# TEST REPORT FOR
# 2018 EMISSIONS PERFORMANCE TESTING AND CEMS RATA AT THE DESERT VIEW POWER, MECCA PLANT

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STAC STACK TESTING ACCREDITATION COUNCIL

ACCREDITED TO ASTM D7036 ONLY CERT #3925.01

MONTROSE AIR QUALITY SERVICES

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## REPORT REVIEW AND CERTIFICATION

I certify that all work performed in the preparation and production of this report was performed by me or under my supervision and that all data presented is authentic.

Date: 6/5/2018

Dave Wonderly
Project Manager

I certify that I have also reviewed this report, both in form and content, and that all data, calculations, and presentations are authentic, accurate, and complete.

To the best of our knowledge, the report has been checked for completeness, and the results presented are accurate, error-free, legible, and representative of the actual emissions measured during the test, and conform to the requirements of ASTM D7036-04, Standard Practice for Competence of Air Emission Testing Bodies (AETBs).

Date: 6/5/2018

Matt McCune
Regional Vice President

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## 1.0 INTRODUCTION

Montrose Air Quality Services, LLC (MAQS), was contracted by Desert View Power, to conduct performance emissions testing at the Desert View Power Project located in Mecca, California. Testing was conducted on March 27-31, 2018. The MAQS test team consisted of Dave Wonderly, Jason Sering, Anya Badalian and Patrick Whitman. Greg Studer of Desert View Power, coordinated plant operations and data retrieval during the test program. The South Coast Air Quality Management District (SCAQMD) was notified of the test date but did not send a representative.

The emissions tests included measurements on Unit 1 and Unit 2 for hydrogen chloride (HCl), particulate, sulfur dioxide, oxides of nitrogen, carbon monoxide, and hydrocarbons. Exhaust flow rate and moisture measurements were performed in conjunction with the testing. Relative Accuracy Test Audits (RATA) were conducted on the plant's continuous emissions monitoring system (CEMS).

The Desert View Power Facility met all emissions limits required by the U.S. Environmental Protection Agency 40 CFR Part 63 Subpart DDDDD the Boiler MACT, the U.S. Environmental Protection Agency Operating Permit NSR 4-4-11;SE 87-01 including amendments through August 14, 2003: 7$^{th}$ Amendment Title V permit to operate CB-OP 99-01 dated 8/1/2000. The plant CEMS met all RATA requirements of CFR 40 Appendix F.

Tables 1-1 and 1-2 summarize the results of the emissions tests and Tables 1-3 and 1-4 present the results of the RATA tests for Unit 1 and Unit 2.

**TABLE 1-1**
**SUMMARY OF EMISSIONS RESULTS UNIT 1**
**DESERT VIEW POWER**
**MARCH 29, 30 AND 31, 2018**

| Parameter | Average Emission Results | Permit Limit | Comment |
|---|---|---|---|
| Hydrochloric Acid | | | |
| mg/dscm | 22.48 | | |
| lb/hr (as HCl) | 8.19 | | |
| lb/MMBtu | 0.0208 | 0.022 | Pass |
| Total Solid Particulate: | | | |
| gr/dscf | 0.0022 | -- | |
| gr/dscf @ 12% $CO_2$ | 0.0022 | 0.010 | Pass |
| lb/hr ($PM_{10}$) | 1.79 | 3.9 | Pass |
| Sulfur Dioxide: | | | |
| ppm @ 3% $O_2$ | 15.57 | 27 | Pass |
| lb/hr | 9.77 | 12 | Pass |
| $NO_x$: | | | |
| ppm at 3% $O_2$ | 56.49 | 94 | Pass |
| lb/hr | 25.46 | 30 | Pass |
| CO: | | | |
| ppm @ 3% $O_2$ | 0.08 | 231 | Pass |
| lb/hr | 0.02 | 13 | Pass |
| Hydrocarbons: | | | |
| ppm @ 3% $O_2$ | 3.11 | | |
| lb/hr | 0.50 | 5.9 | Pass |

Note: $NO_x$ CO and $SO_2$ results are from RATA Runs 1, 2 and 3. Hydrocarbons are total non-methane hydrocarbons reported as methane. The EPA factor of 1.086 for SCAQMD Method 25.3 was used.

**TABLE 1-2**
**SUMMARY OF EMISSIONS RESULTS UNIT 2**
**DESERT VIEW POWER**
**MARCH 27, 2018**

| Parameter | Average Emission Results | Permit Limit | Comment |
|---|---|---|---|
| Hydrochloric Acid | | | |
| mg/dscm | 22.72 | | |
| lb/hr (as HCl) | 8.00 | | |
| lb/MMBtu | 0.0206 | 0.022 | Pass |
| Total Solid Particulate: | | | |
| gr/dscf | 0.0002 | -- | |
| gr/dscf @ 12% $CO_2$ | 0.0002 | 0.010 | Pass |
| lb/hr | 0.13 | 3.9 | Pass |
| Sulfur Dioxide: | | | |
| ppm @ 3% $O_2$ | 10.49 | 27 | Pass |
| lb/hr | 6.85 | 12 | Pass |
| $NO_x$: | | | |
| ppm at 3% $O_2$ | 49.03 | 94 | Pass |
| lb/hr | 22.97 | 30 | Pass |
| CO: | | | |
| ppm @ 3% $O_2$ | 0.25 | 231 | Pass |
| lb/hr | 0.07 | 13 | Pass |
| Hydrocarbons: | | | |
| ppm @ 3% $O_2$ | 3.14 | | |
| lb/hr | 0.51 | 5.9 | Pass |

Note: $NO_x$ CO and $SO_2$ results are from RATA Runs 1, 2 and 3. Hydrocarbons are total non-methane hydrocarbons reported as methane. The EPA factor of 1.086 for SCAQMD Method 25.3 was used.

**TABLE 1-3**
**RELATIVE ACCURACY RESULT SUMMARY UNIT 1**
**DESERT VIEW POWER**
**MARCH 28, 2018**

| CEMS | RA | Limit | Comment |
|---|---|---|---|
| $NO_x$ ppm | 4.7% | 20% | Pass |
| $NO_x$ @ 3% $O_2$ | 4.2% | 20% | Pass |
| $NO_x$ lb/hr | 4.8% | 20% | Pass |
| $O_2$ dry | 0.4% | 20% | Pass |
| CO ppm(1) | -1.81 | <5 ppm(1) | Pass |
| CO @ 3% $O_2$(1) | -2.59 | <5 ppm(1) | Pass |
| CO lb/hr | 2.08% | 5%(2) | Pass |
| $SO_2$ ppm | 8.0% | 20% | Pass |
| $SO_2$ @ 3% $O_2$ | 8.4% | 20% | Pass |
| $SO_2$ lb/hr | 9.2% | 20% | Pass |

(1) PS 4A Criteria, average difference less than 5ppm.
(2) Of applicable standard

**TABLE 1-4**
**RELATIVE ACCURACY RESULT SUMMARY UNIT 2**
**DESERT VIEW POWER**
**MARCH 29-30, 2018**

| CEMS | RA | Limit | Comment |
|---|---|---|---|
| $NO_x$ ppm | 7.7% | 20% | Pass |
| $NO_x$ @ 3% $O_2$ | 7.7% | 20% | Pass |
| $NO_x$ lb/hr | 12.4% | 20% | Pass |
| $O_2$ dry | 0.6% | 20% | Pass |
| CO ppm(1) | -0.92 | <5 ppm(1) | Pass |
| CO @ 3% $O_2$(1) | -1.32 | <5 ppm(1) | Pass |
| CO lb/hr | 1.14% | 5%(2) | Pass |
| $SO_2$ ppm | 13.8% | 20% | Pass |
| $SO_2$ @ 3% $O_2$ | 14.1% | 20% | Pass |
| $SO_2$ lb/hr | 16.5% | 20% | Pass |

(1) PS 4A Criteria, average difference less than 5ppm.
(2) Of applicable standard

## 2.0 UNIT DESCRIPTION

The Desert View Power, plant consists of two 297 MMBtu/hour, circulating bed, biomass-fired boilers. The combined units are designed to produce 47 MW of net electrical output. Each unit is equipped with the following pollution control systems:

- An ammonia injection system for control of $NO_x$ emissions;
- Cyclonic mixing of injected ammonia with flue gas to provide for a minimum amount of ammonia slip (emission);
- A limestone injection system to limit emissions of $SO_2$;
- A reverse air baghouse to control opacity and emissions of sulfates and particulate to very low levels;

The plant CEMS system for each unit includes measurements of $NO_x$, CO, $O_2$, $O_2$ wet, $SO_2$, $CO_2$, flow and opacity. It is an extractive system with a heated line extending from the probe to the CEMS unit. Table 2-1 presents the current CEMS configuration.

**TABLE 2-1**
**CONTINUOUS EMISSION MONITOR SYSTEM**
**UNITS 1 AND 2**
**DESERT VIEW POWER**

| Species | Manufacturer | Unit 1, Model/Serial Number | Unit 2, Model/Serial Number | Range |
|---|---|---|---|---|
| $NO_x$ | CAI | ZRE/A3F4992T | ZRE/A3F4993T | 100 and 500 ppm |
| CO | CAI | ZRE/A3F4992T | ZRE/A3F4993T | 100 and 500 ppm |
| $O_2$ Dry | CAI | ZRE/A3F4992T | ZRE/A3F4993T | 25% |
| $SO_2$ | CAI | ZRE/A3F4992T | ZRE/A3F4993T | 50 and 500 ppm |
| $CO_2$ | CAI | ZRE/A3F4992T | ZRE/A3F4993T | 20% |
| $O_2$ Wet | Thermox | WDG | WDG | 25% |
| Flow | Dietrick Standard/Rosemont | 0260938 | -- | Msdcfh |
| Opacity | Monitor Labs | Lighthawk 560 | Lighthawk 560 | 100% |
| $NO_2$ Convertor | CAI | ZDL04001 | ZDL04001 | |

## 2.1 TEST CONDITIONS

The tests were conducted at or near maximum steady state unit load conditions. Limestone injection rate, fuel combustion rate, ammonia injection rate, ash handling operations, excess air level, combustion air distribution, and combustor temperature were set to maintain stable unit operation. Pertinent operating conditions were recorded by Desert View Power personnel during the tests as presented in Table 2-2.

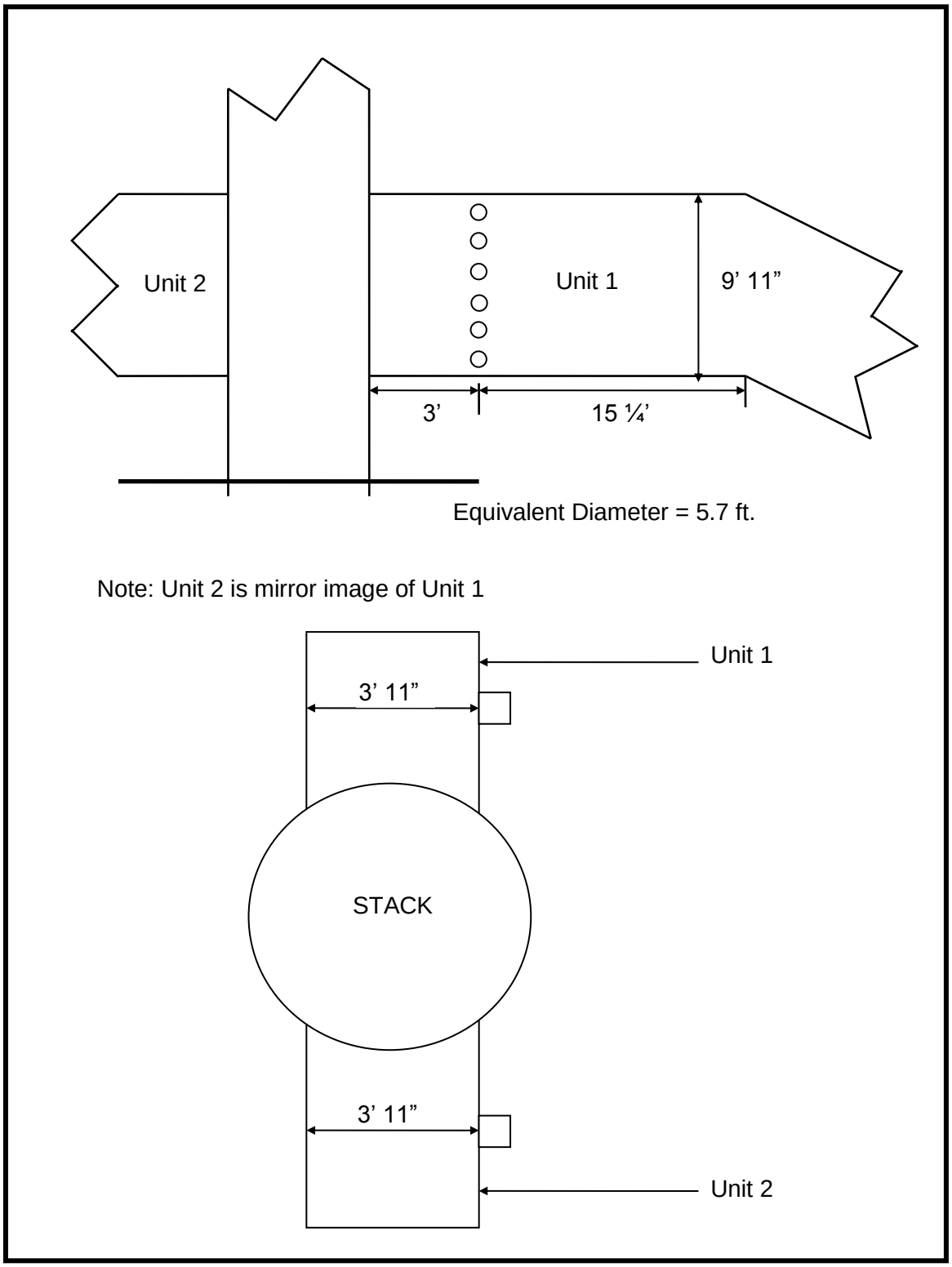
**TABLE 2-2**
**AVERAGE DAILY UNIT DATA**
**DESERT VIEW POWER**
**MARCH AND APRIL 2018**

| Date | Unit No. | Steam Flow klbm/hr | Boiler Input MMBtu/hr |
|---|---|---|---|
| 3/27/2018 | 2 | 201 | 389 |
| 3/28/2018 | 2 | 197 | 401 |
| 3/29/2018 | 1 | 202 | 393 |
| 3/30/2018 | 1 | 200 | 349 |
| 3/31/2018 | 1 | 199 | Not Available |

## 2.2 SAMPLE LOCATIONS

Samples were collected at the stack breaching ducts to the stack. Desert View Power previously conducted three dimensional flow testing and stratification testing on the baghouse exhaust ducts on each unit. This testing was performed in accordance to SCAQMD Chapter X, Section 1 and 13 and was presented in the report titled "Stack Gas Stratification and Absence of Flow Disturbance Testing at Desert View Power" (R106E622.T) submitted to SCAQMD in October of 1994. A copy of the sample location certification report can be found in the test plan in Appendix E of this report. The sample locations meet the requirements. All testing for both Unit 1 and 2 was conducted at the sample location presented in Figure 2-1.

**FIGURE 2-1**
**SCHEMATIC OF THE DESERT VIEW POWER, SAMPLE LOCATION**



## 3.0 TEST DESCRIPTIONS

The test procedures that were used are listed in Table 3-1. Tables 3-2 and 3-3 present the test schedule. The performance test runs for gaseous plant emissions were in some cases also used for RATA test runs. A minimum of nine reference method tests are required for all gaseous species relative accuracy (RA) determinations.

**TABLE 3-1**
**TEST MATRIX PER UNIT**
**DESERT VIEW POWER**

| Parameter | No. of Tests | Measurement Principle | Reference Method | Duration per Test |
|---|---|---|---|---|
| $NO_x$ | 9(1) | Chemiluminescence | EPA 7E | 60/30 minutes |
| CO | 9(1) | Non-Dispersive Infrared | Modified EPA 10 | 60/30 minutes |
| $CO_2$ | 9(1) | Non-Dispersive Infrared | EPA 3A | 60/30 minutes |
| $O_2$ | 9(1) | Electrochemical | EPA 3A | 60/30 minutes |
| HCL | 3 | ion chromatography | EPA 26A | 120 minutes, minimum of 2 DSCM of sample volume |
| PM | 3 | Gravimetric | EPA 5 | 120 minutes |
| $SO_2$ | 9(1) | Barium Thorin Titration | EPA 6 | 60/30 minutes |
| Hydrocarbons | 2 | GC/FID | SCAQMD 25.3 | ~60 minutes |
| Stack Gas Flow Rate | -- | S-Type Pitot Traverse | EPA 2 | -- |
| Moisture | -- | Condensation/Gravimetric | EPA 4 | -- |

(1) Includes compliance and RATA test runs.

**TABLE 3-2**
**TEST SCHEDULE UNIT 1**
**DESERT VIEW POWER**

| Test No. | Date | Time | Test Parameter |
|---|---|---|---|
| 1-RA-U1 | 3/30/2018 | 14:55 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 2-RA-U1 | 3/30/2018 | 15:38 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 3-RA-U1 | 3/30/2018 | 16:22 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 4-RA-U1 | 3/30/2018 | 17:05 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 5-RA-U1 | 3/30/2018 | 17:50 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 6-RA-U1 | 3/30/2018 | 18:33 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 7-RA-U1 | 3/30/2018 | 19:17 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 8-RA-U1 | 3/30/2018 | 20:01 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 9-RA-U1 | 3/30/2018 | 20:45 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 1-HCL-U1 | 3/29/2018 | 9:45 | HCL RM data |
| 2-HCL-U1 | 3/29/2018 | 12:36 | HCL RM data L |
| 3-HCL-U1 | 3/29/2018 | 16:00 | HCL RM data |
| 1A&B-VOC-U1 | 3/29/2018 | 9:46 | Hydrocarbon |
| 1-PM-U1 | 330/2018 | 17:29 | PM, RM data |
| 2-PM-U1 | 3/31/2018 | 7:55 | PM, RM data |
| 3-PM-U1 | 3/31/2018 | 10:40 | PM, RM data |

9 CEMS runs for the RATA were performed. RATA runs 1, 2, and 3 were used for compliance.

**TABLE 3-3**
**TEST SCHEDULE UNIT 2**
**DESERT VIEW POWER**

| Test No. | Date | Time | Test Parameter |
|---|---|---|---|
| 1-RA-U2 | 3/27/2018 | 8:30 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 2-RA-U2 | 3/27/2018 | 9:54 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 3-RA-U2 | 3/27/2018 | 11:32 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 4-RA-U2 | 3/27/2018 | 12:55 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 5-RA-U2 | 3/28/2018 | 13:39 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 6-RA-U2 | 3/28/2018 | 8:01 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 7-RA-U2 | 3/28/2018 | 8:49 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 8-RA-U2 | 3/28/2018 | 9:33 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 9-RA-U2 | 3/28/2018 | 10:17 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 10-RA-U2 | 3/28/2018 | 11:12 | $NO_x$, CO,$SO_2$ & $CO_2$ RM data |
| 1-HCL-U2 | 3/27/2018 | 8:30 | HCL RM data |
| 2-HCL-U2 | 3/27/2018 | 11:32 | HCL RM data L |
| 3-HCL-U2 | 3/28/2018 | 8:01 | HCL RM data |
| 1A&B-VOC-U2 | 3/27/2018 | 9:54 | Hydrocarbon |
| 1-PM-U2 | 3/27/2018 | 8:30 | PM, RM data |
| 2-PM-U2 | 3/27/2018 | 11:32 | PM, RM data |
| 3-PM-U2 | 3/28/2018 | 8:01 | PM, RM data |

10 CEMS runs for the RATA were performed. RATA runs 1, 2, and 3 were used for compliance.

### 3.1 $NO_X$, CO, $O_2$, AND $CO_2$

$NO_x$, $O_2$, $CO_2$ and CO were measured according to EPA reference methods using MAQS' continuous emissions monitoring system (CEM). $NO_x$, $O_2$, $CO_2$ and CO concentrations were determined using MAQS' mobile emission measurement laboratory. The laboratory is housed in a truck outfitted to provide a clean, quiet, environmentally controlled base for the testing operations. The laboratory has lighting, electrical distribution, air conditioning and heating to support the test instruments and provide for optimal test performance.

Concentrations of these gaseous species were measured using an extractive sampling system consisting of a stainless steel probe to minimize reactions, a heat traced Teflon sample line connected to a thermo-electrically cooled sample dryer. Following the dryer, the sample is drawn into a Teflon lined pump where it is pressurized and then filtered for delivery to the gas analysis portion of the system. Gaseous samples were collected at a single point. Three 60-minute compliance tests were performed.

$NO_x$ concentration was determined using a California Analytical Model 600. The analyzer full scale range was 100 ppm. The analyzer is equipped with a $NO_2$ - NO converter for the determination of total nitrogen oxides without interference from other nitrogen containing compounds.

Oxygen concentration was determined using an AMI electro-chemical cell analyzer (model #201). The analyzer full scale range was 20%. The cell contains an electrolytic fluid that reacts with oxygen to generate an electrical signal proportional to the concentration.

$CO_2$ was measured using a non-dispersive infrared analyzer manufactured by Horiba (model #PIR 2000). The analyzer full scale range was 20%.

CO was measured using a non-dispersive infrared/gas filter correlation analyzer manufactured by TECO (model 48i). The analyzer full scale range was 10 ppm.

The analyzers and sampling system were subjected to a variety of calibration and quality assurance procedures including leak checks, linearity and calibration error determinations before sampling, and system bias and drift determinations as part of each test run. Data are corrected for any observed bias or drift in accordance with the reference methods.

### 3.2 HYDROGEN CHLORIDE MEASUREMENTS

Triplicate hydrogen chloride (HCl), samples were collected using EPA Method 26A. Sampling and analysis for HF and $Cl_2$ which is included in EPA Method 26A was not be performed.

The sampling train consists of:

- A glass nozzle and heated glass probe heated to between 248°F and 273°F
- A Teflon Mat out-of-stack filter in a glass filter holder heated to 248°F ± 25°F
- Two impingers containing 100 ml of 0.1 N $H_2SO_4$ for collection of HCl
- One empty impinger
- An impinger containing silica gel

Samples are withdrawn isokinetically from the stack. The Teflon Mat filter collects particulate matter. The acidic absorbing solution collect gaseous HCl and is analyzed for HCl by ion chromatography.

The samples are recovered in the following sample fraction:

- Back half of filter holder, $H_2SO_4$ Impinger Catch – Weighed for moisture content and recovered with DI water into pre-cleaned HDPE bottle.

The filter and probe wash were not recovered for this test program.

Quality assurance samples collected in the field are:

- A field blank
- A reagent blank: 200 ml of 0.1 N $H_2SO_4$
- A reagent blank: 200 ml of DI water

The samples were analyzed by ion chromatography by AAC in Ventura.

## 3.3 PARTICULATE

EPA method 5 was used to measure the particulate emissions from both the Desert View Power, units. The sampling system consists of a nozzle, glass probe, 250°F heated filter, two impingers containing DI water, an empty impinger, and a fourth impinger containing silica gel.

The analysis for particulate is summarized in Table 3-4. Gravimetric analysis was performed on the probe/nozzle wash and filter according to EPA and SCAQMD procedures.

**TABLE 3-4**
**EPA METHOD 5 ANALYSES**

| | Sample Component | Analysis Procedure |
|---|---|---|
| 1. | Probe and Nozzle (Front 1/2) | Evaporation/gravimetric |
| 2. | Heated Filter (83 mm) | Dry/gravimetric |

## 3.4 SULFUR DIOXIDE

Sulfur dioxide was measured according to EPA Method 6. Three runs were used to demonstrate compliance. A barium thorin titration of the hydrogen peroxide impinger samples yielded $SO_2$ concentrations for a minimum of nine relative accuracy tests. The sample system consisted of heated glass probe and filter connected by Teflon tubing to the glass sample train consisting of a series of hydrogen peroxide filled impingers. Prior to the titrimetric analysis, all $SO_x$ samples were passed through an ion exchange resin. This removes interferences associated with ammonium ($NH_4$).

## 3.5 HYDROCARBONS

Samples for hydrocarbon analysis were collected in clean 6-liter Summa canisters and mini water impingers and analyzed according to SCAQMD 25.3. The samples were analyzed by AtmAA in Calabasas, CA using TCA/FID.

## 3.6 VELOCITY AND MOISTURE

Stack gas velocity and moisture content were determined by EPA Methods 2 and 4 during the particulate testing. Velocity traverses were performed during each set of compliance tests ($NO_x$, CO, $SO_2$ and hydrocarbons) and RATA test runs.

## 3.7 FUEL ANALYSIS

Daily fuel samples were collected by Desert View Power personnel. Hourly samples were taken during each HCl test run and composited by the lab prior to analysis. Sampling was consistent with ASTM D6323 sample collection methodology. Desert View power sent the samples out to be analyzed for higher heating value for heat rate calculations, for Btu/lb for calculating the HCL emissions in lb/MMBtu using ASTM E711, for moisture content using ASTM D3173 and for chlorine content using ASTM E776. Copies of the analysis can be found in the appendices.

## 3.8 RATA TEST PROCEDURES

Relative accuracy tests were performed on $NO_x$, $SO_2$, CO and $CO_2$ sub-systems of each unit's CEMS. Relative accuracy was determined by comparing the CEMS data to the corresponding reference method (RM) data over nine test runs. A minimum of nine - 30 minute runs were performed on Units 1 and 2 for the $NO_x$, $SO_2$, CO, and $CO_2$. Relative accuracy is expressed in terms of the absolute value of the mean of the difference between the monitor value and the reference method value. It is reported in terms of a percentage of the mean reference method value. The computational procedure is summarized by the following equations:

$$\overline{RM} = \frac{1}{n}\sum_{i=1}^{n} RM_i$$

$$\bar{d} = \frac{1}{n}\sum_{i=1}^{n} d_i$$

$$S_d = \left[ \frac{\sum_{i=1}^{n} d_i^2 - \frac{\left[\sum_{i=1}^{n} di\right]^2}{n}}{n-1} \right]^{\frac{1}{2}}$$

$$CC = t_{0.975}\frac{S_d}{\sqrt{n}}$$

$$RA = \frac{|\bar{d}| + |CC|}{\overline{RM}} x100$$

Where:

$\overline{RM}$ = mean value of the reference method

$\bar{d}$ = average difference between RM and CEMS (RM – CEMS)

$|\bar{d}|$ = absolute value of the difference between RM and CEMS

$S_d$ = sample standard deviation of the difference between RM and CEMS

$RA$ = Relative Accuracy

$t_{0.975}$ = t value at 95% confidence interval

$n$ = number of valid tests

# 4.0 RESULTS

This section presents the results of the performance tests conducted at Desert View Power, during March of 2018. Test results are presented in the following sections:

4.1 Unit 1 Performance Tests and RATA Results
4.2 Unit 2 Performance Tests and RATA Results
4.3 Fuel Analysis Results

All supporting data sheets, CEM data, instrument strip charts, and plant data are included in Appendix A. Laboratory reports and sample chain of custody records are contained in Appendix B. Emissions and Load calculations are presented in Appendix C. Quality assurance information is contained in Appendix D. The test plan that was submitted and is contained in Appendix E.

## 4.1 UNIT 1 PERFORMANCE TESTS AND RATA RESULTS

The results of the HCL testing are presented in Table 4-1. HCL emissions for Unit 1 were 0.0208 lb/MMBtu. This is below the permit limit of 0.022 lb/MMBtu. The results of the total solid particulate testing are presented in Table 4-2. Total solid particulate emissions for Unit 1 were 1.79 lb/hr. This is below the permit limit of 3.9 lb/hr. Gaseous emissions results are presented in Tables 4-3, and 4-4. $NO_x$, CO, $SO_2$ and hydrocarbon emissions results were below established permit limits. Results from the hydrocarbon tests can be found in Appendix C.1.5.1 and C.1.5.2.

Tables 4-5 through 4-14 present the CEMS RATA for Unit 1. The results demonstrate that the CEMS for Unit 1 is in control as defined in CFR 40 Appendix F. The results of the RATA are presented in units of ppm dry, ppm @ 3% $O_2$, and lb/hr for $NO_x$, CO and $SO_2$. $O_2$ results are presented in concentration units of %.

**TABLE 4-1**
**HYDROCHLORIC ACID TEST RESULTS UNIT 1**
**DESERT VIEW POWER**
**MARCH 29, 2016**

| Test Number | 1-HCL-U1 | 2-HCL-U1 | 3-HCL-U1 | Average | Limit |
|---|---|---|---|---|---|
| **Date** | 03/29/2018 | 03/29/2018 | 03/29/2018 | | |
| **Start/Stop Time** | 945/1208 | 1236/1504 | 1600/1810 | | |
| **Stack Flow Rate, dscfm** | 97,064 | 97,144 | 97,691 | 97,300 | |
| **Sample Volume, dscf** | 94.991 | 93.233 | 93.661 | 93.962 | |
| **$O_2$, %** | 9.09 | 8.93 | 9.12 | 9.04 | |
| **$CO_2$, %** | 11.34 | 11.57 | 11.39 | 11.43 | |
| mg/sample | 55.5 | 63.2 | 60.7 | 59.8 | |
| mg/dscm | 20.631 | 23.936 | 22.884 | 22.483 | |
| ppm (as HCl) | 13.600 | 15.779 | 15.085 | 14.821 | |
| lb/hr (as HCl) | 7.4949 | 8.7028 | 8.3672 | 8.1883 | |
| MMBtu/Hr | 393 | 393 | 393 | 393 | |
| lb/MMBtu | 0.019 | 0.022 | 0.021 | 0.0208 | 0.022 |

**TABLE 4-2**
**PARTICULATE EMISSIONS PERFORMANCE TEST UNIT 1**
**DESERT VIEW POWER**
**MARCH 30 AND 31, 2018**

| | | | |
|---|---|---|---|
| Date: | 3/30/2018 | 3/31/2018 | 3/31/2018 |
| Time: | 1729/1940 | 755/1005 | 1040/1250 |

| Test No. | 2-PM-U1 | 3-PM-U1 | 4-PM-U1 | Average |
|---|---|---|---|---|
| $O_2$, % | 8.6 | 9.1 | 9.0 | 8.9 |
| $CO_2$, % | 11.9 | 12.4 | 12.5 | 12.3 |
| $H_2O$, % | 12.6% | 13.3% | 12.1% | 12.6% |
| Stack Temperature (°F) | 351.0 | 340.7 | 346.3 | 346.0 |
| Gas Flow: | | | | |
| wacfm | 160,555 | 164,151 | 166,422 | 163,709 |
| dscfm | 91,807 | 94,349 | 96,256 | 94,137 |
| Isokinetic Ratio, % | 101.4 | 99.6 | 100.2 | 100.4 |
| Total Solid Particulate: | | | | |
| Grain Loading, gr/dscf | 0.0017 | 0.0026 | 0.0023 | 0.0022 |
| Grain Loading @ 12% $CO_2$ | 0.0017 | 0.0026 | 0.0022 | 0.0022 |
| lb/hr | 1.34 | 2.14 | 1.89 | 1.79 |

Note: Test 1-PM-U1 was not used since sample was lost during the post-test recovery.

**TABLE 4-3**
**$NO_x$, CO, $SO_x$ EMISSIONS PERFORMANCE TESTS UNIT 1**
**DESERT VIEW POWER**
**MARCH 30, 2018**

| | | | |
|---|---|---|---|
| Data From: | 1-RA-U1 | 2-RA-U1 | 3-RA-U1 |
| Date: | 3/30/2018 | 3/30/2018 | 3/30/2018 |
| Time: | 14:55 | 15:38 | 16:22 |

| Test No. | 1-Compliance -U1 | 2-Compliance-U1 | 3-Compliance-U1 | Average |
|---|---|---|---|---|
| $O_2$, % | 8.4 | 8.4 | 8.5 | 8.5 |
| $CO_2$, % | 12.1 | 12.2 | 12.0 | 12.1 |
| $H_2O$, % | 12.4 | 12.7 | 12.3 | 12.5 |
| Stack Temperature, °F | 350 | 352 | 353 | 351.6 |
| Gas Flow: | | | | |
| wacfm | 160,954 | 154,708 | 159,335 | 158,332 |
| dscfm | 92,375 | 88,269 | 91,193 | 90,612 |
| $NO_x$ ppm | 37.96 | 38.87 | 40.84 | **39.22** |
| $NO_x$ ppm @ 3% $O_2$ | 54.54 | 55.84 | 59.10 | **56.49** |
| $NO_x$ lb/hr | 25.12 | 24.58 | 26.68 | **25.46** |
| CO ppm | 0.04 | 0.09 | 0.04 | **0.06** |
| CO ppm @ 3% $O_2$ | 0.06 | 0.14 | 0.05 | **0.08** |
| CO lb/hr | 0.02 | 0.04 | 0.01 | **0.02** |
| $SO_x$ ppm | 9.9 | 9.4 | 13.1 | **10.81** |
| $SO_x$ ppm @ 3% $O_2$ | 14.2 | 13.6 | 18.9 | **15.57** |
| $SO_x$ lb/hr | 9.11 | 8.31 | 11.88 | **9.77** |

**TABLE 4-4**
**HYDROCARBON EMISSIONS PERFORMANCE TEST UNIT 1**
**DESERT VIEW POWER**
**MARCH 29, 2018**

| | | |
|---|---|---|
| Date: | 3/29/2018 | 3/29/2018 |
| Time: | 946/1033 | 946/1033 |

| Test No. | 1A-HC-U1 | 1B-HC-U1 | Average |
|---|---|---|---|
| $O_2$, % | 9.09 | 9.09 | 9.09 |
| $CO_2$, % | 11.34 | 11.34 | 11.34 |
| $H_2O$, % | 13.03% | 13.03% | 13.03% |
| Gas Flow: | | | |
| wacfm | 170,584 | 170,584 | 170,584 |
| dscfm | 97,064 | 97,064 | 97,064 |
| EPA Correction Factor | 1.086 | 1.086 | 1.086 |
| TNMHC ppm | 2.06 | 2.04 | 2.05 |
| TNMHC ppm @ 3% $O_2$ | 3.13 | 3.09 | 3.11 |
| TNMHC, lb/hr | 0.50 | 0.49 | 0.50 |

Note: Flow rates from HCL Run 1

**TABLE 4-5**
**$NO_x$, PPM UNIT 1**
**RELATIVE ACCURACY TEST AUDIT SUMARY**
**DESERT VIEW POWER**
**MARCH 30, 2018**

| Run # | Date | Time | RM $NO_x$, ppm dry | CEMS $NO_x$, ppm dry | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/30/2018 | 14:55 | 38.0 | 39.7 | -1.7 | Y |
| 2 | 3/30/2018 | 15:38 | 38.9 | 40.3 | -1.4 | Y |
| 3 | 3/30/2018 | 16:22 | 40.8 | 42.2 | -1.4 | Y |
| 4 | 3/30/2018 | 17:05 | 38.2 | 39.8 | -1.6 | Y |
| 5 | 3/30/2018 | 17:50 | 37.7 | 39.6 | -1.9 | Y |
| 6 | 3/30/2018 | 18:33 | 35.9 | 37.0 | -1.1 | y |
| 7 | 3/30/2018 | 19:17 | 38.1 | 40.1 | -2.0 | y |
| 8 | 3/30/2018 | 20:01 | 38.1 | 39.7 | -1.6 | Y |
| 9 | 3/30/2018 | 20:45 | 37.9 | 39.6 | -1.7 | Y |

| | | |
|---|---|---|
| Ref. Method Average: | 38.19 | ppm |
| CEMS Average: | 39.78 | ppm |
| Average Difference: | -1.60 | ppm |
| Number of Tests: | 9 | |
| Standard Deviation: | 0.27 | ppm |
| t Value: | 2.306 | |
| Confidence Coefficient: | 0.21 | ppm |
| Relative Accuracy: | 4.74 | % of Reference Method |

**TABLE 4-6**
**$NO_x$, PPM @ 3% $O_2$ UNIT 1**
**RELATIVE ACCURACY TEST AUDIT SUMARY**
**DESERT VIEW POWER**
**MARCH 30, 2018**

| Run # | Date | Time | RM $NO_x$ ppmc | CEMS $NO_x$ ppmc | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/30/2018 | 14:55 | 54.5 | 57.0 | -2.4 | Y |
| 2 | 3/30/2018 | 15:38 | 55.8 | 57.2 | -1.4 | Y |
| 3 | 3/30/2018 | 16:22 | 59.1 | 60.8 | -1.7 | Y |
| 4 | 3/30/2018 | 17:05 | 55.8 | 57.8 | -2.0 | Y |
| 5 | 3/30/2018 | 17:50 | 54.8 | 57.1 | -2.3 | Y |
| 6 | 3/30/2018 | 18:33 | 52.0 | 53.5 | -1.5 | y |
| 7 | 3/30/2018 | 19:17 | 55.1 | 57.4 | -2.4 | y |
| 8 | 3/30/2018 | 20:01 | 55.4 | 57.7 | -2.3 | Y |
| 9 | 3/30/2018 | 20:45 | 54.9 | 57.0 | -2.1 | Y |

| | | |
|---|---|---|
| Ref. Method Average: | 55.28 | ppmc |
| CEMS Average: | 57.30 | ppmc |
| Average Difference: | -2.02 | ppmc |
| Number of Tests: | 9 | |
| Standard Deviation: | 0.39 | ppmc |
| t Value: | 2.306 | |
| Confidence Coefficient: | 0.30 | |
| Relative Accuracy: | 4.19 | % of Reference Method |

**TABLE 4-7**
**$NO_x$, LB/HR UNIT 1**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 30, 2018**

| Run # | Date | Time | RM $NO_x$ lb/hr | CEMS $NO_x$ lb/hr | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/30/2018 | 14:55 | 25.12 | 25.92 | -0.80 | Y |
| 2 | 3/30/2018 | 15:38 | 24.58 | 26.08 | -1.50 | Y |
| 3 | 3/30/2018 | 16:22 | 26.68 | 27.45 | -0.77 | Y |
| 4 | 3/30/2018 | 17:05 | 25.06 | 25.53 | -0.47 | Y |
| 5 | 3/30/2018 | 17:50 | 24.78 | 25.90 | -1.12 | Y |
| 6 | 3/30/2018 | 18:33 | 23.76 | 24.55 | -0.80 | y |
| 7 | 3/30/2018 | 19:17 | 25.34 | 26.89 | -1.55 | y |
| 8 | 3/30/2018 | 20:01 | 25.61 | 25.81 | -0.20 | Y |
| 9 | 3/30/2018 | 20:45 | 25.77 | 25.63 | 0.15 | Y |

| | | |
|---|---|---|
| Ref. Method Average: | 25.188 | lb/hr |
| CEMS Average: | 25.973 | lb/hr |
| Average Difference: | -0.785 | lb/hr |
| Number of Tests: | 9 | |
| Standard Deviation: | 0.561 | lb/hr |
| t Value: | 2.306 | |
| Confidence Coefficient: | 0.4315 | |
| Relative Accuracy: | 4.83 | % of Reference Method |

**TABLE 4-8**
**$SO_2$, PPM UNIT 1**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 30, 2018**

| Run # | Date | Time | RM $SO_2$, ppm dry | CEMS $SO_2$, ppm dry | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/30/2018 | 14:55 | 9.9 | 8.9 | 1.0 | Y |
| 2 | 3/30/2018 | 15:38 | 9.4 | 7.8 | 1.6 | Y |
| 3 | 3/30/2018 | 16:22 | 13.1 | 12.5 | 0.6 | Y |
| 4 | 3/30/2018 | 17:05 | 12.5 | 12.5 | 0.0 | Y |
| 5 | 3/30/2018 | 17:50 | 12.0 | 12.0 | 0.0 | Y |
| 6 | 3/30/2018 | 18:33 | 11.4 | 11.4 | 0.0 | y |
| 7 | 3/30/2018 | 19:17 | 12.1 | 11.9 | 0.2 | y |
| 8 | 3/30/2018 | 20:01 | 12.7 | 12.7 | 0.1 | Y |
| 9 | 3/30/2018 | 20:45 | 12.0 | 10.9 | 1.0 | Y |

| | | |
|---|---|---|
| Ref. Method Average: | 11.68 | ppm |
| CEMS Average: | 11.20 | ppm |
| Average Difference: | 0.49 | ppm |
| Number of Tests: | 9 | |
| Standard Deviation: | 0.59 | ppm |
| t Value: | 2.306 | |
| Confidence Coefficient: | 0.45 | ppm |
| Relative Accuracy: | 8.03 | % of Reference Method |

**TABLE 4-9**
**$SO_2$, PPM @ 3% $O_2$ UNIT 1**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 30, 2018**

| Run # | Date | Time | RM $SO_2$, ppm dry | CEMS $SO_2$, ppm dry | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/30/2018 | 14:55 | 14.2 | 12.8 | 1.4 | Y |
| 2 | 3/30/2018 | 15:38 | 13.6 | 11.2 | 2.4 | Y |
| 3 | 3/30/2018 | 16:22 | 18.9 | 18.0 | 0.9 | Y |
| 4 | 3/30/2018 | 17:05 | 18.2 | 18.2 | 0.1 | Y |
| 5 | 3/30/2018 | 17:50 | 17.5 | 17.4 | 0.1 | Y |
| 6 | 3/30/2018 | 18:33 | 16.5 | 16.5 | 0.0 | y |
| 7 | 3/30/2018 | 19:17 | 17.5 | 17.2 | 0.4 | y |
| 8 | 3/30/2018 | 20:01 | 18.5 | 18.4 | 0.1 | Y |
| 9 | 3/30/2018 | 20:45 | 17.3 | 15.7 | 1.6 | Y |

| | | |
|---|---|---|
| Ref. Method Average: | 16.92 | ppmc |
| CEMS Average: | 16.15 | ppmc |
| Average Difference: | 0.77 | ppmc |
| Number of Tests: | 9 | |
| Standard Deviation: | 0.84 | ppmc |
| t Value: | 2.306 | |
| Confidence Coefficient: | 0.65 | ppmc |
| Relative Accuracy: | 8.39 | % of Reference Method |

**TABLE 4-10**
**$SO_2$, LB/HR UNIT 1**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 30, 2018**

| Run # | Date | Time | RM $SO_2$ lb/hr | CEMS $SO_2$ lb/hr | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/30/2018 | 14:55 | 9.11 | 8.12 | 0.99 | Y |
| 2 | 3/30/2018 | 15:38 | 8.31 | 7.11 | 1.20 | Y |
| 3 | 3/30/2018 | 16:22 | 11.88 | 11.33 | 0.55 | Y |
| 4 | 3/30/2018 | 17:05 | 11.41 | 11.15 | 0.26 | Y |
| 5 | 3/30/2018 | 17:50 | 10.98 | 10.93 | 0.05 | Y |
| 6 | 3/30/2018 | 18:33 | 10.48 | 10.48 | 0.00 | y |
| 7 | 3/30/2018 | 19:17 | 11.22 | 11.11 | 0.11 | y |
| 8 | 3/30/2018 | 20:01 | 11.92 | 11.45 | 0.47 | Y |
| 9 | 3/30/2018 | 20:45 | 11.30 | 9.82 | 1.48 | Y |

| | | |
|---|---|---|
| Ref. Method Average: | 10.73 | lb/hr |
| CEMS Average: | 10.17 | lb/hr |
| Average Difference: | 0.57 | lb/hr |
| Number of Tests: | 9 | |
| Standard Deviation: | 0.54 | lb/hr |
| t Value: | 2.306 | |
| Confidence Coefficient: | 0.41 | ppmc |
| Relative Accuracy: | 9.16 | % of Reference Method |

**TABLE 4-11**
**CO PPM UNIT 1**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 30, 2018**

| Run # | Date | Time | RM CO, ppm dry | CEMS CO, ppm dry | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/30/2018 | 14:55 | 0.0 | 2.7 | -2.7 | Y |
| 2 | 3/30/2018 | 15:38 | 0.1 | 2.5 | -2.4 | Y |
| 3 | 3/30/2018 | 16:22 | 0.0 | 2.4 | -2.4 | Y |
| 4 | 3/30/2018 | 17:05 | 0.0 | 2.4 | -2.4 | Y |
| 5 | 3/30/2018 | 17:50 | 0.1 | 2.2 | -2.1 | Y |
| 6 | 3/30/2018 | 18:33 | 0.1 | 1.7 | -1.6 | y |
| 7 | 3/30/2018 | 19:17 | 0.1 | 1.2 | -1.2 | y |
| 8 | 3/30/2018 | 20:01 | 0.1 | 0.9 | -0.8 | Y |
| 9 | 3/30/2018 | 20:45 | 0.1 | 0.8 | -0.7 | Y |

| | | |
|---|---|---|
| Ref. Method Average: | 0.06 | ppm |
| CEMS Average: | 1.87 | ppm |
| Average Difference: | -1.81 | (PS 4A Criteria: Avg. Diff. less than 5 ppm) |
| Number of Tests: | 9 | |
| Standard Deviation: | 0.75 | ppm |
| t Value: | 2.306 | |
| Confidence Coefficient: | 0.58 | ppm |
| Relative Accuracy: | N/A | % of Reference Method |

**TABLE 4-12**
**CO PPM @ 3% $O_2$ UNIT 1**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 30, 2018**

| Run # | Date | Time | RM CO, ppm dry | CEMS CO, ppm dry | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/30/2018 | 14:55 | 0.1 | 4.0 | -3.9 | Y |
| 2 | 3/30/2018 | 15:38 | 0.1 | 3.6 | -3.4 | Y |
| 3 | 3/30/2018 | 16:22 | 0.1 | 3.5 | -3.4 | Y |
| 4 | 3/30/2018 | 17:05 | 0.0 | 3.6 | -3.5 | Y |
| 5 | 3/30/2018 | 17:50 | 0.1 | 3.1 | -3.0 | Y |
| 6 | 3/30/2018 | 18:33 | 0.1 | 2.2 | -2.2 | y |
| 7 | 3/30/2018 | 19:17 | 0.1 | 1.8 | -1.7 | y |
| 8 | 3/30/2018 | 20:01 | 0.1 | 1.3 | -1.2 | Y |
| 9 | 3/30/2018 | 20:45 | 0.1 | 1.1 | -1.0 | Y |

| | | |
|---|---|---|
| Ref. Method Average: | 0.09 | ppmc |
| CEMS Average: | 2.68 | ppmc |
| Average Difference: | -2.59 | (PS 4A Criteria: Avg. Diff. less than 5 ppm) |
| Number of Tests: | 9 | |
| Standard Deviation: | 1.09 | ppmc |
| t Value: | 2.306 | |
| Confidence Coefficient: | 0.84 | ppmc |
| Applicable Standard: | 231.0 | ppmc |
| Relative Accuracy: | N/A | % of Reference Method |
| Relative Accuracy: | 1.48 | % of Applicable Standard |

**TABLE 4-13**
**CO, LB/HR UNIT 1**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER,**
**MARCH 30, 2018**

| Run # | Date | Time | RM CO, lb/hr | CEMS CO, lb/hr | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/30/2018 | 14:55 | 0.02 | 1.09 | -1.07 | Y |
| 2 | 3/30/2018 | 15:38 | 0.04 | 0.97 | -0.94 | Y |
| 3 | 3/30/2018 | 16:22 | 0.01 | 0.95 | -0.93 | Y |
| 4 | 3/30/2018 | 17:05 | 0.01 | 0.95 | -0.94 | Y |
| 5 | 3/30/2018 | 17:50 | 0.03 | 0.86 | -0.83 | Y |
| 6 | 3/30/2018 | 18:33 | 0.03 | 0.62 | -0.60 | y |
| 7 | 3/30/2018 | 19:17 | 0.03 | 0.50 | -0.47 | y |
| 8 | 3/30/2018 | 20:01 | 0.03 | 0.36 | -0.33 | Y |
| 9 | 3/30/2018 | 20:45 | 0.02 | 0.30 | -0.28 | Y |

| | | |
|---|---|---|
| Ref. Method Average: | 0.02 | lb/hr |
| CEMS Average: | 0.73 | lb/hr |
| Average Difference: | -0.71 | lb/hr |
| Number of Tests: | 9 | |
| Standard Deviation: | 0.297 | |
| t Value: | 2.306 | |
| Confidence Coefficient: | 0.228 | |
| Applicable Standard: | 45.0 | lb/hr |
| Relative Accuracy: | N/A | % of Reference Method |
| Relative Accuracy: | 2.08 | % of Applicable Standard |

**TABLE 4-14**
**$O_2$, % UNIT 1**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 30, 2018**

| Run # | Date | Time | RM $O_2$, % dry | CEMS $O_2$, % dry | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/30/2018 | 14:55 | 8.44 | 8.46 | -0.01 | Y |
| 2 | 3/30/2018 | 15:38 | 8.44 | 8.38 | 0.06 | Y |
| 3 | 3/30/2018 | 16:22 | 8.53 | 8.53 | 0.00 | Y |
| 4 | 3/30/2018 | 17:05 | 8.62 | 8.61 | 0.01 | Y |
| 5 | 3/30/2018 | 17:50 | 8.59 | 8.56 | 0.03 | Y |
| 6 | 3/30/2018 | 18:33 | 8.54 | 8.56 | -0.02 | y |
| 7 | 3/30/2018 | 19:17 | 8.52 | 8.48 | 0.04 | y |
| 8 | 3/30/2018 | 20:01 | 8.59 | 8.62 | -0.02 | Y |
| 9 | 3/30/2018 | 20:45 | 8.54 | 8.54 | 0.00 | Y |

| | | |
|---|---|---|
| Ref. Method Average: | 8.53 | |
| CEMS Average: | 8.53 | |
| Average Difference: | 0.01 | |
| Number of Tests: | 9 | |
| Standard Deviation: | 0.03 | |
| t Value: | 2.306 | |
| Confidence Coefficient: | 0.02 | |
| Relative Accuracy: | 0.35 | % of Reference Method |

## 4.2 UNIT 2 PERFORMANCE TESTS AND RATA RESULTS

The results of the HCL testing are presented in Table 4-15. HCL emissions for Unit 1 were 0.0206 lb/MMBtu. This is below the permit limit of 0.022 lb/MMBtu. The results of the total solid particulate testing are presented in Table 4-16. Total solid particulate emissions for Unit 2 were 0.13 lb/hr. This is below the permit limit of 3.9 lb/hr. Gaseous emissions results are presented in Tables 4-17, and 4-18. $NO_x$, CO, $SO_2$ and hydrocarbon emissions results were also below established permit limits.

Tables 4-19 through 4-28 present the CEMS RATA results for Unit 2. The results demonstrate that the CEMS for Unit 2 is in control as defined in CFR 40 Appendix F. The results of the RATA are presented in units of ppm dry, ppm @ 3% $O_2$ and lb/hr for $NO_x$, CO and $SO_2$. $O_2$ results are presented in concentration units of %.

**TABLE 4-15**
**HYDROCHLORIC ACID TEST RESULTS UNIT 2**
**DESERT VIEW POWER**
**MARCH 27, 2016**

| Test Number | 1-HCL-U2 | 2-HCL-U2 | 3-HCL-U2 | Average | Limit |
|---|---|---|---|---|---|
| **Date** | 03/27/2018 | 03/27/2018 | 03/27/2018 | | |
| **Start/Stop Time** | 830/1104 | 1132/1404 | 801/1037 | | |
| **Stack Flow Rate, dscfm** | 90,088 | 96,914 | 95,236 | 94,079 | |
| **Sample Volume, dscf** | 90.585 | 93.573 | 93.302 | 92.487 | |
| **$O_2$, %** | 8.49 | 8.50 | 8.36 | 8.45 | |
| **$CO_2$, %** | 12.07 | 12.10 | 12.31 | 12.16 | |
| mg/sample | 59.0 | 66.7 | 52.8 | 59.5000 | |
| mg/dscm | 22.998 | 25.169 | 19.982 | 22.717 | |
| ppm (as HCl) | 15.161 | 16.592 | 13.173 | 14.975 | |
| lb/hr (as HCl) | 7.7546 | 9.1297 | 7.1226 | 8.0023 | |
| MMBtu/Hr | 389 | 389 | 389 | 389 | |
| lb/MMBtu | 0.020 | 0.023 | 0.018 | 0.0206 | 0.022 |

**TABLE 4-16**
**PARTICULATE EMISSIONS PERFORMANCE TEST UNIT 2**
**DESERT VIEW POWER**
**MARCH 27-28, 2018**

| | | | |
|---|---|---|---|
| Date: | 3/27/2018 | 3/27/2018 | 3/28/2018 |
| Time: | 830/1104 | 1132/1404 | 801/1031 |

| Test No. | 1-PM-U2 | 2-PM-U2 | 3-PM-U2 | Average |
|---|---|---|---|---|
| $O_2$ (%) | 8.5 | 8.5 | 8.4 | 8.5 |
| $CO_2$ (%) | 12.1 | 12.1 | 12.3 | 12.2 |
| $H_2O$% | 12.1% | 12.0% | 12.3% | 12.1% |
| Stack Temperature (°F) | 346.7 | 349.2 | 345.5 | 347.1 |
| Gas Flow | | | | |
| wacfm | 161,468 | 164,997 | 166,570 | 164,345 |
| dscfm | 93,881 | 95,711 | 96,745 | 95,446 |
| Isokinetic Ratio (%) | 96.1 | 98.9 | 98.9 | 98.0 |
| Total Solid Particulate | | | | |
| Grain Loading, gr/dscf | 0.0002 | 0.0003 | 0.0000 | 0.0002 |
| Grain Loading @ 12% $CO_2$ | 0.0002 | 0.0003 | 0.0000 | 0.0002 |
| lb/hr | 0.15 | 0.23 | 0.00 | 0.13 |

**TABLE 4-17**
**$NO_x$, CO, $SO_x$ EMISSIONS PERFORMANCE TESTS UNIT 2**
**DESERT VIEW POWER**
**MARCH 27, 2018**

| | | | |
|---|---|---|---|
| Data From: | 1-RA-U2 | 2-RA-U2 | 3-RA-U2 |
| Date: | 3/27/2018 | 3/27/2018 | 3/27/2018 |
| Time: | 8:30 | 9:54 | 11:32 |

| Test No. | 1-Compliance –U2 | 2-Compliance-U2 | 3-Compliance-U2 | Average |
|---|---|---|---|---|
| $O_2$, % | 8.6 | 8.4 | 8.6 | 8.5 |
| $CO_2$, % | 12.0 | 12.2 | 12.0 | 12.1 |
| $H_2O$, % | 12.25 | 12.56 | 11.91 | 12.24 |
| Stack Temperature, °F | 348 | 347 | 347 | 347 |
| Gas Flow: | | | | |
| wacfm | 159,704 | 162,944 | 166,663 | 163,104 |
| dscfm | 92,606 | 94,204 | 97,074 | 94,628 |
| $NO_x$ ppm | 33.1 | 34.1 | 34.5 | **33.9** |
| $NO_x$ ppm @ 3% $O_2$ | 47.9 | 48.9 | 50.2 | **49.03** |
| $NO_x$ lb/hr | 21.93 | 23.01 | 23.97 | **22.97** |
| CO ppm | 0.18 | 0.17 | 0.17 | **0.18** |
| CO ppm @ 3% $O_2$ | 0.27 | 0.25 | 0.25 | **0.25** |
| CO lb/hr | 0.07 | 0.07 | 0.07 | **0.07** |
| $SO_x$ ppm | 6.05 | 7.65 | 8.05 | **7.25** |
| $SO_x$ ppm @ 3% $O_2$ | 8.77 | 10.97 | 11.73 | **10.49** |
| $SO_x$ lb/hr | 5.58 | 7.18 | 7.79 | **6.85** |

**TABLE 4-18**
**HYDROCARBON EMISSIONS PERFORMANCE TEST UNIT 2**
**DESERT VIEW POWER**
**MARCH 27, 2018**

| | | |
|---|---|---|
| Date: | 3/27/2018 | 3/27/2018 |
| Time: | 954/1037 | 954/1037 |

| Test No. | 1A-HC-U2 | 1B-HC-U2 | Average |
|---|---|---|---|
| $O_2$, % | 8.49 | 8.49 | 8.49 |
| $CO_2$, % | 12.07 | 12.07 | 12.07 |
| $H_2O$, % | 12.09% | 12.09% | 12.09% |
| Gas Flow: | | | |
| wacfm | 161,468 | 161,468 | 161,468 |
| dscfm | 93,881 | 93,881 | 93,881 |
| EPA Correction Factor | 1.086 | 1.086 | 1.086 |
| TNMHC ppm | 2.06 | 2.29 | 2.18 |
| TNMHC ppm @ 3% $O_2$ | 2.98 | 3.30 | 3.14 |
| TNMHC, lb/hr | 0.48 | 0.54 | 0.51 |

Note: Flow rates from PM Run 1, the higher of the two runs was used to demonstrate compliance since the difference of the individual results was >20% of the average result per SCAQMD Method 25.3.

**TABLE 4-19**
**$NO_x$, PPM UNIT 2**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 27 AND 28, 2018**

| Run # | Date | Time | RM $NO_x$, ppm dry | CEMS $NO_x$, ppm dry | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/27/2018 | 8:30 | 33.1 | 35.5 | -2.4 | y |
| 2 | 3/27/2018 | 9:54 | 34.1 | 36.5 | -2.4 | y |
| 3 | 3/27/2018 | 11:32 | 34.5 | 37.0 | -2.5 | Y |
| 4 | 3/27/2018 | 12:55 | 34.6 | 37.0 | -2.4 | Y |
| 5 | 3/28/2018 | 13:39 | 34.9 | 37.6 | -2.6 | Y |
| 6 | 3/28/2018 | 8:01 | 33.2 | 36.0 | -2.8 | Y |
| 7 | 3/28/2018 | 8:49 | 33.9 | 36.4 | -2.5 | Y |
| 8 | 3/28/2018 | 9:33 | 33.5 | 36.1 | -2.6 | Y |
| 9 | 3/28/2018 | 10:17 | 35.3 | 38.0 | -2.7 | Y |
| 10 | 3/28/2018 | 11:12 | 33.0 | 35.4 | -2.5 | y |

| | | |
|---|---|---|
| Ref. Method Average: | 33.99 | ppm |
| CEMS Average: | 36.54 | ppm |
| Average Difference: | -2.54 | ppm |
| Number of Tests: | 10 | |
| Standard Deviation: | 0.12 | ppm |
| t Value: | 2.262 | |
| Confidence Coefficient: | 0.09 | ppm |
| Relative Accuracy: | 7.74 | % of Reference Method |

**TABLE 4-20**
**$NO_x$, PPM @ 3% $O_2$ UNIT 2**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 27 AND 28, 2018**

| Run # | Date | Time | RM $NO_x$ ppmc | CEMS $NO_x$ ppmc | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/27/2018 | 8:30 | 47.9 | 51.5 | -3.5 | y |
| 2 | 3/27/2018 | 9:54 | 48.9 | 52.6 | -3.7 | y |
| 3 | 3/27/2018 | 11:32 | 50.2 | 53.8 | -3.5 | Y |
| 4 | 3/27/2018 | 12:55 | 49.8 | 53.4 | -3.6 | Y |
| 5 | 3/28/2018 | 13:39 | 49.3 | 53.0 | -3.7 | Y |
| 6 | 3/28/2018 | 8:01 | 47.7 | 51.7 | -3.9 | Y |
| 7 | 3/28/2018 | 8:49 | 48.4 | 52.0 | -3.6 | Y |
| 8 | 3/28/2018 | 9:33 | 47.5 | 51.4 | -3.9 | Y |
| 9 | 3/28/2018 | 10:17 | 50.1 | 53.7 | -3.6 | Y |
| 10 | 3/28/2018 | 11:12 | 47.1 | 50.7 | -3.6 | y |

| | | |
|---|---|---|
| Ref. Method Average: | 48.70 | ppmc |
| CEMS Average: | 52.37 | ppmc |
| Average Difference: | -3.67 | ppmc |
| Number of Tests: | 10 | |
| Standard Deviation: | 0.13 | ppmc |
| t Value: | 2.262 | |
| Confidence Coefficient: | 0.10 | |
| Relative Accuracy: | 7.73 | % of Reference Method |

**TABLE 4-21**
**$NO_x$, LB/HR UNIT 2**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 27 AND 28, 2018**

| Run # | Date | Time | RM $NO_x$ lb/hr | CEMS $NO_x$ lb/hr | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/27/2018 | 8:30 | 21.93 | 25.31 | -3.38 | y |
| 2 | 3/27/2018 | 9:54 | 23.01 | 25.81 | -2.80 | y |
| 3 | 3/27/2018 | 11:32 | 23.97 | 26.29 | -2.32 | Y |
| 4 | 3/27/2018 | 12:55 | 23.96 | 26.25 | -2.29 | Y |
| 5 | 3/28/2018 | 13:39 | 23.51 | 26.65 | -3.13 | Y |
| 6 | 3/28/2018 | 8:01 | 22.97 | 25.49 | -2.53 | Y |
| 7 | 3/28/2018 | 8:49 | 23.31 | 25.59 | -2.28 | Y |
| 8 | 3/28/2018 | 9:33 | 23.23 | 25.28 | -2.05 | Y |
| 9 | 3/28/2018 | 10:17 | 24.27 | 27.03 | -2.76 | Y |
| 10 | 3/28/2018 | 11:12 | 22.74 | 24.41 | -1.67 | y |

| | | |
|---|---|---|
| Ref. Method Average: | 23.288 | lb/hr |
| CEMS Average: | 25.810 | lb/hr |
| Average Difference: | -2.521 | lb/hr |
| Number of Tests: | 10 | |
| Standard Deviation: | 0.511 | lb/hr |
| t Value: | 2.262 | |
| Confidence Coefficient: | 0.3653 | |
| Relative Accuracy: | 12.39 | % of Reference Method |

**TABLE 4-22**
**$SO_2$ PPM UNIT 2**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 27 AND 28, 2018**

| Run # | Date | Time | RM $SO_2$, ppm dry | CEMS $SO_2$, ppm dry | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/27/2018 | 8:30 | 6.0 | 6.1 | 0.0 | y |
| 2 | 3/27/2018 | 9:54 | 7.6 | 7.8 | -0.1 | y |
| 3 | 3/27/2018 | 11:32 | 8.1 | 8.5 | -0.4 | Y |
| 4 | 3/27/2018 | 12:55 | 6.4 | 8.4 | -2.0 | Y |
| 5 | 3/28/2018 | 13:39 | 8.3 | 8.4 | -0.1 | Y |
| 6 | 3/28/2018 | 8:01 | 8.2 | 8.5 | -0.3 | Y |
| 7 | 3/28/2018 | 8:49 | 5.8 | 6.4 | -0.6 | Y |
| 8 | 3/28/2018 | 9:33 | 5.9 | 7.2 | -1.3 | Y |
| 9 | 3/28/2018 | 10:17 | 11.4 | 11.4 | 0.0 | Y |
| 10 | 3/28/2018 | 11:12 | 8.0 | 8.9 | -0.9 | y |

| | | |
|---|---|---|
| Ref. Method Average: | 7.58 | ppm |
| CEMS Average: | 8.16 | ppm |
| Average Difference: | -0.58 | ppm |
| Number of Tests: | 10 | |
| Standard Deviation: | 0.64 | ppm |
| t Value: | 2.262 | |
| Confidence Coefficient: | 0.46 | ppm |
| Relative Accuracy: | 13.75 | % of Reference Method |

**TABLE 4-23**
**$SO_2$ PPM @ 3% $O_2$ UNIT 2**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 27 AND 28, 2018**

| Run # | Date | Time | RM $SO_2$, ppm dry | CEMS $SO_2$, ppm dry | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/27/2018 | 8:30 | 8.8 | 9.0 | -0.2 | y |
| 2 | 3/27/2018 | 9:54 | 11.0 | 11.2 | -0.2 | y |
| 3 | 3/27/2018 | 11:32 | 11.7 | 12.3 | -0.6 | Y |
| 4 | 3/27/2018 | 12:55 | 9.2 | 12.1 | -2.9 | Y |
| 5 | 3/28/2018 | 13:39 | 11.7 | 12.0 | -0.2 | Y |
| 6 | 3/28/2018 | 8:01 | 11.8 | 12.2 | -0.4 | Y |
| 7 | 3/28/2018 | 8:49 | 8.2 | 9.3 | -1.0 | Y |
| 8 | 3/28/2018 | 9:33 | 8.4 | 10.2 | -1.9 | Y |
| 9 | 3/28/2018 | 10:17 | 16.3 | 16.2 | 0.1 | Y |
| 10 | 3/28/2018 | 11:12 | 11.4 | 12.7 | -1.3 | y |

| | | |
|---|---|---|
| Ref. Method Average: | 10.85 | ppmc |
| CEMS Average: | 11.72 | ppmc |
| Average Difference: | -0.86 | ppmc |
| Number of Tests: | 10 | |
| Standard Deviation: | 0.93 | ppmc |
| t Value: | 2.262 | |
| Confidence Coefficient: | 0.66 | ppmc |
| Relative Accuracy: | 14.06 | % of Reference Method |

**TABLE 4-24**
**$SO_2$ LB/HR UNIT 2**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 27 AND 28, 2018**

| Run # | Date | Time | RM $SO_2$ lb/hr | CEMS $SO_2$ lb/hr | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/27/2018 | 8:30 | 5.58 | 6.02 | -0.44 | y |
| 2 | 3/27/2018 | 9:54 | 7.18 | 7.67 | -0.49 | y |
| 3 | 3/27/2018 | 11:32 | 7.79 | 8.39 | -0.60 | Y |
| 4 | 3/27/2018 | 12:55 | 6.18 | 8.29 | -2.12 | Y |
| 5 | 3/28/2018 | 13:39 | 7.79 | 8.33 | -0.54 | Y |
| 6 | 3/28/2018 | 8:01 | 7.92 | 8.41 | -0.49 | Y |
| 7 | 3/28/2018 | 8:49 | 5.52 | 6.28 | -0.76 | Y |
| 8 | 3/28/2018 | 9:33 | 5.71 | 7.02 | -1.31 | Y |
| 9 | 3/28/2018 | 10:17 | 10.94 | 11.39 | -0.44 | Y |
| 10 | 3/28/2018 | 11:12 | 11.40 | 12.74 | -1.34 | y |

| | | |
|---|---|---|
| Ref. Method Average: | 7.60 | lb/hr |
| CEMS Average: | 8.45 | lb/hr |
| Average Difference: | -0.85 | lb/hr |
| Number of Tests: | 10 | |
| Standard Deviation: | 0.56 | lb/hr |
| t Value: | 2.262 | |
| Confidence Coefficient: | 0.40 | ppmc |
| Relative Accuracy: | 16.48 | % of Reference Method |

**TABLE 4-25**
**CO, PPM UNIT 2**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER,**
**MARCH 27 AND 28, 2018**

| Run # | Date | Time | RM CO, ppm dry | CEMS CO, ppm dry | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/27/2018 | 8:30 | 0.2 | 1.3 | -1.1 | y |
| 2 | 3/27/2018 | 9:54 | 0.2 | 1.1 | -0.9 | y |
| 3 | 3/27/2018 | 11:32 | 0.2 | 0.9 | -0.7 | Y |
| 4 | 3/27/2018 | 12:55 | 0.2 | 0.9 | -0.7 | Y |
| 5 | 3/28/2018 | 13:39 | 0.5 | 1.5 | -0.9 | Y |
| 6 | 3/28/2018 | 8:01 | 0.2 | 1.5 | -1.4 | Y |
| 7 | 3/28/2018 | 8:49 | 0.2 | 1.4 | -1.2 | Y |
| 8 | 3/28/2018 | 9:33 | 0.2 | 1.4 | -1.2 | Y |
| 9 | 3/28/2018 | 10:17 | 0.2 | 0.4 | -0.2 | Y |

| | | |
|---|---|---|
| Ref. Method Average: | 0.22 | ppm |
| CEMS Average: | 1.14 | ppm |
| Average Difference: | -0.92 | (PS 4A Criteria: Avg. Diff. less than 5 ppm) |
| Number of Tests: | 9 | |
| Standard Deviation: | 0.34 | ppm |
| t Value: | 2.306 | |
| Confidence Coefficient: | 0.26 | ppm |
| Relative Accuracy: | N/A | % of Reference Method |

**TABLE 4-26**
**CO, PPM @ 3% $O_2$ UNIT 2**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER,**
**MARCH 27 AND 28, 2018**

| Run # | Date | Time | RM CO, ppm @ 3% $O_2$ | CEMS CO, ppm @ 3% $O_2$ | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/27/2018 | 8:30 | 0.3 | 1.8 | -1.6 | y |
| 2 | 3/27/2018 | 9:54 | 0.2 | 1.6 | -1.3 | y |
| 3 | 3/27/2018 | 11:32 | 0.2 | 1.3 | -1.0 | Y |
| 4 | 3/27/2018 | 12:55 | 0.3 | 1.2 | -0.9 | Y |
| 5 | 3/28/2018 | 13:39 | 0.7 | 2.1 | -1.3 | Y |
| 6 | 3/28/2018 | 8:01 | 0.2 | 2.2 | -2.0 | Y |
| 7 | 3/28/2018 | 8:49 | 0.3 | 1.9 | -1.7 | Y |
| 8 | 3/28/2018 | 9:33 | 0.3 | 2.0 | -1.7 | Y |
| 9 | 3/28/2018 | 10:17 | 0.3 | 0.6 | -0.3 | Y |

| | | |
|---|---|---|
| Ref. Method Average: | 0.32 | ppmc |
| CEMS Average: | 1.64 | ppmc |
| Average Difference: | -1.32 | (PS 4A Criteria: Avg. Diff. less than 5 ppm) |
| Number of Tests: | 9 | |
| Standard Deviation: | 0.49 | ppmc |
| t Value: | 2.306 | |
| Confidence Coefficient: | 0.38 | ppmc |
| Applicable Standard: | 231.0 | ppmc |
| Relative Accuracy: | N/A | % of Reference Method |
| Relative Accuracy: | 0.74 | % of Applicable Standard |

**TABLE 4-27**
**CO LB/HR UNIT 2**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 27 AND 28, 2018**

| Run # | Date | Time | RM CO, lb/hr | CEMS CO, lb/hr | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/27/2018 | 8:30 | 0.07 | 0.55 | -0.47 | y |
| 2 | 3/27/2018 | 9:54 | 0.07 | 0.47 | -0.40 | y |
| 3 | 3/27/2018 | 11:32 | 0.07 | 0.38 | -0.30 | Y |
| 4 | 3/27/2018 | 12:55 | 0.09 | 0.37 | -0.29 | Y |
| 5 | 3/28/2018 | 13:39 | 0.21 | 0.63 | -0.41 | Y |
| 6 | 3/28/2018 | 8:01 | 0.07 | 0.66 | -0.60 | Y |
| 7 | 3/28/2018 | 8:49 | 0.08 | 0.58 | -0.50 | Y |
| 8 | 3/28/2018 | 9:33 | 0.09 | 0.60 | -0.51 | Y |
| 9 | 3/28/2018 | 10:17 | 0.08 | 0.19 | -0.10 | Y |

| | | |
|---|---|---|
| Ref. Method Average: | 0.09 | lb/hr |
| CEMS Average: | 0.49 | lb/hr |
| Average Difference: | -0.40 | lb/hr |
| Number of Tests: | 9 | |
| Standard Deviation: | 0.148 | |
| t Value: | 2.306 | |
| Confidence Coefficient: | 0.114 | |
| Applicable Standard: | 45.0 | lb/hr |
| Relative Accuracy: | N/A | % of Reference Method |
| Relative Accuracy: | 1.14 | % of Applicable Standard |

**TABLE 4-28**
**$O_2$, % UNIT 2**
**RELATIVE ACCURACY TEST AUDIT SUMMARY**
**DESERT VIEW POWER**
**MARCH 27 AND 28, 2018**

| Run # | Date | Time | RM $O_2$, % dry | CEMS $O_2$, % dry | Difference | Use Data? (Y or N) |
|---|---|---|---|---|---|---|
| 1 | 3/27/2018 | 8:30 | 8.56 | 8.57 | -0.01 | y |
| 2 | 3/27/2018 | 9:54 | 8.42 | 8.48 | -0.06 | y |
| 3 | 3/27/2018 | 11:32 | 8.61 | 8.60 | 0.02 | Y |
| 4 | 3/27/2018 | 12:55 | 8.47 | 8.52 | -0.05 | Y |
| 5 | 3/28/2018 | 13:39 | 8.22 | 8.26 | -0.04 | Y |
| 6 | 3/28/2018 | 8:01 | 8.44 | 8.45 | -0.01 | Y |
| 7 | 3/28/2018 | 8:49 | 8.36 | 8.41 | -0.05 | Y |
| 8 | 3/28/2018 | 9:33 | 8.28 | 8.36 | -0.08 | Y |
| 9 | 3/28/2018 | 10:17 | 8.31 | 8.34 | -0.03 | Y |
| 10 | 3/28/2018 | 11:12 | 8.37 | 8.41 | -0.04 | y |
| | | Ref. Method Average: | 8.41 | | | |
| | | CEMS Average: | 8.44 | | | |
| | | Average Difference: | -0.03 | | | |
| | | Number of Tests: | 10 | | | |
| | | Standard Deviation: | 0.03 | | | |
| | | t Value: | 2.262 | | | |
| | | Confidence Coefficient: | 0.02 | | | |
| | | Relative Accuracy: | 0.65 | % of Reference Method | | |

## 4.3 FUEL ANALYSIS

The fuel sample analysis results are presented in Appendix B.4.

# APPENDIX A

# FIELD AND PLANT OPERATING DATA

# APPENDIX A.1

# UNIT 1 DATA

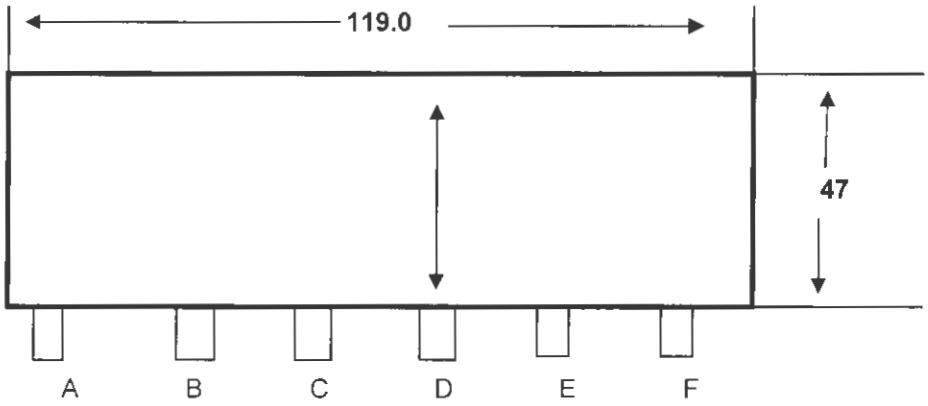
# APPENDIX A.1.1

# UNIT 1 SAMPLE LOCATION

Method 1

Client: Desert View Power  Date: 3/30/2018

Sample Location: Unit 1-2  Prepared By: Dave Wonderly




| | |
|---|---|
| **H (in.)** | **119.0** |
| **W (in.)** | **47.0** |
| **Nipple length** | **13.0** |
| **Distance between points** | **9.40** |
| Stack Area (ft^2) | **38.84** |

| Point No. | Sample Point | Inches from nozzle |
|---|---|---|
| 1 | 4.7 | 17.7 |
| 2 | 14.1 | 27.1 |
| 3 | 23.5 | 36.5 |
| 4 | 32.9 | 45.9 |
| 5 | 42.3 | 55.3 |

# APPENDIX A.1.2

# UNIT 1 CEM DATA

| Date | Time | O2 % | CO2 % | NOx ppm | CO ppm | |
|---|---|---|---|---|---|---|
| 3/29/2018 | 7:14 | 19.58 | 18.45 | 93.09 | 6.81 | |
| 3/29/2018 | 7:15 | 19.58 | 18.47 | 93.12 | 9.48 | |
| 3/29/2018 | 7:16 | 19.57 | 18.47 | 93.12 | 9.56 | |
| 3/29/2018 | 7:17 | 19.58 | 18.47 | 92.68 | 9.58 | |
| 3/29/2018 | 7:18 | 19.58 | 18.47 | 92.73 | 9.57 | High |
| 3/29/2018 | 7:19 | 16.67 | 15.38 | 74.93 | 9.43 | |
| 3/29/2018 | 7:20 | 10.85 | 10.94 | 47.78 | 6.69 | |
| 3/29/2018 | 7:21 | 10.84 | 10.94 | 48.52 | 4.75 | |
| 3/29/2018 | 7:22 | 10.84 | 10.94 | 48.57 | 4.69 | |
| 3/29/2018 | 7:23 | 10.84 | 10.94 | 48.59 | 4.69 | Mid |
| 3/29/2018 | 7:24 | 3.21 | 2.70 | 11.14 | 3.88 | |
| 3/29/2018 | 7:25 | 0.05 | 0.02 | 0.15 | 0.63 | |
| 3/29/2018 | 7:26 | 0.04 | 0.01 | 0.13 | 0.00 | Zero |
| 3/29/2018 | 7:27 | 0.04 | 0.01 | 0.14 | 0.01 | NO Mode Zero |
| 3/29/2018 | 7:28 | 0.04 | 0.01 | 72.11 | 0.02 | |
| 3/29/2018 | 7:29 | 0.04 | 0.01 | 93.09 | 0.00 | NO Mode High |
| 3/29/2018 | 7:30 | 0.04 | 0.01 | 32.43 | 0.01 | |
| 3/29/2018 | 7:31 | 0.04 | 0.01 | 0.23 | 0.03 | NO2 Gas NO Mode |
| 3/29/2018 | 7:32 | 0.04 | 0.01 | 15.53 | 0.00 | |
| 3/29/2018 | 7:33 | 0.04 | 0.01 | 43.05 | -0.01 | NO2 Gas NOx Mode |
| 3/29/2018 | 7:34 | 8.46 | 9.75 | 37.31 | 0.05 | |
| 3/29/2018 | 7:35 | 9.24 | 11.19 | 36.14 | 0.16 | |
| 3/29/2018 | 7:36 | 8.97 | 11.43 | 39.60 | 0.17 | |
| 3/29/2018 | 7:37 | 8.94 | 11.47 | 41.21 | 0.16 | |
| 3/29/2018 | 7:38 | 9.13 | 11.28 | 38.02 | 0.18 | |
| 3/29/2018 | 7:39 | 8.62 | 11.79 | 48.22 | 0.19 | |
| 3/29/2018 | 7:40 | 9.25 | 11.16 | 42.33 | 0.18 | |
| 3/29/2018 | 7:41 | 9.91 | 10.53 | 29.70 | 0.19 | |
| 3/29/2018 | 7:42 | 9.82 | 10.60 | 29.24 | 0.19 | |
| 3/29/2018 | 7:43 | 8.96 | 11.46 | 35.00 | 0.19 | |
| 3/29/2018 | 7:44 | 8.91 | 11.50 | 40.60 | 0.17 | |
| 3/29/2018 | 7:45 | 8.45 | 11.95 | 44.10 | 0.18 | |
| 3/29/2018 | 7:46 | 8.32 | 12.09 | 48.55 | 0.19 | |
| 3/29/2018 | 7:47 | 8.12 | 12.29 | 48.39 | 0.17 | |
| 3/29/2018 | 7:48 | 8.19 | 12.22 | 45.07 | 0.15 | |
| 3/29/2018 | 7:49 | 8.79 | 11.59 | 32.62 | 0.19 | |
| 3/29/2018 | 7:50 | 8.68 | 9.14 | 22.47 | 0.21 | |
| 3/29/2018 | 7:51 | 0.23 | 0.06 | 0.28 | 1.47 | |
| 3/29/2018 | 7:52 | 0.34 | 0.04 | 0.23 | 4.34 | |
| 3/29/2018 | 7:53 | 0.37 | 0.04 | 0.23 | 4.63 | CO Bias |
| 3/29/2018 | 7:54 | 0.36 | 0.04 | 35.07 | 4.02 | |
| 3/29/2018 | 7:55 | 0.36 | 0.04 | 47.79 | 0.98 | NOx Bias |
| 3/29/2018 | 7:56 | 7.47 | 7.26 | 17.99 | 0.28 | |
| 3/29/2018 | 7:57 | 10.97 | 10.72 | 0.27 | 0.08 | |
| 3/29/2018 | 7:58 | 10.97 | 10.76 | 0.22 | 0.03 | O2 CO2 Bias |
| 3/29/2018 | 7:59 | 10.63 | 12.06 | 8.55 | 0.05 | |

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| 3/29/2018 | 8:00 | 9.66 | 10.80 | 29.21 | 0.21 |
| 3/29/2018 | 8:01 | 10.09 | 10.38 | 27.70 | 0.26 |
| 3/29/2018 | 8:02 | 9.64 | 10.83 | 32.52 | 0.24 |
| 3/29/2018 | 8:03 | 9.16 | 11.30 | 33.99 | 0.17 |
| 3/29/2018 | 8:04 | 9.14 | 11.32 | 38.37 | 0.16 |
| 3/29/2018 | 8:05 | 9.06 | 11.40 | 38.18 | 0.16 |
| 3/29/2018 | 8:06 | 9.11 | 11.32 | 38.44 | 0.17 |
| 3/29/2018 | 8:07 | 9.16 | 11.27 | 39.82 | 0.19 |
| 3/29/2018 | 8:08 | 9.12 | 11.32 | 39.79 | 0.20 |
| 3/29/2018 | 8:09 | 8.58 | 11.87 | 40.59 | 0.19 |
| 3/29/2018 | 8:10 | 8.12 | 12.32 | 45.79 | 0.20 |
| 3/29/2018 | 8:11 | 8.57 | 11.85 | 41.12 | 0.19 |
| 3/29/2018 | 8:12 | 8.66 | 11.75 | 37.53 | 0.18 |
| 3/29/2018 | 8:13 | 8.34 | 12.11 | 41.07 | 0.19 |
| 3/29/2018 | 8:14 | 8.42 | 11.99 | 39.79 | 0.20 |
| 3/29/2018 | 8:15 | 9.25 | 11.16 | 26.88 | 0.22 |
| 3/29/2018 | 8:16 | 9.45 | 10.98 | 25.04 | 0.22 |
| 3/29/2018 | 8:17 | 9.69 | 10.74 | 23.21 | 0.24 |
| 3/29/2018 | 8:18 | 9.80 | 10.65 | 22.27 | 0.24 |
| 3/29/2018 | 8:19 | 8.72 | 11.71 | 35.50 | 0.22 |
| 3/29/2018 | 8:20 | 8.11 | 12.33 | 49.28 | 0.19 |
| 3/29/2018 | 8:21 | 8.64 | 11.77 | 46.24 | 0.17 |
| 3/29/2018 | 8:22 | 9.07 | 11.35 | 35.54 | 0.19 |
| 3/29/2018 | 8:23 | 8.92 | 11.51 | 33.82 | 0.21 |
| 3/29/2018 | 8:24 | 9.42 | 11.03 | 27.36 | 0.23 |
| 3/29/2018 | 8:25 | 8.78 | 11.65 | 34.83 | 0.22 |
| 3/29/2018 | 8:26 | 8.83 | 11.61 | 36.27 | 0.21 |
| 3/29/2018 | 8:27 | 8.53 | 11.92 | 37.94 | 0.21 |
| 3/29/2018 | 8:28 | 8.59 | 11.85 | 39.97 | 0.19 |
| 3/29/2018 | 8:29 | 9.39 | 11.05 | 27.91 | 0.21 |
| 3/29/2018 | 8:30 | 9.31 | 11.15 | 25.80 | 0.24 |
| 3/29/2018 | 8:31 | 8.90 | 11.57 | 29.07 | 0.25 |
| 3/29/2018 | 8:32 | 8.87 | 11.57 | 33.09 | 0.26 |
| 3/29/2018 | 8:33 | 9.65 | 10.81 | 23.61 | 0.25 |
| 3/29/2018 | 8:34 | 9.47 | 11.00 | 24.08 | 0.23 |
| 3/29/2018 | 8:35 | 8.83 | 11.64 | 33.25 | 0.22 |
| 3/29/2018 | 8:36 | 8.49 | 11.98 | 37.43 | 0.23 |
| 3/29/2018 | 8:37 | 8.93 | 11.52 | 33.11 | 0.22 |
| 3/29/2018 | 8:38 | 9.25 | 11.19 | 33.72 | 0.21 |
| 3/29/2018 | 8:39 | 9.30 | 11.16 | 30.61 | 0.20 |
| 3/29/2018 | 8:40 | 8.99 | 11.48 | 29.64 | 0.21 |
| 3/29/2018 | 8:41 | 8.59 | 11.85 | 39.16 | 0.18 |
| 3/29/2018 | 8:42 | 8.65 | 11.79 | 37.51 | 0.18 |
| 3/29/2018 | 8:43 | 8.64 | 11.80 | 37.73 | 0.21 |
| 3/29/2018 | 8:44 | 8.32 | 12.14 | 41.38 | 0.18 |
| 3/29/2018 | 8:45 | 8.13 | 12.30 | 44.96 | 0.18 |
| 3/29/2018 | 8:46 | 9.18 | 11.22 | 37.46 | 0.20 |
| 3/29/2018 | 8:47 | 9.12 | 11.29 | 30.44 | 0.20 |
| 3/29/2018 | 8:48 | 8.56 | 11.85 | 35.52 | 0.22 |

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|---|---|---|---|---|---|---|
| 3/29/2018 | 8:49 | 8.10 | 12.32 | 44.57 | 0.19 | |
| 3/29/2018 | 8:50 | 8.60 | 11.77 | 40.38 | 0.16 | |
| 3/29/2018 | 8:51 | 9.13 | 11.25 | 28.61 | 0.23 | |
| 3/29/2018 | 8:52 | 8.75 | 11.63 | 27.69 | 0.23 | |
| 3/29/2018 | 8:53 | 7.95 | 12.44 | 34.13 | 0.19 | |
| 3/29/2018 | 8:54 | 8.09 | 12.26 | 38.96 | 0.20 | |
| 3/29/2018 | 8:55 | 8.26 | 12.09 | 34.52 | 0.17 | |
| 3/29/2018 | 8:56 | 7.84 | 12.52 | 39.62 | 0.19 | |
| 3/29/2018 | 8:57 | 9.29 | 11.02 | 25.68 | 0.21 | |
| 3/29/2018 | 8:58 | 9.96 | 10.41 | 18.16 | 0.23 | |
| 3/29/2018 | 8:59 | 10.75 | 9.60 | 14.85 | 0.23 | |
| 3/29/2018 | 9:00 | 10.39 | 10.01 | 14.51 | 0.22 | |
| 3/29/2018 | 9:01 | 9.49 | 10.89 | 18.14 | 0.24 | |
| 3/29/2018 | 9:02 | 8.94 | 11.41 | 25.32 | 0.25 | |
| 3/29/2018 | 9:03 | 8.72 | 11.62 | 34.09 | 0.21 | |
| 3/29/2018 | 9:04 | 9.14 | 11.20 | 37.76 | 0.22 | |
| 3/29/2018 | 9:05 | 8.33 | 12.02 | 43.75 | 0.20 | |
| 3/29/2018 | 9:06 | 8.14 | 12.21 | 44.59 | 0.19 | |
| 3/29/2018 | 9:07 | 8.25 | 12.07 | 45.74 | 0.20 | |
| 3/29/2018 | 9:08 | 8.70 | 11.62 | 40.27 | 0.21 | |
| 3/29/2018 | 9:09 | 8.74 | 11.60 | 36.17 | 0.22 | |
| 3/29/2018 | 9:10 | 9.19 | 11.14 | 27.72 | 0.22 | |
| 3/29/2018 | 9:11 | 8.85 | 11.49 | 31.30 | 0.24 | |
| 3/29/2018 | 9:12 | 1.93 | 0.76 | 4.53 | 1.30 | |
| 3/29/2018 | 9:11 | 8.85 | 11.49 | 31.30 | 0.24 | |
| 3/29/2018 | 9:12 | 1.93 | 0.76 | 4.53 | 1.30 | |
| 3/29/2018 | 9:13 | 0.04 | 0.03 | 0.23 | 4.52 | |
| 3/29/2018 | 9:14 | 0.04 | 0.03 | 0.22 | 4.75 | CO Bias |
| 3/29/2018 | 9:15 | 0.04 | 0.02 | 15.15 | 4.63 | |
| 3/29/2018 | 9:16 | 0.04 | 0.02 | 48.35 | 1.24 | NOx Bias |
| 3/29/2018 | 9:17 | 6.45 | 6.65 | 22.36 | 0.03 | |
| 3/29/2018 | 9:18 | 10.83 | 10.82 | 0.21 | 0.02 | O2 CO2 Bias |
| 3/29/2018 | 9:19 | 1.96 | 2.06 | 0.17 | 0.04 | |
| 3/29/2018 | 9:20 | 0.04 | 0.01 | 0.13 | 0.02 | Zero |
| 3/29/2018 | 9:21 | 8.77 | 9.57 | 41.33 | 1.60 | |
| 3/29/2018 | 9:22 | 10.89 | 10.86 | 48.69 | 4.58 | |
| 3/29/2018 | 9:23 | 10.89 | 10.87 | 48.71 | 4.73 | Span |
| 3/29/2018 | 9:24 | 9.68 | 11.17 | 46.26 | 4.01 | |
| 3/29/2018 | 9:25 | 9.33 | 11.04 | 36.68 | 0.60 | |
| 3/29/2018 | 9:26 | 9.37 | 10.99 | 37.66 | 0.18 | |
| 3/29/2018 | 9:27 | 9.07 | 11.29 | 40.82 | 0.23 | |
| 3/29/2018 | 9:28 | 9.48 | 10.89 | 36.98 | 0.21 | |
| 3/29/2018 | 9:29 | 9.03 | 11.32 | 42.70 | 0.20 | |
| 3/29/2018 | 9:30 | 9.67 | 10.70 | 29.92 | 0.21 | |
| 3/29/2018 | 9:31 | 9.58 | 10.80 | 29.85 | 0.18 | |
| 3/29/2018 | 9:32 | 9.29 | 11.09 | 31.55 | 0.19 | |
| 3/29/2018 | 9:33 | 9.44 | 10.93 | 33.26 | 0.21 | |
| 3/29/2018 | 9:34 | 9.08 | 11.29 | 33.06 | 0.21 | |

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|---|---|---|---|---|---|
| 3/29/2018 | 9:35 | 8.68 | 11.68 | 37.18 | 0.20 |
| 3/29/2018 | 9:36 | 8.52 | 11.84 | 40.24 | 0.20 |
| 3/29/2018 | 9:37 | 8.17 | 12.19 | 45.55 | 0.23 |
| 3/29/2018 | 9:38 | 8.41 | 11.94 | 48.58 | 0.21 |
| 3/29/2018 | 9:39 | 8.60 | 11.74 | 51.62 | 0.22 |
| 3/29/2018 | 9:40 | 8.87 | 11.48 | 43.81 | 0.24 |
| 3/29/2018 | 9:41 | 9.10 | 11.25 | 38.70 | 0.22 |
| 3/29/2018 | 9:42 | 9.06 | 11.30 | 36.48 | 0.22 |
| 3/29/2018 | 9:43 | 8.80 | 11.55 | 48.25 | 0.24 |
| 3/29/2018 | 9:44 | 9.42 | 10.92 | 41.53 | 0.25 |
| 3/29/2018 | 9:45 | 10.04 | 10.36 | 28.77 | 0.22 |
| 3/29/2018 | 9:46 | 9.39 | 10.99 | 30.94 | 0.23 |
| 3/29/2018 | 9:47 | 9.25 | 11.12 | 31.11 | 0.23 |
| 3/29/2018 | 9:48 | 9.12 | 11.25 | 31.10 | 0.23 |
| 3/29/2018 | 9:49 | 8.49 | 11.87 | 38.09 | 0.23 |
| 3/29/2018 | 9:50 | 7.45 | 12.91 | 55.84 | 0.23 |
| 3/29/2018 | 9:51 | 7.74 | 12.59 | 56.78 | 0.20 |
| 3/29/2018 | 9:52 | 9.12 | 11.20 | 38.02 | 0.20 |
| 3/29/2018 | 9:53 | 8.82 | 11.52 | 33.77 | 0.24 |
| 3/29/2018 | 9:54 | 8.80 | 11.54 | 32.22 | 0.24 |
| 3/29/2018 | 9:55 | 8.26 | 12.08 | 38.53 | 0.23 |
| 3/29/2018 | 9:56 | 8.49 | 11.85 | 33.88 | 0.24 |
| 3/29/2018 | 9:57 | 8.95 | 11.35 | 32.04 | 0.22 |
| 3/29/2018 | 9:58 | 10.02 | 10.36 | 18.42 | 0.24 |
| 3/29/2018 | 9:59 | 9.74 | 10.61 | 19.86 | 0.28 |
| 3/29/2018 | 10:00 | 9.81 | 10.54 | 20.28 | 0.25 |
| 3/29/2018 | 10:01 | 10.23 | 10.16 | 17.97 | 0.26 |
| 3/29/2018 | 10:02 | 9.37 | 10.99 | 21.69 | 0.26 |
| 3/29/2018 | 10:03 | 8.84 | 11.49 | 28.13 | 0.25 |
| 3/29/2018 | 10:04 | 8.77 | 11.52 | 33.38 | 0.22 |
| 3/29/2018 | 10:05 | 8.98 | 11.34 | 30.21 | 0.24 |
| 3/29/2018 | 10:06 | 8.15 | 12.18 | 43.58 | 0.20 |
| 3/29/2018 | 10:07 | 7.67 | 12.60 | 52.98 | 0.19 |
| 3/29/2018 | 10:08 | 7.71 | 12.55 | 54.56 | 0.19 |
| 3/29/2018 | 10:09 | 7.14 | 13.17 | 62.71 | 0.22 |
| 3/29/2018 | 10:10 | 7.64 | 12.63 | 54.13 | 0.23 |
| 3/29/2018 | 10:11 | 7.06 | 13.22 | 62.92 | 0.23 |
| 3/29/2018 | 10:12 | 8.96 | 11.32 | 28.54 | 0.23 |
| 3/29/2018 | 10:13 | 11.38 | 8.96 | 10.68 | 0.26 |
| 3/29/2018 | 10:14 | 12.29 | 8.16 | 7.47 | 0.32 |
| 3/29/2018 | 10:15 | 10.99 | 9.48 | 8.45 | 0.34 |
| 3/29/2018 | 10:16 | 9.84 | 10.56 | 12.08 | 0.28 |
| 3/29/2018 | 10:17 | 9.34 | 11.05 | 16.22 | 0.27 |
| 3/29/2018 | 10:18 | 8.97 | 11.37 | 21.50 | 0.24 |
| 3/29/2018 | 10:19 | 9.51 | 10.82 | 23.79 | 0.19 |
| 3/29/2018 | 10:20 | 9.08 | 11.28 | 28.99 | 0.20 |
| 3/29/2018 | 10:21 | 8.42 | 11.92 | 42.00 | 0.18 |
| 3/29/2018 | 10:22 | 8.49 | 11.84 | 47.99 | 0.18 |
| 3/29/2018 | 10:23 | 8.91 | 11.41 | 41.78 | 0.17 |

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| 3/29/2018 | 10:24 | 8.57 | 11.77 | 41.93 | 0.19 | |
| 3/29/2018 | 10:25 | 8.08 | 12.23 | 50.70 | 0.18 | |
| 3/29/2018 | 10:26 | 8.52 | 11.78 | 45.84 | 0.19 | |
| 3/29/2018 | 10:27 | 9.16 | 11.14 | 36.57 | 0.19 | |
| 3/29/2018 | 10:28 | 9.40 | 10.90 | 27.55 | 0.18 | |
| 3/29/2018 | 10:29 | 9.12 | 11.20 | 27.14 | 0.21 | |
| 3/29/2018 | 10:30 | 8.15 | 12.16 | 37.80 | 0.20 | |
| 3/29/2018 | 10:31 | 7.81 | 12.49 | 44.72 | 0.20 | |
| 3/29/2018 | 10:32 | 8.22 | 12.03 | 45.67 | 0.22 | |
| 3/29/2018 | 10:33 | 8.46 | 11.83 | 37.88 | 0.21 | |
| 3/29/2018 | 10:34 | 9.01 | 11.28 | 34.56 | 0.17 | |
| 3/29/2018 | 10:35 | 9.16 | 11.13 | 29.91 | 0.16 | |
| 3/29/2018 | 10:36 | 11.02 | 9.31 | 16.30 | 0.30 | |
| 3/29/2018 | 10:37 | 11.20 | 9.18 | 15.10 | 0.34 | |
| 3/29/2018 | 10:38 | 9.87 | 10.51 | 20.52 | 0.21 | |
| 3/29/2018 | 10:39 | 9.41 | 10.91 | 29.45 | 0.17 | |
| 3/29/2018 | 10:40 | 9.68 | 10.66 | 28.27 | 0.17 | |
| 3/29/2018 | 10:41 | 9.51 | 10.81 | 31.97 | 0.18 | |
| 3/29/2018 | 10:42 | 9.10 | 11.22 | 33.93 | 0.15 | |
| 3/29/2018 | 10:43 | 8.80 | 11.51 | 40.77 | 0.16 | |
| 3/29/2018 | 10:44 | 8.14 | 12.19 | 49.33 | 0.16 | |
| 3/29/2018 | 10:45 | 8.99 | 11.27 | 41.68 | 0.14 | |
| 3/29/2018 | 10:46 | 3.01 | 2.70 | 9.46 | 0.90 | |
| 3/29/2018 | 10:47 | 0.14 | 0.04 | 0.22 | 4.33 | |
| 3/29/2018 | 10:48 | 0.14 | 0.03 | 0.20 | 4.72 | CO Bias |
| 3/29/2018 | 10:49 | 0.12 | 0.03 | 31.90 | 3.72 | |
| 3/29/2018 | 10:50 | 0.11 | 0.03 | 48.37 | 0.54 | NOx Bias |
| 3/29/2018 | 10:51 | 7.77 | 7.96 | 16.61 | 0.30 | |
| 3/29/2018 | 10:52 | 10.85 | 10.75 | 0.21 | 0.04 | O2 CO2 Bias |
| 3/29/2018 | 10:53 | 1.68 | 0.90 | 0.16 | 0.05 | |
| 3/29/2018 | 10:54 | 0.04 | 0.01 | 0.14 | 0.05 | Zero |
| 3/29/2018 | 10:55 | 8.75 | 9.50 | 41.46 | 1.52 | |
| 3/29/2018 | 10:56 | 10.87 | 10.83 | 48.76 | 4.58 | |
| 3/29/2018 | 10:57 | 10.87 | 10.83 | 48.75 | 4.79 | Span |
| 3/29/2018 | 10:58 | 9.28 | 11.43 | 41.38 | 3.70 | |
| 3/29/2018 | 10:59 | 9.13 | 11.17 | 35.79 | 0.38 | |
| 3/29/2018 | 11:00 | 9.35 | 10.97 | 37.94 | 0.15 | |
| 3/29/2018 | 11:01 | 8.85 | 11.46 | 42.88 | 0.14 | |
| 3/29/2018 | 11:02 | 8.97 | 11.34 | 39.91 | 0.14 | |
| 3/29/2018 | 11:03 | 8.82 | 11.50 | 38.95 | 0.12 | |
| 3/29/2018 | 11:04 | 8.53 | 11.77 | 31.56 | 0.14 | |
| 3/29/2018 | 11:05 | 9.23 | 11.10 | 26.71 | 0.18 | |
| 3/29/2018 | 11:06 | 8.56 | 11.74 | 34.88 | 0.15 | |
| 3/29/2018 | 11:07 | 9.49 | 10.84 | 26.63 | 0.14 | |
| 3/29/2018 | 11:08 | 10.17 | 10.18 | 20.60 | 0.19 | |
| 3/29/2018 | 11:09 | 9.70 | 10.65 | 20.35 | 0.17 | |
| 3/29/2018 | 11:10 | 9.37 | 10.95 | 25.90 | 0.16 | |
| 3/29/2018 | 11:11 | 10.11 | 10.24 | 23.14 | 0.17 | |

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| 3/29/2018 | 11:12 | 10.01 | 10.36 | 24.50 | 0.18 |
| 3/29/2018 | 11:13 | 9.55 | 10.80 | 29.24 | 0.16 |
| 3/29/2018 | 11:14 | 8.96 | 11.36 | 35.88 | 0.16 |
| 3/29/2018 | 11:15 | 8.54 | 11.79 | 45.15 | 0.12 |
| 3/29/2018 | 11:16 | 8.85 | 11.45 | 48.54 | 0.13 |
| 3/29/2018 | 11:17 | 9.28 | 11.05 | 35.41 | 0.16 |
| 3/29/2018 | 11:18 | 9.12 | 11.21 | 33.07 | 0.15 |
| 3/29/2018 | 11:19 | 8.83 | 11.49 | 37.37 | 0.16 |
| 3/29/2018 | 11:20 | 9.09 | 11.22 | 37.30 | 0.15 |
| 3/29/2018 | 11:21 | 9.50 | 10.83 | 33.45 | 0.11 |
| 3/29/2018 | 11:22 | 9.85 | 10.50 | 28.76 | 0.15 |
| 3/29/2018 | 11:23 | 10.11 | 10.25 | 24.87 | 0.17 |
| 3/29/2018 | 11:24 | 10.04 | 10.33 | 24.82 | 0.17 |
| 3/29/2018 | 11:25 | 9.10 | 11.22 | 36.45 | 0.17 |
| 3/29/2018 | 11:26 | 9.90 | 10.40 | 35.82 | 0.14 |
| 3/29/2018 | 11:27 | 9.29 | 11.03 | 44.23 | 0.16 |
| 3/29/2018 | 11:28 | 9.15 | 11.16 | 43.33 | 0.15 |
| 3/29/2018 | 11:29 | 9.61 | 10.71 | 35.46 | 0.14 |
| 3/29/2018 | 11:30 | 10.16 | 10.19 | 26.62 | 0.16 |
| 3/29/2018 | 11:31 | 9.54 | 10.79 | 29.54 | 0.17 |
| 3/29/2018 | 11:32 | 9.16 | 11.15 | 33.69 | 0.14 |
| 3/29/2018 | 11:33 | 9.36 | 10.95 | 37.45 | 0.13 |
| 3/29/2018 | 11:34 | 9.27 | 11.04 | 36.90 | 0.17 |
| 3/29/2018 | 11:35 | 9.12 | 11.17 | 40.43 | 0.14 |
| 3/29/2018 | 11:36 | 8.93 | 11.37 | 44.65 | 0.13 |
| 3/29/2018 | 11:37 | 8.80 | 11.48 | 49.99 | 0.12 |
| 3/29/2018 | 11:38 | 9.10 | 11.18 | 43.62 | 0.15 |
| 3/29/2018 | 11:39 | 8.73 | 11.55 | 48.99 | 0.15 |
| 3/29/2018 | 11:40 | 9.66 | 10.62 | 33.48 | 0.14 |
| 3/29/2018 | 11:41 | 10.35 | 9.96 | 22.54 | 0.17 |
| 3/29/2018 | 11:42 | 10.69 | 9.66 | 19.10 | 0.19 |
| 3/29/2018 | 11:43 | 9.93 | 10.40 | 20.82 | 0.18 |
| 3/29/2018 | 11:44 | 9.42 | 10.89 | 25.17 | 0.17 |
| 3/29/2018 | 11:45 | 8.96 | 11.34 | 32.78 | 0.13 |
| 3/29/2018 | 11:46 | 9.01 | 11.29 | 36.98 | 0.15 |
| 3/29/2018 | 11:47 | 9.81 | 10.51 | 28.02 | 0.15 |
| 3/29/2018 | 11:48 | 9.44 | 10.88 | 28.90 | 0.15 |
| 3/29/2018 | 11:49 | 8.66 | 11.64 | 37.59 | 0.14 |
| 3/29/2018 | 11:50 | 9.09 | 11.21 | 36.18 | 0.16 |
| 3/29/2018 | 11:51 | 8.98 | 11.32 | 36.61 | 0.13 |
| 3/29/2018 | 11:52 | 9.33 | 10.98 | 33.98 | 0.13 |
| 3/29/2018 | 11:53 | 8.89 | 11.43 | 38.88 | 0.13 |
| 3/29/2018 | 11:54 | 8.25 | 12.07 | 50.81 | 0.13 |
| 3/29/2018 | 11:55 | 8.43 | 11.86 | 51.54 | 0.11 |
| 3/29/2018 | 11:56 | 9.88 | 10.45 | 36.10 | 0.11 |
| 3/29/2018 | 11:57 | 9.21 | 11.12 | 37.10 | 0.14 |
| 3/29/2018 | 11:58 | 9.05 | 11.21 | 36.43 | 0.13 |
| 3/29/2018 | 11:59 | 8.48 | 11.83 | 44.11 | 0.12 |
| 3/29/2018 | 12:00 | 9.58 | 10.74 | 31.87 | 0.15 |

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|---|---|---|---|---|---|---|
| 3/29/2018 | 12:01 | 3.40 | 2.12 | 7.50 | 0.91 | |
| 1-HCL O2 CO2 | | 9.11 | 11.10 | | | |
| 3/29/2018 | 12:02 | 0.11 | 0.04 | 0.20 | 4.35 | |
| 3/29/2018 | 12:03 | 0.11 | 0.03 | 0.19 | 4.71 | CO Bias |
| 3/29/2018 | 12:04 | 0.11 | 0.03 | 29.51 | 3.98 | |
| 3/29/2018 | 12:05 | 0.11 | 0.03 | 48.51 | 0.48 | NOx Bias |
| 3/29/2018 | 12:06 | 6.66 | 6.86 | 20.99 | 0.05 | |
| 3/29/2018 | 12:07 | 10.82 | 10.78 | 0.22 | 0.05 | O2 CO2 Bias |
| 3/29/2018 | 12:08 | 1.35 | 1.48 | 0.17 | 0.05 | |
| 3/29/2018 | 12:09 | 0.04 | 0.01 | 0.15 | 0.05 | Zero |
| 3/29/2018 | 12:10 | 9.11 | 9.82 | 42.44 | 1.60 | |
| 3/29/2018 | 12:11 | 10.82 | 10.87 | 48.82 | 4.64 | |
| 3/29/2018 | 12:12 | 10.82 | 10.86 | 48.82 | 4.75 | Span |
| 3/29/2018 | 12:13 | 9.83 | 10.89 | 33.13 | 3.83 | |
| 3/29/2018 | 12:14 | 9.68 | 10.65 | 24.05 | 0.43 | |
| 3/29/2018 | 12:15 | 9.04 | 11.25 | 32.07 | 0.15 | |
| 3/29/2018 | 12:16 | 9.39 | 10.91 | 25.06 | 0.14 | |
| 3/29/2018 | 12:17 | 9.39 | 10.92 | 25.78 | 0.14 | |
| 3/29/2018 | 12:18 | 8.66 | 11.62 | 36.59 | 0.15 | |
| 3/29/2018 | 12:19 | 8.68 | 11.62 | 35.69 | 0.14 | |
| 3/29/2018 | 12:20 | 8.66 | 11.61 | 39.68 | 0.12 | |
| 3/29/2018 | 12:21 | 9.05 | 11.23 | 32.48 | 0.14 | |
| 3/29/2018 | 12:22 | 9.11 | 11.17 | 32.76 | 0.16 | |
| 3/29/2018 | 12:23 | 9.15 | 11.12 | 35.35 | 0.14 | |
| 3/29/2018 | 12:24 | 8.97 | 11.29 | 36.25 | 0.15 | |
| 3/29/2018 | 12:25 | 9.37 | 10.89 | 33.26 | 0.13 | |
| 3/29/2018 | 12:26 | 9.39 | 10.89 | 31.70 | 0.14 | |
| 3/29/2018 | 12:27 | 8.94 | 11.35 | 31.65 | 0.15 | |
| 3/29/2018 | 12:28 | 8.38 | 11.86 | 41.19 | 0.15 | |
| 3/29/2018 | 12:29 | 8.04 | 12.19 | 50.75 | 0.12 | |
| 3/29/2018 | 12:30 | 8.43 | 11.79 | 48.42 | 0.12 | |
| 3/29/2018 | 12:31 | 9.23 | 11.01 | 37.73 | 0.12 | |
| 3/29/2018 | 12:32 | 9.27 | 10.98 | 33.75 | 0.14 | |
| 3/29/2018 | 12:33 | 9.06 | 11.18 | 33.32 | 0.15 | |
| 3/29/2018 | 12:34 | 8.37 | 11.86 | 44.80 | 0.11 | |
| 3/29/2018 | 12:35 | 8.68 | 11.51 | 47.18 | 0.11 | |
| 3/29/2018 | 12:36 | 8.83 | 11.38 | 43.84 | 0.12 | |
| 3/29/2018 | 12:37 | 8.67 | 11.53 | 42.77 | 0.13 | |
| 3/29/2018 | 12:38 | 8.52 | 11.69 | 39.89 | 0.14 | |
| 3/29/2018 | 12:39 | 8.82 | 11.39 | 34.95 | 0.13 | |
| 3/29/2018 | 12:40 | 9.05 | 11.18 | 30.14 | 0.15 | |
| 3/29/2018 | 12:41 | 9.14 | 11.08 | 28.89 | 0.16 | |
| 3/29/2018 | 12:42 | 9.31 | 10.92 | 27.27 | 0.15 | |
| 3/29/2018 | 12:43 | 9.13 | 11.12 | 27.43 | 0.14 | |
| 3/29/2018 | 12:44 | 8.79 | 11.42 | 32.11 | 0.14 | |
| 3/29/2018 | 12:45 | 8.57 | 11.66 | 40.90 | 0.11 | |
| 3/29/2018 | 12:46 | 9.39 | 10.82 | 31.08 | 0.12 | |
| 3/29/2018 | 12:47 | 10.01 | 10.26 | 21.90 | 0.15 | |

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|---|---|---|---|---|---|
| 3/29/2018 | 12:48 | 8.92 | 11.30 | 30.01 | 0.14 |
| 3/29/2018 | 12:49 | 8.74 | 11.47 | 34.87 | 0.13 |
| 3/29/2018 | 12:50 | 9.51 | 10.70 | 30.98 | 0.13 |
| 3/29/2018 | 12:51 | 9.57 | 10.66 | 30.30 | 0.15 |
| 3/29/2018 | 12:52 | 9.05 | 11.17 | 33.66 | 0.14 |
| 3/29/2018 | 12:53 | 8.87 | 11.33 | 40.82 | 0.14 |
| 3/29/2018 | 12:54 | 8.94 | 11.28 | 43.97 | 0.11 |
| 3/29/2018 | 12:55 | 8.64 | 11.57 | 45.76 | 0.11 |
| 3/29/2018 | 12:56 | 8.69 | 11.52 | 45.44 | 0.13 |
| 3/29/2018 | 12:57 | 9.10 | 11.12 | 33.08 | 0.11 |
| 3/29/2018 | 12:58 | 8.92 | 11.31 | 29.56 | 0.14 |
| 3/29/2018 | 12:59 | 8.83 | 11.38 | 33.05 | 0.15 |
| 3/29/2018 | 13:00 | 9.31 | 10.90 | 35.56 | 0.15 |
| 3/29/2018 | 13:01 | 9.39 | 10.85 | 35.04 | 0.12 |
| 3/29/2018 | 13:02 | 8.88 | 11.35 | 37.69 | 0.16 |
| 3/29/2018 | 13:03 | 8.38 | 11.85 | 44.35 | 0.13 |
| 3/29/2018 | 13:04 | 8.33 | 11.88 | 45.32 | 0.15 |
| 3/29/2018 | 13:05 | 8.82 | 11.39 | 38.58 | 0.11 |
| 3/29/2018 | 13:06 | 9.21 | 11.02 | 34.36 | 0.14 |
| 3/29/2018 | 13:07 | 9.02 | 11.21 | 33.26 | 0.15 |
| 3/29/2018 | 13:08 | 8.33 | 11.90 | 38.80 | 0.16 |
| 3/29/2018 | 13:09 | 8.19 | 12.03 | 43.92 | 0.13 |
| 3/29/2018 | 13:10 | 9.69 | 10.55 | 26.68 | 0.15 |
| 3/29/2018 | 13:11 | 8.32 | 11.94 | 35.38 | 0.14 |
| 3/29/2018 | 13:12 | 7.92 | 12.32 | 49.58 | 0.13 |
| 3/29/2018 | 13:13 | 9.33 | 10.89 | 34.07 | 0.13 |
| 3/29/2018 | 13:14 | 10.15 | 10.12 | 21.92 | 0.15 |
| 3/29/2018 | 13:15 | 9.29 | 10.96 | 23.80 | 0.17 |
| 3/29/2018 | 13:16 | 8.31 | 11.93 | 43.24 | 0.16 |
| 3/29/2018 | 13:17 | 8.97 | 11.25 | 35.25 | 0.14 |
| 3/29/2018 | 13:18 | 8.93 | 11.31 | 30.37 | 0.15 |
| 3/29/2018 | 13:19 | 8.81 | 11.42 | 30.24 | 0.16 |
| 3/29/2018 | 13:20 | 9.28 | 10.96 | 26.79 | 0.16 |
| 3/29/2018 | 13:21 | 8.74 | 11.50 | 38.22 | 0.16 |
| 3/29/2018 | 13:22 | 9.11 | 11.11 | 36.79 | 0.12 |
| 3/29/2018 | 13:23 | 9.74 | 10.49 | 26.53 | 0.14 |
| 3/29/2018 | 13:24 | 9.60 | 10.62 | 28.44 | 0.13 |
| 3/29/2018 | 13:25 | 9.67 | 10.56 | 29.69 | 0.12 |
| 3/29/2018 | 13:26 | 9.17 | 11.04 | 37.95 | 0.15 |
| 3/29/2018 | 13:27 | 9.83 | 10.40 | 26.60 | 0.16 |
| 3/29/2018 | 13:28 | 9.25 | 10.97 | 26.51 | 0.15 |
| 3/29/2018 | 13:29 | 9.74 | 10.49 | 23.60 | 0.15 |
| 3/29/2018 | 13:30 | 9.67 | 10.57 | 23.06 | 0.17 |
| 3/29/2018 | 13:31 | 9.25 | 10.97 | 27.21 | 0.16 |
| 3/29/2018 | 13:32 | 9.54 | 10.68 | 26.83 | 0.14 |
| 3/29/2018 | 13:33 | 8.86 | 11.35 | 35.25 | 0.13 |
| 3/29/2018 | 13:34 | 8.39 | 11.83 | 46.43 | 0.15 |
| 3/29/2018 | 13:35 | 9.21 | 11.00 | 38.71 | 0.10 |
| 3/29/2018 | 13:36 | 9.74 | 10.49 | 34.72 | 0.12 |

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|---|---|---|---|---|---|---|
| 3/29/2018 | 13:37 | 8.46 | 11.78 | 46.26 | 0.13 | |
| 3/29/2018 | 13:38 | 7.95 | 12.24 | 57.27 | 0.12 | |
| 3/29/2018 | 13:39 | 8.80 | 11.39 | 49.17 | 0.12 | |
| 3/29/2018 | 13:40 | 8.34 | 11.87 | 46.84 | 0.12 | |
| 3/29/2018 | 13:41 | 8.24 | 11.95 | 42.06 | 0.12 | |
| 3/29/2018 | 13:42 | 8.56 | 11.64 | 34.72 | 0.11 | |
| 3/29/2018 | 13:43 | 8.75 | 11.43 | 35.19 | 0.13 | |
| 3/29/2018 | 13:44 | 2.89 | 1.76 | 6.83 | 1.05 | |
| 3/29/2018 | 13:45 | 0.26 | 0.04 | 0.20 | 4.37 | |
| 3/29/2018 | 13:46 | 0.26 | 0.03 | 0.19 | 4.65 | CO Bias |
| 3/29/2018 | 13:47 | 0.24 | 0.03 | 30.68 | 3.85 | |
| 3/29/2018 | 13:48 | 0.23 | 0.03 | 47.96 | 0.53 | NOx Bias |
| 3/29/2018 | 13:49 | 6.36 | 6.97 | 32.40 | 0.25 | |
| 3/29/2018 | 13:50 | 9.98 | 9.97 | 10.26 | 0.12 | |
| 3/29/2018 | 13:51 | 10.79 | 10.68 | 0.20 | 0.01 | |
| 3/29/2018 | 13:52 | 10.79 | 10.71 | 0.17 | 0.02 | O2 CO2 Bias |
| 3/29/2018 | 13:53 | 1.90 | 1.01 | 0.15 | 0.02 | |
| 3/29/2018 | 13:54 | 0.04 | 0.01 | 0.14 | 0.01 | Zero |
| 3/29/2018 | 13:55 | 8.23 | 9.22 | 38.83 | 1.17 | |
| 3/29/2018 | 13:56 | 10.74 | 10.83 | 48.62 | 4.44 | |
| 3/29/2018 | 13:57 | 10.74 | 10.83 | 48.66 | 4.70 | Span |
| 3/29/2018 | 13:58 | 9.55 | 11.03 | 43.18 | 3.71 | |
| 3/29/2018 | 13:59 | 8.61 | 11.58 | 47.57 | 0.36 | |
| 3/29/2018 | 14:00 | 8.84 | 11.36 | 43.80 | 0.10 | |
| 3/29/2018 | 14:01 | 8.89 | 11.28 | 37.73 | 0.12 | |
| 3/29/2018 | 14:02 | 8.99 | 11.20 | 34.17 | 0.12 | |
| 3/29/2018 | 14:03 | 8.68 | 11.49 | 41.34 | 0.16 | |
| 3/29/2018 | 14:04 | 8.69 | 11.50 | 37.92 | 0.15 | |
| 3/29/2018 | 14:05 | 9.13 | 11.04 | 28.47 | 0.13 | |
| 3/29/2018 | 14:06 | 9.43 | 10.74 | 23.37 | 0.15 | |
| 3/29/2018 | 14:07 | 9.25 | 10.93 | 24.84 | 0.16 | |
| 3/29/2018 | 14:08 | 8.90 | 11.26 | 29.16 | 0.16 | |
| 3/29/2018 | 14:09 | 8.87 | 11.30 | 30.49 | 0.14 | |
| 3/29/2018 | 14:10 | 9.26 | 10.93 | 26.69 | 0.12 | |
| 3/29/2018 | 14:11 | 9.37 | 10.82 | 24.72 | 0.12 | |
| 3/29/2018 | 14:12 | 8.98 | 11.19 | 30.20 | 0.13 | |
| 3/29/2018 | 14:13 | 8.92 | 11.24 | 31.88 | 0.12 | |
| 3/29/2018 | 14:14 | 8.27 | 11.89 | 42.77 | 0.11 | |
| 3/29/2018 | 14:15 | 8.45 | 11.74 | 48.69 | 0.11 | |
| 3/29/2018 | 14:16 | 9.25 | 10.91 | 29.55 | 0.11 | |
| 3/29/2018 | 14:17 | 8.51 | 11.66 | 41.16 | 0.11 | |
| 3/29/2018 | 14:18 | 8.77 | 11.40 | 34.35 | 0.13 | |
| 3/29/2018 | 14:19 | 9.46 | 10.73 | 22.10 | 0.11 | |
| 3/29/2018 | 14:20 | 9.00 | 11.17 | 24.94 | 0.15 | |
| 3/29/2018 | 14:21 | 8.74 | 11.42 | 29.17 | 0.12 | |
| 3/29/2018 | 14:22 | 8.61 | 11.56 | 31.34 | 0.13 | |
| 3/29/2018 | 14:23 | 8.60 | 11.57 | 31.94 | 0.12 | |
| 3/29/2018 | 14:24 | 9.02 | 11.15 | 25.45 | 0.14 | |

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|---|---|---|---|---|---|---|
| 3/29/2018 | 14:25 | 9.30 | 10.88 | 21.95 | 0.16 | |
| 3/29/2018 | 14:26 | 9.25 | 10.91 | 22.50 | 0.16 | |
| 3/29/2018 | 14:27 | 9.32 | 10.84 | 23.12 | 0.14 | |
| 3/29/2018 | 14:28 | 9.45 | 10.74 | 23.26 | 0.13 | |
| 3/29/2018 | 14:29 | 9.18 | 10.99 | 25.36 | 0.15 | |
| 3/29/2018 | 14:30 | 8.86 | 11.29 | 30.86 | 0.13 | |
| 3/29/2018 | 14:31 | 8.39 | 11.07 | 34.39 | 0.10 | |
| 3/29/2018 | 14:32 | 0.34 | 0.14 | 0.98 | 1.84 | |
| 3/29/2018 | 14:31 | 8.39 | 11.07 | 34.39 | 0.10 | |
| 3/29/2018 | 14:32 | 0.34 | 0.14 | 0.98 | 1.84 | |
| 3/29/2018 | 14:33 | 0.25 | 0.04 | 0.20 | 4.54 | |
| 3/29/2018 | 14:34 | 0.24 | 0.03 | 0.18 | 4.64 | CO Bias |
| 3/29/2018 | 14:35 | 0.24 | 0.03 | 24.96 | 4.17 | |
| 3/29/2018 | 14:36 | 0.24 | 0.03 | 47.88 | 0.76 | NOx Bias |
| 3/29/2018 | 14:37 | 5.32 | 5.48 | 27.62 | 0.24 | |
| 3/29/2018 | 14:38 | 10.77 | 10.70 | 0.23 | 0.03 | O2 CO2 Bias |
| 3/29/2018 | 14:39 | 3.39 | 3.51 | 0.17 | 0.02 | |
| 3/29/2018 | 14:40 | 0.04 | 0.01 | 0.13 | 0.00 | Zero |
| 3/29/2018 | 14:41 | 7.05 | 7.92 | 36.53 | 0.76 | |
| 3/29/2018 | 14:42 | 10.74 | 10.82 | 48.55 | 4.24 | |
| 3/29/2018 | 14:43 | 10.74 | 10.82 | 48.54 | 4.68 | Span |
| 3/29/2018 | 14:44 | 9.81 | 10.97 | 33.89 | 3.85 | |
| 3/29/2018 | 14:45 | 8.91 | 11.32 | 29.54 | 0.45 | |
| 3/29/2018 | 14:46 | 8.19 | 12.02 | 45.85 | 0.08 | |
| 3/29/2018 | 14:47 | 8.22 | 11.98 | 46.41 | 0.10 | |
| 3/29/2018 | 14:48 | 8.64 | 11.52 | 37.72 | 0.09 | |
| 3/29/2018 | 14:49 | 9.15 | 11.02 | 27.89 | 0.12 | |
| 3/29/2018 | 14:50 | 9.33 | 10.87 | 21.70 | 0.12 | |
| 3/29/2018 | 14:51 | 8.89 | 11.31 | 25.30 | 0.14 | |
| 3/29/2018 | 14:52 | 8.82 | 11.37 | 26.92 | 0.14 | |
| 3/29/2018 | 14:53 | 8.46 | 11.74 | 32.14 | 0.13 | |
| 3/29/2018 | 14:54 | 8.57 | 11.61 | 34.63 | 0.12 | |
| 3/29/2018 | 14:55 | 8.29 | 11.89 | 39.11 | 0.09 | |
| 3/29/2018 | 14:56 | 8.40 | 11.78 | 38.99 | 0.13 | |
| 3/29/2018 | 14:57 | 8.61 | 11.57 | 33.47 | 0.12 | |
| 3/29/2018 | 14:58 | 9.20 | 10.96 | 24.76 | 0.12 | |
| 3/29/2018 | 14:59 | 8.93 | 11.23 | 25.59 | 0.15 | |
| 3/29/2018 | 15:00 | 9.52 | 10.74 | 18.07 | 0.11 | |
| 3/29/2018 | 15:01 | 8.49 | 11.70 | 28.58 | 0.12 | |
| 3/29/2018 | 15:02 | 8.83 | 11.33 | 28.03 | 0.11 | |
| 3/29/2018 | 15:03 | 8.70 | 11.52 | 28.67 | 0.12 | |
| 3/29/2018 | 15:04 | 8.08 | 12.16 | 39.94 | 0.10 | |
| 2-HCL-O2 CO2 | | 8.93 | 11.26 | | | |
| 3/29/2018 | 15:05 | 8.68 | 11.48 | 33.70 | 0.08 | |
| 3/29/2018 | 15:06 | 9.30 | 10.91 | 24.10 | 0.13 | |
| 3/29/2018 | 15:07 | 8.21 | 11.98 | 35.04 | 0.11 | |
| 3/29/2018 | 15:08 | 8.03 | 12.19 | 41.46 | 0.10 | |
| 3/29/2018 | 15:09 | 7.65 | 12.57 | 42.38 | 0.09 | |

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|---|---|---|---|---|---|---|
| 3/29/2018 | 15:10 | 8.15 | 11.99 | 39.16 | 0.11 | |
| 3/29/2018 | 15:11 | 10.15 | 10.00 | 17.14 | 0.11 | |
| 3/29/2018 | 15:12 | 10.75 | 9.46 | 10.08 | 0.18 | |
| 3/29/2018 | 15:13 | 10.65 | 9.61 | 10.01 | 0.21 | |
| 3/29/2018 | 15:14 | 9.00 | 11.25 | 19.77 | 0.19 | |
| 3/29/2018 | 15:15 | 7.64 | 12.58 | 37.69 | 0.14 | |
| 3/29/2018 | 15:16 | 3.04 | 3.84 | 14.29 | 0.63 | |
| 3/29/2018 | 15:17 | 0.26 | 0.05 | 0.21 | 4.08 | |
| 3/29/2018 | 15:18 | 0.26 | 0.04 | 0.16 | 4.62 | CO Bias |
| 3/29/2018 | 15:19 | 0.24 | 0.01 | 25.15 | 4.16 | |
| 3/29/2018 | 15:20 | 0.21 | 0.03 | 47.82 | 0.65 | NOx Bias |
| 3/29/2018 | 15:21 | 6.45 | 6.58 | 22.26 | 0.03 | |
| 3/29/2018 | 15:22 | 10.74 | 10.71 | 0.21 | 0.00 | O2 CO2 Bias |
| 3/29/2018 | 15:23 | 2.40 | 1.67 | 0.16 | 0.01 | |
| 3/29/2018 | 15:24 | 0.04 | 0.01 | 0.13 | -0.01 | Zero |
| 3/29/2018 | 15:25 | 9.15 | 10.25 | 43.32 | 1.54 | |
| 3/29/2018 | 15:26 | 10.72 | 10.84 | 48.46 | 4.53 | |
| 3/29/2018 | 15:27 | 10.72 | 10.84 | 48.48 | 4.67 | Span |
| 3/29/2018 | 15:28 | 17.99 | 2.61 | 10.65 | 3.86 | |
| 3/29/2018 | 15:29 | 20.63 | 0.10 | 0.26 | 0.67 | |
| 3/29/2018 | 15:30 | 20.33 | 0.36 | 0.68 | 0.44 | |
| 3/29/2018 | 15:31 | 19.77 | 0.86 | 2.04 | 0.39 | |
| 3/29/2018 | 15:32 | 19.96 | 0.70 | 1.59 | 0.39 | |
| 3/29/2018 | 15:33 | 20.05 | 0.61 | 1.57 | 0.38 | |
| 3/29/2018 | 15:34 | 19.93 | 0.74 | 2.14 | 0.37 | |
| 3/29/2018 | 15:35 | 20.52 | 0.17 | 0.51 | 0.40 | |
| 3/29/2018 | 15:36 | 20.36 | 0.33 | 1.09 | 0.40 | |
| 3/29/2018 | 15:37 | 20.11 | 0.56 | 1.80 | 0.40 | |
| 3/29/2018 | 15:38 | 20.66 | 0.09 | 0.24 | 0.39 | |
| 3/29/2018 | 15:39 | 20.64 | 0.11 | 0.25 | 0.43 | |
| 3/29/2018 | 15:40 | 20.62 | 0.12 | 0.32 | 0.40 | |
| 3/29/2018 | 15:41 | 20.62 | 0.13 | 0.34 | 0.42 | |
| 3/29/2018 | 15:42 | 20.67 | 0.08 | 0.22 | 0.42 | |
| 3/29/2018 | 15:43 | 20.68 | 0.08 | 0.22 | 0.43 | |
| 3/29/2018 | 15:44 | 20.67 | 0.08 | 0.22 | 0.45 | |
| 3/29/2018 | 15:45 | 20.67 | 0.08 | 0.21 | 0.47 | |
| 3/29/2018 | 15:46 | 20.67 | 0.08 | 0.22 | 0.44 | |
| 3/29/2018 | 15:47 | 20.67 | 0.09 | 0.25 | 0.43 | |
| 3/29/2018 | 15:48 | 20.68 | 0.09 | 0.24 | 0.44 | |
| 3/29/2018 | 15:49 | 20.44 | 0.31 | 0.84 | 0.43 | |
| 3/29/2018 | 15:50 | 20.26 | 0.44 | 1.31 | 0.40 | |
| 3/29/2018 | 15:51 | 20.26 | 0.45 | 1.17 | 0.37 | |
| 3/29/2018 | 15:52 | 20.26 | 0.44 | 0.89 | 0.38 | |
| 3/29/2018 | 15:53 | 20.36 | 0.34 | 0.99 | 0.36 | |
| 3/29/2018 | 15:54 | 20.62 | 0.13 | 0.43 | 0.42 | |
| 3/29/2018 | 15:55 | 20.48 | 0.25 | 0.82 | 0.43 | |
| 3/29/2018 | 15:56 | 20.65 | 0.10 | 0.32 | 0.41 | |
| 3/29/2018 | 15:57 | 14.34 | 6.32 | 13.85 | 0.41 | |

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|---|---|---|---|---|---|---|
| 3/29/2018 | 15:58 | 7.99 | 12.19 | 36.56 | 0.12 | |
| 3/29/2018 | 15:59 | 7.74 | 12.43 | 36.78 | 0.10 | |
| 3/29/2018 | 16:00 | 8.16 | 12.02 | 31.06 | 0.08 | |
| 3/29/2018 | 16:01 | 8.72 | 11.42 | 28.65 | 0.11 | |
| 3/29/2018 | 16:02 | 8.42 | 11.80 | 30.41 | 0.11 | |
| 3/29/2018 | 16:03 | 8.83 | 11.38 | 24.08 | 0.12 | |
| 3/29/2018 | 16:04 | 8.46 | 11.72 | 30.40 | 0.11 | |
| 3/29/2018 | 16:05 | 8.09 | 12.12 | 34.11 | 0.12 | |
| 3/29/2018 | 16:06 | 7.74 | 12.44 | 42.65 | 0.11 | |
| 3/29/2018 | 16:07 | 8.50 | 11.67 | 35.34 | 0.08 | |
| 3/29/2018 | 16:08 | 8.91 | 11.24 | 25.17 | 0.11 | |
| 3/29/2018 | 16:09 | 9.48 | 10.74 | 16.93 | 0.16 | |
| 3/29/2018 | 16:10 | 9.68 | 10.52 | 17.34 | 0.16 | |
| 3/29/2018 | 16:11 | 8.90 | 11.32 | 24.20 | 0.12 | |
| 3/29/2018 | 16:12 | 8.89 | 11.31 | 23.48 | 0.13 | |
| 3/29/2018 | 16:13 | 9.37 | 10.81 | 21.88 | 0.13 | |
| 3/29/2018 | 16:14 | 9.72 | 10.50 | 19.15 | 0.13 | |
| 3/29/2018 | 16:15 | 9.38 | 10.81 | 22.79 | 0.13 | |
| 3/29/2018 | 16:16 | 9.10 | 11.12 | 27.85 | 0.12 | |
| 3/29/2018 | 16:17 | 9.61 | 10.59 | 22.76 | 0.14 | |
| 3/29/2018 | 16:18 | 9.20 | 11.04 | 27.08 | 0.12 | |
| 3/29/2018 | 16:19 | 8.30 | 11.90 | 42.55 | 0.10 | |
| 3/29/2018 | 16:20 | 8.26 | 11.90 | 47.09 | 0.08 | |
| 3/29/2018 | 16:21 | 8.57 | 11.65 | 38.05 | 0.10 | |
| 3/29/2018 | 16:22 | 8.60 | 11.60 | 36.70 | 0.09 | |
| 3/29/2018 | 16:23 | 8.78 | 11.38 | 36.27 | 0.09 | |
| 3/29/2018 | 16:24 | 8.79 | 11.39 | 33.19 | 0.09 | |
| 3/29/2018 | 16:25 | 8.31 | 11.86 | 41.51 | 0.08 | |
| 3/29/2018 | 16:26 | 8.66 | 11.50 | 36.32 | 0.08 | |
| 3/29/2018 | 16:27 | 8.91 | 11.30 | 32.06 | 0.11 | |
| 3/29/2018 | 16:28 | 9.93 | 10.25 | 20.37 | 0.11 | |
| 3/29/2018 | 16:29 | 9.72 | 10.48 | 21.09 | 0.13 | |
| 3/29/2018 | 16:30 | 9.89 | 10.33 | 15.97 | 0.16 | |
| 3/29/2018 | 16:31 | 9.11 | 11.06 | 19.93 | 0.15 | |
| 3/29/2018 | 16:32 | 9.67 | 10.50 | 18.38 | 0.15 | |
| 3/29/2018 | 16:33 | 9.79 | 9.69 | 19.60 | 0.19 | |
| 3/29/2018 | 16:34 | 2.29 | 2.33 | 7.12 | 0.91 | |
| 3/29/2018 | 16:35 | 0.04 | 0.03 | 0.18 | 4.27 | |
| 3/29/2018 | 16:36 | 0.04 | 0.01 | 0.16 | 4.66 | CO Bias |
| 3/29/2018 | 16:37 | 0.04 | 0.02 | 30.55 | 3.88 | |
| 3/29/2018 | 16:38 | 0.04 | 0.02 | 48.09 | 0.55 | NOx Bias |
| 3/29/2018 | 16:39 | 1.06 | 1.38 | 45.61 | 0.27 | |
| 3/29/2018 | 16:40 | 10.67 | 10.70 | 0.59 | 0.01 | |
| 3/29/2018 | 16:41 | 10.69 | 10.75 | 0.18 | 0.00 | O2 CO2 Bias |
| 3/29/2018 | 16:42 | 0.81 | 0.86 | 0.15 | -0.03 | |
| 3/29/2018 | 16:43 | 0.04 | 0.01 | 0.13 | -0.01 | Zero |
| 3/29/2018 | 16:44 | 8.16 | 9.02 | 39.74 | 1.23 | |
| 3/29/2018 | 16:45 | 10.74 | 10.78 | 48.51 | 4.45 | |

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|---|---|---|---|---|---|---|
| 3/29/2018 | 16:46 | 10.74 | 10.78 | 48.51 | 4.66 | Span |
| 3/29/2018 | 16:47 | 9.41 | 11.23 | 40.56 | 4.14 | |
| 3/29/2018 | 16:48 | 8.98 | 11.24 | 32.93 | 0.56 | |
| 3/29/2018 | 16:49 | 10.00 | 10.17 | 19.49 | 0.09 | |
| 3/29/2018 | 16:50 | 9.52 | 10.65 | 20.17 | 0.12 | |
| 3/29/2018 | 16:51 | 9.73 | 10.46 | 16.13 | 0.11 | |
| 3/29/2018 | 16:52 | 9.53 | 10.62 | 18.46 | 0.14 | |
| 3/29/2018 | 16:53 | 9.60 | 10.59 | 19.30 | 0.13 | |
| 3/29/2018 | 16:54 | 9.40 | 10.77 | 23.79 | 0.10 | |
| 3/29/2018 | 16:55 | 9.44 | 10.73 | 22.66 | 0.09 | |
| 3/29/2018 | 16:56 | 9.40 | 10.75 | 24.62 | 0.10 | |
| 3/29/2018 | 16:57 | 8.85 | 11.29 | 32.02 | 0.08 | |
| 3/29/2018 | 16:58 | 9.02 | 11.16 | 35.29 | 0.07 | |
| 3/29/2018 | 16:59 | 9.68 | 10.49 | 27.64 | 0.07 | |
| 3/29/2018 | 17:00 | 8.80 | 11.31 | 36.78 | 0.08 | |
| 3/29/2018 | 17:01 | 8.07 | 12.11 | 45.01 | 0.10 | |
| 3/29/2018 | 17:02 | 9.08 | 11.07 | 32.64 | 0.08 | |
| 3/29/2018 | 17:03 | 9.17 | 10.96 | 30.06 | 0.08 | |
| 3/29/2018 | 17:04 | 9.39 | 10.78 | 22.94 | 0.10 | |
| 3/29/2018 | 17:05 | 9.36 | 10.79 | 23.21 | 0.10 | |
| 3/29/2018 | 17:06 | 8.77 | 11.37 | 33.23 | 0.09 | |
| 3/29/2018 | 17:07 | 8.64 | 11.50 | 37.30 | 0.07 | |
| 3/29/2018 | 17:08 | 8.78 | 11.37 | 39.54 | 0.08 | |
| 3/29/2018 | 17:09 | 9.30 | 10.84 | 30.77 | 0.07 | |
| 3/29/2018 | 17:10 | 9.23 | 10.96 | 34.66 | 0.07 | |
| 3/29/2018 | 17:11 | 9.10 | 11.06 | 30.87 | 0.09 | |
| 3/29/2018 | 17:12 | 9.41 | 10.77 | 25.92 | 0.10 | |
| 3/29/2018 | 17:13 | 9.43 | 10.74 | 24.29 | 0.12 | |
| 3/29/2018 | 17:14 | 9.05 | 11.12 | 29.73 | 0.11 | |
| 3/29/2018 | 17:15 | 9.29 | 10.88 | 28.44 | 0.08 | |
| 3/29/2018 | 17:16 | 9.35 | 10.83 | 30.24 | 0.06 | |
| 3/29/2018 | 17:17 | 9.97 | 10.20 | 28.82 | 0.08 | |
| 3/29/2018 | 17:18 | 9.56 | 10.61 | 37.17 | 0.10 | |
| 3/29/2018 | 17:19 | 9.37 | 10.78 | 43.25 | 0.08 | |
| 3/29/2018 | 17:20 | 9.97 | 10.21 | 34.95 | 0.10 | |
| 3/29/2018 | 17:21 | 9.05 | 11.07 | 42.12 | 0.06 | |
| 3/29/2018 | 17:22 | 8.88 | 11.25 | 47.37 | 0.09 | |
| 3/29/2018 | 17:23 | 8.86 | 11.31 | 49.89 | 0.06 | |
| 3/29/2018 | 17:24 | 8.80 | 11.38 | 50.96 | 0.06 | |
| 3/29/2018 | 17:25 | 8.80 | 11.31 | 51.84 | 0.06 | |
| 3/29/2018 | 17:26 | 9.07 | 11.11 | 46.35 | 0.07 | |
| 3/29/2018 | 17:27 | 8.64 | 11.53 | 52.31 | 0.08 | |
| 3/29/2018 | 17:28 | 8.95 | 11.17 | 49.84 | 0.05 | |
| 3/29/2018 | 17:29 | 9.32 | 10.88 | 44.97 | 0.07 | |
| 3/29/2018 | 17:30 | 9.38 | 10.78 | 38.03 | 0.08 | |
| 3/29/2018 | 17:31 | 9.06 | 11.09 | 37.58 | 0.07 | |
| 3/29/2018 | 17:32 | 9.51 | 10.66 | 32.43 | 0.06 | |
| 3/29/2018 | 17:33 | 8.64 | 11.49 | 46.17 | 0.07 | |
| 3/29/2018 | 17:34 | 8.91 | 11.26 | 45.37 | 0.07 | |

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|---|---|---|---|---|---|---|
| 3/29/2018 | 17:35 | 9.24 | 10.90 | 41.69 | 0.06 | |
| 3/29/2018 | 17:36 | 9.85 | 10.33 | 31.22 | 0.07 | |
| 3/29/2018 | 17:37 | 8.70 | 11.42 | 41.80 | 0.06 | |
| 3/29/2018 | 17:38 | 9.21 | 10.93 | 39.03 | 0.08 | |
| 3/29/2018 | 17:39 | 8.91 | 11.26 | 46.38 | 0.08 | |
| 3/29/2018 | 17:40 | 9.60 | 10.57 | 36.08 | 0.08 | |
| 3/29/2018 | 17:41 | 8.86 | 11.26 | 44.22 | 0.07 | |
| 3/29/2018 | 17:42 | 8.71 | 11.43 | 47.83 | 0.05 | |
| 3/29/2018 | 17:43 | 8.93 | 11.23 | 47.01 | 0.06 | |
| 3/29/2018 | 17:44 | 8.87 | 11.24 | 46.98 | 0.06 | |
| 3/29/2018 | 17:45 | 8.94 | 11.25 | 46.61 | 0.06 | |
| 3/29/2018 | 17:46 | 9.28 | 10.85 | 39.85 | 0.06 | |
| 3/29/2018 | 17:47 | 9.47 | 10.70 | 39.59 | 0.07 | |
| 3/29/2018 | 17:48 | 9.36 | 10.80 | 38.25 | 0.06 | |
| 3/29/2018 | 17:49 | 9.21 | 10.97 | 42.03 | 0.07 | |
| 3/29/2018 | 17:50 | 10.22 | 9.97 | 32.85 | 0.08 | |
| 3/29/2018 | 17:51 | 8.79 | 11.36 | 46.03 | 0.08 | |
| 3/29/2018 | 17:52 | 8.33 | 11.85 | 51.75 | 0.07 | |
| 3/29/2018 | 17:53 | 8.53 | 11.67 | 52.37 | 0.05 | |
| 3/29/2018 | 17:54 | 9.43 | 10.77 | 39.80 | 0.06 | |
| 3/29/2018 | 17:55 | 9.68 | 10.49 | 34.87 | 0.06 | |
| 3/29/2018 | 17:56 | 9.11 | 11.06 | 39.09 | 0.08 | |
| 3/29/2018 | 17:57 | 8.74 | 11.43 | 46.42 | 0.08 | |
| 3/29/2018 | 17:58 | 8.75 | 11.47 | 51.16 | 0.07 | |
| 3/29/2018 | 17:59 | 8.68 | 11.46 | 47.01 | 0.08 | |
| 3/29/2018 | 18:00 | 7.69 | 12.53 | 59.08 | 0.05 | |
| 3/29/2018 | 18:01 | 8.06 | 12.14 | 57.08 | 0.07 | |
| 3/29/2018 | 18:02 | 8.86 | 11.36 | 50.19 | 0.06 | |
| 3/29/2018 | 18:03 | 8.75 | 11.41 | 44.46 | 0.06 | |
| 3/29/2018 | 18:04 | 9.22 | 11.02 | 37.07 | 0.04 | |
| 3/29/2018 | 18:05 | 9.42 | 10.82 | 34.42 | 0.07 | |
| 3/29/2018 | 18:06 | 9.15 | 11.02 | 36.14 | 0.07 | |
| 3/29/2018 | 18:07 | 8.97 | 11.20 | 40.72 | 0.07 | |
| 3/29/2018 | 18:08 | 9.05 | 11.17 | 41.05 | 0.07 | |
| 3/29/2018 | 18:09 | 9.16 | 11.04 | 46.10 | 0.06 | |
| 3/29/2018 | 18:10 | 9.07 | 11.15 | 42.44 | 0.06 | |
| 3-HCL-O2 CO2 | | 9.08 | 11.09 | | | |
| 3/29/2018 | 18:11 | 3.21 | 3.99 | 14.60 | 0.57 | |
| 3/29/2018 | 18:12 | 0.04 | 0.05 | 0.23 | 4.06 | |
| 3/29/2018 | 18:13 | 0.04 | 0.04 | 0.20 | 4.62 | CO Bias |
| 3/29/2018 | 18:14 | 0.05 | 0.03 | 32.45 | 3.72 | |
| 3/29/2018 | 18:15 | 0.04 | 0.03 | 48.34 | 0.50 | NOx Bias |
| 3/29/2018 | 18:16 | 0.04 | 0.02 | 48.38 | 0.35 | |
| 3/29/2018 | 18:17 | 4.98 | 4.85 | 29.01 | 0.30 | |
| 3/29/2018 | 18:18 | 10.70 | 10.78 | 0.26 | 0.04 | |
| 3/29/2018 | 18:19 | 10.72 | 10.80 | 0.19 | -0.01 | O2 CO2 Bias |
| 3/29/2018 | 18:20 | 2.37 | 2.50 | 0.17 | -0.03 | |
| 3/29/2018 | 18:21 | 0.04 | 0.01 | 0.14 | -0.01 | Zero |

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|---|---|---|---|---|---|---|
| 3/29/2018 | 18:22 | 8.50 | 9.56 | 41.22 | 1.58 | |
| 3/29/2018 | 18:23 | 10.74 | 10.91 | 48.62 | 4.51 | |
| 3/29/2018 | 18:24 | 10.74 | 10.91 | 48.63 | 4.65 | SPan |
| 3/29/2018 | 18:25 | 17.37 | 16.85 | 84.51 | 6.14 | |
| 3/29/2018 | 18:26 | 19.38 | 18.36 | 92.60 | 9.37 | |
| 3/29/2018 | 18:27 | 19.38 | 18.36 | 92.65 | 9.48 | High |

| Date | Time | O2 % | CO2 % | NOx ppm | CO ppm | |
|---|---|---|---|---|---|---|
| 3/30/2018 | 8:00 | 19.582 | 18.451 | 92.705 | 9.516 | |
| 3/30/2018 | 8:01 | 19.582 | 18.452 | 92.748 | 9.569 | |
| 3/30/2018 | 8:02 | 19.58 | 18.449 | 92.742 | 9.577 | High |
| 3/30/2018 | 8:03 | 13.092 | 12.297 | 57.315 | 8.797 | |
| 3/30/2018 | 8:04 | 10.866 | 10.967 | 48.722 | 5.36 | |
| 3/30/2018 | 8:05 | 10.866 | 10.965 | 48.71 | 4.693 | |
| 3/30/2018 | 8:06 | 10.865 | 10.956 | 48.684 | 4.715 | Mid |
| 3/30/2018 | 8:07 | 4.232 | 3.376 | 16.875 | 4.042 | |
| 3/30/2018 | 8:08 | 0.04 | 0.013 | 0.182 | 0.736 | |
| 3/30/2018 | 8:09 | 0.036 | 0.01 | 0.155 | 0.003 | Zero |
| 3/30/2018 | 8:10 | 0.035 | 0.008 | 0.138 | -0.012 | NO Mode Zero |
| 3/30/2018 | 8:11 | 0.035 | 0.009 | 42.945 | 0.014 | |
| 3/30/2018 | 8:12 | 0.035 | 0.008 | 92.914 | 0.002 | NO MOde High |
| 3/30/2018 | 8:13 | 0.035 | 0.007 | 20.336 | 0.026 | |
| 3/30/2018 | 8:14 | 0.035 | 0.007 | 0.204 | -0.004 | NO2 Gas NO Mode |
| 3/30/2018 | 8:15 | 0.036 | 0.007 | 35.472 | -0.004 | |
| 3/30/2018 | 8:16 | 0.035 | 0.006 | 43.164 | 0.002 | |
| 3/30/2018 | 8:17 | 0.035 | 0.006 | 43.168 | -0.006 | NO2 Gas NOx Mode |
| 3/30/2018 | 8:18 | 6.97 | 7.676 | 21.534 | 0.013 | |
| 3/30/2018 | 8:19 | 9.899 | 10.507 | 12.676 | 0.164 | |
| 3/30/2018 | 8:20 | 9.615 | 10.781 | 15.558 | 0.195 | |
| 3/30/2018 | 8:21 | 9.136 | 11.243 | 20.193 | 0.189 | |
| 3/30/2018 | 8:22 | 9.292 | 11.078 | 20.014 | 0.185 | |
| 3/30/2018 | 8:23 | 8.919 | 11.46 | 28.672 | 0.179 | |
| 3/30/2018 | 8:24 | 9.102 | 11.27 | 28.677 | 0.177 | |
| 3/30/2018 | 8:25 | 9.373 | 10.995 | 30.728 | 0.168 | |
| 3/30/2018 | 8:26 | 9.923 | 10.474 | 29.224 | 0.159 | |
| 3/30/2018 | 8:27 | 10.391 | 10.023 | 25.42 | 0.156 | |
| 3/30/2018 | 8:28 | 10.232 | 10.184 | 27.793 | 0.155 | |
| 3/30/2018 | 8:29 | 10.005 | 10.411 | 31.517 | 0.156 | |
| 3/30/2018 | 8:30 | 9.546 | 10.836 | 38.918 | 0.156 | |
| 3/30/2018 | 8:31 | 9.798 | 10.589 | 40.024 | 0.139 | |
| 3/30/2018 | 8:32 | 9.34 | 11.058 | 43.692 | 0.14 | |
| 3/30/2018 | 8:33 | 8.765 | 11.609 | 52.385 | 0.128 | |
| 3/30/2018 | 8:34 | 8.946 | 11.432 | 50.159 | 0.134 | |
| 3/30/2018 | 8:35 | 9.035 | 11.364 | 25.633 | 0.138 | |
| 3/30/2018 | 8:36 | 9.086 | 11.291 | 18.469 | 0.185 | |
| 3/30/2018 | 8:37 | 10.182 | 10.22 | 11.472 | 0.226 | |
| 3/30/2018 | 8:38 | 9.715 | 10.701 | 12.508 | 0.234 | |
| 3/30/2018 | 8:39 | 9.145 | 11.227 | 19.15 | 0.246 | |
| 3/30/2018 | 8:40 | 9.595 | 10.811 | 15.818 | 0.229 | |
| 3/30/2018 | 8:41 | 9.38 | 11.006 | 14.093 | 0.244 | |
| 3/30/2018 | 8:42 | 9.712 | 10.702 | 15.274 | 0.242 | |
| 3/30/2018 | 8:43 | 8.924 | 11.481 | 20.581 | 0.183 | |
| 3/30/2018 | 8:44 | 9.32 | 11.059 | 18.203 | 0.178 | |
| 3/30/2018 | 8:45 | 9.262 | 11.11 | 22.274 | 0.187 | |
| 3/30/2018 | 8:46 | 9.014 | 11.38 | 23.242 | 0.174 | |
| 3/30/2018 | 8:47 | 8.841 | 11.536 | 25.757 | 0.162 | |
| 3/30/2018 | 8:48 | 8.778 | 11.61 | 24.669 | 0.164 | |

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|---|---|---|---|---|---|
| 3/30/2018 | 8:49 | 8.674 | 11.688 | 30.455 | 0.178 |
| 3/30/2018 | 8:50 | 9 | 11.367 | 26.722 | 0.167 |
| 3/30/2018 | 8:51 | 9.279 | 11.091 | 22.024 | 0.151 |
| 3/30/2018 | 8:52 | 8.826 | 11.547 | 23.833 | 0.172 |
| 3/30/2018 | 8:53 | 9.353 | 11.001 | 21.887 | 0.179 |
| 3/30/2018 | 8:54 | 8.834 | 11.532 | 25.318 | 0.181 |
| 3/30/2018 | 8:55 | 8.989 | 11.37 | 22.847 | 0.19 |
| 3/30/2018 | 8:56 | 8.745 | 11.632 | 27.935 | 0.186 |
| 3/30/2018 | 8:57 | 8.423 | 11.932 | 29.78 | 0.187 |
| 3/30/2018 | 8:58 | 8.669 | 11.676 | 30.646 | 0.174 |
| 3/30/2018 | 8:59 | 8.446 | 11.915 | 31.706 | 0.18 |
| 3/30/2018 | 9:00 | 8.612 | 11.729 | 31.624 | 0.164 |
| 3/30/2018 | 9:01 | 8.771 | 11.576 | 25.663 | 0.152 |
| 3/30/2018 | 9:02 | 9.588 | 10.76 | 20.349 | 0.176 |
| 3/30/2018 | 9:03 | 9.492 | 10.865 | 18.798 | 0.179 |
| 3/30/2018 | 9:04 | 8.547 | 11.818 | 29.451 | 0.176 |
| 3/30/2018 | 9:05 | 8.643 | 11.689 | 30.644 | 0.166 |
| 3/30/2018 | 9:06 | 8.656 | 11.685 | 28.219 | 0.163 |
| 3/30/2018 | 9:07 | 9.556 | 10.779 | 21.428 | 0.168 |
| 3/30/2018 | 9:08 | 9.569 | 10.795 | 21.662 | 0.176 |
| 3/30/2018 | 9:09 | 9.102 | 11.246 | 29.679 | 0.185 |
| 3/30/2018 | 9:10 | 8.815 | 11.522 | 36.476 | 0.169 |
| 3/30/2018 | 9:11 | 9.35 | 10.984 | 33.194 | 0.154 |
| 3/30/2018 | 9:12 | 9.151 | 11.203 | 35.675 | 0.151 |
| 3/30/2018 | 9:13 | 8.596 | 11.769 | 42.721 | 0.144 |
| 3/30/2018 | 9:14 | 9.166 | 11.181 | 43.236 | 0.138 |
| 3/30/2018 | 9:15 | 9.003 | 11.364 | 40.922 | 0.153 |
| 3/30/2018 | 9:16 | 8.861 | 11.493 | 42.172 | 0.159 |
| 3/30/2018 | 9:17 | 9.354 | 11.034 | 36.264 | 0.124 |
| 3/30/2018 | 9:18 | 9.306 | 11.063 | 38.324 | 0.136 |
| 3/30/2018 | 9:19 | 9.174 | 11.194 | 37.616 | 0.134 |
| 3/30/2018 | 9:20 | 8.937 | 11.418 | 41.464 | 0.134 |
| 3/30/2018 | 9:21 | 9.534 | 10.842 | 37.107 | 0.127 |
| 3/30/2018 | 9:22 | 9.16 | 11.212 | 40.824 | 0.147 |
| 3/30/2018 | 9:23 | 9.458 | 10.916 | 38.921 | 0.159 |
| 3/30/2018 | 9:24 | 9.185 | 11.197 | 42.265 | 0.151 |
| 3/30/2018 | 9:25 | 8.369 | 12.013 | 53.052 | 0.134 |
| 3/30/2018 | 9:26 | 8.76 | 11.605 | 48.818 | 0.144 |
| 3/30/2018 | 9:27 | 9.389 | 10.983 | 38.695 | 0.131 |
| 3/30/2018 | 9:28 | 8.777 | 11.602 | 44.928 | 0.143 |
| 3/30/2018 | 9:29 | 8.389 | 11.978 | 48.15 | 0.135 |
| 3/30/2018 | 9:30 | 9.297 | 11.069 | 36.989 | 0.124 |
| 3/30/2018 | 9:31 | 8.693 | 11.683 | 43.422 | 0.131 |
| 3/30/2018 | 9:32 | 9.151 | 11.217 | 36.815 | 0.121 |
| 3/30/2018 | 9:33 | 9.52 | 10.863 | 29.376 | 0.135 |
| 3/30/2018 | 9:34 | 9.773 | 10.617 | 26.559 | 0.141 |
| 3/30/2018 | 9:35 | 9.254 | 11.113 | 31.166 | 0.143 |
| 3/30/2018 | 9:36 | 9.31 | 11.03 | 32.702 | 0.145 |
| 3/30/2018 | 9:37 | 9.303 | 11.044 | 36.692 | 0.152 |
| 3/30/2018 | 9:38 | 8.758 | 11.626 | 32.808 | 0.149 |
| 3/30/2018 | 9:39 | 9.526 | 10.85 | 33.152 | 0.44 |
| 3/30/2018 | 9:40 | 10.216 | 10.196 | 29.574 | 0.273 |

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|---|---|---|---|---|---|
| 3/30/2018 | 9:41 | 10.351 | 10.082 | 31.159 | 0.174 |
| 3/30/2018 | 9:42 | 10.356 | 10.073 | 30.117 | 0.13 |
| 3/30/2018 | 9:43 | 9.672 | 10.726 | 34.935 | 0.163 |
| 3/30/2018 | 9:44 | 10.472 | 9.947 | 32.028 | 0.148 |
| 3/30/2018 | 9:45 | 10.33 | 10.062 | 38.802 | 0.145 |
| 3/30/2018 | 9:46 | 10.344 | 10.082 | 39.804 | 0.188 |
| 3/30/2018 | 9:47 | 10.366 | 10.051 | 35.125 | 0.171 |
| 3/30/2018 | 9:48 | 9.29 | 11.098 | 42.486 | 0.145 |
| 3/30/2018 | 9:49 | 9.466 | 10.911 | 45.812 | 0.158 |
| 3/30/2018 | 9:50 | 9.563 | 10.795 | 47.749 | 0.146 |
| 3/30/2018 | 9:51 | 9.661 | 10.709 | 47.538 | 0.146 |
| 3/30/2018 | 9:52 | 9.112 | 11.27 | 47.775 | 0.144 |
| 3/30/2018 | 9:53 | 9.724 | 10.637 | 39.099 | 0.14 |
| 3/30/2018 | 9:54 | 9.662 | 10.713 | 35.962 | 0.165 |
| 3/30/2018 | 9:55 | 10.1 | 10.287 | 31.63 | 0.149 |
| 3/30/2018 | 9:56 | 9.418 | 10.959 | 39.767 | 0.14 |
| 3/30/2018 | 9:57 | 9.031 | 11.325 | 48.325 | 0.14 |
| 3/30/2018 | 9:58 | 8.865 | 11.478 | 51.232 | 0.151 |
| 3/30/2018 | 9:59 | 9.714 | 10.643 | 41.216 | 0.138 |
| 3/30/2018 | 10:00 | 9.97 | 10.412 | 29.046 | 0.149 |
| 3/30/2018 | 10:01 | 9.376 | 10.991 | 33.197 | 0.146 |
| 3/30/2018 | 10:02 | 9.072 | 11.273 | 37.286 | 0.155 |
| 3/30/2018 | 10:03 | 9.028 | 11.332 | 39.142 | 0.121 |
| 3/30/2018 | 10:04 | 8.84 | 11.49 | 46.103 | 0.134 |
| 3/30/2018 | 10:05 | 9.272 | 11.052 | 39.695 | 0.167 |
| 3/30/2018 | 10:06 | 9.401 | 10.934 | 37.639 | 0.15 |
| 3/30/2018 | 10:07 | 9.661 | 10.671 | 34.467 | 0.158 |
| 3/30/2018 | 10:08 | 9.712 | 10.638 | 31.974 | 0.154 |
| 3/30/2018 | 10:09 | 9.4 | 10.935 | 38.872 | 0.146 |
| 3/30/2018 | 10:10 | 9.394 | 10.929 | 37.508 | 0.143 |
| 3/30/2018 | 10:11 | 9.631 | 10.703 | 34.172 | 0.151 |
| 3/30/2018 | 10:12 | 9.609 | 10.74 | 32.055 | 0.134 |
| 3/30/2018 | 10:13 | 9.187 | 11.127 | 40.005 | 0.143 |
| 3/30/2018 | 10:14 | 9.015 | 11.302 | 43.438 | 0.122 |
| 3/30/2018 | 10:15 | 9.139 | 11.177 | 43.918 | 0.15 |
| 3/30/2018 | 10:16 | 9.636 | 10.694 | 35.065 | 0.123 |
| 3/30/2018 | 10:17 | 9.872 | 10.461 | 31.944 | 0.142 |
| 3/30/2018 | 10:18 | 10.099 | 10.248 | 28.942 | 0.155 |
| 3/30/2018 | 10:19 | 8.838 | 11.506 | 39.826 | 0.155 |
| 3/30/2018 | 10:20 | 8.865 | 11.452 | 38.667 | 0.141 |
| 3/30/2018 | 10:21 | 9.316 | 10.995 | 38.275 | 0.15 |
| 3/30/2018 | 10:22 | 9.174 | 11.148 | 38.467 | 0.144 |
| 3/30/2018 | 10:23 | 8.97 | 11.347 | 40.024 | 0.145 |
| 3/30/2018 | 10:24 | 9.169 | 11.148 | 36.965 | 0.135 |
| 3/30/2018 | 10:25 | 9.147 | 11.166 | 19.574 | 0.152 |
| 3/30/2018 | 10:26 | 9.167 | 11.139 | 19.719 | 0.201 |
| 3/30/2018 | 10:27 | 9.144 | 11.175 | 20.555 | 0.204 |
| 3/30/2018 | 10:28 | 9.091 | 11.219 | 23.817 | 0.185 |
| 3/30/2018 | 10:29 | 9.506 | 10.824 | 21.327 | 0.169 |
| 3/30/2018 | 10:30 | 9.657 | 10.677 | 19.977 | 0.174 |
| 3/30/2018 | 10:31 | 9.496 | 10.841 | 22.842 | 0.18 |
| 3/30/2018 | 10:32 | 9.044 | 11.288 | 31.536 | 0.156 |

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|---|---|---|---|---|---|---|
| 3/30/2018 | 10:33 | 8.866 | 11.453 | 39.269 | 0.138 | |
| 3/30/2018 | 10:34 | 9.255 | 11.069 | 42.573 | 0.128 | |
| 3/30/2018 | 10:35 | 9.776 | 10.575 | 33.939 | 0.13 | |
| 3/30/2018 | 10:36 | 9.162 | 11.164 | 34.671 | 0.156 | |
| 3/30/2018 | 10:37 | 8.743 | 11.578 | 39.858 | 0.149 | |
| 3/30/2018 | 10:38 | 8.872 | 11.437 | 40.944 | 0.145 | |
| 3/30/2018 | 10:39 | 9.524 | 10.793 | 37.818 | 0.15 | |
| 3/30/2018 | 10:40 | 9.022 | 11.294 | 38.632 | 0.155 | |
| 3/30/2018 | 10:41 | 8.704 | 11.608 | 42.586 | 0.16 | |
| 3/30/2018 | 10:42 | 9.191 | 11.131 | 37.466 | 0.161 | |
| 3/30/2018 | 10:43 | 8.827 | 11.501 | 38.619 | 0.142 | |
| 3/30/2018 | 10:44 | 8.896 | 11.419 | 37.228 | 0.138 | |
| 3/30/2018 | 10:45 | 10.031 | 10.301 | 26.75 | 0.15 | |
| 3/30/2018 | 10:46 | 9.723 | 10.613 | 24.821 | 0.143 | |
| 3/30/2018 | 10:47 | 9.313 | 11.009 | 31.867 | 0.118 | |
| 3/30/2018 | 10:48 | 9.256 | 11.063 | 32.161 | 0.138 | |
| 3/30/2018 | 10:49 | 10.088 | 10.251 | 27.136 | 0.147 | |
| 3/30/2018 | 10:50 | 10.354 | 9.997 | 27.088 | 0.134 | |
| 3/30/2018 | 10:51 | 10.321 | 10.034 | 29.163 | 0.145 | |
| 3/30/2018 | 10:52 | 9.557 | 10.771 | 35.886 | 0.151 | |
| 3/30/2018 | 10:53 | 6.299 | 7.161 | 27.528 | 0.152 | |
| 3/30/2018 | 10:54 | 0.039 | 0.015 | 0.21 | 0.074 | |
| 3/30/2018 | 10:55 | 0.036 | 0.013 | 0.167 | 0.01 | Zero |
| 3/30/2018 | 10:56 | 8.994 | 9.826 | 42.194 | 0.784 | |
| 3/30/2018 | 10:57 | 10.818 | 10.887 | 48.77 | 4.03 | |
| 3/30/2018 | 10:58 | 10.818 | 10.889 | 48.754 | 4.734 | Span |
| 3/30/2018 | 10:59 | 10.818 | 10.892 | 48.753 | 4.726 | |
| 3/30/2018 | 11:00 | 9.652 | 11.042 | 42.156 | 4.101 | |
| 3/30/2018 | 11:01 | 8.729 | 11.578 | 48.455 | 0.952 | |
| 3/30/2018 | 11:02 | 8.33 | 11.98 | 47.436 | 0.123 | |
| 3/30/2018 | 11:03 | 9.745 | 10.566 | 33.022 | 0.114 | |
| 3/30/2018 | 11:04 | 9.102 | 11.204 | 19.261 | 0.136 | |
| 3/30/2018 | 11:05 | 9.631 | 10.696 | 8.071 | 0.249 | |
| 3/30/2018 | 11:06 | 9.635 | 10.694 | 8.994 | 0.287 | |
| 3/30/2018 | 11:07 | 9.622 | 10.72 | 10.025 | 0.256 | |
| 3/30/2018 | 11:08 | 6.924 | 8.822 | 14.312 | 0.228 | |
| 3/30/2018 | 11:09 | 0.075 | 0.086 | 0.263 | 1.792 | |
| 3/30/2018 | 11:10 | 0.04 | 0.047 | 0.201 | 4.47 | |
| 3/30/2018 | 11:11 | 0.036 | 0.039 | 0.19 | 4.684 | CO Bias |
| 3/30/2018 | 11:12 | 0.036 | 0.033 | 9.371 | 4.664 | |
| 3/30/2018 | 11:13 | 0.036 | 0.031 | 48.351 | 2.609 | Nox Bias |
| 3/30/2018 | 11:14 | 0.805 | 0.879 | 46.822 | 0.436 | |
| 3/30/2018 | 11:15 | 10.706 | 10.727 | 1.2 | 0.15 | |
| 3/30/2018 | 11:16 | 10.768 | 10.816 | 0.213 | 0 | O2 CO2 Bias |
| 3/30/2018 | 11:17 | 10.704 | 10.846 | 0.611 | 0.01 | |
| 3/30/2018 | 11:18 | 8.574 | 11.81 | 40.203 | 0.046 | |
| 3/30/2018 | 11:19 | 9.059 | 11.296 | 41.402 | 0.126 | |
| 3/30/2018 | 11:20 | 9.14 | 11.215 | 41.432 | 0.097 | |
| 3/30/2018 | 11:21 | 8.766 | 11.597 | 45.573 | 0.091 | |
| 3/30/2018 | 11:22 | 8.904 | 11.453 | 40.672 | 0.088 | |
| 3/30/2018 | 11:23 | 8.644 | 11.726 | 39.858 | 0.068 | |

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|---|---|---|---|---|---|
| 3/30/2018 | 11:24 | 8.764 | 11.582 | 44.82 | 0.102 |
| 3/30/2018 | 11:25 | 9.82 | 10.566 | 30.022 | 0.08 |
| 3/30/2018 | 11:26 | 9.325 | 11.076 | 30.729 | 0.06 |
| 3/30/2018 | 11:27 | 8.608 | 11.747 | 41.097 | 0.091 |
| 3/30/2018 | 11:28 | 8.801 | 11.579 | 39.535 | 0.084 |
| 3/30/2018 | 11:29 | 8.816 | 11.578 | 42.03 | 0.079 |
| 3/30/2018 | 11:30 | 8.646 | 11.719 | 41.363 | 0.073 |
| 3/30/2018 | 11:31 | 9.04 | 11.324 | 37.172 | 0.055 |
| 3/30/2018 | 11:32 | 9.306 | 11.099 | 38.418 | 0.071 |
| 3/30/2018 | 11:33 | 8.592 | 11.775 | 42.974 | 0.081 |
| 3/30/2018 | 11:34 | 8.785 | 11.621 | 41.84 | 0.058 |
| 3/30/2018 | 11:35 | 8.555 | 11.81 | 45.538 | 0.073 |
| 3/30/2018 | 11:36 | 9.342 | 11.037 | 37.106 | 0.048 |
| 3/30/2018 | 11:37 | 8.77 | 11.63 | 41.257 | 0.08 |
| 3/30/2018 | 11:38 | 9.175 | 11.204 | 35.762 | 0.089 |
| 3/30/2018 | 11:39 | 9.672 | 10.734 | 30.401 | 0.063 |
| 3/30/2018 | 11:40 | 9.452 | 10.945 | 31.938 | 0.062 |
| 3/30/2018 | 11:41 | 10.149 | 10.273 | 27.631 | 0.058 |
| 3/30/2018 | 11:42 | 10.022 | 10.396 | 29.807 | 0.076 |
| 3/30/2018 | 11:43 | 9.344 | 11.072 | 34.596 | 0.082 |
| 3/30/2018 | 11:44 | 9.405 | 11.004 | 37.178 | 0.08 |
| 3/30/2018 | 11:45 | 9.234 | 11.152 | 38.975 | 0.086 |
| 3/30/2018 | 11:46 | 9.299 | 11.104 | 41.319 | 0.074 |
| 3/30/2018 | 11:47 | 9.519 | 10.893 | 36.815 | 0.065 |
| 3/30/2018 | 11:48 | 9.673 | 10.721 | 35.374 | 0.077 |
| 3/30/2018 | 11:49 | 9.966 | 10.433 | 35.084 | 0.06 |
| 3/30/2018 | 11:50 | 9.773 | 10.628 | 33.717 | 0.071 |
| 3/30/2018 | 11:51 | 9.584 | 10.803 | 37.689 | 0.102 |
| 3/30/2018 | 11:52 | 10.39 | 10.01 | 33.419 | 0.103 |
| 3/30/2018 | 11:53 | 10.413 | 9.996 | 31.517 | 0.078 |
| 3/30/2018 | 11:54 | 9.614 | 10.776 | 34.717 | 0.087 |
| 3/30/2018 | 11:55 | 9.414 | 10.987 | 39.798 | 0.059 |
| 3/30/2018 | 11:56 | 9.48 | 10.893 | 42.048 | 0.089 |
| 3/30/2018 | 11:57 | 9.638 | 10.737 | 39.178 | 0.07 |
| 3/30/2018 | 11:58 | 10.088 | 10.322 | 31.251 | 0.092 |
| 3/30/2018 | 11:59 | 9.079 | 11.325 | 36.828 | 0.065 |
| 3/30/2018 | 12:00 | 8.836 | 11.534 | 40.121 | 0.084 |
| 3/30/2018 | 12:01 | 9.165 | 11.222 | 41.591 | 0.041 |
| 3/30/2018 | 12:02 | 9.056 | 11.335 | 44.503 | 0.058 |
| 3/30/2018 | 12:03 | 9.406 | 10.981 | 38.362 | 0.075 |
| 3/30/2018 | 12:04 | 8.924 | 11.463 | 39.081 | 0.059 |
| 3/30/2018 | 12:05 | 9.004 | 11.418 | 37.159 | 0.062 |
| 3/30/2018 | 12:06 | 8.766 | 11.621 | 41.773 | 0.095 |
| 3/30/2018 | 12:07 | 9.316 | 11.079 | 41.524 | 0.07 |
| 3/30/2018 | 12:08 | 8.996 | 11.4 | 41.535 | 0.071 |
| 3/30/2018 | 12:09 | 9.145 | 11.243 | 38.71 | 0.066 |
| 3/30/2018 | 12:10 | 8.935 | 11.434 | 40.447 | 0.079 |
| 3/30/2018 | 12:11 | 8.929 | 11.475 | 39.38 | 0.067 |
| 3/30/2018 | 12:12 | 8.352 | 12.038 | 46.733 | 0.064 |
| 3/30/2018 | 12:13 | 8.346 | 12.051 | 46.923 | 0.052 |
| 3/30/2018 | 12:14 | 8.433 | 11.942 | 48.006 | 0.049 |
| 3/30/2018 | 12:15 | 8.752 | 11.621 | 40.324 | 0.064 |

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|---|---|---|---|---|---|
| 3/30/2018 | 12:16 | 8.768 | 11.605 | 37.833 | 0.058 |
| 3/30/2018 | 12:17 | 8.499 | 11.898 | 38.872 | 0.055 |
| 3/30/2018 | 12:18 | 11.249 | 9.03 | 36.931 | 0.082 |
| 3/30/2018 | 12:19 | 14.208 | 6.241 | 22.29 | 0.108 |
| 3/30/2018 | 12:20 | 13.937 | 6.487 | 19.412 | 0.126 |
| 3/30/2018 | 12:21 | 12.206 | 7.838 | 18.899 | 0.129 |
| 3/30/2018 | 12:22 | 11.775 | 7.944 | 22.08 | 0.12 |
| 3/30/2018 | 12:23 | 12.071 | 7.643 | 29.1 | 0.099 |
| 3/30/2018 | 12:24 | 11.801 | 7.932 | 31.995 | 0.122 |
| 3/30/2018 | 12:25 | 10.96 | 8.729 | 29.33 | 0.109 |
| 3/30/2018 | 12:26 | 10.389 | 9.06 | 31.683 | 0.093 |
| 3/30/2018 | 12:27 | 9.982 | 9.4 | 33.312 | 0.085 |
| 3/30/2018 | 12:28 | 9.849 | 9.516 | 34.926 | 0.079 |
| 3/30/2018 | 12:29 | 10.229 | 9.134 | 35.316 | 0.068 |
| 3/30/2018 | 12:30 | 8.492 | 10.648 | 39.532 | 0.076 |
| 3/30/2018 | 12:31 | 7.968 | 11.046 | 43.885 | 0.186 |
| 3/30/2018 | 12:32 | 6.573 | 12.362 | 45.33 | 9.74 |
| 3/30/2018 | 12:33 | 8.599 | 10.365 | 46.038 | 9.566 |
| 3/30/2018 | 12:34 | 8.983 | 9.974 | 46.497 | 0.723 |
| 3/30/2018 | 12:35 | 9.467 | 9.494 | 49.29 | 0.158 |
| 3/30/2018 | 12:36 | 7.984 | 10.964 | 50.283 | 6.279 |
| 3/30/2018 | 12:37 | 9.573 | 9.471 | 46.219 | 5.201 |
| 3/30/2018 | 12:38 | 11.421 | 8.29 | 39.676 | 0.159 |
| 3/30/2018 | 12:39 | 9.319 | 10.446 | 36.662 | 0.105 |
| 3/30/2018 | 12:40 | 9.995 | 9.689 | 35.732 | 0.064 |
| 3/30/2018 | 12:41 | 11.898 | 7.851 | 33.874 | 0.094 |
| 3/30/2018 | 12:42 | 12.205 | 7.548 | 32.032 | 0.118 |
| 3/30/2018 | 12:43 | 12.281 | 7.512 | 31.319 | 0.078 |
| 3/30/2018 | 12:44 | 10.109 | 9.759 | 29.487 | 0.085 |
| 3/30/2018 | 12:45 | 9.568 | 10.427 | 32.874 | 0.066 |
| 3/30/2018 | 12:46 | 9.156 | 10.821 | 37.289 | 0.074 |
| 3/30/2018 | 12:47 | 9.063 | 10.902 | 42.104 | 0.073 |
| 3/30/2018 | 12:48 | 9.561 | 10.414 | 41.288 | 0.07 |
| 3/30/2018 | 12:49 | 8.965 | 11.004 | 44.3 | 0.056 |
| 3/30/2018 | 12:50 | 8.401 | 11.566 | 49.914 | 0.054 |
| 3/30/2018 | 12:51 | 8.323 | 11.633 | 51.323 | 0.045 |
| 3/30/2018 | 12:52 | 9.324 | 10.636 | 42.58 | 0.048 |
| 3/30/2018 | 12:53 | 9.43 | 10.541 | 38.689 | 0.044 |
| 3/30/2018 | 12:54 | 8.91 | 11.065 | 40.391 | 0.076 |
| 3/30/2018 | 12:55 | 9.386 | 10.935 | 39.629 | 0.063 |
| 3/30/2018 | 12:56 | 9.378 | 10.973 | 38.963 | 0.056 |
| 3/30/2018 | 12:57 | 9.22 | 11.116 | 35.3 | 0.051 |
| 3/30/2018 | 12:58 | 9.063 | 11.274 | 36.047 | 0.046 |
| 3/30/2018 | 12:59 | 8.49 | 11.842 | 45.981 | 0.053 |
| 3/30/2018 | 13:00 | 8.584 | 11.725 | 46.506 | 0.037 |
| 3/30/2018 | 13:01 | 8.35 | 11.974 | 52.81 | 0.031 |
| 3/30/2018 | 13:02 | 8.379 | 11.926 | 49.908 | 0.03 |
| 3/30/2018 | 13:03 | 8.722 | 11.561 | 45.614 | 0.044 |
| 3/30/2018 | 13:04 | 8.719 | 11.57 | 51.877 | 0.047 |
| 3/30/2018 | 13:05 | 9.199 | 11.068 | 44.315 | 0.06 |
| 3/30/2018 | 13:06 | 8.71 | 11.57 | 49.481 | 0.04 |
| 3/30/2018 | 13:07 | 8.98 | 11.263 | 45.497 | 0.047 |

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|---|---|---|---|---|---|
| 3/30/2018 | 13:08 | 8.824 | 11.454 | 41.988 | 0.075 |
| 3/30/2018 | 13:09 | 8.701 | 11.58 | 18.3 | 0.075 |
| 3/30/2018 | 13:10 | 8.828 | 11.444 | 16.375 | 0.142 |
| 3/30/2018 | 13:11 | 8.524 | 11.745 | 20.238 | 0.126 |
| 3/30/2018 | 13:12 | 8.752 | 11.518 | 21.9 | 0.103 |
| 3/30/2018 | 13:13 | 8.695 | 11.571 | 23.988 | 0.09 |
| 3/30/2018 | 13:14 | 8.554 | 11.721 | 28.574 | 0.097 |
| 3/30/2018 | 13:15 | 7.774 | 12.513 | 38.947 | 0.07 |
| 3/30/2018 | 13:16 | 6.75 | 13.501 | 58.139 | 0.045 |
| 3/30/2018 | 13:17 | 7.236 | 13.01 | 60.364 | 0.048 |
| 3/30/2018 | 13:18 | 7.96 | 12.266 | 49.578 | 0.038 |
| 3/30/2018 | 13:19 | 8.944 | 11.295 | 25.973 | 0.058 |
| 3/30/2018 | 13:20 | 9.827 | 10.406 | 10.33 | 0.165 |
| 3/30/2018 | 13:21 | 10.186 | 10.071 | 7.192 | 0.331 |
| 3/30/2018 | 13:22 | 10.513 | 9.757 | 6.142 | 0.322 |
| 3/30/2018 | 13:23 | 10.12 | 10.134 | 6.359 | 0.297 |
| 3/30/2018 | 13:24 | 10.832 | 9.436 | 5.714 | 0.259 |
| 3/30/2018 | 13:25 | 10.288 | 9.997 | 6.216 | 0.256 |
| 3/30/2018 | 13:26 | 10.385 | 9.88 | 6.36 | 0.23 |
| 3/30/2018 | 13:27 | 10.317 | 9.962 | 6.987 | 0.205 |
| 3/30/2018 | 13:28 | 9.838 | 10.435 | 7.751 | 0.171 |
| 3/30/2018 | 13:29 | 9.183 | 11.036 | 10.974 | 0.172 |
| 3/30/2018 | 13:30 | 9.677 | 10.558 | 11.98 | 0.129 |
| 3/30/2018 | 13:31 | 9.205 | 11.03 | 16.62 | 0.108 |
| 3/30/2018 | 13:32 | 9.484 | 10.741 | 19.736 | 0.073 |
| 3/30/2018 | 13:33 | 9.897 | 10.346 | 22.857 | 0.073 |
| 3/30/2018 | 13:34 | 9.752 | 10.48 | 26.427 | 0.088 |
| 3/30/2018 | 13:35 | 9.162 | 11.059 | 31.428 | 0.059 |
| 3/30/2018 | 13:36 | 9.113 | 11.088 | 37.491 | 0.047 |
| 3/30/2018 | 13:37 | 9.131 | 11.069 | 39.295 | 0.028 |
| 3/30/2018 | 13:38 | 9.262 | 10.959 | 41.65 | 0.058 |
| 3/30/2018 | 13:39 | 9.53 | 10.694 | 41.162 | 0.067 |
| 3/30/2018 | 13:40 | 9.927 | 10.296 | 35.225 | 0.058 |
| 3/30/2018 | 13:41 | 9.025 | 11.193 | 41.45 | 0.052 |
| 3/30/2018 | 13:42 | 8.757 | 11.442 | 46.138 | 0.04 |
| 3/30/2018 | 13:43 | 8.515 | 11.689 | 49.863 | 0.041 |
| 3/30/2018 | 13:44 | 8.357 | 11.844 | 48.604 | 0.042 |
| 3/30/2018 | 13:45 | 8.712 | 11.48 | 44.019 | 0.022 |
| 3/30/2018 | 13:46 | 8.908 | 11.283 | 39.103 | 0.044 |
| 3/30/2018 | 13:47 | 8.883 | 11.314 | 37.212 | 0.052 |
| 3/30/2018 | 13:48 | 8.726 | 11.458 | 38.207 | 0.048 |
| 3/30/2018 | 13:49 | 8.968 | 11.228 | 37.299 | 0.042 |
| 3/30/2018 | 13:50 | 9.131 | 11.074 | 37.408 | 0.04 |
| 3/30/2018 | 13:51 | 9.373 | 10.835 | 33.473 | 0.046 |
| 3/30/2018 | 13:52 | 9.238 | 10.973 | 34.203 | 0.023 |
| 3/30/2018 | 13:53 | 9.089 | 11.129 | 35.709 | 0.069 |
| 3/30/2018 | 13:54 | 8.547 | 11.658 | 43.597 | 0.036 |
| 3/30/2018 | 13:55 | 8.52 | 11.683 | 44.526 | 0.036 |
| 3/30/2018 | 13:56 | 8.191 | 12.032 | 48.506 | 0.017 |
| 3/30/2018 | 13:57 | 8.848 | 11.366 | 40.085 | 0.022 |
| 3/30/2018 | 13:58 | 8.151 | 12.056 | 48.573 | 0.035 |
| 3/30/2018 | 13:59 | 8.756 | 11.445 | 48.698 | 0.037 |

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|---|---|---|---|---|---|---|
| 3/30/2018 | 14:00 | 9.167 | 11.05 | 43.731 | 0.039 | |
| 3/30/2018 | 14:01 | 9.038 | 11.19 | 38.843 | 0.021 | |
| 3/30/2018 | 14:02 | 9.385 | 10.847 | 32.028 | 0.019 | |
| 3/30/2018 | 14:03 | 9.64 | 10.611 | 29.712 | 0.043 | |
| 3/30/2018 | 14:04 | 9.659 | 10.596 | 28.729 | 0.058 | |
| 3/30/2018 | 14:05 | 9.858 | 10.388 | 29.504 | 0.039 | |
| 3/30/2018 | 14:06 | 9.506 | 10.763 | 33.257 | 0.033 | |
| 3/30/2018 | 14:07 | 9.479 | 10.782 | 36.192 | 0.045 | |
| 3/30/2018 | 14:08 | 9.765 | 10.489 | 33.338 | 0.05 | |
| 3/30/2018 | 14:09 | 9.456 | 10.797 | 35.275 | 0.053 | |
| 3/30/2018 | 14:10 | 10.445 | 9.815 | 31.848 | 0.046 | |
| 3/30/2018 | 14:11 | 10.602 | 9.821 | 27.799 | 0.043 | |
| 3/30/2018 | 14:12 | 10.714 | 10.845 | 0.416 | 0.028 | |
| 3/30/2018 | 14:13 | 10.711 | 10.861 | 0.219 | -0.027 | O2 CO2 Bias |
| 3/30/2018 | 14:14 | 7.119 | 7.121 | 0.19 | 0.027 | |
| 3/30/2018 | 14:15 | 0.069 | 0.081 | 0.191 | 2.992 | |
| 3/30/2018 | 14:16 | 0.039 | 0.049 | 0.185 | 4.609 | |
| 3/30/2018 | 14:17 | 0.036 | 0.04 | 0.171 | 4.633 | CO Bias |
| 3/30/2018 | 14:18 | 0.04 | 0.035 | 10.788 | 4.551 | |
| 3/30/2018 | 14:19 | 0.037 | 0.031 | 48.068 | 1.568 | |
| 3/30/2018 | 14:20 | 0.036 | 0.029 | 48.204 | 0.315 | NOx Bias |
| 3/30/2018 | 14:21 | 2.409 | 3.189 | 45.941 | 0.281 | |
| 3/30/2018 | 14:22 | 9.107 | 11.062 | 35.742 | 0.107 | |
| 3/30/2018 | 14:23 | 9.154 | 11.079 | 39.855 | 0.03 | |
| 3/30/2018 | 14:24 | 8.899 | 11.361 | 47.079 | 0.014 | |
| 3/30/2018 | 14:25 | 9.188 | 11.072 | 36.173 | 0.018 | |
| 3/30/2018 | 14:26 | 9.724 | 10.546 | 20.858 | 0.036 | |
| 3/30/2018 | 14:27 | 9.397 | 10.879 | 11.777 | 0.058 | |
| 3/30/2018 | 14:28 | 8.935 | 11.348 | 17.735 | 0.129 | |
| 3/30/2018 | 14:29 | 9.138 | 11.136 | 22.521 | 0.075 | |
| 3/30/2018 | 14:30 | 9.489 | 10.802 | 22.563 | 0.036 | |
| 3/30/2018 | 14:31 | 9.745 | 10.562 | 23.258 | 0.061 | |
| 3/30/2018 | 14:32 | 9.144 | 11.145 | 31.855 | 0.057 | |
| 3/30/2018 | 14:33 | 9.305 | 10.996 | 37.973 | 0.022 | |
| 3/30/2018 | 14:34 | 9.398 | 10.9 | 37.037 | 0.02 | |
| 3/30/2018 | 14:35 | 8.895 | 11.416 | 37.301 | 0.011 | |
| 3/30/2018 | 14:36 | 9.167 | 11.13 | 37.37 | 0.026 | |
| 3/30/2018 | 14:37 | 8.982 | 11.325 | 38.904 | 0.032 | |
| 3/30/2018 | 14:38 | 8.978 | 11.318 | 42.209 | 0.025 | |
| 3/30/2018 | 14:39 | 9.202 | 11.112 | 40.728 | 0.02 | |
| 3/30/2018 | 14:40 | 9.098 | 11.203 | 35.269 | 0.05 | |
| 3/30/2018 | 14:41 | 8.658 | 11.649 | 32.701 | 0.066 | |
| 3/30/2018 | 14:42 | 8.414 | 11.898 | 39.145 | 0.033 | |
| 3/30/2018 | 14:43 | 8.51 | 11.798 | 45.387 | 0.018 | |
| 3/30/2018 | 14:44 | 8.647 | 11.662 | 44.19 | 0.034 | |
| 3/30/2018 | 14:45 | 9.483 | 10.827 | 30.843 | 0.033 | |
| 3/30/2018 | 14:46 | 8.938 | 11.385 | 30.398 | 0.054 | |
| 3/30/2018 | 14:47 | 7.881 | 12.458 | 38.563 | 0.035 | |
| 3/30/2018 | 14:48 | 8.406 | 11.906 | 34.395 | 0.046 | |
| 3/30/2018 | 14:49 | 8.947 | 11.358 | 31.313 | 0.036 | |
| 3/30/2018 | 14:50 | 8.942 | 11.37 | 30.626 | 0.039 | |
| 3/30/2018 | 14:51 | 8.829 | 11.484 | 29.206 | 0.036 | |

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| 3/30/2018 | 14:52 | 9.166 | 11.147 | 27.329 | 0.043 | |
| 3/30/2018 | 14:53 | 8.194 | 12.129 | 43.119 | 0.04 | |
| 3/30/2018 | 14:54 | 9.356 | 10.961 | 30.406 | 0.041 | |
| 3/30/2018 | 14:55 | 8.604 | 11.734 | 36.687 | 0.033 | |
| 3/30/2018 | 14:56 | 8.646 | 11.663 | 36.48 | 0.03 | |
| 3/30/2018 | 14:57 | 8.818 | 11.5 | 35.531 | 0.025 | |
| 3/30/2018 | 14:58 | 8.861 | 11.447 | 35.159 | 0.021 | |
| 3/30/2018 | 14:59 | 8.185 | 12.152 | 40.756 | 0.032 | |
| 3/30/2018 | 15:00 | 8.122 | 12.217 | 45.193 | 0.006 | |
| 3/30/2018 | 15:01 | 8.128 | 12.21 | 44.488 | 0.025 | |
| 3/30/2018 | 15:02 | 8.163 | 12.183 | 45.327 | 0.032 | |
| 3/30/2018 | 15:03 | 8.831 | 11.5 | 33.962 | 0.008 | |
| 3/30/2018 | 15:04 | 8.471 | 11.884 | 33.638 | 0.034 | |
| 3/30/2018 | 15:05 | 8.529 | 11.801 | 29.749 | 0.029 | |
| 3/30/2018 | 15:06 | 8.426 | 11.923 | 32.319 | 0.019 | |
| 3/30/2018 | 15:07 | 8.306 | 12.055 | 32.818 | 0.016 | |
| 3/30/2018 | 15:08 | 8.417 | 11.93 | 32.475 | 0.035 | |
| 3/30/2018 | 15:09 | 8.718 | 11.608 | 31.229 | 0.029 | |
| 3/30/2018 | 15:10 | 8.76 | 11.578 | 31.182 | 0.04 | |
| 3/30/2018 | 15:11 | 8.11 | 12.238 | 37.844 | 0.016 | |
| 3/30/2018 | 15:12 | 7.836 | 12.507 | 44.358 | 0.032 | |
| 3/30/2018 | 15:13 | 7.972 | 12.353 | 49.488 | 0 | |
| 3/30/2018 | 15:14 | 8.195 | 12.135 | 44.26 | 0.011 | |
| 3/30/2018 | 15:15 | 8.852 | 11.448 | 30.952 | 0.018 | |
| 3/30/2018 | 15:16 | 8.881 | 11.436 | 27.313 | 0.037 | |
| 3/30/2018 | 15:17 | 8.005 | 12.326 | 39.868 | 0.027 | |
| 3/30/2018 | 15:18 | 7.822 | 12.494 | 46.945 | 0.014 | |
| 3/30/2018 | 15:19 | 8.257 | 12.039 | 46.331 | 0.012 | |
| 3/30/2018 | 15:20 | 8.357 | 11.937 | 42.445 | 0.016 | |
| 3/30/2018 | 15:21 | 8.263 | 12.032 | 46.328 | 0.002 | |
| 3/30/2018 | 15:22 | 8.344 | 11.956 | 43.112 | 0.006 | |
| 3/30/2018 | 15:23 | 8.439 | 11.863 | 34.648 | 0.009 | |
| 3/30/2018 | 15:24 | 8.664 | 11.627 | 31.032 | 0.03 | |
| 3/30/2018 | 15:25 | 8.895 | 11.388 | 25.742 | 0.042 | |
| Run 1 Average | | 8.41 | 11.91 | 37.70 | 0.02 | |
| 3/30/2018 | 15:26 | 3.676 | 5.044 | 19.986 | 0.27 | |
| 3/30/2018 | 15:27 | 0.044 | 0.06 | 0.259 | 3.618 | |
| 3/30/2018 | 15:28 | 0.036 | 0.041 | 0.217 | 4.605 | CO Bias |
| 3/30/2018 | 15:29 | 0.037 | 0.034 | 27.148 | 4.001 | |
| 3/30/2018 | 15:30 | 0.036 | 0.032 | 47.83 | 0.468 | NOx Bias |
| 3/30/2018 | 15:31 | 3.968 | 4.087 | 33.284 | -0.044 | |
| 3/30/2018 | 15:32 | 10.804 | 10.859 | 0.335 | -0.009 | O2 CO2 Bias |
| 3/30/2018 | 15:33 | 0.482 | 0.611 | 0.177 | -0.004 | |
| 3/30/2018 | 15:34 | 0.036 | 0.012 | 0.147 | 0.015 | Zero |
| 3/30/2018 | 15:35 | 8.103 | 8.983 | 37.529 | 1.974 | |
| 3/30/2018 | 15:36 | 10.89 | 10.922 | 48.378 | 4.652 | |
| 3/30/2018 | 15:37 | 10.89 | 10.924 | 48.136 | 4.722 | Span |
| 3/30/2018 | 15:38 | 9.673 | 11.024 | 30.739 | 3.258 | |
| 3/30/2018 | 15:39 | 8.479 | 11.998 | 34.677 | 0.255 | |
| 3/30/2018 | 15:40 | 8.243 | 12.219 | 40.66 | 0.079 | |
| 3/30/2018 | 15:41 | 8.829 | 11.621 | 33.555 | 0.077 | |

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| 3/30/2018 | 15:42 | 8.59 | 11.875 | 35.791 | 0.085 | |
| 3/30/2018 | 15:43 | 8.786 | 11.654 | 35.074 | 0.094 | |
| 3/30/2018 | 15:44 | 8.854 | 11.594 | 35.009 | 0.107 | |
| 3/30/2018 | 15:45 | 7.927 | 12.525 | 46.493 | 0.088 | |
| 3/30/2018 | 15:46 | 8.652 | 11.755 | 39.747 | 0.079 | |
| 3/30/2018 | 15:47 | 8.605 | 11.828 | 38.46 | 0.07 | |
| 3/30/2018 | 15:48 | 8.327 | 12.101 | 37.11 | 0.065 | |
| 3/30/2018 | 15:49 | 7.896 | 12.507 | 49.967 | 0.076 | |
| 3/30/2018 | 15:50 | 8.288 | 12.13 | 43.127 | 0.051 | |
| 3/30/2018 | 15:51 | 9.056 | 11.338 | 30.938 | 0.08 | |
| 3/30/2018 | 15:52 | 9.374 | 11.037 | 22.746 | 0.093 | |
| 3/30/2018 | 15:53 | 8.726 | 11.695 | 26.097 | 0.085 | |
| 3/30/2018 | 15:54 | 8.124 | 12.292 | 39.303 | 0.097 | |
| 3/30/2018 | 15:55 | 8.237 | 12.156 | 41.384 | 0.07 | |
| 3/30/2018 | 15:56 | 8.364 | 12.039 | 41.513 | 0.045 | |
| 3/30/2018 | 15:57 | 8.349 | 12.031 | 47.02 | 0.064 | |
| 3/30/2018 | 15:58 | 8.555 | 11.83 | 42.575 | 0.06 | |
| 3/30/2018 | 15:59 | 8.542 | 11.843 | 34.702 | 0.092 | |
| 3/30/2018 | 16:00 | 8.502 | 11.887 | 35.858 | 0.088 | |
| 3/30/2018 | 16:01 | 9.324 | 11.027 | 29.154 | 0.11 | |
| 3/30/2018 | 16:02 | 9.275 | 11.135 | 26.165 | 0.12 | |
| 3/30/2018 | 16:03 | 7.176 | 13.197 | 52.173 | 0.102 | |
| 3/30/2018 | 16:04 | 6.905 | 13.424 | 59.305 | 0.082 | |
| 3/30/2018 | 16:05 | 7.776 | 12.571 | 53.47 | 0.088 | |
| 3/30/2018 | 16:06 | 8.21 | 12.161 | 39.341 | 0.083 | |
| 3/30/2018 | 16:07 | 8.311 | 12.019 | 32.357 | 0.085 | |
| 3/30/2018 | 16:08 | 8.469 | 11.86 | 31.239 | 0.107 | |
| Run 2 Average | | 8.43 | 11.98 | 38.50 | 0.09 | |
| 3/30/2018 | 16:09 | 3.731 | 5.096 | 16.492 | 0.41 | |
| 3/30/2018 | 16:10 | 0.045 | 0.064 | 0.245 | 3.923 | |
| 3/30/2018 | 16:11 | 0.035 | 0.044 | 0.202 | 4.715 | CO Bias |
| 3/30/2018 | 16:12 | 0.035 | 0.036 | 26.207 | 3.948 | |
| 3/30/2018 | 16:13 | 0.035 | 0.032 | 47.936 | 0.348 | NOx Bias |
| 3/30/2018 | 16:14 | 3.686 | 3.894 | 34.996 | 0.009 | |
| 3/30/2018 | 16:15 | 10.764 | 10.813 | 0.346 | 0 | O2 CO2 Bias |
| 3/30/2018 | 16:16 | 2.109 | 1.407 | 0.191 | -0.011 | |
| 3/30/2018 | 16:17 | 0.035 | 0.012 | 0.158 | 0.011 | Zero |
| 3/30/2018 | 16:18 | 8.172 | 8.907 | 38 | 1.833 | |
| 3/30/2018 | 16:19 | 10.817 | 10.892 | 48.438 | 4.668 | |
| 3/30/2018 | 16:20 | 10.817 | 10.891 | 48.254 | 4.738 | Span |
| 3/30/2018 | 16:21 | 9.28 | 11.489 | 37.303 | 3.816 | |
| 3/30/2018 | 16:22 | 8.351 | 12.009 | 41.25 | 0.339 | |
| 3/30/2018 | 16:23 | 9.111 | 11.216 | 34.961 | 0.066 | |
| 3/30/2018 | 16:24 | 8.726 | 11.638 | 36.368 | 0.067 | |
| 3/30/2018 | 16:25 | 9.063 | 11.267 | 35.384 | 0.085 | |
| 3/30/2018 | 16:26 | 8.867 | 11.469 | 36.226 | 0.097 | |
| 3/30/2018 | 16:27 | 8.564 | 11.796 | 38.471 | 0.07 | |
| 3/30/2018 | 16:28 | 8.346 | 11.983 | 47.841 | 0.06 | |
| 3/30/2018 | 16:29 | 8.841 | 11.476 | 40.514 | 0.076 | |
| 3/30/2018 | 16:30 | 8.829 | 11.498 | 38.28 | 0.067 | |
| 3/30/2018 | 16:31 | 9.319 | 11.031 | 29.415 | 0.102 | |

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| 3/30/2018 | 16:32 | 8.653 | 11.699 | 36.233 | 0.1 | |
| 3/30/2018 | 16:33 | 8.62 | 11.737 | 40.088 | 0.113 | |
| 3/30/2018 | 16:34 | 8.799 | 11.523 | 38.25 | 0.108 | |
| 3/30/2018 | 16:35 | 8.658 | 11.702 | 39.091 | 0.087 | |
| 3/30/2018 | 16:36 | 8.024 | 12.324 | 49.601 | 0.097 | |
| 3/30/2018 | 16:37 | 8.783 | 11.537 | 41.464 | 0.073 | |
| 3/30/2018 | 16:38 | 8.23 | 12.102 | 47.368 | 0.079 | |
| 3/30/2018 | 16:39 | 8.345 | 11.993 | 39.46 | 0.086 | |
| 3/30/2018 | 16:40 | 7.878 | 12.461 | 48.941 | 0.084 | |
| 3/30/2018 | 16:41 | 7.427 | 12.918 | 54.717 | 0.073 | |
| 3/30/2018 | 16:42 | 8.067 | 12.227 | 46.123 | 0.076 | |
| 3/30/2018 | 16:43 | 8.724 | 11.569 | 37.607 | 0.1 | |
| 3/30/2018 | 16:44 | 8.715 | 11.575 | 34.937 | 0.085 | |
| 3/30/2018 | 16:45 | 8.659 | 11.681 | 32.305 | 0.1 | |
| 3/30/2018 | 16:46 | 8.841 | 11.47 | 29.026 | 0.103 | |
| 3/30/2018 | 16:47 | 8.516 | 11.817 | 34.961 | 0.121 | |
| 3/30/2018 | 16:48 | 7.773 | 12.578 | 49.768 | 0.07 | |
| 3/30/2018 | 16:49 | 7.656 | 12.676 | 53.662 | 0.068 | |
| 3/30/2018 | 16:50 | 8.323 | 11.978 | 40.61 | 0.098 | |
| 3/30/2018 | 16:51 | 8.09 | 12.247 | 44.694 | 0.088 | |
| Run 3 Average | | 8.49 | 11.84 | 40.59 | 0.09 | |
| 3/30/2018 | 16:56 | 0.041 | 0.051 | 0.189 | 4.416 | |
| 3/30/2018 | 16:57 | 0.035 | 0.037 | 0.189 | 4.746 | CO Bias |
| 3/30/2018 | 16:58 | 0.035 | 0.031 | 31.91 | 3.191 | |
| 3/30/2018 | 16:59 | 0.035 | 0.029 | 48.199 | 0.114 | NOx Bias CO Zero Bias |
| 3/30/2018 | 17:00 | 0.037 | 0.013 | 11.12 | 0.018 | CO Zero |
| 3/30/2018 | 17:01 | 0.035 | 0.011 | 0.168 | 1.89 | O2 CO2 NOx Zero |
| 3/30/2018 | 17:02 | 8.568 | 8.598 | 32.713 | 4.697 | |
| 3/30/2018 | 17:03 | 10.792 | 10.907 | 48.327 | 4.715 | Span |
| 3/30/2018 | 17:04 | 9.725 | 10.896 | 30.374 | 3.337 | |
| 3/30/2018 | 17:05 | 9 | 11.321 | 30.65 | 0.221 | |
| 3/30/2018 | 17:06 | 8.157 | 12.16 | 38.713 | 0.074 | |
| 3/30/2018 | 17:07 | 8.505 | 11.784 | 36.745 | 0.079 | |
| 3/30/2018 | 17:08 | 8.692 | 11.608 | 36.928 | 0.066 | |
| 3/30/2018 | 17:09 | 8.804 | 11.495 | 34.743 | 0.102 | |
| 3/30/2018 | 17:10 | 8.97 | 11.324 | 30.839 | 0.092 | |
| 3/30/2018 | 17:11 | 9.492 | 10.808 | 24.611 | 0.12 | |
| 3/30/2018 | 17:12 | 8.925 | 11.369 | 30.813 | 0.094 | |
| 3/30/2018 | 17:13 | 8.656 | 11.641 | 33.604 | 0.104 | |
| 3/30/2018 | 17:14 | 8.759 | 11.525 | 37.35 | 0.103 | |
| 3/30/2018 | 17:15 | 8.758 | 11.539 | 36.404 | 0.079 | |
| 3/30/2018 | 17:16 | 8.111 | 12.211 | 45.329 | 0.086 | |
| 3/30/2018 | 17:17 | 8.001 | 12.313 | 46.799 | 0.089 | |
| 3/30/2018 | 17:18 | 8.546 | 11.737 | 43.758 | 0.085 | |
| 3/30/2018 | 17:19 | 8.592 | 11.714 | 43.225 | 0.106 | |
| 3/30/2018 | 17:20 | 8.403 | 11.906 | 43.902 | 0.079 | |
| 3/30/2018 | 17:21 | 8.876 | 11.411 | 34.481 | 0.092 | |
| 3/30/2018 | 17:22 | 8.215 | 12.093 | 42.868 | 0.101 | |
| 3/30/2018 | 17:23 | 8.644 | 11.647 | 40.098 | 0.077 | |
| 3/30/2018 | 17:24 | 7.816 | 12.493 | 53.281 | 0.094 | |
| 3/30/2018 | 17:25 | 8.486 | 11.813 | 41.533 | 0.058 | |

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| 3/30/2018 | 17:26 | 8.436 | 11.851 | 40.051 | 0.101 | |
| 3/30/2018 | 17:27 | 8.446 | 11.853 | 36.653 | 0.107 | |
| 3/30/2018 | 17:28 | 7.926 | 12.371 | 45.863 | 0.108 | |
| 3/30/2018 | 17:29 | 8.604 | 11.668 | 36.506 | 0.113 | |
| 3/30/2018 | 17:30 | 9.493 | 10.796 | 26.036 | 0.1 | |
| 3/30/2018 | 17:31 | 8.676 | 11.64 | 32.267 | 0.114 | |
| 3/30/2018 | 17:32 | 8.22 | 12.095 | 41.887 | 0.108 | |
| 3/30/2018 | 17:33 | 8.625 | 11.654 | 37.199 | 0.097 | |
| 3/30/2018 | 17:34 | 8.753 | 11.531 | 35.18 | 0.101 | |
| 3/30/2018 | 17:35 | 8.691 | 11.595 | 33.847 | 0.105 | |
| Run 4 Average | | 8.58 | 11.72 | 38.05 | 0.09 | |
| 3/30/2018 | 17:36 | 9.723 | 10.415 | 11.31 | 0.099 | |
| 3/30/2018 | 17:36 | 9.723 | 10.415 | 11.31 | 0.099 | |
| 3/30/2018 | 17:37 | 10.725 | 10.871 | 0.225 | 0.041 | |
| 3/30/2018 | 17:38 | 10.738 | 10.874 | 0.195 | 0.02 | O2 CO2 Bias |
| 3/30/2018 | 17:39 | 3.792 | 3.749 | 0.182 | 0.72 | |
| 3/30/2018 | 17:40 | 0.043 | 0.051 | 0.173 | 4.315 | |
| 3/30/2018 | 17:41 | 0.035 | 0.037 | 0.17 | 4.73 | CO Bias |
| 3/30/2018 | 17:42 | 0.035 | 0.031 | 16.658 | 4.519 | |
| 3/30/2018 | 17:43 | 0.035 | 0.027 | 48.013 | 0.894 | NOx Bias |
| 3/30/2018 | 17:44 | 0.04 | 0.013 | 11.619 | 0.044 | CO Zero |
| 3/30/2018 | 17:45 | 0.035 | 0.011 | 0.16 | 1.083 | O2 CO2 NOx Zero |
| 3/30/2018 | 17:46 | 7.503 | 8.476 | 36.093 | 4.485 | |
| 3/30/2018 | 17:47 | 10.793 | 10.902 | 48.428 | 4.754 | Span |
| 3/30/2018 | 17:48 | 9.825 | 10.795 | 28.693 | 3.359 | |
| 3/30/2018 | 17:49 | 8.934 | 11.366 | 25.469 | 0.22 | |
| 3/30/2018 | 17:50 | 8.474 | 11.819 | 32.587 | 0.108 | |
| 3/30/2018 | 17:51 | 8.463 | 11.816 | 37.495 | 0.085 | |
| 3/30/2018 | 17:52 | 8.322 | 11.96 | 42.259 | 0.078 | |
| 3/30/2018 | 17:53 | 8.712 | 11.564 | 40.047 | 0.098 | |
| 3/30/2018 | 17:54 | 8.549 | 11.732 | 37.553 | 0.072 | |
| 3/30/2018 | 17:55 | 8.737 | 11.542 | 32.446 | 0.097 | |
| 3/30/2018 | 17:56 | 8.402 | 11.88 | 37.762 | 0.109 | |
| 3/30/2018 | 17:57 | 8.018 | 12.266 | 50.204 | 0.103 | |
| 3/30/2018 | 17:58 | 9.081 | 11.175 | 33.5 | 0.095 | |
| 3/30/2018 | 17:59 | 8.577 | 11.702 | 36.589 | 0.089 | |
| 3/30/2018 | 18:00 | 8.587 | 11.682 | 36.21 | 0.123 | |
| 3/30/2018 | 18:01 | 8.262 | 12.011 | 41.759 | 0.093 | |
| 3/30/2018 | 18:02 | 8.037 | 12.249 | 47.499 | 0.098 | |
| 3/30/2018 | 18:03 | 7.746 | 12.541 | 52.624 | 0.055 | |
| 3/30/2018 | 18:04 | 8.129 | 12.151 | 46.312 | 0.082 | |
| 3/30/2018 | 18:05 | 9.234 | 11.032 | 30.687 | 0.107 | |
| 3/30/2018 | 18:06 | 8.305 | 11.976 | 38.871 | 0.118 | |
| 3/30/2018 | 18:07 | 8.663 | 11.603 | 37.886 | 0.105 | |
| 3/30/2018 | 18:08 | 8.566 | 11.709 | 33.577 | 0.106 | |
| 3/30/2018 | 18:09 | 9.088 | 11.175 | 26.453 | 0.124 | |
| 3/30/2018 | 18:10 | 8.653 | 11.635 | 31.289 | 0.106 | |
| 3/30/2018 | 18:11 | 8.448 | 11.818 | 33.715 | 0.123 | |
| 3/30/2018 | 18:12 | 8.346 | 11.916 | 38.249 | 0.096 | |
| 3/30/2018 | 18:13 | 8.406 | 11.854 | 37.022 | 0.118 | |
| 3/30/2018 | 18:14 | 8.525 | 11.731 | 36.781 | 0.101 | |
| 3/30/2018 | 18:15 | 9.091 | 11.171 | 29.461 | 0.092 | |

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| 3/30/2018 | 18:16 | 9.629 | 10.648 | 21.54 | 0.136 | |
| 3/30/2018 | 18:17 | 9.189 | 11.082 | 25.806 | 0.13 | |
| 3/30/2018 | 18:18 | 8.782 | 11.472 | 31.444 | 0.098 | |
| 3/30/2018 | 18:19 | 8.163 | 12.107 | 43.015 | 0.079 | |
| 3/30/2018 | 18:20 | 7.521 | 12.739 | 58.442 | 0.108 | |
| Run 5 Average | | 8.54 | 11.73 | 37.55 | 0.10 | |
| 3/30/2018 | 18:21 | 9.762 | 10.568 | 14.515 | 0.068 | |
| 3/30/2018 | 18:22 | 10.744 | 10.849 | 0.222 | 0.038 | O2 CO2 Bias |
| 3/30/2018 | 18:23 | 3.645 | 3.6 | 0.19 | 0.798 | |
| 3/30/2018 | 18:24 | 0.041 | 0.05 | 0.188 | 4.375 | |
| 3/30/2018 | 18:25 | 0.035 | 0.036 | 0.173 | 4.742 | CO Bias |
| 3/30/2018 | 18:26 | 0.035 | 0.03 | 16.681 | 2.988 | |
| 3/30/2018 | 18:27 | 0.035 | 0.027 | 48.228 | 0.099 | NOx Bias |
| 3/30/2018 | 18:28 | 0.038 | 0.013 | 14.367 | 0.019 | CO Zero |
| 3/30/2018 | 18:29 | 0.036 | 0.01 | 0.168 | 1.325 | O2 CO2 NOx Zero |
| 3/30/2018 | 18:30 | 9.101 | 8.981 | 34.286 | 4.611 | |
| 3/30/2018 | 18:31 | 10.817 | 10.88 | 48.484 | 4.735 | Span |
| 3/30/2018 | 18:32 | 8.886 | 11.67 | 42.956 | 2.612 | |
| 3/30/2018 | 18:33 | 8.418 | 11.861 | 40.519 | 0.131 | |
| 3/30/2018 | 18:34 | 7.879 | 12.421 | 47.68 | 0.073 | |
| 3/30/2018 | 18:35 | 8.241 | 12.021 | 40.802 | 0.094 | |
| 3/30/2018 | 18:36 | 8.574 | 11.714 | 34.499 | 0.111 | |
| 3/30/2018 | 18:37 | 8.207 | 12.06 | 37.442 | 0.098 | |
| 3/30/2018 | 18:38 | 8.331 | 11.945 | 38.038 | 0.061 | |
| 3/30/2018 | 18:39 | 8.141 | 12.125 | 38.388 | 0.11 | |
| 3/30/2018 | 18:40 | 8.166 | 12.113 | 40.005 | 0.082 | |
| 3/30/2018 | 18:41 | 8.228 | 12.018 | 42.476 | 0.087 | |
| 3/30/2018 | 18:42 | 9 | 11.247 | 33.174 | 0.083 | |
| 3/30/2018 | 18:43 | 8.974 | 11.309 | 30.409 | 0.107 | |
| 3/30/2018 | 18:44 | 8.163 | 12.118 | 38.326 | 0.114 | |
| 3/30/2018 | 18:45 | 8.4 | 11.854 | 39.064 | 0.106 | |
| 3/30/2018 | 18:46 | 8.558 | 11.7 | 35.671 | 0.126 | |
| 3/30/2018 | 18:47 | 9.039 | 11.215 | 28.408 | 0.109 | |
| 3/30/2018 | 18:48 | 9.273 | 11.011 | 22.44 | 0.121 | |
| 3/30/2018 | 18:49 | 8.453 | 11.831 | 33.36 | 0.122 | |
| 3/30/2018 | 18:50 | 7.639 | 12.635 | 47.243 | 0.097 | |
| 3/30/2018 | 18:51 | 7.685 | 12.598 | 50.535 | 0.105 | |
| 3/30/2018 | 18:52 | 8.504 | 11.753 | 41.078 | 0.098 | |
| 3/30/2018 | 18:53 | 8.449 | 11.813 | 37.913 | 0.091 | |
| 3/30/2018 | 18:54 | 9.419 | 10.859 | 20.665 | 0.127 | |
| 3/30/2018 | 18:55 | 9.554 | 10.76 | 19.947 | 0.155 | |
| 3/30/2018 | 18:56 | 8.722 | 11.568 | 26.124 | 0.139 | |
| 3/30/2018 | 18:57 | 8.437 | 11.864 | 30.943 | 0.123 | |
| 3/30/2018 | 18:58 | 8.506 | 11.776 | 30.402 | 0.113 | |
| 3/30/2018 | 18:59 | 8.281 | 12.01 | 37.781 | 0.087 | |
| 3/30/2018 | 19:00 | 8.462 | 11.818 | 38.775 | 0.087 | |
| 3/30/2018 | 19:01 | 8.343 | 11.935 | 41.459 | 0.1 | |
| 3/30/2018 | 19:02 | 8.491 | 11.793 | 40.829 | 0.118 | |
| 3/30/2018 | 19:03 | 8.954 | 11.321 | 34.227 | 0.099 | |
| Run 6 Average | | 8.50 | 11.77 | 35.94 | 0.10 | |
| 3/30/2018 | 19:04 | 9.726 | 10.493 | 13.218 | 0.106 | |

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|---|---|---|---|---|---|---|
| 3/30/2018 | 19:05 | 10.764 | 10.85 | 0.218 | 0.045 | O2 CO2 Bias |
| 3/30/2018 | 19:06 | 5.404 | 5.213 | 1.692 | 0.319 | |
| 3/30/2018 | 19:07 | 0.045 | 0.054 | 0.195 | 3.928 | |
| 3/30/2018 | 19:08 | 0.035 | 0.036 | 0.179 | 4.729 | CO Bias |
| 3/30/2018 | 19:09 | 0.035 | 0.03 | 10.824 | 4.701 | |
| 3/30/2018 | 19:10 | 0.035 | 0.025 | 48.469 | 1.323 | NOx Bias |
| 3/30/2018 | 19:11 | 0.039 | 0.017 | 22.292 | 0.159 | |
| 3/30/2018 | 19:12 | 0.036 | 0.011 | 0.166 | 0.047 | Zero |
| 3/30/2018 | 19:13 | 8.643 | 9.601 | 41.775 | 2.067 | |
| 3/30/2018 | 19:14 | 10.817 | 10.886 | 48.816 | 4.727 | |
| 3/30/2018 | 19:15 | 10.817 | 10.891 | 48.818 | 4.746 | Span |
| 3/30/2018 | 19:16 | 10.078 | 11.023 | 41.355 | 4.517 | |
| 3/30/2018 | 19:17 | 8.676 | 11.616 | 35.394 | 0.861 | |
| 3/30/2018 | 19:18 | 8.726 | 11.534 | 37.375 | 0.115 | |
| 3/30/2018 | 19:19 | 8.237 | 12.032 | 44.946 | 0.096 | |
| 3/30/2018 | 19:20 | 8.754 | 11.508 | 35.386 | 0.095 | |
| 3/30/2018 | 19:21 | 9.09 | 11.194 | 26.484 | 0.123 | |
| 3/30/2018 | 19:22 | 9.061 | 11.225 | 26.469 | 0.134 | |
| 3/30/2018 | 19:23 | 8.252 | 12.029 | 37.484 | 0.106 | |
| 3/30/2018 | 19:24 | 7.35 | 12.931 | 52.621 | 0.097 | |
| 3/30/2018 | 19:25 | 8.821 | 11.403 | 37.491 | 0.086 | |
| 3/30/2018 | 19:26 | 9.791 | 10.515 | 26.261 | 0.113 | |
| 3/30/2018 | 19:27 | 9.197 | 11.077 | 28.19 | 0.138 | |
| 3/30/2018 | 19:28 | 7.943 | 12.338 | 45.729 | 0.101 | |
| 3/30/2018 | 19:29 | 8.217 | 12.039 | 42.386 | 0.107 | |
| 3/30/2018 | 19:30 | 7.81 | 12.449 | 52.256 | 0.103 | |
| 3/30/2018 | 19:31 | 8.079 | 12.183 | 49.573 | 0.102 | |
| 3/30/2018 | 19:32 | 7.956 | 12.308 | 49.649 | 0.092 | |
| 3/30/2018 | 19:33 | 8.39 | 11.859 | 38.135 | 0.105 | |
| 3/30/2018 | 19:34 | 9.098 | 11.141 | 28.566 | 0.133 | |
| 3/30/2018 | 19:35 | 9.162 | 11.093 | 24.179 | 0.139 | |
| 3/30/2018 | 19:36 | 9.113 | 11.162 | 25.952 | 0.137 | |
| 3/30/2018 | 19:37 | 8.61 | 11.647 | 35.991 | 0.104 | |
| 3/30/2018 | 19:38 | 9.539 | 10.738 | 25.267 | 0.113 | |
| 3/30/2018 | 19:39 | 7.975 | 12.332 | 42.22 | 0.116 | |
| 3/30/2018 | 19:40 | 7.3 | 12.972 | 59.372 | 0.112 | |
| 3/30/2018 | 19:41 | 7.7 | 12.568 | 55.48 | 0.11 | |
| 3/30/2018 | 19:42 | 8.573 | 11.683 | 41.994 | 0.092 | |
| 3/30/2018 | 19:43 | 8.122 | 12.166 | 40.457 | 0.131 | |
| 3/30/2018 | 19:44 | 8.381 | 11.884 | 37.393 | 0.118 | |
| 3/30/2018 | 19:45 | 8.474 | 11.788 | 36.127 | 0.124 | |
| 3/30/2018 | 19:46 | 8.42 | 11.89 | 34.222 | 0.096 | |
| 3/30/2018 | 19:47 | 8.94 | 11.348 | 30.1 | 0.121 | |
| Run 7 Average | | 8.50 | 11.77 | 38.26 | 0.11 | |
| 3/30/2018 | 19:48 | 9.026 | 11.02 | 24.013 | 0.115 | |
| 3/30/2018 | 19:49 | 10.791 | 10.848 | 0.24 | 0.039 | O2 CO2 Bias |
| 3/30/2018 | 19:50 | 7.959 | 7.768 | 0.199 | 0.086 | |
| 3/30/2018 | 19:51 | 0.06 | 0.069 | 0.169 | 3.322 | |
| 3/30/2018 | 19:52 | 0.035 | 0.043 | 0.172 | 4.764 | CO Bias |
| 3/30/2018 | 19:53 | 0.052 | 0.056 | 0.207 | 4.605 | |
| 3/30/2018 | 19:54 | 0.038 | 0.03 | 44.161 | 0.991 | |

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|---|---|---|---|---|---|---|
| 3/30/2018 | 19:55 | 0.035 | 0.025 | 48.663 | 0.022 | NOx Bias |
| 3/30/2018 | 19:56 | 0.039 | 0.014 | 13.092 | 0.029 | CO Zero |
| 3/30/2018 | 19:57 | 0.035 | 0.014 | 0.172 | 0.669 | O2 CO2 NOx Zero |
| 3/30/2018 | 19:58 | 8.763 | 8.773 | 33.156 | 4.32 | |
| 3/30/2018 | 19:59 | 10.842 | 10.871 | 48.641 | 4.757 | Span |
| 3/30/2018 | 20:00 | 9.764 | 11.031 | 40.422 | 4.305 | |
| 3/30/2018 | 20:01 | 9.406 | 10.9 | 26.201 | 0.596 | |
| 3/30/2018 | 20:02 | 8.203 | 12.093 | 40.857 | 0.14 | |
| 3/30/2018 | 20:03 | 8.26 | 12.021 | 43.506 | 0.147 | |
| 3/30/2018 | 20:04 | 8.731 | 11.557 | 37.96 | 0.186 | |
| 3/30/2018 | 20:05 | 8.767 | 11.526 | 33.409 | 0.189 | |
| 3/30/2018 | 20:06 | 8.845 | 11.448 | 34.607 | 0.2 | |
| 3/30/2018 | 20:07 | 9.255 | 11.03 | 27.421 | 0.185 | |
| 3/30/2018 | 20:08 | 8.974 | 11.32 | 31.604 | 0.182 | |
| 3/30/2018 | 20:09 | 9.025 | 11.268 | 33.909 | 0.195 | |
| 3/30/2018 | 20:10 | 8.295 | 12 | 42.191 | 0.158 | |
| 3/30/2018 | 20:11 | 8.199 | 12.087 | 44.286 | 0.121 | |
| 3/30/2018 | 20:12 | 8.801 | 11.47 | 40.58 | 0.112 | |
| 3/30/2018 | 20:13 | 8.134 | 12.152 | 43.579 | 0.126 | |
| 3/30/2018 | 20:14 | 8.869 | 11.406 | 36.65 | 0.129 | |
| 3/30/2018 | 20:15 | 8.427 | 11.855 | 40.939 | 0.127 | |
| 3/30/2018 | 20:16 | 8.413 | 11.864 | 38.185 | 0.102 | |
| 3/30/2018 | 20:17 | 8.233 | 12.035 | 40.146 | 0.11 | |
| 3/30/2018 | 20:18 | 8.528 | 11.735 | 36.312 | 0.113 | |
| 3/30/2018 | 20:19 | 8.712 | 11.547 | 38.697 | 0.112 | |
| 3/30/2018 | 20:20 | 9.03 | 11.232 | 33.661 | 0.109 | |
| 3/30/2018 | 20:21 | 8.701 | 11.57 | 34.959 | 0.111 | |
| 3/30/2018 | 20:22 | 8.136 | 12.131 | 45.676 | 0.115 | |
| 3/30/2018 | 20:23 | 8.659 | 11.593 | 41.904 | 0.112 | |
| 3/30/2018 | 20:24 | 9.442 | 10.833 | 31.371 | 0.114 | |
| 3/30/2018 | 20:25 | 8.211 | 12.069 | 41.624 | 0.12 | |
| 3/30/2018 | 20:26 | 7.816 | 12.455 | 48.874 | 0.098 | |
| 3/30/2018 | 20:27 | 8.599 | 11.669 | 40.288 | 0.104 | |
| 3/30/2018 | 20:28 | 8.247 | 12.048 | 39.567 | 0.084 | |
| 3/30/2018 | 20:29 | 8.795 | 11.491 | 35.962 | 0.13 | |
| 3/30/2018 | 20:30 | 8.719 | 11.57 | 37.358 | 0.103 | |
| 3/30/2018 | 20:31 | 9.1 | 11.188 | 31.812 | 0.125 | |
| Run 8 Average | | 8.60 | 11.68 | 38.26 | 0.13 | |
| 3/30/2018 | 20:32 | 3.147 | 3.474 | 12.892 | 0.805 | |
| 3/30/2018 | 20:33 | 0.037 | 0.046 | 0.232 | 4.412 | |
| 3/30/2018 | 20:34 | 0.035 | 0.034 | 0.194 | 4.796 | CO Bias |
| 3/30/2018 | 20:35 | 0.035 | 0.03 | 28.24 | 3.902 | |
| 3/30/2018 | 20:36 | 0.035 | 0.026 | 48.432 | 0.545 | NOx Bias |
| 3/30/2018 | 20:37 | 4.314 | 5.105 | 28.498 | 0.224 | |
| 3/30/2018 | 20:38 | 10.837 | 10.851 | 0.188 | 0.064 | O2 CO2 Bias |
| 3/30/2018 | 20:39 | 2.477 | 2.497 | 0.162 | 0.034 | |
| 3/30/2018 | 20:40 | 0.035 | 0.012 | 0.143 | 0.008 | Zero |
| 3/30/2018 | 20:41 | 6.218 | 7.058 | 29.28 | 0.571 | |
| 3/30/2018 | 20:42 | 10.842 | 10.859 | 48.823 | 4.175 | |
| 3/30/2018 | 20:43 | 10.842 | 10.861 | 48.818 | 4.707 | Span |
| 3/30/2018 | 20:44 | 9.233 | 11.309 | 40.461 | 3.404 | |

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|---|---|---|---|---|---|---|
| 3/30/2018 | 20:45 | 8.33 | 11.955 | 43.308 | 0.235 | |
| 3/30/2018 | 20:46 | 8.726 | 11.554 | 37.058 | 0.057 | |
| 3/30/2018 | 20:47 | 8.602 | 11.69 | 37.344 | 0.096 | |
| 3/30/2018 | 20:48 | 7.914 | 12.383 | 45.63 | 0.077 | |
| 3/30/2018 | 20:49 | 7.849 | 12.425 | 48.377 | 0.088 | |
| 3/30/2018 | 20:50 | 8.198 | 12.065 | 45.707 | 0.085 | |
| 3/30/2018 | 20:51 | 7.558 | 12.728 | 56.59 | 0.095 | |
| 3/30/2018 | 20:52 | 7.794 | 12.462 | 54.482 | 0.079 | |
| 3/30/2018 | 20:53 | 8.844 | 11.41 | 39.402 | 0.064 | |
| 3/30/2018 | 20:54 | 9.518 | 10.759 | 21.821 | 0.102 | |
| 3/30/2018 | 20:55 | 9.324 | 10.965 | 19.237 | 0.124 | |
| 3/30/2018 | 20:56 | 8.79 | 11.502 | 22.37 | 0.136 | |
| 3/30/2018 | 20:57 | 7.951 | 12.341 | 34.329 | 0.119 | |
| 3/30/2018 | 20:58 | 8.841 | 11.42 | 26.994 | 0.109 | |
| 3/30/2018 | 20:59 | 9.522 | 10.757 | 24.989 | 0.099 | |
| 3/30/2018 | 21:00 | 8.939 | 11.39 | 30.492 | 0.126 | |
| 3/30/2018 | 21:01 | 7.243 | 13.022 | 54.414 | 0.078 | |
| 3/30/2018 | 21:02 | 8.003 | 12.264 | 50.822 | 0.087 | |
| 3/30/2018 | 21:03 | 9.522 | 10.765 | 32.144 | 0.075 | |
| 3/30/2018 | 21:04 | 8.629 | 11.661 | 36.441 | 0.083 | |
| 3/30/2018 | 21:05 | 8.698 | 11.578 | 37.055 | 0.11 | |
| 3/30/2018 | 21:06 | 8.959 | 11.343 | 33.899 | 0.087 | |
| 3/30/2018 | 21:07 | 8.057 | 12.243 | 45.501 | 0.094 | |
| 3/30/2018 | 21:08 | 8.763 | 11.503 | 38.092 | 0.102 | |
| 3/30/2018 | 21:09 | 9.299 | 11.007 | 29.965 | 0.104 | |
| 3/30/2018 | 21:10 | 8.157 | 12.122 | 42.129 | 0.099 | |
| 3/30/2018 | 21:11 | 8.645 | 11.614 | 41.307 | 0.103 | |
| 3/30/2018 | 21:12 | 8.934 | 11.345 | 36.721 | 0.104 | |
| 3/30/2018 | 21:13 | 8.425 | 11.877 | 39.536 | 0.109 | |
| 3/30/2018 | 21:14 | 8.725 | 11.531 | 38.117 | 0.079 | |
| 3/30/2018 | 21:15 | 8.586 | 11.688 | 42.203 | 0.111 | |
| Run 9 Average | | 8.57 | 11.71 | 38.11 | 0.10 | |
| 3/30/2018 | 21:16 | 8.884 | 11.393 | 30.974 | 0.1 | |
| 3/30/2018 | 21:17 | 8.99 | 11.298 | 30.821 | 0.131 | |
| 3/30/2018 | 21:18 | 7.826 | 10.441 | 38.25 | 0.115 | |
| 3/30/2018 | 21:19 | 0.093 | 0.086 | 1.708 | 1.973 | |
| 3/30/2018 | 21:20 | 0.035 | 0.039 | 0.213 | 4.714 | |
| 3/30/2018 | 21:21 | 0.035 | 0.033 | 0.19 | 4.742 | CO Bias |
| 3/30/2018 | 21:22 | 0.035 | 0.026 | 0.189 | 4.731 | |
| 3/30/2018 | 21:23 | 0.035 | 0.025 | 40.844 | 3.101 | |
| 3/30/2018 | 21:24 | 0.035 | 0.023 | 48.684 | 0.117 | NOx Bias |
| 3/30/2018 | 21:25 | 5.844 | 6.704 | 21.567 | 0.035 | |
| 3/30/2018 | 21:26 | 10.841 | 10.869 | 0.18 | 0.014 | O2 CO2 Bias |
| 3/30/2018 | 21:27 | 1.752 | 1.78 | 0.161 | 0.009 | |
| 3/30/2018 | 21:28 | 0.035 | 0.012 | 0.136 | 0.007 | Zero |
| 3/30/2018 | 21:29 | 8.287 | 9.166 | 39.007 | 1.174 | |
| 3/30/2018 | 21:30 | 10.841 | 10.871 | 48.911 | 4.49 | |
| 3/30/2018 | 21:31 | 10.842 | 10.873 | 48.728 | 4.735 | Span |
| 3/30/2018 | 21:32 | 16.922 | 15.657 | 74.518 | 5.317 | |
| 3/30/2018 | 21:33 | 19.556 | 18.337 | 93.154 | 9.229 | |
| 3/30/2018 | 21:34 | 19.556 | 18.335 | 93.163 | 9.587 | |

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|---|---|---|---|---|---|
| 3/30/2018 | 21:35 | 19.556 | 18.329 | 93.043 | 9.585 |
| 3/30/2018 | 21:36 | 19.556 | 18.331 | 92.699 | 9.631 |

| Date | Time | O2 % | CO2 % | |
|---|---|---|---|---|
| 3/31/2018 | 7:37 | 19.61 | 18.46 | |
| 3/31/2018 | 7:38 | 19.62 | 18.49 | High |
| 3/31/2018 | 7:39 | 11.80 | 11.46 | |
| 3/31/2018 | 7:40 | 10.54 | 10.42 | |
| 3/31/2018 | 7:41 | 3.49 | 2.27 | |
| 3/31/2018 | 7:42 | 0.04 | 0.02 | Zero |
| 3/31/2018 | 7:43 | 14.40 | 0.06 | |
| 3/31/2018 | 7:44 | 20.98 | 0.06 | |
| 3/31/2018 | 7:45 | 20.98 | 0.06 | |
| 3/31/2018 | 7:46 | 20.66 | 0.42 | |
| 3/31/2018 | 7:47 | 10.54 | 10.06 | |
| 3/31/2018 | 7:48 | 9.81 | 9.97 | |
| 3/31/2018 | 7:49 | 10.53 | 10.35 | |
| 3/31/2018 | 7:50 | 10.52 | 10.35 | O2 CO2 Bi |
| 3/31/2018 | 7:51 | 10.52 | 10.36 | |
| 3/31/2018 | 7:52 | 3.01 | 2.72 | |
| 3/31/2018 | 7:53 | 0.06 | 0.04 | Zero Bias |
| 3/31/2018 | 7:54 | 2.61 | 3.52 | |
| 3/31/2018 | 7:55 | 8.92 | 11.44 | |
| 3/31/2018 | 7:56 | 8.89 | 11.47 | |
| 3/31/2018 | 7:57 | 8.97 | 11.39 | |
| 3/31/2018 | 7:58 | 8.87 | 11.49 | |
| 3/31/2018 | 7:59 | 8.43 | 11.97 | |
| 3/31/2018 | 8:00 | 7.69 | 12.65 | |
| 3/31/2018 | 8:01 | 8.15 | 12.18 | |
| 3/31/2018 | 8:02 | 8.60 | 11.75 | |
| 3/31/2018 | 8:03 | 9.37 | 10.98 | |
| 3/31/2018 | 8:04 | 9.60 | 10.75 | |
| 3/31/2018 | 8:05 | 9.11 | 11.23 | |
| 3/31/2018 | 8:06 | 9.29 | 11.06 | |
| 3/31/2018 | 8:07 | 9.15 | 11.22 | |
| 3/31/2018 | 8:08 | 9.20 | 11.16 | |
| 3/31/2018 | 8:09 | 8.26 | 12.06 | |
| 3/31/2018 | 8:10 | 9.06 | 11.31 | |
| 3/31/2018 | 8:11 | 8.78 | 11.56 | |
| 3/31/2018 | 8:12 | 8.82 | 11.53 | |
| 3/31/2018 | 8:13 | 9.18 | 11.15 | |
| 3/31/2018 | 8:14 | 8.53 | 11.83 | |
| 3/31/2018 | 8:15 | 8.60 | 11.74 | |
| 3/31/2018 | 8:16 | 8.94 | 11.38 | |
| 3/31/2018 | 8:17 | 8.76 | 11.62 | |
| 3/31/2018 | 8:18 | 8.91 | 11.42 | |
| 3/31/2018 | 8:19 | 9.73 | 10.61 | |
| 3/31/2018 | 8:20 | 8.86 | 11.51 | |
| 3/31/2018 | 8:21 | 7.55 | 12.83 | |
| 3/31/2018 | 8:22 | 8.21 | 12.10 | |
| 3/31/2018 | 8:23 | 8.69 | 11.62 | |

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|---|---|---|---|
| 3/31/2018 | 8:24 | 9.04 | 11.30 |
| 3/31/2018 | 8:25 | 9.03 | 11.32 |
| 3/31/2018 | 8:26 | 7.84 | 12.53 |
| 3/31/2018 | 8:27 | 8.13 | 12.25 |
| 3/31/2018 | 8:28 | 8.14 | 12.21 |
| 3/31/2018 | 8:29 | 8.46 | 11.90 |
| 3/31/2018 | 8:30 | 8.14 | 12.27 |
| 3/31/2018 | 8:31 | 9.10 | 11.29 |
| 3/31/2018 | 8:32 | 9.53 | 10.86 |
| 3/31/2018 | 8:33 | 9.82 | 10.63 |
| 3/31/2018 | 8:34 | 9.59 | 10.83 |
| 3/31/2018 | 8:35 | 9.35 | 11.11 |
| 3/31/2018 | 8:36 | 7.76 | 12.69 |
| 3/31/2018 | 8:37 | 8.05 | 12.35 |
| 3/31/2018 | 8:38 | 8.45 | 11.96 |
| 3/31/2018 | 8:39 | 9.24 | 11.18 |
| 3/31/2018 | 8:40 | 8.45 | 11.98 |
| 3/31/2018 | 8:41 | 9.07 | 11.34 |
| 3/31/2018 | 8:42 | 9.12 | 11.27 |
| 3/31/2018 | 8:43 | 9.34 | 11.11 |
| 3/31/2018 | 8:44 | 9.24 | 11.18 |
| 3/31/2018 | 8:45 | 9.13 | 11.27 |
| 3/31/2018 | 8:46 | 9.18 | 11.22 |
| 3/31/2018 | 8:47 | 9.19 | 11.23 |
| 3/31/2018 | 8:48 | 8.78 | 11.60 |
| 3/31/2018 | 8:49 | 8.94 | 11.44 |
| 3/31/2018 | 8:50 | 9.28 | 11.09 |
| 3/31/2018 | 8:51 | 9.32 | 11.06 |
| 3/31/2018 | 8:52 | 8.62 | 11.78 |
| 3/31/2018 | 8:53 | 8.57 | 11.79 |
| 3/31/2018 | 8:54 | 8.59 | 11.76 |
| 3/31/2018 | 8:55 | 8.36 | 12.02 |
| 3/31/2018 | 8:56 | 8.01 | 12.35 |
| 3/31/2018 | 8:57 | 8.75 | 11.60 |
| 3/31/2018 | 8:58 | 8.68 | 11.70 |
| 3/31/2018 | 8:59 | 8.05 | 12.32 |
| 3/31/2018 | 9:00 | 8.53 | 11.76 |
| 3/31/2018 | 9:01 | 8.11 | 12.25 |
| 3/31/2018 | 9:02 | 8.61 | 11.72 |
| 3/31/2018 | 9:03 | 8.74 | 11.59 |
| 3/31/2018 | 9:04 | 8.82 | 11.51 |
| 3/31/2018 | 9:05 | 8.56 | 11.74 |
| 3/31/2018 | 9:06 | 8.66 | 11.67 |
| 3/31/2018 | 9:07 | 9.41 | 10.94 |
| 3/31/2018 | 9:08 | 9.18 | 11.19 |
| 3/31/2018 | 9:09 | 8.68 | 11.68 |
| 3/31/2018 | 9:10 | 8.83 | 11.53 |
| 3/31/2018 | 9:11 | 9.10 | 11.27 |
| 3/31/2018 | 9:12 | 9.12 | 11.26 |

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|---|---|---|---|
| 3/31/2018 | 9:13 | 8.83 | 11.56 |
| 3/31/2018 | 9:14 | 8.82 | 11.56 |
| 3/31/2018 | 9:15 | 8.39 | 12.04 |
| 3/31/2018 | 9:16 | 8.33 | 12.04 |
| 3/31/2018 | 9:19 | 8.89 | 11.52 |
| 3/31/2018 | 9:20 | 8.66 | 11.75 |
| 3/31/2018 | 9:21 | 8.53 | 11.88 |
| 3/31/2018 | 9:22 | 8.49 | 11.93 |
| 3/31/2018 | 9:23 | 8.98 | 11.42 |
| 3/31/2018 | 9:24 | 9.35 | 11.05 |
| 3/31/2018 | 9:25 | 9.12 | 11.29 |
| 3/31/2018 | 9:26 | 8.79 | 11.67 |
| 3/31/2018 | 9:27 | 8.18 | 12.21 |
| 3/31/2018 | 9:28 | 8.98 | 11.43 |
| 3/31/2018 | 9:29 | 8.79 | 11.63 |
| 3/31/2018 | 9:30 | 8.72 | 11.69 |
| 3/31/2018 | 9:31 | 8.50 | 11.89 |
| 3/31/2018 | 9:32 | 8.73 | 11.68 |
| 3/31/2018 | 9:33 | 8.65 | 11.76 |
| 3/31/2018 | 9:34 | 8.64 | 11.77 |
| 3/31/2018 | 9:35 | 8.68 | 11.76 |
| 3/31/2018 | 9:36 | 8.96 | 11.42 |
| 3/31/2018 | 9:37 | 8.61 | 11.83 |
| 3/31/2018 | 9:38 | 8.53 | 11.84 |
| 3/31/2018 | 9:39 | 8.31 | 12.08 |
| 3/31/2018 | 9:40 | 8.23 | 12.18 |
| 3/31/2018 | 9:41 | 9.02 | 11.36 |
| 3/31/2018 | 9:42 | 8.91 | 11.53 |
| 3/31/2018 | 9:43 | 8.97 | 11.42 |
| 3/31/2018 | 9:44 | 9.03 | 11.37 |
| 3/31/2018 | 9:45 | 9.04 | 11.37 |
| 3/31/2018 | 9:46 | 9.19 | 11.25 |
| 3/31/2018 | 9:47 | 9.01 | 11.41 |
| 3/31/2018 | 9:48 | 9.08 | 11.34 |
| 3/31/2018 | 9:49 | 8.64 | 11.77 |
| 3/31/2018 | 9:50 | 8.66 | 11.74 |
| 3/31/2018 | 9:51 | 8.72 | 11.65 |
| 3/31/2018 | 9:52 | 8.81 | 11.55 |
| 3/31/2018 | 9:53 | 8.92 | 11.47 |
| 3/31/2018 | 9:54 | 8.50 | 11.86 |
| 3/31/2018 | 9:55 | 9.09 | 11.27 |
| 3/31/2018 | 9:56 | 9.72 | 10.67 |
| 3/31/2018 | 9:57 | 9.60 | 10.79 |
| 3/31/2018 | 9:58 | 8.69 | 11.72 |
| 3/31/2018 | 9:59 | 8.12 | 12.21 |
| 3/31/2018 | 10:00 | 7.79 | 12.58 |
| 3/31/2018 | 10:01 | 8.51 | 11.80 |
| 3/31/2018 | 10:02 | 9.11 | 11.21 |
| 3/31/2018 | 10:03 | 9.08 | 11.26 |

| | | | | |
|---|---|---|---|---|
| 3/31/2018 | 10:04 | 8.86 | 11.48 | |
| 3/31/2018 | 10:05 | 8.98 | 11.33 | |
| 3/31/2018 | 10:06 | 8.88 | 11.49 | |
| 3-PM-U1 | | 8.79 | 11.59 | |
| 3/31/2018 | 10:07 | 7.31 | 10.02 | |
| 3/31/2018 | 10:08 | 0.09 | 0.09 | |
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| 3/31/2018 | 10:10 | 6.24 | 6.49 | |
| 3/31/2018 | 10:11 | 10.38 | 10.36 | O2 CO2 Bi |
| 3/31/2018 | 10:12 | 1.31 | 1.30 | |
| 3/31/2018 | 10:13 | 0.04 | 0.01 | Zero |
| 3/31/2018 | 10:14 | 3.02 | 3.09 | |
| 3/31/2018 | 10:15 | 10.50 | 10.41 | |
| 3/31/2018 | 10:16 | 10.52 | 10.42 | Span |
| 3/31/2018 | 10:17 | 9.05 | 11.50 | |
| 3/31/2018 | 10:18 | 8.61 | 11.81 | |
| 3/31/2018 | 10:19 | 8.63 | 11.80 | |
| 3/31/2018 | 10:20 | 8.66 | 11.77 | |
| 3/31/2018 | 10:21 | 9.26 | 11.20 | |
| 3/31/2018 | 10:22 | 8.33 | 12.13 | |
| 3/31/2018 | 10:23 | 8.76 | 11.68 | |
| 3/31/2018 | 10:24 | 8.62 | 11.87 | |
| 3/31/2018 | 10:25 | 8.75 | 11.70 | |
| 3/31/2018 | 10:26 | 8.04 | 12.44 | |
| 3/31/2018 | 10:27 | 7.88 | 12.60 | |
| 3/31/2018 | 10:28 | 8.32 | 12.14 | |
| 3/31/2018 | 10:29 | 8.67 | 11.80 | |
| 3/31/2018 | 10:30 | 8.95 | 11.51 | |
| 3/31/2018 | 10:31 | 8.72 | 11.78 | |
| 3/31/2018 | 10:32 | 9.67 | 10.80 | |
| 3/31/2018 | 10:33 | 9.98 | 10.55 | |
| 3/31/2018 | 10:34 | 9.40 | 11.16 | |
| 3/31/2018 | 10:35 | 8.24 | 12.29 | |
| 3/31/2018 | 10:36 | 9.01 | 11.45 | |
| 3/31/2018 | 10:37 | 9.40 | 11.15 | |
| 3/31/2018 | 10:38 | 8.51 | 11.98 | |
| 3/31/2018 | 10:39 | 8.76 | 11.75 | |
| 3/31/2018 | 10:40 | 8.06 | 12.45 | |
| 3/31/2018 | 10:41 | 8.86 | 11.67 | |
| 3/31/2018 | 10:42 | 8.89 | 11.62 | |
| 3/31/2018 | 10:43 | 9.19 | 11.35 | |
| 3/31/2018 | 10:44 | 9.16 | 11.38 | |
| 3/31/2018 | 10:45 | 9.23 | 11.33 | |
| 3/31/2018 | 10:46 | 8.90 | 11.63 | |
| 3/31/2018 | 10:47 | 8.82 | 11.72 | |
| 3/31/2018 | 10:48 | 8.69 | 11.84 | |
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| 3/31/2018 | 10:50 | 8.37 | 12.15 | |

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| 3/31/2018 | 10:52 | 8.72 | 11.79 |
| 3/31/2018 | 10:53 | 8.73 | 11.77 |
| 3/31/2018 | 10:54 | 8.95 | 11.56 |
| 3/31/2018 | 10:55 | 7.97 | 12.52 |
| 3/31/2018 | 10:56 | 8.19 | 12.26 |
| 3/31/2018 | 10:57 | 9.16 | 11.31 |
| 3/31/2018 | 10:58 | 9.40 | 11.06 |
| 3/31/2018 | 10:59 | 9.41 | 11.07 |
| 3/31/2018 | 11:00 | 8.81 | 11.64 |
| 3/31/2018 | 11:01 | 8.74 | 11.73 |
| 3/31/2018 | 11:02 | 8.26 | 12.18 |
| 3/31/2018 | 11:03 | 8.32 | 12.10 |
| 3/31/2018 | 11:04 | 7.99 | 12.48 |
| 3/31/2018 | 11:05 | 8.54 | 11.87 |
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| 3/31/2018 | 11:08 | 8.25 | 12.14 |
| 3/31/2018 | 11:09 | 9.05 | 11.33 |
| 3/31/2018 | 11:10 | 8.61 | 11.85 |
| 3/31/2018 | 11:11 | 9.26 | 11.16 |
| 3/31/2018 | 11:12 | 8.98 | 11.43 |
| 3/31/2018 | 11:13 | 9.68 | 10.74 |
| 3/31/2018 | 11:14 | 9.39 | 11.08 |
| 3/31/2018 | 11:15 | 8.94 | 11.52 |
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| 3/31/2018 | 11:18 | 8.90 | 11.56 |
| 3/31/2018 | 11:19 | 8.53 | 11.94 |
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| 3/31/2018 | 11:21 | 9.16 | 11.30 |
| 3/31/2018 | 11:22 | 8.95 | 11.52 |
| 3/31/2018 | 11:23 | 9.09 | 11.39 |
| 3/31/2018 | 11:24 | 8.12 | 12.39 |
| 3/31/2018 | 11:25 | 8.42 | 12.02 |
| 3/31/2018 | 11:26 | 8.99 | 11.49 |
| 3/31/2018 | 11:27 | 9.05 | 11.41 |
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| 3/31/2018 | 11:29 | 8.39 | 12.11 |
| 3/31/2018 | 11:30 | 8.90 | 11.54 |
| 3/31/2018 | 11:31 | 9.16 | 11.34 |
| 3/31/2018 | 11:32 | 9.22 | 11.26 |
| 3/31/2018 | 11:33 | 9.25 | 11.26 |
| 3/31/2018 | 11:34 | 8.01 | 12.51 |
| 3/31/2018 | 11:35 | 7.06 | 13.43 |
| 3/31/2018 | 11:36 | 7.88 | 12.53 |
| 3/31/2018 | 11:37 | 9.22 | 11.25 |
| 3/31/2018 | 11:38 | 9.55 | 10.93 |
| 3/31/2018 | 11:39 | 9.68 | 10.86 |

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| 3/31/2018 | 11:43 | 8.36 | 12.13 |
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| 3/31/2018 | 11:46 | 9.05 | 11.44 |
| 3/31/2018 | 11:47 | 9.01 | 11.48 |
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| 3/31/2018 | 11:49 | 8.90 | 11.57 |
| 3/31/2018 | 11:50 | 8.34 | 12.12 |
| 3/31/2018 | 11:51 | 8.84 | 11.61 |
| 3/31/2018 | 11:52 | 9.22 | 11.23 |
| 3/31/2018 | 11:53 | 9.74 | 10.76 |
| 3/31/2018 | 11:54 | 8.50 | 11.98 |
| 3/31/2018 | 11:55 | 7.28 | 13.17 |
| 3/31/2018 | 11:56 | 8.83 | 11.57 |
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| 3/31/2018 | 11:59 | 7.45 | 13.03 |
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| 3/31/2018 | 12:01 | 8.94 | 11.53 |
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| 3/31/2018 | 12:04 | 8.92 | 11.56 |
| 3/31/2018 | 12:05 | 9.26 | 11.20 |
| 3/31/2018 | 12:06 | 8.72 | 11.75 |
| 3/31/2018 | 12:07 | 8.49 | 11.93 |
| 3/31/2018 | 12:08 | 8.81 | 11.65 |
| 3/31/2018 | 12:09 | 8.76 | 11.72 |
| 3/31/2018 | 12:10 | 8.69 | 11.75 |
| 3/31/2018 | 12:11 | 8.39 | 12.06 |
| 3/31/2018 | 12:12 | 8.96 | 11.49 |
| 3/31/2018 | 12:13 | 9.10 | 11.35 |
| 3/31/2018 | 12:14 | 9.68 | 10.80 |
| 3/31/2018 | 12:15 | 9.14 | 11.31 |
| 3/31/2018 | 12:16 | 9.32 | 11.14 |
| 3/31/2018 | 12:17 | 9.23 | 11.26 |
| 3/31/2018 | 12:18 | 8.68 | 11.82 |
| 3/31/2018 | 12:19 | 8.35 | 12.09 |
| 3/31/2018 | 12:20 | 8.21 | 12.26 |
| 3/31/2018 | 12:21 | 8.53 | 11.91 |
| 3/31/2018 | 12:22 | 9.10 | 11.34 |
| 3/31/2018 | 12:23 | 9.17 | 11.27 |
| 3/31/2018 | 12:24 | 8.56 | 11.94 |
| 3/31/2018 | 12:25 | 8.58 | 11.88 |
| 3/31/2018 | 12:26 | 8.23 | 12.22 |
| 3/31/2018 | 12:27 | 8.34 | 12.10 |
| 3/31/2018 | 12:28 | 9.13 | 11.32 |

| | | | | |
|---|---|---|---|---|
| 3/31/2018 | 12:29 | 8.73 | 11.74 | |
| 3/31/2018 | 12:30 | 8.48 | 12.00 | |
| 3/31/2018 | 12:31 | 8.19 | 12.28 | |
| 3/31/2018 | 12:32 | 8.67 | 11.78 | |
| 3/31/2018 | 12:33 | 8.48 | 12.00 | |
| 3/31/2018 | 12:34 | 8.37 | 12.09 | |
| 3/31/2018 | 12:35 | 9.45 | 11.04 | |
| 3/31/2018 | 12:36 | 8.66 | 11.82 | |
| 3/31/2018 | 12:37 | 8.43 | 12.04 | |
| 3/31/2018 | 12:38 | 8.53 | 11.96 | |
| 3/31/2018 | 12:39 | 8.31 | 12.15 | |
| 3/31/2018 | 12:40 | 8.99 | 11.48 | |
| 3/31/2018 | 12:41 | 8.76 | 11.71 | |
| 3/31/2018 | 12:42 | 8.91 | 11.57 | |
| 3/31/2018 | 12:43 | 8.95 | 11.51 | |
| 3/31/2018 | 12:44 | 8.72 | 11.81 | |
| 3/31/2018 | 12:45 | 8.09 | 12.38 | |
| 3/31/2018 | 12:46 | 9.14 | 11.32 | |
| 3/31/2018 | 12:47 | 9.51 | 11.01 | |
| 3/31/2018 | 12:48 | 8.41 | 12.10 | |
| 3/31/2018 | 12:49 | 8.09 | 12.39 | |
| 3/31/2018 | 12:50 | 8.47 | 11.99 | |
| 4-PM-U1 | | 8.76 | 11.71 | |
| 3/31/2018 | 12:51 | 10.08 | 10.56 | |
| 3/31/2018 | 12:52 | 10.54 | 10.37 | O2 CO2 Bi |
| 3/31/2018 | 12:53 | 4.90 | 4.59 | |
| 3/31/2018 | 12:54 | 0.05 | 0.06 | Zero Bias |
| 3/31/2018 | 12:55 | 9.39 | 9.25 | |
| 3/31/2018 | 12:56 | 10.57 | 10.43 | Span |
| 3/31/2018 | 12:57 | 2.29 | 1.62 | |
| 3/31/2018 | 12:58 | 0.04 | 0.02 | Zero |
| 3/31/2018 | 12:59 | 12.34 | 11.41 | |
| 3/31/2018 | 13:00 | 19.67 | 18.48 | High |

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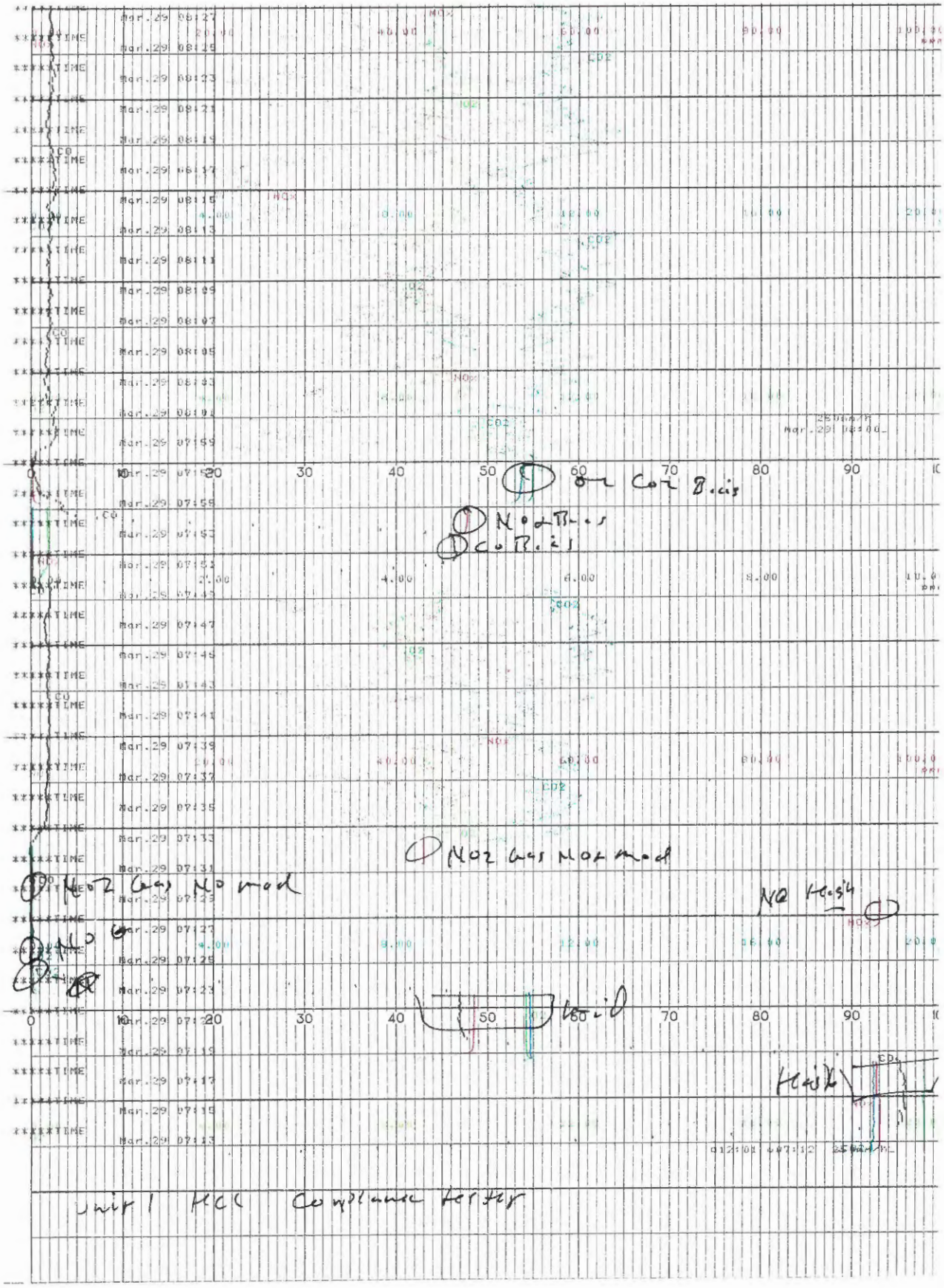
# APPENDIX A.1.3

# UNIT 1 INSTRUMENT STRIP CHARTS



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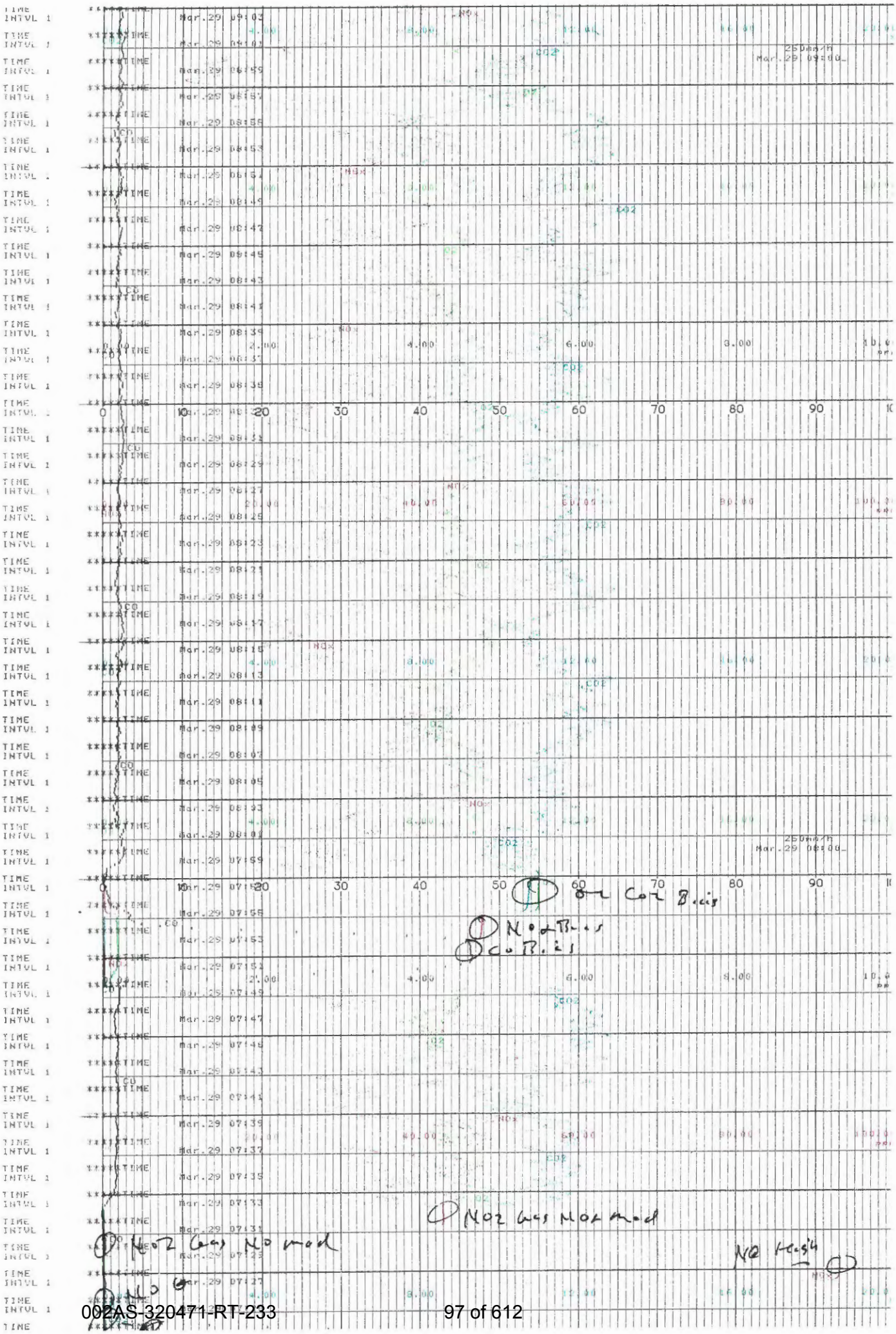
Mar.29 08:23
Mar.29 08:21
Mar.29 08:19
Mar.29 08:17
Mar.29 08:15
Mar.29 08:13
Mar.29 08:11
Mar.29 08:09
Mar.29 08:07
Mar.29 08:05
Mar.29 08:03
Mar.29 08:01
Mar.29 07:59
Mar.29 07:55
Mar.29 07:53
Mar.29 07:51
Mar.29 07:49
Mar.29 07:47
Mar.29 07:45
Mar.29 07:43
Mar.29 07:41
Mar.29 07:39
Mar.29 07:37
Mar.29 07:35
Mar.29 07:33
Mar.29 07:31
Mar.29 07:29
Mar.29 07:27
Mar.29 07:25
Mar.29 07:23
Mar.29 07:19
Mar.29 07:17
Mar.29 07:15
Mar.29 07:13
0 10 20 30 40 50 60 70 80 90
CO2
NOx
CO
O2
Mar.29 08:00
Mar.29 07:12
Unit 1 HCL Compliance Tester



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Mar.29 07:45
Mar.29 07:43
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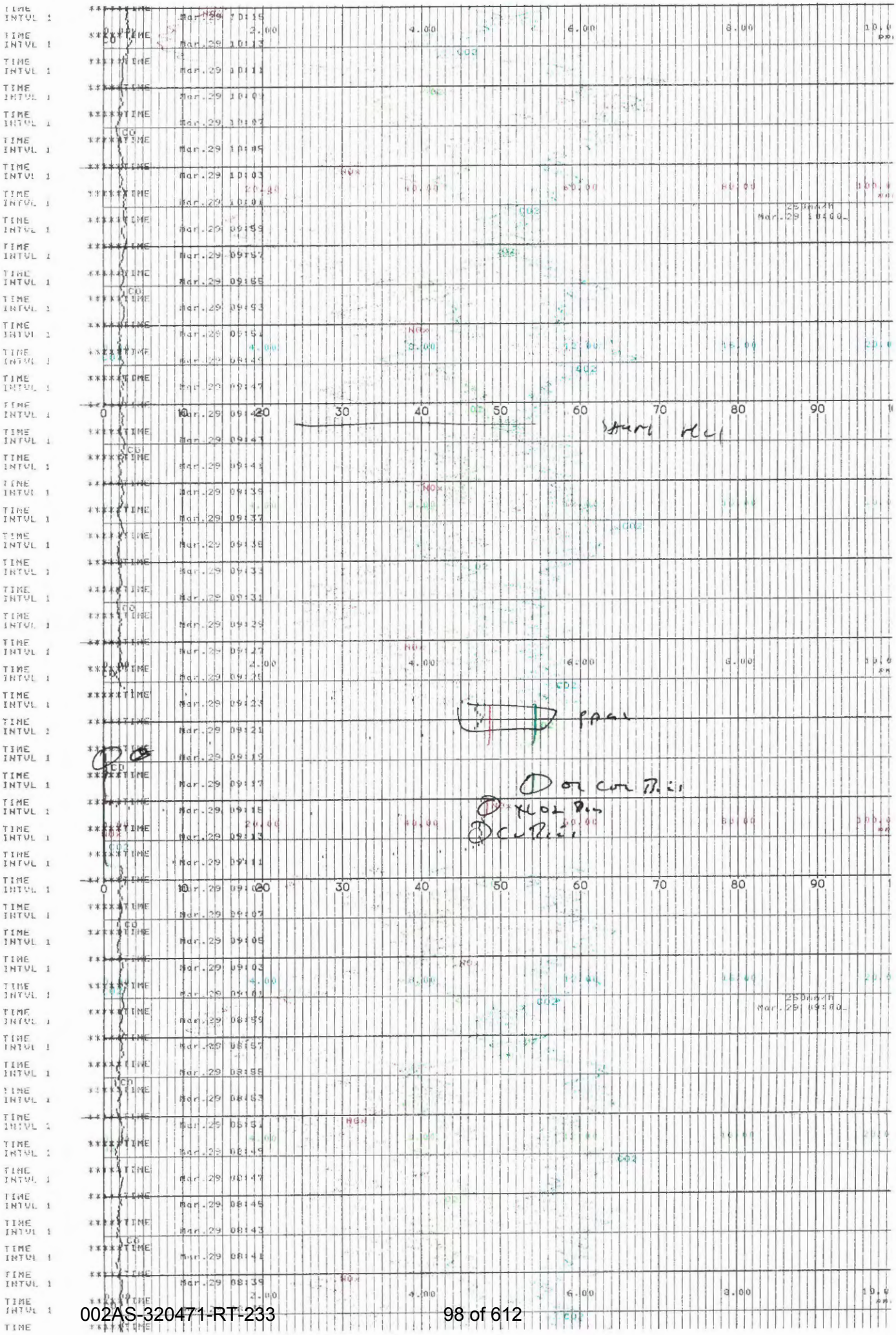
Mar.29 07:39
Mar.29 07:37
Mar.29 07:35
Mar.29 07:33
Mar.29 07:31
Mar.29 07:29
Mar.29 07:27
0 10 20 30 40 50 60 70 80 90
250mm/h
Mar.29 09:00
Mar.29 08:00
or Co2 Bias
NO2 Bias
CO Bias
NO2 Gas NO2 mod
NO2 Gas NO mod
NO High
NO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Mar.29 10:05
Mar.29 10:03
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Mar.29 09:59
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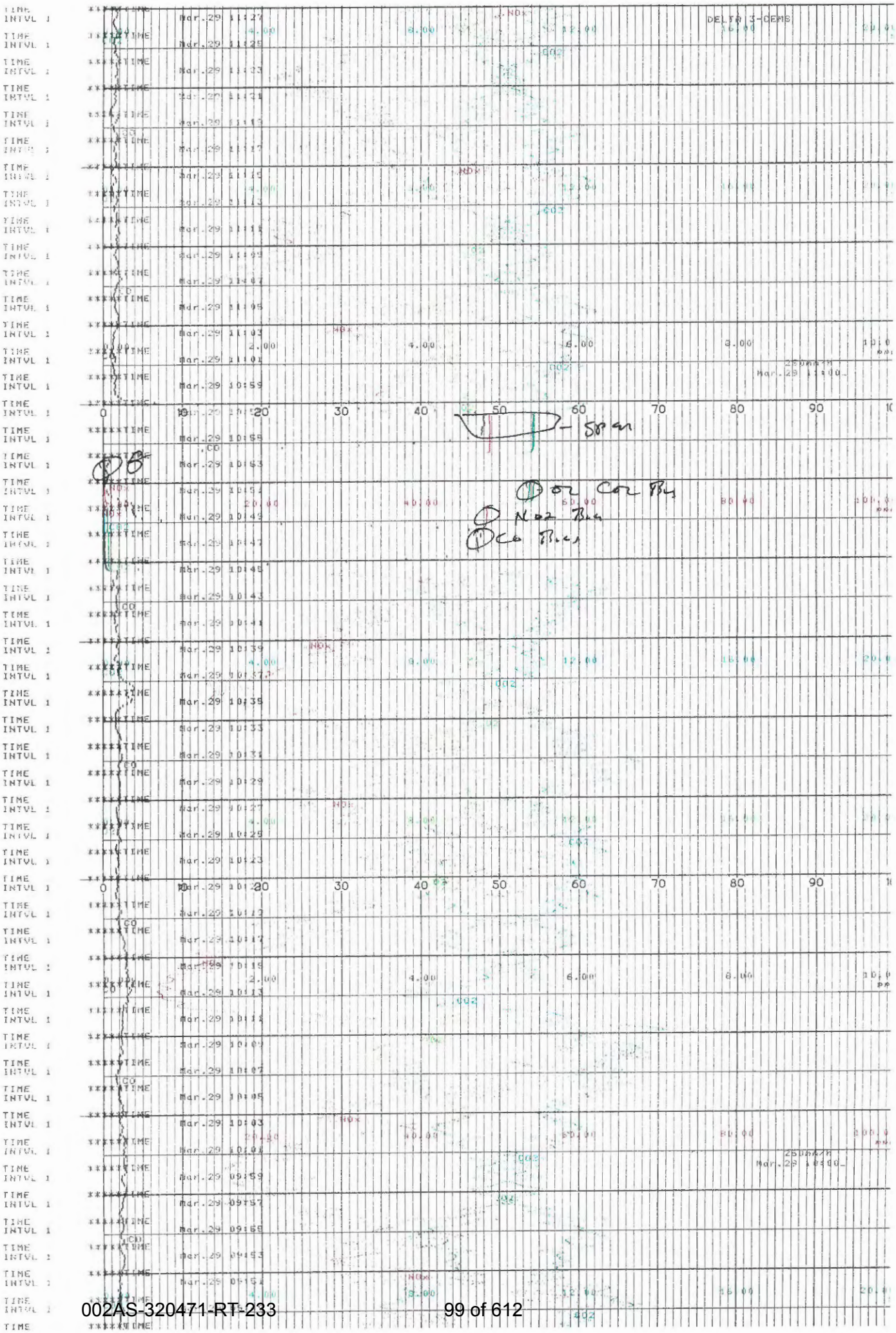
250mm/h
Mar.29 10:00
Mar.29 09:00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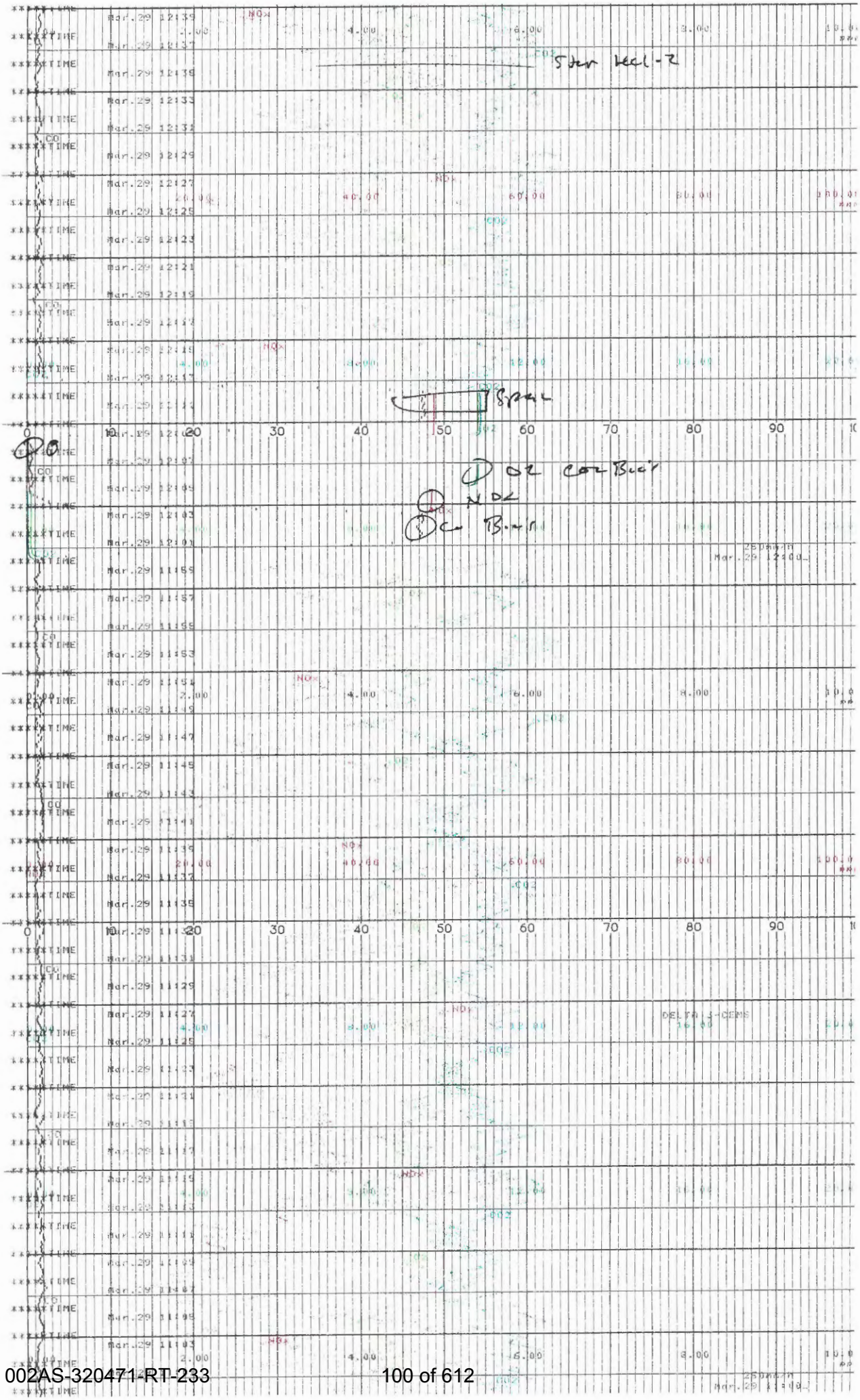
0 10 20 30 40 50 60 70 80 90
- Span
O2 Cor Bias
NO2 Bias
CO Bias


Star Lect-2
Spec
O2 CO2 Bias
NOx
Co Bias
DELTA 3-CEMS
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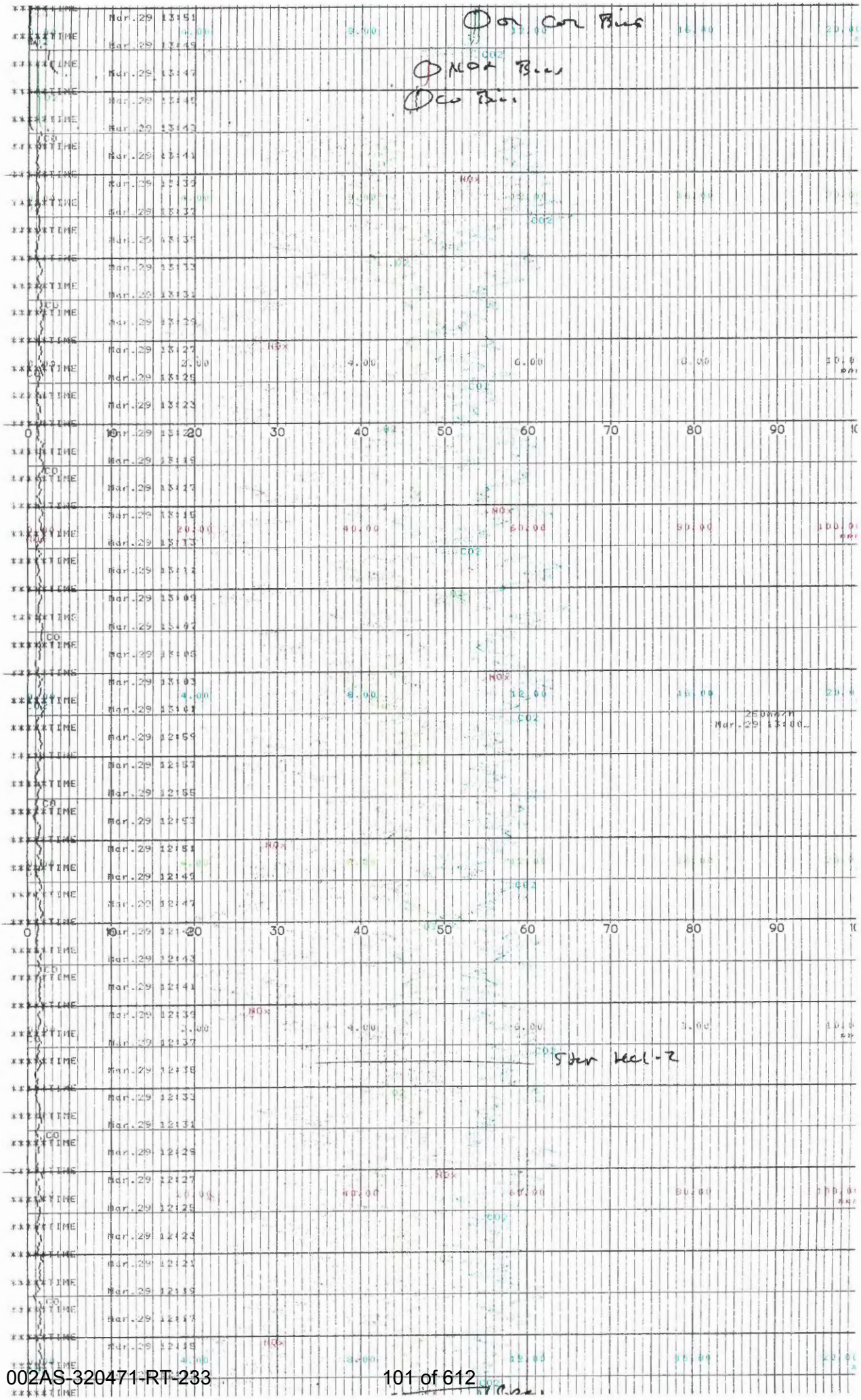
4.00 8.00 12.00 16.00
250mm/m
Mar.29 12:00



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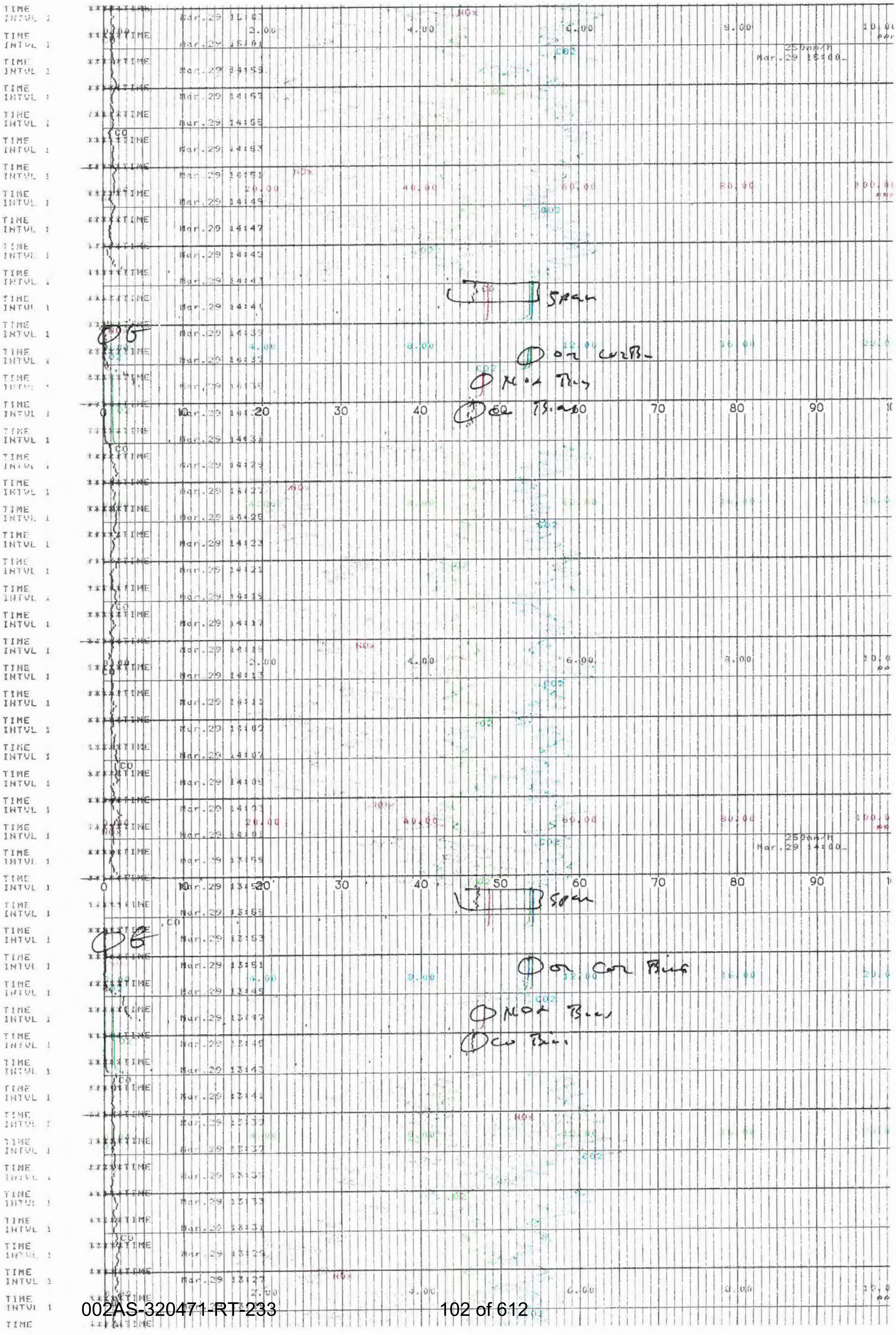
Mar.29 12:17
Mar.29 12:15
0 10 20 30 40 50 60 70 80 90
4.00 8.00 12.00 16.00 20.00
2.00 4.00 6.00 8.00 10.00
20.00 40.00 60.00 80.00 100.00
CO
NOx
CO2
Mar.29 13:00
Star Hcl-2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2.00
4.00
6.00
8.00
250mm/H
Mar.29 15:00
20.00
40.00
60.00
80.00
Span
O2 Corr Bias
NOx Bias
CO Bias
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20
30
40
50
60
70
80
90
Mar.29 14:00
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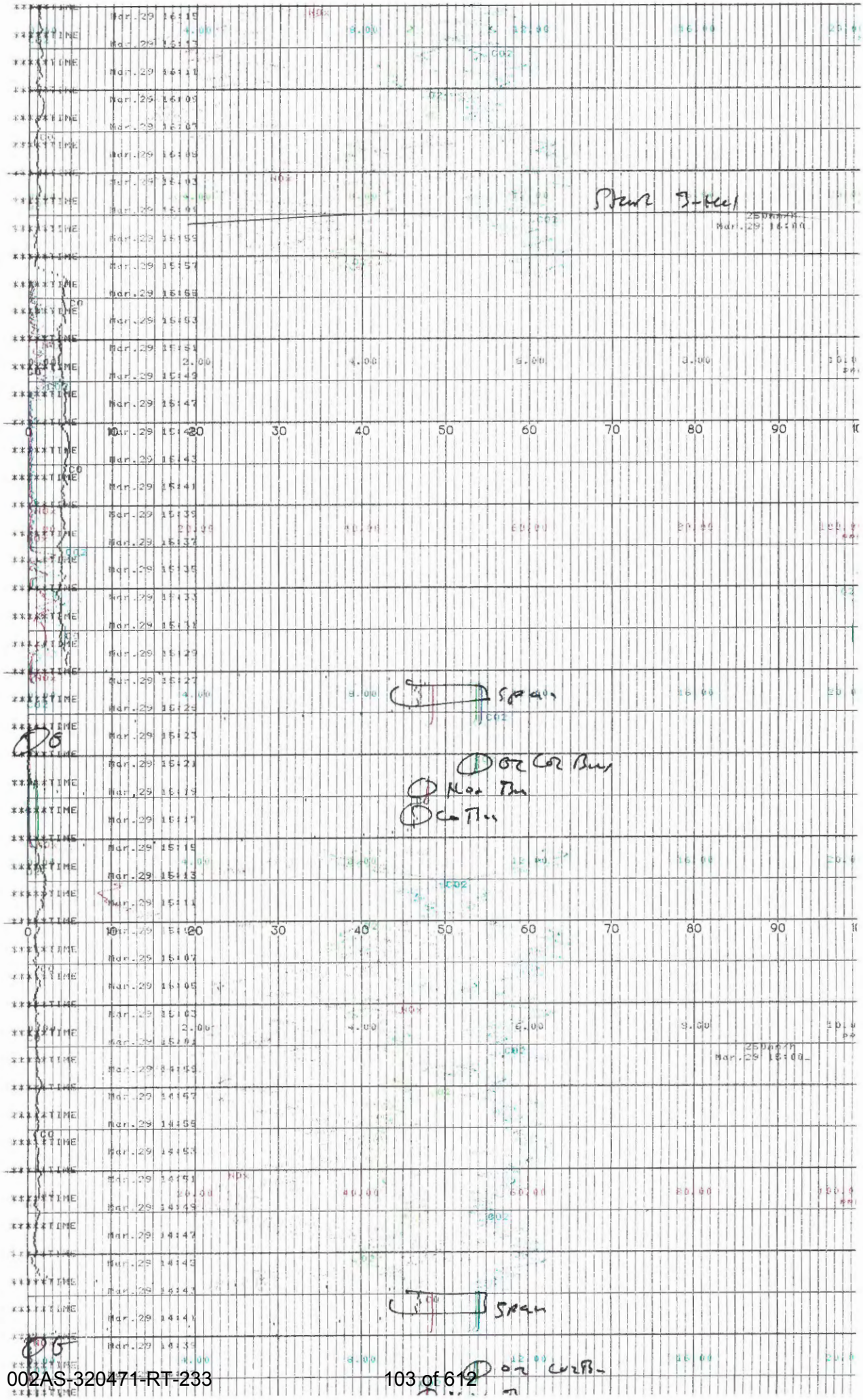
CO2
CO
O2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Mar.29 15:00
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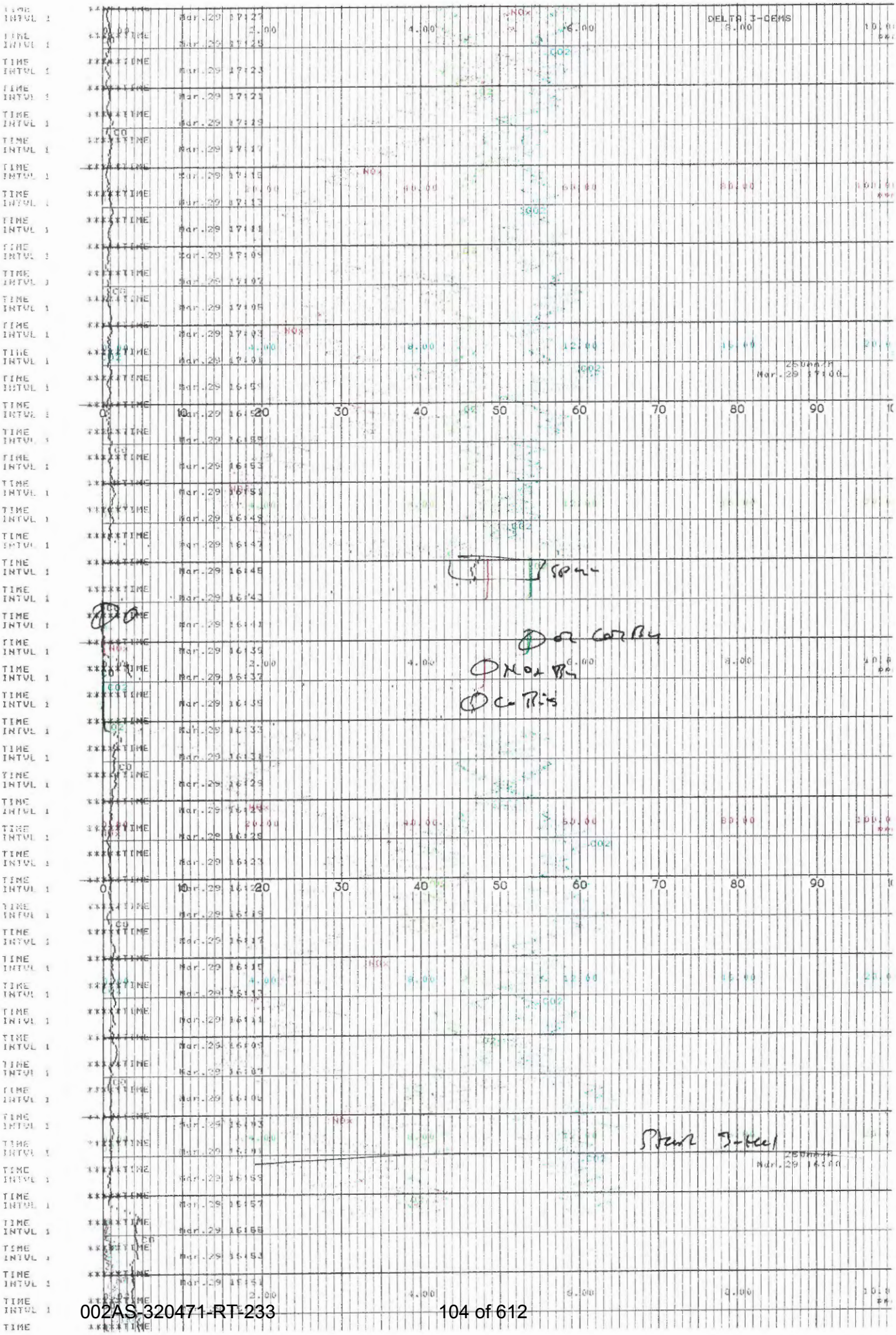
DELTA 3-CEMS
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Or Cor By
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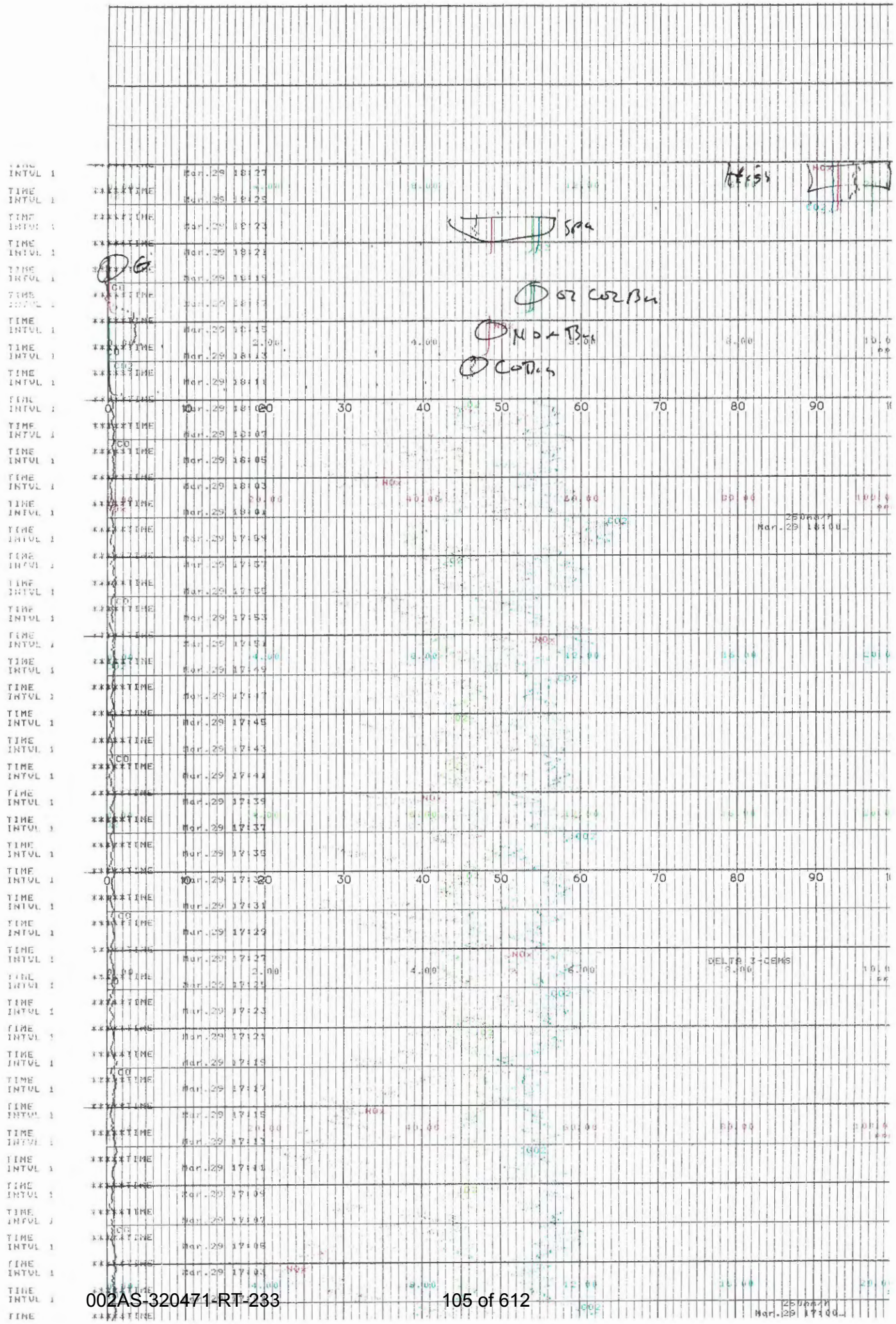

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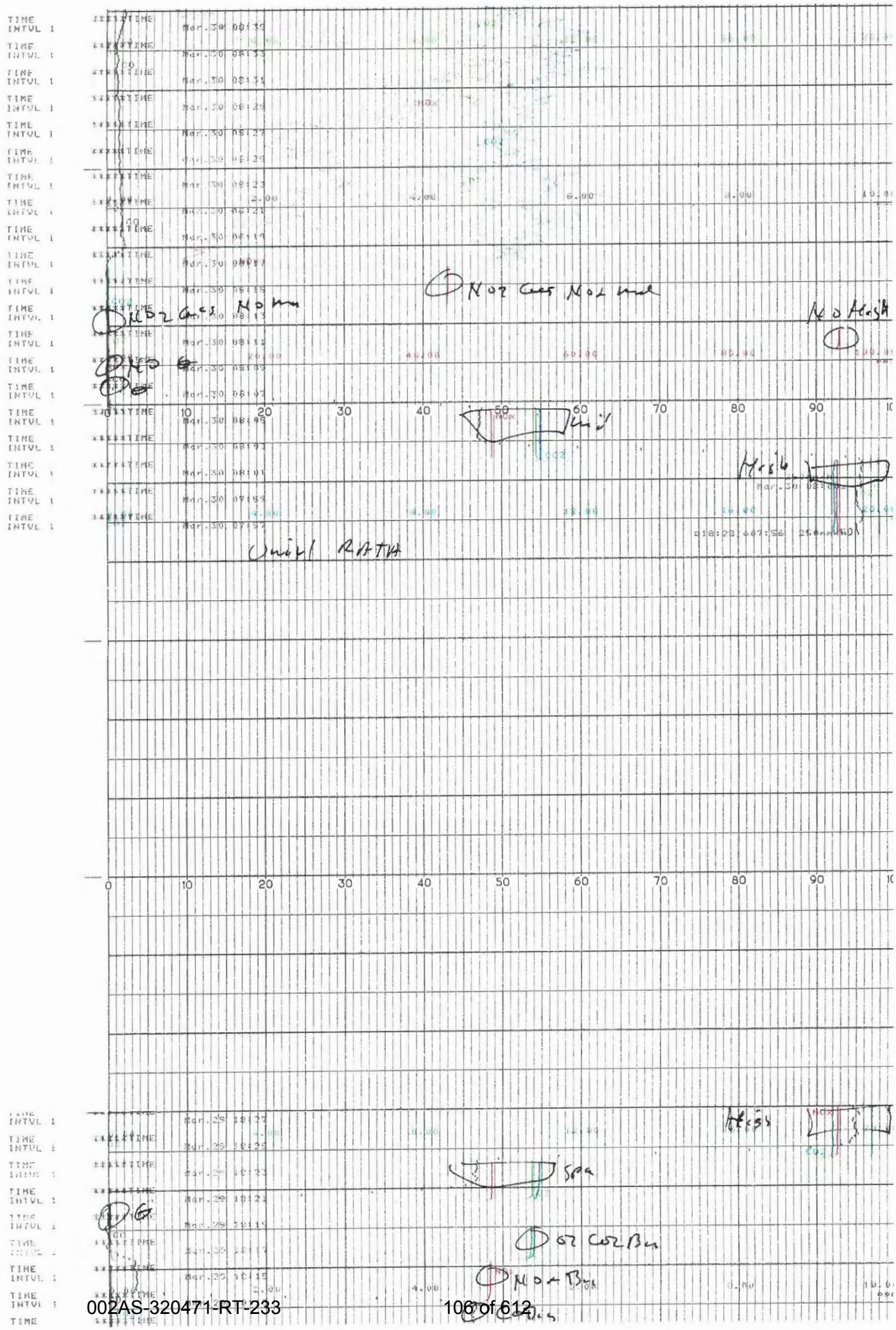
Mar.29 18:00
DELTA 3-CEMS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Mar.30 08:03
Mar.30 08:01
Mar.30 07:59
Mar.30 07:57
0 10 20 30 40 50 60 70 80 90
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Mar.29 18:21
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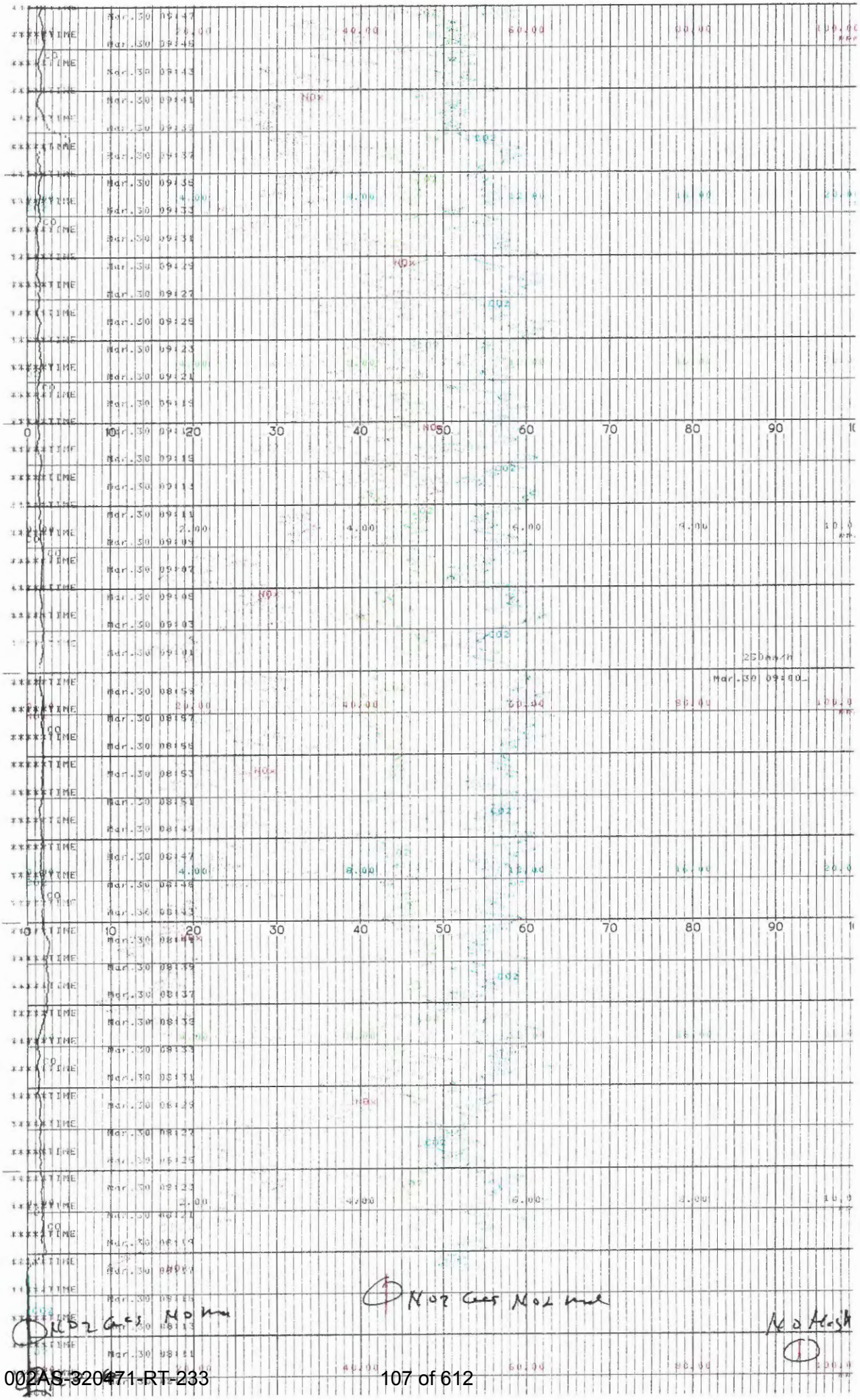
Mar.29 18:15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Mar.30 09:13
Mar.30 09:11
Mar.30 09:09
Mar.30 09:07
Mar.30 09:05
Mar.30 09:03
Mar.30 09:01
250mm/H
Mar.30 09:00
Mar.30 08:59
Mar.30 08:57
Mar.30 08:55
Mar.30 08:53
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Mar.30 08:23
Mar.30 08:21
Mar.30 08:19
Mar.30 08:17
Mar.30 08:15
Mar.30 08:13
Mar.30 08:11
CO
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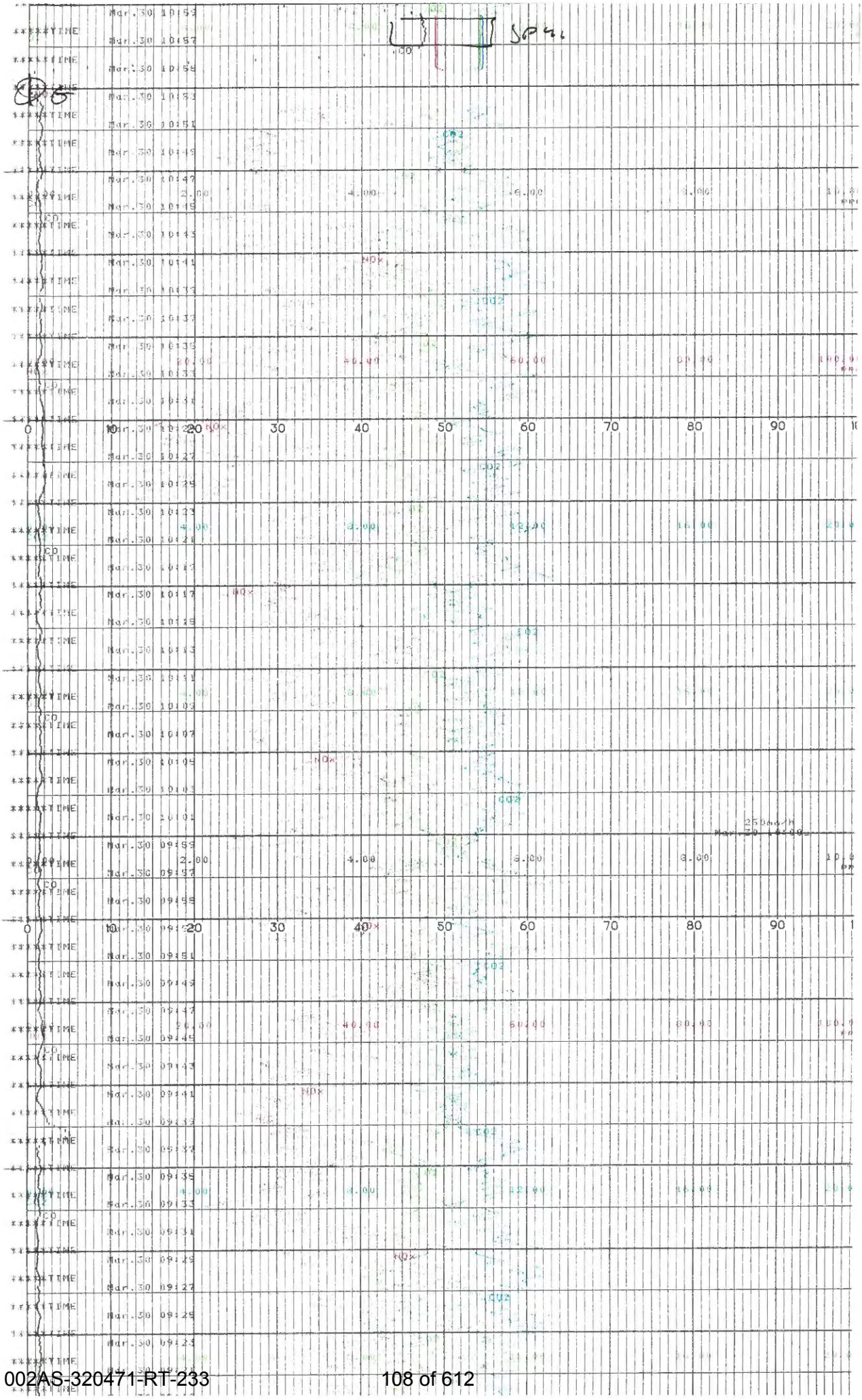
CO2
0
10
20
30
40
50
60
70
80
90
NO2 Gas NO Mod
NO2 Gas NO Mod
No Flash


TIME INTVL 1
Mar.30 10:59
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Mar.30 10:03
Mar.30 10:01
Mar.30 09:59
Mar.30 09:57
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Mar.30 09:51
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Mar.30 09:37
Mar.30 09:35
Mar.30 09:33
Mar.30 09:31
Mar.30 09:29
Mar.30 09:27
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Mar.30 09:23
CO
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20
30
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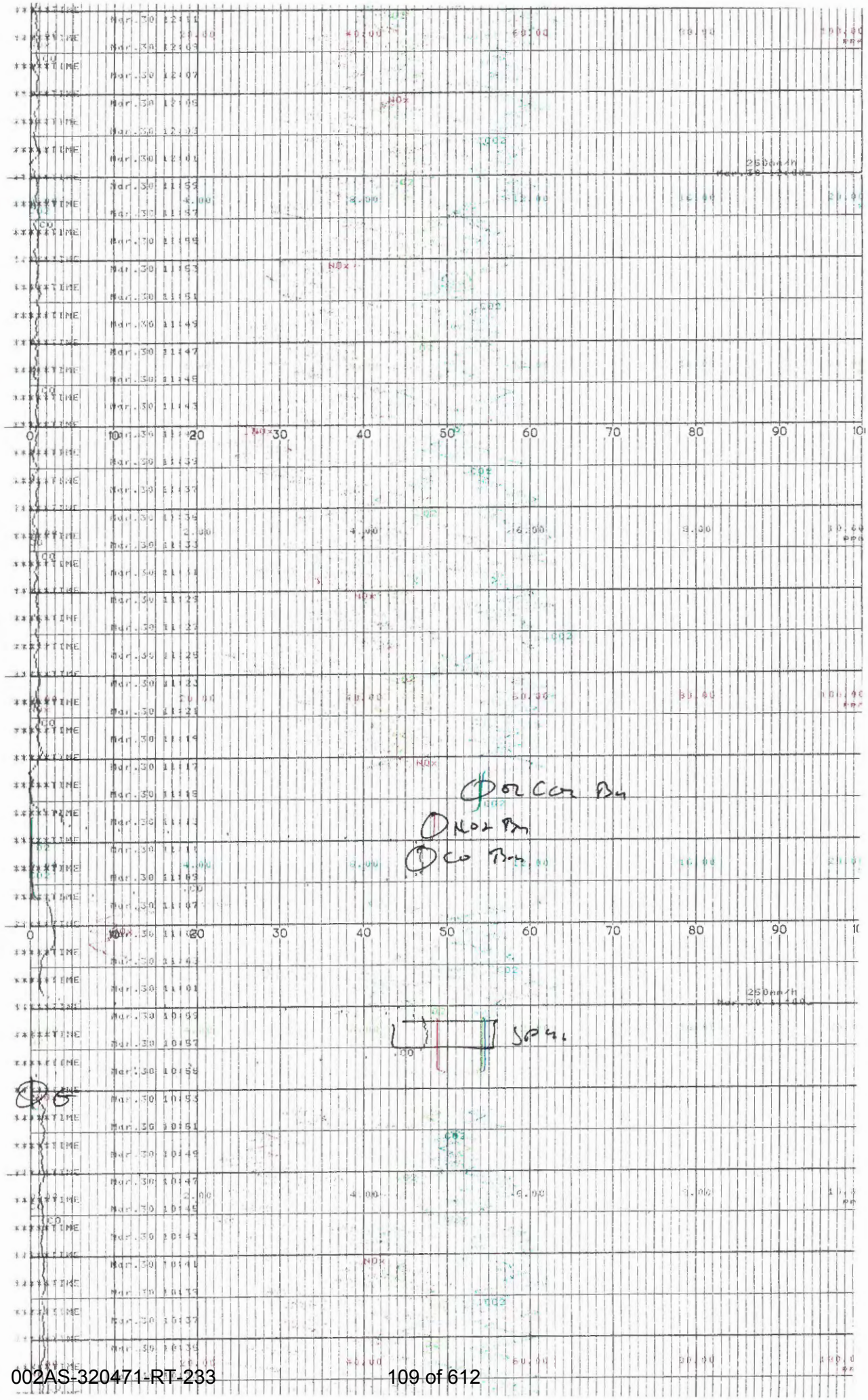
80
90



TIME INTVL 1
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Mar.30 11:25
Mar.30 11:23
Mar.30 11:21
Mar.30 11:19
Mar.30 11:17
Mar.30 11:15
Mar.30 11:13
Mar.30 11:11
Mar.30 11:09
Mar.30 11:07
Mar.30 11:43
Mar.30 11:01
Mar.30 10:59
Mar.30 10:57
Mar.30 10:55
Mar.30 10:53
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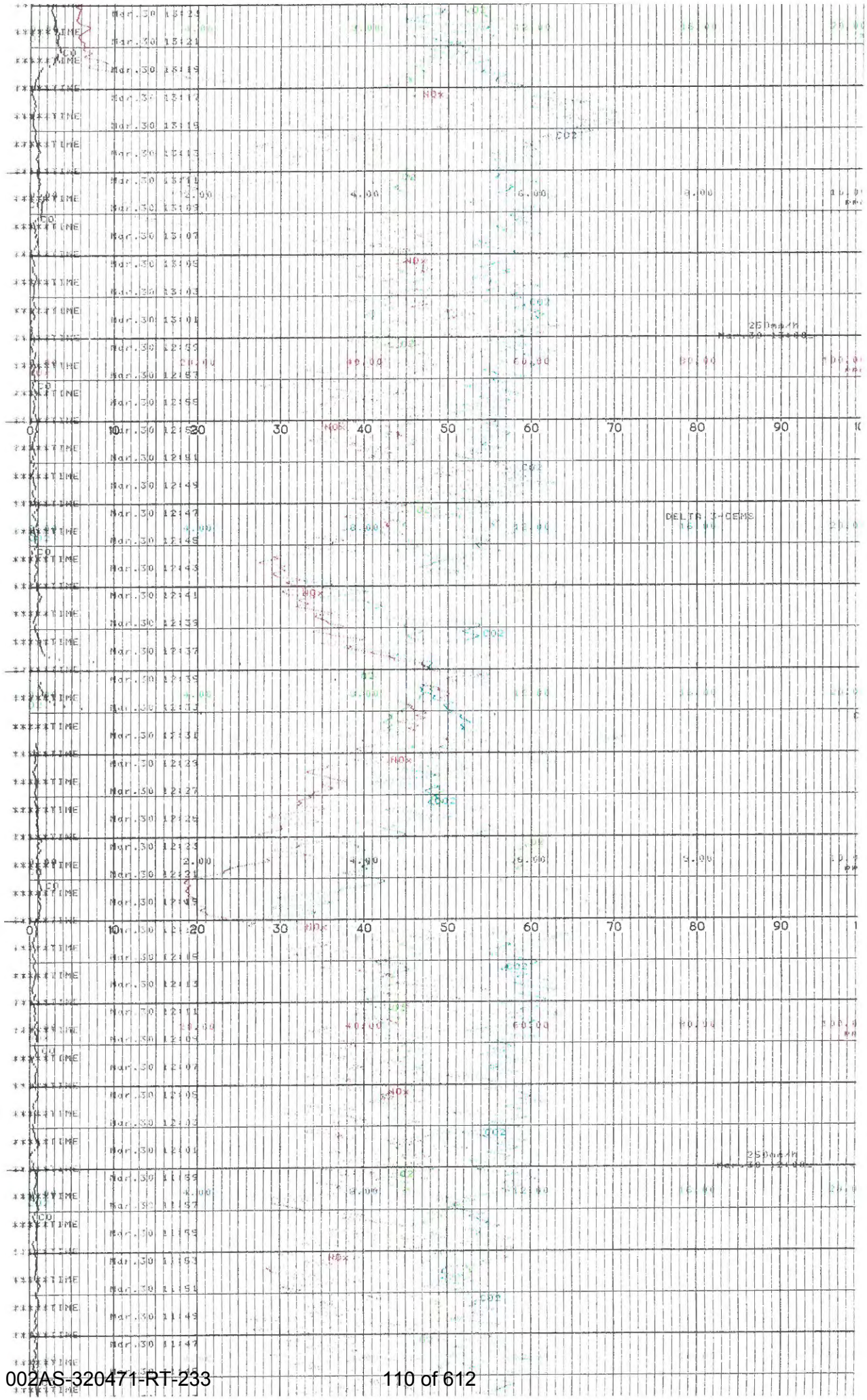
Mar.30 10:49
Mar.30 10:47
Mar.30 10:45
Mar.30 10:43
Mar.30 10:41
Mar.30 10:39
Mar.30 10:37
Mar.30 10:35
0 10 20 30 40 50 60 70 80 90 100
250mm/h
NOx
CO2
CO
O2
O2 Cor Bu
NO2 Bu
CO Bu
SP4


TIME INTVL 1
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Mar.30 13:11
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Mar.30 12:03
Mar.30 12:01
Mar.30 11:59
Mar.30 11:57
Mar.30 11:55
Mar.30 11:53
Mar.30 11:51
Mar.30 11:49
Mar.30 11:47
CO
NOx
CO2
DELTA 3-CEMS
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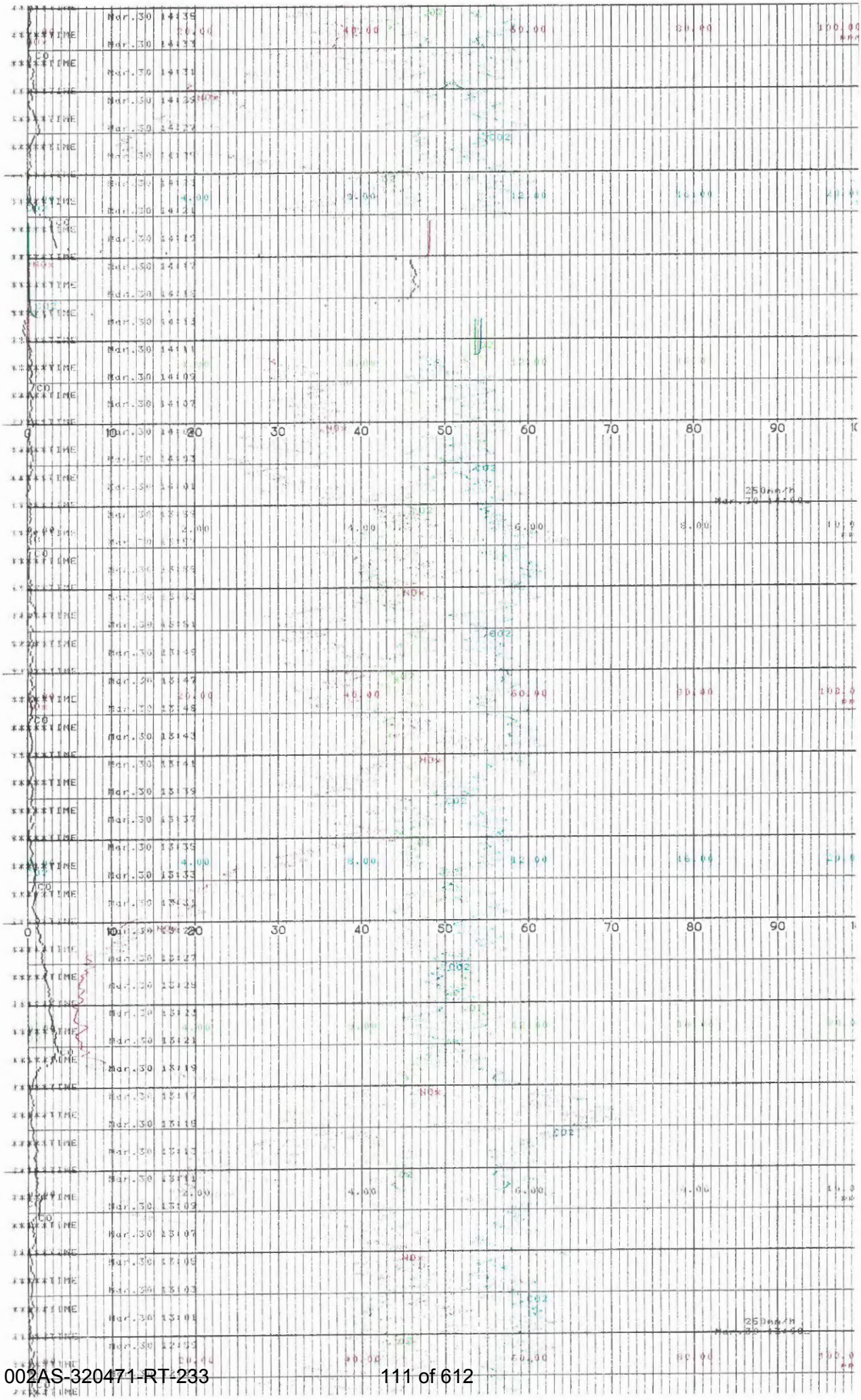
TIME
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Mar.30 14:11
Mar.30 14:09
Mar.30 14:07
Mar.30 14:03
Mar.30 14:01
Mar.30 13:59
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Mar.30 13:49
Mar.30 13:47
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Mar.30 13:33
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Mar.30 13:25
Mar.30 13:23
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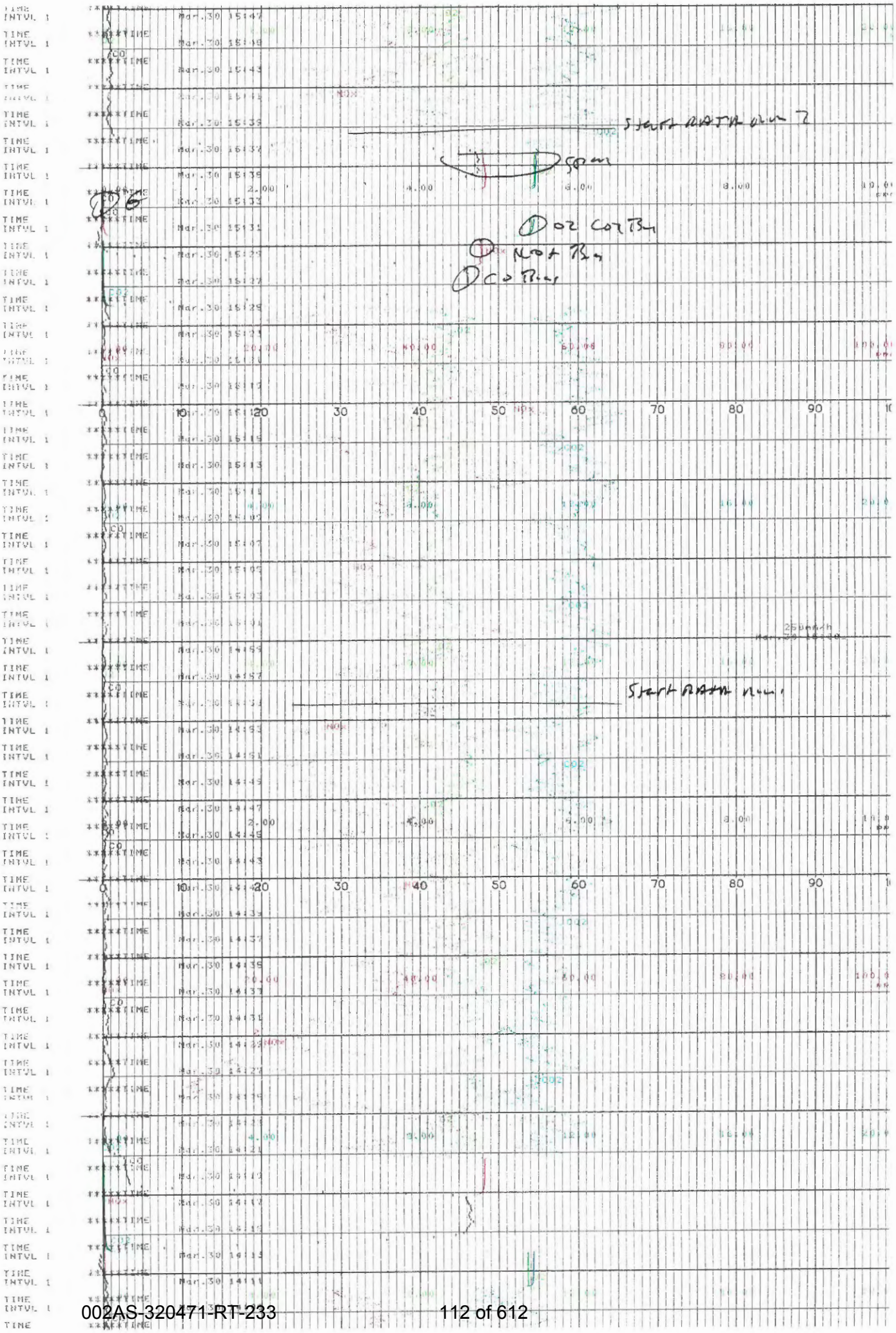
Mar.30 13:17
Mar.30 13:15
Mar.30 13:13
Mar.30 13:11
Mar.30 13:09
Mar.30 13:07
Mar.30 13:05
Mar.30 13:03
Mar.30 13:01
Mar.30 12:59
CO
NOx
CO2
0
10
20
30
40
50
60
70
80
90
250mm/h
Mar.30 14:00
Mar.30 13:00


Start RATA run 2
Start RATA run 1
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10
20
30
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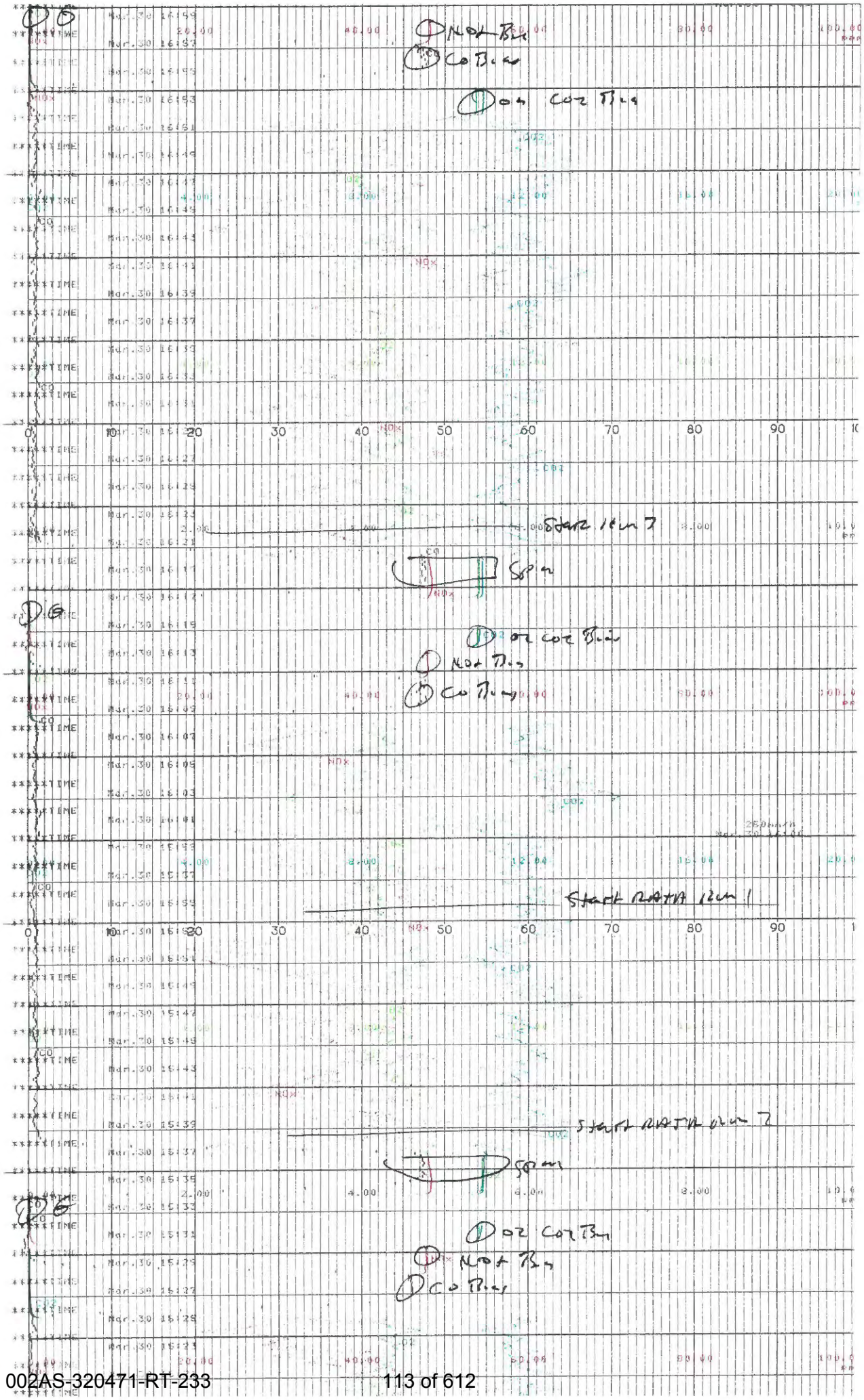
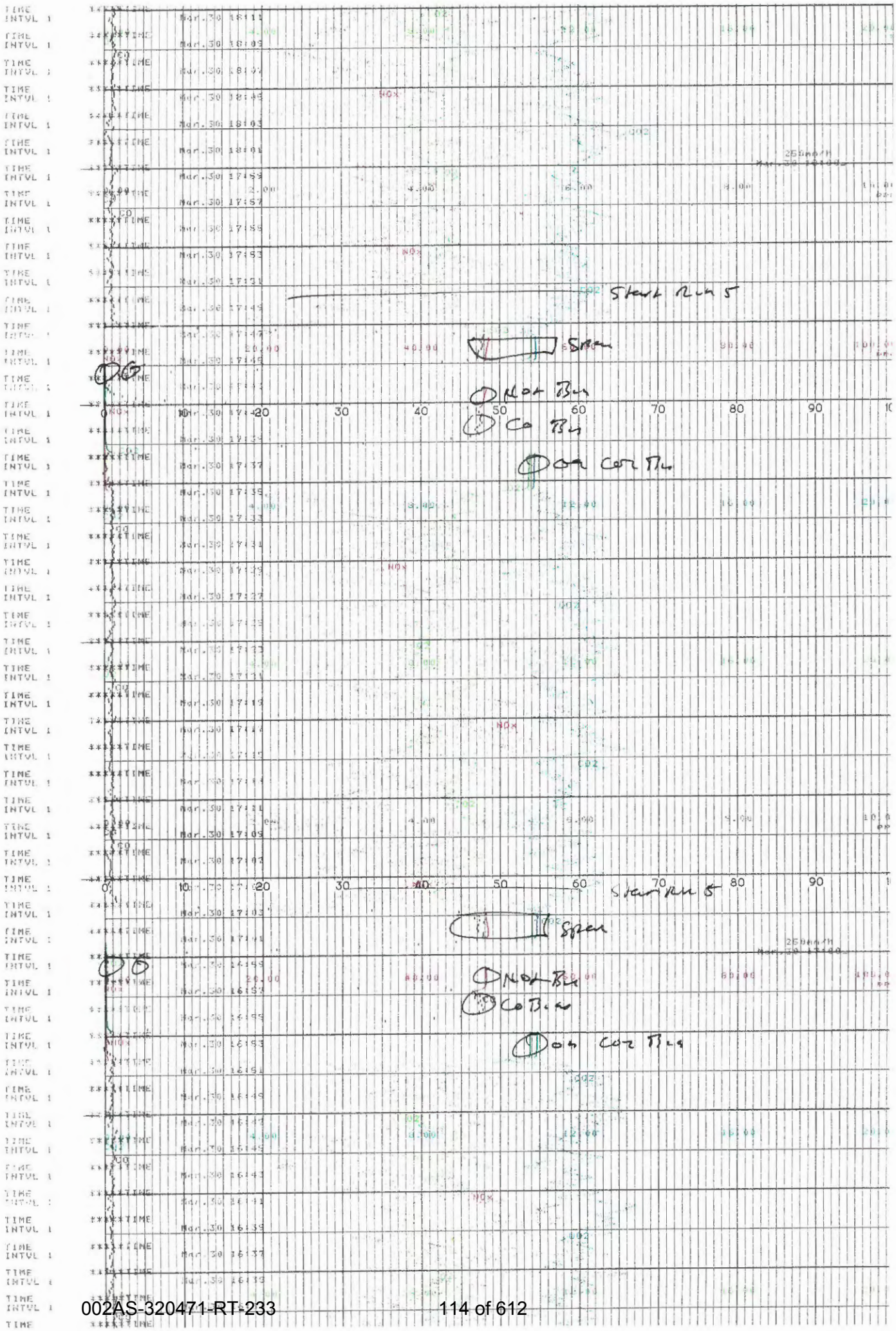
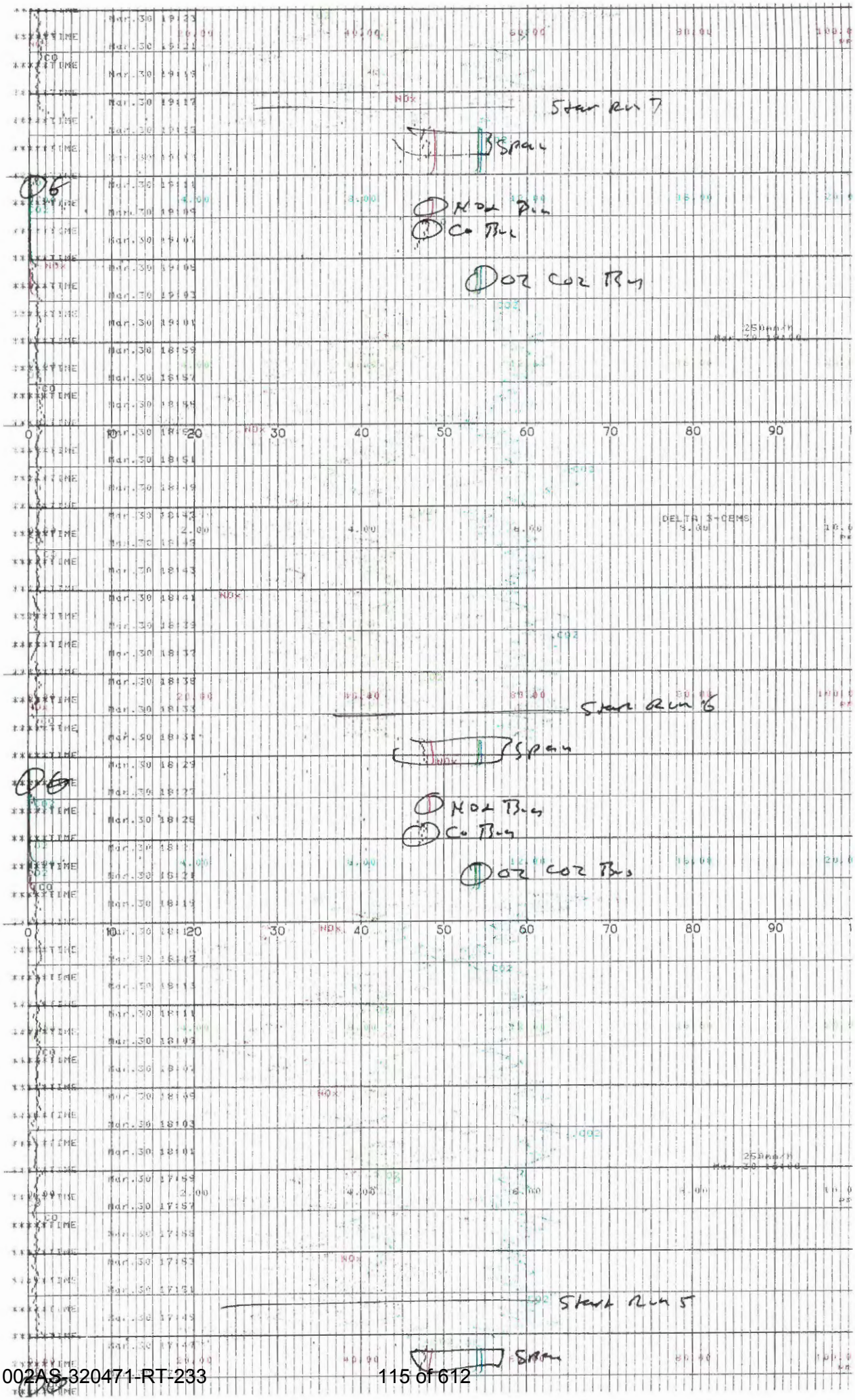
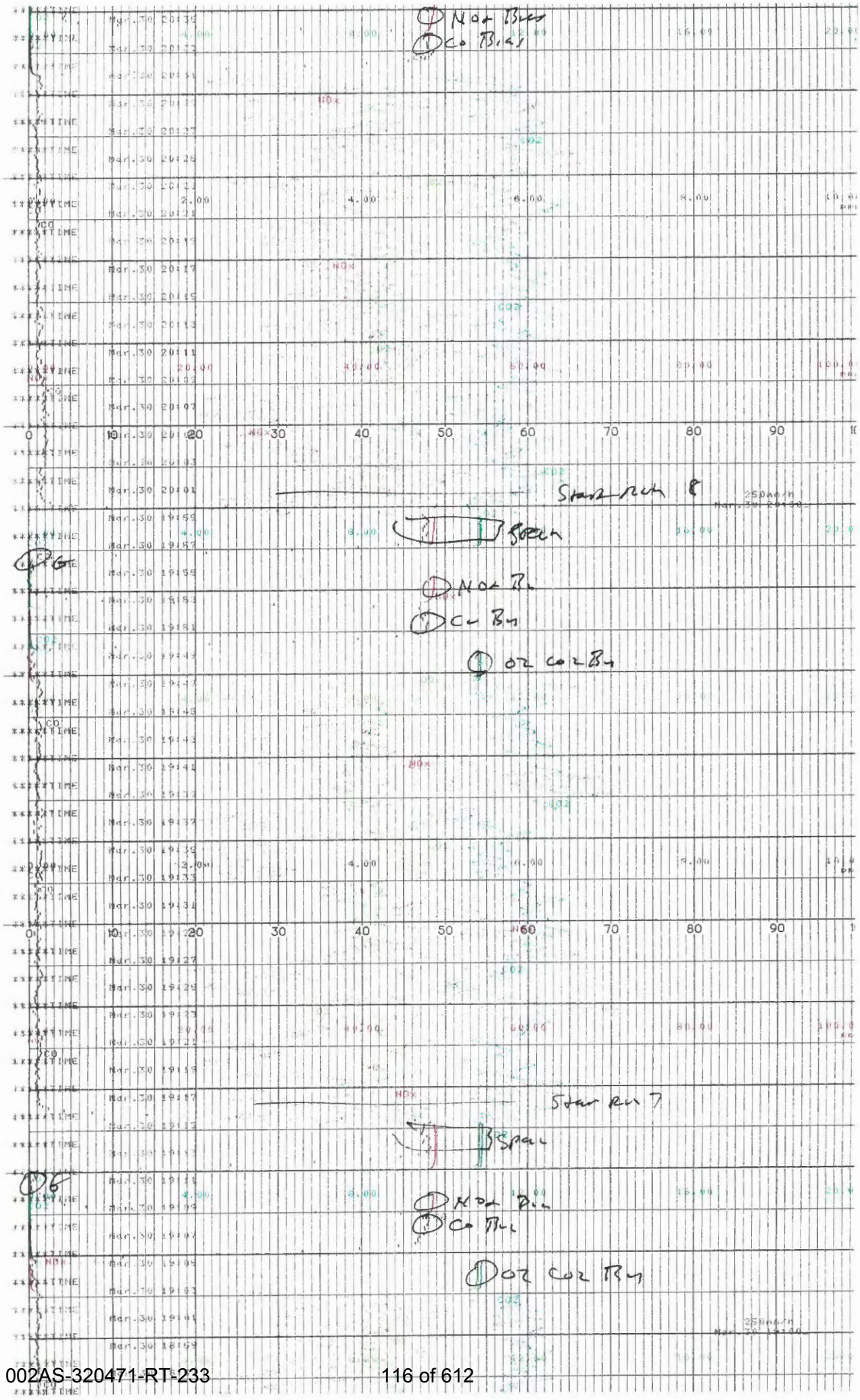
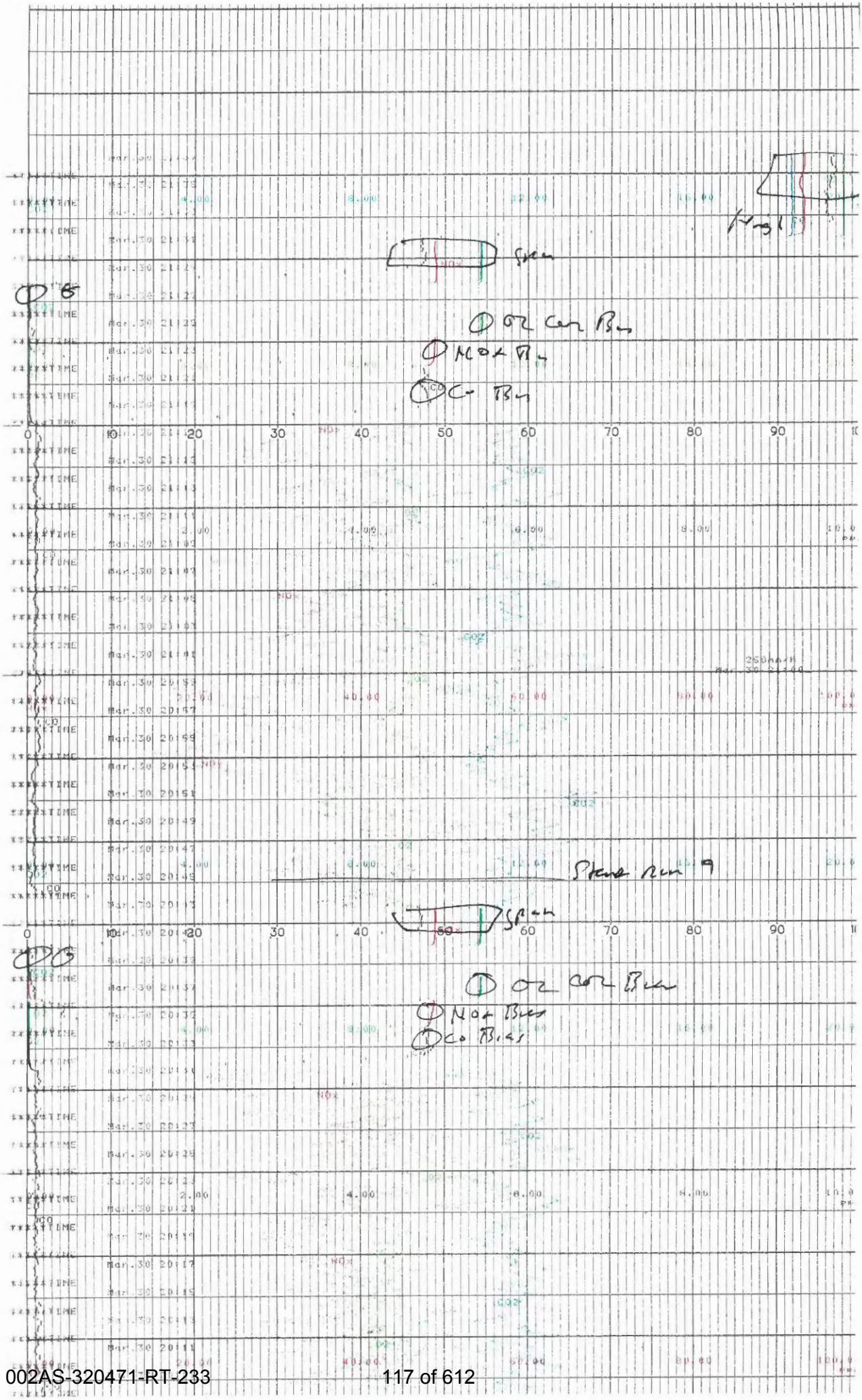
60
70
80
90

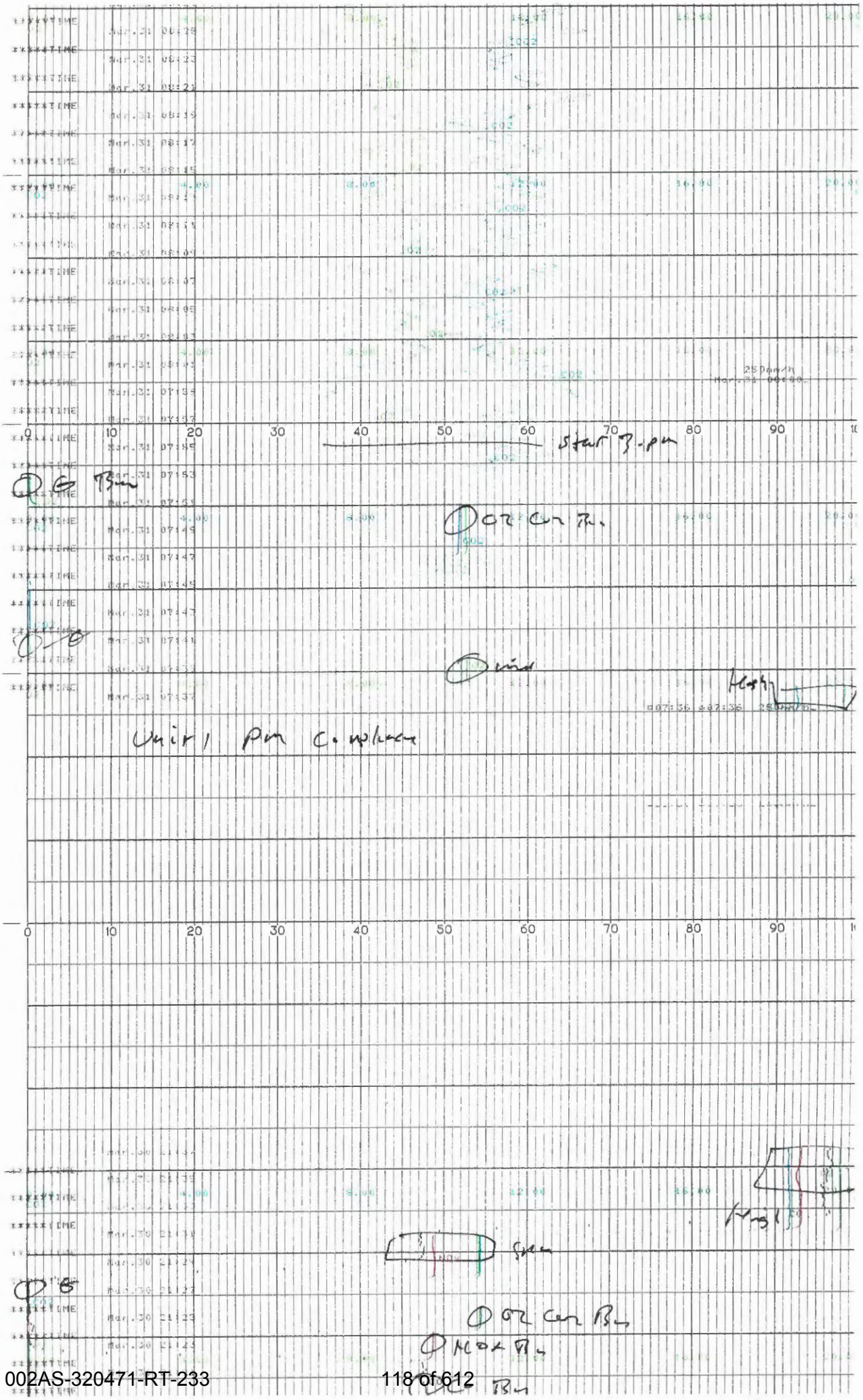

Start Run 7
Start RATA Run 1
Start RATA Run 2


Start Run 5
Start Run 5


Start Run 7
Span
NOx Bias
CO Bias
O2 CO2 Bias
Start Run 6
Span
NOx Bias
CO Bias
O2 CO2 Bias
Start Run 5
Span
DELTA 3-CEMS
25mm/H


Start Run 8
Start Run 7


Span
O2 Cor Bias
NOx Bias
Co Bias
Stand Run 9
Span
O2 Cor Bias
NOx Bias
Co Bias


Start 3-pm
Unit 1 pm Compliance
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Mar.31 08:19
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Mar.31 08:15
Mar.31 08:09
Mar.31 08:07
Mar.31 08:05
Mar.31 07:59
Mar.31 07:57
Mar.31 07:55
Mar.31 07:53
Mar.31 07:49
Mar.31 07:47
Mar.31 07:45
Mar.31 07:43
Mar.31 07:41
Mar.31 07:37
Mar.30 21:39
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Mar.30 21:23
Mar.30 21:23
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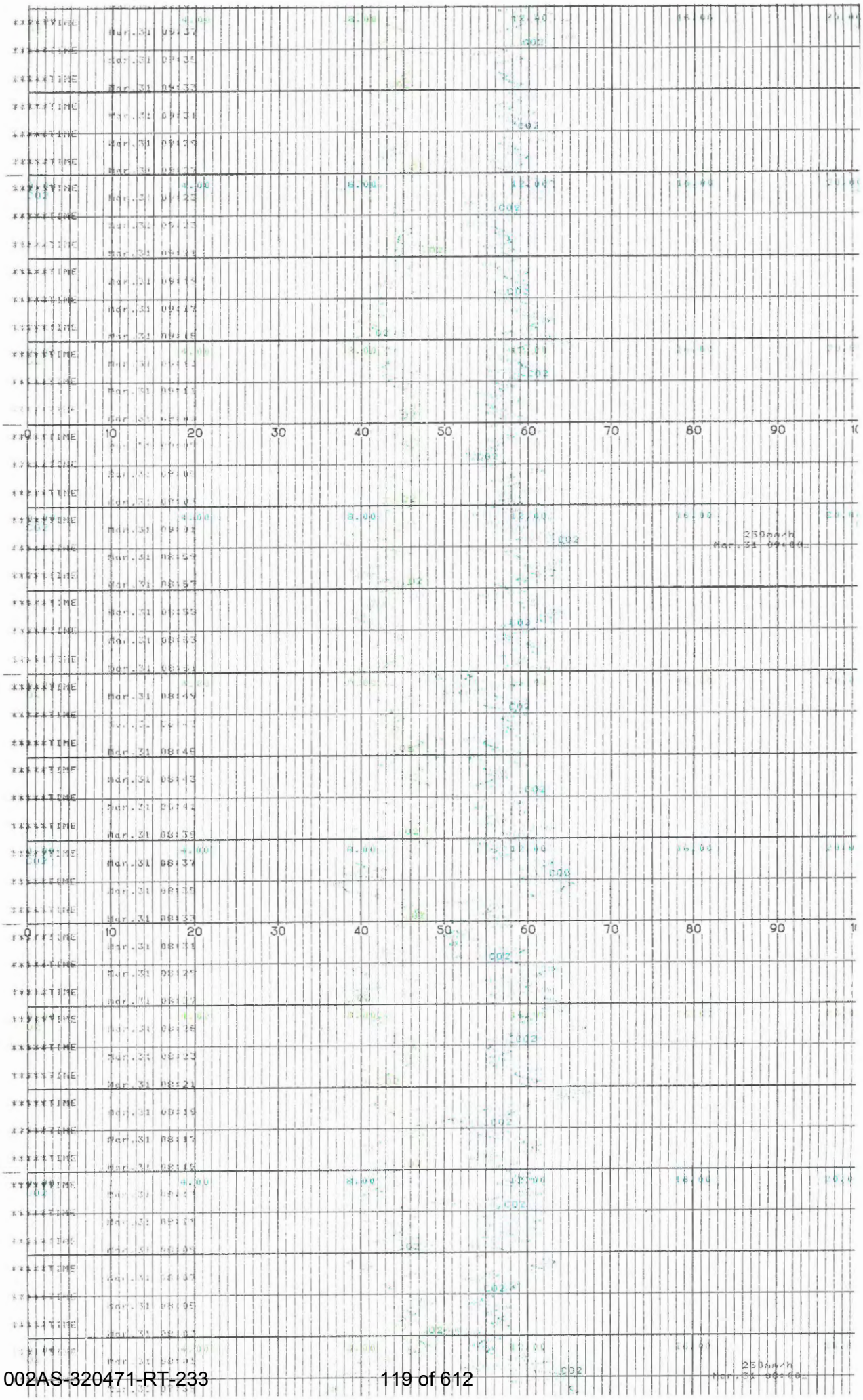
90


TIME
INTVL 1
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Mar.31 09:27
4.00
8.00
12.00
16.00
20.00
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0
10
20
30
40
50
60
70
80
90
Mar.31 08:59
Mar.31 08:57
Mar.31 08:55
Mar.31 08:53
Mar.31 08:51
Mar.31 08:49
Mar.31 08:47
Mar.31 08:45
Mar.31 08:43
Mar.31 08:41
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Mar.31 08:15
Mar.31 08:13
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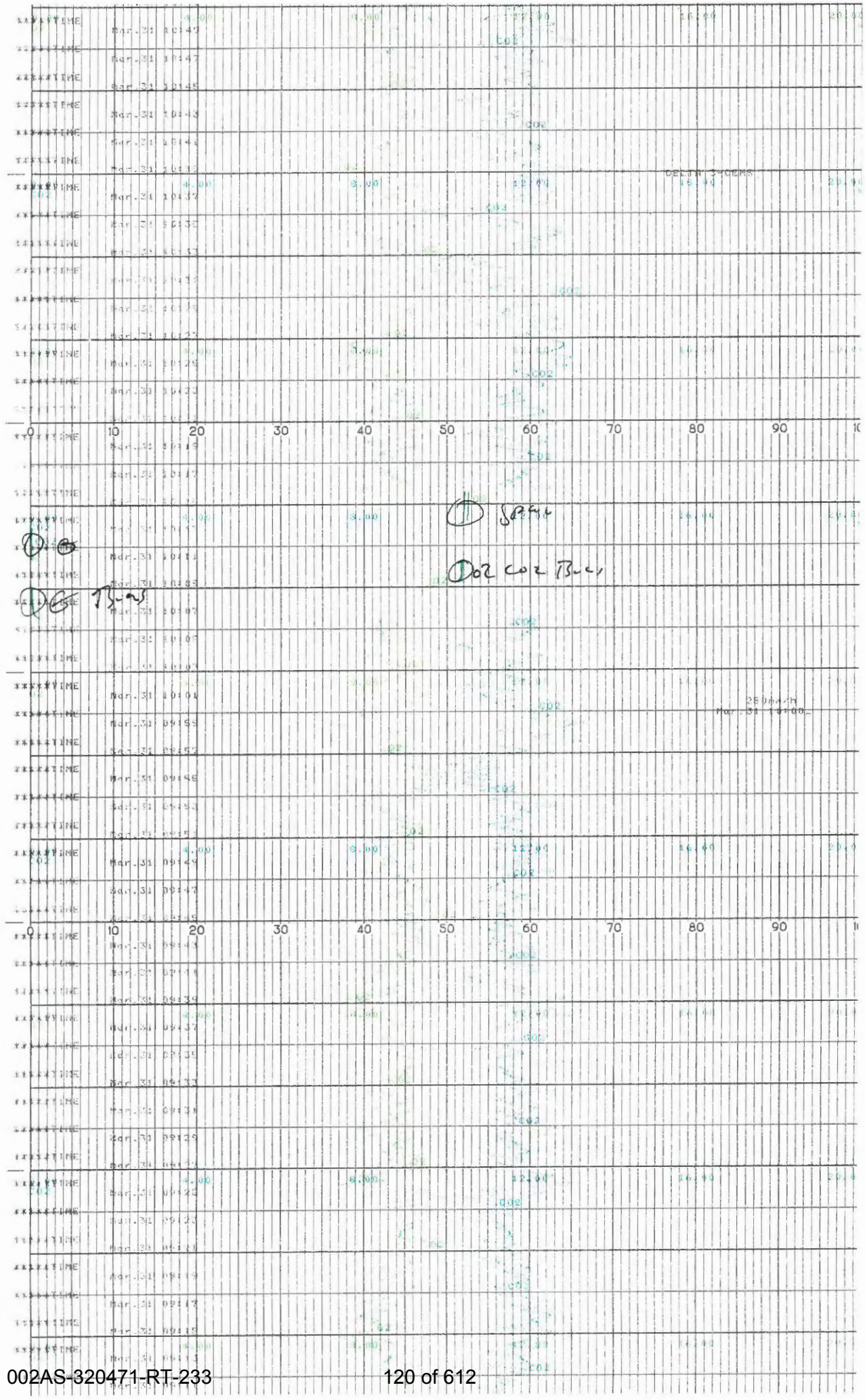
Mar.31 08:07
Mar.31 08:05
Mar.31 08:03
Mar.31 08:01
250mm/h
Mar.31 09:00


TIME INTVL 1
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Mar.31 10:42
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Mar.31 10:04
Mar.31 10:03
Mar.31 10:02
Mar.31 10:01
Mar.31 10:00
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Mar.31 09:16
Mar.31 09:15
Mar.31 09:14
0
10
20
30
40
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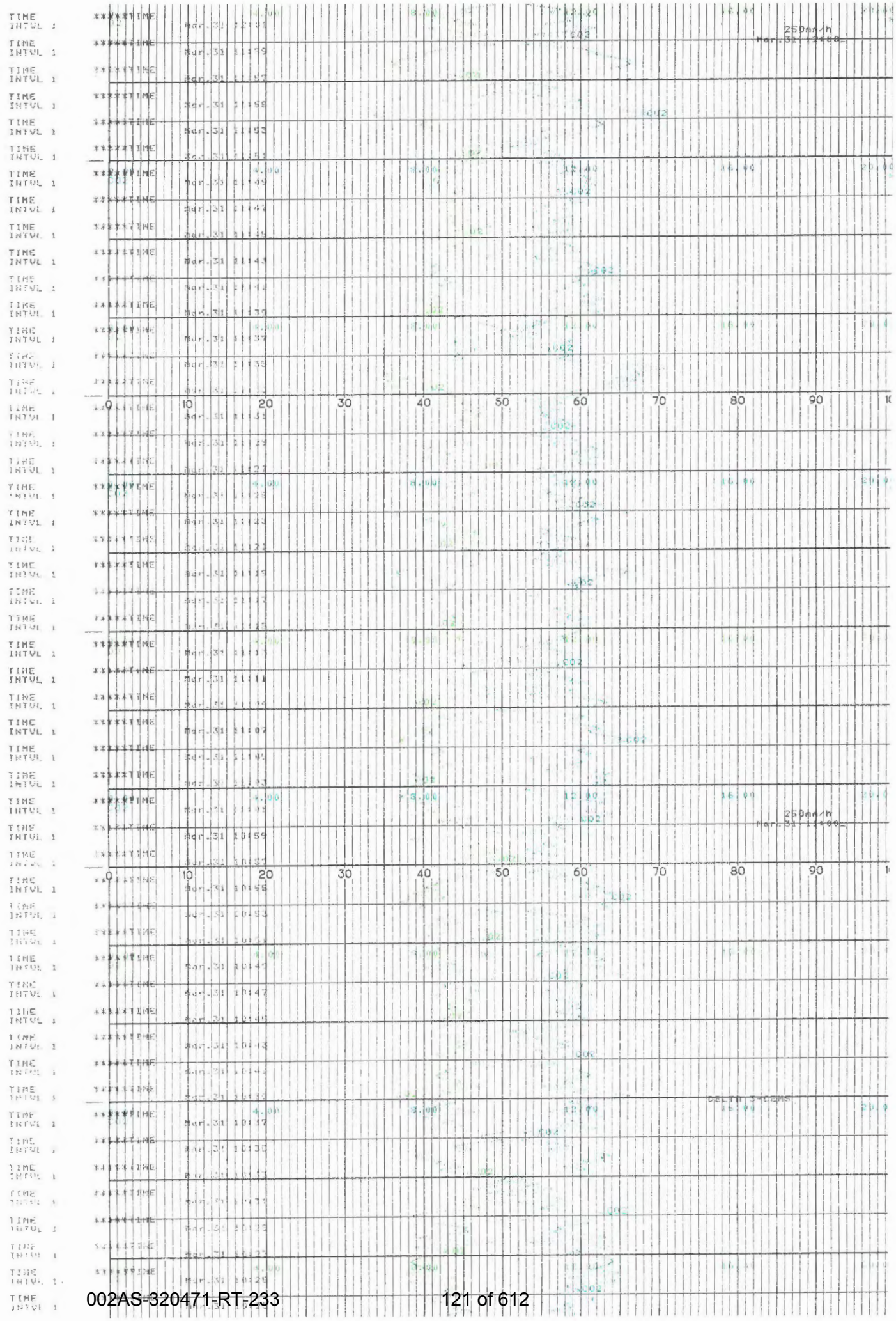
60
70
80
90
4.00
8.00
12.00
16.00
20.00
DELTA 3*DEMS
Spark
Doz Coz Back
Doz Back
28 mm/h
Mar.31 10:00


TIME INTVL 1
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Mar.31 10:33
Mar.31 10:31
Mar.31 10:29
Mar.31 10:27
Mar.31 10:25
250mm/h
Mar.31 12:00
Mar.31 11:00
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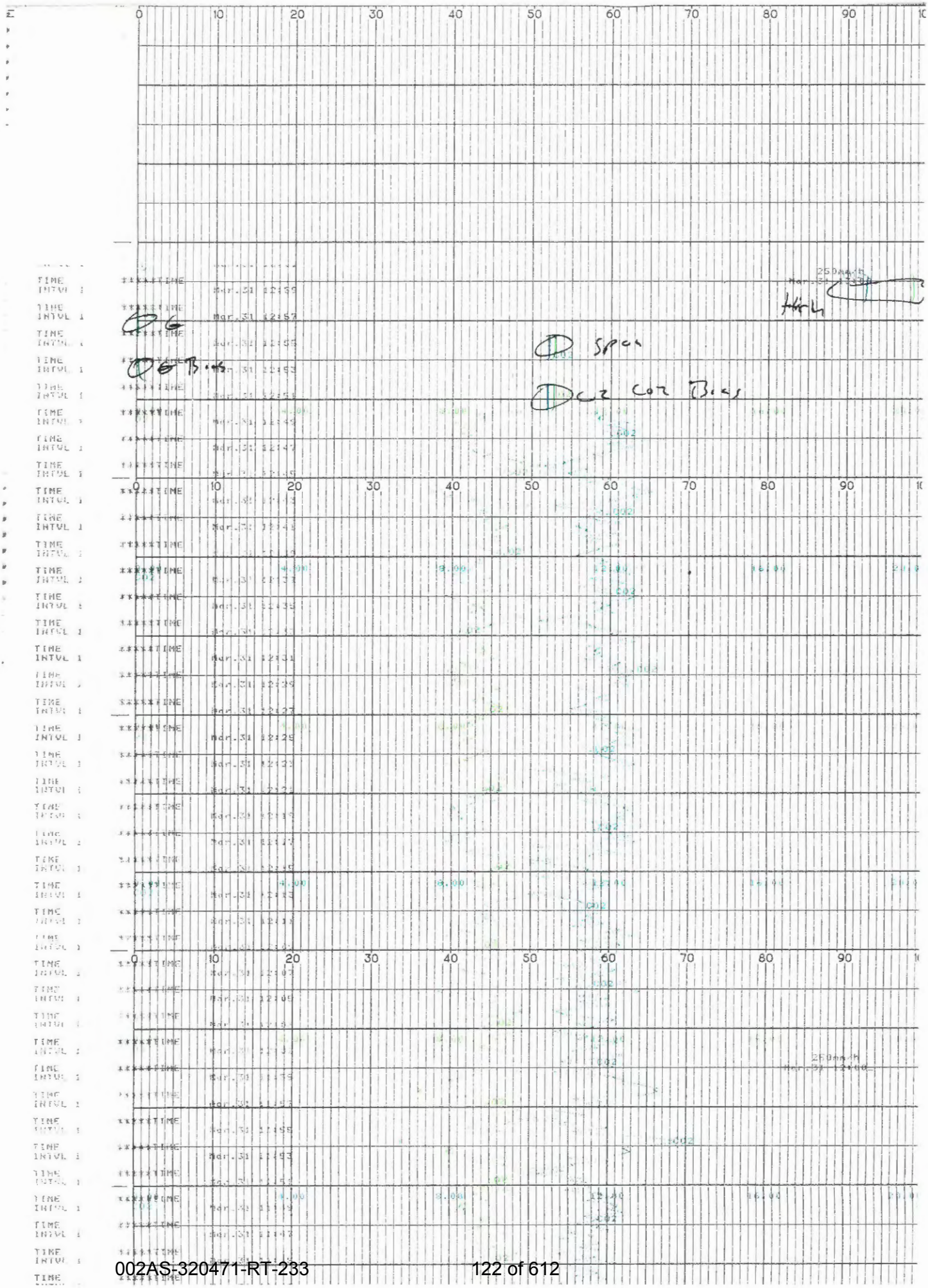
0 10 20 30 40 50 60 70 80 90
4.00 8.00 12.00 16.00 20.00
CO2



0 10 20 30 40 50 60 70 80 90
TIME INTVL 1
Mar.31 12:59
Mar.31 12:57
Mar.31 12:55
Mar.31 12:53
Mar.31 12:51
Mar.31 12:49
Mar.31 12:47
Mar.31 12:45
Mar.31 12:43
Mar.31 12:41
Mar.31 12:39
Mar.31 12:37
Mar.31 12:35
Mar.31 12:33
Mar.31 12:31
Mar.31 12:29
Mar.31 12:27
Mar.31 12:25
Mar.31 12:23
Mar.31 12:21
Mar.31 12:19
Mar.31 12:17
Mar.31 12:15
Mar.31 12:13
Mar.31 12:11
Mar.31 12:07
Mar.31 12:05
Mar.31 12:03
Mar.31 12:01
Mar.31 11:59
Mar.31 11:57
Mar.31 11:55
Mar.31 11:53
Mar.31 11:51
Mar.31 11:49
Mar.31 11:47
4.00 8.00 12.00 16.00 20.00
250mm/h
Mar.31 12:00
Span
CO2 CO2 Bias

# APPENDIX A.1.4

# UNIT 1 HYDROGEN CHLORIDE DATA

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3-29-2018
RUN NO: 1-HCL-U1
OPERATOR: Patrick Whitman
METER BOX NO: 30-WCS
METER ΔH@: 1.737
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: 499.9/500.0
9.9

AMBIENT TEMPERATURE: 80°F
BAROMETRIC PRESSURE: 30.09
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 110 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 196 SS
NOZZLE DIAMETER: 0.239
FILTER NO/TYPE: quartz
PRE-TEST LEAK RATE: : 0.005 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: _____
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | = Difference |
|---|---|---|---|---|
| 1 | 0.1N H2SO4 | 950.1 | 724.5 | |
| 2 | 0.1N H2SO4 | 845.5 | 750.3 | |
| 3 | Empty | 675.6 | 672.6 | |
| 4 | Silica gel | 964.4 | 936.6 | |
| | | | | |
| | Rinse | | 50 | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0945 | 865.100 | 1.2 | 2.3 | 350 | 256 | 252 | 55 | 85 | 86 | 6" | | 1.68 |
| 4 | 0949 | 868.535 | 1.0 | 1.9 | 351 | 257 | 253 | 56 | 90 | 87 | 6" | | |
| 3 | 0953 | 871.860 | 1.2 | 2.3 | 350 | 255 | 252 | 58 | 91 | 90 | 8" | | |
| 2 | 0957 | 875.245 | 1.3 | 2.5 | 352 | 257 | 254 | 55 | 92 | 88 | 6" | | |
| 1 | 1001 | 878.720 | 1.1 | 2.1 | 351 | 255 | 252 | 54 | 93 | 89 | 6" | | |
| E | 1005 | 882.041 | | | | | | | | | | | |
| 5 | 1008 | 882.041 | 1.0 | 1.9 | 353 | 256 | 251 | 53 | 92 | 87 | 6" | | |
| 4 | 1012 | 885.150 | 1.3 | 2.5 | 355 | 254 | 250 | 54 | 93 | 88 | 6" | | |
| 3 | 1016 | 888.665 | 1.4 | 2.7 | 352 | 255 | 251 | 54 | 92 | 86 | 7" | | |
| 2 | 1020 | 892.350 | 1.3 | 2.5 | 352 | 256 | 252 | 54 | 93 | 90 | 8" | | |
| 1 | 1024 | 895.950 | 1.0 | 1.9 | 352 | 257 | 250 | 55 | 93 | 91 | 6" | | |
| E | 1028 | 899.238 | | | | | | | | | | | |
| 5 | 1032 | 899.238 | 1.3 | 2.5 | 353 | 256 | 254 | 54 | 92 | 90 | 7" | | |
| 4 | 1036 | 902.855 | 1.2 | 2.3 | 353 | 253 | 256 | 55 | 92 | 89 | 6" | | |
| 3 | 1040 | 906.240 | 1.0 | 1.9 | 355 | 256 | 257 | 54 | 95 | 94 | 6" | | |
| 2 | 1044 | 909.435 | .94 | 1.8 | 356 | 255 | 258 | 53 | 94 | 92 | 6" | | |
| 1 | 1048 | 912.610 | .96 | 1.8 | 353 | 258 | 252 | 54 | 94 | 91 | 6" | | |
| Average | 1052 | 915.683 | | | | | | | | | | | |

Comments: _____

DS834049

MONTROSE

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3-29-2018
RUN NO: 1-HCL-U1
OPERATOR: Patrick Whitman
METER BOX NO: 30-WCS
METER ΔH@: 1.737
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: _____
Silica Gel Expanded, Y/N: _____
Filter Condition after Test: _____
Check Weight: _____ 1.8

AMBIENT TEMPERATURE: 85°F
BAROMETRIC PRESSURE: 30.09
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 110 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 196 SS
NOZZLE DIAMETER: 0.239
FILTER NO/TYPE: quartz
PRE-TEST LEAK RATE: : 0.005 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: 0.005 CFM@ 15 in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | 0.1N H2SO4 | | | |
| 2 | 0.1N H2SO4 | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | Rinse | | 50 | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1100 | 915.683 | .98 | 1.9 | 353 | 254 | 252 | 55 | 94 | 90 | 6" | | 1.65 |
| 4 | 1104 | 918.825 | .95 | 1.8 | 350 | 255 | 251 | 54 | 95 | 92 | 5" | | |
| 3 | 1108 | 921.910 | 1.0 | 1.9 | 351 | 256 | 252 | 54 | 95 | 91 | 5" | | |
| 2 | 1112 | 924.995 | 1.2 | 2.3 | 351 | 255 | 251 | 53 | 96 | 92 | 6" | | |
| 1 | 1116 | 928.385 | .88 | 1.7 | 352 | 255 | 251 | 54 | 97 | 93 | 6" | | |
| E | 1120 | 931.471 | | | | | | | | | | | |
| 5 | 1124 | 931.471 | 1.4 | 2.7 | 353 | 254 | 252 | 54 | 96 | 94 | 6" | | |
| 4 | 1128 | 935.065 | 1.2 | 2.3 | 355 | 256 | 257 | 55 | 98 | 96 | 6" | | |
| 3 | 1132 | 938.850 | 1.1 | 2.0 | 353 | 256 | 250 | 56 | 99 | 97 | 6" | | |
| 2 | 1136 | 942.075 | .87 | 1.6 | 353 | 254 | 250 | 57 | 98 | 96 | 6" | | |
| 1 | 1140 | 945.015 | .94 | 1.7 | 353 | 254 | 250 | 57 | 99 | 97 | 6" | | |
| E | 1144 | 947.975 | | | | | | | | | | | |
| 5 | 1148 | 947.975 | 1.1 | 2.0 | 353 | 256 | 252 | 58 | 99 | 96 | 6" | | |
| 4 | 1152 | 951.220 | .99 | 1.8 | 352 | 255 | 251 | 58 | 98 | 95 | 6" | | |
| 3 | 1156 | 954.310 | 1.0 | 1.8 | 353 | 254 | 256 | 59 | 100 | 96 | 6" | | |
| 2 | 1200 | 957.365 | 1.2 | ~~2.3~~ 2.2 | 354 | 255 | 251 | 59 | 101 | 97 | 6" | | |
| 1 | 1204 | 960.750 | 1.3 | 2.3 | 356 | 257 | 253 | 59 | 102 | 99 | 7" | | |
| Average | 1208 | 964.123 | | | | | | | | | | | |

Comments: _____

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3-29-2018
RUN NO: 2-HCL-U1
OPERATOR: Patrick Whitman
METER BOX NO: 30-WCS
METER ΔH@: 1.737
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: 499.9/500.0
~~1.8~~ 1.9

AMBIENT TEMPERATURE: 95°F
BAROMETRIC PRESSURE: 30.09
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 110 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 196 SS
NOZZLE DIAMETER: 0.239
FILTER NO/TYPE: quartz
PRE-TEST LEAK RATE: : 0.005 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: : 0.009 CFM@ 15 in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | 0.1N H2SO4 | 913.4 | 661.4 | |
| 2 | 0.1N H2SO4 | 836.7 | 766.9 | |
| 3 | Empty | 485.0 | 482.9 | |
| 4 | Silica gel | 955.4 | 932.8 | |
| | | | | |
| | Rinse | | 50 | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1236 | 964.909 | 1.2 | 2.2 | 350 | 255 | 252 | 59 | 100 | 101 | 6 | | |
| 4 | 1240 | 968.450 | 1.0 | 1.9 | 352 | 256 | 250 | 55 | 100 | 100 | 6 | | |
| 3 | 1244 | 971.685 | 1.1 | 2.1 | 351 | 254 | 251 | 54 | 101 | 99 | 6 | | +0.68 |
| 2 | 1248 | 974.860 | 1.2 | 2.3 | 352 | 255 | 252 | 53 | 102 | 99 | 6 | | |
| 1 | 1252 | 978.415 | 1.0 | 1.9 | 350 | 254 | 251 | 54 | 104 | 99 | 6 | | |
| E | 1256 | 981.468 | | | | | | | | | | | |
| 5 | 1300 | 981.468 | 1.4 | 2.7 | 350 | 255 | 253 | 55 | 103 | 100 | 6 | | |
| 4 | 1304 | 985.165 | 1.3 | 2.5 | 350 | 255 | 252 | 54 | 103 | 99 | 6 | | |
| 3 | 1308 | 988.690 | 1.1 | 2.1 | 351 | 256 | 251 | 54 | 105 | 98 | 6 | | |
| 2 | 1312 | 991.995 | .88 | 1.7 | 351 | 255 | 252 | 53 | 104 | 99 | 6 | | |
| 1 | 1316 | 995.005 | .94 | 1.8 | 352 | 257 | 253 | 54 | 105 | 102 | 6 | | |
| E | 1320 | 998.041 | | | | | | | | | | | |
| 5 | 1323 | 998.041 | .97 | 1.8 | 350 | 255 | 253 | 53 | 106 | 105 | 6 | | |
| 4 | 1327 | 1001.180 | .95 | 1.8 | 351 | 255 | 252 | 54 | 108 | 104 | 6 | | |
| 3 | 1331 | 1004.065 | 1.0 | 1.9 | 352 | 257 | 252 | 55 | 107 | 103 | 6 | | |
| 2 | 1335 | 1007.370 | .87 | 1.7 | 350 | 256 | 253 | 55 | 107 | 104 | 6 | | |
| 1 | 1339 | 1010.425 | .85 | 1.6 | 351 | 255 | 251 | 54 | 106 | 104 | 6 | | |
| Average | 1343 | 1013.413 | | | | | | | | | | | |

Comments: _____

MONTROSE

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3-29-2018
RUN NO: 2-HCL-U1
OPERATOR: Patrick Whitman
METER BOX NO: 30-WCS
METER ΔH@: 1.737
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: _____
Silica Gel Expanded, Y/N: _____
Filter Condition after Test: _____
Check Weight: 1.9

AMBIENT TEMPERATURE: 97°F
BAROMETRIC PRESSURE: 32.09
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 110 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 196 SS
NOZZLE DIAMETER: 0.239
FILTER NO/TYPE: quartz
PRE-TEST LEAK RATE: : <0.005 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: <0.005 CFM@ 15 in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | O.1N H2SO4 | | | |
| 2 | O.1N H2SO4 | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | Rinse | | 50 | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 14:00 | 1013.413 | 1.0 | 1.9 | 350 | 254 | 254 | 58 | 106 | 105 | 6" | | |
| 4 | 1404 | 1016.525 | 1.3 | 2.5 | 350 | 256 | 251 | 54 | 107 | 102 | 6" | | |
| 3 | 1408 | 1020.160 | 1.1 | 2.1 | 350 | 255 | 252 | 53 | 106 | 103 | 6" | | |
| 2 | 1412 | 1023.645 | .94 | 1.8 | 350 | 256 | 251 | 54 | 107 | 102 | 6" | | |
| 1 | 1416 | 1026.830 | .98 | 1.9 | 350 | 255 | 251 | 55 | 107 | 101 | 6" | | |
| E | 1420 | 1029.833 | | | | | | | | | | | |
| 5 | 1423 | 1029.833 | 1.2 | 2.3 | 350 | 254 | 250 | 56 | 106 | 106 | 6" | | |
| 4 | 1426 | 1033.333 | 1.3 | 2.5 | 351 | 256 | 250 | 55 | 107 | 103 | 6" | | |
| 3 | 1430 | 1036.850 | 1.4 | 2.7 | 350 | 255 | 251 | 57 | 108 | 104 | 6" | | |
| 2 | 1434 | 1040.295 | 1.2 | 2.3 | 351 | 256 | 250 | 56 | 107 | 105 | 6" | | |
| 1 | 1438 | 1044.010 | 1.2 | 2.3 | 351 | 257 | 251 | 58 | 109 | 103 | 6" | | |
| E | 1442 | 1047.564 | | | | | | | | | | | |
| 5 | 1445 | 1047.564 | 1.3 | 2.5 | 350 | 255 | 251 | 57 | 108 | 106 | 6" | | |
| 4 | 1449 | 1051.095 | 1.2 | 2.3 | 351 | 256 | 251 | 56 | 109 | 101 | 6" | | |
| 3 | 1453 | 1054.610 | 1.4 | 2.7 | 352 | 257 | 250 | 55 | 108 | 103 | 6" | | |
| 2 | 1457 | 1058.240 | 1.1 | 2.1 | 352 | 255 | 253 | 54 | 109 | 104 | 6" | | |
| 1 | 1501 | 1061.535 | .97 | 1.8 | 352 | 257 | 252 | 53 | 109 | 103 | 6" | | |
| Average | 1504 | 1063.932 | | | | | | | | | | | |

Comments: _____

MONTROSE

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3-29-2018
RUN NO: 3-HCL-U1
OPERATOR: Patrick Whitman
METER BOX NO: 30-WCS
METER ΔH@: 1.737
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: 499.9/.50
1.83

AMBIENT TEMPERATURE: 102°F
BAROMETRIC PRESSURE: 30.09
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 110 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 196 SS
NOZZLE DIAMETER: 0.239
FILTER NO/TYPE: quartz
PRE-TEST LEAK RATE: : <0.005 CFM@ 15 in. Hg.
POST-TEST LEAK RATE: : <0.005 CFM@ 19 in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | 0.1N H2SO4 | 932.7 | 724.8 | |
| 2 | 0.1N H2SO4 | 855.8 | 753.1 | |
| 3 | Empty | 673.7 | 671.9 | |
| 4 | Silica gel | 983.2 | 964.4 | |
| | | | | |
| | Rinse | | 50 | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1600 | 65.200 | 1.1 | 2.0 | 355 | 255 | 252 | 58 | 99 | 99 | 6" | | |
| 4 | 1604 | 68.575 | 1.0 | 1.8 | 355 | 256 | 251 | 54 | 99 | 96 | 6" | | |
| 3 | 1608 | 71.670 | .97 | 1.8 | 356 | 256 | 251 | 53 | 101 | 97 | 6" | | +0.68 |
| 2 | 1612 | 74.855 | 1.3 | 2.4 | 355 | 255 | 250 | 52 | 103 | 99 | 6" | | |
| 1 | 1616 | 78.320 | 1.2 | 2.2 | 355 | 256 | 252 | 53 | 103 | 100 | 6" | | |
| E | 1620 | 81.722 | | | | | | | | | | | |
| 5 | 1622 | 81.722 | 1.3 | 2.4 | 354 | 254 | 252 | 55 | 103 | 106 | 6" | | |
| 4 | 1626 | 85.270 | 1.4 | 2.6 | 355 | 256 | 251 | 54 | 102 | 100 | 6" | | |
| 3 | 1630 | 88.820 | 1.1 | 2.0 | 353 | 255 | 254 | 54 | 102 | 98 | 6" | | |
| 2 | 1634 | 92.085 | .92 | 1.7 | 353 | 255 | 251 | 53 | 103 | 99 | 6" | | |
| 1 | 1638 | 95.505 | .95 | 1.7 | 352 | 255 | 250 | 54 | 106 | 98 | 6" | | |
| E | 1642 | 98.974 | | | | | | | | | | | |
| 5 | 1644 | 98.974 | .99 | 1.8 | 352 | 255 | 252 | 55 | 107 | 100 | 6" | | |
| 4 | 1648 | 102.030 | .96 | 1.8 | 352 | 255 | 253 | 54 | 108 | 99 | 6" | | |
| 3 | 1652 | 105.125 | 1.0 | 1.8 | 351 | 256 | 250 | 53 | 107 | 96 | 6" | | |
| 2 | 1656 | 108.240 | 1.1 | 2.0 | 351 | 257 | 253 | 54 | 108 | 99 | 6" | | |
| 1 | 1700 | 111.415 | .88 | 1.6 | 350 | 258 | 251 | 54 | 109 | 98 | 6" | | |
| Average | 1704 | 114.328 | | | | | | | | | | | |

Comments: _____

MONTROSE

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3-29-2018
RUN NO: 3-HCL-U1
OPERATOR: Patrick Whitman
METER BOX NO: 30-WCS
METER ΔH@: 1.737
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: _____
Silica Gel Expanded, Y/N: _____
Filter Condition after Test: _____
Check Weight: 1.83

AMBIENT TEMPERATURE: 99°F
BAROMETRIC PRESSURE: 30.09
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 110 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 196 SS
NOZZLE DIAMETER: 0.239
FILTER NO/TYPE: quartz
PRE-TEST LEAK RATE: : <0.005 CFM@ 15 in. Hg.
POST-TEST LEAK RATE: : <0.005 CFM@ 17 in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | 0.1N H2SO4 | | | |
| 2 | 0.1N H2SO4 | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | Rinse | | 50 | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1706 | 114.328 | 1.1 | 2.0 | 351 | 254 | 252 | 55 | 106 | 105 | 6" | | |
| 4 | 1710 | 117.540 | 1.2 | 2.2 | 351 | 255 | 251 | 54 | 105 | 100 | 6" | | |
| 3 | 1714 | 120.785 | 1.1 | 2.0 | 350 | 255 | 253 | 52 | 105 | 98 | 6" | | |
| 2 | 1718 | 124.010 | .89 | 1.6 | 350 | 255 | 250 | 53 | 106 | 97 | 6" | | |
| 1 | 1722 | 126.945 | 1.1 | 2.0 | 350 | 255 | 252 | 54 | 107 | 98 | 6" | | |
| E | 1726 | 130.079 | | | | | | | | | | | |
| 5 | 1728 | 130.079 | 1.2 | 2.2 | 350 | 255 | 251 | 55 | 108 | 102 | 6" | | |
| 4 | 1732 | 133.520 | 1.0 | 1.8 | 351 | 255 | 250 | 56 | 107 | 100 | 6" | | |
| 3 | 1736 | 136.170 | 1.3 | 2.4 | 350 | 255 | 251 | 57 | 108 | 101 | 6" | | |
| 2 | 1740 | 140.225 | 1.4 | 2.6 | 352 | 255 | 251 | 57 | 109 | 95 | 6" | | |
| 1 | 1744 | 143.860 | 1.1 | 2.0 | 350 | 255 | 257 | 55 | 108 | 97 | 6" | | |
| E | 1748 | 147.575 | | | | | | | | | | | |
| 5 | 1750 | 147.575 | 1.3 | 2.4 | 351 | 254 | 250 | 56 | 107 | 101 | 6" | | |
| 4 | 1754 | 151.060 | 1.4 | 2.6 | 350 | 255 | 252 | 56 | 106 | 98 | 6" | | |
| 3 | 1758 | 154.755 | 1.0 | 1.8 | 351 | 256 | 257 | 56 | 106 | 97 | 6" | | |
| 2 | 1802 | 157.995 | 1.1 | 2.0 | 351 | 255 | 252 | 57 | 105 | 96 | 6" | | |
| 1 | 1806 | 161.320 | .97 | 1.8 | 351 | 255 | 250 | 57 | 107 | 98 | 6" | | |
| Average | 1810 | 164.384 | | | | | | | | | | | |

Comments: _____

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3-28-2018
RUN NO: Field Blank-HCL
OPERATOR: Patrick Whitman
METER BOX NO: 30-WCS
METER ΔH@: 1.737
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: _____
Silica Gel Expanded, Y/N: _____
Filter Condition after Test: _____
Check Weight: _____

AMBIENT TEMPERATURE: _____
BAROMETRIC PRESSURE: _____
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 110 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 196 SS
NOZZLE DIAMETER: 0.239
FILTER NO/TYPE: quartz
PRE-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
POST-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
PITOT LEAK CHECK - PRE: _____ POST: _____
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | O.1N H2SO4 | | | |
| 2 | O.1N H2SO4 | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | Rinse | | 50 | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. $H_2O$ | ΔH in. $H_2O$ | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | $O_2$ % | P. static in. $H_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
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| | | | | | | | | | | | | | |
| Average: | | | | | | | | | | | | | |

Field Blank

Comments: _____

| 1-HCL-U1 | | | | | | | 2-HCL-U1 | | | | | | | 3-HCL-U1 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dP | (dP)^.5 | dH | Ts | Tm | | | dP | (dP)^.5 | dH | Ts | Tm | | | dP | (dP)^.5 | dH | Ts | Tm | |
| 5 | 1.20 | 1.095 | 2.3 | 350 | 85 | 86 | 5 | 1.20 | 1.095 | 2.30 | 350 | 100 | 101 | 5 | 1.10 | 1.049 | 2.00 | 355 | 99 | 99 |
| 4 | 1.00 | 1.000 | 1.9 | 351 | 90 | 87 | 4 | 1.00 | 1.000 | 1.90 | 352 | 100 | 100 | 4 | 1.00 | 1.000 | 1.80 | 355 | 99 | 96 |
| 3 | 1.20 | 1.095 | 2.3 | 350 | 91 | 90 | 3 | 1.10 | 1.049 | 2.10 | 351 | 101 | 99 | 3 | 0.97 | 0.985 | 1.80 | 356 | 101 | 97 |
| 2 | 1.30 | 1.140 | 2.5 | 352 | 92 | 88 | 2 | 1.20 | 1.095 | 2.30 | 352 | 102 | 99 | 2 | 1.30 | 1.140 | 2.40 | 355 | 103 | 99 |
| 1 | 1.10 | 1.049 | 2.1 | 351 | 93 | 89 | 1 | 1.00 | 1.000 | 1.90 | 350 | 104 | 99 | 1 | 1.20 | 1.095 | 2.20 | 355 | 103 | 100 |
| 5 | 1.00 | 1.000 | 1.9 | 353 | 92 | 87 | 5 | 1.40 | 1.183 | 2.70 | 350 | 103 | 100 | 5 | 1.30 | 1.140 | 2.40 | 354 | 103 | 106 |
| 4 | 1.30 | 1.140 | 2.5 | 355 | 93 | 88 | 4 | 1.30 | 1.140 | 2.50 | 350 | 103 | 99 | 4 | 1.40 | 1.183 | 2.60 | 355 | 102 | 100 |
| 3 | 1.40 | 1.183 | 2.7 | 352 | 92 | 89 | 3 | 1.10 | 1.049 | 2.10 | 351 | 105 | 98 | 3 | 1.10 | 1.049 | 2.00 | 353 | 102 | 98 |
| 2 | 1.30 | 1.140 | 2.5 | 352 | 93 | 90 | 2 | 0.88 | 0.938 | 1.70 | 351 | 104 | 99 | 2 | 0.92 | 0.959 | 1.70 | 353 | 103 | 99 |
| 1 | 1.00 | 1.000 | 1.9 | 352 | 93 | 91 | 1 | 0.94 | 0.970 | 1.80 | 352 | 105 | 100 | 1 | 0.95 | 0.975 | 1.70 | 352 | 106 | 98 |
| 5 | 1.30 | 1.140 | 2.5 | 353 | 92 | 90 | 5 | 0.97 | 0.985 | 1.80 | 350 | 106 | 105 | 5 | 0.99 | 0.995 | 1.80 | 352 | 107 | 100 |
| 4 | 1.20 | 1.095 | 2.3 | 353 | 92 | 89 | 4 | 0.95 | 0.975 | 1.80 | 351 | 108 | 104 | 4 | 0.96 | 0.980 | 1.80 | 352 | 108 | 99 |
| 3 | 1.00 | 1.000 | 1.9 | 355 | 95 | 94 | 3 | 1.00 | 1.000 | 1.90 | 351 | 107 | 103 | 3 | 1.00 | 1.000 | 1.80 | 351 | 107 | 96 |
| 2 | 0.94 | 0.970 | 1.8 | 356 | 94 | 92 | 2 | 0.87 | 0.933 | 1.70 | 350 | 107 | 104 | 2 | 1.10 | 1.049 | 2.00 | 351 | 108 | 99 |
| 1 | 0.96 | 0.980 | 1.8 | 353 | 94 | 91 | 1 | 0.85 | 0.922 | 1.60 | 351 | 106 | 104 | 1 | 0.88 | 0.938 | 1.60 | 350 | 109 | 98 |
| 5 | 0.98 | 0.990 | 1.9 | 353 | 94 | 90 | 5 | 1.00 | 1.000 | 1.70 | 350 | 106 | 105 | 5 | 1.10 | 1.049 | 2.00 | 351 | 106 | 105 |
| 4 | 0.95 | 0.975 | 1.8 | 350 | 95 | 92 | 4 | 1.30 | 1.140 | 2.50 | 350 | 107 | 102 | 4 | 1.20 | 1.095 | 2.20 | 351 | 105 | 100 |
| 3 | 1.00 | 1.000 | 1.9 | 351 | 95 | 91 | 3 | 1.10 | 1.049 | 2.10 | 350 | 106 | 103 | 3 | 1.10 | 1.049 | 2.00 | 350 | 105 | 98 |
| 2 | 1.20 | 1.095 | 2.3 | 351 | 96 | 92 | 2 | 0.94 | 0.970 | 1.80 | 350 | 107 | 102 | 2 | 0.89 | 0.943 | 1.60 | 350 | 106 | 97 |
| 1 | 0.88 | 0.938 | 1.7 | 352 | 97 | 93 | 1 | 0.98 | 0.990 | 1.90 | 350 | 107 | 101 | 1 | 1.10 | 1.049 | 2.00 | 350 | 107 | 98 |
| 5 | 1.40 | 1.183 | 2.7 | 353 | 96 | 94 | 5 | 1.20 | 1.095 | 2.30 | 350 | 108 | 106 | 5 | 1.20 | 1.095 | 2.20 | 350 | 108 | 102 |
| 4 | 1.20 | 1.095 | 2.3 | 355 | 98 | 96 | 4 | 1.30 | 1.140 | 2.50 | 351 | 107 | 103 | 4 | 1.00 | 1.000 | 1.80 | 351 | 107 | 100 |
| 3 | 1.10 | 1.049 | 2.0 | 353 | 99 | 97 | 3 | 1.40 | 1.183 | 2.70 | 350 | 108 | 104 | 3 | 1.30 | 1.140 | 2.40 | 350 | 108 | 101 |
| 2 | 0.87 | 0.933 | 1.6 | 353 | 98 | 96 | 2 | 1.20 | 1.095 | 2.30 | 351 | 107 | 105 | 2 | 1.40 | 1.183 | 2.60 | 352 | 109 | 99 |
| 1 | 0.94 | 0.970 | 1.7 | 353 | 99 | 97 | 1 | 1.20 | 1.095 | 2.30 | 351 | 109 | 103 | 1 | 1.10 | 1.049 | 2.00 | 350 | 108 | 97 |
| 5 | 1.10 | 1.049 | 2.0 | 353 | 99 | 96 | 5 | 1.30 | 1.140 | 2.50 | 350 | 108 | 106 | 5 | 1.30 | 1.140 | 2.40 | 351 | 107 | 101 |
| 4 | 0.99 | 0.995 | 1.8 | 352 | 98 | 95 | 4 | 1.20 | 1.095 | 2.30 | 351 | 109 | 101 | 4 | 1.40 | 1.183 | 2.60 | 350 | 106 | 98 |
| 3 | 1.00 | 1.000 | 1.8 | 353 | 100 | 96 | 3 | 1.40 | 1.183 | 2.70 | 352 | 108 | 103 | 3 | 1.00 | 1.000 | 1.80 | 351 | 106 | 97 |
| 2 | 1.20 | 1.095 | 2.2 | 354 | 101 | 97 | 2 | 1.10 | 1.049 | 2.10 | 352 | 109 | 104 | 2 | 1.10 | 1.049 | 2.00 | 351 | 105 | 96 |
| 1 | 1.30 | 1.140 | 2.3 | 356 | 102 | 99 | 1 | 0.97 | 0.985 | 1.80 | 352 | 109 | 103 | 1 | 0.97 | 0.985 | 1.80 | 351 | 107 | 98 |
| Average | | 1.1050 | 2.097 | 352.7 | 93.5 | | Average | | 1.1056 | 2.120 | 350.7 | 104.0 | | Average | | 1.1058 | 2.033 | 351.9 | 102.2 | |

| | | Meter Vol | Imp | Imp | |
|---|---|---|---|---|---|
| Delta P (iwg) | 1.105 | 865.1 | 950.1 | 724.5 | 225.6 |
| Meter Pressure (iwg) | 2.097 | 964.123 | 845.5 | 750.3 | 95.2 |
| Stack Temperature (F) | 352.667 | 99.023 | 675.6 | 672.6 | 3.0 |
| Meter Temperature (F) | 93.500 | | 964.4 | 936.6 | 27.8 |
| Meter Volume (acf) | 99.023 | | | 50 | -50.0 |
| Liquid Volume (ml) | 301.600 | | | | 301.6 |

| | | Meter Vol | Imp | Imp | |
|---|---|---|---|---|---|
| Delta P (iwg) | 1.106 | 964.9 | 913.4 | 661.4 | 252.0 |
| Meter Pressure (iwg) | 2.120 | 1063.932 | 836.7 | 766.9 | 69.8 |
| Stack Temperature (F | 350.733 | 99.032 | 485.0 | 482.9 | 2.1 |
| Meter Temperature (F) | 104.017 | | 955.4 | 932.8 | 22.6 |
| Meter Volume (acf) | 99.032 | | | 50 | -50.0 |
| Liquid Volume (ml) | 296.500 | | | | 296.5 |

| | | Meter Vo | Imp | Imp | |
|---|---|---|---|---|---|
| Delta P (iwg) | 1.106 | 65.2 | 932.7 | 724.8 | 207.9 |
| Meter Pressure (iwg) | 2.033 | 164.384 | 855.9 | 753.1 | 102.8 |
| Stack Temperature (F | 351.933 | 99.184 | 673.7 | 671.9 | 1.8 |
| Meter Temperature (F | 102.183 | | 983.2 | 964.4 | 18.8 |
| Meter Volume (acf) | 99.184 | | | 50 | -50.0 |
| Liquid Volume (ml) | 281.3 | | | | 281.3 |

# APPENDIX A.1.5

# UNIT 1 PARTICULATE DATA

MONTROSE

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: PV ~~3-29-2018~~ 3-30-18
RUN NO: 2 -PM-U1
OPERATOR: Patrick Whitman
METER BOX NO: 17-WCS
METER ΔH@: 1.542
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: 499.9 / 500
1.9 1.9

AMBIENT TEMPERATURE: 94°F
BAROMETRIC PRESSURE: 30.04
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 111 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 55 SS
NOZZLE DIAMETER: 0.244
FILTER NO/TYPE: # 83-3302 FG
PRE-TEST LEAK RATE: : 0.005 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: ~~0.005~~ CFM@ ~~18~~ in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | DI H2O | 948.2 | 749.3 | |
| 2 | DI H2O | 773.0 | 758.1 | |
| 3 | Empty | 642.4 | 640.7 | |
| 4 | Silica gel | 912.8 | 880.9 | |
| | | | | |
| | | | | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1729 | 913.700 | .85 | 1.6 | 351 | 254 | 252 | 58 | 102 | 100 | 5" | | |
| 4 | 1733 | 916.985 | .89 | 1.7 | 351 | 255 | 254 | 59 | 103 | 97 | 5" | | |
| 3 | 1737 | 919.990 | .93 | 1.8 | 351 | 256 | 254 | 57 | 102 | 96 | 5" | | 0.36 |
| 2 | 1741 | 923.035 | .91 | 1.7 | 350 | 257 | 253 | 58 | 103 | 96 | 5" | | |
| 1 | 1745 | 926.140 | .81 | 1.5 | 350 | 257 | 255 | 56 | 102 | 95 | 5" | | |
| 15 | 1749 | 929.132 | | | | | | | | | | | |
| 5 | 1751 | 929.132 | 1.0 | 1.9 | 350 | 253 | 256 | 56 | 103 | 100 | 5" | | |
| 4 | 1755 | 932.450 | .87 | 1.7 | 351 | 252 | 258 | 55 | 100 | 95 | 5" | | |
| 3 | 1759 | 935.665 | .74 | 1.4 | 350 | 255 | 254 | 54 | 100 | 94 | 5" | | |
| 2 | 1803 | 938.870 | .69 | 1.3 | 351 | 254 | 252 | 53 | 100 | 93 | 5" | | |
| 1 | 1808 | 942.115 | .73 | 1.4 | 347 | 255 | 253 | 54 | 100 | 94 | 5" | | |
| 15 | 1811 | 944.268 | | | | | | | | | | | |
| 5 | 1813 | 944.268 | 1.1 | 2.1 | 346 | 252 | 250 | 56 | 100 | 100 | 5" | | |
| 4 | 1817 | 947.235 | .94 | 1.8 | 351 | 253 | 251 | 55 | 100 | 96 | 5" | | |
| 3 | 1821 | 950.975 | .82 | 1.6 | 352 | 251 | 250 | 54 | 101 | 95 | 5" | | |
| 2 | 1825 | 954.020 | .77 | 1.5 | 352 | 251 | 253 | 53 | 100 | 94 | 5" | | |
| 1 | 1829 | 957.135 | .72 | 1.4 | 352 | 250 | 254 | 54 | 100 | 92 | 5" | | |
| Average: | 1833 | 959.987 | | | | | | | | | | | |

Comments: _____

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3-29-2018
RUN NO: 2 -PM-U1
OPERATOR: Patrick Whitman
METER BOX NO: 17-WCS
METER ΔH@: 1.542
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: _____
Silica Gel Expanded, Y/N: _____
Filter Condition after Test: _____
Check Weight: 1.8

AMBIENT TEMPERATURE: 90°F
BAROMETRIC PRESSURE: 30.09
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 111 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 55 SS
NOZZLE DIAMETER: 0.244
FILTER NO/TYPE: # 83-3302 FG
PRE-TEST LEAK RATE: : 0.003 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: ~~0.005~~ CFM@ 18 in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | DI H2O | | | |
| 2 | DI H2O | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | | | | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1836 | 959.987 | 1.0 | 1.9 | 352 | 251 | 250 | 57 | 99 | 96 | 5 | | |
| 4 | 1840 | 964.125 | 1.3 | 2.3 | 352 | 256 | 251 | 55 | 99 | 93 | 5 | | |
| 3 | 1844 | 967.515 | 1.0 | 1.8 | 352 | 255 | 253 | 54 | 98 | 92 | 5 | | |
| 2 | 1848 | 970.975 | .97 | 1.7 | 351 | 254 | 255 | 55 | 97 | 90 | 5 | | |
| 1 | 1852 | 974.265 | .88 | 1.6 | 353 | 253 | 257 | 53 | 99 | 91 | 5 | | |
| E | 1856 | 977.290 | | | | | | | | | | | |
| 5 | 1858 | 977.290 | 1.3 | 2.3 | 350 | 251 | 250 | 54 | 99 | 96 | 5 | | |
| 4 | 1902 | 980.765 | 1.4 | 2.5 | 351 | 252 | 255 | 55 | 98 | 92 | 5 | | |
| 3 | 1906 | 984.395 | 1.2 | 2.2 | 351 | 256 | 251 | 54 | 98 | 91 | 5 | | |
| 2 | 1910 | 987.850 | 1.0 | 1.8 | 350 | 257 | 253 | 54 | 99 | 92 | 5 | | |
| 1 | 1914 | 991.135 | .97 | 1.7 | 351 | 254 | 252 | 55 | 97 | 90 | 5 | | |
| E | 1918 | 994.318 | | | | | | | | | | | |
| 5 | 1920 | 994.318 | 1.4 | 2.5 | 350 | 256 | 258 | 54 | 97 | 90 | 5 | | |
| 4 | 1924 | 998.055 | 1.2 | 2.2 | 351 | 257 | 251 | 54 | 96 | 89 | 5 | | |
| 3 | 1928 | 1001.512 | 1.2 | 2.3 | 351 | 255 | 252 | 55 | 96 | 88 | 5 | | |
| 2 | 1932 | 1005.248 | 1.1 | 2.0 | 352 | 253 | 251 | 56 | 97 | 87 | 5 | | |
| 1 | 1936 | 1008.530 | .98 | 1.8 | 353 | 251 | 250 | 57 | 96 | 87 | 5 | | |
| Average | E 1940 | 1011.763 | | | | | | | | | | | |

Comments: _____

MONTROSE

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: ~~3-29-2018~~ PW 3-30-18
RUN NO: 3-PM-U1
OPERATOR: Patrick Whitman
METER BOX NO: 17-WCS
METER ΔH@: 1.542
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: 499.5 / 500
1.7 | 14.300

AMBIENT TEMPERATURE: ~~65~~ °F
BAROMETRIC PRESSURE: 30.04
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 101 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 5x SS
NOZZLE DIAMETER: 0.242
FILTER NO/TYPE: # 83-3303 FG
PRE-TEST LEAK RATE: : 0.005 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: _____
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | DI H2O | 989.1 | 740.6 | |
| 2 | DI H2O | 762.2 | 725.9 | |
| 3 | Empty | 493.5 | 492.3 | |
| 4 | Silica gel | 872.0 | 852.3 | |
| | | | | |
| | | | | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0755 | ~~13.750~~ PW | 1.1 | 1.9 | 340 | 256 | 252 | 55 | 65 | 64 | 6" | | |
| 4 | 0759 | 17.575 | 1.2 | 1.3 | 338 | 257 | 255 | 54 | 67 | 63 | 6" | | |
| 3 | 0803 | 20.920 | .97 | 1.6 | 338 | 258 | 251 | 53 | 67 | 64 | 6" | | +0.36 |
| 2 | 0807 | 23.855 | .65 | 1.1 | 337 | 256 | 252 | 54 | 68 | 65 | 5" | | |
| 1 | 0811 | 26.520 | .71 | 1.2 | 338 | 257 | 251 | 53 | 68 | 64 | 5" | | |
| E | 0815 | 29.147 | | | | | | | | | | | |
| 5 | 0817 | 29.147 | 1.0 | 1.7 | 338 | 256 | 252 | 53 | 68 | 65 | 5" | | |
| 4 | 0821 | 32.365 | 1.3 | 2.2 | 338 | 256 | 251 | 54 | 63 | 64 | 6" | | |
| 3 | 0825 | 35.640 | 1.0 | 1.7 | 338 | 255 | 250 | 54 | 68 | 64 | 5" | | |
| 2 | 0829 | 38.895 | .97 | 1.6 | 339 | 258 | 251 | 55 | 69 | 65 | 5" | | |
| 1 | 0833 | 41.850 | .93 | 1.6 | 339 | 256 | 253 | 54 | 72 | 68 | 5" | | |
| E | 0837 | 44.797 | | | | | | | | | | | |
| 5 | 0839 | 44.797 | .96 | 1.6 | 339 | 255 | 252 | 53 | 73 | 69 | 5" | | |
| 4 | 0843 | 47.815 | .93 | 1.6 | 340 | 256 | 251 | 53 | 75 | 70 | 5" | | |
| 3 | 0847 | 50.820 | .95 | 1.6 | 336 | 256 | 252 | 54 | 77 | 69 | 5" | | |
| 2 | 0851 | 53.810 | .87 | 1.5 | 340 | 257 | 253 | 54 | 78 | 70 | 5" | | |
| 1 | 0855 | 56.655 | .98 | 1.7 | 340 | 256 | 254 | 54 | 77 | 70 | 5" | | |
| Average | 0859 | 59.612 | | | | | | | | | | | |

Comments: _____

MONTROSE

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: ~~3-29-2018~~ PV 3-31-18
RUN NO: 3-PM-U1
OPERATOR: Patrick Whitman
METER BOX NO: 17-WCS
METER ΔH@: 1.542
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: _____
Silica Gel Expanded, Y/N: _____
Filter Condition after Test: _____
Check Weight: 1.8

AMBIENT TEMPERATURE: 83°F
BAROMETRIC PRESSURE: 30.05
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 101 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 5x SS
NOZZLE DIAMETER: 0.242
FILTER NO/TYPE: # 83-3303 FG
PRE-TEST LEAK RATE: : 0.005 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: : 0.005 CFM@ 12 in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | DI H2O | | | |
| 2 | DI H2O | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | | | | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0901 | 59.612 | 1.2 | 2.0 | 341 | 256 | 252 | 55 | 78 | 75 | 6" | | |
| 4 | 0905 | 62.820 | 1.3 | 2.3 | 340 | 257 | 250 | 54 | 79 | 79 | 6" | | |
| 3 | 0909 | 66.375 | 1.1 | 2.0 | 341 | 259 | 251 | 53 | 81 | 77 | 6" | | |
| 2 | 0913 | 69.760 | 1.0 | 1.8 | 342 | 256 | 253 | 54 | 84 | 79 | 6" | | |
| 1 | 0917 | 72.985 | .98 | 1.8 | 342 | 258 | 251 | 55 | 85 | 83 | 6" | | |
| E | 0921 | 76.082 | | | | | | | | | | | |
| 5 | 0923 | 76.082 | 1.0 | 1.8 | 342 | 257 | 253 | 56 | 85 | 82 | 6" | | |
| 4 | 0927 | 79.210 | 1.1 | 2.0 | 342 | 256 | 255 | 54 | 85 | 81 | 6" | | |
| 3 | 0931 | 82.580 | 1.3 | 2.3 | 342 | 257 | 254 | 53 | 86 | 80 | 6" | | |
| 2 | 0935 | 85.925 | 1.2 | 2.2 | 343 | 258 | 255 | 53 | 86 | 81 | 6" | | |
| 1 | 0939 | 89.330 | 1.0 | 1.8 | 344 | 257 | 253 | 53 | 86 | 82 | 6" | | |
| E | 0943 | 92.893 | | | | | | | | | | | |
| 5 | 0945 | 92.893 | 1.3 | 2.3 | 343 | 258 | 256 | 54 | 86 | 83 | 6" | | |
| 4 | 0949 | 96.425 | 1.2 | 2.2 | 345 | 256 | 251 | 54 | 87 | 84 | 6" | | |
| 3 | 0953 | 99.830 | 1.1 | 2.0 | 344 | 257 | 252 | 53 | 87 | 84 | 6" | | |
| 2 | 0957 | 103.160 | 1.0 | 1.8 | 344 | 255 | 253 | 55 | 89 | 85 | 6" | | |
| 1 | 1001 | 106.397 | 1.1 | 2.0 | 345 | 256 | 250 | 56 | 89 | 86 | 6" | | |
| Average | E 1005 | 109.681 | | | | | | | | | | | |

Comments: _____

MONTROSE

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3-31-2018
RUN NO: 4-PM-U1
OPERATOR: Patrick Whitman
METER BOX NO: 17-WCS
METER ΔH@: 1.542
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: 499.9/500
1.82

AMBIENT TEMPERATURE: 87°F
BAROMETRIC PRESSURE: 30.05
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 101 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 5x SS
NOZZLE DIAMETER: 0.242
FILTER NO/TYPE: # 83-3304 FG
PRE-TEST LEAK RATE: : 0.005 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: _____
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | = Difference |
|---|---|---|---|---|
| 1 | DI H2O | 985.8 | 754.7 | |
| 2 | DI H2O | 784.2 | 760.7 | |
| 3 | Empty | 640.3 | 639.0 | |
| 4 | Silica gel | 933.2 | 911.4 | |
| | | | | |
| | | | | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H2O | ΔH in. H2O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O2 % | P. static in. H2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1040 | 111.500 | 1.1 | 2.0 | 344 | 255 | 253 | 55 | 87 | 86 | 6" | | |
| 4 | 1044 | 114.925 | 1.2 | 2.2 | 345 | 256 | 257 | 53 | 87 | 85 | 6" | | |
| 3 | 1048 | 118.410 | 1.0 | 1.8 | 346 | 255 | 252 | 54 | 88 | 86 | 6" | | 1.36 |
| 2 | 1052 | 121.770 | .94 | 1.7 | 344 | 254 | 251 | 53 | 89 | 85 | 6" | | |
| 1 | 1056 | 124.925 | .96 | 1.7 | 343 | 253 | 252 | 53 | 90 | 86 | 6" | | |
| E | 1100 | 128.064 | | | | | | | | | | | |
| 5 | 1102 | 128.064 | 1.3 | 2.4 | 344 | 252 | 253 | 54 | 90 | 87 | 6" | | |
| 4 | 1106 | 131.785 | 1.1 | 2.0 | 345 | 256 | 252 | 54 | 90 | 86 | 6" | | |
| 3 | 1110 | 135.140 | .96 | 1.8 | 344 | 252 | 251 | 53 | 91 | 89 | 6" | | |
| 2 | 1114 | 138.385 | 1.0 | 1.8 | 346 | 255 | 250 | 53 | 91 | 87 | 6" | | |
| 1 | 1118 | 141.660 | .85 | 1.6 | 345 | 254 | 251 | 54 | 92 | 88 | 5" | | |
| E | 1122 | 144.758 | | | | | | | | | | | |
| 5 | 1124 | 144.758 | .83 | 1.5 | 345 | 256 | 252 | 54 | 93 | 89 | 5" | | |
| 4 | 1128 | 147.795 | .94 | 1.7 | 345 | 257 | 258 | 55 | 92 | 88 | 6" | | |
| 3 | 1132 | 151.020 | .92 | 1.7 | 346 | 258 | 255 | 54 | 92 | 89 | 6" | | |
| 2 | 1136 | 154.185 | .86 | 1.6 | 347 | 259 | 251 | 54 | 94 | 89 | 6" | | |
| 1 | 1140 | 157.350 | .93 | 1.7 | 347 | 257 | 252 | 54 | 94 | 89 | 6" | | |
| Average | 1144 | 160.508 | | | | | | | | | | | |

Comments: _____

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 3-31-2018
RUN NO: 4-PM-U1
OPERATOR: Patrick Whitman
METER BOX NO: 17-WCS
METER ΔH@: 1.542
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: _____
Silica Gel Expanded, Y/N: _____
Filter Condition after Test: _____
Check Weight: 1.75

AMBIENT TEMPERATURE: 91 °F
BAROMETRIC PRESSURE: 30.05
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 101 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 5x SS
NOZZLE DIAMETER: 0.242
FILTER NO/TYPE: # 83-3304 FG
PRE-TEST LEAK RATE: : 0.005 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: : 0.005 CFM@ 15 in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | DI H2O | | | |
| 2 | DI H2O | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | | | | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1146 | 160.508 | 1.1 | 2.0 | 347 | 256 | 258 | 54 | 93 | 90 | 8" | | |
| 4 | 1150 | 163.875 | 1.3 | 2.3 | 347 | 258 | 255 | 57 | 92 | 88 | 6" | | |
| 3 | 1154 | 167.320 | 1.2 | 2.1 | 347 | 257 | 254 | 53 | 93 | 89 | 6" | | |
| 2 | 1158 | 170.890 | 1.0 | 1.8 | 348 | 256 | 253 | 53 | 94 | 91 | 6" | | |
| 1 | 1202 | 174.185 | 1.1 | 1.9 | 348 | 257 | 255 | 54 | 94 | 90 | 6" | | |
| E | 1206 | 177.492 | | | | | | | | | | | |
| 5 | 1208 | 177.492 | 1.0 | 1.8 | 347 | 256 | 254 | 55 | 95 | 92 | 6" | | |
| 4 | 1212 | 180.745 | 1.1 | 1.9 | 347 | 255 | 252 | 54 | 96 | 91 | 6" | | |
| 3 | 1216 | 183.750 | 1.3 | 2.3 | 348 | 254 | 253 | 54 | 96 | 90 | 6" | | |
| 2 | 1220 | 187.225 | 1.2 | 2.1 | 348 | 256 | 257 | 53 | 97 | 93 | 6" | | |
| 1 | 1224 | 190.780 | 1.0 | 1.8 | 348 | 257 | 256 | 53 | 98 | 94 | 6" | | |
| E | 1228 | 194.042 | | | | | | | | | | | |
| 5 | 1230 | 194.042 | 1.3 | 2.3 | 348 | 256 | 255 | 54 | 97 | 95 | 8" | | |
| 4 | 1234 | 197.450 | 1.4 | 2.5 | 349 | 255 | 254 | 53 | 98 | 94 | 7" | | |
| 3 | 1238 | 200.835 | 1.2 | 2.1 | 348 | 254 | 257 | 50 | 98 | 93 | 6" | | |
| 2 | 1242 | 204.060 | 1.0 | 1.8 | 347 | 255 | 256 | 53 | 97 | 92 | 6" | | |
| 1 | 1246 | 207.245 | 1.1 | 1.9 | 347 | 253 | 257 | 53 | 99 | 94 | 6" | | |
| Average | 1250 | 210.514 | | | | | | | | | | | |

Comments: _____

DS834049

1-PM-U1

| | dP | (dP)^.5 | dH | Ts | Tm | |
|---|---|---|---|---|---|---|
| 5 | 0.85 | 0.922 | 1.6 | 351 | 102 | 100 |
| 4 | 0.89 | 0.943 | 1.7 | 351 | 103 | 97 |
| 3 | 0.93 | 0.964 | 1.8 | 351 | 102 | 96 |
| 2 | 0.91 | 0.954 | 1.7 | 350 | 103 | 96 |
| 1 | 0.81 | 0.900 | 1.5 | 350 | 102 | 95 |
| 5 | 1.00 | 1.000 | 1.9 | 350 | 103 | 100 |
| 4 | 0.87 | 0.933 | 1.7 | 351 | 100 | 95 |
| 3 | 0.74 | 0.860 | 1.4 | 356 | 100 | 94 |
| 2 | 0.69 | 0.831 | 1.3 | 351 | 100 | 93 |
| 1 | 0.73 | 0.854 | 1.4 | 347 | 100 | 94 |
| 5 | 1.10 | 1.049 | 2.1 | 346 | 100 | 100 |
| 4 | 0.94 | 0.970 | 1.8 | 351 | 100 | 96 |
| 3 | 0.82 | 0.906 | 1.6 | 352 | 101 | 95 |
| 2 | 0.77 | 0.877 | 1.5 | 352 | 100 | 94 |
| 1 | 0.72 | 0.849 | 1.4 | 352 | 100 | 92 |
| 5 | 1.00 | 1.000 | 1.9 | 352 | 99 | 96 |
| 4 | 1.30 | 1.140 | 2.3 | 352 | 99 | 93 |
| 3 | 1.00 | 1.000 | 1.8 | 352 | 98 | 92 |
| 2 | 0.97 | 0.985 | 1.7 | 351 | 97 | 90 |
| 1 | 0.88 | 0.938 | 1.6 | 353 | 99 | 91 |
| 5 | 1.30 | 1.140 | 2.3 | 350 | 99 | 90 |
| 4 | 1.40 | 1.183 | 2.5 | 351 | 98 | 92 |
| 3 | 1.20 | 1.095 | 2.2 | 351 | 98 | 91 |
| 2 | 1.00 | 1.000 | 1.8 | 350 | 99 | 92 |
| 1 | 0.97 | 0.985 | 1.7 | 351 | 97 | 90 |
| 5 | 1.40 | 1.183 | 2.5 | 350 | 97 | 90 |
| 4 | 1.20 | 1.095 | 2.2 | 351 | 96 | 89 |
| 3 | 1.30 | 1.140 | 2.3 | 351 | 96 | 88 |
| 2 | 1.10 | 1.049 | 2.0 | 352 | 97 | 87 |
| 1 | 0.98 | 0.990 | 1.8 | 353 | 96 | 87 |

| | | | | | |
|---|---|---|---|---|---|
| Average | 0.9825 | 1.833 | 351.0 | 96.3 | |
| | | Meter Vol | Imp | Imp | |
| Delta P (iwg) | 0.982 | 913.7 | 985.2 | 749.3 | 235.9 |
| Meter Pressure (iwg) | 1.833 | 1011.763 | 773.0 | 758.1 | 14.9 |
| Stack Temperature (F) | 351.033 | 98.063 | 642.4 | 640.7 | 1.7 |
| Meter Temperature (F) | 96.267 | | 912.8 | 880.9 | 31.9 |
| Meter Volume (acf) | 98.063 | | | | 0.0 |
| Liquid Volume (ml) | 284.400 | | | | 284.4 |

2-PM-U1

| | dP | (dP)^.5 | dH | Ts | Tm | |
|---|---|---|---|---|---|---|
| 5 | 1.10 | 1.049 | 1.9 | 340 | 65 | 64 |
| 4 | 1.20 | 1.095 | 2.3 | 338 | 67 | 63 |
| 3 | 0.97 | 0.985 | 1.6 | 338 | 68 | 64 |
| 2 | 0.65 | 0.806 | 1.1 | 337 | 68 | 65 |
| 1 | 0.71 | 0.843 | 1.2 | 338 | 68 | 64 |
| 5 | 1.00 | 1.000 | 1.7 | 338 | 68 | 65 |
| 4 | 1.30 | 1.140 | 2.2 | 338 | 68 | 64 |
| 3 | 1.00 | 1.000 | 1.7 | 338 | 68 | 64 |
| 2 | 0.97 | 0.985 | 1.6 | 339 | 69 | 65 |
| 1 | 0.93 | 0.964 | 1.6 | 339 | 72 | 68 |
| 5 | 0.96 | 0.980 | 1.6 | 339 | 73 | 69 |
| 4 | 0.93 | 0.964 | 1.6 | 340 | 75 | 70 |
| 3 | 0.95 | 0.975 | 1.6 | 339 | 77 | 69 |
| 2 | 0.87 | 0.933 | 1.5 | 340 | 78 | 70 |
| 1 | 0.98 | 0.990 | 1.7 | 340 | 77 | 70 |
| 5 | 1.20 | 1.095 | 2.0 | 341 | 78 | 75 |
| 4 | 1.30 | 1.140 | 2.3 | 340 | 79 | 74 |
| 3 | 1.10 | 1.049 | 2.0 | 341 | 81 | 77 |
| 2 | 1.00 | 1.000 | 1.8 | 342 | 84 | 79 |
| 1 | 0.98 | 0.990 | 1.8 | 342 | 85 | 80 |
| 5 | 1.00 | 1.000 | 1.8 | 342 | 85 | 82 |
| 4 | 1.10 | 1.049 | 2.0 | 342 | 85 | 81 |
| 3 | 1.30 | 1.140 | 2.3 | 342 | 86 | 80 |
| 2 | 1.20 | 1.095 | 2.2 | 343 | 86 | 81 |
| 1 | 1.00 | 1.000 | 1.8 | 344 | 86 | 82 |
| 5 | 1.30 | 1.140 | 2.3 | 343 | 86 | 83 |
| 4 | 1.20 | 1.095 | 2.2 | 345 | 87 | 84 |
| 3 | 1.10 | 1.049 | 2.0 | 344 | 87 | 84 |
| 2 | 1.00 | 1.000 | 1.8 | 344 | 89 | 85 |
| 1 | 1.10 | 1.049 | 2.0 | 345 | 89 | 86 |

| | | | | | |
|---|---|---|---|---|---|
| Average | 1.0405 | 1.840 | 340.7 | 75.7 | |
| | | Meter Vol | Imp | Imp | |
| Delta P (iwg) | 1.040 | 14.3 | 989.1 | 740.6 | 248.5 |
| Meter Pressure (iwg) | 1.840 | 109.681 | 762.2 | 725.9 | 36.3 |
| Stack Temperature (F | 340.700 | 95.381 | 493.5 | 492.3 | 1.2 |
| Meter Temperature (F) | 75.683 | | 872.0 | 852.3 | 19.7 |
| Meter Volume (acf) | 95.381 | | | | 0.0 |
| Liquid Volume (ml) | 305.700 | | | | 305.7 |

3-PM-U1

| | dP | (dP)^.5 | dH | Ts | Tm | |
|---|---|---|---|---|---|---|
| 5 | 1.10 | 1.049 | 2.0 | 344 | 87 | 86 |
| 4 | 1.20 | 1.095 | 2.2 | 345 | 87 | 85 |
| 3 | 1.00 | 1.000 | 1.8 | 346 | 88 | 86 |
| 2 | 0.94 | 0.970 | 1.7 | 344 | 89 | 85 |
| 1 | 0.96 | 0.980 | 1.7 | 343 | 90 | 86 |
| 5 | 1.30 | 1.140 | 2.4 | 344 | 90 | 87 |
| 4 | 1.10 | 1.049 | 2.0 | 345 | 90 | 86 |
| 3 | 0.96 | 0.980 | 1.8 | 344 | 91 | 87 |
| 2 | 1.00 | 1.000 | 1.8 | 346 | 91 | 87 |
| 1 | 0.85 | 0.922 | 1.6 | 345 | 92 | 88 |
| 5 | 0.83 | 0.911 | 1.5 | 345 | 93 | 89 |
| 4 | 0.94 | 0.970 | 1.7 | 345 | 92 | 88 |
| 3 | 0.92 | 0.959 | 1.7 | 346 | 92 | 89 |
| 2 | 0.86 | 0.927 | 1.6 | 347 | 94 | 89 |
| 1 | 0.93 | 0.964 | 1.7 | 347 | 94 | 89 |
| 5 | 1.10 | 1.049 | 2.0 | 347 | 93 | 90 |
| 4 | 1.30 | 1.140 | 2.3 | 347 | 92 | 88 |
| 3 | 1.20 | 1.095 | 2.1 | 347 | 93 | 89 |
| 2 | 1.00 | 1.000 | 1.8 | 348 | 94 | 91 |
| 1 | 1.10 | 1.049 | 1.9 | 348 | 94 | 90 |
| 5 | 1.00 | 1.000 | 1.8 | 347 | 95 | 92 |
| 4 | 1.10 | 1.049 | 1.9 | 347 | 96 | 91 |
| 3 | 1.30 | 1.140 | 2.3 | 348 | 96 | 93 |
| 2 | 1.20 | 1.095 | 2.1 | 348 | 97 | 93 |
| 1 | 1.00 | 1.000 | 1.8 | 348 | 98 | 94 |
| 5 | 1.30 | 1.140 | 2.3 | 348 | 97 | 95 |
| 4 | 1.40 | 1.183 | 2.5 | 349 | 98 | 94 |
| 3 | 1.20 | 1.095 | 2.1 | 348 | 98 | 93 |
| 2 | 1.00 | 1.000 | 1.8 | 347 | 97 | 92 |
| 1 | 1.10 | 1.049 | 1.9 | 347 | 99 | 94 |

| | | | | | |
|---|---|---|---|---|---|
| Average | 1.0679 | 1.927 | 346.3 | 91.4 | |
| | | Meter Vo | Imp | Imp | |
| Delta P (iwg) | 1.068 | 111.5 | 985.8 | 754.7 | 231.1 |
| Meter Pressure (iwg) | 1.927 | 210.514 | 784.2 | 760.7 | 23.5 |
| Stack Temperature (F | 346.333 | 99.014 | 640.3 | 639 | 1.3 |
| Meter Temperature (F | 91.383 | | 933.2 | 911.4 | 21.8 |
| Meter Volume (acf) | 99.014 | | | | 0.0 |
| Liquid Volume (ml) | 277.7 | | | | 277.7 |

# APPENDIX A.1.6

# UNIT 1 $SO_2$ DATA AND VELOCITY DATA

# FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit - 1
PERFORMED BY: Patrick Whitman
TEST DATE: ~~3/29/2018~~ 3-30-18
BAR. PRESSURE: 30.04
TC READOUT ID: #42
DP INDICATOR ID: CC-2
TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer
PITOT TUBE ID: #058
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- ✓ POST- ✓

Run #: 1 Ps: +.36
Start: 14:55 Stop: 15:25

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.3 | 350 | 5 | 1.1 | 350 | 5 | 1.3 | 351 |
| 4 | 1.1 | 350 | 4 | .92 | 350 | 4 | 1.4 | 351 |
| 3 | 1.2 | 350 | 3 | .57 | 351 | 3 | 1.0 | 351 |
| 2 | 1.0 | 349 | 2 | .68 | 351 | 2 | 1.1 | 350 |
| 1 | .95 | 349 | 1 | .71 | 350 | 1 | .97 | 351 |
| | | | | | | | | |
| 5 | .85 | 346 | 5 | 1.0 | 351 | 5 | 1.2 | 351 |
| 4 | .88 | 348 | 4 | 1.1 | 351 | 4 | 1.0 | 351 |
| 3 | .91 | 348 | 3 | 1.3 | 351 | 3 | .98 | 351 |
| 2 | .94 | 349 | 2 | .87 | 350 | 2 | .93 | 350 |
| 1 | .92 | 349 | 1 | .85 | 350 | 1 | .95 | 350 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
| 1 | 292 | 00.4 | 1 | | | 1 | | |
| 2 | 293 | 00.3 | 2 | | | 2 | | |
| 3 | 292 | 00.4 | 3 | | | 3 | | |

## MOISTURE DATA FOR TEST RUNS 1 THROUGH 1

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.9 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 14:55 | 447.800 | 2.5 | 95 | 91 | 57 | 7" | #1 | $H_2O_2$ | 813.4 | 701.3 | |
| 15:05 | 457.196 | 2.5 | 94 | 91 | 58 | 7" | #2 | $H_2O_2$ | 708.2 | 702.0 | |
| 15:15 | 462.549 | 2.5 | 94 | 90 | 58 | 7" | #3 | Empty | 652.8 | 651.9 | |
| 15:25 | 467.867 | | | | | | #4 | Silica Gel | 1018.7 | 1006.8 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: <0.005 CFM @ 17 in. Hg., Post-Test Leak Check: <0.005 CFM @ 16 in. Hg

## FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit - 1
PERFORMED BY: Patrick Whitman TEST DATE: 3/30/2018
BAR. PRESSURE: 30.04 TC READOUT ID: #42
DP INDICATOR ID: CC-2 TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer PITOT TUBE ID: #058 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

**Run #:** 2 **Ps:** 1.36
**Start:** 15:38 **Stop:** 16:08

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.1 | 351 | 5 | .85 | 352 | 5 | 1.0 | 351 |
| 4 | .93 | 351 | 4 | .89 | 352 | 4 | .99 | 352 |
| 3 | .81 | 352 | 3 | .90 | 351 | 3 | 1.1 | 352 |
| 2 | .76 | 352 | 2 | .93 | 352 | 2 | .94 | 352 |
| 1 | .68 | 351 | 1 | .92 | 352 | 1 | .91 | 351 |
| | | | | | | | | |
| 5 | 1.1 | 352 | 5 | 1.1 | 352 | 5 | 1.1 | 351 |
| 4 | .92 | 352 | 4 | 1.2 | 352 | 4 | 1.0 | 352 |
| 3 | .56 | 352 | 3 | .94 | 352 | 3 | .56 | 352 |
| 2 | .69 | 351 | 2 | .96 | 352 | 2 | .91 | 352 |
| 1 | .66 | 351 | 1 | .85 | 351 | 1 | .89 | 352 |

| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
|---|---|---|---|---|---|---|---|---|
| 1 | 292 | 60.4 | 1 | | | 1 | | |
| 2 | 291 | 60.3 | 2 | | | 2 | | |
| 3 | 292 | 60.3 | 3 | | | 3 | | |

**MOISTURE DATA FOR TEST RUNS 2 THROUGH 2**

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.9 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 15:38 | 476.600 | 2.5 | 94 | 89 | 58 | 7" | #1 | $H_2O_2$ | 852.8 | 744.5 | |
| 15:48 | 485.775 | 2.5 | 94 | 90 | 59 | 7" | #2 | $H_2O_2$ | 753.3 | 746.6 | |
| 15:58 | 495.067 | 2.5 | 93 | 88 | 57 | 7" | #3 | Empty | 468.8 | 467.0 | |
| 16:08 | 504.300 | | | | | | #4 | Silica Gel | 862.9 | 846.8 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: 0.005 CFM @ 17 in. Hg., Post-Test Leak Check: 0.005 CFM @ 18 in. Hg

## FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit - 1
PERFORMED BY: Patrick Whitman TEST DATE: 3/30/2018
BAR. PRESSURE: 30.04 TC READOUT ID: #42
DP INDICATOR ID: CC-2 TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer PITOT TUBE ID: #058 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 3 Ps: 1.36
Start: 16:22 Stop: 16:52

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.2 | 353 | 5 | .89 | 353 | 5 | 1.0 | 352 |
| 4 | .95 | 353 | 4 | .88 | 354 | 4 | 1.1 | 353 |
| 3 | .83 | 354 | 3 | .93 | 354 | 3 | 1.2 | 353 |
| 2 | .77 | 354 | 2 | .95 | 353 | 2 | 1.1 | 352 |
| 1 | .68 | 354 | 1 | .90 | 353 | 1 | 1.0 | 352 |
| | | | | | | | | |
| 5 | 1.1 | 354 | 5 | 1.0 | 354 | 5 | 1.2 | 352 |
| 4 | .93 | 354 | 4 | 1.1 | 354 | 4 | 1.3 | 353 |
| 3 | .59 | 354 | 3 | .94 | 354 | 3 | 1.4 | 352 |
| 2 | .66 | 353 | 2 | .97 | 353 | 2 | 1.2 | 352 |
| 1 | .68 | 353 | 1 | .85 | 353 | 1 | 1.0 | 352 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
| 1 | 293 | 00.4 | 1 | | | 1 | | |
| 2 | 292 | 00.3 | 2 | | | 2 | | |
| 3 | 290 | 00.3 | 3 | | | 3 | | |

### MOISTURE DATA FOR TEST RUNS 3 THROUGH 3

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.9 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 16:22 | 204.900 | 2.5 | 95 | 90 | 56 | 7" | #1 | $H_2O_2$ | 801.3 | 694.7 | |
| 16:32 | 213.948 | 2.5 | 94 | 88 | 57 | 7" | #2 | $H_2O_2$ | 714.1 | 706.3 | |
| 16:42 | 522.998 | 2.5 | 93 | 87 | 58 | 7" | #3 | Empty | 651.4 | 656.0 | |
| 16:52 | 532.000 | | | | | | #4 | Silica Gel | 918.0 | 905.8 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: 0.005 CFM @ 17 in. Hg., Post-Test Leak Check: 0.005 CFM @ 16 in. Hg

# FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit - 1
PERFORMED BY: Patrick Whitman TEST DATE: 3/30/2018
BAR. PRESSURE: 36.04 TC READOUT ID: #42
DP INDICATOR ID: CC-2 TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer PITOT TUBE ID: #058 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

**Run #:** 4 Ps: +.36
Start: 17:05 Stop: 17:35

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.2 | 351 | 5 | 1.0 | 352 | 5 | 1.1 | 351 |
| 4 | 1.3 | 351 | 4 | 1.2 | 351 | 4 | .95 | 351 |
| 3 | 1.4 | 351 | 3 | .94 | 351 | 3 | .59 | 351 |
| 2 | 1.2 | 351 | 2 | .96 | 351 | 2 | .66 | 350 |
| 1 | 1.0 | 350 | 1 | .85 | 350 | 1 | .68 | 350 |
| | | | | | | | | |
| 5 | 1.1 | 351 | 5 | .86 | 351 | 5 | 1.0 | 351 |
| 4 | 1.1 | 352 | 4 | .89 | 351 | 4 | .94 | 351 |
| 3 | 1.2 | 352 | 3 | .90 | 351 | 3 | .83 | 352 |
| 2 | 1.1 | 351 | 2 | .95 | 350 | 2 | .77 | 352 |
| 1 | .99 | 351 | 1 | .93 | 350 | 1 | .69 | 351 |

| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
|---|---|---|---|---|---|---|---|---|
| 1 | 291 | 00.2 | 1 | | | 1 | | |
| 2 | 292 | 00.2 | 2 | | | 2 | | |
| 3 | 290 | 00.3 | 3 | | | 3 | | |

**MOISTURE DATA FOR TEST RUNS** 4 **THROUGH** 4

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.9 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 17:05 | 533.060 | 2.5 | 94 | 89 | 57 | 7" | #1 | $H_2O_2$ | 870.8 | 741.7 | |
| 17:15 | 542.254 | 2.5 | 94 | 88 | 58 | 7" | #2 | $H_2O_2$ | 768.2 | 762.7 | |
| 17:25 | 551.515 | 2.5 | 93 | 87 | 59 | 7" | #3 | Empty | 470.1 | 467.7 | |
| 17:35 | 560.757 | | | | | | #4 | Silica Gel | 872.4 | 862.9 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: <0.005 CFM @ 18 in. Hg., Post-Test Leak Check: <0.005 CFM @ 17 in. Hg

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# FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power | LOCATION/UNIT: Unit - 1
PERFORMED BY: Patrick Whitman | TEST DATE: 3/30/2018
BAR. PRESSURE: 30.04 | TC READOUT ID: #42
DP INDICATOR ID: CC-2 | TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer | PITOT TUBE ID: #058 | Cp: 0.84
ZERO: ✓ LEVEL: ✓ | LEAK CHECK PRE- ✓ POST- ✓

Run #: 5 Ps: +.36
Start: 17:50 Stop: 18:20

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.1 | 351 | 5 | .91 | 351 | 5 | 1.1 | 351 |
| 4 | .95 | 350 | 4 | .90 | 351 | 4 | 1.1 | 351 |
| 3 | .86 | 351 | 3 | .94 | 351 | 3 | .95 | 350 |
| 2 | .84 | 351 | 2 | 1.0 | 351 | 2 | .94 | 350 |
| 1 | .86 | 351 | 1 | .97 | 350 | 1 | .91 | 351 |
| | | | | | | | | |
| 5 | 1.2 | 350 | 5 | 1.1 | 351 | 5 | 1.0 | 351 |
| 4 | 1.0 | 351 | 4 | 1.1 | 352 | 4 | 1.2 | 351 |
| 3 | .95 | 351 | 3 | 1.0 | 351 | 3 | 1.1 | 352 |
| 2 | .69 | 351 | 2 | .94 | 351 | 2 | 1.2 | 352 |
| 1 | .71 | 350 | 1 | .91 | 350 | 1 | .99 | 351 |

| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
|---|---|---|---|---|---|---|---|---|
| 1 | 290 | 00.2 | 1 | | | 1 | | |
| 2 | 289 | 00.2 | 2 | | | 2 | | |
| 3 | 290 | 00.3 | 3 | | | 3 | | |

## MOISTURE DATA FOR TEST RUNS 5 THROUGH 5

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.9 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 17:50 | 561.800 | 2.5 | 91 | 87 | 57 | 7" | #1 | $H_2O_2$ | 834.6 | 720.0 | |
| 18:00 | 571.024 | 2.5 | 90 | 86 | 57 | 7" | #2 | $H_2O_2$ | 713.1 | 708.1 | |
| 18:10 | 580.255 | 2.5 | 88 | 84 | 58 | 7" | #3 | Empty | 651.3 | 658.3 | |
| 18:20 | 589.487 | | | | | | #4 | Silica Gel | 928.3 | 918.0 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: <0.005 CFM @ 17 in. Hg., Post-Test Leak Check: <0.005 CFM @ 18 in. Hg

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## FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit - 1
PERFORMED BY: Patrick Whitman TEST DATE: 3/30/2018
BAR. PRESSURE: 30.04 TC READOUT ID: #42
DP INDICATOR ID: CC-2 TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer PITOT TUBE ID: #058 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 6 Ps: +.36
Start: 18:33 Stop: 19:03

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.2 | 352 | 5 | .93 | 351 | 5 | .99 | 351 |
| 4 | 1.0 | 352 | 4 | .94 | 351 | 4 | 1.0 | 351 |
| 3 | .91 | 352 | 3 | .91 | 352 | 3 | 1.2 | 352 |
| 2 | .87 | 352 | 2 | .96 | 352 | 2 | 1.1 | 352 |
| 1 | .79 | 351 | 1 | .99 | 351 | 1 | .98 | 351 |
| | | | | | | | | |
| 5 | 1.2 | 352 | 5 | 1.1 | 352 | 5 | 1.2 | 351 |
| 4 | .95 | 351 | 4 | 1.2 | 352 | 4 | 1.2 | 351 |
| 3 | .91 | 351 | 3 | .95 | 352 | 3 | 1.4 | 352 |
| 2 | .88 | 352 | 2 | .91 | 351 | 2 | 1.1 | 351 |
| 1 | .85 | 351 | 1 | .86 | 351 | 1 | 1.0 | 352 |

| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
|---|---|---|---|---|---|---|---|---|
| 1 | 291 | 00.3 | 1 | | | 1 | | |
| 2 | 290 | 00.4 | 2 | | | 2 | | |
| 3 | 289 | 00.2 | 3 | | | 3 | | |

### MOISTURE DATA FOR TEST RUNS 6 THROUGH 6

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.9 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 18:33 | 590.300 | 2.5 | 94 | 89 | 57 | 7" | #1 | $H_2O_2$ | 883.7 | 768.7 | |
| 18:43 | 599.499 | 2.5 | 93 | 88 | 56 | 7" | #2 | $H_2O_2$ | 759.4 | 752.5 | |
| 18:56 | 611.496 | 2.5 | 92 | 89 | 57 | 7" | #3 | Empty | 469.7 | 469.0 | |
| 19:03 | 617.882 | | | | | | #4 | Silica Gel | | 862.9 | |
| | | | | | | | Total | | 882.6 | | |

Pre-Test Leak Check: <0.005 CFM @ 18 in. Hg., Post-Test Leak Check: <0.005 CFM @ 17 in. Hg

## FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit - 1
PERFORMED BY: Patrick Whitman TEST DATE: 3/30/2018
BAR. PRESSURE: 29.04 TC READOUT ID: #42
DP INDICATOR ID: CC-2 TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer PITOT TUBE ID: #058 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 7 Ps: 1.36
Start: 18:17 Stop: 19:47

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.1 | 352 | 5 | .91 | 352 | 5 | 1.1 | 351 |
| 4 | .94 | 351 | 4 | .90 | 351 | 4 | 1.2 | 352 |
| 3 | .86 | 352 | 3 | .89 | 352 | 3 | 1.3 | 352 |
| 2 | .81 | 352 | 2 | .93 | 352 | 2 | 1.1 | 352 |
| 1 | .76 | 352 | 1 | .92 | 352 | 1 | .97 | 352 |
| | | | | | | | | |
| 5 | 1.2 | 351 | 5 | 1.1 | 352 | 5 | 1.3 | 351 |
| 4 | .95 | 351 | 4 | 1.2 | 351 | 4 | 1.3 | 351 |
| 3 | .91 | 352 | 3 | .96 | 352 | 3 | 1.3 | 352 |
| 2 | .84 | 351 | 2 | .97 | 352 | 2 | 1.4 | 352 |
| 1 | .76 | 352 | 1 | .91 | 351 | 1 | 1.1 | 351 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
| 1 | 292 | 00.3 | 1 | | | 1 | | |
| 2 | 291 | 00.2 | 2 | | | 2 | | |
| 3 | 290 | 00.3 | 3 | | | 3 | | |

### MOISTURE DATA FOR TEST RUNS 7 THROUGH 7

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.9 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 19:17 | 618.805 | 2.5 | 91 | 85 | 56 | 7 | #1 | $H_2O_2$ | 843.2 | 723.4 | |
| 19:27 | 627.855 | 2.5 | 90 | 83 | 56 | 7 | #2 | $H_2O_2$ | 721.4 | 721.4 | |
| 19:37 | 636.882 | 2.5 | 90 | 84 | 57 | 7 | #3 | Empty | 451.1 | 650.0 | |
| 19:47 | 645.915 | | | | | | #4 | Silica Gel | 892.2 | 882.1 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: 0.005 CFM @ 17 in. Hg., Post-Test Leak Check: 0.005 CFM @ 18 in. Hg

## FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit - 1
PERFORMED BY: Patrick Whitman TEST DATE: 3/30/2018
BAR. PRESSURE: 30.04 TC READOUT ID: #42
DP INDICATOR ID: CC-2 TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer PITOT TUBE ID: #058 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 8 Ps: 1.30
Start: 2001 Stop: 2031

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.2 | 351 | 5 | .89 | 351 | 5 | 1.0 | 350 |
| 4 | 1.1 | 351 | 4 | .94 | 350 | 4 | 1.2 | 351 |
| 3 | .98 | 352 | 3 | .96 | 350 | 3 | 1.1 | 351 |
| 2 | .96 | 352 | 2 | .99 | 351 | 2 | 1.2 | 350 |
| 1 | .84 | 351 | 1 | .97 | 350 | 1 | .99 | 350 |
| | | | | | | | | |
| 5 | 1.1 | 350 | 5 | 1.0 | 351 | 5 | 1.1 | 350 |
| 4 | .97 | 351 | 4 | 1.1 | 350 | 4 | 1.3 | 350 |
| 3 | .89 | 350 | 3 | .98 | 351 | 3 | 1.3 | 351 |
| 2 | .91 | 351 | 2 | .99 | 350 | 2 | 1.2 | 351 |
| 1 | .87 | 351 | 1 | 1.0 | 350 | 1 | 1.2 | 350 |

| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
|---|---|---|---|---|---|---|---|---|
| 1 | 291 | 00.2 | 1 | | | 1 | | |
| 2 | 291 | 00.2 | 2 | | | 2 | | |
| 3 | 292 | 00.3 | 3 | | | 3 | | |

### MOISTURE DATA FOR TEST RUNS 8 THROUGH 8

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.9 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 2001 | 646.435 | 2.5 | 87 | 85 | 56 | 7" | #1 | $H_2O_2$ | 882.4 | 760.6 | |
| 2011 | 655.492 | 2.5 | 85 | 83 | 56 | 7" | #2 | $H_2O_2$ | 770.9 | 765.1 | |
| 2021 | 664.539 | 2.5 | 83 | 81 | 58 | 7" | #3 | Empty | 468.4 | 467.6 | |
| 2031 | 673.547 | | | | | | #4 | Silica Gel | 797.5 | 789.6 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: 0.005 CFM @ 17 in. Hg., Post-Test Leak Check: 0.005 CFM @ 16 in. Hg

## FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit - 1
PERFORMED BY: Patrick Whitman TEST DATE: 3/30/2018
BAR. PRESSURE: 30.09 TC READOUT ID: #42
DP INDICATOR ID: CC-2 TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer PITOT TUBE ID: #058 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 9 Ps: 7.36
Start: 20:45 Stop: 21:15

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.3 | 351 | 5 | .99 | 351 | 5 | .94 | 351 |
| 4 | 1.3 | 351 | 4 | 1.1 | 351 | 4 | .94 | 351 |
| 3 | 1.4 | 351 | 3 | .97 | 352 | 3 | .96 | 351 |
| 2 | 1.2 | 350 | 2 | .95 | 351 | 2 | .94 | 351 |
| 1 | 1.0 | 350 | 1 | .89 | 351 | 1 | .97 | 350 |
| | | | | | | | | |
| 5 | 1.1 | 351 | 5 | .96 | 352 | 5 | 1.1 | 352 |
| 4 | 1.0 | 351 | 4 | .95 | 351 | 4 | 1.2 | 352 |
| 3 | 1.2 | 351 | 3 | .93 | 351 | 3 | 1.2 | 351 |
| 2 | 1.2 | 350 | 2 | .97 | 350 | 2 | 1.0 | 351 |
| 1 | 1.0 | 351 | 1 | .99 | 350 | 1 | 1.1 | 351 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
| 1 | 291 | 00.2 | 1 | | | 1 | | |
| 2 | 290 | 00.2 | 2 | | | 2 | | |
| 3 | 289 | 00.3 | 3 | | | 3 | | |

### MOISTURE DATA FOR TEST RUNS 9 THROUGH 9

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.9 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 20:45 | 674.200 | 2.5 | 89 | 86 | 57 | 7" | #1 | $H_2O_2$ | 841.4 | 723.5 | |
| 20:55 | 683.316 | 2.5 | 89 | 85 | 57 | 7" | #2 | $H_2O_2$ | 719.3 | 713.9 | |
| 21:05 | 692.442 | 2.5 | 89 | 85 | 58 | 7" | #3 | Empty | 651.1 | 650.0 | |
| 21:15 | 701.525 | | | | | | #4 | Silica Gel | 901.7 | 892.2 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: <0.005 CFM @ 18 in. Hg., Post-Test Leak Check: <0.005 CFM @ 17 in. Hg

# APPENDIX A.1.7

# UNIT 1 HYDROCARBON DATA

**SCAQMD METHOD 25.3**
**EVACUATED CANISTER SAMPLING DATA**

Client/Facility: Desert View Power Date: 3/29/2018

Unit/Location: Unit 1 Stack Breaching Performed By: Patrick Whitman

Probe Material SS Probe Length 36"

Connecting Tubing Material Teflon Connecting Tubing Length 12"

Barometric Pressure 29.99 Ambient Temperature 80°F

| Test No. | | 1A-VOC-U1 | | 1B-VOC-U1 | | | |
|---|---|---|---|---|---|---|---|
| Vial ID | | M72 | | M73 | | | |
| Canister ID | | 368 | | 158 | | | |
| | | Time | Vacuum | Time | Vacuum | Time | Vacuum |
| Pre-Test Leak Check | Start | 821 | 20 | 821 | 21 | | |
| Pre-Test Leak Check | Stop | 831 | 20 | 831 | 21 | | |
| Sample Collection | Start | 0946 | 30 | 0946 | 30 | | |
| | | 0956 | 25 | 0956 | 28 | | |
| | | 10:06 | 20 | 10:06 | 22 | | |
| | | 10:16 | 18 | 10:16 | 20 | | |
| | | 10:26 | 12 | 10:26 | 16 | | |
| | | | | 10:36 | 14 | | |
| | | | | | | | |
| Sample Collection | Stop | 10:33 | 10 | 10:43 | 10 | | |
| Post -Test Leak Check | Start | 10:38 | 10 | 1048 | 10 | | |
| Post-Test Leak Check | Stop | 1058 | 10 | 1058 | 10 | | |
| | | | | | | | |
| Line Rinse Volume | | | | | | | |

Comments:

# APPENDIX A.1.8

# UNIT 1 PLANT DATA

CeDAR 1-Minute Data

| Timestamp | (Boiler 1) NOx ppm 1-Min | (Boiler 1) NOx ppm @3% O2 1-Min | (Boiler 1) NOx lb/hr 1-Min Avg | (Boiler 1) SO2 ppm 1-Min | (Boiler 1) SO2 ppm @3% O2 1-Min | (Boiler 1) SO2 lb/hr 1-Min Avg | (Boiler 1) CO ppm 1-Min | (Boiler 1) CO ppm @3% O2 1 Min | (Boiler 1) CO lb/hr 1-Min | (Boiler 1) CO2% 1-Min | (Boiler 1) O2% 1-Min | Stack Flow kdscf/hr 1-Min | Calculated CO @ 3% O2 | Calculated CO lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/30/2018 14:56 | 37.94 | 56.22 | 24.57 | 11.09 | 16.43 | 9.99 | 2.39 | 14.82 | 3.94 | 11.68 | 8.82 | 5424 | 3.54 | 0.94 |
| 3/30/2018 14:57 | 39.4 | 58.63 | 25.65 | 11.38 | 16.93 | 10.31 | 2.32 | 14.88 | 3.96 | 11.67 | 8.87 | 5453 | 3.45 | 0.92 |
| 3/30/2018 14:58 | 36.6 | 52.54 | 24.34 | 10.96 | 15.73 | 10.14 | 2.54 | 14.35 | 4.05 | 12.12 | 8.43 | 5570 | 3.65 | 1.03 |
| 3/30/2018 14:59 | 44.95 | 63.55 | 30.26 | 13.44 | 19 | 12.59 | 2.75 | 14.14 | 4.1 | 12.28 | 8.24 | 5638 | 3.89 | 1.13 |
| 3/30/2018 15:00 | 46.37 | 65.1 | 31.07 | 14.29 | 20.06 | 13.32 | 2.94 | 14.04 | 4.08 | 12.36 | 8.15 | 5612 | 4.13 | 1.20 |
| 3/30/2018 15:01 | 50.31 | 70.25 | 33.76 | 14.03 | 19.59 | 13.1 | 2.88 | 13.96 | 4.08 | 12.42 | 8.08 | 5620 | 4.02 | 1.18 |
| 3/30/2018 15:02 | 41.29 | 61.18 | 26.02 | 11.19 | 16.58 | 9.81 | 2.89 | 14.82 | 3.84 | 11.7 | 8.82 | 5278 | 4.28 | 1.11 |
| 3/30/2018 15:03 | 36.07 | 52.66 | 23.07 | 8.29 | 12.1 | 7.38 | 2.87 | 14.6 | 3.89 | 11.92 | 8.64 | 5358 | 4.19 | 1.12 |
| 3/30/2018 15:04 | 33.12 | 47.77 | 21.64 | 8.93 | 12.88 | 8.12 | 3 | 14.42 | 3.98 | 12.02 | 8.49 | 5474 | 4.33 | 1.19 |
| 3/30/2018 15:05 | 30.32 | 44.12 | 19.54 | 7.98 | 11.61 | 7.15 | 2.89 | 14.55 | 3.92 | 11.96 | 8.6 | 5397 | 4.21 | 1.13 |
| 3/30/2018 15:06 | 36.6 | 52.08 | 24.27 | 8.89 | 12.65 | 8.2 | 2.81 | 14.23 | 4.04 | 12.19 | 8.32 | 5555 | 4.00 | 1.13 |
| 3/30/2018 15:07 | 35.3 | 50.43 | 23.06 | 8.02 | 11.46 | 7.29 | 2.99 | 14.29 | 3.98 | 12.16 | 8.37 | 5471 | 4.27 | 1.19 |
| 3/30/2018 15:08 | 33.61 | 49.31 | 21.58 | 6.82 | 10.01 | 6.09 | 2.76 | 14.67 | 3.91 | 11.84 | 8.7 | 5379 | 4.05 | 1.08 |
| 3/30/2018 15:09 | 30.61 | 45.97 | 19.24 | 5.44 | 8.17 | 4.76 | 2.63 | 15.02 | 3.83 | 11.59 | 8.98 | 5264 | 3.95 | 1.01 |
| 3/30/2018 15:10 | 37.99 | 53.97 | 25.3 | 6.43 | 9.13 | 5.96 | 2.59 | 14.21 | 4.05 | 12.25 | 8.3 | 5579 | 3.68 | 1.05 |
| 3/30/2018 15:11 | 41.11 | 56.96 | 27.73 | 7.71 | 10.68 | 7.24 | 2.68 | 13.85 | 4.11 | 12.55 | 7.98 | 5650 | 3.71 | 1.10 |
| 3/30/2018 15:12 | 52.23 | 71.53 | 35.79 | 10.12 | 13.86 | 9.65 | 2.66 | 13.7 | 4.17 | 12.67 | 7.83 | 5740 | 3.64 | 1.11 |
| 3/30/2018 15:13 | 46.73 | 66.23 | 30.23 | 8.57 | 12.15 | 7.71 | 2.6 | 14.17 | 3.94 | 12.24 | 8.27 | 5418 | 3.68 | 1.02 |
| 3/30/2018 15:14 | 43.21 | 63.24 | 27.49 | 8.19 | 11.99 | 7.25 | 2.59 | 14.64 | 3.87 | 11.84 | 8.67 | 5329 | 3.79 | 1.00 |
| 3/30/2018 15:15 | 28.85 | 43.51 | 17.92 | 5.1 | 7.69 | 4.41 | 2.46 | 15.08 | 3.78 | 11.52 | 9.03 | 5202 | 3.71 | 0.93 |
| 3/30/2018 15:16 | 34.7 | 49.22 | 22.77 | 5.92 | 8.4 | 5.4 | 2.62 | 14.18 | 3.99 | 12.3 | 8.28 | 5496 | 3.72 | 1.05 |
| 3/30/2018 15:17 | 47.22 | 64.92 | 31.96 | 9.58 | 13.17 | 9.02 | 2.68 | 13.75 | 4.12 | 12.61 | 7.88 | 5669 | 3.68 | 1.10 |
| 3/30/2018 15:18 | 47.42 | 67.31 | 30.68 | 9.41 | 13.36 | 8.47 | 2.73 | 14.2 | 3.94 | 12.22 | 8.29 | 5420 | 3.88 | 1.08 |
| 3/30/2018 15:19 | 48.08 | 68.41 | 31.22 | 9.6 | 13.66 | 8.67 | 2.79 | 14.23 | 3.95 | 12.18 | 8.32 | 5439 | 3.97 | 1.10 |
| 3/30/2018 15:20 | 47.63 | 67.45 | 31.25 | 9.44 | 13.37 | 8.62 | 2.78 | 14.16 | 3.99 | 12.24 | 8.26 | 5495 | 3.94 | 1.11 |
| 3/30/2018 15:21 | 44.47 | 63.83 | 28.5 | 9 | 12.92 | 8.02 | 2.82 | 14.35 | 3.9 | 12.09 | 8.43 | 5368 | 4.05 | 1.10 |
| 3/30/2018 15:22 | 41.66 | 60.33 | 26.54 | 8.44 | 12.22 | 7.48 | 2.89 | 14.48 | 3.88 | 11.97 | 8.54 | 5337 | 4.19 | 1.12 |
| 3/30/2018 15:23 | 35.13 | 51.5 | 22.27 | 7.25 | 10.63 | 6.39 | 2.87 | 14.66 | 3.86 | 11.84 | 8.69 | 5310 | 4.21 | 1.11 |
| 3/30/2018 15:24 | 29.93 | 44.76 | 18.8 | 6.26 | 9.36 | 5.47 | 2.96 | 14.95 | 3.82 | 11.6 | 8.93 | 5261 | 4.43 | 1.13 |
| 3/30/2018 15:25 | 32.28 | 46.45 | 21.07 | 6.24 | 8.98 | 5.67 | 2.99 | 14.39 | 3.97 | 12.09 | 8.46 | 5467 | 4.30 | 1.19 |
| **Average** | **39.70** | **56.98** | **25.92** | **8.93** | **12.83** | **8.12** | **2.75** | | | **12.07** | **8.46** | **5455.77** | **3.95** | **1.09** |

| | | |
|---|---|---|
| Flow | kdscfh | 5455.77 |
| O2 | % dry | 8.46 |
| CO2 | % dry | 12.07 |
| NOx | ppm dry | 39.70 |
| NOx | ppm @ 3% O2 | 56.98 |
| NOx | lb/hr | 25.92 |
| SO2 | ppm dry | 8.93 |
| SO2 | ppm @ 3% O2 | 12.83 |
| SO2 | lb/hr | 8.12 |
| CO | ppm dry | 2.75 |
| CO | ppm @ 3% O2 | 3.95 |
| CO | lb/hr | 1.09 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 1) NOx ppm 1-Min | (Boiler 1) NOx ppm @3% O2 1-Min | (Boiler 1) NOx lb/hr 1-Min Avg | (Boiler 1) SO2 ppm 1-Min | (Boiler 1) SO2 ppm @3% O2 1-Min | (Boiler 1) SO2 lb/hr 1-Min Avg | (Boiler 1) CO ppm 1-Min | (Boiler 1) CO ppm @3% O2 1 Min | (Boiler 1) CO lb/hr 1-Min | (Boiler 1) CO2% 1-Min | (Boiler 1) O2% 1-Min | Stack Flow kdscf/hr 1-Min | Calculated CO @ 3% O2 | Calculated CO lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/30/2018 15:39 | 39.04 | 55.02 | 26.03 | 6.6 | 9.3 | 6.12 | 2.41 | 14.09 | 4.06 | 12.3 | 8.2 | 5585 | 3.40 | 0.98 |
| 3/30/2018 15:40 | 42.08 | 61.39 | 27.34 | 6.57 | 9.58 | 5.94 | 2.49 | 14.59 | 3.95 | 11.85 | 8.63 | 5442 | 3.63 | 0.98 |
| 3/30/2018 15:41 | 34.96 | 51.5 | 22.05 | 4.82 | 7.37 | 4.23 | 2.52 | 14.73 | 3.84 | 11.81 | 8.75 | 5283 | 3.71 | 0.97 |
| 3/30/2018 15:42 | 36.48 | 52.75 | 23.48 | 4.9 | 7.23 | 4.39 | 2.44 | 14.46 | 3.92 | 11.99 | 8.52 | 5392 | 3.53 | 0.96 |
| 3/30/2018 15:43 | 35.98 | 53.31 | 22.77 | 4.53 | 7.41 | 3.99 | 2.56 | 14.82 | 3.85 | 11.71 | 8.82 | 5301 | 3.79 | 0.99 |
| 3/30/2018 15:44 | 43.04 | 60.76 | 28.07 | 4.87 | 7.06 | 4.42 | 2.65 | 14.12 | 3.97 | 12.31 | 8.22 | 5462 | 3.74 | 1.05 |
| 3/30/2018 15:45 | 47.4 | 66.39 | 31.74 | 7.42 | 10.39 | 6.91 | 2.81 | 14.01 | 4.08 | 12.32 | 8.12 | 5609 | 3.94 | 1.15 |
| 3/30/2018 15:46 | 40.58 | 58.91 | 25.89 | 5.37 | 7.8 | 4.77 | 2.69 | 14.52 | 3.88 | 11.94 | 8.57 | 5343 | 3.91 | 1.04 |
| 3/30/2018 15:47 | 34.66 | 50.24 | 21.99 | 4.85 | 7.25 | 4.28 | 2.81 | 14.49 | 3.86 | 11.98 | 8.55 | 5313 | 4.07 | 1.08 |
| 3/30/2018 15:48 | 49.97 | 67 | 34.94 | 8.16 | 10.94 | 7.94 | 2.78 | 13.41 | 4.26 | 12.91 | 7.55 | 5856 | 3.73 | 1.18 |
| 3/30/2018 15:49 | 47.85 | 68.3 | 30.2 | 9.04 | 12.9 | 7.94 | 2.75 | 14.27 | 3.84 | 12.12 | 8.36 | 5286 | 3.93 | 1.06 |
| 3/30/2018 15:50 | 41.58 | 60.51 | 26.29 | 7.4 | 10.77 | 6.51 | 2.59 | 14.55 | 3.85 | 11.86 | 8.6 | 5296 | 3.77 | 1.00 |
| 3/30/2018 15:51 | 26.16 | 40.61 | 15.66 | 4.87 | 7.76 | 4.06 | 2.59 | 15.52 | 3.64 | 11.18 | 9.37 | 5013 | 4.02 | 0.94 |
| 3/30/2018 15:52 | 25.11 | 37.46 | 15.66 | 3.96 | 7.46 | 3.44 | 2.45 | 14.92 | 3.8 | 11.63 | 8.9 | 5223 | 3.65 | 0.93 |
| 3/30/2018 15:53 | 37.18 | 52.03 | 24.76 | 6.27 | 8.78 | 5.81 | 2.6 | 14 | 4.05 | 12.37 | 8.11 | 5578 | 3.64 | 1.05 |
| 3/30/2018 15:54 | 41.45 | 57.74 | 27.6 | 8.44 | 11.76 | 7.82 | 2.45 | 13.93 | 4.05 | 12.43 | 8.05 | 5578 | 3.41 | 0.99 |
| 3/30/2018 15:55 | 41.84 | 59.58 | 26.89 | 7.48 | 10.65 | 6.69 | 2.39 | 14.24 | 3.91 | 12.14 | 8.33 | 5384 | 3.40 | 0.94 |
| 3/30/2018 15:56 | 50.17 | 70.27 | 33.13 | 8.84 | 12.38 | 8.12 | 2.28 | 14.01 | 4.02 | 12.33 | 8.12 | 5531 | 3.19 | 0.92 |
| 3/30/2018 15:57 | 45.05 | 65.72 | 28.02 | 8.5 | 12.4 | 7.35 | 2.32 | 14.59 | 3.79 | 11.86 | 8.63 | 5209 | 3.38 | 0.88 |
| 3/30/2018 15:58 | 40.16 | 57.65 | 25.82 | 8.08 | 11.6 | 7.23 | 2.22 | 14.35 | 3.91 | 12.04 | 8.43 | 5385 | 3.19 | 0.87 |
| 3/30/2018 15:59 | 34.67 | 49.81 | 25.22 | 8.2 | 11.78 | 8.3 | 2.29 | 3.29 | 1.01 | 12.01 | 8.44 | 6092 | 3.29 | 1.01 |
| 3/30/2018 16:00 | 34.66 | 54.14 | 10.39 | 7.89 | 12.32 | 3.29 | 2.17 | 3.39 | 0.4 | 11.26 | 9.44 | 2512 | 3.39 | 0.40 |
| 3/30/2018 16:01 | 23.25 | 37.49 | 13.77 | 5.17 | 8.34 | 4.26 | 1.98 | 16.13 | 3.61 | 10.83 | 9.8 | 4962 | 3.19 | 0.71 |
| 3/30/2018 16:02 | 40.07 | 54.01 | 28.23 | 8.57 | 11.55 | 8.4 | 2.34 | 13.48 | 4.29 | 12.92 | 7.62 | 5901 | 3.15 | 1.00 |
| 3/30/2018 16:03 | 64.83 | 81.04 | 49.36 | 20.45 | 25.56 | 21.66 | 2.65 | 12.5 | 4.63 | 13.77 | 6.58 | 6377 | 3.31 | 1.23 |
| 3/30/2018 16:04 | 57.85 | 77.86 | 39 | 16.38 | 22.05 | 15.36 | 2.44 | 13.46 | 4.1 | 12.85 | 7.6 | 5647 | 3.28 | 1.00 |
| 3/30/2018 16:05 | 49.88 | 69.43 | 32.5 | 12.09 | 16.83 | 10.96 | 2.46 | 13.92 | 3.97 | 12.39 | 8.04 | 5457 | 3.42 | 0.98 |
| 3/30/2018 16:06 | 35.52 | 50.06 | 23.09 | 9.03 | 12.73 | 8.17 | 2.4 | 14.09 | 3.96 | 12.26 | 8.2 | 5444 | 3.38 | 0.95 |
| 3/30/2018 16:07 | 31.66 | 45.59 | 19.97 | 8.12 | 11.69 | 7.13 | 2.59 | 14.4 | 3.84 | 12 | 8.47 | 5284 | 3.73 | 0.99 |
| 3/30/2018 16:08 | 35.29 | 50.49 | 22.68 | 8.57 | 12.26 | 7.66 | 2.61 | 14.31 | 3.91 | 12.05 | 8.39 | 5382 | 3.73 | 1.02 |
| **Average** | **40.28** | **57.24** | **26.08** | **7.85** | **11.20** | **7.11** | **2.49** | | | **12.11** | **8.38** | **5370.90** | **3.56** | **0.98** |

| | | |
|---|---|---|
| Flow | kdscfh | 5370.90 |
| O2 | % dry | 8.38 |
| CO2 | % dry | 12.11 |
| NOx | ppm dry | 40.28 |
| NOx | ppm @ 3% O2 | 57.24 |
| NOx | lb/hr | 26.08 |
| SO2 | ppm dry | 7.85 |
| SO2 | ppm @ 3% O2 | 11.20 |
| SO2 | lb/hr | 7.11 |
| CO | ppm dry | 2.49 |
| CO | ppm @ 3% O2 | 3.56 |
| CO | lb/hr | 0.98 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 1) NOx ppm 1-Min | (Boiler 1) NOx ppm @3% O2 1-Min | (Boiler 1) NOx lb/hr 1-Min Avg | (Boiler 1) SO2 ppm 1-Min | (Boiler 1) SO2 ppm @3% O2 1-Min | (Boiler 1) SO2 lb/hr 1-Min Avg | (Boiler 1) CO ppm 1-Min | (Boiler 1) CO ppm @3% O2 1 Min | (Boiler 1) CO lb/hr 1-Min | (Boiler 1) CO2% 1-Min | (Boiler 1) O2% 1-Min | Stack Flow kdscf/hr 1-Min | Calculated CO @ 3% O2 | Calculated CO lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/30/2018 16:23 | 36.97 | 55.01 | 23.38 | 8.18 | 12.17 | 7.2 | 2.14 | 14.88 | 3.85 | 11.62 | 8.87 | 5297 | 3.18 | 0.82 |
| 3/30/2018 16:24 | 38.75 | 57.42 | 24.99 | 8.48 | 12.57 | 7.61 | 2.3 | 14.82 | 3.92 | 11.67 | 8.82 | 5401 | 3.41 | 0.90 |
| 3/30/2018 16:25 | 36.31 | 55.31 | 22.73 | 7.91 | 12.05 | 6.89 | 2.17 | 15.23 | 3.81 | 11.37 | 9.15 | 5244 | 3.31 | 0.83 |
| 3/30/2018 16:26 | 37.98 | 55.68 | 24.82 | 8.47 | 12.42 | 7.7 | 2.4 | 14.66 | 3.98 | 11.8 | 8.69 | 5473 | 3.52 | 0.95 |
| 3/30/2018 16:27 | 45.21 | 64.84 | 29.87 | 10.32 | 14.8 | 9.49 | 2.49 | 14.34 | 4.02 | 12.04 | 8.42 | 5534 | 3.57 | 1.00 |
| 3/30/2018 16:28 | 49.44 | 71.25 | 32.52 | 11.39 | 16.42 | 10.42 | 2.6 | 14.41 | 4 | 11.96 | 8.48 | 5510 | 3.75 | 1.04 |
| 3/30/2018 16:29 | 41.57 | 61.6 | 26.46 | 10.08 | 14.94 | 8.93 | 2.48 | 14.82 | 3.87 | 11.65 | 8.82 | 5331 | 3.67 | 0.96 |
| 3/30/2018 16:30 | 35.3 | 54.66 | 21.86 | 9.41 | 14.57 | 8.11 | 2.5 | 15.48 | 3.77 | 11.18 | 9.34 | 5188 | 3.87 | 0.94 |
| 3/30/2018 16:31 | 33.75 | 50.13 | 21.68 | 8.74 | 12.98 | 7.81 | 2.74 | 14.85 | 3.91 | 11.66 | 8.85 | 5380 | 4.07 | 1.07 |
| 3/30/2018 16:32 | 40.98 | 59.35 | 26.99 | 10.91 | 15.8 | 10 | 2.73 | 14.48 | 4.01 | 11.89 | 8.54 | 5517 | 3.95 | 1.09 |
| 3/30/2018 16:33 | 42.15 | 61.94 | 27.29 | 10.96 | 16.11 | 9.87 | 2.56 | 14.7 | 3.94 | 11.77 | 8.72 | 5424 | 3.76 | 1.01 |
| 3/30/2018 16:34 | 38.19 | 56.82 | 24.45 | 10.2 | 15.18 | 9.09 | 2.63 | 14.88 | 3.9 | 11.62 | 8.87 | 5363 | 3.91 | 1.02 |
| 3/30/2018 16:35 | 42.97 | 61.53 | 28.18 | 11.32 | 16.21 | 10.33 | 2.55 | 14.32 | 3.99 | 12.09 | 8.4 | 5494 | 3.65 | 1.02 |
| 3/30/2018 16:36 | 50.81 | 72.47 | 33.95 | 13.93 | 19.87 | 12.95 | 2.47 | 14.26 | 4.07 | 12.07 | 8.35 | 5596 | 3.52 | 1.00 |
| 3/30/2018 16:37 | 46.45 | 66.57 | 30.39 | 11.85 | 16.98 | 10.79 | 2.37 | 14.33 | 3.98 | 12.07 | 8.41 | 5480 | 3.40 | 0.94 |
| 3/30/2018 16:38 | 46.34 | 66.63 | 30.26 | 13.38 | 19.24 | 12.16 | 2.37 | 14.38 | 3.98 | 12 | 8.45 | 5470 | 3.41 | 0.94 |
| 3/30/2018 16:39 | 43.29 | 60.35 | 29.06 | 13.8 | 19.24 | 12.89 | 2.21 | 13.94 | 4.09 | 12.42 | 8.06 | 5623 | 3.08 | 0.90 |
| 3/30/2018 16:40 | 54.27 | 73.48 | 36.72 | 17.53 | 23.74 | 16.5 | 2.3 | 13.54 | 4.12 | 12.76 | 7.68 | 5668 | 3.11 | 0.95 |
| 3/30/2018 16:41 | 56.12 | 75.25 | 38.58 | 20.04 | 26.87 | 19.17 | 2.31 | 13.41 | 4.18 | 12.82 | 7.55 | 5758 | 3.10 | 0.97 |
| 3/30/2018 16:42 | 44.24 | 64.07 | 27.91 | 15.89 | 23.01 | 13.95 | 2.17 | 14.48 | 3.84 | 11.92 | 8.54 | 5284 | 3.14 | 0.83 |
| 3/30/2018 16:43 | 40.42 | 58.54 | 25.63 | 13.95 | 20.2 | 12.31 | 2.11 | 14.48 | 3.86 | 11.92 | 8.54 | 5312 | 3.06 | 0.81 |
| 3/30/2018 16:44 | 30.84 | 46.74 | 18.74 | 12.52 | 18.98 | 10.59 | 2 | 15.16 | 3.7 | 11.43 | 9.09 | 5090 | 3.03 | 0.74 |
| 3/30/2018 16:45 | 35.72 | 52.11 | 23.02 | 13.16 | 19.2 | 11.8 | 2.13 | 14.59 | 3.92 | 11.81 | 8.63 | 5398 | 3.11 | 0.84 |
| 3/30/2018 16:46 | 31.35 | 46.07 | 19.98 | 12.19 | 17.91 | 10.81 | 2.13 | 14.7 | 3.88 | 11.79 | 8.72 | 5338 | 3.13 | 0.83 |
| 3/30/2018 16:47 | 42.46 | 59.1 | 28.5 | 13.88 | 19.32 | 12.96 | 2.34 | 13.92 | 4.09 | 12.43 | 8.04 | 5623 | 3.26 | 0.96 |
| 3/30/2018 16:48 | 55.97 | 75.21 | 38.74 | 17.95 | 24.12 | 17.28 | 2.5 | 13.44 | 4.21 | 12.81 | 7.58 | 5797 | 3.36 | 1.05 |
| 3/30/2018 16:49 | 52.5 | 72.74 | 35.01 | 17.95 | 24.87 | 16.66 | 2.62 | 13.85 | 4.06 | 12.43 | 7.98 | 5586 | 3.63 | 1.06 |
| 3/30/2018 16:50 | 42.35 | 60.65 | 26.72 | 14.97 | 21.44 | 13.14 | 2.42 | 14.32 | 3.84 | 12.07 | 8.4 | 5284 | 3.47 | 0.93 |
| 3/30/2018 16:51 | 42.58 | 61.07 | 27.08 | 15.11 | 21.67 | 13.37 | 2.53 | 14.34 | 3.87 | 12.02 | 8.42 | 5328 | 3.63 | 0.98 |
| 3/30/2018 16:52 | 30.48 | 48.37 | 17.92 | 11.25 | 17.85 | 9.2 | 2.48 | 15.87 | 3.58 | 10.85 | 9.62 | 4925 | | |
| **Average** | **42.19** | **60.83** | **27.45** | **12.52** | **18.02** | **11.33** | **2.39** | | | **11.93** | **8.53** | **5423.87** | **3.45** | **0.95** |

| | | |
|---|---|---|
| Flow | kdscfh | 5423.87 |
| O2 | % dry | 8.53 |
| CO2 | % dry | 11.93 |
| NOx | ppm dry | 42.19 |
| NOx | ppm @ 3% O2 | 60.83 |
| NOx | lb/hr | 27.45 |
| SO2 | ppm dry | 12.52 |
| SO2 | ppm @ 3% O2 | 18.02 |
| SO2 | lb/hr | 11.33 |
| CO | ppm dry | 2.39 |
| CO | ppm @ 3% O2 | 3.45 |
| CO | lb/hr | 0.95 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 1) NOx ppm 1-Min | (Boiler 1) NOx ppm @3% O2 1-Min | (Boiler 1) NOx lb/hr 1-Min Avg | (Boiler 1) SO2 ppm 1-Min | (Boiler 1) SO2 ppm @3% O2 1-Min | (Boiler 1) SO2 lb/hr 1-Min Avg | (Boiler 1) CO ppm 1-Min | (Boiler 1) CO ppm @3% O2 1 Min | (Boiler 1) CO lb/hr 1-Min | (Boiler 1) CO2% 1-Min | (Boiler 1) O2% 1-Min | Stack Flow kdscf/hr 1-Min | Calculated CO @ 3% O2 | Calculated CO lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/30/2018 17:06 | 40.24 | 56.67 | 26.75 | 14.3 | 20.14 | 13.23 | 2.28 | 14.08 | 4.05 | 12.28 | 8.19 | 5569 | 3.21 | 0.92 |
| 3/30/2018 17:07 | 38.75 | 56.48 | 24.54 | 13.79 | 20.1 | 12.15 | 2.23 | 14.58 | 3.86 | 11.85 | 8.62 | 5305 | 3.25 | 0.86 |
| 3/30/2018 17:08 | 36.94 | 55.29 | 22.84 | 12.39 | 18.54 | 10.66 | 2.37 | 14.97 | 3.76 | 11.55 | 8.94 | 5179 | 3.55 | 0.89 |
| 3/30/2018 17:09 | 34.97 | 51.52 | 22.15 | 11.42 | 16.82 | 10.06 | 2.3 | 14.73 | 3.86 | 11.73 | 8.75 | 5305 | 3.39 | 0.89 |
| 3/30/2018 17:10 | 31.97 | 49.63 | 19.55 | 10.74 | 16.67 | 9.14 | 2.39 | 15.52 | 3.72 | 11.12 | 9.37 | 5123 | 3.71 | 0.89 |
| 3/30/2018 17:11 | 27.45 | 42.32 | 16.87 | 8.79 | 13.55 | 7.52 | 2.45 | 15.42 | 3.74 | 11.24 | 9.29 | 5148 | 3.78 | 0.92 |
| 3/30/2018 17:12 | 33.79 | 49.74 | 21.76 | 11.31 | 16.65 | 10.13 | 2.47 | 14.72 | 3.92 | 11.75 | 8.74 | 5393 | 3.64 | 0.97 |
| 3/30/2018 17:13 | 37.7 | 55.04 | 24.45 | 12.58 | 18.37 | 11.35 | 2.71 | 14.6 | 3.95 | 11.83 | 8.64 | 5433 | 3.96 | 1.07 |
| 3/30/2018 17:14 | 38.71 | 56.7 | 25.07 | 12.59 | 18.44 | 11.35 | 2.75 | 14.65 | 3.94 | 11.8 | 8.68 | 5425 | 4.03 | 1.08 |
| 3/30/2018 17:15 | 38 | 56.5 | 23.66 | 12.33 | 18.33 | 10.68 | 2.58 | 14.87 | 3.79 | 11.68 | 8.86 | 5216 | 3.84 | 0.98 |
| 3/30/2018 17:16 | 51.01 | 69.33 | 35.35 | 16.41 | 22.3 | 15.82 | 2.69 | 13.59 | 4.22 | 12.71 | 7.73 | 5805 | 3.66 | 1.13 |
| 3/30/2018 17:17 | 49.59 | 69.89 | 32.71 | 15.73 | 22.17 | 14.44 | 2.63 | 14.09 | 4.02 | 12.23 | 8.2 | 5525 | 3.71 | 1.06 |
| 3/30/2018 17:18 | 41.19 | 61.24 | 25.31 | 12.88 | 19.15 | 11.01 | 2.43 | 14.87 | 3.74 | 11.65 | 8.86 | 5146 | 3.61 | 0.91 |
| 3/30/2018 17:19 | 48.81 | 69.07 | 31.79 | 13.46 | 19.05 | 12.2 | 2.52 | 14.15 | 3.96 | 12.2 | 8.25 | 5456 | 3.57 | 1.00 |
| 3/30/2018 17:20 | 42.21 | 62.49 | 26.52 | 12.99 | 19.23 | 11.36 | 2.26 | 14.81 | 3.82 | 11.63 | 8.81 | 5263 | 3.35 | 0.86 |
| 3/30/2018 17:21 | 41.65 | 58.94 | 27.37 | 12.21 | 17.28 | 11.16 | 2.27 | 14.15 | 4 | 12.24 | 8.25 | 5504 | 3.21 | 0.91 |
| 3/30/2018 17:22 | 40.06 | 59.56 | 24.97 | 13.32 | 19.8 | 11.55 | 2.31 | 14.87 | 3.79 | 11.64 | 8.86 | 5220 | 3.43 | 0.88 |
| 3/30/2018 17:23 | 48.72 | 67.76 | 32.21 | 13.81 | 19.21 | 12.7 | 2.31 | 13.91 | 4.02 | 12.44 | 8.03 | 5537 | 3.21 | 0.93 |
| 3/30/2018 17:24 | 52.44 | 73.74 | 34.61 | 16.46 | 23.14 | 15.11 | 2.22 | 14.06 | 4.02 | 12.24 | 8.17 | 5528 | 3.12 | 0.89 |
| 3/30/2018 17:25 | 41.81 | 59.82 | 26.71 | 13.53 | 19.36 | 12.03 | 2.26 | 14.31 | 3.89 | 12.12 | 8.39 | 5351 | 3.23 | 0.88 |
| 3/30/2018 17:26 | 40.14 | 58.89 | 25.13 | 12.39 | 18.18 | 10.79 | 2.25 | 14.67 | 3.81 | 11.74 | 8.7 | 5243 | 3.30 | 0.86 |
| 3/30/2018 17:27 | 41.08 | 57.36 | 26.95 | 12.37 | 17.27 | 11.29 | 2.26 | 13.96 | 3.99 | 12.41 | 8.08 | 5495 | 3.16 | 0.90 |
| 3/30/2018 17:28 | 46.13 | 65.64 | 29.77 | 14.56 | 20.72 | 13.07 | 2.35 | 14.23 | 3.93 | 12.1 | 8.32 | 5406 | 3.34 | 0.92 |
| 3/30/2018 17:29 | 33.79 | 51.52 | 20.64 | 11.34 | 17.29 | 9.64 | 2.33 | 15.25 | 3.72 | 11.33 | 9.16 | 5117 | 3.55 | 0.87 |
| 3/30/2018 17:30 | 27.95 | 43.2 | 16.84 | 8.59 | 13.28 | 7.2 | 2.39 | 15.46 | 3.67 | 11.2 | 9.32 | 5046 | 3.69 | 0.88 |
| 3/30/2018 17:31 | 37.85 | 53.94 | 24.83 | 10.18 | 14.51 | 9.29 | 2.61 | 14.25 | 3.99 | 12.12 | 8.34 | 5494 | 3.72 | 1.04 |
| 3/30/2018 17:32 | 44.82 | 63.93 | 29.41 | 12.39 | 17.67 | 11.31 | 2.68 | 14.26 | 3.99 | 12.11 | 8.35 | 5496 | 3.82 | 1.07 |
| 3/30/2018 17:33 | 39.94 | 57.98 | 25.71 | 11.34 | 16.46 | 10.16 | 2.56 | 14.52 | 3.92 | 11.89 | 8.57 | 5392 | 3.72 | 1.00 |
| 3/30/2018 17:34 | 36.22 | 53.19 | 22.97 | 10.57 | 15.52 | 9.32 | 2.55 | 14.68 | 3.86 | 11.76 | 8.71 | 5311 | 3.74 | 0.98 |
| 3/30/2018 17:35 | 30.16 | 46.06 | 18.53 | 10.1 | 15.43 | 8.63 | 2.67 | 15.27 | 3.74 | 11.32 | 9.18 | 5145 | 4.08 | 1.00 |
| **Average** | **39.80** | **57.78** | **25.53** | **12.50** | **18.15** | **11.15** | **2.44** | | | **11.86** | **8.61** | **5352.53** | **3.55** | **0.95** |

| | | |
|---|---|---|
| Flow | kdscfh | 5352.53 |
| O2 | % dry | 8.61 |
| CO2 | % dry | 11.86 |
| NOx | ppm dry | 39.80 |
| NOx | ppm @ 3% O2 | 57.78 |
| NOx | lb/hr | 25.53 |
| SO2 | ppm dry | 12.50 |
| SO2 | ppm @ 3% O2 | 18.15 |
| SO2 | lb/hr | 11.15 |
| CO | ppm dry | 2.44 |
| CO | ppm @ 3% O2 | 3.55 |
| CO | lb/hr | 0.95 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 1) NOx ppm 1-Min | (Boiler 1) NOx ppm @3% O2 1-Min | (Boiler 1) NOx lb/hr 1-Min Avg | (Boiler 1) SO2 ppm 1-Min | (Boiler 1) SO2 ppm @3% O2 1-Min | (Boiler 1) SO2 lb/hr 1-Min Avg | (Boiler 1) CO ppm 1-Min | (Boiler 1) CO ppm @3% O2 1 Min | (Boiler 1) CO lb/hr 1-Min | (Boiler 1) CO2% 1-Min | (Boiler 1) O2% 1-Min | Stack Flow kdscf/hr 1-Min | Calculated CO @ 3% O2 | Calculated CO lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/30/2018 17:51 | 43.85 | 62.2 | 29.43 | 12.07 | 17.12 | 11.27 | 2.29 | 14.18 | 4.09 | 12.17 | 8.28 | 5622 | 3.25 | 0.94 |
| 3/30/2018 17:52 | 40.07 | 58.65 | 25.71 | 11.71 | 17.14 | 10.45 | 2.29 | 14.64 | 3.91 | 11.81 | 8.67 | 5375 | 3.35 | 0.89 |
| 3/30/2018 17:53 | 43.13 | 63.13 | 27.76 | 11.41 | 16.7 | 10.22 | 2.34 | 14.64 | 3.92 | 11.78 | 8.67 | 5392 | 3.42 | 0.92 |
| 3/30/2018 17:54 | 37.81 | 55.43 | 24.42 | 11.22 | 16.45 | 10.08 | 2.41 | 14.66 | 3.93 | 11.78 | 8.69 | 5409 | 3.53 | 0.95 |
| 3/30/2018 17:55 | 34.57 | 50.39 | 22.29 | 10.61 | 15.47 | 9.52 | 2.4 | 14.58 | 3.92 | 11.86 | 8.62 | 5401 | 3.50 | 0.94 |
| 3/30/2018 17:56 | 45.73 | 63.36 | 30.97 | 13.36 | 18.51 | 12.59 | 2.35 | 13.85 | 4.12 | 12.45 | 7.98 | 5672 | 3.26 | 0.97 |
| 3/30/2018 17:57 | 47.15 | 69.12 | 30.31 | 14.06 | 20.61 | 12.58 | 2.34 | 14.66 | 3.91 | 11.75 | 8.69 | 5385 | 3.43 | 0.92 |
| 3/30/2018 17:58 | 34.29 | 51.41 | 21.44 | 10.95 | 16.42 | 9.53 | 2.39 | 14.99 | 3.81 | 11.53 | 8.96 | 5237 | 3.58 | 0.91 |
| 3/30/2018 17:59 | 38.66 | 56.26 | 25.08 | 12.03 | 17.51 | 10.86 | 2.38 | 14.55 | 3.95 | 11.86 | 8.6 | 5433 | 3.46 | 0.94 |
| 3/30/2018 18:00 | 38.93 | 55.93 | 25.48 | 12.71 | 18.26 | 11.57 | 2.36 | 14.37 | 3.98 | 12.01 | 8.44 | 5482 | 3.39 | 0.94 |
| 3/30/2018 18:01 | 47.57 | 65.75 | 32.54 | 15.12 | 20.9 | 14.39 | 2.39 | 13.82 | 4.16 | 12.49 | 7.95 | 5730 | 3.30 | 1.00 |
| 3/30/2018 18:02 | 49.99 | 69.1 | 33.19 | 16.26 | 22.48 | 15.02 | 2.27 | 13.82 | 4.04 | 12.5 | 7.95 | 5561 | 3.14 | 0.92 |
| 3/30/2018 18:03 | 56.31 | 77.06 | 37.77 | 18.12 | 24.8 | 16.91 | 2.26 | 13.69 | 4.08 | 12.57 | 7.82 | 5619 | 3.09 | 0.92 |
| 3/30/2018 18:04 | 40.23 | 60.31 | 24.88 | 14.22 | 21.32 | 12.24 | 2.23 | 14.99 | 3.77 | 11.5 | 8.96 | 5181 | 3.34 | 0.84 |
| 3/30/2018 18:05 | 36.9 | 53.79 | 23.5 | 11.47 | 16.72 | 10.16 | 1.98 | 14.58 | 3.88 | 11.85 | 8.62 | 5334 | 2.89 | 0.77 |
| 3/30/2018 18:06 | 39.58 | 57.04 | 25.62 | 13.07 | 18.84 | 11.77 | 1.85 | 14.41 | 3.94 | 11.97 | 8.48 | 5421 | 2.67 | 0.73 |
| 3/30/2018 18:07 | 38.77 | 57.16 | 24.32 | 12.38 | 18.25 | 10.8 | 1.83 | 14.74 | 3.82 | 11.72 | 8.76 | 5254 | 2.70 | 0.70 |
| 3/30/2018 18:08 | 34.24 | 50.32 | 22.09 | 11.16 | 16.4 | 10.02 | 1.95 | 14.7 | 3.93 | 11.72 | 8.72 | 5403 | 2.87 | 0.77 |
| 3/30/2018 18:09 | 24.99 | 38.4 | 15.28 | 9.26 | 14.23 | 7.88 | 1.73 | 15.36 | 3.72 | 11.28 | 9.25 | 5122 | 2.66 | 0.64 |
| 3/30/2018 18:10 | 35.61 | 51.03 | 23.7 | 10.36 | 14.85 | 9.59 | 1.95 | 14.33 | 4.05 | 12.04 | 8.41 | 5574 | 2.79 | 0.79 |
| 3/30/2018 18:11 | 36.8 | 54.95 | 25.93 | 11.46 | 16.23 | 10.65 | 1.94 | 14.16 | 4.07 | 12.2 | 8.26 | 5597 | 2.75 | 0.79 |
| 3/30/2018 18:12 | 39.55 | 56.45 | 26.27 | 11.84 | 16.9 | 10.94 | 1.9 | 14.27 | 4.04 | 12.08 | 8.36 | 5563 | 2.71 | 0.77 |
| 3/30/2018 18:13 | 40.36 | 57.16 | 26.94 | 11.88 | 16.82 | 11.03 | 2.04 | 14.16 | 4.06 | 12.19 | 8.26 | 5591 | 2.89 | |
| 3/30/2018 18:14 | 35.97 | 53.88 | 22.5 | 11.18 | 16.75 | 9.73 | 2 | 14.98 | 3.81 | 11.5 | 8.95 | 5240 | 3.00 | |
| 3/30/2018 18:15 | 26.21 | 41.85 | 15.82 | 8.74 | 13.96 | 7.34 | 2.04 | 15.97 | 3.67 | 10.83 | 9.69 | 5057 | 3.26 | 0.75 |
| 3/30/2018 18:16 | 23.46 | 36.71 | 14.58 | 6.9 | 10.8 | 5.96 | 2.06 | 15.65 | 3.78 | 11.09 | 9.46 | 5204 | 3.22 | 0.78 |
| 3/30/2018 18:17 | 30.62 | 45.11 | 20.22 | 8.3 | 12.23 | 7.63 | 2.21 | 14.73 | 4.02 | 11.71 | 8.75 | 5532 | 3.26 | 0.89 |
| 3/30/2018 18:18 | 35.45 | 51.84 | 23.46 | 9.64 | 14.1 | 8.88 | 2.18 | 14.62 | 4.03 | 11.82 | 8.66 | 5544 | 3.19 | 0.88 |
| 3/30/2018 18:19 | 49.49 | 67.99 | 34.25 | 12.81 | 17.6 | 12.33 | 2.32 | 13.74 | 4.21 | 12.63 | 7.87 | 5797 | 3.19 | 0.98 |
| 3/30/2018 18:20 | 59.94 | 82.66 | 41.2 | 16.53 | 22.8 | 15.81 | 2.23 | 13.79 | 4.18 | 12.46 | 7.92 | 5758 | 3.08 | 0.93 |
| **Average** | **39.61** | **57.15** | **25.90** | **12.03** | **17.37** | **10.93** | **2.16** | | | **11.91** | **8.56** | **5449.67** | **3.14** | **0.86** |

| | | |
|---|---|---|
| Flow | kdscfh | 5449.67 |
| O2 | % dry | 8.56 |
| CO2 | % dry | 11.91 |
| NOx | ppm dry | 39.61 |
| NOx | ppm @ 3% O2 | 57.15 |
| NOx | lb/hr | 25.90 |
| SO2 | ppm dry | 12.03 |
| SO2 | ppm @ 3% O2 | 17.37 |
| SO2 | lb/hr | 10.93 |
| CO | ppm dry | 2.16 |
| CO | ppm @ 3% O2 | 3.14 |
| CO | lb/hr | 0.86 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 1) NOx ppm 1-Min | (Boiler 1) NOx ppm @3% O2 1-Min | (Boiler 1) NOx lb/hr 1-Min Avg | (Boiler 1) SO2 ppm 1-Min | (Boiler 1) SO2 ppm @3% O2 1-Min | (Boiler 1) SO2 lb/hr 1-Min Avg | (Boiler 1) CO ppm 1-Min | (Boiler 1) CO ppm @3% O2 1 Min | (Boiler 1) CO lb/hr 1-Min | (Boiler 1) CO2% 1-Min | (Boiler 1) O2% 1-Min | Stack Flow kdscf/hr 1-Min | Calculated CO @ 3% O2 | Calculated CO lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/30/2018 18:34 | 47.32 | 66.49 | 31.53 | 15.17 | 21.31 | 14.06 | 1.75 | 14.05 | 4.06 | 12.26 | 8.16 | 5581 | 2.46 | 0.71 |
| 3/30/2018 18:35 | 38.57 | 56.54 | 24.65 | 13.44 | 19.7 | 11.95 | 1.72 | 14.66 | 3.89 | 11.75 | 8.69 | 5353 | 2.52 | 0.67 |
| 3/30/2018 18:36 | 38.34 | 54.21 | 25.63 | 12.42 | 17.56 | 11.55 | 1.74 | 14.14 | 4.07 | 12.24 | 8.24 | 5599 | 2.46 | 0.71 |
| 3/30/2018 18:37 | 38.11 | 54.49 | 25.22 | 12.95 | 18.51 | 11.93 | 1.89 | 14.3 | 4.03 | 12.06 | 8.38 | 5544 | 2.70 | 0.76 |
| 3/30/2018 18:38 | 40.26 | 56.04 | 27.43 | 12.87 | 17.91 | 12.2 | 1.96 | 13.92 | 4.15 | 12.42 | 8.04 | 5707 | 2.73 | 0.81 |
| 3/30/2018 18:39 | 40.71 | 57.97 | 26.81 | 12.81 | 18.24 | 11.74 | 2.04 | 14.24 | 4.01 | 12.1 | 8.33 | 5516 | 2.91 | 0.82 |
| 3/30/2018 18:40 | 45.41 | 62.91 | 30.82 | 13.46 | 18.65 | 12.71 | 2.02 | 13.85 | 4.13 | 12.45 | 7.98 | 5685 | 2.80 | 0.83 |
| 3/30/2018 18:41 | 38.49 | 57.27 | 24.43 | 12.29 | 18.29 | 10.85 | 1.93 | 14.88 | 3.86 | 11.58 | 8.87 | 5316 | 2.87 | 0.75 |
| 3/30/2018 18:42 | 33.28 | 50.31 | 21.22 | 9.68 | 14.63 | 8.59 | 1.87 | 15.12 | 3.88 | 11.43 | 9.06 | 5341 | 2.83 | 0.73 |
| 3/30/2018 18:43 | 34.26 | 49.46 | 22.66 | 9.88 | 14.26 | 9.09 | 1.92 | 14.44 | 4.03 | 11.97 | 8.5 | 5539 | 2.77 | 0.77 |
| 3/30/2018 18:44 | 43.17 | 60.37 | 29.66 | 12.02 | 16.81 | 11.49 | 1.78 | 13.98 | 4.18 | 12.31 | 8.1 | 5755 | 2.49 | 0.74 |
| 3/30/2018 18:45 | 38.37 | 55.79 | 25.09 | 11.91 | 17.32 | 10.84 | 1.68 | 14.54 | 3.98 | 11.87 | 8.59 | 5478 | 2.44 | 0.67 |
| 3/30/2018 18:46 | 34.62 | 51.6 | 22.19 | 10.78 | 16.07 | 9.61 | 1.56 | 14.9 | 3.9 | 11.55 | 8.89 | 5369 | 2.33 | 0.61 |
| 3/30/2018 18:47 | 27.39 | 42.01 | 17.47 | 9.53 | 14.62 | 8.46 | 1.58 | 15.34 | 3.88 | 11.24 | 9.23 | 5342 | 2.42 | 0.61 |
| 3/30/2018 18:48 | 28.64 | 42.19 | 19.05 | 8.82 | 12.99 | 8.16 | 1.42 | 14.73 | 4.05 | 11.76 | 8.75 | 5572 | 2.09 | 0.57 |
| 3/30/2018 18:49 | 38.15 | 52.69 | 26.85 | 10.76 | 14.86 | 10.54 | 1.42 | 13.81 | 4.28 | 12.56 | 7.94 | 5895 | 1.96 | 0.61 |
| 3/30/2018 18:50 | 48.85 | 66.55 | 34.21 | 13.76 | 18.74 | 13.41 | 1.52 | 13.62 | 4.26 | 12.66 | 7.76 | 5865 | 2.07 | 0.65 |
| 3/30/2018 18:51 | 51.85 | 72.79 | 35.1 | 15.8 | 22.18 | 14.88 | 1.42 | 14.04 | 4.12 | 12.24 | 8.15 | 5671 | 1.99 | 0.59 |
| 3/30/2018 18:52 | 45.48 | 64.66 | 30.28 | 13.5 | 19.19 | 12.5 | 1.3 | 14.22 | 4.05 | 12.11 | 8.31 | 5576 | 1.85 | 0.53 |
| 3/30/2018 18:53 | 30.13 | 45.44 | 19.09 | 11.4 | 17.19 | 10.05 | 1.39 | 15.08 | 3.86 | 11.43 | 9.03 | 5306 | 2.10 | 0.54 |
| 3/30/2018 18:54 | 19.98 | 32.13 | 12.24 | 8.06 | 12.96 | 6.87 | 1.32 | 16.08 | 3.73 | 10.73 | 9.77 | 5133 | 2.12 | 0.49 |
| 3/30/2018 18:55 | 24.14 | 36.01 | 15.91 | 6.99 | 10.43 | 6.41 | 1.46 | 14.92 | 4.01 | 11.65 | 8.9 | 5520 | 2.18 | 0.59 |
| 3/30/2018 18:56 | 28.33 | 41.77 | 18.77 | 8.14 | 12 | 7.51 | 1.61 | 14.74 | 4.03 | 11.72 | 8.76 | 5551 | 2.37 | 0.65 |
| 3/30/2018 18:57 | 33.07 | 47.21 | 22.66 | 9.77 | 13.95 | 9.32 | 1.62 | 14.27 | 4.17 | 12.08 | 8.36 | 5740 | 2.31 | 0.68 |
| 3/30/2018 18:58 | 35.12 | 50.33 | 23.63 | 10.26 | 14.7 | 9.61 | 1.76 | 14.33 | 4.1 | 12.03 | 8.41 | 5636 | 2.52 | 0.72 |
| 3/30/2018 18:59 | | | | | | | | | | | | 6766 | 0.00 | 0.00 |
| 3/30/2018 19:00 | | | | | | | | | | | | 2898 | 0.00 | 0.00 |
| 3/30/2018 19:01 | 40.07 | 58.6 | 25.88 | 11.55 | 16.89 | 10.38 | 1.65 | 14.62 | 3.93 | 11.81 | 8.66 | 5409 | 2.41 | 0.65 |
| 3/30/2018 19:02 | 40.98 | 60.18 | 26.73 | 10.97 | 16.11 | 9.95 | 1.71 | 14.68 | 3.97 | 11.73 | 8.71 | 5463 | 2.51 | 0.68 |
| 3/30/2018 19:03 | 34.28 | 51.83 | 22.29 | 9.69 | 14.65 | 8.77 | 1.47 | 15.12 | 3.96 | 11.42 | 9.06 | 5447 | 2.22 | 0.58 |
| **Average** | **37.05** | **53.49** | **24.55** | **11.38** | **16.45** | **10.48** | **1.66** | | | **11.90** | **8.56** | **5485.77** | **2.25** | **0.62** |

| | | |
|---|---|---|
| Flow | kdscfh | 5485.77 |
| O2 | % dry | 8.56 |
| CO2 | % dry | 11.90 |
| NOx | ppm dry | 37.05 |
| NOx | ppm @ 3% O2 | 53.49 |
| NOx | lb/hr | 24.55 |
| SO2 | ppm dry | 11.38 |
| SO2 | ppm @ 3% O2 | 16.45 |
| SO2 | lb/hr | 10.48 |
| CO | ppm dry | 1.66 |
| CO | ppm @ 3% O2 | 2.25 |
| CO | lb/hr | 0.62 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 1) NOx ppm 1-Min | (Boiler 1) NOx ppm @3% O2 1-Min | (Boiler 1) NOx lb/hr 1-Min Avg | (Boiler 1) SO2 ppm 1-Min | (Boiler 1) SO2 ppm @3% O2 1-Min | (Boiler 1) SO2 lb/hr 1-Min Avg | (Boiler 1) CO ppm 1-Min | (Boiler 1) CO ppm @3% O2 1 Min | (Boiler 1) CO lb/hr 1-Min | (Boiler 1) CO2% 1-Min | (Boiler 1) O2% 1-Min | Stack Flow kdscf/hr 1-Min | Calculated CO @ 3% O2 | Calculated CO lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/30/2018 19:18 | 45.1 | 63.67 | 30.94 | 12.12 | 17.11 | 11.57 | 1.46 | 14.12 | 4.18 | 12.2 | 8.22 | 5747 | 2.06 | 0.61 |
| 3/30/2018 19:19 | 40.25 | 59.1 | 26.27 | 13.53 | 19.87 | 12.29 | 1.5 | 14.68 | 3.97 | 11.76 | 8.71 | 5467 | 2.20 | 0.60 |
| 3/30/2018 19:20 | 34.49 | 52.19 | 21.91 | 11.62 | 17.58 | 10.27 | 1.34 | 15.13 | 3.87 | 11.4 | 9.07 | 5320 | 2.03 | 0.52 |
| 3/30/2018 19:21 | 28.2 | 42.85 | 18.18 | 9.88 | 15.01 | 8.86 | 1.35 | 15.2 | 3.92 | 11.37 | 9.12 | 5400 | 2.05 | 0.53 |
| 3/30/2018 19:22 | 31.25 | 45.11 | 21.34 | 9.45 | 13.64 | 8.98 | 1.44 | 14.44 | 4.16 | 12 | 8.5 | 5719 | 2.08 | 0.60 |
| 3/30/2018 19:23 | 42.16 | 57.65 | 29.39 | 11.51 | 15.74 | 11.17 | 1.43 | 13.67 | 4.24 | 12.7 | 7.81 | 5840 | 1.96 | 0.61 |
| 3/30/2018 19:24 | 55.64 | 76.49 | 38.87 | 16.65 | 22.89 | 16.18 | 1.39 | 13.75 | 4.25 | 12.46 | 7.88 | 5852 | 1.91 | 0.59 |
| 3/30/2018 19:25 | 33.2 | 53.16 | 20.2 | 11.62 | 18.6 | 9.84 | 1.22 | 16.01 | 3.7 | 10.75 | 9.72 | 5097 | 1.95 | 0.45 |
| 3/30/2018 19:26 | 29.46 | 45.26 | 18.99 | 8.41 | 12.92 | 7.54 | 1.18 | 15.36 | 3.92 | 11.27 | 9.25 | 5399 | 1.81 | 0.46 |
| 3/30/2018 19:27 | 34.01 | 49.74 | 22.41 | 8.72 | 12.75 | 7.99 | 1.08 | 14.62 | 4.01 | 11.9 | 8.66 | 5519 | 1.58 | 0.43 |
| 3/30/2018 19:28 | 46.52 | 64.05 | 33.27 | 12.2 | 16.8 | 12.14 | 1.22 | 13.77 | 4.35 | 12.5 | 7.9 | 5991 | 1.68 | 0.53 |
| 3/30/2018 19:29 | 48.83 | 67.55 | 33.81 | 13.19 | 18.25 | 12.71 | 0.97 | 13.83 | 4.21 | 12.5 | 7.96 | 5799 | 1.34 | 0.41 |
| 3/30/2018 19:30 | 51.43 | 71.25 | 35.45 | 14.53 | 20.13 | 13.94 | 1.13 | 13.85 | 4.2 | 12.42 | 7.98 | 5774 | 1.57 | 0.47 |
| 3/30/2018 19:31 | 49.97 | 70.1 | 33.4 | 13.51 | 18.95 | 12.56 | 0.94 | 14.03 | 4.07 | 12.32 | 8.14 | 5598 | 1.32 | 0.38 |
| 3/30/2018 19:32 | 48 | 67.44 | 32.06 | 13.73 | 19.29 | 12.76 | 1 | 14.05 | 4.07 | 12.25 | 8.16 | 5595 | 1.41 | 0.41 |
| 3/30/2018 19:33 | 36.91 | 54.29 | 23.97 | 12.1 | 17.8 | 10.93 | 0.89 | 14.71 | 3.95 | 11.71 | 8.73 | 5439 | 1.31 | 0.35 |
| 3/30/2018 19:34 | 28.75 | 44.02 | 17.99 | 9.65 | 14.78 | 8.4 | 0.91 | 15.31 | 3.81 | 11.29 | 9.21 | 5241 | 1.39 | 0.35 |
| 3/30/2018 19:35 | 24.89 | 38.05 | 15.78 | 8.28 | 12.66 | 7.31 | 1.04 | 15.29 | 3.86 | 11.3 | 9.19 | 5312 | 1.59 | 0.40 |
| 3/30/2018 19:36 | 32.11 | 46.81 | 21.3 | 8.87 | 12.93 | 8.19 | 0.96 | 14.58 | 4.04 | 11.88 | 8.62 | 5557 | 1.40 | 0.39 |
| 3/30/2018 19:37 | 33.46 | 51.41 | 21.52 | 9.93 | 15.26 | 8.89 | 1.25 | 15.36 | 3.91 | 11.2 | 9.25 | 5387 | 1.92 | 0.49 |
| 3/30/2018 19:38 | 32.08 | 46.76 | 21.36 | 8.55 | 12.46 | 7.92 | 1.18 | 14.58 | 4.05 | 11.94 | 8.62 | 5577 | 1.72 | 0.48 |
| 3/30/2018 19:39 | 51.48 | 68.56 | 37.81 | 12.68 | 16.89 | 12.96 | 1.37 | 13.32 | 4.47 | 12.97 | 7.46 | 6152 | 1.82 | 0.61 |
| 3/30/2018 19:40 | 56.48 | 76.59 | 39.18 | 16.35 | 22.17 | 15.78 | 1.44 | 13.56 | 4.22 | 12.75 | 7.7 | 5810 | 1.95 | 0.61 |
| 3/30/2018 19:41 | 58.11 | 79.95 | 40.31 | 16.87 | 23.21 | 16.28 | 1.35 | 13.76 | 4.22 | 12.46 | 7.89 | 5811 | 1.86 | 0.57 |
| 3/30/2018 19:42 | 41.58 | 60.56 | 26.4 | 13.6 | 19.81 | 12.02 | 1.29 | 14.56 | 3.87 | 11.91 | 8.61 | 5319 | 1.88 | 0.50 |
| 3/30/2018 19:43 | 40.16 | 56.78 | 26.87 | 13.14 | 18.58 | 12.23 | 1.34 | 14.14 | 4.07 | 12.2 | 8.24 | 5605 | 1.89 | 0.55 |
| 3/30/2018 19:44 | 38.72 | 55.09 | 25.74 | 12.66 | 18.01 | 11.71 | 1.33 | 14.23 | 4.05 | 12.14 | 8.32 | 5569 | 1.89 | 0.54 |
| 3/30/2018 19:45 | 34.81 | 50.62 | 22.29 | 12.05 | 17.52 | 10.74 | 1.31 | 14.54 | 3.9 | 11.87 | 8.59 | 5364 | 1.90 | 0.51 |
| 3/30/2018 19:46 | 36.29 | 53.16 | 23.77 | 11.7 | 17.14 | 10.66 | 1.17 | 14.65 | 3.99 | 11.75 | 8.68 | 5486 | 1.71 | 0.47 |
| 3/30/2018 19:47 | 38.33 | 54.32 | 25.8 | 11.21 | 15.89 | 10.5 | 1.2 | 14.17 | 4.1 | 12.21 | 8.27 | 5639 | 1.70 | 0.49 |
| **Average** | **40.09** | **57.42** | **26.89** | **11.94** | **17.15** | **11.11** | **1.22** | | | **11.98** | **8.48** | **5579.50** | **1.76** | **0.50** |

| | | |
|---|---|---|
| Flow | kdscfh | 5579.50 |
| O2 | % dry | 8.48 |
| CO2 | % dry | 11.98 |
| NOx | ppm dry | 40.09 |
| NOx | ppm @ 3% O2 | 57.42 |
| NOx | lb/hr | 26.89 |
| SO2 | ppm dry | 11.94 |
| SO2 | ppm @ 3% O2 | 17.15 |
| SO2 | lb/hr | 11.11 |
| CO | ppm dry | 1.22 |
| CO | ppm @ 3% O2 | 1.76 |
| CO | lb/hr | 0.50 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 1) NOx ppm 1-Min | (Boiler 1) NOx ppm @3% O2 1-Min | (Boiler 1) NOx lb/hr 1-Min Avg | (Boiler 1) SO2 ppm 1-Min | (Boiler 1) SO2 ppm @3% O2 1-Min | (Boiler 1) SO2 lb/hr 1-Min Avg | (Boiler 1) CO ppm 1-Min | (Boiler 1) CO ppm @3% O2 1 Min | (Boiler 1) CO lb/hr 1-Min | (Boiler 1) CO2% 1-Min | (Boiler 1) O2% 1-Min | Stack Flow kdscf/hr 1-Min | Calculated CO @ 3% O2 | Calculated CO lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/30/2018 20:02 | 45.73 | 63.06 | 32.11 | 11.81 | 16.29 | 11.54 | 1.24 | 13.79 | 4.27 | 12.53 | 7.92 | 5881 | 1.71 | 0.53 |
| 3/30/2018 20:03 | 43.48 | 63.64 | 28.12 | 11.88 | 17.39 | 10.69 | 1.19 | 14.64 | 3.94 | 11.78 | 8.67 | 5418 | 1.74 | 0.47 |
| 3/30/2018 20:04 | 36.78 | 54.28 | 23.65 | 10.32 | 15.23 | 9.23 | 1.27 | 14.76 | 3.91 | 11.69 | 8.77 | 5386 | 1.87 | 0.50 |
| 3/30/2018 20:05 | 36.95 | 54.53 | 23.99 | 10.26 | 15.14 | 9.27 | 1.2 | 14.76 | 3.95 | 11.75 | 8.77 | 5438 | 1.77 | 0.47 |
| 3/30/2018 20:06 | 32.01 | 47.83 | 20.73 | 9.72 | 14.52 | 8.76 | 1.03 | 14.94 | 3.94 | 11.57 | 8.92 | 5424 | 1.54 | 0.41 |
| 3/30/2018 20:07 | 28.84 | 44.12 | 18.12 | 8.36 | 12.79 | 7.31 | 0.96 | 15.3 | 3.83 | 11.33 | 9.2 | 5264 | 1.47 | 0.37 |
| 3/30/2018 20:08 | 32.55 | 49.5 | 20.7 | 8.57 | 13.03 | 7.58 | 1.12 | 15.21 | 3.87 | 11.39 | 9.13 | 5326 | 1.70 | 0.43 |
| 3/30/2018 20:09 | 40.26 | 58.59 | 26.56 | 9.77 | 14.22 | 8.97 | 0.87 | 14.55 | 4.02 | 11.88 | 8.6 | 5525 | 1.27 | 0.35 |
| 3/30/2018 20:10 | 45.9 | 63.74 | 31.83 | 11.09 | 15.4 | 10.7 | 0.85 | 13.89 | 4.22 | 12.45 | 8.01 | 5809 | 1.18 | 0.36 |
| 3/30/2018 20:11 | 43.23 | 63.32 | 28.01 | 11.32 | 16.58 | 10.21 | 0.72 | 14.65 | 3.94 | 11.8 | 8.68 | 5428 | 1.05 | 0.28 |
| 3/30/2018 20:12 | 45.11 | 64.08 | 29.86 | 11.38 | 16.17 | 10.48 | 0.84 | 14.21 | 4.03 | 12.18 | 8.3 | 5544 | 1.19 | 0.34 |
| 3/30/2018 20:13 | 41.01 | 60.82 | 26.13 | 12.34 | 18.3 | 10.94 | 0.71 | 14.83 | 3.88 | 11.63 | 8.83 | 5336 | 1.05 | 0.28 |
| 3/30/2018 20:14 | 41.68 | 59.88 | 27.51 | 12.13 | 17.43 | 11.14 | 0.61 | 14.37 | 4.02 | 12.06 | 8.44 | 5528 | 0.88 | 0.25 |
| 3/30/2018 20:15 | 40.89 | 58.46 | 26.96 | 13.03 | 18.63 | 11.95 | 0.59 | 14.3 | 4.01 | 12.08 | 8.38 | 5522 | 0.84 | 0.24 |
| 3/30/2018 20:16 | 39.25 | 55.94 | 25.61 | 13.38 | 19.07 | 12.15 | 0.71 | 14.25 | 3.97 | 12.14 | 8.34 | 5466 | 1.01 | 0.28 |
| 3/30/2018 20:17 | 41.38 | 59.11 | 26.98 | 14.73 | 21.04 | 13.36 | 0.81 | 14.29 | 3.97 | 12.1 | 8.37 | 5462 | 1.16 | 0.32 |
| 3/30/2018 20:18 | 38.42 | 56.05 | 24.44 | 13.51 | 19.71 | 11.96 | 0.77 | 14.59 | 3.87 | 11.82 | 8.63 | 5328 | 1.12 | 0.30 |
| 3/30/2018 20:19 | 37.42 | 56.72 | 23.17 | 12.41 | 18.81 | 10.69 | 0.91 | 15.16 | 3.77 | 11.42 | 9.09 | 5187 | 1.38 | 0.34 |
| 3/30/2018 20:20 | 36.12 | 53.43 | 23.17 | 11.67 | 17.26 | 10.41 | 0.85 | 14.79 | 3.9 | 11.71 | 8.8 | 5372 | 1.26 | 0.33 |
| 3/30/2018 20:21 | 36.93 | 53.05 | 23.95 | 12.87 | 18.49 | 11.61 | 0.93 | 14.37 | 3.95 | 12.06 | 8.44 | 5432 | 1.34 | 0.37 |
| 3/30/2018 20:22 | 51.02 | 71.85 | 34 | 17.38 | 24.48 | 16.11 | 1.15 | 14.08 | 4.06 | 12.22 | 8.19 | 5582 | 1.62 | 0.47 |
| 3/30/2018 20:23 | 39.19 | 59.86 | 24.39 | 14.47 | 22.1 | 12.53 | 0.84 | 15.27 | 3.79 | 11.29 | 9.18 | 5213 | 1.28 | 0.32 |
| 3/30/2018 20:24 | 32.94 | 49.47 | 20.48 | 11.91 | 17.88 | 10.3 | 0.99 | 15.02 | 3.78 | 11.6 | 8.98 | 5207 | 1.49 | 0.37 |
| 3/30/2018 20:25 | 46.79 | 63.59 | 32.53 | 18.83 | 25.59 | 18.21 | 1.12 | 13.59 | 4.23 | 12.76 | 7.73 | 5823 | 1.52 | 0.47 |
| 3/30/2018 20:26 | 47.92 | 67.65 | 31.63 | 19.34 | 27.3 | 17.76 | 1.1 | 14.12 | 4.02 | 12.21 | 8.22 | 5529 | 1.55 | 0.44 |
| 3/30/2018 20:27 | 42.77 | 61.49 | 27.11 | 16.05 | 23.08 | 14.15 | 1.02 | 14.38 | 3.86 | 12.04 | 8.45 | 5309 | 1.47 | 0.39 |
| 3/30/2018 20:28 | 39.81 | 58.08 | 25.23 | 14.89 | 21.72 | 13.13 | 0.91 | 14.59 | 3.86 | 11.84 | 8.63 | 5308 | 1.33 | 0.35 |
| 3/30/2018 20:29 | 40.32 | 58.35 | 25.96 | 13.86 | 20.06 | 12.41 | 0.72 | 14.47 | 3.92 | 11.94 | 8.53 | 5392 | 1.04 | 0.28 |
| 3/30/2018 20:30 | 35.64 | 52.81 | 22.52 | 12.56 | 18.61 | 11.04 | 0.65 | 14.82 | 3.85 | 11.69 | 8.82 | 5293 | 0.96 | 0.25 |
| 3/30/2018 20:31 | 30.98 | 48.43 | 18.73 | 10.65 | 16.65 | 8.96 | 0.66 | 15.63 | 3.68 | 11.08 | 9.45 | 5063 | 1.03 | 0.24 |
| **Average** | **39.71** | **57.72** | **25.81** | **12.68** | **18.43** | **11.45** | **0.91** | | | **11.87** | **8.62** | **5426.50** | **1.33** | **0.36** |

| | | |
|---|---|---|
| Flow | kdscfh | 5426.50 |
| O2 | % dry | 8.62 |
| CO2 | % dry | 11.87 |
| NOx | ppm dry | 39.71 |
| NOx | ppm @ 3% O2 | 57.72 |
| NOx | lb/hr | 25.81 |
| SO2 | ppm dry | 12.68 |
| SO2 | ppm @ 3% O2 | 18.43 |
| SO2 | lb/hr | 11.45 |
| CO | ppm dry | 0.91 |
| CO | ppm @ 3% O2 | 1.33 |
| CO | lb/hr | 0.36 |

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CeDAR 1-Minute Data

| Timestamp | (Boiler 1) NOx ppm 1-Min | (Boiler 1) NOx ppm @3% O2 1-Min | (Boiler 1) NOx lb/hr 1-Min Avg | (Boiler 1) SO2 ppm 1-Min | (Boiler 1) SO2 ppm @3% O2 1-Min | (Boiler 1) SO2 lb/hr 1-Min Avg | (Boiler 1) CO ppm 1-Min | (Boiler 1) CO ppm @3% O2 1 Min | (Boiler 1) CO lb/hr 1-Min | (Boiler 1) CO2% 1-Min | (Boiler 1) O2% 1-Min | Stack Flow kdscf/hr 1-Min | Calculated CO @ 3% O2 | Calculated CO lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/30/2018 20:46 | 39 | 57.03 | 24.89 | 10.77 | 15.75 | 9.56 | 0.96 | 14.62 | 3.88 | 11.82 | 8.66 | 5345 | | |
| 3/30/2018 20:47 | 41.39 | 58.94 | 26.95 | 11.19 | 15.93 | 10.14 | 0.91 | 14.24 | 3.96 | 12.18 | 8.33 | 5453 | 1.30 | 0.36 |
| 3/30/2018 20:48 | 49.25 | 66.58 | 33.91 | 13.97 | 18.89 | 13.38 | 0.87 | 13.52 | 4.19 | 12.81 | 7.66 | 5768 | 1.18 | 0.36 |
| 3/30/2018 20:49 | 50.42 | 69.53 | 33.82 | 14.89 | 20.53 | 13.89 | 0.81 | 13.79 | 4.08 | 12.53 | 7.92 | 5618 | 1.12 | 0.33 |
| 3/30/2018 20:50 | 45.5 | 63.63 | 29.06 | 12.71 | 17.77 | 11.29 | 0.84 | 13.98 | 3.89 | 12.43 | 8.1 | 5350 | 1.17 | 0.33 |
| 3/30/2018 20:51 | 63.8 | 83.6 | 44.73 | 18.34 | 24.03 | 17.89 | 0.83 | 13.1 | 4.27 | 13.17 | 7.24 | 5873 | 1.09 | 0.35 |
| 3/30/2018 20:52 | 48.53 | 70.8 | 29.67 | 14.79 | 21.58 | 12.58 | 0.71 | 14.59 | 3.72 | 11.82 | 8.63 | 5121 | 1.04 | 0.26 |
| 3/30/2018 20:53 | 34.06 | 52.69 | 20.21 | 10.08 | 15.59 | 8.32 | 0.63 | 15.47 | 3.61 | 11.16 | 9.33 | 4969 | 0.97 | 0.23 |
| 3/30/2018 20:54 | 21.37 | 33.35 | 12.88 | 7.16 | 11.17 | 6 | 0.46 | 15.61 | 3.67 | 11.12 | 9.43 | 5047 | 0.72 | 0.17 |
| 3/30/2018 20:55 | 22.36 | 33.38 | 14.19 | 7 | 10.45 | 6.18 | 0.67 | 14.93 | 3.86 | 11.63 | 8.91 | 5315 | 1.00 | 0.26 |
| 3/30/2018 20:56 | 25.74 | 36.68 | 16.71 | 8.31 | 11.84 | 7.51 | 0.61 | 14.25 | 3.95 | 12.21 | 8.34 | 5438 | 0.87 | 0.24 |
| 3/30/2018 20:57 | 35.17 | 50 | 22.95 | 11.11 | 15.8 | 10.09 | 0.63 | 14.22 | 3.97 | 12.13 | 8.31 | 5466 | 0.90 | 0.25 |
| 3/30/2018 20:58 | 28.98 | 44 | 18.03 | 8.36 | 12.69 | 7.24 | 0.73 | 15.18 | 3.79 | 11.38 | 9.11 | 5211 | 1.11 | 0.28 |
| 3/30/2018 20:59 | 24.23 | 38.59 | 14.52 | 5.78 | 9.2 | 4.82 | 0.67 | 15.93 | 3.65 | 10.96 | 9.66 | 5021 | 1.07 | 0.24 |
| 3/30/2018 21:00 | 44.35 | 58.46 | 32.13 | 9.71 | 12.8 | 9.79 | 0.91 | 13.18 | 4.41 | 13.21 | 7.32 | 6068 | 1.20 | 0.40 |
| 3/30/2018 21:01 | 55.43 | 75.11 | 37.69 | 16.06 | 21.76 | 15.19 | 1.07 | 13.55 | 4.14 | 12.72 | 7.69 | 5695 | 1.45 | 0.44 |
| 3/30/2018 21:02 | 45.01 | 68.92 | 27.35 | 12.5 | 19.14 | 10.57 | 0.86 | 15.31 | 3.7 | 11.26 | 9.21 | 5090 | 1.32 | 0.32 |
| 3/30/2018 21:03 | 33.75 | 50.39 | 20.9 | 8.01 | 11.96 | 6.9 | 0.91 | 14.93 | 3.77 | 11.67 | 8.91 | 5188 | 1.36 | 0.34 |
| 3/30/2018 21:04 | 38.93 | 56.84 | 24.83 | 9.45 | 13.8 | 8.39 | 0.87 | 14.6 | 3.88 | 11.83 | 8.64 | 5343 | 1.27 | 0.34 |
| 3/30/2018 21:05 | 36.71 | 54.94 | 23.11 | 9.34 | 13.98 | 8.18 | 0.93 | 14.97 | 3.83 | 11.58 | 8.94 | 5274 | 1.39 | 0.36 |
| 3/30/2018 21:06 | 41.92 | 58.81 | 27.76 | 9.88 | 13.86 | 9.1 | 1.02 | 14.03 | 4.03 | 12.38 | 8.14 | 5546 | 1.43 | 0.41 |
| 3/30/2018 21:07 | 45.41 | 65.18 | 29.48 | 12.56 | 18.03 | 11.34 | 0.92 | 14.35 | 3.95 | 12.01 | 8.43 | 5437 | | |
| 3/30/2018 21:08 | 32.53 | 51.12 | 19.46 | 9.37 | 14.73 | 7.8 | 0.91 | 15.72 | 3.64 | 11.04 | 9.51 | 5010 | | |
| 3/30/2018 21:09 | 36.78 | 52.54 | 23.97 | 9.03 | 12.9 | 8.19 | 0.76 | 14.29 | 3.97 | 12.15 | 8.37 | 5459 | 1.09 | 0.30 |
| 3/30/2018 21:10 | 44.23 | 62.64 | 29.38 | 12.17 | 17.23 | 11.25 | 0.81 | 14.16 | 4.04 | 12.21 | 8.26 | 5563 | 1.15 | 0.33 |
| 3/30/2018 21:11 | 39.7 | 59.52 | 24.72 | 10.98 | 16.46 | 9.51 | 0.76 | 14.99 | 3.79 | 11.56 | 8.96 | 5215 | 1.14 | 0.29 |
| 3/30/2018 21:12 | 37.92 | 55.96 | 23.75 | 10.17 | 15.01 | 8.86 | 0.64 | 14.76 | 3.81 | 11.74 | 8.77 | 5247 | 0.94 | 0.24 |
| 3/30/2018 21:13 | 45.18 | 64.29 | 29.91 | 11.9 | 16.93 | 10.96 | 0.66 | 14.23 | 4.03 | 12.13 | 8.32 | 5546 | 0.94 | 0.27 |
| 3/30/2018 21:14 | 39.67 | 57.87 | 25.22 | 10.92 | 15.93 | 9.66 | 0.47 | 14.59 | 3.87 | 11.88 | 8.63 | 5325 | 0.69 | 0.18 |
| 3/30/2018 21:15 | 41.35 | 59.81 | 26.65 | 11.07 | 16.00 | 9.93 | 0.48 | 14.45 | 3.92 | 11.98 | 8.51 | 5399 | 0.70 | 0.19 |
| **Average** | **39.62** | **57.04** | **25.63** | **10.92** | **15.72** | **9.82** | **0.78** | | | **11.96** | **8.54** | **5380.00** | **1.10** | **0.30** |

| | | |
|---|---|---|
| Flow | kdscfh | 5380.00 |
| O2 | % dry | 8.54 |
| CO2 | % dry | 11.96 |
| NOx | ppm dry | 39.62 |
| NOx | ppm @ 3% O2 | 57.04 |
| NOx | lb/hr | 25.63 |
| SO2 | ppm dry | 10.92 |
| SO2 | ppm @ 3% O2 | 15.72 |
| SO2 | lb/hr | 9.82 |
| CO | ppm dry | 0.78 |
| CO | ppm @ 3% O2 | 1.10 |
| CO | lb/hr | 0.30 |

# APPENDIX A.2

# UNIT 2 DATA

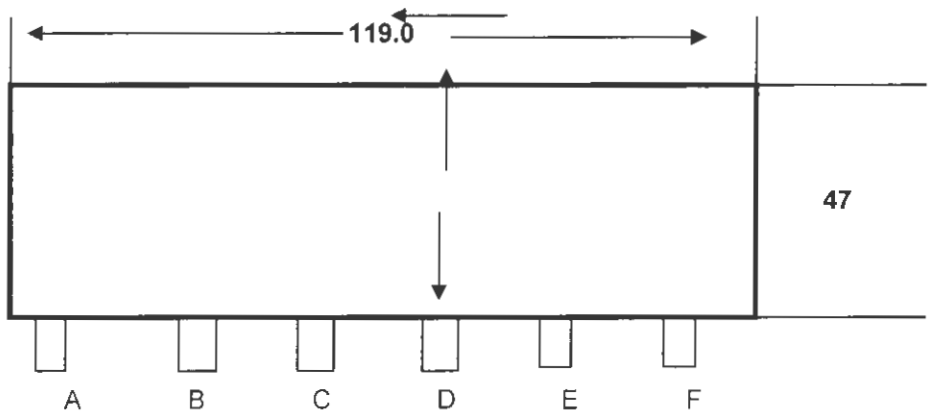
# APPENDIX A.2.1

# UNIT 2 SAMPLE LOCATION

Method 1

Client: Desert View Power  Date: 3/27/2018

Sample Location: Unit 1-2  Prepared By: Dave Wonderly




| | |
|---|---|
| **H (in.)** | **119.0** |
| **W (in.)** | **47.0** |
| **Nipple length** | **13.0** |
| **Distance between points** | **9.40** |
| Stack Area (ft^2) | **38.84** |

| Point No. | Sample Point Inches from nozzle | |
|---|---|---|
| 1 | 4.7 | 17.7 |
| 2 | 14.1 | 27.1 |
| 3 | 23.5 | 36.5 |
| 4 | 32.9 | 45.9 |
| 5 | 42.3 | 55.3 |

# APPENDIX A.2.2

# UNIT 2 CEM DATA

| Date | Time | O2 % | CO2 % | NOx ppm | CO ppm | |
|---|---|---|---|---|---|---|
| 3/27/2018 | 6:57 | 19.601 | 18.752 | 91.863 | 9.565 | |
| 3/27/2018 | 6:58 | 19.603 | 18.796 | 92.616 | 9.552 | |
| 3/27/2018 | 6:59 | 19.605 | 12.512 | 92.788 | 9.545 | |
| 3/27/2018 | 7:00 | 19.602 | 18.372 | 92.678 | 9.577 | |
| 3/27/2018 | 7:01 | 19.602 | 18.478 | 92.756 | 9.551 | |
| 3/27/2018 | 7:02 | 19.6 | 18.476 | 92.791 | 9.539 | High |
| 3/27/2018 | 7:03 | 14.005 | 13.235 | 53.078 | 9.078 | |
| 3/27/2018 | 7:04 | 10.864 | 10.98 | 48.149 | 5.693 | |
| 3/27/2018 | 7:05 | 10.864 | 10.973 | 48.467 | 4.734 | |
| 3/27/2018 | 7:06 | 10.863 | 10.969 | 48.519 | 4.724 | Mid |
| 3/27/2018 | 7:07 | 5.653 | 5.653 | 22.668 | 4.259 | |
| 3/27/2018 | 7:08 | 0.045 | 0.017 | 0.179 | 0.994 | |
| 3/27/2018 | 7:09 | 0.035 | 0.014 | 0.141 | 0.007 | |
| 3/27/2018 | 7:10 | 0.035 | 0.012 | 0.136 | 0.009 | |
| 3/27/2018 | 7:11 | 0.035 | 0.013 | 0.151 | 0.005 | Zero |
| 3/27/2018 | 7:12 | 0.035 | 0.012 | 0.106 | -0.007 | NO Mode Zero |
| 3/27/2018 | 7:13 | 0.035 | 0.012 | 66.148 | -0.009 | |
| 3/27/2018 | 7:14 | 0.034 | 0.012 | 93.289 | 0.014 | NO Mode High |
| 3/27/2018 | 7:15 | 0.035 | 0.012 | 23.518 | 0.026 | |
| 3/27/2018 | 7:16 | 0.035 | 0.011 | 0.237 | 0.011 | NO2 Gas NO mode |
| 3/27/2018 | 7:17 | 0.034 | 0.011 | 26.287 | 0.015 | |
| 3/27/2018 | 7:18 | 0.035 | 0.01 | 43.114 | 0.023 | NO2 Gas NOx Mode |
| 3/27/2018 | 7:19 | 0.035 | 0.01 | 13.84 | 0.026 | |
| 3/27/2018 | 7:20 | 0.035 | 0.01 | 0.33 | 0.029 | |
| 3/27/2018 | 7:21 | 0.035 | 0.01 | 0.269 | 0.022 | |
| 3/27/2018 | 7:22 | 0.035 | 0.009 | 0.228 | 0.039 | |
| 3/27/2018 | 7:23 | 0.035 | 0.011 | 0.216 | -0.004 | |
| 3/27/2018 | 7:24 | 0.035 | 0.01 | 0.203 | -0.001 | |
| 3/27/2018 | 7:25 | 0.035 | 0.009 | 0.188 | 0.005 | |
| 3/27/2018 | 7:26 | 0.035 | 0.009 | 0.185 | 0.006 | |
| 3/27/2018 | 7:27 | 0.035 | 0.009 | 0.168 | 0.003 | |
| 3/27/2018 | 7:28 | 0.035 | 0.008 | 0.162 | 0.002 | |
| 3/27/2018 | 7:29 | 0.035 | 0.009 | 0.16 | 0.01 | |
| 3/27/2018 | 7:30 | 0.035 | 0.009 | 0.157 | 0.011 | |
| 3/27/2018 | 7:31 | 0.035 | 0.009 | 0.159 | 0.008 | |
| 3/27/2018 | 7:32 | 0.035 | 0.009 | 0.152 | 0.019 | |
| 3/27/2018 | 7:33 | 0.035 | 0.009 | 0.153 | 0.012 | |
| 3/27/2018 | 7:34 | 0.035 | 0.009 | 0.137 | -0.012 | |
| 3/27/2018 | 7:35 | 0.035 | 0.009 | 0.134 | 0 | |
| 3/27/2018 | 7:36 | 0.034 | 0.009 | 0.147 | -0.008 | |
| 3/27/2018 | 7:37 | 0.035 | 0.009 | 0.143 | -0.005 | |
| 3/27/2018 | 7:38 | 0.035 | 0.01 | 0.129 | -0.013 | |
| 3/27/2018 | 7:39 | 0.035 | 0.009 | 0.136 | -0.01 | |
| 3/27/2018 | 7:40 | 0.035 | 0.009 | 0.129 | 0.01 | |
| 3/27/2018 | 7:41 | 11.302 | 2.594 | 4.763 | -0.015 | |
| 3/27/2018 | 7:42 | 6.885 | 13.576 | 42.055 | 0.094 | |
| 3/27/2018 | 7:43 | 7.757 | 12.675 | 41.085 | 0.206 | |
| 3/27/2018 | 7:44 | 8.71 | 11.763 | 34.391 | 0.21 | |
| 3/27/2018 | 7:45 | 8.829 | 11.642 | 28.741 | 0.194 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3/27/2018 | 7:46 | 9.018 | 11.473 | 24.777 | 0.208 | |
| 3/27/2018 | 7:47 | 8.319 | 12.162 | 31.425 | 0.212 | |
| 3/27/2018 | 7:48 | 8.858 | 11.614 | 27.146 | 0.207 | |
| 3/27/2018 | 7:49 | 9.228 | 11.253 | 25.582 | 0.2 | |
| 3/27/2018 | 7:50 | 9.143 | 11.321 | 24.541 | 0.196 | |
| 3/27/2018 | 7:51 | 1.497 | 0.345 | 43.3 | 0.212 | |
| 3/27/2018 | 7:52 | 0.038 | 0.031 | 48.628 | 0.295 | NOx Bias |
| 3/27/2018 | 7:53 | 8.337 | 8.562 | 14.02 | 0.252 | |
| 3/27/2018 | 7:54 | 10.839 | 10.898 | 0.285 | 0.03 | O2 CO2 Bias |
| 3/27/2018 | 7:55 | 6.073 | 5.999 | 0.247 | 0.2 | |
| 3/27/2018 | 7:56 | 0.048 | 0.042 | 0.238 | 3.533 | |
| 3/27/2018 | 7:57 | 0.034 | 0.029 | 0.216 | 4.647 | |
| 3/27/2018 | 7:58 | 0.035 | 0.023 | 0.22 | 4.711 | |
| 3/27/2018 | 7:59 | 0.034 | 0.017 | 0.207 | 4.715 | CO Bias |
| 3/27/2018 | 8:00 | 2.978 | 4.664 | 10.466 | 4.533 | |
| 3/27/2018 | 8:01 | 7.844 | 12.55 | 37.482 | 1.2 | |
| 3/27/2018 | 8:02 | 9 | 11.398 | 29.959 | 0.227 | |
| 3/27/2018 | 8:03 | 9.262 | 11.163 | 25.91 | 0.219 | |
| 3/27/2018 | 8:04 | 8.371 | 12.071 | 28.298 | 0.236 | |
| 3/27/2018 | 8:05 | 8.348 | 12.071 | 30.573 | 0.232 | |
| 3/27/2018 | 8:06 | 8.243 | 12.18 | 31.521 | 0.25 | |
| 3/27/2018 | 8:07 | 7.907 | 12.522 | 37.746 | 0.195 | |
| 3/27/2018 | 8:08 | 8.289 | 12.124 | 33.772 | 0.189 | |
| 3/27/2018 | 8:09 | 8.121 | 12.297 | 33.987 | 0.21 | |
| 3/27/2018 | 8:10 | 8.424 | 12.002 | 32.983 | 0.221 | |
| 3/27/2018 | 8:11 | 8.593 | 11.827 | 32.77 | 0.237 | |
| 3/27/2018 | 8:12 | 8.419 | 11.995 | 33.782 | 0.22 | |
| 3/27/2018 | 8:13 | 8.753 | 11.664 | 34.033 | 0.202 | |
| 3/27/2018 | 8:14 | 8.37 | 12.06 | 34.399 | 0.187 | |
| 3/27/2018 | 8:15 | 8.873 | 11.538 | 30.877 | 0.169 | |
| 3/27/2018 | 8:16 | 8.42 | 12.014 | 33.368 | 0.172 | |
| 3/27/2018 | 8:17 | 7.818 | 12.589 | 36.994 | 0.195 | |
| 3/27/2018 | 8:18 | 7.819 | 12.593 | 40.924 | 0.204 | |
| 3/27/2018 | 8:19 | 8.688 | 11.717 | 33.976 | 0.219 | |
| 3/27/2018 | 8:20 | 8.542 | 11.871 | 33.022 | 0.194 | |
| 3/27/2018 | 8:21 | 8.397 | 12.025 | 33.372 | 0.197 | |
| 3/27/2018 | 8:22 | 7.976 | 12.421 | 37.764 | 0.232 | |
| 3/27/2018 | 8:23 | 7.783 | 12.611 | 40.818 | 0.233 | |
| 3/27/2018 | 8:24 | 7.25 | 13.118 | 46.039 | 0.229 | |
| 3/27/2018 | 8:25 | 7.038 | 13.321 | 51.069 | 0.218 | |
| 3/27/2018 | 8:26 | 8.093 | 12.261 | 48.792 | 0.196 | |
| 3/27/2018 | 8:27 | 8.166 | 12.219 | 44.346 | 0.202 | |
| 3/27/2018 | 8:28 | 8.538 | 11.855 | 38.123 | 0.231 | |
| 3/27/2018 | 8:29 | 8.5 | 11.917 | 34.882 | 0.219 | |
| 3/27/2018 | 8:30 | 8.506 | 11.907 | 32.336 | 0.178 | |
| 3/27/2018 | 8:31 | 9.311 | 11.11 | 29.309 | 0.182 | |
| 3/27/2018 | 8:32 | 8.926 | 11.492 | 27.116 | 0.2 | |
| 3/27/2018 | 8:33 | 8.722 | 11.688 | 27.669 | 0.186 | |
| 3/27/2018 | 8:34 | 7.659 | 12.746 | 36.307 | 0.213 | |
| 3/27/2018 | 8:35 | 7.882 | 12.51 | 37.316 | 0.212 | |
| 3/27/2018 | 8:36 | 8.371 | 12.003 | 38.622 | 0.198 | |
| 3/27/2018 | 8:37 | 8.759 | 11.625 | 31.726 | 0.208 | |

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|---|---|---|---|---|---|
| 3/27/2018 | 8:38 | 9.162 | 11.221 | 26.331 | 0.22 |
| 3/27/2018 | 8:39 | 8.521 | 11.854 | 29.464 | 0.201 |
| 3/27/2018 | 8:40 | 8.25 | 12.108 | 32.524 | 0.193 |
| 3/27/2018 | 8:41 | 8.415 | 11.937 | 34.137 | 0.22 |
| 3/27/2018 | 8:42 | 8.789 | 11.564 | 30.947 | 0.222 |
| 3/27/2018 | 8:43 | 8.667 | 11.695 | 29.91 | 0.226 |
| 3/27/2018 | 8:44 | 8.472 | 11.895 | 32.349 | 0.21 |
| 3/27/2018 | 8:45 | 8.344 | 12.034 | 34.043 | 0.185 |
| 3/27/2018 | 8:46 | 8.428 | 11.944 | 34.921 | 0.19 |
| 3/27/2018 | 8:47 | 8.554 | 11.832 | 33.554 | 0.23 |
| 3/27/2018 | 8:48 | 8.305 | 12.074 | 34.412 | 0.218 |
| 3/27/2018 | 8:49 | 8.63 | 11.766 | 36.057 | 0.192 |
| 3/27/2018 | 8:50 | 8.44 | 11.954 | 33.271 | 0.21 |
| 3/27/2018 | 8:51 | 7.943 | 12.471 | 35.747 | 0.211 |
| 3/27/2018 | 8:52 | 8.275 | 12.134 | 32.058 | 0.19 |
| 3/27/2018 | 8:53 | 8.693 | 11.704 | 32.416 | 0.19 |
| 3/27/2018 | 8:54 | 8.71 | 11.705 | 31.06 | 0.205 |
| 3/27/2018 | 8:55 | 8.546 | 11.875 | 29.205 | 0.212 |
| 3/27/2018 | 8:56 | 8.537 | 11.88 | 28.09 | 0.215 |
| 3/27/2018 | 8:57 | 8.841 | 11.558 | 33.483 | 0.158 |
| 3/27/2018 | 8:58 | 8.415 | 11.993 | 37.202 | 0.203 |
| 3/27/2018 | 8:59 | 8.912 | 11.495 | 35.106 | 0.179 |
| 3/27/2018 | 9:00 | 8.151 | 12.252 | 39.98 | 0.186 |
| 3/27/2018 | 9:01 | 8.597 | 11.796 | 36.869 | 0.192 |
| 3/27/2018 | 9:02 | 9.195 | 11.206 | 33.474 | 0.182 |
| 3/27/2018 | 9:03 | 8.812 | 11.6 | 34.436 | 0.2 |
| 3/27/2018 | 9:04 | 8.845 | 11.561 | 33.996 | 0.213 |
| 3/27/2018 | 9:05 | 8.968 | 11.433 | 35.33 | 0.22 |
| 3/27/2018 | 9:06 | 8.729 | 11.671 | 34.563 | 0.194 |
| 3/27/2018 | 9:07 | 8.67 | 11.723 | 33.844 | 0.206 |
| 3/27/2018 | 9:08 | 8.639 | 11.747 | 30.926 | 0.198 |
| 3/27/2018 | 9:09 | 7.876 | 12.517 | 37.866 | 0.242 |
| 3/27/2018 | 9:10 | 8.06 | 12.307 | 40.35 | 0.227 |
| 3/27/2018 | 9:11 | 8.5 | 11.862 | 36.191 | 0.246 |
| 3/27/2018 | 9:12 | 9.083 | 11.28 | 28.482 | 0.217 |
| 3/27/2018 | 9:13 | 8.163 | 12.218 | 32.719 | 0.205 |
| 3/27/2018 | 9:14 | 7.934 | 12.419 | 39.056 | 0.205 |
| 3/27/2018 | 9:15 | 8.624 | 11.739 | 37.495 | 0.206 |
| 3/27/2018 | 9:16 | 8.728 | 11.641 | 36.068 | 0.226 |
| 3/27/2018 | 9:17 | 9.017 | 11.357 | 30.283 | 0.224 |
| 3/27/2018 | 9:18 | 9.221 | 11.164 | 27.183 | 0.184 |
| 3/27/2018 | 9:19 | 8.632 | 11.752 | 30.508 | 0.212 |
| 3/27/2018 | 9:20 | 9.351 | 11.046 | 26.17 | 0.217 |
| 3/27/2018 | 9:21 | 8.503 | 11.89 | 30.281 | 0.214 |
| 3/27/2018 | 9:22 | 8.153 | 12.225 | 34.273 | 0.24 |
| 3/27/2018 | 9:23 | 8.409 | 11.978 | 34.744 | 0.221 |
| 3/27/2018 | 9:24 | 8.987 | 11.394 | 29.944 | 0.228 |
| 3/27/2018 | 9:25 | 8.939 | 11.456 | 30.453 | 0.206 |
| 3/27/2018 | 9:26 | 8.657 | 11.737 | 31.802 | 0.24 |
| 3/27/2018 | 9:27 | 8.724 | 11.67 | 32.157 | 0.217 |
| 3/27/2018 | 9:28 | 8.504 | 11.884 | 35.611 | 0.233 |
| 3/27/2018 | 9:29 | 7.903 | 12.479 | 40.377 | 0.246 |

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|---|---|---|---|---|---|---|
| 3/27/2018 | 9:30 | 8.056 | 12.333 | 40.452 | 0.239 | |
| Run 1 Average | | 8.57 | 11.82 | 33.34 | 0.21 | |
| 3/27/2018 | 9:31 | 8.265 | 12.126 | 35.944 | 0.21 | |
| 3/27/2018 | 9:32 | 8.851 | 11.546 | 32.595 | 0.208 | |
| 3/27/2018 | 9:33 | 8.486 | 11.901 | 34.77 | 0.22 | |
| 3/27/2018 | 9:34 | 8.335 | 12.057 | 37.113 | 0.196 | |
| 3/27/2018 | 9:35 | 8.666 | 11.713 | 33.067 | 0.219 | |
| 3/27/2018 | 9:36 | 9.32 | 11.065 | 28.99 | 0.211 | |
| 3/27/2018 | 9:37 | 8.836 | 11.552 | 30.123 | 0.22 | |
| 3/27/2018 | 9:38 | 7.863 | 12.529 | 35.771 | 0.203 | |
| 3/27/2018 | 9:39 | 7.919 | 12.459 | 38.536 | 0.201 | |
| 3/27/2018 | 9:40 | 4.687 | 5.942 | 23.874 | 0.419 | |
| 3/27/2018 | 9:41 | 0.046 | 0.044 | 0.252 | 3.717 | |
| 3/27/2018 | 9:42 | 0.035 | 0.031 | 0.215 | 4.701 | CO Bias |
| 3/27/2018 | 9:43 | 0.037 | 0.027 | 27.284 | 4.07 | |
| 3/27/2018 | 9:44 | 0.035 | 0.022 | 48.76 | 0.656 | NOx Bias |
| 3/27/2018 | 9:45 | 6.525 | 6.644 | 22.159 | 0.319 | |
| 3/27/2018 | 9:46 | 10.791 | 10.81 | 0.261 | 0.047 | |
| 3/27/2018 | 9:47 | 10.791 | 10.832 | 0.223 | 0.023 | O2 CO2 Bias |
| 3/27/2018 | 9:48 | 1.355 | 0.636 | 0.196 | 0.014 | |
| 3/27/2018 | 9:49 | 0.035 | 0.013 | 0.158 | 0.005 | Zero |
| 3/27/2018 | 9:50 | 6.968 | 7.873 | 34.302 | 0.868 | |
| 3/27/2018 | 9:51 | 10.816 | 10.9 | 49.019 | 4.352 | |
| 3/27/2018 | 9:52 | 10.816 | 10.906 | 49.013 | 4.707 | Span |
| 3/27/2018 | 9:53 | 8.497 | 12.226 | 44.662 | 3.354 | |
| 3/27/2018 | 9:54 | 7.534 | 12.814 | 48.365 | 0.32 | |
| 3/27/2018 | 9:55 | 7.887 | 12.439 | 46.933 | 0.216 | |
| 3/27/2018 | 9:56 | 9.624 | 10.715 | 27.318 | 0.258 | |
| 3/27/2018 | 9:57 | 8.456 | 11.907 | 31.49 | 0.262 | |
| 3/27/2018 | 9:58 | 8.194 | 12.16 | 34.512 | 0.246 | |
| 3/27/2018 | 9:59 | 7.532 | 12.825 | 41.78 | 0.209 | |
| 3/27/2018 | 10:00 | 8.013 | 12.316 | 38.792 | 0.196 | |
| 3/27/2018 | 10:01 | 7.919 | 12.428 | 39.021 | 0.182 | |
| 3/27/2018 | 10:02 | 8.528 | 11.808 | 34.704 | 0.19 | |
| 3/27/2018 | 10:03 | 8.17 | 12.189 | 34.862 | 0.206 | |
| 3/27/2018 | 10:04 | 8.388 | 11.962 | 32.568 | 0.234 | |
| 3/27/2018 | 10:05 | 8.925 | 11.415 | 28.122 | 0.2 | |
| 3/27/2018 | 10:06 | 8.23 | 12.137 | 28.293 | 0.256 | |
| 3/27/2018 | 10:07 | 8.27 | 12.093 | 28.496 | 0.223 | |
| 3/27/2018 | 10:08 | 7.812 | 12.567 | 33.578 | 0.203 | |
| 3/27/2018 | 10:09 | 8.75 | 11.62 | 28.882 | 0.197 | |
| 3/27/2018 | 10:10 | 8.372 | 12.033 | 31.348 | 0.223 | |
| 3/27/2018 | 10:11 | 8.613 | 11.786 | 29.917 | 0.212 | |
| 3/27/2018 | 10:12 | 8.425 | 11.981 | 30.365 | 0.172 | |
| 3/27/2018 | 10:13 | 8.14 | 12.254 | 34.795 | 0.209 | |
| 3/27/2018 | 10:14 | 8.616 | 11.783 | 31.776 | 0.203 | |
| 3/27/2018 | 10:15 | 8.171 | 12.229 | 35.768 | 0.176 | |
| 3/27/2018 | 10:16 | 8.486 | 11.908 | 35.313 | 0.204 | |
| 3/27/2018 | 10:17 | 8.624 | 11.767 | 34.474 | 0.192 | |
| 3/27/2018 | 10:18 | 8.788 | 11.587 | 34.113 | 0.2 | |
| 3/27/2018 | 10:19 | 7.881 | 12.533 | 41.38 | 0.223 | |

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|---|---|---|---|---|---|---|
| 3/27/2018 | 10:20 | 8.222 | 12.157 | 39.489 | 0.227 | |
| 3/27/2018 | 10:21 | 8.328 | 12.058 | 38.141 | 0.185 | |
| 3/27/2018 | 10:22 | 8.451 | 11.935 | 35.243 | 0.217 | |
| 3/27/2018 | 10:23 | 8.628 | 11.757 | 35.192 | 0.169 | |
| 3/27/2018 | 10:24 | 8.344 | 12.038 | 35.284 | 0.149 | |
| 3/27/2018 | 10:25 | 8.508 | 11.835 | 35.323 | 0.168 | |
| 3/27/2018 | 10:26 | 8.31 | 12.05 | 36.619 | 0.157 | |
| 3/27/2018 | 10:27 | 8.421 | 11.928 | 34.527 | 0.183 | |
| 3/27/2018 | 10:28 | 8.868 | 11.502 | 28.233 | 0.184 | |
| 3/27/2018 | 10:29 | 8.197 | 12.204 | 31.033 | 0.194 | |
| 3/27/2018 | 10:30 | 8.861 | 11.519 | 27.412 | 0.21 | |
| 3/27/2018 | 10:31 | 8.363 | 12.034 | 33.525 | 0.237 | |
| 3/27/2018 | 10:32 | 8.284 | 12.129 | 35.003 | 0.225 | |
| 3/27/2018 | 10:33 | 7.815 | 12.622 | 36.233 | 0.175 | |
| 3/27/2018 | 10:34 | 7.781 | 12.653 | 37.947 | 0.177 | |
| 3/27/2018 | 10:35 | 8.958 | 11.452 | 31.243 | 0.214 | |
| 3/27/2018 | 10:36 | 9.089 | 11.345 | 27.839 | 0.202 | |
| 3/27/2018 | 10:37 | 8.78 | 11.675 | 27.878 | 0.225 | |
| 3/27/2018 | 10:38 | 7.812 | 12.651 | 38.228 | 0.218 | |
| 3/27/2018 | 10:39 | 7.822 | 12.622 | 43.401 | 0.222 | |
| 3/27/2018 | 10:40 | 8.686 | 11.75 | 37.455 | 0.252 | |
| 3/27/2018 | 10:41 | 8.655 | 11.789 | 35.913 | 0.184 | |
| 3/27/2018 | 10:42 | 8.436 | 12.021 | 33.315 | 0.158 | |
| 3/27/2018 | 10:43 | 8.09 | 12.364 | 34.131 | 0.167 | |
| 3/27/2018 | 10:44 | 8.592 | 11.853 | 33.337 | 0.173 | |
| 3/27/2018 | 10:45 | 7.651 | 12.799 | 40.739 | 0.215 | |
| 3/27/2018 | 10:46 | 8.431 | 11.996 | 37.537 | 0.22 | |
| 3/27/2018 | 10:47 | 8.703 | 11.728 | 36.89 | 0.191 | |
| 3/27/2018 | 10:48 | 8.8 | 11.639 | 33.118 | 0.154 | |
| 3/27/2018 | 10:49 | 8.177 | 12.282 | 36.149 | 0.158 | |
| 3/27/2018 | 10:50 | 8.591 | 11.843 | 34.834 | 0.168 | |
| 3/27/2018 | 10:51 | 8.704 | 11.723 | 33.694 | 0.196 | |
| 3/27/2018 | 10:52 | 8.824 | 11.6 | 31.879 | 0.173 | |
| 3/27/2018 | 10:53 | 8.655 | 11.784 | 31.878 | 0.225 | |
| 3/27/2018 | 10:54 | 8.259 | 12.173 | 36.577 | 0.248 | |
| Run 2 Average | | 8.40 | 12.00 | 34.40 | 0.20 | |
| 3/27/2018 | 10:55 | 7.884 | 12.555 | 39.896 | 0.189 | |
| 3/27/2018 | 10:56 | 8.672 | 11.726 | 36.85 | 0.222 | |
| 3/27/2018 | 10:57 | 8.218 | 12.204 | 40.652 | 0.207 | |
| 3/27/2018 | 10:58 | 8.197 | 12.235 | 40.462 | 0.249 | |
| 3/27/2018 | 10:59 | 8.435 | 11.99 | 33.993 | 0.219 | |
| 3/27/2018 | 11:00 | 8.519 | 11.899 | 33.837 | 0.234 | |
| 3/27/2018 | 11:01 | 8.768 | 11.655 | 29.041 | 0.25 | |
| 3/27/2018 | 11:02 | 8.537 | 11.899 | 32.887 | 0.232 | |
| 3/27/2018 | 11:03 | 8.639 | 11.782 | 30.695 | 0.198 | |
| 3/27/2018 | 11:04 | 8.513 | 11.919 | 32.881 | 0.202 | |
| 3/27/2018 | 11:05 | 5.3 | 5.86 | 19.922 | 0.351 | |
| 3/27/2018 | 11:06 | 0.046 | 0.047 | 0.246 | 3.621 | |
| 3/27/2018 | 11:07 | 0.036 | 0.035 | 0.216 | 4.713 | CO Bias |
| 3/27/2018 | 11:08 | 0.037 | 0.029 | 21.806 | 4.396 | |
| 3/27/2018 | 11:09 | 0.036 | 0.028 | 48.715 | 0.896 | NOx Bias |

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|---|---|---|---|---|---|---|
| 3/27/2018 | 11:10 | 6.99 | 7.241 | 20.103 | 0.1 | |
| 3/27/2018 | 11:11 | 10.741 | 10.904 | 0.249 | 0.038 | O2 CO2 Bias |
| 3/27/2018 | 11:12 | 1.741 | 1.873 | 0.207 | 0.035 | |
| 3/27/2018 | 11:13 | 0.036 | 0.015 | 0.161 | 0.013 | Zero |
| 3/27/2018 | 11:14 | 8.565 | 9.586 | 41.575 | 1.544 | |
| 3/27/2018 | 11:15 | 10.766 | 10.957 | 48.904 | 4.574 | |
| 3/27/2018 | 11:16 | 10.766 | 10.957 | 48.901 | 4.727 | Span |
| 3/27/2018 | 11:17 | 9.596 | 11.53 | 45.452 | 4.424 | |
| 3/27/2018 | 11:18 | 9.071 | 11.352 | 34.325 | 0.969 | |
| 3/27/2018 | 11:19 | 8.886 | 11.501 | 29.134 | 0.205 | |
| 3/27/2018 | 11:20 | 8.362 | 12.045 | 36.059 | 0.191 | |
| 3/27/2018 | 11:21 | 8.294 | 12.116 | 36.917 | 0.194 | |
| 3/27/2018 | 11:22 | 8.559 | 11.85 | 35.513 | 0.185 | |
| 3/27/2018 | 11:23 | 8.855 | 11.543 | 32.217 | 0.186 | |
| 3/27/2018 | 11:24 | 8.588 | 11.796 | 32.925 | 0.195 | |
| 3/27/2018 | 11:25 | 8.305 | 12.099 | 35.532 | 0.194 | |
| 3/27/2018 | 11:26 | 8.73 | 11.666 | 32.171 | 0.198 | |
| 3/27/2018 | 11:27 | 8.496 | 11.94 | 34.513 | 0.151 | |
| 3/27/2018 | 11:28 | 8.997 | 11.404 | 27.977 | 0.178 | |
| 3/27/2018 | 11:29 | 8.869 | 11.563 | 28.969 | 0.178 | |
| 3/27/2018 | 11:30 | 9.185 | 11.234 | 27.908 | 0.209 | |
| 3/27/2018 | 11:31 | 8.54 | 11.838 | 32.442 | 0.199 | |
| 3/27/2018 | 11:32 | 8.379 | 12.043 | 36.753 | 0.158 | |
| 3/27/2018 | 11:33 | 8.674 | 11.73 | 31.673 | 0.155 | |
| 3/27/2018 | 11:34 | 9.059 | 11.319 | 28.078 | 0.164 | |
| 3/27/2018 | 11:35 | 8.544 | 11.856 | 32.152 | 0.177 | |
| 3/27/2018 | 11:36 | 8.801 | 11.603 | 31.133 | 0.184 | |
| 3/27/2018 | 11:37 | 8.246 | 12.124 | 33.932 | 0.184 | |
| 3/27/2018 | 11:38 | 7.603 | 12.807 | 41.062 | 0.195 | |
| 3/27/2018 | 11:39 | 8.443 | 11.951 | 37.937 | 0.237 | |
| 3/27/2018 | 11:40 | 8.248 | 12.144 | 39.515 | 0.152 | |
| 3/27/2018 | 11:41 | 8.776 | 11.621 | 35.317 | 0.152 | |
| 3/27/2018 | 11:42 | 9.431 | 10.956 | 28.923 | 0.162 | |
| 3/27/2018 | 11:43 | 8.554 | 11.83 | 32.739 | 0.198 | |
| 3/27/2018 | 11:44 | 8.401 | 12.005 | 35.157 | 0.184 | |
| 3/27/2018 | 11:45 | 8.766 | 11.636 | 33.973 | 0.184 | |
| 3/27/2018 | 11:46 | 9.284 | 11.093 | 30.79 | 0.231 | |
| 3/27/2018 | 11:47 | 8.848 | 11.514 | 32.958 | 0.201 | |
| 3/27/2018 | 11:48 | 8.374 | 12.012 | 37.275 | 0.195 | |
| 3/27/2018 | 11:49 | 8.027 | 12.369 | 36.544 | 0.198 | |
| 3/27/2018 | 11:50 | 8.55 | 11.831 | 36.6 | 0.186 | |
| 3/27/2018 | 11:51 | 9.306 | 11.063 | 28.584 | 0.183 | |
| 3/27/2018 | 11:52 | 8.722 | 11.624 | 31.049 | 0.206 | |
| 3/27/2018 | 11:53 | 8.281 | 12.09 | 33.171 | 0.198 | |
| 3/27/2018 | 11:54 | 8.201 | 12.164 | 35.979 | 0.235 | |
| 3/27/2018 | 11:55 | 8.51 | 11.844 | 33.916 | 0.254 | |
| 3/27/2018 | 11:56 | 7.937 | 12.436 | 41.281 | 0.238 | |
| 3/27/2018 | 11:57 | 8.002 | 12.358 | 41.721 | 0.194 | |
| 3/27/2018 | 11:58 | 8.903 | 11.449 | 34.925 | 0.144 | |
| 3/27/2018 | 11:59 | 8.573 | 11.783 | 34.117 | 0.224 | |
| 3/27/2018 | 12:00 | 8.68 | 11.69 | 33.954 | 0.286 | |
| 3/27/2018 | 12:01 | 8.531 | 11.81 | 33.599 | 0.22 | |

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|---|---|---|---|---|---|
| 3/27/2018 | 12:02 | 8.924 | 11.419 | 31.425 | 0.214 |
| 3/27/2018 | 12:03 | 8.729 | 11.636 | 31.736 | 0.241 |
| 3/27/2018 | 12:04 | 9.038 | 11.309 | 29.321 | 0.254 |
| 3/27/2018 | 12:05 | 8.989 | 11.353 | 29.709 | 0.203 |
| 3/27/2018 | 12:06 | 9.259 | 11.124 | 30.146 | 0.228 |
| 3/27/2018 | 12:07 | 9.64 | 10.734 | 26.772 | 0.206 |
| 3/27/2018 | 12:08 | 8.7 | 11.66 | 31.705 | 0.21 |
| 3/27/2018 | 12:09 | 8.711 | 11.628 | 29.569 | 0.227 |
| 3/27/2018 | 12:10 | 8.75 | 11.583 | 32.786 | 0.218 |
| 3/27/2018 | 12:11 | 7.746 | 12.613 | 44.628 | 0.218 |
| 3/27/2018 | 12:12 | 8.369 | 12.003 | 43.801 | 0.225 |
| 3/27/2018 | 12:13 | 9.265 | 11.102 | 35.545 | 0.195 |
| 3/27/2018 | 12:14 | 8.689 | 11.662 | 36.297 | 0.163 |
| 3/27/2018 | 12:15 | 8.323 | 12.06 | 39.712 | 0.195 |
| 3/27/2018 | 12:16 | 8.818 | 11.551 | 34.47 | 0.209 |
| 3/27/2018 | 12:17 | 8.94 | 11.428 | 31.972 | 0.215 |
| 3/27/2018 | 12:18 | 8.102 | 12.261 | 41.82 | 0.229 |
| 3/27/2018 | 12:19 | 7.936 | 12.433 | 41.504 | 0.206 |
| 3/27/2018 | 12:20 | 8.292 | 12.057 | 36.784 | 0.221 |
| 3/27/2018 | 12:21 | 8.33 | 12.054 | 37.269 | 0.187 |
| 3/27/2018 | 12:22 | 8.591 | 11.745 | 32.808 | 0.198 |
| 3/27/2018 | 12:23 | 8.219 | 12.14 | 36.165 | 0.189 |
| 3/27/2018 | 12:24 | 8.28 | 12.095 | 36.636 | 0.239 |
| 3/27/2018 | 12:25 | 8.413 | 11.956 | 34.441 | 0.207 |
| 3/27/2018 | 12:26 | 8.701 | 11.664 | 35.54 | 0.195 |
| 3/27/2018 | 12:27 | 8.814 | 11.57 | 30.317 | 0.208 |
| 3/27/2018 | 12:28 | 8.603 | 11.765 | 32.584 | 0.19 |
| 3/27/2018 | 12:29 | 8.087 | 12.277 | 38.264 | 0.208 |
| 3/27/2018 | 12:30 | 7.895 | 12.462 | 40.857 | 0.185 |
| 3/27/2018 | 12:31 | 8.348 | 11.992 | 38.448 | 0.156 |
| 3/27/2018 | 12:32 | 8.309 | 12.029 | 34.75 | 0.201 |
| Run 3 Average | | 8.57 | 11.80 | 34.76 | 0.20 |
| 3/27/2018 | 12:33 | 8.487 | 11.836 | 30.384 | 0.21 |
| 3/27/2018 | 12:34 | 9.056 | 11.254 | 26.124 | 0.22 |
| 3/27/2018 | 12:35 | 8.104 | 12.22 | 36.619 | 0.206 |
| 3/27/2018 | 12:36 | 7.796 | 12.504 | 40.755 | 0.209 |
| 3/27/2018 | 12:37 | 8.442 | 11.846 | 36.78 | 0.228 |
| 3/27/2018 | 12:38 | 8.156 | 12.145 | 38.197 | 0.195 |
| 3/27/2018 | 12:39 | 7.95 | 12.342 | 37.824 | 0.172 |
| 3/27/2018 | 12:30 | 7.895 | 12.462 | 40.857 | 0.185 |
| 3/27/2018 | 12:31 | 8.348 | 11.992 | 38.448 | 0.156 |
| 3/27/2018 | 12:32 | 8.309 | 12.029 | 34.75 | 0.201 |
| 3/27/2018 | 12:33 | 8.487 | 11.836 | 30.384 | 0.21 |
| 3/27/2018 | 12:34 | 9.056 | 11.254 | 26.124 | 0.22 |
| 3/27/2018 | 12:35 | 8.104 | 12.22 | 36.619 | 0.206 |
| 3/27/2018 | 12:36 | 7.796 | 12.504 | 40.755 | 0.209 |
| 3/27/2018 | 12:37 | 8.442 | 11.846 | 36.78 | 0.228 |
| 3/27/2018 | 12:38 | 8.156 | 12.145 | 38.197 | 0.195 |
| 3/27/2018 | 12:39 | 7.95 | 12.342 | 37.824 | 0.172 |
| 3/27/2018 | 12:40 | 8.522 | 11.748 | 33.474 | 0.202 |
| 3/27/2018 | 12:41 | 4.207 | 4.061 | 13.134 | 0.574 |
| 3/27/2018 | 12:42 | 0.043 | 0.041 | 0.249 | 3.969 |

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|---|---|---|---|---|---|---|
| 3/27/2018 | 12:43 | 0.036 | 0.032 | 0.221 | 4.693 | CO Bias |
| 3/27/2018 | 12:44 | 0.037 | 0.027 | 22.695 | 4.332 | |
| 3/27/2018 | 12:45 | 0.035 | 0.025 | 48.737 | 0.832 | NOx Bias |
| 3/27/2018 | 12:46 | 6.684 | 6.917 | 21.329 | 0.077 | |
| 3/27/2018 | 12:47 | 10.744 | 10.839 | 0.253 | 0.025 | O2 CO2 Bias |
| 3/27/2018 | 12:48 | 3.753 | 3.07 | 0.207 | 0.142 | |
| 3/27/2018 | 12:49 | 0.036 | 0.013 | 0.161 | 0.164 | |
| 3/27/2018 | 12:50 | 0.036 | 0.012 | 0.161 | 0 | Zero |
| 3/27/2018 | 12:51 | 8.227 | 9.063 | 39.394 | 1.231 | |
| 3/27/2018 | 12:52 | 10.79 | 10.885 | 48.923 | 4.514 | |
| 3/27/2018 | 12:53 | 10.79 | 10.886 | 48.922 | 4.719 | Span |
| 3/27/2018 | 12:54 | 9.221 | 11.419 | 33.545 | 3.254 | |
| 3/27/2018 | 12:55 | 8.353 | 11.962 | 34.054 | 0.316 | |
| 3/27/2018 | 12:56 | 8.116 | 12.188 | 36.309 | 0.212 | |
| 3/27/2018 | 12:57 | 8.279 | 12.042 | 36.313 | 0.231 | |
| 3/27/2018 | 12:58 | 8.343 | 11.97 | 33.64 | 0.258 | |
| 3/27/2018 | 12:59 | 8.253 | 12.063 | 37.22 | 0.243 | |
| 3/27/2018 | 13:00 | 8.361 | 11.935 | 37.711 | 0.253 | |
| 3/27/2018 | 13:01 | 8.465 | 11.845 | 36.595 | 0.238 | |
| 3/27/2018 | 13:02 | 7.936 | 12.38 | 37.885 | 0.237 | |
| 3/27/2018 | 13:03 | 8.812 | 11.477 | 32.866 | 0.269 | |
| 3/27/2018 | 13:04 | 8.712 | 11.59 | 30.289 | 0.244 | |
| 3/27/2018 | 13:05 | 9.096 | 11.2 | 25.932 | 0.242 | |
| 3/27/2018 | 13:06 | 8.776 | 11.532 | 28.406 | 0.28 | |
| 3/27/2018 | 13:07 | 8.162 | 12.146 | 35.805 | 0.223 | |
| 3/27/2018 | 13:08 | 8.15 | 12.136 | 38.319 | 0.228 | |
| 3/27/2018 | 13:09 | 8.485 | 11.818 | 36.028 | 0.206 | |
| 3/27/2018 | 13:10 | 8.449 | 11.849 | 36.859 | 0.242 | |
| 3/27/2018 | 13:11 | 7.827 | 12.475 | 39.827 | 0.209 | |
| 3/27/2018 | 13:12 | 7.53 | 12.745 | 44.474 | 0.218 | |
| 3/27/2018 | 13:13 | 7.932 | 12.347 | 45.552 | 0.182 | |
| 3/27/2018 | 13:14 | 8.94 | 11.35 | 31.572 | 0.221 | |
| 3/27/2018 | 13:15 | 8.472 | 11.819 | 32.855 | 0.238 | |
| 3/27/2018 | 13:16 | 8.147 | 12.15 | 35.523 | 0.196 | |
| 3/27/2018 | 13:17 | 8.464 | 11.828 | 34.413 | 0.218 | |
| 3/27/2018 | 13:18 | 8.853 | 11.437 | 30.195 | 0.241 | |
| 3/27/2018 | 13:19 | 8.492 | 11.819 | 32.942 | 0.217 | |
| 3/27/2018 | 13:20 | 8.59 | 11.687 | 36.926 | 0.213 | |
| 3/27/2018 | 13:21 | 8.934 | 11.353 | 33.497 | 0.179 | |
| 3/27/2018 | 13:22 | 8.742 | 11.569 | 32.657 | 0.203 | |
| 3/27/2018 | 13:23 | 8.624 | 11.659 | 33.453 | 0.262 | |
| 3/27/2018 | 13:24 | 8.641 | 11.658 | 32.335 | 0.239 | |
| 3/27/2018 | 13:25 | 8.996 | 11.293 | 29.255 | 0.248 | |
| Run 4 Average | | 8.45 | 11.85 | 34.86 | 0.23 | |
| 3/27/2018 | 13:26 | 3.483 | 3.607 | 11.772 | 0.787 | |
| 3/27/2018 | 13:27 | 0.04 | 0.044 | 0.237 | 4.171 | |
| 3/27/2018 | 13:28 | 0.035 | 0.032 | 0.214 | 4.735 | CO Bias |
| 3/27/2018 | 13:29 | 0.035 | 0.028 | 26.68 | 4.118 | |
| 3/27/2018 | 13:30 | 0.035 | 0.024 | 48.66 | 0.675 | NOx Bias |
| 3/27/2018 | 13:31 | 6.943 | 7.14 | 20.484 | 0.189 | |
| 3/27/2018 | 13:32 | 10.815 | 10.801 | 0.264 | 0.03 | O2 CO2 Bias |

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|---|---|---|---|---|---|---|
| 3/27/2018 | 13:33 | 1.824 | 3.155 | 0.208 | 0.033 | |
| 3/27/2018 | 13:34 | 0.035 | 0.011 | 0.157 | -0.003 | Zero |
| 3/27/2018 | 13:35 | 7.763 | 8.578 | 36.968 | 1.05 | |
| 3/27/2018 | 13:36 | 10.864 | 10.86 | 48.912 | 4.423 | |
| 3/27/2018 | 13:37 | 10.865 | 10.862 | 48.905 | 4.707 | Span |
| 3/27/2018 | 13:38 | 9.182 | 11.454 | 35.453 | 3.55 | |
| 3/27/2018 | 13:39 | 8.839 | 11.488 | 30.027 | 0.394 | |
| 3/27/2018 | 13:40 | 9.347 | 10.982 | 27.198 | 0.204 | |
| 3/27/2018 | 13:41 | 9.057 | 11.276 | 25.961 | 0.237 | |
| 3/27/2018 | 13:42 | 9.06 | 11.269 | 26.889 | 0.303 | |
| 3/27/2018 | 13:43 | 9.115 | 11.221 | 27.223 | 0.331 | |
| 3/27/2018 | 13:44 | 8.556 | 11.789 | 31.85 | 0.334 | |
| 3/27/2018 | 13:45 | 7.474 | 12.852 | 41.103 | 0.348 | |
| 3/27/2018 | 13:46 | 7.626 | 12.699 | 47.346 | 0.392 | |
| 3/27/2018 | 13:47 | 7.932 | 12.369 | 48.978 | 0.403 | |
| 3/27/2018 | 13:48 | 7.867 | 12.454 | 46.158 | 0.442 | |
| 3/27/2018 | 13:49 | 7.799 | 12.504 | 48.56 | 0.45 | |
| 3/27/2018 | 13:50 | 8.186 | 12.127 | 40.909 | 0.497 | |
| 3/27/2018 | 13:51 | 7.908 | 12.395 | 40.952 | 0.506 | |
| 3/27/2018 | 13:52 | 8.615 | 11.675 | 32.446 | 0.522 | |
| 3/27/2018 | 13:53 | 7.95 | 12.37 | 34.306 | 0.579 | |
| 3/27/2018 | 13:54 | 7.835 | 12.466 | 36.448 | 0.648 | |
| 3/27/2018 | 13:55 | 7.962 | 12.355 | 37.468 | 0.625 | |
| 3/27/2018 | 13:56 | 8.106 | 12.188 | 35.966 | 0.632 | |
| 3/27/2018 | 13:57 | 7.832 | 12.492 | 32.602 | 0.651 | |
| 3/27/2018 | 13:58 | 8.284 | 11.997 | 32.826 | 0.691 | |
| 3/27/2018 | 13:59 | 9.252 | 11.042 | 24.17 | 0.67 | |
| 3/27/2018 | 14:00 | 8.874 | 11.441 | 22.556 | 0.643 | |
| 3/27/2018 | 14:01 | 8.115 | 12.202 | 31.936 | 0.666 | |
| 3/27/2018 | 14:02 | 8.014 | 12.317 | 32.635 | 0.667 | |
| 3/27/2018 | 14:03 | 7.711 | 12.603 | 35.964 | 0.69 | |
| 3/27/2018 | 14:04 | 8.501 | 11.794 | 32.404 | 0.683 | |
| 3/27/2018 | 14:05 | 7.677 | 12.625 | 41.823 | 0.682 | |
| 3/27/2018 | 14:06 | 8.243 | 12.053 | 33.777 | 0.713 | |
| 3/27/2018 | 14:07 | 8.304 | 11.999 | 30.287 | 0.668 | |
| 3/27/2018 | 14:08 | 7.655 | 12.672 | 34.657 | 0.672 | |
| 3/27/2018 | 14:09 | 7.641 | 12.647 | 39.835 | 0.695 | |
| Run 5 Average | | 8.22 | 12.10 | 35.17 | 0.54 | |
| 3/27/2018 | 14:10 | 5.933 | 7.421 | 24.997 | 0.742 | |
| 3/27/2018 | 14:11 | 0.049 | 0.055 | 0.284 | 3.404 | |
| 3/27/2018 | 14:12 | 0.035 | 0.036 | 0.24 | 4.734 | |
| 3/27/2018 | 14:13 | 0.035 | 0.029 | 0.216 | 4.703 | CO Bias |
| 3/27/2018 | 14:14 | 0.035 | 0.026 | 32.663 | 3.691 | |
| 3/27/2018 | 14:15 | 0.035 | 0.022 | 48.683 | 0.485 | NOx Bias |
| 3/27/2018 | 14:16 | 6.418 | 6.678 | 22.896 | 0.154 | |
| 3/27/2018 | 14:17 | 10.765 | 10.77 | 0.276 | 0.014 | O2 CO2 Bias |
| 3/27/2018 | 14:18 | 2.406 | 1.678 | 0.202 | 0.018 | |
| 3/27/2018 | 14:19 | 0.035 | 0.009 | 0.164 | 0.012 | Zero |
| 3/27/2018 | 14:20 | 9.444 | 9.238 | 34.837 | 0.677 | |
| 3/27/2018 | 14:21 | 10.816 | 10.832 | 48.975 | 4.255 | |
| 3/27/2018 | 14:22 | 10.813 | 10.841 | 48.992 | 4.708 | Span |

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|---|---|---|---|---|---|---|
| 3/27/2018 | 14:23 | 14.483 | 14.169 | 69.863 | 5.095 | |
| 3/27/2018 | 14:24 | 19.445 | 18.099 | 93.151 | 9.009 | |
| 3/27/2018 | 14:25 | 19.381 | 18.088 | 93.115 | 9.552 | High |
| 3/27/2018 | 14:26 | 19.372 | 18.096 | 92.599 | 9.44 | |

| Date | Time | O2 % | CO2 % | NOx ppm | CO ppm | |
|---|---|---|---|---|---|---|
| 3/28/2018 | 7:17 | 19.582 | 18.501 | 92.712 | 9.517 | |
| 3/28/2018 | 7:18 | 19.582 | 18.495 | 92.752 | 9.566 | |
| 3/28/2018 | 7:19 | 19.598 | 18.492 | 92.777 | 9.564 | |
| 3/28/2018 | 7:20 | 19.607 | 18.484 | 92.821 | 9.559 | High |
| 3/28/2018 | 7:21 | 13.136 | 12.492 | 55.857 | 8.76 | |
| 3/28/2018 | 7:22 | 10.867 | 10.962 | 48.496 | 5.303 | |
| 3/28/2018 | 7:23 | 10.867 | 10.955 | 48.581 | 4.668 | |
| 3/28/2018 | 7:24 | 10.867 | 10.953 | 48.633 | 4.705 | |
| 3/28/2018 | 7:25 | 10.867 | 10.948 | 48.653 | 4.696 | Mid |
| 3/28/2018 | 7:26 | 10.867 | 10.945 | 48.343 | 4.711 | |
| 3/28/2018 | 7:27 | 1.358 | 0.734 | 2.351 | 3.314 | |
| 3/28/2018 | 7:28 | 0.039 | 0.018 | 0.137 | 0.307 | |
| 3/28/2018 | 7:29 | 0.035 | 0.015 | 0.107 | 0.016 | Zero |
| 3/28/2018 | 7:30 | 0.035 | 0.013 | 0.116 | -0.003 | NO Mode Zero |
| 3/28/2018 | 7:31 | 0.035 | 0.012 | 14.341 | 0.009 | |
| 3/28/2018 | 7:32 | 0.035 | 0.012 | 93.047 | 0.017 | NO Mode High |
| 3/28/2018 | 7:33 | 0.035 | 0.011 | 41.844 | 0.004 | |
| 3/28/2018 | 7:34 | 0.035 | 0.01 | 0.188 | 0.009 | |
| 3/28/2018 | 7:35 | 0.035 | 0.011 | 0.165 | -0.01 | NO2 Gas NO Mode |
| 3/28/2018 | 7:36 | 0.035 | 0.009 | 38.045 | 0.004 | |
| 3/28/2018 | 7:37 | 0.035 | 0.008 | 43.11 | 0.021 | NO2 Gas NOx Mode |
| 3/28/2018 | 7:38 | 0.035 | 0.01 | 8.863 | 0.013 | |
| 3/28/2018 | 7:39 | 0.035 | 0.009 | 0.235 | 0.009 | |
| 3/28/2018 | 7:40 | 5.212 | 2.395 | 3.394 | 0.013 | |
| 3/28/2018 | 7:41 | 8.23 | 12.18 | 32.402 | 0.11 | |
| 3/28/2018 | 7:42 | 8.752 | 11.648 | 29.063 | 0.155 | |
| 3/28/2018 | 7:43 | 8.458 | 11.957 | 31.554 | 0.152 | |
| 3/28/2018 | 7:44 | 7.279 | 13.144 | 42.57 | 0.132 | |
| 3/28/2018 | 7:45 | 8.1 | 12.305 | 41.923 | 0.142 | |
| 3/28/2018 | 7:46 | 8.687 | 11.714 | 34.918 | 0.115 | |
| 3/28/2018 | 7:47 | 3.674 | 3.542 | 11.77 | 0.362 | |
| 3/28/2018 | 7:48 | 0.043 | 0.023 | 0.287 | 3.228 | |
| 3/28/2018 | 7:49 | 0.036 | 0.023 | 0.254 | 4.683 | |
| 3/28/2018 | 7:50 | 0.036 | 0.019 | 0.248 | 4.725 | CO Bias |
| 3/28/2018 | 7:51 | 0.036 | 0.017 | 25.56 | 4.402 | |
| 3/28/2018 | 7:52 | 0.036 | 0.016 | 48.473 | 1.415 | NOx Bias |
| 3/28/2018 | 7:53 | 3.69 | 3.824 | 36.204 | 0.349 | |
| 3/28/2018 | 7:54 | 10.816 | 10.856 | 0.328 | 0.085 | |
| 3/28/2018 | 7:55 | 10.817 | 10.87 | 0.234 | 0.034 | |
| 3/28/2018 | 7:56 | 10.817 | 10.88 | 0.218 | 0.042 | O2 CO2 Bias |
| 3/28/2018 | 7:57 | 9.492 | 11.682 | 14.269 | 0.046 | |
| 3/28/2018 | 7:58 | 7.969 | 12.444 | 39.838 | 0.104 | |
| 3/28/2018 | 7:59 | 8.253 | 12.155 | 37.883 | 0.102 | |
| 3/28/2018 | 8:00 | 8.004 | 12.417 | 35.501 | 0.093 | |

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|---|---|---|---|---|---|---|
| 3/28/2018 | 8:01 | 8.509 | 11.905 | 30.287 | 0.106 | |
| 3/28/2018 | 8:02 | 8.805 | 11.596 | 27.079 | 0.142 | |
| 3/28/2018 | 8:03 | 8.429 | 11.992 | 33.345 | 0.17 | |
| 3/28/2018 | 8:04 | 7.785 | 12.63 | 36.236 | 0.16 | |
| 3/28/2018 | 8:05 | 8.124 | 12.275 | 38.136 | 0.151 | |
| 3/28/2018 | 8:06 | 8.592 | 11.81 | 32.832 | 0.144 | |
| 3/28/2018 | 8:07 | 8.52 | 11.885 | 32.311 | 0.13 | |
| 3/28/2018 | 8:08 | 8.24 | 12.171 | 33.69 | 0.14 | |
| 3/28/2018 | 8:09 | 9.08 | 11.313 | 28.479 | 0.156 | |
| 3/28/2018 | 8:10 | 8.769 | 11.65 | 27.526 | 0.172 | |
| 3/28/2018 | 8:11 | 8.407 | 12.006 | 34.174 | 0.169 | |
| 3/28/2018 | 8:12 | 8.755 | 11.647 | 31.18 | 0.158 | |
| 3/28/2018 | 8:13 | 8.867 | 11.537 | 31.405 | 0.168 | |
| 3/28/2018 | 8:14 | 8.28 | 12.141 | 38.58 | 0.179 | |
| 3/28/2018 | 8:15 | 8.007 | 12.421 | 36.704 | 0.182 | |
| 3/28/2018 | 8:16 | 8.553 | 11.848 | 33.003 | 0.171 | |
| 3/28/2018 | 8:17 | 8.25 | 12.173 | 34.072 | 0.172 | |
| 3/28/2018 | 8:18 | 7.947 | 12.485 | 40.6 | 0.183 | |
| 3/28/2018 | 8:19 | 8.849 | 11.562 | 33.927 | 0.181 | |
| 3/28/2018 | 8:20 | 7.962 | 12.485 | 37.218 | 0.16 | |
| 3/28/2018 | 8:21 | 8.275 | 12.153 | 34.477 | 0.187 | |
| 3/28/2018 | 8:22 | 7.692 | 12.748 | 41.564 | 0.165 | |
| 3/28/2018 | 8:23 | 7.98 | 12.453 | 39.909 | 0.178 | |
| 3/28/2018 | 8:24 | 8.44 | 11.988 | 35.732 | 0.16 | |
| 3/28/2018 | 8:25 | 8.876 | 11.558 | 29.294 | 0.167 | |
| 3/28/2018 | 8:26 | 8.802 | 11.635 | 27.718 | 0.213 | |
| 3/28/2018 | 8:27 | 8.312 | 12.125 | 30.525 | 0.212 | |
| 3/28/2018 | 8:28 | 8.529 | 11.891 | 30.966 | 0.199 | |
| 3/28/2018 | 8:29 | 8.798 | 11.629 | 30.537 | 0.181 | |
| 3/28/2018 | 8:30 | 8.742 | 11.676 | 29.653 | 0.191 | |
| 3/28/2018 | 8:31 | 8.626 | 11.797 | 29.308 | 0.184 | |
| Run 6 Average | | 8.44 | 11.98 | 33.34 | 0.17 | |
| 3/28/2018 | 8:32 | 9.042 | 10.441 | 24.282 | 0.209 | |
| 3/28/2018 | 8:33 | 8.838 | 11.547 | 25.226 | 0.304 | |
| 3/28/2018 | 8:34 | 1.522 | 1.615 | 6.033 | 1.269 | |
| 3/28/2018 | 8:35 | 0.037 | 0.036 | 0.207 | 4.437 | |
| 3/28/2018 | 8:36 | 0.036 | 0.029 | 0.188 | 4.662 | CO Bias |
| 3/28/2018 | 8:37 | 0.037 | 0.025 | 32.039 | 3.7 | |
| 3/28/2018 | 8:38 | 0.036 | 0.024 | 48.493 | 0.513 | NOx Bias |
| 3/28/2018 | 8:39 | 8.514 | 8.678 | 14.34 | 0.206 | |
| 3/28/2018 | 8:40 | 10.792 | 10.874 | 0.209 | -0.011 | O2 CO2 Bias |
| 3/28/2018 | 8:41 | 0.946 | 0.997 | 0.169 | 0.007 | |
| 3/28/2018 | 8:42 | 0.036 | 0.013 | 0.122 | 0.018 | Zero |
| 3/28/2018 | 8:43 | 8.592 | 9.33 | 40.84 | 1.577 | |
| 3/28/2018 | 8:44 | 10.842 | 10.94 | 48.727 | 4.56 | |
| 3/28/2018 | 8:45 | 10.842 | 10.941 | 48.747 | 4.695 | Span |
| 3/28/2018 | 8:46 | 8.798 | 12.01 | 35.541 | 2.891 | |
| 3/28/2018 | 8:47 | 8.593 | 11.855 | 28.514 | 0.251 | |
| 3/28/2018 | 8:48 | 7.849 | 12.584 | 36.924 | 0.17 | |
| 3/28/2018 | 8:49 | 7.978 | 12.468 | 36.943 | 0.181 | |
| 3/28/2018 | 8:50 | 7.478 | 12.967 | 44.647 | 0.187 | |

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|---|---|---|---|---|---|---|
| 3/28/2018 | 8:51 | 8.405 | 12.017 | 37.839 | 0.16 | |
| 3/28/2018 | 8:52 | 8.739 | 11.72 | 29.016 | 0.189 | |
| 3/28/2018 | 8:53 | 8.374 | 12.094 | 29.596 | 0.229 | |
| 3/28/2018 | 8:54 | 8.112 | 12.362 | 32.998 | 0.208 | |
| 3/28/2018 | 8:55 | 8.01 | 12.468 | 35.722 | 0.177 | |
| 3/28/2018 | 8:56 | 8.184 | 12.294 | 36.374 | 0.191 | |
| 3/28/2018 | 8:57 | 8.612 | 11.868 | 29.591 | 0.195 | |
| 3/28/2018 | 8:58 | 8.391 | 12.105 | 29.799 | 0.187 | |
| 3/28/2018 | 8:59 | 8.48 | 12.006 | 28.867 | 0.189 | |
| 3/28/2018 | 9:00 | 8.273 | 12.216 | 29.434 | 0.191 | |
| 3/28/2018 | 9:01 | 8.266 | 12.205 | 32.179 | 0.195 | |
| 3/28/2018 | 9:02 | 8.172 | 12.306 | 34.296 | 0.194 | |
| 3/28/2018 | 9:03 | 9.334 | 11.116 | 28.922 | 0.21 | |
| 3/28/2018 | 9:04 | 8.749 | 11.732 | 30.011 | 0.185 | |
| 3/28/2018 | 9:05 | 9.285 | 11.155 | 28.208 | 0.192 | |
| 3/28/2018 | 9:06 | 8.805 | 11.663 | 26.246 | 0.199 | |
| 3/28/2018 | 9:07 | 8.208 | 12.234 | 34.906 | 0.199 | |
| 3/28/2018 | 9:08 | 8.547 | 11.9 | 35.601 | 0.161 | |
| 3/28/2018 | 9:09 | 7.925 | 12.507 | 41.992 | 0.172 | |
| 3/28/2018 | 9:10 | 8.472 | 11.954 | 37.74 | 0.183 | |
| 3/28/2018 | 9:11 | 8.271 | 12.149 | 38.797 | 0.176 | |
| 3/28/2018 | 9:12 | 8.546 | 11.871 | 32.669 | 0.2 | |
| 3/28/2018 | 9:13 | 8.338 | 12.08 | 37.32 | 0.224 | |
| 3/28/2018 | 9:14 | 8.132 | 12.3 | 38.48 | 0.241 | |
| 3/28/2018 | 9:15 | 8.075 | 12.329 | 36.225 | 0.186 | |
| 3/28/2018 | 9:16 | 8.236 | 12.148 | 35.138 | 0.209 | |
| 3/28/2018 | 9:17 | 8.558 | 11.846 | 32.339 | 0.225 | |
| 3/28/2018 | 9:18 | 8.358 | 12.063 | 34.107 | 0.173 | |
| 3/28/2018 | 9:19 | 7.816 | 12.562 | 41.907 | 0.185 | |
| Run 7 Average | | 8.37 | 12.07 | 34.03 | 0.19 | |
| 3/28/2018 | 9:20 | 3.98 | 4.485 | 16.475 | 0.579 | |
| 3/28/2018 | 9:21 | 0.043 | 0.043 | 0.211 | 3.976 | |
| 3/28/2018 | 9:22 | 0.036 | 0.032 | 0.187 | 4.707 | CO Bias |
| 3/28/2018 | 9:23 | 0.035 | 0.026 | 22.419 | 4.358 | |
| 3/28/2018 | 9:24 | 0.035 | 0.022 | 48.536 | 0.887 | NOx Bias |
| 3/28/2018 | 9:25 | 8.146 | 8.351 | 15.167 | 0.126 | |
| 3/28/2018 | 9:26 | 10.842 | 10.828 | 0.198 | 0.004 | O2 CO2 Bias |
| 3/28/2018 | 9:27 | 0.753 | 0.726 | 0.159 | 0.02 | |
| 3/28/2018 | 9:28 | 0.035 | 0.01 | 0.128 | 0.026 | Zero |
| 3/28/2018 | 9:29 | 6.925 | 7.6 | 32.951 | 0.733 | |
| 3/28/2018 | 9:30 | 10.891 | 10.852 | 48.798 | 4.29 | |
| 3/28/2018 | 9:31 | 10.891 | 10.852 | 48.834 | 4.7 | Span |
| 3/28/2018 | 9:32 | 9.269 | 11.649 | 37.414 | 3.976 | |
| 3/28/2018 | 9:33 | 7.821 | 12.554 | 37.586 | 0.593 | |
| 3/28/2018 | 9:34 | 7.694 | 12.66 | 39.64 | 0.179 | |
| 3/28/2018 | 9:35 | 7.966 | 12.393 | 38.249 | 0.199 | |
| 3/28/2018 | 9:36 | 8.108 | 12.244 | 40.403 | 0.211 | |
| 3/28/2018 | 9:37 | 7.723 | 12.633 | 47.506 | 0.202 | |
| 3/28/2018 | 9:38 | 8.086 | 12.245 | 45.412 | 0.19 | |
| 3/28/2018 | 9:39 | 8.531 | 11.812 | 35.377 | 0.214 | |
| 3/28/2018 | 9:40 | 8.629 | 11.713 | 30.14 | 0.232 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3/28/2018 | 9:41 | 7.971 | 12.366 | 32.9 | 0.214 | |
| 3/28/2018 | 9:42 | 8.761 | 11.527 | 30.871 | 0.211 | |
| 3/28/2018 | 9:43 | 8.631 | 11.682 | 28.444 | 0.226 | |
| 3/28/2018 | 9:44 | 8.685 | 11.608 | 28.305 | 0.245 | |
| 3/28/2018 | 9:45 | 8.426 | 11.874 | 29.583 | 0.242 | |
| 3/28/2018 | 9:46 | 7.977 | 12.326 | 30.611 | 0.228 | |
| 3/28/2018 | 9:47 | 8.471 | 11.818 | 26.881 | 0.243 | |
| 3/28/2018 | 9:48 | 8.304 | 11.979 | 30.311 | 0.23 | |
| 3/28/2018 | 9:49 | 8.064 | 12.213 | 30.972 | 0.215 | |
| 3/28/2018 | 9:50 | 8.015 | 12.267 | 36.539 | 0.219 | |
| 3/28/2018 | 9:51 | 7.929 | 12.352 | 37.607 | 0.216 | |
| 3/28/2018 | 9:52 | 8.147 | 12.125 | 33.636 | 0.249 | |
| 3/28/2018 | 9:53 | 8.023 | 12.246 | 35.099 | 0.239 | |
| 3/28/2018 | 9:54 | 8.539 | 11.727 | 33.094 | 0.235 | |
| 3/28/2018 | 9:55 | 8.387 | 11.894 | 33.972 | 0.219 | |
| 3/28/2018 | 9:56 | 8.394 | 11.893 | 31.894 | 0.247 | |
| 3/28/2018 | 9:57 | 8.82 | 11.471 | 29.828 | 0.222 | |
| 3/28/2018 | 9:58 | 8.244 | 12.033 | 32.995 | 0.206 | |
| 3/28/2018 | 9:59 | 8.075 | 12.199 | 33.744 | 0.254 | |
| 3/28/2018 | 10:00 | 8.653 | 11.599 | 32.212 | 0.247 | |
| 3/28/2018 | 10:01 | 8.3 | 11.96 | 32.478 | 0.266 | |
| 3/28/2018 | 10:02 | 8.839 | 11.431 | 30.375 | 0.314 | |
| 3/28/2018 | 10:03 | 8.71 | 11.557 | 29.279 | 0.258 | |
| Run 8 Average | | 8.30 | 11.99 | 33.61 | 0.23 | |
| 3/28/2018 | 10:04 | 4.539 | 4.662 | 15.65 | 0.583 | |
| 3/28/2018 | 10:05 | 0.045 | 0.041 | 0.211 | 3.974 | |
| 3/28/2018 | 10:06 | 0.035 | 0.031 | 0.192 | 4.748 | CO Bias |
| 3/28/2018 | 10:07 | 0.035 | 0.025 | 31.082 | 3.836 | |
| 3/28/2018 | 10:08 | 0.035 | 0.024 | 48.461 | 0.391 | NOx Bias |
| 3/28/2018 | 10:09 | 5.799 | 6.023 | 24.921 | 0.042 | |
| 3/28/2018 | 10:10 | 10.814 | 10.788 | 0.229 | 0.026 | O2 CO2 Bias |
| 3/28/2018 | 10:11 | 1.842 | 0.996 | 0.175 | 0.039 | |
| 3/28/2018 | 10:12 | 0.035 | 0.012 | 0.127 | 0.038 | Zero |
| 3/28/2018 | 10:13 | 8.99 | 9.763 | 41.974 | 1.589 | |
| 3/28/2018 | 10:14 | 10.875 | 10.845 | 48.808 | 4.616 | |
| 3/28/2018 | 10:15 | 10.89 | 10.848 | 48.818 | 4.758 | Span |
| 3/28/2018 | 10:16 | 9.813 | 11.32 | 42.311 | 4.528 | |
| 3/28/2018 | 10:17 | 8.86 | 11.461 | 29.298 | 1.166 | |
| 3/28/2018 | 10:18 | 8.763 | 11.564 | 28.983 | 0.244 | |
| 3/28/2018 | 10:19 | 9.029 | 11.306 | 27.135 | 0.269 | |
| 3/28/2018 | 10:20 | 8.674 | 11.674 | 29.442 | 0.304 | |
| 3/28/2018 | 10:21 | 8.74 | 11.597 | 29.315 | 0.256 | |
| 3/28/2018 | 10:22 | 8.742 | 11.604 | 31.49 | 0.22 | |
| 3/28/2018 | 10:23 | 8.249 | 12.105 | 36.194 | 0.232 | |
| 3/28/2018 | 10:24 | 8.072 | 12.257 | 39.901 | 0.198 | |
| 3/28/2018 | 10:25 | 8.034 | 12.288 | 43.532 | 0.219 | |
| 3/28/2018 | 10:26 | 7.833 | 12.483 | 45.953 | 0.233 | |
| 3/28/2018 | 10:27 | 7.545 | 12.776 | 50.139 | 0.217 | |
| 3/28/2018 | 10:28 | 7.843 | 12.465 | 45.971 | 0.22 | |
| 3/28/2018 | 10:29 | 7.899 | 12.417 | 41.925 | 0.216 | |
| 3/28/2018 | 10:30 | 8.104 | 12.207 | 42.546 | 0.237 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3/28/2018 | 10:31 | 7.866 | 12.441 | 43.729 | 0.25 | |
| 3/28/2018 | 10:32 | 8.503 | 11.817 | 30.23 | 0.257 | |
| 3/28/2018 | 10:33 | 8.431 | 11.888 | 31.591 | 0.27 | |
| 3/28/2018 | 10:34 | 8.334 | 11.984 | 35.4 | 0.251 | |
| 3/28/2018 | 10:35 | 8.831 | 11.488 | 27.175 | 0.233 | |
| 3/28/2018 | 10:36 | 8.443 | 11.877 | 30.693 | 0.243 | |
| 3/28/2018 | 10:37 | 8.124 | 12.199 | 34.502 | 0.232 | |
| 3/28/2018 | 10:38 | 8.525 | 11.795 | 32.089 | 0.224 | |
| 3/28/2018 | 10:39 | 9.249 | 11.086 | 23.791 | 0.244 | |
| 3/28/2018 | 10:40 | 8.625 | 11.717 | 26.114 | 0.242 | |
| 3/28/2018 | 10:41 | 6.979 | 13.34 | 46.015 | 0.22 | |
| 3/28/2018 | 10:42 | 7.592 | 12.712 | 46.712 | 0.233 | |
| 3/28/2018 | 10:43 | 9.048 | 11.268 | 29.055 | 0.238 | |
| 3/28/2018 | 10:44 | 9.566 | 10.792 | 21.899 | 0.254 | |
| 3/28/2018 | 10:45 | 8.748 | 11.586 | 28.644 | 0.24 | |
| 3/28/2018 | 10:46 | 8.022 | 12.319 | 38.228 | 0.248 | |
| 3/28/2018 | 10:47 | 7.517 | 12.81 | 43.609 | 0.21 | |
| Run 9 Average | | 8.33 | 12.00 | 35.40 | 0.24 | |
| 3/28/2018 | 10:48 | 2.084 | 1.553 | 10.675 | 1.239 | |
| 3/28/2018 | 10:49 | 0.037 | 0.04 | 0.235 | 4.498 | |
| 3/28/2018 | 10:50 | 0.035 | 0.031 | 0.211 | 4.762 | CO Bias |
| 3/28/2018 | 10:51 | 0.035 | 0.029 | 0.189 | 4.752 | |
| 3/28/2018 | 10:52 | 0.035 | 0.024 | 27.25 | 4.053 | |
| 3/28/2018 | 10:53 | 0.035 | 0.023 | 48.552 | 0.653 | NOx Bias |
| 3/28/2018 | 10:54 | 7.363 | 7.495 | 19.473 | 0.184 | |
| 3/28/2018 | 10:55 | 10.842 | 10.805 | 0.214 | 0.046 | O2 CO2 Bias |
| 3/28/2018 | 10:56 | 1.096 | 1.064 | 0.17 | 0.026 | |
| 3/28/2018 | 10:57 | 0.035 | 0.012 | 0.116 | 0.014 | Zero |
| 3/28/2018 | 10:58 | 9.33 | 10.246 | 43.556 | 1.56 | |
| 3/28/2018 | 10:59 | 10.867 | 10.852 | 48.941 | 4.623 | |
| 3/28/2018 | 11:00 | 10.867 | 10.856 | 48.935 | 4.745 | Span |
| 3/28/2018 | 11:01 | 9.557 | 11.612 | 43.023 | 4.529 | |
| 3/28/2018 | 11:02 | 7.695 | 12.663 | 34.324 | 1.072 | |
| 3/28/2018 | 11:03 | 7.62 | 12.757 | 41.197 | 0.227 | |
| 3/28/2018 | 11:04 | 7.757 | 12.608 | 39.68 | 0.193 | |
| 3/28/2018 | 11:05 | 7.768 | 12.574 | 41.836 | 0.197 | |
| 3/28/2018 | 11:06 | 8.205 | 12.139 | 38.221 | 0.178 | |
| 3/28/2018 | 11:07 | 7.799 | 12.581 | 35.538 | 0.197 | |
| 3/28/2018 | 11:08 | 7.69 | 12.67 | 41.657 | 0.187 | |
| 3/28/2018 | 11:09 | 7.774 | 12.566 | 44.393 | 0.257 | |
| 3/28/2018 | 11:10 | 8.976 | 11.352 | 30.597 | 0.2 | |
| 3/28/2018 | 11:11 | 8.682 | 11.692 | 27.377 | 0.151 | |
| 3/28/2018 | 11:12 | 8.604 | 11.73 | 28.313 | 0.17 | |
| 3/28/2018 | 11:13 | 8.456 | 11.906 | 30.412 | 0.181 | |
| 3/28/2018 | 11:14 | 8.262 | 12.022 | 38.192 | 0.178 | |
| 3/28/2018 | 11:15 | 8.927 | 11.409 | 31.212 | 0.174 | |
| 3/28/2018 | 11:16 | 8.153 | 12.175 | 34.072 | 0.236 | |
| 3/28/2018 | 11:17 | 8.181 | 12.119 | 36.173 | 0.205 | |
| 3/28/2018 | 11:18 | 8.622 | 11.692 | 29.653 | 0.202 | |
| 3/28/2018 | 11:19 | 8.599 | 11.698 | 28.278 | 0.178 | |
| 3/28/2018 | 11:20 | 8.934 | 11.351 | 26.492 | 0.187 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3/28/2018 | 11:21 | 7.863 | 12.481 | 32.559 | 0.202 | |
| 3/28/2018 | 11:22 | 7.69 | 12.611 | 38.761 | 0.193 | |
| 3/28/2018 | 11:23 | 7.665 | 12.647 | 43.333 | 0.162 | |
| 3/28/2018 | 11:24 | 7.69 | 12.585 | 44.807 | 0.136 | |
| 3/28/2018 | 11:25 | 8.587 | 11.665 | 35.461 | 0.166 | |
| 3/28/2018 | 11:26 | 8.731 | 11.575 | 32.267 | 0.178 | |
| 3/28/2018 | 11:27 | 8.308 | 11.986 | 35.649 | 0.16 | |
| 3/28/2018 | 11:28 | 8.606 | 11.701 | 29.905 | 0.183 | |
| 3/28/2018 | 11:29 | 8.059 | 12.261 | 35.56 | 0.177 | |
| 3/28/2018 | 11:30 | 8.366 | 11.926 | 30.003 | 0.179 | |
| 3/28/2018 | 11:31 | 8.285 | 11.99 | 30.187 | 0.223 | |
| 3/28/2018 | 11:32 | 8.485 | 11.8 | 30.769 | 0.186 | |
| 3/28/2018 | 11:33 | 8.517 | 11.797 | 28.785 | 0.161 | |
| 3/28/2018 | 11:34 | 8.267 | 12.009 | 32.733 | 0.191 | |
| 3/28/2018 | 11:35 | 8.085 | 12.245 | 33.159 | 0.164 | |
| 3/28/2018 | 11:36 | 8.042 | 12.238 | 35.922 | 0.155 | |
| 3/28/2018 | 11:37 | 8.309 | 11.967 | 35.544 | 0.153 | |
| 3/28/2018 | 11:38 | 8.722 | 11.56 | 33.391 | 0.138 | |
| 3/28/2018 | 11:39 | 8.959 | 11.324 | 27.592 | 0.152 | |
| 3/28/2018 | 11:40 | 8.616 | 11.658 | 29.68 | 0.164 | |
| 3/28/2018 | 11:41 | 8.731 | 11.557 | 31.788 | 0.152 | |
| 3/28/2018 | 11:42 | 8.596 | 11.684 | 31.881 | 0.149 | |
| Run 10 Average | | 8.38 | 11.92 | 33.14 | 0.18 | |
| 3/28/2018 | 11:43 | 8.08 | 12.217 | 36.247 | 0.138 | |
| 3/28/2018 | 11:44 | 8.062 | 12.232 | 41.623 | 0.161 | |
| 3/28/2018 | 11:45 | 8.358 | 11.617 | 38.499 | 0.192 | |
| 3/28/2018 | 11:46 | 0.889 | 0.129 | 2.504 | 1.745 | |
| 3/28/2018 | 11:47 | 0.036 | 0.037 | 0.192 | 4.626 | |
| 3/28/2018 | 11:48 | 0.036 | 0.029 | 0.183 | 4.756 | CO Bias |
| 3/28/2018 | 11:49 | 0.036 | 0.025 | 33.431 | 3.718 | |
| 3/28/2018 | 11:50 | 0.036 | 0.022 | 48.601 | 0.285 | NOx Bias |
| 3/28/2018 | 11:51 | 5.924 | 6.23 | 24.404 | 0.039 | |
| 3/28/2018 | 11:52 | 10.767 | 10.78 | 0.22 | 0.024 | O2 CO2 Bias |
| 3/28/2018 | 11:53 | 1.093 | 1.213 | 0.168 | 0.022 | |
| 3/28/2018 | 11:54 | 0.036 | 0.011 | 0.135 | 0.036 | Zero |
| 3/28/2018 | 11:55 | 7.989 | 8.863 | 38.376 | 1.134 | |
| 3/28/2018 | 11:56 | 10.817 | 10.838 | 48.876 | 4.492 | |
| 3/28/2018 | 11:57 | 10.817 | 10.838 | 48.93 | 4.73 | Span |
| 3/28/2018 | 11:58 | 14.839 | 14.465 | 71.323 | 5.03 | |
| 3/28/2018 | 11:59 | 19.53 | 18.264 | 93.093 | 8.175 | |
| 3/28/2018 | 12:00 | 19.512 | 18.261 | 93.077 | 9.561 | |
| 3/28/2018 | 12:01 | 19.506 | 18.274 | 93.073 | 9.59 | High |

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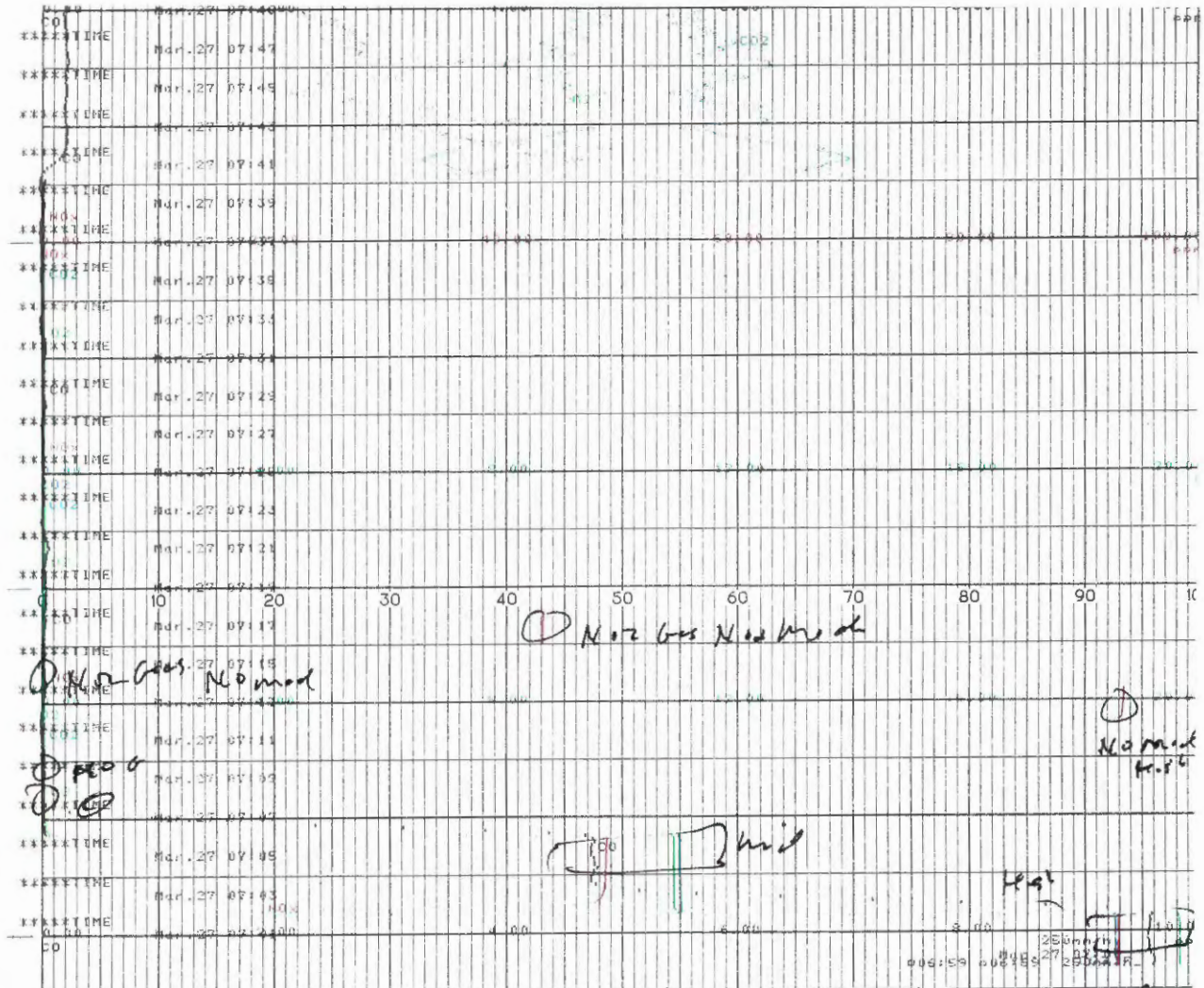
# APPENDIX A.2.3

# UNIT 2 INSTRUMENT STRIP CHARTS



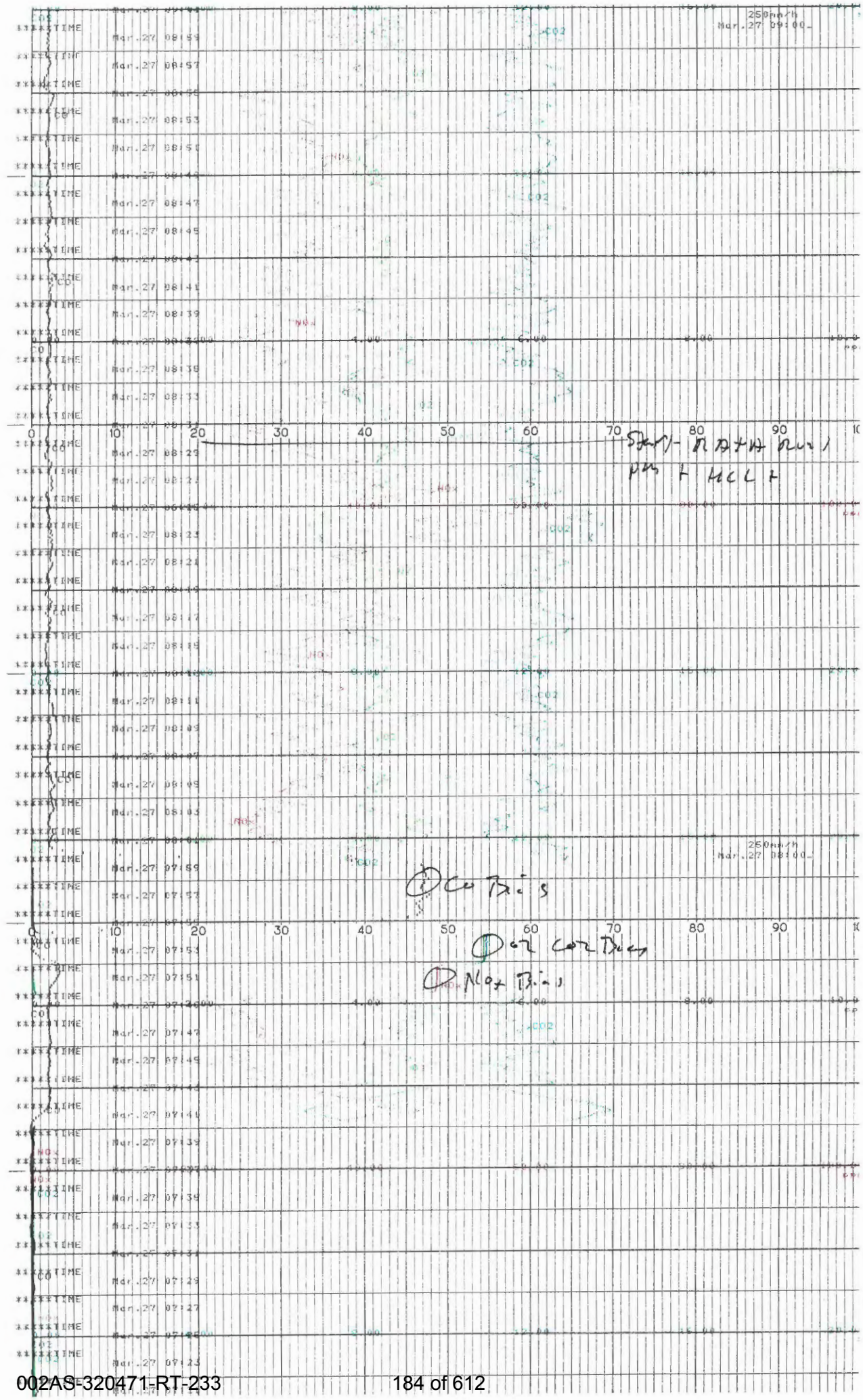

Desert View Power Unit 2 RATA + Compliance Tester Dave Wood
Patrick Whitman
Jason Sever

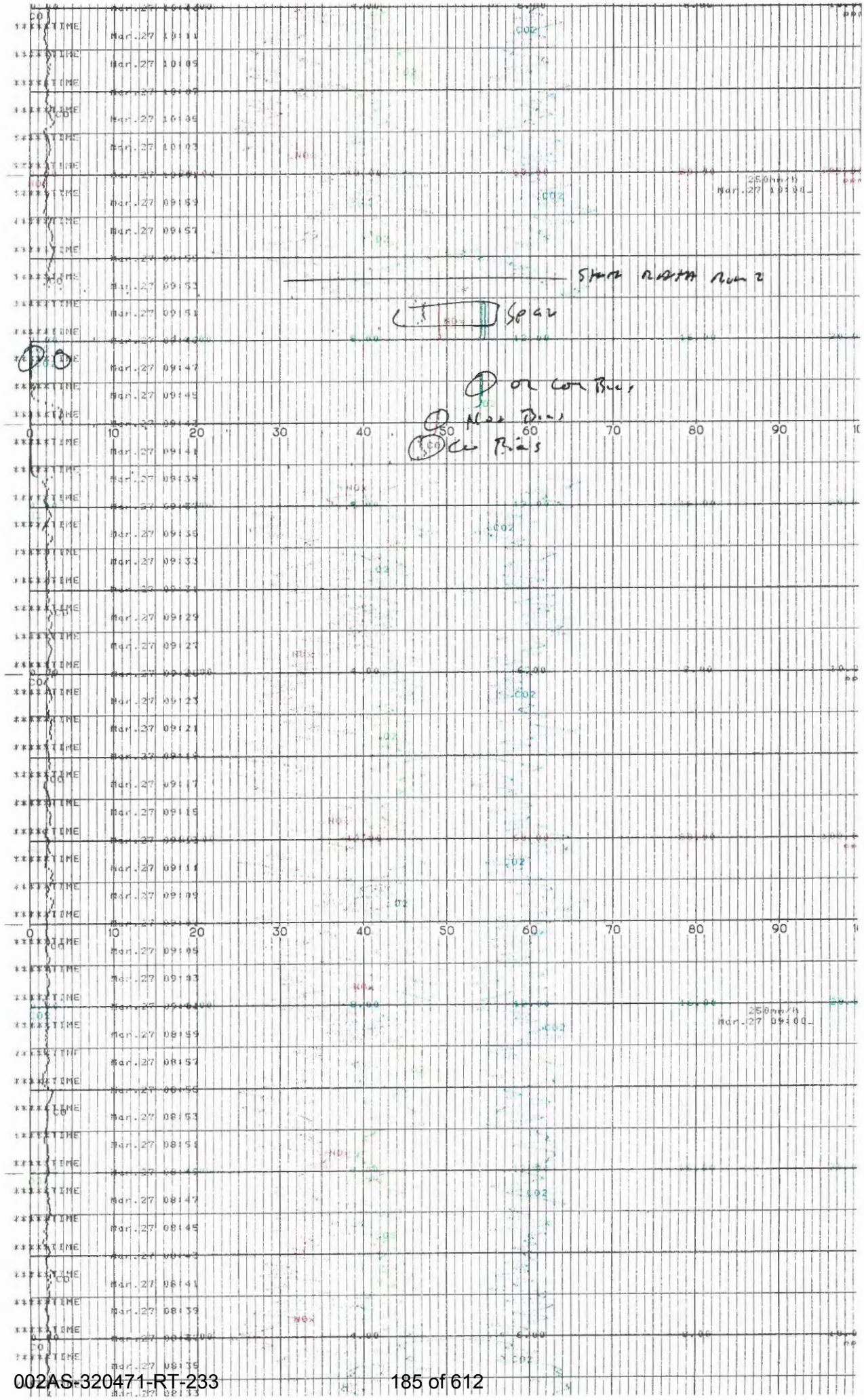
O2 - 0-20% CO2 0-20% NOx 0-100ppm CO - 0-10ppm

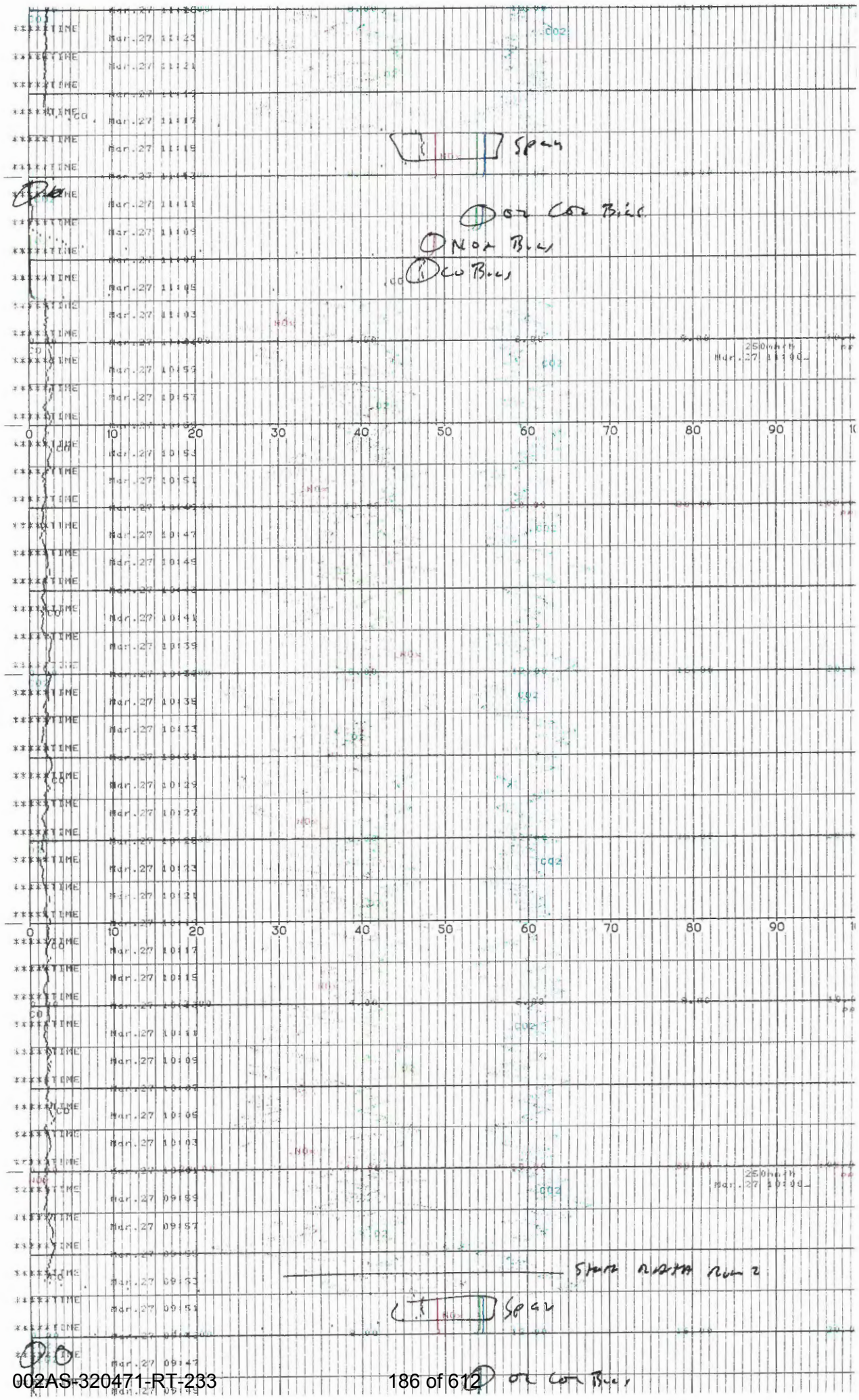
O2 10.81 } ED0002353 NOx 48.4 CC314675 CO - 4.68 ED0055148
CO2 - 11.04 } NOx 92.7 CC28878 CO - 9.55 - CC751444

O2 - 19.59 - CC171976 NO2 - 44.5 CC3516
CO2 - 18.46

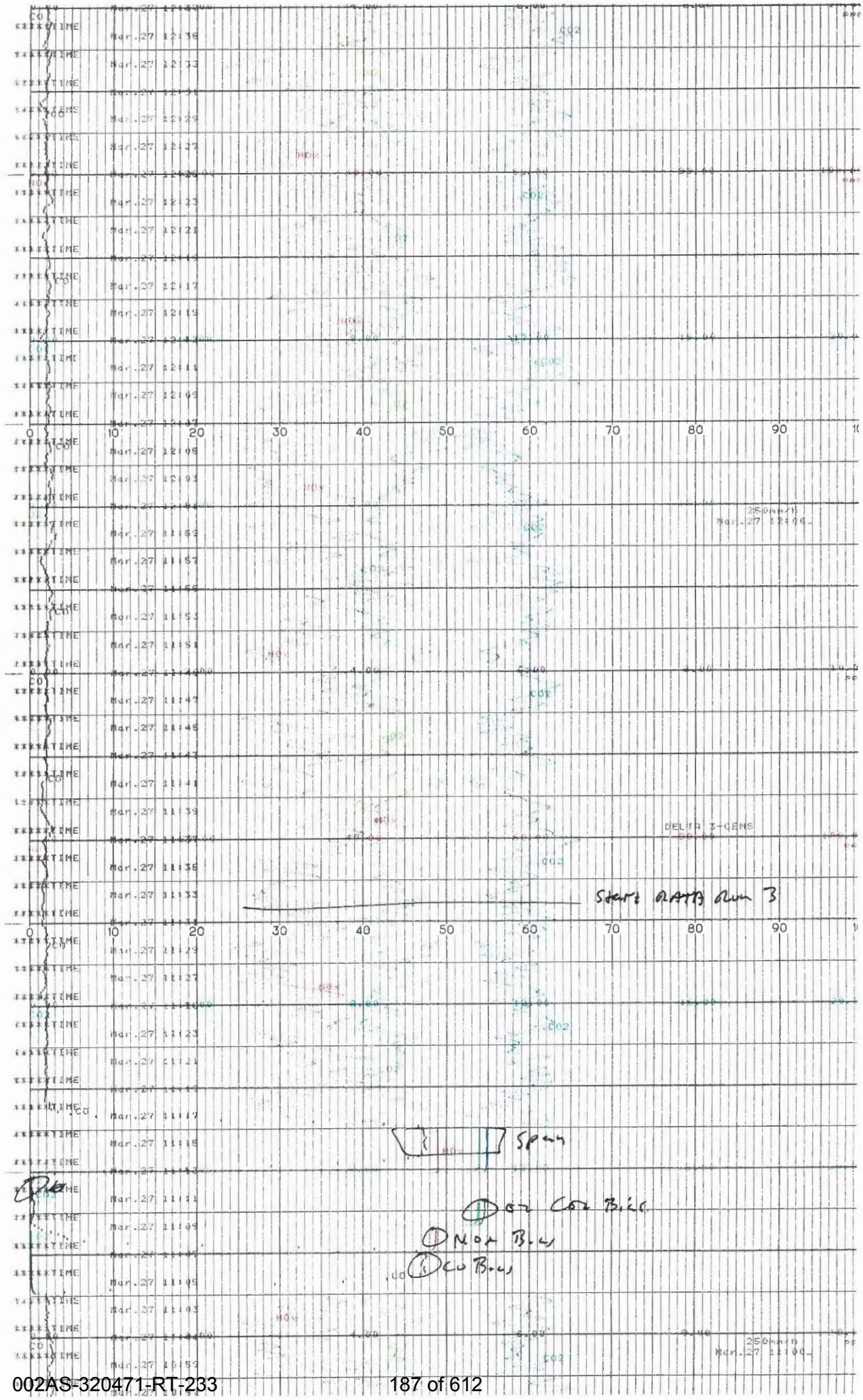
0 10 20 30 40 50 60 70 80 90

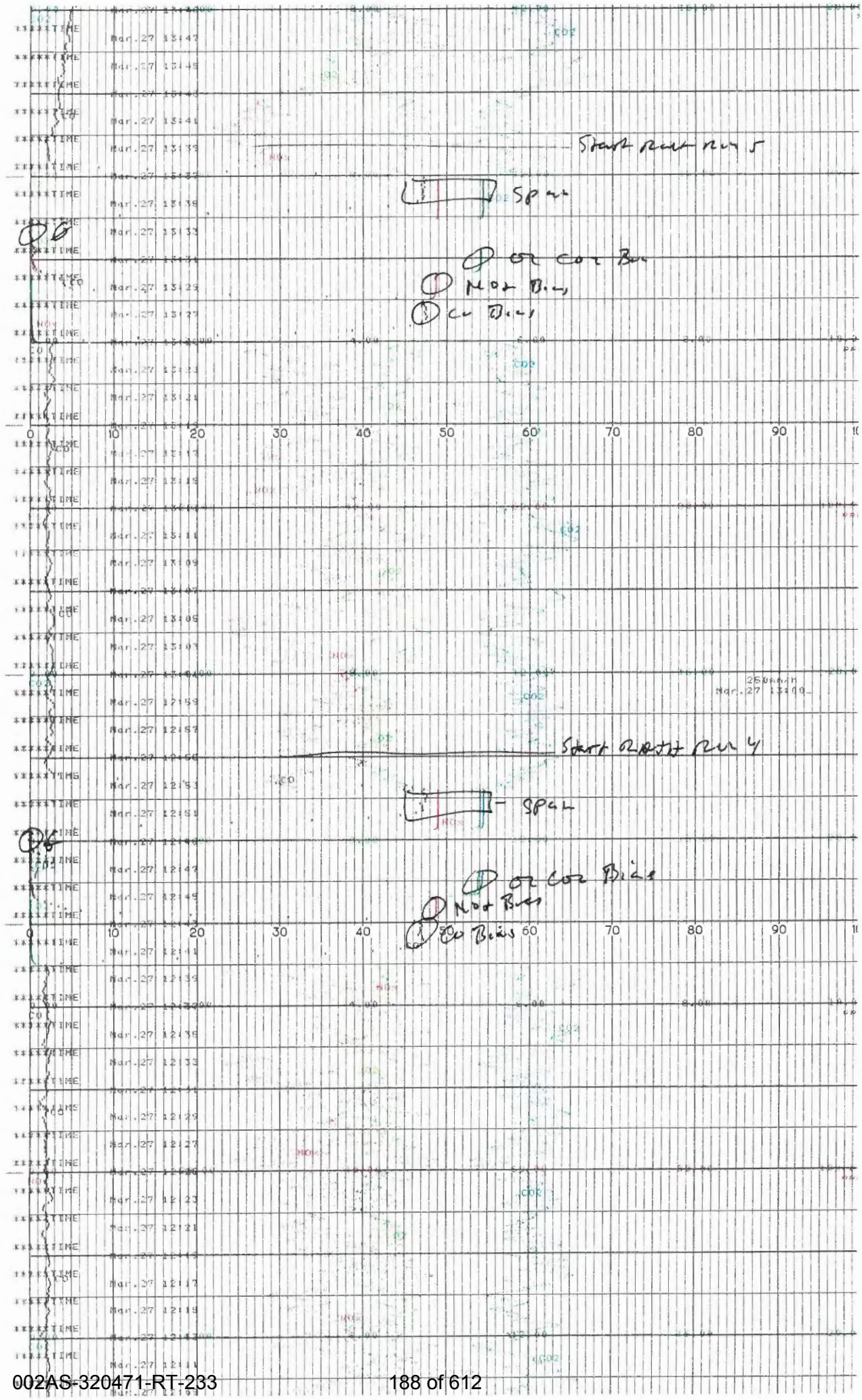

250mm/h
Mar.27 09:00
Mar.27 08:59
Mar.27 08:57
Mar.27 08:53
Mar.27 08:51
Mar.27 08:47
Mar.27 08:45
Mar.27 08:41
Mar.27 08:39
Mar.27 08:35
Mar.27 08:33
Mar.27 08:29
Mar.27 08:23
Mar.27 08:21
Mar.27 08:17
Mar.27 08:15
Mar.27 08:11
Mar.27 08:09
Mar.27 08:05
Mar.27 08:03
Mar.27 07:59
Mar.27 07:57
Mar.27 07:53
Mar.27 07:51
Mar.27 07:47
Mar.27 07:45
Mar.27 07:41
Mar.27 07:39
Mar.27 07:35
Mar.27 07:33
Mar.27 07:29
Mar.27 07:27
Mar.27 07:23
0 10 20 30 40 50 60 70 80 90
Start - RATA Run 1
pm + HCL +
CO Bias
or CO2 Bias
NOx Bias

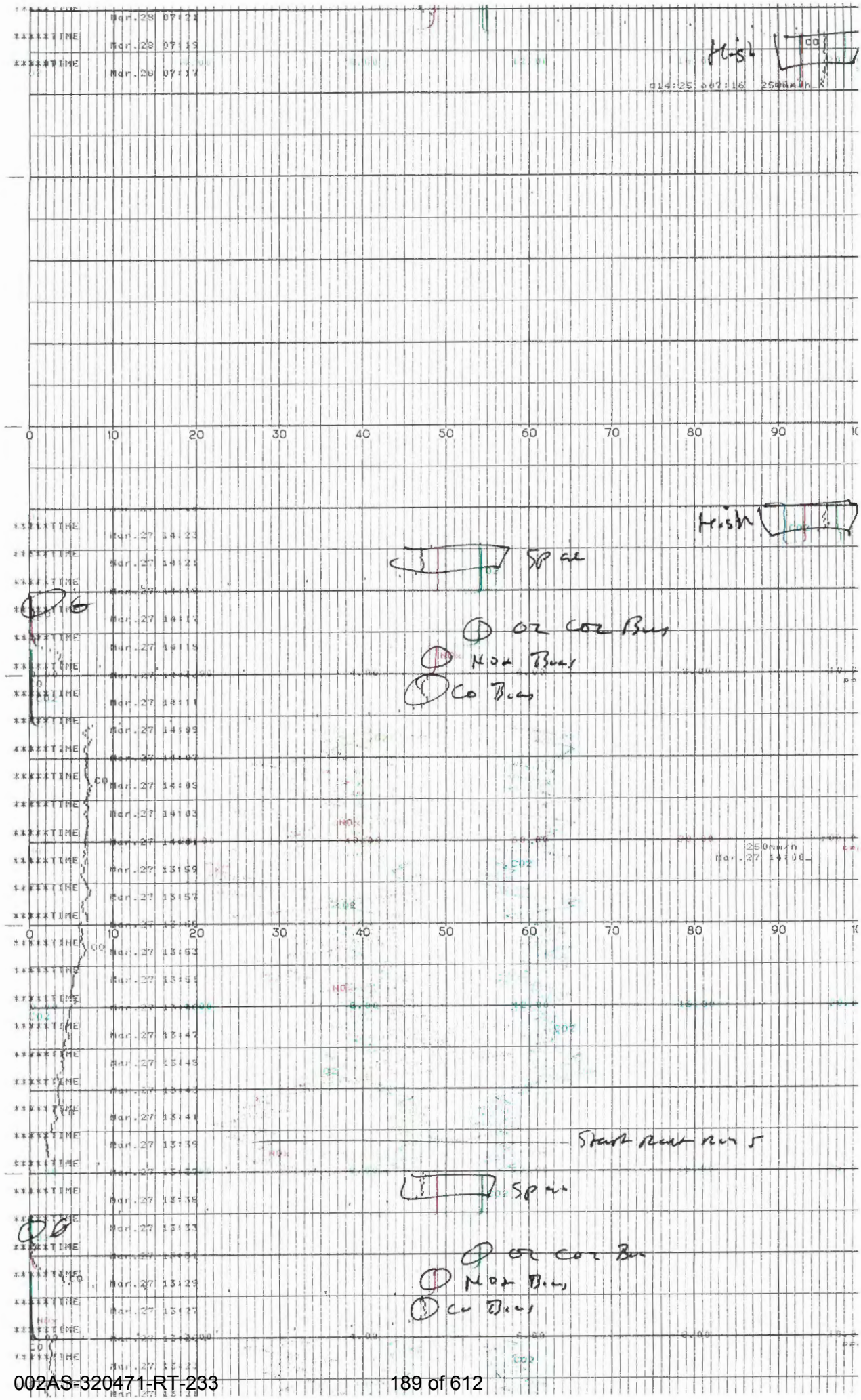

Start Data Run 2
Span
Or Con Bias
Nox Bias
Co Bias
250mm/h
Mar.27 10:00
Mar.27 09:00
Mar.27 08:59
Mar.27 08:57
Mar.27 08:53
Mar.27 08:51
Mar.27 08:47
Mar.27 08:45
Mar.27 08:41
Mar.27 08:39
Mar.27 08:35
Mar.27 08:33
Mar.27 09:59
Mar.27 09:57
Mar.27 09:53
Mar.27 09:51
Mar.27 09:47
Mar.27 09:45
Mar.27 09:41
Mar.27 09:39
Mar.27 09:36
Mar.27 09:33
Mar.27 09:29
Mar.27 09:27
Mar.27 09:23
Mar.27 09:21
Mar.27 09:17
Mar.27 09:15
Mar.27 09:11
Mar.27 09:09
Mar.27 09:05
Mar.27 09:03
0
10
20
30
40
50
60
70
80
90



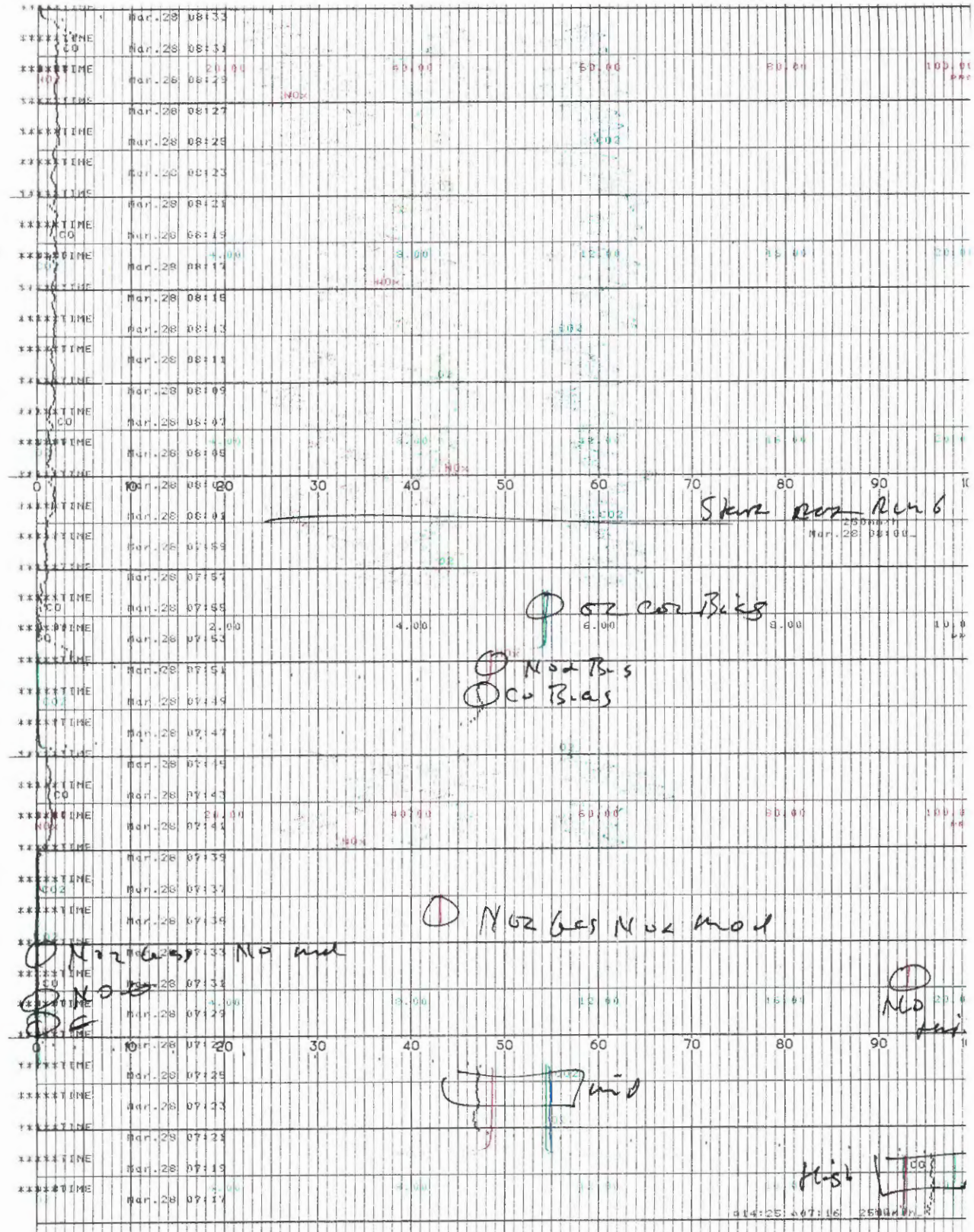
Span
O2 Cal Bias
NOx Bias
CO Bias
Span
Start Data Run 2
O2 Cal Bias

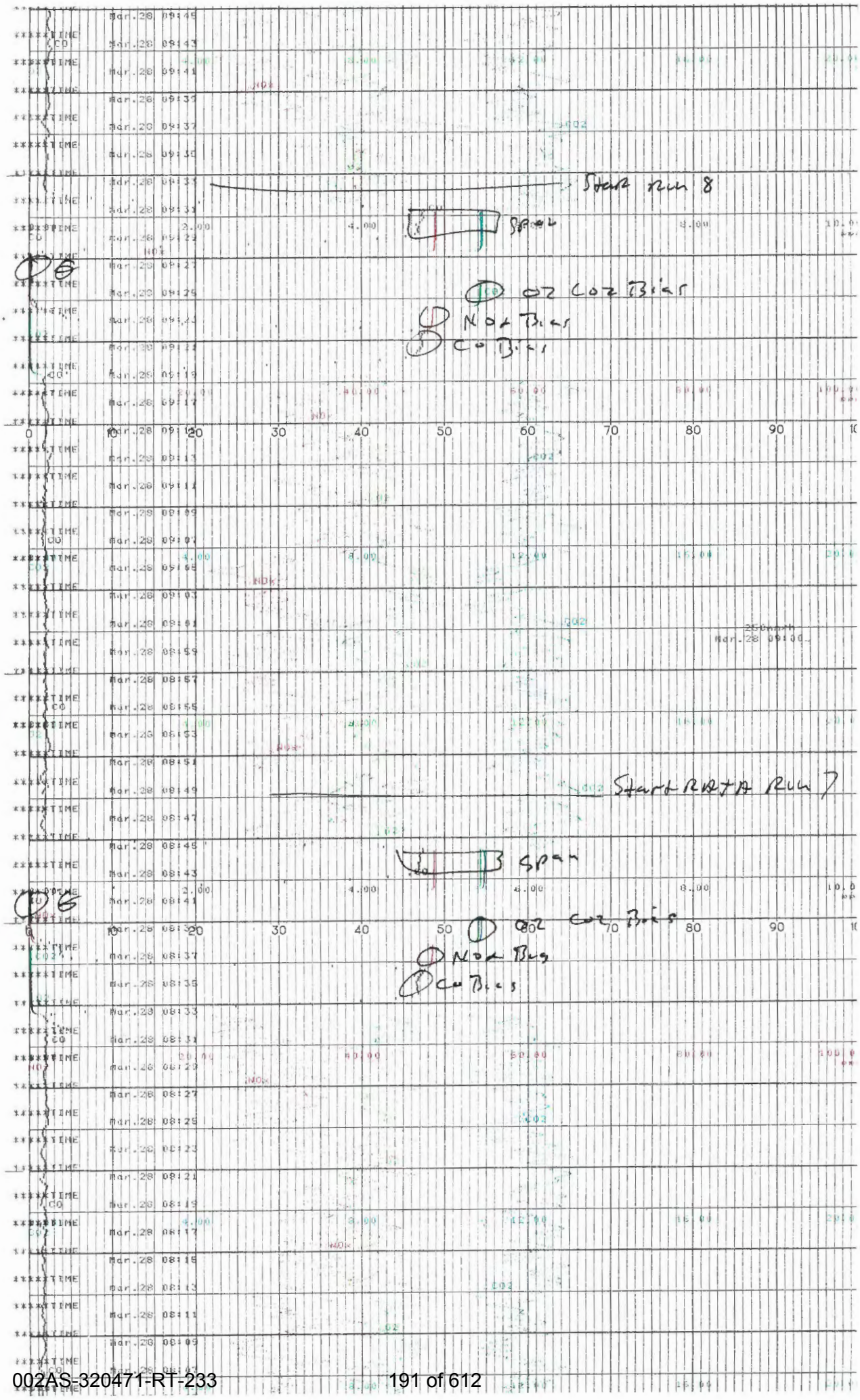

TIME INTVL 1
Mar.27 12:39
Mar.27 12:33
Mar.27 12:29
Mar.27 12:27
Mar.27 12:23
Mar.27 12:21
Mar.27 12:17
Mar.27 12:15
Mar.27 12:11
Mar.27 12:09
0 10 20 30 40 50 60 70 80 90
Mar.27 12:05
Mar.27 12:03
Mar.27 11:59
Mar.27 11:57
Mar.27 11:53
Mar.27 11:51
Mar.27 11:47
Mar.27 11:45
Mar.27 11:41
Mar.27 11:39
DELTA I-GENS
Mar.27 11:35
Mar.27 11:33
Start data run 3
0 10 20 30 40 50 60 70 80 90
Mar.27 11:29
Mar.27 11:27
Mar.27 11:23
Mar.27 11:17
Mar.27 11:15
Spray
Mar.27 11:11
Mar.27 11:09
Mar.27 11:05
Mar.27 11:03
Mar.27 10:59

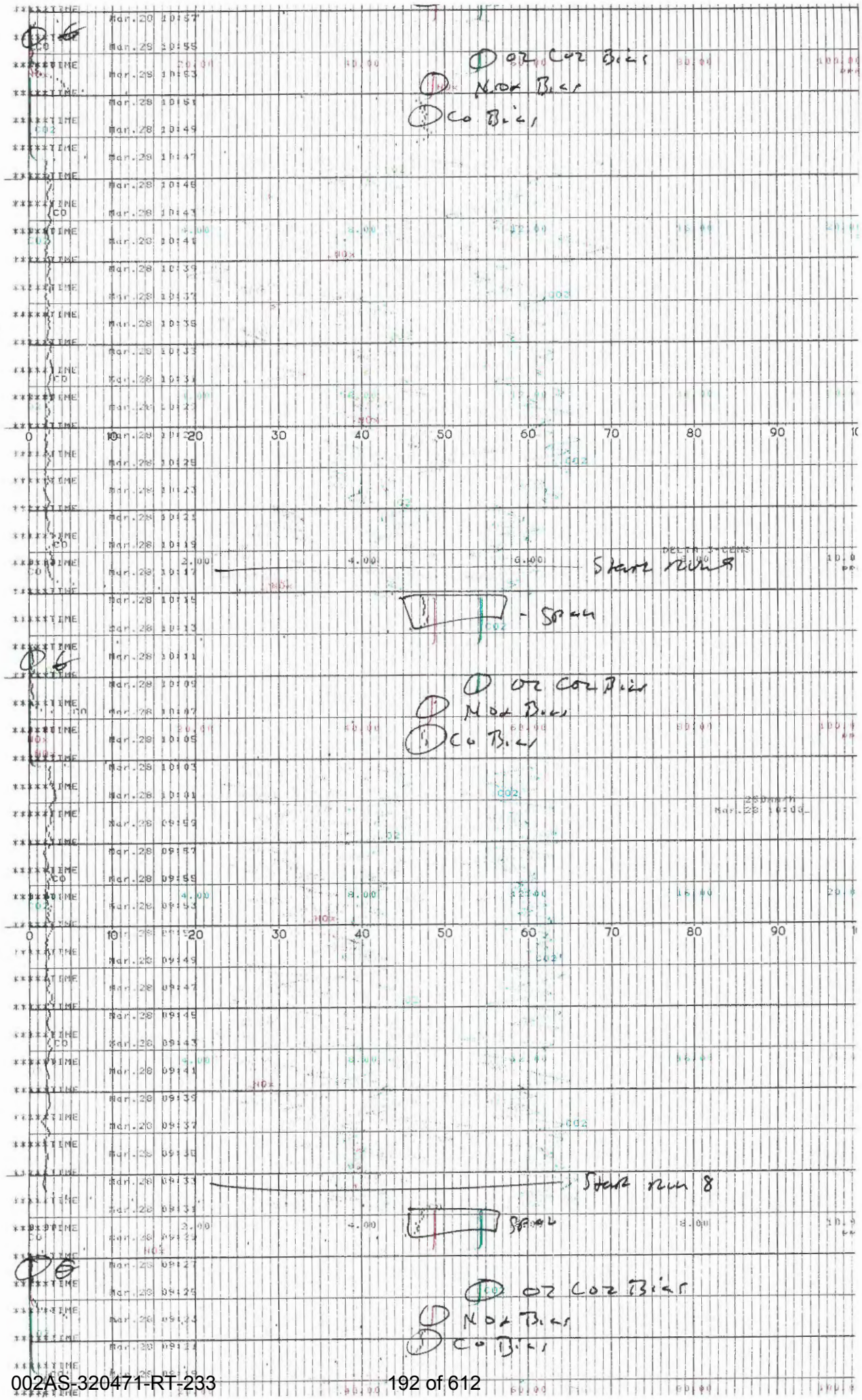

Start Rath Run 5
Span
O2 CO2 Bias
NOx Bias
CO Bias
Start Rath Run 4
Span
O2 CO2 Bias
NOx Bias
CO Bias
0
10
20
30
40
50
60
70
80
90



Mar.28 07:21
Mar.28 07:19
Mar.28 07:17
High
0 10 20 30 40 50 60 70 80 90
Mar.27 14:23
Mar.27 14:21
Mar.27 14:17
Mar.27 14:15
Mar.27 14:11
Mar.27 14:09
Mar.27 14:05
Mar.27 14:03
Mar.27 13:59
Mar.27 13:57
Mar.27 13:53
Mar.27 13:51
Mar.27 13:47
Mar.27 13:45
Mar.27 13:41
Mar.27 13:39
Mar.27 13:38
Mar.27 13:33
Mar.27 13:29
Mar.27 13:27
Mar.27 13:23
Mar.27 13:21
High
Spare
O2 CO2 Bias
NOx Bias
CO Bias
Start Rack Run 5
Spare
O2 CO2 Bias
NOx Bias
CO Bias


Start Run 6
O2 CO2 Bias
NO2 Bias
CO Bias
NO2 Gas NO2 Mod
NO2 Gas NO mod
NO
mid
High


Start Run 8
Span
O2 Co2 Bias
NOx Bias
CO Bias
Start RATA Run 7
Span
O2 Co2 Bias
NOx Bias
CO Bias



TIME INTVL 1
Mar.28 10:57
Mar.28 10:55
Mar.28 10:53
Mar.28 10:51
Mar.28 10:49
Mar.28 10:47
Mar.28 10:45
Mar.28 10:43
Mar.28 10:41
Mar.28 10:39
Mar.28 10:37
Mar.28 10:35
Mar.28 10:33
Mar.28 10:31
Mar.28 10:29
Mar.28 10:27
Mar.28 10:25
Mar.28 10:23
Mar.28 10:21
Mar.28 10:19
Mar.28 10:17
Mar.28 10:15
Mar.28 10:13
Mar.28 10:11
Mar.28 10:09
Mar.28 10:07
Mar.28 10:05
Mar.28 10:03
Mar.28 10:01
Mar.28 09:59
Mar.28 09:57
Mar.28 09:55
Mar.28 09:53
Mar.28 09:49
Mar.28 09:47
Mar.28 09:45
Mar.28 09:43
Mar.28 09:41
Mar.28 09:39
Mar.28 09:37
Mar.28 09:35
Mar.28 09:33
Mar.28 09:31
Mar.28 09:29
Mar.28 09:27
Mar.28 09:25
Mar.28 09:23
Mar.28 09:21
Mar.28 09:19
0 10 20 30 40 50 60 70 80 90
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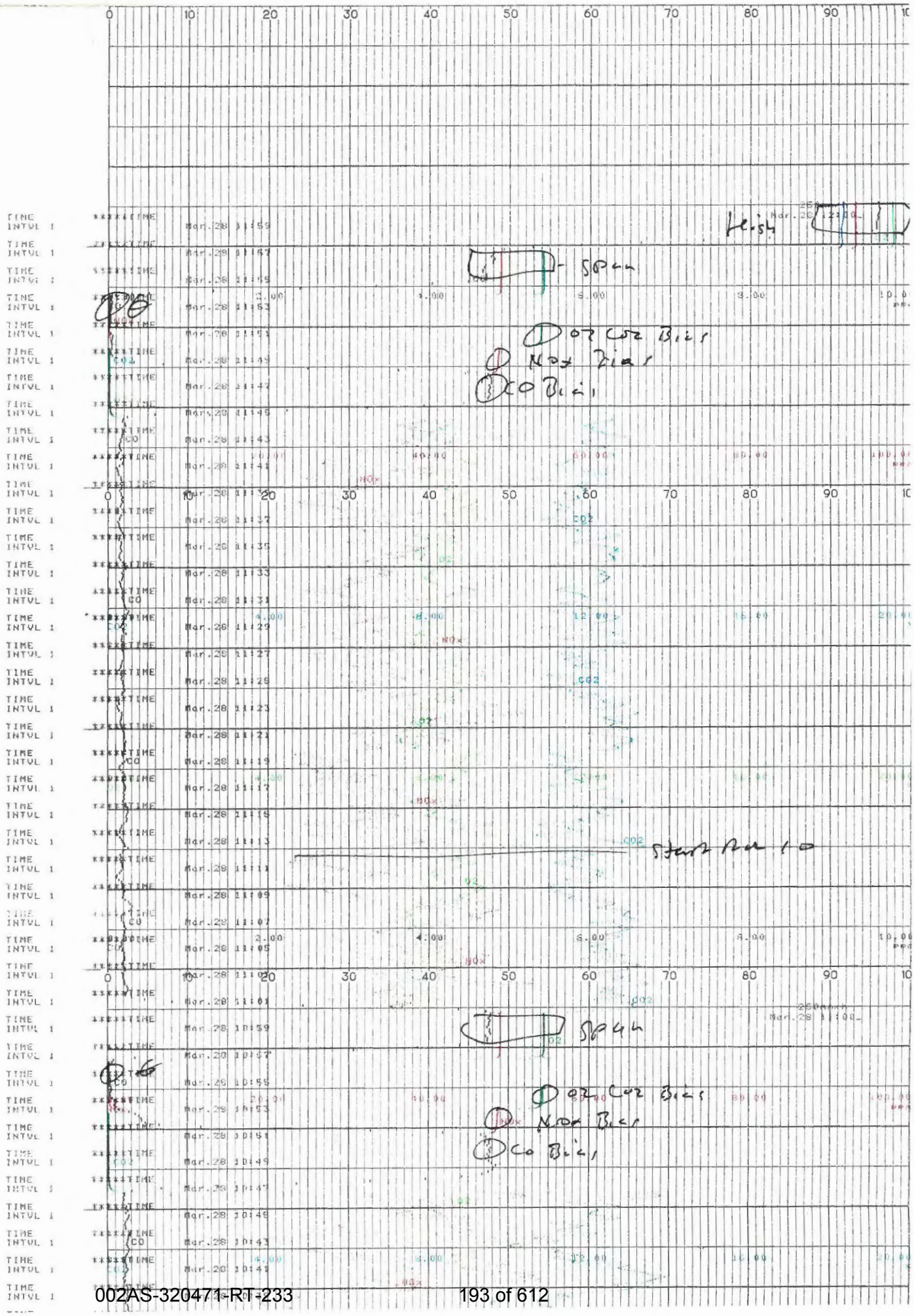
- Span
Start run 8
Span



Mar.28 11:59
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Mar.28 11:05
Mar.28 11:01
Mar.28 10:59
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Mar.28 10:55
Mar.28 10:53
Mar.28 10:51
Mar.28 10:49
Mar.28 10:47
Mar.28 10:45
Mar.28 10:43
Mar.28 10:41
Mar.28 12:00
Mar.28 11:00
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NOx Bias
CO Bias

# APPENDIX A.2.4

# UNIT 2 HYDROGEN CHLORIDE DATA

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3-27-2018
RUN NO: 1-HCL-U2
OPERATOR: Patrick Whitman
METER BOX NO: 30-WCS
METER ΔH@: 1.737
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: 499.8/500
~~+72~~ 1.85

AMBIENT TEMPERATURE: 70
BAROMETRIC PRESSURE: 30.19
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 110 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 196 SS
NOZZLE DIAMETER: 0.237
FILTER NO/TYPE: quartz
PRE-TEST LEAK RATE: : 0.001 CFM@ 12 in. Hg.
POST-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
PITOT LEAK CHECK - PRE: Good POST: _____
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | 0.1N H2SO4 | 928.7 | 712.9 | |
| 2 | 0.1N H2SO4 | 822.4 | 738.9 | |
| 3 | Empty | 676.4 | 673.6 | |
| 4 | Silica gel | 967.6 | 940.4 | |
| | | | | |
| | Rinse | | 50 | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0830 | 539.500 | .99 | 1.7 | 348 | 255 | 259 | 55 | 70 | 70 | 4" | | |
| 4 | 0834 | 542.233 | .98 | 1.7 | 346 | 257 | 253 | 54 | 71 | 70 | 4" | | |
| 3 | 0838 | 545.135 | 1.2 | 2.1 | 345 | 256 | 255 | 55 | 71 | 70 | 5" | | |
| 2 | 0842 | 548.310 | 1.1 | 1.9 | 346 | 255 | 252 | 54 | 72 | 70 | 5" | | |
| 1 | 0846 | 551.375 | 1.0 | 1.7 | 348 | 255 | 253 | 55 | 72 | 71 | 5" | | |
| E | 0850 | 554.230 | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 5 | 854 | 554.230 | 1.3 | 2.2 | 348 | 256 | 257 | 54 | 72 | 70 | 5" | | |
| 4 | 0858 | 557.625 | 1.0 | 1.7 | 347 | 258 | 253 | 55 | 71 | 71 | 5" | | |
| 3 | 0902 | 560.545 | .58 | 1.0 | 346 | 257 | 252 | 56 | 72 | 71 | 5" | | |
| 2 | 0906 | 562.830 | .65 | 1.2 | 346 | 252 | 253 | 57 | 72 | 70 | 5" | | |
| 1 | 0910 | 564.583 | .63 | 1.2 | 346 | 252 | 253 | 57 | 72 | 70 | 5" | | |
| E | 0914 | 567.450 | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Average: | | | | | | | | | | | | | |

Comments: _____

DS834049

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3-27-2018
RUN NO: 1-HCL-U2
OPERATOR: Patrick Whitman
METER BOX NO: 30-WCS
METER ΔH@: 1.737
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: _____
Silica Gel Expanded, Y/N: _____
Filter Condition after Test: _____
Check Weight: _____
~~+85~~ to 2.0

AMBIENT TEMPERATURE: 70°F
BAROMETRIC PRESSURE: 30.16
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 110 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 196 SS
NOZZLE DIAMETER: 0.237
FILTER NO/TYPE: quartz
PRE-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
POST-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
PITOT LEAK CHECK - PRE: _____ POST: _____
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | = Difference |
|---|---|---|---|---|
| 1 | 0.1N H2SO4 | | | |
| 2 | 0.1N H2SO4 | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | Rinse | | 50 | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0919 | 567.450 | .83 | 1.5 | 345 | 251 | 256 | 57 | 72 | 70 | 4" | | -.73 |
| 4 | 0923 | 570.000 | .85 | 1.6 | 345 | 255 | 252 | 56 | 72 | 70 | 4" | | |
| 3 | 0927 | 572.750 | .91 | 1.7 | 348 | 254 | 256 | 55 | 72 | 71 | 4" | | |
| 2 | 0931 | 575.530 | .93 | 1.7 | 345 | 255 | 257 | 56 | 73 | 74 | 4" | | |
| 1 | 0935 | 578.310 | .90 | 1.6 | 349 | 257 | 252 | 56 | 73 | 75 | 4 | | |
| E | 0939 | 581.565 | | | | | | | | | | | |
| 5 | 0954 | 581.565 | 1.1 | 2.1 | 347 | 256 | 256 | 57 | 74 | 75 | 4" | | |
| 4 | 0958 | 584.340 | 1.0 | 1.8 | 348 | 256 | 257 | 56 | 73 | 76 | 4" | | |
| 3 | 1002 | 587.585 | .95 | 1.8 | 347 | 255 | 258 | 55 | 73 | 74 | 4" | | |
| 2 | 1006 | 590.470 | .75 | 1.4 | 348 | 256 | 257 | 54 | 72 | 75 | 4" | | |
| 1 | 1010 | 593.145 | .73 | 1.4 | 349 | 256 | 253 | 52 | 73 | 76 | 4" | | |
| E | 1014 | 595.871 | | | | | | | | | | | |
| 5 | 1019 | 595.871 | 1.1 | 2.1 | 348 | 257 | 258 | 53 | 73 | 75 | 5" | | |
| 4 | 1023 | 598.950 | 1.0 | 1.9 | 349 | 258 | 256 | 55 | 74 | 76 | 5" | | |
| 3 | 1027 | 602.125 | 1.3 | 2.5 | 348 | 256 | 257 | 56 | 74 | 75 | 6" | | |
| 2 | 1031 | 605.570 | 1.3 | 2.8 | 349 | 255 | 258 | 54 | 75 | 77 | 6" | | |
| 1 | 1035 | 609.325 | 1.0 | 2.0 | 348 | 256 | 255 | 56 | 73 | 76 | 5" | | |
| Average | 1039 | 612.866 | | | | | | | | | | | |

Comments: _____

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3-27-2018
RUN NO: 1-HCL-U2
OPERATOR: Patrick Whitman
METER BOX NO: 30-WCS
METER ΔH@: 1.737
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: _____
Silica Gel Expanded, Y/N: _____
Filter Condition after Test: _____
Check Weight: 2.0

AMBIENT TEMPERATURE: 72°F
BAROMETRIC PRESSURE: 30.14
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 110 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 196 SS
NOZZLE DIAMETER: 0.239
FILTER NO/TYPE: quartz
PRE-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
POST-TEST LEAK RATE: 0.000 CFM@ 18 in. Hg.
PITOT LEAK CHECK - PRE: _____ POST: Good
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | 0.1N H2SO4 | | | |
| 2 | 0.1N H2SO4 | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | Rinse | | 50 | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1044 | 612.868 | 1.4 | 2.8 | 345 | 256 | 255 | 57 | 73 | 72 | 6 | | |
| 4 | 1048 | 616.797 | 1.2 | 2.4 | 347 | 253 | 254 | 56 | 73 | 75 | 6 | | |
| 3 | 1052 | 620.235 | 1.3 | 2.6 | 345 | 255 | 257 | 59 | 74 | 75 | 6 | | |
| 2 | 1056 | 623.740 | 1.0 | 2.0 | 349 | 253 | 258 | 59 | 75 | 77 | 6 | | |
| 1 | 1100 | 626.926 | .96 | 1.9 | 348 | 256 | 257 | 58 | 75 | 77 | 5 | | |
| E | 1104 | 630.165 | | | | | | | | | | | |
| | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | |
| Average: | | | | | | | | | | | | | |

Comments: _____

DS834049

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3-27-2018
RUN NO: 2-HCL-U2
OPERATOR: Patrick Whitman
METER BOX NO: 30-WCS
METER ΔH@: 1.737
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: N
Filter Condition after Test: ok
Check Weight: 499.8 / 500

AMBIENT TEMPERATURE: 75°F
BAROMETRIC PRESSURE: 32.19
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 110 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 196 SS
NOZZLE DIAMETER: 0.237
FILTER NO/TYPE: quartz
PRE-TEST LEAK RATE: : 0.005 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
PITOT LEAK CHECK - PRE: Good POST: Good
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | = Difference |
|---|---|---|---|---|
| 1 | 0.1N H2SO4 | 626.7 | 668.2 | |
| 2 | 0.1N H2SO4 | 835.9 | 789.9 | |
| 3 | Empty | 487.5 | 484.8 | |
| 4 | Silica gel | 1038.4 | 1043.7 | |
| | | | | |
| | Rinse | | 50 | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1132 | 631.005 | 1.2 | 2.4 | 348 | 252 | 255 | 56 | 76 | 78 | 5 | | |
| 4 | 1136 | 634.335 | 1.1 | 2.2 | 348 | 253 | 253 | 57 | 77 | 78 | 5 | | |
| 3 | 1140 | 637.620 | 1.5 | 3.0 | 347 | 256 | 250 | 56 | 78 | 80 | 6 | | 0.73 |
| 2 | 1144 | 642.530 | 1.3 | 2.6 | 348 | 255 | 252 | 55 | 79 | 81 | 6 | | |
| 1 | 1148 | 645.050 | 1.1 | 2.2 | 348 | 256 | 251 | 54 | 80 | 82 | 5 | | |
| E | 1152 | 648.505 | | | | | | | | | | | |
| 5 | 1156 | 648.505 | 1.4 | 2.8 | 348 | 255 | 250 | 54 | 81 | 82 | 7 | | |
| 4 | 1200 | 652.150 | 1.0 | 2.0 | 349 | 256 | 251 | 55 | 80 | 83 | 6 | | |
| 3 | 1204 | 655.425 | 1.2 | 2.4 | 348 | 257 | 253 | 56 | 82 | 86 | 6 | | |
| 2 | 1208 | 658.950 | .74 | 1.5 | 349 | 256 | 257 | 55 | 83 | 86 | 5 | | |
| 1 | 1212 | 661.515 | .66 | 1.4 | 348 | 257 | 253 | 56 | 84 | 87 | 5 | | |
| E | 1216 | 664.193 | | | | | | | | | | | |
| 5 | 1220 | 664.193 | .87 | 1.7 | 348 | 257 | 255 | 57 | 83 | 85 | 5 | | |
| 4 | 1224 | 667.125 | .95 | 1.9 | 350 | 254 | 256 | 56 | 84 | 87 | 6 | | |
| 3 | 1228 | 670.210 | .89 | 1.8 | 351 | 257 | 258 | 55 | 85 | 88 | 5 | | |
| 2 | 1232 | 673.165 | .80 | 1.6 | 350 | 256 | 251 | 55 | 85 | 89 | 5 | | |
| 1 | 1236 | 676.140 | .75 | 1.5 | 351 | 257 | 253 | 57 | 86 | 88 | 5 | | |
| Average | 1240 | 678.824 | | | | | | | | | | | |

Comments: _____

DS834049

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3-27-2018
RUN NO: 2-HCL-U2
OPERATOR: Patrick Whitman
METER BOX NO: 30-WCS
METER ΔH@: 1.737
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: _____
Silica Gel Expanded, Y/N: _____
Filter Condition after Test: _____
Check Weight: _____

AMBIENT TEMPERATURE: 80°F
BAROMETRIC PRESSURE: 30.15
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 110 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 196 SS
NOZZLE DIAMETER: 0.237
FILTER NO/TYPE: quartz
PRE-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
POST-TEST LEAK RATE: : 0.005 CFM@ 18 in. Hg.
PITOT LEAK CHECK - PRE: _____ POST: _____
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | 0.1N H2SO4 | | | |
| 2 | 0.1N H2SO4 | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | Rinse | | 50 | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1255 | 678.824 | 1.2 | 2.4 | 351 | 255 | 252 | 57 | 84 | 83 | 6 | | |
| 4 | 1259 | 682.150 | 1.4 | 2.8 | 350 | 256 | 255 | 55 | 83 | 85 | 7 | | |
| 3 | 1303 | 685.750 | 1.0 | ~~2.0~~ 1.8 | 351 | 255 | 254 | 56 | 85 | 87 | 6 | | |
| 2 | 1307 | 688.985 | .82 | 1.5 | 350 | 254 | 259 | 55 | 86 | 88 | 6 | | |
| 1 | 1311 | 691.870 | .78 | 1.4 | 351 | 255 | 257 | 56 | 87 | 88 | 6 | | |
| E | 1315 | 694.728 | | | | | | | | | | | |
| 5 | 1319 | 694.728 | 1.3 | 2.3 | 351 | 256 | 255 | 55 | 87 | 88 | 6 | | |
| 4 | 1323 | 697.015 | 1.2 | 2.2 | 350 | 257 | 254 | 56 | 88 | 89 | 6 | | |
| 3 | 1327 | 700.930 | 1.3 | 2.3 | 352 | 255 | 251 | 55 | 89 | 90 | 6 | | |
| 2 | 1331 | 703.635 | 1.4 | 2.5 | 353 | 256 | 252 | 56 | 90 | 92 | 6 | | |
| 1 | 1335 | 707.115 | 1.0 | 1.8 | 354 | 254 | 259 | 55 | 90 | 92 | 6 | | |
| E | 1339 | 710.134 | | | | | | | | | | | |
| 5 | 1344 | 710.134 | 1.4 | 2.5 | 354 | 256 | 253 | 56 | 89 | 90 | 6 | | |
| 4 | 1348 | 713.82 | 1.3 | 2.3 | 356 | 257 | 254 | 57 | 90 | 91 | 6 | | |
| 3 | 1352 | 717.275 | 1.3 | 2.3 | 357 | 256 | 252 | 58 | 90 | 93 | 6 | | |
| 2 | 1356 | 720.635 | 1.1 | 2.0 | 355 | 254 | 257 | 57 | 91 | 94 | 6 | | |
| 1 | 1400 | 723.840 | 1.0 | 1.8 | 356 | 253 | 251 | 58 | 92 | 95 | 6 | | |
| Average | 1404 | 726.874 | | | | | | | | | | | |

Comments: _____

MONTROSE

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3-28-2018
RUN NO: 3-HCL-U2
OPERATOR: Patrick Whitman
METER BOX NO: 30-WCS
METER ΔH@: 1.737
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: 497+500 1.8

AMBIENT TEMPERATURE: 70°F
BAROMETRIC PRESSURE: 30.16
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 110 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 196 SS
NOZZLE DIAMETER: 0.239
FILTER NO/TYPE: quartz
PRE-TEST LEAK RATE: : 0.005 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: : ✓ CFM@ _____ in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: _____
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | O.1N H2SO4 | ~~950.0~~ 948.8 | 724.5 | |
| 2 | O.1N H2SO4 | 843.4 | 751.4 | |
| 3 | Empty | 674.8 | 673.8 | |
| 4 | Silica gel | 987.5 | 967.6 | |
| | | | | |
| | Rinse | | 50 | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0801 | 727.800 | 1.2 | 2.1 | 346 | 257 | 255 | 57 | 63 | 64 | 5" | | +.75 |
| 4 | 0805 | 730.975 | 1.1 | 2.0 | 345 | 258 | 256 | 55 | 64 | 65 | 5" | | |
| 3 | 0809 | 734.130 | 1.4 | 2.5 | 346 | 257 | 258 | 54 | 64 | 65 | 5" | | |
| 2 | 0813 | 737.845 | 1.3 | 2.3 | 348 | 255 | 253 | 53 | 64 | 66 | 5" | | |
| 1 | 0817 | 741.010 | 1.1 | 2.0 | 345 | 258 | 252 | 54 | 64 | 67 | 5" | | |
| E | 0821 | 744.132 | | | | | | | | | | | |
| 5 | 0825 | 744.132 | 1.3 | 2.3 | 346 | 257 | 253 | 55 | 64 | 65 | 5" | | |
| 4 | 0829 | 747.515 | 1.0 | 1.8 | 345 | 256 | 255 | 54 | 63 | 65 | 5" | | |
| 3 | 0833 | 750.340 | 1.2 | 2.2 | 347 | 257 | 252 | 54 | 63 | 66 | 5" | | |
| 2 | 0837 | 753.765 | .74 | 1.3 | 346 | 255 | 255 | 54 | 64 | 66 | 5" | | |
| 1 | 0841 | 756.370 | .73 | 1.3 | 347 | 256 | 258 | 55 | 64 | 67 | 5" | | |
| E | 0845 | 758.997 | | | | | | | | | | | |
| 5 | 0849 | 758.997 | .93 | 1.7 | 348 | 253 | 251 | 55 | 64 | 65 | 5" | | |
| 4 | 0853 | 761.890 | .96 | 1.7 | 347 | 255 | 252 | 56 | 64 | 66 | 5" | | |
| 3 | 0857 | 763.995 | .87 | 1.6 | 346 | 257 | 254 | 56 | 65 | 67 | 5" | | |
| 2 | 0801 | 767.570 | .83 | 1.5 | 349 | 258 | 255 | 55 | 66 | 68 | 5" | | |
| 1 | 0905 | 770.375 | .74 | 1.3 | 348 | 257 | 256 | 57 | 69 | 71 | 5" | | |
| Average E | 0909 | 773.118 | | | | | | | | | | | |

Comments: _____

DS834049

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3-28-2018
RUN NO: 3-HCL-U2
OPERATOR: Patrick Whitman
METER BOX NO: 30-WCS
METER ΔH@: 1.737
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: _____
Silica Gel Expanded, Y/N: _____
Filter Condition after Test: _____
Check Weight: 1.8

AMBIENT TEMPERATURE: 72°F
BAROMETRIC PRESSURE: 30.18
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 110 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 196 SS
NOZZLE DIAMETER: 0.239
FILTER NO/TYPE: quartz
PRE-TEST LEAK RATE: : 0.005 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
PITOT LEAK CHECK - PRE: _____ POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | = Difference |
|---|---|---|---|---|
| 1 | 0.1N H2SO4 | | | |
| 2 | 0.1N H2SO4 | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | Rinse | | 50 | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0913 | 773.118 | 1.2 | 2.2 | 348 | 256 | 250 | 56 | 70 | 71 | 6" | | |
| 4 | 0917 | 776.534 | 1.3 | 2.3 | 348 | 257 | 253 | 55 | 72 | 73 | 6" | | |
| 3 | 0921 | 779.950 | 1.1 | 2.0 | 348 | 256 | 251 | 56 | 74 | 77 | 6" | | |
| 2 | 0925 | 783.165 | .75 | 1.4 | 348 | 256 | 252 | 57 | 75 | 79 | 6" | | |
| 1 | 0929 | 786.355 | .73 | 1.3 | 348 | 257 | 253 | 55 | 76 | 80 | 5" | | |
| 15 | 0933 | 788.954 | | | | | | | | | | | |
| 5 | 0937 | 788.954 | 1.2 | 2.2 | 347 | 258 | 251 | 57 | 76 | 78 | 6" | | |
| 4 | 0941 | 792.620 | 1.0 | 1.8 | 348 | 257 | 252 | 58 | 77 | 80 | 6" | | |
| 3 | 0945 | 795.450 | 1.3 | 2.3 | 348 | 255 | 251 | 54 | 78 | 82 | 6" | | |
| 2 | 0949 | 798.765 | 1.1 | 2.0 | 347 | 256 | 258 | 54 | 79 | 81 | 6" | | |
| 1 | 0953 | 801.875 | 1.0 | 1.8 | 349 | 257 | 253 | 58 | 79 | 82 | 6" | | |
| 15 | 0957 | 804.911 | | | | | | | | | | | |
| 5 | 1017 | 804.911 | 1.3 | 2.3 | 351 | 257 | 255 | 57 | 80 | 81 | 6" | | |
| 4 | 1021 | 808.375 | 1.4 | 2.5 | 352 | 258 | 251 | 56 | 80 | 82 | 6" | | |
| 3 | 1025 | 811.920 | 1.1 | 2.0 | 351 | 257 | 256 | 56 | 81 | 83 | 6" | | |
| 2 | 1029 | 815.075 | 1.0 | 1.8 | 353 | 256 | 254 | 57 | 83 | 85 | 6" | | |
| 1 | 1033 | 818.150 | .98 | 1.8 | 354 | 257 | 252 | 55 | 84 | 87 | 6" | | |
| Average | 1037 | 821.056 | | | | | | | | | | | |

Comments: _____

DS834049

| 1-HCL-U2 | | | | | | | 2-HCL-U2 | | | | | | | 3-HCL-U2 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dP | (dP)^.5 | dH | Ts | Tm | | | dP | (dP)^.5 | dH | Ts | Tm | | | dP | (dP)^.5 | dH | Ts | Tm | |
| 5 | 0.99 | 0.995 | 1.7 | 348 | 70 | 70 | 5 | 1.20 | 1.095 | 2.4 | 348 | 76 | 78 | 5 | 1.20 | 1.095 | 2.1 | 346 | 63 | 64 |
| 4 | 0.98 | 0.990 | 1.7 | 346 | 71 | 70 | 4 | 1.10 | 1.049 | 2.2 | 348 | 77 | 78 | 4 | 1.10 | 1.049 | 2.0 | 345 | 64 | 65 |
| 3 | 1.20 | 1.095 | 2.1 | 345 | 71 | 70 | 3 | 1.50 | 1.225 | 3.0 | 347 | 78 | 80 | 3 | 1.40 | 1.183 | 2.5 | 346 | 64 | 65 |
| 2 | 1.10 | 1.049 | 1.9 | 346 | 72 | 70 | 2 | 1.30 | 1.140 | 2.6 | 348 | 79 | 81 | 2 | 1.30 | 1.140 | 2.3 | 348 | 64 | 66 |
| 1 | 1.00 | 1.000 | 1.7 | 348 | 72 | 71 | 1 | 1.10 | 1.049 | 2.2 | 348 | 80 | 82 | 1 | 1.10 | 1.049 | 2.0 | 345 | 64 | 67 |
| 5 | 1.30 | 1.140 | 2.2 | 348 | 72 | 70 | 5 | 1.40 | 1.183 | 2.8 | 348 | 81 | 82 | 5 | 1.30 | 1.140 | 2.3 | 346 | 64 | 65 |
| 4 | 1.00 | 1.000 | 1.7 | 347 | 71 | 71 | 4 | 1.00 | 1.000 | 2.0 | 349 | 82 | 83 | 4 | 1.00 | 1.000 | 1.8 | 345 | 63 | 65 |
| 3 | 0.58 | 0.762 | 1.0 | 346 | 72 | 71 | 3 | 1.20 | 1.095 | 2.4 | 348 | 82 | 85 | 3 | 1.20 | 1.095 | 2.2 | 347 | 63 | 66 |
| 2 | 0.65 | 0.806 | 1.2 | 346 | 72 | 70 | 2 | 0.74 | 0.860 | 1.5 | 349 | 83 | 86 | 2 | 0.74 | 0.860 | 1.3 | 346 | 64 | 66 |
| 1 | 0.63 | 0.794 | 1.2 | 346 | 72 | 70 | 1 | 0.68 | 0.825 | 1.4 | 348 | 84 | 87 | 1 | 0.73 | 0.854 | 1.3 | 347 | 64 | 67 |
| 5 | 0.83 | 0.911 | 1.5 | 345 | 72 | 70 | 5 | 0.87 | 0.933 | 1.7 | 348 | 83 | 83 | 5 | 0.93 | 0.964 | 1.7 | 348 | 64 | 65 |
| 4 | 0.85 | 0.922 | 1.6 | 345 | 72 | 70 | 4 | 0.95 | 0.975 | 1.9 | 350 | 84 | 87 | 4 | 0.96 | 0.980 | 1.7 | 347 | 64 | 66 |
| 3 | 0.91 | 0.954 | 1.7 | 348 | 72 | 71 | 3 | 0.89 | 0.943 | 1.8 | 351 | 85 | 88 | 3 | 0.87 | 0.933 | 1.6 | 346 | 65 | 67 |
| 2 | 0.93 | 0.964 | 1.7 | 348 | 73 | 74 | 2 | 0.80 | 0.894 | 1.6 | 350 | 85 | 89 | 2 | 0.83 | 0.911 | 1.5 | 349 | 66 | 68 |
| 1 | 0.90 | 0.949 | 1.6 | 349 | 73 | 75 | 1 | 0.75 | 0.866 | 1.5 | 351 | 86 | 88 | 1 | 0.74 | 0.860 | 1.3 | 348 | 69 | 71 |
| 5 | 1.10 | 1.049 | 2.7 | 347 | 74 | 75 | 5 | 1.20 | 1.095 | 2.4 | 351 | 84 | 83 | 5 | 1.20 | 1.095 | 2.2 | 348 | 70 | 71 |
| 4 | 1.00 | 1.000 | 1.8 | 346 | 73 | 76 | 4 | 1.40 | 1.183 | 2.8 | 350 | 83 | 85 | 4 | 1.30 | 1.140 | 2.3 | 348 | 72 | 73 |
| 3 | 0.93 | 0.964 | 1.8 | 347 | 73 | 74 | 3 | 1.00 | 1.000 | 1.8 | 351 | 85 | 87 | 3 | 1.10 | 1.049 | 2.0 | 348 | 74 | 77 |
| 2 | 0.75 | 0.866 | 1.4 | 348 | 72 | 75 | 2 | 0.82 | 0.906 | 1.5 | 350 | 86 | 88 | 2 | 0.75 | 0.866 | 1.4 | 348 | 75 | 79 |
| 1 | 0.73 | 0.854 | 1.4 | 349 | 73 | 76 | 1 | 0.78 | 0.883 | 1.4 | 351 | 87 | 89 | 1 | 0.73 | 0.854 | 1.3 | 348 | 76 | 80 |
| 5 | 0.11 | 0.332 | 2.1 | 348 | 73 | 75 | 5 | 1.30 | 1.140 | 2.3 | 351 | 87 | 88 | 5 | 1.20 | 1.095 | 2.2 | 347 | 76 | 78 |
| 4 | 1.00 | 1.000 | 1.9 | 349 | 74 | 76 | 4 | 1.20 | 1.095 | 2.2 | 350 | 88 | 89 | 4 | 1.00 | 1.000 | 1.8 | 348 | 77 | 80 |
| 3 | 1.30 | 1.140 | 2.5 | 348 | 74 | 75 | 3 | 1.30 | 1.140 | 2.3 | 352 | 89 | 90 | 3 | 1.30 | 1.140 | 2.3 | 348 | 78 | 82 |
| 2 | 1.30 | 1.140 | 2.8 | 349 | 75 | 77 | 2 | 1.40 | 1.183 | 2.5 | 353 | 90 | 92 | 2 | 1.10 | 1.049 | 2.0 | 347 | 79 | 81 |
| 1 | 1.00 | 1.000 | 2.0 | 348 | 73 | 76 | 1 | 1.00 | 1.000 | 1.8 | 354 | 90 | 92 | 1 | 1.00 | 1.000 | 1.8 | 349 | 79 | 82 |
| 5 | 1.40 | 1.183 | 2.8 | 348 | 73 | 72 | 5 | 1.40 | 1.183 | 2.5 | 354 | 89 | 90 | 5 | 1.30 | 1.140 | 2.3 | 351 | 80 | 81 |
| 4 | 1.20 | 1.095 | 2.4 | 347 | 73 | 75 | 4 | 1.30 | 1.140 | 2.3 | 356 | 90 | 91 | 4 | 1.40 | 1.183 | 2.5 | 352 | 80 | 82 |
| 3 | 1.30 | 1.140 | 2.6 | 349 | 74 | 75 | 3 | 1.30 | 1.140 | 2.3 | 357 | 90 | 93 | 3 | 1.10 | 1.049 | 2.0 | 351 | 81 | 83 |
| 2 | 1.00 | 1.000 | 2.0 | 349 | 75 | 77 | 2 | 1.10 | 1.049 | 2.0 | 355 | 91 | 94 | 2 | 1.00 | 1.000 | 1.8 | 353 | 83 | 85 |
| 1 | 0.96 | 0.980 | 1.9 | 348 | 75 | 77 | 1 | 1.00 | 1.000 | 1.8 | 356 | 92 | 95 | 1 | 0.98 | 0.990 | 1.8 | 354 | 84 | 87 |
| Average | | 0.9393 | 1.887 | 347.4 | 72.9 | | Average | | 1.0866 | 2.097 | 350.7 | 85.8 | | Average | | 1.0517 | 1.910 | 348.0 | 72.1 | |

| | | Meter Vol | Imp | Imp | |
|---|---|---|---|---|---|
| Delta P (iwg) | 0.939 | 539.500 | 928.7 | 712.9 | 215.8 |
| Meter Pressure (iwg) | 1.887 | 630.165 | 822.4 | 738.9 | 83.5 |
| Stack Temperature (F) | 347.367 | 90.665 | 676.4 | 673.6 | 2.8 |
| Meter Temperature (F) | 72.917 | | 967.6 | 940.4 | 27.2 |
| Meter Volume (acf) | 90.665 | | | 50 | -50.0 |
| Liquid Volume (ml) | 279.300 | | | | 279.3 |

| | | Meter Vol | Imp | Imp | |
|---|---|---|---|---|---|
| Delta P (iwg) | 1.087 | 631 | 926.7 | 668.2 | 258.5 |
| Meter Pressure (iwg) | 2.097 | 726.874 | 835.9 | 789.9 | 46.0 |
| Stack Temperature (F | 350.733 | 95.874 | 487.5 | 484.8 | 2.7 |
| Meter Temperature (F | 85.817 | | 1038.4 | 1013.7 | 24.7 |
| Meter Volume (acf) | 95.874 | | | 50 | -50.0 |
| Liquid Volume (ml) | 281.900 | | | | 281.9 |

| | | Meter Vo | Imp | Imp | |
|---|---|---|---|---|---|
| Delta P (iwg) | 1.052 | 727.8 | 948.8 | 724.5 | 224.3 |
| Meter Pressure (iwg) | 1.910 | 821.08 | 843.4 | 751.4 | 92.0 |
| Stack Temperature (F | 347.967 | 93.280 | 674.8 | 673.8 | 1.0 |
| Meter Temperature (F | 72.050 | | 987.5 | 967.6 | 19.9 |
| Meter Volume (acf) | 93.280 | | | 50 | -50.0 |
| Liquid Volume (ml) | 287.2 | | | | 287.2 |

# APPENDIX A.2.5

# UNIT 2 PARTICULATE DATA

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3-27-2018
RUN NO: 1 -PM-U2
OPERATOR: Patrick Whitman
METER BOX NO: 17-WCS
METER ΔH@: 1.542
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: 499.5/500
1.65

AMBIENT TEMPERATURE: 70°F
BAROMETRIC PRESSURE: 30.19
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 101 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 55 SS
NOZZLE DIAMETER: 0.244
FILTER NO/TYPE: # 83-2998 FG
PRE-TEST LEAK RATE: : 0.001 CFM@ 12 in. Hg.
POST-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
PITOT LEAK CHECK - PRE: Good POST: _____
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | DI H2O | 988.6 | 761.3 | |
| 2 | DI H2O | 784.7 | 774.6 | |
| 3 | Empty | 639.4 | 637.5 | |
| 4 | Silica gel | 861.9 | 837.5 | |
| | | | | |
| | | | | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0830 | 495.500 | .85 | 1.4 | 340 | 258 | 255 | 58 | 69 | 70 | 4" | | |
| 4 | 0834 | 498.323 | .92 | 1.5 | 343 | 255 | 252 | 57 | 70 | 71 | 4" | | |
| 3 | 0838 | 501.175 | .95 | 1.6 | 345 | 256 | 254 | 55 | 70 | 72 | 4" | | |
| 2 | 0842 | 504.150 | .77 | 1.3 | 346 | 255 | 252 | 56 | 71 | 73 | 4" | | |
| 1 | 0846 | 507.965 | .75 | 1.2 | 344 | 256 | 255 | 54 | 71 | 74 | 4" | | |
| E | 0850 | 509.485 | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 5 | 0854 | 509.485 | 1.0 | 1.65 | 345 | 255 | 255 | 55 | 71 | 74 | 4" | | |
| 4 | 0858 | 512.510 | 1.0 | 1.65 | 347 | 256 | 258 | 54 | 72 | 73 | 4" | | |
| 3 | 0902 | 515.395 | .88 | 1.5 | 346 | 256 | 255 | 53 | 72 | 74 | 4" | | |
| 2 | 0906 | 518.410 | .75 | 1.2 | 347 | 255 | 253 | 54 | 72 | 75 | 4" | | |
| 1 | 0910 | 521.035 | .73 | 1.2 | 345 | 256 | 254 | 55 | 72 | 75 | 4" | | |
| E | 0914 | 523.781 | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Average: | | | | | | | | | | | | | |

Comments: _____

DS834049

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3-27-2018
RUN NO: 1 -PM-U2
OPERATOR: Patrick Whitman
METER BOX NO: 17-WCS
METER ΔH@: 1.542
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: _____
Silica Gel Expanded, Y/N: _____
Filter Condition after Test: _____
Check Weight: _____

AMBIENT TEMPERATURE: 77°F
BAROMETRIC PRESSURE: 30.15
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 101 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 55 SS
NOZZLE DIAMETER: 0.244
FILTER NO/TYPE: # 83-2998 FG
PRE-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
POST-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
PITOT LEAK CHECK - PRE: _____ POST: _____
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | DI H2O | | | |
| 2 | DI H2O | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | | | | |
| Total: | | | | |

~~1.65~~ 1.75 1.84

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0919 | 523.781 | 1.0 | 1.6 | 346 | 255 | 256 | 58 | 72 | 75 | 4" | | 1.73 |
| 4 | 0923 | 526.785 | 1.1 | 1.8 | 348 | 253 | 257 | 57 | 72 | 76 | 5" | | |
| 3 | 0927 | 529.935 | 1.3 | 2.1 | 347 | 255 | 258 | 56 | 72 | 75 | 5" | | |
| 2 | 0931 | 533.095 | 1.2 | 2.0 | 348 | 256 | 253 | 58 | 73 | 76 | 5" | | |
| 1 | 0935 | 536.315 | 1.0 | 1.6 | 347 | 255 | 257 | 57 | 73 | 75 | 4" | | |
| E | 0939 | 539.535 | | | | | | | | | | | |
| 5 | 0954 | 539.535 | 1.3 | 2.1 | 347 | 256 | 257 | 55 | 74 | 75 | 5" | | |
| 4 | 0958 | 542.550 | 1.1 | 1.9 | 348 | 257 | 252 | 56 | 73 | 75 | 5" | | |
| 3 | 1002 | 545.725 | 1.3 | 2.1 | 348 | 255 | 253 | 54 | 73 | 76 | 5" | | |
| 2 | 1006 | 548.480 | 1.1 | 1.9 | 348 | 256 | 255 | 54 | 72 | 76 | 5" | | |
| 1 | 1010 | 552.125 | .93 | 1.6 | 347 | 258 | 259 | 53 | 73 | 75 | 4" | | |
| E | 1014 | 555.205 | | | | | | | | | | | |
| 5 | 1019 | 555.205 | 1.1 | 1.9 | 348 | 257 | 256 | 53 | 73 | 74 | 5" | | |
| 4 | 1023 | 558.255 | 1.3 | 2.3 | 349 | 258 | 252 | 54 | 72 | 75 | 5" | | |
| 3 | 1027 | 561.540 | 1.0 | 1.7 | 345 | 256 | 254 | 55 | 73 | 75 | 5" | | |
| 2 | 1031 | 564.555 | .78 | 1.4 | 347 | 257 | 252 | 54 | 73 | 76 | 5" | | |
| 1 | 1035 | 567.540 | .65 | 1.1 | 348 | 256 | 254 | 55 | 74 | 76 | 5" | | |
| Average | E 1039 | 570.265 | | | | | | | | | | | |

Comments: _____

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3-27-2018
RUN NO: 1 -PM-U2
OPERATOR: Patrick Whitman
METER BOX NO: 17-WCS
METER ΔH@: 1.542
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: _____
Silica Gel Expanded, Y/N: _____
Filter Condition after Test: _____
Check Weight: 1.85

AMBIENT TEMPERATURE: 72°F
BAROMETRIC PRESSURE: 30.14
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 111 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 55 SS
NOZZLE DIAMETER: 0.244
FILTER NO/TYPE: # 83-3298 FG
PRE-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
POST-TEST LEAK RATE: : 0.005 CFM@ 16 in. Hg.
PITOT LEAK CHECK - PRE: _____ POST: _____
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | DI H2O | | | |
| 2 | DI H2O | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | | | | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1044 | 570.265 | 1.1 | 2.0 | 349 | 257 | 255 | 56 | 74 | 75 | 5" | | |
| 4 | 1048 | 573.480 | 1.0 | 1.6 | 348 | 256 | 254 | 55 | 73 | 76 | 5" | | |
| 3 | 1052 | 576.525 | 1.4 | 2.6 | 349 | 257 | 255 | 57 | 74 | 76 | 6" | | |
| 2 | 1056 | 579.885 | 1.2 | 2.2 | 348 | 256 | 257 | 58 | 74 | 75 | 6" | | |
| 1 | 1100 | 583.127 | 1.0 | 1.8 | 349 | 257 | 253 | 55 | 71 | 76 | 6" | | |
| E | 1104 | 586.215 | | | | | | | | | | | |
| Average: | | | | | | | | | | | | | |

Comments: _____

DS834049

MONTROSE
AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3-27-2018
RUN NO: 2 -PM-U2
OPERATOR: Patrick Whitman
METER BOX NO: 17-WCS
METER ΔH@: 1.542
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: 495.8/620 1.8

AMBIENT TEMPERATURE: 80.1
BAROMETRIC PRESSURE: 29.19
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 111 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 5X SS
NOZZLE DIAMETER: 0.242
FILTER NO/TYPE: # 83-3299 FG
PRE-TEST LEAK RATE: : <0.005 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
PITOT LEAK CHECK - PRE: _____ POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | DI H2O | 978.9 | 750.3 | |
| 2 | DI H2O | 744.0 | 731.3 | |
| 3 | Empty | 489.6 | 486.1 | |
| 4 | Silica gel | 965 | 939.2 | |
| | | | | |
| | | | | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H2O | ΔH in. H2O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O2 % | P. static in. H2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1132 | 586.500 | 1.4 | 2.5 | 347 | 254 | 257 | 57 | 77 | 79 | 5" | | |
| 4 | 1136 | 590.085 | 1.0 | 1.8 | 346 | 256 | 252 | 57 | 78 | 80 | 5" | | |
| 3 | 1140 | 593.315 | 1.2 | 2.2 | 348 | 254 | 250 | 56 | 79 | 81 | 6" | | |
| 2 | 1144 | 596.575 | .73 | 1.3 | 346 | 257 | 253 | 55 | 80 | 82 | 5" | | |
| 1 | 1148 | 599.460 | .65 | 1.2 | 344 | 255 | 253 | 54 | 82 | 85 | 5" | | |
| E | 1152 | 602.233 | | | | | | | | | | | |
| 5 | 1156 | 602.233 | .85 | 1.5 | 346 | 256 | 254 | 55 | 83 | 85 | 5" | | |
| 4 | 1200 | 605.270 | .96 | 1.7 | 348 | 257 | 253 | 54 | 83 | 86 | 5" | | |
| 3 | 1204 | 608.459 | .87 | 1.6 | 346 | 255 | 255 | 55 | 83 | 86 | 5" | | |
| 2 | 1208 | 611.415 | .80 | 1.4 | 344 | 257 | 258 | 55 | 83 | 86 | 5" | | |
| 1 | 1212 | 614.350 | .77 | 1.4 | 346 | 253 | 254 | 56 | 84 | 87 | 5" | | |
| E | 1216 | 617.042 | | | | | | | | | | | |
| 5 | 1220 | 617.042 | 1.3 | 2.3 | 347 | 255 | 251 | 56 | 84 | 85 | 5" | | |
| 4 | 1224 | 620.530 | 1.4 | 2.5 | 348 | 258 | 257 | 57 | 85 | 85 | 6" | | |
| 3 | 1228 | 624.175 | .96 | 1.7 | 347 | 253 | 256 | 55 | 86 | 89 | 5" | | |
| 2 | 1232 | 627.350 | .79 | 1.4 | 346 | 254 | 252 | 56 | 86 | 88 | 5" | | |
| 1 | 1236 | 630.245 | .75 | 1.4 | 348 | 255 | 251 | 57 | 87 | 90 | 5" | | |
| Average | 1240 | 633.000 | | | | | | | | | | | |

Comments: _____

DS834049

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3-27-2018
RUN NO: 2 -PM-U2
OPERATOR: Patrick Whitman
METER BOX NO: 17-WCS
METER ΔH@: 1.542
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: _____
Silica Gel Expanded, Y/N: _____
Filter Condition after Test: _____
Check Weight: 1.6

AMBIENT TEMPERATURE: 80°F
BAROMETRIC PRESSURE: 30.19
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 111 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 5X SS
NOZZLE DIAMETER: 0.242
FILTER NO/TYPE: # 83-3299 FG
PRE-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
POST-TEST LEAK RATE: : <0.005 CFM@ 17 in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: _____
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | DI H2O | | | |
| 2 | DI H2O | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | | | | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1245 | 633.007 | 1.3 | 2.3 | 350 | 256 | 253 | 56 | 85 | 83 | 6 | | |
| 4 | 1249 | 636.320 | 1.1 | 2.0 | 348 | 257 | 251 | 58 | 86 | 86 | 6 | | |
| 3 | 1303 | 639.855 | 1.2 | 2.2 | 349 | 255 | 254 | 57 | 86 | 87 | 6 | | |
| 2 | 1307 | 643.210 | 1.4 | 2.5 | 351 | 257 | 251 | 56 | 86 | 88 | 6 | | |
| 1 | 1311 | 646.655 | 1.1 | 2.0 | 352 | 256 | 254 | 55 | 87 | 89 | 6 | | |
| E | 1315 | 650.169 | | | | | | | | | | | |
| 5 | 1319 | 650.167 | 1.3 | 2.3 | 351 | 256 | 255 | 56 | 88 | 89 | 6 | | |
| 4 | 1323 | 652.750 | 1.1 | 2.0 | 350 | 255 | 257 | 57 | 89 | 91 | 6 | | |
| 3 | 1327 | 655.725 | 1.2 | 2.2 | 351 | 254 | 256 | 55 | 89 | 91 | 6 | | |
| 2 | 1331 | 659.120 | 1.0 | 1.8 | 355 | 257 | 252 | 55 | 90 | 92 | 6 | | |
| 1 | 1335 | 662.335 | .99 | 1.8 | 354 | 256 | 257 | 56 | 91 | 93 | 6 | | |
| E | 1339 | 665.497 | | | | | | | | | | | |
| 5 | 1344 | 665.497 | 1.1 | 2.0 | 353 | 257 | 254 | 56 | 91 | 92 | 6 | | |
| 4 | 1348 | 668.475 | 1.2 | 2.2 | 355 | 255 | 253 | 57 | 91 | 93 | 6 | | |
| 3 | 1352 | 672.280 | 1.3 | 2.3 | 356 | 258 | 257 | 55 | 92 | 94 | 6 | | |
| 2 | 1356 | 675.710 | 1.0 | 1.8 | 352 | 259 | 256 | 56 | 92 | 95 | 6 | | |
| 1 | 1400 | 678.980 | 1.1 | 2.0 | 351 | 254 | 255 | 57 | 92 | 96 | 6 | | |
| Average | E 1404 | 682.257 | | | | | | | | | | | |

Comments: _____

DS834049

MONTROSE

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3-28-2018
RUN NO: 3-PM-U2
OPERATOR: Patrick Whitman
METER BOX NO: 17-WCS
METER ΔH@: 1.542
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test: ok
Silica Gel Expanded, Y/N: no
Filter Condition after Test: ok
Check Weight: 499.8/500 1.7

AMBIENT TEMPERATURE: 70°F
BAROMETRIC PRESSURE:
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 101 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 55 SS
NOZZLE DIAMETER: 0.244
FILTER NO/TYPE: # 83-3300 FG
PRE-TEST LEAK RATE: : 0.005 CFM@ 17 in. Hg.
POST-TEST LEAK RATE: : _____ CFM@ _____ in. Hg.
PITOT LEAK CHECK - PRE: ✓ POST: _____
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | DI H2O | 993.9 | 745.3 | |
| 2 | DI H2O | 777.8 | 762.8 | |
| 3 | Empty | 640.7 | 639.4 | |
| 4 | Silica gel | 881.7 | 861.9 | |
| | | | | |
| | | | | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0801 | 682.700 | 1.3 | 2.2 | 344 | 255 | 251 | 58 | 60 | 61 | 6" | | 1.75 |
| 4 | 0805 | 686.155 | 1.1 | 1.9 | 347 | 258 | 253 | 56 | 61 | 62 | 6" | | |
| 3 | 0809 | 689.270 | 1.2 | 2.0 | 346 | 257 | 258 | 55 | 62 | 63 | 6" | | |
| 2 | 0813 | 692.650 | .76 | 1.3 | 347 | 255 | 254 | 55 | 63 | 65 | 6" | | |
| 1 | 0817 | 695.385 | .70 | 1.2 | 347 | 253 | 251 | 54 | 63 | 66 | 6" | | |
| E | 0821 | 697.874 | | | | | | | | | | | |
| 5 | 0825 | 697.874 | .91 | 1.5 | 345 | 255 | 252 | 55 | 63 | 65 | 5" | | |
| 4 | 0829 | 700.980 | .95 | 1.6 | 349 | 257 | 255 | 54 | 63 | 66 | 5" | | |
| 3 | 0833 | 703.685 | .87 | 1.5 | 342 | 258 | 252 | 55 | 63 | 66 | 5" | | |
| 2 | 0837 | 706.690 | .85 | 1.4 | 345 | 257 | 256 | 54 | 63 | 67 | 5" | | |
| 1 | 0841 | 709.525 | .74 | 1.3 | 343 | 256 | 253 | 55 | 64 | 67 | 5" | | |
| E | 0845 | 712.285 | | | | | | | | | | | |
| 5 | 0849 | 712.285 | 1.4 | 2.4 | 345 | 257 | 254 | 55 | 65 | 66 | 6" | | |
| 4 | 0853 | 715.850 | 1.3 | 2.2 | 347 | 255 | 256 | 54 | 65 | 68 | 6" | | |
| 3 | 0857 | 718.315 | 1.0 | 1.7 | 347 | 258 | 255 | 55 | 64 | 67 | 6" | | |
| 2 | 0901 | 722.185 | .78 | 1.3 | 345 | 257 | 254 | 54 | 68 | 69 | 6" | | |
| 1 | 0905 | 725.025 | .75 | 1.3 | 346 | 258 | 257 | 55 | 70 | 72 | 6" | | |
| Average: | E 0904 | 727.771 | | | | | | | | | | | |

Comments: _____

DS834049

MONTROSE AIR QUALITY SERVICES

# WET CHEMICAL SAMPLING SYSTEM DATA AND WORKSHEET – STANDARD

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 3-28-2018
RUN NO: 3-PM-U2
OPERATOR: Patrick Whitman
METER BOX NO: 17-WCS
METER ΔH@: 1.542
METER Yd: 0.995
STACK AREA, FT²: 38.8
TRAVERSE POINTS, MIN/POINT: 4x30
ΔH= _____ X ΔP:
Probe Condition, pre/post test:
Silica Gel Expanded, Y/N:
Filter Condition after Test:
Check Weight: 1.8

AMBIENT TEMPERATURE: 72°F
BAROMETRIC PRESSURE: 30.16
ASSUMED MOISTURE: 12.5
PITOT TUBE COEFF, Cp: 0.84
PROBE ID NO/MATERIAL: 101 Glass
PROBE LENGTH: 6'
NOZZLE ID NO/ MATERIAL: 55 SS
NOZZLE DIAMETER: 0.244
FILTER NO/TYPE: # 83-3300 FG
PRE-TEST LEAK RATE: : 0.005 CFM@ 15 in. Hg.
POST-TEST LEAK RATE: : 0.005 CFM@ 17 in. Hg.
PITOT LEAK CHECK - PRE: _____ POST: ✓
CHAIN OF CUSTODY: SAMPLE CUSTODIAN DW
SAMPLER PW
SAMPLE CUSTODIAN DW

| Imp. # | Contents | Post-Test | Pre-Test | Difference |
|---|---|---|---|---|
| 1 | DI H2O | | | |
| 2 | DI H2O | | | |
| 3 | Empty | | | |
| 4 | Silica gel | | | |
| | | | | |
| | | | | |
| Total: | | | | |

| Point | Time | Meter Volume, ft³ | ΔP in. H₂O | ΔH in. H₂O | Stack Temp, °F | Probe Temp, °F | Filter Temp, °F | Imp. Out Temp, °F | Meter Temp, °F In | Meter Temp, °F Out | Vacuum in. Hg. | O₂ % | P. static in. H₂O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0913 | 727.771 | 1.1 | 1.9 | 344 | 258 | 253 | 55 | 72 | 73 | 5 | | |
| 4 | 0917 | 731.055 | 1.2 | 2.0 | 343 | 257 | 252 | 54 | 74 | 76 | 5 | | |
| 3 | 0921 | 734.360 | 1.3 | 2.3 | 345 | 258 | 257 | 55 | 76 | 79 | 5 | | |
| 2 | 0925 | 737.875 | 1.4 | 2.5 | 347 | 256 | 253 | 56 | 77 | 80 | 5 | | |
| 1 | 0929 | 741.560 | 1.0 | 1.8 | 344 | 258 | 255 | 57 | 77 | 81 | 6 | | |
| E | 0933 | 744.357 | | | | | | | | | | | |
| 5 | 0937 | 744.357 | 1.4 | 2.5 | 343 | 256 | 252 | 56 | 76 | 77 | 6 | | |
| 4 | 0941 | 748.375 | 1.2 | 2.2 | 346 | 257 | 254 | 57 | 77 | 80 | 6 | | |
| 3 | 0945 | 751.690 | 1.1 | 2.0 | 347 | 258 | 256 | 57 | 79 | 83 | 6 | | |
| 2 | 0949 | 754.950 | 1.0 | 1.8 | 346 | 257 | 253 | 57 | 80 | 83 | 6 | | |
| 1 | 0953 | 758.190 | .97 | 1.7 | 344 | 256 | 254 | 56 | 81 | 83 | 6 | | |
| E | 0957 | 761.297 | | | | | | | | | | | |
| 5 | 1017 | 761.297 | 1.3 | 2.3 | 345 | 258 | 259 | 57 | 80 | 81 | 6 | | |
| 4 | 1021 | 764.525 | 1.1 | 2.0 | 347 | 255 | 251 | 56 | 81 | 83 | 6 | | |
| 3 | 1025 | 768.175 | 1.4 | 2.5 | 346 | 257 | 257 | 57 | 82 | 84 | 6 | | |
| 2 | 1029 | 771.880 | 1.5 | 2.7 | 348 | 256 | 255 | 56 | 83 | 85 | 6 | | |
| 1 | 1033 | 775.665 | 1.0 | 1.8 | 349 | 255 | 256 | 57 | 84 | 87 | 6 | | |
| Average | 1037 | 778.787 | | | | | | | | | | | |

Comments:

DS834049

1-PM-U1

| | dP | (dP)^.5 | dH | Ts | Tm | |
|---|---|---|---|---|---|---|
| 5 | 0.85 | 0.922 | 1.4 | 340 | 69 | 70 |
| 4 | 0.92 | 0.959 | 1.5 | 343 | 70 | 71 |
| 3 | 0.95 | 0.975 | 1.6 | 345 | 70 | 72 |
| 2 | 0.77 | 0.877 | 1.3 | 346 | 71 | 73 |
| 1 | 0.75 | 0.866 | 1.2 | 344 | 71 | 74 |
| 5 | 1.00 | 1.000 | 1.7 | 348 | 71 | 74 |
| 4 | 1.00 | 1.000 | 1.7 | 347 | 72 | 73 |
| 3 | 0.88 | 0.938 | 1.5 | 346 | 72 | 74 |
| 2 | 0.75 | 0.866 | 1.2 | 347 | 72 | 75 |
| 1 | 0.73 | 0.854 | 1.2 | 345 | 72 | 75 |
| 5 | 1.00 | 1.000 | 1.6 | 346 | 72 | 75 |
| 4 | 1.10 | 1.049 | 1.8 | 348 | 72 | 76 |
| 3 | 1.30 | 1.140 | 2.1 | 347 | 72 | 75 |
| 2 | 1.20 | 1.095 | 2.0 | 345 | 73 | 76 |
| 1 | 1.00 | 1.000 | 1.6 | 347 | 73 | 75 |
| 5 | 1.30 | 1.140 | 2.1 | 347 | 74 | 75 |
| 4 | 1.10 | 1.049 | 1.9 | 346 | 73 | 75 |
| 3 | 1.30 | 1.140 | 2.1 | 349 | 73 | 76 |
| 2 | 1.10 | 1.049 | 1.9 | 348 | 72 | 76 |
| 1 | 0.93 | 0.964 | 1.6 | 347 | 73 | 75 |
| 5 | 1.10 | 1.049 | 1.9 | 348 | 73 | 74 |
| 4 | 1.30 | 1.140 | 2.3 | 349 | 72 | 75 |
| 3 | 1.00 | 1.000 | 1.7 | 345 | 73 | 75 |
| 2 | 0.78 | 0.883 | 1.4 | 347 | 73 | 76 |
| 1 | 0.69 | 0.831 | 1.1 | 348 | 74 | 76 |
| 5 | 1.10 | 1.049 | 2.0 | 349 | 74 | 75 |
| 4 | 1.00 | 1.000 | 1.8 | 348 | 73 | 76 |
| 3 | 1.40 | 1.183 | 2.6 | 349 | 74 | 76 |
| 2 | 1.20 | 1.095 | 2.2 | 348 | 74 | 75 |
| 1 | 1.00 | 1.000 | 1.8 | 349 | 74 | 76 |

| Average | 1.0077 | 1.723 | 346.7 | 73.5 | |
|---|---|---|---|---|---|
| | | Meter Vol | Imp | Imp | |
| Delta P (iwg) | 1.008 | 495.500 | 988.6 | 761.3 | 227.3 |
| Meter Pressure (iwg) | 1.723 | 586.215 | 784.7 | 774.6 | 10.1 |
| Stack Temperature (F) | 346.700 | 90.715 | 639.4 | 637.5 | 1.9 |
| Meter Temperature (F) | 73.500 | | 861.9 | 837.5 | 24.4 |
| Meter Volume (acf) | 90.715 | | | | 0.0 |
| Liquid Volume (ml) | 263.700 | | | | 263.7 |

2-PM-U1

| | dP | (dP)^.5 | dH | Ts | Tm | |
|---|---|---|---|---|---|---|
| 5 | 1.40 | 1.183 | 2.50 | 347 | 77 | 79 |
| 4 | 1.00 | 1.000 | 1.80 | 346 | 78 | 80 |
| 3 | 1.20 | 1.095 | 2.20 | 348 | 79 | 81 |
| 2 | 0.73 | 0.854 | 1.30 | 346 | 80 | 82 |
| 1 | 0.65 | 0.806 | 1.20 | 344 | 82 | 85 |
| 5 | 0.85 | 0.922 | 1.50 | 346 | 83 | 85 |
| 4 | 0.96 | 0.980 | 1.70 | 348 | 83 | 86 |
| 3 | 0.87 | 0.933 | 1.60 | 349 | 83 | 86 |
| 2 | 0.80 | 0.894 | 1.40 | 344 | 83 | 86 |
| 1 | 0.77 | 0.877 | 1.40 | 346 | 84 | 87 |
| 5 | 1.30 | 1.140 | 2.30 | 347 | 84 | 85 |
| 4 | 1.40 | 1.183 | 2.50 | 345 | 85 | 88 |
| 3 | 0.96 | 0.980 | 1.70 | 347 | 86 | 89 |
| 2 | 0.79 | 0.889 | 1.40 | 346 | 86 | 88 |
| 1 | 0.75 | 0.866 | 1.40 | 348 | 87 | 90 |
| 5 | 1.30 | 1.140 | 2.30 | 350 | 85 | 83 |
| 4 | 1.10 | 1.049 | 2.00 | 348 | 85 | 86 |
| 3 | 1.20 | 1.095 | 2.20 | 349 | 86 | 87 |
| 2 | 1.40 | 1.183 | 2.50 | 351 | 86 | 88 |
| 1 | 1.10 | 1.049 | 2.00 | 352 | 87 | 89 |
| 5 | 1.30 | 1.140 | 2.30 | 351 | 88 | 89 |
| 4 | 1.10 | 1.049 | 2.00 | 350 | 89 | 91 |
| 3 | 1.20 | 1.095 | 2.20 | 351 | 89 | 91 |
| 2 | 1.00 | 1.000 | 1.80 | 355 | 90 | 92 |
| 1 | 0.99 | 0.995 | 1.80 | 354 | 91 | 93 |
| 5 | 1.10 | 1.049 | 2.00 | 353 | 91 | 92 |
| 4 | 1.20 | 1.095 | 2.20 | 355 | 91 | 93 |
| 3 | 1.30 | 1.140 | 2.30 | 356 | 92 | 94 |
| 2 | 1.00 | 1.000 | 1.80 | 352 | 92 | 95 |
| 1 | 1.10 | 1.049 | 2.00 | 351 | 92 | 96 |

| Average | 1.0495 | 1.910 | 349.2 | 86.8 | |
|---|---|---|---|---|---|
| | | Meter Vol | Imp | Imp | |
| Delta P (iwg) | 1.049 | 586.3 | 978.9 | 750.3 | 228.6 |
| Meter Pressure (iwg) | 1.910 | 682.257 | 744.0 | 731.3 | 12.7 |
| Stack Temperature (F | 349.167 | 95.957 | 489.6 | 486.1 | 3.5 |
| Meter Temperature (F) | 86.833 | | 965.0 | 939.2 | 25.8 |
| Meter Volume (acf) | 95.957 | | | | 0.0 |
| Liquid Volume (ml) | 270.600 | | | | 270.6 |

3-PM-U1

| | dP | (dP)^.5 | dH | Ts | Tm | |
|---|---|---|---|---|---|---|
| 5 | 1.30 | 1.140 | 2.2 | 344 | 60 | 61 |
| 4 | 1.10 | 1.049 | 1.9 | 347 | 61 | 62 |
| 3 | 1.20 | 1.095 | 2.0 | 346 | 62 | 63 |
| 2 | 0.76 | 0.872 | 1.3 | 347 | 63 | 65 |
| 1 | 0.70 | 0.837 | 1.2 | 347 | 63 | 66 |
| 5 | 0.91 | 0.954 | 1.5 | 345 | 63 | 65 |
| 4 | 0.95 | 0.975 | 1.6 | 344 | 63 | 66 |
| 3 | 0.87 | 0.933 | 1.5 | 342 | 63 | 66 |
| 2 | 0.85 | 0.922 | 1.4 | 345 | 63 | 67 |
| 1 | 0.74 | 0.860 | 1.3 | 343 | 64 | 67 |
| 5 | 1.40 | 1.183 | 2.4 | 345 | 65 | 66 |
| 4 | 1.30 | 1.140 | 2.2 | 347 | 65 | 68 |
| 3 | 1.00 | 1.000 | 1.7 | 347 | 64 | 67 |
| 2 | 0.78 | 0.883 | 1.3 | 345 | 68 | 69 |
| 1 | 0.75 | 0.866 | 1.3 | 346 | 70 | 72 |
| 5 | 1.10 | 1.049 | 1.9 | 344 | 72 | 73 |
| 4 | 1.20 | 1.095 | 2.0 | 343 | 74 | 76 |
| 3 | 1.30 | 1.140 | 2.8 | 345 | 76 | 79 |
| 2 | 1.40 | 1.183 | 2.5 | 347 | 77 | 80 |
| 1 | 1.00 | 1.000 | 1.8 | 344 | 77 | 81 |
| 5 | 1.40 | 1.183 | 2.5 | 343 | 76 | 77 |
| 4 | 1.20 | 1.095 | 2.2 | 346 | 77 | 80 |
| 3 | 1.10 | 1.049 | 2.0 | 347 | 79 | 83 |
| 2 | 1.00 | 1.000 | 1.8 | 346 | 80 | 83 |
| 1 | 0.97 | 0.985 | 1.7 | 344 | 81 | 83 |
| 5 | 1.30 | 1.140 | 2.3 | 345 | 80 | 81 |
| 4 | 1.10 | 1.049 | 2.0 | 347 | 81 | 83 |
| 3 | 1.40 | 1.183 | 2.5 | 346 | 82 | 84 |
| 2 | 1.50 | 1.225 | 2.7 | 348 | 83 | 85 |
| 1 | 1.00 | 1.000 | 1.8 | 349 | 84 | 87 |

| Average | 1.0737 | 1.910 | 345.5 | 72.4 | |
|---|---|---|---|---|---|
| | | Meter Vo | Imp | Imp | |
| Delta P (iwg) | 1.074 | 682.7 | 993.9 | 745.3 | 248.6 |
| Meter Pressure (iwg) | 1.910 | 778.787 | 777.8 | 762.8 | 15.0 |
| Stack Temperature (F | 345.467 | 96.087 | 640.7 | 639.4 | 1.3 |
| Meter Temperature (F | 72.350 | | 881.7 | 861.9 | 19.8 |
| Meter Volume (acf) | 96.087 | | | | 0.0 |
| Liquid Volume (ml) | 284.7 | | | | 284.7 |

# APPENDIX A.2.6

# UNIT 2 $SO_2$ DATA AND VELOCITY DATA

# FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit - 2
PERFORMED BY: Patrick Whitman
TEST DATE: 3/27/2018
BAR. PRESSURE: 30.19
TC READOUT ID: #42
DP INDICATOR ID: CC-2
TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer
PITOT TUBE ID: #058
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- ✓ POST- ✓

Run #: 1 Ps: +.73
Start: 0830 Stop: 0930

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.0 | 345 | 5 | .86 | 350 | 5 | 1.0 | 346 |
| 4 | .98 | 348 | 4 | .94 | 351 | 4 | 1.1 | 347 |
| 3 | 1.3 | 346 | 3 | .92 | 348 | 3 | 1.3 | 348 |
| 2 | 1.2 | 347 | 2 | .78 | 349 | 2 | 1.2 | 348 |
| 1 | 1.0 | 347 | 1 | .75 | 347 | 1 | 1.0 | 349 |
| | | | | | | | | |
| 5 | 1.3 | 345 | 5 | 1.1 | 344 | 5 | 1.3 | 347 |
| 4 | 1.1 | 348 | 4 | 1.0 | 346 | 4 | 1.1 | 348 |
| 3 | .60 | 350 | 3 | .91 | 347 | 3 | 1.4 | 349 |
| 2 | .68 | 349 | 2 | .76 | 345 | 2 | 1.0 | 345 |
| 1 | .62 | 348 | 1 | .72 | 348 | 1 | .95 | 349 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
| 1 | 291 | 22.3 | 1 | | | 1 | | |
| 2 | 292 | 22.2 | 2 | | | 2 | | |
| 3 | 293 | 22.3 | 3 | | | 3 | | |

## MOISTURE DATA FOR TEST RUNS 1 THROUGH 1

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.8 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 0830 | 911.600 | 1.0 | 71 | 73 | 56 | 4" | #1 | $H_2O_2$ | 888.1 | 747.6 | |
| 0850 | 923.350 | 1.0 | 73 | 75 | 55 | 4" | #2 | $H_2O_2$ | 761.5 | 760.8 | |
| 0910 | 935.055 | 1.0 | 74 | 76 | 57 | 4" | #3 | Empty | 466.5 | 466.0 | |
| 0930 | 946.577 | | | | | | #4 | Silica Gel | 850.0 | 837.9 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: 0.005 CFM @ 15 in. Hg., Post-Test Leak Check: 0.014 CFM @ 10 in. Hg

# FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit - 2
PERFORMED BY: Patrick Whitman TEST DATE: 3/27/2018
BAR. PRESSURE: TC READOUT ID: #42
DP INDICATOR ID: CC-2 TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer PITOT TUBE ID: #058 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 2 Ps: 1.73
Start: 0954 Stop: 1054

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.1 | 345 | 5 | .86 | 345 | 5 | 1.1 | 346 |
| 4 | 1.0 | 347 | 4 | .97 | 345 | 4 | 1.0 | 348 |
| 3 | 1.4 | 348 | 3 | .88 | 346 | 3 | 1.3 | 347 |
| 2 | 1.2 | 348 | 2 | .79 | 347 | 2 | 1.3 | 348 |
| 1 | 1.0 | 349 | 1 | .74 | 348 | 1 | 1.1 | 346 |
| | | | | | | | | |
| 5 | 1.3 | 346 | 5 | 1.2 | 348 | 5 | 1.4 | 348 |
| 4 | 1.1 | 347 | 4 | 1.1 | 349 | 4 | 1.2 | 347 |
| 3 | 1.0 | 348 | 3 | .93 | 348 | 3 | 1.3 | 348 |
| 2 | .71 | 348 | 2 | .75 | 348 | 2 | 1.0 | 348 |
| 1 | .63 | 347 | 1 | .72 | 345 | 1 | .96 | 347 |

| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
|---|---|---|---|---|---|---|---|---|
| 1 | 291 | 00.2 | 1 | | | 1 | | |
| 2 | 290 | 00.3 | 2 | | | 2 | | |
| 3 | 293 | 00.2 | 3 | | | 3 | | |

## MOISTURE DATA FOR TEST RUNS 2 THROUGH 2

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.8 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 0954 | 947.100 | 1.0 | 75 | 77 | 54 | 4" | #1 | $H_2O_2$ | 850.6 | 707.8 | |
| 1014 | 958.995 | 1.0 | 76 | 78 | 57 | 4" | #2 | $H_2O_2$ | 695.7 | 691.0 | |
| 1034 | 970.725 | 1.0 | 77 | 79 | 55 | 4" | #3 | Empty | 590.5 | 590.5 | |
| 1054 | 982.157 | | | | | | #4 | Silica Gel | 981.6 | 972.7 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: 0.005 CFM @ 15 in. Hg., Post-Test Leak Check: 0.005 CFM @ 10 in. Hg

# FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit - 2
PERFORMED BY: Patrick Whitman TEST DATE: 3/27/2018
BAR. PRESSURE: 30.19 TC READOUT ID: #42
DP INDICATOR ID: CC-2 TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer PITOT TUBE ID: #058 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 3 Ps: 1.73
Start: 1132 Stop: 1232

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.2 | 345 | 5 | .85 | 346 | 5 | 1.2 | 345 |
| 4 | 1.1 | 346 | 4 | .96 | 347 | 4 | 1.0 | 346 |
| 3 | 1.5 | 347 | 3 | .87 | 349 | 3 | 1.3 | 347 |
| 2 | 1.3 | 348 | 2 | .81 | 348 | 2 | 1.41 | 348 |
| 1 | 1.1 | 347 | 1 | .76 | 347 | 1 | 1.0 | 349 |
| | | | | | | | | |
| 5 | 1.4 | 345 | 5 | 1.3 | 348 | 5 | 1.4 | 346 |
| 4 | 1.0 | 346 | 4 | 1.4 | 348 | 4 | 1.3 | 347 |
| 3 | 1.2 | 348 | 3 | .95 | 347 | 3 | 1.3 | 348 |
| 2 | .73 | 348 | 2 | .77 | 349 | 2 | 1.1 | 349 |
| 1 | .65 | 344 | 1 | .75 | 346 | 1 | 1.0 | 348 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
| 1 | 293 | 22.4 | 1 | | | 1 | | |
| 2 | 291 | 22.6 | 2 | | | 2 | | |
| 3 | 290 | 22.5 | 3 | | | 3 | | |

## MOISTURE DATA FOR TEST RUNS 3 THROUGH 3

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.8 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 1132 | 984.750 | 1.0 | 78 | 79 | 57 | 4" | #1 | $H_2O_2$ | 878.1 | 742.8 | |
| 1152 | 996.664 | 1.0 | 80 | 83 | 58 | 4" | #2 | $H_2O_2$ | 760.5 | 748.7 | |
| 1212 | 1008.590 | 1.0 | 81 | 84 | 56 | 4" | #3 | Empty | 467.5 | 466.6 | |
| 1232 | 1019.105 | | | | | | #4 | Silica Gel | 859.4 | 850.0 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: 0.006 CFM @ 16 in. Hg., Post-Test Leak Check: 0.005 CFM @ 11 in. Hg

# FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit - 2
PERFORMED BY: Patrick Whitman TEST DATE: 3/27/2018
BAR. PRESSURE: 30.15 TC READOUT ID: #42
DP INDICATOR ID: CC-2 TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer PITOT TUBE ID: #058 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 4 Ps: 1.73
Start: 1255 Stop: 1325

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.3 | 346 | 5 | .86 | 346 | 5 | 1.3 | 350 |
| 4 | 1.0 | 347 | 4 | .97 | 349 | 4 | 1.2 | 351 |
| 3 | 1.4 | 348 | 3 | .91 | 351 | 3 | 1.3 | 349 |
| 2 | 1.2 | 348 | 2 | .83 | 351 | 2 | 1.5 | 348 |
| 1 | 1.0 | 347 | 1 | .76 | 350 | 1 | 1.1 | 349 |
| | | | | | | | | |
| 5 | 1.3 | 346 | 5 | 1.3 | 349 | 5 | 1.3 | 348 |
| 4 | 1.2 | 348 | 4 | 1.4 | 350 | 4 | 1.2 | 349 |
| 3 | 1.1 | 350 | 3 | .98 | 351 | 3 | 1.3 | 350 |
| 2 | .78 | 351 | 2 | .81 | 352 | 2 | 1.1 | 351 |
| 1 | .70 | 351 | 1 | .77 | 351 | 1 | 1.0 | 350 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
| 1 | 291 | 00.4 | 1 | | | 1 | | |
| 2 | 292 | 00.5 | 2 | | | 2 | | |
| 3 | 293 | 00.3 | 3 | | | 3 | | |

## MOISTURE DATA FOR TEST RUNS 4 THROUGH 4

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.8 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 1255 | 22.500 | 2.5 | 86 | 89 | 56 | 7 | #1 | $H_2O_2$ | ~~813.6~~ 811.8 | 701.8 | |
| 1305 | 30.975 | 2.5 | 87 | 90 | 58 | 7 | #2 | $H_2O_2$ | 710.7 | 704.0 | |
| 1315 | 39.655 | 2.5 | 88 | 91 | 57 | 7 | #3 | Empty | 591.9 | 589.7 | |
| 1325 | 48.660 | | | | | | #4 | Silica Gel | 991.5 | 981.6 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: 0.005 CFM @ 18 in. Hg., Post-Test Leak Check: 0.005 CFM @ 15 in. Hg

# FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit - 2
PERFORMED BY: Patrick Whitman TEST DATE: 3/27/2018
BAR. PRESSURE: 30.19 TC READOUT ID: #42
DP INDICATOR ID: CC-2 TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer PITOT TUBE ID: #058 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

| Run #: 8 | Ps: 1.73 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Start: 1339 | Stop: 1409 | | | | | | | |
| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
| 5 | 1.3 | 349 | 5 | .87 | 350 | 5 | 1.2 | 354 |
| 4 | 1.0 | 350 | 4 | .99 | 351 | 4 | 1.1 | 355 |
| 3 | 1.4 | 355 | 3 | .88 | 353 | 3 | 1.4 | 355 |
| 2 | 1.2 | 356 | 2 | .83 | 355 | 2 | 1.3 | 354 |
| 1 | 1.1 | 355 | 1 | .75 | 354 | 1 | 1.0 | 352 |
| | | | | | | | | |
| 5 | 1.3 | 349 | 5 | 1.2 | 352 | 5 | 1.5 | 351 |
| 4 | 1.1 | 350 | 4 | 1.4 | 355 | 4 | 1.3 | 356 |
| 3 | 1.2 | 353 | 3 | .96 | 355 | 3 | 1.2 | 355 |
| 2 | .74 | 355 | 2 | .78 | 356 | 2 | 1.1 | 354 |
| 1 | .66 | 354 | 1 | .75 | 354 | 1 | 1.1 | 355 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
| 1 | 290 | 00.2 | 1 | | | 1 | | |
| 2 | 293 | 00.3 | 2 | | | 2 | | |
| 3 | 295 | 00.4 | 3 | | | 3 | | |

## MOISTURE DATA FOR TEST RUNS 5 THROUGH 5

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.8 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | T imp | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 1339 | 49.450 | 2.5 | 89 | 90 | 56 | 7" | #1 | $H_2O_2$ | 865.0 | 738.0 | |
| 1349 | 58.565 | 2.5 | 91 | 93 | 55 | 7" | #2 | $H_2O_2$ | 744.4 | 739.7 | |
| 1359 | 67.730 | 2.5 | 92 | 94 | 57 | 7" | #3 | Empty | 468.2 | 467.2 | |
| 1409 | 76.877 | | | | | | #4 | Silica Gel | 867.2 | 859.4 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: <0.005 CFM @ 18 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

## FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit - 2
PERFORMED BY: Patrick Whitman
TEST DATE: 3/28/2018
BAR. PRESSURE: 30.16
TC READOUT ID: #42
DP INDICATOR ID: CC-2
TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer
PITOT TUBE ID: #058
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- Good! POST- ✓

**Run #:** 6 **Ps:** 4.75
Start: 0801 Stop: 0831

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.2 | 346 | 5 | .88 | 346 | 5 | 1.2 | 346 |
| 4 | 1.1 | 346 | 4 | .97 | 346 | 4 | 1.0 | 346 |
| 3 | 1.4 | 347 | 3 | .87 | 347 | 3 | 1.3 | 347 |
| 2 | 1.3 | 347 | 2 | .84 | 347 | 2 | 1.3 | 347 |
| 1 | 1.0 | 346 | 1 | .73 | 346 | 1 | 1.0 | 346 |
| | | | | | | | | |
| 5 | 1.4 | 346 | 5 | 1.3 | 346 | 5 | 1.4 | 346 |
| 4 | 1.1 | 347 | 4 | 1.5 | 346 | 4 | 1.2 | 346 |
| 3 | 1.2 | 346 | 3 | .98 | 346 | 3 | 1.1 | 347 |
| 2 | 0.75 | 345 | 2 | .77 | 347 | 2 | 1.0 | 346 |
| 1 | .68 | 345 | 1 | .76 | 346 | 1 | .98 | 345 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
| 1 | 291 | 022 | 1 | | | 1 | | |
| 2 | 293 | 00.3 | 2 | | | 2 | | |
| 3 | 290 | 00.4 | 3 | | | 3 | | |

### MOISTURE DATA FOR TEST RUNS 6 THROUGH 6

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.9 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 0801 | 78.006 | 2.5 | 70 | 72 | 56 | 7" | #1 | $H_2O_2$ | 848.8 | 737.2 | |
| 0811 | 86.565 | 2.5 | 72 | 72 | 56 | 7" | #2 | $H_2O_2$ | 750.7 | 746.9 | |
| 0821 | 95.335 | 2.5 | 74 | 72 | 58 | 7" | #3 | Empty | 468.0 | 466.2 | |
| 0831 | 104.335 | | | | | | #4 | Silica Gel | 876.3 | 867.2 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: 0.001 CFM @ 17 in. Hg., Post-Test Leak Check: 0.005 CFM @ 15 in. Hg

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# FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit - 2
PERFORMED BY: Patrick Whitman TEST DATE: 3/28/2018
BAR. PRESSURE: 30.16 TC READOUT ID: #42
DP INDICATOR ID: CC-2 TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer PITOT TUBE ID: #058 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- Good POST- Good

Run #: 7 Ps: 1.75
Start: 08:49 Stop: 09:19

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.1 | 347 | 5 | .89 | 347 | 5 | 1.2 | 347 |
| 4 | 1.2 | 347 | 4 | .98 | 347 | 4 | 1.1 | 347 |
| 3 | 1.4 | 346 | 3 | .86 | 347 | 3 | 1.3 | 347 |
| 2 | 1.3 | 347 | 2 | .85 | 346 | 2 | 1.3 | 346 |
| 1 | 1.1 | 346 | 1 | .73 | 346 | 1 | 1.1 | 346 |
| | | | | | | | | |
| 5 | 1.4 | 346 | 5 | 1.2 | 346 | 5 | 1.4 | 347 |
| 4 | 1.0 | 347 | 4 | 1.4 | 347 | 4 | 1.3 | 347 |
| 3 | 1.2 | 347 | 3 | .98 | 346 | 3 | 1.2 | 347 |
| 2 | .77 | 347 | 2 | .76 | 346 | 2 | 1.0 | 346 |
| 1 | .67 | 346 | 1 | .76 | 346 | 1 | .97 | 345 |

| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
|---|---|---|---|---|---|---|---|---|
| 1 | 292 | 00.2 | 1 | | | 1 | | |
| 2 | 291 | 00.2 | 2 | | | 2 | | |
| 3 | 292 | 00.3 | 3 | | | 3 | | |

## MOISTURE DATA FOR TEST RUNS 7 THROUGH 7

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.9 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 08:49 | 105.000 | 2.5 | 74 | 73 | 55 | 7" | #1 | $H_2O_2$ | 829.4 | 710.2 | |
| 08:59 | 113.995 | 2.5 | 76 | 74 | 57 | 7" | #2 | $H_2O_2$ | 712.1 | 705.9 | |
| 09:09 | 123.550 | 2.5 | 78 | 77 | 58 | 7" | #3 | Empty | 591.7 | 590.3 | |
| 09:19 | 132.084 | | | | | | #4 | Silica Gel | 1000.2 | 991.5 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: 0.005 CFM @ 17 in. Hg., Post-Test Leak Check: 0.005 CFM @ 15 in. Hg

# FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit - 2
PERFORMED BY: Patrick Whitman
TEST DATE: 3/28/2018
BAR. PRESSURE: 30.16
TC READOUT ID: #42
DP INDICATOR ID: CC-2
TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer
PITOT TUBE ID: #058
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- Good POST- Good

Run #: 8 Ps: +.75
Start: 09:33 Stop: 10:03

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.2 | 347 | 5 | .89 | 347 | 5 | 1.2 | 347 |
| 4 | 1.1 | 347 | 4 | .97 | 347 | 4 | 1.1 | 348 |
| 3 | 1.3 | 348 | 3 | .87 | 348 | 3 | 1.3 | 348 |
| 2 | 1.3 | 347 | 2 | .85 | 348 | 2 | 1.3 | 347 |
| 1 | 1.1 | 346 | 1 | .74 | 347 | 1 | 1.1 | 347 |
| | | | | | | | | |
| 5 | 1.4 | 347 | 5 | 1.3 | 347 | 5 | 1.4 | 347 |
| 4 | 1.2 | 347 | 4 | 1.5 | 347 | 4 | 1.2 | 348 |
| 3 | 1.2 | 347 | 3 | .99 | 347 | 3 | 1.2 | 348 |
| 2 | .75 | 346 | 2 | .76 | 346 | 2 | 1.1 | 347 |
| 1 | .67 | 346 | 1 | .75 | 347 | 1 | .96 | 347 |

| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
|---|---|---|---|---|---|---|---|---|
| 1 | 292 | 00.2 | 1 | | | 1 | | |
| 2 | 292 | 00.3 | 2 | | | 2 | | |
| 3 | 293 | 00.3 | 3 | | | 3 | | |

## MOISTURE DATA FOR TEST RUNS 8 THROUGH 8

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.9 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | $T_{imp}$ | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 09:33 | 132.600 | 2.5 | 85 | 79 | 57 | 7" | #1 | $H_2O_2$ | 876.7 | 760.4 | |
| 09:43 | 141.605 | 2.5 | 86 | 80 | 57 | 7" | #2 | $H_2O_2$ | 760.7 | 756.3 | |
| 09:53 | 150.625 | 2.5 | 87 | 81 | 58 | 7" | #3 | Empty | 469.8 | 469.3 | |
| 10:03 | 159.658 | | | | | | #4 | Silica Gel | 884.5 | 876.3 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: <0.005 CFM @ 18 in. Hg., Post-Test Leak Check: <0.005 CFM @ 14 in. Hg

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# FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit - 2
PERFORMED BY: Patrick Whitman
TEST DATE: 3/28/2018
BAR. PRESSURE: 30.16
TC READOUT ID: #42
DP INDICATOR ID: CC-2
TC ID: #058
DP INDICATOR TYPE: 0-10" Manometer
PITOT TUBE ID: #058
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- Good. POST- Good.

Run #: 9 Ps: +.75
Start: 10:17 Stop: 10:47

| Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F | Sample Point | Velocity Head inches $H_2O$ | Temp, °F |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.1 | 349 | 5 | .89 | 349 | 5 | 1.1 | 350 |
| 4 | 1.1 | 349 | 4 | .98 | 349 | 4 | 1.2 | 350 |
| 3 | 1.4 | 349 | 3 | .87 | 349 | 3 | 1.3 | 349 |
| 2 | 1.4 | 348 | 2 | .85 | 350 | 2 | 1.2 | 349 |
| 1 | 1.1 | 348 | 1 | .74 | 348 | 1 | 1.0 | 349 |
| | | | | | | | | |
| 5 | 1.3 | 349 | 5 | 1.3 | 349 | 5 | 1.4 | 350 |
| 4 | 1.2 | 350 | 4 | 1.4 | 350 | 4 | 1.3 | 351 |
| 3 | 1.2 | 350 | 3 | .99 | 350 | 3 | 1.1 | 350 |
| 2 | .77 | 349 | 2 | .76 | 349 | 2 | 1.1 | 349 |
| 1 | .69 | 348 | 1 | .75 | 349 | 1 | .97 | 349 |

| | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C | | Heated Line Temp. °F | Chiller Temp. °C |
|---|---|---|---|---|---|---|---|---|
| 1 | 293 | 00.2 | 1 | | | 1 | | |
| 2 | 292 | 00.2 | 2 | | | 2 | | |
| 3 | 293 | 00.3 | 3 | | | 3 | | |

## MOISTURE DATA FOR TEST RUNS 9 THROUGH 9

METER ID: 1-P&M METER Yd: 1.003 BALANCE CHECK WEIGHT: 499.9 / 500

| Dry Gas Meter | | | | | | | Impinger Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Volume | Delta H | Tm (in) | Tm (out) | T imp | Vacuum | No. | Material | End Wt. | Start Wt. | Diff. |
| 10:17 | 160.300 | 2.5 | 88 | 82 | 57 | 7" | #1 | $H_2O_2$ | 818.5 | 702.7 | |
| 10:27 | 169.315 | 2.5 | 89 | 83 | 58 | 7" | #2 | $H_2O_2$ | 707.8 | 701.6 | |
| 10:37 | 178.270 | 2.5 | 90 | 84 | 58 | 7" | #3 | Empty | 590.6 | 589.1 | |
| 10:47 | 187.245 | | | | | | #4 | Silica Gel | 1007.9 | 1000.2 | |
| | | | | | | | Total | | | | |

Pre-Test Leak Check: 0.005 CFM @ 17 in. Hg., Post-Test Leak Check: 0.005 CFM @ 15 in. Hg

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# APPENDIX A.2.7

# UNIT 2 HYDROCARBON DATA

**SCAQMD METHOD 25.3**
**EVACUATED CANISTER SAMPLING DATA**

Client/Facility: Desert View Power Date: 3/27/2018

Unit/Location: Unit 2 Stack Breaching Performed By: Patrick Whitman

Probe Material SS Probe Length 36"

Connecting Tubing Material Teflon Connecting Tubing Length 12"

Barometric Pressure 30.19 Ambient Temperature ~~30.19~~ 70°F

| Test No. | | 1A-VOC-U2 | | 1B-VOC-U2 | | | |
|---|---|---|---|---|---|---|---|
| Vial ID | | M70 | | M71 | | | |
| Canister ID | | 341 | | 114 | | | |
| | | Time | Vacuum | Time | Vacuum | Time | Vacuum |
| Pre-Test Leak Check | Start | 750 | 18 | 750 | 20 | | |
| Pre-Test Leak Check | Stop | 800 | 18 | 800 | 20 | | |
| Sample Collection | Start | 9:54 | 30 | 9:54 | 30 | | |
| | | 10:04 | 25 | 10:04 | 25 | | |
| | | 10:14 | 20 | 10:14 | 20 | | |
| | | 10:24 | 17 | 10:24 | 16 | | |
| | | 10:34 | 12 | 10:34 | 13 | | |
| | | 10:37 | 10 | 10:44 | 10 | | |
| | | | | | | | |
| Sample Collection | Stop | 10:37 | 10 | 10:44 | 10 | | |
| Post -Test Leak Check | Start | 1041 | 9 | 1041 | 9 | | |
| Post-Test Leak Check | Stop | 1051 | 9 | 1051 | 9 | | |
| | | | | | | | |
| Line Rinse Volume | | | | | | | |

Comments:

# APPENDIX A.2.8

# UNIT 2 PLANT DATA

| Timestamp | (Boiler 2) NOx ppm 1-Min | (Boiler 2) NOx ppm @3% O2 1-Min | (Boiler 2) NOx lb/hr 1-Min Avg | (Boiler 2) SO2 ppm 1-Min | (Boiler 2) SO2 ppm @3% O2 1-Min | (Boiler 2) SO2 lb/hr 1-Min Avg | (Boiler 2) CO ppm 1-Min | (Boiler 2) CO ppm @3% O2 1 Min | (Boiler 2) CO lb/hr 1-Min | (Boiler 2) CO2% 1-Min | (Boiler 2) O2% 1-Min | Stack Flow kdscf/hr 1-Min | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/27/2018 8:31 | 28.52 | 44.39 | 19.15 | 5.67 | 8.83 | 5.3 | 1.29 | 15.57 | 4.09 | 11.37 | 9.4 | 5624 | 2.01 | 0.53 |
| 3/27/2018 8:32 | 29.09 | 42.65 | 20.39 | 5.42 | 7.95 | 5.28 | 1.43 | 14.66 | 4.27 | 12.02 | 8.69 | 5870 | 2.10 | 0.61 |
| 3/27/2018 8:33 | 32.41 | 45.79 | 21.69 | 6.08 | 8.59 | 5.66 | 1.55 | 14.13 | 4.07 | 12.48 | 8.23 | 5606 | 2.19 | 0.63 |
| 3/27/2018 8:34 | 39.07 | 53.14 | 28.44 | 9.38 | 12.76 | 9.5 | 1.53 | 13.6 | 4.43 | 12.92 | 7.74 | 6097 | | |
| 3/27/2018 8:35 | 42.77 | 58.4 | 33.47 | 9.24 | 12.62 | 10.06 | 1.44 | 13.65 | 4.76 | 12.87 | 7.79 | 6555 | 1.97 | 0.69 |
| 3/27/2018 8:36 | 36.82 | 54.38 | 26.4 | 7.56 | 11.17 | 7.54 | 1.21 | 14.77 | 4.36 | 11.91 | 8.78 | 6005 | 1.79 | 0.53 |
| 3/27/2018 8:37 | 31.5 | 47.87 | 22.31 | 5.18 | 7.87 | 5.1 | 1.18 | 15.2 | 4.31 | 11.58 | 9.12 | 5933 | 1.79 | 0.51 |
| 3/27/2018 8:38 | 28.9 | 43.11 | 20.04 | 4.13 | 7.46 | 3.98 | 1.06 | 14.92 | 4.22 | 11.83 | 8.9 | 5807 | 1.58 | 0.45 |
| 3/27/2018 8:39 | 31.67 | 45.1 | 22.78 | 4.74 | 7.12 | 4.74 | 1.27 | 14.24 | 4.38 | 12.37 | 8.33 | 6025 | 1.81 | 0.56 |
| 3/27/2018 8:40 | 36.38 | 51.44 | 26.79 | 5.72 | 8.09 | 5.86 | 1.08 | 14.14 | 4.48 | 12.44 | 8.24 | 6169 | 1.53 | 0.48 |
| 3/27/2018 8:41 | 35.13 | 51.17 | 25.67 | 5.59 | 8.14 | 5.68 | 1.25 | 14.56 | 4.45 | 12.07 | 8.61 | 6121 | 1.82 | 0.56 |
| 3/27/2018 8:42 | 33.12 | 48.79 | 23.44 | 4.54 | 7.37 | 4.47 | 1.21 | 14.73 | 4.31 | 11.95 | 8.75 | 5929 | 1.78 | 0.52 |
| 3/27/2018 8:43 | 33.36 | 48.35 | 23.75 | 4.28 | 7.25 | 4.24 | 1.19 | 14.49 | 4.33 | 12.14 | 8.55 | 5964 | 1.72 | 0.52 |
| 3/27/2018 8:44 | 34.81 | 50.13 | 25.15 | 4.58 | 7.2 | 4.6 | 1.28 | 14.4 | 4.4 | 12.22 | 8.47 | 6052 | 1.84 | 0.56 |
| 3/27/2018 8:45 | 36.42 | 52.74 | 25.68 | 4.91 | 7.24 | 4.82 | 1.36 | 14.48 | 4.29 | 12.18 | 8.54 | 5907 | 1.97 | 0.58 |
| 3/27/2018 8:46 | 36.99 | 52.93 | 26.76 | 5.16 | 7.38 | 5.19 | 1.36 | 14.31 | 4.4 | 12.29 | 8.39 | 6059 | 1.95 | 0.60 |
| 3/27/2018 8:47 | 37.78 | 53.25 | 28.13 | 4.89 | 7.05 | 5.07 | 1.51 | 14.09 | 4.53 | 12.5 | 8.2 | 6236 | 2.13 | 0.68 |
| 3/27/2018 8:48 | 35.32 | 52.25 | 24.67 | 5.12 | 7.57 | 4.98 | 1.43 | 14.79 | 4.25 | 11.89 | 8.8 | 5851 | 2.12 | 0.61 |
| 3/27/2018 8:49 | 38.65 | 55.52 | 27.72 | 4.74 | 7.18 | 4.73 | 1.41 | 14.37 | 4.37 | 12.26 | 8.44 | 6008 | 2.03 | 0.62 |
| 3/27/2018 8:50 | 36.44 | 51.12 | 26.04 | 4.98 | 7.01 | 4.95 | 1.6 | 14.03 | 4.35 | 12.58 | 8.14 | 5985 | 2.24 | 0.70 |
| 3/27/2018 8:51 | 36.1 | 50.88 | 25.63 | 5.69 | 8.02 | 5.62 | 1.62 | 14.09 | 4.32 | 12.48 | 8.2 | 5947 | 2.28 | 0.70 |
| 3/27/2018 8:52 | 35.3 | 49.56 | 26.25 | 5.29 | 7.43 | 5.47 | 1.66 | 14.04 | 4.53 | 12.52 | 8.15 | 6228 | 2.33 | 0.75 |
| 3/27/2018 8:53 | 34.5 | 50.66 | 24.32 | 5.3 | 7.78 | 5.2 | 1.47 | 14.68 | 4.29 | 12 | 8.71 | 5905 | 2.16 | 0.63 |
| 3/27/2018 8:54 | 30.77 | 45.26 | 21.27 | 4.55 | 7.35 | 4.38 | 1.41 | 14.71 | 4.21 | 12 | 8.73 | 5790 | 2.07 | 0.59 |
| 3/27/2018 8:55 | 30.78 | 45.31 | 20.92 | 4.92 | 7.36 | 4.65 | 1.37 | 14.72 | 4.14 | 11.94 | 8.74 | 5694 | 2.02 | 0.57 |
| 3/27/2018 8:56 | 31.81 | 45.66 | 23.01 | 5.22 | 7.49 | 5.25 | 1.34 | 14.35 | 4.4 | 12.24 | 8.43 | 6059 | 1.92 | 0.59 |
| 3/27/2018 8:57 | 38.5 | 55.53 | 27.65 | 6.09 | 8.78 | 6.09 | 1.22 | 14.42 | 4.37 | 12.21 | 8.49 | 6016 | 1.76 | 0.53 |
| 3/27/2018 8:58 | 36.65 | 54.99 | 25.13 | 6.46 | 9.69 | 6.16 | 1.19 | 15 | 4.17 | 11.72 | 8.97 | 5744 | 1.79 | 0.50 |
| 3/27/2018 8:59 | 40.3 | 57.62 | 28.42 | 5.9 | 8.44 | 5.79 | 1.1 | 14.3 | 4.29 | 12.32 | 8.38 | 5907 | 1.57 | 0.47 |
| 3/27/2018 9:00 | 40.37 | 57.95 | 29.7 | 7.24 | 10.39 | 7.41 | 1.24 | 14.35 | 4.48 | 12.25 | 8.43 | 6163 | 1.78 | 0.56 |
| 3/27/2018 9:01 | 37.53 | 56.08 | 27.3 | 6.6 | 9.86 | 6.68 | 1.13 | 14.94 | 4.43 | 11.8 | 8.92 | 6094 | 1.69 | 0.50 |
| 3/27/2018 9:02 | 35.32 | 53.67 | 24.63 | 5.85 | 8.89 | 5.67 | 0.88 | 15.2 | 4.24 | 11.62 | 9.12 | 5840 | 1.34 | 0.37 |
| 3/27/2018 9:03 | 36.02 | 53.73 | 25.64 | 6.04 | 9.01 | 5.98 | 0.97 | 14.92 | 4.33 | 11.83 | 8.9 | 5962 | 1.45 | 0.42 |
| 3/27/2018 9:04 | 36.71 | 54.53 | 26.24 | 6.68 | 9.92 | 6.64 | 1.04 | 14.85 | 4.35 | 11.86 | 8.85 | 5988 | 1.54 | 0.45 |
| 3/27/2018 9:05 | 38.65 | 56.94 | 27.84 | 6.65 | 9.8 | 6.66 | 1.19 | 14.73 | 4.38 | 11.96 | 8.75 | 6033 | 1.75 | 0.52 |
| 3/27/2018 9:06 | 35.55 | 52.98 | 24.75 | 7.04 | 10.49 | 6.82 | 1.28 | 14.9 | 4.24 | 11.85 | 8.89 | 5831 | 1.91 | 0.54 |
| 3/27/2018 9:07 | 35.33 | 51.04 | 25.22 | 6.96 | 10.06 | 6.91 | 1.33 | 14.45 | 4.34 | 12.2 | 8.51 | 5979 | 1.92 | 0.58 |
| 3/27/2018 9:08 | 35.25 | 50.36 | 23.99 | 7.39 | 10.56 | 7 | 1.44 | 14.29 | 4.14 | 12.32 | 8.37 | 5701 | 2.06 | 0.60 |
| 3/27/2018 9:09 | 42.19 | 58.27 | 31.09 | 10.45 | 14.43 | 10.72 | 1.52 | 13.81 | 4.49 | 12.73 | 7.94 | 6173 | 2.10 | 0.68 |
| 3/27/2018 9:10 | 41.41 | 58.97 | 30.21 | 9.86 | 14.04 | 10.01 | 1.42 | 14.24 | 4.44 | 12.36 | 8.33 | 6111 | 2.02 | 0.63 |
| 3/27/2018 9:11 | 35.05 | 51.77 | 25.42 | 7.6 | 11.22 | 7.67 | 1.41 | 14.77 | 4.41 | 11.91 | 8.78 | 6075 | 2.08 | 0.62 |
| 3/27/2018 9:12 | 30.53 | 45.73 | 19.9 | 5.76 | 8.63 | 5.22 | 1.22 | 14.98 | 3.97 | 11.79 | 8.95 | 5460 | 1.83 | 0.48 |
| 3/27/2018 9:13 | 37.51 | 51.49 | 27.02 | 7.76 | 10.65 | 7.78 | 1.37 | 13.73 | 4.38 | 12.82 | 7.86 | 6033 | 1.88 | 0.60 |
| 3/27/2018 9:14 | 40.69 | 57.49 | 29.74 | 9.31 | 13.15 | 9.47 | 1.38 | 14.13 | 4.45 | 12.41 | 8.23 | 6123 | 1.95 | 0.61 |
| 3/27/2018 9:15 | 39.9 | 58.98 | 28.2 | 7.68 | 11.35 | 7.55 | 1.24 | 14.78 | 4.3 | 11.9 | 8.79 | 5919 | 1.83 | 0.53 |
| 3/27/2018 9:16 | 35.51 | 53.06 | 25.31 | 6.52 | 9.74 | 6.47 | 1.07 | 14.94 | 4.34 | 11.79 | 8.92 | 5970 | 1.60 | 0.46 |
| 3/27/2018 9:17 | 30.99 | 47.29 | 21.9 | 5.14 | 7.84 | 5.05 | 0.92 | 15.26 | 4.3 | 11.55 | 9.17 | 5918 | 1.40 | 0.40 |
| 3/27/2018 9:18 | 29.65 | 44.19 | 20.45 | 4.03 | 7.45 | 3.87 | 0.92 | 14.9 | 4.2 | 11.85 | 8.89 | 5777 | 1.37 | 0.39 |
| 3/27/2018 9:19 | 31.8 | 48.32 | 22.68 | 4.91 | 7.60 | 4.87 | 1.03 | 15.2 | 4.34 | 11.56 | 9.12 | 5974 | 1.57 | 0.45 |
| 3/27/2018 9:20 | 29 | 43.4 | 19.37 | 3.8 | 7.48 | 3.53 | 0.84 | 14.97 | 4.07 | 11.82 | 8.94 | 5594 | 1.26 | 0.34 |
| 3/27/2018 9:21 | 35.39 | 49.07 | 25.99 | 5.03 | 6.97 | 5.14 | 1.02 | 13.87 | 4.47 | 12.71 | 7.99 | 6152 | 1.41 | 0.46 |
| 3/27/2018 9:22 | 36.23 | 52.09 | 25.82 | 6.67 | 9.59 | 6.61 | 1.04 | 14.38 | 4.34 | 12.23 | 8.45 | 5969 | 1.50 | 0.45 |
| 3/27/2018 9:23 | 35.44 | 52.17 | 25.84 | 6.04 | 8.89 | 6.13 | 1.02 | 14.72 | 4.44 | 11.94 | 8.74 | 6108 | 1.50 | 0.45 |
| 3/27/2018 9:24 | 31.74 | 47.78 | 22.3 | 4.57 | 7.53 | 4.47 | 1.04 | 15.05 | 4.28 | 11.72 | 9.01 | 5886 | 1.57 | 0.44 |
| 3/27/2018 9:25 | 32.25 | 47.67 | 22.75 | 4.29 | 7.39 | 4.21 | 1 | 14.78 | 4.29 | 11.93 | 8.79 | 5909 | 1.48 | 0.43 |
| 3/27/2018 9:26 | 34.76 | 51.42 | 24.36 | 4.77 | 7.4 | 4.65 | 1.12 | 14.79 | 4.27 | 11.89 | 8.8 | 5871 | 1.66 | 0.48 |
| 3/27/2018 9:27 | 35.26 | 50.53 | 25.29 | 4.94 | 7.17 | 4.93 | 1.29 | 14.33 | 4.37 | 12.31 | 8.41 | 6008 | 1.85 | 0.56 |
| 3/27/2018 9:28 | 39.79 | 56.44 | 27.2 | 6.21 | 8.81 | 5.91 | 1.45 | 14.18 | 4.16 | 12.42 | 8.28 | 5725 | 2.06 | 0.60 |
| 3/27/2018 9:29 | 42.25 | 58.35 | 30.59 | 8.04 | 11.10 | 8.1 | 1.47 | 13.81 | 4.41 | 12.71 | 7.94 | 6065 | 2.03 | 0.65 |
| 3/27/2018 9:30 | 42.12 | 59.55 | 30.62 | 8.49 | 12.00 | 8.59 | 1.43 | 14.14 | 4.43 | 12.44 | 8.24 | 6090 | 2.02 | 0.63 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Average** | **35.50** | **51.49** | **25.31** | **6.06** | **8.96** | **6.02** | **1.26** | | **12.13** | **8.57** | **5959.90** | **1.82** | **0.55** |

| | | |
|---|---|---|
| Flow | kdscfh | 5959.90 |
| O2 | % dry | 8.57 |
| CO2 | % dry | 12.13 |
| NOx | ppm dry | 35.50 |
| NOx | ppm @ 3% O2 | 51.49 |
| NOx | lb/hr | 25.31 |
| SO2 | ppm dry | 6.06 |
| SO2 | ppm @ 3% O2 | 8.96 |
| SO2 | lb/hr | 6.02 |
| CO | ppm dry | 1.26 |
| CO | ppm @ 3% O2 | 1.82 |
| CO | lb/hr | 0.55 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 2) NOx ppm 1-Min | (Boiler 2) NOx ppm @3% O2 1-Min | (Boiler 2) NOx lb/hr 1-Min Avg | (Boiler 2) SO2 ppm 1-Min | (Boiler 2) SO2 ppm @3% O2 1-Min | (Boiler 2) SO2 lb/hr 1-Min Avg | (Boiler 2) CO ppm 1-Min | (Boiler 2) CO ppm @3% O2 1 Min | (Boiler 2) CO lb/hr 1-Min | (Boiler 2) CO2% 1-Min | (Boiler 2) O2% 1-Min | Stack Flow kdscf/hr 1-Min | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/27/2018 9:55 | 41.46 | 62.52 | 31.01 | 11.49 | 17.33 | 11.96 | 1.26 | 15.08 | 4.55 | 11.66 | 9.03 | 6265 | 1.90 | 0.57 |
| 3/27/2018 9:56 | 29.23 | 45.82 | 18.5 | 5.61 | 8.79 | 4.94 | 1.08 | 15.67 | 3.85 | 11.32 | 9.48 | 5302 | 1.69 | 0.42 |
| 3/27/2018 9:57 | 35.03 | 49.61 | 25.05 | 6.69 | 9.47 | 6.66 | 1.09 | 14.16 | 4.35 | 12.45 | 8.26 | 5990 | 1.54 | 0.47 |
| 3/27/2018 9:58 | 37.76 | 53.18 | 25.08 | 7.78 | 10.96 | 7.19 | 0.93 | 14.08 | 4.04 | 12.55 | 8.19 | 5563 | 1.31 | 0.38 |
| 3/27/2018 9:59 | 44.55 | 59.78 | 33.58 | 10.64 | 14.28 | 11.16 | 1.01 | 13.42 | 4.59 | 13.11 | 7.56 | 6314 | 1.36 | 0.46 |
| 3/27/2018 10:00 | 39.17 | 54.95 | 27.42 | 9.04 | 12.68 | 8.8 | 0.99 | 14.03 | 4.26 | 12.56 | 8.14 | 5863 | 1.39 | 0.42 |
| 3/27/2018 10:01 | 41.32 | 58.65 | 30.09 | 9.21 | 13.07 | 9.33 | 0.94 | 14.2 | 4.43 | 12.38 | 8.29 | 6100 | 1.33 | 0.42 |
| 3/27/2018 10:02 | 37.19 | 53.69 | 25.78 | 7.88 | 11.38 | 7.6 | 0.91 | 14.44 | 4.22 | 12.23 | 8.5 | 5807 | 1.31 | 0.38 |
| 3/27/2018 10:03 | 34.51 | 50.18 | 23.88 | 8.45 | 12.29 | 8.14 | 1.01 | 14.54 | 4.21 | 12.11 | 8.59 | 5796 | 1.47 | 0.43 |
| 3/27/2018 10:04 | 36.03 | 52.39 | 26.15 | 8.11 | 11.79 | 8.19 | 1.08 | 14.54 | 4.42 | 12.11 | 8.59 | 6079 | 1.57 | 0.48 |
| 3/27/2018 10:05 | 28.72 | 42.17 | 19.36 | 7.1 | 10.43 | 6.66 | 1.02 | 14.68 | 4.1 | 12.04 | 8.71 | 5645 | 1.50 | 0.42 |
| 3/27/2018 10:06 | 30.49 | 43.32 | 21.56 | 8.52 | 12.1 | 8.38 | 1.28 | 14.21 | 4.3 | 12.39 | 8.3 | 5922 | 1.82 | 0.55 |
| 3/27/2018 10:07 | 32.54 | 45.76 | 22.45 | 9.53 | 13.4 | 9.15 | 1.26 | 14.06 | 4.2 | 12.55 | 8.17 | 5779 | 1.77 | 0.53 |
| 3/27/2018 10:08 | 34.87 | 49.5 | 26.02 | 11.51 | 16.34 | 11.95 | 1.28 | 14.2 | 4.54 | 12.39 | 8.29 | 6251 | 1.82 | 0.58 |
| 3/27/2018 10:09 | 30.5 | 44.82 | 20.74 | 8.23 | 12.09 | 7.79 | 1.33 | 14.7 | 4.14 | 12.05 | 8.72 | 5695 | 1.95 | 0.55 |
| 3/27/2018 10:10 | 32.9 | 47.88 | 23.05 | 7.92 | 11.53 | 7.72 | 1.38 | 14.55 | 4.27 | 12.12 | 8.6 | 5869 | 2.01 | 0.59 |
| 3/27/2018 10:11 | 32.85 | 47.19 | 23.08 | 7.43 | 10.67 | 7.26 | 1.26 | 14.37 | 4.28 | 12.29 | 8.44 | 5884 | 1.81 | 0.54 |
| 3/27/2018 10:12 | 34.43 | 48.87 | 24.19 | 7.83 | 11.11 | 7.65 | 1.41 | 14.2 | 4.28 | 12.44 | 8.29 | 5885 | 2.00 | 0.60 |
| 3/27/2018 10:13 | 35.9 | 51.74 | 25.41 | 8.74 | 12.6 | 8.61 | 1.42 | 14.41 | 4.31 | 12.22 | 8.48 | 5928 | 2.05 | 0.61 |
| 3/27/2018 10:14 | 35.76 | 51.09 | 24.74 | 7.43 | 10.61 | 7.15 | 1.21 | 14.29 | 4.21 | 12.38 | 8.37 | 5796 | 1.73 | 0.51 |
| 3/27/2018 10:15 | 37.54 | 54.63 | 26.51 | 8.55 | 12.44 | 8.4 | 1.2 | 14.55 | 4.3 | 12.09 | 8.6 | 5915 | 1.75 | 0.52 |
| 3/27/2018 10:16 | 36.82 | 54.47 | 25.24 | 7.79 | 11.52 | 7.43 | 1.1 | 14.79 | 4.17 | 11.95 | 8.8 | 5741 | 1.63 | 0.46 |
| 3/27/2018 10:17 | 38.07 | 55.09 | 27.93 | 7.38 | 10.68 | 7.53 | 1.07 | 14.47 | 4.47 | 12.18 | 8.53 | 6145 | 1.55 | 0.48 |
| 3/27/2018 10:18 | 35.89 | 53.05 | 22.97 | 7.07 | 10.45 | 6.29 | 0.9 | 14.78 | 3.9 | 11.99 | 8.79 | 5360 | 1.33 | 0.35 |
| 3/27/2018 10:19 | 44.75 | 61.43 | 33.46 | 10.56 | 14.5 | 10.98 | 1.05 | 13.73 | 4.55 | 12.82 | 7.86 | 6262 | 1.44 | 0.48 |
| 3/27/2018 10:20 | 40.71 | 58.3 | 28.6 | 9.91 | 14.19 | 9.69 | 0.96 | 14.32 | 4.28 | 12.34 | 8.4 | 5884 | 1.37 | 0.41 |
| 3/27/2018 10:21 | 39.43 | 56.65 | 28.36 | 8.86 | 12.73 | 8.87 | 0.97 | 14.37 | 4.38 | 12.27 | 8.44 | 6025 | 1.39 | 0.42 |
| 3/27/2018 10:22 | 36.83 | 54.66 | 25.49 | 8.01 | 11.89 | 7.71 | 0.9 | 14.84 | 4.21 | 11.87 | 8.84 | 5797 | 1.34 | 0.38 |
| 3/27/2018 10:23 | 37.54 | 54.59 | 26.33 | 7.61 | 11.07 | 7.43 | 0.89 | 14.54 | 4.27 | 12.13 | 8.59 | 5875 | 1.29 | 0.38 |
| 3/27/2018 10:24 | 38.14 | 54.7 | 27.62 | 8.18 | 11.73 | 8.24 | 0.99 | 14.34 | 4.41 | 12.29 | 8.42 | 6065 | 1.42 | 0.44 |
| 3/27/2018 10:25 | 38.84 | 55.4 | 28.29 | 7.91 | 11.28 | 8.01 | 1 | 14.26 | 4.43 | 12.36 | 8.35 | 6100 | 1.43 | 0.44 |
| 3/27/2018 10:26 | 36.95 | 54.21 | 25.79 | 8.5 | 12.47 | 8.26 | 1.09 | 14.67 | 4.25 | 12.01 | 8.7 | 5847 | 1.60 | 0.46 |
| 3/27/2018 10:27 | 35.99 | 52.25 | 26.64 | 8.06 | 11.7 | 8.3 | 1.18 | 14.52 | 4.5 | 12.14 | 8.57 | 6199 | 1.71 | 0.53 |
| 3/27/2018 10:28 | 31.22 | 46.11 | 21.27 | 6.82 | 10.07 | 6.47 | 1.14 | 14.77 | 4.15 | 11.98 | 8.78 | 5707 | 1.68 | 0.47 |
| 3/27/2018 10:29 | 32.19 | 46.47 | 23.87 | 7.63 | 11.01 | 7.87 | 1.28 | 14.44 | 4.51 | 12.2 | 8.5 | 6212 | 1.85 | 0.58 |
| 3/27/2018 10:30 | 31.06 | 45.57 | 21.26 | 6.37 | 9.35 | 6.07 | 1.34 | 14.67 | 4.17 | 12.07 | 8.7 | 5733 | 1.97 | 0.56 |
| 3/27/2018 10:31 | 36.78 | 52.5 | 25.91 | 7.61 | 10.86 | 7.46 | 1.27 | 14.27 | 4.29 | 12.36 | 8.36 | 5901 | 1.81 | 0.54 |
| 3/27/2018 10:32 | 38.03 | 53.6 | 25.95 | 8.08 | 11.39 | 7.67 | 1.31 | 14.09 | 4.15 | 12.54 | 8.2 | 5716 | 1.85 | 0.54 |
| 3/27/2018 10:33 | 38.85 | 53.04 | 28.28 | 9.13 | 12.47 | 9.25 | 1.38 | 13.65 | 4.43 | 12.92 | 7.79 | 6098 | 1.88 | 0.61 |
| 3/27/2018 10:34 | 38.76 | 55.59 | 29.14 | 9.06 | 12.99 | 9.48 | 1.33 | 14.34 | 4.58 | 12.29 | 8.42 | 6297 | 1.91 | 0.61 |
| 3/27/2018 10:35 | 31.56 | 47.96 | 22.07 | 6.18 | 9.39 | 6.01 | 1.04 | 15.2 | 4.26 | 11.66 | 9.12 | 5857 | 1.58 | 0.44 |
| 3/27/2018 10:36 | 29.06 | 44.73 | 19.33 | 4.98 | 7.7 | 4.61 | 1.03 | 15.39 | 4.05 | 11.49 | 9.27 | 5572 | 1.59 | 0.42 |
| 3/27/2018 10:37 | 33.27 | 47.23 | 22.26 | 4.57 | 7.1 | 4.25 | 1.11 | 14.2 | 4.07 | 12.49 | 8.29 | 5603 | 1.58 | 0.45 |
| 3/27/2018 10:38 | 43.79 | 58.67 | 32.91 | 7.44 | 9.97 | 7.78 | 1.1 | 13.4 | 4.57 | 13.18 | 7.54 | 6295 | 1.47 | 0.50 |
| 3/27/2018 10:39 | 43.65 | 62.76 | 31.78 | 8.25 | 11.86 | 8.36 | 0.96 | 14.38 | 4.43 | 12.24 | 8.45 | 6098 | 1.38 | 0.43 |
| 3/27/2018 10:40 | 37.58 | 55.82 | 25.64 | 5.89 | 8.75 | 5.59 | 0.77 | 14.85 | 4.15 | 11.92 | 8.85 | 5715 | 1.14 | 0.32 |
| 3/27/2018 10:41 | 38.08 | 54.79 | 26.5 | 5.62 | 8.09 | 5.44 | 0.8 | 14.39 | 4.24 | 12.28 | 8.46 | 5828 | 1.15 | 0.34 |
| 3/27/2018 10:42 | 36.54 | 51.58 | 25.68 | 5.9 | 8.33 | 5.77 | 0.79 | 14.12 | 4.28 | 12.52 | 8.22 | 5887 | 1.12 | 0.34 |
| 3/27/2018 10:43 | 34.95 | 50.57 | 24.48 | 6.5 | 9.41 | 6.33 | 0.85 | 14.47 | 4.26 | 12.18 | 8.53 | 5867 | 1.23 | 0.36 |
| 3/27/2018 10:44 | 37.74 | 53.32 | 24.84 | 6.11 | 8.63 | 5.6 | 0.89 | 14.13 | 4.01 | 12.53 | 8.23 | 5513 | 1.26 | 0.36 |
| 3/27/2018 10:45 | 44.27 | 60.17 | 33.64 | 9.25 | 12.57 | 9.78 | 1.15 | 13.59 | 4.63 | 12.95 | 7.73 | 6365 | 1.56 | 0.53 |
| 3/27/2018 10:46 | 40.18 | 58.19 | 29.1 | 8.22 | 11.9 | 8.28 | 1.09 | 14.48 | 4.41 | 12.19 | 8.54 | 6067 | 1.58 | 0.48 |
| 3/27/2018 10:47 | 35.81 | 54 | 24.22 | 6.76 | 10.19 | 6.36 | 0.89 | 15.08 | 4.12 | 11.75 | 9.03 | 5665 | 1.34 | 0.37 |
| 3/27/2018 10:48 | 36.38 | 52.9 | 24.94 | 6.54 | 9.51 | 6.24 | 1.01 | 14.54 | 4.17 | 12.16 | 8.59 | 5743 | 1.47 | 0.42 |
| 3/27/2018 10:49 | 38.3 | 54.76 | 27.44 | 7.74 | 11.07 | 7.71 | 1.09 | 14.3 | 4.36 | 12.35 | 8.38 | 6000 | 1.56 | 0.48 |
| 3/27/2018 10:50 | 37.32 | 54.27 | 26.85 | 7.45 | 10.83 | 7.46 | 1.01 | 14.54 | 4.38 | 12.13 | 8.59 | 6026 | 1.47 | 0.44 |
| 3/27/2018 10:51 | 35.5 | 52 | 25.77 | 6.78 | 9.93 | 6.85 | 1.19 | 14.65 | 4.42 | 12.05 | 8.68 | 6080 | 1.74 | 0.53 |
| 3/27/2018 10:52 | 33.57 | 50.79 | 22.64 | 6.43 | 9.73 | 6.03 | 1.09 | 15.13 | 4.1 | 11.69 | 9.07 | 5648 | 1.65 | 0.45 |
| 3/27/2018 10:53 | 34.56 | 49.97 | 23.67 | 6.47 | 9.35 | 6.16 | 1.14 | 14.46 | 4.17 | 12.22 | 8.52 | 5736 | 1.65 | 0.48 |
| 3/27/2018 10:54 | 40.9 | 57.06 | 28.79 | 7.82 | 10.91 | 7.66 | 1.02 | 13.95 | 4.28 | 12.65 | 8.07 | 5896 | 1.42 | 0.44 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Average** | **36.54** | **52.62** | **25.81** | **7.79** | **11.22** | **7.67** | **1.09** | | **12.25** | **8.48** | **5901.22** | **1.57** | **0.47** |

| | | |
|---|---|---|
| Flow | kdscfh | 5901.22 |
| O2 | % dry | 8.48 |
| CO2 | % dry | 12.25 |
| NOx | ppm dry | 36.54 |
| NOx | ppm @ 3% O2 | 52.62 |
| NOx | lb/hr | 25.81 |
| SO2 | ppm dry | 7.79 |
| SO2 | ppm @ 3% O2 | 11.22 |
| SO2 | lb/hr | 7.67 |
| CO | ppm dry | 1.09 |
| CO | ppm @ 3% O2 | 1.57 |
| CO | lb/hr | 0.47 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 2) NOx ppm 1-Min | (Boiler 2) NOx ppm @3% O2 1-Min | (Boiler 2) NOx lb/hr 1-Min Avg | (Boiler 2) SO2 ppm 1-Min | (Boiler 2) SO2 ppm @3% O2 1-Min | (Boiler 2) SO2 lb/hr 1-Min Avg | (Boiler 2) CO ppm 1-Min | (Boiler 2) CO ppm @3% O2 1 Min | (Boiler 2) CO lb/hr 1-Min | (Boiler 2) CO2% 1-Min | (Boiler 2) O2% 1-Min | Stack Flow kdscf/hr 1-Min | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/27/2018 11:33 | 32.33 | 48.71 | 22.77 | 7.57 | 11.41 | 7.42 | 1 08 | 15.07 | 4.29 | 11.68 | 9.02 | 5898 | 1.63 | 0.46 |
| 3/27/2018 11:34 | 30.95 | 45.94 | 21.61 | 6.73 | 9.99 | 6.54 | 1.01 | 14.84 | 4.25 | 11.87 | 8.84 | 5848 | 1.50 | 0.43 |
| 3/27/2018 11:35 | 34.27 | 50.53 | 24.24 | 7.72 | 11.38 | 7.6 | 0.94 | 14.74 | 4.31 | 11.94 | 8 76 | 5924 | 1.39 | 0.40 |
| 3/27/2018 11:36 | 33.92 | 49.08 | 23.21 | 7.36 | 10.65 | 7.01 | 0.79 | 14.47 | 4.17 | 12.16 | 8.53 | 5732 | 1 14 | 0.33 |
| 3/27/2018 11:37 | 39.51 | 54.15 | 28.12 | 9.16 | 12.55 | 9.07 | 0.97 | 13.71 | 4.33 | 12.84 | 7.84 | 5962 | 1 33 | 0.42 |
| 3/27/2018 11:38 | 41.64 | 58.69 | 30.69 | 11.71 | 16.5 | 12.01 | 0.81 | 14.09 | 4.49 | 12.43 | 8.2 | 6173 | 1.14 | 0.36 |
| 3/27/2018 11:39 | 40.39 | 58.07 | 27.97 | 9.1 | 13.08 | 8.77 | 0.61 | 14.38 | 4.21 | 12.24 | 8.45 | 5800 | 0.88 | 0.26 |
| 3/27/2018 11:40 | 42.74 | 61.06 | 32.03 | 9.75 | 13.93 | 10.17 | 0.65 | 14.29 | 4.56 | 12.28 | 8.37 | 6278 | 0.93 | 0.30 |
| 3/27/2018 11:41 | 34.63 | 53.67 | 24.32 | 8.13 | 12.6 | 7.94 | 0.64 | 15.5 | 4.27 | 11.35 | 9.35 | 5882 | 0.99 | 0.27 |
| 3/27/2018 11:42 | 32.38 | 49.29 | 21.45 | 6.36 | 9.68 | 5.86 | 0.75 | 15.22 | 4.03 | 11.61 | 9.14 | 5548 | 1.14 | 0.30 |
| 3/27/2018 11:43 | 36.38 | 51.68 | 26.54 | 8.23 | 11.69 | 8.35 | 0.73 | 14.21 | 4.44 | 12.39 | 8.3 | 6110 | 1.04 | 0.32 |
| 3/27/2018 11:44 | 36.25 | 53.14 | 25.94 | 8.86 | 12.99 | 8.82 | 0.69 | 14.66 | 4.36 | 12.01 | 8 69 | 5993 | 1 01 | 0.30 |
| 3/27/2018 11:45 | 35.98 | 54.21 | 26.1 | 7.83 | 11.8 | 7.9 | 0.77 | 15.07 | 4.41 | 11.67 | 9.02 | 6075 | 1.16 | 0.34 |
| 3/27/2018 11:46 | 31.99 | 49.36 | 21.3 | 6.6 | 10 18 | 6.11 | 0.81 | 15.43 | 4.05 | 11.44 | 9.3 | 5577 | 1.25 | 0.33 |
| 3/27/2018 11:47 | 39.22 | 56.85 | 27.47 | 7.71 | 11.17 | 7.51 | 0.87 | 14.49 | 4.26 | 12.13 | 8.55 | 5866 | 1.26 | 0.37 |
| 3/27/2018 11:48 | 38.68 | 54.26 | 27.6 | 9.27 | 13 | 9.2 | 0.97 | 14.03 | 4.34 | 12.57 | 8.14 | 5976 | 1.36 | 0.42 |
| 3/27/2018 11:49 | 38.83 | 55.21 | 28.52 | 10.54 | 14.99 | 10.77 | 1.04 | 14.22 | 4.47 | 12.35 | 8.31 | 6152 | 1.48 | 0.46 |
| 3/27/2018 11:50 | 36.71 | 55.03 | 26.91 | 9.19 | 13.78 | 9.37 | 1.03 | 14.99 | 4.46 | 11.72 | 8.96 | 6139 | 1.54 | 0.46 |
| 3/27/2018 11:51 | 30.03 | 46.02 | 20.1 | 6.94 | 10.64 | 6.46 | 0.9 | 15.33 | 4.07 | 11.53 | 9.22 | 5606 | 1.38 | 0.37 |
| 3/27/2018 11:52 | 35.24 | 50.54 | 25.04 | 7.71 | 11.06 | 7 62 | 1.06 | 14.34 | 4.32 | 12.26 | 8.42 | 5951 | 1.52 | 0.46 |
| 3/27/2018 11:53 | 34.78 | 49.53 | 24.94 | 9.05 | 12.89 | 9.03 | 1.16 | 14.24 | 4.36 | 12.36 | 8.33 | 6006 | 1.65 | 0.51 |
| 3/27/2018 11:54 | 38.2 | 54.62 | 27.18 | 9.14 | 13.07 | 9.05 | 1.22 | 14.3 | 4.33 | 12 29 | 8.38 | 5960 | 1.74 | 0.53 |
| 3/27/2018 11:55 | 38.39 | 54.07 | 26.99 | 8.86 | 12.48 | 8.67 | 1.01 | 14.08 | 4.28 | 12.49 | 8.19 | 5889 | 1.42 | 0.43 |
| 3/27/2018 11:56 | 42.97 | 59.39 | 31.4 | 10.37 | 14.33 | 10.54 | 0.98 | 13.82 | 4.45 | 12.72 | 7.95 | 6121 | 1.35 | 0.44 |
| 3/27/2018 11:57 | 42.91 | 62.55 | 31.16 | 10.44 | 15.22 | 10.55 | 0.8 | 14.58 | 4.42 | 12 03 | 8.62 | 6083 | 1.17 | 0.35 |
| 3/27/2018 11:58 | 36.24 | 52.83 | 25.55 | 8.05 | 11.73 | 7.9 | 0.75 | 14.58 | 4.29 | 12.09 | 8.62 | 5905 | 1.09 | 0.32 |
| 3/27/2018 11:59 | 37.32 | 53.49 | 27.41 | 8.31 | 11.91 | 8.49 | 0.75 | 14.33 | 4.47 | 12.29 | 8.41 | 6153 | 1.07 | 0.34 |
| 3/27/2018 12:00 | 34.71 | 51.22 | 24.04 | 7.87 | 11 61 | 7.58 | 0.74 | 14.76 | 4.22 | 11.94 | 8.77 | 5801 | 1.09 | 0.31 |
| 3/27/2018 12:01 | 35.98 | 53.71 | 25.51 | 7.71 | 11.51 | 7 6 | 0.74 | 14.93 | 4.32 | 11.75 | 8.91 | 5938 | 1.10 | 0.32 |
| 3/27/2018 12:02 | 34.17 | 50.34 | 24.51 | 6.81 | 10.03 | 6.8 | 0.64 | 14.73 | 4.37 | 11.97 | 8.75 | 6008 | 0.94 | 0.28 |
| 3/27/2018 12:03 | 31.9 | 47.82 | 22.9 | 6.69 | 10.03 | 6.68 | 0.78 | 14 99 | 4.37 | 11.73 | 8.96 | 6012 | 1.17 | 0.34 |
| 3/27/2018 12:04 | 31.05 | 47 34 | 21.42 | 6.16 | 9.39 | 5.91 | 0.74 | 15.25 | 4.2 | 11.57 | 9.16 | 5777 | 1.13 | 0.31 |
| 3/27/2018 12:05 | 33.63 | 50.21 | 24.92 | 5.92 | 8.84 | 6.1 | 0.68 | 14.93 | 4.51 | 11.78 | 8.91 | 6206 | 1.02 | 0.31 |
| 3/27/2018 12:06 | 31.04 | 49.04 | 21.92 | 5.63 | 8.89 | 5.53 | 0.75 | 15.8 | 4.3 | 11.19 | 9.57 | 5916 | 1.18 | 0.32 |
| 3/27/2018 12:07 | 30.61 | 46.28 | 21.32 | 5.08 | 7.68 | 4.92 | 0.85 | 15.12 | 4.24 | 11.71 | 9.06 | 5834 | 1.29 | 0.36 |
| 3/27/2018 12:08 | 31.99 | 48.08 | 22.3 | 6.95 | 10.45 | 6.74 | 1.11 | 15.03 | 4.24 | 11.7 | 8.99 | 5840 | 1.67 | 0.47 |
| 3/27/2018 12:09 | 33.24 | 48.85 | 23.16 | 7.34 | 10.79 | 7.12 | 0.99 | 14.7 | 4.24 | 11.97 | 8.72 | 5836 | 1.45 | 0.42 |
| 3/27/2018 12:10 | 38.9 | 54.19 | 27.97 | 9.01 | 12.55 | 9.01 | 1.18 | 13.93 | 4.38 | 12.64 | 8.05 | 6022 | 1.64 | 0.52 |
| 3/27/2018 12:11 | 47 13 | 66.53 | 34.3 | 12.69 | 17.91 | 12.85 | 1.13 | 14.12 | 4 43 | 12.44 | 8.22 | 6096 | 1.60 | 0.50 |
| 3/27/2018 12:12 | 45.22 | 66.08 | 34.31 | 10.73 | 15.68 | 11.33 | 1.04 | 14.61 | 4.62 | 12 | 8.65 | 6355 | 1.52 | 0.48 |
| 3/27/2018 12:13 | 36.73 | 56.19 | 24.59 | 7.69 | 11.77 | 7.16 | 0.96 | 15.3 | 4.07 | 11.54 | 9.2 | 5607 | 1.47 | 0.39 |
| 3/27/2018 12:14 | 39.79 | 56.53 | 29.18 | 8.79 | 12.49 | 8.97 | 1.01 | 14.21 | 4.46 | 12.39 | 8 3 | 6143 | 1.43 | 0.45 |
| 3/27/2018 12:15 | 40.26 | 59.71 | 28.57 | 9.88 | 14.65 | 9.76 | 1 | 14.83 | 4.32 | 11.84 | 8.83 | 5945 | 1.48 | 0.43 |
| 3/27/2018 12:16 | 35.6 | 53.1 | 25.22 | 8.22 | 12.26 | 8.1 | 0.94 | 14.92 | 4.31 | 11.8 | 8.9 | 5934 | 1 40 | 0.41 |
| 3/27/2018 12:17 | 36.3 | 52.74 | 24.73 | 7.38 | 10.72 | 6.99 | 0.65 | 14.53 | 4.15 | 12.13 | 8.58 | 5706 | 0 94 | 0.27 |
| 3/27/2018 12:18 | 44.53 | 61.79 | 31.54 | 10.25 | 14.22 | 10.1 | 0.75 | 13.88 | 4.31 | 12.69 | 8 | 5933 | 1.04 | 0.32 |
| 3/27/2018 12:19 | 43.49 | 60.77 | 31.38 | 11.64 | 16.27 | 11.69 | 0.77 | 13.97 | 4.39 | 12.55 | 8.09 | 6044 | 1.08 | 0.34 |
| 3/27/2018 12:20 | 39.29 | 55.33 | 28.69 | 10.16 | 14.31 | 10.32 | 0.64 | 14.08 | 4.45 | 12.47 | 8.19 | 6117 | 0.90 | 0.28 |
| 3/27/2018 12:21 | 37 | 53.8 | 25.86 | 9.21 | 13.39 | 8.96 | 0.65 | 14.54 | 4.25 | 12.08 | 8.59 | 5855 | 0.95 | 0.28 |
| 3/27/2018 12:22 | 35.38 | 50.87 | 24.5 | 8.34 | 11.99 | 8.04 | 0.71 | 14.38 | 4.22 | 12.25 | 8.45 | 5801 | 1.02 | 0.30 |
| 3/27/2018 12:23 | 38.49 | 54.46 | 27.07 | 9.17 | 12.98 | 8.97 | 0.78 | 14.15 | 4.28 | 12.42 | 8.25 | 5890 | 1.10 | 0.33 |
| 3/27/2018 12:24 | 39.67 | 56.09 | 28.26 | 9.5 | 13.43 | 9.42 | 0.86 | 14.14 | 4.34 | 12.43 | 8.24 | 5967 | 1.22 | 0.37 |
| 3/27/2018 12:25 | 37.94 | 54.59 | 27.88 | 9.12 | 13.12 | 9.32 | 0.68 | 14.39 | 4.47 | 12.21 | 8.46 | 6155 | 0.98 | 0.30 |
| 3/27/2018 12:26 | 34.33 | 52.43 | 23.16 | 8.24 | 12.58 | 7.73 | 0.8 | 15.27 | 4.11 | 11.52 | 9.18 | 5651 | 1.22 | 0 33 |
| 3/27/2018 12:27 | 33.35 | 48.38 | 23.15 | 7.37 | 10.69 | 7.12 | 0.82 | 14.51 | 4.23 | 12.15 | 8.56 | 5815 | 1.19 | 0.35 |
| 3/27/2018 12:28 | 37.73 | 53.56 | 26.38 | 8.21 | 11.65 | 7.99 | 1 | 14.2 | 4.26 | 12.39 | 8.29 | 5857 | 1.42 | 0.43 |
| 3/27/2018 12:29 | 40.11 | 56.18 | 27.83 | 9.29 | 13.01 | 8.97 | 0.94 | 14.01 | 4.22 | 12.56 | 8.12 | 5812 | 1.32 | 0.40 |
| 3/27/2018 12:30 | 43.39 | 60.4 | 31.46 | 10.11 | 14.07 | 10.2 | 1.1 | 13.92 | 4.41 | 12.61 | 8.04 | 6074 | 1.53 | 0.49 |
| 3/27/2018 12:31 | 40.71 | 58.02 | 28.93 | 8.95 | 12.76 | 8.85 | 0.99 | 14.25 | 4.33 | 12.32 | 8.34 | 5953 | 1.41 | 0.43 |
| 3/27/2018 12:32 | 33.73 | 48.77 | 23.75 | 7.92 | 11.45 | 7.76 | 1.02 | 14.46 | 4.29 | 12.15 | 8.52 | 5899 | 1.47 | 0 44 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Average** | **37.00** | **53.76** | **26.29** | **8.48** | **12.30** | **8.39** | **0.87** | | **12.09** | **8.60** | **5940.10** | **1.27** | **0.38** |

| | | |
|---|---|---|
| Flow | kdscfh | 5940.10 |
| O2 | % dry | 8.60 |
| CO2 | % dry | 12.09 |
| NOx | ppm dry | 37.00 |
| NOx | ppm @ 3% O2 | 53.76 |
| NOx | lb/hr | 26.29 |
| SO2 | ppm dry | 8.48 |
| SO2 | ppm @ 3% O2 | 12.30 |
| SO2 | lb/hr | 8.39 |
| CO | ppm dry | 0.87 |
| CO | ppm @ 3% O2 | 1.27 |
| CO | lb/hr | 0.38 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 2) NOx ppm 1-Min | (Boiler 2) NOx ppm @3% O2 1-Min | (Boiler 2) NOx lb/hr 1-Min Avg | (Boiler 2) SO2 ppm 1-Min | (Boiler 2) SO2 ppm @3% O2 1-Min | (Boiler 2) SO2 lb/hr 1-Min Avg | (Boiler 2) CO ppm 1-Min | (Boiler 2) CO ppm @3% O2 1 Min | (Boiler 2) CO lb/hr 1-Min | (Boiler 2) CO2% 1-Min | (Boiler 2) O2% 1-Min | Stack Flow kdscf/hr 1-Min | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/27/2018 12:55 | 39.19 | 54.76 | 28.21 | 8.75 | 12.23 | 8.76 | 1.03 | 13.97 | 4.38 | 12.57 | 8.09 | 6029 | 1.44 | 0.45 |
| 3/27/2018 12:56 | 38.04 | 54.21 | 27 | 10.39 | 14.81 | 10.26 | 0.9 | 14.25 | 4.32 | 12.3 | 8.34 | 5946 | 1.28 | 0.39 |
| 3/27/2018 12:57 | 35.86 | 51.85 | 24.85 | 9.74 | 14.08 | 9.39 | 0.86 | 14.46 | 4.22 | 12.13 | 8.52 | 5804 | 1.24 | 0.36 |
| 3/27/2018 12:58 | 38.15 | 54.15 | 27.01 | 9.41 | 13.36 | 9.27 | 0.79 | 14.2 | 4.31 | 12.34 | 8.29 | 5931 | 1.12 | 0.34 |
| 3/27/2018 12:59 | 39.82 | 56.7 | 28.69 | 9.87 | 14.06 | 9.89 | 0.83 | 14.24 | 4.39 | 12.32 | 8.33 | 6035 | 1.18 | 0.36 |
| 3/27/2018 13:00 | 39.01 | 56.04 | 27.79 | 9.31 | 13.37 | 9.23 | 0.67 | 14.37 | 4.34 | 12.23 | 8.44 | 5966 | 0.96 | 0.29 |
| 3/27/2018 13:01 | 38.67 | 55.46 | 26.31 | 8.95 | 12.84 | 8.47 | 0.65 | 14.34 | 4.14 | 12.25 | 8.42 | 5699 | 0.93 | 0.27 |
| 3/27/2018 13:02 | 38.82 | 55.32 | 29 | 10.32 | 14.71 | 10.73 | 0.78 | 14.25 | 4.55 | 12.28 | 8.34 | 6258 | 1.11 | 0.35 |
| 3/27/2018 13:03 | 33.79 | 51.04 | 23.05 | 8.21 | 12.4 | 7.79 | 0.61 | 15.11 | 4.15 | 11.62 | 9.05 | 5714 | 0.92 | 0.25 |
| 3/27/2018 13:04 | 31.31 | 46.28 | 22.95 | 7.64 | 11.29 | 7.79 | 0.73 | 14.78 | 4.46 | 11.88 | 8.79 | 6140 | 1.08 | 0.33 |
| 3/27/2018 13:05 | 28 | 42.76 | 18.96 | 6.46 | 9.87 | 6.09 | 0.7 | 15.27 | 4.12 | 11.54 | 9.18 | 5671 | 1.07 | 0.29 |
| 3/27/2018 13:06 | 33.39 | 48.43 | 22.61 | 6.68 | 9.69 | 6.29 | 0.93 | 14.51 | 4.12 | 12.13 | 8.56 | 5671 | 1.35 | 0.38 |
| 3/27/2018 13:07 | 41.39 | 56.64 | 31.25 | 9.43 | 12.9 | 9.91 | 1.01 | 13.69 | 4.6 | 12.85 | 7.82 | 6324 | 1.38 | 0.46 |
| 3/27/2018 13:08 | 38.34 | 55.84 | 27.08 | 9.99 | 14.55 | 9.82 | 1.04 | 14.56 | 4.3 | 12.04 | 8.61 | 5916 | 1.51 | 0.45 |
| 3/27/2018 13:09 | 37.65 | 55.24 | 25.68 | 8.31 | 12.19 | 7.88 | 0.99 | 14.67 | 4.15 | 11.97 | 8.7 | 5712 | 1.45 | 0.41 |
| 3/27/2018 13:10 | 40.91 | 56.9 | 28.24 | 9.13 | 12.7 | 8.77 | 1.08 | 13.91 | 4.2 | 12.63 | 8.03 | 5782 | 1.50 | 0.45 |
| 3/27/2018 13:11 | 43.84 | 59.14 | 31.5 | 12.02 | 16.21 | 12.02 | 1.24 | 13.49 | 4.37 | 13.02 | 7.63 | 6018 | 1.67 | 0.54 |
| 3/27/2018 13:12 | 47.32 | 64.71 | 34.65 | 12.59 | 17.22 | 12.83 | 1.24 | 13.67 | 4.46 | 12.82 | 7.81 | 6134 | 1.70 | 0.55 |
| 3/27/2018 13:13 | 43.46 | 63.3 | 31.14 | 10.85 | 15.8 | 10.82 | 1.12 | 14.56 | 4.36 | 12.02 | 8.61 | 6002 | 1.63 | 0.49 |
| 3/27/2018 13:14 | 34.19 | 49.84 | 24.21 | 7.55 | 11.01 | 7.44 | 1.05 | 14.58 | 4.31 | 12.05 | 8.62 | 5931 | 1.53 | 0.45 |
| 3/27/2018 13:15 | 34.62 | 50.1 | 23.95 | 7.73 | 11.19 | 7.44 | 1.1 | 14.47 | 4.21 | 12.18 | 8.53 | 5794 | 1.59 | 0.46 |
| 3/27/2018 13:16 | 36.7 | 53.06 | 26.08 | 8.01 | 11.58 | 7.92 | 1.09 | 14.46 | 4.33 | 12.14 | 8.52 | 5953 | 1.58 | 0.47 |
| 3/27/2018 13:17 | 34.74 | 50.76 | 25.04 | 7.2 | 10.52 | 7.22 | 0.97 | 14.61 | 4.39 | 12.01 | 8.65 | 6037 | 1.42 | 0.43 |
| 3/27/2018 13:18 | 32.72 | 48.05 | 22.65 | 6.38 | 9.37 | 6.14 | 0.82 | 14.68 | 4.21 | 11.98 | 8.71 | 5797 | 1.20 | 0.35 |
| 3/27/2018 13:19 | 37.92 | 54.48 | 27.79 | 6.72 | 9.65 | 6.85 | 0.75 | 14.37 | 4.46 | 12.21 | 8.44 | 6139 | 1.08 | 0.33 |
| 3/27/2018 13:20 | 36.91 | 55.24 | 26.38 | 6.96 | 10.42 | 6.92 | 0.56 | 14.97 | 4.35 | 11.75 | 8.94 | 5987 | 0.84 | 0.24 |
| 3/27/2018 13:21 | 35.12 | 52.74 | 24.03 | 6.1 | 9.16 | 5.81 | 0.46 | 15.02 | 4.16 | 11.73 | 8.98 | 5730 | 0.69 | 0.19 |
| 3/27/2018 13:22 | 36.82 | 53.41 | 26.78 | 6.62 | 9.6 | 6.7 | 0.68 | 14.51 | 4.43 | 12.11 | 8.56 | 6091 | 0.99 | 0.30 |
| 3/27/2018 13:23 | 33.26 | 49.65 | 23.15 | 6.82 | 10.18 | 6.6 | 0.61 | 14.93 | 4.24 | 11.77 | 8.91 | 5830 | 0.91 | 0.26 |
| 3/27/2018 13:24 | 34.6 | 51.19 | 25.4 | 6.34 | 9.38 | 6.48 | 0.7 | 14.79 | 4.47 | 11.88 | 8.8 | 6149 | 1.04 | 0.31 |
| 3/27/2018 13:25 | 31.96 | 47.95 | 22.17 | 5.68 | 8.52 | 5.48 | 0.7 | 15 | 4.22 | 11.74 | 8.97 | 5810 | 1.05 | 0.30 |
| **Average** | **36.98** | **53.39** | **26.25** | **8.39** | **12.09** | **8.29** | **0.86** | | | **12.14** | **8.52** | **5935.48** | **1.24** | **0.37** |

| | | |
|---|---|---|
| Flow | kdscfh | 5935.48 |
| O2 | % dry | 8.52 |
| CO2 | % dry | 12.14 |
| NOx | ppm dry | 36.98 |
| NOx | ppm @ 3% O2 | 53.39 |
| NOx | lb/hr | 26.25 |
| SO2 | ppm dry | 8.39 |
| SO2 | ppm @ 3% O2 | 12.09 |
| SO2 | lb/hr | 8.29 |
| CO | ppm dry | 0.86 |
| CO | ppm @ 3% O2 | 1.24 |
| CO | lb/hr | 0.37 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 2) NOx ppm 1-Min | (Boiler 2) NOx ppm @3% O2 1-Min | (Boiler 2) NOx lb/hr 1-Min Avg | (Boiler 2) SO2 ppm 1-Min | (Boiler 2) SO2 ppm @3% O2 1-Min | (Boiler 2) SO2 lb/hr 1-Min Avg | (Boiler 2) CO ppm 1-Min | (Boiler 2) CO ppm @3% O2 1 Min | (Boiler 2) CO lb/hr 1-Min | (Boiler 2) CO2% 1-Min | (Boiler 2) O2% 1-Min | Stack Flow kdscf/hr 1-Min | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/27/2018 13:40 | 28.65 | 44.75 | 19.66 | 5.08 | 7.93 | 4.85 | 0.83 | 15.62 | 4.18 | 11.3 | 9.44 | 5747 | 1.30 | 0.35 |
| 3/27/2018 13:41 | 27.35 | 41.42 | 19.73 | 4.52 | 7.57 | 4.54 | 0.86 | 15.14 | 4.39 | 11.61 | 9.08 | 6043 | 1.30 | 0.38 |
| 3/27/2018 13:42 | 29.42 | 45.13 | 20.61 | 4.49 | 7.67 | 4.38 | 0.82 | 15.34 | 4.26 | 11.49 | 9.23 | 5868 | 1.26 | 0.35 |
| 3/27/2018 13:43 | 30.54 | 45.56 | 20.95 | 4.37 | 7.46 | 4.17 | 0.93 | 14.92 | 4.18 | 11.79 | 8.9 | 5747 | 1.39 | 0.39 |
| 3/27/2018 13:44 | 36.54 | 51.38 | 24.7 | 5.29 | 7.44 | 4.98 | 0.92 | 14.06 | 4.11 | 12.52 | 8.17 | 5662 | 1.29 | 0.38 |
| 3/27/2018 13:45 | 44.69 | 60.1 | 32.35 | 8.93 | 12.01 | 8.99 | 1.13 | 13.45 | 4.41 | 13.03 | 7.59 | 6063 | 1.52 | 0.50 |
| 3/27/2018 13:46 | 52.79 | 71.59 | 39.14 | 10.82 | 14.67 | 11.16 | 1.19 | 13.56 | 4.51 | 12.94 | 7.7 | 6211 | 1.61 | 0.54 |
| 3/27/2018 13:47 | 49.12 | 68.37 | 34.2 | 9.91 | 13.79 | 9.6 | 1.18 | 13.92 | 4.24 | 12.61 | 8.04 | 5832 | 1.64 | 0.50 |
| 3/27/2018 13:48 | 51.88 | 70.51 | 38.43 | 10.18 | 13.84 | 10.49 | 1.42 | 13.59 | 4.51 | 12.9 | 7.73 | 6205 | 1.93 | 0.64 |
| 3/27/2018 13:49 | 46.67 | 65.52 | 33.17 | 10.1 | 14.18 | 9.99 | 1.54 | 14.04 | 4.33 | 12.51 | 8.15 | 5953 | 2.16 | 0.67 |
| 3/27/2018 13:50 | 43.54 | 60.46 | 30.91 | 9.11 | 12.65 | 9 | 1.56 | 13.89 | 4.32 | 12.65 | 8.01 | 5947 | 2.17 | 0.67 |
| 3/27/2018 13:51 | 40.89 | 58.37 | 29.68 | 9.71 | 13.86 | 9.81 | 1.65 | 14.27 | 4.42 | 12.29 | 8.36 | 6080 | 2.36 | 0.73 |
| 3/27/2018 13:52 | 35.07 | 49.98 | 24.13 | 7.83 | 11.16 | 7.49 | 1.72 | 14.25 | 4.19 | 12.35 | 8.34 | 5762 | 2.45 | 0.72 |
| 3/27/2018 13:53 | 35.3 | 49.06 | 24.96 | 9.13 | 12.69 | 8.98 | 1.91 | 13.9 | 4.3 | 12.66 | 8.02 | 5923 | 2.65 | 0.82 |
| 3/27/2018 13:54 | 39.72 | 55.12 | 28.2 | 10 | 13.88 | 9.88 | 1.95 | 13.88 | 4.32 | 12.64 | 8 | 5946 | 2.71 | 0.84 |
| 3/27/2018 13:55 | 41.01 | 56.55 | 30.4 | 9.86 | 13.6 | 10.17 | 1.87 | 13.79 | 4.51 | 12.74 | 7.92 | 6210 | 2.58 | 0.84 |
| 3/27/2018 13:56 | 33.3 | 47.46 | 21.82 | 8.95 | 12.76 | 8.16 | 1.77 | 14.25 | 3.99 | 12.33 | 8.34 | 5489 | 2.52 | 0.71 |
| 3/27/2018 13:57 | 40.05 | 54.15 | 31.26 | 9.9 | 13.38 | 10.75 | 1.78 | 13.52 | 4.75 | 12.95 | 7.66 | 6537 | 2.41 | 0.85 |
| 3/27/2018 13:58 | 29.85 | 45.05 | 21.45 | 8.84 | 13.34 | 8.84 | 1.77 | 15.09 | 4.37 | 11.63 | 9.04 | 6019 | 2.67 | 0.77 |
| 3/27/2018 13:59 | 24.24 | 36.93 | 16.46 | 6.07 | 9.25 | 5.73 | 1.44 | 15.23 | 4.13 | 11.59 | 9.15 | 5686 | 2.19 | 0.60 |
| 3/27/2018 14:00 | 28.3 | 40.56 | 19.59 | 6.22 | 8.91 | 5.99 | 1.47 | 14.33 | 4.21 | 12.3 | 8.41 | 5799 | 2.11 | 0.62 |
| 3/27/2018 14:01 | 33.3 | 47.42 | 22.84 | 8.51 | 12.12 | 8.12 | 1.57 | 14.24 | 4.17 | 12.33 | 8.33 | 5745 | 2.24 | 0.66 |
| 3/27/2018 14:02 | 35.14 | 48.68 | 24.25 | 8.78 | 12.16 | 8.43 | 1.51 | 13.85 | 4.2 | 12.68 | 7.98 | 5781 | 2.09 | 0.63 |
| 3/27/2018 14:03 | 39.96 | 55.41 | 29.96 | 9.69 | 13.44 | 10.11 | 1.54 | 13.87 | 4.56 | 12.62 | 7.99 | 6280 | 2.14 | 0.70 |
| 3/27/2018 14:04 | 35.72 | 50.15 | 24.42 | 8.22 | 11.54 | 7.82 | 1.52 | 14.04 | 4.16 | 12.58 | 8.15 | 5727 | 2.13 | 0.63 |
| 3/27/2018 14:05 | 41.64 | 58.46 | 29.41 | 10.65 | 14.95 | 10.46 | 1.47 | 14.04 | 4.3 | 12.5 | 8.15 | 5915 | 2.06 | 0.63 |
| 3/27/2018 14:06 | 35.76 | 50.8 | 24.86 | 8.63 | 12.26 | 8.35 | 1.38 | 14.21 | 4.23 | 12.36 | 8.3 | 5823 | 1.96 | 0.58 |
| 3/27/2018 14:07 | 33.82 | 47.59 | 22.11 | 8.32 | 11.71 | 7.57 | 1.52 | 14.07 | 3.98 | 12.5 | 8.18 | 5475 | 2.14 | 0.60 |
| 3/27/2018 14:08 | 39.65 | 53.08 | 28.42 | 10.13 | 13.56 | 10.1 | 1.72 | 13.39 | 4.36 | 13.11 | 7.53 | 6004 | 2.30 | 0.75 |
| 3/27/2018 14:09 | 42.84 | 59.22 | 31.38 | 10.87 | 15.02 | 11.08 | 1.68 | 13.82 | 4.46 | 12.7 | 7.95 | 6136 | 2.32 | 0.75 |
| **Average** | **37.56** | **52.96** | **26.65** | **8.44** | **11.96** | **8.33** | **1.45** | | | **12.41** | **8.26** | **5920.50** | **2.05** | **0.63** |

| | | |
|---|---|---|
| Flow | kdscfh | 5920.50 |
| O2 | % dry | 8.26 |
| CO2 | % dry | 12.41 |
| NOx | ppm dry | 37.56 |
| NOx | ppm @ 3% O2 | 52.96 |
| NOx | lb/hr | 26.65 |
| SO2 | ppm dry | 8.44 |
| SO2 | ppm @ 3% O2 | 11.96 |
| SO2 | lb/hr | 8.33 |
| CO | ppm dry | 1.45 |
| CO | ppm @ 3% O2 | 2.05 |
| CO | lb/hr | 0.63 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 2) NOx ppm 1-Min | (Boiler 2) NOx ppm @3% O2 1-Min | (Boiler 2) NOx lb/hr 1-Min Avg | (Boiler 2) SO2 ppm 1-Min | (Boiler 2) SO2 ppm @3% O2 1-Min | (Boiler 2) SO2 lb/hr 1-Min Avg | (Boiler 2) CO ppm 1-Min | (Boiler 2) CO ppm @3% O2 1 Min | (Boiler 2) CO lb/hr 1-Min | (Boiler 2) CO2% 1-Min | (Boiler 2) O2% 1-Min | Stack Flow kdscf/hr 1-Min | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/28/2018 8:02 | 31.72 | 46.46 | 21.82 | 7.2 | 10.55 | 6.89 | 1.76 | 14.65 | 4.19 | 11.98 | 8.68 | 5763 | 2.58 | 0.74 |
| 3/28/2018 8:03 | 34.95 | 49.93 | 22.99 | 8.46 | 12.09 | 7.74 | 1.78 | 14.29 | 4 | 12.28 | 8.37 | 5510 | 2.54 | 0.71 |
| 3/28/2018 8:04 | 42.21 | 56.85 | 32.32 | 10.86 | 14.63 | 11.57 | 1.66 | 13.47 | 4.66 | 12.99 | 7.61 | 6413 | 2.24 | 0.77 |
| 3/28/2018 8:05 | 37.3 | 54.06 | 26.37 | 10.11 | 14.65 | 9.94 | 1.51 | 14.49 | 4.3 | 12.08 | 8.55 | 5921 | 2.19 | 0.65 |
| 3/28/2018 8:06 | 33.65 | 49.49 | 23.11 | 7.81 | 11.49 | 7.46 | 1.43 | 14.71 | 4.18 | 11.91 | 8.73 | 5753 | 2.10 | 0.60 |
| 3/28/2018 8:07 | 35.09 | 50.33 | 24.26 | 8.29 | 11.89 | 7.97 | 1.45 | 14.34 | 4.21 | 12.22 | 8.42 | 5790 | 2.08 | 0.61 |
| 3/28/2018 8:08 | 36.49 | 52.85 | 27.24 | 9.16 | 13.27 | 9.51 | 1.45 | 14.48 | 4.54 | 12.06 | 8.54 | 6253 | 2.10 | 0.66 |
| 3/28/2018 8:09 | 29.09 | 44.58 | 19.55 | 6.9 | 10.57 | 6.45 | 1.34 | 15.33 | 4.09 | 11.46 | 9.22 | 5630 | 2.05 | 0.55 |
| 3/28/2018 8:10 | 31.69 | 45.82 | 22.58 | 6.55 | 9.47 | 6.49 | 1.43 | 14.46 | 4.34 | 12.12 | 8.52 | 5967 | 2.07 | 0.62 |
| 3/28/2018 8:11 | 37.09 | 53.98 | 26.84 | 7.95 | 11.57 | 8.01 | 1.43 | 14.55 | 4.41 | 12.04 | 8.6 | 6062 | 2.08 | 0.63 |
| 3/28/2018 8:12 | 32.85 | 48.64 | 23.51 | 6.72 | 9.95 | 6.69 | 1.39 | 14.81 | 4.36 | 11.84 | 8.81 | 5994 | 2.06 | 0.61 |
| 3/28/2018 8:13 | 36.37 | 54.3 | 24.03 | 6.84 | 10.21 | 6.29 | 1.51 | 14.93 | 4.02 | 11.75 | 8.91 | 5534 | 2.25 | 0.61 |
| 3/28/2018 8:14 | 41.56 | 57.67 | 30.16 | 9.52 | 13.21 | 9.61 | 1.67 | 13.88 | 4.42 | 12.61 | 8 | 6078 | 2.32 | 0.74 |
| 3/28/2018 8:15 | 37.49 | 53.01 | 27.49 | 9.68 | 13.69 | 9.88 | 1.72 | 14.14 | 4.46 | 12.39 | 8.24 | 6142 | 2.43 | 0.77 |
| 3/28/2018 8:16 | 35.74 | 51.3 | 25.12 | 8.26 | 11.86 | 8.08 | 1.71 | 14.35 | 4.28 | 12.21 | 8.43 | 5888 | 2.45 | 0.73 |
| 3/28/2018 8:17 | 38.5 | 54.39 | 27.18 | 9 | 12.72 | 8.84 | 1.72 | 14.13 | 4.3 | 12.41 | 8.23 | 5913 | 2.43 | 0.74 |
| 3/28/2018 8:18 | 41.38 | 59.69 | 29.74 | 10.57 | 15.25 | 10.57 | 1.72 | 14.42 | 4.37 | 12.13 | 8.49 | 6019 | 2.48 | 0.75 |
| 3/28/2018 8:19 | 37.92 | 54.13 | 26.13 | 8.38 | 11.96 | 8.03 | 1.63 | 14.27 | 4.19 | 12.27 | 8.36 | 5772 | 2.33 | 0.68 |
| 3/28/2018 8:20 | 38.41 | 54.14 | 27.42 | 9.65 | 13.6 | 9.59 | 1.64 | 14.09 | 4.35 | 12.41 | 8.2 | 5980 | 2.31 | 0.71 |
| 3/28/2018 8:21 | 39.31 | 54.5 | 27.35 | 9.42 | 13.06 | 9.12 | 1.68 | 13.87 | 4.23 | 12.66 | 7.99 | 5827 | 2.33 | 0.71 |
| 3/28/2018 8:22 | 43.46 | 60.12 | 31.09 | 11.17 | 15.45 | 11.12 | 1.68 | 13.83 | 4.35 | 12.64 | 7.96 | 5992 | 2.32 | 0.73 |
| 3/28/2018 8:23 | 42 | 58.69 | 30.42 | 10.44 | 14.59 | 10.52 | 1.6 | 13.97 | 4.41 | 12.51 | 8.09 | 6066 | 2.24 | 0.71 |
| 3/28/2018 8:24 | | | | | | | | | | | | | | |
| 3/28/2018 8:25 | | | | | | | | | | | | | | |
| 3/28/2018 8:26 | 31.04 | 44.48 | 21.59 | 6.95 | 9.96 | 6.72 | 1.41 | 14.33 | 4.23 | 12.24 | 8.41 | 5825 | 2.02 | 0.60 |
| 3/28/2018 8:27 | 34.32 | 48.79 | 25.25 | 8.14 | 11.57 | 8.33 | 1.37 | 14.22 | 4.48 | 12.3 | 8.31 | 6163 | 1.95 | 0.61 |
| 3/28/2018 8:28 | 31.41 | 47.25 | 21.57 | 7.73 | 11.63 | 7.38 | 1.23 | 15.04 | 4.18 | 11.66 | 9 | 5751 | 1.85 | 0.51 |
| 3/28/2018 8:29 | 32.46 | 47.59 | 23.2 | 7.21 | 10.57 | 7.17 | 1.14 | 14.66 | 4.35 | 11.92 | 8.69 | 5987 | 1.67 | 0.50 |
| 3/28/2018 8:30 | 31.68 | 47.06 | 21.48 | 7.38 | 10.96 | 6.96 | 1.25 | 14.85 | 4.13 | 11.81 | 8.85 | 5680 | | |
| 3/28/2018 8:31 | 32.43 | 46.29 | 24.04 | 8.23 | 11.75 | 8.49 | 1.24 | 14.27 | 4.51 | 12.28 | 8.36 | 6208 | | |
| **Average** | **35.99** | **51.66** | **25.49** | **8.52** | **12.22** | **8.41** | **1.52** | | | **12.19** | **8.45** | **5924.32** | **2.21** | **0.66** |

| | | |
|---|---|---|
| Flow | kdscfh | 5924.32 |
| O2 | % dry | 8.45 |
| CO2 | % dry | 12.19 |
| NOx | ppm dry | 35.99 |
| NOx | ppm @ 3% O2 | 51.66 |
| NOx | lb/hr | 25.49 |
| SO2 | ppm dry | 8.52 |
| SO2 | ppm @ 3% O2 | 12.22 |
| SO2 | lb/hr | 8.41 |
| CO | ppm dry | 1.52 |
| CO | ppm @ 3% O2 | 2.21 |
| CO | lb/hr | 0.66 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 2) NOx ppm 1-Min | (Boiler 2) NOx ppm @3% O2 1-Min | (Boiler 2) NOx lb/hr 1-Min Avg | (Boiler 2) SO2 ppm 1-Min | (Boiler 2) SO2 ppm @3% O2 1-Min | (Boiler 2) SO2 lb/hr 1-Min Avg | (Boiler 2) CO ppm 1-Min | (Boiler 2) CO ppm @3% O2 1 Min | (Boiler 2) CO lb/hr 1-Min | (Boiler 2) CO2% 1-Min | (Boiler 2) O2% 1-Min | Stack Flow kdscf/hr 1-Min | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/28/2018 8:50 | 47.07 | 64.27 | 36.14 | 11.76 | 16.06 | 12.56 | 1.2 | 13.65 | 4.67 | 12.8 | 7.79 | 6431 | 1.64 | 0.56 |
| 3/28/2018 8:51 | 35.16 | 52.14 | 24.04 | 8.31 | 12.32 | 7.91 | 1.21 | 14.83 | 4.16 | 11.82 | 8.83 | 5727 | 1.79 | 0.50 |
| 3/28/2018 8:52 | 31.35 | 45.4 | 21.33 | 6.25 | 9.05 | 5.92 | 1.3 | 14.48 | 4.14 | 12.11 | 8.54 | 5699 | 1.88 | 0.54 |
| 3/28/2018 8:53 | 33.35 | 46.67 | 23.43 | 6.5 | 9.1 | 6.35 | 1.35 | 14 | 4.28 | 12.52 | 8.11 | 5884 | 1.89 | 0.58 |
| 3/28/2018 8:54 | 37.72 | 53 | 26.07 | 7.35 | 10.33 | 7.07 | 1.4 | 14.05 | 4.21 | 12.45 | 8.16 | 5789 | 1.97 | 0.59 |
| 3/28/2018 8:55 | 38.88 | 54.8 | 27.44 | 7.9 | 11.13 | 7.76 | 1.45 | 14.09 | 4.3 | 12.43 | 8.2 | 5912 | 2.04 | 0.62 |
| 3/28/2018 8:56 | 36.95 | 52 | 27.02 | 7.69 | 10.82 | 7.82 | 1.51 | 14.07 | 4.45 | 12.48 | 8.18 | 6126 | 2.12 | 0.67 |
| 3/28/2018 8:57 | 30.35 | 44.75 | 20.3 | 6.3 | 9.29 | 5.86 | 1.41 | 14.74 | 4.07 | 11.9 | 8.76 | 5603 | 2.08 | 0.57 |
| 3/28/2018 8:58 | 33.05 | 47.48 | 23.33 | 5.54 | 7.96 | 5.44 | 1.49 | 14.37 | 4.3 | 12.2 | 8.44 | 5912 | 2.14 | 0.64 |
| 3/28/2018 8:59 | 29.83 | 42.61 | 20.25 | 5.56 | 7.94 | 5.25 | 1.66 | 14.29 | 4.13 | 12.3 | 8.37 | 5687 | 2.37 | 0.69 |
| 3/28/2018 9:00 | 34.79 | 48.01 | 25.29 | 6.02 | 8.31 | 6.09 | 1.59 | 13.8 | 4.42 | 12.69 | 7.93 | 6089 | 2.19 | 0.70 |
| 3/28/2018 9:01 | 33.76 | 48 | 23.66 | 6.61 | 9.4 | 6.44 | 1.66 | 14.22 | 4.27 | 12.34 | 8.31 | 5870 | 2.36 | 0.71 |
| 3/28/2018 9:02 | 34.77 | 51.39 | 25.48 | 6.47 | 9.56 | 6.6 | 1.44 | 14.78 | 4.46 | 11.84 | 8.79 | 6138 | 2.13 | 0.64 |
| 3/28/2018 9:03 | 30.97 | 48 | 20.37 | 4.9 | 7.75 | 4.48 | 1.2 | 15.5 | 4 | 11.36 | 9.35 | 5509 | 1.86 | 0.48 |
| 3/28/2018 9:04 | 32.09 | 47.47 | 23.75 | 4.61 | 7.4 | 4.75 | 1.32 | 14.79 | 4.5 | 11.87 | 8.8 | 6198 | 1.95 | 0.59 |
| 3/28/2018 9:05 | 27.86 | 43.18 | 18.44 | 4.22 | 7.75 | 3.89 | 1.04 | 15.5 | 4.03 | 11.38 | 9.35 | 5544 | 1.61 | 0.42 |
| 3/28/2018 9:06 | 30.77 | 44.13 | 21.32 | 3.83 | 7.17 | 3.69 | 1.22 | 14.34 | 4.22 | 12.26 | 8.42 | 5803 | 1.75 | 0.51 |
| 3/28/2018 9:07 | 38.07 | 54.3 | 27.03 | 5.35 | 7.63 | 5.28 | 1.16 | 14.26 | 4.32 | 12.28 | 8.35 | 5946 | 1.65 | 0.50 |
| 3/28/2018 9:08 | 42.24 | 58.84 | 29.91 | 5.52 | 7.69 | 5.44 | 1.06 | 13.93 | 4.31 | 12.62 | 8.05 | 5932 | 1.48 | 0.46 |
| 3/28/2018 9:09 | 42.8 | 60.9 | 31.11 | 7.21 | 10.26 | 7.29 | 1.18 | 14.23 | 4.42 | 12.29 | 8.32 | 6089 | 1.68 | 0.52 |
| 3/28/2018 9:10 | 39.37 | 57.25 | 27 | 5.98 | 8.7 | 5.71 | 1.18 | 14.54 | 4.17 | 12.09 | 8.59 | 5744 | 1.72 | 0.49 |
| 3/28/2018 9:11 | 39.67 | 56.36 | 28.78 | 5.92 | 8.41 | 5.98 | 1.08 | 14.21 | 4.42 | 12.33 | 8.3 | 6077 | 1.53 | 0.48 |
| 3/28/2018 9:12 | 36.33 | 52.61 | 25.32 | 5.65 | 8.18 | 5.48 | 1.17 | 14.48 | 4.24 | 12.12 | 8.54 | 5838 | 1.69 | 0.50 |
| 3/28/2018 9:13 | 38.73 | 56.04 | 26.18 | 5.85 | 8.47 | 5.5 | 1.35 | 14.47 | 4.11 | 12.13 | 8.53 | 5662 | 1.95 | 0.56 |
| 3/28/2018 9:14 | 41.79 | 58.67 | 29.07 | 6.21 | 8.72 | 6.01 | 1.32 | 14.04 | 4.23 | 12.5 | 8.15 | 5827 | 1.85 | 0.56 |
| 3/28/2018 9:15 | 39.73 | 54.75 | 29.23 | 6.87 | 9.47 | 7.03 | 1.44 | 13.78 | 4.48 | 12.73 | 7.91 | 6162 | 1.98 | 0.64 |
| 3/28/2018 9:16 | 35.9 | 51.95 | 25.13 | 6.47 | 9.36 | 6.3 | 1.59 | 14.47 | 4.26 | 12.11 | 8.53 | 5864 | 2.30 | 0.68 |
| 3/28/2018 9:17 | 36.03 | 52.31 | 24.19 | 5.66 | 8.22 | 5.29 | 1.37 | 14.52 | 4.09 | 12.1 | 8.57 | 5623 | 1.99 | 0.56 |
| 3/28/2018 9:18 | 39.35 | 53.85 | 28.43 | 6.68 | 9.14 | 6.72 | 1.72 | 13.69 | 4.4 | 12.82 | 7.82 | 6052 | 2.35 | 0.76 |
| 3/28/2018 9:19 | 41.89 | 59 | 28.66 | 8.76 | 12.34 | 8.34 | 1.58 | 14.08 | 4.16 | 12.44 | 8.19 | 5731 | 2.23 | 0.66 |
| **Average** | **36.35** | **52.00** | **25.59** | **6.40** | **9.26** | **6.28** | **1.36** | | | **12.24** | **8.41** | **5882.27** | **1.94** | **0.58** |

| | | |
|---|---|---|
| Flow | kdscfh | 5882.27 |
| O2 | % dry | 8.41 |
| CO2 | % dry | 12.24 |
| NOx | ppm dry | 36.35 |
| NOx | ppm @ 3% O2 | 52.00 |
| NOx | lb/hr | 25.59 |
| SO2 | ppm dry | 6.40 |
| SO2 | ppm @ 3% O2 | 9.26 |
| SO2 | lb/hr | 6.28 |
| CO | ppm dry | 1.36 |
| CO | ppm @ 3% O2 | 1.94 |
| CO | lb/hr | 0.58 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 2) NOx ppm 1-Min | (Boiler 2) NOx ppm @3% O2 1-Min | (Boiler 2) NOx lb/hr 1-Min Avg | (Boiler 2) SO2 ppm 1-Min | (Boiler 2) SO2 ppm @3% O2 1-Min | (Boiler 2) SO2 lb/hr 1-Min Avg | (Boiler 2) CO ppm 1-Min | (Boiler 2) CO ppm @3% O2 1 Min | (Boiler 2) CO lb/hr 1-Min | (Boiler 2) CO2% 1-Min | (Boiler 2) O2% 1-Min | Stack Flow kdscf/hr 1-Min | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/28/2018 9:34 | 42.14 | 57.71 | 30.05 | 10.99 | 15.05 | 10.9 | 1.35 | 13.7 | 4.34 | 12.8 | 7.83 | 5973 | 1.85 | 0.59 |
| 3/28/2018 9:35 | 42.04 | 58.61 | 29.66 | 9.74 | 13.58 | 9.56 | 1.44 | 13.94 | 4.29 | 12.58 | 8.06 | 5909 | 2.01 | 0.62 |
| 3/28/2018 9:36 | 42.59 | 59.33 | 28.88 | 9.28 | 12.93 | 8.75 | 1.55 | 13.93 | 4.13 | 12.6 | 8.05 | 5679 | 2.16 | 0.64 |
| 3/28/2018 9:37 | 51.91 | 70.45 | 37.98 | 10.75 | 14.59 | 10.94 | 1.63 | 13.57 | 4.45 | 12.92 | 7.71 | 6129 | 2.21 | 0.73 |
| 3/28/2018 9:38 | 45.62 | 65.12 | 32.71 | 10.21 | 14.57 | 10.19 | 1.62 | 14.27 | 4.36 | 12.27 | 8.36 | 6006 | 2.31 | 0.71 |
| 3/28/2018 9:39 | 35.19 | 51.84 | 24.01 | 7.51 | 11.06 | 7.13 | 1.6 | 14.73 | 4.15 | 11.93 | 8.75 | 5715 | 2.36 | 0.68 |
| 3/28/2018 9:40 | 32.28 | 46.34 | 21.35 | 6.91 | 9.92 | 6.36 | 1.71 | 14.35 | 4.03 | 12.24 | 8.43 | 5541 | 2.45 | 0.69 |
| 3/28/2018 9:41 | 37.63 | 52.09 | 28.68 | 8.41 | 11.64 | 8.92 | 1.78 | 13.84 | 4.64 | 12.64 | 7.97 | 6385 | 2.46 | 0.83 |
| 3/28/2018 9:42 | 31.36 | 47.41 | 20.59 | 7.12 | 10.76 | 6.5 | 1.6 | 15.12 | 4 | 11.62 | 9.06 | 5499 | 2.42 | 0.64 |
| 3/28/2018 9:43 | 32.95 | 46.74 | 24.63 | 6.33 | 8.98 | 6.58 | 1.63 | 14.18 | 4.55 | 12.37 | 8.28 | 6260 | 2.31 | 0.74 |
| 3/28/2018 9:44 | 28.27 | 42.45 | 18.43 | 6.32 | 9.49 | 5.73 | 1.58 | 15.02 | 3.97 | 11.73 | 8.98 | 5462 | 2.37 | 0.63 |
| 3/28/2018 9:45 | 32.41 | 45.79 | 22.36 | 6.47 | 9.14 | 6.21 | 1.59 | 14.13 | 4.2 | 12.42 | 8.23 | 5780 | 2.25 | 0.67 |
| 3/28/2018 9:46 | 31.73 | 45.58 | 21.98 | 6.8 | 9.77 | 6.55 | 1.58 | 14.37 | 4.22 | 12.19 | 8.44 | 5802 | 2.27 | 0.67 |
| 3/28/2018 9:47 | 30.97 | 44.1 | 21.43 | 5.8 | 8.26 | 5.58 | 1.41 | 14.24 | 4.21 | 12.32 | 8.33 | 5795 | 2.01 | 0.59 |
| 3/28/2018 9:48 | 34.53 | 47.88 | 25.01 | 6.19 | 8.58 | 6.24 | 1.45 | 13.87 | 4.41 | 12.67 | 7.99 | 6066 | 2.01 | 0.64 |
| 3/28/2018 9:49 | 31.51 | 45.38 | 20.91 | 6.36 | 9.16 | 5.87 | 1.31 | 14.4 | 4.04 | 12.2 | 8.47 | 5559 | 1.89 | 0.53 |
| 3/28/2018 9:50 | 41.14 | 56.69 | 29.02 | 6.82 | 9.4 | 6.69 | 1.24 | 13.78 | 4.29 | 12.72 | 7.91 | 5909 | 1.71 | 0.53 |
| 3/28/2018 9:51 | 40.23 | 55.69 | 28.88 | 7.46 | 10.33 | 7.45 | 1.27 | 13.84 | 4.37 | 12.66 | 7.97 | 6014 | 1.76 | 0.56 |
| 3/28/2018 9:52 | 36.06 | 50.67 | 25.1 | 6.76 | 9.5 | 6.55 | 1.3 | 14.05 | 4.24 | 12.49 | 8.16 | 5830 | 1.83 | 0.55 |
| 3/28/2018 9:53 | 37.24 | 52.74 | 26.73 | 6.76 | 9.57 | 6.75 | 1.21 | 14.16 | 4.37 | 12.38 | 8.26 | 6013 | 1.71 | 0.53 |
| 3/28/2018 9:54 | 35.74 | 52.27 | 24.47 | 6.21 | 9.08 | 5.91 | 1.29 | 14.62 | 4.17 | 11.99 | 8.66 | 5734 | 1.89 | 0.54 |
| 3/28/2018 9:55 | 35.51 | 51.14 | 24.69 | 6.09 | 8.77 | 5.89 | 1.34 | 14.4 | 4.23 | 12.19 | 8.47 | 5824 | 1.93 | 0.57 |
| 3/28/2018 9:56 | 33.86 | 49.8 | 23.81 | 6.18 | 9.09 | 6.05 | 1.24 | 14.71 | 4.28 | 11.91 | 8.73 | 5891 | 1.82 | 0.53 |
| 3/28/2018 9:57 | 34 | 49.2 | 23.38 | 5.69 | 8.23 | 5.44 | 1.21 | 14.47 | 4.19 | 12.16 | 8.53 | 5761 | 1.75 | 0.51 |
| 3/28/2018 9:58 | 34.75 | 49.13 | 24.35 | 6.61 | 9.35 | 6.44 | 1.29 | 14.14 | 4.27 | 12.44 | 8.24 | 5869 | 1.82 | 0.55 |
| 3/28/2018 9:59 | 36.13 | 51.45 | 26.13 | 7.14 | 10.17 | 7.18 | 1.31 | 14.24 | 4.4 | 12.3 | 8.33 | 6057 | 1.87 | 0.58 |
| 3/28/2018 10:00 | 34.41 | 49.75 | 23.58 | 6.35 | 9.18 | 6.05 | 1.29 | 14.46 | 4.17 | 12.15 | 8.52 | 5739 | 1.87 | 0.54 |
| 3/28/2018 10:01 | 33.88 | 49.79 | 24.29 | 6.69 | 9.83 | 6.67 | 1.26 | 14.7 | 4.36 | 11.9 | 8.72 | 6004 | 1.85 | 0.55 |
| 3/28/2018 10:02 | 31.7 | 47.09 | 21.8 | 5.86 | 8.7 | 5.61 | 1.07 | 14.85 | 4.19 | 11.86 | 8.85 | 5759 | 1.59 | 0.45 |
| 3/28/2018 10:03 | 33.74 | 48.71 | 23.36 | 6.09 | 8.79 | 5.87 | 1.09 | 14.44 | 4.21 | 12.16 | 8.5 | 5800 | 1.57 | 0.46 |
| **Average** | **36.05** | **51.36** | **25.28** | **7.20** | **10.25** | **7.02** | **1.41** | | | **12.29** | **8.36** | **5858.80** | **2.01** | **0.60** |

| | | |
|---|---|---|
| Flow | kdscfh | 5858.80 |
| O2 | % dry | 8.36 |
| CO2 | % dry | 12.29 |
| NOx | ppm dry | 36.05 |
| NOx | ppm @ 3% O2 | 51.36 |
| NOx | lb/hr | 25.28 |
| SO2 | ppm dry | 7.20 |
| SO2 | ppm @ 3% O2 | 10.25 |
| SO2 | lb/hr | 7.02 |
| CO | ppm dry | 1.41 |
| CO | ppm @ 3% O2 | 2.01 |
| CO | lb/hr | 0.60 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 2) NOx ppm 1-Min | (Boiler 2) NOx ppm @3% O2 1-Min | (Boiler 2) NOx lb/hr 1-Min Avg | (Boiler 2) SO2 ppm 1-Min | (Boiler 2) SO2 ppm @3% O2 1-Min | (Boiler 2) SO2 lb/hr 1-Min Avg | (Boiler 2) CO ppm 1-Min | (Boiler 2) CO ppm @3% O2 1 Min | (Boiler 2) CO lb/hr 1-Min | (Boiler 2) CO2% 1-Min | (Boiler 2) O2% 1-Min | Stack Flow kdscf/hr 1-Min | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/28/2018 10:18 | 33.08 | 48.22 | 24.79 | 7.05 | 10.28 | 7.35 | 0.65 | 14.58 | 4.56 | 12.01 | 8.62 | 6276 | 0.95 | |
| 3/28/2018 10:19 | 27.37 | 42.02 | 18.33 | 6.45 | 9.9 | 6.01 | 0.61 | 15.35 | 4.08 | 11.5 | 9.24 | 5609 | 0.94 | |
| 3/28/2018 10:20 | 32.43 | 46.97 | 23.5 | 6.63 | 9.6 | 6.68 | 0.68 | 14.48 | 4.41 | 12.15 | 8.54 | 6069 | 0.98 | 0.30 |
| 3/28/2018 10:21 | 32.7 | 48.1 | 23.49 | 7.07 | 10.4 | 7.07 | 0.58 | 14.71 | 4.37 | 11.95 | 8.73 | 6017 | 0.85 | 0.25 |
| 3/28/2018 10:22 | 33.43 | 49.78 | 22.13 | 6.94 | 10.33 | 6.39 | 0.59 | 14.89 | 4.03 | 11.84 | 8.88 | 5546 | 0.88 | 0.24 |
| 3/28/2018 10:23 | 41.51 | 57.24 | 30.71 | 9.73 | 13.42 | 10.01 | 0.74 | 13.79 | 4.5 | 12.74 | 7.92 | 6196 | 1.02 | 0.33 |
| 3/28/2018 10:24 | 42.47 | 60.87 | 29.06 | 11.14 | 15.97 | 10.6 | 0.68 | 14.33 | 4.16 | 12.26 | 8.41 | 5731 | 0.97 | 0.28 |
| 3/28/2018 10:25 | 47.13 | 63.81 | 34.42 | 12.72 | 17.22 | 12.93 | 0.66 | 13.54 | 4.45 | 12.99 | 7.68 | 6118 | 0.89 | 0.29 |
| 3/28/2018 10:26 | 51.64 | 70.51 | 36.05 | 15.09 | 20.6 | 14.66 | 0.63 | 13.65 | 4.25 | 12.85 | 7.79 | 5848 | 0.86 | 0.27 |
| 3/28/2018 10:27 | 50.86 | 68.45 | 37.81 | 15.95 | 21.47 | 16.5 | 0.59 | 13.46 | 4.53 | 13.03 | 7.6 | 6227 | 0.79 | 0.27 |
| 3/28/2018 10:28 | 45.36 | 63.04 | 31.86 | 14.48 | 20.12 | 14.15 | 0.35 | 13.9 | 4.28 | 12.63 | 8.02 | 5883 | 0.49 | 0.15 |
| 3/28/2018 10:29 | 46.71 | 64.51 | 34.04 | 14.21 | 19.63 | 14.41 | 0.37 | 13.81 | 4.44 | 12.68 | 7.94 | 6104 | 0.51 | 0.16 |
| 3/28/2018 10:30 | 44.39 | 61.36 | 31.9 | 13.96 | 19.3 | 13.96 | 0.37 | 13.82 | 4.37 | 12.72 | 7.95 | 6020 | 0.51 | 0.16 |
| 3/28/2018 10:31 | 40.59 | 58.64 | 28.44 | 14.49 | 20.93 | 14.12 | 0.19 | 14.45 | 4.26 | 12.13 | 8.51 | 5868 | 0.27 | 0.08 |
| 3/28/2018 10:32 | 32.57 | 47.02 | 22.7 | 11.17 | 16.12 | 10.83 | 0.22 | 14.44 | 4.24 | 12.16 | 8.5 | 5837 | 0.32 | 0.09 |
| 3/28/2018 10:33 | 38.28 | 53.24 | 28.44 | 12.1 | 16.83 | 12.51 | 0.11 | 13.91 | 4.52 | 12.66 | 8.03 | 6224 | 0.15 | 0.05 |
| 3/28/2018 10:34 | 32.71 | 48.31 | 23.02 | 12.01 | 17.74 | 11.76 | 0.15 | 14.77 | 4.28 | 11.88 | 8.78 | 5896 | 0.22 | 0.06 |
| 3/28/2018 10:35 | 31.28 | 45.63 | 21.67 | 9.41 | 13.73 | 9.07 | 0.08 | 14.59 | 4.22 | 12.06 | 8.63 | 5803 | 0.12 | 0.03 |
| 3/28/2018 10:36 | 36.05 | 51.25 | 25.28 | 10.98 | 15.61 | 10.71 | 0.31 | 14.22 | 4.27 | 12.34 | 8.31 | 5874 | 0.44 | 0.13 |
| 3/28/2018 10:37 | 35.45 | 50.16 | 25.97 | 11.67 | 16.51 | 11.9 | 0.26 | 14.15 | 4.46 | 12.41 | 8.25 | 6137 | 0.37 | 0.12 |
| 3/28/2018 10:38 | 31.68 | 47.53 | 22.96 | 10.44 | 15.66 | 10.53 | 0.31 | 15 | 4.41 | 11.7 | 8.97 | 6071 | 0.47 | 0.14 |
| 3/28/2018 10:39 | 24.19 | 37.69 | 15.61 | 7.53 | 11.73 | 6.76 | 0.32 | 15.58 | 3.93 | 11.33 | 9.41 | 5404 | 0.50 | 0.13 |
| 3/28/2018 10:40 | 33.84 | 46.38 | 21.8 | 9.43 | 12.92 | 8.45 | 0.53 | 13.71 | 3.92 | 12.87 | 7.84 | 5395 | 0.73 | 0.21 |
| 3/28/2018 10:41 | 52.43 | 67.23 | 41.39 | 22.02 | 28.23 | 24.19 | 0.71 | 12.82 | 4.81 | 13.65 | 6.94 | 6613 | 0.91 | 0.34 |
| 3/28/2018 10:42 | 43.02 | 61.56 | 32.41 | 16.5 | 23.61 | 17.3 | 0.58 | 14.31 | 4.59 | 12.23 | 8.39 | 6311 | 0.83 | 0.27 |
| 3/28/2018 10:43 | 27.8 | 43.96 | 18.93 | 9.13 | 14.44 | 8.65 | 0.4 | 15.81 | 4.15 | 11.13 | 9.58 | 5705 | 0.63 | 0.17 |
| 3/28/2018 10:44 | 27.29 | 41.05 | 18.66 | 7.09 | 10.66 | 6.74 | 0.3 | 15.04 | 4.16 | 11.72 | 9 | 5726 | 0.45 | 0.12 |
| 3/28/2018 10:45 | 34.02 | 48.72 | 23.27 | 8.92 | 12.77 | 8.49 | 0.47 | 14.32 | 4.16 | 12.28 | 8.4 | 5729 | 0.67 | 0.20 |
| 3/28/2018 10:46 | 40.77 | 57.28 | 26.8 | 11.5 | 16.16 | 10.52 | 0.36 | 14.05 | 4 | 12.52 | 8.16 | 5507 | 0.51 | 0.14 |
| 3/28/2018 10:47 | 47.48 | 61.45 | 35.4 | 17.67 | 22.87 | 18.33 | 0.62 | 12.94 | 4.54 | 13.58 | 7.07 | 6245 | 0.80 | 0.28 |
| **Average** | **37.95** | **53.73** | **27.03** | **11.45** | **16.16** | **11.39** | **0.45** | | | **12.33** | **8.34** | **5932.97** | **0.63** | **0.19** |

| | | |
|---|---|---|
| Flow | kdscfh | 5932.97 |
| O2 | % dry | 8.34 |
| CO2 | % dry | 12.33 |
| NOx | ppm dry | 37.95 |
| NOx | ppm @ 3% O2 | 53.73 |
| NOx | lb/hr | 27.03 |
| SO2 | ppm dry | 11.45 |
| SO2 | ppm @ 3% O2 | 16.16 |
| SO2 | lb/hr | 11.39 |
| CO | ppm dry | 0.45 |
| CO | ppm @ 3% O2 | 0.63 |
| CO | lb/hr | 0.19 |

CeDAR 1-Minute Data

| Timestamp | (Boiler 2) NOx ppm 1-Min | (Boiler 2) NOx ppm @3% O2 1-Min | (Boiler 2) NOx lb/hr 1-Min Avg | (Boiler 2) SO2 ppm 1-Min | (Boiler 2) SO2 ppm @3% O2 1-Min | (Boiler 2) SO2 lb/hr 1-Min Avg | (Boiler 2) CO ppm 1-Min | (Boiler 2) CO ppm @3% O2 1 Min | (Boiler 2) CO lb/hr 1-Min | (Boiler 2) CO2% 1-Min | (Boiler 2) O2% 1-Min | Stack Flow kdscf/hr 1-Min | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/28/2018 11:13 | 39 | 53.99 | 28.28 | 8.23 | 11.39 | 8.3 | 0 | 13.84 | 4.41 | 12.67 | 7.97 | 6073 | 0.00 | 0.00 |
| 3/28/2018 11:14 | 38.67 | 57.78 | 26.32 | 11.97 | 17.89 | 11.34 | 0 | 14.94 | 4.14 | 11.7 | 8.92 | 5701 | 0.00 | 0.00 |
| 3/28/2018 11:15 | 33.23 | 48.68 | 21.81 | 6.98 | 10.22 | 6.37 | 0 | 14.65 | 3.99 | 12 | 8.68 | 5497 | 0.00 | 0.00 |
| 3/28/2018 11:16 | 36.68 | 51.37 | 25.6 | 7.92 | 11.09 | 7.69 | 0 | 14.01 | 4.25 | 12.52 | 8.12 | 5845 | 0.00 | 0.00 |
| 3/28/2018 11:17 | 37.5 | 53.74 | 26.29 | 8.88 | 12.73 | 8.66 | 0 | 14.33 | 4.27 | 12.2 | 8.41 | 5873 | 0.00 | 0.00 |
| 3/28/2018 11:18 | 31.3 | 45.81 | 21.52 | 7.29 | 10.67 | 6.97 | 0 | 14.64 | 4.18 | 11.99 | 8.67 | 5758 | 0.00 | 0.00 |
| 3/28/2018 11:19 | 29.95 | 44.79 | 20.63 | 6.61 | 9.88 | 6.34 | 0 | 14.95 | 4.19 | 11.74 | 8.93 | 5770 | 0.00 | 0.00 |
| 3/28/2018 11:20 | 29.41 | 43.08 | 18.41 | 5.81 | 8.51 | 5.06 | 0 | 14.65 | 3.81 | 12.02 | 8.68 | 5242 | 0.00 | 0.00 |
| 3/28/2018 11:21 | 39.22 | 52.75 | 27.92 | 8.1 | 10.89 | 8.02 | 0 | 13.45 | 4.33 | 13.02 | 7.59 | 5963 | 0.00 | 0.00 |
| 3/28/2018 11:22 | 42.08 | 57.59 | 28.39 | 9.61 | 13.15 | 9.02 | 0 | 13.69 | 4.11 | 12.84 | 7.82 | 5652 | 0.00 | 0.00 |
| 3/28/2018 11:23 | 47.69 | 64.33 | 33.44 | 10.1 | 13.62 | 9.85 | 0 | 13.49 | 4.27 | 13 | 7.63 | 5873 | 0.00 | 0.00 |
| 3/28/2018 11:24 | | | | | | | | | | | | | | |
| 3/28/2018 11:25 | | | | | | | | | | | | | | |
| 3/28/2018 11:26 | 38 | 54.81 | 26.19 | 7.65 | 11.03 | 7.33 | 0 | 14.42 | 4.19 | 12.17 | 8.49 | 5772 | 0.00 | 0.00 |
| 3/28/2018 11:27 | 34.24 | 50.24 | 23.03 | 8.31 | 12.19 | 7.78 | 0 | 14.67 | 4.09 | 11.96 | 8.7 | 5633 | 0.00 | 0.00 |
| 3/28/2018 11:28 | 34.96 | 49.59 | 23.89 | 7.41 | 10.51 | 7.04 | 0 | 14.18 | 4.16 | 12.38 | 8.28 | 5723 | 0.00 | 0.00 |
| 3/28/2018 11:29 | 36.31 | 52 | 24.8 | 9.64 | 13.8 | 9.16 | 0 | 14.32 | 4.16 | 12.25 | 8.4 | 5720 | 0.00 | 0.00 |
| 3/28/2018 11:30 | 32.66 | 45.67 | 23.45 | 9.27 | 12.96 | 9.26 | 0 | 13.98 | 4.37 | 12.56 | 8.1 | 6015 | 0.00 | 0.00 |
| 3/28/2018 11:31 | 31.14 | 45.58 | 21.12 | 9.26 | 13.55 | 8.74 | 0 | 14.64 | 4.13 | 12.02 | 8.67 | 5680 | 0.00 | 0.00 |
| 3/28/2018 11:32 | 32.54 | 47.74 | 21.74 | 8.99 | 13.19 | 8.36 | 0 | 14.67 | 4.07 | 11.96 | 8.7 | 5597 | 0.00 | 0.00 |
| 3/28/2018 11:33 | 33.08 | 46.3 | 23.69 | 9.26 | 12.96 | 9.23 | 0 | 14 | 4.36 | 12.57 | 8.11 | 5998 | 0.00 | 0.00 |
| 3/28/2018 11:34 | 34.01 | 49.21 | 22.11 | 9.96 | 14.41 | 9.01 | 0 | 14.47 | 3.96 | 12.14 | 8.53 | 5445 | 0.00 | 0.00 |
| 3/28/2018 11:35 | 37.96 | 51.91 | 27.18 | 10.86 | 14.85 | 10.82 | 0 | 13.67 | 4.36 | 12.83 | 7.81 | 5998 | 0.00 | 0.00 |
| 3/28/2018 11:36 | 39.55 | 55.48 | 28.12 | 11.51 | 16.15 | 11.39 | 0 | 14.03 | 4.33 | 12.51 | 8.14 | 5956 | 0.00 | 0.00 |
| 3/28/2018 11:37 | 35.34 | 52.11 | 24.56 | 10.93 | 16.12 | 10.57 | 0 | 14.74 | 4.23 | 11.88 | 8.76 | 5820 | 0.00 | 0.00 |
| 3/28/2018 11:38 | 35.18 | 52.35 | 24.23 | 9.83 | 14.63 | 9.42 | 0 | 14.88 | 4.19 | 11.83 | 8.87 | 5770 | 0.00 | 0.00 |
| 3/28/2018 11:39 | 29.16 | 43.46 | 19.54 | 8.39 | 12.5 | 7.82 | 0 | 14.9 | 4.08 | 11.81 | 8.89 | 5614 | 0.00 | 0.00 |
| 3/28/2018 11:40 | 32.98 | 48.63 | 22.73 | 8.62 | 12.71 | 8.27 | 0 | 14.74 | 4.2 | 11.9 | 8.76 | 5773 | 0.00 | 0.00 |
| 3/28/2018 11:41 | 36.04 | 52.07 | 25.16 | 8.73 | 12.61 | 8.48 | 0 | 14.45 | 4.25 | 12.18 | 8.51 | 5847 | 0.00 | 0.00 |
| 3/28/2018 11:42 | 34.53 | 49.73 | 23.33 | 8.71 | 12.54 | 8.19 | 0 | 14.4 | 4.11 | 12.21 | 8.47 | 5660 | 0.00 | 0.00 |
| 3/28/2018 11:43 | 38.66 | 55.01 | 25.89 | 9.21 | 13.1 | 8.58 | 0 | 14.23 | 4.08 | 12.35 | 8.32 | 5610 | | |
| **Average** | **35.44** | **50.74** | **24.41** | **8.89** | **12.74** | **8.52** | **0.00** | | | **12.25** | **8.41** | **5759.57** | **0.00** | **0.00** |

| | | |
|---|---|---|
| Flow | kdscfh | 5759.57 |
| O2 | % dry | 8.41 |
| CO2 | % dry | 12.25 |
| NOx | ppm dry | 35.44 |
| NOx | ppm @ 3% O2 | 50.74 |
| NOx | lb/hr | 24.41 |
| SO2 | ppm dry | 8.89 |
| SO2 | ppm @ 3% O2 | 12.74 |
| SO2 | lb/hr | 8.52 |
| CO | ppm dry | 0.00 |
| CO | ppm @ 3% O2 | 0.00 |
| CO | lb/hr | 0.00 |

# APPENDIX A.3

# CALIBRATION DATA

## NO2 to NO Converter Efficiency Test

| | | | | Cylinder # |
|---|---|---|---|---|
| Analyzer Manufacturer: | CAI | NO Cal Gas Value: | 92.7 | CC151542 |
| Analyzer Model: | 600 Series | NO2 Cal Gas Value: | 44.5 | CC3516 |
| Analyzer Serial Number: | S03003 | Performed By: | DW | |
| Date: | 3/27/2018 | CEMS ID#: | 3-CEMS | |

| GAS | ANALYZER MODE | ANALYZER RESPONSE | CAL CORRECTED | LABEL |
|---|---|---|---|---|
| Zero | NOx | 0.2 | -- | -- |
| Zero | NO | 0.1 | -- | -- |
| NO | NO | 93.3 | -- | -- |
| NO | NOx | 92.8 | -- | -- |
| NO2 | NO | 0.2 | 0.1 | $C_1$ |
| NO2 | NOx | 43.1 | 43.0 | $C_2$ |

| | | Label | Requirement |
|---|---|---|---|
| Abs. Value $C_o$-$C_1$: | 44.4 | $D_1$ | -- |
| Abs. Value $C_2$-$C_1$: | 42.9 | $D_2$ | -- |
| $C_1/C_2$ | 0% | $D_3$ | < 5% |
| CE = $D_2/D_1$ * 100%: | 96.6% | -- | > 90% |

# DELTA
## SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power
Unit 2

DATE: 3/27/2018
BY: DW

| | MID SPAN CYLINDER | | HIGH SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | | 99.999 | | |
| $O_2$ | EB0002353 | 10.81 | CC171976 | 19.59 |
| $CO_2$ | EB0002353 | 11.04 | CC171976 | 18.46 |
| $NO_x$ | CC364675 | 48.4 | CC28978 | 92.7 |
| CO | EB0095148 | 4.68 | CC251444 | 9.55 |
| | | | | |

## PRE-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Range | 20 | 20 | 100 | 10 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.04 | 0.01 | 0.15 | 0.01 | | -- |
| Error (% of scale) | 0.2% | 0.1% | 0.2% | 0.1% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.60 | 18.48 | 92.79 | 9.54 | | -- |
| Error (% of scale) | 0.1% | 0.1% | 0.1% | -0.1% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.86 | 10.97 | 48.52 | 4.72 | | -- |
| Error (% of scale) | 0.3% | -0.4% | 0.1% | 0.4% | | PASS |
| Linearity at Mid Point | 0.2% | -0.4% | 0.0% | 0.47% | | |

## POST-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Range | 20 | 20 | 100 | 10 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.04 | 0.01 | 0.16 | 0.01 | | -- |
| Error (% of scale) | 0.2% | 0.0% | 0.2% | 0.1% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.38 | 18.09 | 93.12 | 9.55 | | -- |
| Error (% of scale) | -1.0% | -1.9% | 0.4% | 0.0% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.81 | 10.84 | 48.99 | 4.71 | | -- |
| Error (% of scale) | 0.0% | -1.0% | 0.6% | 0.3% | | PASS |
| Linearity at Mid Point | 0.5% | 0.1% | 0.3% | 0.2% | | |

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE OF SPAN)/RANGE * 100%
ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIPCHART)

# DELTA
## EPA SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power
Unit 2

DATE: 3/27/2018
BY: DW

| | MID SPAN CYLINDER | | HIGH SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | | 99.999 | | |
| $O_2$ | EB0002353 | 10.81 | CC171976 | 19.59 |
| $CO_2$ | EB0002353 | 11.04 | CC171976 | 18.46 |
| $NO_x$ | CC364675 | 48.4 | CC28978 | 92.7 |
| CO | EB0095148 | 4.68 | CC251444 | 9.55 |
| | | | | |

## PRE-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Span | 19.59 | 18.46 | 92.7 | 9.55 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.035 | 0.013 | 0.151 | 0.005 | | -- |
| Error (% of cal span) | 0.2% | 0.1% | 0.2% | 0.1% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.6 | 18.476 | 92.791 | 9.539 | | -- |
| Error (% of cal span) | 0.1% | 0.1% | 0.1% | -0.1% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.863 | 10.969 | 48.519 | 4.724 | | -- |
| Error (% of cal span) | 0.3% | -0.4% | 0.1% | 0.5% | | PASS |
| | | | | | | |

## POST-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Span | 19.59 | 18.46 | 92.7 | 9.55 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.035 | 0.009 | 0.164 | 0.012 | | -- |
| Error (% of cal span) | 0.2% | 0.0% | 0.2% | 0.1% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.381 | 18.088 | 93.115 | 9.552 | | -- |
| Error (% of cal span) | -1.1% | -2.0% | 0.4% | 0.0% | | FAIL |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.813 | 10.841 | 48.992 | 4.708 | | -- |
| Error (% of cal span) | 0.0% | -1.1% | 0.6% | 0.3% | | PASS |

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE)/HIGH SPAN * 100%
ALLOWABLE DEVIATION IS 2% OF HIGH SPAN

# Montrose
## SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power
Unit 2

DATE: 3/27/2018
BY: DW

| | MID SPAN CYLINDER | | HIGH SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | | 99.999 | | |
| $O_2$ | EB0002353 | 10.81 | CC171976 | 19.59 |
| $CO_2$ | EB0002353 | 11.04 | CC171976 | 18.46 |
| $NO_x$ | CC364675 | 48.4 | CC28978 | 92.7 |
| CO | EB0095148 | 4.68 | CC251444 | 9.55 |
| | | | | |

## PRE-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Range | 20 | 20 | 100 | 10 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.04 | 0.01 | 0.15 | 0.01 | | -- |
| Error (% of scale) | 0.2% | 0.1% | 0.2% | 0.1% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.60 | 18.48 | 92.79 | 9.54 | | -- |
| Error (% of scale) | 0.1% | 0.1% | 0.1% | -0.1% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.86 | 10.97 | 48.52 | 4.72 | | -- |
| Error (% of scale) | 0.3% | -0.4% | 0.1% | 0.4% | | PASS |
| Linearity at Mid Point | 0.2% | -0.4% | 0.0% | 0.47% | | |

## POST-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Range | 20 | 20 | 100 | 10 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.04 | 0.01 | 0.16 | 0.01 | | -- |
| Error (% of scale) | 0.2% | 0.0% | 0.2% | 0.1% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.38 | 18.09 | 93.12 | 9.55 | | -- |
| Error (% of scale) | -1.0% | -1.9% | 0.4% | 0.0% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.81 | 10.84 | 48.99 | 4.71 | | -- |
| Error (% of scale) | 0.0% | -1.0% | 0.6% | 0.3% | | PASS |
| Linearity at Mid Point | 0.5% | 0.1% | 0.3% | 0.2% | | |

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE OF SPAN)/RANGE * 100%
ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIPCHART)

## Montrose
## EPA SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power
Unit 2

DATE: 3/27/2018
BY: DW

| | MID SPAN CYLINDER | | HIGH SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | | 99.999 | | |
| $O_2$ | EB0002353 | 10.81 | CC171976 | 19.59 |
| $CO_2$ | EB0002353 | 11.04 | CC171976 | 18.46 |
| $NO_x$ | CC364675 | 48.4 | CC28978 | 92.7 |
| CO | EB0095148 | 4.68 | CC251444 | 9.55 |
| | | | | |

## PRE-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Span | 19.59 | 18.46 | 92.7 | 9.55 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.035 | 0.013 | 0.151 | 0.005 | | -- |
| Error (% of cal span) | 0.2% | 0.1% | 0.2% | 0.1% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.6 | 18.476 | 92.791 | 9.539 | | -- |
| Error (% of cal span) | 0.1% | 0.1% | 0.1% | -0.1% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.863 | 10.969 | 48.519 | 4.724 | | -- |
| Error (% of cal span) | 0.3% | -0.4% | 0.1% | 0.5% | | PASS |
| | | | | | | |

## POST-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Span | 19.59 | 18.46 | 92.7 | 9.55 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.035 | 0.009 | 0.164 | 0.012 | | -- |
| Error (% of cal span) | 0.2% | 0.0% | 0.2% | 0.1% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.381 | 18.088 | 93.115 | 9.552 | | -- |
| Error (% of cal span) | -1.1% | -2.0% | 0.4% | 0.0% | | FAIL |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.813 | 10.841 | 48.992 | 4.708 | | -- |
| Error (% of cal span) | 0.0% | -1.1% | 0.6% | 0.3% | | PASS |

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE)/HIGH SPAN * 100%
ALLOWABLE DEVIATION IS 2% OF HIGH SPAN

## NO2 to NO Converter Efficiency Test

| | | | | Cylinder # |
|---|---|---|---|---|
| Analyzer Manufacturer: | CAI | NO Cal Gas Value: | 92.7 | CC151542 |
| Analyzer Model: | 600 Series | NO2 Cal Gas Value: | 44 5 | CC3516 |
| Analyzer Serial Number: | S03003 | Performed By: | DW | |
| Date: | 3/28/2018 | CEMS ID#: | #REF! | |

| GAS | ANALYZER MODE | ANALYZER RESPONSE | CAL CORRECTED | LABEL |
|---|---|---|---|---|
| Zero | NOx | 0 1 | -- | -- |
| Zero | NO | 0.1 | -- | -- |
| NO | NO | 93 0 | -- | -- |
| NO | NOx | 92 8 | -- | -- |
| NO2 | NO | 0.2 | 0.0 | $C_1$ |
| NO2 | NOx | 43.1 | 43.0 | $C_2$ |

| | | Label | Requirement |
|---|---|---|---|
| Abs. Value $C_o$-$C_1$: | 44.5 | $D_1$ | -- |
| Abs. Value $C_2$-$C_1$: | 42.9 | $D_2$ | -- |
| $C_1/C_2$ | 0% | $D_3$ | < 5% |
| CE = $D_2/D_1$ * 100%: | 97% | -- | > 90% |

## Montrose
## SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power
Unit 2

DATE: 3/28/2018
BY: DW

| | MID SPAN CYLINDER | | HIGH SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | | 99.999 | | |
| $O_2$ | EB0002353 | 10.81 | CC171976 | 19.59 |
| $CO_2$ | EB0002353 | 11.04 | CC171976 | 18.46 |
| $NO_x$ | CC364675 | 48.4 | CC28978 | 92.7 |
| CO | EB0095148 | 4.68 | CC251444 | 9.55 |
| | | | | |

### PRE-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Range | 20 | 20 | 100 | 10 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.04 | 0.02 | 0.11 | 0.02 | | -- |
| Error (% of scale) | 0.2% | 0.1% | 0.1% | 0.2% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.61 | 18.48 | 92.82 | 9.56 | | -- |
| Error (% of scale) | 0.1% | 0.1% | 0.1% | 0.1% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.87 | 10.95 | 48.65 | 4.70 | | -- |
| Error (% of scale) | 0.3% | -0.5% | 0.3% | 0.2% | | PASS |
| Linearity at Mid Point | 0.2% | -0.6% | 0.1% | 0.0% | | |

### POST-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Range | 20 | 20 | 100 | 10 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.036 | 0.011 | 0.135 | 0.036 | | -- |
| Error (% of scale) | 0.2% | 0.1% | 0.1% | 0.4% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.51 | 18.27 | 93.07 | 9.59 | | -- |
| Error (% of scale) | -0.4% | -0.9% | 0.4% | 0.4% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.82 | 10.84 | 48.93 | 4.73 | | -- |
| Error (% of scale) | 0.0% | -1.0% | 0.5% | 0.5% | | PASS |
| Linearity at Mid Point | 0.2% | -0.5% | 0.3% | 0.1% | | |

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE OF SPAN)/RANGE * 100%
ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIPCHART)

## Montrose
## EPA SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power

DATE: 3/28/2018
BY: DW

| | MID SPAN CYLINDER | | HIGH SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | | 99.999 | | |
| $O_2$ | EB0002353 | 10.81 | CC171976 | 19.59 |
| $CO_2$ | EB0002353 | 11.04 | CC171976 | 18.46 |
| $NO_x$ | CC364675 | 48.4 | CC28978 | 92.7 |
| CO | EB0095148 | 4.68 | CC251444 | 9.55 |
| | | | | |

### PRE-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Span | 19.59 | 18.46 | 92.7 | 9.55 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.04 | 0.02 | 0.11 | 0.02 | | -- |
| Error (% of cal span) | 0.2% | 0.1% | 0.1% | 0.2% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.61 | 18.48 | 92.82 | 9.56 | | -- |
| Error (% of cal span) | 0.1% | 0.1% | 0.1% | 0.1% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.87 | 10.95 | 48.65 | 4.70 | | -- |
| Error (% of cal span) | 0.3% | -0.5% | 0.3% | 0.2% | | PASS |
| | | | | | | |

### POST-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Span | 19.59 | 18.46 | 92.7 | 9.55 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.04 | 0.01 | 0.14 | 0.04 | | -- |
| Error (% of cal span) | 0.2% | 0.1% | 0.1% | 0.4% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.51 | 18.27 | 93.07 | 9.59 | | -- |
| Error (% of cal span) | -0.4% | -1.0% | 0.4% | 0.4% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.82 | 10.84 | 48.93 | 4.73 | | -- |
| Error (% of cal span) | 0.0% | -1.1% | 0.6% | 0.5% | | PASS |

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE)/HIGH SPAN * 100%
ALLOWABLE DEVIATION IS 2% OF HIGH SPAN

## NO2 to NO Converter Efficiency Test

| | | | | Cylinder # |
|---|---|---|---|---|
| Analyzer Manufacturer: | CAI | NO Cal Gas Value: | 0 0 | 0 |
| Analyzer Model: | 600 Series | NO2 Cal Gas Value: | 45 8 | CC230245 |
| Analyzer Serial Number: | S03003 | Performed By: | 0 | |
| Date: | 3/29/2018 | CEMS ID#: | 3-CEMS | |

| GAS | ANALYZER MODE | ANALYZER RESPONSE | CAL CORRECTED | LABEL |
|---|---|---|---|---|
| Zero | NOx | 0.1 | -- | -- |
| Zero | NO | 0.1 | -- | -- |
| NO | NO | 48.9 | -- | -- |
| NO | NOx | 48.6 | -- | -- |
| NO2 | NO | 0.4 | 0.0 | $C_1$ |
| NO2 | NOx | 41.9 | 0.0 | $C_2$ |

| | | Label | Requirement |
|---|---|---|---|
| Abs. Value $C_o$-$C_1$: | 45.8 | $D_1$ | -- |
| Abs. Value $C_2$-$C_1$: | 0.0 | $D_2$ | -- |
| $C_1/C_2$ | #DIV/0! | $D_3$ | < 5% |
| CE = $D_2/D_1$ * 100%: | 0% -- | | > 90% |

# Montrose AQS
## SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power
Unit 1

DATE: 3/29/2018
BY: DW

| | MID SPAN CYLINDER | | HIGH SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | | 99.999 | | |
| $O_2$ | EB0002353 | 10.81 | CC171976 | 19.59 |
| $CO_2$ | EB0002353 | 11.04 | CC171976 | 18.46 |
| $NO_x$ | CC364675 | 48.4 | CC28978 | 92.7 |
| CO | EB0095148 | 4.68 | CC251444 | 9.55 |
| | | | | |

## PRE-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Range | 20 | 20 | 100 | 10 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.04 | 0.01 | 0.13 | 0.00 | | -- |
| Error (% of scale) | 0.2% | 0.1% | 0.1% | 0.0% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.58 | 18.47 | 92.73 | 9.57 | | -- |
| Error (% of scale) | 0.0% | 0.0% | 0.0% | 0.1% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.84 | 10.94 | 48.59 | 4.69 | | -- |
| Error (% of scale) | 0.2% | -0.5% | 0.2% | 0.1% | | PASS |
| Linearity at Mid Point | 0.1% | -0.6% | 0.1% | 0.04% | | |

## POST-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Range | 20 | 20 | 100 | 10 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.036 | 0.014 | 0.138 | -0.007 | | -- |
| Error (% of scale) | 0.2% | 0.1% | 0.1% | -0.1% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.383 | 18.364 | 92.653 | 9.483 | | -- |
| Error (% of scale) | -1.0% | -0.5% | 0.0% | -0.7% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.743 | 10.911 | 48.632 | 4.65 | | -- |
| Error (% of scale) | -0.3% | -0.6% | 0.2% | -0.3% | | PASS |
| Linearity at Mid Point | 0.2% | -0.4% | 0.2% | 0.1% | | |

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE OF SPAN)/RANGE * 100%
ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIPCHART)

## Montrose AQS
## EPA SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power

DATE: 3/29/2018
BY: DW

| | MID SPAN CYLINDER | | HIGH SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | | 99.999 | | |
| $O_2$ | EB0002353 | 10.81 | CC171976 | 19.59 |
| $CO_2$ | EB0002353 | 11.04 | CC171976 | 18.46 |
| $NO_x$ | CC364675 | 48.4 | CC28978 | 92.7 |
| CO | EB0095148 | 4.68 | CC251444 | 9.55 |
| | | | | |

### PRE-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Span | 19.59 | 18.46 | 92.7 | 9.55 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.036 | 0.013 | 0.13 | 0.004 | | -- |
| Error (% of cal span) | 0.2% | 0.1% | 0.1% | 0.0% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.583 | 18.47 | 92.733 | 9.565 | | -- |
| Error (% of cal span) | 0.0% | 0.1% | 0.0% | 0.2% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.843 | 10.936 | 48.591 | 4.693 | | -- |
| Error (% of cal span) | 0.2% | -0.6% | 0.2% | 0.1% | | PASS |
| | | | | | | |

### POST-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Span | 19.59 | 18.46 | 92.7 | 9.55 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.036 | 0.014 | 0.138 | -0.007 | | -- |
| Error (% of cal span) | 0.2% | 0.1% | 0.1% | -0.1% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.383 | 18.364 | 92.653 | 9.483 | | -- |
| Error (% of cal span) | -1.1% | -0.5% | -0.1% | -0.7% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.743 | 10.911 | 48.632 | 4.65 | | -- |
| Error (% of cal span) | -0.3% | -0.7% | 0.3% | -0.3% | | PASS |

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE)/HIGH SPAN * 100%
ALLOWABLE DEVIATION IS 2% OF HIGH SPAN

## NO2 to NO Converter Efficiency Test

| | | | | Cylinder # |
|---|---|---|---|---|
| Analyzer Manufacturer: | CAI | NO Cal Gas Value: | 92.7 | CC28978 |
| Analyzer Model: | 600 Series | NO2 Cal Gas Value: | 44.5 | CC3516 |
| Analyzer Serial Number: | S03003 | Performed By: | DW | |
| Date: | 3/30/2018 | CEMS ID#: | 3-CEMS | |

| GAS | ANALYZER MODE | ANALYZER RESPONSE | CAL CORRECTED | LABEL |
|---|---|---|---|---|
| Zero | NOx | 0.2 | -- | -- |
| Zero | NO | 0.1 | -- | -- |
| NO | NO | 92.9 | -- | -- |
| NO | NOx | 92.7 | -- | -- |
| NO2 | NO | 0.2 | 0.1 | $C_1$ |
| NO2 | NOx | 43.2 | 43.1 | $C_2$ |

| | | Label | Requirement |
|---|---|---|---|
| Abs. Value $C_o$-$C_1$: | 44.4 | $D_1$ | -- |
| Abs. Value $C_2$-$C_1$: | 43.0 | $D_2$ | -- |
| $C_1/C_2$ | 0% | $D_3$ | < 5% |
| CE = $D_2/D_1$ * 100%: | 96.8% | -- | > 90% |

# Montrose AQS
## SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power
Unit 1

DATE: 3/30/2018
BY: DW

| | MID SPAN CYLINDER | | HIGH SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | | 99.999 | | |
| $O_2$ | EB0002353 | 10.81 | CC171976 | 19.59 |
| $CO_2$ | EB0002353 | 11.04 | CC171976 | 18.46 |
| $NO_x$ | CC364675 | 48.4 | CC28978 | 92.7 |
| CO | EB0095148 | 4.68 | CC251444 | 9.55 |
| | | | | |

## PRE-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Range | 20 | 20 | 100 | 10 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.04 | 0.01 | 0.16 | 0.00 | | -- |
| Error (% of scale) | 0.2% | 0.1% | 0.2% | 0.0% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.58 | 18.45 | 92.74 | 9.58 | | -- |
| Error (% of scale) | -0.1% | -0.1% | 0.0% | 0.3% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.87 | 10.96 | 48.68 | 4.72 | | -- |
| Error (% of scale) | 0.3% | -0.4% | 0.3% | 0.4% | | PASS |
| Linearity at Mid Point | 0.2% | -0.4% | 0.2% | 0.20% | | |

## POST-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Range | 20 | 20 | 100 | 10 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.035 | 0.012 | 0.136 | 0.007 | | -- |
| Error (% of scale) | 0.2% | 0.1% | 0.1% | 0.1% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.556 | 18.331 | 92.699 | 9.631 | | -- |
| Error (% of scale) | -0.2% | -0.6% | 0.0% | 0.8% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.842 | 10.873 | 48.728 | 4.735 | | -- |
| Error (% of scale) | 0.2% | -0.8% | 0.3% | 0.6% | | PASS |
| Linearity at Mid Point | 0.2% | -0.5% | 0.3% | 0.1% | | |

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE OF SPAN)/RANGE * 100%
ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIPCHART)

## Montrose AQS
## EPA SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power

DATE: 3/30/2018
BY: DW

| | MID SPAN CYLINDER | | HIGH SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | | 99.999 | | |
| $O_2$ | EB0002353 | 10.81 | CC171976 | 19.59 |
| $CO_2$ | EB0002353 | 11.04 | CC171976 | 18.46 |
| $NO_x$ | CC364675 | 48.4 | CC28978 | 92.7 |
| CO | EB0095148 | 4.68 | CC251444 | 9.55 |
| | | | | |

### PRE-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Span | 19.59 | 18.46 | 92.7 | 9.55 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.036 | 0.01 | 0.155 | 0.003 | | -- |
| Error (% of cal span) | 0.2% | 0.1% | 0.2% | 0.0% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.58 | 18.449 | 92.742 | 9.577 | | -- |
| Error (% of cal span) | -0.1% | -0.1% | 0.0% | 0.3% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.865 | 10.956 | 48.684 | 4.715 | | -- |
| Error (% of cal span) | 0.3% | -0.5% | 0.3% | 0.4% | | PASS |
| | | | | | | |

### POST-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | $NO_x$ | CO | | |
| Analyzer Span | 19.59 | 18.46 | 92.7 | 9.55 | | |
| Zero Gas Value | 0 | 0 | 0 | 0 | | -- |
| Analyzer Reads | 0.035 | 0.012 | 0.136 | 0.007 | | -- |
| Error (% of cal span) | 0.2% | 0.1% | 0.1% | 0.1% | | PASS |
| High Gas Value | 19.59 | 18.46 | 92.7 | 9.55 | | -- |
| Analyzer Reads | 19.556 | 18.331 | 92.699 | 9.631 | | -- |
| Error (% of cal span) | -0.2% | -0.7% | 0.0% | 0.8% | | PASS |
| Mid Gas Value | 10.81 | 11.04 | 48.4 | 4.68 | | -- |
| Analyzer Reads | 10.842 | 10.873 | 48.728 | 4.735 | | -- |
| Error (% of cal span) | 0.2% | -0.9% | 0.4% | 0.6% | | PASS |

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE)/HIGH SPAN * 100%
ALLOWABLE DEVIATION IS 2% OF HIGH SPAN

## SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power
Unit 1

DATE: 3/31/2018
BY: DW

| | MID SPAN CYLINDER | | HIGH SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | | | | |
| $O_2$ | CC116546 | 10.46 | CC171976 | 19.59 |
| $CO_2$ | CC116546 | 10.59 | CC171976 | 18.46 |
| | | | | |
| | | | | |
| | | | | |

### PRE-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | | | | |
| Analyzer Range | 20 | 20 | | | | |
| Zero Gas Value | 0.0 | 0.0 | | | | -- |
| Analyzer Reads | 0.04 | 0.02 | | | | -- |
| Error (% of scale) | 0.2% | 0.1% | | | | PASS |
| High Gas Value | 19.59 | 18.46 | | | | -- |
| Analyzer Reads | 19.62 | 18.49 | | | | -- |
| Error (% of scale) | 0.2% | 0.1% | | | | PASS |
| Mid Gas Value | 10.46 | 10.59 | | | | -- |
| Analyzer Reads | 10.54 | 10.42 | | | | -- |
| Error (% of scale) | 0.4% | -0.9% | | | | PASS |
| Linearity at Mid Point | 0.2% | -1.0% | | | | |

### POST-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | | | | |
| Analyzer Range | 20 | 20 | | | | |
| Zero Gas Value | 0.0 | 0.0 | | | | -- |
| Analyzer Reads | 0.05 | 0.06 | | | | -- |
| Error (% of scale) | 0.3% | 0.3% | | | | PASS |
| High Gas Value | 19.59 | 18.46 | | | | -- |
| Analyzer Reads | 19.67 | 18.48 | | | | -- |
| Error (% of scale) | 0.4% | 0.1% | | | | PASS |
| Mid Gas Value | 10.46 | 10.59 | | | | -- |
| Analyzer Reads | 10.57 | 10.43 | | | | -- |
| Error (% of scale) | 0.5% | -0.8% | | | | PASS |
| Linearity at Mid Point | 0.2% | -1.0% | | | | |

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE OF SPAN)/RANGE * 100%
ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIPCHART)

# EPA SPAN GAS RECORD

IENT/LOCATION: Desert View Power DATE:

BY: DW

| | MID SPAN CYLINDER | | HIGH SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | | 100.00 | | |
| $O_2$ | EB0002353 | 10.81 | CC171976 | 19.59 |
| $CO_2$ | EB0002353 | 11.04 | CC171976 | 18.46 |
| | | | | |
| | | | | |
| | | | | |

## PRE-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | | | | |
| Analyzer Span | 19.59 | 18.46 | | | | |
| Zero Gas Value | 0.0 | 0.0 | | | | -- |
| Analyzer Reads | | | | | | -- |
| Error (% of cal span) | 0.0% | 0.0% | | | | PASS |
| High Gas Value | 19.59 | 18.46 | | | | -- |
| Analyzer Reads | | | | | | -- |
| Error (% of cal span) | -100.0% | -100.0% | | | | FAIL |
| Mid Gas Value | 10.81 | 11.04 | | | | -- |
| Analyzer Reads | | | | | | -- |
| Error (% of cal span) | -55.2% | -59.8% | | | | FAIL |
| Linearity at Mid Point | 0.0% | 0.0% | | | | |

## POST-TEST INSTRUMENT CALIBRATION ERROR

| | ANALYZER | | | | | STATUS |
|---|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | | | | |
| Analyzer Span | 19.59 | 18.46 | | | | |
| Zero Gas Value | 0.0 | 0.0 | | | | -- |
| Analyzer Reads | | | | | | -- |
| Error (% of cal span) | 0.0% | 0.0% | | | | PASS |
| High Gas Value | 19.59 | 18.46 | | | | -- |
| Analyzer Reads | | | | | | -- |
| Error (% of cal span) | -100.0% | -100.0% | | | | FAIL |
| Mid Gas Value | 10.81 | 11.04 | | | | -- |
| Analyzer Reads | | | | | | -- |
| Error (% of cal span) | -55.2% | -59.8% | | | | FAIL |

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE)/HIGH SPAN * 100%
ALLOWABLE DEVIATION IS 2% OF HIGH SPAN

PRAXAIR

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5700 South Alameda Street
Los Angeles, CA 90058
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PGVPID: F22016

DocNumber: 000096893

# OF ANALYSIS / EPA PROTOCOL GAS

MONTROSE

Montrose Air Quality Services, LLC
631 E. St. Andrew Pl.
Santa Ana, CA 92705

*Praxair Order Number:* 34592518
*Customer P. O. Number:* 06075567
*Customer Reference Number:*

*Fill Date:* 7/13/2016
*Part Number:* EV NICDOXE43-AS
*Lot Number:* 109619507
*Cylinder Style & Outlet:* AS CGA 590
*Cylinder Pressure & Volume:* 2000 psig 140 cu. ft.

$O_2$-10.81%
$CO_2$-11.04%
EB0002353
Exp. 7/25/24
F22016

*Certified Concentration:*

| | | | |
|---|---|---|---|
| Expiration Date: | | 7/25/2024 | NIST Traceable |
| Cylinder Number: | | EB0002353 | Analytical Uncertainty: |
| 11.04 | % | CARBON DIOXIDE | ± 0.3 % |
| 10.81 | % | OXYGEN | ± 0.4 % |
| | Balance | NITROGEN | |

*Certification Information:* *Certification Date:* 7/25/2016 *Term:* 96 Months *Expiration Date:* 7/25/2024

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG

O2 responses have been corrected for CO2 interference.

*Analytical Data:* *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: CARBON DIOXIDE

Requested Concentration: 11 %
Certified Concentration: 11.04 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 7/18/2016

Reference Standard Type: GMIS
Ref. Std. Cylinder #: SA15063
Ref. Std. Conc.: 9.95%
Ref. Std. Traceable to SRM #: 1674b
SRM Sample #: 7-H-07
SRM Cylinder #: FF10631

First Analysis Data: Date: 7/25/2016

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 9.96 | C: | 11.05 | Conc: | 11.035 |
| R: | 9.97 | Z: | 0 | C: | 11.05 | Conc: | 11.035 |
| Z: | 0 | C: | 11.05 | R: | 9.96 | Conc: | 11.035 |

UOM: % Mean Test Assay: 11.035 %

Second Analysis Data: Date:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 0 | C: | 0 | Conc: | 0 |
| R: | 0 | Z: | 0 | C: | 0 | Conc: | 0 |
| Z: | 0 | C: | 0 | R: | 0 | Conc: | 0 |

UOM: % Mean Test Assay: 0 %

2. Component: OXYGEN

Requested Concentration: 11 %
Certified Concentration: 10.81 %
Instrument Used: OXYMAT 5E
Analytical Method: PARAMAGNETIC
Last Multipoint Calibration: 5/30/2016

Reference Standard Type: GMIS
Ref. Std. Cylinder #: CC187493
Ref. Std. Conc.: 10.00%
Ref. Std. Traceable to SRM #: 2658a
SRM Sample #: 72-D-28
SRM Cylinder #: CAL016862

First Analysis Data: Date: 7/25/2016

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 10.02 | C: | 10.83 | Conc: | 10.798 |
| R: | 10.03 | Z: | 0 | C: | 10.85 | Conc: | 10.818 |
| Z: | 0 | C: | 10.85 | R: | 10.04 | Conc: | 10.818 |

UOM: % Mean Test Assay: 10.811 %

Second Analysis Data: Date:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 0 | C: | 0 | Conc: | 0 |
| R: | 0 | Z: | 0 | C: | 0 | Conc: | 0 |
| Z: | 0 | C: | 0 | R: | 0 | Conc: | 0 |

UOM: % Mean Test Assay: 0 %

Analyzed by: Maria Soberanis

Certified by: Ying Yu

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JD 6/23/17

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22015

DocNumber: 000086489

# CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

SCEC
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

*Praxair Order Number:* 32991305
*Customer P. O. Number:* 05812807
*Customer Reference Number:*

*Fill Date:* 11/5/2015
*Part Number:* NI CD19O2E-AS
*Lot Number:* 109530902
*Cylinder Style & Outlet:* AS CGA 590
*Cylinder Pressure & Volume:* 2000 psig 140 cu. ft.

O2 19.59
CO2 18.46
CC171976
EXP 11/09/23
F22015

## *Certified Concentration:*

| | | | |
|---|---|---|---|
| Expiration Date: | | 11/9/2023 | NIST Traceable |
| Cylinder Number: | | CC171976 | Analytical Uncertainty: |
| 18.46 | % | CARBON DIOXIDE | ± 0.2 % |
| 19.59 | % | OXYGEN | ± 0.2 % |
| | Balance | NITROGEN | |

*Certifcation Information:* *Certification Date:* 11/9/2015 *Term:* 96 Months *Expiration Date:* 11/9/2023

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

O2 responses have been corrected for CO2 interference.

*Analytical Data:* *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: CARBON DIOXIDE

Requested Concentration: 19 %
Certified Concentration: 18.46 %
Instrument Used: Horiba VIA-510 S/N 2807014
Analytical Method: NDIR
Last Multipoint Calibration: 10/10/2015

Reference Standard Type: GMIS
Ref. Std. Cylinder #: CC158146
Ref. Std. Conc: 19.94%
Ref. Std. Traceable to SRM #: N/A
SRM Sample #: 109433807
SRM Cylinder #: CC28033

| First Analysis Data: | | | | | | | Date: 11/9/2015 |
|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 19.94 | C: | 18.45 | Conc: | 18.453 |
| R: | 19.94 | Z: | 0 | C: | 18.46 | Conc: | 18.463 |
| Z: | 0 | C: | 18.45 | R: | 19.93 | Conc: | 18.453 |
| UOM: | % | | | Mean Test Assay: | | | 18.456 % |

| Second Analysis Data: | | | | | | | Date: |
|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 0 | C: | 0 | Conc: | 0 |
| R: | 0 | Z: | 0 | C: | 0 | Conc: | 0 |
| Z: | 0 | C: | 0 | R: | 0 | Conc: | 0 |
| UOM: | % | | | Mean Test Assay: | | | 0 % |

2. Component: OXYGEN

Requested Concentration: 19 %
Certified Concentration: 19.59 %
Instrument Used: OXYMAT 5E
Analytical Method: PARAMAGNETIC
Last Multipoint Calibration: 11/5/2015

Reference Standard Type: GMIS
Ref. Std. Cylinder #: CC243259
Ref. Std. Conc: 20.03%
Ref. Std. Traceable to SRM #: 2659a
SRM Sample #: 71-E-19
SRM Cylinder #: FF22331

| First Analysis Data: | | | | | | | Date: 11/9/2015 |
|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 20.02 | C: | 19.59 | Conc: | 19.6 |
| R: | 20.02 | Z: | 0 | C: | 19.57 | Conc: | 19.58 |
| Z: | 0 | C: | 19.57 | R: | 20.02 | Conc: | 19.58 |
| UOM: | % | | | Mean Test Assay: | | | 19.586 % |

| Second Analysis Data: | | | | | | | Date: |
|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 0 | C: | 0 | Conc: | 0 |
| R: | 0 | Z: | 0 | C: | 0 | Conc: | 0 |
| Z: | 0 | C: | 0 | R: | 0 | Conc: | 0 |
| UOM: | % | | | Mean Test Assay: | | | 0 % |

Analyzed by: Ying-Yu

Certified by: Jack Fu (Jack Fu)

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1-11-16

PRAXAIR

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PGVPID: F22016

DocNumber: 000097779

# CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

MONTROSE

Montrose Air Quality Services, LLC
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

*Praxair Order Number:* 34697981
*Customer P. O. Number:* 06095091
*Customer Reference Number:*

*Fill Date:* 8/8/2016
*Part Number:* NI NO94MZE-AS
*Lot Number:* 109622109
*Cylinder Style & Outlet:* AS CGA 660
*Cylinder Pressure & Volume:* 2000 psig 140 cu. ft.

NOx 92.7
CC28978
8/24/24
F22016

## Certified Concentration:

| | | | |
|---|---|---|---|
| Expiration Date: | 8/24/2024 | | NIST Traceable |
| Cylinder Number: | CC28978 | | Analytical Uncertainty: |
| 92.7 | ppm | NITRIC OXIDE (as NOx) | ± 0.4 % |
| | Balance | NITROGEN | |

NO = 92.3 ppm

NO for Reference Only

*Certification Information:* *Certification Date:* 8/24/2016 *Term:* 96 Months *Expiration Date:* 8/24/2024

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

*Analytical Data:* *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. **Component: NITRIC OXIDE (as NOx)**

| | |
|---|---|
| Requested Concentration | 94 ppm |
| Certified Concentration | 92.7 ppm |
| Instrument Used | Thermo Electron 42i-LS S/N 1030645077 |
| Analytical Method | Chemiluminescence |
| Last Multipoint Calibration | 7/27/2016 |

| | |
|---|---|
| Reference Standard Type | GMIS |
| Ref. Std. Cylinder # | DT0009522 |
| Ref. Std. Conc. | 99.58 ppm |
| Ref. Std. Traceable to SRM # | 1684b |
| SRM Sample # | 44-T-20 |
| SRM Cylinder # | FF6010 |

**First Analysis Data:** **Date:** 8/17/2016

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 99.6 | C: | 92.8 | Conc: | 92.781 |
| R: | 99.6 | Z: | 0 | C: | 92.7 | Conc: | 92.681 |
| Z: | 0 | C: | 92.8 | R: | 99.6 | Conc: | 92.781 |

**UOM:** ppm **Mean Test Assay:** 92.748 ppm

**Second Analysis Data:** **Date:** 8/24/2016

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 99.6 | C: | 92.6 | Conc: | 92.581 |
| R: | 99.6 | Z: | 0 | C: | 92.7 | Conc: | 92.681 |
| Z: | 0 | C: | 92.6 | R: | 99.6 | Conc: | 92.581 |

**UOM:** ppm **Mean Test Assay:** 92.615 ppm

Analyzed by: Matthew Angerer

Certified by: Henry Koung

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

MC 9/27/16

PRAXAIR

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PGVPID: F22017

DocNumber: 000107357

# CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

MONTROSE

Montrose Air Quality Services, LLC
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

*Praxair Order Number:* 70234290
*Customer P. O. Number:*
*Customer Reference Number:*

*Fill Date:* 4/3/2017
*Part Number:* NI NO47.5MZE-AS
*Lot Number:* 109709317
*Cylinder Style & Outlet:* AS CGA 660
*Cylinder Pressure & Volume:* 2000 psig 140 cu. ft.

NOx-48.4ppm
CC 364675
Exp. 4/17/20
F22017

***Certified Concentration:***

| | | | |
|---|---|---|---|
| Expiration Date: | 4/17/2020 | | NIST Traceable |
| Cylinder Number: | CC364675 | | Analytical Uncertainty: |
| 48.4 | ppm | NITRIC OXIDE (as NOx) | ± 0.7 % |
| | Balance | NITROGEN | |

**NO = 48.1 ppm** **NO for Reference Only**

***Certifcation Information:*** *Certification Date:* 4/17/2017 *Term:* 36 Months *Expiration Date:* 4/17/2020

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

***Analytical Data:*** *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. **Component: NITRIC OXIDE (as NOx)**

| | |
|---|---|
| Requested Concentration: | 47.5 ppm |
| Certified Concentration: | 48.4 ppm |
| Instrument Used: | Thermo Electron 42i-LS S/N 1030645077 |
| Analytical Method: | Chemiluminescence |
| Last Multipoint Calibration: | 3/24/2017 |

| | |
|---|---|
| Reference Standard Type | GMIS |
| Ref. Std. Cylinder # | CC30828 |
| Ref. Std. Conc | 50.84 ppm |
| Ref. Std. Traceable to SRM # | vs. 1683b |
| SRM Sample # | 45-V-42 |
| SRM Cylinder # | CAL017897 |

**First Analysis Data:** **Date:** 4/10/2017

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 50.8 | C: | 48.3 | Conc: | 48.275 | | | | |
| R: | 50.9 | Z: | 0 | C: | 48.4 | Conc: | 48.375 | | | | |
| Z: | 0 | C: | 48.4 | R: | 50.9 | Conc: | 48.375 | | | | |

**UOM:** ppm **Mean Test Assay:** 48.341 ppm

**Second Analysis Data:** **Date:** 4/17/2017

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 50.8 | C: | 48.2 | Conc: | 48.461 | | | | |
| R: | 50.5 | Z: | 0 | C: | 48.1 | Conc: | 48.36 | | | | |
| Z: | 0 | C: | 48.4 | R: | 50.4 | Conc: | 48.662 | | | | |

**UOM:** ppm **Mean Test Assay:** 48.494 ppm

Analyzed by: Henry Koung

Certified by: Jack Pu

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JD
6/9/17

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22016

DocNumber: 000096217

# CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

MONTROSE

Montrose Air Quality Services, LLC
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

*Praxair Order Number:* 34529715
*Customer P. O. Number:* 06064636
*Customer Reference Number:*

*Fill Date:* 6/29/2016
*Part Number:* NI CO9.5ME-AS
*Lot Number:* 109618103
*Cylinder Style & Outlet:* AS CGA 350
*Cylinder Pressure & Volume:* 2000 psig 140 cu. ft.

CO - 9.55ppm
CC251444
EXP 7/11/24
F22016

***Certified Concentration:***

| | | | |
|---|---|---|---|
| Expiration Date: | | 7/11/2024 | NIST Traceable |
| Cylinder Number: | | CC251444 | Analytical Uncertainty: |
| 9.55 | ppm | CARBON MONOXIDE | ± 0.9 % |
| | Balance | NITROGEN | |

***Certifcation Information:*** *Certification Date:* 7/11/2016 *Term:* 96 Months *Expiration Date:* 7/11/2024

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

***Analytical Data:*** *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. **Component: CARBON MONOXIDE**

Requested Concentration: 9.5 ppm
Certified Concentration: 9.55 ppm
Instrument Used: Horiba VIA-510 S/N 576876015
Analytical Method: NDIR
Last Multipoint Calibration: 6/29/2016

Reference Standard Type: GMIS
Ref. Std. Cylinder #: CC196524
Ref. Std. Conc: 7.973 ppm
Ref. Std. Traceable to SRM #: 1677c
SRM Sample #: 5-J-42
SRM Cylinder #: 1677c

| First Analysis Data: | | | | | | | Date: | 7/11/2016 |
|---|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 63.5 | C: | 75.8 | Conc: | 9.573 | |
| R: | 63.1 | Z: | 0 | C: | 75.6 | Conc: | 9.547 | |
| Z: | 0 | C: | 75.5 | R: | 62.8 | Conc: | 9.535 | |
| UOM: | ppm | | | Mean Test Assay: | | | 9.552 ppm | |

| Second Analysis Data: | | | | | | | Date: | |
|---|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 0 | C: | 0 | Conc: | 0 | |
| R: | 0 | Z: | 0 | C: | 0 | Conc: | 0 | |
| Z: | 0 | C: | 0 | R: | 0 | Conc: | 0 | |
| UOM: | ppm | | | Mean Test Assay: | | | 0 ppm | |

Analyzed by: Ying Yu

Certified by: Maria Soberanis

PK 9/12/17

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PRAXAIR

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PGVPID: F22017

DocNumber: 000111806

# CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

MONTROSE

Montrose Air Quality Services, LLC
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

*Praxair Order Number:* 70293656
*Customer P. O. Number:*
*Customer Reference Number:*

*Fill Date:* 6/20/2017
*Part Number:* NI CO4 7ME-AS
*Lot Number:* 70086717109
*Cylinder Style & Outlet:* AS CGA 350
*Cylinder Pressure & Volume:* 2000 psig 140 cu. ft.

CO - 4.68ppm
EB0099148
EXP 6/28/25
F22017

***Certified Concentration:***

| | | | |
|---|---|---|---|
| Expiration Date: | | 6/28/2025 | NIST Traceable |
| Cylinder Number: | | EB0099148 | Analytical Uncertainty: |
| 4.68 | ppm | CARBON MONOXIDE | ± 0.6 % |
| | Balance | NITROGEN | |

*Certification Information:* *Certification Date:* 6/28/2017 *Term:* 96 Months *Expiration Date:* 6/28/2025

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

***Analytical Data:*** *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. **Component: CARBON MONOXIDE**

Requested Concentration: 4.7 ppm
Certified Concentration: 4.68 ppm
Instrument Used: MKS Multigas 2031 FTIR
Analytical Method: Fourier Transform Infrared
Last Multipoint Calibration: 6/23/2017

Reference Standard Type: GMIS
Ref. Std. Cylinder #: CC341074
Ref. Std. Conc.: 9.939 ppm
Ref. Std. Traceable to SRM #: 1677c
SRM Sample #: 5-J-42
SRM Cylinder #: CAL015337

| First Analysis Data: | | | | | | Date: | 6/28/2017 |
|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 9.634 | C: | 4.543 | Conc: | 4.684 |
| R: | 9.637 | Z: | 0 | C: | 4.542 | Conc: | 4.683 |
| Z: | 0 | C: | 4.537 | R: | 9.646 | Conc: | 4.678 |
| UOM: | ppm | | | Mean Test Assay: | | | 4.682 ppm |

| Second Analysis Data: | | | | | | Date: | |
|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 0 | C: | 0 | Conc: | 0 |
| R: | 0 | Z: | 0 | C: | 0 | Conc: | 0 |
| Z: | 0 | C: | 0 | R: | 0 | Conc: | 0 |
| UOM: | ppm | | | Mean Test Assay: | | | 0 ppm |

Analyzed by: Ying Yu

Certified by: Pupongmontre Pete

P/L 9/12/17

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

PRAXAIR

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PGVPID: F22017

DocNumber: 000112466

# CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

MONTROSE

Montrose Air Quality Services, LLC
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

*Praxair Order Number:* 70297908
*Customer P. O. Number:*
*omer Reference Number:*

*Fill Date:* 6/26/2017
*Part Number:* AI NX45MZ1E-AS
*Lot Number:* 70086717708
*Cylinder Style & Outlet:* AS CGA 660
*Cylinder Pressure & Volume:* 2000 psig 140 cu. ft.

NO2-44.5
CC 3516
EXP. 7-20-20
F22017

***Certified Concentration:***

| | | | |
|---|---|---|---|
| Expiration Date: | 7/21/2020 | | NIST Traceable |
| Cylinder Number: | CC3516 | | Analytical Uncertainty: |
| 44.5 | ppm | NITROGEN DIOXIDE (as NOx) | ± 1 % |
| | Balance | AIR | |

***Certification Information:*** *Certification Date:* 7/21/2017 *Term:* 36 Months *Expiration Date:* 7/21/2020

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

The above certified concentration of Total Oxides of Nitrogen (NOx) excludes HNO3. [HNO3]= 0.8 ppm (for reference only).

***Analytical Data:*** *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. **Component:** NITROGEN DIOXIDE (as NOx)

| | |
|---|---|
| Requested Concentration: | 45 ppm |
| Certified Concentration: | 44.5 ppm |
| Instrument Used: | Thermo Env. 42i-HL |
| Analytical Method: | Chemiluminescence |
| Last Multipoint Calibration: | 6/26/2017 |

| | |
|---|---|
| Reference Standard Type: | GMIS |
| Ref. Std. Cylinder #: | CC308835 |
| Ref. Std. Conc: | 97.5 ppm |
| Ref. Std. Traceable to SRM #: | 2660a |
| SRM Sample #: | 2660-C-45 |
| SRM Cylinder #: | CAL016162 |

**First Analysis Data:** **Date:** 7/14/2017

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 97.4 | C: | 44.5 | Conc: | 44.5 | | | | |
| R: | 97.6 | Z: | 0 | C: | 44.7 | Conc: | 44.7 | | | | |
| Z: | 0 | C: | 44.7 | R: | 97.5 | Conc: | 44.7 | | | | |

**UOM:** ppm **Mean Test Assay:** 44.633 ppm

**Second Analysis Data:** **Date:** 7/21/2017

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 97.5 | C: | 44.4 | Conc: | 44.4 | | | | |
| R: | 97.4 | Z: | 0 | C: | 44.3 | Conc: | 44.3 | | | | |
| Z: | 0 | C: | 44.4 | R: | 97.6 | Conc: | 44.4 | | | | |

**UOM:** ppm **Mean Test Assay:** 44.367 ppm

Analyzed by: Henry Koung

Certified by: Amalia Real

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RZ 7/31/17

PRAXAIR

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PGVPID: F22017

DocNumber: 000118499

# CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

MONTROSE

Montrose Air Quality Services, LLC
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

*Praxair Order Number:* 70455395
*Customer P. O. Number:*
*Customer Reference Number:*

*Fill Date:* 12/18/2017
*Part Number:* Ni CD10.5O6E-AS
*Lot Number:* 70086735207
*Cylinder Style & Outlet:* AS CGA 590
*Cylinder Pressure & Volume:* 2000 psig 140 cu. ft.

O2 10.48
CO2 10.59
CC116546
Exp 12/27/25
F22017

***Certified Concentration:***

| | | | |
|---|---|---|---|
| Expiration Date: | | 12/27/2025 | NIST Traceable |
| Cylinder Number: | | CC116546 | Analytical Uncertainty: |
| 10.59 | % | CARBON DIOXIDE | ± 0.6 % |
| 10.48 | % | OXYGEN | ± 0.4 % |
| | Balance | NITROGEN | |

***Certification Information:*** *Certification Date:* 12/27/2017 *Term:* 96 Months *Expiration Date:* 12/27/2025

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

CO2 responses have been corrected for O2 IR broadening effect. O2 responses have been corrected for CO2 interference.

***Analytical Data:*** *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

**1. Component: CARBON DIOXIDE**

Requested Concentration: 10.5 %
Certified Concentration: 10.59 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 12/19/2017

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC179324
Ref. Std. Conc: 14.01%
Ref. Std. Traceable to SRM # : 1675b
SRM Sample # : 6-F-51
SRM Cylinder # : CAL014538

| First Analysis Data: | | | | | | | | Date: | 12/27/2017 |
|---|---|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 14.01 | C: | 10.59 | Conc: | 10.59 | | |
| R: | 14.01 | Z: | 0 | C: | 10.6 | Conc: | 10.6 | | |
| Z: | 0 | C: | 10.58 | R: | 14.01 | Conc: | 10.58 | | |
| UOM: | % | | | Mean Test Assay: | | | 10.59 % | | |

| Second Analysis Data: | | | | | | | | Date: | |
|---|---|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 0 | C: | 0 | Conc: | 0 | | |
| R: | 0 | Z: | 0 | C: | 0 | Conc: | 0 | | |
| Z: | 0 | C: | 0 | R: | 0 | Conc: | 0 | | |
| UOM: | % | | | Mean Test Assay: | | | 0 % | | |

**2. Component: OXYGEN**

Requested Concentration: 10.5 %
Certified Concentration: 10.48 %
Instrument Used: PARA 1 OXYMAT 5E
Analytical Method: PARAMAGNETIC
Last Multipoint Calibration: 12/20/2017

Reference Standard Type: NTRM
Ref. Std. Cylinder # : DT0010402
Ref. Std. Conc: 9.88%
Ref. Std. Traceable to SRM # : 170701
SRM Sample # : 17070115
SRM Cylinder # :

| First Analysis Data: | | | | | | | | Date: | 12/27/2017 |
|---|---|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 9.88 | C: | 10.48 | Conc: | 10.48 | | |
| R: | 9.88 | Z: | 0 | C: | 10.48 | Conc: | 10.48 | | |
| Z: | 0 | C: | 10.48 | R: | 9.88 | Conc: | 10.48 | | |
| UOM: | % | | | Mean Test Assay: | | | 10.48 % | | |

| Second Analysis Data: | | | | | | | | Date: | |
|---|---|---|---|---|---|---|---|---|---|
| Z: | 0 | R: | 0 | C: | 0 | Conc: | 0 | | |
| R: | 0 | Z: | 0 | C: | 0 | Conc: | 0 | | |
| Z: | 0 | C: | 0 | R: | 0 | Conc: | 0 | | |
| UOM: | % | | | Mean Test Assay: | | | 0 % | | |

Analyzed by: Danielle Burns

Certified by: Jose Vasquez

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AC 2-13-18

## THERMOCOUPLE CALIBRATION

Thermocouple ID: 101
Date: 1/3/2018
Performed By: S. Donovan/R. Monzon

Calibrated Digital Temperature Readout ID: PTC-9
T1 Reference Thermometer ID: 201100
T2 Reference Thermometer ID: 805002770
T3 Reference Thermometer ID: 805002803

| T/C I.D. 101 | Readout I.D. | T/C - Readout °F Reading 1 | Reading 2 | Reading 3 | Average | Reference Thermometer °F Reading 1 | Reading 2 | Reading 3 | Average | Difference °F | %, (°R) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T3 (OIL) | PTC-9 | 349 | 349 | 349 | 349 | 358 | 358 | 358 | 358 | 9.0 | 1.1% | Pass |
| T2 (Boiling $H_2O$) | PTC-9 | 210 | 210 | 209 | 210 | 212 | 212 | 212 | 212 | 2.3 | 0.3% | Pass |
| T1 (Ice/Water) | PTC-9 | 34 | 34 | 34 | 34 | 32 | 32 | 32 | 32 | 2.0 | 0.4% | Pass |

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

## THERMOCOUPLE CALIBRATION

Thermocouple ID: 111
Date: 1/3/2018
Performed By: S. Donovan/R. Monzon

Calibrated Digital Temperature Readout ID: PTC-9
T1 Reference Thermometer ID: 201100
T2 Reference Thermometer ID: 805002770
T3 Reference Thermometer ID: 805002803

| T/C I.D. 111 | Readout I.D. | T/C - Readout °F Reading 1 | Reading 2 | Reading 3 | Average | Reference Thermometer °F Reading 1 | Reading 2 | Reading 3 | Average | Difference °F | %, (°R) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T3 (OIL) | PTC-9 | 355 | 355 | 355 | 355 | 358 | 358 | 358 | 358 | 3.0 | 0.4% | Pass |
| T2 (Boiling $H_2O$) | PTC-9 | 214 | 214 | 214 | 214 | 212 | 212 | 212 | 212 | 2.0 | 0.3% | Pass |
| T1 (Ice/Water) | PTC-9 | 36 | 36 | 36 | 36 | 32 | 32 | 32 | 32 | 4.0 | 0.8% | Pass |

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

## THERMOCOUPLE CALIBRATION

Thermocouple ID: 110
Date: 1/3/2018
Performed By: S. Donovan/R. Monzon

Calibrated Digital Temperature Readout ID: PTC-9
T1 Reference Thermometer ID: 201100
T2 Reference Thermometer ID: 805002770
T3 Reference Thermometer ID: 805002803

| T/C I.D. **110** | Readout I.D. | T/C - Readout °F Reading 1 | Reading 2 | Reading 3 | Average | Reference Thermometer °F Reading 1 | Reading 2 | Reading 3 | Average | Difference °F | %, (°R) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T3 (OIL) | PTC-9 | 353 | 354 | 354 | 354 | 358 | 358 | 358 | 358 | 4.3 | 0.5% | Pass |
| T2 (Boiling $H_2O$) | PTC-9 | 213 | 213 | 213 | 213 | 212 | 212 | 212 | 212 | 1.0 | 0.1% | Pass |
| T1 (Ice/Water) | PTC-9 | 36 | 36 | 35 | 36 | 32 | 32 | 32 | 32 | 3.7 | 0.7% | Pass |

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

## THERMOCOUPLE CALIBRATION

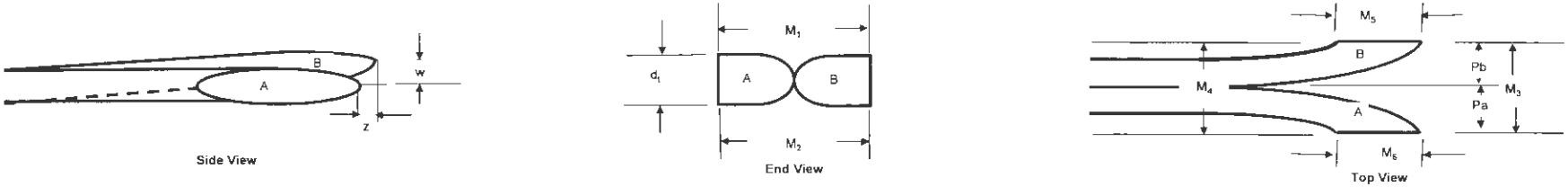
Thermocouple ID: 58
Date: 1/3/2018
Performed By: S. Donovan/R. Monzon

Calibrated Digital Temperature Readout ID: PTC-9
T1 Reference Thermometer ID: 201100
T2 Reference Thermometer ID: 805002770
T3 Reference Thermometer ID: 805002803

| T/C I.D. 58 | Readout I.D. | T/C - Readout °F Reading 1 | Reading 2 | Reading 3 | Average | Reference Thermometer °F Reading 1 | Reading 2 | Reading 3 | Average | Difference °F | %, (°R) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T3 (OIL) | PTC-9 | 362 | 362 | 361 | 362 | 358 | 358 | 358 | 358 | 3.7 | 0.4% | Pass |
| T2 (Boiling $H_2O$) | PTC-9 | 210 | 210 | 210 | 210 | 212 | 212 | 212 | 212 | 2.0 | 0.3% | Pass |
| T1 (Ice/Water) | PTC-9 | 34 | 34 | 34 | 34 | 32 | 32 | 32 | 32 | 2.0 | 0.4% | Pass |

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

# S Type Pitot Tube Dimensional Calibration Record




| Acceptability Criteria | | | z < 1/8" | w < 1/32" | Yes | "3/16" < Dt < 3/8" | n/a | n/a | n/a | n/a | n/a | n/a | 10 degrees | 5 degrees | 1.05 Dt < P < 1.5 Dt | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pitot ID | Date | Calibrated By | Side View, Impact openings Properly aligned, z < 1/8" | Side View, Impact openings Properly aligned, w < 1/32" | Pa = Pb | Tubing Diameter, dt | M1 | M2 | M3 | M4 | M5 | M6 | Average Face Opening Plane Angle, offset from perpendicular to transverse axis | Average Face Opening Plane Frontal Angle from parallel to Longitudinal Axis | Ratio of P/Dt | Status |
| 101 | 1/5/18 | R. Dupont | Y | Y | Y | 0.374 | 0.904 | 0.911 | 0.917 | 0.906 | 0.408 | 0.434 | -0.5 | 0.7 | 1.2 | Pass |
| 111 | 1/5/18 | R. Dupont | Y | Y | Y | 0.374 | 0.954 | 0.955 | 0.953 | 0.953 | 0.419 | 0.413 | -0.1 | 0.0 | 1.3 | Pass |
| 110 | 1/5/18 | R. Dupont | Y | Y | Y | 0.375 | 0.961 | 0.951 | 0.967 | 0.958 | 0.426 | 0.414 | 0.8 | 0.6 | 1.3 | Pass |
| 058 | 1/5/18 | R. Dupont | Y | Y | Y | 0.372 | 0.834 | 0.839 | 0.862 | 0.843 | 0.442 | 0.431 | -0.4 | 1.2 | 1.1 | Pass |
| | | | | | | | | | | | | | | | | |

Notes: Reference "A Type-S Pitot Tube Calibration Study", Robert F. Vollaro, October 15, 1975
If tube is not visibly deformed it is assumed that Pa = Pb = .5 x avg. of M1 & M2, and that average face opening plane angles represent individual angles to tube axis

MONTROSE
AIR QUALITY SERVICES

## NOZZLE CALIBRATION

| Nozzle # | Date | Performed By | $D_1$ | $D_2$ | $D_3$ | Average $D_n$ | Status |
|---|---|---|---|---|---|---|---|
| 196 | 1/12/18 | JG | 0.237 | 0.240 | 0.239 | 0.239 | Pass |
| 55 | 1/12/18 | JG | 0.244 | 0.244 | 0.244 | 0.244 | Pass |
| 5x | 1/12/18 | JG | 0.240 | 0.242 | 0.243 | 0.242 | Pass |
| | | | | | | | |
| | | | | | | | |

## DIGITAL TEMPERATURE READOUT CALIBRATION

Digital Temperature Readout ID: PTC-42
Readout Description: Handheld
Date: 1/4/2018
Performed By: S. Donovan/D. Avila

Calibrated Thermocouple ID: TC-CAL
T1 Reference Thermometer ID: 201100
T2 Reference Thermometer ID: 805002770
T3 Reference Thermometer ID: 805002803

| T/C I.D. TC-CAL | Readout I.D. | T/C - Readout °F Reading 1 | Reading 2 | Reading 3 | Average | Reference Thermometer °F Reading 1 | Reading 2 | Reading 3 | Average | Difference °F | %, (°R) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T3 (OIL) | PTC-42 | 353 | 352 | 353 | 353 | 360 | 360 | 360 | 360 | 7.3 | 0.9% | Pass |
| T2 (Boiling $H_2O$) | PTC-42 | 215 | 215 | 214 | 215 | 212 | 212 | 212 | 212 | 2.7 | 0.4% | Pass |
| T1 (Ice/Water) | PTC-42 | 35 | 35 | 35 | 35 | 32 | 32 | 32 | 32 | 3.0 | 0.6% | Pass |

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

Thermocouple Source Readings

| | T/C Source S/N | T/C - Readout °F Reading 1 | Reading 2 | Reading 3 | Average | T/C Source °F Reading 1 | Reading 2 | Reading 3 | Average | Difference °F | %, (°R) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T4 (~650 F) | S/N 106970 | 650 | 650 | 650 | 650 | 650 | 650 | 650 | 650 | 0.0 | 0.0% | Pass |
| T3 (~370 F) | S/N 106970 | 371 | 371 | 371 | 371 | 370 | 370 | 370 | 370 | 1.0 | 0.1% | Pass |
| T2 (~212 F) | S/N 106970 | 212 | 212 | 213 | 212 | 212 | 212 | 212 | 212 | 0.3 | 0.0% | Pass |
| T1 (~32 F) | S/N 106970 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 0.0 | 0.0% | Pass |

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

## DIGITAL TEMPERATURE READOUT CALIBRATION

Digital Temperature Readout ID: 30-WCS
Readout Description: Control Box
Date: 1/3/2018
Performed By: S. Donovan/R. Monzon

Calibrated Thermocouple ID: TC-CAL
T1 Reference Thermometer ID: 201100
T2 Reference Thermometer ID: 805002770
T3 Reference Thermometer ID: 805002803

| T/C I.D. TC-CAL | Readout I.D. | T/C - Readout °F Reading 1 | Reading 2 | Reading 3 | Average | Reference Thermometer °F Reading 1 | Reading 2 | Reading 3 | Average | Difference °F | %, (°R) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T3 (OIL) | 30-WCS | 351 | 351 | 351 | 351 | 358 | 358 | 358 | 358 | 7.0 | 0.9% | Pass |
| T2 (Boiling $H_2O$) | 30-WCS | 209 | 209 | 209 | 209 | 212 | 212 | 212 | 212 | 3.0 | 0.4% | Pass |
| T1 (Ice/Water) | 30-WCS | 29 | 29 | 29 | 29 | 32 | 32 | 32 | 32 | 3.0 | 0.6% | Pass |

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

Thermocouple Source Readings

| | T/C Source S/N | T/C - Readout °F Reading 1 | Reading 2 | Reading 3 | Average | T/C Source °F Reading 1 | Reading 2 | Reading 3 | Average | Difference °F | %, (°R) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T4 (~650 F) | S/N 106970 | 648 | 648 | 648 | 648 | 650 | 650 | 650 | 650 | 2.0 | 0.2% | Pass |
| T3 (~370 F) | S/N 106970 | 367 | 367 | 367 | 367 | 370 | 370 | 370 | 370 | 3.0 | 0.4% | Pass |
| T2 (~212 F) | S/N 106970 | 209 | 209 | 209 | 209 | 212 | 212 | 212 | 212 | 3.0 | 0.4% | Pass |
| T1 (~32 F) | S/N 106970 | 29 | 29 | 29 | 29 | 32 | 32 | 32 | 32 | 3.0 | 0.6% | Pass |

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

## DIGITAL TEMPERATURE READOUT CALIBRATION

Digital Temperature Readout ID: 17-WCS
Readout Description: Control Box
Date: 1/3/2018
Performed By: S. Donovan/R. Monzon

Calibrated Thermocouple ID: TC-CAL
T1 Reference Thermometer ID: 201100
T2 Reference Thermometer ID: 805002770
T3 Reference Thermometer ID: 805002803

| T/C I.D. TC-CAL | Readout I.D. | T/C - Readout °F Reading 1 | Reading 2 | Reading 3 | Average | Reference Thermometer °F Reading 1 | Reading 2 | Reading 3 | Average | Difference °F | %, (°R) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T3 (OIL) | 17-WCS | 352 | 352 | 352 | 352 | 358 | 358 | 358 | 358 | 6.0 | 0.7% | Pass |
| T2 (Boiling $H_2O$) | 17-WCS | 213 | 213 | 213 | 213 | 212 | 212 | 212 | 212 | 1.0 | 0.1% | Pass |
| T1 (Ice/Water) | 17-WCS | 29 | 29 | 29 | 29 | 32 | 32 | 32 | 32 | 3.0 | 0.6% | Pass |

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

Thermocouple Source Readings

| | T/C Source S/N | T/C - Readout °F Reading 1 | Reading 2 | Reading 3 | Average | T/C Source °F Reading 1 | Reading 2 | Reading 3 | Average | Difference °F | %, (°R) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T4 (~650 F) | S/N 106970 | 649 | 649 | 649 | 649 | 650 | 650 | 650 | 650 | 1.0 | 0.1% | Pass |
| T3 (~370 F) | S/N 106970 | 372 | 372 | 372 | 372 | 370 | 370 | 370 | 370 | 2.0 | 0.2% | Pass |
| T2 (~212 F) | S/N 106970 | 211 | 211 | 211 | 211 | 212 | 212 | 212 | 212 | 1.0 | 0.1% | Pass |
| T1 (~32 F) | S/N 106970 | 31 | 31 | 31 | 31 | 32 | 32 | 32 | 32 | 1.0 | 0.2% | Pass |

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

# BI-MONTHLY DRY GAS METER CALIBRATION CHECK

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename: C:\Users\Dave Wonderly\Information\Calibrations\Meters\1-P&M\2018\[1p-m 3-2-18 Bimonthly Meter Cal.xls]WCS
File Modified From: APEX 522 Series Meter box Calibration
Revised: 3/21/2002

Model #:
ID #: 1 P&M
Date: 3/2/2018
Bar. Pressure: 30.12 (in. Hg)
Performed By: R. Howard
Yd from previous semi-annual calibration: 1.003

| DRY GAS METER READINGS | | | | | | | | | CRITICAL ORIFICE READINGS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Volume | Volume | Volume | Initial Temps. | | Final Temps. | | Orifice | K' Orifice | Actual | Ambient Temperature | | |
| dH | Time | Initial | Final | Total | Inlet | Outlet | Inlet | Outlet | Serial# | Coefficient | Vacuum | Initial | Final | Average |
| (in H2O) | (min) | (cu ft) | (cu ft) | (cu ft) | (deg F) | (deg F) | (deg F) | | (number) | (see above) | (in Hg) | (deg F) | (deg F) | (deg F) |
| 0.63 | 12.00 | 357.980 | 363.412 | 5.432 | 67.0 | 65.0 | 67.0 | 65.0 | 48 | 0.3465 | 20.0 | 60.0 | 60.0 | 60.0 |
| 0.63 | 12.00 | 363.412 | 368.842 | 5.430 | 67.0 | 65.0 | 67.0 | 65.0 | 48 | 0.3465 | 20.0 | 60.0 | 60.0 | 60.0 |
| 0.63 | 12.00 | 368.842 | 374.276 | 5.434 | 67.0 | 66.0 | 67.0 | 66.0 | 48 | 0.3465 | 20.0 | 60.0 | 60.0 | 60.0 |
| | | | | | | | | | | | | | | |
| 1.90 | 7.00 | 376.080 | 381.473 | 5.393 | 67.0 | 66.0 | 67.0 | 66.0 | 63 | 0.5888 | 17.0 | 60.0 | 60.0 | 60.0 |
| 1.90 | 7.00 | 381.473 | 386.864 | 5.391 | 67.0 | 66.0 | 67.0 | 66.0 | 63 | 0.5888 | 17.0 | 60.0 | 60.0 | 60.0 |
| 1.90 | 7.00 | 386.864 | 392.251 | 5.387 | 68.0 | 67.0 | 69.0 | 67.0 | 63 | 0.5888 | 17.0 | 60.0 | 60.0 | 60.0 |

| DRY GAS METER | | ORIFICE | | | | DRY GAS METER CALIBRATION FACTOR | ORIFICE CALIBRATION FACTOR |
|---|---|---|---|---|---|---|---|
| VOLUME CORRECTED Vm(std) (cu ft) | VOLUME CORRECTED Vm(std) (liters) | VOLUME CORRECTED Vcr(std) (cu ft) | VOLUME CORRECTED Vcr(std) (liters) | VOLUME NOMINAL Vcr (cu ft) | | Y Value (number) | dH@ Value (in H2O) |
| 5.495 | 155.6 | 5.492 | 155.5 | 5.375 | | 0.999 | 1.713 |
| 5.493 | 155.6 | 5.492 | 155.5 | 5.375 | | 1.000 | 1.713 |
| 5.492 | 155.5 | 5.492 | 155.5 | 5.375 | | 1.000 | 1.710 |
| | | | | | **Average** | **1.000** | **1.712** |
| 5.468 | 154.8 | 5.444 | 154.2 | 5.328 | | 0.996 | 1.786 |
| 5.466 | 154.8 | 5.444 | 154.2 | 5.328 | | 0.996 | 1.786 |
| 5.449 | 154.3 | 5.444 | 154.2 | 5.328 | | 0.999 | 1.782 |
| | | | | | **Average** | **0.997** | **1.784** |

**Average Yd: 0.998 dH@: 1.748**

**Pass Q @ dH = 1: 0.567**

The Average Yd must be within +/- 2% of the most recent semi-annual calibration Yd. If not, perform 4-point calibration.

SIGNED: Signature on File Date: 3/2/2018

# SEMI-ANNUAL DRY GAS METER/ORIFICE CALIBRATION

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename: C:\Users\Dave Wonderly\Information\Calibrations\Meters\1-P&M\2017\[Semi-Annual Meter Calibration 1-pm 12-29-17.xls]WC
File Modified From: APEX 522 Series Meter box Calibration
Revised: 4/8/2005

Model #:
ID #: 1 p&m
Date: 12/29/2017
Bar Pressure: 30.13 (in. Hg)
Performed By: R Howard
Meter Serial #: 8520465 00

| DRY GAS METER READINGS | | | | | | | | | CRITICAL ORIFICE READINGS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Initial Temps. | | Final Temps. | | | | | Ambient Temperature | | |
| dH (in H2O) | Time (min) | Volume Initial (cu ft) | Volume Final (cu ft) | Volume Total (cu ft) | Inlet (deg F) | Outlet (deg F) | Inlet (deg F) | Outlet (deg F) | Orifice Serial# (number) | K' Orifice Coefficient (see above) | Actual Vacuum (in Hg) | Initial (deg F) | Final (deg F) | Average (deg F) |
| 0.13 | 26.00 | 824.267 | 829.557 | 5.290 | 64.0 | 64.0 | 64.0 | 64.0 | 33 | 0.1553 | 23.0 | 62.0 | 62.0 | 62.0 |
| 0.13 | 26.00 | 829.557 | 834.844 | 5.287 | 65.0 | 64.0 | 65.0 | 64.0 | 33 | 0.1553 | 23.0 | 62.0 | 62.0 | 62.0 |
| 0.13 | 26.00 | 834.844 | 840.136 | 5.292 | 65.0 | 64.0 | 66.0 | 64.0 | 33 | 0.1553 | 23.0 | 62.0 | 62.0 | 62.0 |
| 0.65 | 12.00 | 843.010 | 848.398 | 5.388 | 66.0 | 64.0 | 66.0 | 64.0 | 48 | 0.3465 | 20.0 | 63.0 | 63.0 | 63.0 |
| 0.65 | 12.00 | 848.398 | 853.786 | 5.388 | 67.0 | 64.0 | 67.0 | 64.0 | 48 | 0.3465 | 20.0 | 63.0 | 63.0 | 63.0 |
| 0.65 | 12.00 | 853.786 | 859.172 | 5.386 | 67.0 | 64.0 | 68.0 | 64.0 | 48 | 0.3465 | 20.0 | 63.0 | 63.0 | 63.0 |
| 1.80 | 7.00 | 861.360 | 866.686 | 5.326 | 68.0 | 64.0 | 68.0 | 65.0 | 63 | 0.5888 | 16.0 | 65.0 | 65.0 | 65.0 |
| 1.80 | 7.00 | 866.686 | 872.010 | 5.324 | 68.0 | 65.0 | 69.0 | 65.0 | 63 | 0.5888 | 16.0 | 65.0 | 65.0 | 65.0 |
| 1.80 | 7.00 | 872.010 | 877.336 | 5.326 | 69.0 | 65.0 | 69.0 | 65.0 | 63 | 0.5888 | 16.0 | 65.0 | 65.0 | 65.0 |
| 3.40 | 5.00 | 880.378 | 885.628 | 5.250 | 69.0 | 64.0 | 70.0 | 65.0 | 73 | 0.8202 | 13.0 | 65.0 | 65.0 | 65.0 |
| 3.40 | 5.00 | 885.628 | 890.869 | 5.241 | 70.0 | 65.0 | 70.0 | 65.0 | 73 | 0.8202 | 13.0 | 65.0 | 65.0 | 65.0 |
| 3.40 | 5.00 | 890.869 | 896.117 | 5.248 | 71.0 | 65.0 | 71.0 | 66.0 | 73 | 0.8202 | 13.0 | 65.0 | 65.0 | 65.0 |

| DRY GAS METER | | ORIFICE | | | DRY GAS METER CALIBRATION FACTOR | ORIFICE CALIBRATION FACTOR | Individual Run | Individual Orifice | Orifice Average | Orifice Average |
|---|---|---|---|---|---|---|---|---|---|---|
| VOLUME CORRECTED Vm(std) (cu ft) | VOLUME CORRECTED Vm(std) (liters) | VOLUME CORRECTED Vcr(std) (cu ft) | VOLUME CORRECTED Vcr(std) (liters) | VOLUME NOMINAL Vcr (cu ft) | Y Value (number) | dH@ Value (in H2O) | 0.95 < Y < 1.05? | Ymax - Ymin < 0.010? | 0.98 < Y/Yd < 1.02? | dH@ - dH@ av < 0.155? |
| 5.367 | 152.0 | 5.325 | 150.8 | 5.230 | 0.992 | 1.769 | **Pass** | | | |
| 5.359 | 151.8 | 5.325 | 150.8 | 5.230 | 0.994 | 1.769 | **Pass** | | | |
| 5.362 | 151.8 | 5.325 | 150.8 | 5.230 | 0.993 | 1.769 | **Pass** | | | |
| | | | | **Average** | **0.993** | **1.769** | | **Pass** | **Pass** | **Pass** |
| 5.463 | 154.7 | 5.478 | 155.1 | 5.391 | 1.003 | 1.780 | **Pass** | | | |
| 5.458 | 154.6 | 5.478 | 155.1 | 5.391 | 1.004 | 1.780 | **Pass** | | | |
| 5.453 | 154.4 | 5.478 | 155.1 | 5.391 | 1.005 | 1.780 | **Pass** | | | |
| | | | | **Average** | **1.004** | **1.780** | | **Pass** | **Pass** | **Pass** |
| 5.403 | 153.0 | 5.420 | 153.5 | 5.354 | 1.003 | 1.712 | **Pass** | | | |
| 5.396 | 152.8 | 5.420 | 153.5 | 5.354 | 1.005 | 1.711 | **Pass** | | | |
| 5.395 | 152.8 | 5.420 | 153.5 | 5.354 | 1.005 | 1.711 | **Pass** | | | |
| | | | | **Average** | **1.004** | **1.711** | | **Pass** | **Pass** | **Pass** |
| 5.339 | 151.2 | 5.393 | 152.7 | 5.327 | 1.010 | 1.667 | **Pass** | | | |
| 5.324 | 150.8 | 5.393 | 152.7 | 5.327 | 1.013 | 1.665 | **Pass** | | | |
| 5.324 | 150.8 | 5.393 | 152.7 | 5.327 | 1.013 | 1.663 | **Pass** | | | |
| | | | | **Average** | **1.012** | **1.665** | | **Pass** | **Pass** | **Pass** |

**Average Yd: 1.003** **dH@: 1.731**

**Q @ dH = 1: 0.570**

SIGNED: Signature on File

Date: 12/29/2017

# BI-MONTHLY DRY GAS METER CALIBRATION CHECK

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename: C:\Users\Dave Wonderly\Information\Calibrations\Meters\17-wcs\2018\[17-WCS bimonthly cal 3-5-18.xls]WCS
File Modified From: APEX 522 Series Meter box Calibration
Revised: 3/21/2002

Model #: c5000
ID #: 17-wcs
Date: 3/5/2018
Bar. Pressure: 30.14 (in. Hg)
Performed By: R. Howard
Yd from previous semi-annual calibration: 0.995

| DRY GAS METER READINGS | | | | | | | | | CRITICAL ORIFICE READINGS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Volume | Volume | Volume | Initial Temps. | | Final Temps. | | Orifice | K' Orifice | Actual | Ambient Temperature | | |
| dH | Time | Initial | Final | Total | Inlet | Outlet | Inlet | Outlet | Serial# | Coefficient | Vacuum | Initial | Final | Average |
| (in H2O) | (min) | (cu ft) | (cu ft) | (cu ft) | (deg F) | (deg F) | (deg F) | | (number) | (see above) | (in Hg) | (deg F) | (deg F) | (deg F) |
| 0.51 | 12.00 | 322.118 | 327.593 | 5.475 | 78.0 | 77.0 | 78.0 | 77.0 | 48 | 0.3465 | 19.0 | 75.0 | 75.0 | 75.0 |
| 0.51 | 12.00 | 327.593 | 333.062 | 5.469 | 78.0 | 77.0 | 78.0 | 77.0 | 48 | 0.3465 | 19.0 | 75.0 | 75.0 | 75.0 |
| 0.51 | 12.00 | 333.062 | 338.533 | 5.471 | 79.0 | 78.0 | 80.0 | 78.0 | 48 | 0.3465 | 19.0 | 75.0 | 75.0 | 75.0 |
| | | | | | | | | | | | | | | |
| 1.80 | 7.00 | 340.977 | 346.525 | 5.548 | 80.0 | 77.0 | 80.0 | 78.0 | 63 | 0.5888 | 18.0 | 71.0 | 71.0 | 71.0 |
| 1.80 | 7.00 | 346.525 | 352.076 | 5.551 | 80.0 | 79.0 | 81.0 | 78.0 | 63 | 0.5888 | 18.0 | 71.0 | 71.0 | 71.0 |
| 1.80 | 7.00 | 352.076 | 357.621 | 5.545 | 81.0 | 79.0 | 81.0 | 80.0 | 63 | 0.5888 | 18.0 | 71.0 | 71.0 | 71.0 |

| DRY GAS METER | | ORIFICE | | | | DRY GAS METER CALIBRATION FACTOR | ORIFICE CALIBRATION FACTOR |
|---|---|---|---|---|---|---|---|
| VOLUME CORRECTED Vm(std) (cu ft) | VOLUME CORRECTED Vm(std) (liters) | VOLUME CORRECTED Vcr(std) (cu ft) | VOLUME CORRECTED Vcr(std) (liters) | VOLUME NOMINAL Vcr (cu ft) | | Y Value (number) | dH@ Value (in H2O) |
| 5.422 | 153.6 | 5.418 | 153.4 | 5.452 | | 0.999 | 1.394 |
| 5.416 | 153.4 | 5.418 | 153.4 | 5.452 | | 1.000 | 1.394 |
| 5.406 | 153.1 | 5.418 | 153.4 | 5.452 | | 1.002 | 1.391 |
| | | | | | **Average** | **1.001** | **1.393** |
| 5.499 | 155.7 | 5.391 | 152.7 | 5.384 | | 0.980 | 1.689 |
| 5.494 | 155.6 | 5.391 | 152.7 | 5.384 | | 0.981 | 1.686 |
| 5.481 | 155.2 | 5.391 | 152.7 | 5.384 | | 0.984 | 1.683 |
| | | | | | **Average** | **0.982** | **1.686** |

**Average Yd: 0.991 dH@: 1.540**

**Pass Q @ dH = 1: 0.604**

The Average Yd must be within +/- 2% of the most recent semi-annual calibration Yd. If not, perform 4-point calibration.

SIGNED: Signature on File Date: 3/5/2018

# SEMI-ANNUAL DRY GAS METER/ORIFICE CALIBRATION

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename: C:\Users\Dave Wonderly\Information\Calibrations\Meters\17-wcs\2017\[Semi-Annual Meter Calibration 11-6-17 WCS-17.xls]\
File Modified From: APEX 522 Series Meter box Calibration
Revised: 4/8/2005

Model #: C5000
ID #: 17WCS
Date: 11/6/2017
Bar. Pressure: 30.08 (in. Hg)
Performed By: R. Howard

| DRY GAS METER READINGS | | | | | | | | | CRITICAL ORIFICE READINGS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Initial Temps. | | Final Temps. | | | | | Ambient Temperature | | |
| dH (in H2O) | Time (min) | Volume Initial (cu ft) | Volume Final (cu ft) | Volume Total (cu ft) | Inlet (deg F) | Outlet (deg F) | Inlet (deg F) | Outlet (deg F) | Orifice Serial# (number) | K' Orifice Coefficient (see above) | Actual Vacuum (in Hg) | Initial (deg F) | Final (deg F) | Average (deg F) |
| 0.11 | 26.00 | 244.000 | 249.310 | 5.310 | 66.0 | 63.0 | 67.0 | 64.0 | 33 | 0.1553 | 18.0 | 58.0 | 58.0 | 58.0 |
| 0.11 | 26.00 | 249.310 | 254.623 | 5.313 | 67.0 | 64.0 | 68.0 | 64.0 | 33 | 0.1553 | 18.0 | 60.0 | 60.0 | 60.0 |
| 0.11 | 26.00 | 254.624 | 259.945 | 5.321 | 68.0 | 64.0 | 68.0 | 65.0 | 33 | 0.1553 | 18.0 | 60.0 | 60.0 | 60.0 |
| 0.52 | 12.00 | 262.205 | 267.671 | 5.466 | 69.0 | 66.0 | 70.0 | 66.0 | 48 | 0.3465 | 17.0 | 64.0 | 64.0 | 64.0 |
| 0.52 | 12.00 | 267.721 | 273.189 | 5.468 | 70.0 | 66.0 | 71.0 | 67.0 | 48 | 0.3465 | 17.0 | 64.0 | 64.0 | 64.0 |
| 0.52 | 12.00 | 273.319 | 278.783 | 5.464 | 71.0 | 67.0 | 72.0 | 68.0 | 48 | 0.3465 | 17.0 | 64.0 | 64.0 | 64.0 |
| 1.70 | 7.00 | 226.890 | 232.286 | 5.396 | 66.0 | 63.0 | 66.0 | 63.0 | 63 | 0.5888 | 15.0 | 56.0 | 56.0 | 56.0 |
| 1.70 | 7.00 | 232.286 | 237.668 | 5.382 | 66.0 | 63.0 | 67.0 | 63.0 | 63 | 0.5888 | 15.0 | 56.0 | 56.0 | 56.0 |
| 1.70 | 7.00 | 237.668 | 243.050 | 5.382 | 67.0 | 63.0 | 68.0 | 64.0 | 63 | 0.5888 | 15.0 | 56.0 | 56.0 | 56.0 |
| 3.40 | 5.00 | 279.017 | 284.394 | 5.377 | 72.0 | 70.0 | 72.0 | 70.0 | 73 | 0.8202 | 14.0 | 67.0 | 67.0 | 67.0 |
| 3.40 | 5.00 | 284.394 | 289.766 | 5.372 | 72.0 | 70.0 | 73.0 | 70.0 | 73 | 0.8202 | 14.0 | 67.0 | 67.0 | 67.0 |
| 3.40 | 5.00 | 289.776 | 295.155 | 5.379 | 73.0 | 70.0 | 73.0 | 70.0 | 73 | 0.8202 | 14.0 | 67.0 | 67.0 | 67.0 |

| DRY GAS METER | | ORIFICE | | | DRY GAS METER CALIBRATION FACTOR | ORIFICE CALIBRATION FACTOR | Individual Run | Individual Orifice | Orifice Average | Orifice Average |
|---|---|---|---|---|---|---|---|---|---|---|
| VOLUME CORRECTED Vm(std) (cu ft) | VOLUME CORRECTED Vm(std) (liters) | VOLUME CORRECTED Vcr(std) (cu ft) | VOLUME CORRECTED Vcr(std) (liters) | VOLUME NOMINAL Vcr (cu ft) | Y Value (number) | dH@ Value (in H2O) | 0.95 < Y < 1.05? | Ymax - Ymin < 0.010? | 0.98 < Y/Yd < 1.02? | dH@ - dH@ av < 0.155? |
| 5.368 | 152.0 | 5.337 | 151.1 | 5.210 | 0.994 | 1.489 | **Pass** | | | |
| 5.364 | 151.9 | 5.326 | 150.8 | 5.220 | 0.993 | 1.494 | **Pass** | | | |
| 5.367 | 152.0 | 5.326 | 150.8 | 5.220 | 0.992 | 1.492 | **Pass** | | | |
| | | | | **Average** | **0.993** | **1.492** | | **Pass** | **Pass** | **Pass** |
| 5.503 | 155.8 | 5.464 | 154.7 | 5.396 | 0.993 | 1.424 | **Pass** | | | |
| 5.497 | 155.7 | 5.464 | 154.7 | 5.396 | 0.994 | 1.422 | **Pass** | | | |
| 5.482 | 155.3 | 5.464 | 154.7 | 5.396 | 0.997 | 1.420 | **Pass** | | | |
| | | | | **Average** | **0.995** | **1.422** | | **Pass** | **Pass** | **Pass** |
| 5.482 | 155.2 | 5.458 | 154.6 | 5.308 | 0.996 | 1.597 | **Pass** | | | |
| 5.465 | 154.8 | 5.458 | 154.6 | 5.308 | 0.999 | 1.597 | **Pass** | | | |
| 5.457 | 154.5 | 5.458 | 154.6 | 5.308 | 1.000 | 1.595 | **Pass** | | | |
| | | | | **Average** | **0.998** | **1.596** | | **Pass** | **Pass** | **Pass** |
| 5.418 | 153.4 | 5.374 | 152.2 | 5.337 | 0.992 | 1.658 | **Pass** | | | |
| 5.410 | 153.2 | 5.374 | 152.2 | 5.337 | 0.993 | 1.658 | **Pass** | | | |
| 5.415 | 153.3 | 5.374 | 152.2 | 5.337 | 0.992 | 1.658 | **Pass** | | | |
| | | | | **Average** | **0.993** | **1.658** | | **Pass** | **Pass** | **Pass** |

**Average Yd: 0.996** **dH@: 1.542**

**Q @ dH = 1: 0.604**

SIGNED: Signature on file

Date: 11/6/2017

# SEMI-ANNUAL DRY GAS METER/ORIFICE CALIBRATION

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename: C:\Users\Dave Wonderly\Information\Calibrations\Meters\30-wcs\2018\[semi annual cal 30wcs 1-8-18.xlsx]WCS
File Modified From: APEX 522 Series Meter box Calibration
Revised: 4/8/2005

c-5000
ID #: 30-wcs
Date: 1/8/2018
Bar. Pressure: 29.92 (in. Hg)
Performed By: R Howard
Meter Serial #:

| DRY GAS METER READINGS | | | | | | | | | CRITICAL ORIFICE READINGS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Initial Temps. | | Final Temps. | | | | | Ambient Temperature | | |
| dH (in H2O) | Time (min) | Volume Initial (cu ft) | Volume Final (cu ft) | Volume Total (cu ft) | Inlet (deg F) | Outlet (deg F) | Inlet (deg F) | Outlet (deg F) | Orifice Serial# (number) | K' Orifice Coefficient (see above) | Actual Vacuum (in Hg) | Initial (deg F) | Final (deg F) | Average (deg F) |
| 0.14 | 26.00 | 577.780 | 583.069 | 5.289 | 68.0 | 73.0 | 68.0 | 73.0 | 33 | 0.1553 | 19.0 | 63.0 | 63.0 | 63.0 |
| 0.14 | 26.00 | 583.069 | 588.368 | 5.299 | 68.0 | 73.0 | 68.0 | 73.0 | 33 | 0.1553 | 19.0 | 63.0 | 63.0 | 63.0 |
| 0.14 | 26.00 | 588.368 | 593.662 | 5.294 | 69.0 | 73.0 | 69.0 | 73.0 | 33 | 0.1553 | 19.0 | 63.0 | 63.0 | 63.0 |
| | | | | | | | | | | | | | | |
| 0.60 | 12.00 | 595.140 | 600.582 | 5.442 | 69.0 | 65.0 | 69.0 | 65.0 | 48 | 0.3465 | 17.0 | 65.0 | 65.0 | 65.0 |
| 0.60 | 12.00 | 600.652 | 606.047 | 5.395 | 69.0 | 65.0 | 70.0 | 65.0 | 48 | 0.3465 | 17.0 | 65.0 | 65.0 | 65.0 |
| 0.60 | 12.00 | 606.947 | 612.349 | 5.402 | 70.0 | 65.0 | 71.0 | 65.0 | 48 | 0.3465 | 17.0 | 65.0 | 65.0 | 65.0 |
| | | | | | | | | | | | | | | |
| 1.80 | 7.00 | 613.380 | 618.829 | 5.449 | 71.0 | 64.0 | 71.0 | 64.0 | 63 | 0.5888 | 15.0 | 65.0 | 65.0 | 65.0 |
| 1.80 | 7.00 | 618.829 | 624.281 | 5.452 | 72.0 | 65.0 | 72.0 | 65.0 | 63 | 0.5888 | 15.0 | 65.0 | 65.0 | 65.0 |
| 1.80 | 7.00 | 624.281 | 629.725 | 5.444 | 73.0 | 65.0 | 73.0 | 65.0 | 63 | 0.5888 | 15.0 | 65.0 | 65.0 | 65.0 |
| | | | | | | | | | | | | | | |
| 3.40 | 5.00 | 631.160 | 636.532 | 5.372 | 74.0 | 65.0 | 74.0 | 65.0 | 73 | 0.8202 | 13.0 | 65.0 | 65.0 | 65.0 |
| 3.40 | 5.00 | 636.532 | 641.909 | 5.377 | 74.0 | 65.0 | 74.0 | 65.0 | 73 | 0.8202 | 13.0 | 65.0 | 65.0 | 65.0 |
| 3.40 | 5.00 | 641.909 | 647.274 | 5.365 | 74.0 | 65.0 | 74.0 | 65.0 | 73 | 0.8202 | 13.0 | 65.0 | 65.0 | 65.0 |

| DRY GAS METER | | ORIFICE | | | | DRY GAS METER CALIBRATION FACTOR | ORIFICE CALIBRATION FACTOR | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VOLUME CORRECTED Vm(std) (cu ft) | VOLUME CORRECTED Vm(std) (liters) | VOLUME CORRECTED Vcr(std) (cu ft) | VOLUME CORRECTED Vcr(std) (liters) | VOLUME NOMINAL Vcr (cu ft) | | Y Value (number) | dH@ Value (in H2O) | Individual Run 0.95 < Y < 1.05? | Individual Orifice Ymax - Ymin < 0.010? | Orifice Average 0.98 < Y/Yd < 1.02? | Orifice Average dH@ - dH@ av < 0.155? |
| 5.264 | 149.1 | 5.283 | 149.6 | 5.235 | | 1.004 | 1.890 | **Pass** | | | |
| 5.274 | 149.4 | 5.283 | 149.6 | 5.235 | | 1.002 | 1.890 | **Pass** | | | |
| 5.264 | 149.1 | 5.283 | 149.6 | 5.235 | | 1.004 | 1.890 | **Pass** | | | |
| | | | | | **Average** | **1.003** | **1.890** | | **Pass** | **Pass** | **Pass** |
| 5.458 | 154.6 | 5.430 | 153.8 | 5.401 | | 0.995 | 1.658 | **Pass** | | | |
| 5.408 | 153.2 | 5.430 | 153.8 | 5.401 | | 1.004 | 1.658 | **Pass** | | | |
| 5.410 | 153.2 | 5.430 | 153.8 | 5.401 | | 1.004 | 1.658 | **Pass** | | | |
| | | | | | **Average** | **1.001** | **1.658** | | **Pass** | **Pass** | **Pass** |
| 5.476 | 155.1 | 5.382 | 152.4 | 5.354 | | 0.983 | 1.726 | **Pass** | | | |
| 5.469 | 154.9 | 5.382 | 152.4 | 5.354 | | 0.984 | 1.723 | **Pass** | | | |
| 5.456 | 154.5 | 5.382 | 152.4 | 5.354 | | 0.987 | 1.723 | **Pass** | | | |
| | | | | | **Average** | **0.984** | **1.724** | | **Pass** | **Pass** | **Pass** |
| 5.399 | 152.9 | 5.355 | 151.7 | 5.327 | | 0.992 | 1.677 | **Pass** | | | |
| 5.404 | 153.1 | 5.355 | 151.7 | 5.327 | | 0.991 | 1.677 | **Pass** | | | |
| 5.392 | 152.7 | 5.355 | 151.7 | 5.327 | | 0.993 | 1.677 | **Pass** | | | |
| | | | | | **Average** | **0.992** | **1.677** | | **Pass** | **Pass** | **Pass** |

**Average Yd: 0.995 dH@: 1.737**

**Q @ dH = 1: 0.569**

SIGNED: Signature on File

Date: 1/8/2018

# BI-MONTHLY DRY GAS METER CALIBRATION CHECK

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename: C:\Users\Dave Wonderly\Information\Calibrations\Meters\30-wcs\2018\[Bimonthly 30-wcs 3-9-18.xls]WCS
File Modified From: APEX 522 Series Meter box Calibration
Revised: 3/21/2002

Model #: 5000.00
ID #: 30-WCS
Date: 3/9/18
Bar. Pressure: 29.99 (in. Hg)
Performed By: R. Howard
Yd from previous semi-annual calibration: 0.995

| DRY GAS METER READINGS | | | | | | | | | CRITICAL ORIFICE READINGS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Volume | Volume | Volume | Initial Temps. | | Final Temps. | | Orifice | K' Orifice | Actual | Ambient Temperature | | |
| dH | Time | Initial | Final | Total | Inlet | Outlet | Inlet | Outlet | Serial# | Coefficient | Vacuum | Initial | Final | Average |
| (in H2O) | (min) | (cu ft) | (cu ft) | (cu ft) | (deg F) | (deg F) | (deg F) | | (number) | (see above) | (in Hg) | (deg F) | (deg F) | (deg F) |
| 0.61 | 12.00 | 421.000 | 426.291 | 5.291 | 74.0 | 71.0 | 73.0 | 71.0 | 48 | 0.3465 | 17.0 | 71.0 | 71.0 | 71.0 |
| 0.61 | 12.00 | 426.291 | 431.590 | 5.299 | 73.0 | 71.0 | 73.0 | 71.0 | 48 | 0.3465 | 17.0 | 71.0 | 71.0 | 71.0 |
| 0.61 | 12.00 | 431.590 | 436.902 | 5.312 | 73.0 | 71.0 | 72.0 | 71.0 | 48 | 0.3465 | 17.0 | 72.0 | 72.0 | 72.0 |
| | | | | | | | | | | | | | | |
| 1.90 | 7.00 | 403.000 | 408.375 | 5.375 | 71.0 | 68.0 | 73.0 | 68.0 | 63 | 0.5888 | 13.0 | 68.0 | 68.0 | 68.0 |
| 1.80 | 7.00 | 408.375 | 413.750 | 5.375 | 73.0 | 68.0 | 74.0 | 69.0 | 63 | 0.5888 | 13.0 | 69.0 | 69.0 | 69.0 |
| 1.90 | 7.00 | 413.750 | 419.125 | 5.375 | 74.0 | 69.0 | 75.0 | 69.0 | 63 | 0.5888 | 13.0 | 70.0 | 70.0 | 70.0 |

| DRY GAS METER | | ORIFICE | | | | DRY GAS METER CALIBRATION FACTOR | ORIFICE CALIBRATION FACTOR |
|---|---|---|---|---|---|---|---|
| VOLUME CORRECTED Vm(std) (cu ft) | VOLUME CORRECTED Vm(std) (liters) | VOLUME CORRECTED Vcr(std) (cu ft) | VOLUME CORRECTED Vcr(std) (liters) | VOLUME NOMINAL Vcr (cu ft) | | Y Value (number) | dH@ Value (in H2O) |
| 5.267 | 149.2 | 5.411 | 153.3 | 5.432 | | 1.027 | 1.682 |
| 5.277 | 149.5 | 5.411 | 153.3 | 5.432 | | 1.025 | 1.682 |
| 5.293 | 149.9 | 5.406 | 153.1 | 5.437 | | 1.021 | 1.685 |
| | | | | | **Average** | **1.025** | **1.683** |
| 5.390 | 152.6 | 5.379 | 152.3 | 5.369 | | 0.998 | 1.814 |
| 5.379 | 152.3 | 5.374 | 152.2 | 5.374 | | 0.999 | 1.720 |
| 5.372 | 152.1 | 5.369 | 152.1 | 5.379 | | 0.999 | 1.817 |
| | | | | | **Average** | **0.999** | **1.784** |

| | | | |
|---|---|---|---|
| **Average Yd:** | **1.012** | **dH@:** | **1.733** |
| **Pass** | | **Q @ dH = 1:** | **0.570** |

The Average Yd must be within +/- 2% of the most recent semi-annual calibration Yd. If not, perform 4-point calibration.

SIGNED: _____ Date: 3/9/2018

# APPENDIX B

# LABORATORY REPORTS

# APPENDIX B.1

# HYDROGEN CHLORIDE LABORATORY DATA

# Atmospheric Analysis & Consulting, Inc.

| | |
|---|---|
| Client | : Montrose Air Quality Services |
| Client Project Name | : Desert View Power |
| Client Project No. | : 002AS2-320471 |
| AAC Project No. | : 180447 |
| Reporting Date | : 04/03/2018 |

On April 02, 2018, Atmospheric Analysis & Consulting, Inc. received nine (9) liquid samples for HCl analysis by EPA Method 26A. Upon receipt each sample was assigned a unique Laboratory ID number as follows:

| Client Sample ID | AAC Sample ID | Client Sample ID | AAC Sample ID |
|---|---|---|---|
| 1-HCL-Unit-2 | 180447-107637 | 3-HCL-Unit-1 | 180447-107642 |
| 2-HCL-Unit-2 | 180447-107638 | Reagent Blank-HCL DI $H_2O$ | 180447-107643 |
| 3-HCL-Unit-2 | 180447-107639 | Reagent Blank-HCL 0.1N $H_2SO_4$ | 180447-107644 |
| 1-HCL-Unit-1 | 180447-107640 | Field Blank | 180447-107645 |
| 2-HCL-Unit-1 | 180447-107641 | | |

All of the analyses mentioned above were performed in accordance with AAC's ISO/IEC 17025:2005 and NELAP approved Quality Assurance Plan. For detailed information pertaining to specific EPA, NCASI, ASTM and SCAQMD accreditations (Methods & Analytes), please visit our website at www.aaclab.com.

I certify that this data is technically accurate, complete, and in compliance with the terms and conditions of the contract. No problems were encountered during receiving, preparation, and/or analysis of these samples. The Laboratory Director or his/her designee, as verified by the following signature, has authorized release of the data contained in this hardcopy report.

If you have any questions or require further explanation of data results, please contact the undersigned.

Marcus Hueppe
Laboratory Director

This report consists of 5 pages.



1534 Eastman Ave., Ste. A • Ventura, • CA 93003 www.aaclab.com • (805) 650-1642 • FAX (805) 650-1644

# Atmospheric Analysis & Consulting, Inc.

## *Laboratory Analysis Report*

*Anion Analysis by IC*

| | | | |
|---|---|---|---|
| Client | : Montrose Air Quality Services | Sampling Dates | : 03/28-29/2018 |
| Client Project Name | : Desert View Power | Receiving Date | : 04/02/2018 |
| AAC Project No. | : 180447 | Analysis Date | : 04/03/2018 |
| Analyst | : JZ/JF | Reporting Date | : 04/03/2018 |

### HCl Analysis by EPA Method 26A

| Client Sample ID | AAC Sample ID | Sample Volume (mL) | Analysis DF | HCl (ug/ml) | HCl (mg/sample) | SRL (mg/sample) |
|---|---|---|---|---|---|---|
| 1-HCL-Unit-2 | 180447-107637 | 675 | 10 | 84.9 | 59.0 | 0.694 |
| 2-HCL-Unit-2 | 180447-107638 | 709 | 10 | 91.5 | 66.7 | 0.729 |
| 3-HCL-Unit-2 | 180447-107639 | 620 | 10 | 83.0 | 52.8 | 0.638 |
| 1-HCL-Unit-1 | 180447-107640 | 605 | 10 | 89.1 | 55.5 | 0.622 |
| 2-HCL-Unit-1 | 180447-107641 | 632 | 10 | 97.2 | 63.2 | 0.650 |
| 3-HCL-Unit-1 | 180447-107642 | 610 | 10 | 96.8 | 60.7 | 0.627 |
| Reagent Blank-HCL DI H2O | 180447-107643 | 111 | 5 | <SRL | <SRL | 0.057 |
| Reagent Blank-HCL 0.1N H2SO4 | 180447-107644 | 145 | 5 | <SRL | <SRL | 0.075 |
| Field Blank | 180447-107645 | 290 | 5 | <SRL | <SRL | 0.149 |

<SRL-compound was analyzed for but not detected at or above the SRL (Sample Reporting Limit)

SRL (ug/sample) =Method Reporting Limit (MRL) (0.100 ug/mL) x Sample Volume (mL) x Analysis Dilution Factor x Method Dilution Factor

Marcus Hueppe
Laboratory Director



1534 Eastman Ave., Ste. A • Ventura, • CA 93003 (805) 650-1642 • www.aaclab.com

## *Quality Control/Quality Assurance Report*
*Anions Method*

Analysis Date : 04/03/18
Analyst : JZ/JF

Instrument ID : DIONEX IC # 1

*Calibration Verification of the 09/28/2017 Calibration*

| Sample ID | Analyte | Target Concentration (ug/mL) | Measured Concentration (ug/mL) | Percent Recovery (%)* |
|---|---|---|---|---|
| Opening CV | Chloride | 25.0 | 25.1 | 100 |
| Continuing CV | Chloride | 25.0 | 25.4 | 102 |
| Closing CV | Chloride | 25.0 | 25.6 | 102 |
| Second Source | Chloride | 25.0 | 24.9 | 100 |

* Must be 85-115%

Marcus Hueppe
Laboratory Director



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# Atmospheric Analysis & Consulting, Inc.

## *QUALITY CONTROL/ASSURANCE REPORT*

*Anions Method*

Analysis Date : 04/03/18
Analyst : JZ/JF

Instrument ID : DIONEX IC # 1

*Method Blank Analysis*

| Analyte | Concentration (ug/mL) | Reporting Limit (ug/mL) |
|---|---|---|
| Method Blank 1 | | |
| Chloride | <SRL | 0.100 |

*Laboratory Control Spike Analysis*

| Analyte | Sample Concentration (ug/mL) | Spike Concentration (ug/mL) | Lab Spike Concentration (ug/mL) | Duplicate Lab Spike Concentration (ug/mL) | Spike Recovery (%)** | Duplicate Spike Recovery (%)** | % RPD**** |
|---|---|---|---|---|---|---|---|
| *Laboratory Control Spike 1* | | | | | | | |
| Chloride | 0.000 | 12.5 | 11.6 | 11.6 | 93.0 | 93.0 | 0.1 |

*Matrix Spike Analysis*

| Analyte | Sample Concentration (ug/mL) | Spike Concentration (ug/mL) | Matrix Spike Concentration (ug/mL) | Duplicate Matrix Spike Concentration (ug/mL) | Spike Recovery (%)*** | Duplicate Spike Recovery (%)*** | % RPD**** |
|---|---|---|---|---|---|---|---|
| *Matrix Spike Analysis [Sample 180447-107637x10]* | | | | | | | |
| Chloride | 4.22 | 12.5 | 16.5 | 16.5 | 98.3 | 98.5 | 0.1 |

*Duplicate Sample Analysis*

| Sample ID | Analyte | Result (ug/mL) | Duplicate Result (ug/mL) | %RPD * | DF |
|---|---|---|---|---|---|
| 180447-107637 | Chloride | 84.9 | 83.7 | 1.5 | 10 |
| 180447-107639 | Chloride | 83.0 | 82.6 | 0.4 | 10 |

* Must be <10%
** Must be 85-115%
*** Must be 75-125%
**** Must be < 25%

Marcus Hueppe
Laboratory Director



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# APPENDIX B.2

# PARTICULATE LABORATORY DATA

MONTROSE
AIR QUALITY SERVICES

# PARTICULATE
# EPA METHOD 5

Project # 002AS2-320471
Client/Location Desert View
Sample Location Unit-1
Test # 2-PM-U1

Acetone Blank mg/ml 0.0008

Sample Date 3/30/18
Data Analysis Date 4/3/18
Analyst Initials RF

| Item | Number | Final Weight (g) | Tare Weight (g) | Gain Weight (mg) | Blank Correction (mg) | Aliquot Correction (ml/ml) | Net Gain (mg/Sample) |
|---|---|---|---|---|---|---|---|
| 1. Glass Fiber Filter | 83-3302 | 0.3332 | 0.3236 | 9.6 | — | — | 9.6 |
| 2. Probe and Nozzle Wash (Acetone) | 3097 | 29.5098 | 29.5090 | 0.8 | 0.1 | 88/88 | 0.7 |
| Acetone Blank | 3096 | 29.5976 | 29.5974 | 0.2 | | 250/250 | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Total Particulate = 10.3 mg

| Method of Sample Prep/Notes |
|---|
| |
| |
| |
| |

MONTROSE
AIR QUALITY SERVICES

# PARTICULATE
# EPA METHOD 5

Project # 002AS2-320471
Client/Location Desert View
Sample Location Unit 1
Test # 3-PM-U1

Acetone Blank mg/ml 0.0008

Sample Date 3/31/18
Data Analysis Date 4/3/18
Analyst Initials RF

| Item | Number | Final Weight (g) | Tare Weight (g) | Gain Weight (mg) | Blank Correction (mg) | Aliquot Correction (ml/ml) | Net Gain (mg/Sample) |
|---|---|---|---|---|---|---|---|
| 1. Glass Fiber Filter | 83-3303 | 0.3416 | 0.3266 | 15.0 | — | — | 15.0 |
| 2. Probe and Nozzle Wash (Acetone) | 3098 | 30.4084 | 30.4071 | 1.3 | 0.1 | 74/74 | 1.2 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Total Particulate = 16.2 mg

| Method of Sample Prep/Notes |
|---|
| |
| |
| |
| |

MONTROSE
AIR QUALITY SERVICES

# PARTICULATE
# EPA METHOD 5

Project # 002AS2-320471
Client/Location Desert View
Sample Location Unit-1
Test # 4-PM

Acetone Blank mg/ml 0.0008

Sample Date 3/31/18
Data Analysis Date 4/3/18
Analyst Initials RF

| Item | Number | Final Weight (g) | Tare Weight (g) | Gain Weight (mg) | Blank Correction (mg) | Aliquot Correction (ml/ml) | Net Gain (mg/Sample) |
|---|---|---|---|---|---|---|---|
| 1. Glass Fiber Filter | 83-3304 | 0.3387 | 0.3250 | 13.7 | — | — | 13.7 |
| 2. Probe and Nozzle Wash (Acetone) | 3099 | 28.7073 | 28.7070 | 0.5 | 0.1 | 88/88 | 0.4 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Total Particulate = 14.1 mg

| Method of Sample Prep/Notes |
|---|
| |
| |
| |
| |

MONTROSE
AIR QUALITY SERVICES

# PARTICULATE
# EPA METHOD 5

Project # 002AS2-320471
Client/Location Desert View
Sample Location Unit 2
Test # 1-PM-U2

Acetone Blank mg/ml 0.0008

Sample Date 3/27/18
Data Analysis Date 4/3/18
Analyst Initials RF

| Item | Number | Final Weight (g) | Tare Weight (g) | Gain Weight (mg) | Blank Correction (mg) | Aliquot Correction (ml/ml) | Net Gain (mg/Sample) |
|---|---|---|---|---|---|---|---|
| 1. Glass Fiber Filter | 83-3298 | 0.3266 | 0.3261 | 0.5 | — | — | 0.5 |
| 2. Probe and Nozzle Wash (Acetone) | 3100 | 28.3477 | 28.3470 | 0.7 | 0.1 | 104/104 | 0.6 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Total Particulate = 1.1 mg

| Method of Sample Prep/Notes |
|---|
| |
| |
| |
| |

MONTROSE
AIR QUALITY SERVICES

# PARTICULATE
# EPA METHOD 5

Project # 002AS2-320471
Client/Location Desert View
Sample Location Unit 2
Test # 2-PM-U2

Acetone Blank mg/ml 0.0008

Sample Date 3/27/18
Data Analysis Date 4/3/18
Analyst Initials RF

| Item | Number | Final Weight (g) | Tare Weight (g) | Gain Weight (mg) | Blank Correction (mg) | Aliquot Correction (ml/ml) | Net Gain (mg/Sample) |
|---|---|---|---|---|---|---|---|
| 1. Glass Fiber Filter | 83 - 3299 | 0.3288 | 0.3271 | 1.7 | — | — | 1.7 |
| 2. Probe and Nozzle Wash (Acetone) | 3101 | 29.5879 | 29.5878 | 0.1 | 0.1 | 74/74 | 0.0 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Total Particulate = 1.7 mg

| Method of Sample Prep/Notes |
|---|
| |
| |
| |
| |

MONTROSE
AIR QUALITY SERVICES

# PARTICULATE
# EPA METHOD 5

Project # 002AS2-320471
Client/Location Desert View
Sample Location Unit 2
Test # 3-PM-V2

Acetone Blank mg/ml 0.0008

Sample Date 3/28/18
Data Analysis Date 4/3/18
Analyst Initials RF

| Item | Number | Final Weight (g) | Tare Weight (g) | Gain Weight (mg) | Blank Correction (mg) | Aliquot Correction (ml/ml) | Net Gain (mg/Sample) |
|---|---|---|---|---|---|---|---|
| 1. Glass Fiber Filter | 83-3300 | 0.3270 | 0.3270 | 0.0 | — | — | 0 0 |
| 2. Probe and Nozzle Wash (Acetone) | 3102 | 29.0217 | 29.0216 | 0.1 | 0.1 | 84/84 | 0.0 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Total Particulate = 0.0 mg

| Method of Sample Prep/Notes |
|---|
| |
| |
| |
| |

# PARTICULATE

# EPA METHOD 5

| | | | | | |
|---|---|---|---|---|---|
| **Project #** | 002AS-320471 | | | | |
| **Client/Location** | Desert View Power | | | **Sample Date** | 3/30/2018 |
| **Sample Location** | Unit 1 | | | **Analysis Date** | 4/3/2018 |
| **Test #** | 2-PM-U1 | **Acetone Blank (mg/ml)** | 0.0008 | **Analyst** | RF |

| Item | Item Number | Final Weight (g) | Tare Weight (g) | Gain Weight (mg) | Blank Correction (mg) | Aliquot Correction (ml/ml) | Net Gain (mg/sample) |
|---|---|---|---|---|---|---|---|
| 1. Glass Fiber Filter | 83-3302 | 0.3332 | 0.3236 | 9.6 | 0.0 | -------- | 9.6 |
| 2. Probe and Nozzle Wash | 3097 | 29.5098 | 29.5090 | 0.8 | 0.07 | 88<br>88 | 0.73 |
| Acetone Field Blank | 3096 | 29.5976 | 29.5974 | 0.2 | | 250<br>250 | |
| Filter Blank | | | | 0.0 | | -------- | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Total Particulate = 10.3

| Method of Sample Prep/Analysis Notes |
|---|
| |

# PARTICULATE

# EPA METHOD 5

| | | | | | |
|---|---|---|---|---|---|
| **Project #** | 002AS-320471 | | | | |
| **Client/Location** | Desert View Power | | | **Sample Date** | 3/30/2018 |
| **Sample Location** | Unit 1 | | | **Analysis Date** | 4/3/2018 |
| **Test #** | 3-PM-U1 | **Acetone Blank (mg/ml)** | 0.0008 | **Analyst** | RF |

| Item | Item Number | Final Weight (g) | Tare Weight (g) | Gain Weight (mg) | Blank Correction (mg) | Aliquot Correction (ml/ml) | Net Gain (mg/sample) |
|---|---|---|---|---|---|---|---|
| 1. Glass Fiber Filter | 83-3303 | 0.3416 | 0.3266 | 15.0 | 0.0 | -------- | 15.00 |
| 2. Probe and Nozzle Wash | 3098 | 30.4084 | 30.4071 | 1.3 | 0.06 | 74<br>74 | 1.24 |
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Total Particulate = 16.2

| Method of Sample Prep/Analysis Notes |
|---|
| |

# PARTICULATE

# EPA METHOD 5

**Project #** 002AS-320471
**Client/Location** Desert View Power
**Sample Location** Unit 1
**Test #** 4-PM-U1
**Acetone Blank (mg/ml)** 0.0008
**Sample Date** 3/31/2018
**Analysis Date** 4/3/2018
**Analyst** RF

| Item | Item Number | Final Weight (g) | Tare Weight (g) | Gain Weight (mg) | Blank Correction (mg) | Aliquot Correction (ml/ml) | Net Gain (mg/sample) |
|---|---|---|---|---|---|---|---|
| 1. Glass Fiber Filter | 83-3304 | 0.3387 | 0.325 | 13.7 | 0.0 | -------- | 13.70 |
| 2. Probe and Nozzle Wash | 3099 | 28.7075 | 28.707 | 0.5 | 0.07 | 88<br>88 | 0.43 |
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Total Particulate = 14.1

| Method of Sample Prep/Analysis Notes |
|---|
| |

# PARTICULATE

# EPA METHOD 5

**Project #** 002AS-320471
**Client/Location** Desert View Power
**Sample Location** Unit 2
**Test #** 1-PM-U2
**Acetone Blank (mg/ml)** 0.0008
**Sample Date** 3/27/2018
**Analysis Date** 4/3/2018
**Analyst** RF

| Item | Item Number | Final Weight (g) | Tare Weight (g) | Gain Weight (mg) | Blank Correction (mg) | Aliquot Correction (ml/ml) | Net Gain (mg/sample) |
|---|---|---|---|---|---|---|---|
| 1. Glass Fiber Filter | 83-3298 | 0.3266 | 0.3261 | 0.5 | 0.0 | -------- | 0.50 |
| 2. Probe and Nozzle Wash | 3100 | 28.3477 | 28.347 | 0.7 | 0.08 | 104<br>104 | 0.62 |
| | | | | | | | |
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Total Particulate = 1.1

| Method of Sample Prep/Analysis Notes |
|---|
| |

# PARTICULATE

# EPA METHOD 5

**Project #** 002AS-320471
**Client/Location** Desert View Power
**Sample Location** Unit 2
**Test #** 2-PM-U2
**Acetone Blank (mg/ml)** 0.0008
**Sample Date** 3/27/2018
**Analysis Date** 4/3/2018
**Analyst** RF

| Item | Item Number | Final Weight (g) | Tare Weight (g) | Gain Weight (mg) | Blank Correction (mg) | Aliquot Correction (ml/ml) | Net Gain (mg/sample) |
|---|---|---|---|---|---|---|---|
| 1. Glass Fiber Filter | 83-3299 | 0.3288 | 0.3271 | 1.7 | 0.0 | -------- | 1.70 |
| 2. Probe and Nozzle Wash | 3101 | 29.5879 | 29.5878 | 0.1 | 0.06 | 74<br>74 | 0.04 |
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Total Particulate = 1.7

| Method of Sample Prep/Analysis Notes |
|---|
| |

# PARTICULATE

# EPA METHOD 5

**Project #** 002AS-320471
**Client/Location** Desert View Power
**Sample Location** Unit 2
**Test #** 3-PM-U2
**Acetone Blank (mg/ml)** 0.0008
**Sample Date** 3/28/2018
**Analysis Date** 4/3/2018
**Analyst** RF

| Item | Item Number | Final Weight (g) | Tare Weight (g) | Gain Weight (mg) | Blank Correction (mg) | Aliquot Correction (ml/ml) | Net Gain (mg/sample) |
|---|---|---|---|---|---|---|---|
| 1. Glass Fiber Filter | 83-3300 | 0.327 | 0.327 | 0.0 | 0.0 | -------- | 0.00 |
| 2. Probe and Nozzle Wash | 3102 | 29.0267 | 29.0266 | 0.1 | 0.06 | 74<br>74 | 0.04 |
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Total Particulate = 0.0

| Method of Sample Prep/Analysis Notes |
|---|
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# APPENDIX B.3

# $SO_x$ LABORATORY DATA

MONTROSE AIR QUALITY SERVICES

# SULFATE TITRATION

Project # 002AS2-320471
Client/Location Desert View Power
Sample Location Unit 2
Titrant Used 0.01 N $BaCl_2$

Sample Date 3/27/18
Analysis Date 3/27/18
Analyst Initials AGB

| Test Number | Sample Description | Total Vol (ml) (TV) | $V_{recon}$ | $V_{evap}$ | Aliquot Vol (ml) (Va) | Titrant Volume (ml) (Vt) | X-Blank Vol (ml) | Comments | mg/Sample |
|---|---|---|---|---|---|---|---|---|---|
| Blank ($V_b$): 20 mL 3% $H_2O_2$ + 80 mL IPA | | | | | 20 | 0.01<br>0.03 | 0.02 | | |
| Blank ($V_b$): 20 mL DI $H_2O$ + 80 mL IPA | | | | | 20 | 0.01<br>0.02 | 0.02 | N = (0.02*Va)/Vt | |
| Standardization: 15 ml DI $H_2O$ + 5 ml 0.0200 N $H_2SO_4$ + 80 mL IPA | | | | | 5 | 10.00<br>10.06 | 10.01 | N= 0.00999001 | |
| Audit Sample: 5 ml 1000 ppm $SO_4$ + 15 DI $H_2O$ + 80 mL IPA | | | | | 5 | 9.99<br>9.94 | 9.95 | 95 % recovery | |
| 1-SOX | $H_2O_2$ | 457 | | | 20 | 2.21<br>2.20 | 2.19 | | |
| 2-SOX | $H_2O_2$ | 426 | | | 20 | 2.98<br>2.97 | 2.96 | | |
| 3-SOX | $H_2O_2$ | 436 | | | 20 | 2.97<br>2.98 | 2.96 | | |
| 4-SOX | $H_2O_2$ | 453 | | | 20 | 1.50<br>1.53 | 1.50 | | |
| 5-SOX | $H_2O_2$ | 442 | | | 20 | 2.38<br>2.40 | 2.37 | | |
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| | | | | | | | | | |
| | | | | | mg $H_2SO_4 \bullet 2H_2O$ = (Vt-Vbl) (N) (67) (TV/$V_{evap}$) ($V_{recon}$/Va) | | | | |

| Method of Sample Prep/Analysis Notes |
|---|
| |

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MONTROSE

# SULFATE TITRATION

Project # 002AS2-320471
Client/Location Desert View Power
Sample Location Unit 2
Titrant Used 0.01 N $BaCl_2$

Sample Date 3/28/18
Analysis Date 3/28/18
Analyst Initials AGB

| Test Number | Sample Description | Total Vol (ml) (TV) | $V_{recon}$ | $V_{evap}$ | Aliquot Vol (ml) (Va) | Titrant Volume (ml) (Vt) | X-Blank Vol (ml) | Comments | mg/Sample |
|---|---|---|---|---|---|---|---|---|---|
| Blank ($V_b$): 20 mL 3% $H_2O_2$ + 80 mL IPA | | | | | 20 | 0.03<br>0.01 | 0.02 | | |
| Blank ($V_b$): 20 mL DI $H_2O$ + 80 mL IPA | | | | | 20 | 0.01<br>0.02 | 0.02 | N = (0.02*Va)/Vt | |
| Standardization: 15 ml DI $H_2O$ + 5 ml 0.0200 N $H_2SO_4$ + 80 mL IPA | | | | | 5 | 10.07<br>10.05 | 10.04 | N= 0.0099601594 | |
| Audit Sample: 5 ml 1000 ppm $SO_4$ + 15 DI $H_2O$ + 80 mL IPA | | | | | 5 | 10.04<br>9.99 | 10.00 | 96 | % recovery |
| 6-SOX | $H_2O_2$ | 480 | | | 20 | 2.13<br>2.15 | 2.12 | | |
| 7-SOX | $H_2O_2$ | 475 | | | 20 | 1.56<br>1.59 | 1.56 | | |
| 8-SOX | $H_2O_2$ | 468 | | | 20 | 1.60<br>1.64 | 1.60 | | |
| 9-SOX | $H_2O_2$ | 428 | | | 20 | 3.38<br>3.34 | 3.34 | | |
| 10-SOX | $H_2O_2$ | 425 | | | 20 | 2.38<br>2.39 | 2.37 | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | mg $H_2SO_4 \bullet 2H_2O$ = (Vt-Vbl) (N) (67) (TV/$V_{evap}$) ($V_{recon}$/Va) | | | | |

| Method of Sample Prep/Analysis Notes |
|---|
| |

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Date of last revision 2/14/2017

Master Document Storage\Forms\Datasheets\Lab Forms

MONTROSE AIR QUALITY SERVICES

# SULFATE TITRATION

Project # 002 AS2 - 320471
Client/Location Desert View Power
Sample Location Unit 7
Titrant Used 0.01 N $BaCl_2$

Sample Date 3/30/18
Analysis Date 3/30/18
Analyst Initials RF

| Test Number | Sample Description | Total Vol (ml) (TV) | $V_{recon}$ | $V_{evap}$ | Aliquot Vol (ml) (Va) | Titrant Volume (ml) (Vt) | X-Blank Vol (ml) | Comments | mg/Sample |
|---|---|---|---|---|---|---|---|---|---|
| Blank ($V_b$): 20 mL 3% $H_2O_2$ + 80 mL IPA | | | | | 20 | 0.01 / 0.01 | 0.01 | | |
| Blank ($V_b$): 20 mL DI $H_2O$ + 80 mL IPA | | | | | 20 | 0.01 / 0.01 | 0.01 | N = (0.02*Va)/Vt | |
| Standardization: 15 ml DI $H_2O$ + 5 ml 0.0200 N $H_2SO_4$ + 80 mL IPA | | | | | 5 | 10.00 / 9.99 | 9.97 | N= 0.0100 | |
| Audit Sample: 5 ml 1000 ppm $SO_4$ + 15 DI $H_2O$ + 80 mL IPA | | | | | 5 | 9.91 / 9.91 | 9.90 | 95 % recovery | |
| 1 SOx | | 437 | | | 20 | 2.91 / 2.91 | 2.90 | | 2.90 |
| 2 SOx | | 404 | | | 20 | 2.95 / 2.99 | 2.96 | | 2.96 |
| 3 SOx | | 464 | | | 20 | 4.01 / 4.03 | 4.01 | | 4.01 |
| 4 SOx | | 433 | | | 20 | 3.60 / 3.60 | 3.59 | | 3.59 |
| 5 SOx | | 408 | | | 20 | 3.75 / 3.77 | 3.75 | | 3.75 |
| 6 SOx | | 434 | | | 20 | 3.31 / 3.33 | 3.31 | | 3.31 |
| 7 SOx | | 467 | | | 20 | 3.25 / 3.25 | 3.24 | | 3.24 |
| 8 SOx | | 427 | | | 20 | 3.75 / 3.77 | 3.75 | | 3.75 |
| 9 SOx | | 419 | | | 20 | 3.60 / 3.60 | 3.59 | | 3.59 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | mg $H_2SO_4 \bullet 2H_2O$ = (Vt-Vbl) (N) (67) (TV/$V_{evap}$) ($V_{recon}$/Va) | | | | |

| Method of Sample Prep/Analysis Notes |
|---|
| |

DS1580127

# APPENDIX B.4

# HYDROCARBON LABORATORY REPORT

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services
atmaa.com

April 13, 2018 LTR/010/18

Dave Wonderly
Montrose Air Quality
1631 E. St. Andrew Place
Santa Ana, CA 92705

re: Desert View Power

Dear Dave:

Please find enclosed laboratory analysis report, quality assurance summary, and the original chain of custody form for four M25.3 SUMMA canister/impinger samples received April 2, 2018.

The canisters were analyzed for methane, ethane, TGNMO, oxygen and carbon dioxide. The water impinger samples were analyzed for total organic carbon (TOC). Also enclosed the data packages for all of the samples analyzed.

Sincerely,

AtmAA, Inc.

Michael S. Porter
Senior Analyst

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services
atmaa.com

# LABORATORY ANALYSIS REPORT

Organic Carbon Analysis in Water Impinger and Methane & TGNMO Analysis in SUMMA Canister Samples from Impinger/Canister Train Sample Collection

Report Date: April 13, 2018
Client: Montrose Air Quality Services
Project No.: 002AS2-320471
Source Location : Desert View Power
Source ID: Unit 2 / Unit 1

Date Received: April 2, 2018
Date Analyzed: April 2, - 6, 2018

*Methane, ethane and total gaseous non-methane organics were measured by flame ionization detection/total combustion analysis (FID/TCA). Organic carbon in water vial samples were measured by Dohrman total organic carbon analyzer, water FID/TCA.*

| Lab No. | ID | Canister Methane | Canister Ethane | Canister TGNMO | Impinger Carbon | Impinger Volume | Canister Oxygen | Canister Carbon Dioxide | $P_1$ | P2 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Unit 2 | | (concentration, ppmv) | | | (ml) | (%v) | (%v) | | |
| 10928-1 | 1A-VOC-U2 (341) | <1 | <1 | 1.14 | --- | --- | 8.42 | 10.8 | 447 | 821 |
| | Impinger M70 | --- | --- | --- | 0.76 | 2.42 | --- | --- | -- | -- |
| 10928-2 | 1B-VOC-U2 (114) | <1 | <1 | 1.18 | --- | --- | 8.05 | 11.1 | 451 | 820 |
| | Impinger M71 | --- | --- | --- | 0.93 | 2.86 | --- | --- | -- | -- |
| | Unit 1 | | | | | | | | | |
| 10928-3 | 1A-VOC-U1 (368) | <1 | <1 | 1.22 | --- | --- | 8.81 | 11.1 | 471 | 822 |
| | Impinger M72 | --- | --- | --- | 0.68 | 2.32 | --- | --- | -- | -- |
| 10928-4 | 1B-VOC-U1 (158) | <1 | <1 | 1.23 | --- | --- | 8.94 | 11.1 | 502 | 820 |
| | Impinger M73 | --- | --- | --- | 0.65 | 2.41 | --- | --- | -- | -- |

*TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppmvC.*
*Ethane is reported as ppmvC.*
** Note - Impinger sample results are not field blank corrected. The field blank (impinger M74) contained 0.58 ug carbon, corresponding to 0.31 ppm carbon for a 3.84 liter sample.*
*$P_1$ and $P_2$ are initial and final pressures measured in mm Hg.*

Michael S. Porter
Senior Analyst

QUALITY ASSURANCE SUMMARY
*(Repeat Analysis)*

Source Location : Desert View Power
Date Received: April 2, 2018
Date Analyzed: April 2, - 6, 2018

| Components | Sample ID | Repeat Analysis Run #1 | Repeat Analysis Run #2 | Mean Conc. | % Diff. From Mean |
|---|---|---|---|---|---|
| | | (Concentration in ppmv) | | | |
| Methane | 1A-VOC-U2 (341) | <1 | <1 | --- | --- |
| | 1B-VOC-U2 (114) | <1 | <1 | --- | --- |
| | 1A-VOC-U1 (368) | <1 | <1 | --- | --- |
| | 1B-VOC-U1 (158) | <1 | <1 | --- | --- |
| Ethane | 1A-VOC-U2 (341) | <1 | <1 | --- | --- |
| | 1B-VOC-U2 (114) | <1 | <1 | --- | --- |
| | 1A-VOC-U1 (368) | <1 | <1 | --- | --- |
| | 1B-VOC-U1 (158) | <1 | <1 | --- | --- |
| TGNMO | 1A-VOC-U2 (341) | 1.16 | 1.13 | 1.14 | 0.91 |
| | 1B-VOC-U2 (114) | 1.19 | 1.17 | 1.18 | 1.0 |
| | 1A-VOC-U1 (368) | 1.24 | 1.21 | 1.22 | 0.94 |
| | 1B-VOC-U1 (158) | 1.22 | 1.24 | 1.23 | 0.76 |
| | | (Concentration in %v) | | | |
| Oxygen | 1A-VOC-U2 (341) | 8.38 | 8.47 | 8.42 | 0.52 |
| | 1A-VOC-U1 (368) | 8.68 | 8.95 | 8.81 | 1.5 |
| Carbon Dioxide | 1A-VOC-U2 (341) | 10.8 | 10.8 | 10.8 | 0.09 |
| | 1A-VOC-U1 (368) | 11.1 | 11.1 | 11.1 | 0.32 |

| | | Repeat Analysis Run #1 | Repeat Analysis Run #2 | Repeat Analysis Run #3 | Mean Conc. | % Diff. From Mean |
|---|---|---|---|---|---|---|
| | | (Concentration in ppmv) | | | | |
| Impinger TOC | Impinger M70 | 0.79 | 0.78 | 0.72 | 0.76 | 5.7 |
| | Impinger M71 | 0.93 | 0.94 | 0.93 | 0.93 | 0.36 |
| | Impinger M72 | 0.70 | 0.68 | 0.65 | 0.68 | 3.9 |
| | Impinger M73 | 0.61 | 0.67 | 0.67 | 0.65 | 3.1 |

*A set of 4 SUMMA canister/impinger samples, laboratory number 10928-(1 - 4), was analyzed for methane, ethane, total gaseous non-methane organics (TGNMO), TOC, O2, and CO2. Agreement between repeat analysis is a measure of precision and is shown in the column "% Difference from Mean". The average % Difference from Mean for 12 repeat measurements from the sample set of 4 SUMMA canister/impinger samples is 1.6%.*

Date: April 13, 2018

AtmAA, Inc.

Laboratory Analysis Data Package

| | |
|---|---|
| Client: | Montrose Air Quality Services. |
| Project: | Desert View Power |
| Project No.: | 002AS2-320471 |
| Sample Location: | Unit 2 & 1 / Stack Breaching |
| Date Received: | April 2, 2018 |
| Date Analyzed: | April 2, - 6, 2018 |
| Lab No.: | 10928 - (1 - 4) |
| | M25.3 |

Presheet

CLIENT : Montrose

DATE: 4/2/18

| LAB # | SAMPLE ID | CAN/TANK | Trap | P1 | P2 |
|---|---|---|---|---|---|
| 10928-1 | U2 | 341 | M70 | 447 | 821 |
| -2 | 1 | 114 | M71 | 451 | 820 |
| -3 | U1 | 368 | M72 | 471 | 822 |
| -4 | 1 | 158 | M73 | 502 | 820 |
| -5 | blk | | M74 | | |
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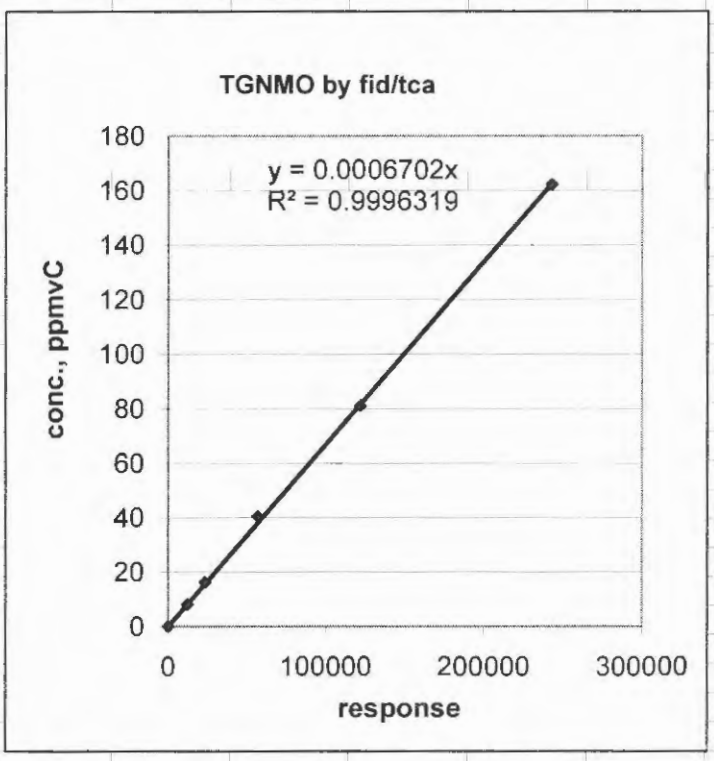
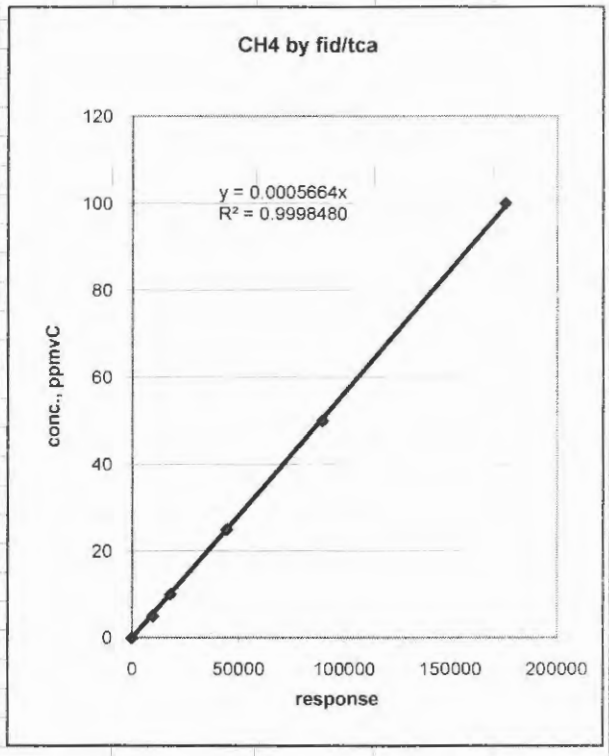
P atm = 733

Samples Pressurized with: $N_2$

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/10/18 | | n2 bkg | | | 1224 | 1149 | 1298 | | | | |
| | chart | | | | avg bkg | b1 | b2 | | | | |
| ALM033827 | | | | 20x | | 10x | | 4x | | 2x | |
| co | 175267 | 101 | 10253 | 5.05 | 18791 | 10.1 | 44136 | 25.3 | 88939 | 50.5 | |
| ch4 | 175780 | 100 | 9846 | 5.00 | 18087 | 10.0 | 44320 | 25.0 | 89531 | 50.0 | |
| co2 | 700655 | 394 | 42508 | 19.7 | 95534 | 39.4 | 176019 | 98.5 | 357020 | 197 | |
| tgnmo | 244008 | 162.3 | 13376 | 8.12 | 24486 | 16.2 | 58050 | 40.6 | 123028 | 81.2 | |
| c2 | 140758 | 80.9 | 8754 | 4.05 | 14804 | 8.09 | 35607 | 20.2 | 71635 | 40.5 | |
| FF9241 | | low prax | | 2x | | | | | | | |
| co | | | | | | | | | | | |
| ch4 | | 4.01 | | 2.01 | | | | | | | |
| co2 | | | | | | | | | | | |
| tgnmo | | 3.00 | | 1.50 | | | | | | | |
| c2 | | 4.00 | | 2.00 | | | | | | | |
| tgnmo | 0 | ch4 | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 0 | 0 | 0 | 0 | | | | | | | | |
| 12153 | 8.115 | 9846 | 5 | | | | | | | | |
| 23263 | 16.23 | 18087 | 10 | | | | | | | | |
| 56827 | 40.575 | 44320 | 25 | | | | | | | | |
| 121805 | 81.15 | 89531 | 50 | | | | | | | | |
| 242785 | 162.3 | 175780 | 100 | | | | | | | | |



| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | Date: | 4/3/2018 | | | | | | |
| 2 | | co2 % | | 3.62 | | | | | | |
| 3 | | area co2 | bkg | 2001 | 1983 | | | | | |
| 4 | | | | | | | bkg avg | 1992 | | |
| 5 | | | Client: | Montrose | | | | | | |
| 6 | | | | Direct TGNMO | | | | | | |
| 7 | | | | | | | | | | CO2 bkg |
| 8 | | | | N2 bkg | 1168 | 1289 | | | | 3.62 |
| 9 | | | | | | avg | 1229 | | | 1992 |
| 10 | | | | tgnmo | rf | ch4 | rf | | | |
| 11 | | | | 162.3 | | 100 | | | | from |
| 12 | | alm033827 | | 243119 | 0.000665 | 174329 | 0.000566 | | | CO2 bkg |
| 13 | | | | 247249 | | 178781 | | | | |
| 14 | | | | | | | ch4 | % co2 | co2 bkg | tgnmo |
| 15 | dil | p1 | p2 | lab# | ch4 | tgnmo | ppm | | | ppm |
| 16 | 1.7 | 447 | 821 | 10928-1 | | 2460 | 0.00 | 3.46 | 1904 | 1.16 |
| 17 | 1.7 | 447 | 821 | 10928-1 | | 2450 | 0.00 | 3.46 | 1904 | 1.13 |
| 18 | 1.7 | 451 | 820 | 10928-2 | | 2551 | 0.00 | 3.58 | 1970 | 1.19 |
| 19 | 1.7 | 451 | 820 | 10928-2 | | 2540 | 0.00 | 3.58 | 1970 | 1.17 |
| 20 | 1.8 | 471 | 822 | 10928-3 | | 2539 | 0.00 | 3.54 | 1948 | 1.24 |
| 21 | 1.8 | 471 | 822 | 10928-3 | | 2528 | 0.00 | 3.54 | 1948 | 1.21 |
| 22 | 1.9 | 502 | 820 | 10928-4 | | 2556 | 0.00 | 3.57 | 1964 | 1.22 |
| 23 | 1.9 | 502 | 820 | 10928-4 | | 2565 | 0.00 | 3.57 | 1964 | 1.24 |

following are calculation formulas using sample 10928-1 as an example:

| | | |
|---|---|---|
| | | FOR 25.3 CANISTER |
| CO | = | $E$31*E33*C33/B33*A33 |
| CH4 | = | $G$12*E16*C16/B16*A16 |
| TGNMO | = | $E$12*(F16-I16)*C16/B16*A16 |
| Ethane | = | $F$29*G33*C33/B33*A33 |
| CO2 bkg | = | $J$9*H16/$J$8 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | date | 4/3/2018 | 4/3/2018 | | | |
| | time | 9:25:12 | 14:31:46 | | | |
| | | | | | | |
| | 3-point | | | | | |
| | rf tgnmo | 0.0006702 | | | | |
| area | n2 bkg | 1168 | 1289 | | | |
| area | FF9241/2 | 3406 | 3523 | | | |
| area | net | 2238 | 2234 | | | |
| ppmv | conc | 1.50 | 1.50 | | | |
| ppmv | theo | 1.50 | 1.50 | | | |
| recovery | %R | 100 | 100 | | | |
| | ethane | | | | | |
| area | net | 2993 | 2995 | | | |
| ppmv | conc | 2.01 | 2.01 | | | |
| ppmv | theo | 2.00 | 2.00 | | | |
| recovery | %R | 100 | 100 | | | |

QC run before after

| | | BEFORE | | | AFTER | |
|---|---|---|---|---|---|---|
| | date: | 4/3/2018 | | | 4/3/2018 | |
| | time: | 9:25:12 | | | 14:31:46 | |
| | tgnmo | | | | | |
| ff49942/2 | | | | | | |
| theoretical | | 1.50 | | | 1.50 | |
| actual | | 1.50 | | | 1.50 | |
| % difference | | 0.0 | | | 0.0 | |
| | ethane | | | | | |
| theoretical | | 2.00 | | | 2.00 | |
| actual | | 2.01 | | | 2.01 | |
| % difference | | 0.50 | | | 0.50 | |

Data File G:\HPCHEM\2\DATA\T040318\SIG10003.D
Sample Name: ~~n2~~ Audit std

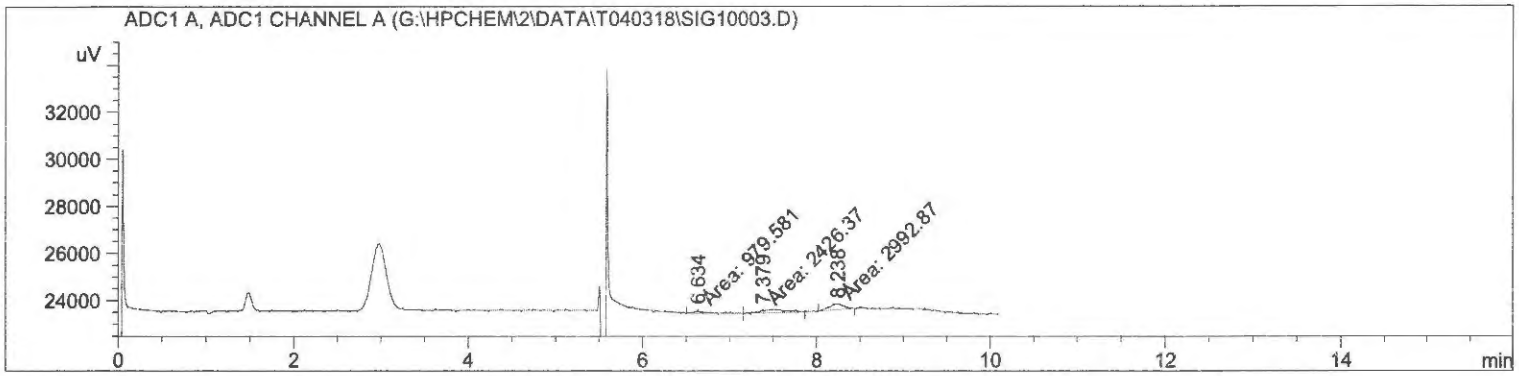
==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 9:25:12 AM
Inj Volume : Manually

Audit std 1

FF 9241/2

Acq. Method : G:\4\METHODS\TCA2S.M
Last changed : 4/3/2018 7:06:06 AM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/13/2018 9:13:51 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % | |
|---|---|---|---|---|---|---|---|
| 1 | 6.634 | MM | 0.1117 | 979.58124 | 146.10277 | 15.30879 | TGNMO 3406 |
| 2 | 7.379 | MM | 0.2957 | 2426.36719 | 136.74435 | 37.91902 | |
| 3 | 8.238 | MM | 0.1998 | 2992.86523 | 249.62769 | 46.77219 | C2 |
| Totals : | | | | 6398.81366 | 532.47481 | | |

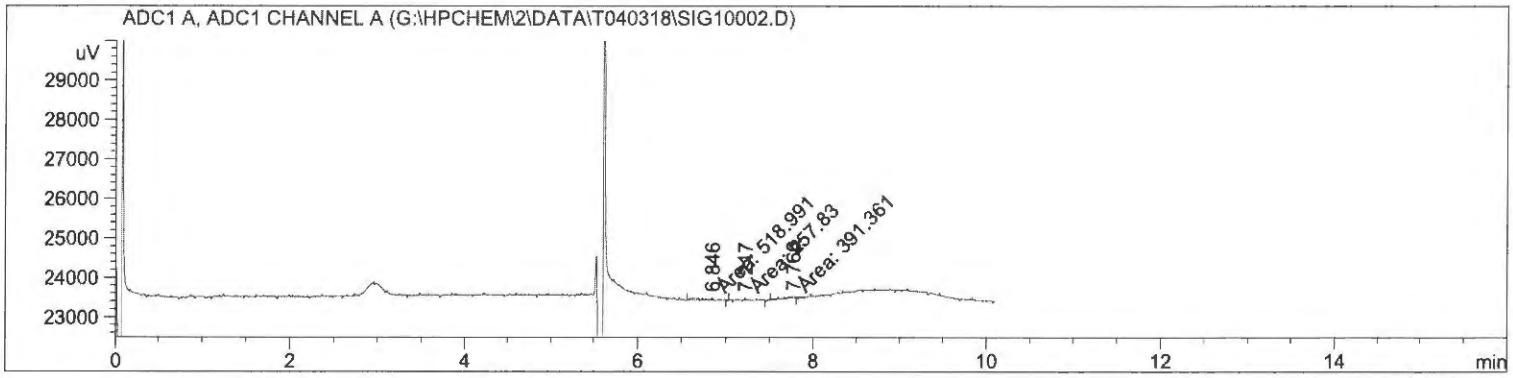
==========

*** End of Report ***

Data File G:\HPCHEM\2\DATA\T040318\SIG10002.D
Sample Name: n2

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 9:10:45 AM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2S.M
Last changed : 4/3/2018 7:06:06 AM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/5/2018 7:42:21 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % |
|---|---|---|---|---|---|---|
| 1 | 6.846 | MM | 0.1264 | 518.99109 | 68.41783 | 44.42724 |
| 2 | 7.217 | MM | 0.0643 | 257.82968 | 66.86559 | 22.07102 |
| 3 | 7.766 | MM | 0.1445 | 391.36145 | 45.14206 | 33.50175 |

TGNMO 1168

Totals : 1168.18222 180.42548

==========

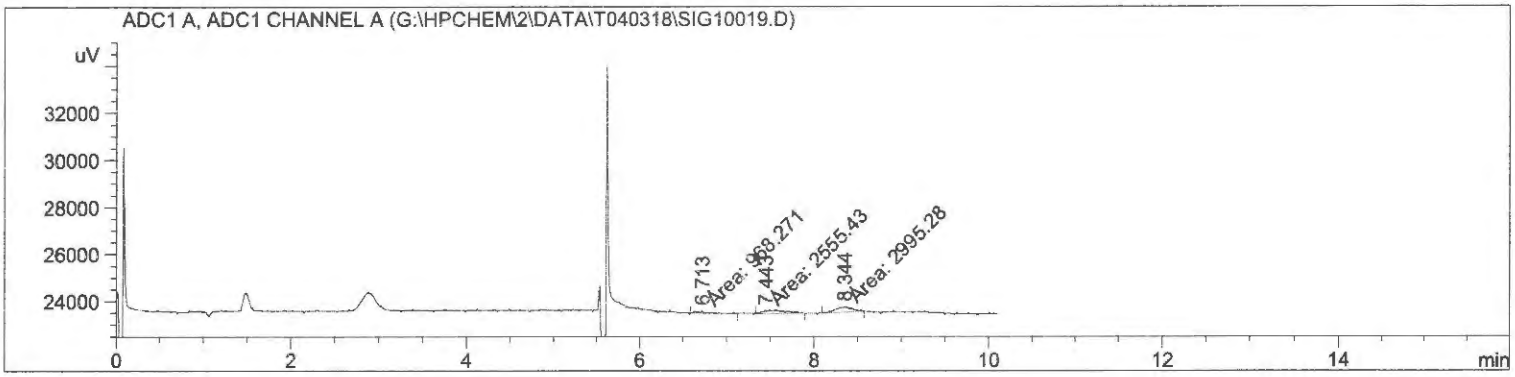
*** End of Report ***

Data File G:\HPCHEM\2\DATA\T040318\SIG10019.D
Sample Name: audit std

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 2:31:46 PM
Inj Volume : Manually

Acq. Method : G:\4\METHODS\TCA2S.M
Last changed : 4/3/2018 2:30:36 PM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/13/2018 9:16:14 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % |
|---|---|---|---|---|---|---|
| 1 | 6.713 | MM | 0.1671 | 968.27063 | 96.58013 | 14.85310 |
| 2 | 7.443 | MM | 0.2874 | 2555.42627 | 148.19566 | 39.19978 |
| 3 | 8.344 | MM | 0.2229 | 2995.28369 | 223.94479 | 45.94712 |

TGNMO 3523
C2

Totals : 6518.98059 468.72059

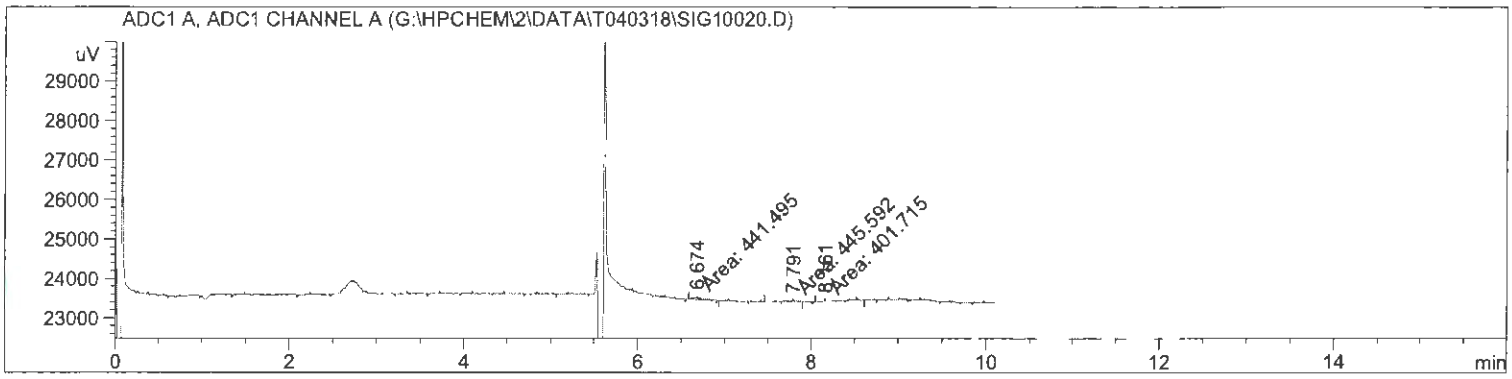
==========

*** End of Report ***

Data File G:\HPCHEM\2\DATA\T040318\SIG10020.D
Sample Name: n2

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 2:43:35 PM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2S.M
Last changed : 4/3/2018 2:30:36 PM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/5/2018 7:42:21 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % |
|---|---|---|---|---|---|---|
| 1 | 6.674 | MM | 0.0781 | 441.49506 | 94.21721 | 34.25624 |
| 2 | 7.791 | MM | 0.1037 | 445.59241 | 71.58197 | 34.57416 |
| 3 | 8.161 | MM | 0.1028 | 401.71451 | 70.92024 | 31.16961 |

TGNNLO 1289

Totals : 1288.80197 236.71942

==========

*** End of Report ***

| | | | | |
|---|---|---|---|---|
| 4/3/2018 | | | PRECISION | |
| | | | | |
| repeat injection precision | | | | |
| TCA1 | | | N2 bkg | |
| alm033827 | | | 1229 | |
| | TGNMO | | | |
| Inj. # | conc. | area | rf | %diff from mean |
| 1 | 162.3 | 243119 | 0.000671 | 0.85 |
| 2 | 162.3 | 247249 | 0.00066 | 0.85 |
| | | | | |
| | | | | |
| | | mean | 0.0006653 | |

Date: April 2, 2018

AtmAA, Inc.

Laboratory Analysis Data Package

Client: Montrose Air Quality Services
Site: Desert View Power
Project No.: 002AS2-320471
SampleLocation: Unit 2 & Unit 1 Stack Breaching

CANISTER ANALYSIS
CHROMATOGRAMS:
M25.3

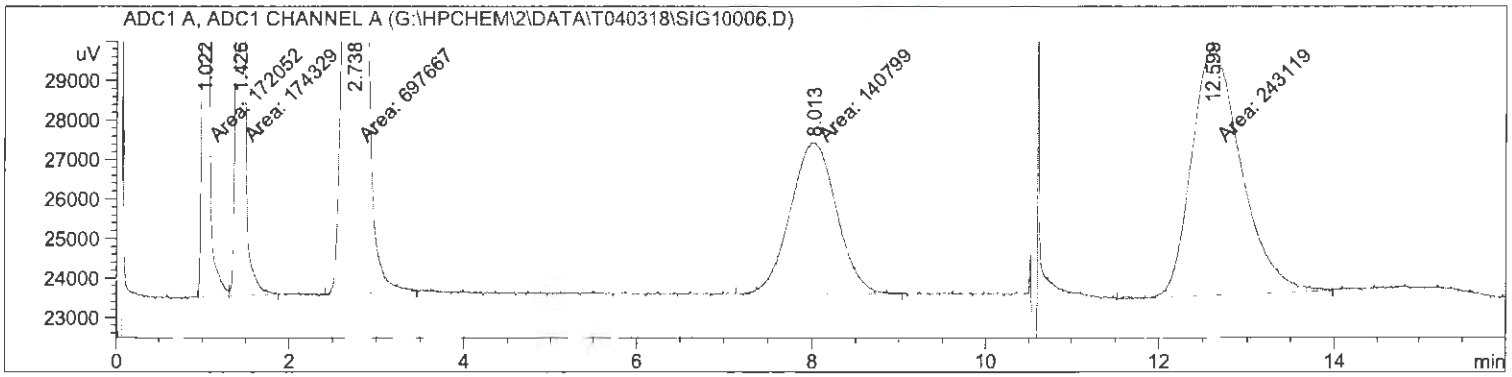
Data File G:\HPCHEM\2\DATA\T040318\SIG10006.D
Sample Name: std

Begin Std

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 10:16:36 AM
Inj Volume : Manually

Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 4/3/2018 9:38:55 AM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/5/2018 7:42:21 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % | |
|---|---|---|---|---|---|---|---|
| 1 | 1.022 | MF | 0.0600 | 1.72052e5 | 4.77862e4 | 12.04876 | cc |
| 2 | 1.426 | FM | 0.0818 | 1.74329e5 | 3.55180e4 | 12.20820 | chy |
| 3 | 2.738 | MM | 0.1887 | 6.97667e5 | 6.16332e4 | 48.85740 | co2 |
| 4 | 8.013 | MM | 0.6122 | 1.40799e5 | 3833.03442 | 9.86012 | c2 |
| 5 | 12.599 | MM | 0.6415 | 2.43119e5 | 6316.31738 | 17.02552 | TGNMO |
| Totals : | | | | 1.42797e6 | 1.55087e5 | | |

==========

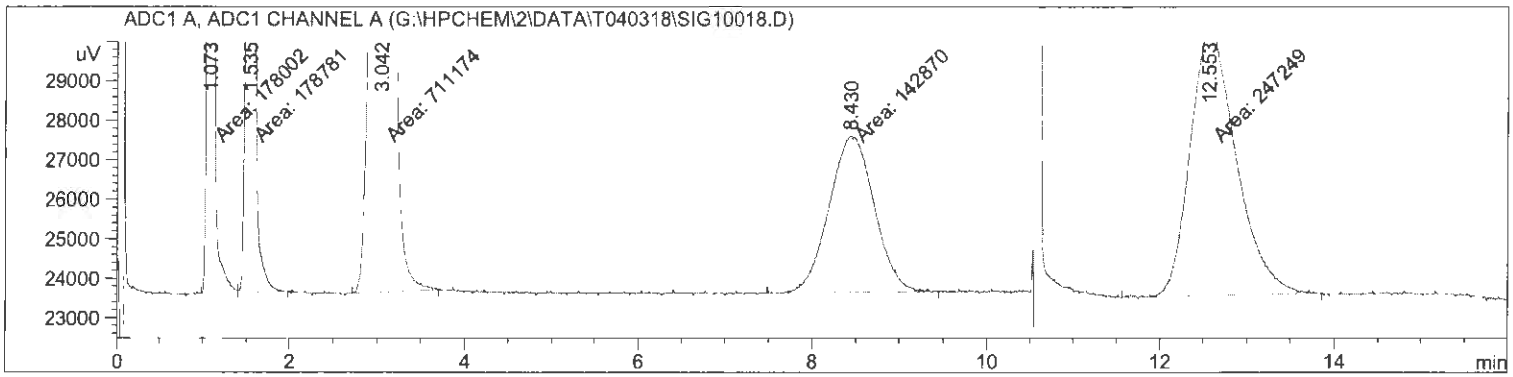
*** End of Report ***

Data File G:\HPCHEM\2\DATA\T040318\SIG10018.D
Sample Name: std

End std

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 2:12:40 PM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 4/3/2018 9:38:55 AM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/5/2018 7:42:21 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % | |
|---|---|---|---|---|---|---|---|
| 1 | 1.073 | MF | 0.0617 | 1.78002e5 | 4.80503e4 | 12.20799 | Co |
| 2 | 1.535 | FM | 0.0863 | 1.78781e5 | 3.45402e4 | 12.26143 | Chy |
| 3 | 3.042 | MM | 0.2003 | 7.11174e5 | 5.91837e4 | 48.77482 | Co2 |
| 4 | 8.430 | MM | 0.5998 | 1.42870e5 | 3970.05957 | 9.79855 | C2 |
| 5 | 12.553 | MM | 0.6200 | 2.47249e5 | 6646.16455 | 16.95721 | Tenmo |

Totals : 1.45808e6 1.52390e5

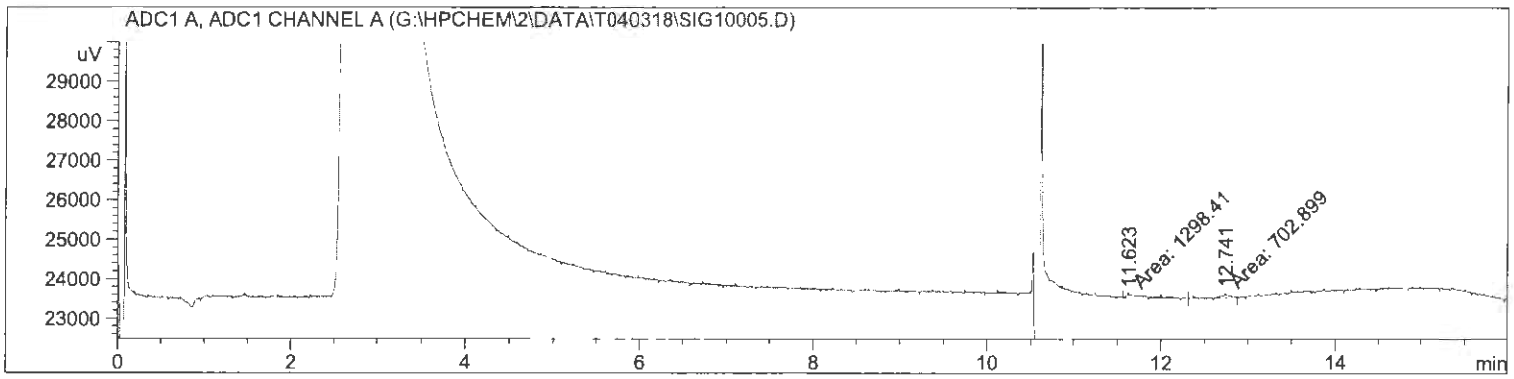
==========

*** End of Report ***

Data File G:\HPCHEM\2\DATA\T040318\SIG10005.D
Sample Name: 3.62% co2bkg

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 9:58:28 AM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 4/3/2018 9:38:55 AM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/5/2018 9:25:03 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % |
|---|---|---|---|---|---|---|
| 1 | 11.623 | MM | 0.1890 | 1298.41089 | 114.50130 | 64.87805 |
| 2 | 12.741 | MM | 0.0992 | 702.89911 | 118.09022 | 35.12195 |

TGNMO 2001

Totals : 2001.31000 232.59151

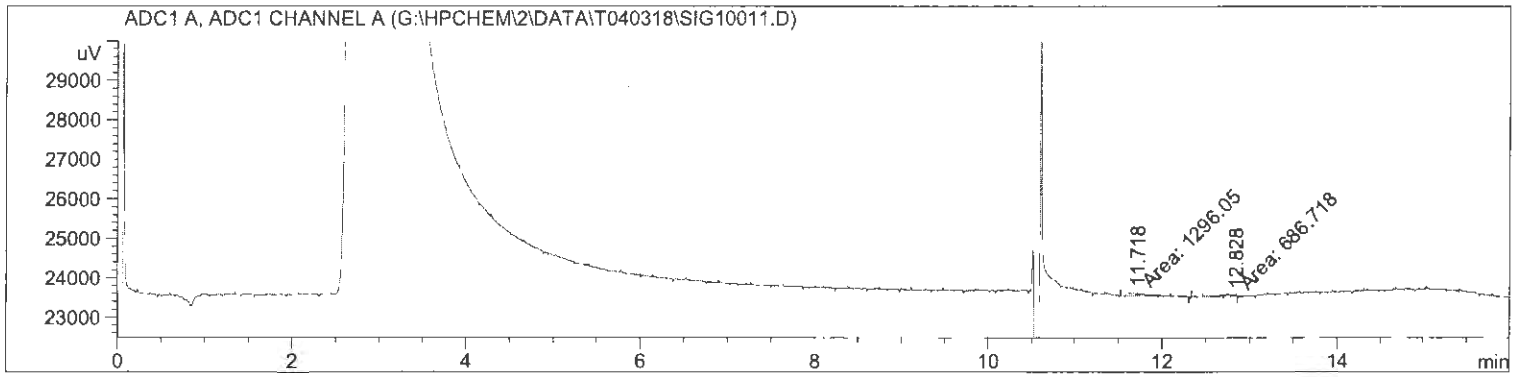
==========

*** End of Report ***

Data File G:\HPCHEM\2\DATA\T040318\SIG10011.D
Sample Name: 3.62% co2bkg 2

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 11:54:45 AM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 4/3/2018 9:38:55 AM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/5/2018 9:25:03 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % |
|---|---|---|---|---|---|---|
| 1 | 11.718 | MM | 0.2243 | 1296.04980 | 96.29052 | 65.36569 |
| 2 | 12.828 | MM | 0.1760 | 686.71796 | 65.01829 | 34.63431 |

TGNMO 1983

Totals : 1982.76776 161.30881

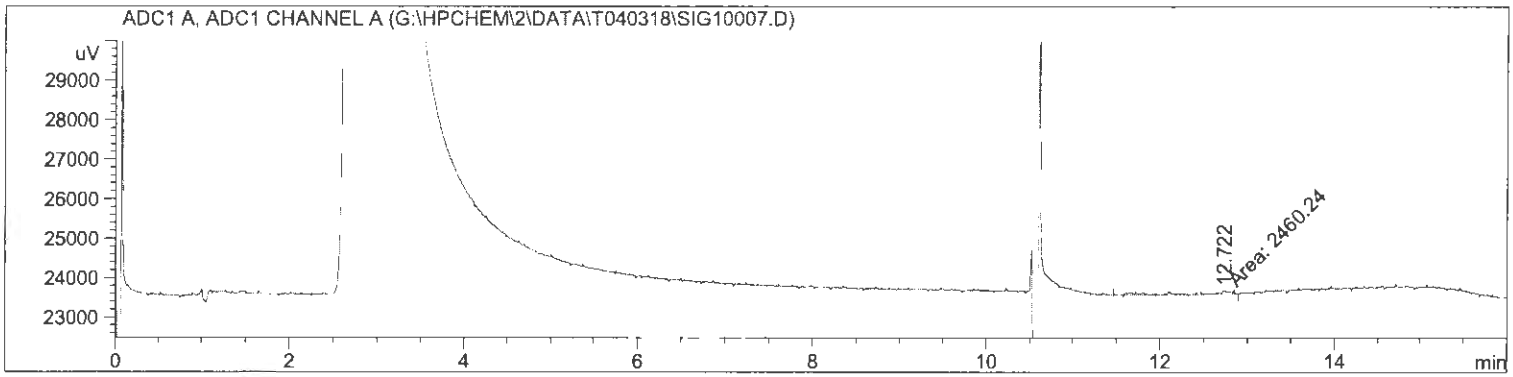
==========

*** End of Report ***

Data File G:\HPCHEM\2\DATA\T040318\SIG10007.D
Sample Name: 10928-1

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 10:36:09 AM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 4/3/2018 9:38:55 AM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/5/2018 9:25:03 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % |
|---|---|---|---|---|---|---|
| 1 | 12.722 | MM | 0.4986 | 2460.24023 | 82.23830 | 1.000e2 |

TGNMO

Totals : 2460.24023 82.23830

==========

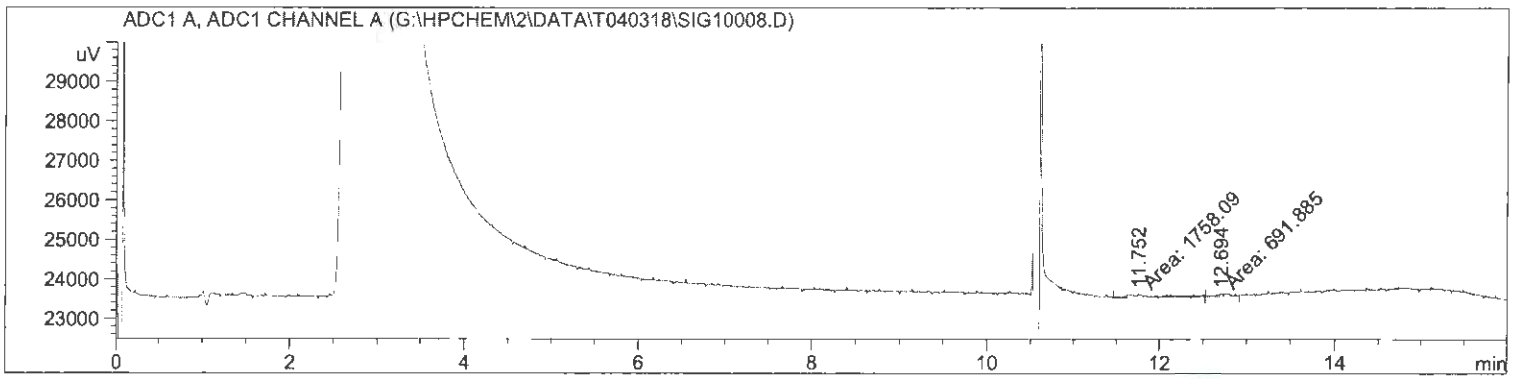
*** End of Report ***

Data File G:\HPCHEM\2\DATA\T040318\SIG10008.D
Sample Name: 10928-1

R-2

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 10:55:08 AM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 4/3/2018 9:38:55 AM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/5/2018 9:25:03 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % |
|---|---|---|---|---|---|---|
| 1 | 11.752 | MM | 0.2879 | 1758.09131 | 101.78402 | 71.75952 |
| 2 | 12.694 | MM | 0.1701 | 691.88525 | 67.80596 | 28.24048 |

TOTAL 2450

Totals : 2449.97656 169.58998

==========

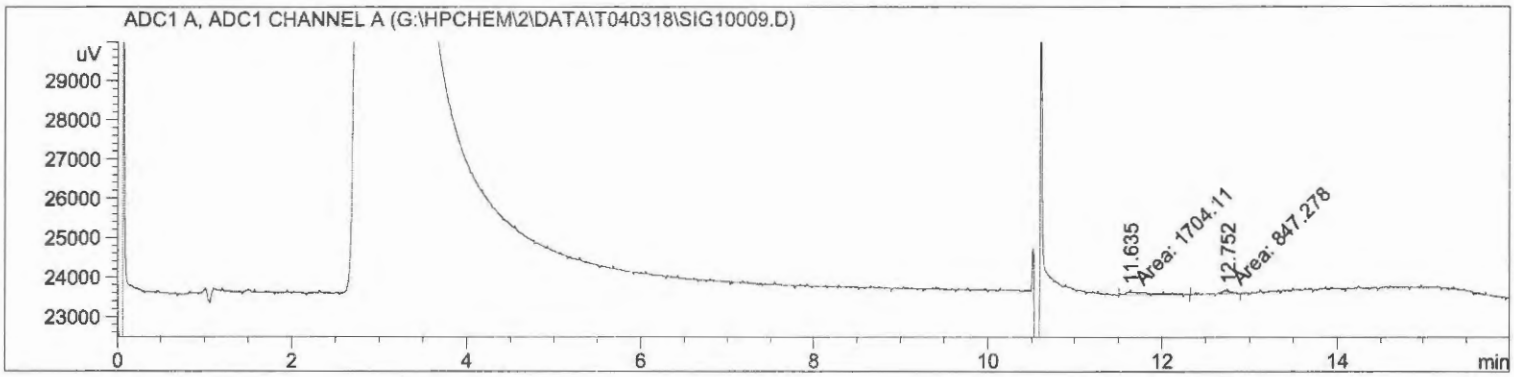
*** End of Report ***

Data File G:\HPCHEM\2\DATA\T040318\SIG10009.D
Sample Name: 10928-2

R.

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 11:16:31 AM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 4/3/2018 9:38:55 AM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/5/2018 9:25:03 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % |
|---|---|---|---|---|---|---|
| 1 | 11.635 | MM | 0.2171 | 1704.10620 | 130.84210 | 66.79145 |
| 2 | 12.752 | MM | 0.1368 | 847.27771 | 103.20321 | 33.20855 |

(TGNMU 2551

Totals : 2551.38391 234.04531

==========

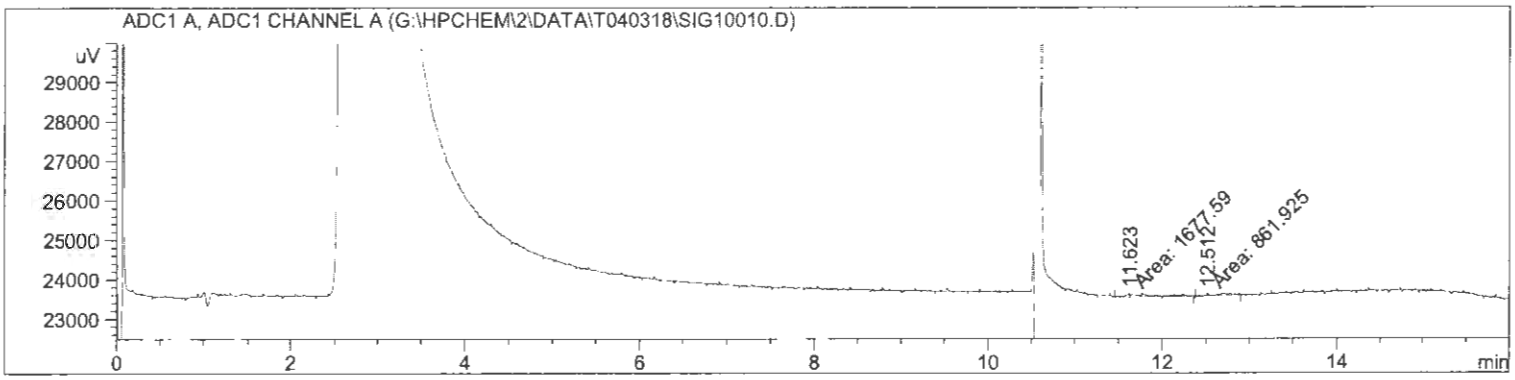
*** End of Report ***

Data File G:\HPCHEM\2\DATA\T040318\SIG10010.D
Sample Name: 10928-2

R2

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 11:35:25 AM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 4/3/2018 9:38:55 AM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/5/2018 9:25:03 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % |
|---|---|---|---|---|---|---|
| 1 | 11.623 | MM | 0.2654 | 1677.59143 | 105.33846 | 66.05948 |
| 2 | 12.512 | MM | 0.1632 | 861.92529 | 88.04726 | 33.94052 |

TGNMO 2540

Totals : 2539.51672 193.38572

==========

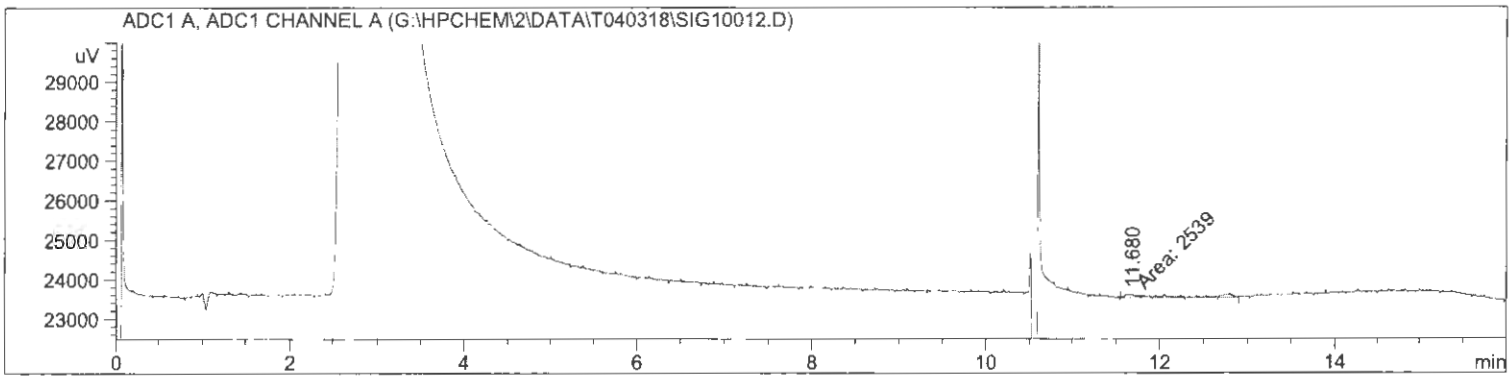
*** End of Report ***

Data File G:\HPCHEM\2\DATA\T040318\SIG10012.D
Sample Name: 10928-3

R1

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 12:14:03 PM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 4/3/2018 9:38:55 AM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/5/2018 9:25:03 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % |
|---|---|---|---|---|---|---|
| 1 | 11.680 | MM | 0.3785 | 2538.99609 | 111.81003 | 1.000e2 |

TONNO

Totals : 2538.99609 111.81003

==========

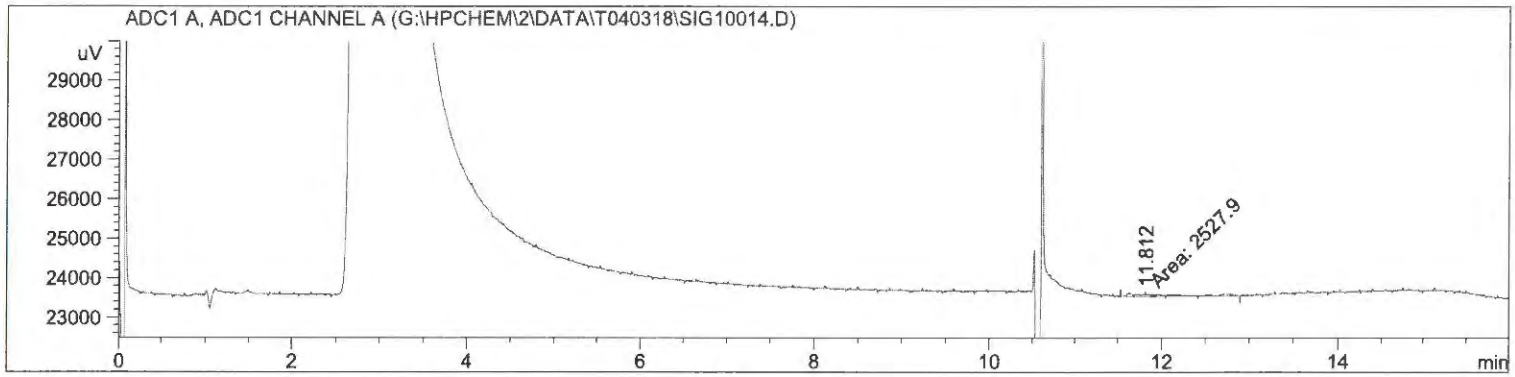
*** End of Report ***

Data File G:\HPCHEM\2\DATA\T040318\SIG10014.D
Sample Name: 10928-3

R2

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 12:52:33 PM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 4/3/2018 9:38:55 AM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/5/2018 9:25:03 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % |
|---|---|---|---|---|---|---|
| 1 | 11.812 | MM | 0.3918 | 2527.89624 | 107.52235 | 1.000e2 |

TGNMO 2528

Totals : 2527.89624 107.52235

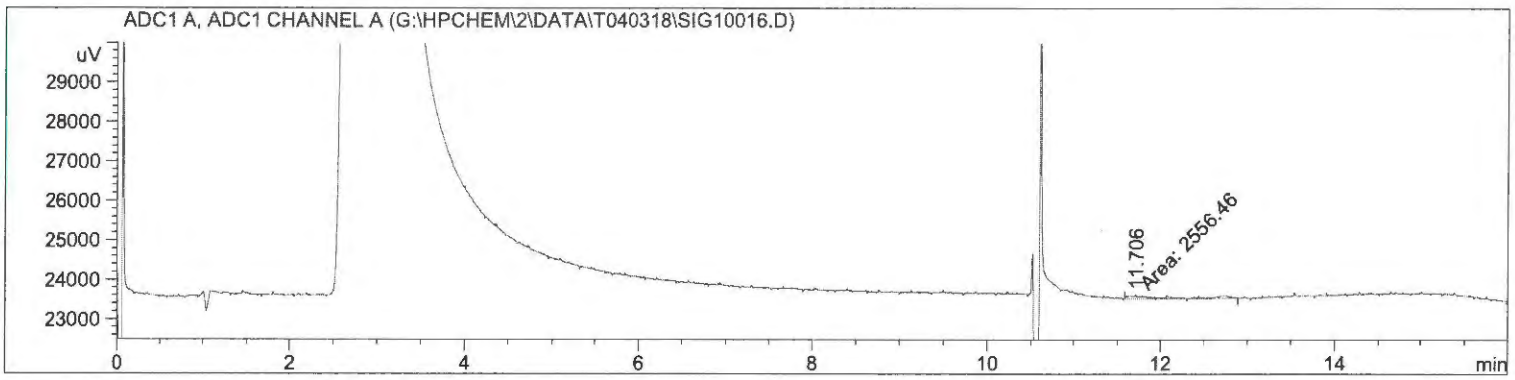
==========

*** End of Report ***

Data File G:\HPCHEM\2\DATA\T040318\SIG10016.D
Sample Name: 10928-4

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 1:31:34 PM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 4/3/2018 9:38:55 AM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/5/2018 9:25:03 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % |
|---|---|---|---|---|---|---|
| 1 | 11.706 | MM | 0.3977 | 2556.45532 | 107.12206 | 1.000e2 |

TGNMO

Totals : 2556.45532 107.12206

==========

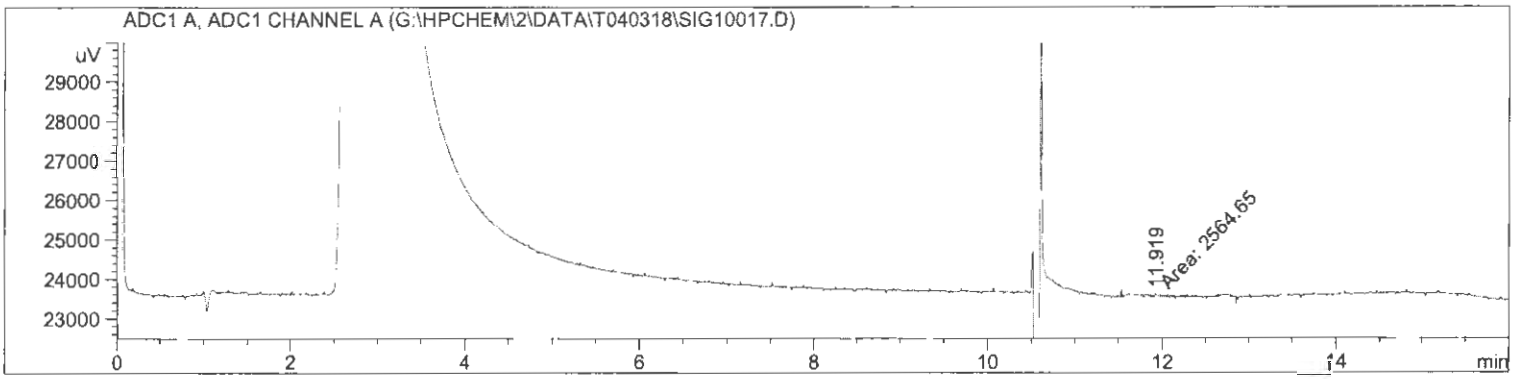
*** End of Report ***

Data File G:\HPCHEM\2\DATA\T040318\SIG10017.D
Sample Name: 10928-4

R 2

==========

Acq. Operator : k2m
Acq. Instrument : TCA #1 Location : Vial 1
Injection Date : 4/3/2018 1:50:27 PM
Inj Volume : Manually
Acq. Method : G:\4\METHODS\TCA2L.M
Last changed : 4/3/2018 9:38:55 AM by k2m
(modified after loading)
Analysis Method : G:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 4/5/2018 9:25:03 AM
(modified after loading)
Method Info : TCA2




==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| Peak # | RetTime [min] | Type | Width [min] | Area [uV*s] | Height [uV] | Area % |
|---|---|---|---|---|---|---|
| 1 | 11.919 | MM | 0.5022 | 2564.65015 | 85.10628 | 1.000e2 |

TENTIC

Totals : 2564.65015 85.10628

==========

*** End of Report ***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | date | 4/2/2018 | | | | |
| | | | | PERMS | | | |
| | | client | Montrose | | | | |
| | | | | | rf | | AVG |
| | | | ch4 | 39.9 | 0.000489 | 0.000488 | 0.000489 |
| | | | co2 | 40.05 | 0.000338 | 0.000338 | 0.000338 |
| | | | o2 | 21.9 | #DIV/0! | #DIV/0! | #DIV/0! |
| | | | n2 | 78.1 | #DIV/0! | #DIV/0! | #DIV/0! |
| | | STD | ch4 | co2 | o2 | n2 | |
| | | | 81534 | 118491 | | | |
| | | lab no. | 81749 | 118632 | | | |
| | 1.00 | 10928-1 | | 17431 | | | |
| | 1.00 | 10928-1 | | 17398 | | | |
| | 1.00 | 10928-2 | | 18000 | | | |
| | 1.00 | 10928-3 | | 18867 | | | |
| | 1.00 | 10928-3 | | 18747 | | | |
| | 1.00 | 10928-4 | | 20055 | | | |
| | 1.00 | | | | | | |
| | 1.00 | | | | | | |
| | 1.00 | | | | | | |
| | 1.00 | | | | | | |
| | 1.00 | | | | | | |
| | 1.00 | | | | | | |
| | 1.00 | | | | | | |
| | 1.00 | | | | | | |
| | 1.00 | | | | | | |
| | 1.00 | | | | | | |
| | | | | uncorr to | | | |
| | | | | p2/p1 | % | Dil | |
| | | | | | | | |
| | | | | conc. | | | |
| sample vol | total vol | | ch4 | co2 | conc | factor | |
| 20 | 34 | 10928-1 | 0.000 | 5.89 | 3.46 | 1.70 | |
| 20 | 34 | 10928-1 | 0.000 | 5.88 | 3.46 | 1.70 | |
| 20 | 34 | 10928-2 | 0.000 | 6.08 | 3.58 | 1.70 | |
| 20 | 36 | 10928-3 | 0.000 | 6.37 | 3.54 | 1.80 | |
| 20 | 36 | 10928-3 | 0.000 | 6.33 | 3.52 | 1.80 | |
| 20 | 38 | 10928-4 | 0.000 | 6.77 | 3.57 | 1.90 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | date | 4/2/2018 | | | | |
| | | | | | PERMS | | | |
| | | | client | Montrose | | | | |
| | | | | avg area | | rf | | AVG |
| | | | | ch4 | 39.9 | 0.000489 | 0.000488 | 0.000489 |
| | | | | co2 | 40.05 | 0.000338 | 0.000338 | 0.000338 |
| | | | | o2 | 21.9 | 0.001225 | 0.001174 | 0.001199 |
| | | | | n2 | 78.1 | #DIV/0! | #DIV/0! | #DIV/0! |
| | | | STD | ch4 | co2 | o2 | n2 | |
| | | | | 81534 | 118491 | 17881 | | |
| p1 | p2 | | lab no. | 81749 | 118632 | 18661 | | |
| 447 | 821 | 1.84 | 10928-1 | 0 | 17431 | 4226 | | |
| 447 | 821 | 1.84 | 10928-1 | 0 | 17398 | 4266 | | |
| 451 | 820 | 1.82 | 10928-2 | 0 | 18000 | 4117 | | |
| 471 | 822 | 1.75 | 10928-3 | 0 | 18867 | 4593 | | |
| 471 | 822 | 1.75 | 10928-3 | 0 | 18747 | 4719 | | |
| 502 | 820 | 1.63 | 10928-4 | 0 | 20055 | 5038 | | |
| | | #DIV/0! | 0 | 0 | 0 | | | |
| | | #DIV/0! | 0 | 0 | 0 | | | |
| | | #DIV/0! | 0 | 0 | 0 | | | |
| | | #DIV/0! | 0 | 0 | 0 | | | |
| | | #DIV/0! | 0 | | | | | |
| | | #DIV/0! | | | | | | |
| | | 1.00 | | | | | | |
| | | 1.00 | | | | | | |
| | | 1.00 | | | | | | |
| | | 1.00 | | | | | | |
| | | | | | corr to | see | | |
| | | | | | p2/p1 | Ar/O2 | | |
| | | | | | | sheet | | |
| | | | | | conc. | | | |
| | | | | ch4 | co2 | o2 | n2 | |
| | | | 10928-1 | 0.000 | 10.81 | 9.31 | #DIV/0! | |
| | | | 10928-1 | 0.000 | 10.79 | 9.40 | #DIV/0! | |
| | | | 10928-2 | 0.000 | 11.06 | 8.98 | #DIV/0! | |
| | | | 10928-3 | 0.000 | 11.12 | 9.61 | #DIV/0! | |
| | | | 10928-3 | 0.000 | 11.05 | 9.88 | #DIV/0! | |
| | | | 10928-4 | 0.000 | 11.07 | 9.87 | #DIV/0! | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Oxygen calculation from reported (measured) values: | | | | | | |
| | | | | | | |
| 1) selection of: dilution by a third substance, assumes O2 and argon are at the same relative proportion as in ambient air. | | | | | | |
| | | | | | | |
| 2) selection of: consumption - combustion, assumes O2 is consumed, argon is not. | | | | | | |
| | | | | | | |
| | | | | | Assumption | |
| | | | | | dilution | consumption |
| o2 | ar | sum | | | | combustion |
| 20.95 | 0.93 | 21.88 | | | | by |
| | %ar | 4.250457 | | | dilution | subtraction |
| | %o2 | 95.74954 | | | by relative | of argon |
| | sum | 100 | | | fraction | in air |
| | | 21.88*x=20.95 | | | | -0.93 |
| | | x=20.95/21.88 | | O2 + Argon | O2 | O2 |
| relative fraction | | x= | 0.957495 | measured | calculated | calculated |
| | | | | | | |
| | | | | % | % | % |
| | | 10928-1 | | 9.31 | 8.91 | 8.38 |
| | | 10928-1 | | 9.40 | 9.00 | 8.47 |
| | | 10928-2 | | 8.98 | 8.59 | 8.05 |
| | | 10928-3 | | 9.61 | 9.20 | 8.68 |
| | | 10928-3 | | 9.88 | 9.46 | 8.95 |
| | | 10928-4 | | 9.87 | 9.45 | 8.94 |

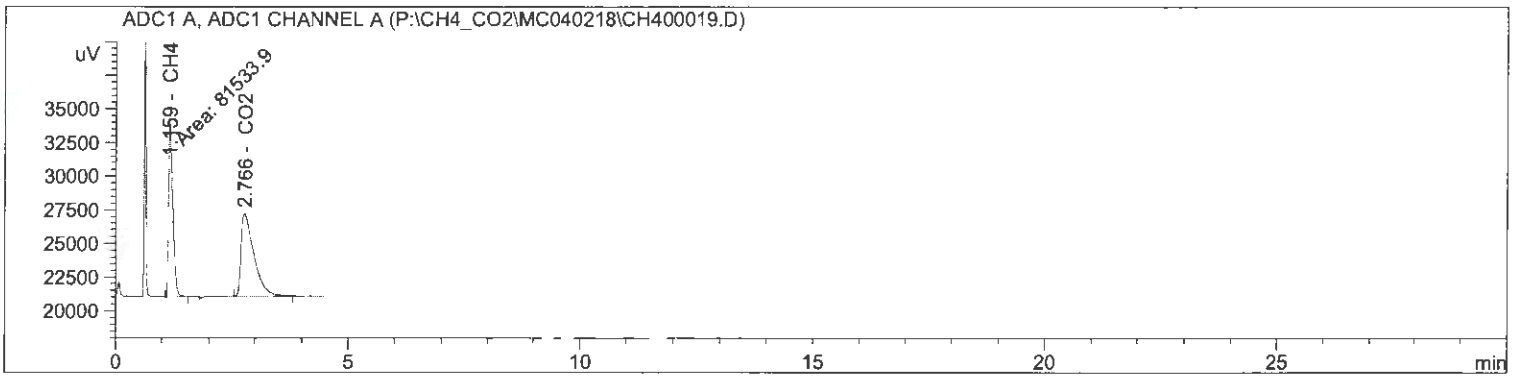
# Methane & Carbon Dioxide by TCD/GC

Data File P:\CH4_CO2\MC040218\CH400019.D
Sample Name: std

Std 1

==========

Acq. Operator : 10898-43
Acq. Instrument : CH4CO2 Location : -
Injection Date : 4/2/2018 12:30:15 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2




==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 1.159 | MM | 8.15339e4 | 4.98388e-4 | 40.63546 | | CH4 |
| 2.766 | BB | 1.18491e5 | 3.38011e-4 | 40.05121 | | CO2 |

Totals : 80.68667

==========

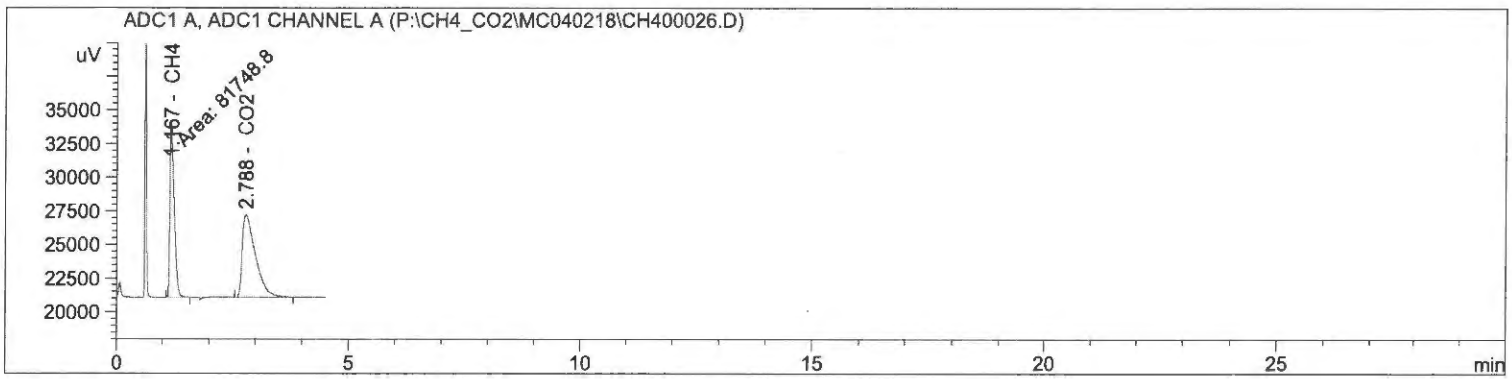
*** End of Report ***

Data File P:\CH4_CO2\MC040218\CH400026.D
Sample Name: std

std 2

==========

Acq. Operator : 10898-43
Acq. Instrument : CH4CO2 Location : -
Injection Date : 4/2/2018 3:39:09 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2




==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 1.167 | MM | 8.17488e4 | 4.98388e-4 | 40.74259 | | CH4 |
| 2.788 | BB | 1.18632e5 | 3.38011e-4 | 40.09894 | | CO2 |

Totals : 80.84153

==========

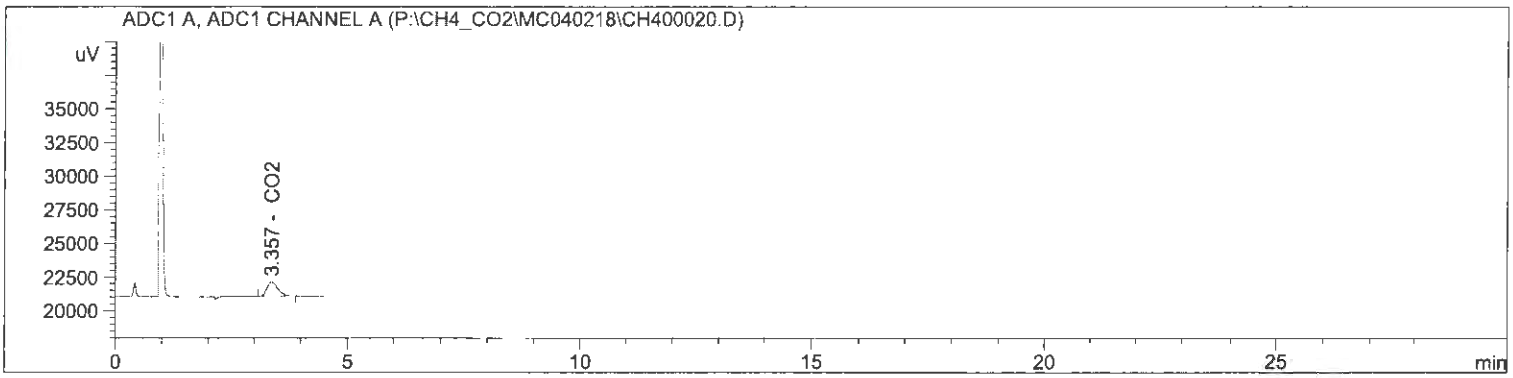
*** End of Report ***

Data File P:\CH4_CO2\MC040218\CH400020.D
Sample Name: 10928-1

R.

==========

Acq. Operator : 10898-43
Acq. Instrument : CH4CO2 Location : -
Injection Date : 4/2/2018 3:03:19 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2




==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 1.282 | | - | - | - | | CH4 |
| 3.357 | BB | 1.74309e4 | 3.38011e-4 | 5.89184 | | CO2 |

Totals : 5.89184

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

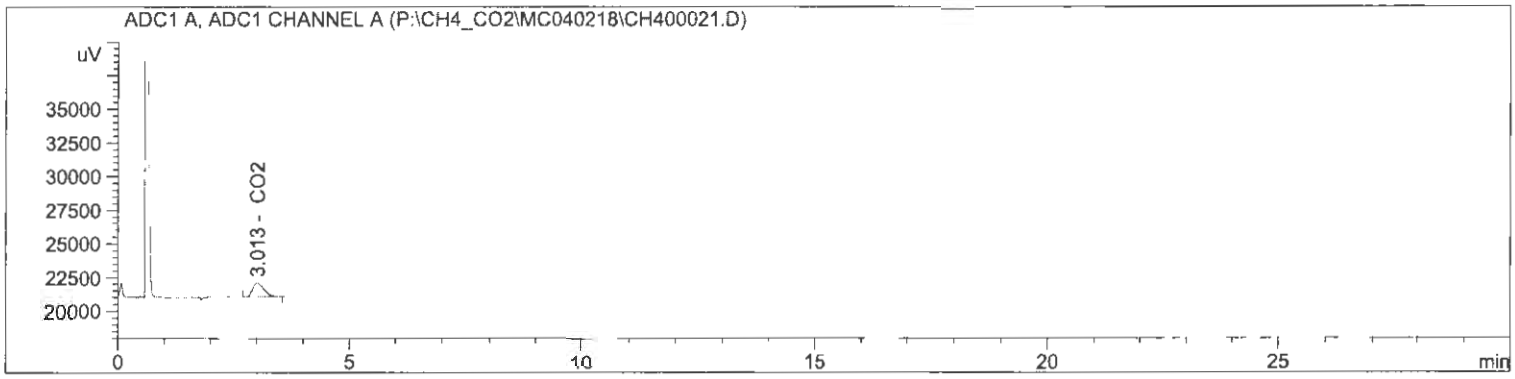
*** End of Report ***

Data File P:\CH4_CO2\MC040218\CH400021.D
Sample Name: 10928-1

R

==========

Acq. Operator : 10898-43
Acq. Instrument : CH4CO2 Location : -
Injection Date : 4/2/2018 3:09:19 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2




==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 1.282 | | - | - | - | | CH4 |
| 3.013 | BB | 1.73983e4 | 3.38011e-4 | 5.88082 | | CO2 |

Totals : 5.88082

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

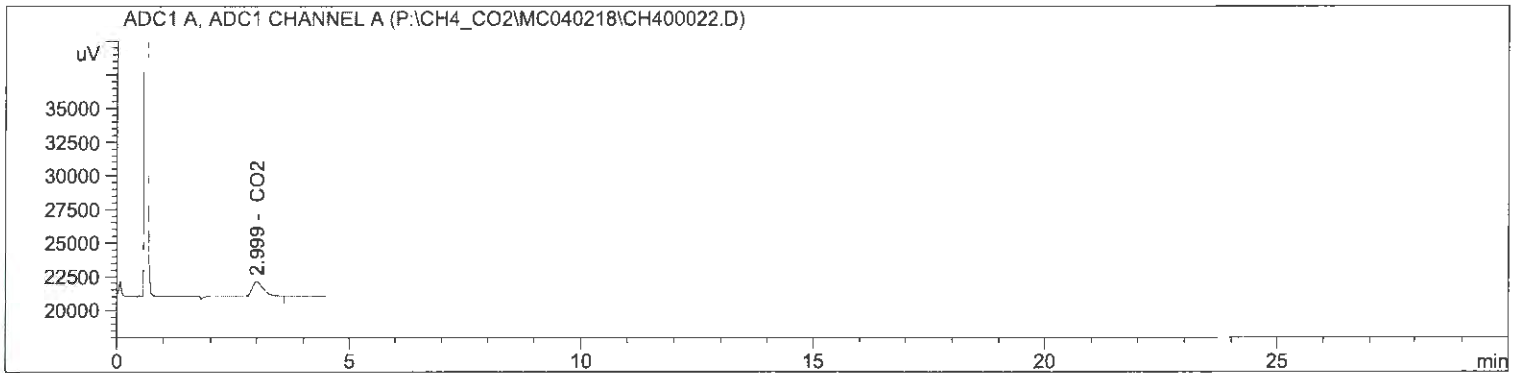
==========

*** End of Report ***

Data File P:\CH4_CO2\MC040218\CH400022.D
Sample Name: 10928-2

==========

Acq. Operator : 10898-43
Acq. Instrument : CH4CO2 Location : -
Injection Date : 4/2/2018 3:15:15 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2




==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 1.282 | | - | - | - | | CH4 |
| 2.999 | BB | 1.79999e4 | 3.38011e-4 | 6.08415 | | CO2 |

Totals : 6.08415

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

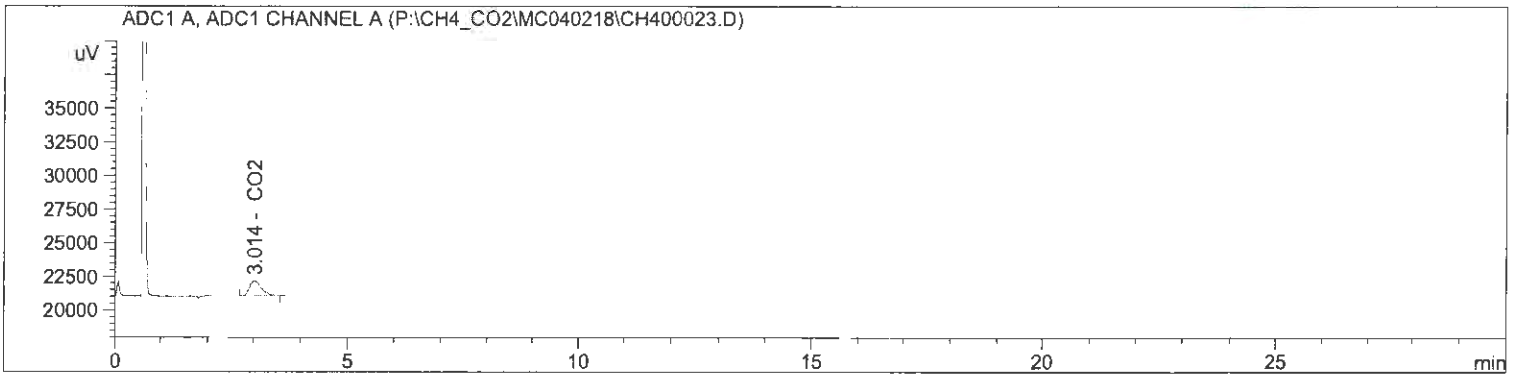
==========

*** End of Report ***

Data File P:\CH4_CO2\MC040218\CH400023.D
Sample Name: 10928-3

==========

Acq. Operator : 10898-43
Acq. Instrument : CH4CO2 Location : -
Injection Date : 4/2/2018 3:21:10 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2




==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 1.282 | | - | - | - | | CH4 |
| 3.014 | BB | 1.88673e4 | 3.38011e-4 | 6.37736 | | CO2 |

Totals : 6.37736

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

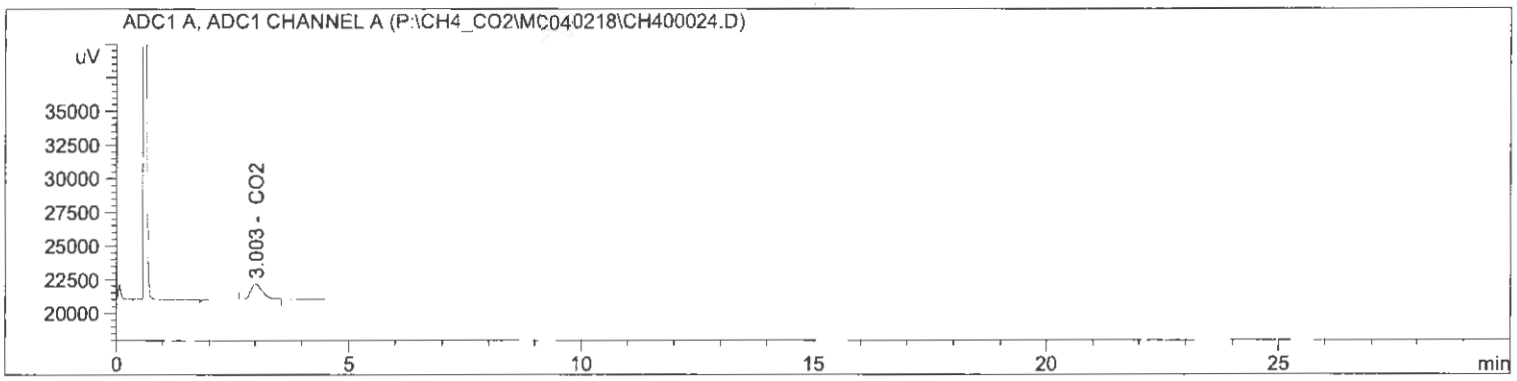
==========

*** End of Report ***

Data File P:\CH4_CO2\MC040218\CH400024.D
Sample Name: 10928-3

==========

Acq. Operator : 10898-43
Acq. Instrument : CH4CO2 Location : -
Injection Date : 4/2/2018 3:26:51 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2




==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 1.282 | | - | - | - | | CH4 |
| 3.003 | BB | 1.87472e4 | 3.38011e-4 | 6.33674 | | CO2 |

Totals : 6.33674

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

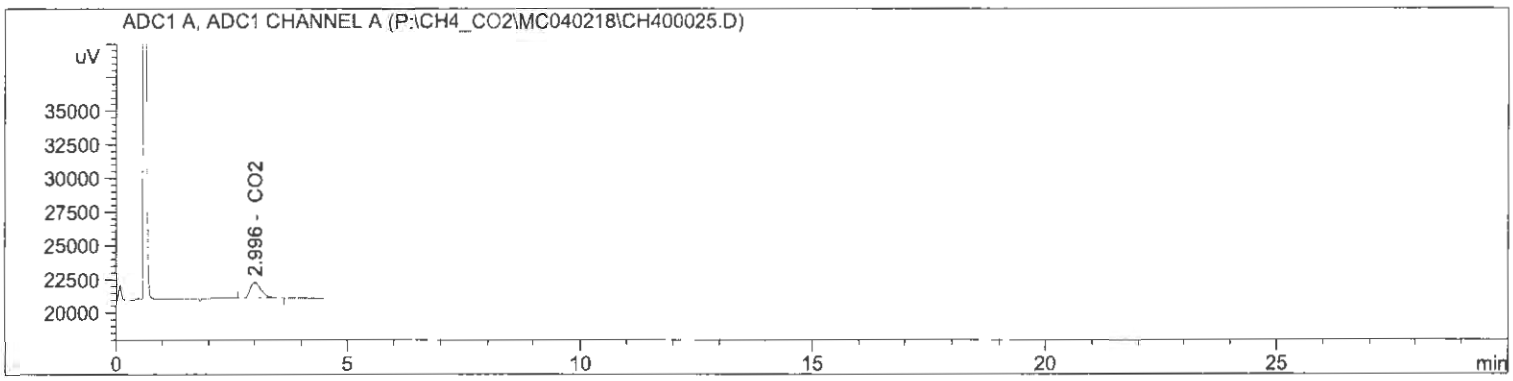
==========

*** End of Report ***

Data File P:\CH4_CO2\MC040218\CH400025.D
Sample Name: 10928-4

==========

Acq. Operator : 10898-43
Acq. Instrument : CH4CO2 Location : -
Injection Date : 4/2/2018 3:32:33 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\CH4-TCD.M
Last changed : 6/11/2014 1:15:59 PM
Analysis Method : C:\MC020813.M\MC020813.M
Last changed : 8/22/2014 9:51:01 AM
Sample Info : Standard Info:
standard 40% = 40.04%CH4 39.98%CO2




==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 7/31/2013 11:10:38 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 1.282 | | - | - | - | | CH4 |
| 2.996 | BB | 2.00552e4 | 3.38011e-4 | 6.77889 | | CO2 |

Totals : 6.77889

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

*** End of Report ***

# Oxygen & Nitrogen by TCD/GC

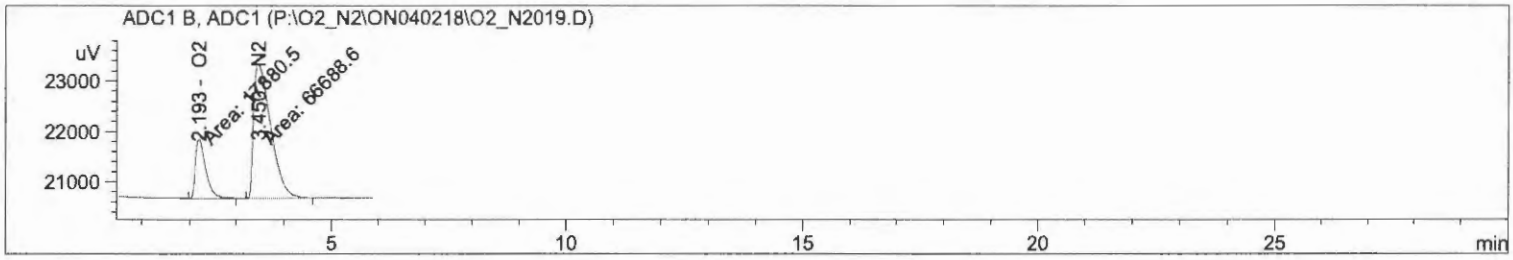
Data File P:\O2_N2\ON040218\O2_N2019.D
Sample Name: std

Std 1

==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 4/2/2018 12:29:48 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 7/21/2017 1:57:30 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2
Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========




==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 2.193 | MM | 1.78805e4 | 1.25937e-3 | 22.51819 | | O2 |
| 3.450 | MM | 6.66886e4 | 1.19675e-3 | 79.80932 | | N2 |

Totals : 102.32751

==========

*** End of Report ***

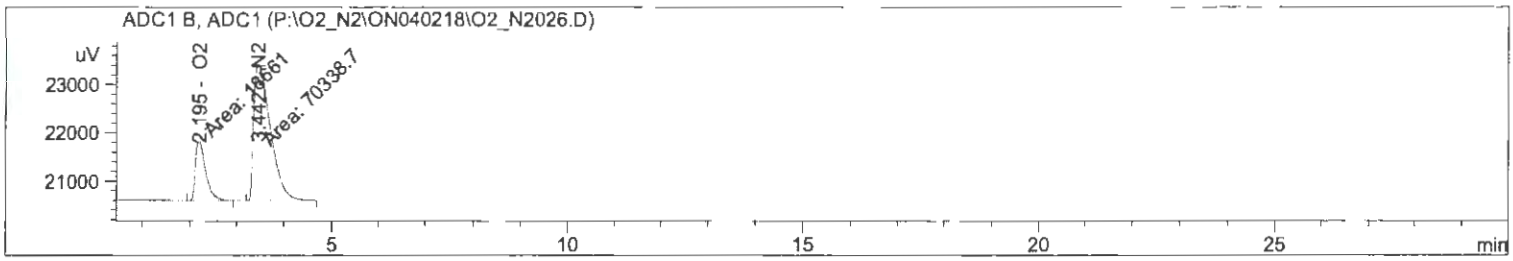
Data File P:\O2_N2\ON040218\O2_N2026.D
Sample Name: std

Std 2

==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 4/2/2018 3:38:50 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 7/21/2017 1:57:30 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2
Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========




==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 2.195 | MM | 1.86610e4 | 1.25937e-3 | 23.50121 | | O2 |
| 3.442 | MM | 7.03387e4 | 1.19675e-3 | 84.17750 | | N2 |

Totals : 107.67872

==========

*** End of Report ***

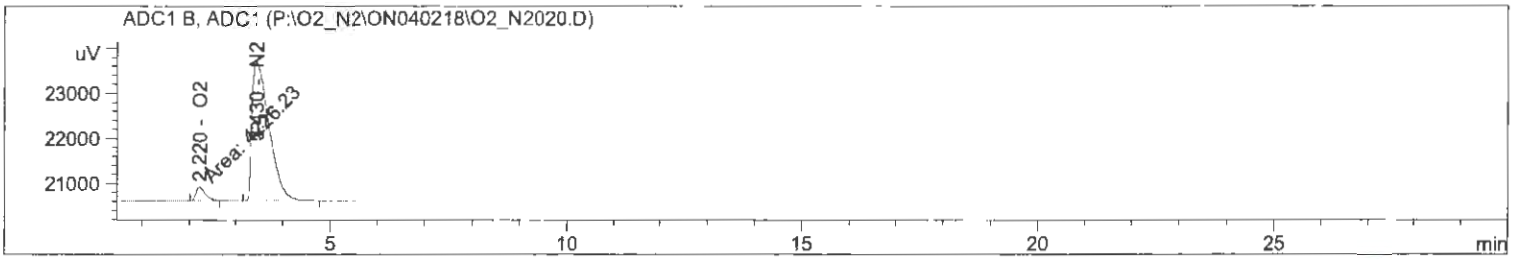
Data File P:\O2_N2\ON040218\O2_N2020.D
Sample Name: 10928-1

R

==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 4/2/2018 3:03:03 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 7/21/2017 1:57:30 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2
Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========




==========

External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 2.220 | MM | 4226.23096 | 1.25937e-3 | 5.32241 | | O2 |
| 3.430 | VB | 7.84253e4 | 1.19675e-3 | 93.85509 | | N2 |

Totals : 99.17749

==========

*** End of Report ***

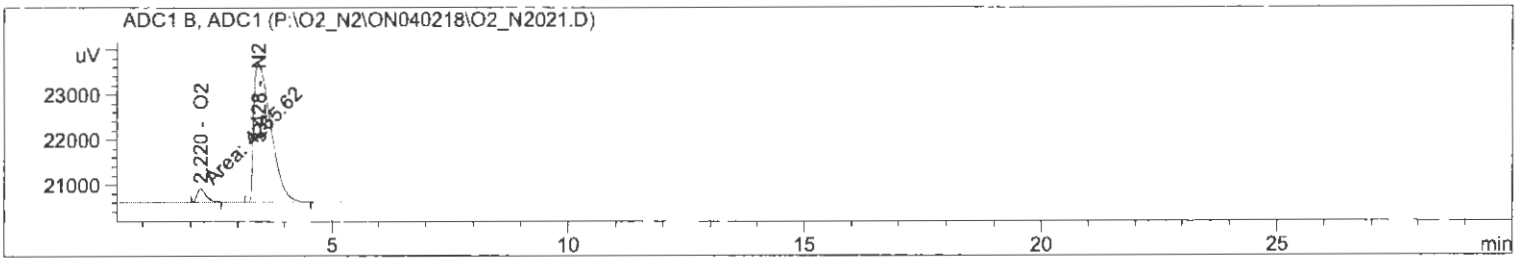
Data File P:\O2_N2\ON040218\O2_N2021.D
Sample Name: 10928-1

R 2

==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 4/2/2018 3:08:57 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 7/21/2017 1:57:30 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2
Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========

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External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 2.220 | MM | 4265.62012 | 1.25937e-3 | 5.37201 | | O2 |
| 3.428 | VV | 7.82747e4 | 1.19675e-3 | 93.67491 | | N2 |

Totals : 99.04692

==========

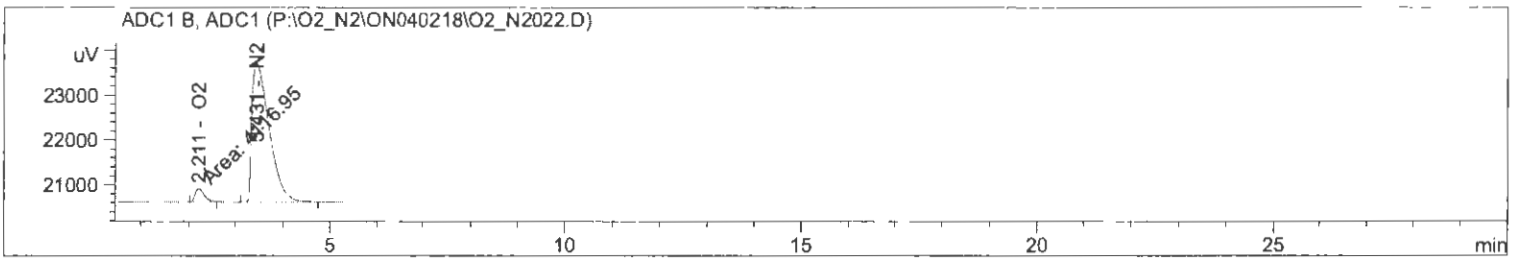
*** End of Report ***

Data File P:\O2_N2\ON040218\O2_N2022.D
Sample Name: 10928-2

==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 4/2/2018 3:14:57 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 7/21/2017 1:57:30 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2
Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========

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External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 2.211 | MM | 4116.95313 | 1.25937e-3 | 5.18478 | | O2 |
| 3.431 | VB | 7.87768e4 | 1.19675e-3 | 94.27581 | | N2 |

Totals : 99.46059

==========

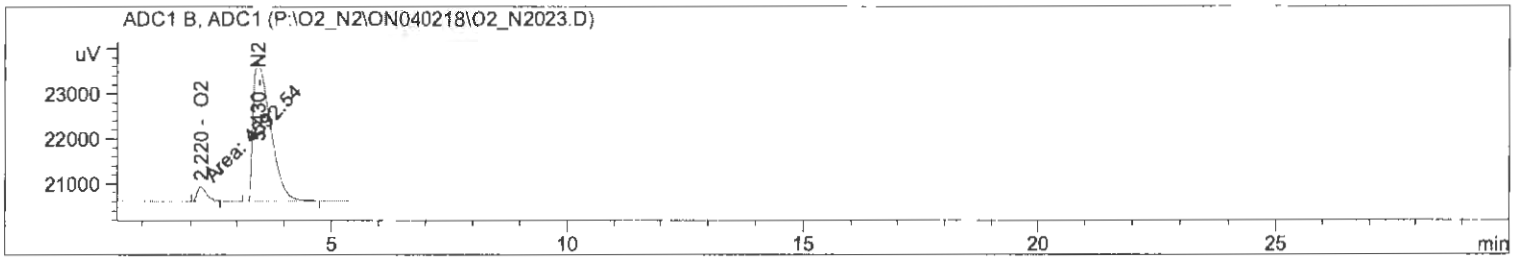
*** End of Report ***

Data File P:\O2_N2\ON040218\O2_N2023.D
Sample Name: 10928-3

==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 4/2/2018 3:20:48 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 7/21/2017 1:57:30 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2
Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========

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External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 2.220 | MM | 4592.54102 | 1.25937e-3 | 5.78373 | | O2 |
| 3.430 | VV | 7.92501e4 | 1.19675e-3 | 94.84218 | | N2 |

Totals : 100.62591

==========

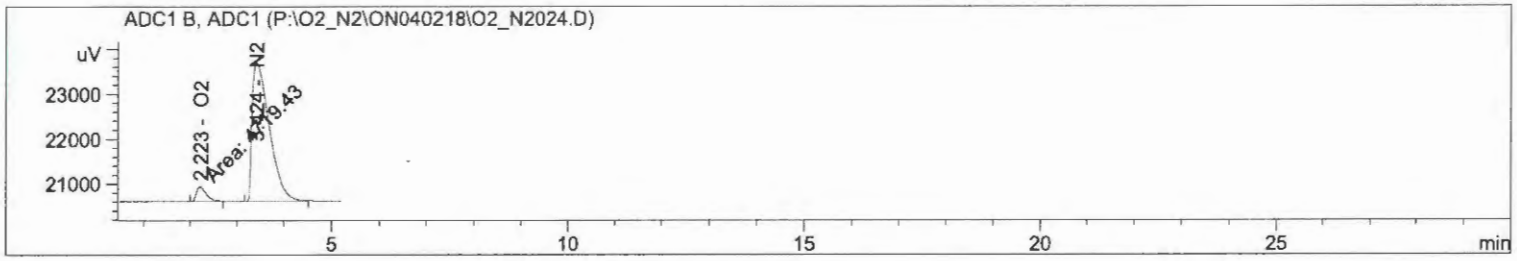
*** End of Report ***

Data File P:\O2_N2\ON040218\O2_N2024.D
Sample Name: 10928-3

==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 4/2/2018 3:26:33 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 7/21/2017 1:57:30 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2
Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========

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External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 2.223 | MM | 4719.42627 | 1.25937e-3 | 5.94352 | | O2 |
| 3.424 | VV | 7.87267e4 | 1.19675e-3 | 94.21584 | | N2 |

Totals : 100.15937

==========

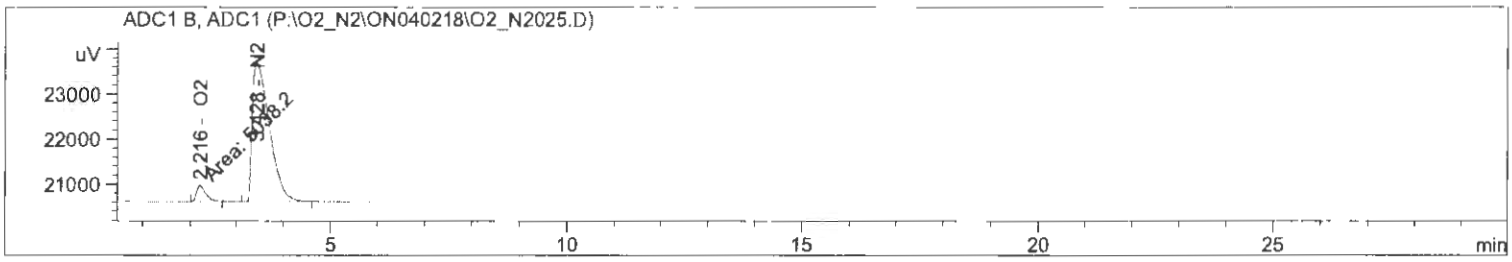
*** End of Report ***

Data File P:\O2_N2\ON040218\O2_N2025.D
Sample Name: 10928-4

==========

Acq. Operator :
Acq. Instrument : O2N2 Location : -
Injection Date : 4/2/2018 3:32:15 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\2\METHODS\O2-N2.M
Last changed : 7/21/2017 1:57:30 PM
Analysis Method : C:\ON020813.M\ON020813.M
Last changed : 11/11/2015 11:22:55 AM
Sample Info : GC TCD O2 - N2
Standard Info: 21.6% O2 76.6% N2
standard 20% = 21.6% O2 76.6% N2

==========

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External Standard Report

==========

Sorted By : Signal
Calib. Data Modified : 5/10/2013 3:01:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 B, ADC1

| RetTime [min] | Type | Area [uV*s] | Amt/Area | Amount Percent(%) | Grp | Name |
|---|---|---|---|---|---|---|
| 2.216 | MM | 5038.19922 | 1.25937e-3 | 6.34498 | | O2 |
| 3.428 | VV | 7.81274e4 | 1.19675e-3 | 93.49862 | | N2 |

Totals : 99.84360

==========

*** End of Report ***

TOC in WATER ANALYSIS
CHROMATOGRAMS
for M25.3 samples

**Water Vial TGNMO** — **ppmV, (C) = [(Axd-B) x slope) x V / L] / 12 x 24.45**

| A | d | | | L | | | | C | | | | | | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Not blank-corr. | | | | | | |
| | | mmHg | Can vol. | Air Vol | OC | Lab. No. | Vial No. | ug carbon | ug/L | ppmV** | ppmV | | | Sample |
| **Area** | **dil fac** | **Can P1** | in **L** | in **L** | **ug/ml C** | **10928** | | **OC** | OC as C | OC as C | **Mean** | Std Dev. | **%CV** | **ml** |
| 8342 | 1 | 447 | 6.24 | 3.67 | 0.59 | 1 | M70 | 1.43 | 0.39 | 0.79 | **0.77** | 0.04 | **4.75** | **2.42** |
| 8314 | 1 | 447 | 6.24 | 3.67 | 0.58 | 1 | | 1.41 | 0.38 | 0.78 | | | | **2.42** |
| 8152 | 1 | 447 | 6.24 | 3.67 | 0.54 | 1 | | 1.30 | 0.36 | 0.72 | | | | **2.42** |
| 8344 | 1 | 451 | 6.24 | 3.70 | 0.59 | 2 | M71 | 1.68 | 0.45 | 0.93 | **0.93** | 0.01 | **0.76** | **2.86** |
| 8378 | 1 | 451 | 6.24 | 3.70 | 0.60 | 2 | | 1.71 | 0.46 | 0.94 | | | | **2.86** |
| 8360 | 1 | 451 | 6.24 | 3.70 | 0.59 | 2 | | 1.70 | 0.46 | 0.93 | | | | **2.86** |
| 8271 | 1 | 471 | 6.24 | 3.87 | 0.57 | 3 | M72 | 1.32 | 0.34 | 0.70 | **0.68** | 0.02 | **3.68** | **2.32** |
| 8226 | 1 | 471 | 6.24 | 3.87 | 0.56 | 3 | | 1.30 | 0.34 | 0.68 | | | | **2.32** |
| 8121 | 1 | 471 | 6.24 | 3.87 | 0.53 | 3 | | 1.23 | 0.32 | 0.65 | | | | **2.32** |
| 8058 | 1 | 502 | 6.24 | 4.12 | 0.51 | 4 | M73 | 1.24 | 0.30 | 0.61 | **0.63** | 0.03 | **5.50** | **2.41** |
| 8249 | 1 | 502 | 6.24 | 4.12 | 0.56 | 4 | | 1.36 | 0.33 | 0.67 | | | | **2.41** |
| 8057 | 1 | 502 | 6.24 | 4.12 | 0.51 | 4 | | 1.24 | 0.30 | 0.61 | | | | **2.41** |
| | | | | | | | | | | | | | | |
| 6884 | 1 | | | 3.84 | 0.20 | 5 | M74 | 0.58 | 0.15 | 0.31 | **0.31** | | | **2.84** |

H2O

**6112** B

6110

6113

5094

5340

4993

5000

4739

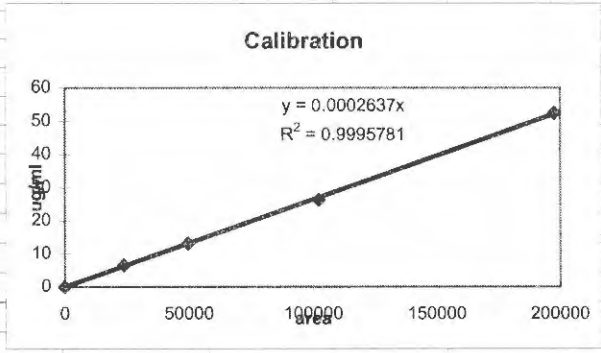
4873

4744

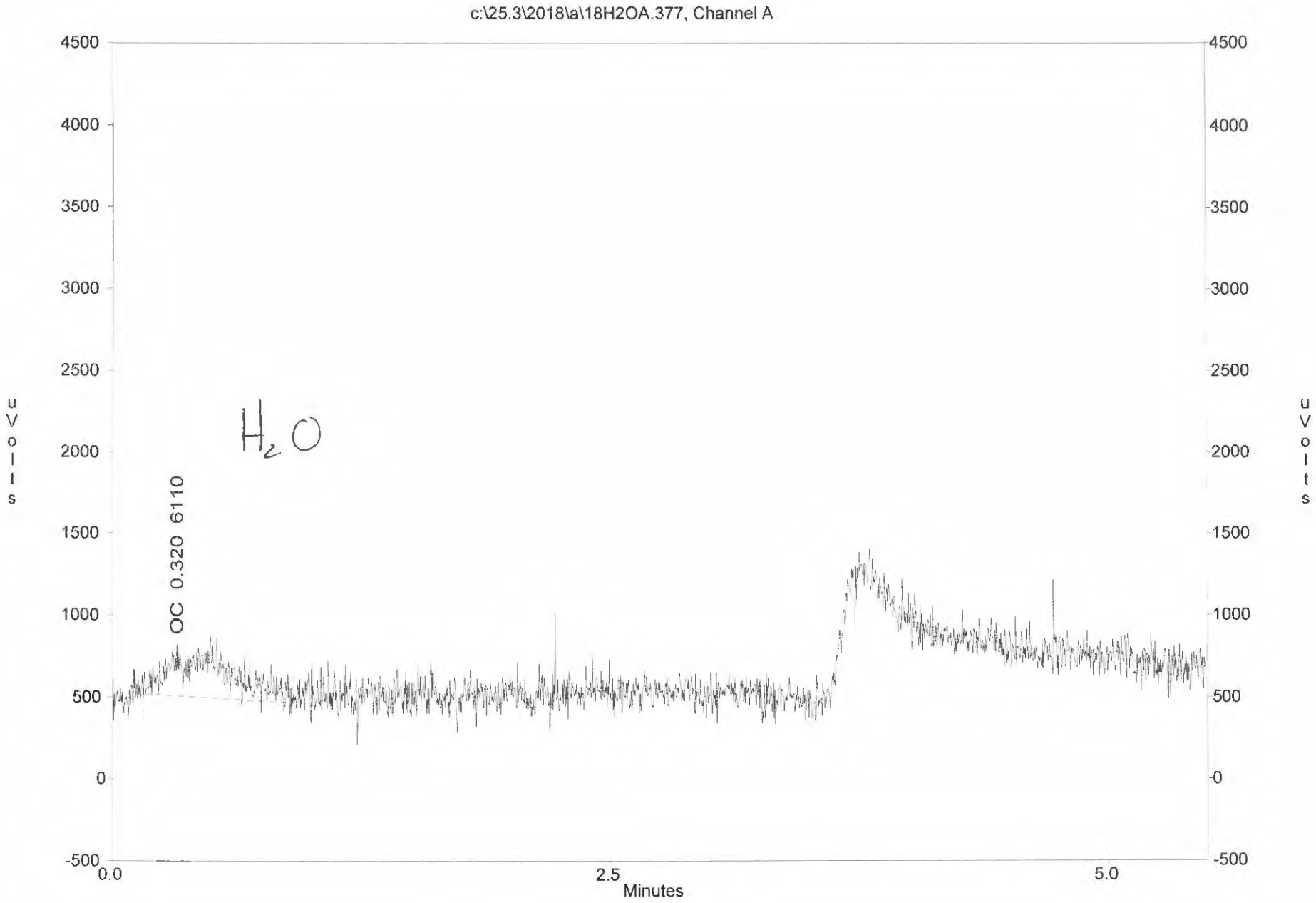
**Standard Injections**

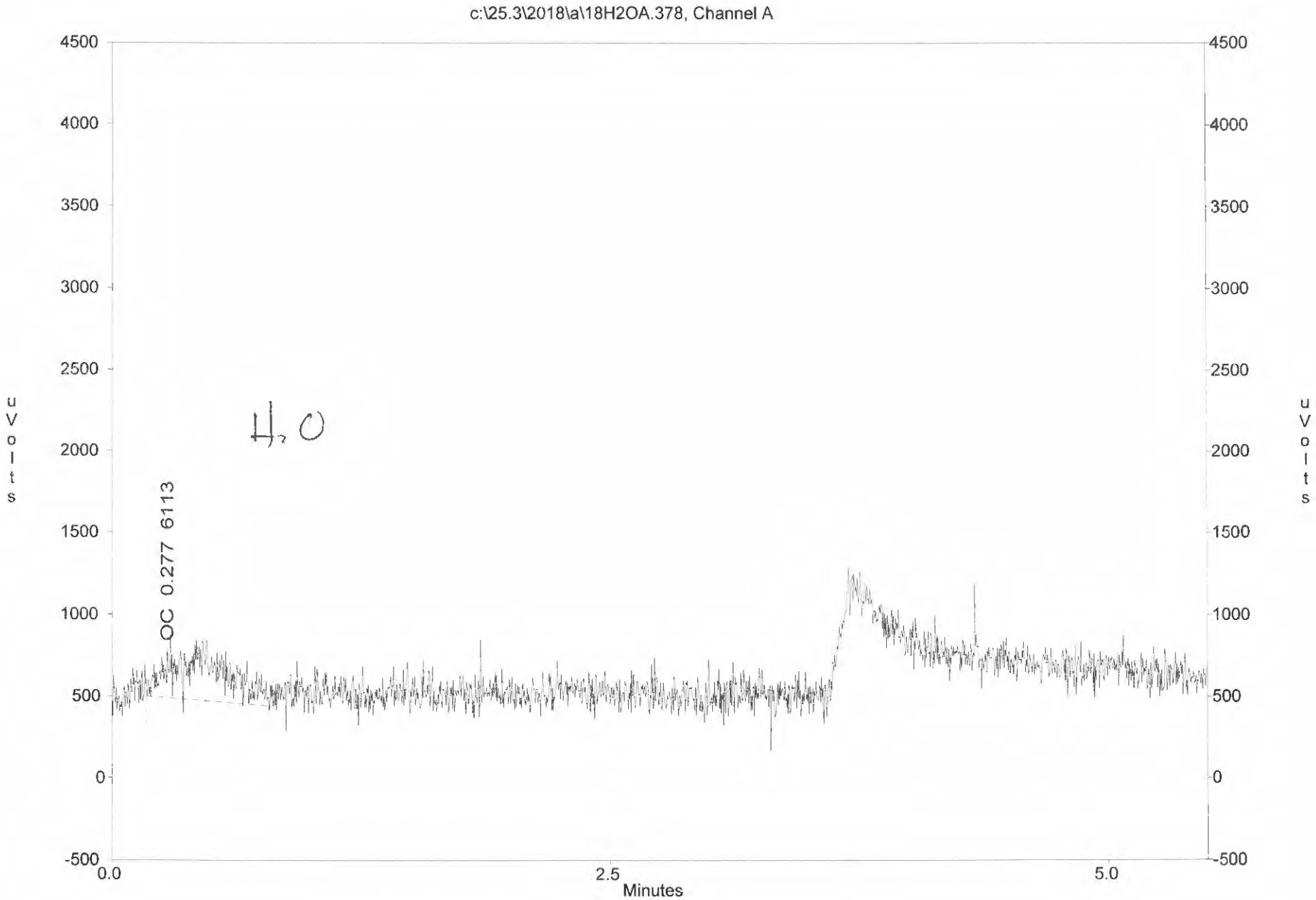
| Original Calibration | | currently | calc. | Recovery |
|---|---|---|---|---|
| Area | ug/ml C | Measured | ug/ml C | % |
| 0 | 0 | | - | - |
| 23772 | 6.56 | | | |
| 49739 | 13.12 | | | |
| 102260 | 26.24 | | | |
| 197695 | 52.47 | | | |
| | 28.93 | 107290 | 28.32 | 97.91 |
| | 28.93 | 107582 | 28.40 | 98.17 |
| End | 28.93 | 107930 | 28.49 | 98.49 |

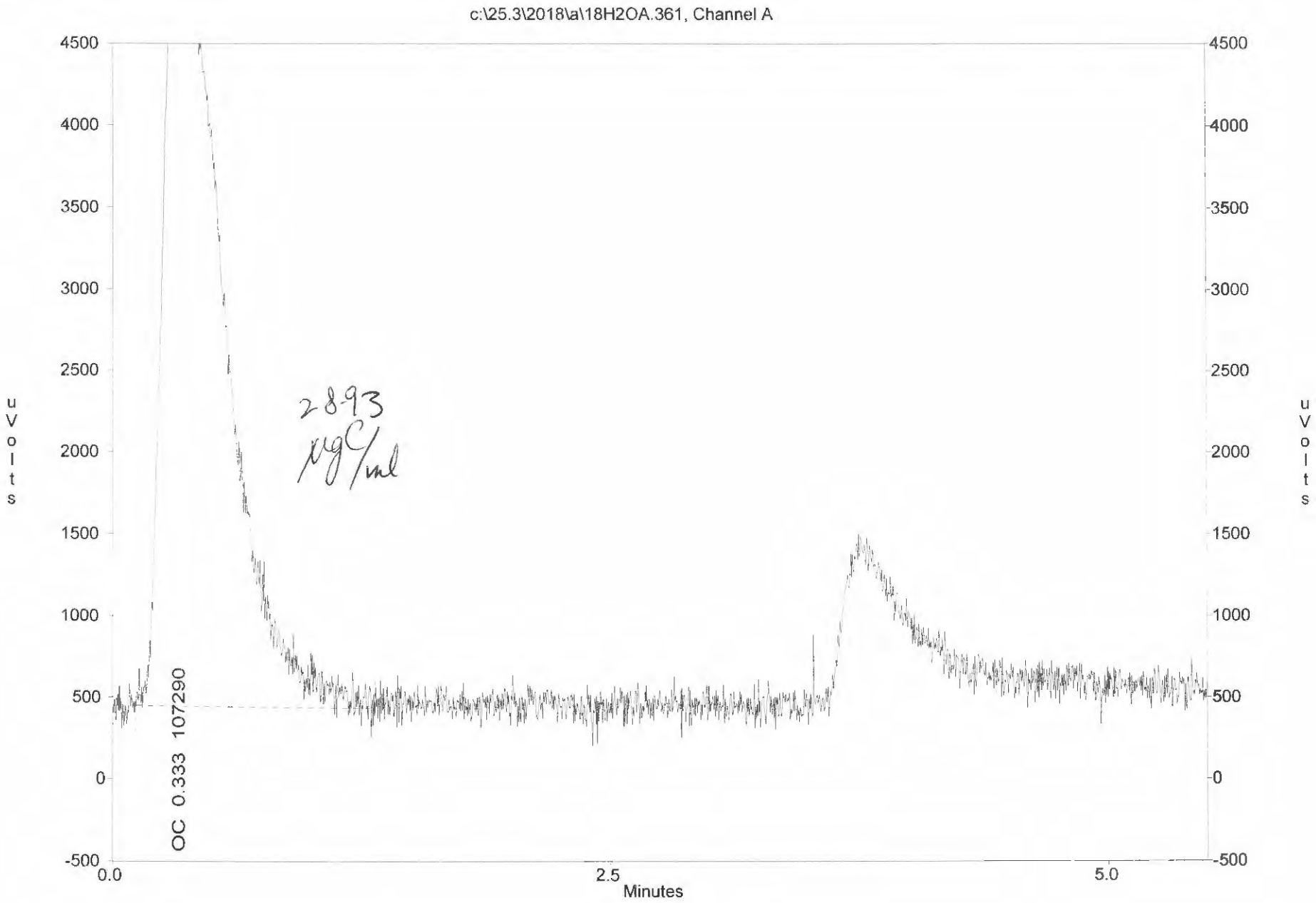
**Avg. RF**
2.64E-04

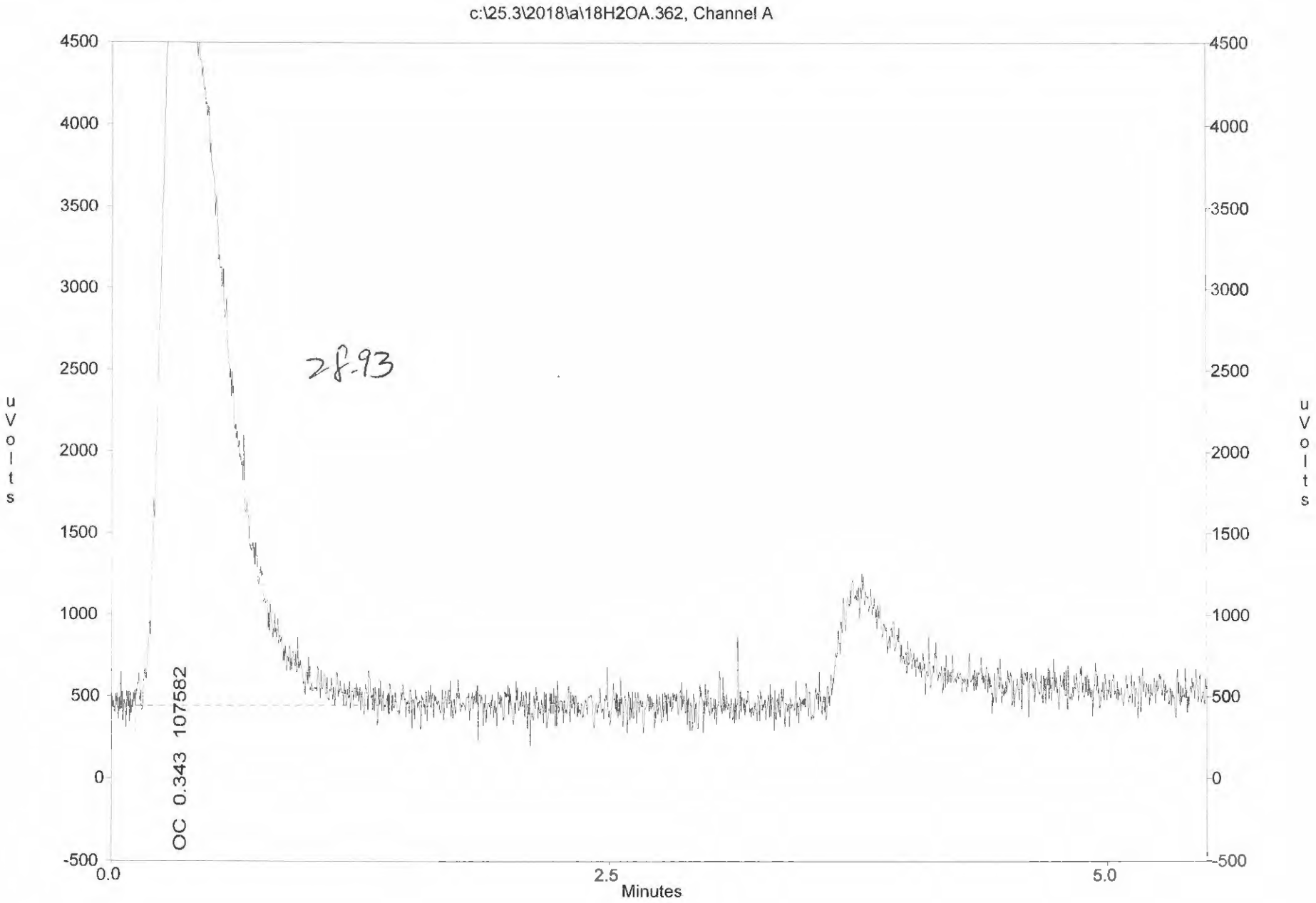


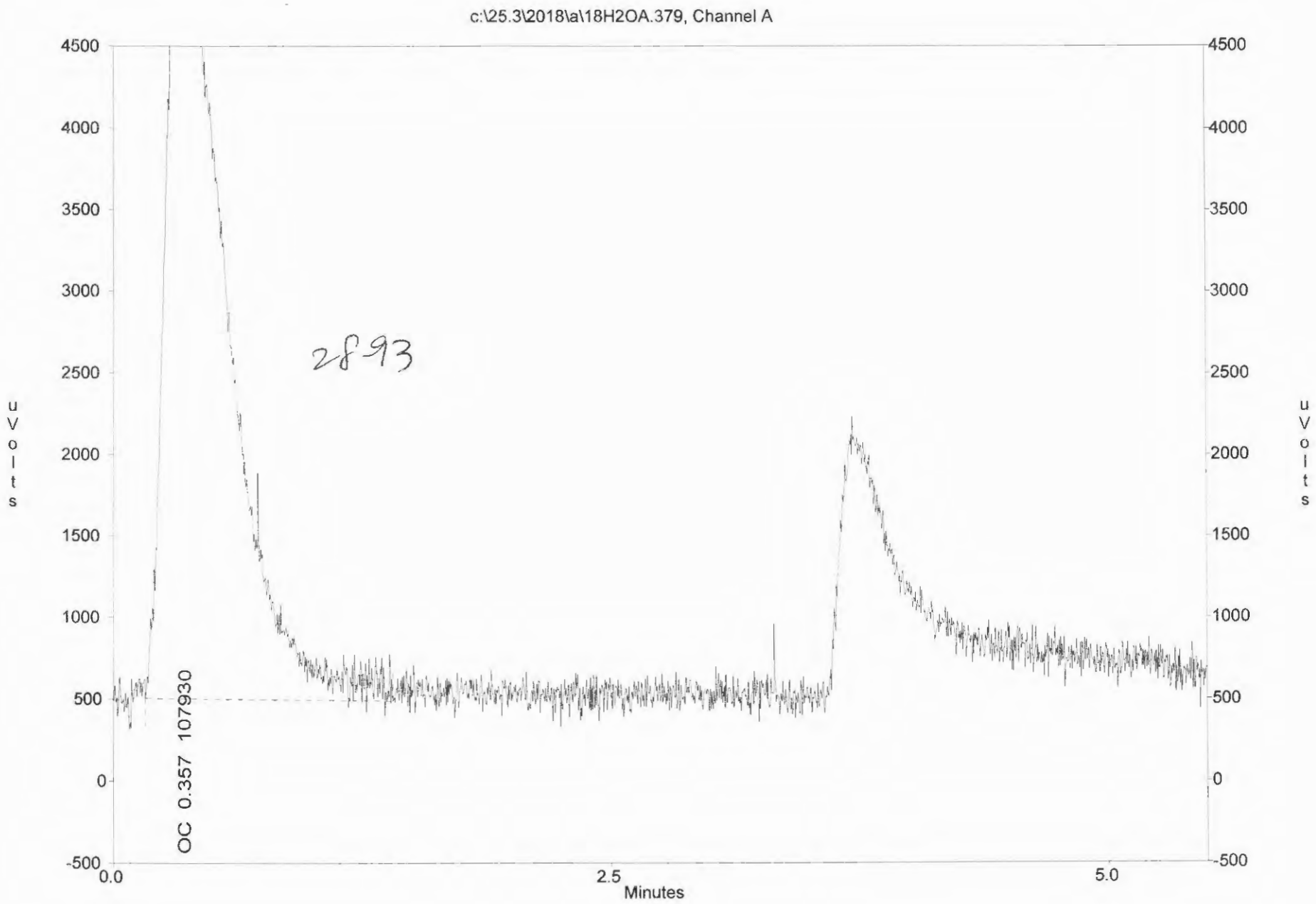
| Water Vial Analysis, Method 25.3 | | | | Date: 4/2/18 |
|---|---|---|---|---|
| Client | Impinger No. | Received Wt. g | Vial Wt., g | Remarks |
| Montrose | M70 | 8.0979 | 5.6762 | |
| | M71 | 8.5536 | 5.6960 | 5.6960 |
| | M72 | 8.0663 | 5.7430 | |
| | M73 | 8.1699 | 5.7635 | |
| | M74(B) | 8.5477 | 5.7042 | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

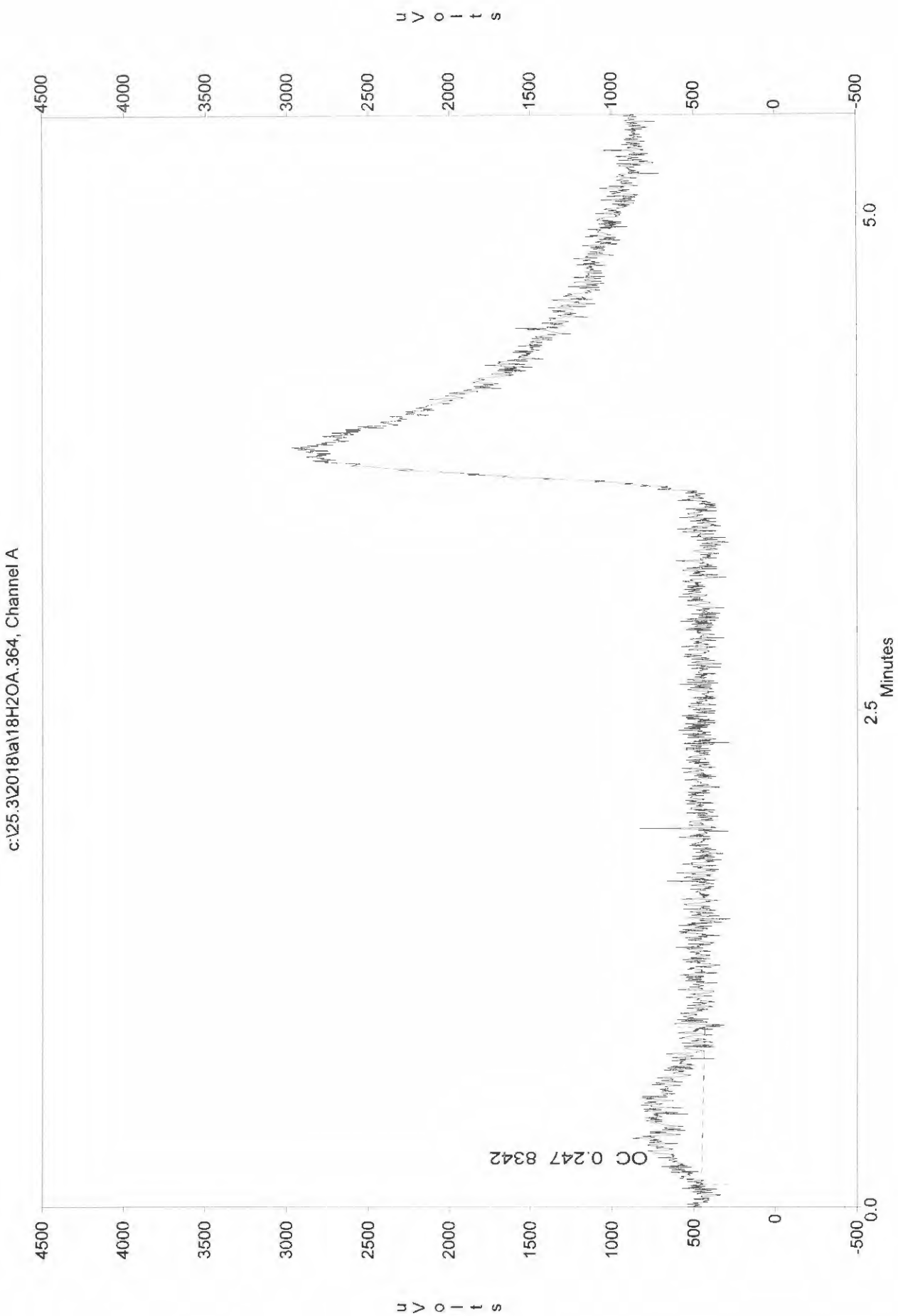

c:\25.3\2018\a\18H2OA.377, Channel A
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.320 6110
$H_2O$
0.0
2.5
5.0
Minutes

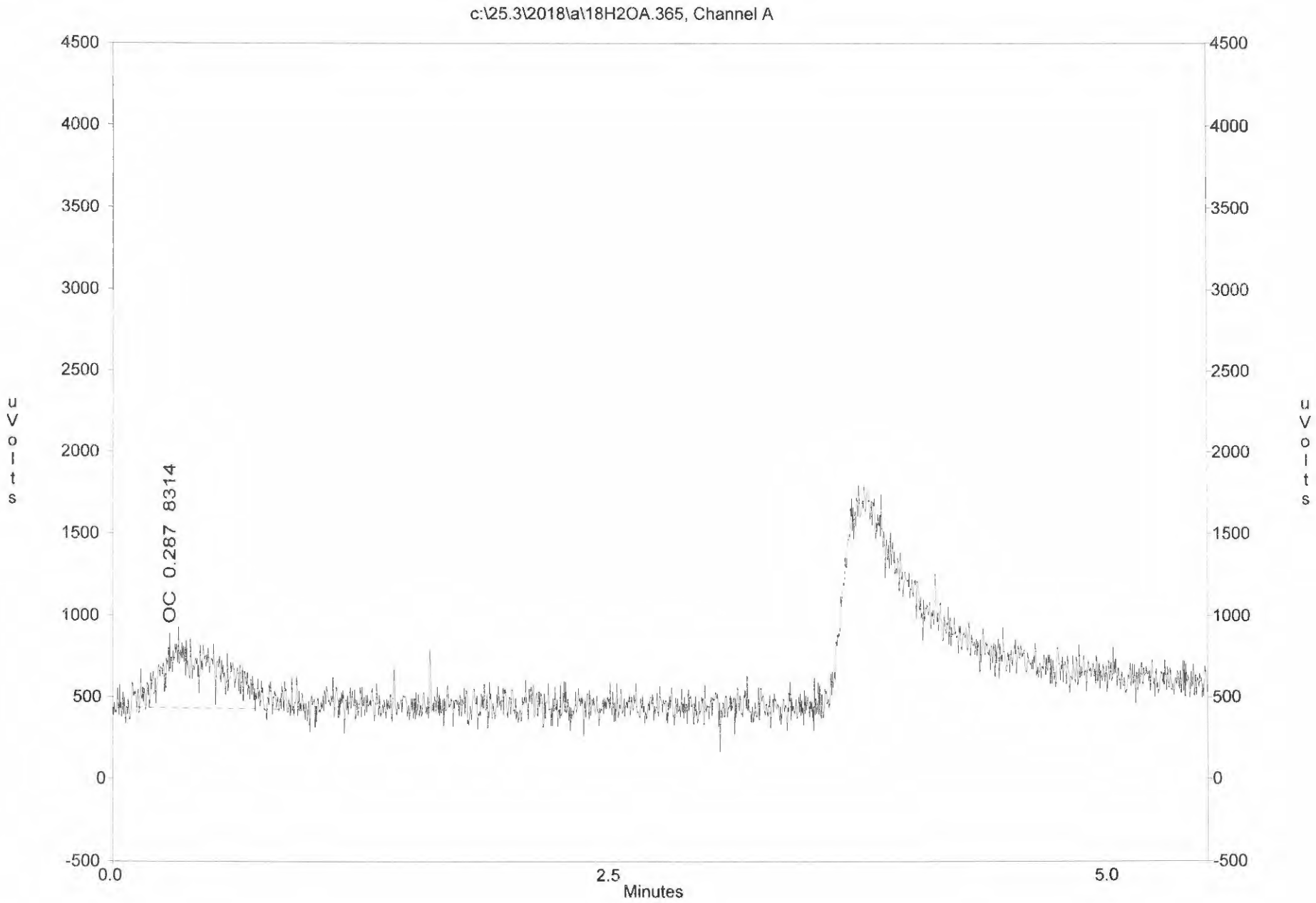

c:\25.3\2018\a\18H2OA.378, Channel A
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.277 6113
H2O
0.0
2.5
5.0
Minutes

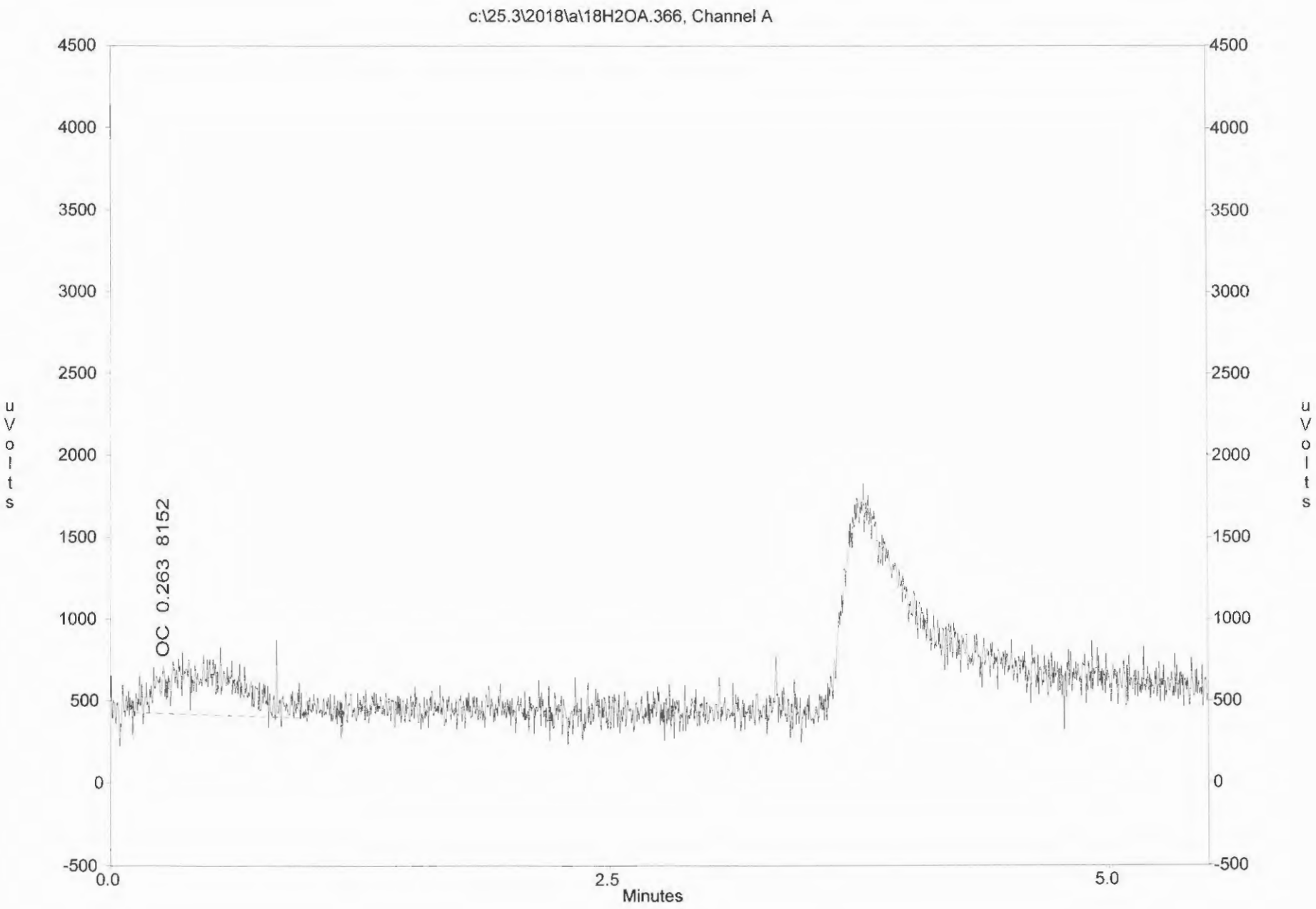

c:\25.3\2018\a\18H2OA.361, Channel A
uVolts
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
0.0
2.5
5.0
Minutes
OC 0.333 107290
28.93
µgC/ml

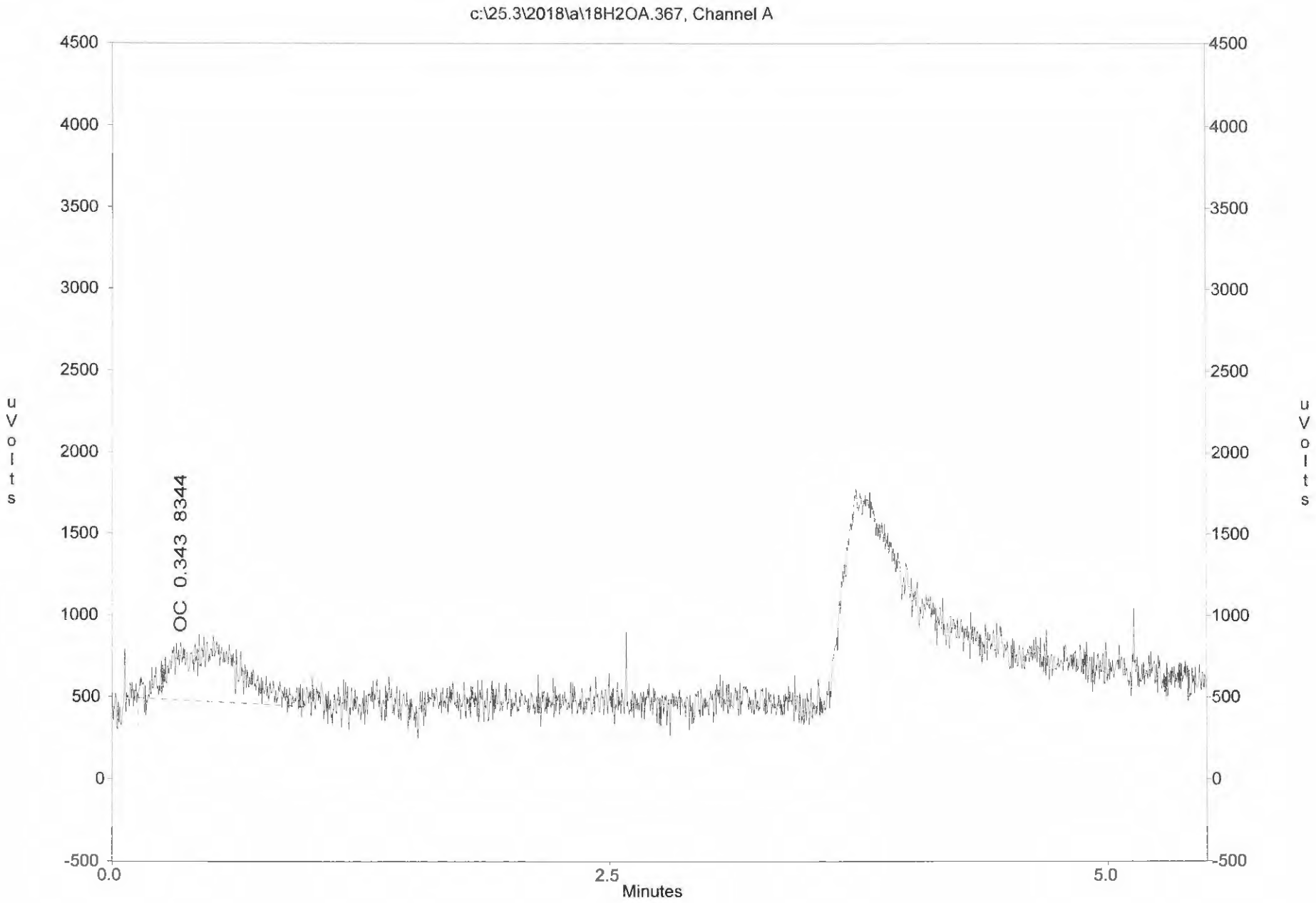

c:\25.3\2018\a\18H2OA.362, Channel A
uVolts
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
0.0
2.5
5.0
Minutes
OC 0.343 107582
28-93

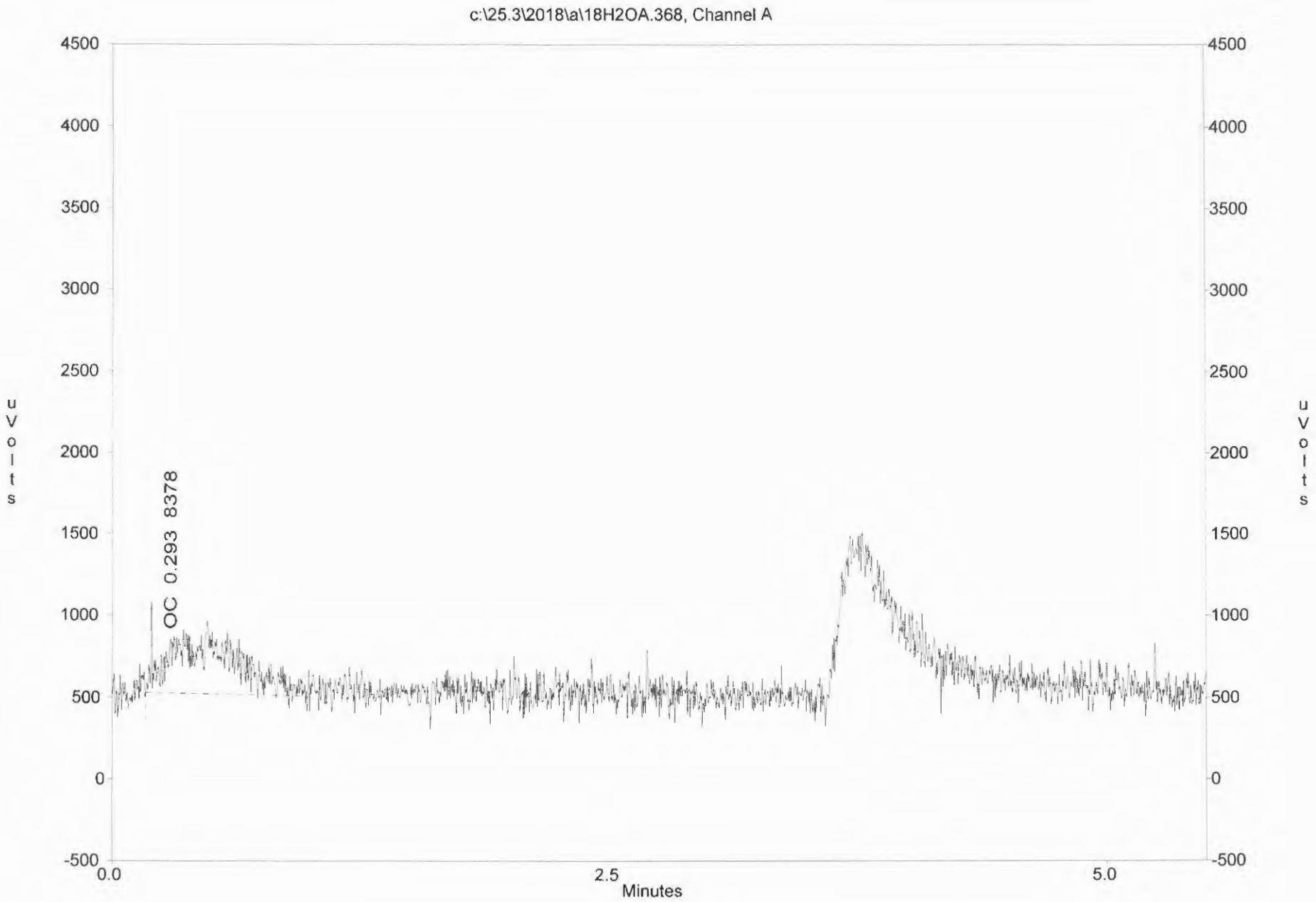

c:\25.3\2018\a\18H2OA.379, Channel A
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
uVolts
0.0
2.5
5.0
Minutes
OC 0.357 107930
2893

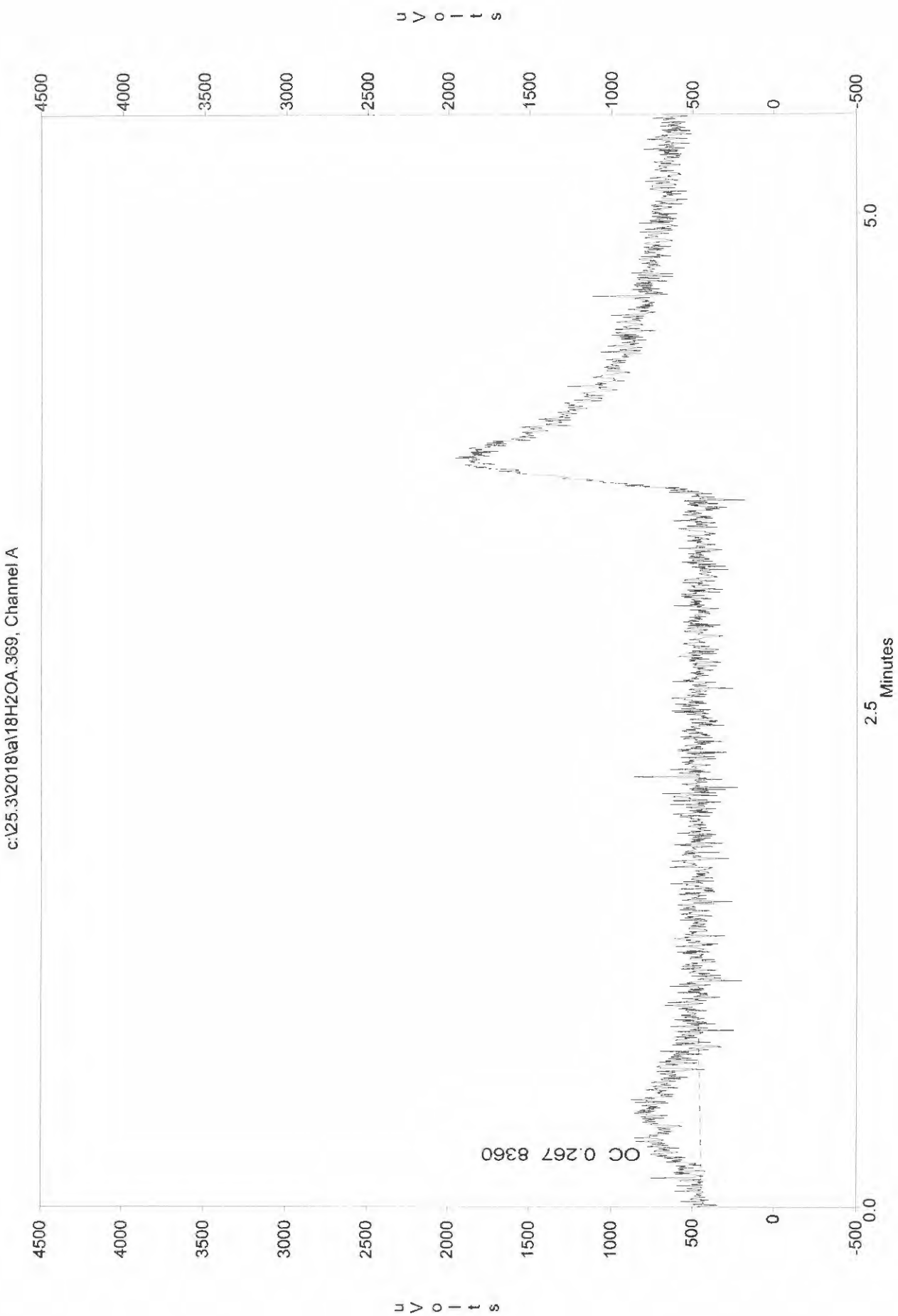

c:\25.3\2018\a18H2OA.364, Channel A
uVolts
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
0.0
2.5
5.0
Minutes
OC 0.247 8342

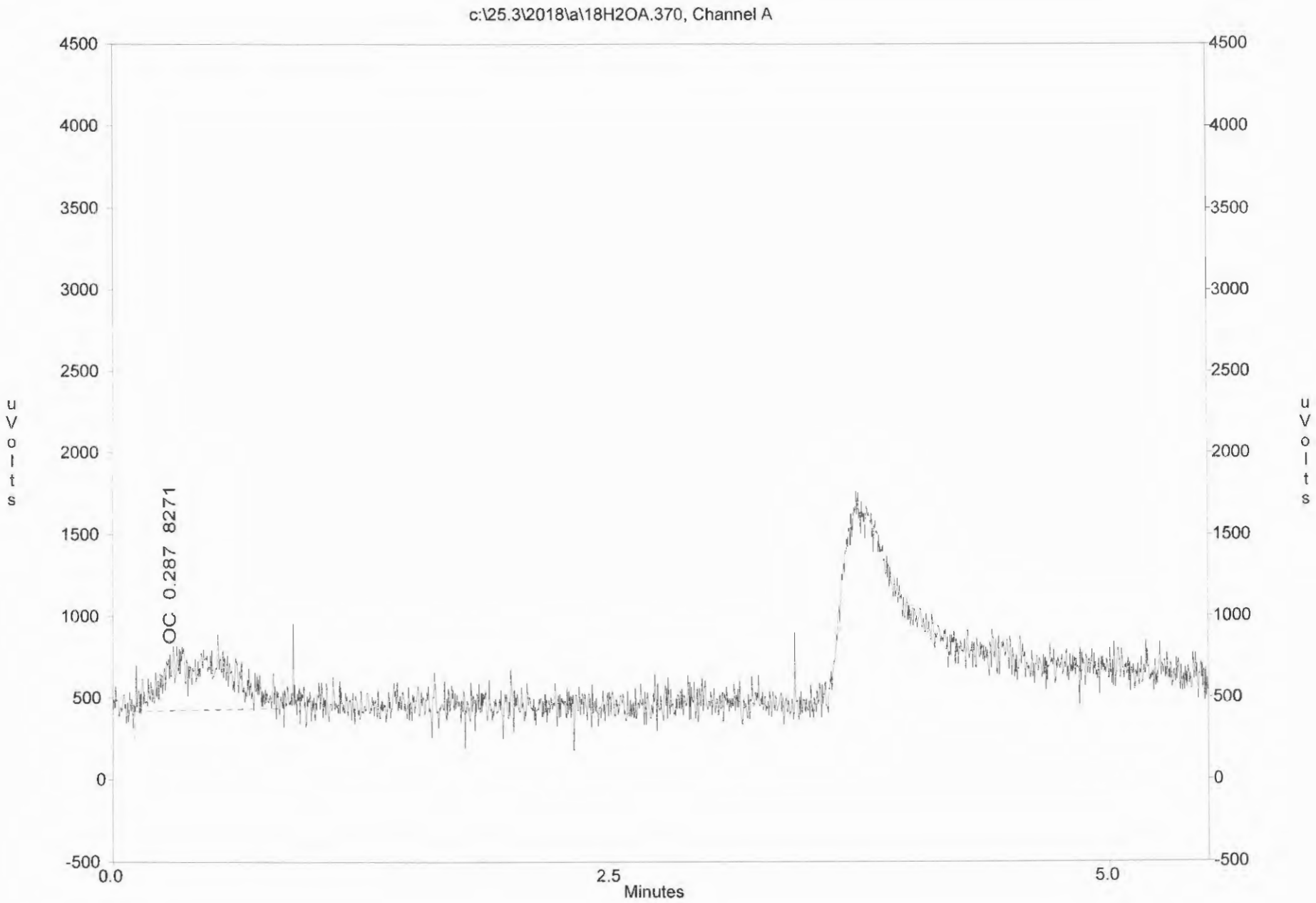

c:\25.3\2018\a\18H2OA.365, Channel A
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.287 8314
0.0
2.5
5.0
Minutes

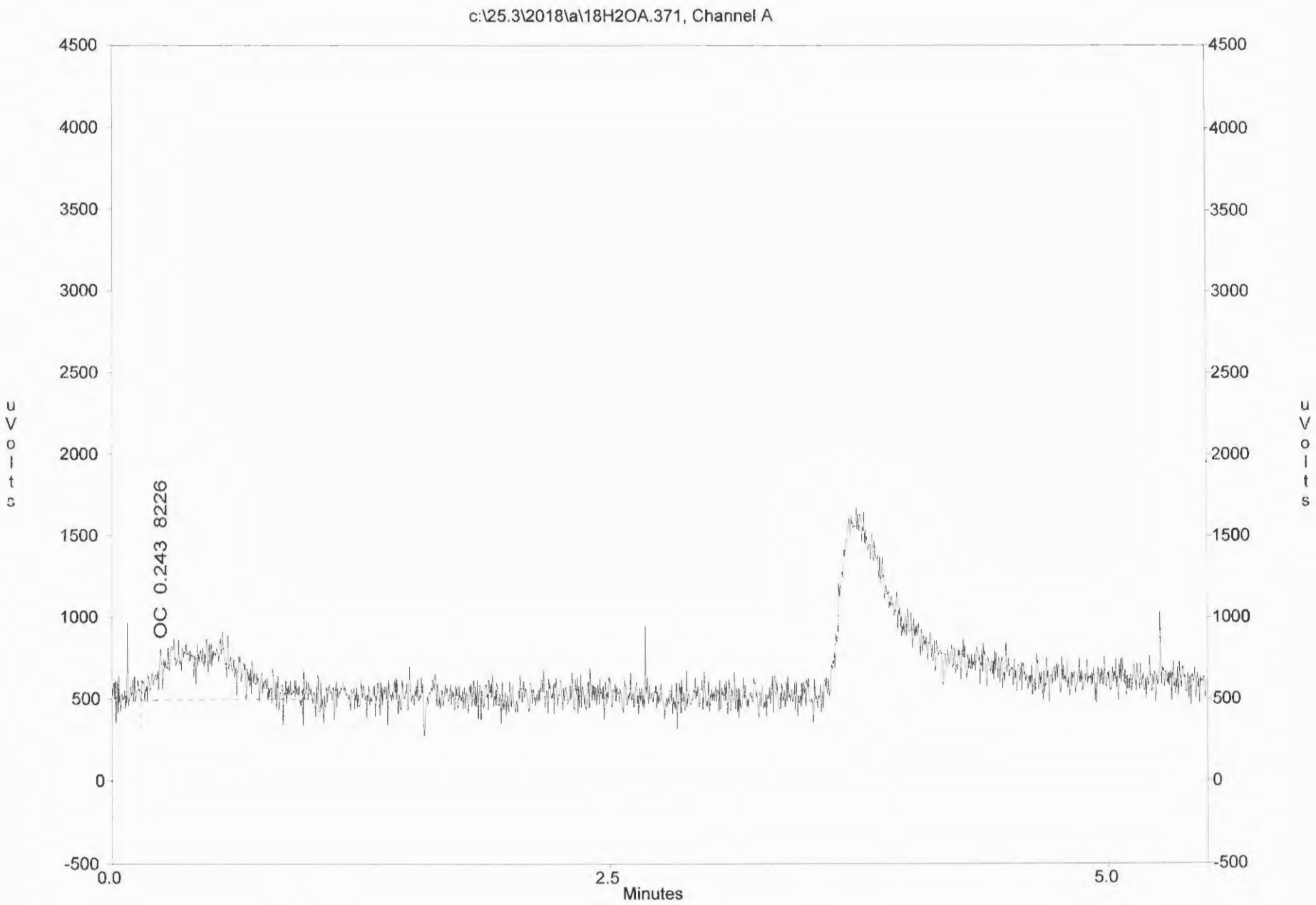

c:\25.3\2018\a\18H2OA.366, Channel A
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.263 8152
0.0
2.5
5.0
Minutes

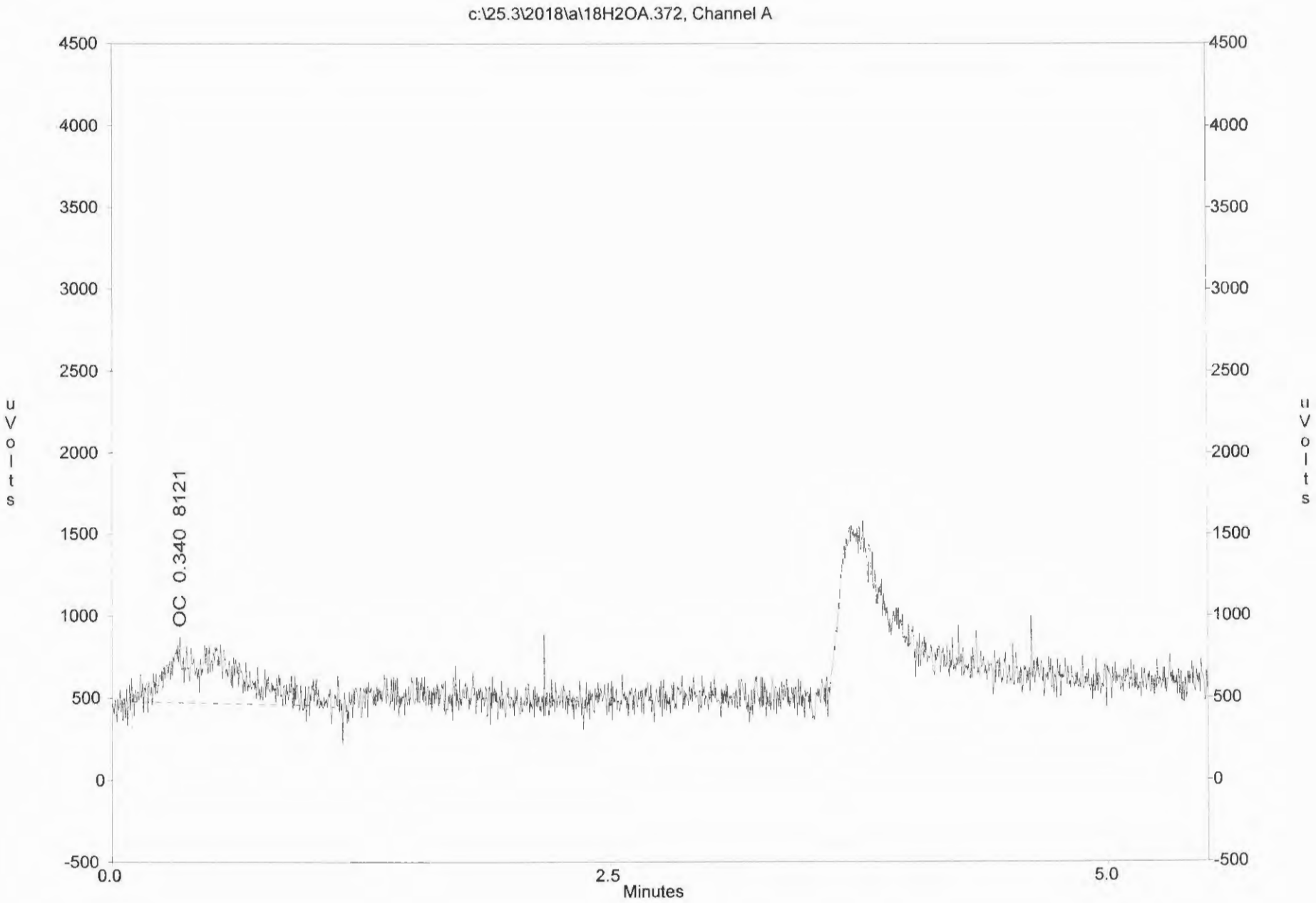

c:\25.3\2018\a\18H2OA.367, Channel A
uVolts
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
OC 0.343 8344
0.0
2.5
5.0
Minutes


c:\25.3\2018\a\18H2OA.368, Channel A
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.293 8378
0.0
2.5
5.0
Minutes


c:\25.3\2018\a\18H2OA.369, Channel A
uVolts
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
0.0
2.5
5.0
Minutes
OC 0.267 8360


c:\25.3\2018\a\18H2OA.370, Channel A
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.287 8271
0.0
2.5
5.0
Minutes


c:\25.3\2018\a\18H2OA.371, Channel A
uVolts
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
OC 0.243 8226
0.0
2.5
5.0
Minutes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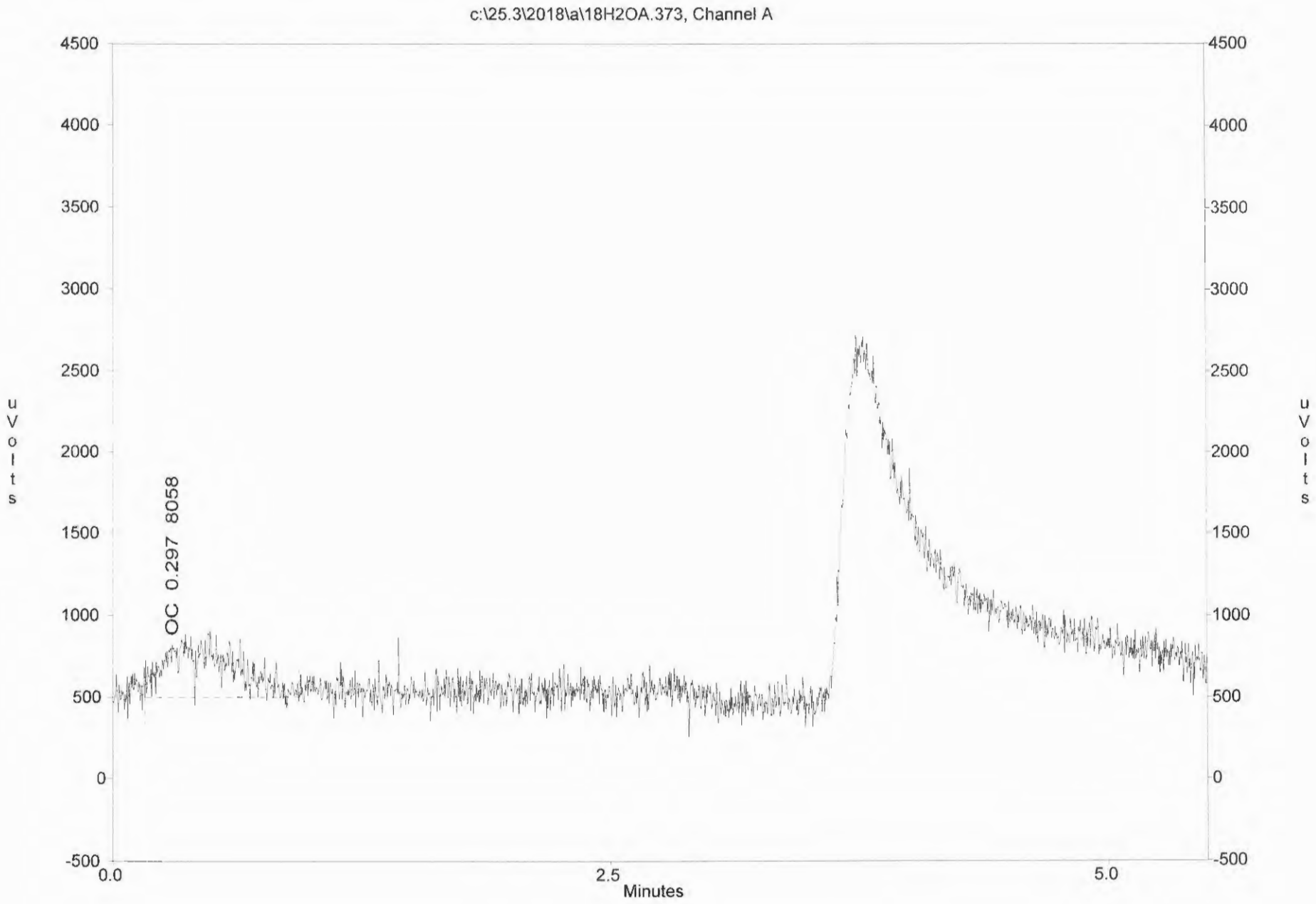
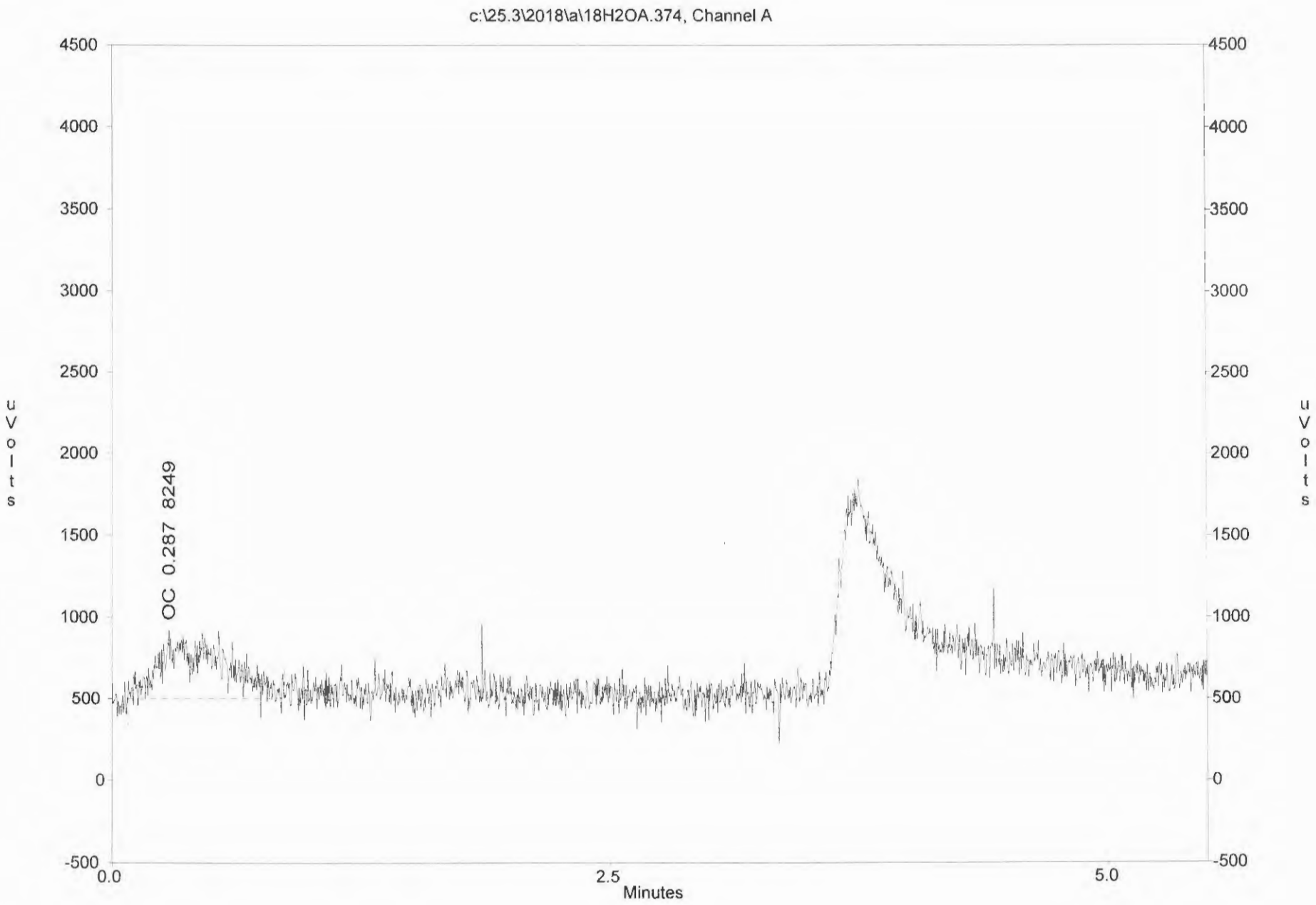
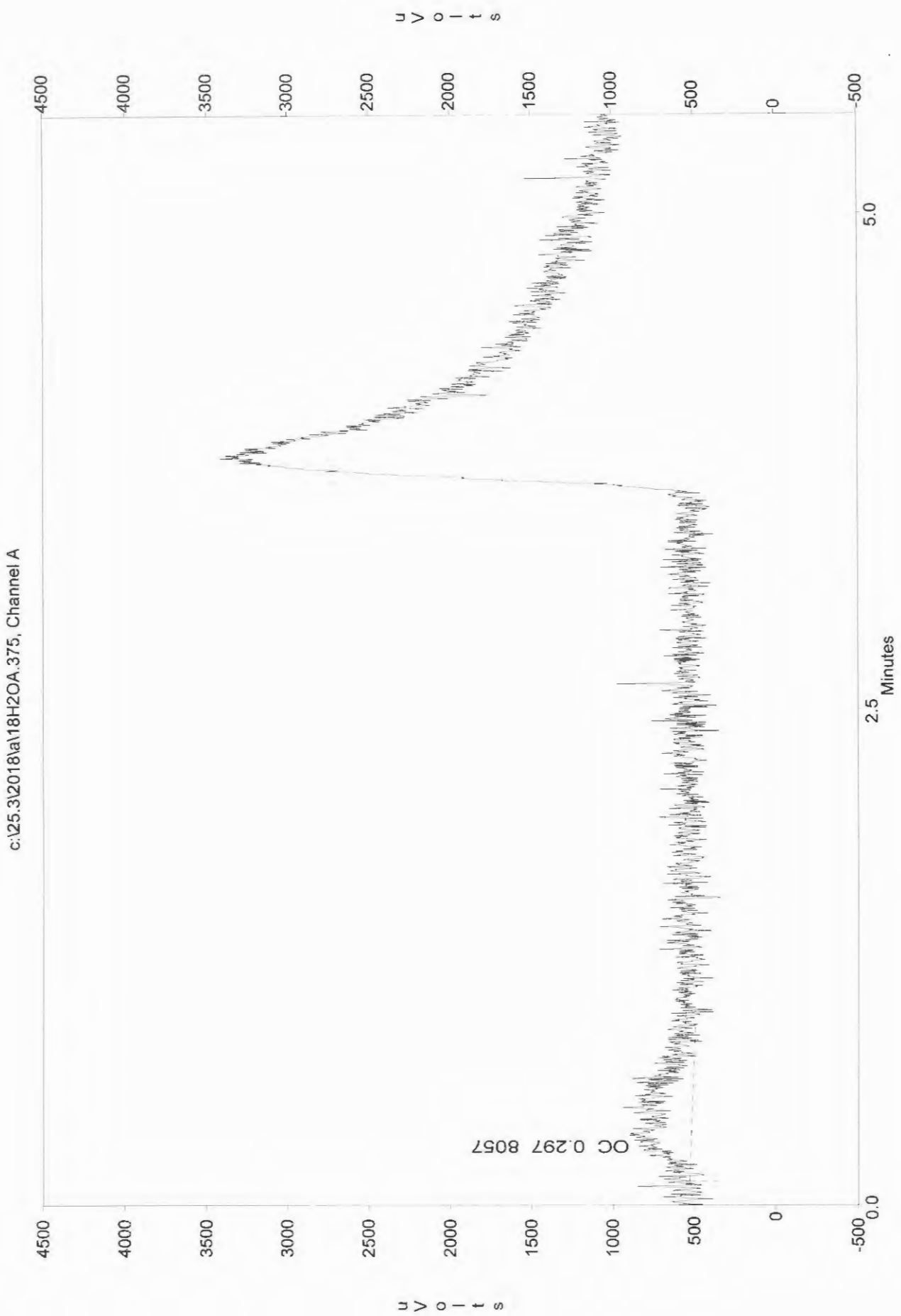
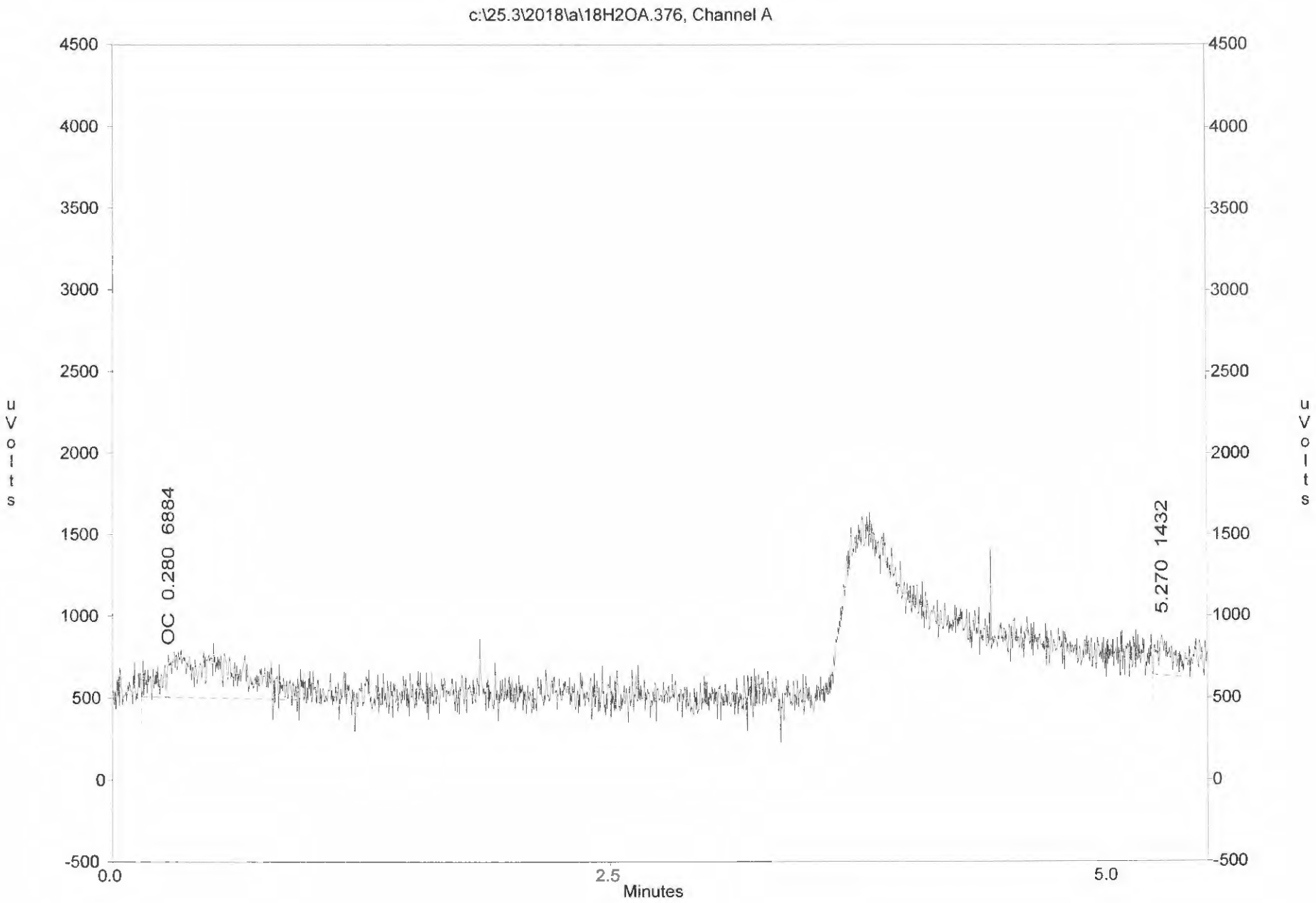
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.340 8121
0.0
2.5
5.0
Minutes


c:\25.3\2018\a\18H2OA.373, Channel A
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.297 8058
0.0
2.5
5.0
Minutes


c:\25.3\2018\a\18H2OA.374, Channel A
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
uVolts
OC 0.287 8249
0.0
2.5
5.0
Minutes


c:\25.3\2018\a18H2OA.375, Channel A
uVolts
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
0.0
2.5
5.0
Minutes
OC 0.297 8057


c:\25.3\2018\a\18H2OA.376, Channel A
uVolts
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
OC 0.280 6884
5.270 1432
0.0
2.5
5.0
Minutes

# APPENDIX B.5

# FUEL ANALYSIS DATA

# EXCELCHEM
## Environmental Labs

1135 W Sunset Boulevard
Suite A
Rocklin, CA 95765
Phone# 916-543-4445
Fax# 916-543-4449


ELAP Certificate No. : 2119

16 May 2018

Russell Huffman

Desert View Power

62300 Gene Welmas

Mecca, CA 92254

RE: MACT

Work order number:1804057

Enclosed are the results of analyses for samples received by the laboratory on 04/06/18 12:00. All Quality Control results are within acceptable limits except where noted as a case narrative. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

John Somers, Lab Director

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project | MACT | |
| 62300 Gene Welmas | Project Number | [none] | Date Reported. |
| Mecca, CA 92254 | Project Manager. | Russell Huffman | 05/16/18 11:05 |

### ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| 1000 3-29-18 U1 | 1804057-01 | Wood | 03/29/18 10:00 | 04/06/18 12:00 |
| 0900 3-29-18 U1 | 1804057-02 | Wood | 03/29/18 09:00 | 04/06/18 12:00 |
| 1200 3-29-18 U1 | 1804057-03 | Wood | 03/29/18 12:00 | 04/06/18 12:00 |
| 0800 3-29-18 U1 | 1804057-04 | Wood | 03/29/18 08:00 | 04/06/18 12:00 |
| 1100 3-29-18 U1 | 1804057-05 | Wood | 03/29/18 11:00 | 04/06/18 12:00 |
| 1300 3-29-18 U1 | 1804057-06 | Wood | 03/29/18 13:00 | 04/06/18 12:00 |
| 1600 3-29-18 U1 | 1804057-07 | Wood | 03/29/18 16:00 | 04/06/18 12:00 |
| 1400 3-29-18 U1 | 1804057-08 | Wood | 03/29/18 14:00 | 04/06/18 12:00 |
| 1800 3-29-18 U1 | 1804057-09 | Wood | 03/29/18 18:00 | 04/06/18 12:00 |
| 1700 3-29-18 U1 | 1804057-10 | Wood | 03/29/18 17:00 | 04/06/18 12:00 |
| 1500 3-29-18 U1 | 1804057-11 | Wood | 03/29/18 15:00 | 04/06/18 12:00 |
| 0800 3-27-18 U2 | 1804057-12 | Wood | 03/27/18 08:00 | 04/06/18 12:00 |
| 1200 3-27-18 U2 | 1804057-13 | Wood | 03/27/18 12:00 | 04/06/18 12:00 |
| 1100 3-28-18 U2 | 1804057-14 | Wood | 03/28/18 11:00 | 04/06/18 12:00 |
| 1000 3-28-18 U2 | 1804057-15 | Wood | 03/28/18 10:00 | 04/06/18 12:00 |
| 0900 3-28-18 U2 | 1804057-16 | Wood | 03/28/18 09:00 | 04/06/18 12:00 |
| 0800 3-28-18 U2 | 1804057-17 | Wood | 03/28/18 08:00 | 04/06/18 12:00 |
| 1300 3-27-18 U2 | 1804057-18 | Wood | 03/27/18 13:00 | 04/06/18 12:00 |
| 0900 3-27-18 U2 | 1804057-19 | Wood | 03/27/18 09:00 | 04/06/18 12:00 |
| 1000 3-27-18 U2 | 1804057-20 | Wood | 03/27/18 10:00 | 04/06/18 12:00 |
| 1100 3-27-18 U2 | 1804057-21 | Wood | 03/27/18 11:00 | 04/06/18 12:00 |
| 2100 3-30-18 U1 | 1804057-22 | Wood | 03/30/18 21:00 | 04/06/18 12:00 |
| 1600 3-30-18 U1 | 1804057-23 | Wood | 03/30/18 16:00 | 04/06/18 12:00 |
| 1900 3-30-18 U1 | 1804057-24 | Wood | 03/30/18 19:00 | 04/06/18 12:00 |
| 1700 3-30-18 U1 | 1804057-25 | Wood | 03/30/18 17:00 | 04/06/18 12:00 |
| 1500 3-30-18 U1 | 1804057-26 | Wood | 03/30/18 15:00 | 04/06/18 12:00 |
| 1800 3-30-18 U1 | 1804057-27 | Wood | 03/30/18 18:00 | 04/06/18 12:00 |
| 2000 3-30-18 U1 | 1804057-28 | Wood | 03/30/18 20:00 | 04/06/18 12:00 |

Excelchem Environmental Lab

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Laboratory Representative

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1000 3-29-18 U1
### 1804057-01 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.153** | | % | A D0210 | 04 18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0300** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.124** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0480** | | mg/kg | A D0210 | " | 05 01 18 | Concentration of HCl | |
| **Gross Calorific Value** | **7340** | 1000 | BTU/Lb | " | " | 04 30 18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **9060** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.11** | 0.03 | % | A D0163 | 04 18/18 | 04 18/18 | EPA 300 0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.036** | 0.016 | mg/kg | A D0085 | 04 12 18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3330** | 20.0 | " | A D0080 | 04 11/18 | 04 12 18 | EPA 6010B | |
| **Sodium** | **701** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **19.0** | 0.100 | % | A D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **10.9** | 0.0100 | % | A D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **20.0** | 0 100 | % | A D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **10.9** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **41.3** | 25.0 | " | A D0210 | 04 18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.04** | 0 009 | " | A D0163 | 04/18 18 | 04 18/18 | EPA 300.0 | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number | [none] | Date Reported. |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**1000 3-29-18 U1**
**1804057-01 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **40.22** | | % | '[none]' | 03 29 18 | 05 11 18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **7.09** | | % | '[none]' | " | 05 11 18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.48** | | % | '[none]' | " | 05 11 18 | % Nitrogen | |

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number | [none] | Date Reported |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**0900 3-29-18 U1**
**1804057-02 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.175** | | % | A D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0240** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.151** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0630** | | mg/kg | A D0210 | " | 05/01/18 | Concentration of HCL | |
| **Gross Calorific Value** | **6670** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8590** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.09** | 0.03 | % | A D0163 | 04/18/18 | 04/18/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.270** | 0.016 | mg/kg | A D0086 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3980** | 20.0 | " | A D0084 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **772** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **22.4** | 0.100 | % | A D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **16.7** | 0.0100 | % | A D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **22.4** | 0.100 | % | A D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **16.7** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **44.0** | 25.0 | " | A D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.07** | 0.009 | " | A D0163 | 04/18/18 | 04/18/18 | EPA 300.0 | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**0900 3-29-18 U1**
**1804057-02 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **31.75** | | % | '[none]' | 03 29 18 | 05 11 18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.63** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.89** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1200 3-29-18 U1
### 1804057-03 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.159** | | % | A D0210 | 04 18 18 | 05 03 18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0310** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.128** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0610** | | mg/kg | A D0210 | " | 05 01 18 | Concentration of HCl | |
| **Gross Calorific Value** | **7170** | 1000 | BTU/Lb | " | " | 04 30 18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8880** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.09** | 0.03 | % | A D0163 | 04 18 18 | 04 18 18 | EPA 300 0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.052** | 0.016 | mg/kg | A D0085 | 04 12 18 | 04 12 18 | EPA 7471A | |
| **Potassium** | **4400** | 20.0 | " | A D0080 | 04 11 18 | 04 12 18 | EPA 6010B | |
| **Sodium** | **796** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **19.2** | 0.100 | % | A D0205 | 04 17 18 | 04 30 18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **11.7** | 0.0100 | % | A D0205 | " | 04 30 18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **19.2** | 0 100 | % | A D0205 | " | 04 30 18 | ASTM E870-82 | |
| **Ash** | **11.7** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **30.5** | 25.0 | " | A D0210 | 04 18 18 | 05 14 18 | Oxygen by Difference | |
| **Sulfur** | **0.06** | 0 01 | " | A D0163 | 04 18 18 | 04 18 18 | EPA 300.0 | |

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project | MACT | |
| 62300 Gene Welmas | Project Number | [none] | Date Reported |
| Mecca, CA 92254 | Project Manager | Russell Huffman | 05/16/18 11:05 |

### 1200 3-29-18 U1
### 1804057-03 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **48.12** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **8.65** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.88** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**0800 3-29-18 U1**
**1804057-04 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.162** | | % | A D0210 | 04.18.18 | 05/03/18 | ASTM F776 | |
| **Water-Solule Chlorine** | **0.0240** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.137** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0520** | | mg/kg | A:D0210 | " | 05/01/18 | Concentration of HCl | |
| **Gross Calorific Value** | **7010** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8880** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.07** | 0.03 | % | A D0163 | 04/18/18 | 04/18/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.088** | 0.016 | mg/kg | A:D0085 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3080** | 20.0 | " | A:D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **654** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **21.1** | 0.100 | % | A:D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **10.1** | 0.0100 | % | A:D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **21.1** | 0.100 | % | A:D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **10.1** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **46.7** | 25.0 | " | A D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.05** | 0.009 | " | A D0163 | 04/18/18 | 04/18/18 | EPA 300.0 | |

Excelchem Environmental Lab.

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11 05 |

**0800 3-29-18 U1**
**1804057-04 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **35.58** | | % | '[none]' | 03-29 18 | 05 11-18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.68** | | % | '[none]' | " | 05-11-18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.91** | | % | '[none]' | " | 05-11-18 | % Nitrogen | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1100 3-29-18 U1
### 1804057-05 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.186** | | % | A D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0310** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.156** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0390** | | mg/kg | A D0210 | " | 05/01/18 | Concentration of HCl | |
| **Gross Calorific Value** | **6580** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8340** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.06** | 0.03 | % | A D0163 | 04/18/18 | 04/18/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.044** | 0.016 | mg/kg | A D0085 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3610** | 20.0 | " | A D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **675** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **21.2** | 0.100 | % | A D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **14.6** | 0.0100 | % | A D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **21.2** | 0.100 | % | A D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **14.6** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **42.5** | 25.0 | " | A D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.08** | 0.009 | " | A D0163 | 04/18/18 | 04/18/18 | EPA 300.0 | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1100 3-29-18 U1
### 1804057-05 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **35.26** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.78** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.83** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

Excelchem Environmental Lab

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1300 3-29-18 U1
### 1804057-06 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.163** | | % | A D0210 | 04/18/18 | 05 03.18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0310** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.132** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0550** | | mg/kg | A/D0210 | " | 05/01/18 | Concentration of HCL | |
| **Gross Calorific Value** | **7140** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8870** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.07** | 0.03 | % | A D0163 | 04.18/18 | 04/19.18 | EPA 300 0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.036** | 0 016 | mg/kg | A/D0085 | 04.12 18 | 04 12/18 | EPA 7471A | |
| **Potassium** | **3550** | 20.0 | " | A/D0080 | 04.11 18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **789** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **19.6** | 0.100 | % | A/D0205 | 04 17 18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **12.2** | 0.0100 | % | A D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moistnre** | **19.6** | 0.100 | % | A D0205 | " | 04.30/18 | ASTM E870-82 | |
| **Ash** | **12.2** | 0 0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **44.0** | 25.0 | " | A/D0210 | 04 18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.07** | 0.01 | " | A/D0163 | 04/18/18 | 04.19/18 | EPA 300.0 | |

Excelchem Environmental Lab.

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1300 3-29-18 U1
### 1804057-06 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **37.95** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **5.12** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.62** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Hullman | 05/16/18 11:05 |

**1600 3-29-18 U1**
**1804057-07 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.159** | | % | A D0210 | 04 18 18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0520** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.107** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0490** | | mg/kg | A D0210 | " | 05/01/18 | Concentration of HCl | |
| **Gross Calorific Value** | **6800** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8480** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.06** | 0 03 | % | A D0163 | 04/18/18 | 04 19 18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.064** | 0.016 | mg/kg | A D0085 | 04/12 18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3210** | 20.0 | " | A D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **566** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **19.8** | 0.100 | % | A D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **13.8** | 0.0100 | % | A D0205 | " | 04 30 18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **19.8** | 0.100 | % | A D0205 | " | 04 30/18 | ASTM E870-82 | |
| **Ash** | **13.8** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **40.2** | 25.0 | " | A D0210 | 04 18/18 | 05.14.18 | Oxygen by Difference | |
| **Sulfur** | **0.10** | 0.01 | " | A D0163 | 04/18/18 | 04/19/18 | EPA 300 0 | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**1600 3-29-18 U1**
**1804057-07 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **38.68** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.72** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.54** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

Excelchem Environmental Lab

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Hulfman | 05/16/18 11:05 |

### 1400 3-29-18 U1
### 1804057-08 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.154** | | % | A D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0240** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.130** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0230** | | mg/kg | A D0210 | " | 05/01/18 | Concentration of HCl | |
| **Gross Calorific Value** | **6780** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8810** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.09** | 0.03 | % | A D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.057** | 0.016 | mg/kg | A D0085 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3330** | 20.0 | " | A D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **655** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **23.0** | 0.100 | % | A D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **9.20** | 0.0100 | % | A D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **23.0** | 0.100 | % | A D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **9.20** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **46.0** | 25.0 | " | A D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.10** | 0.01 | " | A D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**1400 3-29-18 U1**
**1804057-08 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **36.67** | | % | '[none]' | 03-29-18 | 05-11-18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **7.09** | | % | '[none]' | " | 05-11-18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.95** | | % | '[none]' | " | 05-11-18 | % Nitrogen | |

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1800 3-29-18 U1
### 1804057-09 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.174** | | % | A-D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0290** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.145** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0500** | | mg/kg | A-D0210 | " | 05/01/18 | Concentration of HCl | |
| **Gross Calorific Value** | **7100** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8970** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.07** | 0.03 | % | A-D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.020** | 0.016 | mg/kg | A-D0085 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3680** | 20.0 | " | A-D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **863** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **20.9** | 0.100 | % | A-D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **9.89** | 0.0100 | % | A-D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **20.9** | 0.100 | % | A-D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **9.89** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **42.9** | 25.0 | " | A-D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.08** | 0.009 | " | A-D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |

Excelchem Environmental Lab

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager | Russell Huffman | 05/16/18 11:05 |

### 1800 3-29-18 U1
### 1804057-09 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **40.06** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.43** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.6** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**1700 3-29-18 U1**
**1804057-10 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.179** | | % | A D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0270** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.152** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0350** | | mg/kg | A D0210 | " | 05 01 18 | Concentration of HCl | |
| **Gross Calorific Value** | **7030** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8870** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.06** | 0.03 | % | A D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.074** | 0.016 | mg/kg | A D0085 | 04 12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **1800** | 20.0 | " | A D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **649** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **20.7** | 0 100 | % | A D0205 | 04 17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **11.5** | 0.0100 | % | A D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **20.7** | 0.100 | % | A D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **11.5** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **43.9** | 25.0 | " | A D0210 | 04/18 18 | 05 14 18 | Oxygen by Difference | |
| **Sulfur** | **0.07** | 0.009 | " | A D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1700 3-29-18 U1
### 1804057-10 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **37.71** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.25** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.6** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1500 3-29-18 U1
### 1804057-11 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.180** | | % | A:D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0300** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.150** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0230** | | mg/kg | A:D0210 | " | 05/01/18 | Concentration of HCL | |
| **Gross Calorific Value** | **5890** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **7670** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.09** | 0.03 | % | A:D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.036** | 0.016 | mg/kg | A:D0085 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **1630** | 20.0 | " | A:D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **593** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **23.3** | 0.100 | % | A:D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **11.8** | 0.0100 | % | A:D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **23.3** | 0.100 | % | A:D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **11.8** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **45.8** | 25.0 | " | A:D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.10** | 0.009 | " | A:D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**1500 3-29-18 U1**
**1804057-11 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **34.49** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **7.17** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.66** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

Excelchem Environmental Lab

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 0800 3-27-18 U2
### 1804057-12 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.164** | | % | A-D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Soluble Chlorine** | **0.0310** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.133** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0760** | | mg/kg | A-D0210 | " | 05/01/18 | Concentration of HCl | |
| **Gross Calorific Value** | **7050** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8630** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.07** | 0.03 | % | A-D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.057** | 0.016 | mg/kg | A-D0085 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **1800** | 20.0 | " | A-D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **607** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **18.4** | 0.100 | % | A-D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **13.0** | 0.0100 | % | A-D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **18.4** | 0.100 | % | A-D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **13.0** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **42.9** | 25.0 | " | A-D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.06** | 0.01 | " | A-D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 0800 3-27-18 U2
### 1804057-12 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **36.72** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.42** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.83** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**1200 3-27-18 U2**
**1804057-13 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.139** | | % | A:D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0210** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.117** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0770** | | mg/kg | A D0210 | " | 05/01/18 | Concentration of HCl | |
| **Gross Calorific Value** | **7010** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8240** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.07** | 0.02 | % | A D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.071** | 0.016 | mg/kg | A D0085 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **1970** | 20.0 | " | A:D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **575** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **14.8** | 0.100 | % | A:D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **19.4** | 0.0100 | % | A D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **14.8** | 0.100 | % | A D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **19.4** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **34.6** | 25.0 | " | A:D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.05** | 0.007 | " | A:D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**1200 3-27-18 U2**
**1804057-13 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **39.19** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.16** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.66** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

Excelchem Environmental Lab

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1100 3-28-18 U2
### 1804057-14 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.169** | | % | A:D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0340** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.135** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.114** | | mg/kg | A:D0210 | " | 05/01/18 | Concentration of HCL | |
| **Gross Calorific Value** | **7380** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8960** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.08** | 0.03 | % | A:D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.048** | 0.016 | mg/kg | A:D0085 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3580** | 20.0 | " | A:D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **762** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **17.6** | 0.100 | % | A:D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **11.1** | 0.0100 | % | A:D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **17.6** | 0.100 | % | A:D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **11.1** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **41.6** | 25.0 | " | A:D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.06** | 0.009 | " | A:D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**1100 3-28-18 U2**
**1804057-14 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **39.72** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **7.16** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.42** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

Excelchem Environmental Lab

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1000 3-28-18 U2
### 1804057-15 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.208** | | % | A:D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0310** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.177** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.104** | | mg/kg | A:D0210 | " | 05/01/18 | Concentration of HCl | |
| **Gross Calorific Value** | **7620** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **9040** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.08** | 0.03 | % | A:D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.041** | 0.016 | mg/kg | A:D0085 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **2590** | 20.0 | " | A:D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **551** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **15.7** | 0.100 | % | A:D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **10.5** | 0.0100 | % | A:D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **15.7** | 0.100 | % | A:D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **10.5** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **40.9** | 25.0 | " | A:D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.08** | 0.01 | " | A:D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**1000 3-28-18 U2**
**1804057-15 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **41.11** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.94** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.47** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

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| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 0900 3-28-18 U2
### 1804057-16 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.198** | | % | A D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0220** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.175** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0430** | | mg/kg | A D0210 | " | 05/01/18 | Concentration of HCl | |
| **Gross Calorific Value** | **7490** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8740** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.09** | 0.03 | % | A D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.082** | 0.016 | mg/kg | A D0085 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3930** | 20.0 | " | A D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **547** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **14.3** | 0.100 | % | A D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **14.5** | 0.0100 | % | A D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **14.3** | 0.100 | % | A D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **14.5** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **37.8** | 25.0 | " | A D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.05** | 0.009 | " | A D0163 | 04/18/18 | 04/19/18 | EPA 300.0 | |

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**0900 3-28-18 U2**
**1804057-16 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **41.55** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **5.64** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.44** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 0800 3-28-18 U2
### 1804057-17 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.199** | | % | A:D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0410** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.157** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0950** | | mg/kg | A D0210 | " | 05/01/18 | Concentration of HCl | |
| **Gross Calorific Value** | **7510** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8820** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.08** | 0.02 | % | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.084** | 0.016 | mg/kg | A:D0085 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **4390** | 20.0 | " | A:D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **689** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **14.9** | 0.100 | % | A:D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **16.0** | 0.0100 | % | A:D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **14.9** | 0.100 | % | A:D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **16.0** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **36.8** | 25.0 | " | A:D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.09** | 0.008 | " | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**0800 3-28-18 U2**
**1804057-17 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **39.57** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.96** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.62** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**1300 3-27-18 U2**
**1804057-18 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.159** | | % | A D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0270** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.132** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0420** | | mg/kg | A-D0210 | " | 05/01/18 | Concentration of HCL | |
| **Gross Calorific Value** | **7700** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **9080** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.08** | 0 03 | % | A D0164 | 04 20/18 | 04/24/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.025** | 0 016 | mg/kg | A-D0085 | 04 12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3410** | 20.0 | " | A-D0080 | 04.11 18 | 04 12/18 | EPA 6010B | |
| **Sodium** | **774** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **15.2** | 0 100 | % | A D0205 | 04/17.18 | 04 30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **13.5** | 0.0100 | % | A-D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **15.2** | 0.100 | % | A-D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **13.5** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **39.9** | 25.0 | " | A-D0210 | 04 18 18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.09** | 0 01 | " | A D0164 | 04/20/18 | 04 24 18 | EPA 300.0 | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1300 3-27-18 U2
### 1804057-18 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **38.99** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.83** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.7** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Hullman | 05/16/18 11:05 |

**0900 3-27-18 U2**
**1804057-19 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.159** | | % | A:D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0230** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.136** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.104** | | mg/kg | A:D0210 | " | 05/01/18 | Concentration of HCl | |
| **Gross Calorific Value** | **7250** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **8680** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.08** | 0.03 | % | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.110** | 0.016 | mg/kg | A:D0085 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3640** | 20.0 | " | A:D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **724** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **16.6** | 0.100 | % | A:D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **16.6** | 0.0100 | % | A:D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **16.6** | 0.100 | % | A:D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **16.6** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **37.3** | 25.0 | " | A:D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.10** | 0.009 | " | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**0900 3-27-18 U2**
**1804057-19 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **38.45** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.82** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.66** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**1000 3-27-18 U2**
**1804057-20 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0770** | | mg/kg | A D0210 | 04/18/18 | 05/01/18 | Concentration of HCL | |
| **Gross Calorific Value** | **7960** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **9270** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.08** | 0.03 | % | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.050** | 0.016 | mg/kg | A:D0085 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3710** | 20.0 | " | A:D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **722** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **14.1** | 0.100 | % | A:D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **13.1** | 0.0100 | % | A:D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **14.1** | 0.100 | % | A D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **13.1** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **40.0** | 25.0 | " | A D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.10** | 0.01 | " | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |
| **% Carbon** | | | | | | | | |
| **% Carbon** | **39.27** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |

Excelchem Environmental Lab

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**1000 3-27-18 U2**
**1804057-20 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.84** | | % | '[none]' | 03/29/18 | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.7** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**1100 3-27-18 U2**
**1804057-21 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.125** | | % | A D0210 | 04 18/18 | 05.03/18 | ASTM E776 | |
| **Water-Soluie Chlorine** | **0.0260** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.0990** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0980** | | mg/kg | A D0210 | " | 05 01/18 | Concentration of HCL | |
| **Gross Calorific Value** | **5870** | 1000 | BTU/Lb | " | " | 04 30.18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **6700** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.08** | 0 02 | % | A D0164 | 04/20/18 | 04 24/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.110** | 0.016 | mg/kg | A\D0085 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3500** | 20.0 | " | A\D0080 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **616** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **12.4** | 0.100 | % | A D0205 | 04/17/18 | 04 30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **23.2** | 0.0100 | % | A D0205 | " | 04/30 18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **12.4** | 0.100 | % | A D0205 | " | 04.30/18 | ASTM E870-82 | |
| **Ash** | **23.2** | 0 0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **30.3** | 25.0 | " | A\D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.06** | 0 008 | " | A D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |

Excelchem Environmental Lab

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**1100 3-27-18 U2**
**1804057-21 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **39.11** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.48** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.85** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

Excelchem Environmental Lab

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**2100 3-30-18 U1**
**1804057-22 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.201** | | % | A D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0390** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.162** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0810** | | mg/kg | A:D0210 | " | 05/01/18 | Concentration of HCL | |
| **Gross Calorific Value** | **5300** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **6700** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.07** | 0.03 | % | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.057** | 0.016 | mg/kg | A D0086 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3820** | 20.0 | " | A:D0084 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **793** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **20.9** | 0.100 | % | A:D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **15.4** | 0.0100 | % | A D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **20.9** | 0.100 | % | A D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **15.4** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **43.3** | 25.0 | " | A D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.09** | 0.009 | " | A D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |

Excelchem Environmental Lab

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 2100 3-30-18 U1
### 1804057-22 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **34.06** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.53** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.62** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

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| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1600 3-30-18 U1
### 1804057-23 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.227** | | % | A:D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0160** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.211** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0440** | | mg/kg | A:D0210 | " | 05/01/18 | Concentration of HCl | |
| **Gross Calorific Value** | **6470** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **7560** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.06** | 0.02 | % | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.138** | 0.016 | mg/kg | A:D0086 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **4280** | 20.0 | " | A:D0084 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **796** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **14.3** | 0.100 | % | A:D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **15.6** | 0.0100 | % | A:D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **14.3** | 0.100 | % | A:D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **15.6** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **36.0** | 25.0 | " | A:D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.07** | 0.008 | " | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |

Excelchem Environmental Lab

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1600 3-30-18 U1
### 1804057-23 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **40.81** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.74** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.78** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

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| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1900 3-30-18 U1
### 1804057-24 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.210** | | % | A:D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0310** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.180** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0390** | | mg/kg | A:D0210 | " | 05/01/18 | Concentration of HCl | |
| **Gross Calorific Value** | **5710** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **7380** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.08** | 0.03 | % | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.086** | 0.016 | mg/kg | A:D0086 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **4140** | 20.0 | " | A:D0084 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **836** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **22.7** | 0.100 | % | A:D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **10.7** | 0.0100 | % | A:D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **22.7** | 0.100 | % | A:D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **10.7** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **45.5** | 25.0 | " | A:D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.06** | 0.01 | " | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1900 3-30-18 U1
### 1804057-24 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **36.15** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.87** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.71** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

Excelchem Environmental Lab

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1700 3-30-18 U1
### 1804057-25 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.210** | | % | A-D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0240** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.186** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0640** | | mg/kg | A-D0210 | " | 05/01/18 | Concentration of HCl | |
| **Gross Calorific Value** | **5920** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **7280** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.09** | 0.03 | % | A-D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.074** | 0.016 | mg/kg | A-D0086 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3680** | 20.0 | " | A-D0084 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **1270** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **18.8** | 0.100 | % | A-D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **12.5** | 0.0100 | % | A-D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **18.8** | 0.100 | % | A-D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **12.5** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **41.5** | 25.0 | " | A-D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.09** | 0.009 | " | A-D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1700 3-30-18 U1
### 1804057-25 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **38.32** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **7.03** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.59** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1500 3-30-18 U1
**1804057-26 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.187** | | % | A:D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0240** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.163** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0750** | | mg/kg | A:D0210 | " | 05/01/18 | Concentration of HCL | |
| **Gross Calorific Value** | **5570** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **6950** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.07** | 0.03 | % | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.338** | 0.016 | mg/kg | A:D0086 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3570** | 20.0 | " | A:D0084 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **684** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **19.9** | 0.100 | % | A:D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **13.0** | 0.0100 | % | A:D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **19.9** | 0.100 | % | A:D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **13.0** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **42.8** | 25.0 | " | A:D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.05** | 0.01 | " | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1500 3-30-18 U1
### 1804057-26 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | 37.99 | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | 5.32 | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | 0.75 | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 1800 3-30-18 U1
### 1804057-27 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.236** | | % | A:D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0350** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.201** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0620** | | mg/kg | A:D0210 | " | 05/01/18 | Concentration of HCL | |
| **Gross Calorific Value** | **6820** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **7990** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.10** | 0.03 | % | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.048** | 0.016 | mg/kg | A:D0086 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3900** | 20.0 | " | A:D0084 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **1030** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **14.7** | 0.100 | % | A:D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **8.54** | 0.0100 | % | A:D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **14.7** | 0.100 | % | A:D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **8.54** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **41.8** | 25.0 | " | A:D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.09** | 0.01 | " | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported |
| Mecca, CA 92254 | Project Manager: | Russell Hutfman | 05/16/18 11:05 |

### 1800 3-30-18 U1
### 1804057-27 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **42.26** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.9** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.43** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

Excelchem Environmental Lab.

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### 2000 3-30-18 U1
### 1804057-28 (Wood)

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **Fuels** | | | | | | | | |
| **Total Chlorine** | **0.183** | | % | A:D0210 | 04/18/18 | 05/03/18 | ASTM E776 | |
| **Water-Solule Chlorine** | **0.0290** | | " | " | " | " | " | |
| **Water-Insoluble Chlorine** | **0.154** | | " | " | " | " | " | |
| ***** DEFAULT GENERAL METHOD ***** | | | | | | | | |
| **Hydrochloric acid (HCl)** | **0.0650** | | mg/kg | A:D0210 | " | 05/01/18 | Concentration of HCL | |
| **Gross Calorific Value** | **5890** | 1000 | BTU/Lb | " | " | 04/30/18 | ASTM E870-82 | |
| **Gross Calorific Value (dry)** | **7660** | 1000 | " | " | " | " | " | |
| **Ion Chromatography** | | | | | | | | |
| **Chloride** | **0.09** | 0.03 | % | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |
| **Total Recoverable Metals** | | | | | | | | |
| **Mercury** | **0.034** | 0.016 | mg/kg | A:D0086 | 04/12/18 | 04/12/18 | EPA 7471A | |
| **Potassium** | **3660** | 20.0 | " | A:D0084 | 04/11/18 | 04/12/18 | EPA 6010B | |
| **Sodium** | **743** | 20.0 | " | " | " | " | " | |
| **ASTM E871-82** | | | | | | | | |
| **Moisture** | **23.1** | 0.100 | % | A:D0205 | 04/17/18 | 04/30/18 | ASTM E871-82 | |
| **ASTM E1755-01** | | | | | | | | |
| **Ash** | **8.67** | 0.0100 | % | A:D0205 | " | 04/30/18 | ASTM E1755-01 | |
| **Ultimate Analysis** | | | | | | | | |
| **Moisture** | **23.1** | 0.100 | % | A:D0205 | " | 04/30/18 | ASTM E870-82 | |
| **Ash** | **8.67** | 0.0100 | " | " | " | " | ASTM E1755-01 | |
| **Oxygen** | **52.7** | 25.0 | " | A:D0210 | 04/18/18 | 05/14/18 | Oxygen by Difference | |
| **Sulfur** | **0.05** | 0.009 | " | A:D0164 | 04/20/18 | 04/24/18 | EPA 300.0 | |

Excelchem Environmental Lab

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

**2000 3-30-18 U1**
**1804057-28 (Wood)**

| Analyte | Result | Reporting Limit | Units | Batch | Date Prepared | Date Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|
| **% Carbon** | | | | | | | | |
| **% Carbon** | **31.82** | | % | '[none]' | 03/29/18 | 05/11/18 | % Carbon | |
| **% Hydrogen** | | | | | | | | |
| **% Hydrogen** | **6.03** | | % | '[none]' | " | 05/11/18 | % Hydrogen | |
| **% Nitrogen** | | | | | | | | |
| **% Nitrogen** | **0.72** | | % | '[none]' | " | 05/11/18 | % Nitrogen | |

Excelchem Environmental Lab

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## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Hullman | 05/16/18 11:05 |

## Fuels - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch A\D0210 - ASTM E776** | | | | | | | | | | |
| **Duplicate (A\D0210-DUP1)** | | **Source: 1804057-05** | | Prepared: 04/18/18 Analyzed: 05/03/18 | | | | | | |
| Total Chlorine | 0.154 | | % | | 0.186 | | | 18.8 | 200 | |
| Water-Solule Chlorine | 0.0420 | | " | | 0.0310 | | | 30.1 | 200 | |
| Water-Insoluble Chlorine | 0.112 | | " | | 0.156 | | | 32.8 | 200 | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

## Fuels - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch A\D0210 - ASTM E776** | | | | | | | | | | |
| **Duplicate (A\D0210-DUP2)** | | **Source: 1804057-13** | | Prepared: 04/18/18 Analyzed: 05/03/18 | | | | | | |
| Total Chlorine | 0.156 | | % | | 0.139 | | | 11.5 | 200 | |
| Water-Solule Chlorine | 0.0470 | | " | | 0.0210 | | | 76.5 | 200 | |
| Water-Insoluble Chlorine | 0.109 | | " | | 0.117 | | | 7.08 | 200 | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

## Fuels - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|

## Ion Chromatography - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch A\D0163 - EPA 300.0** | | | | | | | | | | |
| **Blank (A\D0163-BLK1)** | | | | Prepared & Analyzed: 04/18/18 | | | | | | |
| Chloride | ND | 0.03 | % | | | | | | | |
| **Duplicate (A\D0163-DUP1)** | | **Source: 1804042-01** | | Prepared & Analyzed: 04/18/18 | | | | | | |
| Chloride | 0.04 | 0.03 | % | | 0.04 | | | 3.52 | 30 | |
| **Batch A\D0164 - EPA 300.0** | | | | | | | | | | |
| **Blank (A\D0164-BLK1)** | | | | Prepared: 04/20/18 Analyzed: 04/24/18 | | | | | | |
| Chloride | ND | 0.03 | % | | | | | | | |
| **Duplicate (A\D0164-DUP1)** | | **Source: 1804057-28** | | Prepared: 04/20/18 Analyzed: 04/24/18 | | | | | | |
| Chloride | 0.10 | 0.03 | % | | 0.09 | | | 5.20 | 30 | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

## Total Recoverable Metals - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch A\D0080 - EPA 6010B** | | | | | | | | | | |
| **Blank (A\D0080-BLK1)** | | | | Prepared & Analyzed: 04/11/18 | | | | | | |
| Potassium | ND | 20.0 | mg/kg | | | | | | | |
| Sodium | ND | 20.0 | " | | | | | | | |
| **LCS (A\D0080-BS1)** | | | | Prepared & Analyzed: 04/11/18 | | | | | | |
| Potassium | 996 | 20.0 | mg/kg | 1000 | | 99.6 | 80-120 | | | |
| Sodium | 106 | 20.0 | " | 100 | | 106 | 80-120 | | | |
| **LCS Dup (A\D0080-BSD1)** | | | | Prepared & Analyzed: 04/11/18 | | | | | | |
| Potassium | 1000 | 20.0 | mg/kg | 1000 | | 100 | 80-120 | 0.650 | 25 | |
| Sodium | 110 | 20.0 | " | 100 | | 110 | 80-120 | 3.71 | 25 | |
| **Matrix Spike (A\D0080-MS1)** | | **Source: 1804057-01** | | Prepared & Analyzed: 04/11/18 | | | | | | |
| Potassium | 4580 | 20.0 | mg/kg | 1000 | 3330 | 125 | 75-125 | | | |
| Sodium | 895 | 20.0 | " | 100 | 701 | 194 | 75-125 | | | QM-01 |
| **Matrix Spike Dup (A\D0080-MSD1)** | | **Source: 1804057-01** | | Prepared & Analyzed: 04/11/18 | | | | | | |
| Potassium | 4480 | 20.0 | mg/kg | 1000 | 3330 | 114 | 75-125 | 2.38 | 25 | |
| Sodium | 836 | 20.0 | " | 100 | 701 | 135 | 75-125 | 6.84 | 25 | QM-01 |
| **Batch A\D0084 - EPA 6010B** | | | | | | | | | | |
| **Blank (A\D0084-BLK1)** | | | | Prepared & Analyzed: 04/11/18 | | | | | | |
| Potassium | ND | 20.0 | mg/kg | | | | | | | |
| Sodium | ND | 20.0 | " | | | | | | | |
| **LCS (A\D0084-BS1)** | | | | Prepared & Analyzed: 04/11/18 | | | | | | |
| Potassium | 990 | 20.0 | mg/kg | 1000 | | 99.0 | 80-120 | | | |
| Sodium | 105 | 20.0 | " | 100 | | 105 | 80-120 | | | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager | Russell Huffman | 05/16/18 11:05 |

## Total Recoverable Metals - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch A\D0084 - EPA 6010B** | | | | | | | | | | |
| **LCS Dup (A\D0084-BSD1)** | | | | Prepared & Analyzed: 04/11/18 | | | | | | |
| Potassium | 984 | 20.0 | mg/kg | 1000 | | 98.4 | 80-120 | 0.628 | 25 | |
| Sodium | 104 | 20.0 | " | 100 | | 104 | 80-120 | 0.768 | 25 | |
| **Matrix Spike (A\D0084-MS1)** | | **Source: 1804057-02** | | Prepared & Analyzed: 04/11/18 | | | | | | |
| Potassium | 4390 | 20.0 | mg/kg | 1000 | 3980 | 41.1 | 75-125 | | | QM-01 |
| Sodium | 783 | 20.0 | " | 100 | 772 | 11.0 | 75-125 | | | QM-01 |
| **Matrix Spike Dup (A\D0084-MSD1)** | | **Source: 1804057-02** | | Prepared & Analyzed: 04/11/18 | | | | | | |
| Potassium | 4090 | 20.0 | mg/kg | 1000 | 3980 | 11.1 | 75-125 | 7.08 | 25 | QM-01 |
| Sodium | 750 | 20.0 | " | 100 | 772 | NR | 75-125 | 4.23 | 25 | QM-01 |
| **Batch A\D0085 - EPA 7471A** | | | | | | | | | | |
| **Blank (A\D0085-BLK1)** | | | | Prepared & Analyzed: 04/12/18 | | | | | | |
| Mercury | ND | 0.016 | mg/kg | | | | | | | |
| **LCS (A\D0085-BS1)** | | | | Prepared & Analyzed: 04/12/18 | | | | | | |
| Mercury | 0.196 | 0.016 | mg/kg | 0.200 | | 98.0 | 80-120 | | | |
| **LCS Dup (A\D0085-BSD1)** | | | | Prepared & Analyzed: 04/12/18 | | | | | | |
| Mercury | 0.186 | 0.016 | mg/kg | 0.200 | | 93.2 | 80-120 | 5.02 | 20 | |
| **Matrix Spike (A\D0085-MS1)** | | **Source: 1804057-01** | | Prepared & Analyzed: 04/12/18 | | | | | | |
| Mercury | 0.232 | 0.016 | mg/kg | 0.200 | 0.0362 | 97.9 | 75-125 | | | |
| **Matrix Spike Dup (A\D0085-MSD1)** | | **Source: 1804057-01** | | Prepared & Analyzed: 04/12/18 | | | | | | |
| Mercury | 0.222 | 0.016 | mg/kg | 0.200 | 0.0362 | 93.1 | 75-125 | 4.23 | 20 | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### Total Recoverable Metals - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch A\D0086 - EPA 7471A** | | | | | | | | | | |
| **Blank (A\D0086-BLK1)** | | | | Prepared & Analyzed: 04/12/18 | | | | | | |
| Mercury | ND | 0.016 | mg/kg | | | | | | | |
| **LCS (A\D0086-BS1)** | | | | Prepared & Analyzed: 04/12/18 | | | | | | |
| Mercury | 0.202 | 0.016 | mg/kg | 0.200 | | 101 | 80-120 | | | |
| **LCS Dup (A\D0086-BSD1)** | | | | Prepared & Analyzed: 04/12/18 | | | | | | |
| Mercury | 0.203 | 0.016 | mg/kg | 0.200 | | 102 | 80-120 | 0.394 | 20 | |
| **Matrix Spike (A\D0086-MS1)** | | **Source: 1804057-02** | | Prepared & Analyzed: 04/12/18 | | | | | | |
| Mercury | 0.246 | 0.016 | mg/kg | 0.200 | 0.270 | NR | 75-125 | | | QM-01 |
| **Matrix Spike Dup (A\D0086-MSD1)** | | **Source: 1804057-02** | | Prepared & Analyzed: 04/12/18 | | | | | | |
| Mercury | 0.310 | 0.016 | mg/kg | 0.200 | 0.270 | 20.0 | 75-125 | 23.0 | 20 | QM-11 |

Excelchem Environmental Lab

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Laboratory Representative

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

## ASTM E871-82 - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch A\D0205 - ASTM E871-82** | | | | | | | | | | |
| **Duplicate (A\D0205-DUP1)** | | **Source: 1804057-19** | | Prepared: 04/17/18 Analyzed: 04/30/18 | | | | | | |
| Moisture | 16.0 | 0.100 | % | | 16.6 | | | 3.18 | 20 | |
| **Duplicate (A\D0205-DUP2)** | | **Source: 1804057-28** | | Prepared: 04/17/18 Analyzed: 04/30/18 | | | | | | |
| Moisture | 22.7 | 0.100 | % | | 23.1 | | | 1.40 | 20 | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

## ASTM E1755-01 - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch A\D0205 - ASTM E1755-01** | | | | | | | | | | |
| **Duplicate (A\D0205-DUP1)** | | **Source: 1804057-19** | | Prepared: 04/17/18 Analyzed: 04/30/18 | | | | | | |
| Ash | 18.8 | 0.0100 | % | | 16.6 | | | 12.3 | 30 | |
| **Duplicate (A\D0205-DUP2)** | | **Source: 1804057-28** | | Prepared: 04/17/18 Analyzed: 04/30/18 | | | | | | |
| Ash | 9.40 | 0.0100 | % | | 8.67 | | | 8.03 | 30 | |

## Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

### Ultimate Analysis - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch A\D0163 - EPA 300.0** | | | | | | | | | | |
| **Blank (A\D0163-BLK1)** | | | | Prepared & Analyzed: 04/18/18 | | | | | | |
| Sulfur | ND | 0.01 | % | | | | | | | |
| **Duplicate (A\D0163-DUP1)** | | **Source: 1804042-01** | | Prepared & Analyzed: 04/18/18 | | | | | | |
| Sulfur | 0.03 | 0.008 | % | | 0.03 | | | 10.9 | 30 | |
| **Batch A\D0164 - EPA 300.0** | | | | | | | | | | |
| **Blank (A\D0164-BLK1)** | | | | Prepared: 04/20/18 Analyzed: 04/24/18 | | | | | | |
| Sulfur | ND | 0.01 | % | | | | | | | |
| **Duplicate (A\D0164-DUP1)** | | **Source: 1804057-28** | | Prepared: 04/20/18 Analyzed: 04/24/18 | | | | | | |
| Sulfur | 0.06 | 0.009 | % | | 0.05 | | | 6.95 | 30 | |
| **Batch A\D0205 - ASTM E1755-01** | | | | | | | | | | |
| **Duplicate (A\D0205-DUP1)** | | **Source: 1804057-19** | | Prepared: 04/17/18 Analyzed: 04/30/18 | | | | | | |
| Ash | 18.8 | 0.0100 | % | | 16.6 | | | 12.3 | 30 | |
| Moisture | 16.0 | 0.100 | " | | 16.6 | | | 3.18 | 20 | |
| **Duplicate (A\D0205-DUP2)** | | **Source: 1804057-28** | | Prepared: 04/17/18 Analyzed: 04/30/18 | | | | | | |
| Moisture | 22.7 | 0.100 | % | | 23.1 | | | 1.40 | 20 | |
| Ash | 9.40 | 0.0100 | " | | 8.67 | | | 8.03 | 30 | |

Excelchem Environmental Lab

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Laboratory Representative

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

## Notes and Definitions

QM-11 The spike recovery and RPD for this analyte is out of QA/QC parameters due to matrix interferences.

QM-01 The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.

ND Analyte not detected at reporting limit.

NR Not reported

# Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power<br>62300 Gene Welmas<br>Mecca, CA 92254 | Project: | MACT | Date Reported: |
| | Project Number: | [none] | 05/16/18 11:05 |
| | Project Manager: | Russell Huffman | |

## CHAIN OF CUSTODY

**Excelchem Environmental Labs**

11135 W. Sunset Blvd. Suite A
Rocklin, CA 95765
Ph: 916-543-4446 Fx: 916-543-4449

Project Manager: Russell Huffman
Email Address for Reporting:
Email Address for Reporting:
Company Name & Address: Desert View Power
Billing Address: 62300 Gene Welmas, Mecca, CA 92254
Phone #: 760-262-1653
Cell #:
Fax #:
P.O#/Project Name: MACT
Project Location: MECCA
Sampler Name:
Sampler Signature:

REPORTING REQUIREMENTS BELOW:

PDF / Standard Format
Geotracker / EDF / Provide Global ID
EDD / Equis / Data Table
MDL Format
Date to be reported to State's Database ? Yes ___ No ___
EDT / CDPH - Provide Source Codes / PWS ID:

page ___ of ___

Matrix Table:
S = Soil / Sludge / Solid (circle one)
A = Air
DW = Drinking Water
MW = Monitoring Wells
GW = Groundwater
TW = Treated Water
WW = Waste Water

| SAMPLE ID: | Source Codes | SAMPLING DATE | SAMPLING TIME | Matrix ( See Matrix Table) | Preserved ? (Mark yes and no if both available) Yes | No | Summa # | Tedlar / Summa | Coliform Tube | 250ml plastic | 500ml plastic | 1000ml plastic | 1 Gallon plastic | 1 Liter Amber | 40ml Voa - Clear | 40ml Voa - Amber | 250ml Amber | 500ml Amber | Soil Jar | Metals Site | Metals Total | ANALYSIS REQUST |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MACT DVP | | 4/16/19 | | W | | | | | | | | | | | | | | | X X | | | BAG |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | X X | | | ASH |
| | | | | | | | | | | | | | | | | | | | X X | | | CHLORIDE IC |
| | | | | | | | | | | | | | | | | | | | X X | | | GCV |
| | | | | | | | | | | | | | | | | | | | X X | | | GCV DRY |
| | | | | | | | | | | | | | | | | | | | X X | | | MERCURY |
| | | | | | | | | | | | | | | | | | | | X X | | | % MOISTURE |
| | | | | | | | | | | | | | | | | | | | X X | | | KNA TTLC |
| | | | | | | | | | | | | | | | | | | | X X | | | ULTIMATE ANALYSIS |

MULTIPLE BAGS (RATH/MACT)

1804057
BIN Dept. 11

| Relinquished by: | DATE | TIME | Received by: | DATE | TIME | Remarks: |
|---|---|---|---|---|---|---|
| OPS | 4/16/18 | 11 | STEVE | 4/16/18 | 12:00 | Courtney McDonald |
| Relinquished by: STEVE | DATE 4/16/18 | TIME 9A | Received by Laboratory: UPS | | | |

Excelchem Environmental Lab

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Laboratory Representative

# Excelchem Environmental Labs

| | | | |
|---|---|---|---|
| Desert View Power | Project: | MACT | |
| 62300 Gene Welmas | Project Number: | [none] | Date Reported: |
| Mecca, CA 92254 | Project Manager: | Russell Huffman | 05/16/18 11:05 |

## Sample Integrity

**WORK ORDER : 1804057**

Date Received: 04/6/2018

**Section 1 – Sample Arrival Info.**

Sample Transport: **UPS** Transported In: **Box**

Describe type of packing materials: **None**

Has chilling process begun? **No** Samples Received: **Ambient**

Temperature of Samples (°C): **24** Ice Chest Temperature(s) (°C): **n/a**

**Section 2 – Bottle/Analysis Info.**

| | Yes | No | N/A | Comments |
|---|---|---|---|---|
| Did all bottles arrive unbroken and intact? | X | | | - |
| Did all bottle labels agree with COC? | X | | | - |
| Were correct containers used for the tests requested? | X | | | - |
| Were correct preservations used for the tests requested? | X | | | - |
| Was a sufficient amount of sample sent for tests indicated? | X | | | - |
| Were bubbles present in VOA Vials? **(Volatile Methods Only)** | | | X | - |

**Section 3 – Summa/Flow regulator Info.**

**Used Summa#:**

**Unused Summa#:**

**Cleaning Summa#:**

**Regulator#:**

Was there any visual damage to summa canisters or flow regulators? **Explain.**

N/A

**Section 4 – COC Info.**

| | Completed Yes | Info From No | Comments | | Completed Yes | No | Comments |
|---|---|---|---|---|---|---|---|
| Was COC Received | | X | -** | Analysis Requested | X | | - |
| Date Sampled | X | | - | Samples arrived within holding time | X | | - |
| Time Sampled | X | | - | Any hold times less than 72 hrs | | X | - |
| Sample ID | X | | - | Client Name | X | | - |
| Rush TAT | | X | - | Address/Telephone # | X | | - |

**Section 5 – Comments / Discrepancies**

Was Client notified of discrepancies: N/A Notified by: N/A

Explanations / Comments:

**-**COC sent in email on 4/10/18**

| | |
|---|---|
| Samples Labeled by: | **CM** |
| Bin #s: | Dept. 11 |
| COC Scanned/Attached by: | **CM** |
| Sample labels reviewed by: | **CM** |

**Filled out by:** *Courtney McDonald* **Date:** 4/10/2018 **Time :** 15:26

Excelchem Environmental Lab.

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Laboratory Representative

# APPENDIX B.6

# SAMPLE CHAIN OF CUSTODY

# CHAIN OF CUSTODY

CLIENT: Desert View Power PROJECT NO: 002AS2-320471 TEST DATE(S): 3/272018 & 3/29/2018

LOCATION: Unit 1 and Unit 2 SAMPLER(S): Patrick Whitman

SAMPLE LOCATION: Stack Breaching PROJECT MANAGER: Dave Wonderly

TEST METHOD(S): SCAQMD 25.3 DATE DUE:

OUTSIDE LAB REQUIRED?: Yes COMPLIANCE TEST? Yes

| DATE | TIME | TEST # | SAMPLE DESCRIPTION | CONTAINERS | SAMPLER | COMMENTS |
|---|---|---|---|---|---|---|
| 3/27/2018 | 954/1037 | 1A-VOC-U2 | Tank # 341 Vial #M70 | 1 | PW | 10928 -1 |
| 3/27/2018 | 954/1037 | 1B-VOC-U2 | Tank # 114 Vial #M71 | 1 | PW | -2 |
| | | | | | | |
| | | | | | | |
| 3/29/2018 | 946/1033 | 1A-VOC-U1 | Tank # 368 Vial #M72 | 1 | PW | -3 |
| 3/29/2018 | 946/1033 | 1B-VOC-U1 | Tank # 158 Vial #M73 | 1 | PW | -4 |
| | | | | | | |
| | | | | | | |
| 3/29/2018 | | Blank | Vial M74 | | | -5 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| RELEASED BY | DATE/TIME | RECEIVED BY | DATE/TIME |
|---|---|---|---|
| [illegible] | 4-2-18 10:00 | SUP MYSS | 4/2/18 12:17 |
| SUP MYSS | 4/2/18 2:37 | [illegible] | 4/2/18 14:38 |
| | | | |
| | | | |

ANALYSIS REQUIRED: Total TGNMO By SCAQMD Method 25.3 Include O2, CO2

#180447

# CHAIN OF CUSTODY

CLIENT: Desert View Power PROJECT NO: 002AS2-320471 TEST DATE(S): 3/272018 & 3/29/2018

LOCATION: Unit 1 and Unit 2 SAMPLER(S): Patrick Whitman

SAMPLE LOCATION: Stack Breaching PROJECT MANAGER: Dave Wonderly

TEST METHOD(S): EPA 26A DATE DUE:

OUTSIDE LAB REQUIRED?: Yes COMPLIANCE TEST? Yes

| DATE | TIME | TEST # | SAMPLE DESCRIPTION | CONTAINERS | SAMPLER | COMMENTS |
|---|---|---|---|---|---|---|
| 3/27/2018 | 830/1104 | 1-HCL-Unit-2 | Impinger contents and Line rinse | 1 | PW | 107637 |
| 3/27/2018 | 1132/1404 | 2-HCL-Unit-2 | Impinger contents and Line rinse | 1 | PW | 107638 |
| 3/28/2018 | 801/1037 | 3-HCL-Unit-2 | Impinger contents and Line rinse | 1 | PW | 107639 |
| | | | | | | |
| | | | | | | |
| 3/29/2018 | 945/1208 | 1-HCL-Unit-1 | Impinger contents and Line rinse | 1 | PW | 107640 |
| 3/29/2018 | 1236/1304 | 2-HCL-Unit-1 | Impinger contents and Line rinse | 1 | PW | 107641 |
| 3/29/2018 | 1600/1810 | 3-HCL-Unit-1 | Impinger contents and Line rinse | 1 | PW | 107642 |
| | | | | | | |
| 3/28/2018 | 800 | Reagent Blank-HCL | 100 ML, DI $H_2O$ | 1 | DW | 107643 |
| 3/28/2018 | 800 | Reagent Blank-HCL | 200 ml 0.1 N, $H_2SO_4$ | 1 | | 107644 |
| 3/28/2018 | 1100 | Field Blank | Impinger contents and Line rinse | 1 | PW | 107645 |
| | | | | | | |

| RELEASED BY | DATE/TIME | RECEIVED BY | DATE/TIME |
|---|---|---|---|
| [illegible] | 4-2-18 [illegible] | [illegible] | 4/2/18 12:17 |
| [illegible] | 4/2/18 4:06 | | |
| | | [illegible] | 4/2/18 1606 |
| | | | |

ANALYSIS REQUIRED: HCl by EPA Method 26A report as mg/sample. Record total volume of each sample.

MONTROSE AIR QUALITY SERVICES

DS834001

Date of last revision – 2/14/2017

Master Document Storage\Forms\Datasheets\Lab Forms

# CHAIN OF CUSTODY

CLIENT: Desert View Power PROJECT NO: 002AS2-320471 TEST DATE(S): March 27, 28, 30 and 31, 2018

LOCATION: Unit 1 and Unit 2 SAMPLER(S): Patrick Whitman

SAMPLE LOCATION: Stack Breaching PROJECT MANAGER: Dave Wonderly

TEST METHOD(S): EPA 5 DATE DUE:

OUTSIDE LAB REQUIRED?: Yes COMPLIANCE TEST? Yes

| DATE | TIME | TEST # | SAMPLE DESCRIPTION | CONTAINERS | SAMPLER | COMMENTS |
|---|---|---|---|---|---|---|
| 3/27/2018 | 830/1104 | 1-PM-Unit-2 | Front 1/2 rinse, Filter # 83-2998 | 2 | PW | |
| 3/27/2018 | 1132/1404 | 2-PM-Unit-2 | Front 1/2 rinse, Filter # 83-3299 | 2 | PW | |
| 3/28/2018 | 801/1037 | 3-PM-Unit-2 | Front 1/2 rinse, Filter # 83-3300 | 2 | PW | |
| | | | | | PW | |
| | | | | | | |
| 3/30/2018 | 1729/1940 | 2-PM-Unit-1 | Front 1/2 rinse, Filter # 83-3302 | 2 | PW | |
| 3/31/2018 | 755/1005 | 3-PM-Unit-1 | Front 1/2 rinse, Filter # 83-3303 | 2 | PW | |
| 3/31/2018 | 1040/1250 | 4-PM-Unit-1 | Front 1/2 rinse, Filter # 83-3304 | 2 | PW | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| RELEASED BY | DATE/TIME | RECEIVED BY | DATE/TIME |
|---|---|---|---|
| [illegible] | 4-2-18 11:30 | AGB | 4/2/18 12:00 |
| | | | |
| | | | |
| | | | |

ANALYSIS REQUIRED: Particulate By EPA Method 5.

DS834001

# APPENDIX C

# CALCULATIONS

# APPENDIX C.1

# GENERAL EMISSIONS CALCULATIONS

**GENERAL EMISSION CALCULATIONS**

I. Stack Gas Velocity

A. Stack gas molecular weight, lb/lb-mole

$$MW_{dry} = 0.44 * \%CO_2 + 0.32 * \%O_2 + 0.28 * \%N_2$$

$$MW_{wet} = MW_{dry} * (1 - B_{wo}) + 18 * B_{wo}$$

B. Absolute stack pressure, iwg

$$Ps = Pbar + \frac{Psg}{13.6}$$

C. Stack gas velocity, ft/sec

$$V_s = 2.9 * C_p * \sqrt{\Delta P} * \sqrt{T_s} * \sqrt{\frac{29.92 * 28.95}{P_s * MW_{wet}}}$$

II. Moisture

A. Sample gas volume, dscf

$$V_{mstd} = 0.03342 * V_m * (P_{bar} + \frac{\Delta H}{13.6}) * \frac{T_{ref}}{T_m} * Y_d$$

B. Water vapor volume, scf

$$V_{wstd} = 0.0472 * V_{lc} * \frac{T_{ref}}{528\ ^oR}$$

C. Moisture content, dimensionless

$$B_{wo} = \frac{V_{wstd}}{(V_{mstd} + V_{wstd})}$$

III. Stack gas volumetric flow rate

A. Actual stack gas volumetric flow rate, wacfm

$$Q = V_s * A_s * 60$$

B. Standard stack gas flow rate, dscfm

$$Q_{sd} = Q * (1 - B_{wo}) * \frac{T_{ref}}{T_s} * \frac{P_s}{29.92}$$

IV. Gaseous Mass Emission Rates, lb/hr

$$M = \frac{ppm * MW_i * Q_{sd} * 60}{SV * 10^6}$$

V. Emission Rates, lb/MMBtu

$$\frac{lb}{MMBtu} = \frac{ppm * MW_i * F}{SV * 10^6} * \frac{20.9}{20.9 - \%O_2}$$

6. Percent Isokinetic

$$I = \frac{17.32 x T_s (V_m std)}{(1 - Bwo) 0 x V_s x Ps x Dn^2} x \frac{528^\circ R}{T_{ref}}$$

7. Particulate emissions

a) Grain loading, gr/dscf

C = 0.01543 ($M_n/V_{m\ std}$)

b) Grain loading at 12% $CO_2$, gr/dscf

$C_{12\%}$ $CO_2$ = C (12/% $CO_2$)

c) Mass emissions, lb/hr

M = C x Qsd x (60 min/hr)/(7000 gr/lb)

d) Particulate emission factor

$$lb/10^6 Btu = C x \frac{1 lb}{7000 gr} x F x \frac{20..9}{20.9 - \%O_2}$$

Nomenclature:

| | |
|---|---|
| $A_s$ | = stack area, $ft^2$ |
| $B_{wo}$ | = flue gas moisture content, dimensionless |
| $C_{12\%CO2}$ | = particulate grain loading, gr/dscf corrected to 12% $CO_2$ |
| C | = particulate grain loading, gr/dscf |
| $C_p$ | = pitot calibration factor, dimensionless |
| Dn | = nozzle diameter, in. |
| F | = fuel F-Factor, dscf/MMBtu @ 0% $O_2$ |
| H | = orifice differential pressure, iwg |
| I | = % isokinetics |
| $M_n$ | = mass of collected particulate, mg |
| $M_i$ | = mass emission rate of specie i, lb/hr |
| MW | = molecular weight of flue gas, lb/lb-mole |
| $M_{wi}$ | = molecular weight of specie i: |
| | $SO_2$: 64 |
| | $NO_x$: 46 |
| | CO: 28 |
| | HC: 16 |
| 0 | = sample time, min. |
| $\Delta P$ | = average velocity head, iwg = $(\sqrt{\Delta P})^2$ |
| $P_{bar}$ | = barometric pressure, inches Hg |
| $P_s$ | = stack absolute pressure, inches Hg |
| $P_{sg}$ | = stack static pressure, iwb |
| Q | = wet stack flow rate at actual conditions, wacfm |
| $Q_{sd}$ | = dry standard stack flow rate, dscfm |
| SV | = specific molar volume of an ideal gas at standard conditions, $ft^3$/lb-mole |
| $T_m$ | = meter temperature, °R |
| $T_{ref}$ | = reference temperature, °R |
| $T_s$ | = stack temperature, °R |
| $V_s$ | = stack gas velocity, ft/sec |
| $V_{lc}$ | = volume of liquid collected in impingers, ml |
| $V_m$ | = uncorrected dry meter volume, dcf |
| $V_{mstd}$ | = dry meter volume at standard conditions, dscf |
| $V_{wstd}$ | = volume of water vapor at standard conditions, scf |
| $Y_d$ | = meter calibration coefficient |

**RATA SPECIFIC EMISSION CALCULATIONS**

The following equations are used for Relative Accuracy Test Audit (RATA) Computational Procedures:

1. Stack Gas Corrected Concentration

a. $$C_{gas} = \left(\bar{C} - C_o\right)\frac{C_{ma}}{C_m - C_o}$$

2. Relative Accuracy Calculations

a. Average Difference

$$\bar{d} = \frac{1}{n}\sum_{i=1}^{n} d_i$$

b. Standard Deviation

$$S_d = \left[\frac{\sum_{i=1}^{n} d_i^{\,2} - \frac{\left(\sum_{i=1}^{n} d_i\right)^2}{n}}{n-1}\right]^{1/2}$$

c. Confidence Coefficient

$$CC = t_{0.975}\frac{S_d}{\sqrt{n}}$$

d. Relative Accuracy

$$RA = \frac{\left|\bar{d}\right| + \left|cc\right|}{\overline{RM}} x100$$

e. Reference Method Average

$$\overline{RM} = \frac{1}{n}\sum_{i=1}^{n} RM_i$$

3. Bias Adjustment Factor

a. $$BAF = 1 + \frac{|\bar{d}|}{\overline{CEM}}$$

4. Nomenclature

| | | |
|---|---|---|
| $C_{gas}$ | = | Corrected Stack Gas Concentration, ppm dry |
| $\bar{C}$ | = | Average Gas Concentration, ppm dry |
| $C_o$ | = | Average of the Initial and Final Zero Bias Check |
| $C_m$ | = | Average of the Initial and Final Upscale Delta Bias Check |
| $C_{ma}$ | = | Actual Value of Upscale Calibration Gas Concentration |
| $\bar{d}$ | = | Arithmetic Mean |
| $S_d$ | = | Standard Deviation |
| N | = | Number of Tests |
| CC | = | Confidence Coefficient |
| RA | = | Relative Accuracy |
| RM | = | Reference Method |
| $t_{0.975}$ | = | t Value |
| $\lvert d \rvert$ | = | Absolute Value of the Mean Difference |

# APPENDIX C.2

# UNIT 1 CALCULATIONS

# APPENDIX C.2.1

# UNIT 1 RATA AND GASEOUS CALCULATIONS

# Montrose AQS
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 1

### PRE-TEST INFORMATION
#### GENERAL

| | |
|---|---|
| Test: | 1-RA-U1 |
| Date: | 3/30/2018 |
| Start Time: | 14 55 |
| Station: | Desert View Power |
| Unit: | #1 |
| Test Condition: | Full Load |
| Performed By: | DW |

### PRE-TEST INFORMATION
#### SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.04 | "Hg |
| Meter No. | 1-P&M | |
| Meter $Y_d$ | 1 0030 | |
| Meter Pressure: | 2 5 | iwg |
| Pstack: | 0.36 | iwg |
| Pstack: | 30.06 | "Hg |
| Cp: | 0 84 | |
| Tref: | 68 | °F |
| Stack Area: | 38 84 | $ft^2$ |

### METHOD 4 DATA
#### Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 813.6 | 701.3 | 112.3 |
| 2/H2O | 708.2 | 702 0 | 6.2 |
| 3/Empty | 652.8 | 651.9 | 0.9 |
| 4/S.G. | 1018.7 | 1006 8 | 11.9 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 81.3 |

#### Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 447 800 | 95 | 91 |
| | | 94 | 91 |
| Stop | 475 867 | 94 | 90 |
| Total | 28.067 | | 92 5 |

#### Summary

| | | |
|---|---|---|
| Sample Volume: | 27.171 | dscf |
| $H_2O$ Volume : | 3.837 | scf |
| Moisture Content: | 12.4 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.300 | 1.1402 | 350 | 79.12 |
| 4 | 1.100 | 1.0488 | 350 | 72.78 |
| 3 | 1.200 | 1.0954 | 350 | 76.02 |
| 2 | 1.000 | 1.0000 | 349 | 69.35 |
| 1 | 0.950 | 0.9747 | 349 | 67.60 |
| 5 | 0.850 | 0.9220 | 346 | 63.82 |
| 4 | 0.880 | 0.9381 | 348 | 65.02 |
| 3 | 0.910 | 0 9539 | 348 | 66.12 |
| 2 | 0.940 | 0.9695 | 349 | 67.24 |
| 1 | 0.920 | 0.9592 | 349 | 66.52 |
| 5 | 1.100 | 1.0488 | 350 | 72.78 |
| 4 | 0.920 | 0.9592 | 350 | 66.56 |
| 3 | 0.570 | 0.7550 | 351 | 52.43 |
| 2 | 0.680 | 0.8246 | 351 | 57.26 |
| 1 | 0 710 | 0.8426 | 350 | 58.47 |
| 5 | 1.000 | 1.0000 | 351 | 69.44 |
| 4 | 1.100 | 1.0488 | 351 | 72.83 |
| 3 | 1 300 | 1.1402 | 351 | 79.17 |
| 2 | 0.870 | 0.9327 | 350 | 64.73 |
| 1 | 0.850 | 0.9220 | 350 | 63.98 |
| 5 | 1.300 | 1.1402 | 351 | 79.17 |
| 4 | 1.400 | 1.1832 | 351 | 82.16 |
| 3 | 1.000 | 1.0000 | 351 | 69.44 |
| 2 | 1.100 | 1.0488 | 350 | 72.78 |
| 1 | 0.970 | 0.9849 | 351 | 68.39 |
| 5 | 1.200 | 1.0954 | 351 | 76.07 |
| 4 | 1.000 | 1.0000 | 351 | 69.44 |
| 3 | 0.980 | 0.9899 | 351 | 68.74 |
| 2 | 0.930 | 0.9644 | 350 | 66.92 |
| 1 | 0.950 | 0.9747 | 350 | 67.64 |
| Average | 0.9905 | 0.9952 | 350.0 | 69.07 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Analyzer Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10 81 | 11.04 | 48 4 | 4.68 |
| Pre Test Zero Direct | 0 04 | 0.01 | 0 17 | 0.01 |
| Pre Test Span Direct | 10.82 | 10 89 | 48.75 | 4.73 |
| Pre-test Zero | 0 04 | 0 04 | 0 17 | -0 03 |
| Pre-test Span | 10 71 | 10 86 | 48.20 | 4 63 |
| 0-30 min | 8 41 | 11 91 | 37 70 | 0 02 |
| Post-test Zero | 0 04 | 0 04 | 0 22 | -0 01 |
| Post-test Span | 10 80 | 10 86 | 47 83 | 4 61 |
| Post Test Zero Direct | 0 04 | 0 01 | 0 15 | 0 02 |
| Post Test Span Direct | 10 89 | 10 92 | 48 14 | 4 72 |
| Average | 8.41 | 11.91 | 37.70 | 0.02 |
| Corr. Results | 8.44 | 12.12 | 37.96 | 0.04 |
| | Cal Error <2% | Bias <5% | Drift <3% | |
| Calibrtion Error | 0.0% | -0.8% | 0.4% | 0.6% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.0% | -0.4% |
| Pre-Test Span Bias | -0.5% | -0.2% | -0 6% | -1.1% |
| Post-Test Zero Bias | 0.0% | 0 2% | 0.1% | -0.3% |
| Post-Test Span Bias | -0.4% | -0.4% | -0.3% | -1.2% |
| Zero Drift | 0.0% | 0.0% | 0.0% | 0.2% |
| Span Drift | 0.5% | 0 0% | -0.4% | -0.3% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.442 | % dry |
| | 7.397 | % wet |
| $CO_2$: | 12.116 | % dry |
| | 10.616 | % wet |
| $NO_x$: | 37.958 | ppm dry |
| | 33.260 | ppm wet |
| | 25.117 | lb/hr |
| $SO_2$: | 9.8998383 | ppm dry |
| SO2: | 9.114 | lb/hr |
| CO: | 0.04 | ppm dry |
| | 0.04 | ppm wet |
| | 0.016 | lb/hr |
| $H_2O$: | 12.4 | % |
| MW: | 28.76 | lb/lb-mole |
| Flow: | 160,954 | wacfm |
| | 92.38 | mdscfm |
| | 5542.51 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5542.51 | 5455.77 | 86.75 | 1.6% |
| $O_2$ | % dry | 8.44 | 8.5 | -0.01 | -0.2% |
| $CO_2$ | % dry | 12.12 | 12.1 | 0.05 | 0.4% |
| $NO_x$ | ppm dry | 37.96 | 39 7 | -1.75 | -4.6% |
| $NO_x$ | ppm @ 3% $O_2$ | 54.54 | 57 0 | -2.44 | -4.5% |
| $NO_x$ | lb/hr | 25.12 | 25.92 | -0.80 | -3.2% |
| $SO_2$ | ppm dry | 9.90 | 8 93 | 0.97 | 9.8% |
| $SO_2$ | ppm @ 3% $O_2$ | 14.22 | 12.83 | 1.40 | 9.8% |
| $SO_2$ | lb/hr | 9.11 | 8 123 | 0.991 | 10.9% |
| CO | ppm dry | 0.04 | 2 75 | -2.71 | |
| CO | ppm @ 3% $O_2$ | 0.06 | 3 95 | -3.89 | |
| CO | lb/hr | 0.016 | 1 089 | -1.07 | |

### SOx Titration Summary

| | B1/2 | Probe |
|---|---|---|
| N BaCl2 | 0.0100000 | |
| Total VOL (ml) | 437 | |
| Aliquot VOL (ml) | 20 | |
| Titrant VOL (ml) | 2.90 | |

# Montrose AQS
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 1

### PRE-TEST INFORMATION
GENERAL

| | |
|---|---|
| Test: | 2-RA-U1 |
| Date: | 3/30/2018 |
| Start Time: | 15:38 |
| Station: | Desert View Power |
| Unit: | #1 |
| Test Condition: | Full Load |
| Performed By: | DW |

### PRE-TEST INFORMATION
SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.04 | "Hg |
| Meter No. | 1-P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0.36 | iwg |
| Pstack: | 30.06 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
**Impingers**

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 852.8 | 744.5 | 108.3 |
| 2/H2O | 753.3 | 746.6 | 6.7 |
| 3/Empty | 468.8 | 467.0 | 1.8 |
| 4/S.G. | 862.9 | 846.8 | 16.1 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 82.9 |

**Dry Gas Meter**

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 476.600 | 94 | 89 |
| | | 94 | 90 |
| Stop | 504.300 | 93 | 88 |
| Total | 27.700 | | 91.3 |

**Summary**

| | | |
|---|---|---|
| Sample Volume: | 26.873 | dscf |
| $H_2O$ Volume : | 3.913 | scf |
| Moisture Content: | 12.7 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.100 | 1.0488 | 351 | 72.86 |
| 4 | 0.930 | 0.9644 | 351 | 67.00 |
| 3 | 0.810 | 0.9000 | 352 | 62.56 |
| 2 | 0.760 | 0.8718 | 352 | 60.60 |
| 1 | 0.680 | 0.8246 | 351 | 57.29 |
| 5 | 1.100 | 1.0488 | 352 | 72.91 |
| 4 | 0.920 | 0.9592 | 352 | 66.68 |
| 3 | 0.560 | 0.7483 | 352 | 52.02 |
| 2 | 0.690 | 0.8307 | 351 | 57.71 |
| 1 | 0.660 | 0.8124 | 351 | 56.44 |
| 5 | 0.850 | 0.9220 | 352 | 64.09 |
| 4 | 0.890 | 0.9434 | 352 | 65.58 |
| 3 | 0.900 | 0.9487 | 351 | 65.91 |
| 2 | 0.930 | 0.9644 | 352 | 67.04 |
| 1 | 0.920 | 0.9592 | 352 | 66.68 |
| 5 | 1.100 | 1.0488 | 352 | 72.91 |
| 4 | 1.200 | 1.0954 | 352 | 76.15 |
| 3 | 0.940 | 0.9695 | 352 | 67.40 |
| 2 | 0.960 | 0.9798 | 352 | 68.11 |
| 1 | 0.850 | 0.9220 | 351 | 64.05 |
| 5 | 1.000 | 1.0000 | 351 | 69.47 |
| 4 | 0.990 | 0.9950 | 352 | 69.17 |
| 3 | 1.100 | 1.0488 | 352 | 72.91 |
| 2 | 0.940 | 0.9695 | 352 | 67.40 |
| 1 | 0.910 | 0.9539 | 351 | 66.27 |
| 5 | 1.100 | 1.0488 | 351 | 72.86 |
| 4 | 1.000 | 1.0000 | 352 | 69.52 |
| 3 | 0.960 | 0.9798 | 352 | 68.11 |
| 2 | 0.910 | 0.9539 | 352 | 66.31 |
| 1 | 0.890 | 0.9434 | 352 | 65.58 |
| Average | 0.9124 | 0.9552 | 351.7 | 66.39 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Analyzer Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.01 | 0.15 | 0.02 |
| Pre Test Span Direct | 10.89 | 10.92 | 48.14 | 4.72 |
| Pre-test Zero | 0.04 | 0.04 | 0.22 | -0.01 |
| Pre-test Span | 10.80 | 10.86 | 47.83 | 4.61 |
| 0-30 min | 8.43 | 11.98 | 38.50 | 0.09 |
| Post-test Zero | 0.04 | 0.04 | 0.20 | 0.00 |
| Post-test Span | 10.76 | 10.81 | 47.94 | 4.72 |
| Post Test Zero Direct | 0.04 | 0.01 | 0.16 | 0.01 |
| Post Test Span Direct | 10.82 | 10.89 | 48.25 | 4.74 |
| Average | 8.43 | 11.98 | 38.50 | 0.09 |
| Corr. Results | 8.44 | 12.21 | 38.87 | 0.09 |
| | Cal Error < 2 ; Bias < 5%, Drift <3% | | | |
| Calibrtion Error | 0.4% | -0.6% | -0.3% | 0.4% |
| Pre-Test Zero Bias | 0.0% | 0.2% | 0.1% | -0.3% |
| Pre-Test Span Bias | -0.4% | -0.4% | -0.3% | -1.2% |
| Post-Test Zero Bias | 0.0% | 0.2% | 0.0% | -0.1% |
| Post-Test Span Bias | -0.3% | -0.4% | -0.3% | -0.2% |
| Zero Drift | 0.0% | 0.0% | 0.0% | 0.1% |
| Span Drift | -0.2% | -0.2% | 0.1% | 1.2% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.438 | % dry |
| | 7.365 | % wet |
| $CO_2$: | 12.208 | % dry |
| | 10.657 | % wet |
| $NO_x$: | 38.874 | ppm dry |
| | 33.933 | ppm wet |
| | 24.580 | lb/hr |
| $SO_2$: | 9.445391 | ppm dry |
| | 8.309 | lb/hr |
| CO: | 0.09 | ppm dry |
| | 0.08 | ppm wet |
| | 0.036 | lb/hr |
| $H_2O$: | 12.7 | % |
| MW: | 28.73 | lb/lb-mole |
| Flow: | 154,708 | wacfm |
| | 88.269 | mdscfm |
| | 5296.17 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5296.17 | 5370.90 | -74.73 | -1.4% |
| $O_2$ | % dry | 8.44 | 8.4 | 0.06 | 0.7% |
| $CO_2$ | % dry | 12.21 | 12.1 | 0.09 | 0.8% |
| $NO_x$ | ppm dry | 38.87 | 40.3 | -1.41 | -3.6% |
| $NO_x$ | ppm @ 3% $O_2$ | 55.84 | 57.2 | -1.40 | -2.5% |
| $NO_x$ | lb/hr | 24.58 | 26.1 | -1.50 | -6.1% |
| $SO_2$ | ppm dry | 9.45 | 7.85 | 1.60 | 16.9% |
| $SO_2$ | ppm @ 3% $O_2$ | 13.57 | 11.20 | 2.37 | 17.5% |
| $SO_2$ | lb/hr | 8.309 | 7.105 | 1.204 | 14.5% |
| CO | ppm dry | 0.09 | 2.49 | -2.40 | |
| CO | ppm @ 3% $O_2$ | 0.14 | 3.56 | -3.42 | |
| CO | lb/hr | 0.036 | 0.974 | | |

### SOx Titration Summary

| | B1/2 | Probe |
|---|---|---|
| N BaCl2 | 0.0100000 | |
| Total VOL (ml) | 404 | |
| Aliquot VOL (ml) | 20 | |
| Titrant VOL (ml) | 2.96 | |

**Montrose AQS**
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
**Desert View Power UNIT 1**

| PRE-TEST INFORMATION GENERAL | | |
|---|---|---|
| Test: | 3-RA-U1 | |
| Date: | 3/30/2018 | |
| Start Time: | 16:22 | |
| Station: | Desert View Power | |
| Unit: | #1 | |
| Test Condition: | Full Load | |
| Performed By: | DW | |

| PRE-TEST INFORMATION SAMPLE TRAIN | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.04 | "Hg |
| Meter No. | 1-P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0.36 | iwg |
| Pstack: | 30.06 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

METHOD 4 DATA

**Impingers**

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 801.3 | 694.7 | 106.6 |
| 2/H2O | 714.1 | 706.3 | 7.8 |
| 3/Empty | 651.4 | 650.0 | 1.4 |
| 4/S.G. | 918.0 | 905.8 | 12.2 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 78.0 |

**Dry Gas Meter**

| Time | Vol | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 504.900 | 95 | 90 |
| | | 94 | 88 |
| Stop | 532.000 | 93 | 87 |
| Total | 27.100 | | 91.2 |

**Summary**

| | | |
|---|---|---|
| Sample Volume: | 26.299 | dscf |
| $H_2O$ Volume : | 3.682 | scf |
| Moisture Content: | 12.3 | % |

METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.200 | 1.0954 | 353 | 76.15 |
| 4 | 0.950 | 0.9747 | 353 | 67.76 |
| 3 | 0.830 | 0.9110 | 354 | 63.37 |
| 2 | 0.770 | 0.8775 | 354 | 61.04 |
| 1 | 0.680 | 0.8246 | 354 | 57.36 |
| 5 | 1.100 | 1.0488 | 354 | 72.96 |
| 4 | 0.930 | 0.9644 | 354 | 67.08 |
| 3 | 0.590 | 0.7681 | 354 | 53.43 |
| 2 | 0.660 | 0.8124 | 353 | 56.48 |
| 1 | 0.680 | 0.8246 | 353 | 57.33 |
| 5 | 0.890 | 0.9434 | 353 | 65.58 |
| 4 | 0.880 | 0.9381 | 354 | 65.25 |
| 3 | 0.930 | 0.9644 | 354 | 67.08 |
| 2 | 0.950 | 0.9747 | 353 | 67.76 |
| 1 | 0.900 | 0.9487 | 353 | 65.95 |
| 5 | 1.000 | 1.0000 | 354 | 69.56 |
| 4 | 1.100 | 1.0488 | 354 | 72.96 |
| 3 | 0.940 | 0.9695 | 354 | 67.44 |
| 2 | 0.970 | 0.9849 | 353 | 68.47 |
| 1 | 0.850 | 0.9220 | 353 | 64.09 |
| 5 | 1.000 | 1.0000 | 352 | 69.48 |
| 4 | 1.100 | 1.0488 | 353 | 72.91 |
| 3 | 1.200 | 1.0954 | 353 | 76.15 |
| 2 | 1.100 | 1.0488 | 352 | 72.87 |
| 1 | 1.000 | 1.0000 | 352 | 69.48 |
| 5 | 1.200 | 1.0954 | 352 | 76.11 |
| 4 | 1.300 | 1.1402 | 353 | 79.26 |
| 3 | 1.400 | 1.1832 | 352 | 82.21 |
| 2 | 1.200 | 1.0954 | 352 | 76.11 |
| 1 | 1.000 | 1.0000 | 352 | 69.48 |
| Average | 0.9672 | 0.9834 | 353.1 | 68.37 |

METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.01 | 0.16 | 0.01 |
| Pre Test Span Direct | 10.82 | 10.89 | 48.25 | 4.74 |
| Pre-test Zero | 0.04 | 0.04 | 0.20 | 0.00 |
| Pre-test Span | 10.76 | 10.81 | 47.94 | 4.72 |
| 0-30 min | 8.49 | 11.84 | 40.59 | 0.09 |
| Post-test Zero | 0.04 | 0.04 | 0.19 | 0.11 |
| Post-test Span | 10.74 | 10.90 | 48.20 | 4.75 |
| Post Test Zero Direct | 0.04 | 0.01 | 0.17 | 0.02 |
| Post Test Span Direct | 10.79 | 10.93 | 48.33 | 4.72 |
| Average | 8.49 | 11.84 | 40.59 | 0.09 |
| Corr. Results | 8.53 | 12.04 | 40.84 | 0.04 |
| | Cal Error <2%, Bias <5%, Drift <3% | | | |
| Calibrtion Error | 0.0% | -0.8% | -0.2% | 0.6% |
| Pre-Test Zero Bias | 0.0% | 0.2% | 0.0% | -0.1% |
| Pre-Test Span Bias | -0.3% | -0.4% | -0.3% | -0.2% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.0% | 1.0% |
| Post-Test Span Bias | -0.3% | 0.0% | -0.1% | 0.3% |
| Zero Drift | 0.0% | 0.0% | 0.0% | 1.2% |
| Span Drift | -0.1% | 0.5% | 0.3% | 0.3% |

TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.530 | % dry |
| | 7.483 | % wet |
| $CO_2$: | 12.042 | % dry |
| | 10.563 | % wet |
| $NO_x$: | 40.837 | ppm dry |
| | 35.822 | ppm wet |
| | 26.676 | lb/hr |
| $SO_2$: | 13.075303 | ppm dry |
| | 11.883 | lb/hr |
| CO: | 0.04 | ppm dry |
| | 0.03 | ppm wet |
| | 0.015 | lb/hr |
| $H_2O$: | 12.3 | % |
| MW: | 28.76 | lb/lb-mole |
| Flow: | 159,335 | wacfm |
| | 91.19 | mdscfm |
| | 5471.57 | kdscfh |

RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5471.57 | 5424 | 47.70 | 0.9% |
| $O_2$ | % dry | 8.53 | 8.5 | 0.00 | 0.0% |
| $CO_2$ | % dry | 12.04 | 11.9 | 0.11 | 0.9% |
| $NO_x$ | ppm dry | 40.84 | 42.2 | -1.35 | -3.3% |
| $NO_x$ | ppm @ 3% $O_2$ | 59.10 | 60.8 | -1.74 | -2.9% |
| $NO_x$ | lb/hr | 26.68 | 27.45 | -0.77 | -2.9% |
| $SO_2$ | ppm dry | 13.08 | 12.52 | 0.55 | 4.2% |
| $SO_2$ | ppm @ 3% $O_2$ | 18.92 | 18.02 | 0.90 | 4.7% |
| $SO_2$ | lb/hr | 11.883 | 11.333 | 0.551 | 4.6% |
| CO | ppm dry | 0.04 | 2.39 | -2.35 | |
| CO | ppm @ 3% $O_2$ | 0.05 | 3.45 | -3.40 | |
| CO | lb/hr | 0.015 | 0.945 | -0.93 | |

SOx Titration Summary

| | B1/2 | Probe |
|---|---|---|
| N BaCl2 | 0.0100000 | |
| Total VOL (ml) | 404 | |
| Aliquot VOL (ml) | 20 | |
| Titrant VOL (ml) | 4.01 | |

# Montrose AQS
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 1

### PRE-TEST INFORMATION
#### GENERAL

| | |
|---|---|
| Test: | 4-RA-U1 |
| Date: | 3/30/2018 |
| Start Time: | 17.05 |
| Station: | Desert View Power |
| Unit: | #1 |
| Test Condition: | Full Load |
| Performed By: | DW |

#### PRE-TEST INFORMATION
#### SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.04 | "Hg |
| Meter No. | 1-P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0.36 | iwg |
| Pstack: | 30.06 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
#### Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 870.8 | 761.7 | 109.1 |
| 2/H2O | 768.2 | 762.7 | 5.5 |
| 3/Empty | 470.1 | 467.7 | 2.4 |
| 4/S.G. | 872.6 | 862.9 | 9.7 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 76.7 |

#### Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 533.600 | 94 | 89 |
| | | 94 | 88 |
| Stop | 560.757 | 93 | 87 |
| Total | 27.157 | | 90.8 |

#### Summary

| | | |
|---|---|---|
| Sample Volume: | 26.370 | dscf |
| $H_2O$ Volume : | 3.620 | scf |
| Moisture Content: | 12.1 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.200 | 1.0954 | 351 | 76.05 |
| 4 | 1.300 | 1.1402 | 351 | 79.16 |
| 3 | 1.400 | 1.1832 | 351 | 82.14 |
| 2 | 1.200 | 1.0954 | 351 | 76.05 |
| 1 | 1.000 | 1.0000 | 350 | 69.38 |
| 5 | 1.100 | 1.0488 | 351 | 72.81 |
| 4 | 1.100 | 1.0488 | 352 | 72.86 |
| 3 | 1.200 | 1.0954 | 352 | 76.10 |
| 2 | 1.100 | 1.0488 | 351 | 72.81 |
| 1 | 0.990 | 0.9950 | 351 | 69.08 |
| 5 | 1.000 | 1.0000 | 352 | 69.47 |
| 4 | 1.200 | 1.0954 | 351 | 76.05 |
| 3 | 0.940 | 0.9695 | 351 | 67.31 |
| 2 | 0.960 | 0.9798 | 351 | 68.02 |
| 1 | 0.850 | 0.9220 | 350 | 63.97 |
| 5 | 0.860 | 0.9274 | 351 | 64.38 |
| 4 | 0.890 | 0.9434 | 351 | 65.50 |
| 3 | 0.900 | 0.9487 | 351 | 65.86 |
| 2 | 0.950 | 0.9747 | 350 | 67.63 |
| 1 | 0.930 | 0.9644 | 350 | 66.91 |
| 5 | 1.100 | 1.0488 | 351 | 72.81 |
| 4 | 0.950 | 0.9747 | 351 | 67.67 |
| 3 | 0.590 | 0.7681 | 351 | 53.33 |
| 2 | 0.660 | 0.8124 | 350 | 56.37 |
| 1 | 0.680 | 0.8246 | 350 | 57.21 |
| 5 | 1.000 | 1.0000 | 351 | 69.42 |
| 4 | 0.940 | 0.9695 | 351 | 67.31 |
| 3 | 0.830 | 0.9110 | 352 | 63.29 |
| 2 | 0.770 | 0.8775 | 352 | 60.96 |
| 1 | 0.690 | 0.8307 | 351 | 57.67 |
| Average | 0.9665 | 0.9831 | 351.0 | 68.25 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.01 | 0.17 | 0.02 |
| Pre Test Span Direct | 10.79 | 10.91 | 48.33 | 4.72 |
| Pre-test Zero | 0.04 | 0.04 | 0.19 | 0.11 |
| Pre-test Span | 10.74 | 10.90 | 48.20 | 4.75 |
| 0-30 min | 8.58 | 11.72 | 38.05 | 0.09 |
| Post-test Zero | 0.04 | 0.04 | 0.20 | 0.02 |
| Post-test Span | 10.74 | 10.87 | 48.0* | 4.73 |
| Post Test Zero Direct | 0.04 | 0.01 | 0.16 | 0.04 |
| Post Test Span Direct | 10.79 | 10.90 | 48.43 | 4.75 |
| Average | 8.58 | 11.72 | 38.05 | 0.09 |
| Corr. Results | 8.62 | 11.89 | 38.24 | 0.03 |
| | Cal Error <2%, Bias <5%, Drift <3% | | | |
| Calibrtion Error | -0.1% | -0.7% | -0.1% | 0.4% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.0% | 1.0% |
| Pre-Test Span Bias | -0.3% | 0.0% | -0.1% | 0.3% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.0% | -0.3% |
| Post-Test Span Bias | -0.3% | -0.2% | -0.4% | -0.3% |
| Zero Drift | 0.0% | 0.0% | 0.0% | -1.0% |
| Span Drift | 0.0% | -0.2% | -0.2% | -0.2% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.624 | % dry |
| | 7.583 | % wet |
| $CO_2$: | 11.887 | % dry |
| | 10.452 | % wet |
| $NO_x$: | 38.242 | ppm dry |
| | 33.626 | ppm wet |
| | 25.064 | lb/hr |
| $SO_2$: | 12.512185 | ppm dry |
| | 11.409 | lb/hr |
| CO: | 0.03 | ppm dry |
| | 0.02 | ppm wet |
| | 0.011 | lb/hr |
| $H_2O$: | 12.1 | % |
| MW: | 28.77 | lb/lb-mole |
| Flow: | 159,056 | wacfm |
| | 91.49 | mdscfm |
| | 5489.60 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5489.60 | 5352.53 | 137.06 | 2.5% |
| $O_2$ | % dry | 8.62 | 8.6 | 0.01 | 0.1% |
| $CO_2$ | % dry | 11.89 | 11.9 | 0.02 | 0.2% |
| $NO_x$ | ppm dry | 38.24 | 39.8 | -1.56 | -4.1% |
| $NO_x$ | ppm @ 3% $O_2$ | 55.76 | 57.8 | -2.02 | -3.6% |
| $NO_x$ | lb/hr | 25.06 | 25.5323 | -0.47 | -1.9% |
| $SO_2$ | ppm dry | 12.51 | 12.50 | 0.02 | 0.1% |
| $SO_2$ | ppm @ 3% $O_2$ | 18.24 | 18.15 | 0.09 | 0.5% |
| $SO_2$ | lb/hr | 11.409 | 11.145 | 0.264 | 2.3% |
| CO | ppm dry | 0.03 | 2.44 | -2.41 | |
| CO | ppm @ 3% $O_2$ | 0.04 | 3.55 | -3.51 | |
| CO | lb/hr | 0.011 | 0.948 | | |

### SOx Titration Summary

| | B1/2 | Probe |
|---|---|---|
| N BaCl2 | 0.0100000 | |
| Total VOL (ml) | 433 | |
| Aliquot VOL (ml) | 20 | |
| Titrant VOL (ml) | 3.59 | |

# Montrose AQS
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 1

### PRE-TEST INFORMATION
#### GENERAL

| | |
|---|---|
| Test: | 5-RA-U1 |
| Date: | 3/30/2018 |
| Start Time: | 17:50 |
| Station: | Desert View Power |
| Unit: | #1 |
| Test Condition: | Full Load |
| Performed By: | DW |

### PRE-TEST INFORMATION
#### SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.04 | "Hg |
| Meter No. | 1-P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0.36 | iwg |
| Pstack: | 30.06 | "Hg |
| Cp: | 0.84 | |
| Tref: | 66 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
#### Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 834.6 | 720.0 | 114.6 |
| 2/H2O | 713.1 | 708.1 | 5.0 |
| 3/Empty | 651.3 | 650.3 | 1.0 |
| 4/S.G. | 928.3 | 918.0 | 10.3 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 80.9 |

#### Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 561.800 | 91 | 87 |
| | | 90 | 86 |
| Stop | 589.487 | 88 | 84 |
| Total | 27.687 | | 87.7 |

#### Summary

| | | |
|---|---|---|
| Sample Volume: | 27.040 | dscf |
| $H_2O$ Volume : | 3.818 | scf |
| Moisture Content: | 12.4 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.100 | 1.0488 | 357 | 73.12 |
| 4 | 0.950 | 0.9747 | 350 | 67.66 |
| 3 | 0.860 | 0.9274 | 351 | 64.42 |
| 2 | 0.840 | 0.9165 | 351 | 63.67 |
| 1 | 0.860 | 0.9274 | 351 | 64.42 |
| 5 | 1.200 | 1.0954 | 350 | 76.05 |
| 4 | 1.000 | 1.0000 | 351 | 69.46 |
| 3 | 0.950 | 0.9747 | 351 | 67.71 |
| 2 | 0.690 | 0.8307 | 351 | 57.70 |
| 1 | 0.710 | 0.8426 | 350 | 58.50 |
| 5 | 0.910 | 0.9539 | 351 | 66.26 |
| 4 | 0.900 | 0.9487 | 351 | 65.90 |
| 3 | 0.940 | 0.9695 | 351 | 67.35 |
| 2 | 1.000 | 1.0000 | 351 | 69.46 |
| 1 | 0.970 | 0.9849 | 350 | 68.37 |
| 5 | 1.100 | 1.0488 | 351 | 72.85 |
| 4 | 1.100 | 1.0488 | 352 | 72.90 |
| 3 | 1.000 | 1.0000 | 351 | 69.46 |
| 2 | 0.940 | 0.9695 | 351 | 67.35 |
| 1 | 0.910 | 0.9539 | 350 | 66.22 |
| 5 | 1.100 | 1.0488 | 351 | 72.85 |
| 4 | 1.100 | 1.0488 | 351 | 72.85 |
| 3 | 0.950 | 0.9747 | 350 | 67.66 |
| 2 | 0.940 | 0.9695 | 350 | 67.31 |
| 1 | 0.910 | 0.9539 | 351 | 66.26 |
| 5 | 1.000 | 1.0000 | 351 | 69.46 |
| 4 | 1.200 | 1.0954 | 351 | 76.09 |
| 3 | 1.100 | 1.0488 | 352 | 72.90 |
| 2 | 1.200 | 1.0954 | 352 | 76.14 |
| 1 | 0.990 | 0.9950 | 351 | 69.12 |
| Average | 0.9766 | 0.9882 | 351.1 | 68.65 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.01 | 0.16 | 0.04 |
| Pre Test Span Direct | 10.79 | 10.90 | 48.43 | 4.75 |
| Pre-test Zero | 0.04 | 0.04 | 0.20 | 0.02 |
| Pre-test Span | 10.74 | 10.87 | 48.01 | 4.73 |
| 0-30 min | 8.54 | 11.73 | 37.55 | 0.10 |
| Post-test Zero | 0.04 | 0.04 | 0.22 | 0.04 |
| Post-test Span | 10.74 | 10.85 | 48.23 | 4.74 |
| Post Test Zero Direct | 0.04 | 0.01 | 0.17 | 0.02 |
| Post Test Span Direct | 10.82 | 10.88 | 48.48 | 4.74 |
| Average | 8.54 | 11.73 | 37.55 | 0.10 |
| Corr. Results | 8.59 | 11.93 | 37.72 | 0.07 |
| | Cal. Error <2% | Bias <5% | Drift <3% | |
| Calibrtion Error | -0.1% | -0.7% | 0.0% | 0.8% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.0% | -0.3% |
| Pre-Test Span Bias | -0.3% | -0.2% | -0.4% | -0.3% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.2% |
| Post-Test Span Bias | -0.4% | -0.2% | -0.3% | 0.1% |
| Zero Drift | 0.0% | 0.0% | 0.0% | 0.2% |
| Span Drift | 0.0% | -0.1% | 0.2% | 0.1% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.589 | % dry |
| | 7.526 | % wet |
| $CO_2$: | 11.927 | % dry |
| | 10.451 | % wet |
| $NO_x$: | 37.722 | ppm dry |
| | 33.054 | ppm wet |
| | 24.778 | lb/hr |
| $SO_2$: | 12.010033 | ppm dry |
| | 10.976 | lb/hr |
| CO: | 0.07 | ppm dry |
| | 0.06 | ppm wet |
| | 0.029 | lb/hr |
| $H_2O$: | 12.4 | % |
| MW: | 28.74 | lb/lb-mole |
| Flow: | 159,983 | wacfm |
| | 91.70 | mdscfm |
| | 5501.90 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5501.90 | 5449.67 | 52.24 | 0.9% |
| $O_2$ | % dry | 8.59 | 8.6 | 0.03 | 0.4% |
| $CO_2$ | % dry | 11.93 | 11.9 | 0.02 | 0.2% |
| $NO_x$ | ppm dry | 37.72 | 39.6 | -1.89 | -5.0% |
| $NO_x$ | ppm @ 3% $O_2$ | 54.85 | 57.1 | -2.30 | -4.2% |
| $NO_x$ | lb/hr | 24.78 | 25.8983 | -1.12 | -4.5% |
| $SO_2$ | ppm dry | 12.01 | 12.03 | -0.02 | -0.1% |
| $SO_2$ | ppm @ 3% $O_2$ | 17.46 | 17.37 | 0.09 | 0.5% |
| $SO_2$ | lb/hr | 10.976 | 10.925 | 0.051 | 0.5% |
| CO | ppm dry | 0.07 | 2.16 | -2.09 | |
| CO | ppm @ 3% $O_2$ | 0.10 | 3.14 | -3.03 | |
| CO | lb/hr | 0.029 | 0.862 | -0.83 | |

### SOx Titration Summary

| | B1/2 | Probe |
|---|---|---|
| N BaCl2 | 0.0100000 | |
| Total VOL (ml) | 408 | |
| Aliquot VOL (ml) | 20 | |
| Titrant VOL (ml) | 3.75 | |

# Montrose AQS
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 1

### PRE-TEST INFORMATION
#### GENERAL

| | |
|---|---|
| Test: | 6-RA-U1 |
| Date: | 3/30/2018 |
| Start Time: | 18:33 |
| Station: | Desert View Power |
| Unit: | #1 |
| Test Condition: | Full Load |
| Performed By: | DW |

### PRE-TEST INFORMATION
#### SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.04 | "Hg |
| Meter No. | 1-P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0.36 | iwg |
| Pstack: | 30.06 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
#### Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 883.7 | 768.7 | 115.0 |
| 2/H2O | 759.4 | 757.5 | 1.9 |
| 3/Empty | 469.7 | 468.0 | 1.7 |
| 4/S.G. | 882.6 | 862.9 | 19.7 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 88.3 |

#### Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 590.300 | 94 | 89 |
| | | 93 | 88 |
| Stop | 617.882 | 92 | 89 |
| Total | 27.582 | | 90.8 |

#### Summary

| | | |
|---|---|---|
| Sample Volume: | 26.783 | dscf |
| $H_2O$ Volume . | 4.168 | scf |
| Moisture Content: | 13.5 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.200 | 1.0954 | 352 | 76.31 |
| 4 | 1.000 | 1.0000 | 352 | 69.66 |
| 3 | 0.910 | 0.9539 | 352 | 66.45 |
| 2 | 0.870 | 0.9327 | 352 | 64.98 |
| 1 | 0.790 | 0.8888 | 351 | 61.88 |
| 5 | 1.200 | 1.0954 | 352 | 76.31 |
| 4 | 0.950 | 0.9747 | 351 | 67.86 |
| 3 | 0.910 | 0.9539 | 351 | 66.41 |
| 2 | 0.880 | 0.9381 | 352 | 65.35 |
| 1 | 0.850 | 0.9220 | 351 | 64.19 |
| 5 | 0.930 | 0.9644 | 351 | 67.14 |
| 4 | 0.940 | 0.9695 | 351 | 67.50 |
| 3 | 0.910 | 0.9539 | 352 | 66.45 |
| 2 | 0.960 | 0.9798 | 352 | 68.25 |
| 1 | 0.990 | 0.9950 | 351 | 69.27 |
| 5 | 1.100 | 1.0488 | 352 | 73.06 |
| 4 | 1.200 | 1.0954 | 352 | 76.31 |
| 3 | 0.950 | 0.9747 | 352 | 67.90 |
| 2 | 0.910 | 0.9539 | 351 | 66.41 |
| 1 | 0.860 | 0.9274 | 351 | 64.56 |
| 5 | 0.990 | 0.9950 | 351 | 69.27 |
| 4 | 1.000 | 1.0000 | 351 | 69.62 |
| 3 | 1.200 | 1.0954 | 352 | 76.31 |
| 2 | 1.100 | 1.0488 | 352 | 73.06 |
| 1 | 0.980 | 0.9899 | 351 | 68.92 |
| 5 | 1.200 | 1.0954 | 351 | 76.26 |
| 4 | 1.200 | 1.0954 | 351 | 76.26 |
| 3 | 1.400 | 1.1832 | 352 | 82.43 |
| 2 | 1.100 | 1.0488 | 351 | 73.02 |
| 1 | 1.000 | 1.0000 | 352 | 69.66 |
| Average | 1.0114 | 1.0057 | 351.5 | 70.04 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.01 | 0.17 | 0.02 |
| Pre Test Span Direct | 10.82 | 10.88 | 48.48 | 4.74 |
| Pre-test Zero | 0.04 | 0.04 | 0.22 | 0.04 |
| Pre-test Span | 10.74 | 10.85 | 48.23 | 4.74 |
| 0-30 min | 8.50 | 11.77 | 35.94 | 0.10 |
| Post-test Zero | 0.04 | 0.04 | 0.22 | 0.05 |
| Post-test Span | 10.76 | 10.85 | 48.47 | 4.73 |
| Post Test Zero Direct | 0.04 | 0.01 | 0.17 | 0.09 |
| Post Test Span Direct | 10.82 | 10.89 | 48.82 | 4.75 |
| Average | 8.50 | 11.77 | 35.94 | 0.10 |
| Corr. Results | 8.54 | 11.98 | 35.92 | 0.06 |
| | Cal Error <2% | Bias <5% | Drift <3% | |
| Calibrtion Error | 0.0% | -0.9% | 0.1% | 0.6% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.2% |
| Pre-Test Span Bias | -0.4% | -0.2% | -0.3% | 0.1% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.0% |
| Post-Test Span Bias | -0.3% | -0.2% | -0.4% | -0.2% |
| Zero Drift | 0.0% | 0.0% | 0.0% | 0.1% |
| Span Drift | 0.1% | 0.0% | 0.3% | -0.1% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.539 | % dry |
| | 7.389 | % wet |
| $CO_2$: | 11.983 | % dry |
| | 10.370 | % wet |
| $NO_x$: | 35.918 | ppm dry |
| | 31.082 | ppm wet |
| | 23.757 | lb/hr |
| $SO_2$: | 11.384778 | ppm dry |
| | 10.477 | lb/hr |
| CO: | 0.06 | ppm dry |
| | 0.05 | ppm wet |
| | 0.025 | lb/hr |
| $H_2O$: | 13.5 | % |
| MW: | 28.61 | lb/lb-mole |
| Flow: | 163,212 | wacfm |
| | 92.33 | mdscfm |
| | 5540.05 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5540.05 | 5485.77 | 54.29 | 1.0% |
| $O_2$ | % dry | 8.54 | 8.6 | -0.02 | -0.2% |
| $CO_2$ | % dry | 11.98 | 11.9 | 0.08 | 0.7% |
| $NO_x$ | ppm dry | 35.92 | 37.0 | -1.13 | -3.1% |
| $NO_x$ | ppm @ 3% $O_2$ | 52.01 | 53.5 | -1.48 | -2.8% |
| $NO_x$ | lb/hr | 23.76 | 24.5536 | -0.80 | -3.4% |
| $SO_2$ | ppm dry | 11.38 | 11.38 | 0.00 | 0.0% |
| $SO_2$ | ppm @ 3% $O_2$ | 16.49 | 16.45 | 0.03 | 0.2% |
| $SO_2$ | lb/hr | 10.477 | 10.480 | -0.003 | 0.0% |
| CO | ppm dry | 0.06 | 1.66 | -1.60 | |
| CO | ppm @ 3% $O_2$ | 0.09 | 2.25 | -2.16 | |
| CO | lb/hr | 0.025 | 0.624 | | |

### SOx Titration Summary

| | B1/2 | Probe |
|---|---|---|
| N BaCl2 | 0.0100000 | |
| Total VOL (ml) | 434 | |
| Aliquot VOL (ml) | 20 | |
| Titrant VOL (ml) | 3.31 | |

# Montrose AQS
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 1

### PRE-TEST INFORMATION
GENERAL

| | |
|---|---|
| Test: | 7-RA-U1 |
| Date: | 3/30/2018 |
| Start Time: | 19:17 |
| Station: | Desert View Power |
| Unit: | #1 |
| Test Condition: | Full Load |
| Performed By: | DW |

### PRE-TEST INFORMATION
SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.04 | "Hg |
| Meter No. | 1 P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0.36 | iwg |
| Pstack: | 30.06 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 843.2 | 723.4 | 119.8 |
| 2/H2O | 727.4 | 721.6 | 5.8 |
| 3/Empty | 651.1 | 650.0 | 1.1 |
| 4/S.G. | 892.2 | 882.1 | 10.1 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 86.8 |

Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 618.805 | 91 | 85 |
| | | 90 | 83 |
| Stop | 645.915 | 90 | 84 |
| Total | 27.110 | | 87.2 |

Summary

| | | |
|---|---|---|
| Sample Volume: | 26.501 | dscf |
| $H_2O$ Volume : | 4.097 | scf |
| Moisture Content: | 13.4 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.100 | 1.0488 | 352 | 73.05 |
| 4 | 0.940 | 0.9695 | 351 | 67.49 |
| 3 | 0.860 | 0.9274 | 352 | 64.59 |
| 2 | 0.810 | 0.9000 | 352 | 62.69 |
| 1 | 0.760 | 0.8718 | 352 | 60.72 |
| 5 | 1.200 | 1.0954 | 351 | 76.25 |
| 4 | 0.950 | 0.9747 | 351 | 67.85 |
| 3 | 0.910 | 0.9539 | 352 | 66.44 |
| 2 | 0.840 | 0.9165 | 351 | 63.80 |
| 1 | 0.760 | 0.8718 | 352 | 60.72 |
| 5 | 0.910 | 0.9539 | 352 | 66.44 |
| 4 | 0.900 | 0.9487 | 351 | 66.04 |
| 3 | 0.890 | 0.9434 | 352 | 65.71 |
| 2 | 0.930 | 0.9644 | 352 | 67.17 |
| 1 | 0.920 | 0.9592 | 352 | 66.81 |
| 5 | 1.100 | 1.0488 | 352 | 73.05 |
| 4 | 1.200 | 1.0954 | 351 | 76.25 |
| 3 | 0.960 | 0.9798 | 352 | 68.24 |
| 2 | 0.970 | 0.9849 | 352 | 68.60 |
| 1 | 0.910 | 0.9539 | 351 | 66.40 |
| 5 | 1.100 | 1.0488 | 351 | 73.01 |
| 4 | 1.200 | 1.0954 | 352 | 76.30 |
| 3 | 1.300 | 1.1402 | 352 | 79.42 |
| 2 | 1.100 | 1.0488 | 352 | 73.05 |
| 1 | 0.970 | 0.9849 | 352 | 68.60 |
| 5 | 1.300 | 1.1402 | 351 | 79.37 |
| 4 | 1.300 | 1.1402 | 351 | 79.37 |
| 3 | 1.300 | 1.1402 | 352 | 79.42 |
| 2 | 1.400 | 1.1832 | 352 | 82.41 |
| 1 | 1.100 | 1.0488 | 351 | 73.01 |
| Average | 1.0223 | 1.0111 | 351.6 | 70.41 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.01 | 0.17 | 0.05 |
| Pre Test Span Direct | 10.82 | 10.89 | 48.82 | 4.75 |
| Pre-test Zero | 0.04 | 0.04 | 0.22 | 0.05 |
| Pre-test Span | 10.76 | 10.85 | 48.47 | 4.73 |
| 0-30 min | 8.50 | 11.77 | 38.26 | 0.11 |
| Post-test Zero | 0.04 | 0.04 | 0.24 | 0.04 |
| Post-test Span | 10.79 | 10.85 | 48.66 | 4.76 |
| Post Test Zero Direct | 0.04 | 0.01 | 0.17 | 0.03 |
| Post Test Span Direct | 10.84 | 10.87 | 48.64 | 4.76 |
| Average | 8.50 | 11.77 | 38.26 | 0.11 |
| Corr. Results | 8.52 | 11.98 | 38.08 | 0.07 |
| | Cal Error < 2% Bias <5% Drift <3% | | | |
| Calibrtion Error | 0.0% | -0.8% | 0.5% | 0.7% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.0% |
| Pre-Test Span Bias | -0.3% | -0.2% | -0.4% | -0.2% |
| Post-Test Zero Bias | 0.0% | 0.2% | 0.1% | 0.1% |
| Post-Test Span Bias | -0.3% | -0.1% | 0.0% | 0.1% |
| Zero Drift | 0.0% | 0.0% | 0.0% | -0.1% |
| Span Drift | 0.1% | 0.0% | 0.2% | 0.4% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.521 | % dry |
| | 7.380 | % wet |
| $CO_2$: | 11.978 | % dry |
| | 10.375 | % wet |
| $NO_x$: | 38.079 | ppm dry |
| | 32.980 | ppm wet |
| | 25.338 | lb/hr |
| $SO_2$: | 12.118933 | ppm dry |
| | 11.220 | lb/hr |
| CO: | 0.07 | ppm dry |
| | 0.06 | ppm wet |
| | 0.028 | lb/hr |
| $H_2O$: | 13.4 | % |
| MW: | 28.62 | lb/lb-mole |
| Flow: | 164,082 | wacfm |
| | 92.89 | mdscfm |
| | 5573.58 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5573.58 | 5579.50 | -5.92 | -0.1% |
| $O_2$ | % dry | 8.52 | 8.5 | 0.04 | 0.5% |
| $CO_2$ | % dry | 11.98 | 12.0 | 0.00 | 0.0% |
| $NO_x$ | ppm dry | 38.08 | 40.1 | -2.01 | -5.3% |
| $NO_x$ | ppm @ 3% $O_2$ | 55.06 | 57.4 | -2.36 | -4.3% |
| $NO_x$ | lb/hr | 25.34 | 26.8860 | -1.55 | -6.1% |
| $SO_2$ | ppm dry | 12.12 | 11.94 | 0.18 | 1.4% |
| $SO_2$ | ppm @ 3% $O_2$ | 17.52 | 17.15 | 0.37 | 2.1% |
| $SO_2$ | lb/hr | 11.220 | 11.111 | 0.109 | 1.0% |
| CO | ppm dry | 0.07 | 1.22 | -1.15 | |
| CO | ppm @ 3% $O_2$ | 0.10 | 1.76 | -1.66 | |
| CO | lb/hr | 0.028 | 0.497 | | |

### SOx Titration Summary

| | B1/2 | Probe |
|---|---|---|
| N BaCl2 | 0.0100000 | |
| Total VOL (ml) | 467 | |
| Aliquot VOL (ml) | 20 | |
| Titrant VOL (ml) | 3.24 | |

**Montrose AQS**
RELATIVE ACCURACY TEST AUDIT
DATA AND WORKSHEET
**Desert View Power UNIT 1**

| PRE-TEST INFORMATION GENERAL | | |
|---|---|---|
| Test: | 8-RA-U1 | |
| Date: | 3/30/2018 | |
| Start Time: | 20.01 | |
| Station: | Desert View Power | |
| Unit: | #1 | |
| Test Condition: | Full Load | |
| Performed By: | DW | |

| PRE-TEST INFORMATION SAMPLE TRAIN | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.04 | "Hg |
| Meter No. | 1-P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0.36 | iwg |
| Pstack: | 30.06 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

METHOD 4 DATA

| Impingers #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 882.4 | 760.6 | 121.8 |
| 2/H2O | 770.3 | 765.1 | 5.2 |
| 3/Empty | 468.6 | 467.6 | 1.0 |
| 4/S.G. | 797.5 | 789.6 | 7.9 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 85.9 |

| Dry Gas Meter Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 646.435 | 87 | 85 |
| | | 85 | 83 |
| Stop | 673.547 | 83 | 81 |
| Total | 27.112 | | 84.0 |

| Summary | | |
|---|---|---|
| Sample Volume: | 26.657 | dscf |
| $H_2O$ Volume : | 4.054 | scf |
| Moisture Content: | 13.2 | % |

METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.200 | 1.0954 | 351 | 76.24 |
| 4 | 1.100 | 1.0488 | 351 | 72.99 |
| 3 | 0.980 | 0.9899 | 352 | 68.94 |
| 2 | 0.960 | 0.9798 | 352 | 68.23 |
| 1 | 0.840 | 0.9165 | 351 | 63.78 |
| 5 | 1.100 | 1.0488 | 350 | 72.95 |
| 4 | 0.970 | 0.9849 | 351 | 68.54 |
| 3 | 0.890 | 0.9434 | 350 | 65.61 |
| 2 | 0.910 | 0.9539 | 351 | 66.39 |
| 1 | 0.870 | 0.9327 | 351 | 64.91 |
| 5 | 0.890 | 0.9434 | 351 | 65.66 |
| 4 | 0.940 | 0.9695 | 350 | 67.43 |
| 3 | 0.960 | 0.9798 | 350 | 68.15 |
| 2 | 0.990 | 0.9950 | 351 | 69.25 |
| 1 | 0.970 | 0.9849 | 350 | 68.50 |
| 5 | 1.000 | 1.0000 | 351 | 69.59 |
| 4 | 1.100 | 1.0488 | 350 | 72.95 |
| 3 | 0.980 | 0.9899 | 351 | 68.89 |
| 2 | 0.990 | 0.9950 | 350 | 69.20 |
| 1 | 1.000 | 1.0000 | 350 | 69.55 |
| 5 | 1.000 | 1.0000 | 350 | 69.55 |
| 4 | 1.200 | 1.0954 | 351 | 76.24 |
| 3 | 1.100 | 1.0488 | 351 | 72.99 |
| 2 | 1.200 | 1.0954 | 350 | 76.19 |
| 1 | 0.990 | 0.9950 | 350 | 69.20 |
| 5 | 1.100 | 1.0488 | 350 | 72.95 |
| 4 | 1.300 | 1.1402 | 350 | 79.30 |
| 3 | 1.300 | 1.1402 | 351 | 79.35 |
| 2 | 1.200 | 1.0954 | 351 | 76.24 |
| 1 | 1.200 | 1.0954 | 350 | 76.19 |
| Average | 1.0374 | 1.0185 | 350.6 | 70.86 |

METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.01 | 0.17 | 0.03 |
| Pre Test Span Direct | 10.84 | 10.87 | 48.64 | 4.76 |
| Pre-test Zero | 0.04 | 0.04 | 0.24 | 0.04 |
| Pre-test Span | 10.79 | 10.85 | 48.66 | 4.76 |
| 0-30 min | 8.60 | 11.68 | 38.26 | 0.13 |
| Post-test Zero | 0.04 | 0.03 | 0.19 | 0.06 |
| Post-test Span | 10.84 | 10.85 | 48.43 | 4.80 |
| Post Test Zero Direct | 0.04 | 0.01 | 0.14 | 0.01 |
| Post Test Span Direct | 10.84 | 10.86 | 48.82 | 4.71 |
| Average | 8.60 | 11.68 | 38.26 | 0.13 |
| Corr. Results | 8.59 | 11.88 | 38.10 | 0.08 |
| | Cal Error <2% | Bias <5% | Drift <3% | |
| Calibrtion Error | 0.2% | -0.9% | 0.3% | 0.8% |
| Pre-Test Zero Bias | 0.0% | 0.2% | 0.1% | 0.1% |
| Pre-Test Span Bias | -0.3% | -0.1% | 0.0% | 0.1% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.6% |
| Post-Test Span Bias | 0.0% | -0.1% | -0.4% | 0.9% |
| Zero Drift | 0.0% | 0.0% | 0.0% | 0.3% |
| Span Drift | 0.2% | 0.0% | -0.2% | 0.3% |

TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.594 | % dry |
| | 7.459 | % wet |
| $CO_2$: | 11.883 | % dry |
| | 10.315 | % wet |
| $NO_x$: | 38.101 | ppm dry |
| | 33.071 | ppm wet |
| | 25.605 | lb/hr |
| $SO_2$: | 12.749961 | ppm dry |
| | 11.921 | lb/hr |
| CO: | 0.08 | ppm dry |
| | 0.07 | ppm wet |
| | 0.033 | lb/hr |
| $H_2O$: | 13.2 | % |
| MW: | 28.63 | lb/lb-mole |
| Flow: | 165,145 | wacfm |
| | 93.82 | mdscfm |
| | 5629.01 | kdscfh |

RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5629.01 | 5426.50 | 202.51 | 3.6% |
| $O_2$ | % dry | 8.59 | 8.6 | -0.02 | -0.3% |
| $CO_2$ | % dry | 11.88 | 11.9 | 0.02 | 0.1% |
| $NO_x$ | ppm dry | 38.10 | 39.7 | -1.61 | -4.2% |
| $NO_x$ | ppm @ 3% $O_2$ | 55.42 | 57.7 | -2.30 | -4.2% |
| $NO_x$ | lb/hr | 25.61 | 25.8060 | -0.20 | -0.8% |
| $SO_2$ | ppm dry | 12.75 | 12.68 | 0.07 | 0.5% |
| $SO_2$ | ppm @ 3% $O_2$ | 18.55 | 18.43 | 0.11 | 0.6% |
| $SO_2$ | lb/hr | 11.921 | 11.452 | 0.470 | 3.9% |
| CO | ppm dry | 0.08 | 0.91 | -0.83 | |
| CO | ppm @ 3% $O_2$ | 0.12 | 1.33 | -1.21 | |
| CO | lb/hr | 0.033 | 0.360 | | |

SOx Titration Summary

| | B1/2 | Probe |
|---|---|---|
| N BaCl2 | 0.0100000 | |
| Total VOL (ml) | 427 | |
| Aliquot VOL (ml) | 20 | |
| Titrant VOL (ml) | 3.75 | |

# Montrose AQS
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 1

### PRE-TEST INFORMATION
#### GENERAL

| | |
|---|---|
| Test: | 9-RA-U1 |
| Date: | 3/30/2018 |
| Start Time: | 20:45 |
| Station: | Desert View Power |
| Unit: | #1 |
| Test Condition: | Full Load |
| Performed By: | DW |

### PRE-TEST INFORMATION
#### SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.04 | "Hg |
| Meter No. | 1-P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0.36 | iwg |
| Pstack: | 30.06 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
#### Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 841.4 | 723.5 | 117.9 |
| 2/H2O | 719.3 | 713.9 | 5.4 |
| 3/Empty | 651.1 | 650.0 | 1.1 |
| 4/S.G. | 901.7 | 892.2 | 9.5 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 83.9 |

#### Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 674.200 | 89 | 86 |
| | | 89 | 85 |
| Stop | 701.525 | 89 | 85 |
| Total | 27.325 | | 87.2 |

#### Summary

| | | |
|---|---|---|
| Sample Volume: | 26.711 | dscf |
| $H_2O$ Volume . | 3.960 | scf |
| Moisture Content: | 12.9 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.300 | 1.1402 | 351 | 79.30 |
| 4 | 1.300 | 1.1402 | 351 | 79.30 |
| 3 | 1.400 | 1.1832 | 351 | 82.29 |
| 2 | 1.200 | 1.0954 | 350 | 76.14 |
| 1 | 1.000 | 1.0000 | 350 | 69.51 |
| 5 | 1.100 | 1.0488 | 351 | 72.94 |
| 4 | 1.000 | 1.0000 | 351 | 69.55 |
| 3 | 1.200 | 1.0954 | 351 | 76.19 |
| 2 | 1.200 | 1.0954 | 350 | 76.14 |
| 1 | 1.000 | 1.0000 | 351 | 69.55 |
| 5 | 0.990 | 0.9950 | 351 | 69.20 |
| 4 | 1.100 | 1.0488 | 351 | 72.94 |
| 3 | 0.970 | 0.9849 | 352 | 68.54 |
| 2 | 0.950 | 0.9747 | 351 | 67.79 |
| 1 | 0.890 | 0.9434 | 351 | 65.61 |
| 5 | 0.960 | 0.9798 | 352 | 68.19 |
| 4 | 0.950 | 0.9747 | 351 | 67.79 |
| 3 | 0.930 | 0.9644 | 351 | 67.07 |
| 2 | 0.970 | 0.9849 | 350 | 68.46 |
| 1 | 0.990 | 0.9950 | 350 | 69.16 |
| 5 | 0.940 | 0.9695 | 351 | 67.43 |
| 4 | 0.940 | 0.9695 | 351 | 67.43 |
| 3 | 0.960 | 0.9798 | 351 | 68.14 |
| 2 | 0.940 | 0.9695 | 351 | 67.43 |
| 1 | 0.970 | 0.9849 | 350 | 68.46 |
| 5 | 1.100 | 1.0488 | 352 | 72.99 |
| 4 | 1.200 | 1.0954 | 352 | 76.23 |
| 3 | 1.210 | 1.1000 | 351 | 76.50 |
| 2 | 1.000 | 1.0000 | 351 | 69.55 |
| 1 | 1.100 | 1.0488 | 351 | 72.94 |
| Average | 1.0548 | 1.0270 | 350.9 | 71.43 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.01 | 0.14 | 0.01 |
| Pre Test Span Direct | 10.84 | 10.86 | 48.82 | 4.71 |
| Pre-test Zero | 0.04 | 0.03 | 0.19 | 0.06 |
| Pre-test Span | 10.84 | 10.85 | 48.43 | 4.80 |
| 0-30 min | 8.57 | 11.71 | 38.11 | 0.10 |
| Post-test Zero | 0.04 | 0.03 | 0.19 | 0.01 |
| Post-test Span | 10.84 | 10.87 | 48.68 | 4.74 |
| Post Test Zero Direct | 0.04 | 0.01 | 0.14 | 0.01 |
| Post Test Span Direct | 10.84 | 10.87 | 48.73 | 4.74 |
| Average | 8.57 | 11.71 | 38.11 | 0.10 |
| Corr. Results | 8.54 | 11.91 | 37.94 | 0.06 |
| | Cal Error < 2%, Bias < 5% Drift < 3% | | | |
| Calibrtion Error | 0.2% | -1.0% | 0.5% | 0.3% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.6% |
| Pre-Test Span Bias | 0.0% | -0.1% | -0.4% | 0.9% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.1% |
| Post-Test Span Bias | 0.0% | 0.0% | 0.0% | 0.1% |
| Zero Drift | 0.0% | 0.0% | 0.0% | -0.5% |
| Span Drift | 0.0% | 0.1% | 0.3% | -0.6% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.537 | % dry |
| | 7.435 | % wet |
| $CO_2$: | 11.911 | % dry |
| | 10.373 | % wet |
| $NO_x$: | 37.940 | ppm dry |
| | 33.042 | ppm wet |
| | 25.774 | lb/hr |
| $SO_2$: | 11.953093 | ppm dry |
| | 11.298 | lb/hr |
| CO: | 0.06 | ppm dry |
| | 0.05 | ppm wet |
| | 0.023 | lb/hr |
| $H_2O$: | 12.9 | % |
| MW: | 28.67 | lb/lb-mole |
| Flow: | 166,450 | wacfm |
| | 94.84 | mdscfm |
| | 5690.14 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5690.14 | 5380.00 | 310.13 | 5.5% |
| $O_2$ | % dry | 8.54 | 8.5 | 0.00 | -0.1% |
| $CO_2$ | % dry | 11.91 | 12.0 | -0.05 | -0.4% |
| $NO_x$ | ppm dry | 37.94 | 39.6 | -1.68 | -4.4% |
| $NO_x$ | ppm @ 3% $O_2$ | 54.93 | 57.0 | -2.11 | -3.8% |
| $NO_x$ | lb/hr | 25.77 | 25.63 | 0.15 | 0.6% |
| $SO_2$ | ppm dry | 11.95 | 10.92 | 1.03 | 8.6% |
| $SO_2$ | ppm @ 3% $O_2$ | 17.31 | 15.72 | 1.58 | 9.1% |
| $SO_2$ | lb/hr | 11.298 | 9.817 | 1.481 | 13.1% |
| CO | ppm dry | 0.06 | 0.78 | -0.72 | |
| CO | ppm @ 3% $O_2$ | 0.08 | 1.10 | -1.01 | |
| CO | lb/hr | 0.023 | 0.299 | | |

### SOx Titration Summary

| | B1/2 | Probe |
|---|---|---|
| N BaCl2 | 0.0100000 | |
| Total VOL (ml) | 419 | |
| Aliquot VOL (ml) | 20 | |
| Titrant VOL (ml) | 3.59 | |

# APPENDIX C.2.2

# UNIT 1 HYDROGEN CHLORIDE CALCULATIONS

## EPA METHOD 26A SOURCE TEST

## DATA AND WORKSHEET

| Client | Desert View Power Parameter | | | Full Load |
|---|---|---|---|---|
| Loaction | Mecca | Fuel | | Biomass |
| Unit | 1 | Data By | | DW |
| Test Number | 1-HCL-U1 | 2-HCL-U1 | 3-HCL-U1 | Average |
| Reference Temperature, F | 68 | 68 | 68 | |
| Test Date | 3/29/2018 | 3/29/2018 | 3/29/2018 | |
| Sample Train | 30-WCS | 30-WCS | 30-WCS | - |
| Pitot Factor | 0.840 | 0.840 | 0.840 | - |
| Meter Calibration Factor | 0.995 | 0.995 | 0.995 | - |
| Stack Area (sq ft) | 38.84 | 38.84 | 38.84 | - |
| Sample Time (Min) | 120 | 120 | 120 | 120 |
| Barometric Pressure (in Hg) | 30.09 | 30.09 | 30.09 | 30.09 |
| Nozzle Diam (in) | 0.239 | 0.239 | 0.239 | 0.239 |
| Start/Stop Time | 945/1208 | 1236/1504 | 1600/1810 | - |
| Stack Pressure (iwg) | 0.68 | 0.68 | 0.68 | 0.68 |
| Delta P (iwg) | 1.105 | 1.106 | 1.106 | 1.1055 |
| Meter Pressure (iwg) | 2.10 | 2.12 | 2.03 | 2.083 |
| Stack Temperature (F) | 352.7 | 350.7 | 351.9 | 351.8 |
| Meter Temperature (F) | 93.5 | 104.0 | 102.2 | 99.9 |
| Meter Volume (acf) | 99.023 | 99.032 | 99.184 | 99.080 |
| Liquid Volume (ml) | 301.6 | 296.5 | 281.3 | 293.1 |
| Stack O2 (%) | 9.09 | 8.93 | 9.12 | 9.0 |
| Stack CO2 (%) | 11.34 | 11.57 | 11.39 | 11.4 |
| Standard Sample Volume (SCF | 94.991 | 93.233 | 93.661 | 93.962 |
| Moisture Fraction | 0.130 | 0.131 | 0.124 | 0.128 |
| Molecular Weight (wet) | 28.59 | 28.62 | 28.67 | 28.63 |
| Stack Gas Velocity (ft/sec) | 73.20 | 73.10 | 73.09 | 73.13 |
| Stack Flow Rate (wacfm) | 170,584 | 170,355 | 170,321 | 170,420 |
| Stack Flow Rate (dscfm) | 97,064 | 97,144 | 97,691 | 97,300 |
| Isokinetic Ratio (%) | 101.64 | 99.67 | 99.57 | 100.29 |

## HYDROCHLORIC ACID TEST RESULTS
### Unit 1

| **Test Number** | 1-HCL-U1 | 2-HCL-U1 | 3-HCL-U1 | **Average** |
|---|---|---|---|---|
| **Date** | 03/29/18 | 03/29/18 | 03/29/18 | |
| **Start/Stop Time** | 945/1208 | 1236/1504 | 1600/1810 | |
| **Stack Flow Rate, dscfm[1]** | 97,064 | 97,144 | 97,691 | 97,300 |
| **Sample Volume, dscf** | 94.991 | 93.233 | 93.661 | 93.962 |
| **$O_2$, %** | 9.09 | 8.93 | 9.12 | 9.04 |
| **$CO_2$, %** | 11.34 | 11.57 | 11.39 | 11.43 |

| | | | | |
|---|---|---|---|---|
| mg/sample | 55.5 | 63.2 | 60.7 | 59.8 |
| mg/dscm | 20.631 | 23.936 | 22.884 | 22.483 |
| ppm (as HCl) | 13.600 | 15.779 | 15.085 | 14.821 |
| lb/hr (as HCl) | 7.4949 | 8.7028 | 8.3672 | 8.1883 |
| MMBtu/Hr | 393 | 393 | 393 | 393 |
| Lb/MMBtu | 0.019 | 0.022 | 0.021 | 0.0208 |

* @ 68 Deg-F

# APPENDIX C.2.3

# UNIT 1 PARTICULATE CALCULATIONS

## EPA METHOD 26A SOURCE TEST

## DATA AND WORKSHEET

| Client | Desert View Power Parameter | | | Full Load |
|---|---|---|---|---|
| Loaction | Mecca | Fuel | | Biomass |
| Unit | 1 | Data By | | DW |
| Test Number | 1-HCL-U1 | 2-HCL-U1 | 3-HCL-U1 | Average |
| Reference Temperature, F | 68 | 68 | 68 | |
| Test Date | 3/29/2018 | 3/29/2018 | 3/29/2018 | |
| Sample Train | 30-WCS | 30-WCS | 30-WCS | - |
| Pitot Factor | 0.840 | 0.840 | 0.840 | - |
| Meter Calibration Factor | 0.995 | 0.995 | 0.995 | - |
| Stack Area (sq ft) | 38.84 | 38.84 | 38.84 | - |
| Sample Time (Min) | 120 | 120 | 120 | 120 |
| Barometric Pressure (in Hg) | 30.09 | 30.09 | 30.09 | 30.09 |
| Nozzle Diam (in) | 0.239 | 0.239 | 0.239 | 0.239 |
| Start/Stop Time | 945/1208 | 1236/1504 | 1600/1810 | - |
| Stack Pressure (iwg) | 0.68 | 0.68 | 0.68 | 0.68 |
| Delta P (iwg) | 1.105 | 1.106 | 1.106 | 1.1055 |
| Meter Pressure (iwg) | 2.10 | 2.12 | 2.03 | 2.083 |
| Stack Temperature (F) | 352.7 | 350.7 | 351.9 | 351.8 |
| Meter Temperature (F) | 93.5 | 104.0 | 102.2 | 99.9 |
| Meter Volume (acf) | 99.023 | 99.032 | 99.184 | 99.080 |
| Liquid Volume (ml) | 301.6 | 296.5 | 281.3 | 293.1 |
| Stack O2 (%) | 9.09 | 8.93 | 9.12 | 9.0 |
| Stack CO2 (%) | 11.34 | 11.57 | 11.39 | 11.4 |
| Standard Sample Volume (SCF | 94.991 | 93.233 | 93.661 | 93.962 |
| Moisture Fraction | 0.130 | 0.131 | 0.124 | 0.128 |
| Molecular Weight (wet) | 28.59 | 28.62 | 28.67 | 28.63 |
| Stack Gas Velocity (ft/sec) | 73.20 | 73.10 | 73.09 | 73.13 |
| Stack Flow Rate (wacfm) | 170,584 | 170,355 | 170,321 | 170,420 |
| Stack Flow Rate (dscfm) | 97,064 | 97,144 | 97,691 | 97,300 |
| Isokinetic Ratio (%) | 101.64 | 99.67 | 99.57 | 100.29 |

# APPENDIX C.2.4

# UNIT 1 HYDROCARBON CALCULATIONS

SCAQMD 25.3 SOURCE TEST

DATA AND WORKSHEET

| | | | |
|---|---|---|---|
| Client | Desert View Powe | Parameter | >90% |
| Loaction | Mecca | Fuel | Biomass/coke |
| Unit | 1 | Data By | DW |
| Test Number | 1A-HC-U1 | 1B-HC-U1 | Average |
| Reference Temperature, F | 68 | 68 | |
| Test Date | 3/29/2018 | 3/29/2018 | |
| Sample Time (Min) | ~60 | ~60 | ~60 |
| Barometric Pressure (in Hg) | 30.09 | 30 09 | 30.09 |
| Start/Stop Time | 946/1033 | 946/1033 | |
| Stack O2 (%) | 9.09 | 9.09 | 9.1 |
| Stack CO2 (%) | 11.34 | 11.34 | 11.3 |
| Stack H2O (%) | 13.0% | 13.0% | 13.0% |
| Stack Flow Rate (wacfm) | 170,584 | 170,584 | 170,584 |
| Stack Flow Rate (dscfm) | 97,064 | 97,064 | 97,064 |
| Laboraotory Results | | | |
| Vial-Organic Carbon as Methane | 0.68 | 0.65 | 0.67 |
| SC-TGNMO ppm | 1.22 | 1.23 | 1.23 |
| TGNMO EPA Correction Factor | 1.086 | 1.086 | |
| TGNMO ppm | 2.1 | 2.0 | 2.05 |
| TGNMO ppm @ 3% O2 | 3.13 | 3.09 | 3.11 |
| TGNMO lb/hr | 0.50 | 0.49 | 0.50 |

# APPENDIX C.2.5

# UNIT 1 MMBTU/HR CALCULATIONS

2017 Annual Average MMBtu/Hr Calculation

| | | | |
|---|---|---|---|
| Period Hours | 17,520 | | |
| Boiler #1 Operating Hours | 7,900 | | |
| Boiler #2 Operating Hours | 8,076 | | |
| Total Operating Hours | 15,976 | | |
| | | | |
| Gross Generation | 400,048 | | |
| Net Generation | 345,748 | | |
| | | | |
| Hazen Fuel Analysis | 7,870 | HHV Btu | |
| Hazen Fuel Analysis | 7,355 | LHV Btu | |
| | | | |
| 2017 Fuel Records | 370,276 | tons purchased | |
| | 7,304 | System loss | |
| | -2,201 | Net change in inventory | |
| | 365,173 | tons consumed | |
| | 0.91 | tons/MWh | Gross |
| | **1.06** | **tons/MWh** | **Net** |
| | 730,345,640 | pounds consumed | |
| | 5,747,820,186,800 | Btu wood | HHV |
| | 5,371,692,182,200 | Btu wood | LHV |
| | 5,747,820 | MMBtu wood | HHV |
| | 5,371,692 | MMBtu wood | LHV |
| | 38,523 | MMBtu gas | 0.67% |
| | 15,976 | operating hours | |
| Annual avg, Units 1 & 2 | 362 | MMBtu/hr | HHV |
| Annual avg, Units 1 & 2 | 339 | MMBtu/hr | LHV |

Average MMBtu/Hr Calculation

Stack test date: 3/29/2018

| | | | |
|---|---|---|---|
| Avg daily steam production, Unit 1 | 199 | kpph | |
| Avg daily steam production, Unit 2 | 190 | kpph | |
| Burn rate during stack test | 1.06 | | |
| Boiler #1 Operating Hours | 24 | | |
| Boiler #2 Operating Hours | 24 | | |
| Net Generation | 1,006 | MWh | |
| Fuel Analysis | 8,675 | HHV Btu | |
| Fuel Analysis | 0 | LHV Btu | |
| Tested Unit | 199 | kpph | |
| Fuel consumption | 1,063 | tons consumed total | |
| Fuel consumption, tested unit | 544 | tons consumed total | |
| | 9,430,114,094 | Btu wood | HHV |
| | 0 | Btu wood | LHV |
| | 9,430 | MMBtu wood | HHV |
| | 0 | MMBtu wood | LHV |
| | 0 | MMBtu gas | 0.00% |
| | 24 | operating hours | |
| Heat input during test (tested unit) | **393** | **MMBtu/hr** | **HHV** |
| Heat input during test (tested unit) | 0 | MMBtu/hr | LHV |

**UNIT 1**

| | | | |
|---|---|---|---|
| Average MMBtu/Hr Calculation | | | |
| Stack test date: 3/30/2018 | | | |
| Avg daily steam production, Unit 1 | 206 | kpph | |
| Avg daily steam production, Unit 2 | 180 | kpph | |
| Burn rate during stack test | 1.06 | | |
| Boiler #1 Operating Hours | 24 | | |
| Boiler #2 Operating Hours | 24 | | |
| Net Generation | 1,008 | MWh | |
| Fuel Analysis | 7,360 | HHV Btu | |
| Fuel Analysis | 0 | LHV Btu | |
| Tested Unit | 206 | kpph | |
| Fuel consumption | 1,065 | tons consumed total | |
| Fuel consumption, tested unit | 568 | tons consumed total | |
| | 8,363,480,074 | Btu wood | HHV |
| | 0 | Btu wood | LHV |
| | 8,363 | MMBtu wood | HHV |
| | 0 | MMBtu wood | LHV |
| | 3 | MMBtu gas | 0.04% |
| | 24 | operating hours | |
| Heat input during test (tested unit) | 349 | MMBtu/hr | HHV |
| Heat input during test (tested unit) | 0 | MMBtu/hr | LHV |

# APPENDIX C.3

# UNIT 2 CALCULATIONS

# APPENDIX C.3.1

# UNIT 2 RATA AND GASEOUS CALCULATIONS

# DELTA
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 2

### PRE-TEST INFORMATION
#### GENERAL

| | |
|---|---|
| Test: | 1-RA-U2 |
| Date: | 3/27/2018 |
| Start Time: | 8:30 |
| Station: | Desert View Power |
| Unit: | Unit 2 |
| Test Condition: | Full Load |
| Performed By: | DW |

#### PRE-TEST INFORMATION
#### SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.19 | "Hg |
| Meter No. | 1-P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure. | 1.0 | iwg |
| Pstack: | 0.73 | iwg |
| Pstack: | 30.24 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
#### Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 888.1 | 747.6 | 140.5 |
| 2/H2O | 761.5 | 760.8 | 0.7 |
| 3/Empty | 466.5 | 466.0 | 0.5 |
| 4/S.G. | 850.0 | 837.9 | 12.1 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 103.8 |

#### Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 911.600 | 71 | 73 |
| | | 73 | 75 |
| Stop | 946.577 | 74 | 76 |
| Total | 34.977 | | 73.7 |

#### Summary

| | | |
|---|---|---|
| Sample Volume: | 35.102 | dscf |
| $H_2O$ Volume : | 4.295 | scf |
| Moisture Content: | 12.2 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.000 | 1.0000 | 345 | 68.97 |
| 4 | 0.980 | 0.9899 | 348 | 68.41 |
| 3 | 1.300 | 1.1402 | 346 | 78.69 |
| 2 | 1.200 | 1.0954 | 347 | 75.65 |
| 1 | 1.000 | 1.0000 | 347 | 69.06 |
| 5 | 1.300 | 1.1402 | 345 | 78.64 |
| 4 | 1.100 | 1.0488 | 348 | 72.47 |
| 3 | 0.600 | 0.7746 | 350 | 53.59 |
| 2 | 0.680 | 0.8246 | 349 | 57.02 |
| 1 | 0.620 | 0.7874 | 346 | 54.34 |
| 5 | 0.860 | 0.9274 | 350 | 64.16 |
| 4 | 0.940 | 0.9695 | 351 | 67.12 |
| 3 | 0.920 | 0.9592 | 348 | 66.28 |
| 2 | 0.780 | 0.8832 | 349 | 61.07 |
| 1 | 0.750 | 0.8660 | 347 | 59.81 |
| 5 | 1.100 | 1.0488 | 344 | 72.29 |
| 4 | 1.000 | 1.0000 | 346 | 69.01 |
| 3 | 0.910 | 0.9539 | 347 | 65.88 |
| 2 | 0.760 | 0.8718 | 348 | 60.24 |
| 1 | 0.720 | 0.8485 | 348 | 58.63 |
| 5 | 1.000 | 1.0000 | 346 | 69.01 |
| 4 | 1.100 | 1.0488 | 347 | 72.43 |
| 3 | 1.300 | 1.1402 | 348 | 78.79 |
| 2 | 1.200 | 1.0954 | 348 | 75.70 |
| 1 | 1.000 | 1.0000 | 349 | 69.14 |
| 5 | 1.300 | 1.1402 | 347 | 78.74 |
| 4 | 1.100 | 1.0488 | 348 | 72.47 |
| 3 | 1.400 | 1.1832 | 349 | 81.81 |
| 2 | 1.000 | 1.0000 | 348 | 69.10 |
| 1 | 0.950 | 0.9747 | 349 | 67.39 |
| Average | 0.9841 | 0.9920 | 347.6 | 68.53 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Analyzer Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.01 | 0.15 | 0.01 |
| Pre Test Span Direct | 10.86 | 10.97 | 48.52 | 4.72 |
| Pre-test Zero | [illegible] | [illegible] | [illegible] | [illegible] |
| Pre-test Span | [illegible] | [illegible] | [illegible] | [illegible] |
| 0-60 min | 8.57 | 11.82 | 33.34 | 0.21 |
| Post-test Zero | [illegible] | [illegible] | [illegible] | [illegible] |
| Post-test Span | [illegible] | [illegible] | [illegible] | [illegible] |
| Post Test Zero Direct | [illegible] | [illegible] | [illegible] | [illegible] |
| Post Test Span Direct | [illegible] | [illegible] | [illegible] | [illegible] |
| Average | 8.57 | 11.82 | 33.34 | 0.21 |
| Corr. Results | 8.56 | 12.01 | 33.06 | 0.18 |

Cal Error <2% Bias <5% Drift <3%

| | | | | |
|---|---|---|---|---|
| Calibration Error | 0.3% | -0.4% | 0.1% | 0.5% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.3% |
| Pre-Test Span Bias | -0.1% | -0.4% | 0.1% | -0.1% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.2% |
| Post-Test Span Bias | -0.1% | -0.4% | -0.3% | -0.1% |
| Zero Drift | 0.0% | 0.0% | -0.1% | -0.1% |
| Span Drift | -0.2% | -0.4% | 0.1% | -0.1% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.557 | % dry |
| $CO_2$: | 12.013 | % dry |
| $NO_x$: | 33.057 | ppm dry |
| | 21.929 | lb/hr |
| $SO_2$: | 6.0458297 | ppm dry |
| SO2: | 5.580 | lb/hr |
| CO: | 0.18 | ppm dry |
| | 0.074 | lb/hr |
| $H_2O$: | 12.2 | % |
| MW: | 28.76 | lb/lb-mole |
| Flow: | 159,704 | wacfm |
| | 92.61 | mdscfm |
| | 5556.39 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5556.39 | 5959.90 | -403.51 | -7.3% |
| $O_2$ | % dry | 8.56 | 8.6 | -0.01 | -0.2% |
| $CO_2$ | % dry | 12.01 | 12.1 | -0.12 | -1.0% |
| $NO_x$ | ppm dry | 33.06 | 35.5 | -2.44 | -7.4% |
| $NO_x$ | ppm @ 3% $O_2$ | 47.94 | 51.5 | -3.55 | -7.4% |
| $NO_x$ | lb/hr | 21.93 | 25.31 | -3.38 | -15.4% |
| $SO_2$ | ppm dry | 6.05 | 6.06 | -0.02 | -0.2% |
| $SO_2$ | ppm @ 3% $O_2$ | 8.77 | 8.96 | -0.19 | -2.2% |
| $SO_2$ | lb/hr | 5.58 | 6.018 | -0.438 | -7.9% |
| CO | ppm dry | 0.18 | 1.26 | -1.08 | |
| CO | ppm @ 3% $O_2$ | 0.27 | 1.82 | -1.56 | |
| CO | lb/hr | 0.074 | 0.545 | | |

### SOx Titration Summary

| | B1/2 |
|---|---|
| N BaCl2 | 0.0099900 |
| Total VOL (ml) | 457 |
| Aliquot VOL (ml) | 20 |
| Titrant VOL (ml) | 2.19 |

# DELTA
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 2

### PRE-TEST INFORMATION
GENERAL

| | |
|---|---|
| Test: | 2-RA-U2 |
| Date: | 3/27/2018 |
| Start Time: | 9:54 |
| Station: | Desert View Power |
| Unit: | Unit 2 |
| Test Condition: | Full Load |
| Performed By: | DW |

### PRE-TEST INFORMATION
SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.19 | "Hg |
| Meter No. | 1-P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 1.0 | iwg |
| Pstack: | 0.73 | iwg |
| Pstack: | 30.24 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 850.6 | 707.8 | 142.8 |
| 2/H2O | 695.7 | 691.0 | 4.7 |
| 3/Empty | 590.5 | 590.5 | 0.0 |
| 4/S.G. | 981.6 | 972.7 | 8.9 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 106.4 |

Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 947.100 | 75 | 77 |
| | | 76 | 78 |
| Stop | 982.157 | 77 | 79 |
| Total | 35.057 | | 77.0 |

Summary

| | | |
|---|---|---|
| Sample Volume: | 34.964 | dscf |
| $H_2O$ Volume : | 5.022 | scf |
| Moisture Content: | 12.6 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.100 | 1.0488 | 345 | 72.36 |
| 4 | 1.000 | 1.0000 | 347 | 69.08 |
| 3 | 1.400 | 1.1832 | 348 | 81.79 |
| 2 | 1.200 | 1.0954 | 348 | 75.72 |
| 1 | 1.000 | 1.0000 | 349 | 69.16 |
| 5 | 1.300 | 1.1402 | 346 | 78.71 |
| 4 | 1.100 | 1.0488 | 347 | 72.45 |
| 3 | 1.000 | 1.0000 | 348 | 69.12 |
| 2 | 0.710 | 0.8426 | 348 | 58.24 |
| 1 | 0.630 | 0.7937 | 347 | 54.83 |
| 5 | 0.880 | 0.9381 | 345 | 64.72 |
| 4 | 0.970 | 0.9849 | 345 | 67.95 |
| 3 | 0.880 | 0.9381 | 346 | 64.76 |
| 2 | 0.790 | 0.8888 | 347 | 61.40 |
| 1 | 0.740 | 0.8602 | 348 | 59.46 |
| 5 | 1.200 | 1.0954 | 348 | 75.72 |
| 4 | 1.100 | 1.0488 | 349 | 72.54 |
| 3 | 0.930 | 0.9644 | 348 | 66.66 |
| 2 | 0.750 | 0.8660 | 348 | 59.86 |
| 1 | 0.720 | 0.8485 | 345 | 58.54 |
| 5 | 1.100 | 1.0488 | 346 | 72.41 |
| 4 | 1.000 | 1.0000 | 348 | 69.12 |
| 3 | 1.300 | 1.1402 | 347 | 78.76 |
| 2 | 1.300 | 1.1402 | 348 | 78.81 |
| 1 | 1.100 | 1.0488 | 346 | 72.41 |
| 5 | 1.400 | 1.1832 | 348 | 81.79 |
| 4 | 1.200 | 1.0954 | 347 | 75.67 |
| 3 | 1.300 | 1.1402 | 348 | 78.81 |
| 2 | 1.000 | 1.0000 | 348 | 69.12 |
| 1 | 0.960 | 0.9798 | 346 | 67.64 |
| Average | 1.0243 | 1.0121 | 347.1 | 69.92 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Analyzer Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | [illegible] | [illegible] | [illegible] | [illegible] |
| Pre Test Span Direct | [illegible] | [illegible] | [illegible] | [illegible] |
| Pre-test Zero | [illegible] | [illegible] | [illegible] | [illegible] |
| Pre-test Span | [illegible] | [illegible] | [illegible] | [illegible] |
| 0-60 min | [illegible] | [illegible] | [illegible] | [illegible] |
| Post-test Zero | 0.04 | 0.04 | 0.22 | 0.04 |
| Post-test Span | [illegible] | [illegible] | [illegible] | [illegible] |
| Post Test Zero Direct | 0.04 | 0.02 | 0.16 | 0.01 |
| Post Test Span Direct | [illegible] | [illegible] | [illegible] | [illegible] |
| Average | 8.40 | 12.00 | 34.40 | 0.20 |
| Corr. Results | 8.42 | 12.19 | 34.10 | 0.17 |
| Cal Error <2%, Bias <5%, Drift <3% | | | | |
| Calibrtion Error | 0.0% | -0.7% | 0.7% | 0.3% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.2% |
| Pre-Test Span Bias | -0.1% | -0.4% | -0.3% | -0.1% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.3% |
| Post-Test Span Bias | -0.1% | -0.3% | -0.2% | -0.1% |
| Zero Drift | 0.0% | 0.0% | 0.0% | 0.2% |
| Span Drift | -0.3% | 0.4% | 0.0% | 0.1% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.425 | % dry |
| $CO_2$: | 12.193 | % dry |
| $NO_x$: | 34.096 | ppm dry |
| | 23.008 | lb/hr |
| $SO_2$: | 7.647314 | ppm dry |
| | 7.180 | lb/hr |
| CO: | 0.17 | ppm dry |
| | 0.070 | lb/hr |
| $H_2O$: | 12.6 | % |
| MW: | 28.74 | lb/lb-mole |
| Flow: | 162,944 | wacfm |
| | 94.20 | mdscfm |
| | 5652.25 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5652.25 | 5901.22 | -248.97 | -4.4% |
| $O_2$ | % dry | 8.42 | 8.5 | -0.06 | -0.7% |
| $CO_2$ | % dry | 12.19 | 12.2 | -0.05 | -0.4% |
| $NO_x$ | ppm dry | 34.10 | 36.5 | -2.45 | -7.2% |
| $NO_x$ | ppm @ 3% $O_2$ | 48.92 | 52.6 | -3.69 | -7.5% |
| $NO_x$ | lb/hr | 23.01 | 25.8 | -2.80 | -12.2% |
| $SO_2$ | ppm dry | 7.65 | 7.79 | -0.14 | -1.8% |
| $SO_2$ | ppm @ 3% $O_2$ | 10.97 | 11.22 | -0.24 | -2.2% |
| $SO_2$ | lb/hr | 7.180 | 7.666 | -0.486 | -6.8% |
| CO | ppm dry | 0.17 | 1.09 | -0.92 | |
| CO | ppm @ 3% $O_2$ | 0.25 | 1.57 | -1.33 | |
| CO | lb/hr | 0.070 | 0.469 | | |

### SOx Titration Summary

| | B1/2 |
|---|---|
| N BaCl2 | 0.0099900 |
| Total VOL (ml) | 426 |
| Aliquot VOL (ml) | 20 |
| Titrant VOL (ml) | 2.96 |

# DELTA
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 2

### PRE-TEST INFORMATION
#### GENERAL

| | |
|---|---|
| Test: | 3-RA-U2 |
| Date: | 3/27/2018 |
| Start Time: | 11:32 |
| Station: | Desert View Power |
| Unit: | Unit 2 |
| Test Condition: | Full Load |
| Performed By: | DW |

#### PRE-TEST INFORMATION
#### SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.19 | "Hg |
| Meter No. | 1-P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 1.0 | iwg |
| Pstack: | 0.73 | iwg |
| Pstack: | 30.24 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
#### Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 878.1 | 742.8 | 135.3 |
| 2/H2O | 750.5 | 748.7 | 1.8 |
| 3/Empty | 467.5 | 466.6 | 0.9 |
| 4/S.G. | 859.4 | 850.0 | 9.4 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 97.4 |

#### Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 984.780 | 78 | 79 |
| | | 80 | 83 |
| Stop | 1019.105 | 81 | 84 |
| Total | 34.325 | | 80.8 |

#### Summary

| | | |
|---|---|---|
| Sample Volume: | 33.991 | dscf |
| $H_2O$ Volume : | 4.597 | scf |
| Moisture Content: | 11.9 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.200 | 1.0954 | 345 | 75.50 |
| 4 | 1.100 | 1.0488 | 346 | 72.33 |
| 3 | 1.500 | 1.2247 | 347 | 84.52 |
| 2 | 1.300 | 1.1402 | 348 | 78.73 |
| 1 | 1.100 | 1.0488 | 347 | 72.38 |
| 5 | 1.400 | 1.1832 | 345 | 81.55 |
| 4 | 1.000 | 1.0000 | 346 | 68.97 |
| 3 | 1.200 | 1.0954 | 348 | 75.64 |
| 2 | 0.750 | 0.8660 | 348 | 59.80 |
| 1 | 0.650 | 0.8062 | 344 | 55.53 |
| 5 | 0.850 | 0.9220 | 346 | 63.59 |
| 4 | 0.960 | 0.9798 | 347 | 67.62 |
| 3 | 0.870 | 0.9327 | 349 | 64.45 |
| 2 | 0.810 | 0.9000 | 348 | 62.15 |
| 1 | 0.760 | 0.8718 | 347 | 60.16 |
| 5 | 1.300 | 1.1402 | 348 | 78.73 |
| 4 | 1.400 | 1.1832 | 348 | 81.70 |
| 3 | 0.950 | 0.9747 | 347 | 67.26 |
| 2 | 0.770 | 0.8775 | 349 | 60.63 |
| 1 | 0.750 | 0.8660 | 346 | 59.73 |
| 5 | 1.200 | 1.0954 | 345 | 75.50 |
| 4 | 1.000 | 1.0000 | 346 | 68.97 |
| 3 | 1.300 | 1.1402 | 347 | 78.68 |
| 2 | 1.400 | 1.1832 | 348 | 81.70 |
| 1 | 1.000 | 1.0000 | 349 | 69.10 |
| 5 | 1.400 | 1.1832 | 346 | 81.60 |
| 4 | 1.300 | 1.1402 | 347 | 78.68 |
| 3 | 1.300 | 1.1402 | 348 | 78.73 |
| 2 | 1.100 | 1.0488 | 349 | 72.47 |
| 1 | 1.000 | 1.0000 | 348 | 69.05 |
| Average | 1.0738 | 1.0363 | 347.1 | 71.52 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.02 | 0.16 | 0.01 |
| Pre Test Span Direct | 10.77 | 10.96 | 46.90 | 4.73 |
| Pre-test Zero | 0.04 | 0.04 | 0.22 | 0.04 |
| Pre-test Span | 10.74 | 10.90 | 48.72 | 4.71 |
| 0-60 min | 8.57 | 11.80 | 34.76 | 0.20 |
| Post-test Zero | [illegible] | [illegible] | [illegible] | [illegible] |
| Post-test Span | [illegible] | [illegible] | [illegible] | [illegible] |
| Post Test Zero Direct | [illegible] | [illegible] | [illegible] | [illegible] |
| Post Test Span Direct | [illegible] | [illegible] | [illegible] | [illegible] |
| Average | 8.57 | 11.80 | 34.76 | 0.20 |
| Corr. Results | 8.61 | 11.99 | 34.47 | 0.17 |
| Cal Error <2%, Bias <5%, Drift <3% | | | | |
| Calibrtion Error | -0.2% | -0.4% | 0.5% | 0.5% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.3% |
| Pre-Test Span Bias | -0.1% | -0.3% | -0.2% | -0.1% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.3% |
| Post-Test Span Bias | -0.2% | -0.3% | -0.2% | -0.3% |
| Zero Drift | 0.0% | 0.0% | 0.0% | -0.1% |
| Span Drift | 0.0% | -0.4% | 0.0% | -0.2% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.615 | % dry |
| $CO_2$: | 11.987 | % dry |
| $NO_x$: | 34.469 | ppm dry |
| | 23.968 | lb/hr |
| $SO_2$: | 8.0508026 | ppm dry |
| | 7.789 | lb/hr |
| CO: | 0.17 | ppm dry |
| | 0.073 | lb/hr |
| $H_2O$: | 11.9 | % |
| MW: | 28.80 | lb/lb-mole |
| Flow: | 166,663 | wacfm |
| | 97.07 | mdscfm |
| | 5824.42 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5824.42 | 5940.10 | -115.68 | -2.0% |
| $O_2$ | % dry | 8.61 | 8.6 | 0.02 | 0.2% |
| $CO_2$ | % dry | 11.99 | 12.1 | -0.11 | -0.9% |
| $NO_x$ | ppm dry | 34.47 | 37.0 | -2.54 | -7.4% |
| $NO_x$ | ppm @ 3% $O_2$ | 50.22 | 53.8 | -3.53 | -7.0% |
| $NO_x$ | lb/hr | 23.97 | 26.2878 | -2.32 | -9.7% |
| $SO_2$ | ppm dry | 8.05 | 8.48 | -0.43 | -5.3% |
| $SO_2$ | ppm @ 3% $O_2$ | 11.73 | 12.30 | -0.57 | -4.8% |
| $SO_2$ | lb/hr | 7.789 | 8.389 | -0.600 | -7.7% |
| CO | ppm dry | 0.17 | 0.87 | -0.70 | |
| CO | ppm @ 3% $O_2$ | 0.25 | 1.27 | -1.02 | |
| CO | lb/hr | 0.073 | 0.376 | -0.30 | |

### SOx Titration Summary

| | B1/2 |
|---|---|
| N BaCl2 | 0.0099900 |
| Total VOL (ml) | 436 |
| Aliquot VOL (ml) | 20 |
| Titrant VOL (ml) | 2.96 |

# DELTA
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 2

### PRE-TEST INFORMATION
#### GENERAL

| | |
|---|---|
| Test: | 4-RA-U2 |
| Date: | 3/27/2018 |
| Start Time: | 12.55 |
| Station: | Desert View Power |
| Unit: | Unit 2 |
| Test Condition: | Full Load |
| Performed By: | DW |

#### PRE-TEST INFORMATION
#### SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.19 | "Hg |
| Meter No. | 1 P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0.73 | iwg |
| Pstack: | 30.24 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
#### Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 811.8 | 701.8 | 110.0 |
| 2/H2O | 710.7 | 704.0 | 6.7 |
| 3/Empty | 591.9 | 589.7 | 2.2 |
| 4/S.G. | 991.5 | 981.6 | 9.9 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 78.8 |

#### Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 22.500 | 86 | 89 |
| | | 87 | 90 |
| Stop | 48.660 | 88 | 91 |
| Total | 26.160 | | 88.5 |

#### Summary

| | | |
|---|---|---|
| Sample Volume: | 25.637 | dscf |
| $H_2O$ Volume : | 3.719 | scf |
| Moisture Content: | 12.7 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.300 | 1.1402 | 346 | 78.75 |
| 4 | 1.000 | 1.0000 | 347 | 69.11 |
| 3 | 1.400 | 1.1832 | 346 | 81.72 |
| 2 | 1.200 | 1.0954 | 348 | 75.75 |
| 1 | 1.000 | 1.0000 | 347 | 69.11 |
| 5 | 1.300 | 1.1402 | 346 | 78.75 |
| 4 | 1.200 | 1.0954 | 348 | 75.75 |
| 3 | 1.100 | 1.0488 | 350 | 72.62 |
| 2 | 0.780 | 0.8832 | 351 | 61.19 |
| 1 | 0.700 | 0.8367 | 351 | 57.97 |
| 5 | 0.860 | 0.9274 | 346 | 64.05 |
| 4 | 0.970 | 0.9849 | 349 | 68.15 |
| 3 | 0.910 | 0.9539 | 351 | 66.09 |
| 2 | 0.830 | 0.9110 | 351 | 63.12 |
| 1 | 0.760 | 0.8718 | 350 | 60.36 |
| 5 | 1.300 | 1.1402 | 349 | 78.90 |
| 4 | 1.400 | 1.1832 | 350 | 81.92 |
| 3 | 0.980 | 0.9899 | 351 | 68.59 |
| 2 | 0.810 | 0.9000 | 352 | 62.39 |
| 1 | 0.770 | 0.8775 | 351 | 60.79 |
| 5 | 1.300 | 1.1402 | 350 | 78.94 |
| 4 | 1.200 | 1.0954 | 351 | 75.89 |
| 3 | 1.300 | 1.1402 | 349 | 78.90 |
| 2 | 1.500 | 1.2247 | 348 | 84.70 |
| 1 | 1.100 | 1.0488 | 349 | 72.57 |
| 5 | 1.300 | 1.1402 | 348 | 78.85 |
| 4 | 1.200 | 1.0954 | 349 | 75.80 |
| 3 | 1.300 | 1.1402 | 350 | 78.94 |
| 2 | 1.100 | 1.0488 | 351 | 72.66 |
| 1 | 1.000 | 1.0000 | 350 | 69.24 |
| Average | 1.0842 | 1.0412 | 349.2 | 72.05 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | [illegible] | [illegible] | [illegible] | [illegible] |
| Pre Test Span Direct | [illegible] | [illegible] | [illegible] | [illegible] |
| Pre-test Zero | [illegible] | [illegible] | [illegible] | [illegible] |
| Pre-test Span | [illegible] | [illegible] | [illegible] | [illegible] |
| 0-30 min | 8.45 | 11.85 | 34.86 | 0.23 |
| Post-test Zero | [illegible] | [illegible] | [illegible] | [illegible] |
| Post-test Span | [illegible] | [illegible] | [illegible] | [illegible] |
| Post Test Zero Direct | [illegible] | [illegible] | [illegible] | [illegible] |
| Post Test Span Direct | [illegible] | [illegible] | [illegible] | [illegible] |
| Average | 8.45 | 11.85 | 34.86 | 0.23 |
| Corr. Results | 8.47 | 12.09 | 34.58 | 0.20 |
| Cal Error < 2% Bias < 5% Drift < 3% | | | | |
| Calibrtion Error | -0.1% | -0.8% | 0.6% | 0.4% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.3% |
| Pre-Test Span Bias | -0.2% | -0.3% | -0.2% | -0.3% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.3% |
| Post-Test Span Bias | -0.3% | -0.3% | -0.3% | 0.3% |
| Zero Drift | 0.0% | 0.0% | 0.0% | 0.1% |
| Span Drift | 0.4% | -0.2% | -0.1% | 0.4% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.469 | % dry |
| $CO_2$: | 12.089 | % dry |
| $NO_x$: | 34.580 | ppm dry |
| | 23.956 | lb/hr |
| $SO_2$: | 6.407096 | ppm dry |
| | 6.175 | lb/hr |
| CO: | 0.20 | ppm dry |
| | 0.085 | lb/hr |
| $H_2O$: | 12.7 | % |
| MW: | 28.72 | lb/lb-mole |
| Flow: | 167,913 | wacfm |
| | 96.71 | mdscfm |
| | 5802.65 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5802.65 | 5935.48 | -132.83 | -2.3% |
| $O_2$ | % dry | 8.47 | 8.5 | -0.05 | -0.6% |
| $CO_2$ | % dry | 12.09 | 12.1 | -0.06 | -0.5% |
| $NO_x$ | ppm dry | 34.58 | 37.0 | -2.40 | -7.0% |
| $NO_x$ | ppm @ 3% $O_2$ | 49.79 | 53.4 | -3.60 | -7.2% |
| $NO_x$ | lb/hr | 23.96 | 26.2452 | -2.29 | -9.6% |
| $SO_2$ | ppm dry | 6.41 | 8.39 | -1.99 | -31.0% |
| $SO_2$ | ppm @ 3% $O_2$ | 9.23 | 12.09 | -2.87 | -31.1% |
| $SO_2$ | lb/hr | 6.175 | 8.291 | -2.115 | -34.3% |
| CO | ppm dry | 0.20 | 0.86 | -0.66 | |
| CO | ppm @ 3% $O_2$ | 0.29 | 1.24 | -0.95 | |
| CO | lb/hr | 0.085 | 0.372 | | |

### SOx Titration Summary

| | B1/2 |
|---|---|
| N BaCl2 | 0.0099900 |
| Total VOL (ml) | 453 |
| Aliquot VOL (ml) | 20 |
| Titrant VOL (ml) | 1.71 |

# DELTA
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 2

### PRE-TEST INFORMATION
GENERAL

| | |
|---|---|
| Test: | 5-RA-U2 |
| Date: | 3/28/2018 |
| Start Time: | 13:39 |
| Station: | Desert View Power |
| Unit: | Unit 2 |
| Test Condition: | Full Load |
| Performed By: | DW |

### PRE-TEST INFORMATION
SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.16 | "Hg |
| Meter No. | 1-P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0.73 | iwg |
| Pstack: | 30.21 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 865.0 | 738.0 | 127.0 |
| 2/H2O | 744.4 | 739.7 | 4.7 |
| 3/Empty | 468.2 | 467.2 | 1.0 |
| 4/S.G. | 867.2 | 851.4 | 15.8 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 98.5 |

Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 49.450 | 89 | 90 |
| | | 91 | 93 |
| Stop | 76.877 | 92 | 94 |
| Total | 27.427 | | 91.5 |

Summary

| | | |
|---|---|---|
| Sample Volume: | 26.706 | dscf |
| $H_2O$ Volume : | 4.649 | scf |
| Moisture Content: | 14.8 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.300 | 1.1402 | 349 | 79.26 |
| 4 | 1.000 | 1.0000 | 350 | 69.56 |
| 3 | 1.400 | 1.1832 | 355 | 82.55 |
| 2 | 1.200 | 1.0954 | 356 | 76.48 |
| 1 | 1.100 | 1.0488 | 355 | 73.18 |
| 5 | 1.300 | 1.1402 | 349 | 79.26 |
| 4 | 1.100 | 1.0488 | 350 | 72.95 |
| 3 | 1.200 | 1.0954 | 353 | 76.34 |
| 2 | 0.740 | 0.8602 | 355 | 60.02 |
| 1 | 0.660 | 0.8124 | 354 | 56.65 |
| 5 | 0.870 | 0.9327 | 350 | 64.88 |
| 4 | 0.990 | 0.9950 | 351 | 69.25 |
| 3 | 0.880 | 0.9381 | 353 | 65.37 |
| 2 | 0.830 | 0.9110 | 355 | 63.56 |
| 1 | 0.750 | 0.8660 | 354 | 60.39 |
| 5 | 1.200 | 1.0954 | 352 | 76.29 |
| 4 | 1.400 | 1.1832 | 355 | 82.55 |
| 3 | 0.960 | 0.9798 | 355 | 68.36 |
| 2 | 0.780 | 0.8832 | 356 | 61.66 |
| 1 | 0.750 | 0.8660 | 354 | 60.39 |
| 5 | 1.200 | 1.0954 | 354 | 76.38 |
| 4 | 1.100 | 1.0488 | 355 | 73.18 |
| 3 | 1.400 | 1.1832 | 355 | 82.55 |
| 2 | 1.300 | 1.1402 | 354 | 79.50 |
| 1 | 1.000 | 1.0000 | 352 | 69.64 |
| 5 | 1.500 | 1.2247 | 351 | 85.24 |
| 4 | 1.300 | 1.1402 | 356 | 79.60 |
| 3 | 1.200 | 1.0954 | 355 | 76.43 |
| 2 | 1.100 | 1.0488 | 354 | 73.13 |
| 1 | 1.100 | 1.0488 | 355 | 73.18 |
| Average | 1.0747 | 1.0367 | 353.4 | 72.26 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | [illegible] | [illegible] | [illegible] | [illegible] |
| Pre Test Span Direct | [illegible] | [illegible] | [illegible] | 4.31 |
| Pre-test Zero | [illegible] | [illegible] | [illegible] | [illegible] |
| Pre-test Span | [illegible] | [illegible] | [illegible] | 4.74 |
| 0-30 min | 8.22 | 12.10 | 35.17 | 0.54 |
| Post-test Zero | 0.04 | 0.03 | 0.22 | 0.01 |
| Post-test Span | 10.77 | 10.77 | 48.68 | 4.70 |
| Post Test Zero Direct | 0.04 | 0.01 | 0.16 | 0.01 |
| Post Test Span Direct | 10.81 | 10.84 | 48.99 | 4.71 |
| Average | 8.22 | 12.10 | 35.17 | 0.54 |
| Corr Results | 8.22 | 12.39 | 34.92 | 0.52 |
| Cal Error <2% Bias <5% Drift <3% | | | | |
| Calibration Error | 0.3% | -1.0% | 0.5% | 0.3% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.3% |
| Pre-Test Span Bias | -0.3% | -0.3% | -0.3% | 0.3% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.0% |
| Post-Test Span Bias | -0.2% | -0.4% | -0.3% | -0.1% |
| Zero Drift | 0.0% | 0.0% | 0.0% | -0.2% |
| Span Drift | -0.3% | -0.2% | 0.0% | -0.3% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.223 | % dry |
| $CO_2$: | 12.385 | % dry |
| $NO_x$: | 34.919 | ppm dry |
| | 23.514 | lb/hr |
| $SO_2$: | 8.3175431 | ppm dry |
| | 7.792 | lb/hr |
| CO: | 0.52 | ppm dry |
| | 0.212 | lb/hr |
| $H_2O$: | 14.8 | % |
| MW: | 28.49 | lb/lb-mole |
| Flow: | 168,392 | wacfm |
| | 94.00 | mdscfm |
| | 5640.28 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5640.28 | 5920.50 | -280.22 | -5.0% |
| $O_2$ | % dry | 8.22 | 8.3 | -0.04 | -0.5% |
| $CO_2$ | % dry | 12.39 | 12.4 | -0.02 | -0.2% |
| $NO_x$ | ppm dry | 34.92 | 37.6 | -2.64 | -7.6% |
| $NO_x$ | ppm @ 3% $O_2$ | 49.31 | 53.0 | -3.65 | -7.4% |
| $NO_x$ | lb/hr | 23.51 | 26.6483 | -3.13 | -13.3% |
| $SO_2$ | ppm dry | 8.32 | 8.44 | -0.12 | -1.4% |
| $SO_2$ | ppm @ 3% $O_2$ | 11.74 | 11.96 | -0.22 | -1.8% |
| $SO_2$ | lb/hr | 7.792 | 8.333 | -0.541 | -6.9% |
| CO | ppm dry | 0.52 | 1.45 | -0.94 | |
| CO | ppm @ 3% $O_2$ | 0.73 | 2.05 | -1.32 | |
| CO | lb/hr | 0.212 | 0.627 | -0.41 | |

### SOx Titration Summary

| | B1/2 |
|---|---|
| N BaCl2 | 0.0099900 |
| Total VOL (ml) | 442 |
| Aliquot VOL (ml) | 20 |
| Titrant VOL (ml) | 2.37 |

# DELTA
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 2

### PRE-TEST INFORMATION
#### GENERAL

| | |
|---|---|
| Test: | 6-RA-U2 |
| Date: | 3/28/2018 |
| Start Time: | 8.01 |
| Station: | Desert View Power |
| Unit: | Unit 2 |
| Test Condition: | Full Load |
| Performed By: | DW |

#### PRE-TEST INFORMATION
#### SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.16 | "Hg |
| Meter No. | 1-P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0.75 | iwg |
| Pstack: | 30.21 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
#### Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 848.8 | 737.2 | 111.6 |
| 2/H2O | 750.3 | 746.9 | 3.4 |
| 3/Empty | 468.0 | 466.2 | 1.8 |
| 4/S.G. | 876.3 | 867.2 | 9.1 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 75.9 |

#### Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 78.006 | 70 | 72 |
| | | 72 | 72 |
| Stop | 104.335 | 74 | 72 |
| Total | 26.329 | | 72.0 |

#### Summary

| | | |
|---|---|---|
| Sample Volume: | 26.576 | dscf |
| $H_2O$ Volume : | 3.582 | scf |
| Moisture Content: | 11.9 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.200 | 1.0954 | 346 | 75.56 |
| 4 | 1.100 | 1.0488 | 346 | 72.34 |
| 3 | 1.400 | 1.1832 | 347 | 81.66 |
| 2 | 1.300 | 1.1402 | 347 | 78.69 |
| 1 | 1.000 | 1.0000 | 346 | 68.97 |
| 5 | 1.400 | 1.1832 | 346 | 81.61 |
| 4 | 1.100 | 1.0488 | 347 | 72.39 |
| 3 | 1.200 | 1.0954 | 346 | 75.56 |
| 2 | 0.750 | 0.8660 | 345 | 59.70 |
| 1 | 0.680 | 0.8246 | 345 | 56.84 |
| 5 | 0.880 | 0.9381 | 346 | 64.70 |
| 4 | 0.970 | 0.9849 | 346 | 67.93 |
| 3 | 0.870 | 0.9327 | 347 | 64.37 |
| 2 | 0.840 | 0.9165 | 347 | 63.25 |
| 1 | 0.730 | 0.8544 | 346 | 58.93 |
| 5 | 1.300 | 1.1402 | 346 | 78.64 |
| 4 | 1.500 | 1.2247 | 346 | 84.48 |
| 3 | 0.980 | 0.9899 | 346 | 68.28 |
| 2 | 0.770 | 0.8775 | 347 | 60.56 |
| 1 | 0.760 | 0.8718 | 346 | 60.13 |
| 5 | 1.200 | 1.0954 | 346 | 75.56 |
| 4 | 1.000 | 1.0000 | 346 | 68.97 |
| 3 | 1.300 | 1.1402 | 347 | 78.69 |
| 2 | 1.300 | 1.1402 | 347 | 78.69 |
| 1 | 1.000 | 1.0000 | 346 | 68.97 |
| 5 | 1.400 | 1.1832 | 346 | 81.61 |
| 4 | 1.200 | 1.0954 | 346 | 75.56 |
| 3 | 1.100 | 1.0488 | 347 | 72.39 |
| 2 | 1.000 | 1.0000 | 346 | 68.97 |
| 1 | 0.980 | 0.9899 | 345 | 68.24 |
| Average | 1.0616 | 1.0303 | 346.2 | 71.07 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.02 | 0.11 | 0.02 |
| Pre Test Span Direct | 10.87 | 10.95 | 48.65 | 4.70 |
| Pre-test Zero | 0.04 | 0.02 | 0.25 | 0.04 |
| Pre-test Span | 10.82 | 10.88 | 48.47 | 4.73 |
| 0-30 min | 8.44 | 11.98 | 33.34 | 0.17 |
| Post-test Zero | 0.04 | 0.03 | 0.19 | -0.01 |
| Post-test Span | 10.79 | 10.87 | 48.49 | 4.66 |
| Post Test Zero Direct | 0.04 | 0.01 | 0.12 | 0.02 |
| Post Test Span Direct | 10.84 | 10.94 | 48.75 | 4.70 |
| Average | 8.44 | 11.98 | 33.34 | 0.17 |
| Corr. Results | 8.44 | 12.16 | 33.21 | 0.16 |
| Cal Error <2%, Bias <5%, Drift <3% | | | | |
| Calibrtion Error | 0.3% | -0.5% | 0.3% | 0.2% |
| Pre-Test Zero Bias | 0.0% | 0.0% | 0.2% | 0.3% |
| Pre-Test Span Bias | -0.3% | -0.4% | -0.2% | 0.3% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.1% | -0.3% |
| Post-Test Span Bias | -0.3% | -0.4% | -0.3% | -0.3% |
| Zero Drift | 0.0% | 0.1% | -0.1% | -0.6% |
| Span Drift | -0.1% | 0.0% | 0.0% | -0.7% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.439 | % dry |
| $CO_2$: | 12.158 | % dry |
| $NO_x$: | 33.214 | ppm dry |
| | 22.965 | lb/hr |
| $SO_2$: | 8.229824 | ppm dry |
| | 7.917 | lb/hr |
| CO: | 0.16 | ppm dry |
| | 0.065 | lb/hr |
| $H_2O$: | 11.9 | % |
| MW: | 28.82 | lb/lb-mole |
| Flow: | 165,634 | wacfm |
| | 96.53 | mdscfm |
| | 5791.52 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5791.52 | 5924.32 | -132.80 | -2.3% |
| $O_2$ | % dry | 8.44 | 8.4 | -0.01 | -0.1% |
| $CO_2$ | % dry | 12.16 | 12.2 | -0.03 | -0.2% |
| $NO_x$ | ppm dry | 33.21 | 36.0 | -2.77 | -8.3% |
| $NO_x$ | ppm @ 3% $O_2$ | 47.71 | 51.7 | -3.94 | -8.3% |
| $NO_x$ | lb/hr | 22.97 | 25.4946 | -2.53 | -11.0% |
| $SO_2$ | ppm dry | 8.23 | 8.52 | -0.29 | -3.5% |
| $SO_2$ | ppm @ 3% $O_2$ | 11.82 | 12.22 | -0.40 | -3.4% |
| $SO_2$ | lb/hr | 7.917 | 8.408 | -0.491 | -6.2% |
| CO | ppm dry | 0.16 | 1.52 | -1.36 | |
| CO | ppm @ 3% $O_2$ | 0.22 | 2.21 | -1.99 | |
| CO | lb/hr | 0.065 | 0.663 | | |

### SOx Titration Summary

| | B1/2 |
|---|---|
| N BaCl2 | 0.0099602 |
| Total VOL (ml) | 488 |
| Aliquot VOL (ml) | 20 |
| Titrant VOL (ml) | 2.12 |

# DELTA
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 2

### PRE-TEST INFORMATION
#### GENERAL

| | |
|---|---|
| Test: | 7-RA-U2 |
| Date: | 3/28/2018 |
| Start Time: | 8:49 |
| Station: | Desert View Power |
| Unit: | Unit 2 |
| Test Condition: | Full Load |
| Performed By: | DW |

#### PRE-TEST INFORMATION
#### SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.16 | "Hg |
| Meter No. | 1-P&M | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0.75 | iwg |
| Pstack: | 30.21 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
#### Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 829.4 | 710.2 | 119.2 |
| 2/H2O | 712.1 | 705.9 | 6.2 |
| 3/Empty | 591.7 | 591.3 | 0.4 |
| 4/S.G. | 1000.2 | 991.5 | 8.7 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 84.5 |

#### Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 105.000 | 74 | 73 |
| | | 76 | 74 |
| Stop | 132.084 | 78 | 77 |
| Total | 27.084 | | 75.3 |

#### Summary

| | | |
|---|---|---|
| Sample Volume: | 27.168 | dscf |
| $H_2O$ Volume : | 3.988 | scf |
| Moisture Content: | 12.8 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.100 | 1.0488 | 347 | 72.51 |
| 4 | 1.200 | 1.0954 | 347 | 75.73 |
| 3 | 1.400 | 1.1832 | 346 | 81.75 |
| 2 | 1.300 | 1.1402 | 347 | 78.82 |
| 1 | 1.100 | 1.0488 | 346 | 72.46 |
| 5 | 1.400 | 1.1832 | 346 | 81.75 |
| 4 | 1.000 | 1.0000 | 347 | 69.13 |
| 3 | 1.200 | 1.0954 | 347 | 75.73 |
| 2 | 0.770 | 0.8775 | 347 | 60.66 |
| 1 | 0.670 | 0.8185 | 346 | 56.55 |
| 5 | 0.890 | 0.9434 | 347 | 65.22 |
| 4 | 0.980 | 0.9899 | 347 | 68.44 |
| 3 | 0.860 | 0.9274 | 347 | 64.11 |
| 2 | 0.850 | 0.9220 | 346 | 63.70 |
| 1 | 0.730 | 0.8544 | 346 | 59.03 |
| 5 | 1.200 | 1.0954 | 346 | 75.69 |
| 4 | 1.400 | 1.1832 | 347 | 81.80 |
| 3 | 0.980 | 0.9899 | 346 | 68.40 |
| 2 | 0.760 | 0.8718 | 346 | 60.23 |
| 1 | 0.760 | 0.8718 | 346 | 60.23 |
| 5 | 1.200 | 1.0954 | 347 | 75.73 |
| 4 | 1.100 | 1.0488 | 347 | 72.51 |
| 3 | 1.300 | 1.1402 | 347 | 78.82 |
| 2 | 1.300 | 1.1402 | 346 | 78.78 |
| 1 | 1.100 | 1.0488 | 346 | 72.46 |
| 5 | 1.400 | 1.1832 | 347 | 81.80 |
| 4 | 1.300 | 1.1402 | 347 | 78.82 |
| 3 | 1.200 | 1.0954 | 347 | 75.73 |
| 2 | 1.000 | 1.0000 | 346 | 69.09 |
| 1 | 0.970 | 0.9849 | 345 | 68.00 |
| Average | 1.0690 | 1.0339 | 346.5 | 71.46 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.01 | 0.12 | 0.02 |
| Pre Test Span Direct | 10.84 | 10.94 | 48.75 | 4.70 |
| Pre-test Zero | 0.04 | 0.03 | 0.19 | -0.01 |
| Pre-test Span | 10.79 | 10.87 | 48.49 | 4.66 |
| 0-30 min | 8.37 | 12.07 | 34.03 | 0.19 |
| Post-test Zero | 0.04 | 0.03 | 0.19 | 0.00 |
| Post-test Span | 10.84 | 10.83 | 48.54 | 4.71 |
| Post Test Zero Direct | 0.04 | 0.01 | 0.13 | 0.03 |
| Post Test Span Direct | 10.89 | 10.85 | 48.83 | 4.70 |
| Average | 8.37 | 12.07 | 34.03 | 0.19 |
| Corr. Results | 8.36 | 12.29 | 33.90 | 0.20 |
| Cal Error <2%, Bias <5%, Drift <3% | | | | |
| Calibrtion Error | 0.2% | -0.5% | 0.4% | 0.2% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.1% | -0.3% |
| Pre-Test Span Bias | -0.3% | -0.4% | -0.3% | -0.3% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.1% | -0.2% |
| Post-Test Span Bias | -0.3% | -0.1% | -0.3% | 0.1% |
| Zero Drift | 0.0% | 0.0% | 0.0% | 0.2% |
| Span Drift | 0.3% | -0.2% | 0.0% | 0.5% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.358 | % dry |
| $CO_2$: | 12.288 | % dry |
| $NO_x$: | 33.896 | ppm dry |
| | 23.308 | lb/hr |
| $SO_2$: | 5.766168 | ppm dry |
| | 5.516 | lb/hr |
| CO: | 0.20 | ppm dry |
| | 0.082 | lb/hr |
| $H_2O$: | 12.8 | % |
| MW: | 28.73 | lb/lb-mole |
| Flow: | 166,526 | wacfm |
| | 95.99 | mdscfm |
| | 5759.60 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5759.60 | 5882.27 | -122.67 | -2.1% |
| $O_2$ | % dry | 8.36 | 8.4 | -0.05 | -0.6% |
| $CO_2$ | % dry | 12.29 | 12.2 | 0.04 | 0.4% |
| $NO_x$ | ppm dry | 33.90 | 36.4 | -2.46 | -7.3% |
| $NO_x$ | ppm @ 3% $O_2$ | 48.38 | 52.0 | -3.63 | -7.5% |
| $NO_x$ | lb/hr | 23.31 | 25.5900 | -2.28 | -9.8% |
| $SO_2$ | ppm dry | 5.77 | 6.40 | -0.63 | -11.0% |
| $SO_2$ | ppm @ 3% $O_2$ | 8.23 | 9.26 | -1.03 | -12.6% |
| $SO_2$ | lb/hr | 5.516 | 6.275 | -0.759 | -13.8% |
| CO | ppm dry | 0.20 | 1.36 | -1.16 | |
| CO | ppm @ 3% $O_2$ | 0.28 | 1.94 | -1.66 | |
| CO | lb/hr | 0.082 | 0.579 | | |

### SOx Titration Summary

| | B1/2 |
|---|---|
| N BaCl2 | 0.0099602 |
| Total VOL (ml) | 475 |
| Aliquot VOL (ml) | 20 |
| Titrant VOL (ml) | 1.56 |

# DELTA
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 2

### PRE-TEST INFORMATION
GENERAL

| | |
|---|---|
| Test: | 8-RA-U2 |
| Date: | 3/28/2018 |
| Start Time: | 9.33 |
| Station: | Desert View Power |
| Unit: | Unit 2 |
| Test Condition: | Full Load |
| Performed By: | DW |

### PRE-TEST INFORMATION
SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.16 | "Hg |
| Meter No. | 17 WCS | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0.75 | iwg |
| Pstack: | 30.21 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 876.7 | 760.4 | 116.3 |
| 2/H2O | 760.7 | 756.3 | 4.4 |
| 3/Empty | 469.8 | 469.3 | 0.5 |
| 4/S G. | 884.5 | 876.3 | 8.2 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 79.4 |

Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 132.600 | 85 | 79 |
| | | 86 | 80 |
| Stop | 159.658 | 87 | 81 |
| Total | 27.058 | | 83.0 |

Summary

| | | |
|---|---|---|
| Sample Volume: | 26.759 | dscf |
| $H_2O$ Volume : | 3.748 | scf |
| Moisture Content: | 12.3 | % |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.200 | 1.0954 | 347 | 75.66 |
| 4 | 1.100 | 1.0488 | 347 | 72.44 |
| 3 | 1.300 | 1.1402 | 348 | 78.80 |
| 2 | 1.300 | 1.1402 | 347 | 78.75 |
| 1 | 1.100 | 1.0488 | 346 | 72.39 |
| 5 | 1.400 | 1.1832 | 347 | 81.72 |
| 4 | 1.200 | 1.0954 | 347 | 75.66 |
| 3 | 1.200 | 1.0954 | 347 | 75.66 |
| 2 | 0.750 | 0.8660 | 346 | 59.78 |
| 1 | 0.670 | 0.8185 | 346 | 56.50 |
| 5 | 0.890 | 0.9434 | 347 | 65.16 |
| 4 | 0.970 | 0.9849 | 347 | 68.02 |
| 3 | 0.870 | 0.9327 | 348 | 64.46 |
| 2 | 0.850 | 0.9220 | 348 | 63.72 |
| 1 | 0.740 | 0.8602 | 347 | 59.41 |
| 5 | 1.300 | 1.1402 | 347 | 78.75 |
| 4 | 1.500 | 1.2247 | 347 | 84.59 |
| 3 | 0.990 | 0.9950 | 347 | 68.72 |
| 2 | 0.760 | 0.8718 | 346 | 60.17 |
| 1 | 0.750 | 0.8660 | 347 | 59.81 |
| 5 | 1.200 | 1.0954 | 347 | 75.66 |
| 4 | 1.100 | 1.0488 | 348 | 72.48 |
| 3 | 1.300 | 1.1402 | 348 | 78.80 |
| 2 | 1.300 | 1.1402 | 347 | 78.75 |
| 1 | 1.100 | 1.0488 | 347 | 72.44 |
| 5 | 1.400 | 1.1832 | 347 | 81.72 |
| 4 | 1.200 | 1.0954 | 348 | 75.71 |
| 3 | 1.200 | 1.0954 | 348 | 75.71 |
| 2 | 1.100 | 1.0488 | 347 | 72.44 |
| 1 | 0.960 | 0.9798 | 347 | 67.67 |
| Average | 1.0781 | 1.0383 | 347.1 | 71.72 |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.01 | 0.13 | 0.03 |
| Pre Test Span Direct | 10.89 | 10.85 | 48.83 | 4.70 |
| Pre-test Zero | 0.04 | 0.03 | 0.19 | 0.00 |
| Pre-test Span | 10.84 | 10.83 | 48.54 | 4.71 |
| 0-30 min | 8.30 | 11.99 | 33.61 | 0.23 |
| Post-test Zero | 0.04 | 0.03 | 0.19 | 0.03 |
| Post-test Span | 10.81 | 10.79 | 48.46 | 4.75 |
| Post Test Zero Direct | 0.04 | 0.01 | 0.13 | 0.04 |
| Post Test Span Direct | 10.89 | 10.85 | 48.82 | 4.76 |
| Average | 8.30 | 11.99 | 33.61 | 0.23 |
| Corr. Results | 8.28 | 12.26 | 33.49 | 0.21 |
| Cal Error <2%, Bias <5%, Drift <3% | | | | |
| Calibrtion Error | 0.4% | -1.0% | 0.5% | 0.2% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.1% | -0.2% |
| Pre-Test Span Bias | -0.3% | -0.1% | -0.3% | 0.1% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.1% | -0.1% |
| Post-Test Span Bias | -0.4% | -0.3% | -0.4% | -0.1% |
| Zero Drift | 0.0% | 0.0% | 0.0% | 0.2% |
| Span Drift | -0.1% | -0.2% | -0.1% | 0.4% |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.281 | % dry |
| $CO_2$: | 12.256 | % dry |
| $NO_x$: | 33.485 | ppm dry |
| | 23.229 | lb/hr |
| $SO_2$: | 5.9159919 | ppm dry |
| | 5.710 | lb/hr |
| CO: | 0.21 | ppm dry |
| | 0.090 | lb/hr |
| $H_2O$: | 12.3 | % |
| MW: | 28.78 | lb/lb-mole |
| Flow: | 167,131 | wacfm |
| | 96.84 | mdscfm |
| | 5810.45 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5810.45 | 5858.80 | -48.35 | -0.8% |
| $O_2$ | % dry | 8.28 | 8.4 | -0.08 | -0.9% |
| $CO_2$ | % dry | 12.26 | 12.3 | -0.04 | -0.3% |
| $NO_x$ | ppm dry | 33.49 | 36.1 | -2.57 | -7.7% |
| $NO_x$ | ppm @ 3% $O_2$ | 47.50 | 51.4 | -3.86 | -8.1% |
| $NO_x$ | lb/hr | 23.23 | 25.2750 | -2.05 | -8.8% |
| $SO_2$ | ppm dry | 5.92 | 7.20 | -1.28 | -21.6% |
| $SO_2$ | ppm @ 3% $O_2$ | 8.39 | 10.25 | -1.86 | -22.1% |
| $SO_2$ | lb/hr | 5.710 | 7.019 | -1.309 | -22.9% |
| CO | ppm dry | 0.21 | 1.41 | -1.20 | |
| CO | ppm @ 3% $O_2$ | 0.30 | 2.01 | -1.71 | |
| CO | lb/hr | 0.090 | 0.600 | | |

### SOx Titration Summary

| | B1/2 |
|---|---|
| N BaCl2 | 0.0099602 |
| Total VOL (ml) | 468 |
| Aliquot VOL (ml) | 20 |
| Titrant VOL (ml) | 1.60 |

# DELTA
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 2

### PRE-TEST INFORMATION
#### GENERAL

| | |
|---|---|
| Test: | 9-RA-U2 |
| Date: | 3/28/2018 |
| Start Time: | 10:17 |
| Station: | Desert View Power |
| Unit: | Unit 2 |
| Test Condition: | Full Load |
| Performed By: | DW |

### PRE-TEST INFORMATION
#### SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.16 | "Hg |
| Meter No. | 17-WCS | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0.75 | iwg |
| Pstack: | 30.21 | "Hg |
| Cp: | 0.84 | |
| Tref: | 68 | °F |
| Stack Area: | 38.84 | $ft^2$ |

### METHOD 4 DATA
#### Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 818.5 | 702.7 | 115.8 |
| 2/H2O | 707.8 | 701.6 | 6.2 |
| 3/Empty | 590.6 | 589.1 | 1.5 |
| 4/S.G. | 1007.9 | 1000.2 | 7.7 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 81.2 |

#### Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 160.300 | 88 | 82 |
| | | 89 | 83 |
| Stop | 187.245 | 90 | 84 |
| Total | 26.945 | | 86.0 |

#### Summary

| | | |
|---|---|---|
| Sample Volume: | 26.501 | dscf |
| $H_2O$ Volume : | 3.833 | scf |
| Moisture Content: | 12.6 | % |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92.70 | 9.55 |
| Actual Span Value | 10.81 | 11.04 | 48.4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.01 | 0.13 | 0.04 |
| Pre Test Span Direct | 10.89 | 10.85 | 48.82 | 4.76 |
| Pre-test Zero | 0.04 | 0.03 | 0.19 | 0.03 |
| Pre-test Span | 10.81 | 10.79 | 48.46 | 4.75 |
| 0-30 min | 8.33 | 12.00 | 35.40 | 0.24 |
| Post-test Zero | 0.04 | 0.03 | 0.21 | 0.05 |
| Post-test Span | 10.84 | 10.81 | 48.55 | 4.76 |
| Post Test Zero Direct | 0.04 | 0.01 | 0.12 | 0.01 |
| Post Test Span Direct | 10.87 | 10.86 | 48.94 | 4.75 |
| Average | 8.33 | 12.00 | 35.40 | 0.24 |
| Corr. Results | 8.31 | 12.27 | 35.27 | 0.20 |
| Cal Error <2%, Bias <5%, Drift <3% | | | | |
| Calibrtion Error | 0.4% | -1.0% | 0.5% | 0.8% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.1% | -0.1% |
| Pre-Test Span Bias | -0.4% | -0.3% | -0.4% | -0.1% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0.3% |
| Post-Test Span Bias | -0.1% | -0.3% | -0.4% | 0.2% |
| Zero Drift | 0.0% | 0.0% | 0.0% | 0.2% |
| Span Drift | 0.1% | 0.1% | 0.1% | 0.1% |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.100 | 1.0488 | 349 | 72.58 |
| 4 | 1.100 | 1.0488 | 349 | 72.58 |
| 3 | 1.400 | 1.1832 | 349 | 81.88 |
| 2 | 1.400 | 1.1832 | 348 | 81.83 |
| 1 | 1.100 | 1.0488 | 348 | 72.53 |
| 5 | 1.300 | 1.1402 | 349 | 78.90 |
| 4 | 1.200 | 1.0954 | 350 | 75.85 |
| 3 | 1.200 | 1.0954 | 350 | 75.85 |
| 2 | 0.770 | 0.8775 | 349 | 60.72 |
| 1 | 0.690 | 0.8307 | 348 | 57.45 |
| 5 | 0.890 | 0.9434 | 349 | 65.28 |
| 4 | 0.980 | 0.9899 | 349 | 68.50 |
| 3 | 0.870 | 0.9327 | 349 | 64.55 |
| 2 | 0.850 | 0.9220 | 350 | 63.84 |
| 1 | 0.740 | 0.8602 | 348 | 59.49 |
| 5 | 1.300 | 1.1402 | 349 | 78.90 |
| 4 | 1.400 | 1.1832 | 350 | 81.93 |
| 3 | 0.990 | 0.9950 | 350 | 68.90 |
| 2 | 0.760 | 0.8718 | 349 | 60.33 |
| 1 | 0.750 | 0.8660 | 349 | 59.93 |
| 5 | 1.100 | 1.0488 | 350 | 72.62 |
| 4 | 1.200 | 1.0954 | 350 | 75.85 |
| 3 | 1.300 | 1.1402 | 349 | 78.90 |
| 2 | 1.200 | 1.0954 | 349 | 75.81 |
| 1 | 1.000 | 1.0000 | 349 | 69.20 |
| 5 | 1.400 | 1.1832 | 350 | 81.93 |
| 4 | 1.300 | 1.1402 | 351 | 79.00 |
| 3 | 1.100 | 1.0488 | 350 | 72.62 |
| 2 | 1.100 | 1.0488 | 349 | 72.58 |
| 1 | 0.970 | 0.9849 | 349 | 68.15 |
| Average | 1.0707 | 1.0347 | 349.2 | 71.62 |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.309 | % dry |
| $CO_2$: | 12.269 | % dry |
| $NO_x$: | 35.268 | ppm dry |
| | 24.269 | lb/hr |
| $SO_2$: | 11.430779 | ppm dry |
| | 10.944 | lb/hr |
| CO: | 0.20 | ppm dry |
| | 0.084 | lb/hr |
| $H_2O$: | 12.6 | % |
| MW: | 28.74 | lb/lb-mole |
| Flow: | 166,895 | wacfm |
| | 96.06 | mdscfm |
| | 5763.84 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5763.84 | 5932.97 | -169.13 | -2.9% |
| $O_2$ | % dry | 8.31 | 8.3 | -0.03 | -0.3% |
| $CO_2$ | % dry | 12.27 | 12.3 | -0.06 | -0.5% |
| $NO_x$ | ppm dry | 35.27 | 38.0 | -2.68 | -7.6% |
| $NO_x$ | ppm @ 3% $O_2$ | 50.14 | 53.7 | -3.59 | -7.2% |
| $NO_x$ | lb/hr | 24.27 | 27.03 | -2.76 | -11.4% |
| $SO_2$ | ppm dry | 11.43 | 11.45 | -0.02 | -0.2% |
| $SO_2$ | ppm @ 3% $O_2$ | 16.25 | 16.16 | 0.09 | 0.6% |
| $SO_2$ | lb/hr | 10.944 | 11.386 | -0.442 | -4.0% |
| CO | ppm dry | 0.20 | 0.45 | -0.25 | |
| CO | ppm @ 3% $O_2$ | 0.29 | 0.63 | -0.35 | |
| CO | lb/hr | 0.084 | 0.188 | | |

### SOx Titration Summary

| | B1/2 |
|---|---|
| N BaCl2 | 0.0099602 |
| Total VOL (ml) | 429 |
| Aliquot VOL (ml) | 20 |
| Titrant VOL (ml) | 3.34 |

# DELTA
## RELATIVE ACCURACY TEST AUDIT
## DATA AND WORKSHEET
## Desert View Power UNIT 2

### PRE-TEST INFORMATION
#### GENERAL

| | |
|---|---|
| Test: | 10-RA-U2 |
| Date: | 3/28/2018 |
| Start Time: | 11 12 |
| Station: | Desert View Power |
| Unit: | Unit 2 |
| Test Condition: | Full Load |
| Performed By: | DW |

### PRE-TEST INFORMATION
#### SAMPLE TRAIN

| | | |
|---|---|---|
| Barom. Pressure: | | psi |
| | 30.16 | "Hg |
| Meter No. | 17-WCS | |
| Meter $Y_d$ | 1.0030 | |
| Meter Pressure: | 2.5 | iwg |
| Pstack: | 0 75 | iwg |
| Pstack: | 30.21 | "Hg |
| Cp: | 0 84 | |
| Tref: | 68 | °F |
| Stack Area: | 38 84 | $ft^2$ |

### METHOD 4 DATA
#### Impingers

| #/Matl. | End | Start | Diff. |
|---|---|---|---|
| 1/H2O | 846.4 | 737.2 | 109.2 |
| 2/H2O | 755 0 | 748.1 | 6.9 |
| 3/Empty | 468.7 | 467 0 | 1.7 |
| 4/S.G. | 805 0 | 796.1 | 8.9 |
| Rinse | | 50.0 | -50.0 |
| Total | | | 76.7 |

#### Dry Gas Meter

| Time | Vol. | Tm(in) | Tm(out) |
|---|---|---|---|
| Start | 187 900 | 89 | 84 |
| | | 90 | 86 |
| Stop | 215.138 | 91 | 87 |
| Total | 27.238 | | 87 8 |

#### Summary

| | | |
|---|---|---|
| Sample Volume: | 26.699 | dscf |
| $H_2O$ Volume | 3.620 | scf |
| Moisture Content: | 11.9 | % |

### METHOD 3A, 6C, 7E DATA

| | $O_2$ | $CO_2$ | $NO_x$ | CO |
|---|---|---|---|---|
| Span | 19.59 | 18.46 | 92 70 | 9.55 |
| Actual Span Value | 10.81 | 11 04 | 48 4 | 4.68 |
| Pre Test Zero Direct | 0.04 | 0.01 | 0.12 | 0.01 |
| Pre Test Span Direct | 10.87 | 10 86 | 48.94 | 4.75 |
| Pre-test Zero | 0.04 | 0 03 | 0 21 | 0 05 |
| Pre-test Span | 10.84 | 10 81 | 48.55 | 4.76 |
| 0-30 min | 8.38 | 11 92 | 33.14 | 0 18 |
| Post-test Zero | 0 04 | 0 03 | 0 18 | 0 02 |
| Post-test Span | 10 77 | 10 78 | 48.60 | 4 76 |
| Post Test Zero Direct | 0.04 | 0 01 | 0 14 | 0 04 |
| Post Test Span Direct | 10 82 | 10 84 | 48 93 | 4 73 |
| Average | 8.38 | 11.92 | 33.14 | 0.18 |
| Corr. Results | 8.37 | 12.20 | 32.96 | 0.14 |
| Cal Error <2% - Bias <5% Drift <3% | | | | |
| Calibrtion Error | 0.3% | -1.0% | 0.6% | 0.7% |
| Pre-Test Zero Bias | 0.0% | 0.1% | 0.1% | 0 3% |
| Pre-Test Span Bias | -0.1% | -0.3% | -0.4% | 0.2% |
| Post-Test Zero Bias | 0.0% | 0.1% | 0.1% | -0.1% |
| Post-Test Span Bias | -0.3% | -0.3% | -0.4% | 0.3% |
| Zero Drift | 0.0% | 0.0% | 0.0% | -0.2% |
| Span Drift | -0.4% | -0.1% | 0.1% | -0.1% |

### METHOD 2 DATA

| Point | dP (in. $H_2O$) | $dP^2$ (in. $H_2O^2$) | Temp (°F) | Velocity (fps) |
|---|---|---|---|---|
| 5 | 1.200 | 1.0954 | 350 | 75.75 |
| 4 | 1.100 | 1.0488 | 350 | 72.52 |
| 3 | 1.400 | 1.1832 | 351 | 81.87 |
| 2 | 1.200 | 1.0954 | 350 | 75.75 |
| 1 | 1.100 | 1.0488 | 350 | 72.52 |
| 5 | 1.300 | 1.1402 | 350 | 78.84 |
| 4 | 1.200 | 1.0954 | 351 | 75.80 |
| 3 | 1.200 | 1.0954 | 351 | 75.80 |
| 2 | 0.750 | 0.8660 | 351 | 59.92 |
| 1 | 0.670 | 0.8185 | 350 | 56.60 |
| 5 | 0.890 | 0.9434 | 350 | 65.24 |
| 4 | 0.970 | 0.9849 | 351 | 68.15 |
| 3 | 0.880 | 0.9381 | 351 | 64.91 |
| 2 | 0.850 | 0.9220 | 351 | 63.79 |
| 1 | 0.740 | 0.8602 | 350 | 59.48 |
| 5 | 1.300 | 1.1402 | 350 | 78.84 |
| 4 | 1.400 | 1.1832 | 351 | 81.87 |
| 3 | 0.990 | 0.9950 | 351 | 68.85 |
| 2 | 0.760 | 0.8718 | 350 | 60.28 |
| 1 | 0.760 | 0.8718 | 350 | 60.28 |
| 5 | 1.200 | 1.0954 | 350 | 75.75 |
| 4 | 1.100 | 1.0488 | 351 | 72.57 |
| 3 | 1 200 | 1.0954 | 351 | 75.80 |
| 2 | 1.300 | 1.1402 | 350 | 78.84 |
| 1 | 1.100 | 1.0488 | 350 | 72.52 |
| 5 | 1.300 | 1.1402 | 350 | 78.84 |
| 4 | 1.200 | 1.0954 | 350 | 75.75 |
| 3 | 1.100 | 1.0488 | 351 | 72.57 |
| 2 | 1.100 | 1.0488 | 351 | 72.57 |
| 1 | 0.970 | 0.9849 | 350 | 68.10 |
| Average | 1.0640 | 1.0315 | 350.4 | 71.35 |

### TEST SUMMARY

| | | |
|---|---|---|
| $O_2$: | 8.373 | % dry |
| $CO_2$: | 12.198 | % dry |
| $NO_x$: | 32 958 | ppm dry |
| | 22.740 | lb/hr |
| $SO_2$: | 7.9756872 | ppm dry |
| | 7.656 | lb/hr |
| CO: | 0.14 | ppm dry |
| | 0.058 | lb/hr |
| $H_2O$: | 11.9 | % |
| MW: | 28.82 | lb/lb-mole |
| Flow: | 166,267 | wacfm |
| | 96.32 | mdscfm |
| | 5779.23 | kdscfh |

### RELATIVE ACCURACY DATA

| Parameter | Units | Ref. Meth | CEMS | Diff. | Diff. % |
|---|---|---|---|---|---|
| Flow | kdscfh | 5779.23 | 5759.57 | 19.66 | 0.3% |
| $O_2$ | % dry | 8.37 | 8 4 | -0.04 | -0.5% |
| $CO_2$ | % dry | 12.20 | 12.2 | -0.05 | -0.4% |
| $NO_x$ | ppm dry | 32.96 | 35.4 | -2.49 | -7.5% |
| $NO_x$ | ppm @ 3% $O_2$ | 47.09 | 50 7 | -3.65 | -7.7% |
| $NO_x$ | lb/hr | 22.74 | 24.41 | -1.67 | -7.3% |
| $SO_2$ | ppm dry | 7.98 | 8.89 | -0.91 | -11.4% |
| $SO_2$ | ppm @ 3% $O_2$ | 11.40 | 12.74 | -1.34 | -11.8% |
| $SO_2$ | lb/hr | 7.656 | 8.518 | -0.861 | -11.2% |
| CO | ppm dry | 0.14 | 0 00 | 0.14 | |
| CO | ppm @ 3% $O_2$ | 0.20 | 0 00 | 0 20 | |
| CO | lb/hr | 0.058 | 0.000 | | |

### SOx Titration Summary

| | |
|---|---|
| | B1/2 |
| N BaCl2 | 0.0099602 |
| Total VOL (ml) | 425 |
| Aliquot VOL (ml) | 20 |
| Titrant VOL (ml) | 2.37 |

# APPENDIX C.3.2

# UNIT 2 HYDROGEN CHLORIDE CALCULATIONS

## EPA METHOD 26A SOURCE TEST

## DATA AND WORKSHEET

| Client | Desert View Power Parameter | | | Full Load |
|---|---|---|---|---|
| Loaction | Mecca | Fuel | | Biomass |
| Unit | Unit 2 | Data By | | DW |
| Test Number | 1-HCL-U2 | 2-HCL-U2 | 3-HCL-U2 | Average |
| Reference Temperature, F | 68 | 68 | 68 | |
| Test Date | 3/27/2018 | 3/27/2018 | 3/27/2018 | |
| Sample Train | 18-WCS | 18-WCS | 18-WCS | - |
| Pitot Factor | 0.840 | 0.840 | 0.840 | - |
| Meter Calibration Factor | 0.995 | 0.995 | 0.995 | - |
| Stack Area (sq ft) | 38.84 | 38.84 | 38.84 | - |
| Sample Time (Min) | 120 | 120 | 120 | 120 |
| Barometric Pressure (in Hg) | 30.19 | 30.19 | 30.17 | 30.18 |
| Nozzle Diam (in) | 0.239 | 0.239 | 0.239 | 0.239 |
| Start/Stop Time | 830/1104 | 1132/1404 | 801/1037 | - |
| Stack Pressure (iwg) | 0.73 | 0.73 | 0.75 | 0.74 |
| Delta P (iwg) | 0.939 | 1.087 | 1.052 | 1.0259 |
| Meter Pressure (iwg) | 1.89 | 2.10 | 1.91 | 1.964 |
| Stack Temperature (F) | 347.4 | 350.7 | 348.0 | 348.7 |
| Meter Temperature (F) | 72.9 | 85.8 | 72.1 | 76.9 |
| Meter Volume (acf) | 90.665 | 95.874 | 93.280 | 93.273 |
| Liquid Volume (ml) | 279.3 | 281.9 | 287.2 | 282.8 |
| Stack O2 (%) | 8.49 | 8.50 | 8.36 | 8.5 |
| Stack CO2 (%) | 12.07 | 12.10 | 12.31 | 12.2 |
| Standard Sample Volume (SCF | 90.585 | 93.573 | 93.302 | 92.487 |
| Moisture Fraction | 0.127 | 0.124 | 0.127 | 0.126 |
| Molecular Weight (wet) | 28.71 | 28.75 | 28.74 | 28.73 |
| Stack Gas Velocity (ft/sec) | 67.01 | 72.18 | 70.91 | 70.03 |
| Stack Flow Rate (wacfm) | 156,161 | 168,203 | 165,258 | 163,208 |
| Stack Flow Rate (dscfm) | 90,088 | 96,914 | 95,236 | 94,079 |
| Isokinetic Ratio (%) | 104.43 | 100.27 | 101.75 | 102.15 |

## HYDROCHLORIC ACID TEST RESULTS
## Unit 2

| **Test Number** | 1-HCL-U2 | 2-HCL-U2 | 3-HCL-U2 | **Average** |
|---|---|---|---|---|
| **Date** | 03/27/18 | 03/27/18 | 03/27/18 | |
| **Start/Stop Time** | 830/1104 | 1132/1404 | 801/1037 | |
| **Stack Flow Rate, dscfm[1]** | 90,088 | 96,914 | 95,236 | 94,079 |
| **Sample Volume, dscf** | 90.585 | 93.573 | 93.302 | 92.487 |
| **$O_2$, %** | 8.49 | 8.50 | 8.36 | 8.45 |
| **$CO_2$, %** | 12.07 | 12.10 | 12.31 | 12.16 |
| mg/sample | 59.0 | 66.7 | 52.8 | 59.5000 |
| mg/dscm | 22.998 | 25.169 | 19.982 | 22.717 |
| ppm (as HCl) | 15.161 | 16.592 | 13.173 | 14.975 |
| lb/hr (as HCl) | 7.7546 | 9.1297 | 7.1226 | 8.0023 |
| MMBtu/Hr | 389 | 389 | 389 | 389 |
| Lb/MMBtu | 0.020 | 0.023 | 0.018 | 0.0206 |

* @ 68 Deg-F

# APPENDIX C.3.3

# UNIT 2 PARTICULATE CALCULATIONS

## EPA METHOD 5 SOURCE TEST

## DATA AND WORKSHEET

| Client | Desert View Power Parameter | | | Full Load |
|---|---|---|---|---|
| Loaction | Mecca | Fuel | | Biomass |
| Unit | Unit 2 | Data By | | DW |
| Test Number | 1-PM-U2 | 2-PM-U2 | 3-PM-U2 | Average |
| Reference Temperature, F | 68 | 68 | 68 | |
| Test Date | 3/27/2018 | 3/27/2018 | 3/28/2018 | |
| Sample Train | 17-WCS | 17-WCS | 17-WCS | - |
| Pitot Factor | 0.840 | 0.840 | 0.840 | - |
| Meter Calibration Factor | 0.995 | 0.995 | 0.995 | - |
| Stack Area (sq ft) | 38.84 | 38.84 | 38.84 | - |
| Sample Time (Min) | 120 | 120 | 120 | 120 |
| Barometric Pressure (in Hg) | 30.19 | 30.19 | 30.17 | 30.18 |
| Nozzle Diam (in) | 0.244 | 0.242 | 0.244 | 0.243 |
| Start/Stop Time | 830/1104 | 1132/1404 | 801/1031 | - |
| Stack Pressure (iwg) | 0.73 | 0.73 | 0.75 | 0.74 |
| Delta P (iwg) | 1.008 | 1.0495 | 1.0737 | 1.0436 |
| Meter Pressure (iwg) | 1.723 | 1.910 | 1.910 | 1.848 |
| Stack Temperature (F) | 346.7 | 349.2 | 345.5 | 347.1 |
| Meter Temperature (F) | 73.5 | 86.8 | 72.4 | 77.6 |
| Meter Volume (acf) | 90.715 | 95.957 | 96.087 | 94.253 |
| Liquid Volume (ml) | 263.7 | 270.6 | 284.7 | 273.0 |
| Stack O2 (%) | 8.49 | 8.50 | 8.36 | 8.5 |
| Stack CO2 (%) | 12.07 | 12.10 | 12.31 | 12.2 |
| Standard Sample Volume (SCF | 90.500 | 93.437 | 96.056 | 93.331 |
| Moisture Fraction | 0.121 | 0.120 | 0.123 | 0.121 |
| Molecular Weight (wet) | 28.79 | 28.80 | 28.79 | 28.79 |
| Stack Gas Velocity (ft/sec) | 69.29 | 70.80 | 71.48 | 70.52 |
| Stack Flow Rate (wacfm) | 161,468 | 164,997 | 166,570 | 164,345 |
| Stack Flow Rate (dscfm) | 93,881 | 95,711 | 96,745 | 95,446 |
| Isokinetic Ratio (%) | 96.05 | 98.89 | 98.93 | 97.96 |
| ***Analysis*** | | | | |
| Filter mg | 0.50 | 1.70 | 0.00 | 0.73 |
| Probe/Nozzle mg | 0.60 | 0.00 | 0.00 | 0.20 |
| Particulate Catch, mg | 1.10 | 1.70 | 0.00 | 0.93 |
| **Particulate Emissions** | | | | |
| Grain Loading gr/dscf | 0.00019 | 0.00028 | 0.00000 | 0.0002 |
| Grain Loading @ 12% CO2 | 0.00019 | 0.00028 | 0.00000 | 0.0002 |
| Part emission lb/hr | 0.151 | 0.230 | 0.000 | 0.13 |

# APPENDIX C.3.4

# UNIT 2 HYDROCARBON CALCULATIONS

SCAQMD 25.3 SOURCE TEST

DATA AND WORKSHEET

| | | | |
|---|---|---|---|
| Client | Desert View Powe | Parameter | >90% |
| Loaction | Mecca | Fuel | Biomass/coke |
| Unit | Unit 2 | Data By | DW |
| Test Number | 1A-HC-U2 | 1B-HC-U2 | Average |
| Reference Temperature, F | 68 | 68 | |
| Test Date | 3/27/2018 | 3/27/2018 | |
| Sample Time (Min) | ~60 | ~60 | ~60 |
| Barometric Pressure (in Hg) | 30.19 | 30.19 | 30.19 |
| Start/Stop Time | 954/1037 | 954/1037 | |
| Stack O2 (%) | 8.49 | 8.49 | 8.5 |
| Stack CO2 (%) | 12.07 | 12.07 | 12.1 |
| Stack H2O (%) | 12.1% | 12.1% | 12.1% |
| Stack Flow Rate (wacfm) | 161.468 | 161,468 | 161,468 |
| Stack Flow Rate (dscfm) | 93.881 | 93.881 | 93,881 |
| Laboraotory Results | | | |
| Vial-Organic Carbon as Methane | 0.76 | 0.93 | 0.85 |
| SC-TGNMO ppm | 1.14 | 1.18 | 1.16 |
| TGNMO EPA Correction Factor | 1.086 | 1.086 | |
| TGNMO ppm | 2.1 | 2.3 | 2.18 |
| TGNMO ppm @ 3% O2 | 2.98 | 3.30 | 3.14 |
| TGNMO lb/hr | 0.48 | 0.54 | 0.51 |

Note: Flow rates from Test 1-PM-U2

# APPENDIX C.3.5

# UNIT 2 MMBTU/HR CALCULATIONS

2017 Annual Average MMBtu/Hr Calculation

| | | | |
|---|---|---|---|
| Period Hours | 17,520 | | |
| Boiler #1 Operating Hours | 7,900 | | |
| Boiler #2 Operating Hours | 8,076 | | |
| Total Operating Hours | 15,976 | | |
| | | | |
| Gross Generation | 400,048 | | |
| Net Generation | 345,748 | | |
| | | | |
| Hazen Fuel Analysis | 7,870 | HHV Btu | |
| Hazen Fuel Analysis | 7,355 | LHV Btu | |
| | | | |
| 2017 Fuel Records | 370,276 | tons purchased | |
| | 7,304 | System loss | |
| | -2,201 | Net change in inventory | |
| | 365,173 | tons consumed | |
| | 0.91 | tons/MWh | Gross |
| | **1.06** | **tons/MWh** | **Net** |
| | 730,345,640 | pounds consumed | |
| | 5,747,820,186,800 | Btu wood | HHV |
| | 5,371,692,182,200 | Btu wood | LHV |
| | 5,747,820 | MMBtu wood | HHV |
| | 5,371,692 | MMBtu wood | LHV |
| | 38,523 | MMBtu gas | 0.67% |
| | 15,976 | operating hours | |
| Annual avg, Units 1 & 2 | 362 | MMBtu/hr | HHV |
| Annual avg, Units 1 & 2 | 339 | MMBtu/hr | LHV |

**UNIT 2**

| | | | |
|---|---|---|---|
| Average MMBtu/Hr Calculation | | | |
| Stack test date: 3/27/2018 | | | |
| | | | |
| Avg daily steam production, Unit 1 | 187 | kpph | |
| Avg daily steam production, Unit 2 | 198 | kpph | |
| | | | |
| Burn rate during stack test (annual) | 1.06 | | |
| Boiler #1 Operating Hours | 24 | | |
| Boiler #2 Operating Hours | 24 | | |
| | | | |
| Net Generation | 1,020 | MWh | |
| | | | |
| Fuel Analysis | 8,433 | HHV Btu | |
| Fuel Analysis | 0 | LHV Btu | |
| | | | |
| Tested Unit | 198 | kpph | |
| | | | |
| Fuel consumption | 1,077 | tons consumed total | |
| Fuel consumption, tested unit | 554 | tons consumed total | |
| | 9,344,857,073 | Btu wood | HHV |
| | 0 | Btu wood | LHV |
| | 9,345 | MMBtu wood | HHV |
| | 0 | MMBtu wood | LHV |
| | 0 | MMBtu gas | 0.00% |
| | 24 | operating hours | |
| Heat input during test (tested unit) | 389 | MMBtu/hr | HHV |
| Heat input during test (tested unit) | 0 | MMBtu/hr | LHV |

**UNIT 2**

| | | | |
|---|---|---|---|
| Average MMBtu/Hr Calculation | | | |
| Stack test date: 3/28/2018 | | | |
| | | | |
| Avg daily steam production, Unit 1 | 193 | kpph | |
| Avg daily steam production, Unit 2 | 197 | kpph | |
| | | | |
| Burn rate during stack test (annual) | 1.06 | | |
| Boiler #1 Operating Hours | 24 | | |
| Boiler #2 Operating Hours | 24 | | |
| | | | |
| Net Generation | 1,015 | MWh | |
| | | | |
| Fuel Analysis | 8,890 | HHV Btu | |
| Fuel Analysis | 0 | LHV Btu | |
| | | | |
| Tested Unit | 197 | kpph | |
| | | | |
| Fuel consumption | 1,072 | tons consumed total | |
| Fuel consumption, tested unit | 542 | tons consumed total | |
| | 9,628,046,669 | Btu wood | HHV |
| | 0 | Btu wood | LHV |
| | 9,628 | MMBtu wood | HHV |
| | 0 | MMBtu wood | LHV |
| | 0 | MMBtu gas | 0.00% |
| | 24 | operating hours | |
| Heat input during test (tested unit) | 401 | MMBtu/hr | HHV |
| Heat input during test (tested unit) | 0 | MMBtu/hr | LHV |

# APPENDIX D

# QUALITY ASSURANCE

# APPENDIX D.1

# QUALITY ASSURANCE PROGRAM SUMMARY

**QUALITY ASSURANCE PROGRAM SUMMARY**

As part of Montrose Air Quality Services, LLC (Montrose) ASTM D7036-04 certification, Montrose is committed to providing emission related data which is complete, precise, accurate, representative, and comparable. Montrose quality assurance program and procedures are designed to ensure that the data meet or exceed the requirements of each test method for each of these items. The quality assurance program consists of the following items:

- Assignment of an Internal QA Officer
- Development and use of an internal QA Manual
- Personnel training
- Equipment maintenance and calibration
- Knowledge of current test methods
- Chain-of-custody
- QA reviews of test programs

Assignment of an Internal QA Officer: Montrose has assigned an internal QA Officer who is responsible for administering all aspects of the QA program.

Internal Quality Assurance Manual: Montrose has prepared a QA Manual according to the requirements of ASTM D7036-04 and guidelines issued by EPA. The manual documents and formalizes all of Montrose QA efforts. The manual is revised upon periodic review and as Montrose adds capabilities. The QA manual provides details on the items provided in this summary.

Personnel Testing and Training: Personnel testing and training is essential to the production of high quality test results. Montrose training programs include:

- A requirement for all technical personnel to read and understand the test methods performed
- A requirement for all technical personnel to read and understand the Montrose QA manual
- In-house testing and training
- Quality Assurance meetings
- Third party testing where available
- Maintenance of training records.

Equipment Maintenance and Calibration: All laboratory and field equipment used as a part of Montrose emission measurement programs is maintained according to manufacturer's recommendations. A summary of the major equipment maintenance schedules is summarized in Table 1. In addition to routine maintenance, calibrations are performed on all sampling equipment according to the procedures outlined in the applicable test method. The calibration intervals and techniques for major equipment components is summarized in Table 2. The calibration technique may vary to meet regulatory agency requirements.

Knowledge of Current Test Methods: Montrose maintains current copies of EPA, ARB, and SCAQMD Source Test Manuals and Rules and Regulations.

Chain-of-Custody: Montrose maintains chain-of-custody documentation on all data sheets and samples. Samples are stored in a locked area accessible only to Montrose source test personnel. Data sheets are kept in the custody of the originator, program manager, or in locked storage until return to Montrose office. Electronic field data is duplicated for backup on secure storage media. The original data sheets are used for report preparation and any additions are initialed and dated.

QA Reviews: Periodic field, laboratory, and report reviews are performed by the in-house QA coordinator. Periodically, test plans are reviewed to ensure proper test methods are selected and reports are reviewed to ensure that the methods were followed and any deviations from the methods are justified and documented.

**ASTM D7036-04 Required Information**

Uncertainty Statement

"Both qualitative and quantitative factors contribute to field measurement uncertainty and should be taken into consideration when interpreting the results contained within this report. Whenever possible, Montrose Air Quality Services, LLC (Montrose) personnel reduce the impact of these uncertainty factors through the use of approved and validated test methods. In addition, Montrose personnel perform routine instrument and equipment calibrations and ensure that the calibration standards, instruments, and equipment used during test events meet, at a minimum, test method specifications as well as the specifications of our Quality Manual and ASTM D 7036-04. The limitations of the various methods, instruments, equipment, and materials utilized during this test have been reasonably considered, but the ultimate impact of the cumulative uncertainty of this project is not fully identified within the results of this report."

Performance Data

Performance data are available for review.

Qualified Personnel

A qualified individual (QI), defined by performance on a third party or internal test on the test methods, will be present on each test event.

Plant Entry and Safety Requirements

**Plant Entry**

All test personnel are required to check in with the guard at the entrance gate or other designated area. Specific details are provided by the facility and project manager.

**Safety Requirements**

All personnel shall have the following personal protective equipment (PPE) and wear them where designated:

- Hard Hat
- Safety Glasses
- Steel Toe Boots
- Hearing Protection
- Gloves
- High Temperature Gloves (if required)

The following safety measures will be followed:

- Good housekeeping
- SDS for all on-site hazardous materials
- Confine selves to necessary areas (stack platform, mobile laboratory, CEMS data acquisition system, control room, administrative areas)
- Knowledge of evacuation procedures

Each facility will provide plant specific safety training.

**TABLE 1**
**EQUIPMENT MAINTENANCE SCHEDULE**

| Equipment | Acceptance Limits | Frequency of Service | Methods of Service |
|---|---|---|---|
| Pumps | 1. Absence of leaks<br>2. Ability to draw manufacturers required vacuum and flow | As recommended by manufacturer | 1. Visual inspection<br>2. Clean<br>3. Replace parts<br>4. Leak check |
| Flow Meters | 1. Free mechanical movement | As recommended by manufacturer | 1. Visual inspection<br>2. Clean<br>3. Calibrate |
| Sampling Instruments | 1. Absence of malfunction<br>2. Proper response to zero, span gas | As recommended by manufacturer | As recommended by manufacturer |
| Integrated sampling tanks | 1. Absence of leaks | Depends on nature of use | 1. Steam clean<br>2. Leak check |
| Mobile van sampling system | 1. Absence of leaks | Depends on nature of use | 1. Change filters<br>2. Change gas dryer<br>3. Leak check<br>4. Check for system contamination |
| Sampling lines | 1. Sample degradation less than 2% | After each test series | 1. Blow dry, inert gas through line until dry. |

**TABLE 2**
**MAJOR SAMPLING EQUIPMENT CALIBRATION REQUIREMENTS**

| Sampling Equipment | Calibration Frequency | Calibration Procedure | Acceptable Calibration Criteria |
|---|---|---|---|
| Continuous Analyzers | Before and After Each Test Day | 3-point calibration error test | < 2% of analyzer range |
| Continuous Analyzers | Before and After Each Test Run | 2-point sample system bias check | < 5% of analyzer range |
| Continuous Analyzers | After Each Test Run | 2-point analyzer drift determination | < 3% of analyzer range |
| CEMS System | Beginning of Each Day | leak check | < 1 in. Hg decrease in 5 min. at > 20 in. Hg |
| Continuous Analyzers | Semi-Annually | 3-point linearity | < 1% of analyzer range |
| $NO_x$ Analyzer | Daily | $NO_2$ -> NO converter efficiency | > 90% |
| Differential Pressure Gauges (except for manometers) | Semi-Annually | Correction factor based on 5-point comparison to standard | +/- 5% |
| Differential Pressure Gauges (except for manometers) | Bi-Monthly | 3-point comparison to standard, no correction factor | +/- 5% |
| Barometer | Semi-Annually | Adjusted to mercury-in-glass or National Weather Service Station | +/- 0.1 inches Hg |
| Dry Gas Meter | Semi-Annually | Calibration check at 4 flow rates using a NIST traceable standard | +/- 2% |
| Dry Gas Meter | Bi-Monthly | Calibration check at 2 flow rates using a NIST traceable standard | +/- 2% of semi-annual factor |
| Dry Gas Meter Orifice | Annually | 4-point calibration for $\Delta H@$ | -- |
| Temperature Sensors | Semi-Annually | 3-point calibration vs. NIST traceable standard | +/- 1.5% |

Note: Calibration requirements will be used that meet applicable regulatory agency requirements.

# APPENDIX D.2

# CARB, SCAQMD, AND STAC CERTIFICATIONS

State of California

Air Resources Board

Approved Independent Contractor

**Montrose Air Quality Services, LLC**

This is to certify that the company listed above has been approved by the California Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, through June 30, 2020, for those test methods listed below:

**CARB Source Test Methods:**

**1, 2, 3, 4, 5, 6, 8, 17, 20**

**100 (CO, $CO_2$, $NO_x$, $O_2$, $SO_2$, THC)**

Dr. Michael T. Benjamin, Chief
Monitoring and Laboratory Division

State of California

Air Resources Board

Approved Independent Contractor

**Montrose Air Quality Services, LLC**

This is to certify that the company listed above has been approved by the California Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, through June 30, 2020, for those test methods listed below:

**U.S. EPA Source Test Methods 201A, 202 and 205**
**Visible Emissions Evaluation**

Dr. Michael T. Benjamin, Chief
Monitoring and Laboratory Division

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

October 4, 2017

Mr. John Peterson
Montrose Air Quality Services, LLC (MAQS-SNA, Delta, SCEC)
1631 E. Saint Andrew Place
Santa Ana, CA 92705

Subject: LAP Approval Notice
Reference # 96LA1220

Dear Mr. Peterson:

We have reviewed your renewal letter under the South Coast Air Quality Management District's Laboratory Approval Program (SCAQMD LAP). We are pleased to inform you that your firm is approved for the period beginning September 30, 2017, and ending September 30, 2018 for the following methods, subject to the requirements in the LAP Conditions For Approval Agreement and conditions listed in the attachment to this letter:

SCAQMD Methods 1-4
SCAQMD Methods 10.1 and 100.1
USEPA CTM-030 and ASTM D6522-00
SCAQMD Rule 1420/1420.1/1420.2 – (Lead) Source and Ambient Sampling
SCAQMD Methods 5.1, 5.2, 5.3, 6.1
SCAQMD Methods 25.1 and 25.3 (Sampling)
SCAQMD Rule 1121/ 1146.2 Protocol

Your LAP approval to perform nitrogen oxide emissions compliance testing for SCAQMD Rule 1121/ 1146.2 Protocols includes satellite facilities located at:

McKenna Boiler
1510 North Spring Street
Los Angeles, CA 90012

Noritz America Corp.
11160 Grace Avenue
Fountain Valley, CA 92708

Ajax Boiler, Inc.
2701 S. Harbor Blvd.
Santa Ana, CA 92704

Thank you for participating in the SCAQMD LAP. Your cooperation helps us to achieve the goal of the LAP: to maintain high standards of quality in the sampling and analysis of source emissions. You may direct any questions or information to LAP Coordinator, Glenn Kasai. He may be reached by telephone at (909) 396-2271, or via e-mail at gkasai@aqmd.gov.

Sincerely,

D. Sarkar

Dipankar Sarkar
Program Supervisor
Source Test Engineering

DS:GK/gk

Attachment

171004 LapRenewalRev.doc

*Cleaning the air that we breathe...™*



MONTROSE AIR QUALITY SERVICES

STAC STACK TESTING ACCREDITATION COUNCIL

A2LA American Association for Laboratory Accreditation

# Accredited Air Emission Testing Body

A2LA has accredited

## MONTROSE AIR QUALITY SERVICES

In recognition of the successful completion of the joint A2LA and Stack Testing Accreditation Council (STAC) evaluation process, this laboratory is accredited to perform testing activities in compliance with ASTM D7036:2004 - Standard Practice for Competence of Air Emission Testing Bodies.

Presented this 5th day of March 2018.

President and CEO
For the Accreditation Council
Certificate Number 3925.01
Valid to February 29, 2020

*This accreditation program is not included under the A2LA ILAC Mutual Recognition Arrangement.*



MONTROSE AIR QUALITY SERVICES

# APPENDIX D.3

# INDIVIDUAL QI CERTIFICATIONS

# CERTIFICATE OF COMPLETION

## Dave Wonderly

This document certifies that this individual has passed a comprehensive examination and is now a Qualified Individual (QI) as defined in Section 8.3 of ASTM D7036-04 for the following method(s):

**Source Evaluation Society Group 1:** *EPA Manual Gas Volume and Flow Measurements and Isokinetic Particulate Sampling Methods*

**Certificate Number:** 002-2018-22

Tate Strickler, Accreditation Director

DATE OF ISSUE: 11/9/13

DATE OF EXPIRATION: 11/9/18

MONTROSE ENVIRONMENTAL

# CERTIFICATE OF COMPLETION

Dave Wonderly

This document certifies that this individual has passed a comprehensive examination and is now a Qualified Individual (QI) as defined in Section 8.3 of ASTM D7036-04 for the following method(s):

**Source Evaluation Society Group 2:** *EPA Manual Gaseous Pollutants Source Sampling Methods*

Certificate Number: 002-2018-23

Tate Strickler, Accreditation Director

DATE OF ISSUE: 11/9/13

DATE OF EXPIRATION: 11/9/18

MONTROSE ENVIRONMENTAL

# CERTIFICATE OF COMPLETION

## Dave Wonderly

This document certifies that this individual has passed a comprehensive examination and is now a Qualified Individual (QI) as defined in Section 8.3 of ASTM D7036-04 for the following method(s):

**Source Evaluation Society Group 3:** *EPA Gaseous Pollutants Instrumental Methods*

**Certificate Number:** 002-2018-24

Tate Strickler, Accreditation Director

DATE OF ISSUE: 9/28/13

DATE OF EXPIRATION: 9/28/18

MONTROSE ENVIRONMENTAL

# CERTIFICATE OF COMPLETION

Dave Wonderly

This document certifies that this individual has passed a comprehensive examination and is now a Qualified Individual (QI) as defined in Section 8.3 of ASTM D7036-04 for the following method(s):

**SCAQMD Methods 25.1, 25.3 & 307-91**

**Certificate Number:** 002-2016-32

Tate Strickler, Accreditation Director

DATE OF ISSUE: 12/9/16

DATE OF EXPIRATION: 12/9/21

MONTROSE ENVIRONMENTAL

# APPENDIX E

# TEST PLAN

# TEST PLAN FOR EMISSIONS PERFORMANCE TESTING AT THE DESERT VIEW POWER PLANT

PREPARED FOR:

**DESERT VIEW POWER**
62-300 GENE WELMAS DR.
MECCA, CA. 92254-0758

FOR SUBMITTAL TO:

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**
21865 COPLEY DRIVE
DIAMOND BAR, CALIFORNIA 91765-4178

PREPARED BY:

**MONTROSE AIR QUALITY SERVICES, LLC**
1631 E. ST. ANDREW PL.
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(714) 279-6777

DAVE WONDERLY

PROJECT NUMBER: **002AS2-320471**

PRODUCTION DATE: **FEBRUARY 7, 2018**

DOCUMENT NUMBER: **R1415706**

MONTROSE
AIR QUALITY SERVICES

## CONFIDENTIALITY STATEMENT

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## 1.0 INTRODUCTION

Montrose Air Quality Services, LLC (MAQS), has been contracted by Desert View Power to conduct annual emissions compliance testing on two Fluid Bed Boilers, and a relative accuracy test audit (RATA) of the continuous emissions monitoring system (CEMS) at the Desert View Power Plant located in Mecca, California. MAQS will conduct testing to comply with U.S. Environmental Protection Agency Operating Permit NSR 4-4-11;SE 87-01 including amendments through August 14, 2003: 7th Amendment Title V permit to operate CB-OP 99-01 dated 8/1/2000 and 40 CFR 60, Appendix F. This test plan presents the testing procedures, a description of the sample locations and a summary of quality assurance procedures.

Emissions tests will be performed on each Biomass fired boiler as specified in the permit for:

- Particulate
- $NO_x$, CO and $SO_2$
- Hydrocarbons
- Hydrogen Chloride (HCl)
- Method 19 F-Factor Using ASTM D6323 and ASTM E711 for Fuel BTU/lb
- Volumetric Flow Rate
- Oxygen and Carbon Dioxide concentration
- Flue gas moisture content

A relative accuracy test audit will be performed to satisfy the requirements of 40 CFR 60, Appendix F, as part of the quarterly CEMS testing. The Continuous Emissions Monitoring System (CEMS) Relative Accuracy Test Audit includes $NO_x$, CO and $SO_2$.

## 2.0 UNIT DESCRIPTION

The Desert View Power Plant consists of two 297 MMBtu/hour, circulating bed, biomass-fired boilers, and combined unit are designed to produce 47 MW of net electrical output. Each unit is equipped with the following pollution control systems:

1. An ammonia injection system for control of $NO_x$ emissions;
2. Cyclonic mixing of injected ammonia with flue gas to provide for a minimum amount of ammonia slip (emission);
3. A limestone injection system to limit emissions of $SO_2$;
4. A hydrated lime injection system to limit emissions of HCL;
5. A reverse air baghouse to restrict opacity and emissions of sulfates and particulate to very low levels.

The plant CEM system for each unit includes measurements of $NO_x$, CO, $O_2$, $O_2$ wet, $SO_2$, $CO_2$, flow and opacity. It is an extractive system with a heated line extending from the probe to the CEM unit. Table 2-1 presents the current CEMS configuration.

**TABLE 2-1**
**CONTINUOUS EMISSION MONITOR SYSTEM**
**DESERT VIEW POWER PLANT**

| Species | Manufacturer | Model | Range |
|---|---|---|---|
| $NO_x$ | CAI | ZRE-5 Multi Component Analyzer | 100 and 500 ppm |
| CO | CAI | ZRE-5 Multi Component Analyzer | 100 and 500 ppm |
| $O_2$ Dry | CAI | ZRE-5 Multi Component Analyzer | 25% |
| $SO_2$ | CAI | ZRE-5 Multi Component Analyzer | 50 and 500 ppm |
| $CO_2$ | CAI | ZRE-5 Multi Component Analyzer | 20% |
| $O_2$ Wet | AMETEK | Thermox 2000 | 25% |
| Flow | Diet Greg Standard | -- | Msdcfh |
| Opacity | Monitor Labs | Lighthawk 560 | 100% |

## 2.1 SAMPLE LOCATIONS

Samples will be collected from the transition ducts to the stack. Carnot Technical Services, Inc. conducted three dimensional flow testing and stratification testing on the transition exhaust ducts on each unit. This testing was conducted in accordance to SCAQMD chapter X section 1 and 13 and will be presented in the report titled "Stack Gas Stratification and Absence of Flow Disturbance Testing at Desert View Power Mecca Project" (R106E622.T) submitted to SCAQMD in October of 1994. The sample locations met all the requirements. Copies of the results from that report can be found in Appendix B .All testing for both Unit 1 and 2 will be done at the sample location presented in Figure 2-1.

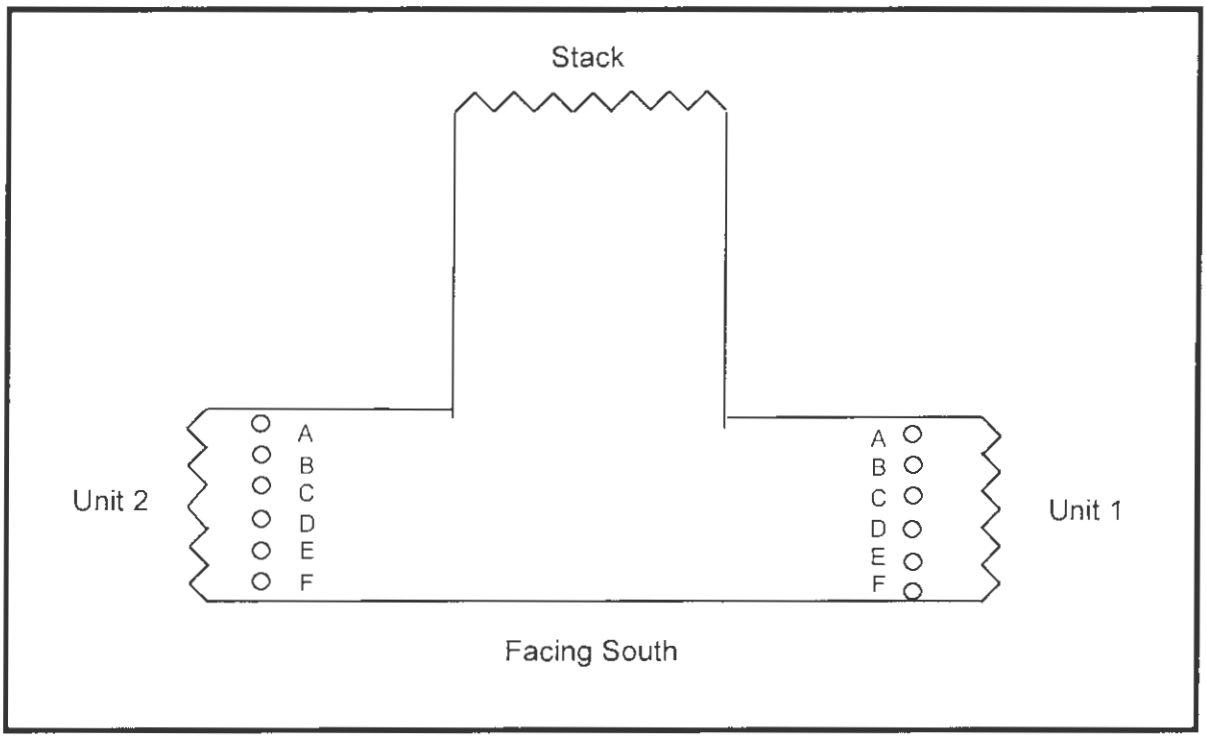


**Figure 2-1 Desert View Power Sample Location**

## 2.2 UNIT OPERATION

The tests will be conducted at or near maximum steady state unit load conditions. Limestone injection rate, fuel combustion rate, ammonia injection rate, ash handling operations, excess air level, combustion air distribution, and combustion temperature will all be set to maintain stable unit operation. Pertinent operating conditions will be recorded by Desert View Power personnel during the tests. Full load will be defined as greater than 267 MMBtu/hr of total (biomass and natural gas) heat input to the boiler.

## 3.0 TEST PROCEDURES

The test procedures to be used are listed in Table 3-1. Part of the gaseous plant emissions performance testing data will be used for CEMS RATA determinations. A minimum of nine reference method tests are required for all gaseous species relative accuracy (RA) determinations.

**TABLE 3-1**
**PROPOSED TEST MATRIX PER UNIT**
**FOR DESERT VIEW POWER MECCA PROJECT**

| Parameter | No. of Tests | Measurement Principle | Reference Method | Duration per Test |
|---|---|---|---|---|
| $NO_x$ | 9(1) | Chemiluminescence | EPA 7E | 60/30 minutes |
| CO | 9(1) | Non-Dispersive Infrared | EPA 10 | 60/30 minutes |
| $O_2/CO_2$ | 9(1) | Non-Dispersive Infrared | EPA 3A | 60/30 minutes |
| PM | 3 | Gravimetric | EPA 5 | 90 minutes |
| $SO_2$ | 9(1) | Barium Thorin Titration | EPA 6 | 60/30 minutes |
| Hydrocarbons | 2 | GC/FID | SCAQMD 25.3 | 60 minute composite |
| HCL | 3 | ion chromatography | EPA 26A | 120 minutes, minimum of 2 DSCM of sample volume |
| Fuel Sampling | Daily | | ASTM D6323 | Composite hourly samples |
| Fuel BTU/lb | Daily | | ASTM E711 | Composite hourly samples |
| Fuel Moisture | Daily | | ASTM D3173 | Composite hourly samples |
| Fuel Chlorine | Daily | | ASTM E776 | Composite hourly samples |
| Stack Gas Flow Rate | -- | S-Type Pitot Traverse | EPA 2 | -- |
| Moisture | -- | Condensation/Gravimetric | EPA 4 | -- |

(1) Includes compliance and RATA test runs.

## 3.1 CONTINUOUS GASEOUS MEASUREMENTS

$NO_x$, $O_2$, $CO_2$ and CO will be measured according to EPA reference methods using MAQS continuous emissions monitoring system (CEM). $NO_x$, $O_2$, $CO_2$ and CO concentrations will be determined using MAQS mobile emission measurement laboratory. The laboratory is housed in an 18 foot trailer outfitted to provide a clean, quiet, environmentally controlled base for the testing operations. The laboratory has lighting, electrical distribution, air conditioning and heating to support the test instruments and provide for optimal test performance.

Concentrations of these gaseous species are measured using an extractive sampling system consisting of a heated stainless steel probe to minimize reactions, a heat traced Teflon sample line connected to a thermo-electrically cooled sample dryer. Following the dryer, the sample is drawn into a Teflon lined pump where it is pressurized and then filtered for delivery to the gas analysis portion of the system. Gaseous samples will be collected at a single point. Three minimum 60-minute compliance tests will be performed.

$NO_x$ concentration is determined using a California Analytical Instruments (CAI) chemiluminescence analyzer (model 600 Series). The analyzer has full scale ranges from 2.5 to 10,000 ppm. The analyzer is equipped with a vitreous carbon $NO_2$ - NO converter for the determination of total nitrogen oxides without interference from other nitrogen containing compounds.

Oxygen concentration is determined using a AMI electro-chemical cell analyzer (model # 201). The analyzer has three full scale ranges; 0-5%, 10%, and 25%. The cell contains an electrolytic fluid that reacts with oxygen to generate an electrical signal proportional to the concentration.

$CO_2$ is measured using a non-dispersive infrared analyzer manufactured by CAI (model # 100 Series). The analyzer has full scale ranges of 0-5%, 10%, 20% and 40%.

CO is measured using a non-dispersive infrared/gas filter correlation analyzer manufactured by TECO (model # 48i). The analyzer has user definable full scale ranges from of 0-10 to 0-10,000 ppm.

The analyzers and sampling system are subjected to a variety of calibration and quality assurance procedures including leak checks, linearity and calibration error determinations before sampling, and system bias and drift determinations as part of each test run. Data are corrected for any observed bias or drift in accordance with the reference methods.

## 3.2 PARTICULATE MEASUREMENTS

EPA method 5 sampling system will be used to measure the particulate emissions from both Desert View Power units. The sampling system consists of a nozzle, glass probe, 250°F heated filter, two impingers containing DI water, a third empty impinger and a fourth impinger containing silica gel.

The analysis for particulate is summarized in Table 3-2. Gravimetric Analysis will be performed on the probe/nozzle wash and filter.

**TABLE 3-2**
**EPA METHOD 5 ANALYSES**

| | Sample Component | Analysis Procedure |
|---|---|---|
| 1. | Probe and Nozzle (Front 1/2) | Evaporation/gravimetric |
| 2. | Heated Filter (83 mm) | Bake/gravimetric |

## 3.3 SULFUR DIOXIDE

Sulfur dioxide will be measured according to EPA Method 6. The first three runs will be 60 minutes and will be used to demonstrate compliance and as RATA runs. Subsequent RATA runs will consist of 30 minute tests per the Methods. A barium thorin titration of the hydrogen peroxide impinger samples will yield $SO_2$ concentrations for nine relative accuracy test runs. The sample system will consist of a heated glass probe connected to the impinger train with an un-heated Teflon sample line. All the unheated portion of the sample train will be recovered and analyzed. Prior to the titrimetric analysis, all $SO_x$ samples will pass through an ion exchange resin. This removes interference associated with ammonium ($NH_4^+$). The Method 6 train will not include the IPA impinger, which is provided in the method as an option. The $H_2O_2$ will absorb both $SO_2$ and $SO_3$ (if any). $SO_3$ will be counted as $SO_2$.

## 3.4 HYDROCARBON

Samples for hydrocarbon analysis will be collected in clean 6-L Summa Canister and mini water impingers and analyzed according to SCAQMD 25.3. The samples will be analyzed by AtmAA inc. in Calabasas, CA using TCA/FID. Results will be reported as total non-methane hydrocarbons as carbon.

## 3.5 HYDROGEN CHLORIDE MEASUREMENTS

Triplicate hydrogen chloride (HCl), samples will be collected using EPA Method 26A. Sampling and analysis for HF and Cl2 which is included in EPA Method 26A will not be performed.

The sampling train consists of:

- A glass nozzle and heated glass probe heated to between 248°F and 273°F
- A Teflon Mat or quartz out-of-stack filter in a glass filter holder heated to 248°F ± 25°F
- Two impingers containing 100 ml of 0.1 N $H_2SO_4$ for collection of HCl
- One empty impinger
- An impinger containing silica gel

Samples are withdrawn isokinetically from the stack. The Teflon Mat or quartz-fiber filter collects particulate matter. The acidic absorbing solution collect gaseous HCl and is analyzed for HCl by ion chromatography.

The samples are recovered in the following sample fractions:

1) Back half of filter holder, $H_2SO_4$ Impinger Catch – Weighed for moisture content and recovered with DI water into pre-cleaned HDPE bottle.
2) The filter and probe wash will not be recovered for this test program.

Quality assurance samples collected in the field are:

- A field blank
- A reagent blank: 200 ml of 0.1 N H2SO4
- A reagent blank: 200 ml of DI water

The samples will be analyzed by ion chromatography by AAC in Ventura.

## 3.6 VELOCITY AND MOISTURE

Stack gas velocity and moisture content will be determined by EPA Methods 2 and 4 during the particulate test. Velocity traverses will be performed during each set of compliance tests ($NO_x$, CO, $SO_2$ and hydrocarbons) and for each RATA run.

## 3.7 FUEL ANALYSIS

Daily fuel samples will be collected by Desert View Power personnel. Hourly samples will be taken and composited by the lab prior to analysis. Sampling will be consistent with ASTM D6323 sample collection methodology. MAQS will send the samples out to be analyzed for higher heating value for heat rate calculations, for BTU/lb for calculating the HCL emissions in lb/MMBtu using ASTM E711, for moisture content using ASTM D3173 and for chlorine content using ASTM E776. Copies of the analysis will be included with the final report.

## 3.8 RELATIVE ACCURACY TEST AUDIT

Relative Accuracy tests will be performed for $NO_x$, $SO_2$, CO and $O_2$ on sub systems of each unit's CEMS. Relative accuracy is determined by comparing the CEMS data to the corresponding reference method (RM) data over nine to twelve test runs. Nine 30-minute minimum tests will be performed for the $NO_x$, $SO_2$, CO, and $O_2$ relative accuracy. Relative accuracy is expressed in terms of the absolute value of the mean of the difference between the monitor value and the reference method value. It is reported in terms of a percentage of the mean reference method value. The computational procedure is summarized by the following equations:

$$\overline{RM} = \frac{1}{n}\sum_{i=1}^{n} RM_1$$

$$\overline{d} = \sum_{i=1}^{n} d_i$$

$$S_d = \left[\frac{\sum_{i=1}^{n} d_i^2 - \frac{\left(\sum_{i=1}^{n} d_i\right)^2}{n}}{n-1}\right]^{\frac{1}{2}}$$

$$CC = t_{0.975}\frac{S_d}{\sqrt{n}}\,1$$

$$RA = \frac{|\overline{d}| + |cc|}{\overline{RM}}\,x100$$

The RA will be determined for the monitoring systems in parts per million dry (ppm) and lb/hr.

## 3.9 TEST SCHEDULE

The scheduled test dates have been set for March 27 – March 30, 2018 for compliance and RATA testing. A proposed test schedule for on-site testing activities is shown in Table 3-3. This schedule is based on the number of tests and the required sample times.

**TABLE 3-3**
**ON-SITE TEST SCHEDULE**
**DESERT VIEW POWER**

| Date | Unit No. | Test No. | Type of Test |
|---|---|---|---|
| 3/26/2018 | 1 | -- | Set-up |
| 3/27/2018 | 1 | 1-3 PM, 1-3 HCL<br>1-3 Comp RATA testing | Particulate Tests 1-3, HCL Tests 1-3 CEMS RATA and Compliance $NO_x$, $SO_2$, CO &VOC Tests 1-3 Fuel Samples |
| 3/28/2018 | 1 | RATA testing Continued | CEMS RATA |
| 3/29/2018 | 2 | 1-3 PM, 1-3 HCL<br>1-3 Comp RATA testing | Particulate Tests 1-3, HCL Tests 1-3 CEMS RATA and Compliance $NO_x$, $SO_2$, CO &VOC Tests 1-3 Fuel Samples |
| 3/30/2018 | 2 | RATA testing Continued | CEMS RATA |

## 4.0 REPORTING

MAQS will prepare a comprehensive emissions report that includes all raw data and calculations for the test program. The test format is presented in Table 4-1. The test report will be submitted within 45 days from completion of testing.

**TABLE 4-1**
**REPORT FORMAT**

**Title page**
Report Title
Prepared For
For Submittal To:
Author and reviewer names
Test Dates and Report Issue Date
Report Number

**Review Page**
Signatures of person who prepared the report and signature of person who reviewed the report

**Table of Contents**

**Introduction and Summary**
Identifies the client, source, reason for the test, test date(s), test personnel, client/source personnel, regulatory observers
Summarizes the results of the test, indicates applicable rules and pass/fail criteria and makes a statement regarding the test results
Outlines the organization of remainder of the report.
Table of analysis results

**Unit Description**
Describes the process which was tested
Describes any applicable control equipment
Test conditions

**Test Description**
Test methods, replicates, duration, calculations
Test locations
Test critique

**Results**
Re-states the results of the test and makes a statement regarding compliance with applicable regulations
Results tables with more detail on individual test runs and supporting data

**Appendices**
A. Test and Laboratory Data
  1. Test Location
  2. Test Data (by type)
  3. Quality Assurance Data
    a. Certification
    b. Equipment Calibration
    c. Calibration Gas Certificate
    d. Chain of Custody
B. Process Operating Data
C. Measurement Procedures
D. Calculations
E. Instrument Strip Charts

# APPENDIX A QUALITY ASSURANCE AND CERTIFICATIONS

## QUALITY ASSURANCE PROGRAM SUMMARY

As part of Montrose Air Quality Services, LLC (MAQS) ASTM D7036-04 certification, MAQS is committed to providing emission related data which is complete, precise, accurate, representative, and comparable. MAQS quality assurance program and procedures are designed to ensure that the data meet or exceed the requirements of each test method for each of these items. The quality assurance program consists of the following items:

- Assignment of an Internal QA Officer
- Development and use of an internal QA Manual
- Personnel training
- Equipment maintenance and calibration
- Knowledge of current test methods
- Chain-of-custody
- QA reviews of test programs

Assignment of an Internal QA Officer: MAQS has assigned an internal QA Officer who is responsible for administering all aspects of the QA program.

Internal Quality Assurance Manual: MAQS has prepared a QA Manual according to the requirements of ASTM D7036-04 and guidelines issued by EPA. The manual documents and formalizes all of MAQS QA efforts. The manual is revised upon periodic review and as MAQS adds capabilities. The QA manual provides details on the items provided in this summary.

Personnel Testing and Training: Personnel testing and training is essential to the production of high quality test results. MAQS training programs include:

- A requirement for all technical personnel to read and understand the test methods performed
- A requirement for all technical personnel to read and understand the MAQS QA manual
- In-house testing and training
- Quality Assurance meetings
- Third party testing where available
- Maintenance of training records.

Equipment Maintenance and Calibration: All laboratory and field equipment used as a part of MAQS emission measurement programs is maintained according to manufacturer's recommendations. A summary of the major equipment maintenance schedules is summarized in Table 1. In addition to routine maintenance, calibrations are performed on all sampling equipment according to the procedures outlined in the applicable test method. The calibration intervals and techniques for major equipment components is summarized in Table 2. The calibration technique may vary to meet regulatory agency requirements.

Knowledge of Current Test Methods: MAQS maintains current copies of EPA, ARB, and SCAQMD Source Test Manuals and Rules and Regulations.

Chain-of-Custody: MAQS maintains chain-of-custody documentation on all data sheets and samples. Samples are stored in a locked area accessible only to MAQS source test personnel. Data sheets are kept in the custody of the originator, program manager, or in locked storage until return to MAQS office. Electronic field data is duplicated for backup on secure storage media. The original data sheets are used for report preparation and any additions are initialed and dated.

QA Reviews: Periodic field, laboratory, and report reviews are performed by the in-house QA coordinator. Periodically, test plans are reviewed to ensure proper test methods are selected and reports are reviewed to ensure that the methods were followed and any deviations from the methods are justified and documented.

**ASTM D7036-04 Required Information**

Uncertainty Statement

"Both qualitative and quantitative factors contribute to field measurement uncertainty and should be taken into consideration when interpreting the results contained within this report. Whenever possible, Montrose Air Quality Services, LLC (MAQS) personnel reduce the impact of these uncertainty factors through the use of approved and validated test methods. In addition, MAQS personnel perform routine instrument and equipment calibrations and ensure that the calibration standards, instruments, and equipment used during test events meet, at a minimum, test method specifications as well as the specifications of our Quality Manual and ASTM D 7036-04. The limitations of the various methods, instruments, equipment, and materials utilized during this test have been reasonably considered, but the ultimate impact of the cumulative uncertainty of this project is not fully identified within the results of this report."

Performance Data

Performance data are available for review.

Qualified Personnel

A qualified individual (QI), defined by performance on a third party or internal test on the test methods, will be present on each test event.

Plant Entry and Safety Requirements

**Plant Entry**

All test personnel are required to check in with the guard at the entrance gate or other designated area. Specific details are provided by the facility and project manager.

**Safety Requirements**

All personnel shall have the following personal protective equipment (PPE) and wear them where designated:

- Hard Hat
- Safety Glasses
- Steel Toe Boots
- Hearing Protection
- Gloves
- High Temperature Gloves (if required)

The following safety measures will be followed:

- Good housekeeping
- SDS for all on-site hazardous materials
- Confine selves to necessary areas (stack platform, mobile laboratory, CEMS data acquisition system, control room, administrative areas)
- Knowledge of evacuation procedures

Each facility will provide plant specific safety training.

**TABLE 1**
**EQUIPMENT MAINTENANCE SCHEDULE**

| Equipment | Acceptance Limits | Frequency of Service | Methods of Service |
|---|---|---|---|
| Pumps | 1. Absence of leaks<br>2. Ability to draw manufacturers required vacuum and flow | As recommended by manufacturer | 1. Visual inspection<br>2. Clean<br>3. Replace parts<br>4. Leak check |
| Flow Meters | 1. Free mechanical movement | As recommended by manufacturer | 1. Visual inspection<br>2. Clean<br>3. Calibrate |
| Sampling Instruments | 1. Absence of malfunction<br>2. Proper response to zero, span gas | As recommended by manufacturer | As recommended by manufacturer |
| Integrated sampling tanks | 1. Absence of leaks | Depends on nature of use | 1. Steam clean<br>2. Leak check |
| Mobile van sampling system | 1. Absence of leaks | Depends on nature of use | 1. Change filters<br>2. Change gas dryer<br>3. Leak check<br>4. Check for system contamination |
| Sampling lines | 1. Sample degradation less than 2% | After each test series | 1. Blow dry, inert gas through line until dry. |

## TABLE 2
## MAJOR SAMPLING EQUIPMENT CALIBRATION REQUIREMENTS

| Sampling Equipment | Calibration Frequency | Calibration Procedure | Acceptable Calibration Criteria |
|---|---|---|---|
| Continuous Analyzers | Before and After Each Test Day | 3-point calibration error test | < 2% of analyzer range |
| Continuous Analyzers | Before and After Each Test Run | 2-point sample system bias check | < 5% of analyzer range |
| Continuous Analyzers | After Each Test Run | 2-point analyzer drift determination | < 3% of analyzer range |
| CEMS System | Beginning of Each Day | leak check | < 1 in. Hg decrease in 5 min. at > 20 in. Hg |
| Continuous Analyzers | Semi-Annually | 3-point linearity | < 1% of analyzer range |
| $NO_x$ Analyzer | Daily | $NO_2$ -> NO converter efficiency | > 90% |
| Differential Pressure Gauges (except for manometers) | Semi-Annually | Correction factor based on 5-point comparison to standard | +/- 5% |
| Differential Pressure Gauges (except for manometers) | Bi-Monthly | 3-point comparison to standard, no correction factor | +/- 5% |
| Barometer | Semi-Annually | Adjusted to mercury-in-glass or National Weather Service Station | +/- 0.1 inches Hg |
| Dry Gas Meter | Semi-Annually | Calibration check at 4 flow rates using a NIST traceable standard | +/- 2% |
| Dry Gas Meter | Bi-Monthly | Calibration check at 2 flow rates using a NIST traceable standard | +/- 2% of semi-annual factor |
| Dry Gas Meter Orifice | Annually | 4-point calibration for $\Delta H@$ | -- |
| Temperature Sensors | Semi-Annually | 3-point calibration vs. NIST traceable standard | +/- 1.5% |

Note: Calibration requirements will be used that meet applicable regulatory agency requirements.

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

October 4, 2017

Mr. John Peterson
Montrose Air Quality Services, LLC (MAQS-SNA, Delta, SCEC)
1631 E. Saint Andrew Place
Santa Ana, CA 92705

Subject: LAP Approval Notice
Reference # 96LA1220

Dear Mr. Peterson:

We have reviewed your renewal letter under the South Coast Air Quality Management District's Laboratory Approval Program (SCAQMD LAP). We are pleased to inform you that your firm is approved for the period beginning September 30, 2017, and ending September 30, 2018 for the following methods, subject to the requirements in the LAP Conditions For Approval Agreement and conditions listed in the attachment to this letter:

| | |
|---|---|
| SCAQMD Methods 1-4 | SCAQMD Methods 5.1, 5.2, 5.3, 6.1 |
| SCAQMD Methods 10.1 and 100.1 | SCAQMD Methods 25.1 and 25.3 (Sampling) |
| USEPA CTM-030 and ASTM D6522-00 | SCAQMD Rule 1121/ 1146.2 Protocol |
| SCAQMD Rule 1420/1420.1/1420.2 – (Lead) Source and Ambient Sampling | |

Your LAP approval to perform nitrogen oxide emissions compliance testing for SCAQMD Rule 1121/ 1146.2 Protocols includes satellite facilities located at:

| | | |
|---|---|---|
| McKenna Boiler | Noritz America Corp. | Ajax Boiler, Inc. |
| 1510 North Spring Street | 11160 Grace Avenue | 2701 S. Harbor Blvd. |
| Los Angeles, CA 90012 | Fountain Valley, CA 92708 | Santa Ana, CA 92704 |

Thank you for participating in the SCAQMD LAP. Your cooperation helps us to achieve the goal of the LAP: to maintain high standards of quality in the sampling and analysis of source emissions. You may direct any questions or information to LAP Coordinator, Glenn Kasai. He may be reached by telephone at (909) 396-2271, or via e-mail at gkasai@aqmd.gov.

Sincerely,

D. Sarkar

Dipankar Sarkar
Program Supervisor
Source Test Engineering

DS:GK/gk

Attachment

171004 LapRenewalRev.doc

MONTROSE AIR QUALITY SERVICES

State of California

# Air Resources Board

Approved Independent Contractor

**Delta Air Quality Services, Incorporated**

This is to certify that the company listed above has been approved by the Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, until June 30, 2018, for those test methods listed below:

**ARB Source Test Methods:**
**1, 2, 3, 4, 5, 6, 8, 17, 20, 501**
**100 ($CO$, $CO_2$, $NO_x$, $O_2$, $SO_2$)**

Dr. Michael T. Benjamin, Chief
Monitoring and Laboratory Division

State of California

# Air Resources Board

Approved Independent Contractor

**Delta Air Quality Services, Incorporated**

This is to certify that the company listed above has been approved by the Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, until June 30, 2018, for those test methods listed below:

**U.S. EPA Source Test Methods 201A and 202**
**Visible Emissions Evaluation**

Dr. Michael T. Benjamin, Chief
Monitoring and Laboratory Division

STAC STACK TESTING ACCREDITATION COUNCIL

A2LA American Association for Laboratory Accreditation

# Accredited Air Emission Testing Body

A2LA has accredited

## MONTROSE AIR QUALITY SERVICES

In recognition of the successful completion of the joint A2LA and Stack Testing Accreditation Council (STAC) evaluation process, this organization is accredited to perform testing activities in compliance with ASTM D7036 - Standard Practice for Competence of Air Emission Testing Bodies.

Presented this 2nd day of February 2016

Senior Director of Quality and Communications
Certificate Number 3925.01
Valid to February 28, 2018

*This accreditation program is not included under the A2LA ILAC Mutual Recognition Arrangement.*

MONTROSE AIR QUALITY SERVICES

# APPENDIX B SAMPLE LOCATION VERIFICATION DATA

# STACK GAS STRATIFICATION AND ABSENCE OF FLOW DISTURBANCE TESTING AT COLMAC MECCA PROJECT

Prepared For:

UC Operating Service
Mecca, California

For Submittal To:

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Diamond Bar, California

Prepared By:

Edward J. Filadelfia

CARNOT
Tustin, California

JULY 1994

REVIEW AND CERTIFICATION

All work, calculations, and other activities and tasks performed and documented in this report were carried out under my direction and supervision.

Date 10/14/94

Edward J. Filadelfia
Senior Engineer

I have reviewed, technically and editorially, details, calculations, results, conclusions and other appropriate written material contained herein, and hereby certify that the presented material is authentic and accurate.

Date 10/14/94

Edward J. Filadelfia
Senior Engineer

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SECTION 1.0

# INTRODUCTION

Carnot was contracted by UC Operating Service (UCOS) to determine the suitability of the alternate sample location accessible from the stack inlet duct. Tests were conducted to determine the level of stack gas stratification and flow disturbance. The tests were performed at this location to satisfy the requirements of alternate sample location CFR 40 Appendix A Method 1. The tests were performed using the standard methods in Chapter X of the SCAQMD's Source Test Manual.

The flow disturbance and gaseous stratification tests were performed on June 27-28, 1994. The test program was coordinated by Greg Deedon of UCOS and Edward Filadelfia of Carnot. The Carnot test team consisted of Edward Filadelfia, Dave Wonderly, and Chris Hone. Unit operation was established and maintained by UCOS personnel.

The results of the tests are summarized in Tables 1-1 and 1-2. These results show that the sample location meets the requirements of the SCAQMD and EPA by demonstrating that the stack gas stratification is less than 10% and the average resultant flow angle is less than 20 degrees with a standard deviation of less than 10 degrees.

A description of the unit is presented in Section 2.0. Test procedures and locations are presented in Section 3.0. Test results are presented in Section 4.0. Tests procedure descriptions, field data sheets, calculations, and control room data are included in the Appendices.

TABLE 1-1
SUMMARY OF GASEOUS STRATIFICATION
COLMAC ENERGY PROJECT
JULY 1994

| Parameter | Unit 1 % Stratification | Unit 2 % Stratification | SCAQMD Limit, % |
|---|---|---|---|
| $O_2$, % | 0.4% | 1.0% | ≤10 |

TABLE 1-2
SUMMARY OF FLOW DISTURBANCE MEASUREMENTS
COLMAC ENERGY PROJECT
JULY 1994

| Parameter | Unit 1 Measured | Unit 2 Measured | SCAQMD Limit, % | EPA Limit, % |
|---|---|---|---|---|
| Average Resultant Angle, Degrees | 5.6° | 5.9° | ≤20 | ≤20 |
| Standard Deviation, Degrees | 3.3° | 4.0° | ≤10 | N/A |

## SECTION 2.0

## UNIT DESCRIPTION

The Colmac Energy Plant consists of two 297 MMBtu/hour, circulating bed boilers, the combined units are designed to produce 47 MW of net electrical output. Each unit is equipped with the following pollution control systems:

1. An ammonia injection system for control of $NO_x$ emissions.

2. Cyclonic mixing of injected ammonia with flue gas to provide for a minimum amount of ammonia slip (emission).

3. A limestone injection system to limit emissions of $SO_2$.

4. A reverse air baghouse to restrict opacity and emissions of sulfates and particulate to very low levels.

SECTION 3.0

# TEST DESCRIPTION

## 3.1 TEST CONDITIONS

All tests were performed with the unit operating at full load. Tests were conducted while the unit was firing bio mass and operating under normal conditions. Unit operations were established by UCOS operators.

## 3.2 SAMPLE LOCATION

Measurements were made from Units 1 and 2 inlet ducts to the stack. A schematic of the Sample location is shown in Figure 3-1. Chapter X sampling consisted of 40 point traverse for stratification, and a 42 point traverse for flow disturbances.

## 3.3 TEST PROCEDURES

Tests were performed using methods from the SCAQMD's Source Test Manual. These methods are contained in Chapter X - Section 1 for disturbed flow and Section 13 for gaseous stratification. Table 3-1 presents the test methods used in this program. $O_2$ concentrations were measured using Carnot's mobile emission monitoring system. Flow angles were measured using a United Sensor 3D probe. A description of the Carnot's Continuous Emissions Monitoring System and the standard measurement procedures are presented in Appendix A. A summary of the procedures used for gaseous stratification and disturbed flow are presented below.

### 3.3.1 Gaseous Stratification

Chapter X (Non-Standard Methods and Techniques), Chapter 13 of the SCAQMD Source Test Manual defines gaseous stratification as the presence of a difference, in excess of 10 percent, between any two points in the same cross sectional plane. Stratification can be determined for either pollutant gases (e.g., $NO_x$) or diluent gases (e.g., $O_2$, $CO_2$) in units of concentration. For this test program, the $O_2$ concentration was used to measure the level of stack gas stratification.

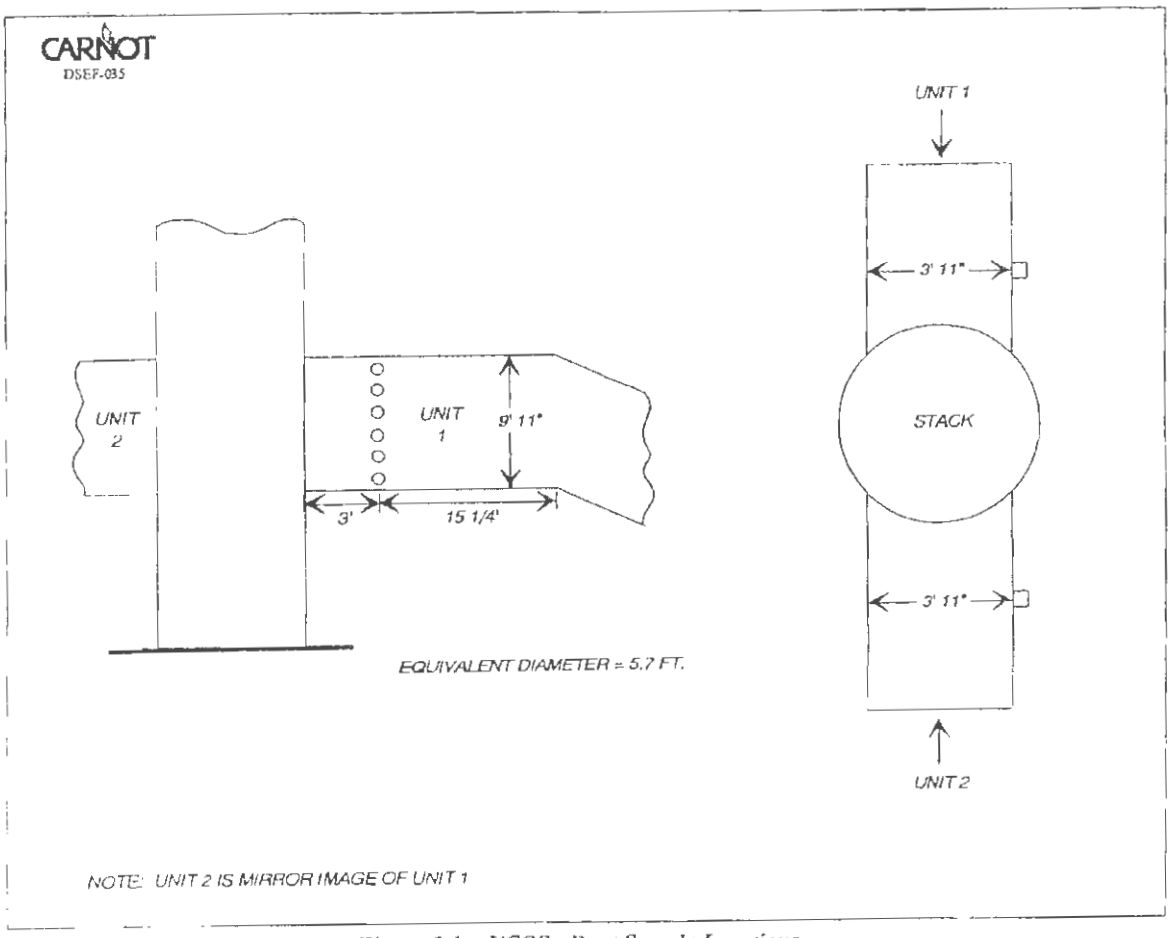



*Figure 3-1. UCOS - Duct Sample Locations*

Due to variations in process $O_2$ concentrations, two $O_2$ analyzers were used. The first $O_2$ analyzer was used as a reference point and located at the center of the duct. The second was located at 40 traverse points during the test. Gases were monitored for three minutes at each traverse point.

**TABLE 3-1**
**TEST PROCEDURES**
**COLMAC ENERGY PROJECT**
**JULY 1994**

| Parameter | Units | Measurement Principle | Reference Method | Comments |
|---|---|---|---|---|
| $O_2$ | % | Electrochemical Call | EPA 3A | 40 point traverse for gaseous stratification according to Chapter X, Section 13 |
| Flow Angle | Degrees | 3D probe for pitch and yaw | 1.1 | 42 point traverse for disturbed flow according to Chapter X, Section 1 |

SECTION 4.0

RESULTS

## 4.1 GASEOUS STRATIFICATION

The results of the gaseous stratification tests are summarized in Table 4-1. The results show that the $O_2$ concentration stratification levels for both sample locations were below the limit of 10%.

**TABLE 4-1**
**GASEOUS STRATIFICATION**
**COLMAC ENERGY PROJECT**
**JULY 1994**

| Parameter | Percent Stratification |
|---|---|
| Unit 1 $O_2$, % | 0.4% |
| Unit 2 $O_2$, % | 1.0% |

## 4.2 FLOW DISTURBANCE

The results of the flow disturbance measurements made with the 3-dimensional velocity probe are presented in Table 4-2. The results of these tests show that the average resultant flow angle was below the limit of 20 degrees with a standard deviation of less than 10 degrees for both sample locations.

**TABLE 4-2**
**FLOW DISTURBANCE RESULTS**
**COLMAC ENERGY PROJECT**
**JULY 1994**

| Parameter | Unit 1 3D Probe | Unit 2 3D Probe |
|---|---|---|
| Avg. Yaw Angle, degrees | 2.0 | 4.4 |
| Avg. Pitch Angle, degrees | -0.4 | -1.0 |
| Avg. Resultant Angle, degrees | 5.6 | 5.9 |
| Standard Deviation, degrees | 3.3 | 4.0 |

# APPENDIX A

# MEASUREMENT PROCEDURES

Continuous Emissions Monitoring System

Oxygen ($O_2$) by Continuous Analyzer

Three-Dimensional Velocity Testing

Continuous Emissions Monitoring System

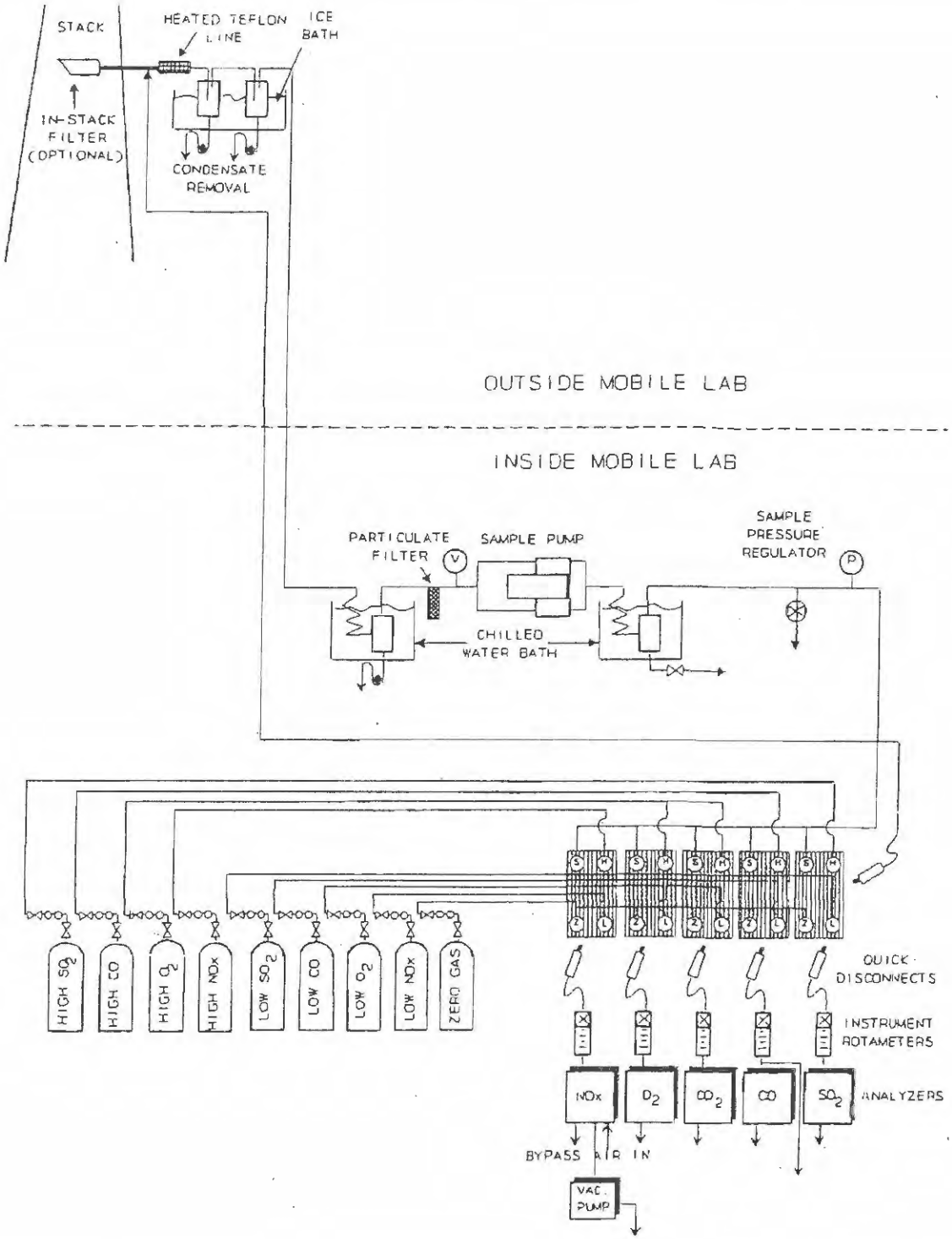
$O_2$, CO, $CO_2$, NO, $NO_x$ and $SO_2$ are measured using an extractive continuous emissions monitoring (CEM) package, shown in the following figure. This package is comprised of three basic subsystems. They are: (1) the sample acquisition and conditioning system, (2) the calibration gas system, and (3) the analyzers themselves. This section presents a description of the sampling and calibration systems. Descriptions of the analyzers used in this program and the corresponding reference test methods follow. Information regarding quality assurance information on the system, including calibration routines and system performance data follows.

The sample acquisition and conditioning system contains components to extract a representative sample from the stack or flue, transport the sample to the analyzers, and remove moisture and particulate material from the sample. In addition to performing the tasks above, the system must preserve the measured species and deliver the sample for analysis intact. The sample acquisition system extracts the sample through a stainless steel probe. The probe is insulated or heated as necessary to avoid condensation. If the particulate loading in the stack is high, a sintered stainless steel filter is used on the end of the probe.

Where water soluble $NO_2$ and/or $SO_2$ are to be measured, the sample is drawn from the probe through a heated teflon sample line into an on-stack cooled (approximately 35-40°F) water removal trap. The trap consists of stainless steel flasks in a bath of ice and water. This design removes the water vapor by condensation. The contact between the sample and liquid water is minimized and the soluble $NO_2$ and $SO_2$ are conserved. This system meets the requirements of EPA Method 20. The sample is then drawn through a teflon transport line, particulate filter, secondary water removal and into the sample pump. The pump is a dual head, diaphragm pump. All sample-wetted components of the pump are stainless steel or teflon. The pressurized sample leaving the pump flows through a third condensate trap in a refrigerated water bath (≈38°F) for final moisture removal. A drain line and valve are provided to constantly expel any condensed moisture from the dryer at this point. After the dryer, the sample is directed into a distribution manifold. Excess sample is vented through a back-pressure regulator, maintaining a constant pressure of 5-6 psig to the analyzer rotameters.

The calibration system is comprised of two parts: the analyzer calibration, and the system bias check (dynamic calibration). The analyzer calibration equipment includes pressurized cylinders of certified span gas. The gases used are, as a minimum, certified to 1% by the manufacturer. Where necessary to comply with reference method requirements EPA Protocol 1 gases are used. The cylinders are equipped with pressure regulators which supply the calibration gas to the analyzers at the same pressure and flow rate as the sample. The selection of zero, span, or sample gas directed to each analyzer is accomplished by operation of the sample/calibration selector fittings.

The system bias check is accomplished by transporting the same gases used to zero and span the analyzers to the sample system as close as practical to the probe inlet. This is done either by attaching the calibration gas supply line to the probe top with flexible tubing or by actuation of a solenoid valve located at the sample conditioner inlet (probe exit). The span gas is exposed to the same elements as the sample and the system response is documented. The analyzer indications for the system calibration check must agree within 5% of the analyzer calibration. Values are adjusted and changes/repairs are made to the system to compensate for any difference in analyzer readings. Specific information on the analytical equipment and test methods used is provided in the following pages.




Schematic of CEM System

| | |
|---|---|
| Method: | **Oxygen ($O_2$) by Continuous Analyzer** |
| Applicable Reference Methods: | EPA 3A, EPA 20, ARB 100, BA ST-14, SCAQMD 100.1 |
| Principle: | A sample is continuously drawn from the flue gas stream, conditioned, and conveyed to the instrument for direct readout of $O_2$ concentration. |
| Analyzer: | Teledyne Model 326A |
| Measurement Principle: | Electrochemical cell |
| Ranges: | 0-5, 0-10, 0-25 % $O_2$ |
| Accuracy: | 1 % of full scale |
| Output: | 0-100 mV, linear |
| Interferences: | Halogens and halogenated compounds will cause a positive interference. Acid gases will consume the fuel cell and cause a slow calibration drift. |
| Response Time: | 90% <7 seconds |
| Sampling Procedure: | A representative flue gas sample is collected and conditioned using the CEM system described previously. If Method 20 is used, that method's specific procedures for selecting sample points are used. Otherwise, stratification checks are performed at the start of a test program to select single or multiple-point sample locations. |
| Analytical Procedure: | An electrochemical cell is used to measure $O_2$ concentration. Oxygen in the flue gas diffuses through a Teflon membrane and is reduced on the surface of the cathode. A corresponding oxidation occurs at the anode internally, and an electric current is produced that is proportional to the concentration of oxygen. This current is measured and conditioned by the instrument's electronic circuitry to give an output in percent $O_2$ by volume. |
| Special Calibration Procedure: | The measurement cells used with the $O_2$ instrument have to be replaced on a regular basis. After extended use, the cell tend to produce a nonlinear response. Therefore, a three-point calibration is performed at the start of each test day to check for linearity. If the response is not linear ($\pm$ 2% of scale), the cell is replaced. |

| | |
|---|---|
| Method: | Three-Dimensional Velocity Testing |
| Applicable Ref. Method: | EPA Method 1, ANSI ASME PTC 11 - 1984 |
| Applicability of Method: | When a sample location to be used for velocity or particulate tests does not meet the traditional Method 1 criteria of being at least two duct diameters downstream and one-half diameter upstream of any flow disturbance, this alternate method is used to evaluate the suitability of the location.<br><br>A three-dimensional velocity probe is used to measure pitch and yaw angle at a minimum of 40 traverse points for round ducts and 42 points for rectangular ducts. If the average resultant angle is less than 20° and the standard deviation is less than 10°, the sample location is deemed acceptable. Velocity and particulate traverses are then performed at the same traverse points using standard Method 2 and 5 equipment and procedures. |
| Principle: | The instrument measures yaw and pitch angles of fluid flow, as well as total and static pressures. |
| Analyzer: | United Sensor Three-Dimensional Directional Probe |
| Sampling Procedure: | Each probe has five measuring holes in its tip. A centrally located pressure hole measures pressure P1, while two lateral pressure holes measure pressures P2 and P3. If the probe is rotated manually until P2 and P3 are identical as a readout on the manometer, the yaw angle of flow is then indicated by the number of degrees rotated.<br><br>When the yaw angle has been determined, an additional differential pressure P4 - P5 is measured by pressure holes located above and below the total pressure (P1) hole. Pitch angle is determined by calculating (P4 - P5)/(P1 - P2) and using the calibration data for the individual probe and interpolating between the bracketing data. At any particular pitch angle, the velocity pressure coefficient (Pt - Ps)/(P1 -P2) can also be interpolated from the calibration data and Pt - Ps and Ps calculated.<br><br>Note that this probe also allows for very accurate gas flow measurements, in addition to the EPA Method 1 procedures that allow it to be used for determination of flow angle. |

Definitions:

$P_1$ = Total Pressure
$P_2$ = Static Pressure
$P_3$ = Static Pressure
$P_4$ = Pitch Pressure
$P_5$ = Pitch Pressure

$P_1 - P_2$ = Velocity Head Pressure

$\frac{P_4 - P_5}{P_1 - P_2}$ = Pitch angle calculated on calibration curve

Calculations:

Velocity (fps) in direction of flow

$$V_s = 2.90\ C_P\sqrt{\Delta P\ T_s}\ \sqrt{\left(\frac{29.92}{P_S}\right)\left(\frac{28.95}{MW_{wet}}\right)}$$

where:
$C_P$ = Pitot Calibration factor
$\Delta P$ = Average velocity, head, iwg $(\overline{\sqrt{\Delta P}})^2$
$T_S$ = Stack Temperature, °R
$P_S$ = Stack Pressure (iwg)
$MW_{wet}$ = Molecular weight, wet

Resultant angle:

$$R = \left|\frac{\cos^{-1}(\cos\phi_{Y,R}\cos\phi_{P,R})}{0.0175}\right|$$

where:
$\phi_{Y,R}$ = Yaw Angle in Radians
$\phi_{P,R}$ = Pitch Angle in Radians
R = Resultant Angle in Degrees

Pitch Angle Curve Fit Equation (Degrees)

$$\phi_P = A_1\left(\frac{P_4-P_5}{P_1-P_2}\right) + A_2\left(\frac{P_4-P_5}{P_1-P_2}\right)^2 - A_3\left(\frac{P_4-P_5}{P_1-P_2}\right)^3 - A_4\left(\frac{P_4-P_5}{P_1-P_2}\right)^4 + A_5\left(\frac{P_4-P_3}{P_1-P_2}\right)^5 + A_6\left(\frac{P_4-P_5}{P_1-P_2}\right)^6$$

Pitot coefficient curve fit equation (used to calculate corrected axial velocities)

$$\frac{P_t-P_s}{P_1-P_2} = B_1 + B_2\,\phi_P + B_3 + \phi_P + B_4\,\phi_P^3 + B_5\,\phi_P^4 + B_6\,\phi_P^5 + B_7\,\phi_P^6$$

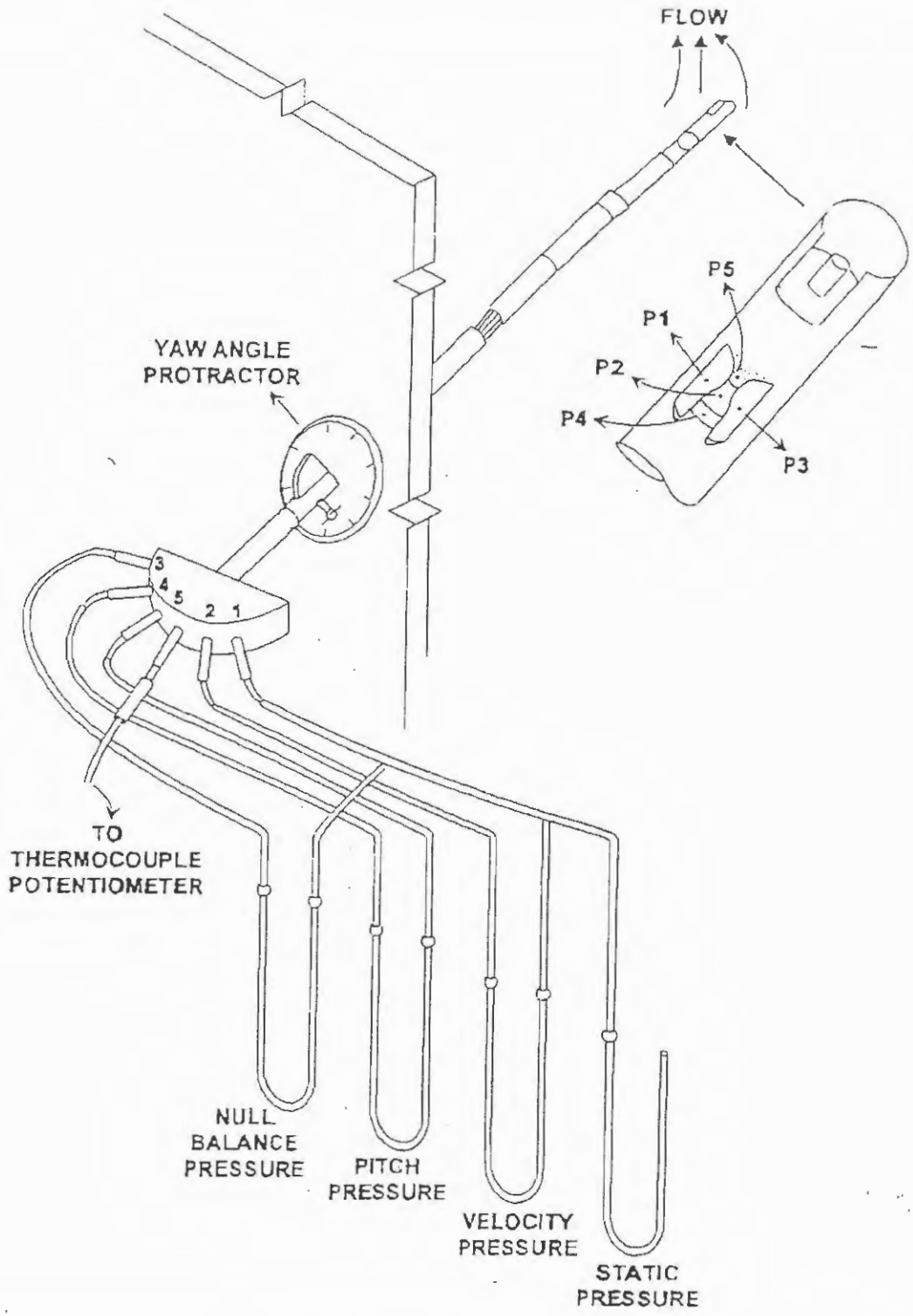



Figure Five Hole Probe

## 3-DIMENSIONAL VELOCITY PROBE CALIBRATION FACTORS

| Probe | B-2455 |
|---|---|
| $A_1$ | 63.09 |
| $A_2$ | 23.69 |
| $A_3$ | 24.505 |
| $A_4$ | 33.312 |
| $A_5$ | 7.5203 |
| $A_6$ | 11.669 |
| $B_1$ | 0.997 |
| $B_2$ | $7 \times 10^{-3}$ |
| $B_3$ | $3 \times 10^{-5}$ |
| $B_4$ | $8 \times 10^{-7}$ |
| $B_5$ | $1 \times 10^{-9}$ |
| $B_6$ | $3 \times 10^{-10}$ |
| $B_7$ | $3 \times 10^{-2}$ |

# APPENDIX B
# QUALITY ASSURANCE

Appendix B.1

Quality Assurance Program Summary

## QUALITY ASSURANCE PROGRAM SUMMARY AND ARB CERTIFICATION

Carnot ensures the quality and validity of its emission measurement and reporting procedures through a rigorous quality assurance (QA) program. The program is developed and administered by an internal QA Officer and encompasses seven major areas:

1. Development and use of an internal QA manual.
2. QA reviews of reports, laboratory work, and field testing.
3. Equipment calibration and maintenance.
4. Chain of custody.
5. Training.
6. Knowledge of current test methods.
7. Agency certification.

Each of these areas is discussed individually below.

Quality Assurance Manual. Carnot has prepared a QA Manual according to EPA guidelines. The manual serves to document and formalize all of Carnot's QA efforts. The manual is constantly updated, and each member of the Source Test Division is required to read and understand its contents. The manual includes details on the other six QA areas discussed below.

QA Reviews. Carnot's review procedure includes review of each source test report by the QA Officer, and spot check reviews of laboratory and field work.

The most important review is the one that takes place before a test program begins. The QA Officer works closely with Source Test Division personnel to prepare and review test protocols. Test protocol review includes selection of appropriate test procedures, evaluation of any interferences or other restrictions that might preclude use of standard test procedures, and evaluation and/or development of alternate procedures.

Equipment Calibration and Maintenance. The equipment used to conduct the emissions measurements is maintained according to the manufacturer's instructions to ensure proper operation. In addition to the maintenance program, calibrations are carried out on each measurement device according to the schedule outlined by the California Air Resources Board (CARB). The schedule for maintenance and calibrations are given in Tables B-1 and B-2. Quality control checks are also conducted in the field for each test program. The following is a partial list of checks made as part of each CEM system test series.

- Sample acquisition and conditioning system leak check.
- 2-point analyzer calibrations (all analyzers)
- 3-point analyzer calibrations (analyzers with potential for linearity errors).
- Complete system calibration check ("dynamic calibration" through entire sample system).

- Periodic analyzer calibration checks (once per hour) are conducted at the start and end of each test run. Any change between pre- and post-test readings are recorded.

- All calibrations are conducted using gases certified by the manufacturer to be + 1% of label value (NBS traceable).

Calibration and CEM performance data are fully documented, and are included in each source test report.

Chain of Custody. Carnot maintains full chain of custody documentation on all samples and data sheets. In addition to normal documentation of changes between field sample custodians, laboratory personnel, and field test personnel, Carnot documents every individual who handles any test component in the field (e.g., probe wash, impinger loading and recovery, filter loading and recovery, etc.).

Samples are stored in a locked area to which only Source Test Division personnel have access. Neither other Carnot employees nor cleaning crews have keys to this area.

Data sheets are copied immediately upon return from the field, and this first generation copy is placed in locked storage. Any notes made on original sheets are initialed and dated.

Training. Personnel training is essential to ensure quality testing. Carnot has formal and informal training programs which include:

1. Attendance at EPA-sponsored training courses.
2. Enrollment in EPA correspondence courses.
3. A requirement for all technicians to read and understand Carnot's QA Manual.
4. In-house training and QA meetings on a regular basis.
5. Maintenance of training records.

Knowledge of Current Test Methods. With the constant updating of standard test methods and the wide variety of emerging test methods, it is essential that any qualified source tester keep abreast of new developments. Carnot subscribes to services which provide updates on EPA and CARB reference methods, and on EPA, CARB and SCAQMD rules and regulations. Additionally, source test personnel regularly attend and present papers at testing and emission-related seminars and conferences. Carnot personnel maintain membership in the Air and Waste Management Association, the Source Evaluation Society, and the ASME Environmental Control Division.

## AGENCY CERTIFICATION

Carnot is certified by the CARB as an independent source test contractor for gaseous and particulate measurements. Carnot is certified by the SCAQMD as an independent source test contractor for gaseous and particulate measurements using SCAQMD Methods 1, 2, 3, 4, 5, 6, 7 and 100.1. Carnot also participates in EPA QA audit programs for Methods 5, 6 and 7.

TABLE B-1
SAMPLING INSTRUMENTS AND EQUIPMENT CALIBRATION SCHEDULE
As Specified by the CARB

| Instrument Type | Frequency of Calibration | Standard of Comparison or Method of Calibration | Acceptance Limits |
|---|---|---|---|
| Orifice Meter (large) | 12 months | Calibrated dry test meter | ± 2% of volume measured |
| Dry Gas Meter | 12 months or when repaired | Calibrated dry test meter | ± 2% of volume measured |
| S-Type Pitot (for use with EPA-type sampling train | 6 months | EPA Method 2 | Cp constant (+5%) over working range; difference between average Cp for each leg must be less than 2% |
| Vacuum Gauges Pressure Gauges | 6 months | Manometer | ± 3% |
| Field Barometer | 6 months | Mercury barometer | ± 0.2" Hg |
| Temperature Measurement | 6 months | NBS mercury thermometer or NBS calibrated platinum RTD | ± 4°F for <400°F<br>± 1.5% for >400°F |
| Temperature Readout Devices | 6 months | Precision potentiometer | ± 2% full scale reading |
| Analytical Balance | 12 months (cbeck prior to each use) | Should be performed by manufacturer or qualified laboratory | ± 0.3 mg of stated weight |
| Probe Nozzles | 12 Months | Nozzle diameter check micrometer | Range < ± 0.10 mm for three measurements |
| Continuous Analyzers | Depends upon use, frequency and performance | As specified by manufacturers operating manuals, EPA NBS gases and/or reference methods | Satisfy all limits specified in operating specifications |

TABLE B-2
EQUIPMENT MAINTENANCE SCHEDULE
Based on Manufacturer's Specifications and Carnot Experience

| Equipment | Performance Requirement | Maintenance Interval | Corrective Action |
|---|---|---|---|
| Pumps | 1. Absence of leaks<br>2. Ability to draw manufacturer required vacuum and flow | Every 500 hours of operation or 6 months, whichever is less | 1. Visual inspection<br>2. Clean<br>3. Replace worn parts<br>4. Leak check |
| Flow Measuring Device | 1. Free mechanical movement<br>2. Absence of malfunction | Every 500 hours of operation or 6 months, whichever is less<br><br>After each test, if used in $H_2S$ sampling or other corrosive atmospheres | 1. Visual inspection<br>2. Clean<br>3. Calibrate |
| Sampling Instruments | 1. Absence of malfunction<br>2. Proper response to zero, span gas | As required by the manufacturer | As recommended by manufacturer |
| Integrated Sampling Tanks | Absence of leaks | Depends on nature of use | 1. Steam clean<br>2. Leak check |
| Mobile Van Sampling Systems | Absence of leaks | Depends on nature of use | 1. Change filters<br>2. Change gas dryer<br>3. Leak check<br>4. Check for system contamination |
| Sampling Lines | Sample degradation less than 2% | After each test or test series | Blow filtered air through line until dry |

Appendix B.2

ARB Certification

State of California
AIR RESOURCES BOARD

Executive Order G-94-028

Approval to Carnot
To Conduct Testing as an Independent Contractor

WHEREAS, the Air Resources Board (ARB), pursuant to Section 41512 of the California Health and Safety Code, has established the procedures contained in Section 91200-91220, Title 17, California Code of Regulations, to allow the use of independent testers for compliance tests required by the ARB; and

WHEREAS, pursuant to Sections 91200-91220, Title 17, California Code of Regulations, the Executive Officer has determined that Carnot meets the requirements of the ARB for conducting ARB Test Methods 1, 2, 3, 4, 5, 6, 8, 10, and 100 (NOx, O2) when the following conditions are met:

1. Carnot conducts ARB Test Method 100 for O2 using a Teledyne 326 analyzer with either a A5 or a B1 sensor, or a paramagnetic analyzer.

NOW, THEREFORE, BE IT ORDERED that Carnot is granted an approval, from the date of execution of this order, until June 30, 1995 to conduct the tests listed above, subject to compliance with Section 91200-91220, Title 17, California Code of Regulations.

BE IT FURTHER ORDERED that during the approved period the Executive Officer or his or her authorized representative may field audit one or more tests conducted pursuant to this order for each type of testing listed above.

Executed this 29TH day of JUNE 1994, at Sacramento, California.

James J. Morgester, Chief
Compliance Division

STATE OF CALIFORNIA

AIR RESOURCES BOARD
2020 L STREET
P.O. BOX 2815
SACRAMENTO, CA 95812

RECEIVED
JUL 13 1994
CARNOT

PETE WILSON, Governor

July 8, 1994

Mr. Michael L. Schmitt
Carnot
15991 Red Hill Avenue, Suite 110
Tustin, California 92680

Dear Mr. Schmitt:

Testing Approval

We are pleased to inform you that we have renewed your approval to conduct the types of testing listed in the enclosed Executive Order. This approval is valid until June 30, 1995 during which time a field audit of your company's testing ability may be conducted. We have also enclosed a certificate of approval.

Should you have any questions or need further assistance, please contact Ms. Kathryn Gugeler at (916) 327-1521 or Mr. David Tribble at (916) 323-2217. All correspondence should be addressed to me at the post office box above.

Sincerely,

James J. Morgester, Chief
Compliance Division

Enclosures

cc: Mr. Ed Jeung
Department of Health Services
Air and Industrial Hygiene Laboratory
2151 Berkeley Way
Berkeley, California 94704

State of California

# Air Resources Board

## Approved Independent Contractor

Carnot

This is to certify that the company listed above has been approved by the Air Resources Board to conduct compliance testing pursuant to Section 91207, Title 17, California Code of Regulations, until June 30, 1995, for those test methods listed below:

ARB Source Test Methods:
1, 2, 3, 4, 5, 6, 8, 10, 100(NOx, O2)

James J. Morgester, Chief
Compliance Division

Laura McKinney, Manager
Certification and Investigation Section

Appendix B.3

Calibration Data

# CARNOT
## SPAN GAS RECORD

CLIENT/LOCATION: UCOS - Colmac DATE: 6/27/98

BY: GS

| GAS | SPAN CYLINDER | | AUX. SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | | 99.999 % | | |
| NOx | AAL3583 | 88.54 | AAL1240 | 47.51 |
| $O_2$ | ALM045927 | 8.937 | ALM05739 | 12.45 |
| CO | | | | |
| $CO_2$ | ALM045927 | 22.43 | ALM05739 | 15.16 |
| $SO_2$ | | | | |

# CARNOT
## INSTRUMENT LINEARITY

| | ANALYZER | | | | |
|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | CO | NOx | $SO_2$ |
| ANALYZER RANGE | 0-25 | — | — | 0-100 | — |
| SET TO HIGH STD (80-90% OF RANGE) | 20.9 | — | — | 88.5 | — |
| ACTUAL VALUE OF LOW STD | 12.45 | — | — | 47.51 | — |
| AS-FOUND LOW STD (50-60% OF RANGE) | 12.33 | — | — | 48.9 | — |
| DIFFERENCE IN % OF FULL SCALE | 0.5 | — | — | +1.3 | — |

*% ERROR CALCULATION:*

$$\frac{\text{(AS FOUND - ACTUAL VALUE OF SPAN)}}{\text{RANGE}} \times 100$$

*ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIP CHART).*

CARNOT

PMF-009

# CARNOT
## SPAN GAS RECORD

CLIENT/LOCATION: UCOS Colmac DATE: 6-28-94

BY: D.W.

| GAS | SPAN CYLINDER | | AUX. SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | | | | |
| NOx | AAL3583 | 88.54 | AAL12400 | 47.51 |
| $O_2$ | ALM-045427 | 8.937 | ALM-739 | 12.45 |
| CO | | | | |
| $CO_2$ | | | | |
| $SO_2$ | | | | |

# CARNOT
## INSTRUMENT LINEARITY

| | ANALYZER | | | | |
|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | CO | NOx | $SO_2$ |
| ANALYZER RANGE | 0-25 | | | 0-100 | |
| SET TO HIGH STD (80-90% OF RANGE) | 20.74 | | | 88.5 | |
| ACTUAL VALUE OF LOW STD | 12.45 | | | 47.51 | |
| AS-FOUND LOW STD (50-60% OF RANGE) | 12.55 | | | 47.00 | |
| DIFFERENCE IN % OF FULL SCALE | .5% | | | .5% | |

*% ERROR CALCULATION:*

$$\frac{(\text{AS FOUND} - \text{ACTUAL VALUE OF SPAN})}{\text{RANGE}} \times 100$$

*ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIP CHART).*

CARNOT

PMF-009

# CARNOT
## CEM PERFORMANCE DATA

CLIENT/LOCATION: UCOS-Colmer DATE: 6/28/94

BY: [illegible]

| SYSTEM CONFIGURATION F600 | | | | |
|---|---|---|---|---|
| **ANALYZERS IN SERVICE** | | | | |
| ANALYZERS: | $O_2$ | $CO_2$ | CO | NOx |
| MODEL: | Teledyne | PIR 2000 | 48 | 10S |
| SERIAL NO.: | | | | |

| PROBE | MAIN | MUX | SAMPLE CONDITIONER | |
|---|---|---|---|---|
| LENGTH: | 6' | 4' | CONDENSER-VACUUM SIDE (CHECK FLOW): | ✓ |
| LINER MATERIAL: | SS | SS | CONDENSER-PRESSURE SIDE (CHECK FLOW): | ✓ |
| HEATED PROBE (Y/N): | no | no | CONDENSER TEMPERATURE: | 40 |
| HEATED LINE (Y/N): | yes | yes | FILTER CONDITION (COND. OR DATE LAST CHANGED): | 5/24/94 |

| SAMPLE LINE | | | SYSTEM LEAK CHECK | MAIN | MUX |
|---|---|---|---|---|---|
| LENGTH: | 50' | 50' | PRE-TEST (cfh): | 0.0 | 0.0 |
| LINER MATERIAL: | teflon | teflon | POST-TEST (cfh): | | |
| SYSTEM BIAS LINE: | teflon | teflon | LEAK RATE (%) = POST-TEST (cfh) / SYSTEM FLOW RATE (cfm) x 60 x 100 = _____ % | | |

| ON-STACK CONDITIONER | | NOx CONVERSION EFFICIENCY | |
|---|---|---|---|
| IN SERVICE (Y/N): | yes | HIGH CAL NOx | |
| KNOCK-OUT CONDITION (CHECK FLOW): | ✓ | HIGH CAL NO (AS FOUND) | 1 |
| COOLANT: | ICE | LOW CAL NOx | |
| | | LOW CAL NO (AS FOUND) | 1 |

| OPERATING CONDITIONS | |
|---|---|
| SAMPLE PRESSURE: | SYSTEM RESPONSE TIME CHECK |
| SAMPLE VACUUM: | UPSCALE: _____ sec. |
| NOx VACUUM: | DOWNSCALE: _____ sec. |

CARNOT

PMF-011

# Scott Specialty Gases, Inc.

2600 CAJON BOULEVARD, SAN BERNARDINO, CA 92411 (909) 887-2571 FAX: (909) 887-0549

## CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
CARNOT
RICK MADRIGAL
15991 RED HILL AVE
TUSTIN, CA 92680

Assay Laboratory
Scott Specialty Gases
2600 Cajon Boulevard
San Bernardino, CA 92411

Purchase Order 1818
Project # 30380003

## ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September 1993.

Cylinder Number ALM045739 Certification Date 03-15-94 Exp. Date 03-15-97
Cylinder Pressure+ 2000 PSIG

### ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Uncertainty* |
|---|---|---|
| (CARBON DIOXIDE) | 15.16 % | ± 1 % NIST Traceable |
| (OXYGEN) | 12.45 % | |
| (Nitrogen) | Balance Gas | |

+Do not use when cylinder pressure is below 150 psig.
*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

### REFERENCE STANDARD

| Type/Sample No. | Expiration Date | Cylinder Number | Concentration |
|---|---|---|---|
| GMIS | 06-94 | A018082 | 18.97 % CO2 IN N2 |
| GMIS | 06-94 | A6513 | 12.45 % O2 IN N2 |

### INSTRUMENTATION

| Instrument/Model/Serial # | Last Date Calibrated | Analytical Principle |
|---|---|---|
| CO2:Horiba / OPE-135C / 56553902 | 02-22-94 | NDIR |
| O2:Horiba / OPE-335 / 850557042 | 02-25-94 | Magnetopneumatic |

### ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

**Components** | **First Triad Analysis** | **Second Triad Analysis** | **Calibration Curve**

Carbon Dioxide

First Triad Analysis — Date: 03-15-94 Response Units: mv
Z1= 0.00 R1= 97.0 T1= 85.9
R2= 97.0 Z2= 0.00 T2= 85.8
Z3= 0.00 T3= 85.8 R3= 97.0
Avg. Conc. of Cust Cyl. 15.16 %

Second Triad Analysis — Date: Response Units: mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Calibration Curve — Concentration= $Ax^3+Bx^2+Cx+D$
A =0.000007988
B =0.0002062
C =0.1000
D =-0.0001333

Oxygen

First Triad Analysis — Date: 03-15-94 Response Units: mv
Z1= 0.00 R1= 94.1 T1= 49.8
R2= 94.1 Z2= 0.00 T2= 49.8
Z3= 0.00 T3= 49.8 R3= 94.1
Avg. Conc. of Cust Cyl. 12.45 %

Second Triad Analysis — Date: Response Units: mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Calibration Curve — Concentration= $Ax+B$
A =0.2500
B =-0.004586

Date: Response Units: mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Second Triad Analysis — Date: Response Units: mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Calibration Curve — Concentration=

Special Notes:

ANALYST

# Scott Specialty Gases, Inc.

2600 CAJON BOULEVARD, SAN BERNARDINO, CA 92411 (909) 887-2571 FAX (909) 887-0549

## CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

**Customer**
CARNOT
RICK MADRIGAL
15991 RED HILL AVE
SUITE 110
TUSTIN, CA 92680

**Assay Laboratory**
Scott Specialty Gases
2600 Cajon Boulevard
San Bernardino, CA 92411

Purchase Order 1914
Project # 30667.009

## ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September 1993.

Cylinder Number ALM045927 Certification Date 03-30-94 Exp. Date 03-30-97
Cylinder Pressure+ 1900 PSIG

### ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Uncertainty* |
|---|---|---|
| (CARBON DIOXIDE) | 22.43 % | ± 1 % NIST Traceable |
| (OXYGEN) | 8.937 % | |
| (Nitrogen) | Balance Gas | |

+Do not use when cylinder pressure is below 150 psig.
*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

### REFERENCE STANDARD

| Type/Sample No. | Expiration Date | Cylinder Number | Concentration |
|---|---|---|---|
| CRM1675 | 06-94 | ALM001136 | 14.08 % CO2/N2 |
| GMIS | 06-94 | A10868 | 9.520 % O2/N2 |

### INSTRUMENTATION

| Instrument/Model/Serial # | Last Date Calibrated | Analytical Principle |
|---|---|---|
| CO2:PIR2000-ACUBLEND | 03-24-94 | NDIR |
| O2:Horiba / OPE-335 / 850557042 | 03-30-94 | Magnetopneumatic |

### ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

**Components** | **First Triad Analysis** | **Second Triad Analysis** | **Calibration Curve**

Carbon Dioxide

First Triad Analysis — Date: 03-30-94 Response Units: mv

| | | |
|---|---|---|
| Z1= 0.00 | R1= 72.9 | T1= 92.2 |
| R2= 72.9 | Z2= 0.00 | T2= 92.2 |
| Z3= 0.00 | T3= 92.2 | R3= 72.9 |

Avg. Conc. of Cust Cyl. 22.43 %

Second Triad Analysis — Date: Response Units: mv

| | | |
|---|---|---|
| Z1= | R1= | T1= |
| R2= | Z2= | T2= |
| Z3= | T3= | R3= |

Avg. Conc. of Cust Cyl.

Calibration Curve — Concentration= $Ax^4+Bx^3+Cx^2+DX+E$

A =-0.0000001952
B =-0.00001975
C =0.001882
D =0.02535
E =0.002942

Oxygen

First Triad Analysis — Date: 03-30-94 Response Units: mv

| | | |
|---|---|---|
| Z1= 0.00 | R1= 95.3 | T1= 89.4 |
| R2= 95.3 | Z2= 0.00 | T2= 89.4 |
| Z3= 0.00 | T3= 89.3 | R3= 95.3 |

Avg. Conc. of Cust Cyl. 8.937 %

Second Triad Analysis — Date: Response Units: mv

| | | |
|---|---|---|
| Z1= | R1= | T1= |
| R2= | Z2= | T2= |
| Z3= | T3= | R3= |

Avg. Conc. of Cust Cyl.

Calibration Curve — Concentration= Ax + B

A =0.09999
B =0.0004275

Date: Response Units: mv

| | | |
|---|---|---|
| Z1= | R1= | T1= |
| R2= | Z2= | T2= |
| Z3= | T3= | R3= |

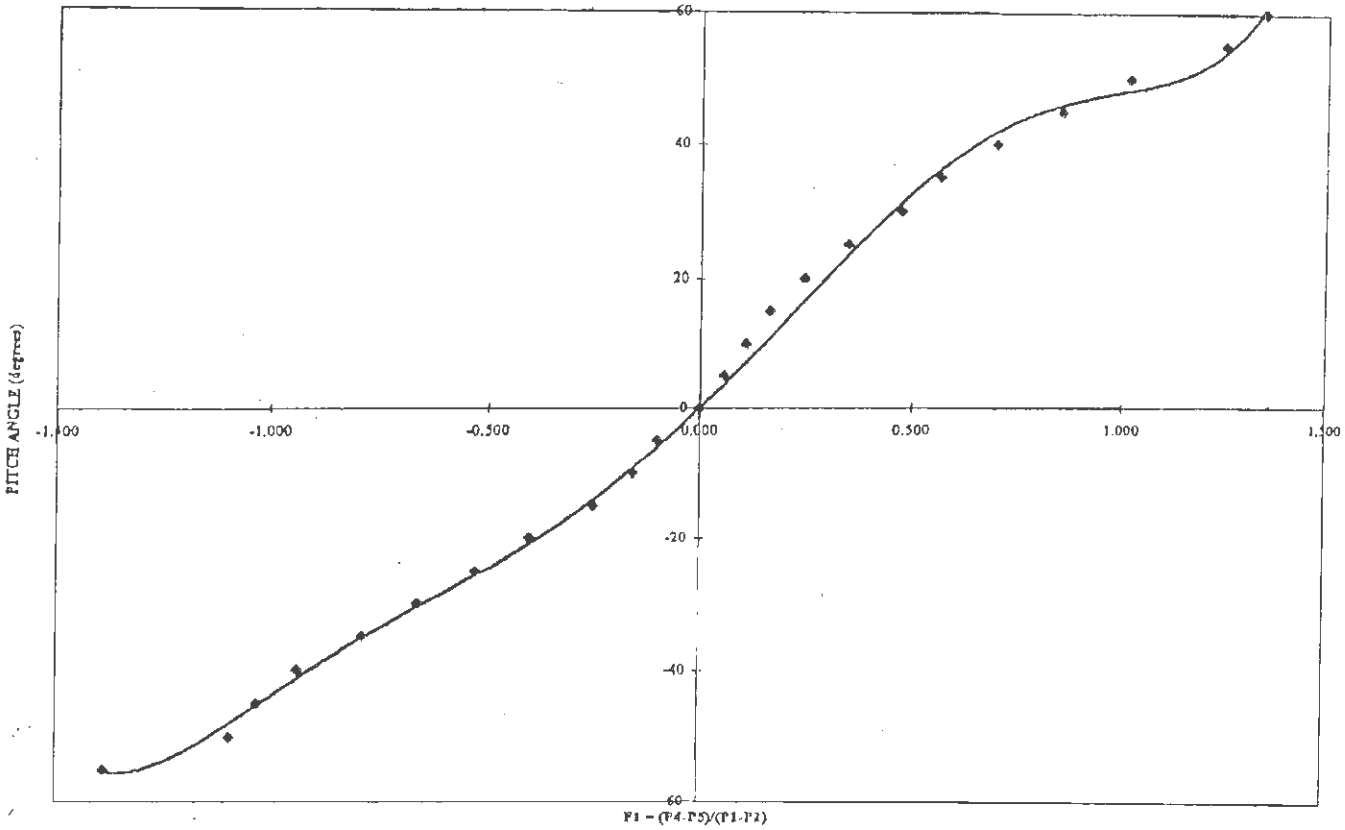
Date: Response Units: mv

| | | |
|---|---|---|
| Z1= | R1= | T1= |
| R2= | Z2= | T2= |
| Z3= | T3= | R3= |

Concentration=

Analyst: [signature]

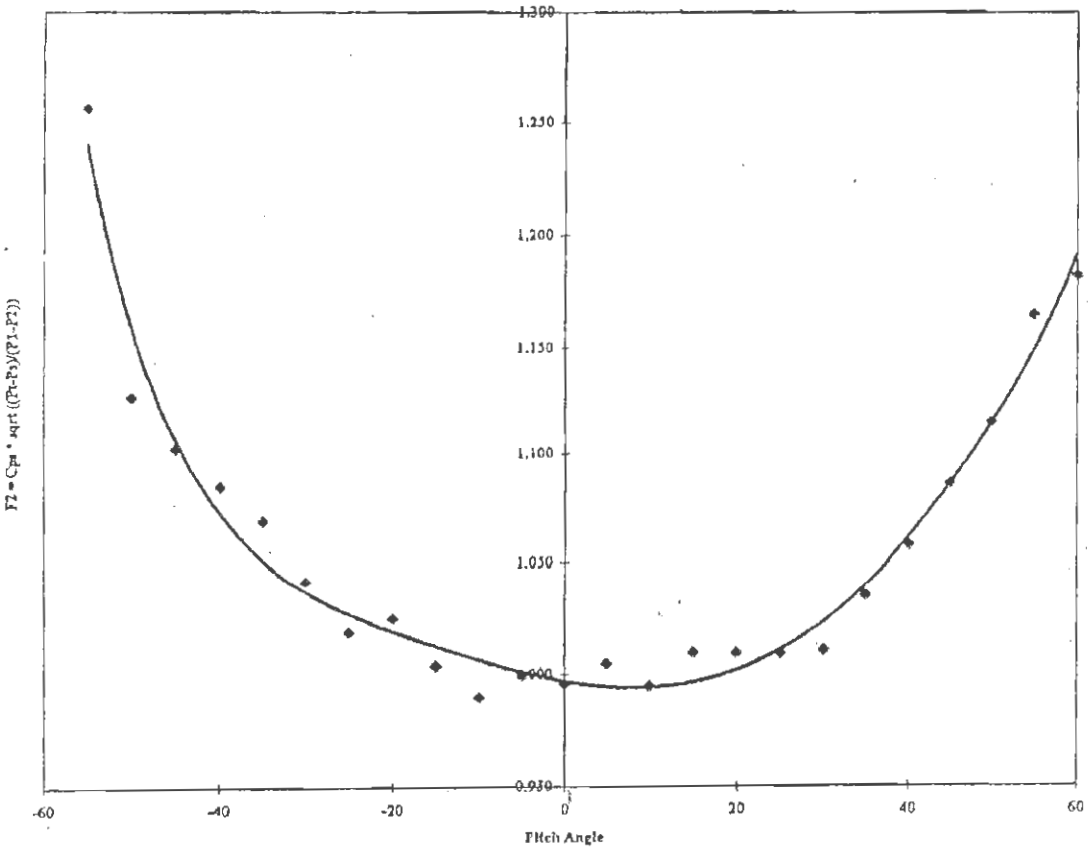
CARNOT
3-DIMENSIONAL VELOCITY PROBE CALIBRATION
PITCH ANGLE vs. F1
PROBE ID: B-2455




Pitch Angle = 63.09X + 23.69X^2 - 24.505X^3 - 33.312X^4 + 7.5203X^5 + 11.669X^6

Performed By: MM/RM
Date: 5/18/94

CARNOT
3-DIMENSIONAL VELOCITY PROBE CALIBRATION
F2 vs. PITCH ANGLE
PROBE ID: B-2455




$F2 = 0.997 - 0.0007X + 3E\text{-}5X^2 + 8E\text{-}7X^3 + 1E\text{-}8X^4 - 3E\text{-}10X^5 + 3E\text{-}12X^6$

Performed By: MM/RM
Date: 5/18/94

# APPENDIX C
# DATA SHEETS

Appendix C.1

Sample Locations

# CARNOT

## SAMPLING POINT LOCATION DATA - EPA METHOD 1

PLANT: Ucos - Colmac DATA BY: EP

DATE: 6/27/94

TEST LOCATION: Unit 2 Duct

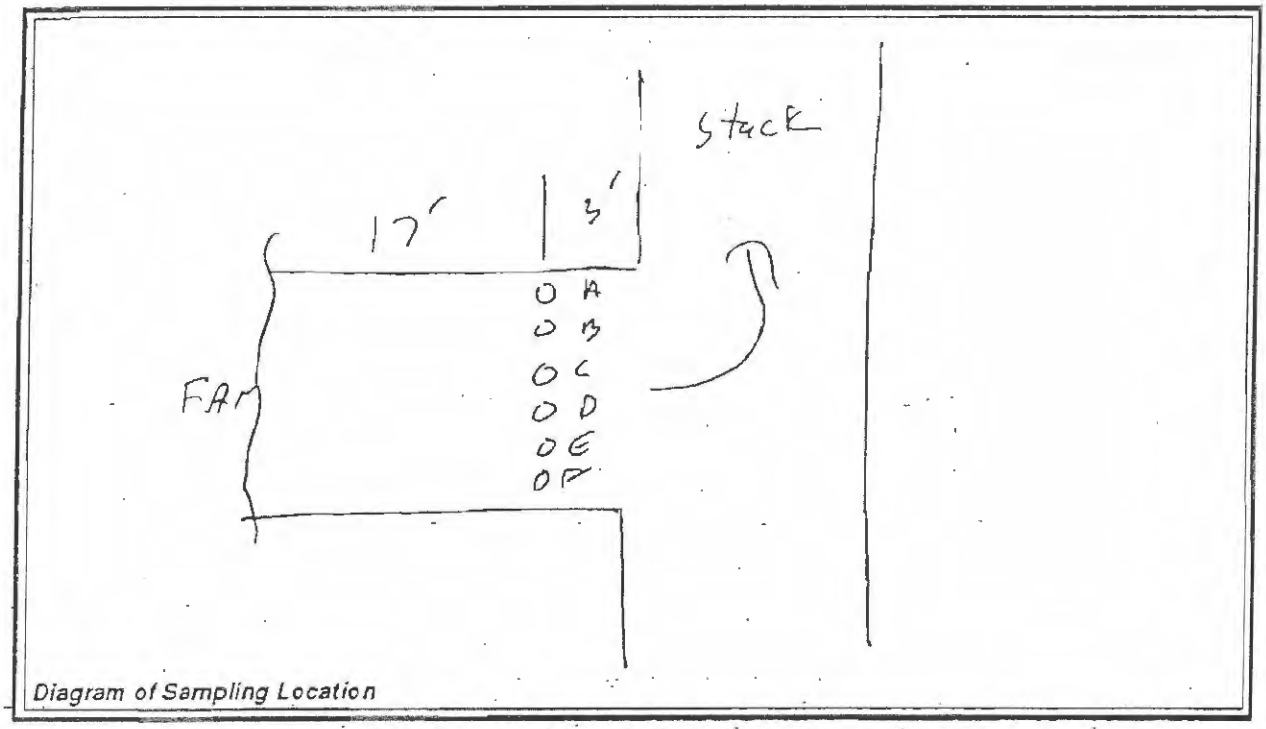



*Diagram of Sampling Location*

UPSTREAM DIST./DIA.: 17/

DOWNSTREAM DIST./DIA.: 3/

COUPLING LENGTH: 8"

NO. OF SAMPLING PTS.: 42

STACK DIMENSION: 47" x 119"

STACK AREA, FT²: 38.8

| SAMPLE POINT | % OF DIAMETER | IN. FROM NEAR WALL | IN. FROM NOZZLE* |
|---|---|---|---|
| 1 | | 3.4 | 11.42 |
| 2 | | 10.3 | 18.3 |
| 3 | | 17.14 | 25.14 |
| 4 | | 24 | 32 |
| 5 | | 30.86 | 38.86 |
| 6 | | 37.7 | 45.71 |
| 7 | | 44.5 | 52.57 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

*INCHES FROM WALL PLUS COUPLING LENGTH

CARNOT

PMF-002

Appendix C.2

CEM Data

(1)

# CARNOT
## CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS - Colmac
DATE: 6/28/98
OPERATOR: EP
TEST LOCATION: Unit 1 Outlet
TEST NUMBERS: 1-1- Start

AMBIENT TEMP., DB/WB: ~115
BAROMETRIC PRESSURE: 29.80
DUCT STATIC PRESSURE: -0.7
FUEL: Bio Mass

| TEST NO. | SAMPLE TIME | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $O_2$ | $O_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| | | Zero / Span | .3 / 12.2 | .1 / 12.4 | | | | | | | | |
| 1-1 | 1218 / 1221 | A5 | 6.9 | 6.9 | | | | | | | | |
| | 1221 / 1224 | A4 | 7.2 | 7.1 | | | | | | | | |
| | 1224 / 1227 | A3 | 6.7 | 6.7 | | | | | | | | |
| | 1227 / 1230 | A2 | 7.0 | 7.2 | | | | | | | | |
| * | 1230 / 1233 | A1 | 7.1 | 8.0 | | | | | | | | |
| | 1236 / 1239 | B5 | 6.5 | 6.5 | | | | | | | | |
| | 1239 / 1242 | B4 | 6.7 | 6.7 | | | | | | | | |
| | 1242 / 1245 | B3 | 6.9 | 6.6 | | | | | | | | |
| | 1245 / 1248 | B2 | 6.3 | 6.2 | | | | | | | | |
| | 1248 / 1251 | B1 | 6.5 | 6.5 | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

COMMENTS:

CARNOT

PMF-013

(2)

# CARNOT
## CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS-Colmn

DATE: 6/28/94

OPERATOR: EP

TEST LOCATION: Unit 1

TEST NUMBERS: 1-1- Start

AMBIENT TEMP., DB/WB:

BAROMETRIC PRESSURE:

DUCT STATIC PRESSURE:

FUEL: Bio Mass

| TEST NO. | SAMPLE TIME | SAMPLE POINT/ CONDITION | REF DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $O_2$ | $O_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| | 1254/1257 | C5 | 6.6 | 6.5 | | | | | | | | |
| | 1257/1300 | C4 | 6.3 | 6.2 | | | | | | | | |
| | 1300/1303 | C3 | 6.4 | 6.4 | | | | | | | | |
| | 1303/1306 | C2 | 6.9 | 6.8 | | | | | | | | |
| | 1306/1309 | C1 | 6.7 | 6.7 | | | | | | | | |
| | 1312/1315 | D5 | 6.7 | 6.6 | | | | | | | | |
| | 1315/1318 | D4 | 6.9 | 6.8 | | | | | | | | |
| | 1318/1321 | D3 | 6.7 | 6.7 | | | | | | | | |
| | 1321/1324 | D2 | 6.6 | 6.6 | | | | | | | | |
| | 1324/1327 | D1 | 6.7 | 6.7 | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

COMMENTS:

CARNOT

PMF-013

(5)

# CARNOT
## CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS-Colmac

DATE: 6/28/94

OPERATOR: SS

TEST LOCATION: Unit 2 Outlet

TEST NUMBERS: 1-1- Stmo

AMBIENT TEMP., DB/WB:

BAROMETRIC PRESSURE:

DUCT STATIC PRESSURE:

FUEL:

| TEST NO. | SAMPLE TIME | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ref $O_2$ | $O_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| 1-1 | 1330/1333 | E-5 | 7.0 | 6.9 | | | | | | | | |
| | 1333/1336 | E-4 | 6.6 | 6.6 | | | | | | | | |
| | 1336/1339 | E-3 | 6.6 | 6.6 | | | | | | | | |
| | 1339/1342 | E-2 | 6.9 | 6.8 | | | | | | | | |
| | 1342/1345 | E-1 | 6.9 | 6.6 | | | | | | | | |
| | 1348/1351 | F-5 | 6.5 | 6.5 | | | | | | | | |
| | 1351/1354 | F-4 | 6.2 | 6.2 | | | | | | | | |
| | 1354/1357 | F-3 | 6.8 | 6.8 | | | | | | | | |
| | 1357/1400 | F-2 | 6.8 | 6.8 | | | | | | | | |
| | 1400/1403 | F-1 | 6.8 | 6.8 | | | | | | | | |
| | 1406/1409 | A-1 | 6.5 | 6.5 | | | | | | | | |
| | SYS | Zero/SPAN | .34/12.1 | .1/12.1 | | | | | | | | |
| | | | | | | | | | | | | |

COMMENTS:

CARNOT

PMF-013

# CARNOT
## CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS- Colmac

DATE: 6/28/94

OPERATOR: EF

TEST LOCATION: 2-2-CEM

TEST NUMBERS:

AMBIENT TEMP., DB/WB:

BAROMETRIC PRESSURE:

DUCT STATIC PRESSURE:

FUEL:

| TEST NO. | SAMPLE TIME | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ____% ____, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $O_2$ | REF $O_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| | SYS | zero / span | .3 / 12.2 | .1 / 12.4 | | | | | | | | |
| | 933 / 936 | F5 | 7.0 | 7.0 | | | | | | | | |
| | 936 / 939 | F4 | 6.4 | 6.5 | | | | | | | | |
| | 939 / 942 | F3 | 7.3 | 7.4 | | | | | | | | |
| | 942 / 945 | F2 | 7.0 | 7.0 | | | | | | | | |
| | 945 / 948 | F1 | 6.7 | 6.7 | | | | | | | | |
| | 951 / 954 | E5 | 6.5 | 6.5 | | | | | | | | |
| | 954 / 957 | E-4 | 6.7 | 6.8 | | | | | | | | |
| | 957 / 1000 | E-3 | 7.1 | 7.1 | | | | | | | | |
| | 1000 / 1003 | E-2 | 6.9 | 7.0 | | | | | | | | |
| | 1003 / 1006 | E-1 | 6.7 | 6.8 | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

COMMENTS:

CARNOT

PMF-013

# CARNOT
## CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS - Colmac

DATE: 6/28/94

OPERATOR: EF

TEST LOCATION:

TEST NUMBERS:

AMBIENT TEMP., DB/WB:

BAROMETRIC PRESSURE:

DUCT STATIC PRESSURE:

FUEL:

| TEST NO. | SAMPLE TIME | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ____% ____, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $O_2$ | Ref $O_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| 2-2 | 1009/1012 | D-5 | 6.9 | 7.0 | | | | | | | | |
| | 1012/1015 | D-4 | 6.3 | 6.4 | | | | | | | | |
| | 1015/1018 | D-3 | 7.2 | 7.2 | | | | | | | | |
| | 1018/1021 | D-2 | 7.7 | 7.7 | | | | | | | | |
| | 1021/1024 | D-1 | 7.0 | 7.0 | | | | | | | | |
| | 1033/1036 | C-5 | 6.5 | 6.4 | | | | | | | | |
| | 1036/1039 | C-4 | 6.6 | 6.6 | | | | | | | | |
| | 1039/1042 | C-3 | 6.5 | 6.6 | | | | | | | | |
| | 1042/1045 | C-2 | 6.4 | 6.4 | | | | | | | | |
| | 1045/1048 | C-1 | 7.4 | 7.5 | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

COMMENTS:

CARNOT

PMF-013

# CARNOT
## CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS - Colmac

DATE: 6/28/96

OPERATOR: [illegible]

TEST LOCATION: outlet #2

TEST NUMBERS: 2-2-ST

AMBIENT TEMP., DB/WB: 105

BAROMETRIC PRESSURE: 29.92

DUCT STATIC PRESSURE:

FUEL: Bio Mass

| TEST NO. | SAMPLE TIME | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ____% ____, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ref $O_2$ | $O_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| | 1051/1054 | B-5 | 6.0 | 6.1 | | | | - | | | | |
| | 1054/1057 | B-4 | 6.2 | 6.3 | | | | | | | | |
| | 1057/1100 | B-3 | 6.5 | 6.6 | | | | | | | | |
| | 1100/1103 | B-2 | 6.7 | 6.8 | | | | | | | | |
| | 1103/1106 | B-1 | 6.6 | 6.7 | | | | | | | | |
| | 1109/1112 | A-5 | 7.1 | 7.3 | | | | | | | | |
| | 1112/1115 | A-4 | 6.7 | 6.9 | | | | | | | | |
| | 1115/1118 | A-3 | 7.4 | 7.5 | | | | | | | | |
| | 1118/1121 | A-2 | 6.7 | 6.8 | | | | | | | | |
| | 1121/1124 | A-1 | 6.4 | 6.6 | | | | | | | | |
| | GAS | zero/span | .3/12.2 | .1/12.4 | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

COMMENTS:

CARNOT

PMF-013

Appendix C.3

3D Flow Data

CARNOT

3-DIMENSIONAL VELOCITY DATA

Client/Location: UCOS Colmac

Date: 6-28-94

Sample Location: Unit 1 outlet

Data Taken By: Dave Wombly

Unit No: 1

Test Description: 3-D traverse

Test No: 1-3-BD-traverse

Pitot I.D. No.:

Barometric Pressure (in Hg):

Pre-Test Leak Check: o.k

Static Pressure in Stack (iwg):

Post-Test Leak Check: 0.k

| Time | Port | Point | Yaw Angle (Degrees) | Velocity (P1-P2) | Pitch (P4-P5) | Temperature (F) |
|---|---|---|---|---|---|---|
| | D | 7 | -10 | .45 | 0 | 413 |
| | | 6 | -6 | .47 | 0 | 413 |
| | | 5 | -5 | .43 | +.01 | 414 |
| 1215 | | 4 | 0 | .40 | +.01 | 414 |
| | | 3 | -1 | .39 | +.01 | 416 |
| | | 2 | 0 | .34 | +0 | 416 |
| | | 1 | 0 | .31 | +.01 | 415 |
| | BC | 7 | -10 | .4 | -.04 | 415 |
| | BC | 6 | -10 | .35 | -.02 | 416 |
| | | 5 | -5 | .37 | -.00 | 416 |
| | | 4 | 0 | .35 | 0 | 417 |
| | | 3 | +5 | .41 | +.01 | 417 |
| | | 2 | +8 | .4 | +.02 | 417 |
| | | 1 | +10 | .33 | +.03 | 417 |
| | B | 7 | -5 | .58 | 0 | 416 |
| | | 6 | -10 | .57 | 0 | 417 |
| | | 5 | -6 | .48 | 0 | 417 |
| | | 4 | -8 | .34 | -.02 | 417 |
| | | 3 | 0 | .26 | +.03 | 417 |
| | | 2 | +7 | .26 | +.03 | 417 |
| | | 1 | +8 | .28 | +.01 | 417 |

Note: Clockwise rotation of the probe corresponds to a positive yaw angle: > 0 or > 90 degrees.

3D_DATA.XLS
2/14/94
8:03 PM

CARNOT

3-DIMENSIONAL VELOCITY DATA

Client/Location: UCOS Colmac Date: 6-28

Sample Location: unit 1 outlet Data Taken By: Dave W.

Unit No: 1 Test Description: 3-D traverse

Test No: 1-7-3D-traerse Pitot I.D. No.:

Barometric Pressure (in Hg): 29.80 Pre-Test Leak Check

Static Pressure in Stack (iwg): Post-Test Leak Check:

| Time | Port | Point | Yaw Angle (Degrees) | Velocity (P1-P2) | Pitch (P4-P5) | Temperature (F) |
|---|---|---|---|---|---|---|
| | A | 7 | -10 | .59 | -.07 | 415 |
| | | 6 | -8 | .48 | -.07 | 416 |
| | | 5 | -6 | .48 | -.03 | 418 |
| | | 4 | 0 | .5 | -.05 | 418 |
| | | 3 | 0 | .57 | -.04 | 419 |
| | | 2 | 0 | .6 | -.05 | 419 |
| | | 1 | 0 | .6 | -.07 | 419 |
| | E | 7 | +5 | .57 | .0 | 419 |
| | | 6 | -8 | .55 | 0 | 420 |
| | | 5 | 0 | .56 | 0 | 420 |
| | | 4 | 0 | .6 | 0 | 420 |
| | | 3 | -3 | .58 | 0 | 420 |
| | | 2 | -2 | .6 | +.03 | 420 |
| | | 1 | -2 | .58 | .02 | 420 |
| | S | 7 | -4 | .5 | -.01 | 418 |
| | | 6 | 0 | .6 | -.03 | 418 |
| | | 5 | +2 | .55 | -.04 | 419 |
| | | 4 | 0 | .52 | -.04 | 419 |
| | | 3 | 0 | .62 | -.04 | 419 |
| | | 2 | 0 | .62 | -.04 | 419 |
| | | 1 | 0 | .60 | -.03 | 419 |

Note: Clockwise rotation of the probe corresponds to a positive yaw angle: > 0 or > 90 degrees.

3D_DATA.XLS
2/14/94
8:03 PM

CARNOT
3-DIMENSIONAL VELOCITY DATA

Client/Location: UCCS
Date: 8-28-94
Sample Location: Unit 2 outlet
Data Taken By: D. W
Unit No: 2
Test Description: 3-D
Test No: 2-2-3D
Pitot I.D. No.:
Barometric Pressure (in Hg):
Pre-Test Leak Check
Static Pressure in Stack (iwg): -0.75
Post-Test Leak Check:

| Time | Port | Point | Yaw Angle (Degrees) | Velocity (P1-P2) | Pitch (P4-P5) | Temperature (F) |
|---|---|---|---|---|---|---|
| 1035 | A | 7 | -6 | .55 | -.05 | 439 |
| | | 6 | -9 | .45 | -.05 | 439 |
| | | 5 | -12 | .45 | -.05 | 439 |
| | | 4 | -3 | .5 | -.05 | 439 |
| | | 3 | -9 | .6 | -.04 | 439 |
| | | 2 | -8 | .6 | -.05 | 439 |
| | | 1 | -8 | .55 | -.00 | 440 |
| | B | 7 | +5 | .7 | -.00 | 439 |
| | | 6 | -7 | .65 | 0 | 439 |
| | | 5 | 0 | .57 | 0 | 439 |
| | | 4 | -1 | .48 | 0 | 439 |
| | | 3 | -2 | .72 | 0 | 439 |
| | | 2 | -3 | .25 | 0 | 438 |
| | | 1 | -15 | .27 | -.02 | 438 |
| | C | 7 | 0 | .41 | -.01 | 437 |
| | | 6 | 0 | .42 | -.02 | 436 |
| | | 5 | 0 | .37 | -.01 | 437 |
| | | 4 | -2 | .37 | +.01 | 437 |
| | | 3 | -6 | .36 | +.02 | 437 |
| | | 2 | -7 | .4 | +.02 | 437 |
| | | 1 | -9 | .36 | +.02 | 437 |

Note: Clockwise rotation of the probe corresponds to a positive yaw angle: > 0 or > 90 degrees.

3D_DATA.XLS
2/14/94
8:03 PM

CARNOT

3-DIMENSIONAL VELOCITY DATA

Client/Location: UCOS Colmac

Sample Location: Outlet

Unit No: 2

Test No: 2-2-3D-vel

Barometric Pressure (in Hg): 29.82

Static Pressure in Stack (iwg):

Date: 6-27-94

Data Taken By: Dave Wonderly

Test Description: 3-D

Pitot I.D. No.:

Pre-Test Leak Check: O.K.

Post-Test Leak Check: O.K.

| Time | Port | Point | Yaw Angle (Degrees) | Velocity (P1-P2) | Pitch (P4-P5) | Temperature (F) |
|---|---|---|---|---|---|---|
| | F | 7 | -7° | .55 | -.05 | |
| | 6 | | -7° | .57 | -.04 | 446 |
| | 5 | | -7° | .50 | -.06 | 441 |
| | 4 | | -6° | .59 | -.03 | 443 |
| | 3 | | -1 | .66 | -.03 | 441 |
| | 2 | | -8° | .60 | 0 | 442 |
| | 1 | | -10 | .52 | +.07 | 445 |
| | E | 7 | -9° | .52 | 0 | 441 |
| | | 6 | -10° | .52 | +.01 | 442 |
| | | 5 | -5° | .54 | +.02 | 442 |
| | | 4 | -7° | .55 | 0 | 442 |
| | | 3 | -3° | .53 | 0 | 441 |
| | | 2 | -9° | .53 | 0 | 441 |
| | | 1 | -10° | .55 | +.02 | 440 |
| | D | 7 | 0 | .49 | 0 | 440 |
| | | 6 | +1 | .45 | +.02 | 438 |
| | | 5 | -2 | .42 | +.02 | 437 |
| | | 4 | 0 | .39 | +.01 | 437 |
| | | 3 | 0 | .36 | 0 | 437 |
| | | 2 | -3° | .30 | -.01 | 437 |
| | | 1 | +2 | .25 | 0 | 437 |

Note: Clockwise rotation of the probe corresponds to a positive yaw angle: > 0 or > 90 degrees.

3D_DATA.XLS
2/14/94
8:03 PM

# APPENDIX D
# CALCULATIONS

# 3D VELOCITY - DATA AND WORKSHEET

| | | | |
|---|---|---|---|
| Client: | UCOS COLMAC | Date: | |
| Unit: | # 1 | Data By: | EF |
| Sample Location: | Outlet duct | Baro. Pressure, In Hg.: | 29.90 |
| Test No.: | 1-1-3d | Static Pressure, In WG: | -0.78 |
| Probe ID No.: | B-2131 | Abs. Pressure, In Hg.: | 29.84 |
| Unit Load: | | Average O2, % dry: | 6.70 |
| Test Date: | 6/28/94 | Average CO2, % dry: | 12.00 |
| Time (Start/Stop): | 0950/1145 | Moisture Content, %: | 15.00 |
| | | Molecular Weight, wet: | 28.36 |

| Sample Point | | Yaw Angle deg. | Pitch P4-P5 In WG | Total P1-P2 In WG | Stack Temp. F | P4-P5/ P1-P2 In WG | Pitch Angle deg. | Pt-Ps/ P1-P2 In WG | Pt-Ps In WG | Result Angle deg. | Velocity uncorr.* fps | Velocity Axial fps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 7 | -10 | -0.03 | 0.58 | 415 | -0.05 | -3.2 | 1.00 | 0.58 | 10.5 | 66.1 | 65.0 |
| A | 6 | -8 | -0.03 | 0.48 | 416 | -0.06 | -3.8 | 1.00 | 0.48 | 8.9 | 60.2 | 59.4 |
| A | 5 | -6 | -0.03 | 0.48 | 418 | -0.06 | -3.8 | 1.00 | 0.48 | 7.1 | 60.2 | 59.8 |
| A | 4 | 0 | -0.05 | 0.50 | 418 | -0.10 | -6.1 | 1.00 | 0.50 | 6.1 | 61.5 | 61.2 |
| A | 3 | 0 | -0.04 | 0.57 | 419 | -0.07 | -4.3 | 1.00 | 0.57 | 4.3 | 65.7 | 65.5 |
| A | 2 | 0 | -0.05 | 0.60 | 419 | -0.08 | -5.1 | 1.00 | 0.60 | 5.1 | 67.4 | 67.2 |
| A | 1 | 0 | -0.03 | 0.60 | 419 | -0.05 | -3.1 | 1.00 | 0.60 | 3.1 | 67.4 | 67.3 |
| E | 7 | -5 | 0.00 | 0.53 | 419 | 0.00 | 0.0 | 1.00 | 0.53 | 5.0 | 63.2 | 63.0 |
| E | 6 | -8 | 0.00 | 0.55 | 420 | 0.00 | 0.0 | 1.00 | 0.55 | 8.0 | 64.4 | 63.8 |
| E | 5 | 0 | 0.00 | 0.56 | 420 | 0.00 | 0.0 | 1.00 | 0.56 | 0.0 | 65.0 | 65.0 |
| E | 4 | 0 | 0.00 | 0.60 | 420 | 0.00 | 0.0 | 1.00 | 0.60 | 0.0 | 67.3 | 67.3 |
| E | 3 | -3 | 0.00 | 0.58 | 420 | 0.00 | 0.0 | 1.00 | 0.58 | 3.0 | 66.2 | 66.1 |
| E | 2 | -2 | 0.03 | 0.60 | 420 | 0.05 | 3.2 | 1.00 | 0.60 | 3.8 | 67.2 | 67.1 |
| E | 1 | -2 | 0.02 | 0.58 | 420 | 0.03 | 2.2 | 1.00 | 0.58 | 3.0 | 66.1 | 66.0 |
| F | 7 | -4 | -0.01 | 0.50 | 418 | -0.02 | -1.3 | 1.00 | 0.50 | 4.2 | 61.4 | 61.2 |
| F | 6 | 0 | -0.03 | 0.60 | 418 | -0.05 | -3.1 | 1.00 | 0.60 | 3.1 | 67.3 | 67.2 |
| F | 5 | 2 | -0.04 | 0.55 | 419 | -0.07 | -4.5 | 1.00 | 0.55 | 4.9 | 64.5 | 64.3 |
| F | 4 | 0 | -0.04 | 0.52 | 419 | -0.08 | -4.7 | 1.00 | 0.52 | 4.7 | 62.8 | 62.5 |
| F | 3 | 0 | -0.04 | 0.62 | 419 | -0.06 | -4.0 | 1.00 | 0.62 | 4.0 | 68.5 | 68.3 |
| F | 2 | 0 | -0.04 | 0.62 | 419 | -0.06 | -4.0 | 1.00 | 0.62 | 4.0 | 68.5 | 68.3 |
| F | 1 | 0 | -0.03 | 0.60 | 419 | -0.05 | -3.1 | 1.00 | 0.60 | 3.1 | 67.4 | 67.3 |
| D | 7 | -10 | 0.00 | 0.45 | 413 | 0.00 | 0.0 | 1.00 | 0.45 | 10.0 | 58.1 | 57.2 |
| D | 6 | -6 | 0.01 | 0.47 | 413 | 0.02 | 1.4 | 1.00 | 0.47 | 6.2 | 59.3 | 59.0 |
| D | 5 | -5 | 0.01 | 0.43 | 414 | 0.02 | 1.5 | 1.00 | 0.43 | 5.2 | 56.8 | 56.5 |
| D | 4 | 0 | 0.01 | 0.40 | 414 | 0.03 | 1.6 | 1.00 | 0.40 | 1.6 | 54.7 | 54.7 |
| D | 3 | 1 | 0.01 | 0.39 | 416 | 0.03 | 1.6 | 1.00 | 0.39 | 1.9 | 54.1 | 54.1 |
| D | 2 | 0 | 0.00 | 0.34 | 416 | 0.00 | 0.0 | 1.00 | 0.34 | 0.0 | 50.6 | 50.6 |
| D | 1 | 0 | 0.01 | 0.31 | 415 | 0.03 | 2.1 | 1.00 | 0.31 | 2.1 | 48.2 | 48.2 |
| C | 7 | -10 | -0.04 | 0.40 | 415 | -0.10 | -6.1 | 1.00 | 0.40 | 11.7 | 54.9 | 53.8 |
| C | 6 | -10 | -0.02 | 0.35 | 416 | -0.06 | -3.5 | 1.00 | 0.35 | 10.6 | 51.4 | 50.5 |
| C | 5 | -5 | 0.00 | 0.37 | 416 | 0.00 | 0.0 | 1.00 | 0.37 | 5.0 | 52.7 | 52.5 |
| C | 4 | 0 | 0.00 | 0.35 | 417 | 0.00 | 0.0 | 1.00 | 0.35 | 0.0 | 51.3 | 51.3 |
| C | 3 | 5 | 0.01 | 0.41 | 417 | 0.02 | 1.6 | 1.00 | 0.41 | 5.2 | 55.5 | 55.3 |
| C | 2 | 8 | 0.02 | 0.40 | 417 | 0.05 | 3.2 | 1.00 | 0.40 | 8.6 | 54.8 | 54.2 |
| C | 1 | 10 | 0.03 | 0.33 | 417 | 0.09 | 5.9 | 0.99 | 0.33 | 11.6 | 49.8 | 48.7 |
| B | 7 | -9 | 0.00 | 0.58 | 416 | 0.00 | 0.0 | 1.00 | 0.58 | 9.0 | 66.0 | 65.2 |
| B | 6 | -10 | 0.00 | 0.57 | 417 | 0.00 | 0.0 | 1.00 | 0.57 | 10.0 | 65.5 | 64.5 |
| B | 5 | -6 | 0.00 | 0.48 | 417 | 0.00 | 0.0 | 1.00 | 0.48 | 6.0 | 60.1 | 59.8 |
| B | 4 | -8 | 0.02 | 0.34 | 417 | 0.06 | 3.8 | 0.99 | 0.34 | 8.8 | 50.5 | 49.9 |
| B | 3 | 0 | 0.03 | 0.26 | 417 | 0.12 | 7.6 | 0.99 | 0.26 | 7.6 | 44.2 | 43.8 |
| B | 2 | 7 | 0.03 | 0.26 | 417 | 0.12 | 7.6 | 0.99 | 0.26 | 10.3 | 44.2 | 43.5 |
| B | 1 | 8 | 0.01 | 0.28 | 417 | 0.04 | 2.3 | 1.00 | 0.28 | 8.3 | 45.9 | 45.4 |

## RESULTS

0.48

| | | | |
|---|---|---|---|
| Yaw Angle: | 2.0 degrees | Stack Temperature: | 417 F |
| Pitch Angle: | -0.4 degrees | Velocity*: | 59.45 fps (feet per sec.) |
| Resultant Angle: | 5.6 degrees | Axial Velocity: | 59.08 fps |
| Standard Deviation: | 3.3 degrees | | |

*velocity in the direction of flow

CARNOT
15991 Red Hill Ave., Suite 110
714-259-9520
FAX 714-259-0372

40985.XLS/1-1 3d

10/13/94
6:04 AM

# STRATIFICATION CHECK

Client: UCOS COLMAC
Project #: 1409-40950
Unit No: 1.0
Date: 6/28/94

| Point | $O_2$ pt | Ref $O_2$ | % Diff | Point | $O_2$ pt | Ref $O_2$ | % Diff |
|---|---|---|---|---|---|---|---|
| A5 | 6.9 | 6.9 | 0.0% | D5 | 6.5 | 6.4 | -1.6% |
| A4 | 7.2 | 7.1 | -1.4% | D4 | 6.6 | 6.6 | 0.0% |
| A3 | 6.7 | 6.7 | 0.0% | D3 | 6.7 | 6.7 | 0.0% |
| A2 | 7.0 | 7.2 | 2.8% | D2 | 6.6 | 6.6 | 0.0% |
| A1 | 6.5 | 6.5 | 0.0% | D1 | 6.7 | 6.7 | 0.0% |
| B5 | 6.5 | 6.5 | 0.0% | E5 | 7.0 | 6.9 | -1.4% |
| B4 | 6.7 | 6.7 | 0.0% | E4 | 6.6 | 6.6 | 0.0% |
| B3 | 6.7 | 6.6 | -1.5% | E3 | 6.6 | 6.6 | 0.0% |
| B2 | 6.3 | 6.2 | -1.6% | E2 | 6.9 | 6.8 | -1.5% |
| B1 | 6.5 | 6.5 | 0.0% | E1 | 6.7 | 6.6 | -1.5% |
| C5 | 6.6 | 6.5 | -1.5% | F5 | 6.5 | 6.5 | 0.0% |
| C4 | 6.3 | 6.2 | -1.6% | F4 | 6.2 | 6.2 | 0.0% |
| C3 | 6.4 | 6.4 | 0.0% | F3 | 6.8 | 6.8 | 0.0% |
| C2 | 6.9 | 6.8 | -1.5% | F2 | 6.8 | 6.8 | 0.0% |
| C1 | 6.7 | 6.7 | 0.0% | F1 | 6.8 | 6.8 | 0.0% |

O2 Stratification= -0.4%

CARNOT
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# 3D VELOCITY - DATA AND WORKSHEET

| | |
|---|---|
| Client: | UCOS COLMAC |
| Unit: | # 2 |
| Sample Location: | Outlet duct |
| Test No.: | 2-2-3d |
| Probe ID No.: | B-2131 |
| Unit Load: | |
| Test Date: | 6/28/94 |
| Time (Start/Stop): | 0950/1145 |

| | |
|---|---|
| Date: | |
| Data By: | EF |
| Baro. Pressure, in Hg.: | 29.90 |
| Static Pressure, in WG: | -0.78 |
| Abs. Pressure, in Hg.: | 29.84 |
| Average O2, % dry: | 6.70 |
| Average CO2, % dry: | 12.00 |
| Moisture Content, %: | 15.00 |
| Molecular Weight, wet: | 28.36 |

| Sample Point | | Yaw Angle deg. | Pitch P4-P5 in WG | Total P1-P2 in WG | Stack Temp. F | P4-P5/ P1-P2 in WG | Pitch Angle deg. | Pt-Ps/ P1-P2 in WG | Pt-Ps in WG | Result Angle deg. | Velocity uncorr.* fps | Axial fps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 7 | -6 | -0.05 | 0.55 | 439 | -0.09 | -5.5 | 1.00 | 0.55 | 8.1 | 65.3 | 64.6 |
| A | 6 | -9 | -0.05 | 0.45 | 439 | -0.11 | -6.7 | 1.00 | 0.45 | 11.2 | 59.1 | 58.0 |
| A | 5 | -12 | -0.05 | 0.45 | 439 | -0.11 | -6.7 | 1.00 | 0.45 | 13.7 | 59.1 | 57.4 |
| A | 4 | -3 | -0.05 | 0.50 | 439 | -0.10 | -6.1 | 1.00 | 0.50 | 6.8 | 62.3 | 61.8 |
| A | 3 | -9 | -0.04 | 0.60 | 439 | -0.07 | -4.1 | 1.00 | 0.60 | 9.9 | 68.1 | 67.1 |
| A | 2 | -8 | -0.05 | 0.60 | 439 | -0.08 | -5.1 | 1.00 | 0.60 | 9.5 | 68.2 | 67.3 |
| A | 1 | -8 | 0.00 | 0.55 | 440 | 0.00 | 0.0 | 1.00 | 0.55 | 8.0 | 65.2 | 64.5 |
| B | 7 | 5 | 0.00 | 0.70 | 439 | 0.00 | 0.0 | 1.00 | 0.70 | 5.0 | 73.5 | 73.2 |
| B | 6 | -3 | 0.00 | 0.65 | 439 | 0.00 | 0.0 | 1.00 | 0.65 | 3.0 | 70.8 | 70.7 |
| B | 5 | 0 | 0.00 | 0.57 | 439 | 0.00 | 0.0 | 1.00 | 0.57 | 0.0 | 66.3 | 66.3 |
| B | 4 | -1 | 0.00 | 0.48 | 439 | 0.00 | 0.0 | 1.00 | 0.48 | 1.0 | 60.9 | 60.8 |
| B | 3 | -2 | 0.00 | 0.32 | 439 | 0.00 | 0.0 | 1.00 | 0.32 | 2.0 | 49.7 | 49.7 |
| B | 2 | -3 | 0.00 | 0.25 | 438 | 0.00 | 0.0 | 1.00 | 0.25 | 3.0 | 43.9 | 43.8 |
| B | 1 | -15 | -0.02 | 0.27 | 438 | -0.07 | -4.5 | 1.00 | 0.27 | 15.7 | 45.7 | 44.0 |
| C | 7 | 0 | -0.01 | 0.41 | 437 | -0.02 | -1.5 | 1.00 | 0.41 | 1.5 | 56.2 | 56.2 |
| C | 6 | 0 | -0.02 | 0.42 | 436 | -0.05 | -2.9 | 1.00 | 0.42 | 2.9 | 56.9 | 56.8 |
| C | 5 | 0 | -0.02 | 0.37 | 437 | -0.05 | -3.3 | 1.00 | 0.37 | 3.3 | 53.4 | 53.3 |
| C | 4 | -2 | -0.01 | 0.37 | 437 | -0.03 | -1.7 | 1.00 | 0.37 | 2.6 | 53.4 | 53.3 |
| C | 3 | -6 | 0.02 | 0.36 | 437 | 0.06 | 3.6 | 0.99 | 0.36 | 7.0 | 52.6 | 52.2 |
| C | 2 | -3 | 0.02 | 0.40 | 437 | 0.05 | 3.2 | 1.00 | 0.40 | 4.4 | 55.4 | 55.3 |
| C | 1 | -9 | 0.02 | 0.36 | 437 | 0.06 | 3.6 | 0.99 | 0.36 | 9.7 | 52.6 | 51.8 |
| F | 7 | -7 | -0.05 | 0.55 | 440 | -0.09 | -5.5 | 1.00 | 0.55 | 8.9 | 65.3 | 64.5 |
| F | 6 | -3 | -0.04 | 0.53 | 440 | -0.08 | -4.6 | 1.00 | 0.53 | 5.5 | 64.1 | 63.8 |
| F | 5 | -6 | -0.06 | 0.50 | 441 | -0.12 | -7.2 | 1.00 | 0.50 | 9.4 | 62.4 | 61.5 |
| F | 4 | -1 | -0.03 | 0.59 | 443 | -0.05 | -3.1 | 1.00 | 0.59 | 3.3 | 67.7 | 67.6 |
| F | 3 | -8 | -0.03 | 0.66 | 441 | -0.05 | -2.8 | 1.00 | 0.66 | 8.5 | 71.5 | 70.7 |
| F | 2 | -10 | 0.00 | 0.60 | 442 | 0.00 | 0.0 | 1.00 | 0.60 | 10.0 | 68.1 | 67.1 |
| F | 1 | -9 | 0.07 | 0.52 | 445 | 0.13 | 8.9 | 0.99 | 0.52 | 12.6 | 63.4 | 61.9 |
| E | 7 | -10 | 0.00 | 0.52 | 441 | 0.00 | 0.0 | 1.00 | 0.52 | 10.0 | 63.4 | 62.4 |
| E | 6 | -5 | 0.01 | 0.52 | 442 | 0.02 | 1.2 | 1.00 | 0.52 | 5.1 | 63.4 | 63.2 |
| E | 5 | -7 | 0.02 | 0.54 | 442 | 0.04 | 2.4 | 1.00 | 0.54 | 7.4 | 64.6 | 64.1 |
| E | 4 | -3 | 0.00 | 0.55 | 441 | 0.00 | 0.0 | 1.00 | 0.55 | 3.0 | 65.2 | 65.1 |
| E | 3 | -9 | 0.00 | 0.53 | 441 | 0.00 | 0.0 | 1.00 | 0.53 | 9.0 | 64.0 | 63.2 |
| E | 2 | -10 | 0.00 | 0.53 | 441 | 0.00 | 0.0 | 1.00 | 0.53 | 10.0 | 64.0 | 63.0 |
| E | 1 | 0 | 0.02 | 0.55 | 440 | 0.04 | 2.3 | 1.00 | 0.55 | 2.3 | 65.1 | 65.1 |
| D | 7 | 1 | 0.00 | 0.49 | 440 | 0.00 | 0.0 | 1.00 | 0.49 | 1.0 | 61.5 | 61.5 |
| D | 6 | -2 | 0.02 | 0.45 | 438 | 0.04 | 2.8 | 1.00 | 0.45 | 3.5 | 58.8 | 58.7 |
| D | 5 | 0 | 0.02 | 0.42 | 437 | 0.05 | 3.1 | 1.00 | 0.42 | 3.1 | 56.8 | 56.7 |
| D | 4 | 0 | 0.01 | 0.39 | 437 | 0.03 | 1.6 | 1.00 | 0.39 | 1.6 | 54.8 | 54.7 |
| D | 3 | 0 | 0.00 | 0.36 | 437 | 0.00 | 0.0 | 1.00 | 0.36 | 0.0 | 52.6 | 52.6 |
| D | 2 | -3 | -0.01 | 0.30 | 437 | -0.03 | -2.1 | 1.00 | 0.30 | 3.6 | 48.1 | 48.0 |
| D | 1 | 2 | 0.00 | 0.25 | 437 | 0.00 | 0.0 | 1.00 | 0.25 | 2.0 | 43.9 | 43.8 |

## RESULTS

| | | |
|---|---|---|
| Yaw Angle: | 4.4 | degrees |
| Pitch Angle: | -1.0 | degrees |
| Resultant Angle: | 5.9 | degrees |
| Standard Deviation: | 4.0 | degrees |

| | | |
|---|---|---|
| Stack Temperature: | 439 | F |
| Velocity*: | 60.18 | fps (feet per sec.) |
| Axial Velocity: | 59.71 | fps |

*velocity in the direction of flow

CARNOT
15991 Red Hill Ave., Suite 110
Tustin, California 92680
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FAX 714-259-0372

40985.XLS/2-2-3d

10/13/94
5:59 AM

# STRATIFICATION CHECK

Client: UCOS COLMAC
Project #: 1409-40985
Unit No: 2
Date: 6/28/94

| Point | $O_2$ pt | Ref $O_2$ | % Diff | Point | $O_2$ pt | Ref $O_2$ | % Diff |
|---|---|---|---|---|---|---|---|
| F5 | 7.0 | 7.0 | 0.0% | C5 | 6.5 | 6.4 | -1.6% |
| F4 | 6.4 | 6.5 | 1.5% | C4 | 6.6 | 6.6 | 0.0% |
| F3 | 7.3 | 7.4 | 1.4% | C3 | 6.5 | 6.6 | 1.5% |
| F2 | 7.0 | 7.0 | 0.0% | C2 | 6.4 | 6.4 | 0.0% |
| F1 | 6.7 | 6.7 | 0.0% | C1 | 7.4 | 7.5 | 1.3% |
| E5 | 6.5 | 6.5 | 0.0% | B5 | 6.0 | 6.1 | 1.6% |
| E4 | 6.7 | 6.8 | 1.5% | B4 | 6.2 | 6.3 | 1.6% |
| E3 | 7.1 | 7.1 | 0.0% | B3 | 6.5 | 6.6 | 1.5% |
| E2 | 6.9 | 7.0 | 1.4% | B2 | 6.7 | 6.8 | 1.5% |
| E1 | 6.7 | 6.8 | 1.5% | B1 | 6.6 | 6.7 | 1.5% |
| D5 | 6.9 | 7.0 | 1.4% | A5 | 7.1 | 7.3 | 2.7% |
| D4 | 6.3 | 6.4 | 1.6% | A4 | 6.7 | 6.9 | 2.9% |
| D3 | 7.2 | 7.2 | 0.0% | A3 | 7.4 | 7.5 | 1.3% |
| D2 | 7.7 | 7.7 | 0.0% | A2 | 6.7 | 6.8 | 1.5% |
| D1 | 7.0 | 7.0 | 0.0% | A1 | 6.4 | 6.6 | 3.0% |

O2 Stratification= 1.0%

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15991 Red Hill Ave. Suite 110
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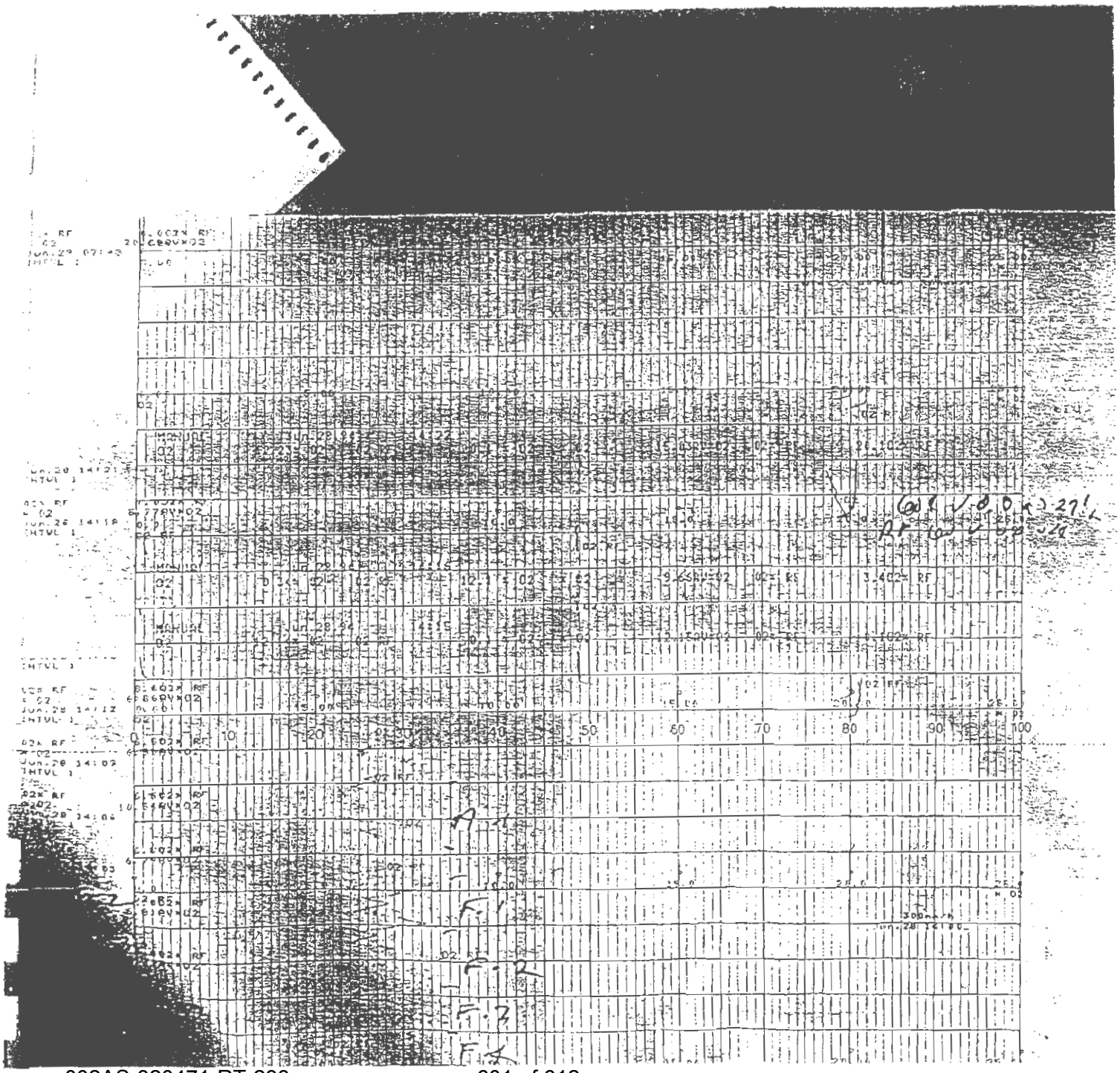
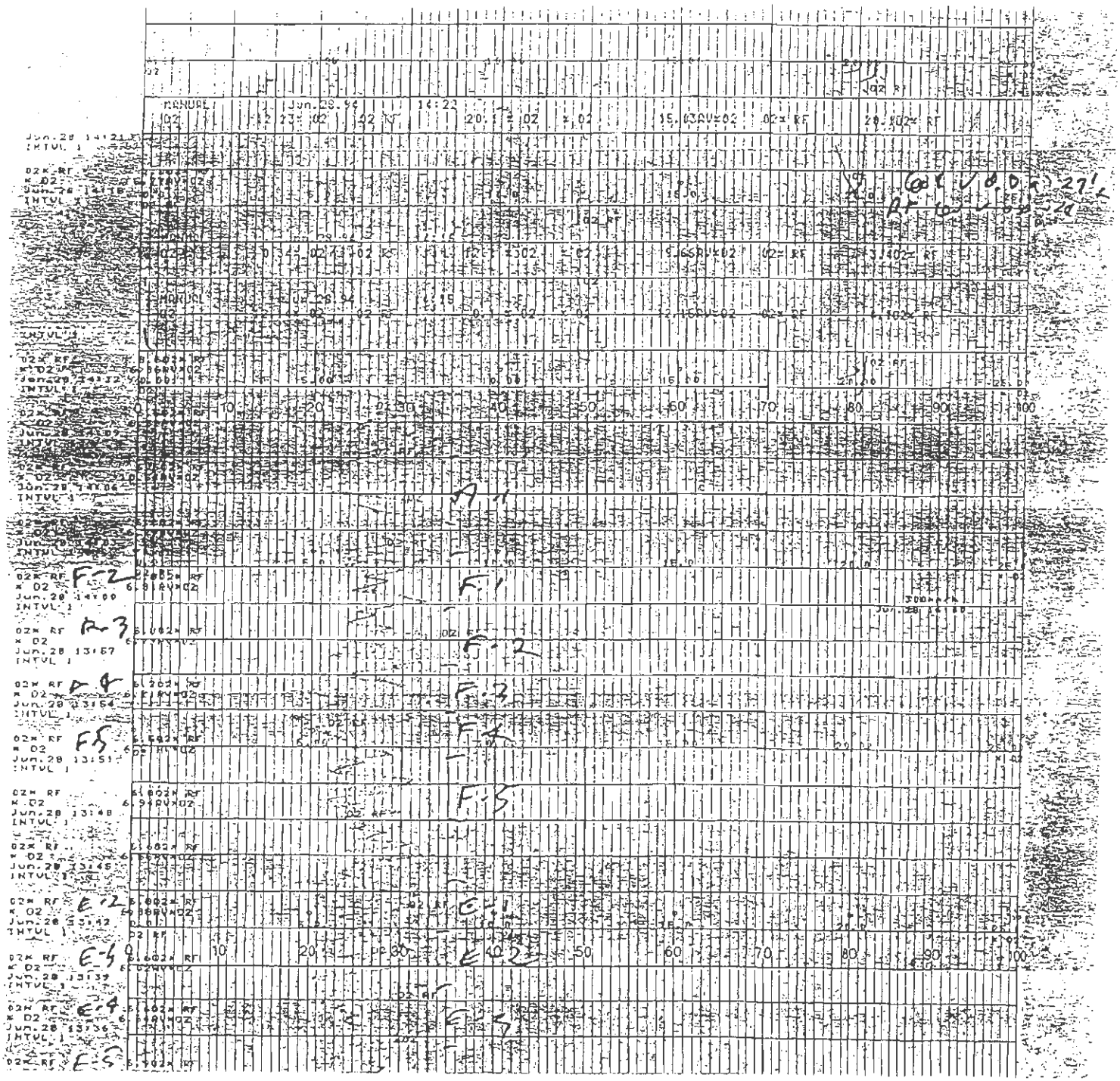
714-259-9520
FAX 714-259-0372

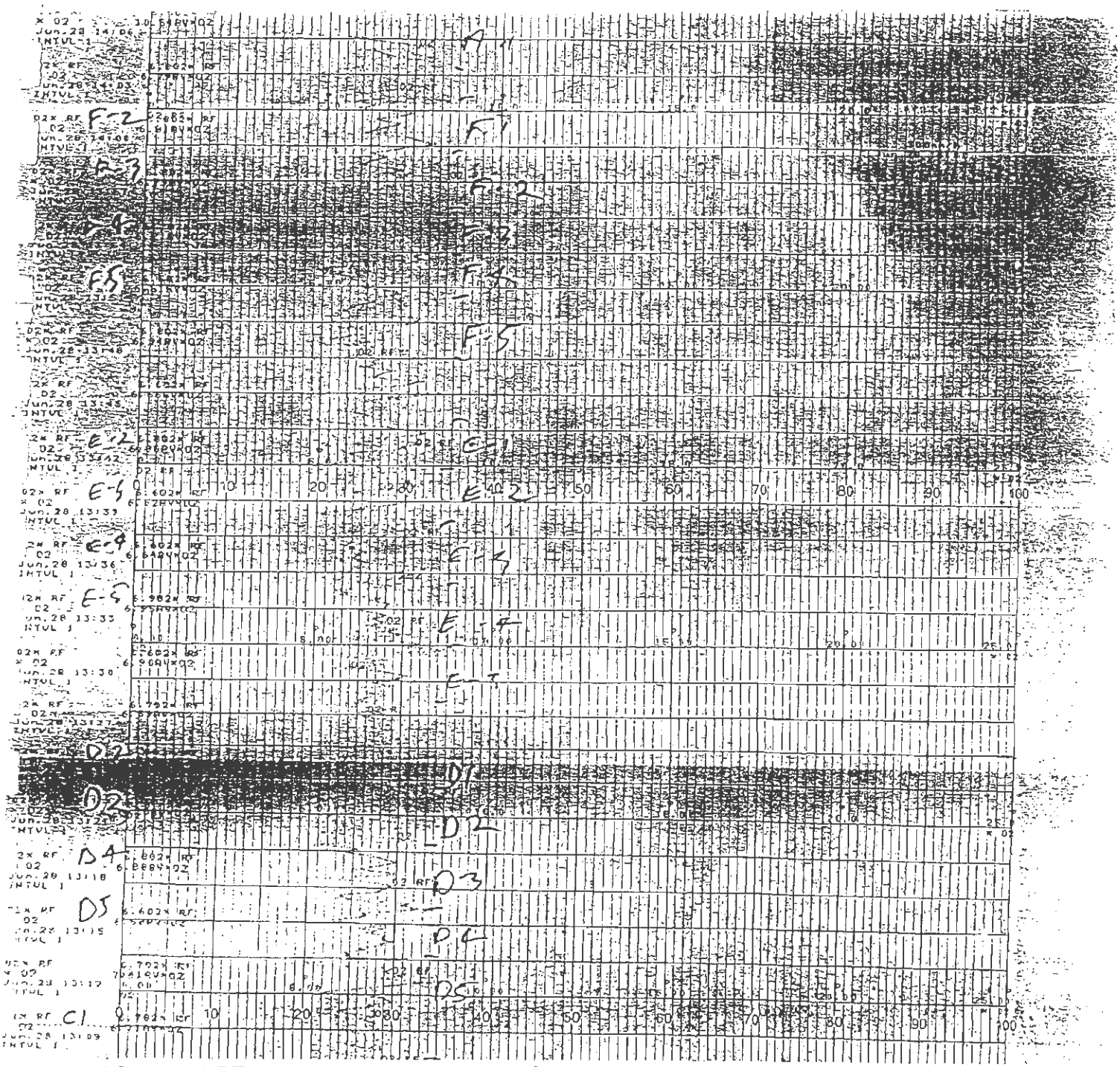
40985.XLS/2-2-Strat

10/3/94
8:01 AM

# APPENDIX E
# STRIP CHARTS



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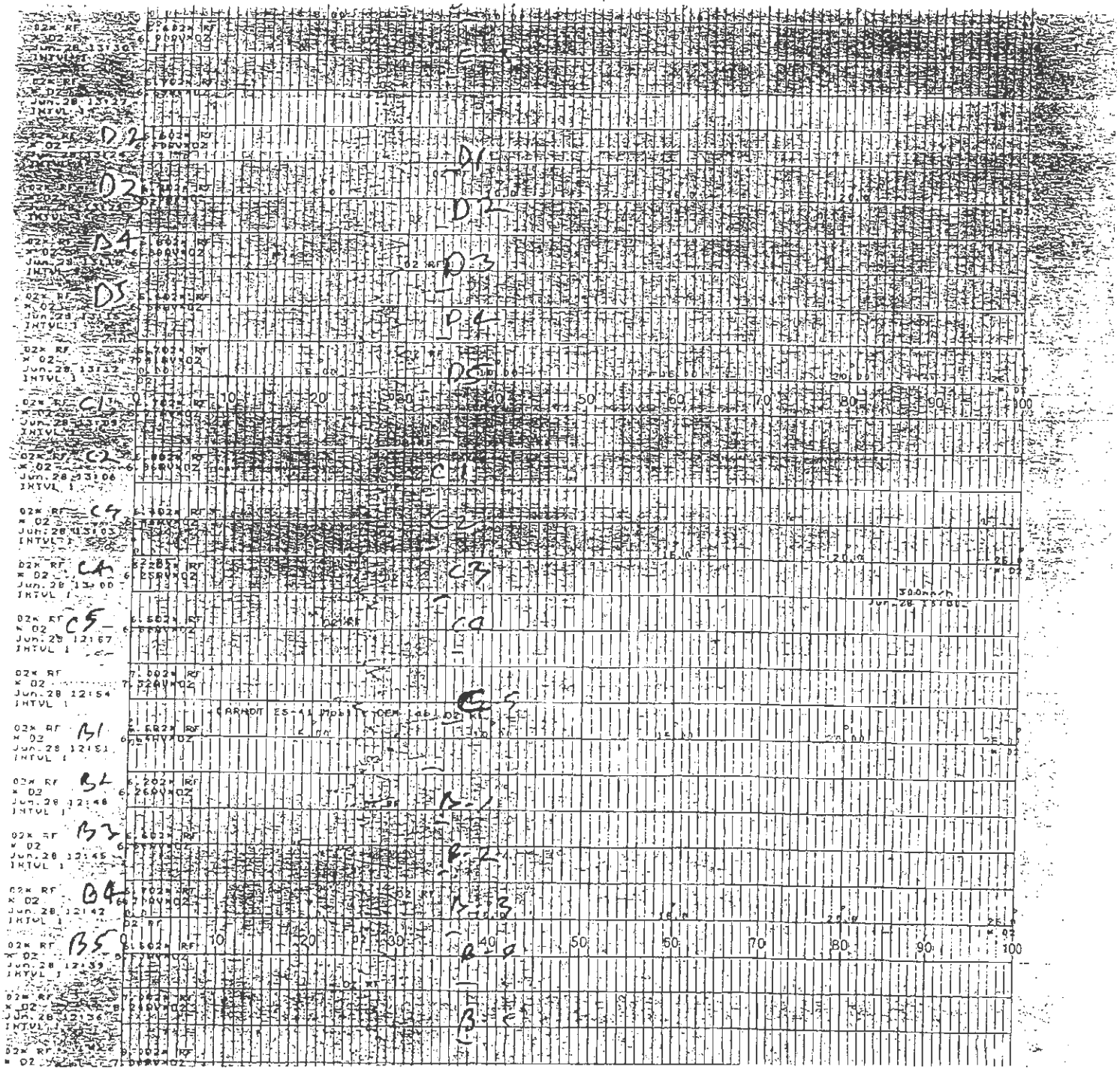
F-3
F-4
F-5
E-2
E-4
E-5
D2
D4
D5
C1


D2
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D4
D5
C1
C2
C4
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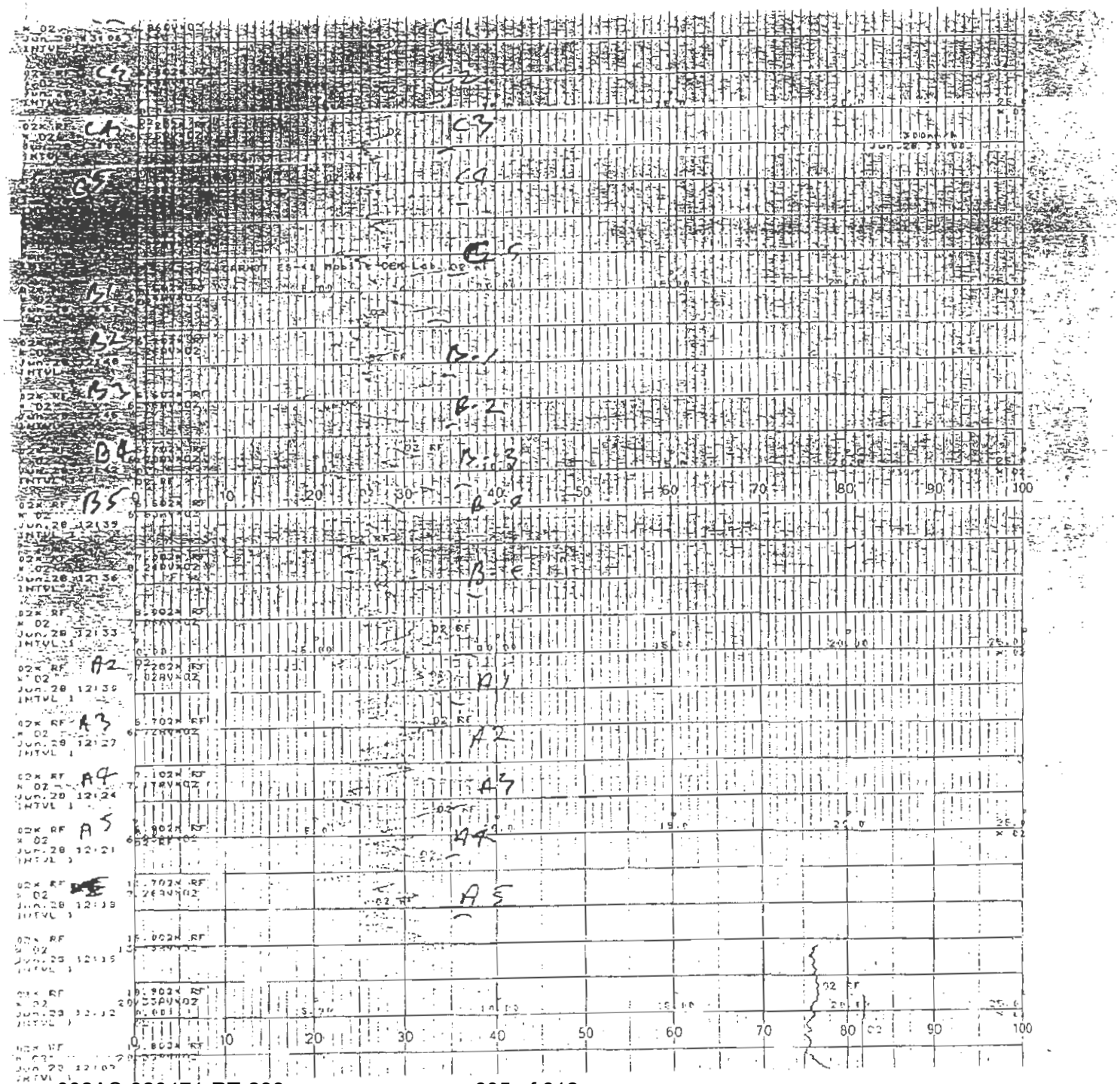
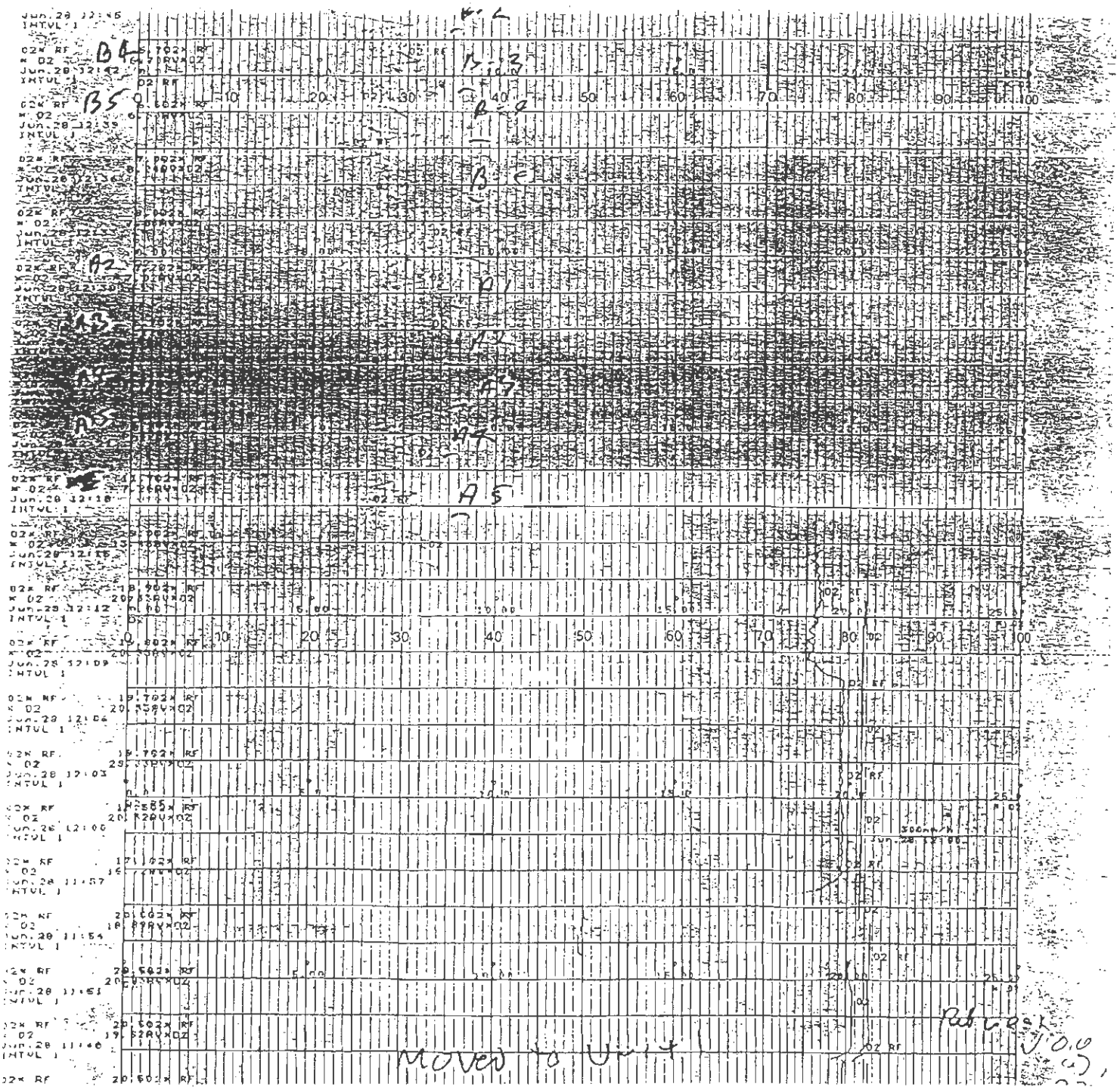
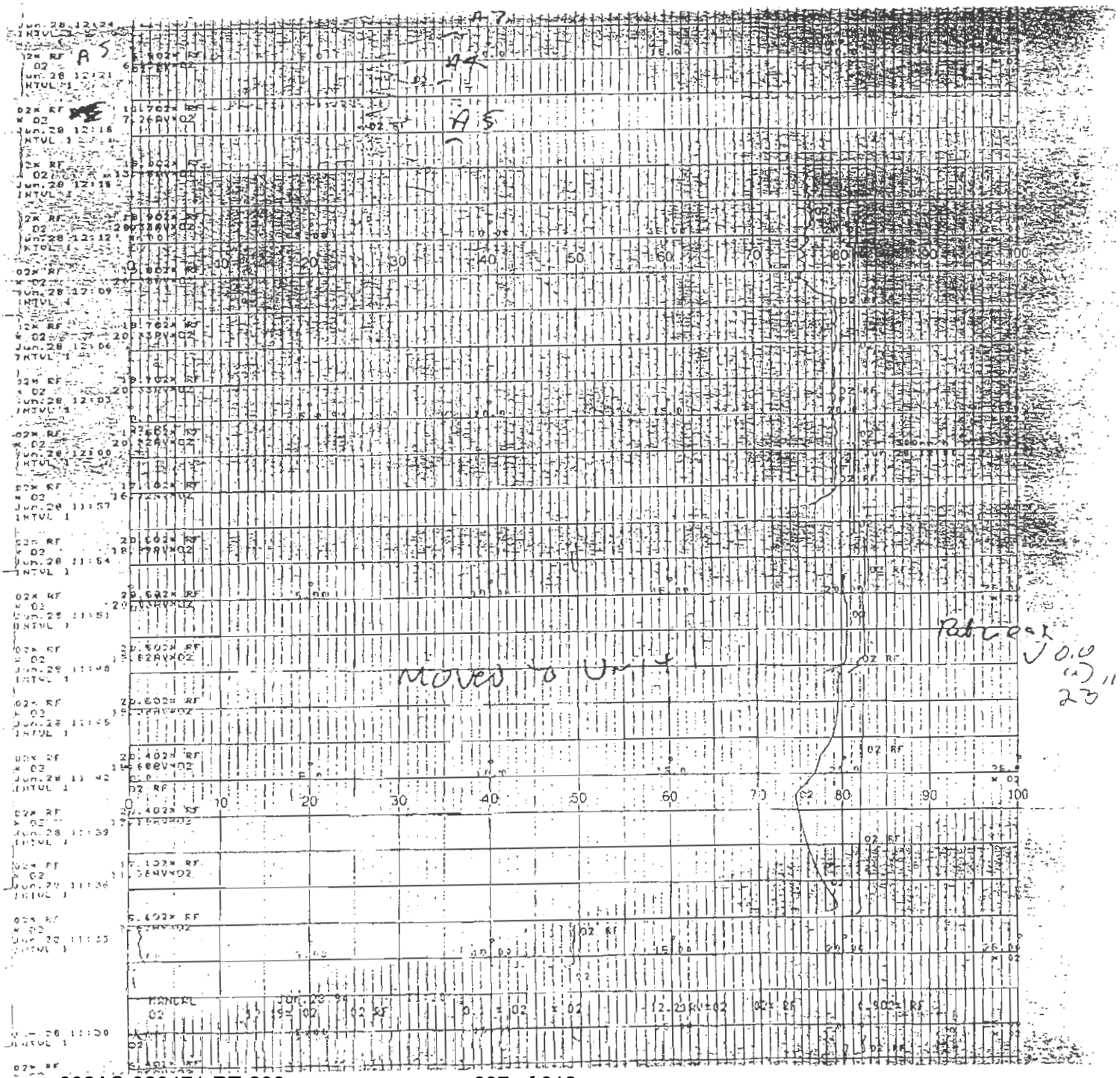
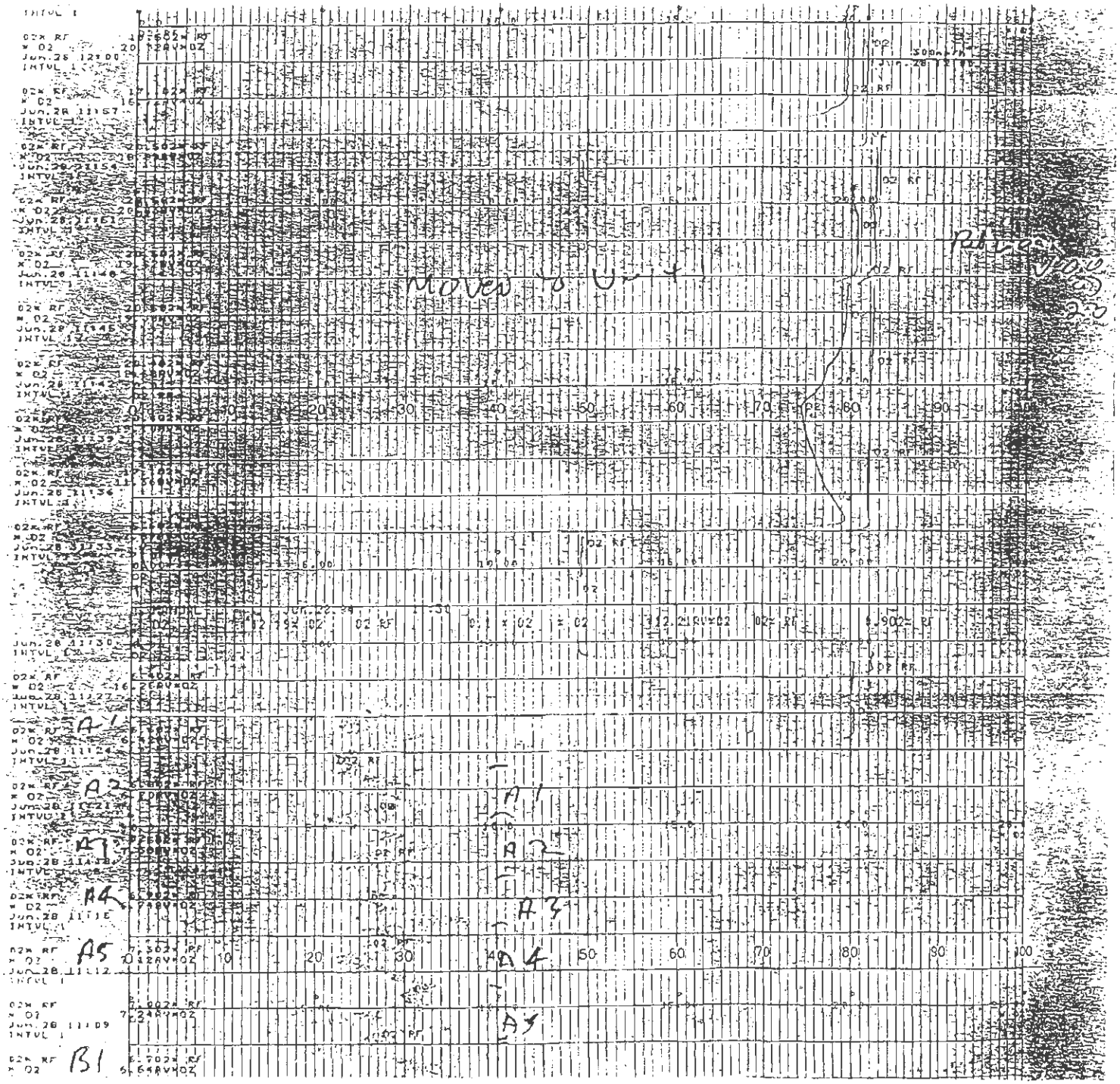
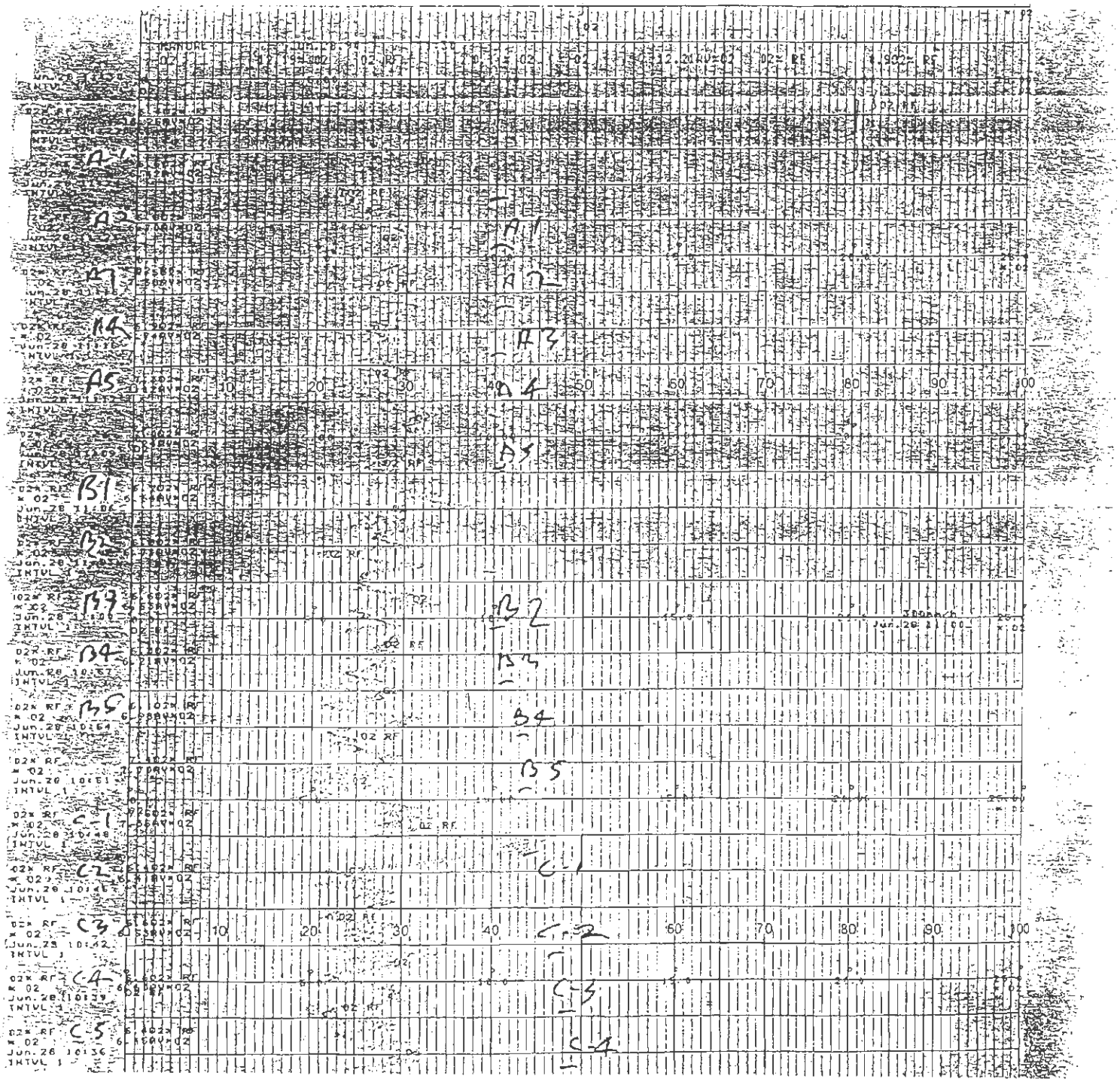
90
100




B4
B5
A2
A3
A5
Moved to Unit


A5
A7
A4
A5
Moved to Unit
Rebreak
0.0
23"
MANUAL
02
0
10
20
30
40
50
60
70
80
90
100


Moved to Unit
A1
A2
A3
A4
A5
B1


A-1
A2
A3
A4
A5
B1
B2
B3
B4
B5
C-1
C2
C3
C-4
C-5
A1
A2
A3
A4
A5
B2
B3
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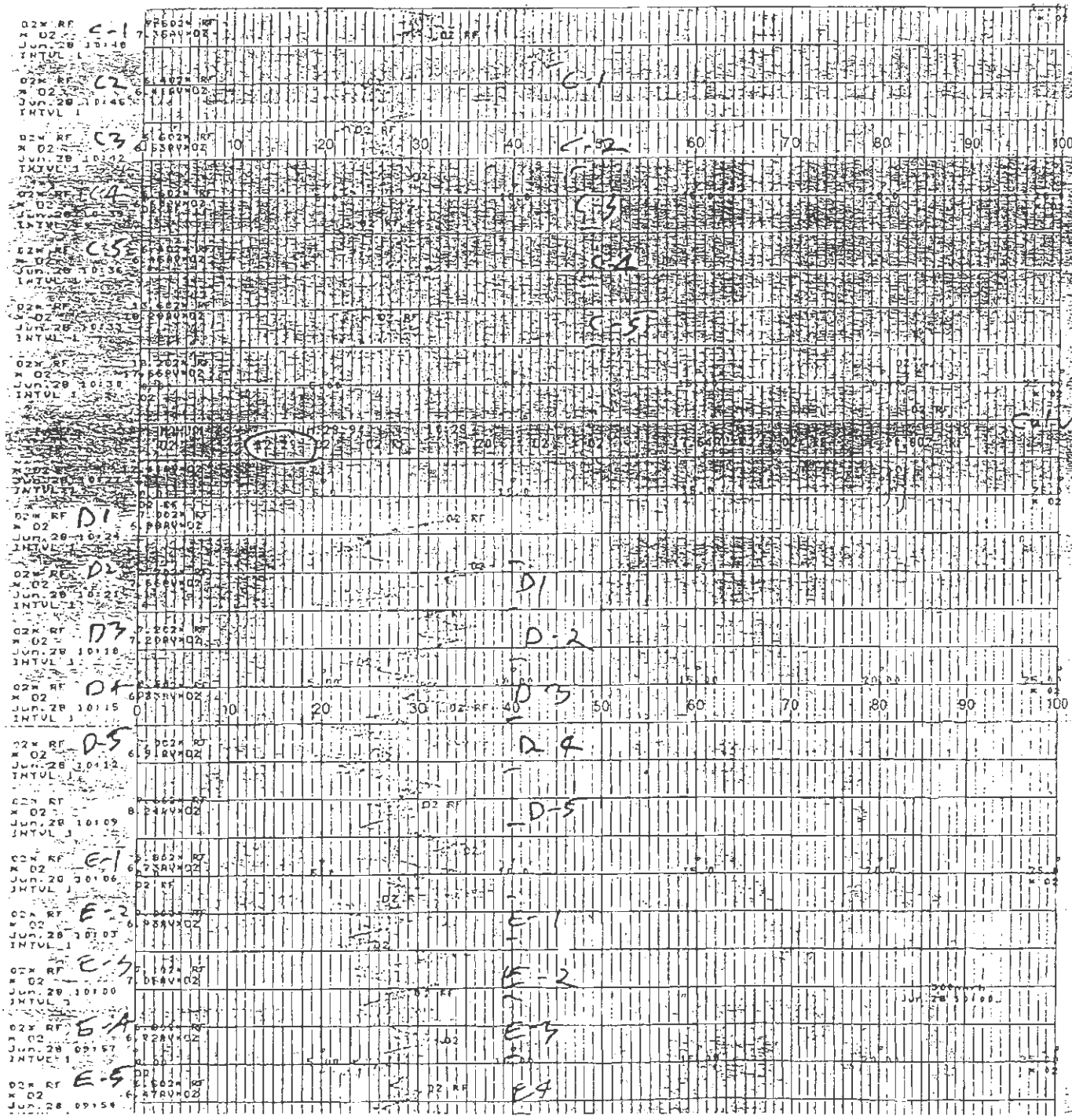
80
90
100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C4
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D1
D2
D3
D4
D5
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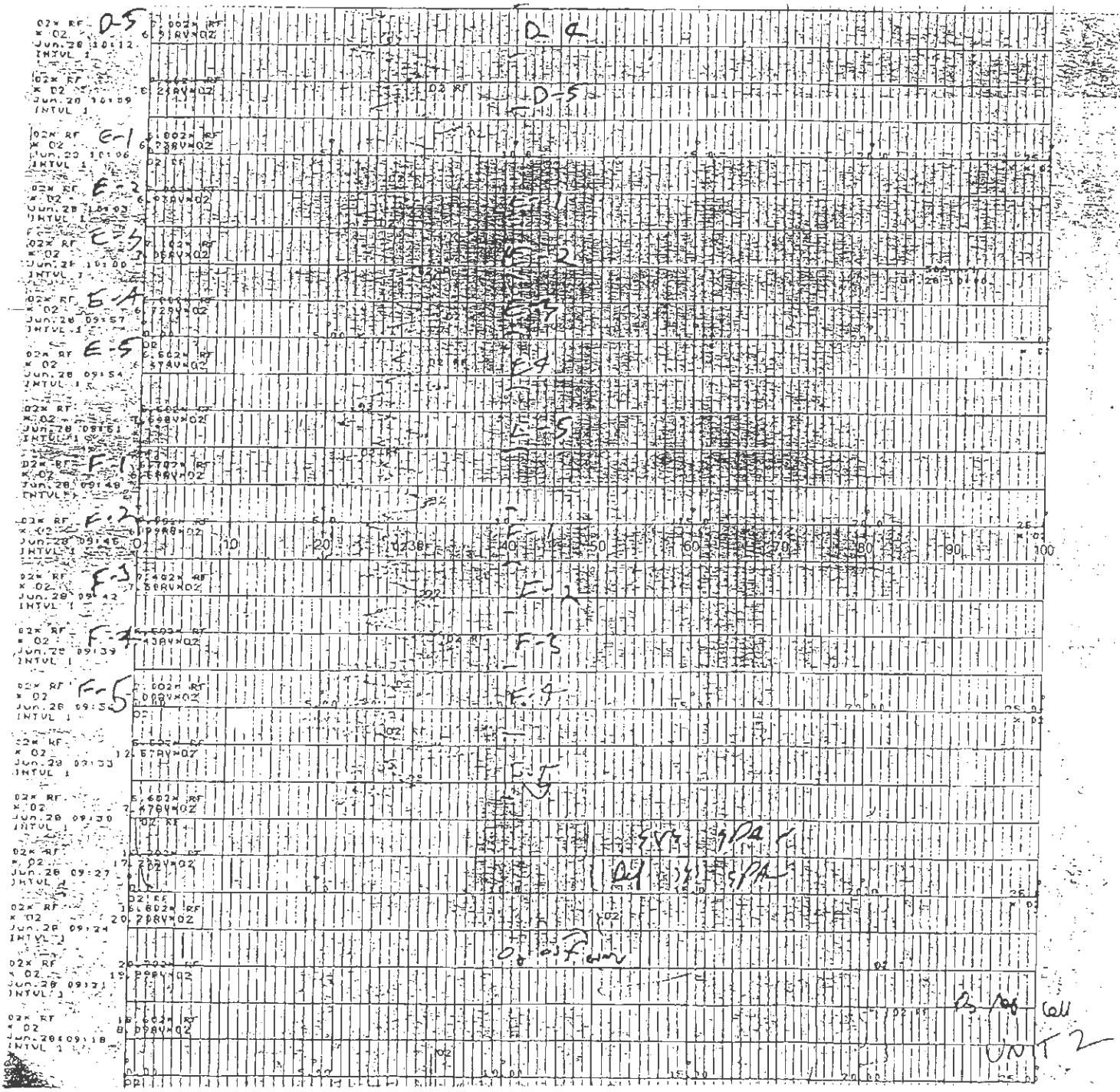
50
60
70
80
90
100


D-5
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F-1
F-2
F-3
F-4
F-5
10
20
40
50
60
70
80
90
100
UNIT 2

# THIS IS THE LAST PAGE OF THIS DOCUMENT

If you have any questions, please contact one of the following individuals by email or phone.

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