Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

AP-42 #9
Section 1.4
(BID Ch. 2)

UREA PERMIT
COMPLIANCE TESTING AT ALAMITOS GENERATING STATION UNIT 2

Prepared For:

Southern California Edison Company
Rosemead, California

For Submittal To:

South Coast Air Quality Management District

Prepared By:

Edward J. Filadelfia

CARNOT
Tustin, California

NOVEMBER 1992

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.

Edward J. Filadelfia Date 11/24/92

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.

Carmela J. Rossi Date 11/24/92

Carmela J. Rossi, P.E.
Senior Engineer

REGISTERED PROFESSIONAL ENGINEER
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SECTION 1.0

INTRODUCTION

Carnot was contracted to conduct a series of emissions tests on Unit 2 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 248230.

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 2 for the following:

- NO_x, CO, and O_2
- ROG as non-methane hydrocarbons
- Particulates
- NH_3 (urea on only)

Emissions testing was conducted by Edward J. Filadelfia, Craig H. Fry, Jim Mulligan and Robert Madrigal of Carnot, on October 6, 7, and 8, 1992. Mr. Barry Novodvorsky and Mike Escarcega of SCE coordinated the testing.

TABLE 1-1
EMISSIONS TEST RESULTS SUMMARY
ALAMITOS UNIT 2
October, 1992

	NET LOAD 165 MW		NET LOAD 138 MW		NET LOAD 40 MW	
Parameter	Urea Off	Urea On	Urea Off	Urea On	Urea Off	Urea On
NO_x ppm (1)	144.9	106.5	83.2	71.3	108.2	91.0
NO_x PPM @ 3% O_2 (1)	141.9	103.1	85.8	73.7	142.9	120.5
CO ppm (1)	1.4	4.6	0.6	1.2	0.31	0.6
ppm @ 3%O_2 (1)	1.3	4.5	0.6	1.2	0.4	0.8
Methane, ppm	ND<1.0	<1.4	<1.1	ND<1.0	ND<1.0	ND<1.0
TNMHC as CH_4, ppm	15.7	18.7	14.1	13.4	12.6	11.2
Particulate, lb/hr	1.30	1.23	0.44	1.36	0.24	1.01
Grain loading, gr/dscf	0.0008	0.0007	0.0003	0.0009	0.0003	0.0013
Total urea flow	0.0	1.2	0.0	0.7	0.0	0.25
NH_3 Slip						
ppm	-	7.8	-	5.4	-	3.3
ppm @ 3%O_2(2)	-	10.3	-	7.4	-	6.3

(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.

SECTION 2.0

BOILER DESCRIPTION

1750 MMBTU/HR

Alamitos Unit 2 is a gas- or oil-fired steam-electric unit with a nameplate rating of 175 MW. The boiler is similar to five other units designed and built by B&W for SCE in 1956, and has a steam capacity of 1,140,000 lb/hr at design conditions of 1990 psig, 1000°F superheat, and 1000°F reheat steam temperature.

The furnace is fired with 16 combination gas/oil B&W burners arranged in a four-by-four matrix on the front wall. During gas fuel operation, the oil guns and diffusers are retracted to the back of the windbox. Gas is introduced radially inward through an external manifold spud burner. Combustion air enters each burner through adjustable vane-type air registers. The draft system is comprised of forced and induced draft fans, and the furnace is operated with slightly negative pressure.

The boilers are equipped with flue gas recirculation (GR) to the furnace hopper which is intended for steam temperature control. The flue gas is extracted from the boiler exhaust upstream of both air preheaters, and introduced into the furnace through slots between the waterwall tubes located in the rear wall immediately above the hopper. Spray attemperation for the superheaters and reheaters is also provided for steam temperature control.

SECTION 3.0

TEST DESCRIPTION

3.1 TEST CONDITIONS

The demonstration tests were conducted at two conditions and at three loads. 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: 40, 138 and 165 MW. All testing were performed with the boiler fired on natural gas fuel. 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 two exhaust ducts located between the air preheater (APH) and the stack. Samples were drawn from two ports with seven points each on both the east and west ducts. This resulted in a total of 14 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, as shown in Figure 3-2, 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 2
October, 1992

Test	Date	Time	Type of Test	Load MW	Urea Injection Status	Comments
1-2-PM	10/6/92	0900/1027	Particulate	165	off	
1-2-HC	10/6/92	1012/1032	Hydrocarbon	165	off	
1-2-CEM	10/6/92	1012/1042	NO_x, CO & O_2	165	off	
2-2-PM	10/6/92	1115/1157	Particulate	165	off	Isokinetics out of range.
3-2-PM	10/6/92	1305/1449	Particulate	165	off	
3-2-HC	10/6/92	1316/1336	Hydrocarbon	165	off	
3-2-CEM	10/6/92	1315/1350	NO_x, CO & O_2	165	off	
4-2-PM	10/6/92	1530/1700	Particulate	165	on	
4-2-HC	10/6/92	1410/1430	Hydrocarbon	165	on	
4-2-CEM	10/6/92	1615/1645	NO_x, CO & O_2	165	on	
4-2-NH_3	10/6/92	1610/1641	Ammonia	165	on	
5-2-PM	10/6/92	1740/1907	Particulate	165	on	
5-2-HC	10/6/92	1810/1830	Hydrocarbon	165	on	
5-2-CEM	10/6/92	1815/1845	NO_x, CO & O_2	165	on	
5-2-NH_3	10/6/92	1810/1841	Ammonia	165	on	
6-2-PM	10/7/92	0830/1012	Particulate	138	off	
6-2-HC	10/7/92	0917/0937	Hydrocarbon	138	off	
6-2-CEM	10/7/92	0910/0955	NO_x, CO & O_2	138	off	
7-2-PM	10/7/92	1056/1222	Particulate	138	off	
7-2-HC	10/7/92	1126/1146	Hydrocarbon	138	off	
7-2-CEM	10/7/92	1130/1225	NO_x, CO & O_2	138	off	

(Continued)

TABLE 3-1 (Cont'd)
TEST MATRIX SCE ALAMITOS UNIT 2
October, 1992

Test	Date	Time	Type of Test	Load MW	Urea Injection Status	Comments
8-2-PM	10/7/92	1327/1457	Particulate	138	on	
8-2-HC	10/7/92	1400/1420	Hydrocarbon	138	on	
8-2-CEM	10/7/92	1400/1445	NO_x, CO & O_2	138	off	
8-2-NH_3	10/7/92	1400/1431	Ammonia	138	on	
9-2-PM	10/7/92	1535/1704	Particulate	138	on	
9-2-HC	10/7/92	1615/1635	Hydrocarbon	138	on	
9-2-CEM	10/7/92	1620/1650	NO_x, CO & O_2	138	on	
9-2-NH_3	10/7/92	1615/1646	Ammonia	138	on	
10-2-PM	10/8/92	0835/1012	Particulate	40	on	
10-2-HC	10/8/92	0909/0929	Hydrocarbon	40	on	
10-2-CEM	10/8/92	0905/0935	NO_x, CO & O_2	40	on	
10-2-NH_3	10/8/92	0900/0131	Ammonia	40	on	
11-2-PM	10/8/92	1105/1233	Particulate	40	on	
11-2-HC	10/8/92	1117/1137	Hydrocarbon	40	on	
11-2-CEM	10/8/92	1115/1145	NO_x, CO & O_2	40	on	
11-2-NH_3	10/8/92	1116/1147	Ammonia	40	on	
12-2-PM	10/8/92	1215/1441	Particulate	40	off	
12-2-HC	10/8/92	1345/1405	Hydrocarbon	40	off	
12-2-CEM	10/8/92	1345/1415	NO_x, CO & O_2	40	off	
13-2-PM	10/8/92	1515/1641	Particulate	40	off	
13-2-HC	10/8/92	1525/1545	Hydrocarbon	40	off	
13-2-CEM	10/8/92	1525/1555	NO_x, CO & O_2	40	off	

TABLE 3-2
UNIT OPERATING DATA SCE ALAMITOS UNIT 2
October, 1992

Test No.	Date	Load MW	Urea Status	Total Urea Flow gpm
1-2	10/6/92	166	off	0.0
2-2	10/6/92	166	off	0.0
3-2	10/6/92	166	off	0.0
4-2	10/6/92	166	on	1.2
5-2	10/6/92	166	on	1.2
6-2	10/7/92	137	off	0.0
7-2	10/7/92	138	off	0.0
8-2	10/7/92	137	on	0.7
9-2	10/7/92	138	on	0.7
10-2	10/8/92	39	off	0.25
11-2	10/8/92	39	off	0.25
12-2	10/8/92	39	off	0.0
13-2	10/8/92	39	off	0.0

(1) Burners Out Of Service.

TABLE 3-3
EMISSIONS TEST PROCEDURES SCE ALAMITOS UNIT 2
October, 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 EPA 3A	Below 2% of instrument full scale
ROG as Hydrocarbons	2	20	Gas chromatography/FID	SCAQMD 25.2	0.1 ppm
Particulate	2	86	In-stack filtration	SCAQMD 5.3	0.002 gr/dscf
Ammonia	2	30	Colorimetry 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 done 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 all isokinetic 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 84 minutes in duration. Emissions were calculated in lb/hr and lb/MMBtu.

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 isokinetic test.

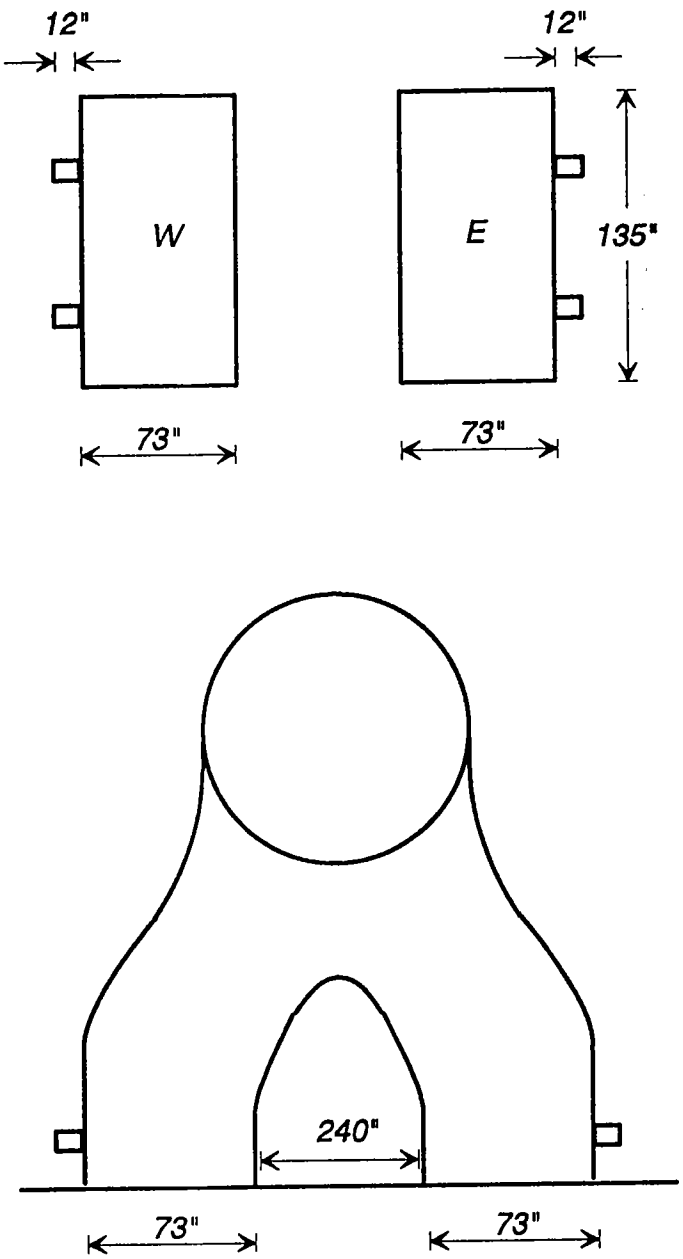


Figure 3-1. Alamitos Unit 2 Air Preheater Outlet Ducts Test Location

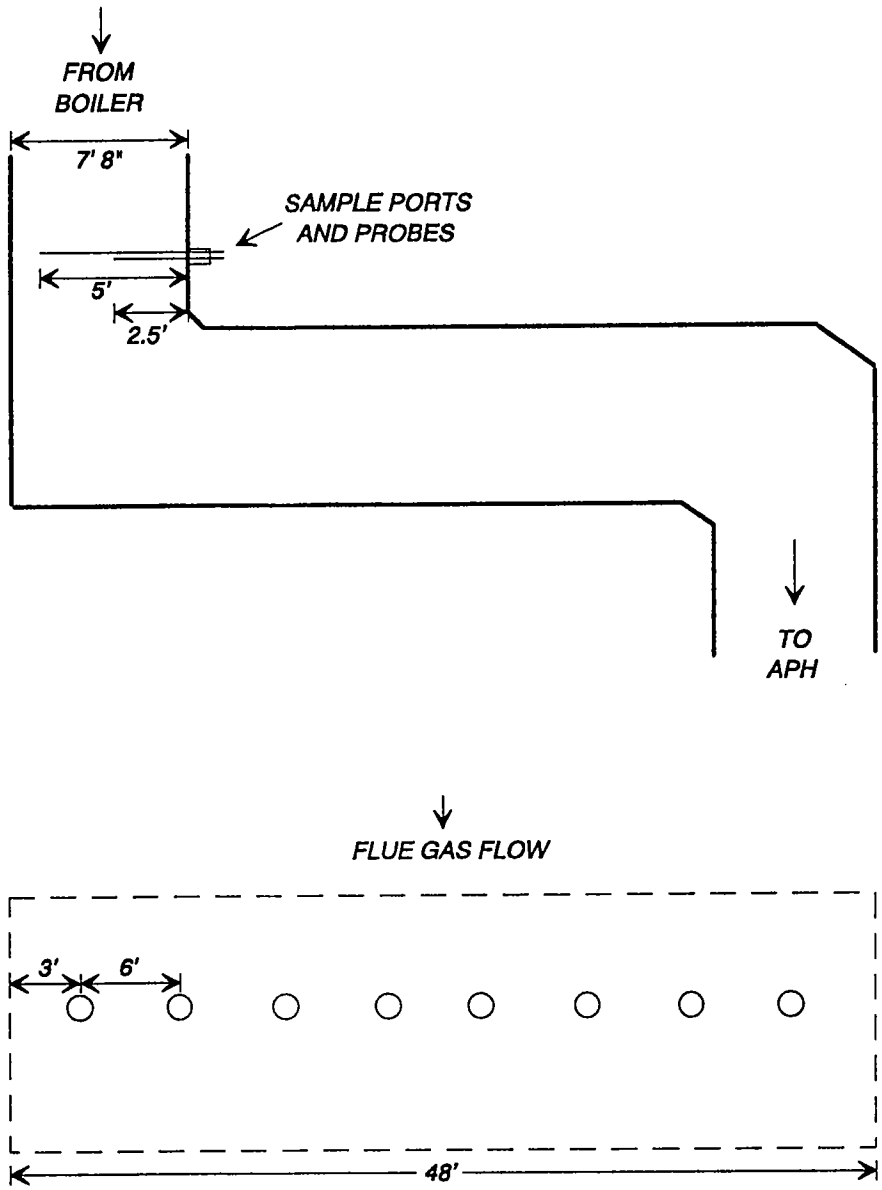


Figure 3-2. Alamitos Unit 2 Air Preheater Inlet Sample Test Location for NOx, CO and O_2 Sampling

SECTION 4.0

RESULTS

Emissions test results are presented in Tables 4-1 to 4-6. 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 165 MW
UREA OFF
ALAMITOS UNIT 2
October 6, 1992

Parameter	Test No. 1-2	Test No. 3-2	Test Averages
NO_x,			
ppm[1]	147.3	142.4	144.9
ppm @ 3% O_2[1]	145.8	137.9	141.9
CO,			
ppm[1]	0.8	1.9	1.4
ppm @ 3% O_2[1]	0.8	1.8	1.3
O_2%[1]	2.8	2.4	2.6
Methane, ppm			
Total non-methane hydrocarbon	ND < 1.0	ND < 1.0	ND < 1.0
as methane, ppm	13.8	17.5	15.7
Particulate analysis:			
Flow dscfm	187,400	199,700	193,600
Stack temperature °F	314.5	329.0	321.8
Moisture %	14.0	15.1	14.6
O_2%[2]	7.7	7.4	7.6
lb/hr	1.61	0.98	1.30
Grain loading, gr/dscf	0.0013	0.0008	0.0010

(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 4-2
EMISSIONS TEST RESULTS AT 165 MW
UREA ON
ALAMITOS UNIT 2
October 6, 1992

Parameter	Test No. 4-2	Test No. 5-2	Test Averages
NO_x,			
ppm(1)	109.3	103.6	106.5
ppm @ 3% O_2(1)	105.9	100.3	103.1
CO,			
ppm(1)	3.3	5.9	4.6
ppm @ 3% O_2(1)	3.2	5.7	4.5
O_2%(1)	2.4	2.4	2.4
Methane, ppm			
Total non-methane hydrocarbon	1.7	ND< 1.0	<1.4
as methane, ppm	18.0	19.4	18.7
NH_3, ppm	4.0	11.5	7.8
ppm @ 3% O_2(2)	5.3	15.3	10.3
Particulate analysis:			
Flow dscfm	216,600	192,500	204,600
Stack temperature °F	310.4	319.6	315.0
Moisture %	16.1	15.2	15.6
O_2%(2)	7.4	7.4	7.4
lb/hr	1.17	1.29	1.23
Grain loading, gr/dscf	0.0006	0.0008	0.0007

(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 4-3
EMISSION TEST RESULTS AT 138 MW
UREA OFF
ALAMITOS UNIT 2
October 7, 1992

Parameter	Test No. 6-2	Test No. 7-2	Test Averages
NO_x,			
ppm[1]	82.9	83.5	83.2
ppm @ 3% O_2[1]	84.8	86.7	85.8
CO,			
ppm[1]	0.7	0.5	0.6
ppm @ 3% O_2[1]	0.7	0.5	0.6
O_2%[1]	3.4	3.7	3.6
Methane, ppm			
Total non-methane hydrocarbon	1.2	ND<1.0	<1.1
as methane, ppm	14.6	13.6	14.1
Particulate analysis:			
Flow dscfm	156,600	193,500	175,100
Stack temperature °F	300.2	339.6	319.9
Moisture %	13.9	14.2	14.1
O_2% [2]	8.5	8.1	8.3
lb/hr	0.24	0.64	0.44
Grain loading, gr/dscf	0.0002	0.0004	0.0003

(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 138 MW
UREA ON
ALAMITOS UNIT 2
October 7, 1992

Parameter	Test No. 8-2	Test No. 9-2	Test Averages
NO_x,			
ppm(1)	70.7	71.9	71.3
ppm @ 3% O_2(1)	72.9	74.4	73.7
CO,			
ppm(1)	1.3	1.0	1.2
ppm @ 3% O_2(1)	1.4	1.0	1.2
O_2%(1)	3.5	3.6	3.6
Methane, ppm			
Total non-methane hydrocarbon	ND<1.0	ND<1.0	ND<1.0
as methane, ppm	13.6	13.1	13.4
NH_3, ppm	3.3	7.5	5.4
ppm @ 3% O_2(2)	4.6	10.2	7.4
Particulate analysis:			
Flow dscfm	177,600	156,000	166,800
Stack temperature °F	342.3	298.5	320.4
Moisture %	14.7	14.0	14.3
O_2%(2)	8.2	7.8	8.0
lb/hr	1.80	0.91	1.36
Grain loading, gr/dscf	0.0012	0.0007	0.0009

(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 40 MW
UREA OFF
ALAMITOS UNIT 2
October 8, 1992

15.0

Parameter	Test No. 12-2	Test No. 13-2	Test Averages
NO_x,			
ppm[1]	108.6	107.7	108.2
ppm @ 3% O_2[1]	143.4	142.4	142.9
CO,			
ppm[1]	0.32	0.30	0.31
ppm @ 3% O_2[1]	0.4	0.4	0.4
O_2%[1]	7.3	7.3	7.3
Methane, ppm			
Total non-methane hydrocarbon	ND<1.0	ND<1.0	ND<1.0
as methane, ppm	10.3	14.8	12.6
Particulate analysis:			
Flow dscfm	76,800	113,800	95,300
Stack temperature °F	337.6	284.1	310.9
Moisture %	11.6	11.9	11.8
O_2% [2]	12.2	11.1	11.7
lb/hr	0.22	0.26	0.24
Grain loading, gr/dscf	0.0003	0.0023	0.0013

(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 40 MW
UREA On
ALAMITOS UNIT 2
October 8, 1992

15.7

Parameter	Test No. 10-2	Test No. 11-2	Test Averages
NO_x,			
ppm(1)	89.3	92.7	91.0
ppm @ 3% O_2(1)	117.8	123.1	120.5
CO,			
ppm(1)	0.5	0.7	0.6
ppm @ 3% O_2(1)	0.7	0.9	0.8
O_2%(1)	7.3	7.4	7.4
Methane, ppm			
Total non-methane hydrocarbon	ND<1.0	ND<1.0	ND<1.0
as methane, ppm	11.1	11.3	11.2
NH_3, ppm	4.1	2.5	3.3
ppm @ 3% O_2(2)	7.8	4.8	6.3
Particulate analysis:			
Flow dscfm	104,100	88,200	96,200
Stack temperature °F	282.2	335.4	308.8
Moisture %	13.4	11.8	12.6
O_2%(2)	11.6	11.5	11.6
lb/hr	0.3	1.72	1.01
Grain loading, gr/dscf	0.0003	0.0003	0.0003

(1) Carnot CEM Data.
(2) Oxygen for correction from portable O2 meter.

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

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, NO_x and SO_2 are measured using an extractive continuous emissions monitoring (CEM) package, shown in the following figure. This package is comprised of three basic subsystems. They are: (1) the sample acquisition and conditioning system, (2) the calibration gas system, and (3) the analyzers themselves. This section presents a description of the sampling and calibration systems. Descriptions of the analyzers used in this program and the corresponding reference test methods follow. Information regarding quality assurance information on the system, including calibration routines and system performance data follows.

The sample acquisition and conditioning system contains components to extract a representative sample from the stack or flue, transport the sample to the analyzers, and remove moisture and particulate material from the sample. In addition to performing the tasks above, the system must preserve the measured species and deliver the sample for analysis intact. The sample acquisition system extracts the sample through a stainless steel probe. The probe is insulated or heated as necessary to avoid condensation. If the particulate loading in the stack is high, a sintered stainless steel filter is used on the end of the probe.

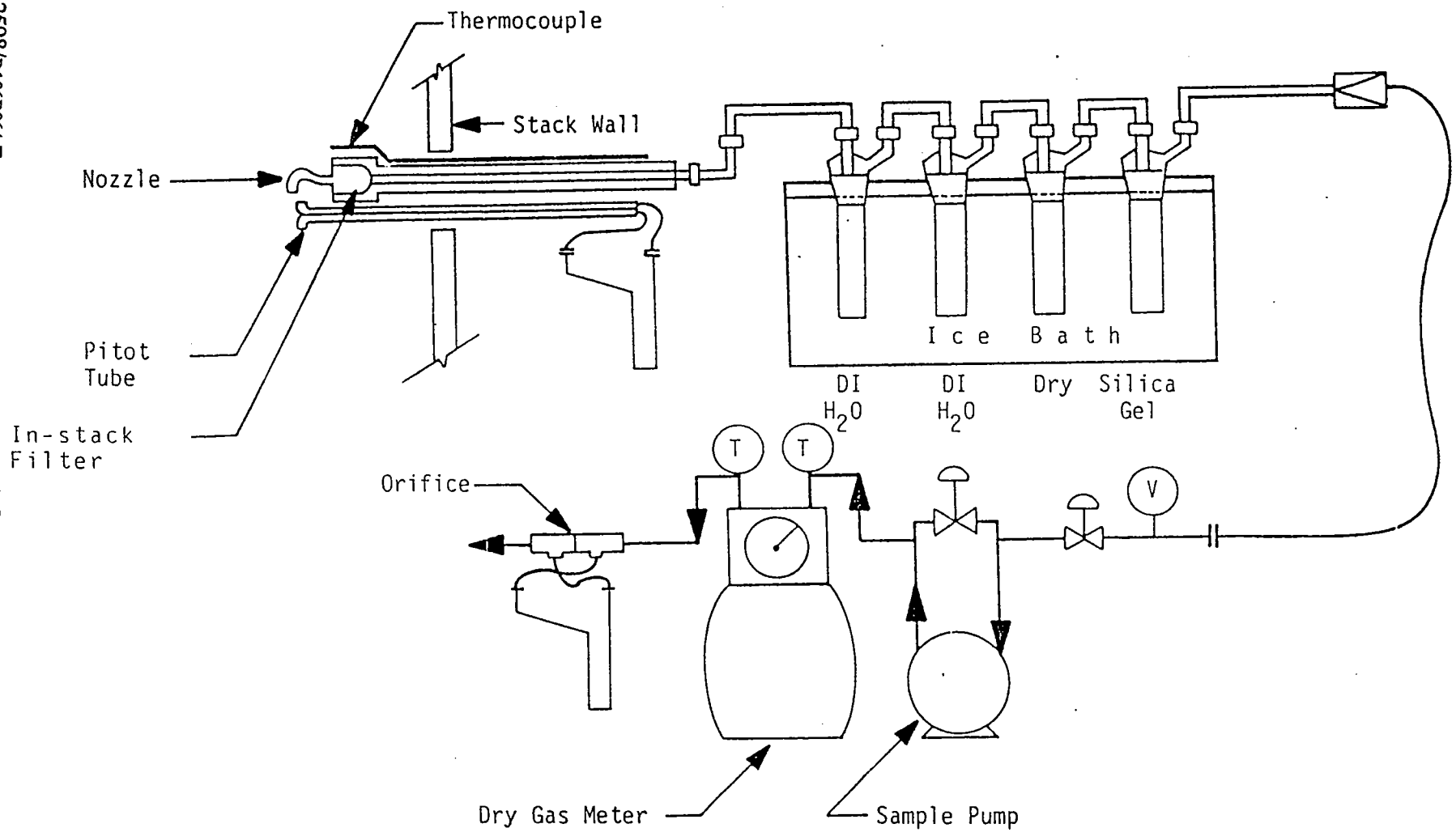
Where water soluble NO_2 and/or SO_2 are to be measured, the sample is drawn from the probe through a heated teflon sample line into an on-stack cooled (approximately 35-40°F) water removal trap. The trap consists of stainless steel flasks in a bath of ice and water. This design removes the water vapor by condensation. The contact between the sample and liquid water is minimized and the soluble NO_2 and SO_2 are conserved. This system meets the requirements of EPA Method 20. The sample is then drawn through a teflon transport line, particulate filter, secondary water removal and into the sample pump. The pump is a dual head, diaphragm pump. All sample-wetted components of the pump are stainless steel or teflon. The pressurized sample leaving the pump flows through a third condensate trap in a refrigerated water bath ($\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.

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:	**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.



Sample Train for Determination of Particulate by SCAQMD Method 5.3

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.
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.

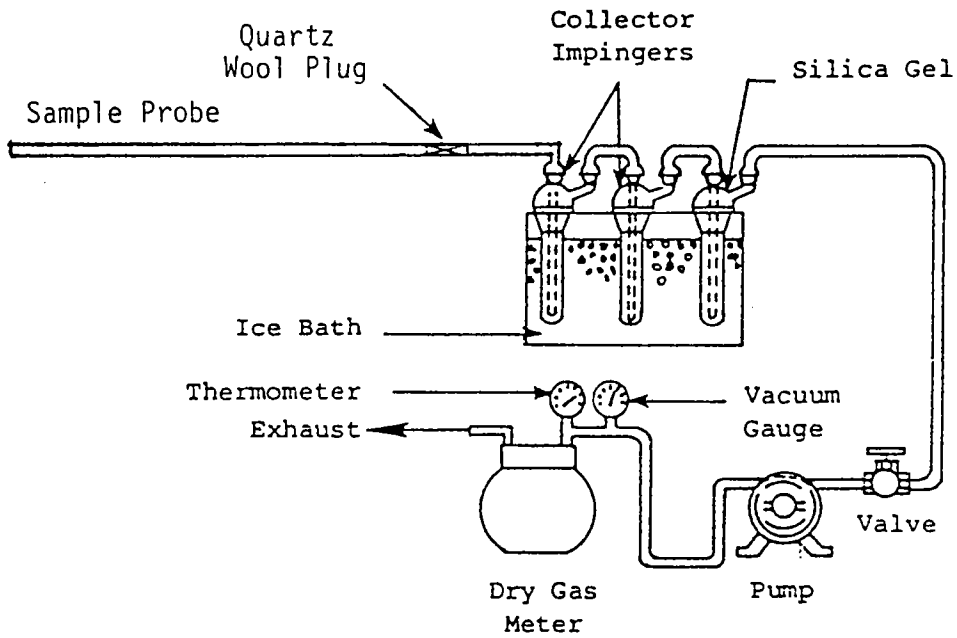
Analytical Procedure: Ammonia in source test samples is analyzed by ion selective electrode or colorimetrically. Source test samples are generally at low levels and titrations for ammonia are not applicable. The following sections discuss the two applicable analytical techniques.

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:

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



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 ± 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 2. Ability to draw manufacturer required vacuum and flow	Every 500 hours of operation or 6 months, whichever is less	1. Visual inspection 2. Clean 3. Replace worn parts 4. Leak check
Flow Measuring Device	1. Free mechanical movement 2. Absence of malfunction	Every 500 hours of operation or 6 months, whichever is less After each test, if used in H_2S sampling or other corrosive atmospheres	1. Visual inspection 2. Clean 3. Calibrate
Sampling Instruments	1. Absence of malfunction 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 2. Leak check
Mobile Van Sampling Systems	Absence of leaks	Depends on nature of use	1. Change filters 2. Change gas dryer 3. Leak check 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 / Unit 2 DATE: 10-6-97

BY: CHF

GAS	SPAN CYLINDER		AUX. SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO	ALM009761	99.998		
NOx	IL2595	90.52 / 90.2	ALM 22747	222.4 / 188.6 %
O_2	AAL12047	4.990	ALM 12263	7.926
CO	IL2958	55.84	ALM 12604	90.79
CO_2	AAL12047	15.00	ALM 12263	22.15 88.6
SO_2				

CARNOT
INSTRUMENT LINEARITY

	ANALYZER				
	O_2	CO_2	CO	NOx	~~SO2~~ CO
ANALYZER RANGE	0-10%	0-25%	0-100 ppm	0-250 ppm	0-500 ppm
SET TO HIGH STD (80-90% OF RANGE)	7.926	22.15	90.79	222.4	
ACTUAL VALUE OF LOW STD	4.990	15.00	55.84	90.52	
AS-FOUND LOW STD (50-60% OF RANGE)	4.999	15.1	55.0	90.00	
DIFFERENCE IN % OF FULL SCALE					

% ERROR CALCULATION:

$$\frac{\text{(AS FOUND - ACTUAL VALUE OF SPAN)}}{\text{RANGE}} \times 100$$

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

CARNOT

CARNOT
SPAN GAS RECORD

CLIENT/LOCATION: SCE DATE: 10-7-92

BY: CHF

New O_2 Bottle

GAS	SPAN CYLINDER		AUX. SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO				
NOx				
O_2	ALM026680	4.973	ALM12263	7.926
CO				
CO_2	ALM026680	14.98		22.15
SO_2				

CARNOT
INSTRUMENT LINEARITY

	ANALYZER				
	O_2	CO_2	CO	NOx	SO_2
ANALYZER RANGE	0-10%	0-25%			
SET TO HIGH STD (80-90% OF RANGE)	7.926	22.15			
ACTUAL VALUE OF LOW STD	4.973	14.98			
AS-FOUND LOW STD (50-60% OF RANGE)	5.02	15.10			
DIFFERENCE IN % OF FULL SCALE					

% ERROR CALCULATION:

$$\frac{\text{(AS FOUND - ACTUAL VALUE OF SPAN)}}{\text{RANGE}} \times 100$$

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

CARNOT
SPAN GAS RECORD

CLIENT/LOCATION: SCE / Alamitos 2 DATE: 10-8-92

BY: CHF

GAS	SPAN CYLINDER		AUX. SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO				
NOx	ALM02[illegible]	49.80	IL2595	90.52
O_2				
CO				
CO_2				
SO_2				

CARNOT
INSTRUMENT LINEARITY

	ANALYZER				
	O_2	CO_2	CO	NOx	SO_2
ANALYZER RANGE				0-100 ppm	
SET TO HIGH STD (80-90% OF RANGE)				90.52	
ACTUAL VALUE OF LOW STD				49.80	
AS-FOUND LOW STD (50-60% OF RANGE)				50.4	
DIFFERENCE IN % OF FULL SCALE					

% ERROR CALCULATION:

$$\frac{\text{(AS FOUND - ACTUAL VALUE OF SPAN)}}{\text{RANGE}} \times 100$$

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

CARNOT

PMF-009

CARNOT

SUBJECT Portable O_2 Linearity JOB NO. 1259.

SHEET NO. ___ of ___

COMPUTED BY EF DATE 10/6/92 CHECKED BY ___ DATE ___

Dwyer 259

10/6/92

ALM 015788 12.66

ALM 026660 9.973

Spt 20.9

As found	12.7	0.2%
As found	5.0	0.11%
Zero	0.1	0.4%

10/6/92

Spt	20.9	
As found	12.7	0.2%
As found	5.1	0.5%
Zero	0.1	0.4%

139696

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

CARNOT

SUBJECT Portable O2 Linearity JOB NO. 12599

SHEET NO. ___ of ___

COMPUTED BY EF DATE 10/7/92 CHECKED BY ___ DATE ___

Range 25%

10/7/92

		ALM 015788	12.66
		ALM 026682	4.973
Set 20.9			
As found	12.8		0.6 %
As found	5.2		0.9 %
Zero	0.1		0.4 %

10/7/92

Set	20.9	
As found	12.7	0.2%
As found	5.1	0.5%
Zero	0.1	0.4%

139696

CARNOT

SUBJECT Portable O_2 Linearity JOB NO. [illegible]

SHEET NO. ___ of ___

COMPUTED BY EF DATE 10/8/92 CHECKED BY ___ DATE ___

Range 25%

[illegible]

[illegible] 20.9

[illegible] 12.7 [illegible] [illegible] [illegible]

[illegible] [illegible] [illegible] [illegible] [illegible]

[illegible] 0.1 0.4%

10/8/92

Set 20.9

Cal from 12.7 0.4%

Cal from 5.1 0.5%

Zero 0.1 0.4%

139696

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

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 8/26/91
Our Project No: 15145
Your P.O. No: 7527
Page 1 of 1
Expiration Date: 2/93

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

CERTIFICATE OF ANALYSIS – EPA PROTOCOL GASES

Certified Per Traceability Protocol No. 1 Procedure No. G1 Cylinder No. ALM-22747 Cylinder Pressure 2050 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	218.0 PPM	GMIS	AAL-5248	236.6 PPM	THERMO-ELECTRON	7/12/91	CHEMI-LUMINENSCENT
NOX	222.4 PPM	TRACEABLE TO CRM1685			10 AR 14853-150		

BALANCE GAS NITROGEN

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

Component NITRIC OXIDE
First Analysis Date 8/15/91 Units mv

Z 0.00	R 94.64	T 86.85
R 94.69	Z 0.02	T 87.37
Z 0.02	T 87.24	R 94.95

Mean Test Assay 217.6 PPM

Second Analysis Date 8/23/91 Units mv

Z 0.00	R 94.64	T 87.55
R 94.81	Z 0.04	T 87.57
Z -0.07	T 87.62	R 95.24

Mean Test Assay 218.4 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: [signature]

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 05/27/92
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

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	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 C. 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

Prepared Per Traceability Protocol No. 1 Procedure No. G1 Cylinder No. ALM026583 Cylinder Pressure 2050 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	48.73 PPM	GMIS TRACEABLE	ALM003664	97.73 PPM	THERMO-ELECTRON	04/23/92	CHEMI-LUMINESCENT
		TO CRM1684B			10AR 14853-150		
NOX	49.86 PPM						

BALANCE GAS NITROGEN

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

Component NITRIC OXIDE
First Analysis Date 07/14/92 Units mv

0.00	R	96.97	T	48.29	
96.95	Z	-0.35	T	48.48	
-0.27	T	48.28	R	96.95	

Mean Test Assay 48.84 PPM

Second Analysis Date 07/21/92 Units mv

0.00	R	96.40	T	47.72	
96.33	Z	-0.20	T	47.93	
-0.04	T	48.02	R	96.28	

Mean Test Assay 48.62 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.

FA. -887-0549
PHONE: 714-887-2571

2600 CAJON BLVD., SAN BERNARDINO, CA 92411

From:
Date Shipped: 05/07/92
Our Project No: 19565
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. 1L2958 Cylinder Pressure 2000 PSIG Certified Accuracy ±1% % NIST Traceable

COMPONENTS	CERTIFIED CONC	REFERENCE STD SRM/CRM NO.	CYL. NO.	CONC.	GAS ANALYZER MAKE/MODEL/SERIAL NO.	LAST CAL. DATE	ANALYTICAL PRINCIPLE
CARBON MONOXIDE	55.84 PPM	GMIS TRACEABLE TO 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 01/09/92 Units mv

Z	R	T
00.00	40.2	23.7
40.2	00.01	23.7
00.02	23.7	40.2

Mean Test Assay 55.87 PPM

Second Analysis Date 05/05/92 Units mv

Z	R	T
00.00	40.2	23.7
40.2	00.01	23.7
00.01	23.7	40.2

Mean Test Assay 55.81 PPM

Component _____ Units mv
Date _____

Z	R	T

Mean Test Assay _____

Date _____ Units mv

Z	R	T

Mean Test Assay _____

Component _____ Units mv
Date _____

Z	R	T

Mean Test Assay _____

Date _____ Units mv

Z	R	T

Mean Test Assay _____

Chronology: Date _____
Assay _____

Analyst M. JOHNSON

Approved By: A.F. LANGE, 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: RICK MADRIGAL
15991 RED HILL AVE
SUITE 110
TUSTIN CA 92680

PROJECT #: 02-21908
PO#: 8957
ITEM #: 0202C3000701AL
DATE: 10/02/92

CYLINDER #: ALM026680
FILL PRESSURE: 2000 PSIG

ANALYTICAL ACCURACY: +/-1%

COMPONENT	REQUESTED GAS CONC	MOLES	ANALYSIS (MOLES)	
CARBON DIOXIDE	15.	PCT	14.98	PCT
OXYGEN	5.	PCT	4.973	PCT
NITROGEN		BAL		BAL

CARGOT 10/1 TIN#10
CERTIFIED TO HAVE BEEN BLENDED AND VERIFIED TO BE CORRECT BY ANALYSIS.

GRAVIMETRIC MASTER GAS - AGAINST NIST CERTIFIED WEIGHTS INDEPENDENT LABORATORY

ANALYST: JDLT
JOSEPH DE LA TORRE

APPROVED BY: G. Lage
DR ARMAND LANGE PH D

Scott Specialty Gases, Inc.

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

CERTIFICATE OF ANALYSIS

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

PROJECT #: 02-17313
PO#: 7477
ITEM #: 0202C3000701AL
DATE:12/16/91

CYLINDER #: ALM015788 ANALYTICAL ACCURACY: +/-1%

COMPONENT	REQUESTED GAS CONC MOLES		ANALYSIS (MOLES)	
CARBON DIOXIDE	15.	PCT	15.23	PCT
OXYGEN	12.5	PCT	12.66	PCT
NITROGEN		BAL		BAL

CYLINDER PRESSURE 1915 PSI
CERTIFIED TO HAVE BEEN BLENDED
ND VERIFIED TO BE CORRECT BY
NALYSIS.

GRAVIMETRIC MASTER GAS -
AGAINST NIST CERTIFIED WEIGHTS
INDEPENDENT LABORATORY

ANALYST: MAYNARD JOHNSON

APPROVED BY: DR ARMAND LANGE, PHD

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. Lange
DR ARMAND LANGE PHD

Scott Specialty Gases, Inc.

Shipped 2600 CAJON BLVD. SAN BERNARDINO CA 92411-0000
om: 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. ES-19 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@
6.189	82.0	0.50	15	6.254	*76.0	0.15	0.413	1.022	1.61	1.0281	1.60
6.218	90.0	0.50	15	6.251	76.0	0.15	0.415	1.032	1.59		
6.208	91.0	0.50	15	6.223	76.0	0.15	0.414	1.031	1.60		
6.163	80.0	0.80	12	6.285	76.0	0.25	0.514	1.027	1.64	1.0399	1.64
6.094	87.0	0.80	12	6.247	76.0	0.25	0.508	1.046	1.63		
6.113	90.0	0.80	12	6.243	76.0	0.25	0.509	1.047	1.63		
5.601	91.0	1.00	10	5.725	76.0	0.30	0.560	1.050	1.68	1.0497	1.68
5.612	92.0	1.00	10	5.729	76.0	0.30	0.561	1.050	1.67		
5.637	94.0	1.00	10	5.728	76.0	0.30	0.564	1.049	1.67		
5.570	87.0	2.00	7	5.671	76.0	0.55	0.796	1.035	1.69	1.0338	1.73
5.481	90.0	2.00	7	5.532	76.0	0.55	0.783	1.032	1.76		
5.539	92.0	2.00	7	5.580	76.0	0.55	0.791	1.034	1.73		
5.801	93.0	3.00	6	5.828	76.0	0.75	0.967	1.030	1.74	1.0336	1.74
5.789	95.0	3.00	6	5.824	76.0	0.75	0.965	1.036	1.74		
5.803	95.0	3.00	6	5.835	76.0	0.75	0.967	1.035	1.73		

AVERAGE Yd = 1.0370 1.68

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

DRY GAS METER CALIBRATION DATA

TE 9-4-92 BY [illegible]

TEST METER ID. ES-13

LD DRY GAS METER ID ES-19

TEST METER Y$_d$ _____

DATE LAST CALIB. _____

AROMETRIC PRESSURE (P_b) _____ (IN. Hg)

METER LEAK CHECK VAC. 2.4" H_2O INIT. [illegible]

ΔH	FIELD DRY GAS METER FINAL VOLUME	FIELD DRY GAS METER INITIAL VOLUME	FIELD DRY GAS METER VOLUME (V_m)ft³	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_w)ft³	TEMPERATURES, °F INLET BEG.	INLET END	OUTLET BEG.	OUTLET END	AVERAGE	PRESSURE IN. H_2O
0.50	508.825	502.636	6.189	79	91	78	81	82	1216 15: 1231	006.254	0.00	6.254	76	76	76	76	76	.15
	515.043	508.825	6.218	94	96	83	85	90	1232 15: 1247	012.505	006.254	6.251	76	76	76	76	76	.15
	521.251	515.043	6.208	93	97	86	88	91	1248 15: 1303	018.728	012.505	6.223	76	76	76	76	76	.15
0.80	527.788	521.625	6.163	76	90	75	78	80	1420 12: 1432	006.285	0.00	6.285	76	76	76	76	76	.25
	533.882	527.788	6.094	90	96	79	83	87	1433 12: 1445	012.532	006.285	6.247	76	76	76	76	76	.25
	539.995	533.882	6.113	92	99	83	86	90	1446 12: 1458	018.775	012.532	6.243	76	76	76	76	76	.25
1.00	546.001	540.400	5.601	91	100	86	88	91	1501 10: 1511	005.725	0.00	5.725	76	76	76	76	76	.30
	551.613	546.001	5.612	91	101	86	89	92	1512 10: 1522	011.454	005.725	5.729	76	76	76	76	76	.30
	557.250	551.613	5.637	96	102	89	90	94	1523 10: 1533	017.182	011.454	5.728	76	76	76	76	76	.30
2.00	563.421	557.851	5.570	84	94	84	84	87	1551 07: 1558	005.671	0.00	5.671	76	76	76	76	76	.55
	568.902	563.421	5.481	92	98	84	85	90	1559 07: 1606	011.203	005.671	5.532	76	76	76	76	76	.55
	574.441	568.902	5.539	95	100	86	87	92	1607 07: 1614	016.783	011.203	5.580	76	76	76	76	76	.55
3.00	580.896	575.095	5.801	96	102	87	88	93	1616 06: 1622	005.828	0.00	5.828	76	76	76	76	76	.75
	586.685	580.896	5.789	98	103	88	89	95	1623 06: 1629	011.652	005.828	5.824	76	76	76	76	76	.75
	592.488	586.685	5.803	99	103	89	90	95	1630 06: 1636	017.487	011.652	5.835	76	76	76	76	76	.75

CARNOT

MF-054

CARNOT

POST TEST DRY GAS METER CALIBRATION CHECK

CALIBRATED BY DE
DATE 10/09/92
FIELD GAS METER I.D. 71-4
INITIAL Yd 1.004
INITIAL H@ 1.881

DATA ENTRY BY DE
BAROMETRIC PRESSURE 29.91
TEST MEETER ES-13
TEST METER Y (Yt) 1.0014
TEST METER LAST CAL. 12/16/91

FIELD METERR				TEST METER			RESULTS		
VOLUME cu.ft.	TEMP.a IN	TEMP OUT	DELTA "H2O	TIME min.	VOLUME cu.ft.	TEMP. 'F	Q cfm	Y	H@
5.367	72.0	71.0	1.00	10	5.444	71.0	0.537	1.013	1.89
5.376	79.5	74.0	1.00	10	5.432	73.0	0.538	1.015	1.91
5.479	81.5	76.5	1.00	10	5.416	74.0	0.548	0.995	1.92
						AVERAGES		1.008	1.91

PASS - INDIVIDUAL Yd VALUES ACCEPTABLE
PASS - INDIVIDUAL DELTA H@ VALUES ACCEPTABLE
PASS - POST TEST Yd WITHIN LIMITS

CARNOT

CALIBRATED BY DE

DATE 10/09/92

FIELD GAS METER I.D. 71-5

INITIAL Yd 1.004

INITIAL H@ 1.881

POST TEST DRY GAS METER CALIBRATION CHECK

DATA ENTRY BY DE

BAROMETRIC PRESSURE 29.91

TEST MEETER ES-13

TEST METER Y (Yt) 1.0014

TEST METER LAST CAL. 12/16/91

FIELD METERR				TEST METER			RESULTS		
VOLUME cu.ft.	TEMP.a IN	TEMP OUT	DELTA "H2O	TIME min.	VOLUME cu.ft.	TEMP. 'F	Q cfm	Y	H@
5.698	70.5	70.0	1.00	10	5.832	76.0	0.570	1.010	1.68
5.700	73.5	70.5	1.00	10	5.831	76.5	0.570	1.012	1.69
5.684	76.5	73.0	1.00	10	5.786	77.5	0.568	1.010	1.71
						AVERAGES		1.011	1.70

PASS - INDIVIDUAL Yd VALUES ACCEPTABLE

PASS - INDIVIDUAL DELTA H@ VALUES ACCEPTABLE

PASS - POST TEST Yd WITHIN LIMITS

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

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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_d _____

BAROMETRIC PRESSURE (P_b) 29.92 (IN. Hg)

METER LEAK CHECK VAC. 10" INIT. RM

DATE LAST CALIB. _____

ΔH	FIELD DRY GAS METER									TEST METER								
	FINAL VOLUME	INITIAL VOLUME	VOLUME (V_m)ft³	TEMPERATURES, °F INLET BEG.	INLET END	OUTLET BEG.	OUTLET END	AVERAGE	TIME (θ)MIN.	FINAL VOLUME	INITIAL VOLUME	VOLUME (V_m)ft³	TEMPERATURES, °F INLET BEG.	INLET END	OUTLET BEG.	OUTLET END	AVERAGE	PRESSURE IN. H_2O
0.50	831.332	825.941	5.391	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	5.316	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	78	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

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PMF-054

APPENDIX C
DATA SHEETS

Appendix C.1

Sample Locations

CARNOT

SAMPLING POINT LOCATION DATA - EPA METHOD 1

PLANT: SCE/Alamitos DATA BY: Rob M.

DATE: 10-7-92

TEST LOCATION: Units # 1 & 2

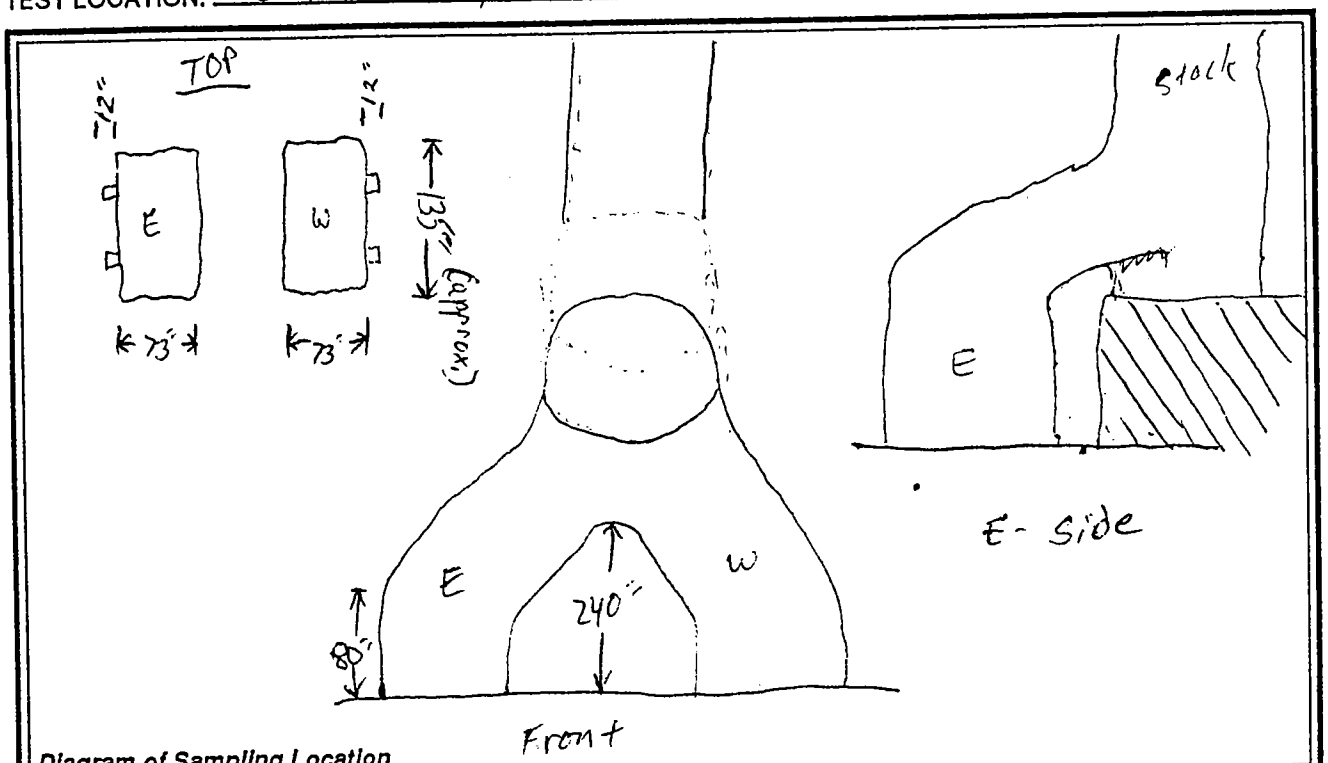

Diagram of Sampling Location

SAMPLE POINT	% OF DIAMETER	IN. FROM NEAR WALL	IN. FROM NOZZLE*

UPSTREAM DIST./DIA.: _____

DOWNSTREAM DIST./DIA.: _____

COUPLING LENGTH: 12"

NO. OF SAMPLING PTS.: _____

STACK DIMENSION: _____

STACK AREA, FT²: _____

**INCHES FROM WALL PLUS COUPLING LENGTH*

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PMF-002

Appendix C.2

Unit Data

UNIT DATA

Client: [illegible] Location: [illegible]
Unit: [illegible] Data by: [illegible]

TEST #	[illegible]	1-2	[illegible]	3-2
DATE	[illegible]	10/6/92	[illegible]	10/6/92
TIME	[illegible]	1040	[illegible]	1310
LOAD MW	[illegible]	[illegible]	[illegible]	[illegible]
AUX. LOAD	[illegible]	7.4	[illegible]	8.3
UREA ON/OFF	[illegible]	OFF	[illegible]	OFF
UREA MODE	[illegible]	[illegible]	[illegible]	[illegible]
UREA FLOW GPM			[illegible]	[illegible]
UREA H_2O FLOW GPM				[illegible]
UREA H_2O PRES. PSI	[illegible]	[illegible]	[illegible]	[illegible]
UREA HEADER PRES. PSI		[illegible]	[illegible]	[illegible]
TANK	[illegible]	[illegible]	[illegible]	[illegible]
O_2% EAST	[illegible]	[illegible]	[illegible]	[illegible]
O_2% WEST	[illegible]	[illegible]	[illegible]	1.5
STM. PRES PSI	[illegible]	[illegible]	[illegible]	1842
FUEL FLOW * 10^6 SCFH	[illegible] 1.7	[illegible] 1.7	[illegible] 1.7	[illegible] 1.7
FUEL	[illegible]	[illegible]	[illegible]	[illegible]
WP/FURN dP	[illegible]	[illegible]	[illegible]	[illegible]
ID FAN EAST (AMPS)	[illegible]	[illegible]	[illegible]	[illegible]
FD FAN EAST (AMPS)		[illegible]		[illegible]
ID FAN WEST (AMPS)	[illegible]	[illegible]	[illegible]	[illegible]
FD FAN WEST (AMPS)	[illegible]	[illegible]	[illegible]	[illegible]

*INCORRECT [illegible]

FGR (AMPS)	210	270	[illegible]	270
BOOS	15-14	15-14	15-12	14-15
APH OUT EAST °F	332.2		331.1	335
APH OUT WEST °F	345.2		343.6	345
~~TEST #~~ ~~[illegible]~~	~~[illegible]~~	[illegible]		

NOTES:

UNIT DATA

Client: CCI
Unit: ALAN TOS #2

Location:
Data by: MDE / EF

TEST #	3-2	4-2	4-2	5-2
DATE	10/6/92	10/6/92	10/6/92	10/6/92
TIME	1437	1545	1705	1745
LOAD MW	[illegible]	166	166	165
AUX. LOAD	[illegible]	2.3	2.3	[illegible]
UREA ON/OFF	[illegible]	ON	ON	ON
UREA MODE	—	4	4	4
UREA FLOW GPM	[illegible]	0/.60/.60	0/.60/.60	0/.60/[illegible]
UREA H_2O FLOW GPM	[illegible]	[illegible]	[illegible]	[illegible]
UREA H_2O PRES. PSI	[illegible]	[illegible]/30.0/30.0	[illegible]/30.0/[illegible]	[illegible]/30.0/[illegible]
UREA HEADER PRES. PSI	[illegible]	25.4	[illegible]	[illegible]
TANK / LEVEL	102/47.7	102/42.3	102/32.6	102/[illegible]
O_2% EAST	1.6	1.6	1.5	[illegible]
O_2% WEST	1.4	1.4	1.4	1.4
STM. PRES PSI	1845	1846	1847	[illegible]
FUEL FLOW 10^6 SCF	1.70	1.71	1.70	[illegible]
FUEL	[illegible]	[illegible]	[illegible]	[illegible]
WP/FURN dP	[illegible]	[illegible]	[illegible]	[illegible]
ID FAN EAST (AMPS)	138	138	138	138
FD FAN EAST (AMPS)	71	71	71	71
ID FAN WEST (AMPS)	135	[illegible]	136	135
FD FAN WEST (AMPS)	72	72	72	72

FGR (AMPS)	270	270	270	
BOOS	14-15	14-15	14-15	14-15
APH OUT EAST °F 8	337	341	340	340
APH OUT WEST °F 7	347	348	349	348
~~TEST~~ #				

NOTES:

UNIT DATA

Client: SCE
Unit: PLAN -JS #2

Location:
Data by: MDE/EF

TEST #	5-2			
DATE	10/6/92			
TIME	1900			
LOAD MW	1[illegible]			
AUX. LOAD	8.3			
UREA ON/OFF	ON			
UREA MODE	4			
UREA FLOW GPM	0/.59/[illegible]			
UREA H_2O FLOW GPM	[illegible]			
UREA H_2O PRES. PSI	[illegible]			
UREA HEADER PRES. PSI	[illegible]			
TANK [illegible]	[illegible]			
O_2% EAST	1.5			
O_2% WEST	1.4			
STM. PRES PSI	1844			
FUEL FLOW 10^6 SCF	[illegible]			
FUEL	[illegible]			
WP/FURN dP	[illegible]			
ID FAN EAST (AMPS)	[illegible]			
FD FAN EAST (AMPS)	71			
ID FAN WEST (AMPS)	136			
FD FAN WEST (AMPS)	71			

FGR (AMPS)	270			
BOOS	14-15			
APH OUT EAST °F 8	340			
APH OUT WEST °F 7	347			
~~TEST #~~				

NOTES:

UNIT DATA

Client: [illegible]
Unit: [illegible]

Location: [illegible]
Data by: _____

TEST #	[illegible]	6-2	7-2	7-2
DATE	[illegible]	10/7/92	10/7/92	10/7/92
TIME	[illegible]	[illegible]	11:10	12:15
LOAD MW	137	137	138	138
AUX. LOAD	7.5	7.5	7.5	7.5
UREA ON/OFF	[illegible]	[illegible]	OFF	
UREA MODE	[illegible]	[illegible]	[illegible]	[illegible]
UREA FLOW GPM	[illegible]		[illegible]	[illegible]
UREA H_2O FLOW GPM	[illegible]		[illegible]	0.0/0.0/0.0
UREA H_2O PRES. PSI	[illegible]	[illegible]	3.2/7.6/13.0	3.3/7.6/14.0
UREA HEADER PRES. PSI	[illegible]	[illegible]	142.1	144.5
TANK LEVEL %	[illegible]	[illegible]	102/50.7	102/50.8
O_2% EAST	[illegible]	[illegible]	[illegible]	2.5
O_2% WEST	[illegible]	[illegible]	2.5	2.5
STM. PRES PSI	[illegible]	[illegible]	1840	1841
FUEL FLOW 10^6 SCF	1.35	1.35	1.35	1.35
FUEL	[illegible]	[illegible]	→	→
WP/FURN dP	[illegible]	[illegible]	-4.7	+4.7
ID FAN EAST (AMPS)	[illegible]	[illegible]	[illegible]	115
FD FAN EAST (AMPS)	[illegible]	[illegible]	[illegible]	64
ID FAN WEST (AMPS)	120	[illegible]	120	120
FD FAN WEST (AMPS)	[illegible]	[illegible]	[illegible]	67

	FGR (AMPS)	250	255	255	255
	BOOS	13,14/15,16	13,14/15,16	13,14,15,16	13,14/15 16
9	APH OUT EAST °F	305.9	303.5	303	303.1
7	APH OUT WEST °F	350.6	351.1	351	350.9
	~~TEST #~~				

NOTES:

UNIT DATA

Client: SCE
Unit: ALAMITOS #2

Location: ALAMITOS
Data by: MDE/EF

TEST #	8-2	8-2	9-2	9-2
DATE	10/7/92	10/7/92	10/7/92	10/7/92
TIME	1335	1500	1540	1705
LOAD MW	137	137	[illegible]	138
AUX. LOAD	7.6	7.6	7.6	7.6
UREA ON/OFF	ON	ON	ON	ON
UREA MODE	3	3	3	3
UREA FLOW GPM	[illegible]	[illegible]	[illegible]	[illegible]
UREA H_2O FLOW GPM	[illegible]	[illegible]	[illegible]	[illegible]
UREA H_2O PRES. PSI	[illegible]	[illegible]	[illegible]	[illegible]
UREA HEADER PRES. PSI	95.3	96.6	96.9	[illegible]
TANK LEVEL IN.	102/48.4	106/43.9	102/41.3	102/36.[illegible]
O_2% EAST	2.1	2.0	2.2	2.2
O_2% WEST	2.4	2.5	2.3	2.4
STM. PRES PSI	1841	1842	1847	1845
FUEL FLOW 10^6 SCFH	1.35	1.35	[illegible]	1.35
FUEL	[illegible]	[illegible]	[illegible]	→
WP/FURN dP	4.8	[illegible]	[illegible]	4.7
ID FAN EAST (AMPS)	116	[illegible]	116	[illegible]
FD FAN EAST (AMPS)	39	[illegible]	69	[illegible]
ID FAN WEST (AMPS)	160	120	120	[illegible]
FD FAN WEST (AMPS)	67	67	66	67

FGR (AMPS)	255	255	250	255
BOOS	13-16	13-16	13/4 | 15/16	13-16
APH OUT EAST °F 8	308	309	310.9	313
APH OUT WEST °F 7	353	355	356.1	356
TEST #				

NOTES:

UNIT DATA

Client: _____ Location: _____
Unit: _____ Data by: _____

TEST #				
DATE				
TIME				
LOAD MW				
AUX. LOAD				
UREA ON/OFF				
UREA MODE				
UREA FLOW GPM				
UREA H_2O FLOW GPM				
UREA H_2O PRES. PSI				
UREA HEADER PRES. PSI				
TANK				
O_2% EAST				
O_2% WEST				
STM. PRES PSI				
FUEL FLOW 10^5 SCF				
FUEL				
WP/FURN dP				
ID FAN EAST (AMPS)				
FD FAN EAST (AMPS)				
ID FAN WEST (AMPS)				
FD FAN WEST (AMPS)				

FGR (AMPS)	[illegible]	[illegible]	[illegible]	[illegible]
BOOS	14,[illegible]	[illegible]	13.[illegible]	13.[illegible]
APH OUT EAST °F	[illegible]	[illegible]	[illegible]	290.8
APH OUT WEST °F	[illegible]	[illegible]	[illegible]	305.2
~~TEST~~ #				

NOTES:

UNIT DATA

Client: _____ Location: _____
Unit: _____ Data by: _____

TEST #				
DATE				
TIME				
LOAD MW				
AUX. LOAD				
UREA ON/OFF				
UREA MODE				
UREA FLOW GPM				
UREA H_2O FLOW GPM				
UREA H_2O PRES. PSI				
UREA HEADER PRES. PSI				
TANK				
O_2% EAST				
O_2% WEST				
STM. PRES PSI				
FUEL FLOW 10^6 SCF				
FUEL				
WP/FURN dP				
ID FAN EAST (AMPS)				
FD FAN EAST (AMPS)				
ID FAN WEST (AMPS)				
FD FAN WEST (AMPS)				

FGR (AMPS)	[illegible]	[illegible]	[illegible]	[illegible]
BOOS	[illegible]	[illegible]	[illegible]	[illegible]
APH OUT EAST °F	389.0	240	290.0	272.9
APH OUT WEST °F	305.7	360.3	370.0	371.3
TEST #				

NOTES:

Appendix C.3

CEM Data

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REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE ; Unit 2 CONDITION: 165 MW No Urea

DATE: 10-6-92 OPERATOR: CHE

TEST NUMBER: 1-2-CEM TEST LOCATION: Exhaust

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												
		AS FOUND ANAL. SPAN	4.99	15.00	55.84	90.52						
	958	SYSTEM ZERO	.05	0.0	0.0	0.5						
		SYSTEM SPAN	4.93	14.75	56.0	87.2						
	BEGIN 1012 END 1017	Start All Probe	2.64	10.12	0.9	139.3						
	BEGIN 1017 END 1022		2.74	10.04	0.9	139.5						
	BEGIN 1022 END 1027		2.86	10.00	.8	142.5						
	BEGIN 1027 END 1032		2.88	10.00	.8	143.8						
	BEGIN [illegible] END [illegible]		2.90	10.00	.7	144.5						
	BEGIN 1037 END 1042	NOx Probe /NO				107	101.3	5.75				
	BEGIN END											
	BEGIN END											
	BEGIN END											
	BEGIN END											
	BEGIN END											
	BEGIN END											
		SYSTEM ZERO	.06	.03	0.0	1.75						
		SYSTEM SPAN	4.94	14.58	55.1	87.5						
RAW AVERAGE			2.804	10.03	0.80	141.12						
CORRECTED AVERAGE												
COMMENTS:												

CARNOT

PAGE ____ OF ____

REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE Unit 2

CONDITION: 165 MW No Urea

DATE: 10-[illegible]

OPERATOR: CHF

TEST NUMBER: [illegible] - CEM

TEST LOCATION: Exhaust

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												
		AS FOUND ANAL. SPAN										
	1113	SYSTEM ZERO	.03	0.0	0.0	.75						
		SYSTEM SPAN	4.98	14.8	55.84	87.5						
	BEGIN 1130 END 1135	Start All Pass	2.64	10.3	1.0	136.0						
	BEGIN 1135 END 1140		2.62	10.3	0.9	136.0						
	BEGIN 1140 END 1145		2.60	10.3	0.8	136.3						
	BEGIN 1145 END 1150		2.60	10.3	0.8	135.8						
	BEGIN 1150 END 1155		2.60	10.3	0.9	135.5						
	BEGIN 1155 END 1200	End	2.59	10.3	0.8	135.5						
	BEGIN 1200 END 1205	NOx Pass				105	96.3	8.75				
	BEGIN END											
	BEGIN END											
	BEGIN END											
	BEGIN END											
	BEGIN END											
		SYSTEM ZERO	0.02	0.0	0.0	1.0						
		SYSTEM SPAN	4.96	14.8	[illegible]	88.0						
RAW AVERAGE												
CORRECTED AVERAGE												
COMMENTS:												

CARNOT

PAGE ___ OF 1

REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE Unit 2

CONDITION: [illegible]

DATE: 10-6 92

OPERATOR: CHF

TEST NUMBER: 2-2 CEM

TEST LOCATION: Exhaust

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													
			AS FOUND ANAL. SPAN	7.926	22.15								
	1241		SYSTEM ZERO	.02	0.0	0.0	0.5						
			SYSTEM SPAN	7.80	21.68	55.84	90.0						
	BEGIN	1315	Start All Runs	2.45	10.4	1.5	143.8						
	END	1320											
	BEGIN	1320		2.42	10.4	1.6	142.8						
	END	1325											
	BEGIN	1325		2.40	10.4	1.9	141.0						
	END	1330											
	BEGIN	1330		2.40	10.4	1.9	141.0						
	END	1335											
	BEGIN	1335		2.37	10.4	2.0	140.5						
	END	1340											
	BEGIN	1340		2.39	10.4	2.5	140.0						
	END	1345											
	BEGIN	1345	NOx Prove No mode				106.8	98	8.8				
	END	1350											
	BEGIN	----											
	END												
	BEGIN	----											
	END												
	BEGIN	----											
	END												
	BEGIN	----											
	END												
	BEGIN	----											
	END												
			SYSTEM ZERO	.03	0.0	0.0	0.5						
			SYSTEM SPAN	7.90	21.6	55.8	91.6						
RAW AVERAGE													
CORRECTED AVERAGE													
COMMENTS:													

CARNOT

PAGE ____ OF ____

REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE

CONDITION: 165MW Urea ON

DATE: 10-6-92

OPERATOR: CHF

TEST NUMBER: 4-2-CEM

TEST LOCATION:

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													
			AS FOUND ANAL. SPAN	7.93	22.15	55.84	90.52						
	1605		SYSTEM ZERO	.05	0.0	0.0	1.25						
			SYSTEM SPAN	7.83	220	56	88.5						
	BEGIN	1615	[illegible]	2.4	10.5	3.8	104.8						
	END	1620											
	BEGIN	1620		2.4	10.5	3.2	105.0						
	END	1625											
	BEGIN	1625		2.4	10.5	3.8	105.2						
	END	1630											
	BEGIN	1630		2.42	10.5	3.5	105.8						
	END	1635											
	BEGIN	1635		2.42	10.5	3.7	106.5						
	END	1640											
	BEGIN	1640		2.41	10.45	3.1	107						
	END	1645											
	BEGIN	———	NOx [illegible] NO [illegible]				81.3	76.0	5.3				
	END												
	BEGIN	———											
	END												
	BEGIN	———											
	END												
	BEGIN	———											
	END												
	BEGIN	———											
	END												
	BEGIN	———											
	END												
			SYSTEM ZERO	0.05	0.0	0.4	1.25						
	1700		SYSTEM SPAN	7.8	21.93	55.84	87.5						
RAW AVERAGE				[illegible]	[illegible]	[illegible]	[illegible]						
CORRECTED AVERAGE													
COMMENTS:													

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REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE

CONDITION: 165 MW Urea ON

DATE: 10-6-92

OPERATOR: CHF

TEST NUMBER: 5-2-CEM

TEST LOCATION:

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													
			AS FOUND ANAL. SPAN										
	1805		SYSTEM ZERO	.02	0.0	0.1	.75						
			SYSTEM SPAN	7.85	22.05	55.7	89.5						
	BEGIN	1815	Start Probe	2.45	10.5	5.8	103.6						
	END	1820											
	BEGIN	1820		2.41	10.5	5.4	103.3						
	END	1825											
	BEGIN	1825		2.41	10.5	6.2	102.8						
	END	1830											
	BEGIN	1830		2.4	10.5	5.8	102.5						
	END	1835											
	BEGIN	1835		2.4	10.5	6.5	102.5						
	END	1840											
	BEGIN	1840		2.4	10.5	6.0	101.8						
	END	1845											
	BEGIN	---											
	END												
	BEGIN	1955	NOx/NO				78.3	73.0	5.3				
	END												
	BEGIN	---											
	END												
	BEGIN	---											
	END												
	BEGIN	---											
	END												
	BEGIN	---											
	END												
	1847		SYSTEM ZERO	.02	0.0	0.1	.50						
			SYSTEM SPAN	7.90	21.98	55.84	90.75						
RAW AVERAGE													
CORRECTED AVERAGE													
COMMENTS:													

CARNOT

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PAGE ____ OF ____

REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE Alum

CONDITION: 140MW Urea OFF

DATE: 10-7-92

OPERATOR: CHF

TEST NUMBER: 6-2-CEM

TEST LOCATION:

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													
			AS FOUND ANAL. SPAN	4.97	14.98	55.[illegible]	[illegible]						
	900		SYSTEM ZERO	.03	0.0	.3	.75						
			SYSTEM SPAN	4.97	14.75	55.84	88.25						
	BEGIN	910	Start Alipuser	3.39	9.83	1.0	80.0						
	END	915											
	BEGIN	915		3.35	9.8	1.0	[illegible]						
	END	[illegible]											
	BEGIN	920		3.35	9.8	[illegible]	80.8						
	END	925											
	BEGIN	925		3.37	9.8	1.0	81.25						
	END	930											
	BEGIN	930		3.38	9.3	1.0	[illegible]						
	END	[illegible]											
	BEGIN	[illegible]		3.38	9.8	1.0	80.8						
	END	[illegible]											
	BEGIN												
	END												
	BEGIN	955	NOx Probe				47.0	43.8	3.2				
	END												
	BEGIN												
	END												
	BEGIN												
	END												
	BEGIN												
	END												
	BEGIN												
	END												
			SYSTEM ZERO	.02	0.0	.2	.75						
			SYSTEM SPAN	4.[illegible]	14.7	55.9	88.3						
RAW AVERAGE				[illegible]	[illegible]								
CORRECTED AVERAGE													
COMMENTS:													

PMF-039

CARNOT

CARNOT

PAGE ____ OF ____

REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE Alamitos

CONDITION: 140 MW Urea Off

DATE: 10-7-97

OPERATOR: CHF

TEST NUMBER: 7-2-CEM

TEST LOCATION:

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													
			AS FOUND ANAL. SPAN										
			SYSTEM ZERO	.02	0.0	.2	.50						
			SYSTEM SPAN	4.92	14.75	55.5	5[illegible]						
	BEGIN	1130	[illegible]	3.62	9.68	0.8	80.8						
	END	1135											
	BEGIN	1135		3.62	9.68	0.7	80.7						
	END	1140											
	BEGIN	1140		3.61	9.68	0.7	80.8						
	END	1145											
	BEGIN	1145		3.61	9.7	0.7	80.8						
	END	1150											
	BEGIN	1150		3.61	9.7	.7	80.8						
	END	1155											
	BEGIN	1155		3.61	9.7	.7	80.8						
	END	1200	[illegible]										
	BEGIN	___											
	END												
	BEGIN	___											
	END												
	BEGIN	1220	NO [illegible]				46.3	44.5	1.8				
	END		NO [illegible]										
	BEGIN	___											
	END												
	BEGIN	___											
	END												
	BEGIN	___											
	END												
			SYSTEM ZERO	.02	.05	.2	.50						
			SYSTEM SPAN	4.91	14.70	54.4	87.5						
RAW AVERAGE				[illegible]	[illegible]	[illegible]	[illegible]						
CORRECTED AVERAGE													
COMMENTS:													

CARNOT

PAGE ____ OF ____

REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE [illegible] 2

CONDITION: 140 MW Urea ON

DATE: 10-7-92

OPERATOR: CHF

TEST NUMBER: 8-2-CFM

TEST LOCATION:

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													
			AS FOUND ANAL. SPAN										
	1045		SYSTEM ZERO	.02	.00	.23	.25						
			SYSTEM SPAN	4.88	14.75	55.84	89.25						
	BEGIN	1400	[illegible]	3.48	9.75	1.7	68.8						
	END	1405											
	BEGIN	1405		3.46	9.75	1.5	69.5						
	END	1410											
	BEGIN	1410		3.48	9.75	1.5	69.5						
	END	1415											
	BEGIN	1415		3.4[illegible]	9.75	1.5	69.8						
	END	1420											
	BEGIN	1420		3.47	9.75	1.5	70.0						
	END	1425											
	BEGIN	1425	[illegible]	3.46	9.75	1.4	70.0						
	END	1430											
	BEGIN	---											
	END												
	BEGIN	---											
	END												
	BEGIN	1445	NO_2 Meas				37.5	36.25	1.25				
	END												
	BEGIN	---											
	END												
	BEGIN	---											
	END												
	BEGIN	---											
	END												
	1432		SYSTEM ZERO	.03	.00	.2	.75						
			SYSTEM SPAN	4.87	14.75	55.84	89.25						
RAW AVERAGE				[illegible]	[illegible]	[illegible]	[illegible]						
CORRECTED AVERAGE													
COMMENTS:													

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PAGE ____ OF ____

REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE / [illegible]

CONDITION: [illegible]

DATE: [illegible]

OPERATOR: SHF

TEST NUMBER: [illegible]

TEST LOCATION: ____

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													
			AS FOUND ANAL. SPAN										
	1609		SYSTEM ZERO	.01	0.0	.2	.5						
			SYSTEM SPAN	4.96	14.8	55.8	90.52						
	BEGIN	1620	[illegible]	3.69	9.75	1.2	71.0						
	END	1625											
	BEGIN	[illegible]		3.58	9.75	1.1	71.3						
	END	[illegible]											
	BEGIN	1630		3.6	9.75	1.1	71.3						
	END	1635											
	BEGIN	1635		3.56	9.75	1.1	72.0						
	END	1640											
	BEGIN	1640		3.54	9.75	1.2	72.2						
	END	1645											
	BEGIN	1645		3.52	9.75	1.3	72.2						
	END	1650	[illegible]										
	BEGIN	----											
	END												
	BEGIN	----	NOx Probe				58.75	37.5	1.3				
	END												
	BEGIN	----											
	END												
	BEGIN	----											
	END												
	BEGIN	----											
	END												
	BEGIN	----											
	END												
			SYSTEM ZERO	.02	0.0	.2	.5						
			SYSTEM SPAN	4.95	14.82	55.84	90.25						
RAW AVERAGE				[illegible]	[illegible]	[illegible]	[illegible]						
CORRECTED AVERAGE													
COMMENTS:													

CARNOT

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PAGE ____ OF ____

REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE/Alamitos

CONDITION: 40 MW Unit ON

DATE: 10-2-92

OPERATOR: CHF

TEST NUMBER: 10-2-CEM

TEST LOCATION:

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													
			AS FOUND ANAL. SPAN										
			SYSTEM ZERO	.02	0.0	0.3	.3						
	S[illegible]		SYSTEM SPAN	4.97	14.93	55.84	48.5						
	BEGIN	905	Stack Auto	7.3	7.68	0.9	86.5						
	END	910											
	BEGIN	910		7.3	7.65	0.9	86.5						
	END	915											
	BEGIN	915		7.25	7.65	0.9	85.5						
	END	920											
	BEGIN	920		7.28	7.65	0.9	85.5						
	END	925											
	BEGIN	925		7.30	7.65	0.9	86.5						
	END	930											
	BEGIN	930	Final	7.29	7.65	0.9	88.0						
	END	935											
	BEGIN	— — —											
	END												
	BEGIN	— — —											
	END												
	BEGIN	— — —	NOx Probe				54.5	51	3.5				
	END												
	BEGIN	— — —											
	END												
	BEGIN	— — —											
	END												
	BEGIN	— — —											
	END												
			SYSTEM ZERO	.03	0.0	0.5	-.25						
			SYSTEM SPAN	4.97	14.85	55.84	48.0						
RAW AVERAGE				[illegible]	[illegible]	[illegible]	[illegible]						
CORRECTED AVERAGE													
COMMENTS:													

CARNOT

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CARNOT

PAGE ____ OF ____

REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE Alt 2

CONDITION: 40 MW Urea ON

DATE: 10 [illegible]

OPERATOR: CHF

TEST NUMBER: 1 + 2 - CEM

TEST LOCATION:

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													
			AS FOUND ANAL. SPAN				49.86						
	1046		SYSTEM ZERO	.03	0.0	.1	.3						
			SYSTEM SPAN	4.98	14.8	55.84	48.5						
	BEGIN	1115	Start	7.42	7.55	0.8	90.5						
	END	1120	All Pass										
	BEGIN	1120		7.40	7.55	0.8	91.0						
	END	1125											
	BEGIN	1125		7.42	7.55	0.8	90.5						
	END	1130											
	BEGIN	1130		7.40	7.55	0.8	89.5						
	END	1135											
	BEGIN	1135		7.4	7.55	.8	90.0						
	END	1140											
	BEGIN	1140	End	7.4	7.55	.8	90.0						
	END	1145											
	BEGIN	---											
	END												
	BEGIN	---											
	END												
	BEGIN	1210	NOx				55	52	3.0				
	END		[illegible]										
	BEGIN	---											
	END												
	BEGIN	---											
	END												
	BEGIN	---											
	END												
			SYSTEM ZERO	.02	0.0	0.1	1.7						
			SYSTEM SPAN	5.00	14.9	[illegible]	49.5						
RAW AVERAGE				—	7.55	0.8	[illegible]						
CORRECTED AVERAGE													
COMMENTS:													

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PAGE ____ OF ____

REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE / Alt 2

CONDITION: 40 mw Urea Off

DATE: 10-8-92

OPERATOR: CHF

TEST NUMBER: 12-2-CEM

TEST LOCATION: HSAPH

TEST NO.	TIME		SAMPLE POINT/ CONDITION	250 Range DRY, UNCORRECTED O_2	CO_2	CO	NOx	NO	NO_2	SO_2	CORRECTED TO ____% ____, DRY CO	NOx	SO_2
SPAN GAS CONCENTRATION													
			AS FOUND ANAL. SPAN				90.52						
	1355		SYSTEM ZERO	.03	0.0	0.0	0.25						
			SYSTEM SPAN	4.99	14.8	55.84	87.0						
	BEGIN	1045	Start All Probes	7.32	7.53	.3	104.0						
	END	1350											
	BEGIN	1350		7.30	7.55	0.3	103.0						
	END	1355											
	BEGIN	1355		7.30	7.55	0.4	103.8						
	END	1400											
	BEGIN	1400		7.32	7.5[illegible]	.3	103.8						
	END	1405											
	BEGIN	1405		7.30	7.55	.3	103.5						
	END	1410											
	BEGIN	1410	End	7.34	7.55	.3	103.8						
	END	1415											
	BEGIN	1415											
	END	1420											
	BEGIN												
	END												
	BEGIN												
	END												
	BEGIN												
	END												
	BEGIN												
	END												
	BEGIN												
	END												
	1420		SYSTEM ZERO	.02	0.0	0.0	.25						
			SYSTEM SPAN	4.97	14.8	55.7	85.6						
RAW AVERAGE				[illegible]	[illegible]	[illegible]	[illegible]						
CORRECTED AVERAGE													
COMMENTS:													

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CARNOT

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REFERENCE METHOD GASEOUS MEASUREMENTS

CLIENT/LOCATION: SCE Ala 2

CONDITION: 40 MW Vac off

DATE: 10 3 92

OPERATOR: CHK

TEST NUMBER: 13-2-CEM

TEST LOCATION: HSAPH

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													
			AS FOUND ANAL. SPAN										
	1514		SYSTEM ZERO	.03	0.0	.1	0.0						
			SYSTEM SPAN	4.99	14.75	55.84	86.25						
	BEGIN	1525	Start	7.36	7.5	.4	100						
	END	1530											
	BEGIN	1530		7.40	7.5	.4	104						
	END	1535											
	BEGIN	1535		7.35	7.5	.4	104						
	END	1540											
	BEGIN	1540		7.32	7.5	.4	102.5						
	END	1545											
	BEGIN	1545		7.30	7.5	.4	103.0						
	END	1550											
	BEGIN	1550		7.31	7.5	.4	103.3						
	END	[illegible]	End										
	BEGIN	———											
	END												
	BEGIN	———											
	END												
	BEGIN	———	NOx Probe				68.3	66.3	2.0				
	END												
	BEGIN	———											
	END												
	BEGIN	———											
	END												
	BEGIN	———											
	END												
			SYSTEM ZERO	.02	0.0	.1	.50						
			SYSTEM SPAN	5.00	14.7	55.84	87.5						
RAW AVERAGE				[illegible]	[illegible]		[illegible]						
CORRECTED AVERAGE													
COMMENTS:													

PMF-039 Post Leak Ck All Probes [illegible] 20 scfh ✓ CHK

CARNOT

Appendix C.4

Particulate

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT SCE/ Alamitos — UNIT 2 — TEST NO. 1-2-PM — METHOD 5.3 — PAGE 1 OF 1
SAMPLE LOCATION EGR Resort — TEST CONDITION — AMB. TEMP., °F 72 — PROJECT # 12598
OPERATOR/ASSISTANT S.M — METER VOL. (START/END) 432.223 / 476.585 — DATE 10/6/97

PRE-TEST DATA:

Barometric Press., in. Hg.	30.01
Assumed Stack Press.	
Assumed Moisture	10%
Assumed Molecular Wt.	28.5
Assumed ΔP	
Assumed ΔH	
Stack Diameter, in.	60
Sample Time: Total	84
per point	2
Total of Traverse Points	14

ΔH = .78 x ΔP

EQUIPMENT INFO:

Meter No.	71-4
Meter, Yd.	1.0040
CFM @ ΔH = 1.0	0.54
Pitot ID, Cp	.84
O_2/CO_2 Method	Orsat
Teflon Connecting Line (Y/N)	Yes
Probe: Mat'l	Teflon
Length	6'
Nozzle: Mat'l	SS
Diam.	0.185
Filter: No.	45-167
Mat'l	

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	H_2O	706.3	571.9	134.4
#2	H_2O	562.1	564.1	-2.0
#3	Ø	521.4	517.9	3.5
#4	SG	762.1	748.3	14.8
#5				
Total				154.7

POST TEST INFO:
Filter Appearance: Clean
Impinger Appearance: Clean
Silica Gel Spent (Y/N): No

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	.002	15	OK	SM
Post-Test	.002	18	OK	SM

PRE-TEST CALIBRATION CHECK:

	Time	ΔH	Meter Reading	Meter Temp. In	Meter Temp. Out
Init.	601	1.00	429.500	76	72
Final	606	1.00	432.223		

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
7	700	1.04	1.6	432.223	321		79	76		56	6.5	15	
6	706	.07	.80	435.571	332		81	77		54	6.8	10	
5	712	1.55	1.19	438.761	316		82	77		58	7.5	10	
4	718	1.30	.96	441.415	310		82	76		55	7.8	10	+5.5
3	724	2.3	1.74	444.438	307		84	77		60	7.5	15	
2	730	2.2	1.67	448.381	305		86	77		64	8.1	16	
1	736	2.50	1.90	451.550	308		87	78		65	8.6	17	
stop	942			456.387									
7	945	1.45	1.10	456.387	324		83	78		63	7.5	11	
6	951	.56	.43	460.021	324		86	78		64	7.5	5	
5	957	.61	.47	462.618	320		88	79		64	7.7	5	
4	1003	.94	.73	464.58	312		88	79		65	7.8	5	
3	1009	1.40	1.09	467.371	308		89	80		63	8.0	12	
2	1015	0.95	.74	470.420	308		91	82		63		12	
1	1021	1.00	.78	473.535	308		93	83		64			
stop	1027			476.585									

CHAIN OF CUSTODY INFORMATION

Impingers Loaded	CHF
Impingers Recovered	GT
Filter Loaded	SM
Filter Recovered	CF
Probe Wash	SM

TEST SUMMARY

Calculated by:	JM
Checked by:	EB
Sample Vol., c.f.	44.316
Stack Press., iwg	+5.5
ΔH, iwg	.57
ΔP, iwg	~~1.47~~
Meter Temp., °F	~~[illegible]~~
Stack Temp., °F	314.5
Water Collected, g	
O_2/CO_2	77
Comments:	

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CARNOT

SAMPLE TRAIN TEST DATA

CLIENT: SCE / ALAMITOS
SAMPLE LOCATION: CSAPH
OPERATOR/ASSISTANT:
UNIT: 2
TEST NO.: 2-2-PM
METHOD: 5.3
PAGE 1 OF 2
TEST CONDITION: UREA OFF
AMB. TEMP., °F:
PROJECT #: 12598
METER VOL. (START/END): 476.871 /
DATE:

PRE-TEST DATA:

Barometric Press., in. Hg.	30.01
Assumed Stack Press.	+4.0
Assumed Moisture	15
Assumed Molecular Wt.	29
Assumed ΔP	1.3
Assumed ΔH	1.00
Stack Diameter, in.	66.93
Sample Time: Total	84
per point	6
Total of Traverse Points	14

ΔH = .86 x ΔP

EQUIPMENT INFO:

Meter No.	71-4
Meter, Yd.	
CFM @ ΔH = 1.0	
Pitot ID, Cp	
O_2/CO_2 Method	
Teflon Connecting Line (Y/N)	YES
Probe: Mat'l	Teflon
Probe: Length	8'
Nozzle: Mat'l	SS
Nozzle: Diam.	.197
Filter: No.	115-166
Filter: Mat'l	Glass

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	H_2O		562.6	
#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	.004	18		[illegible]
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
7	1115	1.0	.86	476.871	337		52	51		70		4	
6	1121	1.80	1.54	478.612	338		54	52		62	6.8	18	
5	1127	1.9	1.63	481.02	336		55	52		61	6.8	23	
4	1133	1.8	1.54	483.157	336		56	53		64	6.7	24	
3	1139	2.6	1.4	484.871	327		56	53		65	7.8	23	
2	1145	3.4	1.4	486.750	324		57	54		65	7.6	23	
1	1151	2.5	1.4	486.87	321		56	52		68	8.2	23	
Stop	1157			501.409									

Impingers Loaded	54
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:	

VOID

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CARNOT

SAMPLE TRAIN TEST DATA

CLIENT SCE / Harris UNIT 2 TEST NO. 3-2-1m METHOD 5 PAGE 1 OF
SAMPLE LOCATION TEST CONDITION AMB. TEMP., °F PROJECT #
OPERATOR/ASSISTANT J.M METER VOL. (START/END) 506.021 / 557.485 DATE 10/8/15

PRE-TEST DATA:

Barometric Press., in. Hg.	29.94
Assumed Stack Press.	
Assumed Moisture	
Assumed Molecular Wt.	
Assumed ΔP	
Assumed ΔH	
Stack Diameter, in.	63.4
Sample Time: Total	84
per point	6
Total of Traverse Points	14

ΔH = .72 x ΔP

EQUIPMENT INFO:

Meter No.	4-4
Meter, Yd.	1.000
CFM @ ΔH = 1.0	0.54
Pitot ID, Cp	0.84
O_2/CO_2 Method	
Teflon Connecting	195
Line (Y/N)	
Probe: Mat'l	7
Length	10'
Nozzle: Mat'l	SS
Diam.	0.194
Filter: No.	45-165
Mat'l	

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	H_2O	722.7	558.8	= 163.9
#2	H_2O	566.0	561.0	= 5.0
#3	Ø	517.6	516.3	= 1.3
#4	Si	778.2	763.8	= 15.4
#5				=
Total				185.6

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	.000	15	OK	JM
Post-Test	.000	15	OK	JM

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
7	1308	.95	.61	506.021	335		93	92		200	8.0	7	
6	1312	1.10	.73	509.448	340		94	93		64		8	
5	1318	1.40	1.00	512.445	335		98	94		64		7	
4	1324	2.1	1.51	516.625	324		99	93		64	7.4	10	
1330/1463	1330	3.4	2.44	518.432	324		105	95		64		12	
2	1332	2.5	1.80	525.618	318		103	95		64	7.4	5	
1	1338	1.6	1.15	531.351	318		104	94		63	7.2	7	
Stop	1404			535.125									
7	1407	.78	.56	535.128	330		95	94		61	7.2	4	
6	1413	.94	.67	537.681	336		100	95		65	7.0	4	
5	1419	2.3	1.65	540.112	334		100	95		63	7.2	8	7.1
4	1425	2.2	1.58	544.410	328		105	96		63	7.6	5	
3	1431	1.0	.72	548.610	323		105	96		64	7.4	6	
2	1437	1.3	.93	551.531	325		104	96		65	7.4	6	
1	1443	1.0	.72	554.281	324		104	96		64		6	
Stop	1451			557.485									

Impingers Loaded CF
Impingers Recovered CF
Filter Loaded CF
Filter Recovered CF
Probe Wash JM

TEST SUMMARY

Calculated by: [illegible]
Checked by:
Sample Vol., c.f. 51.468
Stack Press., iwg
ΔH, iwg ~~1.156~~ 1.156
ΔP, iwg 1.5247
Meter Temp., °F ~~97.12~~ 97.75
Stack Temp., °F 329
Water Collected, g 125.6
O_2/CO_2 7.4
Comments: Clayo. Filter

PMF-057

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CARNOT

SAMPLE TRAIN TEST DATA

CLIENT SCE, Alamitos
UNIT 2
TEST NO. A-2-PM
METHOD 5.3
PAGE 1 OF 1
SAMPLE LOCATION CSAPH
TEST CONDITION VLEA ON
AMB. TEMP., °F
PROJECT # 12578
OPERATOR/ASSISTANT
METER VOL. (START/END) 557.710 /
DATE

PRE-TEST DATA:

Barometric Press., in. Hg.	30.05
Assumed Stack Press.	-5.0
Assumed Moisture	15
Assumed Molecular Wt.	28
Assumed ΔP	
Assumed ΔH	
Stack Diameter, in.	63.4
Sample Time: Total	84
per point	6
Total of Traverse Points	14

ΔH = .72 x ΔP

EQUIPMENT INFO:

Meter No.	714
Meter, Yd.	1.004
CFM @ ΔH = 1.0	0.56
Pitot ID, Cp	0.84
O_2/CO_2 Method	
Teflon Connecting Line (Y/N)	Y
Probe: Mat'l	[illegible]
Length	8
Nozzle: Mat'l	SS
Diam.	0.185
Filter: No.	45-149
Mat'l	

Imp.	Mat'l	Wt.(End)		Wt.(Start)		Wt.(g)
#1	DI 100	791.7	-	616.5	=	175.2
#2	DI 100	603.0	-	589.0	=	14.0
#3	—	528.9	-	525.5	=	3.4
#4	SG	647.6	-	627.2	=	20.4
#5			-		=	
Total						213

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	.002	15	OK	JM
Post-Test	.000	10		JM

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
7	1530	.65	.45	557.710	340	340	99	96		[illegible]	8.4	4	
6	1536	.78	.56	560.31	310	341	100	98		64	8.0	4	
5	1542	3.1	2.22	562.45	287	342	102	99		64	7.4	8	
4	1548	4.1	2.95	567.172	286	341	105	100		63	7.0	12	
3	1554	3.4	2.44	573.121	277	339	103	102		63	7.6	11	0.8
2	1600	1.8	1.29	575.218	286	336	116	102		63	7.4	11	
1	1606	2.0	1.7	584.38	256	28	116	104		62		9	
stop	1612			588.955									
7	1618	.75	.54	588.558	340		109	105		62	6.7	9	
6	1624	1.05	.75	591.728	341		111	106		62	6.6	9	
5	1630	2.5	1.80	594.678	331		111	106		62	7.0	8	
4	1636	[illegible]	1.0	599.052	327		115	106		62	7.5	8	
3	1642	2.0	1.44	603.450	330		115	108		62	7.2	7	
2	1648	1.5	1.06	606.648	328		115	108		63	7.4	7	
1	1654	1.3	.93	609.912	326		114	108		63	7.4	7	
stop	1700			613.251									

CHAIN OF CUSTODY INFORMATION

Impingers Loaded	GY
Impingers Recovered	CF
Filter Loaded	GY
Filter Recovered	GY/CF
Probe Wash	JM

TEST SUMMARY

Calculated by:	
Checked by:	[illegible]
Sample Vol., c.f.	~~55.840~~
Stack Press., iwg	
ΔH, iwg	~~1.366~~ 1.369
ΔP, iwg	1.78
Meter Temp., °F	106.82
Stack Temp., °F	~~332~~ 310.36
Water Collected, g	213.0
O_2/CO_2	7.4
Comments:	

PMF-057

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT SCE/ Alamitos | UNIT 2 | TEST NO. 6-2-PM | METHOD 5.3 | PAGE 1 OF 1
SAMPLE LOCATION CSAPH | TEST CONDITION UREA off | AMB. TEMP., °F | PROJECT # 12598
OPERATOR/ASSISTANT [illegible] | METER VOL. (START/END) 662.585 / 697.504 | DATE 10/7/9[illegible]

PRE-TEST DATA:

Barometric Press., in. Hg.	30.01
Assumed Stack Press.	+5.0
Assumed Moisture	15
Assumed Molecular Wt.	28
Assumed ΔP	1.35
Assumed ΔH	3.15
Stack Diameter, in.	60.71
Sample Time: Total	84
per point	6
Total of Traverse Points	14

ΔH = .70 x ΔP

EQUIPMENT INFO:

Meter No.	714
Meter, Yd.	1.004
CFM @ ΔH = 1.0	0.34
Pitot ID, Cp	0.84
O_2/CO_2 Method	
Teflon Connecting Line (Y/N)	Y
Probe: Mat'l	Teflon
Length	8
Nozzle: Mat'l	SS
Diam.	0.185
Filter: No.	47448
Mat'l	

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	H_2O	674.7	677	= 10.0
#2	H_2O	592.3	585.0	= 7.3
#3	Ø	525.3	524.7	= 0.6
#4	SG	703.7	695.8	= 7.9
#5				=
Total				18.8

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	<.002	17	OK	JM
Post-Test	<.002	11		JM

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
7	830	.84	.58	662.559	352		73	71		65	7.7	3	
6	836	.61	.47	665.165	304		76	72		60		3	
5	842	1.1	.77	667.125	308		78	73		53	7.8	3	
4	848	1.04	.51	670.152	304		81	74		52	8.1	4	
3	854	1.2	.59	673.312	308		83	75		54	8.0	4	
2	900	.99	.65	676.142	302		84	76		55	8.7	4	
1	906	1.13	.51	679.220	300		85	77		57	8.2	4	
Stop	912			681.572									
7	930	1.3	.91	681.872	297		84	80		55	8.	4	
6	936	1.3	.51	684.660	298		86	81		53	7.9	4	
5	942	.50	.35	686.915	294		89	82		56	8.2	4	
4	948	.67	.46	689.280	292		90	82		55	8.3	3	
3	954	.52	.36	691.125	290		92	84		55	8.4	3	7.8
2	1000	.41	.42	693.412	285		93	84		60	8.7	3	
1	1006	.85	.55	695.301	285		93	84		58	8.8	3	
Stop	1012			697.504									

Impingers Loaded	CF
Impingers Recovered	CF
Filter Loaded	[illegible]
Filter Recovered	[illegible]
Probe Wash	
TEST SUMMARY	
Calculated by:	JM
Checked by:	
Sample Vol., c.f.	35.305
Stack Press., iwg	+7.8
ΔH, iwg	~~.73~~ .274
ΔP, iwg	~~.550~~
Meter Temp., °F	81.5
Stack Temp., °F	300.2
Water Collected, g	
O_2/CO_2	8.4
Comments:	

PMF-057

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT [illegible] UNIT [illegible] TEST NO. 5-2-PM METHOD [illegible] PAGE 1 OF 1
SAMPLE LOCATION [illegible] TEST CONDITION [illegible] AMB. TEMP., °F [illegible] PROJECT # [illegible]
OPERATOR/ASSISTANT J. Mally METER VOL. (START/END) 613.655 / 662.040 DATE [illegible]

PRE-TEST DATA:

Barometric Press., in. Hg.	
Assumed Stack Press.	
Assumed Moisture	15
Assumed Molecular Wt.	
Assumed ΔP	
Assumed ΔH	
Stack Diameter, in.	68.4
Sample Time: Total	
per point	
Total of Traverse Points	

ΔH = .75 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	H2O	737.2	584.9	= 152.3
#2	H2O	589.1	580.8	= 8.3
#3	Ø	518.6	516.4	= 2.2
#4	SG	760	723.8	= 12.2
#5				=
Total				175.0

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	<.005	15	24	EF
Post-Test	<.002	8		JM

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
7	1740	.91	.65	613.655	325		100	95		66	7.4	4	
6	1746	.55	.44	616.638	330		100	94		58	6.8	3	
5	1752	1.4	1.05	618.700	322		101	93		60	7.0	5	6.5
4	1758	.95	1.17	622.045	316		102	98		60	7.6	7	
3	1804	1.6	1.2	626.647	310		104	97		61	7.8	6	
2	1810	1.1	.82	630.531	314		103	97		61	8.0	4	
1	1816	.94	.70	633.485	318		102	97		61		4	
stop	1822			636.548									
7	1825	1.4	1.05	636.543	327		95	95		62	6.4	4	
6	1831	1.6	1.20	640.987	325		98	93		60	7.0	6	
5	1837	1.5	1.12	644.135	320		98	93		60	7.2	5	
4	1843	1.3	.97	647.18	324		98	92		61		5	
3	1849	1.8	1.35	651.328	321		97	91		61	7.0	6	
2	1855	1.4	1.05	655.871	314		97	90		64	8.2	6	
1	1901	1.2	1.05	658.686	310		94	89			8.2	6	
stop	1907			662.040									

CHAIN OF CUSTODY INFORMATION
Impingers Loaded
Impingers Recovered
Filter Loaded
Filter Recovered
Probe Wash
TEST SUMMARY
Calculated by:
Checked by:
Sample Vol., c.f. 48.331
Stack Press., iwg
ΔH, iwg ~~1.016~~
ΔP, iwg ~~1.418~~
Meter Temp., °F 97.36
Stack Temp., °F [illegible]
Water Collected, g [illegible]
O_2/CO_2 ~~7.7~~ 7.4
Comments:

PMF-057

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT: SCE / Mamitos
UNIT: 2
TEST NO.: 8.2-PM
METHOD: 5.3
PAGE 1 OF 1
SAMPLE LOCATION: ~~CEM~~ CSPM
TEST CONDITION: OCEA O
AMB. TEMP., °F:
PROJECT #:
OPERATOR/ASSISTANT: JM
METER VOL. (START/END): 744.951 / 751.036
DATE: 10-8-92

PRE-TEST DATA:

Barometric Press., in. Hg.	30.05
Assumed Stack Press.	2
Assumed Moisture	14
Assumed Molecular Wt.	28
Assumed ΔP	1.0
Assumed ΔH	1.75
Stack Diameter, in.	48.42
Sample Time: Total	44
per point	6
Total of Traverse Points	14

ΔH = 745.47 x ΔP

EQUIPMENT INFO:

Meter No.	71-4
Meter, Yd.	1.004
CFM @ ΔH = 1.0	0.54
Pitot ID, Cp	0.84
O_2/CO_2 Method	
Teflon Connecting Line (Y/N)	Y
Probe: Mat'l	Teflon
Length	6
Nozzle: Mat'l	SS
Diam.	0.185
Filter: No.	47-050
Mat'l	

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	H2O		571.2	= 134.5
#2	H2O		557.7	= 7.6
#3	0		522.8	= 3.4
#4	Si	715.7	703.7	= 11.7
#5				=
Total				157.2

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	.004	15	OK	17
Post-Test	.004	14	OK	

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
7	1307	.56	.41	744.951	343		83	94		Pre		3	
6	1333	.66	.48	747.218	345		95	95		60	8.2	3	
5	1335	.78	.57	749.028	344		97	95		60		3	
4	1345	1.8	1.33	751.820	339		100	96		61	8.5	6	
3	1351	1.3	.96	756.481	339		103	96		60	9.0	5	
2	1357	.76	.51	760.028	334		107	97		59	8.9	4	9.2
1	1403	.78	.57	762.150	336		106	98		58	8.6	4	
Stop	1409			764.678									
7	1415	1.86	.66	764.678	350		100	101		58	8.2	4	
6	1421	1.58	.44	767.461	350		106	101		58	7.4	4	
5	1427	1.1	.84	769.924	349		108	102		59	7.4	5	
4	1433	2.5	2.15	772.710	346		109	104		61	7.4	9	
3	1439	3.7	2.84	777.141	342		113	104		62	7.7	11	
2	1445	2.5	1.92	783.216	338		115	106		62	8.1	9	
1	1451	.78	.60	787.512	330		116	106		64	8.4	5	
Stop	1457			791.036									

CHAIN OF CUSTODY INFORMATION

Impingers Loaded	C.L.
Impingers Recovered	C.L.
Filter Loaded	C.L.
Filter Recovered	C.L.
Probe Wash	C.L.

TEST SUMMARY

Calculated by:	
Checked by:	
Sample Vol., c.f.	46.085
Stack Press., iwg	
ΔH, iwg	~~1.076~~ 1.054
ΔP, iwg	1.214
Meter Temp., °F	102.4 ✓
Stack Temp., °F	~~341.5~~ 342
Water Collected, g	159.2 ✓
O_2/CO_2	8.19
Comments:	

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT SCE / Alamitos UNIT 2 TEST NO. 7-2-PM METHOD 5.2 PAGE 1 OF 1
SAMPLE LOCATION [illegible] TEST CONDITION AMB. TEMP., °F PROJECT #
OPERATOR/ASSISTANT J. Mulligan METER VOL. (START/END) 695.205 / 744.768 DATE 10/2/92

PRE-TEST DATA:

Barometric Press., in. Hg.	[illegible]
Assumed Stack Press.	
Assumed Moisture	
Assumed Molecular Wt.	
Assumed ΔP	
Assumed ΔH	
Stack Diameter, in.	63.90
Sample Time: Total	
per point	6
Total of Traverse Points	

ΔH = 71 x ΔP

EQUIPMENT INFO:

Meter No.	714
Meter, Yd.	1.0040
CFM @ ΔH = 1.0	5.00
Pitot ID, Cp	.84
O_2/CO_2 Method	
Teflon Connecting	[illegible]
Line (Y/N)	[illegible]
Probe: Mat'l	[illegible]
Length	8
Nozzle: Mat'l	[illegible]
Diam.	0.195
Filter: No.	47-449
Mat'l	

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	H2O	715.8	675.7	40.1
#2	H2O	580.2	577.0	3.4
#3	✓	516.6	515.0	1.6
#4	SG	746.6	735.8	10.8
#5				
Total				156.4

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	.012	15	on	[illegible]
Post-Test	.010	10	off	[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
7	1056	.95	.68	695.205	346		97	51		[illegible]		4	
6	1102	.51	.37	700.350	348		97	50		64	7.8	4	
5	1108	2.2	1.56	702.712	348		95	52		66	7.2	6	
4	1114	3.0	2.2	706.5	347		101	53		55	7.2	8	
3	1120	3.7	2.6	711.654	340		103	54		55	7.8	11	
2	1126	1.5	1.85	717.120	333		105	55		60	8.4	5	
1	1132	1.9	1.4	721.764	332		105	56		62	5.8	8	
stop	1138			726.040									
7	1140	.45	.37	726.040	341		101	53		66	7.8	3	
6	1146	.65	.53	728.136	342		97	54		62	7.6	3	
5	1152	.84	.62	731.681	342		97	54		62	7.2	3	
4	1158	2.0	1.48	733.142	337		96	54		63	8.1	3	
3	1204	1.1	.81	736.861	334		99	54		63	8.7	4	5.8
2	1210	.88	.65	739.871	332		99	54		64	8.8	4	
1	1216	.75	.55	742.618	332		98	54		65	9.4	4	
stop	1222			744.768									

CHAIN OF CUSTODY INFORMATION	
Impingers Loaded	[illegible]
Impingers Recovered	
Filter Loaded	
Filter Recovered	
Probe Wash	
TEST SUMMARY	
Calculated by:	[illegible]
Checked by:	
Sample Vol., c.f.	46.503
Stack Press., iwg	
ΔH, iwg	1.134
ΔP, iwg	1.4204
Meter Temp., °F	[illegible]
Stack Temp., °F	339
Water Collected, g	[illegible]
O_2/CO_2	8.06
Comments:	

PMF 057

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT SCE / Alamitos
UNIT 2 TEST NO. 7-2-PM METHOD 5.2 PAGE 1 OF 1
SAMPLE LOCATION
TEST CONDITION AMB. TEMP., °F PROJECT #
OPERATOR/ASSISTANT J. Mulligan
METER VOL. (START/END) 658.268 / 744.768 DATE 10/12/92

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 6
Total of Traverse Points
ΔH = 71 x ΔP

EQUIPMENT INFO:
Meter No. 714
Meter, Yd. 100040
CFM @ ΔH = 1.0 .960
Pitot ID, Cp .84
O_2/CO_2 Method
Teflon Connecting Line (Y/N)
Probe: Mat'l
Length 8
Nozzle: Mat'l
Diam. 0.150
Filter: No. 47-449
Mat'l

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	H_2O	715.2	675.7	40.1
#2	H_2O	580.6	577.0	3.6
#3		516.6	515.0	1.6
#4	CG	746.6	735.8	10.8
#5				
Total				156.4

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	.012	15	OK	OK
Post-Test	.010	0	OK	OK

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
7	1056	.95	.68	698.205	346		92	91		[illegible]		4	
6	1102	.81	.57	700.950	348		92	90		64	7.8	4	
5	1108	2.2	1.56	702.712	348		95	92		66	7.2	6	
4	1114	3.0	2.2	706.5	347		101	93		55	7.2	8	
3	1120	3.7	2.6	711.654	340		103	94		55	7.8	11	
2	1126	1.5	1.05	717.120	333		105	95		60	8.4	5	
1	1132	1.9	1.4	721.764	332		105	96		62	5.8	8	
stop	1138			726.040									
7	1140	.45	.37	726.040	341		104	93		66	7.8	3	
6	1146	.65	.53	728.136	342		97	94		62	7.6	3	
5	1152	.84	.62	731.681	342		97	94		62	7.2	3	
4	1158	2.0	1.48	733.142	337		96	94		63	8.1	3	
3	1204	1.1	.81	736.861	334		97	94		63	8.7	4	5.8
2	1210	.89	.65	739.871	332		99	94		61	8.8	4	
1	1216	.75	.55	742.618	332		98	94		65	9.4	4	
stop	1222			744.768									

CHAIN OF CUSTODY INFORMATION

Impingers Loaded	CHF
Impingers Recovered	
Filter Loaded	
Filter Recovered	
Probe Wash	

TEST SUMMARY

Calculated by:	CF
Checked by:	
Sample Vol., c.f.	46.503
Stack Press., iwg	
ΔH, iwg	1.134
ΔP, iwg	1.4204
Meter Temp., °F	
Stack Temp., °F	339
Water Collected, g	
O_2/CO_2	8.06
Comments:	

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT SCE / Mammoth
UNIT 2
TEST NO. 8.2-PM
METHOD 5.3
PAGE 1 OF 1
SAMPLE LOCATION ~~CEM~~ CSPM
TEST CONDITION OREA 0.2
AMB. TEMP., °F
PROJECT #
OPERATOR/ASSISTANT JM
METER VOL. (START/END) 744.951 / 751.036
DATE 10-8-92

PRE-TEST DATA:

Barometric Press., in. Hg.	30.05
Assumed Stack Press.	7.3
Assumed Moisture	14
Assumed Molecular Wt.	28
Assumed ΔP	1.0
Assumed ΔH	1.73
Stack Diameter, in.	3.91
Sample Time: Total	99
per point	6
Total of Traverse Points	14

ΔH = 745.97 x ΔP

EQUIPMENT INFO:

Meter No.	71-4
Meter, Yd.	1.004
CFM @ ΔH = 1.0	0.84
Pitot ID, Cp	0.84
O_2/CO_2 Method	
Teflon Connecting Line (Y/N)	yes
Probe: Mat'l	Teflon
Length	6
Nozzle: Mat'l	SS
Diam.	0.185
Filter: No.	47-950
Mat'l	

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	H2O		[illegible]	= 134.5
#2	H2O		[illegible]	= 9.6
#3	0		[illegible]	= 3.4
#4	Si	715.2	[illegible]	= 11.7
#5				=
Total				159.2

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	.004	16	OK	17
Post-Test	.004	14	OK	[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
7	1307	.56	.41	744.951	343		93	94		Tue		3	
6	1313	.66	.48	747.218	345		95	95		60	8.2	3	
5	1325	.78	.57	749.028	344		97	95		60		3	
4	1345	1.8	1.33	751.820	339		100	96		61	8.5	6	
3	1351	1.3	.96	756.481	337		105	96		60	9.0	5	
2	1357	.76	.57	760.028	334		107	97		59	8.9	4	5.2
1	1403	.77	.57	762.150	336		106	98		58	8.6	4	
Stop	1409			764.678									
7	1415	1.86	.66	764.678	350		100	101		58	8.2	4	
6	1421	1.58	.64	767.461	350		106	101		58	7.4	4	
5	1427	1.1	.84	769.924	349		108	102		59	7.4	5	
4	1433	2.8	2.15	772.710	346		109	104		61	7.4	9	
3	1439	3.7	2.84	777.141	342		113	104		62	7.7	11	
2	1445	2.5	1.92	783.216	338		115	106		62	8.1	9	
1	1451	.78	1.06	787.512	330		116	106		64	8.4	5	
Stop	1457			791.036									

CHAIN OF CUSTODY INFORMATION	
Impingers Loaded	C.L.
Impingers Recovered	C.L.
Filter Loaded	[illegible]
Filter Recovered	C.L.
Probe Wash	C.L.

TEST SUMMARY	
Calculated by:	
Checked by:	
Sample Vol., c.f.	46.085
Stack Press., iwg	
ΔH, iwg	~~1.076~~ 1.054 3
ΔP, iwg	1.214
Meter Temp., °F	102.4 ✓
Stack Temp., °F	~~341.5~~ 342.
Water Collected, g	159.2 ✓
O_2/CO_2	8.13
Comments:	

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT: SCE/Alamitos | UNIT: 2 | TEST NO.: 9-2-PM | METHOD: 5.3 | PAGE 1 OF 1
SAMPLE LOCATION: CSTPH | TEST CONDITION: UCEA ON | AMB. TEMP., °F: | PROJECT #: 12598
OPERATOR/ASSISTANT: JM | METER VOL. (START/END): 791.206 / 830.450 | DATE: 10-7-92

PRE-TEST DATA:

Barometric Press., in. Hg.	29.99
Assumed Stack Press.	0
Assumed Moisture	14
Assumed Molecular Wt.	28
Assumed ΔP	1.0
Assumed ΔH	1.77
Stack Diameter, in.	0.375
Sample Time: Total	84
per point	6
Total of Traverse Points	14

ΔH = 81 x ΔP

EQUIPMENT INFO:

Meter No.	71-4
Meter, Yd.	1.009
CFM @ ΔH = 1.0	0.54
Pitot ID, Cp	0.84
O_2/CO_2 Method	
Teflon Connecting Line (Y/N)	YES
Probe: Mat'l	Teflon
Length	8
Nozzle: Mat'l	SS
Diam.	0.185
Filter: No.	47-451
Mat'l	

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1		665.1	557.1	108.0
#2		577.2	569.1	8.1
#3		518.2	516.9	1.3
#4		819.1	810.2	8.9
#5				
Total				126.3

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	.002	15	NA	JM
Post-Test	.002	10		JM

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
7	1535	.95	.79	791.206	305		103	100		56		4	
6	1541	.94	.76	793.301	304		106	102		60		4	1.8
5	1547	.65	.69	796.218	304		110	103			78	4	
4	1553	1.1	0.81	799.005	302		114	105		58	74	4	
3	1600		1.12	802.432	294		116	106		64	80	4	
2	1606	1.1	.85	806.561	294		118	107		64		4	
1	1612	.91	.73	809.646	294		120	108		61	83	4	
Dup	1618			812.000									
7	1622	.65	.52	813.000	303		115	110		66	7.4	4	
6	1628	.74	.43	814.300	303		115	111		60	7.0	4	
5	1634	.64	.51	815.550	298		117	112		60	7.2	4	
4	1640	.80	.66	816.950	296		115	112		60	7.5	4	
3	1641	.65	.57	821.678	294		120	112		61	8.0	4	
2	1653	.65	.54	824.541	294		120	112		64	8.4	4	
1	1658	1.1	.91	827.415	294		121	113		64		4	
Dup	1704			830.450									

CHAIN OF CUSTODY INFORMATION

Impingers Loaded	CH
Impingers Recovered	CH
Filter Loaded	CH
Filter Recovered	CH
Probe Wash	JM

TEST SUMMARY

Calculated by:	
Checked by:	
Sample Vol., c.f.	39.244
Stack Press., iwg	1.8
ΔH, iwg	0.716
ΔP, iwg	~~0.872~~ 0.668
Meter Temp., °F	
Stack Temp., °F	
Water Collected, g	
O_2/CO_2	
Comments:	100.06

PMF-057

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT: SCE / Alamitos
UNIT: 2
TEST NO.: 10-7-PM
METHOD: 5-3
PAGE: 1 OF 1
SAMPLE LOCATION: Stack Exit
TEST CONDITION: 40 min Average
AMB. TEMP., °F: 70
PROJECT #:
OPERATOR/ASSISTANT: Jim Mulligan
METER VOL. (START/END): 830.101 / 865.657
DATE: 10-8-92

PRE-TEST DATA:

Barometric Press., in. Hg.	30.05
Assumed Stack Press.	[illegible]
Assumed Moisture	[illegible]
Assumed Molecular Wt.	[illegible]
Assumed ΔP	[illegible]
Assumed ΔH	[illegible]
Stack Diameter, in.	[illegible]
Sample Time: Total	84
per point	7
Total of Traverse Points	12

ΔH = _____ x ΔP

EQUIPMENT INFO:

Meter No.	71-4
Meter, Yd.	1.0146
CFM @ ΔH = 1.0	[illegible]
Pitot ID, Cp	[illegible]
O_2/CO_2 Method	Portable
Teflon Connecting	[illegible]
Line (Y/N)	Y-S
Probe: Mat'l	Teflon
Length	[illegible]
Nozzle: Mat'l	[illegible]
Diam.	.188/.187
Filter: No.	[illegible]
Mat'l	

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	H_2O	644.4	554.7	94.7
#2	H_2O	587.4	582.6	4.8
#3	Silica Gel	515.4	517.6	-2.2
#4	Silica Gel	826.3	819.1	7.2
#5				
Total				107.5 ✓

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	0.002	10	OK	DM
Post-Test	0.0010	10	OK	DM

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
7	835	.33	.21	830.701	283		78	76		58	13.5	2	
6	841	.30	.25	832.941	283		81	77		60	11.4	2	
5	847	.37	.35	834.450	283		84	78		58	11.4	2	
4	853	.39	.32	836.358	284		87	80		58	11.5	2	
3	859	.30	.18	838.350	282		88	81		57	11.5	2	10.0
2	905	.27	.25	840.412	281		89	81		58	11.5	2	
1	911	.31	.29	842.928	281		89	82		58	11.5	2	
Stop	917			843.950									
	1000	1.10	1.00	[illegible]		Avg	1.10	[illegible]	[illegible]	[illegible]			
7	930	.64	1.66	844.813	281		88	82		60	11.5	5	
6	936	.38	1.50	846.090	282		85	83		60	11.2	5	
5	942	.38	.85	847.320	283		90	85		63	11.2	4	
4	948	.48	1.79	848.671	283		98	86		65	11.5	4	
3	954	.35	.67	849.520	282		100	87		64	11.5	4	
2	1000	.23	.62	850.620	282		99	88		65	11.2	4	
1	1006	.59	1.45	851.975	281		98	88		60	11.4	4	
Stop	1012			853.057									

CHAIN OF CUSTODY INFORMATION	
Impingers Loaded	CHF
Impingers Recovered	CHF
Filter Loaded	CHF
Filter Recovered	CHF
Probe Wash	[illegible]

TEST SUMMARY	
Calculated by:	[illegible]
Checked by:	
Sample Vol., c.f.	13.249 / 20.244
Stack Press., iwg	10.0
ΔH, iwg	0.297 / 1.167
ΔP, iwg	0.316 / 0.291 ✓
Meter Temp., °F	82.21 / 90.71 ✓
Stack Temp., °F	242.4 / 282.0 ✓
Water Collected, g	38 / 69.5
O_2/CO_2	11.8/2.3 / 11.4/2.0
Comments:	

MF-05

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT: SCE/ Alamitos | UNIT: 2 | TEST NO.: 11-2-PM | METHOD: 5.3 | PAGE 1 OF 1
SAMPLE LOCATION: CSAPM | TEST CONDITION: UNIT ON | AMB. TEMP., °F: 74 | PROJECT #: 12598
OPERATOR/ASSISTANT: J Mulligan | METER VOL. (START/END): 548.620 / | DATE: 10-8-92

PRE-TEST DATA:

Barometric Press., in. Hg.	29.98
Assumed Stack Press.	FW
Assumed Moisture	15
Assumed Molecular Wt.	29
Assumed ΔP	0.40
Assumed ΔH	1.0
Stack Diameter, in.	63.62
Sample Time: Total	84
per point	6
Total of Traverse Points	14

$\Delta H = \frac{2.4}{2.3} \times \Delta P$

EQUIPMENT INFO:

Meter No.	E5-19
Meter, Yd.	1.00
CFM @ ΔH = 1.0	0.375
Pitot ID, Cp	0.84
O_2/CO_2 Method	
Teflon Connecting Line (Y/N)	Y
Probe: Mat'l	Teflon
Probe: Length	8
Nozzle: Mat'l	SS
Nozzle: Diam.	0.250
Filter: No.	47-953
Filter: Mat'l	

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	H_2O	650.9		97.5
#2	H_2O	590.5		2.6
#3	"	522.6	522.2	.6
#4	SG	790.9	787.4	3.5
#5				
Total				108

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	.012	17	OK	JM
Post-Test	.005	10		JM

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
7	1105	.29	.62	548.620	335		90	88		64	11.3	2	5.0
6	1111	.20	.52	551.110	335		99	88		60	11.6	2	
5	1117	.23	.60	553.61	335		98	90		58	11.5	2	
4	1123	.21	.55	556.741	335		99	90		58	11.4	2	
3	1129	.19	.49	559.123	335		99	91		60	11.5	2	
2	1135	.23	.60	562.00	335		99	91		61	11.5	2	
1	1141	.27	.70	564.610	331		100	91		61	11.5	2	
Smpy	1147			566.831									
7	1151	.55	1.4	566.881	336		95	91		65	11.4	5	
6	1157	.28	.69	571.440	336		104	92		58	11.7	3	
5	1203	.24	.55	573.61	336		100	92		62	11.7	3	
4	1209	.20	.46	577.00	336		100	92		63	11.7	3	
3	1215	.14	.32	579.21	337		98	92		64	11.5	2	
2	1221	.45	1.03	581.238	337		97	92		67	11.5	4	
1	1227	.56	1.28	584.141	336		103	92		62	11.7	4	
Smpy	1233			588.405									

CHAIN OF CUSTODY INFORMATION

Impingers Loaded	CF
Impingers Recovered	CF
Filter Loaded	CF
Filter Recovered	CF
Probe Wash	JM

TEST SUMMARY

Calculated by:	JM
Checked by:	
Sample Vol., c.f.	35.735
Stack Press., iwg	+5.0
ΔH, iwg	0.707
ΔP, iwg	0.378
Meter Temp., °F	94.75
Stack Temp., °F	335.4
Water Collected, g	
O_2/CO_2	11.5 / 5.5
Comments:	

PMF-057

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT: SCE / Alamitos
SAMPLE LOCATION:
OPERATOR/ASSISTANT: J. Mulligan

UNIT: 2 TEST NO.: 12-2-pm METHOD: 5.3 PAGE 1 OF 1
TEST CONDITION: 40 MW/40 Amps AMB. TEMP., °F: 65 PROJECT #:
METER VOL. (START/END): 588.855 / 623.548 DATE: 10-8-92

PRE-TEST DATA:

Barometric Press., in. Hg.	[illegible]
Assumed Stack Press.	9.0
Assumed Moisture	15%
Assumed Molecular Wt.	28.3
Assumed ΔP	.43
Assumed ΔH	.67
Stack Diameter, in.	[illegible]
Sample Time: Total	84
per point	6
Total of Traverse Points	14

ΔH = ~~2.38~~ 2.29 x ΔP

EQUIPMENT INFO:

Meter No.	71-4
Meter, Yd.	1.0040
CFM @ ΔH = 1.0	.540
Pitot ID, Cp	.84
O_2/CO_2 Method	Post-Run
Teflon Connecting Line (Y/N)	Yes
Probe: Mat'l	Teflon
Probe: Length	10
Nozzle: Mat'l	SS
Nozzle: Diam.	~~.140~~ .205
Filter: No.	47-454
Filter: Mat'l	

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	[illegible]	646.1	565.4	
#2	[illegible]	573.9	[illegible]	
#3	0	516.2	516.7	
#4	G	712.7	703.4	
#5				
Total				

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	.005	15	OK	[illegible]
Post-Test	.005	8	OK	[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
7	1315	.49	1.12	588.855	337		104	93		ICE	12.0	5	
6	1321	.35	.80	592.471	338		108	94		65	12.0	3	
5	1327	.17	.40	595.468	338		105	94		66	12.4	2	
4	1333	.11	.26	598.025	338		102	95		64	12.5	2	
3	1339	.17	.40	599.871	338		100	94		63	12.4	2	+5.1
2	1345	.15	.35	602.276	338		101	95		62		2	
1	1351	.61	1.45	604.165	338		99	94		64	12.1	5	
stop	1357			608.689									
7	1359	.14	.33	608.689	338		95	93		68	12.0	2	
6	1405	.11	.25	610.340	338		97	93		65	12.1	2	
5	1411	.18	.41	612.476	338		95	92		64	12.1	2	
4	1417	.13	.29	614.752	337		76	91		62	12.0	2	
3	1423	.17	.38	616.745	337		95	90		64	12.2	2	
2	1429	.14	.32	618.015	337		96	90		63	12.0	2	
1	1435	.27	.61	620.850	337		94	90		63	12.1	2	
Stop	1441			623.548									

CHAIN OF CUSTODY INFORMATION

Impingers Loaded	[illegible]
Impingers Recovered	[illegible]
Filter Loaded	[illegible]
Filter Recovered	[illegible]
Probe Wash	[illegible]

TEST SUMMARY

Calculated by:	[illegible]
Checked by:	[illegible]
Sample Vol., c.f.	34.689
Stack Press., iwg	+5.1
ΔH, iwg	0.529
ΔP, iwg	~~0.271~~
Meter Temp., °F	95.96
Stack Temp., °F	337.64
Water Collected, g	
O_2/CO_2	
Comments:	

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT SCE/Alumitech | UNIT 2 | TEST NO. B-2-PM | METHOD 5-3 | PAGE 1 OF 1
SAMPLE LOCATION | TEST CONDITION Normal Operation | AMB. TEMP., °F 74 | PROJECT #
OPERATOR/ASSISTANT S Mulligan | METER VOL. (START/END) 623.732 / 673.868 | DATE 10-8-92

PRE-TEST DATA:

Barometric Press., in. Hg.	30.40
Assumed Stack Press.	[illegible]
Assumed Moisture	[illegible]
Assumed Molecular Wt.	[illegible]
Assumed ΔP	[illegible]
Assumed ΔH	[illegible]
Stack Diameter, in.	68.75
Sample Time: Total	84
per point	6
Total of Traverse Points	12

ΔH = ~~2.75~~ 2.55 / 7.64 x ΔP

EQUIPMENT INFO:

Meter No.	58-19
Meter, Yd.	1.00
CFM @ ΔH = 1.0	.575
Pitot ID, Cp	.84
O_2/CO_2 Method	Portable
Teflon Connecting Line (Y/N)	Yes
Probe: Mat'l	Teflon
Length	10'
Nozzle: Mat'l	SS
Diam.	0.250
Filter: No.	
Mat'l	

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	1110	686.4	572.2	114.1
#2	1110	621.0	613.2	7.8
#3	0	504.0	502.2	1.8
#4	56	800.8	790.8	10.0
#5				
Total				134.3

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	<.002	15	OK	JM
Post-Test	<.0020			JM

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
7	15:15	.55	2.42	623.723	284		107	90		60	11.5	6	
6	15:21	.55	1.65	628.414	287		110	92		57	11.2	5	
5	15:27	.50	1.07	633.218	287		109	94		60		5	
4	15:33	.25	.74	636.820	284		110	95		57	11.2	5	72.1
3	15:39	.17	.43	639.561	284		106	97		58	11.0	3	
2	15:45	.47	1.15	641.761	284		105	98		60	11.3	4	
1	15:51	.60	1.88	646.161	284		112	99		58	11.2	5	
Stop	15:57			650.691									
7	15:59	.35	.85	650.691	285		107	101		64	11.0	2	
6	16:05	.44	1.22	654.168	285		114	102		63	10.5	4	
5	16:11	.32	.84	657.813	285		116	103		63	11.1	3	
4	16:17	.35	.85	660.850	286		113	103		64	11.0	3	
3	16:23	.34	.86	663.970	285		113	103		64	11.1	3	
2	16:29	.40	1.07	667.100	285		113	104		65	11.2	3	
1	16:35	.45	.89	671.761	285		112	103		67			
Stop	16:41			673.868									

CHAIN OF CUSTODY INFORMATION

Impingers Loaded	CHF
Impingers Recovered	CHF
Filter Loaded	CHF
Filter Recovered	CHF
Probe Wash	JM

TEST SUMMARY

Calculated by:	
Checked by:	✓
Sample Vol., c.f.	~~50.131~~
Stack Press., iwg	5.4
ΔH, iwg	1.152
ΔP, iwg	~~0.482~~
Meter Temp., °F	104.68
Stack Temp., °F	284.10
Water Collected, g	
O_2/CO_2	11.1
Comments:	

PMF-057

Appendix C.5

Hydrocarbon

CARNOT
TEDLAR BAG SAMPLE DATA

CLIENT/PROJECT: SCE/Alamitos

DATE: 10-6-92 UNIT: #2 BY: Rob M.

	BAG ID 1-2 ~~NH_3~~	BAG ID 2-2	BAG ID 3-2 ~~NH_3~~
TEST NO.	1-2	2-2	3-2 ~~NH_3~~
SAMPLE RATE			
START TIME	1012	1130	1316
STOP TIME	1032	1150	1336
SAMPLE LOCATION	W-CSAPH	E-CSAPH	E-CSAPH

DATE: 10-6-92 UNIT: #2 BY: Rob M.

	BAG ID 4-2-~~NH_3~~ NH_3	BAG ID 5-2-NH_3	BAG ID _____
TEST NO.	4-2-NH_3	5-2 NH_3	
SAMPLE RATE			
START TIME	1410	1810	
STOP TIME	1430	1830	
SAMPLE LOCATION	E-CSAPH	W-CSAPH	

NOTES:

CARNOT

PMF-007

CARNOT
TEDLAR BAG SAMPLE DATA

*12598

CLIENT/PROJECT: SCE/Alamitos

DATE: 10-7-92 UNIT: #2 BY: Rob M.

	BAG ID 6-2	BAG ID 7-2	BAG ID 8-2-NH_3
TEST NO.	6-2	7-2	8-2-NH_3
SAMPLE RATE			
START TIME	0917	1126	1400
STOP TIME	0937	1146	1420
SAMPLE LOCATION	W-CSAPH	E-CSAPH	E-CSAPH

DATE: 10-7-92 UNIT: #2 BY: Rob M.

	BAG ID 9-2-NH_3	BAG ID	BAG ID
TEST NO.	9-2-NH_3		
SAMPLE RATE			
START TIME	1615		
STOP TIME	1635		
SAMPLE LOCATION	W-CSAPH		

NOTES:

CARNOT
TEDLAR BAG SAMPLE DATA

CLIENT/PROJECT: SCE/Alamitos

DATE: 10-8-92 UNIT: #2 BY: Rob. M

	BAG ID 10-2-NH_3	BAG ID 11-2-NH_3	BAG ID 12-2
TEST NO.	10-2-~~NH~~HC	11-2-~~NH~~HC	12-2-HC
SAMPLE RATE			
START TIME	0909	1117	1345
STOP TIME	0929	1137	1405
SAMPLE LOCATION	W-CSAPH	E-CSAPH	-CSAPH

DATE: 10-8-92 UNIT: #2 BY: Rob M.

	BAG ID 13-2-HC	BAG ID _____	BAG ID _____
TEST NO.	13-2-HC		
SAMPLE RATE			
START TIME	1525		
STOP TIME	1545		
SAMPLE LOCATION	-CSAPH	~~-CSAPH~~	

NOTES:

CARNOT

PMF-007

Appendix C.6

Ammonia

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT: SCE/Alamitos
SAMPLE LOCATION: CSAPH
OPERATOR/ASSISTANT: RM

UNIT: #2
TEST NO.: 42-NH3
METHOD: Kr, Quick
PAGE 1 OF 1
TEST CONDITION: Oven On
AMB. TEMP., °F:
PROJECT #: 12598
METER VOL. (START/END): /
DATE: 10-6-92

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	30
per point	5
Total of Traverse Points	6

ΔH = _____ x ΔP

EQUIPMENT INFO:

Meter No.	North
Meter, Yd.	1.006
CFM @ ΔH = 1.0	–
Pitot ID, Cp	–
O_2/CO_2 Method	CEM
Teflon Connecting Line (Y/N)	N
	Y
Probe: Mat'l	SS
Length	8'
Nozzle: Mat'l	–
Diam.	–
Filter: No.	–
Mat'l	–

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	H2O	666.4	712	[illegible]
#2	H2O	597.2	580.1	[illegible]
#3	/	527.4	523.6	[illegible]
#4	Si	709.2	695.9	[illegible]
#5				
Total				107.4

POST TEST INFO:

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	0.005	14"	–	RM
Post-Test	0.00	10"	–	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-6	1610		1.5	836.504			88	81		ICE	–	9.0	
5	1615		"	841.6			101	80		"	–	9.0	
4	1620		"	846.62			108	82		"	–	9.0	
3	1625		"	851.677			115	82		"	–	9.0	
2	1631		"	856.76			118	84		"	–	9.0	
1	1636		"	861.81			120	86		"	–	9.0	
STOP	1641			866.850									

CHAIN OF CUSTODY INFORMATION

Impingers Loaded	
Impingers Recovered	
Filter Loaded	
Filter Recovered	
Probe Wash	RM

TEST SUMMARY

Calculated by:	
Checked by:	
Sample Vol., c.f.	30.446
Stack Press., iwg	
ΔH, iwg	1.5
ΔP, iwg	
Meter Temp., °F	95.4
Stack Temp., °F	
Water Collected, g	107.4
O_2/CO_2	7.5
Comments:	

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(West-side)

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT SCE/Alamitos
SAMPLE LOCATION CS APH
OPERATOR/ASSISTANT RM

UNIT #2 TEST NO. 5-2-NH3 METHOD NH3 Draft PAGE 1 OF 1
TEST CONDITION Unit On AMB. TEMP., °F
METER VOL. (START/END) / PROJECT # 1259
DATE 10-6-92

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	30
per point	5
Total of Traverse Points	6

ΔH = _____ x ΔP

EQUIPMENT INFO:

Meter No.		North
Meter, Yd.		1.006
CFM @ ΔH = 1.0		–
Pitot ID, Cp		–
O_2/CO_2 Method		CEM
Teflon Connecting Line (Y/N)		N
Probe:	Mat'l	SS
	Length	8
Nozzle:	Mat'l	–
	Diam.	–
Filter:	No.	–
	Mat'l	–

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	1. NH_4SO_4	619.2	538.7	80.5
#2	1. NH_4SO_4	586.9	575.4	11
#3	–	514.7	514.6	0.1
#4	SG	655.8	646.6	9.2
#5				
Total				106.3

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"	–	RM
Post-Test	0.00	7"	–	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
W-6	1810		1.5	867.078			86	86		ICE	–	5.0	
5	1815		"	872.09			104	86		"	–	6.0	
4	1820		"	877.1			112	86		"	–	6.0	
3	1825 ~~1826~~		"	882.124			119	86		"	–	6.0	
2	1831		"	887.15			118	87		"	–	6.0	
1	1836		"	892.1			120	87		"	–	6.0	
STOP	1841			897.117									

CHAIN OF CUSTODY INFORMATION

Impingers Loaded	RM
Impingers Recovered	CHF
Filter Loaded	
Filter Recovered	
Probe Wash	RM

TEST SUMMARY

Calculated by:	
Checked by:	
Sample Vol., c.f.	30.039
Stack Press., iwg	
ΔH, iwg	1.5
ΔP, iwg	
Meter Temp., °F	98.1
Stack Temp., °F	
Water Collected, g	106.3
O_2/CO_2	7.3
Comments:	

CARNOT

SAMPLE TRAIN TEST DATA

CLIENT: SCE/Alamitos | UNIT: #2 | TEST NO.: 8-2-NH3 | METHOD: | PAGE 1 OF 1
SAMPLE LOCATION: E-C5APH | TEST CONDITION: | AMB. TEMP., °F: | PROJECT #: 12598
OPERATOR/ASSISTANT: RM | METER VOL. (START/END): 897.314 / 927.769 | DATE: 10-7-92

PRE-TEST DATA:

Barometric Press., in. Hg.	30.05
Assumed Stack Press.	
Assumed Moisture	
Assumed Molecular Wt.	
Assumed ΔP	
Assumed ΔH	
Stack Diameter, in.	
Sample Time: Total	30
per point	5
Total of Traverse Points	6

ΔH = _____ x ΔP

EQUIPMENT INFO:

Meter No.	North
Meter, Yd.	1.006
CFM @ ΔH = 1.0	—
Pitot ID, Cp	—
O_2/CO_2 Method	CEM
Teflon Connecting Line (Y/N)	N
Probe: Mat'l	SS
Length	8'
Nozzle: Mat'l	—
Diam.	—
Filter: No.	—
Mat'l	—

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	H_2SO_4	587.4	317.6	[illegible]
#2	H_2SO_4	598.2	587.2	11.0
#3	Ø	5[illegible]	516.3	6.1
#4	SG	710.6	699.0	11.6
#5				
Total				[illegible]

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	0.00	13"	—	RM
Post-Test	0.00	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
E-6	1400		1.5	897.314			84	76		ICE		8.0	
5	1405		"	902.5			95	76		"		8.0	
4	1410		"	907.56			102	78		"		8.0	
3	~~1415~~ 1416		"	912.641			106	78		"		8.0	
2	1421		"	917.71			105	80		"		8.0	
1	1426		"	922.715			109	79		"		8.0	
STOP	1431			927.769									

CHAIN OF CUSTODY INFORMATION

Impingers Loaded	[illegible]
Impingers Recovered	[illegible]
Filter Loaded	
Filter Recovered	
Probe Wash	RM

TEST SUMMARY

Calculated by:	
Checked by:	
Sample Vol., c.f.	[illegible]
Stack Press., iwg	
ΔH, iwg	1.5
ΔP, iwg	
Meter Temp., °F	[illegible]
Stack Temp., °F	
Water Collected, g	[illegible]
O_2/CO_2	[illegible]
Comments:	

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CARNOT

SAMPLE TRAIN TEST DATA

CLIENT SCE/Alamitos UNIT #2 TEST NO. 9-2-NH3 METHOD _____ PAGE 1 OF 1
SAMPLE LOCATION W-CS APH TEST CONDITION _____ AMB. TEMP., °F _____ PROJECT # 12598
OPERATOR/ASSISTANT RM METER VOL. (START/END) 928.075 / 958.171 DATE 10-7-92

PRE-TEST DATA:

Barometric Press., in. Hg.	29.77
Assumed Stack Press.	
Assumed Moisture	
Assumed Molecular Wt.	
Assumed ΔP	
Assumed ΔH	
Stack Diameter, in.	
Sample Time: Total	30
per point	5
Total of Traverse Points	6

ΔH = _____ x ΔP

EQUIPMENT INFO:

Meter No.	North
Meter, Yd.	1.006
CFM @ ΔH = 1.0	—
Pitot ID, Cp	—
O_2/CO_2 Method	CGM
Teflon Connecting Line (Y/N)	N
Probe: Mat'l	Y SS
Length	8'
Nozzle: Mat'l	—
Diam.	—
Filter: No.	—
Mat'l	—

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	H2O	679.0	545.9	[illegible]
#2	H2O	605.2	592.1	[illegible]
#3	Ø	525.1	522.0	[illegible]
#4	SG	716.2	709.2	[illegible]
#5				
Total				106.2

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	0.005	13"	—	RM
Post-Test	0.00	8"	—	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
W-6	1615		1.5	928.075			103	93		ICE		7.0	
5	1620		"	933.03			115	93		"		7.0	
4	1625		"	938.05			122	93		"		7.0	
3	~~1630~~ 1631		"	943.062			128	94		"		7.0	
2	1636		"	948.12			126	95		"		7.0	
1	1641		"	953.19			133	95		"		7.0	
STOP	1646			958.171									

CHAIN OF CUSTODY INFORMATION

Impingers Loaded	
Impingers Recovered	
Filter Loaded	—
Filter Recovered	—
Probe Wash	RM

TEST SUMMARY

Calculated by:	[illegible]
Checked by:	[illegible]
Sample Vol., c.f.	30.096 ✓
Stack Press., iwg	—
ΔH, iwg	1.5 ✓
ΔP, iwg	—
Meter Temp., °F	101.4 ✓
Stack Temp., °F	—
Water Collected, g	106.2 ✓
O_2/CO_2	7.8
Comments:	

SAMPLE TRAIN TEST DATA

UNIT #2 TEST NO. 10-2-NH3 METHOD 202.1 PAGE 1 OF 1
TEST CONDITION AMB. TEMP., °F PROJECT # 12598
METER VOL. (START/END) 958.515 / 989.459 DATE 10-8-92

...ENT INFO:

...o.	North
...d.	1.06
ΔH = 1.0	—
...o	—
...thod	CEM
...nnecting	N
Line (Y/N)	Y
Mat'l	SS
Length	5'
Mat'l	—
Diam.	—
No.	—
Mat'l	—

Imp.	Mat'l	Wt.(End)	Wt.(Start)	Wt.(g)
#1	0.1N H2SO4	522.4	581.3	= 63.2
#2	0.1N H2SO4	589.3	584.0	= 5.3
#3	—	544.5	520.7	= 2.2
#4	SG	225.1	216.1	= 9.0
#5				=
Total				79.7

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

SAMPLE TRAIN LEAK CHECK:

	CFM	Vac.	Pitot	Init.
Pre-Test	0.002	14"	—	RM
Post-Test	0.002	9"	—	RM

PRE-TEST CALIBRATION CHECK:

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

...TIONS METER READING	TEMPERATURES, °F STACK	PROBE	METER IN	METER OUT	OVEN	IMP. OUT	O_2	VAC.	STATIC PRESS. iwg
58.515			92	80		ICE		8.0	
3.66			94	80		"		8.0	
8.79			103	80		"		8.0	
3.94			102	81		"		8.0	
9.18			105	80		"		8.0	
4.31			108	80		"		8.0	
9.459									

CHAIN OF CUSTODY INFORMATION	
Impingers Loaded	CF
Impingers Recovered	RM
Filter Loaded	—
Filter Recovered	—
Probe Wash	RM
TEST SUMMARY	
Calculated by:	CF
Checked by:	—
Sample Vol., c.f.	30.944
Stack Press., iwg	—
ΔH, iwg	1.5
ΔP, iwg	—
Meter Temp., °F	90.1
Stack Temp., °F	—
Water Collected, g	79.7
O_2/CO_2	11.6
Comments:	

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

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

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

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

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

θ = sample time, min.

ΔP = 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: #2
Location: HSAPH

Condition: Urea On
Load: 165 MW

	O2%	CO2%	CO ppm	NOx ppm
Analyzer Range:	10	25	100	250
Span Value:	7.93	22.15	55.84	90.79

Test #: 4-2-CEM Date: 10/6/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.05	0.00	0.00	1.25
System Span	7.83	22.00	56.00	88.50
Raw Average	2.41	10.49	3.52	105.72
System Zero	0.05	0.00	0.40	1.25
System Span	7.80	21.93	55.84	87.50
Corrected Average	2.41	10.58	3.33	109.34
System Bias Check				
Zero Pre-test	0.50%	0.00%	0.00%	0.50%
Zero Post-test	0.50%	0.00%	0.40%	0.50%
Span Pre-test	-0.96%	-0.60%	0.16%	-0.92%
Span Post-test	-1.26%	-0.88%	0.00%	-1.32%

Test #: 5-2-CEM Date: 10/6/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.02	0.00	0.10	0.75
System Span	7.85	22.05	55.70	89.50
Raw Average	2.41	10.50	5.95	102.75
System Zero	0.02	0.00	0.10	0.50
System Span	7.90	21.98	55.84	90.75
Corrected Average	2.41	10.56	5.87	103.60
System Bias Check				
Zero Pre-test	0.20%	0.00%	0.10%	0.30%
Zero Post-test	0.20%	0.00%	0.10%	0.20%
Span Pre-test	-0.76%	-0.40%	-0.14%	-0.52%
Span Post-test	-0.26%	-0.68%	0.00%	-0.02%
Test Average	2.41	10.57	4.60	106.47

CARNOT EMISSIONS TRAILER
CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: #2
Location: HSAPH

Condition: Urea Off
Load: 138 MW

	O2%	CO2%	CO ppm	NOx ppm
Analyzer Range:	10	25	100	250
Span Value:	4.99	15.00	55.84	90.79

Test #: 6-2-CEM Date: 10/7/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.03	0.00	0.30	0.75
System Span	4.97	14.75	55.84	88.25
Raw Average	3.37	9.82	1.00	80.68
System Zero	0.02	0.00	0.30	0.75
System Span	4.93	14.70	55.90	88.30
Corrected Average	3.39	10.00	0.70	82.91
System Bias Check				
Zero Pre-test	0.30%	0.00%	0.30%	0.30%
Zero Post-test	0.20%	0.00%	0.30%	0.30%
Span Pre-test	-0.20%	-1.00%	0.00%	-1.02%
Span Post-test	-0.60%	-1.20%	0.06%	-1.00%

Test #: 7-2-CEM Date: 10/7/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.02	0.00	0.20	0.50
System Span	4.92	14.75	55.50	88.00
Raw Average	3.61	9.69	0.72	80.78
System Zero	0.02	0.05	0.20	0.50
System Span	4.91	14.70	55.84	87.50
Corrected Average	3.66	9.86	0.52	83.54
System Bias Check				
Zero Pre-test	0.20%	0.00%	0.20%	0.20%
Zero Post-test	0.20%	0.20%	0.20%	0.20%
Span Pre-test	-0.70%	-1.00%	-0.34%	-1.12%
Span Post-test	-0.80%	-1.20%	0.00%	-1.32%
Test Average	3.52	9.93	0.61	83.22

CARNOT EMISSIONS TRAILER
CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: #2
Location: HSAPH

Condition: Urea Off
Load: 165 MW

	O2%	CO2%	CO ppm	NOx ppm
Analyzer Range:	10	25	100	250
Span Value:	4.99	15.00	55.84	90.79

Test #: 1-2-CEM Date: 10/6/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.05	0.00	0.00	0.50
System Span	4.93	14.75	56.00	87.30
Raw Average	2.80	10.03	0.80	141.12
System Zero	0.06	0.03	0.00	1.75
System Span	4.94	14.58	55.90	87.50
Corrected Average	2.81	14.58	0.80	147.32
System Bias Check				
Zero Pre-test	0.50%	0.00%	0.00%	0.20%
Zero Post-test	0.60%	0.12%	0.00%	0.70%
Span Pre-test	-0.60%	-1.00%	0.16%	-1.40%
Span Post-test	-0.50%	-1.68%	0.06%	-1.32%

Test #: 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: #2
Location: HSAPH

Condition: Urea Off
Load: 165 MW

	O2%	CO2%	CO ppm	NOx ppm
Analyzer Range:	10	25	100	250
Span Value:	7.93	22.15	55.84	90.79

Test #: 3-2-CEM Date: 10/6/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.02	0.00	0.00	0.50
System Span	7.80	21.68	55.84	90.00
Raw Average	2.41	10.40	1.90	141.52
System Zero	0.03	0.00	0.00	2.50
System Span	7.90	21.60	55.80	91.60
Corrected Average	2.42	14.58	1.90	142.36
System Bias Check				
Zero Pre-test	0.20%	0.00%	0.00%	0.20%
Zero Post-test	0.30%	0.00%	0.00%	1.00%
Span Pre-test	-1.26%	-1.88%	0.00%	-0.32%
Span Post-test	-0.26%	-2.20%	-0.04%	0.32%

Test #: 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: #2
Location: HSAPH

Condition: Urea On
Load: 165 MW

	O2%	CO2%	CO ppm	NOx ppm
Analyzer Range:	10	25	100	250
Span Value:	7.93	22.15	55.84	90.79

Test #: 4-2-CEM Date: 10/6/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.05	0.00	0.00	1.25
System Span	7.83	22.00	56.00	88.50
Raw Average	2.41	10.49	3.52	105.72
System Zero	0.05	0.00	0.40	1.25
System Span	7.80	21.93	55.84	87.50
Corrected Average	2.41	10.58	3.33	109.34
System Bias Check				
Zero Pre-test	0.50%	0.00%	0.00%	0.50%
Zero Post-test	0.50%	0.00%	0.40%	0.50%
Span Pre-test	-0.96%	-0.60%	0.16%	-0.92%
Span Post-test	-1.26%	-0.88%	0.00%	-1.32%

Test #: 5-2-CEM Date: 10/6/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.02	0.00	0.10	0.75
System Span	7.85	22.05	55.70	89.50
Raw Average	2.41	10.50	5.95	102.75
System Zero	0.02	0.00	0.10	0.50
System Span	7.90	21.98	55.84	90.75
Corrected Average	2.41	10.56	5.87	103.60
System Bias Check				
Zero Pre-test	0.20%	0.00%	0.10%	0.30%
Zero Post-test	0.20%	0.00%	0.10%	0.20%
Span Pre-test	-0.76%	-0.40%	-0.14%	-0.52%
Span Post-test	-0.26%	-0.68%	0.00%	-0.02%
Test Average	2.41	10.57	4.60	106.47

CARNOT EMISSIONS TRAILER
CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: #2
Location: HSAPH

Condition: Urea Off
Load: 138 MW

	O2%	CO2%	CO ppm	NOx ppm
Analyzer Range:	10	25	100	250
Span Value:	4.99	15.00	55.84	90.79

Test #: 6-2-CEM Date: 10/7/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.03	0.00	0.30	0.75
System Span	4.97	14.75	55.84	88.25
Raw Average	3.37	9.82	1.00	80.68
System Zero	0.02	0.00	0.30	0.75
System Span	4.93	14.70	55.90	88.30
Corrected Average	3.39	10.00	0.70	82.91
System Bias Check				
Zero Pre-test	0.30%	0.00%	0.30%	0.30%
Zero Post-test	0.20%	0.00%	0.30%	0.30%
Span Pre-test	-0.20%	-1.00%	0.00%	-1.02%
Span Post-test	-0.60%	-1.20%	0.06%	-1.00%

Test #: 7-2-CEM Date: 10/7/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.02	0.00	0.20	0.50
System Span	4.92	14.75	55.50	88.00
Raw Average	3.61	9.69	0.72	80.78
System Zero	0.02	0.05	0.20	0.50
System Span	4.91	14.70	55.84	87.50
Corrected Average	3.66	9.86	0.52	83.54
System Bias Check				
Zero Pre-test	0.20%	0.00%	0.20%	0.20%
Zero Post-test	0.20%	0.20%	0.20%	0.20%
Span Pre-test	-0.70%	-1.00%	-0.34%	-1.12%
Span Post-test	-0.80%	-1.20%	0.00%	-1.32%
Test Average	3.52	9.93	0.61	83.22

CARNOT EMISSIONS TRAILER
CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: #2
Location: HSAPH

Condition: Urea On
Load: 138 MW

	O2%	CO2%	CO ppm	NOx ppm
Analyzer Range:	10	25	100	250
Span Value:	4.99	15.00	55.84	90.79

Test #: 8-2-CEM Date: 10/7/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.02	0.00	0.23	0.25
System Span	4.88	14.75	55.84	89.25
Raw Average	3.47	9.75	1.52	69.60
System Zero	0.03	0.00	0.20	0.75
System Span	4.87	14.70	55.84	89.25
Corrected Average	3.54	9.93	1.31	70.69
System Bias Check				
Zero Pre-test	0.20%	0.00%	0.23%	0.10%
Zero Post-test	0.30%	0.00%	0.20%	0.30%
Span Pre-test	-1.10%	-1.00%	0.00%	-0.62%
Span Post-test	-1.20%	-1.20%	0.00%	-0.62%

Test #: 9-2-CEM Date: 10/7/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.01	0.00	0.20	0.50
System Span	4.96	14.80	55.84	90.52
Raw Average	3.57	9.75	1.17	71.72
System Zero	0.02	0.00	0.20	0.50
System Span	4.95	14.83	55.84	90.25
Corrected Average	3.59	9.87	0.97	71.94
System Bias Check				
Zero Pre-test	0.10%	0.00%	0.20%	0.20%
Zero Post-test	0.20%	0.00%	0.20%	0.20%
Span Pre-test	-0.30%	-0.80%	0.00%	-0.11%
Span Post-test	-0.40%	-0.68%	0.00%	-0.22%
Test Average	3.57	9.90	1.14	71.31

CARNOT EMISSIONS TRAILER
CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: #2
Location: HSAPH

Condition: Urea On
Load: 40 MW

	O2%	CO2%	CO ppm	NOx ppm
Analyzer Range:	10	25	100	250
Span Value:	4.99	15.00	55.84	49.86

Test #: 10-2-CEM Date: 10/8/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.02	0.00	0.30	0.30
System Span	4.97	14.93	55.84	48.50
Raw Average	7.29	7.66	0.90	86.42
System Zero	0.03	0.00	0.50	-0.25
System Span	4.97	14.85	55.84	48.00
Corrected Average	7.33	7.72	0.50	89.32
System Bias Check				
Zero Pre-test	0.20%	0.00%	0.30%	0.12%
Zero Post-test	0.30%	0.00%	0.50%	-0.10%
Span Pre-test	-0.20%	-0.28%	0.00%	-0.54%
Span Post-test	-0.20%	-0.60%	0.00%	-0.74%

Test #: 11-2-CEM Date: 10/8/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.03	0.00	0.10	0.30
System Span	4.98	14.80	55.84	48.50
Raw Average	7.41	7.55	0.80	90.25
System Zero	0.02	0.00	0.10	1.70
System Span	5.00	14.90	55.84	49.50
Corrected Average	7.42	7.63	0.70	92.71
System Bias Check				
Zero Pre-test	0.30%	0.00%	0.10%	0.12%
Zero Post-test	0.20%	0.00%	0.10%	0.68%
Span Pre-test	-0.10%	-0.80%	0.00%	-0.54%
Span Post-test	0.10%	-0.40%	0.00%	-0.14%
Test Average	7.38	7.67	0.60	91.02

CARNOT EMISSIONS TRAILER
CONTINUOUS GASEOUS MEASUREMENTS SUMMARY

Client: SCE Alamitos
Unit: #2
Location: HSAPH

Condition: Urea Off
Load: 40 MW

	O2%	CO2%	CO ppm	NOx ppm
Analyzer Range:	10	25	100	250
Span Value:	4.99	15.00	55.84	90.52

Test #: 12-2-CEM Date: 10/8/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.03	0.00	0.00	0.25
System Span	4.99	14.80	55.84	87.00
Raw Average	7.31	7.55	0.32	103.48
System Zero	0.02	0.00	0.00	0.25
System Span	4.97	14.80	55.70	85.60
Corrected Average	7.34	7.65	0.32	108.59
System Bias Check				
Zero Pre-test	0.30%	0.00%	0.00%	0.10%
Zero Post-test	0.20%	0.00%	0.00%	0.10%
Span Pre-test	0.00%	-0.80%	0.00%	-1.41%
Span Post-test	-0.20%	-0.80%	-0.14%	-1.97%

Test #: 13-2CEM Date: 10/8/92

	O2%	CO2%	CO ppm	NOx ppm
System Zero	0.03	0.00	0.10	0.00
System Span	4.99	14.75	55.84	86.25
Raw Average	7.34	7.50	0.40	103.30
System Zero	0.02	0.00	0.10	0.50
System Span	5.00	14.70	55.84	87.50
Corrected Average	7.34	7.64	0.30	107.68
System Bias Check				
Zero Pre-test	0.30%	0.00%	0.10%	0.00%
Zero Post-test	0.20%	0.00%	0.10%	0.20%
Span Pre-test	0.00%	-1.00%	0.00%	-1.71%
Span Post-test	0.10%	-1.20%	0.00%	-1.21%
Test Average	7.34	7.65	0.31	108.14

CARNOT

11/24/92

Particulate

SOURCE TEST DATA SUMMARY WORKSHEET

Client/Location.....	SCE	Parameter.....	Urea Off
Unit.....	2	Fuel.....	Natural Gas
Sample Location.....	CSAPH	Data By.....	EF
Test Number.....	1-2-PM	3-2-PM	Average
Reference Temperature, F.....	60	60	
Test Date.....	10/6/92	10/6/92	
Test Method.....	SCAQMD 5.3	SCAQMD 5.3	SCAQMD 5.3
Sample Train.....	71-4	71-4	-
Pitot Factor	0.840	0.840	-
Meter Calibration Factor.....	1.004	1.004	-
Stack Area (sq ft).....	68.43	68.43	-
Sample Time (Min).....	84	84	84
Barometric Pressure (in Hg).....	30.08	29.94	30.08
Nozzle Diam (in).....	0.185	0.194	-
Start/Stop Time.....	900/1027	1305/1449	-
Stack Pressure (iwg).....	5.90	7.10	6.50
Stack Temperature (F).....	314.5	329.0	321.8
Delta P (iwg).....	1.2868	1.5245	1.4057
Meter Volume (acf).....	44.316	51.468	47.892
Meter Temperature (F).....	82.0	97.8	89.9
Meter Pressure (iwg).....	1.157	1.152	1.155
Liquid Volume (ml).....	150.7	185.6	168.2
Stack O2 (%).....	7.7	7.4	7.6
Stack CO2 (%).....	7.8	7.9	7.9
Standard Sample Volume (SCF)	43.034	48.341	45.688
Moisture Fraction.....	0.140	0.151	0.146
Molecular Weight. (wet).....	27.94	27.81	27.87
Stack Gas Velocity (ft/sec).....	77.53	85.44	81.48
Stack Flow Rate (wacfm).....	318,307	350,796	334,551
Stack Flow Rate (dscfm).....	187,400	199,694	193,547
Isokinetic Ratio (%).....	100.18	96.04	98.11
Particulate Catch, mg.....	**2.80**	**1.80**	**2.30**
Grain Loading gr/dscf.....	**0.0010**	**0.0006**	**0.0008**
Grain Loading @ 12% CO2.....	**0.0015**	**0.0009**	**0.0012**
Part emission lb/hr.....	**1.61**	**0.98**	**1.30**

CARNOT

11/24/92

Particulate

SOURCE TEST DATA SUMMARY WORKSHEET

Client/Location	SCE	Parameter		Urea On
Unit	2	Fuel		Natural Gas
Sample Location	CSAPH	Data By		EF
Test Number	4-2-PM	5-2-PM		Average
Reference Temperature, F	60	60		
Test Date	10/6/92	10/6/92		
Test Method	SCAQMD 5.3	SCAQMD 5.3		SCAQMD 5.3
Sample Train	71-4	71-4		-
Pitot Factor	0.840	0.840		-
Meter Calibration Factor	1.004	1.004		-
Stack Area (sq ft)	68.43	68.43		-
Sample Time (Min)	84	84		84
Barometric Pressure (in Hg)	30.05	29.92		30.05
Nozzle Diam (in)	0.185	0.185		-
Start/Stop Time	1530/1700	1740/1907		-
Stack Pressure (iwg)	6.80	6.50		6.65
Stack Temperature (F)	310.4	319.6		315.0
Delta P (iwg)	1.7800	1.4044		1.5922
Meter Volume (acf)	55.541	48.381		51.961
Meter Temperature (F)	106.8	97.4		102.1
Meter Pressure (iwg)	1.369	1.081		1.225
Liquid Volume (ml)	213.0	175.0		194.0
Stack O2 (%)	7.4	7.4		7.4
Stack CO2 (%)	7.9	7.9		7.9
Standard Sample Volume (SCF)	51.548	45.436		48.492
Moisture Fraction	0.161	0.152		0.156
Molecular Weight. (wet)	27.70	27.80		27.75
Stack Gas Velocity (ft/sec)	91.28	81.61		86.44
Stack Flow Rate (wacfm)	374,765	335,064		354,915
Stack Flow Rate (dscfm)	216,630	192,539		204,585
Isokinetic Ratio (%)	103.81	102.95		103.38
Particulate Catch, mg	2.10	2.30		2.20
Grain Loading gr/dscf	0.0006	0.0008		0.0007
Grain Loading @ 12% CO2	0.0010	0.0012		0.0011
Part emission lb/hr	1.17	1.29		1.23

CARNOT

11/24/92

Particulate

SOURCE TEST DATA SUMMARY WORKSHEET

Client/Location.....	SCE	Parameter.....	Urea Off
Unit.....	2	Fuel.....	Natural Gas
Sample Location.....	CSAPH	Data By.....	EF
Test Number.....	6-2-PM	7-2-PM	Average
Reference Temperature, F.....	60	60	
Test Date.....	10/7/92	10/7/92	
Test Method.....	SCAQMD 5.3	SCAQMD 5.3	SCAQMD 5.3
Sample Train.....	71-4	71-4	-
Pitot Factor	0.840	0.840	-
Meter Calibration Factor.....	1.004	1.004	-
Stack Area (sq ft).....	68.43	68.43	-
Sample Time (Min).....	84	84	84
Barometric Pressure (in Hg).....	30.01	30.05	30.01
Nozzle Diam (in).....	0.185	0.185	-
Start/Stop Time.....	0830/1012	1056/1222	-
Stack Pressure (iwg).....	7.80	5.80	6.80
Stack Temperature (F).....	300.2	339.6	319.9
Delta P (iwg).....	0.8762	1.4204	1.1483
Meter Volume (acf).....	35.308	46.503	40.906
Meter Temperature (F).....	81.5	96.1	88.8
Meter Pressure (iwg).....	0.628	1.113	0.871
Liquid Volume (ml).....	118.8	156.4	137.6
Stack O2 (%).....	8.5	8.1	8.3
Stack CO2 (%).....	7.2	7.4	7.3
Standard Sample Volume (SCF)	34.194	43.966	39.080
Moisture Fraction.....	0.139	0.142	0.140
Molecular Weight. (wet).....	27.89	27.87	27.88
Stack Gas Velocity (ft/sec).....	63.36	82.91	73.13
Stack Flow Rate (wacfm).....	260,131	340,393	300,262
Stack Flow Rate (dscfm).....	156,560	193,454	175,007
Isokinetic Ratio (%).....	95.28	99.15	97.22
Particulate Catch, mg.....	0.40	1.10	0.75
Grain Loading gr/dscf.....	0.0002	0.0004	0.0003
Grain Loading @ 12% CO2.....	0.0003	0.0006	0.0005
Part emission lb/hr.....	0.24	0.64	0.44

CARNOT

11/24/92

Particulate

SOURCE TEST DATA SUMMARY WORKSHEET

Client/Location	SCE	Parameter	Urea On
Unit	2	Fuel	Natural Gas
Sample Location	CSAPH	Data By	EF
Test Number	8-2-PM	9-2-PM	Average
Reference Temperature, F	60	60	
Test Date	10/7/92	10/7/92	
Test Method	SCAQMD 5.3	SCAQMD 5.3	SCAQMD 5.3
Sample Train	71-4	71-4	-
Pitot Factor	0.840	0.840	-
Meter Calibration Factor	1.004	1.004	-
Stack Area (sq ft)	68.43	68.43	-
Sample Time (Min)	84	84	84
Barometric Pressure (in Hg)	30.05	30.08	30.05
Nozzle Diam (in)	0.185	0.185	-
Start/Stop Time	1327/1457	1535/1704	-
Stack Pressure (iwg)	5.20	7.80	6.50
Stack Temperature (F)	342.3	298.5	320.4
Delta P (iwg)	1.2140	0.8672	1.0406
Meter Volume (acf)	46.085	39.244	42.665
Meter Temperature (F)	102.4	111.9	107.2
Meter Pressure (iwg)	1.054	0.716	0.885
Liquid Volume (ml)	159.2	126.3	142.8
Stack O2 (%)	8.2	7.8	8.0
Stack CO2 (%)	7.3	7.5	7.4
Standard Sample Volume (SCF)	43.075	36.075	39.575
Moisture Fraction	0.147	0.140	0.143
Molecular Weight. (wet)	27.81	27.90	27.86
Stack Gas Velocity (ft/sec)	76.92	62.88	69.90
Stack Flow Rate (wacfm)	315,813	258,176	286,995
Stack Flow Rate (dscfm)	177,634	155,921	166,778
Isokinetic Ratio (%)	105.79	100.94	103.36
Particulate Catch, mg	3.30	1.60	2.45
Grain Loading gr/dscf	0.0012	0.0007	0.0009
Grain Loading @ 12% CO2	0.0019	0.0011	0.0015
Part emission lb/hr	1.80	0.91	1.36

CARNOT

11/9/92

Particulate

SOURCE TEST DATA SUMMARY WORKSHEET

Client/Location.....	SCE	Parameter.....	Urea On
Unit.....	2	Fuel.....	Natural Gas
Sample Location.....	CSAPH	Data By.....	EF
Test Number.....	10-2-PM	11-2-PM	Average
Reference Temperature, F.....	60	60	
Test Date.....	10/8/92	10/8/92	
Test Method.....	SCAQMD 5.3	SCAQMD 5.3	SCAQMD 5.3
Sample Train.....	71-4	ES-19	-
Pitot Factor	0.840	0.840	-
Meter Calibration Factor.....	1.004	1.000	-
Stack Area (sq ft).....	68.43	68.43	-
Sample Time (Min).....	84	84	84
Barometric Pressure (in Hg).....	30.05	29.98	30.05
Nozzle Diam (in).....	0.220	0.250	-
Start/Stop Time.....	835/1012	1105/1233	-
Stack Pressure (iwg).....	10.00	9.00	9.50
Stack Temperature (F).....	282.2	335.4	308.8
Delta P (iwg).....	0.3706	0.2780	0.3243
Meter Volume (acf).....	33.493	39.735	36.614
Meter Temperature (F).....	86.5	94.8	90.6
Meter Pressure (iwg).....	0.732	0.707	0.720
Liquid Volume (ml).....	107.5	108.0	107.8
Stack O2 (%).....	11.6	11.5	11.6
Stack CO2 (%).....	5.4	5.5	5.5
Standard Sample Volume (SCF)	32.193	37.383	34.788
Moisture Fraction.....	0.134	0.118	0.126
Molecular Weight. (wet).....	27.81	28.00	27.90
Stack Gas Velocity (ft/sec).....	40.64	36.40	38.52
Stack Flow Rate (wacfm).....	166,878	149,461	158,170
Stack Flow Rate (dscfm).....	104,113	88,202	96,157
Isokinetic Ratio (%).....	95.39	101.25	98.32
Particulate Catch, mg.....	0.70	5.50	3.10
Grain Loading gr/dscf.....	0.0003	0.0023	0.0013
Grain Loading @ 12% CO2.....	0.0007	0.0050	0.0028
Part emission lb/hr.....	0.30	1.72	1.01

CARNOT

11/9/92

Particulate

SOURCE TEST DATA SUMMARY WORKSHEET

Client/Location.....	SCE	Parameter.....	Urea Off
Unit.....	2	Fuel.....	Natural Gas
Sample Location.....	CSAPH	Data By.....	EF
Test Number.....	12-2-PM	13-2-PM	Average
Reference Temperature, F.....	60	60	
Test Date.....	10/8/92	10/8/92	
Test Method.....	SCAQMD 5.3	SCAQMD 5.3	SCAQMD 5.3
Sample Train.....	ES-19	ES-19	-
Pitot Factor.....	0.840	0.840	-
Meter Calibration Factor.....	1.000	1.000	-
Stack Area (sq ft).....	68.43	68.43	-
Sample Time (Min).....	84	84	84
Barometric Pressure (in Hg).....	30.00	30.00	30.00
Nozzle Diam (in).....	0.250	0.250	-
Start/Stop Time.....	1215/1441	1515/1641	-
Stack Pressure (iwg).....	9.10	10.10	9.60
Stack Temperature (F).....	337.6	284.1	310.9
Delta P (iwg).....	0.2098	0.4322	0.3210
Meter Volume (acf).....	34.689	50.145	42.417
Meter Temperature (F).....	96.0	104.7	100.3
Meter Pressure (iwg).....	0.529	1.152	0.841
Liquid Volume (ml).....	91.8	134.3	113.1
Stack O2 (%).....	12.2	11.1	11.6
Stack CO2 (%).....	5.1	5.8	5.5
Standard Sample Volume (SCF)	32.572	46.428	39.500
Moisture Fraction.....	0.116	0.119	0.117
Molecular Weight. (wet).....	27.99	28.03	28.01
Stack Gas Velocity (ft/sec).....	31.66	43.81	37.73
Stack Flow Rate (wacfm).....	129,975	179,862	154,919
Stack Flow Rate (dscfm).....	76,778	113,817	95,297
Isokinetic Ratio (%).....	101.35	97.45	99.40
Particulate Catch, mg.....	0.70	0.80	0.75
Grain Loading gr/dscf.....	0.0003	0.0003	0.0003
Grain Loading @ 12% CO2.....	0.0008	0.0006	0.0007
Part emission lb/hr.....	0.22	0.26	0.24

CARNOT

11/9/92

Ammonia

SOURCE TEST DATA SUMMARY WORKSHEET

Client/Location.....	SCE	Parameter.....	165 MW
Unit.....	2	Fuel.....	Natural Gas
Sample Location.....	CSAPH	Data By.....	EF

Test Number.....	4-2-NH3	5-2-NH3		Average
Reference Temperature, F.....	60	60		
Test Date.....	10/6/92	10/6/92		
Test Method.....	NH3 Draft	NH3 Draft		NH3 Draft
Sample Train.....	North Outlet	North Outlet		-
Meter Calibration Factor.....	0.975	0.975		-
Sample Time (Min).....	30	30		30
Barometric Pressure (in Hg).....	30.05	29.92		30.05
Start/Stop Time.....	1610/1641	1810/1841		-
Meter Volume (acf).....	30.346	30.039		30.193
Meter Temperature (F).....	95.4	98.1		96.8
Meter Pressure (iwg).....	1.500	1.500		1.500
Liquid Volume (ml).....	107.4	106.3		106.9
Stack O2 (%).....	7.4	7.4		7.4
Stack CO2 (%).....	7.9	7.9		7.9
Standard Sample Volume (SCF)	27.916	27.382		27.649
Moisture Fraction.....	0.152	0.153		0.152
Molecular Weight. (wet).....	27.81	27.79		27.80
AMMONIA ANALYSIS				
NH3 ppm wt in solution.....	3.61	10.05		6.83
Sample volume (ml).....	630	640		635
NH3 ppmV in flue gas.....	**4.0**	**11.5**		**7.8**
NH3 ppmV @ 3%O2.....	**5.3**	**15.3**		**10.3**

CARNOT

11/9/92

Ammonia

SOURCE TEST DATA SUMMARY WORKSHEET

Client/Location.....	SCE	Parameter.....		138 MW
Unit.....	2	Fuel.....		Natural Gas
Sample Location.....	CSAPH	Data By.....		EF
Test Number.....	8-2-NH3	9-2-NH3		Average
Reference Temperature, F.....	60	60		
Test Date.....	10/7/92	10/7/92		
Test Method.....	NH3 Draft	NH3 Draft		NH3 Draft
Sample Train.....	North Outlet	North Outlet		-
Meter Calibration Factor.....	0.975	0.975		-
Sample Time (Min).....	30	30		30
Barometric Pressure (in Hg).....	30.05	29.99		30.05
Start/Stop Time.....	1400/1431	1615/1646		-
Meter Volume (acf).....	30.455	30.096		30.276
Meter Temperature (F).....	89.0	107.4		98.2
Meter Pressure (iwg).....	1.500	1.500		1.500
Liquid Volume (ml).....	98.5	106.3		102.4
Stack O2 (%).....	8.2	7.8		8.0
Stack CO2 (%).....	7.3	7.5		7.4
Standard Sample Volume (SCF)	28.343	27.047		27.695
Moisture Fraction.....	0.139	0.154		0.147
Molecular Weight. (wet).....	27.90	27.73		27.82
AMMONIA ANALYSIS				
NH3 ppm wt in solution.....	3.25	7.37		5.31
Sample volume (ml).....	580	560		570
NH3 ppmV in flue gas.....	3.3	7.5		5.4
NH3 ppmV @ 3%O2.....	4.6	10.2		7.4

CARNOT

11/9/92

Ammonia

SOURCE TEST DATA SUMMARY WORKSHEET

Client/Location.....	SCE	Parameter.....		40 MW
Unit.....	2	Fuel.....		Natural Gas
Sample Location.....	CSAPH	Data By.....		EF
Test Number.....	10-2-NH3	11-2-NH3		Average
Reference Temperature, F.....	60	60		
Test Date.....	10/8/92	10/8/92		
Test Method.....	NH3 Draft	NH3 Draft		NH3 Draft
Sample Train.....	North Outlet	North Outlet		-
Meter Calibration Factor.....	0.975	0.975		-
Sample Time (Min).....	30	30		30
Barometric Pressure (in Hg).....	30.05	30.05		30.05
Start/Stop Time.....	0900/0931	1116/1147		-
Meter Volume (acf).....	30.944	31.837		31.391
Meter Temperature (F).....	90.1	91.9		91.0
Meter Pressure (iwg).....	1.500	1.500		1.500
Liquid Volume (ml).....	79.7	85.3		82.5
Stack O2 (%).....	11.6	11.5		11.6
Stack CO2 (%).....	5.4	5.5		5.5
Standard Sample Volume (SCF)	28.741	29.474		29.107
Moisture Fraction.....	0.114	0.119		0.116
Molecular Weight. (wet).....	28.03	28.00		28.01
AMMONIA ANALYSIS				
NH3 ppm wt in solution.....	4.01	3.18		3.60
Sample volume (ml).....	595	475		535
NH3 ppmV in flue gas.....	4.1	2.5		3.3
NH3 ppmV @ 3%O2.....	7.8	4.8		6.3

CARNOT

SUBJECT NOx / NO Concentration JOB NO. 12598

SHEET NO. ___ of ___

COMPUTED BY [illegible] DATE ___ CHECKED BY ___ DATE ___

TEST #	NOx	NO
1-2	107.0	101.3
2-2	105.0	96.3
3-2	106.8	98.0
4-2	81.3	76.0
5-2	78.3	73.0
6-3	47.0	43.8
9-3	46.3	44.5
8-2	37.5	36.3
9-2	38.8	37.5
10-2	54.5	51.0
11-2	55.0	52.0
12-2	68.3	66.3

148161

APPENDIX E
LABORATORY REPORTS

PARTICULATE
SCAQMD 5.3, IN STACK FILTER

PROJECT # 12598

WATER BLANK mg/ml 0.0020 Front ½ 0.0040 Back ½

CLIENT/LOCATION SCE Alamitos 2

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 10/16/92

SAMPLE LOCATION CSA PH

DATA ANALYSIS DATE 10/16 92

TEST # 1-2-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	45-167	0.1020	0.1027	-0.7	—	/	0.0 ~~-0.7~~
2. PROBE AND NOZZLE WASH	5099	28.68355	28.68245	1.1	0.2 ✓	100/100	0.9 ✓
3. IMPINGER a. WATER FRACTION	5120	28.8604	28.85835	2.05 ✓	1.24 ✓	620/310	1.6 ✓
b. ORGANIC EXTRACTION 125 ml $MeCl_2$	5108	28.9748	28.9745	0.3	0.17 ✓	620/310	0.3 ✓
				.		/	.
				.		/	.
				.		/	.

TOTAL PARTICULATE = 2.8 mg ✓

METHOD OF SAMPLE PREP/NOTES

CARNOT

PML-050

PARTICULATE
SCAQMD 5.3, IN STACK FILTER

PROJECT # 12598 WATER BLANK mg/ml 0.0020 Front ½ 0.0040 Back ½

CLIENT/LOCATION SCE Alamitos 2 $MeCl_2$ BLANK mg/ml 0.0013 SAMPLE DATE 10/6/92

SAMPLE LOCATION CSAPH DATA ANALYSIS DATE 10/19/92

TEST # 3-2-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	45165A 45-200B	0.10515 0.1044	0.10515 0.1042	0.0 0.2	—	/	0.0 0.2
2. PROBE AND NOZZLE WASH	5100	28.54365	28.5425	1.15	0.16	78/78	1.0
3. IMPINGER a. WATER FRACTION	5121	28.3984	28.39665	1.75	1.48	740/370	0.5
b. ORGANIC EXTRACTION 125 ml $MeCl_2$	5109	28.79395	28.7937	0.25	0.17	740/370	0.2
				.		/	.
				.		/	.
				.		/	.

TOTAL PARTICULATE = 1.9 mg

METHOD OF SAMPLE PREP/NOTES

PML-050 CARNOT

PARTICULATE
SCAQMD 5.3, IN STACK FILTER

PROJECT # 12598

WATER BLANK mg/ml 0.0020 Front½ 0.0040 Back½

CLIENT/LOCATION SCE Alamitos 2

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 10/16/92

SAMPLE LOCATION CSAPH

DATA ANALYSIS DATE 10/19/92

TEST # 4-2-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	45-199	0.1048	0.10425	0.55	—	/	0.6
2. PROBE AND NOZZLE WASH	5101	28.56295	28.5616	1.35	0.24	120 ~~790~~ / 120 390	1.1
3. IMPINGER a. WATER FRACTION	5122	28.55965	28.55825	1.40	1.56	790/390	-0.0
b. ORGANIC EXTRACTION 125 ml $MeCl_2$	5110	27.9675	27.9668	0.35	0.17	790/390	0.4
				.		/	.
				.		/	.
				.		/	.

TOTAL PARTICULATE = 2.1 mg

METHOD OF SAMPLE PREP/NOTES

PML-050

CARNOT

PARTICULATE
SCAQMD 5.3, IN STACK FILTER

PROJECT # 12598

WATER BLANK mg/ml 0.0020 Front 1/2, 0.0040 Back 1/2

CLIENT/LOCATION SCE Alamitos 2

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 10, 6, 92

SAMPLE LOCATION CSAPH

DATA ANALYSIS DATE 10/19/92

TEST # 5-2-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	45-178	0.1058	0.1053	0.5	—	/	0.5
2. PROBE AND NOZZLE WASH	5102	28.49595	28.4952	0.75	0.12	60/60	0.6
3. IMPINGER a. WATER FRACTION	5127	28.66175	28.6602	1.55	1.12	510/280	0.9
b. ORGANIC EXTRACTION 125 ml $MeCl_2$	5123	28.2809	28.2806	0.3	0.17	570/280	0.3
				.		/	.
				.		/	.
				.		/	.

TOTAL PARTICULATE = 2.3 mg

METHOD OF SAMPLE PREP/NOTES

CARNOT

PML-050

PARTICULATE
SCAQMD 5.3, IN STACK FILTER

PROJECT # 12598

CLIENT/LOCATION SCE Alamitos 2

SAMPLE LOCATION CSAPH

TEST # 6-2-PM

WATER BLANK mg/ml 0.0020 Front ½ 0.0040 Back ½

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 10/7/92

DATA ANALYSIS DATE 10/19/92

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	47-448	0.1104	0.1104	0.0	—	/	0.0
2. PROBE AND NOZZLE WASH	5111	28.4579	28.45745	0.45	0.34	168/168	0.1
3. IMPINGER a. WATER FRACTION	5128	27.5152	27.5142	1.0	128	640/320	-0.0
b. ORGANIC EXTRACTION 125 ml $MeCl_2$	5124	30.2839	30.28355	0.35	0.17	640/320	0.4
				.		/	.
				.		/	.
				.		/	.

TOTAL PARTICULATE = 0.4 mg

METHOD OF SAMPLE PREP/NOTES

CARNOT

PML-050

PARTICULATE
SCAQMD 5.3, IN STACK FILTER

PROJECT # 12598 WATER BLANK mg/ml 0.0020 Front½ 0.0040 Back½

CLIENT/LOCATION SCE Alamitos 2 $MeCl_2$ BLANK mg/ml 0.0013 SAMPLE DATE 10, 7, 92

SAMPLE LOCATION CSAPH DATA ANALYSIS DATE 10,19,92

TEST # 7-2-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	47449	0.1107	0.1106	0.1	—	/	0.1
2. PROBE AND NOZZLE WASH	5112	27.58345	27.58265	0.8	0.24	120/120	0.6
3. IMPINGER a. WATER FRACTION	5129	28.17895	28.17785	1.1	1.2	610/300	-0.0
b. ORGANIC EXTRACTION 125 ml $MeCl_2$	5125	28.33765	28.3373	0.35	0.17	610/300	0.4
				.		/	.
				.		/	.
				.		/	.

TOTAL PARTICULATE = 1.1 mg

METHOD OF SAMPLE PREP/NOTES

PML-050

CARNOT

PARTICULATE
SCAQMD 5.3, IN STACK FILTER

PROJECT # 12598

CLIENT/LOCATION SCE Alamitos

SAMPLE LOCATION CSAPH

TEST # 8-2-PM

WATER BLANK mg/ml 0.0020 Front½ 0.0040 Back½

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 10,7,92

DATA ANALYSIS DATE 10,19,92

ANALYST INITIALS JRW

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	47450	0.1112	0.11045	0.75	—	1/	0.8
2. PROBE AND NOZZLE WASH	5113	29.82045	29.81895	1.5	0.3	150/150	1.2
3. IMPINGER a. WATER FRACTION	5140	29.0521	29.0503	1.8	1.16	590/290	1.3
b. ORGANIC EXTRACTION 125 ml $MeCl_2$	5139	28.5349	28.53485	0.05	0.17	590/290	-0.0
				.		/	.
				.		/	.
				.		/	.

TOTAL PARTICULATE = 3.3 mg

METHOD OF SAMPLE PREP/NOTES

CARNOT

PML-050

PARTICULATE
SCAQMD 5.3, IN STACK FILTER

PROJECT # 12598

WATER BLANK mg/ml 0.0020 Front 0.0040 Back

CLIENT/LOCATION SCE Alamitos 2

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 10/7/92

SAMPLE LOCATION CSAPH

DATA ANALYSIS DATE 10/19/92

TEST # 9-2-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	47-451	0.1106	0.10995	0.65	—	/	0.7
2. PROBE AND NOZZLE WASH	5114	27.70235	27.70155	0.8	0.2	98/98	0.6
3. IMPINGER a. WATER FRACTION	5130	27.7438	27.74255	1.25	1.28	640/320	-0.0
b. ORGANIC EXTRACTION 125 ml $MeCl_2$	5126	28.2293	28.2290	0.3	0.17	640/320	0.3
				.		/	.
				.		/	.
				.		/	.

TOTAL PARTICULATE = 1.6 mg

METHOD OF SAMPLE PREP/NOTES

CARNOT

PML-050

PARTICULATE
SCAQMD 5.3, IN STACK FILTER

PROJECT # 12598

WATER BLANK mg/ml 0.0020 Front ½ 0.0040 Back ½

CLIENT/LOCATION SCE Alamitos 2

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 10/8/92

SAMPLE LOCATION CSAPH

DATA ANALYSIS DATE 10/19/92

TEST # 10-2-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	47-452	0.11075	0.1107	+0.05	—	/	+0.1
2. PROBE AND NOZZLE WASH	5115	29.0833	29.0827	0.6	0.2	98/98	0.4
3. IMPINGER a. WATER FRACTION	5135	28.50915	28.50795	1.20	1.28	640/320	-0.0
b. ORGANIC EXTRACTION 125 ml $MeCl_2$	5131	28.93725	28.9370	0.25	0.17	640/320	0.2
				.		/	.
				.		/	.
				.		/	.

TOTAL PARTICULATE = 0.7 mg

METHOD OF SAMPLE PREP/NOTES

CARNOT

PML-050

PARTICULATE
SCAQMD 5.3, IN STACK FILTER

PROJECT # 12598

WATER BLANK mg/ml 0.0020 Front 1/2, 0.0040 Back 1/2

CLIENT/LOCATION SCE Alamitos 2

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 10/8/92

SAMPLE LOCATION CSAPH

DATA ANALYSIS DATE 10/19/92

TEST # 11-2-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	47-453	0.11145	0.1107	0.75	—	/	0.8
2. PROBE AND NOZZLE WASH	5116	31.44665	31.4465	0.5	0.12	62/62	0.4
3. IMPINGER a. WATER FRACTION	5136	27.75935	27.7561	3.25	1.08	540/270	~~2.3~~ 4.3
b. ORGANIC EXTRACTION 125 ml $MeCl_2$	5132	29.8063	29.80615	0.15	0.17	540/270	0.0
				.		/	.
				.		/	.
				.		/	.

TOTAL PARTICULATE = 5.5 mg

METHOD OF SAMPLE PREP/NOTES

PML-050

CARNOT

PARTICULATE
SCAQMD 5.3, IN STACK FILTER

PROJECT # 12598

CLIENT/LOCATION SCE Alamitos 2

SAMPLE LOCATION CSAPH

TEST # 12-2-PM

WATER BLANK mg/ml 0.0020 Front½ 0.0040 Back½

$MeCl_2$ BLANK mg/ml 0.0013

SAMPLE DATE 10/8/92

DATA ANALYSIS DATE 10/20/92

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	47454	0.10985	0.1095	0.35	—	/	0.4
2. PROBE AND NOZZLE WASH	5117	29.0564	29.05595	0.45	0.3	150/150	0.2
3. IMPINGER a. WATER FRACTION	5137	28.9399	28.9389	1.0	1.12	560/280	0.0
b. ORGANIC EXTRACTION 125 ml $MeCl_2$	5133	29.66535	29.66515	0.2	0.17	560/280	0.1
				.		/	.
				.		/	.
				.		/	.

TOTAL PARTICULATE = 0.7 mg

METHOD OF SAMPLE PREP/NOTES

CARNOT

PML-050

PARTICULATE
SCAQMD 5.3, IN STACK FILTER

PROJECT # 12598 WATER BLANK mg/ml 0.0020 Front 1/2 0.0040 Back 1/2

CLIENT/LOCATION SCE Alamitos 2 $MeCl_2$ BLANK mg/ml _____ SAMPLE DATE 10,8,92

SAMPLE LOCATION CSAPH DATA ANALYSIS DATE 10,19,92

TEST # 13-2-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	47-455	0.1090	0.1093	-0.2 ✓	—	/	-0.2
2. PROBE AND NOZZLE WASH	5118	28.9840	28.9834	0.6 ✓	0.12 ✓	61/61	0.5 ✓
3. IMPINGER a. WATER FRACTION	5138	27.83755	27.83635	1.2 ✓	1.08 ✓	540/270	0.2 ✓
b. ORGANIC EXTRACTION 125 ml $MeCl_2$	5134	28.9801	28.9799	0.2 ✓	0.17 ✓	540/270	0.1 ✓
				.		/	.
				.		/	.
				.		/	.

TOTAL PARTICULATE = .8 mg ✓ (4)

METHOD OF SAMPLE PREP/NOTES

CARNOT

PML-050

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October 14, 1992

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OCT 19 1992
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LTR/400/92
4037

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CARNOT
15991 Red Hill Ave., Suite 110
Tustin, CA 92680

re: 12598

Dear Kelly:

Please find enclosed the laboratory analysis reports, quality assurance summaries, and the original chain of custody forms for nine Tedlar bag samples received on October 7, & 8, 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.
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 13, 1992
Client:	CARNOT
P.O. No.:	9018
Project No.:	12598
Date Received:	October 7, 1992
Date Analyzed:	October 7, 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.:	92812-2	92812-3	92812-4	92812-5	92812-6
Sample I.D.:	1-2-HC	2-2-HC	3-2-HC	4-2-HC	5-2-HC
Components:	(Concentration in ppm, v/v)				
Methane	<1	1.27	<1	1.65	<1
TGNMO	13.8	15.2	17.5	18.0	19.4

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.: 12598

Component:	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in ppm, v/v)			
Methane	3-2-HC	<1	<1	---	---
TGNMO	3-2-HC	16.3	18.7	17.5	6.9

A set of 6 Tedlar bag samples laboratory numbers, 92812-(2-6) 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 1 repeat measurement from the sample set of 5 Tedlar bag samples is 6.9%.

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LABORATORY ANALYSIS REPORT

Methane & Total Gaseous Non-Methane Organics (TGNMO)
Analysis in Tedlar Bag Samples

Report Date:	October 14, 1992
Client:	CARNOT
P.O. No.:	9022
Project No.:	12598
Date Received:	October 8, 1992
Date Analyzed:	October 8, 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.:	92822-1	92822-2	92822-3	92822-4
Sample I.D.:	6-2-HC	7-2-HC	8-2-HC	9-2-HC
Components:	(Concentration in ppm, v/v)			
Methane	1.21	<1	<1	<1
TGNMO	14.6	13.6	13.6	13.1

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.: 12598

Component:	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in ppm, v/v)			
Methane	6-2-HC	1.18	1.24	1.21	2.5
TGNMO	6-2-HC	14.7	14.6	14.6	0.34

A set of 4 Tedlar bag samples laboratory numbers, 92822-(1-4) 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 2 repeat measurements from the sample set of 4 Tedlar bag samples is 1.4%.

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RECEIVED
OCT 21 1992
CARNOT

October 16, 1992

LTR/406/92
4037

Kelly Borkenhagen
CARNOT
15991 Red Hill Ave., Suite 110
Tustin, CA 92680

re: 12599

Dear Kelly:

Please find enclosed the laboratory analysis report, quality assurance summary, and the original chain of custody form for four Tedlar bag samples received on October 9, 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 ANALYSIS REPORT

Methane & Total Gaseous Non-Methane Organics (TGNMO)
Analysis in Tedlar Bag Samples

Report Date:	October 16, 1992
Client:	CARNOT
P.O. No.:	9023
Project No.:	12599
Date Received:	October 9, 1992
Date Analyzed:	October 9, 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.:	92832-22	92832-23	92832-24	92832-25
Sample I.D.:	10-2-HC	11-2-HC	12-2-HC	13-2-HC
Components:	(Concentration in ppm, v/v)			
Methane	<1	<1	<1	<1
TGNMO	11.1	11.3	10.3	14.8

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.: 12599

Component:	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in ppm, v/v)			
Methane	10-2-HC	<1	<1	---	---
TGNMO	10-2-HC	10.6	11.6	11.1	4.5
	13-2-HC	14.6	14.9	14.8	1.0

A set of 4 Tedlar bag samples laboratory numbers, 92832-(22-25) 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 2 repeat measurements from the sample set of 4 Tedlar bag samples is 2.8%.

AMMONIA BY NESSLERIZATION
SCAQMD DRAFT METHOD

CLIENT :	SCE	STORAGE DISK:	LOTUS DATA
LOCATION:	ALAMITOS #2	ANALYST:	JRH
PROJECT :	12598	CALIBRATION DATE:	10/8/92

SAMPLE ANALYSIS:

SAMPLE ID	SAMPLE DATE	ANALYSIS DATE	ALIQUOT FACTOR	ABSORBANCE (OD)	CONC. (ug/ml)	TOTAL VOLUME (ml)
4-2-NH3	10/6/92	10/8/92	8.33	0.021	3.61	630
4-2-NH3SPK(2)	10/6/92	10/8/92	10.00	0.033	5.03	---
5-2-NH3	10/6/92	10/8/92	25.0	0.015	10.0	640
5-2-NH3	10/6/92	10/8/92	25.0	0.016	10.1	640
8-2-NH3	10/7/92	10/8/92	6.25	0.036	3.25	580
9-2-NH3	10/7/92	10/8/92	12.5	0.048	7.37	560
10-2-NH3	10/8/92	10/8/92	6.25	0.057	4.01	595
11-2-NH3	10/8/92	10/8/92	6.25	0.034	3.18	475

NOTES:

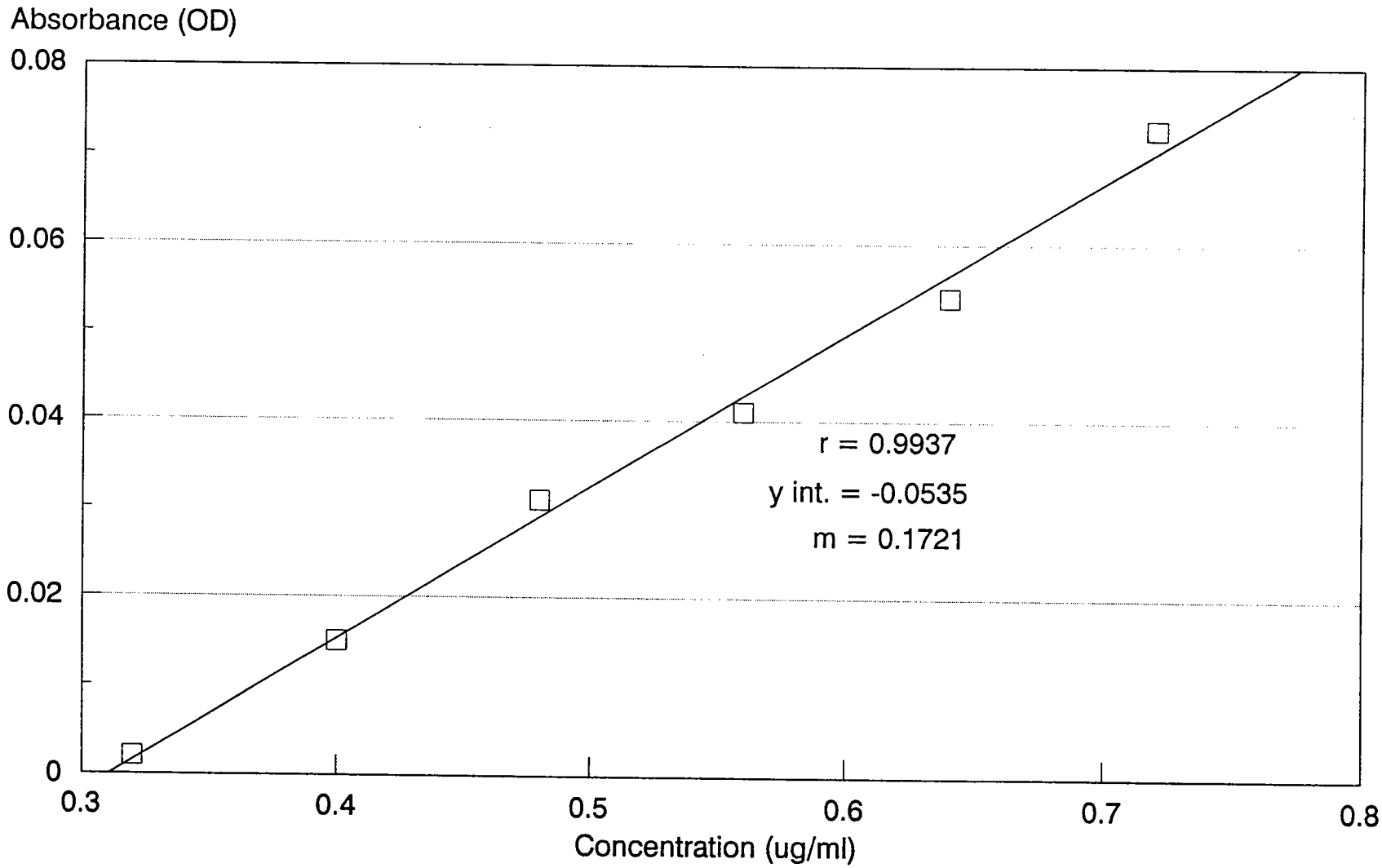
(1) A 0.48 ug/ml Ricca standard was analyzed periodically during sample analysis. Range of recovery was 100 to 101 percent. Average recovery was 101 percent.

(2) 1 ml of 12.1 ug/ml Ricca standard and 4 ml of sample were diluted to 50 ml.
Recovery = (conc. spike - conc. sample)/ conc. std * 100 = 88.43%

AMMONIA CALIBRATION CURVE

Calibration Date: 10/8/92

Analyst: JRH



AMMONIA BY NESSLERIZATION
SCAQMD DRAFT METHOD

CLIENT :	SCE	STORAGE DISK:	LOTUS DATA
LOCATION:	ALAMITOS #2	ANALYST:	JRH
PROJECT :	12598	CAL DATE:	10/8/92

STANDARDS :

EXPECTED CONC. (ug/ml)	ABSORBANCE (OD)	ACTUAL CONC. (ug/ml)	RESPONSE FACTOR (mg/OD)
0.00	0.000	0.31	
0.32	0.002	0.32	8.0000
0.40	0.015	0.40	1.3333
0.48	0.031	0.49	0.7742
0.56	0.041	0.55	0.6829
0.64	0.054	0.62	0.5926
0.72	0.073	0.73	0.4932
		AVG	2.2766

Y-Int.=	-0.0535
Slope =	0.1721
Corr. =	0.9937

LIMIT OF DETECTION:

SAMPLES	ABSORBANCE (OD)	CONC (ug/ml)
1	0.004	0.33
2	0.006	0.35
3	0.007	0.35
4	0.007	0.35
5	0.008	0.36
6	0.006	0.35
7	0.008	0.36

TRUE VALUE =	0.32
MEAN =	0.3490
STD DEV =	0.0081
MDL =	0.03
REPORTING LIMIT =	0.26

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 (%)
10/8/92	5-2-NH3	10.0	10.1	-1.4%

APPENDIX F

INSTRUMENT STRIP CHARTS

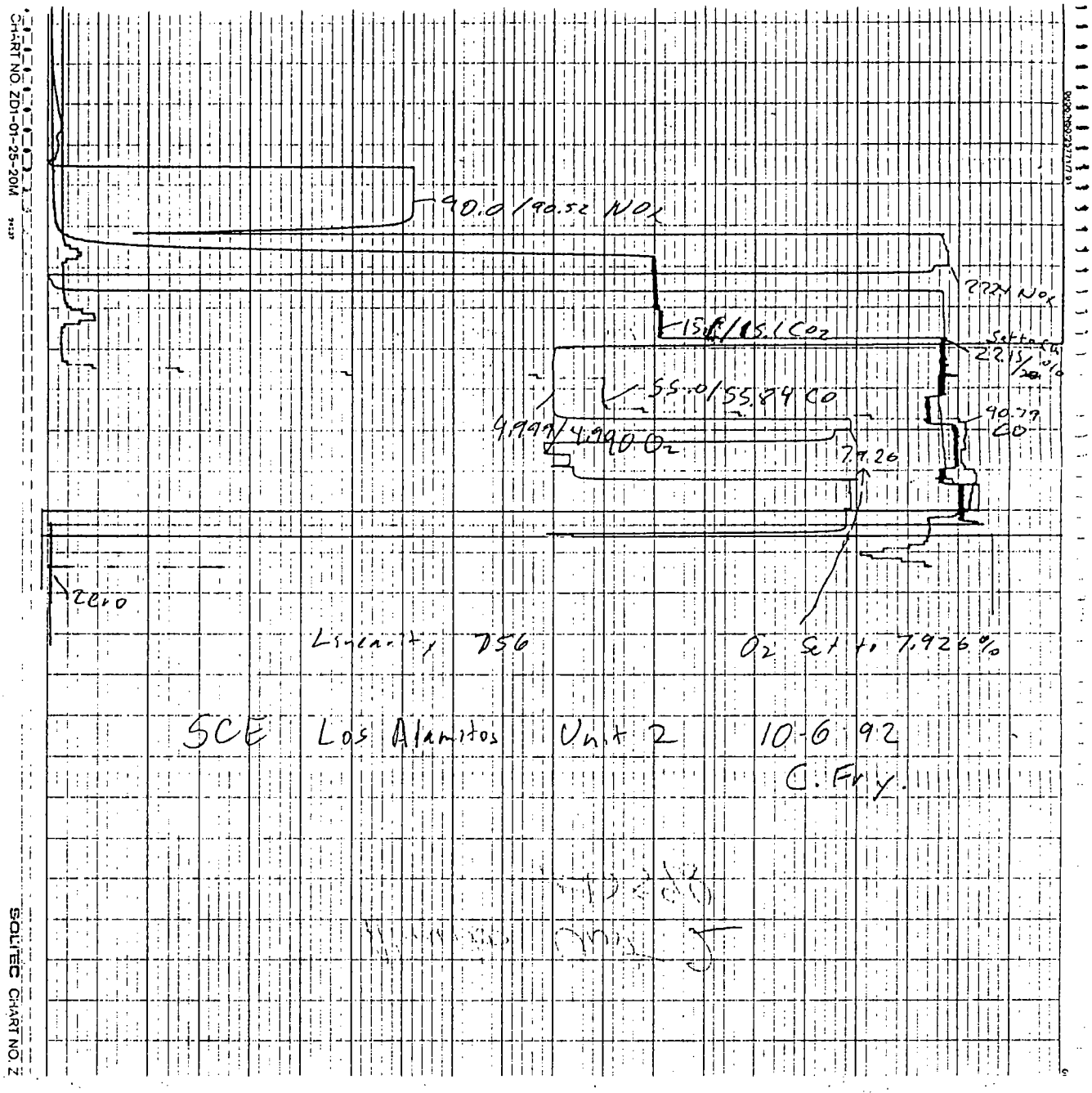
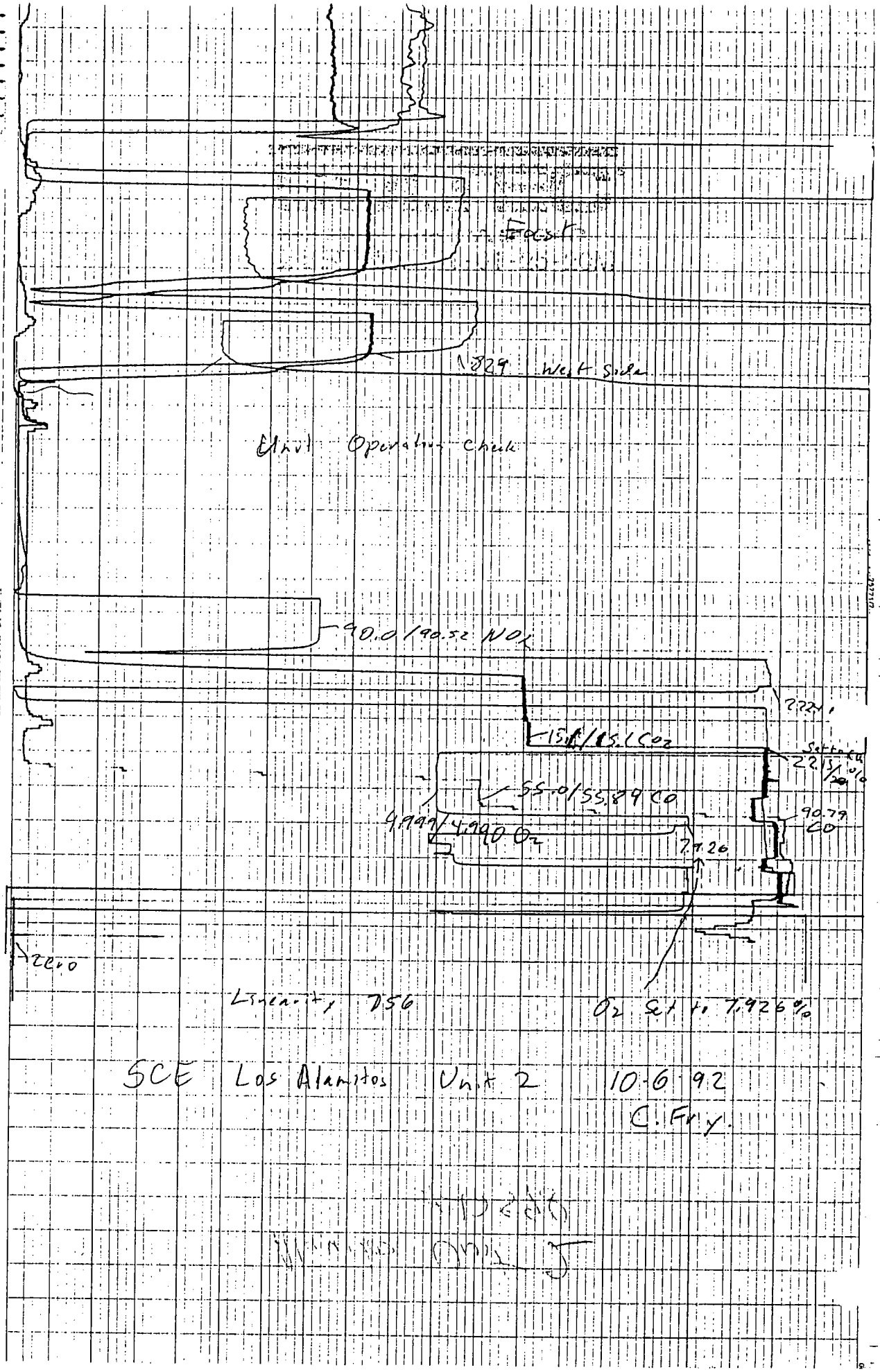


CHART NO. ZD1-01-25-20M
90.0/90.52 NOx
???? NOx
15.0/15.1 CO2
Setting 22.1 %
55.0/55.84 CO
90.79 CO
4.999/4.990 O2
7.926
Zero
Limit, 256
O2 Set to 7.926 %
SCE Los Alamitos Unit 2 10-6-92
C. Fry
SOLTEC CHART NO. Z



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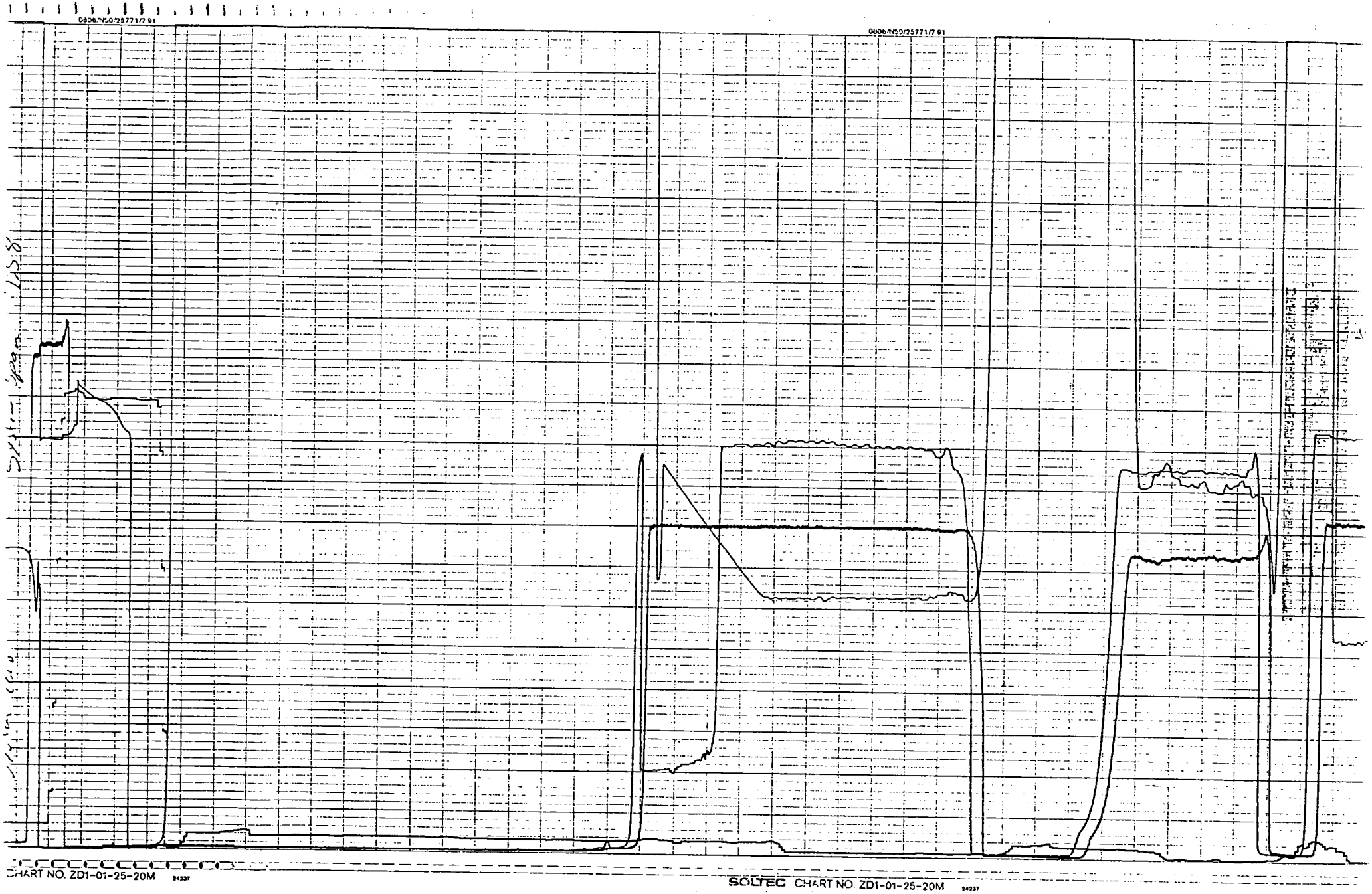
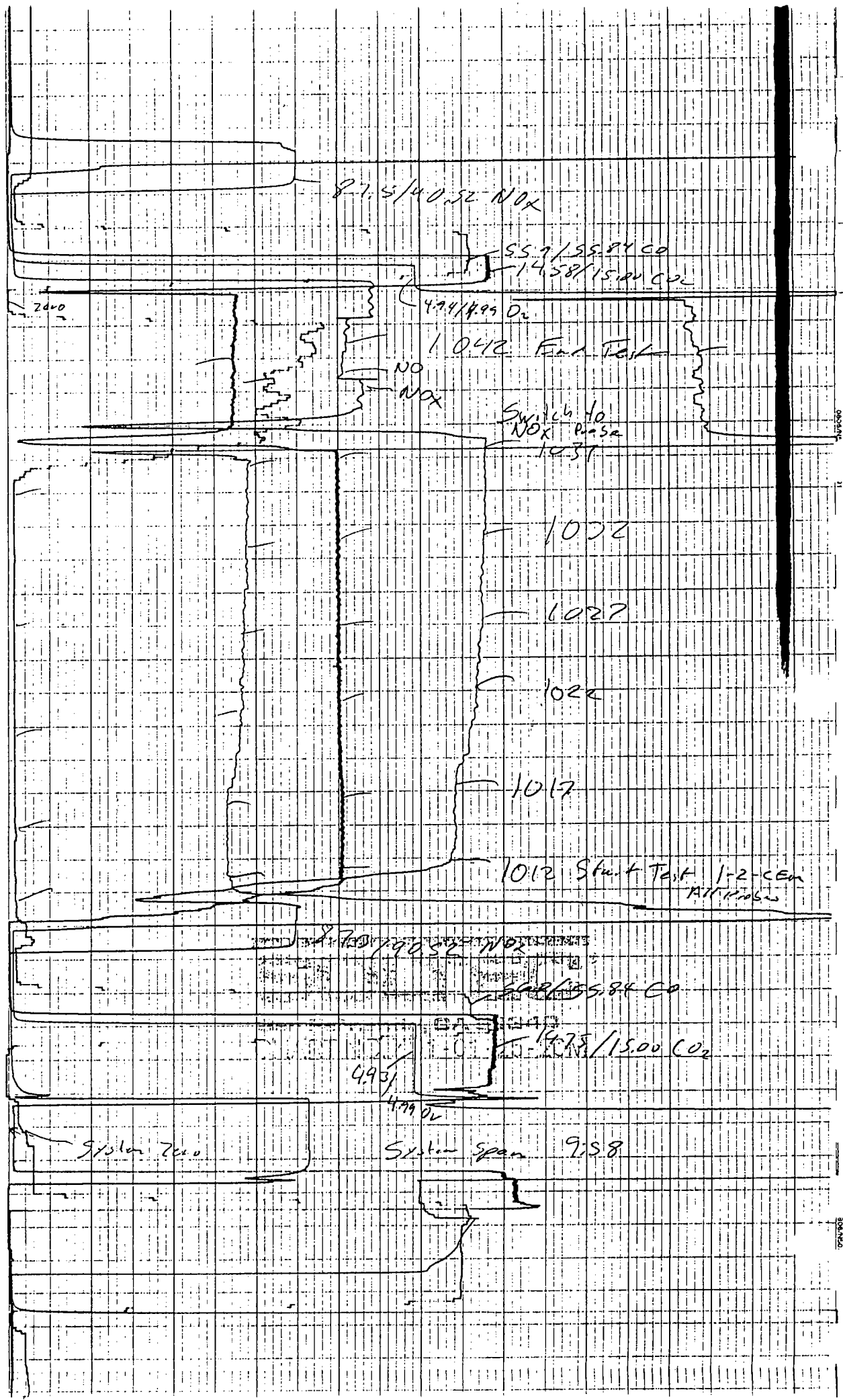
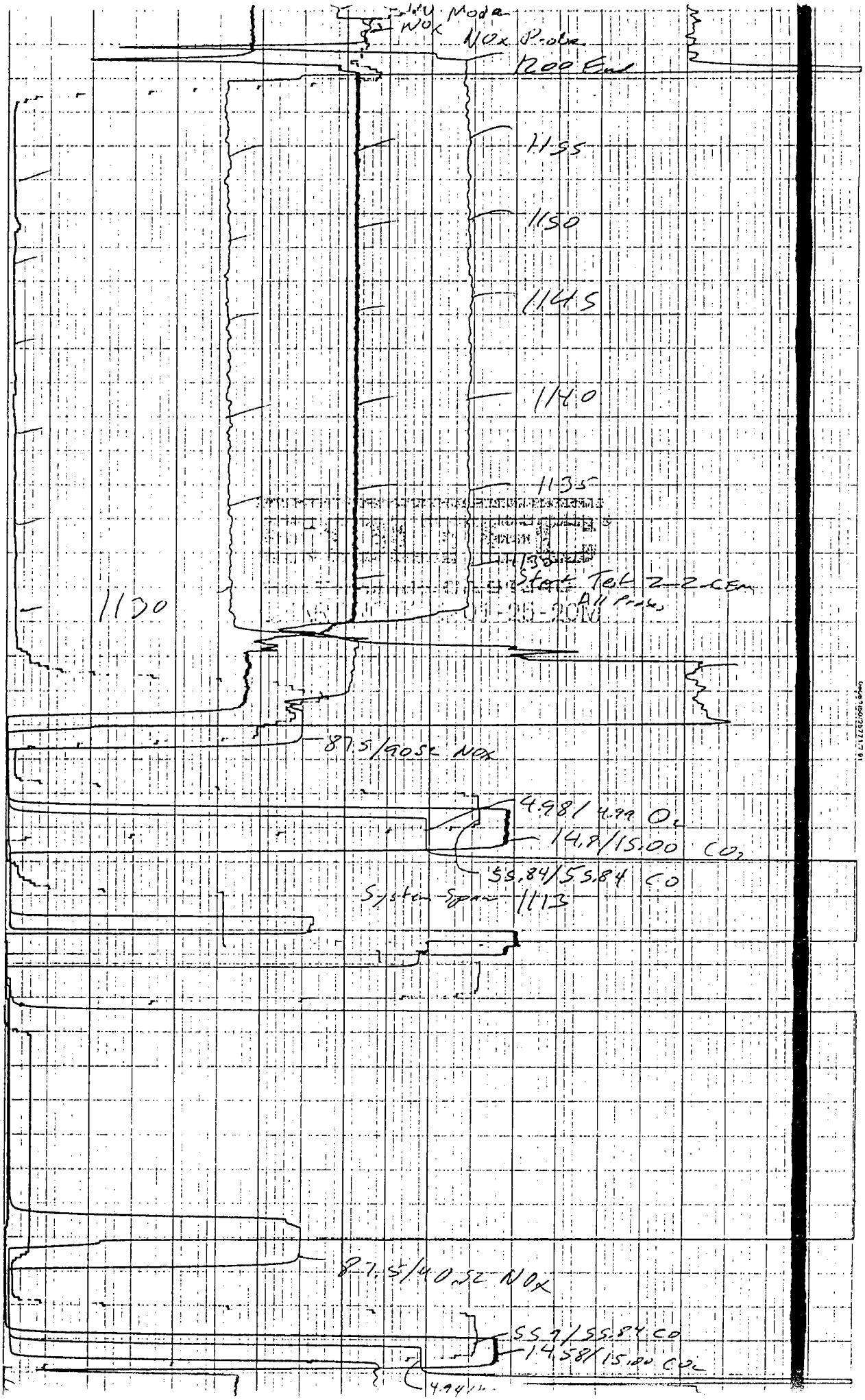
SOLTEC CHART NO. Z


0806/N50/25771/7.91
0806/N50/25771/7.91
CHART NO. ZD1-01-25-20M
SOLTEC CHART NO. ZD1-01-25-20M


87.5/40.52 NOx
55.91/55.84 CO
14.58/15.00 CO2
4.94/4.99 O2
Zero
1042 Final Test
NO
NOx
Switch to NOx Phase
1031
1032
1027
1022
1017
1012 Start Test 1-2-CEM
8 Point 19.82 NOx
55.84 CO
14.78/15.00 CO2
4.93/4.99 O2
System Zero
System Span 9.58
SOLTEC CHART NO. ZD1-01-25-20M
SOLTEC CHART NO. ZD1-01-25-20M



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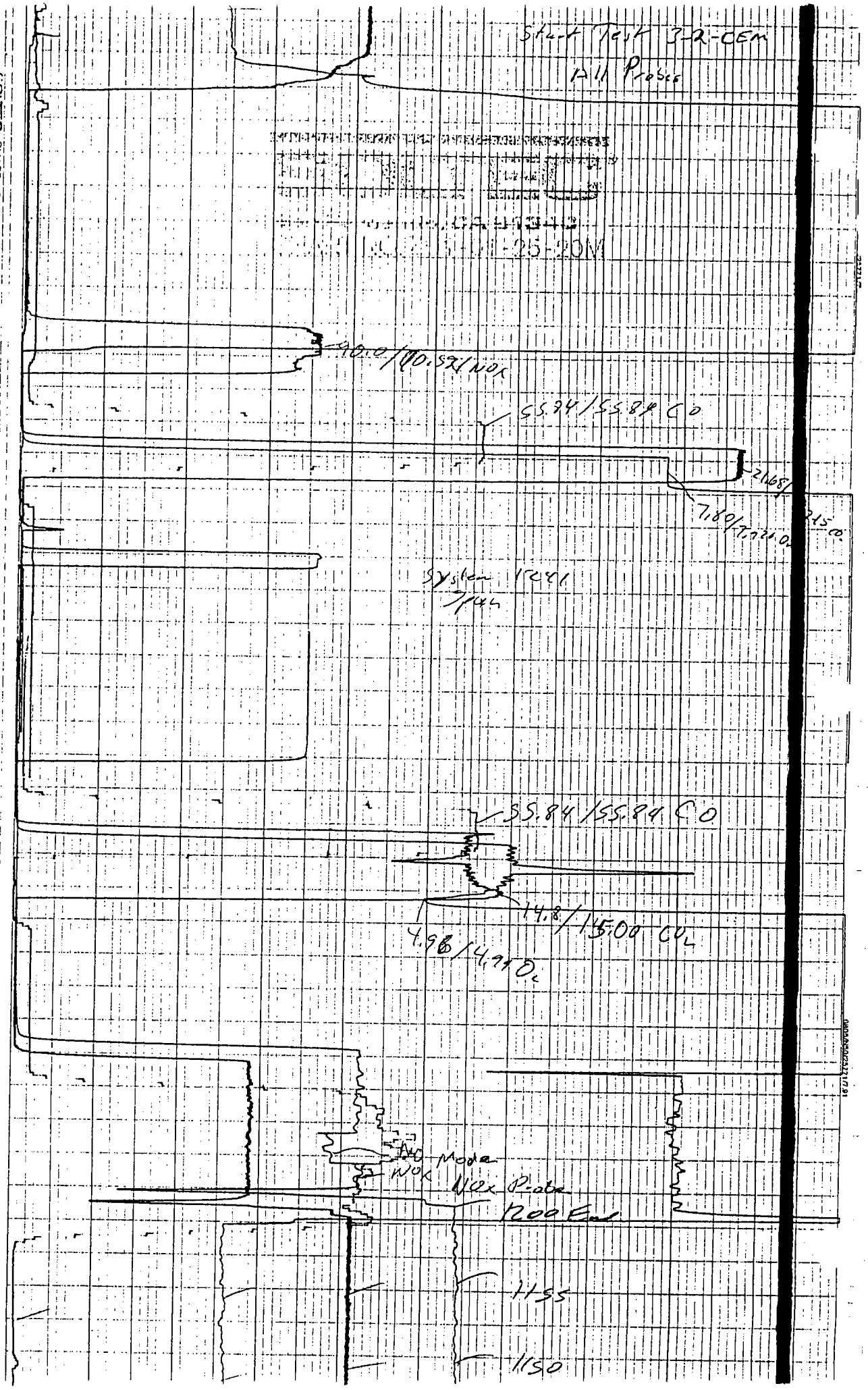

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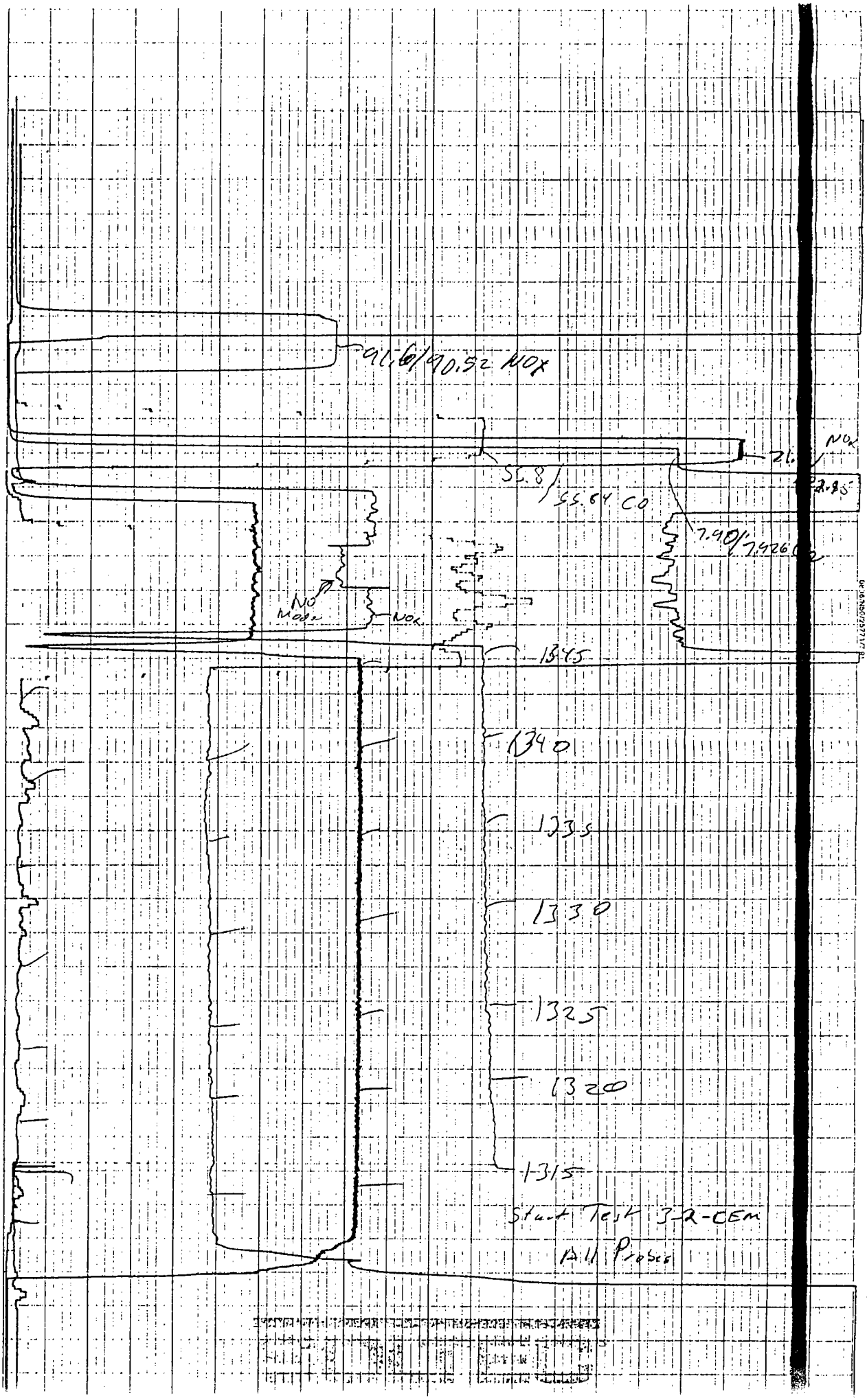
SOLTEC CHART NO. ZD1-01-25-20M



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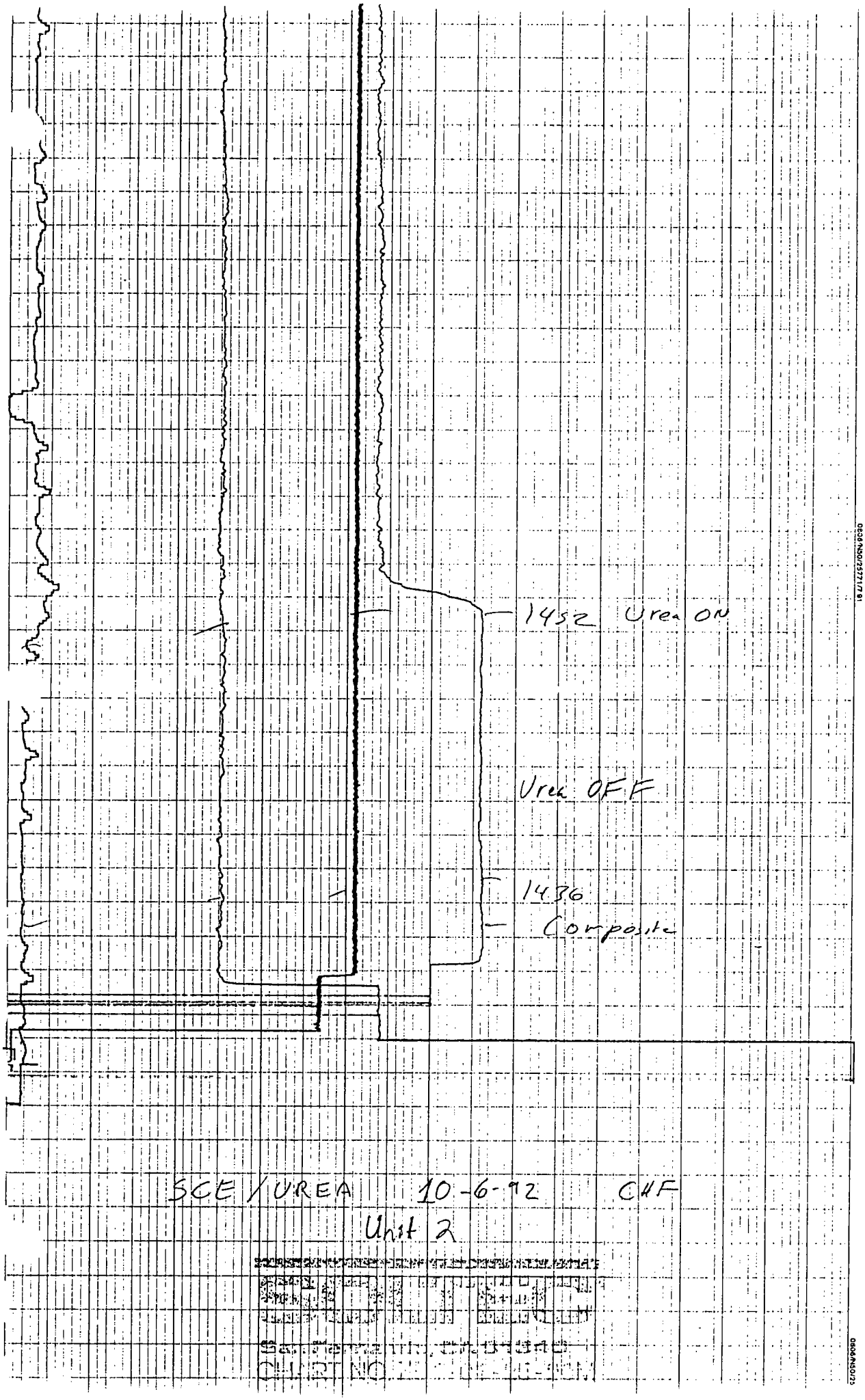
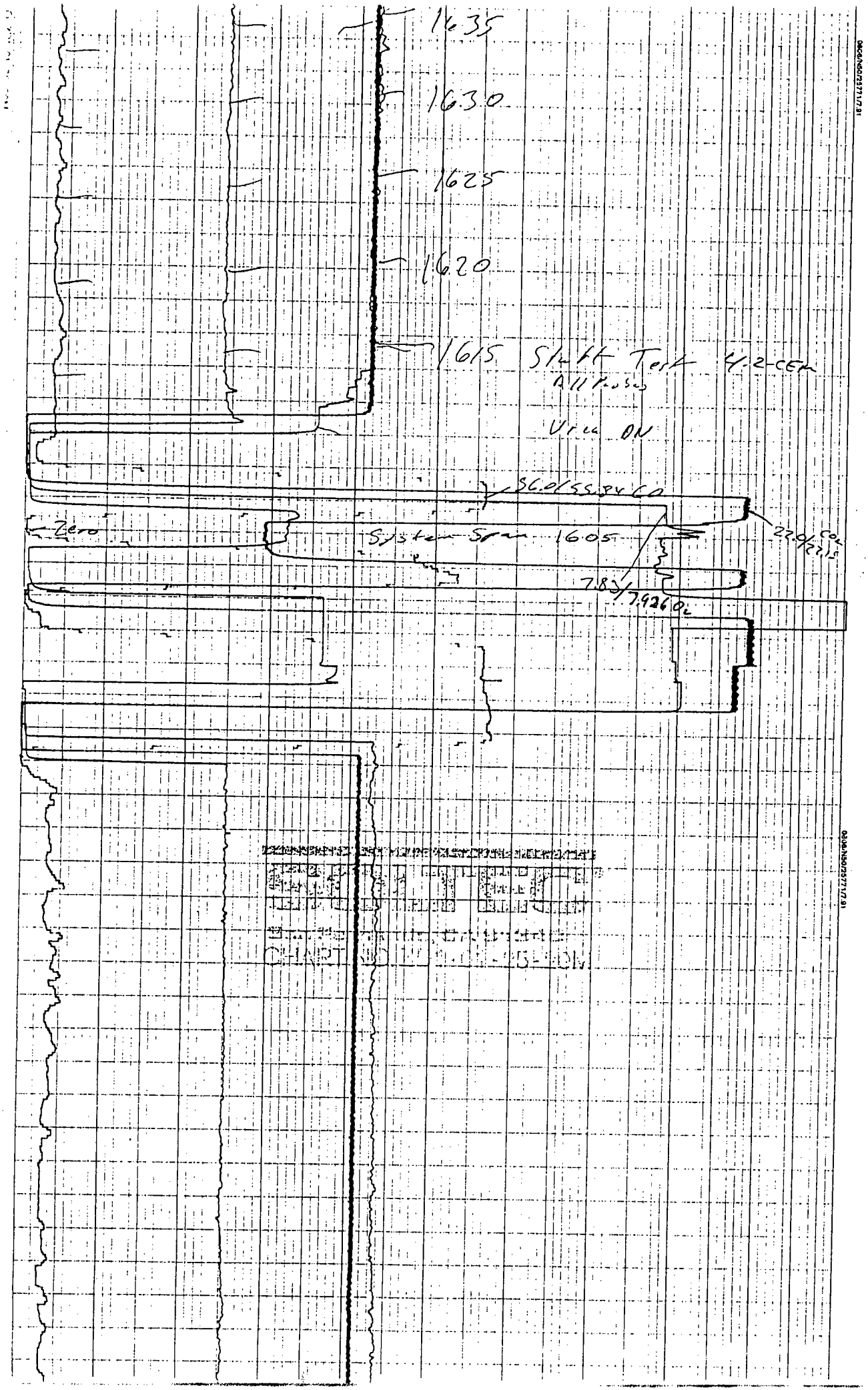
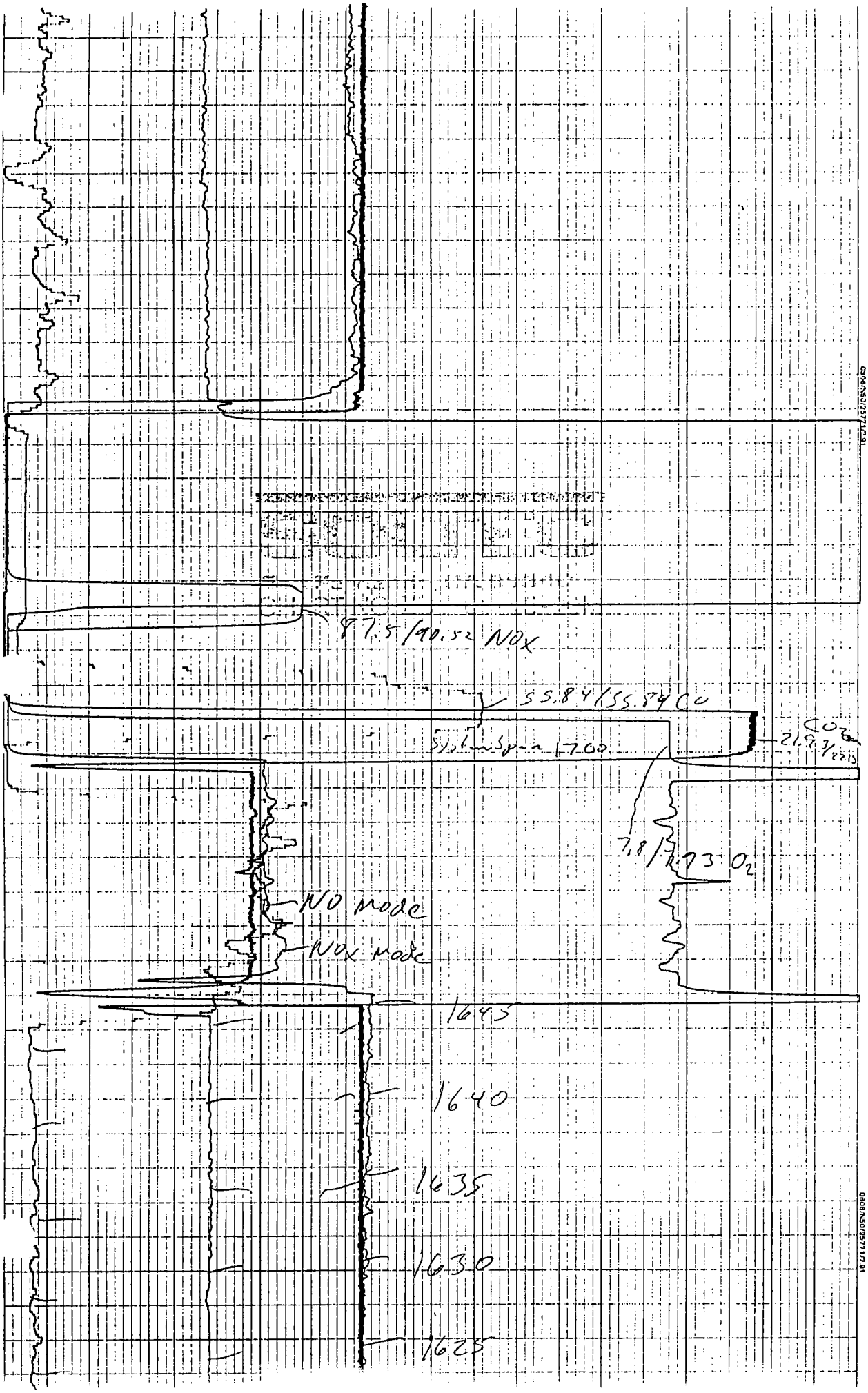
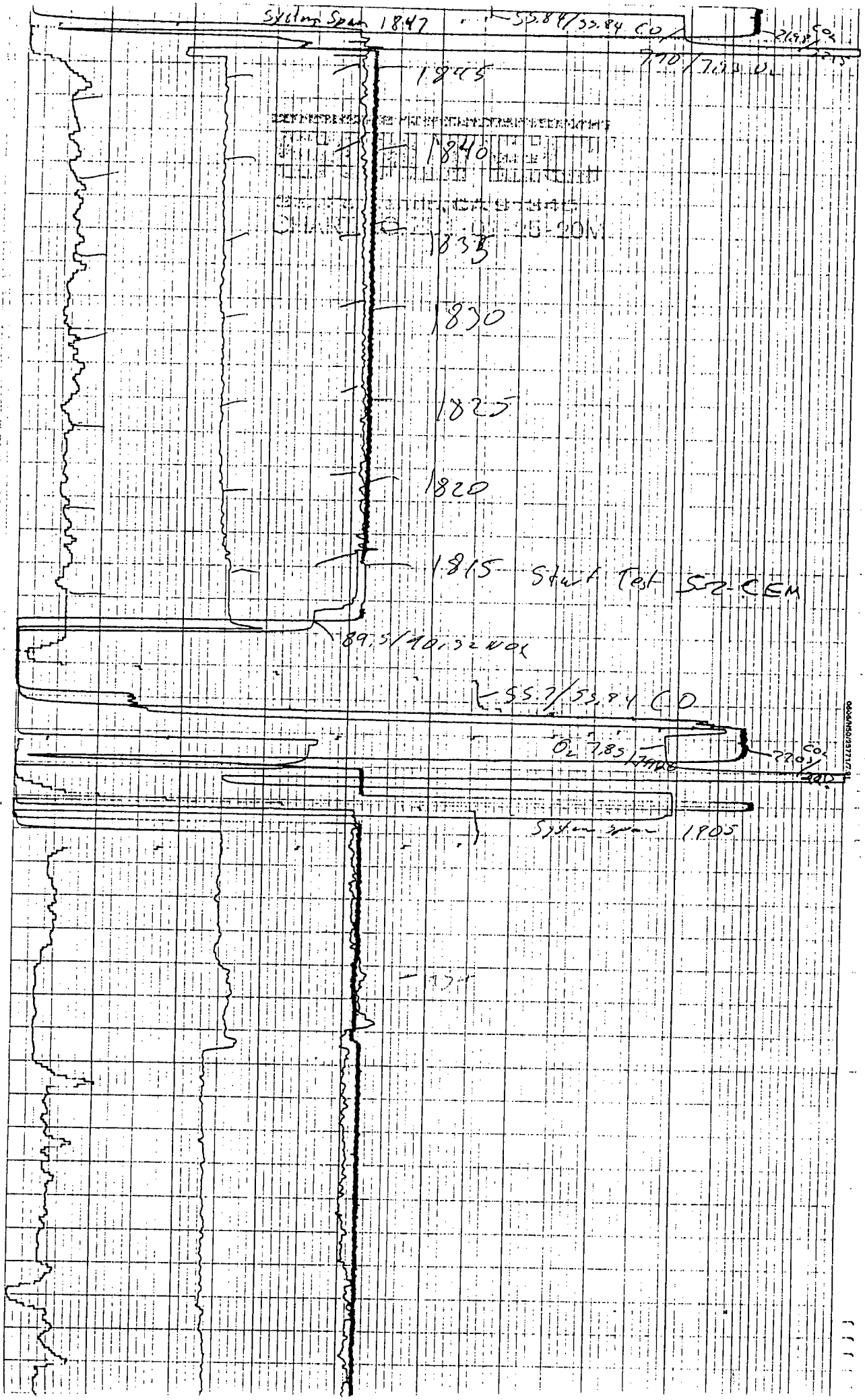
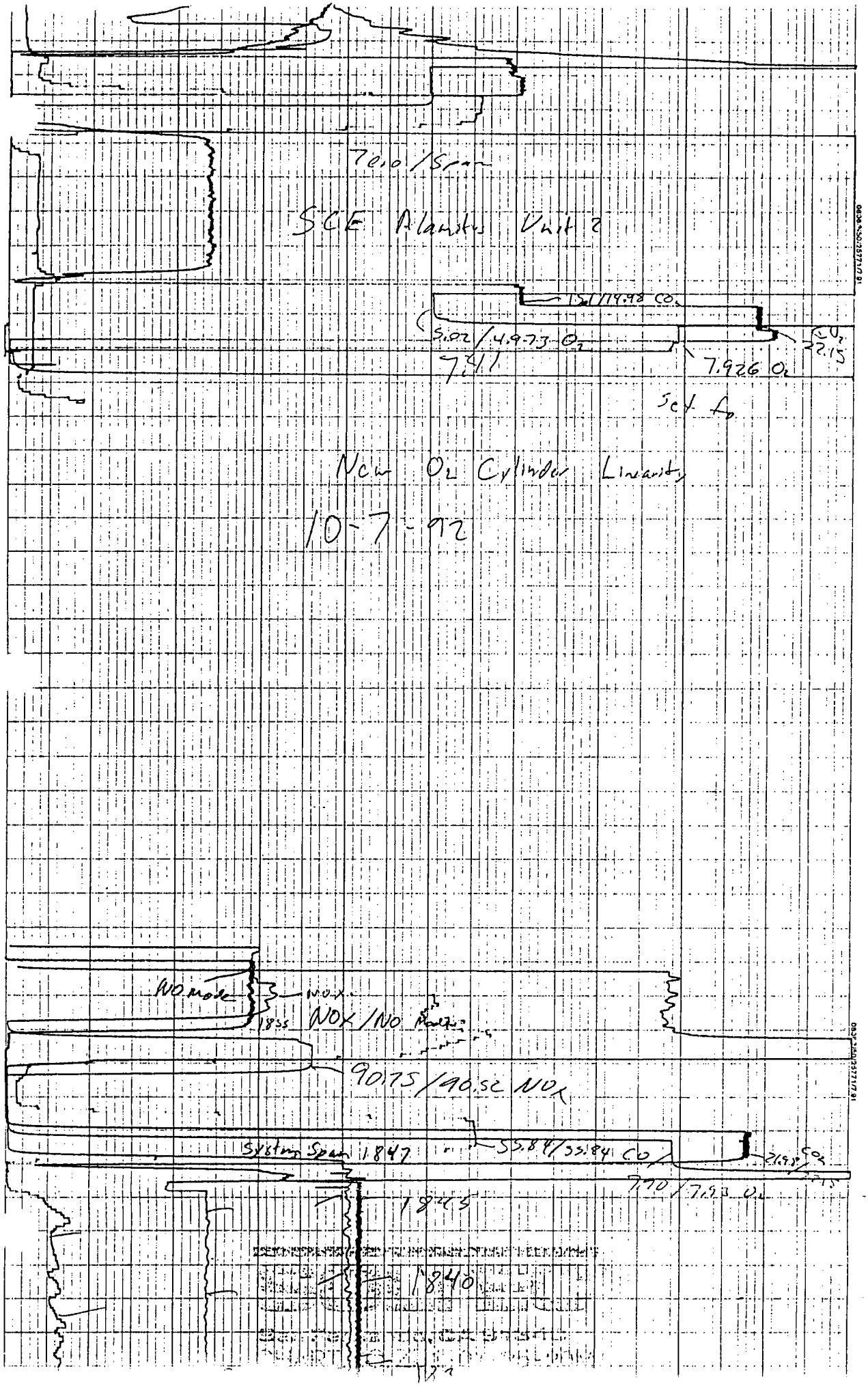
SOLTEC CHART NO.

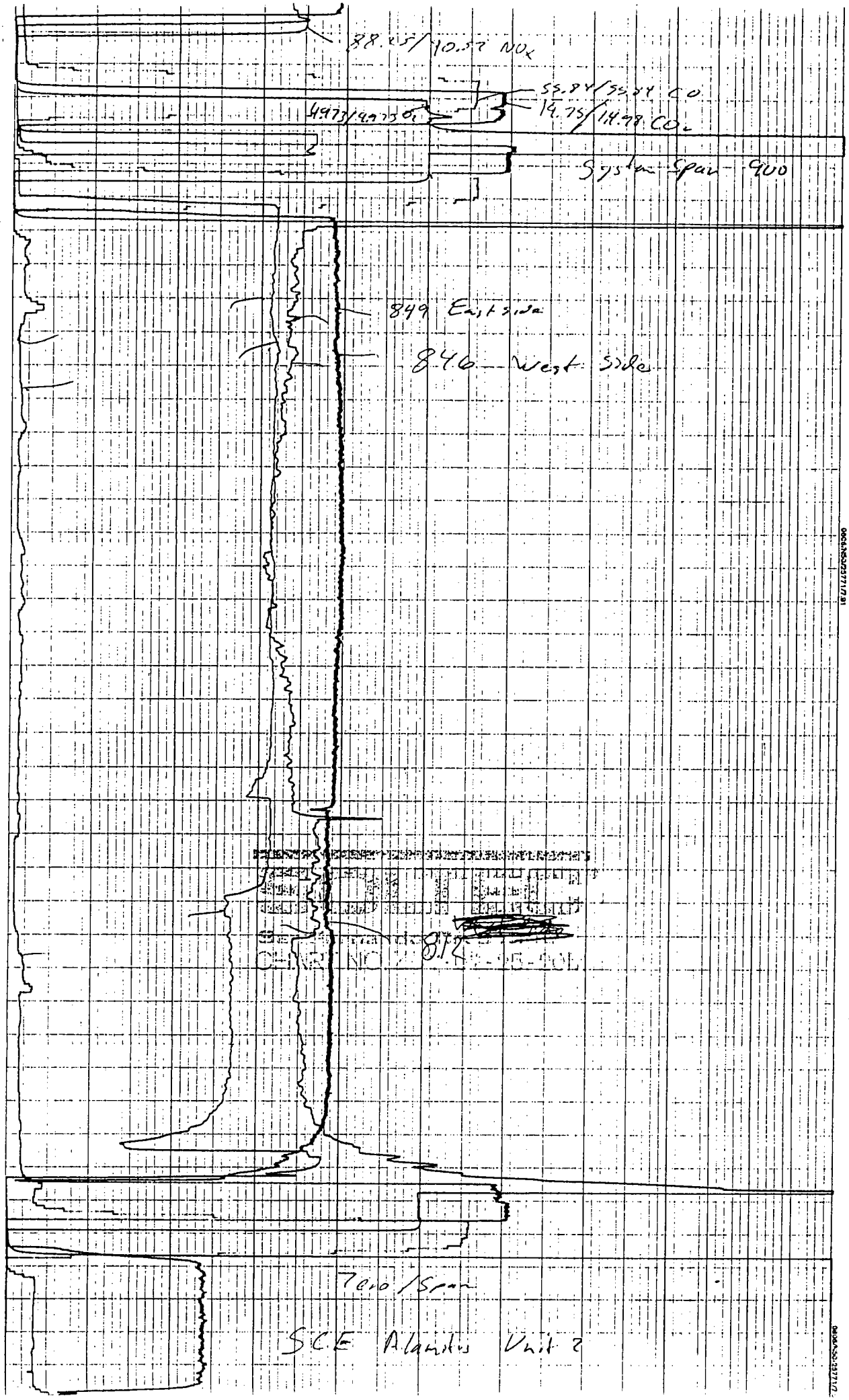

1452 Urea ON
Urea OFF
1436
Composite
SCE / UREA 10-6-92 CHF
Unit 2

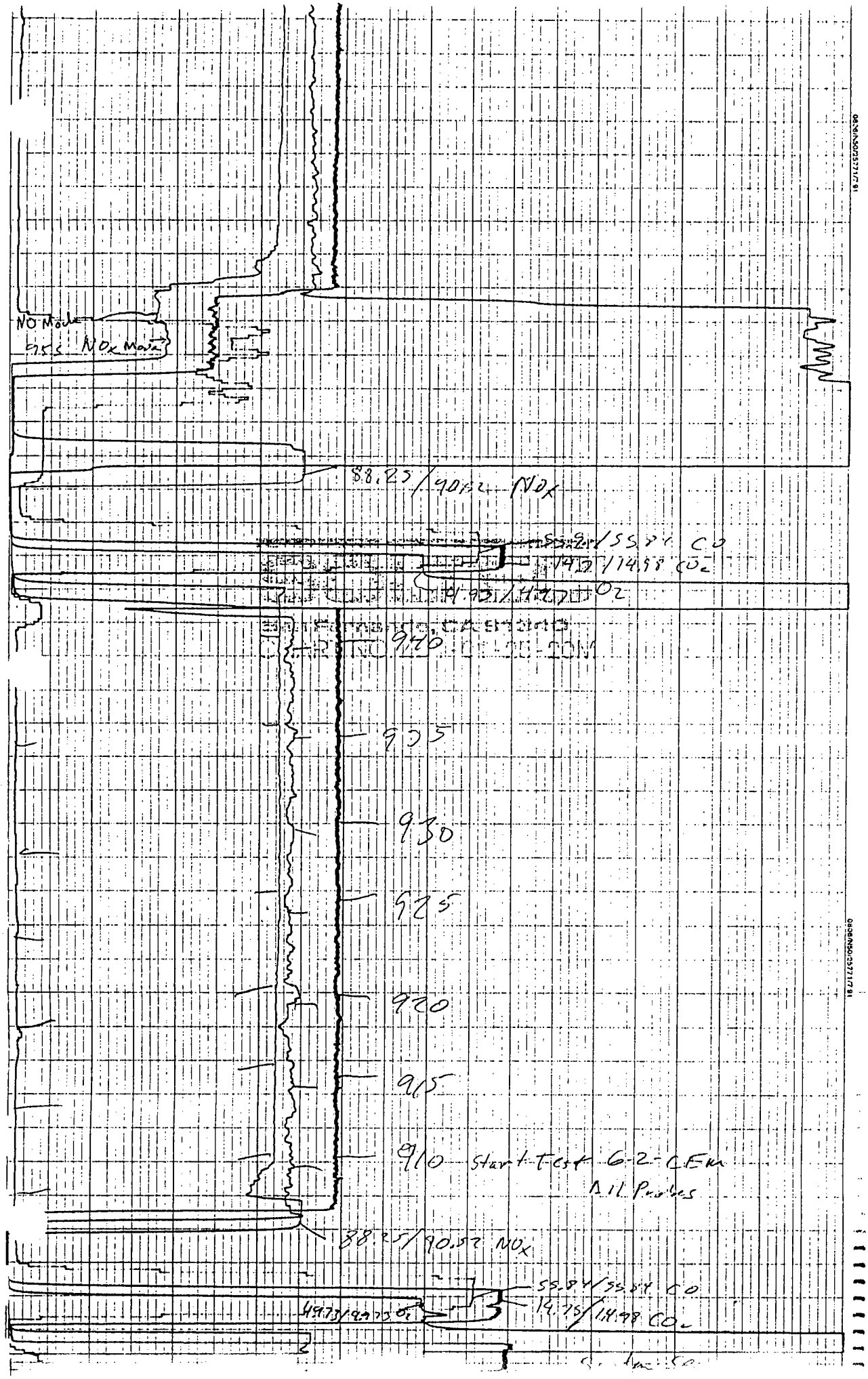

1635
1630
1625
1620
1615 Shift Test 4-2-CEM
All Pumps
Vrcu ON
56.0/55.8x Co
Zero
System Span 1605
22.0/22.15 Co
7.83/7.926 O2

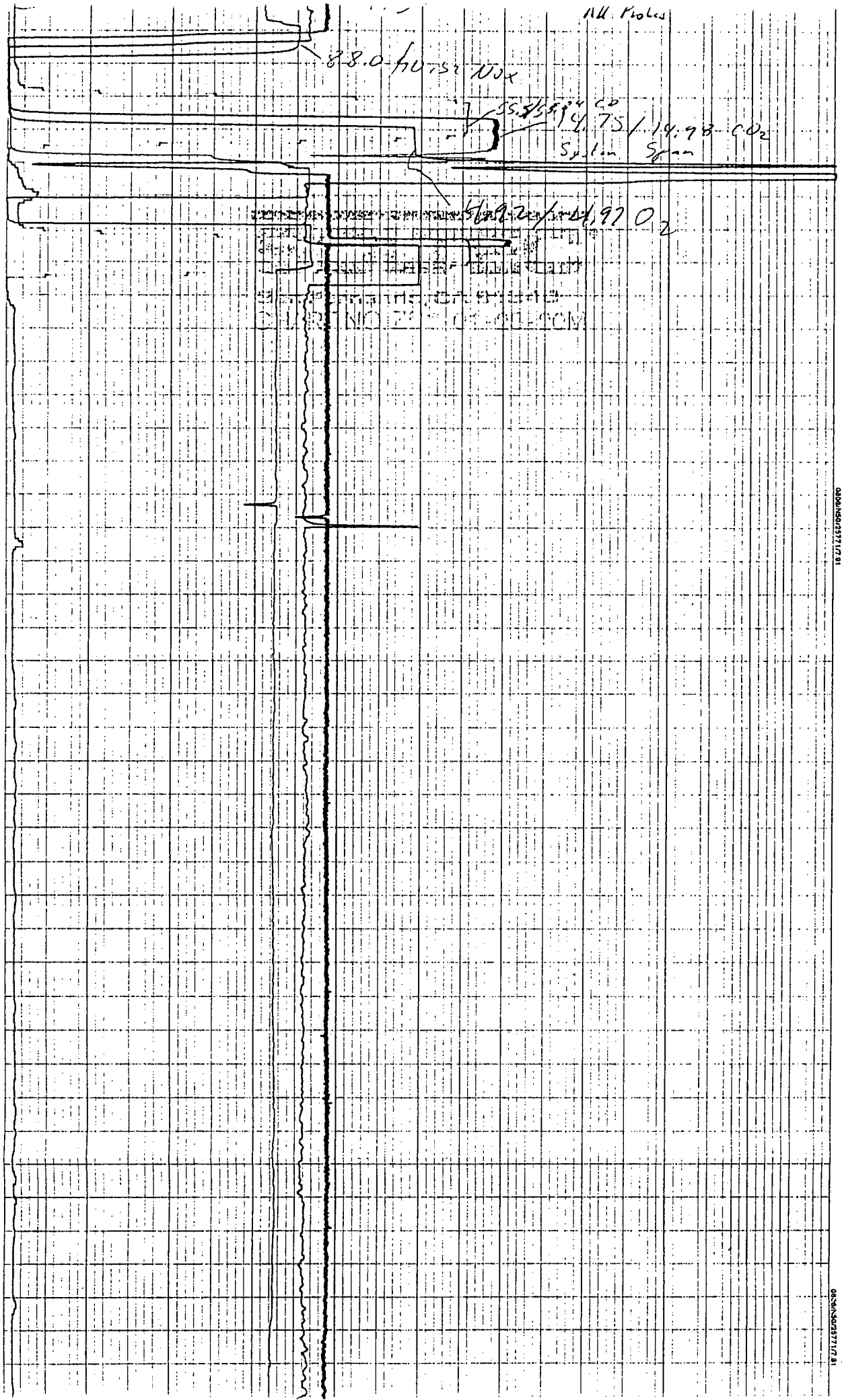

87.5/90.52 NOx
55.84/55.84 CO
Sys. Span 1700
21.9/21.9 CO2
7.8/7.73 O2
NO mode
NOx mode
1645
1640
1635
1630
1625

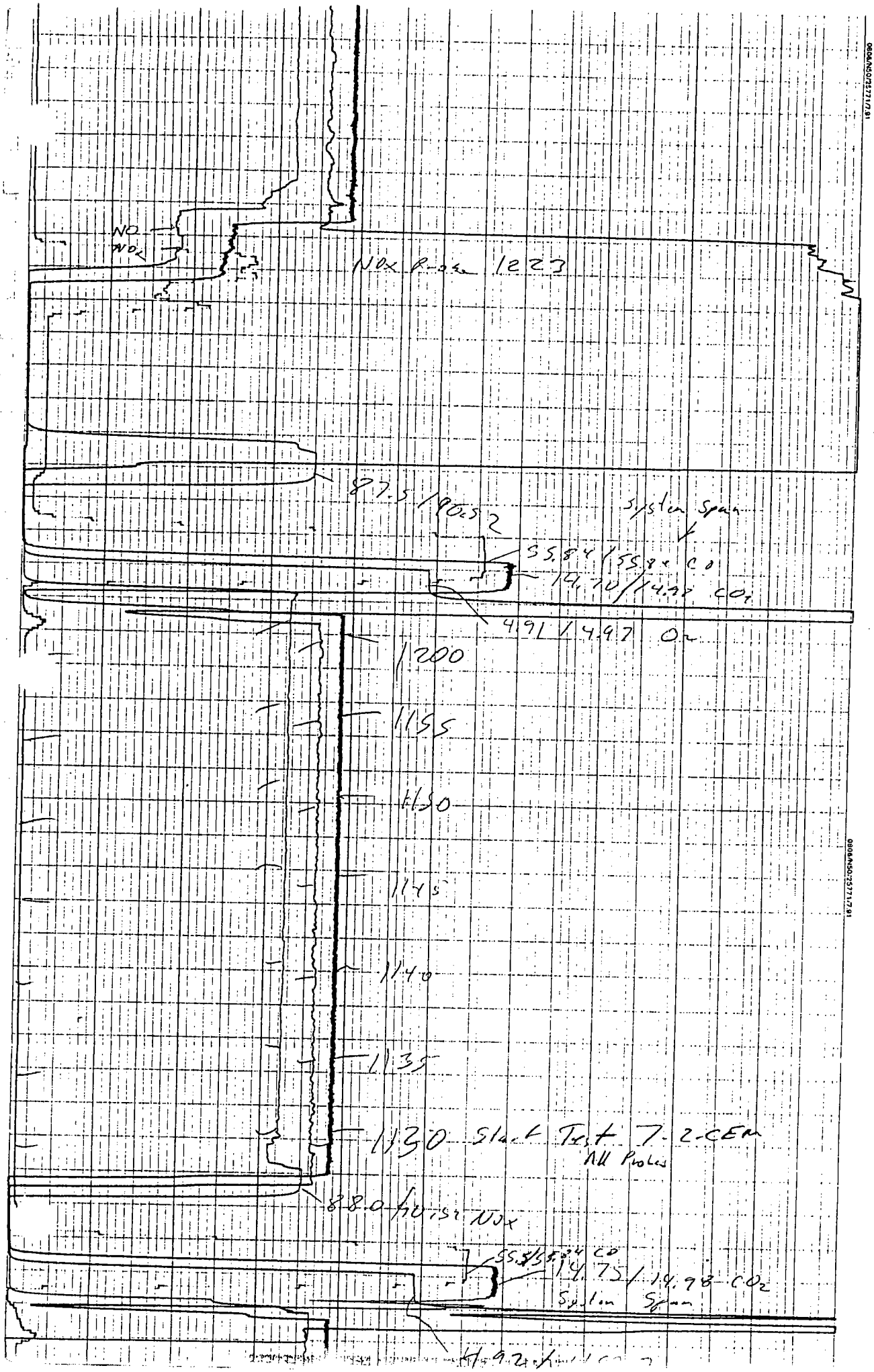

System Span 1847
55.84/55.84 CO
1845
1840
1835
1830
1825
1820
1815
Start Test SS-CEM
89.5/90.32 NOx
55.7/55.84 CO
O2 7.85/7.88
System Span 1805

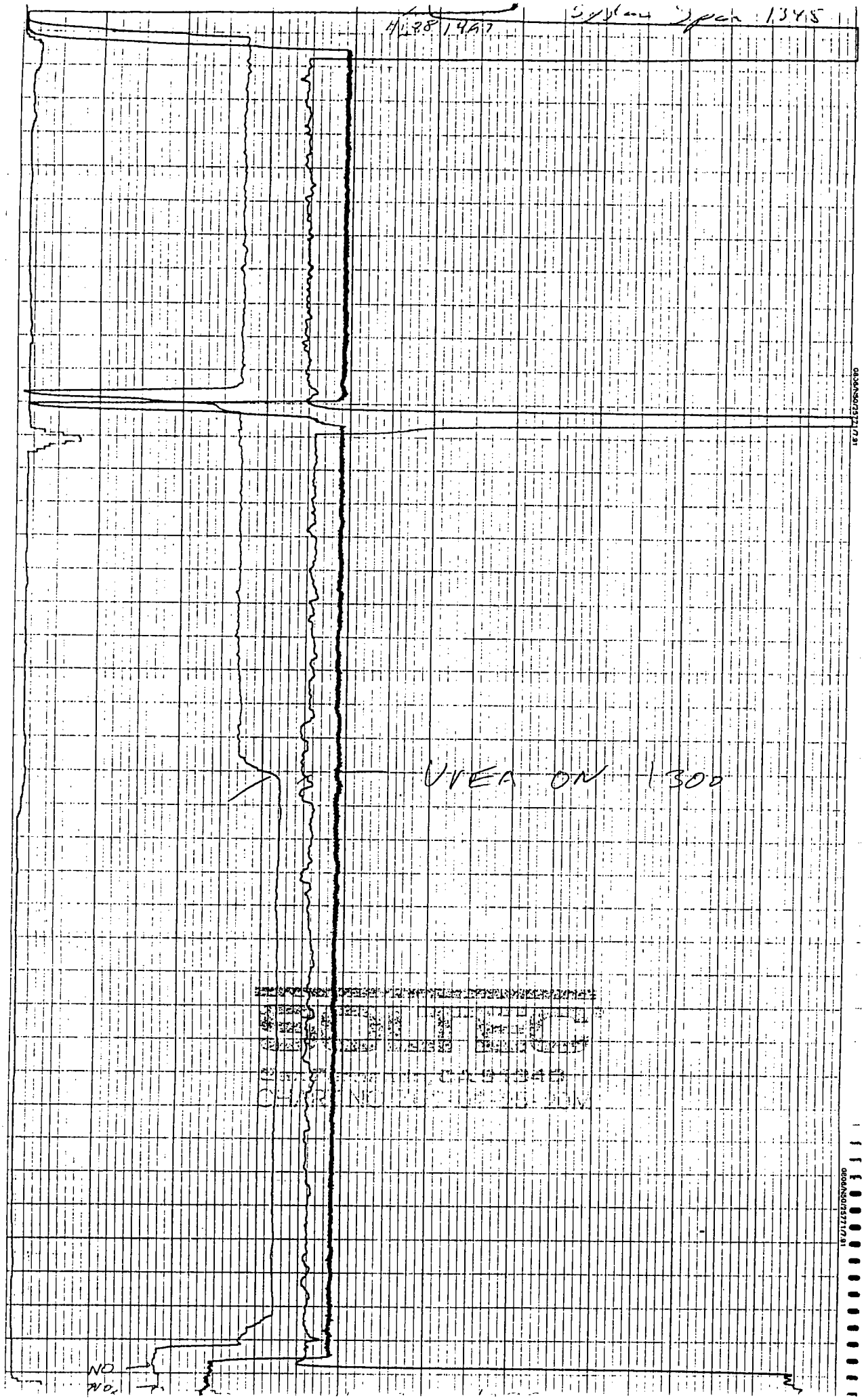

70.0 / Span
SCE Alamitos Unit 2
15.1/14.98 CO2
5.02/4.973 O2
7.41
7.926 O2
2.15 CO2
Scf Fo
New O2 Cylinder Linearity
10-7-92
NO mode
NOx
1855 NOX/NO Mode
90.75/90.5c NOx
System Span 1847
55.84/55.84 CO
2.19 SO2
7.70/7.93 O2
1825
1840

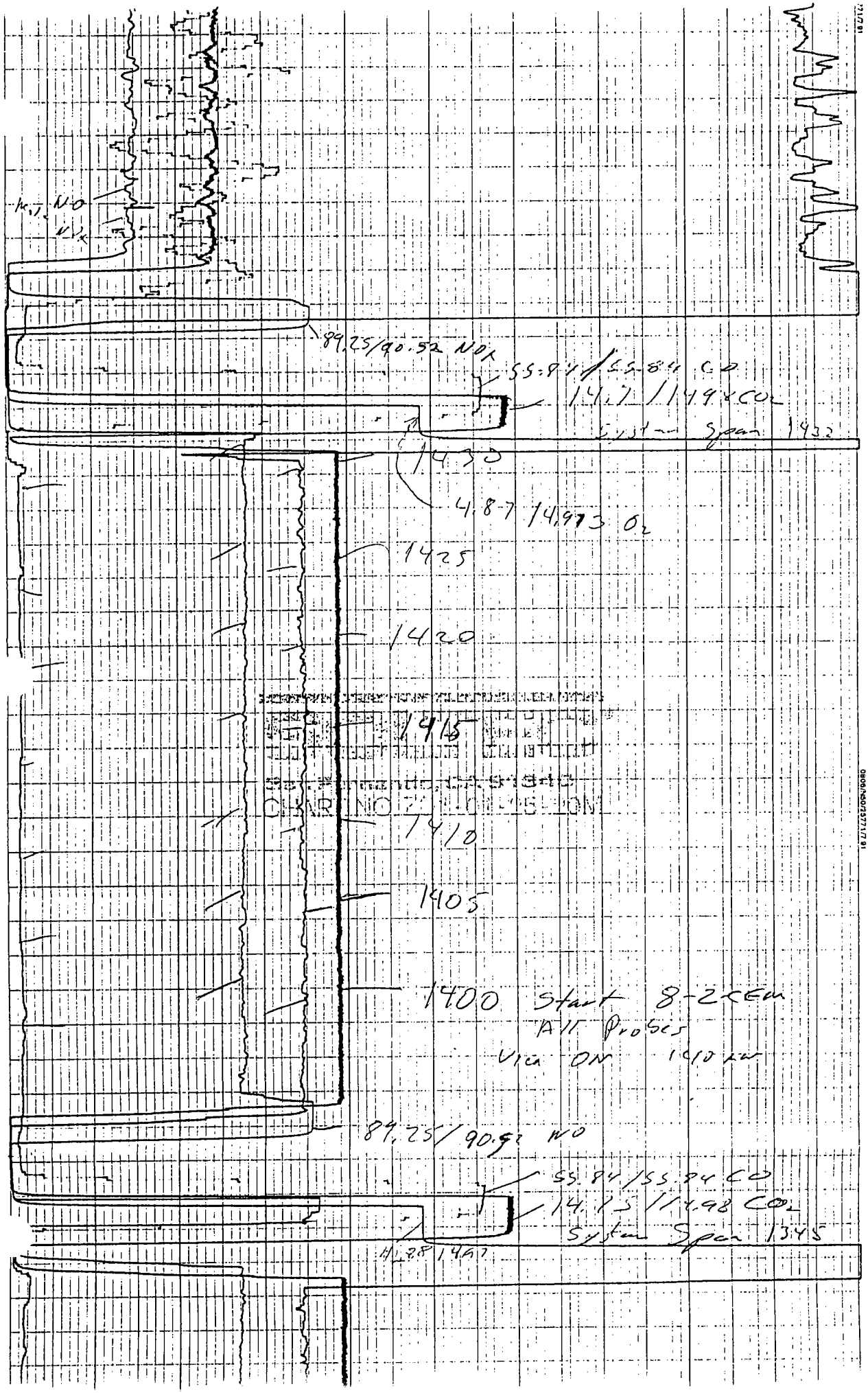

88.25/90.52 NOx
55.84/55.84 CO
14.75/14.98 CO2
4.973/4.973 O2
System Span - 900
849 East side
846 West side
Zero/Span
SCE Alamitos Unit 2

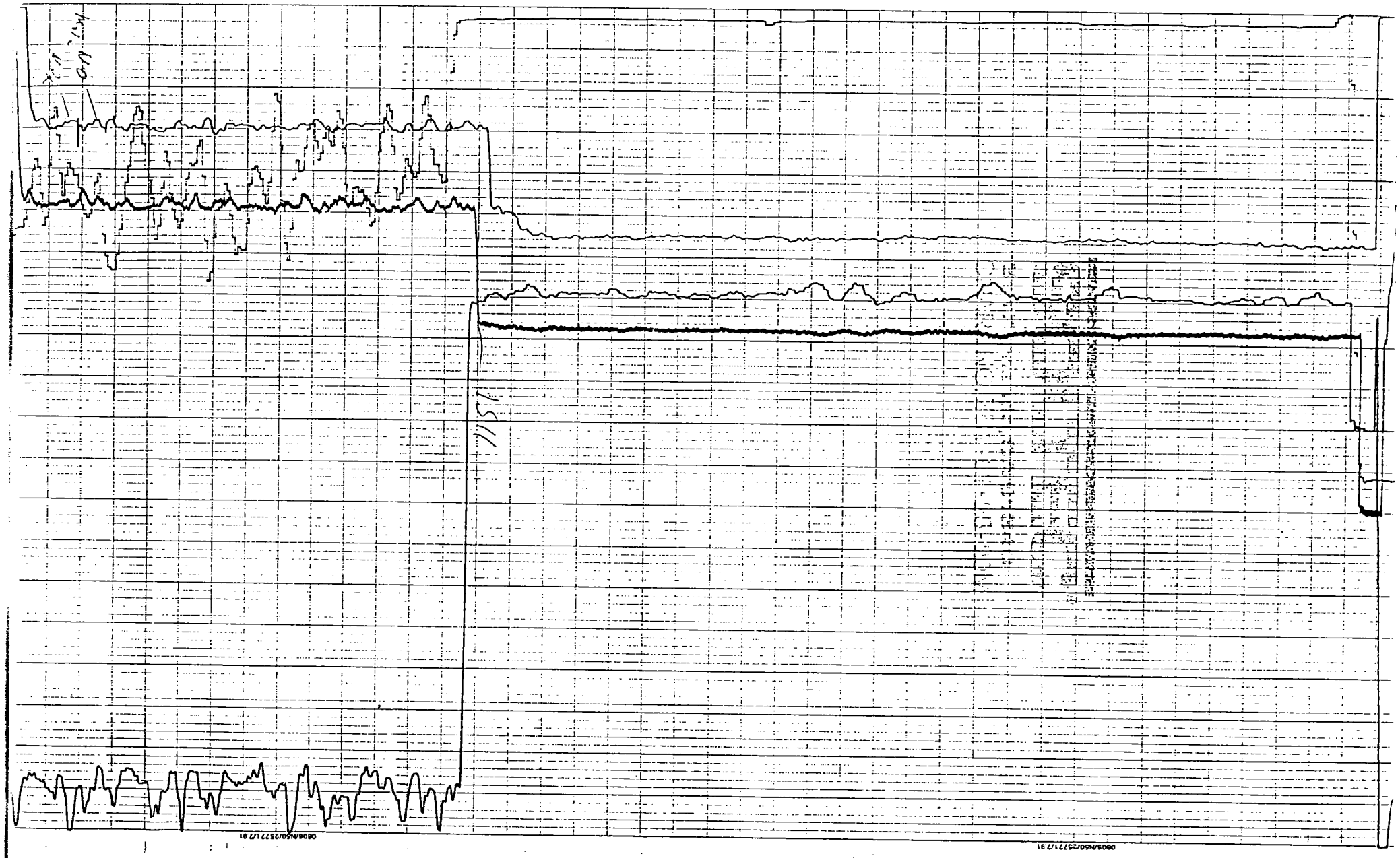

NO Mode
95% NOx Mode
88.25/90.52 NOx
55.84/55.84 CO
14.75/14.98 CO2
49.73/49.73 O2
940
935
930
925
920
915
910 Start Test 6-2-CEM
All Probes
88.25/90.52 NOx
55.84/55.84 CO
14.75/14.98 CO2
49.73/49.73 O2

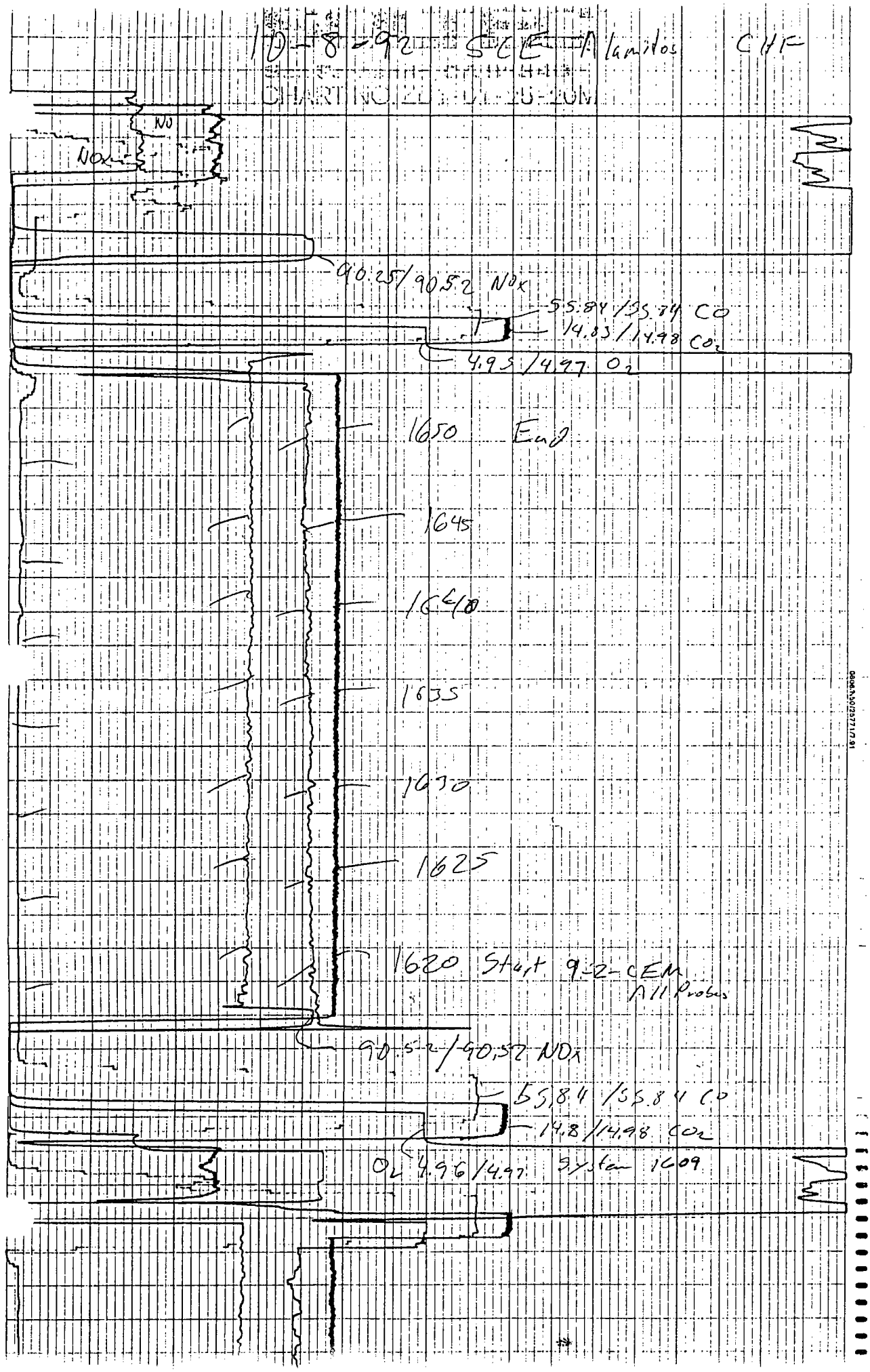

All. Probes
88.0 hours NOx
55.5/55.94 CO
14.75/14.98 CO2
Sylon Sgas
5.92/5.94 O2

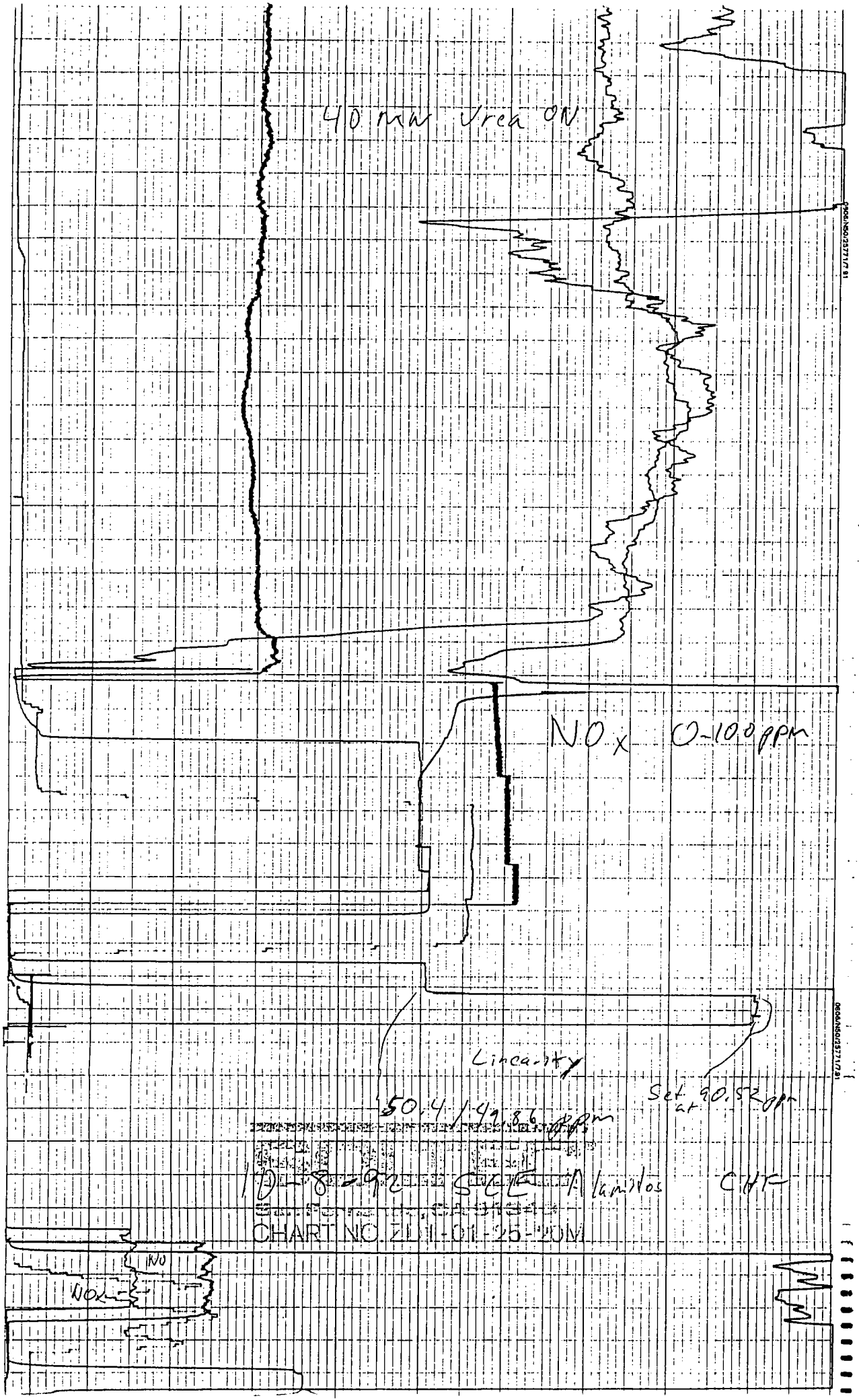

NO
NOx
NOx Peak 1223
87.5 / 90.52
System Span
55.84 / 55.84 CO
14.70 / 14.72 CO2
4.91 / 4.97 O2
1200
1155
1150
1145
1140
1135
1130 Start Test 7-2-CEM
All Probes
88.0 Noise NOx
55.84 / 55.84 CO
14.75 / 14.98 CO2
System Span

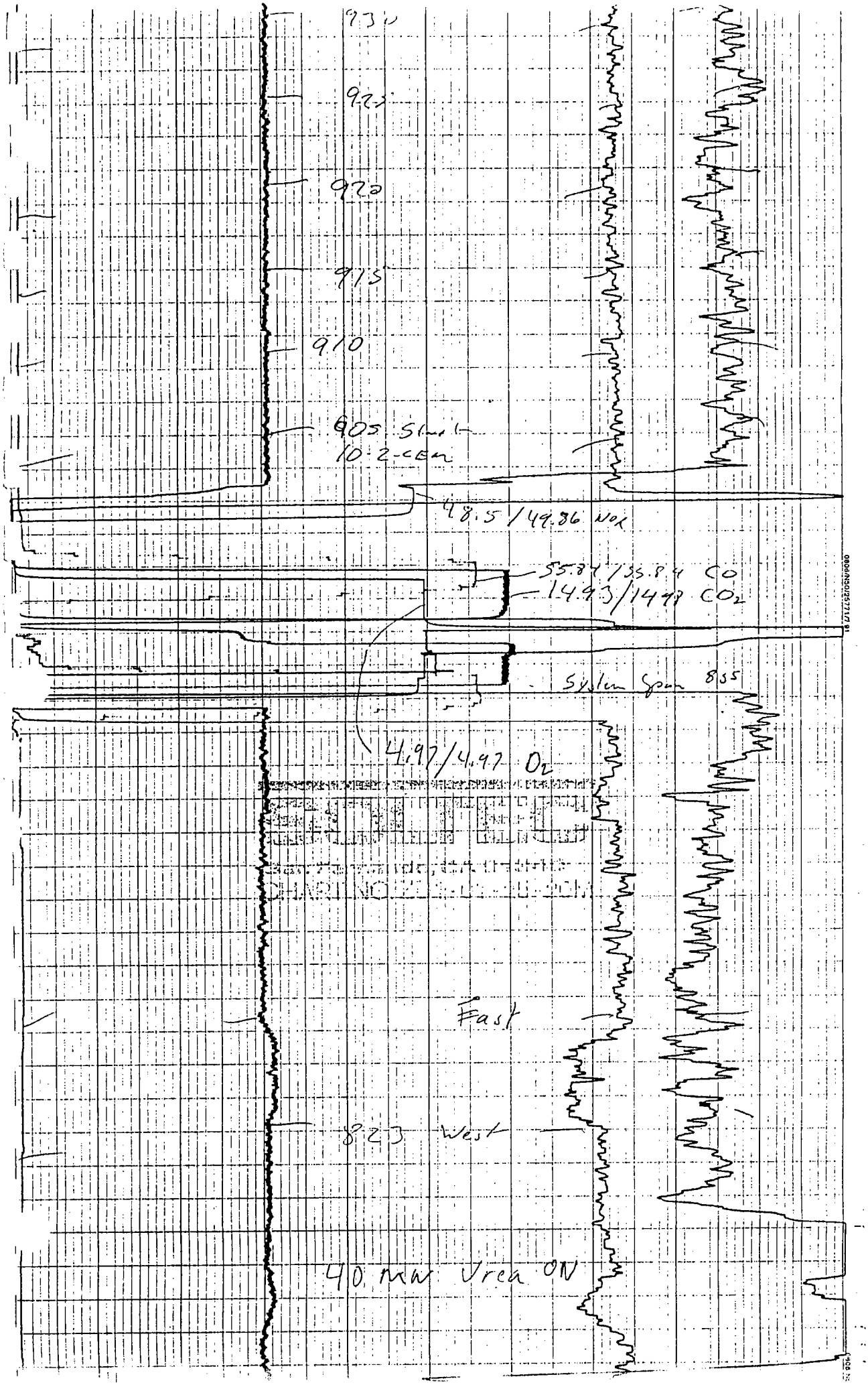

4/28/1997
System Upset 1345
UREA ON 1300
NO
NO2

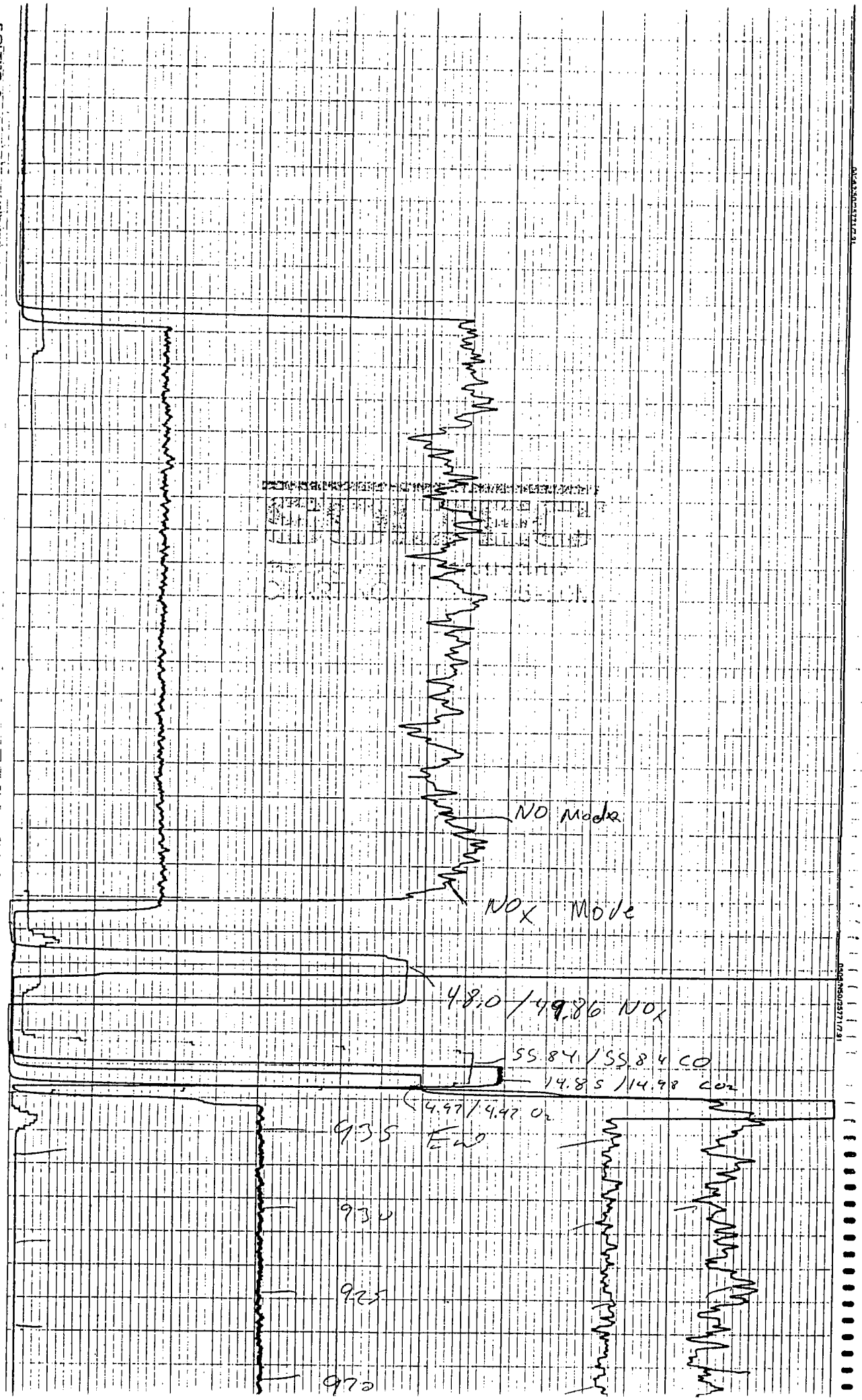

NO
NOx
89.25/90.52 NOx
55.84/55.84 CO
14.7/14.98 CO2
System Span 1432
1430
4.87/4.973 O2
1425
1420
1415
1410
1405
1400 Start 8-2 Cem
All Process
Vice ON 1410 hr
89.25/90.52 NO
55.84/55.84 CO
14.75/14.98 CO2
System Span 1345
4.28/4.97

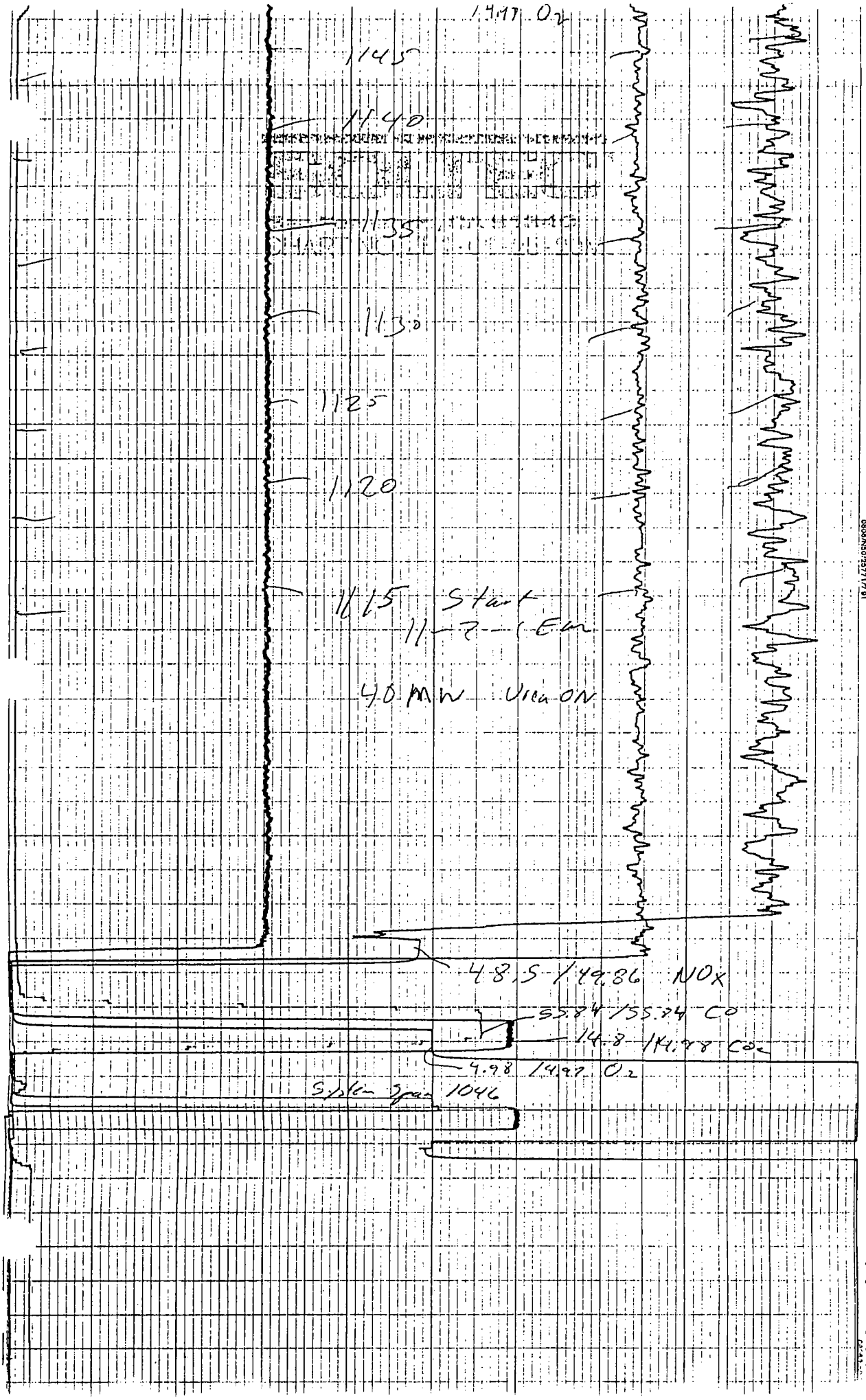

0003/N50/25271/2 91
0004/N50/25271/2 91

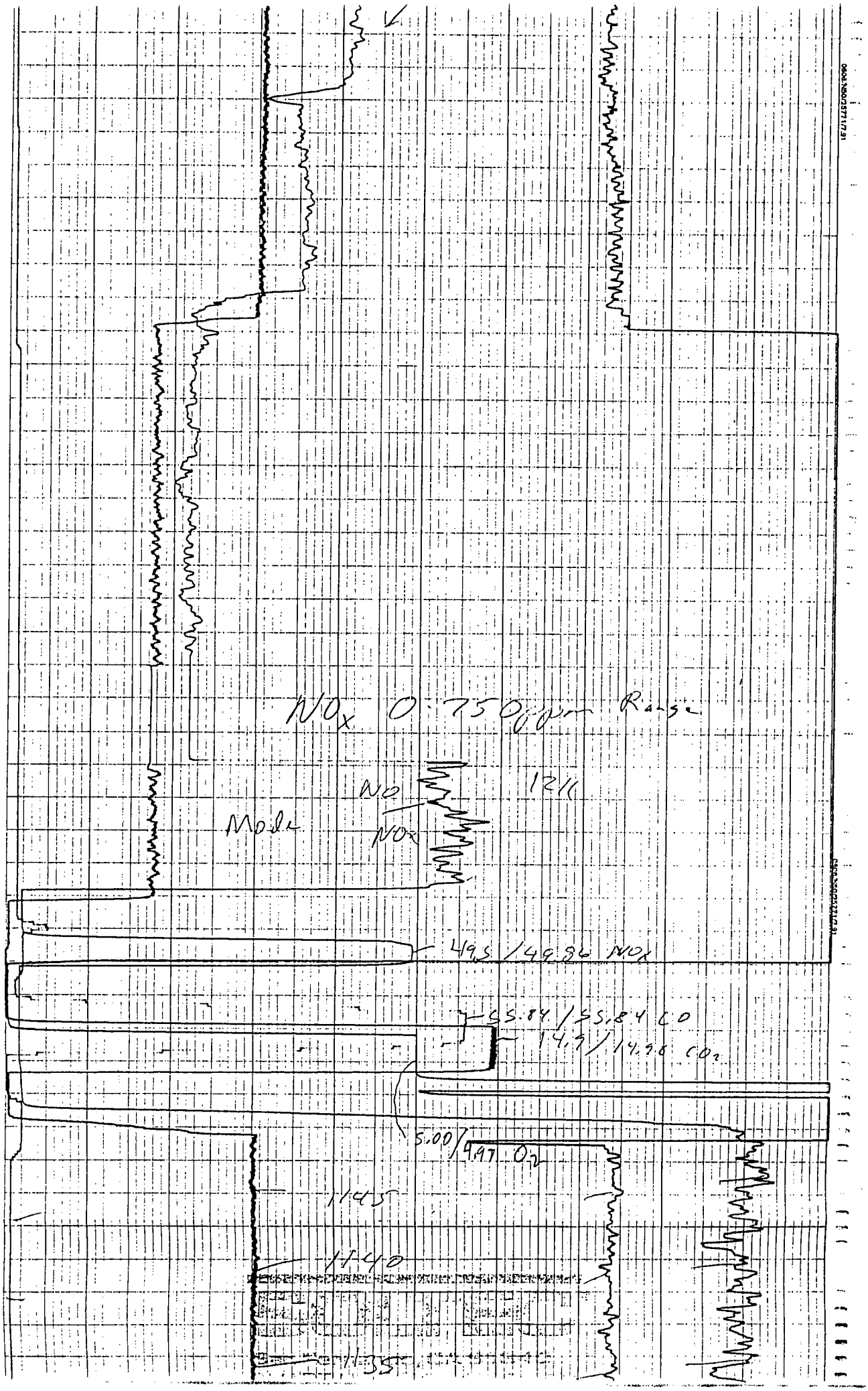

10-8-92 SCE Lamitos CHK
CHART NO. 2
NO
NOx
90.25/90.52 NOx
55.84/55.84 CO
14.03/14.98 CO2
4.95/4.97 O2
1650 End
1645
1640
1635
1630
1625
1620 Start 9-2-CEM
All Probes
90.52/90.52 NOx
55.84/55.84 CO
14.8/14.98 CO2
O2 4.96/4.97 System 1609

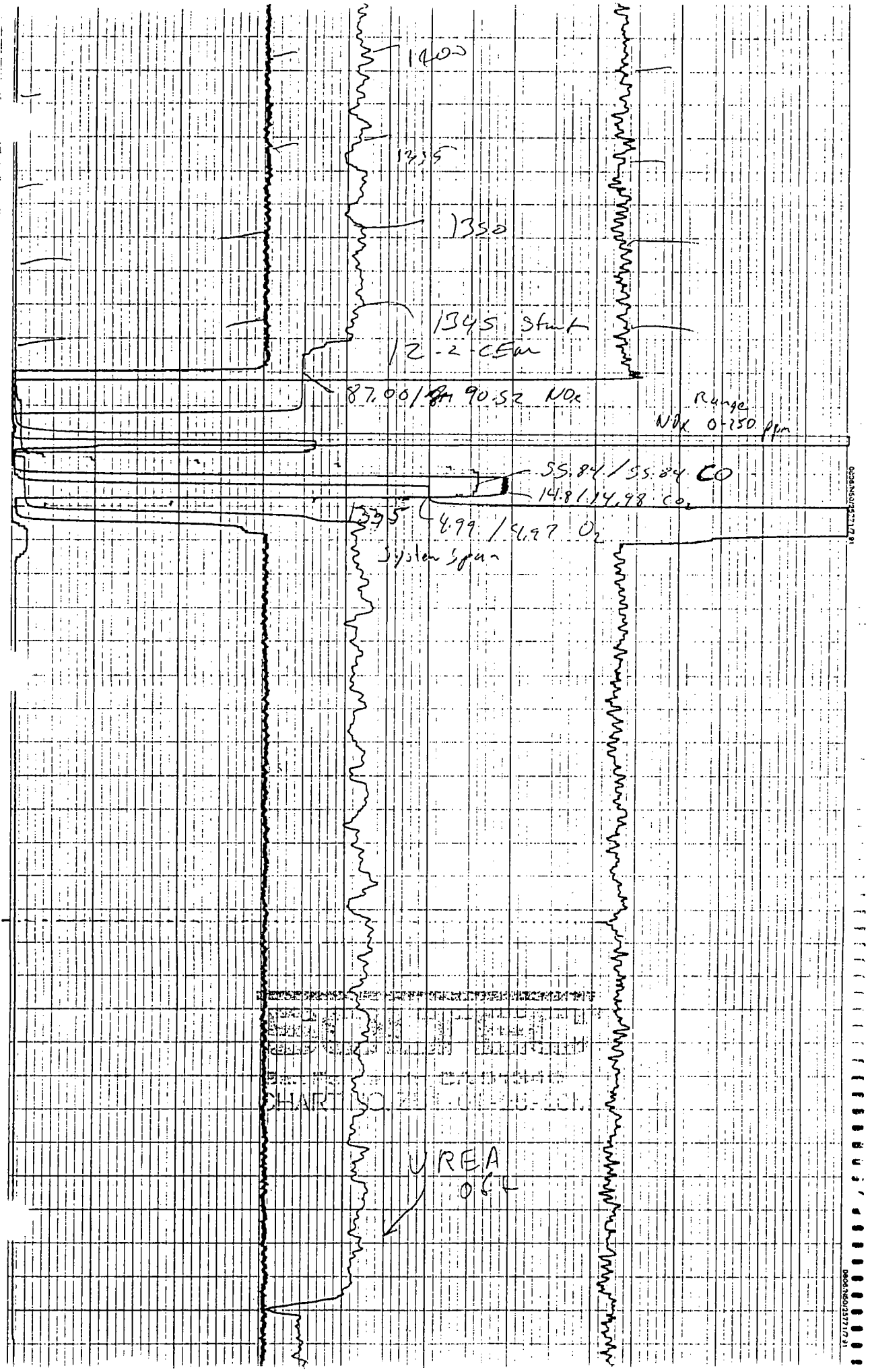

40 MW Urea ON
NOx 0-100 ppm
Linearity
50.4 / 49.86 ppm
Set at 90.52 ppm
10-8-92 Solar Alamitos CHT
CHART NO. ZD1-01-25-20M
NO
NOx

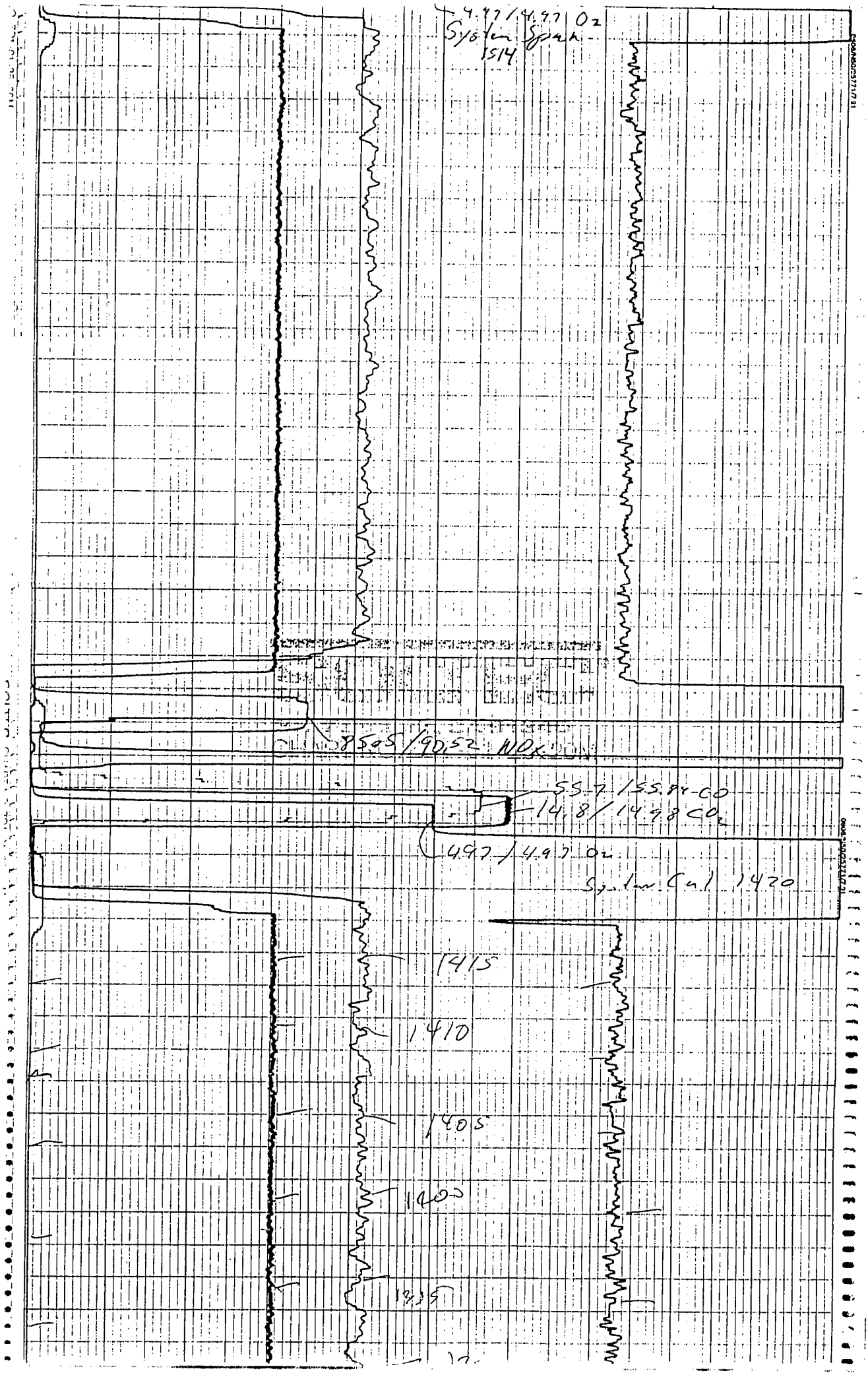

930
925
920
915
910
905 Slow
10.2-cfm
48.5/49.86 NOx
55.84/55.84 CO
14.93/14.93 CO2
System Span 8.55
4.97/4.97 O2
Fast
823 West
40 MW Urea ON

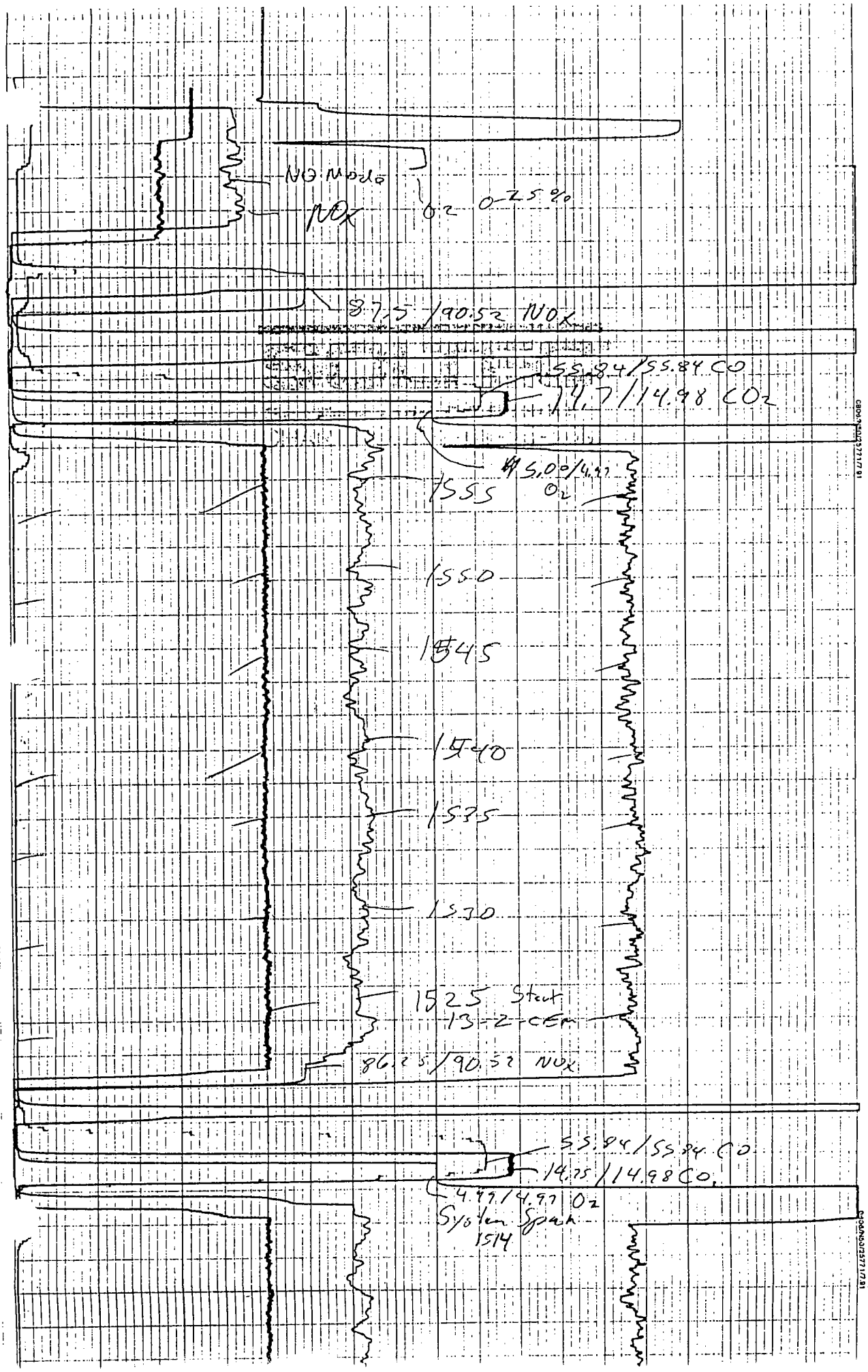

NO Mode
NOx Mode
48.0 / 49.86 NOx
55.84 / 55.84 CO
14.85 / 14.98 CO2
4.97 / 4.97 O2
935 Exo
930
925
920


14.97 O2
1145
1140
1135
1130
1125
1120
1115 Start
11-2-(Em
40 MW Vica ON
48.5 / 49.86 NOx
55.84 / 55.74 CO
14.8 / 14.98 CO2
4.98 / 4.97 O2
System Span 1046


NOx 0-750 ppm Range
NO
NOx
1216
Mode
49.5 / 49.96 NOx
55.84 / 55.84 CO
14.9 / 14.96 CO2
5.00 / 4.97 O2
1145
1140
1135


1400
1355
1350
1345 Start
12-2-Clear
87.00/87.90.52 NOx
Range
NOx 0-250 ppm
55.84/55.84 CO
14.81/14.98 CO2
1335
4.99/4.97 O2
System Span
UREA
OFF


4.97/4.97 O2
System Span
1514
85.05/90.52 NOx
55.7/55.84 CO
14.8/14.98 CO2
4.97/4.97 O2
System Cal 1420
1415
1410
1405
1400
1395


NO Mode
NOx
O2 0-25%
87.5 / 90.52 NOx
55.84 / 55.84 CO
14.7 / 14.98 CO2
5.00 / 4.97 O2
1555
1550
1545
1540
1535
1530
1525 Start
13-2-CEM
86.25 / 90.52 NOx
55.84 / 55.84 CO
14.75 / 14.98 CO2
4.97 / 4.97 O2
System Span
1514

NO Mode
NOx
O2 0-25%
87.5 / 90.52 NOx
55.84 / 55.84 CO
14.7 / 14.98 CO2
CHART
5.00 / 4.97
1555
O2
1550

APPENDIX G
CHAIN OF CUSTODY

CHAIN OF CUSTODY

PROJECT # [illegible]

CLIENT/LOCATION [illegible]

SAMPLE LOCATION [illegible]

COMPLIANCE TEST (Y/N) [illegible]

OUTSIDE LAB REQUIRED (Y/N) [illegible]

METHOD(S) [illegible] 5.3

SAMPLE DATE [illegible]

PROJECT MANAGER [illegible]

TECHNICIAN [illegible]

DATE DUE [illegible]

DATE	TIME	TEST #	SAMPLE DESCRIPTION	CONTAIN-ERS	SAMPLER	COMMENTS
1018	:	[illegible]	[illegible]			
/	:	[illegible]	[illegible]			
/	:	10 [illegible]	[illegible]			
/	:	[illegible]	[illegible]			
/	:	[illegible]	[illegible]			
/	:	[illegible]	[illegible]			
/	:	[illegible]	[illegible]			
/	:	[illegible]	[illegible]			
/	:	[illegible]	[illegible]			
/	:	[illegible]	[illegible]			
/	:	[illegible]	[illegible]			
/	:	[illegible]	[illegible]			
/	:	[illegible]	[illegible]			
/	:	[illegible]	[illegible]			
/	:					
/	:					
/	:					

CHAIN OF CUSTODY

PROJECT # 12598

CLIENT/LOCATION SCE/Alamitos #2

SAMPLE LOCATION CSAPH

COMPLIANCE TEST (Y/N) Yes

OUTSIDE LAB REQUIRED (Y/N) NO

METHOD(S) SEE COMMENTS

SAMPLE DATE 10 16 93

PROJECT MANAGER EP

TECHNICIAN CF

DATE DUE ASAP

DATE	TIME	TEST #	SAMPLE DESCRIPTION	CONTAIN-ERS	SAMPLER	COMMENTS
✓ 1016	:	1-2-PM	Front 1/2	1		SCAQMD 5.3
✓ 1016	:	1-2-PM	Back 1/2	1		
✓ 1016	:	1-2-PM	Ø 5mm filter 45-167	1		
1016		[illegible]	Front 1/2	1		

CHAIN OF CUSTODY

PROJECT # 12598 | OUTSIDE LAB REQUIRED (Y/N) NO | SAMPLE DATE 10 16 193

CLIENT/LOCATION SCE/Alamitos #2 | PROJECT MANAGER EP

SAMPLE LOCATION CSAPH | METHOD(S) SEE COMMENTS | TECHNICIAN CF

COMPLIANCE TEST (Y/N) Yes | DATE DUE ASAP

DATE	TIME	TEST #	SAMPLE DESCRIPTION	CONTAIN-ERS	SAMPLER	COMMENTS
10/16	:	1-2-PM	Front 1/2	1		SCAQMD 5.3
10/16	:	1-2-PM	Back 1/2	1		
10/16	:	1-2-PM	05mm filter 45-1674	1		

/	:	4-2-HC	↓	1		
/	:	5-2-HC	↓	1		
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					

TRANSFER OF SAMPLES FROM FIELD SAMPLE CUSTODIAN (FSC):

RELEASED BY (FSC)	DATE AND TIME	RECEIVED BY	DATE AND TIME
[illegible]	[illegible] :	Kelly Barberhagen	10/17/92 05:00
	/ / :		/ / :
	/ / :		/ / :

ANALYSIS REQUIRED: Analyze for CH_4 & TNMHC By SCAQMD Method 25.2. Report in PPM

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 # 12598

OUTSIDE LAB: ATM AA

SAMPLE DATE 10 16 92

PROJECT MANAGER EF

SAMPLE LOCATION CSAPH

METHOD(S) SCAQMD 25.2

TECHNICIAN CF/RM

COMPLIANCE TEST (Y/N) YES

DATE DUE

TEST #	COMPLETE DESCRIPTION
1-2-HC	Tedlar bag, Analyze for CH_4 and TNMHC by SCAQMD 25.2. Report in ppm
2-2-HC	↓
3-2-HC	↓
4-2-HC	↓
5-2-HC	↓
	Please return these samples to Carnot. Thank you.
	PO#9018

#12.2
-3
-4
-5
-6

CHAIN OF CUSTODY PRIOR TO SHIPMENT:

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
Kelly Barkenhagen	10 7 92	10:00		/ /	:
	/ /	:		/ /	:
	/ /	:		/ /	:

OUTSIDE LAB INFORMATION

SAMPLES SHIPPED TO ATM AA
21354 NORDOFF STREET, Suite 113
CHATSWORTH, CA 91311
PHONE: (818) 718-6070

CARNOT SHIPPER Rite-O-Way

DATE 10 7 92

CARRIER # ACT 5009

AIR BILL # NA

RECIPIENT Karen P. Porter

COMPANY ATM AA

DATE 10 7 92

CHAIN OF CUSTODY

PROJECT # 12598

CLIENT/LOCATION SCE/Alamitos

SAMPLE LOCATION CSAPM

COMPLIANCE TEST (Y/N) Yes

OUTSIDE LAB REQUIRED (Y/N) Yes

METHOD(S) SCAQMD 25.2

SAMPLE DATE 10 17

PROJECT MANAGER EF

TECHNICIAN CF

DATE DUE

DATE	TIME	TEST #	SAMPLE DESCRIPTION	CONTAINERS	SAMPLER	COMMENTS
10/7	:	6-2-TK	Tedlar Bag	1		
/	:	7-2-TK		1		
/	:	8-2-TK		1		
/	:	9-2-TK		1		
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					

TRANSFER OF SAMPLES FROM FIELD SAMPLE CUSTODIAN (FSC):

RELEASED BY (FSC)	DATE AND TIME	RECEIVED BY	DATE AND TIME
[illegible]	/ / :	[illegible]	10/8/92 :
	/ / :		/ / :
	/ / :		/ / :

ANALYSIS REQUIRED: Analyze for CH_4 + TNMHC using 25.2 Report in PPM

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 # 12598 OUTSIDE LABS Atm AA SAMPLE DATE 10/7/92

PROJECT MANAGER EF

SAMPLE LOCATION CSAPM METHOD(S) SCAQMD 25.1 TECHNICIAN CF

COMPLIANCE TEST (Y/N) YES DATE DUE 10/10/92

TEST #	COMPLETE DESCRIPTION
822-1 6-2-HC	Tedlar bags for CH_4 + TNMHC analysis by SCAQMD 25.1
-2 7-2-HC	↓ ↓ ↓
-3 8-2-HC	
-4 9-2-HC	
	Please report in ppm.
	Please return these samples to Carnot.
	PO# 9022

CHAIN OF CUSTODY PRIOR TO SHIPMENT:

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
Kelly Berkenbage	10/8/92	6:00a		/ /	:
	/ /	:		/ /	:
	/ /	:		/ /	:

OUTSIDE LAB INFORMATION

SAMPLES SHIPPED TO Atm AA
21354 Nordhoff Street, Suite 113
Chatsworth, CA 91311
PHONE: (818) 718-6070

CARNOT SHIPPER KB
DATE 10/8/92
CARRIER # Rite-O-Way
AIR BILL # ACCT # 5009

RECIPIENT Karen Peter
COMPANY AtmAA, Inc.
DATE 10/8/92

CHAIN OF CUSTODY

PROJECT # [illegible] OUTSIDE LAB REQUIRED (Y/N) [illegible] SAMPLE DATE 10/8/1

CLIENT/LOCATION [illegible] PROJECT MANAGER [illegible]

SAMPLE LOCATION [illegible] METHOD(S) [illegible] TECHNICIAN [illegible]

COMPLIANCE TEST (Y/N) [illegible] DATE DUE

DATE	TIME	TEST #	SAMPLE DESCRIPTION	CONTAIN-ERS	SAMPLER	COMMENTS
10/8	:	[illegible]	[illegible]	1		
10/8	:	[illegible]	1			
10/8	:	[illegible]				
10/8	:	[illegible]	✓			
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					

TRANSFER OF SAMPLES FROM FIELD SAMPLE CUSTODIAN (FSC):

RELEASED BY (FSC)	DATE AND TIME	RECEIVED BY	DATE AND TIME
[illegible]	[illegible] 92 X	[illegible]	10/9/92 X
	/ / :		/ / :
	/ / :		/ / :

ANALYSIS REQUIRED:

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 # 12599

OUTSIDE LAB: Atm AA

SAMPLE DATE 10 18 92

PROJECT MANAGER EF

SAMPLE LOCATION

METHOD(S) SCAQMD 25.1 for CH4 + TNMHC

TECHNICIAN CF

COMPLIANCE TEST (Y/N) YES

DATE DUE 10/10/92

TEST #	COMPLETE DESCRIPTION
10-2-HC	Tedlar bag for CH4 + TNMHC by SCAQMD 25.1. Please report in ppm.
11-2-HC	
12-2-HC	
13-2-HC	
	PO# 9023
	Please return these samples to Carnot

D9832-22
23
-24
-25

CHAIN OF CUSTODY PRIOR TO SHIPMENT:

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
Kelly Berkenbag	10/9/92	8:00	Dave Vance	10/9/92	9:30
Dave Vance	10/9/92	9:30		/ /	:
	/ /	:		/ /	:

OUTSIDE LAB INFORMATION

SAMPLES SHIPPED TO Atm AA
21354 Nordhoff, Unit 113
Chatsworth, CA 91311
PHONE: (818) 718-6070

CARNOT SHIPPER 1

DATE 10/9/92

CARRIER # RITE-O-WAY

AIR BILL # Acct # 5009

RECIPIENT Kaud Peter

COMPANY AtmAA, Inc.

DATE 10/9/92

15991 Red Hill Ave., Suite 110, Tustin, California 92680-7388 (714) 259-9520 - FAX (714) 259-0372

CARNOT

CHAIN OF CUSTODY

PROJECT # 12598

CLIENT/LOCATION SCE/Alamitos

SAMPLE LOCATION CSAPH

COMPLIANCE TEST (Y/N) Yes

OUTSIDE LAB REQUIRED (Y/N) NO

METHOD(S) Draft 207.1

SAMPLE DATE 10 17

PROJECT MANAGER EF

TECHNICIAN CF

DATE DUE ASAP

DATE	TIME	TEST #	SAMPLE DESCRIPTION	CONTAINERS	SAMPLER	COMMENTS
10/7	:	82-4H	Probe → impinger	1		
10/7	:	9-2-M1	Probe → impinger	1		
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					

TRANSFER OF SAMPLES FROM FIELD SAMPLE CUSTODIAN (FSC):

RELEASED BY (FSC)	DATE AND TIME	RECEIVED BY	DATE AND TIME
[illegible]	/ / :	Jody R. Howe	10/8 1929:00
	/ / :		/ / :
	/ / :		/ / :

ANALYSIS REQUIRED: Analyze for NH_3 using Draft SCAQMD 207.1 report total volume and NH_3 in PPM.

15991 Red Hill Ave., Suite 110, Tustin, California 92680-7388 (714) 259-9520 - FAX (714) 259-0372

CARNOT

PML-007

CHAIN OF CUSTODY

PROJECT # 12598 OUTSIDE LAB REQUIRED (Y/N) NO SAMPLE DATE 10 18 92

CLIENT/LOCATION SCE / Alamitos #2 PROJECT MANAGER EF

SAMPLE LOCATION METHOD(S) SCAQMD DRAFT 207 TECHNICIAN CF

COMPLIANCE TEST (Y/N) YES DATE DUE 10/6/92

DATE	TIME	TEST #	SAMPLE DESCRIPTION	CONTAIN-ERS	SAMPLER	COMMENTS
10 18	:	10-2-M1	Probe → IMPINGE	1		
10 18	:	11-2-M3	↓	1		
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					
/	:					

TRANSFER OF SAMPLES FROM FIELD SAMPLE CUSTODIAN (FSC):

RELEASED BY (FSC)	DATE AND TIME	RECEIVED BY	DATE AND TIME
[illegible]	10 18 92 :	Jody R Horne	10 18 92 13:10
	/ / :		/ / :
	/ / :		/ / :

ANALYSIS REQUIRED: Analyze for NH_3 using Nessler reagents. Report in PPM

15991 Red Hill Ave., Suite 110, Tustin, California 92680-7388 (714) 259-9520 - FAX (714) 259-0372

CARNOT

PML-007

Background Report Reference

AP-42 Section Number: 1.4

Background Chapter: 2

Reference Number: 9

Title: Urea Permit Compliance Testing at Alamitos Generation Station Unit 2

Carnot

Carnot

November 1992