# Background Report Reference

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# UREA PERMIT COMPLIANCE TESTING AT ALAMITOS GENERATING STATION UNIT 4

Prepared For:

**SOUTHERN CALIFORNIA EDISON COMPANY**
Rosemead, California

For Submittal To:

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

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**CARNOT**
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APRIL 1993

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 3/31/93

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 4/1/93

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Senior Engineer

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## SECTION 1.0

## INTRODUCTION

Carnot was contracted to conduct a series of emissions tests on Unit 4 at the Alamitos Generating Station for Southern California Edison (SCE). Carnot conducted testing to comply with South Coast Air Quality Management District (SCAQMD) Permit A/N 240354.

A test program was conducted to quantify the effect of urea injection on various stack emissions as stated in the permit to construct. Emissions tests were performed on Alamitos Unit 4 for the following:

- $NO_x$, CO, and $O_2$
- ROG as non-methane hydrocarbons
- Particulates
- $NH_3$

Emissions testing was conducted by Edward J. Filadelfia, Bhaskar Chandan, Robert Madrigal and John Peterson of Carnot, on September 14, 15, 18, 19, 20 and 28, 1992. Mr. Barry Novodvorsky and Mr. Mike Escarcega of SCE coordinated the testing.

## TABLE 1-1
## EMISSIONS TEST RESULTS SUMMARY
## ALAMITOS UNIT 4
## SEPTEMBER, 1992

| | NET LOAD 253 MW | | NET LOAD 152 MW | | NET LOAD 70 MW | |
|---|---|---|---|---|---|---|
| Parameter | Urea Off | Urea On | Urea Off | Urea On | Urea Off | Urea On |
| $NO_x$ ppm (1) | 69.9 | 61.7 | 35.2 | 33.0 | 26.8 | 24.9 |
| $NO_x$ ppm @ 3% $O_2$ (1) | 66.7 | 58.9 | 34.6 | 32.6 | 38.2 | 34.8 |
| CO ppm (1) | 11.6 | 8.6 | 0.0 | 0.0 | 29.5 | 26.8 |
| CO @ 3%$O_2$ (1) | 11.1 | 8.2 | 0.0 | 0.0 | 41.9 | 37.5 |
| Methane, ppm | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | <1.2 | 13.0 |
| TNMHC as $CH_4$, ppm | ND<1.0 | ND<1.0 | 11.3 | 9.8 | 9.3 | 9.6 |
| Particulate, lb/hr | 3.45 | 3.37 | 3.15 | 2.68 | 1.38 | - (3) |
| Grain loading, gr/dscf | 0.0006 | 0.0006 | 0.0009 | 0.0007 | 0.0004 | - (3) |
| Total urea flow | 0.0 | 1.2 | 0.0 | 0.8 | 0.0 | 0.3 |
| $NH_3$ Slip | | | | | | |
| ppm | - | 7.8 | - | 5.6 | - | 6.4 |
| ppm @ 3%$O_2$ (2) | - | 9.0 | - | 6.9 | - | 12.6 |

(1) Carnot CEM Data.
(2) Oxygen for correction from portable $O_2$ meter.
(3) Test result invalid, see discussion in Section 3.1

Notes: ND < indicates that this species was not detected.
< indicated that this species was detected in at least one but not all samples.

2350 MMBTU/HR

## SECTION 2.0

## BOILER DESCRIPTION

Alamitos Generating Station Unit 4 is one of six similar Combustion Engineering inverted tangentially-fired boilers in the SCE system. Unit 4 is rated at 320 net MW. The boilers are fired from the top and consist of the three tiers of burners with eight burners in each tier. Each burner contains one oil gun and two gas injectors. Each unit is divided into two furnaces by a division wall, with burners in each of the four corners to provide the "tangential" firing.

The boilers are equipped with burner tilts, which can be varied from the horizontal to 10 degrees up and 30 degrees down. All three burners in a furnace corner are controlled by one mechanism, with all the burners in a furnace set at the same position. Combustion air is supplied by two forced draft fans through primary and secondary air ducts. The primary air ducts supply air only to the immediate vicinity of the burners. The secondary air is introduced above and below each burner. Air flow to individual burners is controlled by dampers. Existing controls regulate the position of all the primary and secondary dampers separately. Each unit has two flue gas recirculation (FGR) fans that mix flue gas with the secondary air supply. The furnace is operated under positive pressure.

## SECTION 3.0

## TEST DESCRIPTION

### 3.1 TEST CONDITIONS

The demonstration tests were conducted at two conditions and at three loads. Full load (320 MW) was not tested on Unit 4 due to operating load limits imposed by tube leaks. Condition one was with urea off and condition two was with optimum urea injection. Duplicate tests were performed at each of the following net loads: 70, 152 and 253 MW. All tests were performed with the boiler fired on natural gas fuel. The initial "urea on" ammonia slip, gaseous emission and particulate tests conducted at 70 MW on September 18 -19 were considered invalid due to the incorrect installation of the urea injection nozzles on the east side of the unit. This was discovered several days after completion of the tests during an inspection. Ammonia slip and gaseous concentrations tests at 70MW were repeated on September 28, 1992. The particulate tests at 70 MW could not be repeated due to time constraints imposed by the unit's scheduled annual outage. The test matrix and unit operating data are outlined in Tables 3-1 and 3-2. Test conditions were established by SCE personnel, and unit data was collected by Carnot and SCE personnel.

### 3.2 SAMPLE LOCATIONS

The particulate sampling was performed in the exhaust duct located between the air preheater (APH) and the stack. Samples were drawn from six ports with seven points each. This resulted in a total of 42 points per duct as shown in Figure 3-1.

Ammonia and hydrocarbon sampling was performed at the same locations as the particulates.

All gaseous testing ($NO_x$, CO and $O_2$) was performed on the hot (inlet) side of the APH, with an 8-point sampling grid on both the east and west ducts (16-point total).

### 3.3 TEST PROCEDURES

The test procedures used for this program are in Table 3-3. Descriptions of standard procedures are included in Appendix A. Additional information and modifications to standard procedures are presented in the following section.

## TABLE 3-1
## TEST MATRIX SCE ALAMITOS UNIT 4
## SEPTEMBER 1992

| Test | Date | Time | Type of Test | Load MW | Urea Injection Status |
|---|---|---|---|---|---|
| 1-4-PM | 9/14/92 | 1208/1603 | Particulate | 253 | Off |
| 2-4-PM | 9/15/92 | 0650/0924 | Particulate | 253 | Off |
| 2A-4-CEM | 9/15/92 | 0845/0915 | $NO_x$, CO | 253 | Off |
| 2A-4-$NH_3$ | 9/15/92 | 0840/0910 | Ammonia | 253 | Off |
| 2A-4-HC | 9/15/92 | 0840/0910 | Hydrocarbon | 253 | Off |
| 2B-4-CEM | 9/15/92 | 0948/1018 | $NO_x$, CO | 253 | Off |
| 2B-4-$NH_3$ | 9/15/92 | 0943/1013 | Ammonia | 253 | Off |
| 2B-4-HC | 9/15/92 | 0983/1013 | Hydrocarbon | 253 | Off |
| 3-4-PM | 9/15/92 | 1122/1358 | Particulate | 253 | On |
| 3-4-CEM | 9/15/92 | 1245/1315 | $NO_x$, CO | 253 | On |
| 3-4-$NH_3$ | 9/15/92 | 1245/1315 | Ammonia | 253 | On |
| 3-4-HC | 9/15/92 | 1245/1315 | Hydrocarbon | 253 | On |
| 4-4-PM | 9/15/92 | 1432/1652 | Particulate | 253 | On |
| 4-4-CEM | 9/15/92 | 1547/1617 | $NO_x$, CO | 253 | On |
| 4-4-$NH_3$ | 9/15/92 | 1547/1617 | Ammonia | 253 | On |
| 4-4-HC | 9/15/92 | 1547/1617 | Hydrocarbon | 253 | On |
| 5-4-PM | 9/18/92 | 2200/0017 | Particulate | 70 | Off |
| 5-4-CEM | 9/18/92 | 2325/2355 | $NO_x$, CO | 70 | Off |
| 5-4-$NH_3$ | 9/18/92 | 2325/2355 | Ammonia | 70 | Off |
| 5-4-HC | 9/18/92 | 2345/2355 | Hydrocarbon | 70 | Off |
| 6-4-PM | 9/19/92 | 0100/0317 | Particulate | 70 | Off |
| 6-4-CEM | 9/19/92 | 0215/0245 | $NO_x$, CO | 70 | Off |
| 6-4-$NH_3$ | 9/19/92 | 0215/0245 | Ammonia | 70 | Off |
| 6-4-HC | 9/19/92 | 0225/0245 | Hydrocarbon | 70 | Off |
| 7-4-PM | 9/19/92 | 0400/0617 | Particulate | 70 | On |
| 7-4-CEM | 9/19/92 | 0500/0530 | $NO_x$, CO | 70 | On |
| 7-4-$NH_3$ | 9/19/92 | 0500/0530 | Ammonia | 70 | On |
| 7-4-HC | 9/19/92 | 0505/0925 | Hydrocarbon | 70 | On |
| 8-4-PM | 9/19/92 | 0650/0940 | Particulate | 70 | On |
| 8-4-CEM | 9/19/92 | 0805/0835 | $NO_x$, CO | 70 | On |
| 8-4-$NH_3$ | 9/19/92 | 0800/0830 | Ammonia | 70 | On |
| 8-4-HC | 9/19/92 | 0805/0825 | Hydrocarbon | 70 | On |

(Continued)

**TABLE 3-1 (Cont'd)**
**TEST MATRIX SCE ALAMITOS UNIT 4**
**SEPTEMBER 1992**

| Test | Date | Time | Type of Test | Load MW | Urea Injection Status |
|---|---|---|---|---|---|
| 9-4-PM | 9/19/92 | 2133/2350 | Particulate | 152 | Off |
| 9-4-CEM | 9/19/92 | 2230/2300 | $NO_x$, CO | 152 | Off |
| 9-4-$NH_3$ | 9/19/92 | 2230/2300 | Ammonia | 152 | Off |
| 9-4-HC | 9/19/92 | 2240/2300 | Hydrocarbon | 152 | Off |
| 10-4-PM | 9/20/92 | 0027/0248 | Particulate | 152 | Off |
| 10-4-CEM | 9/20/92 | 0145/0215 | $NO_x$, CO | 152 | Off |
| 10-4-$NH_3$ | 9/20/92 | 0145/0215 | Ammonia | 152 | Off |
| 10-4-HC | 9/20/92 | 0150/0210 | Hydrocarbon | 152 | Off |
| 11-4-PM | 9/20/92 | 0331/0548 | Particulate | 152 | On |
| 11-4-CEM | 9/20/92 | 0445/0315 | $NO_x$, CO | 152 | On |
| 11-4-$NH_3$ | 9/20/92 | 0448/0518 | Ammonia | 152 | On |
| 11-4-HC | 9/20/92 | 0453/0513 | Hydrocarbon | 152 | On |
| 12-4-PM | 9/20/92 | 0630/0852 | Particulate | 152 | On |
| 12-4-CEM | 9/20/92 | 0700/0730 | $NO_x$, CO | 152 | On |
| 12-4-$NH_3$ | 9/20/92 | 0700/0730 | Ammonia | 152 | On |
| 12-4-HC | 9/20/92 | 0710/0730 | Hydrocarbon | 152 | On |
| 13-4-CEM | 9/28/92 | 0510/0540 | $NO_x$, CO | 70 | On |
| 13-4-$NH_3$ | 9/28/92 | 0450/0521 | Ammonia | 70 | On |
| 13-4-HC | 9/28/92 | 0412/0544 | Hydrocarbon | 70 | On |
| 14-4-CEM | 9/28/92 | 0612/0642 | $NO_x$, CO | 70 | On |
| 14-4-$NH_3$ | 9/28/92 | 0555/0627 | Ammonia | 70 | On |
| 14-4-HC | 9/28/92 | 0615/0635 | Hydrocarbon | 70 | On |
| 15-4-CEM | 9/28/92 | 0713/0743 | $NO_x$, CO | 70 | Off |
| 15-4-$NH_3$ | 9/28/92 | 0720/0750 | Hydrocarbon | 70 | Off |
| 16-4-CEM | 9/28/92 | 0800/0830 | $NO_x$, CO | 70 | Off |
| 16-4-HC | 9/28/92 | 0805/0825 | Hydrocarbon | 70 | Off |

**TABLE 3-2**
**UNIT OPERATING DATA SCE ALAMITOS UNIT 4**
**SEPTEMBER 1992**

| Test No. | Date | Load MW | Urea Status | Total Urea Flow gpm |
|---|---|---|---|---|
| 1-4 | 9/14/92 | 253 | Off | 0.0 |
| 2-4 | 9/15/92 | 253 | Off | 0.0 |
| 3-4 | 9/15/92 | 253 | On | 1.2 |
| 4-4 | 9/15/92 | 253 | On | 1.2 |
| 5-4 | 9/19/92 | 70 | Off | 0.0 |
| 6-4 | 9/19/92 | 70 | Off | 0.0 |
| 7-4 | 9/19/92 | 70 | On | 0.5 |
| 8-4 | 9/19/92 | 70 | On | 0.4 |
| 9-4 | 9/19/92 | 152 | Off | 0.0 |
| 10-4 | 9/20/92 | 152 | Off | 0.0 |
| 11-4 | 9/20/92 | 152 | On | 0.8 |
| 12-4 | 9/20/92 | 152 | On | 0.8 |
| 13-4 | 9/28/92 | 70 | On | 0.3 |
| 14-4 | 9/28/92 | 70 | On | 0.3 |
| 15-4 | 9/28/92 | 70 | Off | 0.0 |
| 16-4 | 9/28/92 | 70 | Off | 0.0 |

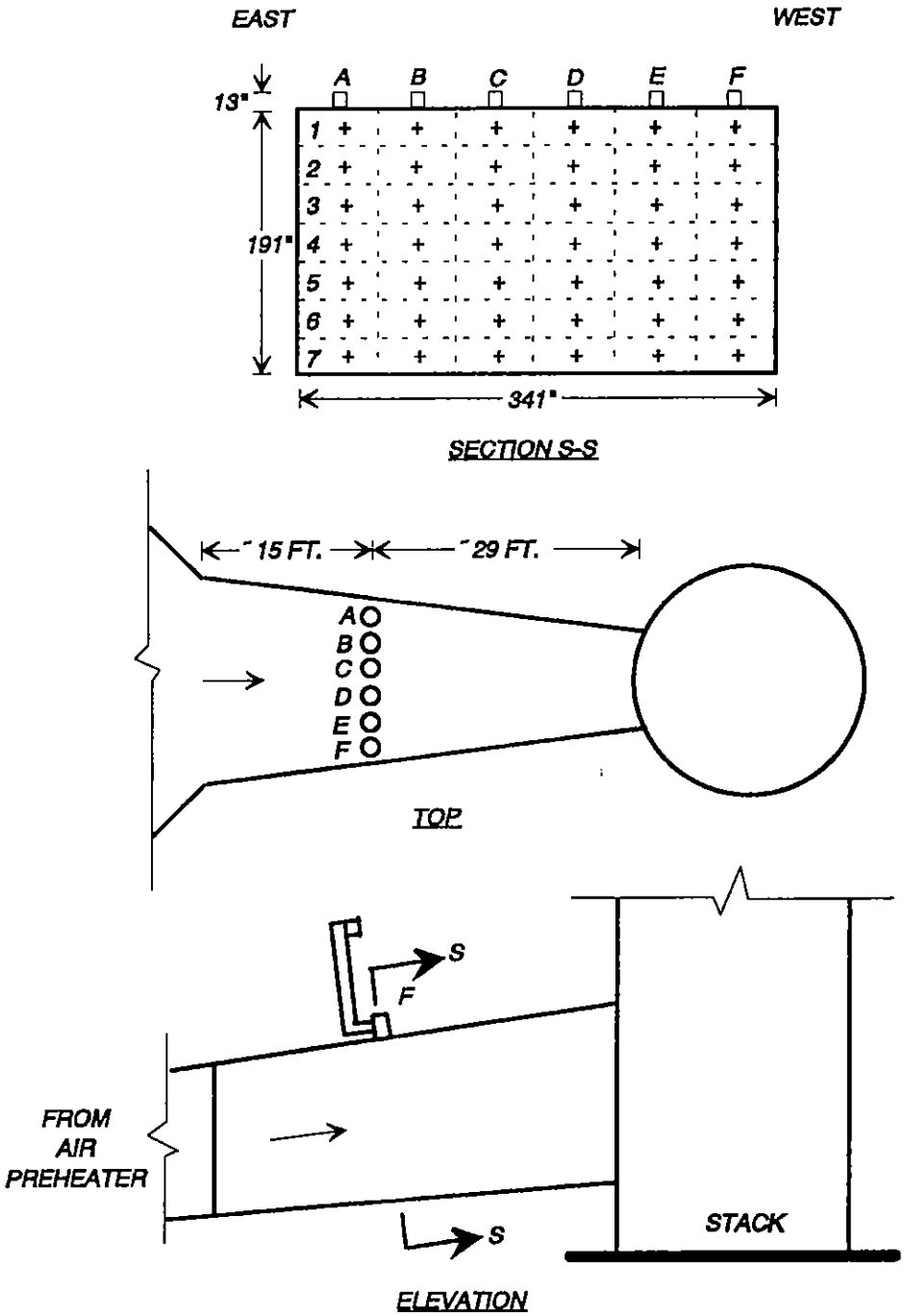


Figure 3-1. Alamitos Unit 4 Air Preheater Outlet Duct Test Location

**TABLE 3-3**
**EMISSIONS TEST PROCEDURES SCE ALAMITOS UNIT 4**
**SEPTEMBER 1992**

| Parameter | Number of Replicates | Duration of Test (Minutes) | Measurement Principle | Reference Method | Method Detection Limit |
|---|---|---|---|---|---|
| $NO_x$ | 2 | 30 | Chemiluminescent | SCAQMD 100.1 | Below 2% of instrument full scale |
| CO | 2 | 30 | NDIR/Gas filter correlation | SCAQMD 100.1 | Below 2% of instrument full scale |
| $O_2$ | 2 | 30 | Electrochemical cell | SCAQMD 100.1<br>EPA 3A | Below 2% of instrument full scale |
| ROG as Hydrocarbons | 2 | 20 | Gas chromatography/FID | SCAQMD 25.2 | 0.1 ppm |
| Particulate | 2 | 126 | In-stack filtration | SCAQMD 5.3 | 0.002 gr/dscf |
| Ammonia | 2 | 30 | Colorimetry<br>Spectrophotometry | SCAQMD Draft 207.1 | 0.1 ppm |

3.3.1 Gaseous Emissions

Gaseous species ($NO_x$, CO and $O_2$) were measured using Carnot's Continuous Emissions Monitor (CEM) described in Appendix A. This system meets SCAQMD, CARB and EPA requirements for gaseous species. Two thirty minute gaseous emissions test runs were conducted for each test condition and load. Leak checks were done at the beginning and end of the test program on all points of the grid. Carnot connected one of the probes to a heated line and knockout to perform a system bias. $NO_2$ was measured once at each test condition. The results can be found in Appendix D.2. On the cold side of the APH, $O_2$ was measured at each point during particulate, $NH_3$ and ROG tests with a portable Teledyne $O_2$ analyzer. Linearity of the portable $O_2$ analyzer was established before and after each test day. The results from these calibrations are presented in Appendix C. For molecular weight and dilution calculations on the cold side of the APH, $CO_2$ was determined by stoichiometric calculation.

3.3.2 Particulate Matter

Particulate was measured according to SCAQMD Method 5.3 (in-stack filtration). A total of two separate runs were used for each load condition. Each test run was 126 minutes in duration. Emissions were calculated in lb/hr and grain loading.

During particulate sampling, a gas sample was drawn through a stainless steel nozzle into a **Gelman** in stack filter housing with a tared 45 mm fiberglass filter. The filter collected existing particulate at actual exhaust temperature. The gas sample was then drawn through two **Smith Greenburg** impingers containing 100 ml of distilled water, an empty impinger as a knock-out, a fourth impinger containing silica gel. The impingers collected any condensible particulate species.

3.3.3 Reactive Organic Gases (ROG) as Hydrocarbons

Hydrocarbon samples were collected in new tedlar bags and analyzed according to SCAQMD method 25.2. The samples were analyzed within 72 hours of collection by Atmosphere Assessments in Chatsworth, California.

3.3.4 Ammonia

Ammonia samples were collected non-isokinetically, with $NH_3$ being absorbed in two impingers containing 0.1 N $H_2SO_4$. The ammonia was analyzed by SCAQMD $NH_3$ Draft Method in Carnot's Tustin Laboratory.

3.3.5 Velocity and Moisture

Stack gas velocity and moisture were determined by SCAQMD methods 2 and 4 in conjunction with every particulate test.

## SECTION 4.0

## RESULTS

Emissions test results are presented in Tables 4-1 to 4-7. Measurement procedures are detailed in Appendix A. Quality assurance and equipment calibrations are in Appendix B. All raw data sheets from Carnot's testing and from unit operation are included in Appendix C. Appendix D contains general and specific emissions calculations. Appendix E contains laboratory reports. Carnot's instrument strip charts are in Appendix F. Chain of Custody information is included in Appendix G.

**TABLE 4-1**
**EMISSION TEST RESULTS AT 255 MW**
**UREA OFF**
**ALAMITOS UNIT 4**
**SEPTEMBER 1992**

| Parameter | Test No. 1-4 | Test No. 2A-4 | Test No. 2B-4 | Test Averages |
|---|---|---|---|---|
| Date | 9/14/92 | 9/15/92 | 9/15/92 | |
| Time | 1208/1603 | 0650/0924 | 0650/0924 | |
| $NO_x$, | | | | |
| ppm[1] | - [3] | 70.5 | 69.2 | 69.9 |
| ppm @ 3% $O_2$[1] | - [3] | 67.1 | 66.2 | 66.7 |
| CO, | | | | |
| ppm[1] | - [3] | 12.5 | 10.7 | 11.6 |
| ppm @ 3% $O_2$[1] | - [3] | 11.9 | 10.2 | 11.1 |
| $O_2$%[1] | - [3] | 2.1 | 2.2 | 2.2 |
| Methane, ppm | - [3] | ND < 1.0 | ND < 1.0 | ND < 1.0 |
| Total non-methane hydrocarbon as methane, ppm | - [3] | ND < 1.0 | ND < 1.0 | ND < 1.0 |
| $NH_3$, | | | | |
| ppm | - [3] | 1.7 | 0.4 | 1.1 |
| ppm @ 3% $O_2$[2] | - [3] | 1.9 | 0.5 | 1.2 |
| Particulate analysis: | | | | |
| Flow dscfm | 619,000 | - | 637,000 | 628,000 |
| Stack temperature °F | 228.0 | - | 241.3 | 234.7 |
| Moisture % | 16.1 | - | 16.6 | 16.3 |
| $O_2$%[2] | 5.3 | - | 4.9 | 5.1 |
| lb/hr | 4.51 | - | 2.38 | 3.45 |
| Grain loading, gr/dscf | 0.0009 | - | 0.0004 | 0.0006 |

12.2

(1) Carnot CEM Data.
(2) Oxygen from portable $O_2$ meter.
(3) Gaseous test data delayed due to failure of Carnot CEMS secondary water removal system.

Notes: ND < indicates that this species was not detected.
< indicated that this species was detected in at least one but no all samples.

**TABLE 4-2**
**EMISSIONS TEST RESULTS AT 253 MW**
**UREA ON**
**ALAMITOS UNIT 4**
**SEPTEMBER 1992**

| Parameter | Test No. 3-4 | Test No. 4-4 | Test Averages |
|---|---|---|---|
| Date | 9/15/92 | 9/15/92 | |
| Time | 1122/1358 | 1432/1652 | |
| $NO_x$, | | | |
| ppm[1] | 59.6 | 63.8 | 61.7 12.3 |
| ppm @ 3% $O_2$[1] | 56.8 | 60.9 | 58.9 |
| CO, | | | |
| ppm[1] | 12.4 | 4.8 | 8.6 |
| ppm @ 3% $O_2$[1] | 11.8 | 4.6 | 8.2 |
| $O_2$%[1] | 2.1 | 2.2 | 2.1 |
| Methane, ppm | ND<1.0 | ND<1.0 | ND<1.0 |
| Total non-methane hydrocarbon as methane, ppm | ND<1.0 | ND<1.0 | ND<1.0 |
| $NH_3$, ppm | 8.9 | 6.7 | 7.8 |
| ppm @ 3% $O_2$[2] | 10.3 | 7.7 | 9.0 |
| Particulate analysis: | | | |
| Flow dscfm | 622,000 | 660,000 | 641,000 |
| Stack temperature °F | 228.6 | 230.2 | 229.4 |
| Moisture % | 16.4 | 16.5 | 16.5 |
| $O_2$%[2] | 5.4 | 5.3 | 5.4 |
| lb/hr | 3.17 | 3.57 | 3.37 |
| Grain loading, gr/dscf | 0.0006 | 0.0006 | 0.0006 |

(1) Carnot CEM Data.
(2) Oxygen from portable $O_2$ meter.

Notes: ND < indicates that this species was not detected.
< indicated that this species was detected in at least one but not all samples.

**TABLE 4-3**
**EMISSION TEST RESULTS AT 152 MW**
**UREA OFF**
**ALAMITOS UNIT 4**
**SEPTEMBER 1992**

| Parameter | Test No. 9-4 | Test No. 10-4 | Test Averages |
|---|---|---|---|
| Date | 6/19/92 | 6/20/92 | |
| Time | 2133/2350 | 0027/0248 | |
| $NO_x$, | | | |
| ppm[1] | 35.2 | 35.2 | 35.2 |
| ppm @ 3% $O_2$[1] | 34.6 | 34.6 | 34.6 |
| CO, | | | |
| ppm[1] | 0.0 | 0.0 | 0.0 |
| ppm @ 3% $O_2$[1] | 0.0 | 0.0 | 0.0 |
| $O_2$%[1] | 2.7 | 2.7 | 2.7 |
| Methane, ppm | ND < 1.0 | ND < 1.0 | ND < 1.0 |
| Total non-methane hydrocarbon as methane, ppm | 10.0 | 12.6 | 11.3 |
| $NH_3$, | | | |
| ppm | 0.5 | 0.5 | 0.5 |
| ppm @ 3% $O_2$[2] | 0.7 | 0.6 | 0.7 |
| Particulate analysis: | | | |
| Flow dscfm | 428,000 | 443,000 | 436,000 |
| Stack temperature °F | 196.9 | 196.8 | 196.9 |
| Moisture % | 15.7 | 16.0 | 15.9 |
| $O_2$% [2] | 7.1 | 6.6 | 6.9 |
| lb/hr | 4.32 | 1.97 | 3.15 |
| Grain loading, gr/dscf | 0.0012 | 0.0005 | 0.0009 |

12.6/12.7

(1) Carnot CEM Data.
(2) Oxygen for correction from portable $O_2$ meter.

Notes: ND < indicates that this species was not detected.
< indicated that this species was detected in at least one but not all samples.

**TABLE 4-4**
**EMISSION TEST RESULTS AT 152 MW**
**UREA ON**
**ALAMITOS UNIT 4**
**SEPTEMBER 1992**

| Parameter | Test No. 11-4 | Test No. 12-4 | Test Averages |
|---|---|---|---|
| Date | 6/20/92 | 6/20/92 | |
| Time | 0331/0508 | 0630/0852 | |
| $NO_x$, | | | |
| ppm[1] | 32.9 | 33.1 | 33.0 |
| ppm @ 3% $O_2$[1] | 32.5 | 32.7 | 32.6 |
| CO, | | | |
| ppm[1] | 0.0 | 0.0 | 0.0 |
| ppm @ 3% $O_2$[1] | 0.0 | 0.0 | 0.0 |
| $O_2$%[1] | 2.8 | 2.8 | 2.8 |
| Methane, ppm | ND < 1.0 | ND < 1.0 | ND < 1.0 |
| Total non-methane hydrocarbon as methane, ppm | 9.7 | 9.9 | 9.8 |
| $NH_3$, ppm | 4.4 | 6.9 | 5.6 |
| ppm @ 3% $O_2$[2] | 5.4 | 8.5 | 6.9 |
| Particulate analysis: | | | |
| Flow dscfm | 462,000 | 429,000 | 446,000 |
| Stack temperature °F | 199.4 | 196.4 | 197.9 |
| Moisture % | 15.9 | 16.2 | 16.0 |
| $O_2$%[2] | 6.4 | 6.4 | 6.4 |
| lb/hr | 3.52 | 1.85 | 2.68 |
| Grain loading, gr/dscf | 0.0009 | 0.0005 | 0.0007 |

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(1) Carnot CEM Data.
(2) Oxygen for correction from portable $O_2$ meter.

Notes: ND < indicates that this species was not detected.
< indicated that this species was detected in at least one but not all samples.

**TABLE 4-5**
**EMISSION TEST RESULTS AT 70 MW**
**UREA OFF**
**ALAMITOS UNIT 4**
**SEPTEMBER 1992**

| Parameter | Test No. 5-4 | Test No. 6-4 | Test Averages |
|---|---|---|---|
| Date | 9/18/92 | 9/19/92 | |
| Time | 2200/0017 | 0100/0317 | |
| $NO_x$, | | | |
| ppm[1] | 28.2 | 28.6 | 28.4 19.4/19.5 |
| ppm @ 3% $O_2$[1] | 39.3 | 39.4 | 39.4 |
| CO, | | | |
| ppm[1] | 1.7 | 1.8 | 1.8 |
| ppm @ 3% $O_2$[1] | 2.4 | 2.5 | 2.5 |
| $O_2$%[1] | 8.1 | 7.9 | 8.0 |
| Methane, ppm | ND<1.0 | ND<1.0 | ND<1.0 |
| Total non-methane hydrocarbon as methane, ppm | 8.5 | 10.0 | 9.3 |
| $NH_3$, ppm | 0.4 | 0.4 | 0.4 |
| ppm @ 3% $O_2$[2] | 0.8 | 0.7 | 0.8 |
| Particulate analysis: | | | |
| Flow dscfm | 358,000 | 381,000 | 370,000 |
| Stack temperature °F | 169.0 | 167.7 | 168.4 |
| Moisture % | 11.2 | 11.4 | 11.3 |
| $O_2$% [2] | 11.5 | 11.6 | 11.6 |
| lb/hr | 0.95 | 1.81 | 1.38 |
| Grain loading, gr/dscf | 0.0003 | 0.0006 | 0.0004 |

(1) Carnot CEM Data.
(2) Oxygen for correction from portable $O_2$ meter.

Notes: ND < indicates that this species was not detected.
< indicated that this species was detected in at least one but not all samples.

**TABLE 4-6**
**EMISSION TEST RESULTS AT 70 MW**
**UREA OFF**
**ALAMITOS UNIT 4**
**SEPTEMBER 1992**

| Parameter | Test No. 15-4 | Test No. 16-4 | Test Averages |
|---|---|---|---|
| Date | 9/28/92 | 9/28/92 | |
| Time | 0713/0743 | 0800/0830 | |
| $NO_x$, | | | |
| ppm[1] | 26.7 | 26.9 | 26.8 1910 |
| ppm @ 3% $O_2$[1] | 38.0 | 38.3 | 38.2 |
| CO, | | | |
| ppm[1] | 29.2 | 29.7 | 29.5 |
| ppm @ 3% $O_2$[1] | 41.5 | 42.3 | 41.9 |
| $O_2$%[1] | 8.3 | 8.3 | 8.3 |
| Methane,ppm | ND<1.0 | 1.4 | <1.2 |
| Total non-methane hydrocarbon As methane, ppm | 11.4 | 12.8 | 12.1 |

(1) Carnot CEM Data.

**TABLE 4-7**
**EMISSION TEST RESULTS AT 70 MW**
**UREA ON**
**ALAMITOS UNIT 4**
**SEPTEMBER 1992**

| Parameter | Test No. 13-4 | Test No. 14-4 | Test Averages |
|---|---|---|---|
| Date | 9/28/92 | 9/28/92 | |
| Time | 0510/0540 | 0600/0631 | |
| $NO_x$, | | | |
| ppm[1] | 25.20 | 24.6 | 24.9 19.9 |
| ppm @ 3% $O_2$[1] | 35.2 | 34.4 | 34.8 |
| CO, | | | |
| ppm[1] | 26.0 | 27.6 | 26.8 |
| ppm @ 3% $O_2$[1] | 36.3 | 38.6 | 37.5 |
| $O_2$%[1] | 8.1 | 8.1 | 8.1 |
| $NH_3$, | | | |
| ppm | 7.9 | 5.3 | 6.6 |
| ppm @ 3% $O_2$[2] | 14.6 | 9.7 | 12.2 |
| Methane, ppm | 24.7 | 1.3 | 13.0 |
| Total non-methane hydrocarbon As Methane, ppm | 11.4 | 10.8 | 11.1 |

(1) Carnot CEM Data.
(2) Oxygen for correction from portable $O_2$ meter.

# APPENDIX A

# MEASUREMENT PROCEDURES

Continuous Emissions Monitoring System

Oxygen ($O_2$) by Continuous Analyzer

$NO/NO_x$ by Continuous Analyzer

Carbon Monoxide (CO) by NDIR/Gas Filter Correlation

Total Particulate by SCAQMD Method 5.3 w/Condensible Analysis

Hydrocarbons by SCAQMD Micro TCA Method

Ammonia

**Continuous Emissions Monitoring System**

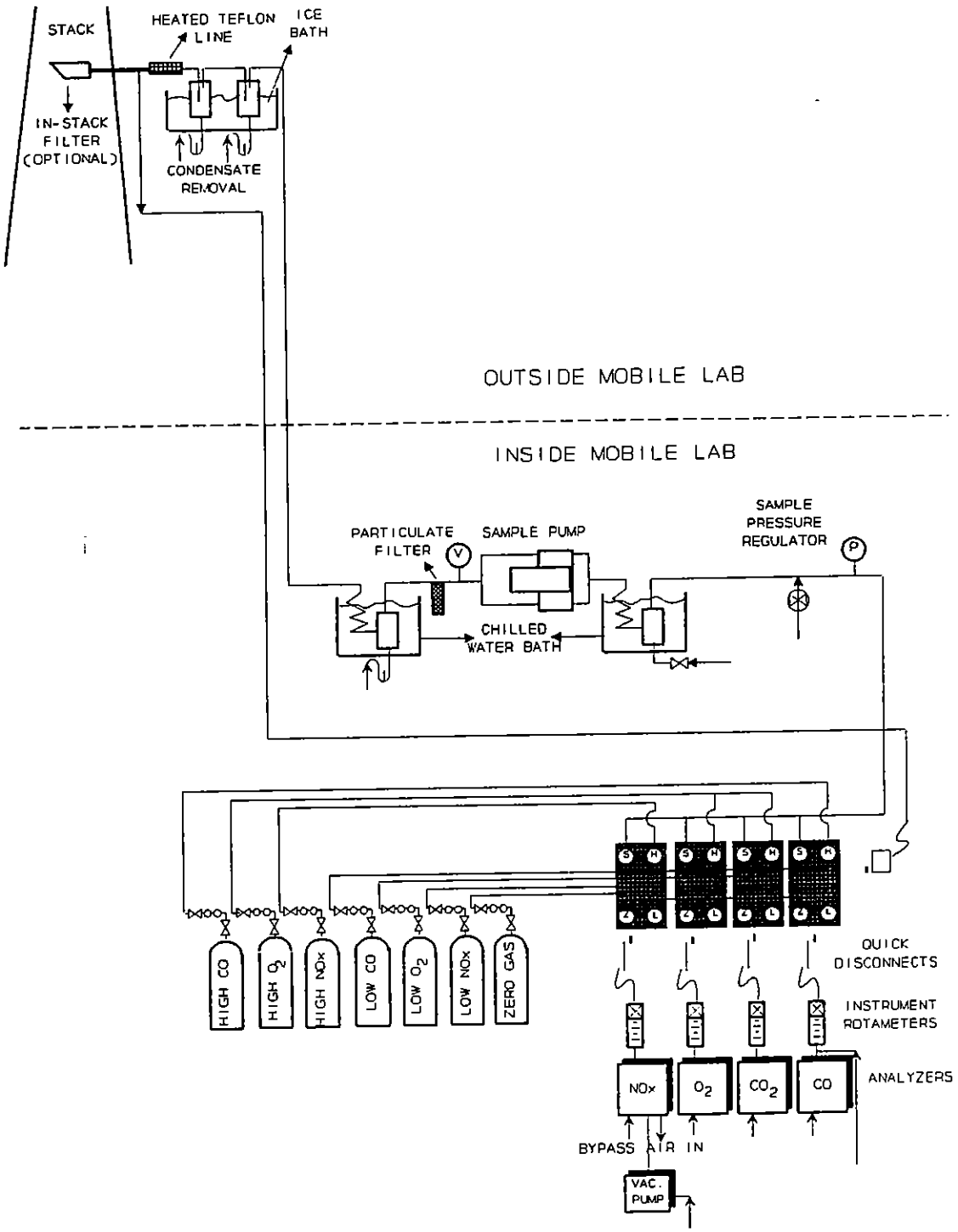
$O_2$, CO, $CO_2$, NO, and $NO_x$ are measured using an extractive continuous emissions monitoring (CEM) package, shown in the following figure. This package is comprised of three basic subsystems. They are: (1) the sample acquisition and conditioning system, (2) the calibration gas system, and (3) the 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 $NO_2$ is 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 $NO_2$ is 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 ($\approx$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: | **$NO/NO_x$ by Continuous Analyzer** |
| Applicable Reference Methods: | EPA 7E, EPA 20; ARB 100, BA ST-13A, SCAQMD 100.1 |
| Principle: | A sample is continuously drawn from the flue gas stream, conditioned, and conveyed to the instrument for direct readout of NO or $NO_x$. |
| Analyzer: | Teco Model No. 10AR |
| Measurement Principle: | Chemiluminescence |
| Accuracy: | 1% of full scale |
| Ranges: | 0-2.5, 0-10, 0-25, 0-100, 0-250, 0-1000, 0-2500, 0-10,000 ppm |
| Output: | 0-10 mV |
| Inferences: | Compounds containing nitrogen (other than ammonia) may cause interference. |
| Response Time: | 90%, 1.5 seconds (NO mode) and 1.7 seconds ($NO_x$ mode) |
| Sampling Procedure: | A representative flue gas sample is collected and conditioned using the CEM system described previously. If EPA Method 20 is used, that method's specific procedures for selecting sample points are used. |
| Analytical Procedure: | The oxides of nitrogen monitoring instrument is a chemiluminescent nitric oxide analyzer. The operational basis of the instrument is the chemiluminescent reaction of NO and ozone ($O_3$) to form $NO_2$ in an excited state. Light emission results when excited $NO_2$ molecules revert to their ground state. The resulting chemiluminescence is monitored through an optical filter by a high sensitivity photomultiplier tube, the output of which is electronically processed so it is linearly proportional to the NO concentration. The output of the instrument is in ppmV.<br><br>When $NO_2$ is expected to be present in the flue gas, a supercooled water dropout flask will be placed in the sample line to avoid loss of $NO_2$. Since $NO_2$ is highly soluble in water, "freezing out" the water will allow the $NO_2$ to reach the analyzers for analysis. The analyzer measures NO only. In the $NO_x$ mode, the gas is passed through a moly converter which converts $NO_2$ to NO and a total $NO_x$ measurement is obtained. $NO_2$ is determined as the difference between NO and $NO_x$. Use of a moly converter instead of a stainless steel converter eliminates $NH_3$ interference; $NH_3$ is converted to NO with a stainless converter, but not with a moly converter. |

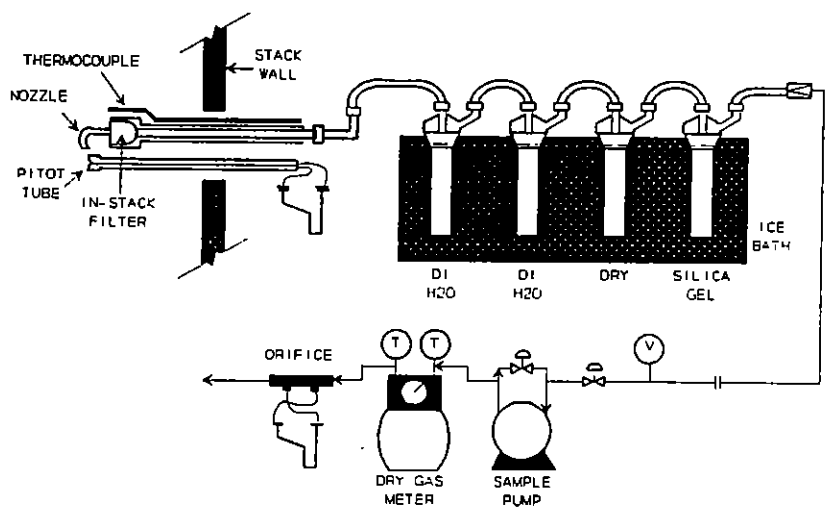
| | |
|---|---|
| Method: | **Carbon Monoxide (CO) by NDIR/Gas Filter Correlation** |
| Applicable Reference Methods: | EPA 10; ARB 1-100; BA ST-6, SCAQMD 100.1 |
| Principle: | A sample is continuously drawn from the flue gas stream, conditioned, and conveyed to the instrument for direct readout of CO concentration. |
| Analyzer: | TECO, Model 48 |
| Measurement Principle: | NDIR/Gas Filter Correlation |
| Precision: | 0.1% ppm |
| Ranges: | 0-5, 0-10, 0-25, 0-50, 0-100, 0-250, 0-500, 0-1000, 0-5000 ppm |
| Output: | 0-100 mV |
| Interferences: | Negligible interference from water and $CO_2$ |
| Rise/Fall Times (0-95%) | 1 minute @ 1 lpm flow, 30 second integration time |
| Sampling Procedure: | A representative flue gas sample is collected and conditioned using the CEM system described previously. Sample point selection has been described previously. |
| Analytical Procedure: | Radiation from an infrared source is chopped and then passed through a gas filter which alternates between CO and $N_2$ due to rotation of a filter wheel. The radiation then passes through a narrow band-pass filter and a multiple optical pass sample cell where absorption by the sample gas occurs. The IR radiation exits the sample cell and falls on a solid state IR detector. |

Method: **Total Particulate by SCAQMD Method 5.3 with Condensible Analysis**

Reference: EPA Method 5
SCAQMD Source Testing Manual, March, 1989

Principle: A metered flue gas sample is collected isokinetically and particulates are collected in-stack filter followed by a series of water impingers.

Sampling Procedure: The sample train used in the tests is shown in the following figure. The sample is drawn isokinetically through a nozzle, a stainless steel or glass probe, and an in-stack filter. This is followed by two Smith-Greenburg impingers which contain 100 ml of distilled water, an empty impinger as a knock-out, and an impinger containing silica-gel to protect the leak-tight vacuum pump and calibrated dry gas meter from moisture. The impingers collect condensible particulate species while the filter collects any existing as particulate at stack temperature.




**Total Particulate by SCAQMD Method 5.3 with Condensible Analysis**

EPA Method 4 (moisture) and Methods 1 and 2 (velocity) are performed in conjunction with the test. Stack velocity is measured during the test to maintain isokinetic sampling and to measure stack flow rate. Moisture concentration is determined by weighing the impingers before and after sampling to determine the amount of moisture collected.

Sample Recovery and Analysis:

Following testing, the impingers are weighed for moisture determination and the following sample fractions are recovered:

1. Probe, nozzle and front-half glassware - water and brushing
2. Filter
3. Impingers and connecting glassware - water wash

The probe wash is evaporated at low temperatures, baked at 105°C, desiccated and weighed; the filter is baked at 105°C, desiccated and weighed; and the aliquots of the impinger catch are baked at 105°C, desiccated and weighed.

Each sample train fraction is analyzed by acid-base titration for its acid sulfate content and by barium-thorin titration for sulfate content.

Particulate concentration is determined by dividing the mass of particulate collected by the sample gas volume.

If the sample contains semi-volatile hydrocarbon species that might be lost by evaporating at 105°C, the sample is extracted with methylene chloride to remove those species, and the methylene chloride fraction is evaporated at ambient temperature and weighed.

If there are high concentrations of $SO_2$ in the gas stream, a positive interference can be caused by oxidation of $SO_2$ to sulfuric acid in the impingers. In this case, the impinger boildown residue is analyzed for sulfuric acid (either by titration or precipitation) and the acid is subtracted from the particulate catch as $H_2SO_4 \cdot 2H_2O$. If the filter was heated to 250°F, this fraction includes both $SO_2$-related "pseudo-particulate" as well as the true particulate species $SO_3$, a separate test for sulfuric acid mist is run and sulfuric acid mist is added back to the particulate catch as $H_2SO_4 \cdot 2H_2O$.

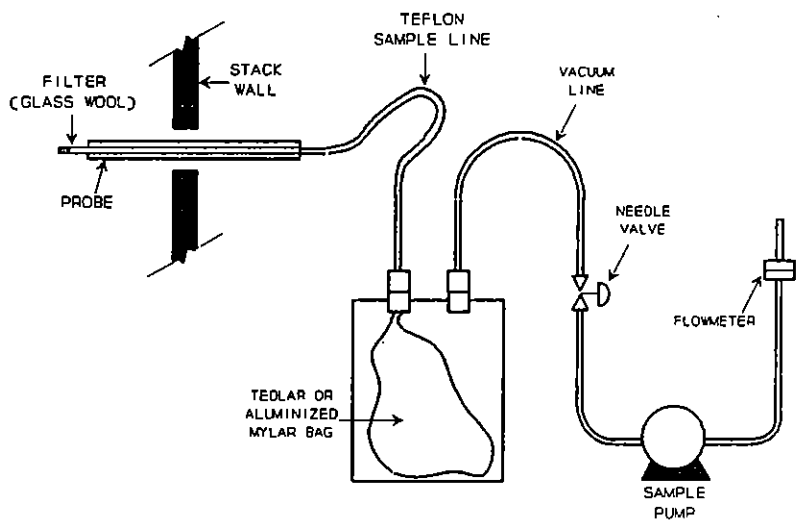
If interfering species such as $NH_3$ or HCl are present in the gas, large quantities of pseudoparticulate sulfates and chlorides can be formed. In these cases, special procedures must be used to ensure that erroneously high particulate emission rates are not reported.

Method: **Hydrocarbons by SCAQMD Micro Total Carbon Analysis (TCA/FID) Method**

Reference: SCAQMD Method 25.2 (draft Source Test Manual)

Principle: A Tedlar bag is filled with flue gas at a constant rate. The bag contents are analyzed by gas chromatography/flame ionization detection for CO, $CO_2$, methane and total gaseous non-methane hydrocarbons.

Sampling Procedure: Samples are collected using a lung-type sampling system shown in the attached figure. In this system, a bag is placed in a sealed container and the container is evacuated. Flue gas enters the bag as it expands to fill the container. Sampling rate is monitored by a rotameter on the container exhaust. This system allows sample collection without exposing the sample to pumps, flowmeters, oils, etc.




**Sample Train for Determination of Hydrocarbons by SCAQMD Micro TCA Method**

Analytical Procedure: In the analytical phase, gaseous carbon compounds from the tank are fractioned on a chromatographic column, eluting in the order: carbon monoxide, methane, carbon dioxide, non-methane hydrocarbons. All resulting vapors are passed through oxidizers where they are combusted to carbon dioxide, then converted to methane and measured by flame ionization detection. $CO_2$, CO, $CH_4$, and total gaseous non-methane hydrocarbons are reported separately.

This method provides lower detection limits than the standard TCA procedure, which uses GC/NDIR. Since this method does not use a steel condensate trap, it eliminates positive interferences that have been associated with carbon dioxide dissolved in water frozen in the condensate trap and released during analysis.

The TCA/FID method is appropriate for combustion sources and ambient sampling where low concentrations of hydrocarbons are expected.

Carnot subcontracts TCA analysis to qualified local laboratories experienced in the analytical procedures.

Method: Ammonia

Principle: Ammonia emissions are determined by collecting a dry, metered volume of flue gas containing ammonia vapor in dilute sulfuric acid solution. The ammonia concentration of the sample is then determined by ion selective electrode or colorimetric spectrophotometry.

Sampling Procedure: The ammonia sampling probe/train arrangement used during the test program is shown schematically in the following figure.

A sample is extracted through a glass probe fitted with a quartz wool plug or filter used to remove particulate matter. The plug is located and/or heated to avoid condensation of moisture at the plug. The sample is then passed through four impingers. The first two impingers are filled with 100 ml of 0.1 N sulfuric acid ($H_2SO_4$), the third is empty, and the fourth is filled with silica gel.

After each sample run, the quartz wool plug is removed and placed in a sample bottle. If a filter is used, it is generally saved but not analyzed. The impingers, glass probe, and sampling train glassware are washed with dilute $H_2SO_4$ into a separate sample bottle. The sample bottles containing the impinger wash solution and the quartz wool plug or filter are returned to the laboratory for analysis.

Analytical Procedure: Ammonia in source test samples is analyzed by ion selective electrode or colorimetrically. Source test samples are generally at low levels and titrations for ammonia are not applicable. The following sections discuss the two applicable analytical techniques.

Ion Selective Electrode

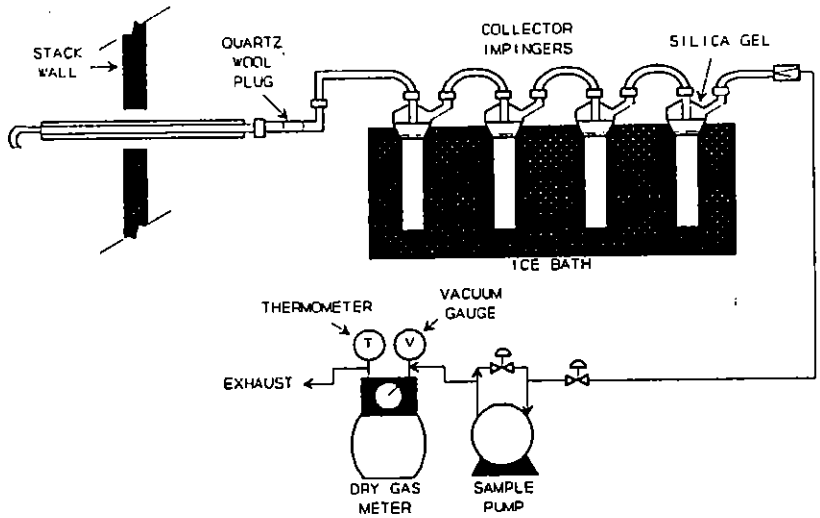
The ammonia samples are analyzed using an Orion Research Model 940 Microprocessor Ionanalyzer equipped with an ammonia ion selective electrode. The ammonia electrode is a glass electrode and reference electrode mounted behind a gas permeable membrane that separates the sample solution from the internal filling solution. After the addition of sodium hydroxide, ammonia in the sample diffuses across the electrode membrane. The measured pH change in the internal electrode solution is proportional to the concentration of ammonia in the sample solution.

The ammonia concentrations of the sample solutions are measured in units of ppm $NH_3$ by weight with the specific ion analyzer. By using the $NH_3$ concentration in ppm by weight, measuring the liquid volume of the sample solution, and obtaining the volume of the flue gas sample, the stack flue gas $NH_3$ concentration in ppm by volume is calculated using the equation:

$$NH_3 \text{ ppmV} = 0.049 \frac{(\text{ppm wt } NH_3 \text{ soln}) (\text{liq. vol., ml})}{\text{DSCF (at 60°F) of sampled flue gas}}$$

Colorimetric Spectrophotometry:

In the analytical phase, the resulting ammonium sulfate is mixed with Nessler reagent, forming a yellow-brown compound with a maximum absorbance in the 440 nm range. The ammonia concentration in the sample is determined colorimetrically by comparison to a standard calibration curve. Care will be taken to dilute the sample to the optimum observed range. If turbidity exists upon addition of Nessler reagent, the option of distillation or ion selective electrode will be used. Distillation will remove any aromatic and aliphatic amines along with other organic and inorganic compounds which can cause interference with the analysis.




**Ammonia sampling probe/train arrangement**

# 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 Pollution Control 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 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 (check 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-767

Approval to Carnot
To Conduct Testing as an Independent Contractor

WHEREAS, the Air Resources Board ("Board"), 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 Board; 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 Board 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, 1993 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 10TH day of August 1992, at Sacramento, California.

James J. Morgester, Chief
Compliance Division

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, 1993, 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

for H. Roye Jackson, Manager
Field Evaluation Section

Appendix B.3

Calibration Data

# CARNOT
## SPAN GAS RECORD

CLIENT/LOCATION: SCE/ALAMITOS UNIT #4 DATE: 9/14/92

BY: EF/BA

| GAS | SPAN CYLINDER | | AUX. SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | ALM 005639 | | | |
| NOx | AAL 3939 | 49.37 | 1L 2595 | 90.52 |
| $O_2$ | ALM 12263 | 7.926 | AAL 21109 | 5.031 |
| CO | AAL 2392 | 55.63 | ALM 012609 | 90.79 |
| $CO_2$ | ~~AAL 21109~~ AAL 21109 | 14.99 | ALM 12263 | 22.15 |
| $SO_2$ | | | | |

# CARNOT
## INSTRUMENT LINEARITY

| | ANALYZER | | | | |
|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | CO | NOx | $SO_2$ |
| ANALYZER RANGE | 0-10% | 0-25% | 0-100 | 0-100 | |
| SET TO HIGH STD (80-90% OF RANGE) | 7.926 | 22.15 | 90.79 | 90.52 | |
| AS-FOUND LOW STD (50-60% OF RANGE) | 5.01 | 14.95 | 54.50 | 49.80 | |
| ACTUAL VALUE OF LOW STD | 5.031 | 14.99 | 55.63 | 49.37 | |
| DIFFERENCE IN % OF FULL SCALE | 0.2 | 0.2 | 1.13 | 0.43 | |

*ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIP CHART).*

CARNOT

PMF-009

# CARNOT
## SPAN GAS RECORD

CLIENT/LOCATION: SCE/ ALAMITOS UNIT 4 DATE: 9/25/92

BY: GA

| GAS | SPAN CYLINDER | | AUX. SPAN CYLINDER | |
|---|---|---|---|---|
| | CYLINDER NO. | CONCENTRATION | CYLINDER NO. | CONCENTRATION |
| ZERO | ACM 005679 | 0.0 | | |
| NOx | ACM011848 | 50.63 | IC 2595 | 90.52 |
| $O_2$ | AAL12047 | 7.99 | ACM012263 | 7.926 |
| CO | ACM010954 | 55.87 | ACM012604 | 90.79 |
| $CO_2$ | AAL12047 | 15.00 | ACM012263 | 22.15 |
| $SO_2$ | | | | |

# CARNOT
## INSTRUMENT LINEARITY

| | ANALYZER | | | | |
|---|---|---|---|---|---|
| | $O_2$ | $CO_2$ | CO | NOx | $SO_2$ |
| ANALYZER RANGE | 0-10 | 0-25 | 0-100 | 0-100 | — |
| SET TO HIGH STD (80-90% OF RANGE) | 7.9 | 22.15 | 90.5 | 90.5 | — |
| AS-FOUND LOW STD (50-60% OF RANGE) | 5.0 | 15.0 | 55.9 | 50.4 | — |
| ACTUAL VALUE OF LOW STD | 4.9 | 15.00 | 55.87 | 50.63 | — |
| DIFFERENCE IN % OF FULL SCALE | 0.10 | 0.0 | 0.03 | 0.8 | — |

*ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIP CHART).*

CARNOT

SUBJECT Portable $O_2$ Analyzer Linearity JOB NO. 12582

SHEET NO. ___ of ___

COMPUTED BY ___ DATE ___ CHECKED BY ___ DATE ___

ALM 012263 7.926 %

9/14/92 ACM 21109 5.031 %

| | | |
|---|---|---|
| Set | 20.9 | Δ %FS |
| gs flow | 8.0 | 0.3 % |
| gs flow | 5.1 | 0.3 % |
| zero | 0.1 | 0.4 |

9/15/92

| | | |
|---|---|---|
| Set | 20.9 | |
| gs flow | 8.0 | 0.3 % |
| gs flow | 5.1 | 0.3 % |
| zero | 0.1 | 0.4 % |

148161

15991 RED HILL AVENUE, SUITE 110, TUSTIN, CA 92680-7388
(714) 259-9520 / Telecopy: (714) 259-0372

CARNOT

SUBJECT Portable $O_2$ Linearity JOB NO. 1258

SHEET NO. ___ of ___

COMPUTED BY GG DATE ___ CHECKED BY ___ DATE ___

ACM 012263 7.9268
ACM 12047 4.998

9/18/92

| Set | 20.9 | Δ %FS |
|---|---|---|
| gs tank | 8.1 | 0.7 |
| gs tank | 5.1 | 0.4 |
| zero | 0.1 | 0.4 |

9/19/92

| Set | 20.9 | |
|---|---|---|
| gs tank | 8.0 | 0.3 |
| gs tank | 5.1 | 0.4 |
| zero | 0.1 | 0.4 |

9/20/92

| Set | 20.9 | |
|---|---|---|
| gs tank | 8.0 | 0.3 |
| gs tank | 5.1 | 0.4 |
| zero | 0.1 | 0.4 |

148161

15991 RED HILL AVENUE, SUITE 110, TUSTIN, CA 92680-7388
(714) 259-9520 / Telecopy: (714) 259-0372

CARNOT

SUBJECT Portable $O_2$ Linearity JOB NO. 12582

SHEET NO. ___ of ___

COMPUTED BY SY DATE ___ CHECKED BY ___ DATE ___

ACM 012263 7.926%

ACM 12047 4.99%

9/28/92

| | | |
|---|---|---|
| Set | 20.9 | 1 %FS |
| gas flow | 8.0 | 0.7 |
| gas flow | 5.1 | 0.4 |
| zero | 0.1 | 0.4 |

148161

15991 RED HILL AVENUE, SUITE 110, TUSTIN, CA 92680-7388
(714) 259-9520 / Telecopy: (714) 259-0372

TELEX: 510-100-8831 (ScotGas)
FAX: 714-887-0549
PHONE: 714-887-2571

Scott Specialty Gases a division of
Scott Environmental Technology Inc. 2600 CAJON BLVD., SAN BERNARDINO, CA 92405

CARNOT
15991 RED HILL AVENUE
SUITE 110
TUSTIN, CA 92680

RE: Scott Project No. 14295
Customer P.O. No. 7424

The following cylinders are all certified as follows: ULTRA ZERO AMBIENT MONITORING ZERO NITROGEN

| Cylinder Number (s) | Components |
|---|---|
| ALM005639 | THC less than 0.05 PPM |
| ALM007318 | CARBON MONOXIDE less than 0.05 PPM |
| ALM006169 | OXYGEN less than 2 PPM |
| ALM004325 | CARBON DIOXIDE less than 1 PPM |
| AAL15151 | NOX less than 0.001 PPM |
| | SULFUR HEXAFLUORIDE less than 0.001 PPM |
| | SULFUR DIOXIDE less than 0.001 PPM |
| | WATER less than 4 PPM |

CERTIFIED

Sincerely,

# Scott Specialty Gases, Inc.

FAX 714-887-0549
PHONE: 714-887-2571

2600 CAJON BLVD., SAN BERNARDINO, CA 92411

Shipped From: Scott SAN BERNARDI CA
Date Shipped 05/27/92
Our Project No: 19572
Your P.O. No: 7477-C
Page 1 of 1
Expiration Date: 11/93

CARNOT
JIM MULLIGAN
15991 RED HILL AVE
SUITE 110
TUSTIN CA 92680

## CERTIFICATE OF ANALYSIS – EPA PROTOCOL GASES

Certified Per Traceability Protocol No. 1 Procedure No. G1 Cylinder No. 1L2595 Cylinder Pressure 2000 PSIG Certified Accuracy ±1% % NIST Traceable

| REFERENCE STD | | | | | GAS ANALYZER | | |
|---|---|---|---|---|---|---|---|
| COMPONENTS | CERTIFIED CONC | SRM/CRM NO. | CYL. NO. | CONC. | MAKE/MODEL/SERIAL NO. | LAST CAL. DATE | ANALYTICAL PRINCIPLE |
| NITRIC OXIDE | 86.22 PPM | CRM1684B | ALM013297 | 95.26 PPM | THERMO-ELECTRON 10AR 14853-150 | 04/10/92 | CHEMI-LUMINESCENT |
| NOX | 90.52 PPM | | | | | | |

**BALANCE GAS** NITROGEN

**ANALYZER READINGS:** Z = Zero Gas T = Test Gas R = Reference Gas

Component NITRIC OXIDE
First Analysis Date 05/13/92 Units mv

| | | |
|---|---|---|
| Z 0.00 | R 94.70 | T 85.92 |
| R 94.84 | Z 0.11 | T 85.72 |
| Z 0.08 | T 85.78 | R 94.80 |

Mean Test Assay 86.24 PPM

Second Analysis Date 05/20/92 Units mv

| | | |
|---|---|---|
| Z 0.00 | R 95.48 | T 86.38 |
| R 95.52 | Z 0.00 | T 86.49 |
| Z 0.00 | T 86.45 | R 95.56 |

Mean Test Assay 86.20 PPM

Component _____
Date _____ Units mv

| | | |
|---|---|---|
| Z | R | T |
| R | Z | T |
| Z | T | R |

Mean Test Assay _____

Date _____ Units mv

| | | |
|---|---|---|
| Z | R | T |
| R | Z | T |
| Z | T | R |

Mean Test Assay _____

Component _____
Date _____ Units mv

| | | |
|---|---|---|
| Z | R | T |
| R | Z | T |
| Z | T | R |

Mean Test Assay _____

Date _____ Units mv

| | | |
|---|---|---|
| Z | R | T |
| R | Z | T |
| Z | T | R |

Mean Test Assay _____

Chronology: Date _____
Assay _____

Analyst G. KING

Approved By: _____
A.F. LANGE, Ph.D., MANAGER, QA

# Scott Specialty Gases, Inc.

FAX 714-887-0549
PHONE: 714-887-2571

2600 CAJON BLVD., SAN BERNARDINO, CA 92411

Shipped From: Scott SAN BERNARDINO, CA
Date Shipped 05/21/92
Our Project No: 19572
Your P.O. No: 7477-C
Page 1 of 1
Expiration Date: 11/93

CARNOT
JIM MULLIGAN
15991 RED HILL AVE
SUITE 110
TUSTIN CA 92680

## CERTIFICATE OF ANALYSIS – EPA PROTOCOL GASES

Certified Per Traceability Protocol No. 1 Procedure No. G1 Cylinder No. AAL3939 Cylinder Pressure 2000 PSIG Certified Accuracy ±1% % NIST Traceable

| COMPONENTS | CERTIFIED CONC | REFERENCE STD SRM/CRM NO. | REFERENCE STD CYL. NO. | REFERENCE STD CONC. | GAS ANALYZER MAKE/MODEL/SERIAL NO. | GAS ANALYZER LAST CAL. DATE | GAS ANALYZER ANALYTICAL PRINCIPLE |
|---|---|---|---|---|---|---|---|
| NITRIC OXIDE | 47.82 PPM | CRM1684B | ALM013297 | 95.26 PPM | THERMO-ELECTRON 10AR 14853-150 | 04/10/92 | CHEMI-LUMINESCENT |
| NOX | 49.37 PPM | | | | | | |

**BALANCE GAS** NITROGEN

**ANALYZER READINGS:** Z = Zero Gas T = Test Gas R = Reference Gas

Component NITRIC OXIDE
First Analysis Date 05/11/92 Units mv

| | | |
|---|---|---|
| Z 0.00 | R 95.47 | T 48.02 |
| R 95.63 | Z 0.10 | T 48.11 |
| Z 0.08 | T 48.12 | R 95.60 |

Mean Test Assay 47.90 PPM

Second Analysis Date 05/19/92 Units mv

| | | |
|---|---|---|
| Z 0.00 | R 95.25 | T 47.62 |
| R 94.95 | Z 0.06 | T 47.66 |
| Z 0.00 | T 47.64 | R 94.92 |

Mean Test Assay 47.74 PPM

Component _____
Date _____ Units mv

| | | |
|---|---|---|
| Z | R | T |
| R | Z | T |
| Z | T | R |

Mean Test Assay _____

Date _____ Units mv

| | | |
|---|---|---|
| Z | R | T |
| R | Z | T |
| Z | T | R |

Mean Test Assay _____

Component _____
Date _____ Units mv

| | | |
|---|---|---|
| Z | R | T |
| R | Z | T |
| Z | T | R |

Mean Test Assay _____

Date _____ Units mv

| | | |
|---|---|---|
| Z | R | T |
| R | Z | T |
| Z | T | R |

Mean Test Assay _____

Chronology: Date _____
Assay _____

Analyst G. KING

Approved By: _____
A.F. LANGE, Ph.D., MANAGER, QA

# Scott Specialty Gases, Inc.

FAX 714-887-0549
PHONE: 714-887-2571

2600 CAJON BLVD., SAN BERNARDINO, CA 92411

Shipped From: Scott SAN BERNARDINO, CA
Date Shipped 01/06/92
Our Project No: 17398
Your P.O. No: 7477
Page 1 of 1
Expiration Date: 06/93

CARNOT
MIKE SCHMITT
15991 RED HILL AVE
SUITE 110
TUSTIN CA 92680

## CERTIFICATE OF ANALYSIS – EPA PROTOCOL GASES

Certified Per Traceability Protocol No. 1 Procedure No. G1 Cylinder No. ALM011848 Cylinder Pressure 2000 PSIG Certified Accuracy ±1% % NIST Traceable

| COMPONENTS | CERTIFIED CONC | REFERENCE STD SRM/CRM NO. | REFERENCE STD CYL. NO. | REFERENCE STD CONC. | GAS ANALYZER MAKE/MODEL/SERIAL NO. | GAS ANALYZER LAST CAL. DATE | GAS ANALYZER ANALYTICAL PRINCIPLE |
|---|---|---|---|---|---|---|---|
| NITRIC OXIDE | 50.02 PPM | GMIS TRACEABLE TO CRM1684B | AAL13616 | 99.34 PPM | THERMO-ELECTRON 10AR 14853-150 | 7/12/91 | CHEMI-LUMINENSCENT |
| NOX | 50.63 PPM | | | | | | |

**BALANCE GAS** NITROGEN

**ANALYZER READINGS:** Z = Zero Gas T = Test Gas R = Reference Gas

Component NITRIC OXIDE
First Analysis Date 11/18/91 Units mv
Z 0.00 R 99.43 T 49.85
R 99.82 Z 0.00 T 50.16
Z 0.14 T 50.12 R 99.49
Mean Test Assay 49.90 PPM
Second Analysis Date 12/30/91 Units mv
Z 0.00 R 97.60 T 49.25
R 97.65 Z 0.00 T 49.30
Z 0.02 T 49.35 R 97.71
Mean Test Assay 50.14 PPM

Component
Date Units mv
Z R T
R Z T
Z T R
Mean Test Assay
Date Units mv
Z R T
R Z T
Z T R
Mean Test Assay

Component
Date Units mv
Z R T
R Z T
Z T R
Mean Test Assay
Date Units mv
Z R T
R Z T
Z T R
Mean Test Assay

Chronology: Date
Assay

Analyst G. KING

Approved By: A.F. LANGE, Ph.D., MANAGER, QA

# Scott Specialty Gases, Inc.

FAX 714-887-0549
PHONE: 714-887-2571

2600 CAJON BLVD., SAN BERNARDINO, CA 92411

Shipped From: Scott SAN BERNARDINO, CA
Date Shipped 07/27/92
Our Project No: 20636
Your P.O. No: 8641
Page 1 of 1
Expiration Date: 1/94

CARNOT
ATTN: RICH MADRIGAL
15991 RED HILL AVE
SUITE 110
TUSTIN CA 92680

## CERTIFICATE OF ANALYSIS – EPA PROTOCOL GASES

Certified Per Traceability Protocol No. 1 Procedure No. G1 Cylinder No. ALM012609 Cylinder Pressure 2000 PSIG Certified Accuracy ±1% % NIST Traceable

| COMPONENTS | CERTIFIED CONC | REFERENCE STD SRM/CRM NO. | REFERENCE STD CYL. NO. | REFERENCE STD CONC. | GAS ANALYZER MAKE/MODEL/SERIAL NO. | GAS ANALYZER LAST CAL. DATE | GAS ANALYZER ANALYTICAL PRINCIPLE |
|---|---|---|---|---|---|---|---|
| CARBON MONOXIDE | 90.79 PPM | GMIS TRACEABLE TO SRM2636 | AAL657 | 252.0 PPM | HORIBA AIA-24 4564403 | 06/03/92 | INFRA-RED |

**BALANCE GAS** NITROGEN

**ANALYZER READINGS:** Z = Zero Gas T = Test Gas R = Reference Gas

Component CARBON MONOXIDE
First Analysis Date 07/15/92 Units mv

| | | |
|---|---|---|
| Z 00.00 | R 95.0 | T 37.1 |
| R 95.0 | Z 00.04 | T 37.1 |
| Z 00.06 | T 37.1 | R 95.0 |

Mean Test Assay 91.05 PPM

Second Analysis Date 07/22/92 Units mv

| | | |
|---|---|---|
| Z 00.00 | R 95.0 | T 36.9 |
| R 95.0 | Z 00.01 | T 36.9 |
| Z -00.02 | T 36.9 | R 95.0 |

Mean Test Assay 90.53 PPM

Component _____
Date _____ Units mv
Z _____ R _____ T _____
R _____ Z _____ T _____
Z _____ T _____ R _____
Mean Test Assay _____

Date _____ Units mv
Z _____ R _____ T _____
R _____ Z _____ T _____
Z _____ T _____ R _____
Mean Test Assay _____

Component _____
Date _____ Units mv
Z _____ R _____ T _____
R _____ Z _____ T _____
Z _____ T _____ R _____
Mean Test Assay _____

Date _____ Units mv
Z _____ R _____ T _____
R _____ Z _____ T _____
Z _____ T _____ R _____
Mean Test Assay _____

Chronology: Date _____
Assay _____

Analyst M. JOHNSON

Approved By: _____
A.F. LANGE, Ph.D., MANAGER, QA

# Scott Specialty Gases, Inc.

FAX 714-887-0549
PHONE: 714-887-2571

2600 CAJON BLVD., SAN BERNARDINO, CA 92411

Shipped From: Scott SAN BERNA NO, CA
Date Shipped 01/06/92
Our Project No: 17313
Your P.O. No: 7477
Page 1 of 1
Expiration Date: 06/93

CARNOT
ATTN: MIKE SCHMITT
15991 RED HILL AVE
TUSTIN CA 92680-0000

## CERTIFICATE OF ANALYSIS – EPA PROTOCOL GASES

Certified Per Traceability Protocol No. 1 Procedure No. G1 Cylinder No. ALM010954 Cylinder Pressure 2000 PSIG Certified Accuracy +1% % NIST Traceable

| COMPONENTS | CERTIFIED CONC | REFERENCE STD SRM/CRM NO. | REFERENCE STD CYL. NO. | REFERENCE STD CONC. | GAS ANALYZER MAKE/MODEL/SERIAL NO. | GAS ANALYZER LAST CAL. DATE | GAS ANALYZER ANALYTICAL PRINCIPLE |
|---|---|---|---|---|---|---|---|
| CARBON MONOXIDE | 55.87 PPM | CRM1679 | ALM010524 | 96.67 PPM | HORIBA AIA-24 4564403 | 10/23/91 | INFRA-RED |

BALANCE GAS NITROGEN
ANALYZER READINGS: Z = Zero Gas T = Test Gas R = Reference Gas

Component CARBON MONOXIDE
First Analysis Date 12/31/91 Units mv
Z 00.00 R 40.2 T 23.7
R 40.2 Z 00.01 T 23.7
Z 00.02 T 23.7 R 40.2
Mean Test Assay 55.87 PPM

Second Analysis Date 01/03/92 Units mv
Z 00.00 R 40.2 T 23.7
R 40.2 Z 00.04 T 23.7
Z 00.02 T 23.7 R 40.2
Mean Test Assay 55.87 PPM

Component _____
Date _____ Units mv
Z _____ R _____ T _____
R _____ Z _____ T _____
Z _____ T _____ R _____
Mean Test Assay _____

Date _____ Units mv
Z _____ R _____ T _____
R _____ Z _____ T _____
Z _____ T _____ R _____
Mean Test Assay _____

Component _____
Date _____ Units mv
Z _____ R _____ T _____
R _____ Z _____ T _____
Z _____ T _____ R _____
Mean Test Assay _____

Date _____ Units mv
Z _____ R _____ T _____
R _____ Z _____ T _____
Z _____ T _____ R _____
Mean Test Assay _____

Chronology: Date _____
Assay _____

Analyst M. JOHNSON

Approved By: A. Lange
A.F. LANGE, Ph.D., MANAGER, QA

# Scott Specialty Gases, Inc.

FAX 714-887-0549
PHONE: 714-887-2571

2600 CAJON BLVD., SAN BERNARDINO, CA 92411

Shipped From: Scott SAN BERNARDINO, CA
Date Shipped 2/30/91
Our Project No: 17397
Your P.O. No: 7477
Page 1 of 1
Expiration Date: 06/93

CARNOT
MIKE SCHMITT
15991 RED HILL AVE
SUITE 110
TUSTIN CA 92680

## CERTIFICATE OF ANALYSIS – EPA PROTOCOL GASES

Certified Per Traceability Protocol No. 1 Procedure No. G1 Cylinder No. AAL2392 Cylinder Pressure 2000 PSIG Certified Accuracy ±1% % NIST Traceable

| COMPONENTS | CERTIFIED CONC | REFERENCE STD SRM/CRM NO. | REFERENCE STD CYL. NO. | REFERENCE STD CONC. | GAS ANALYZER MAKE/MODEL/SERIAL NO. | GAS ANALYZER LAST CAL DATE | GAS ANALYZER ANALYTICAL PRINCIPLE |
|---|---|---|---|---|---|---|---|
| CARBON MONOXIDE | 55.63 PPM | CRM1679 | ALM010524 | 96.67 PPM | HORIBA AIA-24 4564403 | 10/24/91 | INFRA-RED |

**BALANCE GAS** NITROGEN

**ANALYZER READINGS:** Z = Zero Gas T = Test Gas R = Reference Gas

Component CARBON MONOXIDE
First Analysis Date 12/2/91 Units mv

| Z | R | T |
|---|---|---|
| 00.0 | 40.2 | 23.7 |
| 40.2 | 00.0 | 23.6 |
| 00.0 | 23.5 | 40.2 |

Mean Test Assay 55.63 PPM

Second Analysis Date 12/19/91 Units mv

| Z | R | T |
|---|---|---|
| 00.00 | 40.2 | 23.6 |
| 40.2 | 00.05 | 23.6 |
| 00.06 | 23.6 | 40.2 |

Mean Test Assay

Component
Date Units mv

| Z | R | T |
|---|---|---|
| | | |
| | | |
| | | |

Mean Test Assay

Date Units mv

| Z | R | T |
|---|---|---|
| | | |
| | | |
| | | |

Mean Test Assay

Component
Date Units mv

| Z | R | T |
|---|---|---|
| | | |
| | | |
| | | |

Mean Test Assay

Date Units mv

| Z | R | T |
|---|---|---|
| | | |
| | | |
| | | |

Mean Test Assay

Chronology: Date
Assay

Analyst F. VILIMAS

Approved By: A.F. LANCE, Ph.D., MANAGER, QA

# Scott Specialty Gases, Inc.

Shipped From: 2600 CAJON BLVD.
SAN BERNARDINO CA 92411
Phone: 714-887-2571 Fax: 714-887-0549

## CERTIFICATE OF ANALYSIS

CARNOT
ATTN: RICH MADRIGAL
15991 RED HILL AVE
SUITE 110
TUSTIN CA 92680

PROJECT #: 02-20636
PO#: 8641
ITEM #: 0202C3013601AL
DATE: 7/15/92

CYLINDER #: ALM012263
FILL PRESSURE: 1900 PSIG

ANALYTICAL ACCURACY: +/-1%

| COMPONENT | REQUESTED GAS CONC | MOLES | ANALYSIS (MOLES) | |
|---|---|---|---|---|
| CARBON DIOXIDE | 22.5 | PCT | 22.15 | PCT |
| OXYGEN | 8. | PCT | 7.926 | PCT |
| NITROGEN | | BAL | | BAL |

CARNOT 7/16 BIN 1
CERTIFIED TO HAVE BEEN BLENDED AND VERIFIED TO BE CORRECT BY ANALYSIS.

GRAVIMETRIC MASTER GAS - AGAINST NIST CERTIFIED WEIGHTS INDEPENDENT LABORATORY

ANALYST: M.J.
MAYNARD JOHNSON

APPROVED BY: A. Lage
DR ARMAND LAGE PHD

# Scott Specialty Gases, Inc.

Shipped From: 2600 CAJON BLVD. SAN BERNARDINO CA 92411-0000
Phone: 714-887-2571 Fax: 714-887-0549

## CERTIFICATE OF ANALYSIS

CARNOT
JIM MULLIGAN
15991 RED HILL AVE
SUITE 110
TUSTIN CA 92680

PROJECT #: 02-18807
PO#: 7477-B #1
ITEM #: 0202C3000701AL
DATE: 3/18/92

CYLINDER #: AAL12047

ANALYTICAL ACCURACY: +/-1%

| COMPONENT | REQUESTED GAS CONC MOLES | | ANALYSIS (MOLES) | |
|---|---|---|---|---|
| CARBON DIOXIDE | 15. | PCT | 15.00 | PCT |
| OXYGEN | 5. | PCT | 4.990 | PCT |
| NITROGEN | | BAL | | BAL |

CYLINDER PRESSURE 1900 PSI
CERTIFIED TO HAVE BEEN BLENDED AND VERIFIED TO BE CORRECT BY ANALYSIS.

GRAVIMETRIC MASTER GAS - AGAINST NIST CERTIFIED WEIGHTS INDEPENDENT LABORATORY

ANALYST: MAYNARD JOHNSON

APPROVED BY: DR ARMAND LANGE PHD

CARNOT

DRY GAS METER CALIBRATION

FIELD GAS METER I.D. SCE N.OUTLET TEST METER ES-13

DATE 9/16/92 TEST METER LAST CAL. 12/16/91 1.0014 = Yt

BAROMETRIC PRESSURE 29.96

| FIELD METER | | | TEST METER | | | | RESULTS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VOLUME cu.ft. | TEMP.a 'F | DELTA H "H2O | TIME min. | VOLUME cu.ft. | TEMP. 'F | PRESS. "H2O | Q cfm | Y | H@ | AVE.Y | AVG. H@ |
| 5.391 | 92.0 | 0.50 | 15 | 5.131 | 74.0 | 0.10 | 0.359 | 0.984 | 2.33 | 0.9894 | 2.34 |
| 5.360 | 96.0 | 0.50 | 15 | 5.107 | 74.0 | 0.10 | 0.357 | 0.992 | 2.34 | | |
| 5.376 | 97.0 | 0.50 | 15 | 5.112 | 74.0 | 0.10 | 0.358 | 0.992 | 2.33 | | |
| 7.624 | 96.0 | 0.80 | 12 | 7.129 | 74.0 | 0.30 | 0.635 | 0.973 | 1.23 | 0.9750 | 1.48 |
| 7.262 | 100.0 | 0.80 | 12 | 6.784 | 75.0 | 0.30 | 0.605 | 0.977 | 1.35 | | |
| 6.224 | 99.0 | 0.80 | 12 | 5.809 | 75.0 | 0.30 | 0.519 | 0.975 | 1.84 | | |
| 7.759 | 100.0 | 1.00 | 10 | 7.213 | 75.0 | 0.50 | 0.776 | 0.972 | 1.03 | 0.9702 | 1.04 |
| 7.800 | 100.0 | 1.00 | 10 | 7.231 | 76.0 | 0.50 | 0.780 | 0.968 | 1.03 | | |
| 7.789 | 101.0 | 1.00 | 10 | 7.234 | 76.0 | 0.50 | 0.779 | 0.971 | 1.03 | | |
| 8.820 | 92.0 | 2.00 | 7 | 8.293 | 76.0 | 1.00 | 1.260 | 0.965 | 0.78 | 0.9697 | 0.78 |
| 8.849 | 99.0 | 2.00 | 7 | 8.270 | 76.0 | 1.00 | 1.264 | 0.971 | 0.77 | | |
| 8.836 | 100.0 | 2.00 | 7 | 8.257 | 76.0 | 1.00 | 1.262 | 0.973 | 0.78 | | |
| 9.690 | 101.0 | 3.00 | 6 | 9.033 | 76.0 | 1.60 | 1.615 | 0.970 | 0.71 | 0.9700 | 0.72 |
| 9.699 | 103.0 | 3.00 | 6 | 9.146 | 77.0 | 1.60 | 1.617 | 0.983 | 0.69 | | |
| 9.724 | 102.0 | 3.00 | 6 | 8.949 | 77.0 | 1.60 | 1.621 | 0.957 | 0.73 | | |
| | | | | | | | | AVERAGE Yd = | | 0.9748 | 1.27 |
| | | | | | | | | | | ******* | ********* |

::

# DRY GAS METER CALIBRATION DATA

DATE 9-16-92 BY Rob M.

TEST METER ID. ES-13

FIELD DRY GAS METER ID SCE/North Outlet

TEST METER Y. _____

BAROMETRIC PRESSURE ($P_b$) 29.92 (IN. Hg) METER LEAK CHECK VAC. 10" INIT. RM DATE LAST CALIB. _____

| ΔH | FIELD DRY GAS METER | | | | | | | | TIME (θ)MIN. | TEST METER | | | | | | | | PRESSURE IN. $H_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FINAL VOLUME | INITIAL VOLUME | VOLUME ($V_m$)ft³ | TEMPERATURES, °F INLET DEG. | INLET END | OUTLET DEG. | OUTLET END | AVERAGE | | FINAL VOLUME | INITIAL VOLUME | VOLUME ($V_m$)ft³ | TEMPERATURES, °F INLET DEG. | INLET END | OUTLET DEG. | OUTLET END | AVERAGE | |
| 0.50 | 831.332 | 825.441 | 5.891 | 101 | 113 | 76 | 76 | 92 | 0915 15:0930 | 005.131 | 0.00 | 5.131 | 74 | 74 | 74 | 74 | 74 | .10 |
| | 836.692 | 831.332 | 5.36 | 111 | 117 | 77 | 78 | 96 | 0931 15:0946 | 010.238 | 005.131 | 5.107 | 74 | 74 | 74 | 74 | 74 | .10 |
| | 842.068 | 836.692 | 5.376 | 115 | 119 | 77 | 78 | 97 | 0947 15:1002 | 015.350 | 010.238 | 5.112 | 74 | 74 | 74 | 74 | 74 | .10 |
| 0.80 | 850.042 | 842.468 | 7.624 | 110 | 119 | 78 | 75 | 96 | 1001 12:1018 | 007.129 | 0.00 | 7.129 | 74 | 74 | 74 | 74 | 74 | .30 |
| | 857.354 | 850.042 | 7.262 | 119 | 125 | 78 | 77 | 100 | 1019 12:1031 | 013.913 | 007.129 | 6.784 | 75 | 75 | 74 | 74 | 75 | .30 |
| | 863.578 | 857.354 | 6.224 | 121 | 122 | 77 | 77 | 99 | 1032 12:1044 | 019.722 | 013.913 | 5.809 | 75 | 76 | 74 | 74 | 75 | .30 |
| 1.00 | 871.863 | 864.104 | 7.759 | 121 | 126 | 76 | 76 | 100 | 1045 10:1055 | 007.213 | 0.00 | 7.213 | 76 | 76 | 74 | 75 | 75 | .50 |
| | 879.663 | 871.863 | 7.80 | 122 | 124 | 76 | 77 | 100 | 1056 10:1106 | 014.444 | 007.213 | 7.231 | 76 | 76 | 75 | 75 | 76 | .50 |
| | 887.452 | 879.663 | 7.789 | 121 | 128 | 76 | 77 | 101 | 1107 10:1117 | 021.678 | 014.444 | 7.234 | 76 | 76 | 75 | 75 | 76 | .50 |
| 2.00 | 917.458 | 908.638 | 8.82 | 98 | 116 | 78 | 77 | 92 | 1331 07:1338 | 008.293 | 0.00 | 8.293 | 76 | 76 | 75 | 75 | 76 | 1.0 |
| | 926.307 | 917.458 | 8.849 | 116 | 124 | 78 | 78 | 99 | 1339 07:1346 | 016.563 | 008.293 | 8.27 | 76 | 76 | 75 | 75 | 76 | 1.0 |
| | 935.143 | 926.307 | 8.836 | 120 | 127 | 78 | 76 | 100 | 1347 07:1354 | 024.820 | 016.563 | 8.257 | 76 | 76 | 75 | 75 | 76 | 1.0 |
| 3.00 | 945.542 | 935.852 | 9.690 | 125 | 128 | 76 | 75 | 101 | 1358 06:1404 | 009.033 | 0.00 | 9.033 | 76 | 77 | 75 | 76 | 76 | 1.60 |
| | 955.241 | 945.542 | 9.699 | 127 | 132 | 76 | 75 | 103 | 1405 06:1411 | 018.179 | 009.033 | 9.146 | 77 | 77 | 76 | 76 | 77 | 1.60 |
| | 964.965 | 955.241 | 9.724 | 127 | 133 | 75 | 74 | 102 | 1412 06:1418 | 027.128 | 018.179 | 8.949 | 77 | 77 | 76 | 76 | 77 | 1.60 |

CARNOT

PM-054

CARNOT

DRY GAS METER CALIBRATION

FIELD GAS METER I.D. ES-28 TEST METER ES-13

DATE 9/4/92 TEST METER LAST CAL. 12/16/91 1.0014 = Yt

BAROMETRIC PRESSURE 29.98

| FIELD METER | | | TEST METER | | | | RESULTS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VOLUME cu.ft. | TEMP.a 'F | DELTA H "H2O | TIME min. | VOLUME cu.ft. | TEMP. 'F | PRESS. "H2O | Q cfm | Y | H@ | AVE.Y | AVG. H@ |
| 6.043 | 78.0 | 0.50 | 15 | 5.927 | *75.0 | 0.15 | 0.403 | 0.986 | 1.80 | 0.9895 | 1.79 |
| 6.086 | 84.0 | 0.50 | 15 | 5.945 | 76.0 | 0.15 | 0.406 | 0.992 | 1.77 | | |
| 6.107 | 87.0 | 0.50 | 15 | 5.926 | 76.0 | 0.15 | 0.407 | 0.990 | 1.77 | | |
| 6.136 | 89.0 | 0.80 | 12 | 5.955 | 76.0 | 0.25 | 0.511 | 0.993 | 1.79 | 0.9945 | 1.80 |
| 6.130 | 91.0 | 0.80 | 12 | 5.942 | 76.0 | 0.25 | 0.511 | 0.996 | 1.79 | | |
| 6.124 | 91.0 | 0.80 | 12 | 5.926 | 76.0 | 0.25 | 0.510 | 0.994 | 1.80 | | |
| 5.659 | 90.0 | 1.00 | 10 | 5.482 | 76.0 | 0.30 | 0.566 | 0.993 | 1.83 | 0.9946 | 1.96 |
| 5.666 | 91.0 | 1.00 | 10 | 6.483 | 76.0 | 0.30 | 0.567 | 1.175 | 1.31 | | |
| 5.675 | 92.0 | 1.00 | 10 | 4.501 | 76.0 | 0.30 | 0.568 | 0.816 | 2.71 | | |
| 5.544 | 92.0 | 2.00 | 7 | 5.393 | 76.0 | 0.50 | 0.792 | 0.998 | 1.85 | 0.9988 | 1.86 |
| 5.517 | 92.0 | 2.00 | 7 | 5.367 | 76.0 | 0.50 | 0.788 | 0.998 | 1.87 | | |
| 5.541 | 92.0 | 2.00 | 7 | 5.398 | 76.0 | 0.50 | 0.792 | 1.000 | 1.85 | | |
| 5.711 | 91.0 | 3.00 | 6 | 5.575 | 76.0 | 0.70 | 0.952 | 0.998 | 1.91 | 1.0107 | 1.86 |
| 5.697 | 92.0 | 3.00 | 6 | 5.750 | 76.0 | 0.70 | 0.950 | 1.033 | 1.79 | | |
| 5.748 | 92.0 | 3.00 | 6 | 5.621 | 76.0 | 0.70 | 0.958 | 1.001 | 1.88 | | |

AVERAGE Yd = 0.9976 1.85

******* *********

# DRY GAS METER CALIBRATION DATA

DATE 9-3-92 BY [illegible]

TEST METER ID. ES-13

FIELD DRY GAS METER ID ES-28

TEST METER Y. _____

BAROMETRIC PRESSURE ($P_b$) _____ (IN. Hg)

METER LEAK CHECK VAC. 0.0 INIT. [illegible]

DATE LAST CALIB. _____

| ΔH | FIELD DRY GAS METER | | | | | | | | TIME (0)MIN. | TEST METER | | | | | | | | PRESSURE IN. $H_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FINAL VOLUME | INITIAL VOLUME | VOLUME ($V_m$)ft³ | TEMPERATURES, °F INLET DEG. | INLET END | OUTLET DEG. | OUTLET END | AVERAGE | | FINAL VOLUME | INITIAL VOLUME | VOLUME ($V_m$)ft³ | TEMPERATURES, °F INLET DEG. | INLET END | OUTLET DEG. | OUTLET END | AVERAGE | |
| 0.50 | 390.166 | 384.123 | 6.043 | 76 | 84 | 74 | 76 | 78 | 1315 15:1330 | 005.927 | 0.00 | 005.927 | 75 | 75 | 75 | 75 | 75 | .15 |
| | 396.252 | 390.166 | 6.086 | 85 | 90 | 78 | 82 | 84 | 1331 15:1346 | 011.872 | 005.927 | 005.945 | 76 | 76 | 76 | 76 | 76 | .15 |
| | 402.359 | 396.252 | 6.107 | 90 | 92 | 82 | 85 | 87 | 1347 15:1402 | 017.798 | 011.872 | 005.926 | 76 | 76 | 76 | 76 | 76 | .15 |
| 0.80 | 409.134 | 402.998 | 6.136 | 89 | 94 | 85 | 86 | 89 | 1406 12:1418 | 005.955 | 0.00 | 005.955 | 76 | 76 | 76 | 76 | 76 | .25 |
| | 415.264 | 409.134 | 6.13 | 94 | 95 | 87 | 87 | 91 | 1417 12:1431 | 011.897 | 005.955 | 005.942 | 76 | 76 | 76 | 76 | 76 | .25 |
| | 421.388 | 415.264 | 6.124 | 93 | 95 | 87 | 88 | 91 | 1432 12:1444 | 017.823 | 011.897 | 005.926 | 76 | 76 | 76 | 76 | 76 | .25 |
| 1.00 | 427.752 | 422.093 | 5.659 | 90 | 96 | 87 | 88 | 90 | 1447 10:1457 | 005.482 | 0.00 | 005.482 | 76 | 76 | 76 | 76 | 76 | .30 |
| | 433.418 | 427.752 | 5.666 | 91 | 96 | 88 | 88 | 91 | 1458 10:1508 | 011.965 | 005.482 | 006.483 | 76 | 76 | 76 | 76 | 76 | .30 |
| | 439.093 | 433.418 | 5.675 | 93 | 97 | 88 | 88 | 92 | 1509 10:1519 | 016.466 | 011.965 | 004.501 | 76 | 76 | 76 | 76 | 76 | .30 |
| 2.00 | 445.820 | 440.276 | 5.544 | 91 | 98 | 88 | 89 | 92 | 1522 07:1529 | 005.393 | 0.00 | 005.393 | 76 | 76 | 76 | 76 | 76 | .50 |
| | 451.337 | 445.820 | 5.517 | 93 | 97 | 88 | 89 | 92 | 1530 07:1537 | 010.760 | 005.393 | 005.367 | 76 | 76 | 76 | 76 | 76 | .50 |
| | 456.878 | 451.337 | 5.541 | 93 | 96 | 89 | 89 | 92 | 1538 07:1545 | 016.158 | 010.760 | 005.398 | 76 | 76 | 76 | 76 | 76 | .50 |
| 3.00 | 463.154 | 457.443 | 5.711 | 90 | 97 | 88 | 88 | 91 | 1547 06:1553 | 005.575 | 0.00 | 005.575 | 76 | 76 | 76 | 76 | 76 | .70 |
| | 468.851 | 463.154 | 5.697 | 94 | 98 | 88 | 88 | 92 | 1554 06:1600 | 011.145 | 005.575 | 005.75 | 76 | 76 | 76 | 76 | 76 | .70 |
| | 474.599 | 468.851 | 5.748 | 91 | 98 | 88 | 89 | 92 | 1601 06:1607 | 016.766 | 011.145 | 005.621 | 76 | 76 | 76 | 76 | 76 | .70 |

CARNOT

PMF-054

CARNOT

DRY GAS METER CALIBRATION

FIELD GAS METER I.D. ES-8 TEST METER ES-13

DATE 7/02/92 TEST METER LAST CAL. 12/16/91 1.0014 = Yt

BAROMETRIC PRESSURE 30

| FIELD METERR | | | TEST METER | | | | RESULTS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VOLUME cu.ft. | TEMP.a 'F | DELTA H "H2O | TIME min. | VOLUME cu.ft. | TEMP. 'F | PRESS. "H2O | Q cfm | Y | H@ | AVE.Y | AVG. H@ |
| 6.340 | 101.3 | 0.50 | 15 | 5.002 | 63.0 | 0.16 | 0.423 | 0.847 | 2.31 | 0.9601 | 1.93 |
| 6.361 | 101.5 | 0.50 | 15 | 7.028 | 63.0 | 0.16 | 0.424 | 1.186 | 1.17 | | |
| 6.338 | 101.3 | 0.50 | 15 | 5.002 | 63.0 | 0.16 | 0.423 | 0.847 | 2.31 | | |
| 7.308 | 102.3 | 0.80 | 14 | 6.928 | 63.5 | 0.25 | 0.522 | 1.018 | 1.68 | 1.0213 | 1.69 |
| 6.203 | 102.5 | 0.80 | 12 | 5.914 | 63.8 | 0.25 | 0.517 | 1.023 | 1.69 | | |
| 6.224 | 103.5 | 0.80 | 12 | 5.924 | 64.0 | 0.25 | 0.519 | 1.023 | 1.69 | | |
| 5.689 | 83.3 | 1.00 | 10 | 5.603 | 65.0 | 0.30 | 0.569 | 1.018 | 1.70 | 1.0202 | 1.70 |
| 5.720 | 88.0 | 1.00 | 10 | 5.590 | 65.0 | 0.30 | 0.572 | 1.019 | 1.70 | | |
| 5.738 | 93.5 | 1.00 | 10 | 5.576 | 65.0 | 0.30 | 0.574 | 1.023 | 1.69 | | |
| 5.503 | 98.8 | 2.00 | 7 | 5.235 | 64.3 | 0.55 | 0.786 | 1.010 | 1.85 | 1.0279 | 1.79 |
| 5.523 | 101.0 | 2.00 | 7 | 5.421 | 64.5 | 0.55 | 0.789 | 1.046 | 1.72 | | |
| 5.521 | 100.0 | 2.00 | 7 | 5.330 | 64.5 | 0.55 | 0.789 | 1.027 | 1.79 | | |
| 6.337 | 106.0 | 3.00 | 6.36 | 6.103 | 66.5 | 0.70 | 0.996 | 1.029 | 1.68 | 1.0273 | 1.75 |
| 6.056 | 107.0 | 3.00 | 6.15 | 5.816 | 68.0 | 0.70 | 0.985 | 1.025 | 1.74 | | |
| 5.756 | 107.8 | 3.00 | 6 | 5.533 | 68.0 | 0.70 | 0.959 | 1.028 | 1.83 | | |

AVERAGE Yd = 1.0113

******* *********

CFM @ H = 1.00 = .572

yD. = 0.9979

ES-8

Vacuum 6"

# DRY GAS METER CALIBRATION DATA

DATE 7/1/92 BY JP

FIELD DRY GAS METER ID ES-8

BAROMETRIC PRESSURE ($P_b$) 30.0 (IN. Hg)

METER LEAK CHECK VAC. _____ INIT. _____

TEST METER ID. ES-13

TEST METER $Y_d$ 1.0044

DATE LAST CALIB. 12-16-92

| ΔH | FIELD DRY GAS METER FINAL VOLUME | FIELD DRY GAS METER INITIAL VOLUME | FIELD DRY GAS METER VOLUME ($V_m$)ft³ | FIELD DRY GAS METER TEMPERATURES, °F INLET BEG. | INLET END | OUTLET BEG. | OUTLET END | AVERAGE | TIME (θ)MIN. | TEST METER FINAL VOLUME | TEST METER INITIAL VOLUME | TEST METER VOLUME ($V_m$)ft³ | TEST METER TEMPERATURES, °F INLET BEG. | INLET END | OUTLET BEG. | OUTLET END | AVERAGE | PRESSURE IN. $H_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.50 | 964.120 | 957.780 | 6.340 | 101 | 108 | 96 | 97 | 101.30 | 15: | 5.002 | 0.0 | 5.002 | 64 | 64 | 62 | 62 | 63.00 | .155 |
| | 970.481 | 964.120 | 6.361 | 103 | 108 | 97 | 98 | 101.50 | 15: | 12.03 | 5.002 | 7.028 | 64 | 64 | 62 | 62 | 63.00 | .155 |
| | 976.819 | 970.481 | 6.338 | 102 | 108 | 97 | 98 | 101.25 | 15: | 17.032 | 12.03 | 5.002 | 64 | 64 | 62 | 62 | 63.00 | .155 |
| 0.80 | 995.021 | 987.713 | 7.308 | 105 | 108 | 98 | 98 | 102.25 | 14 | 6.928 | 0.0 | 6.928 | 64 | 64 | 63 | 63 | 63.50 | .125 |
| | 8.754 | 2.551 | 6.203 | 102 | 110 | 99 | 99 | 102.50 | 12: | 5.914 | 0.0 | 5.914 | 64 | 64 | 63 | 64 | 63.75 | .125 |
| | 14.978 | 8.754 | 6.224 | 106 | 110 | 99 | 99 | 103.50 | 12: | 11.838 | 5.914 | 5.924 | 64 | 64 | 64 | 64 | 64.00 | .125 |
| 1.00 | 26.061 | 20.372 | 5.689 | 85 | 92 | 76 | 80 | 83.25 | 10: | 5.603 | 0.0 | 5.603 | 66 | 66 | 64 | 64 | 65.00 | .130 |
| | 31.781 | 26.061 | 5.720 | 96 | 101 | 81 | 84 | 88.00 | 10: | 11.193 | 5.603 | 5.590 | 66 | 66 | 64 | 64 | 65.00 | .130 |
| | 37.519 | 31.781 | 5.738 | 95 | 105 | 85 | 89 | 93.50 | 10: | 16.769 | 11.193 | 5.576 | 66 | 66 | 64 | 64 | 65.00 | .130 |
| 2.00 | 49.233 | 43.730 | 5.503 | 99 | 111 | 92 | 93 | 98.75 | 07: | 5.235 | 0.0 | 5.235 | 64 | 65 | 64 | 64 | 64.25 | .135 |
| | 54.756 | 49.233 | 5.523 | 104 | 112 | 93 | 95 | 101.00 | 07: | 10.656 | 5.235 | 5.421 | 65 | 65 | 64 | 64 | 64.50 | .135 |
| | 60.277 | 54.756 | 5.521 | 100 | 111 | 94 | 95 | 100.00 | 07: | 15.986 | 10.656 | 5.330 | 65 | 65 | 64 | 64 | 64.50 | .135 |
| 3.00 | 98.665 | 92.328 | 6.337 | 111 | 111 | 101 | 101 | 106.00 | 06:36 | 6.103 | 0.0 | 6.103 | 66 | 68 | 65 | 67 | 66.50 | .170 |
| | 104.721 | 98.665 | 6.056 | 111 | 115 | 101 | 101 | 107.00 | 06:15 | 11.919 | 6.103 | 5.816 | 68 | 68 | 68 | 68 | 68.00 | .170 |
| | 110.475 | 104.721 | 5.756 | 112 | 117 | 101 | 101 | 107.75 | 06: | 17.452 | 11.919 | 5.533 | 68 | 68 | 68 | 68 | 68.00 | .170 |

CARNOT

PMF-054

# APPENDIX C
# DATA SHEETS

Appendix C.1

Sample Locations

# CARNOT

## SAMPLING POINT LOCATION DATA - EPA METHOD 1

PLANT: SCE Unit 4 DATA BY: G.S.

DATE: 9/15/92

TEST LOCATION: Coldside AP


*Diagram of Sampling Location*

Sample location

UPSTREAM DIST./DIA.: 2.8

DOWNSTREAM DIST./DIA.: 1.47

COUPLING LENGTH: 6"

NO. OF SAMPLING PTS.: 191" x 341"

STACK DIMENSION: Ø'

STACK AREA, FT²: 452.3

| SAMPLE POINT | % OF DIAMETER | IN. FROM NEAR WALL | IN. FROM NOZZLE* |
|---|---|---|---|
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*INCHES FROM WALL PLUS COUPLING LENGTH

CARNOT

PMF-002

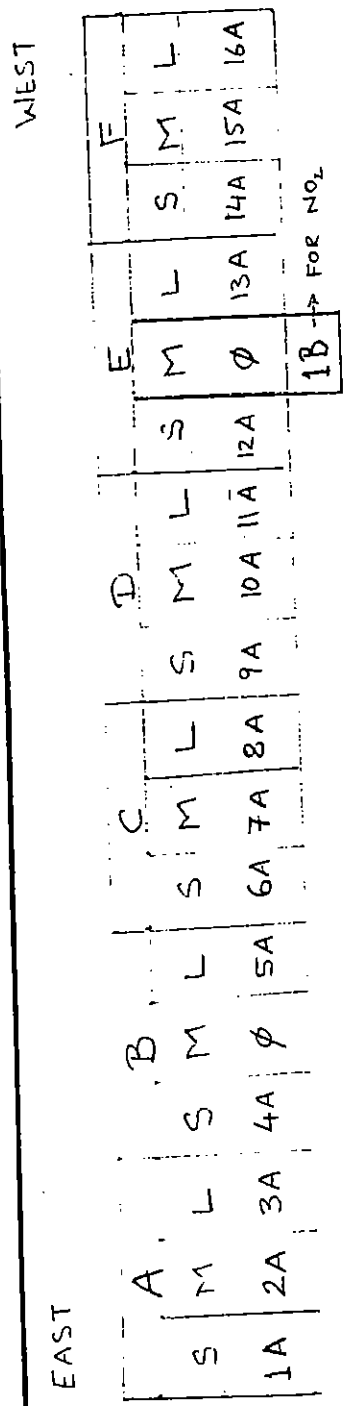
CARNOT

SUBJECT SCE/ALAMITOS UNIT #4 Hotside APM

JOB NO. 12582

SHEET NO. 1 of 1

COMPUTED BY BAC DATE 9/15/92 CHECKED BY _____ DATE _____




S = SHORT PROBE

M = MEDIUM PROBE

L = LONG PROBE

139896

15991 RED HILL AVENUE, SUITE 110, TUSTIN, CA 92680-7388
(714) 259-9520 / Telecopy: (714) 259-0372

Appendix C.2

Unit Data

# UNIT DATA

Client: SCE
Unit: ALAMITOS #4

Date: 9/14/92
Load:

| | TIME | 1415 | 1550 | | |
|---|---|---|---|---|---|
| | TEST # | 1-4 | 1-4 | | |
| | LOAD (NET MW) | 255 | 255 | | |
| | AUX. LOAD (MW) | 7.5 | 7.5 | | |
| | UREA | OFF | OFF | | |
| | UREA LOOP | NA | NA | | |
| | UREA FLOW (GPM) | ~~0~~ | ~~0~~ | | |
| | $H_2O$ FLOW (GPM) | ~~0~~ | ~~0~~ | | |
| | $O_2$ (E) % | 2.0 | 2.0 | | |
| | $O_2$ (W) % | 1.9 | 1.9 | | |
| | STM PRES. (PSI) | 1922 | 1922 | | |
| | STM FLOW (KLB/HR) | 1589 | 1590 | | |
| | FDWT. FLOW (KLB/HR) | 1658 | 1645 | | |
| DART | TOTAL FUEL FLOW ($M^3$SCF) | 2.446 | 2.441 | | |
| | FUEL FLOW (%) | 65.2 | 65.3 | | |
| | AIR FLOW (%) | 66.95 | 67.3 | | |
| | SH STM TEMP | 1050 | 1050 | | |
| | RH " " | 1000 | 1000 | | |
| RMC | FD FAN E (%) | 41 | 41 | | |
| RMC | FD " W (%) | 32 | 32 | | |
| | FD FAN (E) AMPS | 165 | 164 | | |
| | FD " (W) AMPS | 160 | 160 | | |
| | $O_2$/CO BIAS | 1.92 | 1.92 | | |
| | BLR. MASTER (%) | 68.7 | 68.5 | | |
| F | GR AMPS (E) | 58 | 58 | | |
| F | GR AMPS (W) | 60 | 59 | | |
| | | | | | |

# UNIT DATA

Client: SCE
Unit: ALA. #4

Date: 9/14
Load:

| | TEST # | 1-4 | 1-4 | | |
|---|---|---|---|---|---|
| (E) | FGR OUT DAMP. | 33.88 | 33.89 | | |
| (W) | " " " | 65.04 | 65.04 | | |
| (E) | FGR INLET DAMP | 70.0 | 70.0 | | |
| (W) | " " " | 70.0 | 70.0 | | |
| | TILT (E) | 11.7 | 10.92 | | |
| | TILT (W) | 24.2 | 24.3 | | |
| | WB FUR. ΔP | 6.3 | 6.3 | | |
| | BOOS | 12E, 11W | 12E, 11W | | |
| PT. 2 | APH OUT(E) | 237 | 237 | | |
| PT. 6 | APH OUT(W) | 237 | 238 | | |
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UNIT DATA

Client: SCE
Unit: ALAMITOS #4

Date:
~~Engr.~~ M. ESCARCEGA
DATA By: B Novodversky / EF

| TEST # | 2-4 | 2-4 | 3-4 | 3-4 |
|---|---|---|---|---|
| DATE | 9/15/92 | 9/15/92 | 9/15/92 | 9/15/92 |
| TIME | 0700 | 0955 | 1200 | 1245 |
| LOAD (NMW) | 254 | 254 | 253 | 253 |
| AUX. LOAD (MW) | 7.5 | 7.5 | 7.5 | 7.5 |
| UREA ON/OFF | OFF | OFF | ON | ON |
| UREA LOOP | NA | N/A | 1 | 1 |
| UREA FLOW (GPM) | Ø | Ø | 1.2 | 1.2 |
| $H_2O$ FLOW (GPM)/PRES | Ø | Ø | 5.5/55 | 5.5/50.4 |
| $O_2$ (E) % | 1.9 | 1.9 | 1.9 | 2.0 |
| $O_2$ (W) % | 2.0 | 2.1 | 2.0 | 2.0 |
| STM. PRES. (PSI) | 1924 | 1924 | 1924 | 1921 |
| STM. FLOW (KLB/HR) | 1570 | 1560 | 1556 | 1558 |
| FDWTR. FLOW (KLB/HR) | 1615 | 1620 | 1622 | 1625 |
| DART INST. TOTAL FUEL FLOW ($10^6$ SCF) | 2.448 | 2.436 | 2420 | 2424 |
| FUEL FLOW (%) | 65.33 | 64.82 | 64.42 | 64.72 |
| AIR FLOW (% | 66.39 | 66.14 | 65.99 | 66.65 |
| SH STM. TEMP (°F) | 1050 | 1050.3 | 1049.9 | 1049.8 |
| RH STM. TEMP. (°F) | 1000 | 1000 | 1000 | 1000 |
| FD FAN (E) % | 41 | 41 | 40 | 40 |
| FD FAN (W) % | 31 | 32 | 32 | 32 |
| FD FAN (E) AMPS | 160 | 160 | 163 | 160 |
| FD FAN (W) AMPS | 160 | 160 | 160 | 160 |
| $O_2$/CO BIAS (SP) | 1.92 | 1.92 | 1.92 | 1.92 |
| BLR. MASTER (%) | 68.34 | 68.35 | 68.10 | 68.10 |
| FGR AMPS (E) | 59 | 58 | 59 | 59 |

VAN 4658

# UNIT DATA

Client: SCE
Unit: ALAMITOS #4

Date:
~~Load~~: M. ESCARCEGA
DATA BY B. Novodvorsky IEF

| | TEST # | 2-4 | 2-4 | 3-4 | 3-4 |
|---|---|---|---|---|---|
| | FGR AMPS (W) | 60 | 59 | 59 | 60 |
| | FGR OUTLET DAMP. (E) | 33.88 | 33.88 | 33.88 | 33.84 |
| | FGR OUTLET DAMP. (W) | 65.04 | 65.04 | 65.04 | 65.04 |
| | FGR INLET DAMP. (E) | 70.00 | 70.00 | 70.00 | 70.00 |
| | FGR INLET DAMP. (W) | 70.00 | 70.00 | 70.00 | 70.00 |
| | BNR. TILTS (E) | 17.90 | 13.81 | 14.08 | 15.80 |
| | BNR. TILTS (W) | 31.70 | 29.32 | 30.49 | 32.02 |
| | WB/FURN. (ΔP) | 6.3 | 6.3 | 6.3 | 6.51 |
| | BOOS | 12E, 11W | 12E, 11W | 12E, 11W | 12E, 11W |
| PT. 2 | APH OUT (E) °F | 234 | 237 | 239 | 239.8 |
| PT. 6 | APH OUT (W) °F | 231 | 232 | 234 | 235.5 |
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# UNIT DATA

Client: SCE [illegible]
Unit: 4

Date:
Load:
DATA IN ETF

| TEST # | 3-4 | 4-4 | 4-4 | |
|---|---|---|---|---|
| DATE | 9/15/92 | 9/15/92 | 9/15/92 | |
| TIME | 1415 | 1515 | 1645 | |
| LOAD (NMW) | 293 | 293 | 292 | |
| AUX. LOAD (MW) | 7.5 | 7.5 | 7.5 | |
| UREA ON/OFF | ON | ON | ON | |
| UREA LOOP | 1 | 1 | 1 | |
| UREA FLOW (GPM) | 1.2 | 1.2 | 1.1 | |
| $H_2O$ FLOW (GPM) | 5.5/55.0 | 5.4/55.0 | 5.4/55.5 | |
| $O_2$ (E) % | 2.1 | 2.1 | 2.1 | |
| $O_2$ (W) % | 1.9 | 1.9 | 1.9 | |
| STM. PRES. (PSI) | 1924 | 1924 | 1923 | |
| STM. FLOW (KLB/HR) | 1565 | 1559 | 1547 | |
| FDWTR. FLOW (KLB/HR) | 1633 | 1618 | 1621 | |
| DART INST. TOTAL FUEL FLOW ($10^6$ SCF) | 2.034 | 2.420 | 2.412 | |
| FUEL FLOW (%) | 64.38 | 64.51 | 64.51 | |
| AIR FLOW (% | 65.91 | 66.65 | 66.28 | |
| SH STM. TEMP (°F) | 1050.9 | 1050.2 | 1050.6 | |
| RH STM. TEMP. (°F) | 1000 | 1000 | 1000 | |
| FD FAN (E) % | 40 | 42 | 40 | |
| FD FAN (W) % | 31 | 32 | 23 | |
| FD FAN (E) AMPS | 160 | 160 | 160 | |
| FD FAN (W) AMPS | 160 | 160 | 160 | |
| $O_2$/CO BIAS (SP) | 1.92 | 1.92 | 1.92 | |
| BLR. MASTER (%) | 64.75 | 68.34 | 68.08 | |
| FGR AMPS (E) | 59 | 59 | 59 | |

# UNIT DATA

Client: _____ Date: _____
Unit: _____ Load: _____

| TEST # | 3-4 | 4-4 | 4-4 | |
|---|---|---|---|---|
| FGR AMPS (W) | 60 | 60 | 60 | |
| FGR OUTLET DAMP. (E) | 33.80 | 33.88 | 33.88 | |
| FGR OUTLET DAMP. (W) | 65.04 | 65.02 | 65.02 | |
| FGR INLET DAMP. (E) | 70.00 | 70.00 | 70.00 | |
| FGR INLET DAMP. (W) | 70.00 | 70.00 | 70.00 | |
| BNR. TILTS (E) | 15.89 | 7.20 | 19.55 | |
| BNR. TILTS (W) | 30.08 | 36.08 | 35.27 | |
| WB/FURN. (ΔP) | 6.51 | 6.51 | 6.52 | |
| BOOS " | 12E, 11W | 12E, 11W | 12E, 11W | |
| APH OUT (E) °F | 237.3 | 239.7 | 239.7 | |
| APH OUT (W) °F | 236.0 | 236.8 | 236.0 | |
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# UNIT DATA

Client: SCE
Unit: ALAMITOS #4

Date:
Load:
DATA BY: M. ESCARCEGA

| | TEST # | 5-4 | 5-4 | 6-4 | 6-4 |
|---|---|---|---|---|---|
| | DATE | 9/18/92 | 9/19/92 | 9/19/92 | 9/19/92 |
| | TIME | 1015 | 0020 | 0105 | 0310 |
| | LOAD (MMW) | 70 | 70 | 70 | 70 |
| | AUX. LOAD (MW) | 6.4 | 6.4 | 6.4 | 6.4 |
| | UREA ON/OFF | OFF | OFF | OFF | OFF |
| | UREA LOAP | — | — | — | — |
| | UREA FLOW (GPM) | 0 | 0 | 0 | 0 |
| | $H_2O$ FLOW (GPM) | 0 | 0 | 0 | 0 |
| | $O_2$ (E) % | 6.4 | 6.2 | 6.3 | 6.4 |
| | $O_2$ (W) % | 6.5 | 6.4 | 6.2 | 6.3 |
| | STM. PRES. (PSI) | 1906 | 1914 | 1911 | 1910 |
| | STM. FLOW (KLB/HR) | 460 | 459 | 461 | 460 |
| | FDWTR. FLOW (KLB/HR) | 522 | 530 | 509 | 518 |
| DART INST. | TOTAL FUEL FLOW ($10^6$ SCF) | 0.853 | 0.824 | 0.860 | 0.849 |
| | FUEL FLOW (%) | 20.0 | 19.18 | 20.17 | 19.90 |
| | AIR FLOW (% | 27.07 | 27.50 | 26.98 | 26.58 |
| | SH STM. TEMP (°F) | 1026 | 1026 | 1027 | 1027 |
| E/W | RH STM. TEMP. (°F) | 926/949 | 928/951 | 927/949 | 925/950 |
| | FD FAN (E) % | 28 | 28 | 28 | 28 |
| | FD FAN (W) % | 11 | 12 | 12 | 11 |
| | FD FAN (E) AMPS | 110 | 110 | 110 | 110 |
| | FD FAN (W) AMPS | 100 | 105 | 105 | 105 |
| | $O_2$/CO BIAS (SP) | 2.00 | 2.00 | 2.00 | 2.00 |
| | BLR. MASTER (%) | 19.25 | 20.01 | 20.01 | 20.01 |
| | FGR AMPS (E) | 70 | 70 | 70 | 70 |

# UNIT DATA

Client: SCE
Unit: ALAMITOS #4

Date:
Load:
DATA BY: M. ED. ARCELLE

| | TEST # | 5-4 | 5-4 | 6-4 | 6+4 |
|---|---|---|---|---|---|
| | FGR AMPS (W) | 65 | 65 | 65 | 65 |
| OUTPUT | FGR OUTLET DAMP. (E) | 34.56 | 34.56 | 34.56 | 34.56 |
| OUTPUT | FGR OUTLET DAMP. (W) | 51.14 | 51.14 | 51.14 | 51.14 |
| " | FGR INLET DAMP. (E) | 70 | 70 | 70 | 70 |
| " | FGR INLET DAMP. (W) | 70 | 70 | 70 | 70 |
| " | BNR. TILTS (E) | 100.0 | 100.00 | 100.00 | 100.00 |
| " | BNR. TILTS (W) | 99.6 | 99.7 | 100.00 | 100.00 |
| | WB/FURN. (ΔP) | 6.5 | 6.5 | 6.5 | 6.5 |
| | BOOS | 12E, 11W | 12E, 11W | 12E, 11W | 12E, 11W |
| | APH OUT (E) °F | 183 | 180 | 180 | 178 |
| | APH OUT (W) °F | 186 | 186 | 185 | 183 |
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# UNIT DATA

Client: SCE
Unit: ALAMITOS #4

Date:
Load:
DATA BY: M. ESCARCEGA

| | | | | |
|---|---|---|---|---|
| TEST # | 7-4 | 7-4 | 8-4 | 8-4 |
| DATE | 9/19/92 | 9/19/92 | 9/19/92 | 9/19/92 |
| TIME | 0408 | 0625 | 0657 | 0900 |
| LOAD (MW) | 70 | 70 | 70 | 70 |
| AUX. LOAD (MW) | 6.4 | 6.2 | 6.2 | 6.1 |
| UREA ON/OFF | ON | ON | ON | ON |
| UREA LOOP | 3 | 3 | 3 | 3 |
| UREA FLOW (GPM) | 0.4 | 0.5 | 0.4 | 0.4 |
| $H_2O$ FLOW (GPM)/PSI | 4.6/65.1 | 4.6/65.1 | 4.6/65.2 | 4.6/65.0 |
| $O_2$ (E) % | 5.9 | 5.9 | 5.7 | 6.0 |
| $O_2$ (W) % | 5.8 | 5.9 | 5.7 | 6.0 |
| STM. PRES. (PSI) | 1921 | 1918 | 1925 | 1920 |
| STM. FLOW (KLB/HR) | 459 | 459 | 459 | 459 |
| FDWTR. FLOW (KLB/HR) | 536 | 535 | 540 | 540 |
| DART INST. TOTAL FUEL FLOW ($10^6$ SCF) | 0.831 | .862 | .836 | .825 |
| FUEL FLOW (%) | 19.41 | 21.29 | 19.41 | 19.53 |
| AIR FLOW (%) | 27.84 | 26.27 | 27.22 | 27.43 |
| SH STM. TEMP (°F) | 1026 | 1026 | 1027 | 1025 |
| E/W RH STM. TEMP. (°F) | 926/953 | 927/952 | 925/949 | 926/952 |
| FD FAN (E) % | 28 | 27 | 27 | 27 |
| FD FAN (W) % | 12 | 12 | 12 | 12 |
| FD FAN (E) AMPS | 110 | [illegible] | 105 | 105 |
| FD FAN (W) AMPS | 105 | 98 | 98 | 97 |
| $O_2$/CO BIAS (SP) | 2.00 | 2.04 | 2.01 | 2.00 |
| BLR. MASTER (%) | 20.01 | 20.54 | 20.57 | 24.15 |
| FGR AMPS (E) | 70 | 70 | 69 | 69 |

# UNIT DATA

Client: _____ Date: _____
Unit: _____ Load: _____

| | TEST # | 7-4 | 7-4 | 8-4 | 8-4 |
|---|---|---|---|---|---|
| | FGR AMPS (W) | 65 | 65 | 65 | 66 |
| OUTPUT | FGR OUTLET DAMP. (E) | 34.56 | 34.56 | 34.56 | 34.56 |
| " | FGR OUTLET DAMP. (W) | 51.14 | 51.14 | 51.14 | 51.14 |
| " | FGR INLET DAMP. (E) | 70 | 70 | 70 | 70 |
| " | FGR INLET DAMP. (W) | 70 | 70 | 70 | 70 |
| " | BNR. TILTS (E) | 99.9 | 100.0 | 100.0 | 100 |
| " | BNR. TILTS (W) | 99.7 | 100.0 | 100.0 | 100 |
| | WB/FURN. (ΔP) | 6.5 | 6.44 | 6.22 | 6.31 |
| | BOOS | 12E, 11W | 12E, 11W | 12E, 11W | 12E, 11W |
| 2 | APH OUT (E) °F | 180 | 180 | 180 | 187 |
| 6 | APH OUT (W) °F | 184 | 184 | 183 | 185 |
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# UNIT DATA

Client: SCE
Unit: ALAMITOS #4

Date:
Load:
DATA BY: M. ESCARCEGA

| | TEST # | 9-L | 9-L | 10-L | 10-L |
|---|---|---|---|---|---|
| | DATE | 9/19/92 | 9/19/92 | 9/20/92 | 9/20/92 |
| | TIME | 2130 | 2348 | 0030 | 0235 |
| | LOAD (MW) | 151 | 152 | 152 | 152 |
| | AUX. LOAD (MW) | 6.5 | 6.5 | 6.5 | 6.5 |
| | UREA ON/OFF | OFF | OFF | OFF | OFF |
| | UREA LOAD | — | — | — | — |
| | UREA FLOW (GPM) | 0 | 0 | 0 | 0 |
| | $H_2O$ FLOW (GPM)/(PSI) | 0 | 0 | 0 | 0 |
| | $O_2$ (E) % | 2.2 | 2.3 | 2.3 | 2.4 |
| | $O_2$ (W) % | 1.9 | 2.1 | 2.0 | 2.0 |
| | STM. PRES. (PSI) | 1916 | 1917 | 1918 | 1921 |
| | STM. FLOW (KLB/HR) | 922 | 921 | 925 | 921 |
| | FDWTR. FLOW (KLB/HR) | 973 | 962 | 985 | 976 |
| DART INST. | TOTAL FUEL FLOW ($10^6$ SCF) | 1.546 | 1.534 | 1.531 | 1.542 |
| | FUEL FLOW (%) | 39.75 | 39.38 | 39.29 | 39.44 |
| | AIR FLOW (% | 39.60 | 39.82 | 39.73 | 40.23 |
| | SH STM. TEMP (°F) | 1050 | 1050 | 1049 | 1050 |
| E/W | RH STM. TEMP. (°F) | 1000/1000 | 1000/999 | 1000/999 | [illegible] |
| | FD FAN (E) % | 31 | 31 | 31 | 31 |
| | FD FAN (W) % | 19 | 19 | 19 | 19 |
| | FD FAN (E) AMPS | 127 | 127 | 127 | 127 |
| | FD FAN (W) AMPS | 110 | 110 | 110 | 110 |
| | $O_2$/CO BIAS (SP) | 2.00 | 2.00 | 2.00 | 2.00 |
| | BLR. MASTER (%) | 20.01 | 20.01 | 20.01 | 20.01 |
| | FGR AMPS (E) | 66 | 66 | 66 | 66 |

# UNIT DATA

Client: _____
Unit: ALAMITOS #4

Date: _____
Load: _____
DATA BY: M. ESCARCEGA

| | TEST # | 9-4 | 9-4 | 10-4 | 10-4 |
|---|---|---|---|---|---|
| | FGR AMPS (W) | 63 | 63 | 64 | 63 |
| OUTPUT | FGR OUTLET DAMP. (E) | 34.56 | 34.56 | 34.56 | 34.56 |
| " | FGR OUTLET DAMP. (W) | 51.14 | 51.14 | 51.14 | 51.14 |
| " | FGR INLET DAMP. (E) | 70 | 70 | 70 | 70 |
| " | FGR INLET DAMP. (W) | 70 | 70 | 70 | 70 |
| " | BNR. TILTS (E) | 61.72 | 62.76 | 63.48 | 68.74 |
| " | BNR. TILTS (W) | 51.26 | 54.63 | 59.52 | 62.40 |
| | WB/FURN. (AP) | 6.6 | 6.6 | 6.6 | 6.5 |
| | BOOS | 12E, 11W | 12E, 11W | 12E, 11W | 12E, 11W |
| | APH OUT (E) °F | 204 | 202 | 202 | 202 |
| | APH OUT (W) °F | 219 | 218 | 217 | 219 |
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# UNIT DATA

Client: SCE
Unit: ALAMITOS #4

Date:
Load:
DATA BY: M. ESCARCEGA

| | | | | | |
|---|---|---|---|---|---|
| | TEST # | 11-4 | 11-4 | 12-4 | 12-4 |
| | DATE | 9/20/92 | 9/20/92 | 9/20/92 | 9/20/92 |
| | TIME | 0340 | 0540 | 0630 | 0845 |
| | LOAD (NMW) | 152 | 153 | 153 | 153 |
| | AUX. LOAD (MW) | 6.6 | 6.6 | 6.6 | 6.6 |
| | UREA ON/OFF | ON | ON | ON | ON |
| | UREA LOAP | 3 | 3 | 3 | 3 |
| | UREA FLOW (GPM) | 0.8 | 0.8 | 0.8 | 0.8 |
| | $H_2O$ FLOW (GPM)/(PSI) | 8.1/65.1 | 8.1/65.2 | 8.1/64.8 | 8.1/65.0 |
| | $O_2$ (E) % | 2.3 | 2.2 | 2.2 | 2.2 |
| | $O_2$ (W) % | 2.0 | 2.1 | 2.1 | 2.1 |
| | STM. PRES. (PSI) | 1922 | 1924 | 1922 | 1921 |
| | STM. FLOW (KLB/HR) | 926 | 924 | 928 | 923 |
| | FDWTR. FLOW (KLB/HR) | 983 | 994 | 977 | 984 |
| DART INST. | TOTAL FUEL FLOW ($10^6$ SCF) | 1.552 | 1.553 | 1.552 | 1.554 |
| | FUEL FLOW (%) | 39.84 | 39.72 | 39.90 | 39.85 |
| | AIR FLOW (% | 39.81 | 40.04 | 40.30 | 39.88 |
| | SH STM. TEMP (°F) | 1049 | 1051 | 1050 | 1050 |
| E/W | RH STM. TEMP. (°F) | 999/1000 | 1000/1000 | 1000/1000 | 1000/1000 |
| | FD FAN (E) % | 31 | 30 | 30 | 31 |
| | FD FAN (W) % | 19 | 19 | 19 | 19 |
| | FD FAN (E) AMPS | 127 | 127 | 127 | 127 |
| | FD FAN (W) AMPS | 110 | 110 | 110 | 110 |
| | $O_2$/CO BIAS (SP) | 2.00 | 2.10 | 2.10 | 2.10 |
| | BLR. MASTER (%) | 20.01 | 20.01 | 20.01 | 20.01 |
| | FGR AMPS (E) | 66 | 66 | 66 | 66 |

# UNIT DATA

Client: _____ Date: _____
Unit: _____ Load: _____

| | TEST # | 11-4 | 11-4 | 12-4 | 12-4 |
|---|---|---|---|---|---|
| | FGR AMPS (W) | 63 | 63 | 63 | 63 |
| OUTPUT | FGR OUTLET DAMP. (E) | 34.56 | 34.56 | 34.56 | 34.56 |
| " | FGR OUTLET DAMP. (W) | 51.14 | 51.14 | 51.14 | 51.14 |
| " | FGR INLET DAMP. (E) | 70 | 70 | 70 | 70 |
| " | FGR INLET DAMP. (W) | 70 | 70 | 70 | 70 |
| " | BNR. TILTS (E) | 64.50 | 60.80 | 58.85 | 49.10 |
| " | BNR. TILTS (W) | 61.57 | 67.76 | 60.04 | 59.64 |
| | WB/FURN. (ΔP) | 6.5 | 6.5 | 6.5 | 6.5 |
| | BOOS | 12E, 11W | 12, E, 11W | → | → |
| | APH OUT (E) °F | 204 | 208 | 208 | 211 |
| | APH OUT (W) °F | 221 | 215 | 216 | 216 |
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# UNIT DATA

Client: SCE
Unit: ALAMITOS #4

Location:
Data by: M. ESCARCEGA

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|---|---|---|---|---|
| TEST # | 13-4 | 14-4 | 15-4 | 16-4 |
| DATE | 9/28/92 | 9/28/92 | 9/28/92 | 9/28/92 |
| TIME | 0530 | 0615 | 0725 | 0815 |
| LOAD MW | 70 | 70 | 70 | 70 |
| AUX. LOAD | 6.0 | 6.0 | 6.0 | 6.0 |
| UREA ON/OFF | ON | ON | OFF | OFF |
| UREA LOOP | 3 | 3 | — | — |
| UREA FLOW GPM | 0.3 | 0.3 | — | — |
| $H_2O$ FLOW GPM / PSI | 9.2/65.7 | 9.1/64.8 | — | — |
| $O_2$% EAST | 5.6 | 5.9 | 5.6 | 5.8 |
| $O_2$% WEST | 5.9 | 6.3 | 5.9 | 6.1 |
| STM. PRES PSI | 1955 | 1948 | 1965 | 1955 |
| STM FLOW KLB/HR | 453 | 454 | 453 | 454 |
| FDWTR FLOW KLB/HR | 536 | 533 | 535 | 532 |
| DART REC. FUEL FLOW $10^6$ SCF | 0.867 | 0.860 | 0.853 | 0.856 |
| FUEL FLOW % | 19.73 | 19.60 | 18.90 | 19.58 |
| AIR FLOW % | 27.0 | 27.8 | 27.3 | 27.0 |
| SH STM TEMP °F | 1017 | 1016 | 1017 | 1018 |
| E/W RH STM TEMP °F | 903/950 | 900/947 | 904/950 | 903/948 |
| FD FAN % EAST | 28 | 28 | 28 | 28 |
| FD FAN % WEST | 12 | 12 | 12 | 12 |
| FD FAN AMPS EAST | 110 | 108 | 109 | 109 |
| FD FAN AMPS WEST | 105 | 102 | 102 | 104 |

| TEST # | 13 | 14 | 15 | 16 |
|---|---|---|---|---|
| $O_2$/CO BIAS SET POINT | 1.76 | 1.76 | 1.76 | 1.76 |
| BLR MASTER | 19.49 | 21.79 | 22.46 | 20.42 |
| FGR AMPS EAST | 64 | 64 | 64 | 64 |
| FGR AMPS WEST | 66 | 66 | 66 | 66 |
| FGR OUTLET DAMPER EAST | 28.92 | 28.92 | 28.92 | 28.92 |
| FGR OUTLET DAMPER WEST | 57.72 | 57.72 | 57.72 | 57.72 |
| FGR INLET DAMPER EAST | 70.0 | 70.0 | 70.0 | 70.0 |
| FGR INLET DAMPER WEST | 70.0 | 70.0 | 70.0 | 70.0 |
| BNR TILTS EAST | 100.0 | 100.0 | 100.0 | 100.0 |
| BNR TILTS WEST | 100.0 | 100.0 | 100.0 | 100.0 |
| WB/FURN dP | 6.3 | 6.3 | 6.3 | 6.4 |
| BOOS | 11E, 11W, 12E | 11E, 11W, 12E | → | → |
| 2 APH OUT °F EAST | 194 | 194 | 192 | 193 |
| 6 APH OUT °F WEST | 181 | 181 | 179 | 179 |
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NOTES:

Appendix C.3

CEM Data

# CARNOT

## REFERENCE METHOD GASEOUS MEASUREMENTS

PROJ. # 12582

CLIENT/LOCATION: SCE / ALAMITOS - UNIT #4 CONDITION: W/o Urea Inj @ Load ≈ 254

DATE: 9/15/92 OPERATOR: BAC

TEST NUMBER: 2A - 4 - CEM TEST LOCATION: APH Cool Side

| TEST NO. | TIME | | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0-10 $O_2$ | 0-25 $CO_2$ | 0-100 CO | 0-100 NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| SPAN GAS CONCENTRATION | | | | 5.031 | 14.99 | 55.63 | 49.37 | | | | | | |
| | | | AS FOUND ANAL. SPAN | 5.03 | 14.98 | 55.5 | 49.25 | | | | | | |
| | | | SYSTEM ZERO | 0.01 | 0.08 | -0.2 | 0.8 ~~48.00~~ | | | | | | |
| | | | SYSTEM SPAN | 5.00 ~~0.01~~ | 14.80 | 55.6 | 48.00 ~~0.8~~ | | | | | | |
| | BEGIN | 0945 | | 2.11 | 10.53 | 12.5 | 69 | | | | | | |
| | END | 0950 | | | | | | | | | | | |
| | BEGIN | 0950 | | 2.10 | 10.53 | 14.0 | 69 | | | | | | |
| | END | 0955 | | | | | | | | | | | |
| | BEGIN | 0955 | | 2.13 | 10.53 | 10.5 | 69.2 | | | | | | |
| | END | 0900 | | | | | | | | | | | |
| | BEGIN | 0900 | | 2.10 | 10.53 | 12.0 | 69.0 | | | | | | |
| | END | 0905 | | | | | | | | | | | |
| | BEGIN | 0905 | | 2.10 | 10.53 | 14.0 | 68.8 | | | | | | |
| | END | 0910 | | | | | | | | | | | |
| | BEGIN | 0910 | | 2.11 | 10.53 | 13.0 | 68.2 | | | | | | |
| | END | 0915 | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | | | SYSTEM ZERO | 0.01 | 0.03 | 0.7 | 1.2 | | | | | | |
| | | | SYSTEM SPAN | 4.95 | 14.75 | 55.6 | 49.00 | | | | | | |
| RAW AVERAGE | | | | 2.11 ✓ | 10.53 | [illegible] ✓ | 48.55 ✓ | | | | | | |
| CORRECTED AVERAGE | | | | | | | | | | | | | |
| COMMENTS: | | | | | | | | | | | | | |

CARNOT

PMF-039

# CARNOT



## REFERENCE METHOD GASEOUS MEASUREMENTS

Proj # 12582

CLIENT/LOCATION: SCE/ALAMITOS -UNIT #4 CONDITION: w/o Urea Inj. @ Load ≈ 254

DATE: 9/15/92 OPERATOR: BAC

TEST NUMBER: 2B-4-CEM TEST LOCATION: APH Cool Side

| TEST NO. | TIME | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $O_2$ | $CO_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| SPAN GAS CONCENTRATION | | | 5.031 | 14.99 | 55.63 | 90.52 | | | | | | |
| | | AS FOUND ANAL SPAN | | | | 90.50 | | | | | | |
| | | SYSTEM ZERO | 0.01 | 0.03 | 0.07 | 1.0 | | | | | | |
| | | SYSTEM SPAN | 4.95 | 14.75 | 55.6 | 88.0 | | | | | | |
| | BEGIN 0948 END 0953 | COMP | 2.13 | 10.48 | 10.0 | 67.3 | | | | | | |
| | BEGIN 0953 END 0958 | COMP | 2.15 | 10.50 | 11.0 | 67.5 | | | | | | |
| | BEGIN 0958 END 1003 | COMP | 2.14 | 10.50 | 11.0 | 67.5 | | | | | | |
| | BEGIN 1003 END 1008 | COMP | 2.15 | 10.50 | 13.0 | 67.5 | | | | | | |
| | BEGIN 1008 END 1013 | 1B-FOR NO2 PORT E | 2.4 | 10.30 | 0.0 | 70.2 | | | | | | |
| | BEGIN 1013 END 1018 | | 2.12 | 10.50 | 11.0 | 67.9 | → | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | | SYSTEM ZERO | 0.01 | 0.05 | 0.06 | 1.0 | | | | | | |
| | | SYSTEM SPAN | 4.92 | 14.75 | 55.90 | 88.1 | | | | | | |
| RAW AVERAGE | | | | | | | | | | | | |
| CORRECTED AVERAGE | | | | | | | | | | | | |
| COMMENTS: | | | | | | Change Span gas | | | | | | |

CARNOT

PMF-039

# CARNOT



## REFERENCE METHOD GASEOUS MEASUREMENTS

Proj. # 12582

CLIENT/LOCATION: SCE/ALAMITOS - UNIT #4

CONDITION: With Urea Injection / Load ≈ 253

DATE: 9/15/92

OPERATOR: BAC

TEST NUMBER: 3-4-CEM

TEST LOCATION: APH Cool Side

| TEST NO. | TIME | | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0-10 $O_2$ | 0-25 $CO_2$ | 0-100 CO | 0-100 NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| SPAN GAS CONCENTRATION | | | | 5.031 | 14.99 | 55.63 | 90.52 | | | | | | |
| | | | AS FOUND ANAL. SPAN | 5.0 | | | 90.5 | | | | | | |
| | | | SYSTEM ZERO | 0.01 | 0.05 | 0.02 | 0.4 | | | | | | |
| | | | SYSTEM SPAN | 5.0 | 14.80 | 57.0 | 88.0 | | | | | | |
| | BEGIN | 1245 | COMP | 2.08 | 10.58 | 12.5 | 57.7 | | | | | | |
| | END | 1250 | | | | | | | | | | | |
| | BEGIN | 1250 | COMP | 2.07 | 10.63 | 12.0 | 57.8 | | | | | | |
| | END | 1255 | | | | | | | | | | | |
| | BEGIN | 1255 | 1B FOR $NO_2$ PORT E | | | | 58.5 | 88.5 | | | | | |
| | END | 1302 | | | | | | | | | | | |
| | BEGIN | 1302 | COMP | 2.03 | 10.65 | 15.0 | 58.0 | | | | | | |
| | END | 1305 | | | | | | | | | | | |
| | BEGIN | 1305 | COMP | 2.05 | 10.65 | 13.0 | 57.5 | | | | | | |
| | END | 1310 | | | | | | | | | | | |
| | BEGIN | 1310 | COMP | 2.06 | 10.68 | 12.0 | 57.2 | | | | | | |
| | END | 1315 | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | | | SYSTEM ZERO | 0.01 | 0.05 | 0.03 | 0.8 | | | | | | |
| | | | SYSTEM SPAN | 5.0 | 14.83 | 56.8 | 86.5 | | | | | | |
| RAW AVERAGE | | | | [illegible] | [illegible] | [illegible] | [illegible] | | | | | | |
| CORRECTED AVERAGE | | | | | | | | | | | | | |
| COMMENTS: | | | | | | | | | | | | | |

# CARNOT



## REFERENCE METHOD GASEOUS MEASUREMENTS

Proj. # 12582

CLIENT/LOCATION: SCE/ALAMITOS – UNIT #4

CONDITION: With Urea Inj @ Load = 253

DATE: 9/15/92

OPERATOR: BAC

TEST NUMBER: 4-4-CEM

TEST LOCATION: APH Cool Side

| TEST NO. | TIME | | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ | $CO_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| SPAN GAS CONCENTRATION | | | | 5.031 | 14.99 | 55.63 | 90.52 | | | | | | |
| | | | AS FOUND ANAL SPAN | 5.0 | | | 90.5 | | | | | | |
| | | | SYSTEM ZERO | 0.02 | 0.05 | 0.1 | 0.2 | | | | | | |
| | | | SYSTEM SPAN | 5.0 | 14.88 | 56.5 | 89.3 | | | | | | |
| | BEGIN | 1547 | Comp | 2.18 | 10.63 | 4.0 | 62.5 | | | | | | |
| | END | 1552 | | | | | | | | | | | |
| | BEGIN | 1552 | Comp | 2.16 | 10.63 | 5.0 | 62.6 | | | | | | |
| | END | 1557 | | | | | | | | | | | |
| | BEGIN | 1557 | Comp | 2.18 | 10.63 | 4.0 | 62.5 | | | | | | |
| | END | 1602 | | | | | | | | | | | |
| | BEGIN | 1602 | PORT E | | | | 61.5 | 61.5 | | | | | |
| | END | 1608 | | | | | | | | | | | |
| | BEGIN | 1608 | Comp | 2.17 | 10.63 | 6.0 | 62.8 | | | | | | |
| | END | 1612 | | | | | | | | | | | |
| | BEGIN | 1612 | Comp. | 2.17 | 10.63 | 6.0 | 62.5 | | | | | | |
| | END | 1617 | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | | | SYSTEM ZERO | 0.02 | 0.05 | 0.2 | 0.5 | | | | | | |
| | | | SYSTEM SPAN | 5.01 | 14.88 | 56.9 | 88.1 | | | | | | |
| RAW AVERAGE | | | | 6.17 | [illegible] | 5.0 | 66.58 | | | | | | |
| CORRECTED AVERAGE | | | | | | | | | | | | | |
| COMMENTS: | | | | | | | | | | | | | |

# CARNOT



## REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE / ALAMITOS UNIT #4 CONDITION: W/O Urea @ 70 MW

DATE: 9/18/92 OPERATOR: BAC

TEST NUMBER: 5-4-CEM TEST LOCATION: APH ~~Cold~~ Hot Side

| TEST NO. | TIME | | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___ DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ | $CO_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| SPAN GAS CONCENTRATION | | | | 4.99 | 15.00 | 55.87 | 50.63 | | | | | | |
| | | | AS FOUND ANAL. SPAN | | | | | | | | | | |
| | | | SYSTEM ZERO | 0.08 | 0.05 | 0.3 | 0.8 | | | | | | |
| | | | SYSTEM SPAN | 4.95 | 14.90 | 55.60 | 50.20 | | | | | | |
| | BEGIN | 2325 | COMP | 7.9 | 7.3 | 2.3 | 29.0 | | | | | | |
| | END | 2330 | | | | | | | | | | | |
| | BEGIN | 2330 | COMP | 7.9 | 7.25 | 2.1 | 29.2 | | | | | | |
| | END | 2335 | | | | | | | | | | | |
| | BEGIN | 2335 | COMP | 7.8 | 7.4 | 2.0 | 28.0 | | | | | | |
| | END | 2340 | | | | | | | | | | | |
| | BEGIN | 2340 | FOE NO PORT E | 6.8 | 8.0 | ϕ | 33.7 | 32.0 | 1.7 | | | | |
| | END | 2345 | | | | | | | | | | | |
| | BEGIN | 2345 | COMP | 8.0 | 7.25 | 2.1 | 28.5 | | | | | | |
| | END | 2350 | | | | | | | | | | | |
| | BEGIN | 2350 | COMP | 8.1 | 7.25 | 1.6 | 27.0 | | | | | | |
| | END | 2355 | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | | | SYSTEM ZERO | 0.08 | 0.05 | 0.3 | 1.0 | | | | | | |
| | | | SYSTEM SPAN | 4.98 | 14.90 | 55.50 | 50.3 | | | | | | |
| RAW AVERAGE | | | / | 7.94 | 7.29 | 2.02 | 28.34 | | | | | | |
| CORRECTED AVERAGE | | | | | | | | | | | | | |
| COMMENTS: | | | | | | | | | | | | | |

# CARNOT

## REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE / ALAMITOS UNIT #4

CONDITION: w/o Urea @ 70 MW

DATE: 9/19/92

OPERATOR: BAC

TEST NUMBER: 6-4-CEM

TEST LOCATION: APH ~~Cool~~ Hot Side.

| TEST NO. | TIME | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___ DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $O_2$ | $CO_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| SPAN GAS CONCENTRATION | | | 4.99 | 15.00 | 55.87 | 50.63 | | | | | | |
| | | AS FOUND ANAL. SPAN | | | | | | | | | | |
| | | SYSTEM ZERO | 0.05 | 0.025 | 0.1 | 1.0 | | | | | | |
| | | SYSTEM SPAN | 4.92 | 14.98 | 55.7 | 50.4 | | | | | | |
| | BEGIN 0215 END 0220 | COMP | 7.9 | 7.30 | 2.0 | 28.5 | | | | | | |
| | BEGIN 0220 END 0225 | COMP | 7.7 | 7.38 | 2.0 | 28.0 | | | | | | |
| | BEGIN 0225 END 0230 | COMP | 7.85 | 7.30 | 2.0 | 27.5 | | | | | | |
| | BEGIN 0230 END 0235 | PORT E | 6.6 | 7.88 | ϕ | 32.5 | 31.0 | 1.5 | | | | |
| | BEGIN 0235 END 0240 | COMP | 7.9 | 7.25 | 2.0 | 30.0 | | | | | | |
| | BEGIN 0240 END 0245 | COMP. | 7.6 | 7.50 | 1.8 | 31.0 | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | | SYSTEM ZERO | 0.08 | 0.025 | 0.2 | 0.78 | | | | | | |
| | | SYSTEM SPAN | 4.95 | 14.90 | 55.5 | 51.0 | | | | | | |
| RAW AVERAGE | | | 7.79 | 7.35 | 1.96 | 29.0 | | | | | | |
| CORRECTED AVERAGE | | | | | | | | | | | | |
| COMMENTS: | | | | | | | | | | | | |

# CARNOT

## REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE/Alamitos Unit #4

CONDITION: with Urea @ 70 MW

DATE: 9/19/92

OPERATOR: BAC

TEST NUMBER: 7-4-CEM

TEST LOCATION: APH Hot Side

| TEST NO. | TIME | | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ | $CO_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| SPAN GAS CONCENTRATION | | | | 4.99 | 15.00 | 55.87 | 50.63 | | | | | | |
| | | | AS FOUND ANAL. SPAN | | | | | | | | | | |
| | | | SYSTEM ZERO | 0.05 | 0.025 | 0.1 | 0.8 | | | | | | |
| | | | SYSTEM SPAN | 4.9 | 14.88 | 55.6 | 49.8 | | | | | | |
| | BEGIN | 0500 | COMP | 7.45 | 7.55 | 17.0 | 23 | | | | | | |
| | END | 0505 | | | | | | | | | | | |
| | BEGIN | 0505 | COMP | 7.8 | 7.3 | 12.0 | 23 | | | | | | |
| | END | 0510 | | | | | | | | | | | |
| | BEGIN | 0510 | COMP | 7.5 | 7.55 | 3.5 | 23.8 | | | | | | |
| | END | 0515 | | | | | | | | | | | |
| | BEGIN | 0515 | Port E | 6.9 | 7.8 | Ø | 32.0 | 31.9 | 0.1 | | | | |
| | END | 0520 | | | | | | | | | | | |
| | BEGIN | 0520 | COMP | 7.3 | 7.75 | 7.0 | 25.0 | | | | | | |
| | END | 0525 | | | | | | | | | | | |
| | BEGIN | 0525 | COMP | 7.5 | 7.5 | 3.2 | 25.5 | | | | | | |
| | END | 0530 | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | | | SYSTEM ZERO | 0.09 | Ø | 0.2 | 0.2 | | | | | | |
| | | | SYSTEM SPAN | 4.9 | 14.88 | 55.90 | 48.9 | | | | | | |
| RAW AVERAGE | | | | 7.51 | 7.53 | 8.54 | 24.06 | | | | | | |
| CORRECTED AVERAGE | | | | | | | | | | | | | |
| COMMENTS: | | | | | | | | | | | | | |

CARNOT

PMF-039

# CARNOT



## REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE/ALAMITOS UNIT #4

CONDITION: With Urea Inj. @ 70 MW

DATE: 9/19/92

OPERATOR: BAC

TEST NUMBER: 8-4-CEM

TEST LOCATION: APH Hot Side

| TEST NO. | TIME | | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___ DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ | $CO_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| SPAN GAS CONCENTRATION | | | | 4.99 | 15.00 | 55.87 | 50.63 | | | | | | |
| | | | AS FOUND ANAL. SPAN | | | | | | | | | | |
| | | | SYSTEM ZERO | 0.07 | 0.025 | 0.1 | 0.8 | | | | | | |
| | | | SYSTEM SPAN | 4.9 | 14.88 | 55.8 | 49.6 | | | | | | |
| | BEGIN | 0805 | COMP | 7.4 | 7.6 | 2.5 | 25.5 | | | | | | |
| | END | 0810 | | | | | | | | | | | |
| | BEGIN | 0810 | COMP | 7.7 | 7.5 | 3.0 | 25.5 | | | | | | |
| | END | 0815 | | | | | | | | | | | |
| | BEGIN | 0815 | COMP | 7.7 | 7.5 | 9.0 | 25.0 | | | | | | |
| | END | 0820 | | | | | | | | | | | |
| | BEGIN | 0820 | COMP | 7.6 | 7.5 | 16.0 | 24.0 | | | | | | |
| | END | 0825 | | | | | | | | | | | |
| | BEGIN | 0825 | FOR NO2 PORT E | 6.5 | 8.0 | ϕ | ~~31.5~~ 32.0 | 31.2 | 0.8 | | | | |
| | END | 0830 | | | | | | | | | | | |
| | BEGIN | 0830 | COMP | 7.5 | 7.25 | 6.0 | 25.5 | | | | | | |
| | END | 0835 | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | | | SYSTEM ZERO | 0.08 | 0.025 | 0.1 | 0.2 | | | | | | |
| | | | SYSTEM SPAN | 4.9 | 14.9 | 55.6 | 49.8 | | | | | | |
| RAW AVERAGE | | | | 7.58 | 7.47 | 7.3 | 25.10 | | | | | | |
| CORRECTED AVERAGE | | | | | | | | | | | | | |
| COMMENTS: | | | | | | | | | | | | | |

# CARNOT



## REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE/ALAMITOS UNIT #4 CONDITION: W/o Urea @ 150 MW

DATE: 9/19/92 OPERATOR: BAC

TEST NUMBER: 9-4-CEM TEST LOCATION: APH Hot side

| TEST NO. | TIME | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___ DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $O_2$ | $CO_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| SPAN GAS CONCENTRATION | | | 4.99 | 15.00 | 55.87 | 50.63 | | | | | | |
| | | AS FOUND ANAL. SPAN | | | | | | | | | | |
| | | SYSTEM ZERO | 0.01 | ϕ | 0.2 | 0.8 | | | | | | |
| | | SYSTEM SPAN | 5.0 | 14.75 | 56.1 | 52.0 | | | | | | |
| | BEGIN 2230 END 2235 | COMP | 257 | 10.25 | ϕ | 36.9 | | | | | | |
| | BEGIN 2235 END 2240 | COMP | 262 | 10.23 | ϕ | 36.5 | | | | | | |
| | BEGIN 2240 END 2245 | FOR NO2 PORTE | 250 | 10.23 | ϕ | 36.3 | 36.0 | 0.3 | | | | |
| | BEGIN 2245 END 2250 | COMP | 272 | 10.13 | ϕ | 36.3 | | | | | | |
| | BEGIN 2250 END 2255 | COMP | 275 | 10.13 | ϕ | 37.0 | | | | | | |
| | BEGIN 2255 END 2300 | COMP | 263 | 10.20 | ϕ | 37.5 | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | | SYSTEM ZERO | 0.01 | -0.025 | 0.1 | 1.4 | | | | | | |
| | | SYSTEM SPAN | 4.94 | 14.75 | 56.1 | 53.1 | | | | | | |
| RAW AVERAGE | | | 2.66 | 10.19 | ϕ | 36.84 | | | | | | |
| CORRECTED AVERAGE | | | | | | | | | | | | |
| COMMENTS: | | | | | | | | | | | | |

# CARNOT



## REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE/ALAMITOS UNIT #4 CONDITION: W/o Urea @ 150 MW

DATE: 9/20/92 OPERATOR: BAC

TEST NUMBER: 10-4-CEM TEST LOCATION: APH Hot Side

| TEST NO. | TIME | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $O_2$ | $CO_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| SPAN GAS CONCENTRATION | | | 4.99 | 15.00 | 55.87 | 50.63 | | | | | | |
| | | AS FOUND ANAL. SPAN | | | | | | | | | | |
| | | SYSTEM ZERO | 0.01 | 0.025 | 0.1 | -0.1 | | | | | | |
| | | SYSTEM SPAN | 4.96 | 14.75 | 56.0 | 49.1 | | | | | | |
| | BEGIN 0145 END 0150 | COMP | 2.67 | 10.25 | ϕ | 35.0 | | | | | | |
| | BEGIN 0150 END 0155 | COMP | 2.65 | 10.25 | ϕ | 34.9 | | | | | | |
| | BEGIN 0155 END 0200 | COMP | 2.65 | 10.25 | ϕ | 35.0 | | | | | | |
| | BEGIN 0200 END 0205 | PORT E | 2.60 | 10.25 | ϕ | 34.5 | 34.2 | 0.3 | | | | |
| | BEGIN 0205 END 0210 | COMP | 2.65 | 10.25 | ϕ | 35.0 | | | | | | |
| | BEGIN 0210 END 0215 | COMP. | 2.80 | 10.20 | ϕ | 35.0 | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | | SYSTEM ZERO | 0.01 | 0.05 | ϕ | 0.9 | | | | | | |
| | | SYSTEM SPAN | 4.90 | 14.75 | 56.1 | 51.2 | | | | | | |
| RAW AVERAGE | | | 2.68 | 10.24 | ϕ | 34.98 | | | | | | |
| CORRECTED AVERAGE | | | | | | | | | | | | |
| COMMENTS: | | | | | | | | | | | | |

# CARNOT



## REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE/ALAMITOS UNIT #4

CONDITION: With Urea Inj. @ 150 MW

DATE: 9/20/92

OPERATOR: BAC

TEST NUMBER: 11-4-CEM

TEST LOCATION: APH Hot Side

| TEST NO. | TIME | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $O_2$ | $CO_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| SPAN GAS CONCENTRATION | | | 4.99 | 15.00 | 55.87 | 50.63 | | | | | | |
| | | AS FOUND ANAL. SPAN | | | | | | | | | | |
| | | SYSTEM ZERO | 0.01 | 0.05 | ϕ | 0.07 | | | | | | |
| | | SYSTEM SPAN | 4.86 | 14.88 | 56.20 | 49.80 | | | | | | |
| | BEGIN 0445 END 0450 | COMP | 2.6 | 10.25 | ϕ | 32.0 | | | | | | |
| | BEGIN 0450 END 0455 | COMP | 2.72 | 10.20 | ϕ | 32.4 | | | | | | |
| | BEGIN 0455 END 0500 | COMP | 2.7 | 10.23 | ϕ | 32.7 | | | | | | |
| | BEGIN 0500 END 0505 | PORT E | 2.85 | 10.13 | ϕ | 34.5 | 34.5 | 0.0 | | | | |
| | BEGIN 0505 END 0510 | COMP | 2.75 | 10.20 | ϕ | 33.0 | | | | | | |
| | BEGIN 0510 END 0515 | COMP. | 2.72 | 10.20 | ϕ | 32.5 | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | BEGIN END | | | | | | | | | | | |
| | | SYSTEM ZERO | 0.0 | 0.05 | ϕ | 0.9 | | | | | | |
| | | SYSTEM SPAN | 4.87 | 14.88 | 56.20 | 49.4 | | | | | | |
| RAW AVERAGE | | | 2.10 | 10.22 | ϕ | 32.52 | | | | | | |
| CORRECTED AVERAGE | | | | | | | | | | | | |
| COMMENTS: | | | | | | | | | | | | |

# CARNOT



## REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE/ALAMITOS UNIT #4 CONDITION: With Urea Inj @ 150 MW

DATE: 9/20/92 OPERATOR: BAC

TEST NUMBER: 12-4-CEM TEST LOCATION: APH Hot Side

| TEST NO. | TIME | | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ | $CO_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| SPAN GAS CONCENTRATION | | | | 4.99 | 15.00 | 55.87 | 50.63 | | | | | | |
| | | | AS FOUND ANAL. SPAN | ~~[illegible]~~ | | | | | | | | | |
| | | | SYSTEM ZERO | 0.01 | 0.05 | ∅ | 0.5 | | | | | | |
| | | | SYSTEM SPAN | 4.88 | 14.80 | 56.20 | 49.70 | | | | | | |
| | BEGIN | 0700 | COMP | 2.75 | 10.13 | ∅ | 32.5 | | | | | | |
| | END | 0705 | | | | | | | | | | | |
| | BEGIN | 0705 | COMP | 2.73 | 10.18 | ∅ | 32.6 | | | | | | |
| | END | 0710 | | | | | | | | | | | |
| | BEGIN | 0710 | COMP | 2.72 | 10.20 | ∅ | 32.5 | | | | | | |
| | END | 0715 | | | | | | | | | | | |
| | BEGIN | 0715 | PORT E | 2.75 | 10.18 | ∅ | 34.5 | 34.5 | ∅ | | | | |
| | END | 0720 | | | | | | | | | | | |
| | BEGIN | 0720 | COMP | 2.70 | 10.20 | ∅ | 32.2 | | | | | | |
| | END | 0725 | | | | | | | | | | | |
| | BEGIN | 0725 | COMP | 2.69 | 10.23 | ∅ | 32.0 | | | | | | |
| | END | 0730 | | | | | | | | | | | |
| | BEGIN | --- | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | --- | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | --- | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | --- | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | --- | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | BEGIN | --- | | | | | | | | | | | |
| | END | | | | | | | | | | | | |
| | | | SYSTEM ZERO | 0.01 | 0.05 | ∅ | -0.2 | | | | | | |
| | | | SYSTEM SPAN | 4.85 | 14.88 | 56.2 | 49.1 | | | | | | |
| RAW AVERAGE | | | | 6.76 | [illegible] | ∅ | [illegible] | | | | | | |
| CORRECTED AVERAGE | | | | | | | | | | | | | |
| COMMENTS: | | | | | | | | | | | | | |

# CARNOT
## CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: SCE/ALAMITOS UNIT #4

DATE: 9/28/92

OPERATOR: BAC

TEST LOCATION: APH Hot Side

TEST NUMBERS: 13-4-CEM

w/ Urea Inj

AMBIENT TEMP., DB/WB:

BAROMETRIC PRESSURE:

DUCT STATIC PRESSURE:

FUEL: N.G.

DATE: 9/29/92 Prj # 1258

| TEST NO. | SAMPLE TIME | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ___% ___, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 4.99 | 15.00 | 55.84 | 50.63 | | | | | | |
| | | | $O_2$ 0-18 | $CO_2$ 0-25 | CO 0-100 | NOx 0-100 | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| | | SYS ZERO | 0.03 | 0.05 | 0.2 | 0.3 | | | | | | |
| | | SYS SPAN | 4.93 | 14.9 | 55.2 | 49.6 | | | | | | |
| | 0510 0515 | COMP. | 7.9 | 7.25 | 26 | 25.2 | | | | | | |
| | 0515 0520 | COMP. | 7.95 | 7.25 | 28 | 25.3 | | | | | | |
| | 0520 0525 | COMP. | 7.95 | 7.25 | 24 | 25.4 | | | | | | |
| | 0525 0530 | FOR $NO_2$ PORT E | 7.60 | 7.45 | Ø | 32.3 | 32.5 | 0.2 | | | | |
| | 0530 0535 | COMP. | 8.0 | 7.25 | 26 | 25.0 | | | | | | |
| | 0535 0540 | COMP. | 7.9 | 7.25 | 25 | 24.1 | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | SYS. ZERO | 0.02 | 0.[illegible] | [illegible] | 0.7 | | | | | | |
| | | SYS. SPAN | 4.9 | 14.78 | 55.3 | 49.8 | | | | | | |

COMMENTS: AVG 7.98 ✓ 25.9 25.0 ✓

CARNOT

PMF-013

# CARNOT
## CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: SCE/ALAMITOS UNIT # 4

DATE: 9/28/92

OPERATOR: BAC

TEST LOCATION: APH Hot Side

TEST NUMBERS: 4-4 - CEM

w/- Urea Inj

AMBIENT TEMP., DB/WB:

BAROMETRIC PRESSURE:

DUCT STATIC PRESSURE:

FUEL: N-Gas

9/28/92 12582

| TEST NO. | SAMPLE TIME | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ____% ____, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 4.99 $O_2$ | 15.00 $CO_2$ | 55.84 CO | 50.63 NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| | | SYS ZERO | 0.02 | 0.03 | 0.1 | 0.7 | | | | | | |
| | | SYS SPAN | 4.9 | 14.78 | 55.3 | 49.8 | | | | | | |
| | | | | | | | | | | | | |
| | 0612 0617 | COMP | 7.85 | 7.38 | 23 | 24.8 | | | | | | |
| | 0617 0622 | COMP | 7.90 | 7.25 | 28.5 | 24.6 | | | | | | |
| | 0622 0627 | FOR NOx PORT E | 7.2 | 7.50 | Ø | 27.5 | 26.0 | 1.5 | | | | |
| | 0627 0632 | COMP | 8.0 | 7.25 | 30 | 24.5 | | | | | | |
| | 0632 0637 | COMP | 8.05 | 7.25 | 30 | 25.2 | | | | | | |
| | 0637 0642 | COMP | 7.85 | 7.25 | 25 | 24.5 | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | SYS ZERO | 0.03 | 0.05 | 0.0 | 1.1 | | | | | | |
| | | SYS SPAN | 4.9 | 14.8 | 55 | 50.1 | | | | | | |

COMMENTS:

CARNOT

PMF-013

# CARNOT
## CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: SCE / ALAMITOS UNIT #4

DATE: 9/28/92

OPERATOR: BAC

TEST LOCATION: APH Hot side

TEST NUMBERS: 15-4-CEM
w/o Urea Inj

AMBIENT TEMP., DB/WB:

BAROMETRIC PRESSURE:

DUCT STATIC PRESSURE:

FUEL:

DATE: 9/28/92 12582

| TEST NO. | SAMPLE TIME | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ____% ____, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $O_2$ | $CO_2$ | CO | NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| | | SYS. ZERO | 0.02 | 0.05 | 0.0 | 0.3 | | | | | | |
| | | SYS SPAN | 4.9 | 14.8 | 55 | 49.3 | | | | | | |
| | | | | | | | | | | | | |
| | 0718 0728 | COMP | 8.2 | 7.00 | 30 | 26.0 | | | | | | |
| | 0728 0723 | COMP | 8.2 | 7.13 | 25 | 26.5 | | | | | | |
| | 0723 0728 | COMP | 8.2 | 7.13 | 31 | 26.3 | | | | | | |
| | 0728 0733 | ~~COMP~~ ~~AP ML~~ ~~PORT E~~ | 8.1 | 7.20 | 30 | 26.3 | | | | | | |
| | 0733 0738 | PORT E ~~COMP~~ | 7.8 | 7.25 | ϕ | 35 | 35 | ϕ | | | | |
| | 0738 0743 | COMP | 8.0 | 7.13 | 28 | 27.5 | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | SYS. ZERO | 0.02 | 0.03 | 0.2 | 0.8 | | | | | | |
| | | SYS. SPAN | 4.9 | 14.75 | 55.0 | 50.2 | | | | | | |

COMMENTS:

CARNOT

PMF-013

# CARNOT
## CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: SCE/ALAMITOS UNIT #4

DATE: 9/28/92

OPERATOR: BAC

TEST LOCATION: APH Hot Side

TEST NUMBERS: 16-4-CEM

AMBIENT TEMP., DB/WB:

BAROMETRIC PRESSURE:

DUCT STATIC PRESSURE:

FUEL:

9/28/92 12582

| TEST NO. | SAMPLE TIME | SAMPLE POINT/ CONDITION | DRY, UNCORRECTED | | | | | | | CORRECTED TO ____% ____, DRY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 4.99 $O_2$ | 15.00 $CO_2$ | 55.84 CO | 50.63 NOx | NO | $NO_2$ | $SO_2$ | CO | NOx | $SO_2$ |
| | | SYS. ZERO | | | | | | | | | | |
| | | SYS SPAN | SEE PREVIOUS TEST | | | | | | | | | |
| | | | | | | | | | | | | |
| | 0800 0805 | COMP | 8.3 | 7.0 | 32 | 27.0 | | | | | | |
| | 0805 0810 | COMP | 8.2 | 7.1 | 27 | 27.3 | | | | | | |
| | 0810 0815 | ~~For NO2~~ PORT E | 7.9 | 7.25 | ∅ | 36.5 | 36.5 | ∅ | | | | |
| | 0815 0820 | COMP | 8.0 | 7.1 | 28 | 27.5 | | | | | | |
| | 0820 0825 | COMP | 8.2 | 7.0 | 30 | 27.0 | | | | | | |
| | 0825 0830 | COMP | 8.2 | 7.0 | 29 | 26.8 | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | SYS ZERO | 0.06 | 0.03 | ∅ | 0.9 | | | | | | |
| | | SYS SPAN | 4.93 | 14.75 | 54.7 | 50.3 | | | | | | |

COMMENTS:

CARNOT

PMF-013

Appendix C.4

Particulate

A, B, C, D, (E) (F)

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE / Alamitos
UNIT 4 TEST NO. 1-4-PM METHOD SQAQMD 5.3 PAGE 1 OF 3
SAMPLE LOCATION Duct Inlet TEST CONDITION AMB. TEMP., °F PROJECT # 12582
OPERATOR/ASSISTANT RM/JF METER VOL. (START/END) *478.508 1534.529 DATE 9-14-92

**PRE-TEST DATA:**
Barometric Press., in. Hg. 29.92
Assumed Stack Press.
Assumed Moisture 15%
Assumed Molecular Wt. 29
Assumed ΔP
Assumed ΔH
Stack Diameter, in. H2 ~~144~~ 45.3
Sample Time: Total 126 ~~144~~ min.
per point 3 min.
Total of Traverse Points 42

$\Delta H = \frac{\Delta P}{2.1} \times \Delta P$

**EQUIPMENT INFO:**
Meter No. ES-28
Meter, Yd. 1.00
CFM @ ΔH = 1.0 .5588
Pitot ID, Cp .84
$O_2/CO_2$ Method Pit.
Teflon Connecting Line (Y/N) Y
Probe: Mat'l Tef.
Length 19'
Nozzle: Mat'l SS
Diam. 0.245"
Filter: No. 47-47
Mat'l

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | DI H2O | 815.2 | 619.0 | = 196.2 |
| #2 | DI-H2O | 624 | 620.8 | = 3.6 |
| #3 | — | 513.6 | 512.1 | = 1.5 |
| #4 | SG | 755.2 | 740.0 | = 15.2 |
| #5 | totals | 2708.4 | 2491.9 | = 216.5 |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance Rust / Carbon Deposit
Impinger Appearance Good
Silica Gel Spent (Y/N) N

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.001 | 15" | JF | JF |
| Post-Test | 0.014 | 17" | — | RM |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E-1 | 1208 | .11 | .22 | 478.508 | 242 | | 73 | 70 | | 67 | — | 3.0 | |
| 2 | 1211 | .24 | .48 | 479.1 | 239 | | 74 | 71 | | 63 | | | |
| Stop | 1213 | Stop | | 479.422 | * Meter Line / Fixed / Leak ck. @ 15" 0.002 | | | | | | | | |
| E-2 | 1336 | .25 | .50 | 480.080 | 240 | | 88 | 84 | | 62 | | 8.0 | |
| E-3 | 1337 | .45 | .90 | 408.5 | 240 | | 93 | 85 | | 60 | | 12.0 | |
| 4 | 1340 | .45 | .90 | 481.98 | 242 | | 95 | 85 | | 53 | | 12.0 | |
| 5 | 1343 | .50 | 1.0 | 483.5 | 241 | | 96 | 85 | | 52 | 4.0 | 13.5 | +1.2 |
| 6 | 1346 | .50 | 1.0 | 485.19 | 240 | | 97 | 85 | | 51 | 3.8 | 14.0 | |
| 7 | 1349 | .48 | .96 | 486.8 | 241 | | 97 | 85 | | 53 | 3.8 | 14.0 | |
| Stop | 1352 | | | 488.528 | | | | | | | | | |
| E-1 | 1358 | .12 | .25 | 488.528 | 222 | | 86 | 85 | | 66 | — | 4.0 | |
| 2 | 1401 | .10 | .21 | 489.42 | 223 | | 89 | 86 | | 61 | 6.5 | 3.5 | |
| 3 | 1404 | .15 | .32 | 490.2 | 214 | | 90 | 85 | | 66 | — | 5.0 | +1.0 |
| 4 | 1407 | .18 | .38 | 491.18 | 214 | | 91 | 85 | | 67 | 6.7 | 6.0 | |
| 5 | 1410 | .16 | .34 | 492.2 | 214 | | 92 | 85 | | 68 | — | 5.5 | |
| 6 | 1413 | .48 | 1.008 | 493.28 | 226 | | 92 | 85 | | 68 | 5.0 | 14.0 | |
| 7 | 1416 | .52 | 1.09 | 494.7 | 224 | | 97 | 85 | | 69 | — | 15.0 | |
| Stop | 1419 | | | 496.411 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**
Impingers Loaded
Impingers Recovered
Filter Loaded
Filter Recovered
Probe Wash JF/RM

**TEST SUMMARY**
Calculated by:
Checked by: RM
Sample Vol., c.f. 55.368
Stack Press., iwg ~~+0.393~~ 1.0
ΔH, iwg 0.6923
ΔP, iwg 0.3036
Meter Temp., °F 88.1
Stack Temp., °F 228.02
Water Collected, g 216.5
$O_2/CO_2$ 15.3 / 9.1
Comments:

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/Alamitos UNIT 4 TEST NO. 1-4-PM METHOD SCAQMD 5.3 PAGE 2 OF 3
SAMPLE LOCATION Inlet duct to stack TEST CONDITION AMB. TEMP., °F PROJECT # 12587
OPERATOR/ASSISTANT RM, JF METER VOL. (START/END) / DATE 9-14-92

**PRE-TEST DATA:**
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = _____ x ΔP

**EQUIPMENT INFO:**
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting
Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

| Imp. | Mat'l | Wt.(End) | | Wt.(Start) | | Wt.(g) |
|---|---|---|---|---|---|---|
| #1 | | | - | | = | |
| #2 | | | - | | = | |
| #3 | | | - | | = | |
| #4 | | | - | | = | |
| #5 | | | - | | = | |
| Total | | | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D-1 | 1426 | .02 | .042 | 496.411 | 224 | | 84 | 85 | | 68 | – | 1.5 | | Impingers Loaded |
| 2 | 1429 | .04 | .084 | 496.8 | 223 | | 85 | 85 | | 68 | 6.3 | 2.0 | | Impingers Recovered |
| 3 | 1432 | .18 | .38 | 497.3 | 217 | | 90 | 85 | | 68 | – | 6.0 | + 1.0 | Filter Loaded |
| 4 | 1435 | .18 | .38 | 498.25 | 218 | | 91 | 85 | | 56 | 6.4 | 6.0 | | Filter Recovered |
| 5 | 1438 | .44 | .92 | 499.3 | 220 | | 91 | 85 | | 56 | – | 13.0 | | Probe Wash |
| 6 | 1441 | .42 | .88 | 500.77 | 220 | | 95 | 85 | | 51 | 5.8 | 12.5 | | TEST SUMMARY |
| 7 | 1444 | .45 | .95 | 502.43 | 220 | | 95 | 85 | | 53 | – | 14.0 | | Calculated by: |
| STOP | 1447 | | | 504.039 | | | | | | | – | | | Checked by: |
| C-1 | 1450 | .05 | .11 | 504.039 | 228 | | 85 | 84 | | 66 | – | 2.5 | | Sample Vol., c.f. |
| 2 | 1453 | .05 | .11 | 504.62 | 229 | | 87 | 84 | | 67 | 6.0 | 2.5 | | Stack Press., iwg |
| 3 | 1456 | .14 | .29 | 505.19 | 224 | | 86 | 85 | | 63 | – | 5.0 | | ΔH, iwg |
| 4 | 1459 | .18 | .378 | 506. | 225 | | 91 | 85 | | 60 | – | 6.5 | | ΔP, iwg |
| 5 | 1502 | .45 | .95 | 507.15 | 224 | | 92 | 85 | | 58 | – | 14.0 | + 1.0 | Meter Temp., °F |
| 6 | 1505 | .47 | .99 | 508.64 | 225 | | 96 | 85 | | 52 | 5.6 | 15.0 | | Stack Temp., °F |
| 7 | 1508 | .48 | 1.008 | 510.32 | 226 | | 96 | 85 | | 52 | – | 15.0 | | Water Collected, g |
| STOP | 1511 | | | 512.025 | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE / Alamitos
UNIT: 4
TEST NO.: 1-4-PM
METHOD: SCAQMD 5.3
PAGE 3 OF 3
SAMPLE LOCATION: Inlet duct to stack
TEST CONDITION:
AMB. TEMP., °F:
PROJECT #: 12582
OPERATOR/ASSISTANT: RM / JF
METER VOL. (START/END): /
DATE: 9-14-92

***PRE-TEST DATA:***

| | |
|---|---|
| Barometric Press., in. Hg. | |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | |
| Sample Time: Total | |
| per point | |
| Total of Traverse Points | |

ΔH = _____ x ΔP

***EQUIPMENT INFO:***

| | |
|---|---|
| Meter No. | |
| Meter, Yd. | |
| CFM @ ΔH = 1.0 | |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | |
| Teflon Connecting Line (Y/N) | |
| Probe: Mat'l | |
| Length | |
| Nozzle: Mat'l | |
| Diam. | |
| Filter: No. | |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | = |
| #2 | | | | = |
| #3 | | | | = |
| #4 | | | | = |
| #5 | | | | = |
| Total | | | | |

***POST TEST INFO:***

| | |
|---|---|
| Filter Appearance | |
| Impinger Appearance | |
| Silica Gel Spent (Y/N) | |

***SAMPLE TRAIN LEAK CHECK:***

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

***PRE-TEST CALIBRATION CHECK:***

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

SCE Pg 1

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-1 | 1517 | .50 | 1.05 | 512.025 | 238 | | 84 | 85 | | 68 | – | 15.5 | | Impingers Loaded |
| 2 | 1520 | .50 | 1.05 | 513.7 | 239 | | 92 | 85 | | 68 | 4.9 | 16.0 | | Impingers Recovered |
| 3 | 1523 | [illegible] | .92 | 515.43 | 234 | | 94 | 86 | | 68 | – | 15.0 | | Filter Loaded |
| 4 | 1526 | .42 | .88 | 517.1 | 234 | | 94 | 86 | | 68 | – | 15.0 | | Filter Recovered |
| 5 | 1529 | .45 | .95 | 518.7 | 233 | | 95 | 86 | | 68 | – | 15.2 | | Probe Wash |
| 6 | 1532 | .52 | 1.1 | 520.4 | 233 | | 96 | 86 | | 69 | – | 16.5 | | TEST SUMMARY |
| 7 | 1535 | .43 | .9 | 522.2 | 232 | | 95 | 87 | | 67 | 5.6 | 15.0 | +1.1 | Calculated by: |
| STOP | 1538 | | | 523.657 | | | | | | | | | | Checked by: |
| A-1 | 1542 | .28 | .59 | 523.657 | 235 | | 89 | 87 | | 68 | – | 10.0 | | Sample Vol., c.f. |
| 2 | 1545 | .25 | .53 | 524.7 | 235 | | 93 | 87 | | 65 | 5.4 | 9.0 | | Stack Press., iwg |
| 3 | 1548 | .47 | .99 | 526.2 | 230 | | 97 | 87 | | 66 | – | 16.5 | +.95 | ΔH, iwg |
| 4 | 1551 | .40 | .84 | 527.7 | 228 | | 97 | 87 | | 66 | 4.4 | 15.0 | | ΔP, iwg 0.2036 |
| 5 | 1554 | .50 | 1.05 | 529.4 | 218 | | 97 | 87 | | 68 | – | 16.5 | | Meter Temp., °F |
| 6 | 1557 | .48 | 1.008 | 531.– | 215 | | 96 | 87 | | 68 | 4.8 | 16.5 | | Stack Temp., °F |
| 7 | 1600 | .42 | .88 | 532.6 | 216 | | 95 | 87 | | 69 | – | 16.0 | | Water Collected, g |
| STOP | 1603 | | | 534.529 | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |
| | | | | | | | | | | | | | | |

PMF-057

$\left(\Sigma \sqrt{\frac{\Delta H}{N}}\right)$

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE/Alamitos | UNIT: #4 | TEST NO.: 2-4-PM | METHOD: SCAQMD 5.3 | PAGE 1 OF 3
SAMPLE LOCATION: Duct/Stack Inlet | TEST CONDITION: | AMB. TEMP., °F: | PROJECT #: 12582
OPERATOR/ASSISTANT: RM/JF | METER VOL. (START/END): 536.315 / | DATE: 9/15/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 29.92 |
| Assumed Stack Press. | +1.0 |
| Assumed Moisture | 15% |
| Assumed Molecular Wt. | 29 |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. 45.3 | 191" |
| Sample Time: Total | 1:56 |
| per point | 3 |
| Total of Traverse Points | 42 |

ΔH = [illegible] x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | ES-28 |
| Meter, Yd. | 1.02 |
| CFM @ ΔH = 1.0 | 0.558 |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | TEDLAR |
| Teflon Connecting Line (Y/N) | Y |
| Probe: Mat'l | TEFLON |
| Length | 20' |
| Nozzle: Mat'l | TEFLON |
| Diam. | |
| Filter: No. | 45-172 |
| Mat'l | 0.1035 |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | $H_2O$ | 829.3 | 611.5 | 217.8 |
| #2 | $H_2O$ | 667.0 | 658.2 | 8.8 |
| #3 | Ø | 514.5 | 513.2 | 1.3 |
| #4 | S.G. | 660.4 | 647.0 | 13.4 |
| #5 | | | | |
| Total | | | | 241.3 |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.001 | 15" | | |
| Post-Test | 0.005 | 14" | ✓ | RP |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F1 | 0650 | 0.31 | 0.65 | 536.315 | 234 | 66 | 79 | 84 | | | | 7.0 | |
| F2 | 0653 | 0.29 | 0.61 | 537.505 | 234 | 50 | 89 | 85 | | | | 7.0 | |
| F3 | 0656 | 0.51 | 1.07 | 538.820 | 236 | 52 | 92 | 86 | | | | 11.5 | |
| F4 | 0659 | 0.49 | 1.03 | 540.612 | 238 | 54 | 93 | 86 | | | | 11.5 | |
| F5 | 0702 | 0.47 | 0.99 | 542.240 | 237 | 55 | 94 | 87 | | | | 11.5 | |
| F6 | 0705 | 0.49 | 1.03 | 543.913 | 238 | 56 | 94 | 88 | | | | 12 | |
| F7 | 0708 | 0.49 | 1.03 | 545.625 | 238 | 56 | 95 | 88 | | | | 12 | 1.35 |
| STOP | 0711 | | | 548.524 | | | | | | | | | |
| AVG | — | 0.43 | 0.92 | 12.209 | 236 | 56 | 91 | 86 | | | | | |
| E1 | 0721 | 0.18 | 0.38 | 548.524 | 219 | 61 | 87 | 90 | | | | 4.5 | |
| E2 | 0724 | 0.16 | 0.34 | 549.252 | 220 | 56 | 90 | 90 | | | 6.4 | 4.5 | |
| E3 | 0727 | 0.39 | 0.80 | 550.350 | 209 | 54 | 95 | 91 | | | | 9.0 | 1.1 |
| E4 | 0730 | 0.36 | 0.76 | 551.932 | 209 | 55 | 97 | 91 | | | | 8.5 | |
| E5 | 0733 | 0.50 | 1.05 | 553.360 | 219 | 56 | 99 | 91 | | | | 12 | |
| E6 | 0736 | 0.51 | 1.07 | 554.995 | 217 | 57 | 99 | 92 | | | | 12 | |
| E7 | 0739 | 0.50 | 1.05 | 556.825 | 219 | 59 | 100 | 92 | | | | 12 | |
| STOP | 0742 | | | 558.959 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | John F |
| Impingers Recovered | John F |
| Filter Loaded | John F |
| Filter Recovered | John F |
| Probe Wash | RM/JB |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | CG |
| Checked by: | CG |
| Sample Vol., c.f. | 60.015 ✓ |
| Stack Press., iwg | +1.1 ✓ |
| ΔH, iwg | 0.7493 ✓ |
| ΔP, iwg | 0.3305 ✓ |
| Meter Temp., °F | 93.46 ✓ |
| Stack Temp., °F | 223.5 ✓ |
| Water Collected, g | 241.3 ✓ |
| $O_2/CO_2$ | 4.94 ✓ / 9.4 |
| Comments: | |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCG/ALAMITOS
SAMPLE LOCATION: STACK INLET
OPERATOR/ASSISTANT: DAVIS/MODRIGAL

UNIT: 4
TEST NO.: 2-4-PM
METHOD: SCAQMD 5.3
PAGE 2 OF 3
TEST CONDITION:
AMB. TEMP., °F:
PROJECT #: 12582
METER VOL. (START/END):
DATE: 9/18/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | |
| Sample Time: Total | |
| per point | |
| Total of Traverse Points | |

ΔH = 2.1 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | |
| Meter, Yd. | |
| CFM @ ΔH = 1.0 | |
| Pitot ID, Cp | 125F6F |
| $O_2/CO_2$ Method | |
| Teflon Connecting Line (Y/N) | |
| Probe: Mat'l | |
| Length | |
| Nozzle: Mat'l | |
| Diam. | |
| Filter: No. | |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | |
| #2 | | | | |
| #3 | | | | |
| #4 | | | | |
| #5 | | | | |
| Total | | | | |

**POST TEST INFO:**

| | |
|---|---|
| Filter Appearance | |
| Impinger Appearance | |
| Silica Gel Spent (Y/N) | |

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. Iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D1 | 0749 | 0.03 | 0.06 | 558.960 | 217 | 62 | 88 | 93 | | | | 1 | | Impingers Loaded |
| D2 | 0752 | 0.03 | 0.06 | 558.962 | 218 | 61 | 89 | 94 | | | 6.4 | 1 | 1.0 | Impingers Recovered |
| D3 | 0755 | 0.14 | 0.29 | 559.395 | 212 | 59 | 92 | 94 | | | | 5 | | Filter Loaded |
| D4 | 0758 | 0.20 | 0.42 | 560.378 | 212 | 57 | 95 | 94 | | | | 5 | | Filter Recovered |
| D5 | 0801 | 0.49 | 1.03 | 561.595 | 212 | 56 | 99 | 94 | | | | 10 | | Probe Wash |
| D6 | 0804 | 0.49 | 1.03 | 563.205 | 211 | 56 | 101 | 94 | | | 6.0 | 10 | | TEST SUMMARY |
| D7 | 0807 | 0.49 | 1.03 | 564.900 | 212 | 58 | 102 | 95 | | | | 11 | | Calculated by: |
| STOP | 0810 | | | 566.595 | | | | | | | | | | Checked by: |
| | | | | | | | | | | | | | | Sample Vol., c.f. |
| | | | | | | | | | | | | | | Stack Press., iwg |
| C1 | 0813 | 0.04 | 0.08 | 566.595 | 233 | 62 | 90 | 95 | | | | 1 | | ΔH, iwg |
| C2 | 0816 | 0.05 | 0.11 | 567.215 | 223 | 60 | 91 | 95 | | | 4.1 | 1.5 | 1.0 | ΔP, iwg |
| C3 | 0819 | 0.21 | 0.44 | 568.084 | 220 | 62 | 95 | 95 | | | | 5 | | Meter Temp., °F |
| C4 | 0822 | 0.21 | 0.44 | 568.875 | 219 | 57 | 97 | 95 | | | | 5.5 | | Stack Temp., °F |
| C5 | 0825 | 0.44 | 0.92 | 570.110 | 221 | 57 | 98 | 95 | | | | 10 | | Water Collected, g |
| C6 | 0828 | 0.46 | 0.97 | 571.785 | 220 | 56 | 99 | 95 | | | 5.6 | 11 | | $O_2/CO_2$ |
| C7 | 0831 | 0.45 | 0.95 | 573.265 | 220 | 57 | 99 | 95 | | | | 11 | | Comments: |
| STOP | 0834 | | | 574.873 | | | | | | | | | | |

PME 057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCS/ ALAMITOS
SAMPLE LOCATION STACK INLET
OPERATOR/ASSISTANT DAVIS/MADRIGAL

UNIT 4 TEST NO. 2-4-pm METHOD SCAQMD PAGE 3 OF 3
TEST CONDITION AMB. TEMP., °F PROJECT # 12582
METER VOL. (START/END) / DATE 15 SEPT 92

**PRE-TEST DATA:**
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = 2.1 x ΔP

**EQUIPMENT INFO:**
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | |
| #2 | | | | |
| #3 | | | | |
| #4 | | | | |
| #5 | | | | |
| Total | | | | |

TO PAGE 1

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B1 | 0838 | 0.28 | 0.44 | 574.873 | 233 | 63 | 91 | 93 | | | | 6 | 1.0 | Impingers Loaded |
| B2 | 0841 | 0.32 | 0.46 | 576.127 | 234 | 59 | 94 | 94 | | | 3.8 | 6 | | Impingers Recovered |
| B3 | 0844 | 0.40 | 0.64 | 577.250 | 233 | 58 | 96 | 94 | | | | 9 | | Filter Loaded |
| B4 | 0847 | 0.41 | 0.86 | 578.852 | 230 | 58 | 97 | 94 | | | | 10.5 | | Filter Recovered |
| B5 | 0850 | 0.50 | 1.05 | 580.435 | 223 | 58 | 100 | 94 | | | 4.7 | 12 | | Probe Wash |
| B6 | 0853 | 0.50 | 1.05 | 582.135 | 223 | 59 | 100 | 94 | | | | 12.5 | | TEST SUMMARY |
| B7 | 0856 | 0.50 | 1.05 | 583.830 | 222 | 59 | 100 | 94 | | | | 12.5 | | Calculated by: |
| STOP | 0859 | | | 585.504 | | | | | | | | | | Checked by: |
| | | | | | | | | | | | | | | Sample Vol., c.f. |
| A1 | 0903 | 0.25 | 0.53 | 585.504 | 235 | 63 | 91 | 94 | | | | 7 | 1.1 | Stack Press., iwg |
| A2 | 0906 | 0.27 | 0.57 | 586.685 | 235 | 57 | 95 | 93 | | | 5.0 | 8 | | ΔH, iwg |
| A3 | 0909 | 0.45 | 0.95 | 588.125 | 230 | 57 | 96 | 93 | | | | 12 | | ΔP, iwg |
| A4 | 0912 | 0.46 | 0.97 | 589.685 | 229 | 57 | 96 | 92 | | | | 12.5 | | Meter Temp., °F |
| A5 | 0915 | 0.48 | 1.01 | 591.255 | 216 | 61 | 97 | 92 | | | 2.8 | 13 | | Stack Temp., °F |
| A6 | 0918 | 0.48 | 1.01 | 592.975 | 214 | 58 | 97 | 91 | | | | 13 | | Water Collected, g |
| A7 | 0921 | 0.47 | 0.99 | 594.663 | 214 | 59 | 96 | 91 | | | | | | $O_2/CO_2$ |
| STOP | 0924 | | | 596.330 | | | | | | | | | | Comments: |

MF-09

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/Kamitos UNIT 4 TEST NO. 3-4-PM METHOD SCAQMD 5.3 PAGE 1 OF 3
SAMPLE LOCATION Cold Side APH TEST CONDITION AMB. TEMP., °F PROJECT # 12582
OPERATOR/ASSISTANT KM/BD METER VOL. (START/END) / DATE 9-15-92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 29.91 |
| Assumed Stack Press. | |
| Assumed Moisture | 15 |
| Assumed Molecular Wt. | 29 |
| Assumed ΔP | .3 |
| Assumed ΔH | .7 |
| Stack Diameter, in. | 452.3 |
| Sample Time: Total | 120 |
| per point | 3 |
| Total of Traverse Points | 40 |

ΔH = 2.1 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | 65-28 |
| Meter, Yd. | 1.00 |
| CFM @ ΔH = 1.0 | 0.32 |
| Pitot ID, Cp | .84 |
| $O_2/CO_2$ Method | CEM |
| Teflon Connecting | Y |
| Line (Y/N) | Y |
| Probe: Mat'l | Tef |
| Length | 19' |
| Nozzle: Mat'l | SS |
| Diam. | 0.240 |
| Filter: No. | 45-173 |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | Direct | 784.7 | 576.4 | = 208.3 |
| #2 | " | 627.7 | 621.7 | = 6.0 |
| #3 | D | 484.7 | 482.4 | = 2.3 |
| #4 | SG | 659.2 | 645.7 | = 13.5 |
| #5 | | | | = ~~238~~ |
| Total | | | | 232.1 |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.005 | 15" | RM | RM |
| Post-Test | 0.005 | 17" | — | RM |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A-1 | 1122 | .11 | .23 | 597.064 | 237 | | 86 | 88 | | 67 | — | 2.0 | |
| STOP | 1123 | | | 597.315 | | | | | | | | | |
| A-1 | 1132 | .12 | .25 | 597.315 | 238 | | 86 | 88 | | 67 | — | 2.0 | |
| 2 | 1134 | .25 | .53 | 597.89 | 240 | | 90 | 88 | | 61 | 4.8 | 4.0 | |
| 3 | 1137 | .45 | .95 | 599.2 | 235 | | 96 | 88 | | 57 | — | 7.0 | |
| 4 | 1140 | .46 | .96 | 600.7 | 235 | | 99 | 88 | | 55 | 3.8 | 7.5 | +.97 |
| 5 | 1143 | .41 | .86 | 602.3 | 232 | | 98 | 88 | | 57 | — | 7.0 | |
| 6 | 1146 | .52 | 1.1 | 603.91 | 219 | | 98 | 88 | | 58 | 4.2 | 8.0 | |
| 7 | 1149 | .51 | 1.07 | 605.6 | 219 | | 98 | 88 | | 59 | — | 8.0 | |
| STOP | 1152 | | | 607.464 | | | | | | | | | |
| B-1 | 1156 | .20 | .42 | 607.464 | 238 | | 87 | 87 | | 66 | — | 3.5 | |
| 2 | 1159 | .22 | .46 | 608.6 | 238 | | 91 | 87 | | 63 | 5.2 | 4.0 | |
| 3 | 1202 | .37 | .78 | 609.78 | 236 | | 92 | 87 | | 61 | — | 6.5 | |
| 4 | 1205 | .42 | .88 | 611.2 | 237 | | 94 | 87 | | 59 | 5.0 | 7.0 | |
| 5 | 1208 | .51 | 1.07 | 612. | 229 | | 94 | 87 | | 59 | — | 8.5 | +1.0 |
| 6 | 1211 | .50 | 1.05 | 614.6 | 228 | | 95 | 87 | | 60 | — | 8.5 | |
| 7 | 1214 | .51 | 1.07 | 616.21 | 228 | | 95 | 87 | | 60 | 4.5 | 8.5 | |
| STOP | 1217 | | | 617.995 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | EF |
| Impingers Recovered | JF |
| Filter Loaded | EF |
| Filter Recovered | JF |
| Probe Wash | JF |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | KM |
| Checked by: | [illegible] |
| Sample Vol., c.f. | 57.394 |
| Stack Press., iwg | 0.992 |
| ΔH, iwg | 0.7120 |
| ΔP, iwg | 0.3087 |
| Meter Temp., °F | 88.7 |
| Stack Temp., °F | 228.6 |
| Water Collected, g | 230.1 |
| $O_2/CO_2$ | 14.4 / 19.0 |
| Comments: | |

PMF-057

90.4

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/Alamitos
SAMPLE LOCATION Duct to stack
OPERATOR/ASSISTANT RM/BD
UNIT 4 TEST NO. 3-4-PM METHOD SCAQMD 53 PAGE 2 OF 3
TEST CONDITION
AMB. TEMP., °F PROJECT # 12582
METER VOL. (START/END) DATE 9-15-92

**PRE-TEST DATA:**
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = _____ x ΔP

**EQUIPMENT INFO:**
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

| Imp. | Mat'l | Wt.(End) | | Wt.(Start) | | Wt.(g) |
|---|---|---|---|---|---|---|
| #1 | | | - | | = | |
| #2 | | | - | | = | |
| #3 | | | - | | = | |
| #4 | | | - | | = | |
| #5 | | | - | | = | |
| Total | | | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C-1 | 1224 | .04 | .084 | 617.995 | 228 | | 83 | 85 | | 64 | 5.2 | 1.0 | |
| 2 | 1227 | .05 | .105 | 618.5 | 228 | | 84 | 85 | | 60 | 5.2 | 1.0 | |
| 3 | 1230 | .20 | .42 | 619.0 | 225 | | 84 | 84 | | 60 | 6.2 | 4.0 | |
| 4 | 1233 | .19 | .399 | 619.9 | 224 | | 89 | 85 | | 55 | 6.2 | 3.5 | +.90 |
| 5 | 1236 | .44 | .92 | 621.08 | 224 | | 89 | 85 | | 56 | 5.8 | 8.0 | |
| 6 | 1239 | .50 | 1.05 | 622.56 | 224 | | 93 | 85 | | 53 | 5.6 | 9.0 | |
| 7 | 1242 | .48 | 1.008 | 624.27 | 225 | | 94 | 85 | | 53 | 5.6 | 9.0 | |
| STOP | 1245 | | | 626.008 | | | | | | | | | |
| D-1 | 1248 | .03 | .063 | 626.008 | 223 | | 83 | 84 | | 63 | 6.0 | 1.0 | |
| 2 | 1251 | .04 | .084 | 626.440 | 223 | | 84 | 84 | | 63 | 6.4 | 1.0 | |
| 3 | 1254 | .11 | .23 | 626.9 | 219 | | 85 | 85 | | 63 | 6.6 | 2.5 | |
| 4 | 1257 | .13 | .27 | 627.7 | 215 | | 88 | 85 | | 61 | 6.7 | 3.0 | |
| 5 | 1300 | .15 | .32 | 628.7 | 215 | | 89 | 85 | | 60 | 6.7 | 3.0 | |
| 6 | 1303 | .49 | 1.03 | 629.68 | 215 | | 89 | 85 | | 60 | 6.1 | 8.5 | +1.1 |
| 7 | 1306 | .47 | .987 | 631.2 | 217 | | 93 | 85 | | 56 | 6.0 | 8.5 | |
| STOP | 1309 | | | 632.933 | | | | | | | | | |

| CHAIN OF CUSTODY INFORMATION |
|---|
| Impingers Loaded |
| Impingers Recovered |
| Filter Loaded |
| Filter Recovered |
| Probe Wash |
| **TEST SUMMARY** |
| Calculated by: |
| Checked by: |
| Sample Vol., c.f. |
| Stack Press., iwg |
| ΔH, iwg |
| ΔP, iwg |
| Meter Temp., °F |
| Stack Temp., °F |
| Water Collected, g |
| $O_2/CO_2$ |
| Comments: |

MF-05

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/ Alamitos
SAMPLE LOCATION
OPERATOR/ASSISTANT RM/BD

UNIT 4 TEST NO. 3-4-PM METHOD SCAQMD 5.3 PAGE 3 OF 3
TEST CONDITION AMB. TEMP., °F PROJECT # 12582
METER VOL. (START/END) / DATE 9-15-92

***PRE-TEST DATA:***

Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = _____ x ΔP

***EQUIPMENT INFO:***

Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | |
| #2 | | | | |
| #3 | | | | |
| #4 | | | | |
| #5 | | | | |
| Total | | | | |

***POST TEST INFO:***

Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

***SAMPLE TRAIN LEAK CHECK:***

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

***PRE-TEST CALIBRATION CHECK:***

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E-1 | 1313 | .15 | .32 | 632.933 | 225 | | 85 | 84 | | 65 | 6.4 | 3.0 | | Impingers Loaded |
| 2 | 1316 | .19 | .399 | 633.95 | 224 | | 89 | 85 | | 62 | 6.6 | 4.0 | | Impingers Recovered |
| 3 | 1319 | .32 | .67 | 635.04 | 212 | | 92 | 85 | | 61 | 6.0 | 6.0 | | Filter Loaded |
| 4 | 1322 | .35 | .74 | 636.43 | 214 | | 93 | 85 | | 60 | 6.4 | 7.0 | | Filter Recovered |
| 5 | 1325 | .35 | .74 | 637.9 | 213 | | 94 | 85 | | 61 | 6.4 | 7.0 | +.99 | Probe Wash |
| 6 | 1328 | .48 | 1.008 | 639.4 | 224 | | 94 | 85 | | 61 | 5.0 | 9.0 | | TEST SUMMARY |
| 7 | 1331 | .51 | 1.07 | 641.09 | 225 | | 95 | 85 | | 61 | 4.8 | 9.0 | | Calculated by: |
| STOP | 1334 | | | 642.796 | | | | | | | | | | Checked by: |
| E-1 | 1337 | .30 | .63 | 642.796 | 242 | | 90 | 85 | | 64 | 4.6 | 6.0 | | Sample Vol., c.l. |
| 2 | 1340 | .29 | .61 | 644.1 | 240 | | 93 | 86 | | 62 | 4.6 | 6.0 | | Stack Press., iwg |
| 3 | 1343 | .49 | 1.03 | 645.5 | 241 | | 95 | 86 | | 61 | 3.8 | 10.0 | | ΔH, iwg |
| 4 | 1346 | .51 | 1.07 | 647.11 | 243 | | 96 | 86 | | 61 | 3.8 | 10.0 | | ΔP, iwg |
| 5 | 1349 | .58 | 1.22 | 648.8 | 242 | | 96 | 86 | | 62 | 4.1 | 13.0 | | Meter Temp., °F |
| 6 | 1352 | .58 | 1.22 | 650.7 | 243 | | 97 | 86 | | 62 | 4.0 | 13.0 | | Stack Temp., °F |
| 7 | 1355 | .59 | 1.24 | 652.5 | 243 | | 98 | 87 | | 63 | 4.2 | 13.0 | | Water Collected, g |
| STOP | 1358 | | | 654.458 | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE/Alamitos
SAMPLE LOCATION: STACK INLET
OPERATOR/ASSISTANT: DAVIS/MADRIGAL
UNIT: #4
TEST NO.: 4-4-PM
TEST CONDITION: Unit On
METER VOL. (START/END): 655.119 /
METHOD: 5.3
AMB. TEMP., °F:
PAGE 1 OF 3
PROJECT #: 12582
DATE: 15 SEPT 97

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 29.99 |
| Assumed Stack Press. | +1.0 |
| Assumed Moisture | 1 |
| Assumed Molecular Wt. | 28 |
| Assumed ΔP | 0.42 |
| Assumed ΔH | 0.96 |
| Stack Diameter, in. | |
| Sample Time: Total | 45.3 |
| per point | 3 min |
| Total of Traverse Points | 49 |

ΔH = 2.1 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | ES-28 |
| Meter, Yd. | 1.00 |
| CFM @ ΔH = 1.0 | 0.558 |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | FISHERMAN |
| Teflon Connecting Line (Y/N) | Y |
| Probe: Mat'l | TEFLON |
| Probe: Length | 20' |
| Nozzle: Mat'l | TEFLON |
| Nozzle: Diam. | |
| Filter: No. | 45-171 |
| Filter: Mat'l | 0.1027 |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | H2O | 884.1 | 655.0 | 229.1 |
| #2 | H2O | 625.5 | 622.0 | 3.5 |
| #3 | Ø | 496.3 | 495.6 | 0.7 |
| #4 | S.G. | 684.4 | 668.8 | 15.6 |
| #5 | | | | 248.9 |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.004 | 15 | / | KD |
| Post-Test | 0.002 | 19 | – | KD |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F1 | 1432 | 0.31 | 0.65 | 655.119 | 243 | 67 | 91 | 87 | | | 5.6 | 6 | 1.1 |
| F2 | 1435 | 0.30 | 0.63 | 656.605 | 241 | 56 | 96 | 88 | | | 5.6 | 5.5 | |
| F3 | 1438 | 0.41 | 0.86 | 657.985 | 243 | 54 | 98 | 88 | | | 3.8 | 7.5 | |
| F4 | 1441 | 0.44 | 0.92 | 659.545 | 242 | 54 | 99 | 89 | | | 3.8 | 10 | |
| F5 | 1444 | 0.50 | 1.05 | 661.392 | 243 | 56 | 100 | 89 | | | 4.0 | 10.5 | |
| F6 | 1447 | 0.57 | 1.20 | 663.165 | 243 | 58 | 101 | 89 | | | 4.1 | 11 | |
| F7 | 1450 | 0.59 | 1.24 | 665.059 | 244 | 60 | 101 | 89 | | | 3.9 | 11.5 | |
| STOP | 1453 | | | 666.831 | | | | | | | | | |
| | | | | | | | | | | | | | |
| E1 | 1456 | 0.20 | 0.42 | 666.831 | 225 | 66 | 92 | 89 | | | 6.4 | 4 | 1.0 |
| E2 | 1459 | 0.20 | 0.42 | 668.852 | 226 | 64 | 95 | 89 | | | 6.2 | 4 | |
| E3 | 1502 | 0.30 | 0.63 | 669.255 | 216 | 63 | 96 | 89 | | | 6.4 | 6 | |
| E4 | 1505 | 0.30 | 0.63 | 670.570 | 217 | 65 | 97 | 89 | | | 6.4 | 6 | |
| E5 | 1508 | 0.52 | 1.09 | 671.994 | 226 | 62 | 99 | 90 | | | 4.8 | 9 | |
| E6 | 1511 | 0.54 | 1.13 | 673.705 | 227 | 62 | 103 | 90 | | | 4.8 | 10 | |
| E7 | 1514 | 0.54 | 1.13 | 675.554 | 226 | 64 | 104 | 90 | | | | | |
| STOP | 1517 | | | 677.337 | | | | | | | | | |
| | | | | | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | JF |
| Impingers Recovered | JF |
| Filter Loaded | JF |
| Filter Recovered | JF |
| Probe Wash | RM |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | |
| Checked by: | |
| Sample Vol., c.f. | 62.1810 |
| Stack Press., iwg | 1.02 |
| ΔH, iwg | 0.8050 |
| ΔP, iwg | 0.3478 |
| Meter Temp., °F | 92 |
| Stack Temp., °F | 230.2 |
| Water Collected, g | 248.9 |
| $O_2/CO_2$ | 5.3 / 9.1 |
| Comments: | |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCG/ALAMITOS UNIT 4 TEST NO. 4-4-PM METHOD SCAQMD 5.3 PAGE 2 OF 3
SAMPLE LOCATION STACK INLET TEST CONDITION AMB. TEMP., °F PROJECT # 12582
OPERATOR/ASSISTANT DAVIS/MARRIGA METER VOL. (START/END) / DATE 15 SEPT 12

**PRE-TEST DATA:**
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = 2.1 x ΔP

**EQUIPMENT INFO:**
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | = |
| #2 | | | | = |
| #3 | | | | = |
| #4 | | | | = |
| #5 | | | | = |
| Total | | | | |

ABSENT TO PABS

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D 1 | 1521 | 0.03 | 0.06 | 677.337 | 225 | 73 | 88 | 89 | | | 5.2 | 1 | | Impingers Loaded |
| D2 | 1524 | 0.03 | 0.06 | 677.810 | 220 | 69 | 89 | 89 | | | 5.2 | 1 | | Impingers Recovered |
| D3 | 1527 | 0.15 | 0.32 | 678.235 | 218 | 63 | 92 | 89 | | | 6.2 | 4 | 1.0 | Filter Loaded |
| D4 | 1530 | 0.15 | 0.32 | 679.335 | 220 | 60 | 94 | 90 | | | 6.2 | 4 | | Filter Recovered |
| D5 | 1533 | 0.45 | 0.95 | 680.515 | 218 | 59 | 97 | 90 | | | 6.2 | 8 | | Probe Wash |
| D6 | 1536 | 0.51 | 1.07 | 681.422 | 220 | 58 | 101 | 91 | | | 6.2 | 9.5 | | TEST SUMMARY |
| D7 | 1539 | 0.51 | 1.07 | 683.655 | 219 | 61 | 101 | 90 | | | 6.2 | 9.5 | | Calculated by: |
| STOP | 1542 | | | 684.799 | | | | | | | | | | Checked by: |
| | | | | | | | | | | | | | | Sample Vol., c.f. |
| C 1 | 1543 | 0.03 | 0.06 | 684.799 | 231 | 69 | 90 | 90 | | | 6.2 | 1 | | Stack Press., iwg |
| C 2 | 1546 | 0.05 | 0.06 | 685.195 | 231 | 68 | 90 | 90 | | | | 1 | | ΔH, iwg |
| C 3 | 1549 | 0.25 | 0.48 | 685.643 | 227 | 64 | 93 | 90 | | | 6.2 | 5 | | ΔP, iwg |
| C 4 | 1552 | 0.22 | 0.46 | 686.812 | 227 | 60 | 96 | 90 | | | 6.2 | 4 | 1.0 | Meter Temp., °F |
| C 5 | 1555 | 0.54 | 1.13 | 688.056 | 229 | 59 | 99 | 91 | | | 6.0 | 9.5 | | Stack Temp., °F |
| C6 | 1558 | 0.51 | 1.07 | 689.800 | 227 | 59 | 100 | 91 | | | 5.8 | 10 | | Water Collected, g |
| C7 | 1601 | 0.54 | 1.13 | 691.562 | 229 | 60 | 100 | 92 | | | 5.8 | 11 | | $O_2/CO_2$ |
| STOP | 1604 | | | 693.427 | | | | | | | | | | Comments: |
| | | | | | | | | | | | | | | |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCG/ALAMITA
SAMPLE LOCATION STACK INLET
OPERATOR/ASSISTANT DAVIS/MARRIGAL

UNIT 4 TEST NO. 4-4-8A METHOD SCAQMD 5.3 PAGE 3 OF 3
TEST CONDITION AMB. TEMP., °F PROJECT # 10582
METER VOL. (START/END) / DATE 15 SEPT 92

**PRE-TEST DATA:**
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = 2.2 x ΔP

**EQUIPMENT INFO:**
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | - | = |
| #2 | | | - | = |
| #3 | | | - | = |
| #4 | | | - | = |
| #5 | | | | = |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B 1 | 1607 | 0.25 | 0.53 | 693.427 | 239 | 63 | 97 | 91 | | | 5.6 | 6 | 1.0 |
| B 2 | 1610 | 0.25 | 0.53 | 694.853 | 240 | 61 | 100 | 91 | | | 5.6 | 6 | |
| B 3 | 1613 | 0.34 | 0.71 | 696.225 | 235 | 61 | 98 | 91 | | | 5.5 | 7 | |
| B 4 | 1616 | 0.31 | 0.65 | 697.615 | 237 | 61 | 96 | 91 | | | 5.5 | 6.5 | |
| B 5 | 1619 | 0.55 | 1.16 | 698.952 | 231 | 62 | 99 | 91 | | | 4.9 | 10 | |
| B 6 | 1622 | 0.53 | 1.11 | 700.805 | 231 | 62 | 100 | 91 | | | 4.9 | 11 | |
| B 7 | 1625 | 0.53 | 1.17 | 702.133 | 232 | 62 | 100 | 91 | | | 4.9 | 12 | |
| STOP | 1628 | | | 704.340 | | | | | | | | | |
| | | | | | | | | | | | | | |
| A 1 | 1631 | 0.33 | 0.73 | 704.840 | 240 | 63 | 98 | 89 | | | 5.0 | 7.5 | 1.0 |
| A 2 | 1634 | 0.29 | 0.64 | 706.653 | 241 | 62 | 97 | 90 | | | 5.0 | 7 | |
| A 3 | 1637 | 0.56 | 1.23 | 707.985 | 240 | 63 | 99 | 90 | | | 4.2 | 12 | |
| A 4 | 1640 | 0.51 | 1.12 | 709.712 | 236 | 61 | 100 | 90 | | | 4.2 | 12 | |
| A 5 | 1643 | 0.59 | 1.30 | 711.495 | 221 | 62 | 100 | 91 | | | 4.5 | 13 | |
| A 6 | 1646 | .58 | 1.27 | 713.5 | 221 | 62 | 99 | 90 | | | 4.4 | 13 | |
| A 7 | 1649 | 0.60 | 1.32 | 715.485 | 222 | 63 | 98 | 90 | | | 4.4 | 14 | |
| STOP | 1652 | | | 717.300 | | | | | | | | | |

| CHAIN OF CUSTODY INFORMATION |
|---|
| Impingers Loaded |
| Impingers Recovered |
| Filter Loaded |
| Filter Recovered |
| Probe Wash |
| **TEST SUMMARY** |
| Calculated by: |
| Checked by: |
| Sample Vol., c.f. |
| Stack Press., iwg |
| ΔH, iwg |
| ΔP, iwg |
| Meter Temp., °F |
| Stack Temp., °F |
| Water Collected, g |
| $O_2/CO_2$ |
| Comments: |

ΔH = .34
CFM = 7.169 .3414
.5831 12.2444 1.477 .983

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/ALAMITOS UNIT 4 TEST NO. 5-4-PM METHOD SCAQMD 5.3 PAGE 1 OF 3
SAMPLE LOCATION STACK TEST CONDITION/[redacted] MW AMB. TEMP., °F _____ PROJECT # 17582
OPERATOR/ASSISTANT RM/JP METER VOL. (START/END) 720.676 / 1 DATE 9/18/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 29.89 |
| Assumed Stack Press. | -1.0 |
| Assumed Moisture | 10 |
| Assumed Molecular Wt. | 29.4 |
| Assumed ΔP | .1 |
| Assumed ΔH | .3 |
| Stack Diameter, in. | 452.3 |
| Sample Time: Total | 126 |
| per point | 3 |
| Total of Traverse Points | 42 |

ΔH = 3.0 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | ES28 |
| Meter, Yd. | 1.0 |
| CFM @ ΔH = 1.0 | .558 |
| Pitot ID, Cp | .84 |
| $O_2/CO_2$ Method | PORTABLE |
| Teflon Connecting Line (Y/N) | Y |
| Probe: Mat'l | TEFLON |
| Probe: Length | |
| Nozzle: Mat'l | SS |
| Nozzle: Diam. | 0.251 |
| Filter: No. | 47-469 |
| Filter: Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | DI $H_2O$ | 717.5 | 634.9 | 82.60 |
| #2 | DI $H_2O$ | 602.5 | 600.4 | 2.10 |
| #3 | — | 494.2 | 492.7 | 1.5 |
| #4 | SG | 649.9 | 641.5 | 8.4 |
| #5 | | | | |
| Total | | | | 94.6 |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | .001 | 15 | ✓ | JP/RM |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E 1 | 2200 | .1 | .3 | 720.676 | 183 | | 85 | 85 | | 61 | 10 | 2 | — |
| 2 | 2203 | .1 | .3 | 721.59 | 178 | | 88 | 85 | | 58 | — | 2 | — |
| 3 | 2206 | .09 | .28 | 722.57 | 177 | | 89 | 86 | | 58 | 10 | 2 | — |
| 4 | 2209 | .1 | .32 | 723.55 | 177 | | 90 | 87 | | 57 | 10 | 2 | -.1 |
| 5 | 2212 | .11 | .35 | 724.54 | 176 | | 90 | 88 | | 57 | 10.5 | 2 | — |
| 6 | 2215 | .13 | .41 | 725.61 | 171 | | 91 | 88 | | 57 | 11 | 3 | — |
| 7 | 2218 | .14 | .44 | 726.69 | 172 | | 91 | 88 | | 57 | 11 | 3 | — |
| E 1 | 2223 | .13 | .41 | 727.845 | 175 | | 88 | 87 | | 60 | 11.5 | 3 | — |
| 2 | 2226 | .1 | .32 | 728.96 | 178 | | 90 | 88 | | 59 | 12 | 3 | — |
| 3 | 2229 | .1 | .32 | 729.99 | 168 | | 89 | 88 | | 59 | 12 | 3 | — |
| 4 | 2232 | .1 | .32 | 730.96 | 165 | | 89 | 88 | | 59 | 11.5 | 3 | -.12 |
| 5 | 2235 | .11 | .35 | 731.98 | 162 | | 89 | 88 | | 59 | 12.5 | 3 | — |
| 6 | 2238 | .11 | .35 | 733.09 | 160 | | 89 | 88 | | 60 | — | 3 | — |
| 7 | 2241 | .1 | .32 | 734.06 | 159 | | 89 | 88 | | 60 | 12 | 3 | — |
| D 1 | 2246 | .02 | .06 | 735.064 | 169 | | 85 | 88 | | 63 | 12 | 1 | — |
| 2 | 2249 | .07 | .21 | 735.54 | 163 | | 85 | 88 | | 62 | 12.5 | 2 | — |
| 3 | 2252 | .05 | .15 | 736.31 | 162 | | 85 | 87 | | 61 | 12.5 | 1 | — |
| 4 | 2255 | .06 | .18 | 736.95 | 162 | | 85 | 87 | | 61 | 12.5 | 1 | -.1 |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | KJ |
| Impingers Recovered | EF/KJ |
| Filter Loaded | KJ |
| Filter Recovered | EF/KJ |
| Probe Wash | RM/JP |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | [illegible] |
| Checked by: | [illegible] |
| Sample Vol., c.f. | 37.785 ✓ |
| Stack Press., iwg | 0.06 |
| ΔH, iwg | 0.27 |
| ΔP, iwg | 0.0869 |
| Meter Temp., °F | 86.4 ✓ |
| Stack Temp., °F | 169.0 |
| Water Collected, g | 94.6 |
| $O_2/CO_2$ | 11.5 / [illegible] |
| Comments: | |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE/ALAMITOS
SAMPLE LOCATION: STACK
OPERATOR/ASSISTANT: RM/DP

UNIT: 4 TEST NO.: S-4-PM METHOD: 5.3 PAGE 2 OF 3
TEST CONDITION: NO AMB. TEMP., °F: PROJECT #: 12587
METER VOL. (START/END): / DATE: 9/18/92

**PRE-TEST DATA:**
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = 82.8 x ΔP

**EQUIPMENT INFO:**
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting
Line (Y/N)
Probe: Mat'l — SEE
Length
Nozzle: Mat'l
Diam.
Filter: No. — PAGE
Mat'l — #2

| Imp. | Mat'l | Wt.(End) | | Wt.(Start) | | Wt.(g) |
|---|---|---|---|---|---|---|
| #1 | | | - | | = | |
| #2 | | | - | | = | |
| #3 | | | - | | = | |
| #4 | | | - | | = | |
| #5 | | | - | | = | |
| Total | | | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D 5 | 2258 | .11 | .33 | 737.79 | 159 | | 87 | 87 | | 60 | 13 | 2 | — |
| 6 | 2301 | .1 | .3 | 738.76 | 158 | | 88 | 87 | | 59 | 12.5 | 2 | — |
| 7 | 2304 | .11 | .33 | 739.74 | 158 | | 87 | 87 | | 59 | 13 | 2 | — |
| C 1 | 2309 | .02 | .06 | 740.744 | 170 | | 83 | 86 | | 62 | 12.5 | 1 | — |
| 2 | 2312 | .01 | .03 | 741.18 | 172 | | 83 | 86 | | 63 | 11.5 | 1 | — |
| 3 | 2315 | .01 | .03 | 741.51 | 172 | | 83 | 86 | | 64 | 11.5 | 1 | — |
| 4 | 2318 | .03 | .18 | 741.89 | 164 | | 84 | 88 | | 63 | 12 | 1 | -.06 |
| 5 | 2321 | .11 | .33 | 742.57 | 161 | | 86 | 87 | | 60 | 12 | 2 | — |
| 6 | 2324 | .12 | .36 | 743.44 | 161 | | 87 | 87 | | 59 | 12 | 2 | — |
| 7 | 2327 | .12 | .33 | 744.48 | 161 | | 88 | 87 | | 59 | 12.5 | 2 | — |
| B 1 | 2332 | .09 | .25 | 745.476 | 175 | | 84 | 87 | | 61 | 11 | 2 | — |
| 2 | 2335 | .08 | .22 | 746.35 | 178 | | 85 | 87 | | 59 | 10.5 | 2 | — |
| 3 | 2338 | .07 | .19 | 747.15 | 171 | | 85 | 86 | | 59 | 11.5 | 1 | — |
| 4 | 2341 | .09 | .25 | 747.92 | 169 | | 84 | 86 | | 59 | 11.5 | 2 | -.09 |
| 5 | 2344 | .11 | .3 | 748.84 | 169 | | 85 | 86 | | 59 | 11 | 2 | — |
| 6 | 2347 | .13 | .36 | 749.86 | 164 | | 85 | 86 | | 59 | 11.5 | 2 | — |
| 7 | 2350 | .13 | .36 | 750.87 | 164 | | 86 | 85 | | 59 | 11.5 | 2 | — |
| A 1 | 2356 | .08 | .22 | 752.105 | 178 | | 81 | 84 | | 61 | 11 | 1 | — |

| CHAIN OF CUSTODY INFORMATION |
|---|
| Impingers Loaded |
| Impingers Recovered |
| Filter Loaded |
| Filter Recovered |
| Probe Wash |
| **TEST SUMMARY** |
| Calculated by: |
| Checked by: |
| Sample Vol., c.f. |
| Stack Press., iwg |
| ΔH, iwg |
| ΔP, iwg |
| Meter Temp., °F |
| Stack Temp., °F |
| Water Collected, g |
| $O_2/CO_2$ |
| Comments: |

PMF-C

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/ALAMITOS UNIT -1 TEST NO. S-1-PM METHOD 5.3 PAGE 3 OF 3
SAMPLE LOCATION STACK TEST CONDITION MLO AMB. TEMP., °F PROJECT # 12582
OPERATOR/ASSISTANT JB/EM METER VOL. (START/END) / DATE 9/18/92

***PRE-TEST DATA:***
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = _____ x ΔP

***EQUIPMENT INFO:***
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting
Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

SEE PAGE #1

| Imp. | Mat'l | Wt.(End) | | Wt.(Start) | | Wt.(g) |
|---|---|---|---|---|---|---|
| #1 | | | - | | = | |
| #2 | | | - | | = | |
| #3 | | | - | | = | |
| #4 | | | - | | = | |
| #5 | | | - | | = | |
| Total | | | | | | |

***POST TEST INFO:***
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

***SAMPLE TRAIN LEAK CHECK:***

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

***PRE-TEST CALIBRATION CHECK:***

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A 2 | 2359 | .06 | .16 | 752.93 | 180 | | 83 | 85 | | 60 | 11 | 1 | — | Impingers Loaded |
| 3 | 0002 | .06 | .16 | 753.63 | 180 | | 83 | 84 | | 60 | 11 | 1 | — | Impingers Recovered |
| 4 | 0005 | .1 | .28 | 754.31 | 176 | | 84 | 85 | | 60 | 10.5 | 2 | -.1 | Filter Loaded |
| 5 | 0008 | .13 | .36 | 755.25 | 169 | | 85 | 85 | | 59 | 11 | 2 | — | Filter Recovered |
| 6 | 0011 | .14 | .39 | 756.35 | 168 | | 86 | 85 | | 59 | 11 | 2 | — | Probe Wash |
| 7 | 0014 | .13 | .36 | 757.44 | 168 | | 86 | 85 | | 59 | 10.5 | 2 | — | TEST SUMMARY |
| | 0017 | | | 758.471 | | | STOP | | | | | | | Calculated by: |
| | | | | | | | | | | | | | | Checked by: |
| | | | | | | | | | | | | | | Sample Vol., c.f. |
| | | | | | | | | | | | | | | Stack Press., iwg |
| | | | | | | | | | | | | | | ΔH, iwg |
| | | | | | | | | | | | | | | ΔP, iwg |
| | | | | | | | | | | | | | | Meter Temp., °F |
| | | | | | | | | | | | | | | Stack Temp., °F |
| | | | | | | | | | | | | | | Water Collected, g |
| | | | | | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE / Alamitos
SAMPLE LOCATION STACK
OPERATOR/ASSISTANT RM / JP

UNIT 4 TEST NO. 6-4-PM METHOD SCAQMD 5.3 PAGE 1 OF 3
TEST CONDITION 70 MW AMB. TEMP., °F PROJECT # 12582
METER VOL. (START/END) 758.643 / 796.314 DATE 9-19-92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 29.90 |
| Assumed Stack Press. | |
| Assumed Moisture | 15 |
| Assumed Molecular Wt. | 29 |
| Assumed ΔP | 8.6 |
| Assumed ΔH | 8.3 |
| Stack Diameter, in. | 452.3 |
| Sample Time: Total | 126 min |
| per point | 3 min |
| Total of Traverse Points | 42 |

ΔH = 2.8 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | ES-28 |
| Meter, Yd. | 1.00 |
| CFM @ ΔH = 1.0 | .558 |
| Pitot ID, Cp | .84 |
| $O_2/CO_2$ Method | Orsat/CEM |
| Teflon Connecting Line (Y/N) | Y |
| Probe: Mat'l | Teflon |
| Length | 19' |
| Nozzle: Mat'l | SS |
| Diam. | 0.240 |
| Filter: No. | 47-470 |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | DI $H_2O$ | 697.1 | 607.9 | 89.2 |
| #2 | DI $H_2O$ | 632.3 | 629.5 | 2.8 |
| #3 | — | 515.3 | 515.0 | 0.3 |
| #4 | SG | 667.9 | 659.7 | 8.2 |
| #5 | | | | 100.5 |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.008 | 15" | OK | KJ |
| Post-Test | 0.00 | 5" | — | RM |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A-1 | 0100 | .07 | .196 | 758.643 | 179 | | 74 | 78 | | 63 | 13.0 | 2.0 | |
| 2 | 0103 | .07 | .196 | 759.3 | 180 | | 76 | 77 | | 59 | 11.5 | 2.0 | |
| 3 | 0106 | .11 | .308 | 760.1 | 178 | | 76 | 78 | | 58 | 10.5 | 2.0 | |
| 4 | 0109 | .12 | .336 | 761.114 | 174 | | 77 | 77 | | 57 | 10.5 | 2.2 | |
| 5 | 0112 | .11 | .308 | 762.1 | 171 | | 79 | 77 | | 56 | 11.0 | 2.0 | -.11 |
| 6 | 0115 | .14 | .39 | 763.62 | 167 | | 82 | 78 | | 56 | 11.5 | 2.5 | |
| 7 | 0118 | .13 | .36 | 764.1 | 167 | | 80 | 78 | | 56 | 10.5 | 2.2 | |
| STOP | 0121 | | | 765.205 | | | | | | | | | |
| B-1 | 0123 | .09 | .252 | 765.205 | 173 | | 77 | 79 | | 58 | 11.5 | 2.0 | |
| 2 | 0126 | .10 | .28 | 766.0 | 176 | | 78 | 79 | | 57 | 11.0 | 2.0 | |
| 3 | 0129 | .09 | .252 | 766.7 | 172 | | 78 | 79 | | 57 | 11.0 | 2.0 | -.10 |
| 4 | 0132 | .10 | .28 | 767.685 | 167 | | 79 | 79 | | 57 | 11.5 | 2.0 | |
| 5 | 0135 | .14 | .392 | 768.62 | 163 | | 80 | 79 | | 57 | 11.5 | 2.8 | |
| 6 | 0138 | .13 | .36 | 769.7 | 163 | | 81 | 80 | | 58 | 11.5 | 2.5 | |
| 7 | 0141 | .13 | .36 | 770.8 | 163 | | 82 | 80 | | 58 | 11.5 | 2.5 | |
| STOP | 0144 | | | 771.815 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | EG |
| Impingers Recovered | |
| Filter Loaded | |
| Filter Recovered | |
| Probe Wash | |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | BAC |
| Checked by: | |
| Sample Vol., c.f. | 37.671 |
| Stack Press., iwg | 0.1183 |
| ΔH, iwg | 0.275 |
| ΔP, iwg | ~~0.1029~~ 1.54 |
| Meter Temp., °F | 79.95 |
| Stack Temp., °F | 167.7 |
| Water Collected, g | 100.5 |
| $O_2/CO_2$ | 11.6 / 5.1 |
| Comments: | |

MF-05

CARNOT

# SAMPLE TRAIN TEST DATA

~~1439~~ 1438

CLIENT: SCE/ Alamitos
SAMPLE LOCATION: Stack
OPERATOR/ASSISTANT: RM/JP

UNIT: 4
TEST NO.: 6-4-PM
METHOD: SCAQMD 5.3
PAGE 2 OF 3
TEST CONDITION: 70 MW
AMB. TEMP., °F:
PROJECT #: 12582
METER VOL. (START/END):
DATE: 9-19-92

**PRE-TEST DATA:**
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = _____ x ΔP

**EQUIPMENT INFO:**
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | |
| #2 | | | | |
| #3 | | | | |
| #4 | | | | |
| #5 | | | | |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

See Pg 1

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C-1 | 0146 | .03 | .084 | 771.815 | 167 | | 77 | 80 | | 60 | 12.5 | 1.0 | | Impingers Loaded |
| 2 | 0149 | .04 | .112 | 772.3 | 168 | | 78 | 80 | | 60 | 11.7 | 1.6 | | Impingers Recovered |
| 3 | 0152 | .06 | .168 | 772.9 | 164 | | 79 | 80 | | 59 | 12.5 | 1.4 | | Filter Loaded |
| 4 | 0155 | .07 | .196 | 773.5 | 162 | | 79 | 80 | | 59 | 12.5 | 1.5 | -.11 | Filter Recovered |
| 5 | 0158 | .13 | .364 | 774.39 | 161 | | 80 | 81 | | 58 | 12.0 | 2.8 | | Probe Wash |
| 6 | 0201 | .14 | .392 | 775.4 | 160 | | 82 | 81 | | 57 | 12.0 | 2.8 | | TEST SUMMARY |
| 7 | 0204 | .13 | .364 | 776. | 160 | | 83 | 81 | | 56 | 12.5 | 2.5 | | Calculated by: |
| STOP | 0207 | | | 777.564 | | | | | | | | | | Checked by: |
| D-1 | 0210 | .03 | .084 | 777.564 | 164 | | 78 | 81 | | 61 | 12.0 | 1.0 | | Sample Vol., c.f. |
| 2 | 0213 | .03 | .084 | 778.0 | 167 | | 78 | 81 | | 60 | 12.0 | 1.0 | | Stack Press., iwg |
| 3 | 0216 | .06 | .168 | 778.5 | 166 | | 78 | 81 | | 59 | 12.5 | 1.4 | | ΔH, iwg |
| 4 | 0219 | .06 | .168 | 779.3 | 159 | | 79 | 81 | | 57 | 12.5 | 1.4 | -.11 | ΔP, iwg |
| 5 | 0222 | .11 | .308 | 780.0 | 159 | | 80 | 81 | | 57 | 12.5 | 2.0 | | Meter Temp., °F |
| 6 | 0225 | .10 | .28 | 781.0 | 156 | | 81 | 81 | | 56 | 13.0 | 2.0 | | Stack Temp., °F |
| 7 | 0228 | .09 | .252 | 781.9 | 156 | | 82 | 81 | | 56 | 13.0 | 2.0 | | Water Collected, g |
| STOP | 0231 | | | 782.828 | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |

PMF-057

,5404

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/Alamitos
SAMPLE LOCATION stack
OPERATOR/ASSISTANT RM/JP

UNIT 4 TEST NO. 6-4-PM METHOD SCAQMD 5.3 PAGE 3 OF 3
TEST CONDITION 70 MW AMB. TEMP., °F PROJECT # 12582
METER VOL. (START/END) / DATE 9-19-92

**PRE-TEST DATA:**
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = _____ x ΔP

**EQUIPMENT INFO:**
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | |
| #2 | | | | |
| #3 | | | | |
| #4 | | | | |
| #5 | | | | |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

SCE Pg 0

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. Iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E-1 | 0233 | .09 | .252 | 782.828 | 174 | | 79 | 81 | | 58 | 11.5 | 2.0 | | Impingers Loaded |
| 2 | 0236 | .10 | .28 | 783.6 | 175 | | 80 | 81 | | 58 | 11.5 | 2.0 | | Impingers Recovered |
| 3 | 0239 | .11 | .308 | 784.6 | 173 | | 81 | 81 | | 56 | 12.0 | 2.0 | -.15 | Filter Loaded |
| 4 | 0242 | .10 | .28 | 785.6 | 163 | | 81 | 82 | | 56 | 11.5 | 2.0 | | Filter Recovered |
| 5 | 0245 | .12 | .336 | 786.5 | 160 | | 81 | 81 | | 56 | 12.0 | 2.8 | | Probe Wash |
| 6 | 0248 | .11 | .308 | 787.62 | 157 | | 82 | 82 | | 56 | 12.5 | 2.0 | | TEST SUMMARY |
| 7 | 0251 | .10 | .28 | 788.5 | 156 | | 82 | 82 | | 57 | 11.5 | 2.0 | | Calculated by: BAC |
| STOP | 0254 | | | 789.485 | | | | | | | | | | Checked by: |
| F-1 | 0256 | .10 | .28 | 789.485 | 181 | | 80 | 82 | | 58 | 10.5 | 2.0 | | Sample Vol., c.f. |
| 2 | 0259 | .11 | .308 | 790.3 | 181 | | 80 | 81 | | 57 | 10.2 | 2.2 | | Stack Press., iwg |
| 3 | 0302 | .11 | .308 | 791.36 | 180 | | 81 | 81 | | 56 | 10.0 | 2.2 | -.13 | ΔH, iwg |
| 4 | 0305 | .10 | .28 | 792.3 | 174 | | 81 | 81 | | 56 | 9.8 | 2.0 | | ΔP, iwg |
| 5 | 0308 | .12 | .336 | 793.23 | 174 | | 81 | 81 | | 56 | 11.0 | 2.5 | | Meter Temp., °F 79.45 |
| 6 | 0311 | .13 | .364 | 794.2 | 167 | | 82 | 83 | | 56 | 11.0 | 3.0 | | Stack Temp., °F |
| 7 | 0314 | .12 | .336 | 795.3 | 166 | | 83 | 82 | | 55 | 10.5 | 2.5 | | Water Collected, g |
| STOP | 0317 | | | 796.314 | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |

MF-05

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/Mamitos | UNIT 4 | TEST NO. 7-4-PM | METHOD SCAQMD 5.3 | PAGE 1 OF
SAMPLE LOCATION STACK | TEST CONDITION 70MW | AMB. TEMP., °F | PROJECT # 12582
OPERATOR/ASSISTANT JP/RM | METER VOL. (START/END) | DATE 9/19/82

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 28.89 |
| Assumed Stack Press. | +0.2 |
| Assumed Moisture | 10 |
| Assumed Molecular Wt. | 29.4 |
| Assumed ΔP | 0.2 |
| Assumed ΔH | 0.3 |
| Stack Diameter, in. | 4.523 |
| Sample Time: Total | 120 |
| per point | 3 |
| Total of Traverse Points | 40 |

ΔH = ~~2.8~~ 2.9 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | ES28 |
| Meter, Yd. | 1.00 |
| CFM @ ΔH = 1.0 | .558 |
| Pitot ID, Cp | .84 |
| $O_2/CO_2$ Method | PORTABLE |
| Teflon Connecting Line (Y/N) | Y |
| Probe: Mat'l | TEFLON |
| Probe: Length | 19 |
| Nozzle: Mat'l | SS |
| Nozzle: Diam. | 0.320 |
| Filter: No. | 47-463 |
| Filter: Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | $H_2O$ | 727.8 | 639.1 | 88.7 |
| #2 | $H_2O$ | 601.7 | 598.5 | 3.2 |
| #3 | — | 494.3 | 493.1 | 1.2 |
| #4 | SG | 663.3 | 656.5 | 6.8 |
| #5 | | | | |
| Total | | | | 99.9 |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | .01 | 10" | ✓ | JP |
| Post-Test | .008 | 5" | — | JP |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F 1 | 0400 | .1 | .28 | 796.438 | 183 | | 69 | 71 | | 60 | 12.5 | 2 | — | Impingers Loaded KJ |
| 2 | 0403 | .11 | .3 | 797.41 | 183 | | 71 | 71 | | 54 | 12 | 2 | — | Impingers Recovered KJ |
| 3 | 0406 | .1 | .28 | 798.29 | 176 | | 72 | 71 | | 53 | 10 | 2 | — | Filter Loaded KJ |
| 4 | 0409 | .1 | .28 | 799.18 | 175 | | 73 | 71 | | 53 | 10 | 2 | -.1 | Filter Recovered |
| 5 | 0412 | .11 | .3 | 800.04 | 170 | | 74 | 72 | | 52 | 11 | 2 | — | Probe Wash JP/RM |
| 6 | 0415 | .12 | .33 | 801.04 | 165 | | 76 | 72 | | 51 | 11 | 2 | — | TEST SUMMARY |
| 7 | 0418 | .11 | .3 | 802.01 | 164 | | 76 | 73 | | 52 | 11 | 2 | — | Calculated by: |
| E 1 | 0423 | .09 | .25 | 802.939 | 171 | | 74 | 74 | | 55 | 11.5 | 2 | — | Checked by: |
| 2 | 0426 | .09 | .25 | 803.83 | 174 | | 76 | 75 | | 53 | 11 | 2 | — | Sample Vol., c.f. 37.117 |
| 3 | 0429 | .11 | .3 | 804.72 | 163 | | 77 | 75 | | 52 | 11.5 | 2 | — | Stack Press., iwg -0.12 |
| 4 | 0432 | .11 | .3 | 805.68 | 163 | | 77 | 78 | | 52 | 12 | 2 | -.1 | ΔH, iwg 0.2738 |
| 5 | 0435 | .11 | .3 | 806.68 | 160 | | 78 | 76 | | 52 | 11.5 | 2 | — | ΔP, iwg 0.0982 |
| 6 | 0438 | .1 | .28 | 807.58 | 157 | | 78 | 77 | | 52 | 11.5 | 2 | — | Meter Temp., °F |
| 7 | 0441/0444 | .11 | .3 | 808.51 | 157 | | 78 | 77 | | 52 | 11.5 | 2 | — | Stack Temp., °F 165.67 |
| D 1 | 0446 | .03 | .08 | 809.434 | 164 | | 74 | 76 | | 56 | 12 | 1 | — | Water Collected, g |
| 2 | 0449 | .03 | .08 | 809.85 | 166 | | 79 | 79 | | 55 | 12 | 1 | — | $O_2/CO_2$ 11.6 |
| 3 | 0452 | .07 | .20 | 810.33 | 160 | | 76 | 77 | | 56 | 12.5 | 1 | — | Comments: |
| 4 | 0455 | .08 | .23 | 811.06 | 158 | | 77 | 78 | | 54 | 12.5 | 2 | -.1 | |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE / ALAMITOS
SAMPLE LOCATION: STACK
OPERATOR/ASSISTANT: JP / RM

UNIT: 4
TEST NO.: 7-4-PM
METHOD: 5.3
PAGE 2 OF 3
TEST CONDITION: 70,440
AMB. TEMP., °F:
PROJECT #: 12582
METER VOL. (START/END):
DATE: 9/19/92

**PRE-TEST DATA:**
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = 2.9 x ΔP

**EQUIPMENT INFO:**
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l
SEE PAGE 27

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | |
| #2 | | | | |
| #3 | | | | |
| #4 | | | | |
| #5 | | | | |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D 5 | 0458 | .11 | .31 | 811.91 | 156 | | 79 | 78 | | 53 | 12.5 | 2 | — |
| 6 | 0501 | .1 | .29 | 812.87 | 155 | | 80 | 78 | | 53 | 12.5 | 2 | — |
| 7 | 0504/0507 | .1 | .29 | 813.78 | 155 | | 80 | 79 | | 53 | 12.5 | 2 | — |
| C 1 | 0509 | .03 | .08 | 814.613 | 159 | | 76 | 78 | | 57 | 12.5 | 1 | — |
| 2 | 0512 | .04 | .12 | 815.16 | 167 | | 76 | 79 | | 56 | 11.5 | 1 | — |
| 3 | 0515 | .06 | .17 | 815.63 | 161 | | 78 | 79 | | 55 | 12.5 | 1 | — |
| 4 | 0518 | .06 | .17 | 816.44 | 160 | | 78 | 79 | | 55 | 12.5 | 1 | -.2 |
| 5 | 0521 | .12 | .34 | 817.14 | 158 | | 80 | 79 | | 55 | 12 | 2 | — |
| 6 | 0524 | .14 | .40 | 818.21 | 159 | | 81 | 80 | | 54 | 12.5 | 2 | — |
| 7 | 0527/0530 | .14 | .4 | 819.27 | 158 | | 81 | 80 | | 54 | 12.5 | 2 | — |
| B 1 | 0532 | .05 | .14 | 820.36 | 167 | | 77 | 79 | | 57 | 12.5 | 1 | — |
| 2 | 0535 | .06 | .17 | 821.01 | 176 | | 78 | 79 | | 56 | 11 | 1 | — |
| 3 | 0538 | .11 | .31 | 821.69 | 168 | | 80 | 80 | | 55 | 11.5 | 1 | — |
| 4 | 0541 | .09 | .26 | 822.67 | 165 | | 80 | 81 | | 55 | 11.5 | 1 | -.11 |
| 5 | 0544 | .08 | .23 | 823.57 | 163 | | 81 | 80 | | 55 | 11 | 2 | — |
| 6 | 0547 | .14 | .4 | 824.51 | 162 | | 82 | 81 | | 55 | 11.5 | 2 | — |
| | 0550 | .14 | .4 | 825.59 | 162 | | 83 | 81 | | 55 | 12 | 2 | — |
| A 1 | 10:56 | .08 | .3 | [illegible] | 17[illegible] | | 7[illegible] | 30 | | 57 | 11 | 1 | — |

| CHAIN OF CUSTODY INFORMATION |
|---|
| Impingers Loaded |
| Impingers Recovered |
| Filter Loaded |
| Filter Recovered |
| Probe Wash |
| **TEST SUMMARY** |
| Calculated by: |
| Checked by: |
| Sample Vol., c.f. |
| Stack Press., iwg |
| ΔH, iwg |
| ΔP, iwg |
| Meter Temp., °F |
| Stack Temp., °F |
| Water Collected, g |
| $O_2/CO_2$ |
| Comments: |

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/A UNIT 4 TEST NO. 2-4-PM METHOD 5.3 PAGE 3 OF 3
SAMPLE LOCATION TEST CONDITION 70 MW AMB. TEMP., °F PROJECT # 12582
OPERATOR/ASSISTANT METER VOL. (START/END) / DATE 9/19/92

***PRE-TEST DATA:***

| | |
|---|---|
| Barometric Press., in. Hg. | |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | |
| Sample Time: Total | |
| per point | |
| Total of Traverse Points | |

ΔH = _____ x ΔP

***EQUIPMENT INFO:***

| | |
|---|---|
| Meter No. | |
| Meter, Yd. | |
| CFM @ ΔH = 1.0 | |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | |
| Teflon Connecting | |
| Line (Y/N) | |
| Probe: Mat'l | |
| Length | |
| Nozzle: Mat'l | |
| Diam. | |
| Filter: No. | |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | | Wt.(Start) | | Wt.(g) |
|---|---|---|---|---|---|---|
| #1 | | | - | | = | |
| #2 | | | - | | = | |
| #3 | | | - | | = | |
| #4 | | | - | | = | |
| #5 | | | - | | = | |
| Total | | | | | | |

***POST TEST INFO:***

| | |
|---|---|
| Filter Appearance | |
| Impinger Appearance | |
| Silica Gel Spent (Y/N) | |

***SAMPLE TRAIN LEAK CHECK:***

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

***PRE-TEST CALIBRATION CHECK:***

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A 2 | 0559 | .08 | .23 | 827.54 | 178 | | 79 | 80 | | 56 | 11 | 1 | – | Impingers Loaded |
| 3 | 0602 | .12 | .34 | 828.36 | 173 | | 80 | 81 | | 55 | 11 | 2 | – | Impingers Recovered |
| 4 | 0605 | .11 | .31 | 829.34 | 173 | | 81 | 81 | | 55 | 10.5 | 2 | -.12 | Filter Loaded |
| 5 | 0608 | .14 | .4 | 830.31 | 164 | | 80 | 80 | | 55 | 11 | 2 | – | Filter Recovered |
| 6 | 0611 | .15 | .43 | 831.25 | 165 | | 80 | 81 | | 54 | 11 | 2 | – | Probe Wash |
| 7 | 0614 | .15 | .43 | 832.43 | 165 | | 80 | 80 | | 54 | 11.5 | 3 | – | TEST SUMMARY |
| | 0617 | | | 833.555 | | | STOP | | | | | | | Calculated by: |
| | | | | | | | ? | | | | | | | Checked by: |
| | | | | | | | | | | | | | | Sample Vol., c.f. |
| | | | | | | | | | | | | | | Stack Press., iwg |
| | | | | | | | | | | | | | | ΔH, iwg |
| | | | | | | | | | | | | | | ΔP, iwg |
| | | | | | | | | | | | | | | Meter Temp., °F |
| | | | | | | | | | | | | | | Stack Temp., °F |
| | | | | | | | | | | | | | | Water Collected, g |
| | | | | | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |

PMF-057

14899

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE | Alamitos
SAMPLE LOCATION: AQH outlet
OPERATOR/ASSISTANT: RM/JP
UNIT: 4
TEST NO.: 8-4-PM
METHOD: Swamp 5.3
PAGE 1 OF 3
TEST CONDITION:
AMB. TEMP., °F:
PROJECT # 12582
METER VOL. (START/END):
DATE: 9/19/02

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 28.89 |
| Assumed Stack Press. | -.12 |
| Assumed Moisture | 11 |
| Assumed Molecular Wt. | 28 |
| Assumed ΔP | .1 |
| Assumed ΔH | .3 |
| Stack Diameter, in. | 52.3 |
| Sample Time: Total | 126 min |
| per point | 3 min |
| Total of Traverse Points | 42 |

ΔH = 2.8 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | ES-28 |
| Meter, Yd. | 1.00 |
| CFM @ ΔH = 1.0 | .358 |
| Pitot ID, Cp | .84 |
| $O_2/CO_2$ Method | Fort/CEM |
| Teflon Connecting | Y |
| Line (Y/N) | Y |
| Probe: Mat'l | Ref. |
| Length | 19' |
| Nozzle: Mat'l | SS |
| Diam. | .251 |
| Filter: No. | 47-445 |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | $0H_2O$ | 694.5 | 614.3 | 80.20 |
| #2 | $0H_2O$ | 636.4 | 634.7 | 1.7 |
| #3 | – | 517.2 | 516.1 | 1.1 |
| #4 | SG | 684.8 | 675.4 | 9.4 |
| #5 | | | | |
| Total | | | | 92.4 |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.01 | 10" | – | JP |
| Post-Test | 0.00 | 5" | – | RM |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A-1 | 0650 | .06 | .168 | 833.688 | 177 | | 67 | 69 | | 58 | 13.5 | 1.2 | |
| 2 | 0653 | .06 | .168 | 834.42 | 177 | | 68 | 70 | | 54 | 11.0 | 1.2 | |
| 3 | 0656 | .10 | .28 | 835.1 | 176 | | 70 | 70 | | 52 | 11.5 | 2.5 | |
| 4 | 0659 | .09 | .252 | 836.0 | 172 | | 72 | 71 | | 51 | 10.5 | 2.0 | -.11 |
| 5 | 0702 | .11 | .308 | 836.92 | 167 | | 73 | 71 | | 50 | 11.0 | 2.5 | |
| 6 | 0705 | .12 | .336 | 837.8 | 165 | | 75 | 72 | | 50 | 11.5 | 2.5 | |
| 7 | 0708 | .11 | .308 | 838.905 | 166 | | 76 | 73 | | 50 | 11.0 | 2.0 | |
| STOP | 0711 | | | 839.861 | | | | | | | | | |
| B-1 | 0713 | .06 | .168 | 839.861 | 173 | | 74 | 74 | | 54 | 11.0 | 1.5 | |
| 2 | 0716 | .07 | .196 | 840.6 | 175 | | 76 | 74 | | 52 | 11.0 | 1.5 | |
| 3 | 0719 | .07 | .196 | 841.3 | 169 | | 77 | 75 | | 52 | 11.0 | 1.5 | |
| 4 | 0722 | .06 | .168 | 842.12 | 166 | | 77 | 76 | | 53 | 11.0 | 1.2 | |
| 5 | 0725 | .11 | .308 | 842.85 | 162 | | 78 | 76 | | 53 | 11.5 | 2.5 | -.12 |
| 6 | 0728 | .12 | .336 | 843.83 | 161 | | 80 | 77 | | 52 | 11.8 | 2.5 | |
| 7 | 0731 | .11 | .308 | 844.86 | 161 | | 80 | 77 | | 52 | 11.0 | 2.0 | |
| STOP | 0734 | | | 845.830 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

Impingers Loaded KJ
Impingers Recovered KJ
Filter Loaded KJ
Filter Recovered KJ
Probe Wash RM/JP

**TEST SUMMARY**

Calculated by: [illegible]
Checked by: [illegible]
Sample Vol., c.f. ~~34.844~~
Stack Press., iwg -0.11
ΔH, iwg 0.252
ΔP, iwg ~~0.0793~~
Meter Temp., °F [illegible] 79.5
Stack Temp., °F 166.6
Water Collected, g
$O_2/CO_2$ 11.5 / [illegible] 5.5
Comments:

MF-05

.4147
.2430

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/Alamitos UNIT 4 TEST NO. 8-4-PM METHOD SCAQMD 5.3 PAGE 2 OF 3
SAMPLE LOCATION Stack TEST CONDITION AMB. TEMP., °F PROJECT # 12582
OPERATOR/ASSISTANT RM/JP METER VOL. (START/END) / DATE 9-19-92

***PRE-TEST DATA:***
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = 2.8 x ΔP

***EQUIPMENT INFO:***
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | - | = |
| #2 | | | - | = |
| #3 | | | | |
| #4 | | | | |
| #5 | | | | |
| Total | | | | |

SEE Pg. 1

***POST TEST INFO:***
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

***SAMPLE TRAIN LEAK CHECK:***

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

***PRE-TEST CALIBRATION CHECK:***

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C-1 | 0737 | .03 | .084 | 845.830 | 167 | | 76 | 78 | | 59 | 11.5 | 1.0 | | Impingers Loaded |
| 2 | 0740 | .02 | .056 | 846.3 | 169 | | 76 | 78 | | 58 | 11.5 | 1.0 | | Impingers Recovered |
| 3 | 0743 | .05 | .14 | 846.74 | 165 | | 76 | 78 | | 58 | 11.5 | 1.5 | -.10 | Filter Loaded |
| 4 | 0746 | .04 | .112 | 847.4 | 161 | | 78 | 78 | | 56 | 12.0 | 1.0 | | Filter Recovered |
| 5 | 0749 | .07 | .196 | 848.0 | 160 | | 78 | 79 | | 56 | 12.5 | 1.8 | | Probe Wash |
| 6 | 0752 | .12 | .336 | 848.75 | 159 | | 79 | 79 | | 55 | 12.0 | 2.9 | | TEST SUMMARY |
| 7 | 0755 | .11 | .308 | 849.81 | 159 | | 81 | 79 | | 54 | 11.7 | 2.0 | | Calculated by: |
| STOP | 0758 | | | 850.775 | | | | | | | | | | Checked by: |
| D-1 | 0800 | .02 | .056 | 850.775 | 164 | | 77 | 79 | | 59 | 12.0 | 1.0 | | Sample Vol., c.f. |
| 2 | 0803 | .02 | .056 | 851.24 | 165 | | 77 | 80 | | 59 | 12.0 | 1.0 | | Stack Press., iwg |
| 3 | 0806 | .07 | .196 | 551.7 | 164 | | 77 | 80 | | 59 | 12.0 | 2.0 | -.10 | ΔH, iwg |
| 4 | 0809 | .05 | .14 | 852.54 | 159 | | 80 | 80 | | 57 | 12.5 | 1.0 | | ΔP, iwg |
| 5 | 0812 | .09 | .252 | 853.1 | 158 | | 80 | 80 | | 57 | 12.5 | 2.2 | | Meter Temp., °F |
| 6 | 0815 | .10 | .28 | 854.07 | 156 | | 83 | 82 | | 57 | 12.3 | 2.2 | | Stack Temp., °F |
| 7 | 0818 | .08 | .224 | 854.99 | 156 | | 83 | 81 | | 56 | 12.5 | | | Water Collected, g |
| STOP | 0821 | | | 855.878 | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |
| | | | | | | | | | | | | | | |

PMF-057

,5138

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/Alamitos
SAMPLE LOCATION Stack
OPERATOR/ASSISTANT RM/JP

UNIT 4 TEST NO. 8-4-PM METHOD SCAQMD 5.3 PAGE 3 OF 3
TEST CONDITION
AMB. TEMP., °F PROJECT # 12582
METER VOL. (START/END) / DATE 9-19-92

**PRE-TEST DATA:**
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = _____ x ΔP

**EQUIPMENT INFO:**
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | |
| #2 | | | | |
| #3 | | | | |
| #4 | | | | |
| #5 | | | | |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.01 | 10" | — | JP |
| Post-Test | | | — | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E-1 | 0823 | .08 | .224 | 855.878 | 171 | | 81 | 82 | | 61 | 12.3 | 2.0 | | Impingers Loaded |
| 2 | 0826 | .07 | .196 | 856.7 | 174 | | 82 | 82 | | 59 | 11.5 | 1.9 | | Impingers Recovered |
| 3 | 0829 | .11 | .308 | 857.5 | 168 | | 84 | 82 | | 59 | 11.5 | 2.5 | -.11 | Filter Loaded |
| 4 | 0832 | .10 | .28 | 858.5 | 163 | | 85 | 83 | | 59 | 12.0 | 2.0 | | Filter Recovered |
| 5 | 0835 | .11 | .308 | 859.42 | 160 | | 85 | 83 | | 58 | 12.0 | 2.5 | | Probe Wash |
| 6 | 0838 | .10 | .28 | 860.44 | 156 | | 86 | 83 | | 58 | 11.7 | 2.2 | | TEST SUMMARY |
| 7 | 0841 | .09 | .252 | 861.37 | 156 | | 86 | 83 | | 59 | 11.5 | 2.0 | | Calculated by: |
| STOP | 0844 | | | 862.268 | | | | | | | | | | Checked by: |
| F-1 | 0846 | .09 | .252 | 862.268 | 176 | | 82 | 84 | | 63 | 11.5 | 2.2 | | Sample Vol., c.f. |
| 2 | 0849 | .08 | .224 | 863.14 | 183 | | 84 | 84 | | 61 | 9.5 | 2.0 | | Stack Press., iwg |
| 3 | 0852 | .10 | .28 | 863.93 | 177 | | 85 | 84 | | 62 | 10.0 | 2.5 | -.11 | ΔH, iwg |
| 4 | 0855 | .10 | .28 | 864.8 | 175 | | 86 | 84 | | 61 | 10.3 | 2.5 | | ΔP, iwg |
| 5 | 0858 | .09 | .252 | 865.74 | 170 | | 87 | 85 | | 60 | 10.0 | 2.2 | | Meter Temp., °F |
| 6 | 0901 | .11 | .308 | 866.567 | 168 | | 87 | 85 | | 60 | 10.5 | 2.5 | | Stack Temp., °F |
| 7 | 0904 | .13 | .364 | 867.50 | 172 | | 88 | 86 | | 60 | 10.5 | 3.0 | | Water Collected, g |
| STOP | 0907 | | | 868.537 | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE / Alamitos
UNIT: 4
TEST NO.: 9-4-PM
METHOD: SCAQMD 5.3
PAGE 1 OF 3
SAMPLE LOCATION: AH-C3
TEST CONDITION: 150 MW
AMB. TEMP., °F:
PROJECT #: 12582
OPERATOR/ASSISTANT: JP / RM
METER VOL. (START/END):
DATE: 9/19/97

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 28.89 |
| Assumed Stack Press. | 1.0 |
| Assumed Moisture | 14 |
| Assumed Molecular Wt. | 14 |
| Assumed ΔP | 0.13 |
| Assumed ΔH | 0.39 |
| Stack Diameter, in. | 152.7 ft² |
| Sample Time: Total | 126 |
| per point | 3 |
| Total of Traverse Points | 42 |

ΔH = 2.4 2.5 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | 28 |
| Meter, Yd. | 1.001 |
| CFM @ ΔH = 1.0 | .1558 |
| Pitot ID, Cp | .84 |
| $O_2/CO_2$ Method | PORTABLE |
| Teflon Connecting Line (Y/N) | Y |
| Probe: Mat'l | TEFLON |
| Probe: Length | 20' |
| Nozzle: Mat'l | SS |
| Nozzle: Diam. | 0.290 |
| Filter: No. | 97-446 |
| Filter: Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | DI+H2O | 767.6 | 621.7 | 145.9 |
| #2 | DI+H2O | 603.4 | 600.1 | 3.3 |
| #3 | — | 496.5 | 495.7 | 0.8 |
| #4 | SG | 660.9 | 648.8 | 12.1 |
| #5 | | | | 162.1 |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.008 | 10" | RM | RM |
| Post-Test | 0.003 | 10" | — | JP |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F 1 | 2133 | .14 | .33 | 868.865 | 220 | | 81 | 81 | | 66 | 6.5 | 3 | — |
| 2 | 2136 | .14 | .33 | 869.89 | 220 | | 84 | 81 | | 66 | 5.5 | 3 | — |
| 3 | 2139 | .12 | .3 | 870.99 | 216 | | 84 | 81 | | 66 | 5.5 | 3 | — |
| 4 | 2142 | .19 | .47 | 871.86 | 215 | | 85 | 81 | | 66 | — | 4 | +.2 |
| 5 | 2145 | .12 | .5 | 873.06 | 214 | | 86 | 83 | | 66 | 5.5 | 4 | — |
| 6 | 2148 | .25 | .62 | 874.38 | 214 | | 86 | 83 | | 67 | 5.5 | 5 | — |
| 7 | 2151/2154 | .25 | .62 | 875.55 | 214 | | 87 | 88 | | 67 | 5.5 | 5 | — |
| E 1 | 2155 | .11 | .25 | 876.811 | 206 | | 80 | 97 | | 66 | 7.5 | 2 | — |
| 2 | 2158 | .12 | .3 | 877.39 | 206 | | 81 | 83 | | 67 | 8 | 3 | — |
| 3 | 2201 | .19 | .47 | 878.36 | 201 | | 82 | 82 | | 66 | 6.5 | 3 | — |
| 4 | 2204 | .17 | .42 | 879.57 | 199 | | 83 | 85 | | 66 | 6.5 | 3 | +.21 |
| 5 | 2207 | .19 | .45 | 880.59 | 199 | | 85 | 82 | | 66 | 7 | 3 | — |
| 6 | 2210 | .16 | .4 | 881.76 | 200 | | 83 | 88 | | 66 | 7.5 | 3 | — |
| 7 | 2213/2216 | .16 | .4 | 882.88 | 199 | | 83 | 82 | | 66 | 7.5 | 3 | — |
| D 1 | 2219 | .01 | .02 | 883.919 | 198 | | 77 | 81 | | 66 | 7.5 | 1 | — |
| 2 | 2222 | .01 | .02 | 884.31 | 197 | | 78 | 80 | | 66 | 8 | 1 | — |
| 3 | 2225 | .00 | .2 | 884.74 | 190 | | 79 | 80 | | 67 | 8.5 | 2 | — |
| 4 | 2228 | .11 | .25 | 885.51 | 188 | | 81 | 80 | | 66 | 9 | 3 | +.15 |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | KJ |
| Impingers Recovered | KJ |
| Filter Loaded | KJ |
| Filter Recovered | KJ |
| Probe Wash | RM / JP |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | SG |
| Checked by: | |
| Sample Vol., c.f. | 43.73 |
| Stack Press., iwg | 0.12 |
| ΔH, iwg | ~~0.246~~ 0.4104 |
| ΔP, iwg | 0.1422 |
| Meter Temp., °F | 81.5 |
| Stack Temp., °F | 196.9 |
| Water Collected, g | |
| $O_2/CO_2$ | 7.1 |
| Comments: | |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE | ALAMITOS
SAMPLE LOCATION Stack
OPERATOR/ASSISTANT JP | RM
UNIT 4
TEST NO. 9-4-PM
METHOD 5.3
PAGE 2 OF 2 3
TEST CONDITION 150 MW
AMB. TEMP., °F
PROJECT # 12582
METER VOL. (START/END) /
DATE 9/19/92

**PRE-TEST DATA:**
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = 2.5 3.0 x ΔP

**EQUIPMENT INFO:**
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

SEE PROBE #1

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | |
| #2 | | | | |
| #3 | | | | |
| #4 | | | | |
| #5 | | | | |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D 5 | 2231 | .1 | .25 | 886.47 | 190 | | 81 | 84 | | 66 | 9 | 2 | – | Impingers Loaded |
| 6 | 2234 | .18 | .45 | 887.31 | 189 | | 82 | 81 | | 66 | 8 | 4 | – | Impingers Recovered |
| 7 | 2231/2240 | .2 | .5 | 888.45 | 188 | | 83 | 81 | | 66 | 8.5 | 4 | – | Filter Loaded |
| C 1 | 2242 | .01 | .02 | 889.654 | 194 | | 78 | 80 | | 66 | 8 | 1 | – | Filter Recovered |
| 2 | 2245 | .01 | .02 | 889.97 | 196 | | 77 | 80 | | 66 | 8 | 1 | – | Probe Wash |
| 3 | 2248 | .05 | .12 | 890.29 | 188 | | 77 | 80 | | 65 | 8 | 1 | – | TEST SUMMARY |
| 4 | 2251 | .05 | .12 | 890.88 | 187 | | 78 | 80 | | 65 | 8 | 1 | +.1 | Calculated by: |
| 5 | 2254 | .2 | .5 | 891.53 | 183 | | 80 | 80 | | 65 | 8 | 4 | – | Checked by: |
| 6 | 2257 | .2 | .5 | 892.68 | 183 | | 82 | 80 | | 65 | 8 | 4 | – | Sample Vol., c.f. |
| 7 | 2300/2303 | .23 | .57 | 893.85 | 182 | | 82 | 79 | | 65 | 8.5 | 4 | – | Stack Press., iwg |
| B 1 | 2305 | .11 | .27 | 895.129 | 198 | | 77 | 87 | | 65 | 7 | 3 | – | ΔH, iwg |
| 2 | 2308 | .13 | .32 | 896.07 | 200 | | 80 | 83 | | 65 | 6.5 | 3 | – | ΔP, iwg |
| 3 | 2311 | .13 | .32 | 897.11 | 194 | | 80 | 79 | | 65 | 7 | 3 | – | Meter Temp., °F |
| 4 | 2314 | .12 | .3 | 898.11 | 192 | | 81 | 79 | | 65 | – | 3 | +.18 | Stack Temp., °F |
| 5 | 2317 | .25 | .62 | 899.02 | 186 | | 81 | 79 | | 65 | 7 | 5 | – | Water Collected, g |
| 6 | 2320 | .24 | .72 | 900.33 | 185 | | 83 | 79 | | 65 | 6.5 | 5 | – | $O_2/CO_2$ |
| 7 | 2323/2326 | .25 | .75 | 901.71 | 185 | | 84 | 80 | | 65 | 7 | 5 | – | Comments: |
| A 1 | 2328 | .15 | .45 | 903.186 | 202 | | 77 | 79 | | 66 | 6.5 | 4 | – | |

TMF-05

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE / ALAMITOS  UNIT 4  TEST NO. 9-4-PM  METHOD 5.3  PAGE 3 OF 3
SAMPLE LOCATION STACK  TEST CONDITION  AMB. TEMP., °F  PROJECT # 12582
OPERATOR/ASSISTANT JP / RM  METER VOL. (START/END) /  DATE 9/19/92

***PRE-TEST DATA:***

| | |
|---|---|
| Barometric Press., in. Hg. | |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | |
| Sample Time: Total | |
| per point | |
| Total of Traverse Points | |

ΔH = _____ x ΔP

***EQUIPMENT INFO:***

| | |
|---|---|
| Meter No. | |
| Meter, Yd. | |
| CFM @ ΔH = 1.0 | |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | |
| Teflon Connecting Line (Y/N) | |
| Probe: Mat'l | |
| Length | SEE |
| Nozzle: Mat'l | PAGE |
| Diam. | |
| Filter: No. | |
| Mat'l | #2 |

| Imp. | Mat'l | Wt.(End) | | Wt.(Start) | | Wt.(g) |
|---|---|---|---|---|---|---|
| #1 | | | - | | = | |
| #2 | | | - | | = | |
| #3 | | | - | | = | |
| #4 | | | - | | = | |
| #5 | | | - | | = | |
| Total | | | | | | |

***POST TEST INFO:***

| | |
|---|---|
| Filter Appearance | |
| Impinger Appearance | |
| Silica Gel Spent (Y/N) | |

***SAMPLE TRAIN LEAK CHECK:***

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

***PRE-TEST CALIBRATION CHECK:***

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 2332 | .15 | .45 | 904.35 | 203 | | 81 | 80 | | 65 | 6.5 | 4 | – | Impingers Loaded |
| 3 | 2335 | .12 | .60 | 905.52 | 198 | | 82 | 79 | | 65 | 5.5 | 5 | – | Impingers Recovered |
| 4 | 2338 | .2 | .6 | 906.77 | 197 | | 83 | 79 | | 66 | 5.5 | 5 | +.24 | Filter Loaded |
| 5 | 2341 | .27 | .81 | 908.11 | 186 | | 84 | 79 | | 65 | 6 | 6 | – | Filter Recovered |
| 6 | 2344 | .26 | .78 | 909.59 | 185 | | 85 | 79 | | 65 | 6 | 5 | – | Probe Wash |
| 7 | 2347 | .28 | .84 | 911.04 | 184 | | 85 | 79 | | 63 | 6 | 6 | – | TEST SUMMARY |
| | 2350 | | | 912.595 | | | STOP | | | | | | | Calculated by: |
| | | | | | | | 7 | | | | | | | Checked by: |
| | | | | | | | | | | | | | | Sample Vol., c.f. |
| | | | | | | | | | | | | | | Stack Press., iwg |
| | | | | | | | | | | | | | | ΔH, iwg |
| | | | | | | | | | | | | | | ΔP, iwg |
| | | | | | | | | | | | | | | Meter Temp., °F |
| | | | | | | | | | | | | | | Stack Temp., °F |
| | | | | | | | | | | | | | | Water Collected, g |
| | | | | | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE | Alamitos
SAMPLE LOCATION: AHCS
OPERATOR/ASSISTANT: JP | RM
UNIT: 4
TEST NO.: 10-4-PM
METHOD: 5.3
PAGE 1 OF 3
TEST CONDITION: 150 MW
AMB. TEMP., °F:
PROJECT #: 12582
METER VOL. (START/END):
DATE: 9/20/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 28.98 |
| Assumed Stack Press. | +0.2 |
| Assumed Moisture | 10 |
| Assumed Molecular Wt. | 29.4 |
| Assumed ΔP | 0.2 |
| Assumed ΔH | 0.4 |
| Stack Diameter, in. ft² | 052.3 |
| Sample Time: Total | 126 |
| per point | 3 |
| Total of Traverse Points | 42 |

ΔH = 2.3 / 2.7 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | EG-28 |
| Meter, Yd. | 1.00 |
| CFM @ ΔH = 1.0 | .558 |
| Pitot ID, Cp | .84 |
| $O_2/CO_2$ Method | Port/CEM |
| Teflon Connecting Line (Y/N) | Y |
| Probe: Mat'l | Teflon |
| Length | 19' |
| Nozzle: Mat'l | SS |
| Diam. | 0.251 |
| Filter: No. | 45-175 |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | DI $H_2O$ | 773.1 | 618.3 | 156.8 |
| #2 | DI $H_2O$ | 646.0 | 641.9 | 4.1 |
| #3 | — | 515.9 | 514.7 | 1.2 |
| #4 | SG | 680.0 | 671.6 | 8.4 |
| #5 | | | | 170.5 |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.016 | 10" | OD | JP |
| Post-Test | | | — | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A-1 | 0027 | .13 | .299 | 912.725 | 203 | | 78 | 79 | | 65 | 6.0 | 2.0 | | Impingers Loaded |
| 2 | 0030 | .11 | .253 | 913.68 | 203 | | 79 | 78 | | 65 | 5.6 | 2.0 | | Impingers Recovered |
| 3 | 0033 | .19 | .437 | 914.5 | 202 | | 80 | 79 | | 65 | 5.0 | 3.0 | +.22 | Filter Loaded |
| 4 | 0036 | .20 | .46 | 915.69 | 197 | | 82 | 79 | | 65 | 5.0 | 3.0 | | Filter Recovered |
| 5 | 0039 | .24 | .552 | 916.84 | 196 | | 83 | 80 | | 65 | 5.5 | 3.5 | | Probe Wash |
| 6 | 0042 | .26 | .598 | 918. | 185 | | 84 | 82 | | 65 | 5.6 | 4.0 | | TEST SUMMARY |
| 7 | 0045 | .26 | .598 | 919.4 | 185 | | 85 | 81 | | 65 | 5.5 | 4.0 | | Calculated by: |
| STOP | 0048 | | | 920.711 | | | | | | | | | | Checked by: |
| B-1 | 0050 | .13 | .299 | 920.711 | 199 | | 79 | 81 | | 66 | 5.8 | 2.0 | | Sample Vol., c.f. 44.64 |
| 2 | 0053 | .10 | .23 | 921.6 | 200 | | 80 | 81 | | 65 | 5.8 | 2.0 | | Stack Press., iwg +0.19 |
| 3 | 0056 | .15 | .345 | 922.5 | 192 | | 81 | 86 | | 66 | 6.4 | 3.0 | | ΔH, iwg 0.4065 |
| 4 | 0059 | .12 | .276 | 923.5 | 192 | | 82 | 81 | | 65 | 6.4 | 2.0 | +.18 | ΔP, iwg ~~0.15~~ 0.1551 |
| 5 | 0102 | .25 | .575 | 924.475 | 188 | | 82 | 82 | | 66 | 6.0 | 4.0 | | Meter Temp., °F |
| 6 | 0105 | .24 | .552 | 925.7 | 185 | | 84 | 82 | | 66 | 6.1 | 4.0 | | Stack Temp., °F 196.83 |
| 7 | 0108 | .24 | .552 | 927.0 | 185 | | 84 | 81 | | 66 | 6.0 | 4.0 | | Water Collected, g |
| STOP | 0111 | | | 928.327 | | | | | | | | | | $O_2/CO_2$ 6.5 |
| | | | | | | | | | | | | | | Comments: |

PMF-1

1/.5408 .5075

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/Alamitos
SAMPLE LOCATION Stack
OPERATOR/ASSISTANT RM/JP

UNIT 4 TEST NO. 10-4-PM METHOD SCAQMD 5.3 PAGE 2 OF 3
TEST CONDITION AMB. TEMP., °F PROJECT # 12582
METER VOL. (START/END) / DATE 9-30-92

**PRE-TEST DATA:**
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = _____ x ΔP

**EQUIPMENT INFO:**
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | = |
| #2 | | | | = |
| #3 | | | | = |
| #4 | | | | = |
| #5 | | | | = |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C-1 | 0114 | .02 | .046 | 928.327 | 192 | | 77 | 81 | | 66 | 6.4 | 1.0 | | Impingers Loaded |
| 2 | 0117 | .02 | .046 | 928.8 | 194 | | 77 | 81 | | 66 | 7.0 | 1.0 | | Impingers Recovered |
| 3 | 0120 | .06 | .138 | 929.1 | 188 | | 78 | 80 | | 55 | 7.4 | 1.8 | | Filter Loaded |
| 4 | 0123 | .07 | .161 | 929.86 | 186 | | 78 | 80 | | 52 | 7.8 | 2.0 | +.13 | Filter Recovered |
| 5 | 0126 | .25 | .575 | 930.59 | 184 | | 80 | 80 | | 50 | 7.8 | 4.5 | | Probe Wash |
| 6 | 0129 | .24 | .552 | 931.81 | 182 | | 84 | 81 | | 47 | 7.3 | 4.0 | | TEST SUMMARY |
| 7 | 0132 | .23 | .529 | 933.06 | 181 | | 85 | 81 | | 47 | 7.4 | 4.0 | | Calculated by: |
| STOP | 0135 | | | 934.297 | | | | | | | | | | Checked by: |
| D-1 | 0137 | .02 | .046 | 934.297 | 194 | | 78 | 81 | | 56 | 7.6 | 1.0 | | Sample Vol., c.f. |
| 2 | 0140 | .01 | .023 | 934. | 197 | | 78 | 81 | | 56 | 7.8 | 1.0 | | Stack Press., iwg |
| 3 | 0143 | .10 | .23 | 935.21 | 193 | | 78 | 81 | | 56 | 8.2 | 2.0 | | ΔH, iwg |
| 4 | 0146 | .09 | .207 | 936.03 | 187 | | 80 | 81 | | 51 | 8.4 | 2.0 | +.14 | ΔP, iwg |
| 5 | 0149 | .19 | .437 | 936.8 | 187 | | 80 | 81 | | 51 | 7.8 | 3.5 | | Meter Temp., °F |
| 6 | 0152 | .18 | .414 | 937.95 | 186 | | 83 | 81 | | 50 | 7.8 | 3.0 | | Stack Temp., °F |
| 7 | 0155 | .20 | .46 | 939.1 | 187 | | 83 | 81 | | 50 | 7.6 | 3.8 | | Water Collected, g |
| STOP | 0158 | | | 940.253 | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |

PMF-057

.6300 1001 .7979

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/Alamitos
SAMPLE LOCATION Stack
OPERATOR/ASSISTANT Rm/JP

UNIT 4 TEST NO. 10-4-PM METHOD SCAQMD 5.3 PAGE 3 OF 3
TEST CONDITION
AMB. TEMP., °F
METER VOL. (START/END) /
PROJECT # 12582
DATE 9-20-93

***PRE-TEST DATA:***
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = _____ x ΔP
2.8

***EQUIPMENT INFO:***
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | |
| #2 | | | | |
| #3 | | | | |
| #4 | | | | |
| #5 | | | | |
| Total | | | | |

***POST TEST INFO:***
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

***SAMPLE TRAIN LEAK CHECK:***

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

***PRE-TEST CALIBRATION CHECK:***

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E-1 | 0201 | .11 | .253 | 940.253 | 204 | | 78 | 81 | | 55 | 7.6 | 2.3 | | Impingers Loaded |
| 2 | 0204 | .10 | .23 | 941.17 | 204 | | 79 | 81 | | 51 | 7.8 | 2.0 | | Impingers Recovered |
| 3 | 0207 | .18 | .414 | 942.02 | 205 | | 79 | 80 | | 51 | 7.8 | 3.5 | +.24 | Filter Loaded |
| 4 | 0210 | .22 | .506 | 943. | 199 | | 81 | 80 | | 50 | 7.8 | 4.0 | | Filter Recovered |
| 5 | 0213 | .23 | .529 | 944.3 | 198 | | 83 | 81 | | 49 | 7.2 | 4.0 | | Probe Wash |
| 6 | 0216 | .20 | .46 | 945.63 | 199 | | 83 | 81 | | 50 | 7.0 | 3.8 | | TEST SUMMARY |
| 7 | 0219 | .20 | .46 | 946.81 | 199 | | 83 | 81 | | 50 | 7.0 | 3.8 | | Calculated by: |
| STOP | 0222 | | | 947.983 | | | | | | | | | | Checked by: |
| E-1 | 0227 | .14 | .392 | 947.983 | 219 | | 77 | 80 | | 55 | 5.8 | 3.0 | | Sample Vol., c.f. |
| 2 | 0230 | .15 | .42 | 949.05 | 221 | | 79 | 80 | | 51 | 5.2 | 3.5 | | Stack Press., iwg |
| 3 | 0233 | .18 | .63 | 950.161 | 219 | | 80 | 80 | | 50 | 5.0 | 5.0 | +.25 | ΔH, iwg |
| 4 | 0236 | .22 | .77 | 951.4 | 216 | | 83 | 80 | | 49 | 3.8 | 6.0 | | ΔP, iwg |
| 5 | 0239 | .23 | .805 | 952.9 | 212 | | 84 | 80 | | 49 | 5.8 | 6.2 | | Meter Temp., °F |
| 6 | 0242 | .24 | .84 | 954.4 | 212 | | 85 | 80 | | 49 | 5.6 | 6.2 | | Stack Temp., °F |
| 7 | 0245 | .24 | .60 | 956.05 | 210 | | 86 | 80 | | 49 | 6.0 | 5.0 | | Water Collected, g |
| STOP | 0248 | | | 957.389 | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |

PMF-

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE / Alamitos
SAMPLE LOCATION: AP HCS
OPERATOR/ASSISTANT: JP / RM

UNIT: 4
TEST NO.: 11-[illegible]4-PM
METHOD: 5.3
PAGE 1 OF 3
TEST CONDITION: 150 MW
AMB. TEMP., °F:
PROJECT #: 12582
METER VOL. (START/END): 330 [illegible]
DATE: 9/20/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 29.65 |
| Assumed Stack Press. | +0.2 |
| Assumed Moisture | 10 |
| Assumed Molecular Wt. | 29.2 |
| Assumed ΔP | 0.2 |
| Assumed ΔH | 0.2 |
| Stack Diameter, in. | 95.3 |
| Sample Time: Total | 126 |
| per point | 3 |
| Total of Traverse Points | 42 |

ΔH = 2.8 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | ES-28 |
| Meter, Yd. | 1.00 |
| CFM @ ΔH = 1.0 | .558 |
| Pitot ID, Cp | 84 |
| $O_2/CO_2$ Method | |
| Teflon Connecting Line (Y/N) | Y |
| Probe: Mat'l | Stainless |
| Length | 10' |
| Nozzle: Mat'l | SS |
| Diam. | 0.251 |
| Filter: No. | 45-176 |
| Mat'l | Gelman |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | $H_2O$ | 808.7 | 644.2 | 164.5 |
| #2 | $H_2O$ | 589.8 | 586.3 | 3.5 |
| #3 | — | 497.8 | 495.8 | 2.0 |
| #4 | Sg | 665.9 | 653.2 | 12.7 |
| #5 | | | | 182.7 |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | .010 | 15" | OK | [illegible] |
| Post-Test | .001 | 8" | — | [illegible] |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A-1 | 3:34 | .16 | .44 | 957.827 | 220 | | 82 | 82 | | 57 | 5.5 | 3. | |
| 2 | 3:34 | .14 | .39 | 959.021 | 221 | | 84 | 82 | | 56 | 5.5 | 3. | |
| 3 | 3:37 | .18 | .50 | 960.218 | 223 | | 84 | 82 | | 53 | 5.5 | 3.2 | |
| 4 | 3:40 | .18 | .50 | 961.122 | 221 | | 83 | 82 | | 55 | 5.5 | 3.2 | |
| 5 | 3:43 | .20 | .56 | 962.258 | 214 | | 85 | 82 | | 55. | 5.5 | 4.0 | +.28 |
| 6 | 3:46 | .24 | .67 | 963.945 | 212 | | 86 | 83 | | 55 | 5.5 | 4.0 | |
| 7 | 3:49 | | | 965.092 | | | | | | | | | |
| E-1 | 3:54 | .11 | .30 | 965.092 | 205. | | 82 | 82 | | 55 | 5.5 | 2.0 | |
| 2 | 3:57 | .11 | .30 | 966.208 | 206 | | 83 | 83 | | 59 | 6.5 | 2.8 | |
| 3 | 4:00 | .20 | .56 | 967.173 | 201 | | 84 | 83 | | 58 | 7.5 | 3.9 | |
| 4 | 4:03 | .19 | .53 | 968.467 | 201 | | 86 | 84 | | 57 | 7.5 | 3.9 | |
| 5 | 4:06 | .18 | .50 | 969.922 | 200 | | 85 | 84 | | 58 | 7.5 | 3.2 | +.23 |
| 6 | 4:09 | .18 | .50 | 970.952 | 200 | | 85 | 84 | | 58 | 7.5 | 3.2 | |
| 7 | 4:12 | .18 | .50 | 972.073 | 200 | | 85 | 83 | | 58 | 7.0 | 3.2 | |
| End. | 4:15. | | | 973.275 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | EJ |
| Impingers Recovered | EJ |
| Filter Loaded | EJ |
| Filter Recovered | EJ |
| Probe Wash | JP/RM |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | [illegible] |
| Checked by: | |
| Sample Vol., c.f. | 47.431 |
| Stack Press., iwg | +0.24 |
| ΔH, iwg | ~~0.443~~ 4%.1 |
| ΔP, iwg | 0.1629 |
| Meter Temp., °F | 83 |
| Stack Temp., °F | 1944 |
| Water Collected, g | |
| $O_2/CO_2$ | [illegible] |
| Comments: | |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE / Alamitos
SAMPLE LOCATION: APHCS
OPERATOR/ASSISTANT: Rickm / JP
UNIT: 4
TEST NO.: 11-4-PM
TEST CONDITION: 150 MW
METER VOL. (START/END): /
METHOD: 5.3
AMB. TEMP., °F:
PAGE 2 OF 3
PROJECT #: 12582
DATE: 9-20-92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | |
| Sample Time: Total | |
| per point | |
| Total of Traverse Points | |

ΔH = 2.8 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | |
| Meter, Yd. | |
| CFM @ ΔH = 1.0 | |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | |
| Teflon Connecting Line (Y/N) | |
| Probe: Mat'l | |
| Length | |
| Nozzle: Mat'l | |
| Diam. | |
| Filter: No. | |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | | Wt.(Start) | | Wt.(g) |
|---|---|---|---|---|---|---|
| #1 | | | - | | = | |
| #2 | | | - | | = | |
| #3 | | | - | | = | |
| #4 | | | - | | = | |
| #5 | | | - | | = | |
| Total | | | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D-1 | 4:17 | .11 | .44 | 973.275 | 197 | | 83 | 83 | | 59 | 6.5 | 3.0 | | |
| 2 | 4:20 | .19 | .53 | 974.589 | 198 | | 82 | 83 | | 58 | 6.5 | 4.0 | | Impingers Loaded |
| 3 | 4:23 | .08 | .22 | 975.148 | 198 | | 83 | 83 | | 58 | 6.5 | 4.0 | | Impingers Recovered |
| 4 | 4:26 | .08 | .22 | 976.118 | 188 | | 83 | 83 | | 58 | 6.5 | 2.0 | | Filter Loaded |
| 5 | 4:29 | .18 | .50 | 976.889 | 187 | | 83 | 83 | | 59 | 7.5 | 2.0 | | Filter Recovered |
| 6 | 4:32 | .18 | .50 | 978.083 | 186 | | 84 | 83 | | 58 | 7.5 | 4.0 | +.24 | Probe Wash |
| 7 | 4:35 | .18 | .50 | 979.372 | 185 | | 84 | 83 | | 58 | 7.5 | 4.0 | | TEST SUMMARY |
| End | 4:38 | | | 980.664 | | | | | | | | | | Calculated by: |
| C-1 | 4:40 | .03 | .08 | 980.664 | 193 | | 80 | 83 | | 60 | 7.5 | 1.6 | | Checked by: |
| 2 | 4:43 | .03 | .08 | 981.282 | 195 | | 79 | 83 | | 60 | 7.5 | 1.6 | | Sample Vol., c.f. |
| 3 | 4:46 | .07 | .19 | 981.785 | 192 | | 78 | 82 | | 60 | 7.5 | 2.0 | | Stack Press., iwg |
| 4 | 4:49 | .07 | .19 | 982.442 | 187 | | 79 | 82 | | 59 | 7.5 | 2.0 | | ΔH, iwg |
| 5 | 4:52 | .24 | .67 | 983.182 | 187 | | 84 | 83 | | 58 | 7.5 | 4.0 | +.24 | ΔP, iwg |
| 6 | 4:55 | .24 | .67 | 984.504 | 186 | | 85 | 82 | | 57 | 7.5 | 4.0 | | Meter Temp., °F |
| 7 | 4:58 | .24 | .67 | 985.888 | 185 | | 85 | 82 | | 57 | 7.5 | 4.0 | | Stack Temp., °F |
| End. | 5:01 | | | 987.264 | | | | | | | | | | Water Collected, g |
| | | | | | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |

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971.2670

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE / Alamitos
UNIT: 4
TEST NO.: 11-4-PM
METHOD: 5.3.
PAGE 3 OF 3
SAMPLE LOCATION: APHCS
TEST CONDITION: 150 MW
AMB. TEMP., °F:
PROJECT #: 12582
OPERATOR/ASSISTANT: Rickm / JP.
METER VOL. (START/END): /
DATE: 9-20-92.

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | |
| Sample Time: Total | |
| per point | |
| Total of Traverse Points | |

ΔH = 2.8 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | |
| Meter, Yd. | |
| CFM @ ΔH = 1.0 | |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | |
| Teflon Connecting | |
| Line (Y/N) | |
| Probe: Mat'l | |
| Length | |
| Nozzle: Mat'l | |
| Diam. | |
| Filter: No. | |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | |
| #2 | | | | |
| #3 | | | | |
| #4 | | | | |
| #5 | | | | |
| Total | | | | |

**POST TEST INFO:**

| | |
|---|---|
| Filter Appearance | |
| Impinger Appearance | |
| Silica Gel Spent (Y/N) | |

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp In | Meter Temp Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-1 | 5:03. | .15 | .42 | 987.264 | 201 | | 80 | 82 | | 59 | 6.0 | 3.2 | | Impingers Loaded |
| 2 | 5:06 | .15 | .42 | 988.338 | 202 | | 83 | 82 | | 59 | 6.0 | 3.2 | | Impingers Recovered |
| 3 | 5:09 | .19 | .53 | 989.517 | 202 | | 84 | 82 | | 59 | 6.0 | 3.2 | | Filter Loaded |
| 4 | 5:12 | .14 | .39 | 990.908 | 200 | | 84 | 82 | | 59 | 6.0 | 3.0 | | Filter Recovered |
| 5 | 5:15 | .21 | .58 | 991.882 | 194 | | 83 | 82 | | 59 | 6.0 | 4.0 | +.28 | Probe Wash |
| 6 | 5:18 | .24 | .67 | 993.102 | 194 | | 85 | 82 | | 60 | 6.0 | 4.7 | | TEST SUMMARY |
| 7 | 5:21 | .22 | .61 | 994.489 | 193 | | 86 | 82 | | 60 | 6.0 | 4.2 | | Calculated by: |
| End. | 5:24 | | | 995.878 | | | | | | | | | | Checked by: |
| A-1 | 5:27 | .15 | .42 | 995.878 | 204 | | 80 | 82 | | 60 | 6.0 | 3.8 | | Sample Vol., c.f. |
| 2 | 5:30 | .15 | .42 | 997.005 | 206 | | 83 | 82 | | 60. | 6.0 | 3.8 | | Stack Press., iwg |
| 3 | 5:33 | .20 | .56 | 998.112 | 201 | | 83 | 82 | | 59. | 5.0 | 3.8 | | ΔH, iwg |
| 4 | 5:36 | .20 | .56 | 999.383 | 200 | | 84 | 82 | | 59 | 5.0 | 4.0 | | ΔP, iwg |
| 5 | 5:39 | .24 | .67 | 000.724 | 200 | | 85 | 82 | | 60 | 5.0 | 4.0 | +.24 | Meter Temp., °F |
| 6 | 5:42 | .24 | .67 | 002.008 | 200 | | 86 | 82 | | 61 | 5.0 | 4.9 | | Stack Temp., °F |
| 7 | 5:45 | .32 | .89 | 003.823 | 189 | | 86 | 82 | | 62 | 5.0 | 5.0 | | Water Collected, g |
| End. | 5:48 | | | 005.258 | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE/Alamitos
SAMPLE LOCATION: AQHCS
OPERATOR/ASSISTANT: JP/RM

UNIT: 4
TEST NO.: 12-4-PM
METHOD: 5.3
PAGE 1 OF 3
TEST CONDITION: 150MW
AMB. TEMP., °F:
PROJECT #: 12582
METER VOL. (START/END): 6:39 Am / 8:52 Am
DATE: 9/20/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 29.00 |
| Assumed Stack Press. | +0.12 |
| Assumed Moisture | 10 |
| Assumed Molecular Wt. | 29.4 |
| Assumed ΔP | 0.2 |
| Assumed ΔH | 0.4 |
| Stack Diameter, in. | 452.3 |
| Sample Time: Total | 126 |
| per point | 3 |
| Total of Traverse Points | 42 |

ΔH = 2.8 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | ES-20 |
| Meter, Yd. | 1.00 |
| CFM @ ΔH = 1.0 | .558 |
| Pitot ID, Cp | 84 |
| $O_2/CO_2$ Method | 2 |
| Teflon Connecting | Y |
| Line (Y/N) | Y |
| Probe: Mat'l | Teflon |
| Length | 19' |
| Nozzle: Mat'l | SS |
| Diam. | .251 |
| Filter: No. | 48-17 |
| Mat'l | Gilman |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | PFH2O | 787.6 | 623.7 | 163.9 |
| #2 | DIH2O | 624.5 | 621.0 | 3.5 |
| #3 | – | 516.4 | 515.8 | 0.6 |
| #4 | SG | 714.1 | 702.8 | 11.3 |
| #5 | | | | |
| Total | | | | 179.3 |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | .001 | 15" | Rm | Rm |
| Post-Test | .001 | 9" | – | Rm |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A-1 | 6:30 | .12 | .33 | 005.411 | 206 | | 78 | 79 | | 60 | 5.0 | 3.0 | |
| 2 | 6:33 | .10 | .28 | 006.489 | 205 | | 80 | 80 | | 65 | 5.0 | 2.8 | |
| 3 | 6:36 | .16 | .44 | 007.404 | 206 | | 81 | 80 | | 63 | 5.0 | 3.0 | |
| 4 | 6:39 | .20 | .56 | 008.608 | 201 | | 83 | 80 | | 60 | 5.0 | 3.8 | |
| 5 | 6:42 | .23 | .64 | 009.802 | 195 | | 84 | 84 | | 60 | 5.0 | 4.0 | +.22 |
| 6 | 6:45 | .24 | .67 | 011.105 | 189 | | 85 | 81 | | 57 | 5.0 | 4.0 | |
| 7 | 6:48 | .25 | .70 | 012.542 | 188 | | 85 | 82 | | 57 | 5.0 | 4.8 | |
| End. | 6:51 | | | 013.958 | | | | | | | | | |
| B-1 | 6:55 | .12 | .33 | 013.958 | 200 | | 80 | 82 | | 60 | 6.0 | 2.0 | |
| 2 | 6:58 | .12 | .33 | 014.948 | 203 | | 82 | 82 | | 58 | 6.0 | 2.0 | |
| 3 | 7:01 | .13 | .36 | 015.882 | 199 | | 83 | 82 | | 58 | 6.0 | 2.8 | |
| 4 | 7:04 | .12 | .33 | 017.023 | 195 | | 83 | 82 | | 58 | 6.0 | 2.8 | |
| 5 | 7:07 | .26 | .76 | 018.042 | 193 | | 83 | 82 | | 58 | 6.0 | 5.0 | |
| 6 | 7:10 | .33 | .92 | 019.438 | 188 | | 87 | 82 | | 56 | 6.5 | 6.0 | +.24 |
| 7 | 7:13 | .33 | .92 | 020.008 | 186 | | 88 | 83 | | 56 | 6.5 | 6.0 | |
| End. | 7:16 | | | 022.683 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

Impingers Loaded
Impingers Recovered
Filter Loaded
Filter Recovered
Probe Wash

**TEST SUMMARY**

Calculated by: EF
Checked by:
Sample Vol., c.f. 46.417
Stack Press., iwg 0.23
ΔH, iwg ~~0.429~~
ΔP, iwg 0.144
Meter Temp., °F
Stack Temp., °F ~~196.2~~ 196.
Water Collected, g
$O_2/CO_2$
Comments:

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE / Alamitos
UNIT: 4
TEST NO.: 12-4-PM
METHOD: 5.3
PAGE 2 OF 3
SAMPLE LOCATION: APHCS
TEST CONDITION: 150 MW
AMB. TEMP., °F:
PROJECT #: 12582
OPERATOR/ASSISTANT: RL-CM/JP.
METER VOL. (START/END): /
DATE: 9-20-92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | |
| Sample Time: Total | |
| per point | |
| Total of Traverse Points | |

ΔH = 2.8 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | |
| Meter, Yd. | |
| CFM @ ΔH = 1.0 | |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | |
| Teflon Connecting Line (Y/N) | |
| Probe: Mat'l | |
| Length | |
| Nozzle: Mat'l | |
| Diam. | |
| Filter: No. | |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | = |
| #2 | | | | = |
| #3 | | | | = |
| #4 | | | | = |
| #5 | | | | = |
| Total | | | | |

See page ~~11~~ 1

**POST TEST INFO:**

| | |
|---|---|
| Filter Appearance | |
| Impinger Appearance | |
| Silica Gel Spent (Y/N) | |

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C-1 | 7:19 | .01 | .028 | 022.683 | 195 | | 82 | 83 | | 60 | 7.0 | 1.0 | | Impingers Loaded |
| 2 | 7:22 | .01 | .028 | 023.668 | 194 | | 81 | 83 | | 60 | 7.0 | 1.0 | | Impingers Recovered |
| 3 | 7:25 | .02 | .056 | 023.858 | 192 | | 80 | 84 | | 62 | 7.0 | 1.0 | | Filter Loaded |
| 4 | 7:28 | .07 | .196 | 024.382 | 187 | | 80 | 84 | | 60 | 7.0 | 1.0 | | Filter Recovered |
| 5 | 7:31 | .13 | .36 | 024.905 | 186 | | 83 | 83 | | 58 | 7.0 | 3.0 | | Probe Wash |
| 6 | 7:34 | .22 | .61 | 025.988 | 184 | | 85 | 83 | | 57 | 7.0 | 4.0 | +.24 | TEST SUMMARY |
| 7 | 7:37 | .24 | .67 | 027.283 | 185 | | 86 | 83 | | 56 | 7.0 | 4.0 | | Calculated by: |
| End | 7:40 | | | 028.687 | | | | | | | | | | Checked by: |
| D-1 | 7:42 | .02 | .056 | 028.687 | 192 | | 80 | 83 | | 60 | 8.0 | 1.0 | | Sample Vol., c.f. |
| 2 | 7:45 | .02 | .056 | 029.118 | 194 | | 80 | 83 | | 60 | 8.0 | 1.0 | | Stack Press., iwg |
| 3 | 7:48 | .03 | .084 | 029.632 | 189 | | 80 | 83 | | 60 | 8.0 | 1.0 | | ΔH, iwg |
| 4 | 7:51 | .08 | .22 | 030.182 | 188 | | 81 | 83 | | 59 | 8.0 | 2.0 | +.17 | ΔP, iwg |
| 5 | 7:54 | .19 | .53 | 031.068 | 185 | | 84 | 83 | | 58 | 8.0 | 4.0 | | Meter Temp., °F |
| 6 | 7:57 | .17 | .47 | 032.582 | 195 | | 86 | 83 | | 57 | 8.0 | 3.2 | | Stack Temp., °F |
| 7 | 8:00 | .17 | .47 | 033.502 | 185 | | 86 | 83 | | 58 | 8.0 | 3.2 | | Water Collected, g |
| End | 8:03 | | | 034.624 | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE / Alamitos.
UNIT: 4
TEST NO.: 2-4-PM
METHOD: 5.3
PAGE 3 OF 3
SAMPLE LOCATION: APHCS.
TEST CONDITION: 150 MW
AMB. TEMP., °F:
PROJECT #: 12582
OPERATOR/ASSISTANT: Rick / J.P.
METER VOL. (START/END): /
DATE: 9-20-92

**PRE-TEST DATA:**
Barometric Press., in. Hg.
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH
Stack Diameter, in.
Sample Time: Total
per point
Total of Traverse Points

ΔH = _____ x ΔP

**EQUIPMENT INFO:**
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting
Line (Y/N)
Probe: Mat'l
Length
Nozzle: Mat'l
Diam.
Filter: No.
Mat'l

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | | | | = |
| #2 | | | | = |
| #3 | | | | = |
| #4 | | | | = |
| #5 | | | | = |
| Total | | | | |

See page #1

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | | | | |
| Post-Test | | | | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg | CHAIN OF CUSTODY INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E-1 | 8:08 | .12 | .33 | 034.624 | 202 | | 81 | 84 | | 65 | 7.5 | 3.0 | | Impingers Loaded |
| 2 | 8:11 | .15 | .42 | 035.812 | 202 | | 85 | 84 | | 60 | 7.5 | 3.0 | | Impingers Recovered |
| 3 | 8:14 | .22 | .61 | 036.878 | 195 | | 87 | 85 | | 59 | 7.5 | 4.0 | | Filter Loaded |
| 4 | 8:17 | .22 | .61 | 038.328 | 195 | | 87 | 85 | | 59 | 7.0 | 4.0 | +.25 | Filter Recovered |
| 5 | 8:20 | .18 | .50 | 039.562 | 195 | | 88 | 85 | | 60 | 7.0 | 3.8 | | Probe Wash |
| 6 | 8:23 | .18 | .50 | 040.748 | 195 | | 88 | 85 | | 60 | 7.0 | 3.8 | | TEST SUMMARY |
| 7 | 8:26 | .18 | .50 | 041.063 | 195 | | 88 | 85 | | 60 | 7.0 | 3.8 | | Calculated by: |
| End | 8:29 | | | 043.183 | | | | | | | | | | Checked by: |
| F-1 | 8:31 | .18 | .50 | 043.183 | 214 | | 85 | 85 | | 63 | 5.5 | 4.0 | | Sample Vol., c.f. |
| 2 | 8:34 | .16 | .44 | 044.428 | 215 | | 88 | 86 | | 62 | 5.5 | 3.2 | | Stack Press., iwg |
| 3 | 8:37 | .16 | .44 | 045.652 | 215 | | 88 | 86 | | 62 | 5.0 | 3.2 | | ΔH, iwg |
| 4 | 8:40 | .19 | .53 | 046.908 | 214 | | 88 | 86 | | 62 | 5.0 | 3.8 | | ΔP, iwg |
| 5 | 8:43 | .19 | .53 | 048.573 | 206 | | 90 | 87 | | 63 | 5.0 | 3.8 | | Motor Temp., °F |
| 6 | 8:46 | .22 | .61 | 049.472 | 207 | | 90 | 87 | | 63 | 5.0 | 4.0 | +.26 | Stack Temp., °F |
| 7 | 8:49 | .22 | .61 | 050.492 | 205 | | 90 | 87 | | 63 | 5.0 | 4.0 | | Water Collected, g |
| End. | 8:52 | | | 051.828 | | | | | | | | | | $O_2/CO_2$ |
| | | | | | | | | | | | | | | Comments: |

PMF-057

Appendix C.5

Hydrocarbon

# CARNOT
## TEDLAR BAG SAMPLE DATA

CLIENT/PROJECT: SCE/Alamitos #4

DATE: 9/15/92 UNIT: #4 BY: JF

| | BAG ID | BAG ID | BAG ID |
|---|---|---|---|
| TEST NO. | 2A 4-HC | 2B 4-HC | |
| SAMPLE RATE | .5L/MN | .5L/MN | |
| START TIME | 8 40 AM | 9 43 AM | |
| STOP TIME | 9 10 AM | 10 13 AM | |
| SAMPLE LOCATION | Stack Inlet | Stack Inlet | |

DATE: UNIT: BY:

| | BAG ID | BAG ID | BAG ID |
|---|---|---|---|
| TEST NO. | | | |
| SAMPLE RATE | | | |
| START TIME | | | |
| STOP TIME | | | |
| SAMPLE LOCATION | | | |

| NOTES: |
|---|
| |
| |
| |
| |

# CARNOT
## TEDLAR BAG SAMPLE DATA

CLIENT/PROJECT: SCE / Alamitos

DATE: 9/28/92 UNIT: #4 BY: MM/ES

| | BAG ID _____ | BAG ID _____ | BAG ID _____ |
|---|---|---|---|
| TEST NO. | 13-4-HC | 14-4-HC | 15-4-HC |
| SAMPLE RATE | 1 l/min | 1 l/min | 1 l/min |
| START TIME | 0555 | 0615 | 7:30 |
| STOP TIME | 0615 | 0635 | 7:50 |
| SAMPLE LOCATION | CSAPH | CSAPH | CSAPH |

DATE: 9/28/92 UNIT: #2 BY: ES

| | BAG ID _____ | BAG ID _____ | BAG ID _____ |
|---|---|---|---|
| TEST NO. | 16-4-HC | | |
| SAMPLE RATE | 1 l/min | | |
| START TIME | 8:05 | | |
| STOP TIME | 8:25 | | |
| SAMPLE LOCATION | CSAPH | | |

| NOTES: | $O_2$ | |
|---|---|---|
| 13-4 | | |
| 14-4 | | |
| 15-4 | | |
| 16-4 | | |



CARNOT

# CARNOT
## TEDLAR BAG SAMPLE DATA

CLIENT/PROJECT: SCE / Alamitos

DATE: 9/18/92 UNIT: 4 BY: KDJ

| | BAG ID 5-4-HC | BAG ID 6-4-HC | BAG ID 7-4-HC |
|---|---|---|---|
| TEST NO. | 5-4-HC | 6-4-HC | 7-4-HC |
| SAMPLE RATE | 0.5 l/min | 0.5 l/m | 0.5 l/min |
| START TIME | 23:45 | 225 | 505 |
| STOP TIME | 23:55 | 245 | 525 |
| SAMPLE LOCATION | E3 | B3 | E3 |

DATE: 9/19/92 UNIT: 4 BY: KDJ

| | BAG ID 8-4-HC | BAG ID | BAG ID |
|---|---|---|---|
| TEST NO. | 8-4-HC | | |
| SAMPLE RATE | 0.5 l/min | | |
| START TIME | 805 | | |
| STOP TIME | 825 | | |
| SAMPLE LOCATION | B3 | | |

| NOTES: |
|---|
| |
| |
| |
| |

CARNOT

PMF-007

# CARNOT
## TEDLAR BAG SAMPLE DATA

CLIENT/PROJECT: SCE / Alamitos

DATE: 9/19/92 UNIT: 4 BY: KDJ

| | BAG ID 9-4-HC | BAG ID 10-4-HC | BAG ID 11-4-HC |
|---|---|---|---|
| TEST NO. | 9-4-HC | 10-4-HC | 11-4-HC |
| SAMPLE RATE | 0.1 l/min | 0.1 l/min | 0.1 l/min |
| START TIME | 2240 | 150 | 453 |
| STOP TIME | 2300 | 210 | 503 |
| SAMPLE LOCATION | E3 | B3 | E3 |

DATE: 9/20/92 UNIT: 4 BY: KDJ

| | BAG ID 12-4-HC | BAG ID | BAG ID |
|---|---|---|---|
| TEST NO. | 12-4-HC | | |
| SAMPLE RATE | 0.1 l/min | | |
| START TIME | 710 | | |
| STOP TIME | 730 | | |
| SAMPLE LOCATION | B3 | | |

| NOTES: |
|---|
| |
| |
| |
| |

Appendix C.6

Ammonia

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/Alamitos
SAMPLE LOCATION Duct/Inlet Stack
OPERATOR/ASSISTANT JF

UNIT #4 TEST NO. 2A-4-NH3 METHOD SCAQMD Draft PAGE 1 OF 1
TEST CONDITION 1/Ser 00-0 AMB. TEMP., °F PROJECT # 12582
METER VOL. (START/END) 445.021 / 468.115 DATE 9/15/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 29.94 |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | 152.3 |
| Sample Time: Total | 2.1 |
| per point | |
| Total of Traverse Points | Single |

ΔH = _____ x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | ES-8 |
| Meter, Yd. | 0.9979 |
| CFM @ ΔH = 1.0 | 1.0=.572 |
| Pitot ID, Cp | — |
| $O_2/CO_2$ Method | Teledyne |
| Teflon Connecting Line (Y/N) | Yes |
| Probe: Mat'l | Stainless Steel |
| Length | 5' |
| Nozzle: Mat'l | — |
| Diam. | — |
| Filter: No. | — |
| Mat'l | — |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1W | $H_2SO_4$ | 711.3 | 651.7 | 59.6 |
| #2 IN | $H_2SO_4$ | 680.8 | 675.0 | 5.8 |
| #3 | Ø | 517.2 | 514.8 | 2.4 |
| #4 | S.G. | 657.5 | 649.6 | 7.9 |
| #5 | total | 2566.8 | 2491.1 | — |
| Total | | | | 75.70 |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.0 | 15" | — | RM |
| Post-Test | 0.0 | 5" | — | RM |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single | 8:40 Am | — | 2.0 | 445.021 | — | — | 77 | 76 | — | 62 | 4.8 | 3 | — |
| | 8:50 Am | — | 2.0 | 452.73 | — | — | 106 | 92 | — | 61 | 7.4 | 3 | — |
| | 9:00 Am | — | 2.0 | 460.40 | | | 109 | 87 | | 61 | 7.4 | 3 | — |
| | 9:10 Am | | | 468.115 | | | | | | | | | |

| CHAIN OF CUSTODY INFORMATION | |
|---|---|
| Impingers Loaded | John F. |
| Impingers Recovered | GT |
| Filter Loaded | — |
| Filter Recovered | — |
| Probe Wash | — |

| TEST SUMMARY | |
|---|---|
| Calculated by: | GT |
| Checked by: | GT |
| Sample Vol., c.f. | 23.094 |
| Stack Press., iwg | — |
| ΔH, iwg | 2.0 |
| ΔP, iwg | — |
| Meter Temp., °F | 89.5 |
| Stack Temp., °F | — |
| Water Collected, g | 75.70 |
| $O_2/CO_2$ | 7.4/7.4 |
| Comments: | |

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Test #1
2B-4-NH3

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/Alamitos #4 UNIT #4 TEST NO. ~~Test 10#3~~ METHOD Scrubber Draft PAGE 1 OF 1
SAMPLE LOCATION Stack Inlet TEST CONDITION Unit Off AMB. TEMP., °F PROJECT #
OPERATOR/ASSISTANT JF METER VOL. (START/END) 468.275 / 491.528 DATE 9/15/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., In. Hg. | 29.94 |
| Assumed Stack Press. | +6 |
| Assumed Moisture | 15 |
| Assumed Molecular Wt. | 27 |
| Assumed ΔP | / |
| Assumed ΔH | / |
| Stack Diameter, in. | |
| Sample Time: Total | 30 |
| per point | 5min |
| Total of Traverse Points | Single |

ΔH = _____ x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | ES-8 |
| Meter, Yd. | 0.9979 |
| CFM @ ΔH = 1.0 | .572 |
| Pitot ID, Cp | — |
| $O_2/CO_2$ Method | Teledyne |
| Teflon Connecting Line (Y/N) | Yes |
| Probe: Mat'l | S.S. |
| Length | 5' |
| Nozzle: Mat'l | — |
| Diam. | — |
| Filter: No. | — |
| Mat'l | — |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | $H_2SO_4$ | 657.3 | 591.1 | 66.2 |
| #2 | $H_2SO_4$ | 610.6 | 602.3 | 8.3 |
| #3 | Ø | 525.7 | 522.4 | 3.3 |
| #4 | S.G. | 678.2 | 669.0 | 9.2 |
| #5 | | | | 87.0 |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance /
Impinger Appearance Good
Silica Gel Spent (Y/N) N

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.0 | 10" | — | RM |
| Post-Test | 0.0 | 5" | — | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single | 9:43 AM | — | 2.0 | 468.275 | — | — | 103 | 94 | — | 74 | 5.8 | 3 | — |
| | 9:53 | — | 2.0 | 476.17 | — | — | 115 | 96 | — | ~~74~~ 58 | 4.8 | 4 | — |
| | 10:03 | — | 2.0 | 483.89 | — | — | 114 | 97 | — | 58 | 5.6 | 4 | — |
| | 10.13 | | | 491.528 | | | | | | | | | |

| CHAIN OF CUSTODY INFORMATION | |
|---|---|
| Impingers Loaded | JF |
| Impingers Recovered | JF |
| Filter Loaded | / |
| Filter Recovered | / |
| Probe Wash | JF |
| **TEST SUMMARY** | |
| Calculated by: | |
| Checked by: | |
| Sample Vol., c.f. | 23.253 |
| Stack Press., iwg | — |
| ΔH, iwg | 2.0 |
| ΔP, iwg | — |
| Meter Temp., °F | 103.2 |
| Stack Temp., °F | — |
| Water Collected, g | 87.0 |
| $O_2/CO_2$ | 5.4 |
| Comments: | |

PMF-

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE / Alamitos
UNIT 4
TEST NO. 3-4-Ulg
METHOD SCAQMD Draft
PAGE 1 OF 1
SAMPLE LOCATION Stack Inlet
TEST CONDITION Unit On
AMB. TEMP., °F
PROJECT # 12582
OPERATOR/ASSISTANT JF
METER VOL. (START/END) 491.653 / 514.899
DATE 9/15/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 29.70 |
| Assumed Stack Press. | — |
| Assumed Moisture | 15 |
| Assumed Molecular Wt. | 29 |
| Assumed ΔP | — |
| Assumed ΔH | — |
| Stack Diameter, in. | — |
| Sample Time: Total | 30 min |
| per point | 5 min |
| Total of Traverse Points | — |

ΔH = _____ x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | ES-8 |
| Meter, Yd. | 0.9974 |
| CFM @ ΔH = 1.0 | .572 |
| Pitot ID, Cp | — |
| $O_2/CO_2$ Method | Teledyne |
| Teflon Connecting Line (Y/N) | Yes |
| Probe: Mat'l | SS |
| Length | 5' |
| Nozzle: Mat'l | — |
| Diam. | — |
| Filter: No. | — |
| Mat'l | — |

| Imp. | Mat'l | Wt.(End) | | Wt.(Start) | | Wt.(g) |
|---|---|---|---|---|---|---|
| #1 | 1 in H2SO4 | 689.8 | - | 608.8 | = | 81.0 |
| #2 | " | 604.1 | - | 600.6 | = | 3.5 |
| #3 | — | 518.4 | - | 517.7 | = | 0.7 |
| #4 | SG | 662.4 | - | 657.5 | = | 4.9 |
| #5 | | | - | | = | |
| Total | | | | | | 90.1 |

**POST TEST INFO:**
Filter Appearance —
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.0 | 10" | — | JF |
| Post-Test | 0.0 | 5" | — | JF |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single | 12:45pm | — | 2.0 | 491.653 | — | — | 80 | 80 | — | 65 | 6.5 | 3 | — |
| | 12:55 | — | 2.0 | 499.41 | — | — | 104 | 85 | — | 58 | 6.2 | 3 | — |
| | 13:05 | — | 2.0 | 507.16 | — | — | 105 | 88 | — | 59 | 6.0 | 3 | — |
| — | 13:15 | | | 514.899 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | [illegible] |
| Impingers Recovered | JF |
| Filter Loaded | — |
| Filter Recovered | — |
| Probe Wash | JF |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | [illegible] |
| Checked by: | [illegible] |
| Sample Vol., c.f. | 23.406 |
| Stack Press., iwg | |
| ΔH, iwg | 2.0 |
| ΔP, iwg | — |
| Meter Temp., °F | 90.33 |
| Stack Temp., °F | — |
| Water Collected, g | 90.1 |
| $O_2/CO_2$ | 6.2 |
| Comments: | |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE / Alamitos #4 UNIT #4 TEST NO. 4-4-NH3 METHOD SCAQMD Draft PAGE 1 OF 1
SAMPLE LOCATION Stack Inlet TEST CONDITION Open Oon AMB. TEMP., °F PROJECT # 12552
OPERATOR/ASSISTANT BD / RW METER VOL. (START/END) 514.699 1538.814 DATE 9/15/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 29.99 |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | |
| Sample Time: Total | 30 |
| per point | 30 |
| Total of Traverse Points | 1 |

ΔH = _____ x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | ES-8 |
| Meter, Yd. | 0.9979 |
| CFM @ ΔH = 1.0 | .572 |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | Teledyne |
| Teflon Connecting Line (Y/N) | Yes |
| Probe: Mat'l | S.S. |
| Length | 5' |
| Nozzle: Mat'l | |
| Diam. | |
| Filter: No. | |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | 1N H2SO4 | 699.3 | 626.7 | 72.6 |
| #2 | 1N H2SO4 | 645.3 | 641.2 | 4.1 |
| #3 | Ø | 523.9 | 522.8 | 1.10 |
| #4 | S.G. | 683.3 | 678.2 | 5.10 |
| #5 | | | | |
| Total | | | | 82.90 |

**POST TEST INFO:**

| | |
|---|---|
| Filter Appearance | |
| Impinger Appearance | ok |
| Silica Gel Spent (Y/N) | No |

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.0 | 10" | — | JF |
| Post-Test | 0.0 | 5" | — | JF |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single | 15:47 | — | 2.0 | 514.699 | — | — | 84 | 84 | — | 56 | 7.6 | 4 | — |
| | 15:57 | — | 2.0 | 522.91 | — | — | 106 | 86 | — | 59 | 7.6 | 4 | — |
| | 16:07 | — | 2.0 | 530.86 | — | — | 109 | 91 | — | 61 | 7.7 | 4 | — |
| — | 16:17 | | | 538.814 | | | | | | | | | |

| CHAIN OF CUSTODY INFORMATION | |
|---|---|
| Impingers Loaded | JF |
| Impingers Recovered | JF |
| Filter Loaded | |
| Filter Recovered | |
| Probe Wash | JF |
| **TEST SUMMARY** | |
| Calculated by: | |
| Checked by: | |
| Sample Vol., c.f. | 24.115 |
| Stack Press., iwg | |
| ΔH, iwg | 2.0 |
| ΔP, iwg | |
| Meter Temp., °F | 93.5 |
| Stack Temp., °F | |
| Water Collected, g | 82.90 |
| $O_2/CO_2$ | 7.63 |
| Comments: | |

PMF-

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE / ALAMITOS
UNIT: 4
TEST NO.: 5-4-NH3
METHOD: SCAQMD 207 (Nessler)
PAGE 1 OF 1
SAMPLE LOCATION: ~~STACK~~ APH Cool side
TEST CONDITION: w/o Urea @ 70 MW
AMB. TEMP., °F:
PROJECT #: 12532
OPERATOR/ASSISTANT: Kusha
METER VOL. (START/END): 965.116 / 996.387
DATE: 9/18/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 28.59 |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | |
| Sample Time: Total | 30 |
| per point | |
| Total of Traverse Points | 5x4 |

ΔH = 1.5 ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | North |
| Meter, Yd. | 1.001 |
| CFM @ ΔH = 1.0 | |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | |
| Teflon Connecting Line (Y/N) | |
| Probe: Mat'l | |
| Length | |
| Nozzle: Mat'l | |
| Diam. | — |
| Filter: No. | — |
| Mat'l | — |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | 0.1N H2SO4 | 687.4 | 635.4 | 52.0 |
| #2 | 0.1N H2SO4 | 630.7 | 623.1 | 7.6 |
| #3 | — | 523.0 | 521.9 | 2.1 |
| #4 | SG | 688.5 | 680.7 | 7.8 |
| #5 | | | | 69.5 |
| Total | | | | 69.5 |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.004 | 15" | NA | KJ |
| Post-Test | .001 | 14" | NA | KJ |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E3 | 23:25 | 30 | 1.5 | 965.116 | | 83 | | 74 | | 50 | | 8 | |
| | 23:30 | | | 970.500 | | | | 71 | | 58 | | 8 | |
| | 23:35 | | | 975.500 | | 92 | 101 | 74 | | 60 | | 8 | |
| | 23:40 | | | 980.000 | | | 102 | 77 | | 61 | | 8 | |
| | 23:45 | | | — | | | 111 | 73 | | 67 | | 8 | |
| | 23:50 | | | | | | 112 | 75 | | 67 | | 8 | |
| END | 23:55 | 30 | | 996.387 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

Impingers Loaded: BK
Impingers Recovered: BK
Filter Loaded
Filter Recovered
Probe Wash: JP

**TEST SUMMARY**

Calculated by:
Checked by:
Sample Vol., c.f. 31.271
Stack Press., iwg
ΔH, iwg 1.5
ΔP, iwg —
Meter Temp., °F 87.1
Stack Temp., °F
Water Collected, g
$O_2/CO_2$
Comments: BAG-23.[illegible]
45

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/Alamitos
SAMPLE LOCATION ~~Source~~ APH Exit
OPERATOR/ASSISTANT JP/RM

UNIT 4 TEST NO. 6-4-NH3 METHOD SCAAMD 207 PAGE 1 OF 1
TEST CONDITION 70 MW AMB. TEMP., °F PROJECT # 12582
METER VOL. (START/END) 996.668 / 1027.800 DATE 9/19/02

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 29.40 |
| Assumed Stack Press. | / |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | 132.3 |
| Sample Time: Total | 30 |
| per point | |
| Total of Traverse Points | 5x01 |

ΔH = 1.5 ~~ΔP~~

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | North |
| Meter, Yd. | |
| CFM @ ΔH = 1.0 | |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | |
| Teflon Connecting Line (Y/N) | Yes |
| Probe: Mat'l | SS |
| Length | 6' |
| Nozzle: Mat'l | |
| Diam. | |
| Filter: No. | / |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | 0.1N H2SO4 | 689.0 | 627.3 | 61.7 |
| #2 | 0.1N H2SO4 | 621.1 | 612.5 | 8.6 |
| #3 | — | 524.8 | 520.8 | 4.0 |
| #4 | gel | 679.0 | 670.5 | 8.5 |
| #5 | | | | 82.8 |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | .004 | 15" | — | KJ |
| Post-Test | .004 | 15" | — | KJ |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B3 | 215 | | 1.5 | 996.668 | | | 77 | 69 | | 53 | | 7.5 | |
| | 220 | | | 003.000 | | | 91 | 69 | | 56 | | 9 | |
| | 225 | | | 008.700 | | | 101 | 69 | | 59 | | 9 | |
| | 230 | | | 014.200 | | | 106 | 70 | | 63 | | 9 | |
| | 235 | | | 017.300 | | | 109 | 70 | | 66 | | 9 | |
| | 240 | | | 023.300 | | | 112 | 72 | | 68 | | | |
| | 245 | | | 027.800 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | BK |
| Impingers Recovered | BK |
| Filter Loaded | / |
| Filter Recovered | |
| Probe Wash | JP |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | KJ |
| Checked by: | |
| Sample Vol., c.f. | 31.132 |
| Stack Press., iwg | |
| ΔH, iwg | 1.5 |
| ΔP, iwg | |
| Meter Temp., °F | 84.6 |
| Stack Temp., °F | |
| Water Collected, g | 82.8 |
| $O_2/CO_2$ | 14.5 |
| Comments: | |

CMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE Alamitos
SAMPLE LOCATION: AQH cont side
OPERATOR/ASSISTANT: KS

UNIT: 4
TEST NO.: 7-4-NH3
METHOD: SCAQMD 207
PAGE 1 OF 1
TEST CONDITION: 70 MW
AMB. TEMP., °F:
PROJECT #: 12582
METER VOL. (START/END): /
DATE: 9/19/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 28.89 |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | |
| Sample Time: Total | |
| per point | 5P |
| Total of Traverse Points | |

ΔH = 1.5 NA

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | North ~~East~~ |
| Meter, Yd. | 1.006 |
| CFM @ ΔH = 1.0 | — |
| Pitot ID, Cp | — |
| $O_2/CO_2$ Method | PM |
| Teflon Connecting Line (Y/N) | Y |
| Probe: Mat'l | SS |
| Probe: Length | 6 |
| Nozzle: Mat'l | NA |
| Nozzle: Diam. | |
| Filter: No. | NA |
| Filter: Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | 0.1 N $H_2SO_4$ | 686.0 | 626.5 | 59.5 |
| #2 | 0.1 N $H_2SO_4$ | 652.4 | 646.0 | 6.4 |
| #3 | — | 523.7 | 522.3 | 1.4 |
| #4 | SG | 666.1 | 657.8 | 8.3 |
| #5 | | | | |
| Total | | | | 75.6 |

**POST TEST INFO:**

| | |
|---|---|
| Filter Appearance | |
| Impinger Appearance | |
| Silica Gel Spent (Y/N) | |

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | .005 | 15" | — | KJ |
| Post-Test | .008 | 15" | — | KJ |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B3 | 500 | | 1.5 | 027.998 | | | 74 | 65 | | 52 | | 9 | |
| | 505 | | | 033.500 | | | 84 | 66 | | 53 | | 9 | |
| | 510 | | | 038.900 | | | 93 | 66 | | 58 | | 9 | |
| | 515 | | | 044.500 | | | 101 | 67 | | 59 | | 9 | |
| | 520 | | | 49.600 | | | 104 | 68 | | 61 | | 9 | |
| | 525 | | | 54.301 | | | 108 | 69 | | 61 | | 9 | |
| END | 530 | | | 059.482 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | KJ |
| Impingers Recovered | KJ |
| Filter Loaded | — |
| Filter Recovered | — |
| Probe Wash | KJ |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | |
| Checked by: | |
| Sample Vol., c.f. | 31.484 |
| Stack Press., iwg | |
| ΔH, iwg | 1.5 |
| ΔP, iwg | — |
| Meter Temp., °F | ~~75.3~~ |
| Stack Temp., °F | |
| Water Collected, g | |
| $O_2/CO_2$ | |
| Comments: | |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE / Alamitos
SAMPLE LOCATION HPH
OPERATOR/ASSISTANT

UNIT 4 TEST NO. 8-4-NH3 METHOD SCAQMD 207 PAGE 1 OF 1
TEST CONDITION 70MW AMB. TEMP., °F PROJECT # 12582
METER VOL. (START/END) / DATE 9/19/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 28.85 |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | 1.5 |
| Stack Diameter, in. | 48.3 |
| Sample Time: Total | 30 |
| per point | |
| Total of Traverse Points | SMG |

ΔH = 1.5 W/AVR

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | North |
| Meter, Yd. | 1.0000 |
| CFM @ ΔH = 1.0 | |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | |
| Teflon Connecting Line (Y/N) | Y |
| Probe: Mat'l | SS |
| Length | 6 |
| Nozzle: Mat'l | |
| Diam. | |
| Filter: No. | |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | 0.1 $NH_2SO_4$ | 686.3 | 619.8 | 66.5 |
| #2 | 0.1 $NH_2SO_4$ | 637.6 | 628.2 | 9.4 |
| #3 | — | 526.0 | 523.0 | 3.0 |
| #4 | SC | 672.3 | 664.0 | 8.3 |
| #5 | | | | 87.2 |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.002 | 15" | — | EJ |
| Post-Test | 0.002 | 16" | — | EJ |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B3 | 800:30 | | 1.5 | 059.696 | | | 82 | 65 | | 53 | | 8.5 | |
| | 805 | | 1.5 | 064.506 | | | 87 | 66 | | 55 | | 8.5 | |
| | 810 | | 1.5 | — | | | 93 | 68 | | 60 | | 8.5 | |
| | 815 | | 1.5 | — | | | 100 | 69 | | 66 | | 8.5 | |
| | 820 | | 1.5 | 080.000 | | | 109 | 69 | | 66 | | 8.5 | |
| | 825 | | 1.75 | 085.250 | | | 112 | 71 | | 67 | | 10 | |
| | 830 | | | 089.758 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | |
| Impingers Recovered | |
| Filter Loaded | — |
| Filter Recovered | — |
| Probe Wash | |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | |
| Checked by: | |
| Sample Vol., c.f. | 30.062 |
| Stack Press., iwg | — |
| ΔH, iwg | 1.5 |
| ΔP, iwg | |
| Meter Temp., °F | 82.6 |
| Stack Temp., °F | |
| Water Collected, g | |
| $O_2/CO_2$ | |
| Comments: | |

MF-05

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE / Alamitos
SAMPLE LOCATION APHCS
OPERATOR/ASSISTANT CG

UNIT 4
TEST NO. 9-4-NH3
METHOD SCAQMD 207
PAGE 1 OF 1
TEST CONDITION 150 MW
AMB. TEMP., °F
PROJECT # 12582
METER VOL. (START/END) /
DATE 9/17/97

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 29.89 |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | 45x23 |
| Sample Time: Total | 30 |
| per point | |
| Total of Traverse Points | 5x6 |

ΔH = 1.6

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | North |
| Meter, Yd. | |
| CFM @ ΔH = 1.0 | |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | |
| Teflon Connecting Line (Y/N) | Yes |
| Probe: Mat'l | S.S |
| Length | 6' |
| Nozzle: Mat'l | |
| Diam. | |
| Filter: No. | |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | 0.1 N $H_2SO_4$ | 702.0 | 623.2 | 78.8 |
| #2 | 0.1 N $H_2SO_4$ | 633.5 | 625.3 | 8.2 |
| #3 | — | 527.4 | 524.1 | 3.3 |
| #4 | SG | 700.5 | 693.0 | 7.5 |
| #5 | | | | |
| Total | | | | 97.8 |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.001 | 15" | — | |
| Post-Test | 0.004 | 15" | — | |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E3 | 22:30 | | 1.6 | 090.060 | | | 89 | 70 | | 60 | | 9 | |
| | 22:35 | | 1.6 | 096.300 | | | 97 | 71 | | 62 | | 9 | |
| | 2240 | | 1.6 | 101.300 | | | 100 | 71 | | 63 | | 9 | |
| | 2245 | | 1.6 | 106.800 | | | 101 | 72 | | 64 | | 9 | |
| | 2250 | | 1.6 | 114.800 | | | 102 | 73 | | 65 | | | |
| | 2255 | | 1.6 | — | | | 102 | 73 | | 65 | | | |
| | 2300 | | | 121.159 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | |
| Impingers Recovered | |
| Filter Loaded | — |
| Filter Recovered | — |
| Probe Wash | |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | |
| Checked by: | |
| Sample Vol., c.f. | 31.089 |
| Stack Press., iwg | — |
| ΔH, iwg | 1.6 |
| ΔP, iwg | — |
| Meter Temp., °F | 85.1 |
| Stack Temp., °F | — |
| Water Collected, g | 97.8 |
| $O_2/CO_2$ | |
| Comments: | Tedlar Bag 2240 |

PMF-057

1.7 13.68

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE / Alamitos
SAMPLE LOCATION: AHCS
OPERATOR/ASSISTANT: KJ

UNIT: 4
TEST NO.: 10-4-NH3
METHOD: 207
PAGE: 1 OF 1
TEST CONDITION: 150mw
AMB. TEMP., °F:
PROJECT #: 12582
METER VOL. (START/END): /
DATE: 9/20/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 28.98 |
| Assumed Stack Press. | / |
| Assumed Moisture | / |
| Assumed Molecular Wt. | / |
| Assumed ΔP | / |
| Assumed ΔH | / |
| Stack Diameter, in. | 150.3 |
| Sample Time: Total | 30 |
| per point | / |
| Total of Traverse Points | SNGL |

ΔH = _____ x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | Nertt |
| Meter, Yd. | 1, Core |
| CFM @ ΔH = 1.0 | / |
| Pitot ID, Cp | / |
| $O_2/CO_2$ Method | / |
| Teflon Connecting Line (Y/N) | Y |
| Probe: Mat'l | SS |
| Length | 6 |
| Nozzle: Mat'l | / |
| Diam. | / |
| Filter: No. | / |
| Mat'l | / |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | 0.1 $N_2SO_4$ | 720.6 | 621.7 | = |
| #2 | 0.1 $NH_2SO_4$ | 638.3 | 629.2 | = 9. |
| #3 | — | 526.0 | 523.5 | = |
| #4 | Sc | 681.4 | 672.6 | = |
| #5 | | | | = |
| Total | | | | |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | .002 | 15" | — | KJ |
| Post-Test | .001 | 15" | — | KJ |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B3 | 145 | | 1.6 | 121.440 | | | 79 | 66 | | 54 | | 9 | |
| | 150 | | 1.6 | 129.400 | | | 86 | 67 | | 60 | | 9 | |
| | 155 | | 1.6 | — | | | 93 | 68 | | 65 | | 9 | |
| | 200 | | 1.6 | 140.600 | | | 94 | 68 | | 64 | | 9 | |
| | 205 | | 1.6 | 144.800 | | | 97 | 68 | | 65 | | 9 | |
| | 210 | | 1.6 | — | | | 100 | 69 | | 65 | | 9 | |
| END | 215 | | | 151.942 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | KJ |
| Impingers Recovered | KJ |
| Filter Loaded | / |
| Filter Recovered | / |
| Probe Wash | / |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | |
| Checked by: | |
| Sample Vol., c.f. | |
| Stack Press., iwg | |
| ΔH, iwg | / |
| ΔP, iwg | |
| Meter Temp., °F | |
| Stack Temp., °F | |
| Water Collected, g | |
| $O_2/CO_2$ | |
| Comments: | |

PMF

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE/Mamitos | UNIT: 4 | TEST NO.: 11-4-NH3 | METHOD: 207 | PAGE: 1 OF 1
SAMPLE LOCATION: APHCS | TEST CONDITION: 150 MW | AMB. TEMP., °F: | PROJECT #: 12.58
OPERATOR/ASSISTANT: LJ | METER VOL. (START/END): / | DATE: 9/20/92

**PRE-TEST DATA:**
Barometric Press., in. Hg. 29.55
Assumed Stack Press.
Assumed Moisture
Assumed Molecular Wt.
Assumed ΔP
Assumed ΔH 1.5
Stack Diameter, in. 452.3
Sample Time: Total 30
per point
Total of Traverse Points Small

ΔH = _____ x ΔP

**EQUIPMENT INFO:**
Meter No.
Meter, Yd.
CFM @ ΔH = 1.0
Pitot ID, Cp
$O_2/CO_2$ Method
Teflon Connecting Line (Y/N)
Probe: Mat'l / Length
Nozzle: Mat'l / Diam.
Filter: No. / Mat'l

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | 0.1 N H2SO4 | 700.3 | 620.9 | 79.40 |
| #2 | 0.1 N H2SO4 | 644.7 | 636.3 | 8.4 |
| #3 | — | 525.7 | 523.3 | 2.4 |
| #4 | Si | 687.3 | 680.2 | 7.1 |
| #5 | | | | |
| Total | | | | 97.3 |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N) BLEIN CHUNKS "BLAUGH"

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.004 | 15" | — | KJ |
| Post-Test | 0.008 | 15" | — | KJ |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E3 | 448 | | 1.6 | 152.096 | | | 81 | 67 | | 54 | | 9 | |
| | 453 | | 1.6 | — | | | 68 | 65 | | 60 | | 9 | |
| | 458 | | 1.6 | — | | | 94 | 68 | | 61 | | 9 | |
| | 503 | | 1.6 | — | | | 95 | 69 | | 62 | | 9 | |
| | 508 | | 1.6 | — | | | 96 | 69 | | 63 | | 9 | |
| | 513 | | 1.6 | — | | | 99 | 70 | | 64 | | 9 | |
| END | 518 | | | 182.901 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**
Impingers Loaded
Impingers Recovered
Filter Loaded
Filter Recovered
Probe Wash

**TEST SUMMARY**
Calculated by:
Checked by:
Sample Vol., c.f. 30.905
Stack Press., iwg
ΔH, iwg 1.6
ΔP, iwg
Meter Temp., °F 90.75
Stack Temp., °F
Water Collected, g
$O_2/CO_2$
Comments:

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT: SCE/Manitou's | UNIT: 4 | TEST NO.: 12-4-NH3 | METHOD: 207 | PAGE 1 OF 1
SAMPLE LOCATION: AQHCS | TEST CONDITION: 150 mW/6N | AMB. TEMP., °F: | PROJECT #: 12582
OPERATOR/ASSISTANT: KJ | METER VOL. (START/END): / | DATE: 9/20/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 29.65 |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | 1.5 |
| Stack Diameter, in. | 42.13 |
| Sample Time: Total | 30 |
| per point | |
| Total of Traverse Points | 5x01 |

ΔH = _____ x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | North |
| Meter, Yd. | 1.002 |
| CFM @ ΔH = 1.0 | |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | |
| Teflon Connecting Line (Y/N) | yes |
| Probe: Mat'l | SS |
| Length | 6' |
| Nozzle: Mat'l | |
| Diam. | |
| Filter: No. | |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | 0.1N $H_2SO_4$ | 716.1 | 628.4 | 87.7 |
| #2 | 0.1N $H_2SO_4$ | 658.6 | 641.9 | 16.7 |
| #3 | — | 530.0 | 525.4 | 4.6 |
| #4 | SG | 693.0 | 684.5 | 8.5 |
| #5 | | | | |
| Total | | | | 117.5 |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | 0.004 | 15" | — | KJ |
| Post-Test | 0.005 | 15" | — | KJ |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B3 | 700 | | 1.6 | 183.060 | | | 80 | 68 | | 52 | | 8 | |
| | 705 | | 1.6 | — | | | 92 | 68 | | 58 | | 8 | |
| | 710 | | | — | | | 99 | 69 | | 59 | | 8 | |
| | 715 | | | — | | | 103 | 70 | | 63 | | 8 | |
| | 720 | | | — | | | 106 | 71 | | 66 | | 8 | |
| | 725 | | | — | | | 107 | 72 | | 67 | | 8 | |
| END | 730 | | | 214.088 | | | | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | KJ |
| Impingers Recovered | KJ |
| Filter Loaded | — |
| Filter Recovered | — |
| Probe Wash | KJ |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | GS |
| Checked by: | |
| Sample Vol., c.f. | 31.028 |
| Stack Press., iwg | |
| ΔH, iwg | 1.6 |
| ΔP, iwg | |
| Meter Temp., °F | 83.8 |
| Stack Temp., °F | |
| Water Collected, g | |
| $O_2/CO_2$ | |
| Comments: | |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/ALAMITOS
SAMPLE LOCATION APH East Side
OPERATOR/ASSISTANT JK/MM

UNIT # 4 TEST NO. 13-4-NH3 METHOD SCAQMD DRAFT PAGE 1 OF 1
TEST CONDITION @ 70 MW AMB. TEMP., °F PROJECT # 12532
METER VOL. (START/END) 595.874 / DATE 9/28/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 29.92 |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | 95.3 |
| Sample Time: Total | |
| per point | |
| Total of Traverse Points | |

ΔH = 1.5 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | NORTH |
| Meter, Yd. | 1.005 |
| CFM @ ΔH = 1.0 | |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | |
| Teflon Connecting Line (Y/N) | Yes |
| Probe: Mat'l | Gl |
| Length | 6' |
| Nozzle: Mat'l | |
| Diam. | |
| Filter: No. | |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | 0.1 $NH_2SO_4$ | 679.0 | 610.2 | 68.8 |
| #2 | 0.1 $H_2SO_4$ | 615.2 | 609.6 | 5.6 |
| #3 | – | 521.2 | 520.1 | 1.1 |
| #4 | S.G. | 652.8 | 644.2 | 8.6 |
| #5 | | | | |
| Total | | | | 84.1 |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | .003 | 15" | – | JK |
| Post-Test | .004 | 10" | – | JK |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E 3 | 0513 | | 1.5 | 585.274 | | | 83 | 79 | | 59 | 11.2 | 9 | |
| E 3 | 0517 | | | 591.01 | | | 95 | 78 | | 53 | 12 | 9 | |
| E 2 | 0522/0523 | | | 596.056 | | | 104 | 78 | | 63 | 11.5 | 9 | |
| E 2 | 0528 | | | 601.09 | | | 110 | 78 | | 64 | 11.7 | 9 | |
| E 1 | 0533/0534 | | | 606.049 | | | 117 | 81 | | 62 | 11.5 | 9 | |
| E 1 | 0539 | | | 611.37 | | | 118 | 80 | | 62 | 9 | 9 | |
| | 0544 | | | 616.125 | | | STOP | | | | | | |

**CHAIN OF CUSTODY INFORMATION**

| | |
|---|---|
| Impingers Loaded | JK |
| Impingers Recovered | JK |
| Filter Loaded | |
| Filter Recovered | |
| Probe Wash | JK |

**TEST SUMMARY**

| | |
|---|---|
| Calculated by: | JRH |
| Checked by: | |
| Sample Vol., c.f. | 30.251 |
| Stack Press., iwg | |
| ΔH, iwg | 1.5 |
| ΔP, iwg | |
| Meter Temp., °F | 91.75 |
| Stack Temp., °F | |
| Water Collected, g | 84.1 |
| $O_2/CO_2$ | 11.2 / 9.2 |
| Comments: | |

PMF-057

CARNOT

# SAMPLE TRAIN TEST DATA

CLIENT SCE/ACAMI TOS
SAMPLE LOCATION APH Cool Side
OPERATOR/ASSISTANT

UNIT #4 TEST NO. 14-4-NH3 METHOD SCAQMD DRAFT PAGE 1 OF 1
TEST CONDITION @ 70 MW AMB. TEMP., °F PROJECT # 12582
METER VOL. (START/END) / DATE 9/28/92

**PRE-TEST DATA:**

| | |
|---|---|
| Barometric Press., in. Hg. | 24.59 |
| Assumed Stack Press. | |
| Assumed Moisture | |
| Assumed Molecular Wt. | |
| Assumed ΔP | |
| Assumed ΔH | |
| Stack Diameter, in. | 48x48 |
| Sample Time: Total | 30 |
| per point | 5 |
| Total of Traverse Points | 6 |

ΔH = 1.5 x ΔP

**EQUIPMENT INFO:**

| | |
|---|---|
| Meter No. | NORTH |
| Meter, Yd. | 1.006 |
| CFM @ ΔH = 1.0 | |
| Pitot ID, Cp | |
| $O_2/CO_2$ Method | |
| Teflon Connecting Line (Y/N) | |
| Probe: Mat'l | SS |
| Length | 6 |
| Nozzle: Mat'l | |
| Diam. | |
| Filter: No. | |
| Mat'l | |

| Imp. | Mat'l | Wt.(End) | Wt.(Start) | Wt.(g) |
|---|---|---|---|---|
| #1 | 0.1N $H_2SO_4$ | 677.3 | 618.0 | 59.3 |
| #2 | 0.1N $H_2SO_4$ | 586.8 | 582.2 | 4.6 |
| #3 | — | 494.3 | 493.1 | 1.2 |
| #4 | S.G. | 696.7 | 687.2 | 9.5 |
| #5 | | | | |
| Total | | | | 74.6 |

**POST TEST INFO:**
Filter Appearance
Impinger Appearance
Silica Gel Spent (Y/N)

**SAMPLE TRAIN LEAK CHECK:**

| | CFM | Vac. | Pitot | Init. |
|---|---|---|---|---|
| Pre-Test | .005 | 15" | — | JP |
| Post-Test | .002 | 10" | — | JP |

**PRE-TEST CALIBRATION CHECK:**

| | Time | ΔH | Meter Reading | Meter Temp. In | Meter Temp. Out |
|---|---|---|---|---|---|
| Init. | | | | | |
| Final | | | | | |

| SAMPLE POINT | TIME | METER CONDITIONS ΔP | ΔH | METER READING | TEMPERATURES, °F STACK | PROBE | METER IN | METER OUT | OVEN | IMP. OUT | $O_2$ | VAC. | STATIC PRESS. iwg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W 4 | 0555 | | 1.5 | 611.291 | | | 103 | 80 | | 60 | 12 | 8 | |
| W 4 | 0600 | | | 621.42 | | | 109 | 79 | | 60 | 12 | 8 | |
| W 5 | 0605/0606 | | | 626.32 | | | 117 | 81 | | 61 | 12.5 | 9 | |
| W 5 | 0611 | | | 631.31 | | | 117 | 80 | | 62 | 11.5 | 9 | |
| W 6 | 0616/0617 | | | 636.44 | | | 115 | 81 | | 64 | 9 | 9 | |
| W 6 | 0622 | | | 641.56 | | | 120 | 82 | | 64 | 9.5 | 9 | |
| | 0627 | | | 646.69 | | | STOP | | | | | | |

| CHAIN OF CUSTODY INFORMATION | |
|---|---|
| Impingers Loaded | BAC |
| Impingers Recovered | MM |
| Filter Loaded | |
| Filter Recovered | |
| Probe Wash | JP |
| **TEST SUMMARY** | |
| Calculated by: | JRH |
| Checked by: | |
| Sample Vol., c.f. | 30.328 |
| Stack Press., iwg | |
| ΔH, iwg | 1.5 |
| ΔP, iwg | |
| Meter Temp., °F | 97.0 |
| Stack Temp., °F | |
| Water Collected, g | 74.6 |
| $O_2/CO_2$ | 11.1 / 5.5 |
| Comments: | |

RMS-057

# APPENDIX D
# CALCULATIONS

Appendix D.1

General Emissions Calculations

# EMISSION CALCULATIONS

1. Sample Volume and Isokinetics

a. Sample gas volume, dscf

$$V_{m\ std} = 0.03342\ V_m \left(P_{bar} + \frac{H}{13.6}\right)\left(\frac{T_{ref}}{T_m}\right)(Y)$$

b. Water vapor volume, scf

$$V_{w\ std} = 0.0472\ V_{lc} \left(\frac{T_{ref}}{528\ ^\circ R}\right)$$

c. Moisture content, nondimensional

$$B_{wo} = \frac{V_{w\ std}}{V_{m\ std} + V_{w\ std}}$$

d. Stack gas molecular weight, lb/lb mole

$$MW_{dry} = 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%N_2)$$

$$MW_{wet} = MW_{dry}\ (1 - B_{wo}) + 18\ (B_{wo})$$

e. Absolute stack pressure, iwg

$$P_s = P_{bar} + \frac{P_{sg}}{13.6}$$

f. Stack velocity, ft/sec

$$V_s = 2.90\ C_p \sqrt{\Delta P T_s} \sqrt{\left(\frac{29.92}{p_s}\right)\left(\frac{28.95}{MW_{wet}}\right)}$$

g. Actual stack flow rate, wacfm

$$Q = (V_s)(A_s)(60)$$

h. Standard stack gas flow rate, dscfm

$$Q_{sd} = Q\ (1 - B_{wo})\left(\frac{T_{ref}}{T_s}\right)\left(\frac{P_s}{29.92}\right)$$

i. Percent isokinetic

$$I = \left(\frac{17.32(T_s)(V_{m\ std})}{(1 - B_{wo})(\Theta)(V_s)(P_s)(D_n^2)}\right)\left(\frac{528\ ^\circ R}{T_{ref}}\right)$$

2. Particulate Emissions

a. Grain loading, gr/dscf

$$C = 0.01543 \left(\frac{M_n}{V_{m\ std}}\right)$$

b. Grain loading at 12% $CO_2$, gr/dscf

$$C_{12\%CO_2} = C\left(\frac{12}{\%CO_2}\right)$$

c. Mass emissions, lb/hr

$$M = C(Q_{sd})\frac{(60\ \text{min}/hr)}{(7000\ gr/lb)}$$

3. Gaseous Emissions, lb/hr

$$M = (ppm)(10^{-6})\left(\frac{MW_i\ lb/lb\ mole}{SV}\right)(Q_{sd})(60\ \text{min}/hr)$$

where,

$SV$ = *specific molar volume of an ideal gas*:

$SV = 385.3\ ft^3/lb\ mole \quad for\ T_{ref} = 528\ °R$

$SV = 379.5\ ft^3/lb\ mole \quad for\ T_{ref} = 520\ °R$

4. Emissions Rates, lb/$10^6$ Btu

a. Fuel factor at 68 °F, dscf/$10^6$ Btu at 0% $O_2$

$$F_{68} = \frac{10^6[3.64(\%H) + 1.53(\%C) + 0.14\ (\%N) + 0.57(\%S) - 0.46(\%O_2, fuel)]}{HHV,\ Btu/lb}$$

b. Fuel factor at 60 °F

$$F_{60} = F_{68}\left(\frac{520\ °R}{528\ °R}\right)$$

c. Gaseous Emissions factor

$$\left(\frac{lb}{10^6\ Btu}\right)_i = (ppm)_i\ (10^{-6})\left(\frac{MW_i\ lb}{lb\ mole}\right)\left(\frac{1}{SV}\right)(F)\left(\frac{20.9}{20.9 - \%O_2}\right)$$

d. Paticulate emission factor

$$\left(\frac{lb}{10^6\ Btu}\right) = C\left(\frac{1\ lb}{7000\ gr}\right)(F)\left(\frac{20.9}{20.9 - \%O_2}\right)$$

Nomenclature:

$A_s$ = stack area, $ft^2$

$B_{wo}$ = flue gas moisture content

$C_{12\% CO_2}$ = 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/$10^6$ Btu at 0% $O_2$

$H$ = orifice pressure differential, iwg

$I$ = % isokinetics

$M_n$ = mass of collected particulate, mg

$M_i$ = mass emissions of species i, lb/hr

$MW$ = molecular weight of flue gas

$MW_i$ = molecular weight of species i:

| | | |
|---|---|---|
| $NO_x$ | : | 46 |
| CO | : | 28 |
| $SO_x$ | : | 64 |
| HC | : | 16 |

$\theta$ = sample time, min.

$\Delta P$ = average velocity head, iwg = $\left(\overline{\sqrt{\Delta P}}\right)^2$

$P_{bar}$ = barometric pressure, in.Hg

$P_s$ = stack absolute pressure, in.Hg

$P_{sg}$ = stack static pressure, iwg

**Nomenclature (Continued):**

| | | |
|---|---|---|
| $Q$ | = | wet stack gas flow rate at actual conditions, wacfm |
| $Qsd$ | = | dry stack gas flow rate at standard conditions, dscfm |
| $SV$ | = | specific molar volume of an ideal gas at standard conditions, $ft^3$/lb mole |
| $Tm$ | = | meter temperature, °R |
| $T_{ref}$ | = | reference temperature, °R |
| $Ts$ | = | stack temperature, °R |
| $V_s$ | = | stack velocity, ft/sec |
| $V_{lc}$ | = | volume of liquid collected in impingers, ml |
| $Vm$ | = | dry meter volume uncorrected, dcf |
| $V_{m\ std}$ | = | dry meter volume at standard conditions, dscf |
| $V_{w\ std}$ | = | volume of water vapor at standard conditions, scf |
| $Y$ | = | meter calibration coefficient |

Appendix D.2

Specific Emissions Calculations

# CARNOT EMISSIONS TRAILER
## CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: #4
Location: HSAPH

Condition: Urea Off
Load: 254 MW

| | O2% | CO2% | CO ppm | NOx ppm | |
|---|---|---|---|---|---|
| Analyzer Range: | 10 | | 100 | 100 | |
| Span Value: | 5.03 | | 55.63 | 49.37 | |

| Test #: 2A-4-CEM | Time 0845/0915 | | | Date 9/15/92 | |
|---|---|---|---|---|---|
| | O2% | CO2% | CO ppm | NOx ppm | |
| System Zero | 0.01 | | -0.20 | 0.80 | |
| System Span | 5.00 | | 55.60 | 48.00 | |
| Raw Average | 2.11 | | 12.67 | 68.87 | |
| System Zero | 0.01 | | 0.70 | 1.20 | |
| System Span | 4.95 | | 55.60 | 49.00 | |
| Corrected Average | 2.13 | | 12.48 | 70.54 | |
| System Bias Check | | | | | |
| Zero Pre-test | 0.10% | | -0.20% | 0.80% | |
| Zero Post-test | 0.10% | | 0.70% | 1.20% | |
| Span Pre-test | -0.31% | | -0.03% | -1.37% | |
| Span Post-test | -0.81% | | -0.03% | -0.37% | |

| Test #: | Time | | | Date | |
|---|---|---|---|---|---|
| | O2% | CO2% | CO ppm | NOx ppm | |
| System Zero | | | | | |
| System Span | | | | | |
| Raw Average | | | | | |
| System Zero | | | | | |
| System Span | | | | | |
| Corrected Average | | | | | |
| System Bias Check | | | | | |
| Zero Pre-test | | | | | |
| Zero Post-test | | | | | |
| Span Pre-test | | | | | |
| Span Post-test | | | | | |
| Test Average | | | | | |

# CARNOT EMISSIONS TRAILER
## CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: #4
Location: HSAPH

Condition: Urea Off
Load: 254 MW

| | O2% | CO2% | CO ppm | NOx ppm |
|---|---|---|---|---|
| Analyzer Range: | 10 | | 100 | 100 |
| Span Value: | 5.03 | | 55.63 | 90.52 |

Test #: 2B-4-CEM Time 0948/1018 Date 9/15/92

| | O2% | CO2% | CO ppm | NOx ppm |
|---|---|---|---|---|
| System Zero | 0.01 | | 0.70 | 1.00 |
| System Span | 4.95 | | 55.60 | 88.00 |
| Raw Average | 2.14 | | 11.20 | 67.54 |
| System Zero | 0.01 | | 0.60 | 1.00 |
| System Span | 4.92 | | 55.90 | 88.10 |
| Corrected Average | 2.18 | | 10.65 | 69.19 |
| System Bias Check | | | | |
| Zero Pre-test | 0.10% | | 0.70% | 1.00% |
| Zero Post-test | 0.10% | | 0.60% | 1.00% |
| Span Pre-test | -0.81% | | -0.03% | -2.52% |
| Span Post-test | -1.11% | | 0.27% | -2.42% |

Test #: Time Date

| | O2% | CO2% | CO ppm | NOx ppm |
|---|---|---|---|---|
| System Zero | | | | |
| System Span | | | | |
| Raw Average | | | | |
| System Zero | | | | |
| System Span | | | | |
| Corrected Average | | | | |
| System Bias Check | | | | |
| Zero Pre-test | | | | |
| Zero Post-test | | | | |
| Span Pre-test | | | | |
| Span Post-test | | | | |
| Test Average | | | | |

# CARNOT EMISSIONS TRAILER
## CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: #4
Location: HSAPH

Condition: Urea On
Load: 254 MW

| | O2% | CO2% | CO ppm | NOx ppm |
|---|---|---|---|---|
| Analyzer Range: | 10 | | 100 | 100 |
| Span Value: | 5.03 | | 55.63 | 90.52 |

Test #: 3-4-CEM Time 1245/1315 Date 9/15/92

| | O2% | CO2% | CO ppm | NOx ppm |
|---|---|---|---|---|
| System Zero | 0.01 | | 0.20 | 0.40 |
| System Span | 5.00 | | 57.00 | 88.00 |
| Raw Average | 2.06 | | 12.90 | 57.64 |
| System Zero | 0.01 | | 0.30 | 0.80 |
| System Span | 5.00 | | 56.80 | 86.50 |
| Corrected Average | 2.07 | | 12.42 | 59.59 |
| System Bias Check | | | | |
| Zero Pre-test | 0.10% | | 0.20% | 0.40% |
| Zero Post-test | 0.10% | | 0.30% | 0.80% |
| Span Pre-test | -0.31% | | 1.37% | -2.52% |
| Span Post-test | -0.31% | | 1.17% | -4.02% |

Test #: 4-4-CEM Time 1547/1617 Date 9/15/92

| | O2% | CO2% | CO ppm | NOx ppm |
|---|---|---|---|---|
| System Zero | 0.02 | | 0.10 | 0.20 |
| System Span | 5.00 | | 56.50 | 89.30 |
| Raw Average | 2.17 | | 5.00 | 62.58 |
| System Zero | 0.02 | | 0.20 | 0.50 |
| System Span | 5.01 | | 56.90 | 88.10 |
| Corrected Average | 2.17 | | 4.77 | 63.76 |
| System Bias Check | | | | |
| Zero Pre-test | 0.20% | | 0.10% | 0.20% |
| Zero Post-test | 0.20% | | 0.20% | 0.50% |
| Span Pre-test | -0.31% | | 0.87% | -1.22% |
| Span Post-test | -0.21% | | 1.27% | -2.42% |
| Test Average | 2.12 | | 8.60 | 61.67 |

# CARNOT EMISSIONS TRAILER
## CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: # 4
Location: HSAPH

Condition: Urea Off
Load: 70 MW

| | O2% | CO2% | CO ppm | NOx ppm | |
|---|---|---|---|---|---|
| Analyzer Range: | 10 | | 100 | 100 | |
| Span Value: | 4.99 | | 55.87 | 50.63 | |
| Test #: 5-4-CEM | | Time | 2325/2355 | | Date 9/18/92 |
| | O2% | CO2% | CO ppm | NOx ppm | |
| System Zero | 0.08 | | 0.30 | 0.80 | |
| System Span | 4.95 | | 55.60 | 50.20 | |
| Raw Average | 7.94 | | 2.02 | 28.34 | |
| System Zero | 0.08 | | 0.30 | 1.00 | |
| System Span | 4.93 | | 55.50 | 50.30 | |
| Corrected Average | 8.07 | | 1.74 | 28.15 | |
| System Bias Check | | | | | |
| Zero Pre-test | 0.80% | | 0.30% | 0.80% | |
| Zero Post-test | 0.80% | | 0.30% | 1.00% | |
| Span Pre-test | -0.40% | | -0.27% | -0.43% | |
| Span Post-test | -0.60% | | -0.37% | -0.33% | |
| Test #: 6-4-CEM | | Time | 0215/0245 | | Date 9/19/92 |
| | O2% | CO2% | CO ppm | NOx ppm | |
| System Zero | 0.05 | | 0.10 | 1.00 | |
| System Span | 4.92 | | 55.70 | 50.40 | |
| Raw Average | 7.79 | | 1.96 | 29.00 | |
| System Zero | 0.08 | | 0.20 | 0.80 | |
| System Span | 4.95 | | 55.50 | 51.00 | |
| Corrected Average | 7.92 | | 1.82 | 28.57 | |
| System Bias Check | | | | | |
| Zero Pre-test | 0.50% | | 0.10% | 1.00% | |
| Zero Post-test | 0.80% | | 0.20% | 0.80% | |
| Span Pre-test | -0.70% | | -0.17% | -0.23% | |
| Span Post-test | -0.40% | | -0.37% | 0.37% | |
| Test Average | 7.99 | | 1.78 | 28.36 | |

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# CARNOT EMISSIONS TRAILER
## CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: # 4
Location: HSAPH

Condition: Urea On
Load: 70 MW

| | O2% | CO2% | CO ppm | NOx ppm |
|---|---|---|---|---|
| Analyzer Range: | 10 | | 100 | 100 |
| Span Value: | 4.99 | | 55.87 | 50.63 |

| Test #: 7-4-CEM | Time | 0500/0530 | Date | 9/19/92 |
|---|---|---|---|---|

| | O2% | CO2% | CO ppm | NOx ppm |
|---|---|---|---|---|
| System Zero | 0.05 | | 0.10 | 0.80 |
| System Span | 4.90 | | 55.60 | 49.80 |
| Raw Average | 7.51 | | 8.54 | 24.06 |
| System Zero | 0.09 | | 0.20 | 0.20 |
| System Span | 4.90 | | 55.90 | 48.90 |
| Corrected Average | 7.69 | | 8.43 | 24.42 |
| System Bias Check | | | | |
| Zero Pre-test | 0.50% | | 0.10% | 0.80% |
| Zero Post-test | 0.90% | | 0.20% | 0.20% |
| Span Pre-test | -0.90% | | -0.27% | -0.83% |
| Span Post-test | -0.90% | | 0.03% | -1.73% |

| Test #: 8-4-CEM | Time | 0805/0835 | Date | 9/19/92 |
|---|---|---|---|---|

| | O2% | CO2% | CO ppm | NOx ppm |
|---|---|---|---|---|
| System Zero | 0.07 | | 0.10 | 0.80 |
| System Span | 4.90 | | 55.80 | 49.50 |
| Raw Average | 7.58 | | 7.30 | 25.10 |
| System Zero | 0.08 | | 0.10 | 0.20 |
| System Span | 4.90 | | 55.60 | 49.80 |
| Corrected Average | 7.76 | | 7.23 | 25.34 |
| System Bias Check | | | | |
| Zero Pre-test | 0.70% | | 0.10% | 0.80% |
| Zero Post-test | 0.80% | | 0.10% | 0.20% |
| Span Pre-test | -0.90% | | -0.07% | -1.13% |
| Span Post-test | -0.90% | | -0.27% | -0.83% |
| Test Average | 7.72 | | 7.83 | 24.88 |

# CARNOT EMISSIONS TRAILER
## CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: # 4
Location: HSAPH

Condition: Urea Off
Load: 150 MW

| | O2% | CO2% | CO ppm | NOx ppm |
|---|---|---|---|---|
| Analyzer Range: | 10 | | 100 | 100 |
| Span Value: | 4.99 | | 55.87 | 50.63 |

| Test #: 9-4-CEM | Time 2230/2300 | | | Date 9/19/92 |
|---|---|---|---|---|
| | O2% | CO2% | CO ppm | NOx ppm |
| System Zero | 0.01 | | 0.20 | 0.80 |
| System Span | 5.00 | | 56.10 | 52.00 |
| Raw Average | 2.66 | | 0.00 | 36.84 |
| System Zero | 0.01 | | 0.10 | 1.40 |
| System Span | 4.94 | | 56.10 | 53.10 |
| Corrected Average | 2.67 | | -0.15 | 35.17 |
| System Bias Check | | | | |
| Zero Pre-test | 0.10% | | 0.20% | 0.80% |
| Zero Post-test | 0.10% | | 0.10% | 1.40% |
| Span Pre-test | 0.10% | | 0.23% | 1.37% |
| Span Post-test | -0.50% | | 0.23% | 2.47% |

| Test #: 10-4-CEM | Time 0145/0215 | | | Date 9/20/92 |
|---|---|---|---|---|
| | O2% | CO2% | CO ppm | NOx ppm |
| System Zero | 0.01 | | 0.10 | -0.10 |
| System Span | 4.96 | | 56.00 | 49.10 |
| Raw Average | 2.68 | | 0.00 | 34.98 |
| System Zero | 0.01 | | 0.00 | 0.90 |
| System Span | 4.90 | | 56.10 | 51.20 |
| Corrected Average | 2.71 | | -0.05 | 35.19 |
| System Bias Check | | | | |
| Zero Pre-test | 0.10% | | 0.10% | -0.10% |
| Zero Post-test | 0.10% | | 0.00% | 0.90% |
| Span Pre-test | -0.30% | | 0.13% | -1.53% |
| Span Post-test | -0.90% | | 0.23% | 0.57% |
| Test Average | 2.69 | | -0.10 | 35.18 |

# CARNOT EMISSIONS TRAILER
## CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: # 4
Location: HSAPH

Condition: Urea On
Load: 150 MW

| | O2% | CO2% | CO ppm | NOx ppm |
|---|---|---|---|---|
| Analyzer Range: | 10 | | 100 | 100 |
| Span Value: | 4.99 | | 55.87 | 50.63 |

| Test #: 11-4-CEM | | Time | 0445/0515 | Date 9/20/92 |
|---|---|---|---|---|
| | O2% | CO2% | CO ppm | NOx ppm |
| System Zero | 0.01 | | 0.00 | 0.70 |
| System Span | 4.86 | | 56.20 | 49.80 |
| Raw Average | 2.70 | | 0.00 | 32.52 |
| System Zero | 0.00 | | 0.00 | 0.90 |
| System Span | 4.87 | | 56.20 | 49.40 |
| Corrected Average | 2.77 | | 0.00 | 32.91 |
| System Bias Check | | | | |
| Zero Pre-test | 0.10% | | 0.00% | 0.70% |
| Zero Post-test | 0.00% | | 0.00% | 0.90% |
| Span Pre-test | -1.30% | | 0.33% | -0.83% |
| Span Post-test | -1.20% | | 0.33% | -1.23% |

| Test #: 12-4-CEM | | Time | 0700/0730 | Date 9/20/92 |
|---|---|---|---|---|
| | O2% | CO2% | CO ppm | NOx ppm |
| System Zero | 0.01 | | 0.00 | 0.50 |
| System Span | 4.88 | | 56.20 | 49.70 |
| Raw Average | 2.72 | | 0.00 | 32.36 |
| System Zero | 0.01 | | 0.00 | -0.20 |
| System Span | 4.85 | | 56.20 | 49.10 |
| Corrected Average | 2.79 | | 0.00 | 33.11 |
| System Bias Check | | | | |
| Zero Pre-test | 0.10% | | 0.00% | 0.50% |
| Zero Post-test | 0.10% | | 0.00% | -0.20% |
| Span Pre-test | -1.10% | | 0.33% | -0.93% |
| Span Post-test | -1.40% | | 0.33% | -1.53% |
| Test Average | 2.78 | | 0.00 | 33.01 |

# CARNOT EMISSIONS TRAILER
## CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: # 4
Location: HSAPH

Condition: Urea ON
Load: 70 MW

| | O2% | CO2% | CO ppm | NOx ppm |
|---|---|---|---|---|
| Analyzer Range: | 10 | | 100 | 100 |
| Span Value: | 4.99 | | 55.84 | 50.63 |

| Test #: 13-4-CEM | | Time | 0510/0540 | Date 9/28/92 |
|---|---|---|---|---|
| | O2% | CO2% | CO ppm | NOx ppm |
| System Zero | 0.03 | | 0.20 | 0.30 |
| System Span | 4.93 | | 55.20 | 49.60 |
| Raw Average | 7.94 | | 25.80 | 25.00 |
| System Zero | 0.02 | | 0.10 | 0.70 |
| System Span | 4.90 | | 55.30 | 49.80 |
| Corrected Average | 8.08 | | 25.99 | 25.21 |
| System Bias Check | | | | |
| Zero Pre-test | 0.30% | | 0.20% | 0.30% |
| Zero Post-test | 0.20% | | 0.10% | 0.70% |
| Span Pre-test | -0.60% | | -0.64% | -1.03% |
| Span Post-test | -0.90% | | -0.54% | -0.83% |

| Test #: 14-4-CEM | | Time | 0612/0642 | Date 9/28/92 |
|---|---|---|---|---|
| | O2% | CO2% | CO ppm | NOx ppm |
| System Zero | 0.02 | | 0.10 | 0.70 |
| System Span | 4.90 | | 55.30 | 49.80 |
| Raw Average | 7.93 | | 27.30 | 24.72 |
| System Zero | 0.03 | | 0.00 | 1.10 |
| System Span | 4.90 | | 55.00 | 50.10 |
| Corrected Average | 8.09 | | 27.62 | 24.59 |
| System Bias Check | | | | |
| Zero Pre-test | 0.20% | | 0.10% | 0.70% |
| Zero Post-test | 0.30% | | 0.00% | 1.10% |
| Span Pre-test | -0.90% | | -0.54% | -0.83% |
| Span Post-test | -0.90% | | -0.84% | -0.53% |
| Test Average | 8.08 | | 26.81 | 24.90 |

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# CARNOT EMISSIONS TRAILER
## CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: # 4
Location: HSAPH

Condition: Urea Off
Load: 70 MW

| | O2% | CO2% | CO ppm | NOx ppm |
|---|---|---|---|---|
| Analyzer Range: | 10 | | 100 | 100 |
| Span Value: | 4.99 | | 55.87 | 50.63 |

| Test #: 15-4-CEM | | Time 0713/0743 | | Date 9/28/92 |
|---|---|---|---|---|
| | O2% | CO2% | CO ppm | NOx ppm |
| System Zero | 0.03 | | 0.00 | 0.30 |
| System Span | 4.90 | | 55.00 | 49.30 |
| Raw Average | 8.14 | | 28.80 | 26.52 |
| System Zero | 0.02 | | 0.20 | 0.80 |
| System Span | 4.90 | | 55.00 | 50.20 |
| Corrected Average | 8.31 | | 29.21 | 26.72 |
| System Bias Check | | | | |
| Zero Pre-test | 0.30% | | 0.00% | 0.30% |
| Zero Post-test | 0.20% | | 0.20% | 0.80% |
| Span Pre-test | -0.90% | | -0.87% | -1.33% |
| Span Post-test | -0.90% | | -0.87% | -0.43% |

| Test #: 16-4-CEM | | Time 0800/0830 | | Date 9/28/92 |
|---|---|---|---|---|
| | O2% | CO2% | CO ppm | NOx ppm |
| System Zero | 0.02 | | 0.20 | 0.80 |
| System Span | 4.90 | | 55.00 | 50.20 |
| Raw Average | 8.18 | | 29.20 | 27.12 |
| System Zero | 0.06 | | 0.00 | 0.90 |
| System Span | 4.93 | | 54.70 | 50.30 |
| Corrected Average | 8.33 | | 29.70 | 26.92 |
| System Bias Check | | | | |
| Zero Pre-test | 0.20% | | 0.20% | 0.80% |
| Zero Post-test | 0.60% | | 0.00% | 0.90% |
| Span Pre-test | -0.90% | | -0.87% | -0.43% |
| Span Post-test | -0.60% | | -1.17% | -0.33% |
| Test Average | 8.32 | | 29.45 | 26.82 |

# CARNOT

12/9/92

## Particulate

## SOURCE TEST DATA SUMMARY WORKSHEET

| | | | |
|---|---|---|---|
| Client/Location | SCE | Parameter | Urea Off |
| Unit | 4 | Fuel | Natural Gas |
| Sample Location | CSAPH | Data By | EF |

| Test Number | 1-4-PM | 2-4-PM | | Average |
|---|---|---|---|---|
| Reference Temperature, F | 60 | 60 | | |
| Test Date | 9/14/92 | 9/15/92 | | |
| Test Method | SCAQMD 5.3 | SCAQMD 5.3 | | SCAQMD 5.3 |
| Sample Train | ES-28 | ES-28 | | - |
| Pitot Factor | 0.840 | 0.840 | | - |
| Meter Calibration Factor | 1.000 | 1.000 | | - |
| Stack Area (sq ft) | 452.30 | 452.30 | | - |
| Sample Time (Min) | 126 | 126 | | 126 |
| Barometric Pressure (in Hg) | 29.92 | 29.92 | | 29.92 |
| Nozzle Diam (in) | 0.240 | 0.240 | | - |
| Start/Stop Time | 1208/1603 | 0650/0924 | | - |
| Stack Pressure (iwg) | 1.04 | 1.10 | | 1.07 |
| Stack Temperature (F) | 228.0 | 241.3 | | 234.7 |
| Delta P (iwg) | 0.3036 | 0.3305 | | 0.3171 |
| Meter Volume (acf) | 55.368 | 60.015 | | 57.692 |
| Meter Temperature (F) | 88.1 | 93.5 | | 90.8 |
| Meter Pressure (iwg) | 0.692 | 0.749 | | 0.721 |
| Liquid Volume (ml) | 216.5 | 241.3 | | 228.9 |
| Stack O2 (%) | 5.3 | 4.9 | | 5.1 |
| Stack CO2 (%) | 9.1 | 9.4 | | 9.3 |
| Standard Sample Volume (SCF) | 52.615 | 56.486 | | 54.551 |
| Moisture Fraction | 0.161 | 0.166 | | 0.163 |
| Molecular Weight. (wet) | 27.79 | 27.76 | | 27.78 |
| Stack Gas Velocity (ft/sec) | 35.89 | 37.82 | | 36.86 |
| Stack Flow Rate (wacfm) | 973,964 | 1,026,467 | | 1,000,216 |
| Stack Flow Rate (dscfm) | 619,369 | 636,587 | | 627,978 |
| Isokinetic Ratio (%) | 97.03 | 101.35 | | 99.19 |
| Particulate Catch, mg | 2.90 | 1.60 | | 2.25 |
| Grain Loading gr/dscf | 0.0009 | 0.0004 | | 0.0006 |
| Grain Loading @ 12% CO2 | 0.0011 | 0.0006 | | 0.0008 |
| Part emission lb/hr | 4.51 | 2.38 | | 3.45 |

# CARNOT

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## Particulate

## SOURCE TEST DATA SUMMARY WORKSHEET

| | | | |
|---|---|---|---|
| Client/Location | SCE | Parameter | Urea On |
| Unit | 4 | Fuel | Natural Gas |
| Sample Location | CSAPH | Data By | EF |
| Test Number | 3-4-PM | 4-4-PM | Average |
| Reference Temperature, F | 60 | 60 | |
| Test Date | 9/15/92 | 9/15/92 | |
| Test Method | SCAQMD 5.3 | SCAQMD 5.3 | SCAQMD 5.3 |
| Sample Train | ES-28 | ES-28 | - |
| Pitot Factor | 0.840 | 0.840 | - |
| Meter Calibration Factor | 1.000 | 1.000 | - |
| Stack Area (sq ft) | 452.30 | 452.30 | - |
| Sample Time (Min) | 126 | 126 | 126 |
| Barometric Pressure (in Hg) | 29.91 | 29.99 | 29.91 |
| Nozzle Diam (in) | 0.240 | 0.240 | - |
| Start/Stop Time | 1122/1358 | 1432/1652 | - |
| Stack Pressure (iwg) | 0.99 | 1.02 | 1.01 |
| Stack Temperature (F) | 228.6 | 230.2 | 229.4 |
| Delta P (iwg) | 0.3087 | 0.3478 | 0.3283 |
| Meter Volume (acf) | 57.394 | 62.181 | 59.788 |
| Meter Temperature (F) | 88.7 | 93.5 | 91.1 |
| Meter Pressure (iwg) | 0.712 | 0.805 | 0.759 |
| Liquid Volume (ml) | 230.1 | 248.9 | 239.5 |
| Stack O2 (%) | 5.4 | 5.3 | 5.4 |
| Stack CO2 (%) | 9.0 | 9.1 | 9.1 |
| Standard Sample Volume (SCF) | 54.465 | 58.665 | 56.565 |
| Moisture Fraction | 0.164 | 0.165 | 0.164 |
| Molecular Weight. (wet) | 27.74 | 27.75 | 27.74 |
| Stack Gas Velocity (ft/sec) | 36.25 | 38.46 | 37.36 |
| Stack Flow Rate (wacfm) | 983,666 | 1,043,829 | 1,013,748 |
| Stack Flow Rate (dscfm) | 622,059 | 659,917 | 640,988 |
| Isokinetic Ratio (%) | 100.01 | 101.54 | 100.78 |
| Particulate Catch, mg | 2.10 | 2.40 | 2.25 |
| Grain Loading gr/dscf | 0.0006 | 0.0006 | 0.0006 |
| Grain Loading @ 12% CO2 | 0.0008 | 0.0008 | 0.0008 |
| Part emission lb/hr | 3.17 | 3.57 | 3.37 |

# CARNOT

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## Particulate

## SOURCE TEST DATA SUMMARY WORKSHEET

| | | | |
|---|---|---|---|
| Client/Location | SCE | Parameter | Urea Off |
| Unit | 4 | Fuel | Natural Gas |
| Sample Location | CSAPH | Data By | EF |

| Test Number | 5-4-PM | 6-4-PM | | Average |
|---|---|---|---|---|
| Reference Temperature, F | 60 | 60 | | |
| Test Date | 9/18/92 | 9/19/92 | | |
| Test Method | SCAQMD 5.3 | SCAQMD 5.3 | | SCAQMD 5.3 |
| Sample Train | ES-28 | ES-28 | | - |
| Pitot Factor | 0.840 | 0.840 | | - |
| Meter Calibration Factor | 1.000 | 1.000 | | - |
| Stack Area (sq ft) | 452.30 | 452.30 | | - |
| Sample Time (Min) | 126 | 126 | | 126 |
| Barometric Pressure (in Hg) | 28.89 | 29.90 | | 28.89 |
| Nozzle Diam (in) | 0.251 | 0.240 | | - |
| Start/Stop Time | 2200/2417 | 0100/0317 | | - |
| Stack Pressure (iwg) | 0.06 | 0.12 | | 0.09 |
| Stack Temperature (F) | 169.0 | 167.7 | | 168.4 |
| Delta P (iwg) | 0.0869 | 0.0954 | | 0.0912 |
| Meter Volume (acf) | 37.795 | 37.671 | | 37.733 |
| Meter Temperature (F) | 86.4 | 80.0 | | 83.2 |
| Meter Pressure (iwg) | 0.270 | 0.275 | | 0.273 |
| Liquid Volume (ml) | 94.6 | 100.5 | | 97.6 |
| Stack O2 (%) | 11.5 | 11.6 | | 11.6 |
| Stack CO2 (%) | 5.5 | 5.4 | | 5.5 |
| Standard Sample Volume (SCF) | 34.752 | 36.277 | | 35.514 |
| Moisture Fraction | 0.112 | 0.114 | | 0.113 |
| Molecular Weight. (wet) | 28.07 | 28.04 | | 28.05 |
| Stack Gas Velocity (ft/sec) | 18.62 | 19.16 | | 18.89 |
| Stack Flow Rate (wacfm) | 505,177 | 520,000 | | 512,589 |
| Stack Flow Rate (dscfm) | 357,938 | 381,406 | | 369,672 |
| Isokinetic Ratio (%) | 101.39 | 108.64 | | 105.02 |
| Particulate Catch, mg | 0.70 | 1.30 | | 1.00 |
| Grain Loading gr/dscf | 0.0003 | 0.0006 | | 0.0004 |
| Grain Loading @ 12% CO2 | 0.0007 | 0.0012 | | 0.0010 |
| Part emission lb/hr | 0.95 | 1.81 | | 1.38 |

# CARNOT

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## Particulate

## SOURCE TEST DATA SUMMARY WORKSHEET

| | | | | |
|---|---|---|---|---|
| Client/Location | SCE | Parameter | | Urea On |
| Unit | 4 | Fuel | | Natural Gas |
| Sample Location | CSAPH | Data By | | EF |
| Test Number | 7-4-PM | 8-4-PM | | Average |
| Reference Temperature, F | 60 | 60 | | |
| Test Date | 9/19/92 | 9/19/92 | | |
| Test Method | SCAQMD 5.3 | SCAQMD 5.3 | | SCAQMD 5.3 |
| Sample Train | ES-28 | ES-28 | | - |
| Pitot Factor | 0.840 | 0.840 | | - |
| Meter Calibration Factor | 1.000 | 1.000 | | - |
| Stack Area (sq ft) | 452.30 | 452.30 | | - |
| Sample Time (Min) | 126 | 126 | | 126 |
| Barometric Pressure (in Hg) | 28.89 | 28.89 | | 28.89 |
| Nozzle Diam (in) | 0.240 | 0.251 | | - |
| Start/Stop Time | 0400/0617 | 0650/0907 | | - |
| Stack Pressure (iwg) | -0.12 | -0.11 | | -0.12 |
| Stack Temperature (F) | 165.7 | 166.6 | | 166.2 |
| Delta P (iwg) | 0.0949 | 0.0796 | | 0.0873 |
| Meter Volume (acf) | 37.117 | 34.849 | | 35.983 |
| Meter Temperature (F) | 77.4 | 79.0 | | 78.2 |
| Meter Pressure (iwg) | 0.276 | 0.232 | | 0.254 |
| Liquid Volume (ml) | 99.9 | 92.4 | | 96.2 |
| Stack O2 (%) | 11.6 | 11.5 | | 11.6 |
| Stack CO2 (%) | 5.4 | 5.5 | | 5.5 |
| Standard Sample Volume (SCF) | 34.698 | 32.479 | | 33.588 |
| Moisture Fraction | 0.118 | 0.117 | | 0.117 |
| Molecular Weight. (wet) | 27.99 | 28.02 | | 28.00 |
| Stack Gas Velocity (ft/sec) | 19.43 | 17.80 | | 18.62 |
| Stack Flow Rate (wacfm) | 527,361 | 483,111 | | 505,236 |
| Stack Flow Rate (dscfm) | 373,039 | 341,735 | | 357,387 |
| Isokinetic Ratio (%) | 106.24 | 99.25 | | 102.75 |
| Particulate Catch, mg | 5.80 | 4.90 | | 5.35 |
| Grain Loading gr/dscf | 0.0026 | 0.0023 | | 0.0025 |
| Grain Loading @ 12% CO2 | 0.0057 | 0.0051 | | 0.0054 |
| Part emission lb/hr | 8.25 | 6.82 | | 7.53 |

# CARNOT

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## Particulate

## SOURCE TEST DATA SUMMARY WORKSHEET

| | | | |
|---|---|---|---|
| Client/Location | SCE | Parameter | Urea Off |
| Unit | 4 | Fuel | Natural Gas |
| Sample Location | CSAPH | Data By | EF |
| Test Number | 9-4-PM | 10-4-PM | Average |
| Reference Temperature, F | 60 | 60 | |
| Test Date | 9/19/92 | 9/20/92 | |
| Test Method | SCAQMD 5.3 | SCAQMD 5.3 | SCAQMD 5.3 |
| Sample Train | ES-28 | ES-28 | - |
| Pitot Factor | 0.840 | 0.840 | - |
| Meter Calibration Factor | 1.000 | 1.000 | - |
| Stack Area (sq ft) | 452.30 | 452.30 | - |
| Sample Time (Min) | 126 | 126 | 126 |
| Barometric Pressure (in Hg) | 28.89 | 28.98 | 28.89 |
| Nozzle Diam (in) | 0.240 | 0.251 | - |
| Start/Stop Time | 2133/2350 | 0027/0248 | - |
| Stack Pressure (iwg) | 0.18 | 0.19 | 0.19 |
| Stack Temperature (F) | 196.9 | 196.8 | 196.9 |
| Delta P (iwg) | 0.1422 | 0.1531 | 0.1477 |
| Meter Volume (acf) | 43.730 | 44.664 | 44.197 |
| Meter Temperature (F) | 81.4 | 80.8 | 81.1 |
| Meter Pressure (iwg) | 0.410 | 0.410 | 0.410 |
| Liquid Volume (ml) | 162.1 | 170.5 | 166.3 |
| Stack O2 (%) | 7.1 | 6.6 | 6.8 |
| Stack CO2 (%) | 8.0 | 8.5 | 8.3 |
| Standard Sample Volume (SCF) | 40.592 | 41.635 | 41.113 |
| Moisture Fraction | 0.157 | 0.160 | 0.158 |
| Molecular Weight. (wet) | 27.75 | 27.76 | 27.76 |
| Stack Gas Velocity (ft/sec) | 24.47 | 25.34 | 24.91 |
| Stack Flow Rate (wacfm) | 664,010 | 687,738 | 675,874 |
| Stack Flow Rate (dscfm) | 428,173 | 443,146 | 435,660 |
| Isokinetic Ratio (%) | 108.29 | 98.12 | 103.20 |
| Particulate Catch, mg | 3.10 | 1.40 | 2.25 |
| Grain Loading gr/dscf | 0.0012 | 0.0005 | 0.0008 |
| Grain Loading @ 12% CO2 | 0.0018 | 0.0007 | 0.0013 |
| Part emission lb/hr | 4.32 | 1.97 | 3.15 |

# CARNOT

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## Particulate

## SOURCE TEST DATA SUMMARY WORKSHEET

| | | | | |
|---|---|---|---|---|
| Client/Location..... | SCE | Parameter..... | | Urea On |
| Unit..... | 4 | Fuel..... | | Natural Gas |
| Sample Location..... | CSAPH | Data By..... | | EF |
| Test Number..... | 11-4-PM | 12-4-PM | | Average |
| Reference Temperature, F..... | 60 | 60 | | |
| Test Date..... | 9/20/92 | 9/20/92 | | |
| Test Method..... | SCAQMD 5.3 | SCAQMD 5.3 | | SCAQMD 5.3 |
| Sample Train..... | ES-28 | ES-28 | | - |
| Pitot Factor ..... | 0.840 | 0.840 | | - |
| Meter Calibration Factor..... | 1.000 | 1.000 | | - |
| Stack Area (sq ft)..... | 452.30 | 452.30 | | - |
| Sample Time (Min)..... | 126 | 126 | | 126 |
| Barometric Pressure (in Hg)..... | 29.65 | 29.00 | | 29.65 |
| Nozzle Diam (in)..... | 0.251 | 0.251 | | - |
| Start/Stop Time..... | 0331/0548 | 0630/0852 | | - |
| Stack Pressure (iwg)..... | 0.24 | 0.23 | | 0.24 |
| Stack Temperature (F)..... | 199.4 | 196.4 | | 197.9 |
| Delta P (iwg)..... | 0.1629 | 0.1441 | | 0.1535 |
| Meter Volume (acf)..... | 47.431 | 46.417 | | 46.924 |
| Meter Temperature (F)..... | 82.9 | 83.8 | | 83.4 |
| Meter Pressure (iwg)..... | 0.476 | 0.441 | | 0.459 |
| Liquid Volume (ml)..... | 182.7 | 179.3 | | 181.0 |
| Stack O2 (%)..... | 6.4 | 6.4 | | 6.4 |
| Stack CO2 (%)..... | 8.7 | 8.7 | | 8.7 |
| Standard Sample Volume (SCF) | 45.070 | 43.064 | | 44.067 |
| Moisture Fraction..... | 0.159 | 0.162 | | 0.160 |
| Molecular Weight. (wet)..... | 27.80 | 27.76 | | 27.78 |
| Stack Gas Velocity (ft/sec)..... | 25.88 | 24.57 | | 25.22 |
| Stack Flow Rate (wacfm)..... | 702,197 | 666,790 | | 684,494 |
| Stack Flow Rate (dscfm)..... | 461,919 | 429,123 | | 445,521 |
| Isokinetic Ratio (%)..... | 101.89 | 104.80 | | 103.35 |
| Particulate Catch, mg..... | 2.60 | 1.40 | | 2.00 |
| Grain Loading gr/dscf..... | 0.0009 | 0.0005 | | 0.0007 |
| Grain Loading @ 12% CO2..... | 0.0012 | 0.0007 | | 0.0010 |
| Part emission lb/hr..... | 3.52 | 1.85 | | 2.68 |

# CARNOT

11/23/92

## Ammonia

## SOURCE TEST DATA SUMMARY WORKSHEET

| | | | |
|---|---|---|---|
| Client/Location | SCE | Parameter | Urea Off |
| Unit | 4 | Fuel | Natural Gas |
| Sample Location | CSAPH | Data By | EF |

| Test Number | 2A-4-NH3 | 2B-4-NH3 | | Average |
|---|---|---|---|---|
| Reference Temperature, F | 60 | 60 | | |
| Test Date | 9/15/92 | 9/15/92 | | |
| Test Method | NH3 Draft | NH3 Draft | | NH3 Draft |
| Sample Train | ES-8 | ES-8 | | - |
| Meter Calibration Factor | 0.998 | 0.998 | | - |
| Sample Time (Min) | 30 | 30 | | 30 |
| Barometric Pressure (in Hg) | 29.94 | 29.94 | | 29.94 |
| Start/Stop Time | 0840/0910 | 0943/1013 | | - |
| Meter Volume (acf) | 23.094 | 23.253 | | 23.174 |
| Meter Temperature (F) | 89.5 | 103.2 | | 96.4 |
| Meter Pressure (iwg) | 2.000 | 2.000 | | 2.000 |
| Liquid Volume (ml) | 75.7 | 87.0 | | 81.4 |
| Stack O2 (%) | 4.9 | ~~4.9~~ | | 4.9 |
| Stack CO2 (%) | 9.4 | 9.4 | | 9.4 |
| Standard Sample Volume (SCF) | 21.928 | 21.542 | | 21.735 |
| Moisture Fraction | 0.138 | 0.158 | | 0.148 |
| Molecular Weight. (wet) | 28.08 | 27.85 | | 27.97 |
| **AMMONIA ANALYSIS** | | | | |
| NH3 ppm wt in solution | 1.33 | 0.39 | | 0.86 |
| Sample volume (ml) | 560 | 500 | | 530 |
| NH3 ppmV in flue gas | 1.7 | 0.4 | | 1.1 |
| NH3 ppmV @ 3%O2 | 1.9 | 0.5 | | 1.2 |

GT 11/23/92

# CARNOT

11/30/92

## Ammonia

## SOURCE TEST DATA SUMMARY WORKSHEET

| | | | | |
|---|---|---|---|---|
| Client/Location..... | SCE | Parameter..... | | Urea On |
| Unit..... | 4 | Fuel..... | | Natural Gas |
| Sample Location..... | CSAPH | Data By..... | | EF |
| Test Number..... | 3-4-NH3 | 4-4-NH3 | | Average |
| Reference Temperature, F..... | 60 | 60 | | |
| Test Date..... | 9/15/92 | 9/15/92 | | |
| Test Method..... | NH3 Draft | NH3 Draft | | NH3 Draft |
| Sample Train..... | ES-8 | ES-8 | | - |
| Meter Calibration Factor..... | 0.998 | 0.998 | | - |
| Sample Time (Min)..... | 30 | 30 | | 30 |
| Barometric Pressure (in Hg)..... | 29.90 | 29.99 | | 29.90 |
| Start/Stop Time..... | 1245/1315 | 1547/1617 | | - |
| Meter Volume (acf)..... | 23.246 | 24.115 | | 23.681 |
| Meter Temperature (F)..... | 90.3 | 93.3 | | 91.8 |
| Meter Pressure (iwg)..... | 2.000 | 2.000 | | 2.000 |
| Liquid Volume (ml)..... | 90.1 | 82.9 | | 86.5 |
| Stack O2 (%)..... | 5.4 | 5.3 | | 5.4 |
| Stack CO2 (%)..... | 9.0 | 9.1 | | 9.1 |
| Standard Sample Volume (SCF) | 22.010 | 22.778 | | 22.394 |
| Moisture Fraction..... | 0.160 | 0.145 | | 0.152 |
| Molecular Weight. (wet)..... | 27.79 | 27.98 | | 27.89 |
| AMMONIA ANALYSIS | | | | |
| NH3 ppm wt in solution..... | 8.03 | 5.92 | | 6.98 |
| Sample volume (ml)..... | 500 | 530 | | 515 |
| NH3 ppmV in flue gas..... | 8.9 | 6.7 | | 7.8 |
| NH3 ppmV @ 3%O2..... | 10.3 | 7.7 | | 9.0 |

11/30/92

# CARNOT

12/3/92

## Ammonia

## SOURCE TEST DATA SUMMARY WORKSHEET

| | | | | |
|---|---|---|---|---|
| Client/Location..... | SCE | Parameter..... | | Urea Off |
| Unit..... | 4 | Fuel..... | | Natural Gas |
| Sample Location..... | CSAPH | Data By..... | | EF |
| Test Number..... | 5-4-NH3 | 6-4-NH3 | | Average |
| Reference Temperature, F..... | 60 | 60 | | |
| Test Date..... | 9/19/92 | 9/20/92 | | |
| Test Method..... | NH3 Draft | NH3 Draft | | NH3 Draft |
| Sample Train..... | North | North | | - |
| Meter Calibration Factor..... | 0.975 | 0.975 | | - |
| Sample Time (Min)..... | 30 | 30 | | 30 |
| Barometric Pressure (in Hg)..... | 28.89 | 29.40 | | 28.89 |
| Start/Stop Time..... | 2325/2355 | 0215/0245 | | - |
| Meter Volume (acf)..... | 31.271 | 31.132 | | 31.202 |
| Meter Temperature (F)..... | 87.1 | 84.6 | | 85.9 |
| Meter Pressure (iwg)..... | 1.500 | 1.500 | | 1.500 |
| Liquid Volume (ml)..... | 69.5 | 82.8 | | 76.2 |
| Stack O2 (%)..... | 11.5 | 11.6 | | 11.6 |
| Stack CO2 (%)..... | 5.5 | 5.4 | | 5.5 |
| Standard Sample Volume (SCF) | 28.086 | 28.584 | | 28.335 |
| Moisture Fraction..... | 0.103 | 0.119 | | 0.111 |
| Molecular Weight. (wet)..... | 28.17 | 27.98 | | 28.08 |
| AMMONIA ANALYSIS | | | | |
| NH3 ppm wt in solution..... | 0.47 | 0.35 | | 0.41 |
| Sample volume (ml)..... | 540 | 630 | | 585 |
| NH3 ppmV in flue gas..... | 0.4 | 0.4 | | 0.4 |
| NH3 ppmV @ 3%O2..... | 0.8 | 0.7 | | 0.8 |

# CARNOT

11/30/92

## Ammonia

## SOURCE TEST DATA SUMMARY WORKSHEET

| | | | |
|---|---|---|---|
| Client/Location | SCE | Parameter | Urea On |
| Unit | 4 | Fuel | Natural Gas |
| Sample Location | CSAPH | Data By | EF |

| Test Number | 7-4-NH3 | 8-4-NH3 | | Average |
|---|---|---|---|---|
| Reference Temperature, F | 60 | 60 | | |
| Test Date | 9/19/92 | 9/19/92 | | |
| Test Method | NH3 Draft | NH3 Draft | | NH3 Draft |
| Sample Train | North | North | | - |
| Meter Calibration Factor | 0.975 | 0.975 | | - |
| Sample Time (Min) | 30 | 30 | | 30 |
| Barometric Pressure (in Hg) | 28.89 | 28.89 | | 28.89 |
| Start/Stop Time | 0500/0530 | 0800/0830 | | - |
| Meter Volume (acf) | 31.484 | 30.062 | | 30.773 |
| Meter Temperature (F) | 80.4 | 82.6 | | 81.5 |
| Meter Pressure (iwg) | 1.500 | 1.500 | | 1.500 |
| Liquid Volume (ml) | 75.6 | 87.2 | | 81.4 |
| Stack O2 (%) | 11.6 | 11.5 | | 11.6 |
| Stack CO2 (%) | 5.4 | 5.5 | | 5.5 |
| Standard Sample Volume (SCF) | 28.627 | 27.224 | | 27.926 |
| Moisture Fraction | 0.109 | 0.130 | | 0.119 |
| Molecular Weight. (wet) | 28.09 | 27.87 | | 27.98 |
| AMMONIA ANALYSIS | | | | |
| NH3 ppm wt in solution | 2.82 | 22.30 | | 12.56 |
| Sample volume (ml) | 600 | 555 | | 578 |
| NH3 ppmV in flue gas | 2.9 | 22.3 | | 12.6 |
| NH3 ppmV @ 3%O2 | 5.6 | 42.4 | | 24.0 |

11/30/92

GY

# CARNOT

11/30/92

Ammonia

## SOURCE TEST DATA SUMMARY WORKSHEET

| | | | |
|---|---|---|---|
| Client/Location..... | SCE | Parameter..... | Urea Off |
| Unit..... | 4 | Fuel..... | Natural Gas |
| Sample Location..... | CSAPH | Data By..... | EF |
| Test Number..... | 9-4-NH3 | 10-4-NH3 | Average |
| Reference Temperature, F..... | 60 | 60 | |
| Test Date..... | 9/19/92 | 9/20/92 | |
| Test Method..... | NH3 Draft | NH3 Draft | NH3 Draft |
| Sample Train..... | North | North | - |
| Meter Calibration Factor..... | 0.975 | 0.975 | - |
| Sample Time (Min)..... | 30 | 30 | 30 |
| Barometric Pressure (in Hg)..... | 28.89 | 28.98 | 28.89 |
| Start/Stop Time..... | 2230/2300 | 0145/0215 | - |
| Meter Volume (acf)..... | 31.099 | 30.502 | 30.801 |
| Meter Temperature (F)..... | 85.1 | 79.6 | 82.3 |
| Meter Pressure (iwg)..... | 1.600 | 1.600 | 1.600 |
| Liquid Volume (ml)..... | 97.8 | 119.3 | 108.6 |
| Stack O2 (%)..... | 7.1 | 6.6 | 6.9 |
| Stack CO2 (%)..... | 8.0 | 8.5 | 8.3 |
| Standard Sample Volume (SCF) | 28.041 | 27.870 | 27.956 |
| Moisture Fraction..... | 0.140 | 0.166 | 0.153 |
| Molecular Weight. (wet)..... | 27.95 | 27.69 | 27.82 |
| AMMONIA ANALYSIS | | | |
| NH3 ppm wt in solution..... | 0.51 | 0.45 | 0.48 |
| Sample volume (ml)..... | 590 | 630 | 610 |
| NH3 ppmV in flue gas..... | 0.5 | 0.5 | 0.5 |
| NH3 ppmV @ 3%O2..... | 0.7 | 0.6 | 0.7 |

97 11/30/97

# CARNOT

12/9/92

## Ammonia

## SOURCE TEST DATA SUMMARY WORKSHEET

| | | | | |
|---|---|---|---|---|
| Client/Location..... | SCE | Parameter..... | | Urea On |
| Unit..... | 4 | Fuel..... | | Natural Gas |
| Sample Location..... | CSAPH | Data By..... | | EF |
| Test Number..... | 11-4-NH3 | 12-4-NH3 | | Average |
| Reference Temperature, F..... | 60 | 60 | | |
| Test Date..... | 9/20/92 | 9/20/92 | | |
| Test Method..... | NH3 Draft | NH3 Draft | | NH3 Draft |
| Sample Train..... | North | North | | - |
| Meter Calibration Factor..... | 0.975 | 0.975 | | - |
| Sample Time (Min)..... | 30 | 30 | | 30 |
| Barometric Pressure (in Hg)..... | 29.65 | 29.65 | | 29.65 |
| Start/Stop Time..... | 0448/0518 | 0700/0730 | | - |
| Meter Volume (acf)..... | 30.805 | 31.028 | | 30.917 |
| Meter Temperature (F)..... | 80.8 | 83.8 | | 82.3 |
| Meter Pressure (iwg)..... | 1.600 | 1.600 | | 1.600 |
| Liquid Volume (ml)..... | 97.3 | 117.5 | | 107.4 |
| Stack O2 (%)..... | 6.4 | 6.4 | | 6.4 |
| Stack CO2 (%)..... | 8.7 | 8.7 | | 8.7 |
| Standard Sample Volume (SCF) | 28.733 | 28.779 | | 28.756 |
| Moisture Fraction..... | 0.136 | 0.160 | | 0.148 |
| Molecular Weight. (wet)..... | 28.06 | 27.79 | | 27.93 |
| AMMONIA ANALYSIS | | | | |
| NH3 ppm wt in solution..... | 4.01 | 6.62 | | 5.32 |
| Sample volume (ml)..... | 640 | 610 | | 625 |
| NH3 ppmV in flue gas..... | 4.4 | 6.9 | | 5.6 |
| NH3 ppmV @ 3%O2..... | 5.4 | 8.5 | | 6.9 |

# CARNOT

12/9/92

## Ammonia

## SOURCE TEST DATA SUMMARY WORKSHEET

| | | | | |
|---|---|---|---|---|
| Client/Location..... | SCE | Parameter..... | | Urea Off |
| Unit..... | 4 | Fuel..... | | Natural Gas |
| Sample Location..... | CSAPH | Data By..... | | EF |
| Test Number..... | 13-4-NH3 | 14-4-NH3 | | Average |
| Reference Temperature, F..... | 60 | 60 | | |
| Test Date..... | 9/28/92 | 9/28/92 | | |
| Test Method..... | NH3 Draft | NH3 Draft | | NH3 Draft |
| Sample Train..... | North | North | | - |
| Meter Calibration Factor..... | 0.975 | 0.975 | | - |
| Sample Time (Min)..... | 30 | 30 | | 30 |
| Barometric Pressure (in Hg)..... | 29.94 | 29.94 | | 29.94 |
| Start/Stop Time..... | 0512/0544 | 0555/0627 | | - |
| Meter Volume (acf)..... | 30.251 | 30.328 | | 30.290 |
| Meter Temperature (F)..... | 91.8 | 97.0 | | 94.4 |
| Meter Pressure (iwg)..... | 1.500 | 1.500 | | 1.500 |
| Liquid Volume (ml)..... | 84.1 | 74.6 | | 79.4 |
| Stack O2 (%)..... | 11.2 | 11.1 | | 11.2 |
| Stack CO2 (%)..... | 5.8 | 5.9 | | 5.9 |
| Standard Sample Volume (SCF) | 27.916 | 27.724 | | 27.820 |
| Moisture Fraction..... | 0.123 | 0.111 | | 0.117 |
| Molecular Weight. (wet)..... | 27.98 | 28.12 | | 28.05 |
| AMMONIA ANALYSIS | | | | |
| NH3 ppm wt in solution..... | 8.53 | 6.67 | | 7.60 |
| Sample volume (ml)..... | 530 | 450 | | 490 |
| NH3 ppmV in flue gas..... | 7.9 | 5.3 | | 6.6 |
| NH3 ppmV @ 3%O2..... | 14.6 | 9.7 | | 12.2 |

CARNOT

SUBJECT NOX / NO Concentration JOB NO. 12582

SHEET NO. ___ of ___

COMPUTED BY EZ DATE ___ CHECKED BY ___ DATE ___

| TEST # | NOX | NO |
|---|---|---|
| 2B-4 | 70.2 | 67.9 |
| 3-4 | 58.5 | 58.5 |
| 4-4 | 61.5 | 61.5 |
| 5-4 | 33.7 | 32.0 |
| 6-4 | 32.5 | 31.0 |
| 7-4 | 32.0 | 31.9 |
| 8-4 | 32.0 | 31.2 |
| 9-4 | 36.3 | 36.0 |
| 10-4 | 34.5 | 34.2 |
| 11-4 | 34.5 | 34.5 |
| 12-4 | 34.5 | 34.5 |
| 13-4 | 32.3 | 32.5 |
| 14-4 | 27.5 | 26.0 |
| 15-4 | 35.0 | 35.0 |
| 16-4 | 36.5 | 36.5 |

148161

15991 RED HILL AVENUE, SUITE 110, TUSTIN, CA 92680-7388
(714) 259-9520 / Telecopy: (714) 259-0372

# APPENDIX E
# LABORATORY REPORTS

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582

CLIENT/LOCATION SCE Alamitos 4

SAMPLE LOCATION CSAPH

TEST # 1-4-PM

WATER BLANK mg/ml 0.0020 Front Half / 0.0040 Back Half

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 9, 14, 92

DATA ANALYSIS DATE 10, 16, 92

ANALYST INITIALS JRH

| 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 | 47-447 | 0.10835 | 0.1090 | -0.65 | — | / | -0.7 |
| 2. PROBE AND NOZZLE WASH | 5062 | 28.83275 | 28.82845 | 3.8 | 1.16 | 580/580 | 2.6 |
| 3. IMPINGER<br>a. WATER FRACTION | 5079 | 28.6386 | 28.63665 | 1.95 | 1.8 | 900/450 | 0.3 |
| b. ORGANIC EXTRACTION 150 ml $MeCl_2$ | 5076 | 28.61545 | 28.61525 | 0.2 | 0.2 | 900/450 | 0.0 |
| | | | | . | | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = 2.9 mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |



CARNOT

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582

WATER BLANK mg/ml 0.0020 Front Half / 0.0040 Back Half

CLIENT/LOCATION SCE Alamitos 4

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 9/15/92

SAMPLE LOCATION CSAPH

DATA ANALYSIS DATE 10/16/92

TEST # 2-4-PM

ANALYST INITIALS JRH

| 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 | 45-172 | 0.10395 | 0.1035 | 0.45 | — | / | 0.5 |
| 2. PROBE AND NOZZLE WASH | 5063 | 28.95475 | 28.95325 | 1.5 | 0.4 | 200/200 | 1.1 |
| 3. IMPINGER<br>a. WATER FRACTION | 5081 | 28.6503 | 28.64855 | 1.75 | 1.8 | 900/450 | . |
| b. ORGANIC EXTRACTION ___ ml $MeCl_2$ | 5077 | 28.7373 | 28.73715 | 0.15 | 0.2 | 900/450 | . |
| | | | | . | | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = 1.6 mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |

CARNOT

PML-050

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582

CLIENT/LOCATION SCE Alamitos 4

SAMPLE LOCATION CSAPH

TEST # 3-4-PM

WATER BLANK mg/ml 0.0020 Front½ 0.0040 Back½

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 9 15,92

DATA ANALYSIS DATE 10,15,92

ANALYST INITIALS JRH

| 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 | 45-173 | 0.10275 | 0.10315 | -0.4 | — | / | -0.4 |
| 2. PROBE AND NOZZLE WASH | 5064 | 28.76925 | 28.76835 | 0.9 | 0.32 | 160/160 | 0.6 |
| 3. IMPINGER a. WATER FRACTION | 5086 | 28.4823 | 28.4799 | 2.4 | 1.64 | 820/410 | 1.5 |
| b. ORGANIC EXTRACTION 150 ml $MeCl_2$ | 5082 | 27.7940 | 27.79395 | 0.05 | 0.2 | 820/410 | - . |
| | | | | . | | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = 2.1 mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |

CARNOT

PML-050

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582

WATER BLANK mg/ml 0.0020 Front 1/2, 0.0040 Back 1/2

CLIENT/LOCATION SCE Alamitos 4

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 9, ,92

SAMPLE LOCATION CSAPH

DATA ANALYSIS DATE 10,15,92

TEST # 4-4-PM

ANALYST INITIALS JRH

| 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 | 45-171 | 0.1033 | 0.1027 | 0.6 | — | / | 0.6 |
| 2. PROBE AND NOZZLE WASH | 5065 | 28.74395 | 28.74315 | 0.8 | 0.33 | 166/166 | 0.5 |
| 3. IMPINGER<br>a. WATER FRACTION | 5087 | 28.6611 | 28.6584 | 2.7 | 2.08 | 1050/520 | 1.3 |
| b. ORGANIC EXTRACTION 150 ml $MeCl_2$ | 5083 | 29.1492 | 29.1491 | 0.1 | 0.2 | 1050/520 | - . |
| | | | | . | | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = 2.4 mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |

CARNOT

PML-050

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582

WATER BLANK mg/ml 0.0020 Front 1/2, 0.0040 Back 1/2

CLIENT/LOCATION SCE Alamitos 4

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 9/18/92

SAMPLE LOCATION CSAPH

DATA ANALYSIS DATE 10/15/92

TEST # 5-4-PM

ANALYST INITIALS JRH

| 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 | 47-469 | 0.1109 | 0.11115 | -0.25 | — | / | -0.3 |
| 2. PROBE AND NOZZLE WASH | 5066 | 28.8353 | 28.83425 | 1.05 | 0.38 | 188/188 | 0.7 |
| 3. IMPINGER a. WATER FRACTION | 5088 | 29.4221 | 29.4209 | 1.2 | 1.88 | 960/470 | -0.0 |
| b. ORGANIC EXTRACTION 150 ml $MeCl_2$ | 5084 | 28.99235 | 28.9924 | -0.05 | 0.2 | 960/470 | -0.0 |
| | | | | . | | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = 0.7 mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |

CARNOT

PML-050

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582

WATER BLANK mg/ml 0.0020 Front½ 0.0040 Back½

CLIENT/LOCATION SCE Alamitos 4

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 9 ,19 ,92

SAMPLE LOCATION CSAPH

DATA ANALYSIS DATE 10,15 ,92

TEST # 6-4-PM

ANALYST INITIALS JRH

| 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 | 47-470 | 0.1102 | 0.11055 | -0.35 | — | / | -0.4 |
| 2. PROBE AND NOZZLE WASH | 5067 | 28.7297 | 28.72925 | 0.45 | 0.21 | 106/106 | 0.2 |
| 3. IMPINGER a. WATER FRACTION | 5092 | 28.80355 | 28.8014 | 2.15 | 1.6 | 800/400 | 1.1 |
| b. ORGANIC EXTRACTION 125 ml $MeCl_2$ | 5089 | 29.9586 | 29.9585 | -0.05 | 0.10 | 800/400 | -0.0 |
| | | | | . | | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = 1.3 mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |

CARNOT

PML-050

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582 WATER BLANK mg/ml 0.0020 Front 1/2 0.0040 Back 1/2

CLIENT/LOCATION SCE Alamitos 4 $MeCl_2$ BLANK mg/ml 0.0013 SAMPLE DATE 9/19/92

SAMPLE LOCATION CSAPH DATA ANALYSIS DATE 10/15/92

TEST # 7-4-PM ANALYST INITIALS JRH

| 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 | 47-468 | 0.1104 | 0.1099 | 0.5 | — | / | 0.5 |
| 2. PROBE AND NOZZLE WASH | 5068 | 27.85229 | 27.8511 | 1.15 | 0.24 | 120/120 | 0.9 |
| 3. IMPINGER<br>a. WATER FRACTION | 5093 | 29.03115 | 29.02725 | 3.9 | 1.48 | 750/370 | 4.9 |
| b. ORGANIC EXTRACTION 125 ml $MeCl_2$ | 5090 | 28.4816 | 28.48175 | -0.15 | 0.18 | 800/400 | -0.0 |
| | | | | . | . | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = 6.3 mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |

PML-050

CARNOT

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582

WATER BLANK mg/ml 0.0020 FRONT 1/2, 0.0040 BACK 1/2

CLIENT/LOCATION SCE/ALAMITOS

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 9/19/92

SAMPLE LOCATION UNIT 4 CSAPH

DATA ANALYSIS DATE 12/3 92

TEST # 7-4-PM

ANALYST INITIALS MR

| 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 | 47-468 | 0.1104 | 0.1099 | 0.5 | | / | 0.5 ✓ |
| 2. PROBE AND NOZZLE WASH | 5068 | 27.8522 | 27.8511 | 1.15 | 0.24 | 120/120 | 0.9 ✓ |
| 3. IMPINGER a. WATER FRACTION | 5378 | 28.4730 | 28.4707 | 2.3 | 1.0 | 750/250 | 3.9 ✓ |
| b. ORGANIC EXTRACTION 125 ml $MeCl_2$ | 5379 | 28.4755 | 28.4754 | 0.1 | 0.2 | 750/250 | 0.0 ✓ |
| | | | | . | | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = 5.3 mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |

PML-050

CARNOT

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582

WATER BLANK mg/ml 0.0020 Front½ 0.0040 Back½

CLIENT/LOCATION SCE Alamitos 4

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 9/19/92

SAMPLE LOCATION CSAPH

DATA ANALYSIS DATE 10/15/92

TEST # 8-4-PM

ANALYST INITIALS JRH

| 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 | 47-445 | 0.1091 | 0.1088 | 0.3 | — | / | 0.3 |
| 2. PROBE AND NOZZLE WASH | 5069 | 29.1603 | 29.15965 | 0.65 | 0.3 | 150/150 | 0.4 |
| 3. IMPINGER a. WATER FRACTION | 5094 | 28.28115 | 28.27715 | 4.0 | 1.52 | 770/380 | 5.0 |
| b. ORGANIC EXTRACTION 125 ml $MeCl_2$ | 5091 | 29.05415 | 29.05435 | -0.2 | 0.16 | 770/380 | -0.0 |
| | | | | . | | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = 5.7 mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |

PML-050

CARNOT

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582

WATER BLANK mg/ml 0.0020 FRONT 1/2 / 0.0040 BACK 1/2

CLIENT/LOCATION SCE/ALAMITOS

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 9/19/92

SAMPLE LOCATION UNIT 4 CSAPH

DATA ANALYSIS DATE 12/2/92

TEST # 8-4-PM

ANALYST INITIALS MR

| 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 | 47-445 | 0.1091 | 0.1088 | 0.3 | | / | 0.3 |
| 2. PROBE AND NOZZLE WASH | 5069 | 29.1603 | 29.1545 | 0.65 | 0.3 | 150/150 | 0.4 |
| 3. IMPINGER<br>a. WATER FRACTION | 5380 | 28.7975 | 28.7954 | 2.1 | 1.0 | 770/250 | 3.4 |
| b. ORGANIC EXTRACTION 125 ml $MeCl_2$ | 5381 | 28.3153 | 28.3153 | 0.0 | 0.2 | 770/250 | 0.0 |
| | | | | . | | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = 4.1 mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |



CARNOT

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582

WATER BLANK mg/ml 0.0020 Front½ 0.0040 Back½

CLIENT/LOCATION SCE Alamitos 4

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 9 ,19,92

SAMPLE LOCATION CSAPA

DATA ANALYSIS DATE 10,16,92

TEST # 9-4-PM

ANALYST INITIALS JRH

| 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 | 47-446 | 0.1102 | 0.1104 | -0.2 | — | / | -0.2 |
| 2. PROBE AND NOZZLE WASH | 5070 | 28.6706 | 28.6700 | 0.6 | 0.2 | 98/98 | 0.4 |
| 3. IMPINGER<br>a. WATER FRACTION | 5103 | 29.74915 | 29.7464 | 2.75 | 1.4 | 700/350 | 2.7 |
| b. ORGANIC EXTRACTION 125 ml $MeCl_2$ | 5095 | 28.9659 | 28.96575 | 0.15 | 0.16 ~~0.17~~ | 700/350 | 0.0 |
| | | | | . | | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = 3.1 mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |

CARNOT

PML-050

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582

WATER BLANK mg/ml 0.0020 Front 1/2, 0.0040 Back 1/2

CLIENT/LOCATION SCE Alamitos 4

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 9,20,92

SAMPLE LOCATION CSAPH

DATA ANALYSIS DATE 10,16,92

TEST # 10-4-PM

ANALYST INITIALS JRH

| 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 | 45-175 | 0.1039 | 0.10405 | -0.15 | — | / | -0.2 |
| 2. PROBE AND NOZZLE WASH | 5071 | 28.1108 | 28.1104 | 0.4 | 0.17 | 86/86 | 0.2 |
| 3. IMPINGER a. WATER FRACTION | 5104 | 28.8949 | 28.89275 | 2.15 | 1.56 | 790/390 | 1.2 |
| b. ORGANIC EXTRACTION 125 ml $MeCl_2$ | 5096 | 28.1939 | 28.19395 | 0.15 | 0.16 | 790/390 | 0.0 |
| | | | | . | | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = 1.4 mg

METHOD OF SAMPLE PREP/NOTES

PML-050

CARNOT

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582

WATER BLANK mg/ml 0.0020 Front 1/2 0.0040 Back 1/2

CLIENT/LOCATION SCE Alamitos 4

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 9/20/92

SAMPLE LOCATION CSAPH

DATA ANALYSIS DATE / /

TEST # 11-4-PM

ANALYST INITIALS JRH

| 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 | 45-176 | 0.1053 | 0.10485 | 0.45 | — | / | 0.5 |
| 2. PROBE AND NOZZLE WASH | 5072 | 29.94385 | 29.94385 | 0.0 | 0.44 | 220/220 | -0.0 |
| 3. IMPINGER a. WATER FRACTION | 5105 | 29.7784 ~~29.7784~~ | 29.7760 | 2.4 | 1.36 | 690/340 | 2.1 |
| b. ORGANIC EXTRACTION 125 ml $MeCl_2$ | 5097 | 28.89885 | 28.89885 | 0.0 | 0.16 | 690/340 | -0.0 |
| | | | | . | | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = 2.6 mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |

PML-050

CARNOT

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582

WATER BLANK mg/ml 0.0020 From 1/2, 0.0040 Back 1/2

CLIENT/LOCATION SCE Alamitos 4

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 9 20,92

SAMPLE LOCATION CSAPH

DATA ANALYSIS DATE / /

TEST # 12-4-PM

ANALYST INITIALS JRH

| 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 | 45-177 | 0.10615 | 0.10525 | 0.9 | — | / | 0.9 |
| 2. PROBE AND NOZZLE WASH | 5073 | 28.68895 | 28.6882 | 0.75 | 0.29 | 145/145 | 0.5 |
| 3. IMPINGER a. WATER FRACTION | 5106 | 28.5707 | 28.56905 | 1.65 | 1.72 | 870/430 | -0.0 |
| b. ORGANIC EXTRACTION 125 ml $MeCl_2$ | 5098 | 29.1672 | 29.16735 | -0.15 | 0.16 | 870/430 | -0.0 |
| | | | | . | | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = 1.4 mg

METHOD OF SAMPLE PREP/NOTES

PML-050

CARNOT

# PARTICULATE
## SCAQMD 5.3, IN STACK FILTER

PROJECT # 12582 WATER BLANK mg/ml 0.0020 Front 1/2 0.0040 Back 1/2

CLIENT/LOCATION SCE Alamitos 4&2 $MeCl_2$ BLANK mg/ml 0.0013 SAMPLE DATE 9/20/92

SAMPLE LOCATION CSAPH DATA ANALYSIS DATE 10/15/92

TEST # Blank ANALYST INITIALS JRH

| 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 | NA | | | . | | / | . |
| 2. PROBE AND NOZZLE WASH | 5032 | 29.90245 | 29.90235 | 0.1 | | 200/50 | . |
| 3. IMPINGER a. WATER FRACTION | 5078 | 29.64435 | 29.64395 | 0.4 | | 200/100 | . |
| b. ORGANIC EXTRACTION 150 ml $MeCl_2$ | 5075 | 28.23705 | 28.23685 | 0.2 | | 200/100 | . |
| | | | | . | | / | . |
| | | | | . | | / | . |
| | | | | . | | / | . |

TOTAL PARTICULATE = . mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |

# PARTICULATE

PROJECT # 12582

CLIENT/LOCATION SCE Alamitos 4

SAMPLE LOCATION SAPH

TEST # _____

WATER BLANK mg/ml _____

$MeCl_2$ BLANK mg/ml _____

IPA BLANK mg/ml _____

ACETONE BLANK mg/ml _____

SAMPLE DATE ___ / ___ / ___

DATA ANALYSIS DATE 10/19/92

ANALYST INITIALS JPH

| ITEM | NUMBER | FINAL WEIGHT (g) | TARE WEIGHT (g) | GAIN WEIGHT (mg) | BLANK CORRECTION (mg) | ALIQUOT CORRECTION (ml/ml) | NET GAIN (mg/SAMPLE) |
|---|---|---|---|---|---|---|---|
| 1-4-PM Insoluble Particulate | 63-634 | 0.2000 | 0.20015 | -0.15 | | 900/900 | 0.0 |
| 2-4-PM Insoluble Particulate | 63-648 | 0.1970 | 0.19745 | -0.45 | | 900/900 | 0.0 |
| 3-4-PM Insoluble Particulate | 63-655 | 0.2001 | 0.20025 | -0.15 | | 820/820 | 0.0 |
| 4-4-PM Insoluble Particulate | 63-656 | 0.2006 | 0.2012 | -0.60 | | 1050/1050 | 0.0 |
| 5-4-PM Insoluble Particulate | 63-658 | 0.19755 | 0.19765 | -0.10 | | 960/960 | 0.0 |
| 6-4-PM Insoluble Particulate | 63-660 | 0.20025 | 0.20065 | -0.40 | | 800/800 | 0.0 |
| 7-4-PM Insoluble Particulate | 63-661 | 0.1999 | 0.20075 | -0.85 | | 750/750 | 0.0 |

TOTAL PARTICULATE = _____ . mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| - Back Half of all samples from Unit 4 were filtered to remove bits of glass and/or teflon from filter housing |
| - This filter was weighed and ~~tt~~ labeled insoluble particulate. |

CARNOT

PML-040

# PARTICULATE

PROJECT # 12582

CLIENT/LOCATION SCE Alamitos 4

SAMPLE LOCATION CSAPH

TEST # _____

WATER BLANK mg/ml _____

$MeCl_2$ BLANK mg/ml _____

IPA BLANK mg/ml _____

ACETONE BLANK mg/ml _____

SAMPLE DATE ___ / ___ / ___

DATA ANALYSIS DATE 10/19/92

ANALYST INITIALS JTRN

| ITEM | NUMBER | FINAL WEIGHT (g) | TARE WEIGHT (g) | GAIN WEIGHT (mg) | BLANK CORRECTION (mg) | ALIQUOT CORRECTION (ml/ml) | NET GAIN (mg/SAMPLE) |
|---|---|---|---|---|---|---|---|
| 8-4-PM Insoluble Particulate | 63-662 | 0.19925 | 0.19975 | -0.50 | | 770/770 | 0.0 |
| 9-4-PM Insoluble Particulate | 63-663 | 0.19815 | 0.19895 | -0.80 | | 700/700 | 0.0 |
| 10-4-PM Insoluble Particulate | 63664 | 0.19855 | 0.19865 | -0.10 | | 790/790 | 0.0 |
| 11-4-PM Insoluble Particulate | 63-665 | 0.2007 | 0.2011 | -0.40 | | 690/690 | 0.0 |
| 12-4-PM Insoluble Particulate | 63-666 | 0.19925 | 0.19965 | -0.4 | | 870/870 | 0.0 |
| Blank Insoluble Particulate | 63-659 | 0.19745 | 0.19815 | -0.7 | | / | 0.0 |
| | | | | . | | / | . |

TOTAL PARTICULATE = _____ . mg

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |

CARNOT

PML-040

# ACID BASE TITRATION

PROJECT # 12582

CLIENT/LOCATION SCE Alamitos 4

SAMPLE LOCATION CSAPH

TITRANT USED 0.0090 N NaOH

SAMPLE DATE 9/15-9/20/92

DATA ANALYSIS DATE 10/22/92

ANALYST INITIALS JRH

| TEST NUMBER | SAMPLE DESCRIPTION | TOTAL VOL (ml) (TV) | $V_{recov}$ | $V_{evap}$ | ALIQUOT VOL (ml) (Va) | TITRANT VOL (ml) (Vt) | $\bar{X}$-BLANK VOL (ml) | COMMENTS | mg/SAMPLE |
|---|---|---|---|---|---|---|---|---|---|
| BLANK ($V_{bl}$): | DI WATER | | — | | 50 | 0.00 | | | |
| STANDARDIZATION: | 0.02000 N $H_2SO_4$ | | — | | 2.0 | 4.45<br>4.43 | | | |
| AUDIT SAMPLE: | EPA #9701; 1150 mg/dscm ~~dsim~~ | | — | | 10.0<br>~~7.0~~ | 8.18<br>8.20 | | 97.8% recovery | |
| Blank | 5078 BACK HALF | 200 | 100 | 100 | 25.0 | 0.00 | 0 | | 0.00 |
| 1-4-PM | 5079 | 900 | 100 | 450 | 25.0 | 0.00 | 0.00 | | |
| 2-4-PM | 5081 | 900 | 100 | 450 | 25.0 | 0.00 | | | |
| 3-4-PM | 5086 | 820 | 100 | 410 | 20.0 | 0.00 | | | |
| 4-4-PM | 5087 | 1050 | 100 | 520 | 20.0 | 0.00 | | | |
| 5-4-PM | 5088 | 960 | 100 | 470 | 25.0 | 0.00 | | | |
| 6-4-PM | 5092 | 800 | 100 | 400 | 25.0 | 0.00 | | | |
| 7-4-PM | 5093 | 750 | 100 | 370 | 20.0 | 0.00 | | | |
| 8-4-PM | 5094 | 770 | 100 | 380 | 20.0 | 0.00 | | | |
| 9-4-PM | 5103 | 700 | 100 | 350 | 25.0 | 0.15<br>0.14 | | | 0.70 |

EPA AUDIT in mg/dscm = $\frac{(32.03)(N)(Vt - Vbl)(100)}{(Va)(0.021)}$

mg $H_2SO_4 \cdot 2H_2O$ = (Vt - Vbl) (N) (67) ($TV/V_{evap}$) ($V_{recov}/Va$)

**METHOD OF SAMPLE PREP/NOTES**

CARNOT

PML-012

# ACID BASE TITRATION

PROJECT # 12582

CLIENT/LOCATION SCE Alamitos 4

SAMPLE LOCATION ESAPH

TITRANT USED 0.0090 N NaOH

SAMPLE DATE 9/15-20/92

DATA ANALYSIS DATE 10/22/92

ANALYST INITIALS JRH

| TEST NUMBER | SAMPLE DESCRIPTION | TOTAL VOL (ml) (TV) | $V_{meter}$ | $V_{evap}$ | ALIQUOT VOL (ml) (Va) | TITRANT VOL (ml) (Vt) | X̄-BLANK VOL (ml) | COMMENTS | mg/SAMPLE |
|---|---|---|---|---|---|---|---|---|---|
| BLANK ($V_{bl}$): | DI WATER | | — | | | | | See page 1 | |
| STANDARDIZATION: | 0.02000 N $H_2SO_4$ | | — | | | | | | |
| AUDIT SAMPLE: | EPA #____ ; ____ dstm | | — | | 1.0 | | | | |
| 10-4-PM | 5104 | 790 | 100 | 390 | 25.0 | 0.00 | 0.00 | | 0.00 |
| 11-4-PM | 5105 | 690 | 100 | 340 | 20.0 | 0.00 | ↓ | | ↓ |
| 12-4-PM | 5106 | 870 | 100 | 430 | 20.0 | 0.00 | ↓ | | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

EPA AUDIT in mg/dscm = $\frac{(32.03)(N)(Vt - Vbl)(100)}{(Va)(0.021)}$

mg $H_2SO_4 \cdot 2H_2O$ = (Vt - Vbl) (N) (67) ($TV/V_{evap}$) ($V_{meter}/Va$)

| METHOD OF SAMPLE PREP/NOTES |
|---|
| |
| |
| |

CARNOT

# SOx TITRATION

PROJECT # 12582

CLIENT/LOCATION SCE Alamitos 4

SAMPLE LOCATION CSAPH

TITRANT USED 0.0104 N $BaCl_2$

SAMPLE DATE 9/15-20/92

DATA ANALYSIS DATE 10/26/92

ANALYST INITIALS JRH

| TEST NUMBER | SAMPLE DESCRIPTION | TOTAL VOL (ml) (TV) | $V_{recon}$ | $V_{evap}$ | ALIQUOT VOL (ml) (Va) | TITRANT VOL (ml) (Vt) | $\bar{X}$-BLANK VOL (ml) | COMMENTS | mg/SAMPLE |
|---|---|---|---|---|---|---|---|---|---|
| BLANK ($V_{bl}$): | ~~3% $H_2O_2$~~ 80% IPA | | — | | 10.0 | 0.11<br>0.08 | 0.095 | | |
| STANDARDIZATION: | 0.02000 N $H_2SO_4$ | | — | | 2.0 | 3.90<br>3.96 | 0.095 | $N = \frac{(.02)(Va)}{Vt} =$ 0.0104 | |
| AUDIT SAMPLE: | EPA #9701; 1150 dscm | | — | | | 6.53<br>6.47 | 0.095 | 88 % RECOVERY (1) | |
| Blank | ~~5032~~ 5078 | 200 | 100 | 100 | 10.0 | 0.14<br>0.12 | 0.13 | | . |
| 1-4-PM | 5079 | 900 | | 450 | | 0.30<br>0.32 | 0.13 | | . |
| 2-4-PM | 5081 | 900 | | 450 | | 0.30<br>0.30 | | | . |
| 5-4-PM | 5088 | 960 | | 470 | | 0.22<br>0.23 | | | . |
| 6-4-PM | 5092 | 800 | | 400 | | 0.35<br>0.35 | | | . |
| 9-4-PM | 5103 | 700 | | 350 | | 0.43<br>0.41 | | | . |
| 10-4-PM | 5104 | 790 | | 390 | | 0.32<br>0.30 | | | . |
| 3-4-PM | 5086 | 820 | | 410 | | 0.32<br>0.32 | | | . |
| 4-4-PM | 5087 | 1050 | | 520 | | 0.31<br>0.33 | | | . |
| 7-4-PM | 5093 | 750 | ↓ | 370 | ↓ | 0.53<br>0.55 | ↓ | | . |

EPA AUDIT in mg/dscm = $\frac{(32.03)(N)(Vt - Vbl)(100)}{(Va)(0.021)}$

SOx, ppm = $\frac{(0.805)(N)(Vt - Vbl)(TV)(Tref)}{(Vm\ std)(Va)}$

mg $H_2SO_4 \cdot 2H_2O$ = (Vt - Vbl) (N) (67) ($TV/V_{evap}$) ($V_{recon}/Va$)

**METHOD OF SAMPLE PREP/NOTES**

SAMPLE RUN THROUGH AMBERLITE IR120H ION EXCHANGE RESIN ☒ YES ☐ NO

(1) AUDIT SAMPLE ALSO RUN THROUGH RESIN. RECOVERY FOR AUDIT SAMPLE NOT RUN THROUGH RESIN WAS 99.4% (7.30ml Titrant)

CARNOT

PML-011

# SOx TITRATION

PROJECT # 12582

CLIENT/LOCATION SCE Alamitos 4

SAMPLE LOCATION CSAPH

TITRANT USED 0.0104 N $BaCl_2$

SAMPLE DATE 9/15-10/20/92

DATA ANALYSIS DATE 10/26/92

ANALYST INITIALS JRH

| TEST NUMBER | SAMPLE DESCRIPTION | TOTAL VOL (ml) (TV) | $V_{recon}$ | $V_{evap}$ | ALIQUOT VOL (ml) (Va) | TITRANT VOL (ml) (Vt) | $\bar{X}$-BLANK VOL (ml) | COMMENTS | mg/SAMPLE |
|---|---|---|---|---|---|---|---|---|---|
| ~~BLANK ($V_{bl}$): 3% $H_2O_2$, 80% IPA~~ | | | — | | | | | See previous page | |
| ~~STANDARDIZATION: 0.02000 N $H_2SO_4$~~ | | | — | | | | | N = (.02) (Va) / Vt = | |
| ~~AUDIT SAMPLE: EPA #9701; 1150 dscm~~ | | | — | | | | | ____ % RECOVERY | |
| 8-4-PM | 5094 BACK HALF | 770 | 100 | 380 | 10.0 | 0.53 0.58 | 0.13 | | |
| 11-4-PM | 5105 | 690 | 100 | 340 | | 0.36 0.35 | | | |
| 12-4-PM | 5106 | 870 | 100 | 430 | | 0.28 0.28 | | | |
| | | | | | | | | | |
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| | | | | | | | | | |

EPA AUDIT in mg/dscm = (32.03) (N) (Vt - Vbl) (100) / (Va) (0.021)

SOx, ppm = (0.805) (N) (Vt - Vbl) (TV) (Tref) / (Vm std) (Va)

mg $H_2SO_4 \cdot 2H_2O$ = (Vt - Vbl) (N) (67) (TV/$V_{evap}$) ($V_{recon}$/Va)

| METHOD OF SAMPLE PREP/NOTES | | |
|---|---|---|
| SAMPLE RUN THROUGH AMBERLITE IR120H ION EXCHANGE RESIN | ☒ YES | ☐ NO |

CARNOT

PML-C11

**AMMONIA BY NESSLERIZATION**
**SCAQMD DRAFT METHOD**

| | | | |
|---|---|---|---|
| CLIENT : | SCE | STORAGE DISK: | LOTUS DATA |
| LOCATION: | ALAMITOS #4 | ANALYST: | JRH |
| PROJECT : | 12582 | CALIBRATION DATE: | 9/17/92 |

SAMPLE ANALYSIS:

| SAMPLE ID | SAMPLE DATE | ANALYSIS DATE | ALIQUOT FACTOR | ABSORBANCE (OD) | CONC. (ug/ml) | TOTAL VOLUME (ml) |
|---|---|---|---|---|---|---|
| FIELD BLANK | 9/15/92 | 9/17/92 | 1.00 | 0.000 | < 0.35 | |
| 2A-4-NH3 | 9/15/92 | 9/17/92 | 2.00 | 0.044 | 1.33 | 560 |
| 2B-4-NH3 | 9/15/92 | 9/17/92 | 1.00 | 0.011 | 0.40 | 500 |
| 3-4-NH3 | 9/15/92 | 9/18/92 | 16.7 | 0.021 | 8.03 | 500 |
| 4-4-NH3 | 9/15/92 | 9/18/92 | 12.5 | 0.020 | 5.92 | 530 |
| 2A-4-NH3 | 9/15/92 | 9/18/92 | 2.00 | 0.044 | 1.33 | 560 |
| 2B-4-NH3 | 9/15/92 | 9/18/92 | 1.00 | 0.008 | 0.38 | 500 |
| 5-4-NH3 | 9/19/92 | 9/21/92 | 1.00 | 0.019 | 0.47 | 540 |
| 6-4-NH3 | 9/19/92 | 9/21/92 | 1.00 | 0.003 | < 0.35 | 630 |
| 7-4-NH3 | 9/19/92 | 9/21/92 | 5.00 | 0.033 | 2.88 | 600 |
| 7-4-NH3 | 9/19/92 | 9/21/92 | 6.25 | 0.016 | 2.76 | 600 |
| 8-4-NH3 | 9/19/92 | 9/21/92 | 50.0 | 0.016 | 22.1 | 555 |
| 8-4-NH3DUP | 9/19/92 | 9/21/92 | 50.0 | 0.017 | 22.5 | 555 |
| 9-4-NH3 | 9/19/92 | 9/21/92 | 1.00 | 0.024 | 0.51 | 590 |
| 10-4-NH3 | 9/20/92 | 9/21/92 | 1.00 | 0.017 | 0.45 | 630 |
| 11-4-NH3 | 9/20/92 | 9/21/92 | 8.33 | 0.021 | 4.01 | 640 |
| 12-4-NH3 | 9/20/92 | 9/21/92 | 12.5 | 0.027 | 6.62 | 610 |

NOTES:

(1) Standard checks were analyzed each day periodically during sample analysis.
Average recovery was 101 percent.

AMMONIA BY NESSLERIZATION
SCAQMD DRAFT METHOD

| | | | |
|---|---|---|---|
| CLIENT : | SCE | STORAGE DISK: | LOTUS DATA |
| LOCATION: | ALAMITOS #4 | ANALYST: | JRH |
| PROJECT : | 12582 | CAL DATE: | 9/17/92 |

STANDARDS :

| EXPECTED CONC. (ug/ml) | ABSORBANCE (OD) | ACTUAL CONC. (ug/ml) | RESPONSE FACTOR (mg/OD) |
|---|---|---|---|
| 0.00 | 0.000 | 0.32 | |
| 0.32 | 0.002 | 0.33 | 8.0000 |
| 0.40 | 0.012 | 0.41 | 1.6667 |
| 0.48 | 0.018 | 0.46 | 1.3333 |
| 0.56 | 0.030 | 0.55 | 0.9333 |
| 0.64 | 0.039 | 0.62 | 0.8205 |
| 0.72 | 0.054 | 0.74 | 0.6667 |
| | | AVG | 2.5508 |

| | |
|---|---|
| Y-Int.= | -0.0397 |
| Slope = | 0.1261 |
| Corr. = | 0.9863 |

LIMIT OF DETECTION:

| SAMPLES | ABSORBANCE (OD) | CONC (ug/ml) |
|---|---|---|
| 1 | 0.004 | 0.35 |
| 2 | 0.006 | 0.36 |
| 3 | 0.007 | 0.37 |
| 4 | 0.007 | 0.37 |
| 5 | 0.008 | 0.38 |
| 6 | 0.006 | 0.36 |
| 7 | 0.008 | 0.38 |

| | |
|---|---|
| TRUE VALUE = | 0.32 |
| MEAN = | 0.3672 |
| STD DEV = | 0.0111 |
| MDL = | 0.03 |
| REPORTING LIMIT = | 0.35 |

NOTES:

MDL = (3.143*STD DEV OF 7 REPLICATES OF 0.32 ug/ml STD)
RL = (MDL*10)

DUPLICATES:

| ANALYSIS DATE | SAMPLE | RESULT 1 | RESULT 2 | DIFFERENCE (%) |
|---|---|---|---|---|
| 9/21/92 | 8-4-NH3 | 22.1 | 22.5 | -1.8% |

## AMMONIA BY NESSLERIZATION
## SCAQMD DRAFT METHOD

| | | | |
|---|---|---|---|
| CLIENT : | SCE | STORAGE DISK: | LOTUS DATA |
| LOCATION: | ALAMITOS #4 | ANALYST: | JRH |
| PROJECT : | 12582 | CAL DATE: | 9/24/92 |

STANDARDS :

| EXPECTED CONC. (ug/ml) | ABSORBANCE (OD) | ACTUAL CONC. (ug/ml) | RESPONSE FACTOR (mg/OD) |
|---|---|---|---|
| 0.00 | 0.000 | 0.30 | |
| 0.32 | 0.005 | 0.33 | 3.2000 |
| 0.40 | 0.012 | 0.38 | 1.6667 |
| 0.48 | 0.030 | 0.50 | 0.8000 |
| 0.56 | 0.038 | 0.55 | 0.7368 |
| 0.64 | 0.052 | 0.65 | 0.6154 |
| 0.72 | 0.062 | 0.72 | 0.5806 |
| | | AVG | 1.4038 |

| | |
|---|---|
| Y-Int.= | -0.0435 |
| Slope = | 0.1475 |
| Corr. = | 0.9902 |

LIMIT OF DETECTION:

| SAMPLES | ABSORBANCE (OD) | CONC (ug/ml) |
|---|---|---|
| 1 | 0.004 | 0.32 |
| 2 | 0.006 | 0.34 |
| 3 | 0.007 | 0.34 |
| 4 | 0.007 | 0.34 |
| 5 | 0.008 | 0.35 |
| 6 | 0.006 | 0.34 |
| 7 | 0.008 | 0.35 |

| | |
|---|---|
| TRUE VALUE = | 0.32 |
| MEAN = | 0.3397 |
| STD DEV = | 0.0095 |
| MDL = | 0.03 |
| REPORTING LIMIT = | 0.30 |

NOTES:

MDL = (3.143*STD DEV OF 7 REPLICATES OF 0.32 ug/ml STD)
RL = (MDL*10)

DUPLICATES:

| ANALYSIS DATE | SAMPLE | RESULT 1 | RESULT 2 | DIFFERENCE (%) |
|---|---|---|---|---|
| 9/30/92 | 13-4-NH3 | 8.5 | 8.5 | 0.0% |
| 9/30/92 | 14-4-NH3 | 6.8 | 6.5 | 5.1% |

## AMMONIA BY NESSLERIZATION
## SCAQMD DRAFT METHOD

| | | | |
|---|---|---|---|
| CLIENT : | SCE | STORAGE DISK: | LOTUS DATA |
| LOCATION: | ALAMITOS #4 | ANALYST: | JRH |
| PROJECT : | 12582 | CALIBRATION DATE: | 9/17/92 |

SAMPLE ANALYSIS:

| SAMPLE ID | SAMPLE DATE | ANALYSIS DATE | ALIQUOT FACTOR | ABSORBANCE (OD) | CONC. (ug/ml) | TOTAL VOLUME (ml) |
|---|---|---|---|---|---|---|
| FIELD BLANK | 9/15/92 | 9/17/92 | 1.00 | 0.000 | < 0.35 | |
| A-4-NH3 | 9/14/92 | 9/17/92 | 1.00 | 0.031 | 0.56 | 485 |
| B-4-NH3 | 9/14/92 | 9/17/92 | 12.5 | 0.038 | 7.71 | 495 |
| C-4-NH3 | 9/14/92 | 9/17/92 | 5.00 | 0.039 | 3.12 | 520 |
| 2A-4-NH3 | 9/15/92 | 9/17/92 | 2.00 | 0.044 | 1.33 | 560 |
| 2B-4-NH3 | 9/15/92 | 9/17/92 | 1.00 | 0.011 | 0.40 | 500 |
| 3-4-NH3 | 9/15/92 | 9/18/92 | 16.7 | 0.021 | 8.03 | 500 |
| 4-4-NH3 | 9/15/92 | 9/18/92 | 12.5 | 0.020 | 5.92 | 530 |
| 2A-4-NH3 | 9/15/92 | 9/18/92 | 2.00 | 0.044 | 1.33 | 560 |
| 2B-4-NH3 | 9/15/92 | 9/18/92 | 1.00 | 0.008 | 0.38 | 500 |
| 5-4-NH3 | 9/19/92 | 9/21/92 | 1.00 | 0.019 | 0.47 | 540 |
| 6-4-NH3 | 9/19/92 | 9/21/92 | 1.00 | 0.003 | < 0.35 | 630 |
| 7-4-NH3 | 9/19/92 | 9/21/92 | 5.00 | 0.033 | 2.88 | 600 |
| 7-4-NH3 | 9/19/92 | 9/21/92 | 6.25 | 0.016 | 2.76 | 600 |
| 8-4-NH3 | 9/19/92 | 9/21/92 | 50.0 | 0.016 | 22.1 | 555 |
| 8-4-NH3DUP | 9/19/92 | 9/21/92 | 50.0 | 0.017 | 22.5 | 555 |
| 9-4-NH3 | 9/19/92 | 9/21/92 | 1.00 | 0.024 | 0.51 | 590 |
| 10-4-NH3 | 9/20/92 | 9/21/92 | 1.00 | 0.017 | 0.45 | 630 |
| 11-4-NH3 | 9/20/92 | 9/21/92 | 8.33 | 0.021 | 4.01 | 640 |
| 12-4-NH3 | 9/20/92 | 9/21/92 | 12.5 | 0.027 | 6.62 | 610 |

NOTES:

(1) Standard checks were analyzed each day periodically during sample analysis. Average recovery was 101 percent.

**AMMONIA BY NESSLERIZATION**
**SCAQMD DRAFT METHOD**

| | | | |
|---|---|---|---|
| CLIENT : | SCE | STORAGE DISK: | LOTUS DATA |
| LOCATION: | ALAMITOS #4 | ANALYST: | JRH |
| PROJECT : | 12582 | CALIBRATION DATE: | 9/24/92 |

SAMPLE ANALYSIS:

| SAMPLE ID | SAMPLE DATE | ANALYSIS DATE | ALIQUOT FACTOR | ABSORBANCE (OD) | CONC. (ug/ml) | TOTAL VOLUME (ml) |
|---|---|---|---|---|---|---|
| E-4-NH3 | 9/25/92 | 9/25/92 | 25.0 | 0.040 | 14.2 | 510 |
| E-4-NH3DUP | 9/25/92 | 9/25/92 | 25.0 | 0.040 | 14.2 | 510 |
| F-4-NH3 | 9/25/92 | 9/25/92 | 25.0 | 0.048 | 15.5 | 520 |
| F-4-NH3DUP | 9/25/92 | 9/25/92 | 25.0 | 0.043 | 14.7 | 520 |
| G-4-NH3 | 9/28/92 | 9/30/92 | 25.0 | 0.043 | 14.7 | 560 |
| H-4-NH3 | 9/28/92 | 9/30/92 | 25.0 | 0.030 | 12.5 | 440 |
| I-4-NH3 | 9/28/92 | 9/30/92 | 25.0 | 0.026 | 11.8 | 525 |
| 13-4-NH3 | 9/28/92 | 9/30/92 | 16.7 | 0.032 | 8.53 | 530 |
| 13-4-NH3DUP | 9/28/92 | 9/30/92 | 16.7 | 0.032 | 8.53 | 530 |
| 14-4-NH3 | 9/28/92 | 9/30/92 | 16.7 | 0.017 | 6.84 | 450 |
| 14-4-NH3DUP | 9/28/92 | 9/30/92 | 16.7 | 0.014 | 6.50 | 450 |

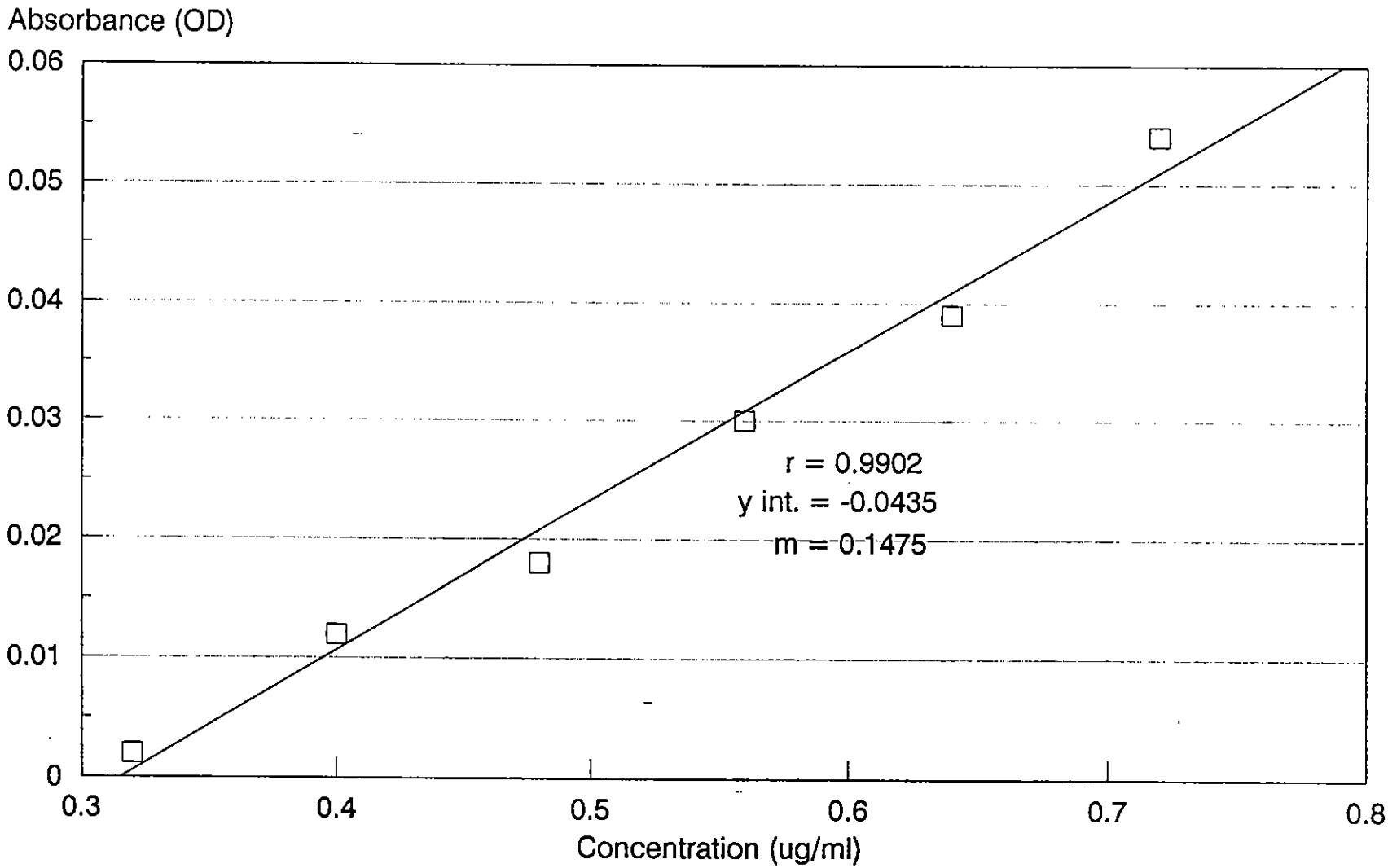
NOTES:

(1) A 0.48ug/ml Ricca standard was analyzed periodically during sample analysis. Average recovery was 101 percent.

# AMMONIA CALIBRATION CURVE

**Calibration Date: 9/24/92**

**Analyst: JRH**



**AMMONIA BY NESSLERIZATION**
**SCAQMD DRAFT METHOD**

| | | | |
|---|---|---|---|
| CLIENT : | SCE | STORAGE DISK: | LOTUS DATA |
| LOCATION: | ALAMITOS #4 | ANALYST: | JRH |
| PROJECT : | 12582 | CALIBRATION DATE: | 9/24/92 |

SAMPLE ANALYSIS:

| SAMPLE ID | SAMPLE DATE | ANALYSIS DATE | ALIQUOT FACTOR | ABSORBANCE (OD) | CONC. (ug/ml) | TOTAL VOLUME (ml) |
|---|---|---|---|---|---|---|
| 13-4-NH3 | 9/28/92 | 9/30/92 | 16.7 | 0.032 | 8.53 | 530 |
| 13-4-NH3DUP | 9/28/92 | 9/30/92 | 16.7 | 0.032 | 8.53 | 530 |
| 14-4-NH3 | 9/28/92 | 9/30/92 | 16.7 | 0.017 | 6.84 6.67 | 450 |
| 14-4-NH3DUP | 9/28/92 | 9/30/92 | 16.7 | 0.014 | 6.50 | 450 |

NOTES:

(1) A 0.48ug/ml Ricca standard was analyzed periodically during sample analysis. Average recovery was 101 percent.

AtmAA Inc.
21354 Nordhoff St., Suite 113, Chatsworth, CA 91311 (818) 718-6070 • FAX (818) 718-9779
environmental consultants
laboratory services

RECEIVED
SEP 25 1992
CARNOT

September 21, 1992

LTR/350/92
4037

Derek Kumm
CARNOT
15991 Red Hill Ave., Suite 110
Tustin, CA 92680

re: 12582

Dear Derek:

Please find enclosed the laboratory analysis report, quality assurance summary, and the original chain of custody form for four Tedlar bag samples received on September 17, 1992.

The samples were analyzed for methane and total gaseous non-methane organics.

Sincerely,

AtmAA, Inc.

Michael L. Porter
Laboratory Director

Encl.
MLP/krp

AtmAA Inc.
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laboratory services

# LABORATORY ANALYSIS REPORT

Methane & Total Gaseous Non-Methane Organics
Analysis in Tedlar Bag Samples

| | |
|---|---|
| Report Date: | September 21, 1992 |
| Client: | CARNOT |
| Project No.: | 12582 |
| Date Received: | September 17, 1992 |
| Date Analyzed: | September 18, 1992 |

## ANALYSIS DESCRIPTION

Methane and total gaseous non-methane organics (TGNMO) were analyzed by flame ionization detection/total combustion analysis, SCAQMD Method 25, analysis portion.

| AtmAA Lab No. | Sample ID | Methane | TGNMO |
|---|---|---|---|
| | | (Concentration in ppm, v/v) | |
| 92622-1 | 2-A-4-HC | <1 | <1 |
| 92622-2 | 2-B-4-HC | <1 | <1 |
| 92622-3 | 3-4-HC | <1 | <1 |
| 92622-4 | 4-4-HC | <1 | <1 |

TGNMO is total gaseous non-methane organics measured and reported as ppm methane.

Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analysis)

Client Proj. No.: 12582

| Component | Sample ID | Repeat Analysis Run #1 | Repeat Analysis Run #2 | Mean Conc. | % Diff. From Mean |
|---|---|---|---|---|---|
| | | (Concentration in ppm, v/v) | | | |
| Methane | 2-B-4-HC | < 1 | < 1 | --- | --- |
| TGNMO | 2-B-4-HC | < 1 | < 1 | --- | --- |

A set of 4 Tedlar bag samples, laboratory numbers 92622-(1-4) was analyzed for methane, and TGNMO. Agreement between repeat analyses is a measure precision and is shown above in the column "% Difference from Mean." Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean cannot be determined since no measurable difference was detected.

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environmental consultants
laboratory services

September 29, 1992

LTR/358/92
4037

RECEIVED
OCT 02 1992
CARNOT

Ed Filadelfia
CARNOT
15991 Red Hill Ave., Suite 110
Tustin, CA 92680

re: 12581 & 12582

Dear Ed:

Please find enclosed the laboratory analysis reports, quality assurance summaries, and the original chain of custody forms for twenty Tedlar bag samples received on September 21, 23, & 24, 1992.

The samples were analyzed for methane and total gaseous non-methane.

Sincerely,

AtmAA, Inc.

Michael L. Porter
Laboratory Director

Encl.
MLP/krp

QUALITY ASSURANCE SUMMARY
(Repeat Analysis)

Client Proj. No.: 12582

| Component | Sample ID | Repeat Analysis Run #1 | Repeat Analysis Run #2 | Mean Conc. | % Diff. From Mean |
|---|---|---|---|---|---|
| | | (Concentration in ppm, v/v) | | | |
| Methane | 8-4-HC | <1 | <1 | --- | --- |
| TGNMO | 8-4-HC | 11.2 | 10.3 | 10.8 | 4.2 |
| | 10-4-HC | 11.0 | 14.3 | 12.6 | 13 |
| | 11-4-HC | 10.6 | 8.87 | 9.74 | 8.9 |
| | 12-4-HC | 9.39 | 10.4 | 9.90 | 5.1 |

A set of 8 Tedlar bag samples laboratory numbers, 92652-(24-31) was analyzed for methane and TGNMO. Agreement between repeat analyses is a measure precision and is shown above in the column "% Difference from Mean." Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 4 repeat measurements from the sample set of 8 Tedlar bag samples is 7.8%.

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# LABORATORY ANALYSIS REPORT

## Methane & Total Gaseous Non-Methane Organics Analysis in Tedlar Bag Samples

| | |
|---|---|
| Report Date: | September 21, 1992 |
| Client: | CARNOT |
| P.O. No.: | 8950 |
| Project No.: | 12582 |
| Date Received: | September 21, 1992 |
| Date Analyzed: | September 21, 1992 |

## ANALYSIS DESCRIPTION

Methane and total gaseous non-methane organics (TGNMO) were analyzed by flame ionization detection/total combustion analysis, SCAQMD Method 25, analysis portion.

| AtmAA Lab No. | Sample ID | Methane | TGNMO |
|---|---|---|---|
| | | (Concentration in ppm, v/v) | |
| 92652-24 | 5-4-HC | <1 | 8.47 |
| 92652-25 | 6-4-HC | <1 | 9.96 |
| 92652-26 | 7-4-HC | <1 | 8.38 |
| 92652-27 | 8-4-HC | <1 | 10.8 |
| 92652-28 | 9-4-HC | <1 | 9.97 |
| 92652-29 | 10-4-HC | <1 | 12.6 |
| 92652-30 | 11-4-HC | <1 | 9.74 |
| 92652-31 | 12-4-HC | <1 | 9.90 |

TGNMO is total gaseous non-methane organics measured and reported as ppm methane.

Michael L. Porter
Laboratory Director

AtmAA Inc.
21354 Nordhoff St., Suite 113, Chatsworth, CA 91311 (818) 718-6070 • FAX (818) 718-9779
environmental consultants
laboratory services

# LABORATORY ANALYSIS REPORT

Methane & Total Gaseous Non-Methane Organics (TGNMO)
Analysis in Tedlar Bag Samples

| | |
|---|---|
| Report Date: | October 2, 1992 |
| Client: | CARNOT |
| Project No.: | 12582 |
| Date Received: | September 29, 1992 |
| Date Analyzed: | September 30, 1992 |

## ANALYSIS DESCRIPTION

*Methane and total gaseous non-methane organics were measured by flame ionization detection/total combustion analysis portion (FID/TCA).*

| AtmAA Lab No.: | 92732-7 | 92732-8 | 92732-9 | 92732-10 |
|---|---|---|---|---|
| Sample I.D.: | 13-4-NH3 | 14-4-NH3 | 15-4-NH3 | 16-4-NH3 |
| Components: | (Concentration in ppm, v/v) | | | |
| Methane | 24.7 | 1.30 | <1 | 1.36 |
| TGNMO | 11.4 | 10.8 | 11.4 | 12.8 |

*TGNMO is total gaseous non-methane organics measured and reported as ppm methane.*

*Michael L. Porter*
*Laboratory Director*

QUALITY ASSURANCE SUMMARY
*(Repeat Analysis)*

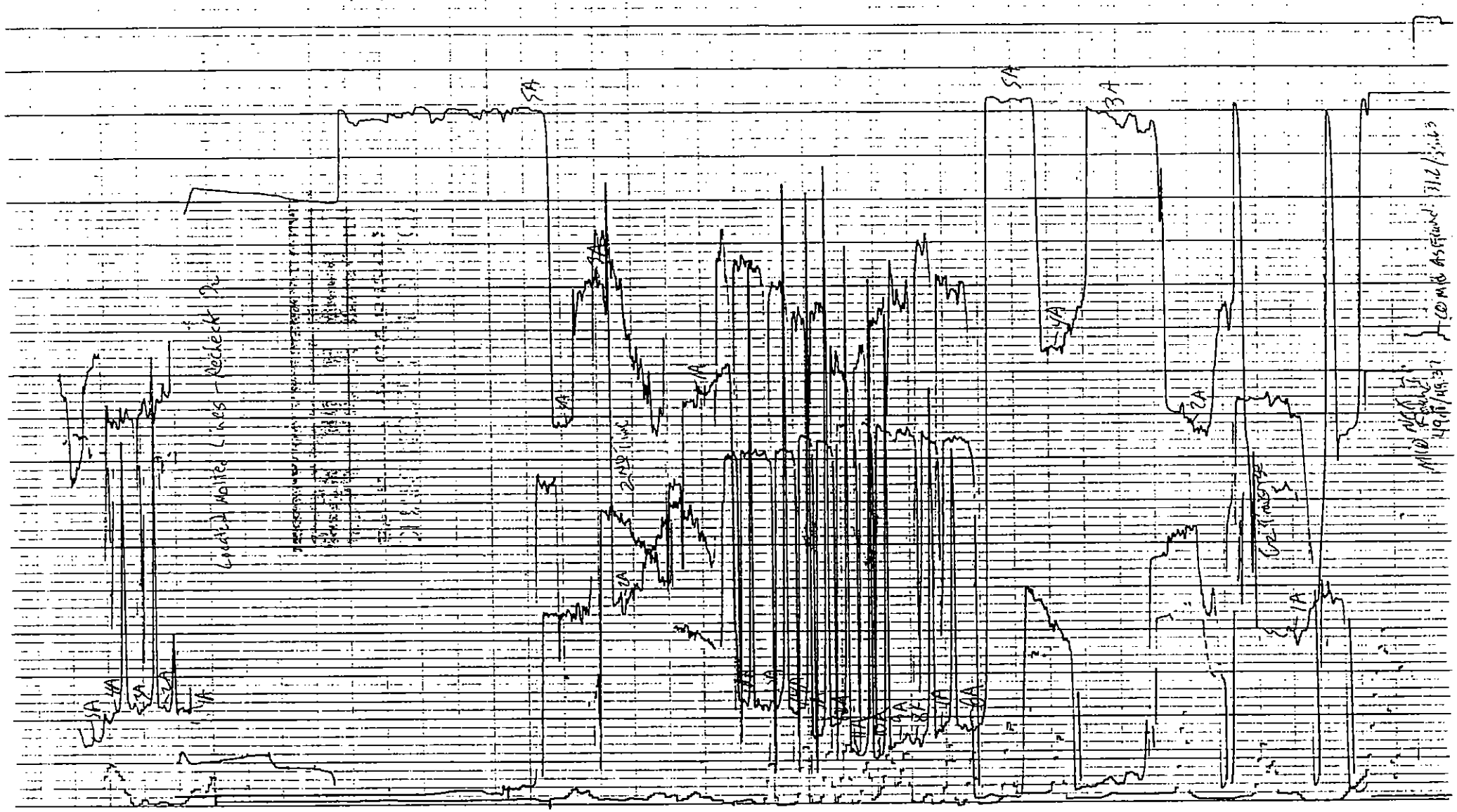
Project No.: 12582

| Component: | Sample ID | Repeat Analysis Run #1 | Repeat Analysis Run #2 | Mean Conc. | % Diff. From Mean |
|---|---|---|---|---|---|
| | | (Concentration in ppm, v/v) | | | |
| Methane | 13-4-NH3 | 24.8 | 24.6 | 24.7 | 0.40 |
| | 16-4-NH3 | 1.35 | 1.38 | 1.36 | 1.1 |
| TGNMO | 13-4-NH3 | 11.2 | 11.6 | 11.4 | 1.8 |
| | 16-4-NH3 | 13.0 | 12.6 | 12.8 | 1.6 |

*A set of 4 Tedlar bag samples laboratory numbers, 92732-(7-10) was analyzed for methane and TGNMO. Agreement between repeat analyses is a measure of precision and is shown above in the column "% Difference from Mean." Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 4 repeat measurements from the sample set of 4 Tedlar bag samples is 1.2%.*

# APPENDIX F

# INSTRUMENT STRIP CHARTS

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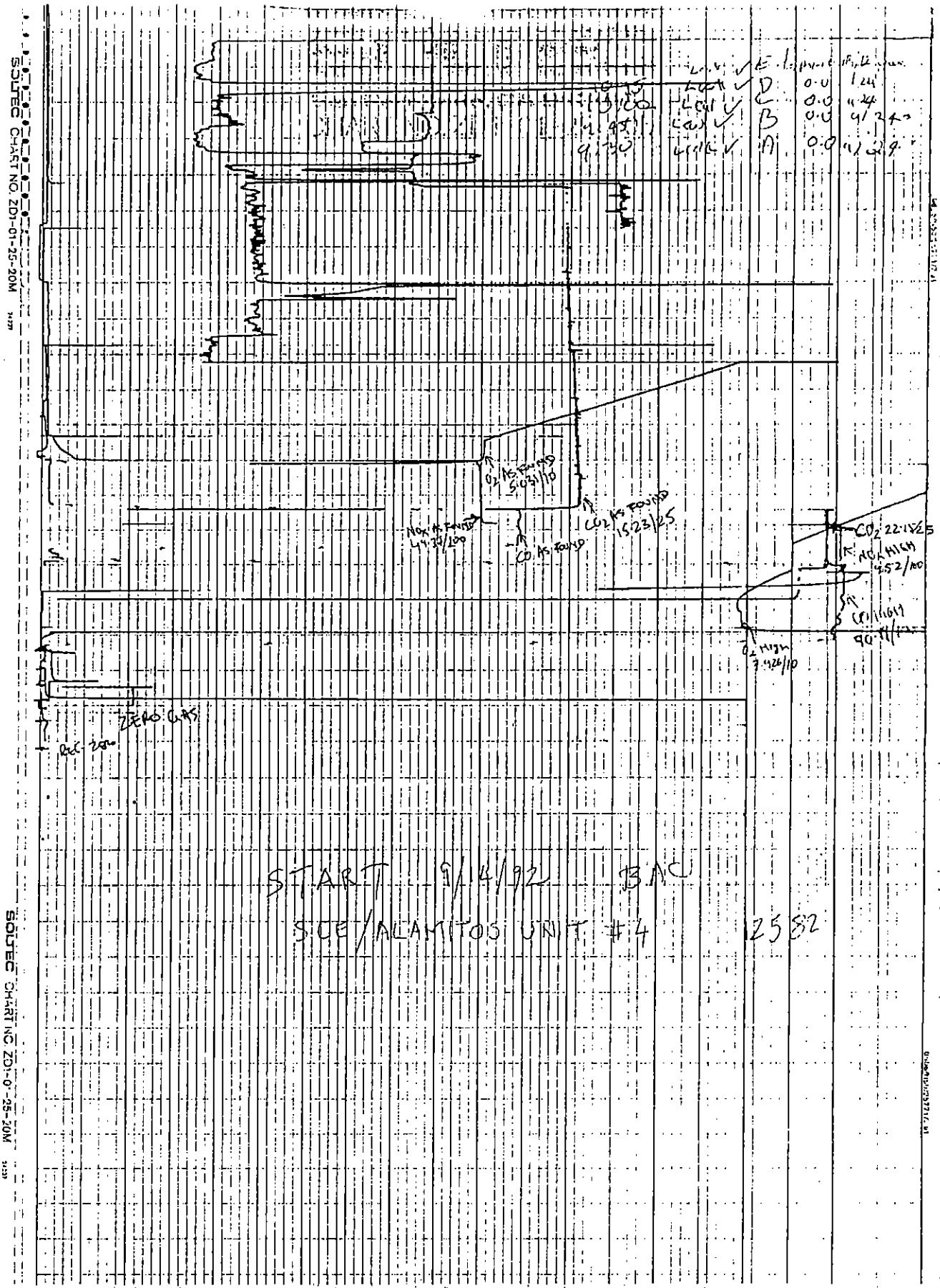
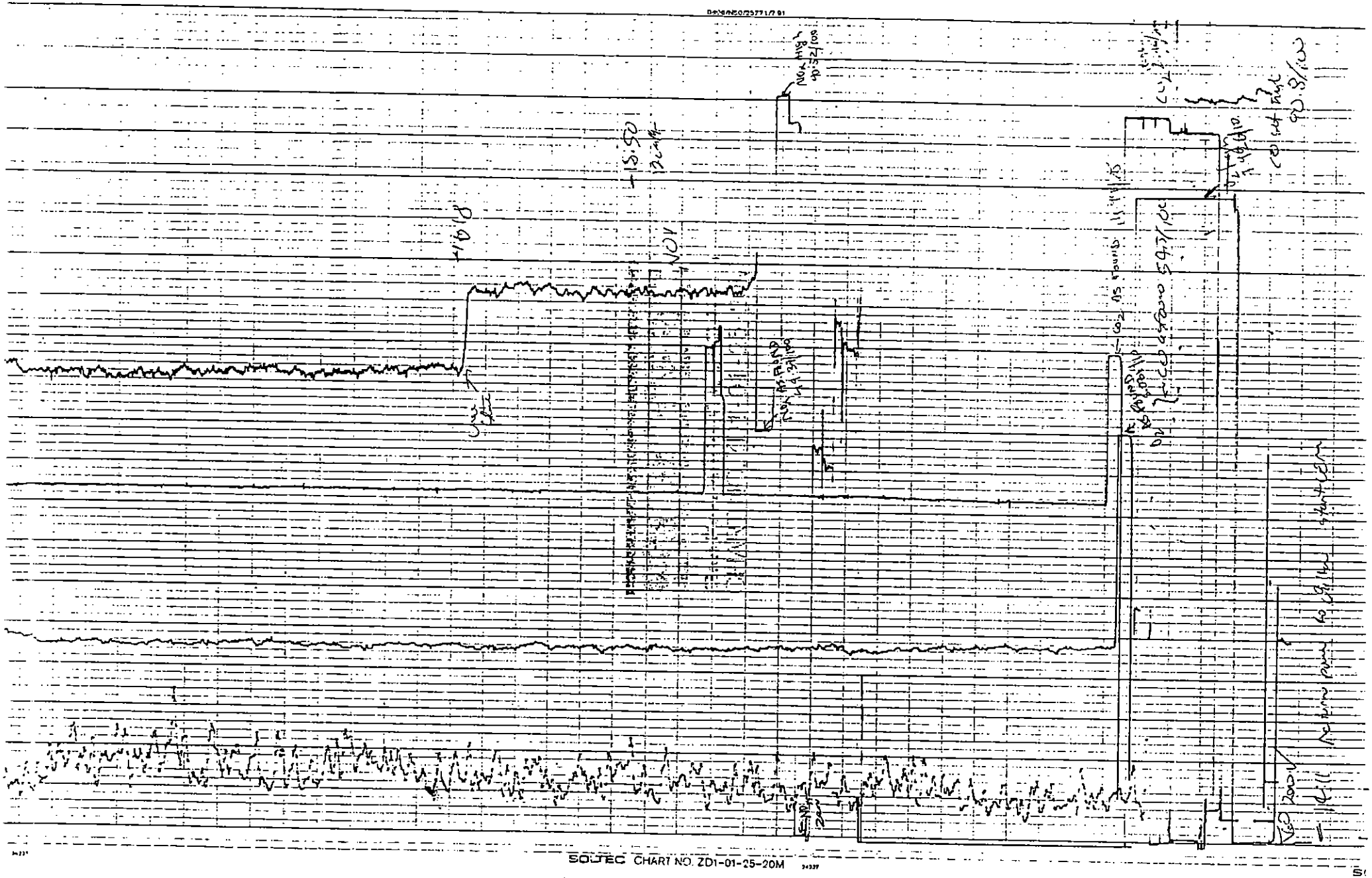
SOLTEC CHART NO. ZD1-

SOLTEC CHART NO. ZD1-01-25-20M


SOLTEC CHART NO. ZD1-01-25-20M
SOLTEC CHART NO. ZD1-0-25-20M
ZERO GAS
START 9/14/92 BAC
SCE/ALAMITOS UNIT #4
2582

SOLTEC CHART NO. ZD1-01-25-20M
SOLTEC CHART NO. ZD1-01-25-20M
9:30
9:45
10:00
0.0
0.0
0.0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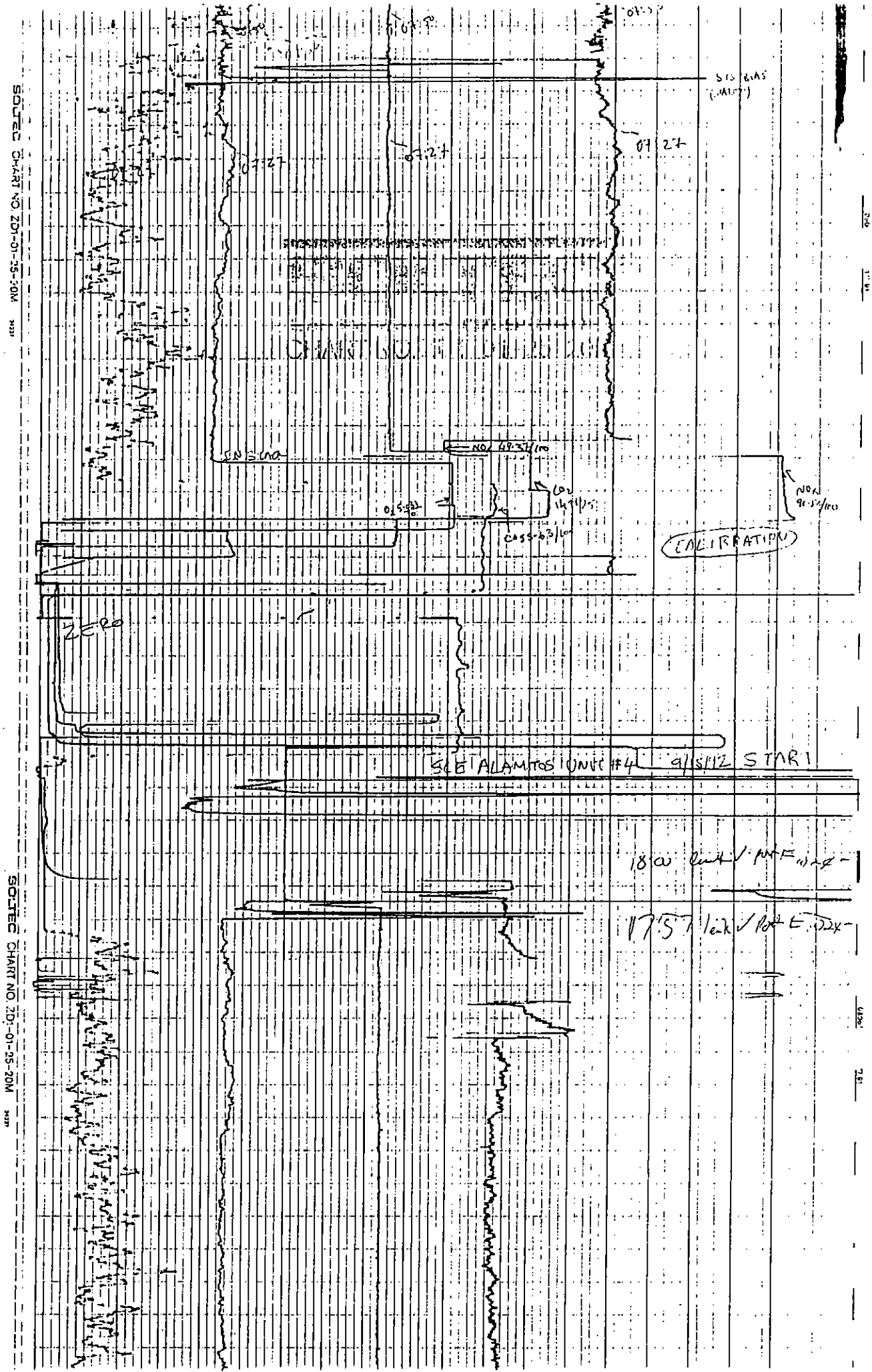
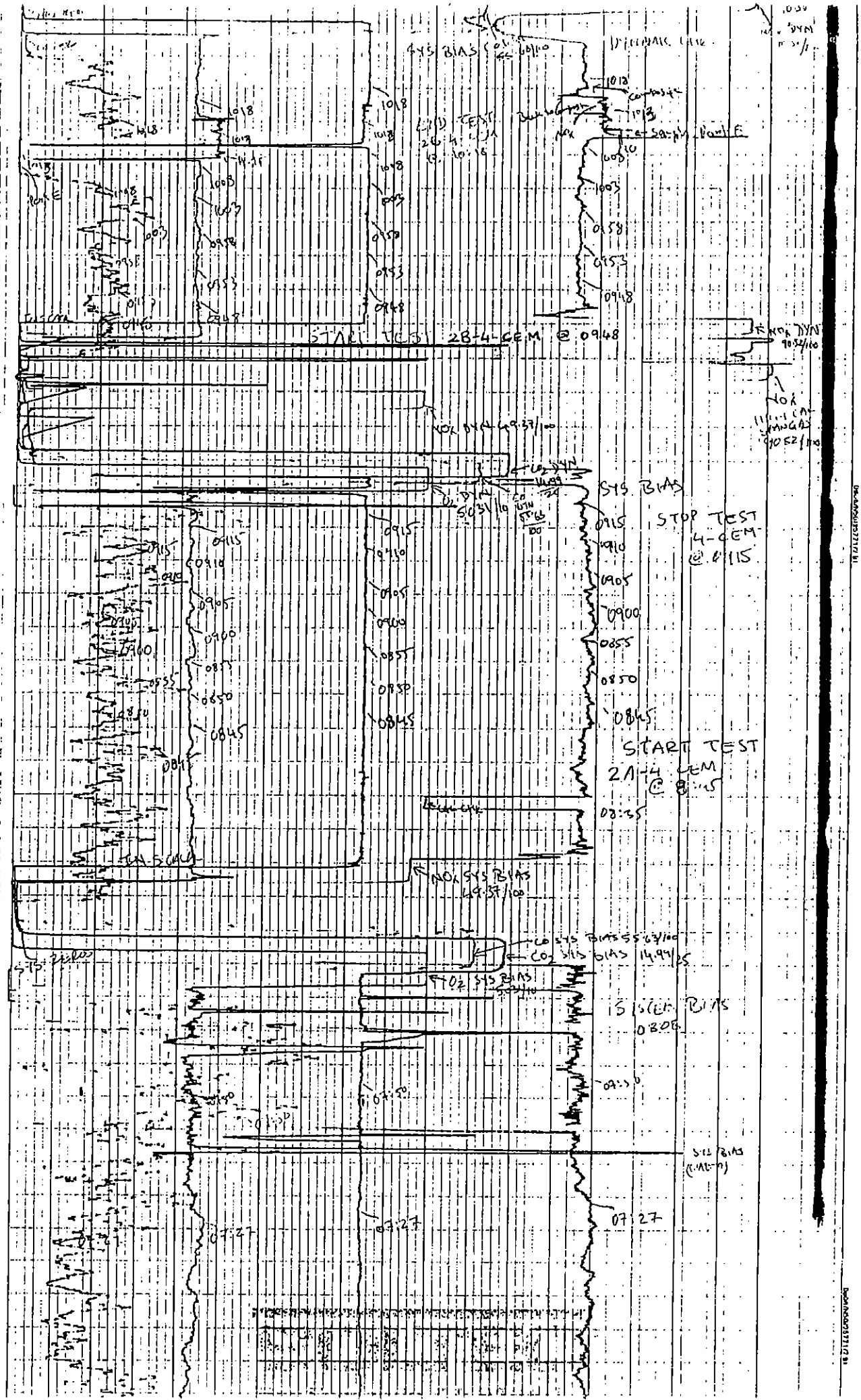
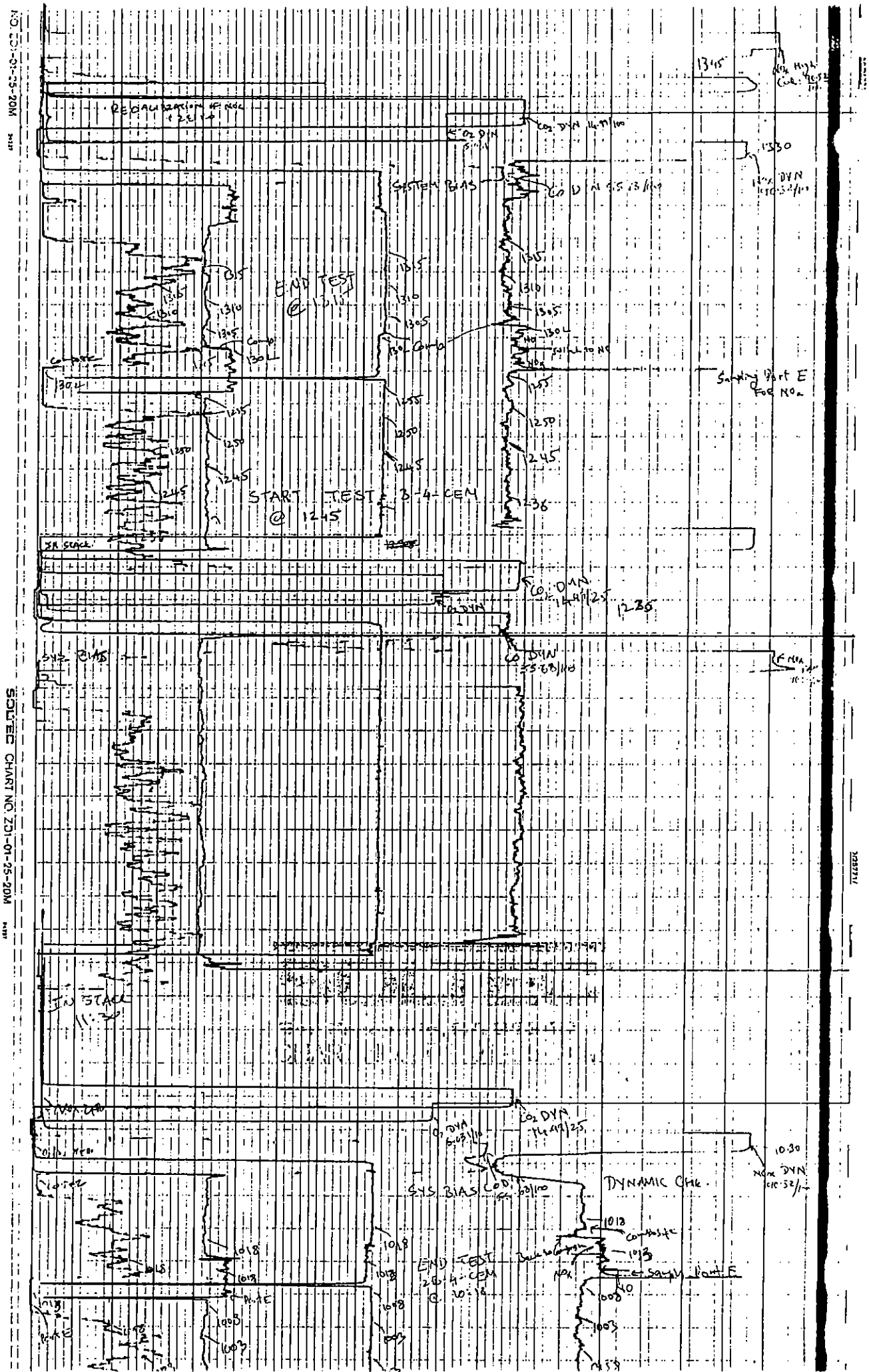
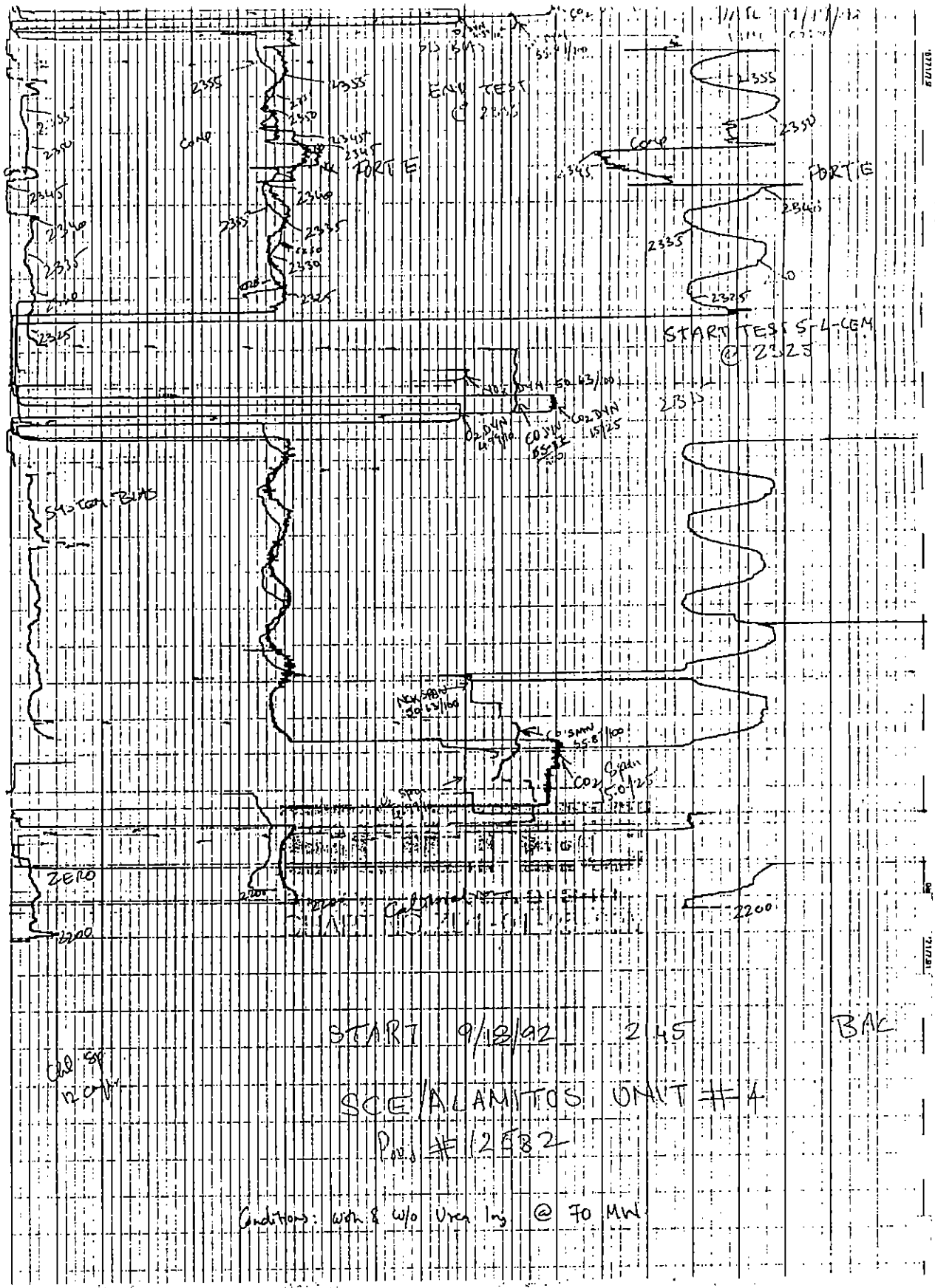
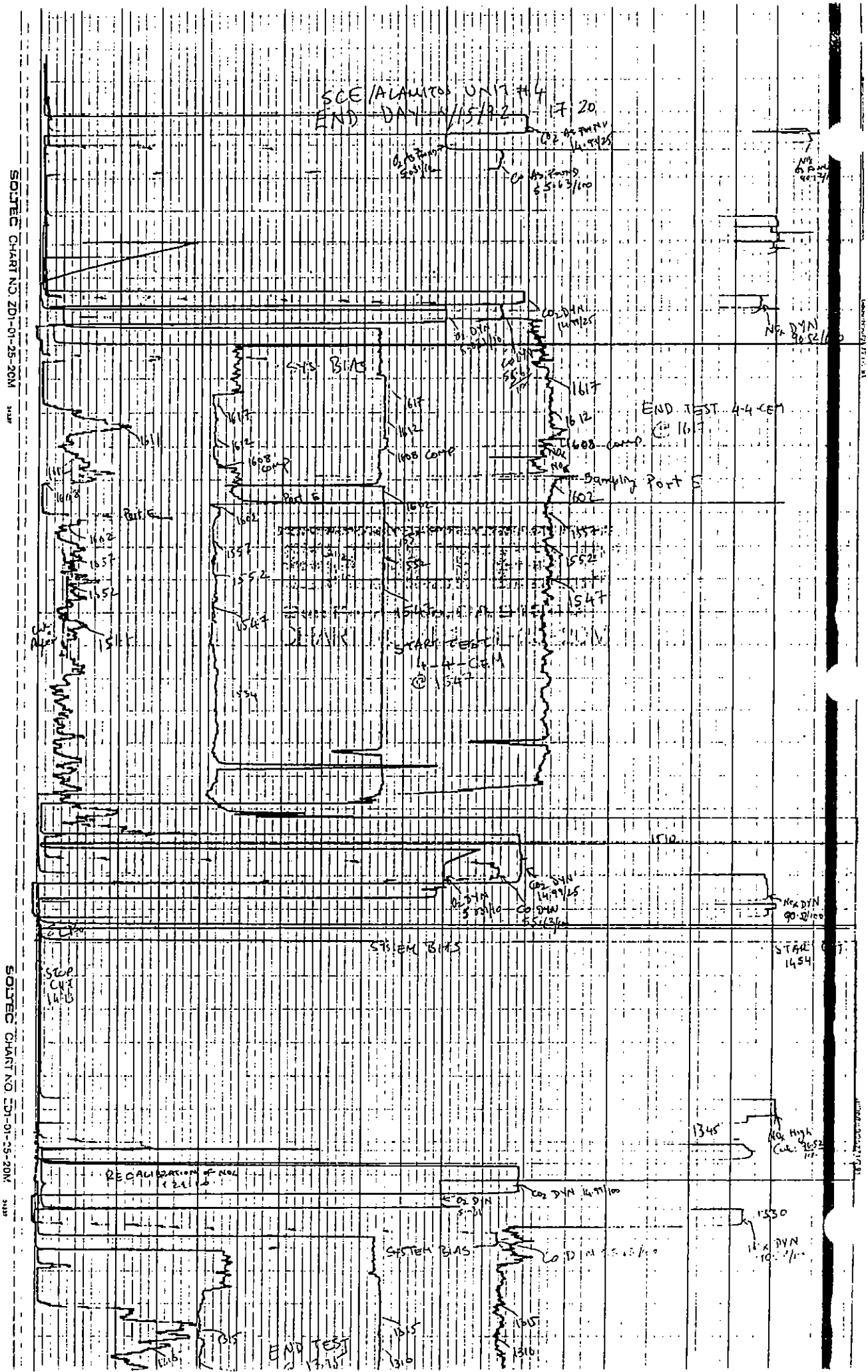
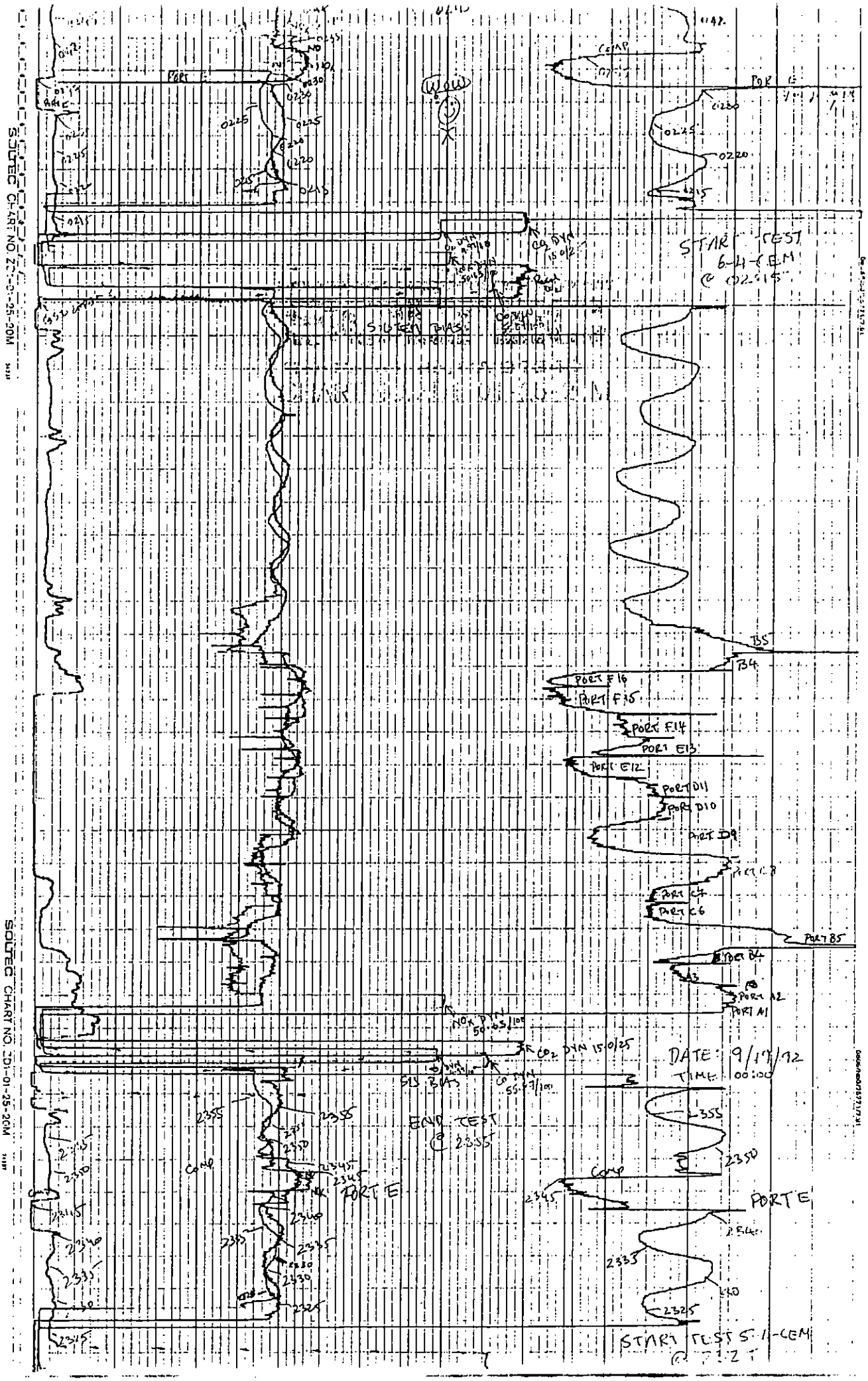

SOLTEC CHART NO. ZD1-01-25-20M
SOLTEC CHART NO. ZD1-01-25-20M
07:27
07:27
07:27
CALIBRATION
SCE ALAMITOS UNIT #4
9/15/12 START
1800 leak / MAE
1757 leak / Pol E

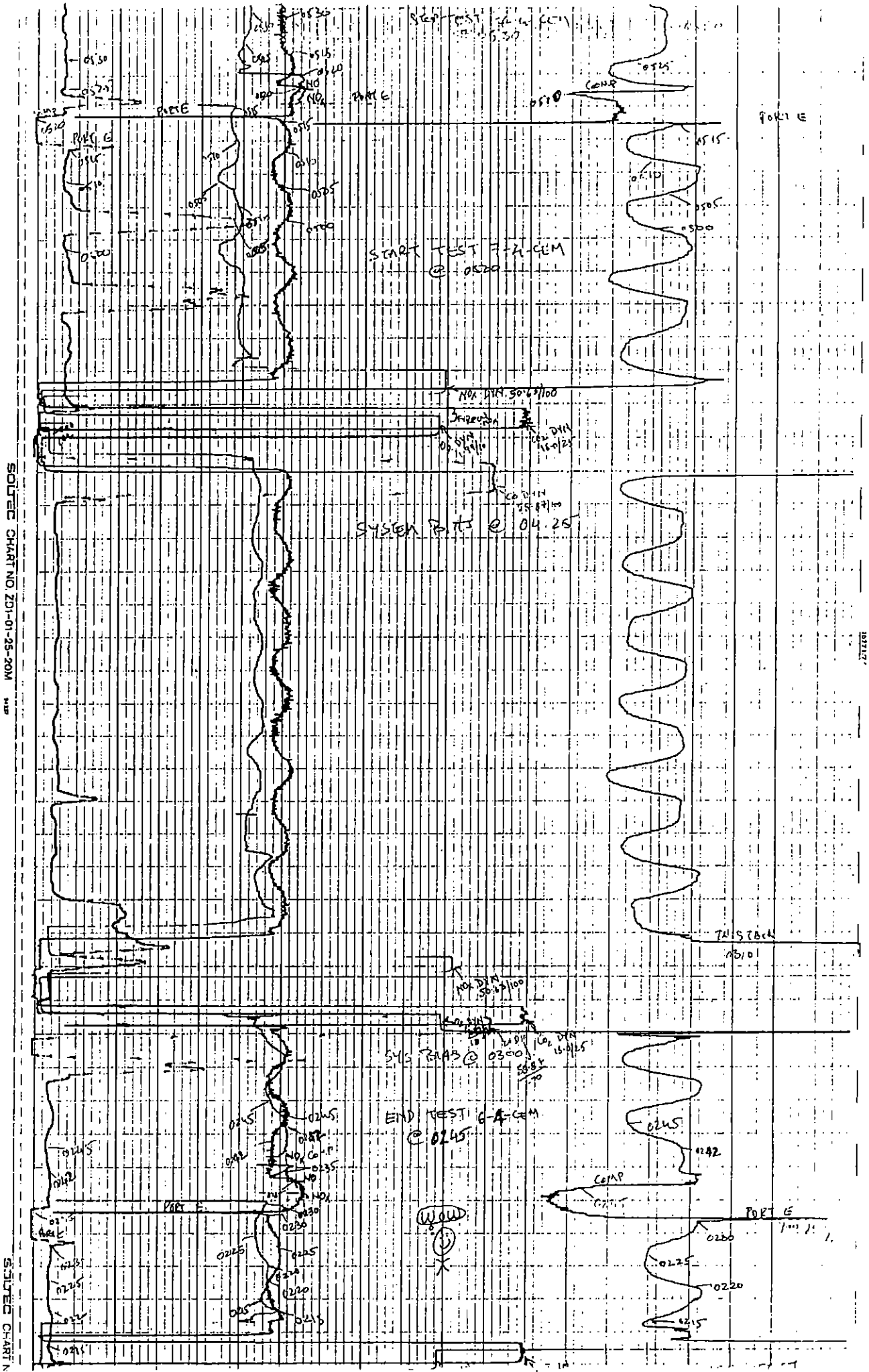

SOLTEC CHART NO. ZD1-01-25-20M
SYS BIAS
START TEST 2B-4-GEM @ 0948
STOP TEST 4-GEM @ 0915
START TEST 2A-4-GEM @ 0845
NOx SYS BIAS 49.37/100
CO SYS BIAS 55.63/100
CO2 SYS BIAS 14.99/25
O2 SYS BIAS
SOLTEC CHART NO. ZD1-01-25-20M

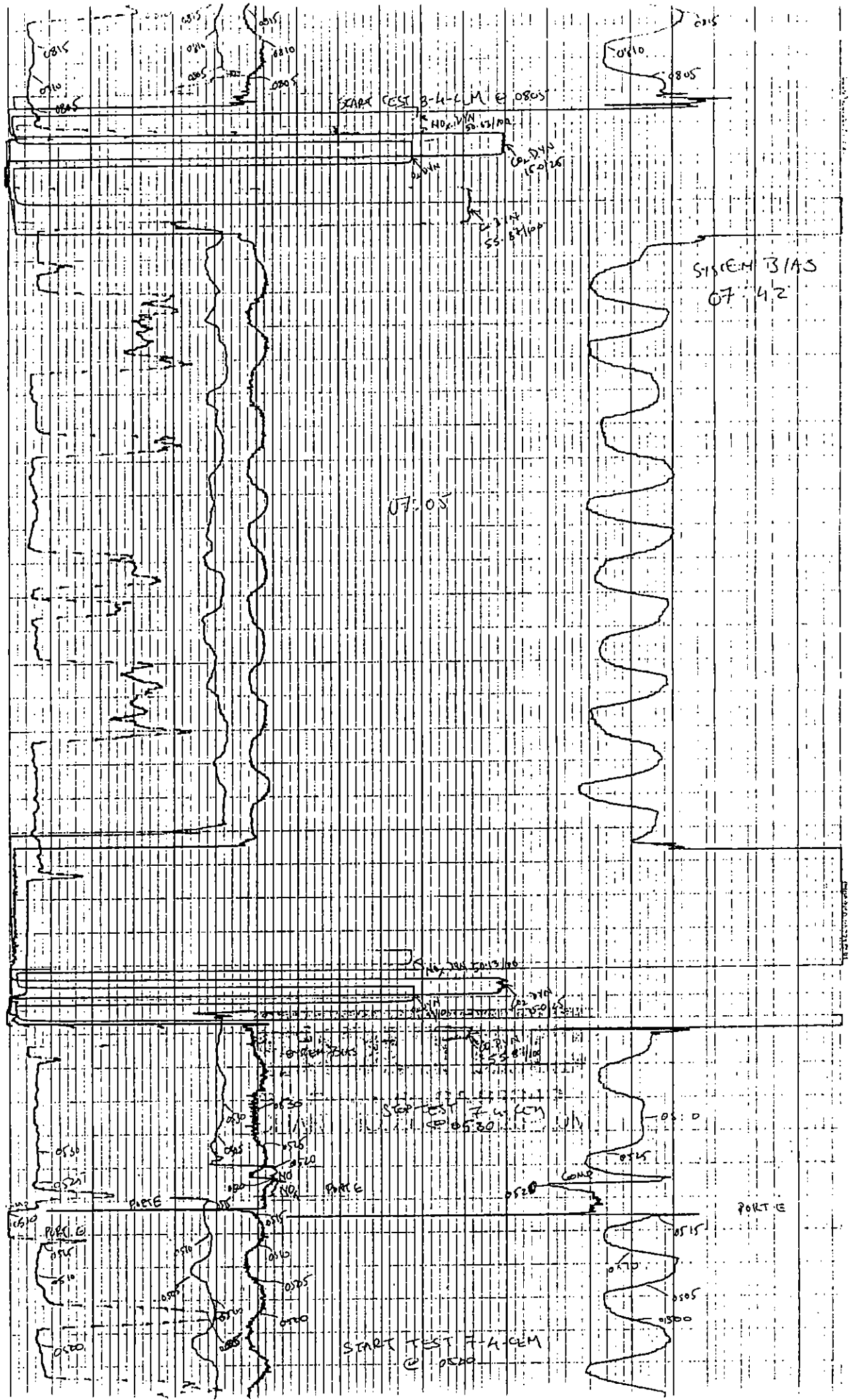

NO. ZD1-01-25-20M
SOLTEC CHART NO. ZD1-01-25-20M
REGULARIZATION OF NOx
SYSTEM BIAS
END TEST @ 1312
START TEST 3-4-CEM @ 1245
Sampling Port E For NOx
DYNAMIC CHK.
SYS BIAS
END TEST 2-4-CEM @ 10:18
Sampling Port E

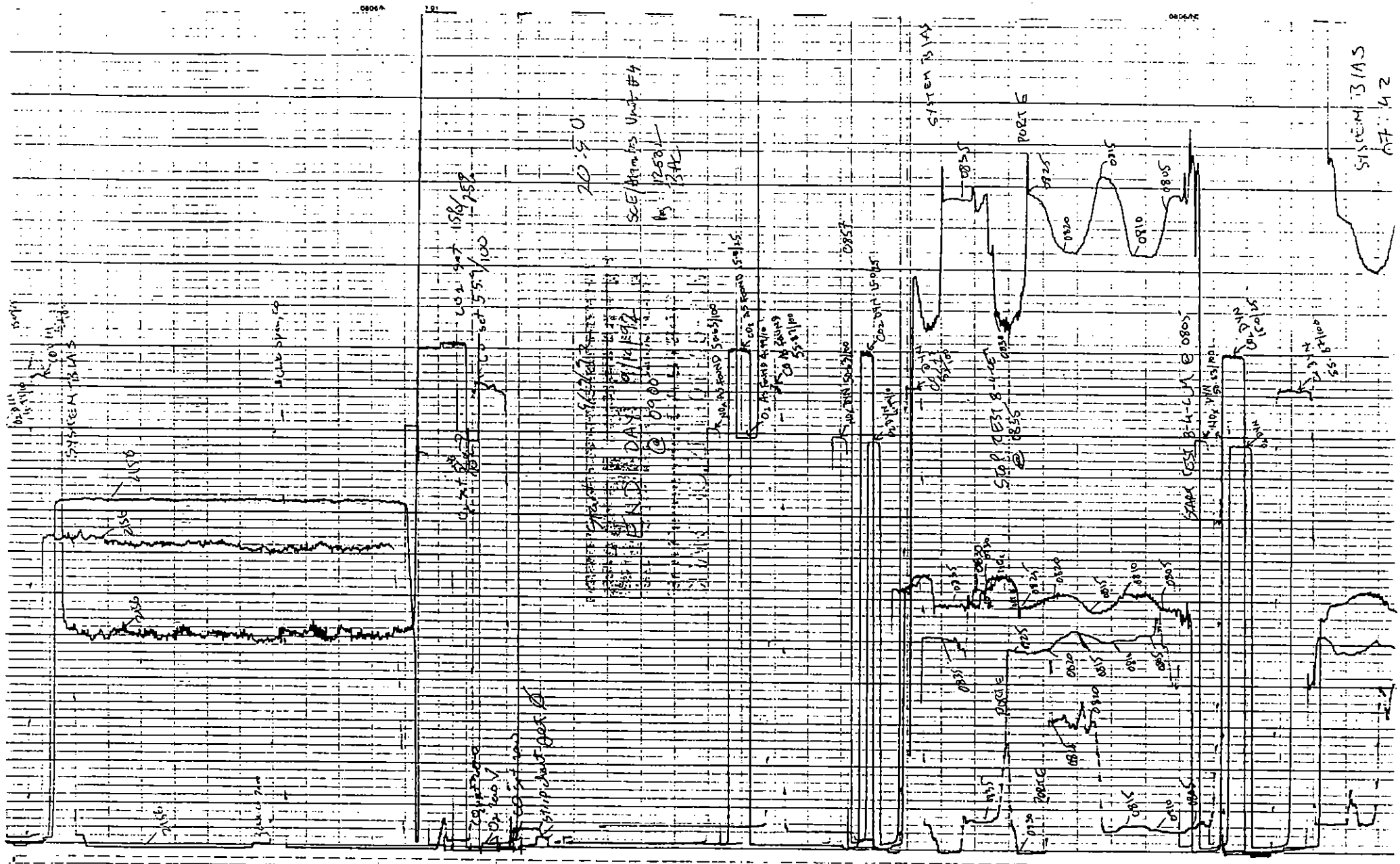


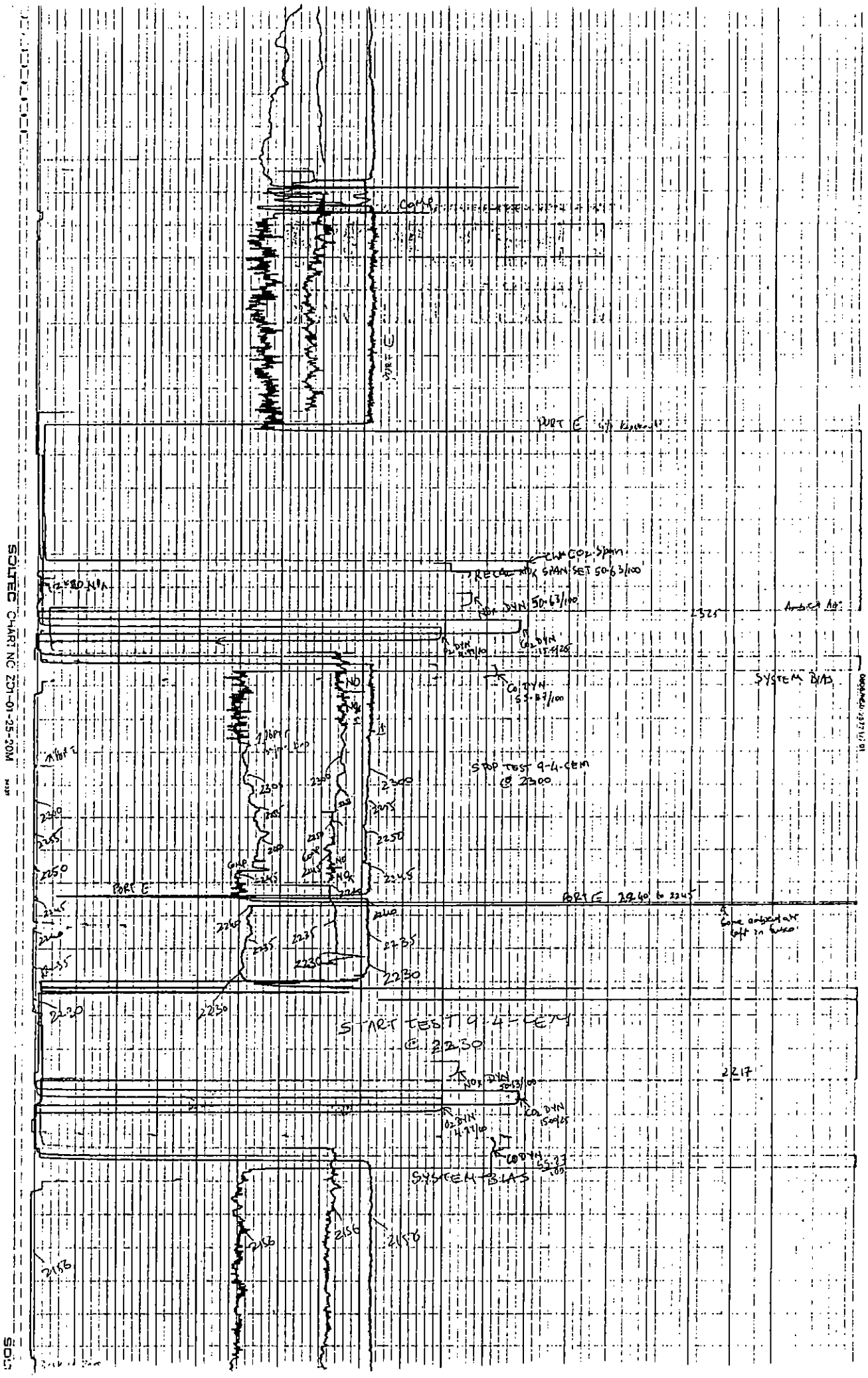

SCE ALAMITOS UNIT #4
END DAY 11/15/92
SYS BIAS
END TEST 4-4 CEM
Sampling Port 5
SYSTEM BIAS
STOP CNT
RECALIBRATION OF NOx
SYSTEM BIAS
END TEST
SOLTEC CHART NO. ZD1-01-25-20M
SOLTEC CHART NO. ZD1-01-25-20M

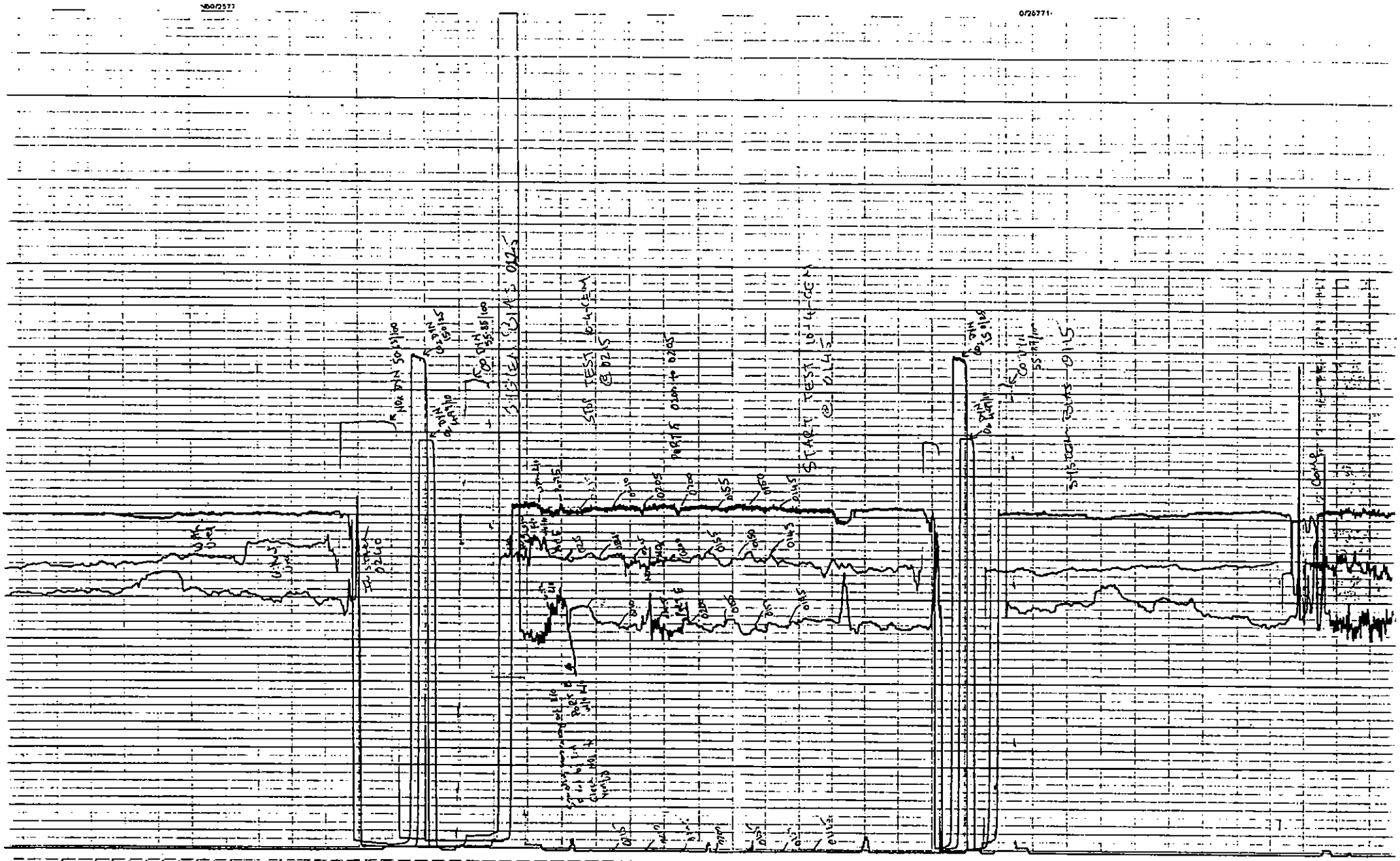

SOLTEC CHART NO. 20-01-25-20M
SOLTEC CHART NO. 20-01-25-20M
START TEST
6-4-CEM
@ 02:15
SIGNAL BIAS
PORT E
PORT E16
PORT F15
PORT F14
PORT E13
PORT E12
PORT D11
PORT D10
PORT D9
PORT C7
PORT C6
PORT B5
PORT B4
PORT A2
PORT A1
B5
B4
NOx DYN 50.03/100
CO2 DYN 15.0/25
CO DYN 55.97/100
DATE: 9/17/92
TIME: 00:00
END TEST
@ 23:55
PORT E
START TEST 5-1-CEM

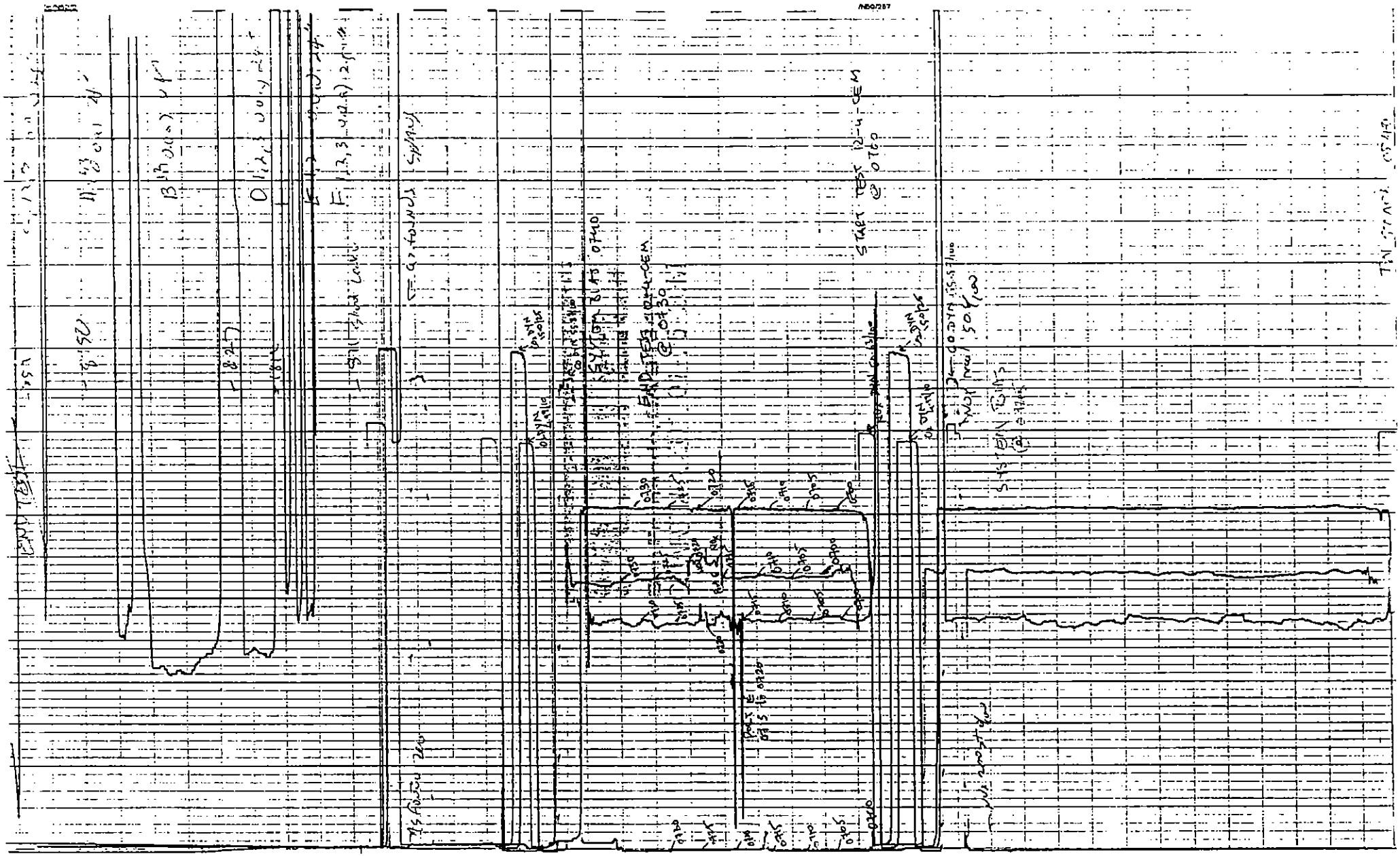

START TEST 7-A-CEM
@ 0520
SYSTEM BATS @ 04.25
SYS BAAS @ 0300
END TEST 6-A-CEM
@ 0245
PORT E
COMP
NOx DIN 30.63/100
CO DIN 15.0/25
SOLTEC CHART NO. ZD1-01-25-20M

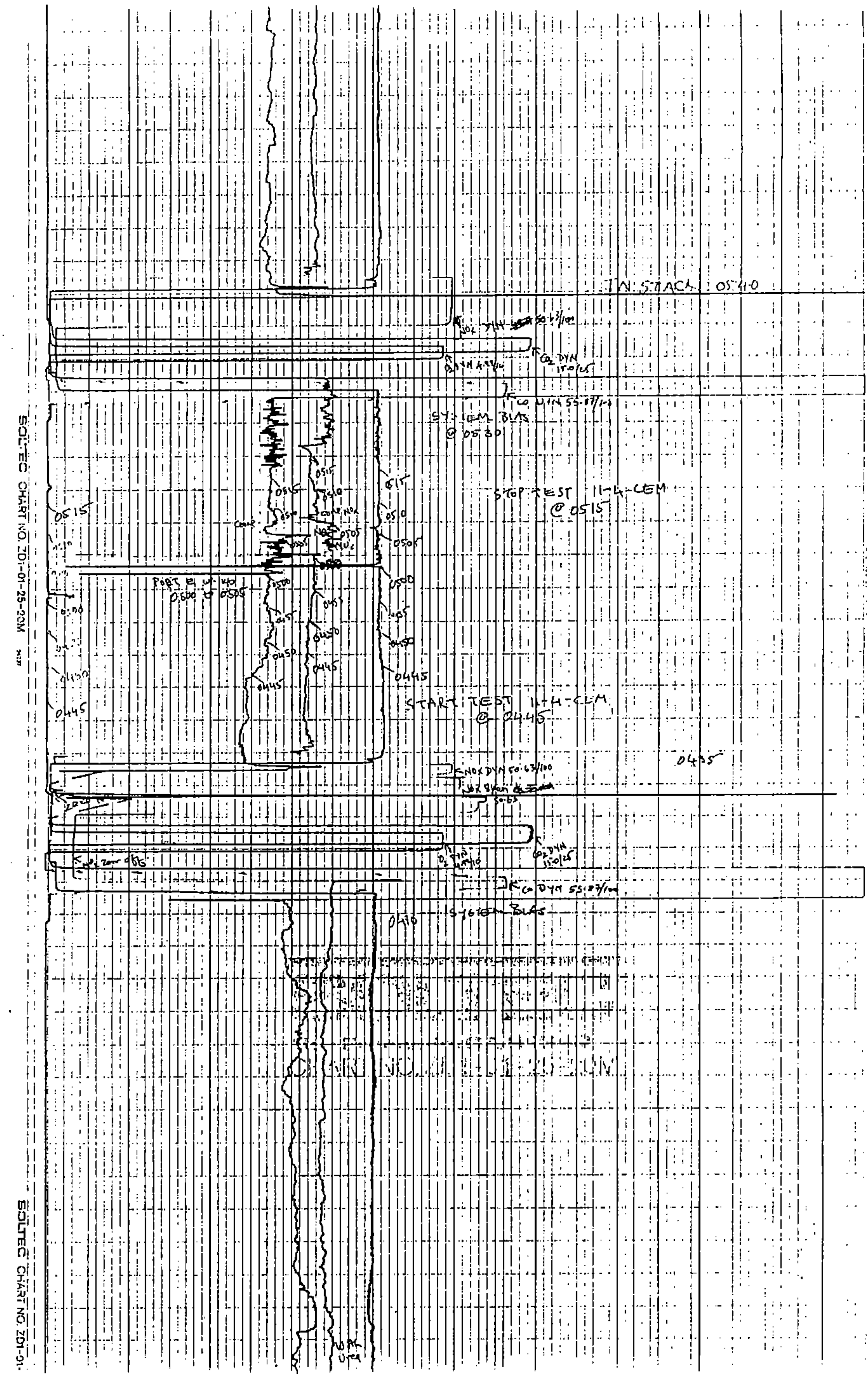

SOLTEC CHART NO. ZD1-01-25-20M
START TEST 3-4-LM @ 0805
SYSTEM BIAS
07:42
07:05
START TEST 7-4-CEM
@ 0540
PORT E
PORT G

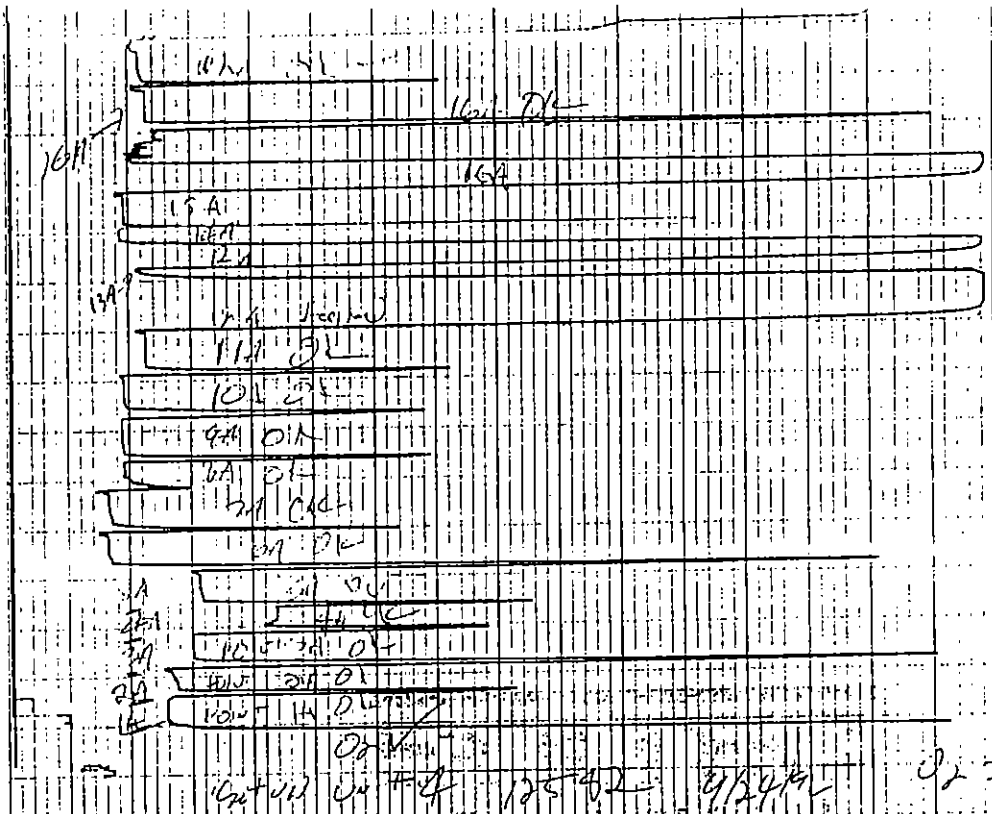

SOLTEC CHART NO ZD1-01-25-20M
SOLTEC CHART NO. ZD1-01-25-20M
SYSTEM 3/4
PORT 5
SCE/Unit #4
DAYS
STOP TEST
START TEST
SYSTEM 3/4
PORT 5

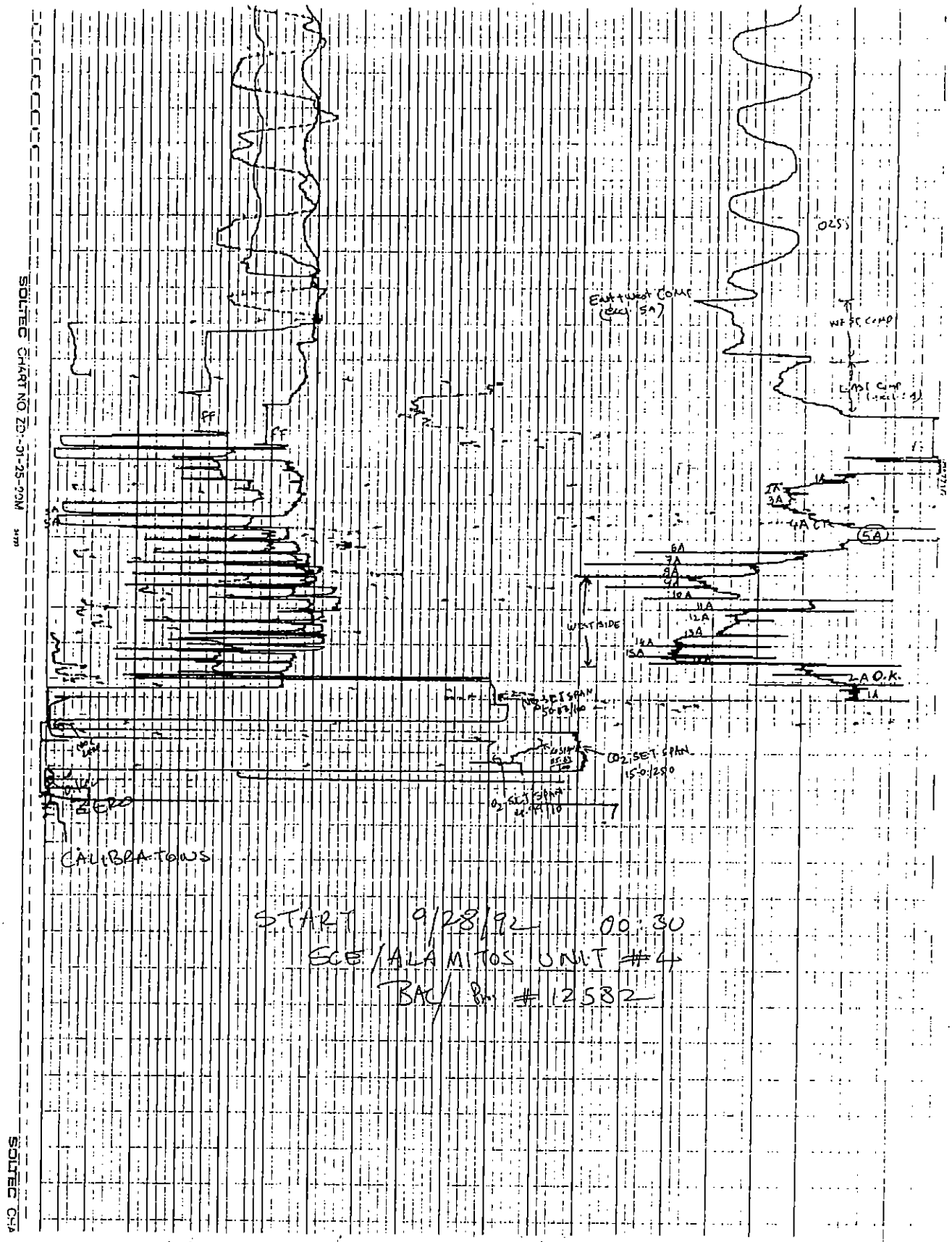

SOLTEC CHART NC 201-01-25-20M
PORT E
PORT E
PORT E
PORT E 22.60 to 22.45
SYSTEM BIAS
SYSTEM BIAS
STOP TEST 9-4-CEM
@ 2300
START TEST 9-4-CEM
@ 2230
2325
2217
2156

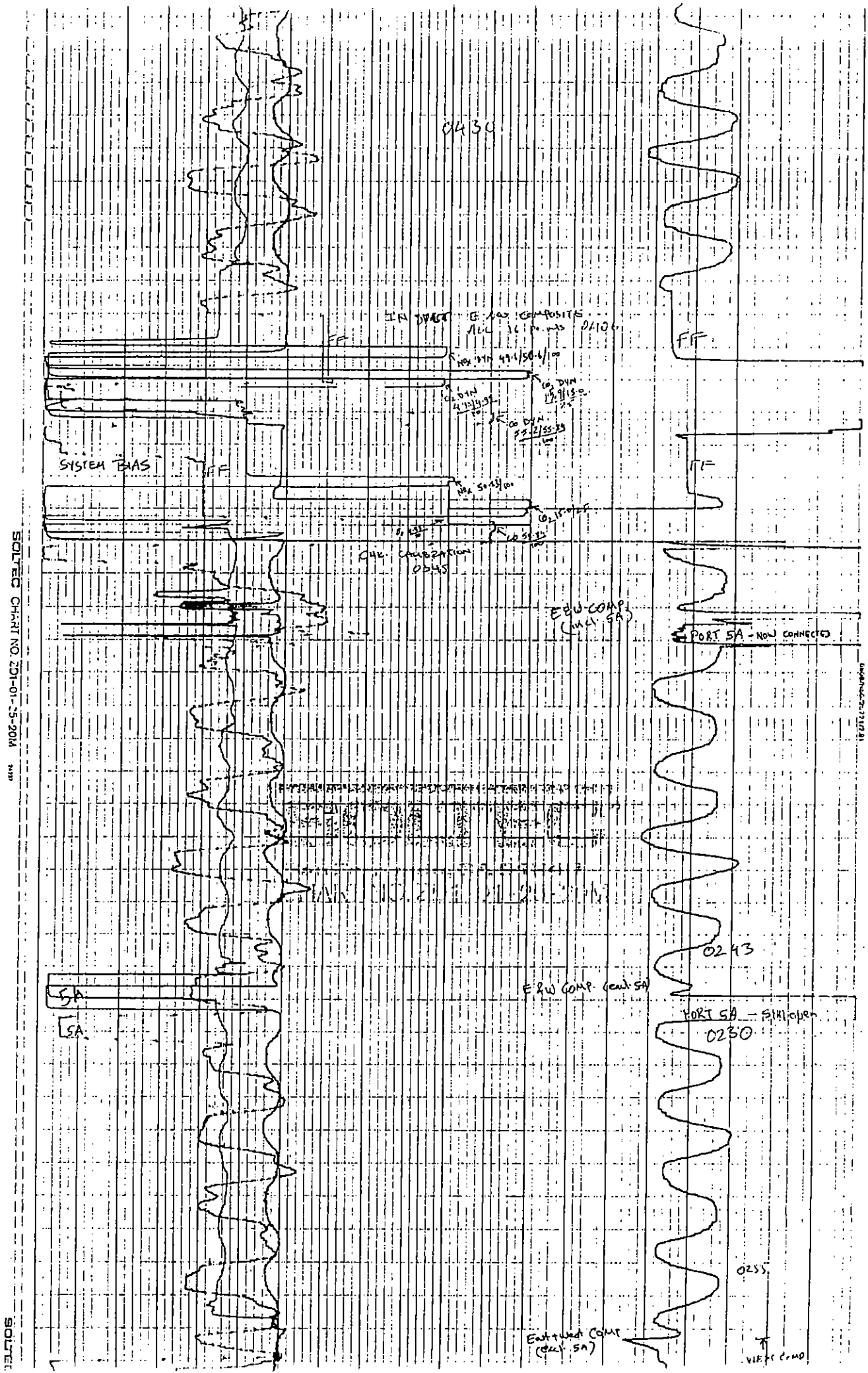

SOLTEC CHART NO. ZD1-01-25-20M
SOLTEC CHART NO. ZD1-01-25-20M

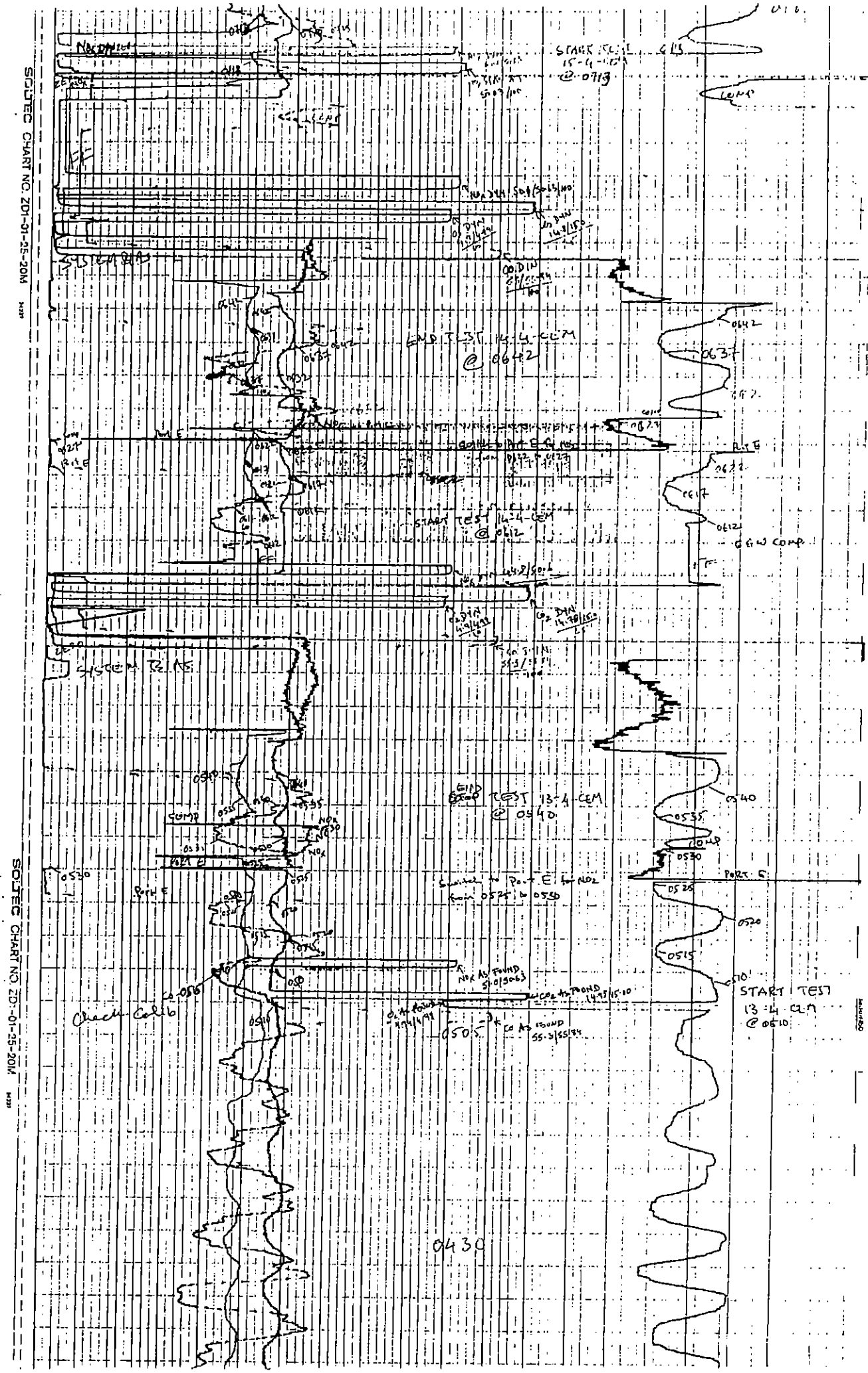

START TEST 12-4-CEM
@ 0700
END TEST 12-4-CEM
@ 0730
SOLTEC CHART NO. ZD1-01-25-20M

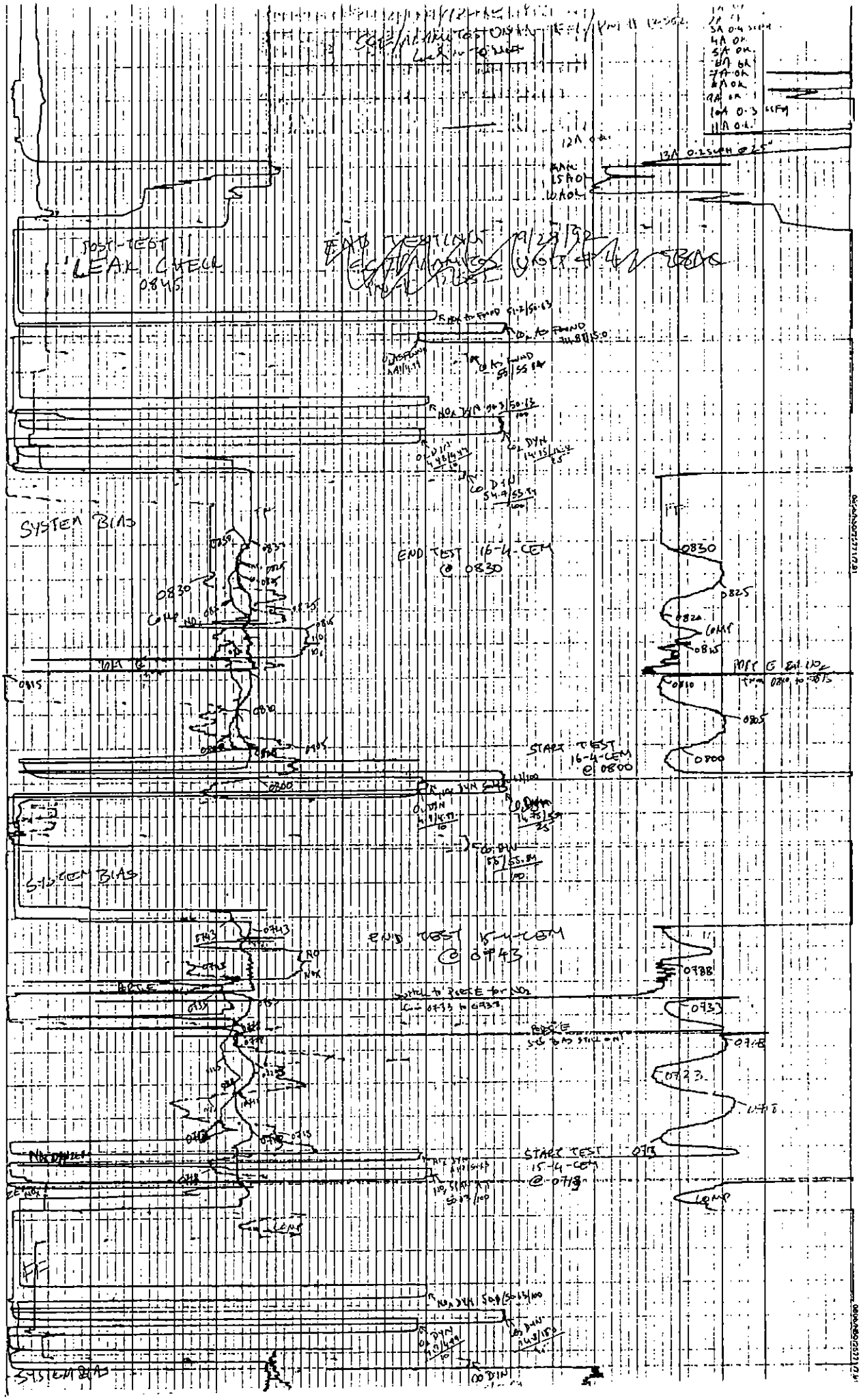

IN STACK 05:40
NOx DYN 50.63/100
O2 DYN 4.97/10
CO2 DYN 15.0/25
CO DYN 55.87/100
SYSTEM BIAS
@ 0530
STOP TEST 11-4-CEM
@ 0515
0515
0510
0505
0500
0455
0450
0445
COMP NOx
COMP
NOx
PORT E W 40
0500 @ 0505
START TEST 11-4-CEM
@ 0445
0435
NOX DYN 50.63/100
NOx DYN
50.63
O2 DYN
4.97/10
CO2 DYN
15.0/25
CO DYN 55.87/100
0410
SYSTEM BIAS
N2 Zero O2
SOLTEC CHART NO. ZD1-01-25-20M
SOLTEC CHART NO. ZD1-01-




SOLTEC CHART NO. ZD-01-25-90M
SOLTEC CHA
East + West COMP (Calc 5A)
WEST COMP
EAST COMP
1A
2A
3A
4A CK
5A
6A
7A
8A
9A
10A
11A
12A
13A
14A
15A
WEST SIDE
2A O.K.
1A
CO2 SET SPAN
15.0:12.90
ZERO
CALIBRATIONS
START 9/28/92 00:30
SCE/ALAMITOS UNIT #4
BAG/ Bn. #12582




SOLTEC CHART NO. ZD1-01-25-20M
SOLTEC CHART NO. ZD1-01-25-20M
END TEST 14-4-CEM
@ 0642
START TEST 14-4-CEM
@ 0612
GEM COMP
SYSTEM RELAY
END TEST 13-4-CEM
@ 0540
START TEST
13-4-CEM
@ 0510
Check Calib
0430


POST-TEST
LEAK CHECK
0845
END TEST
SYSTEM BIAS
END TEST 16-4-CEM
@ 0830
START TEST
16-4-CEM
@ 0800
SYSTEM BIAS
END TEST 15-4-CEM
@ 0743
START TEST
15-4-CEM
@ 0713
SYSTEM BIAS
SOLTEC CHART NO. ZD1-01-05-20M
SOLTEC CHART NO. ZD1-01-05-20

# APPENDIX G
# CHAIN OF CUSTODY

# CHAIN OF CUSTODY

PROJECT # 12582 OUTSIDE LAB REQUIRED (Y/N) NO SAMPLE DATE 9/15/92

CLIENT/LOCATION SCE PROJECT MANAGER EP

SAMPLE LOCATION Colusa HPP METHOD(S) SCAQMD $NH_3$ Draft TECHNICIAN RM

COMPLIANCE TEST (Y/N) Yes DATE DUE

| DATE | TIME | TEST # | SAMPLE DESCRIPTION | CONTAINERS | SAMPLER | COMMENTS |
|---|---|---|---|---|---|---|
| 9/15 | : | 2A-4-$NH_3$ | $NH_3$ sample | 1 | | |
| 9/15 | : | 2B-4-$NH_3$ | " | 1 | | |
| 9/15 | : | 3-4-$NH_3$ | " | 1 | | |
| 9/15 | : | 4-4-$NH_3$ | " | 1 | | |
| 9/15 | : | 1-$NH_3$ Blank | Blank | 1 | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |

**TRANSFER OF SAMPLES FROM FIELD SAMPLE CUSTODIAN (FSC):**

| RELEASED BY (FSC) | DATE AND TIME | RECEIVED BY | DATE AND TIME |
|---|---|---|---|
| [illegible] | 9/16/92 : | [illegible] | 9/16/92 15:00 |
| | / / : | | / / : |
| | / / : | | / / : |

ANALYSIS REQUIRED: Analyze for $NH_3$ using SCAQMD Draft method ~~by~~ with Nessler reagent

15991 Red Hill Ave., Suite 110, Tustin, California 92680-7388 (714) 259-9520 - FAX (714) 259-0372

CARNOT

PML-007

# CHAIN OF CUSTODY

PROJECT # 12582 OUTSIDE LAB REQUIRED (Y/N) NO SAMPLE DATE 9/15/92

CLIENT/LOCATION SCE PROJECT MANAGER EF

SAMPLE LOCATION Colosi & APIT METHOD(S) SCAQMD NH3 Draft TECHNICIAN RM

COMPLIANCE TEST (Y/N) Yes DATE DUE

| DATE | TIME | TEST # | SAMPLE DESCRIPTION | CONTAINERS | SAMPLER | COMMENTS |
|---|---|---|---|---|---|---|
| 9/15 | : | 2A-4-NH3 | NH3 sample | 1 | | |
| 9/15 | : | 2B-4-NH3 | " | 1 | | |
| 9/15 | : | 3-4-NH3 | " | 1 | | |
| 9/15 | : | 4-4-NH3 | " | 1 | | |
| 9/15 | : | 1-NH3 Blank | Blank | 1 | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |

**TRANSFER OF SAMPLES FROM FIELD SAMPLE CUSTODIAN (FSC):**

| RELEASED BY (FSC) | DATE AND TIME | RECEIVED BY | DATE AND TIME |
|---|---|---|---|
| [illegible signature] | 9/16/92 : | [illegible signature] | 9/16/92 15:00 |
| | / / : | | / / : |
| | / / : | | / / : |

ANALYSIS REQUIRED: Analyze for NH3 using SCAQMD Draft method ~~by~~ with Nessler reagent

15991 Red Hill Ave., Suite 110, Tustin, California 92680-7388 (714) 259-9520 - FAX (714) 259-0372

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PML-007

# CHAIN OF CUSTODY

PROJECT # 12582

CLIENT/LOCATION SCE / Alamitos

SAMPLE LOCATION CSAPH

COMPLIANCE TEST (Y/N) Yes

OUTSIDE LAB REQUIRED (Y/N) ~~YES~~ NO

METHOD(S) 207.1

SAMPLE DATE 9/19/92

PROJECT MANAGER EF

TECHNICIAN RM

DATE DUE 9/21/92

| DATE | TIME | TEST # | SAMPLE DESCRIPTION | CONTAINERS | SAMPLER | COMMENTS |
|---|---|---|---|---|---|---|
| 9/19 | : | 5-4-NH3 | Probe weight → Filter | 1 | | |
| 9/19 | : | 6-4-NH3 | ↓ | 1 | | |
| 9/19 | : | 7-4-NH3 | ↓ | 1 | | |
| 9/19 | : | 8-4-NH3 | ↓ | 1 | | |
| 9/19 | : | 9-4-NH3 | ↓ | 1 | | |
| 9/20 | : | 10-4-NH3 | ↓ | 1 | | |
| 9/20 | : | 11-4-NH3 | ↓ | 1 | | |
| 9/20 | : | 12-4-NH3 | ↓ | 1 | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |

**TRANSFER OF SAMPLES FROM FIELD SAMPLE CUSTODIAN (FSC):**

| RELEASED BY (FSC) | DATE AND TIME | RECEIVED BY | DATE AND TIME |
|---|---|---|---|
| [signature] | 9/21/92 : | Judy R Howe | 9/21/92 9:30 |
| | / / : | | / / : |
| | / / : | | / / : |

ANALYSIS REQUIRED: Analyze using SCAQMD $NH_3$ Draft method (207.1) (Nessler Reagent) report in PPM solution

15991 Red Hill Ave., Suite 110, Tustin, California 92680-7388 (714) 259-9520 - FAX (714) 259-0372

CARNOT

PML-007

# CHAIN OF CUSTODY

PROJECT # 12582

OUTSIDE LAB REQUIRED (Y/N) Yes

SAMPLE DATE 9/15/92

CLIENT/LOCATION SCE/ALAMITOS 4

PROJECT MANAGER ET

SAMPLE LOCATION Cold side APM

METHOD(S) SCAQMD 25.2

TECHNICIAN RM

COMPLIANCE TEST (Y/N) Yes.

DATE DUE

| DATE | TIME | TEST # | SAMPLE DESCRIPTION | CONTAINERS | SAMPLER | COMMENTS |
|---|---|---|---|---|---|---|
| 9/15 | : | 2A-4-HC | TEDLAR BAG | 1 | | |
| 9/15 | : | 2B-4-HC | | 1 | | |
| 9/15 | : | 3-4-HC | | 1 | | |
| 9/15 | : | 4-4-HC | | 1 | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
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| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |

TRANSFER OF SAMPLES FROM FIELD SAMPLE CUSTODIAN (FSC):

| RELEASED BY (FSC) | DATE AND TIME | RECEIVED BY | DATE AND TIME |
|---|---|---|---|
| | / / : | Derek Kum | 9/17/92 : |
| | / / : | | / / : |
| | / / : | | / / : |

ANALYSIS REQUIRED: Analyze for CH4 + TNMHC by TCA/FID

Analyze in 72 hrs

15991 Red Hill Ave., Suite 110, Tustin, California 92680-7388 (714) 259-9520 - FAX (714) 259-0372

CARNOT

PML-007

# CERTIFICATION OF SAMPLE RECEIPT

PROJECT # 12582

OUTSIDE LAB: ATMAA

SAMPLE DATE 9/15/92

PROJECT MANAGER EF

SAMPLE LOCATION Coldside ADM

METHOD(S) SCAQMD 25.2

TECHNICIAN RM

COMPLIANCE TEST (Y/N) YES

DATE DUE

| TEST # | COMPLETE DESCRIPTION | ATMAA # |
|---|---|---|
| 2-A-4HC | Tedlar Bag | 92622-1 |
| 2B-4-HC | ↓ | 92622-2 |
| 3-4-HC | | 92622-3 |
| 4-4-HC | | 92622-4 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

CHAIN OF CUSTODY PRIOR TO SHIPMENT:

| RELEASED BY | DATE | TIME | RECEIVED BY | DATE | TIME |
|---|---|---|---|---|---|
| Derek Kumm | 9/15/92 | 14:30 | | / / | : |
| | / / | : | | / / | : |
| | / / | : | | / / | : |

OUTSIDE LAB INFORMATION

SAMPLES SHIPPED TO Atm AA
21354 Nordhoff, #113
Chatsworth CA 91311

PHONE: ( ) -

CARNOT SHIPPER Derek Kumm

DATE 9/17/92

CARRIER #

AIR BILL #

RECIPIENT [illegible]

COMPANY ATMAA, Inc

DATE 9/17/92 7pm

15991 Red Hill Ave., Suite 110, Tustin, California 92680-7388 (714) 259-9520 - FAX (714) 259-0372

CARNOT

PML-001

# CHAIN OF CUSTODY

PROJECT # 12582

CLIENT/LOCATION SCE / Alamitos 4

SAMPLE LOCATION CS APH

COMPLIANCE TEST (Y/N) Yes

OUTSIDE LAB REQUIRED (Y/N) Yes

METHOD(S) SCAQMD 25.2

SAMPLE DATE 9 11 91.

PROJECT MANAGER EF

TECHNICIAN RM

DATE DUE

| DATE | TIME | TEST # | SAMPLE DESCRIPTION | CONTAINERS | SAMPLER | COMMENTS |
|---|---|---|---|---|---|---|
| 9 118 | : | 5-4HC | TEDLAR Bag | 1 | | Analyze by 9/21/92 |
| 9 119 | : | 6-4HC | ↓ | 1 | | " 9/22/92 |
| 9 119 | : | 7-4HC | ↓ | 1 | | " 9/22/92 |
| 9 119 | : | 8-4HC | ↓ | 1 | | " 9/22/92 |
| 9 119 | : | 9-4HC | ↓ | 1 | | " 9/22/92 |
| 9 120 | : | 10-4HC | ↓ | 1 | | " 9/22/92 |
| 9 120 | : | 11-4HC | ↓ | 1 | | " 9/22/92 |
| 9 120 | : | 12-4HC | ↓ | | | " 9/22/92 |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |
| / | : | | | | | |

**TRANSFER OF SAMPLES FROM FIELD SAMPLE CUSTODIAN (FSC):**

| RELEASED BY (FSC) | DATE AND TIME | RECEIVED BY | DATE AND TIME |
|---|---|---|---|
| [signature] | / / : | [signature] | 9/21/92 9:30 |
| [signature] | 9/21/ 10:00 | | / / : |
| | / / : | | / / : |

ANALYSIS REQUIRED: Analyze using SCAQMD 25.2 for Methane + TNMHC, report in ppm

15991 Red Hill Ave., Suite 110, Tustin, California 92680-7388 (714) 259-9520 - FAX (714) 259-0372



CARNOT

# CERTIFICATION OF SAMPLE RECEIPT

PROJECT # 12582

OUTSIDE LAB: Atm AA

SAMPLE DATE 9/19/92

PROJECT MANAGER EF

SAMPLE LOCATION APHCS

METHOD(S) SCAQMD 25.2

TECHNICIAN

COMPLIANCE TEST (Y/N) Y

DATE DUE 9/21

| TEST # | COMPLETE DESCRIPTION | | |
|---|---|---|---|
| 12652-24 5-4-HC | Tedlar | Bag | Samples taken 9/19 |
| -25 6-4-HC | | | |
| -26 7-4-HC | | | |
| -27 8-4-HC | | | |
| -28 9-4-HC | | | |
| -29 10-4-HC | | | |
| -30 11-4-HC | | | |
| -31 12-4-HC | | | |
| | | | |
| | | | |
| | | | |

CHAIN OF CUSTODY PRIOR TO SHIPMENT:

| RELEASED BY | DATE | TIME | RECEIVED BY | DATE | TIME |
|---|---|---|---|---|---|
| Derek Kum | 9/21/92 | 10:00 | | / / | : |
| | / / | : | | / / | : |
| | / / | : | | / / | : |

OUTSIDE LAB INFORMATION

SAMPLES SHIPPED TO Atm AA
21354 Nordhoff St., Ste 113
Chatsworth, CA 91311
PHONE: (818) 718-6070

CARNOT SHIPPER DEREK KUMM

DATE 9/21/92

CARRIER # Ritoway

AIR BILL #

RECIPIENT Karen Porter

COMPANY Atm AA, Inc.

DATE 9/21/92

15991 Red Hill Ave., Suite 110, Tustin, California 92680-7388 (714) 259-9520 - FAX (714) 259-0372

CARNOT

PML-001