503  
 Analyzer Range 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 1.004840     | 1.004840      | Backgd or Offset: 5.66 | 5.76          |
| Calibration intercept: | -0.021121    | 0.178882      | Coeff or Slope: 1.008  | 1.031         |

### 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----   |
| as found span         | 4925                          | 74.3                        | 80.0                                | 78.7                               | 1.020  |
| as found 2nd point    | 4962                          | 37.2                        | 40.0                                | 39.2                               | 1.029  |
| as found 3rd point    | 4981                          | 18.6                        | 20.0                                | 19.4                               | 1.048  |
| 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.5                                | ----  |
| high point                              | 4925                          | 74.3                        | 80.0                                | 80.7                               | 0.991   |
| second point                            | 4962                          | 37.2                        | 40.0                                | 40.2                               | 0.996   |
| third point                             | 4981                          | 18.6                        | 20.0                                | 20.0                               | 1.001   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.5                                | ----  |
| as left span                            | 4925                          | 74.3                        | 80.0                                | 80.4                               | 0.995   |
| SO2 Scrubber Check                      | 4920                          | 80.0                        | 800.0                               | -0.1                               | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    | 0.996   |
| Date of last converter efficiency test: |                               |                             |                                     | efficiency                         |   |

Baseline Corr As found: 78.4 Prev response: 80.32 \*% change: -2.5%  
 Baseline Corr 2nd AF pt: 38.9 AF Slope: 0.982257 AF Intercept: 0.019323  
 Baseline Corr 3rd AF pt: 19.1 AF Correlation: 0.999942

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

Notes: Scrubber checked after the calibrator zero. No maintenance done. Span adjusted.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## TRS Calibration Summary

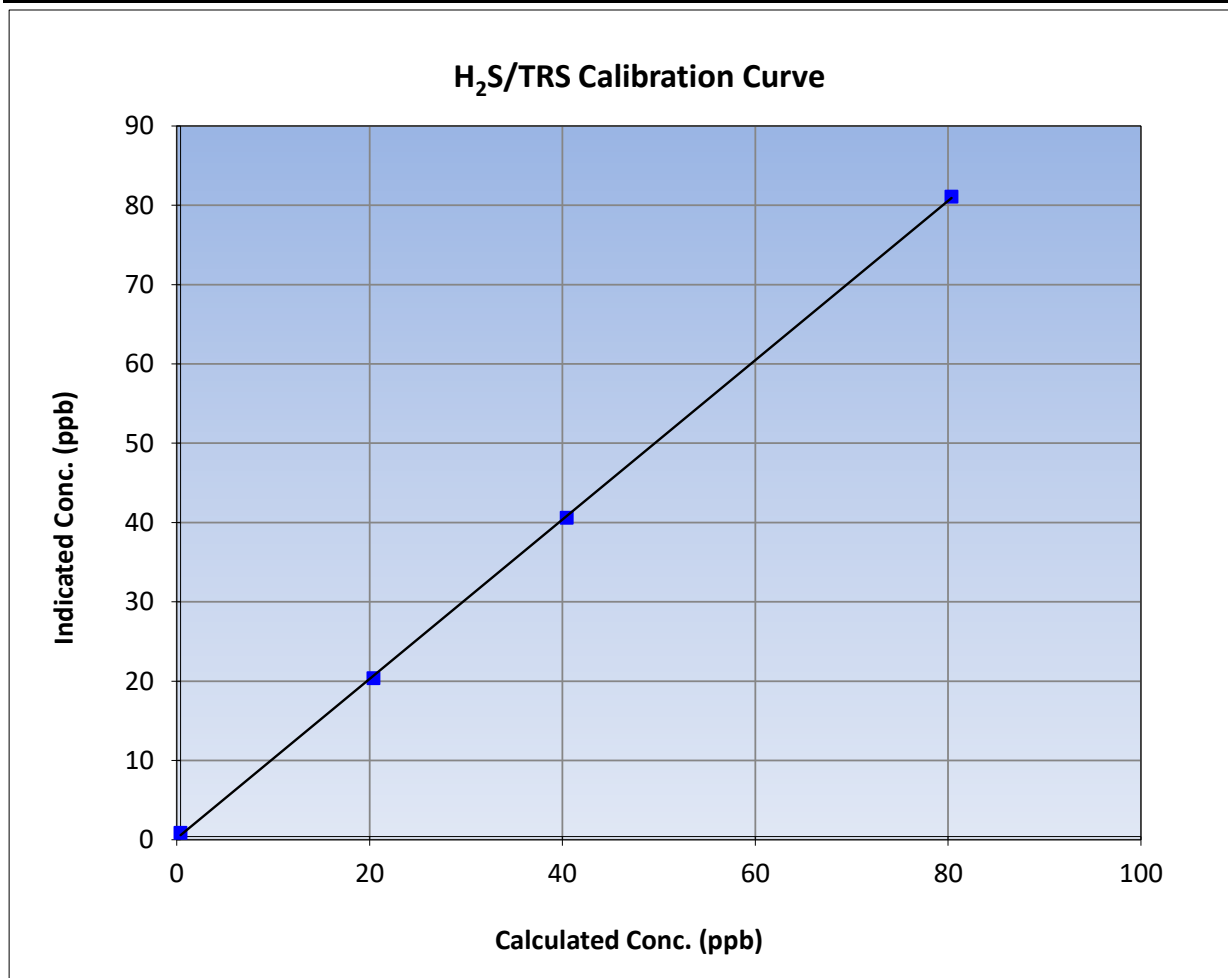
Version-11-2021

### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 1, 2023  | Previous Calibration: | February 3, 2023 |
| Station Name:     | Anzac          | Station Number:       | AMS14            |
| Start Time (MST): | 8:49           | End Time (MST):       | 12:51            |
| Analyzer make:    | Thermo 43i-TLE | Analyzer serial #:    | 1180540019       |

### Calibration Data

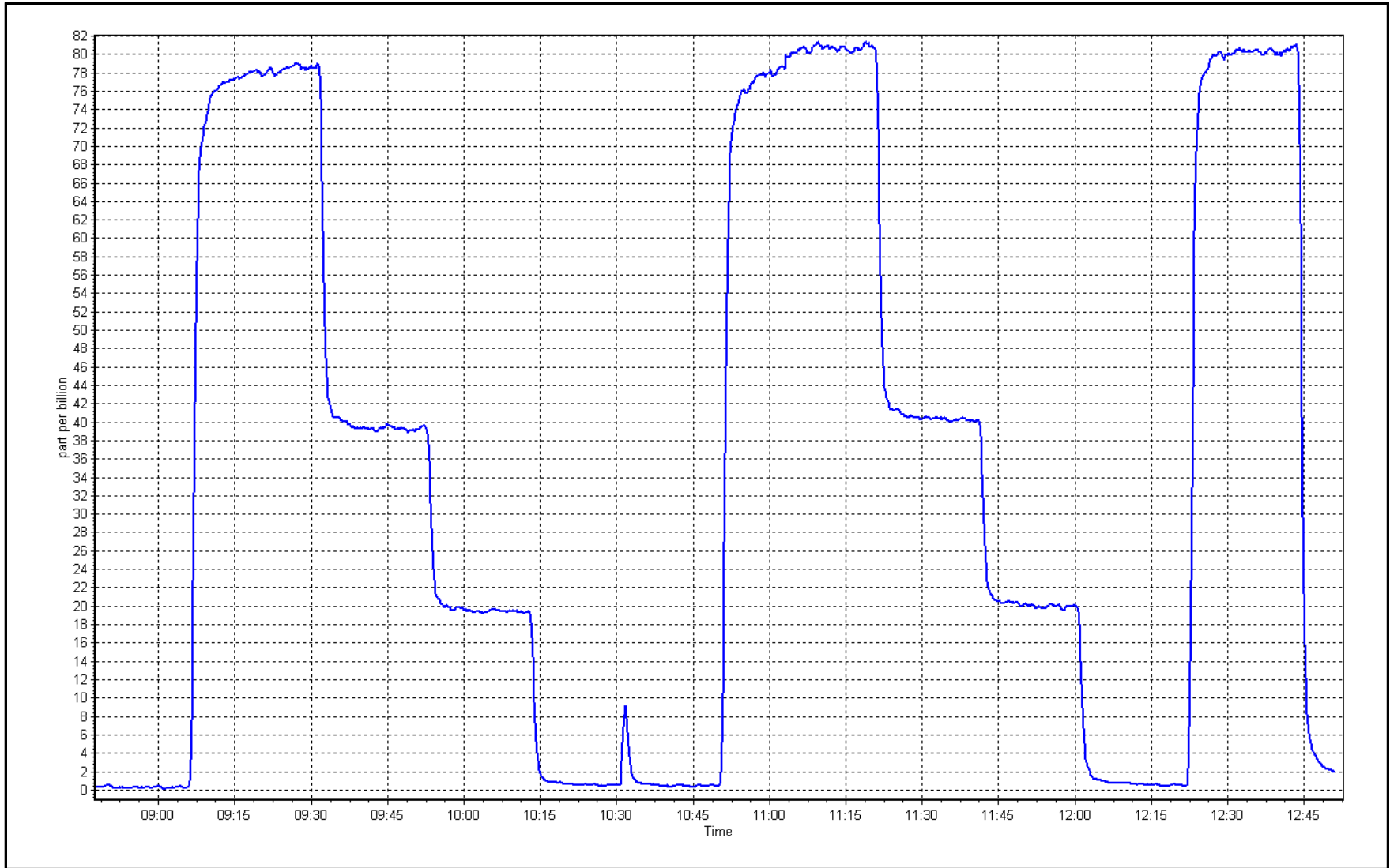
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.5                                | ----                      | Correlation Coefficient | 0.999926 | ≥0.995      |
| 80.0                                | 80.7                               | 0.9908                    |                         |          |             |
| 40.0                                | 40.2                               | 0.9959                    | Slope                   | 1.004840 | 0.90 - 1.10 |
| 20.0                                | 20.0                               | 1.0008                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.178882 | +/-3        |



TRS Calibration Plot

Date: March 1, 2023

Location: Anzac





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                 |                 |                   |
|-------------------|-----------------|-----------------|-------------------|
| Station Name:     | Anzac           | Station number: | AMS 14            |
| Calibration Date: | March 1, 2023   | Last Cal Date:  | February 21, 2023 |
| Start time (MST): | 7:45            | End time (MST): | 8:51              |
| Reason:           | Cylinder Change |                 |                   |

### Calibration Standards

|   |           |                             |                 |
|---|-----------|-----------------------------|-----------------|
| Gas Cert Reference:                         | CC279389  | Cal Gas Expiry Date:        | January 5, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 499.3 ppm | CH <sub>4</sub> Equiv Conc. | 1068.8 ppm      |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.1 ppm |                             |                 |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA              |
| Removed CH <sub>4</sub> Conc.               | 499.3 ppm | CH <sub>4</sub> Equiv Conc. | 1068.8 ppm      |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.1 ppm | Diff between cyl (THC):     |                 |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                 |
| Calibrator Model:                           | API T700  | Serial Number:              | 5252            |
| 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 | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.85E-04     | 3.85E-04      | NMHC SP Ratio:  | 4.46E-05      |
| CH <sub>4</sub> Retention time: | 12.00        | 12.00         | NMHC Peak Area: | 204554        |
|                                 |              |               |                 | 204554        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span         | 4920              | 80.1                 | 17.12                | 17.02                                      | 1.006                      |
| as found 2nd point    |                   |                      |                      |  |                            |
| as found 3rd point    |                   |                      |                      |  |                            |
| new cylinder response |                   |                      |                      |  |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point            | 4920              | 80.1                 | 17.12                | 16.98                                      | 1.008                      |
| second point          |                   |                      |                      |  |                            |
| third point           |                   |                      |                      |  |                            |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                  | 1.008                      |
| Baseline Corr AF:     | 17.02             | Prev response        | 16.92                | *% change                                  | 0.6%                       |
| 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as found span         | 4920              | 80.1                 | 9.12                 | 9.02   | 1.011                      |
| as found 2nd point    |                   |                      |                      |  |                            |
| as found 3rd point    |                   |                      |                      |  |                            |
| new cylinder response |                   |                      |                      |  |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| high point            | 4920              | 80.1                 | 9.12                 | 9.00   | 1.013                      |
| second point          |                   |                      |                      |  |                            |
| third point           |                   |                      |                      |  |                            |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                            | 1.013                      |
| Baseline Corr AF:     | 9.02              | Prev response        | 9.01                 | *% change  | 0.1%                       |
| Baseline Corr 2nd AF: | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF: | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### CH<sub>4</sub> Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as found span         | 4920              | 80.1                 | 8.00                 | 7.99   | 1.001                      |
| as found 2nd point    |                   |                      |                      |  |                            |
| as found 3rd point    |                   |                      |                      |  |                            |
| new cylinder response |                   |                      |                      |  |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| high point            | 4920              | 80.1                 | 8.00                 | 7.98   | 1.002                      |
| second point          |                   |                      |                      |  |                            |
| third point           |                   |                      |                      |  |                            |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                            | 1.002                      |
| Baseline Corr AF:     | 7.99              | Prev response        | 7.98                 | *% change  | 0.1%                       |
| Baseline Corr 2nd AF: | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF: | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.988889     | 0.991693      |
| THC Cal Offset:             | -0.013842    | 0.000000      |
| CH <sub>4</sub> Cal Slope:  | 0.999568     | 0.997671      |
| CH <sub>4</sub> Cal Offset: | -0.016046    | 0.000000      |
| NMHC Cal Slope:             | 0.989676     | 0.986890      |
| NMHC Cal Offset:            | -0.015788    | 0.000000      |

Notes:

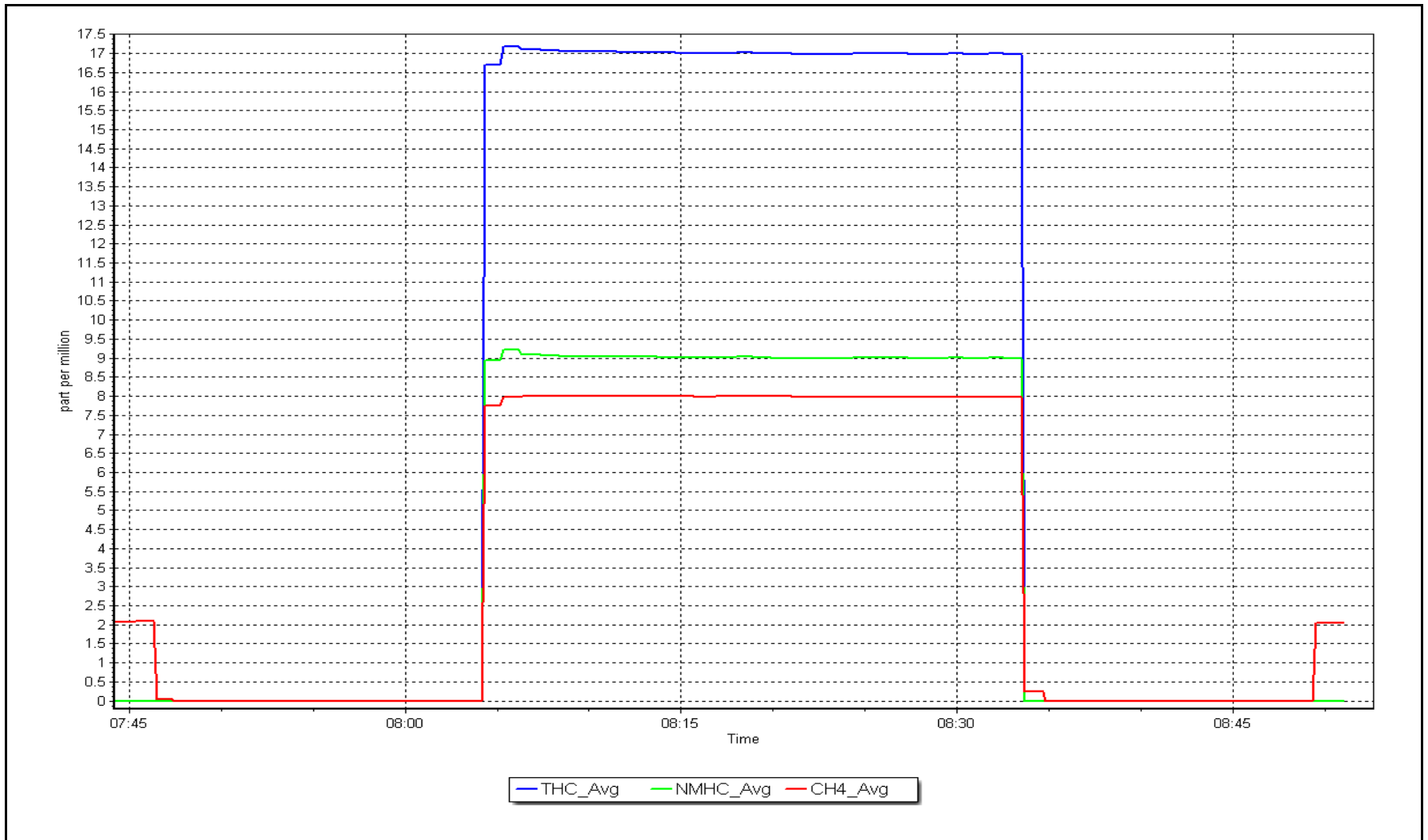
Nitrogen Cylinder Change

Calibration Performed By: Melissa Lemay

NMHC Calibration Plot

Date: March 1, 2023

Location: Anzac





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                |                 |                   |
|-------------------|----------------|-----------------|-------------------|
| Station Name:     | Anzac          | Station number: | AMS 14            |
| Calibration Date: | March 17, 2023 | Last Cal Date:  | February 21, 2023 |
| Start time (MST): | 6:45           | End time (MST): | 9:15              |
| Reason:           | Routine        |                 |                   |

### Calibration Standards

|   |           |                             |                 |
|---|-----------|-----------------------------|-----------------|
| Gas Cert Reference:                         | CC279389  | Cal Gas Expiry Date:        | January 5, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 499.3 ppm | CH <sub>4</sub> Equiv Conc. | 1068.8 ppm      |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.1 ppm |                             |                 |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA              |
| Removed CH <sub>4</sub> Conc.               | 499.3 ppm | CH <sub>4</sub> Equiv Conc. | 1068.8 ppm      |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.1 ppm | Diff between cyl (THC):     |                 |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                 |
| Calibrator Model:                           | API T700  | Serial Number:              | 5252            |
| 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 | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.85E-04     | 3.85E-04      | NMHC SP Ratio:  | 4.46E-05      |
| CH <sub>4</sub> Retention time: | 12.00        | 12.00         | NMHC Peak Area: | 204554        |
|                                 |              |               |                 | 204554        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4920              | 80.1                 | 17.12                | 17.02               | 1.006                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4920              | 80.1                 | 17.12                | 17.04               | 1.005                      |
| second point          | 4960              | 40.0                 | 8.55                 | 8.50                | 1.006                      |
| third point           | 4980              | 20.0                 | 4.28                 | 4.21                | 1.016                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4920              | 80.1                 | 17.12                | 16.97               | 1.009                      |

| Average Correction Factor |       |                 |       | 1.009                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 17.02 | Prev response   | 16.92 | *% change 0.6%                             |
| 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.1                 | 9.12                 | 9.09                                       | 1.004                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.1                 | 9.12                 | 9.10                                       | 1.003                      |
| second point              | 4960              | 40.0                 | 4.56                 | 4.54                                       | 1.004                      |
| third point               | 4980              | 20.0                 | 2.28                 | 2.24                                       | 1.017                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.1                 | 9.12                 | 9.06                                       | 1.007                      |
| Average Correction Factor |                   |                      |                      |  | 1.008                      |
| Baseline Corr AF:         | 9.09              | Prev response        | 9.01                 | *% change                                  | 0.8%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.1                 | 8.00                 | 7.93                                       | 1.009                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.1                 | 8.00                 | 7.94                                       | 1.007                      |
| second point              | 4960              | 40.0                 | 3.99                 | 3.97                                       | 1.006                      |
| third point               | 4980              | 20.0                 | 2.00                 | 1.97                                       | 1.014                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.1                 | 8.00                 | 7.91                                       | 1.011                      |
| Average Correction Factor |                   |                      |                      |  | 1.009                      |
| Baseline Corr AF:         | 7.93              | Prev response        | 7.98                 | *% change                                  | -0.6%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.988889     | 0.996031      |
| THC Cal Offset:             | -0.013842    | -0.019815     |
| CH <sub>4</sub> Cal Slope:  | 0.999568     | 0.993278      |
| CH <sub>4</sub> Cal Offset: | -0.016046    | -0.004047     |
| NMHC Cal Slope:             | 0.989676     | 0.998568      |
| NMHC Cal Offset:            | -0.015788    | -0.013765     |

Notes: No adjustments done. Hydrogen Cylinder changed out.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## THC Calibration Summary

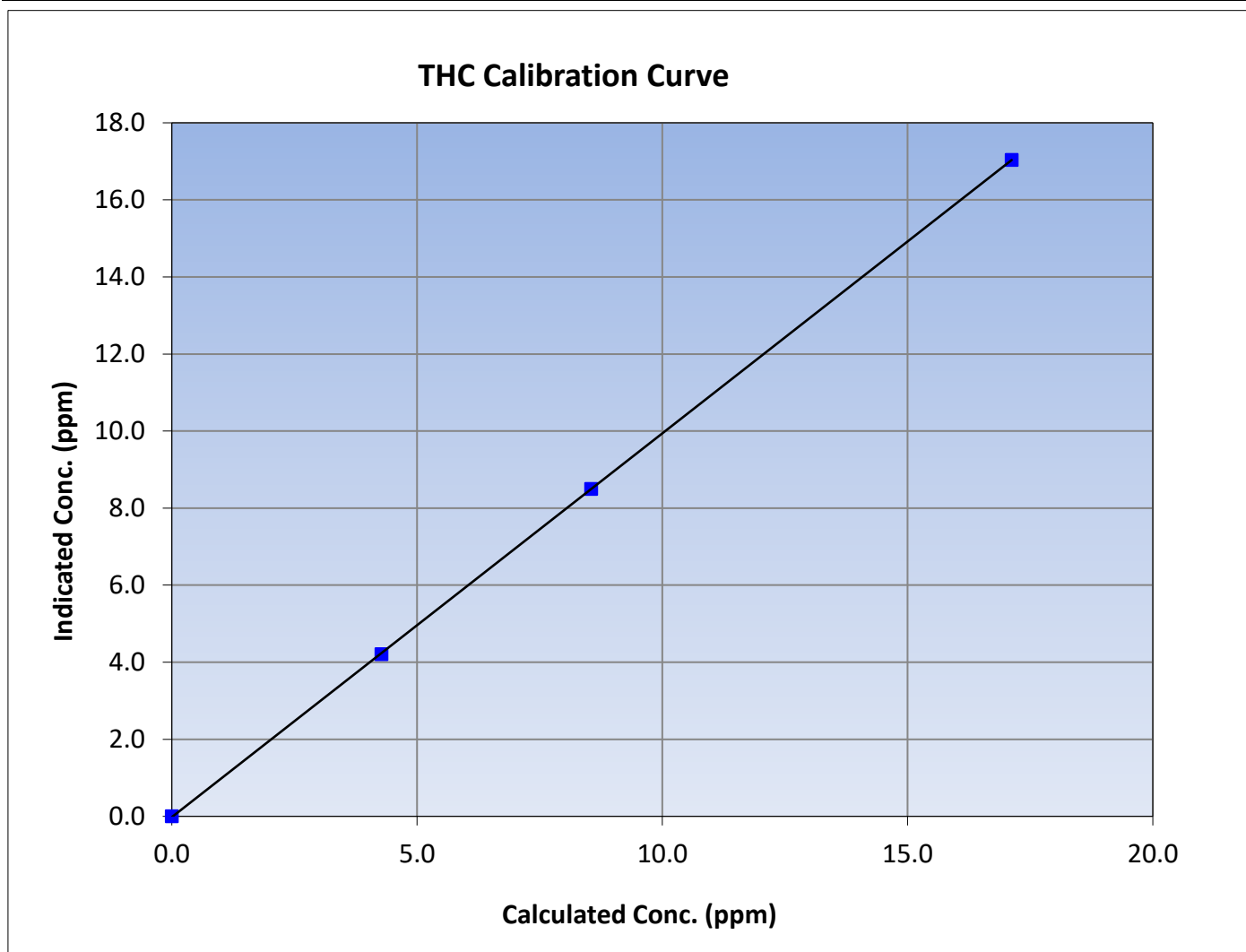
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 17, 2023 | Previous Calibration: | February 21, 2023 |
| Station Name:     | Anzac          | Station Number:       | AMS 14            |
| Start Time (MST): | 6:45           | End Time (MST):       | 9:15              |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1118148494        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999992  | $\geq 0.995$  |       |          |             |
| 17.12                               | 17.04                              | 1.0048                    |                         |           |               |       |          |             |
| 8.55                                | 8.50                               | 1.0060                    |                         |           |               | Slope | 0.996031 | 0.90 - 1.10 |
| 4.28                                | 4.21                               | 1.0155                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.019815 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

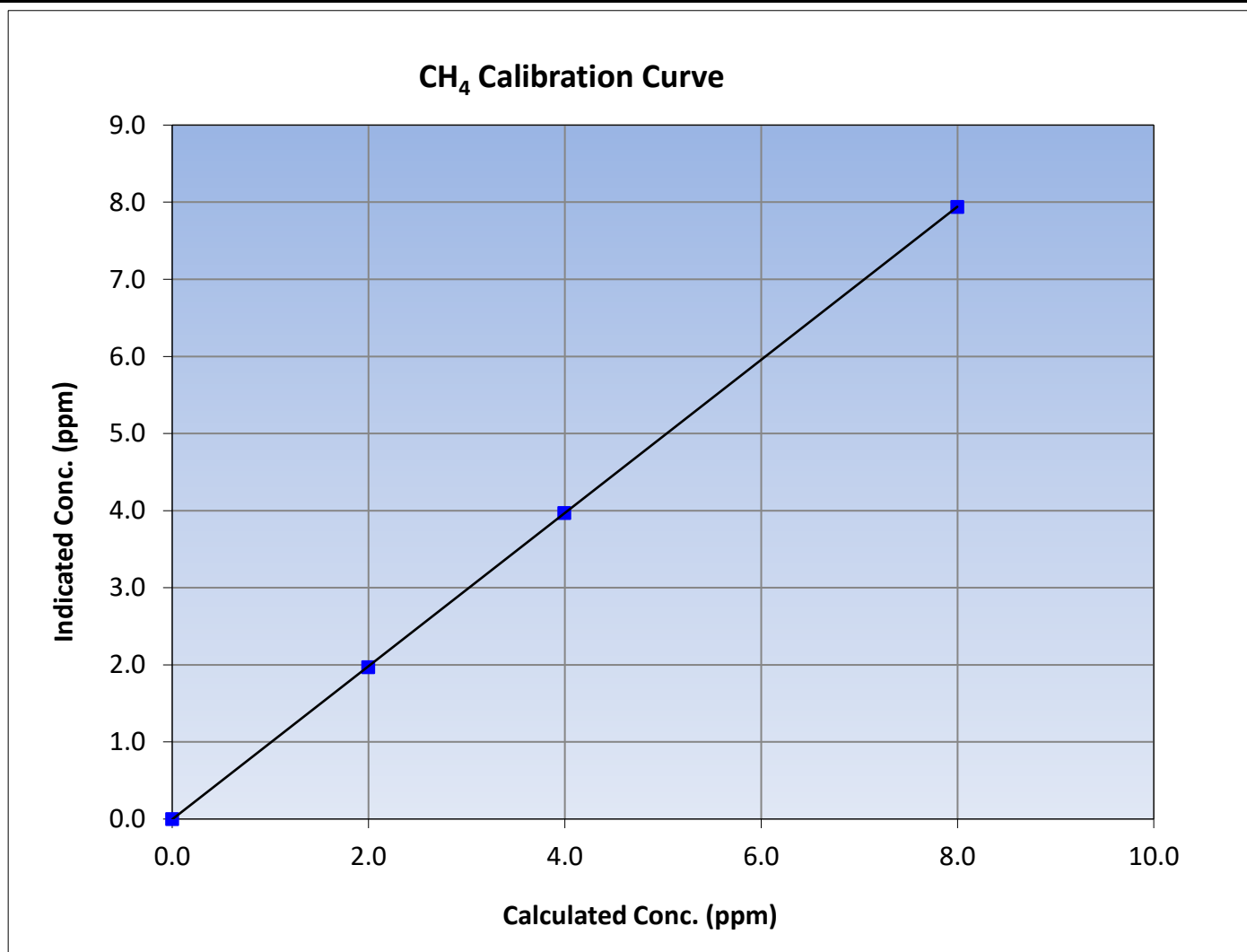
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 17, 2023 | Previous Calibration: | February 21, 2023 |
| Station Name:     | Anzac          | Station Number:       | AMS 14            |
| Start Time (MST): | 6:45           | End Time (MST):       | 9:15              |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1118148494        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999996  | ≥0.995        |       |          |             |
| 8.00                                | 7.94                               | 1.0074                    |                         |           |               |       |          |             |
| 3.99                                | 3.97                               | 1.0061                    |                         |           |               | Slope | 0.993278 | 0.90 - 1.10 |
| 2.00                                | 1.97                               | 1.0138                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.004047 | +/-0.5        |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

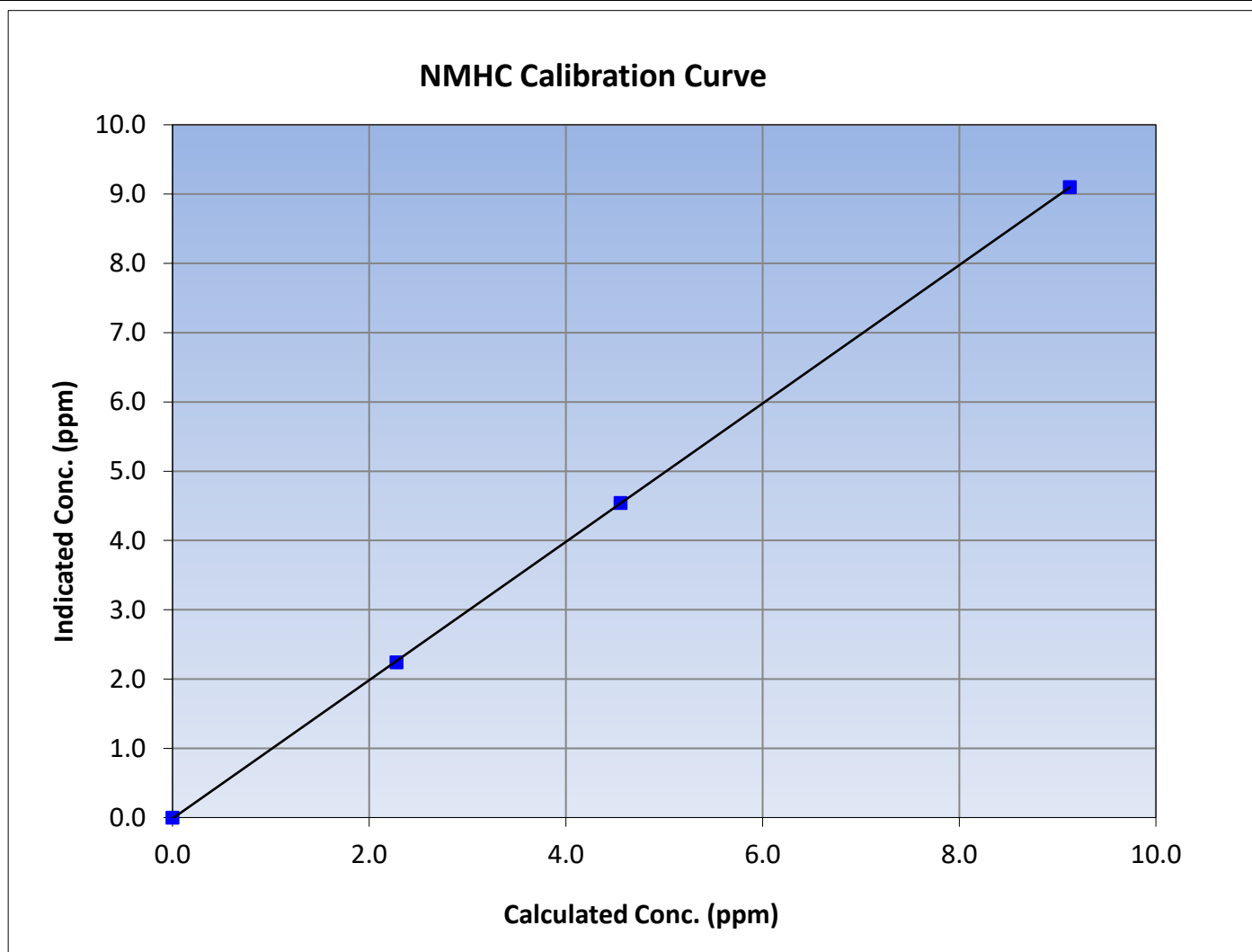
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 17, 2023 | Previous Calibration: | February 21, 2023 |
| Station Name:     | Anzac          | Station Number:       | AMS 14            |
| Start Time (MST): | 6:45           | End Time (MST):       | 9:15              |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1118148494        |

### Calibration Data

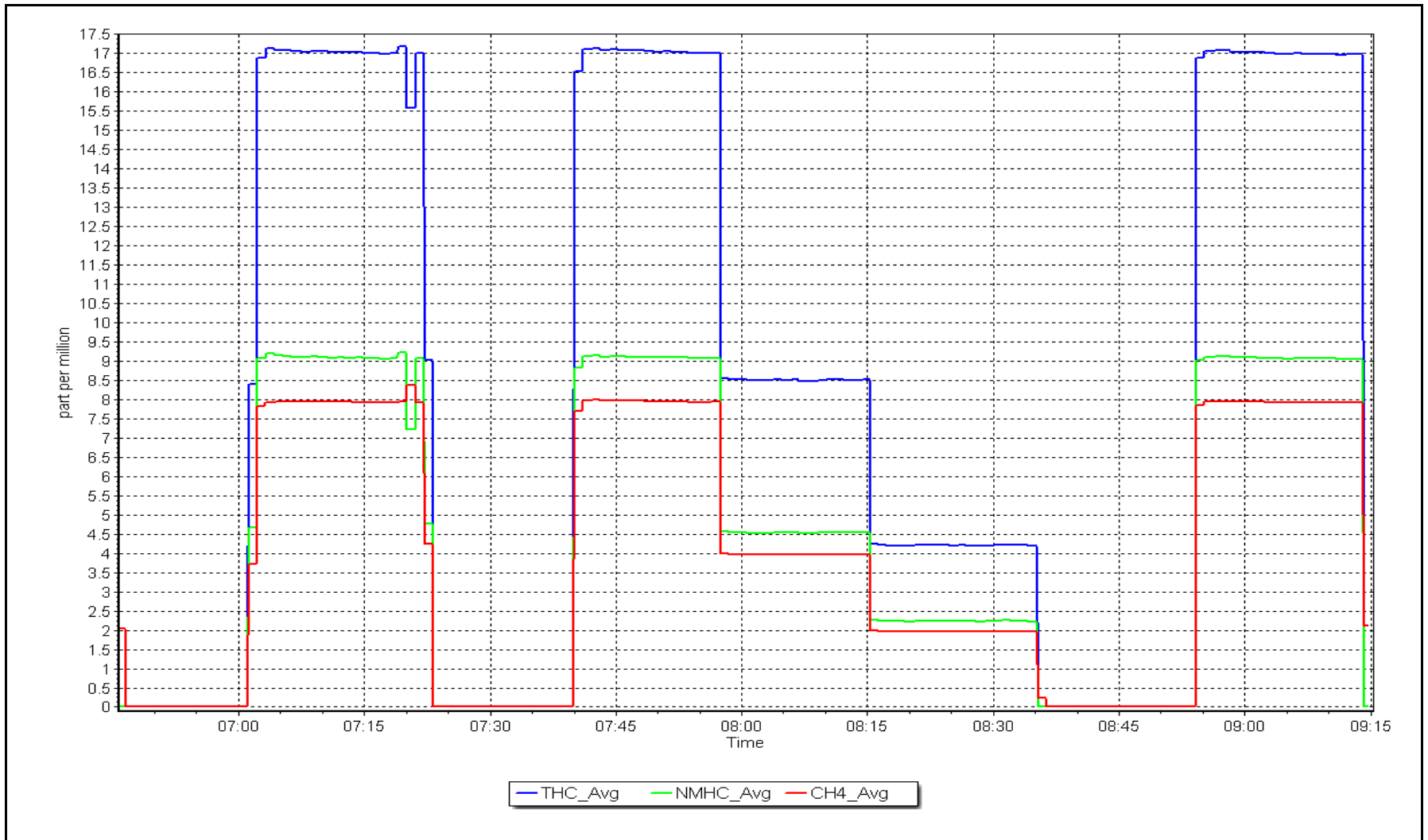
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |           |           |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-----------|-----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999985 | $\geq 0.995$  |           |           |             |
| 9.12                                | 9.10                               | 1.0026                    |                         |          |               |           |           |             |
| 4.56                                | 4.54                               | 1.0036                    |                         |          |               | Slope     | 0.998568  | 0.90 - 1.10 |
| 2.28                                | 2.24                               | 1.0170                    |                         |          |               | Intercept | -0.013765 | +/-0.5      |



NMHC Calibration Plot

Date: March 17, 2023

Location: Anzac







# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Anzac  
Calibration Date: March 2, 2023  
Start time (MST): 7:45  
Reason: Routine  
Station number: AMS 14  
Last Cal Date: February 2, 2023  
End time (MST): 12:16

### Calibration Standards

NO Gas Cylinder #: T2Y1P8D  
NOX Cal Gas Conc: 50.92 ppm  
Removed Cylinder #: NA  
Removed Gas NOX Conc: 50.92 ppm  
NOX gas Diff:  
Calibrator Model: Teledyne API T700  
ZAG make/model: Teledyne API 701H  
Cal Gas Expiry Date: December 11, 2023  
NO Cal Gas Conc: 50.05 ppm  
Removed Gas Exp Date: NA  
Removed Gas NO Conc: 50.05 ppm  
NO gas Diff:  
Serial Number: 5239  
Serial Number: 357

### Analyzer Information

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

Analyzer serial #: 1426262592

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.361        | 1.361         | NO bkgnd or offset:  | 3.7          | 3.7           |
| NOX coeff or slope: | 0.996        | 0.996         | NOX bkgnd or offset: | 3.7          | 3.7           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 158.5        | 163.3         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.011937     | 0.993239      |
| NO <sub>x</sub> Cal Offset: | -0.743109    | -0.747177     |
| NO Cal Slope:               | 1.013337     | 0.995505      |
| NO Cal Offset:              | -1.947043    | -2.010875     |
| NO <sub>2</sub> Cal Slope:  | 1.000011     | 0.999852      |
| NO <sub>2</sub> Cal Offset: | 0.089892     | 0.368111      |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | -0.2                                  | 0.4  | ----  | ----   |
| as found span             | 4921                      | 78.6                        | 800.5   | 786.8                                  | 13.7  | 796.8  | 781.7                                 | 15.1   | 1.0047  | 1.0066   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | -0.1                                  | 0.2  | ----  | ----   |
| high point                | 4921                      | 78.6                        | 800.5   | 786.8                                  | 13.7  | 794.7  | 782.1                                 | 12.6   | 1.0073  | 1.0061   |
| second point              | 4961                      | 39.3                        | 400.2   | 393.4                                  | 6.8   | 396.7  | 389.1                                 | 7.6  | 1.0088  | 1.0110   |
| third point               | 4980                      | 19.6                        | 199.6   | 196.2                                  | 3.4   | 196.3  | 191.1                                 | 5.2  | 1.0169  | 1.0267   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | -0.1                                  | 0.3  | ----  | ----   |
| as left span              | 4921                      | 78.6                        | 800.5   | 396.5                                  | 404.0   | 791.4  | 387.9                                 | 403.5  | 1.0115  | 1.0223   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0110  | 1.0146   |

|                      |                             |                |  |                                  |                         |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|
| Corrected As found   | NO <sub>x</sub> = 796.6 ppb | NO = 781.9 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -1.6% |
| Previous Response    | NO <sub>x</sub> = 809.3 ppb | NO = 795.4 ppb |  | *Percent Change                  | NO = -1.7%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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)       | 776.1                                      | 385.8                                 | 404.0   | 404.2  | 0.9994   | 100.1%   |
| 2nd GPT point (200 ppb O3)       | 776.1                                      | 591.4                                 | 198.4   | 198.8  | 0.9979   | 100.2%   |
| 3rd GPT point (100 ppb O3)       | 776.1                                      | 683.8                                 | 106.0   | 106.5  | 0.9951   | 100.5%   |
| Average Correction Factor        |  |                                       |   |  | 0.9975   | 100.3%   |

Notes:

No maintenance or adjustments done.

Melissa Lemay



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

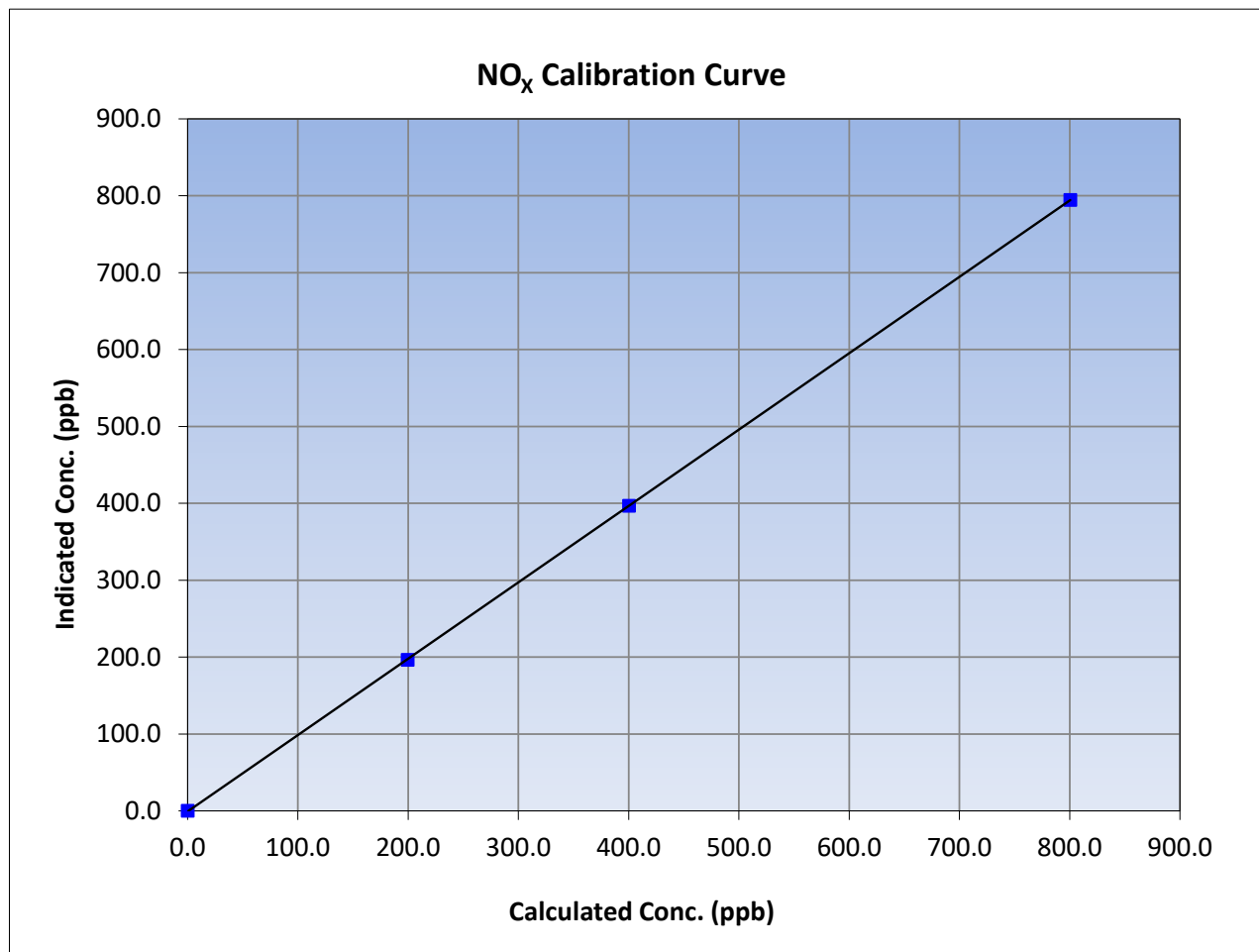
Version-04-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 2, 2023 | Previous Calibration: | February 2, 2023 |
| Station Name:     | Anzac         | Station Number:       | AMS 14           |
| Start Time (MST): | 7:45          | End Time (MST):       | 12:16            |
| 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                                 | 0.2                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.5                               | 794.7                              | 1.0073                    |   |                                |
| 400.2                               | 396.7                              | 1.0088                    |   |                                |
| 199.6                               | 196.3                              | 1.0169                    |   |                                |
|                                     |                                    |                           | 0.999993                                      |                                |
|                                     |                                    |                           | 0.993239                                      |                                |
|                                     |                                    |                           | -0.747177                                     |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

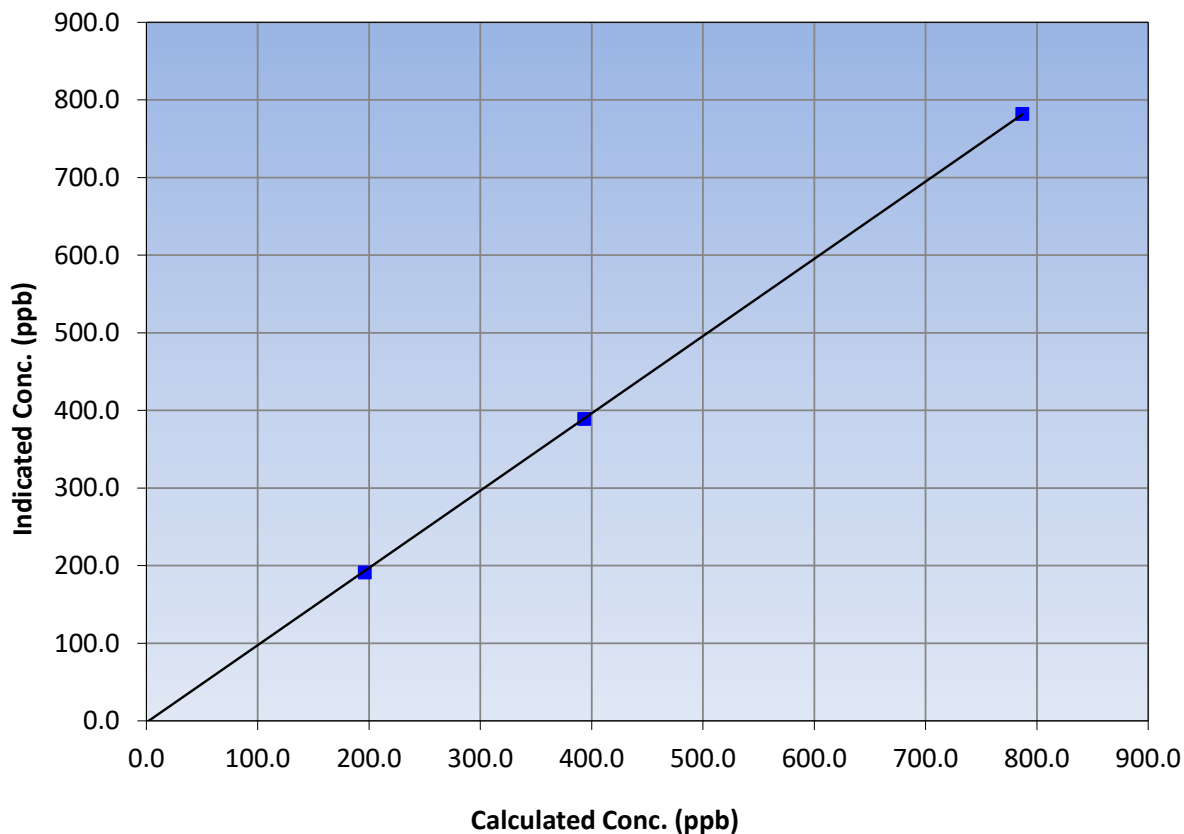
### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 2, 2023 | Previous Calibration: | February 2, 2023 |
| Station Name:     | Anzac         | Station Number:       | AMS 14           |
| Start Time (MST): | 7:45          | End Time (MST):       | 12:16            |
| 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 | ≥0.995      |       |
| 786.8                               | 782.1                              | 1.0061                    |                         |             |       |
| 393.4                               | 389.1                              | 1.0110                    | Slope                   | 0.90 - 1.10 |       |
| 196.2                               | 191.1                              | 1.0267                    |                         |             |       |
|                                     |                                    |                           | Intercept               | -2.010875   | +/-20 |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

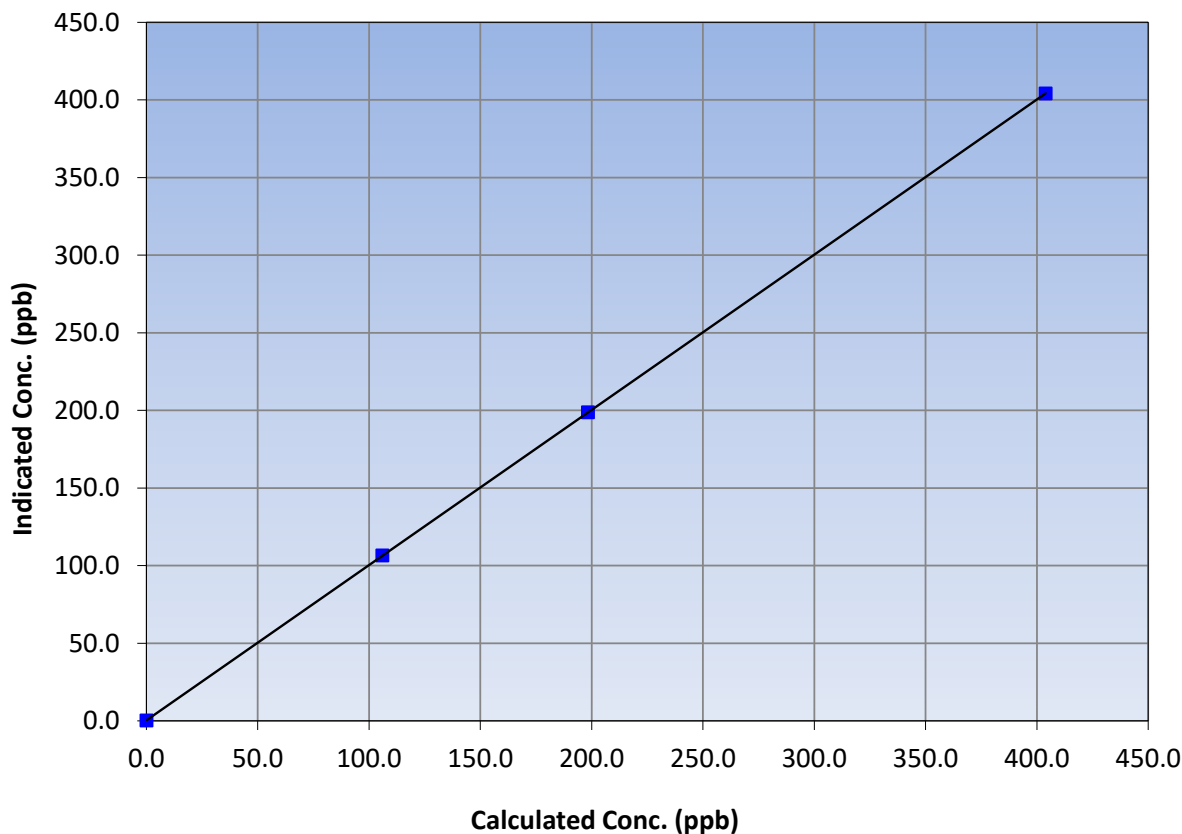
### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 2, 2023 | Previous Calibration: | February 2, 2023 |
| Station Name:     | Anzac         | Station Number:       | AMS 14           |
| Start Time (MST): | 7:45          | End Time (MST):       | 12:16            |
| 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                                 | 0.2                                | ----                      | Correlation Coefficient | ≥0.995   |             |
| 404.0                               | 404.2                              | 0.9994                    |                         |          |             |
| 198.4                               | 198.8                              | 0.9979                    |                         |          |             |
| 106.0                               | 106.5                              | 0.9951                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 0.999852 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.368111 | +/-20       |

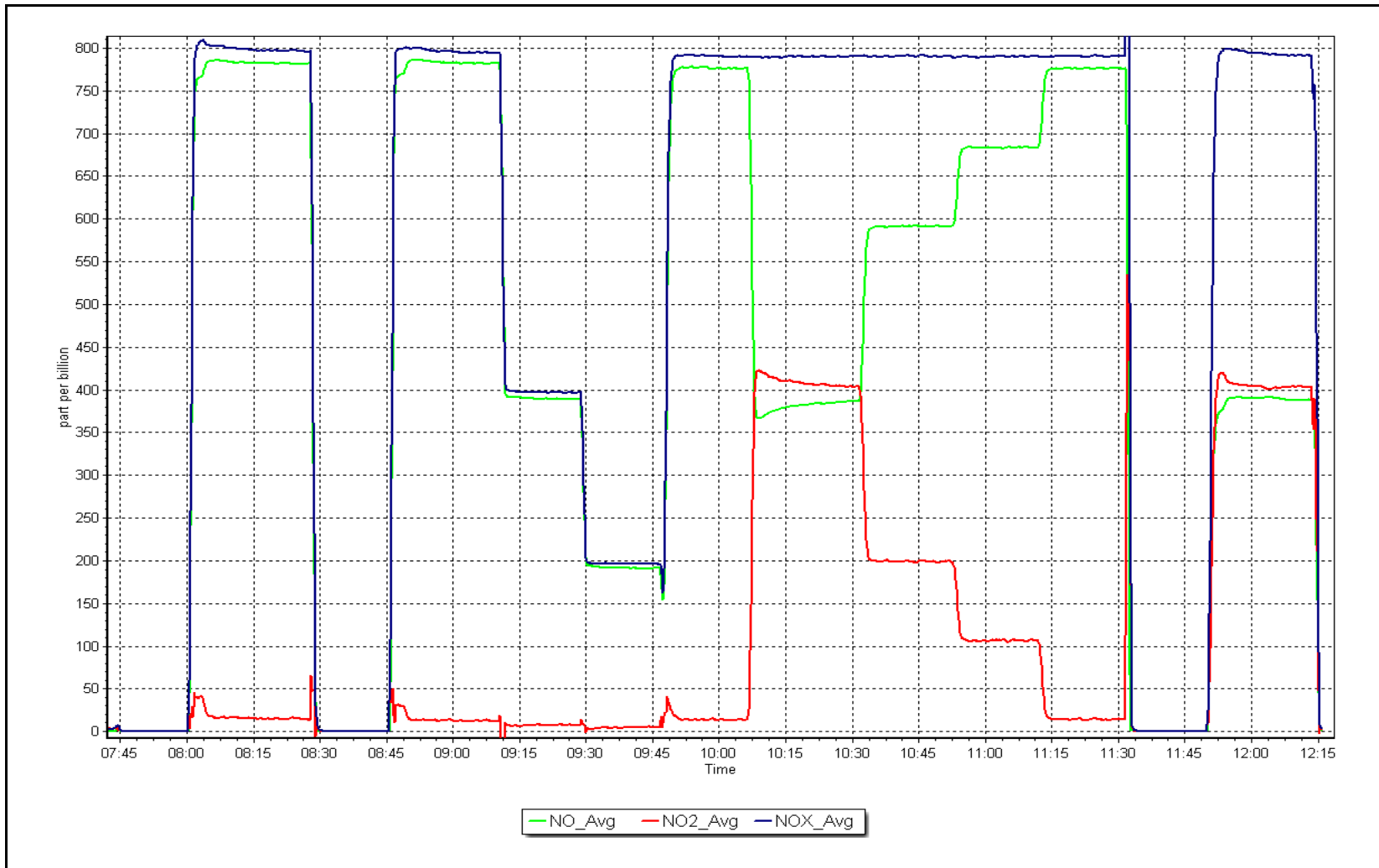
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: March 2, 2023

Location: Anzac







# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

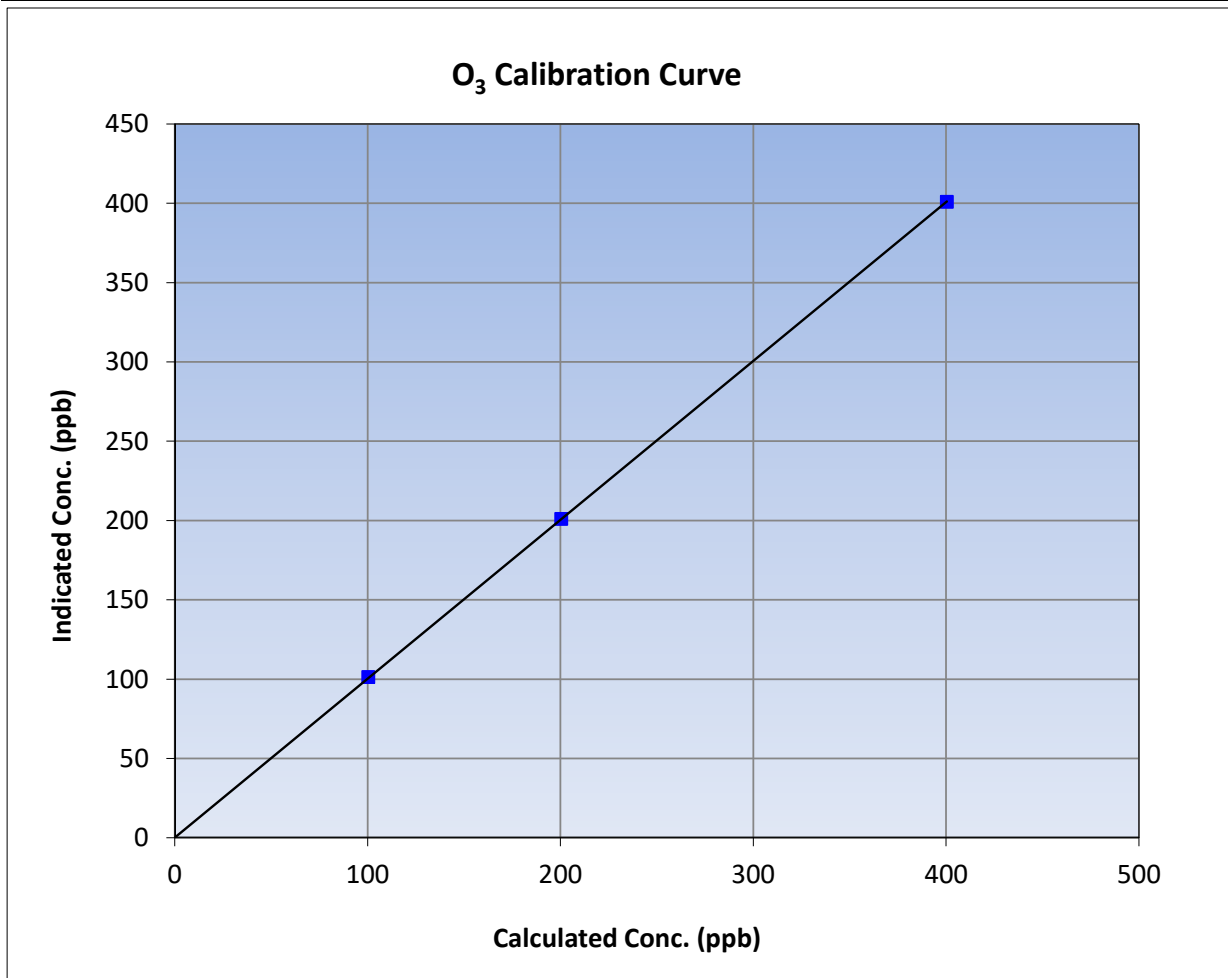
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 30, 2023 | Previous Calibration: | February 21, 2023 |
| Station Name:     | Anzac          | Station Number:       | AMS14             |
| Start Time (MST): | 7:34           | End Time (MST):       | 10:25             |
| Analyzer make:    | Thermo 49i     | Analyzer serial #:    | 1426262595        |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | -0.5                               | ----                      | Correlation Coefficient | 0.999990 | ≥0.995      |
| 400.0                               | 400.5                              | 0.9988                    |                         |          |             |
| 200.0                               | 200.6                              | 0.9970                    | Slope                   | 1.001686 | 0.90 - 1.10 |
| 100.0                               | 100.9                              | 0.9911                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.080000 | +/- 5       |

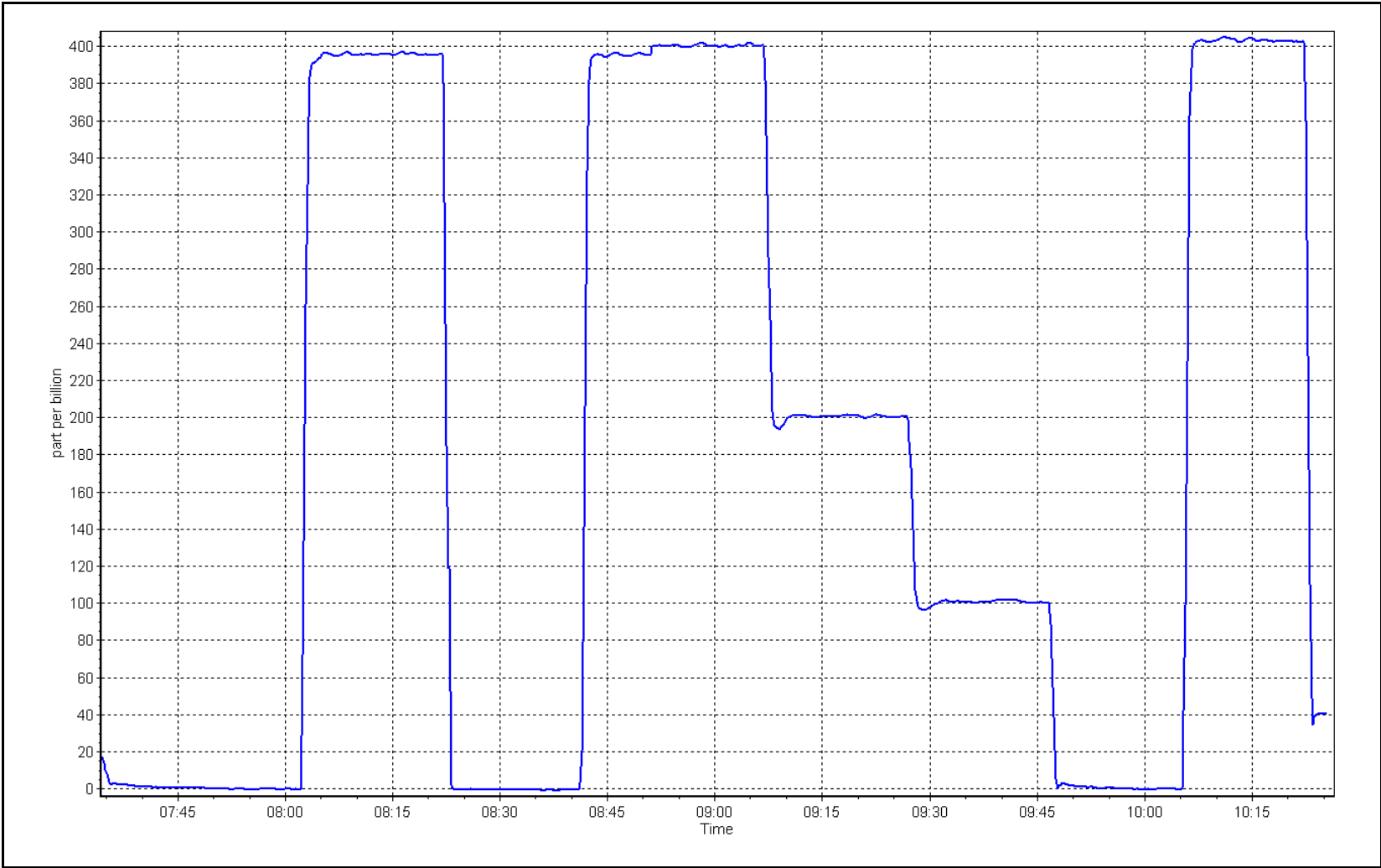




O<sub>3</sub> Calibration Plot

Date: March 30, 2023

Location: Anzac





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Anzac Station number: AMS 14  
 Calibration Date: March 30, 2023 Last Cal Date: February 22, 2023  
 Start time (MST): 6:25 End time (MST): 7:27

Analyzer Make: API T640 S/N: 825  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Alicat FP-25 S/N: 388753  
 Temp/RH standard: Alicat FP-25 S/N: 388753

### Monthly Calibration Test

| Parameter  | As found                             | Measured                                | As left                 | Adjusted                 | (Limits)     |
|------------|--------------------------------------|---|-------------------------|--------------------------|--------------|
| T (°C)     | -15                                  | -14.8                                   | -15                     | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 715.2                                | 716.2                                   | 715.2                   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5                                    | 5.09                                    | 5                       | <input type="checkbox"/> | +/- 0.25 LPM |
| Leak Test: | Date of check: <u>March 30, 2023</u> | Last Cal Date: <u>February 22, 2023</u> | PM w/o HEPA: <u>3.2</u> | PM w/ HEPA: <u>0</u>     | <0.2 ug/m3   |

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

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter                     | As found | Post maintenance        | As left           | Adjusted                            | (Limits)     |
|-------------------------------|----------|-------------------------|-------------------|-------------------------------------|--------------|
| PMT Peak Test                 | 9.1      | 10                      | 10.8              | <input checked="" type="checkbox"/> | 10.9 +/- 0.5 |
| Post-maintenance leak check:  |          | PM w/o HEPA: <u>100</u> | w/ HEPA: <u>0</u> |                                     | <0.2 ug/m3   |
| Date Optical Chamber Cleaned: |          | <u>March 30, 2023</u>   |                   |                                     |              |
| Disposable Filter Changed:    |          | <u>March 30, 2023</u>   |                   |                                     |              |

### Annual Maintenance

Date Sample Tube Cleaned: June 21, 2022  
 Date RH/T Sensor Cleaned: June 21, 2022

Notes: PMT adjusted after cleaning. Zero and Flow also checked before and after cleaning. Head Cleaned.

Calibration by: Melissa Lemay



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS17  
WAPASU  
MARCH 2023**

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

April 29, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

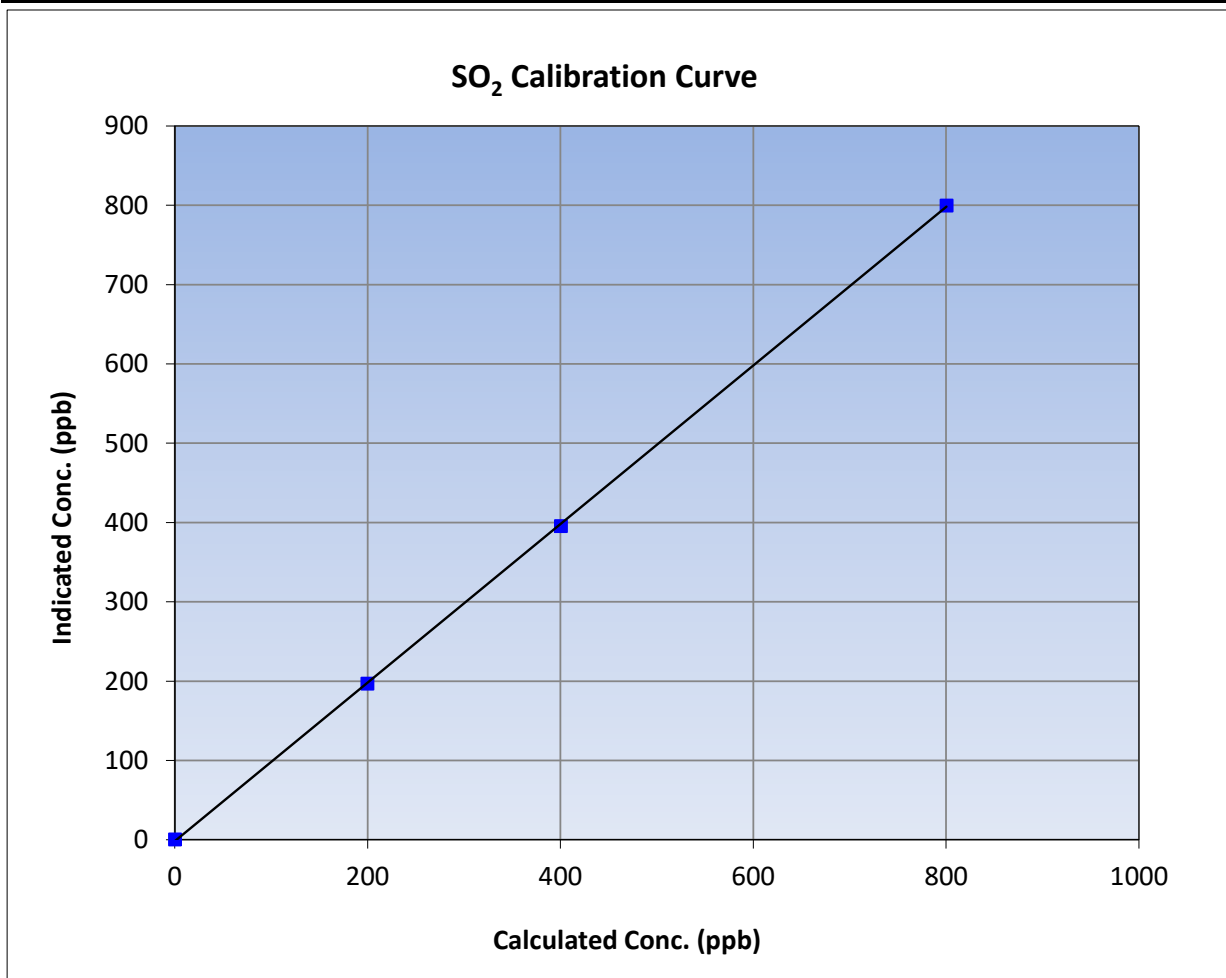
Version-01-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 9, 2023 | Previous Calibration: | February 14, 2023 |
| Station Name:     | Wapasu        | Station Number:       | AMS17             |
| Start Time (MST): | 10:07         | End Time (MST):       | 13:28             |
| Analyzer make:    | Thermo 43i    | Analyzer serial #:    | 1218153459        |

### Calibration Data

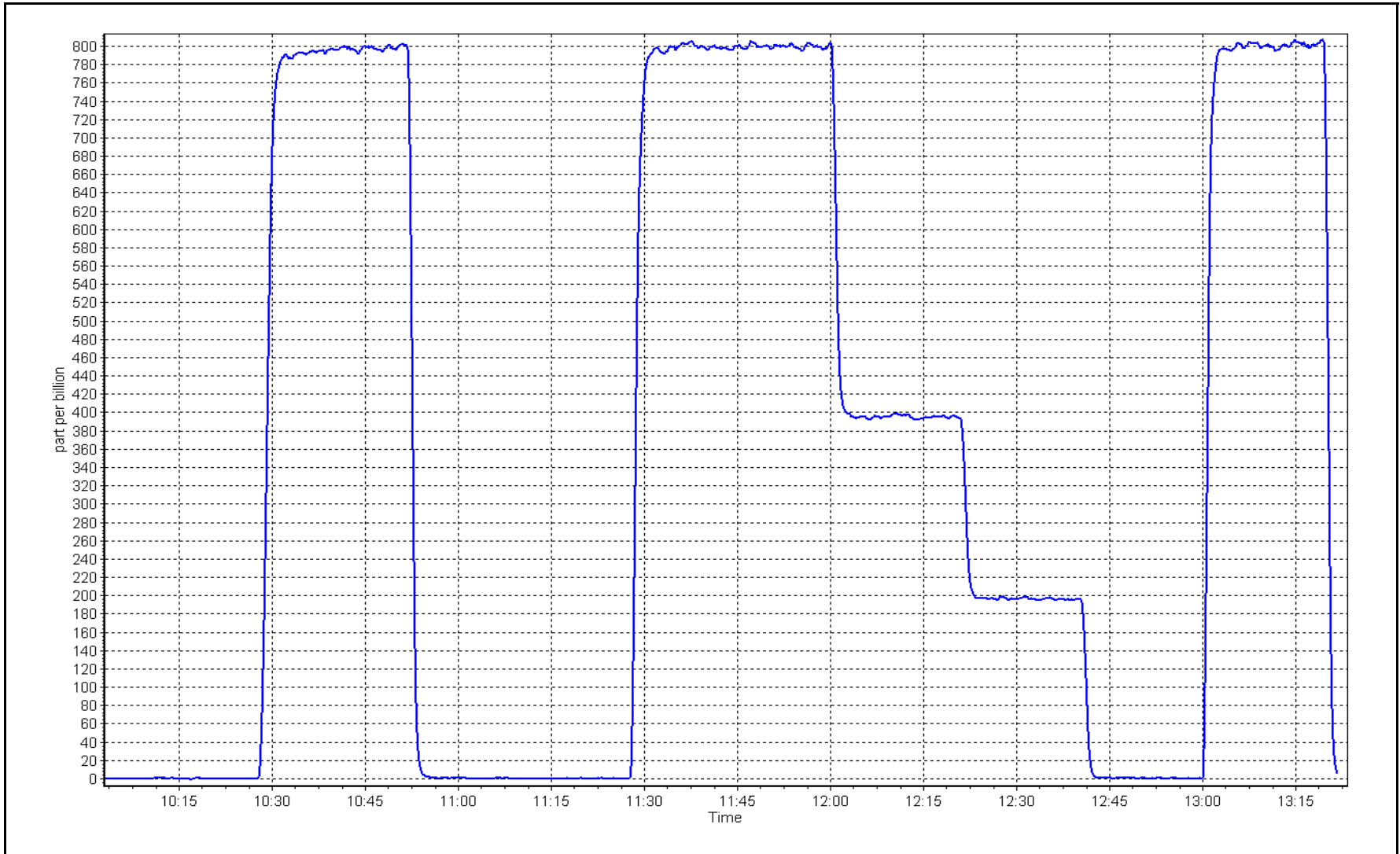
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999956  | ≥0.995      |
| 800.0                               | 799.5                              | 1.0006                    |                         |           |             |
| 400.0                               | 395.3                              | 1.0120                    | Slope                   | 0.999724  | 0.90 - 1.10 |
| 199.5                               | 196.7                              | 1.0143                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -1.859598 | +/-30       |



SO2 Calibration Plot

Date: March 9, 2023

Location: Wapasu





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

|                   |               |                 |                   |
|-------------------|---------------|-----------------|-------------------|
| Station Name:     | Wapasu        | Station number: | AMS17             |
| Calibration Date: | March 8, 2023 | Last Cal Date:  | February 16, 2023 |
| Start time (MST): | 10:19         | End time (MST): | 14:42             |
| 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 |                     |            |

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u>    |
|------------------------|--------------|---------------|-------------------|------------------|
| Calibration slope:     | 0.995568     | 0.990568      | Backgd or Offset: | 13.0      12.7   |
| Calibration intercept: | 0.080792     | 0.180784      | Coeff or Slope:   | 1.085      1.085 |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4921                          | 78.8                        | 80.0                                | 79.7                               | 1.005  |
| as found 2nd point    | 4961                          | 39.4                        | 40.0                                | 40.1                               | 1.000  |
| as found 3rd point    | 4980                          | 19.7                        | 20.0                                | 20.1                               | 1.000  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.5                                | ----  |
| high point                              | 4921                          | 78.8                        | 80.0                                | 79.6                               | 1.005   |
| second point                            | 4961                          | 39.4                        | 40.0                                | 39.6                               | 1.010   |
| third point                             | 4980                          | 19.7                        | 20.0                                | 19.7                               | 1.015   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.7                                | ----  |
| as left span                            | 4921                          | 78.8                        | 80.0                                | 78.5                               | 1.019   |
| SO2 Scrubber Check                      | 4921                          | 79.4                        | 800.0                               | -0.2                               | ----  |
| Date of last scrubber change:           |                               | n/a                         |                                     | Ave Corr Factor                    | 1.010   |
| Date of last converter efficiency test: |                               | n/a                         |                                     |                                    | efficiency  |

|                          |      |                 |          |               |          |
|--------------------------|------|-----------------|----------|---------------|----------|
| Baseline Corr As found:  | 79.6 | Prev response:  | 79.73    | *% change:    | -0.2%    |
| Baseline Corr 2nd AF pt: | 40.0 | AF Slope:       | 0.994854 | AF Intercept: | 0.180802 |
| Baseline Corr 3rd AF pt: | 20.0 | AF Correlation: | 0.999992 |               |          |

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

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

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

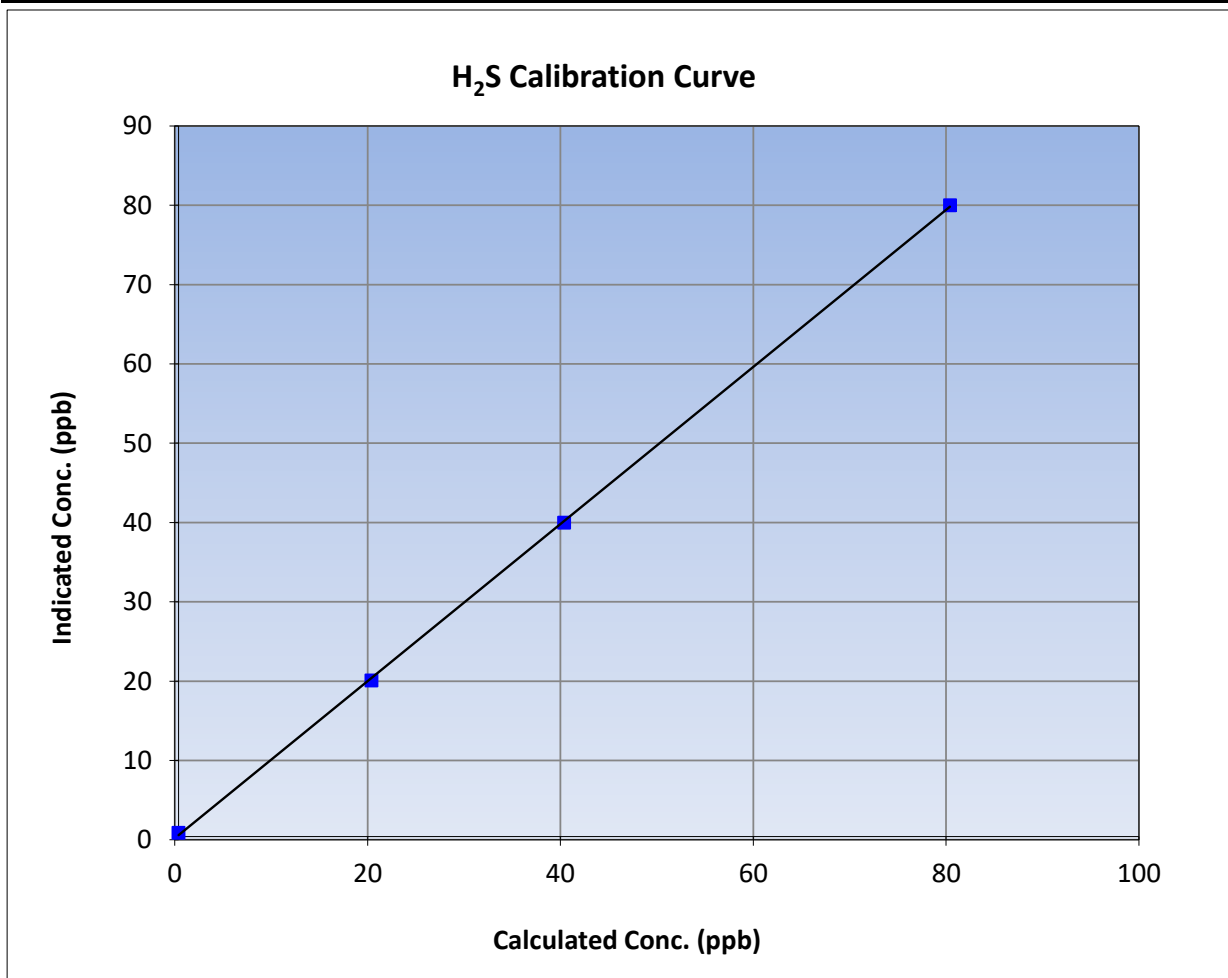
Version-11-2021

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 8, 2023 | Previous Calibration: | February 16, 2023 |
| Station Name:     | Wapasu        | Station Number:       | AMS17             |
| Start Time (MST): | 10:19         | End Time (MST):       | 14:42             |
| Analyzer make:    | Thermo 450i   | Analyzer serial #:    | 1218153583        |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.5                                | ----                      | Correlation Coefficient | 0.999925 | ≥0.995      |
| 80.0                                | 79.6                               | 1.0050                    |                         |          |             |
| 40.0                                | 39.6                               | 1.0100                    | Slope                   | 0.990568 | 0.90 - 1.10 |
| 20.0                                | 19.7                               | 1.0153                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.180784 | +/-3        |

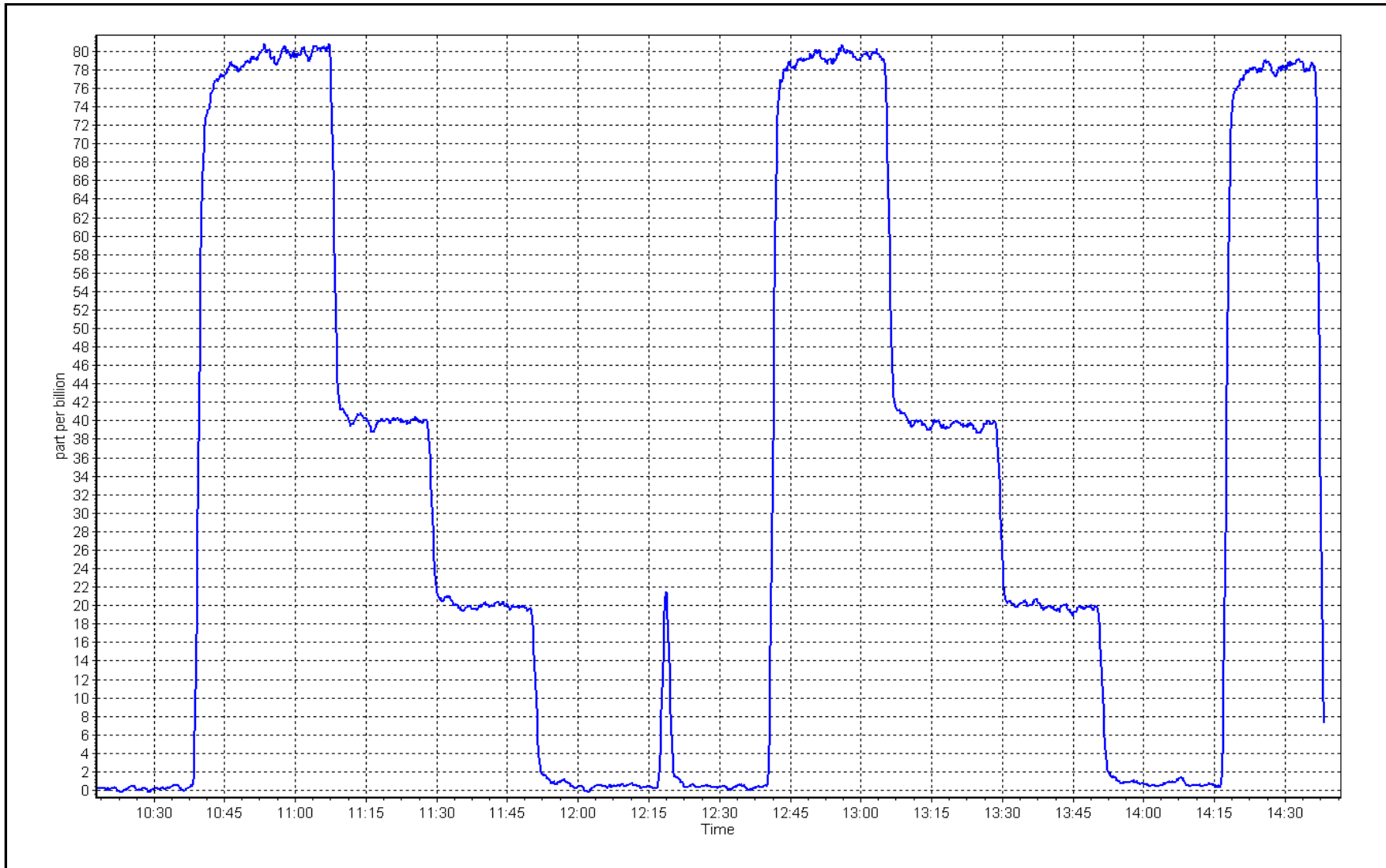




H<sub>2</sub>S Calibration Plot

Date: March 8, 2023

Location: Wapasu





# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

|                   |               |                 |                   |
|-------------------|---------------|-----------------|-------------------|
| Station Name:     | Wapasu        | Station number: | AMS17             |
| Calibration Date: | March 9, 2023 | Last Cal Date:  | February 14, 2023 |
| Start time (MST): | 10:07         | End time (MST): | 13:28             |
| Reason:           | Routine       |                 |                   |

### Calibration Standards

|                        |                  |                      |                  |
|------------------------|------------------|----------------------|------------------|
| Gas Cert Reference:    | ALM066507        | Cal Gas Expiry Date: | January 12, 2029 |
| CH4 Cal Gas Conc.      | <u>503.5</u> ppm | CH4 Equiv Conc.      | 1076.3 ppm       |
| C3H8 Cal Gas Conc.     | <u>208.3</u> ppm |                      |                  |
| Removed Gas Cert:      | n/a              | Removed Gas Expiry:  | n/a              |
| Removed CH4 Conc.      | <u>503.5</u> ppm | CH4 Equiv Conc.      | 1076.3 ppm       |
| Removed C3H8 Conc.     | <u>208.3</u> 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

|                        |              |               |              |              |               |
|------------------------|--------------|---------------|--------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |              | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.011424     | 1.000425      | Background:  | 3.090        | 3.140         |
| Calibration intercept: | -0.037301    | -0.058335     | Coefficient: | 4.324        | 4.250         |

### 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.00                                | 0.08                               | ----  |
| as found span             | 4921                          | 79.4                        | 17.09                               | 17.48                              | 0.978   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.00                                | -0.03                              | ----  |
| high point                | 4921                          | 79.4                        | 17.09                               | 17.07                              | 1.001   |
| second point              | 4960                          | 39.7                        | 8.55                                | 8.43                               | 1.014   |
| third point               | 4980                          | 19.8                        | 4.26                                | 4.20                               | 1.014   |
| as left zero              | 5000                          | 0.0                         | 0.00                                | 0.00                               | ----  |
| as left span              | 4920                          | 79.4                        | 17.09                               | 17.07                              | 1.001   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.010   |
| Baseline Corr As found:   | 17.40                         | Previous response           | 17.25                               | *% change                          | 0.9%  |
| Baseline Corr 2nd AF pt:  | NA                            | AF Slope:                   |                                     | AF Intercept:                      |   |
| Baseline Corr 3rd AF pt:  | NA                            | AF Correlation:             |                                     |                                    |   |

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

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

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## THC Calibration Summary

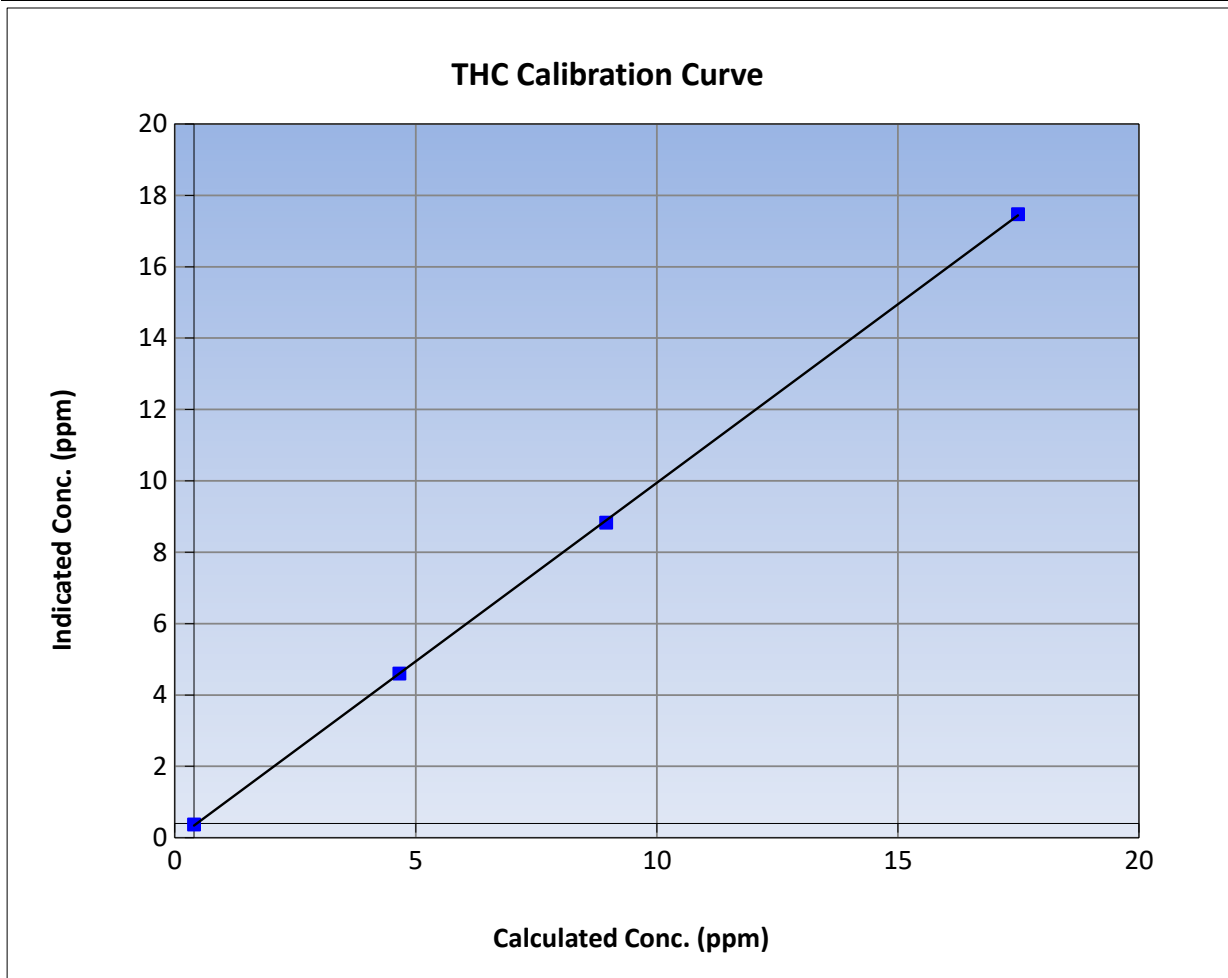
Version-01-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 9, 2023 | Previous Calibration: | February 14, 2023 |
| Station Name:     | Wapasu        | Station Number:       | AMS17             |
| Start Time (MST): | 10:07         | End Time (MST):       | 13:28             |
| Analyzer make:    | Thermo 51i-LT | Analyzer serial #:    | 1218153352        |

### Calibration Data

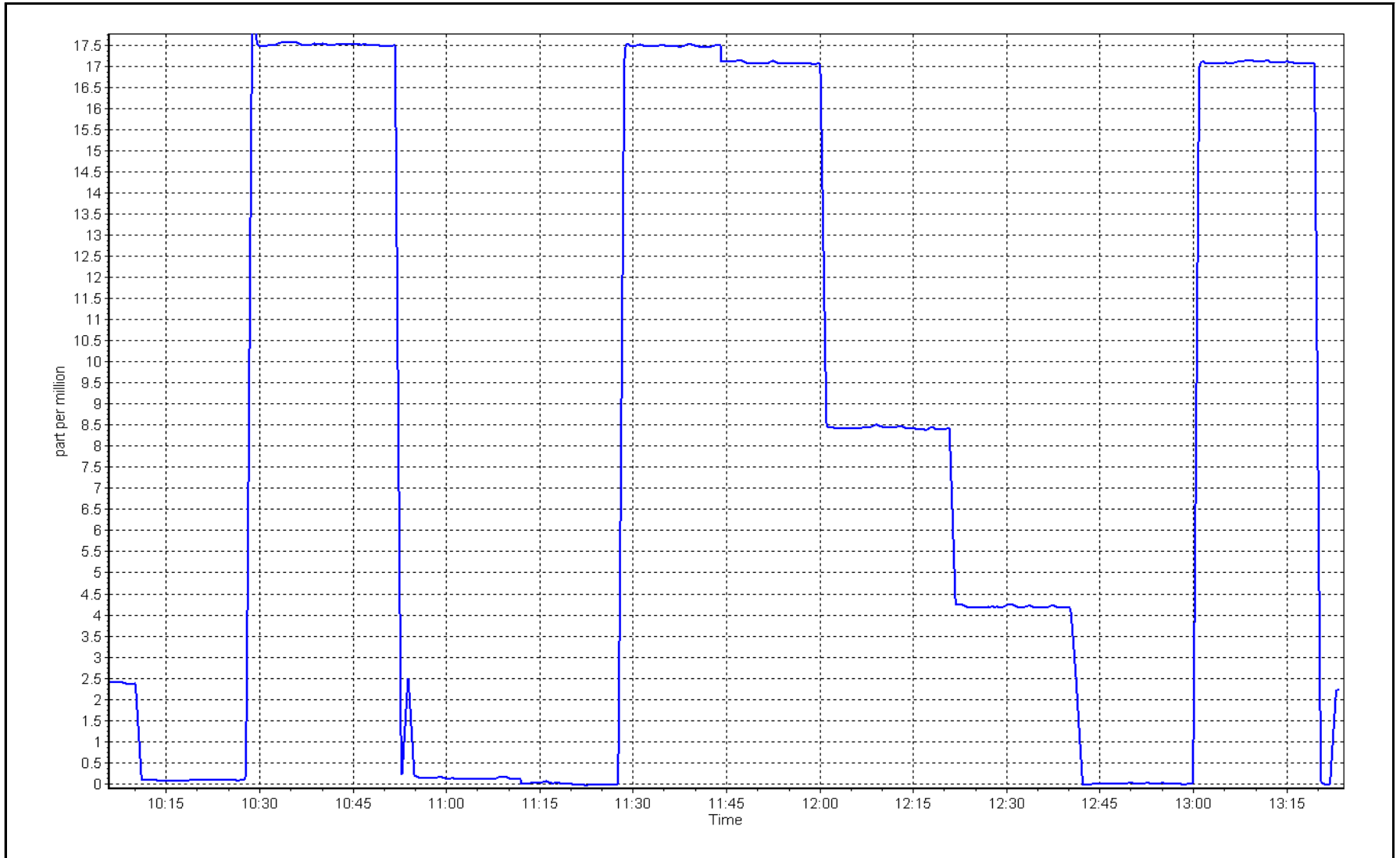
| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (lc) | Correction factor (Cc/lc) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.00                                | -0.03                              | ----                      | Correlation Coefficient | 0.999961  | ≥0.995      |
| 17.09                               | 17.07                              | 1.0011                    |                         |           |             |
| 8.55                                | 8.43                               | 1.0141                    | Slope                   | 1.000425  | 0.90 - 1.10 |
| 4.26                                | 4.20                               | 1.0139                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -0.058335 | +/-1.5      |



THC Calibration Plot

Date: March 9, 2023

Location: Wapasu





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Wapasu  
Calibration Date: March 23, 2023  
Start time (MST): 9:09  
Reason: Routine  
Station number: AMS17  
Last Cal Date: February 23, 2023  
End time (MST): 14:05

### Calibration Standards

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

### Analyzer Information

Analyzer make: Teledyne API T200  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 833

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 0.820        | 0.820         | NO bkgnd or offset:  | 0.1          | 0.1           |
| NOX coeff or slope: | 0.812        | 0.812         | NOX bkgnd or offset: | -0.4         | -0.4          |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 4.5          | 4.4           |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.989719     | 0.987970      |
| NO <sub>x</sub> Cal Offset: | -1.420000    | -1.020000     |
| NO Cal Slope:               | 0.990300     | 0.989414      |
| NO Cal Offset:              | -1.880000    | -1.920000     |
| NO <sub>2</sub> Cal Slope:  | 0.986936     | 0.999015      |
| NO <sub>2</sub> Cal Offset: | -0.501997    | 0.401105      |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | -0.3                                  | 0.6  | ----  | ----   |
| as found span             | 4917                      | 83.2                        | 817.2   | 799.9                                  | 17.3  | 805.1  | 788.1                                 | 17.1   | 1.0150  | 1.0150   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | -0.1                                  | 0.3  | ----  | ----   |
| high point                | 4917                      | 83.2                        | 817.2   | 799.9                                  | 17.3  | 807.2  | 790.4                                 | 16.8   | 1.0124  | 1.0120   |
| second point              | 4958                      | 41.6                        | 408.6   | 399.9                                  | 8.7   | 401.3  | 392.9                                 | 8.5  | 1.0182  | 1.0179   |
| third point               | 4979                      | 20.8                        | 204.3   | 200.0                                  | 4.3   | 200.1  | 194.1                                 | 6.1  | 1.0210  | 1.0302   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.3  | 0.1                                   | 0.2  | ----  | ----   |
| as left span              | 4917                      | 83.2                        | 817.2   | 410.0                                  | 407.2   | 798.5  | 394.7                                 | 403.8  | 1.0234  | 1.0387   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0172  | 1.0201   |

|                      |                             |                |  |                                  |                         |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 804.9 ppb | NO = 788.4 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -0.3% |                      |
| Previous Response    | NO <sub>x</sub> = 807.4 ppb | NO = 790.2 ppb |  | *Percent Change                  | NO = -0.2%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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)       | 784.9                                      | 395.0                                 | 407.2   | 407.2  | 1.0000   | 100.0%   |
| 2nd GPT point (200 ppb O3)       | 784.9                                      | 589.8                                 | 212.4   | 212.5  | 0.9996   | 100.0%   |
| 3rd GPT point (100 ppb O3)       | 784.9                                      | 689.7                                 | 112.5   | 113.0  | 0.9956   | 100.4%   |
| Average Correction Factor        |  |                                       |   |  | 0.9984   | 100.2%   |

Notes: Sample inlet filter changed after as founds. No adjustments made. Used the second NO reference point.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

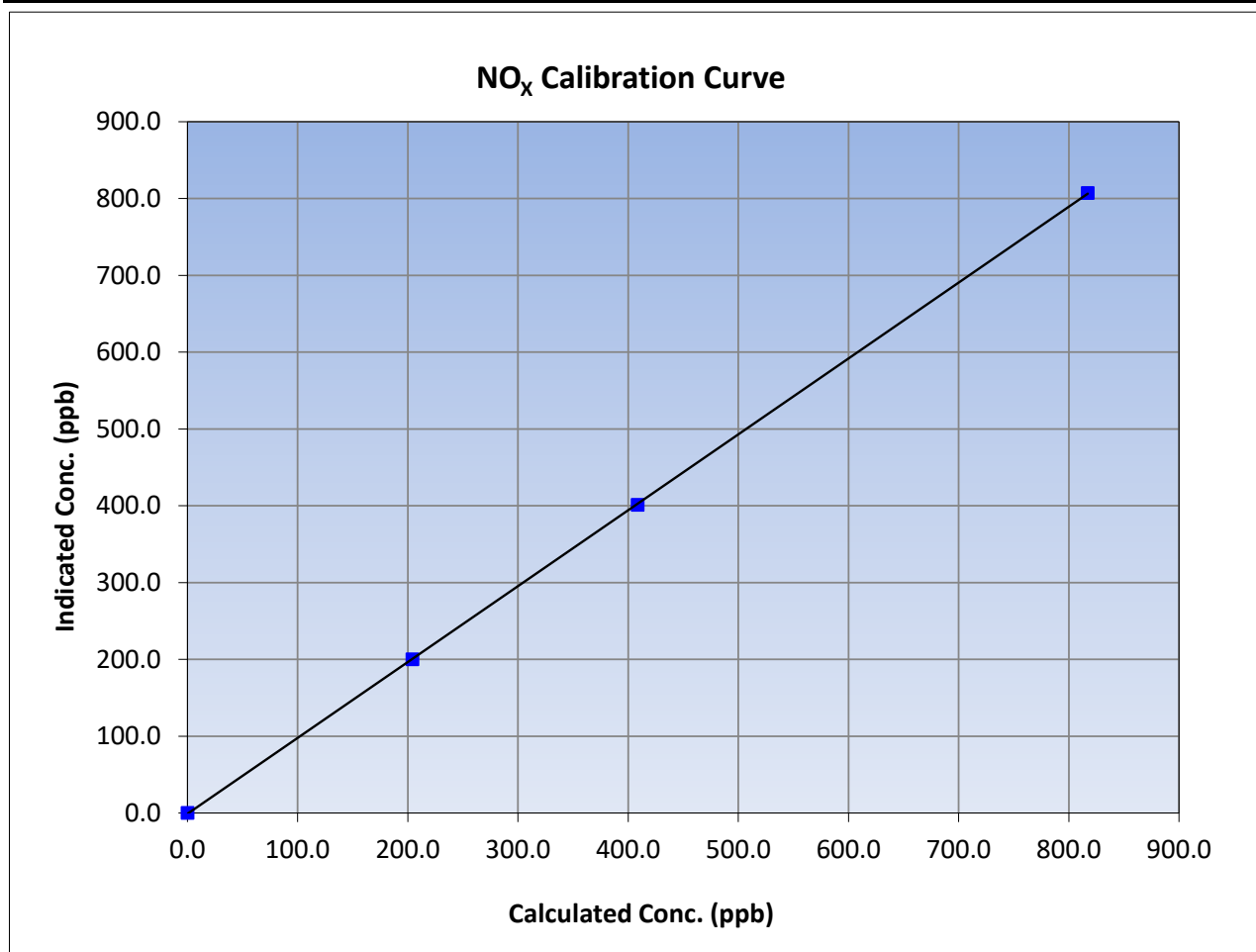
Version-04-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 23, 2023    | Previous Calibration: | February 23, 2023 |
| Station Name:     | Wapasu            | Station Number:       | AMS17             |
| Start Time (MST): | 9:09              | End Time (MST):       | 14:05             |
| 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<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 817.2                               | 807.2                              | 1.0124                    |   |                                |
| 408.6                               | 401.3                              | 1.0182                    |   |                                |
| 204.3                               | 200.1                              | 1.0210                    |   |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

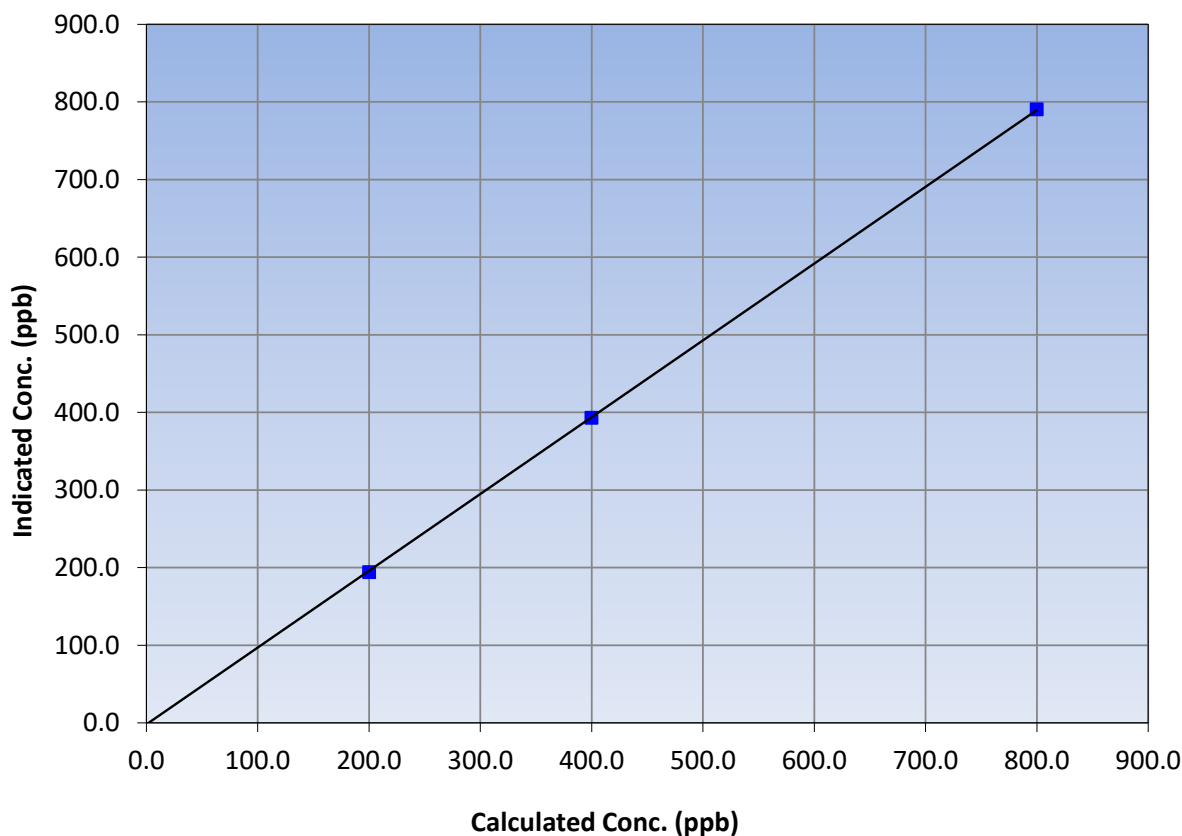
### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 23, 2023    | Previous Calibration: | February 23, 2023 |
| Station Name:     | Wapasu            | Station Number:       | AMS17             |
| Start Time (MST): | 9:09              | End Time (MST):       | 14:05             |
| Analyzer make:    | Teledyne API T200 | Analyzer serial #:    | 833               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | ≥0.995        |             |
| 799.9                               | 790.4                              | 1.0120                    |                         |               |             |
| 399.9                               | 392.9                              | 1.0179                    |                         |               |             |
| 200.0                               | 194.1                              | 1.0302                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.989414      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -1.920000     | +/-20       |

**NO Calibration Curve**







# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

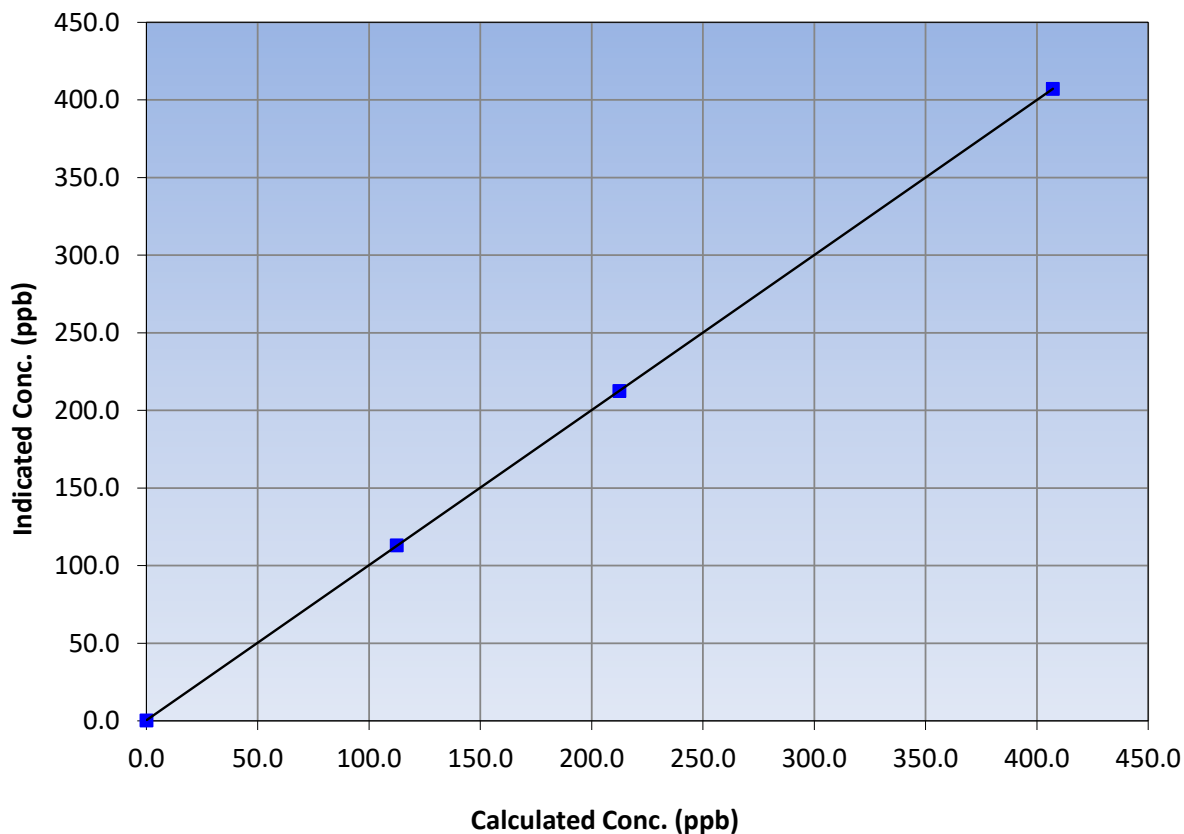
### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 23, 2023    | Previous Calibration: | February 23, 2023 |
| Station Name:     | Wapasu            | Station Number:       | AMS17             |
| Start Time (MST): | 9:09              | End Time (MST):       | 14:05             |
| Analyzer make:    | Teledyne API T200 | Analyzer serial #:    | 833               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 407.2                               | 407.2                              | 1.0000                    |   |                                |
| 212.4                               | 212.5                              | 0.9996                    |   |                                |
| 112.5                               | 113.0                              | 0.9956                    |   |                                |
|                                     |                                    |                           |   |                                |

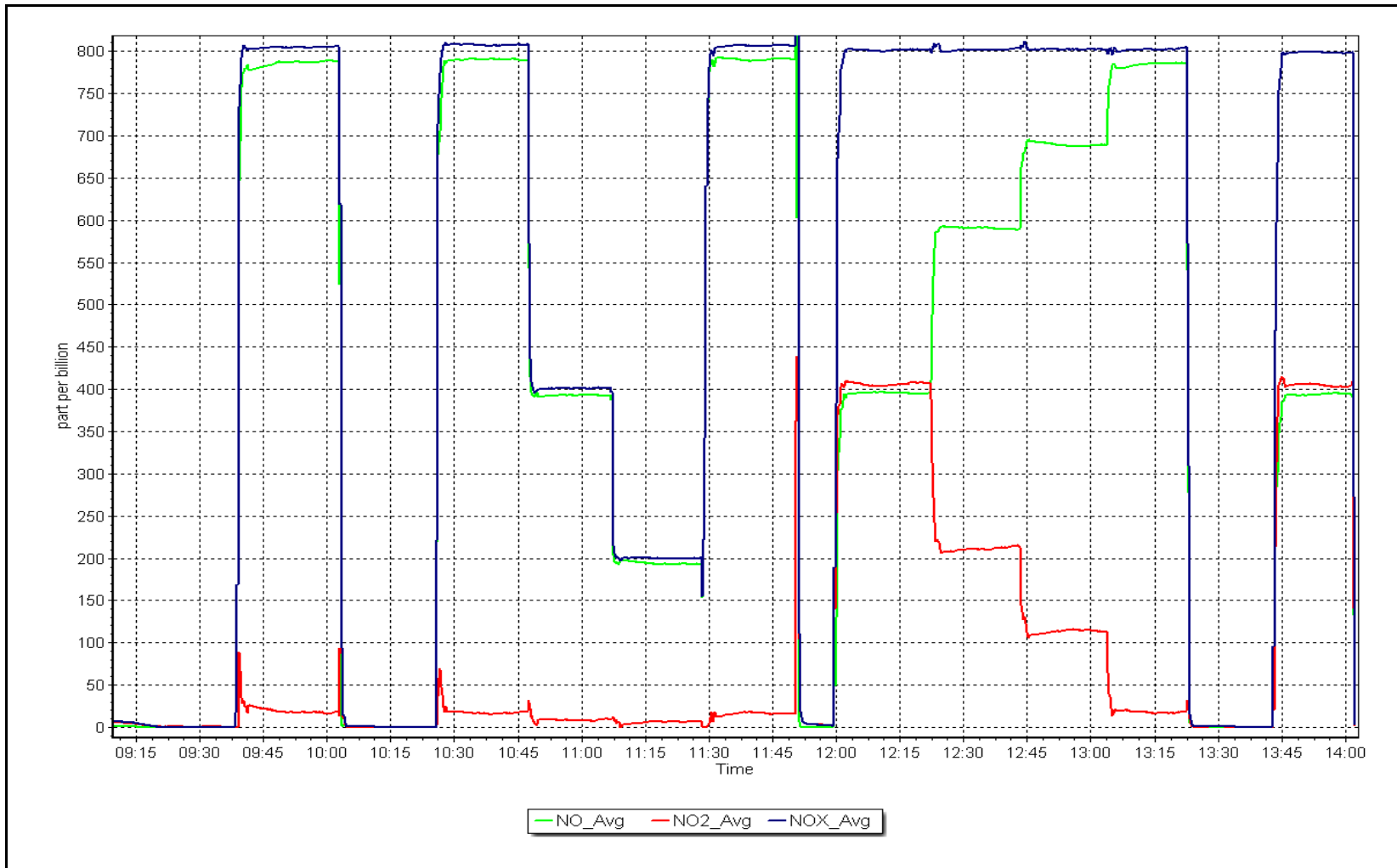
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: March 23, 2023

Location: Wapasu







# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

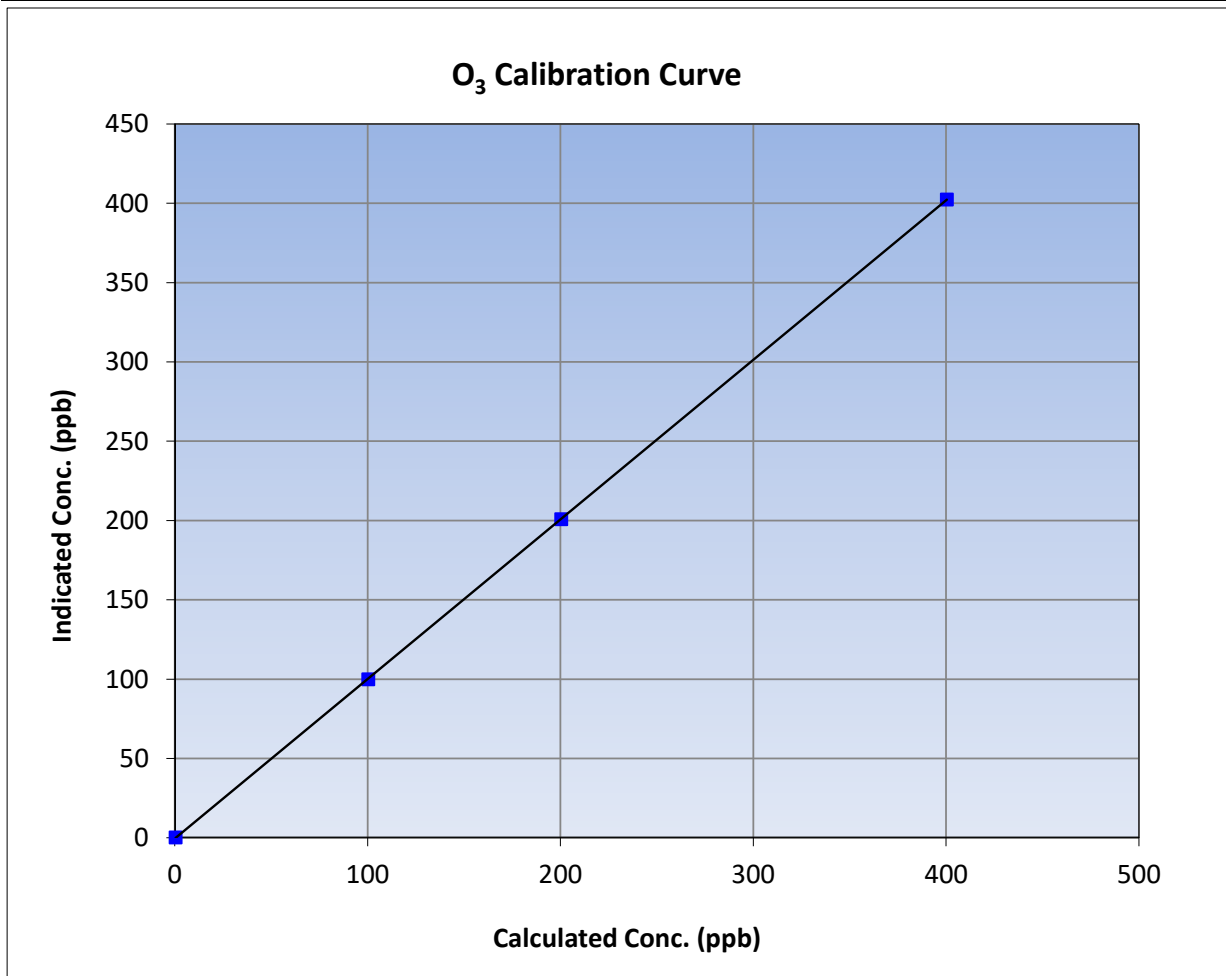
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 3, 2023 | Previous Calibration: | February 6, 2023 |
| Station Name:     | Wapasu        | Station Number:       | AMS17            |
| Start Time (MST): | 10:33         | End Time (MST):       | 13:30            |
| Analyzer make:    | API T400      | Analyzer serial #:    | 3870             |

### Calibration Data

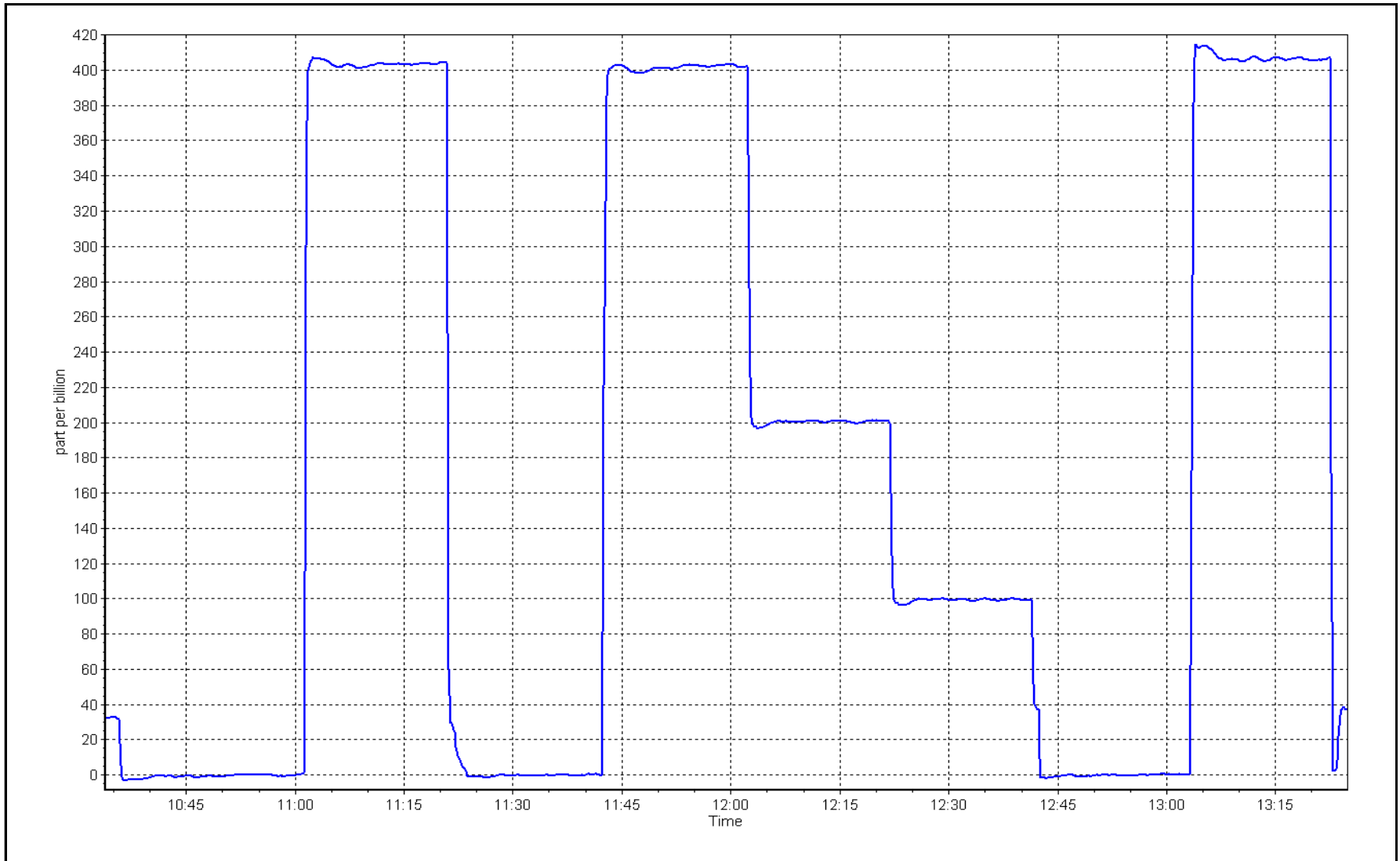
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999995      |             |
| 400.0                               | 402.1                              | 0.9948                    |                         |               | ≥0.995      |
| 200.0                               | 200.5                              | 0.9975                    | Slope                   | 1.006086      |             |
| 100.0                               | 99.6                               | 1.0040                    |                         |               | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.540000     | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: March 3, 2023

Location: Wapasu





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Wapasu Station number: AMS 17  
 Calibration Date: March 23, 2023 Last Cal Date: February 23, 2023  
 Start time (MST): 10:50 End time (MST): 12:02

Analyzer Make: API T640 S/N: 1183  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Delta Cal S/N: 1102  
 Temp/RH standard: Delta Cal S/N: 1102

### Monthly Calibration Test

| Parameter  | As found                             | Measured                                | As left                 | Adjusted                 | (Limits)     |
|------------|--------------------------------------|---|-------------------------|--------------------------|--------------|
| T (°C)     | -1.8                                 | -1.8                                    | -1.8                    | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 706.9                                | 708.4                                   | 706.9                   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.02                                 | 5.06                                    | 5.02                    | <input type="checkbox"/> | +/- 0.25 LPM |
| Leak Test: | Date of check: <u>March 23, 2023</u> | Last Cal Date: <u>February 23, 2023</u> | PM w/o HEPA: <u>4.8</u> | PM w/ HEPA: <u>0.0</u>   | <0.2 ug/m3   |

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

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter                     | As found | Post maintenance        | As left             | Adjusted                 | (Limits)     |
|-------------------------------|----------|-------------------------|---------------------|--------------------------|--------------|
| PMT Peak Test                 | 11.0     | 11.1                    | 11.1                | <input type="checkbox"/> | 10.9 +/- 0.5 |
| Post-maintenance leak check:  |          | PM w/o HEPA: <u>8.1</u> | w/ HEPA: <u>0.0</u> |                          | <0.2 ug/m3   |
| Date Optical Chamber Cleaned: |          | <u>March 23, 2023</u>   |                     |                          |              |
| Disposable Filter Changed:    |          | <u>March 23, 2023</u>   |                     |                          |              |

### Annual Maintenance

Date Sample Tube Cleaned: \_\_\_\_\_  
 Date RH/T Sensor Cleaned: \_\_\_\_\_

Notes: No adjustments made. Leak check passed. Optical chamber and inlet head cleaned.

Calibration by: Karan Pandit



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS18 STONY MOUNTAIN MARCH 2023**

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

April 29, 2023



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                |                 |                   |
|-------------------|----------------|-----------------|-------------------|
| Station Name:     | Stony Mountain | Station number: | AMS 18            |
| Calibration Date: | March 30, 2023 | Last Cal Date:  | February 17, 2023 |
| Start time (MST): | 9:58           | End time (MST): | 12:52             |
| 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 |                    |              |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.008829     | 1.006974      | Backgd or Offset: | 23.0         | 22.9          |
| Calibration intercept: | -0.882227    | -1.482948     | Coeff or Slope:   | 0.817        | 0.817         |

### SO<sub>2</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5009                          | 0.0                         | 0.0                                 | -0.6                               | ----  |
| as found span             | 4919                          | 81.0                        | 800.3                               | 801.6                              | 0.998   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | -0.2                               | ----  |
| high point                | 4919                          | 81.0                        | 800.3                               | 804.6                              | 0.995   |
| second point              | 4959                          | 40.5                        | 400.2                               | 402.1                              | 0.995   |
| third point               | 4979                          | 20.2                        | 199.6                               | 197.4                              | 1.011   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | -0.5                               | ----  |
| as left span              | 4919                          | 81.0                        | 800.3                               | 803.1                              | 0.996   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.000   |

|                          |        |                   |        |               |       |
|--------------------------|--------|-------------------|--------|---------------|-------|
| Baseline Corr As found:  | 802.20 | Previous response | 806.46 | *% 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: Sample inlet filter changed after as founds. No adjustments were made

Calibration Performed By: Karan Pandit





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

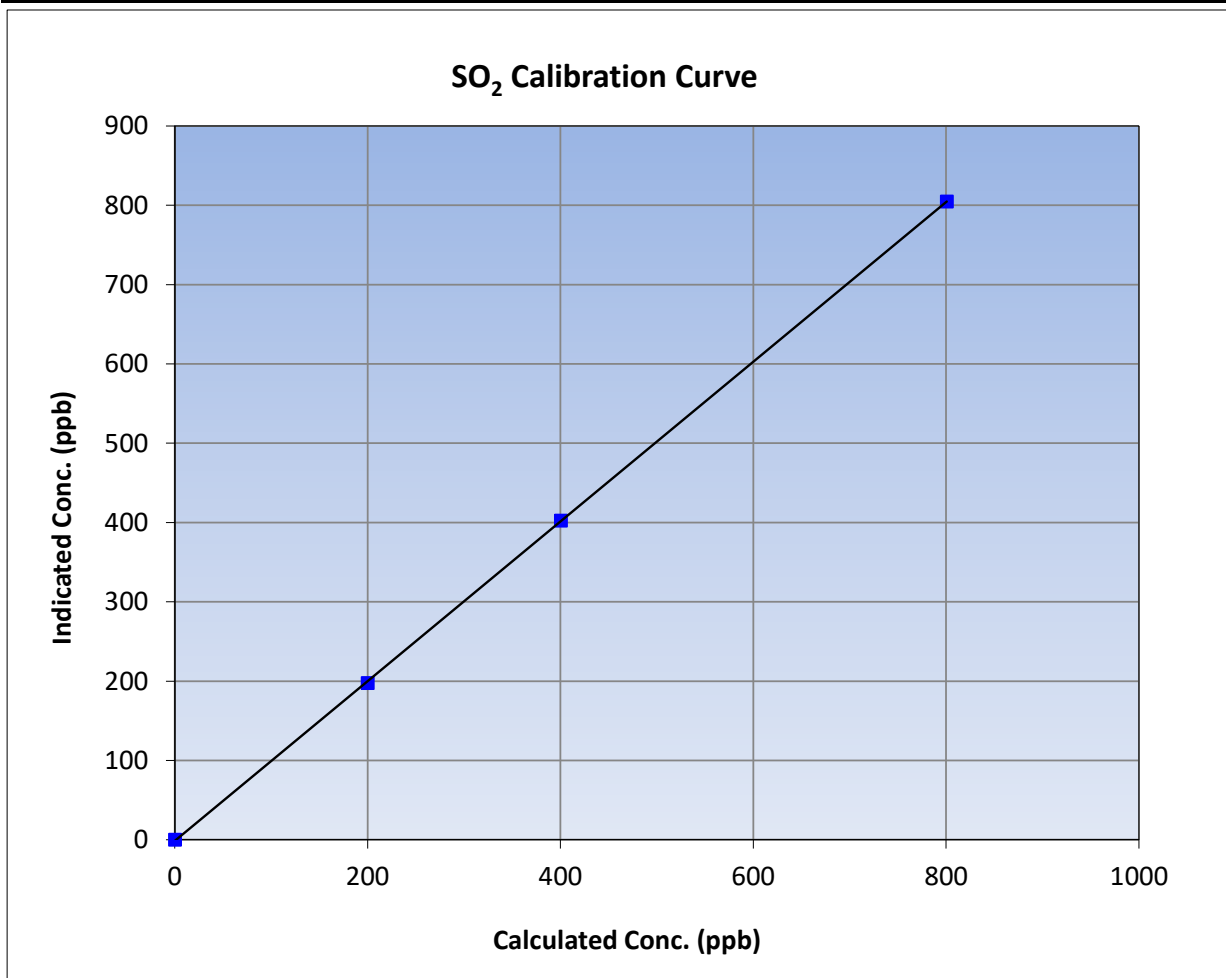
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 30, 2023 | Previous Calibration: | February 17, 2023 |
| Station Name:     | Stony Mountain | Station Number:       | AMS 18            |
| Start Time (MST): | 9:58           | End Time (MST):       | 12:52             |
| Analyzer make:    | Thermo 43i     | Analyzer serial #:    | JC1501301453      |

### Calibration Data

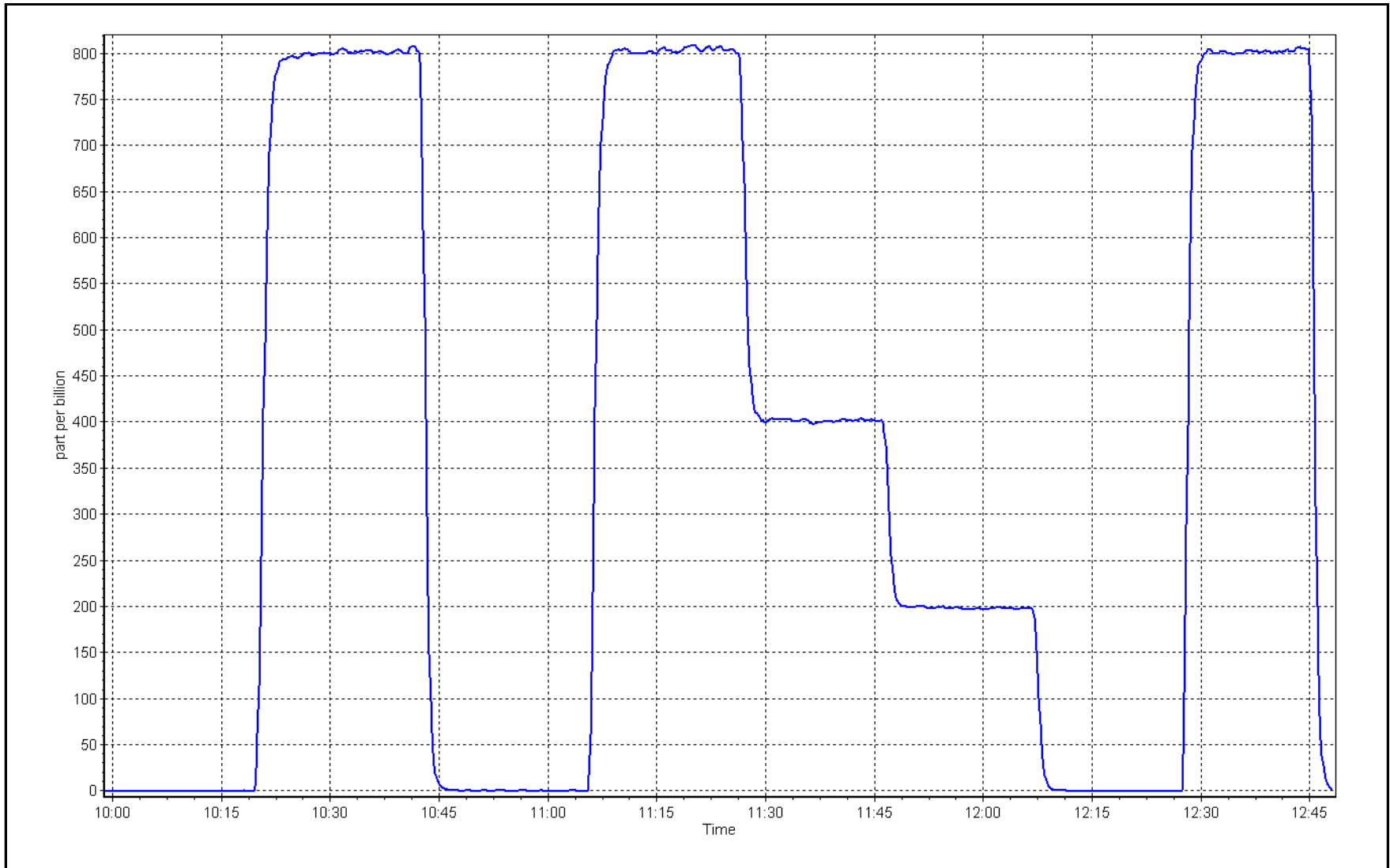
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | -0.2                                  | ----                         | Correlation Coefficient | 0.999982      |             |
| 800.3                                  | 804.6                                 | 0.9946                       |                         |               | ≥0.995      |
| 400.2                                  | 402.1                                 | 0.9952                       | Slope                   | 1.006974      |             |
| 199.6                                  | 197.4                                 | 1.0112                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | -1.482948     | +/-30       |



SO2 Calibration Plot

Date: March 30, 2023

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 7, 2023      Last Cal Date: February 13, 2023  
 Start time (MST): 10:34      End time (MST): 14:45  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.479 ppm      Cal Gas Exp Date: January 4, 2025  
 Cal Gas Cylinder #: CC500395  
 Removed Cal Gas Conc: 5.479 ppm      Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA      Diff between cyl:  
 Calibrator Make/Model: Teledyne API T700      Serial Number: 2658  
 ZAG Make/Model: Teledyne API T701      Serial Number: 360

### Analyzer Information

Analyzer make: Thermo 43i-TLE      Analyzer serial #: 1218153359  
 Converter make: CD Nova CDN-101      Converter serial #: 555  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 1.000870     | 1.005159      | Backgd or Offset: 2.63 | 2.56          |
| Calibration intercept: | 0.161019     | 0.260882      | Coeff or Slope: 1.151  | 1.151         |

### 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4927                          | 73.0                        | 80.0                                | 80.7                               | 0.992  |
| as found 2nd point    | 4964                          | 36.5                        | 40.0                                | 40.8                               | 0.983  |
| as found 3rd point    | 4983                          | 18.3                        | 20.0                                | 20.3                               | 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                              | 4927                          | 73.0                        | 80.0                                | 80.6                               | 0.992   |
| second point                            | 4964                          | 36.5                        | 40.0                                | 40.6                               | 0.985   |
| third point                             | 4983                          | 18.3                        | 20.0                                | 20.4                               | 0.983   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----  |
| as left span                            | 4927                          | 73.0                        | 80.0                                | 80.6                               | 0.992   |
| SO2 Scrubber Check                      | 4923                          | 77.1                        | 771.0                               | 0.1                                | ----  |
| Date of last scrubber change:           | 17-Dec-21                     |                             |                                     | Ave Corr Factor                    | 0.987   |
| Date of last converter efficiency test: |                               |                             |                                     |                                    | efficiency  |

Baseline Corr As found: 80.6      Prev response: 80.22      \*% change: 0.5%  
 Baseline Corr 2nd AF pt: 40.7      AF Slope: 1.008159      AF Intercept: 0.180871  
 Baseline Corr 3rd AF pt: 20.2      AF Correlation: 0.999966

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

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

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## TRS Calibration Summary

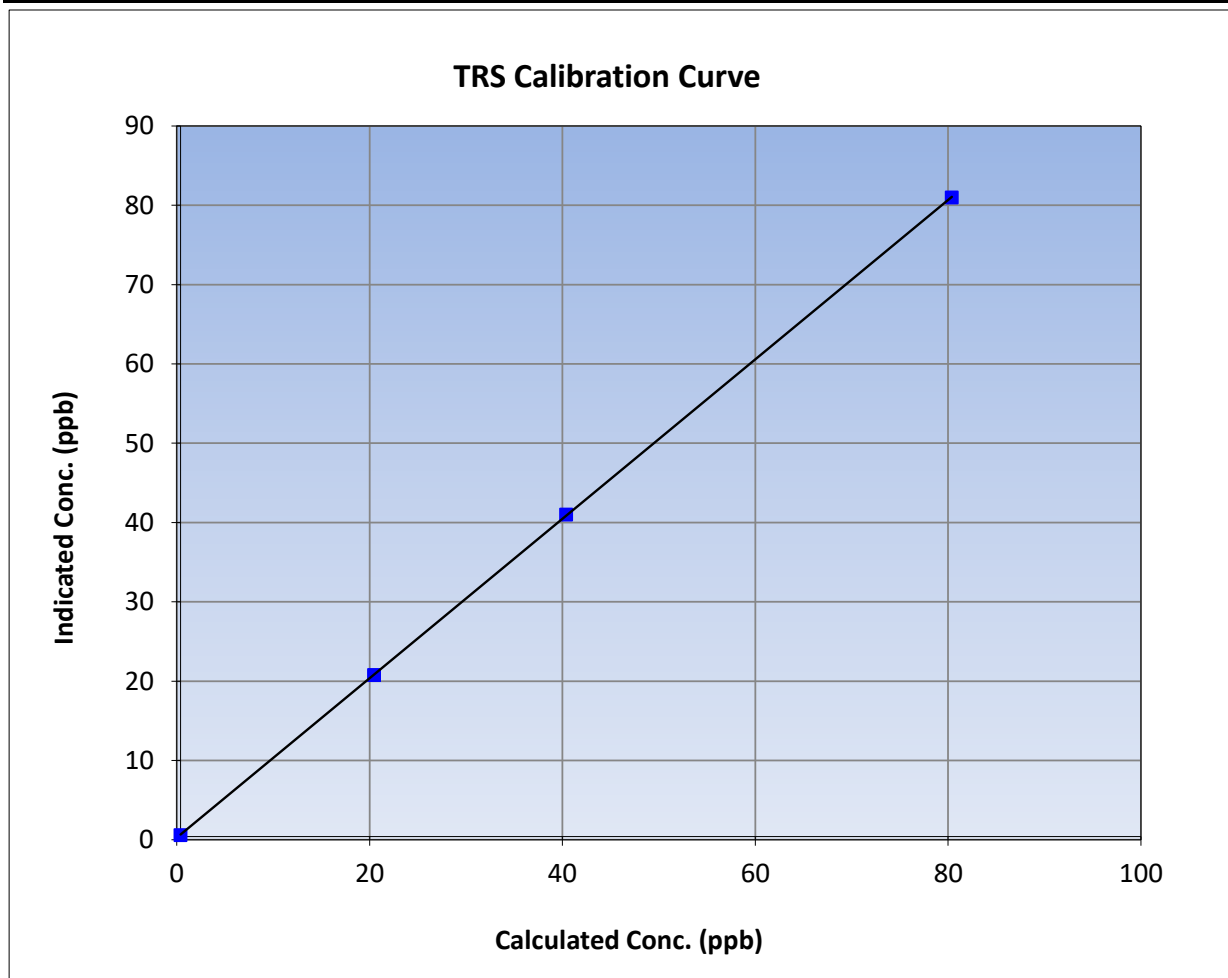
Version-11-2021

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 7, 2023  | Previous Calibration: | February 13, 2023 |
| Station Name:     | Stony Mountain | Station Number:       | AMS18             |
| Start Time (MST): | 10:34          | End Time (MST):       | 14:45             |
| Analyzer make:    | Thermo 43i-TLE | Analyzer serial #:    | 1218153359        |

### Calibration Data

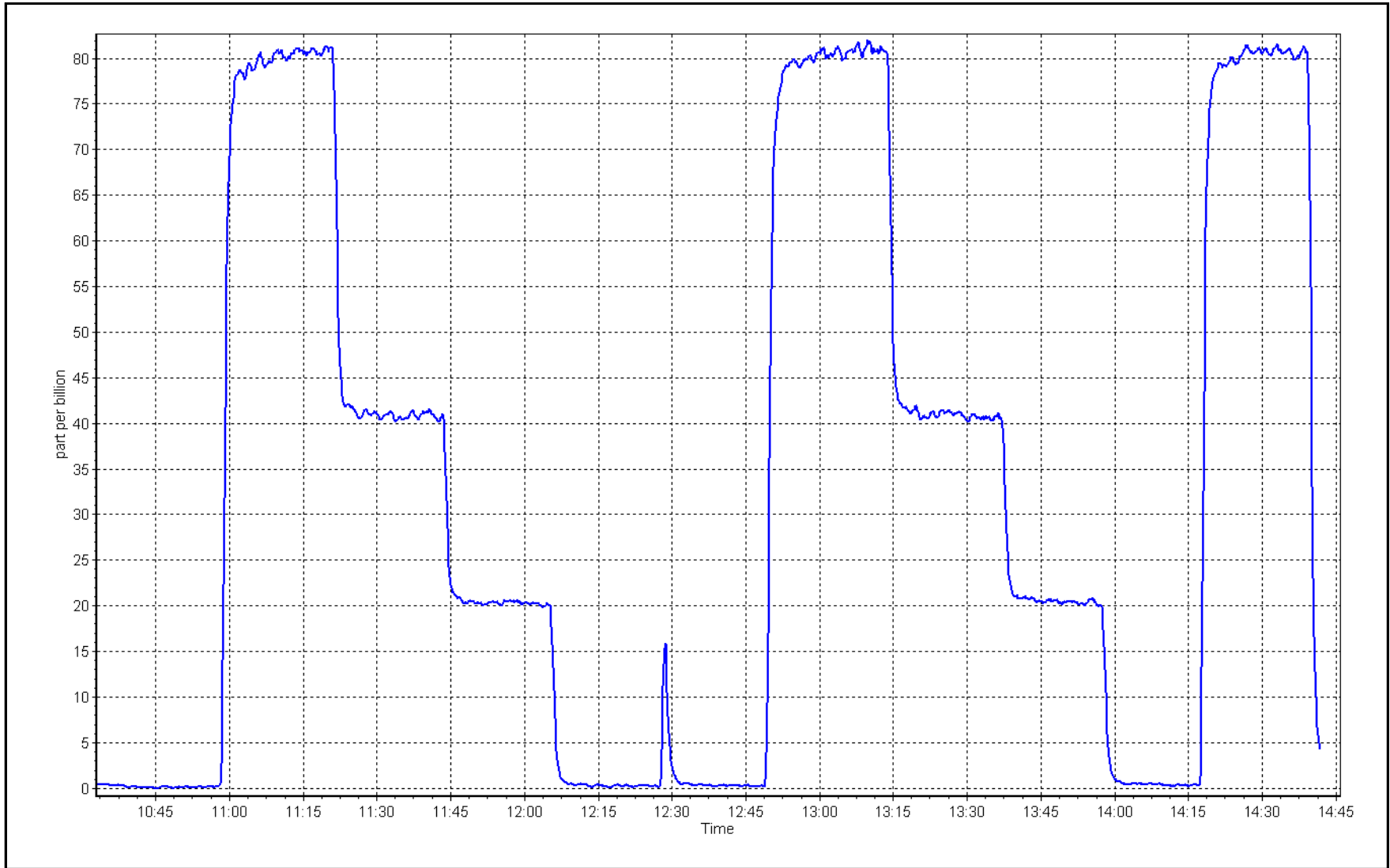
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999992 | ≥0.995      |
| 80.0                                | 80.6                               | 0.9925                    |                         |          |             |
| 40.0                                | 40.6                               | 0.9850                    | Slope                   | 1.005159 | 0.90 - 1.10 |
| 20.0                                | 20.4                               | 0.9827                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.260882 | +/-3        |



TRS Calibration Plot

Date: March 7, 2023

Location: Stony Mountain





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                |                 |                   |
|-------------------|----------------|-----------------|-------------------|
| Station Name:     | Stony Mountain | Station number: | AMS 18            |
| Calibration Date: | March 30, 2023 | Last Cal Date:  | February 17, 2023 |
| Start time (MST): | 9:58           | End time (MST): | 12:52             |
| Reason:           | Routine        |                 |                   |

### Calibration Standards

|   |                    |                             |                   |
|---|--------------------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC463851           | Cal Gas Expiry Date:        | February 23, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 500.8 ppm          | CH <sub>4</sub> Equiv Conc. | 1066.8 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.8 ppm          |                             |                   |
| Removed Gas Cert:                           | NA                 | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 500.8 ppm          | CH <sub>4</sub> Equiv Conc. | 1066.8 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.8 ppm          | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |                    | 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 #:           | 1180320039 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.06E-04     | 3.06E-04      | NMHC SP Ratio:  | 5.66E-05      |
| CH <sub>4</sub> Retention time: | 14.60        | 14.60         | NMHC Peak Area: | 162130        |
|                                 |              |               |                 | 162130        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4919              | 81.0                 | 17.28                | 17.31               | 0.998                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4919              | 81.0                 | 17.28                | 17.23               | 1.003                      |
| second point          | 4959              | 40.5                 | 8.64                 | 8.60                | 1.004                      |
| third point           | 4979              | 20.2                 | 4.31                 | 4.28                | 1.007                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4919              | 81.0                 | 17.28                | 17.26               | 1.001                      |

| Average Correction Factor |       |                 |       | 1.005                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 17.31 | Prev response   | 17.32 | *% change 0.0%                             |
| 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as found span             | 4919              | 81.0                 | 9.17                 | 9.16   | 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              | 81.0                 | 9.17                 | 9.10   | 1.007                      |
| second point              | 4959              | 40.5                 | 4.58                 | 4.56   | 1.006                      |
| third point               | 4979              | 20.2                 | 2.29                 | 2.27   | 1.006                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as left span              | 4919              | 81                   | 9.17                 | 9.09   | 1.009                      |
| Average Correction Factor |                   |                      |                      |  | 1.006                      |
| Baseline Corr AF:         | 9.16              | Prev response        | 9.16                 | *% change  | -0.1%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as found span             | 4919              | 81.0                 | 8.11                 | 8.15   | 0.995                      |
| 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                 | 8.11                 | 8.12   | 0.999                      |
| second point              | 4959              | 40.5                 | 4.06                 | 4.04   | 1.003                      |
| third point               | 4979              | 20.2                 | 2.02                 | 2.01   | 1.009                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as left span              | 4919              | 81.0                 | 8.11                 | 8.17   | 0.993                      |
| Average Correction Factor |                   |                      |                      |  | 1.004                      |
| Baseline Corr AF:         | 8.15              | Prev response        | 8.15                 | *% change  | 0.0%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.002575     | 0.997054      |
| THC Cal Offset:             | -0.009777    | -0.008797     |
| CH <sub>4</sub> Cal Slope:  | 1.007610     | 1.001440      |
| CH <sub>4</sub> Cal Offset: | -0.020602    | -0.011209     |
| NMHC Cal Slope:             | 0.998345     | 0.992924      |
| NMHC Cal Offset:            | 0.010426     | 0.002412      |

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

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## THC Calibration Summary

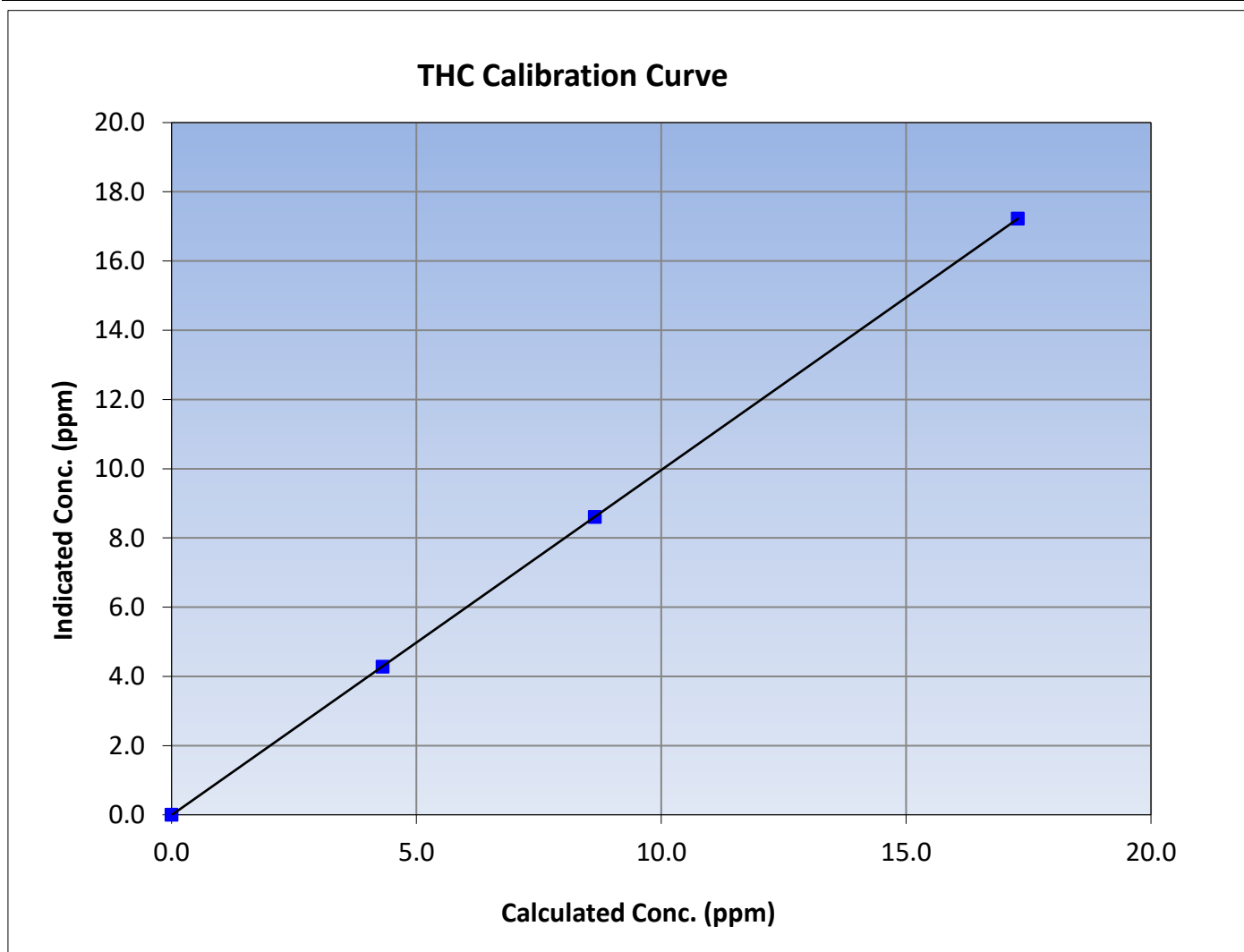
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 30, 2023 | Previous Calibration: | February 17, 2023 |
| Station Name:     | Stony Mountain | Station Number:       | AMS 18            |
| Start Time (MST): | 9:58           | End Time (MST):       | 12:52             |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1180320039        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999999  | $\geq 0.995$  |       |          |             |
| 17.28                               | 17.23                              | 1.0032                    |                         |           |               |       |          |             |
| 8.64                                | 8.60                               | 1.0045                    |                         |           |               | Slope | 0.997054 | 0.90 - 1.10 |
| 4.31                                | 4.28                               | 1.0071                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.008797 | $\pm 0.5$     |       |          |             |







# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

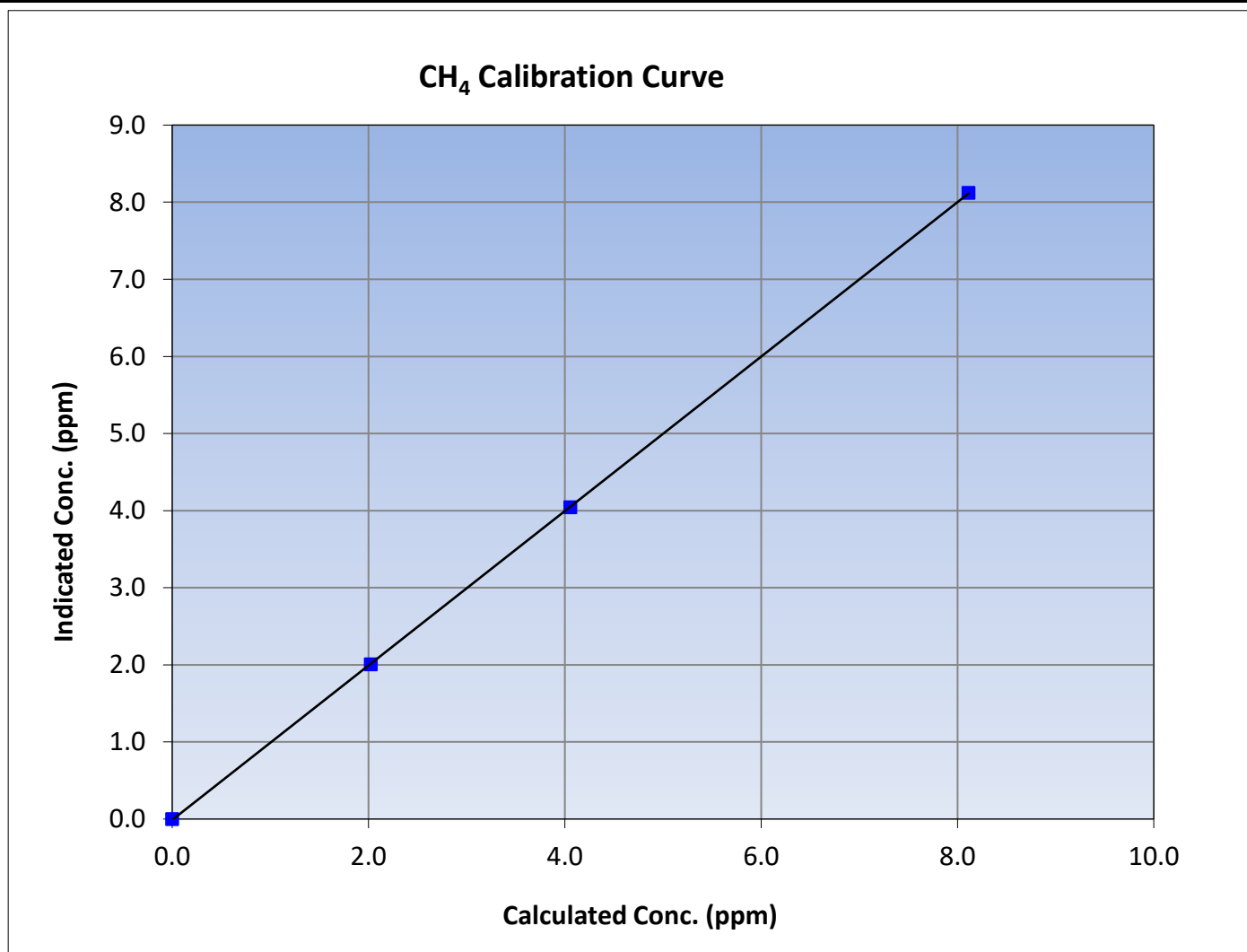
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 30, 2023 | Previous Calibration: | February 17, 2023 |
| Station Name:     | Stony Mountain | Station Number:       | AMS 18            |
| Start Time (MST): | 9:58           | End Time (MST):       | 12:52             |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1180320039        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999991  | ≥0.995        |       |          |             |
| 8.11                                | 8.12                               | 0.9991                    |                         |           |               |       |          |             |
| 4.06                                | 4.04                               | 1.0034                    |                         |           |               | Slope | 1.001440 | 0.90 - 1.10 |
| 2.02                                | 2.01                               | 1.0088                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.011209 | +/-0.5        |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

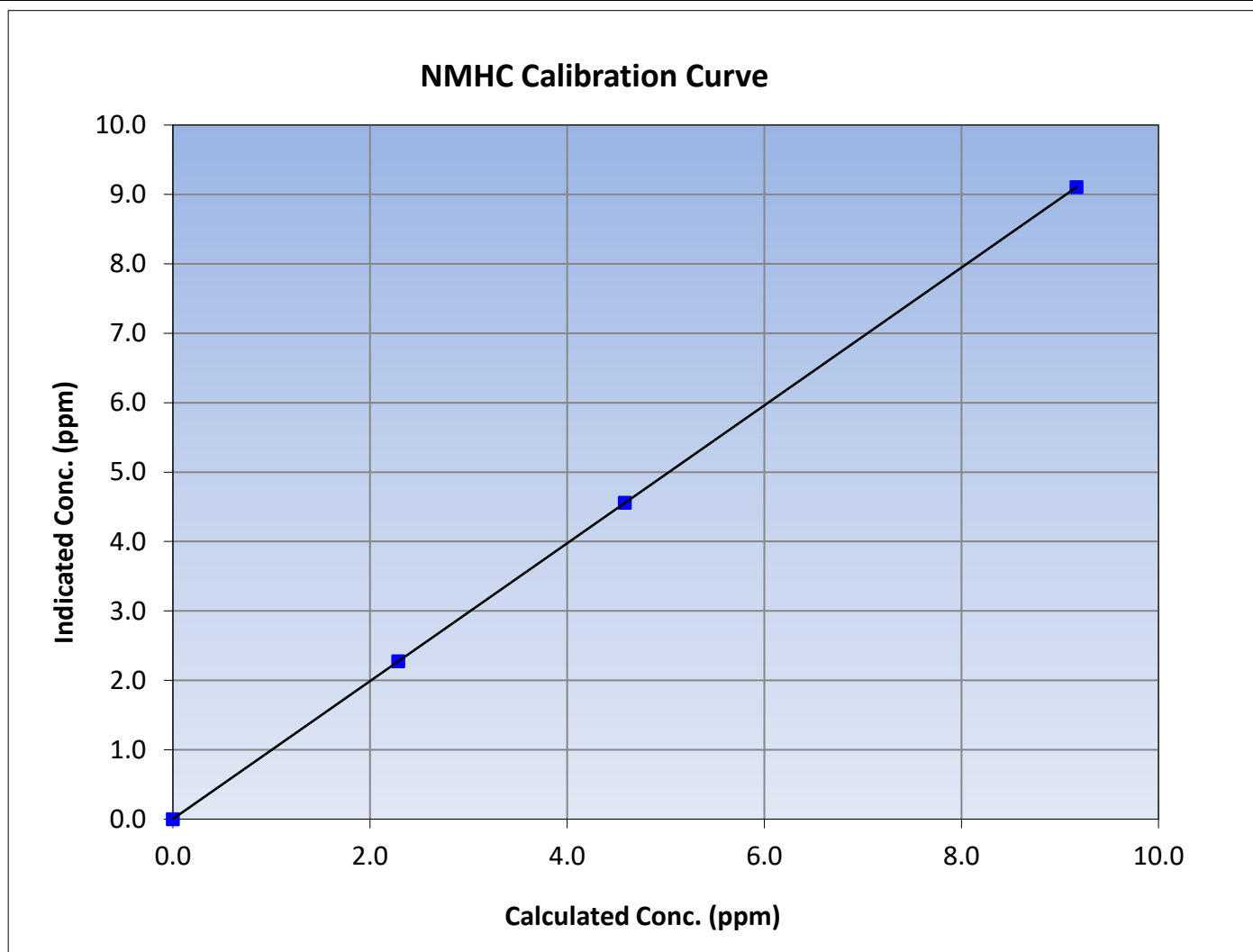
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 30, 2023 | Previous Calibration: | February 17, 2023 |
| Station Name:     | Stony Mountain | Station Number:       | AMS 18            |
| Start Time (MST): | 9:58           | End Time (MST):       | 12:52             |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1180320039        |

### Calibration Data

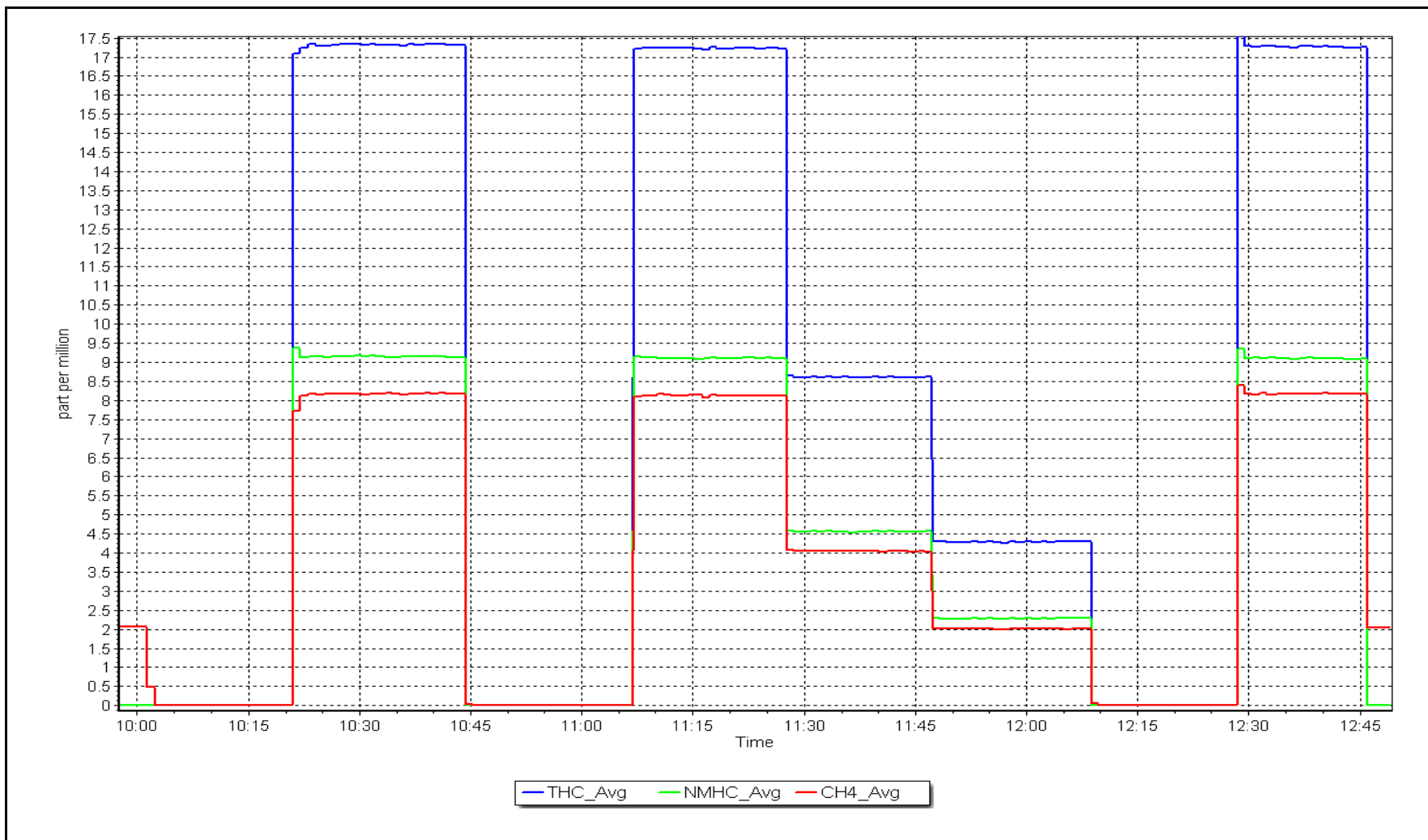
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 1.000000 | $\geq 0.995$  |
| 9.17                                | 9.10                               | 1.0071                    |                         |          |               |
| 4.58                                | 4.56                               | 1.0058                    |                         |          |               |
| 2.29                                | 2.27                               | 1.0056                    |                         |          |               |
|                                     |                                    |                           | Slope                   | 0.992924 | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | 0.002412 | +/-0.5        |



NMHC Calibration Plot

Date: March 30, 2023

Location: Stony Mountain





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Stony Mountain Station number: AMS 18  
Calibration Date: March 22, 2023 Last Cal Date: February 22, 2023  
Start time (MST): 9:43 End time (MST): 14:15  
Reason: Routine

### Calibration Standards

NO Gas Cylinder #: T2XX7ME Cal Gas Expiry Date: January 14, 2024  
NOX Cal Gas Conc: 50.48 ppm NO Cal Gas Conc: 49.22 ppm  
Removed Cylinder #: NA Removed Gas Exp Date: NA  
Removed Gas NOX Conc: 50.48 ppm Removed Gas NO Conc: 49.22 ppm  
NOX gas Diff: NO gas Diff:  
Calibrator Model: Teledyne API T700 Serial Number: 2658  
ZAG make/model: Teledyne API 701H Serial Number: 360

### Analyzer Information

Analyzer make: Thermo 42i Analyzer serial #: 1336160088  
NOX Range (ppb): 0 - 1000 ppb

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.043        | 1.062         | NO bkgnd or offset:  | 2.9          | 3.0           |
| NOX coeff or slope: | 0.987        | 0.984         | NOX bkgnd or offset: | 2.9          | 3.0           |
| NO2 coeff or slope: | 0.999        | 0.999         | Reaction cell Press: | 222.7        | 223.9         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.002587     | 0.999873      |
| NO <sub>x</sub> Cal Offset: | 0.289742     | -0.210265     |
| NO Cal Slope:               | 1.003123     | 1.002239      |
| NO Cal Offset:              | -0.910073    | -0.950426     |
| NO <sub>2</sub> Cal Slope:  | 0.999064     | 0.999365      |
| NO <sub>2</sub> Cal Offset: | 0.020158     | -0.185598     |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.1  | ----  | ----   |
| as found span             | 4919                      | 81.3                        | 820.8   | 800.3                                  | 20.5  | 809.4  | 786.6                                 | 22.9   | 1.0140  | 1.0174   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.1  | 0.0                                   | 0.0  | ----  | ----   |
| high point                | 4919                      | 81.3                        | 820.8   | 800.3                                  | 20.5  | 820.4  | 801.2                                 | 19.2   | 1.0004  | 0.9988   |
| second point              | 4959                      | 40.7                        | 410.9   | 400.7                                  | 10.3  | 411.1  | 401.3                                 | 9.8  | 0.9996  | 0.9984   |
| third point               | 4980                      | 20.3                        | 204.9   | 199.8                                  | 5.1   | 204.0  | 197.6                                 | 6.4  | 1.0046  | 1.0112   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | 0.0                                   | 0.1  | ----  | ----   |
| as left span              | 4919                      | 81.3                        | 820.8   | 362.9                                  | 457.9   | 821.8  | 358.8                                 | 463.0  | 0.9987  | 1.0113   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0015  | 1.0028   |

|                      |                             |                |  |                                  |                         |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 809.4 ppb | NO = 786.7 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -1.7% |                      |
| Previous Response    | NO <sub>x</sub> = 823.2 ppb | NO = 801.9 ppb |  | *Percent Change                  | NO = -1.9%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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)       | 799.3                                      | 361.9                                 | 457.9   | 457.4  | 1.0011   | 99.9%  |
| 2nd GPT point (200 ppb O3)       | 799.3                                      | 588.6                                 | 231.2   | 231.1  | 1.0004   | 100.0%   |
| 3rd GPT point (100 ppb O3)       | 799.3                                      | 695.6                                 | 124.2   | 123.5  | 1.0056   | 99.4%  |
| Average Correction Factor        |  |                                       |   |  | 1.0023   | 99.8%  |

Notes:

Sample inlet filter changed after as founds. Adjusted the span only.

Calibration Performed By:

Karan Pandit



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

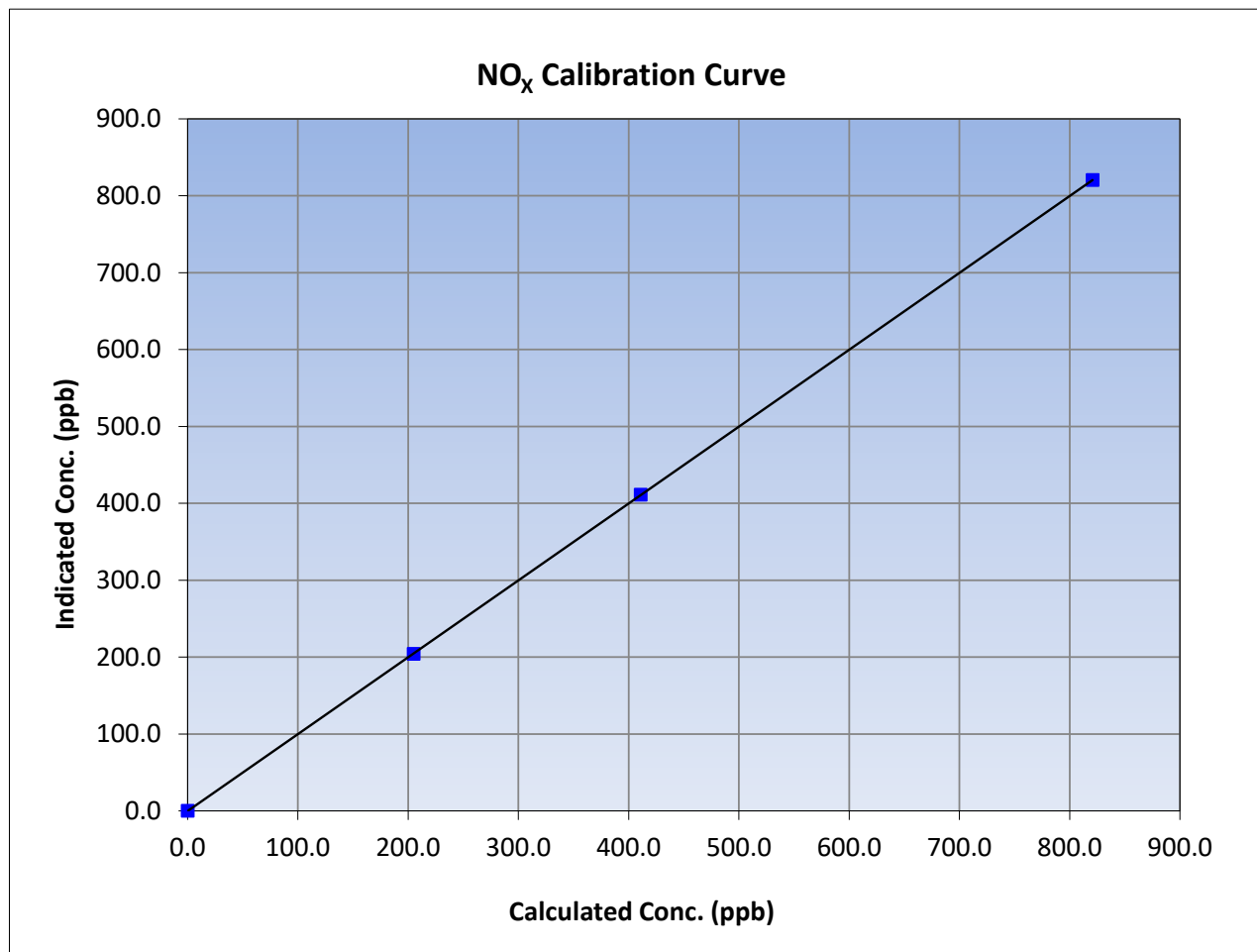
Version-04-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 22, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Stony Mountain | Station Number:       | AMS 18            |
| Start Time (MST): | 9:43           | End Time (MST):       | 14:15             |
| 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 | ≥0.995    |             |
| 820.8                               | 820.4                              | 1.0004                    |                         |           |             |
| 410.9                               | 411.1                              | 0.9996                    |                         |           |             |
| 204.9                               | 204.0                              | 1.0046                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 0.999873  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.210265 | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

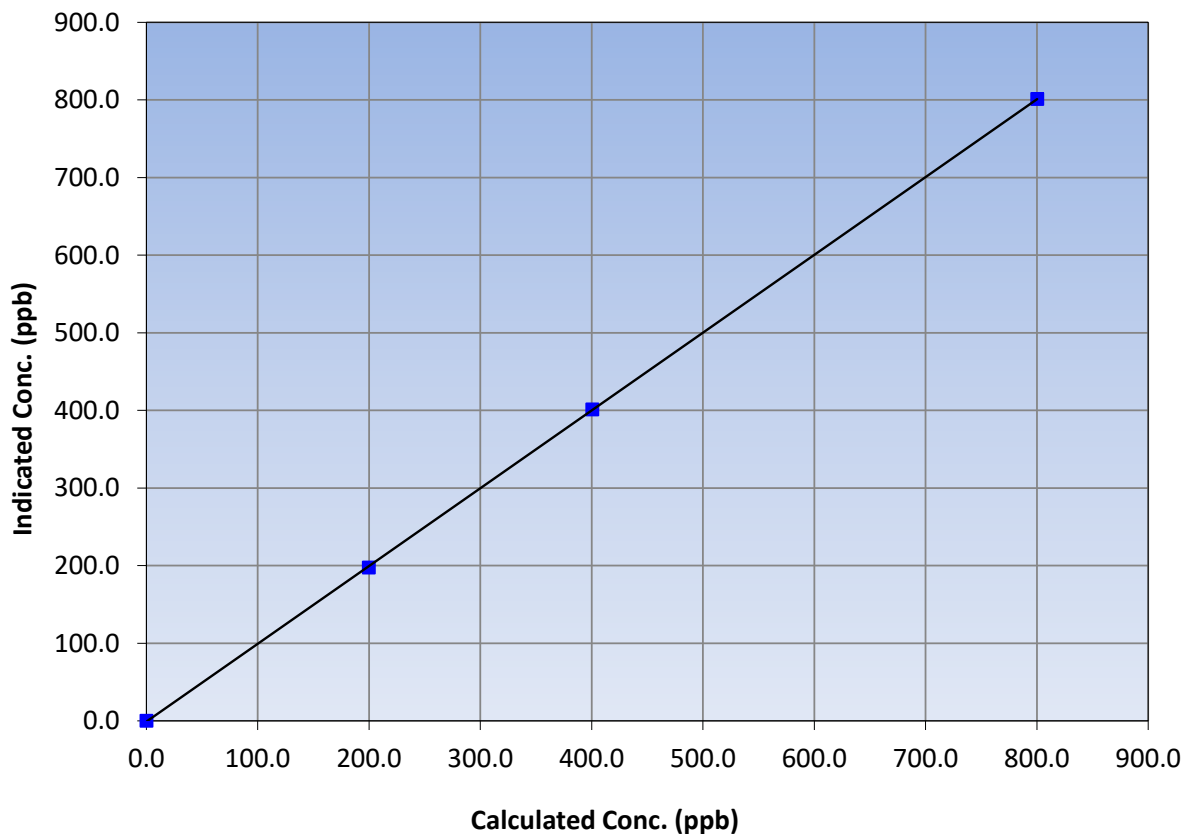
### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 22, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Stony Mountain | Station Number:       | AMS 18            |
| Start Time (MST): | 9:43           | End Time (MST):       | 14:15             |
| 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<br>Slope<br>Intercept | $\geq 0.995$<br>$0.90 - 1.10$<br>$\pm 20$ |
| 800.3                               | 801.2                              | 0.9988                    |   |   |
| 400.7                               | 401.3                              | 0.9984                    |   |   |
| 199.8                               | 197.6                              | 1.0112                    |   |   |
|                                     |                                    |                           |   |   |

NO Calibration Curve





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

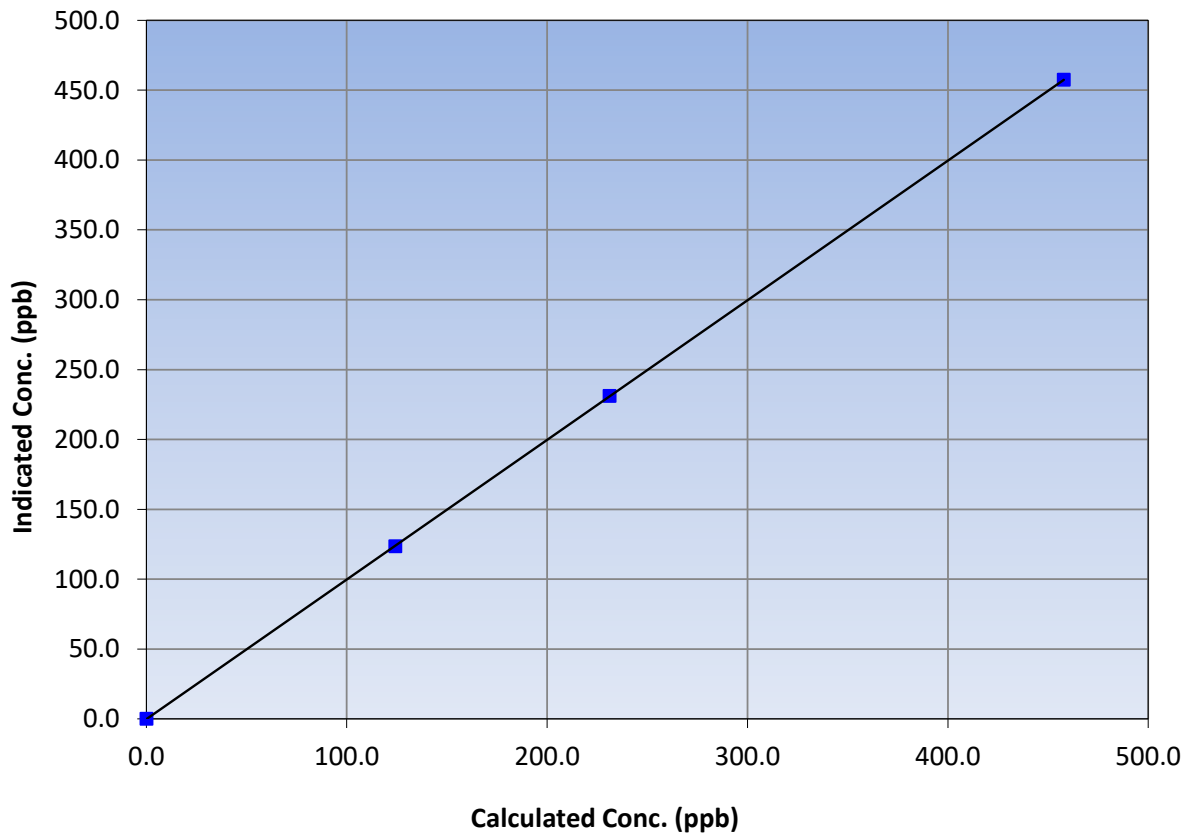
### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 22, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Stony Mountain | Station Number:       | AMS 18            |
| Start Time (MST): | 9:43           | End Time (MST):       | 14:15             |
| Analyzer make:    | Thermo 42i     | Analyzer serial #:    | 1336160088        |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 457.9                               | 457.4                              | 1.0011                    |   |                                |
| 231.2                               | 231.1                              | 1.0004                    |   |                                |
| 124.2                               | 123.5                              | 1.0056                    |   |                                |
|                                     |                                    |                           | 0.999998                                      |                                |
|                                     |                                    |                           | 0.999365                                      |                                |
|                                     |                                    |                           | -0.185598                                     |                                |

**NO<sub>2</sub> Calibration Curve**

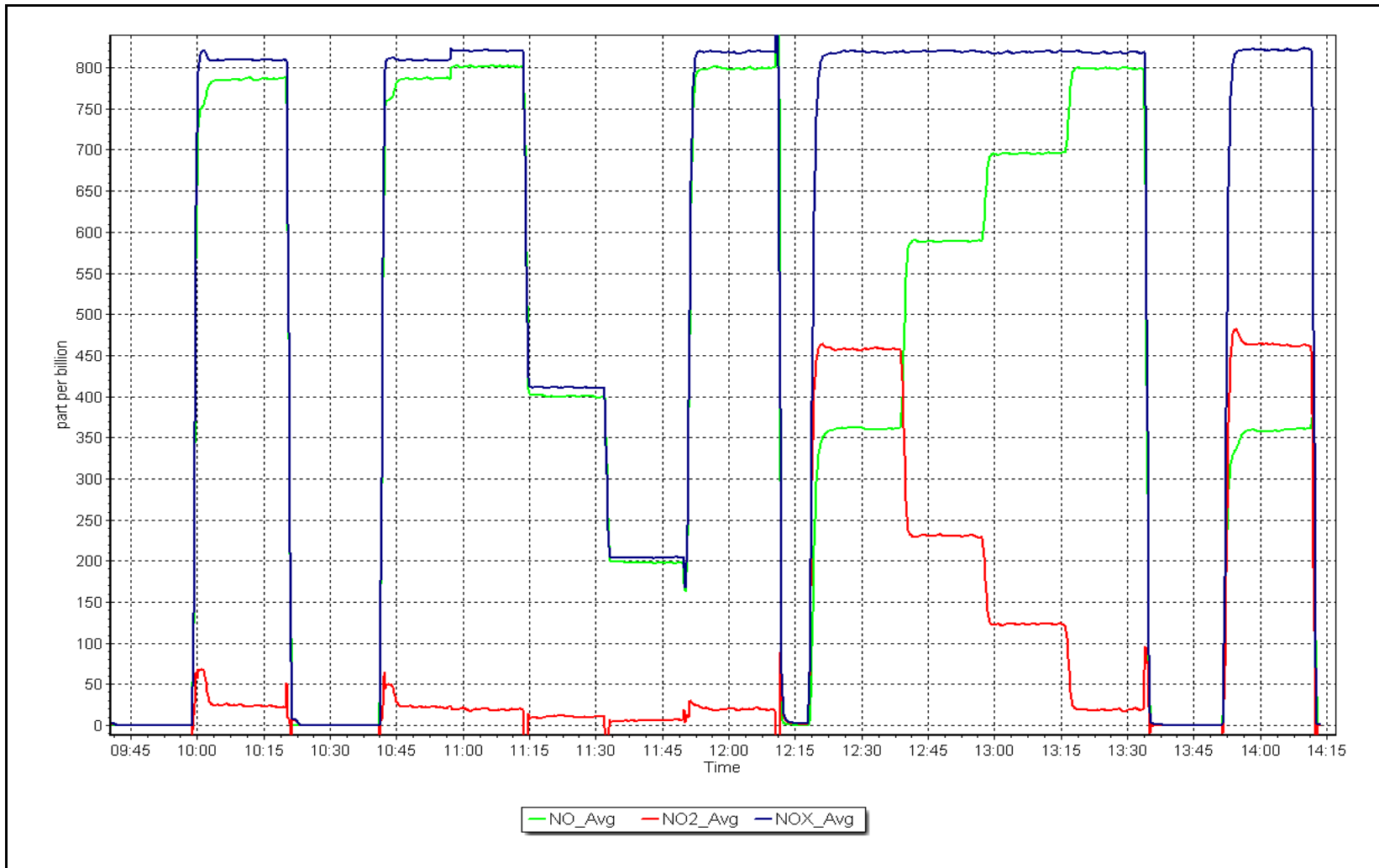




NO<sub>x</sub> Calibration Plot

Date: March 22, 2023

Location: Stony Mountain





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Stony Mountain Station number: AMS 18  
 Calibration Date: March 22, 2023 Last Cal Date: February 24, 2023  
 Start time (MST): 11:05 End time (MST): 12:06

Analyzer Make: API T640 S/N: 1335  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Delta Cal S/N: 1102  
 Temp/RH standard: Delta Cal S/N: 1102

### Monthly Calibration Test

| Parameter  | As found                             | Measured                                | As left                 | Adjusted                 | (Limits)     |
|------------|--------------------------------------|---|-------------------------|--------------------------|--------------|
| T (°C)     | -3.1                                 | -3.2                                    | -3.1                    | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 692.0                                | 693.3                                   | 692.0                   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 4.99                                 | 4.95                                    | 4.99                    | <input type="checkbox"/> | +/- 0.25 LPM |
| Leak Test: | Date of check: <u>March 22, 2023</u> | Last Cal Date: <u>February 24, 2023</u> | PM w/o HEPA: <u>6.7</u> | PM w/ HEPA: <u>0.0</u>   | <0.2 ug/m3   |

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

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter                     | As found | Post maintenance        | As left             | Adjusted                            | (Limits)     |
|-------------------------------|----------|-------------------------|---------------------|-------------------------------------|--------------|
| PMT Peak Test                 | 10.0     | 10.4                    | 11.0                | <input checked="" type="checkbox"/> | 10.9 +/- 0.5 |
| Post-maintenance leak check:  |          | PM w/o HEPA: <u>8.6</u> | w/ HEPA: <u>0.0</u> |                                     | <0.2 ug/m3   |
| Date Optical Chamber Cleaned: |          | <u>March 22, 2023</u>   |                     |                                     |              |
| Disposable Filter Changed:    |          | <u>March 22, 2023</u>   |                     |                                     |              |

### Annual Maintenance

Date Sample Tube Cleaned: August 30, 2022  
 Date RH/T Sensor Cleaned: August 30, 2022

Notes: No adjustments made to temperature, pressure or flow. Optical chamber and inlet head cleaned. Leak check passed. PMT adjusted.

Calibration by: Karan Pandit



# Wood Buffalo Environmental Association

## CO Calibration Report

Version-01-2020

### Station Information

|                   |                |                 |                   |
|-------------------|----------------|-----------------|-------------------|
| Station Name:     | Stony Mountain | Station number: | AMS 18            |
| Calibration Date: | March 24, 2023 | Last Cal Date:  | February 24, 2023 |
| Start time (MST): | 9:30           | End time (MST): | 12:18             |
| Reason:           | Routine        |                 |                   |

### Calibration Standards

|                        |                   |     |                   |                  |
|------------------------|-------------------|-----|-------------------|------------------|
| Cal Gas Concentration: | 3,050             | ppm | Cal Gas Exp Date: | December 1, 2028 |
| Cal Gas Cylinder #:    | ALM063503         |     |                   |                  |
| Removed Cal Gas Conc:  | 3,050             | ppm | Rem Gas Exp Date: | NA               |
| Removed Gas Cyl #:     | NA                |     | Diff between cyl: |                  |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 2658             |
| ZAG Make/Model:        | Teledyne API T701 |     | Serial Number:    | 360              |

### Analyzer Information

|                 |            |                    |      |
|-----------------|------------|--------------------|------|
| Analyzer make:  | API T300   | Analyzer serial #: | 3504 |
| Analyzer Range: | 0 - 50 ppm |                    |      |

|                        |                     |                      |                   |                     |                      |
|------------------------|---------------------|----------------------|-------------------|---------------------|----------------------|
|                        | <b><u>Start</u></b> | <b><u>Finish</u></b> |                   | <b><u>Start</u></b> | <b><u>Finish</u></b> |
| Calibration slope:     | 0.997892            | 1.002302             | Backgd or Offset: | -0.009              | -0.009               |
| Calibration intercept: | 0.161801            | 0.205803             | Coeff or Slope:   | 0.904               | 0.904                |

### 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)<br><i>Limit = 0.95-1.05</i> |
|----------------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero                    | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as found span                    | 4933                          | 66.7                        | 40.7                                | 40.9                               | 0.994   |
| 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                        | 40.7                                | 40.9                               | 0.995   |
| second point                     | 4966                          | 33.3                        | 20.3                                | 20.8                               | 0.978   |
| third point                      | 4983                          | 16.7                        | 10.2                                | 10.4                               | 0.982   |
| as left zero                     | 3000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| as left span                     | 2960                          | 40.0                        | 40.7                                | 41.1                               | 0.991   |
| <b>Average Correction Factor</b> |                               |                             |                                     |                                    | <b>0.985</b>  |

|                          |       |                 |       |               |      |
|--------------------------|-------|-----------------|-------|---------------|------|
| Baseline Corr As found:  | 40.80 | Prev response:  | 40.77 | *% 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: Sample inlet filter changed after as founds. No adjustments made.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## CO Calibration Summary

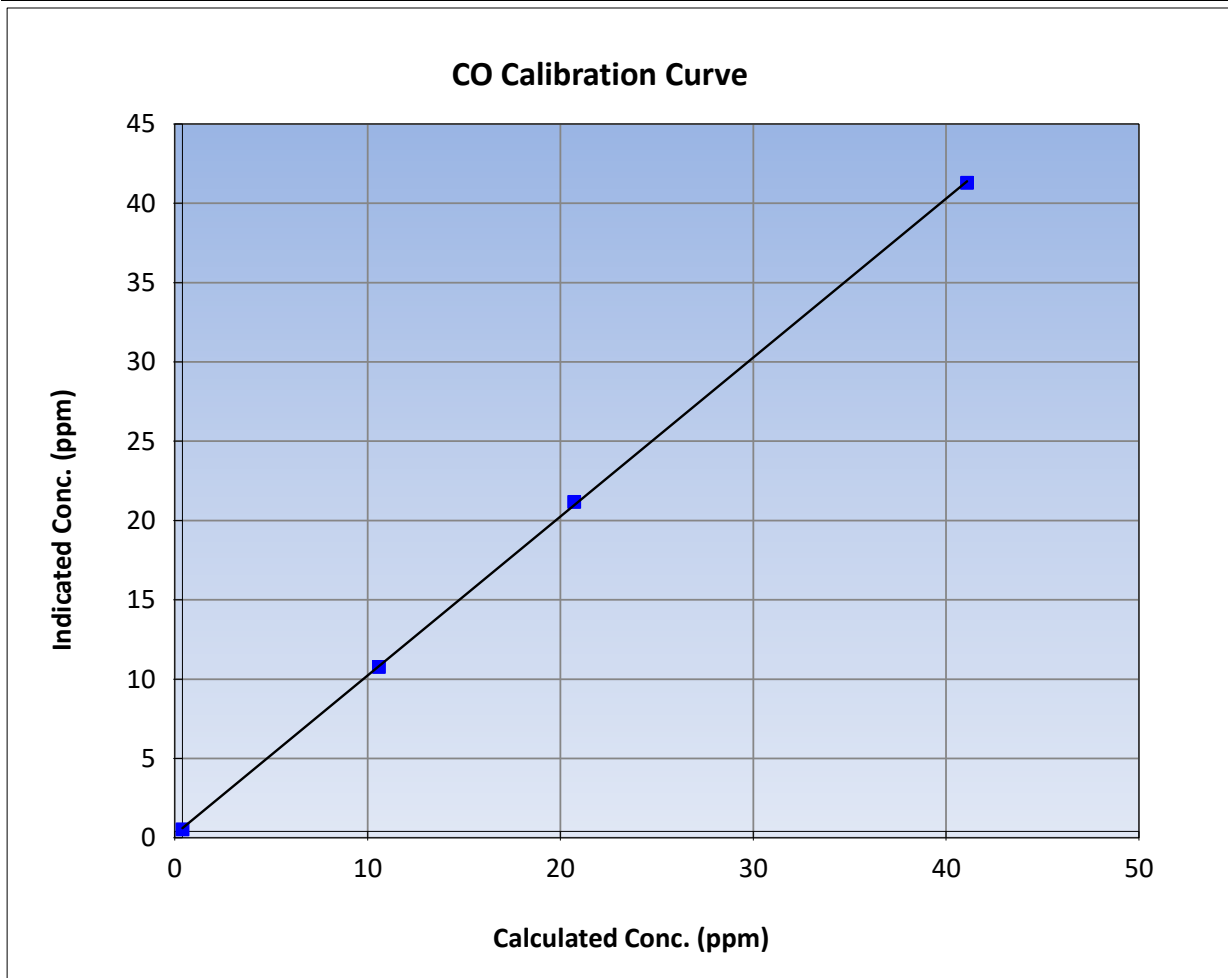
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 24, 2023 | Previous Calibration: | February 24, 2023 |
| Station Name:     | Stony Mountain | Station Number:       | AMS 18            |
| Start Time (MST): | 9:30           | End Time (MST):       | 12:18             |
| Analyzer make:    | API T300       | Analyzer serial #:    | 3504              |

### Calibration Data

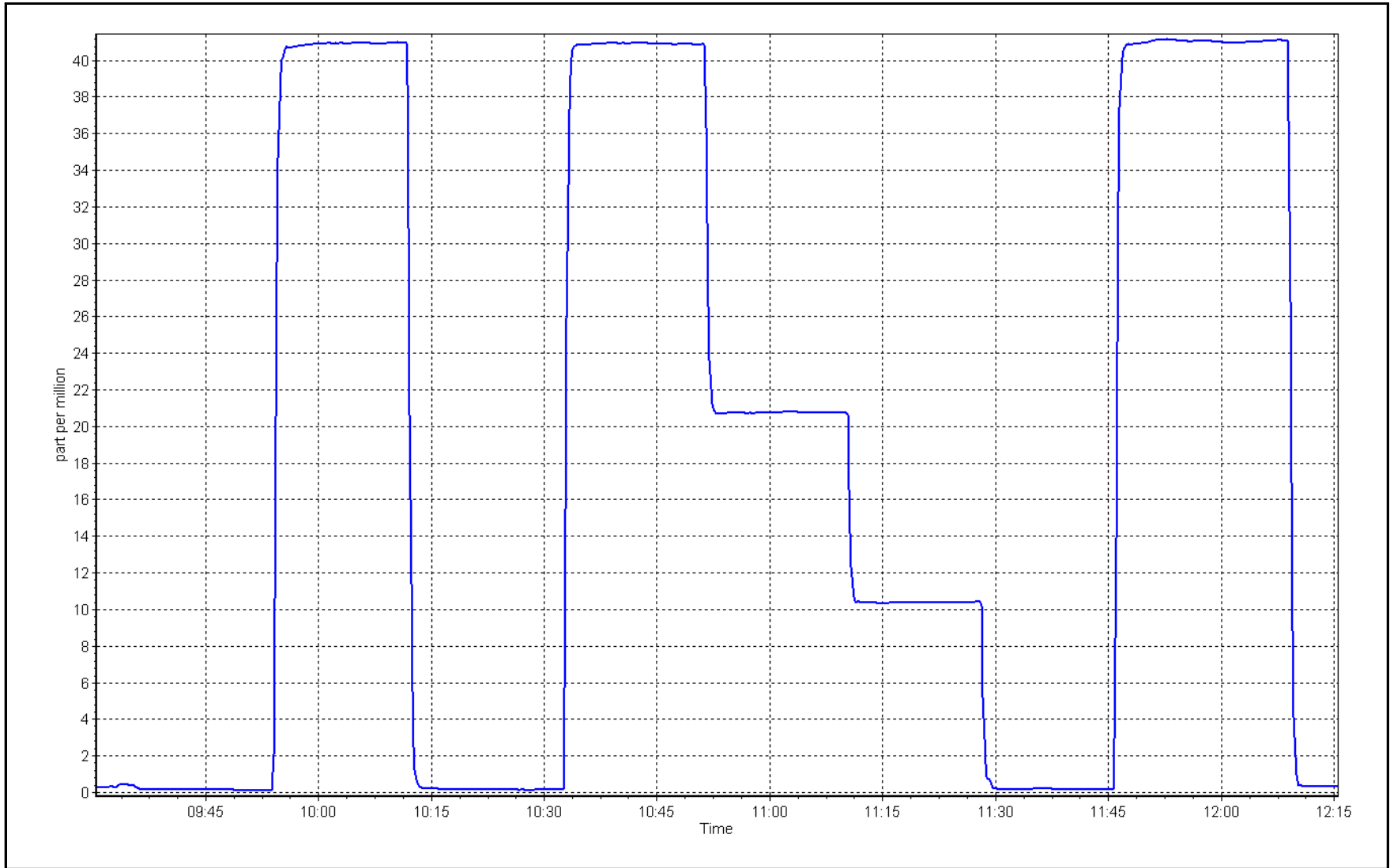
| Calculated concentration<br>(ppm) (Cc) | Indicated concentration<br>(ppm) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |
|--|---------------------------------------|------------------------------|-------------------------|---------------|
| 0.0                                    | 0.1                                   | ----                         | Correlation Coefficient | 0.999939      |
| 40.7                                   | 40.9                                  | 0.9949                       |                         |               |
| 20.3                                   | 20.8                                  | 0.9781                       | Slope                   | 1.002302      |
| 10.2                                   | 10.4                                  | 0.9824                       |                         |               |
|  |                                       |                              | Intercept               | 0.205803      |
|  |                                       |                              |                         | $\pm 1.5$     |



CO Calibration Plot

Date: March 24, 2023

Location: Stony Mountain





# Wood Buffalo Environmental Association

## CO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                |                 |                  |
|-------------------|----------------|-----------------|------------------|
| Station Name:     | Stony Mountain | Station number: | AMS 18           |
| Calibration Date: | March 29, 2023 | Last Cal Date:  | February 8, 2023 |
| Start time (MST): | 9:42           | End time (MST): | 13:18            |
| Reason:           | Maintenance    |                 |                  |

### Calibration Standards

|                        |                   |     |                   |                  |
|------------------------|-------------------|-----|-------------------|------------------|
| Cal Gas Concentration: | 60,220            | ppm | Cal Gas Exp Date: | December 1, 2026 |
| Cal Gas Cylinder #:    | ALM063503         |     |                   |                  |
| 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:    | 2658             |
| N2 Gen Make/Model:     | Peak Scientific   |     | Serial Number:    | 771048317        |

### Analyzer Information

|                              |                        |
|------------------------------|------------------------|
| Analyzer make: API T360      | Analyzer serial #: 283 |
| Analyzer Range 0 - 2,000 ppm |                        |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.999561     | 1.008751      | Backgd or Offset: | -0.059       | -0.059        |
| Calibration intercept: | 1.700000     | 4.460000      | Coeff or Slope:   | 1.066        | 1.066         |

### CO<sub>2</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 3000                          | 0.0                         | 0.0                                 | 0.6                                | ----  |
| as found span             | 2920                          | 80.0                        | 1605.9                              | 1612.7                             | 0.996   |
| as found 2nd point        | 2960                          | 40.0                        | 802.9                               | 815.4                              | 0.985   |
| as found 3rd point        | 2980                          | 20.0                        | 401.5                               | 405.9                              | 0.989   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 3000                          | 0.0                         | 0.0                                 | 0.5                                | ----  |
| high point                | 2920                          | 80.0                        | 1605.9                              | 1620.5                             | 0.991   |
| second point              | 2960                          | 40.0                        | 802.9                               | 822.1                              | 0.977   |
| third point               | 2980                          | 20.0                        | 401.5                               | 409.6                              | 0.980   |
| as left zero              | 3000                          | 0.0                         | 0.0                                 | 0.5                                | ----  |
| as left span              | 2930                          | 80.0                        | 1600.5                              | 1619.4                             | 0.988   |
| Average Correction Factor |                               |                             |                                     |                                    | 0.983   |

|                          |         |                 |          |               |          |
|--------------------------|---------|-----------------|----------|---------------|----------|
| Baseline Corr As found:  | 1612.10 | Prev response:  | 1606.86  | *% change:    | 0.3%     |
| Baseline Corr 2nd AF pt: | 814.8   | AF Slope:       | 1.004019 | AF Intercept: | 3.260000 |
| Baseline Corr 3rd AF pt: | 405.3   | AF Correlation: | 0.999964 |               |          |

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

Notes: Pump and sample inlet filter changed after multipoint as founds. No adjustments made.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## CO<sub>2</sub> Calibration Summary

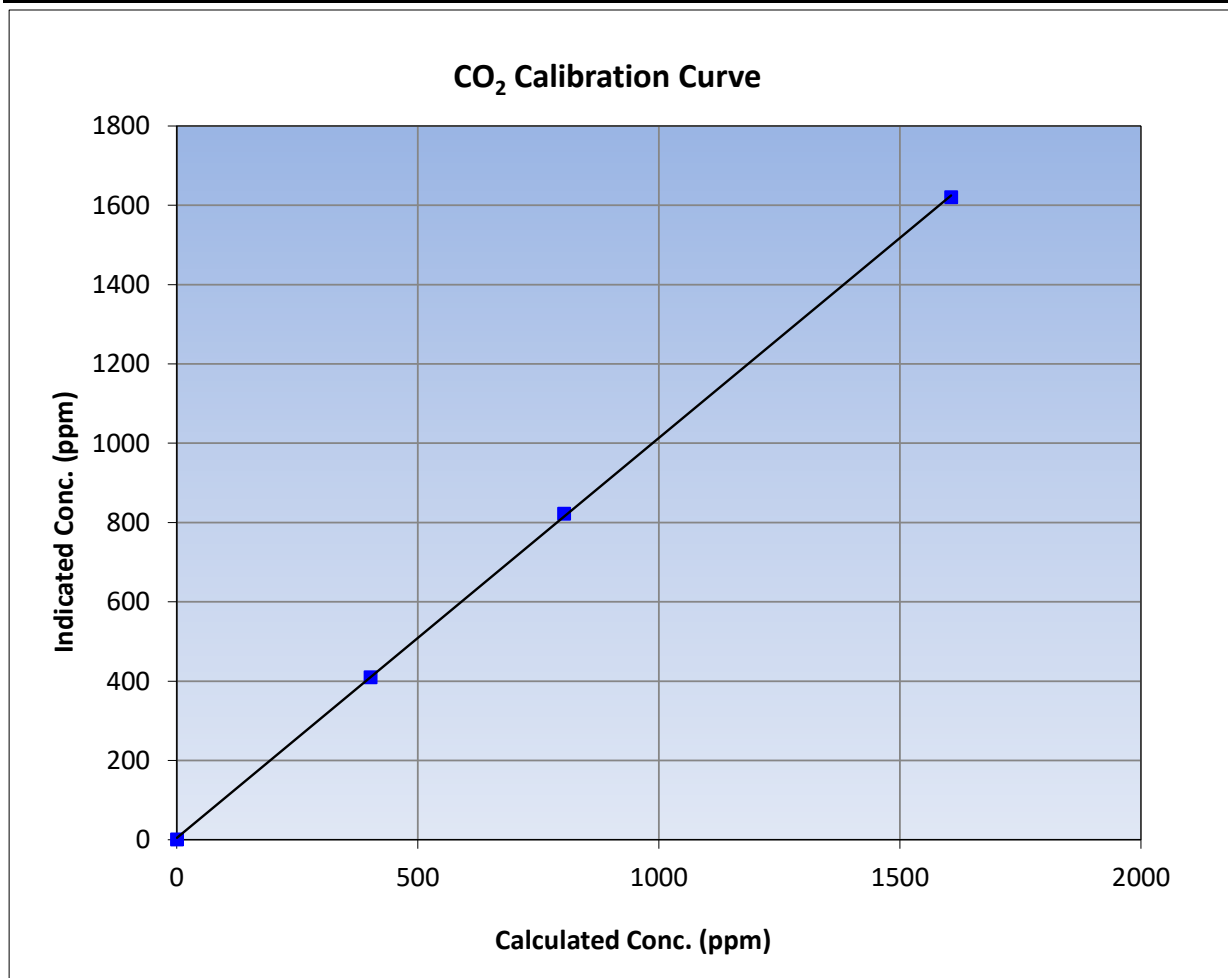
Version-01-2020

### Station Information

|                  |                |                      |                  |
|------------------|----------------|----------------------|------------------|
| Calibration Date | March 29, 2023 | Previous Calibration | February 8, 2023 |
| Station Name     | Stony Mountain | Station Number       | AMS 18           |
| Start Time (MST) | 9:42           | End Time (MST)       | 13:18            |
| Analyzer make    | API T360       | Analyzer serial #    | 283              |

### Calibration Data

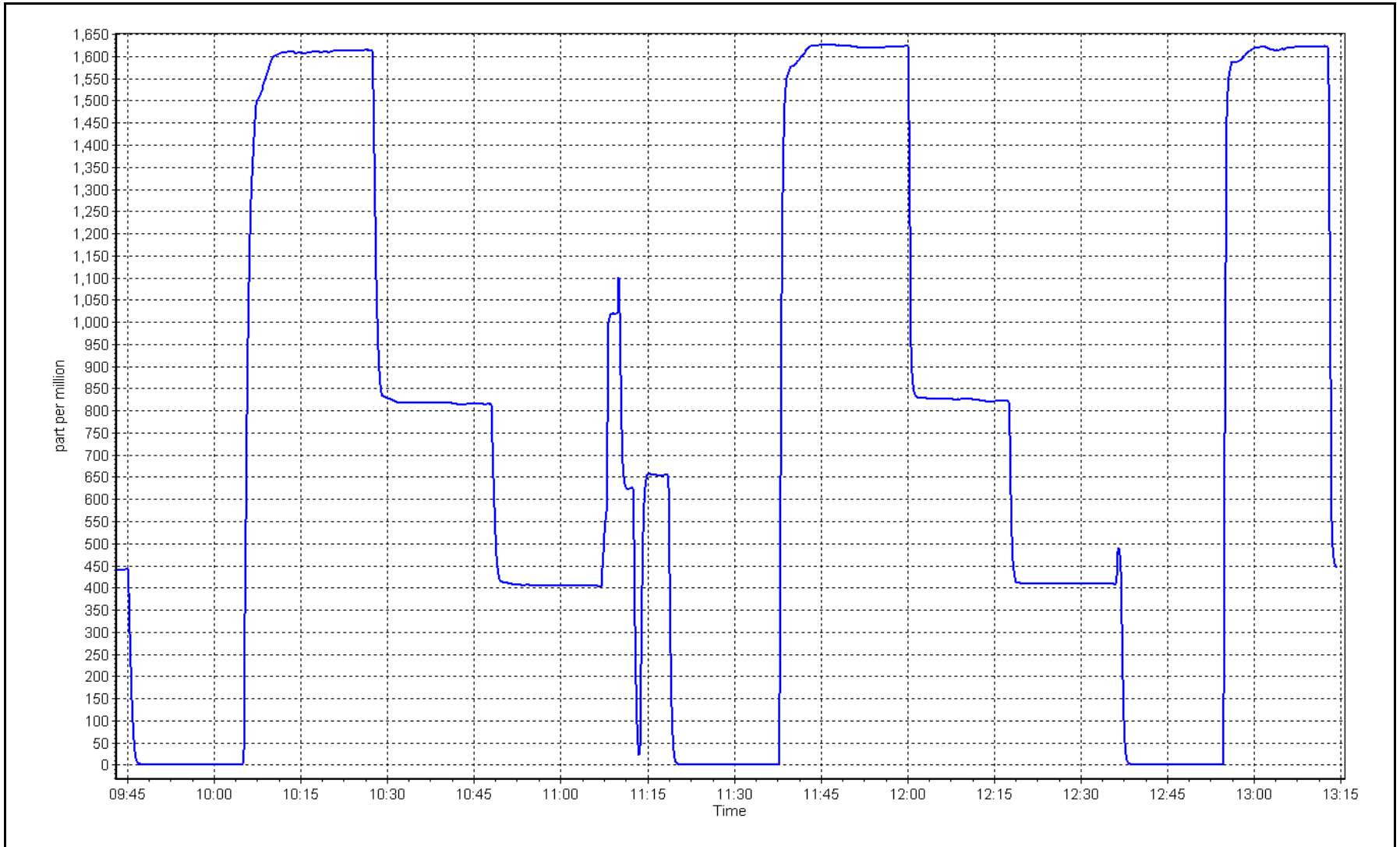
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.5                                | ----                      | Correlation Coefficient | 0.999937 | ≥0.995      |
| 1605.9                              | 1620.5                             | 0.9910                    |                         |          |             |
| 802.9                               | 822.1                              | 0.9767                    | Slope                   | 1.008751 | 0.90 - 1.10 |
| 401.5                               | 409.6                              | 0.9801                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 4.460000 | +/-10       |



CO<sub>2</sub> Calibration Plot

Date: March 29, 2023

Location: Stony Mountain







## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS19 FIREBAG MARCH 2023**

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

April 29, 2023







# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

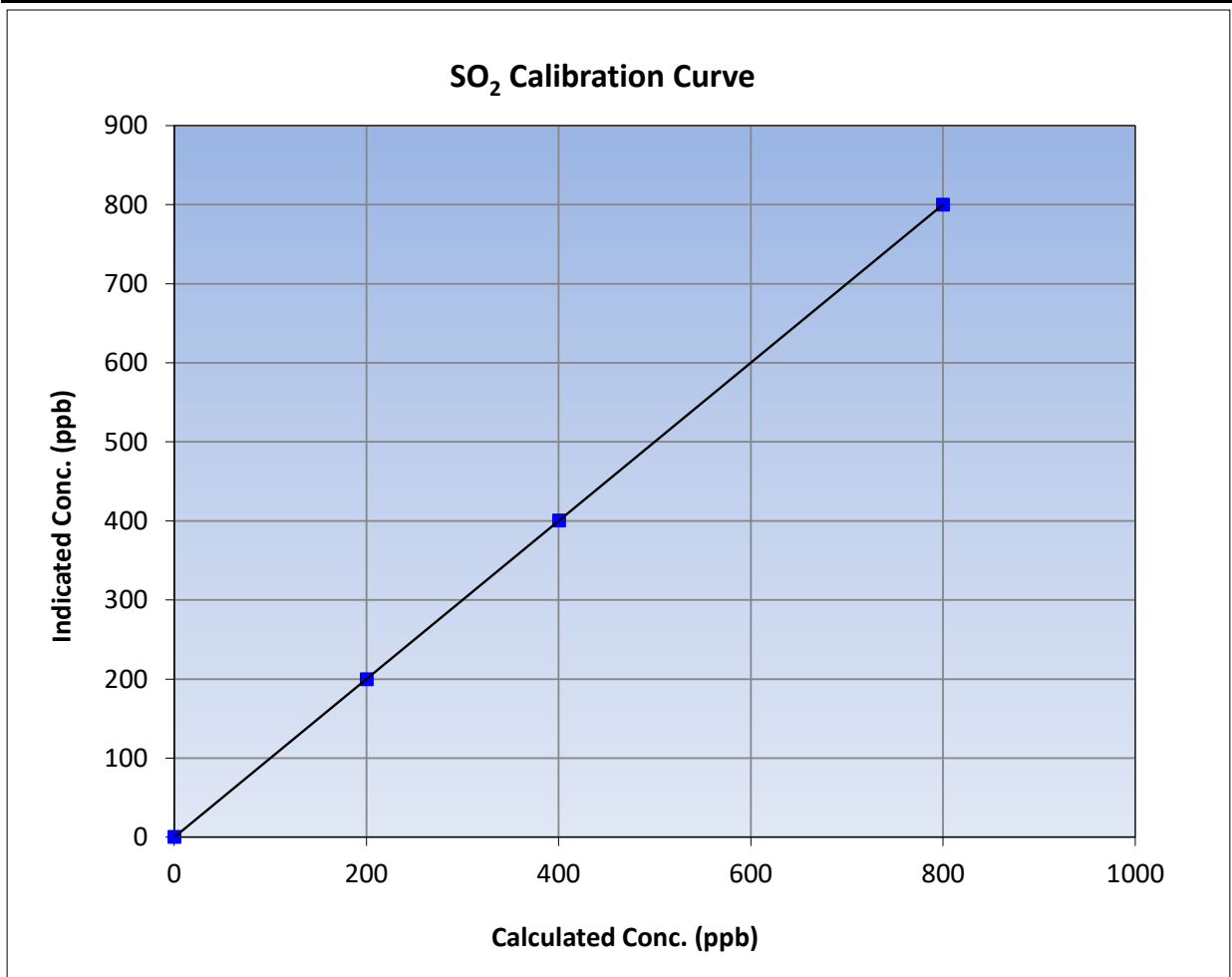
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 7, 2023 | Previous Calibration: | February 7, 2023 |
| Station Name:     | Firebag       | Station Number:       | AMS 19           |
| Start Time (MST): | 11:15         | End Time (MST):       | 14:43            |
| Analyzer make:    | Thermo 43i    | Analyzer serial #:    | 1410661308       |

### Calibration Data

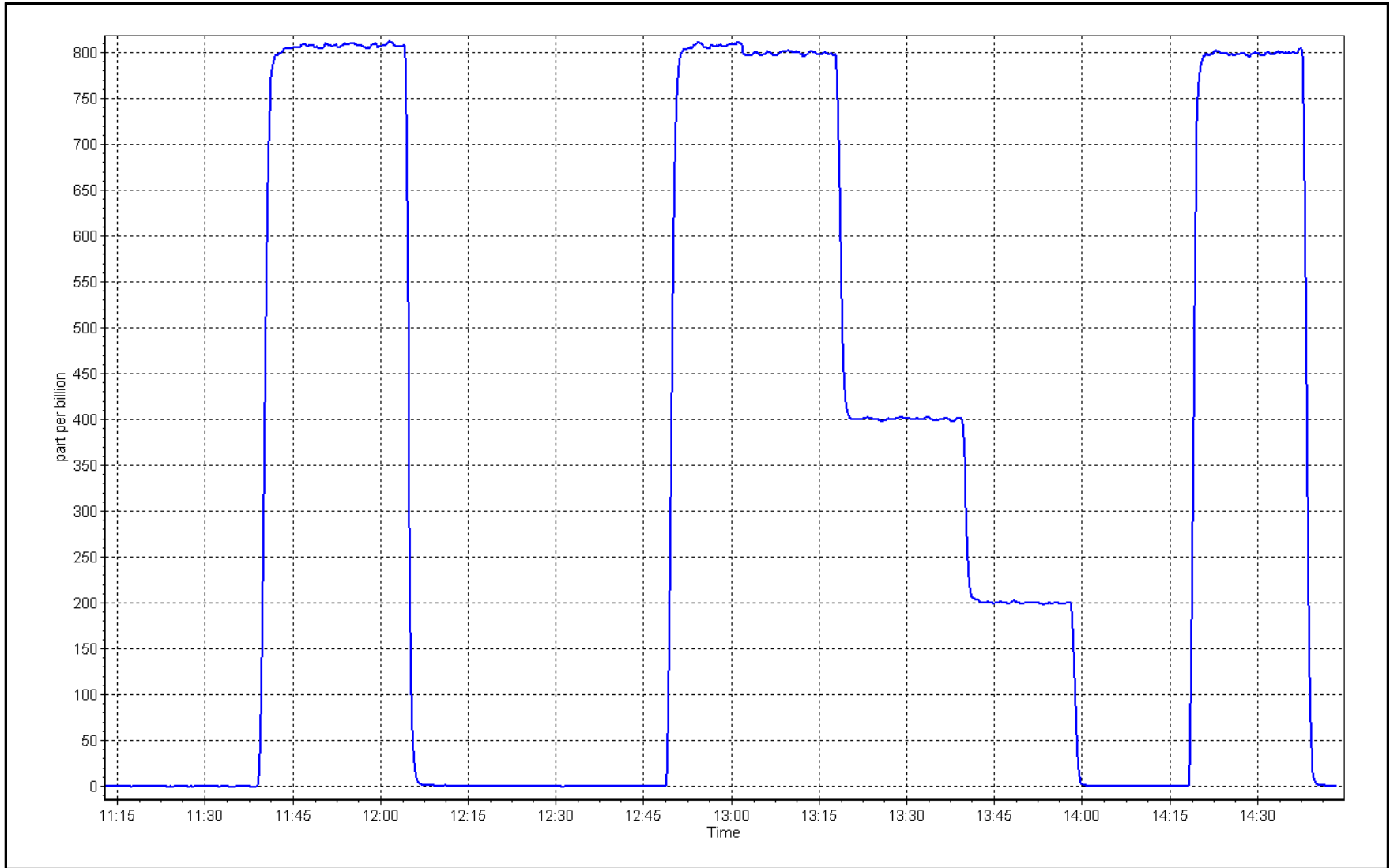
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.1                                   | ----                         | Correlation Coefficient | 0.999999      |             |
| 799.5                                  | 799.7                                 | 0.9997                       |                         |               | ≥0.995      |
| 400.3                                  | 400.3                                 | 0.9999                       | Slope                   | 1.000420      |             |
| 200.1                                  | 199.6                                 | 1.0025                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | -0.181972     | +/-30       |



SO2 Calibration Plot

Date: March 7, 2023

Location: Firebag





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Firebag Station number: AMS19  
 Calibration Date: March 2, 2023 Last Cal Date: February 6, 2023  
 Start time (MST): 11:30 End time (MST): 16:07  
 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 #: 1336160090  
 Converter make: Global Converter serial #: 2022-222  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.997909     | 1.003769      | Backgd or Offset: 2.96 | 3.18          |
| Calibration intercept: | 0.118481     | 0.038321      | Coeff or Slope: 0.979  | 0.990         |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4922                          | 78.2                        | 80.0                                | 79.3                               | 1.010  |
| as found 2nd point    | 4961                          | 39.1                        | 40.0                                | 39.8                               | 1.007  |
| as found 3rd point    | 4980                          | 19.6                        | 20.0                                | 20.0                               | 1.007  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                              | 4922                          | 78.2                        | 80.0                                | 80.3                               | 0.996   |
| second point                            | 4961                          | 39.1                        | 40.0                                | 40.2                               | 0.995   |
| third point                             | 4980                          | 19.6                        | 20.0                                | 20.2                               | 0.992   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span                            | 4922                          | 78.2                        | 80.0                                | 80.1                               | 0.998   |
| SO2 Scrubber Check                      | 4922                          | 78.3                        | 800.2                               | 0.0                                | ----  |
| Date of last scrubber change:           | December 9, 2021              |                             |                                     | Ave Corr Factor                    | 0.994   |
| Date of last converter efficiency test: | n/a                           |                             |                                     | efficiency                         |   |

Baseline Corr As found: 79.2 Prev response: 79.93 \*% change: -0.9%  
 Baseline Corr 2nd AF pt: 39.7 AF Slope: 0.990191 AF Intercept: 0.138629  
 Baseline Corr 3rd AF pt: 19.9 AF Correlation: 0.999998

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

Notes: SOx scrubber check done after calibrator zero. Adjusted zero and span. Changed sample inlet filter after MPAF's.

Calibration Performed By: Braiden Boutillier



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

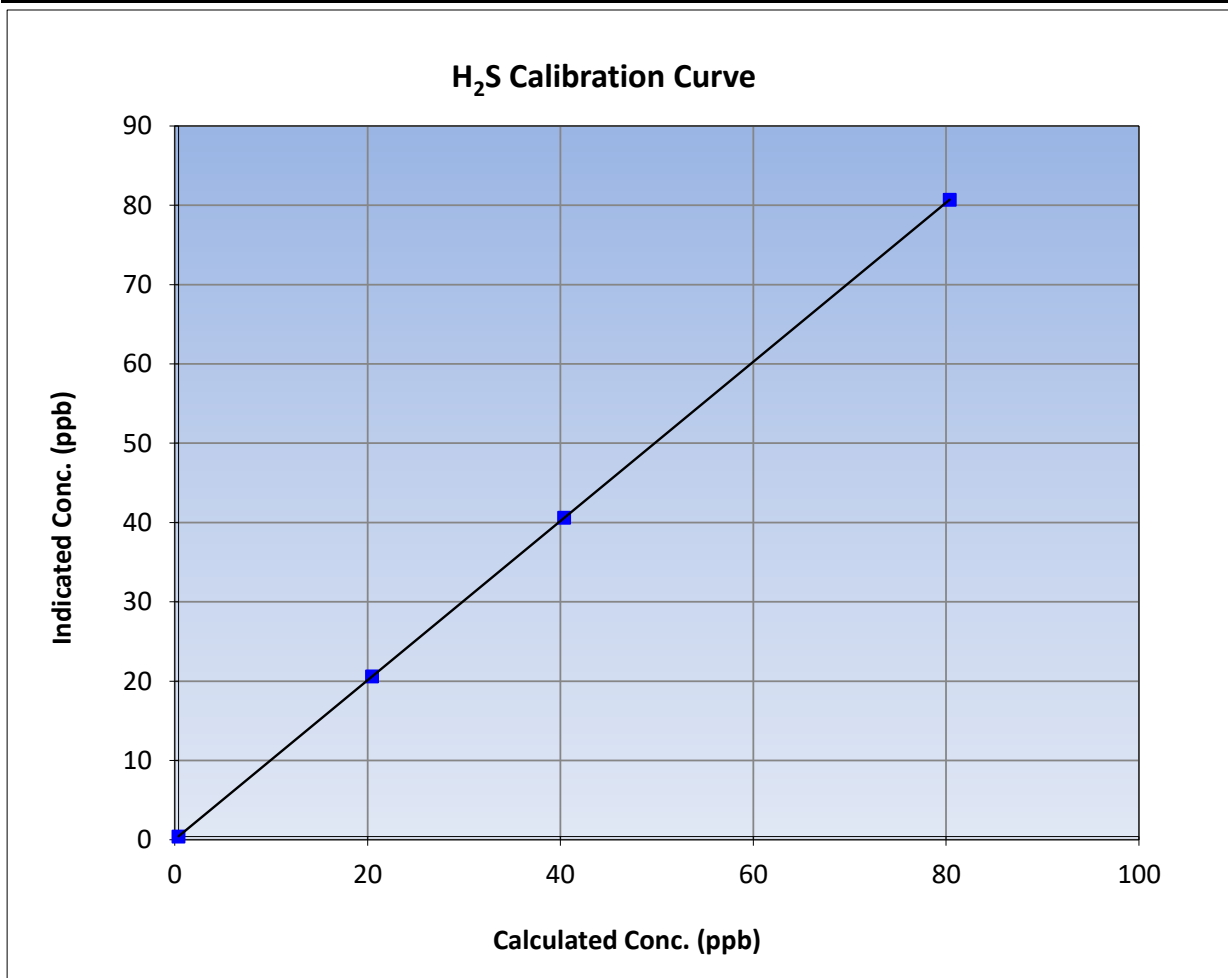
Version-11-2021

### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 2, 2023  | Previous Calibration: | February 6, 2023 |
| Station Name:     | Firebag        | Station Number:       | AMS19            |
| Start Time (MST): | 11:30          | End Time (MST):       | 16:07            |
| Analyzer make:    | Thermo 43i-TLE | Analyzer serial #:    | 1336160090       |

### Calibration Data

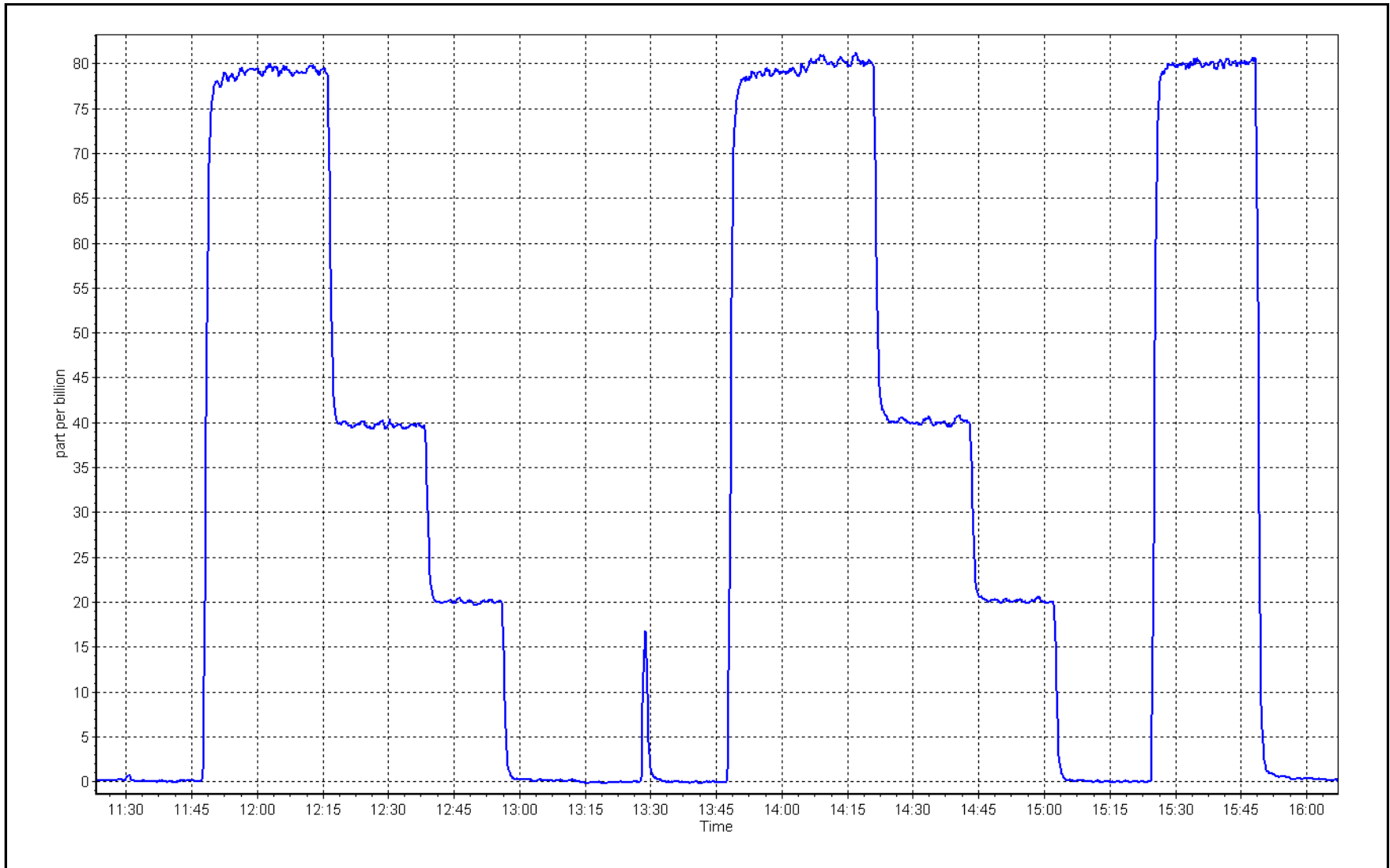
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999999 |             |
| 80.0                                | 80.3                               | 0.9960                    |                         |          | ≥0.995      |
| 40.0                                | 40.2                               | 0.9948                    | Slope                   | 1.003769 |             |
| 20.0                                | 20.2                               | 0.9925                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.038321 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: March 2, 2023

Location: Firebag







# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

|                   |               |                 |                  |
|-------------------|---------------|-----------------|------------------|
| Station Name:     | Firebag       | Station number: | AMS 19           |
| Calibration Date: | March 7, 2023 | Last Cal Date:  | February 7, 2023 |
| Start time (MST): | 11:15         | End time (MST): | 14:43            |
| 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

|                        |              |               |              |              |               |
|------------------------|--------------|---------------|--------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |              | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.986792     | 0.998521      | Background:  | 2.11         | 2.24          |
| Calibration intercept: | 0.033117     | -0.017736     | Coefficient: | 3.748        | 3.732         |

### 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.00                                | 0.12                               | ----  |
| as found span             | 4919                          | 81.1                        | 17.31                               | 17.56                              | 0.985   |
| 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                               | 17.29                              | 1.001   |
| second point              | 4959                          | 40.6                        | 8.66                                | 8.59                               | 1.009   |
| third point               | 4980                          | 20.3                        | 4.33                                | 4.28                               | 1.012   |
| as left zero              | 5000                          | 0.0                         | 0.00                                | 0.05                               | ----  |
| as left span              | 4919                          | 81.1                        | 17.31                               | 17.35                              | 0.997   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.007   |
| Baseline Corr As found:   | 17.44                         | Previous response           | 17.11                               | *% change                          | 1.9%  |
| Baseline Corr 2nd AF pt:  | NA                            | AF Slope:                   |                                     | AF Intercept:                      |   |
| Baseline Corr 3rd AF pt:  | NA                            | AF Correlation:             |                                     |                                    |   |

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

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

Calibration Performed By:              Braiden Boutillier



# Wood Buffalo Environmental Association

## THC Calibration Summary

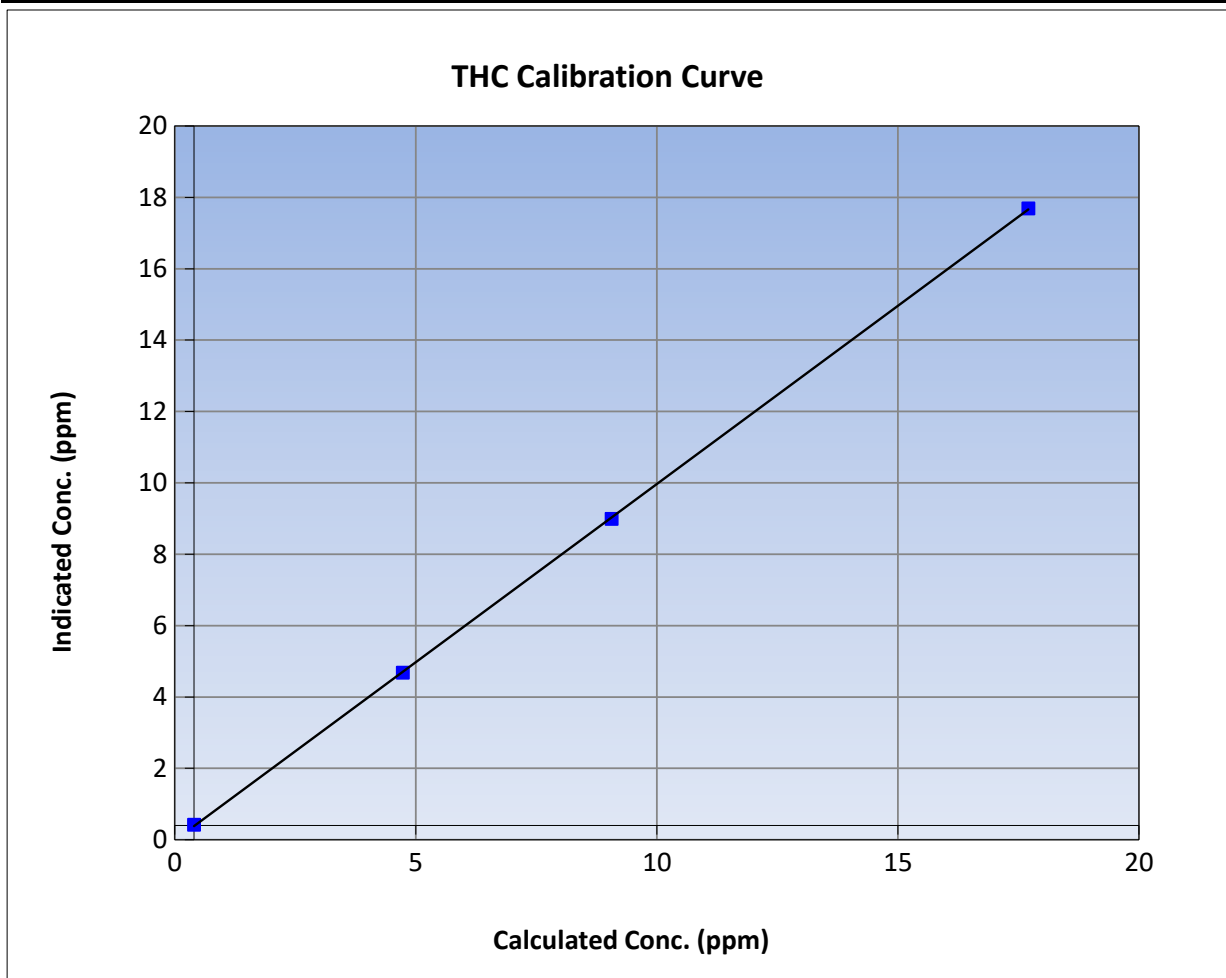
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 7, 2023 | Previous Calibration: | February 7, 2023 |
| Station Name:     | Firebag       | Station Number:       | AMS 19           |
| Start Time (MST): | 11:15         | End Time (MST):       | 14:43            |
| Analyzer make:    | Thermo 51i-LT | Analyzer serial #:    | 1336160089       |

### Calibration Data

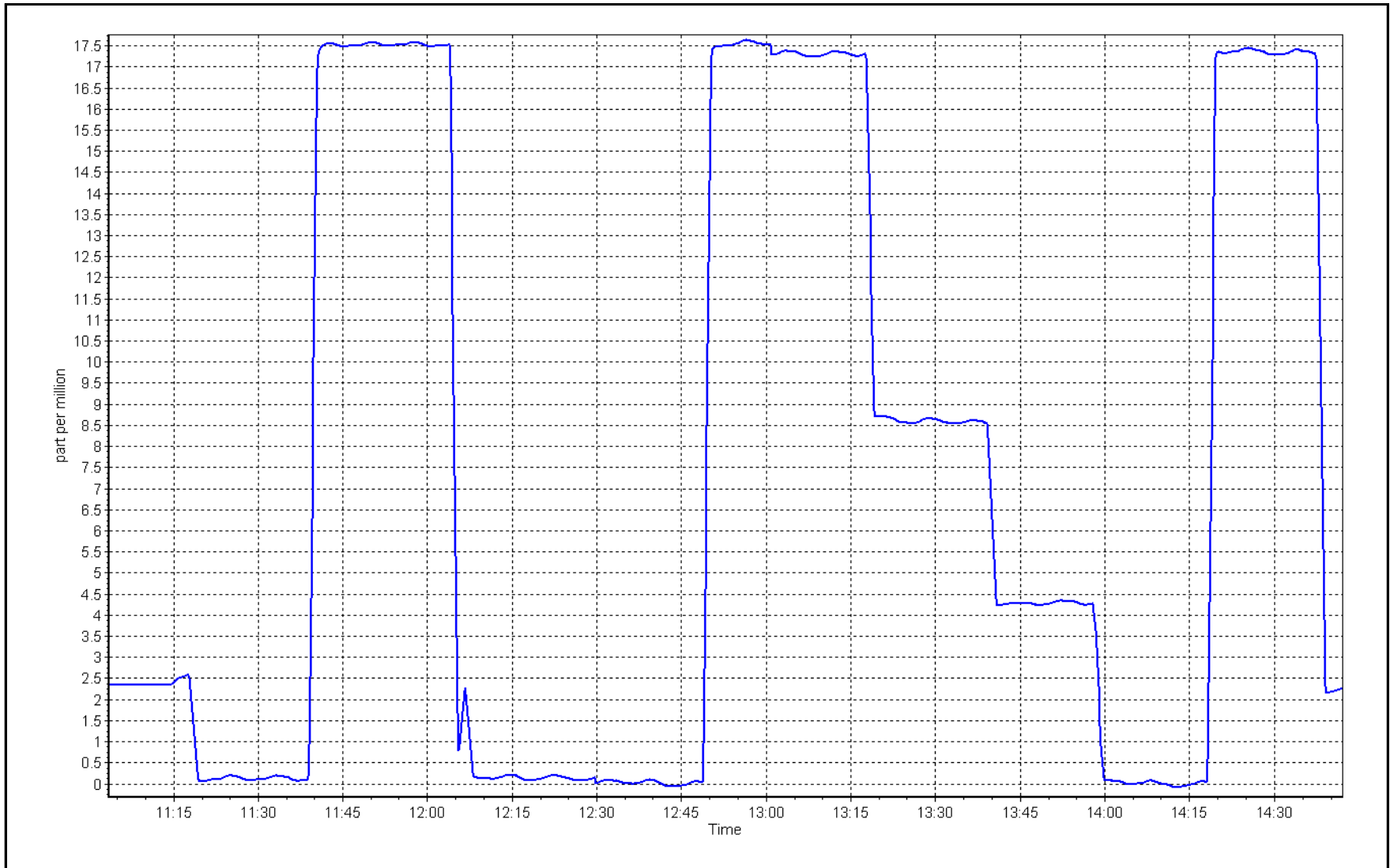
| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (lc) | Correction factor (Cc/lc) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.00                                | 0.02                               | ----                      | Correlation Coefficient | 0.999969      |             |
| 17.31                               | 17.29                              | 1.0009                    |                         |               | ≥0.995      |
| 8.66                                | 8.59                               | 1.0086                    | Slope                   | 0.998521      |             |
| 4.33                                | 4.28                               | 1.0115                    |                         |               | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.017736     | +/-1.5      |



THC Calibration Plot

Date: March 7, 2023

Location: Firebag





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Firebag  
Calibration Date: March 3, 2023  
Start time (MST): 11:14  
Reason: Routine  
Station number: AMS 19  
Last Cal Date: February 8, 2023  
End time (MST): 16:11

### Calibration Standards

NO Gas Cylinder #: T2Y1K63  
NOX Cal Gas Conc: 51.12 ppm  
Removed Cylinder #: n/a  
Removed Gas NOX Conc: 51.12 ppm  
NOX gas Diff:  
Calibrator Model: Teledyne API T700  
ZAG make/model: Teledyne API T701  
Cal Gas Expiry Date: November 30, 2023  
NO Cal Gas Conc: 49.40 ppm  
Removed Gas Exp Date: n/a  
Removed Gas NO Conc: 49.40 ppm  
NO gas Diff:  
Serial Number: 1607  
Serial Number: 1118

### Analyzer Information

Analyzer make: Thermo 42i  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 1410661309

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.041        | 1.041         | NO bkgnd or offset:  | 7.3          | 7.2           |
| NOX coeff or slope: | 0.996        | 0.996         | NOX bkgnd or offset: | 7.3          | 7.3           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 210.9        | 206.6         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.997423     | 0.994815      |
| NO <sub>x</sub> Cal Offset: | 0.135510     | 0.755137      |
| NO Cal Slope:               | 0.998470     | 0.993858      |
| NO Cal Offset:              | -0.351682    | 0.287575      |
| NO <sub>2</sub> Cal Slope:  | 0.999864     | 1.003159      |
| NO <sub>2</sub> Cal Offset: | -0.568980    | 0.561215      |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 4999                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.2   | -0.2                                  | -0.1   | ----  | ----   |
| as found span             | 4919                      | 81.0                        | 828.1   | 800.3                                  | 27.9  | 825.0  | 794.6                                 | 30.1   | 1.0038  | 1.0071   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 4999                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.1  | ----  | ----   |
| high point                | 4919                      | 81.0                        | 828.1   | 800.3                                  | 27.9  | 824.0  | 795.3                                 | 29.1   | 1.0050  | 1.0063   |
| second point              | 4960                      | 40.5                        | 414.0   | 400.1                                  | 13.9  | 413.7  | 398.6                                 | 15.1   | 1.0008  | 1.0038   |
| third point               | 4980                      | 20.2                        | 206.5   | 199.6                                  | 6.9   | 206.5  | 198.7                                 | 7.8  | 1.0001  | 1.0044   |
| as left zero              | 4999                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.1  | ----  | ----   |
| as left span              | 4919                      | 81.0                        | 828.1   | 364.8                                  | 463.4   | 827.0  | 358.3                                 | 468.3  | 1.0014  | 1.0181   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0020  | 1.0048   |

|                      |                             |                |  |                                  |                     |                         |
|----------------------|-----------------------------|----------------|--|----------------------------------|---------------------|-------------------------|
| Corrected As found   | NO <sub>x</sub> = 825.2 ppb | NO = 794.8 ppb | <i>* = &gt; +/-5% change initiates investigation</i> |                                  | *Percent Change     | NO <sub>x</sub> = -0.1% |
| Previous Response    | NO <sub>x</sub> = 826.1 ppb | NO = 798.7 ppb |  |                                  | *Percent Change     | NO = -0.5%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:              | Nx Int:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found   | NO r <sup>2</sup> :              | NO SI:              | NO Int:                 |
|                      |                             |                | As found   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI: | NO <sub>2</sub> Int:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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)       | 793.1                                      | 357.6                                 | 463.4   | 465.2  | 0.9961   | 100.4%   |
| 2nd GPT point (200 ppb O3)       | 793.1                                      | 575.8                                 | 245.2   | 246.5  | 0.9946   | 100.5%   |
| 3rd GPT point (100 ppb O3)       | 793.1                                      | 686.4                                 | 134.6   | 136.2  | 0.9880   | 101.2%   |
| Average Correction Factor        |  |                                       |   |  | 0.9929   | 100.7%   |

Notes:

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

Calibration Performed By:

Braiden Boutilier



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

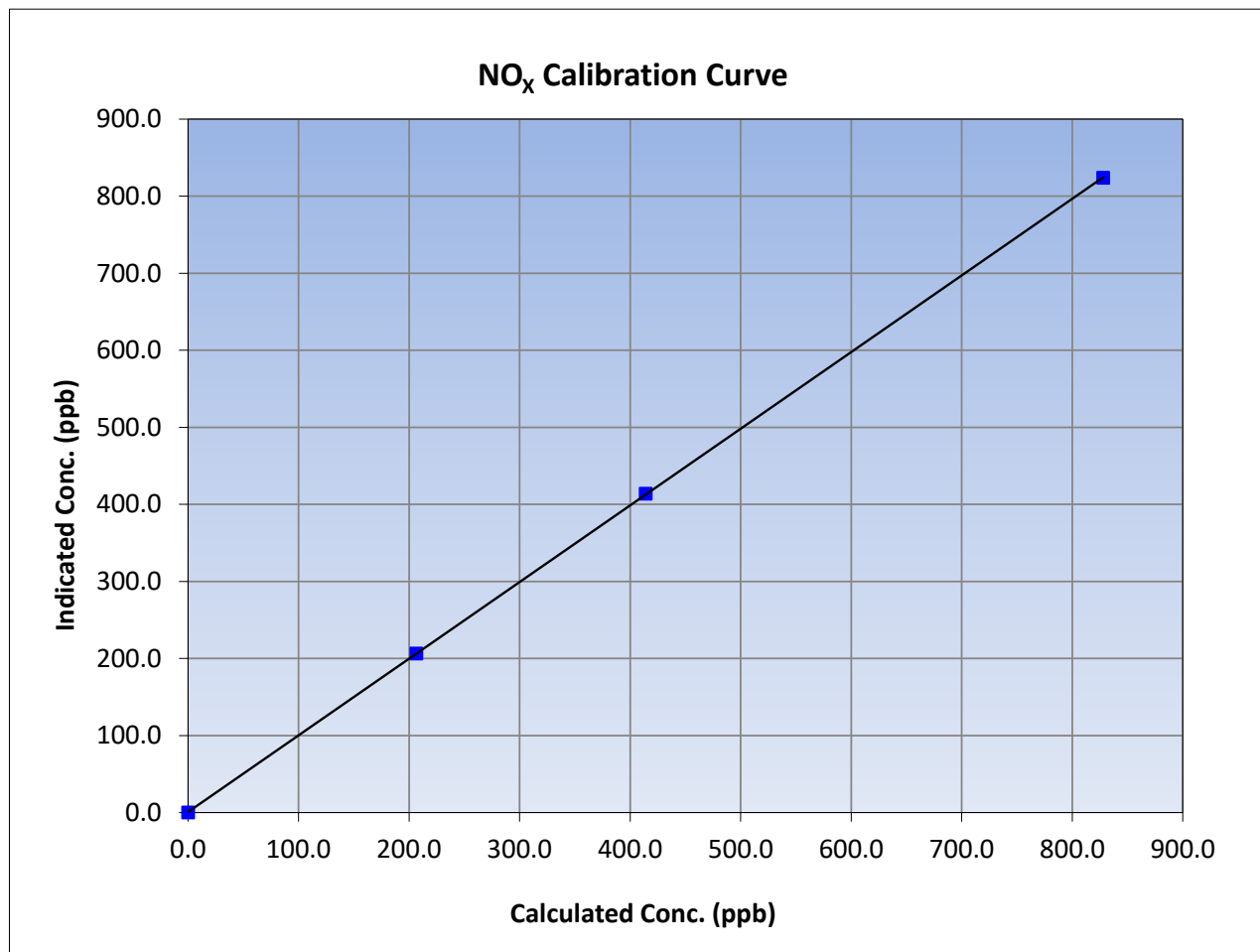
Version-04-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 3, 2023 | Previous Calibration: | February 8, 2023 |
| Station Name:     | Firebag       | Station Number:       | AMS 19           |
| Start Time (MST): | 11:14         | End Time (MST):       | 16:11            |
| Analyzer make:    | Thermo 42i    | Analyzer serial #:    | 1410661309       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 828.1                               | 824.0                              | 1.0050                    |                         |               |             |
| 414.0                               | 413.7                              | 1.0008                    |                         |               |             |
| 206.5                               | 206.5                              | 1.0001                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.994815      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.755137      | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

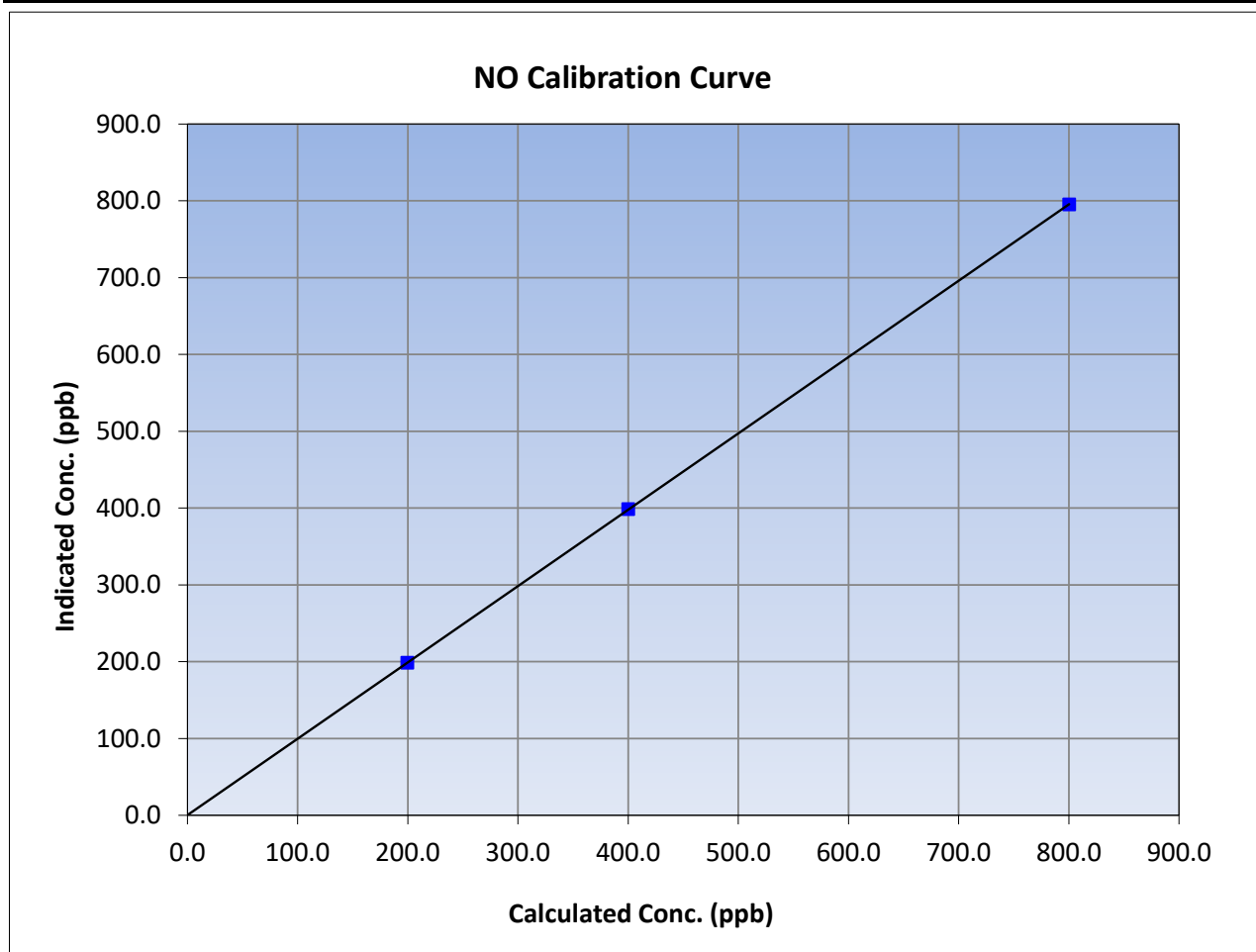
Version-04-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 3, 2023 | Previous Calibration: | February 8, 2023 |
| Station Name:     | Firebag       | Station Number:       | AMS 19           |
| Start Time (MST): | 11:14         | End Time (MST):       | 16:11            |
| Analyzer make:    | Thermo 42i    | Analyzer serial #:    | 1410661309       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.3                               | 795.3                              | 1.0063                    |   |                                |
| 400.1                               | 398.6                              | 1.0038                    |   |                                |
| 199.6                               | 198.7                              | 1.0044                    |   |                                |
|                                     |                                    |                           |   |                                |





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

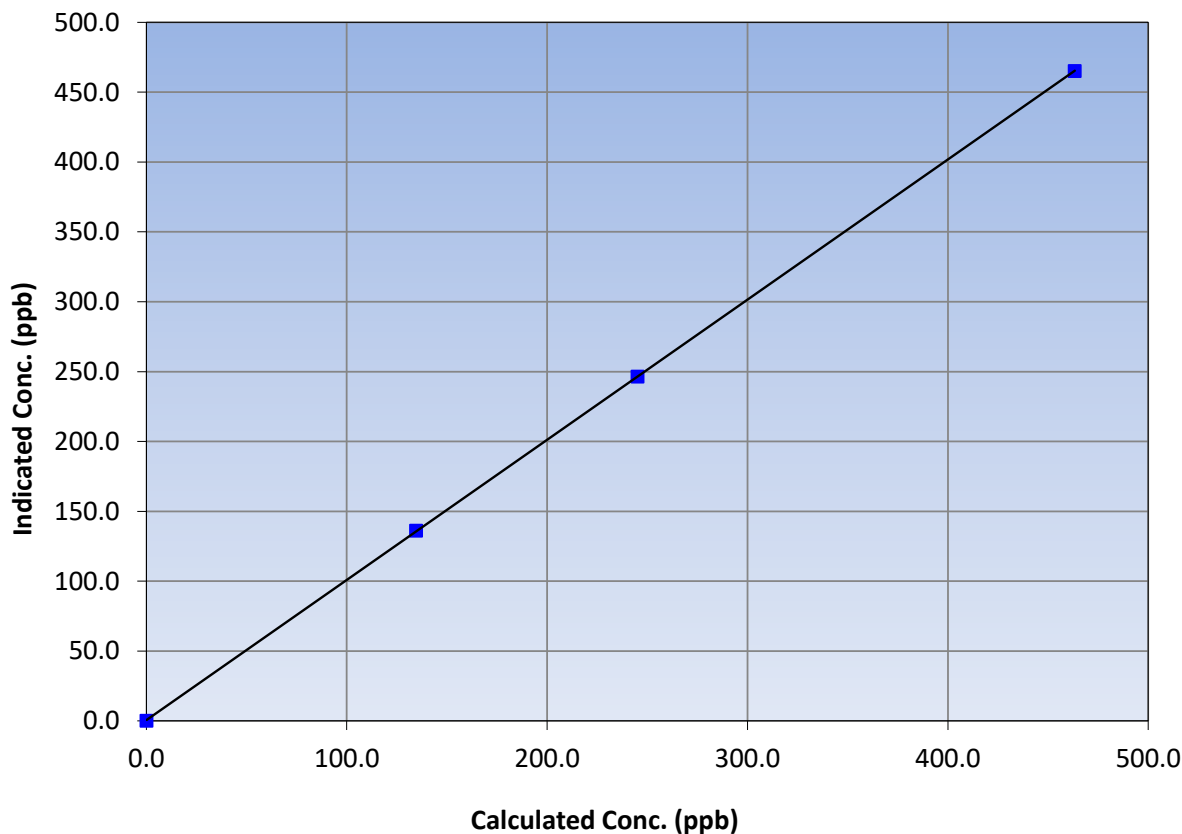
### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 3, 2023 | Previous Calibration: | February 8, 2023 |
| Station Name:     | Firebag       | Station Number:       | AMS 19           |
| Start Time (MST): | 11:14         | End Time (MST):       | 16:11            |
| Analyzer make:    | Thermo 42i    | Analyzer serial #:    | 1410661309       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 463.4                               | 465.2                              | 0.9961                    |   |                                |
| 245.2                               | 246.5                              | 0.9946                    |   |                                |
| 134.6                               | 136.2                              | 0.9880                    |   |                                |
|                                     |                                    |                           |   |                                |

**NO<sub>2</sub> Calibration Curve**

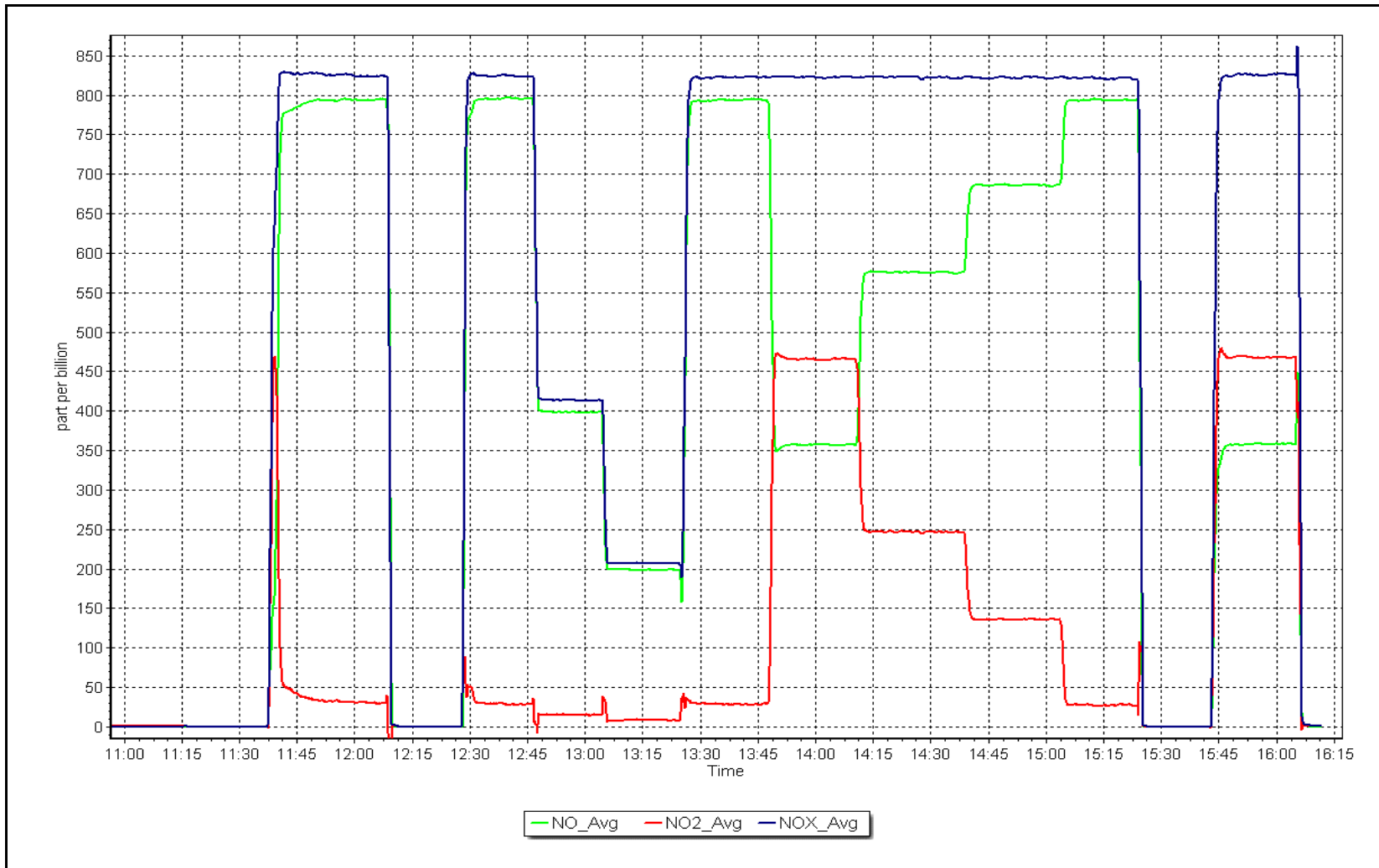




NO<sub>x</sub> Calibration Plot

Date: March 3, 2023

Location: Firebag





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS20 MACKAY RIVER MARCH 2023**

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

April 29, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

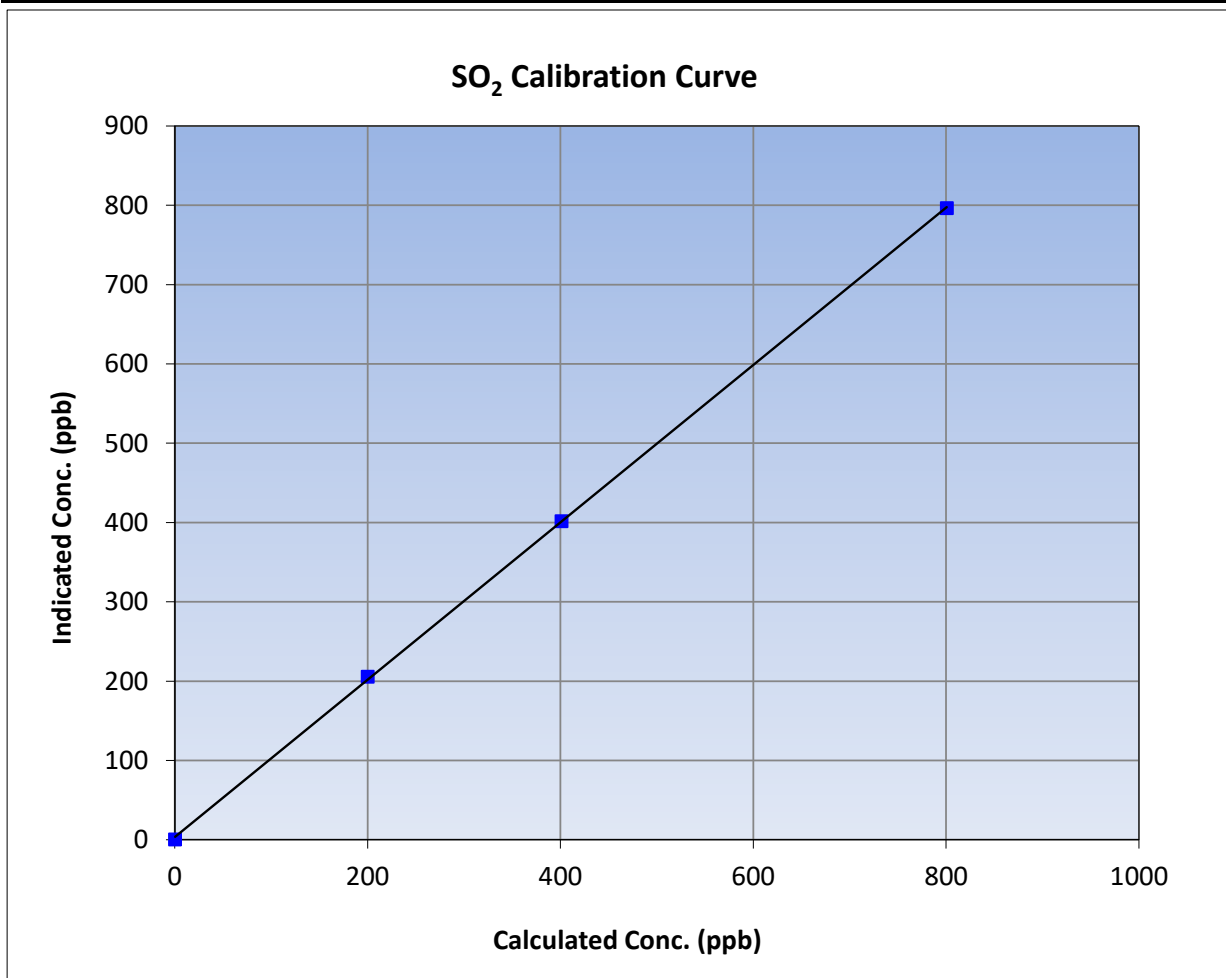
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 1, 2023 | Previous Calibration: | February 1, 2023 |
| Station Name:     | MacKay River  | Station Number:       | AMS20            |
| Start Time (MST): | 10:51         | End Time (MST):       | 14:17            |
| Analyzer make:    | Thermo 43i    | Analyzer serial #:    | 1501301450       |

### Calibration Data

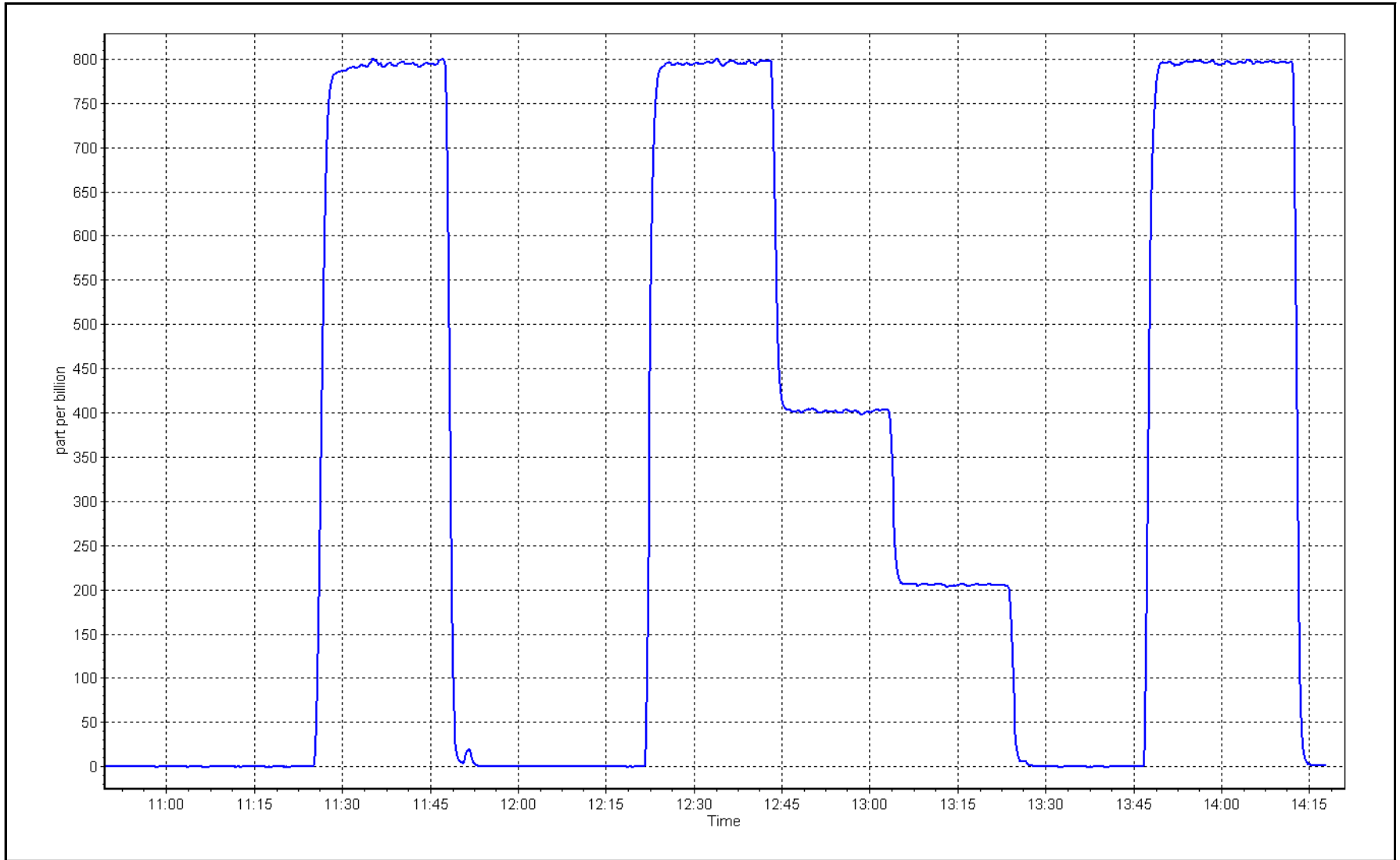
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.1                                   | ----                         | Correlation Coefficient | 0.999921      |             |
| 800.3                                  | 796.0                                 | 1.0054                       |                         |               | ≥0.995      |
| 400.7                                  | 401.5                                 | 0.9979                       | Slope                   | 0.992140      |             |
| 199.8                                  | 205.4                                 | 0.9728                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | 3.311046      | +/-30       |



SO2 Calibration Plot

Date: March 1, 2023

Location: MacKay River





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: MacKay River Station number: AMS20  
 Calibration Date: March 2, 2023 Last Cal Date: February 13, 2023  
 Start time (MST): 10:17 End time (MST): 15:13  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 4.87 ppm Cal Gas Exp Date: May 5, 2023  
 Cal Gas Cylinder #: EY0001922  
 Removed Cal Gas Conc: 4.87 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: Teledyne API T101 Analyzer serial #: 196  
 Converter make: Internal Converter serial #: NA  
 Analyzer Range 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.990859     | 1.005578      | Backgd or Offset: 46.3 | 47.9          |
| Calibration intercept: | 0.878999     | 0.338970      | Coeff or Slope: 0.981  | 0.991         |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.5                                | ----   |
| as found span         | 4918                          | 82.1                        | 80.0                                | 81.0                               | 0.993  |
| as found 2nd point    | 4959                          | 41.1                        | 40.0                                | 41.3                               | 0.981  |
| as found 3rd point    | 4979                          | 20.5                        | 20.0                                | 21.3                               | 0.960  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | -0.1                               | ----  |
| high point                              | 4918                          | 82.1                        | 80.0                                | 80.5                               | 0.993   |
| second point                            | 4959                          | 41.1                        | 40.0                                | 40.9                               | 0.979   |
| third point                             | 4979                          | 20.5                        | 20.0                                | 20.8                               | 0.960   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| as left span                            | 4918                          | 82.1                        | 80.0                                | 79.9                               | 1.001   |
| SO2 Scrubber Check                      | 4919                          | 80.0                        | 800.2                               | 0.1                                | ----  |
| Date of last scrubber change:           | December 15, 2020             |                             |                                     | Ave Corr Factor                    | 0.977   |
| Date of last converter efficiency test: |                               |                             |                                     |                                    | efficiency  |

Baseline Corr As found: 80.5 Prev response: 80.11 \*% change: 0.5%  
 Baseline Corr 2nd AF pt: 40.8 AF Slope: 1.004434 AF Intercept: 0.879013  
 Baseline Corr 3rd AF pt: 20.8 AF Correlation: 0.999898

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

Notes: Changed inlet filter after multi point as founds. Performed scrubber test after calibrator zero. Adjusted zero only.

Calibration Performed By: Mohammed Kashif



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

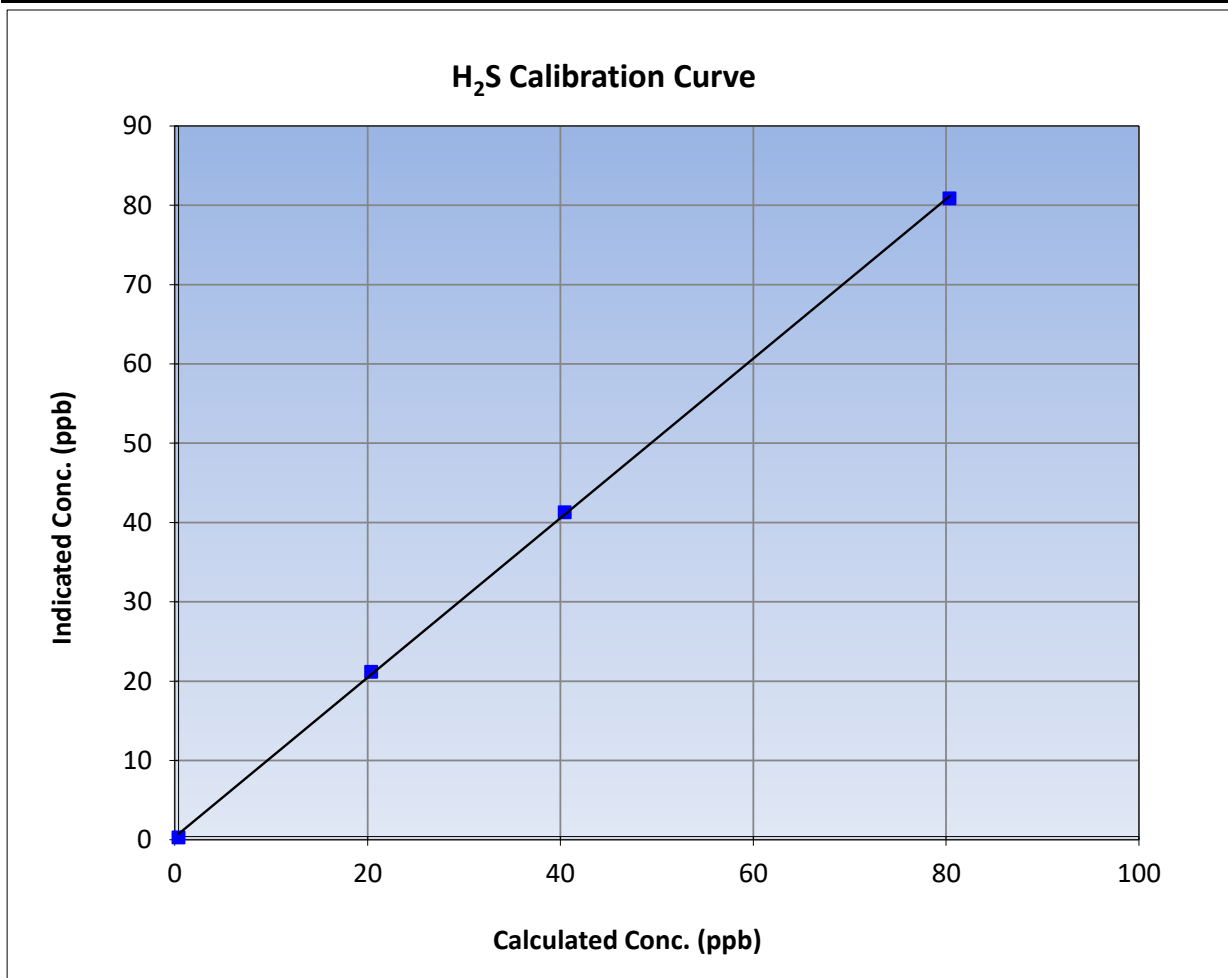
Version-11-2021

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 2, 2023     | Previous Calibration: | February 13, 2023 |
| Station Name:     | MacKay River      | Station Number:       | AMS20             |
| Start Time (MST): | 10:17             | End Time (MST):       | 15:13             |
| Analyzer make:    | Teledyne API T101 | Analyzer serial #:    | 196               |

### Calibration Data

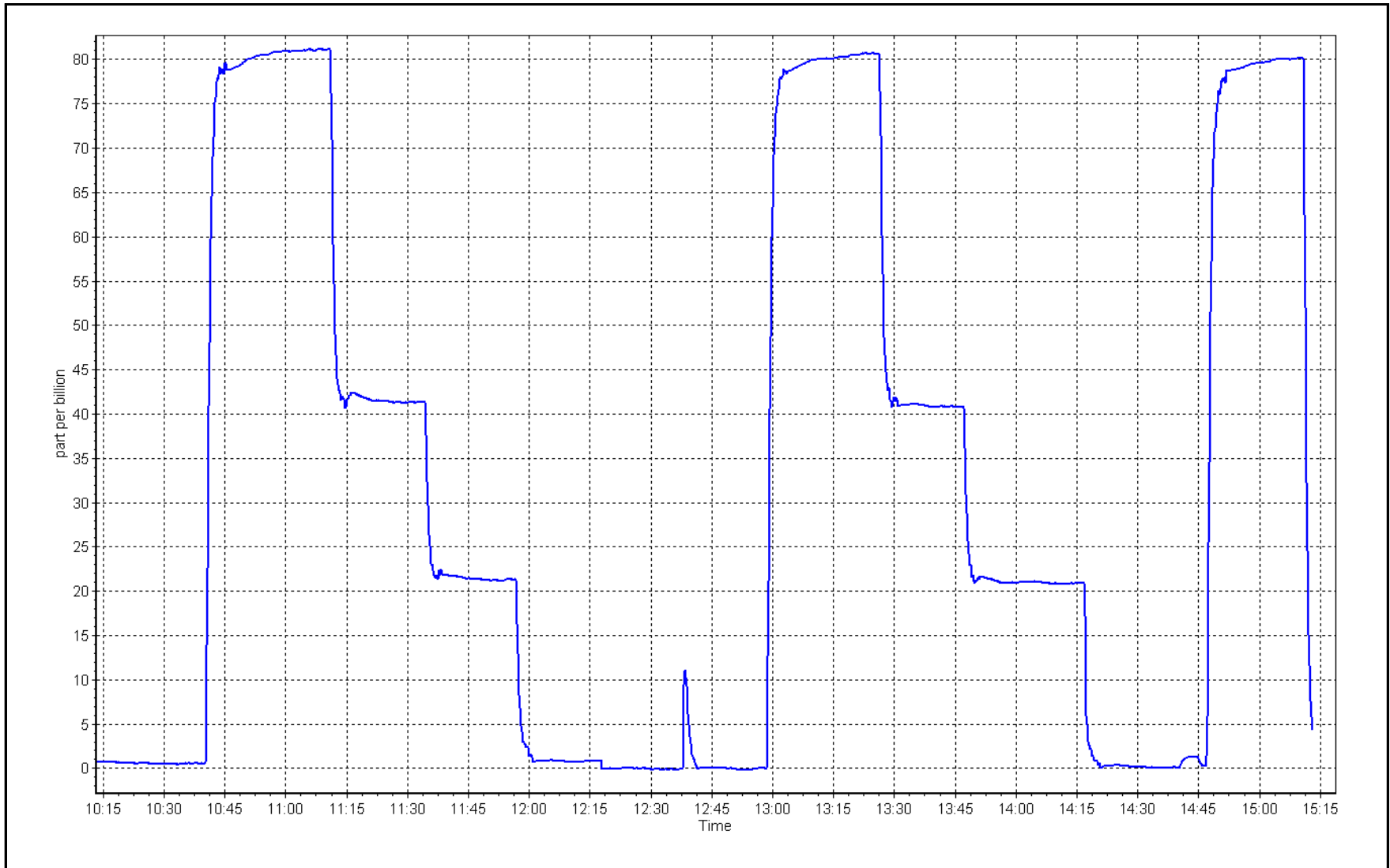
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999860 | ≥0.995      |
| 80.0                                | 80.5                               | 0.9933                    |                         |          |             |
| 40.0                                | 40.9                               | 0.9787                    | Slope                   | 1.005578 | 0.90 - 1.10 |
| 20.0                                | 20.8                               | 0.9600                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.338970 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: March 2, 2023

Location: MacKay River







# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: MacKay River      Station number: AMS20  
 Calibration Date: March 8, 2023      Last Cal Date: March 2, 2023  
 Start time (MST): 10:20      End time (MST): 15:58  
 Reason: Maintenance

### Calibration Standards

Cal Gas Concentration: 4.87 ppm      Cal Gas Exp Date: May 5, 2023  
 Cal Gas Cylinder #: EY0001922  
 Removed Cal Gas Conc: 4.87 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: Teledyne API T101      Analyzer serial #: 196  
 Converter make: Internal      Converter serial #: NA  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 1.005578     | 0.999432      | Backgd or Offset: 47.9 | 44.9          |
| Calibration intercept: | 0.338970     | 0.479018      | Coeff or Slope: 0.991  | 1.008         |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | -1.4                               | ----   |
| as found span         | 4918                          | 82.1                        | 80.0                                | 77.8                               | 1.010  |
| as found 2nd point    | 4959                          | 41.1                        | 40.0                                | 38.7                               | 0.998  |
| as found 3rd point    | 4979                          | 20.5                        | 20.0                                | 19.0                               | 0.979  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|-----------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point      | 4918                          | 82.1                        | 80.0                                | 80.2                               | 0.997   |
| second point    | 4959                          | 41.1                        | 40.0                                | 40.7                               | 0.984   |
| third point     | 4979                          | 20.5                        | 20.0                                | 20.8                               | 0.960   |
| as left zero    | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| as left span    | 4918                          | 82.1                        | 80.0                                | 79.4                               | 1.007   |

### SO<sub>2</sub> Scrubber Check

|   |                   |                 |       |
|---|-------------------|-----------------|-------|
| Date of last scrubber change:           | December 15, 2020 | Ave Corr Factor | 0.980 |
| Date of last converter efficiency test: |                   | efficiency      |       |

Baseline Corr As found: 79.2      Prev response: 80.75      \*% change: -2.0%  
 Baseline Corr 2nd AF pt: 40.1      AF Slope: 0.988429      AF Intercept: -1.060971  
 Baseline Corr 3rd AF pt: 20.4      AF Correlation: 0.999916

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

Notes: Adjusted zero and span.

Calibration Performed By: Mohammed Kashif



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

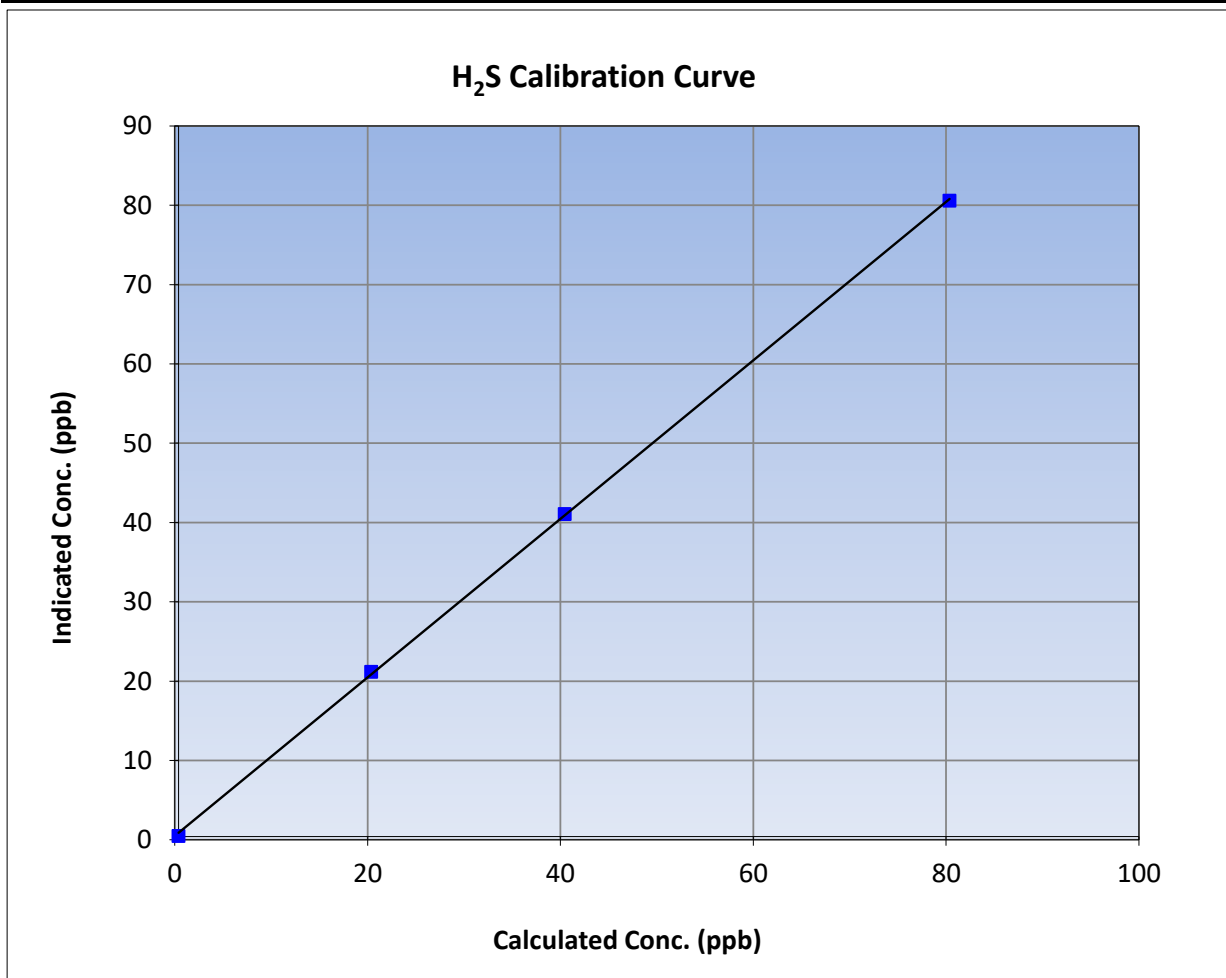
Version-11-2021

### Station Information

|                   |                   |                       |               |
|-------------------|-------------------|-----------------------|---------------|
| Calibration Date: | March 8, 2023     | Previous Calibration: | March 2, 2023 |
| Station Name:     | MacKay River      | Station Number:       | AMS20         |
| Start Time (MST): | 10:20             | End Time (MST):       | 15:58         |
| Analyzer make:    | Teledyne API T101 | Analyzer serial #:    | 196           |

### Calibration Data

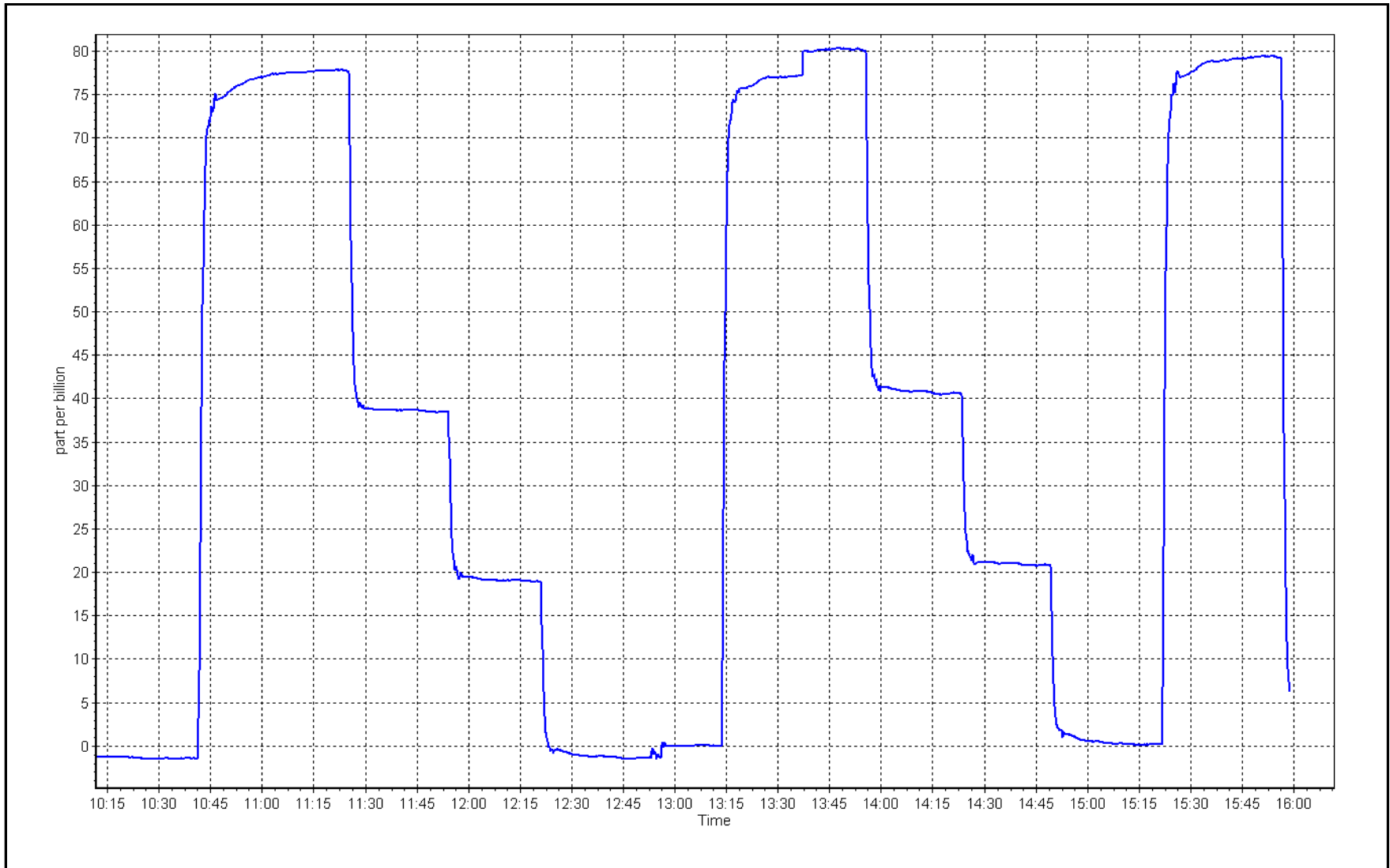
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.1                                   | ----                         | Correlation Coefficient | 0.999897      | ≥0.995      |
| 80.0                                   | 80.2                                  | 0.9971                       |                         |               |             |
| 40.0                                   | 40.7                                  | 0.9836                       | Slope                   | 0.999432      | 0.90 - 1.10 |
| 20.0                                   | 20.8                                  | 0.9600                       |                         |               |             |
|  |                                       |                              | Intercept               | 0.479018      | +/-3        |



# H<sub>2</sub>S Calibration Plot

Date: March 8, 2023

Location: MacKay River







# Wood Buffalo Environmental Association

## THC Calibration Summary

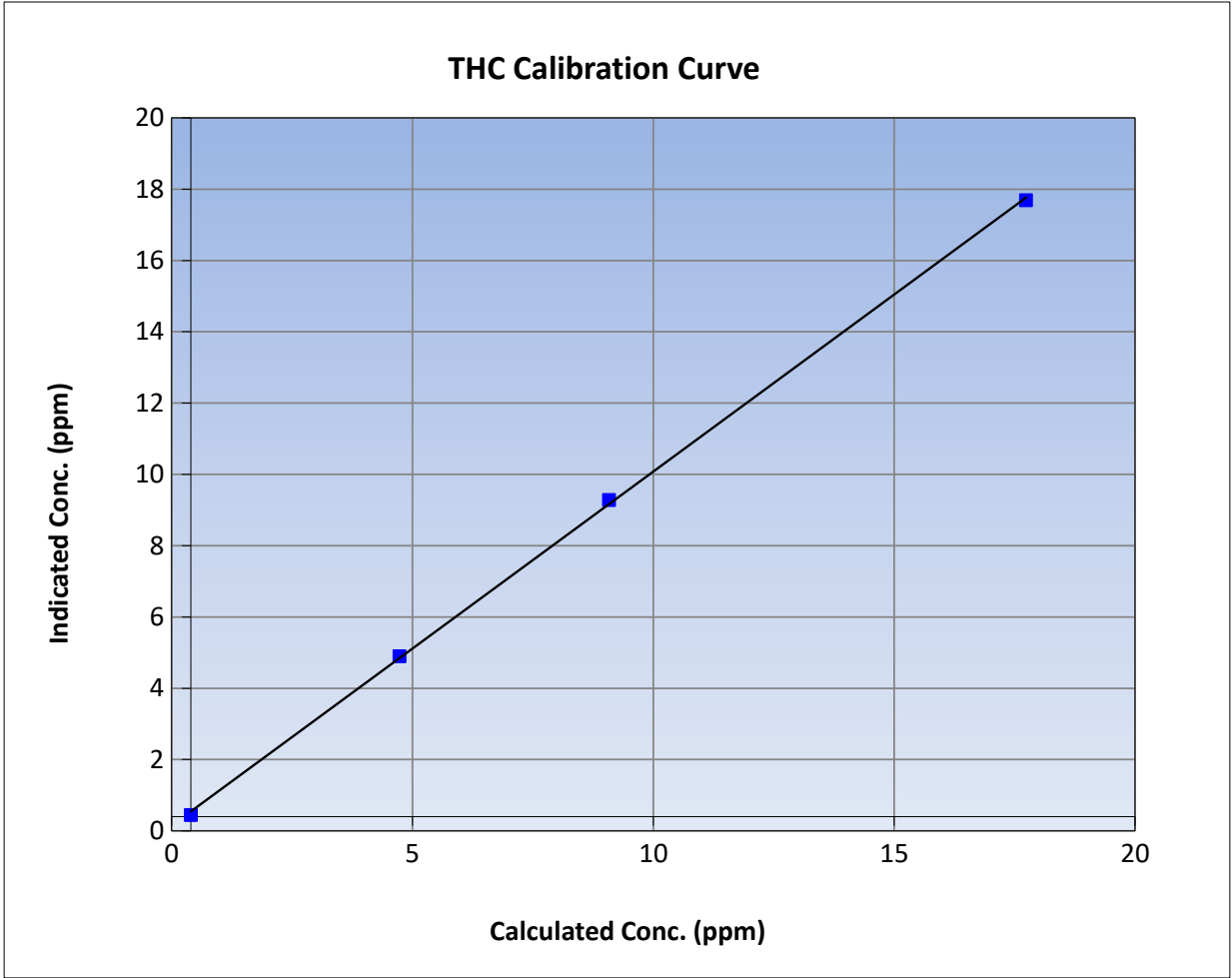
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 1, 2023 | Previous Calibration: | February 1, 2023 |
| Station Name:     | MacKay River  | Station Number:       | AMS20            |
| Start Time (MST): | 10:51         | End Time (MST):       | 14:17            |
| Analyzer make:    | Thermo 51i-LT | Analyzer serial #:    | 1501663727       |

### Calibration Data

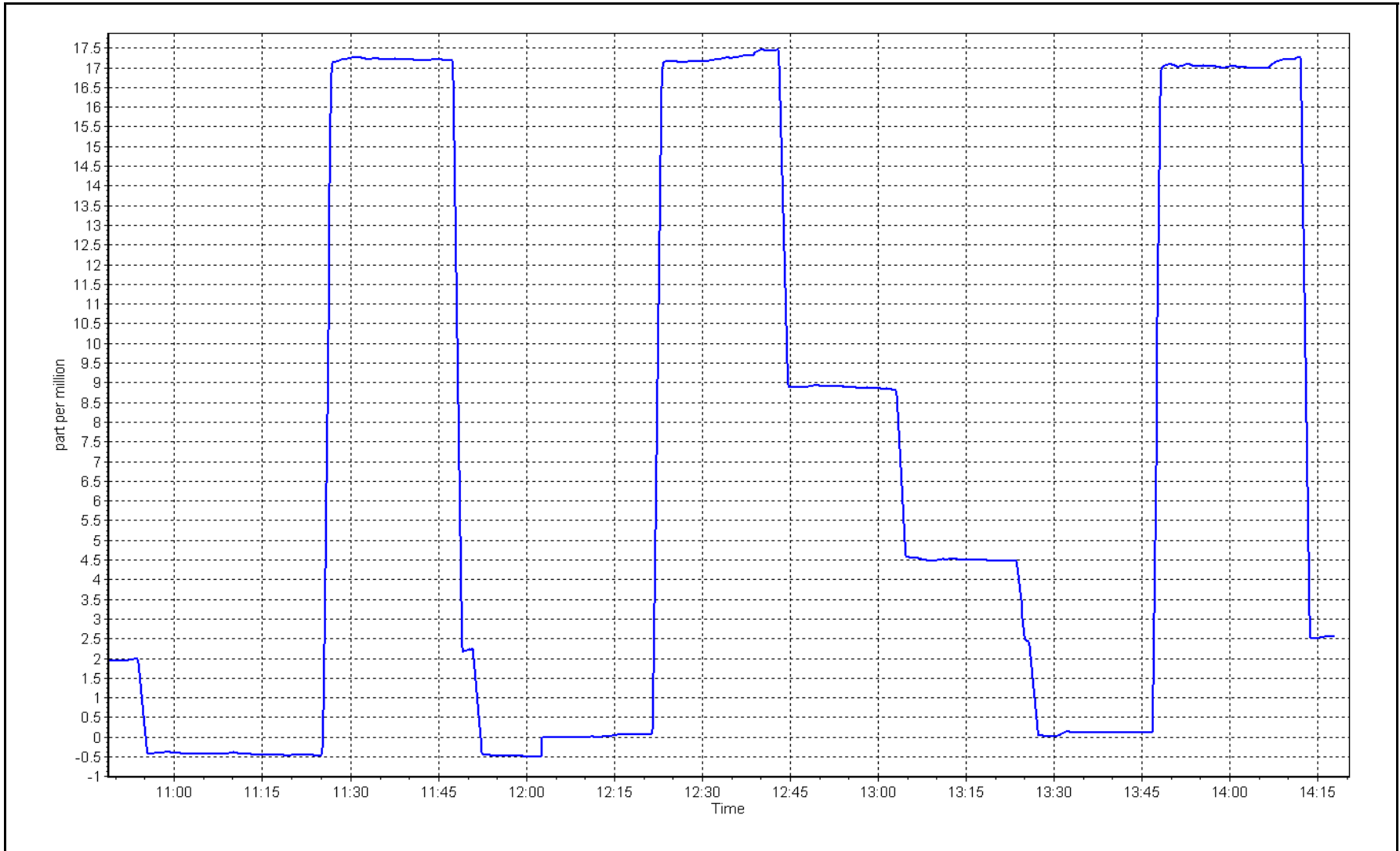
| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (lc) | Correction factor (Cc/lc) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.00                                | 0.05                               | ----                      | Correlation Coefficient | 0.999803 | ≥0.995      |
| 17.34                               | 17.29                              | 1.0027                    |                         |          |             |
| 8.68                                | 8.89                               | 0.9770                    | Slope                   | 0.993043 | 0.90 - 1.10 |
| 4.33                                | 4.50                               | 0.9625                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.145942 | +/-1.5      |



THC Calibration Plot

Date: March 1, 2023

Location: MacKay River







# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.1   | -0.1                                  | 0.0  | ----  | ----   |
| as found span             | 4917                      | 83.3                        | 819.5   | 800.3                                  | 19.2  | 803.5  | 784.2                                 | 19.3   | 1.0199  | 1.0205   |
| 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                | 4917                      | 83.3                        | 819.5   | 800.3                                  | 19.2  | 822.2  | 805.0                                 | 17.3   | 0.9967  | 0.9942   |
| second point              | 4956                      | 41.7                        | 410.4   | 400.8                                  | 9.6   | 415.0  | 405.3                                 | 9.7  | 0.9890  | 0.9890   |
| third point               | 4979                      | 20.8                        | 204.6   | 199.9                                  | 4.8   | 212.4  | 205.6                                 | 6.8  | 0.9635  | 0.9721   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.1  | 0.0                                   | 0.1  | ----  | ----   |
| as left span              | 4917                      | 83.3                        | 819.5   | 462.2                                  | 357.3   | 813.3  | 455.6                                 | 357.7  | 1.0076  | 1.0145   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9830  | 0.9851   |

|                      |                             |                |  |                                  |                         |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 803.6 ppb | NO = 784.3 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -1.7% |                      |
| Previous Response    | NO <sub>x</sub> = 817.3 ppb | NO = 799.7 ppb |  | *Percent Change                  | NO = -2.0%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 795.4                                      | 457.3                                 | 357.3   | 356.9  | 1.0010   | 99.9%  |
| 2nd GPT point (200 ppb O3)       | 795.4                                      | 618.1                                 | 196.5   | 194.1  | 1.0121   | 98.8%  |
| 3rd GPT point (100 ppb O3)       | 795.4                                      | 703.8                                 | 110.8   | 107.7  | 1.0284   | 97.2%  |
| Average Correction Factor        |  |                                       |   |  | 1.0138   | 98.6%  |

Notes:

Adjusted span only.

Calibration Performed By:

Mohammed Kashif





# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

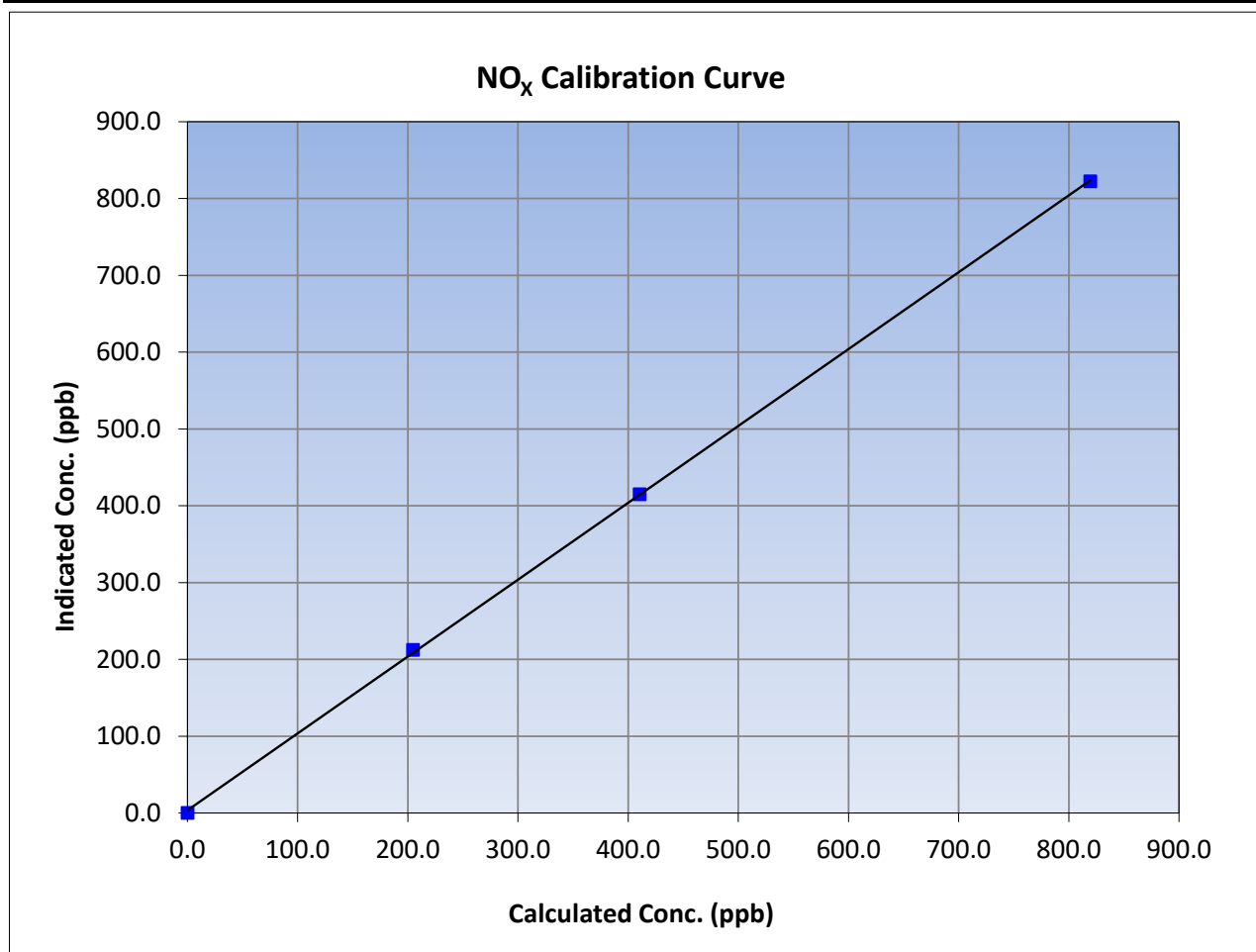
Version-04-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 9, 2023 | Previous Calibration: | February 2, 2023 |
| Station Name:     | Mackay River  | Station Number:       | AMS20            |
| Start Time (MST): | 10:48         | End Time (MST):       | 15:41            |
| 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<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 819.5                               | 822.2                              | 0.9967                    |   |                                |
| 410.4                               | 415.0                              | 0.9890                    |   |                                |
| 204.6                               | 212.4                              | 0.9635                    |   |                                |
|                                     |                                    |                           |   |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

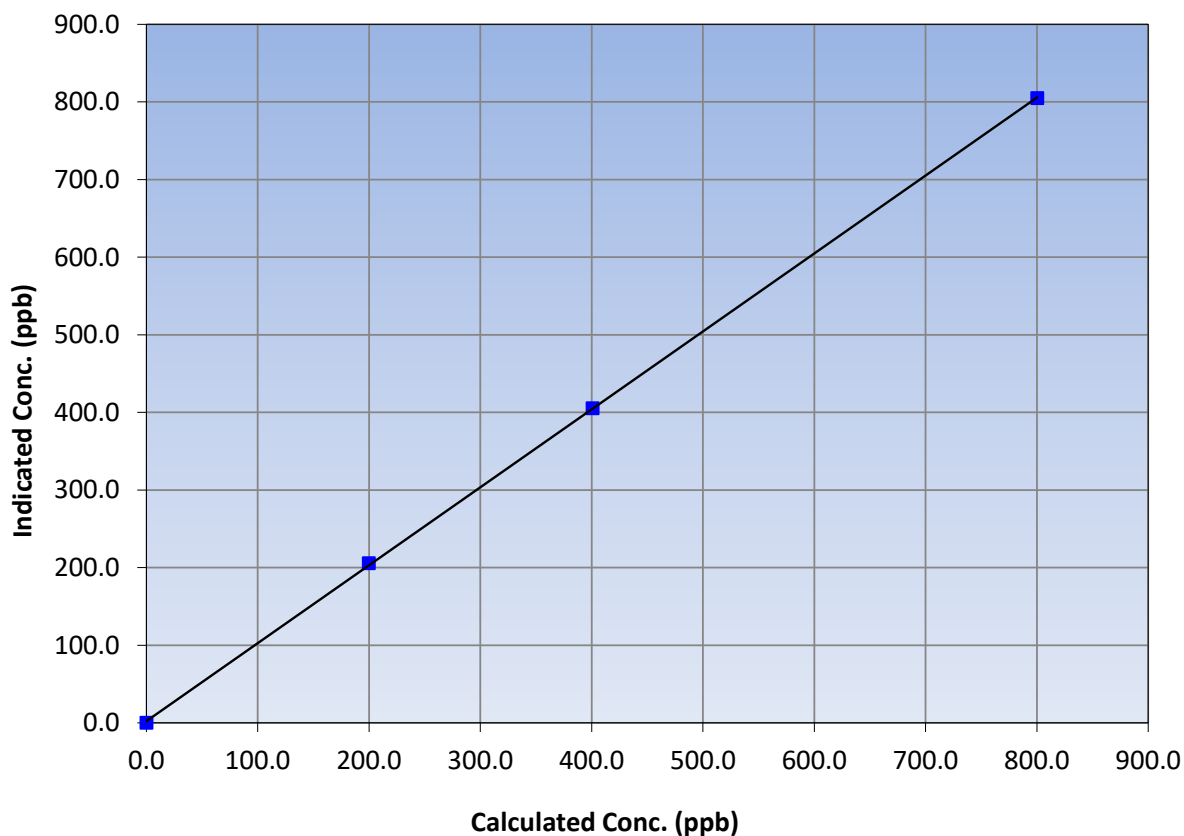
### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 9, 2023 | Previous Calibration: | February 2, 2023 |
| Station Name:     | Mackay River  | Station Number:       | AMS20            |
| Start Time (MST): | 10:48         | End Time (MST):       | 15:41            |
| Analyzer make:    | Thermo 42i    | Analyzer serial #:    | 1505164379       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                               |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | $\geq 0.995$<br>0.90 - 1.10<br>+/-20 |
| 800.3                               | 805.0                              | 0.9942                    |   |                                      |
| 400.8                               | 405.3                              | 0.9890                    |   |                                      |
| 199.9                               | 205.6                              | 0.9721                    |   |                                      |
|                                     |                                    |                           | Correlation Coefficient                       | 0.999963                             |
|                                     |                                    |                           | Slope   | 1.004217                             |
|                                     |                                    |                           | Intercept                                     | 2.250337                             |

NO Calibration Curve





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

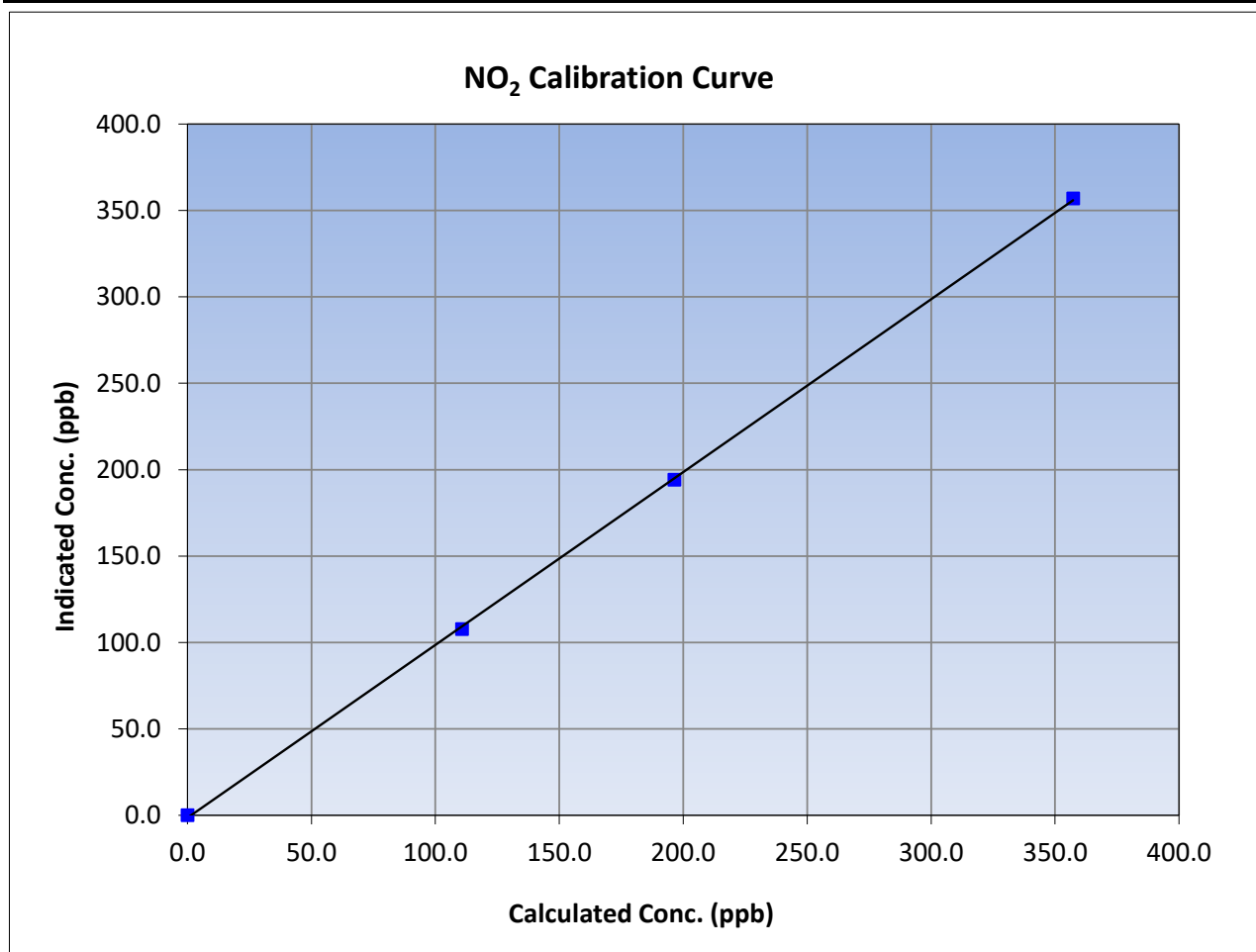
Version-04-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 9, 2023 | Previous Calibration: | February 2, 2023 |
| Station Name:     | MacKay River  | Station Number:       | AMS20            |
| Start Time (MST): | 10:48         | End Time (MST):       | 15:41            |
| Analyzer make:    | Thermo 42i    | Analyzer serial #:    | 1505164379       |

### Calibration Data

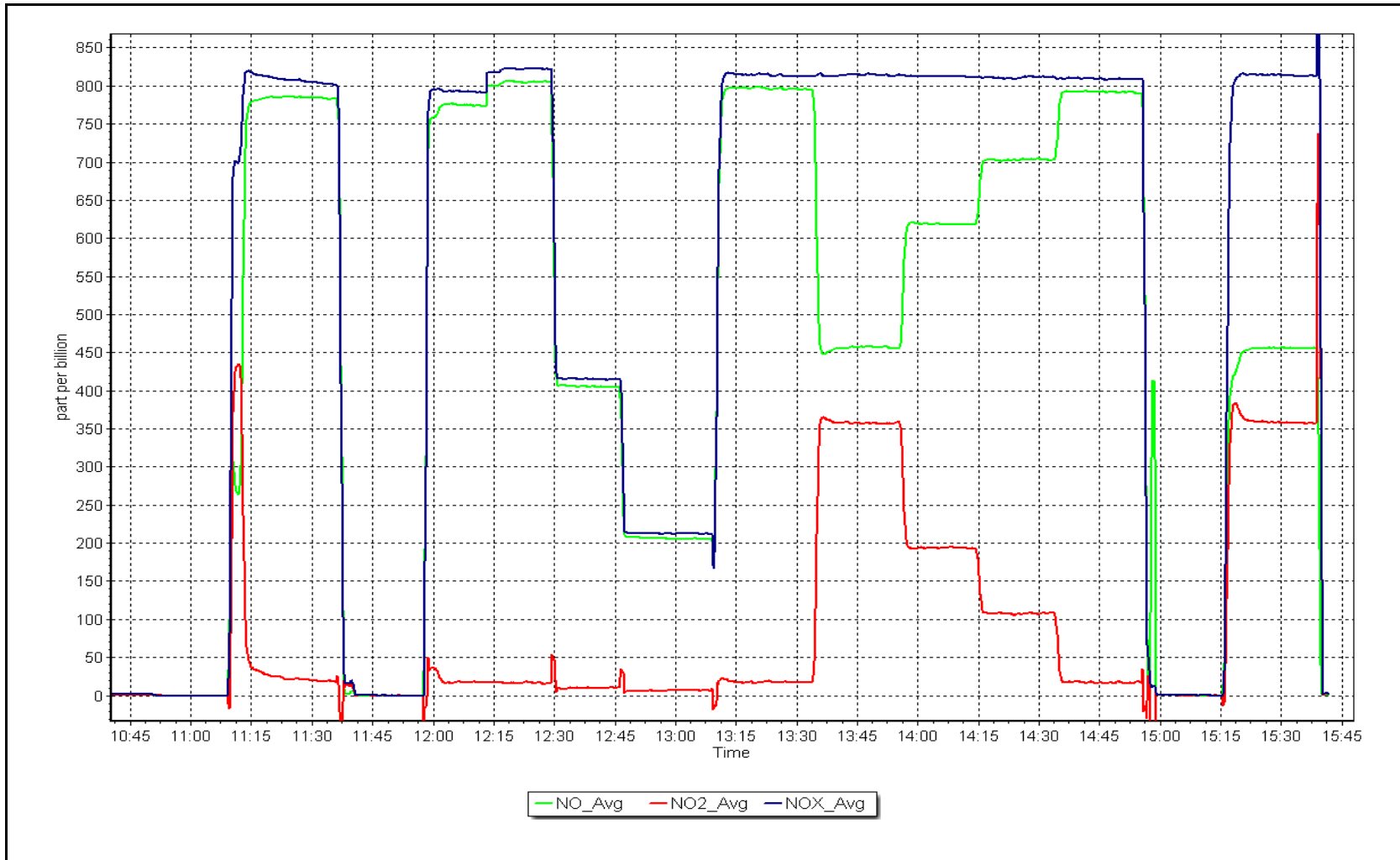
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 357.3                               | 356.9                              | 1.0010                    |   |                                |
| 196.5                               | 194.1                              | 1.0121                    |   |                                |
| 110.8                               | 107.7                              | 1.0284                    |   |                                |
|                                     |                                    |                           |   |                                |



NO<sub>x</sub> Calibration Plot

Date: March 9, 2023

Location: MacKay River





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS21  
CONKLIN  
MARCH 2023**

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

April 29, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

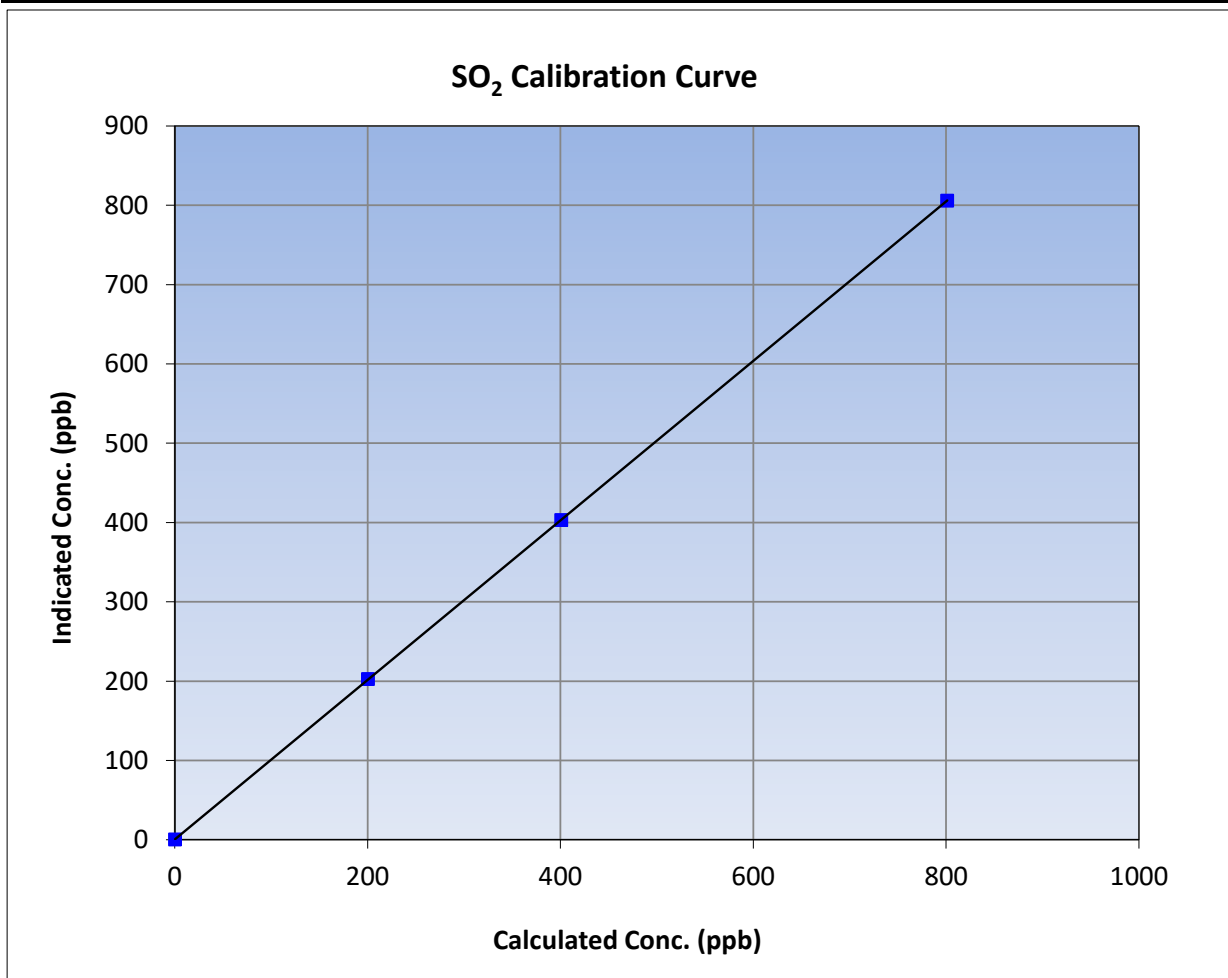
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 3, 2023 | Previous Calibration: | February 6, 2023 |
| Station Name:     | Conklin       | Station Number:       | AMS21            |
| Start Time (MST): | 10:17         | End Time (MST):       | 13:00            |
| Analyzer make:    | Thermo 43i    | Analyzer serial #:    | 1428701363       |

### Calibration Data

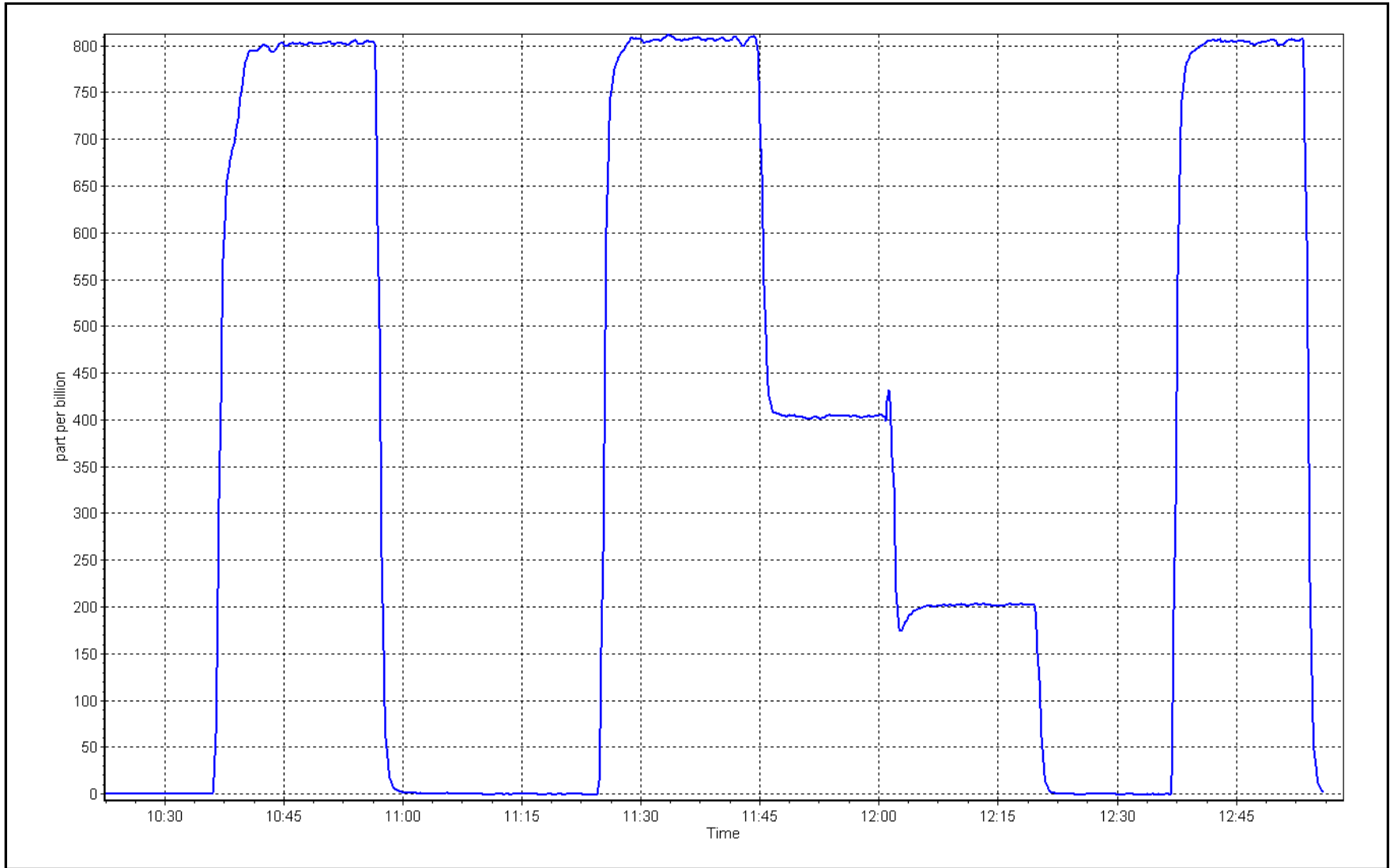
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999998 | ≥0.995      |
| 800.8                               | 805.6                              | 0.9941                    |                         |          |             |
| 400.4                               | 402.9                              | 0.9939                    | Slope                   | 1.005625 | 0.90 - 1.10 |
| 200.1                               | 202.3                              | 0.9892                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.356047 | +/-30       |



SO2 Calibration Plot

Date: March 3, 2023

Location: Conklin







# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

Station Name: Conklin Station number: AMS21  
 Calibration Date: March 22, 2023 Last Cal Date: February 8, 2023  
 Start time (MST): 9:27 End time (MST): 13:20  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.03 ppm Cal Gas Exp Date: April 16, 2022  
 Cal Gas Cylinder #: CC505493  
 Removed Cal Gas Conc: 5.03 ppm Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA Diff between cyl:  
 Calibrator Make/Model: API T700 Serial Number: 3810  
 ZAG Make/Model: API 701 Serial Number: 263

### Analyzer Information

Analyzer make: Thermo 43i-TLE Analyzer serial #: 1236656116  
 Converter make: CD-Nova 101 Converter serial #: NA  
 Analyzer Range 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>          | <u>Finish</u> |
|------------------------|--------------|---------------|-----------------------|---------------|
| Calibration slope:     | 0.983711     | 1.019442      | Backgd or Offset: 2.8 | 2.9           |
| Calibration intercept: | 0.237934     | 0.237078      | Coeff or Slope: 0.951 | 0.991         |

### 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | -0.4                               | ----   |
| as found span         | 4921                          | 79.5                        | 80.0                                | 77.3                               | 1.029  |
| as found 2nd point    | 4960                          | 39.8                        | 40.0                                | 39.2                               | 1.011  |
| as found 3rd point    | 4980                          | 19.9                        | 20.0                                | 19.7                               | 0.996  |
| 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | -0.1                               | ----  |
| high point                              | 4921                          | 79.5                        | 80.0                                | 81.5                               | 0.981   |
| second point                            | 4960                          | 39.8                        | 40.0                                | 41.5                               | 0.965   |
| third point                             | 4980                          | 19.9                        | 20.0                                | 20.8                               | 0.962   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span                            | 4921                          | 79.5                        | 80.0                                | 81.0                               | 0.987   |
| SO2 Scrubber Check                      | 4920                          | 80.2                        | 802.0                               | -0.1                               | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    | 0.970   |
| Date of last converter efficiency test: |                               |                             |                                     | efficiency                         |   |

Baseline Corr As found: 77.7 Prev response: 78.90 \*% change: -1.5%  
 Baseline Corr 2nd AF pt: 39.6 AF Slope: 0.969850 AF Intercept: -0.001815  
 Baseline Corr 3rd AF pt: 20.1 AF Correlation: 0.999866

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

Notes: Adjusted the span only.

Calibration Performed By: Denny Ray Estador



# Wood Buffalo Environmental Association

## TRS Calibration Summary

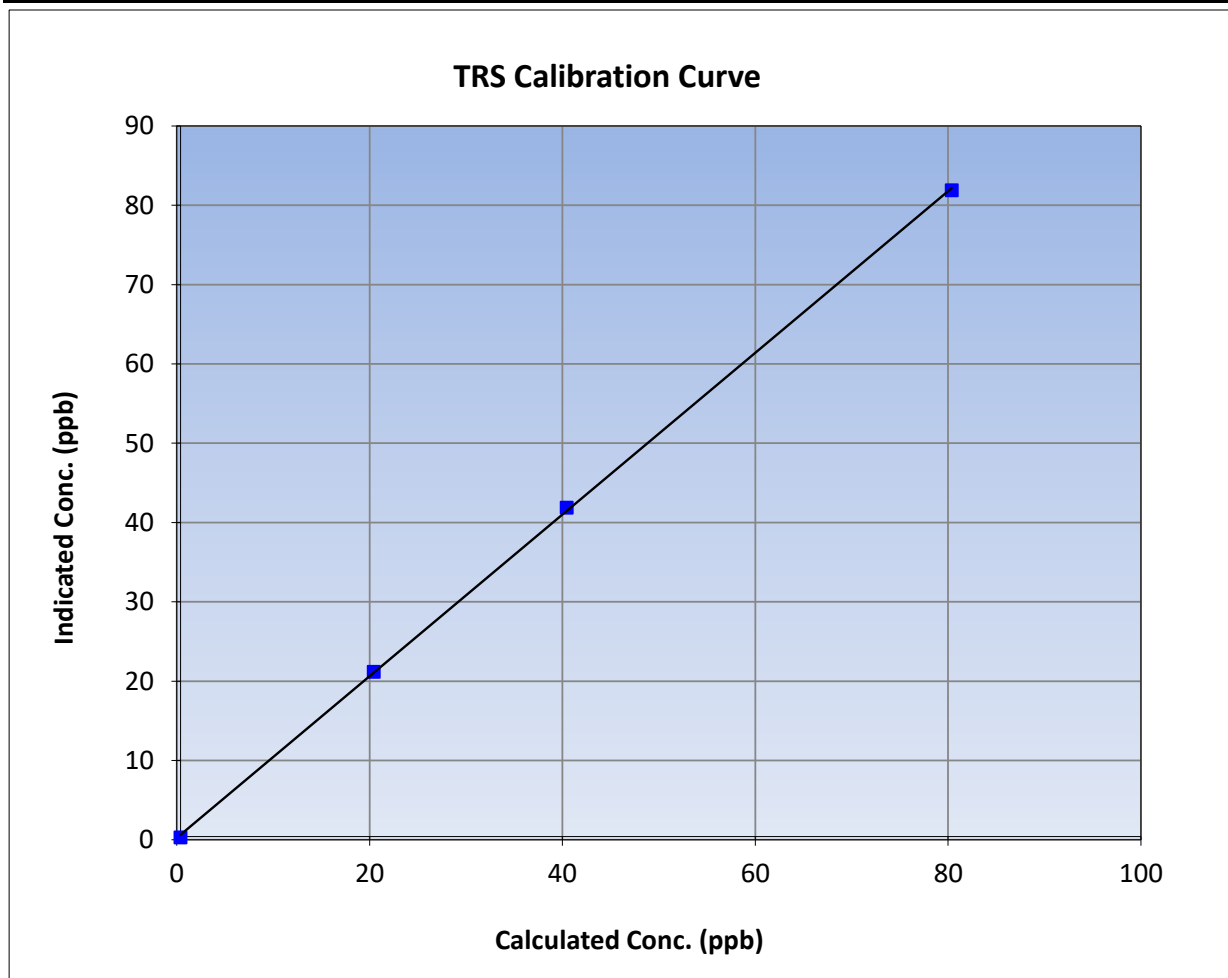
Version-11-2021

### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 22, 2023 | Previous Calibration: | February 8, 2023 |
| Station Name:     | Conklin        | Station Number:       | AMS21            |
| Start Time (MST): | 9:27           | End Time (MST):       | 13:20            |
| Analyzer make:    | Thermo 43i-TLE | Analyzer serial #:    | 1236656116       |

### Calibration Data

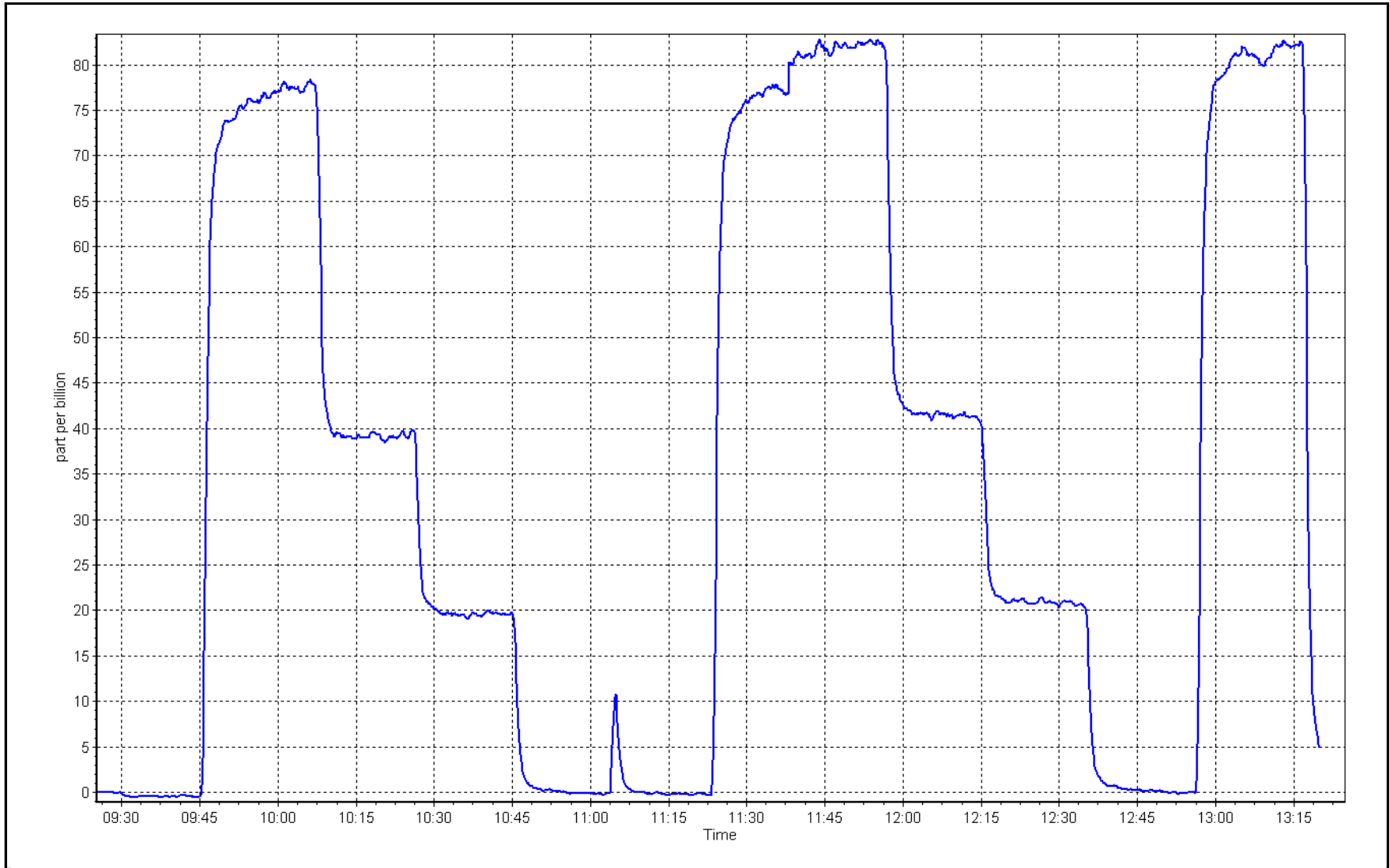
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999889 | ≥0.995      |
| 80.0                                | 81.5                               | 0.9812                    |                         |          |             |
| 40.0                                | 41.5                               | 0.9648                    | Slope                   | 1.019442 | 0.90 - 1.10 |
| 20.0                                | 20.8                               | 0.9625                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.237078 | +/-3        |



TRS Calibration Plot

Date: March 22, 2023

Location: Conklin





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-06-2022

### Station Information

|                   |               |                 |                  |
|-------------------|---------------|-----------------|------------------|
| Station Name:     | Conklin       | Station number: | AMS21            |
| Calibration Date: | March 3, 2023 | Last Cal Date:  | February 3, 2023 |
| Start time (MST): | 10:17         | End time (MST): | 13:00            |
| Reason:           | Routine       |                 |                  |

### Calibration Standards

|   |                   |                             |                 |
|---|-------------------|-----------------------------|-----------------|
| Gas Cert Reference:                         | CC259455          | Cal Gas Expiry Date:        | January 5, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 497.9 ppm         | CH <sub>4</sub> Equiv Conc. | 1067.7 ppm      |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.2 ppm         |                             |                 |
| Removed Gas Cert:                           | NA                | Removed Gas Expiry:         | NA              |
| Removed CH <sub>4</sub> Conc.               | 497.9 ppm         | CH <sub>4</sub> Equiv Conc. | 1067.7 ppm      |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.2 ppm         | Diff between cyl (THC):     |                 |
| Diff between cyl (CH <sub>4</sub> ):        |                   | Diff between cyl (NM):      |                 |
| Calibrator Model:                           | Teledyne API T700 | Serial Number:              | 3810            |
| ZAG make/model:                             | Teledyne API 701  | Serial Number:              | 691             |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 118148495  |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 1.86E-04     | 1.86E-04      | NMHC SP Ratio:  | 4.56E-05      |
| CH <sub>4</sub> Retention time: | 12.60        | 12.60         | NMHC Peak Area: | 200658        |
|                                 |              |               |                 | 200658        |

### THC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.2                 | 17.13                | 17.22                                      | 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              | 80.2                 | 17.13                | 17.20                                      | 0.996                      |
| second point              | 4960              | 40.1                 | 8.56                 | 8.64                                       | 0.992                      |
| third point               | 4980              | 20.0                 | 4.27                 | 4.34                                       | 0.985                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.2                 | 17.13                | 17.10                                      | 1.001                      |
| Average Correction Factor |                   |                      |                      |  | 0.991                      |
| Baseline Corr AF:         | 17.22             | Prev response        | 17.14                | *% 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.2                 | 9.14                 | 9.17                                       | 0.997                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.2                 | 9.14                 | 9.17                                       | 0.997                      |
| second point              | 4960              | 40.1                 | 4.57                 | 4.60                                       | 0.993                      |
| third point               | 4980              | 20.0                 | 2.28                 | 2.31                                       | 0.985                      |
| 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 |                   |                      |                      |  | 0.992                      |
| Baseline Corr AF:         | 9.17              | Prev response        | 9.14                 | *% change                                  | 0.3%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.2                 | 7.99                 | 8.05                                       | 0.992                      |
| 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                 | 8.03                                       | 0.994                      |
| second point              | 4960              | 40.1                 | 3.99                 | 4.03                                       | 0.990                      |
| third point               | 4980              | 20.0                 | 1.99                 | 2.03                                       | 0.984                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.2                 | 7.99                 | 8.00                                       | 0.998                      |
| Average Correction Factor |                   |                      |                      |  | 0.989                      |
| Baseline Corr AF:         | 8.05              | Prev response        | 8.00                 | *% change                                  | 0.6%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.998993     | 1.003632      |
| THC Cal Offset:             | 0.030589     | 0.026595      |
| CH <sub>4</sub> Cal Slope:  | 1.001541     | 1.005332      |
| CH <sub>4</sub> Cal Offset: | -0.002053    | 0.011959      |
| NMHC Cal Slope:             | 0.996416     | 1.002247      |
| NMHC Cal Offset:            | 0.033041     | 0.014236      |

Notes: No adjustments made. Changed N2 cylinder after the as founds.

Calibration Performed By: Denny Ray Estador



# Wood Buffalo Environmental Association

## THC Calibration Summary

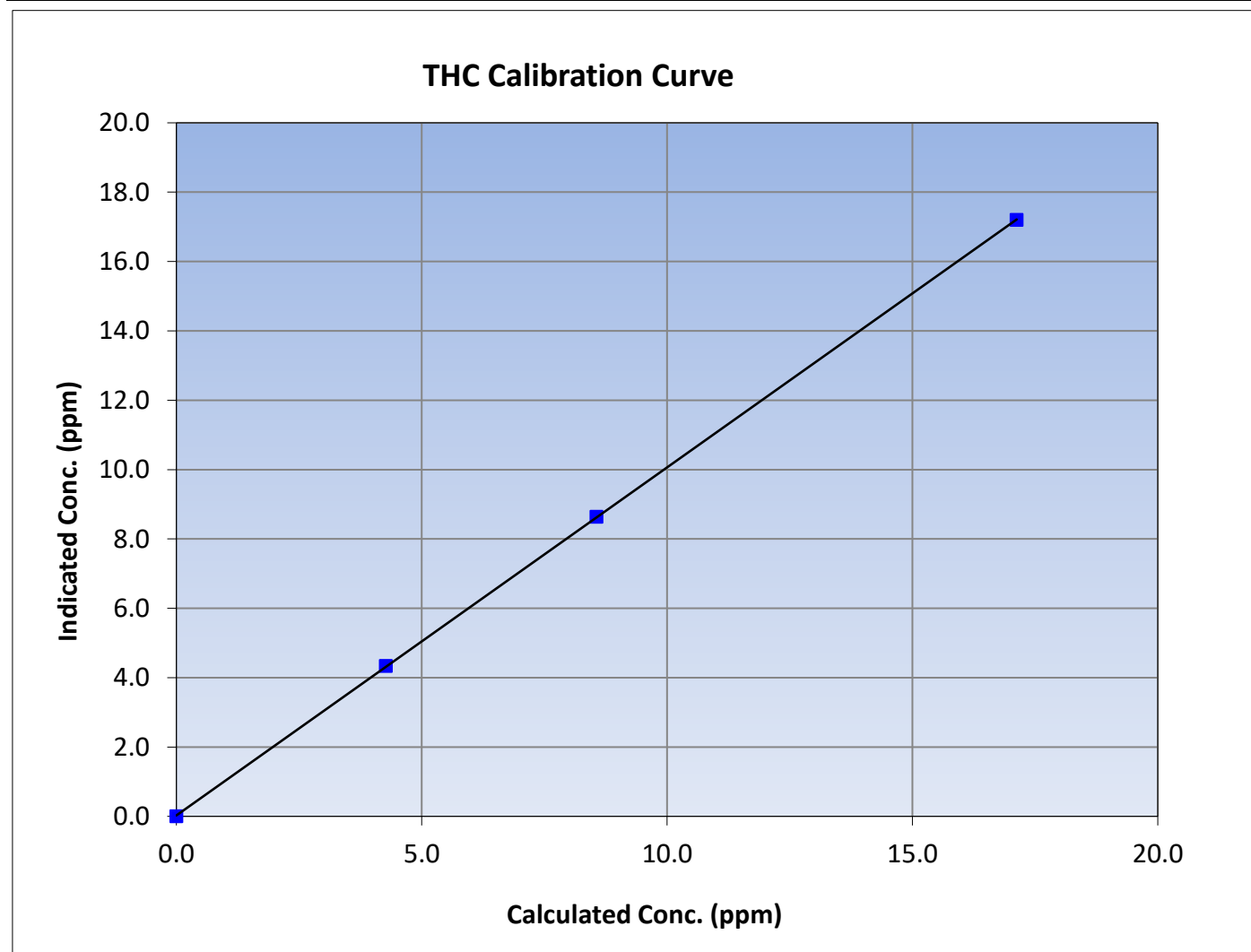
Version-06-2022

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 3, 2023 | Previous Calibration: | February 3, 2023 |
| Station Name:     | Conklin       | Station Number:       | AMS21            |
| Start Time (MST): | 10:17         | End Time (MST):       | 13:00            |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 118148495        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999989 | $\geq 0.995$  |       |          |             |
| 17.13                               | 17.20                              | 0.9957                    |                         |          |               |       |          |             |
| 8.56                                | 8.64                               | 0.9915                    |                         |          |               | Slope | 1.003632 | 0.90 - 1.10 |
| 4.27                                | 4.34                               | 0.9845                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.026595 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

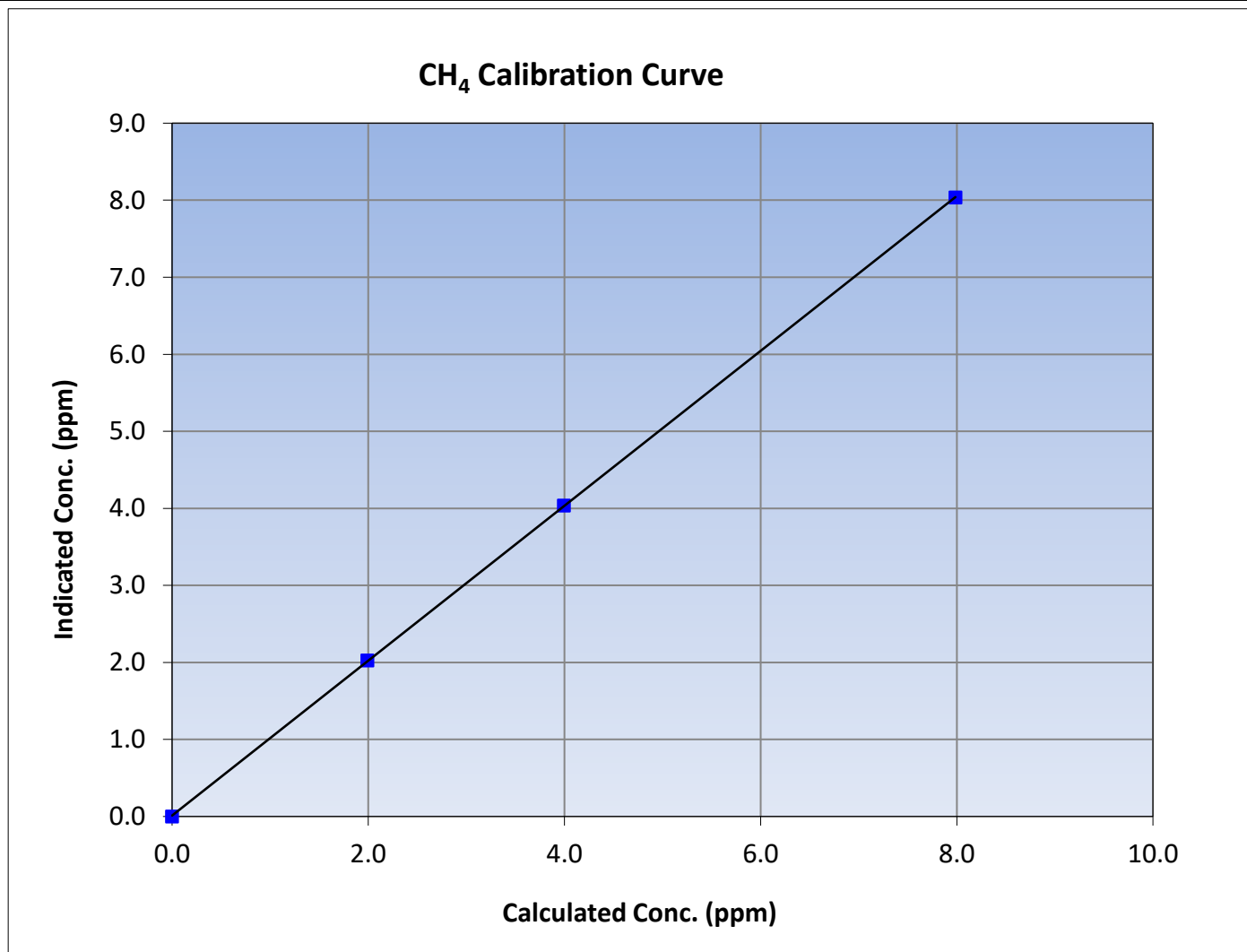
Version-06-2022

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 3, 2023 | Previous Calibration: | February 3, 2023 |
| Station Name:     | Conklin       | Station Number:       | AMS21            |
| Start Time (MST): | 10:17         | End Time (MST):       | 13:00            |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 118148495        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999990 | $\geq 0.995$  |       |          |             |
| 7.99                                | 8.03                               | 0.9940                    |                         |          |               |       |          |             |
| 3.99                                | 4.03                               | 0.9899                    |                         |          |               | Slope | 1.005332 | 0.90 - 1.10 |
| 1.99                                | 2.03                               | 0.9835                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.011959 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

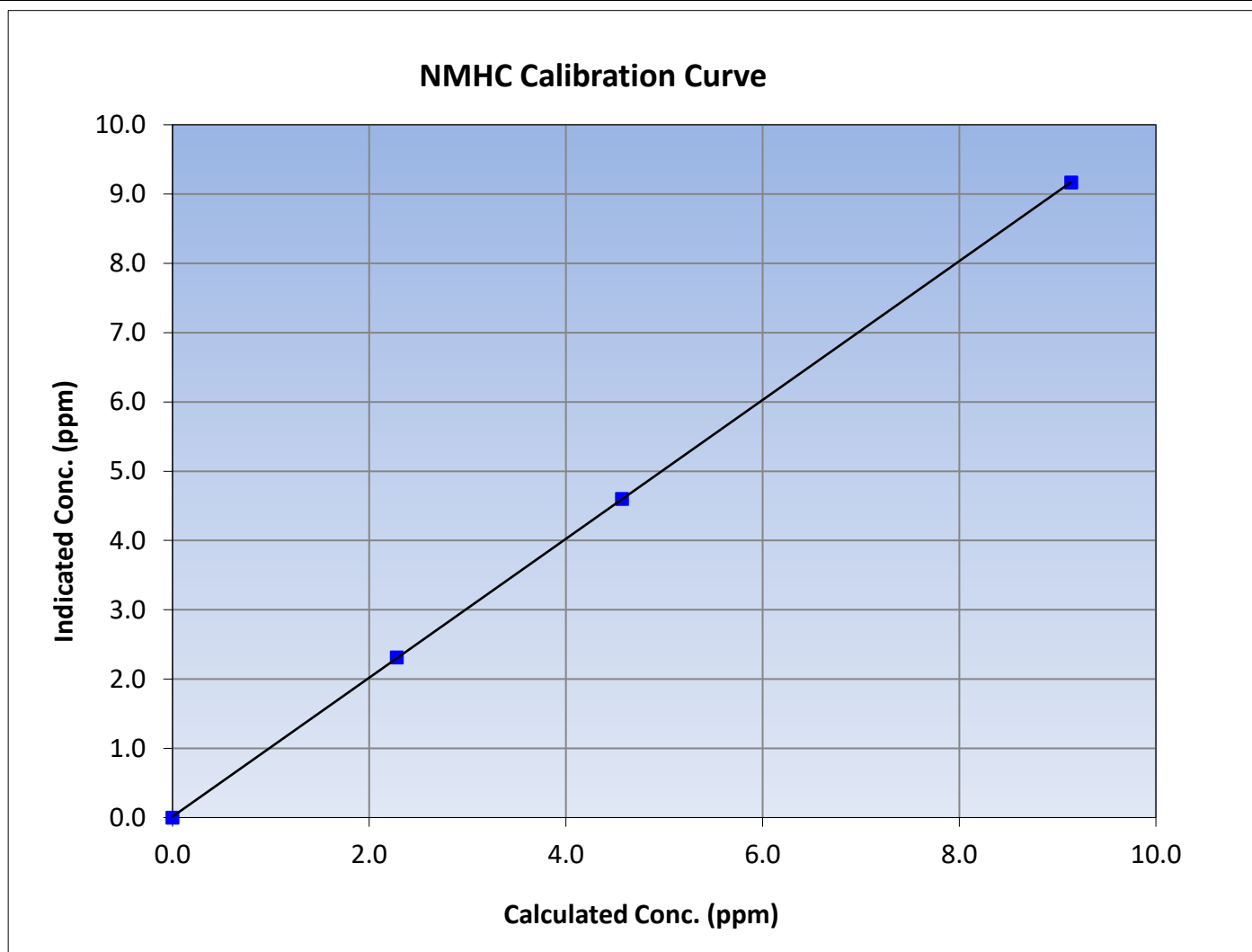
Version-06-2022

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 3, 2023 | Previous Calibration: | February 3, 2023 |
| Station Name:     | Conklin       | Station Number:       | AMS21            |
| Start Time (MST): | 10:17         | End Time (MST):       | 13:00            |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 118148495        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999989 | $\geq 0.995$  |       |          |             |
| 9.14                                | 9.17                               | 0.9970                    |                         |          |               |       |          |             |
| 4.57                                | 4.60                               | 0.9932                    |                         |          |               | Slope | 1.002247 | 0.90 - 1.10 |
| 2.28                                | 2.31                               | 0.9854                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.014236 | $\pm 0.5$     |       |          |             |

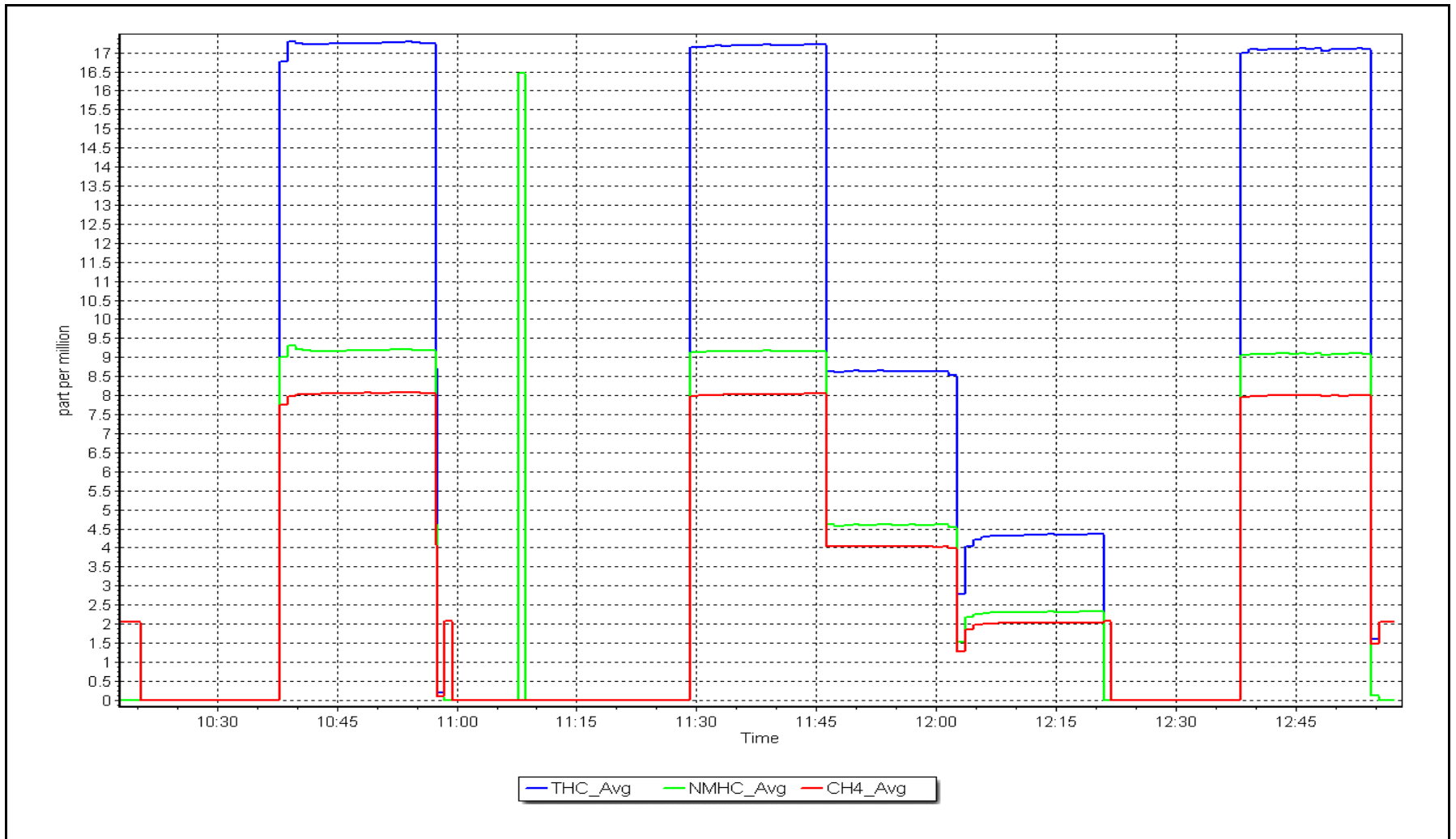




NMHC Calibration Plot

Date: March 3, 2023

Location: Conklin





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-06-2022

### Station Information

|                   |                 |                 |               |
|-------------------|-----------------|-----------------|---------------|
| Station Name:     | Conklin         | Station number: | AMS21         |
| Calibration Date: | March 17, 2023  | Last Cal Date:  | March 3, 2023 |
| Start time (MST): | 9:45            | End time (MST): | 11:30         |
| 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 <sub>4</sub> ): |                   | Diff between cyl (NM):  |                 |
| Calibrator Model:                    | Teledyne API T700 | Serial Number:          | 3810            |
| ZAG make/model:                      | Teledyne API 701  | Serial Number:          | 691             |

### Analyzer Information

|                   |            |                    |            |
|-------------------|------------|--------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #: | 118148495  |
| THC Range (ppm):  | 0 - 20 ppm |                    |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH4 Range (ppm):   | 0 - 10 ppm |

|                     | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------|--------------|---------------|-----------------|---------------|
| CH4 SP Ratio:       | 1.86E-04     | 1.86E-04      | NMHC SP Ratio:  | 4.56E-05      |
| CH4 Retention time: | 12.60        | 12.60         | NMHC Peak Area: | 200658        |

### THC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.2                 | 17.13                | 17.78                                      | 0.963                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           |                   |                      |                      |  |                            |
| high point                |                   |                      |                      |  |                            |
| second point              |                   |                      |                      |  |                            |
| third point               |                   |                      |                      |  |                            |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.2                 | 17.13                | 17.69                                      | 0.968                      |
| Average Correction Factor |                   |                      |                      |  |                            |
| Baseline Corr AF:         | 17.78             | Prev response        | 17.21                | *% change                                  | 3.2%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|----------------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero                    | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as found span                    | 4920              | 80.2                 | 9.14                 | 9.57   | 0.955                      |
| as found 2nd point               |                   |                      |                      |  |                            |
| as found 3rd point               |                   |                      |                      |  |                            |
| new cylinder response            |                   |                      |                      |  |                            |
| calibrator zero                  |                   |                      |                      |  |                            |
| high point                       |                   |                      |                      |  |                            |
| second point                     |                   |                      |                      |  |                            |
| third point                      |                   |                      |                      |  |                            |
| as left zero                     | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as left span                     | 4920              | 80.2                 | 9.14                 | 9.49   | 0.963                      |
| <b>Average Correction Factor</b> |                   |                      |                      |  |                            |
| Baseline Corr AF:                | 9.57              | Prev response        | 9.17                 | *% change  | 4.1%                       |
| Baseline Corr 2nd AF:            | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF:            | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                        | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|----------------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero                    | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as found span                    | 4920              | 80.2                 | 7.99                 | 8.20   | 0.974                      |
| as found 2nd point               |                   |                      |                      |  |                            |
| as found 3rd point               |                   |                      |                      |  |                            |
| new cylinder response            |                   |                      |                      |  |                            |
| calibrator zero                  |                   |                      |                      |  |                            |
| high point                       |                   |                      |                      |  |                            |
| second point                     |                   |                      |                      |  |                            |
| third point                      |                   |                      |                      |  |                            |
| as left zero                     | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as left span                     | 4920              | 80.2                 | 7.99                 | 8.20   | 0.974                      |
| <b>Average Correction Factor</b> |                   |                      |                      |  |                            |
| Baseline Corr AF:                | 8.20              | Prev response        | 8.04                 | *% change  | 2.0%                       |
| Baseline Corr 2nd AF:            | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF:            | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.003632     |               |
| THC Cal Offset:             | 0.026595     |               |
| CH <sub>4</sub> Cal Slope:  | 1.005332     |               |
| CH <sub>4</sub> Cal Offset: | 0.011959     |               |
| NMHC Cal Slope:             | 1.002247     |               |
| NMHC Cal Offset:            | 0.014236     |               |

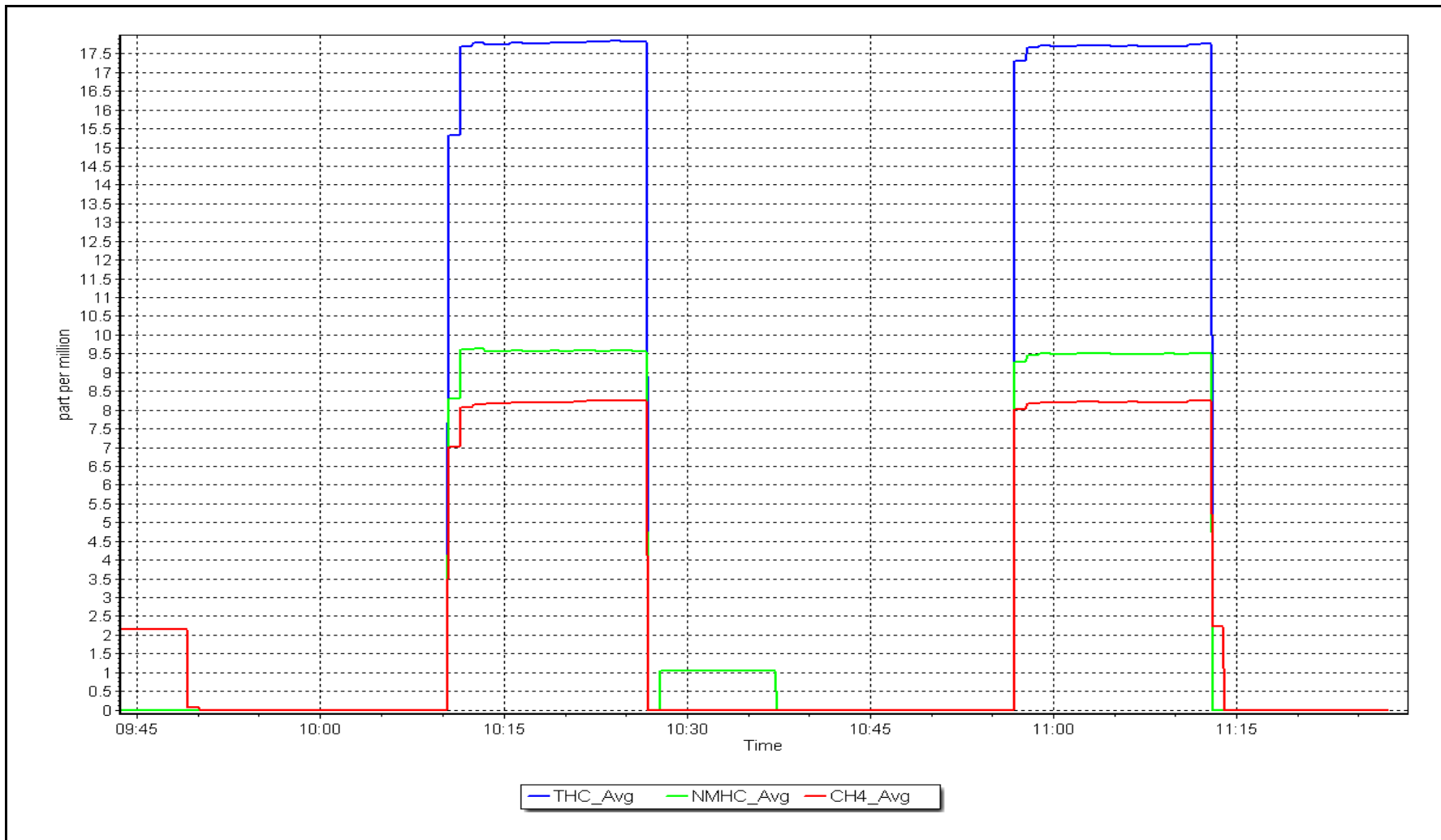
Notes: Replaced H2 Cylinder.

Calibration Performed By: Denny Ray Estador

NMHC Calibration Plot

Date: March 17, 2023

Location: Conklin





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Conklin  
Calibration Date: March 29, 2023  
Start time (MST): 9:37  
Reason: Routine  
Station number: AMS21  
Last Cal Date: February 24, 2023  
End time (MST): 13:35

### Calibration Standards

NO Gas Cylinder #: T2Y1P1H  
NOX Cal Gas Conc: 51.09 ppm  
Removed Cylinder #: n/a  
Removed Gas NOX Conc: 51.09 ppm  
NOX gas Diff:  
Calibrator Model: Teledyne API T750  
ZAG make/model: Teledyne API T701  
Cal Gas Expiry Date: December 11, 2023  
NO Cal Gas Conc: 50.39 ppm  
Removed Gas Exp Date: n/a  
Removed Gas NO Conc: 50.39 ppm  
NO gas Diff:  
Serial Number: 282  
Serial Number: 361

### Analyzer Information

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

Analyzer serial #: 1501663731

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.144        | 1.144         | NO bkgnd or offset:  | 11.6         | 11.6          |
| NOX coeff or slope: | 1.001        | 1.001         | NOX bkgnd or offset: | 11.8         | 11.8          |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 224.3        | 220.7         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.004927     | 1.009334      |
| NO <sub>x</sub> Cal Offset: | 1.765059     | 2.026079      |
| NO Cal Slope:               | 1.004393     | 1.010890      |
| NO Cal Offset:              | 0.961963     | 0.963352      |
| NO <sub>2</sub> Cal Slope:  | 1.001583     | 1.002951      |
| NO <sub>2</sub> Cal Offset: | -0.384496    | -0.706596     |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.2   | -0.2                                  | 0.0  | ----  | ----   |
| as found span             | 4921                      | 79.4                        | 811.2   | 800.1                                  | 11.1  | 822.7  | 809.4                                 | 13.3   | 0.9861  | 0.9885   |
| 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                | 4921                      | 79.4                        | 811.2   | 800.1                                  | 11.1  | 819.9  | 809.4                                 | 10.5   | 0.9894  | 0.9885   |
| second point              | 4960                      | 39.7                        | 405.7   | 400.1                                  | 5.6   | 412.2  | 405.6                                 | 6.6  | 0.9842  | 0.9865   |
| third point               | 4980                      | 19.8                        | 202.3   | 199.6                                  | 2.8   | 208.6  | 204.0                                 | 4.6  | 0.9699  | 0.9782   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.0                                   | 0.0  | ----  | ----   |
| as left span              | 4921                      | 79.4                        | 811.2   | 370.5                                  | 440.7   | 818.3  | 378.8                                 | 439.6  | 0.9914  | 0.9782   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9812  | 0.9844   |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 822.9 ppb | NO = 809.6 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 0.7% |
| Previous Response    | NO <sub>x</sub> = 817.0 ppb | NO = 804.6 ppb |  | *Percent Change                  | NO = 0.6%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI: ;  |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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)       | 805.0                                      | 375.4                                 | 440.7   | 441.7  | 0.9978   | 100.2%   |
| 2nd GPT point (200 ppb O3)       | 805.0                                      | 598.0                                 | 218.1   | 217.6  | 1.0024   | 99.8%  |
| 3rd GPT point (100 ppb O3)       | 805.0                                      | 701.9                                 | 114.2   | 113.2  | 1.0090   | 99.1%  |
| Average Correction Factor        |  |                                       |   |  | 1.0030   | 99.7%  |

Notes:

No adjustments required.

Calibration Performed By:

Denny Ray Estador



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

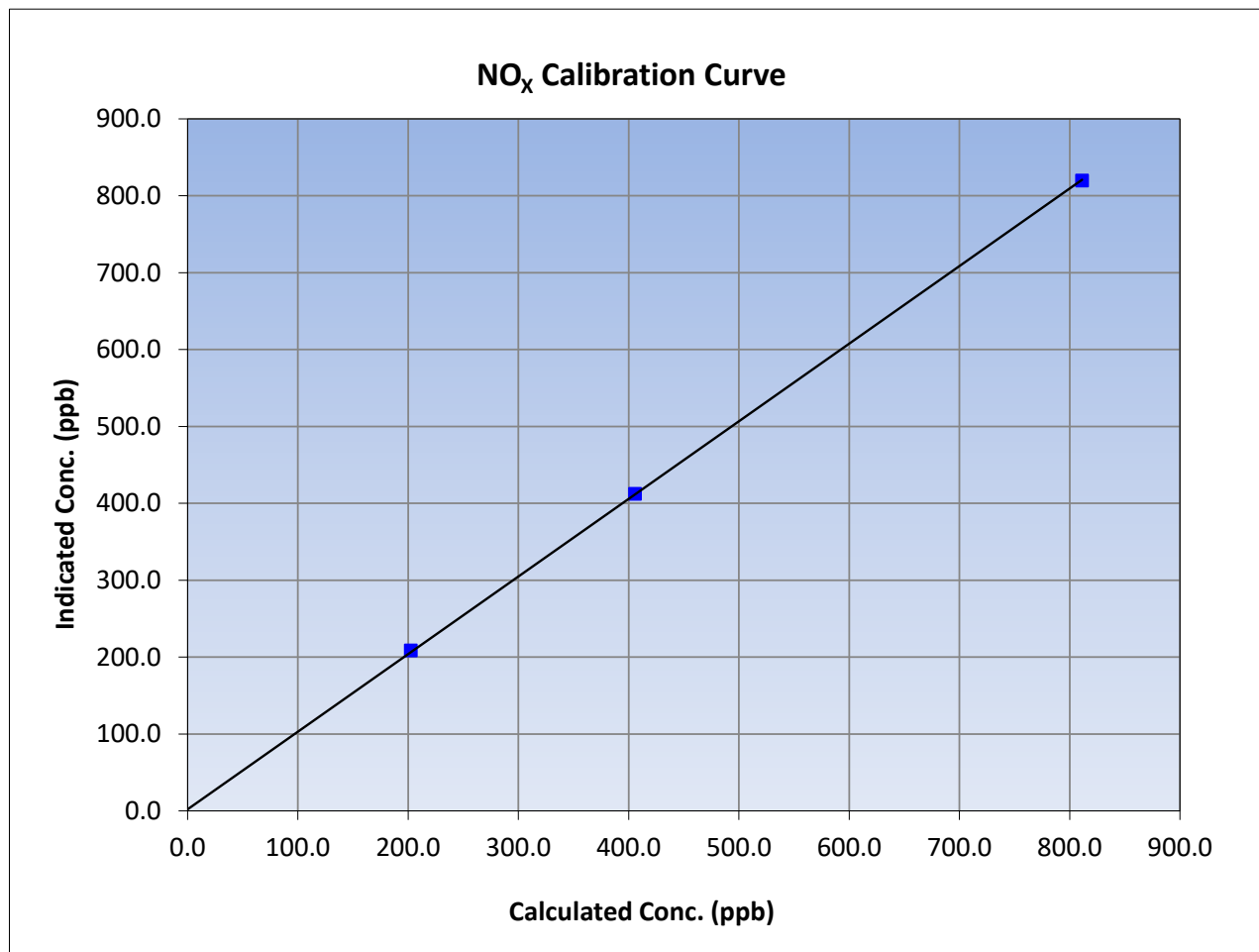
Version-04-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 29, 2023 | Previous Calibration: | February 24, 2023 |
| Station Name:     | Conklin        | Station Number:       | AMS21             |
| Start Time (MST): | 9:37           | End Time (MST):       | 13:35             |
| 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<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 811.2                               | 819.9                              | 0.9894                    |   |                                |
| 405.7                               | 412.2                              | 0.9842                    |   |                                |
| 202.3                               | 208.6                              | 0.9699                    |   |                                |
|                                     |                                    |                           | 0.999969                                      |                                |
|                                     |                                    |                           | 1.009334                                      |                                |
|                                     |                                    |                           | 2.026079                                      |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

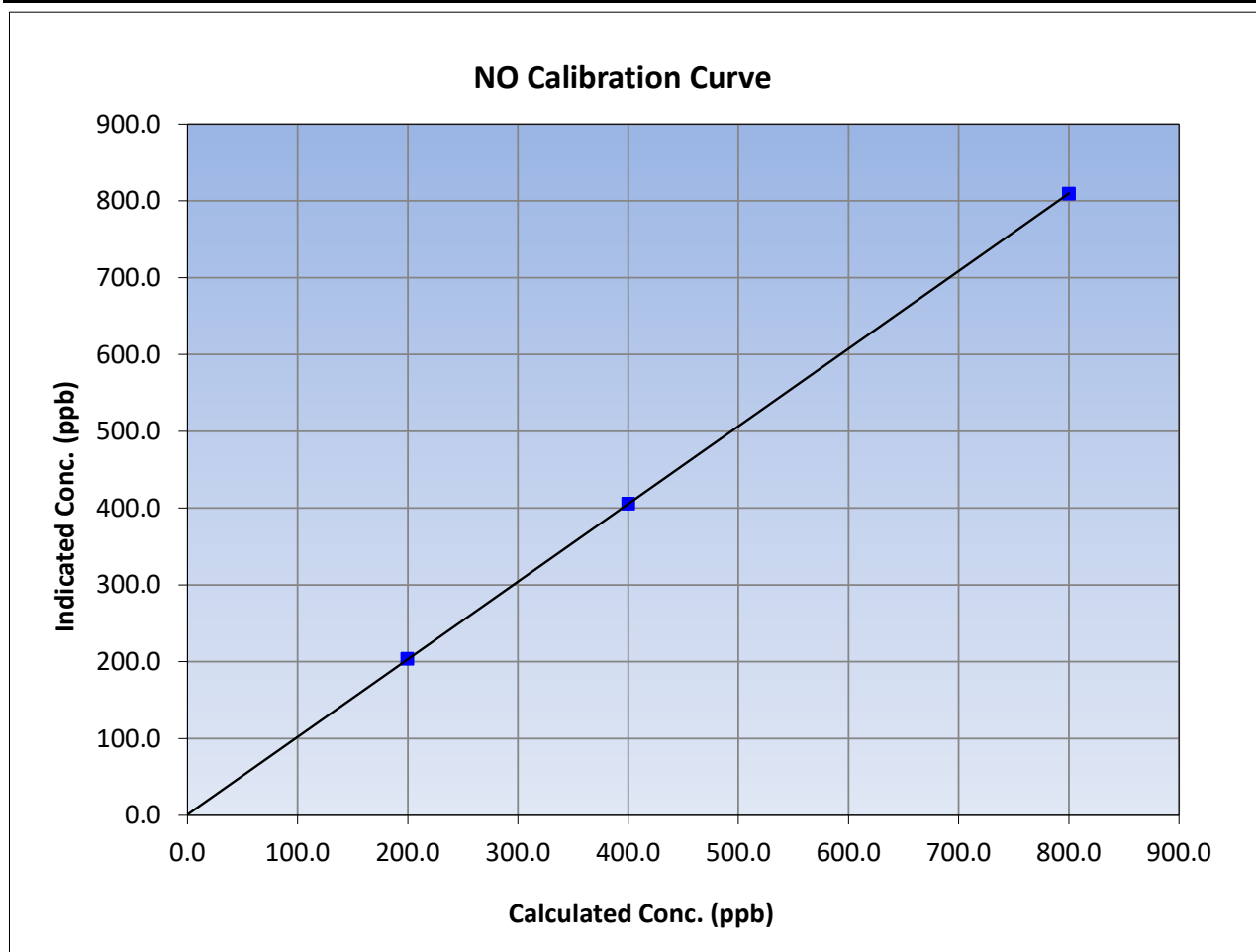
Version-04-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 29, 2023 | Previous Calibration: | February 24, 2023 |
| Station Name:     | Conklin        | Station Number:       | AMS21             |
| Start Time (MST): | 9:37           | End Time (MST):       | 13:35             |
| 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<br>Slope<br>Intercept | $\geq 0.995$<br>0.90 - 1.10<br>+/-20 |
| 800.1                               | 809.4                              | 0.9885                    |   |                                      |
| 400.1                               | 405.6                              | 0.9865                    |   |                                      |
| 199.6                               | 204.0                              | 0.9782                    |   |                                      |
|                                     |                                    |                           |   |                                      |







# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

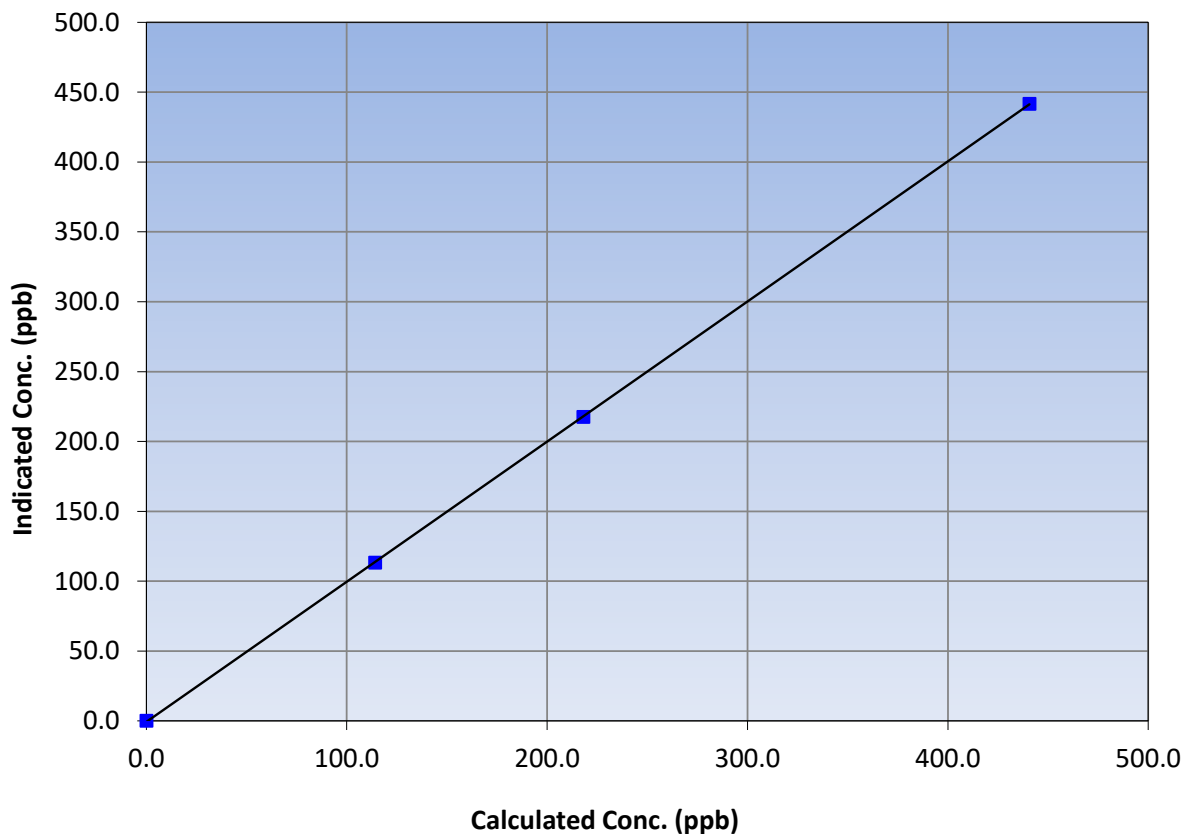
### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 29, 2023 | Previous Calibration: | February 24, 2023 |
| Station Name:     | Conklin        | Station Number:       | AMS21             |
| Start Time (MST): | 9:37           | End Time (MST):       | 13:35             |
| 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<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 440.7                               | 441.7                              | 0.9978                    |   |                                |
| 218.1                               | 217.6                              | 1.0024                    |   |                                |
| 114.2                               | 113.2                              | 1.0090                    |   |                                |
|                                     |                                    |                           |   |                                |

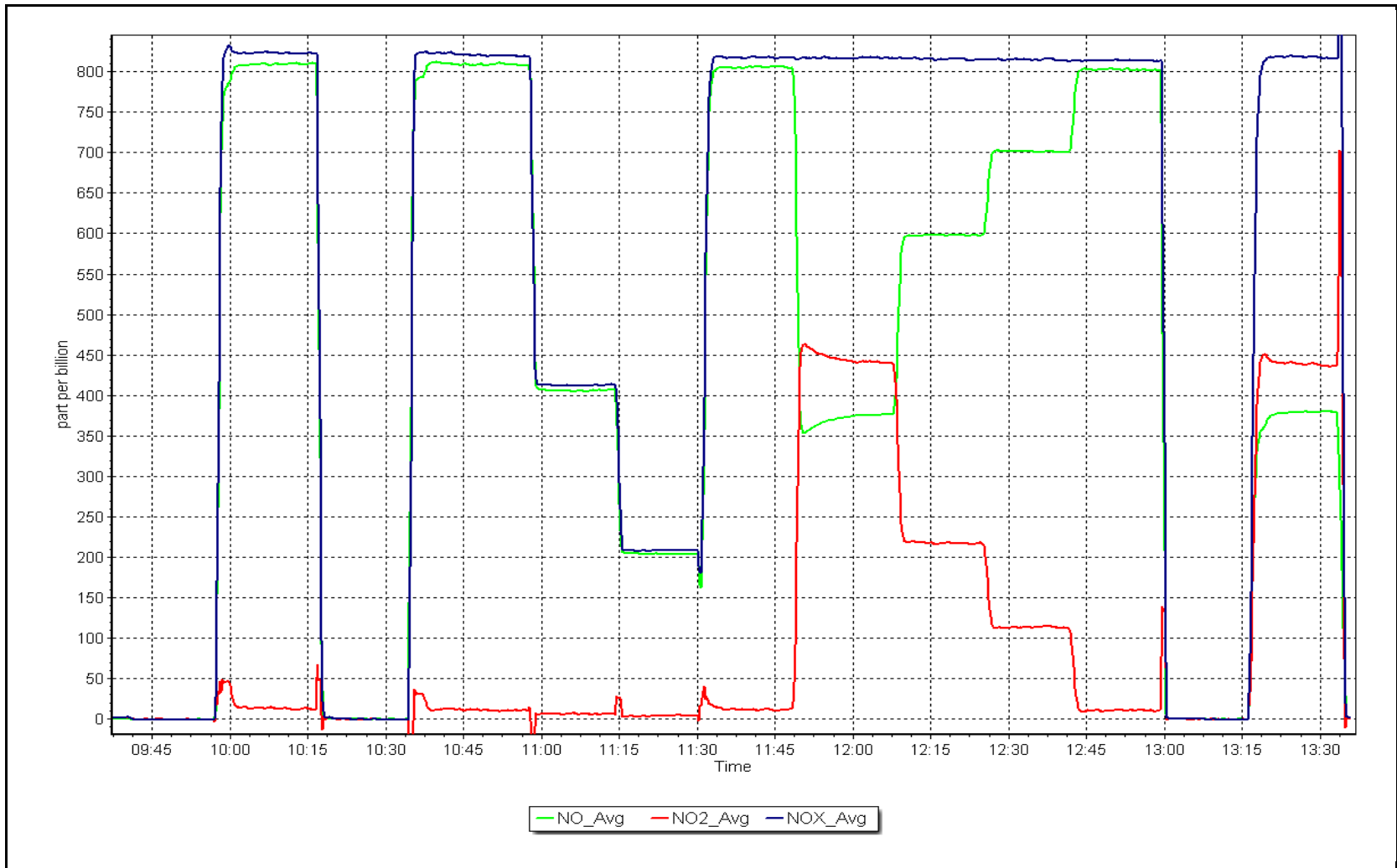
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: March 29, 2023

Location: Conklin







# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

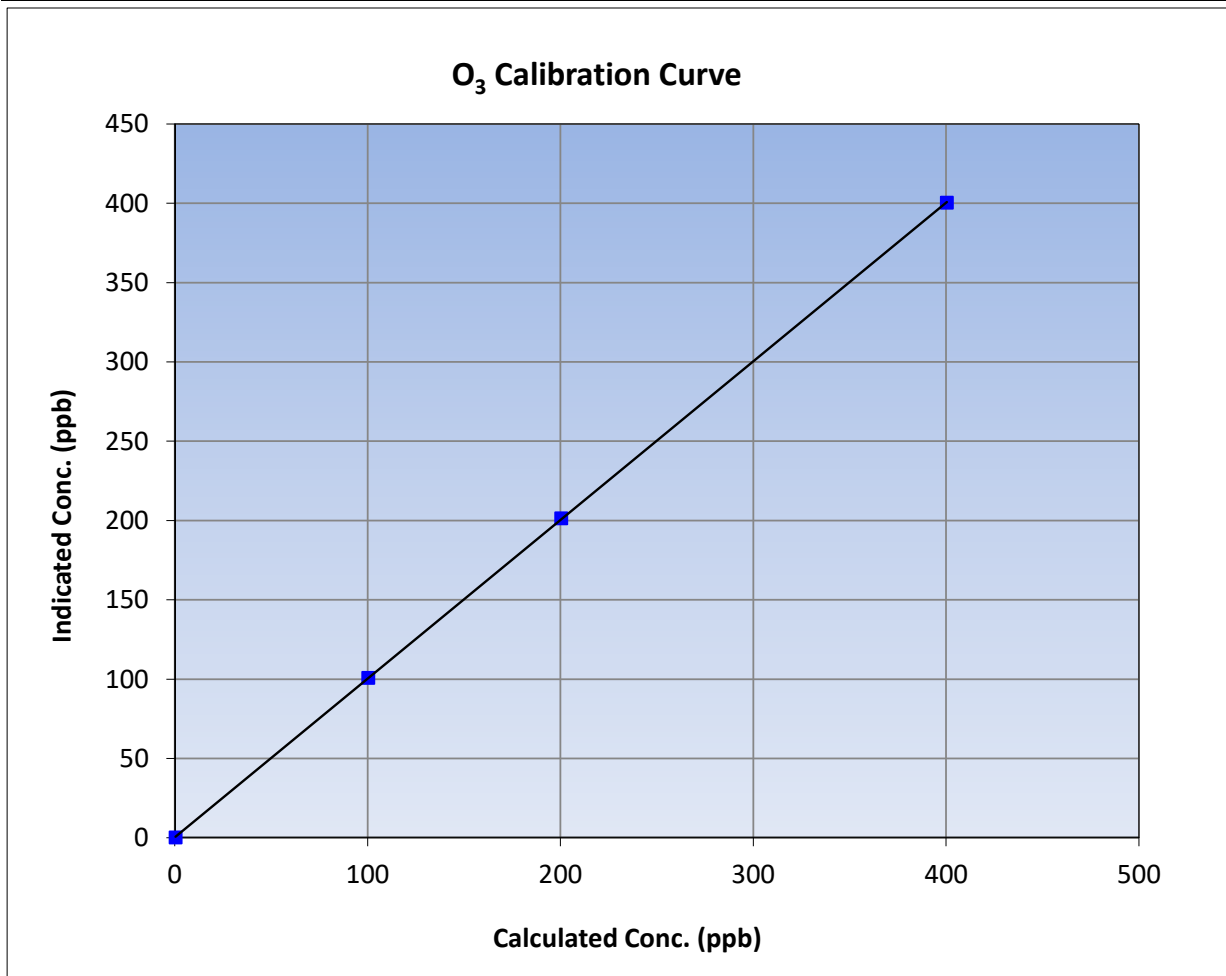
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 9, 2023 | Previous Calibration: | February 3, 2023 |
| Station Name:     | Conklin       | Station Number:       | AMS21            |
| Start Time (MST): | 10:34         | End Time (MST):       | 13:26            |
| Analyzer make:    | Thermo 49i    | Analyzer serial #:    | 1501663734       |

### Calibration Data

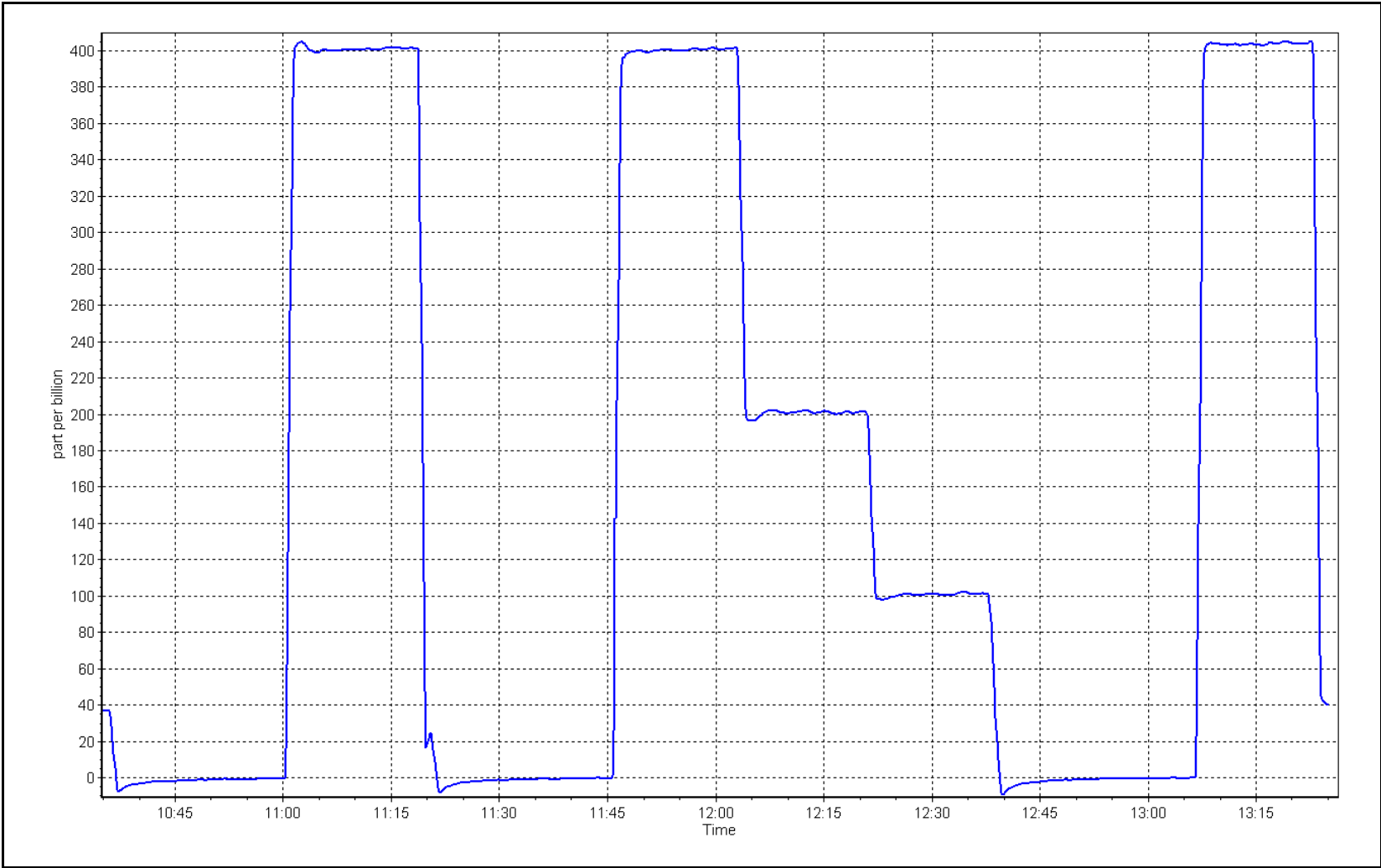
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | -0.2                                  | ----                         | Correlation Coefficient | 0.999991      |             |
| 400.0                                  | 400.0                                 | 1.0000                       |                         |               | ≥0.995      |
| 200.0                                  | 201.0                                 | 0.9950                       | Slope                   | 1.000343      |             |
| 100.0                                  | 100.4                                 | 0.9960                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | 0.240000      | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: March 9, 2023

Location: Conklin





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Conklin Station number: AMS 21  
 Calibration Date: March 29, 2023 Last Cal Date: February 8, 2023  
 Start time (MST): 10:02 End time (MST): 11:10

Analyzer Make: API T640 S/N: 1547  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: DeltaCal S/N: 954  
 Temp/RH standard: DeltaCal S/N: 954

### Monthly Calibration Test

| Parameter  | As found | Measured | As left | Adjusted                 | (Limits)     |
|------------|----------|----------|---------|--------------------------|--------------|
| T (°C)     | -0.2     | -0.4     | -0.2    | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 710.8    | 707.4    | 710.8   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5        | 5.06     | 5       | <input type="checkbox"/> | +/- 0.25 LPM |

Leak Test: Date of check: March 29, 2023 Last Cal Date: February 8, 2023  
 PM w/o HEPA: 3.6 PM w/ HEPA: 0 <0.2 ug/m3

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

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter     | As found | Post maintenance | As left | Adjusted                            | (Limits)     |
|---------------|----------|------------------|---------|-------------------------------------|--------------|
| PMT Peak Test | 11.1     | 11.9             | 11      | <input checked="" type="checkbox"/> | 10.9 +/- 0.5 |

Post-maintenance leak check: PM w/o HEPA: 3.3 w/ HEPA: 0  
 Date Optical Chamber Cleaned: March 29, 2023 <0.2 ug/m3  
 Disposable Filter Changed: March 29, 2023

### Annual Maintenance

Date Sample Tube Cleaned: \_\_\_\_\_  
 Date RH/T Sensor Cleaned: \_\_\_\_\_

Notes: Adjustment made for PMT Peak Test. Inspect inlet head; relatively clean.

Calibration by: Denny Ray Estador



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS22  
JANVIER  
MARCH 2023**

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

April 29, 2023







# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

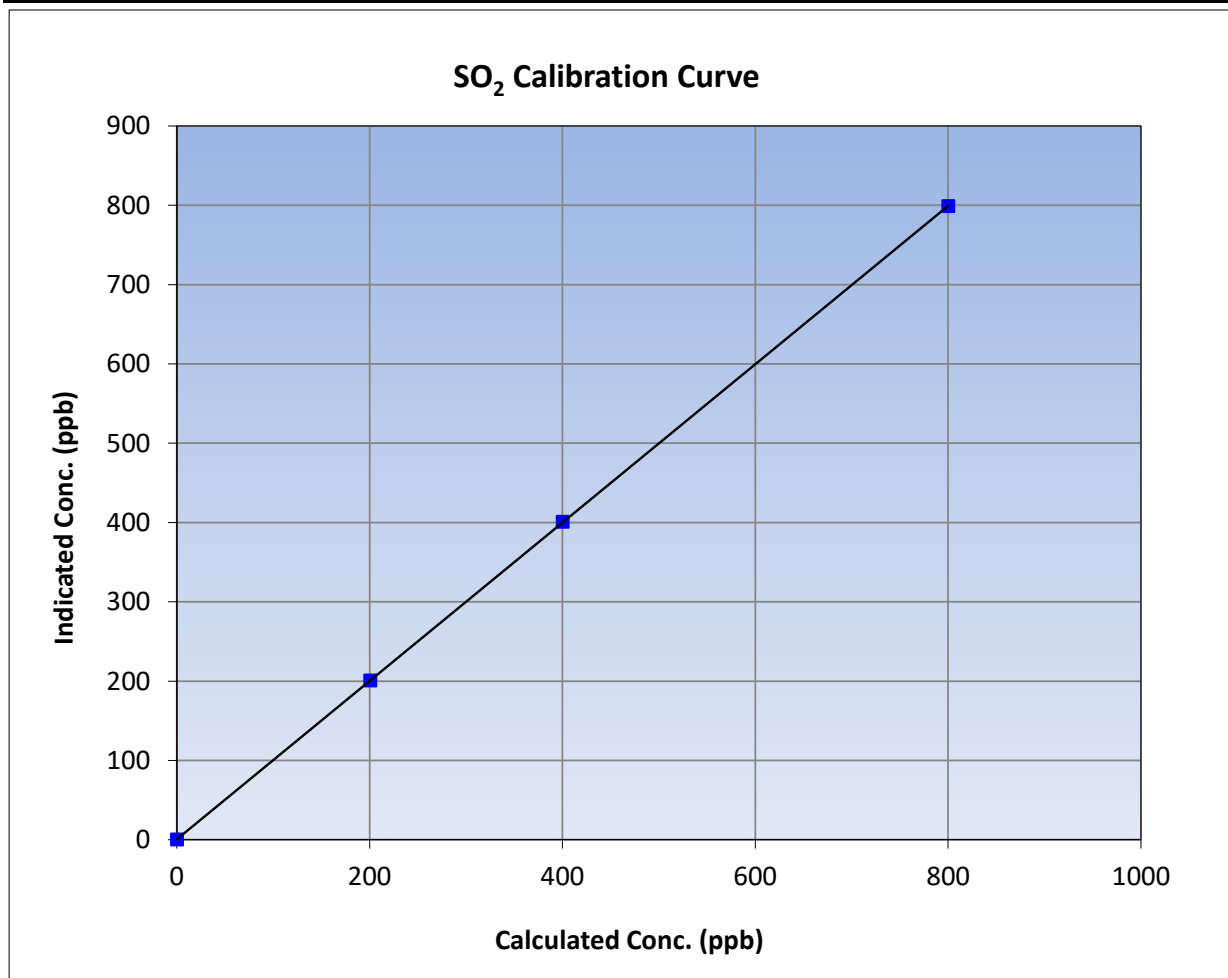
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 15, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Janvier        | Station Number:       | AMS 22            |
| Start Time (MST): | 10:37          | End Time (MST):       | 14:05             |
| Analyzer make:    | Thermo 43i     | Analyzer serial #:    | 1152430006        |

### Calibration Data

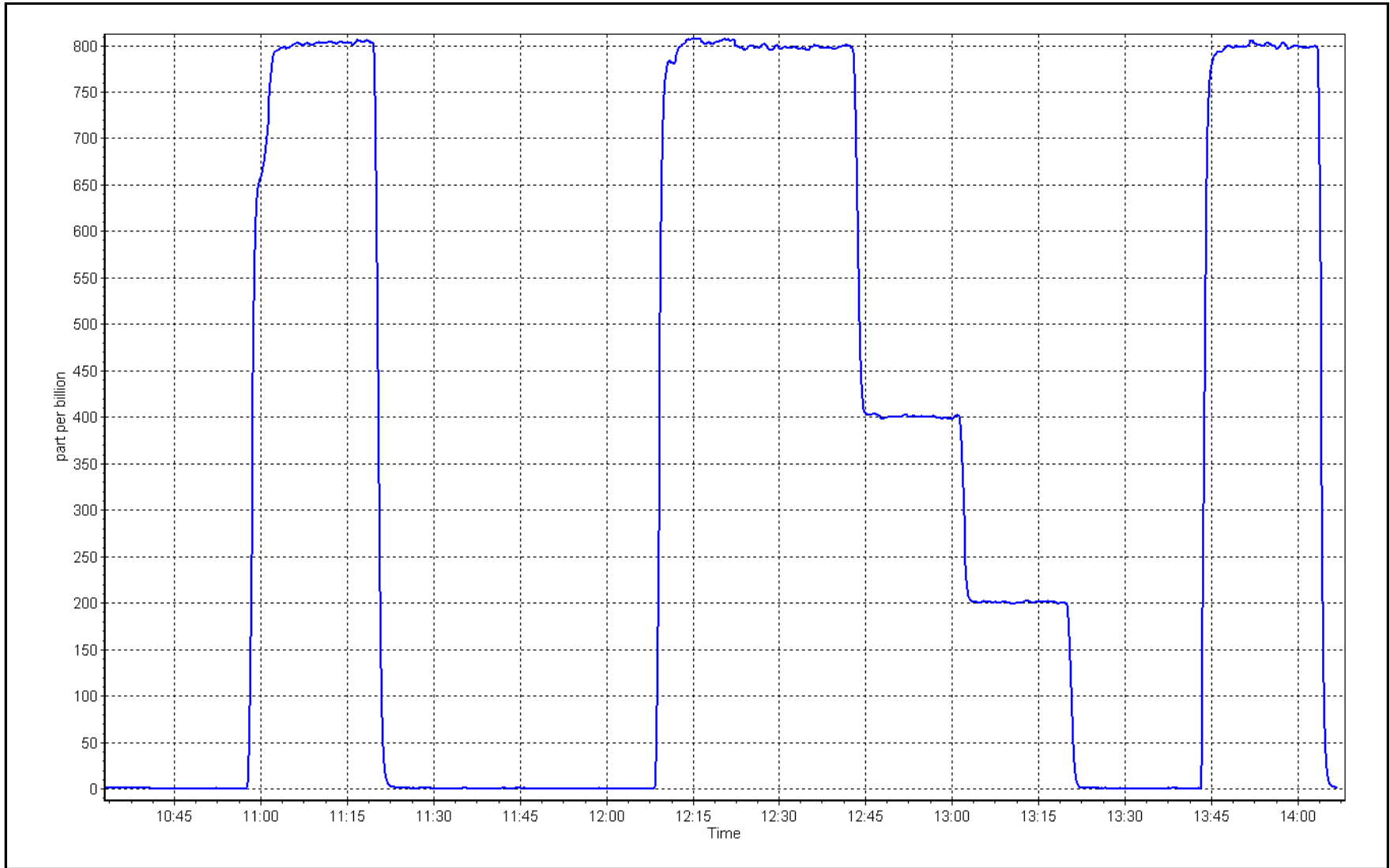
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.1                                   | ----                         | Correlation Coefficient | 0.999997      |             |
| 799.8                                  | 798.6                                 | 1.0015                       |                         |               | ≥0.995      |
| 399.9                                  | 400.6                                 | 0.9982                       | Slope                   | 0.998449      |             |
| 200.4                                  | 200.5                                 | 0.9997                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | 0.464715      | +/-30       |



SO2 Calibration Plot

Date: March 15, 2023

Location: Janvier





# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

Station Name: Janvier Station number: AMS22  
 Calibration Date: March 29, 2023 Last Cal Date: February 24, 2023  
 Start time (MST): 10:46 End time (MST): 15:08  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.03 ppm Cal Gas Exp Date: April 16, 2022  
 Cal Gas Cylinder #: DT0018680  
 Removed Cal Gas Conc: 5.03 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

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 1.002650     | 0.999222      | Backgd or Offset: | 3.56         | 3.50          |
| Calibration intercept: | 0.120931     | 0.140953      | Coeff or Slope:   | 1.239        | 1.220         |

### 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4920                          | 79.5                        | 80.0                                | 80.2                               | 0.999  |
| as found 2nd point    | 4960                          | 39.8                        | 40.0                                | 40.8                               | 0.984  |
| as found 3rd point    | 4980                          | 19.9                        | 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point                              | 4920                          | 79.5                        | 80.0                                | 80.0                               | 1.000   |
| second point                            | 4960                          | 39.8                        | 40.0                                | 40.3                               | 0.994   |
| third point                             | 4980                          | 19.9                        | 20.0                                | 20.1                               | 0.996   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| as left span                            | 4920                          | 79.5                        | 80.0                                | 79.9                               | 1.001   |
| SO2 Scrubber Check                      | 4920                          | 79.8                        | 798.0                               | 0.1                                | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    | 0.996   |
| Date of last converter efficiency test: |                               |                             |                                     | efficiency                         |   |

Baseline Corr As found: 80.1 Prev response: 80.32 \*% change: -0.3%  
 Baseline Corr 2nd AF pt: 40.7 AF Slope: 1.000369 AF Intercept: 0.400787  
 Baseline Corr 3rd AF pt: 20.5 AF Correlation: 0.999919

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

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

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## TRS Calibration Summary

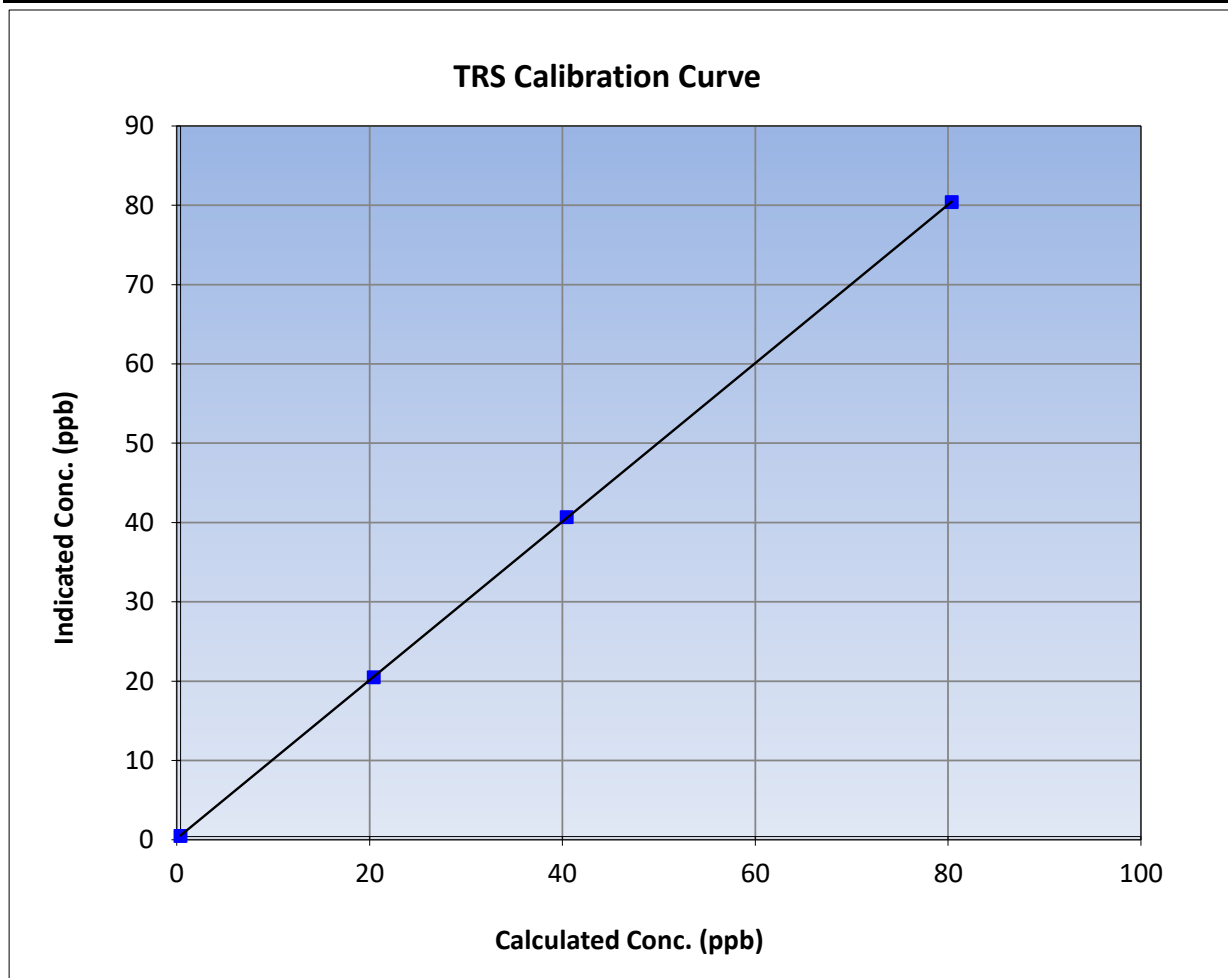
Version-11-2021

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 29, 2023 | Previous Calibration: | February 24, 2023 |
| Station Name:     | Janvier        | Station Number:       | AMS22             |
| Start Time (MST): | 10:46          | End Time (MST):       | 15:08             |
| Analyzer make:    | Thermo 43i-TLE | Analyzer serial #:    | 1151680031        |

### Calibration Data

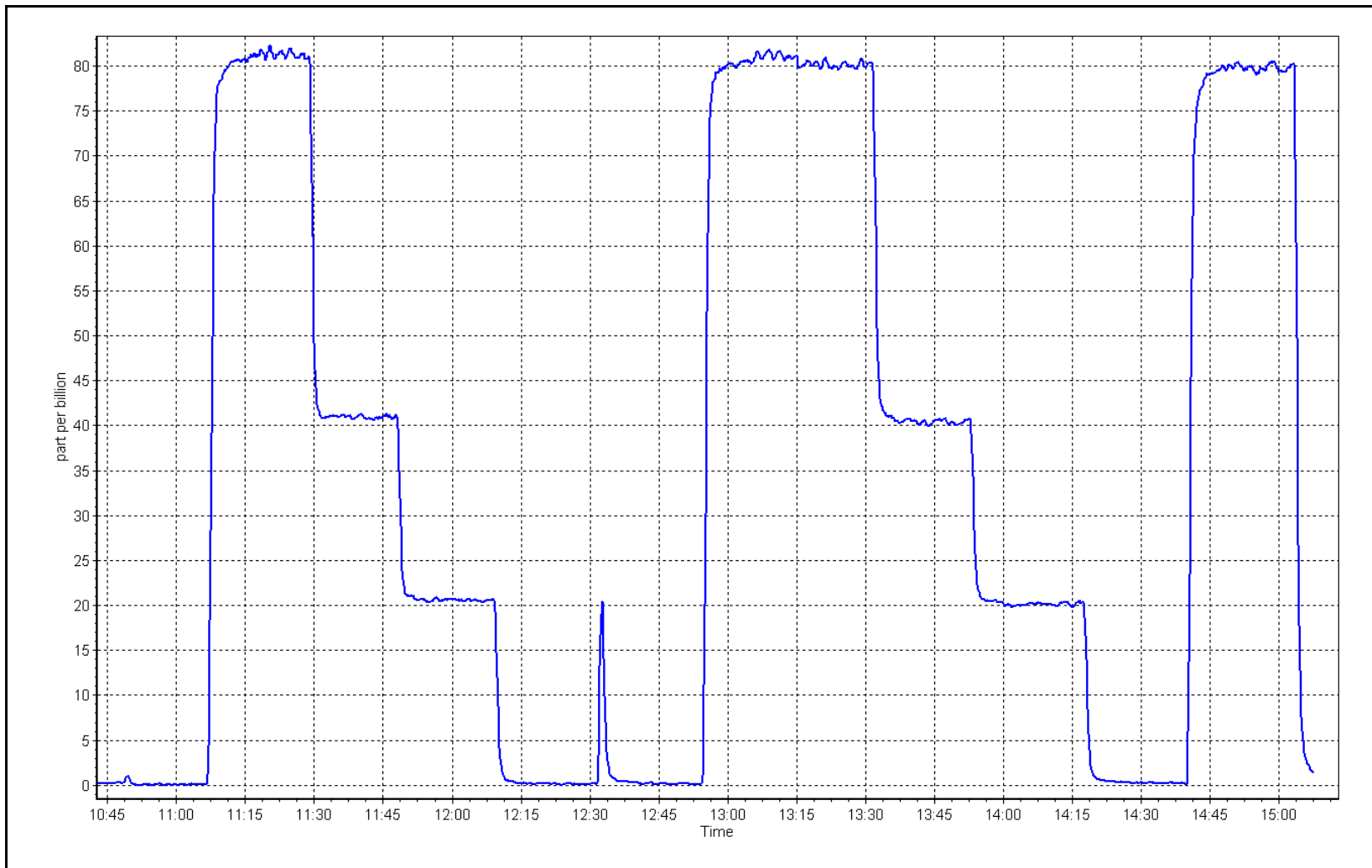
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | 0.999991 | ≥0.995      |
| 80.0                                | 80.0                               | 0.9998                    |                         |          |             |
| 40.0                                | 40.3                               | 0.9936                    | Slope                   | 0.999222 | 0.90 - 1.10 |
| 20.0                                | 20.1                               | 0.9960                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.140953 | +/-3        |



TRS Calibration Plot

Date: March 29, 2023

Location: Janvier





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                |                 |                   |
|-------------------|----------------|-----------------|-------------------|
| Station Name:     | Janvier        | Station number: | AMS 22            |
| Calibration Date: | March 15, 2023 | Last Cal Date:  | February 22, 2023 |
| Start time (MST): | 10:37          | End time (MST): | 14:05             |
| Reason:           | Routine        |                 |                   |

### Calibration Standards

|   |                  |                             |                  |
|---|------------------|-----------------------------|------------------|
| Gas Cert Reference:                         | CC281519         | Cal Gas Expiry Date:        | January 18, 2029 |
| CH <sub>4</sub> Cal Gas Conc.               | 502.8 ppm        | CH <sub>4</sub> Equiv Conc. | 1075.9 ppm       |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 208.4 ppm        |                             |                  |
| Removed Gas Cert:                           | N/A              | Removed Gas Expiry:         | N/A              |
| Removed CH <sub>4</sub> Conc.               | 502.8 ppm        | CH <sub>4</sub> Equiv Conc. | 1075.9 ppm       |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 208.4 ppm        | Diff between cyl (THC):     |                  |
| Diff between cyl (CH <sub>4</sub> ):        |                  | 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 #:           | 1172750023 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.180E-04    | 2.150E-04     | NMHC SP Ratio:  | 4.50E-05      |
| CH <sub>4</sub> Retention time: | 13.20        | 13.20         | NMHC Peak Area: | 203120        |
|                                 |              |               |                 | 202703        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| 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       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4920              | 79.8                 | 17.17                | 17.16               | 1.001                      |
| second point          | 4960              | 39.9                 | 8.59                 | 8.55                | 1.005                      |
| third point           | 4980              | 20.0                 | 4.30                 | 4.25                | 1.013                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4920              | 79.8                 | 17.17                | 17.25               | 0.996                      |

|                       |       |                 |       | Average Correction Factor                  | 1.006 |
|-----------------------|-------|-----------------|-------|--|-------|
| Baseline Corr AF:     | 17.43 | Prev response   | 17.21 | *% 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 79.8                 | 9.15                 | 9.40                                       | 0.974                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 79.8                 | 9.15                 | 9.10                                       | 1.005                      |
| second point              | 4960              | 39.9                 | 4.57                 | 4.55                                       | 1.006                      |
| third point               | 4980              | 20.0                 | 2.29                 | 2.26                                       | 1.013                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 79.8                 | 9.15                 | 9.16                                       | 0.999                      |
| Average Correction Factor |                   |                      |                      |  | 1.008                      |
| Baseline Corr AF:         | 9.40              | Prev response        | 9.17                 | *% change                                  | 2.4%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 79.8                 | 8.03                 | 8.04                                       | 0.999                      |
| 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                 | 8.06                                       | 0.996                      |
| second point              | 4960              | 39.9                 | 4.01                 | 4.00                                       | 1.003                      |
| third point               | 4980              | 20.0                 | 2.01                 | 1.99                                       | 1.013                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 79.8                 | 8.03                 | 8.09                                       | 0.992                      |
| Average Correction Factor |                   |                      |                      |  | 1.004                      |
| Baseline Corr AF:         | 8.04              | Prev response        | 8.05                 | *% 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

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.003856     | 1.000168      |
| THC Cal Offset:             | -0.027606    | -0.027388     |
| CH <sub>4</sub> Cal Slope:  | 1.004586     | 1.005284      |
| CH <sub>4</sub> Cal Offset: | -0.017766    | -0.018965     |
| NMHC Cal Slope:             | 1.003078     | 0.995905      |
| NMHC Cal Offset:            | -0.009039    | -0.008823     |

Notes: Changed the inlet filter and H<sub>2</sub>/N<sub>2</sub> cylinders after as founds. Adjusted span only.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## THC Calibration Summary

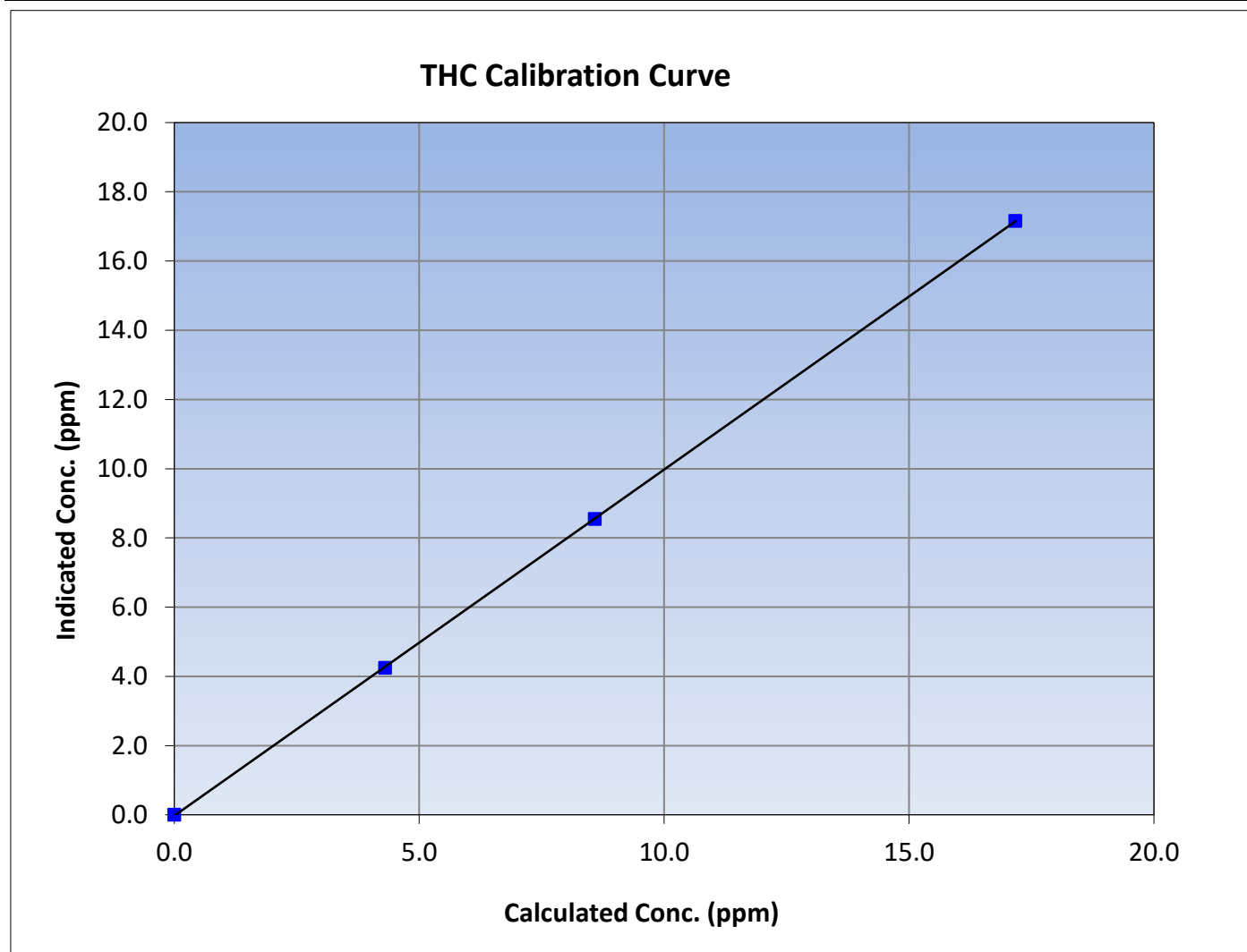
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 15, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Janvier        | Station Number:       | AMS 22            |
| Start Time (MST): | 10:37          | End Time (MST):       | 14:05             |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1172750023        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999988  | $\geq 0.995$  |       |          |             |
| 17.17                               | 17.16                              | 1.0006                    |                         |           |               |       |          |             |
| 8.59                                | 8.55                               | 1.0045                    |                         |           |               | Slope | 1.000168 | 0.90 - 1.10 |
| 4.30                                | 4.25                               | 1.0129                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.027388 | $\pm 0.5$     |       |          |             |







# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

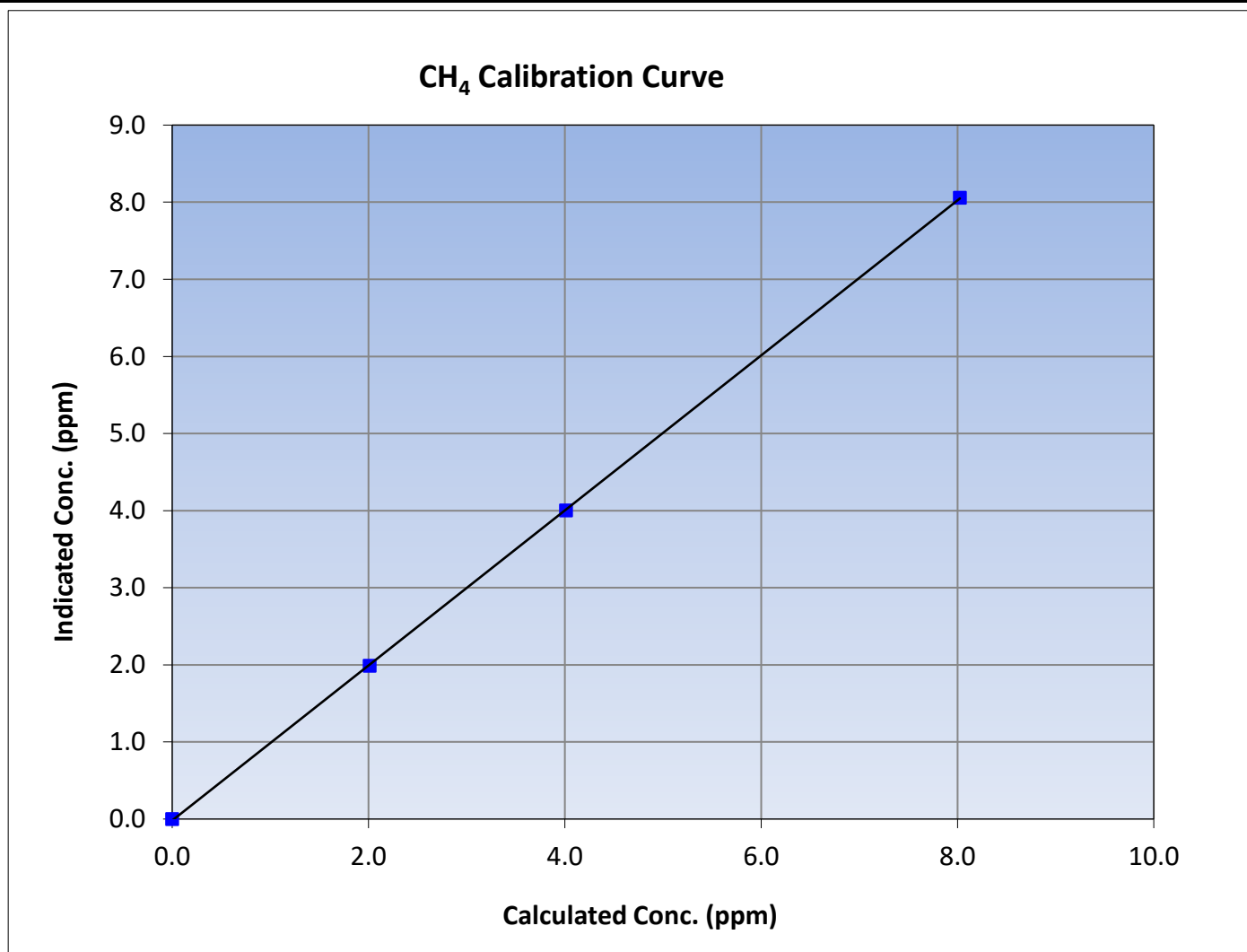
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 15, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Janvier        | Station Number:       | AMS 22            |
| Start Time (MST): | 10:37          | End Time (MST):       | 14:05             |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1172750023        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999974  | ≥0.995        |       |          |             |
| 8.03                                | 8.06                               | 0.9958                    |                         |           |               |       |          |             |
| 4.01                                | 4.00                               | 1.0026                    |                         |           |               | Slope | 1.005284 | 0.90 - 1.10 |
| 2.01                                | 1.99                               | 1.0127                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.018965 | +/-0.5        |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

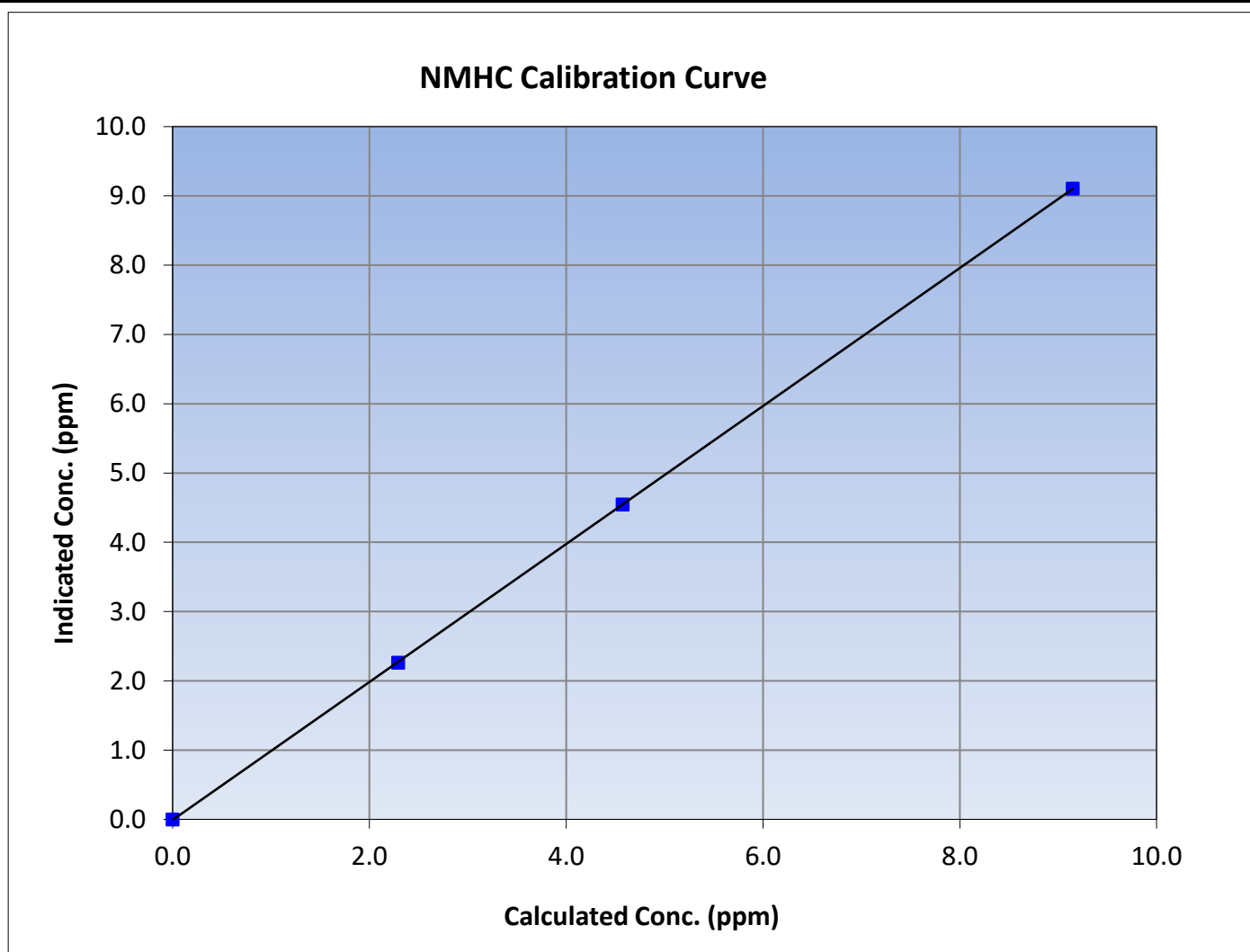
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 15, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Janvier        | Station Number:       | AMS 22            |
| Start Time (MST): | 10:37          | End Time (MST):       | 14:05             |
| Analyzer make:    | Thermo 55i     | Analyzer serial #:    | 1172750023        |

### Calibration Data

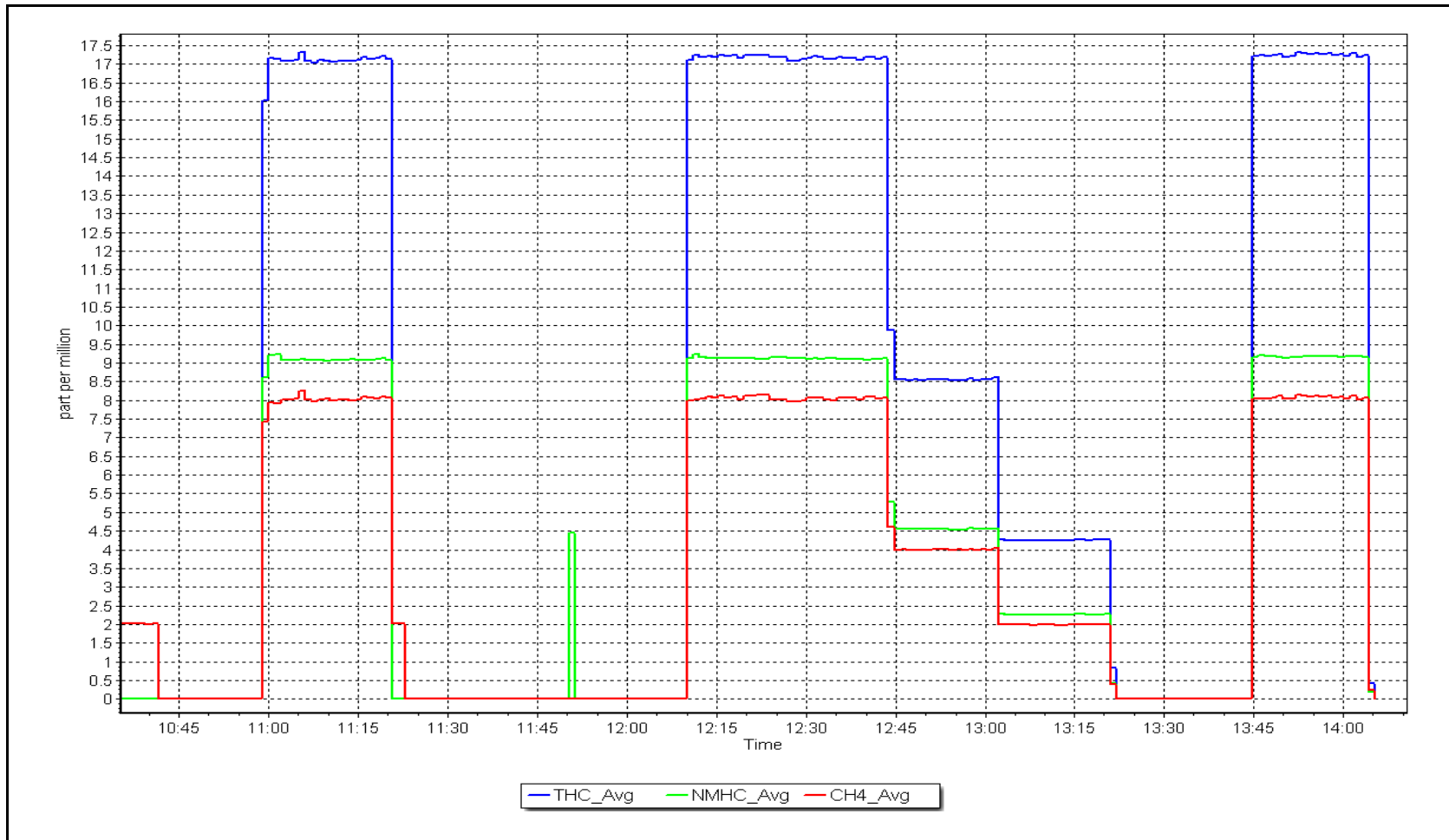
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999995  | $\geq 0.995$  |       |          |             |
| 9.15                                | 9.10                               | 1.0047                    |                         |           |               |       |          |             |
| 4.57                                | 4.55                               | 1.0063                    |                         |           |               | Slope | 0.995905 | 0.90 - 1.10 |
| 2.29                                | 2.26                               | 1.0130                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.008823 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: March 15, 2023

Location: Janvier





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Janvier Station number: AMS 22  
Calibration Date: March 9, 2023 Last Cal Date: February 23, 2023  
Start time (MST): 12:20 End time (MST): 17:03  
Reason: Routine

### Calibration Standards

NO Gas Cylinder #: CC424183 Cal Gas Expiry Date: April 16, 2023  
NOX Cal Gas Conc: 48.60 ppm NO Cal Gas Conc: 48.60 ppm  
Removed Cylinder #: NA Removed Gas Exp Date: NA  
Removed Gas NOX Conc: 48.60 ppm Removed Gas NO Conc: 48.60 ppm  
NOX gas Diff: NO gas Diff:  
Calibrator Model: Teledyne API T700 Serial Number: 3806  
ZAG make/model: Teledyne API T701 Serial Number: 4890

### Analyzer Information

Analyzer make: Teledyne API T200 Analyzer serial #: 7117  
NOX Range (ppb): 0 - 1000 ppb

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.019        | 1.019         | NO bkgnd or offset:  | -0.3         | -0.3          |
| NOX coeff or slope: | 1.009        | 1.009         | NOX bkgnd or offset: | 0.4          | 0.4           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 5.1          | 5.1           |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.000016     | 1.001316      |
| NO <sub>x</sub> Cal Offset: | 0.328470     | 0.648371      |
| NO Cal Slope:               | 0.999486     | 1.001644      |
| NO Cal Offset:              | -0.011076    | 0.008462      |
| NO <sub>2</sub> Cal Slope:  | 0.999574     | 1.000730      |
| NO <sub>2</sub> Cal Offset: | 0.324675     | 0.876715      |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.0                                   | 0.0  | ----  | ----   |
| as found span             | 4918                      | 82.3                        | 799.9   | 799.9                                  | 0.0   | 798.3  | 796.4                                 | 1.9  | 1.0020  | 1.0044   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.2                                   | -0.2   | ----  | ----   |
| high point                | 4918                      | 82.3                        | 799.9   | 799.9                                  | 0.0   | 801.4  | 801.2                                 | 0.2  | 0.9981  | 0.9984   |
| second point              | 4959                      | 41.2                        | 400.4   | 400.4                                  | 0.0   | 401.6  | 401.4                                 | 0.2  | 0.9971  | 0.9976   |
| third point               | 4980                      | 20.6                        | 200.2   | 200.2                                  | 0.0   | 202.0  | 200.1                                 | 1.9  | 0.9911  | 1.0005   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.2                                   | -0.2   | ----  | ----   |
| as left span              | 4918                      | 82.3                        | 799.9   | 408.7                                  | 391.2   | 800.6  | 417.0                                 | 383.6  | 0.9991  | 0.9801   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9955  | 0.9989   |

|                      |                             |                |  |                                  |                         |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|
| Corrected As found   | NO <sub>x</sub> = 798.3 ppb | NO = 796.4 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -0.2% |
| Previous Response    | NO <sub>x</sub> = 800.2 ppb | NO = 799.5 ppb |  | *Percent Change                  | NO = -0.4%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 800.5                                      | 409.3                                 | 391.2   | 391.9  | 0.9982   | 100.2%   |
| 2nd GPT point (200 ppb O3)       | 800.5                                      | 608.6                                 | 191.9   | 193.3  | 0.9928   | 100.7%   |
| 3rd GPT point (100 ppb O3)       | 800.5                                      | 707.7                                 | 92.8  | 94.9   | 0.9779   | 102.3%   |
| Average Correction Factor        |  |                                       |   |  | 0.9896   | 101.1%   |

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

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

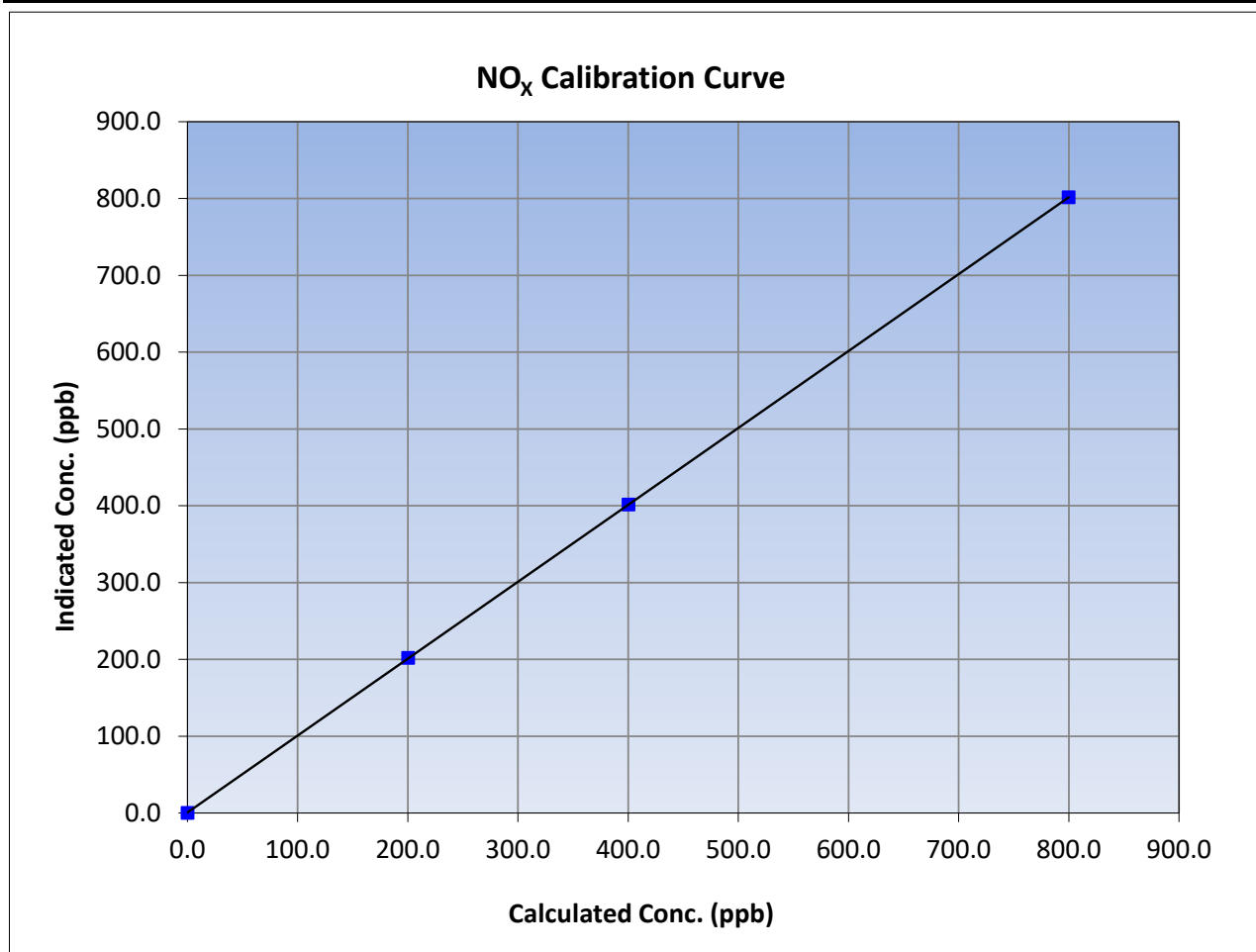
Version-04-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 9, 2023     | Previous Calibration: | February 23, 2023 |
| Station Name:     | Janvier           | Station Number:       | AMS 22            |
| Start Time (MST): | 12:20             | End Time (MST):       | 17:03             |
| Analyzer make:    | Teledyne API T200 | Analyzer serial #:    | 7117              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 799.9                               | 801.4                              | 0.9981                    |   |                                |
| 400.4                               | 401.6                              | 0.9971                    |   |                                |
| 200.2                               | 202.0                              | 0.9911                    |   |                                |
|                                     |                                    |                           |   |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

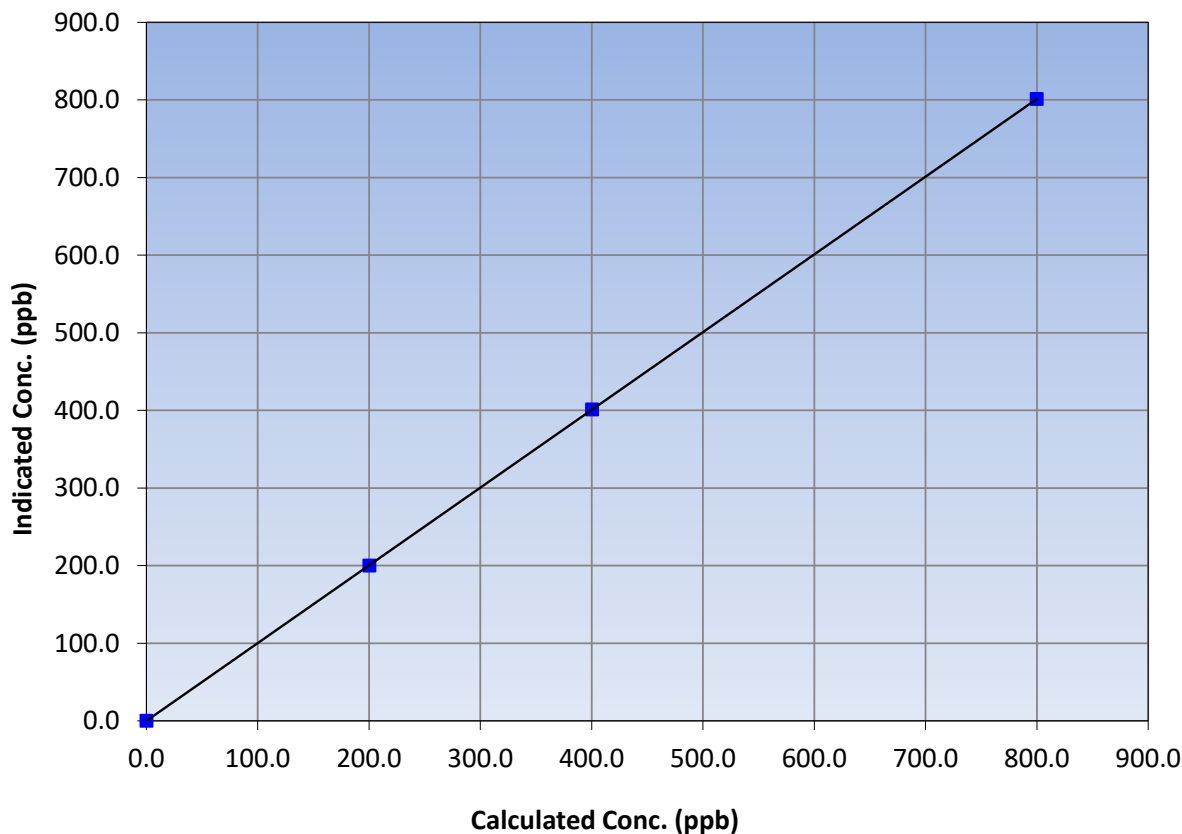
### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 9, 2023     | Previous Calibration: | February 23, 2023 |
| Station Name:     | Janvier           | Station Number:       | AMS 22            |
| Start Time (MST): | 12:20             | End Time (MST):       | 17:03             |
| Analyzer make:    | Teledyne API T200 | Analyzer serial #:    | 7117              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | ≥0.995   |             |
| 799.9                               | 801.2                              | 0.9984                    |                         |          |             |
| 400.4                               | 401.4                              | 0.9976                    |                         |          |             |
| 200.2                               | 200.1                              | 1.0005                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 1.001644 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.008462 | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

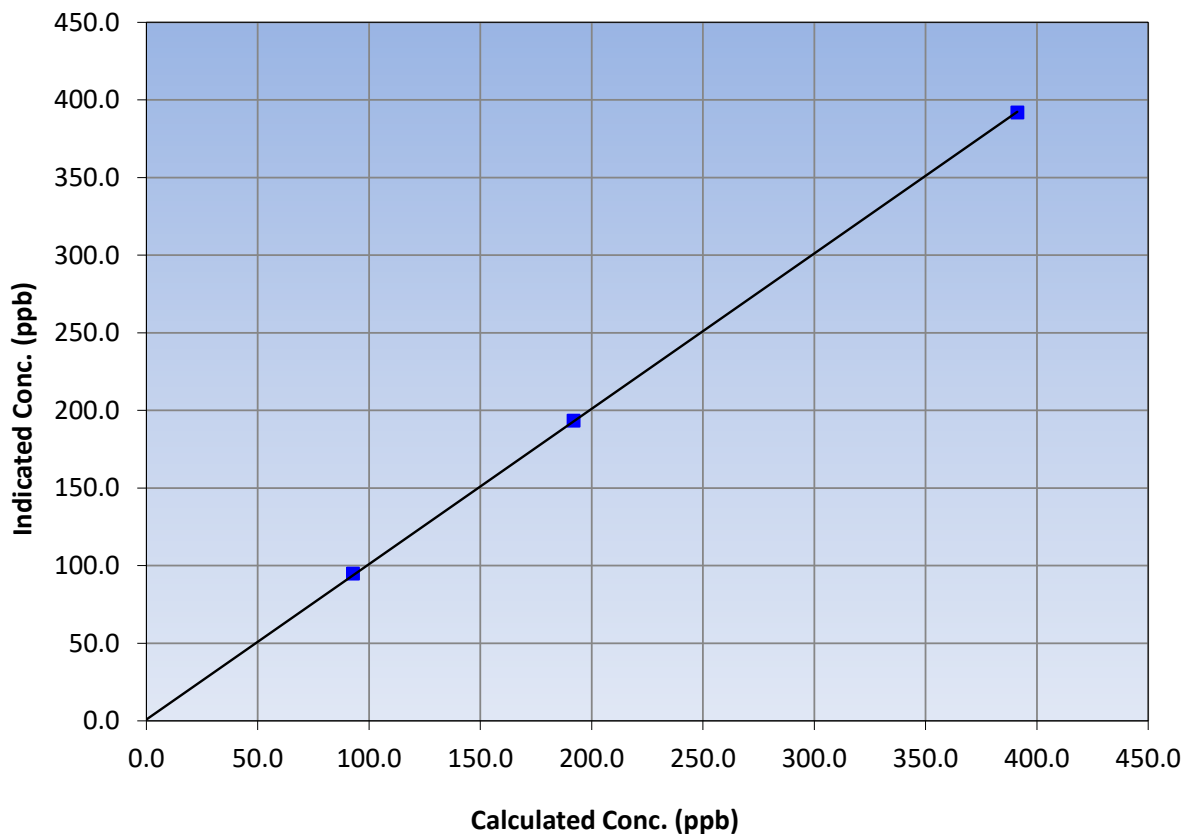
### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 9, 2023     | Previous Calibration: | February 23, 2023 |
| Station Name:     | Janvier           | Station Number:       | AMS 22            |
| Start Time (MST): | 12:20             | End Time (MST):       | 17:03             |
| Analyzer make:    | Teledyne API T200 | Analyzer serial #:    | 7117              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | -0.2                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 391.2                               | 391.9                              | 0.9982                    |   |                                |
| 191.9                               | 193.3                              | 0.9928                    |   |                                |
| 92.8                                | 94.9                               | 0.9779                    |   |                                |
|                                     |                                    |                           | 0.999966                                      |                                |
|                                     |                                    |                           | 1.000730                                      |                                |
|                                     |                                    |                           | 0.876715                                      |                                |

**NO<sub>2</sub> Calibration Curve**

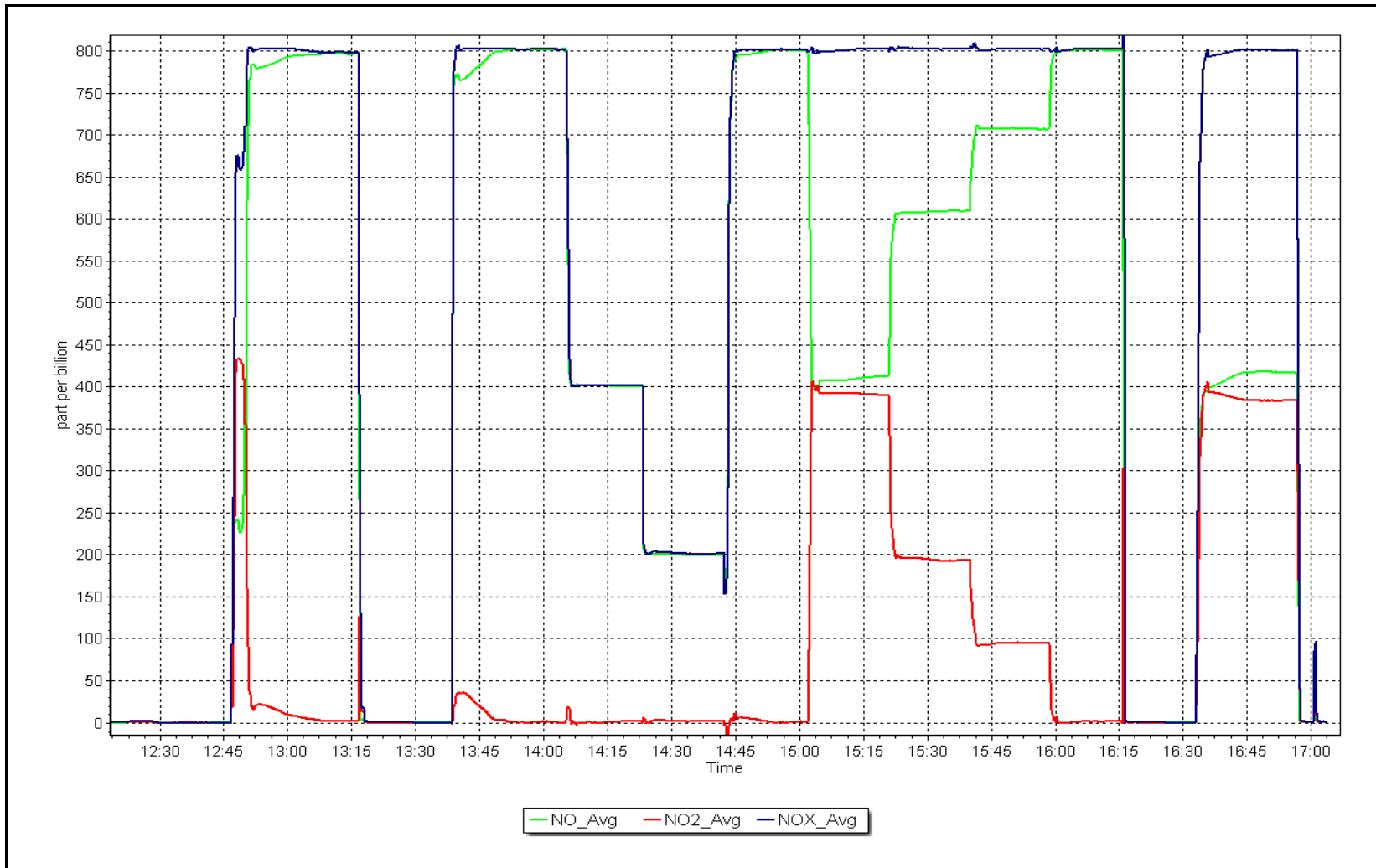




NO<sub>x</sub> Calibration Plot

Date: March 9, 2023

Location: Janvier





# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Janvier Station number: AMS 22  
 Calibration Date: March 28, 2023 Last Cal Date: February 14, 2023  
 Start time (MST): 10:33 End time (MST): 13:26  
 Reason: Routine

### Calibration Standards

O3 generation mode: Photometer  
 Calibrator Make/Model: Teledyne API T700 Serial Number: 3806  
 ZAG Make/Model: Teledyne API T701 Serial Number: 201

### Analyzer Information

Analyzer make: Teledyne API T400 Analyzer serial #: 3869  
 Analyzer Range 0 - 500 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 1.000057     | 1.000429      | Backgd or Offset: | -2.0         | -2.0          |
| Calibration intercept: | 0.440000     | 0.000000      | Coeff or Slope:   | 1.011        | 1.011         |

### O<sub>3</sub> 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                       | 800.0                         | 0.0                                 | -0.1                               | ----  |
| as found span             | 4893                       | 899.1                         | 400.0                               | 399.3                              | 1.002   |
| as found 2nd point        |                            |                               |                                     |                                    |   |
| as found 3rd point        |                            |                               |                                     |                                    |   |
| calibrator zero           | 5000                       | 800.0                         | 0.0                                 | 0.2                                | ----  |
| high point                | 4893                       | 899.1                         | 400.0                               | 400.3                              | 0.999   |
| second point              | 4893                       | 753.4                         | 200.0                               | 199.9                              | 1.001   |
| third point               | 4893                       | 655.7                         | 100.0                               | 99.9                               | 1.001   |
| as left zero              | 5000                       | 800.0                         | 0.0                                 | 0.1                                | ----  |
| as left span              | 4816                       | 899.1                         | 400.0                               | 401.0                              | 0.998   |
| Average Correction Factor |                            |                               |                                     |                                    | 1.000   |

|                          |       |                   |       |               |       |
|--------------------------|-------|-------------------|-------|---------------|-------|
| Baseline Corr As found:  | 399.4 | Previous response | 400.5 | *% 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

## O<sub>3</sub> Calibration Summary

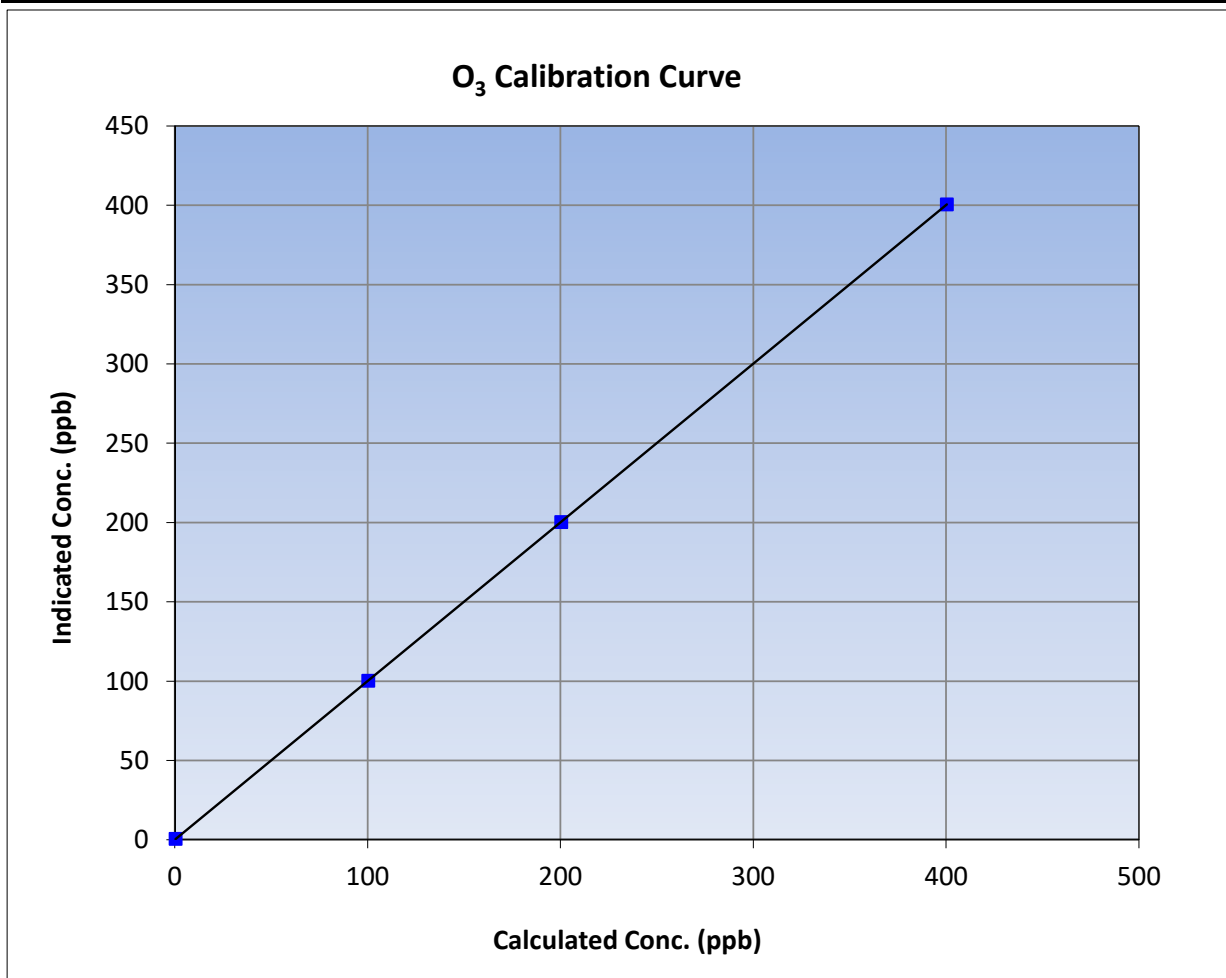
Version-01-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | March 28, 2023    | Previous Calibration: | February 14, 2023 |
| Station Name:     | Janvier           | Station Number:       | AMS 22            |
| Start Time (MST): | 10:33             | End Time (MST):       | 13:26             |
| Analyzer make:    | Teledyne API T400 | Analyzer serial #:    | 3869              |

### Calibration Data

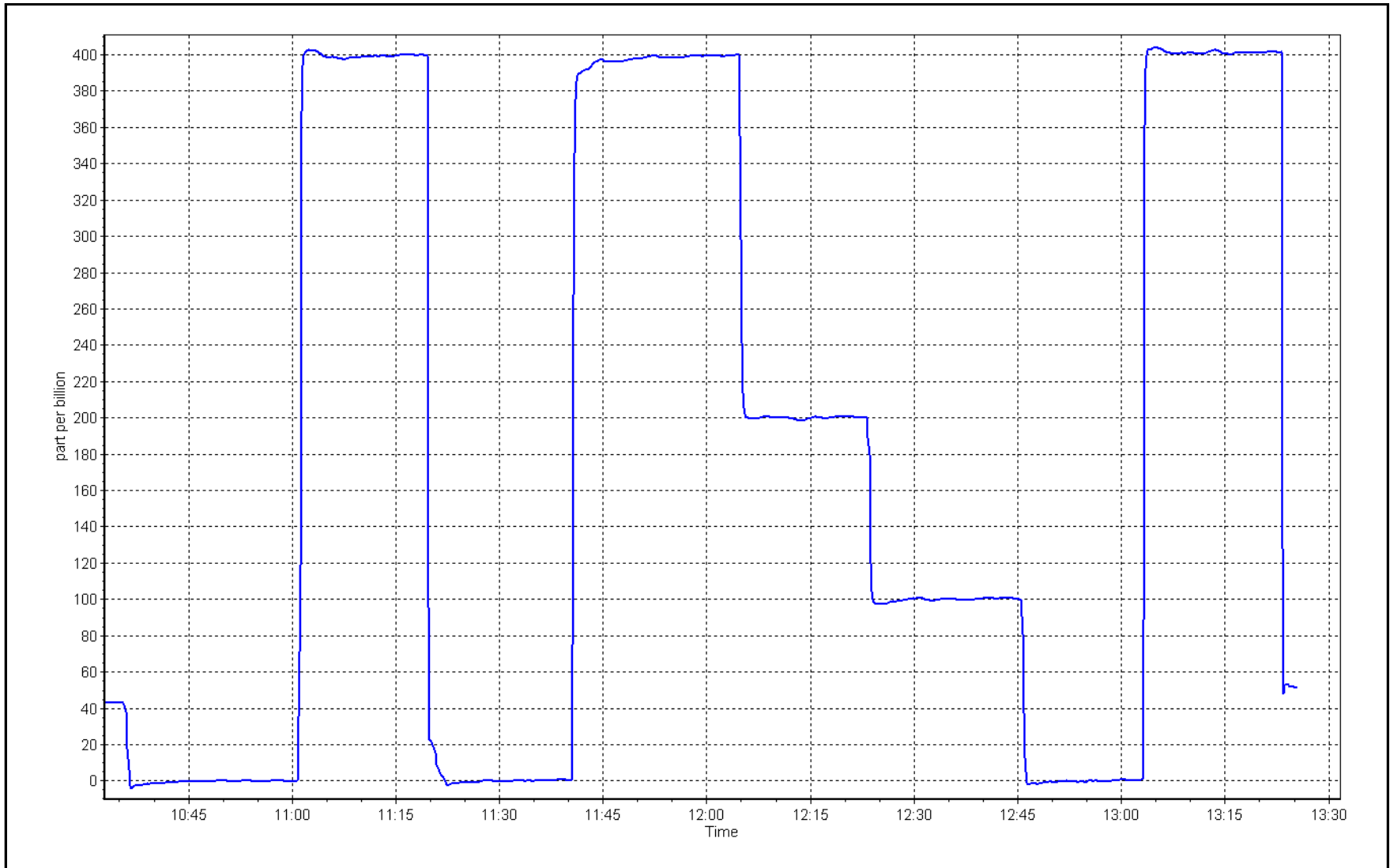
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999999 |             |
| 400.0                               | 400.3                              | 0.9993                    |                         |          | ≥0.995      |
| 200.0                               | 199.9                              | 1.0005                    | Slope                   | 1.000429 |             |
| 100.0                               | 99.9                               | 1.0010                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.000000 | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: March 28, 2023

Location: Janvier





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Janvier Station number: AMS 22  
 Calibration Date: March 29, 2023 Last Cal Date: February 24, 2023  
 Start time (MST): 12:11 End time (MST): 13:33

Analyzer Make: Teledyne API T640 S/N: 325  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Delta Cal S/N: 1450  
 Temp/RH standard: Delta Cal S/N: 1450

### Monthly Calibration Test

| Parameter  | As found | Measured | As left | Adjusted                 | (Limits)     |
|------------|----------|----------|---------|--------------------------|--------------|
| T (°C)     | 0.6      | 0        | 0.6     | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 716.4    | 714.9    | 716.4   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.01     | 4.88     | 5.01    | <input type="checkbox"/> | +/- 0.25 LPM |

Leak Test: Date of check: March 29, 2023 Last Cal Date: February 24, 2023  
 PM w/o HEPA: 3 PM w/ HEPA: 0 <0.2 ug/m3

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

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter     | As found | Post maintenance | As left | Adjusted                 | (Limits)     |
|---------------|----------|------------------|---------|--------------------------|--------------|
| PMT Peak Test |          |                  |         | <input type="checkbox"/> | 11.3 +/- 0.5 |

Post-maintenance leak check: PM w/o HEPA: \_\_\_\_\_ w/ HEPA: \_\_\_\_\_  
 Date Optical Chamber Cleaned: January 26, 2023 <0.2 ug/m3  
 Disposable Filter Changed: January 26, 2023

### Annual Maintenance

Date Sample Tube Cleaned: October 6, 2022  
 Date RH/T Sensor Cleaned: October 6, 2022

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

Calibration by: Rene Chamberland



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS23 FORT HILLS MARCH 2023**

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

April 29, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

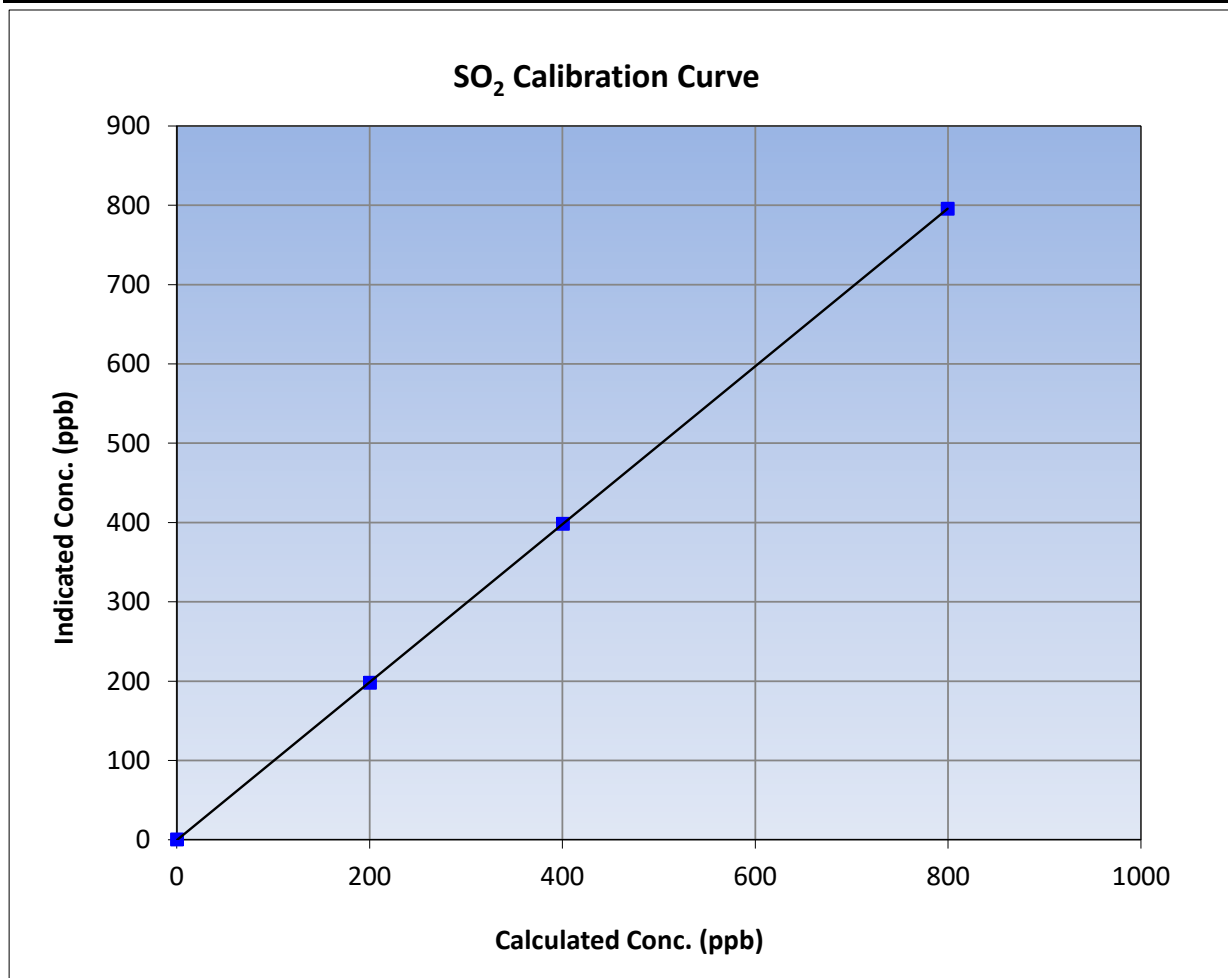
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 2, 2023 | Previous Calibration: | February 1, 2023 |
| Station Name:     | Fort Hills    | Station Number:       | AMS23            |
| Start Time (MST): | 11:31         | End Time (MST):       | 14:55            |
| Analyzer make:    | Thermo 43i    | Analyzer serial #:    | 1160290012       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999994  | ≥0.995      |
| 799.1                               | 795.5                              | 1.0045                    |                         |           |             |
| 400.1                               | 398.0                              | 1.0052                    | Slope                   | 0.995960  | 0.90 - 1.10 |
| 200.0                               | 197.5                              | 1.0128                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -0.582785 | +/-30       |

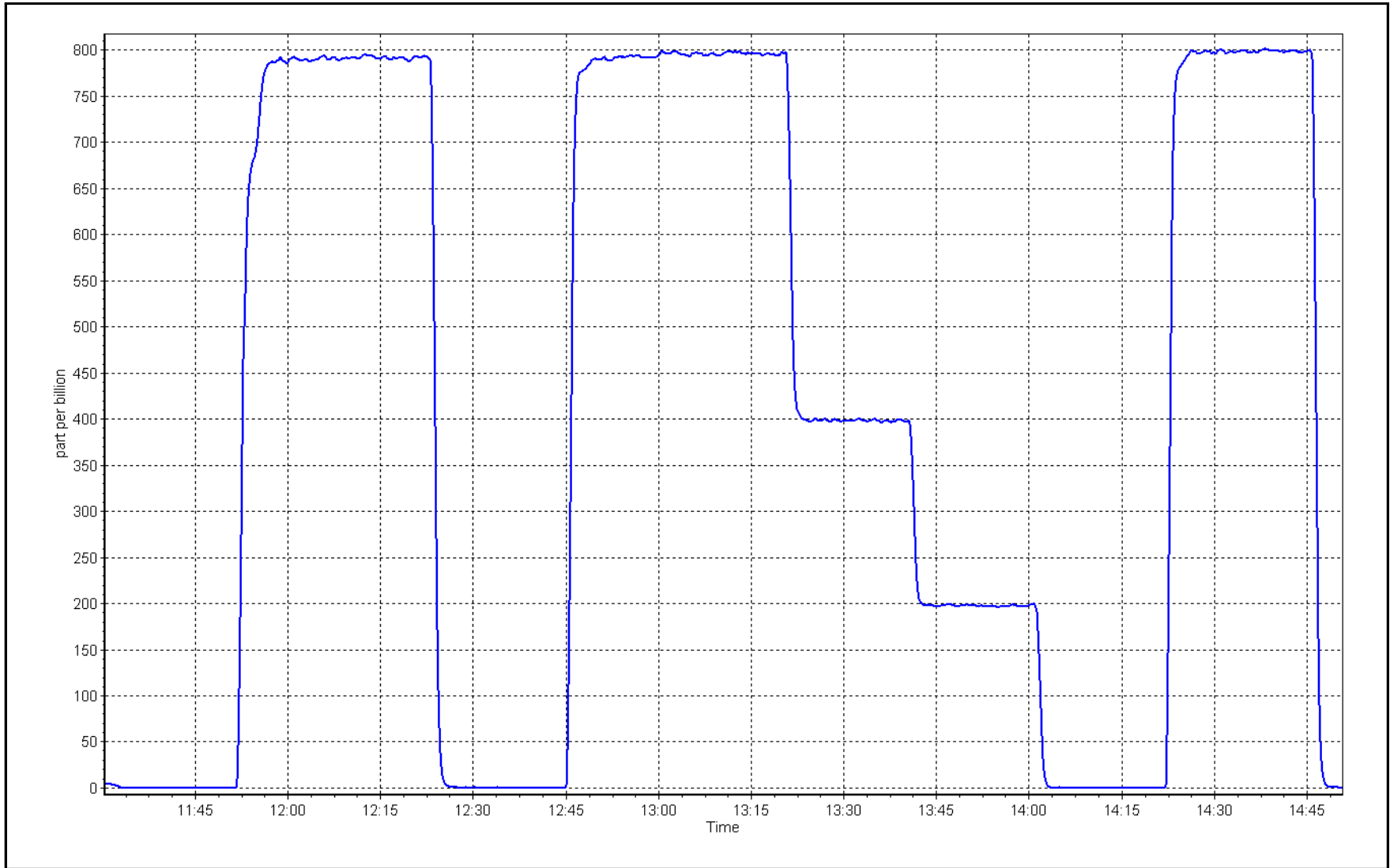




SO2 Calibration Plot

Date: March 2, 2023

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 17, 2023 | Last Cal Date:  | February 14, 2023 |
| Start time (MST): | 9:03           | End time (MST): | 12:00             |
| Reason:           | Removal        |                 |                   |

### 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 43iQ TLE | Analyzer serial #:  | 12113311965 |
| Converter make: | CDN-101         | Converter serial #: | 594         |
| Analyzer Range  | 0 - 100 ppb     |                     |             |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.004890     |               | Backgd or Offset: | 0.96         | N/A           |
| Calibration intercept: | -0.158196    |               | Coeff or Slope:   | 0.714        | N/A           |

### TRS As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----   |
| as found span         | 4923                          | 77.0                        | 80.0                                | 80.2                               | 1.000  |
| as found 2nd point    | 4962                          | 38.5                        | 40.0                                | 40.1                               | 1.002  |
| as found 3rd point    | 4981                          | 19.2                        | 19.9                                | 19.9                               | 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         |                               |                             |                                     |                                    |   |
| high point                              |                               |                             |                                     |                                    |   |
| second point                            |                               |                             |                                     |                                    |   |
| third point                             |                               |                             |                                     |                                    |   |
| as left zero                            |                               |                             |                                     |                                    |   |
| as left span                            |                               |                             |                                     |                                    |   |
| SO2 Scrubber Check                      | 4922                          | 78.3                        | 783.0                               |                                    | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    |   |
| Date of last converter efficiency test: |                               |                             |                                     |                                    | efficiency  |
| Baseline Corr As found:                 | 80.0                          | Prev response:              | 80.24                               | *% change:                         | -0.3%   |
| Baseline Corr 2nd AF pt:                | 39.9                          | AF Slope:                   | 1.000887                            | AF Intercept:                      | 0.081840  |
| Baseline Corr 3rd AF pt:                | 19.7                          | AF Correlation:             | 0.999989                            |                                    |   |

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

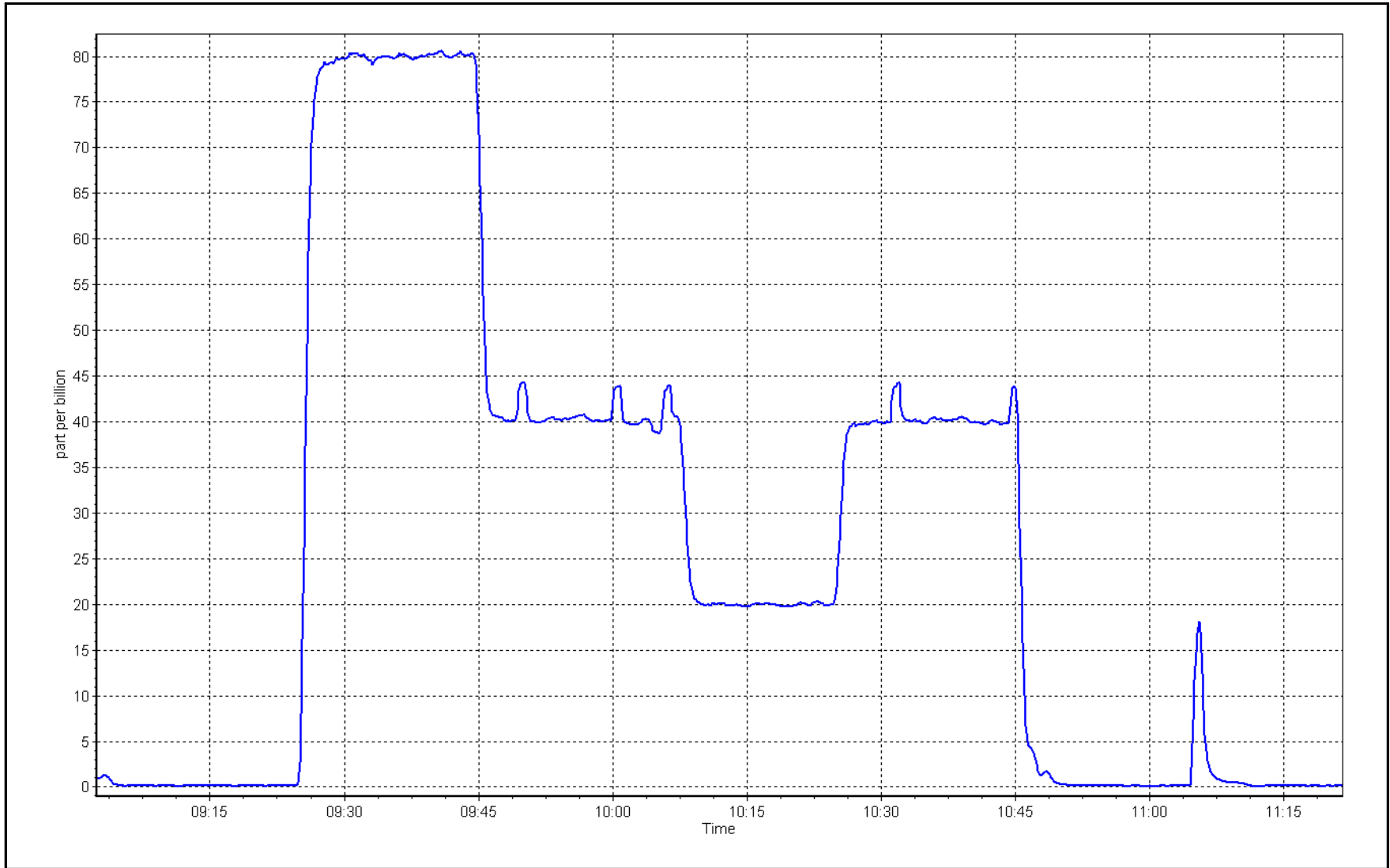
Notes: Pump flow on the instrument is dropping and the readings spiking during the drop, changed the pump and still getting the same problem, removing the instrument to replace it with a new one.

Calibration Performed By: Max Farrell

TRS Calibration Plot

Date: March 17, 2023

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 17, 2023 | Last Cal Date:  | February 14, 2023 |
| Start time (MST): | 14:30          | End time (MST): | 18:56             |
| Reason:           | Install        |                 |                   |

### 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 43iQ TLE | Analyzer serial #:  | 1300156232 |
| Converter make: | CDN-101         | Converter serial #: | 594        |
| Analyzer Range  | 0 - 100 ppb     |                     |            |

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|---------------|
| Calibration slope:     |              | 0.998462      | Backgd or Offset: | 1.75          |
| Calibration intercept: |              | -0.258331     | Coeff or Slope:   | 1.031         |

### 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         |                               |                             |                                     |                                    |  |
| as found span         |                               |                             |                                     |                                    |  |
| as found 2nd point    |                               |                             |                                     |                                    |  |
| as found 3rd point    |                               |                             |                                     |                                    |  |
| 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)<br><i>Limit = 0.95-1.05</i> |
|-----------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point      | 4923                          | 77.0                        | 80.0                                | 79.8                               | 1.003   |
| second point    | 4962                          | 38.5                        | 40.0                                | 39.5                               | 1.013   |
| third point     | 4981                          | 19.2                        | 19.9                                | 19.3                               | 1.034   |
| as left zero    | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span    | 4923                          | 77.0                        | 80.0                                | 79.0                               | 1.013   |

#### SO2 Scrubber Check

|   |                 |       |
|---|-----------------|-------|
| Date of last scrubber change:           | Ave Corr Factor | 1.016 |
| 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: Installing a new green tagged TRS due to noise issues. Scrubber test was completed earlier today.  
Adjusted the span only.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## TRS Calibration Summary

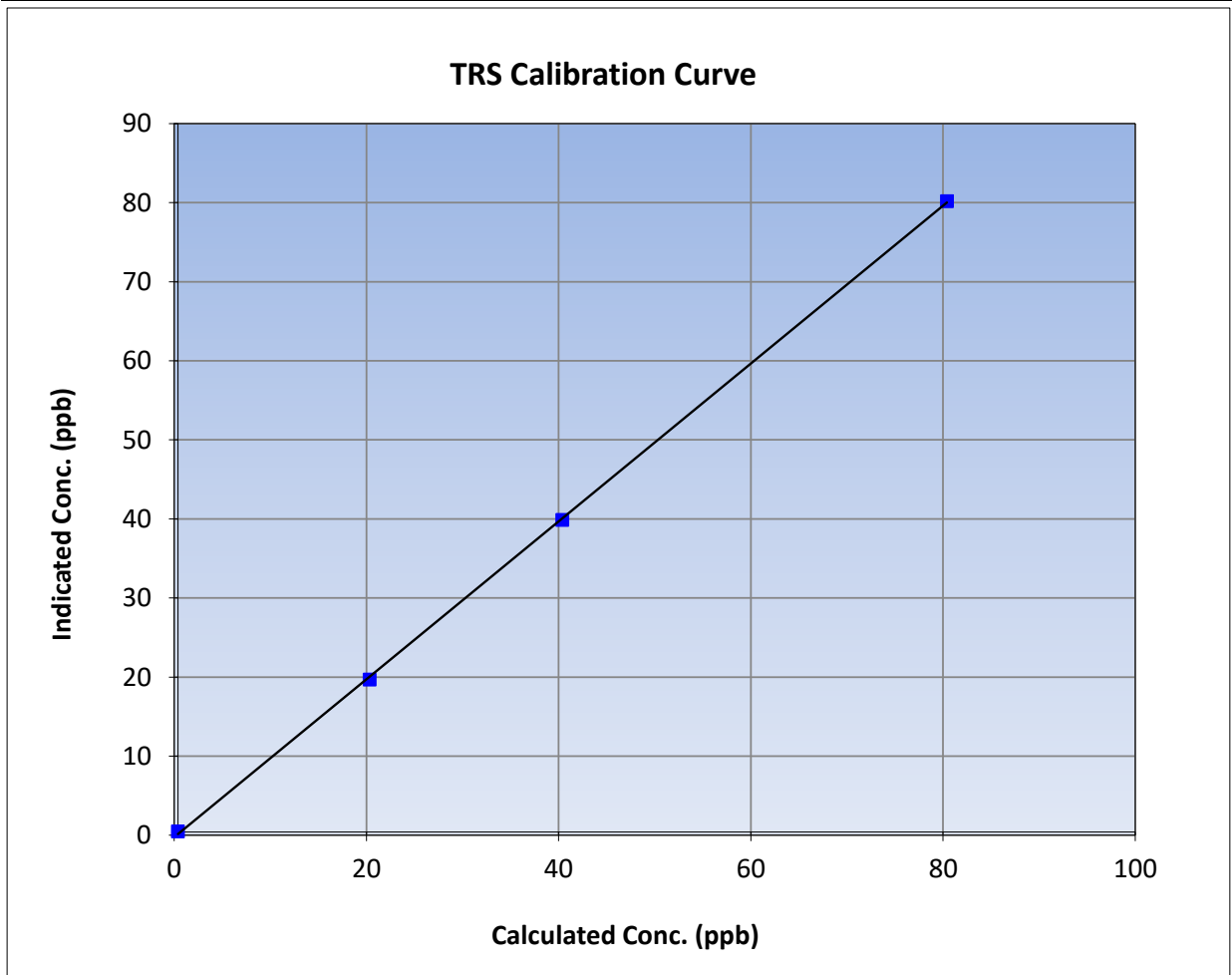
Version-11-2021

### Station Information

|                   |                 |                       |                   |
|-------------------|-----------------|-----------------------|-------------------|
| Calibration Date: | March 17, 2023  | Previous Calibration: | February 14, 2023 |
| Station Name:     | Fort Hills      | Station Number:       | AMS23             |
| Start Time (MST): | 14:30           | End Time (MST):       | 18:56             |
| Analyzer make:    | Thermo 43iQ TLE | Analyzer serial #:    | 1300156232        |

### Calibration Data

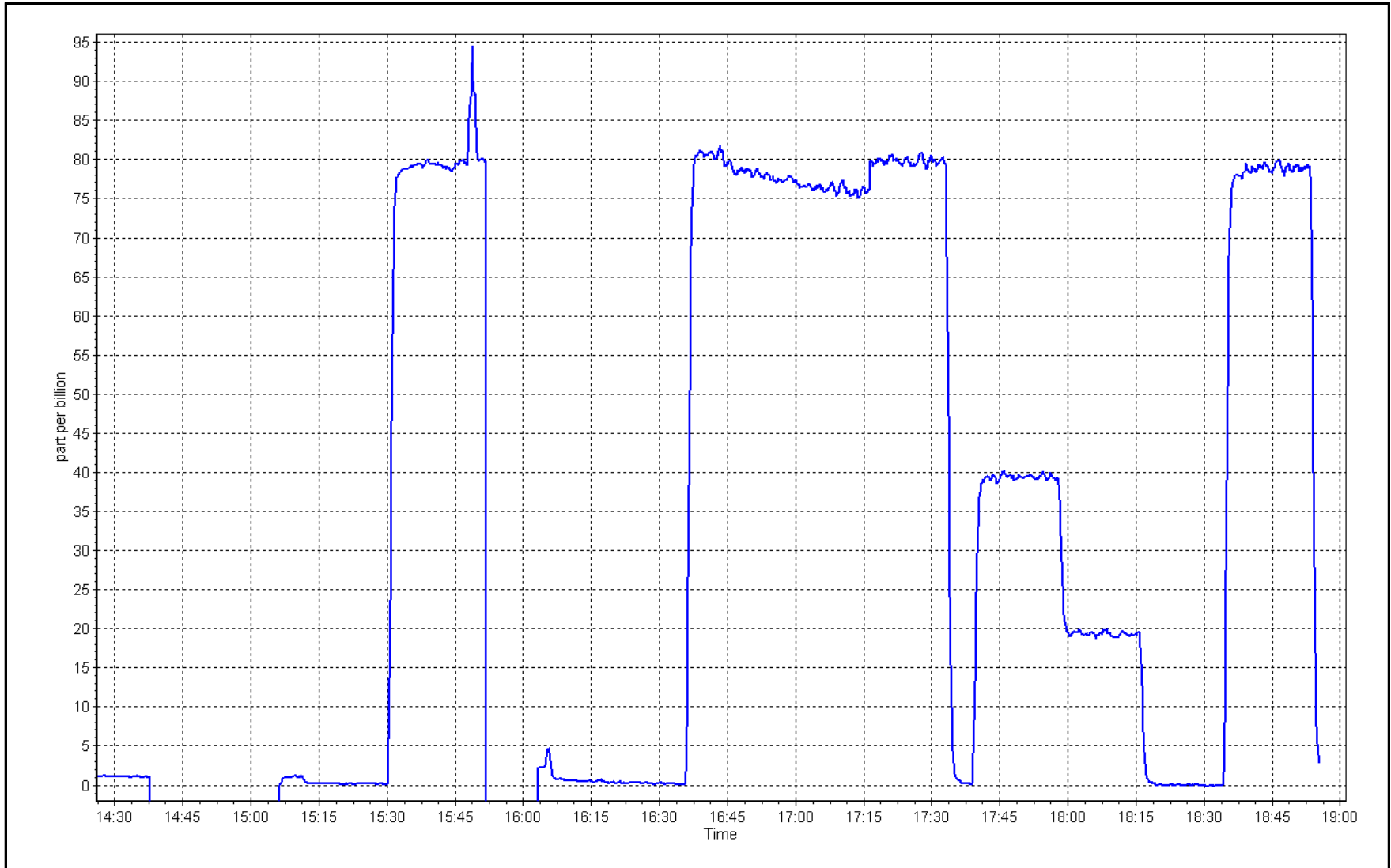
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | 0.999908  |             |
| 80.0                                | 79.8                               | 1.0025                    |                         |           | ≥0.995      |
| 40.0                                | 39.5                               | 1.0126                    | Slope                   | 0.998462  |             |
| 19.9                                | 19.3                               | 1.0336                    |                         |           | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.258331 | +/-3        |



TRS Calibration Plot

Date: March 17, 2023

Location: Fort Hills





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |               |                 |                  |
|-------------------|---------------|-----------------|------------------|
| Station Name:     | Fort Hills    | Station number: | AMS23            |
| Calibration Date: | March 2, 2023 | Last Cal Date:  | February 1, 2023 |
| Start time (MST): | 11:31         | End time (MST): | 14:55            |
| Reason:           | Routine       |                 |                  |

### Calibration Standards

|   |           |                             |                 |
|---|-----------|-----------------------------|-----------------|
| Gas Cert Reference:                         | CC281425  | Cal Gas Expiry Date:        | January 5, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 500.2 ppm | CH <sub>4</sub> Equiv Conc. | 1070.6 ppm      |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.4 ppm |                             |                 |
| Removed Gas Cert:                           | N/A       | Removed Gas Expiry:         | N/A             |
| Removed CH <sub>4</sub> Conc.               | 500.2 ppm | CH <sub>4</sub> Equiv Conc. | 1070.6 ppm      |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.4 ppm | Diff between cyl (THC):     |                 |
| Diff between cyl (CH <sub>4</sub> ):        |           | 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 | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.28E-04     | 2.36E-04      | NMHC SP Ratio:  | 5.02E-05      |
| CH <sub>4</sub> Retention time: | 13.0         | 13.0          | NMHC Peak Area: | 183429        |
|                                 |              |               |                 | 175506        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4920              | 80.3                 | 17.19                | 16.62               | 1.035                      |
| 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                | 17.21               | 0.999                      |
| second point          | 4960              | 40.2                 | 8.61                 | 8.62                | 0.998                      |
| third point           | 4980              | 20.1                 | 4.30                 | 4.33                | 0.994                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4920              | 80.3                 | 17.19                | 17.23               | 0.998                      |

| Average Correction Factor |       |                 |       | 0.997                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 16.62 | Prev response   | 17.27 | *% change -3.9%                            |
| 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<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.3                 | 9.16                 | 8.80                                       | 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              | 80.3                 | 9.16                 | 9.18                                       | 0.998                      |
| second point              | 4960              | 40.2                 | 4.59                 | 4.63                                       | 0.990                      |
| third point               | 4980              | 20.1                 | 2.29                 | 2.36                                       | 0.974                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.3                 | 9.16                 | 9.18                                       | 0.998                      |
| Average Correction Factor |                   |                      |                      |  | 0.987                      |
| Baseline Corr AF:         | 8.80              | Prev response        | 9.20                 | *% change                                  | -4.6%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.3                 | 8.03                 | 7.81                                       | 1.028                      |
| 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                 | 8.03                                       | 1.000                      |
| second point              | 4960              | 40.2                 | 4.02                 | 3.99                                       | 1.008                      |
| third point               | 4980              | 20.1                 | 2.01                 | 1.98                                       | 1.018                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.3                 | 8.03                 | 8.06                                       | 0.997                      |
| Average Correction Factor |                   |                      |                      |  | 1.009                      |
| Baseline Corr AF:         | 7.81              | Prev response        | 8.06                 | *% change                                  | -3.2%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.005188     | 1.000597      |
| THC Cal Offset:             | -0.012392    | 0.010408      |
| CH <sub>4</sub> Cal Slope:  | 1.007325     | 1.000840      |
| CH <sub>4</sub> Cal Offset: | -0.029242    | -0.020438     |
| NMHC Cal Slope:             | 1.003089     | 1.000146      |
| NMHC Cal Offset:            | 0.017251     | 0.031047      |

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

Calibration Performed By: Max Farrell





# Wood Buffalo Environmental Association

## THC Calibration Summary

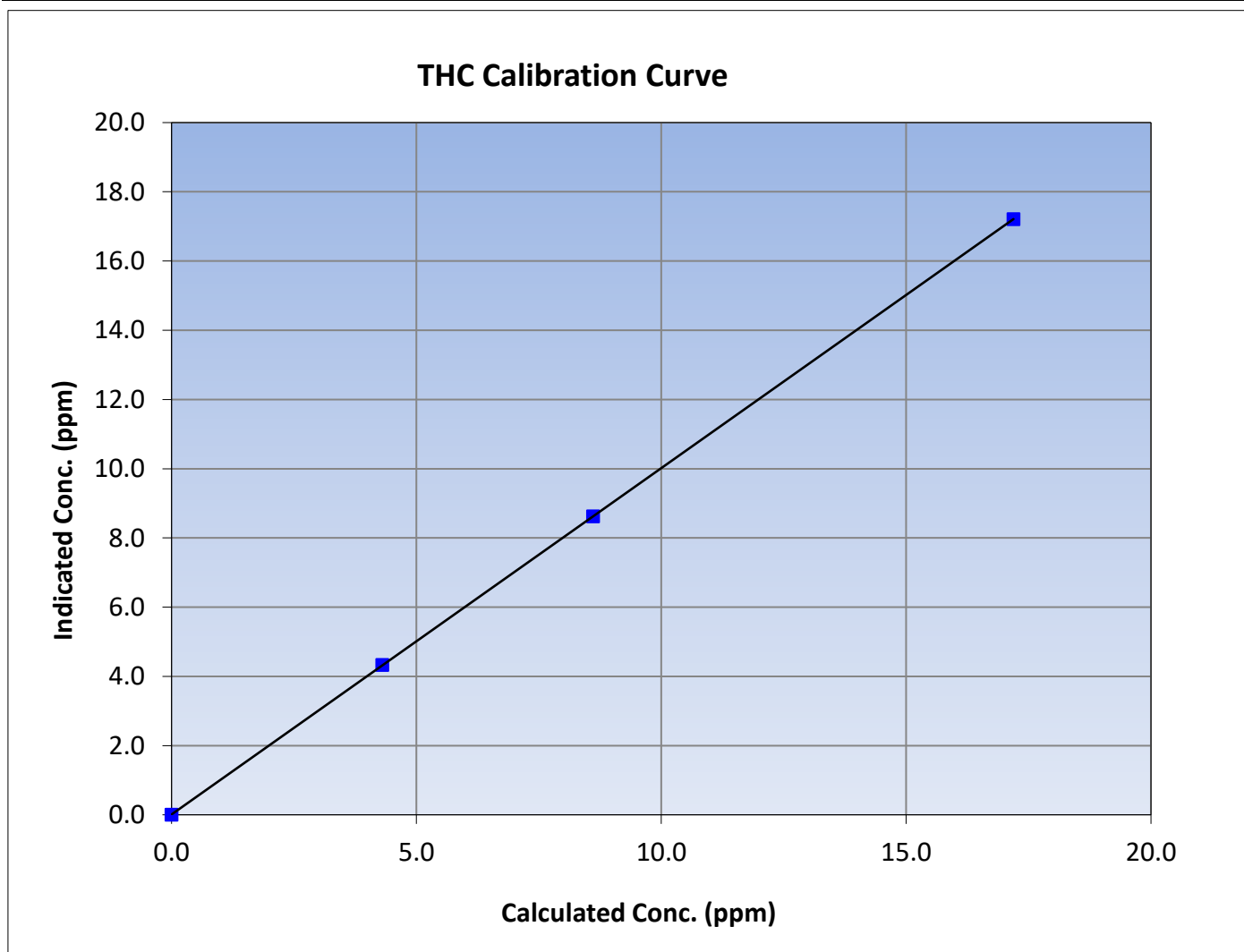
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 2, 2023 | Previous Calibration: | February 1, 2023 |
| Station Name:     | Fort Hills    | Station Number:       | AMS23            |
| Start Time (MST): | 11:31         | End Time (MST):       | 14:55            |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1193585648       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999998 | $\geq 0.995$  |       |          |             |
| 17.19                               | 17.21                              | 0.9990                    |                         |          |               |       |          |             |
| 8.61                                | 8.62                               | 0.9981                    |                         |          |               | Slope | 1.000597 | 0.90 - 1.10 |
| 4.30                                | 4.33                               | 0.9939                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.010408 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

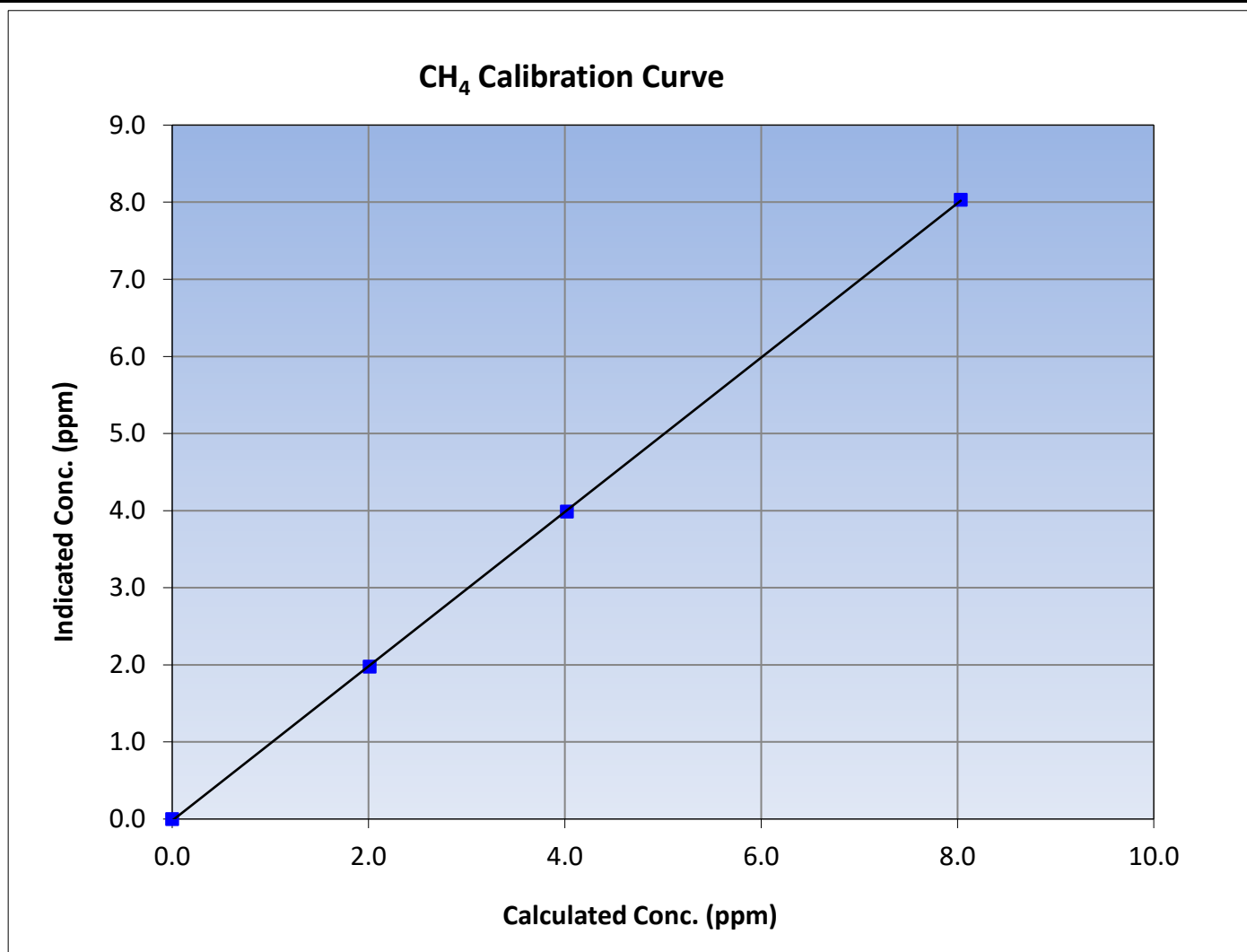
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 2, 2023 | Previous Calibration: | February 1, 2023 |
| Station Name:     | Fort Hills    | Station Number:       | AMS23            |
| Start Time (MST): | 11:31         | End Time (MST):       | 14:55            |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1193585648       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999969  | ≥0.995        |       |          |             |
| 8.03                                | 8.03                               | 1.0002                    |                         |           |               |       |          |             |
| 4.02                                | 3.99                               | 1.0081                    |                         |           |               | Slope | 1.000840 | 0.90 - 1.10 |
| 2.01                                | 1.98                               | 1.0181                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.020438 | +/-0.5        |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

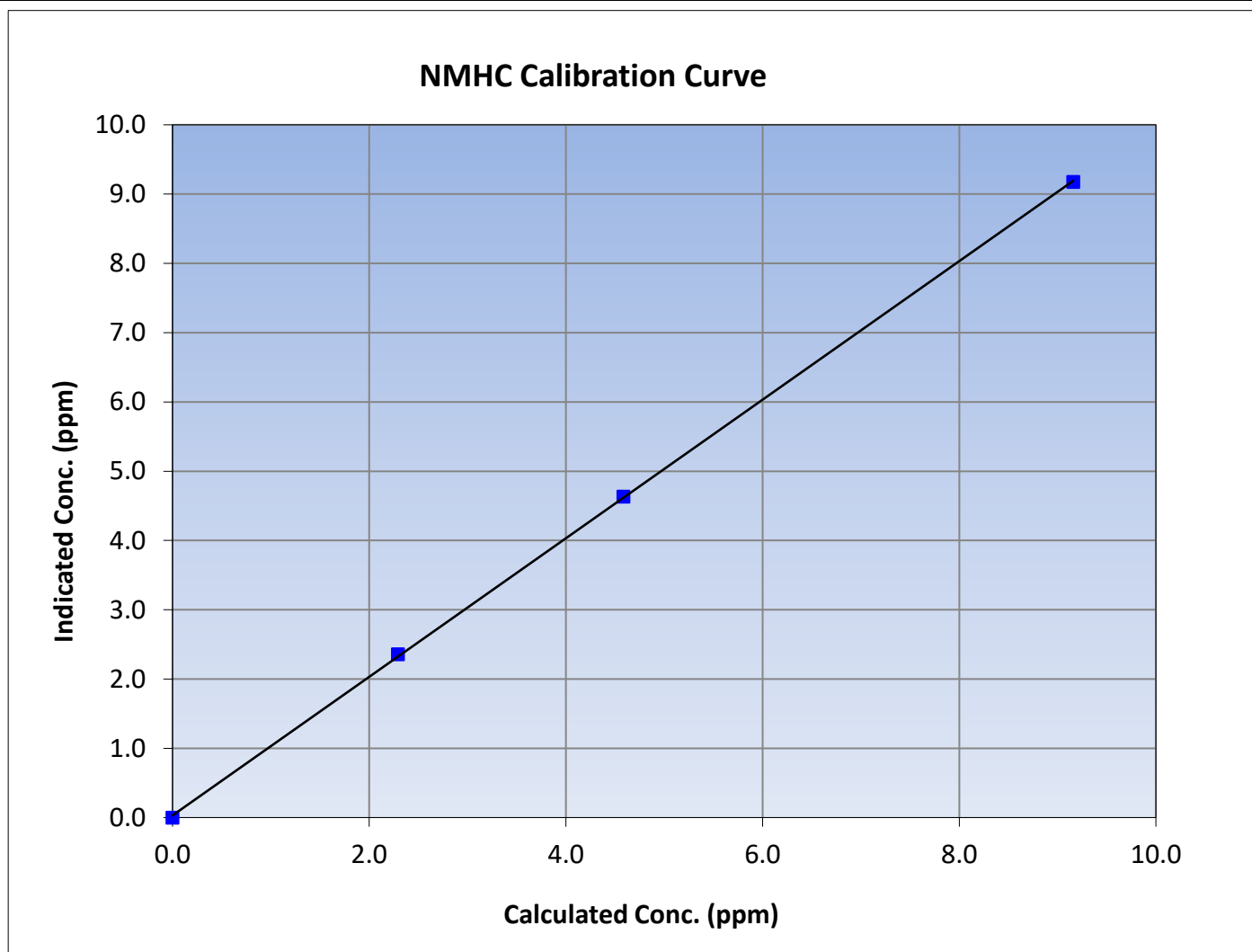
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 2, 2023 | Previous Calibration: | February 1, 2023 |
| Station Name:     | Fort Hills    | Station Number:       | AMS23            |
| Start Time (MST): | 11:31         | End Time (MST):       | 14:55            |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1193585648       |

### Calibration Data

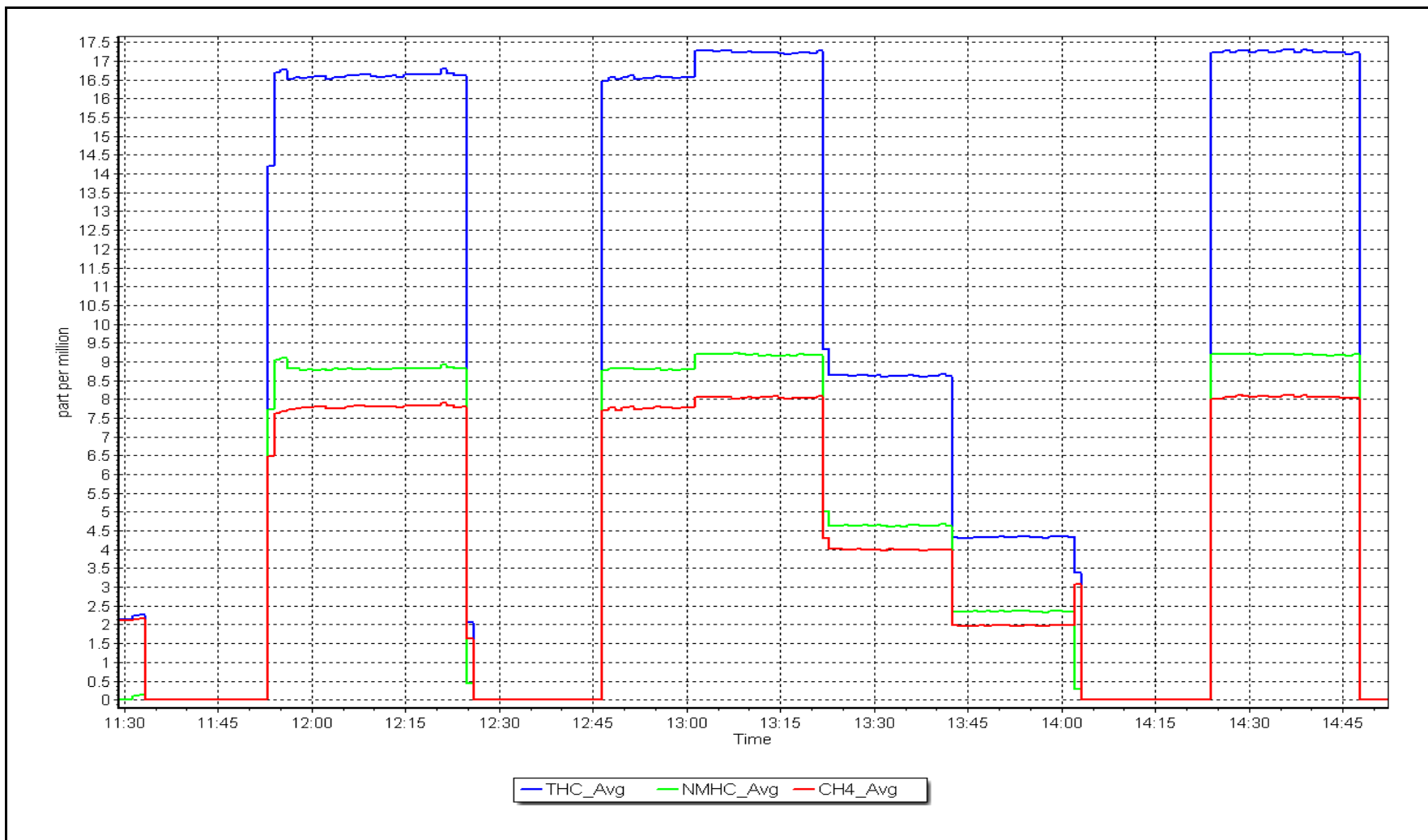
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999947 | $\geq 0.995$  |       |          |             |
| 9.16                                | 9.18                               | 0.9982                    |                         |          |               |       |          |             |
| 4.59                                | 4.63                               | 0.9897                    |                         |          |               | Slope | 1.000146 | 0.90 - 1.10 |
| 2.29                                | 2.36                               | 0.9736                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.031047 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: March 2, 2023

Location: Fort Hills





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Fort Hills Station number: AMS23  
Calibration Date: March 1, 2023 Last Cal Date: February 23, 2023  
Start time (MST): 10:10 End time (MST): 18:08  
Reason: Maintenance

### Calibration Standards

NO Gas Cylinder #: CC332703 Cal Gas Expiry Date: January 28, 2024  
NOX Cal Gas Conc: 49.7 ppm NO Cal Gas Conc: 49.7 ppm  
Removed Cylinder #: N/A Removed Gas Exp Date: N/A  
Removed Gas NOX Conc: 49.7 ppm Removed Gas NO Conc: 49.7 ppm  
NOX gas Diff: NO gas Diff:  
Calibrator Model: Teledyne API T750 Serial Number: 275  
ZAG make/model: Teledyne API T751H Serial Number: 307

### Analyzer Information

Analyzer make: Thermo 42i Analyzer serial #: 1152430007  
NOX Range (ppb): 0 - 1000 ppb

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.815        | 1.025         | NO bkgnd or offset:  | 5.1          | 2.8           |
| NOX coeff or slope: | 0.996        | 0.995         | NOX bkgnd or offset: | 5.6          | 3.1           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 266.3        | 155           |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.004364     | 0.992756      |
| NO <sub>x</sub> Cal Offset: | 0.065025     | 0.201484      |
| NO Cal Slope:               | 1.005722     | 0.995756      |
| NO Cal Offset:              | -0.434914    | -1.598210     |
| NO <sub>2</sub> Cal Slope:  | 0.999767     | 0.998881      |
| NO <sub>2</sub> Cal Offset: | -0.637319    | 0.599000      |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.2   | 0.0                                   | -0.2   | ----  | ----   |
| as found span             | 4920                      | 80.5                        | 800.2   | 800.2                                  | 0.0   | 762.0  | 759.4                                 | 2.6  | 1.050   | 1.054  |
| as found 2nd              | 4960                      | 40.2                        | 399.6   | 399.6                                  | 0.0   | 383.4  | 381.4                                 | 2.0  | 1.0422  | 1.0476   |
| as found 3rd              | 4980                      | 20.1                        | 199.8   | 199.8                                  | 0.0   | 190.5  | 188.6                                 | 1.9  | 1.0488  | 1.0593   |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 1.5  | 0.3                                   | 1.3  | ----  | ----   |
| high point                | 4920                      | 80.5                        | 800.2   | 800.2                                  | 0.0   | 795.2  | 796.1                                 | -0.9   | 1.006   | 1.005  |
| second point              | 4960                      | 40.2                        | 399.6   | 399.6                                  | 0.0   | 396.3  | 395.4                                 | 0.9  | 1.008   | 1.011  |
| third point               | 4980                      | 20.1                        | 199.8   | 199.8                                  | 0.0   | 197.2  | 195.4                                 | 1.8  | 1.013   | 1.022  |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.1  | 0.0                                   | 0.1  | ----  | ----   |
| as left span              | 4920                      | 80.5                        | 800.2   | 443.5                                  | 356.7   | 792.7  | 435.4                                 | 357.3  | 1.009   | 1.019  |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.009   | 1.013  |

|                      |                             |                |  |   |                              |                             |
|----------------------|-----------------------------|----------------|--|---|------------------------------|-----------------------------|
| Corrected As found   | NO <sub>x</sub> = 762.2 ppb | NO = 759.4 ppb | <i>* = &gt; +/-5% change initiates investigation</i> |   | *Percent Change              | NO <sub>x</sub> = -5.4%     |
| Previous Response    | NO <sub>x</sub> = 803.7 ppb | NO = 804.3 ppb |  |   | *Percent Change              | NO = -5.9%                  |
| Baseline Corr 2nd pt | NO <sub>x</sub> = 383.6 ppb | NO = 381.4 ppb | As found   | NO <sub>x</sub> r <sup>2</sup> : 0.999980 | Nx SI: 0.952804              | Nx Int: 0.555               |
| Baseline Corr 3rd pt | NO <sub>x</sub> = 190.7 ppb | NO = 188.6 ppb | As found   | NO r <sup>2</sup> : 0.999983              | NO SI: 0.949792              | NO Int: 0.034               |
|                      |                             |                | As found   | NO <sub>2</sub> r <sup>2</sup> : 1.000000 | NO <sub>2</sub> SI: 1.000874 | NO <sub>2</sub> Int: -0.200 |

### GPT Calibration Data

| O3 Setpoint (ppb)                             | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|---|--|---------------------------------------|---|--|--|--|
| as found GPT zero                             | ----                                       | ----                                  | 0.0   | -0.2   | ----   | ----   |
| as found GPT point (400 ppb NO <sub>2</sub> ) | 756.7                                      | 413.3                                 | 343.4   | 343.5  | 0.9997   | 100.0%   |
| as found GPT point (200 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O <sub>3</sub> )       | 790.8                                      | 434.1                                 | 356.7   | 357.2  | 0.999  | 100.1%   |
| 2nd GPT point (200 ppb O <sub>3</sub> )       | 790.8                                      | 615.0                                 | 175.8   | 176.0  | 0.999  | 100.1%   |
| 3rd GPT point (100 ppb O <sub>3</sub> )       | 790.8                                      | 701.3                                 | 89.5  | 89.2   | 1.003  | 99.7%  |
| Average Correction Factor                     |  |                                       |   |  | 1.000  | 100.0%   |

Notes: Completed multipoint as founds. Found the leak that caused the low chamber pressure and fixed the leak. Adjusted the span.

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

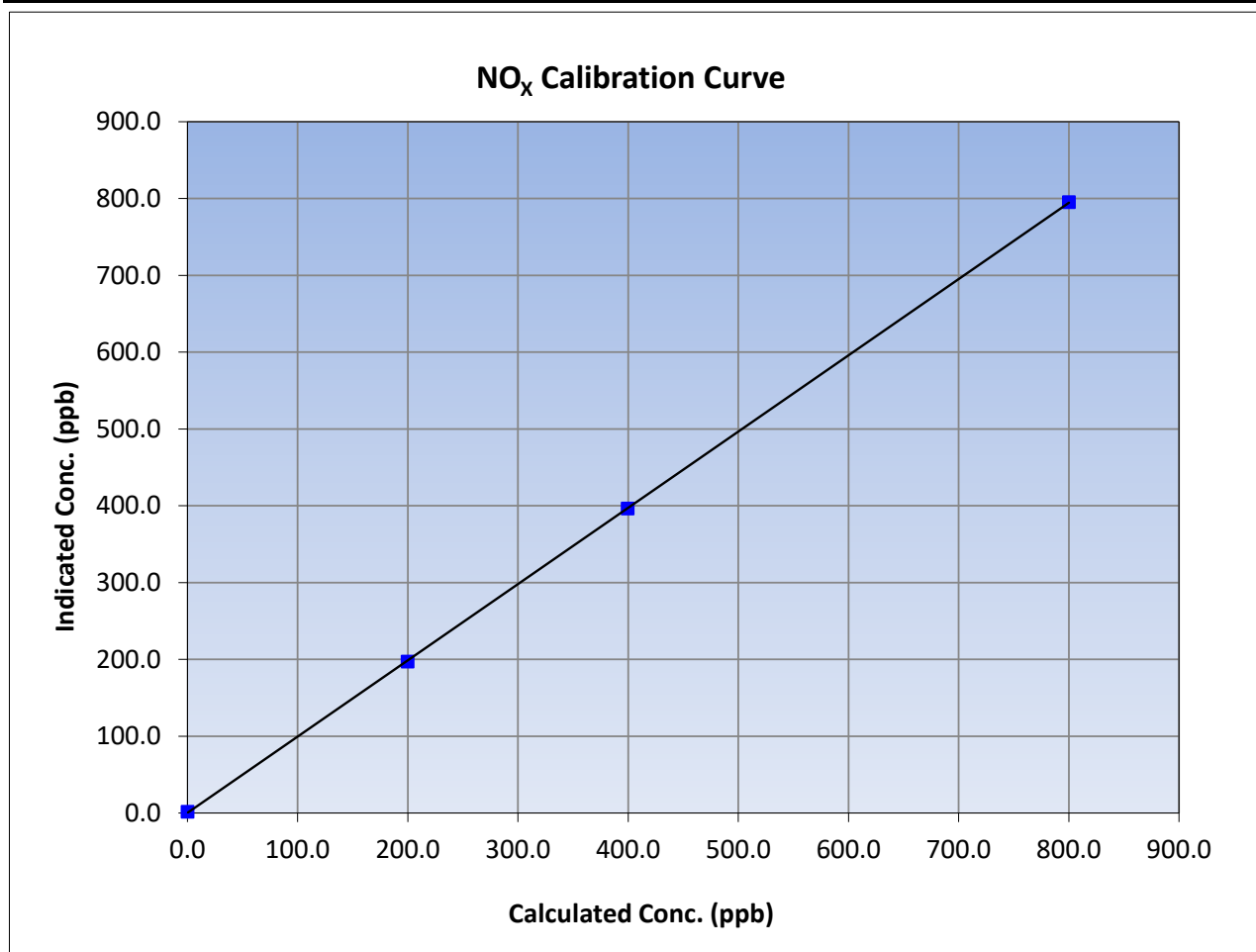
Version-04-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 1, 2023 | Previous Calibration: | February 23, 2023 |
| Station Name:     | Fort Hills    | Station Number:       | AMS23             |
| Start Time (MST): | 10:10         | End Time (MST):       | 18:08             |
| 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                                 | 1.5                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.2                               | 795.2                              | 1.0063                    |   |                                |
| 399.6                               | 396.3                              | 1.0083                    |   |                                |
| 199.8                               | 197.2                              | 1.0131                    |   |                                |
|                                     |                                    |                           | 0.999988                                      |                                |
|                                     |                                    |                           | 0.992756                                      |                                |
|                                     |                                    |                           | 0.201484                                      |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

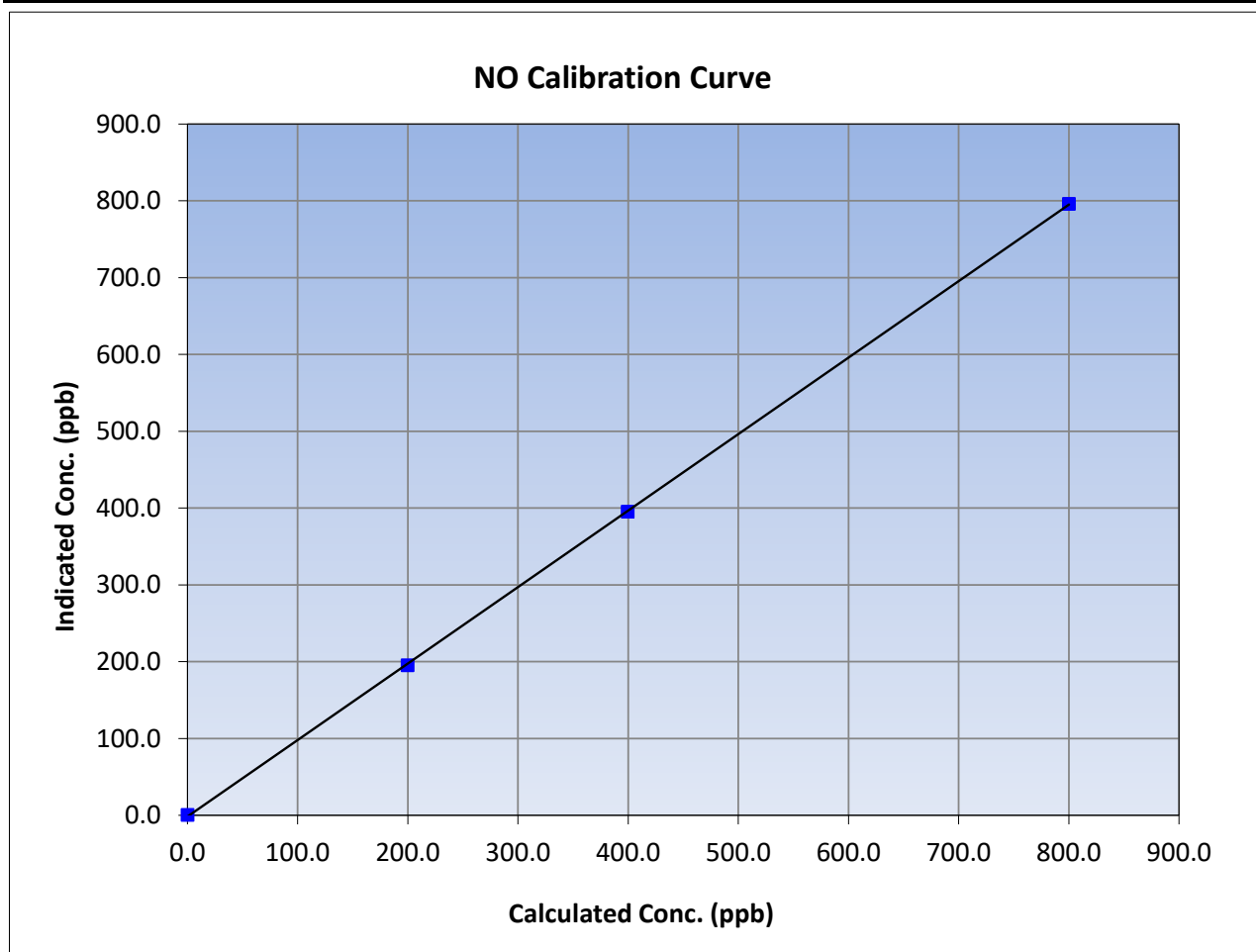
Version-04-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 1, 2023 | Previous Calibration: | February 23, 2023 |
| Station Name:     | Fort Hills    | Station Number:       | AMS23             |
| Start Time (MST): | 10:10         | End Time (MST):       | 18:08             |
| 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                                 | 0.3                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.2                               | 796.1                              | 1.0051                    |   |                                |
| 399.6                               | 395.4                              | 1.0106                    |   |                                |
| 199.8                               | 195.4                              | 1.0225                    |   |                                |
|                                     |                                    |                           |   |                                |







# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

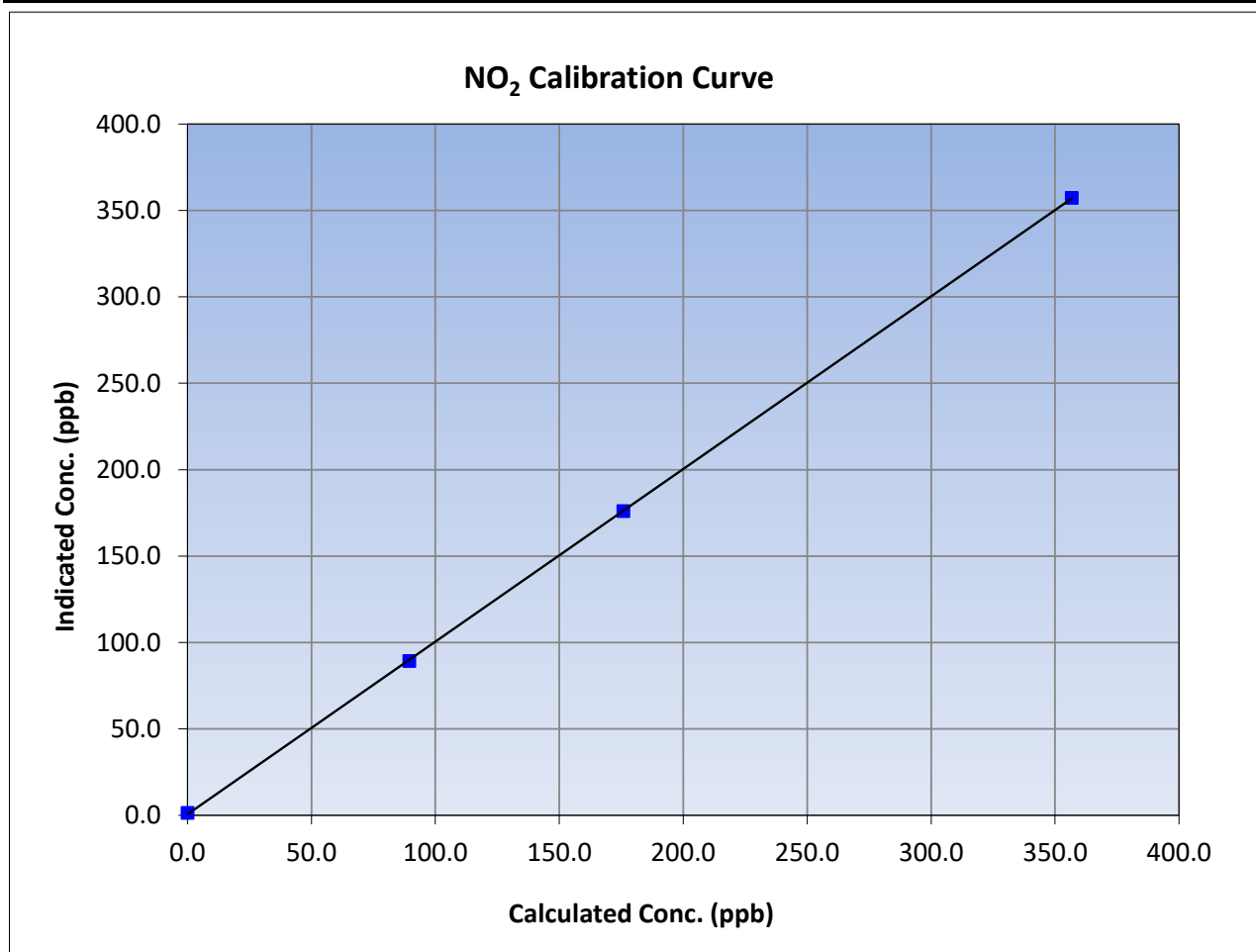
Version-04-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 1, 2023 | Previous Calibration: | February 23, 2023 |
| Station Name:     | Fort Hills    | Station Number:       | AMS23             |
| Start Time (MST): | 10:10         | End Time (MST):       | 18:08             |
| Analyzer make:    | Thermo 42i    | Analyzer serial #:    | 1152430007        |

### Calibration Data

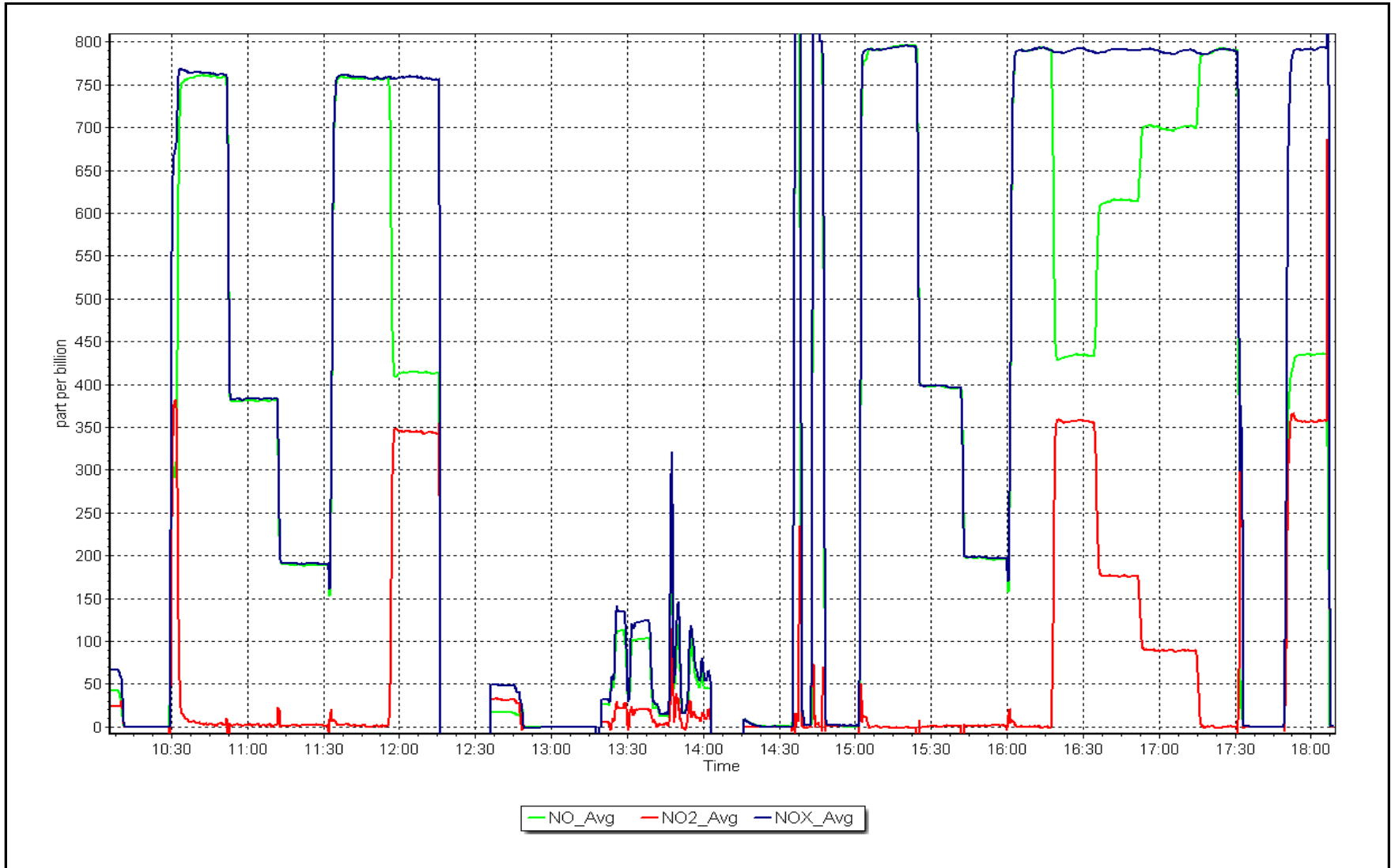
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|
| 0.0                                 | 1.3                                | ----                      | Correlation Coefficient | 0.999982 | ≥0.995        |
| 356.7                               | 357.2                              | 0.9986                    |                         |          |               |
| 175.8                               | 176.0                              | 0.9989                    |                         |          |               |
| 89.5                                | 89.2                               | 1.0034                    |                         |          |               |
|                                     |                                    |                           | Slope                   | 0.998881 | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | 0.599000 | +/-20         |



NO<sub>x</sub> Calibration Plot

Date: March 1, 2023

Location: Fort Hills





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Fort Hills Station number: AMS 23  
 Calibration Date: March 18, 2023 Last Cal Date: February 17, 2023  
 Start time (MST): 12:37 End time (MST): 13:25

Analyzer Make: API T640 S/N: 1546  
 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)     | 4.6                                  | 4.48                                    | 4.6     | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 735.81                               | 735                                     | 735.81  | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.00                                 | 4.948                                   | 5.00    | <input type="checkbox"/> | +/- 0.25 LPM |
| Leak Test: | Date of check: <u>March 18, 2023</u> | Last Cal Date: <u>February 17, 2023</u> |         |                          |              |
|            | PM w/o HEPA: <u>NA</u>               | PM w/ HEPA: <u>NA</u>                   |         |                          | <0.2 ug/m3   |

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

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter                     | As found | Post maintenance        | As left             | Adjusted                 | (Limits)     |
|-------------------------------|----------|-------------------------|---------------------|--------------------------|--------------|
| PMT Peak Test                 | NA       | 11.2                    | 11.2                | <input type="checkbox"/> | 11.3 +/- 0.5 |
| Post-maintenance leak check:  |          | PM w/o HEPA: <u>8.7</u> | w/ HEPA: <u>0.0</u> |                          |              |
| Date Optical Chamber Cleaned: |          | <u>March 18, 2023</u>   |                     |                          | <0.2 ug/m3   |
| Disposable Filter Changed:    |          | <u>March 18, 2023</u>   |                     |                          |              |

### Annual Maintenance

Date Sample Tube Cleaned: September 26, 2022  
 Date RH/T Sensor Cleaned: September 26, 2022

Notes: Analyzer DOA. Removed asset: 11458, installed asset: 11808. No adjustments made.

Calibration by: Braiden Boutilier



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS25 WASKŌW OHCI PIMÂTISIWIN MARCH 2023**

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

April 29, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

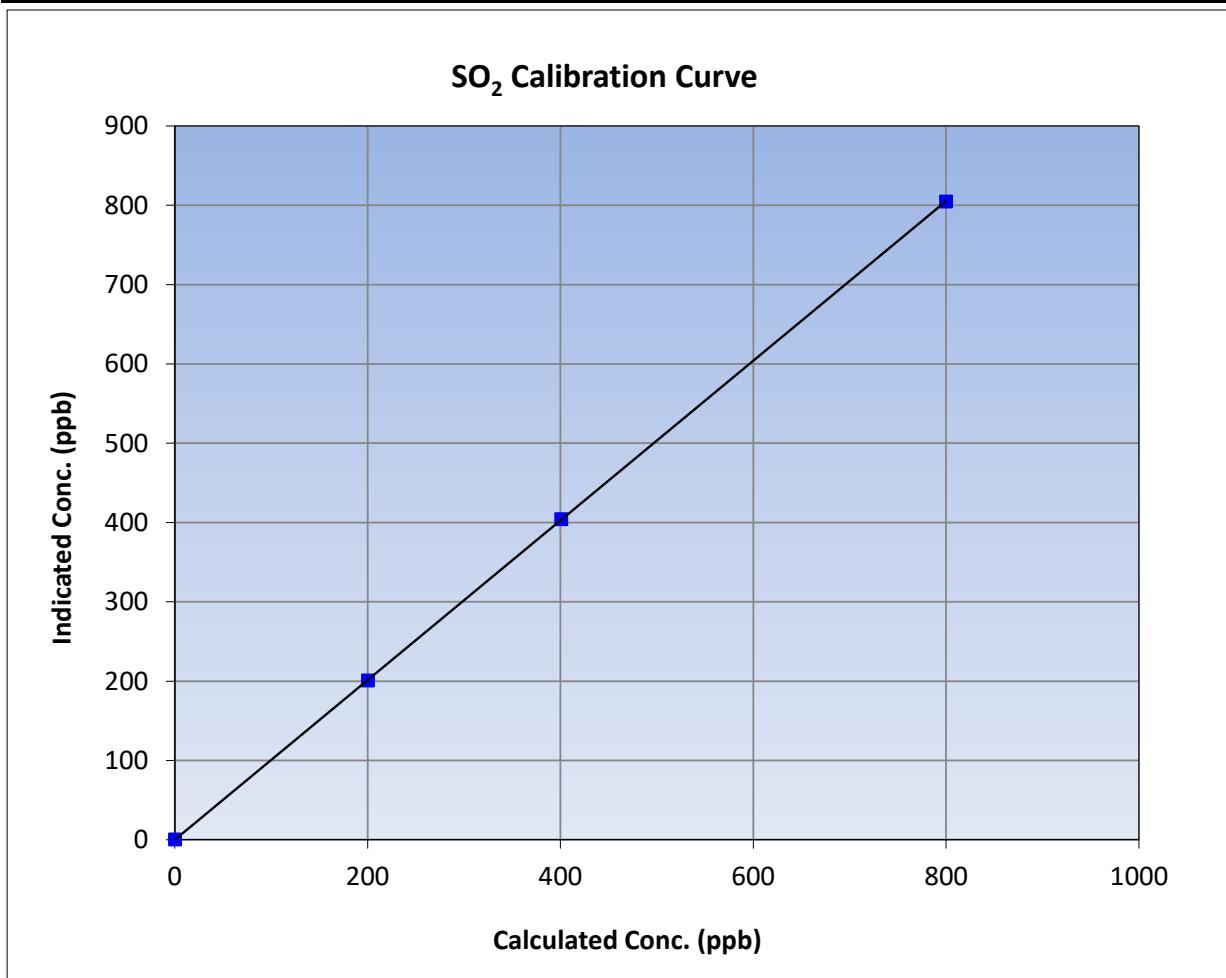
Version-01-2020

### Station Information

|                   |                         |                       |                 |
|-------------------|-------------------------|-----------------------|-----------------|
| Calibration Date: | March 15, 2023          | Previous Calibration: | January 3, 2023 |
| Station Name:     | Waskow ohci Pimatisiwin | Station Number:       | AMS25           |
| Start Time (MST): | 10:00                   | End Time (MST):       | 12:12           |
| Analyzer make:    | Thermo 43i              | Analyzer serial #:    | 1118148497      |

### Calibration Data

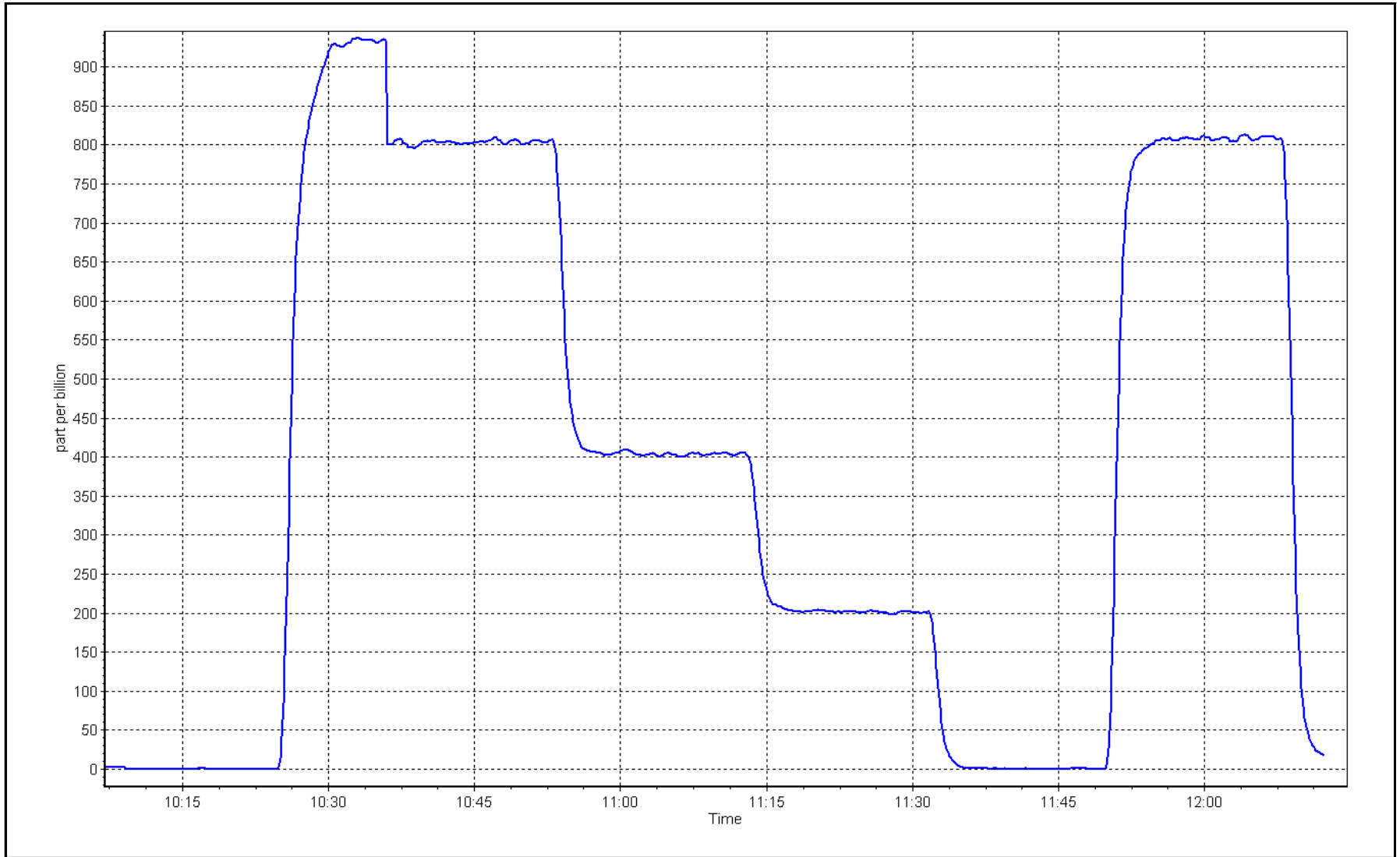
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.0                                   | ----                         | Correlation Coefficient | 0.999995      |             |
| 799.6                                  | 804.6                                 | 0.9938                       |                         |               | ≥0.995      |
| 400.3                                  | 403.9                                 | 0.9911                       | Slope                   | 1.006789      |             |
| 200.2                                  | 200.6                                 | 0.9978                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | -0.116149     | +/-30       |



SO2 Calibration Plot

Date: March 15, 2023

Location: Waskow ohci Pimatisiwin





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

|                   |                         |                 |                  |
|-------------------|-------------------------|-----------------|------------------|
| Station Name:     | Waskow ohci Pimatisiwin | Station number: | AMS25            |
| Calibration Date: | March 16, 2023          | Last Cal Date:  | January 11, 2023 |
| Start time (MST): | 7:20                    | End time (MST): | 10:14            |
| Reason:           | Install                 |                 |                  |

### Calibration Standards

|                        |          |     |                   |             |
|------------------------|----------|-----|-------------------|-------------|
| Cal Gas Concentration: | 4.90     | ppm | Cal Gas Exp Date: | May 5, 2023 |
| Cal Gas Cylinder #:    | LL119538 |     |                   |             |
| Removed Cal Gas Conc:  | 4.90     | 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: | Thermo 43C     | Converter serial #: | 328702539  |
| Analyzer Range  | 0 - 100 ppb    |                     |            |

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 1.002738     | 1.003738      | Backgd or Offset: | 3.3          | 3.3           |
| Calibration intercept: | 0.341605     | 0.281608      | Coeff or Slope:   | 1.085        | 1.085         |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         |                               |                             |                                     |                                    |  |
| as found span         |                               |                             |                                     |                                    |  |
| as found 2nd point    |                               |                             |                                     |                                    |  |
| as found 3rd point    |                               |                             |                                     |                                    |  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                              | 4918                          | 81.6                        | 80.0                                | 80.5                               | 0.993   |
| second point                            | 4959                          | 40.8                        | 40.0                                | 40.5                               | 0.987   |
| third point                             | 4980                          | 20.4                        | 20.0                                | 20.4                               | 0.980   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| as left span                            | 4912                          | 88.3                        | 800.0                               | 803.0                              | 0.996   |
| SO2 Scrubber Check                      | 4924                          | 76.3                        | 800.0                               | 0.2                                | ----  |
| Date of last scrubber change:           | 19-Jul-10                     |                             |                                     | Ave Corr Factor                    | 0.987   |
| 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: Sox scrubber checked after the calibrator zero. No adjustments done. Install Calibration after power put back on.

Calibration Performed By: Melissa Lemay





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

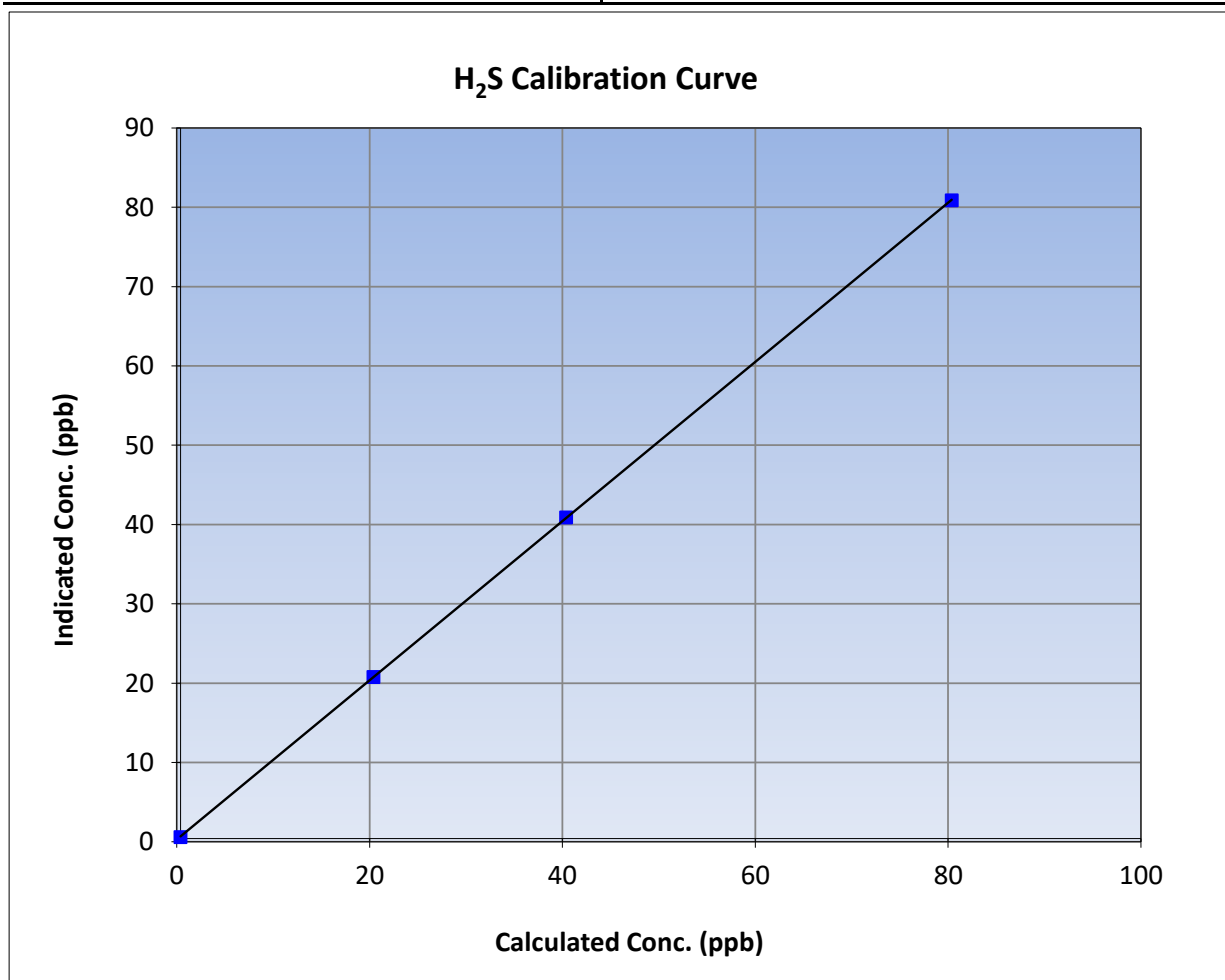
Version-11-2021

### Station Information

|                   |                         |                       |                  |
|-------------------|-------------------------|-----------------------|------------------|
| Calibration Date: | March 16, 2023          | Previous Calibration: | January 11, 2023 |
| Station Name:     | Waskow ohci Pimatisiwin | Station Number:       | AMS25            |
| Start Time (MST): | 7:20                    | End Time (MST):       | 10:14            |
| Analyzer make:    | Thermo 43i-LTE          | Analyzer serial #:    | 1170050146       |

### Calibration Data

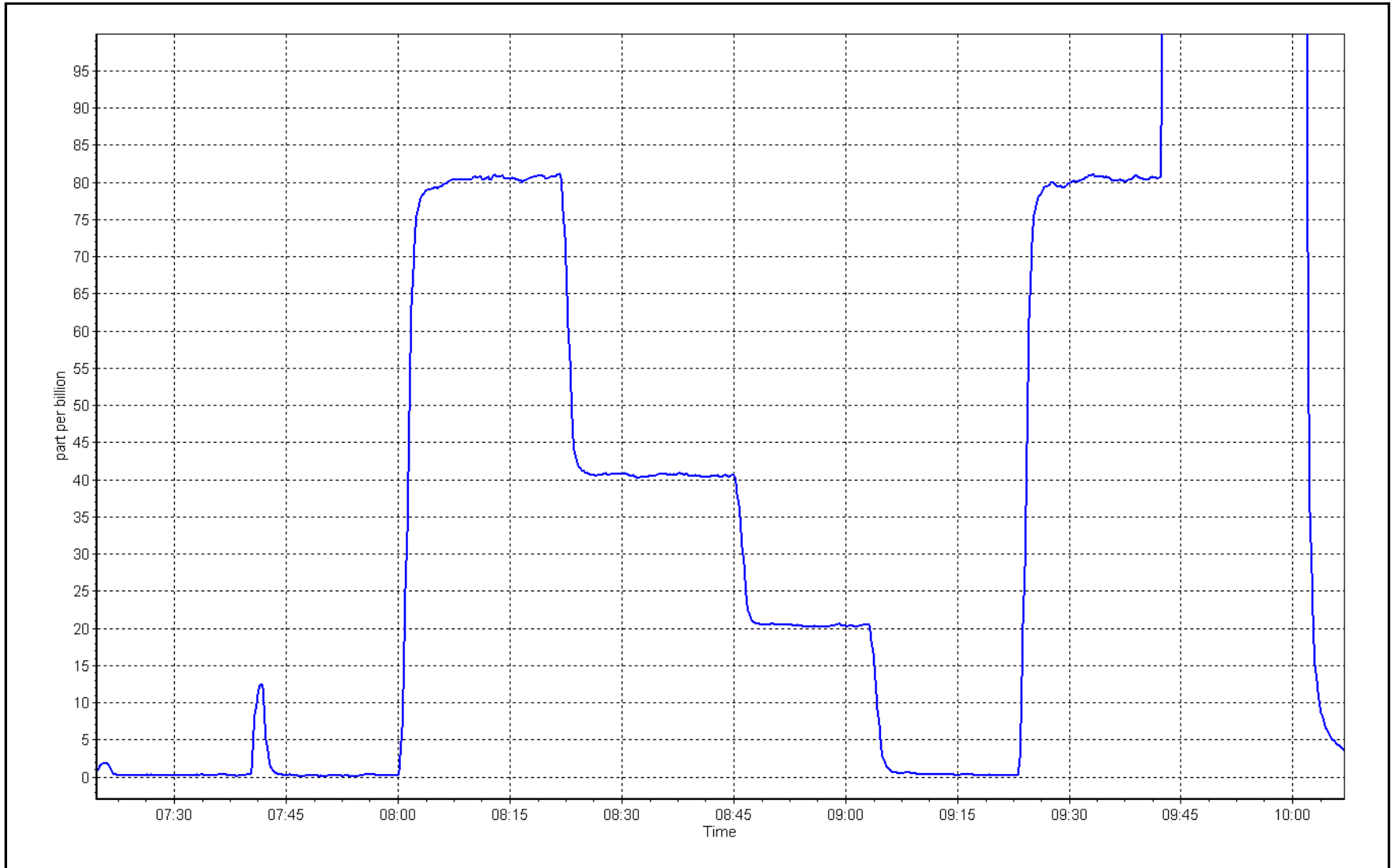
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999994 | ≥0.995      |
| 80.0                                | 80.5                               | 0.9935                    |                         |          |             |
| 40.0                                | 40.5                               | 0.9873                    | Slope                   | 1.003738 | 0.90 - 1.10 |
| 20.0                                | 20.4                               | 0.9799                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.281608 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: March 16, 2023

Location: Waskow ohci Pimatisiwin





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS26 CHRISTINA LAKE MARCH 2023**

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

April 29, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

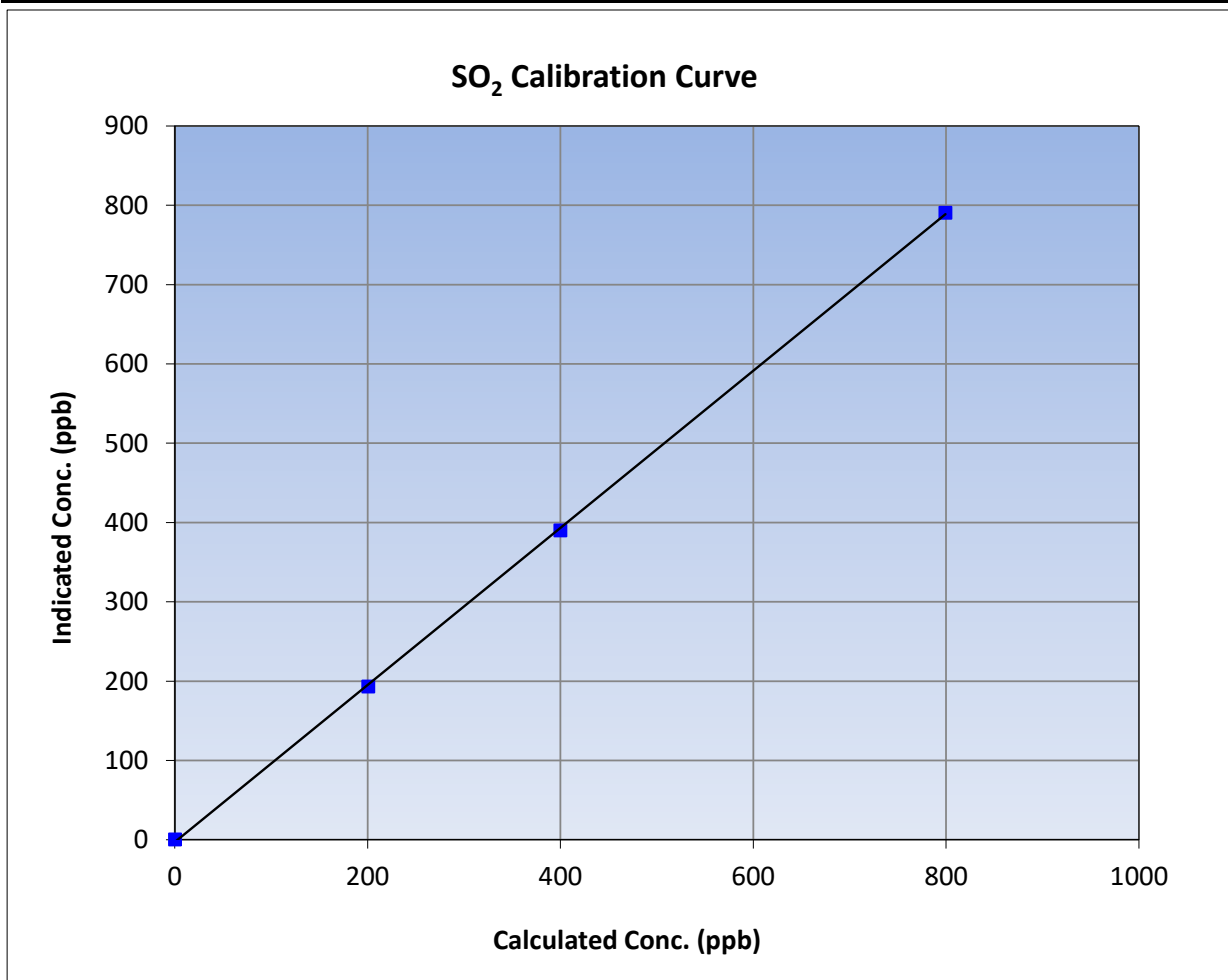
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 23, 2023 | Previous Calibration: | February 14, 2023 |
| Station Name:     | Christina Lake | Station Number:       | AMS 26            |
| Start Time (MST): | 10:41          | End Time (MST):       | 13:40             |
| Analyzer make:    | Thermo 43i     | Analyzer serial #:    | 1173410001        |

### Calibration Data

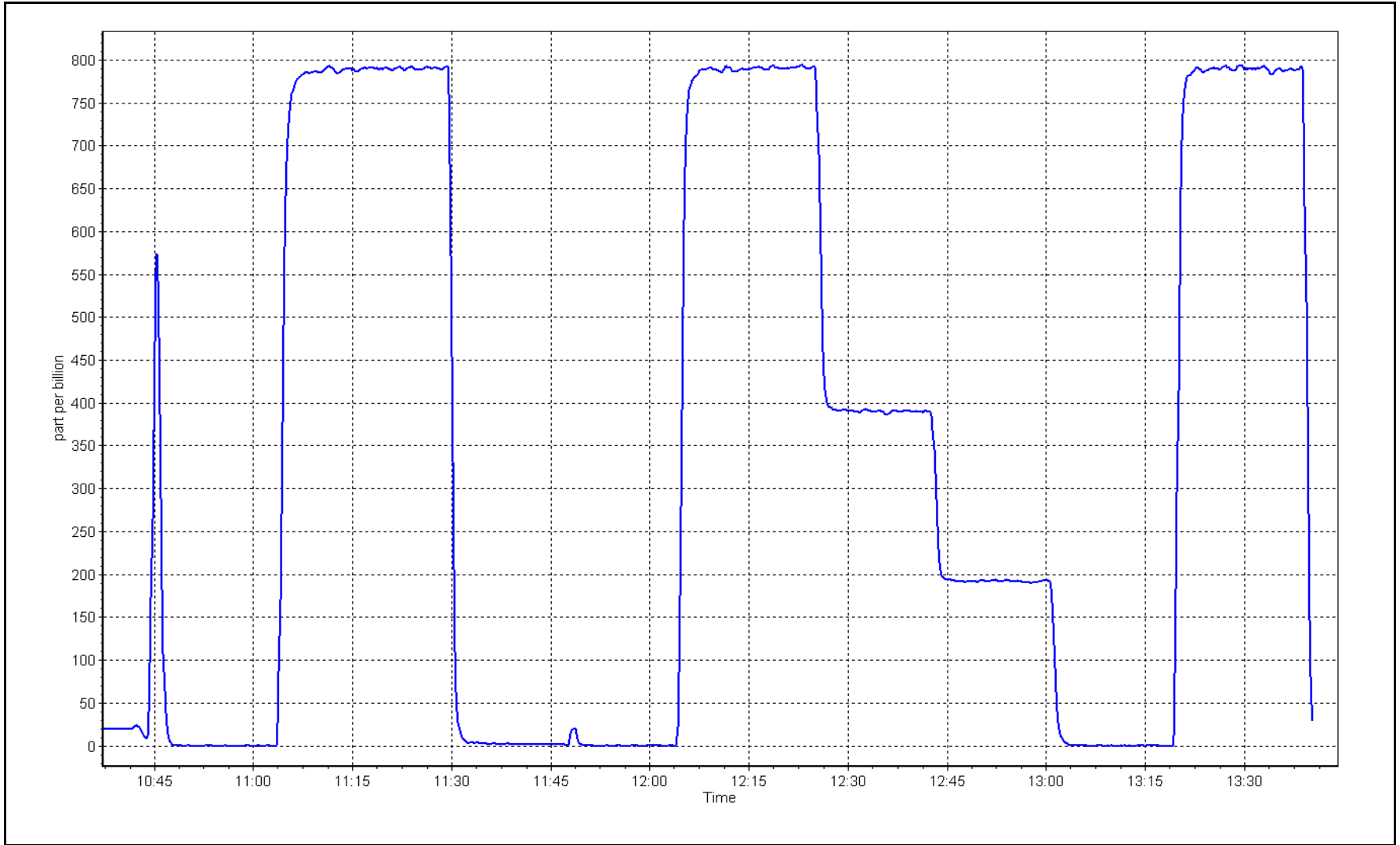
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999919  | ≥0.995      |
| 799.0                               | 790.4                              | 1.0108                    |                         |           |             |
| 399.4                               | 389.9                              | 1.0244                    | Slope                   | 0.990536  | 0.90 - 1.10 |
| 200.2                               | 192.9                              | 1.0379                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -2.994790 | +/-30       |



SO2 Calibration Plot

Date: March 23, 2023

Location: Christina Lake





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Christina Lake      Station number: AMS26  
 Calibration Date: March 22, 2023      Last Cal Date: February 15, 2023  
 Start time (MST): 10:38      End time (MST): 15:04  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 4.89 ppm      Cal Gas Exp Date: February 9, 2024  
 Cal Gas Cylinder #: EY0002466  
 Removed Cal Gas Conc: 4.89 ppm      Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA      Diff between cyl:  
 Calibrator Make/Model: API T700      Serial Number: 2447  
 ZAG Make/Model: API T701      Serial Number: 953

### Analyzer Information

Analyzer make: Thermo 450i      Analyzer serial #: 1180030032  
 Converter make: NA      Converter serial #: NA  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|---------------|
| Calibration slope:     | 0.996758     | 0.979904      | Backgd or Offset: | 33.6          |
| Calibration intercept: | 0.098881     | 0.438608      | Coeff or Slope:   | 1.125         |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.5                                | ----   |
| as found span         | 4918                          | 81.8                        | 80.0                                | 80.6                               | 0.999  |
| as found 2nd point    | 4959                          | 40.9                        | 40.0                                | 40.4                               | 1.003  |
| as found 3rd point    | 4979                          | 20.4                        | 20.0                                | 20.1                               | 1.018  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.6                                | ----  |
| high point                              | 4918                          | 81.8                        | 80.0                                | 78.9                               | 1.014   |
| second point                            | 4959                          | 40.9                        | 40.0                                | 39.6                               | 1.010   |
| third point                             | 4979                          | 20.4                        | 20.0                                | 19.8                               | 1.008   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.6                                | ----  |
| as left span                            | 4918                          | 81.8                        | 80.0                                | 80.8                               | 0.990   |
| SO2 Scrubber Check                      | 4919                          | 80.6                        | 806.1                               | 0.1                                | ----  |
| Date of last scrubber change:           | 27-Feb-19                     |                             |                                     | Ave Corr Factor                    | 1.011   |
| Date of last converter efficiency test: |                               |                             |                                     |                                    | efficiency  |

|                          |      |                 |          |               |          |
|--------------------------|------|-----------------|----------|---------------|----------|
| Baseline Corr As found:  | 80.1 | Prev response:  | 79.84    | *% change:    | 0.3%     |
| Baseline Corr 2nd AF pt: | 39.9 | AF Slope:       | 1.002613 | AF Intercept: | 0.319026 |
| Baseline Corr 3rd AF pt: | 19.6 | AF Correlation: | 0.999975 |               |          |

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

Notes: Changed sample inlet filter after MAF's, changed zero/span valve before calibrator zero. Ran scrubber check after calibrator zero. No adjustments made.

Calibration Performed By: Mohammed Kashif



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

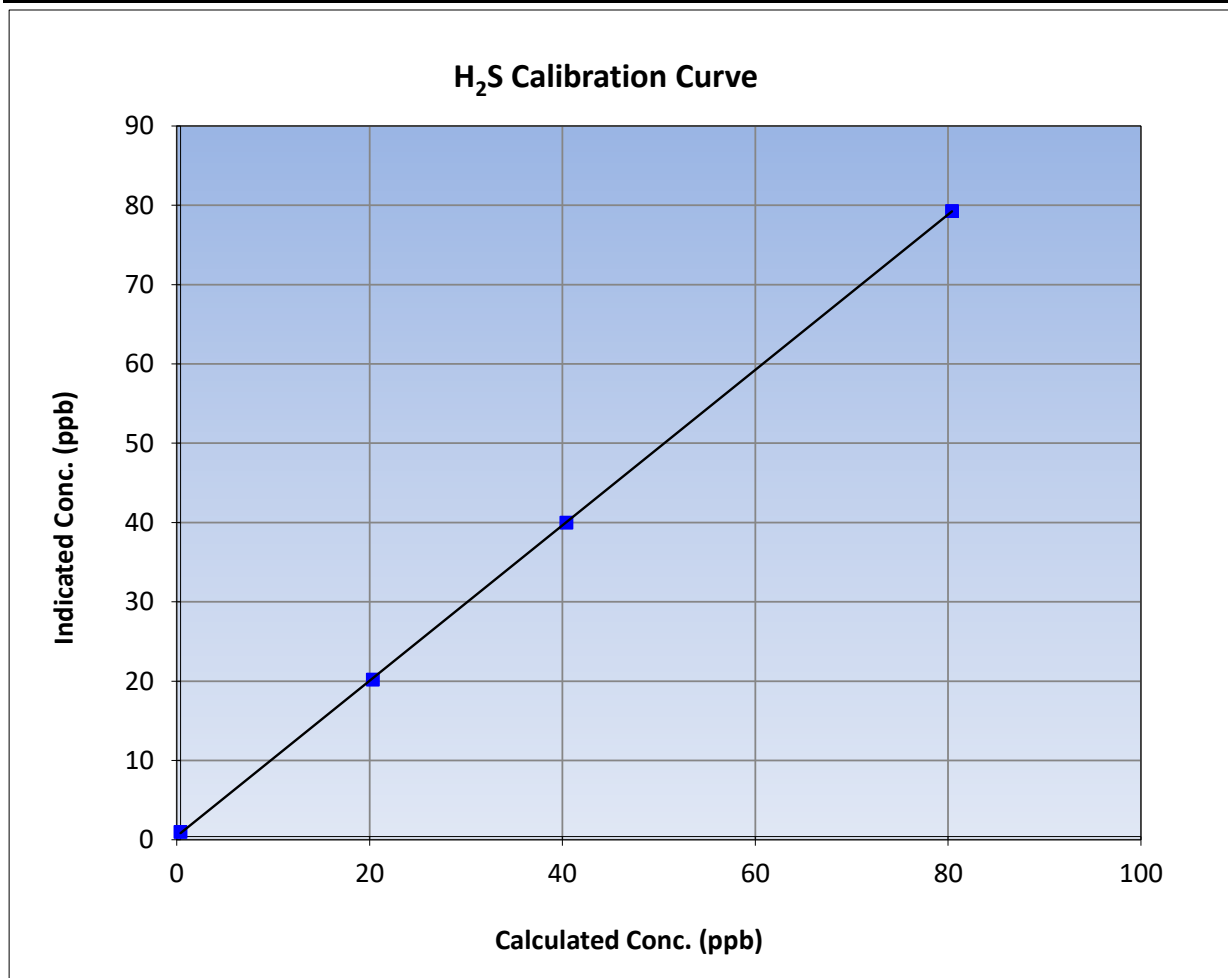
Version-11-2021

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 22, 2023 | Previous Calibration: | February 15, 2023 |
| Station Name:     | Christina Lake | Station Number:       | AMS26             |
| Start Time (MST): | 10:38          | End Time (MST):       | 15:04             |
| Analyzer make:    | Thermo 450i    | Analyzer serial #:    | 1180030032        |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.6                                | ----                      | Correlation Coefficient | 0.999980 | ≥0.995      |
| 80.0                                | 78.9                               | 1.0140                    |                         |          |             |
| 40.0                                | 39.6                               | 1.0101                    | Slope                   | 0.979904 | 0.90 - 1.10 |
| 20.0                                | 19.8                               | 1.0078                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.438608 | +/-3        |

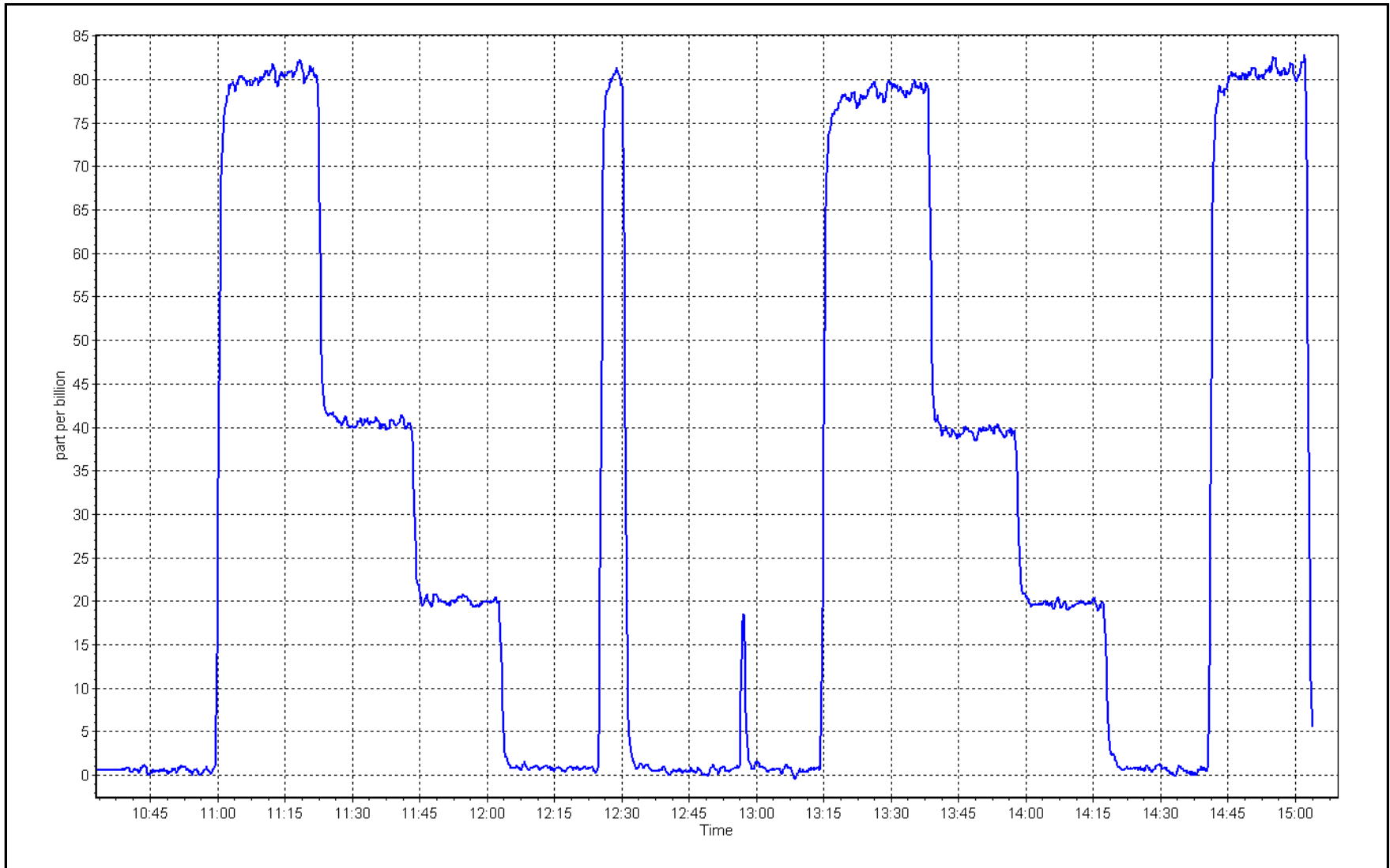




H<sub>2</sub>S Calibration Plot

Date: March 22, 2023

Location: Christina Lake







# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.0  | ----  | ----   |
| as found span             | 4920                      | 80.0                        | 813.1   | 800.3                                  | 12.8  | 804.3  | 788.3                                 | 16.0   | 1.0110  | 1.0152   |
| 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                | 4920                      | 80.0                        | 813.1   | 800.3                                  | 12.8  | 803.9  | 791.1                                 | 12.8   | 1.0115  | 1.0117   |
| second point              | 4960                      | 40.0                        | 406.6   | 400.2                                  | 6.4   | 399.4  | 392.3                                 | 7.1  | 1.0179  | 1.0200   |
| third point               | 4980                      | 20.0                        | 203.3   | 200.1                                  | 3.2   | 197.3  | 192.3                                 | 5.0  | 1.0303  | 1.0405   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | 0.1                                   | 0.1  | ----  | ----   |
| as left span              | 4920                      | 80.0                        | 813.1   | 398.4                                  | 414.7   | 807.0  | 389.8                                 | 417.0  | 1.0076  | 1.0221   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0199  | 1.0240   |

|                      |                             |                |  |                                  |                         |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 804.3 ppb | NO = 788.4 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -1.0% |                      |
| Previous Response    | NO <sub>x</sub> = 812.2 ppb | NO = 798.3 ppb |  | *Percent Change                  | NO = -1.3%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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)       | 789.7                                      | 387.8                                 | 414.7   | 415.8  | 0.9974   | 100.3%   |
| 2nd GPT point (200 ppb O3)       | 789.7                                      | 595.4                                 | 207.1   | 207.3  | 0.9990   | 100.1%   |
| 3rd GPT point (100 ppb O3)       | 789.7                                      | 697.0                                 | 105.5   | 106.5  | 0.9906   | 100.9%   |
| Average Correction Factor        |  |                                       |   |  | 0.9957   | 100.4%   |

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

Calibration Performed By: Mohammed Kashif



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

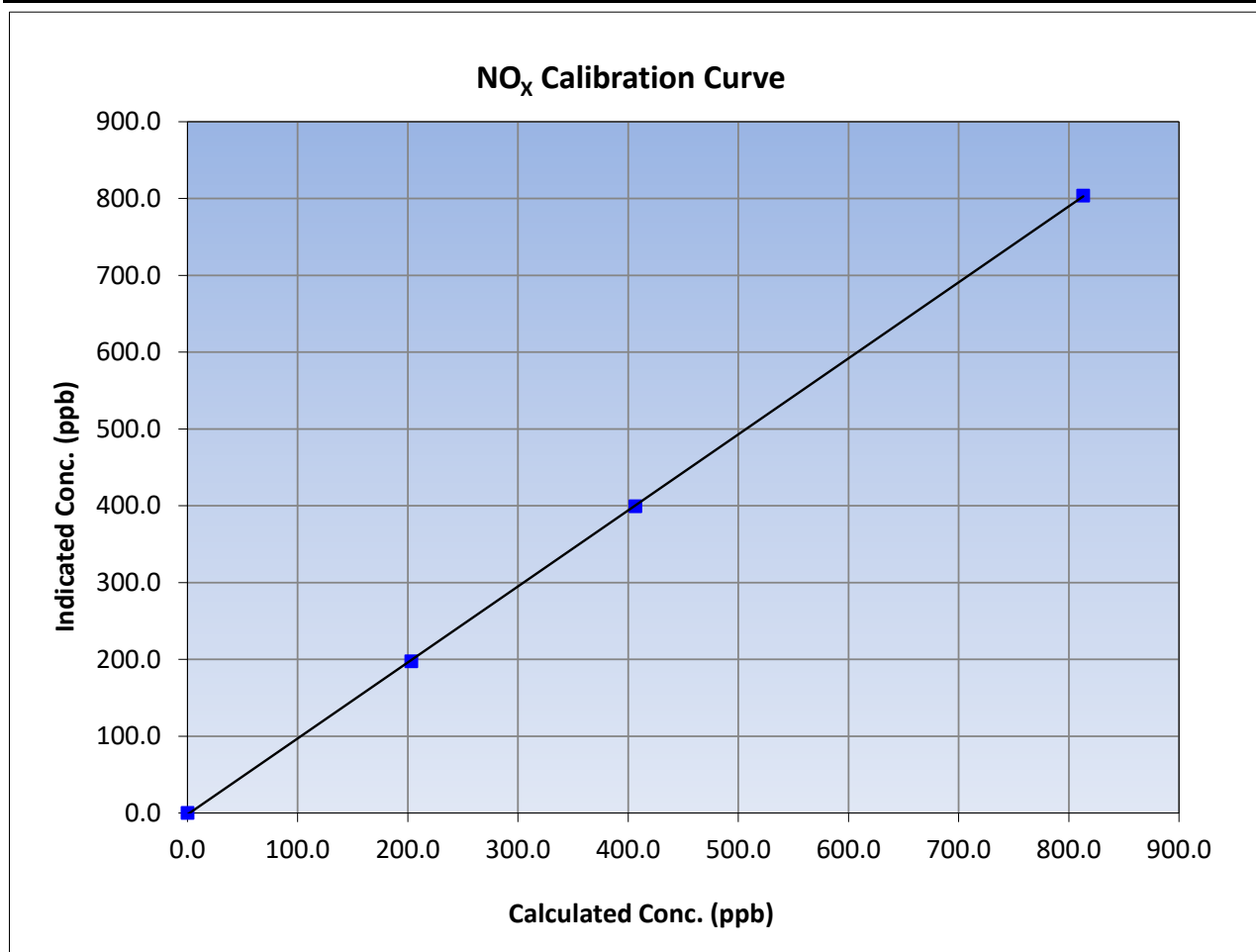
Version-04-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 29, 2023 | Previous Calibration: | February 16, 2023 |
| Station Name:     | Christina Lake | Station Number:       | AMS 26            |
| Start Time (MST): | 10:57          | End Time (MST):       | 15:06             |
| Analyzer make:    | Thermo 42i     | Analyzer serial #:    | 14:00             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 813.1                               | 803.9                              | 1.0115                    |   |                                |
| 406.6                               | 399.4                              | 1.0179                    |   |                                |
| 203.3                               | 197.3                              | 1.0303                    |   |                                |
|                                     |                                    |                           |   |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

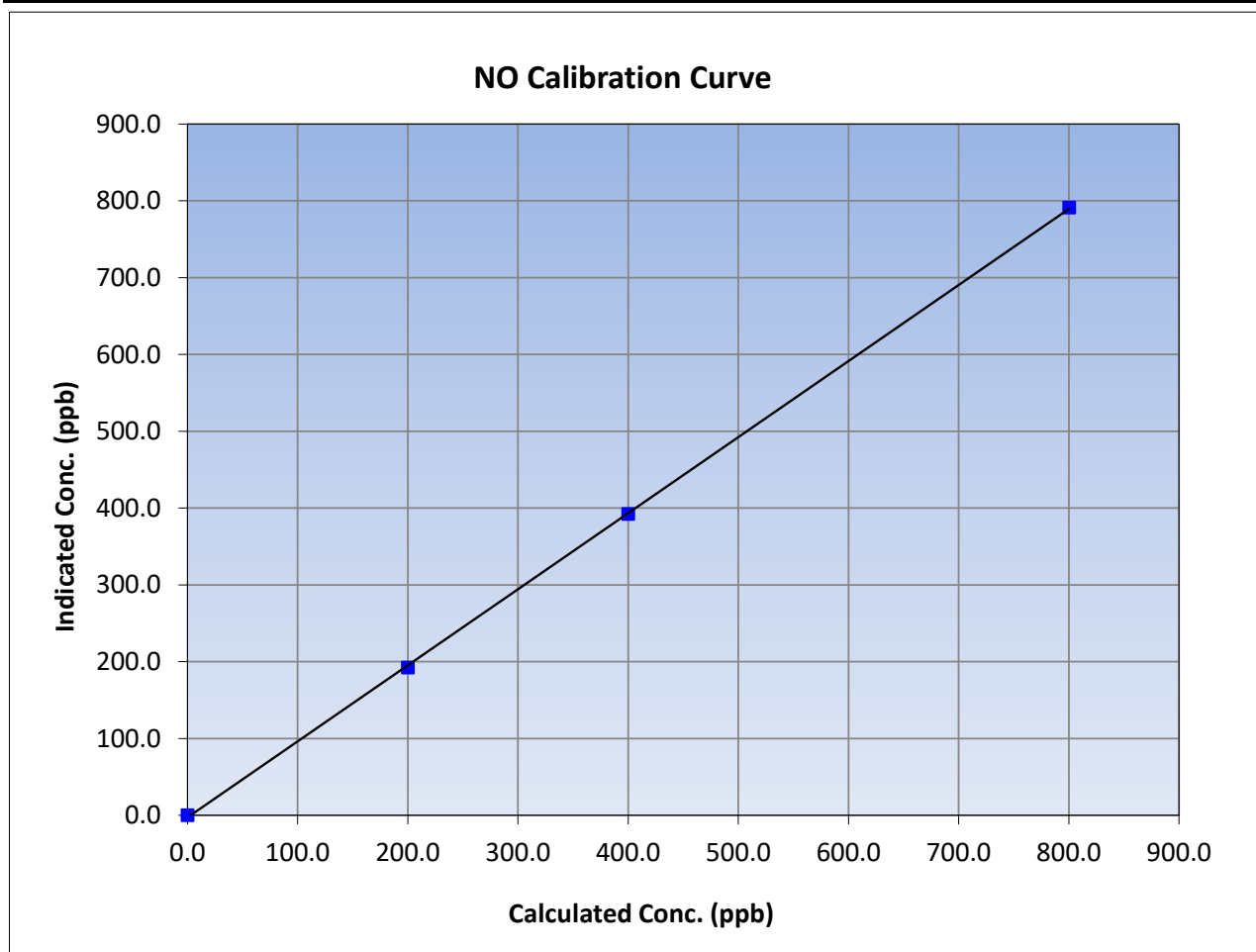
Version-04-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 29, 2023 | Previous Calibration: | February 16, 2023 |
| Station Name:     | Christina Lake | Station Number:       | AMS 26            |
| Start Time (MST): | 10:57          | End Time (MST):       | 15:06             |
| Analyzer make:    | Thermo 42i     | Analyzer serial #:    | 14:00             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <u>Limits</u>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.3                               | 791.1                              | 1.0117                    |   |                                |
| 400.2                               | 392.3                              | 1.0200                    |   |                                |
| 200.1                               | 192.3                              | 1.0405                    |   |                                |





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

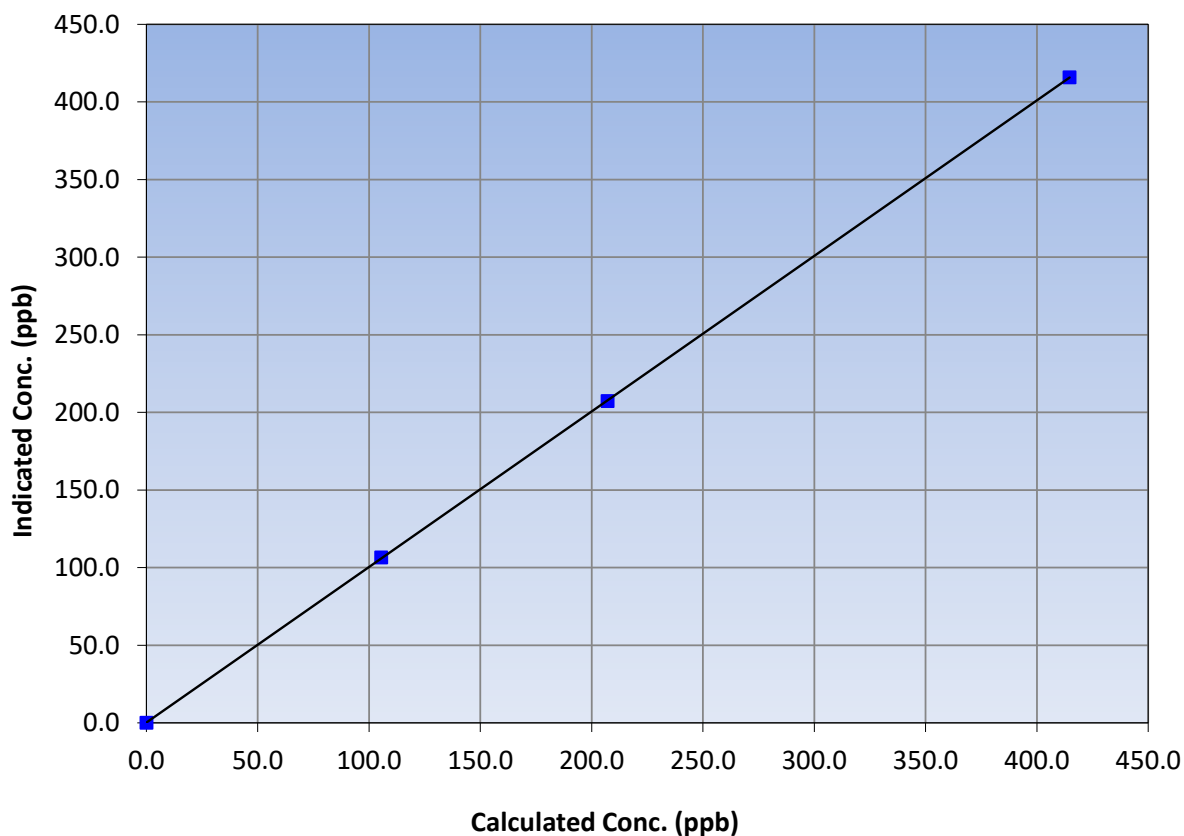
### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 29, 2023 | Previous Calibration: | February 16, 2023 |
| Station Name:     | Christina Lake | Station Number:       | AMS 26            |
| Start Time (MST): | 10:57          | End Time (MST):       | 15:06             |
| Analyzer make:    | Thermo 42i     | Analyzer serial #:    | 14:00             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 414.7                               | 415.8                              | 0.9974                    |   |                                |
| 207.1                               | 207.3                              | 0.9990                    |   |                                |
| 105.5                               | 106.5                              | 0.9906                    |   |                                |
|                                     |                                    |                           | 0.999994                                      |                                |
|                                     |                                    |                           | 1.001972                                      |                                |
|                                     |                                    |                           | 0.216428                                      |                                |

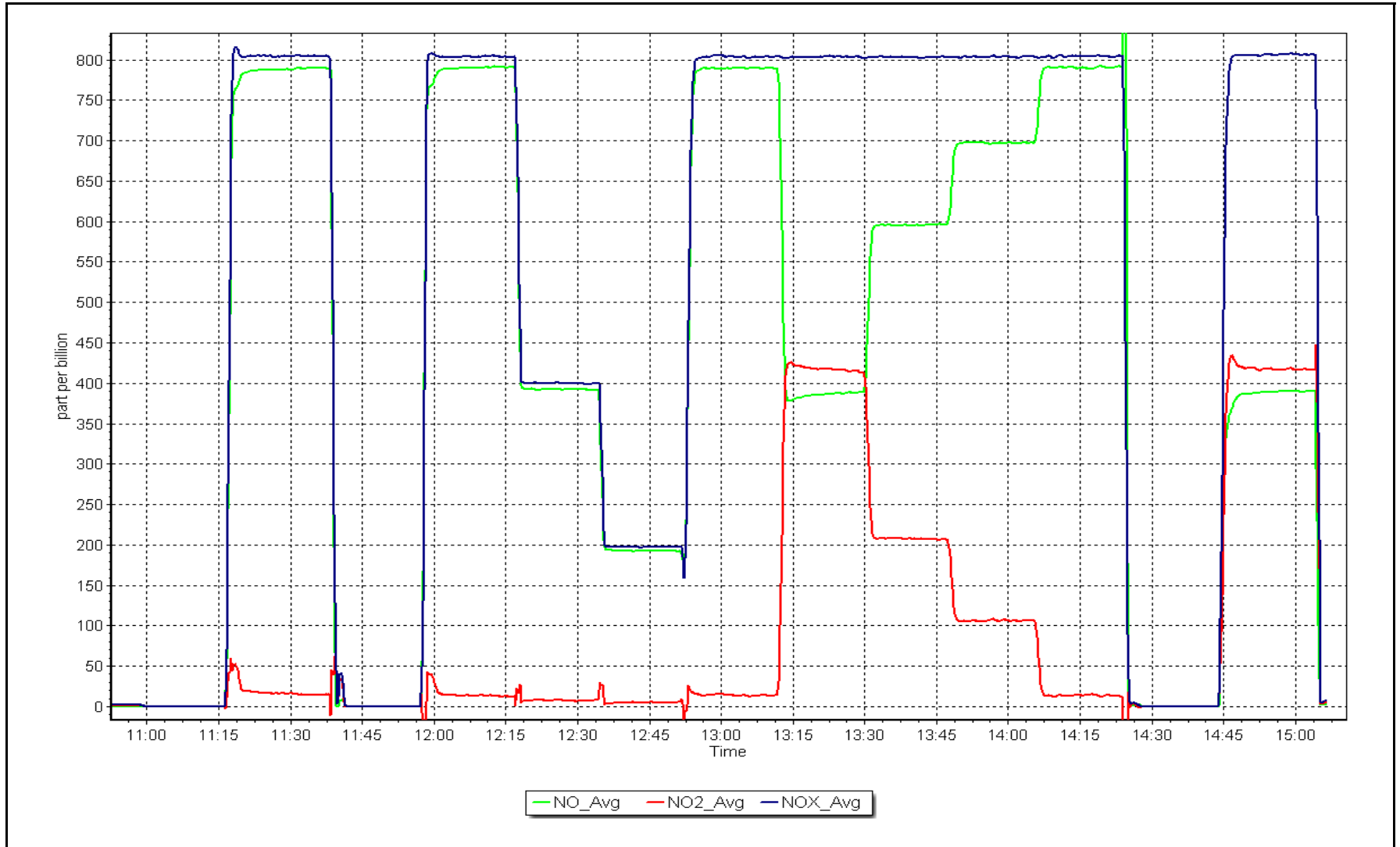
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: March 29, 2023

Location: Christina Lake





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS27**  
**JACKFISH 2/3**  
**MARCH 2023**

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

April 29, 2023







# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

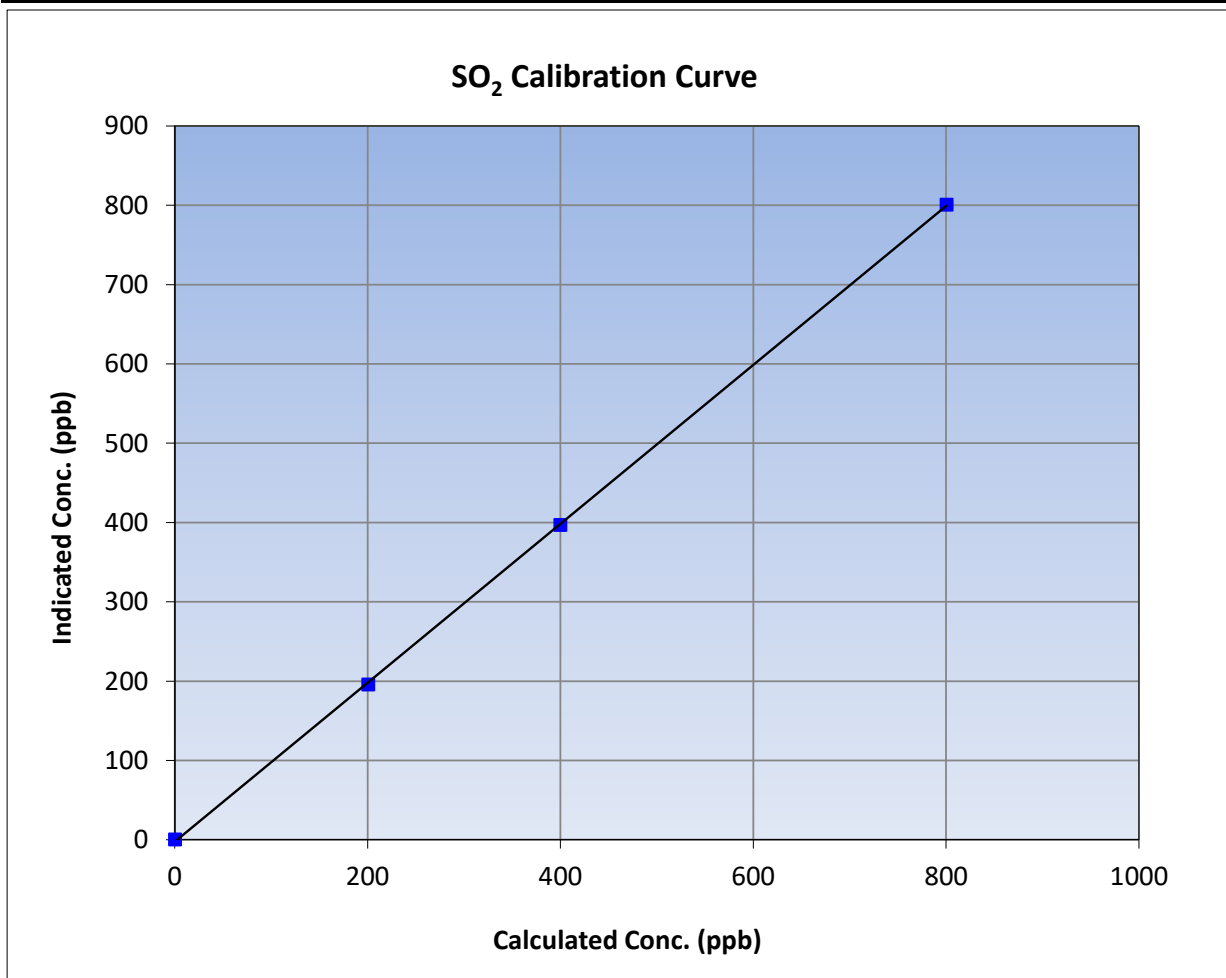
Version-01-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 8, 2023 | Previous Calibration: | February 14, 2023 |
| Station Name:     | Jackfish 2/3  | Station Number:       | AMS 27            |
| Start Time (MST): | 10:52         | End Time (MST):       | 13:45             |
| Analyzer make:    | Thero 43iQ    | Analyzer serial #:    | 12124313138       |

### Calibration Data

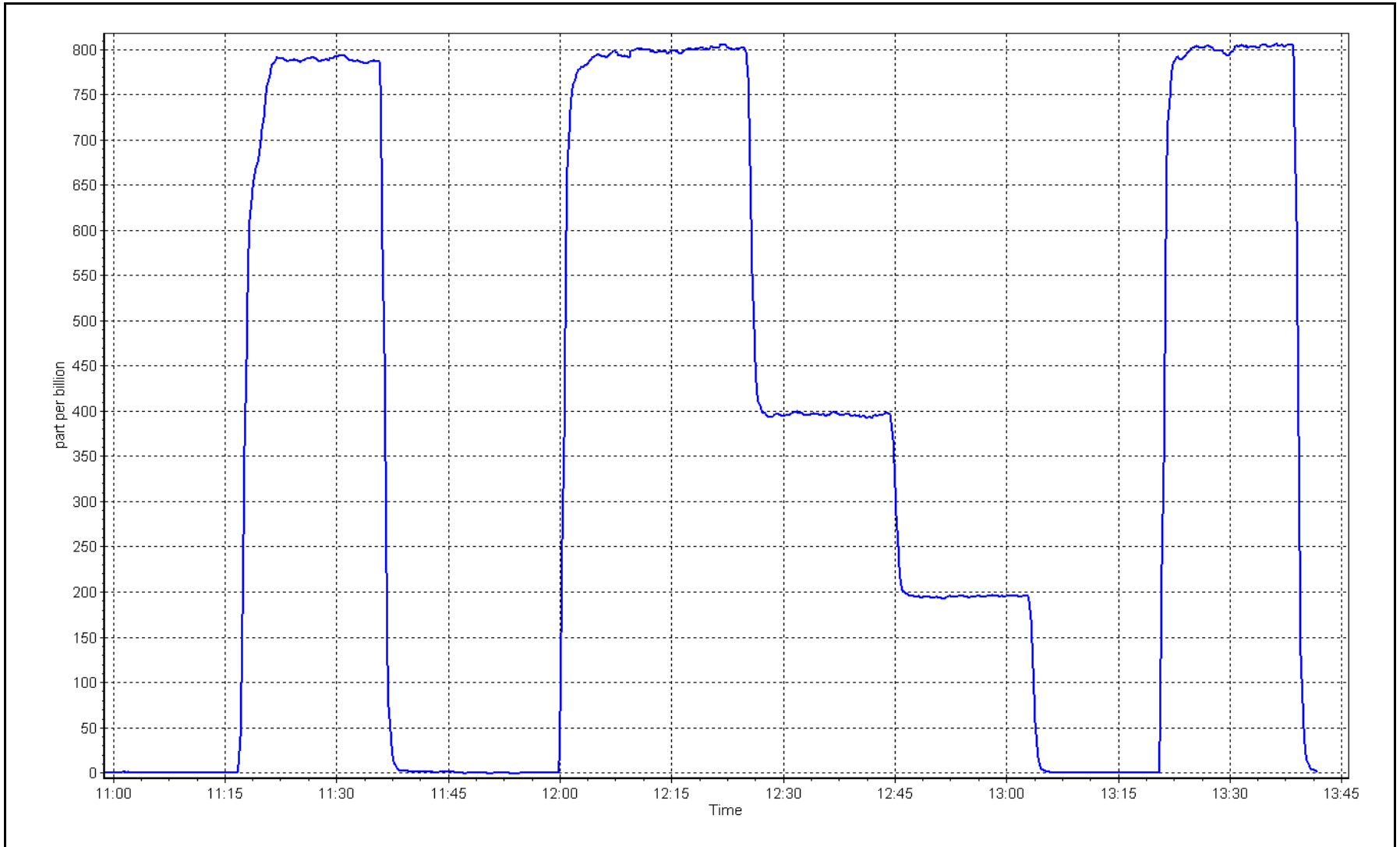
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999954      |             |
| 800.2                               | 800.5                              | 0.9996                    |                         |               | ≥0.995      |
| 399.5                               | 396.6                              | 1.0074                    | Slope                   | 1.002034      |             |
| 200.3                               | 195.6                              | 1.0241                    |                         |               | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -2.538384     | +/-30       |



SO2 Calibration Plot

Date: March 8, 2023

Location: Jackfish 2/3





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Jackfish 2/3      Station number: AMS27  
 Calibration Date: March 23, 2023      Last Cal Date: February 7, 2023  
 Start time (MST): 9:29      End time (MST): 13:37  
 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 701H      Serial Number: 135

### Analyzer Information

Analyzer make: API T101      Analyzer serial #: 621  
 Converter make:      Converter serial #:  
 Analyzer Range 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 1.000628     | 0.983812      | Backgd or Offset: 25.4 | 25.4          |
| Calibration intercept: | -0.177928    | -0.138417     | Coeff or Slope: 0.949  | 0.949         |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4926                          | 74.1                        | 80.2                                | 80.4                               | 0.998  |
| as found 2nd point    | 4963                          | 37.0                        | 40.0                                | 39.9                               | 1.006  |
| as found 3rd point    | 4982                          | 18.5                        | 20.0                                | 19.5                               | 1.032  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                              | 4926                          | 74.1                        | 80.2                                | 78.9                               | 1.016   |
| second point                            | 4963                          | 37.0                        | 40.0                                | 39.1                               | 1.024   |
| third point                             | 4982                          | 18.5                        | 20.0                                | 19.2                               | 1.042   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| as left span                            | 4926                          | 74.1                        | 80.2                                | 79.0                               | 1.015   |
| SO2 Scrubber Check                      | 4921                          | 79.1                        | 791.0                               | 0.0                                | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    | 1.027   |
| Date of last converter efficiency test: |                               |                             |                                     | efficiency                         |   |

Baseline Corr As found: 80.3      Prev response: 80.05      \*% change: 0.3%  
 Baseline Corr 2nd AF pt: 39.8      AF Slope: 1.003909      AF Intercept: -0.217940  
 Baseline Corr 3rd AF pt: 19.4      AF Correlation: 0.999925

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

Notes: No adjustments made.

Calibration Performed By: Denny Ray Estador



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

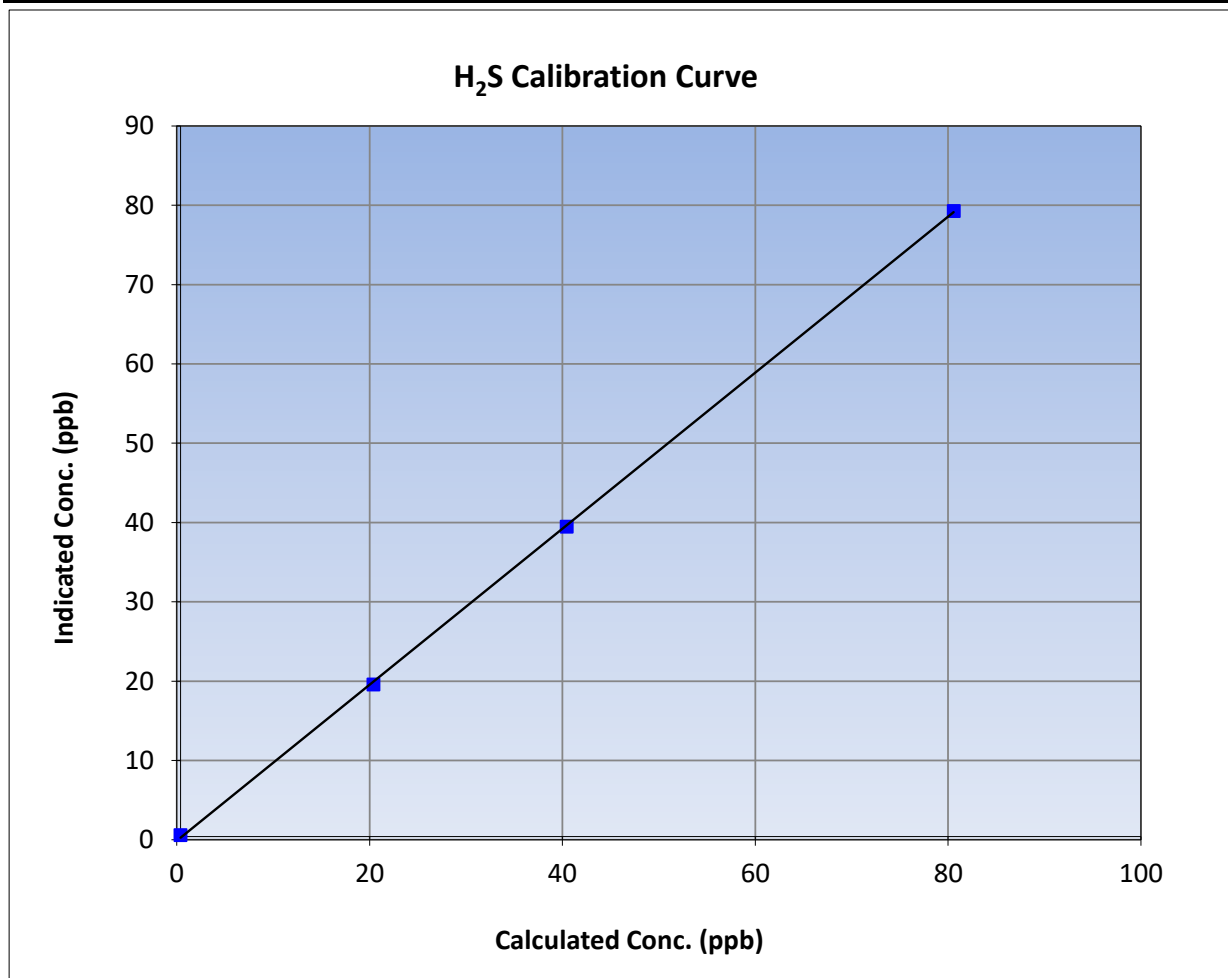
Version-11-2021

### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 23, 2023 | Previous Calibration: | February 7, 2023 |
| Station Name:     | Jackfish 2/3   | Station Number:       | AMS27            |
| Start Time (MST): | 9:29           | End Time (MST):       | 13:37            |
| Analyzer make:    | API T101       | Analyzer serial #:    | 621              |

### Calibration Data

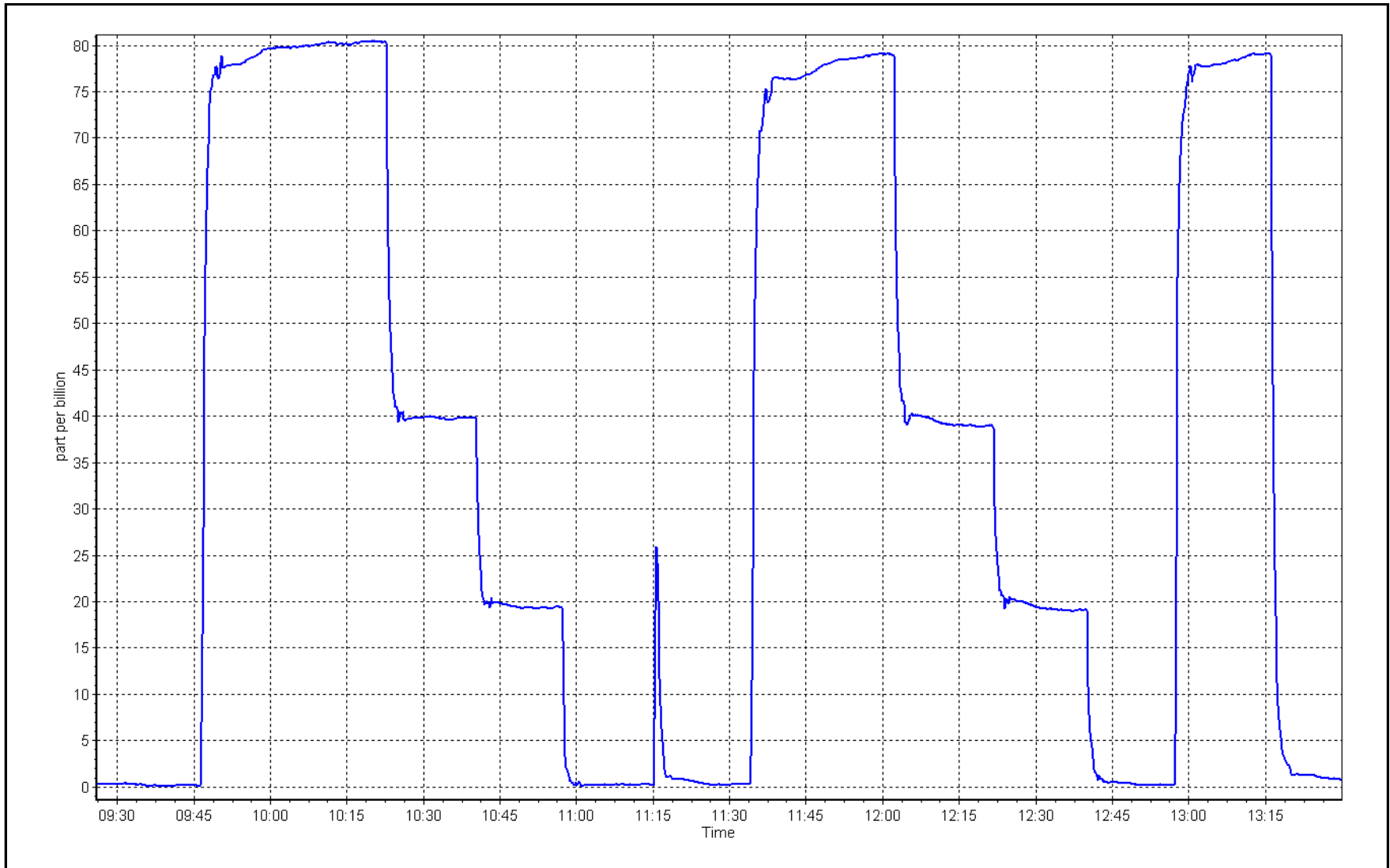
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999916  |             |
| 80.2                                | 78.9                               | 1.0162                    |                         |           | ≥0.995      |
| 40.0                                | 39.1                               | 1.0239                    | Slope                   | 0.983812  |             |
| 20.0                                | 19.2                               | 1.0424                    |                         |           | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.138417 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: March 23, 2023

Location: Jackfish 2/3







# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.2                                  | 0.2  | ----  | ----   |
| as found span             | 4921                      | 79.4                        | 816.8   | 800.3                                  | 16.5  | 810.0  | 796.9                                 | 13.2   | 1.0084  | 1.0043   |
| 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                | 4921                      | 79.4                        | 816.8   | 800.3                                  | 16.5  | 813.6  | 797.5                                 | 16.1   | 1.0039  | 1.0035   |
| second point              | 4960                      | 39.7                        | 408.5   | 400.2                                  | 8.3   | 400.2  | 393.9                                 | 6.2  | 1.0206  | 1.0160   |
| third point               | 4980                      | 19.8                        | 203.7   | 199.6                                  | 4.1   | 195.7  | 192.2                                 | 3.5  | 1.0409  | 1.0385   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.5   | -0.3                                  | -0.2   | ----  | ----   |
| as left span              | 4921                      | 79.4                        | 816.8   | 412.5                                  | 417.7   | 807.6  | 403.3                                 | 404.3  | 1.0114  | 1.0228   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0218  | 1.0193   |

|                      |                             |                |  |                                  |                         |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 810.0 ppb | NO = 797.1 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -0.3% |                      |
| Previous Response    | NO <sub>x</sub> = 812.7 ppb | NO = 798.5 ppb |  | *Percent Change                  | NO = -0.2%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 796.1                                      | 394.9                                 | 417.7   | 414.9  | 1.0068   | 99.3%  |
| 2nd GPT point (200 ppb O3)       | 796.1                                      | 609.4                                 | 203.2   | 203.6  | 0.9981   | 100.2%   |
| 3rd GPT point (100 ppb O3)       | 796.1                                      | 707.9                                 | 104.7   | 101.1  | 1.0357   | 96.5%  |
| Average Correction Factor        |  |                                       |   |  | 1.0135   | 98.7%  |

Notes:

No adjustments made.

Calibration Performed By:

Denny Ray Estador





# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

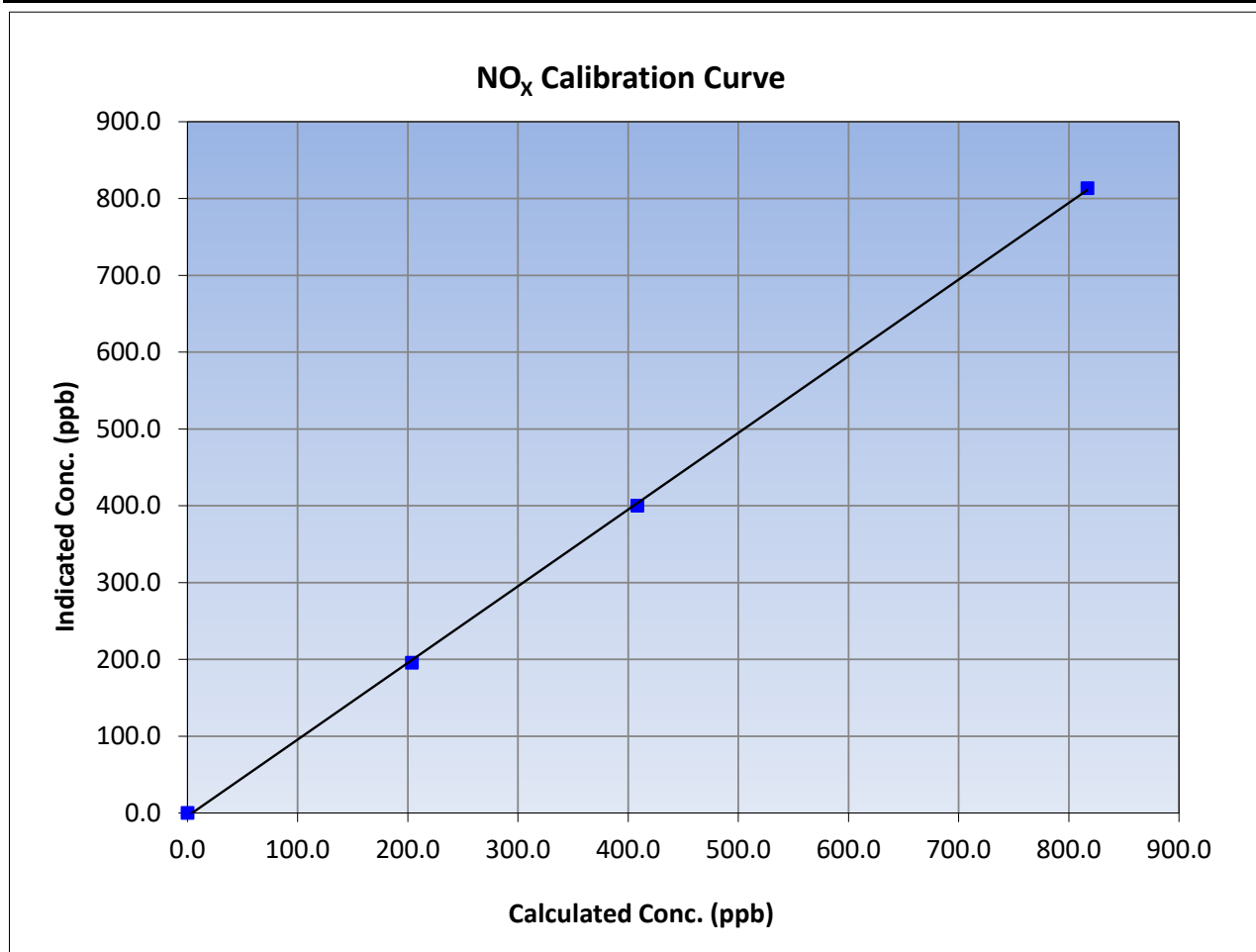
Version-04-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 28, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Jackfish 2/3   | Station Number:       | AMS27             |
| Start Time (MST): | 9:45           | End Time (MST):       | 13:50             |
| Analyzer make:    | API T200       | Analyzer serial #:    | 4460              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 816.8                               | 813.6                              | 1.0039                    |   |                                |
| 408.5                               | 400.2                              | 1.0206                    |   |                                |
| 203.7                               | 195.7                              | 1.0409                    |   |                                |
|                                     |                                    |                           |   |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

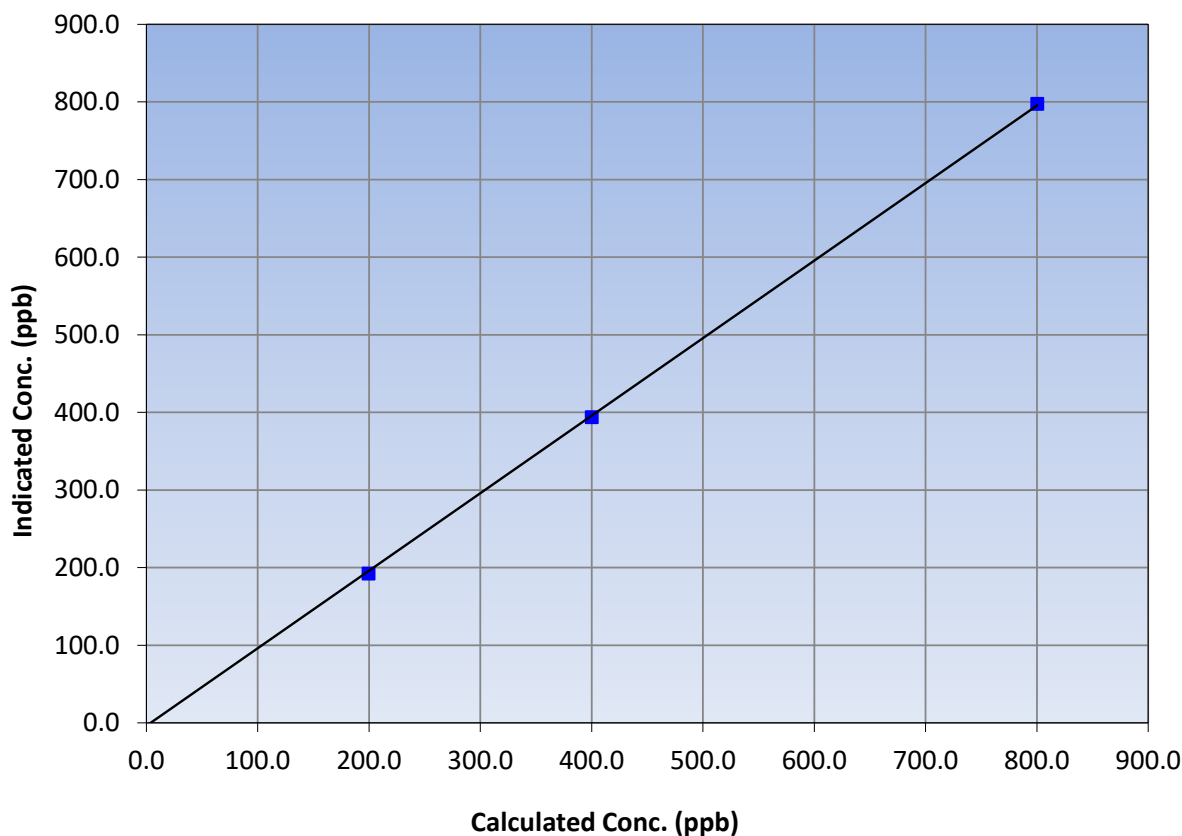
### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 28, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Jackfish 2/3   | Station Number:       | AMS27             |
| Start Time (MST): | 9:45           | End Time (MST):       | 13:50             |
| Analyzer make:    | API T200       | Analyzer serial #:    | 4460              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.3                               | 797.5                              | 1.0035                    |   |                                |
| 400.2                               | 393.9                              | 1.0160                    |   |                                |
| 199.6                               | 192.2                              | 1.0385                    |   |                                |
|                                     |                                    |                           | 0.999906                                      |                                |
|                                     |                                    |                           | 0.998789                                      |                                |
|                                     |                                    |                           | -3.720948                                     |                                |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

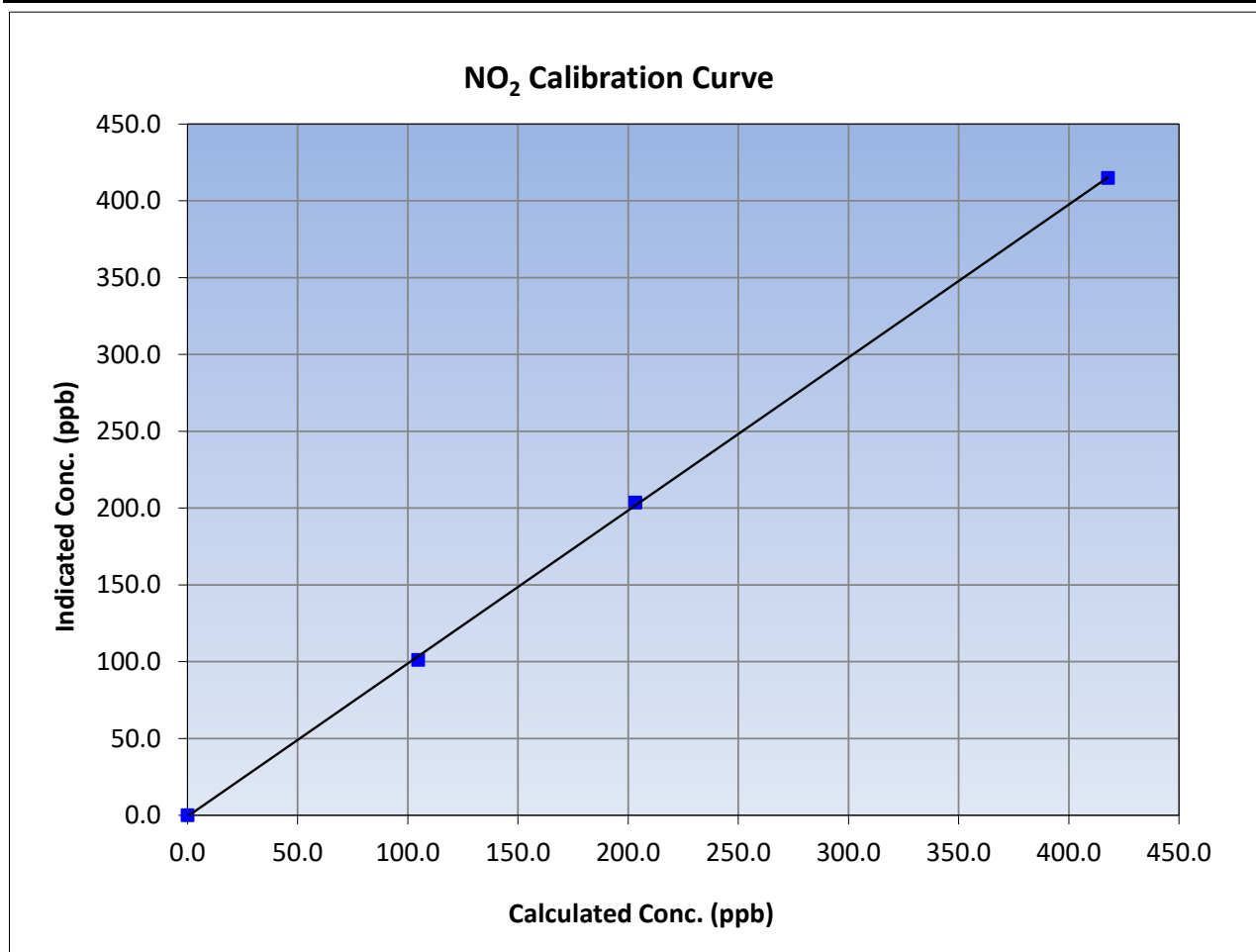
Version-04-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 28, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Jackfish 2/3   | Station Number:       | AMS27             |
| Start Time (MST): | 9:45           | End Time (MST):       | 13:50             |
| Analyzer make:    | API T200       | Analyzer serial #:    | 4460              |

### Calibration Data

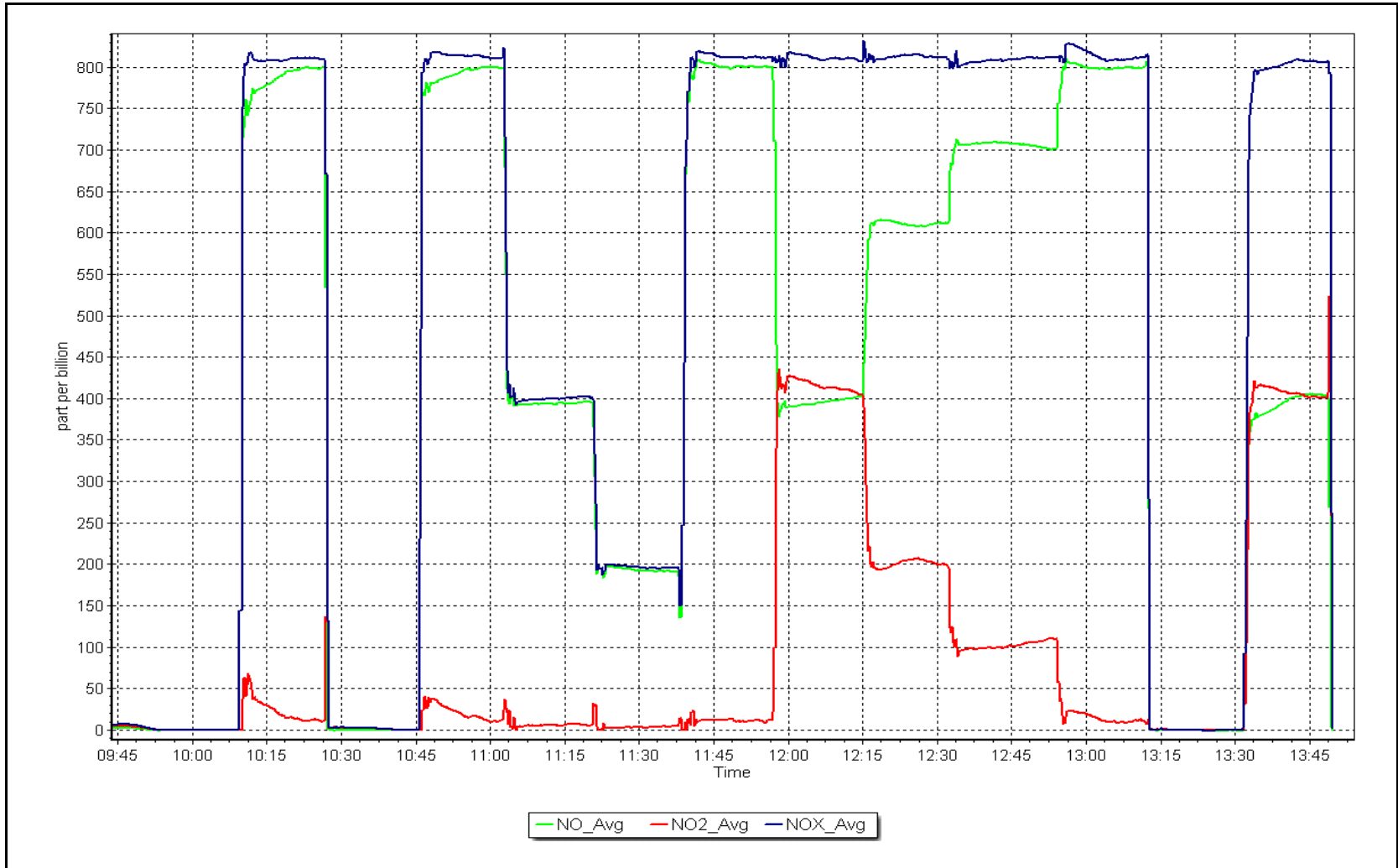
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 417.7                               | 414.9                              | 1.0068                    |                         |               |             |
| 203.2                               | 203.6                              | 0.9981                    |                         |               |             |
| 104.7                               | 101.1                              | 1.0357                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.995821      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.727241     | +/-20       |



NO<sub>x</sub> Calibration Plot

Date: March 28, 2023

Location: Jackfish 2/3





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS29  
SURMONT 2  
MARCH 2023**

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

April 29, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

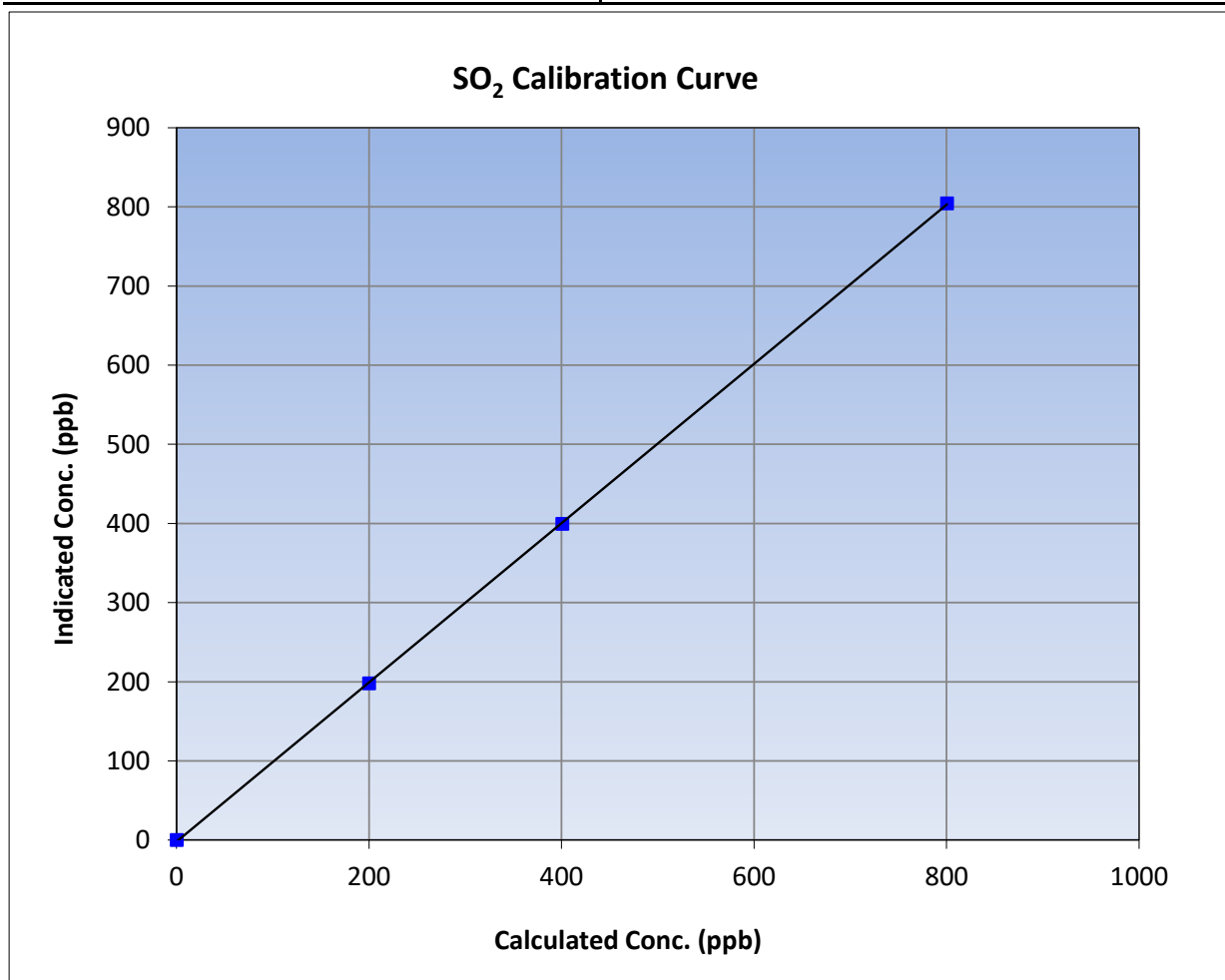
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 13, 2023 | Previous Calibration: | February 16, 2023 |
| Station Name:     | Surmont 2      | Station Number:       | AMS29             |
| Start Time (MST): | 10:09          | End Time (MST):       | 13:27             |
| Analyzer make:    | Thermo 43i     | Analyzer serial #:    | 1170050150        |

### Calibration Data

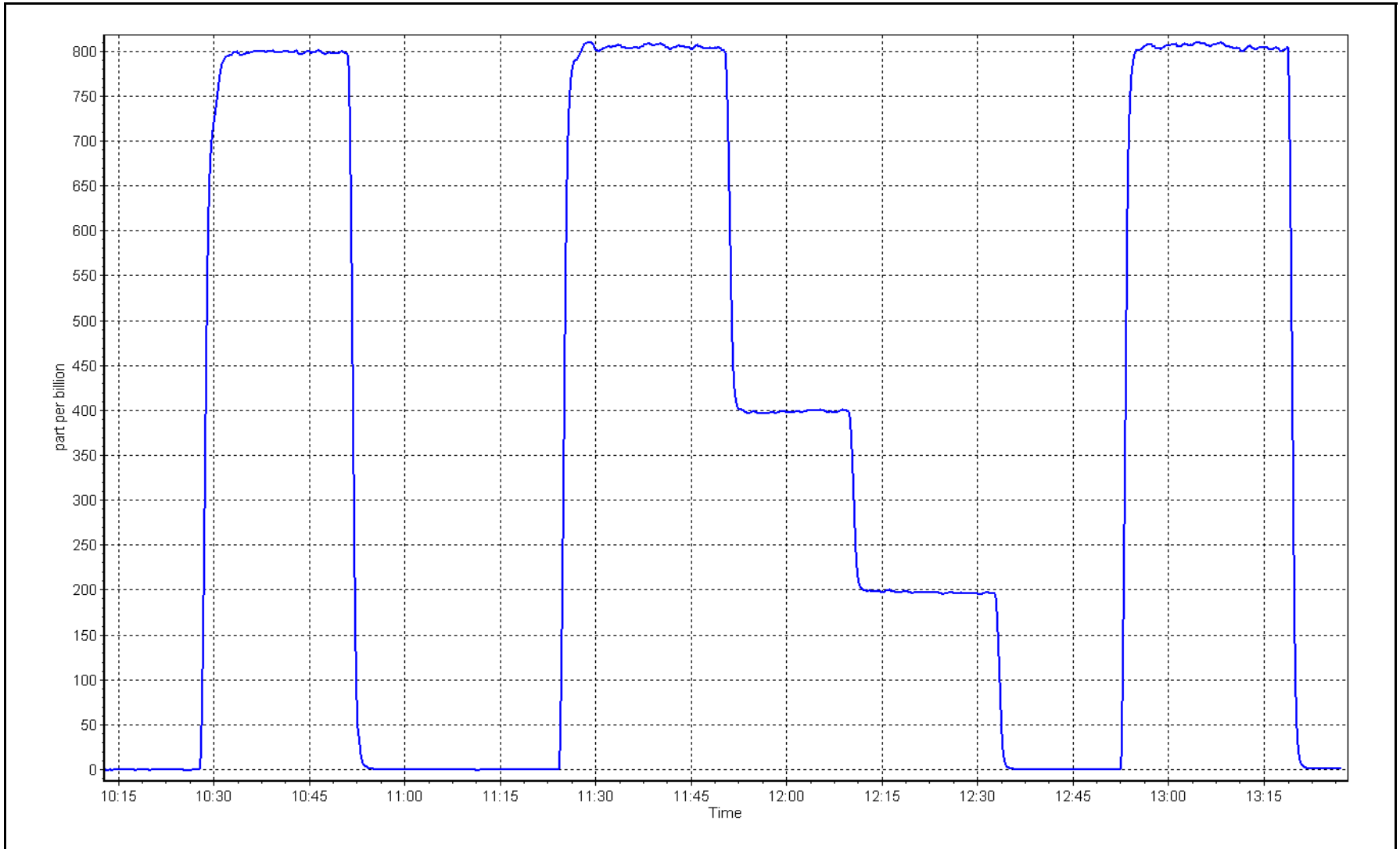
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.3                               | ----                      | Correlation Coefficient | 0.999974  | ≥0.995      |
| 800.1                               | 804.0                              | 0.9952                    |                         |           |             |
| 400.6                               | 399.3                              | 1.0032                    | Slope                   | 1.006112  | 0.90 - 1.10 |
| 199.8                               | 197.5                              | 1.0117                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -2.145180 | +/-30       |



SO2 Calibration Plot

Date: March 13, 2023

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 13, 2023 | Last Cal Date:  | February 16, 2023 |
| Start time (MST): | 10:09          | End time (MST): | 13:27             |
| Reason:           | Routine        |                 |                   |

### Calibration Standards

|                        |                   |                      |                   |
|------------------------|-------------------|----------------------|-------------------|
| Gas Cert Reference:    | CC356008          | Cal Gas Expiry Date: | February 23, 2025 |
| CH4 Cal Gas Conc.      | <u>499.0</u> ppm  | CH4 Equiv Conc.      | 1064.7 ppm        |
| C3H8 Cal Gas Conc.     | <u>205.7</u> ppm  |                      |                   |
| Removed Gas Cert:      | NA                | Removed Gas Expiry:  | NA                |
| Removed CH4 Conc.      | <u>499.0</u> ppm  | CH4 Equiv Conc.      | 1064.7 ppm        |
| Removed C3H8 Conc.     | <u>205.7</u> ppm  | Diff between cyl:    |                   |
| Calibrator Make/Model: | Teledyne API T700 | Serial Number:       | 5258              |
| ZAG Make/Model:        | Teledyne API T701 | Serial Number:       | 4297              |

### Analyzer Information

Analyzer make: Thermo 51i-LT                      Analyzer serial #: 1170050149  
 Analyzer Range: 0 - 20 ppm

|                        |              |               |              |              |               |
|------------------------|--------------|---------------|--------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |              | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.995950     | 1.008880      | Background:  | 4.36         | 4.62          |
| Calibration intercept: | 0.026135     | -0.118074     | Coefficient: | 5.223        | 5.286         |

### 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)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.00                                | 0.11                               | ----  |
| as found span             | 4918                          | 81.3                        | 17.31                               | 17.22                              | 1.005   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.00                                | -0.06                              | ----  |
| high point                | 4918                          | 81.3                        | 17.31                               | 17.37                              | 0.997   |
| second point              | 4959                          | 40.7                        | 8.67                                | 8.62                               | 1.005   |
| third point               | 4979                          | 20.3                        | 4.32                                | 4.17                               | 1.036   |
| as left zero              | 5000                          | 0.0                         | 0.00                                | -0.17                              | ----  |
| as left span              | 4918                          | 81.3                        | 17.31                               | 17.40                              | 0.995   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.013   |
| Baseline Corr As found:   | 17.11                         | Previous response           | 17.27                               | *% 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 zero.

Calibration Performed By:                  Braiden Boutilier



# Wood Buffalo Environmental Association

## THC Calibration Summary

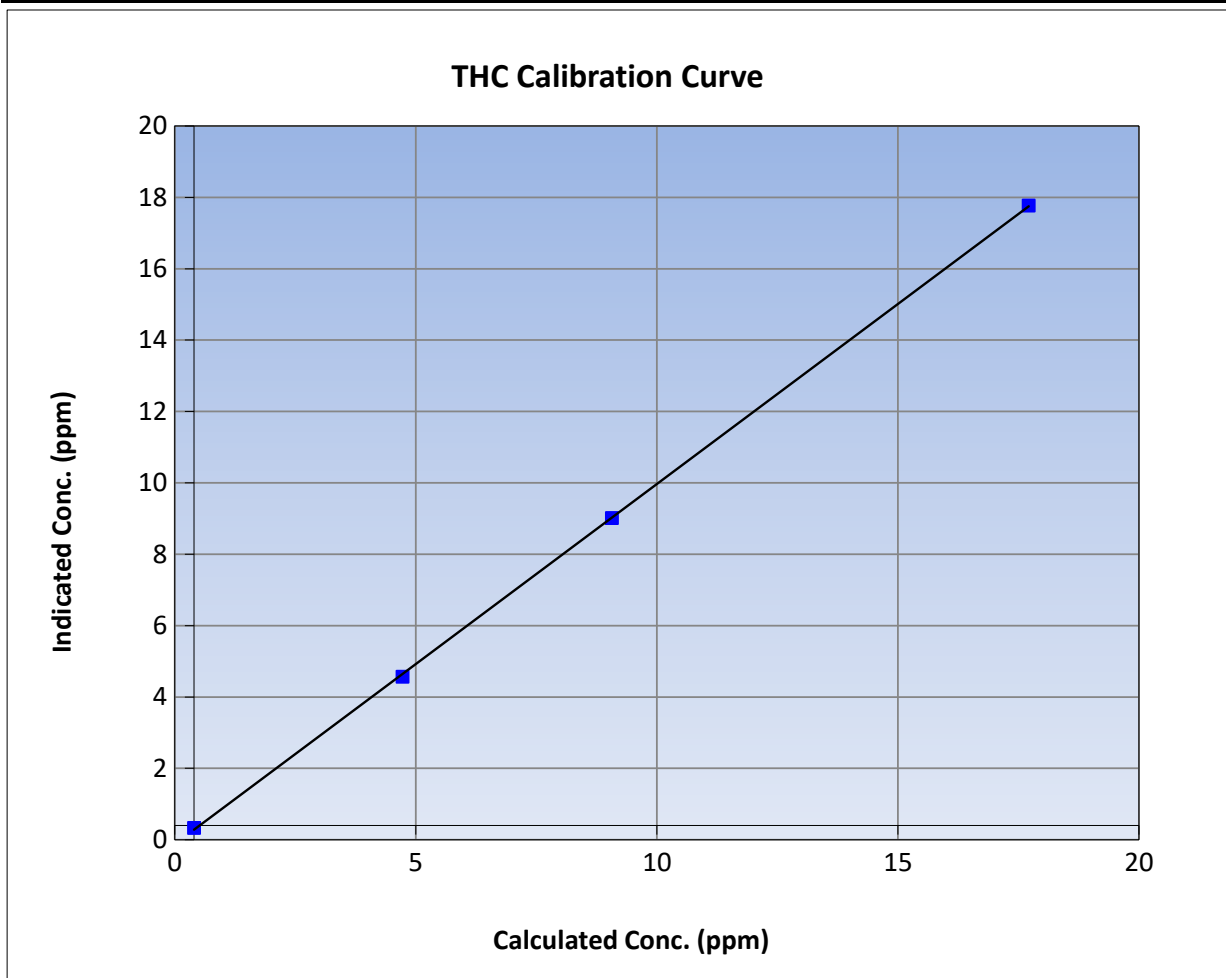
Version-01-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 13, 2023 | Previous Calibration: | February 16, 2023 |
| Station Name:     | Surmont 2      | Station Number:       | AMS29             |
| Start Time (MST): | 10:09          | End Time (MST):       | 13:27             |
| Analyzer make:    | Thermo 51i-LT  | Analyzer serial #:    | 1170050149        |

### Calibration Data

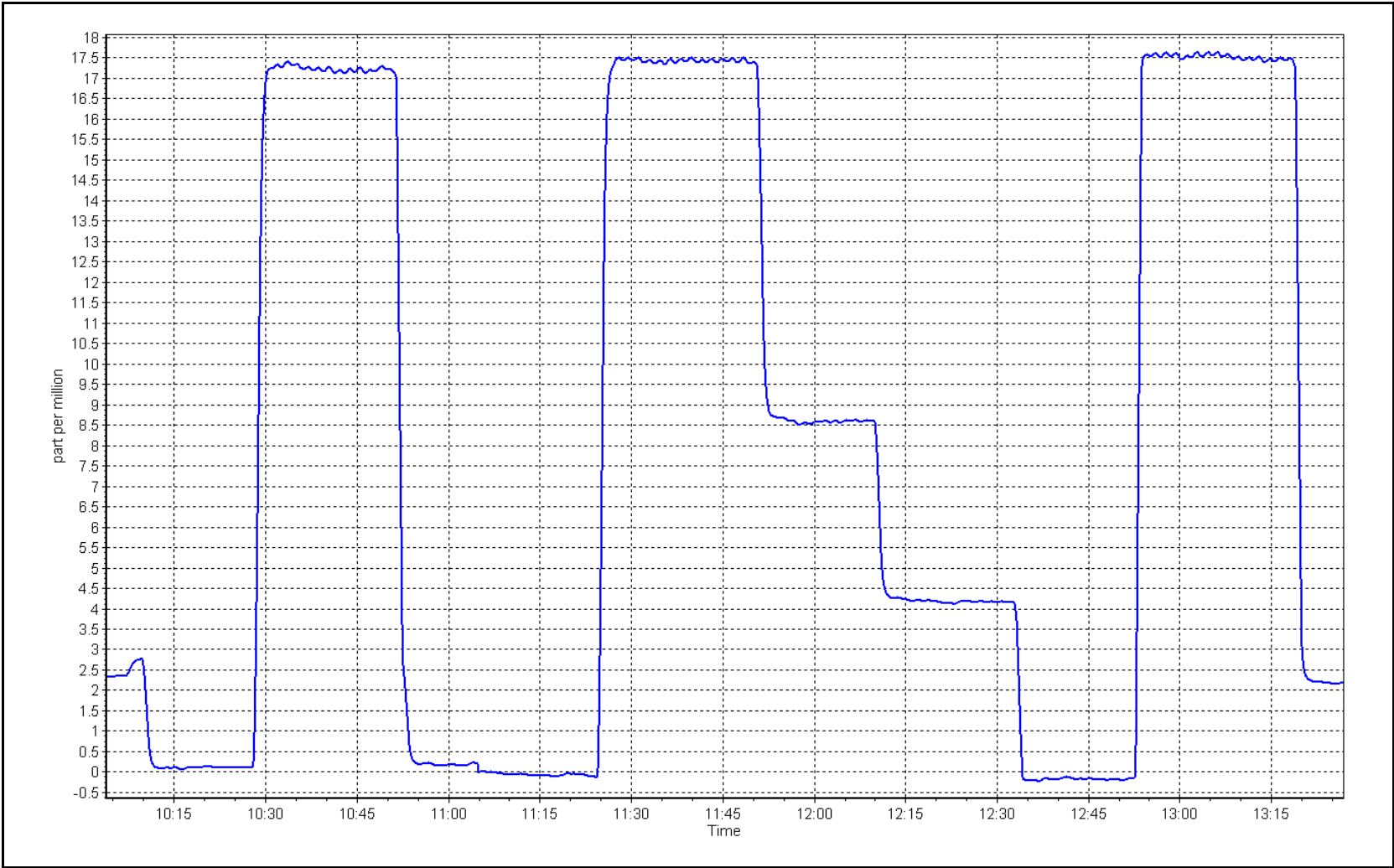
| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (lc) | Correction factor (Cc/lc) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.00                                | -0.06                              | ----                      | Correlation Coefficient | 0.999950      |             |
| 17.31                               | 17.37                              | 0.9968                    |                         |               | ≥0.995      |
| 8.67                                | 8.62                               | 1.0054                    | Slope                   | 1.008880      |             |
| 4.32                                | 4.17                               | 1.0357                    |                         |               | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.118074     | +/-1.5      |



THC Calibration Plot

Date: March 13, 2023

Location: Surmont 2





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

|                   |                |                 |                   |
|-------------------|----------------|-----------------|-------------------|
| Station Name:     | Surmont 2      | Station number: | AMS29             |
| Calibration Date: | March 29, 2023 | Last Cal Date:  | February 13, 2023 |
| Start time (MST): | 10:05          | End time (MST): | 12:20             |
| Reason:           | Removal        |                 |                   |

### Calibration Standards

|                        |                   |     |                   |                 |
|------------------------|-------------------|-----|-------------------|-----------------|
| Cal Gas Concentration: | <u>5.391</u>      | ppm | Cal Gas Exp Date: | January 4, 2025 |
| Cal Gas Cylinder #:    | <u>CC508338</u>   |     |                   |                 |
| Removed Cal Gas Conc:  | <u>5.391</u>      | ppm | Rem Gas Exp Date: | NA              |
| Removed Gas Cyl #:     | <u>CC508338</u>   |     | Diff between cyl: |                 |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 5258            |
| ZAG Make/Model:        | Teledyne API T701 |     | Serial Number:    | 4297            |

### Analyzer Information

|                 |             |                     |            |
|-----------------|-------------|---------------------|------------|
| Analyzer make:  | Thermo 450i | Analyzer serial #:  | 1170050142 |
| Converter make: | Internal    | Converter serial #: | NA         |
| Analyzer Range  | 0 - 100 ppb |                     |            |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.994905     |               | Backgd or Offset: | 17.0         | 17.0          |
| Calibration intercept: | -0.062658    |               | Coeff or Slope:   | 1.024        | 1.024         |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | -0.2                               | ----   |
| as found span         | 4926                          | 74.2                        | 80.0                                | 83.0                               | 0.962  |
| as found 2nd point    | 4963                          | 37.2                        | 40.1                                | 41.5                               | 0.962  |
| as found 3rd point    | 4982                          | 18.6                        | 20.1                                | 20.3                               | 0.978  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|-----------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero |                               |                             |                                     |                                    |   |
| high point      |                               |                             |                                     |                                    |   |
| second point    |                               |                             |                                     |                                    |   |
| third point     |                               |                             |                                     |                                    |   |
| as left zero    |                               |                             |                                     |                                    |   |
| as left span    |                               |                             |                                     |                                    |   |

### SO<sub>2</sub> Scrubber Check

|   |           |                 |  |
|---|-----------|-----------------|--|
| Date of last scrubber change:           | 15-Apr-21 | Ave Corr Factor |  |
| Date of last converter efficiency test: |           | efficiency      |  |

|                          |      |                 |          |               |           |
|--------------------------|------|-----------------|----------|---------------|-----------|
| Baseline Corr As found:  | 83.2 | Prev response:  | 79.53    | *% change:    | 4.4%      |
| Baseline Corr 2nd AF pt: | 41.7 | AF Slope:       | 1.041475 | AF Intercept: | -0.344531 |
| Baseline Corr 3rd AF pt: | 20.5 | AF Correlation: | 0.999978 |               |           |

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

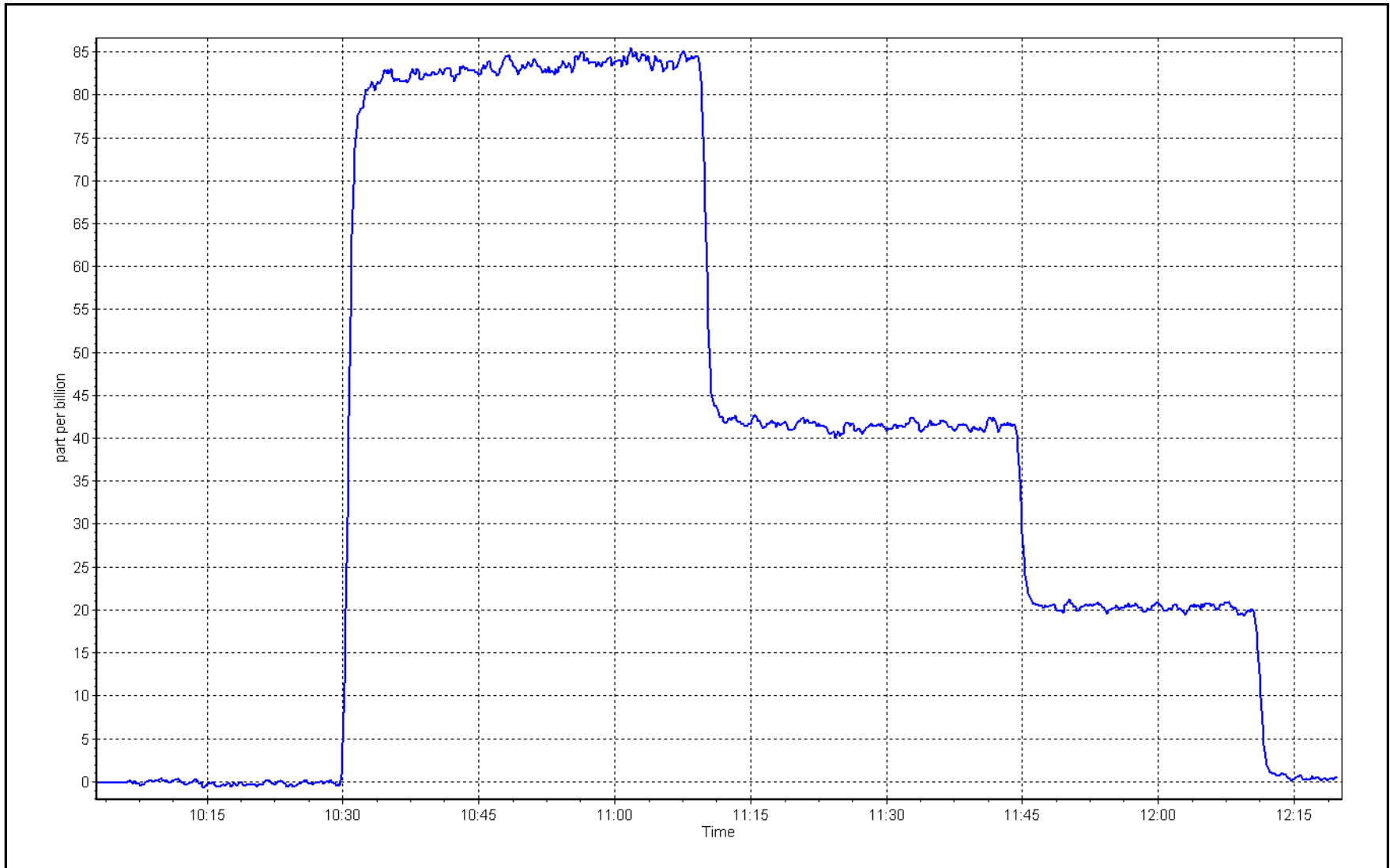
Notes: As founds done in preparation to swap the 450i with a 43iQ-TLE with an external converter.

Calibration Performed By: Braiden Boutillier

H<sub>2</sub>S Calibration Plot

Date: March 29, 2023

Location: Surmont 2







# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

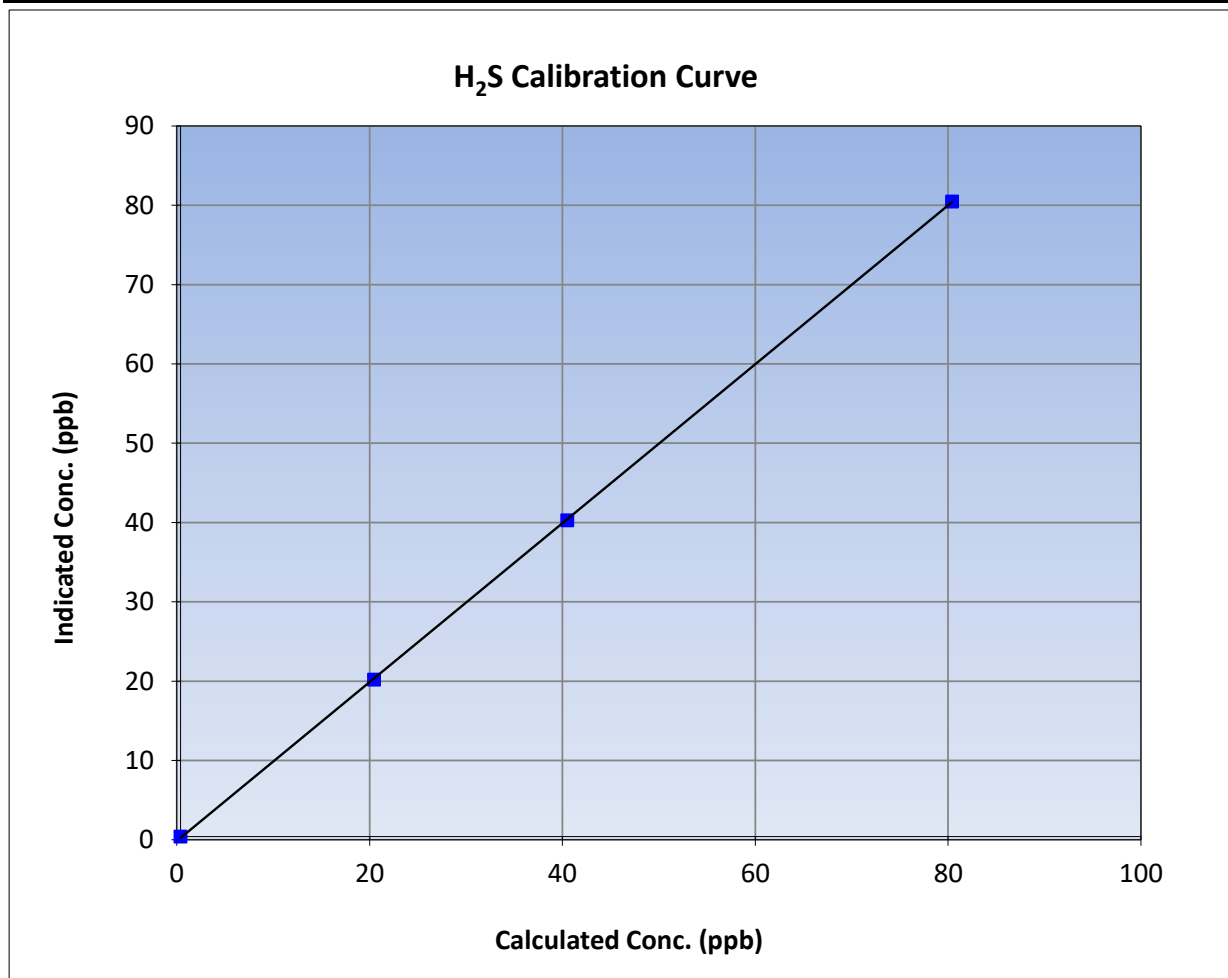
Version-11-2021

### Station Information

|                   |                 |                       |                |
|-------------------|-----------------|-----------------------|----------------|
| Calibration Date: | March 30, 2023  | Previous Calibration: | March 29, 2023 |
| Station Name:     | Surmont 2       | Station Number:       | AMS29          |
| Start Time (MST): | 9:33            | End Time (MST):       | 15:27          |
| Analyzer make:    | Thermo 43iQ-TLE | Analyzer serial #:    | 1200326170     |

### Calibration Data

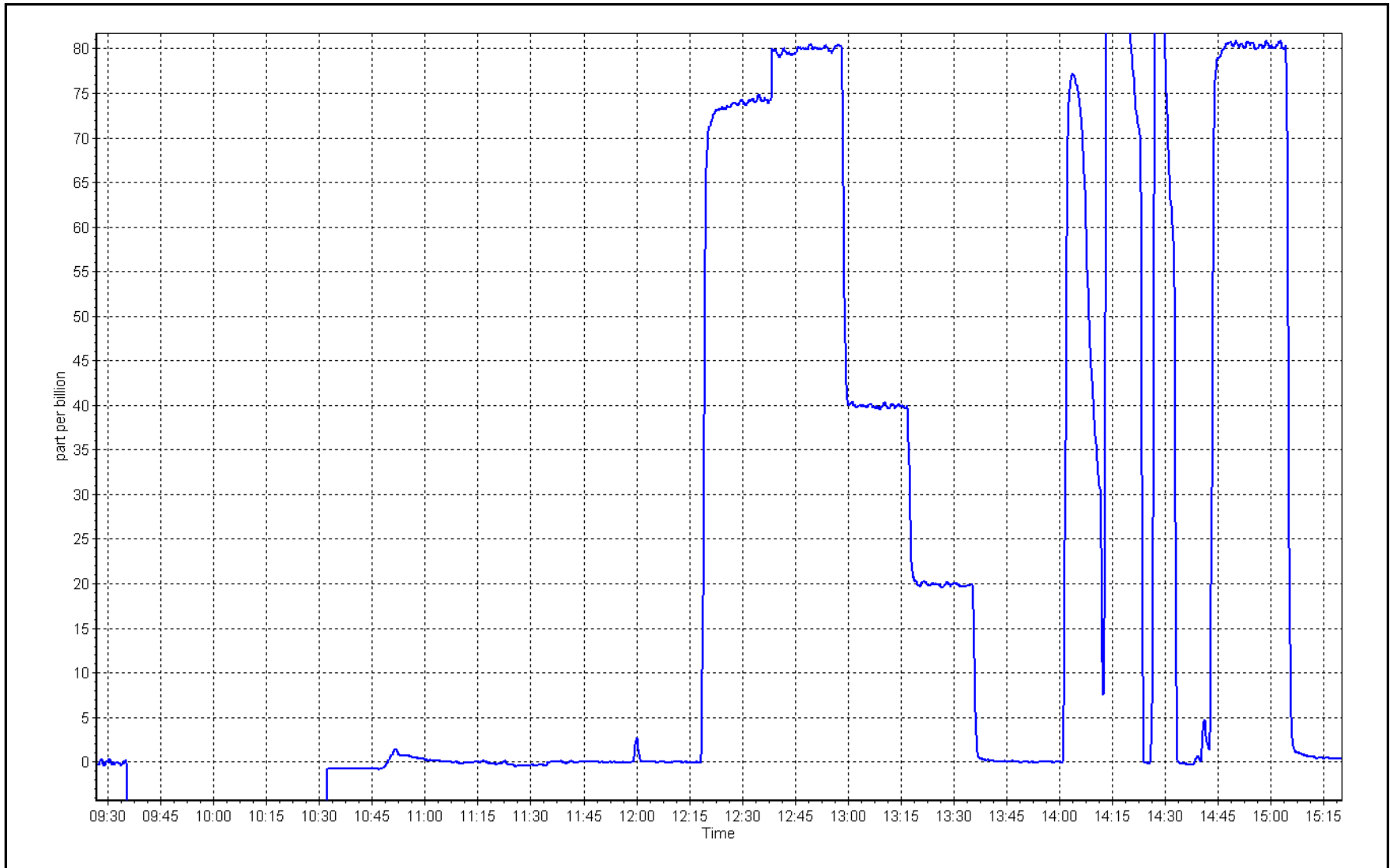
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits      |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | ≥0.995      |
| 80.0                                | 80.1                               | 0.9988                    |                         |             |
| 40.1                                | 39.9                               | 1.0052                    | Slope                   | 0.90 - 1.10 |
| 20.1                                | 19.8                               | 1.0128                    |                         |             |
|                                     |                                    |                           | Intercept               | +/-3        |



# H<sub>2</sub>S Calibration Plot

Date: March 30, 2023

Location: Surmont 2









# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point       | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|-----------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero   | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.0                                   | 0.0  | ----  | ----   |
| as found span   | 4916                      | 84.2                        | 799.2   | 799.2                                  | 0.0   | 783.8  | 778.8                                 | 5.1  | 1.0196  | 1.0262   |
| as found 2nd    |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd    |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp    |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero |                           |                             |   |  |   |  |                                       |  |   |  |
| high point      |                           |                             |   |  |   |  |                                       |  |   |  |
| second point    |                           |                             |   |  |   |  |                                       |  |   |  |
| third point     |                           |                             |   |  |   |  |                                       |  |   |  |
| as left zero    | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.0  | ----  | ----   |
| as left span    | 4916                      | 84.2                        | 799.2   | 416.8                                  | 382.4   | 780.2  | 397.9                                 | 382.2  | 1.0243  | 1.0475   |

#### Average Correction Factor

|                      |                             |                |  |                                  |                     |                         |
|----------------------|-----------------------------|----------------|--|----------------------------------|---------------------|-------------------------|
| Corrected As found   | NO <sub>x</sub> = 783.8 ppb | NO = 778.8 ppb | <i>* = &gt; +/-5% change initiates investigation</i> |                                  | *Percent Change     | NO <sub>x</sub> = -2.1% |
| Previous Response    | NO <sub>x</sub> = 799.9 ppb | NO = 798.9 ppb |  |                                  | *Percent Change     | NO = -2.6%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:              | Nx Int:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found   | NO r <sup>2</sup> :              | NO SI:              | NO Int:                 |
|                      |                             |                | As found   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI: | NO <sub>2</sub> Int:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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)       | 778.8                                      | 396.4                                 | 382.4   | 384.0  | 0.9958   | 100.4%   |
| 2nd GPT point (200 ppb O3)       |  |                                       |   |  |  |  |
| 3rd GPT point (100 ppb O3)       |  |                                       |   |  |  |  |
| Average Correction Factor        |  |                                       |   |  | 0.9958   | 100.4%   |

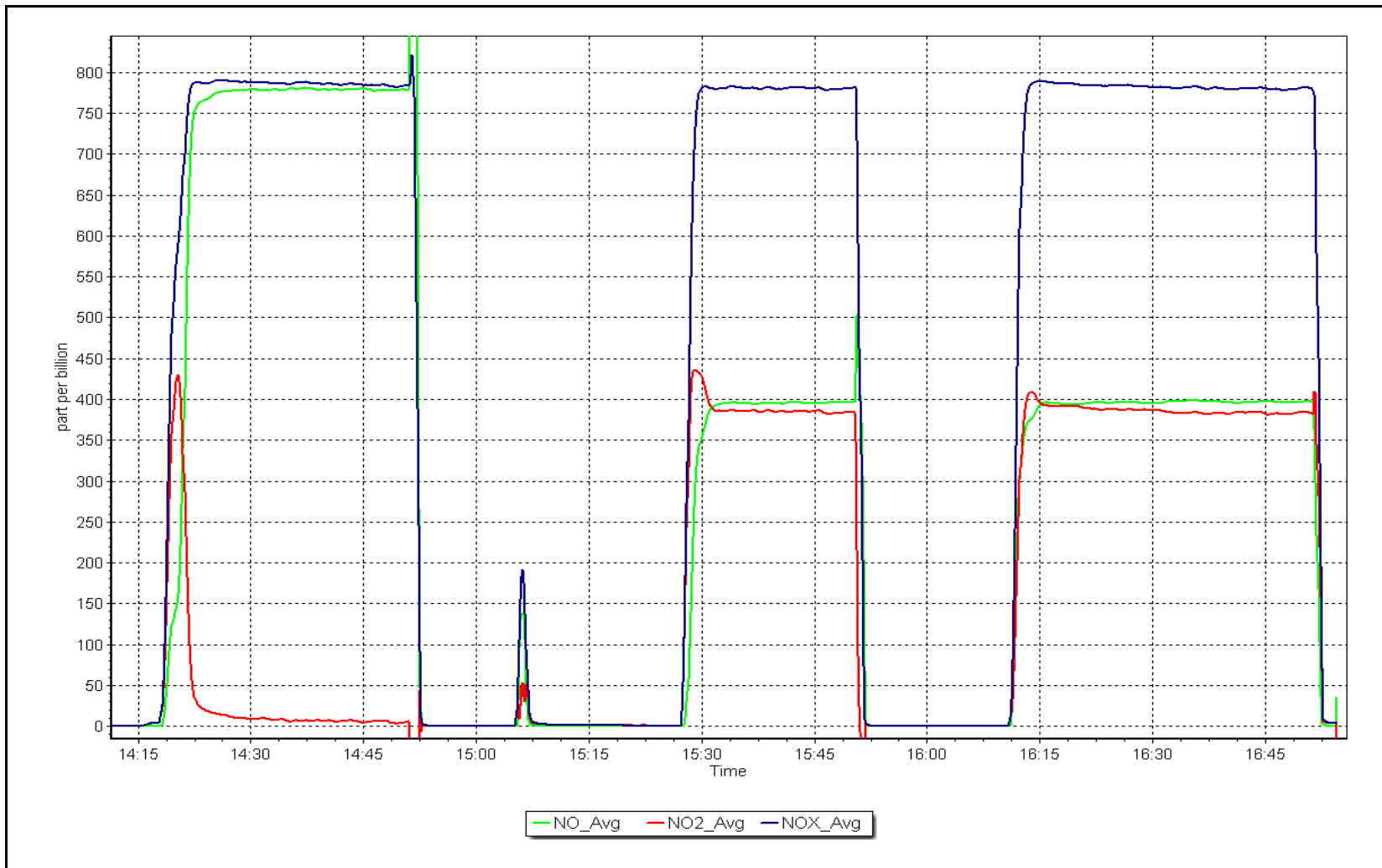
Notes: Checking the output of the calibrator prior to the monthly NO<sub>x</sub> calibration. GPTPS 400 ozone point generated, GPT 400 ozone point checked.

Calibration Performed By: Braiden Boutilier

NO<sub>x</sub> Calibration Plot

Date: March 13, 2023

Location: Surmont 2







# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.1   | -0.2                                  | 0.0  | ----  | ----   |
| as found span             | 4916                      | 84.2                        | 799.2   | 799.2                                  | 0.0   | 790.1  | 788.0                                 | 2.1  | 1.0115  | 1.0142   |
| 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   | 797.4  | 797.7                                 | -0.3   | 1.0023  | 1.0019   |
| second point              | 4958                      | 42.1                        | 399.6   | 399.6                                  | 0.0   | 398.6  | 397.2                                 | 1.4  | 1.0025  | 1.0061   |
| third point               | 4979                      | 21.1                        | 200.3   | 200.3                                  | 0.0   | 196.9  | 195.9                                 | 1.0  | 1.0172  | 1.0223   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.1  | 0.0                                   | 0.1  | ----  | ----   |
| as left span              | 4916                      | 84.2                        | 799.2   | 412.9                                  | 386.3   | 790.0  | 403.0                                 | 387.1  | 1.0116  | 1.0246   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0073  | 1.0101   |

|                      |                             |                |  |                                  |                         |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|
| Corrected As found   | NO <sub>x</sub> = 790.2 ppb | NO = 788.2 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -1.2% |
| Previous Response    | NO <sub>x</sub> = 799.9 ppb | NO = 798.9 ppb |  | *Percent Change                  | NO = -1.4%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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)       | 788.5                                      | 402.2                                 | 386.3   | 386.2  | 1.0003   | 100.0%   |
| 2nd GPT point (200 ppb O3)       | 788.5                                      | 587.0                                 | 201.5   | 201.6  | 0.9995   | 100.0%   |
| 3rd GPT point (100 ppb O3)       | 788.5                                      | 688.7                                 | 99.8  | 101.2  | 0.9862   | 101.4%   |
| Average Correction Factor        |  |                                       |   |  | 0.9953   | 100.5%   |

Notes: Changed sample inlet filter after as founds. Adjusted span. Second high NO reference point used for Indicated NO reference concentrations.

Calibration Performed By: Braiden Boutilier



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

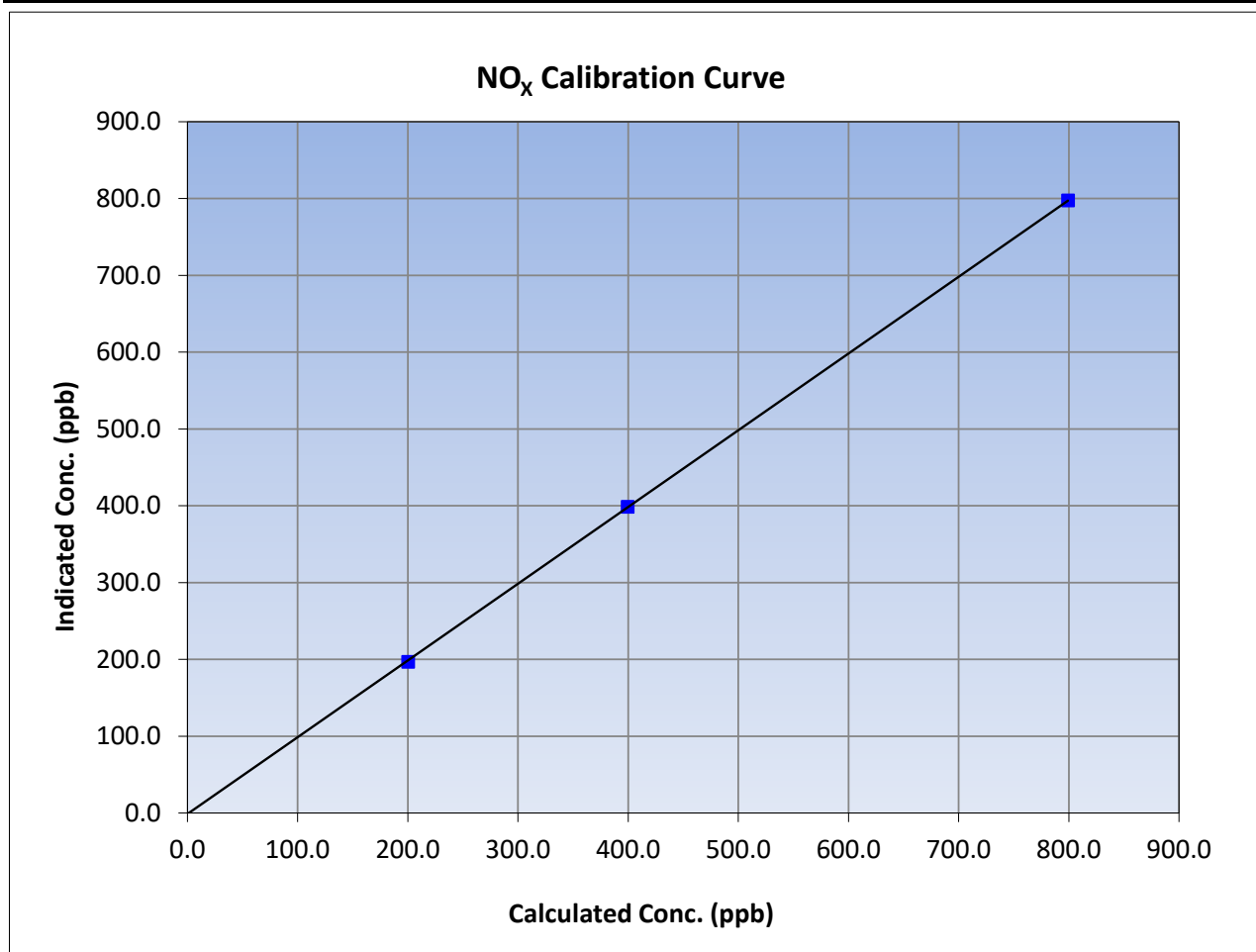
Version-04-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 16, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Surmont 2      | Station Number:       | AMS29             |
| Start Time (MST): | 10:06          | End Time (MST):       | 15:50             |
| 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<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 799.2                               | 797.4                              | 1.0023                    |   |                                |
| 399.6                               | 398.6                              | 1.0025                    |   |                                |
| 200.3                               | 196.9                              | 1.0172                    |   |                                |
|                                     |                                    |                           | 0.999984                                      |                                |
|                                     |                                    |                           | 0.999093                                      |                                |
|                                     |                                    |                           | -1.251932                                     |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

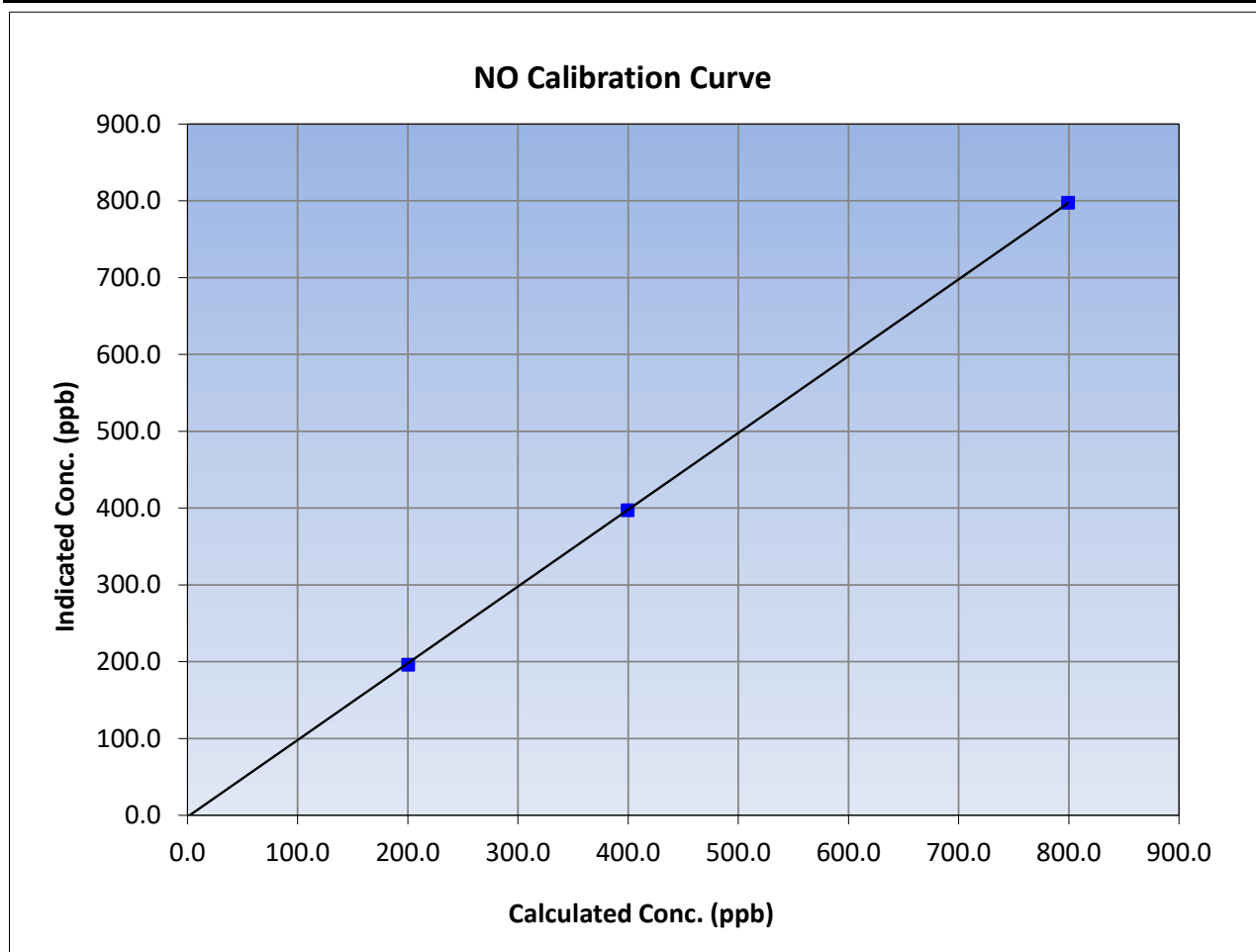
Version-04-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 16, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Surmont 2      | Station Number:       | AMS29             |
| Start Time (MST): | 10:06          | End Time (MST):       | 15:50             |
| 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<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 799.2                               | 797.7                              | 1.0019                    |   |                                |
| 399.6                               | 397.2                              | 1.0061                    |   |                                |
| 200.3                               | 195.9                              | 1.0223                    |   |                                |
|                                     |                                    |                           |   |                                |





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

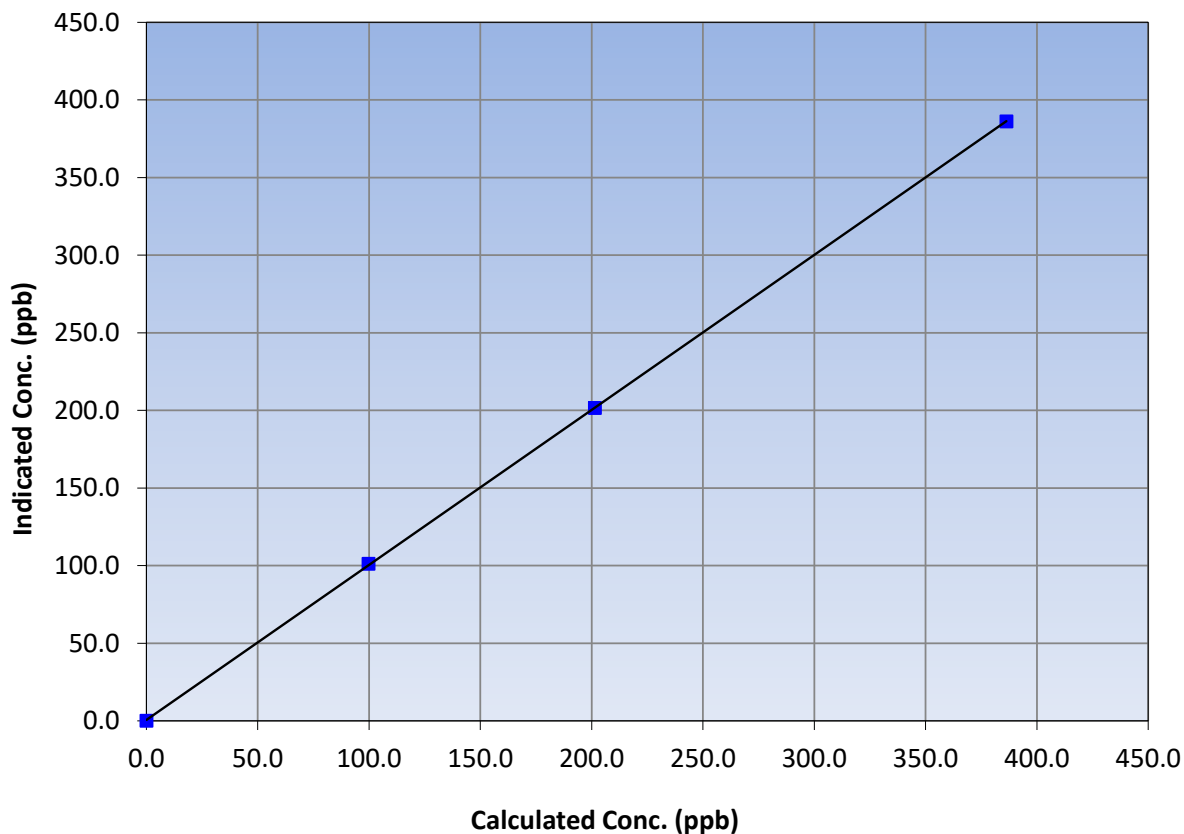
### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 16, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Surmont 2      | Station Number:       | AMS29             |
| Start Time (MST): | 10:06          | End Time (MST):       | 15:50             |
| Analyzer make:    | Thermo 42i     | Analyzer serial #:    | 1170050148        |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 386.3                               | 386.2                              | 1.0003                    |   |                                |
| 201.5                               | 201.6                              | 0.9995                    |   |                                |
| 99.8                                | 101.2                              | 0.9862                    |   |                                |
|                                     |                                    |                           | 0.999984                                      |                                |
|                                     |                                    |                           | 0.998536                                      |                                |
|                                     |                                    |                           | 0.601598                                      |                                |

**NO<sub>2</sub> Calibration Curve**

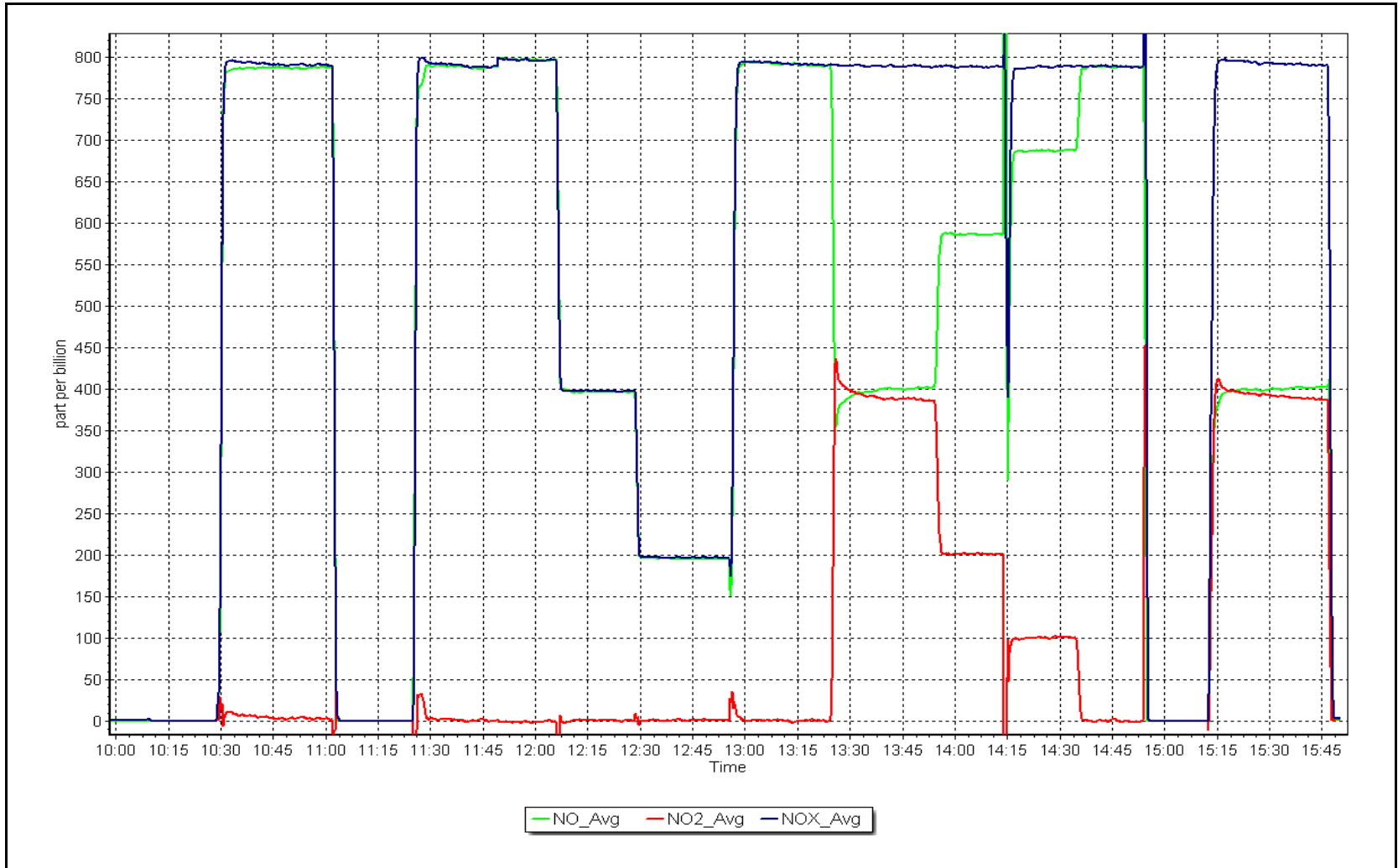




NO<sub>x</sub> Calibration Plot

Date: March 16, 2023

Location: Surmont 2







## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS30  
ELLS RIVER  
MARCH 2023**

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

April 29, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

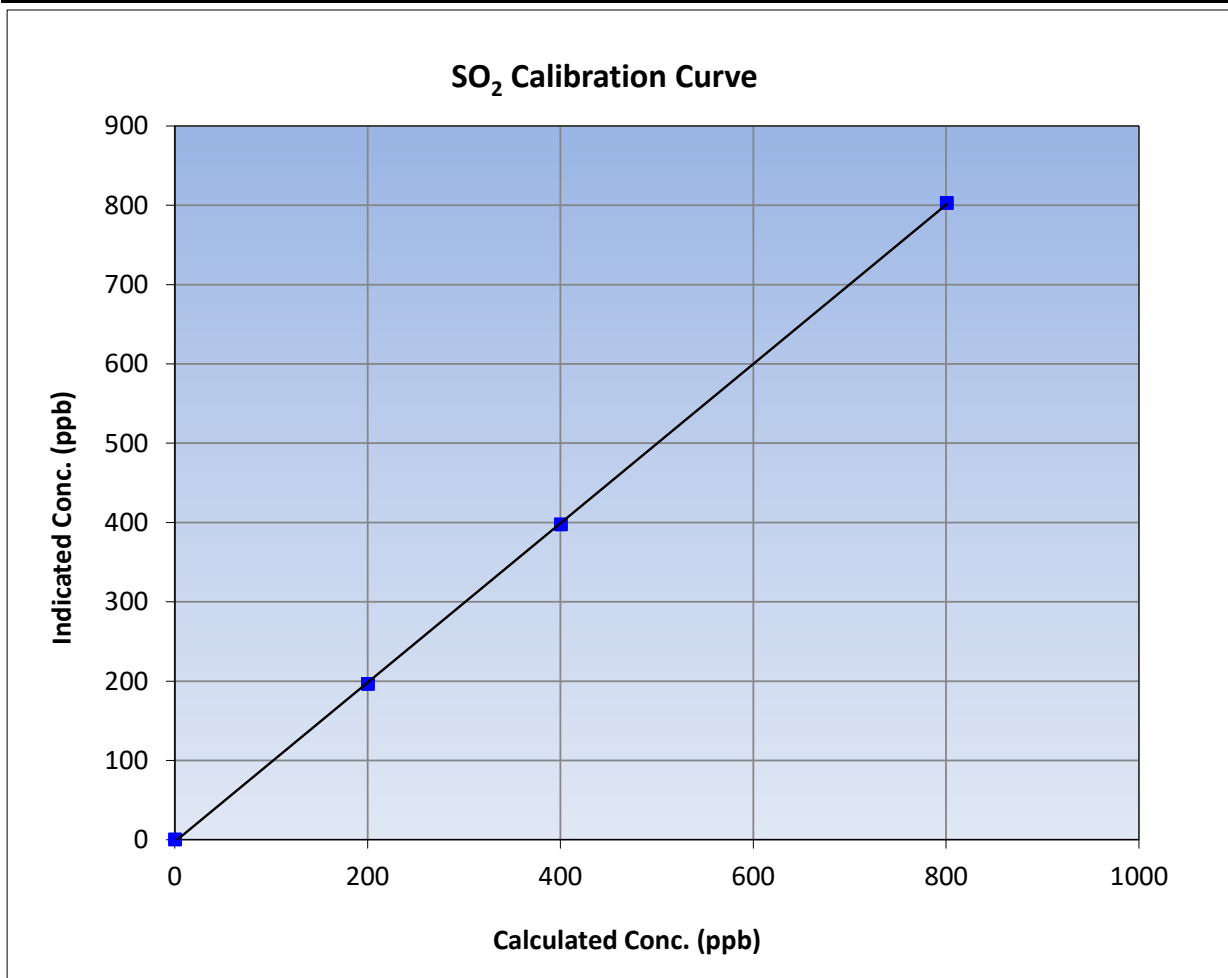
Version-01-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 1, 2023 | Previous Calibration: | February 15, 2023 |
| Station Name:     | Ells River    | Station Number:       | AMS 30            |
| Start Time (MST): | 9:43          | End Time (MST):       | 12:45             |
| Analyzer make:    | Thermo 43i    | Analyzer serial #:    | 1008841397        |

### Calibration Data

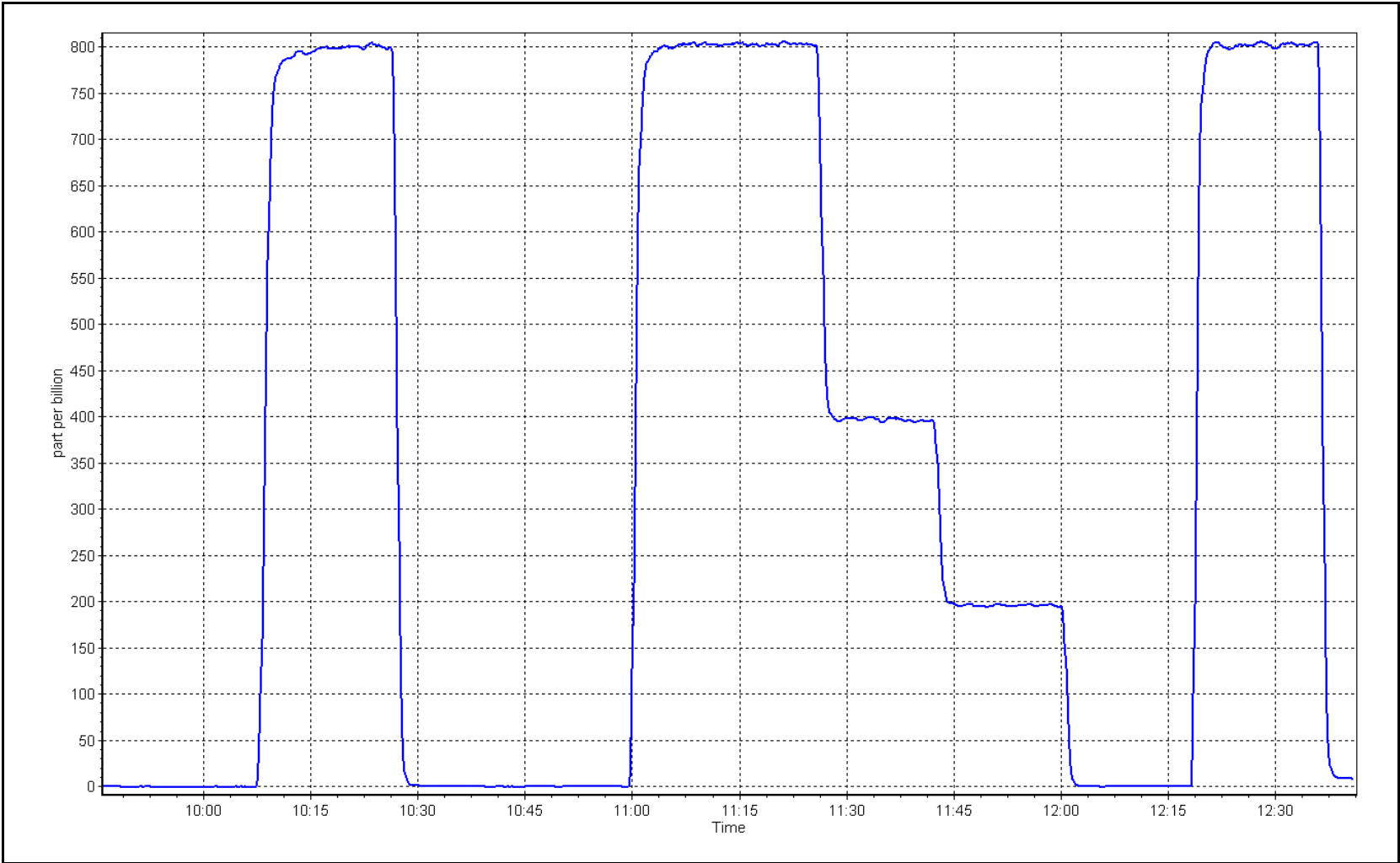
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999949      | ≥0.995      |
| 800.4                               | 802.6                              | 0.9972                    |                         |               |             |
| 400.2                               | 397.2                              | 1.0076                    | Slope                   | 1.004115      | 0.90 - 1.10 |
| 200.1                               | 196.2                              | 1.0199                    |                         |               |             |
|                                     |                                    |                           | Intercept               | -2.615941     | +/-30       |



SO2 Calibration Plot

Date: March 1, 2023

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 2, 2023 Last Cal Date: February 13, 2023  
 Start time (MST): 9:39 End time (MST): 13:20  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.08 ppm Cal Gas Exp Date: February 9, 2024  
 Cal Gas Cylinder #: EY0002443  
 Removed Cal Gas Conc: 5.08 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 TLE Analyzer serial #: 1410661331  
 Converter make: CDN - 101 Converter serial #: 555  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.999493     | 0.998207      | Backgd or Offset: | 1.57         | 1.57          |
| Calibration intercept: | 0.040843     | 0.060852      | Coeff or Slope:   | 1.092        | 1.092         |

### 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----   |
| as found span         | 4921                          | 78.7                        | 80.0                                | 79.3                               | 1.008  |
| as found 2nd point    | 4961                          | 39.4                        | 40.0                                | 39.4                               | 1.016  |
| as found 3rd point    | 4980                          | 19.7                        | 20.0                                | 19.5                               | 1.026  |
| 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point                              | 4921                          | 78.7                        | 80.0                                | 79.9                               | 1.001   |
| second point                            | 4961                          | 39.4                        | 40.0                                | 40.0                               | 1.001   |
| third point                             | 4980                          | 19.7                        | 20.0                                | 20.0                               | 1.001   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| as left span                            | 4921                          | 78.7                        | 80.0                                | 80.3                               | 0.996   |
| SO2 Scrubber Check                      | 4921                          | 79.2                        | 800.4                               | -0.1                               | ----  |
| Date of last scrubber change:           | N/A                           |                             |                                     | Ave Corr Factor                    | 1.001   |
| Date of last converter efficiency test: | N/A                           |                             |                                     | 95.1% efficiency                   |   |

Baseline Corr As found: 79.3 Prev response: 79.96 \*% change: -0.8%  
 Baseline Corr 2nd AF pt: 39.4 AF Slope: 0.992773 AF Intercept: -0.198955  
 Baseline Corr 3rd AF pt: 19.5 AF Correlation: 0.999971

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

Notes: No adjustments made.

Calibration Performed By: Denny Ray Estador



# Wood Buffalo Environmental Association

## TRS Calibration Summary

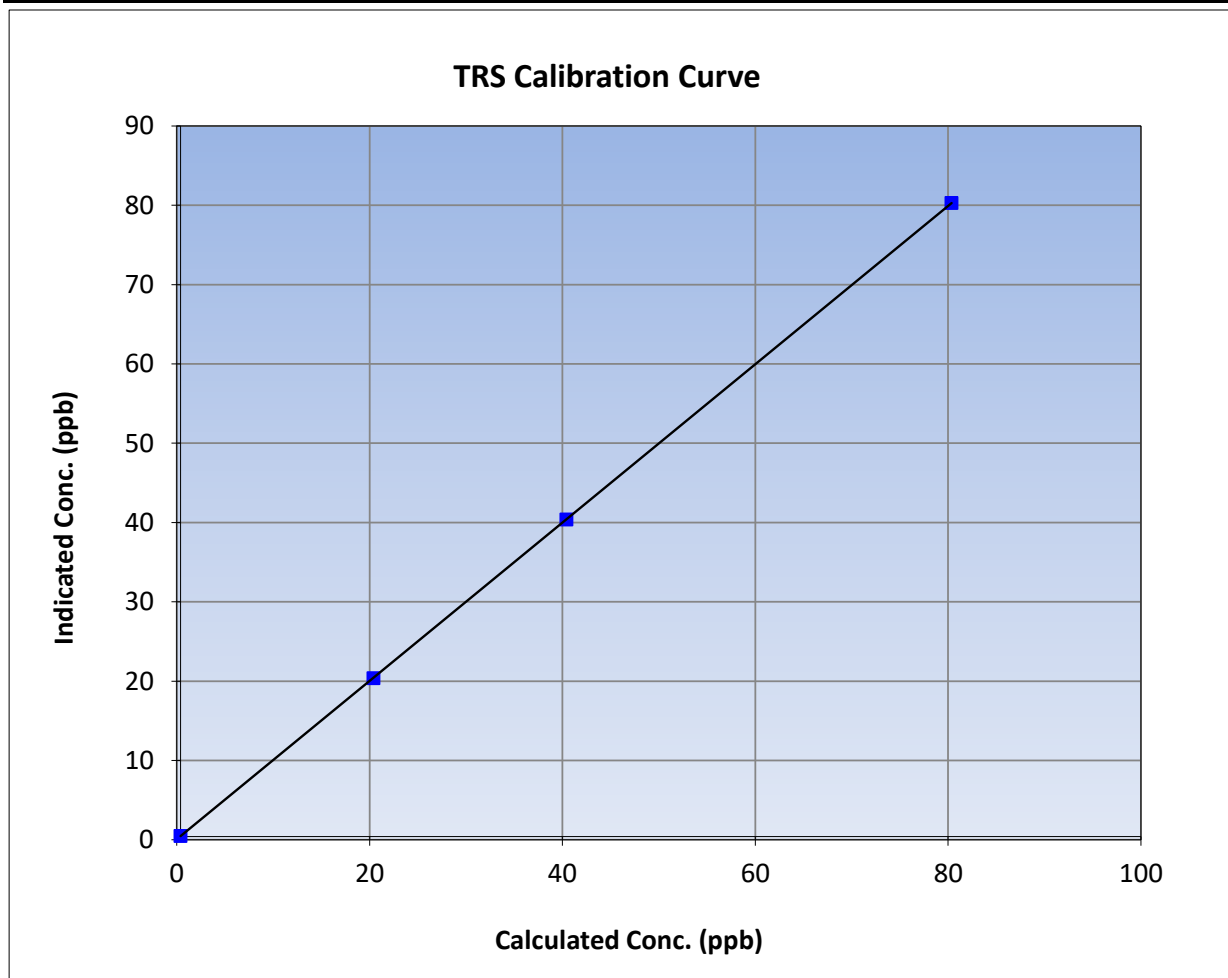
Version-11-2021

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 2, 2023  | Previous Calibration: | February 13, 2023 |
| Station Name:     | Ells River     | Station Number:       | AMS30             |
| Start Time (MST): | 9:39           | End Time (MST):       | 13:20             |
| Analyzer make:    | Thermo 43i TLE | Analyzer serial #:    | 1410661331        |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | 0.999999 |             |
| 80.0                                | 79.9                               | 1.0008                    |                         |          | ≥0.995      |
| 40.0                                | 40.0                               | 1.0007                    | Slope                   | 0.998207 |             |
| 20.0                                | 20.0                               | 1.0008                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.060852 | +/-3        |

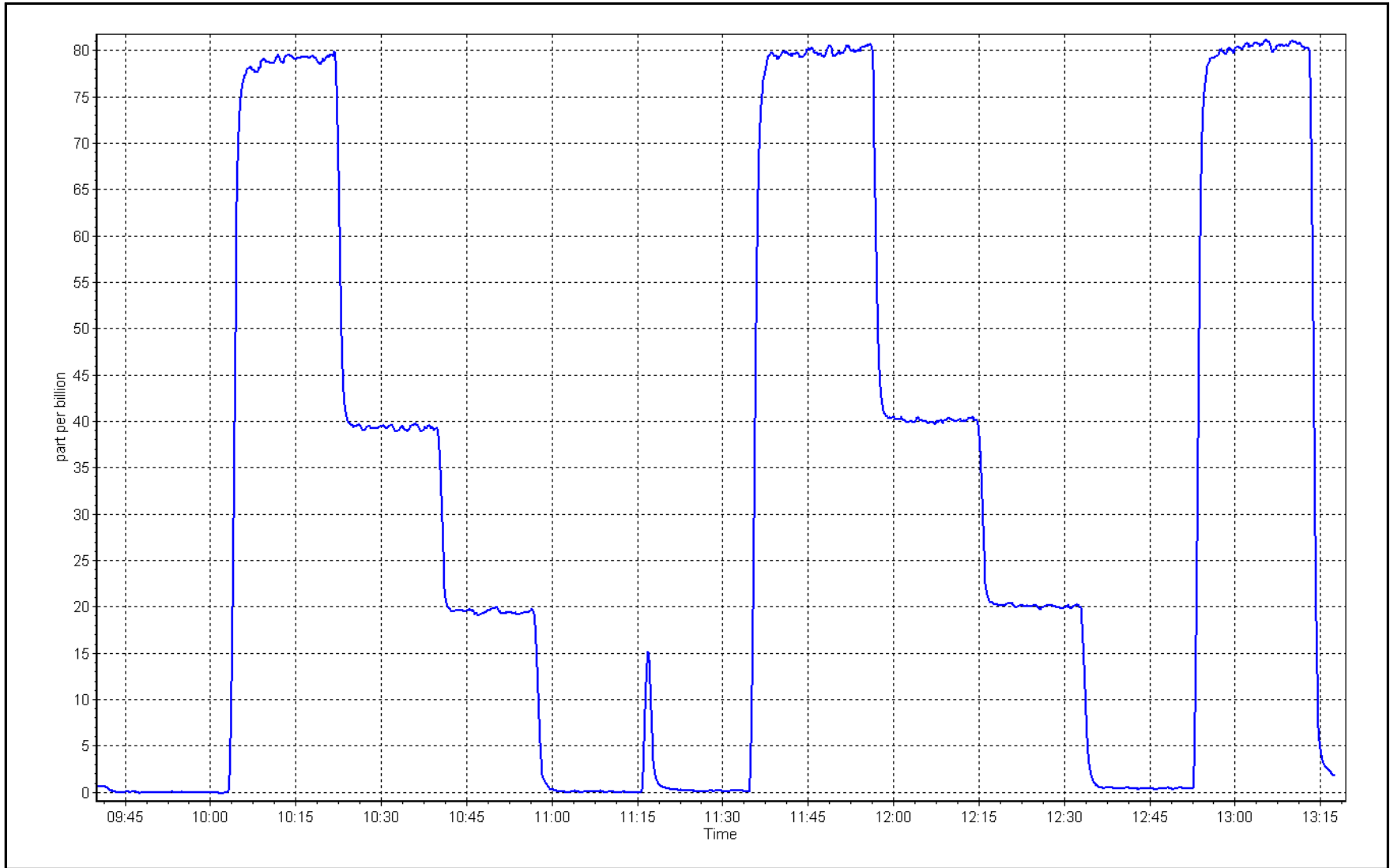




TRS Calibration Plot

Date: March 2, 2023

Location: Ells River





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |               |                 |                   |
|-------------------|---------------|-----------------|-------------------|
| Station Name:     | Ells River    | Station number: | AMS 30            |
| Calibration Date: | March 1, 2023 | Last Cal Date:  | February 10, 2023 |
| Start time (MST): | 9:43          | End time (MST): | 12:45             |
| Reason:           | Routine       |                 |                   |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC494126  | Cal Gas Expiry Date:        | December 29, 2028 |
| CH <sub>4</sub> Cal Gas Conc.               | 499.7 ppm | CH <sub>4</sub> Equiv Conc. | 1075.0 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 209.2 ppm |                             |                   |
| Removed Gas Cert:                           |           | Removed Gas Expiry:         |                   |
| Removed CH <sub>4</sub> Conc.               | 499.7 ppm | CH <sub>4</sub> Equiv Conc. | 1075.0 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 209.2 ppm |                             |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (THC):     |                   |
| Calibrator Model:                           | API T700  | Diff between cyl (NM):      |                   |
| ZAG make/model:                             | API T701H | Serial Number:              | 3061              |
|   |           | Serial Number:              | 358               |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1193585650 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>            | <u>Finish</u> |
|---------------------------------|--------------|---------------|-------------------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 0.000236     | 0.000234      | NMHC SP Ratio: 4.96E-05 | 4.19E-05      |
| CH <sub>4</sub> Retention time: | 13.6         | 14.2          | NMHC Peak Area:         | 183767        |
|                                 |              |               |                         | 217301        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4921              | 79.2                 | 17.03                | 16.46               | 1.035                      |
| 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                 | 8.40                | 1.014                      |
| third 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                | 17.01               | 1.001                      |

| Average Correction Factor |       |               |       | 1.012                                      |
|---------------------------|-------|---------------|-------|--|
| Baseline Corr AF:         | 16.46 | Prev response | 16.88 | *% change -2.6%                            |
| Baseline Corr 2nd AF:     | NA    | AF Slope:     |       | AF Intercept:                              |
| Baseline Corr 3rd AF:     | NA    | -0.023379     |       | * = > +/-5% change initiates investigation |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / 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 <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4921              | 79.2                 | 9.11                 | 8.74                                       | 1.043                      |
| 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                 | 9.11                                       | 1.001                      |
| second point              | 4960              | 39.6                 | 4.56                 | 4.52                                       | 1.008                      |
| third point               | 4980              | 19.8                 | 2.28                 | 2.25                                       | 1.014                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4921              | 79.2                 | 9.11                 | 9.13                                       | 0.998                      |
| Average Correction Factor |                   |                      |                      |  | 1.008                      |
| Baseline Corr AF:         | 8.74              | Prev response        | 9.00                 | *% change                                  | -3.0%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4921              | 79.2                 | 7.91                 | 7.72                                       | 1.025                      |
| 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                 | 7.89                                       | 1.003                      |
| second point              | 4960              | 39.6                 | 3.96                 | 3.88                                       | 1.020                      |
| third point               | 4980              | 19.8                 | 1.98                 | 1.92                                       | 1.029                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4921              | 79.2                 | 7.91                 | 7.89                                       | 1.004                      |
| Average Correction Factor |                   |                      |                      |  | 1.017                      |
| Baseline Corr AF:         | 7.72              | Prev response        | 7.89                 | *% change                                  | -2.2%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.994670     | 0.998858      |
| THC Cal Offset:             | -0.054336    | -0.050537     |
| CH <sub>4</sub> Cal Slope:  | 1.000380     | 0.997766      |
| CH <sub>4</sub> Cal Offset: | -0.030757    | -0.031956     |
| NMHC Cal Slope:             | 0.989848     | 1.000170      |
| NMHC Cal Offset:            | -0.023379    | -0.018781     |

Notes: Changed N2 cylinder after the as founds. Adjusted the span.

Calibration Performed By: Denny Ray Estador



# Wood Buffalo Environmental Association

## THC Calibration Summary

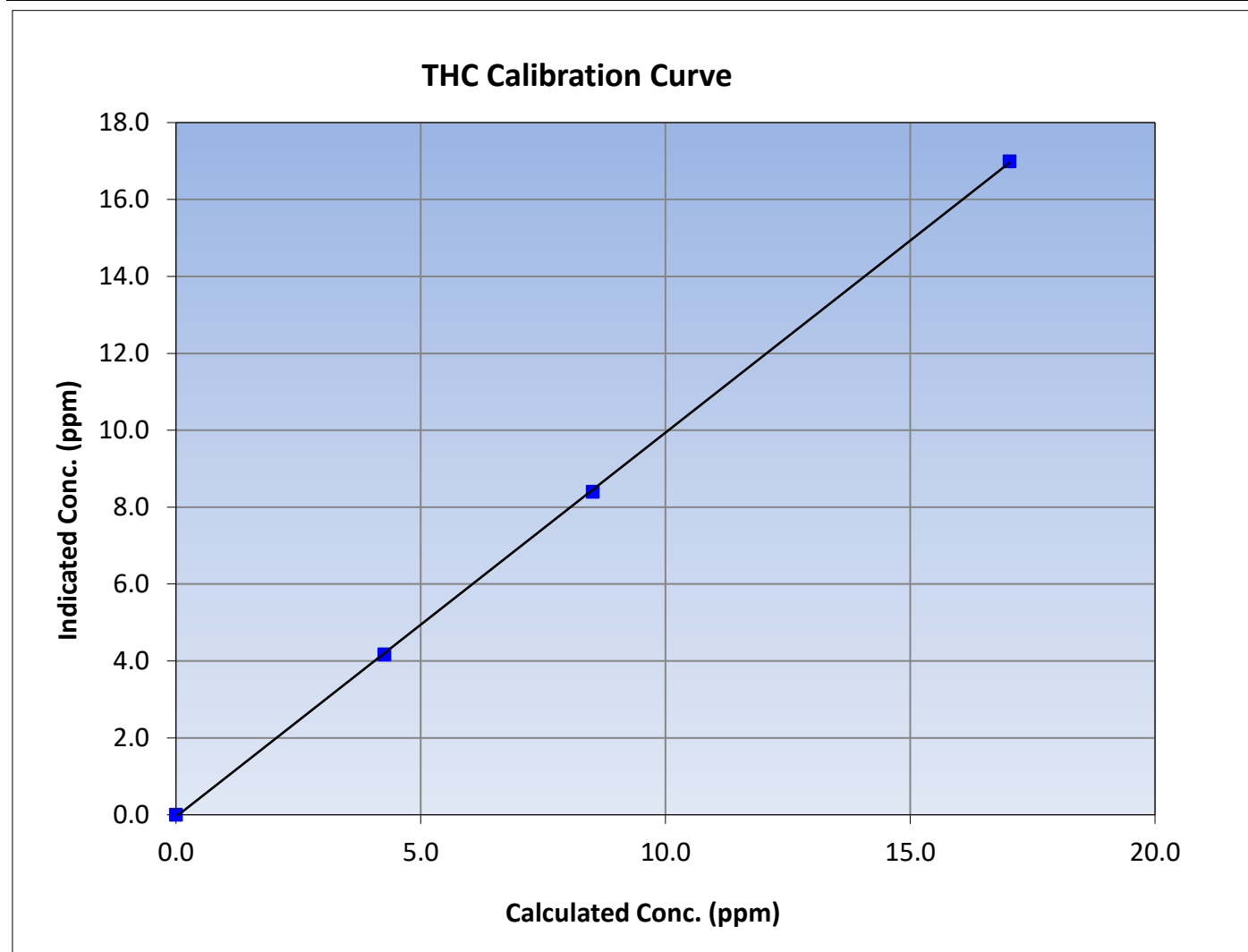
Version-01-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 1, 2023 | Previous Calibration: | February 10, 2023 |
| Station Name:     | Ells River    | Station Number:       | AMS 30            |
| Start Time (MST): | 9:43          | End Time (MST):       | 12:45             |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1193585650        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999952  | $\geq 0.995$  |       |          |             |
| 17.03                               | 16.99                              | 1.0021                    |                         |           |               |       |          |             |
| 8.51                                | 8.40                               | 1.0135                    |                         |           |               | Slope | 0.998858 | 0.90 - 1.10 |
| 4.26                                | 4.17                               | 1.0209                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.050537 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

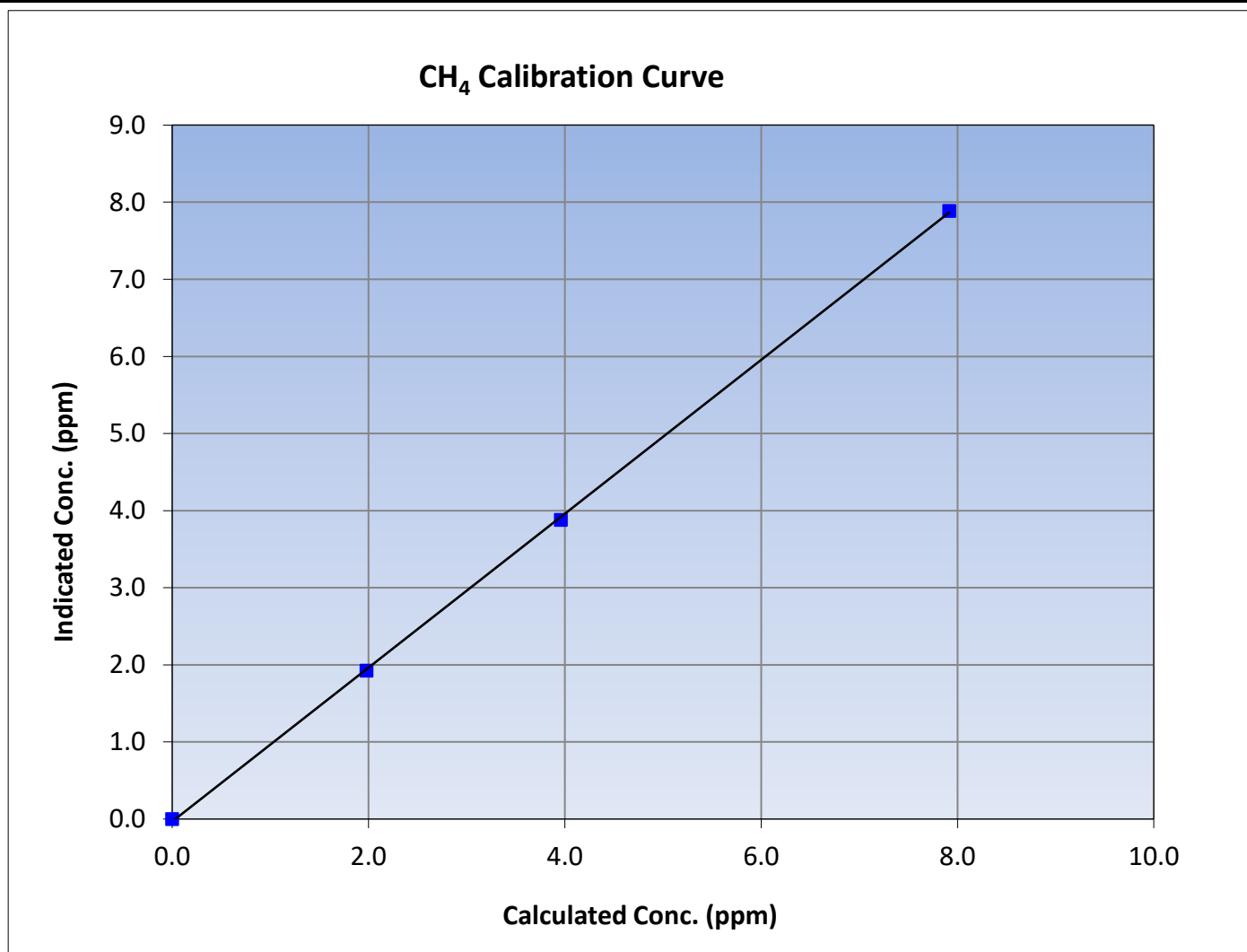
Version-01-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 1, 2023 | Previous Calibration: | February 10, 2023 |
| Station Name:     | Ells River    | Station Number:       | AMS 30            |
| Start Time (MST): | 9:43          | End Time (MST):       | 12:45             |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1193585650        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999907  | ≥0.995        |
| 7.91                                | 7.89                               | 1.0034                    |                         |           |               |
| 3.96                                | 3.88                               | 1.0198                    |                         |           |               |
| 1.98                                | 1.92                               | 1.0285                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 0.997766  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.031956 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

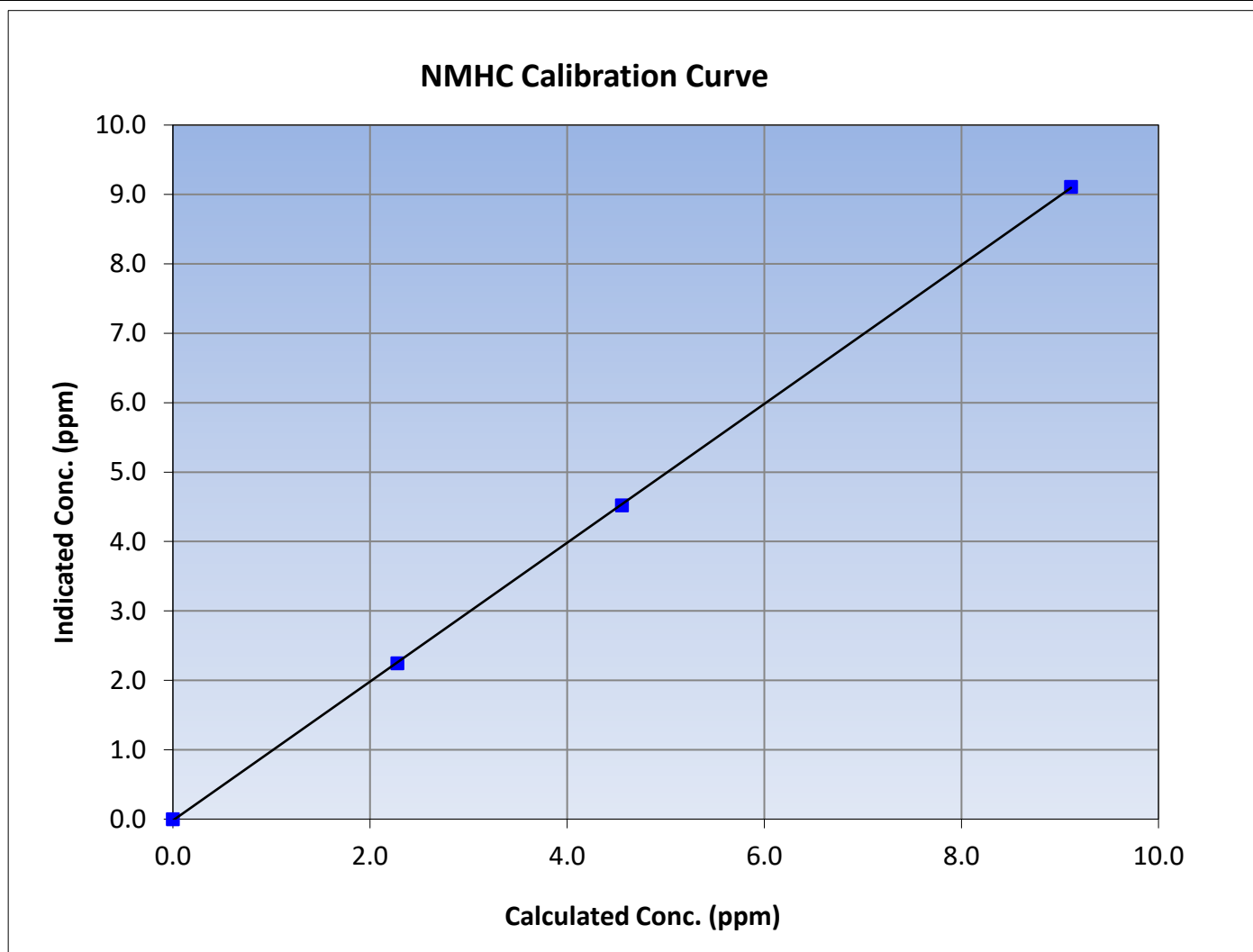
Version-01-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 1, 2023 | Previous Calibration: | February 10, 2023 |
| Station Name:     | Ells River    | Station Number:       | AMS 30            |
| Start Time (MST): | 9:43          | End Time (MST):       | 12:45             |
| Analyzer make:    | Thermo 55i    | Analyzer serial #:    | 1193585650        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999979  | $\geq 0.995$  |       |          |             |
| 9.11                                | 9.11                               | 1.0006                    |                         |           |               |       |          |             |
| 4.56                                | 4.52                               | 1.0077                    |                         |           |               | Slope | 1.000170 | 0.90 - 1.10 |
| 2.28                                | 2.25                               | 1.0144                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.018781 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: March 1, 2023

Location: Ells River



-0.02338



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Ells River  
Calibration Date: March 15, 2023  
Start time (MST): 9:24  
Reason: Routine  
Station number: AMS 30  
Last Cal Date: February 1, 2023  
End time (MST): 13:40

### Calibration Standards

NO Gas Cylinder #: T2Y1P2R  
NOX Cal Gas Conc: 50.83 ppm  
Removed Cylinder #:  
Removed Gas NOX Conc: 50.83 ppm  
NOX gas Diff:  
Calibrator Model: API T700  
ZAG make/model: API T701H  
Cal Gas Expiry Date: December 11, 2023  
NO Cal Gas Conc: 49.97 ppm  
Removed Gas Exp Date:  
Removed Gas NO Conc: 49.97 ppm  
NO gas Diff:  
Serial Number: 3061  
Serial Number: 358

### Analyzer Information

Analyzer make: Thermo 42i  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 710321429

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.029        | 1.029         | NO bkgnd or offset:  | 12.5         | 12.5          |
| NOX coeff or slope: | 0.992        | 0.992         | NOX bkgnd or offset: | 12.4         | 12.4          |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 185.1        | 182.7         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.001096     | 0.999129      |
| NO <sub>x</sub> Cal Offset: | -0.800000    | -0.900000     |
| NO Cal Slope:               | 1.001429     | 0.999714      |
| NO Cal Offset:              | -1.540000    | -1.740000     |
| NO <sub>2</sub> Cal Slope:  | 1.001609     | 1.002165      |
| NO <sub>2</sub> Cal Offset: | 0.350570     | 0.164860      |





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.3   | -0.3                                  | 0.0  | ----  | ----   |
| as found span             | 4920                      | 80.0                        | 813.3   | 799.5                                  | 13.8  | 814.8  | 800.0                                 | 14.7   | 0.9981  | 0.9994   |
| 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                | 4920                      | 80.0                        | 813.3   | 799.5                                  | 13.8  | 812.1  | 798.3                                 | 13.9   | 1.0015  | 1.0015   |
| second point              | 4960                      | 40.0                        | 406.6   | 399.8                                  | 6.9   | 404.9  | 397.3                                 | 7.6  | 1.0043  | 1.0062   |
| third point               | 4980                      | 20.0                        | 203.3   | 199.9                                  | 3.4   | 201.5  | 196.3                                 | 5.1  | 1.0090  | 1.0182   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.1  | ----  | ----   |
| as left span              | 4920                      | 80.0                        | 813.3   | 432.3                                  | 381.0   | 812.3  | 423.3                                 | 389.0  | 1.0012  | 1.0213   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0049  | 1.0087   |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 815.1 ppb | NO = 800.3 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 0.2% |
| Previous Response    | NO <sub>x</sub> = 813.4 ppb | NO = 799.1 ppb |  | *Percent Change                  | NO = 0.1%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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)       | 793.6                                      | 426.4                                 | 381.0   | 381.9  | 0.9975   | 100.2%   |
| 2nd GPT point (200 ppb O3)       | 793.6                                      | 617.0                                 | 190.4   | 190.9  | 0.9972   | 100.3%   |
| 3rd GPT point (100 ppb O3)       | 793.6                                      | 704.1                                 | 103.3   | 103.9  | 0.9938   | 100.6%   |
| Average Correction Factor        |  |                                       |   |  | 0.9962   | 100.4%   |

Notes:

No adjustments have been made.

Calibration Performed By: Denny Ray Estador



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

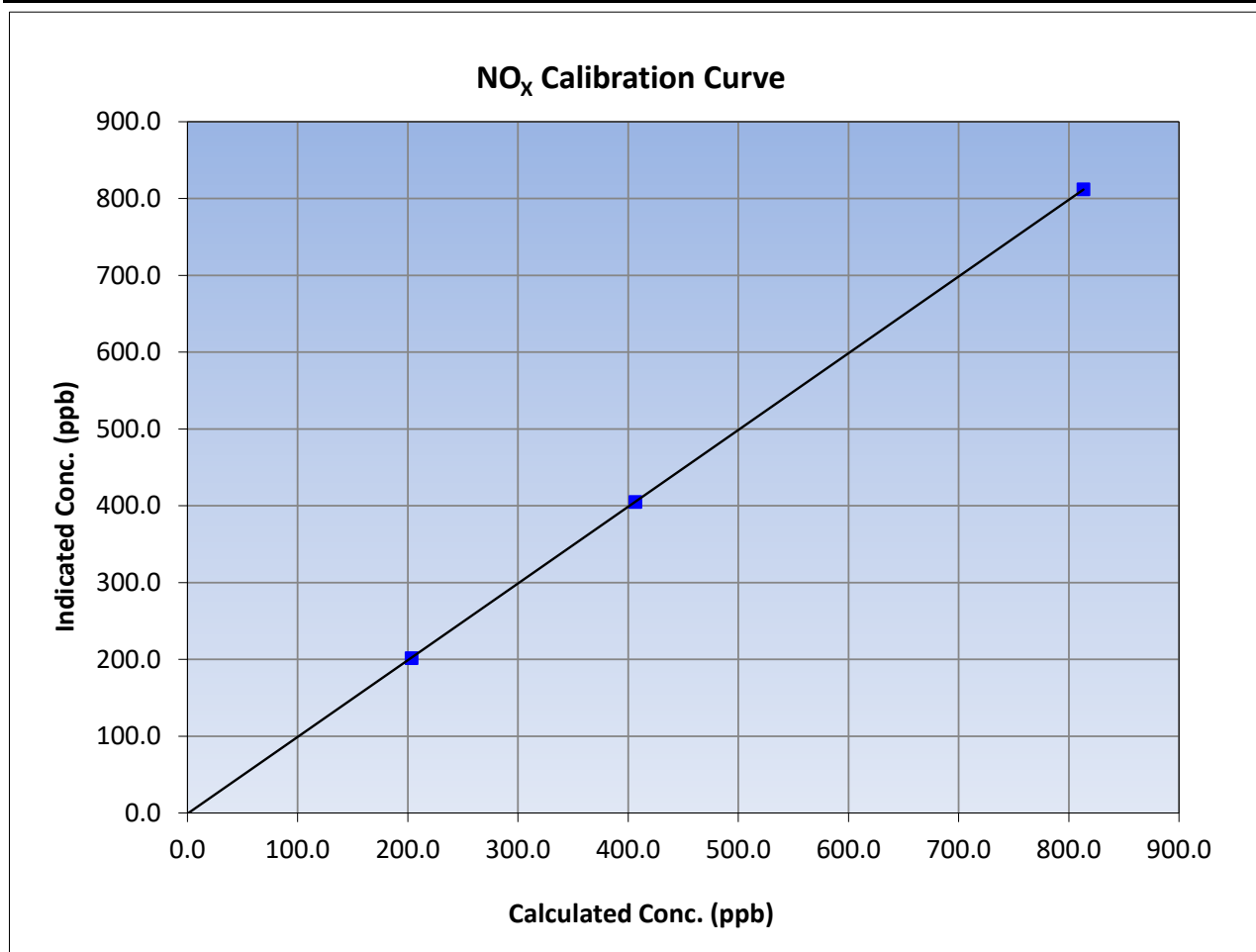
Version-04-2020

### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 15, 2023 | Previous Calibration: | February 1, 2023 |
| Station Name:     | Ells River     | Station Number:       | AMS 30           |
| Start Time (MST): | 9:24           | End Time (MST):       | 13:40            |
| 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<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 813.3                               | 812.1                              | 1.0015                    |   |                                |
| 406.6                               | 404.9                              | 1.0043                    |   |                                |
| 203.3                               | 201.5                              | 1.0090                    |   |                                |
|                                     |                                    |                           | 0.999996                                      |                                |
|                                     |                                    |                           | 0.999129                                      |                                |
|                                     |                                    |                           | -0.900000                                     |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

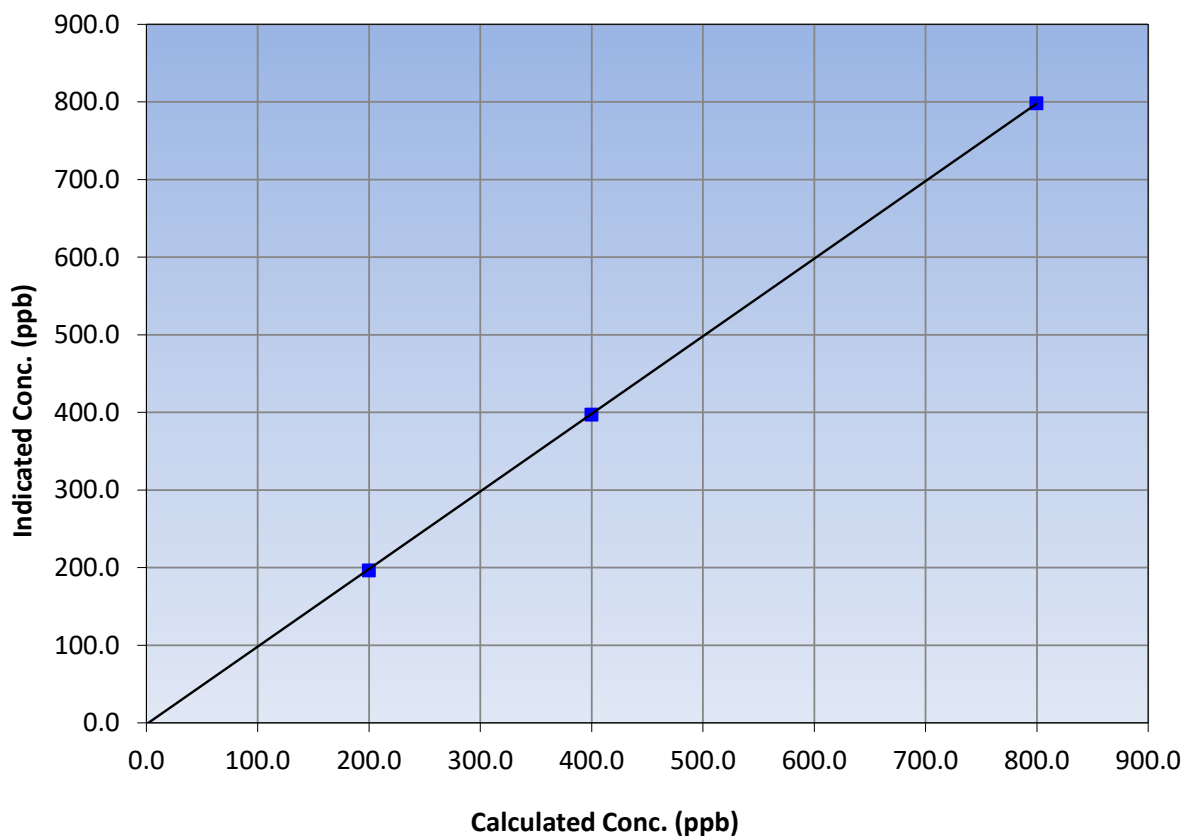
### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 15, 2023 | Previous Calibration: | February 1, 2023 |
| Station Name:     | Ells River     | Station Number:       | AMS 30           |
| Start Time (MST): | 9:24           | End Time (MST):       | 13:40            |
| 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 | ≥0.995    |             |
| 799.5                               | 798.3                              | 1.0015                    |                         |           |             |
| 399.8                               | 397.3                              | 1.0062                    |                         |           |             |
| 199.9                               | 196.3                              | 1.0182                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 0.999714  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -1.740000 | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

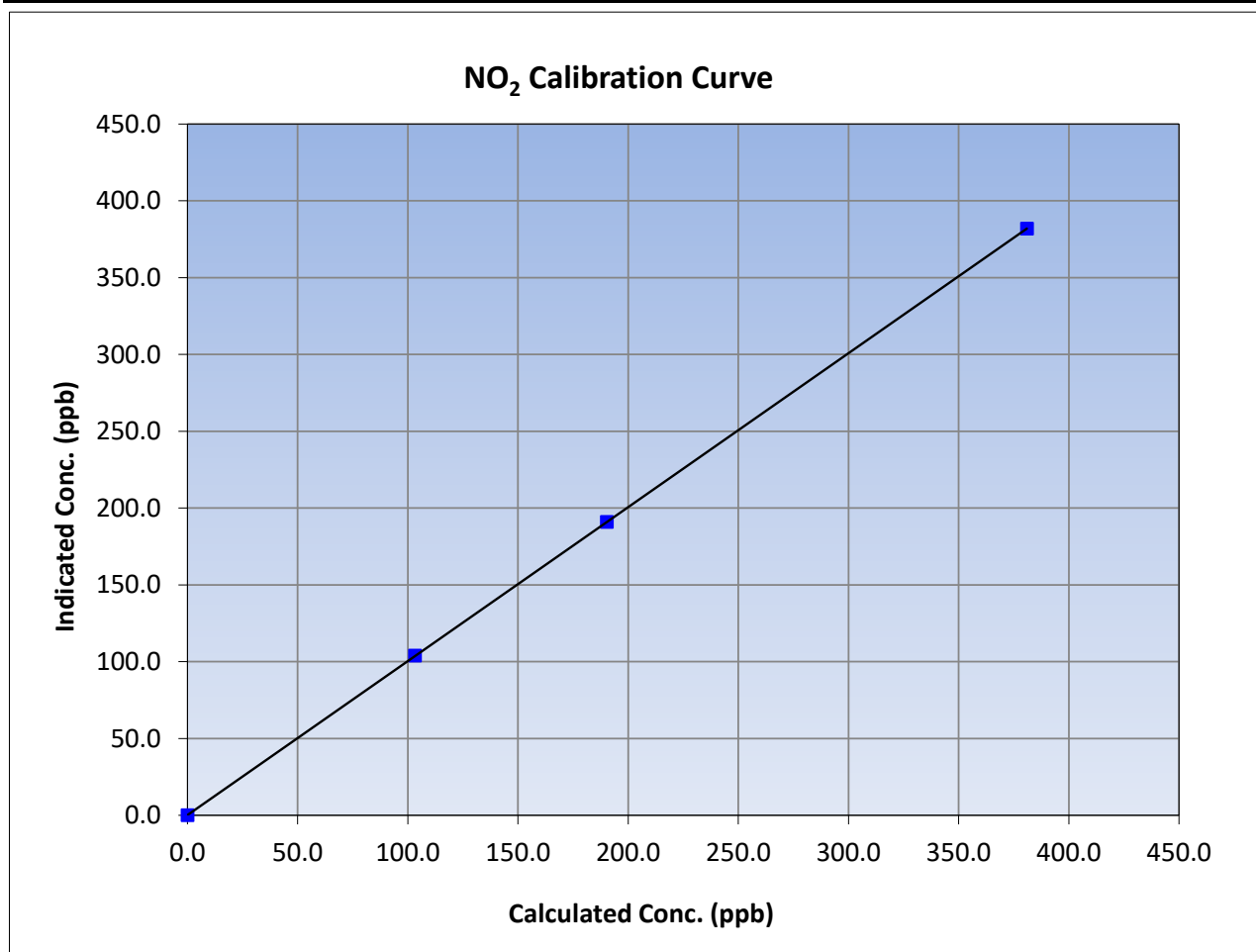
Version-04-2020

### Station Information

|                   |                |                       |                  |
|-------------------|----------------|-----------------------|------------------|
| Calibration Date: | March 15, 2023 | Previous Calibration: | February 1, 2023 |
| Station Name:     | Ells River     | Station Number:       | AMS 30           |
| Start Time (MST): | 9:24           | End Time (MST):       | 13:40            |
| Analyzer make:    | Thermo 42i     | Analyzer serial #:    | 710321429        |

### Calibration Data

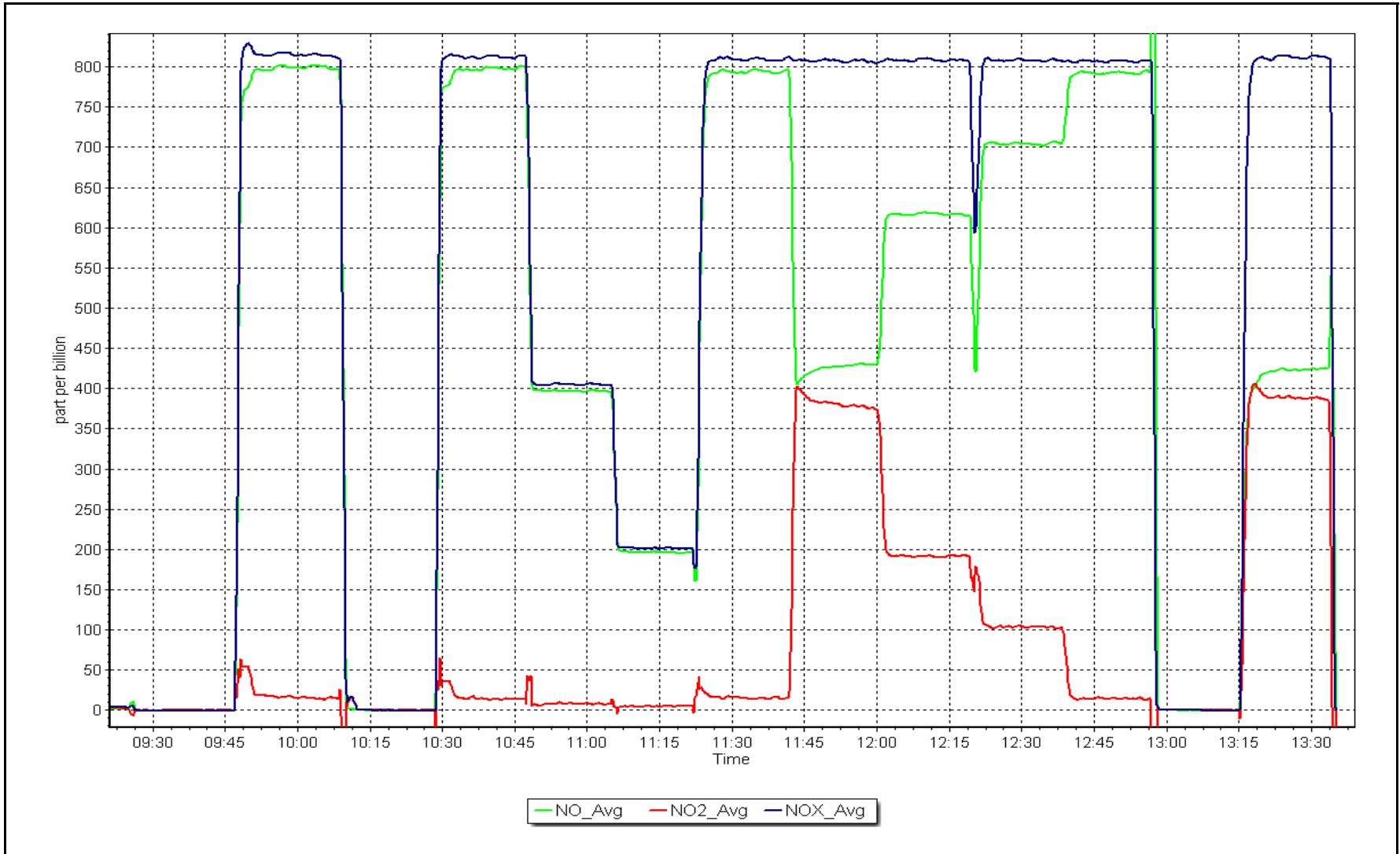
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <i>Limits</i> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999999 | ≥0.995        |
| 381.0                               | 381.9                              | 0.9975                    |                         |          |               |
| 190.4                               | 190.9                              | 0.9972                    |                         |          |               |
| 103.3                               | 103.9                              | 0.9938                    |                         |          |               |
|                                     |                                    |                           | Slope                   | 1.002165 | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | 0.164860 | +/-20         |



NO<sub>x</sub> Calibration Plot

Date: March 15, 2023

Location: Ells River





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Ells River Station number: AMS 30  
 Calibration Date: March 16, 2023 Last Cal Date: February 17, 2023  
 Start time (MST): 9:41 End time (MST): 10:50

Analyzer Make: API T640 S/N: 875  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Delta Cal S/N: 954  
 Temp/RH standard: Delta Cal S/N: 954

### Monthly Calibration Test

| Parameter  | As found | Measured | As left | Adjusted                 | (Limits)     |
|------------|----------|----------|---------|--------------------------|--------------|
| T (°C)     | -11      | -11      | -11     | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 739.3    | 736.7    | 739.3   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.01     | 5.05     | 5.01    | <input type="checkbox"/> | +/- 0.25 LPM |

Leak Test: Date of check: March 16, 2023 Last Cal Date: February 17, 2023  
 PM w/o HEPA: 4.2 PM w/ HEPA: 0 <0.2 ug/m3

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

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter     | As found | Post maintenance | As left | Adjusted                 | (Limits)     |
|---------------|----------|------------------|---------|--------------------------|--------------|
| PMT Peak Test | 8.7      | 10.8             | 10.8    | <input type="checkbox"/> | 10.9 +/- 0.5 |

Post-maintenance leak check: PM w/o HEPA: 4.9 w/ HEPA: 0  
 Date Optical Chamber Cleaned: March 16, 2023 <0.2 ug/m3  
 Disposable Filter Changed: March 16, 2023

### Annual Maintenance

Date Sample Tube Cleaned: \_\_\_\_\_  
 Date RH/T Sensor Cleaned: \_\_\_\_\_

Notes: No adjustments made. Inlet head still clean.

Calibration by: Denny Ray Estador



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS506**  
**JACKFISH 1**  
**MARCH 2023**

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

April 29, 2023







# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

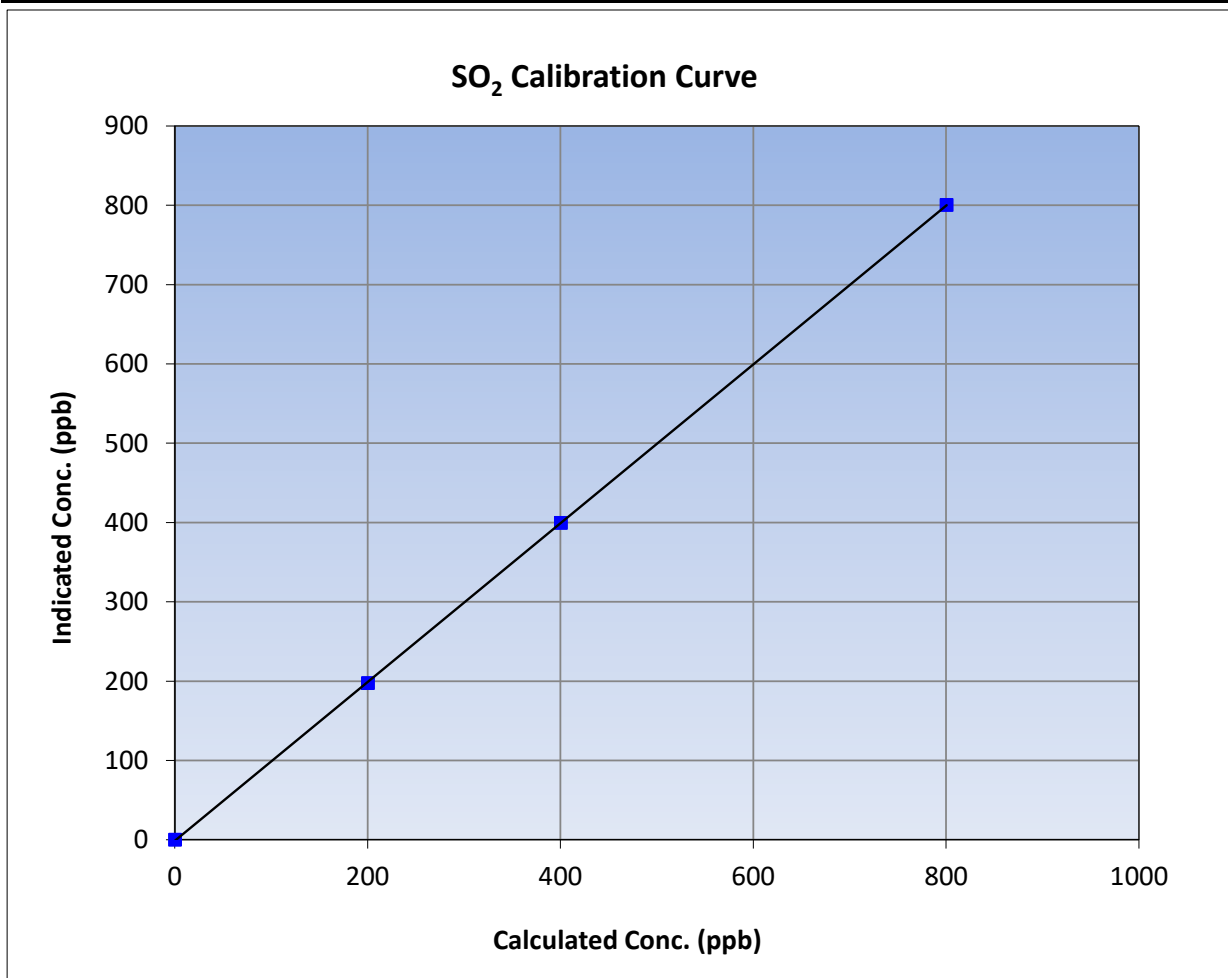
Version-01-2020

### Station Information

|                   |               |                       |                   |
|-------------------|---------------|-----------------------|-------------------|
| Calibration Date: | March 9, 2023 | Previous Calibration: | February 14, 2023 |
| Station Name:     | Jackfish 1    | Station Number:       | AMS 506           |
| Start Time (MST): | 10:58         | End Time (MST):       | 13:43             |
| Analyzer make:    | Thermo 43i    | Analyzer serial #:    | 1160290011        |

### Calibration Data

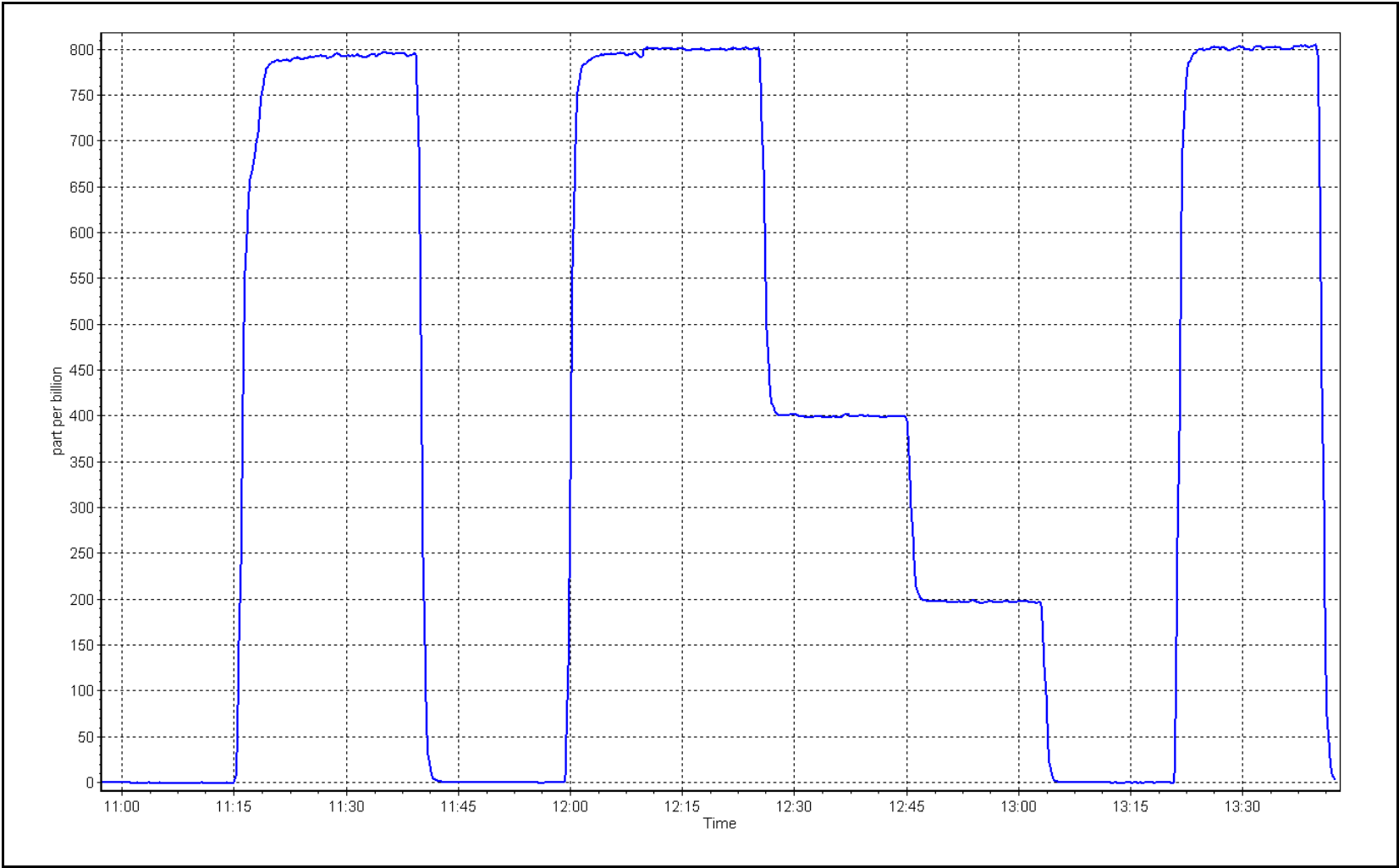
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | -0.2                                  | ----                         | Correlation Coefficient | 0.999987      |             |
| 800.2                                  | 800.1                                 | 1.0001                       |                         |               | ≥0.995      |
| 400.2                                  | 399.3                                 | 1.0021                       | Slope                   | 1.001172      |             |
| 200.1                                  | 197.2                                 | 1.0145                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | -1.416002     | +/-30       |



SO2 Calibration Plot

Date: March 9, 2023

Location: Jackfish 1





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Jackfish 1      Station number: AMS506  
 Calibration Date: March 29, 2023      Last Cal Date: February 24, 2023  
 Start time (MST): 8:21      End time (MST): 12:06  
 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

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.995862     | 1.005003      | Backgd or Offset: 1.04 | 3.42          |
| Calibration intercept: | 0.041428     | -0.178301     | Coeff or Slope: 0.720  | 1.090         |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | -0.5                               | ----   |
| as found span         | 4922                          | 77.8                        | 80.0                                | 76.4                               | 1.040  |
| as found 2nd point    | 4961                          | 38.9                        | 40.0                                | 38.1                               | 1.036  |
| as found 3rd point    | 4981                          | 19.4                        | 19.9                                | 18.4                               | 1.055  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|--------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero    | 5000                          | 0.0                         | 0.0                                 | -0.1                               | ----  |
| high point         | 4922                          | 77.8                        | 80.0                                | 80.2                               | 0.997   |
| second point       | 4961                          | 38.9                        | 40.0                                | 40.1                               | 0.997   |
| third point        | 4981                          | 19.4                        | 19.9                                | 19.7                               | 1.012   |
| as left zero       | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span       | 4922                          | 77.8                        | 80.0                                | 80.1                               | 0.999   |
| SO2 Scrubber Check | 4921                          | 79.2                        | 792.0                               | 0.1                                | ----  |

|   |                  |                 |       |
|---|------------------|-----------------|-------|
| Date of last scrubber change:           | 24-Feb-23        | Ave Corr Factor | 1.002 |
| Date of last converter efficiency test: | December 1, 2022 | efficiency      |       |

Baseline Corr As found: 76.9      Prev response: 79.69      \*% change: -3.6%  
 Baseline Corr 2nd AF pt: 38.6      AF Slope: 0.962861      AF Intercept: -0.579245  
 Baseline Corr 3rd AF pt: 18.9      AF Correlation: 0.999973

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

Notes: Cahnged inlet filter after multi-point as founds. Scrubber test done and passed after calibrator zero. Adjusted zero and span.

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

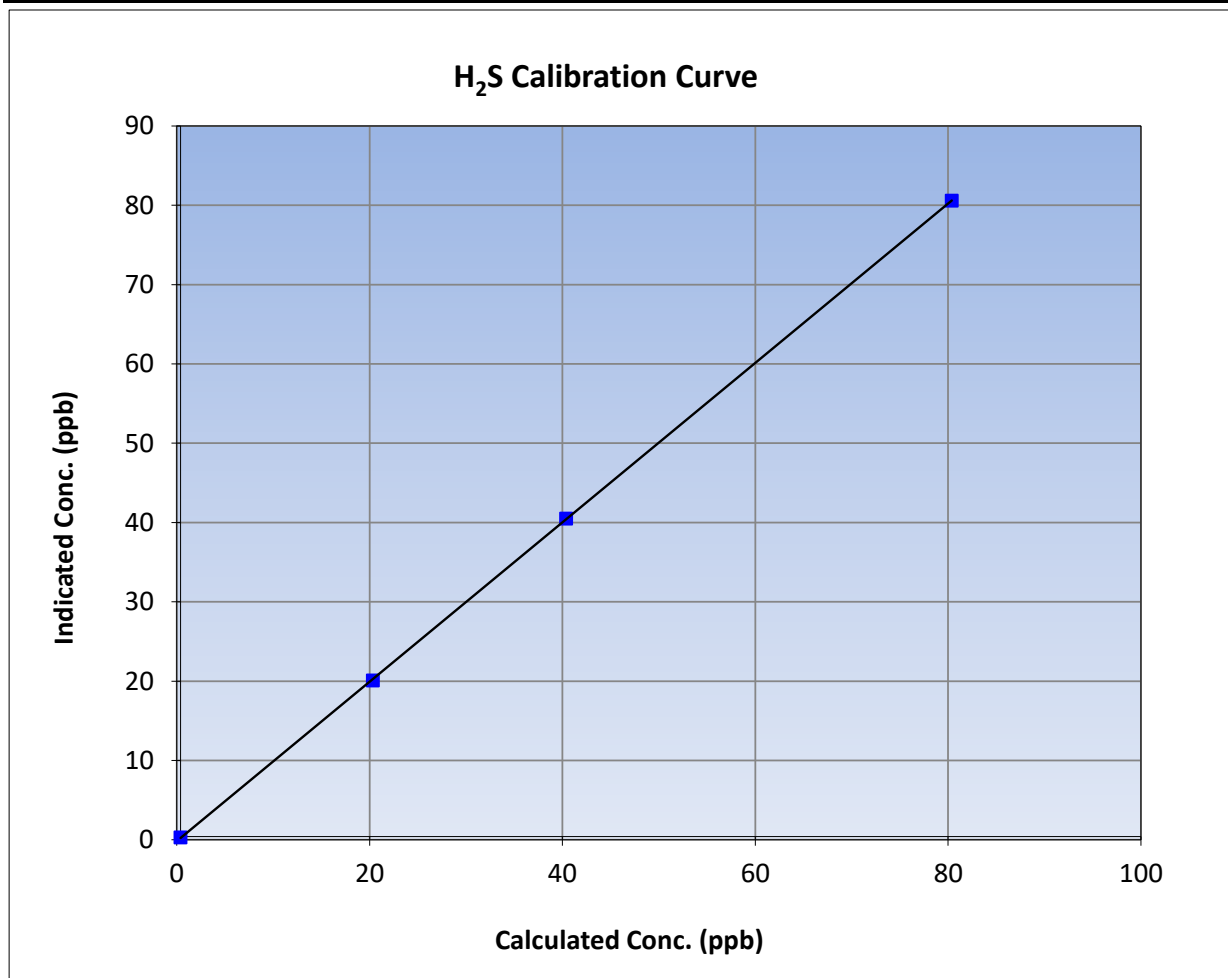
Version-11-2021

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 29, 2023 | Previous Calibration: | February 24, 2023 |
| Station Name:     | Jackfish 1     | Station Number:       | AMS506            |
| Start Time (MST): | 8:21           | End Time (MST):       | 12:06             |
| Analyzer make:    | Thermo 43i-TLE | Analyzer serial #:    | 1180540020        |

### Calibration Data

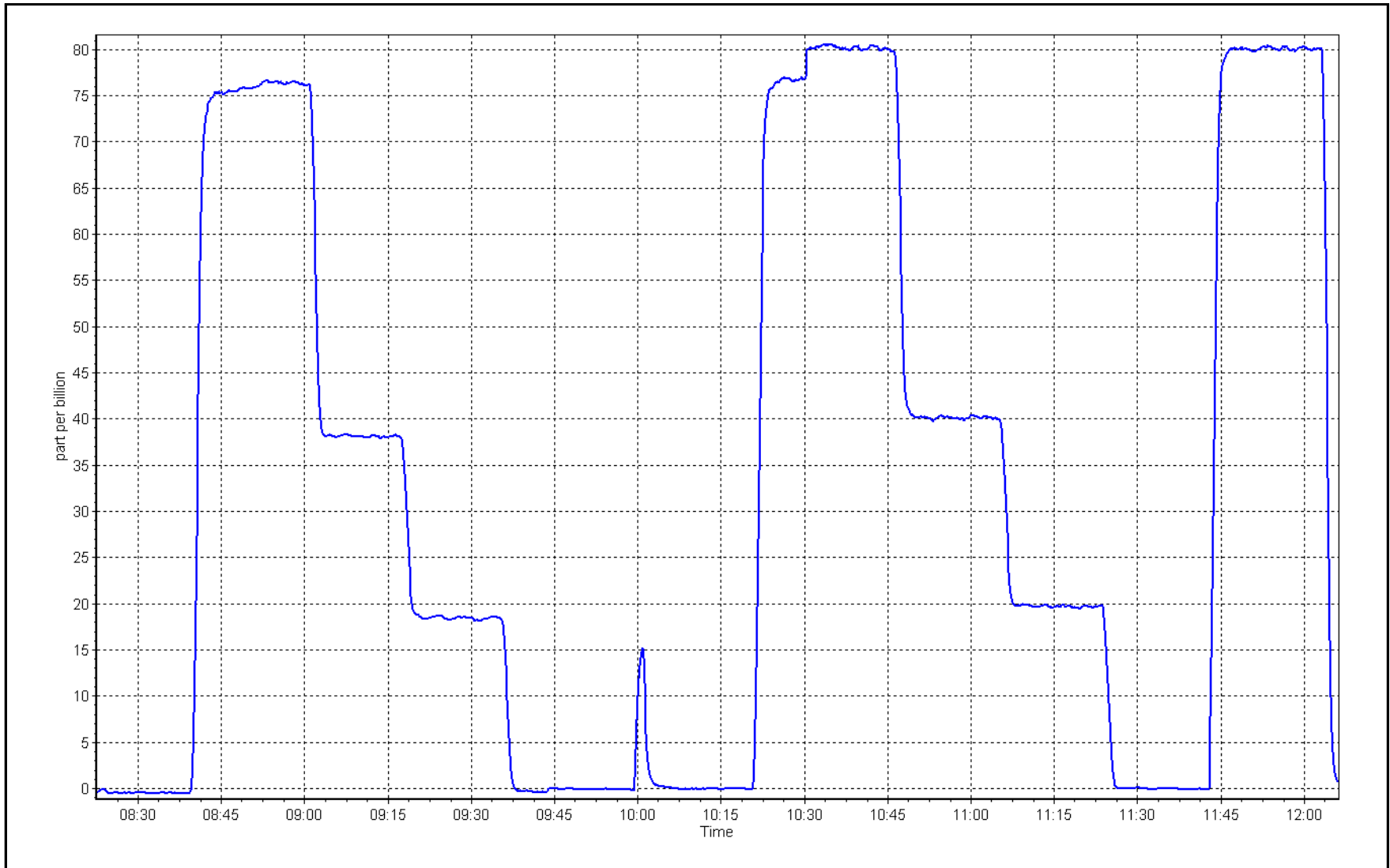
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits      |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | ≥0.995      |
| 80.0                                | 80.2                               | 0.9973                    |                         |             |
| 40.0                                | 40.1                               | 0.9973                    | Slope                   | 0.90 - 1.10 |
| 19.9                                | 19.7                               | 1.0123                    |                         |             |
|                                     |                                    |                           | Intercept               | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: March 29, 2023

Location: Jackfish 1







# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.1  | 0.1                                   | 0.0  | ----  | ----   |
| as found span             | 4916                      | 84.4                        | 801.1   | 799.9                                  | 1.2   | 812.2  | 807.9                                 | 4.2  | 0.9863  | 0.9901   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | 0.2                                   | 0.0  | ----  | ----   |
| high point                | 4916                      | 84.4                        | 801.1   | 799.9                                  | 1.2   | 803.1  | 800.9                                 | 2.2  | 0.9975  | 0.9987   |
| second point              | 4958                      | 42.2                        | 400.5   | 400.0                                  | 0.6   | 402.3  | 400.2                                 | 2.1  | 0.9956  | 0.9994   |
| third point               | 4979                      | 21.1                        | 200.3   | 200.0                                  | 0.3   | 198.1  | 196.0                                 | 2.2  | 1.0110  | 1.0203   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.1  | 0.1                                   | 0.0  | ----  | ----   |
| as left span              | 4916                      | 84.4                        | 801.1   | 401.7                                  | 399.4   | 803.4  | 404.6                                 | 398.7  | 0.9971  | 0.9928   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0014  | 1.0061   |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 812.1 ppb | NO = 807.8 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 1.5% |
| Previous Response    | NO <sub>x</sub> = 799.8 ppb | NO = 798.8 ppb |  | *Percent Change                  | NO = 1.1%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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                                      | 401.3                                 | 399.4   | 401.0  | 0.9960   | 100.4%   |
| 2nd GPT point (200 ppb O3)       | 799.5                                      | 587.7                                 | 213.0   | 214.4  | 0.9934   | 100.7%   |
| 3rd GPT point (100 ppb O3)       | 799.5                                      | 689.3                                 | 111.4   | 112.9  | 0.9866   | 101.4%   |
| Average Correction Factor        |  |                                       |   |  | 0.9920   | 100.8%   |

Notes:

Adjusted the span only.

Calibration Performed By:

Sean Bala



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

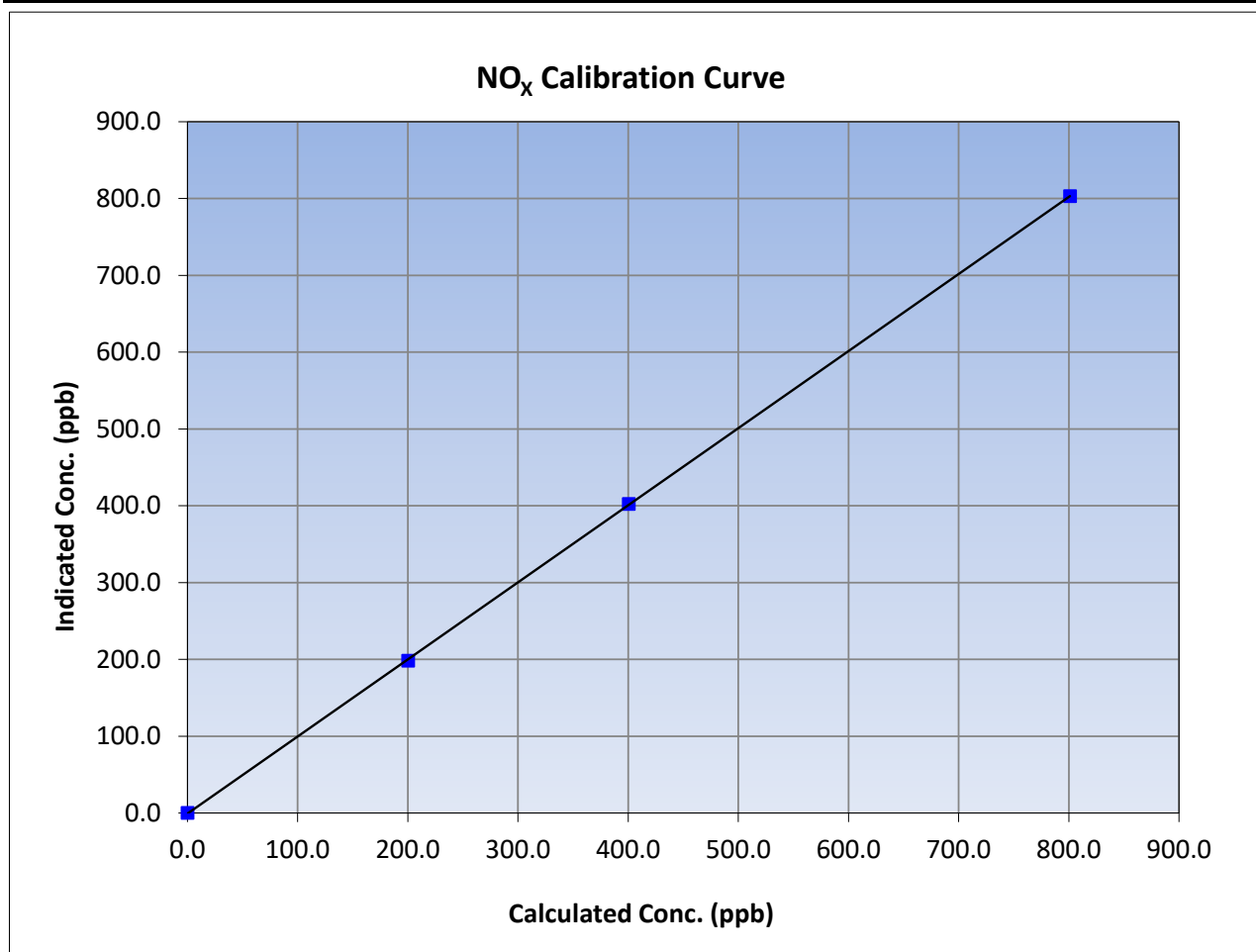
Version-04-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 30, 2023 | Previous Calibration: | February 15, 2023 |
| Station Name:     | Jackfish 1     | Station Number:       | AMS506            |
| Start Time (MST): | 8:22           | End Time (MST):       | 12:36             |
| Analyzer make:    | Thermo 42i     | Analyzer serial #:    | 1218153356        |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 801.1                               | 803.1                              | 0.9975                    |                         |               |             |
| 400.5                               | 402.3                              | 0.9956                    |                         |               |             |
| 200.3                               | 198.1                              | 1.0110                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 1.003601      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.808032     | +/-20       |







# Wood Buffalo Environmental Association

## NO Calibration Summary

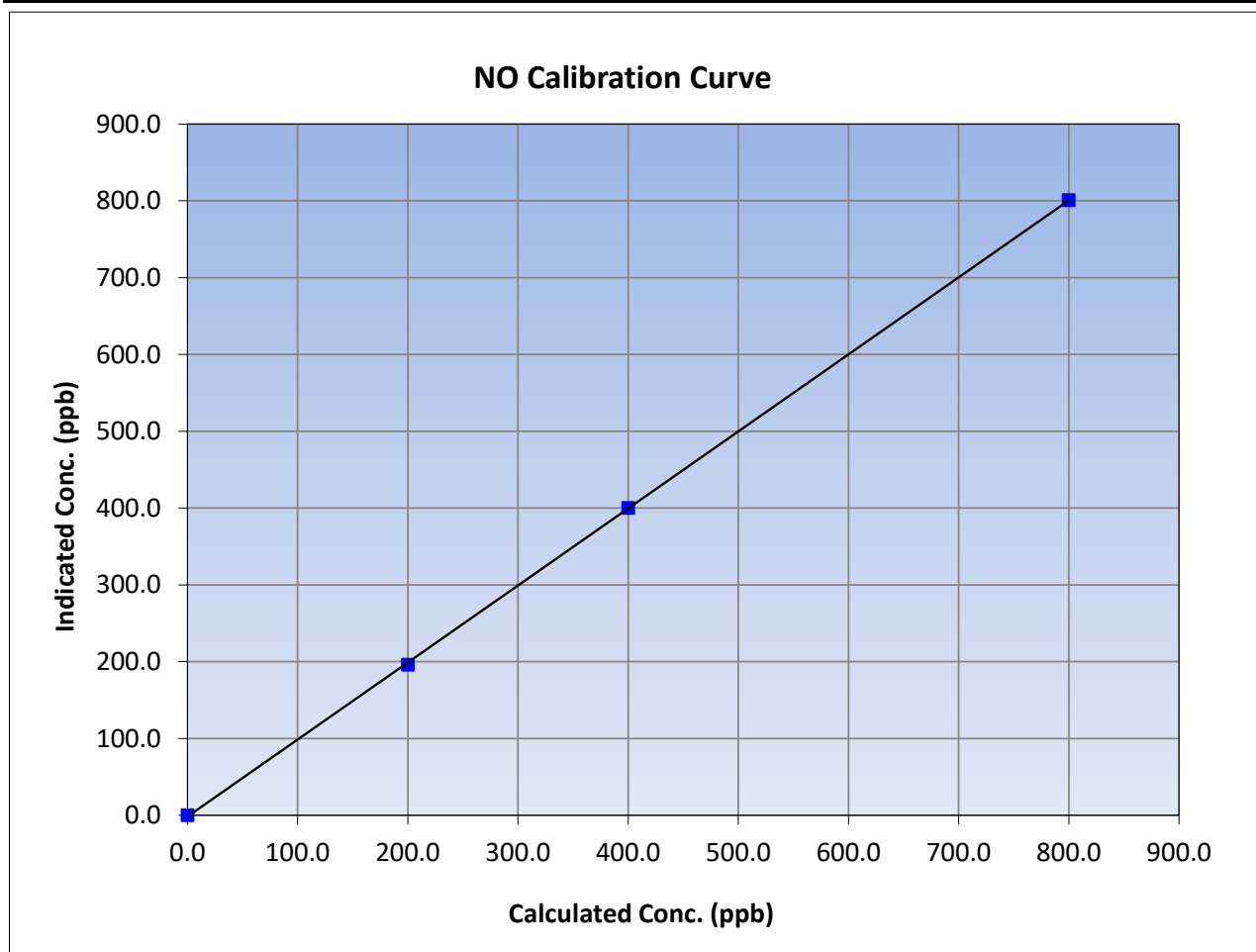
Version-04-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 30, 2023 | Previous Calibration: | February 15, 2023 |
| Station Name:     | Jackfish 1     | Station Number:       | AMS506            |
| Start Time (MST): | 8:22           | End Time (MST):       | 12:36             |
| 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<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 799.9                               | 800.9                              | 0.9987                    |   |                                |
| 400.0                               | 400.2                              | 0.9994                    |   |                                |
| 200.0                               | 196.0                              | 1.0203                    |   |                                |
|                                     |                                    |                           |   |                                |





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

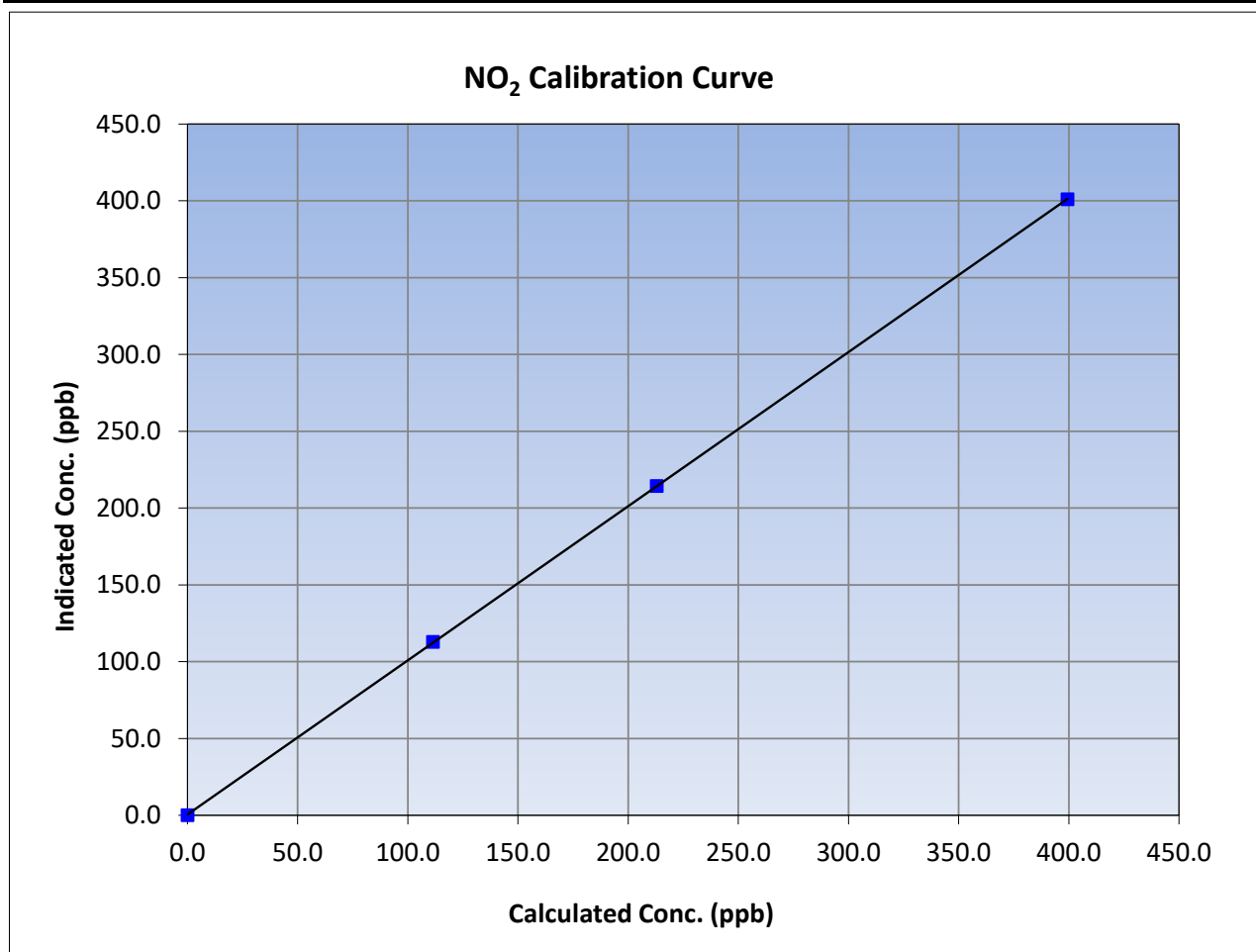
Version-04-2020

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 30, 2023 | Previous Calibration: | February 15, 2023 |
| Station Name:     | Jackfish 1     | Station Number:       | AMS506            |
| Start Time (MST): | 8:22           | End Time (MST):       | 12:36             |
| Analyzer make:    | Thermo 42i     | Analyzer serial #:    | 1218153356        |

### Calibration Data

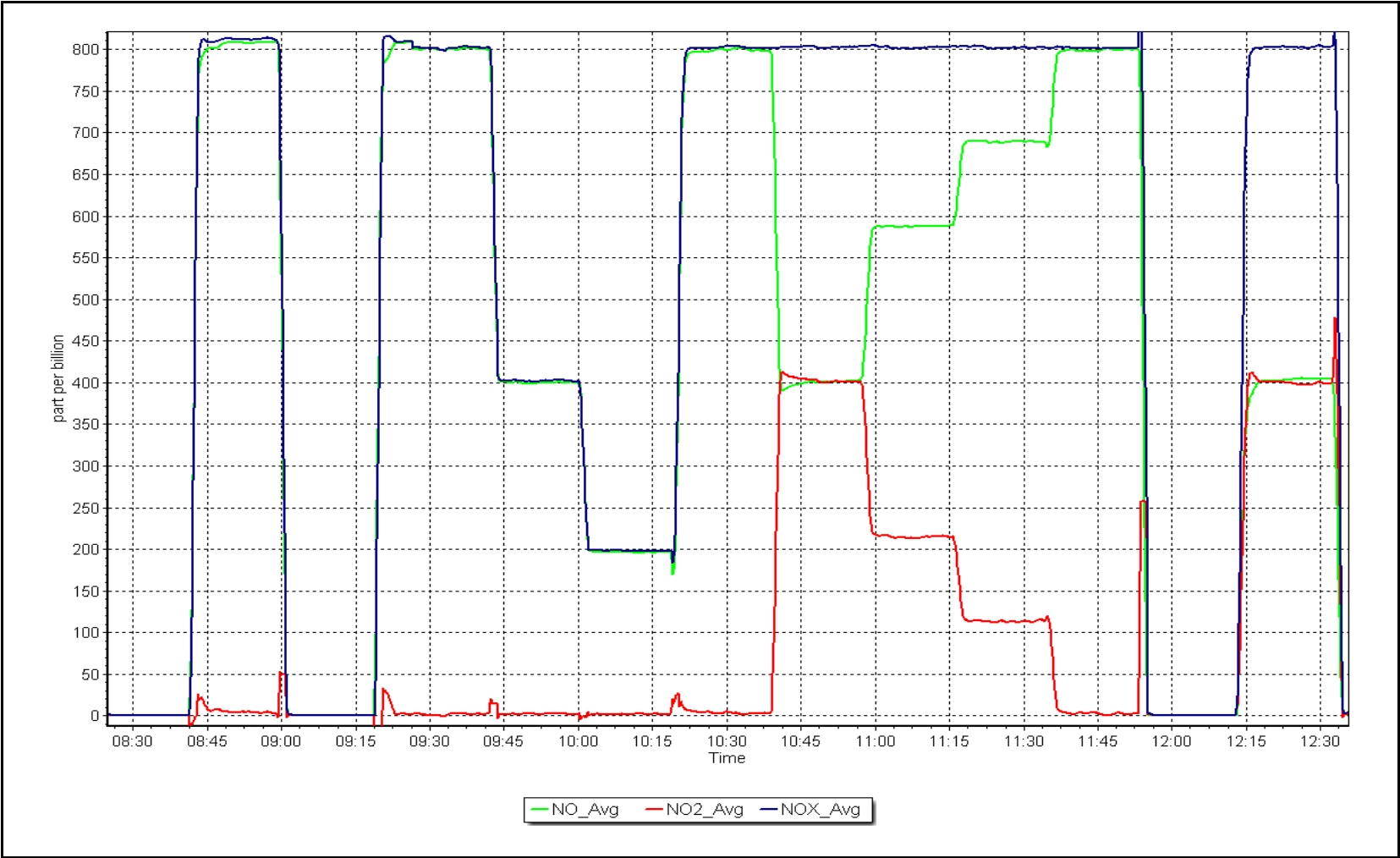
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 399.4                               | 401.0                              | 0.9960                    |                         |               |             |
| 213.0                               | 214.4                              | 0.9934                    |                         |               |             |
| 111.4                               | 112.9                              | 0.9866                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 1.003399      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.523900      | +/-20       |



NO<sub>x</sub> Calibration Plot

Date: March 30, 2023

Location: Jackfish 1





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS508**  
**KIRBY NORTH**  
**MARCH 2023**

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

April 29, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

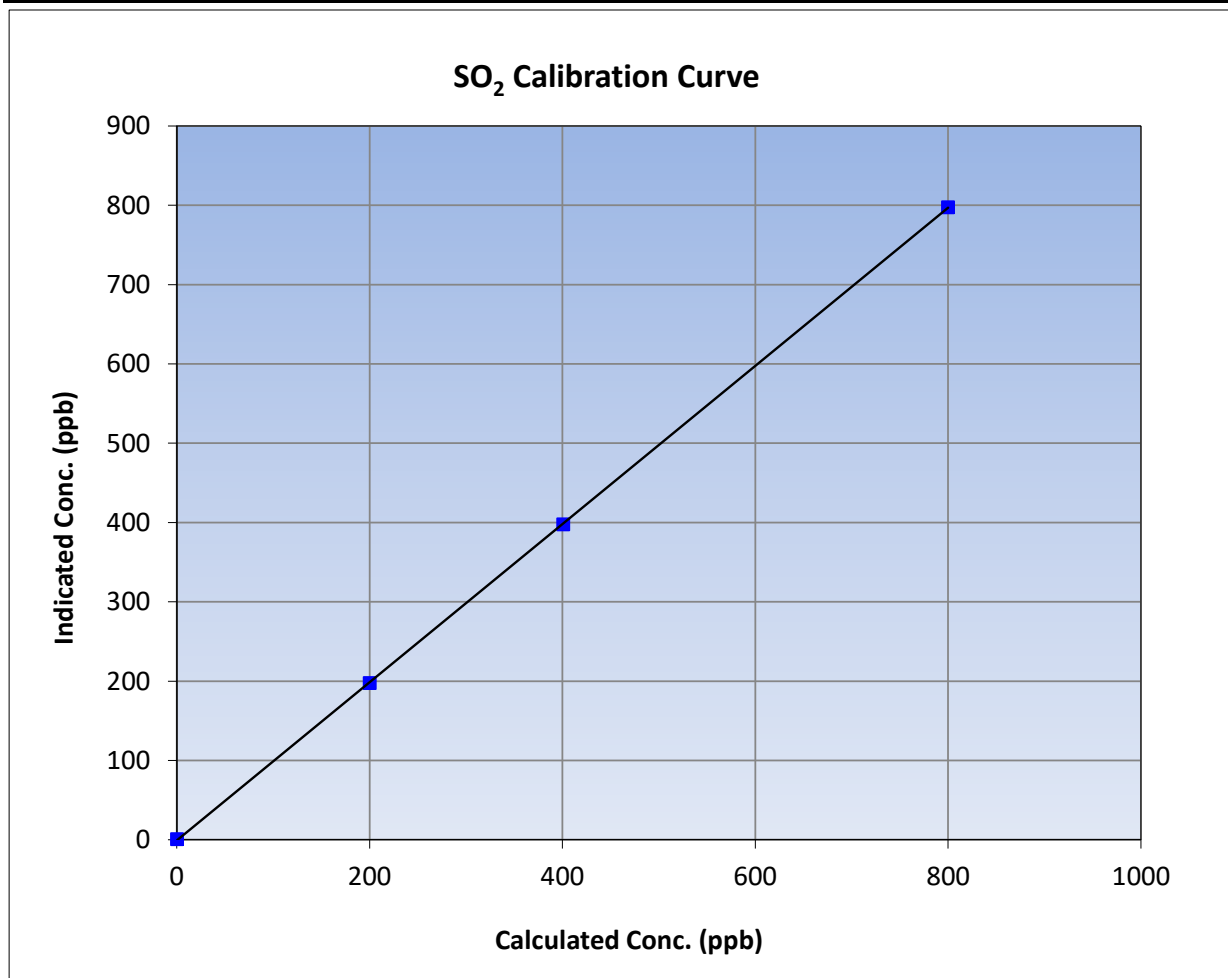
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 9, 2023 | Previous Calibration: | February 2, 2023 |
| Station Name:     | Kirby North   | Station Number:       | AMS508           |
| Start Time (MST): | 8:48          | End Time (MST):       | 14:04            |
| Analyzer make:    | Thermo 43iQ   | Analyzer serial #:    | 1182340007       |

### Calibration Data

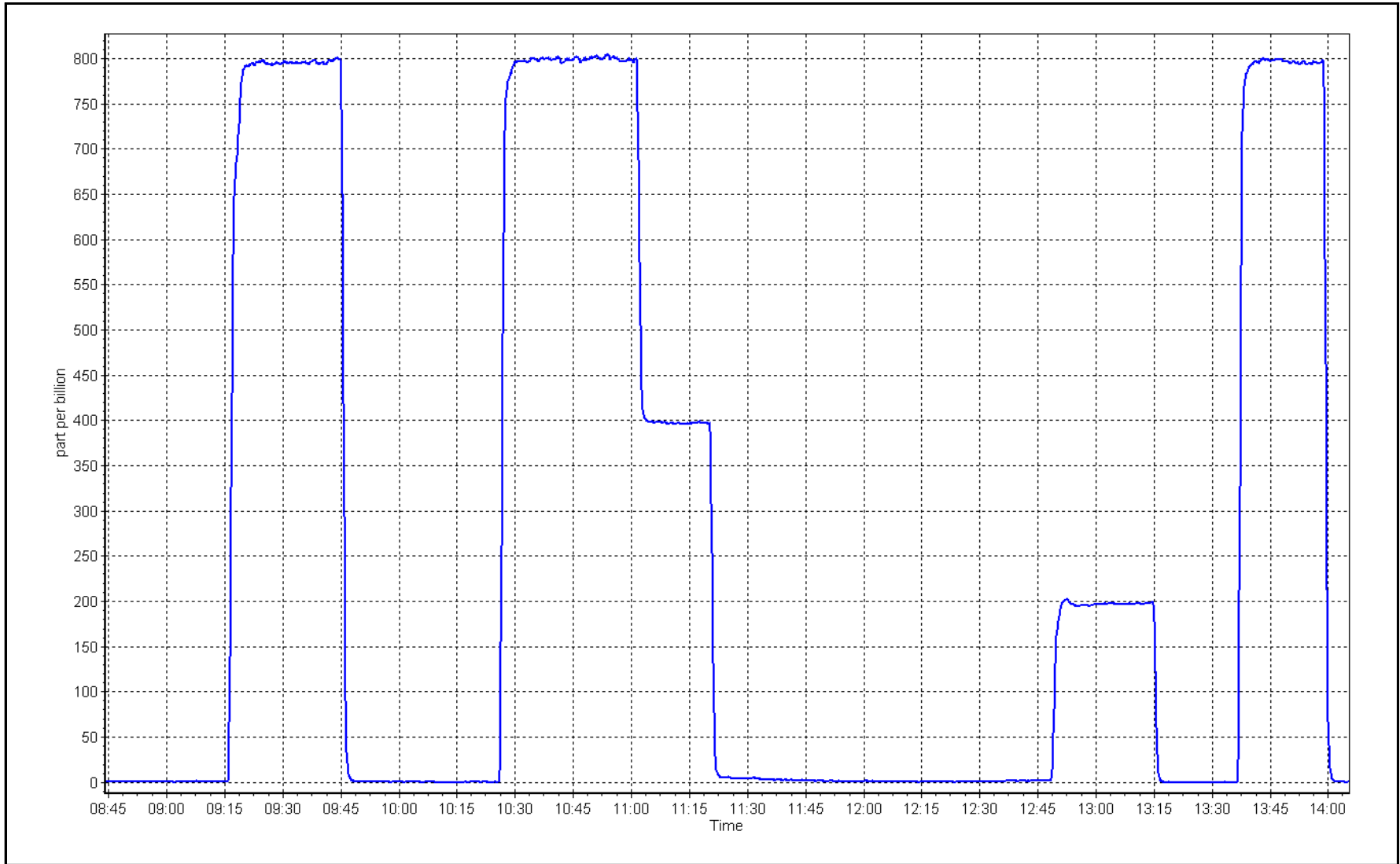
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient | 0.999989  | ≥0.995      |
| 799.6                               | 797.3                              | 1.0029                    |                         |           |             |
| 400.3                               | 397.4                              | 1.0074                    | Slope                   | 0.997350  | 0.90 - 1.10 |
| 199.7                               | 197.2                              | 1.0125                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -0.929311 | +/-30       |



SO2 Calibration Plot

Date: March 9, 2023

Location: Kirby North





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Kirby North Station number: AMS508  
 Calibration Date: March 9, 2023 Last Cal Date: February 15, 2023  
 Start time (MST): 8:48 End time (MST): 15:13  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.167 ppm Cal Gas Exp Date: February 5, 2024  
 Cal Gas Cylinder #: CC517378  
 Removed Cal Gas Conc: 5.167 ppm Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA Diff between cyl:  
 Calibrator Make/Model: API T750 Serial Number: 282  
 ZAG Make/Model: API 751H Serial Number: 322

### Analyzer Information

Analyzer make: Thermo 43i TLE Analyzer serial #: 1150840012  
 Converter make: Global Converter serial #: 2022-197  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.995603     | 1.007456      | Backgd or Offset: | 1.70         | 1.67          |
| Calibration intercept: | -0.101015    | -0.140937     | Coeff or Slope:   | 1.022        | 1.009         |

### H<sub>2</sub>S 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))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | -0.2                               | ----   |
| as found span         | 4923                          | 77.4                        | 80.0                                | 81.5                               | 0.979  |
| as found 2nd point    | 4961                          | 38.8                        | 40.1                                | 40.5                               | 0.985  |
| as found 3rd point    | 4981                          | 19.3                        | 19.9                                | 20.2                               | 0.978  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S 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)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | -0.1                               | ----  |
| high point                              | 4923                          | 77.4                        | 80.0                                | 80.5                               | 0.994   |
| second point                            | 4961                          | 38.8                        | 40.1                                | 40.1                               | 1.000   |
| third point                             | 4981                          | 19.3                        | 19.9                                | 20.0                               | 0.997   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span                            | 4923                          | 77.4                        | 80.0                                | 78.6                               | 1.018   |
| SO2 Scrubber Check                      | 4920                          | 79.8                        | 798.0                               | 0.1                                | ----  |
| Date of last scrubber change:           | 21-Sep-22                     |                             |                                     | Ave Corr Factor                    | 0.997   |
| Date of last converter efficiency test: | efficiency                    |                             |                                     |                                    |   |

Baseline Corr As found: 81.7 Prev response: 79.53 \*% change: 2.7%  
 Baseline Corr 2nd AF pt: 40.7 AF Slope: 1.021025 AF Intercept: -0.240889  
 Baseline Corr 3rd AF pt: 20.4 AF Correlation: 0.999985

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

Notes: Changed sample inlet filter after as founds. Adjusted span. Ran scrubber check after cal zero.  
 Second Sox scrubber check passed after hydrating the scrubber beads.

Calibration Performed By: Braiden Boutillier





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

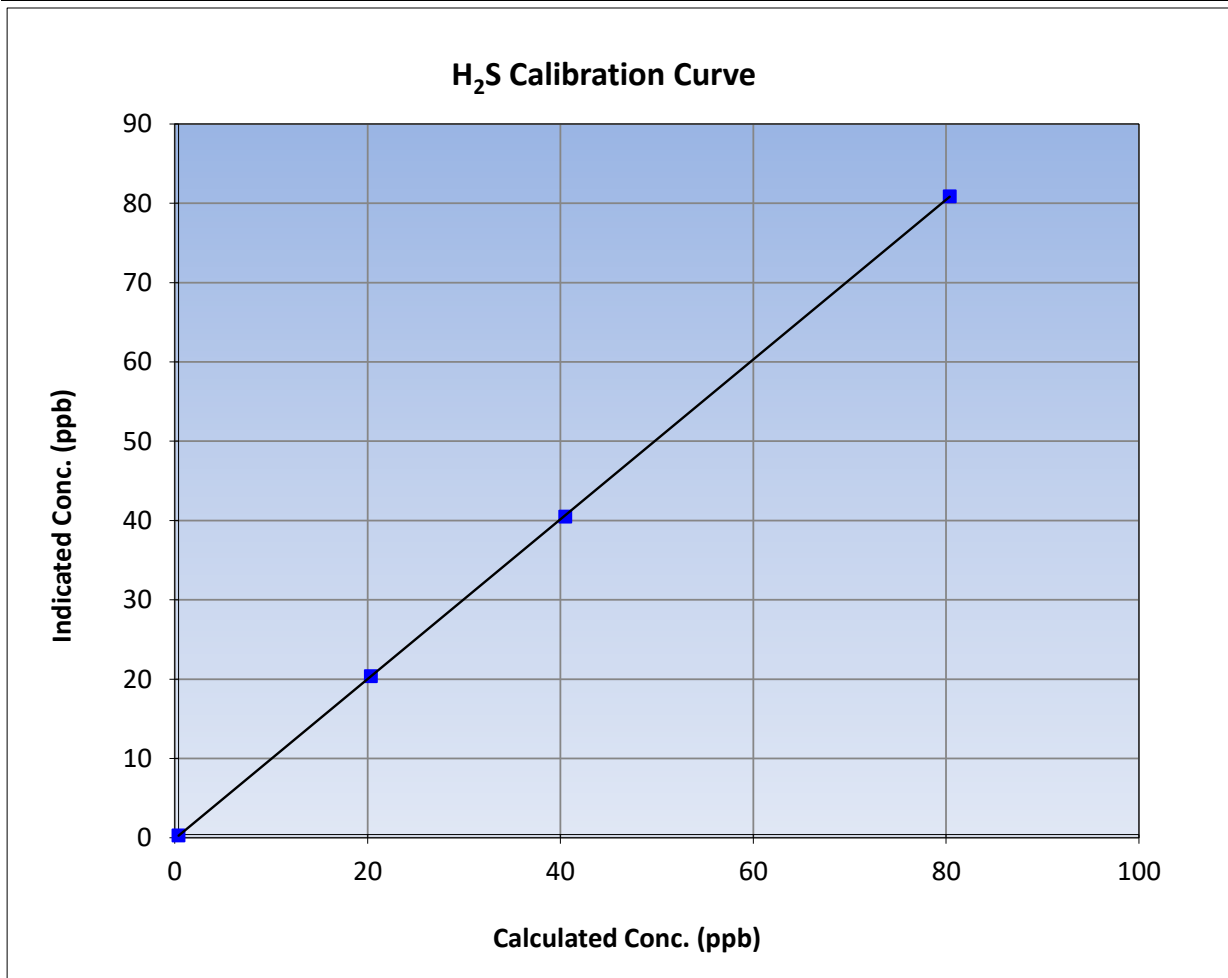
Version-11-2021

### Station Information

|                   |                |                       |                   |
|-------------------|----------------|-----------------------|-------------------|
| Calibration Date: | March 9, 2023  | Previous Calibration: | February 15, 2023 |
| Station Name:     | Kirby North    | Station Number:       | AMS508            |
| Start Time (MST): | 8:48           | End Time (MST):       | 15:13             |
| Analyzer make:    | Thermo 43i-TLE | Analyzer serial #:    | 1150840012        |

### Calibration Data

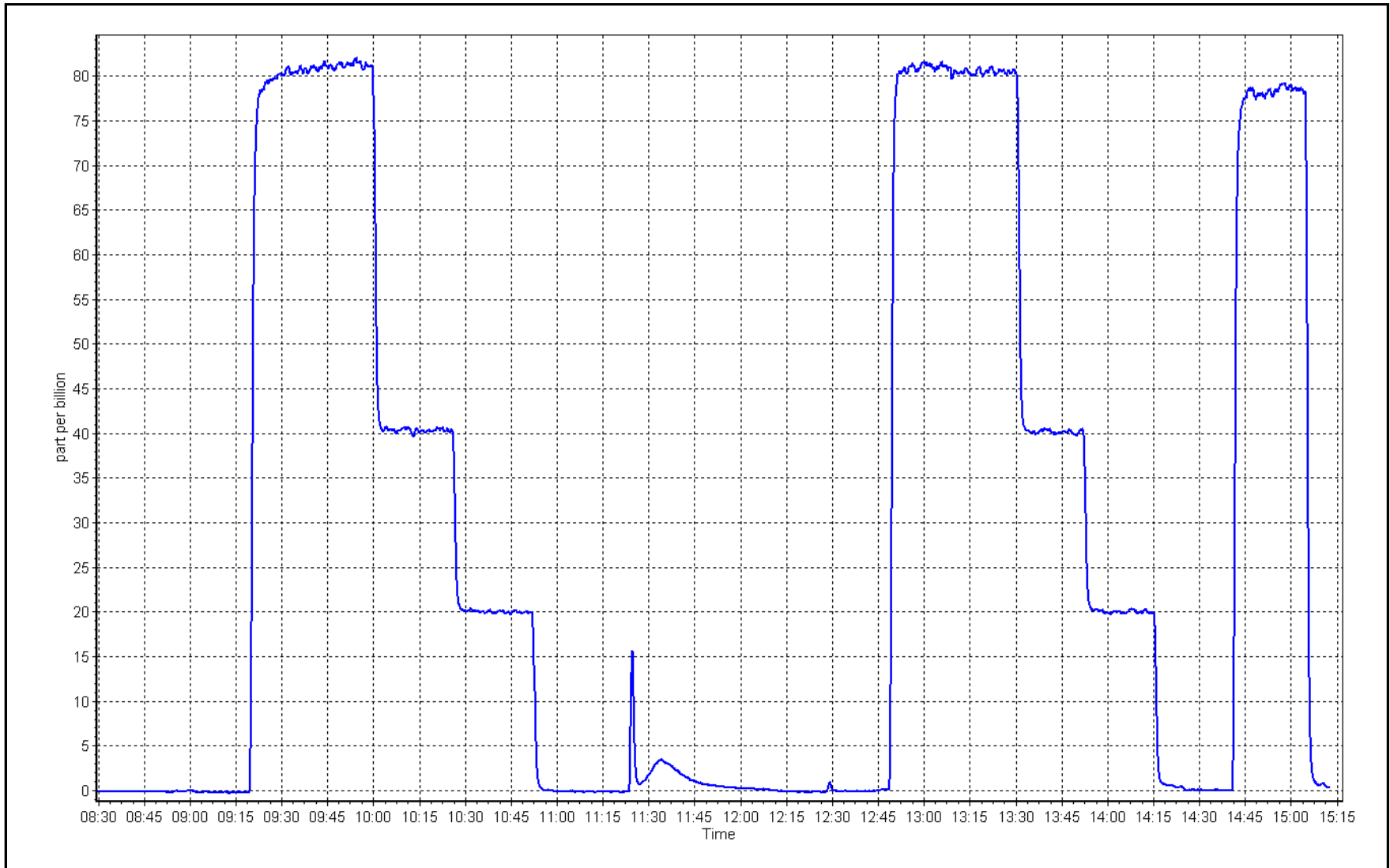
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999991  | ≥0.995      |
| 80.0                                | 80.5                               | 0.9935                    |                         |           |             |
| 40.1                                | 40.1                               | 0.9999                    | Slope                   | 1.007456  | 0.90 - 1.10 |
| 19.9                                | 20.0                               | 0.9972                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -0.140937 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: March 9, 2023

Location: Kirby North







# Wood Buffalo Environmental Association

## THC Calibration Summary

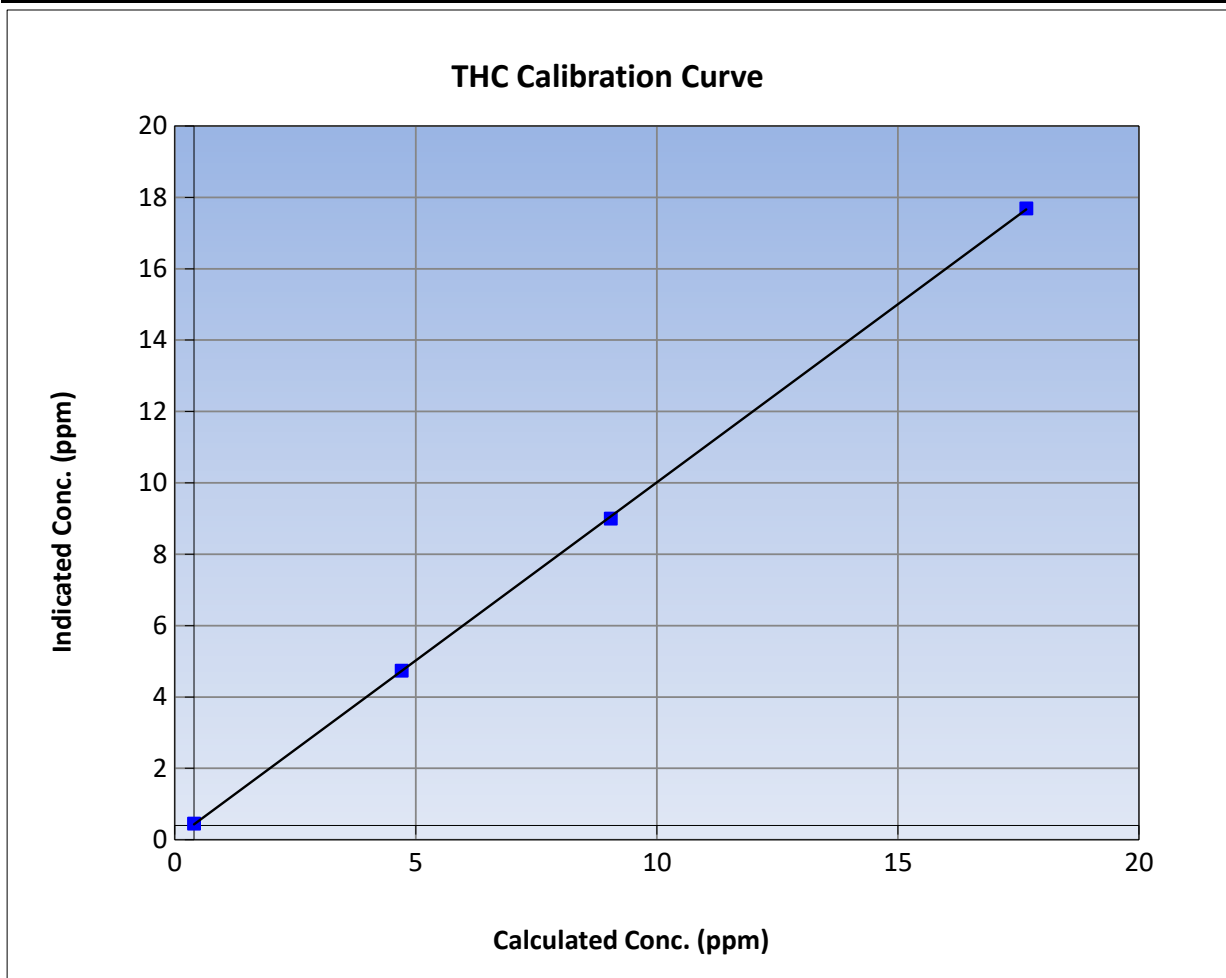
Version-01-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 9, 2023 | Previous Calibration: | February 4, 2023 |
| Station Name:     | Kirby North   | Station Number:       | AMS508           |
| Start Time (MST): | 8:48          | End Time (MST):       | 14:04            |
| Analyzer make:    | Thermo 51i    | Analyzer serial #:    | 1182340005       |

### Calibration Data

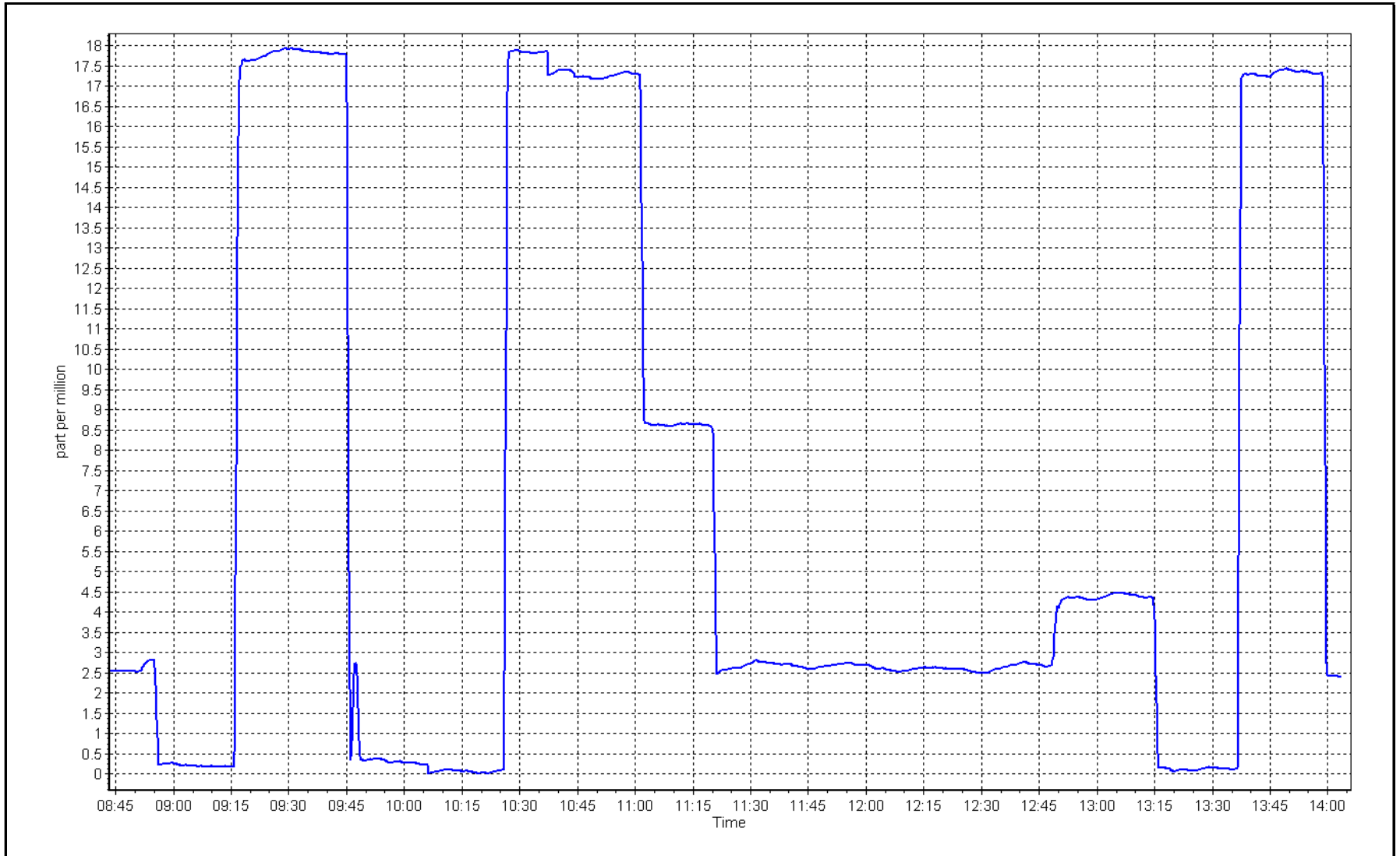
| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (lc) | Correction factor (Cc/lc) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.00                                | 0.06                               | ----                      | Correlation Coefficient | 0.999970      |             |
| 17.26                               | 17.29                              | 0.9984                    |                         |               | ≥0.995      |
| 8.64                                | 8.60                               | 1.0050                    | Slope                   | 0.998186      |             |
| 4.31                                | 4.34                               | 0.9929                    |                         |               | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.031226      | +/-1.5      |



THC Calibration Plot

Date: March 9, 2023

Location: Kirby North







# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.2   | -0.2                                  | 0.0  | ----  | ----   |
| as found span             | 4919                      | 81.0                        | 800.1   | 794.1                                  | 6.0   | 780.8  | 774.4                                 | 6.3  | 1.0247  | 1.0255   |
| 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                | 4919                      | 81.0                        | 800.1   | 794.1                                  | 6.0   | 797.1  | 790.3                                 | 6.8  | 1.0038  | 1.0048   |
| second point              | 4960                      | 40.5                        | 400.0   | 397.0                                  | 3.0   | 396.8  | 392.4                                 | 4.5  | 1.0081  | 1.0118   |
| third point               | 4980                      | 20.2                        | 199.5   | 198.0                                  | 1.5   | 196.3  | 193.0                                 | 3.3  | 1.0164  | 1.0261   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.2   | -0.2                                  | 0.1  | ----  | ----   |
| as left span              | 4919                      | 81.0                        | 800.1   | 415.1                                  | 385.0   | 792.0  | 408.2                                 | 383.8  | 1.0103  | 1.0170   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0094  | 1.0142   |

|                      |                             |                |  |                                  |                         |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 781.0 ppb | NO = 774.6 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -2.5% |                      |
| Previous Response    | NO <sub>x</sub> = 800.4 ppb | NO = 792.9 ppb |  | *Percent Change                  | NO = -2.4%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| 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)       | 788.7                                      | 409.7                                 | 385.0   | 388.3  | 0.9915   | 100.9%   |
| 2nd GPT point (200 ppb O3)       | 788.7                                      | 594.2                                 | 200.5   | 203.0  | 0.9877   | 101.2%   |
| 3rd GPT point (100 ppb O3)       | 788.7                                      | 697.1                                 | 97.6  | 99.8   | 0.9779   | 102.3%   |
| Average Correction Factor        |  |                                       |   |  | 0.9857   | 101.5%   |

Notes: Changed sample inlet filter after as founds. No adjustments made. Second High NO reference point used for converter efficiency.

Calibration Performed By: Braiden Boutilier



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

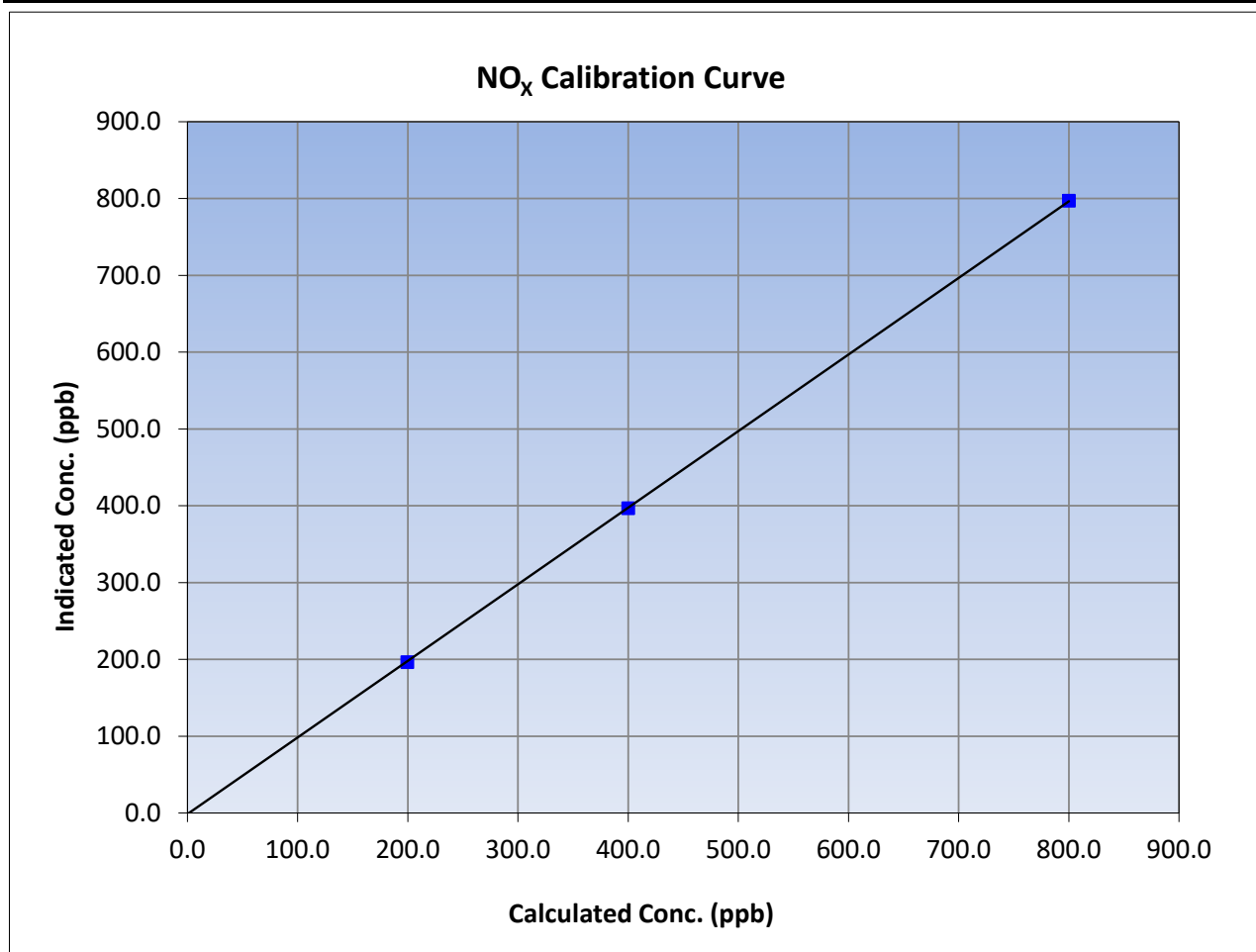
Version-04-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 8, 2023 | Previous Calibration: | February 1, 2023 |
| Station Name:     | Kirby North   | Station Number:       | AMS508           |
| Start Time (MST): | 11:35         | End Time (MST):       | 17:03            |
| Analyzer make:    | API T200      | Analyzer serial #:    | 7029             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <u>Limits</u>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.1                               | 797.1                              | 1.0038                    |   |                                |
| 400.0                               | 396.8                              | 1.0081                    |   |                                |
| 199.5                               | 196.3                              | 1.0164                    |   |                                |
|                                     |                                    |                           |   |                                |







# Wood Buffalo Environmental Association

## NO Calibration Summary

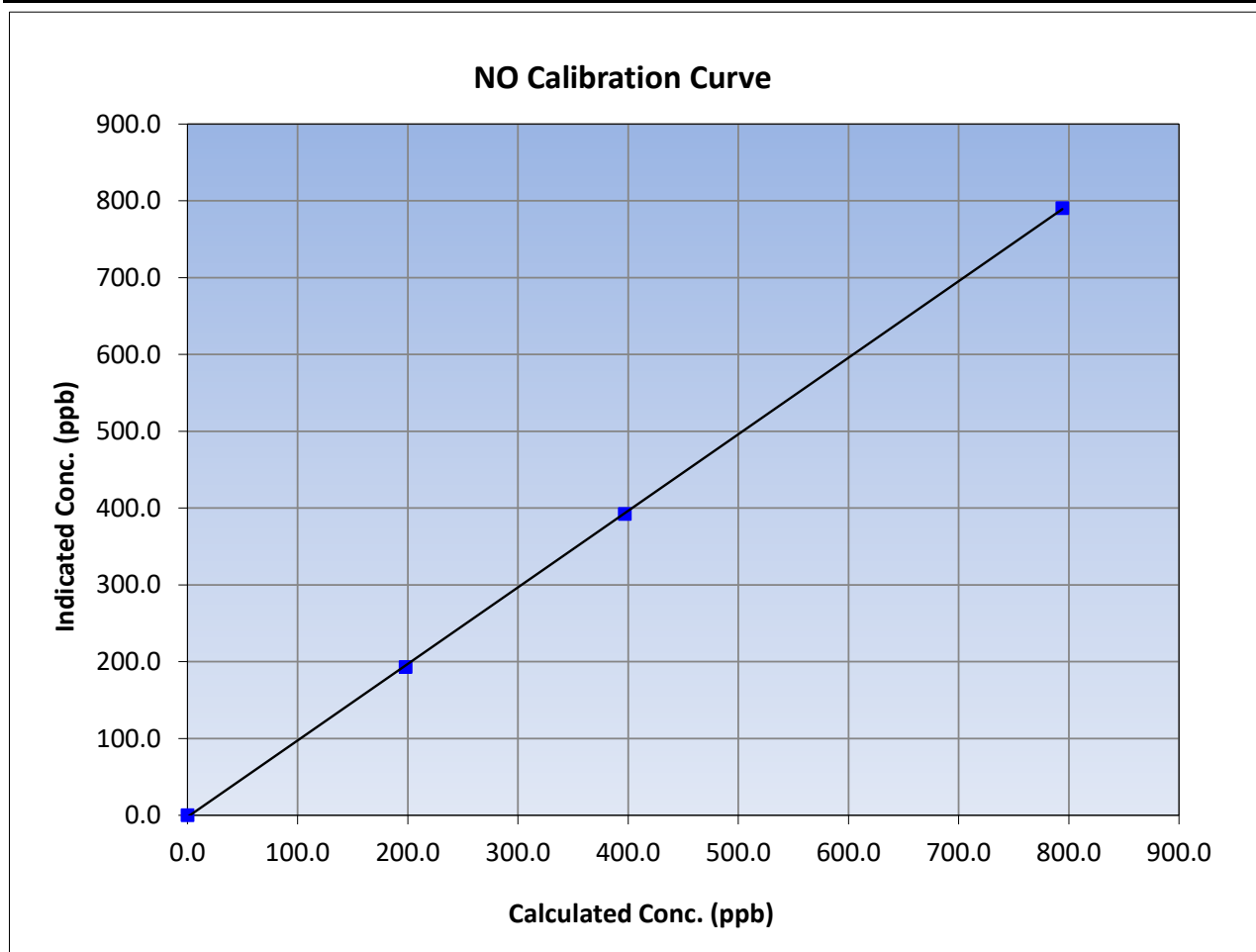
Version-04-2020

### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 8, 2023 | Previous Calibration: | February 1, 2023 |
| Station Name:     | Kirby North   | Station Number:       | AMS508           |
| Start Time (MST): | 11:35         | End Time (MST):       | 17:03            |
| Analyzer make:    | API T200      | Analyzer serial #:    | 7029             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 794.1                               | 790.3                              | 1.0048                    |                         |               |             |
| 397.0                               | 392.4                              | 1.0118                    |                         |               |             |
| 198.0                               | 193.0                              | 1.0261                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.996559      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -2.174660     | +/-20       |





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

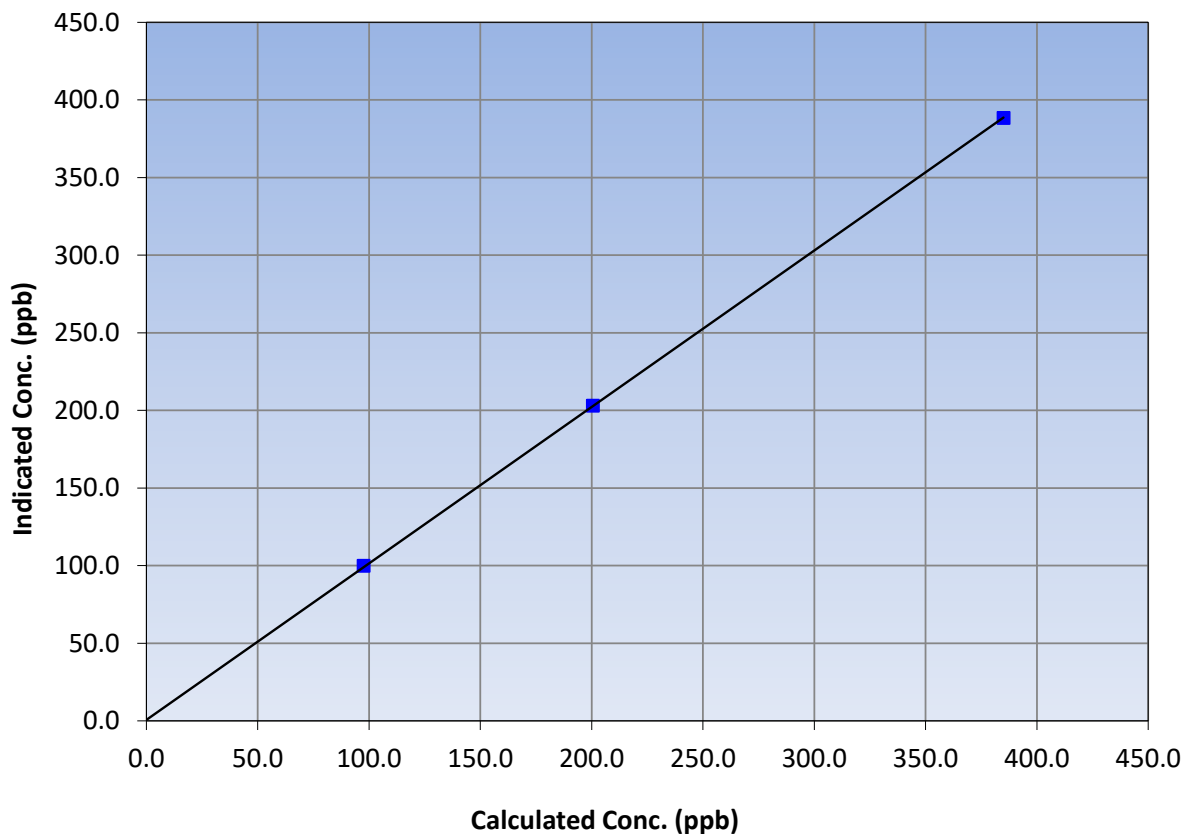
### Station Information

|                   |               |                       |                  |
|-------------------|---------------|-----------------------|------------------|
| Calibration Date: | March 8, 2023 | Previous Calibration: | February 1, 2023 |
| Station Name:     | Kirby North   | Station Number:       | AMS508           |
| Start Time (MST): | 11:35         | End Time (MST):       | 17:03            |
| Analyzer make:    | API T200      | Analyzer serial #:    | 7029             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | ≥0.995        |             |
| 385.0                               | 388.3                              | 0.9915                    |                         |               |             |
| 200.5                               | 203.0                              | 0.9877                    |                         |               |             |
| 97.6                                | 99.8                               | 0.9779                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 1.007853      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.638504      | +/-20       |

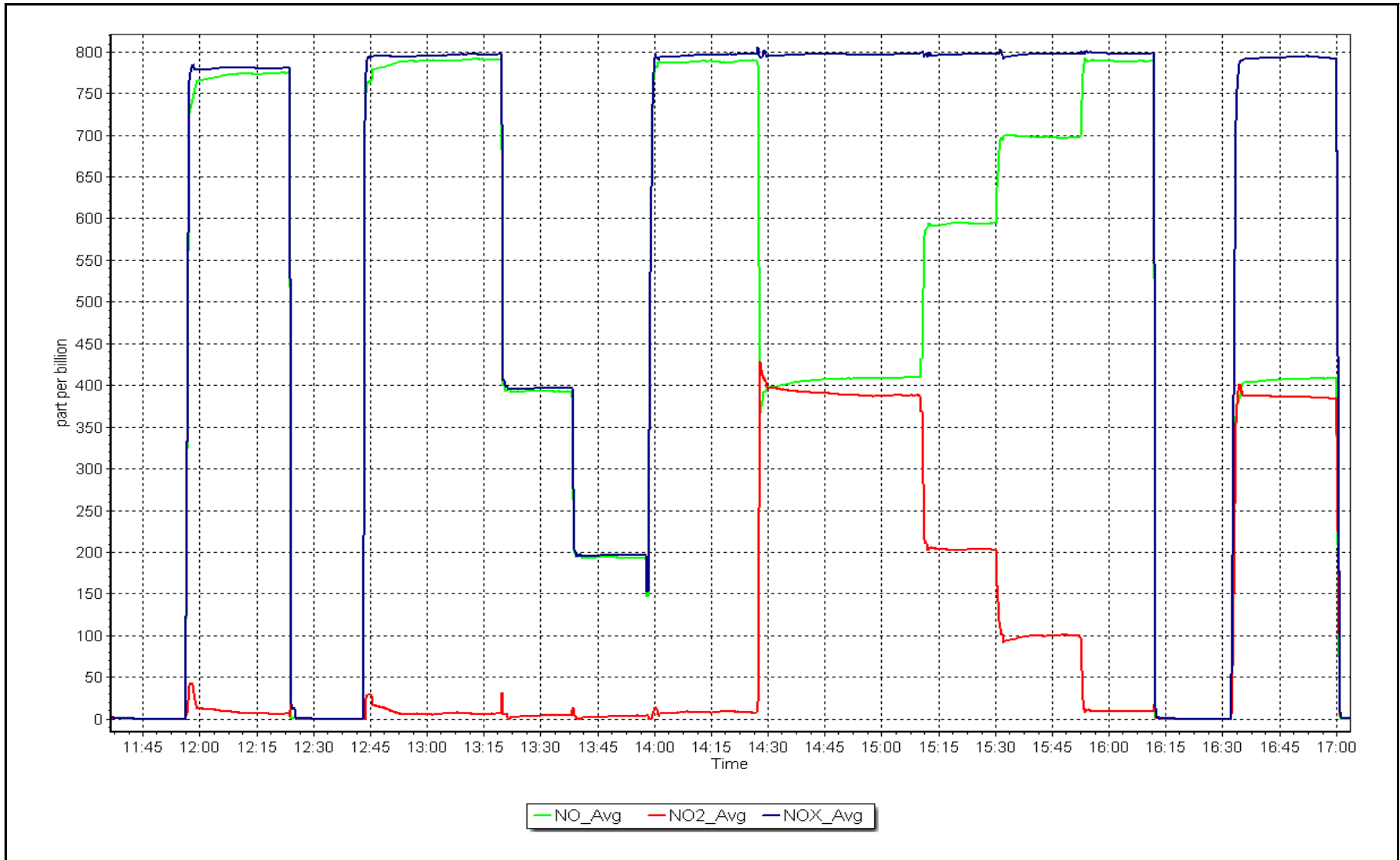
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: March 8, 2023

Location: Kirby North





End of Report