



S22-001-FR

**EMISSION COMPLIANCE TEST
ON TWO LANDFILL GAS FLARES**

SAN MARCOS LANDFILL

November 1994

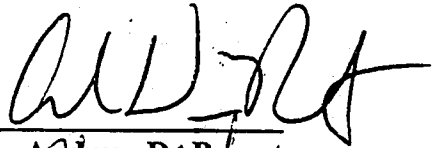
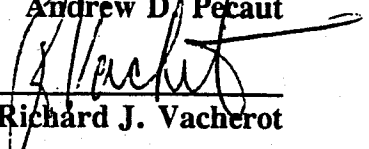
Startup Authorization Application #930492

Prepared for

**COUNTY OF SAN DIEGO - SOLID WASTE DIVISION
5555 Overland Avenue
San Diego, California 92123**

Prepared by:

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Andrew D. Pecaut

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January 12, 1995

Mr. Carl Niizawa
County of San Diego
Solid Waste Division
5555 Overland Avenue, MS0383
San Diego, California 92123

Dear Mr. Niizawa:

Please find enclosed three copies of the final report entitled "Emission Compliance Test on Two Landfill Gas Flares at the San Marcos Landfill" for submittal to the SDCAPCD.

If you have any questions, please call me at (805) 498-8781.

Sincerely,

HORIZON AIR MEASUREMENT SERVICES, INC.

A handwritten signature in black ink, appearing to read "Andrew D. Pecaut".

Andrew D. Pecaut
Air Quality Scientist

AP:lmg

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1. INTRODUCTION

Under San Diego County Air Pollution Control District (SDCAPCD) Start-up Authorization No. 930492, San Diego County Solid Waste Division (COUNTY) is required to conduct an emissions compliance test on two landfill gas flares, located at the San Marcos Landfill in San Marcos, California. HORIZON AIR MEASUREMENT SERVICES, INC. had been retained by the COUNTY to conduct the testing program. The testing program was conducted on November 16 through 18, 1994 in accordance with the test procedures approved by SDCAPCD in the Test Plan and subsequent correspondences (Appendix F). Mr. Ian Morris of SDCAPCD observed all testing and field calibrations. Operation of each flare was the responsibility of San Marcos Landfill.

The emission parameters measured at each location are provided in Table 1-1. The results of the testing program are summarized in Section 2. A brief description of each flare and flare operating conditions during the emissions test is provided in Section 3. Sections 4 and 5 provide a description of sampling/analytical techniques and QA/QC procedures. A more detailed discussion of the results is provided in Section 6.

TABLE 1-1
Constituents Tested
San Marcos Landfill Flares #1 and #2
November 1994

PARAMETER	LOCATION	METHOD	NUMBER OF TEST RUNS
Total Hydrocarbons	Inlet**	GC/FID Analysis of TGNMO (C ₂ - C ₁₃) and Methane From SUMMA Canisters	2 x 30 mins.
	Outlet**	GC/FID Analysis of TGNMO (C ₂ - C ₁₃) and Methane From SUMMA Canisters	3 x 60 mins.***
Trace Organic Species	Inlet	SUMMA Canisters/GC-MS Analyses (Calderon List)	2 x 30 mins.
	Outlet	SUMMA Canisters/GC-MS Analyses (Calderon List)	3 x 60 mins.***
Volatile and Semi Volatile Hydrocarbons	Condensate Storage Tank	US EPA Methods 624 and 625	3 samples
Methane & Ethane	Inlet	SUMMA Canisters/GC-FID Analyses (using same canisters as above)	2 x 30 mins.
	Outlet	SUMMA Canisters/GC-FID Analyses (using same canisters as above)	3 x 60 mins.***
Particulate Matter	Outlet	SDCAPCD Method 5	3 x 60 mins.
Total Reduced Sulfur Compounds	Inlet	EPA Method 16 Modified (Tedlar Bags)	2 Tedlar Bags
Sulfur Dioxide	Outlet	Calculated From TRS	-----
Oxides of Nitrogen	Outlet	SDCAPCD Method 20	3 x 60 mins.***
Carbon Monoxide	Outlet	SDCAPCD Method 20	3 x 60 mins.***
Oxygen	Outlet	SDCAPCD Method 20	3 x 60 mins.***
	Inlet	SUMMA Canisters/GC-TCD Analyses	2 x 30 mins.
Carbon Dioxide	Inlet	SDCAPCD Method 3	2 x 30 mins.
	Outlet	SDCAPCD Method 20	3 x 60 mins.***
Flow Rate/Temperature	Outlet	SDCAPCD Methods 1 & 2 Calculated	3
	Inlet	Calibrated, On-Line Flowmeter	3
Moisture	Outlet	SDCAPCD Method 5	3
	Inlet	Wet/Dry Bulb	2

** Total hydrocarbons were determined from each SUMMA canister sampled in conjunction with methane, ethane and speciated organic compounds.

*** Total and speciated hydrocarbons, NO_x, CO and diluent gases were sampled in conjunction with particulate matter utilizing twenty-four traverse points for three, sixty-minute test runs per flare (see Section 6.). Exceptions include Flare #2, Run #1 which was sampled for 120 minutes to achieve adequate sample volume for particulate matter sampling.

2. SUMMARY OF RESULTS

The results of the testing program for each flare are summarized in Table 2-1. Three, replicate test runs were conducted for each parameter of interest. Per the request of Mr. Ian Morris of the SDCAPCD, Run #1 of Flare #2 was invalidated due to large carbon monoxide (CO) concentration spikes. Flare exhaust flow rate was stoichiometrically calculated from the landfill gas flow rate, as measured using the calibrated, on-line orifice plate, and exhaust oxygen (O₂) concentrations. Average landfill gas flow rate for the two reported test runs of Flare #2 was 2451 scfm. Average landfill gas flow rate for the three sample runs of Flare #1 was 587 dscfm. Total hydrocarbon destruction efficiency is based upon the summation of TGNMO (as determined by FID/GC) and methane at each flare inlet and exhaust. Total hydrocarbon destruction efficiency exceeded 99.95 percent for each test run of each flare tested. The total non-methane hydrocarbon (TNMHC) emission rate and destruction efficiency of each flare is based upon the summation of the speciated gaseous organic compound emission rates at each flare inlet and outlet, respectively. The average TNMHC destruction efficiency was 98.74 percent and 98.56 percent for Flare #2 and Flare #1, respectively. The total hydrocarbon emission rate, as methane, is based on the FID analysis of SUMMA canisters taken at each flare outlet.

Oxides of nitrogen (NO_x) and carbon monoxide (CO) emission rates were based upon continuous, real-time monitoring results using SDCAPCD Method 20. Particulate matter results are based upon SDCAPCD Method 5 (non isokinetic) results. Sulfur dioxide (SO₂) emission rate was calculated based upon the assumption that all total reduced sulfur compounds in the landfill gas, as measured, are oxidized to SO₂ in each flare (see Section 6 for discussion).

The speciated volatile organic compounds (VOC) emission rates and average destruction efficiencies are provided in Tables 2-2 and 2-3 for Flare #2 and Tables 2-4 through 2-6 for Flare #1, respectively. All speciated VOC's were determined from GC-MS analyses (EPA TO-14) of SUMMA canister samples.

Table 2-2
Trace Organic Species Destruction Efficiency Results
San Marcos Landfill
Flare #2, Run #2
November 17, 1994

Species	Concentration (ppb)	Emission Rate (lb/hr)		Concentration (ppb)	Emission Rate (lb/hr)	Destruction Efficiency (%)
Benzene	2340.0	6.95E-02		3.12	9.09E-04	98.6925
Vinyl Chloride	859.0	2.04E-02	<	0.10	2.33E-05	> 99.8858
1,2-dibromoethane	< 2.5	1.79E-04	<	0.25	1.75E-04	NA
1,2-dichloroethane	146.0	5.49E-03	<	0.10	3.69E-05	> 99.3284
Benzyl chloride	< 10.0	4.81E-04	<	0.50	2.36E-04	NA
*Dichlorobenzenes	2105.0	1.18E-01	<	0.55	3.02E-04	> 99.7438
1,1-dichloroethylene	308.5	1.14E-02	<	0.25	9.04E-05	> 99.2053
Chlorobenzene	168.5	7.21E-03	<	0.10	4.20E-05	> 99.4180
Dichloromethane	12600.0	4.07E-01		0.17	5.38E-05	99.9868
Perchloroethene	3280.0	2.95E-01		0.10	8.83E-05	99.9701
Carbon Tetrachloride	< 2.5	1.46E-04	<	0.03	1.72E-05	NA
m+p-xylenes	18950.0	7.65E-01		0.18	7.13E-05	99.9907
o-xylene	6535.0	2.64E-01	<	0.50	1.98E-04	> 99.9250
Toluene	41700.0	1.46E+00		183.00	6.29E-02	95.6966
1,1,1-trichloroethane	3020.0	1.53E-01		0.13	6.47E-05	99.9578
Trichloroethene	1780.0	8.89E-02	<	0.50	2.45E-04	> 99.7245
Chloroform	< 4.0	1.82E-04	<	0.04	1.78E-05	NA
1,1,2,2-tetrachloroethane	< 2.5	1.60E-04	<	0.03	1.56E-05	NA
Styrene	1525.0	6.04E-02		0.10	3.88E-05	99.9357

Note: All values preceded by "<" are below the detection limit - reported values are 1/2 detection limit values.

NA: Not applicable, destruction efficiency cannot be calculated since inlet concentration is below the detection limit.

Table 2-3
Trace Organic Species Destruction Efficiency Results
San Marcos Landfill
Flare #2, Run #3
November 17, 1994

Species	Inlet		Outlet		Destruction Efficiency (%)
	Concentration (ppb)	Emission Rate (lb/hr)	Concentration (ppb)	Emission Rate (lb/hr)	
Benzene	2340.0	7.01E-02	0.20	5.82E-05	99.9171
Vinyl Chloride	859.0	2.06E-02	< 0.10	2.33E-05	> 99.8871
1,2-dibromoethane	< 2.5	1.80E-04	< 0.25	1.75E-04	NA
1,2-dichloroethane	146.0	5.54E-03	< 0.10	3.68E-05	> 99.3355
Benzyl chloride	< 10.0	4.86E-04	< 0.50	2.36E-04	NA
*Dichlorobenzenes	2105.0	1.19E-01	< 0.55	3.01E-04	> 99.7465
1,1-dichloroethylene	308.5	1.15E-02	< 0.25	9.02E-05	> 99.2138
Chlorobenzene	168.5	7.28E-03	< 0.10	4.19E-05	> 99.4242
Dichloromethane	12600.0	4.11E-01	0.23	7.27E-05	99.9823
Perchloroethene	3280.0	2.98E-01	0.08	7.05E-05	99.9763
Carbon Tetrachloride	< 2.5	1.48E-04	< 0.03	1.72E-05	NA
m+p-xylenes	18950.0	7.72E-01	0.16	6.32E-05	99.9918
o-xylene	6535.0	2.66E-01	< 0.05	1.98E-05	> 99.9926
Toluene	41700.0	1.47E+00	81.80	2.81E-02	98.0968
1,1,1-trichloroethane	3020.0	1.55E-01	0.31	1.54E-04	99.9001
Trichloroethene	1780.0	8.98E-02	< 0.05	2.45E-05	> 99.9727
Chloroform	< 4.0	1.83E-04	< 0.04	1.78E-05	NA
1,1,2,2-tetrachloroethane	< 2.5	1.61E-04	< 0.03	1.56E-05	NA
Styrene	1525.0	6.09E-02	0.05	2.09E-05	99.9656

Note: All values preceded by "<" are below the detection limit - reported values are 1/2 detection limit values.

NA: Not applicable, destruction efficiency cannot be calculated since inlet concentration is below the detection limit.

Table 2-4
Trace Organic Species Destruction Efficiency Results
San Marcos Landfill
Flare #1, Run#1
November 18, 1994

Species	Inlet		Outlet		Destruction Efficiency (%)
	Concentration (ppb)	Emission Rate (lb/hr)	Concentration (ppb)	Emission Rate (lb/hr)	
Benzene	2360.0	1.69E-02	0.70	8.45E-05	99.5007
Vinyl Chloride	757.5	4.35E-03	< 0.10	9.66E-06	> 99.7778
1,2-dibromoethane	< 2.5	4.31E-05	< 0.25	7.26E-05	NA
1,2-dichloroethane	123.0	1.12E-03	< 0.10	1.53E-05	> 98.6315
Benzyl chloride	< 10.0	1.16E-04	< 0.50	9.79E-05	NA
*Dichlorobenzenes	2745.0	3.71E-02	< 0.55	1.25E-04	> 99.6627
1,1-dichloroethylene	204.0	1.82E-03	< 0.25	3.75E-05	> 97.9372
Chlorobenzene	182.0	1.88E-03	< 0.10	1.74E-05	> 99.0751
Dichloromethane	15550.0	1.21E-01	0.51	6.70E-05	99.9448
Perchloroethene	3460.0	7.52E-02	0.18	6.59E-05	99.9124
Carbon Tetrachloride	< 2.5	3.53E-05	0.10	2.28E-05	NA
m+p-xylenes	21650.0	2.11E-01	0.48	7.88E-05	99.9627
o-xylene	7550.0	7.36E-02	0.36	5.91E-05	99.9197
Toluene	44450.0	3.76E-01	56.40	8.03E-03	97.8642
1,1,1-trichloroethane	1405.0	1.72E-02	18.90	3.90E-03	77.3569
Trichloroethene	1750.0	2.11E-02	< 0.05	1.02E-05	> 99.9519
Chloroform	< 4.0	4.39E-05	< 0.04	7.38E-06	NA
1,1,2,2-tetrachloroethane	< 2.5	3.85E-05	< 0.03	6.49E-06	NA
Styrene	1660.0	1.59E-02	0.08	1.27E-05	99.9199

Note: All values preceded by "<" are below the detection limit - reported values are 1/2 detection limit values.
NA: Not applicable, destruction efficiency cannot be calculated since inlet concentration is below the detection limit.

Table 2-5
Trace Organic Species Destruction Efficiency Results
San Marcos Landfill
Flare #1, Run#2
November 18, 1994

Species	Inlet		Outlet		Destruction Efficiency (%)
	Concentration (ppb)	Emission Rate (lb/hr)	Concentration (ppb)	Emission Rate (lb/hr)	
Benzene	2360.0	1.69E-02	5.14	4.34E-04	97.4355
Vinyl Chloride	757.5	4.35E-03	< 0.10	6.76E-06	> 99.8446
1,2-dibromoethane	< 2.5	4.31E-05	< 0.25	5.08E-05	NA
1,2-dichloroethane	123.0	1.12E-03	< 0.10	1.07E-05	> 99.0427
Benzyl chloride	< 10.0	1.16E-04	< 0.50	6.85E-05	NA
*Dichlorobenzenes	2745.0	3.71E-02	< 0.55	8.74E-05	> 99.7641
1,1-dichloroethylene	204.0	1.82E-03	< 0.25	2.62E-05	> 98.5570
Chlorobenzene	182.0	1.88E-03	< 0.10	1.22E-05	> 99.3530
Dichloromethane	15550.0	1.21E-01	0.88	8.08E-05	99.9334
Perchloroethene	3460.0	7.52E-02	0.09	2.20E-05	99.9707
Carbon Tetrachloride	< 2.5	3.53E-05	< 0.03	4.99E-06	NA
m+p-xylenes	21650.0	2.11E-01	0.38	4.36E-05	99.9793
o-xylene	7550.0	7.36E-02	0.17	1.95E-05	99.9735
Toluene	44450.0	3.76E-01	25.30	2.52E-03	99.3298
1,1,1-trichloroethane	1405.0	1.72E-02	19.20	2.77E-03	83.9093
Trichloroethene	1750.0	2.11E-02	< 0.05	7.11E-06	> 99.9664
Chloroform	< 4.0	4.39E-05	< 0.04	5.17E-06	NA
1,1,2,2-tetrachloroethane	< 2.5	3.85E-05	< 0.03	4.54E-06	NA
Styrene	1660.0	1.59E-02	1.27	1.43E-04	99.0992

Note: All values preceded by "<" are below the detection limit - reported values are 1/2 detection limit values.
NA: Not applicable, destruction efficiency cannot be calculated since inlet concentration is below the detection limit.

Table 2-6
Trace Organic Species Destruction Efficiency Results
San Marcos Landfill
Flare #1, Run #3
November 18, 1994

Species	Inlet		Outlet		Destruction Efficiency (%)
	Concentration (ppb)	Emission Rate (lb/hr)	Concentration (ppb)	Emission Rate (lb/hr)	
Benzene	2360.0	1.67E-02	0.25	2.04E-05	99.8782
Vinyl Chloride	757.5	4.30E-03	< 0.10	6.53E-06	> 99.8482
1,2-dibromoethane	< 2.5	4.27E-05	< 0.25	4.91E-05	NA
1,2-dichloroethane	123.0	1.11E-03	< 0.10	1.03E-05	> 99.0652
Benzyl chloride	< 10.0	1.15E-04	< 0.50	6.61E-05	NA
*Dichlorobenzenes	2745.0	3.67E-02	< 0.55	8.45E-05	> 99.7696
1,1-dichloroethylene	204.0	1.80E-03	< 0.25	2.53E-05	> 98.5909
Chlorobenzene	182.0	1.86E-03	< 0.10	1.18E-05	> 99.3682
Dichloromethane	15550.0	1.20E-01	0.28	2.48E-05	99.9793
Perchloroethene	3460.0	7.44E-02	0.07	1.73E-05	99.9767
Carbon Tetrachloride	< 2.5	3.49E-05	< 0.03	4.82E-06	NA
m+p-xylenes	21650.0	2.09E-01	0.13	1.44E-05	99.9931
o-xylene	7550.0	7.28E-02	< 0.05	5.54E-06	> 99.9924
Toluene	44450.0	3.72E-01	24.00	2.31E-03	99.3792
1,1,1-trichloroethane	1405.0	1.70E-02	21.90	3.05E-03	82.0775
Trichloroethene	1750.0	2.09E-02	< 0.05	6.86E-06	> 99.9671
Chloroform	< 4.0	4.34E-05	< 0.04	4.99E-06	NA
1,1,2,2-tetrachloroethane	< 2.5	3.81E-05	< 0.03	4.38E-06	NA
Styrene	1660.0	1.57E-02	< 0.02	1.63E-06	> 99.9896

Note: All values preceded by "<" are below the detection limit - reported values are 1/2 detection limit values.

NA: Not applicable, destruction efficiency cannot be calculated since inlet concentration is below the detection limit.

3. FLARE DESCRIPTION AND OPERATION

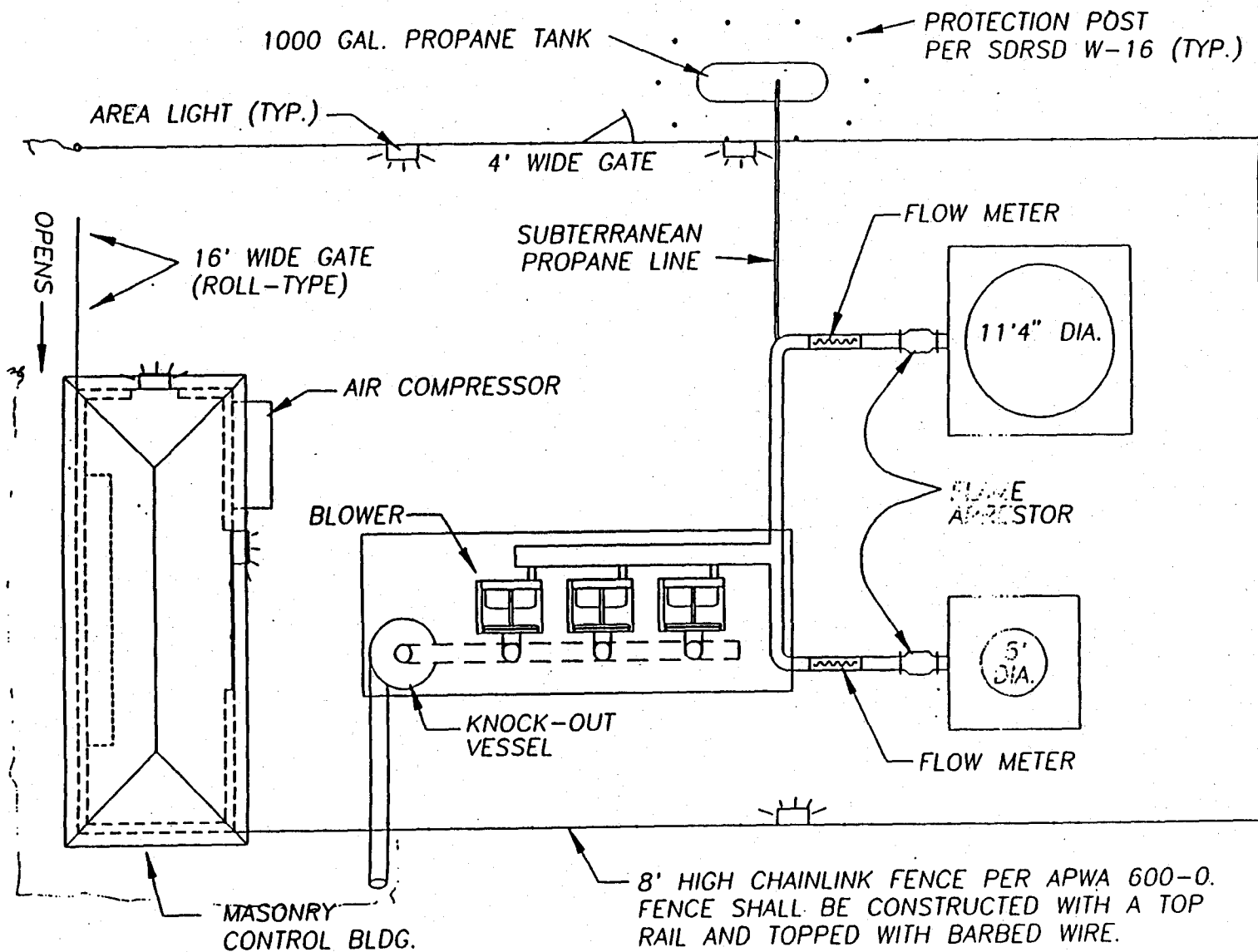
3.1 Flare Description

The landfill gas flares (Flare #1 and Flare #2) consist of an insulated steel cylinder approximately 40 feet high. Flare #1 is five feet in diameter; Flare #2 is 11 feet - 4 inches in diameter. Each flare is equipped with an optical flame detector, automatic shut-off valve, three stack thermocouples, flame arrestor, and sampling ports. Flare station controls and monitoring equipment include in-line landfill gas oxygen and methane analyzers, landfill gas flow meters, and back-up fuel supply. The landfill gas flow rate was expected to be approximately 2600 cubic feet per minute (cfm) during the emissions testing for Flare #2 and 600 cfm for Flare #1.

Both flare operating temperature range is 1500°F to 1800°F. Both flares were operated between 1500°F and 1800°F during the test program. Flare temperature is continuously monitored by the facility. A schematic of the facility layout is provided in Figure 3-1.

3.2 Sample Location

Flare #1 exhaust samples were obtained from each of two ports positioned at right angles at a distance of 37 feet and 6 inches above ground. Flare #2 exhaust samples were obtained from each of four ports positioned at right angles at a distance of 35 feet and 6 inches above ground. The flare inlet landfill gas samples were obtained from a 1/4 inch stainless steel nipple located upstream of the flame arrestor of each stack. Landfill gas condensate samples were obtained from the 5,000 gallon storage vessel at the facility.



Drawn by S.W. Checked by S.W.	County of San Diego - Department of Public Works			
Approved by R.O.E.	FACILITY LAYOUT FOR SAN MARCOS FLARE			
Date JUNE 10, 1993				
Revision	By	Revision	By	
SCALE HOR 1" = 6' VERT. 1" = 6'	WA. #	RS.		
Sheet of Sheets				

Figure 3-1

4. SAMPLING/ANALYSES

The sampling/analytical program has been designed to quantify the parameters of interest outlined in Table 1-1 in accordance with the procedures agreed upon in the Test Plan and subsequent correspondences with SDCAPCD. Three replicate test runs were completed simultaneously for each constituent of interest at each applicable sample location.

4.1 Sample Location

4.1.1 Flare Exhaust

At the flare exhaust, 24 sample points (12 per diameter), determined in accordance with Method 1, were utilized for the determination of the following compounds:

- Particulate matter
- Moisture
- NO_x
- CO
- O₂/CO₂
- Speciated organic compounds
- Total hydrocarbons
- Methane & ethane

4.1.2 Landfill Gas Supply Line

A single sample point was utilized for the collection of the following compounds, where applicable:

- total hydrocarbons
- methane & ethane
- CO₂/O₂
- speciated organic compounds
- moisture
- total reduced sulfur compounds

Landfill gas velocity was determined from the on-line flow monitor (calibrated orifice) located at the inlet to each flare.

4.1.3 Landfill Gas Condensate Storage Vessel

Sample of condensate was obtained from the 5,000 gallon storage vessel and utilized in the characterization and quantification of volatile and semi-volatile hydrocarbons as determined using US EPA Methods 624 and 625, respectively.

4.2 Moisture (Inlet/Outlet)

Moisture content of the landfill gas was determined using a wet bulb/dry bulb thermocouple probe. Moisture content of the flare exhaust was determined in conjunction with SDCAPCD Method 5 testing.

4.3 Flow Rate

4.3.1 Inlet

The landfill gas flow rate (scfm) was determined using the facility's on-line flow monitor (orifice plate) at each flare inlet. The dry scfm was then calculated using the results of the percent moisture obtained using a wet bulb/dry bulb.

4.3.2 Outlet

Each flare exhaust flow rate was calculated stoichiometrically using the following equation:

$$\text{Landfill Gas Flow Rate (dscfm)} \times \text{ExpansionFactor} \times \left(\frac{20.92}{20.92 - \%O_2} \right)$$

Although a measured velocity was determined as per SDCAPCD Methods 1 and 2, in conjunction with SDCAPCD Method 5 sampling, the calculated flow rate was utilized in determining emissions rates. A check for cyclonic flow was conducted at the flare exhaust concurrent with the preliminary velocity traverse requirements as specified in SDCAPCD Method 5.

4.4 PM₁₀ as Total Particulate Matter (Outlet Only)

HORIZON conducted three, 60-minute test runs on each flare exhaust at each previously described sample location in accordance with SDCAPCD Method 5 protocol. Exceptions to this include all samples taken at Flare #2 which were not collected isokinetically and Run #2 of Flare #2 which had a total duration of 120 minutes. Since the velocity (ΔP) was too low to be accurately measured, the Method 5 train was operated at a constant rate for all runs of Flare #2. Specifically, the sample rate (ΔH) chosen corresponded to the average ΔP observed during the preliminary traverse. Run numbers one and two of Flare #1 were sampled isokinetically. However, Run #2 was excluded from analysis due to an excessive leak discovered during the post test leak check. Twenty-four traverse points were utilized for the collection of particulate matter at each flare exhaust.

HORIZON utilized a sampling train which conforms to SDCAPCD Method 5 specifications. Exhaust gases are withdrawn through an integral quartz nozzle and probe followed by 3/8 inch OD Teflon tubing and a series of four impingers. A 47 mm glass fiber filter is placed between the third and fourth impingers. A thermocouple and pitot tube are connected to the probe per Method 5.

The first, third and fourth impingers are of the modified Greenburgh-Smith design, and the second is a standard type. The first and second impingers contain 100 ml of deionized (DI) H₂O each. The third impinger is empty. The last contains a preweighed amount of silica gel. An umbilical cord connects the last impinger to the flow control console containing a leakless, lubricated vane pump, dry gas meter, calibrated orifice, and a dual 0-0.25 or 0-5 inch H₂O magnahelics.

A leak check of the pitot tube lines and sampling trains is conducted prior to and after each sampling run and prior to and after either changing any of the constituents of the train or disconnecting umbilical cords to facilitate transport of the trains.

Upon completion of each sampling run, the nozzle, probe and 3/8" OD Teflon tubing is brushed and rinsed three times with deionized water followed by a triple rinse of acetone. The impingers and all connecting glassware are collected and rinsed gravimetrically three times with DI water and acetone. The filter is then replaced in its original container pending analyses. All sample bottles and filter containers are sealed with tape and all liquid levels marked. Analyses

Upon completion of each sampling run, the nozzle, probe and 3/8" OD Teflon tubing is brushed and rinsed three times with deionized water followed by a triple rinse of acetone. The impingers and all connecting glassware are collected and rinsed gravimetrically three times with DI water and acetone. The filter is then replaced in its original container pending analyses. All sample bottles and filter containers are sealed with tape and all liquid levels marked. Analyses are conducted on the DI water rinse, acetone rinse and filter sample fractions in accordance with SDCAPCD Method 5.

4.5 Continuous Emission Monitoring (NO_x, CO, CO₂, O₂) System Description - Outlet

Flare exhaust NO_x, CO, CO₂ and O₂ concentration were determined using SDCAPCD Method 20. Three, 60-minute test runs were conducted at each flare exhaust using HORIZON's continuous emissions monitoring system. The continuous emission monitoring system consists of a Thermo Electron Model 10 chemiluminescence NO/NO_x analyzer, a Teledyne electrochemical O₂ analyzer, a Thermo Electron Model 48H CO gas filter correlation analyzer and a Horiba non-dispersive infrared CO₂ analyzer. All analyzer specifications are provided in Table 4-1. All concentrations are determined on a dry basis. Concentrations of NO_x, CO, O₂ and CO₂ are continuously recorded on a Linseis 10-inch strip chart recorder. The extractive monitoring system utilized in the testing program conforms with the requirements of SDCAPCD Method 20.

The sampling probe, constructed of 1/2 inch diameter, 316 stainless steel, is connected to a condenser with a two foot length of 1/4 inch Teflon line. The condenser consists of a series of three glass moisture knock-out bottles immersed in an ice bath. The system is designed to minimize contact between the sample and the condensate. The sample exiting the condenser is then transported through 1/4 inch O.D. Teflon tubing, through a 47 mm glass fiber filter and an Altech sample gas cooler conditioning system (15°C dewpoint) and a Teflon coated, diaphragm pump to the sample manifold. The sample manifold is constructed of stainless steel tubing and directs the sample through each of five rotameters to the NO_x monitor, O₂ monitor, CO monitor, CO₂ monitor and excess sample exhaust line, as illustrated in Figure 4-1. Sample flow through each channel is controlled by a stainless steel needle valve on each rotameter and a manifold pressure regulator. All components of the sampling system that contact the sample are composed of stainless steel, Teflon, or glass.

TABLE 4-1

CONTINUOUS EMISSIONS MONITORING VAN

NO_x CHEMILUMINESCENT ANALYZER -- THERMO ELECTRON MODEL 10 A

Response Time (0-90%)	1.5 sec -- NO mode/1.7 sec -- NO _x mode
Zero Drift	Negligible after 1/2 hour warmup
Linearity	$\pm 1\%$ of full scale
Accuracy	Derived from the NO or NO ₂ calibration gas, $\pm 1\%$ of full scale
Operating Ranges (ppm)	2.5, 10, 25, 100, 250, 1000, 2500, 10000
Output	0-1 volt
Serial Number	10-22759-207

O₂ ANALYZER, FUEL TYPE -- TELEDYNE MODEL 326RA

Response Time (0-90%)	60 seconds
Accuracy	$\pm 1\%$ of scale at constant temperature $\pm 1\%$ of scale of $\pm 5\%$ of reading, whichever is greater, over the operation temperature range.
Operating Ranges (%)	0-5, 0-25, 0-100
Output	0-1 volt
Serial Number	99634

O₂ ANALYZER, PARAMAGNETIC -- SERVOMEX MODEL 1400B

Response Time (0-90%)	15 seconds
Accuracy	0.1% oxygen
Linearity	$\pm 1\%$ scale
Operating Ranges (%)	0-25, 0-100
Output	0-1 volt
Serial Number	

CO GAS FILTER CORRELATION -- THERMO ELECTRON MODEL 48H

Response Time (0-95%)	1 minute
Zero Drift	± 0.2 ppm CO
Span Drift	Less than 1% full scale in 24 hours
Linearity	$\pm 1\%$ full scale, all ranges
Accuracy	± 0.1 ppm CO
Operating Ranges (ppm)	50, 100, 250, 500, 1000, 2500, 5000, 10,000, 25,000, 50,000
Output	0-1 volt
Serial Number	48H-240-76-213

TABLE 4-1 (Cont.)

CO₂ INFRARED GAS ANALYZER -- HORIBA - MODEL PIR 2000

Response Time (0-90%)	5 seconds
Zero Drift	$\pm 1\%$ of full scale in 24 hours
Span Drift	$\pm 1\%$ of full scale in 24 hours
Linearity	$\pm 2\%$ of full scale
Resolution	Less than 1% of full scale
Operating Ranges (%)	0-5, 0-15, 0-25
Output	0-1 volt
Serial Number	811017

RATFISCH FID TOTAL HYDROCARBON ANALYZER -- MODEL 55CA

Response Time (0-90%)	5 seconds
Zero Drift	$\pm 1\%$ full scale in 24 hours
Span Drift	$\pm 1\%$ full scale in 24 hours
Linearity	$\pm 1\%$ full scale - constant
Accuracy	$\pm 1\%$ full scale at constant temp.
Operating Ranges (ppm)	10, 100, 1000, 10,000
Output	0 - 10 volts
Serial Number	1119590N

LINSEIS MODEL L2045 FOUR PEN STRIP CHART RECORDER

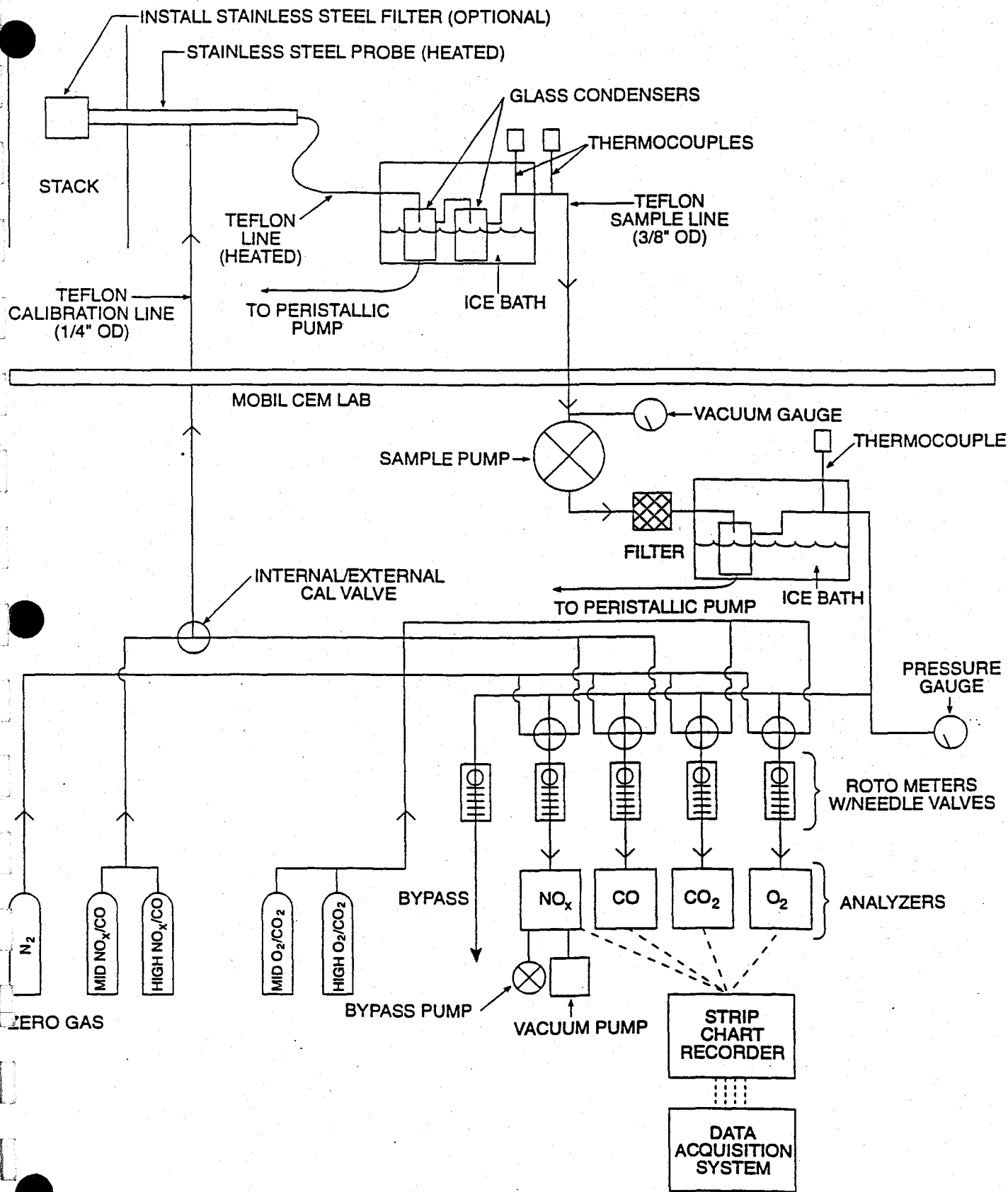
Pen Speed	up to 120 cm/min
Measuring Response	0-20 volts
Linearity Error	0.25%
Accuracy	0.3%
Zero Suppression	Manual (from 1 to 10X full scale)
Serial Number	P-1524

LINEAR 3 PEN CONTINUOUS -- MODEL 595 STRIP CHART

Pen Response	20 inches/second
Measuring Response	1 Mv through 5V
Zero Set	Electronically adjustable full scale with 1 full scale of zero suppression
Accuracy	Total limit of error $\pm 0.5\%$
Serial Number	53163

SOLTEC 2 PEN CONTINUOUS -- MODEL 1242 STRIP CHART

Pen Speed	Better than 750 mm/sec
Measuring Response	1 mV through 200 V
Zero Set	Electronically adjustable full scale with 1 full scale of zero suppression
Accuracy	Total limit of error $\pm 0.3\%$



CEM System Schematic

Figure 4-1

4.5.1 NO/NO Monitoring System Description

The Thermo Electron Model 10AR NO/NO₂ analyzer automatically and continuously determines the concentration of nitric oxide (NO) or oxides of nitrogen (NO_x) in a flowing gas mixture. The analytical technique is chemiluminescence.

In the determination of NO, the sample is quantitatively converted to NO₂ by gas phase oxidation with molecular ozone produced within the analyzer. In this reaction, the NO₂ molecules are elevated to an electronically excited state and immediately reverted to a non-excited ground state. This conversion is accompanied by emission of photons, which impinge on a photomultiplier detector and generate a low level DC current. The current is amplified and used to drive a front panel meter and a data recorder.

For the determination of NO_x, the analyzer utilizes the same principle as it does for determination of NO except that before the sample enters the reaction chamber it is routed through a converter where the NO_x is dissociated to form NO. The NO_x concentration sensed by the instrument includes the contributions of both the NO in the effluent and the NO resulting from the dissociation of NO₂.

The sample conditioning/distribution system includes calibration gas injection ports, both immediately upstream of the analyzer and at the sample probe. This arrangement provides both ease in checking the analyzer performance and a means of evaluating the integrity of the entire monitoring system. The outputs of the NO_x analyzer are recorded on a four pen, 10-inch strip chart recorder.

4.5.2 Carbon Monoxide System Description

Carbon monoxide concentration will be monitored using SDCAPCD Method 20. A continuous sample is extracted from the stack using the system described for the NO_x monitoring.

Sample is routed through a rotameter from the sample manifold to a Thermo Electron Model 48H nondispersive infrared gas filter correlation analyzer (NDIR). The analyzer output is continuously recorded on a 10-inch strip chart recorder. Prior to, and at the conclusion of, each day of testing the analyzer linearity is checked using appropriate EPA Protocol or certified ($\pm 1\%$) gas standards. Prior to each series of tests a system performance test (leak check, analyzer linearity, etc.) as described for NO_x is completed.

The analyzer is calibrated prior to each test run using zero air (N_2), a mid-level CO (40-60%) and a high level (80-100%) gas standard as appropriate. Calibration values (zero and span) are recorded at the end of each test run to determine calibration drift. Cross-scale (0-100 ppm, 0-200 ppm, 0-50 ppm) linearity of CO measurements are verified after all test series which require multiple CO ranges.

4.5.3 Oxygen Monitoring System Description

Oxygen and carbon dioxide concentrations are determined using SDCAPCD Method 20. Oxygen concentration is monitored using a Teledyne Model 326RA O_2 analyzer which utilizes a micro fuel cell. Oxygen in the sample stream is consumed by the cell which generates a proportionate micro ampere current which is then amplified to result in a D.C. signal. The D.C. signal is continuously monitored on a panel meter and 10-inch strip chart recorder.

A continuous sample is extracted from the stack using the system described in Section 4.5. Prior to, and at the conclusion of each test run the analyzer is zeroed with N_2 and certified O_2 gas standard(s) ($\pm 1\%$).

4.5.4 Carbon Dioxide System Description

Carbon dioxide concentration is monitored using a Horiba nondispersive infrared (NDIR) analyzer. Carbon dioxide is continuously monitored on a digital panel meter and 10-inch strip recorder. A continuous sample is extracted from the stack using the system described in Section 4.5. Prior to, and at the conclusion of, each test run the analyzer is zeroed with N_2 and calibrated with a certified CO_2 gas standard of ($\pm 1\%$).

4.5.5 Calibration Procedures

Calibration procedures (included semiannual, pre-test and post-test procedures) are described in subsequent subsections.

4.5.5.1 Semiannual Monitor and System Performance Test Procedures

The continuous emissions monitoring system undergoes a semiannual series of performance checks as described in subsequent subsections.

4.5.5.1.1 Linearity Check

A linearity check of the continuous analyzers is performed semi-annually at all instrument ranges used for testing. Monitor linearity is checked by injecting low, mid and high level span gases (EPA protocol 1 or certified gas standards) within each applicable range. A nitrogen/CO₂/O₂ mix is used for zero air. Linearity is confirmed if all values agree with the calibration gas values to within 2% of the applicable analyzer range.

4.5.5.1.2 Interference Response Check

The output response of the measurement system to a component in the sample gas, other than the gas component being measured, is based on manufacturers specification information.

4.5.5.1.3 NO₂ to NO Conversion Efficiency

A NO₂ to NO conversion efficiency is tested in accordance with EPA Method 20. The NO₂ and NO conversion efficiency check is performed by preparing an equal volume mix of NO in N₂ calibration gas and dried ambient air in a Tedlar bag; the gas mixture is then sampled over a period of 30 minutes. The resulting NO_x reading after 30 minutes must be within 2% of the initial value for the instrument to be considered valid for field use.

4.5.5.1.4 System Response Time

The system response time is defined as the time required for the system to display 95 percent of a step change in gas concentration on the data recorder. The system response time is checked semi-annually.

4.5.5.2 Test Series Calibrations

The following procedures are conducted before and after each series of test runs.

4.5.5.2.1 Leak Check

The leak check is performed by plugging the end of the sampling probe, then evacuating the system to at least 20 inches of Hg. The leak check is deemed satisfactory if the system holds 95% of the 20 inches of Hg vacuum for five minutes, a loss less than one inch Hg vacuum.

Alternately the leak check is accomplished by plugging the probe at the tip and operating the system in the "sample" position. The excess sample vent is closed and the flow observed on the low-flow (0-140 cc/min) sample delivery system. If no flow is observed the system is deemed leak tight.

4.5.5.2.2 Linearity Check

The NO_x and CO analyzer linearity checks are performed by introducing, at a minimum, zero gas, mid range calibration gas (40-60% scale) and high range calibration gas (80-100% scale). Instrument span value is set with the mid range gas. Linearity is confirmed if all values agree with the calibration gas value to within 2% of the range. The oxygen (O₂) and carbon dioxide (CO₂) analyzer linearity check is performed by introducing zero gas, mid range calibration gas (40-50% scale) and high range calibration gas (70-80% of scale). Again, linearity is confirmed if all values agree within 2% of the range.

4.5.5.2.3 Stratification Check

Stratification checks were not performed since all samples were taken using a twenty-four point traverse for each stack.

4.5.5.2.4 System Bias (Integrity) Check

Prior to, and at the conclusion, of each test series, a sampling system bias check is performed by introducing a zero gas and either the mid range or high range NO_x calibration gas (whichever most closely approximates the effluent concentrations) to the probe tip. During this check the system is operated at the normal sampling rate with no adjustments. The system bias check is considered valid if the difference between the gas concentration exhibited by the measurement system when a known concentration gas is introduced at the sampling probe tip and when the sample gas is introduced directly to the analyzer, does not exceed $\pm 5\%$ of the analyzer range.

4.5.5.2.5 NO₂ System Integrity Check

Two, 10-minute sub-tests were completed in the NO mode at the conclusion of Run 2 and Run 3 of Flare #2 and one, 10-minute sub-test at the end of Run #3 of Flare #1 to verify each flare as a low NO₂ source. Since the flare exhausts were determined to be a low NO₂ emission source ($<5\%$ NO₂/Total NO_x), the NO₂ system integrity check was not required.

4.5.5.2.6 NO₂ to NO_x Conversion Efficiency

The NO₂ to NO_x converter efficiency check as described in Section 4.5.5.1.3 were repeated on-site.

4.5.5.3 Test Run Calibration

The following procedures are conducted between each test run (sub-test).

4.5.5.3.1 Analyzer Calibration

The analyzer calibration is performed by introducing the zero and mid range gases, to each analyzer prior to each test run, and adjusting the instrument calibration as necessary.

4.5.5.3.2 Zero and Calibration Drift Check

The zero and calibration drift check were performed by introducing zero and mid range calibration gases to the instruments, with no adjustments (with the exception of flow to instruments) after each test run. The analyzer response must be within $\pm 3\%$ of the actual calibration gas value.

4.6 Oxygen and Carbon Dioxide (Landfill Gas)

Landfill gas O₂ and CO₂ concentration was determined from SUMMA canister samples using GC-TCD and GC-FID (equipped with a methanizer) analyses, respectively.

4.7 Methane, Ethane and Speciated Organic Compounds

Methane, ethane and speciated organic compound samples were collected at the flare exhaust and flare inlet using the SUMMA canister method described below. Three, 60-minute test runs were completed with the exception of Flare #2, Run #2 in which a 120-minute test run was completed.

Samples were collected using 6-liter SUMMA polished stainless steel canisters which are evacuated to less than 10 mm Hg absolute. The tanks are pressurized and evacuated five times with ultrapure nitrogen and leak checked prior to use. A gas flow metering device (vacuum regulator) and stainless steel shutoff valve is located just upstream of the canister. Representative, integrated samples are collected through a heat conditioned 1/4 inch O.D. stainless steel probe (outlet) and Teflon tubing (inlet). The gas samples are metered into the canisters through the vacuum regulator maintaining a constant flow rate throughout each 60 minute sampling period. Prior to sampling, the sampling apparatus is purged with stack gas or landfill gas, as appropriate, for a period of at least five minutes.

The sampling apparatus is checked for leaks prior to the sampling program by attaching the probe end to an absolute pressure gauge and vacuum pump in series. The sample lines are evacuated to less than 10 mm Hg and the gauge shutoff valve is then closed. The sample lines are deemed to be leak-free if no loss of vacuum occurs as indicated by the vacuum gauge. During sampling, tank pressures are monitored with a 0-30 inch Hg vacuum gauge to ensure integrated sampling.

The final vacuum of each sample is measured using an absolute pressure gauge. The sample is then pressurized to 800 mm Hg absolute with ultrapure nitrogen. Each sample was analyzed for the following parameters:

<u>Parameter</u>	<u>Analytical Technique</u>	<u>Number of Analysis</u>
Methane/Ethane	GC-FID	Outlet 3/Inlet 2
Speciated Organic Compounds	GC/MS (Calderon List)	Outlet 3/Inlet 2
Oxygen (Inlet Only)	GC/TCD	2
Carbon Dioxide (Inlet Only)	GC/FID (with methanizer)	2

4.8 Total Hydrocarbons

Flare exhaust total hydrocarbon concentrations were determined in conjunction with the methane, ethane and speciated organic compound samples described in Section 4.7. Sample extraction and handling was identical to that exhibited in the previous section. Analysis consisted of a FID without catalyst and reported results as TGNMO ($C_2 - C_{13}$). Concentration of TGNMO was then added to the corresponding methane values provided by GC-FID analysis

and applied to the stack flow rate for the determination of the total hydrocarbon emission rate.

Scheduled use of Method 25A on each outlet stack location was replaced with the previously described method upon the malfunction of the Ratfisch Model 55CA total hydrocarbon analyzer. Permission to use this alternative method of total hydrocarbon determination was granted by Mr. Ian Morris of SDCAPCD.

4.8.1 Landfill Gas (EPA Method 25B)

Landfill gas total hydrocarbon concentration was monitored over three, 60-minute test runs per flare using EPA Method 25B. This method is identical to US EPA Method 25A with the exception that an infrared gas analyzer (RR Model LFG-10) was used in place of the FID (Ratfisch RS55CA). The sample interface (1/4" stainless steel probe and heated Teflon tubing) was assembled and the measurement system operated according to the manufacturers instructions. After spanning the instrument, linearity was checked on site using zero ($< \pm 1\%$ of span value), high level, low level and mid level calibration gases. The mid-level calibration gas was then introduced at the probe tip to determine sampling system bias. The sampling system was deemed acceptable for testing due to recorded values within 5% of the span gas value. At the conclusion of each test, a drift determination was made using zero and mid level gases. Prior to and at the conclusion of the test period a leak check, sample system bias and linearity check were performed. Calibration drift was checked and the instruments recalibrated between each sub-test. Linearity was checked using methane standards of 25%, 48% and 80% by volume in nitrogen. All other procedures will be identical to those described in Section 4.8.1 above.

4.9 Sulfur Dioxide and Speciated Reduced Sulfur Compounds (Modified EPA Method 16)

Two, nominal 15-minute speciated reduced sulfur compound samples were collected at the flare inlet using a modified EPA Method 16. Each sample was collected in a 10-liter Tedlar bag, equipped with a polypropylene valve. The bag was connected to a stainless steel sample valve at the landfill gas supply line, which is under positive pressure, with a short length of 1/4

inch O.D. Teflon tubing. The sample valve was opened slightly to allow the bag to fill with landfill gas (under pressure) over a nominal 15-minute period.

Within 24-hours of collection, each sample was analyzed for a complete list of reduced sulfur compound species using GC-FID procedures as outlined in EPA Method 16. From the resulting data the flare exhaust sulfur dioxide (SO₂) emission rate was calculated based upon the assumption that all sulfur compounds in the landfill gas are oxidized in the flare to SO₂.

4.10 Volatile and Semi-Volatile Hydrocarbons (Condensate Injection)

During compliance testing three samples were taken of the landfill gas condensate being injected into Flare #2. These samples were then analyzed for the characterization and quantification of volatile and semi-volatile hydrocarbons as per US EPA Methods 624 and 625.

5. QUALITY ASSURANCE SUMMARY

A strict quality assurance (QA) program was adhered to throughout the source sampling and analytical phases of the program. QA encompasses the organization and program within which quality control (QC) activities are performed. QC activities are those which accompany testing, engineering and other procedures to provide control of data quality, and quantify the quality of data resulting from those procedures. Following is a summary of results all applicable QC procedures utilized during the test program.

5.1 Field Sampling Equipment Calibration

The sampling equipment was calibrated at the HORIZON office before transport and recalibrated upon return. All calibrations were verified on-site prior to testing. The sampling equipment was calibrated according to the EPA procedures specified in APTD-0576 and 40 CRF 60, Appendix A, CARB and manufacturer's specifications. Calibration results are summarized below:

SDCAPCD Method 5

- Dry Gas Meter and Orifice Meter Method 5. The dry gas meters for all sampling trains were calibrated against a GCA/Precision wet test meter or a dry gas meter which has been calibrated against a spirometer. The orifice meters in the particulate trains are checked against the dry gas meter to which it is attached. The calibration was checked at HORIZON after the conclusion of the test program using the calibration check procedure. All on-site and post test calibration checks were within US EPA limits.
- Sampling Nozzle. Each nozzle was measured with a micrometer prior to each testing event. The internal diameter of each sampling nozzle was measured to the nearest 0.001 inches along three points of the circumference with a dial vernier caliper. The three measurements were then averaged and reported. All nozzle calibrations were verified on-site prior to sampling.
- Balance. The analytical balance is certified yearly by Sartorius. Balance calibration was checked daily by HORIZON analytical personnel against Class S weights.

- Thermocouples. The type-K thermocouples in the meter control box, heated sample box, impinger umbilical connector and the one attached to the probe were calibrated against ASTM mercury in glass thermometers at two points. The first point is in an ice bath and the second at the boiling point of water.
- Pitot Tube. The "S" type pitot tubes are designed to meet geometric configurations as defined in Method 2. The configurations were checked on-site as specified and any pitot tube not meeting the criteria was replaced or repaired.

SDCAPCD Method 20/EPA Method 25A

- Calibration Gas. NO_x and CO calibration gases are EPA protocol 1 gases. O₂, CO₂ and CH₄ calibration gases were certified ($\pm 1\%$) gas standards.
- The NO_x, CO, CO₂, O₂ and total hydrocarbon analyzers passed all on-site performance and calibration checks as detailed in Section 4 including the following:
 - Repeatability Check (EPA Method 25B)
 - Instrument Linearity (On-Site)
 - NO₂ to NO converter efficiency (on-site)
 - Calibration Drift
 - Sample System bias (Integrity Check)
 - Leak Checks

5.2 Additional Field Sampling QC Activities

The criteria evaluated to evaluate all field sampling data is summarized below:

- All test procedures used were approved formally in the Test Plan or approved on-site by the SDCAPCD representative.
- All reagents used were of sufficient quality for the test program including DI water and acetone.
- All leak checks were passed prior to and at the conclusion of each test with the exception of Flare #1, Run #2 Method 5 for particulate matter. The final leak check was in gross excess of the limit of 0.02 cfm. Accordingly, the sample was excluded from analysis and not reported, per Mr. Ian Morris of SDCAPCD.
- All chain-of-custody records and field data sheets were completed with requested information and signatures.
- The minimum sample volume was obtained for all samples including a minimum of 40 ft³ for each Method 5 sample.

5.3 Laboratory QA Summary

The following is the summary of criteria used to evaluate the laboratory data:

- Field Based Blanks - DI water and acetone used for the Method 5 sampling and analyses were both below acceptable blank levels of SDCAPCD Method 5.
- Method Blanks - Method blanks were processed for all GC analyses (including total reduced sulfur compounds). All method blanks were below detectable limits.
- Duplicate Analyses - A second aliquot of CH₄, ethane, TGNMO and each speciated VOC sample was analyzed to verify analytical precision. All repeat analyses were within 10% of the mean value with the exception of low level xylene (SUMMA S-6) which was 18% different from the mean (0.42 ppb and 0.29 ppb).
- Interference Check - A high level CO₂ bag sample was spiked with hydrogen sulfide, carbonyl sulfide, methyl mercaptan and analyzed to determine analytical accuracy in a high CO₂ matrix sample. No CO₂ interference was observed; analytical accuracy was within 2% of spiked values.
- Holding Time - All gaseous samples were analyzed within the requisite holding times.

6. RESULTS DISCUSSION

The results of the testing program conducted on Flare #2 and Flare #1 are summarized in Table 6-1 and 6-2, respectively.

The landfill gas flow rate (dscfm) is based upon the facility's on-line monitor readings (scfm). The flare exhaust flow rate was below the limit of standard velocity measurement methods, and was, therefore, calculated using the following equation:

$$\text{Landfill Gas Flow Rate (dscfm)} \times \text{Expansion Factor} \times \left(\frac{20.9}{20.9 - \%O_2} \right)$$

Subsequently, all flare emission rates, including particulate matter, are based upon the calculated flare exhaust flow rate.

The reported sulfur dioxide emission rate was calculated from the total reduced sulfur compound concentration measured in the landfill gas and the landfill gas flow rate using the following equation:

$$MW \times C_s \times (2.59 \times 10^{-9}) \times F_L \times 60 = E_{SO_2}$$

Where,

C_s = Concentration of total sulfur compounds in landfill gas as S_i (ppm)

F_L = Landfill gas flow rate (dscfm)

MW = Molecular weight of SO_2 (64.04)

E_{SO_2} = SO_2 Emission Rate (lb/hr)

Speciated volatile organic compound (VOC) concentrations and emission rates from Flare #2 are provided in Tables 2-2 and 2-3. Speciated VOC concentrations and emission rates from Flare #1 are provided in Tables 2-4, 2-5 and 2-6.

Test Critique

Due to unusually high carbon monoxide spikes ($> 100\%$ of scale) from the exhaust of Flare #2 during Run #1, it was determined that the flare operation was abnormal (possibly due to strong wind conditions). Therefore, samples taken during this period have been excluded from this report, as per Mr. Ian Morris of the SDCAPCD.

After the sixty-minute sample period of Flare #2, Run #2, it was discovered that the minimum sample volume (40 cubic feet) required by SDCAPCD Method 5 had not been achieved. Therefore, a full sample traverse of the outlet stack was repeated for each parameter of interest for an additional 60-minute period.

During the post leak check of Flare #1, Run #2, a broken silica gel impinger of the Method 5 train was discovered yielding an unacceptable leak rate of greater than 0.02 cfm. The sample was deemed invalid by Ian Morris of the SDCAPCD and, therefore, not analyzed or reported herein.

TABLE 6-1
Summary of Results - Criteria Pollutants
San Marcos Landfill - Flare #2
November 1994

	LANDFILL GAS		FLARE EXHAUST	
	Run #2	Run #3	Run #2	Run #3
STACK GAS CHARACTERISTICS				
Temperature (°F)	NA	NA	1636	1651
Moisture (%)	1.5	1.5	10.2	9.2
Flow Rate (dscfm)	2440	2462	23928	23889
Fixed Gases				
Methane (%)	44.5	44.5	<0.0001	<0.0001
Oxygen (%)	0.685	0.685	11.6	11.5
Carbon Dioxide (%)	37.45	37.45	8.2	8.4
Nitrogen	17.36	17.36	80.2	80.1
Heating Value, Btu/lb (HHV)	450	450	---	---
mmBtu/hr	66.8	67.4	---	---
EMISSIONS				
Oxides of Nitrogen				
ppm	---	---	10.6	11.0
ppm @ 3% O ₂	---	---	20.4	20.9
lb/hr	---	---	1.82	1.88
lb/mmBtu	---	---	0.027	0.028
Carbon Monoxide				
ppm	---	---	64.7	26.9
ppm @ 3% O ₂	---	---	124.5	51.2
lb/hr	---	---	6.76	2.80
lb/mmBtu	---	---	0.101	0.0415
Particulate Matter				
gr/dscf	---	---	0.0123	0.0067
gr/dscf @ 12% CO ₂	---	---	0.0180	0.0097
lb/hr	---	---	2.53	1.37
Sulfur Dioxide				
lb/hr	---	---	1.28	1.29
Total Hydrocarbons (includes methane)				
ppm (as CH ₄)	448,735	448,735	<11.1	<6.03
lb/hr (as CH ₄)	2733	2762	<0.664	<0.360
lb/mmBtu (as CH ₄)	---	---	<0.010	<0.0053
destruction efficiency (%)	---	---	>99.98	>99.99

Note: All values preceded by "<" are below the detection limit - reported values are half detection limit values.

TABLE 6-2
Summary of Results - Criteria Pollutants
San Marcos Landfill - Flare #1
November 1994

	LANDFILL GAS			FLARE EXHAUST		
	Run #1	Run #2	Run #3	Run #1	Run #2	Run #3
STACK GAS CHARACTERISTICS						
Temperature (°F)	NA	NA	NA	1598	1558	1553
Moisture (%)	1.5	1.5	1.5	9.6	9.8	9.7
Flow Rate (dscfm)	589	589	583	9921	6940	6702
Fixed Gases						
Methane (%)	48.65	48.65	48.65	<0.0005	<0.0003	<0.0009
Oxygen (%)	0.89	0.89	0.89	15.1	12.6	12.4
Carbon Dioxide (%)	38.55	38.55	38.55	5.3	6.1	7.8
Nitrogen	11.91	11.91	11.91	79.6	81.3	79.8
Heating Value, Btu/lb (HHV)	491	491	491	---	---	---
mmBtu/hr	17.6	17.6	17.4	---	---	---
EMISSIONS						
Oxides of Nitrogen						
ppm	---	---	---	7.6	9.1	11.0
ppm @ 3% O ₂	---	---	---	23.5	19.6	23.2
lb/hr	---	---	---	0.54	0.45	0.529
lb/mmBtu	---	---	---	0.030	0.026	0.030
Carbon Monoxide						
ppm	---	---	---	26.3	158	190
ppm @ 3% O ₂	---	---	---	22.5	135	163
lb/hr	---	---	---	1.14	4.79	5.55
lb/mmBtu	---	---	---	0.0648	0.272	0.319
Particulate Matter						
gr/dscf	---	---	---	0.0050	NM	0.0064
gr/dscf @ 12% CO ₂	---	---	---	0.0115	NM	0.0104
lb/hr	---	---	---	0.426	NM	0.367
Sulfur Dioxide						
lb/hr	---	---	---	0.37	0.37	0.37
Total Hydrocarbons (includes methane)						
ppm (as CH ₄)	491,185	491,185	491,185	13.4	16.7	14.5
lb/hr (as CH ₄)	723.7	723.7	715.7	0.332	0.289	0.243
lb/mmBtu (as CH ₄)	---	---	---	0.0191	0.0166	0.0141
destruction efficiency (%)	---	---	---	99.95	99.96	99.97

: All values preceded by "<" are below the detection limit - reported values are detection limit values.
 NM: Not measured due to an excessive post test leak rate analysis was not performed per Mr. Ian Morris of SDCAPCD.

APPENDIX A
Computer Printout of Results

APPENDIX A-1

Flare #2

EXPANSION AND F-FACTOR CALC. METHOD

Client: County of San Diego
 Location: San Marcos Landfill
 Unit: Flare #2

Date: 11/16/1994
 Job #: S22-001
 Test Run #: 1

Fuel temperature	<u>na</u>	deg F	Std. Temp.	<u>68</u>
Fuel Pressure	<u>na</u>	psi		
Fuel Flow Rate	<u>na</u>	cfm	Fuel Flow	<u>2452.7</u> dscfm
Exhaust Outlet O2	<u>11.7</u>	%		
Barometric Pressure	<u>na</u>			

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		0.685			0.007
Nitrogen		17.36			0.174
Carbon Dioxide		37.45			0.375
Methane		44.5	449.45	404.68	3.814
Ethane	C2	0.0004	0.01	0.01	0.000
Propane	C3	0	0.00	0.00	0.000
Iso-Butane	C4	0	0.00	0.00	0.000
N-Butane		0	0.00	0.00	0.000
Iso-Pentane	C5	0	0.00	0.00	0.000
N-Pentane		0	0.00	0.00	0.000
Hexane	C6	0	0.00	0.00	0.000
Heptane	C7	0	0.00	0.00	0.000
Octane	C8	0	0.00	0.00	0.000
Nonane	C9	0	0.00	0.00	0.000
Total		100.00	449.46	404.69	4.37

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92/20.92-%O2)

24312.2 DSCFM

F - FACTOR = (Exp Fac*10^6)/((hhv*((460+Tstd)/528))*(20.92/(20.92-%O2)))

21720.0 SCF/MMBtu

EXPANSION AND F-FACTOR CALC. METHOD

Client: County of San Diego
 Location: San Marcos Landfill
 Unit: Flare #2

Date: 11/17/1994
 Job #: S22-001
 Test Run #: 2

Fuel temperature	<u>na</u>	deg F	Std. Temp.	<u>68</u>
Fuel Pressure	<u>na</u>	psi		
Fuel Flow Rate	<u>na</u>	cfm	Fuel Flow	<u>2440.1</u> dscfm
Exhaust Outlet O2	<u>11.6</u>	%		
Barometric Pressure	<u>na</u>			

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		0.685			0.007
Nitrogen		17.36			0.174
Carbon Dioxide		37.45			0.375
Methane		44.5	449.45	404.68	3.814
Ethane	C2	0.0004	0.01	0.01	0.000
Propane	C3	0	0.00	0.00	0.000
Iso-Butane	C4	0	0.00	0.00	0.000
N-Butane		0	0.00	0.00	0.000
Iso-Pentane	C5	0	0.00	0.00	0.000
N-Pentane		0	0.00	0.00	0.000
Hexane	C6	0	0.00	0.00	0.000
Heptane	C7	0	0.00	0.00	0.000
Octane	C8	0	0.00	0.00	0.000
Nonane	C9	0	0.00	0.00	0.000
Total		100.00	449.46	404.69	4.37

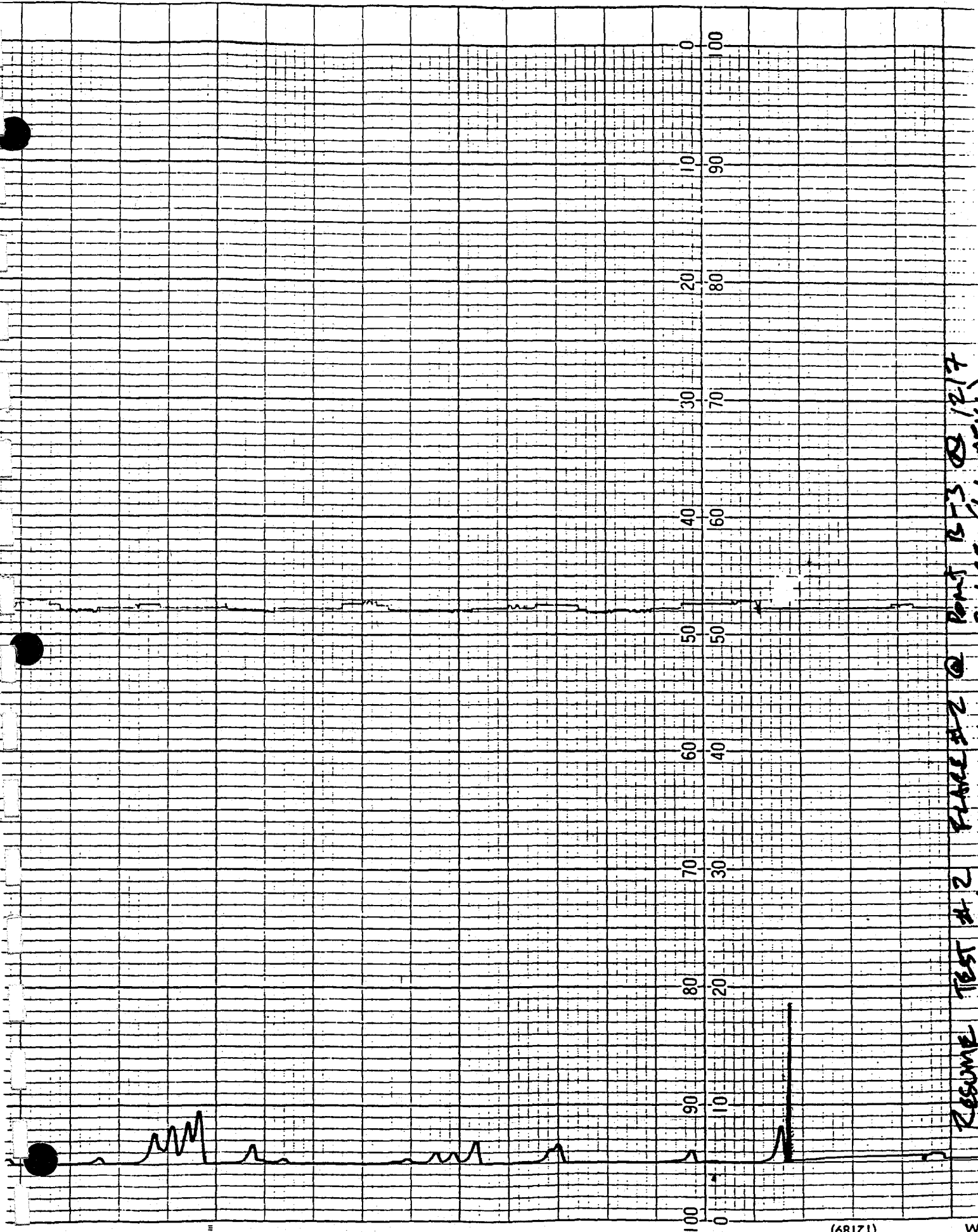
CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92/20.92-%O2)

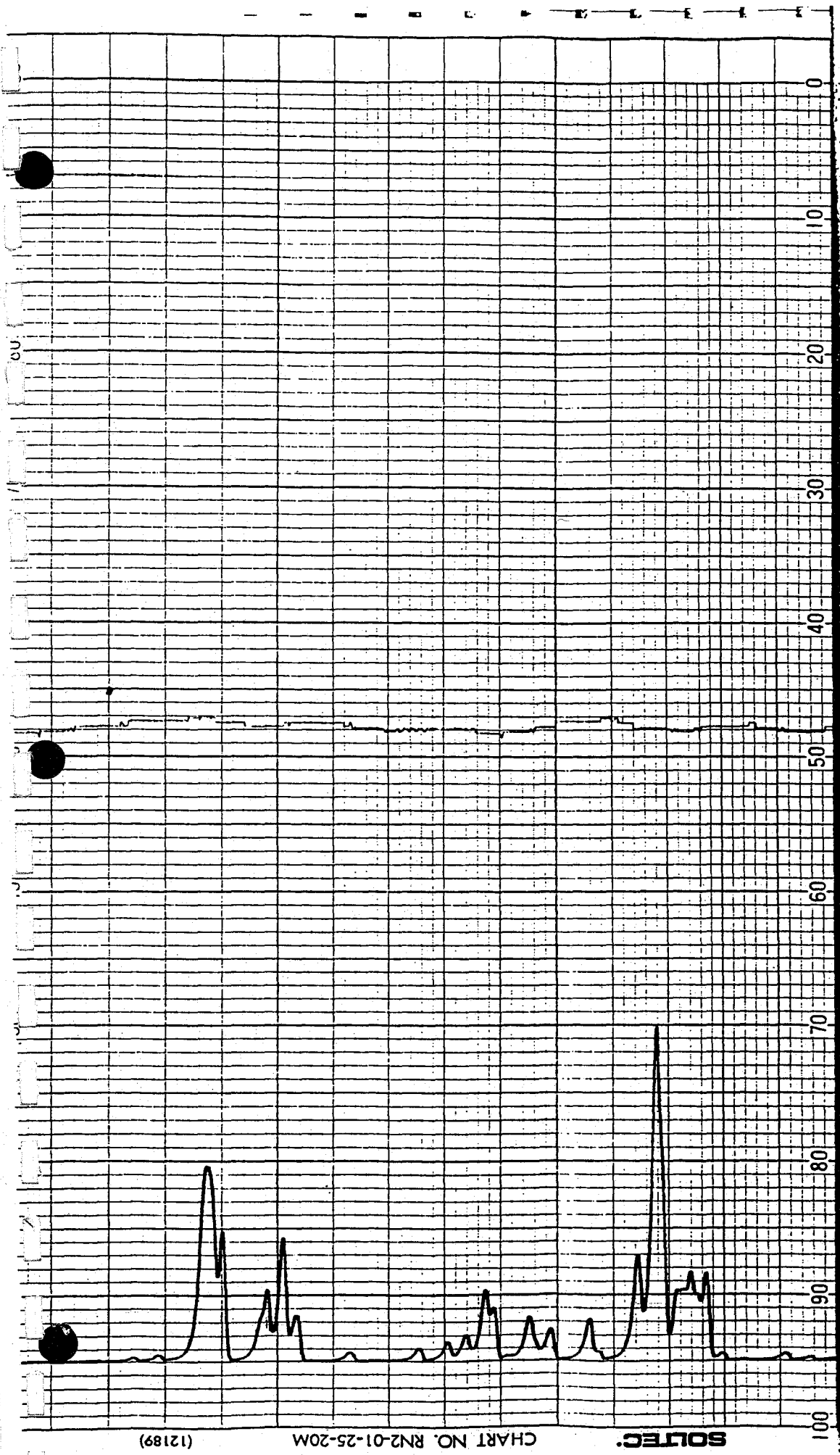
23927.7 DSCFM

F - FACTOR = (Exp Fac*10^6)/(hhv*((460+Tstd)/528))(20.92/(20.92-%O2))

21487.0 SCF/MMBtu



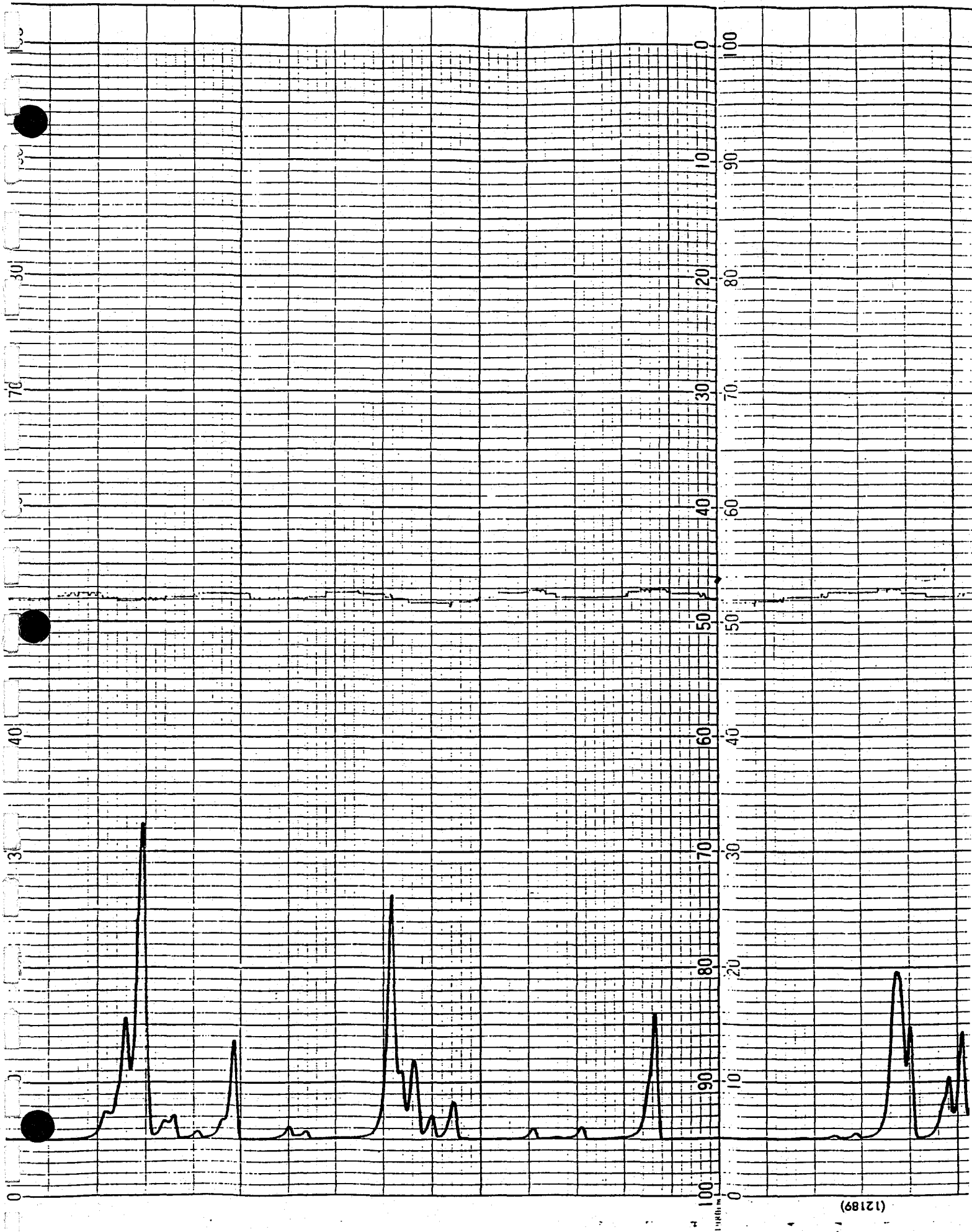
Resume Test #2 PLACE #2 @ Point B-3 12/17
2. WAF 1/1/1971

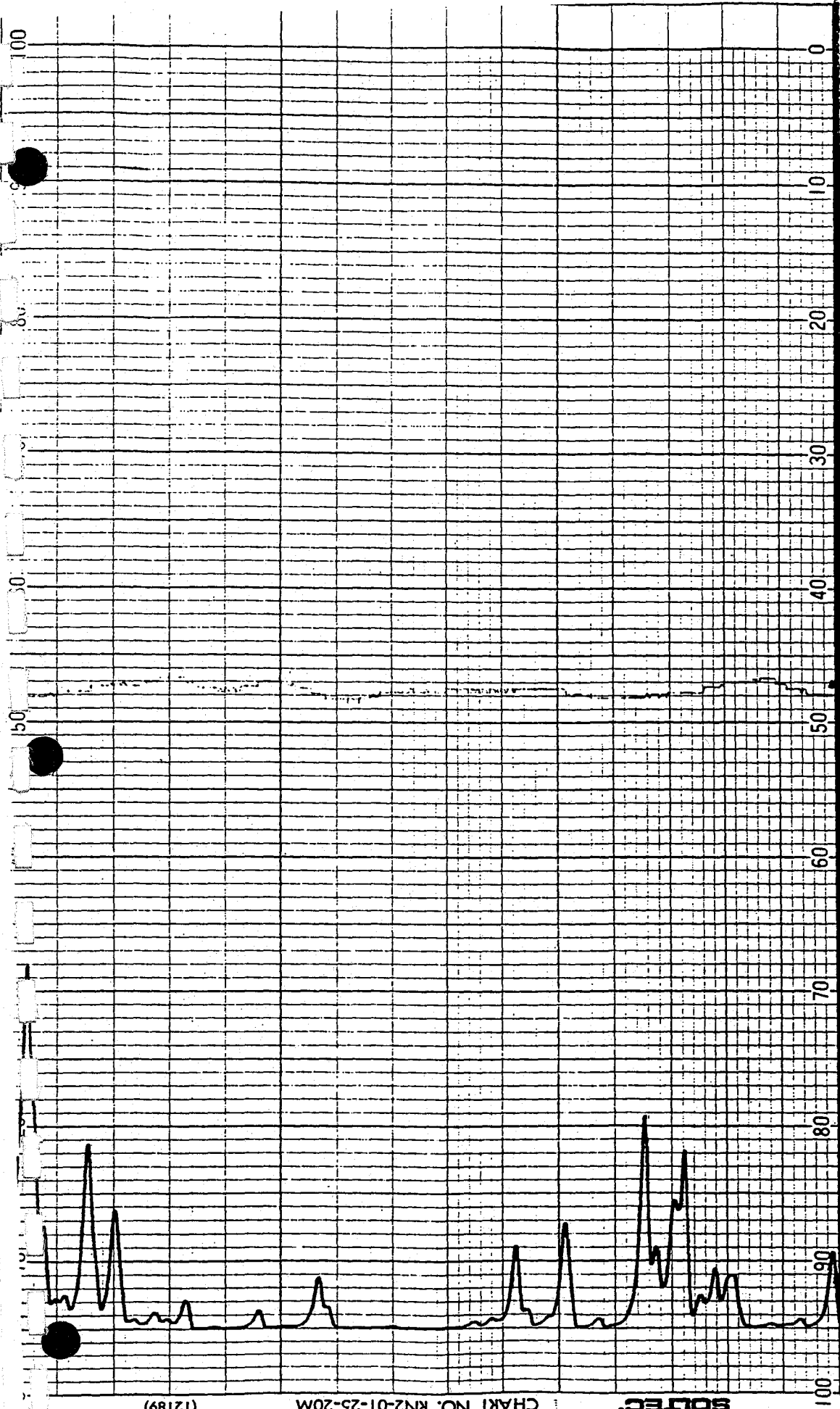


SOLTEC.

CHART NO. RN2-01-25-20M

(12189)

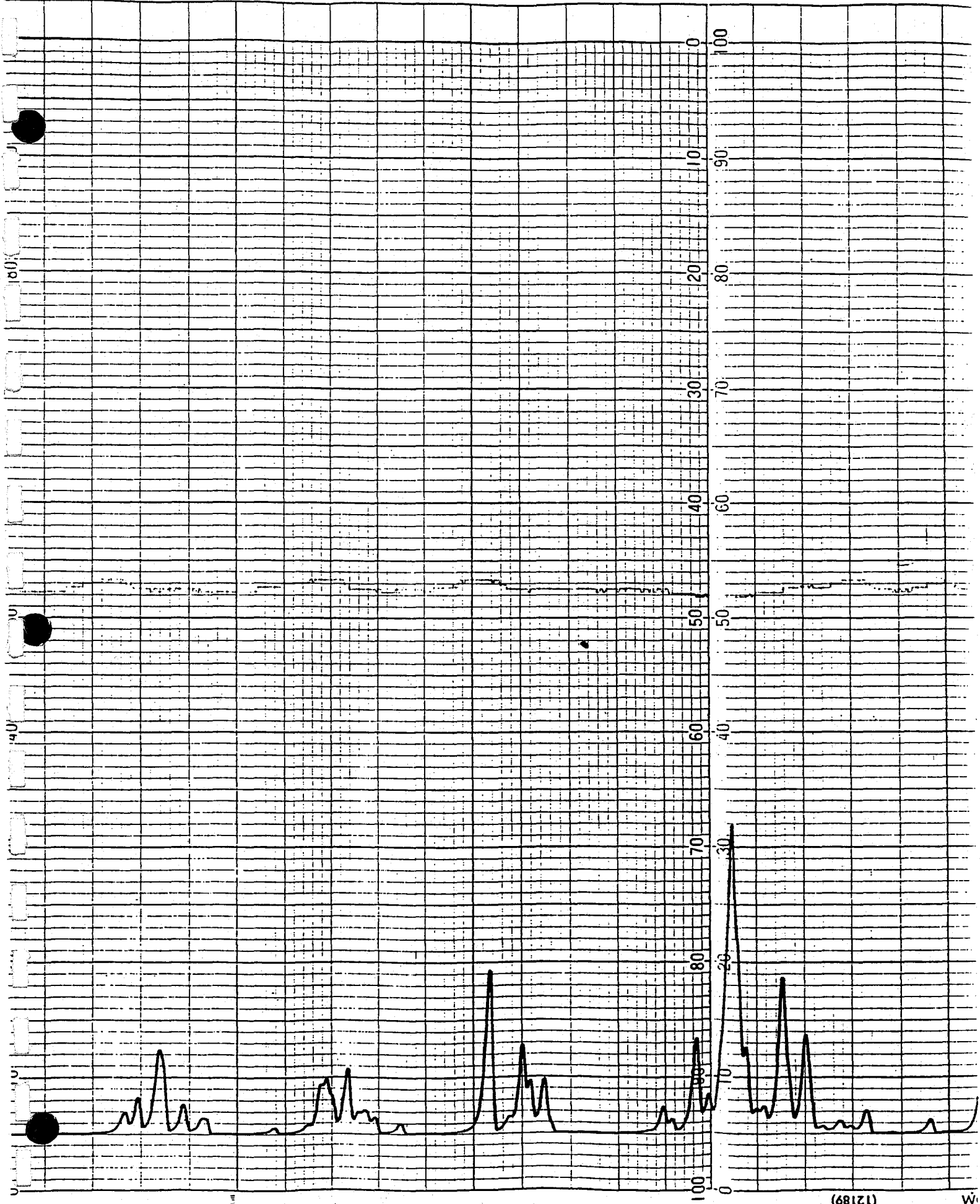




SOLTEC.

CHART NO. RN2-01-25-20M

(12189)



(12189)

W

(12189)

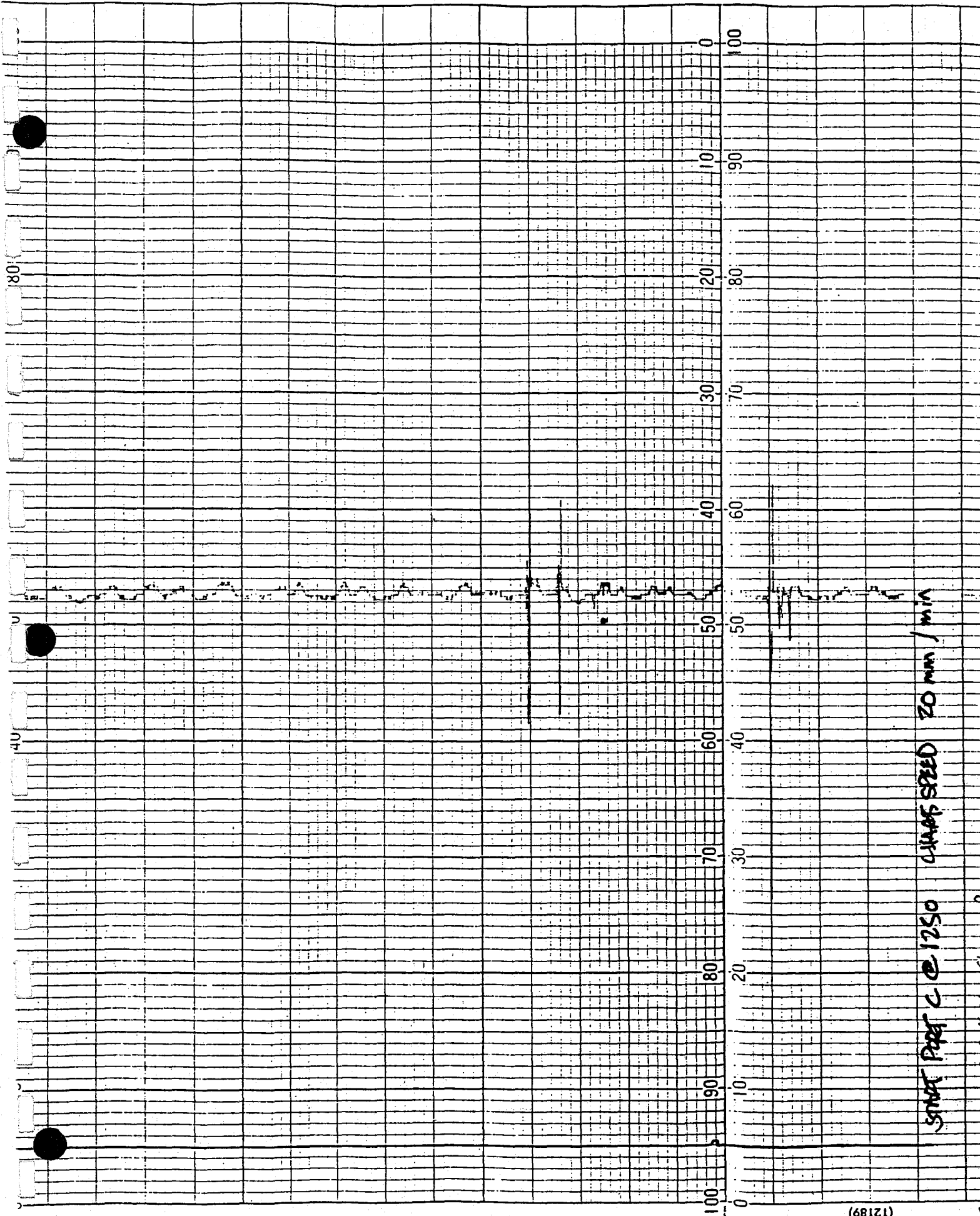
CHART NO. RN2-01-25-20M

SOITEC

START PLOT C @ 1250 CHART SPEED 20 mm/min

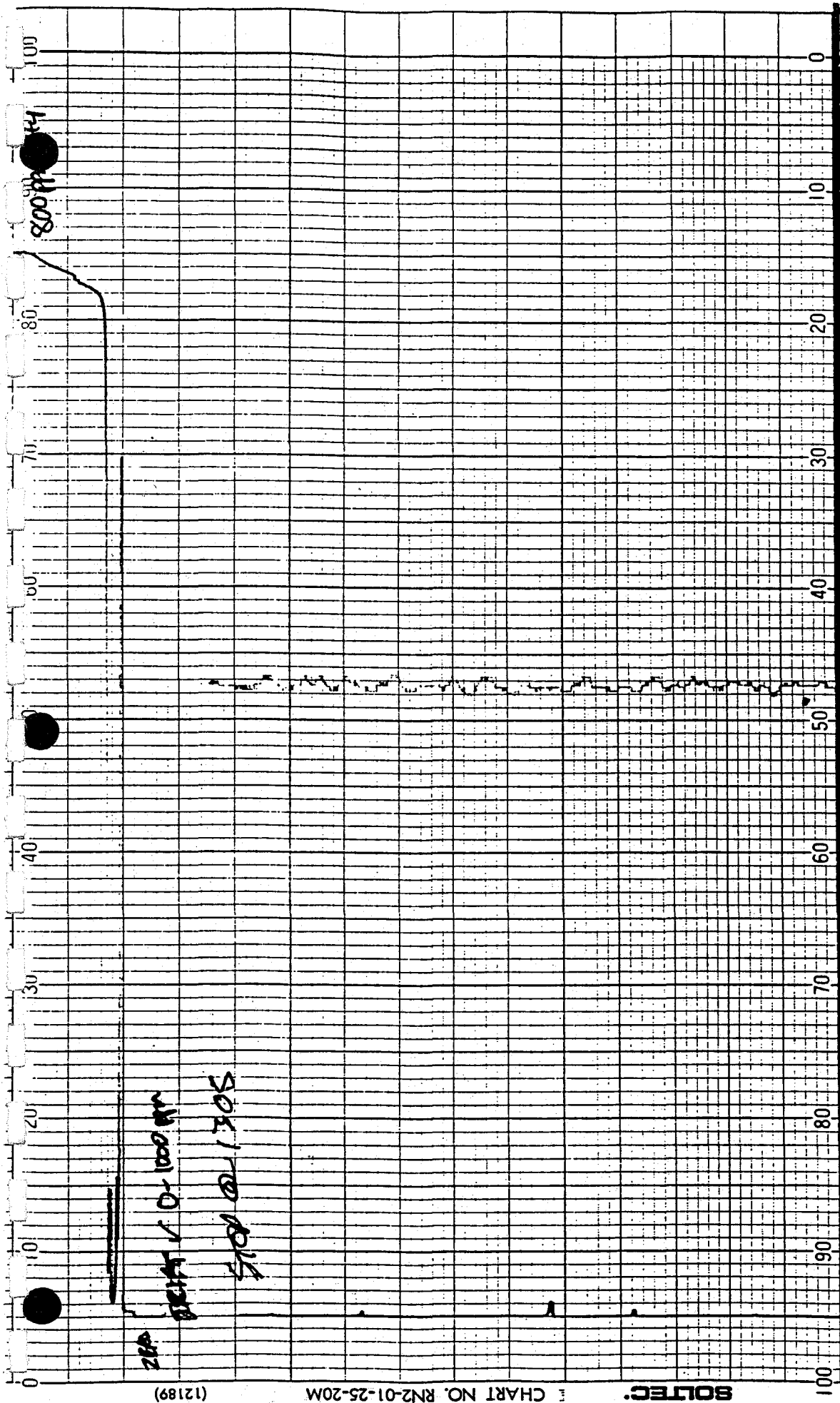
STOP @ 1126 CURVE PART





SMALL PLOT C @ 1250 CARRIER SPEED 20 mm/min

4900 P. 1126 CURVE PLOT



0 10 20 30 40 50 60 70 80 90 100

1. 0-1000 rpm
start part 0 @ 13/7 chart speed 20 cm/min

79.9%
Approx 11%

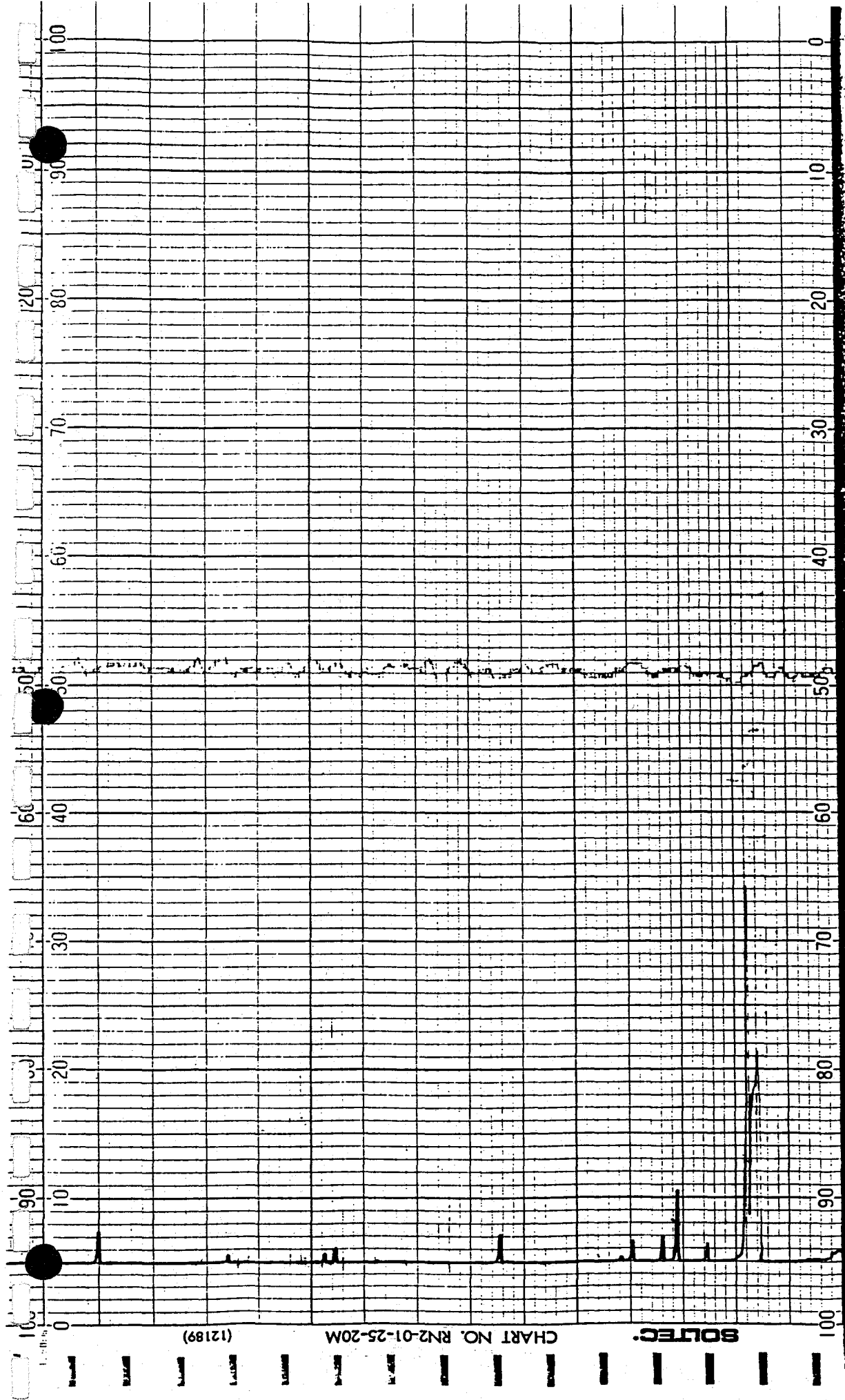
zero

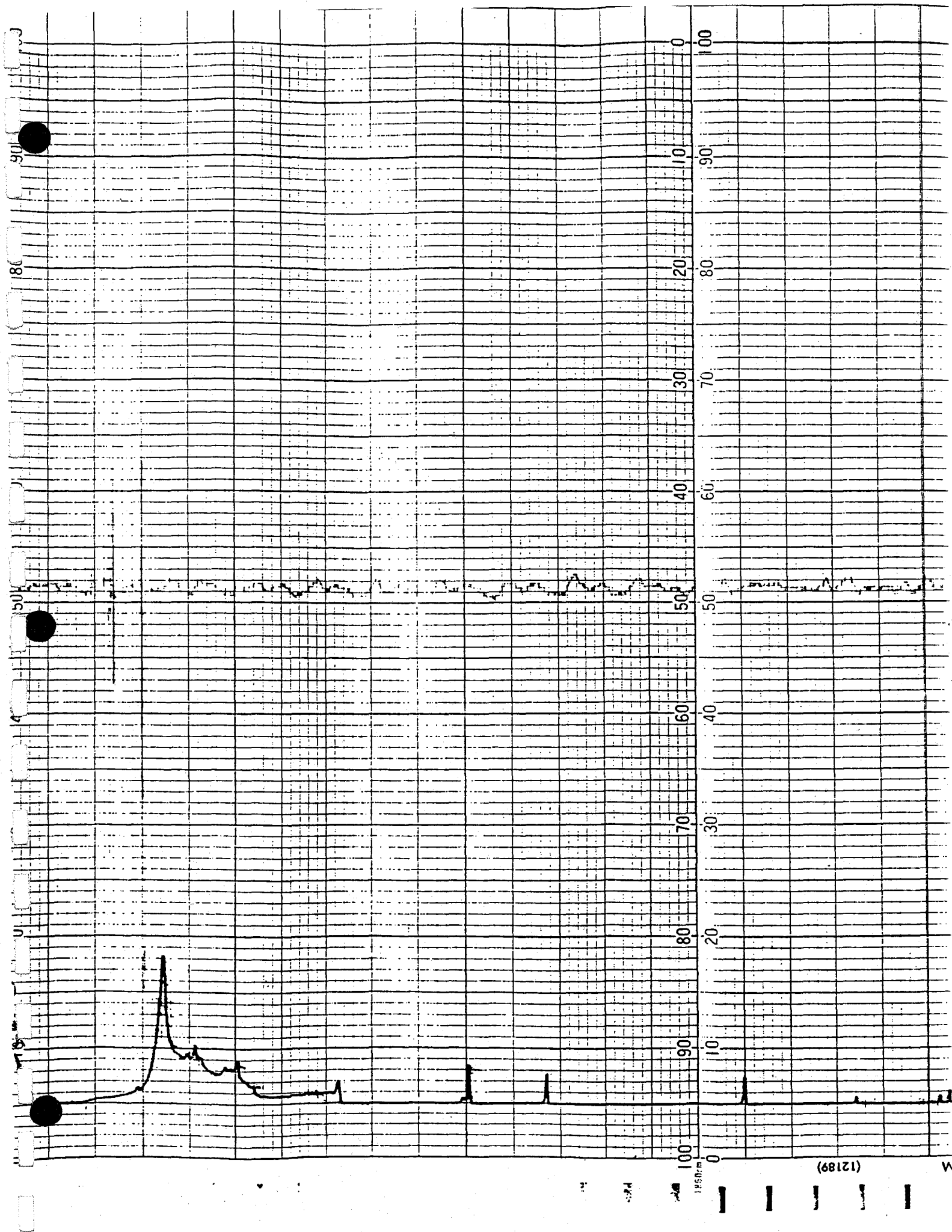
0-1000 rpm
start

0 10 20 30 40 50 60 70 80 90 100

800 rpm city

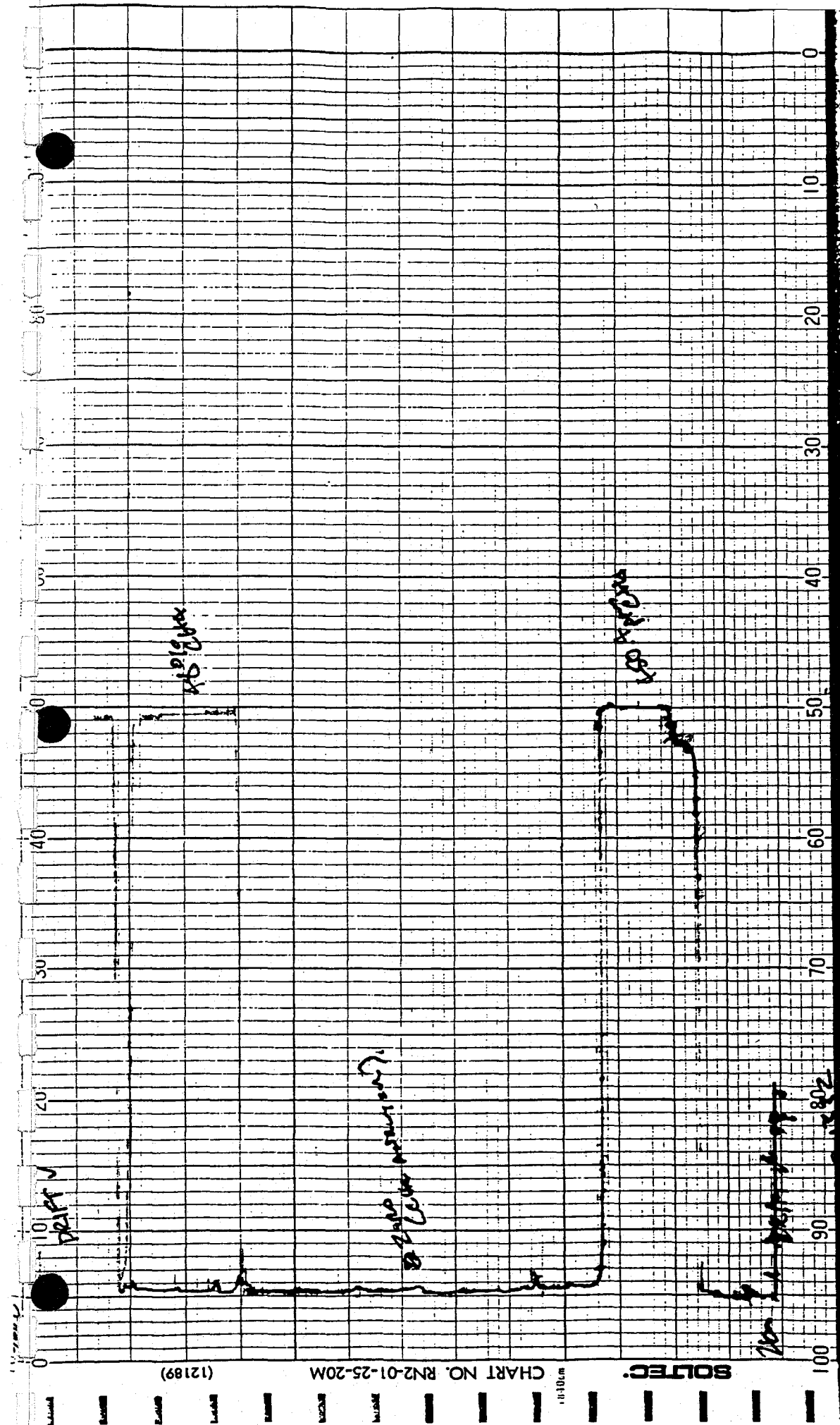
280
start 0-1000 rpm
stop @ 1305

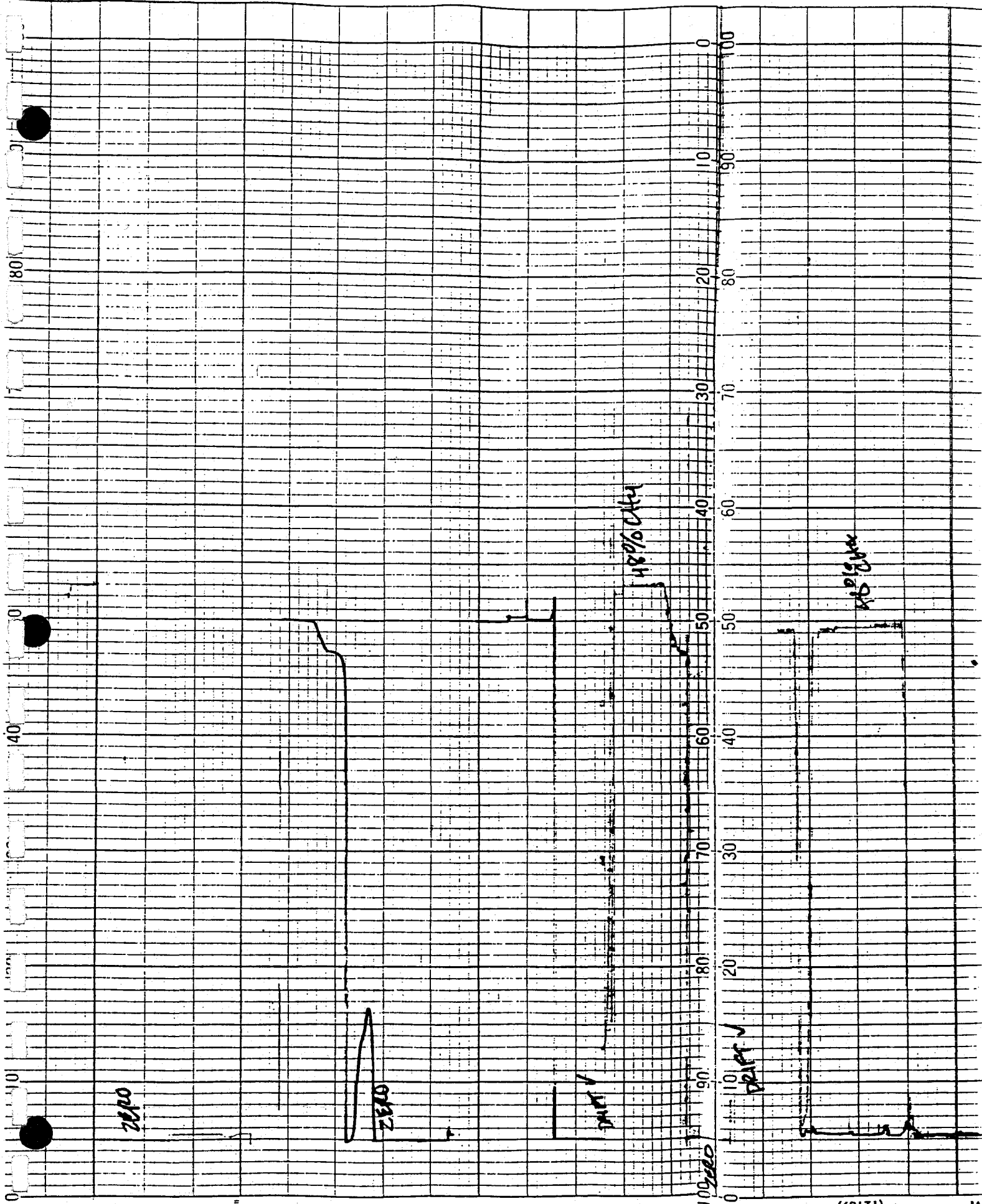




(12189)

V

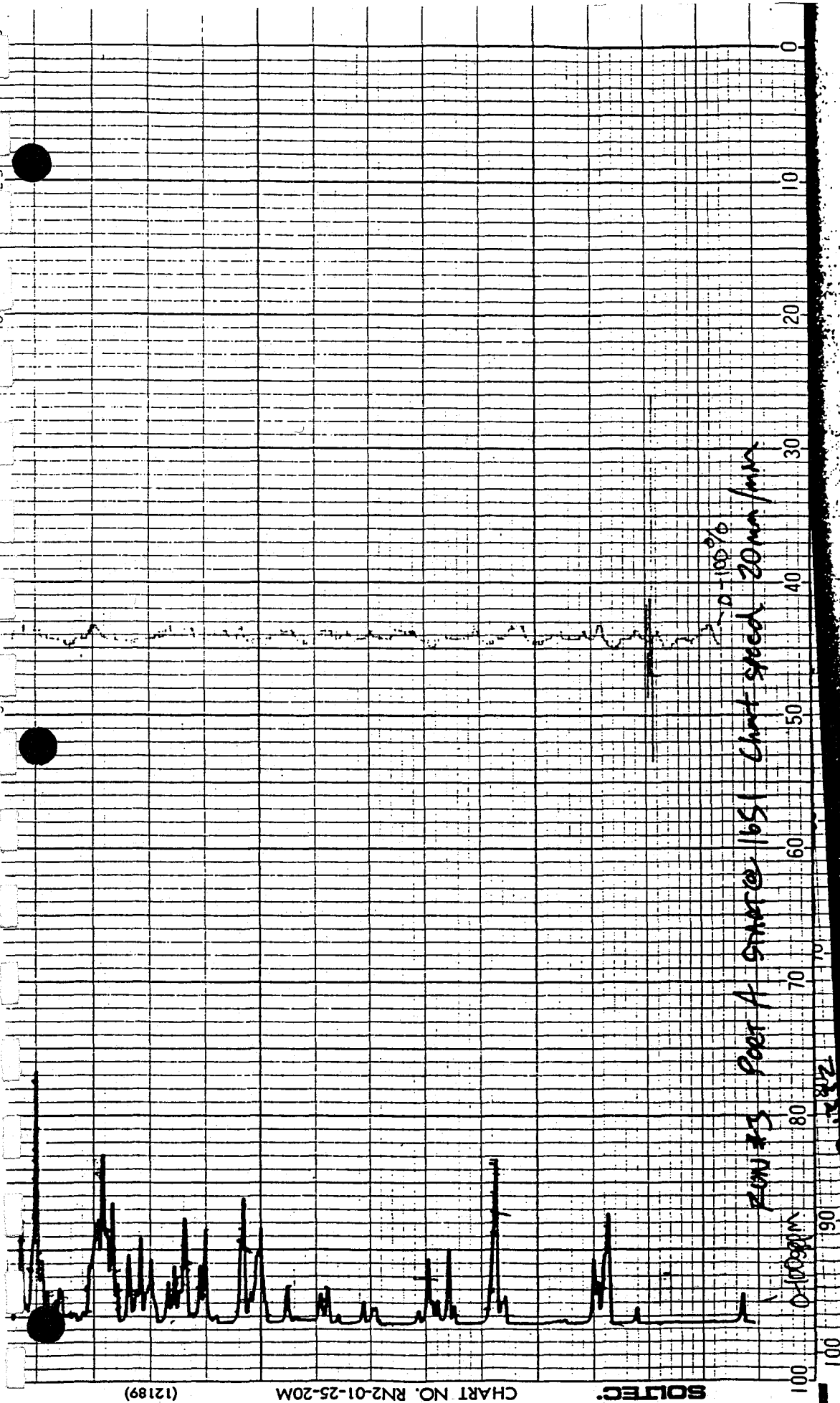


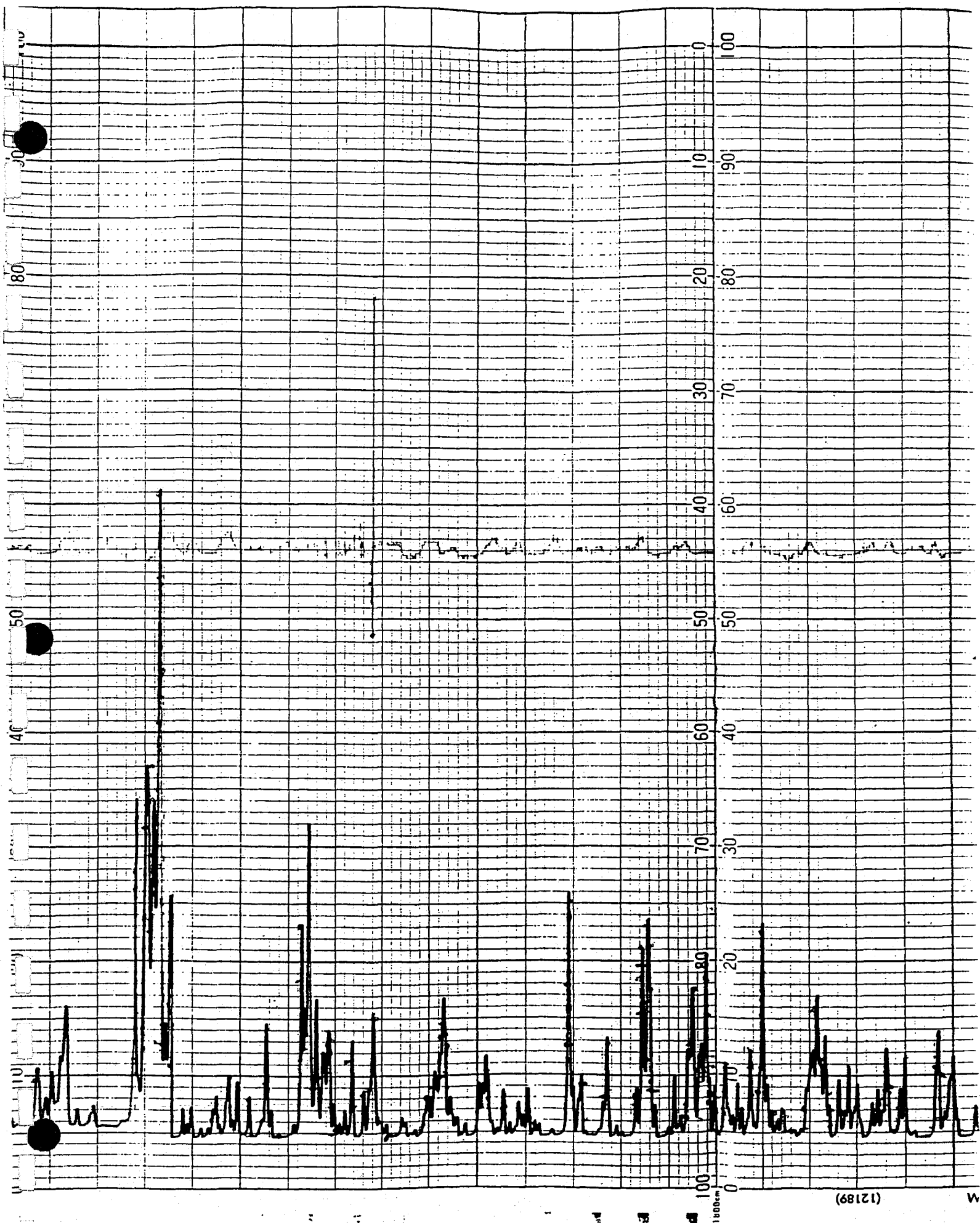


(12189)

CHART NO. RN2-01-25-20M

SOLEC





(12189)

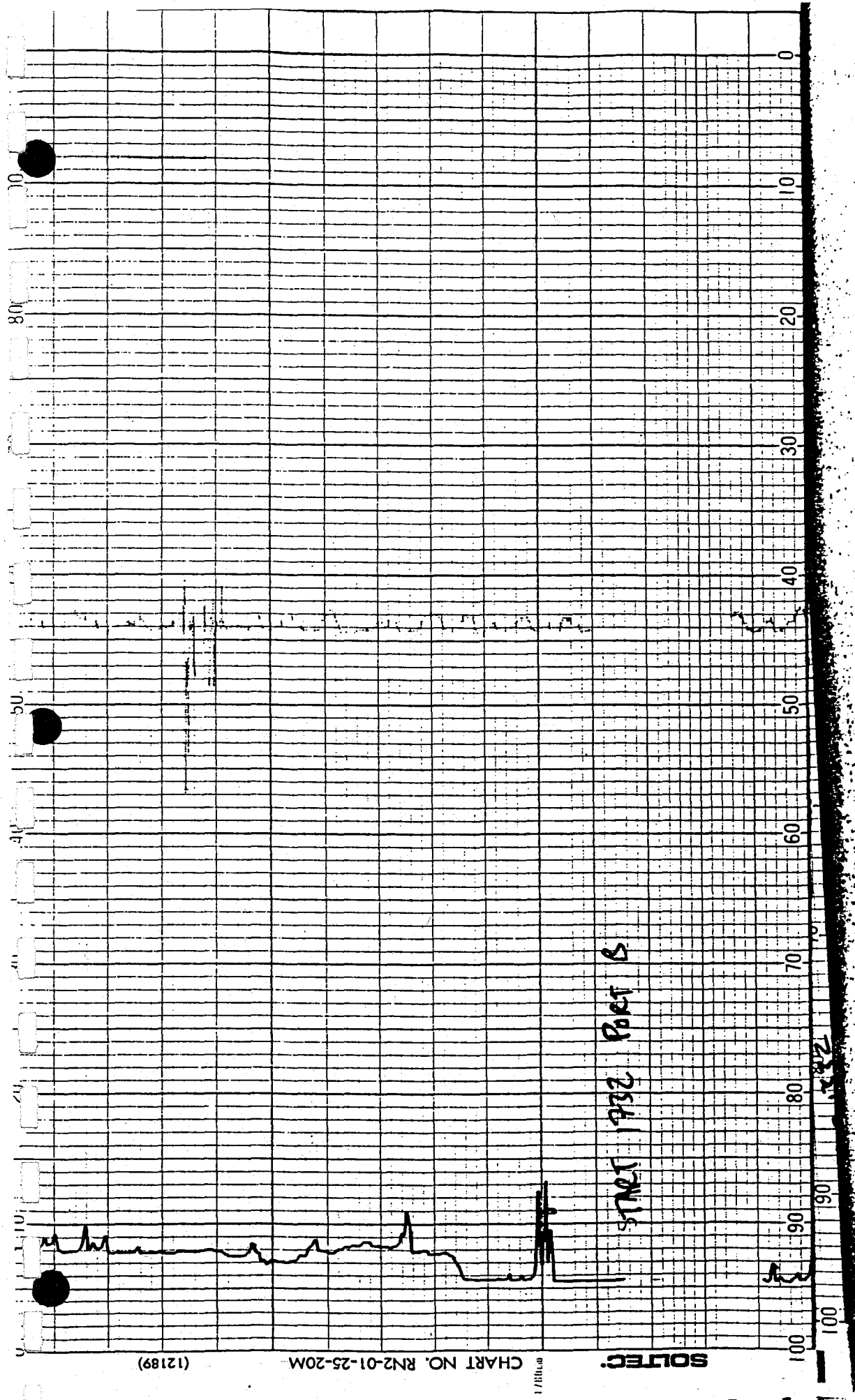
M

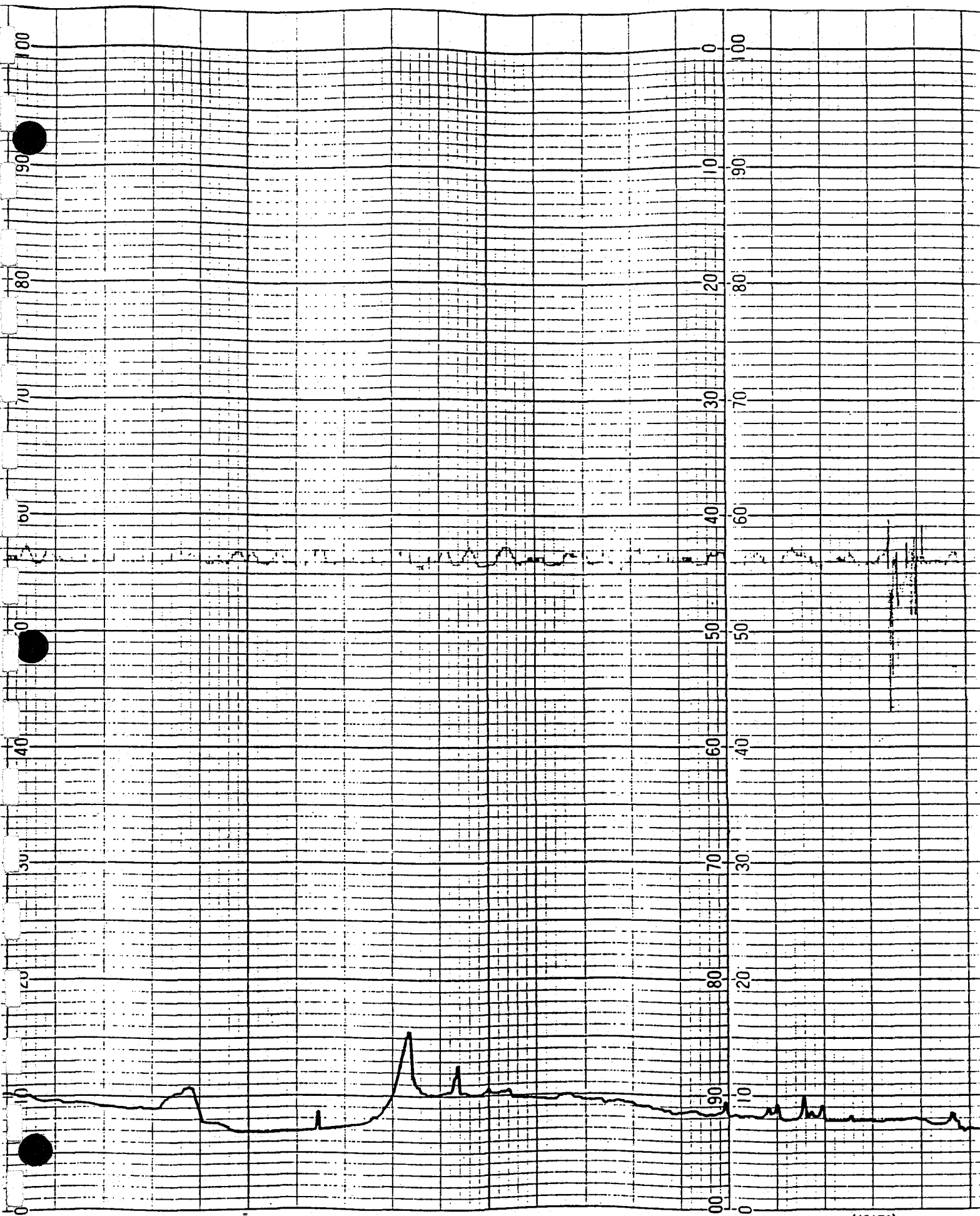
(12189)

CHART NO. RN2-01-25-20M

SOLETC

STRET 1732 Port B





(12189)

(12189)

CHART NO. RN2-01-25-20M

SOLTEC

48.0

450.4 RPM

28.2

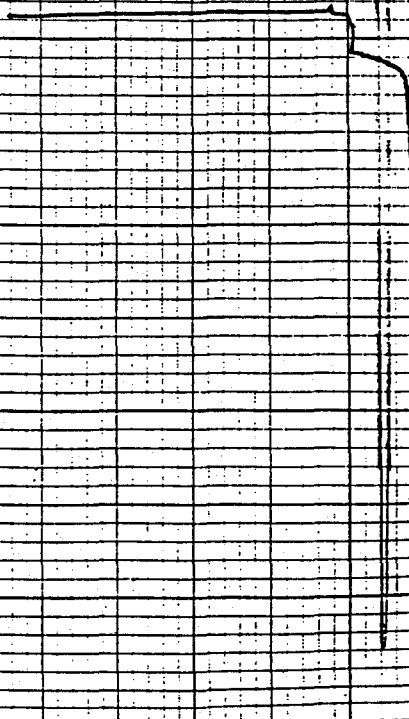
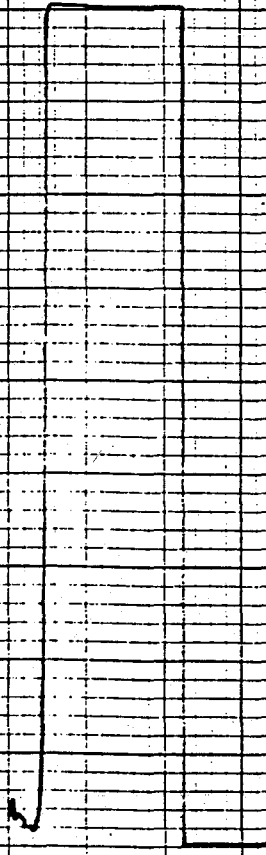
450.4

28.2

48.0

0 10 20 30 40 50 60 70 80 90 100

START PWT C @ 1837 20MP/MIN

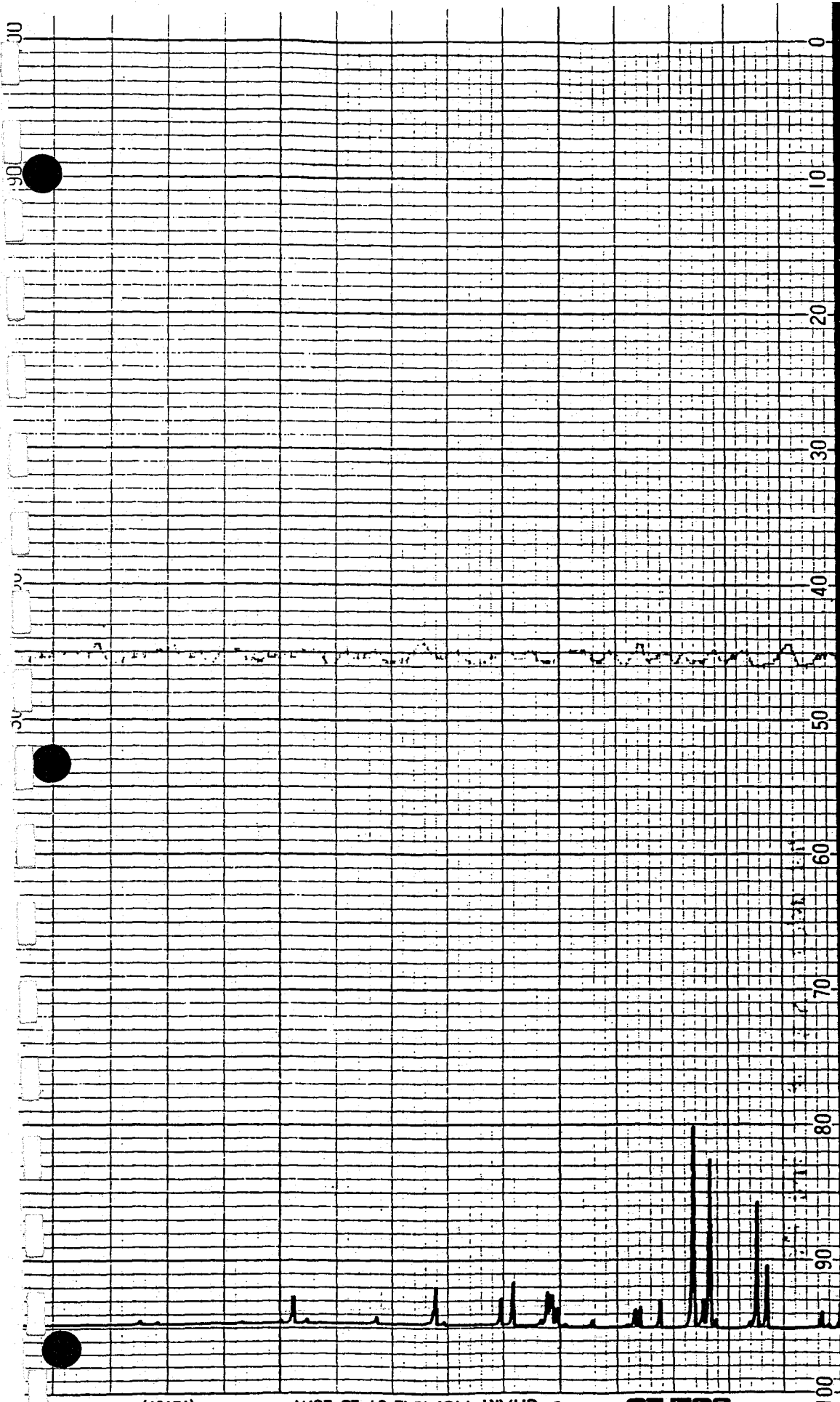


100 90 80 70 60 50 40 30 20 10 0

48.0

46.2

450.4 mm

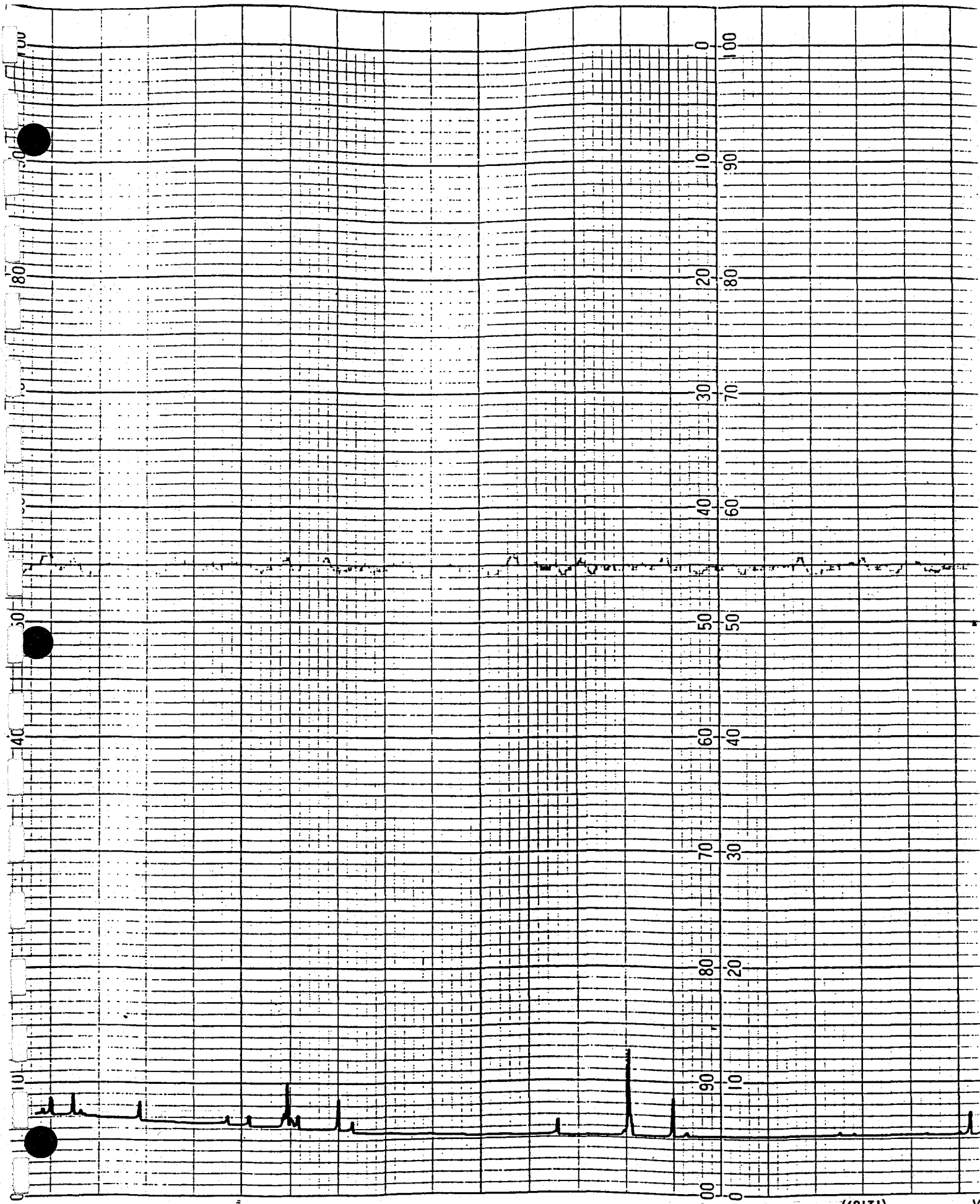


(12189)

CHART NO. RN2-01-25-20M

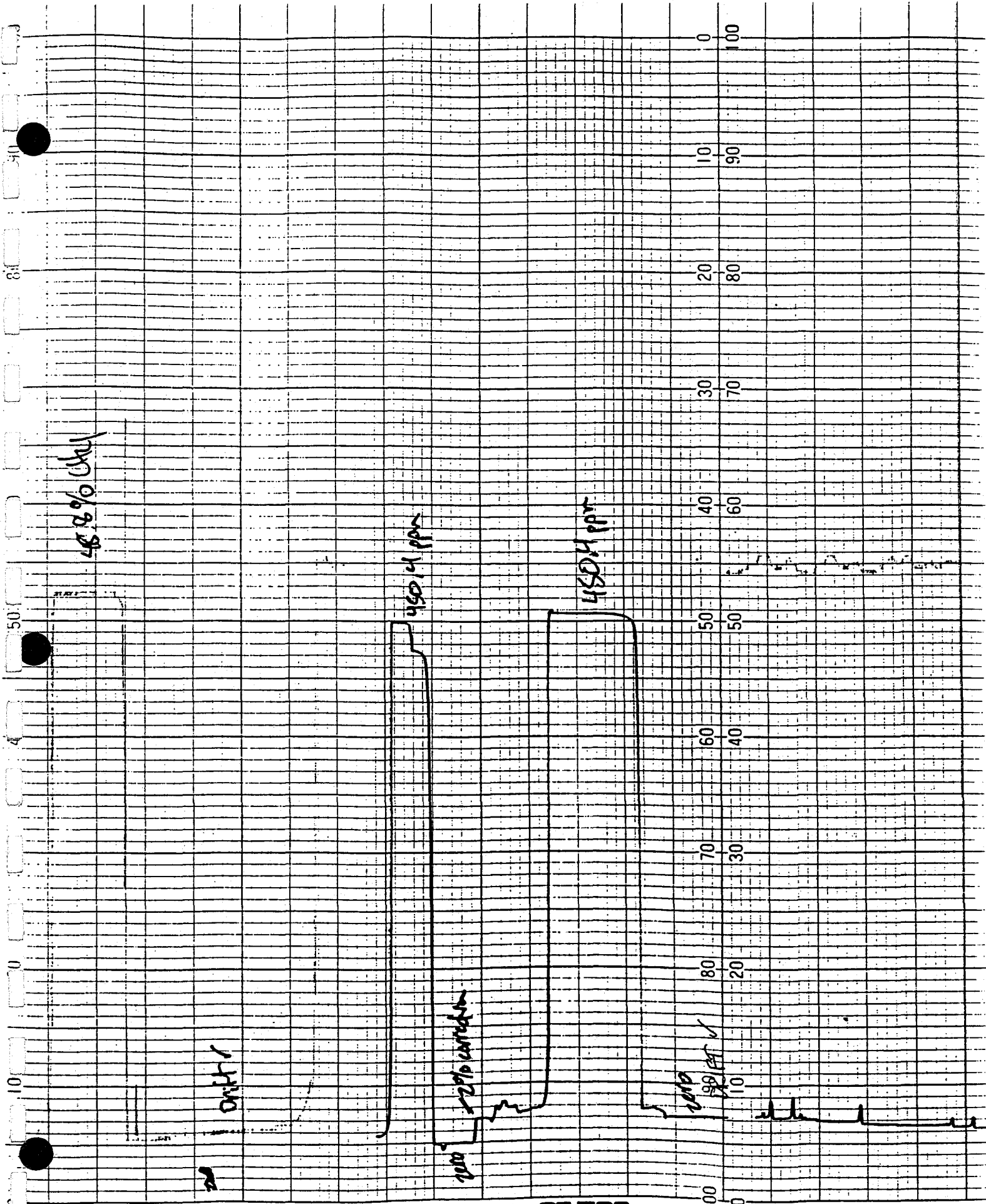
SOLTEC

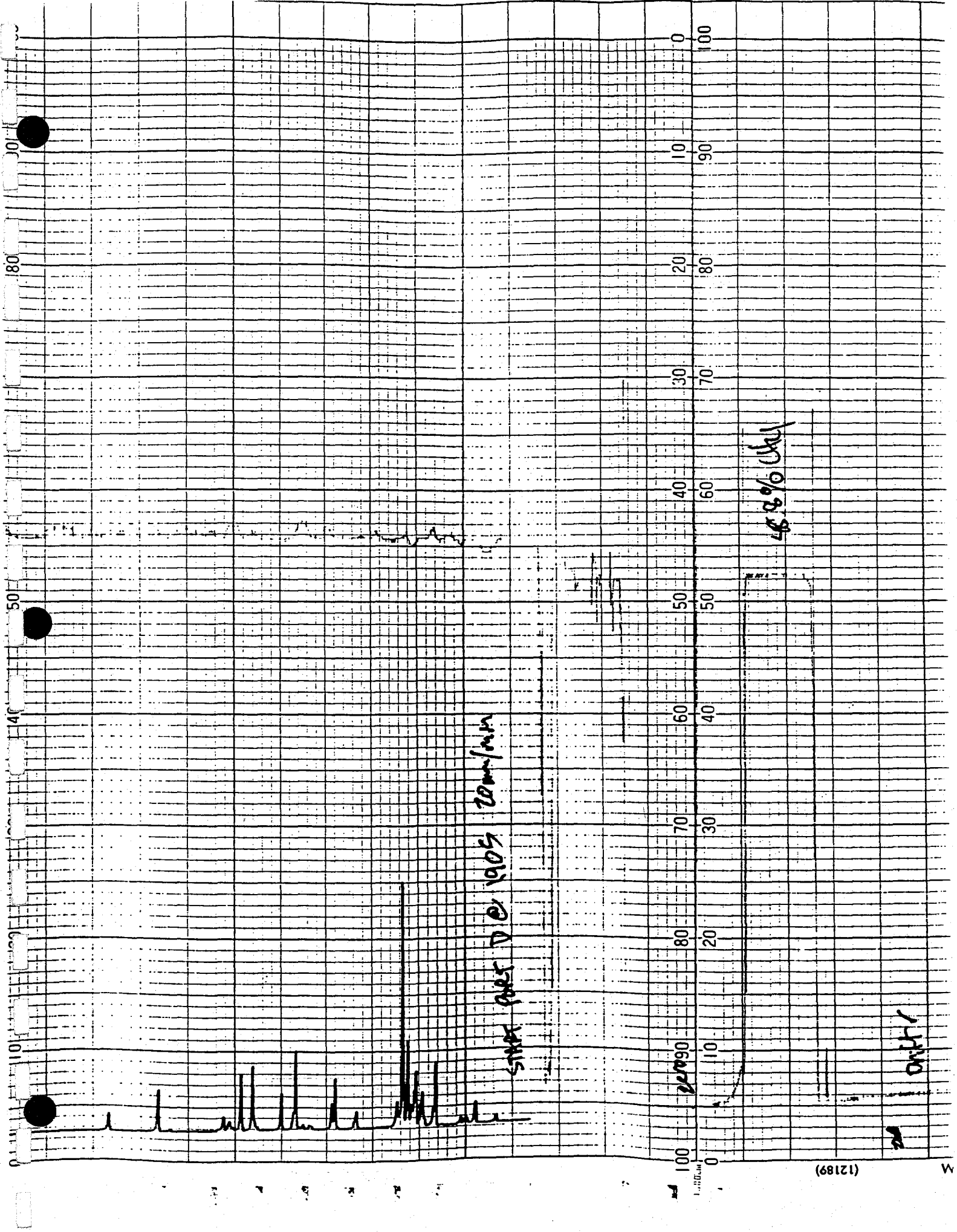
11/2/71

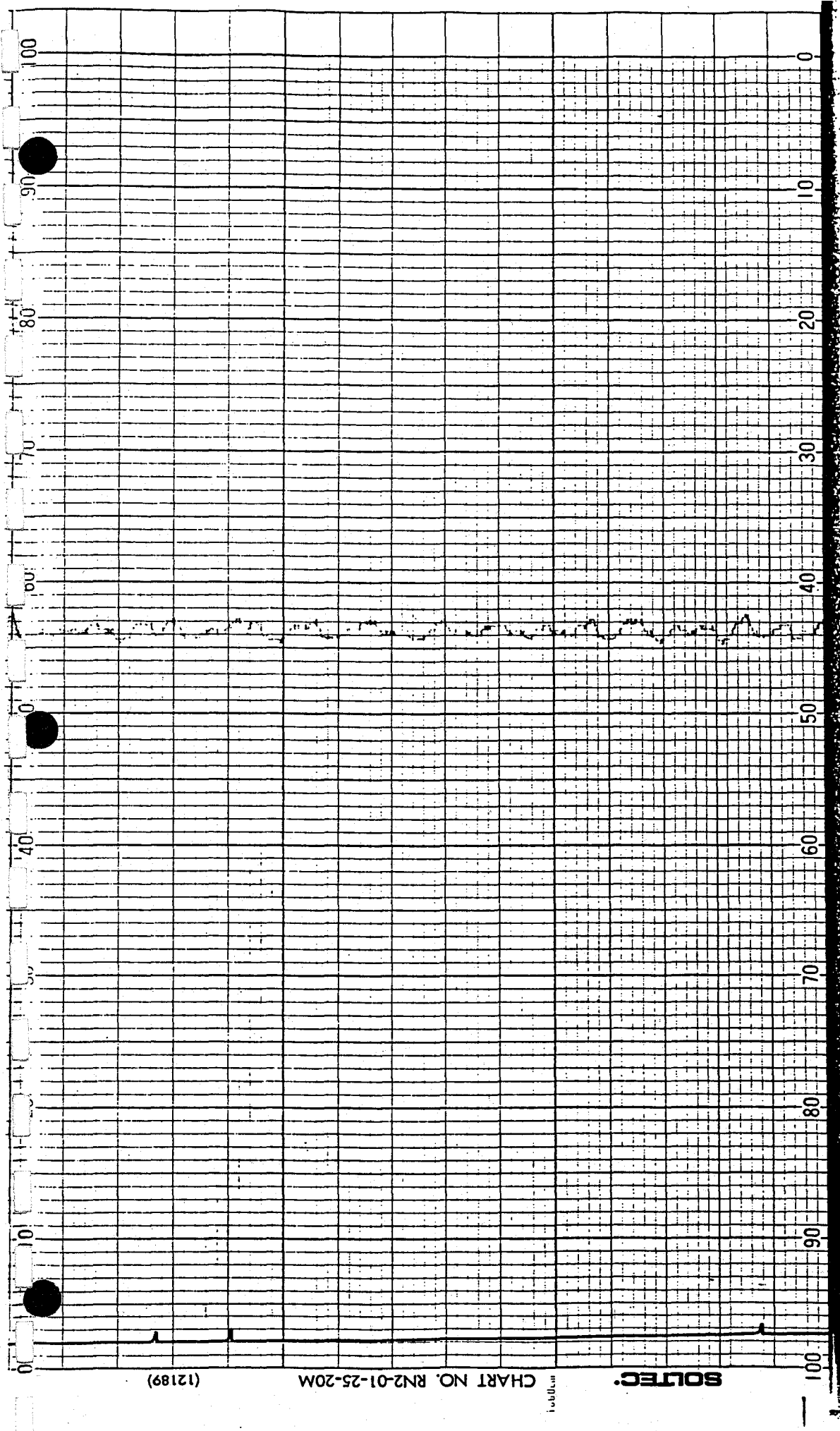


(12189)

V







3

1000um

adjust

adjust

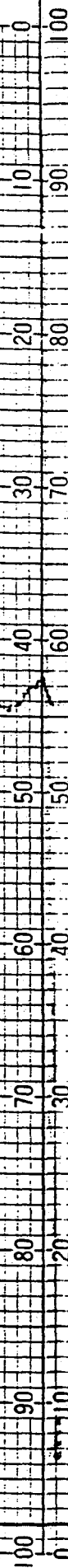
450

450

Drift check #2

Drift check #1

No adjustment made

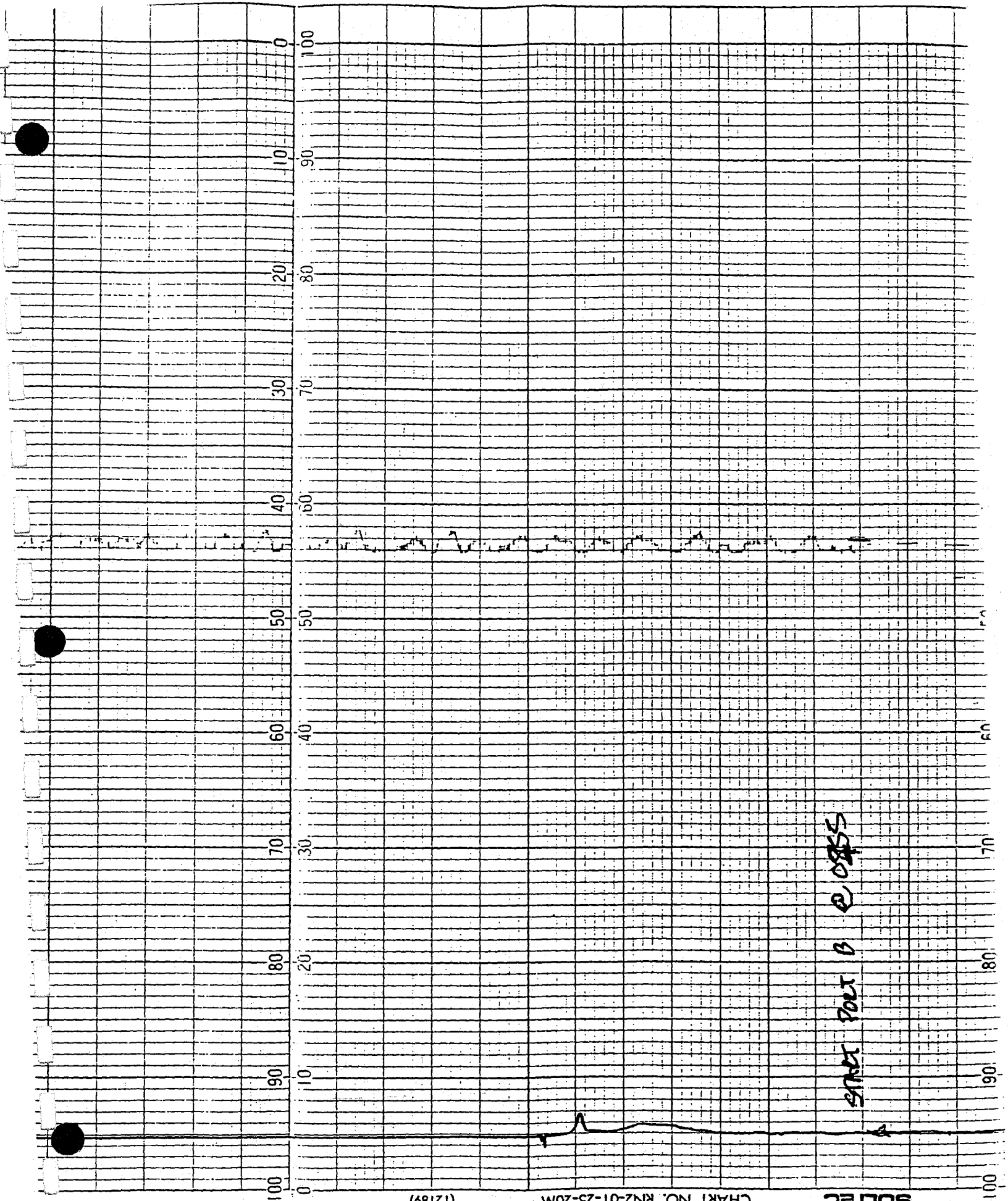


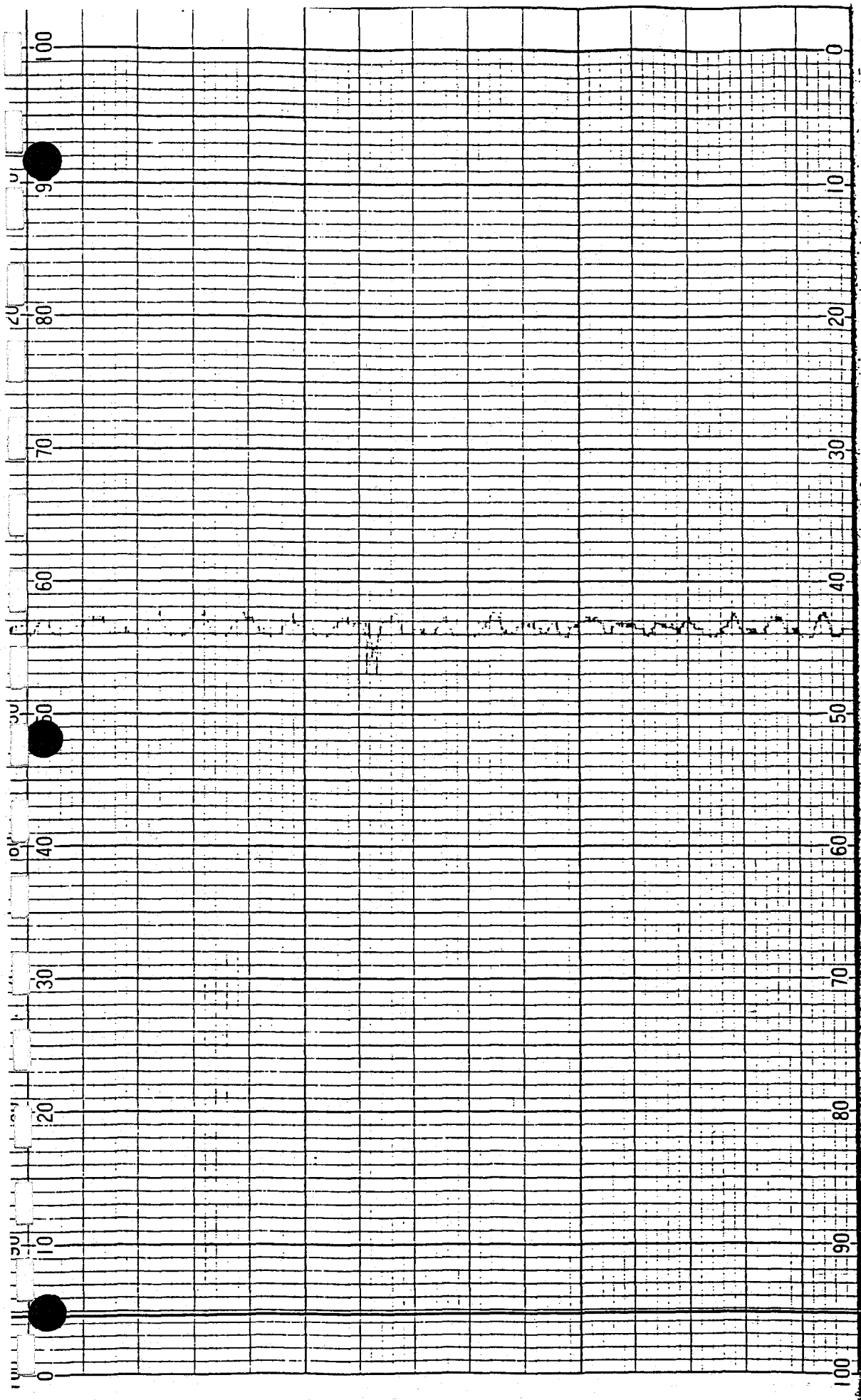
SOLTEC

CHART NO. RN2-01-25-20M

(12189)

START POINT B @ 0855





SYSTEM OILS

900 RPM CH4

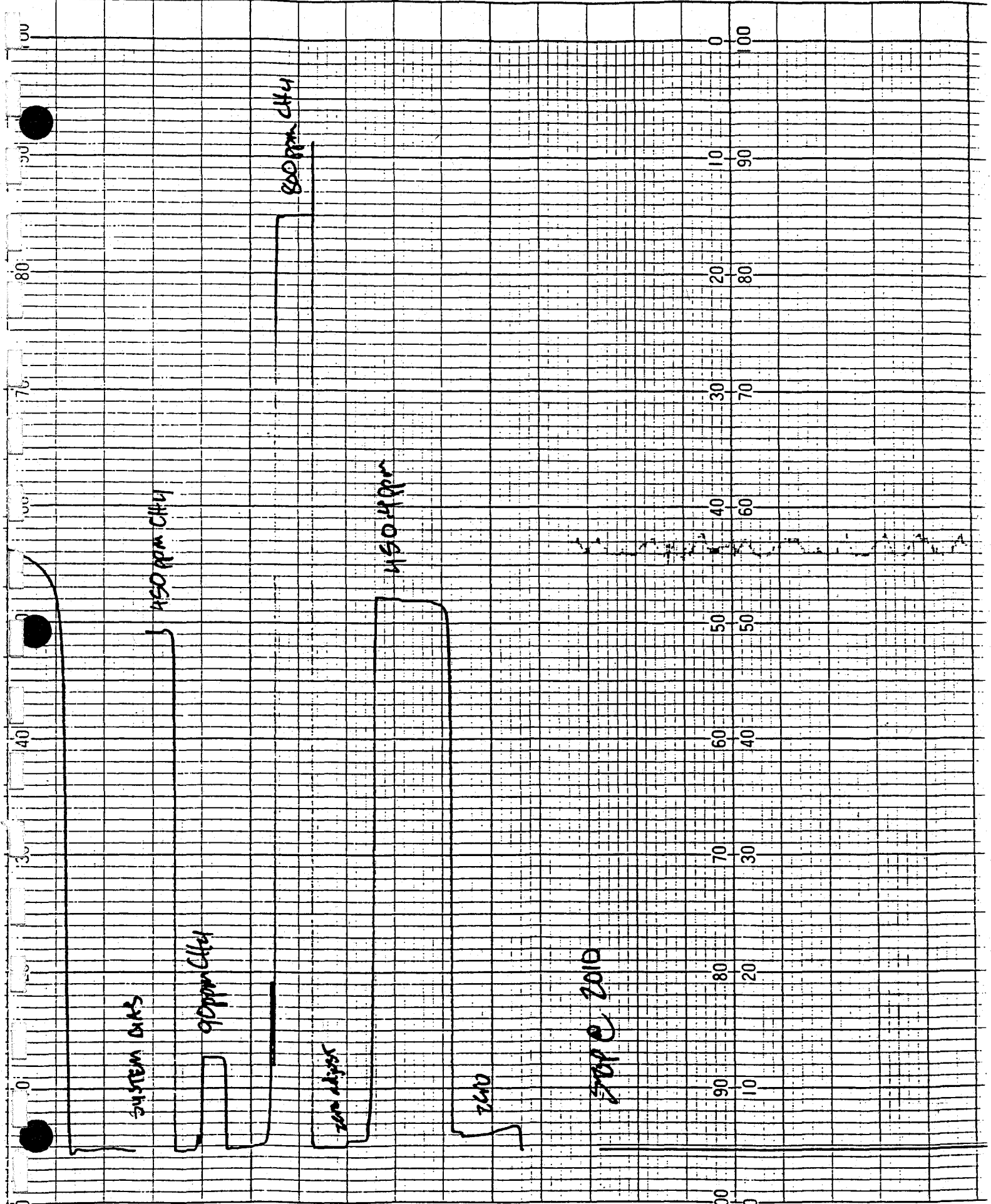
700 RPM

700

450 RPM

800 RPM CH4

700 @ 2010



79.1025645

20

30

40

50

60

70

80

90

100

0 10 20 30 40 50 60 70 80 90 100

100BIAS

48.7%

25% CH4

19.9%

48.8%

3822

DATA 0-100%



100

20

30

40

50

60

70

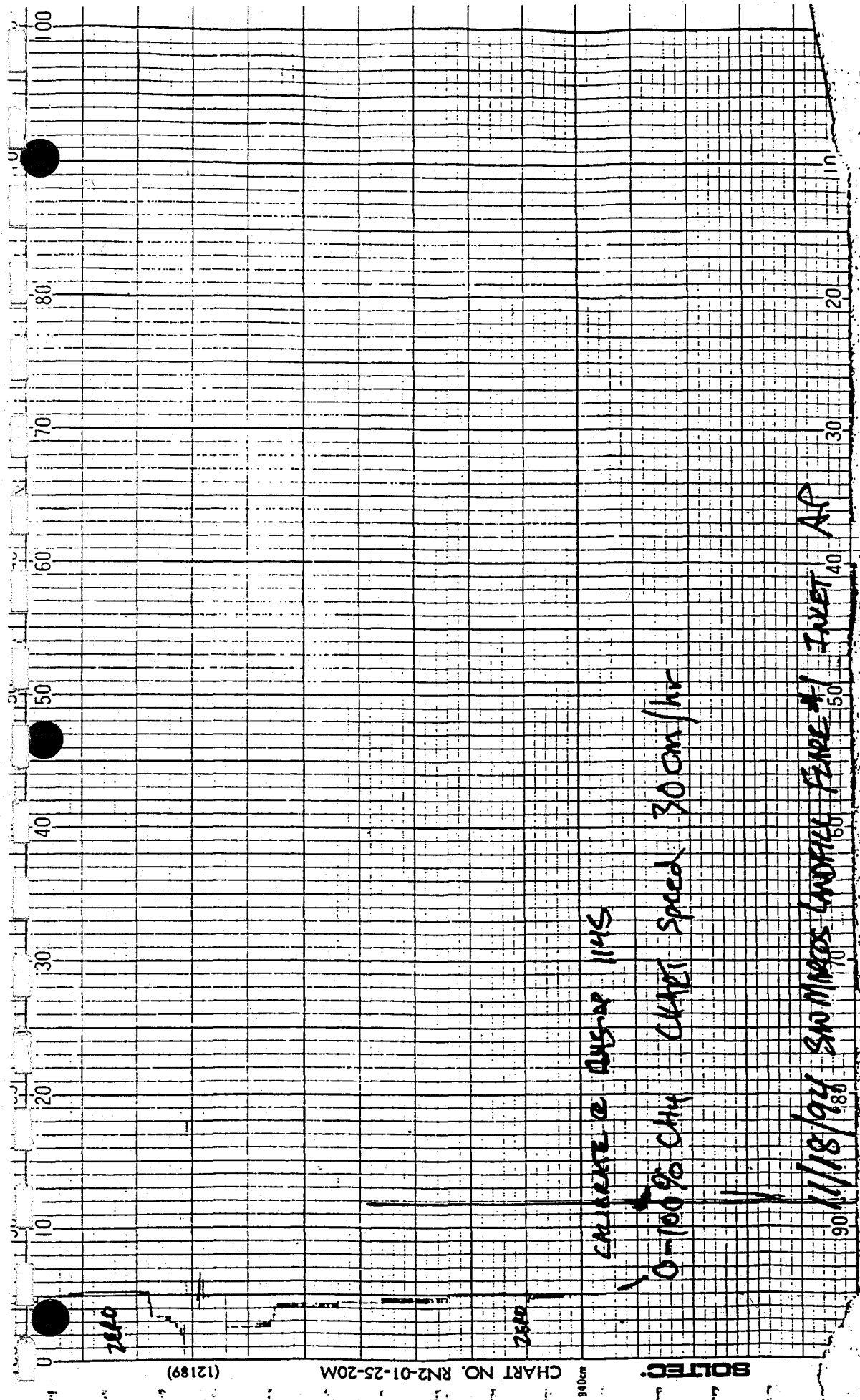
80

90

100

0 10 20 30 40 50 60 70 80 90 100

SYSTEM BIAS



SOLEC
CHART NO. RN2-01-25-20M
(12189)

CALIBRATE @ 145-148

0-100% CH4 CHART SPEED 30 cm/hr

11/18/94 SUNNIES LINDHILL FENCE #1 INLET AP

✓ 0-100% ✓ 44

356N Run # 1 @ 1201

✓ 0-100% ✓ 44

五

五

THE

25

天

100%

2010/02/22

7/19/99 05:04

2

18.8%
weight %

100%
100%

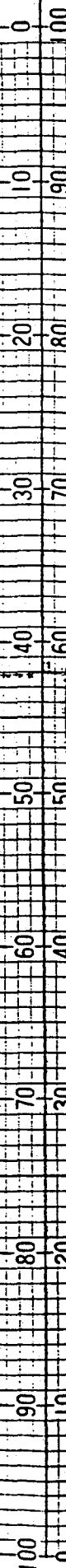
3600 RUN 2 @ 1255

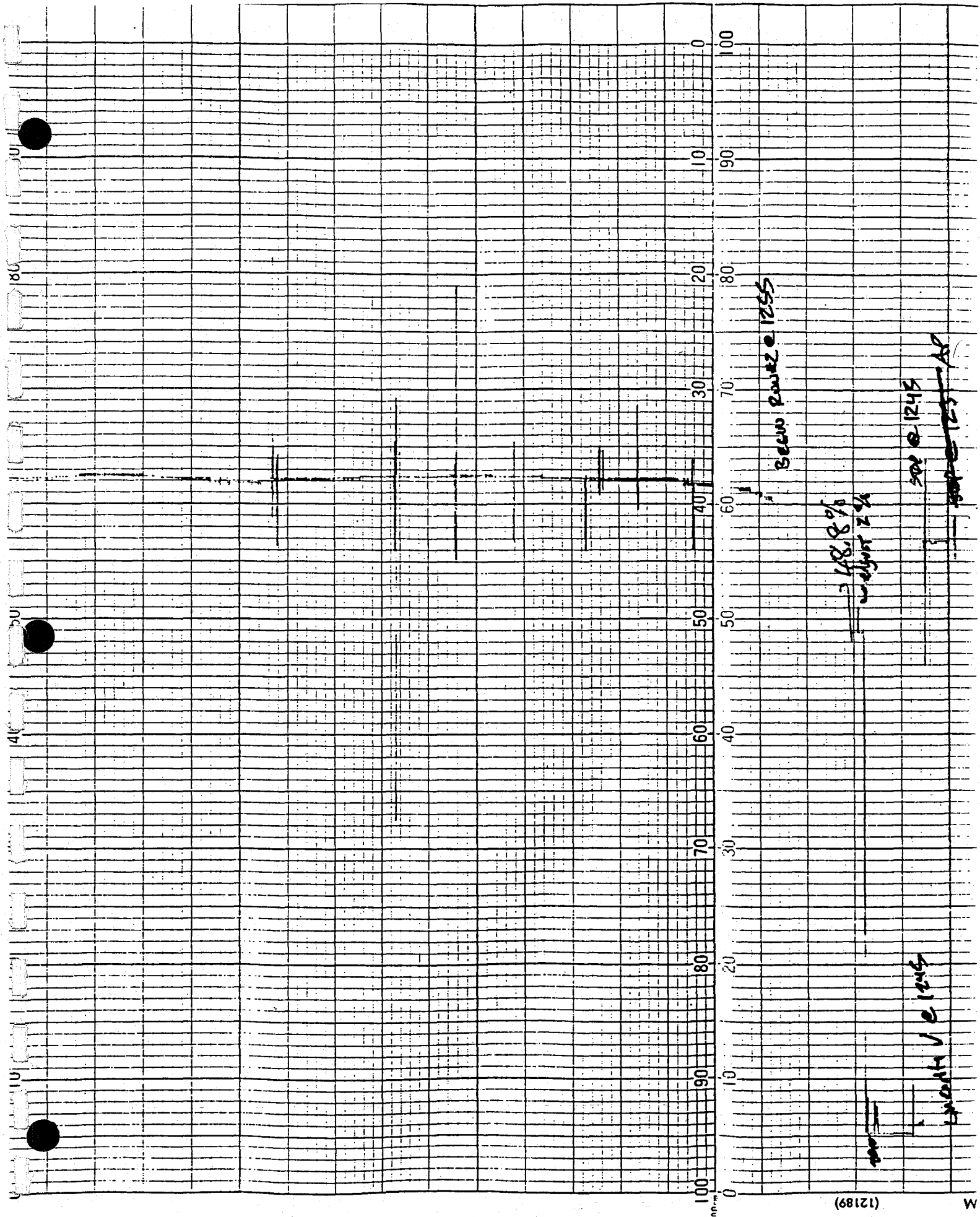
3600 @ 1245
~~3600 @ 1255~~ AP

100%
100%

3600 RUN 1 @ 1201

3600 RUN 1 @ 1201





(12189)

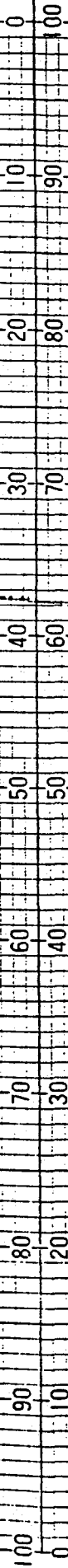
M

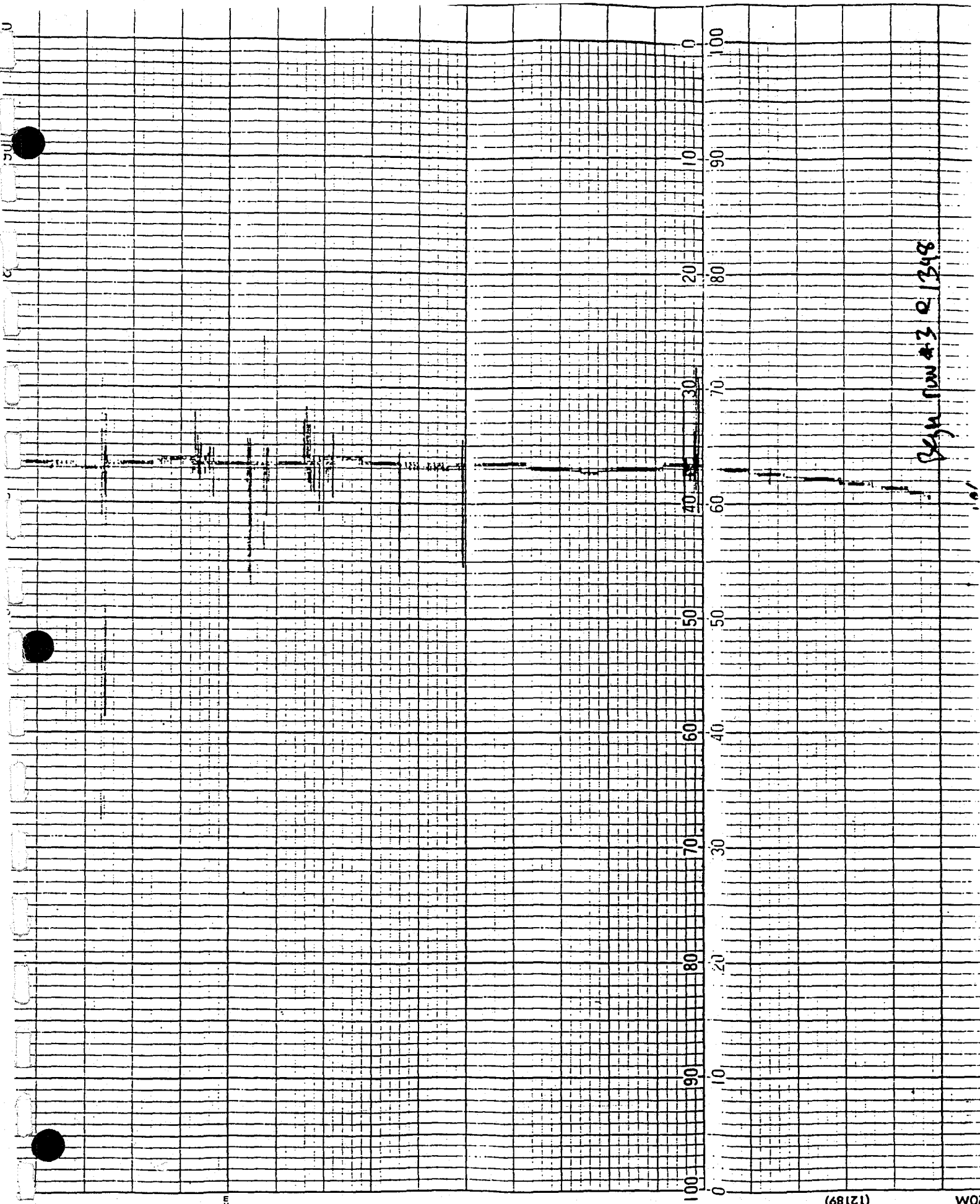
By the sun at 3 Q 1348

Adjust 10%
KMS 1000

DATE ✓

500 Q 1340



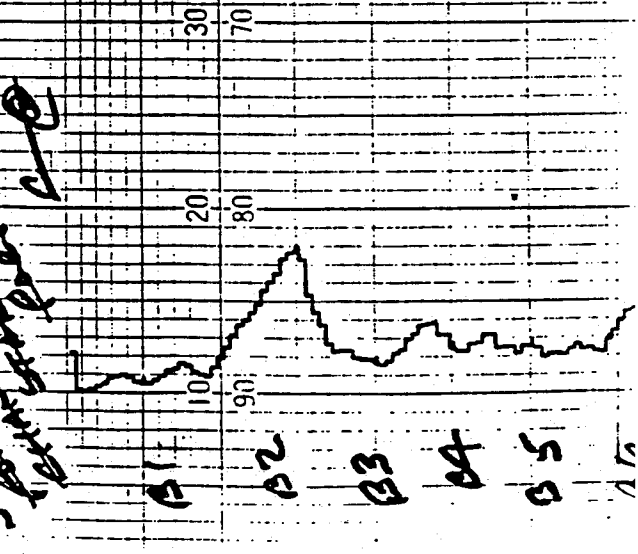
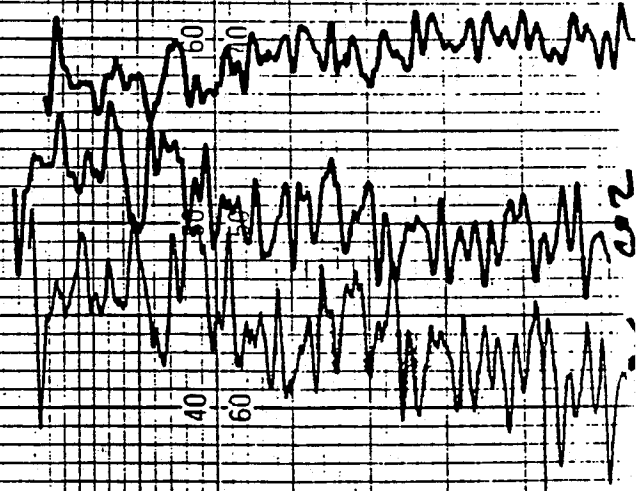
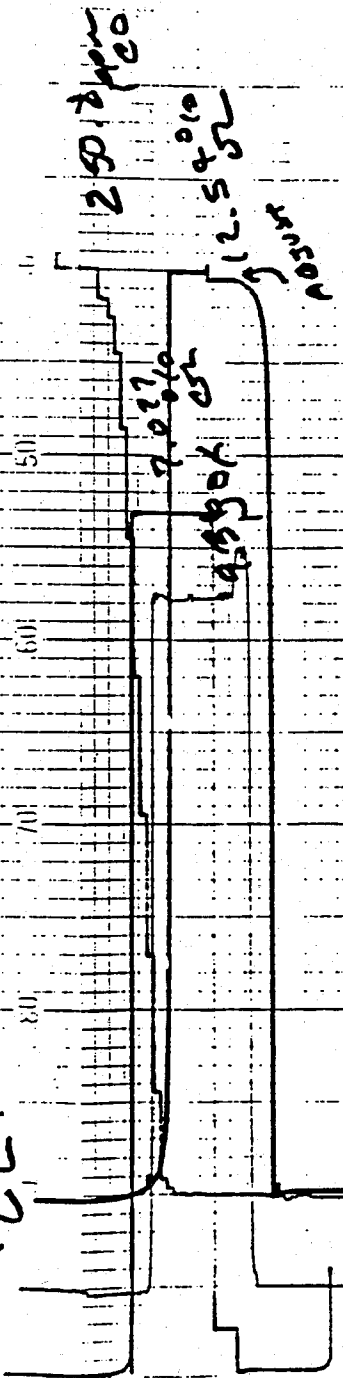
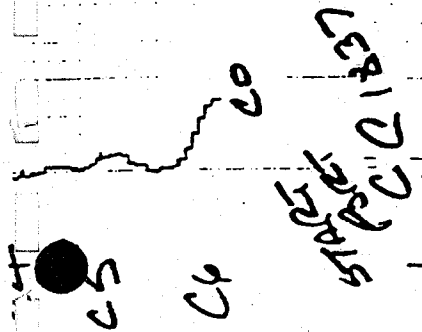
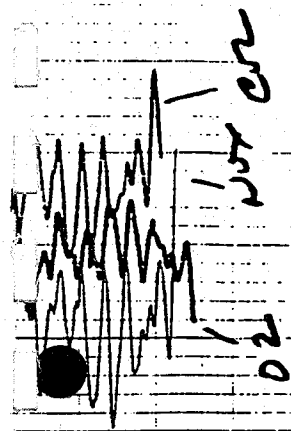


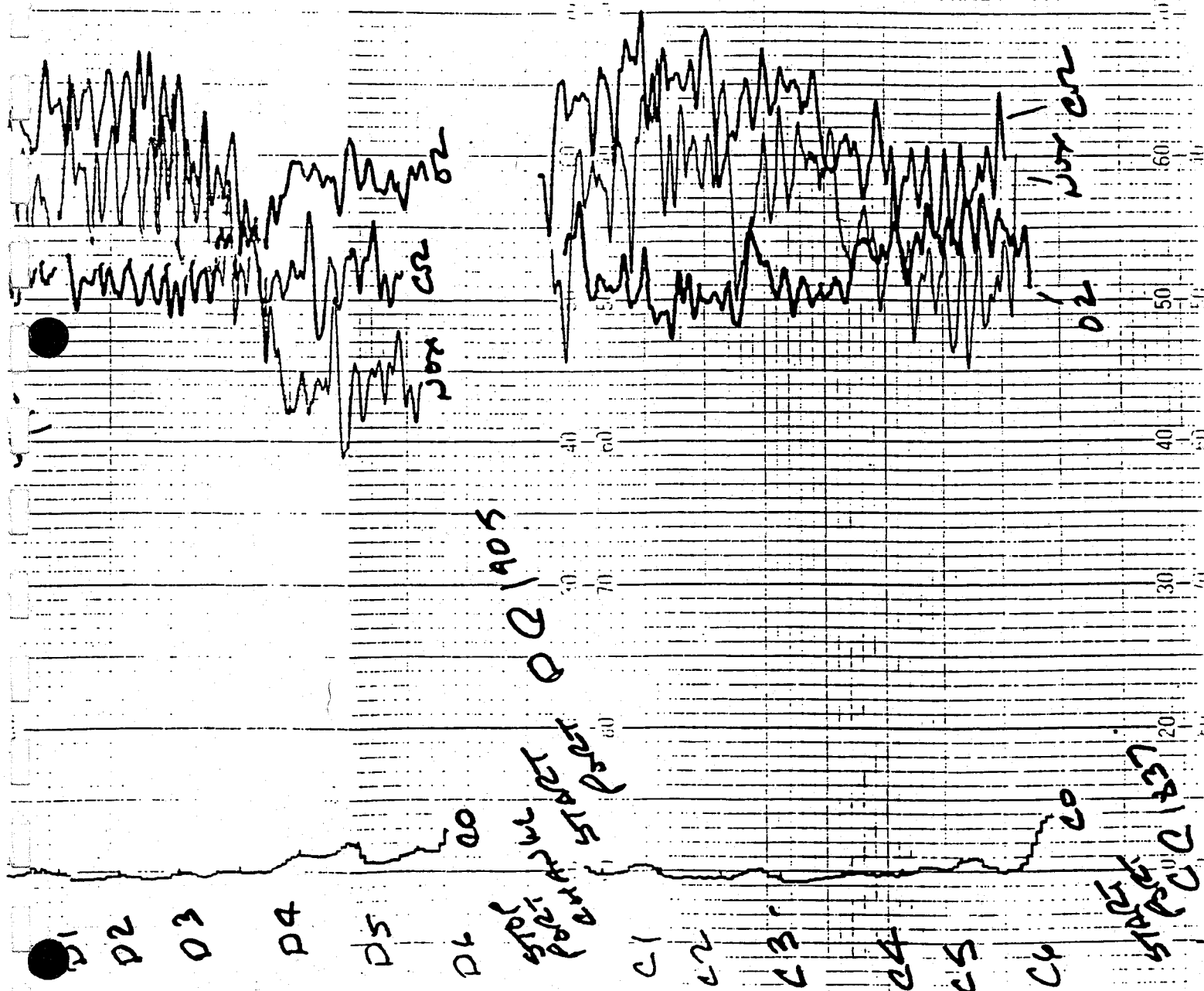
Signal 1000 #3 Q 348

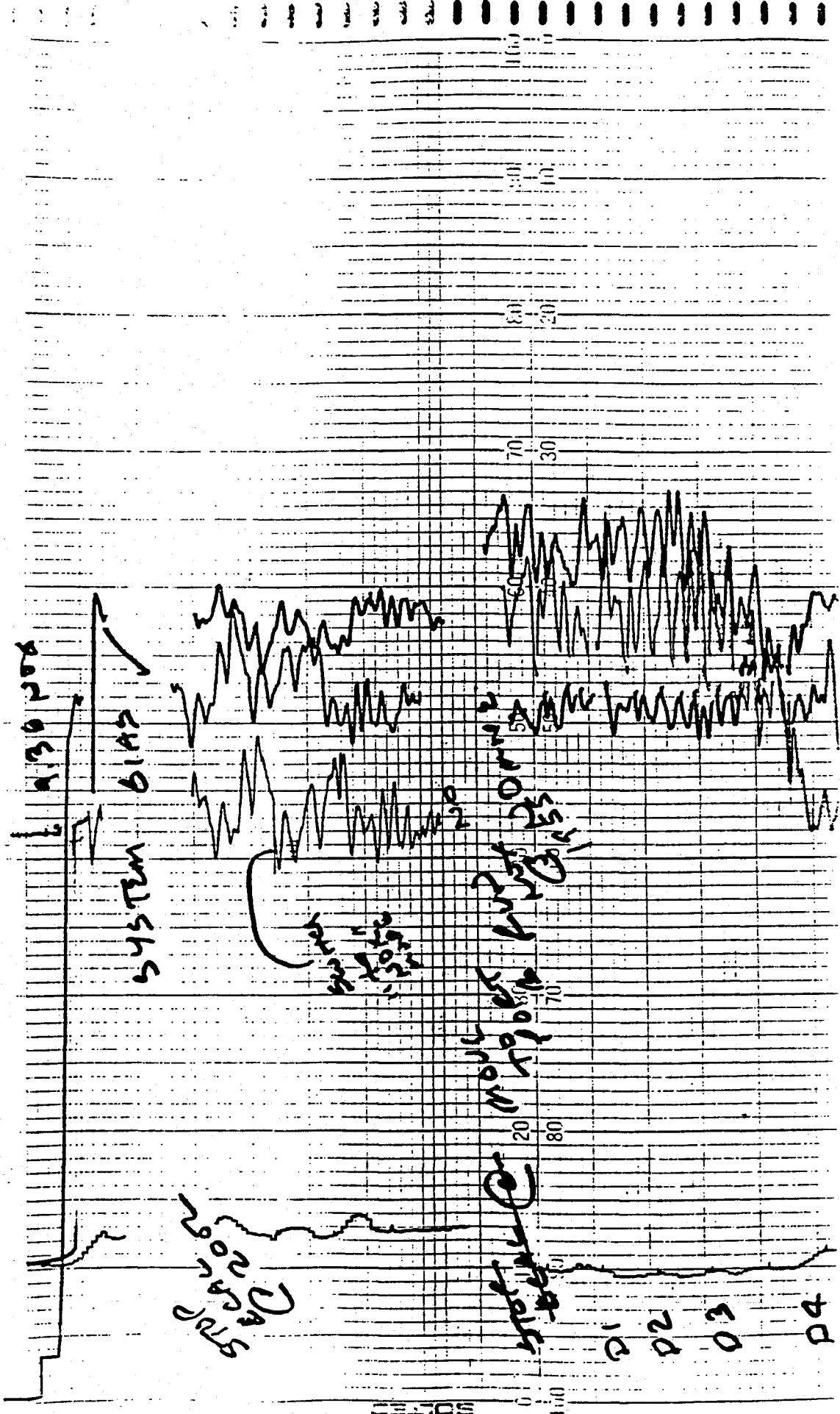
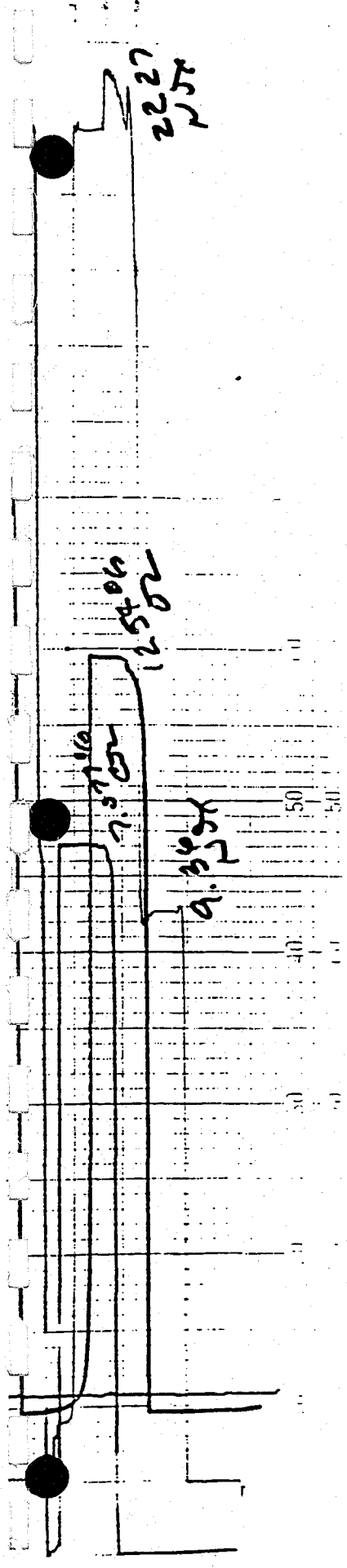
(12189)

20M

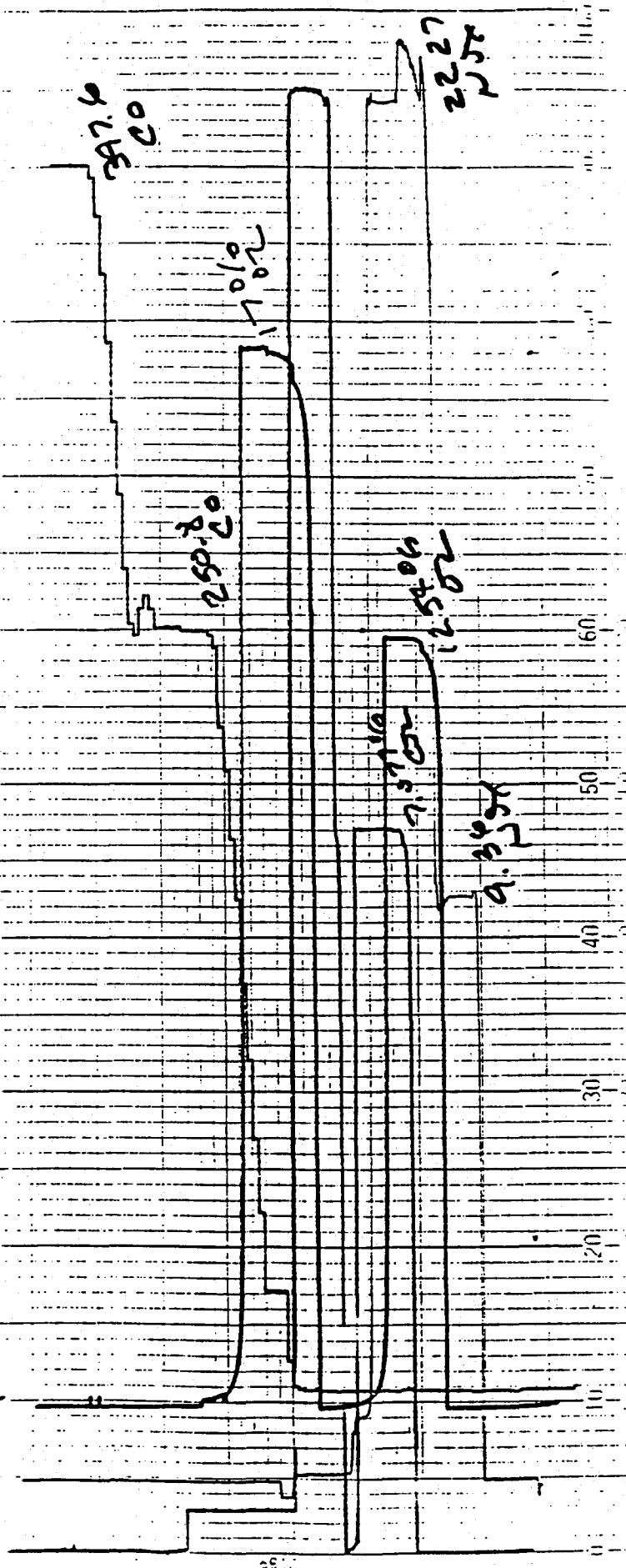
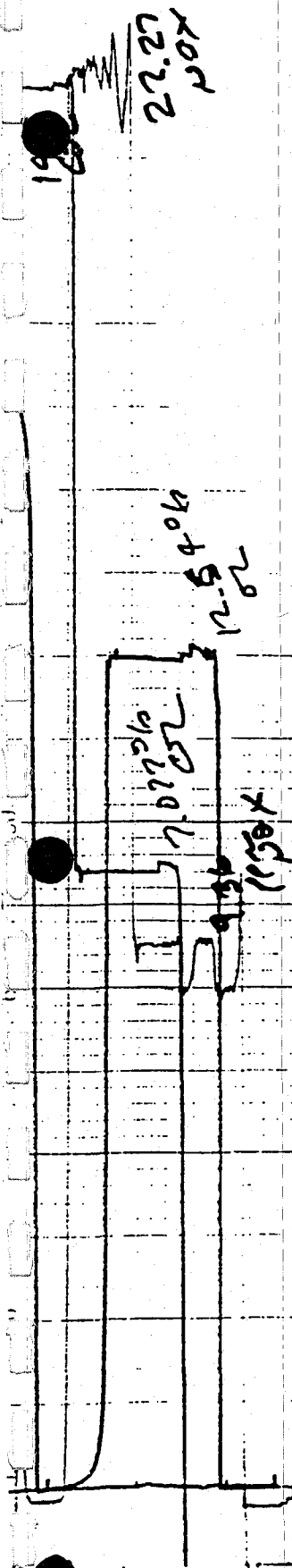
8410cm

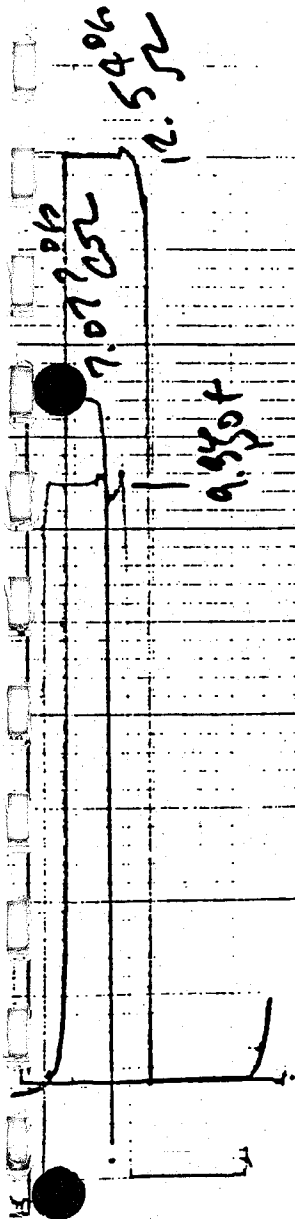






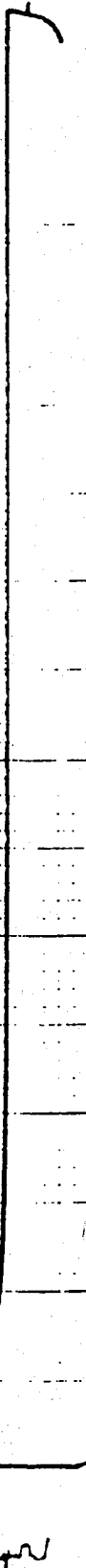
CAV 0A30
② 0A30
11/18/04
FUND-#1



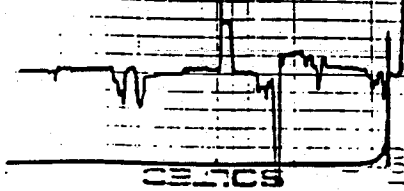


REC'D 1145

00000000



SYSTEM B.145 ✓



397.6
P80

250.7
P120

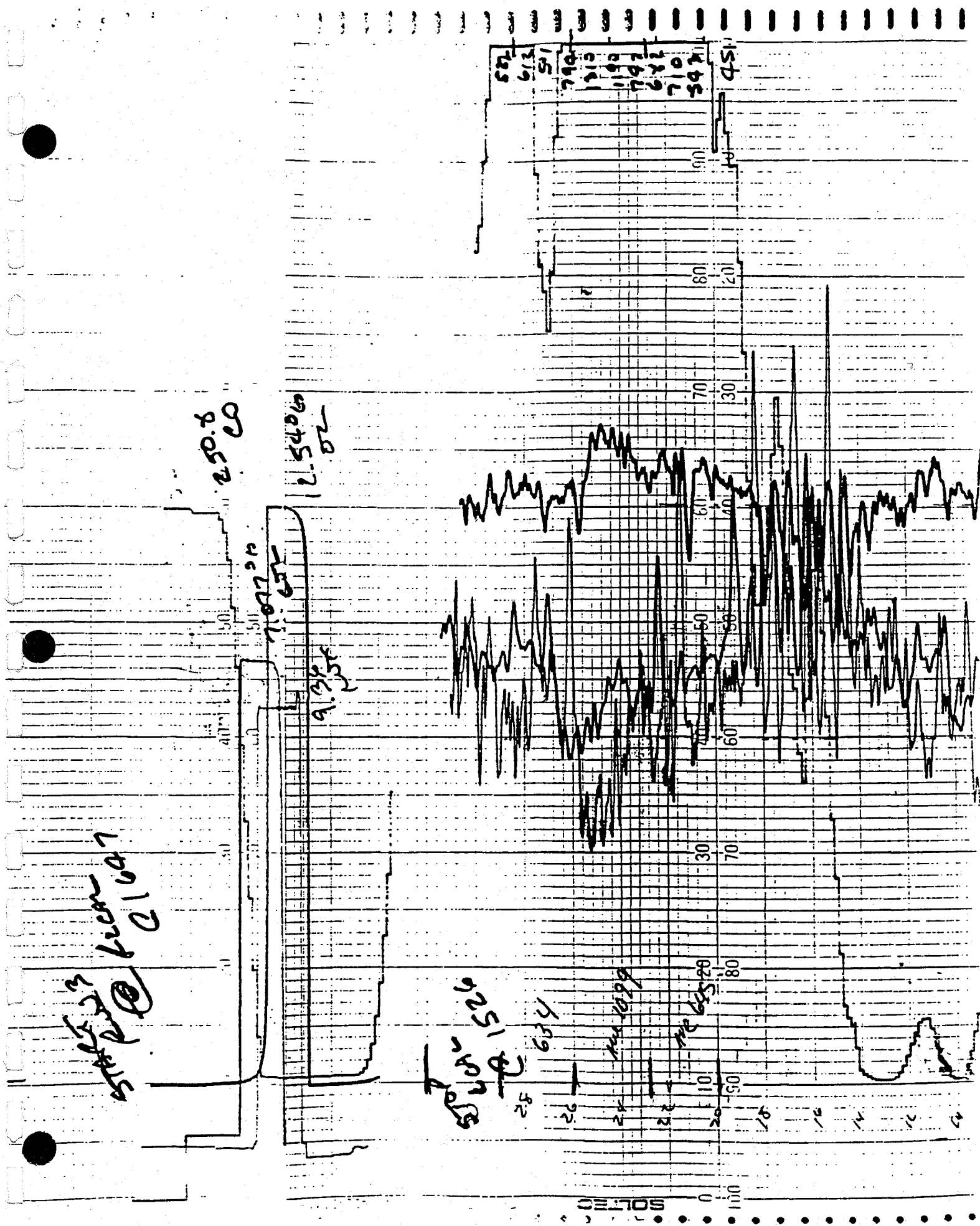
80.47
P80

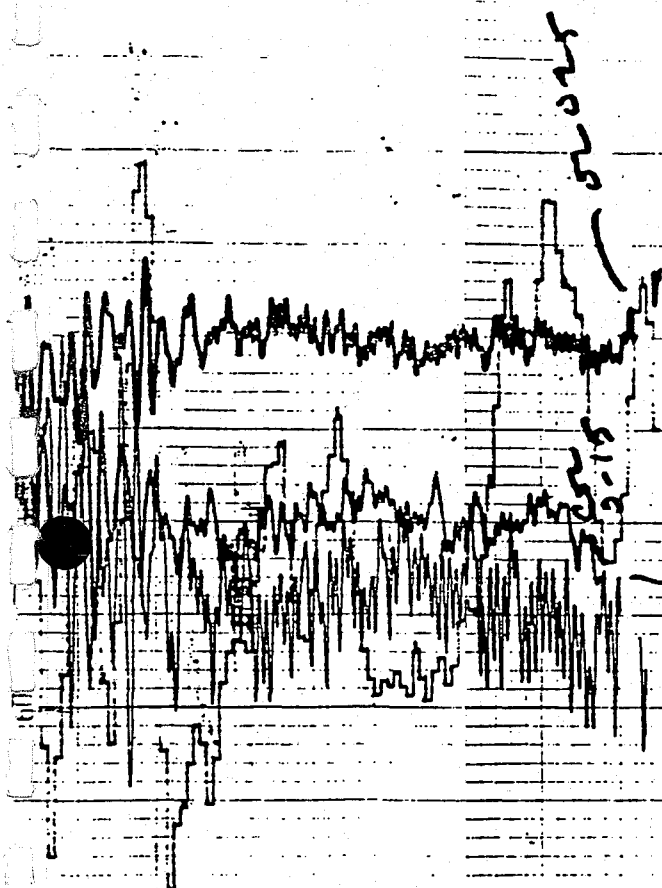
14.0

27.27
P07

70.54
P04

1150x





5000

00-0-50°

Door A

5000 @ 100

2500

9.0500

9.30

12.5

5000 @ 100

2500

9.0500

9.30

12.5

361
500
624

498
504

52
50

007
1743

start
@ 1743

501730
501730

8

3

2

685-

SC 100

0
100

10
90

20
80

30
70

40
60

50
50

60
40

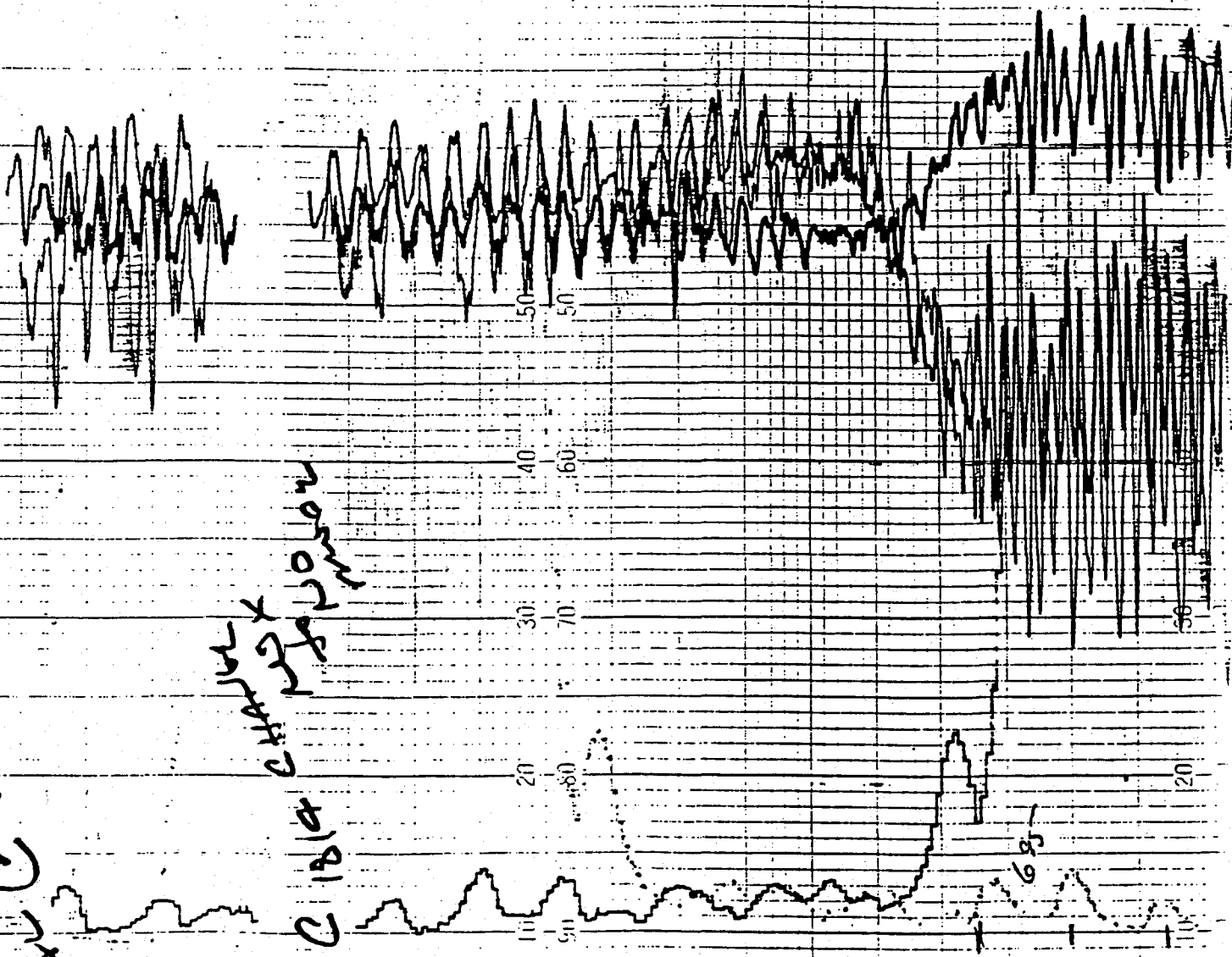
70
30

80
20

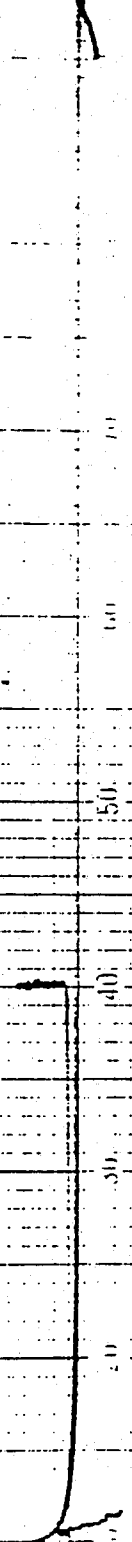
90
10

100
0

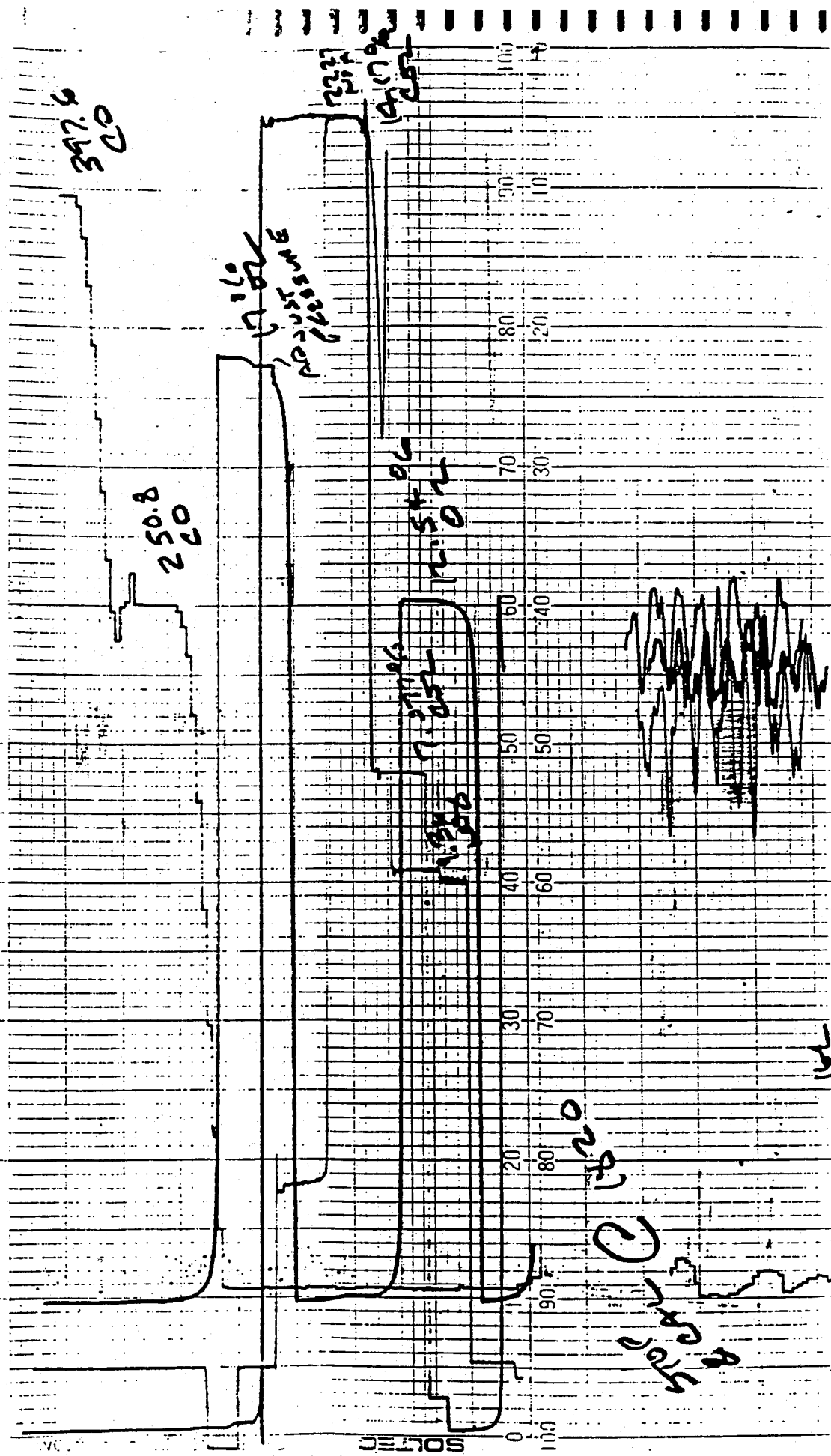
2021

[illegible]

৯৯:৬

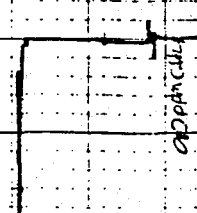
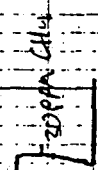
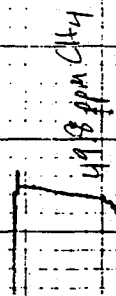
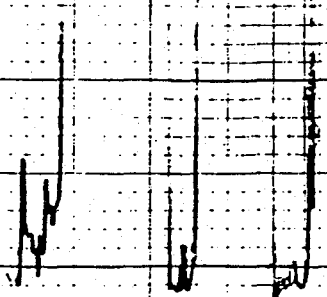


SYSTEM BIAS ✓



1200

SCALING

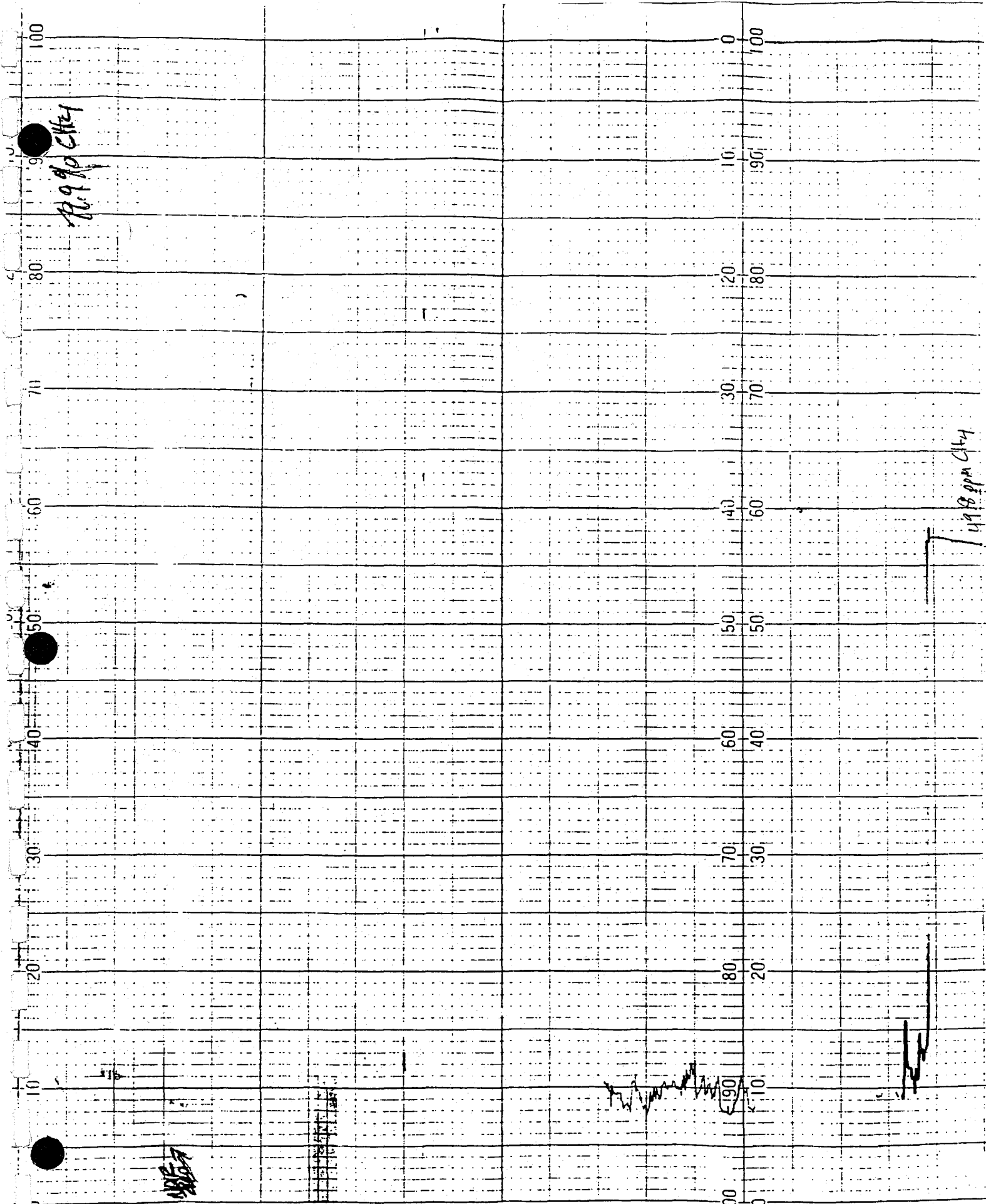


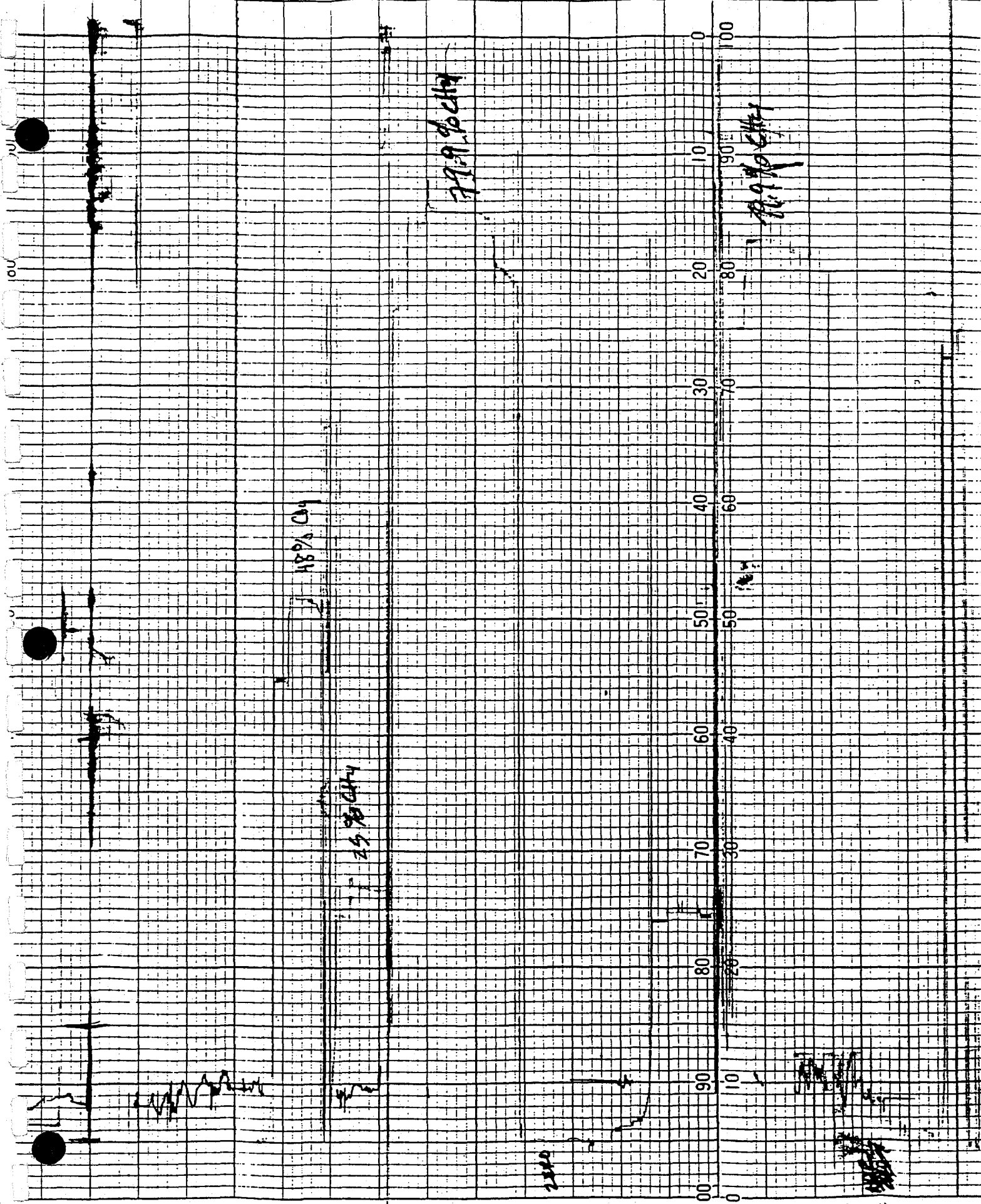
622-001
 FID GAGE 0-100 ppm SCALE
 NDIR GAGE 0-100 % SCALE
 SAW MARCHES FLARE #2

CHART SPEED 30 cm/hr
 16 16 94 AD

METHOD 2S A B STRIP CHARTS

100 90 80 70 60 50 40 30 20 10 0





79.9% CH4
20.1% O2
0.1% N2

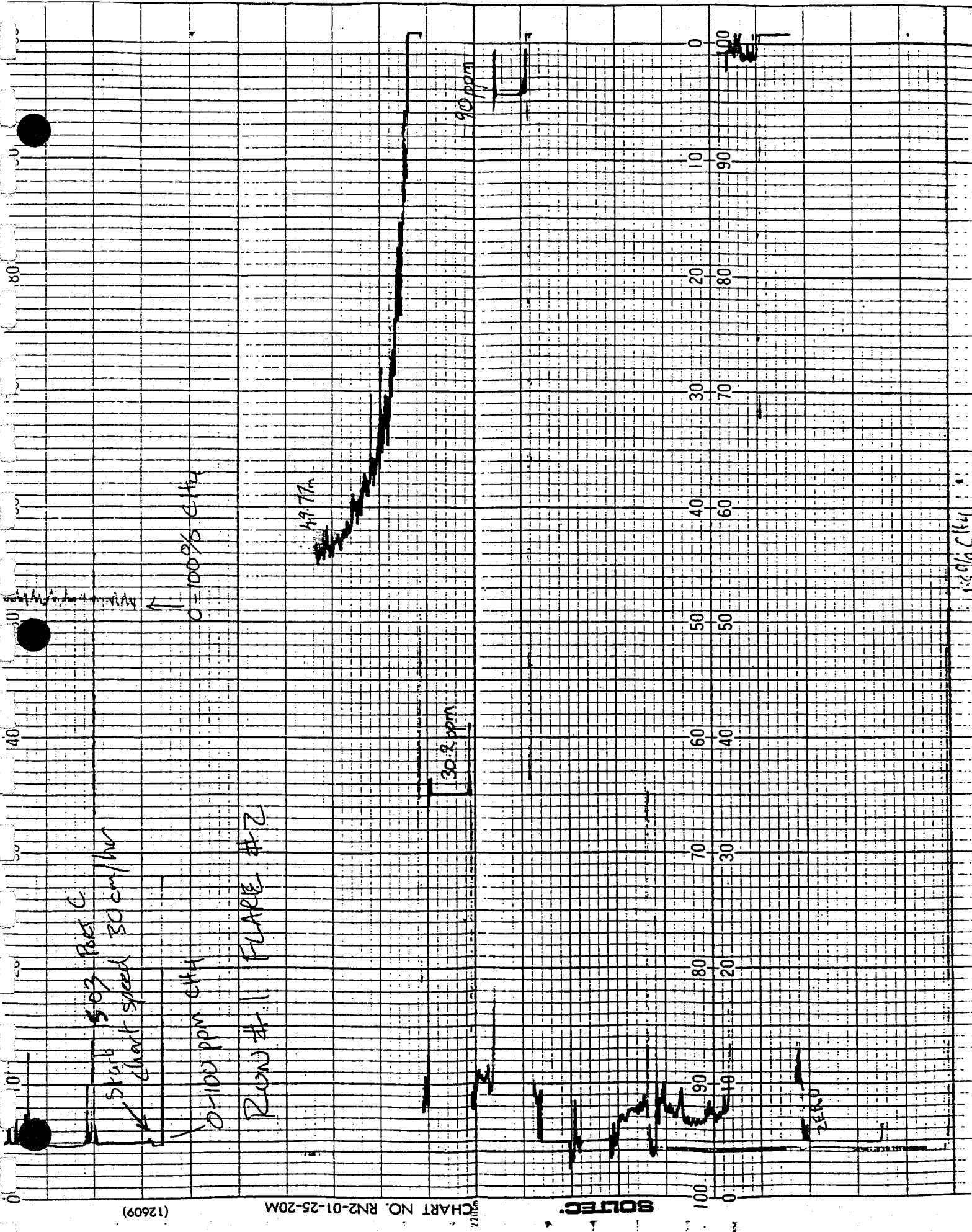
1430 DECAU

100 0 90 10 20 30 40 50 60 70 80 90 100

79.9% CH4

WAVE



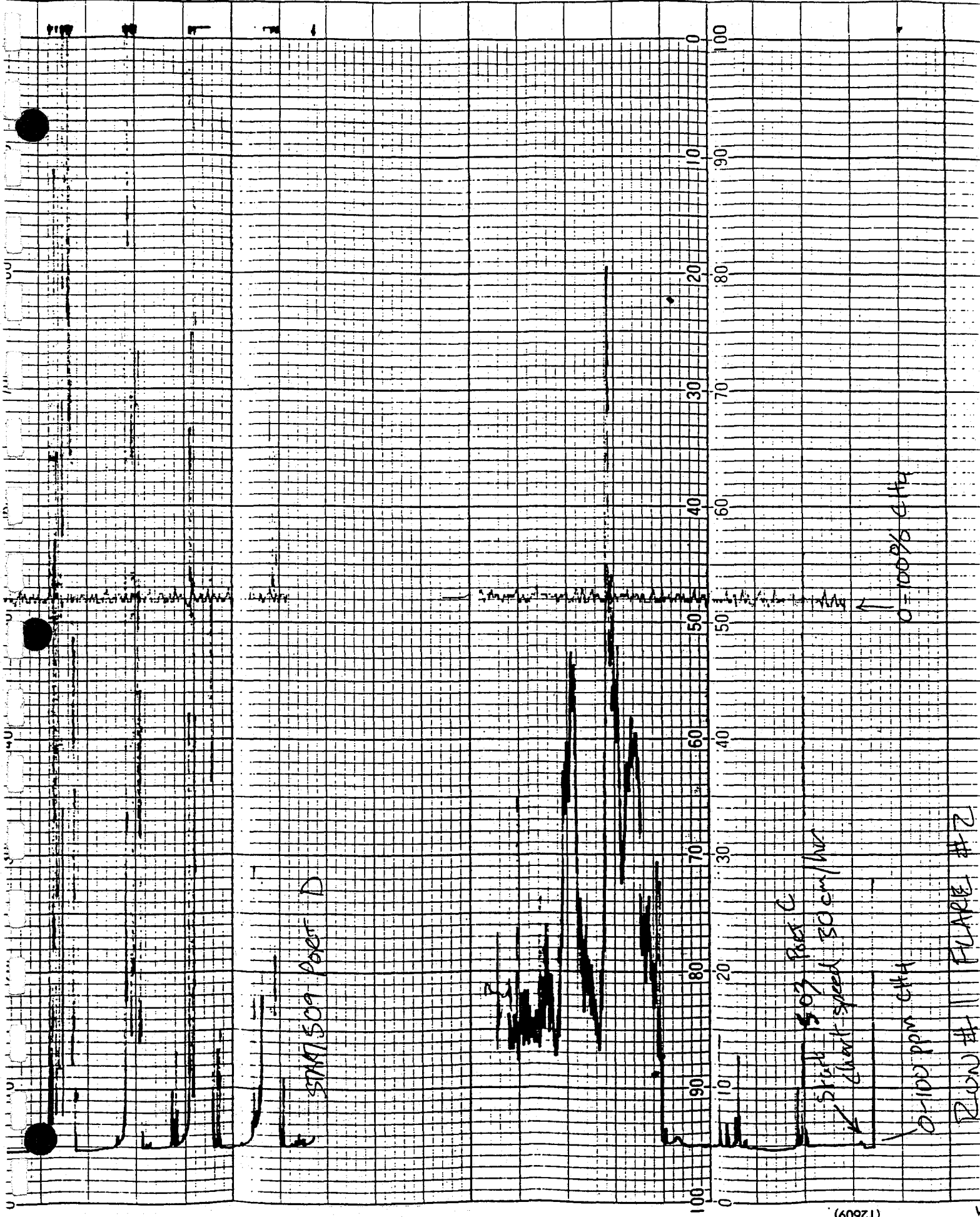


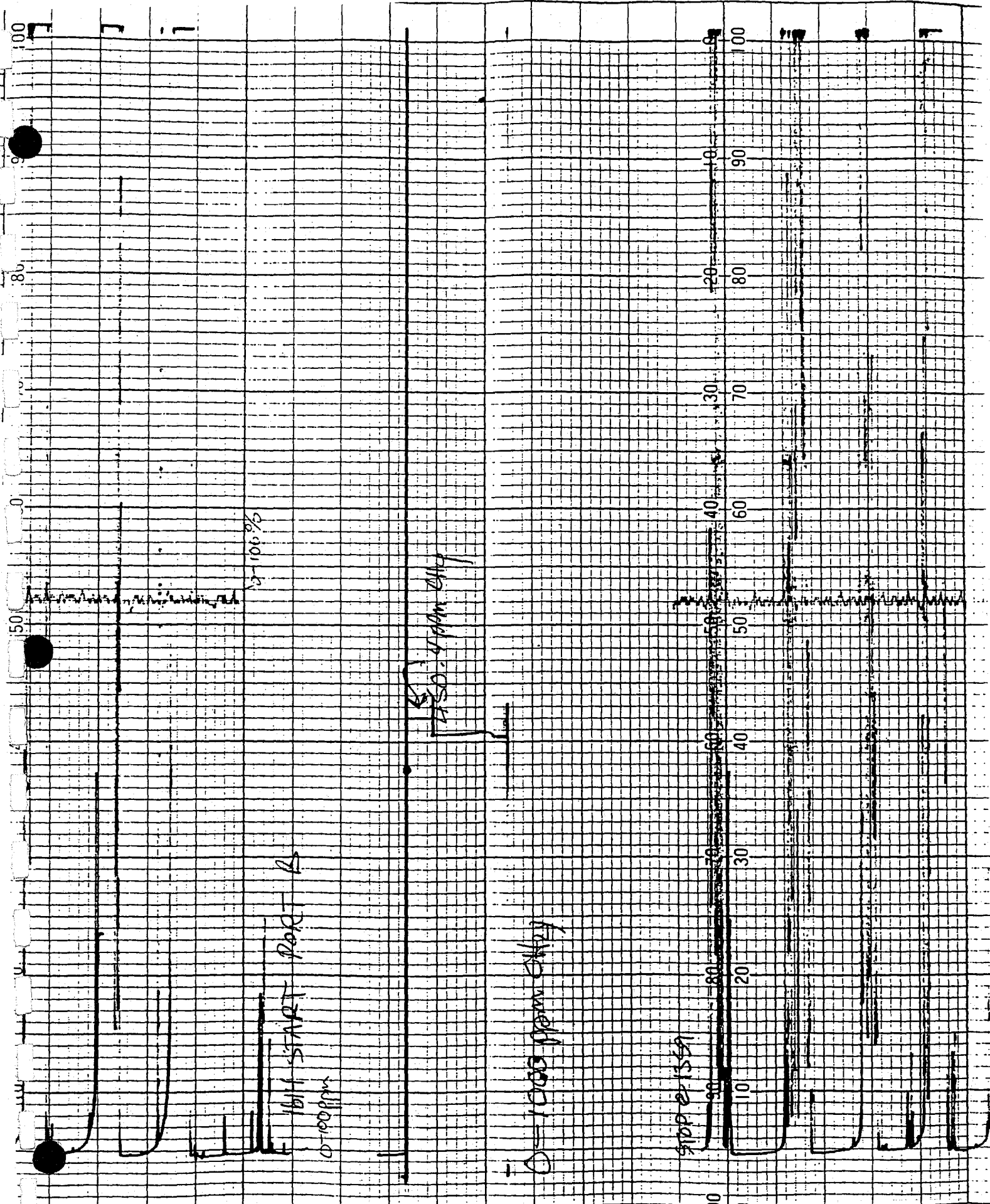
(12609)

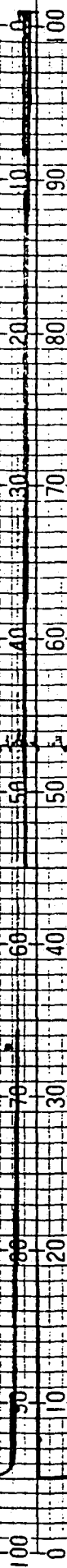
CHART NO. RM2-01-25-20M

SOLEC

12.0% CH₄

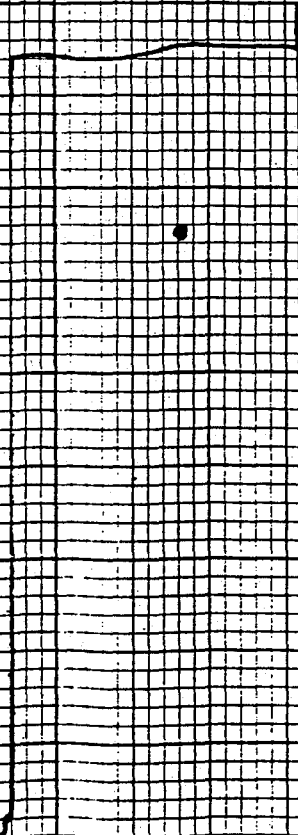






2017 11 16

0-1000 ppm C¹³H₂



11 Sep 05 Thu

17-09-2021

2007-2008

2-0-00098 @ 1675

0780

0780

0780

100 0 90 80 70 60 50 40 30 20 10 0

0 10 20 30 40 50 60 70 80 90 100

OUTLET STAKE / PPM CH4 - BLUE PEN
INLET STAKE / % CH4 - RED PEN

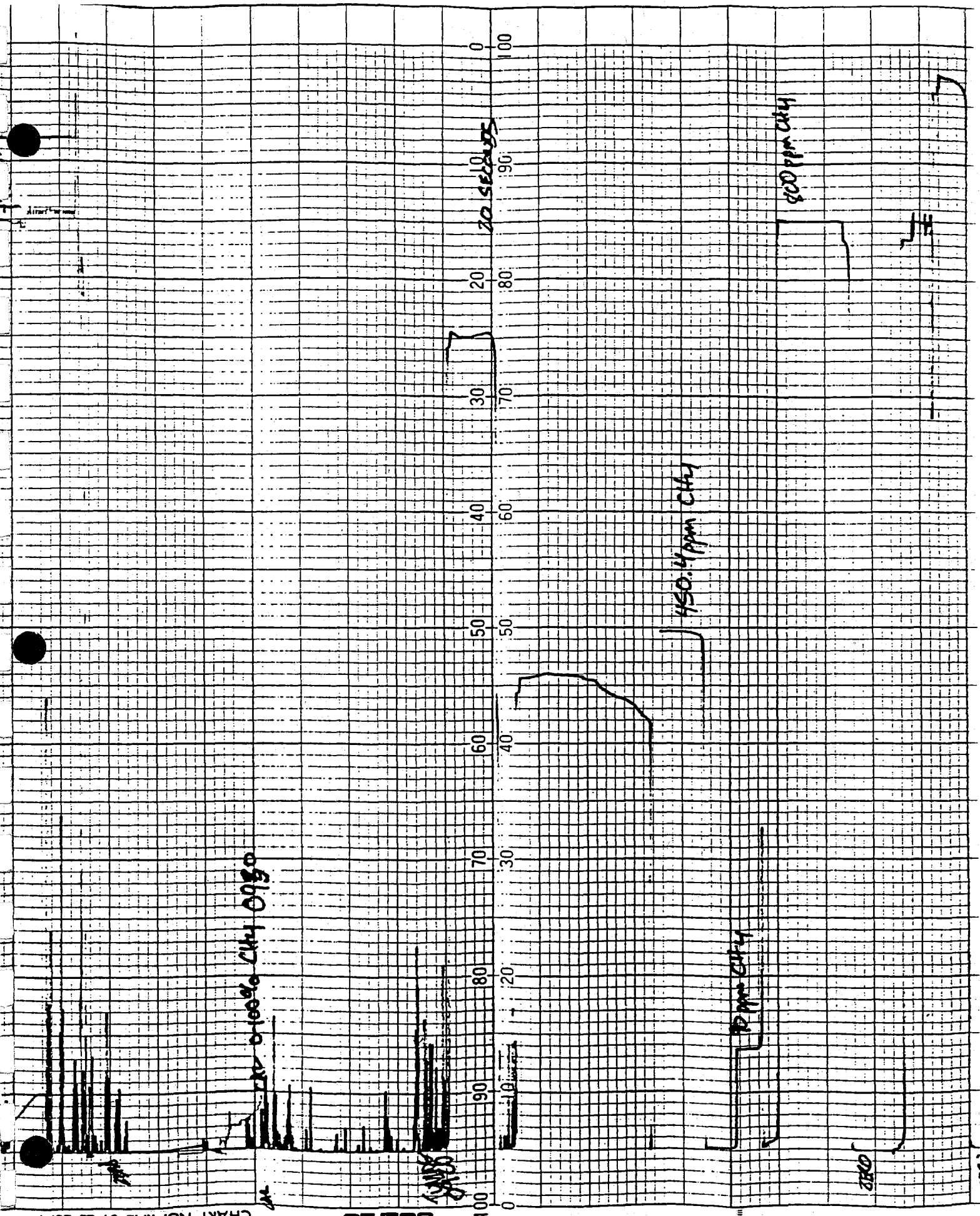
11/17/94 S22-001 SMO MARCOS FLARE #2 AP

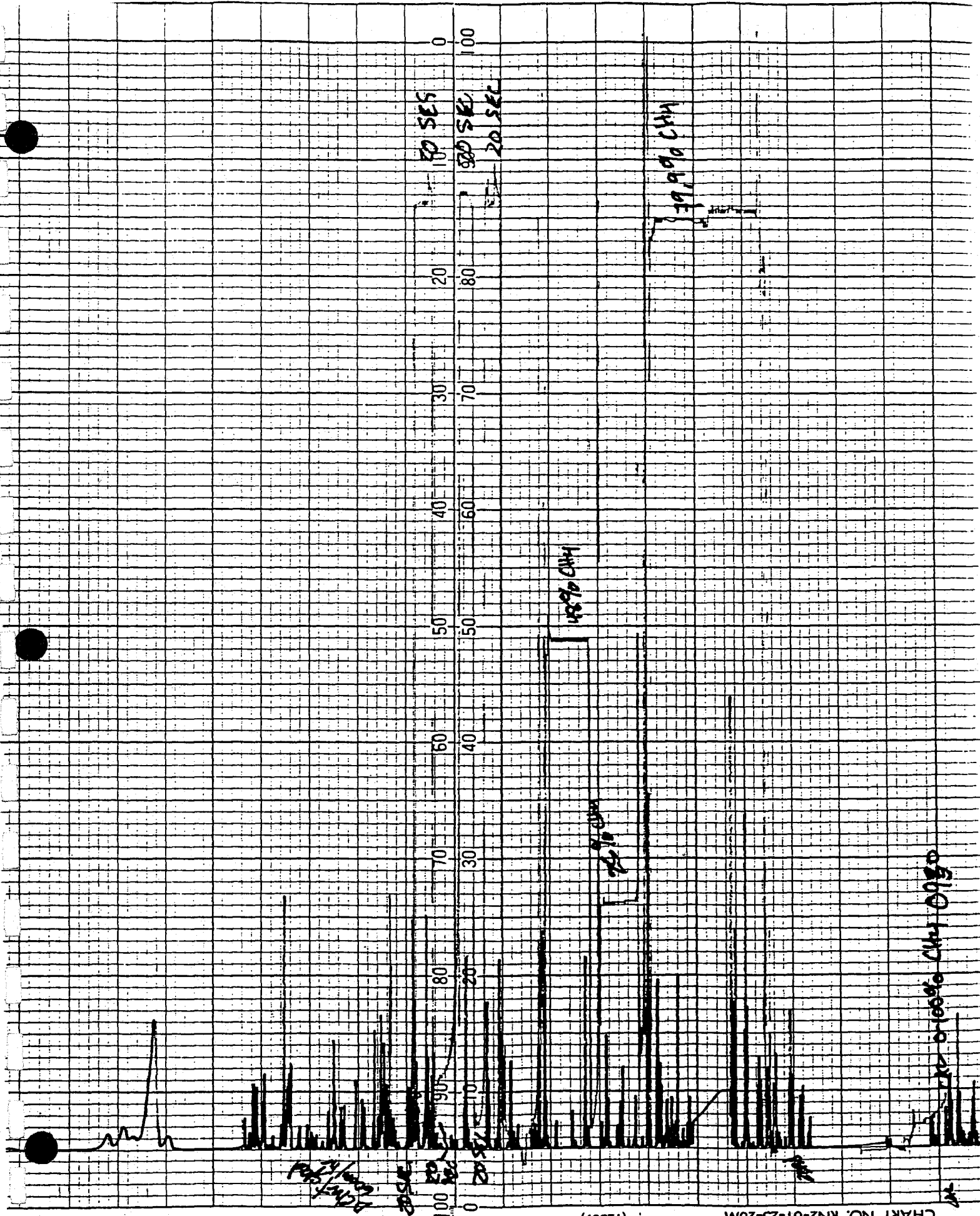
(12609)

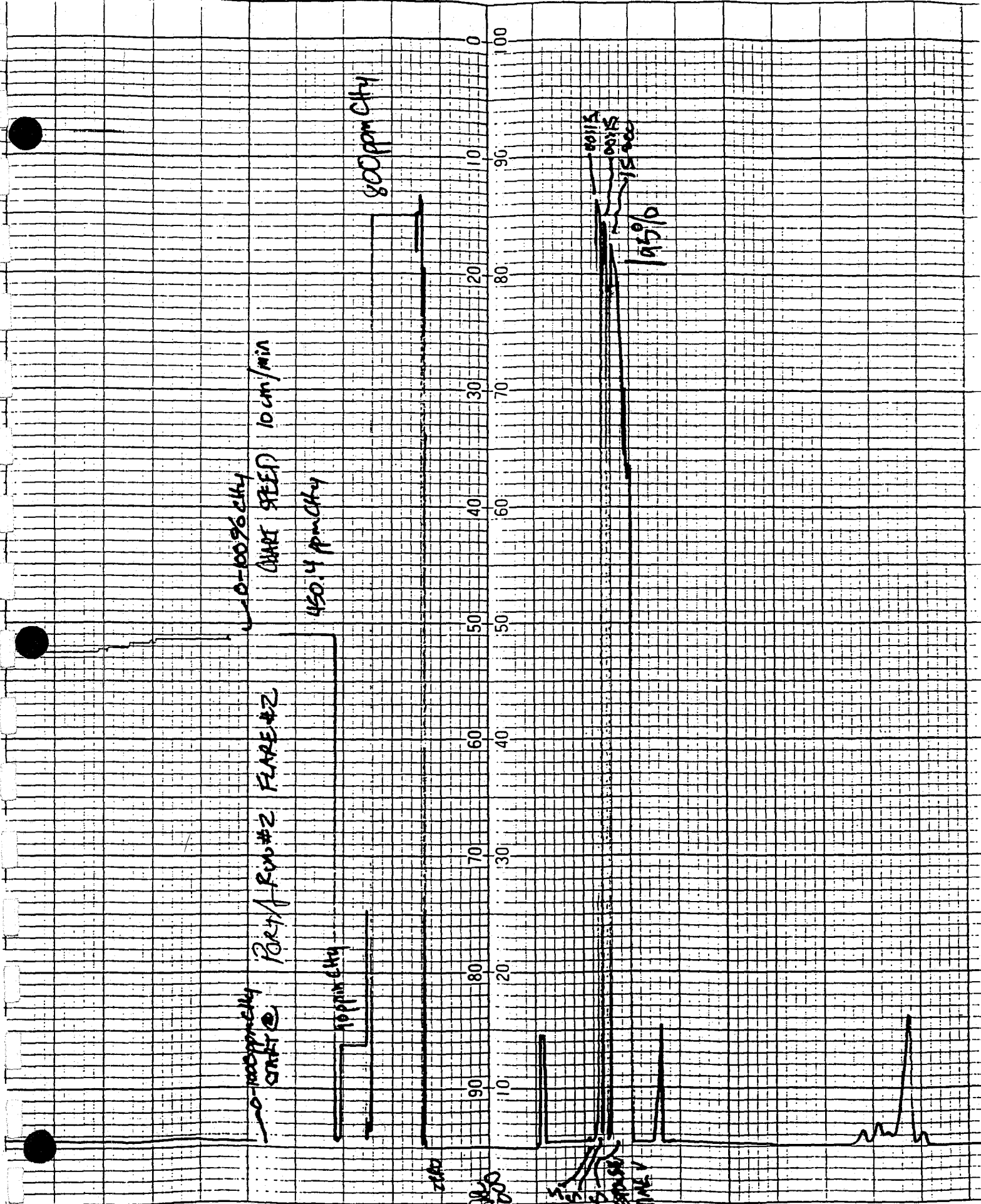
2-01-25-20M

CHART NO. RN2-01-25-20M

SOLEC.





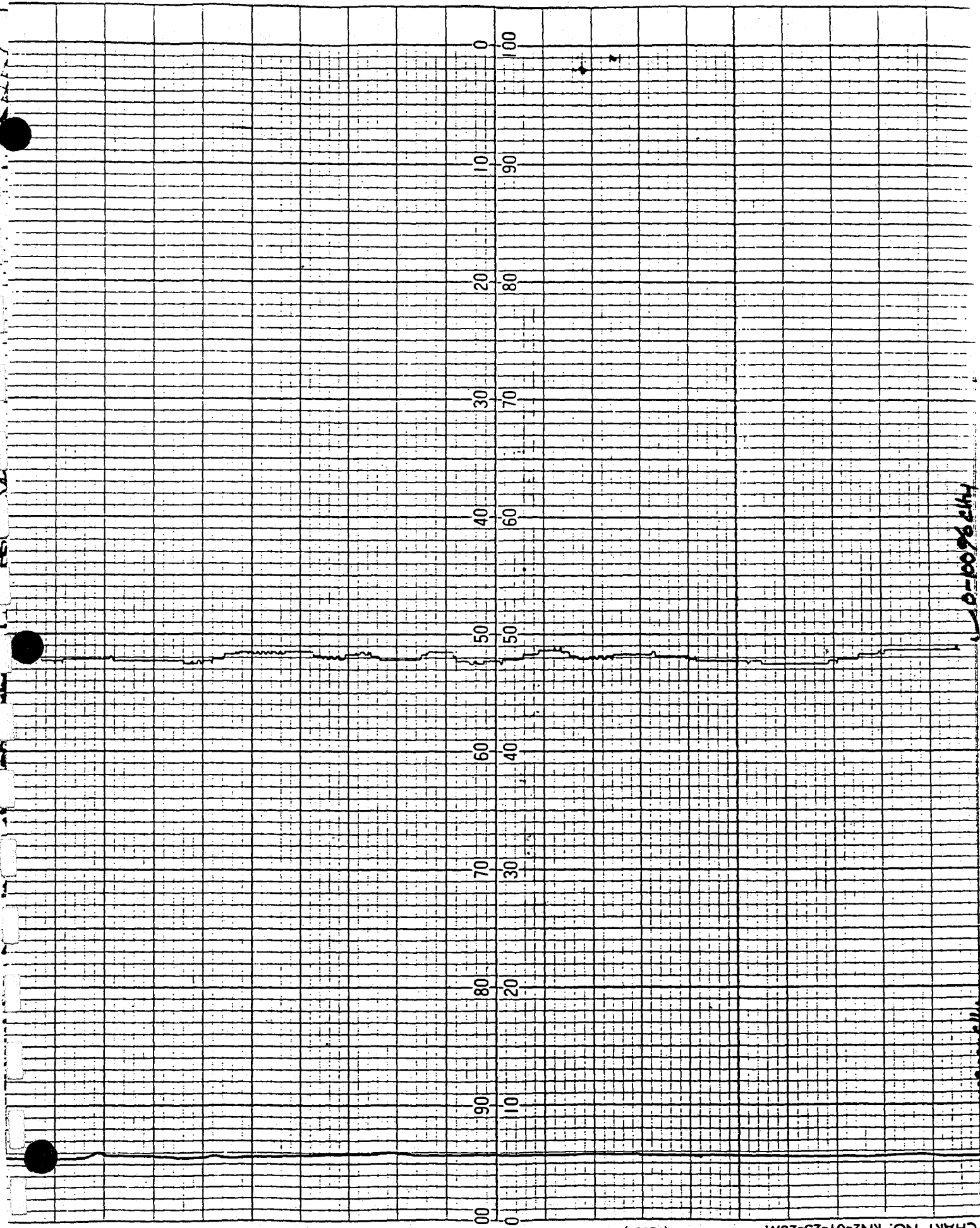


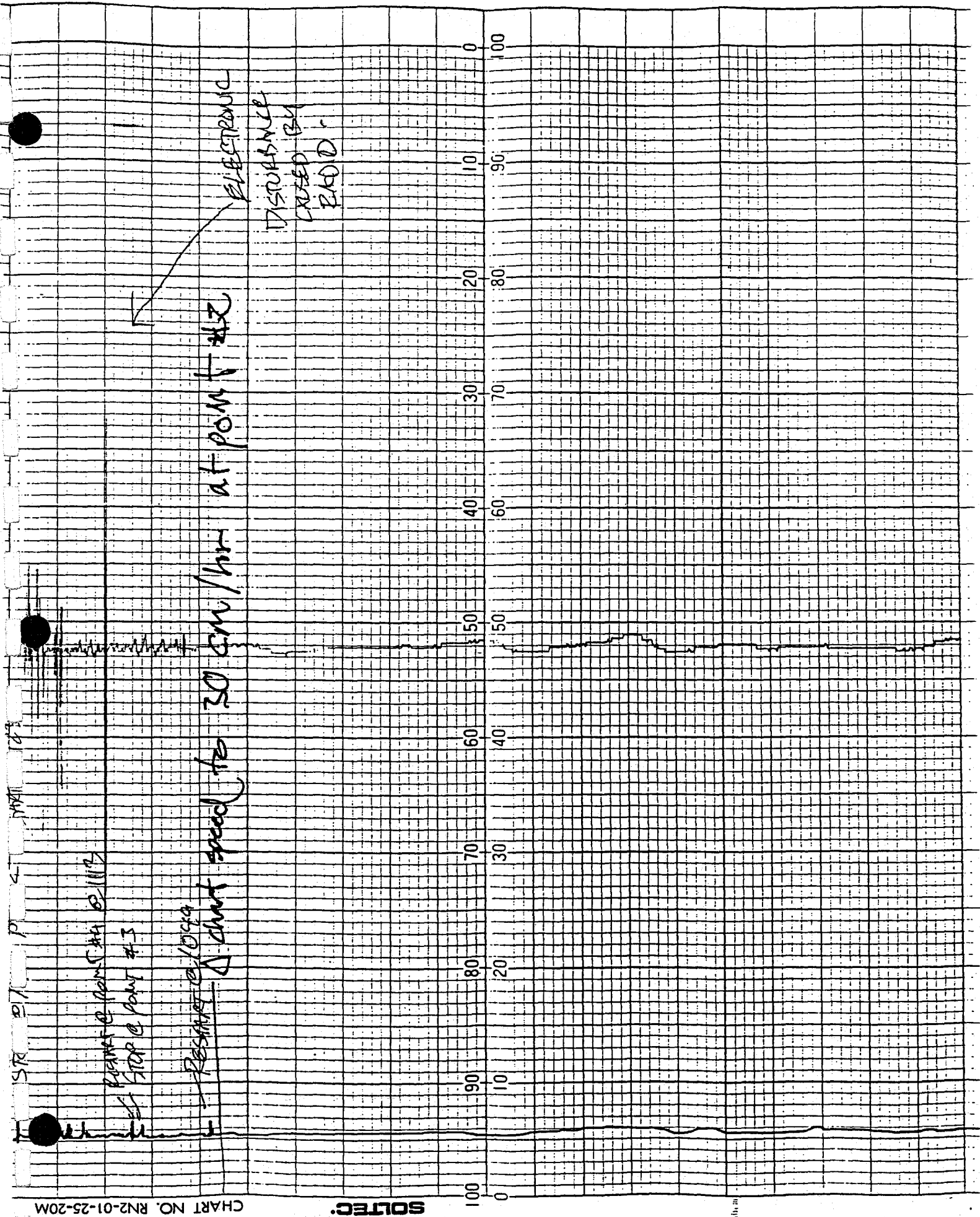
(12609)

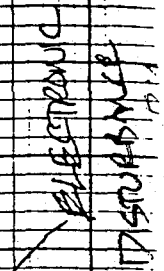
CHART NO. RN2-01-25-20M

HYDRAULIC

10-0096244







Δ chart speed to 30 cm/hr at point 22

Dec 10 1999

re D rem C #4 B III 2

TPP @ point #3

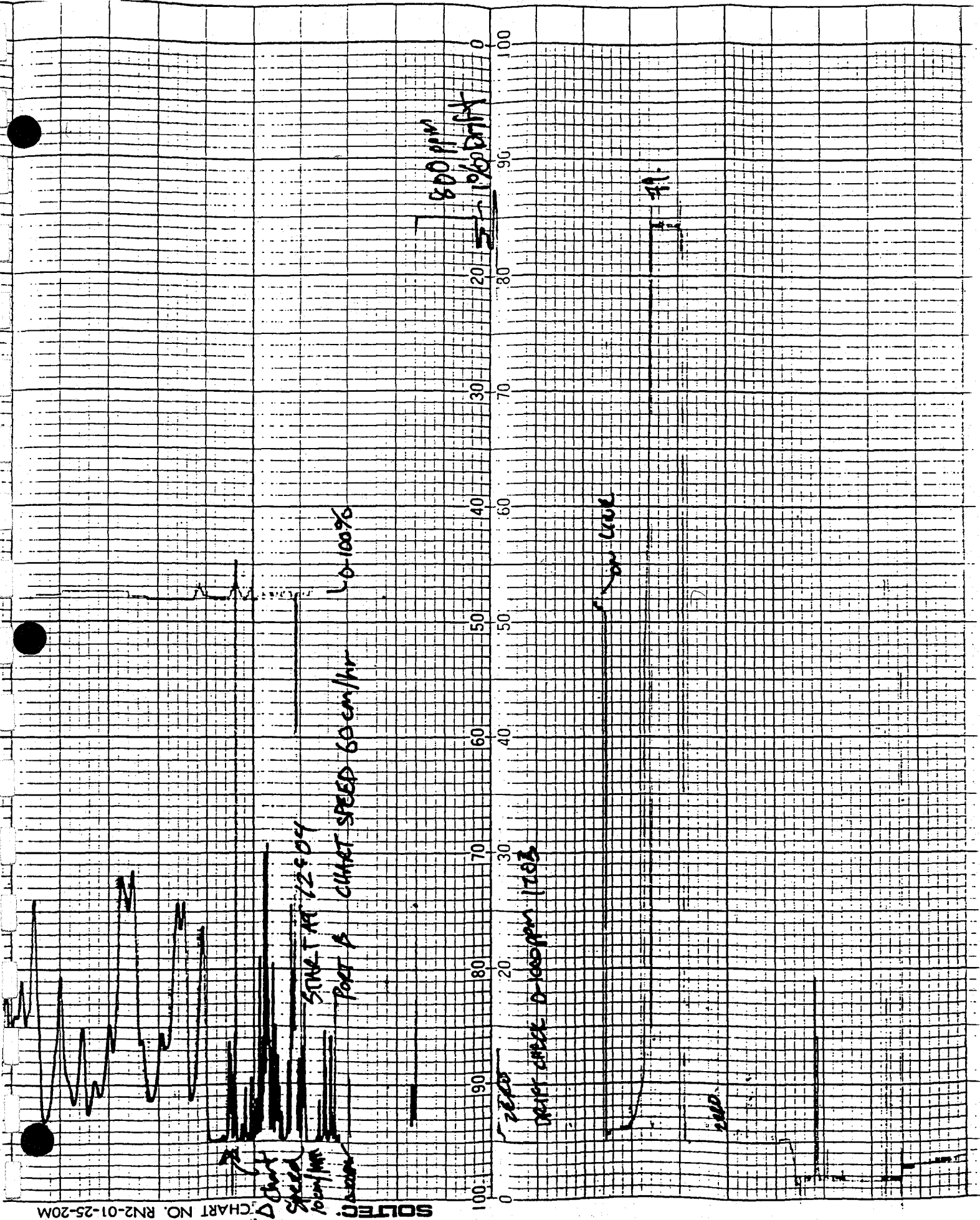
59110 144534 2746 81102025

2019-08-25

6/2/1942 0-100% CH₄ 17.05

02146





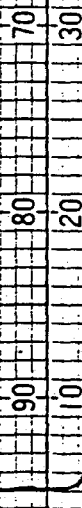
THE ABOVE IS A CHART OF THE ABOVE

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THE ABOVE IS A CHART OF THE ABOVE

0 100 10 90 20 80 30 70 40 60 50 50 60 40 70 30 80 20 90 100 0



(12609)

CHART NO. RM2-01-25-20M

Chart speed

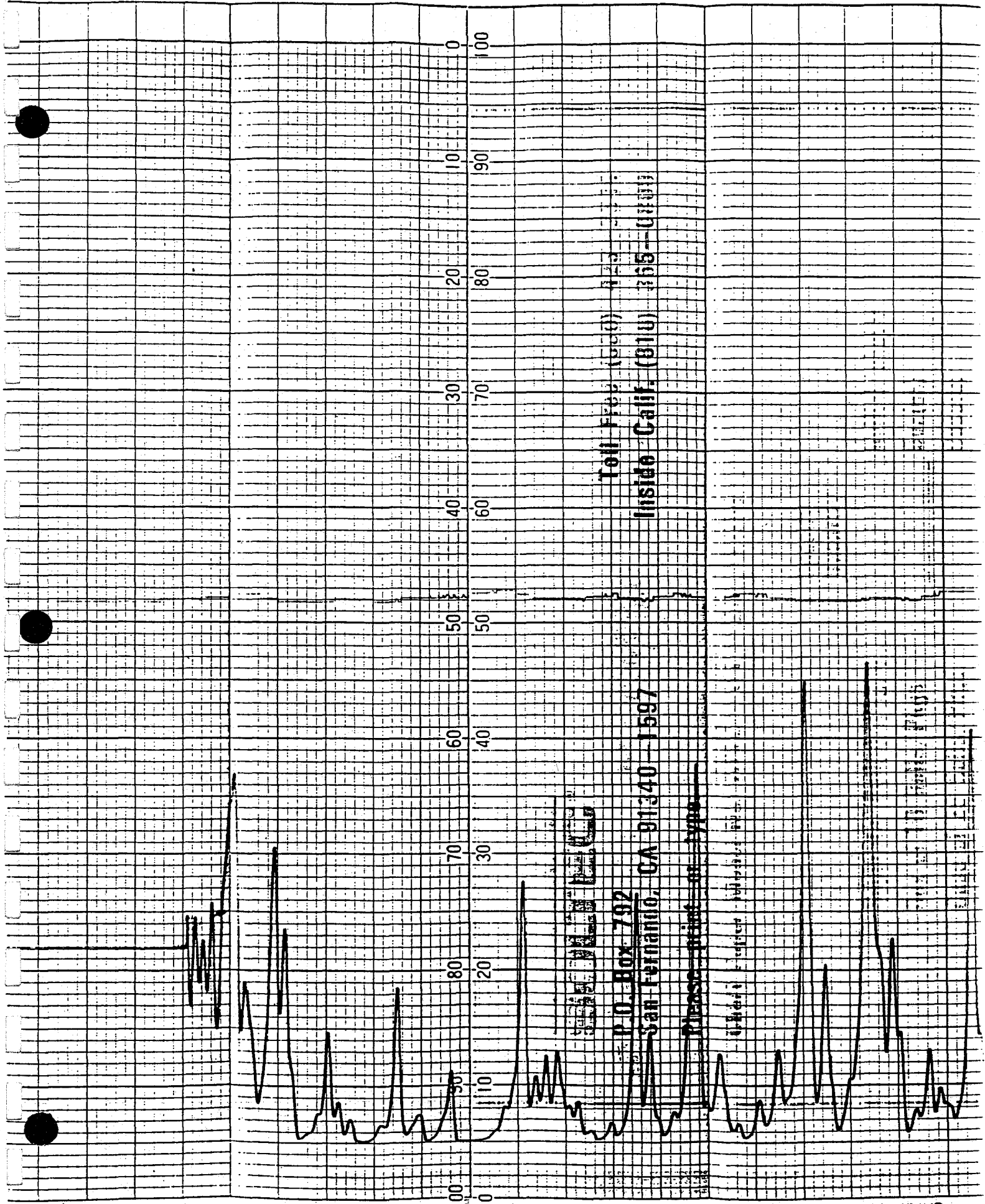
100 0 10 20 30 40 50 60 70 80 90 100

Phone Number with Area Code

Purchase Order or Requisition

Signature of person

Complete up to address if different from above (to P.O. and before last)



P.O. Box 792
San Fernando, CA 91340-1597
Please print or type

Identified subject: [illegible]

RESUME TEST #2 PLACE #2 @ POINT B-3 12/17
S22-001 11/19/94 SAN MARCOS PLACE (LANDFILL)

SEB
CORPORATION

P.O. BOX 792

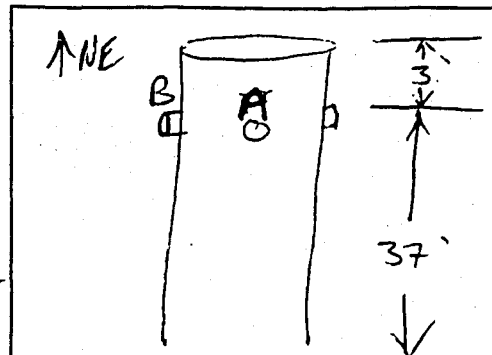
SAN FERNANDO, CA 91341-0792
(818) 365-0800

CHART NO. RN2-01-25-20M

VELOCITY DATA SHEET - METHOD 2

Plant: SAN MARCOS LANDFILL
 Job #: S22-001
 Source: FLARE #1
 Date: 11/18/94
 Operator: AP, JT
 Baro. Press.: 29.31
 Offset Length: ~3"

D₁ upstream: 0.6
 D₁ downstream: 7.4
 Pitot Tube #: 7-1
 Pitot Tube Type: 0.84
 Magnahelic #: RAC #5
 Stack Diameter: 60" = 2.8274 m
 Static Press.: -.085



Schematic of Stack

Leak Check:

Initial 4.0 / 4.1 Final 3.6 / 3.1

FIELD DATA

Traverse Point Number	Position, in.	Velocity Head (ΔP_s) in. H ₂ O		Stack Temp °F	Cyclonic Flow Determination	
		USE FOR NE			ΔP_s at 0° reference	Angle which yields a null ΔP
A - 1	1.3	.09	.10	1666		
2	4.0	.09	.09	1672		
3	7.1	.10	.10	1682		
4	10.6	.10	.10	1687		
5	15.0	.10	.08	1620		
6	21.4	.10	.07	1617		
7	38.6	.06	.06	1605		
8	45.0	.06	.06	1594		
9	49.4	.05	.05	1678		
10	52.9	.04	.05	1648		
11	56.0	.05	.06	1534		
12	58.7	.05	.06	1508, 1563		
B - 1	1.3	.07	.03	1687		
2	4.0	.04		1022, 1357		
3	7.1	.05		1531		
4	10.6	.06		1570		
5	15.0	.07		1568		
6	21.4	.09		1523		
7	38.6	.11		1588		
8	45.0	.10		1622		
9	49.4	.10		1652		
10	52.9	.10		1605		
11	56.0	.09		1685		
12	58.7	.07		1689		
AVERAGE		FBP = 0.2698		1582.4		

T SAN MARCOS LANDFILL
11/15/94
 CATION SAN MARCOS CA
 TRATOR AP JT
 ICE FLARE #1
1 SCRAPED METALS
 BOX NO. B
 TER BOX NO. S
 R Δ H @ 1.90's
0.990
 ME START 1201

AMBIENT TEMPERATURE S1
 BARO. PRESS. 29.35
 ASSUMED MOISTURE, % 8
 PROBE LENGTH, in. 76 *Continuous Quartz*
 NOZZLE DIAMETER, in. 0.666
 STACK DIAMETER, in. 60
 PROBE HEATER SETTING NA
 HEATER BOX SETTING NA
 Δ Cp FACTOR 0.84 *Plot # 6-1*
 FILTER NO. Q733
 STATIC PRESSURE -0.09

INDEX = S2

PRE TEST LEAK CHECKS

METER 0.002 @ 15 in. Hg
 PITOTS 0/0 @ 4/3 in. Hg
 ORSAT -

#	TIME	T _s °F	Δ P in H ₂ O	√ Δ P	Δ H in H ₂ O	V _m ft ³	T _{m IN} °F	T _{m OUT} °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
12	1201 00	1608	0.1		5.1	258.210	70	61	NA	50	5
11	25	1514	0.025		3.8	261.4	80	64	1	50	4
10	50	1709	0.1		5.1	264.1	82	65	1	54	5
9	75	1594	0.11		5.6	267.0	83	66		57	6
8	100	1643	0.1		5.1	270.1	83	67		59	5
7	125	1542	0.08		4.1	273.1	83	68		63	4
6	150	1535	0.09		4.6	275.8	83	68		64	5
5	175	1632	0.09		4.6	278.6	83	69		65	5
4	200	1576	0.08		4.1	281.6	83	69		66	4
3	225	1558	0.06		3.05	284.8	82	70		64	3.5
2	250	1547	0.07		3.6	286.9	82	70		61	4
1	275	1584	0.06		3.05	289.4	83	70		58	4
12	1245 30.0	1668	0.06		3.05	291.820/291.820	75	68		48	4
11	325	1602	0.07		3.6	294.0	79	68		46	4.5
10	350	1622	0.07		3.6	296.5	81	68		49	4.5
9	375	1585	0.07		3.6	299.2	81	68		50	4.5
8	400	1577	0.08		4.1	301.6	82	67		51	5
7	425	1609	0.06		3.05	304.3	82	69		52	4
6	450	1603	0.08		4.1	306.8	82	70		53	5
5	475	1582	0.09		4.6	309.3	83	70		53	6
4	500	1622	0.11		5.6	312.3	83	70		54	7
3	525	1633	0.11		5.6	315.4	83	70		54	7
2	550	1584	0.07		3.6	318.4	83	71		54	5
1	575/ 00	1628	0.06		3.05	321.2/323.418	83	71		53	4
Avg.	60	1598.28		0.2832	4.14	65.208		74.9			

END = 1315

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	5
Final	208	125	2	NA	263.2
Initial	100	100	0		253.5
Liquid Collected	108	25	2		9.7
Total Collected					144.9

POST TEST LEAK CHECKS

Meter 0.000 @ 8 in. Hg
 Pitots 0/0 @ 7/8 in. Hg
 ORSAT -

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					
Nozzle Cal	D ₁	D ₂	D ₃	Average	
	0.666	0.666	0.666	0.666	

PARTICULATE FIELD DATA

SITE SAN MARCOS LANDFILL
 DATE 11/18/94
 LOCATION SAN MARCOS, CA
 OPERATOR AP, JT
 RECE FRARE #1
 BOX NO. C
 ER BOX NO. S
 ER Δ H @ 1.905
0.910
 ME START 1354

AMBIENT TEMPERATURE 52
 BARO. PRESS. 29.29
 ASSUMED MOISTURE, % 8
 PROBE LENGTH, in. 76 CONTAMINATED QUARTZ
 NOZZLE DIAMETER, in. 0.666
 STACK DIAMETER, in. 60
 PROBE HEATER SETTING NA
 HEATER BOX SETTING NA
 Δ Cp FACTOR 0.84 PITOT # 6-1
 FILTER NO. G-724
 STATIC PRESSURE - .08

INDEX = 52

PRE TEST LEAK CHECKS
 METER 0.007 @ 15 in. Hg
 PITOTS 0/0 @ 7/8 in. Hg
 ORSAT

#	TIME	T _s °F	Δ P in H ₂ O	√ Δ P	Δ H in H ₂ O	V _m ft ³	T _{m IN} °F	T _{m OUT} °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
-12	1354.00	1532	0.06		3.05	323.690	72	66	NA	51	5.5
11	2.5	1527	0.07		3.6	326.1	81	68		49	6
10	5.0	1537	0.06		3.05	328.6	82	68		51	5.5
9	7.5	1551	0.06		3.05	331.0	83	69		53	5.5
8	10.0	1518	0.07		3.6	333.3	83	69		54	6.0
7	12.5	1602	0.08		4.1	335.5	82	70		56	7
6	15.0	1616	0.08	4.1	2.55	338.6	82	70		57	7
5	17.5	1673	0.09		4.6	341.2	82	70		58	8
4	20.0	1608	0.10		5.1	344.3	82	70		58	9
3	22.5	1632	0.06		3.05	347.2	81	70		59	5.5
2	25.0	1624	0.07		3.6	349.6	82	71		58	6
1	27.5	1642	0.06		3.05	352.1	82	71		58	5
15-12	1455.30.0	1511	0.05		2.55	354.53/354.53	74	64		44	2
11	32.5	1512	0.04		2.05	356.8	77	64		46	1.8
10	35.0	1550	0.04		2.05	358.9	78	65		47	1.8
9	37.5	1553	0.06		3.05	360.9	79	65		48	2
8	40.0	1533	0.06		3.05	363.3	80	65		50	2
7	42.5	1641	0.08		4.1	365.6	80	66		50	3
6	45.0	1540	0.06		3.05	368.3	80	67		51	2
5	47.5	1507	0.09		4.6	370.8	80	67		52	3
4	50.0	1578	0.06		3.05	373.5	80	67		52	2
3	52.5	1468	0.06		3.05	376.0	80	67		52	2
2	55.0	1462	0.05		2.55	378.5	80	68		52	2
1	57.5/60.0	1485	0.04		2.05	380.6/382.610	80	68		51	
Avg.	60	1558.4		0.2523	3.30	58.920		73.9			

ME END = 1525

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	
Final	205	113	2	NA	2923 281.3
Initial	100	100	0		11.0
Liquid Collected	105	13	2		131.0
Vol. Collected					

POST TEST LEAK CHECKS
 Meter 0.007 @ 15 in. Hg
 Pitots 0/0 @ 7/8 in. Hg
 Orsat

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					
Nozzle Cal	D ₁	D ₂	D ₃	Average	
	0.666	0.666	0.666	0.666	

HORIZON AIR MEASUREMENT SERVICES, INC.

* HORIZON TO CONDUCT TWO OF THREE SCHEDULED TEST RUNS DUE TO DISQUALIFICATION OF RUN #2, AT THE DISCRETION OF JIM MORRIS (SEAL).

NT SAN MARCOS LANDFILL
 E 11/18/94
 LOCATION SAN MARCOS, CA
 OPERATOR AP JT
 TRACE FLARE #1
3 SILICATED meths
 BOX NO. C
 SER BOX NO. S
 ER Δ H @ 1.908
0.910
 ME START 1700

AMBIENT TEMPERATURE 50
 BARO. PRESS. N-745 29.31
 ASSUMED MOISTURE, % 3
 PROBE LENGTH, in. 76 CONTINUOUS QUARTZ
 NOZZLE DIAMETER, in. 0.666
 STACK DIAMETER, in. 60
 PROBE HEATER SETTING NA
 HEATER BOX SETTING NA
 Δ Cp FACTOR 0.84 #6-1
 FILTER NO. Q-742
 STATIC PRESSURE -0.10

INDEX S2

PRE TEST LEAK CHECKS
 METER 0.003 @ 15 in. Hg
 PITOTS 0/2 @ 6/7 in. Hg
 ORSAT

#	TIME	T _s °F	Δ P in. H ₂ O	√ Δ P	Δ H in. H ₂ O	V _m ft ³	T _{m IN} °F	T _{m OUT} °F	OVEN °F	IMP. OUT °F	VAC. (in. Hg)
-12	1700	1525	0.07		3.6	386.944	68	58	NA	50	4
11	2.5	1501	0.07		3.6	389.3	76	59		50	4
10	5.0	1504	0.08		4.1	392.0	79	60		49	5
9	7.5	1521	0.070		3.6	395.1	79	61		50	4.5
8	10.0	1471	0.08		4.1	397.2	78	61		51	5
7	12.5	1463	0.08		4.1	399.9	78	62		52	5
6	15.0	1609	0.09		4.6	402.6	78	62		52	5
5	17.5	1520	0.10		5.0	405.2	78	62		52	6.5
4	20.0	1557	0.07		3.6	408.2	79	63		51	5
3	22.5	1578	0.07		3.6	411.3	78	63		52	5
2	25.0	1591	0.07		3.6	413.7	79	63		54	5
1	27.5	1603	0.06		3.05	416.4	79	63		53	4.5
12	30.0	1509	0.06		3.05	418.9	72	60		49	4
11	32.5	1498	0.08		4.1	421.7	73	61		50	5
	35.0	1565	0.09		4.8	423.8	77	61		50	5.5
9	37.5	1497	0.09		4.8	426.3	77	61		50	6
8	40.0	1530	0.09		4.8	429.9	77	62		51	6
7	42.5	1592	0.09		4.8	432.7	77	62		52	6
6	45.0	1573	0.1		5.3	435.5	78	62		51	6
5	47.5	1594	0.1		5.3	438.3	78	63		51	6
4	50.0	1621	0.8008		4.25	441.2	77	63		52	5
3	52.5	1660	0.07		3.7	444.1	77	63		52	4.5
2	55.0	1584	0.07		3.7	446.6	77	63		52	4
1	57.5	1596	0.06		3.06	449.2	76	63		52	3
Avg.	60	1552.6		0.2798	4.10	64.853		69.3			

END - 1813

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	
Final	203	121	7.5		314.0
Initial	100	100	0		301.5
Liquid Collected	103	21	7.5		12.5
Net Vol. Collected					144.0

POST TEST LEAK CHECKS
 Meter 0.001 @ 9 in. Hg
 Pitots 0/2 @ 7/3 in. Hg
 Orsat

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					
Nozzle Cal	D ₁	D ₂	D ₃	Average	
	0.666	0.666	0.666	0.666	

* Reset nomograph for lower stack temp.

San Marcos Landfill SZZ-001 November 16-18, 1994

LANDFILL GAS VOLUMETRIC FLOWRATE, Dry STANDARD

LANDFILL GAS TEMP °F = 72° Wet / 103° Dry

% H₂O = 1.5

Dry Molecular Weight = 0.9850 lb/lb mole

FLARE #2 11/17/94

Run #2

$$2,477.3 \text{ scfm} * 0.9850 = 2,440.1 \text{ dscfm}$$

Run #3

$$2,499.8 \text{ scfm} * 0.9850 = 2,462.3 \text{ dscfm}$$

FLARE #1 11/18/94

Run #1

$$598.4 \text{ scfm} * 0.9850 = 589.4 \text{ dscfm}$$

Run #2

$$598.4 \text{ scfm} * 0.9850 = 589.4 \text{ dscfm}$$

Run #3

$$591.8 \text{ scfm} * 0.9850 = \cancel{589.4} 582.9 \text{ dscfm}$$

* NOTE FLARE #2 Run #1 was excluded by SDCAED representative on site 11/16/94. However, all measurements from this run are contained within the appendices
FLARE #2 Run #1 (11/16/94)
 $2490.1 \text{ scfm} * 0.9850 = 2452.7 \text{ dscfm}$

APPENDIX D
Operation Data

PAGE 1 of 7

HISTORY DATA REPORT

21 NOV 94 14:13 Page 3

POINT : SM-GAS-FLOW-TO-S2

5 Minute Sample Interval

Report Starting Date: 16-NOV-1994

Time: 07:00

DATE	TIME	VALUE	STATUS
16-NOV-1994	14:16	2567.4 SCFM	NORMAL
16-NOV-1994	14:21	2552.3 SCFM	NORMAL
16-NOV-1994	14:22	2532.6 SCFM	NORMAL
16-NOV-1994	14:26	2504.7 SCFM	NORMAL
16-NOV-1994	14:31	2517.5 SCFM	NORMAL
16-NOV-1994	14:36	2574.3 SCFM	NORMAL
16-NOV-1994	14:41	2540.7 SCFM	NORMAL
16-NOV-1994	14:46	2539.5 SCFM	NORMAL
16-NOV-1994	14:51	2446.7 SCFM	NORMAL
16-NOV-1994	14:56	2478.0 SCFM	NORMAL
16-NOV-1994	15:01	2429.3 SCFM	NORMAL
16-NOV-1994	15:06	2523.3 SCFM	NORMAL
16-NOV-1994	15:11	2473.4 SCFM	NORMAL
16-NOV-1994	15:13	2532.6 SCFM	NORMAL
16-NOV-1994	15:16	2494.3 SCFM	NORMAL
16-NOV-1994	15:21	2511.7 SCFM	NORMAL
16-NOV-1994	15:26	2290.1 SCFM	NORMAL
16-NOV-1994	15:31	2518.7 SCFM	NORMAL
16-NOV-1994	15:36	2572.0 SCFM	NORMAL
16-NOV-1994	15:41	2501.3 SCFM	NORMAL
16-NOV-1994	15:46	2510.5 SCFM	NORMAL
16-NOV-1994	15:51	2464.1 SCFM	NORMAL
16-NOV-1994	15:56	2544.2 SCFM	NORMAL
16-NOV-1994	16:01	2534.9 SCFM	NORMAL
16-NOV-1994	16:04	2478.0 SCFM	NORMAL
16-NOV-1994	16:06	2512.9 SCFM	NORMAL
16-NOV-1994	16:11	2466.4 SCFM	NORMAL
16-NOV-1994	16:16	2554.6 SCFM	NORMAL
16-NOV-1994	16:21	2436.3 SCFM	NORMAL
16-NOV-1994	16:26	2416.6 SCFM	NORMAL
16-NOV-1994	16:31	2416.6 SCFM	NORMAL
16-NOV-1994	16:32	2481.5 SCFM	NORMAL
16-NOV-1994	16:37	2504.7 SCFM	NORMAL
16-NOV-1994	16:42	2530.3 SCFM	NORMAL
16-NOV-1994	16:47	2526.8 SCFM	NORMAL
16-NOV-1994	16:52	2518.7 SCFM	NORMAL
16-NOV-1994	16:56	2598.7 SCFM	NORMAL
16-NOV-1994	16:57	2472.2 SCFM	NORMAL
16-NOV-1994	17:02	2525.6 SCFM	NORMAL
16-NOV-1994	17:07	2264.6 SCFM	NORMAL
16-NOV-1994	17:12	2546.5 SCFM	NORMAL
16-NOV-1994	17:17	2453.7 SCFM	NORMAL
16-NOV-1994	17:22	2548.8 SCFM	NORMAL
16-NOV-1994	17:27	2490.8 SCFM	NORMAL
16-NOV-1994	17:32	2530.3 SCFM	NORMAL
16-NOV-1994	17:37	2424.7 SCFM	NORMAL
16-NOV-1994	17:42	2464.1 SCFM	NORMAL

BEGN
F2 R14503

END F2 R1
e1652

SCFM = 2490.1

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HISTORY DATA REPORT

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POINT : SM-GAS-FLOW-TO-S2

5 Minute Sample Interval

Report Starting Date: 17-NOV-1994

Time: 07:00

DATE	TIME	VALUE	STATUS
17-NOV-1994	10:40	2406.1 SCFM	NORMAL
17-NOV-1994	10:45	2293.6 SCFM	NORMAL
17-NOV-1994	10:46	2338.8 SCFM	NORMAL
17-NOV-1994	10:50	2540.7 SCFM	NORMAL
17-NOV-1994	10:55	2425.8 SCFM	NORMAL
17-NOV-1994	11:00	2518.7 SCFM	NORMAL
17-NOV-1994	11:05	2515.2 SCFM	NORMAL
17-NOV-1994	11:10	2494.3 SCFM	NORMAL
17-NOV-1994	11:15	2553.5 SCFM	NORMAL
17-NOV-1994	11:20	2417.7 SCFM	NORMAL
17-NOV-1994	11:25	2467.6 SCFM	NORMAL
17-NOV-1994	11:30	2537.2 SCFM	NORMAL
17-NOV-1994	11:35	2481.5 SCFM	NORMAL
17-NOV-1994	11:37	2544.2 SCFM	NORMAL
17-NOV-1994	11:40	2380.6 SCFM	NORMAL
17-NOV-1994	11:45	2489.7 SCFM	NORMAL
17-NOV-1994	11:50	2454.8 SCFM	NORMAL
17-NOV-1994	11:55	2524.5 SCFM	NORMAL
17-NOV-1994	12:00	2468.8 SCFM	NORMAL
17-NOV-1994	12:05	2497.8 SCFM	NORMAL
17-NOV-1994	12:10	2575.5 SCFM	NORMAL
17-NOV-1994	12:15	2476.9 SCFM	NORMAL
17-NOV-1994	12:20	2407.3 SCFM	NORMAL
17-NOV-1994	12:25	2415.4 SCFM	NORMAL
17-NOV-1994	12:28	2413.1 SCFM	NORMAL
17-NOV-1994	12:30	2423.5 SCFM	NORMAL
17-NOV-1994	12:35	2423.5 SCFM	NORMAL
17-NOV-1994	12:36	2469.9 SCFM	NORMAL
17-NOV-1994	12:41	2551.1 SCFM	NORMAL
17-NOV-1994	12:46	2478.0 SCFM	NORMAL
17-NOV-1994	12:51	2343.5 SCFM	NORMAL
17-NOV-1994	12:56	2525.6 SCFM	NORMAL
17-NOV-1994	13:01	2519.8 SCFM	NORMAL
17-NOV-1994	13:06	2442.1 SCFM	NORMAL
17-NOV-1994	13:11	2406.1 SCFM	NORMAL
17-NOV-1994	13:16	2291.3 SCFM	NORMAL
17-NOV-1994	13:20	2434.0 SCFM	NORMAL
17-NOV-1994	13:21	2595.2 SCFM	NORMAL
17-NOV-1994	13:26	2553.5 SCFM	NORMAL
17-NOV-1994	13:31	2435.1 SCFM	NORMAL
17-NOV-1994	13:36	2417.7 SCFM	NORMAL
17-NOV-1994	13:41	2560.4 SCFM	NORMAL
17-NOV-1994	13:46	2553.5 SCFM	NORMAL
17-NOV-1994	13:51	2547.7 SCFM	NORMAL
17-NOV-1994	13:56	2503.6 SCFM	NORMAL
17-NOV-1994	14:01	2453.7 SCFM	NORMAL
17-NOV-1994	14:06	2519.8 SCFM	NORMAL

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HISTORY DATA REPORT

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POINT : SM-GAS-FLOW-TO-S2

5 Minute Sample Interval

Report Starting Date: 17-NOV-1994

Time: 07:00

DATE	TIME	VALUE	STATUS
17-NOV-1994	14:11	2464.1 SCFM	NORMAL
17-NOV-1994	14:16	2496.6 SCFM	NORMAL
17-NOV-1994	14:21	2502.4 SCFM	NORMAL
17-NOV-1994	14:26	2543.0 SCFM	NORMAL
17-NOV-1994	14:31	2473.4 SCFM	NORMAL
17-NOV-1994	14:36	2509.4 SCFM	NORMAL
17-NOV-1994	14:41	2444.4 SCFM	NORMAL
17-NOV-1994	14:46	2487.3 SCFM	NORMAL
17-NOV-1994	14:51	2533.7 SCFM	NORMAL
17-NOV-1994	14:56	2387.6 SCFM	NORMAL
17-NOV-1994	15:01	2474.6 SCFM	NORMAL
17-NOV-1994	15:01	2474.6 SCFM	NORMAL
17-NOV-1994	15:06	2459.5 SCFM	NORMAL
17-NOV-1994	15:11	2432.8 SCFM	NORMAL
17-NOV-1994	15:16	2364.3 SCFM	NORMAL
17-NOV-1994	15:21	2453.7 SCFM	NORMAL
17-NOV-1994	15:26	2456.0 SCFM	NORMAL
17-NOV-1994	15:31	2497.8 SCFM	NORMAL
17-NOV-1994	15:36	2540.7 SCFM	NORMAL
17-NOV-1994	15:41	2555.8 SCFM	NORMAL
17-NOV-1994	15:46	2569.7 SCFM	NORMAL
17-NOV-1994	15:51	2533.7 SCFM	NORMAL
17-NOV-1994	15:52	2478.0 SCFM	NORMAL
17-NOV-1994	15:56	2556.9 SCFM	NORMAL
17-NOV-1994	16:01	2588.3 SCFM	NORMAL
17-NOV-1994	16:06	2494.3 SCFM	NORMAL
17-NOV-1994	16:11	2474.6 SCFM	NORMAL
17-NOV-1994	16:16	2486.2 SCFM	NORMAL
17-NOV-1994	16:21	2525.6 SCFM	NORMAL
17-NOV-1994	16:26	2497.8 SCFM	NORMAL
17-NOV-1994	16:31	2392.2 SCFM	NORMAL
17-NOV-1994	16:36	2478.0 SCFM	NORMAL
17-NOV-1994	16:41	2479.2 SCFM	NORMAL
17-NOV-1994	16:43	2511.7 SCFM	NORMAL
17-NOV-1994	16:46	2451.4 SCFM	NORMAL
17-NOV-1994	16:51	2432.8 SCFM	NORMAL
17-NOV-1994	16:56	2488.5 SCFM	NORMAL
17-NOV-1994	17:01	2546.5 SCFM	NORMAL
17-NOV-1994	17:06	2440.9 SCFM	NORMAL
17-NOV-1994	17:11	2514.0 SCFM	NORMAL
17-NOV-1994	17:16	2497.8 SCFM	NORMAL
17-NOV-1994	17:21	2525.6 SCFM	NORMAL
17-NOV-1994	17:26	2577.8 SCFM	NORMAL
17-NOV-1994	17:31	2510.5 SCFM	NORMAL
17-NOV-1994	17:35	2461.8 SCFM	NORMAL
17-NOV-1994	17:37	2488.5 SCFM	NORMAL
17-NOV-1994	17:42	2473.4 SCFM	NORMAL

END F2
F2 @ 1558
F2 @ 1651
F3 @ 1651
F2 @ 1651
F3 @ 1651

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HISTORY DATA REPORT

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POINT : SM-GAS-FLOW-TO-S2

Report Starting Date: 17-NOV-1994

Time: 07:00

5 Minute Sample Interval

DATE	TIME	VALUE	STATUS
17-NOV-1994	17:47	2514.0 SCFM	NORMAL
17-NOV-1994	17:52	2531.4 SCFM	NORMAL
17-NOV-1994	17:57	2551.1 SCFM	NORMAL
17-NOV-1994	18:02	2547.7 SCFM	NORMAL
17-NOV-1994	18:07	2536.1 SCFM	NORMAL
17-NOV-1994	18:12	2533.7 SCFM	NORMAL
17-NOV-1994	18:17	2512.9 SCFM	NORMAL
17-NOV-1994	18:22	2454.8 SCFM	NORMAL
17-NOV-1994	18:26	2548.8 SCFM	NORMAL
17-NOV-1994	18:27	2495.5 SCFM	NORMAL
17-NOV-1994	18:32	2516.3 SCFM	NORMAL
17-NOV-1994	18:37	2522.1 SCFM	NORMAL
17-NOV-1994	18:42	2515.2 SCFM	NORMAL
17-NOV-1994	18:47	2521.0 SCFM	NORMAL
17-NOV-1994	18:52	2461.8 SCFM	NORMAL
17-NOV-1994	18:57	2487.3 SCFM	NORMAL
17-NOV-1994	19:02	2364.3 SCFM	NORMAL
17-NOV-1994	19:07	2469.9 SCFM	NORMAL
17-NOV-1994	19:12	2485.0 SCFM	NORMAL
17-NOV-1994	19:17	2490.8 SCFM	NORMAL
17-NOV-1994	19:22	2475.7 SCFM	NORMAL
17-NOV-1994	19:27	2545.3 SCFM	NORMAL
17-NOV-1994	19:32	2511.7 SCFM	NORMAL
17-NOV-1994	19:37	2364.3 SCFM	NORMAL
17-NOV-1994	19:42	2550.0 SCFM	NORMAL
17-NOV-1994	19:47	2485.0 SCFM	NORMAL
17-NOV-1994	19:52	2569.7 SCFM	NORMAL
17-NOV-1994	19:57	2525.6 SCFM	NORMAL
17-NOV-1994	20:02	2575.5 SCFM	NORMAL
17-NOV-1994	20:07	2511.7 SCFM	NORMAL
17-NOV-1994	20:07	2511.7 SCFM	NORMAL
17-NOV-1994	20:12	2386.4 SCFM	NORMAL
17-NOV-1994	20:17	5.6 SCFM	NORMAL
17-NOV-1994	20:22	1034.7 SCFM	NORMAL
17-NOV-1994	20:27	972.1 SCFM	NORMAL
17-NOV-1994	20:32	1913.0 SCFM	NORMAL
17-NOV-1994	20:37	2498.9 SCFM	NORMAL
17-NOV-1994	20:42	2504.7 SCFM	NORMAL
17-NOV-1994	20:47	2563.9 SCFM	NORMAL
17-NOV-1994	20:52	2633.5 SCFM	NORMAL
17-NOV-1994	20:57	2667.2 SCFM	NORMAL
17-NOV-1994	20:58	2529.1 SCFM	NORMAL
17-NOV-1994	21:02	2539.5 SCFM	NORMAL
17-NOV-1994	21:07	2533.7 SCFM	NORMAL
17-NOV-1994	21:12	2563.9 SCFM	NORMAL
17-NOV-1994	21:17	2464.1 SCFM	NORMAL
17-NOV-1994	21:22	2619.6 SCFM	NORMAL

END FZRS @ 1920
SCFM = 2,499.8
JP

567

HISTORY DATA REPORT

21 NOV 94 14:50 Page 2

POINT : SM-GAS-FLOW-TO-S1

5 Minute Sample Interval

Report Starting Date: 18-NOV-1994

Time: 07:00

DATE	TIME	VALUE	STATUS
18-NOV-1994	10:35	595.7 SCFM	TR5 BAG NORMAL
18-NOV-1994	10:40	597.6 SCFM	NORMAL
18-NOV-1994	10:45	590.3 SCFM	NORMAL
18-NOV-1994	10:50	603.1 SCFM	NORMAL
18-NOV-1994	10:55	602.5 SCFM	NORMAL
18-NOV-1994	11:00	602.2 SCFM	NORMAL
18-NOV-1994	11:05	594.2 SCFM	NORMAL
18-NOV-1994	11:10	603.7 SCFM	NORMAL
18-NOV-1994	11:15	592.4 SCFM	END SAMPLE SCFM = 598.7 NORMAL
18-NOV-1994	11:20	601.9 SCFM	NORMAL
18-NOV-1994	11:25	604.3 SCFM	NORMAL
18-NOV-1994	11:25	604.3 SCFM	NORMAL
18-NOV-1994	11:30	604.3 SCFM	NORMAL
18-NOV-1994	11:35	603.1 SCFM	NORMAL
18-NOV-1994	11:40	592.1 SCFM	NORMAL
18-NOV-1994	11:45	592.7 SCFM	NORMAL
18-NOV-1994	11:50	603.7 SCFM	NORMAL
18-NOV-1994	11:55	604.3 SCFM	BEGIN FI FI @ 1201 NORMAL
18-NOV-1994	12:00	606.4 SCFM	NORMAL
18-NOV-1994	12:05	596.4 SCFM	NORMAL
18-NOV-1994	12:10	596.4 SCFM	NORMAL
18-NOV-1994	12:15	597.6 SCFM	NORMAL
18-NOV-1994	12:16	597.6 SCFM	NORMAL
18-NOV-1994	12:20	597.0 SCFM	NORMAL
18-NOV-1994	12:25	599.7 SCFM	NORMAL
18-NOV-1994	12:30	589.9 SCFM	NORMAL
18-NOV-1994	12:35	590.9 SCFM	NORMAL
18-NOV-1994	12:40	601.6 SCFM	NORMAL
18-NOV-1994	12:45	601.6 SCFM	NORMAL
18-NOV-1994	12:50	601.9 SCFM	NORMAL
18-NOV-1994	12:55	597.9 SCFM	NORMAL
18-NOV-1994	13:00	597.9 SCFM	NORMAL
18-NOV-1994	13:05	597.0 SCFM	NORMAL
18-NOV-1994	13:07	597.0 SCFM	NORMAL
18-NOV-1994	13:10	607.4 SCFM	NORMAL
18-NOV-1994	13:15	596.1 SCFM	END FI FI @ 1315 NORMAL
18-NOV-1994	13:20	606.4 SCFM	NORMAL
18-NOV-1994	13:25	593.9 SCFM	SCFM = 598.4 jg NORMAL
18-NOV-1994	13:30	603.7 SCFM	NORMAL
18-NOV-1994	13:35	592.7 SCFM	NORMAL
18-NOV-1994	13:40	592.7 SCFM	NORMAL
18-NOV-1994	13:41	603.1 SCFM	NORMAL
18-NOV-1994	13:46	603.1 SCFM	BEGIN FI R2 @ 1354 NORMAL
18-NOV-1994	13:51	603.1 SCFM	NORMAL
18-NOV-1994	13:56	592.4 SCFM	NORMAL
18-NOV-1994	13:59	592.4 SCFM	NORMAL
18-NOV-1994	14:01	595.4 SCFM	NORMAL

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HISTORY DATA REPORT

21 NOV 94 14:50 Page 3

POINT : SM-GAS-FLOW-TO-S1

5 Minute Sample Interval

Report Starting Date: 18-NOV-1994

Time: 07:00

DATE	TIME	VALUE	STATUS
18-NOV-1994	14:06	606.1 SCFM	NORMAL
18-NOV-1994	14:11	606.1 SCFM	NORMAL
18-NOV-1994	14:16	606.1 SCFM	NORMAL
18-NOV-1994	14:21	600.3 SCFM	NORMAL
18-NOV-1994	14:26	573.5 SCFM	NORMAL
18-NOV-1994	14:31	597.0 SCFM	NORMAL
18-NOV-1994	14:36	606.4 SCFM	NORMAL
18-NOV-1994	14:41	596.4 SCFM	NORMAL
18-NOV-1994	14:46	606.7 SCFM	NORMAL
18-NOV-1994	14:50	597.0 SCFM	NORMAL
18-NOV-1994	14:51	597.0 SCFM	NORMAL
18-NOV-1994	14:56	597.9 SCFM	NORMAL
18-NOV-1994	15:01	597.3 SCFM	NORMAL
18-NOV-1994	15:06	611.3 SCFM	NORMAL
18-NOV-1994	15:11	603.4 SCFM	NORMAL
18-NOV-1994	15:16	581.1 SCFM	NORMAL
18-NOV-1994	15:21	598.5 SCFM	NORMAL
18-NOV-1994	15:26	599.4 SCFM	NORMAL
18-NOV-1994	15:31	589.0 SCFM	NORMAL
18-NOV-1994	15:36	599.4 SCFM	NORMAL
18-NOV-1994	15:41	599.4 SCFM	NORMAL
18-NOV-1994	15:46	599.4 SCFM	NORMAL
18-NOV-1994	15:51	599.4 SCFM	NORMAL
18-NOV-1994	15:56	599.4 SCFM	NORMAL
18-NOV-1994	16:01	600.0 SCFM	NORMAL
18-NOV-1994	16:06	600.3 SCFM	NORMAL
18-NOV-1994	16:11	623.2 SCFM	NORMAL
18-NOV-1994	16:16	600.3 SCFM	NORMAL
18-NOV-1994	16:21	600.0 SCFM	NORMAL
18-NOV-1994	16:26	600.0 SCFM	NORMAL
18-NOV-1994	16:31	598.8 SCFM	NORMAL
18-NOV-1994	16:31	598.8 SCFM	NORMAL
18-NOV-1994	16:36	591.2 SCFM	NORMAL
18-NOV-1994	16:41	601.6 SCFM	NORMAL
18-NOV-1994	16:46	601.6 SCFM	NORMAL
18-NOV-1994	16:51	590.9 SCFM	NORMAL
18-NOV-1994	16:56	561.2 SCFM	NORMAL
18-NOV-1994	17:01	638.2 SCFM	NORMAL
18-NOV-1994	17:06	569.8 SCFM	NORMAL
18-NOV-1994	17:11	526.1 SCFM	NORMAL
18-NOV-1994	17:16	576.5 SCFM	NORMAL
18-NOV-1994	17:21	548.4 SCFM	NORMAL
18-NOV-1994	17:22	594.5 SCFM	NORMAL
18-NOV-1994	17:26	644.3 SCFM	NORMAL
18-NOV-1994	17:31	582.0 SCFM	NORMAL
18-NOV-1994	17:36	592.1 SCFM	NORMAL
18-NOV-1994	17:41	582.6 SCFM	NORMAL

END FI R2 @ 1525
SCFM = 595.4
JH

BEGIN FI R3 @ 1700

7 & 7

HISTORY DATA REPORT

21 NOV 94 14:50 Page 4

POINT : SM-GAS-FLOW-TO-S1

Report Starting Date: 18-NOV-1994

Time: 07:00

5 Minute Sample Interval

DATE	TIME	VALUE	STATUS
18-NOV-1994	17:46	614.4 SCFM	NORMAL
18-NOV-1994	17:51	594.5 SCFM	NORMAL
18-NOV-1994	17:56	615.9 SCFM	NORMAL
18-NOV-1994	18:01	612.8 SCFM	NORMAL
18-NOV-1994	18:06	577.1 SCFM	NORMAL
18-NOV-1994	18:11	604.9 SCFM	NORMAL
18-NOV-1994	18:13	586.9 SCFM	NORMAL
18-NOV-1994	18:16	599.4 SCFM	NORMAL
18-NOV-1994	18:21	585.1 SCFM	NORMAL
18-NOV-1994	18:26	618.3 SCFM	NORMAL
18-NOV-1994	18:31	-999999.0 SCFM	NORMAL
18-NOV-1994	18:36	-999999.0 SCFM	NORMAL
18-NOV-1994	18:41	-999999.0 SCFM	NORMAL
18-NOV-1994	18:42	-999999.0 SCFM	NORMAL
18-NOV-1994	18:47	9.5 SCFM	NORMAL
18-NOV-1994	18:52	9.5 SCFM	NORMAL
18-NOV-1994	18:57	30.9 SCFM	NORMAL
18-NOV-1994	19:02	30.9 SCFM	NORMAL
18-NOV-1994	19:05	41.3 SCFM	NORMAL
18-NOV-1994	19:07	30.9 SCFM	NORMAL
18-NOV-1994	19:12	30.9 SCFM	NORMAL
18-NOV-1994	19:17	30.9 SCFM	NORMAL
18-NOV-1994	19:22	30.9 SCFM	NORMAL
18-NOV-1994	19:27	30.9 SCFM	NORMAL
18-NOV-1994	19:32	30.9 SCFM	NORMAL
18-NOV-1994	19:37	30.9 SCFM	NORMAL
18-NOV-1994	19:42	30.9 SCFM	NORMAL
18-NOV-1994	19:47	30.9 SCFM	NORMAL
18-NOV-1994	19:52	30.9 SCFM	NORMAL
18-NOV-1994	19:56	30.9 SCFM	NORMAL
18-NOV-1994	19:57	30.9 SCFM	NORMAL
18-NOV-1994	20:02	30.9 SCFM	NORMAL
18-NOV-1994	20:07	30.9 SCFM	NORMAL
18-NOV-1994	20:12	30.9 SCFM	NORMAL
18-NOV-1994	20:17	30.9 SCFM	NORMAL
18-NOV-1994	20:22	30.9 SCFM	NORMAL
18-NOV-1994	20:27	30.9 SCFM	NORMAL
18-NOV-1994	20:32	30.9 SCFM	NORMAL
18-NOV-1994	20:37	30.9 SCFM	NORMAL
18-NOV-1994	20:42	30.9 SCFM	NORMAL
18-NOV-1994	20:47	30.9 SCFM	NORMAL
18-NOV-1994	20:52	30.9 SCFM	NORMAL
18-NOV-1994	20:57	30.9 SCFM	NORMAL
18-NOV-1994	21:02	30.9 SCFM	NORMAL
18-NOV-1994	21:07	30.9 SCFM	NORMAL
18-NOV-1994	21:12	30.9 SCFM	NORMAL
18-NOV-1994	21:17	30.9 SCFM	NORMAL

END F123
21813
SCFM = 591.8



FLUID COMPONENTS INTL

A limited liability company

1755 La Costa Meadows Drive, San Marcos, California, 92069
(619) 744-6950 (800) 854-1993 FAX: (619) 736-6250

GF Series Delta "R"

V. 4.0 EPROM

Shop Order:	43478	Decade Box	Equip. #	Cal. Due
Customer:	AMERON ENGINEERING	(Act):	EL-297	08-03-94
Date:	04/18/94	(Ref):	EL-368	06-16-94
Serial #:	125620 OP1	DVM:	EL-302	08-28-94
Tag #:	FTQ-171	250Ω R:	EL-311	01-05-95

Nominal Sensor Resistance:	1k
Indicated Temperature (at nominal resistance):	31.8°F

Test Tech:	F.C.I. TECH 151
Display Units:	SCFM



Δ R	VDC Across 250 Ω	mA Output	Unit dR	Indicated Display
48.93	1.000	4.00	148.99	0.000
148.92	1.039	4.16	148.98	10.00
12.06	1.248	4.99	112.13	61.99
93.05	1.498	5.99	93.130	125.0
74.39	1.997	7.99	74.476	250.0
56.56	2.999	11.99	56.638	500.0
46.83	3.998	15.99	46.910	750.1
38	5.003	20.01	40.457	1000

EPROM
Information

Version
4.02R

Date
12/9/93

Checksum
702F88

Verify 5.1

Verify 5.8

Factor	13.2	Relay 2	OFF
Low	9.997	Above	Above 999mm SCFM
High	1199	H	0.00
Units	SCFM	D	0.000
d. Dens.	0.0761600 LBM/FT3	Port 1	
Tot. Unit	No Totalizer	Mode	4-20 mA
Area	31.73 sq in	F.S.	1.00m SCFM
Diam.	6.3569 in	Zero	0.00 SCFM
Temp. Unit	F	Port 2	
Tcal Add	0.000	Mode	4-20 mA
Tcal Mult.	1.000	F.S.	700 SCFM
Relay 1	OFF	Zero	0.00 SCFM
Above	Above 999mm SCFM	CORR1	0.000000000
H	0.00	CORR2	1.000000000
D	0.000	CORR3	0.000000000
		CORR4	0.000000000

dR Gain	0.066	dR Max.	152.96
REF Gain	0.491	Curr. Group	1
dR Off	0.375	Sens. Type	GF90 (1000ohm)
REF Off	-3.303	C1	0.00712401
Offset 1	-0.0065	C2	0.58368248
Slope 1	0.0006	C3	-108.583602
Offset 2	-0.0132	C4	7314.20507
Slope 2	0.0006	C5	-1793.75695
Prt. B	157	Cal Ref	1090
Prt. C	184	T1	0.0007097
A/D Mode	0	T2	125620.00
Boxcar	32	T3	43488.000
Link Mode	0	T4	0.0000000
Flow Min.	0.7559		
Flow Max.	90.730		
dR Min.	32.494		

FLUID COMPONENTS, INC.
1755 La Costa Meadows Dr., San Marcos, CA. 92069. (800) 854-1993

NO. _____ 43478	P.O. NO. _____ G-15395
TAG NO. _____ FTQ-171	SERIAL NO. _____ 125620-OP1
CUSTOMER MEDIUM _____ DIGESTER GAS	PRESSURE _____ 12" H2O (G)
TEMPERATURE _____ 32 TO 200 DEG F	LINE SIZE _____ 6.357"
ORIENTATION _____ HORIZONTAL	MOUNTING _____ TOP
FLOW DIRECTION _____ RIGHT TO LEFT	CALIBRATION MEDIUM _____ AIR

CALIBRATION TABLE PREPARED FOR AMERON ENGINEERING

	SCFM	mA	SCFM	mA	SCFM
000	0.00	9.400	337.50	14.800	675.00
100	12.50	9.600	350.00	15.000	687.50
200	25.00	9.800	362.50	15.200	700.00
300	37.50	10.000	375.00	15.400	712.50
400	50.00	10.200	387.50	15.600	725.00
500	62.50	10.400	400.00	15.800	737.50
600	75.00	10.600	412.50	16.000	750.00
700	87.50	10.800	425.00	16.200	762.50
800	100.00	11.000	437.50	16.400	775.00
900	112.50	11.200	450.00	16.600	787.50
1000	125.00	11.400	462.50	16.800	800.00
1100	137.50	11.600	475.00	17.000	812.50
1200	150.00	11.800	487.50	17.200	825.00
1300	162.50	12.000	500.00	17.400	837.50
1400	175.00	12.200	512.50	17.600	850.00
1500	187.50	12.400	525.00	17.800	862.50
1600	200.00	12.600	537.50	18.000	875.00
1700	212.50	12.800	550.00	18.200	887.50
1800	225.00	13.000	562.50	18.400	900.00
1900	237.50	13.200	575.00	18.600	912.50
2000	250.00	13.400	587.50	18.800	925.00
2100	262.50	13.600	600.00	19.000	937.50
2200	275.00	13.800	612.50	19.200	950.00
2300	287.50	14.000	625.00	19.400	962.50
2400	300.00	14.200	637.50	19.600	975.00
2500	312.50	14.400	650.00	19.800	987.50
2600	325.00	14.600	662.50	20.000	1000.00



TEST TECH

DATE

APR 18 1994



FLUID COMPONENTS INTL

A limited liability company

1755 La Costa Meadows Drive, San Marcos, California, 92069
(619) 744-6950 (800) 854-1993 FAX: (619) 736-6250

GF Series Delta "R"

V. 4.0 EPROM

Shop Order:	43478	Decade Box	Equip. #	Cal. Due
Customer:	AMERON ENGINEERING	(Act):	EL-297	08/03/94
Date:	04/13/94	(Ref):	EL-366	06/16/94
Serial #:	125621 (OUTPUT 1)	DVM:	EL-302	08/28/94
Tag #:	FTQ-172	250Ω R:	EL-311	01/20/95

Nominal Sensor Resistance:	1k
Indicated Temperature (at nominal resistance):	31.9°F

Test Tech:	F.C.I. TECH. 127
Display Units:	SCFM



Δ R	VDC Across 250 Ω	mA Output	Unit dR	Indicated Display
154.40	1.001	4.00	154.39	0.000
154.37	1.039	4.16	154.36	38.00
111.97	1.250	5.00	111.98	236.2
93.75	1.500	6.00	93.76	476.8
75.10	2.001	8.00	75.12	952.6
56.57	3.001	12.00	56.59	1905
46.26	3.999	16.00	46.28	2856
39.45	5.000	20.00	39.45	3800

EPROM
Information

Version
4.02R

Date
12/9/93

Checksum
702F88

Verify 5.1

Verify 5.8

Factor	50.2	Relay 2	OFF
Low	37.99	Above	Above 999mm SCFM
High	4560	H	0.00
Units	SCFM	D	0.000
I. Dens.	0.0761600 LBM/FT3	Port 1	
Tot. Unit	No Totalizer	Mode	4-20 mA
Area	120.5 sq in	F.S.	3.79m SCFM
Diam.	12.390 in	Zero	0.00 SCFM
Temp. Unit	F	Port 2	
Cal Add	0.000	Mode	4-20 mA
Cal Mult	1.000	F.S.	2.79m SCFM
Day 1	OFF	Zero	0.00 SCFM
Above	Above 999mm SCFM	CORR1	0.000000000
H	0.00	CORR2	1.000000000
D	0.000	CORR3	0.000000000
		CORR4	0.000000000

dR Gain	0.066	dR Max	151.71
REF Gain	0.492	Curr. Group	1
dR Off	0.258	Sens. Type	GF90 (1000ohm)
REF Off	-3.553	C1	-0.01040858
Offset 1	-0.0079	C2	0.59362559
Slope 1	0.0006	C3	-97.5440139
Offset 2	-0.0384	C4	5575.50830
Slope 2	0.0006	C5	-1096.28942
Prt. B	141	Cal Ref	1086
Prt. C	184	T1	0.0008258
A/D Mode	0	T2	125621.00
Boxcar	32	T3	43478.000
Link Mode	0	T4	0.0000000
Flow Min	0.7564		
Flow Max	90.769		
dR Min	31.094		

FLUID COMPONENTS, INC.

1755 La Costa Meadows Dr., San Marcos, CA. 92069. (800) 854-1993

NO. _____ 43478
 TAG NO. _____ FTQ-172
 CUSTOMER MEDIUM _____ DIGESTER GAS
 TEMPERATURE _____ 32 TO 200 DEG F
 ORIENTATION _____ HORIZONTAL
 FLOW DIRECTION _____ RIGHT TO LEFT

P.O. NO. _____ G-15395
 SERIAL NO. _____ 125621 OP1
 PRESSURE _____ 12" H2O
 LINE SIZE _____ 12.39" ID
 MOUNTING _____ TOP
 CALIBRATION MEDIUM _____ AIR

CALIBRATION TABLE PREPARED FOR AMERON ENGINEERING

	SCFM	mA	SCFM	mA	SCFM
000	0.00	9.400	1282.00	14.800	2565.00
200	47.00	9.600	1330.00	15.000	2612.00
00	95.00	9.800	1377.00	15.200	2660.00
00	142.00	10.000	1425.00	15.400	2707.00
800	190.00	10.200	1472.00	15.600	2755.00
00	237.00	10.400	1520.00	15.800	2802.00
00	285.00	10.600	1567.00	16.000	2850.00
400	332.00	10.800	1615.00	16.200	2897.00
600	380.00	11.000	1662.00	16.400	2945.00
00	427.00	11.200	1710.00	16.600	2992.00
00	475.00	11.400	1757.00	16.800	3040.00
200	522.00	11.600	1805.00	17.000	3087.00
00	570.00	11.800	1852.00	17.200	3135.00
00	617.00	12.000	1900.00	17.400	3182.00
800	665.00	12.200	1947.00	17.600	3230.00
00	712.00	12.400	1995.00	17.800	3277.00
00	760.00	12.600	2042.00	18.000	3325.00
400	807.00	12.800	2090.00	18.200	3372.00
600	855.00	13.000	2137.00	18.400	3420.00
00	902.00	13.200	2185.00	18.600	3467.00
00	950.00	13.400	2232.00	18.800	3515.00
200	997.00	13.600	2280.00	19.000	3562.00
00	1045.00	13.800	2327.00	19.200	3610.00
00	1092.00	14.000	2375.00	19.400	3658.00
800	1140.00	14.200	2422.00	19.600	3705.00
000	1187.00	14.400	2470.00	19.800	3753.00
00	1235.00	14.600	2517.00	20.000	3800.00

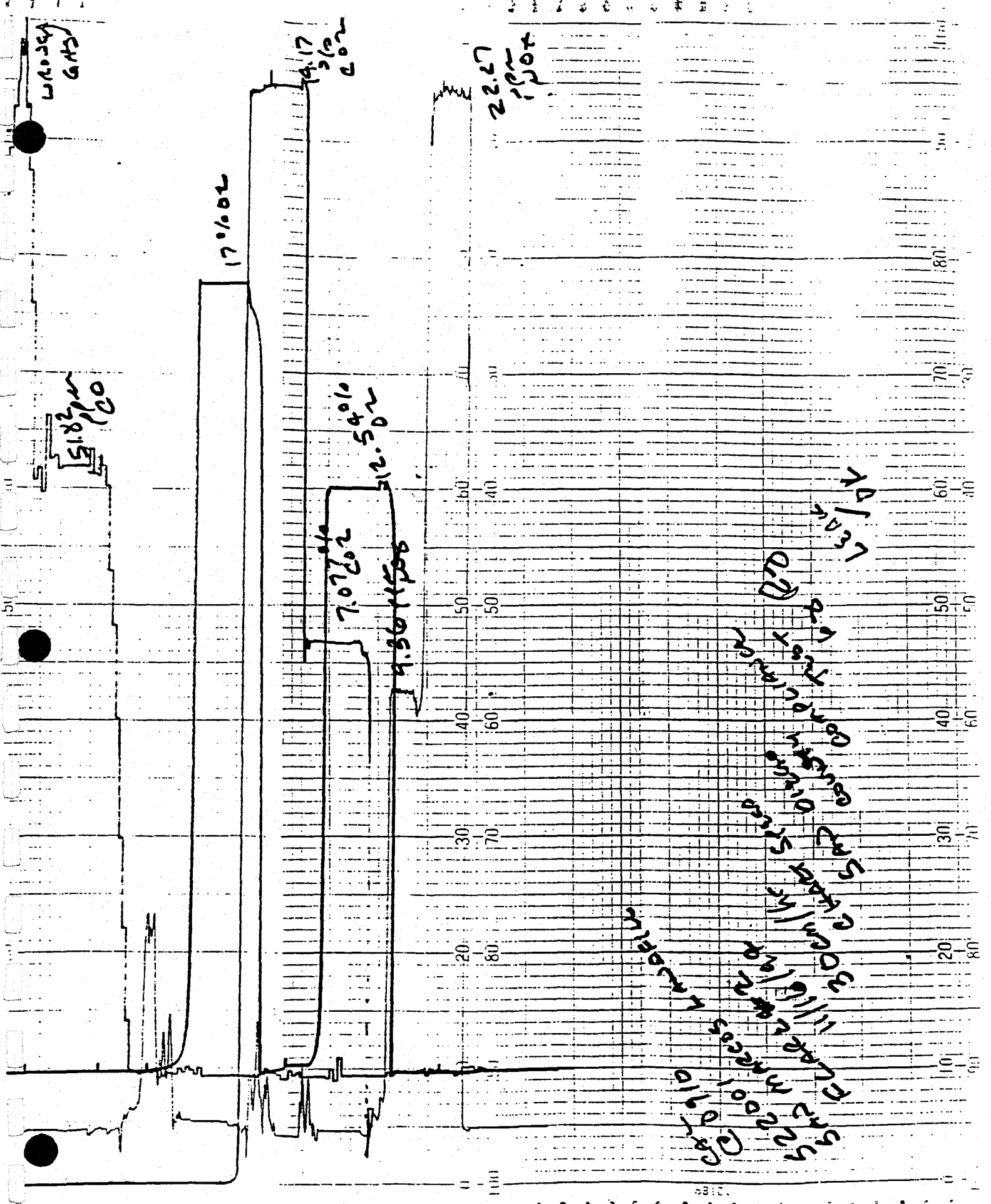


ST TECH

APR 14 1994

APPENDIX E

Strip Charts



W 10.50
G 1.5

15.18
15.15

17'0"02

14.17
1.02
2.02

7.07
12.54
4.30
1.50

22.27
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15.18
15.15

analog output 0.005

NO₂ Conversion - through probe

46.66% NO₂

Directive 0.100 scale
CHAMP 0.100 scale

NO₂ for NO conversion ✓

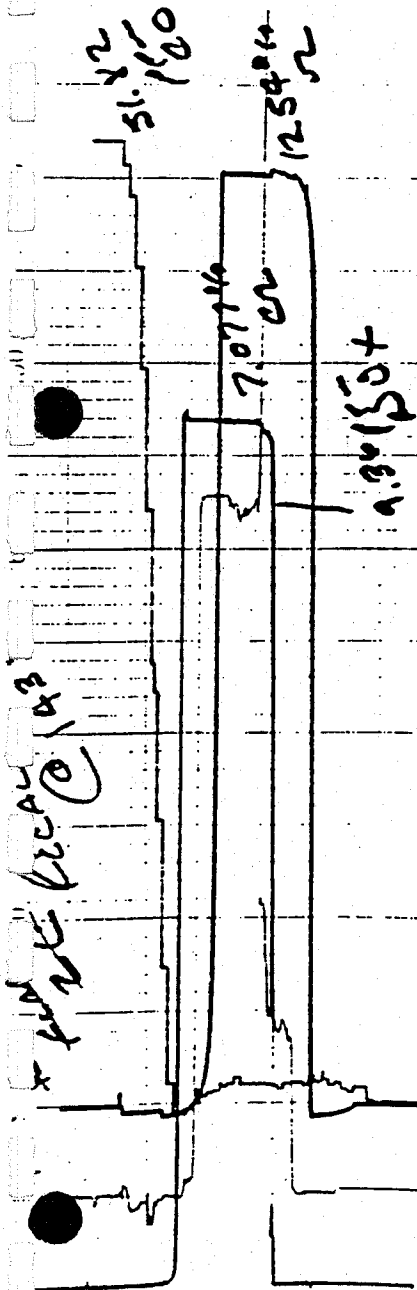
System error ✓

90.98% NO₂
46.66% NO₂

15.82% NO₂

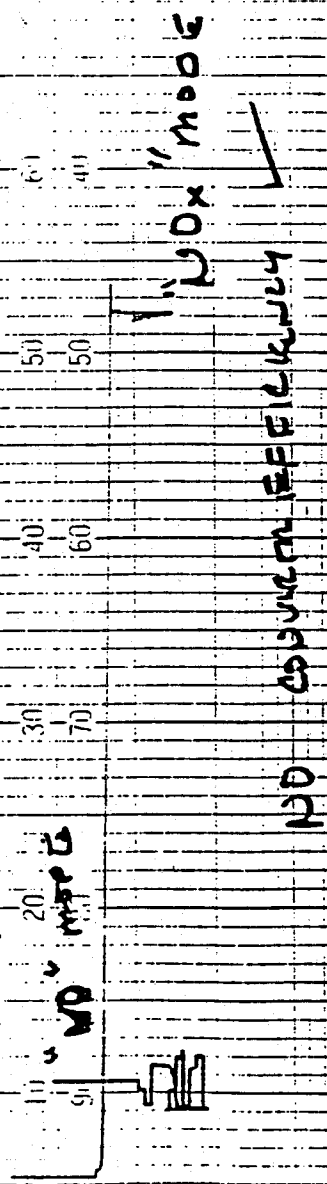
17.00%

SOLENO



Recal
C 11121

stop
probe



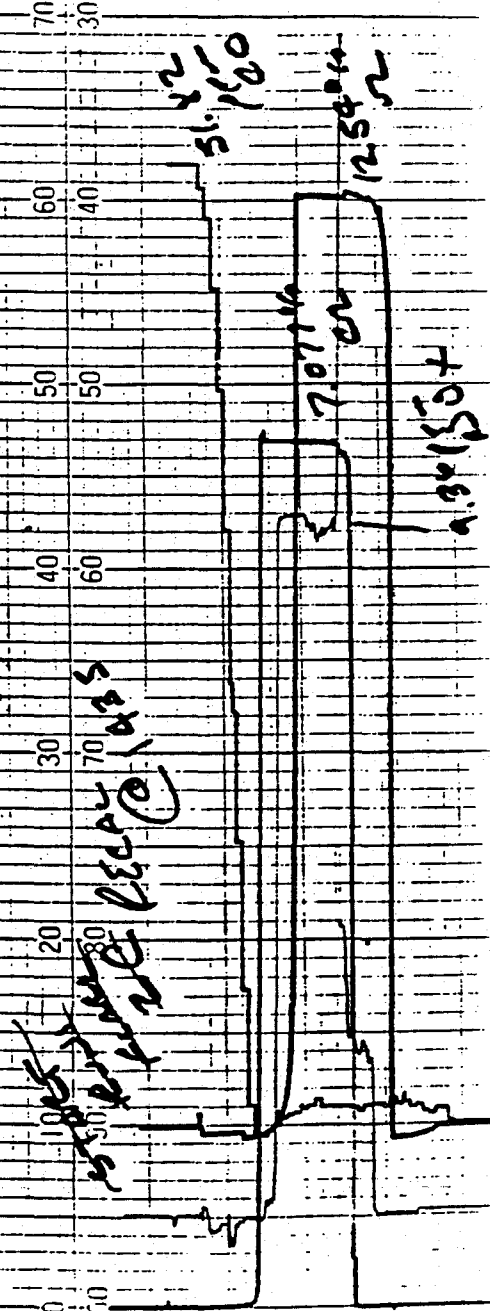
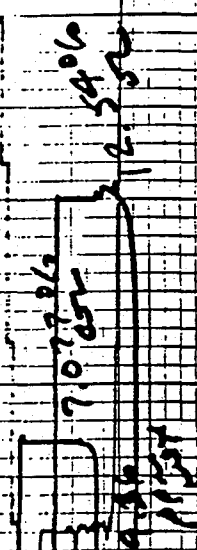
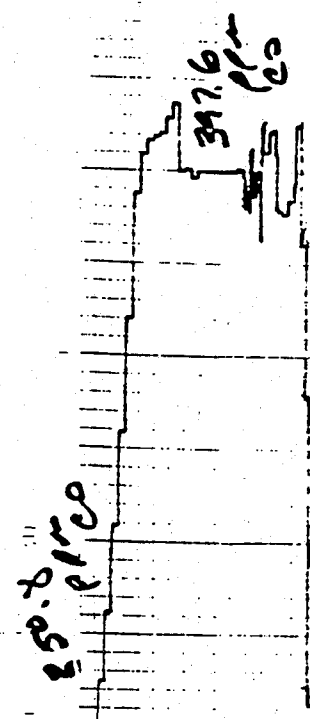
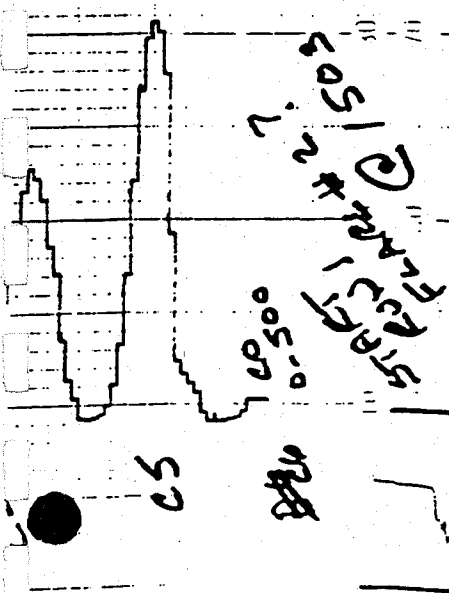
STARTS
C 11121

STARTS
C 11121

NO2 Conversion

through probe

46.66



0-150

سید محمد علی حسینی
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سید محمد علی حسینی
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522,001

22

100-2537

30cm/hr chart speed

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23

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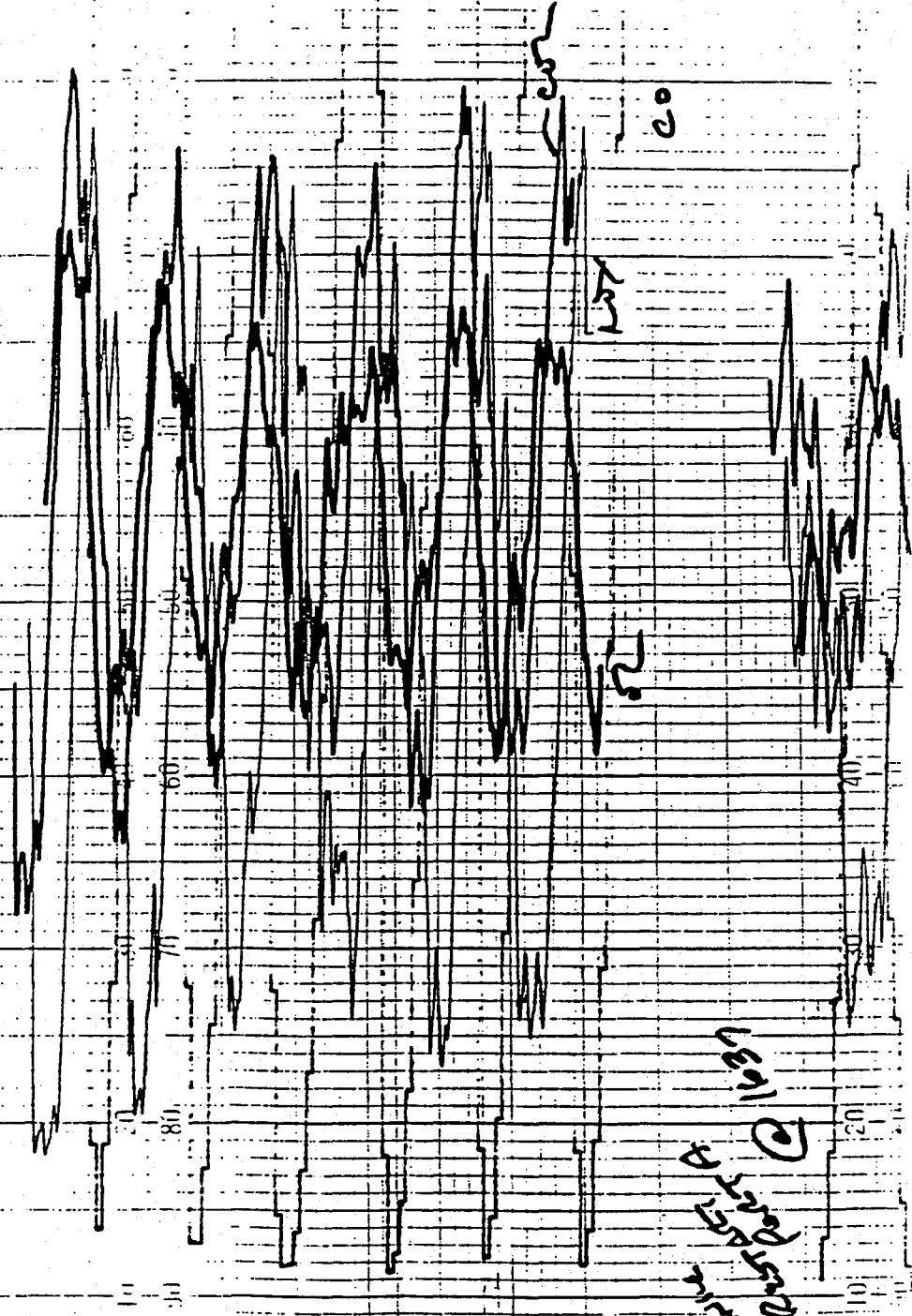
5

5

کے لئے ایک نیا راستہ

1437

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79.87

7757

122

691

728

619

22

83

228

12

142

System B. A7-1

397.6
P20

2227

250.810

9.360x

1752

$\frac{1}{2} \cdot 7.0 \cdot 7.7 \cdot 10^{-10} = 2.7 \cdot 10^{-10}$

對

30cm/hr, 1st 5/12/20

100

22

522-001

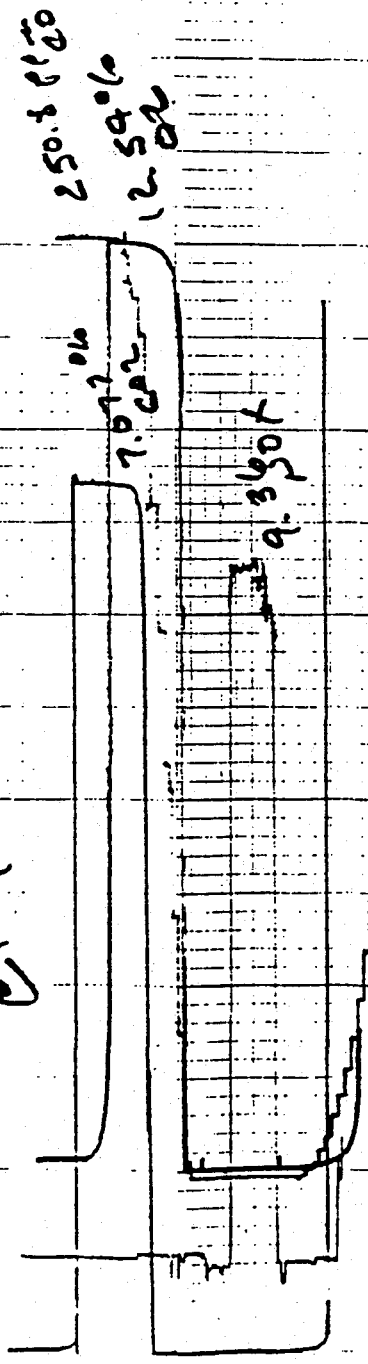
[illegible]

0-25

0-25

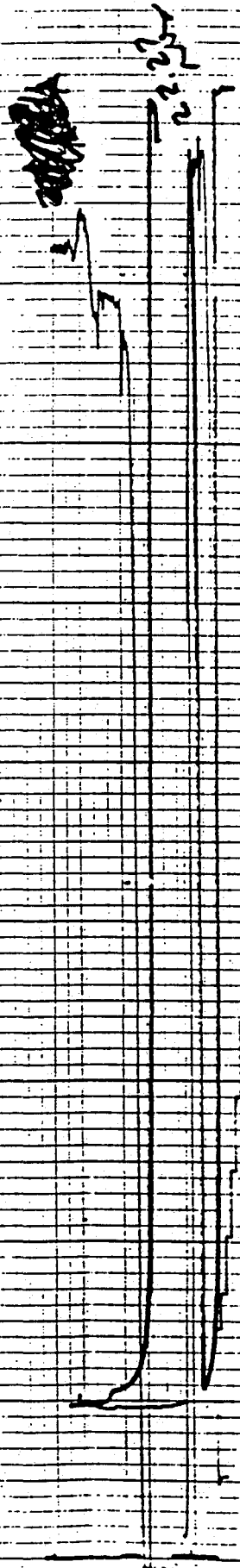
0-25

250.8 0120
250.8 0120
250.8 0120



250.8 0120

250.8 0120

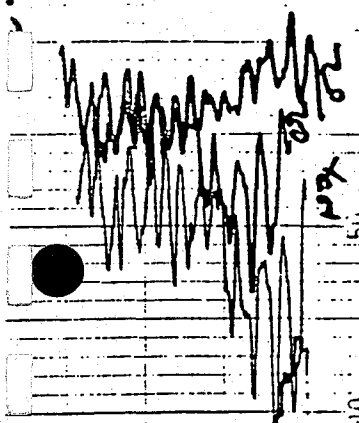


SYSTEM BIAS

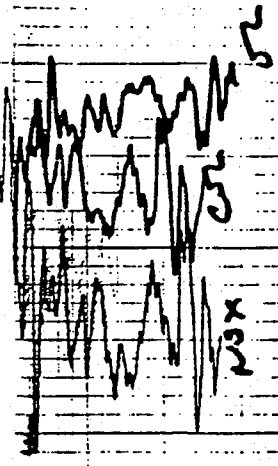
250.8 0120

Stop at 1204
0400
0400

A1



Stop at 1121 Pt # A2



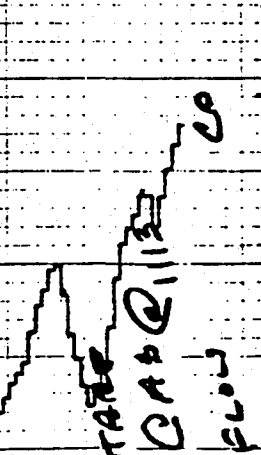
A2

Restart
CAB @ 1113

Stop Flow

A4

Stop at 1118 See A2222

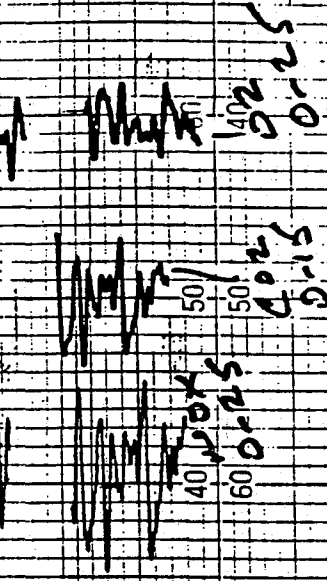


A5

Stop at 1104
0400
0400

Stop at 1104
0400
0400

Stop at 1104
0400
0400



Stop at 1104
0400
0400

Stop at 1104
0400
0400

مجلسه ۱۰۰

[Handwritten scribbles and marks]

23

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3

C. sp. culture HC AWA472d
Pulse 1A0

42

2

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5067-201204

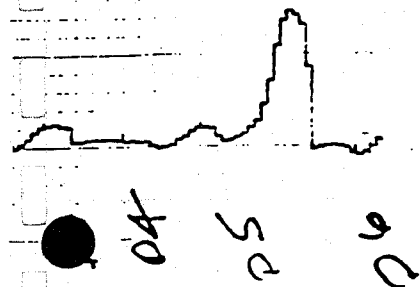
U.S.

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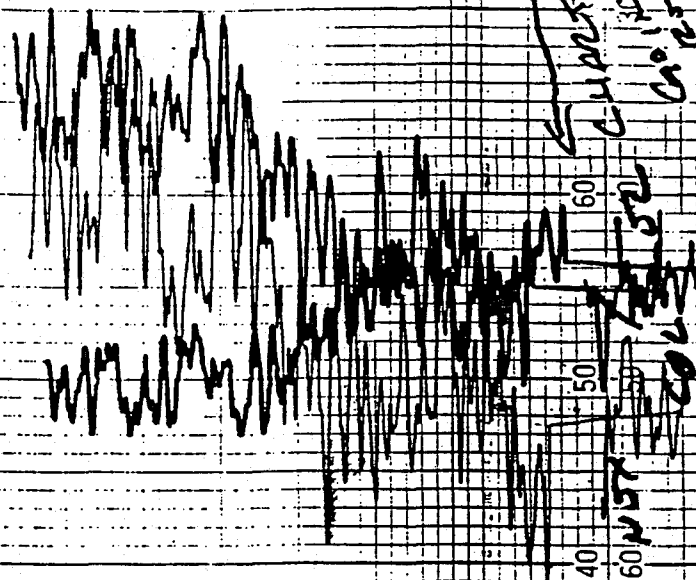
50

100

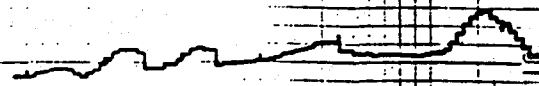
2A#



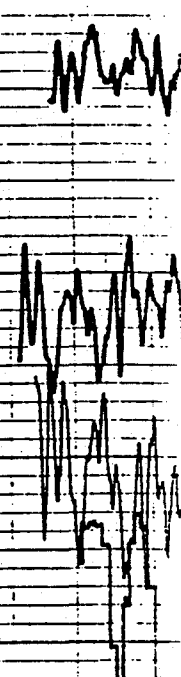
$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$



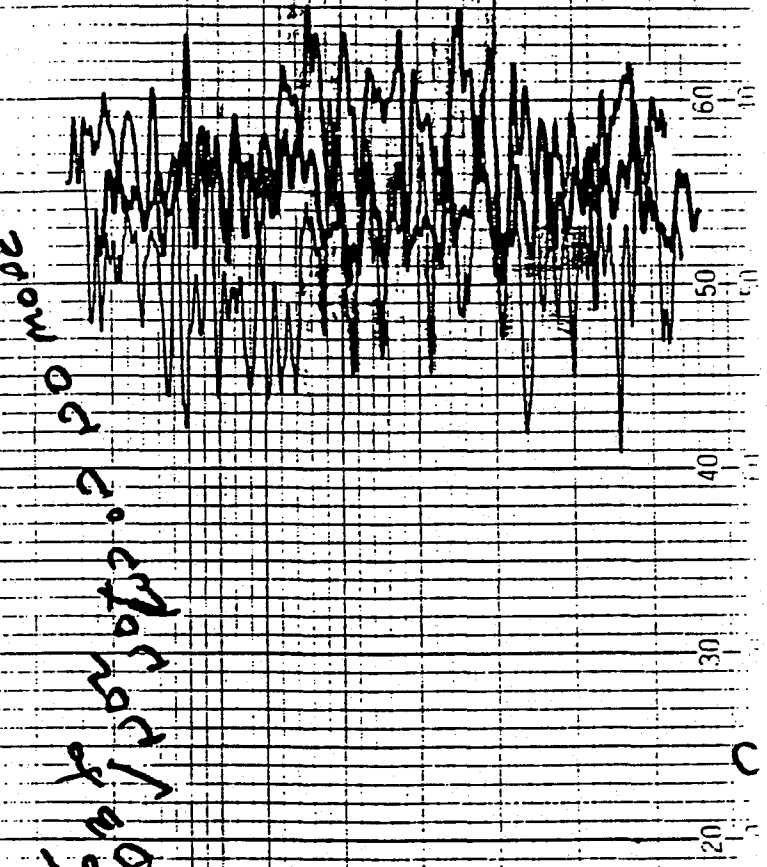
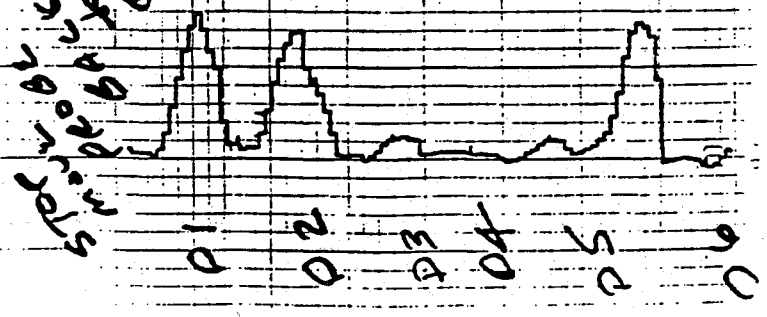
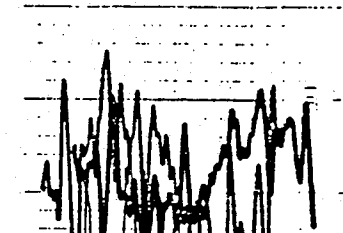
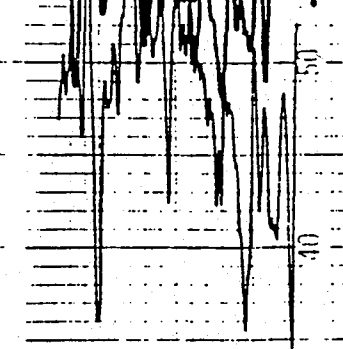
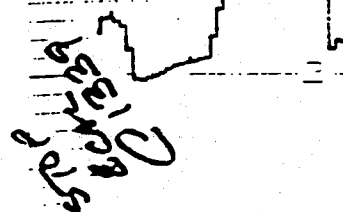
الحمد لله
والصلاة والسلام
على رسول الله



1. Chlorophyll
 2. Carotenoids
 3. Xanthophylls
 4. Phycobilins
 5. Anthocyanins
 6. Flavonoids
 7. Alkaloids
 8. Glycosides
 9. Terpenes
 10. Phenols
 11. Essential oils
 12. Resins
 13. Gums
 14. Starch
 15. Cellulose
 16. Lignin
 17. Proteins
 18. Nucleic acids
 19. Enzymes
 20. Hormones
 21. Antibiotics
 22. Anticancer drugs
 23. Antiviral drugs
 24. Antifungal drugs
 25. Antiparasitic drugs
 26. Anticoagulants
 27. Antidiabetic drugs
 28. Antihypertensive drugs
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 218. Anticonvulsants
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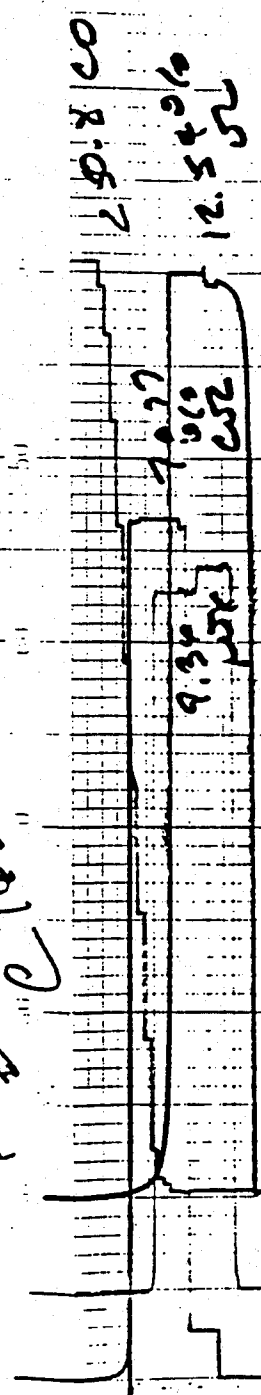
19.36

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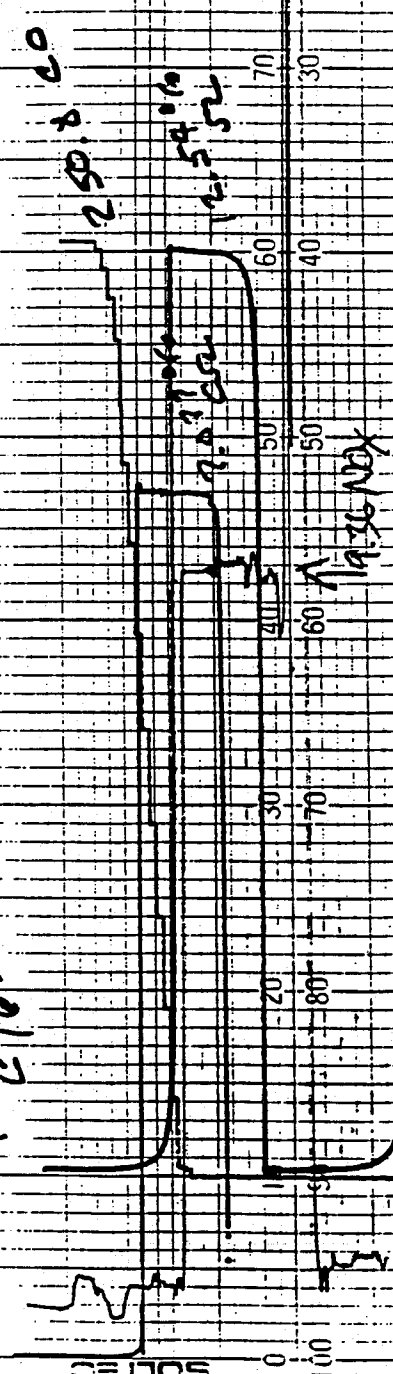
12.2
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 2.0
 1.0

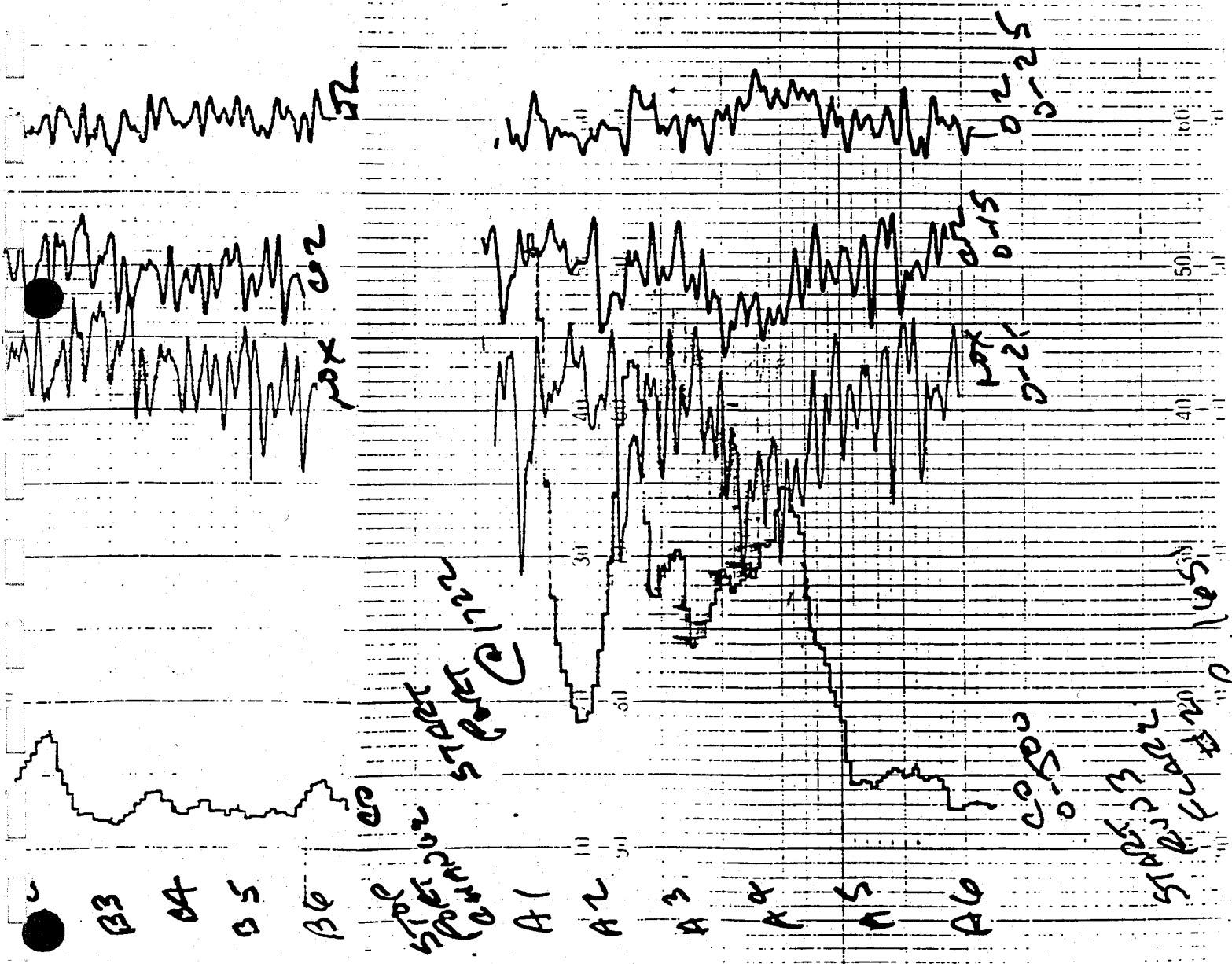


10.30



SOLEC

6.4



APPENDIX C

Field Data

TOTAL COMBUSTION ANALYSIS

FIELD SAMPLING DATA SHEET

Job #: S22-001

Control Device: FLARE #2

Facility: SAN MARCOS LANDFILL

Sample Location: FLARE OUTLET

Location: SAN MARCOS CA

Ambient Temperature: 60

Date: 11/16/94

Barometric Pressure: 29.31

Operator: JT

SAMPLE A

SAMPLE B

Tank #: 51 Trap #: —

Tank #: — Trap #: —

Initial Vacuum: 1.3

Initial Vacuum: —

Final Vacuum: —

Final Vacuum: —

241

TIME Δ	VACUUM ("Hg)	FLOW (cc/min)
0	24.25	150 66/66
5	21.0	66
10	18.5	
15	17.0	
20	15.5	
25	14.0	
30	12.5	
35	11	
40	9.5	
45	8	
50	6.5	66
55	5.0	66
60		

TIME	VACUUM ("Hg)	FLOW (cc/min)

Leak Rate Pre Test: O.K.

Post Test: I.K.

* Minutes represent total time of sample taken in correlation with meth S and CEM sampling.

HORIZON

TOTAL COMBUSTION ANALYSIS

FIELD SAMPLING DATA SHEET

Job #: 522-001

Control Device: FLARE # 2

Facility: SAN MARCOS LANDFILL

Sample Location: FLARE # 2 OUTLET

Location: CARLSBAD, CA

Ambient Temperature: 70

Date: 11/17/94

Barometric Pressure: 29.33

Operator: JT

SAMPLE A

Tank #: 59 Trap #:

Initial Vacuum: 1.3 torr

Final Vacuum:

SAMPLE B

Tank #: 53 Trap #:

Initial Vacuum: 1.3 torr

Final Vacuum:

R#2

TIME	VACUUM ("Hg)	FLOW (cc/min)
1042		
0	30	66
5	28	66
10	26	66
15	24	66
20	22	66
25	20	66
30	18	66
35	16	66
40	14	66
45	12	66
50	10	66
55	8	66
60	6	66

R#3

TIME	VACUUM ("Hg)	FLOW (cc/min)
1421		
0	30	66
5	28	66
10	26	66
15	24	66
20	22	66
25	20	66
30	18	66
35	16	66
40	14	66
45	12	66
50	10	66
55	7	66
60	5	66

Leak Rate Pre Test: P.K.

Post Test: P.K.

P.K.

P.K.

HORIZON

**TOTAL COMBUSTION ANALYSIS
SCAQMD METHOD 25
FIELD SAMPLING DATA SHEET**

Job #: S22-001
Facility: SAN MARCOS LANDFILL
Location: SAN MARCOS CA
Date: 11/17/94
Operator: AP

Control Device: FLARE #2
Sample Location: INLET
Ambient Temperature: 70
Barometric Pressure: 29.33

SAMPLE A

Tank #: S8 Trap #: _____
Initial Vacuum: 1.3 mm
Final Vacuum: _____

SAMPLE B

Tank #: S12 Trap #: _____
Initial Vacuum: 1.3 mm
Final Vacuum: _____

R#1

TIME	VACUUM ("Hg)	FLOW (cc/min)
1045	28	~120
1050	25	/
1055	22	
1100	18.5	
1105	15	
1110	12	
1115	9	

R#2

TIME	VACUUM ("Hg)	FLOW (cc/min)
1200	28	~120
1205	25	/
1210	22	
1215	18.5	
1220	15	
1225	12	
1230	9	

Leak Rate Pre Test: ok / ok
Post Test: ok / ok

HORIZON

INTEGRATED BAG SAMPLING DATA FORM

Run number FZ-TRS #1 & #2

Date 11/17/94

Plant SAN MARCOS LANDFILL

Sampling location *FLARE # 2 INLET*

Barometric pressure 29.30

Ambient temp. °C 15.6 Stack temp. °C ~~25.2~~ 39.4 Dry

Operator AP

22.2 WET

		* ESTIMATED Rate meter flow, rate (Q), cm ³ /min	% Dev. ^a
Time	Traverse point		
1700	Smylc	667 cc/min	NA
1705			
1710			
1715		stop	
1720		667	
1725		667	
1730		667	
1735		stop	
		Avg = 667	

$$\% \text{ Dev.} = \left(\frac{Q - Q_{avg}}{Q_{avg}} \right) 100; \text{ must be } \leq 10\%.$$

* BASED ON TIME REQUIRED TO FILL BAG USING THE POSITIVE PRESSURE OF INLET STACK GAS

TOTAL COMBUSTION ANALYSIS

FIELD SAMPLING DATA SHEET

Job #: 522-001
 Facility: SAN MARCOS LANDFILL
 Location: SAN MARCOS, CA
 Date: 11/18/94
 Operator: JT

Control Device: FLARE # 1
 Sample Location: FLARE # 1 OUTLET
 Ambient Temperature: 52
 Barometric Pressure: 29.29

SAMPLE A

Tank #: S4 Trap #: -
 Initial Vacuum: 1.3 tor
 Final Vacuum: 631
 800
 4.6

#1

TIME	VACUUM ("Hg)	FLOW (cc/min)
0	30	70
5	28	70
10	26	70
15	24	70
20	22	70
25	20	70
30	18	70
35	16	70
40	14.5	70
45	12.5	70
50	10.5	70
55	8.5	70
60	6.5	70

Leak Rate Pre Test: O.K.

Post Test: O.K.

SAMPLE B

Tank #: S6 Trap #: -
 Initial Vacuum: 1.3
 Final Vacuum: 628
 800
 4.75

#2

TIME	VACUUM ("Hg)	FLOW (cc/min)
13540	27	70
5	25.5	70
10	24	70
15	22.5	70
20	21	70
25	19.5	70
30	18	70
35	16.5	70
40	15	70
45	13.5	70
50	10.5	70
55	8.5	70
60	7	70

Leak Rate Pre Test: O.K.

O.K.

HORIZON

TOTAL COMBUSTION ANALYSIS

FIELD SAMPLING DATA SHEET

Job #: 522-001Control Device: FLAKE OUTLETFacility: SAN MARCOS LANDFILLSample Location: FLAKE #1Location: SAN MARCOS, CAAmbient Temperature: 54Date: 11/18/14Barometric Pressure: 29.29Operator: gt

SAMPLE A

SAMPLE B

Tank #: 7 Trap #: —Tank #: — Trap #: —Initial Vacuum: 1.3 torrInitial Vacuum: —Final Vacuum: 606Final Vacuum: —

*3

5.6

500

TIME	VACUUM ("Hg)	FLOW (cc/min)
1700 0	30	70
5	28	70
10	26	70
15	24	70
20	22.5	70
25	20	70
30	18.5	70
35	16.5	70
40	14	70
45	12.5	70
50	11	70
55	10	70
60	8	70

TIME	VACUUM ("Hg)	FLOW (cc/min)

Leak Rate Pre Test: P.KPost Test: P.K

HORIZON

TOTAL COMBUSTION ANALYSIS
~~SCAQMD METHOD 25~~ ^{AP}
FIELD SAMPLING DATA SHEET

Job #: S22-CO1

Control Device: FLARE #1

Facility: San Marcos Landfill

Sample Location: INLET

Location: San Marcos, CA

Ambient Temperature: 52

Date: 11/18/94

Barometric Pressure: 29.29

Operator: AP

SAMPLE A

SAMPLE B

Tank #: Summ 11 Trap #: _____

Tank #: S10 Trap #: _____

Initial Vacuum: 1.3

Initial Vacuum: 1.3

Final Vacuum: 496.7

Final Vacuum: 496.7

Run #1 ⁸¹⁵ 9.9 1.3 cfm

Run #2 9.9

TIME	VACUUM ("Hg)	FLOW (cc/min)
1230	26	~120
1236	22.8	
1242	19.2	
1248	15.7	
1254	12.1	
1300	8.5	

TIME	VACUUM ("Hg)	FLOW (cc/min)
1400	26.5	~120
1406	22.9	
1412	19.3	
1418	15.7	
1424	12.1	
1430	8.5	

Leak Rate Pre Test: OK / OK

Post Test: OK / OK

HORIZON

INTEGRATED BAG SAMPLING DATA FORM

Run number F1-TR5 #1 & 2

Date 11/18/94 Plant SAN MARCOS LANDFILL

Sampling location FLARE #1 INLET

Barometric pressure 29.35

Ambient temp. °C 10.6 Stack temp. °C 39.4 dry

Operator AP 22.2 WET

[illegible]

a

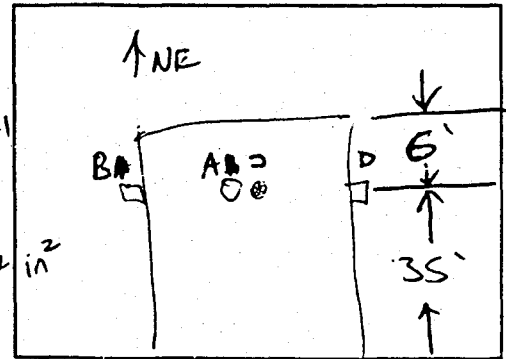
$$\% \text{ Dev.} = \left(\frac{Q - Q_{avg}}{Q_{avg}} \right) 100; \text{ must be } \leq 10\%.$$

* SAME AS TRS BAGS TAKEN AT INLET TO FLARE #2

VELOCITY DATA SHEET - METHOD 2

Plant: SWIMMAROS LANDFILL
 Job #: S22-001
 Source: FLARE #2
 Date: 11/10/10
 Operator: 2
 Baro. Press.: 29.30
 Offset Length: ~3"

D₁ upstream: ~0.5
 D₁ downstream: ~3.1
 Pitot Tube #: INCON. #6-7-1
 Pitot Tube Type: S
 Magnahelic #: RAC #5
 Stack Diameter: 136" = 14,526.7 in²
 Static Press.: -.003



Schematic of Stack

Leak Check:

Initial 3.1 / 2.9 Final 3.1 / 3.0

FIELD DATA

Traverse Point Number	Position, in.	Velocity Head (ΔP_s) in. H ₂ O	Stack Temp °F	Cyclonic Flow Determination	
				ΔP_s at 0° reference	Angle which yields a null ΔP
A - 1	2.9	.01	1745		
	9.1	.01	1802		
	16.0	.01	1825		
	24.1	.015	1738		
	34.0	.02	1680		
	48.4	.01	1745		
B - 1		.005	1505		
	-2	.008	1790		
	-3	.01	1849		
	-4	.02	1851		
	-5	.02	1748		
	-6	.025	1723		
C - 1		.01	1529		
	-2	.01	1879, 1551		
	-3	.01	1488		
	-4	.015	1402		
	-5	.02	1495		
	-6	.03	1412		
D - 1		.003	1358		
	-2	.002	1568		
	-3	.005	1494		
	-4	.01	1445		
	-5	.02	1374		
	-6	.02	1413		
AVERAGE		$\overline{V} = .1094$	1,598		

PARTICULATE FIELD DATA

INT 540 INARCOE LADPILL
 ATE 15-17-74 AP 11/16/94
 LOCATION CACUS 500, CA
 ERATOR RY AP, JT, RC
 URCE FLEET #2 OUTLET
 ON 1-500000 METHOD 5
 M BOX NO. 4
 TER BOX NO. 5
 TER A H @ 1.90X
 = 0.910
 ME START 1503

AMBIENT TEMPERATURE 60
 BARO. PRESS. 29.31
 ASSUMED MOISTURE, % 2
 PROBE LENGTH, in. 7' continuous Quartz
 NOZZLE DIAMETER, in. .666
 STACK DIAMETER, in. 136"
 PROBE HEATER SETTING NA
 HEATER BOX SETTING NA
 Δ Cp FACTOR 0.84 6-1
 FILTER NO. Q-712
 STATIC PRESSURE -0.07

INDEX = 49.5
 INDEX = 48.0

PRE TEST LEAK CHECKS
 METER 2.006 @ 15 in. Hg
 PITOTS 1/1 @ 6/7 in. Hg
 ORSAT

PH	TIME	T _s °F	Δ P in. H ₂ O	√ Δ P	Δ H in. H ₂ O	V _m ft ³	T _{m IN} °F	T _{m OUT} °F	OVEN °F	IMP. OUT. °F	VAC. (in. Hg)
6	1503	1770	0.025		1.23	116.945	81	69	NA	59	2
5	1504	1694	0.025		1.22	119.5	82	69		59	2
4	1505	1708	0.03		1.48	120.0	83	69		59	2.5
3	1507	1743	0.005		0.243	121.5	81	69		61	0
2	1509	1735	0.005		0.243	123.0	79	69		63	0
1	1512	1690	0.01		0.485	123.6	78	70		66	1.5
6	1515	1678	0.013*		0.64	125.310	77	67		58	1
5	1517	1730	0.013	AI Index	0.62	127.1	76	69		55	1
4	1520	1689	0.013		0.62	128.8	76	69		54	1
3	1524	1701	0.013		0.62	130.6	75	68		53	1
2	1526	1590	0.013		0.62	132.4	75	68		53	1
1	1528	1745	0.013		0.62	134.1	75	67		52	1
6	1530	1608	0.013		0.62	135.900	75	66		53	1
5	1532	1616	0.013		0.62	136.4	75	66		54	1
4	1535	1474	0.013		0.62	137.8	76	66		55	1
3	1538	1480	0.013		0.62	139.1	76	67		57	1
2	1540	1760	0.013		0.62	140.2	76	67		60	1
1	1542	1793	0.013		0.62	141.4	76	67		60	1
6	1637 450	1383	0.013		0.62	142.923	75	66		55	1
5	415	1470	0.013		0.62	143.6	76	66		44	1
4	503	1512	0.013		0.62	144.6	76	66		48	1
3	525	1416	0.013		0.62	145.8	77	66		51	1
2	540	1709	0.013		0.62	146.9	77	66		51	1
1	545	1737	0.013		0.62	147.8	77	66		52	1
Avg.	60	1640.9	0.1160	0.34	148.813	72.3					

ME END = 1652

* 0.013 represents the average ΔP of the preliminary traverse. The max ΔP was proposed to be used but later changed in order to avoid sample dilution. As per Mr. J. J. Mott, SDCAPCD.

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	
Final	160	101	0		256.5
Initial	100	100	0		249.2
Liquid Collected	60	1	0		7.3
Total Vol. Collected					68.3

POST TEST LEAK CHECKS
 Meter 2.000 @ 2.5 in. Hg
 Pitots 1/1 @ 6/8 in. Hg
 Orsat

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					
Nozzle Cal	D ₁	D ₂	D ₃	Average	
	.665	.668	.665	0.666	



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

CLIENT: Andrew Pecaut
Horizon Air Measurement Services
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Lab Number : CK-5517-3
Project : S22-001, San Marcos
Landfill
Analyzed : 12/05/94
Analyzed by: LC
Method : EPA 625

REPORT OF ANALYTICAL RESULTS

Page 2 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-C	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Butylbenzylphthalate	(85687)	1000.	ND	
2-Chloronaphthalene	(91587)	1000.	ND	
4-Chlorophenylphenylether	(7005723)	1000.	ND	
Chrysene	(218019)	1000.	ND	
Dibenz (a,h) anthracene	(53703)	2000.	ND	
Di-n-butylphthalate	(84742)	1000.	ND	
1,2-Dichlorobenzene	(95501)	1000.	ND	
1,3-Dichlorobenzene	(541731)	1000.	ND	
1,4-Dichlorobenzene	(106467)	1000.	ND	
3,3-Dichlorobenzidine	(91941)	2000.	ND	
Diethylphthalate	(84662)	1000.	ND	
Dimethylphthalate	(131113)	2000.	ND	
2,4-Dinitrotoluene	(121142)	2000.	ND	
2,6-Dinitrotoluene	(606202)	2000.	ND	
Di-n-octylphthalate	(117840)	2000.	ND	
1,2-Diphenylhydrazine (as Azobenzene)	(122667)	4000.	ND	
Fluoranthene	(206440)	1000.	ND	
Fluorene	(86737)	1000.	ND	
Hexachlorobenzene	(118741)	1000.	ND	
Hexachlorobutadiene	(87683)	1000.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2IA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/120506A
DET/edtedt
BNAW-018



REPORT OF LABORATORY ANALYSIS

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REPORT OF ANALYTICAL RESULTS

Page 3 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-C	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Hexachlorocyclopentadiene	(77474)	2000.	ND	
Hexachloroethane	(67721)	1000.	ND	
Indeno (1,2,3-cd) pyrene	(193395)	2000.	ND	
Isophorone	(78591)	1000.	ND	
Naphthalene	(91203)	1000.	ND	
Nitrobenzene	(98953)	1000.	ND	
N-Nitrosodimethylamine	(62759)	2000.	ND	
N-Nitrosodiphenylamine	(86306)	2000.	ND	
N-Nitrosodi-n-propylamine	(621647)	2000.	ND	
Phenanthrene	(85018)	1000.	ND	
Pyrene	(129000)	1000.	ND	
1,2,4-Trichlorobenzene	(108703)	1000.	ND	
4-Chloro-3-methylphenol	(59507)	2000.	ND	
2-Chlorophenol	(95578)	2000.	ND	
2,4-Dichlorophenol	(120832)	2000.	ND	
2,4-Dimethylphenol	(105679)	2000.	ND	
2,4-Dinitrophenol	(51285)	2000.	ND	
2-Methyl-4,6-dinitrophenol	(534521)	2000.	ND	
2-Nitrophenol	(88755)	2000.	ND	
4-Nitrophenol	(100027)	2000.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/120506A
DET/edtedt
BNAW-018



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

CLIENT: Andrew Pecaut
Horizon Air Measurement Services
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Lab Number : CK-5517-3
Project : S22-001, San Marcos
Landfill
Analyzed : 12/05/94
Analyzed by: LC
Method : EPA 625

REPORT OF ANALYTICAL RESULTS

Page 4 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-C	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Pentachlorophenol	(87865)	2000.	ND	
Phenol	(108952)	1000.	3100.	
2,4,6-Trichlorophenol	(88062)	2000.	ND	
2-Methylphenol	(95487)	2000.	ND	
3- and 4-Methylphenol	(106445)	2000.	2900.	
Methylnaphthalenes		1000.	ND	
Nitrobenzene-d5 spike level		100.	ND	
2-Fluorobiphenyl spike level		100.	ND	
4-Terphenyl-d14 spike level		100.	ND	
Phenol-d5 spike level		200.	ND	
2-Fluorophenol spike level		200.	ND	
2,4,6-Tribromophenol spike level		200.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/120506A
DET/edtedt
BNAW-018



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

CLIENT: Andrew Pecaut
Horizon Air Measurement Services
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Order Number : CK5517
Project : S22-001, San Marcos
Landfill
Receive Date : 11/19/94

QC Batch ID Cross Reference Table

Constituent	QC Batch Number	Lab Number	Sample Description
Volatile Organics by GC/MS	CK55171327V	CK5517*1	LFGC-A
SVOA PRIORITY POLLUTANTS	BNAW-017	CK5517*1	LFGC-A
SVOA PRIORITY POLLUTANTS	BNAW-018	CK5517*2	LFGC-B
Volatile Organics by GC/MS	CK55171327V	CK5517*2	LFGC-B
SVOA PRIORITY POLLUTANTS	BNAW-018	CK5517*3	LFGC-C
Volatile Organics by GC/MS	CK55171327V	CK5517*3	LFGC-C



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

QC Batch ID: CK55171327V

CLIENT: PACE Incorporated

Analyzed : 11/23/94
Analyzed by: JY
Method : EPA 624

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

Page 1 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED		
METHOD BLANK			Aqueous		
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE	
Volatile Organics by GC/MS					
Acetone	(67641)	10.	ND		
Acrolein	(107028)	200.	ND		
Acrylonitrile	(107131)	200.	ND		
Benzene	(71432)	2.	ND		
Bromodichloromethane	(75274)	2.	ND		
Bromoform	(75252)	2.	ND		
Bromomethane (Methyl bromide)	(74839)	2.	ND		
2-Butanone (MEK)	(78933)	20.	ND		
Carbon disulfide	(75150)	2.	ND		
Carbon tetrachloride	(56235)	2.	ND		
Chlorobenzene	(108907)	2.	ND		
Chloroethane (Ethyl chloride)	(75003)	2.	ND		
2-Chloroethyl vinyl ether	(110758)	4.	ND		
Chloroform	(67663)	2.	ND		
Chloromethane (Methyl chloride)	(74873)	2.	ND		
Dibromochloromethane	(124481)	2.	ND		
Dibromomethane	(74953)	2.	ND		
1,2-Dibromoethane (EDB)	(106934)	2.	ND		
1,4-Dichloro-2-butene	(764410)	2.	ND		
Dichlorodifluoromethane (Freon 12)	(75718)	2.	ND		
1,1-Dichloroethane	(75343)	2.	ND		
1,2-Dichloroethane (EDC)	(107062)	2.	ND		

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD7/CS785
DI/eicmo(dw)/yl
CK5517-1



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

QC Batch ID: CK55171327V

CLIENT: PACE Incorporated

Analyzed : 11/23/94
Analyzed by: JY
Method : EPA 624

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

Page 2 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED		
METHOD BLANK	Aqueous				
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE	
1,1-Dichloroethene	(75354)	2.	ND		
cis-1,2-Dichloroethene	(156592)	2.	ND		
trans-1,2-Dichloroethene	(156605)	2.	ND		
1,2-Dichloropropane	(78875)	2.	ND		
cis-1,3-Dichloropropene	(10061015)	2.	ND		
trans-1,3-Dichloropropene	(10061026)	2.	ND		
Ethylbenzene	(100414)	2.	ND		
Ethyl methacrylate	(97632)	20.	ND		
2-Hexanone	(591786)	20.	ND		
Iodomethane	(74884)	2.	ND		
Methylene chloride	(75092)	4.	ND		
4-Methyl-2-pentanone (MIBK)	(108101)	10.	ND		
Styrene	(100425)	2.	ND		
1,1,2,2-Tetrachloroethane	(79345)	2.	ND		
Tetrachloroethene (PCE)	(127184)	2.	ND		
Toluene	(108883)	2.	ND		
1,1,1-Trichloroethane (TCA)	(71556)	2.	ND		
1,1,2-Trichloroethane	(79005)	2.	ND		
Trichloroethene (TCE)	(79016)	2.	ND		
Trichlorofluoromethane (Freon 11)	(75694)	2.	ND		
1,2,3-Trichloropropane	(96184)	2.	ND		
Vinyl acetate	(108054)	20.	ND		
Vinyl chloride	(75014)	2.	ND		

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD7/CS785
DI/eicmo(dw)/yl
CK5517-1



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

QC Batch ID: CK55171327V

CLIENT: PACE Incorporated

Analyzed : 11/23/94
Analyzed by: JY
Method : EPA 624

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

Page 3 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED		
METHOD BLANK	Aqueous				
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE	
Xylenes	(1330207)	2.	ND		
1,2-Dichlorobenzene	(95501)	2.	ND		
1,3-Dichlorobenzene	(541731)	2.	ND		
1,4-Dichlorobenzene	(106467)	2.	ND		
Hexachlorobutadiene	(87683)	2.	ND		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	(76131)	2.	ND		
1,2-Dichloroethane-d4 spike level		30.	32.		
1,2-Dichloroethane-d4 (Surrogate Percent Recovery)			107.		
Toluene-d8 spike level		30.	30.		
Toluene-d8 (Surrogate Percent Recovery)			100.		
p-Bromofluorobenzene spike level		30.	30.		
p-Bromofluorobenzene (Surrogate Percent Recovery)			100.		

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD7/CS785
DI/eicmo(dw)/yl
CK5517-1



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

QC Batch ID: CK55171327V

CLIENT: PACE Incorporated

Analyzed : 11/23/94
Analyzed by: JY
Method : EPA 624

QC SPIKE
REPORT OF ANALYTICAL RESULTS

Page 1 of 1

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED		
QC SPIKE	Aqueous				
CONSTITUENT	*PQL μg/L	SPIKE AMOUNT	RESULT μg/L	%REC	NOTE
Volatile Organics by GC/MS					
Benzene	2.	20.	19.	95.	
Chlorobenzene	2.	20.	19.	95.	
1,1-Dichloroethene	2.	20.	17.	85.	
Toluene	2.	20.	19.	95.	
Trichloroethene (TCE)	2.	20.	20.	100.	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD7/CS782
DI/eicmo(dw)/yl
CK5517-1



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

CLIENT: PACE Incorporated

QC Batch ID: CK55171327V

Analyzed : 11/23/94
Analyzed by: JY
Method : EPA 624

QC SPIKE
REPORT OF ANALYTICAL RESULTS

Page 1 of 1

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED			
QC SPIKE DUPLICATE	Aqueous					
CONSTITUENT	*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	%DIFF	NOTE
Volatile Organics by GC/MS						
Benzene	2.	20.	20.	100.	5.1	
Chlorobenzene	2.	20.	21.	105.	10.	
1,1-Dichloroethene	2.	20.	18.	90.	5.7	
Toluene	2.	20.	20.	100.	5.1	
Trichloroethene (TCE)	2.	20.	21.	105.	4.9	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD7/CS783
DI/eicmo(dw)/yl
CK5517-1



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

CLIENT: PACE Incorporated

QC Batch ID: BNAW8270-017

Analyzed : 11/29/94

Analyzed by: LC

Method : EPA 8270

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

Page 1 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED	
METHOD BLANK	Aqueous			
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
SVOA PRIORITY POLLUTANTS				1
Acenaphthylene	(208968)	5.	ND	
Acenaphthene	(83329)	5.	ND	
Anthracene	(120127)	5.	ND	
Benzidine	(92875)	10.	ND	
Benz(a)anthracene	(56553)	5.	ND	
Benzo(b)fluoranthene	(205992)	5.	ND	
Benzo(k)fluoranthene	(207089)	5.	ND	
Benzyl alcohol	(100516)	10.	ND	
Benzoic acid	(65850)	50.	ND	
Benzo(a)pyrene	(50328)	10.	ND	
Benzo(ghi)perylene	(191242)	10.	ND	
Bis(2-chloroethoxy)methane	(111911)	5.	ND	
Bis(2-chloroethyl)ether	(111444)	5.	ND	
Bis(2-chloroisopropyl)ether	(39638329)	5.	ND	
4-Chloroaniline	(106478)	10.	ND	
Bis(2-ethylhexyl)phthalate	(117817)	10	ND	
4-Bromophenylphenylether	(101553)	5.	ND	
Butylbenzylphthalate	(85687)	5.	ND	
2-Chloronaphthalene	(91587)	5.	ND	
4-Chlorophenylphenylether	(7005723)	5.	ND	
Chrysene	(218019)	5.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 11/21/94 by EKB using EPA 3520

12/06/94
MSD8/112907A
DET/edtedt/lc
CK5384-2



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

QC Batch ID: BNAW8270-017

CLIENT: PACE Incorporated

Analyzed : 11/29/94
Analyzed by: LC
Method : EPA 8270

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

Page 2 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED		
METHOD BLANK	Aqueous				
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE	
Dibenz(a,h)anthracene	(53703)	10.	ND		
Di-n-butylphthalate	(84742)	5.	ND		
1,2-Dichlorobenzene	(95501)	5.	ND		
1,3-Dichlorobenzene	(541731)	5.	ND		
1,4-Dichlorobenzene	(106467)	5.	ND		
3,3-Dichlorobenzidine	(91941)	10.	ND		
Diethylphthalate	(84662)	5.	ND		
Dimethylphthalate	(131113)	10.	ND		
2,4-Dinitrotoluene	(121142)	10.	ND		
2,6-Dinitrotoluene	(606202)	10.	ND		
Di-n-octylphthalate	(117840)	10.	ND		
Fluoranthene	(206440)	5.	ND		
Fluorene	(86737)	5.	ND		
Hexachlorobenzene	(118741)	5.	ND		
Hexachlorobutadiene	(87683)	5.	ND		
Hexachlorocyclopentadiene	(77474)	10.	ND		
Hexachloroethane	(67721)	5.	ND		
2-Nitroaniline	(88744)	50.	ND		
3-Nitroaniline	(99092)	50.	ND		
4-Nitroaniline	(100016)	50.	ND		
Indeno(1,2,3-cd)pyrene	(193395)	10.	ND		
Isophorone	(78591)	5.	ND		
Naphthalene	(91203)	5.	ND		

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/112907A
DET/edtedt/lc
CK5384-2



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

CLIENT: PACE Incorporated

QC Batch ID: BNAW8270-017

Analyzed : 11/29/94
Analyzed by: LC
Method : EPA 8270

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

Page 3 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED	
METHOD BLANK	Aqueous			
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Nitrobenzene	(98953)	5.	ND	
N-Nitrosodimethylamine	(62759)	10.	ND	
N-Nitrosodiphenylamine	(86306)	10.	ND	
N-Nitrosodi-n-propylamine	(621647)	10.	ND	
Phenanthrene	(85018)	5.	ND	
Pyrene	(129000)	5.	ND	
1,2,4-Trichlorobenzene	(108703)	5.	ND	
Aldrin	(309002)	50.	ND	
delta-BHC	(319868)	50.	ND	
gamma BHC (Lindane)	(58899)	50.	ND	
p,p'-DDD	(72548)	50.	ND	
p,p'-DDE	(72559)	50.	ND	
p,p'-DDT	(50293)	50.	ND	
Dieldrin	(60571)	50.	ND	
Endrin Aldehyde	(7421934)	50.	ND	
Heptachlor	(76448)	50.	ND	
Heptachlor Epoxide	(1024573)	50.	ND	
4-Chloro-3-methylphenol	(59507)	10.	ND	
2-Chlorophenol	(95578)	10.	ND	
2,4-Dichlorophenol	(120832)	10.	ND	
2,4-Dimethylphenol	(105679)	10.	ND	
2,4-Dinitrophenol	(51285)	10.	ND	
2-Methyl-4,6-dinitrophenol	(534521)	10.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/112907A
DET/edtedt/lc
CK5384-2



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

QC Batch ID: BNAW8270-017

CLIENT: PACE Incorporated

Analyzed : 11/29/94
Analyzed by: LC
Method : EPA 8270

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

Page 4 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED	
METHOD BLANK	Aqueous			
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
2-Nitrophenol	(88755)	10.	ND	
4-Nitrophenol	(100027)	10.	ND	
Pentachlorophenol	(87865)	10.	ND	
Phenol	(108952)	5.	ND	
2,4,6-Trichlorophenol	(88062)	10.	ND	
2-Methylphenol	(95487)	10.	ND	
3- and 4-Methylphenol	(106445)	10.	ND	
Methylnaphthalenes		5.	ND	
Nitrobenzene-d5 spike level		100.	75.4	
Nitrobenzene-d5 (Surrogate Percent Recovery)			75.	
2-Fluorobiphenyl spike level		100.	76.0	
2-Fluorobiphenyl (Surrogate Percent Recovery)			76.	
4-Terphenyl-d14 spike level		100.	75.8	
4-Terphenyl-d14 (Surrogate Percent Recovery)			76.	
Phenol-d5 spike level		200.	98.4	
Phenol-d5 (Surrogate Percent Recovery)			49.	
2-Fluorophenol spike level		200.	123.	
2-Fluorophenol (Surrogate Percent Recovery)			61.	
2,4,6-Tribromophenol spike level		200.	133.	
2,4,6,-Tribromophenol (Surrogate Percent Recovery)			67.	
Dibenzofuran	(132649)	10.	ND	
2,4,5-Trichlorophenol	(95954)	10.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/112907A
DET/edtedt/lc
CK5384-2



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

QC Batch ID: BNAW8270-017

CLIENT: PACE Incorporated

Analyzed : 11/30/94
Analyzed by: LC
Method : EPA 8270

INSTRUMENT BLANK
REPORT OF ANALYTICAL RESULTS

Page 1 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED		
INSTRUMENT BLANK	Aqueous				
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE	
SVOA PRIORITY POLLUTANTS					
Acenaphthylene	(208968)	5.	ND		
Acenaphthene	(83329)	5.	ND		
Anthracene	(120127)	5.	ND		
Benzidine	(92875)	10.	ND		
Benz(a)anthracene	(56553)	5.	ND		
Benzo(b)fluoranthene	(205992)	5.	ND		
Benzo(k)fluoranthene	(207089)	5.	ND		
Benzyl alcohol	(100516)	10.	ND		
Benzoic acid	(65850)	50.	ND		
Benzo(a)pyrene	(50328)	10.	ND		
Benzo(ghi)perylene	(191242)	10.	ND		
Bis(2-chloroethoxy)methane	(111911)	5.	ND		
Bis(2-chloroethyl)ether	(111444)	5.	ND		
Bis(2-chloroisopropyl)ether	(39638329)	5.	ND		
4-Chloroaniline	(106478)	10.	ND		
Bis(2-ethylhexyl)phthalate	(117817)	10	ND		
4-Bromophenylphenylether	(101553)	5.	ND		
Butylbenzylphthalate	(85687)	5.	ND		
2-Chloronaphthalene	(91587)	5.	ND		
4-Chlorophenylphenylether	(7005723)	5.	ND		
Chrysene	(218019)	5.	ND		
Dibenz(a,h)anthracene	(53703)	10.	ND		

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/113003A
DET/edtedt/lc
CK5384-2



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

QC Batch ID: BNAW8270-017

CLIENT: PACE Incorporated

Analyzed : 11/30/94
Analyzed by: LC
Method : EPA 8270

INSTRUMENT BLANK
REPORT OF ANALYTICAL RESULTS

Page 2 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED		
INSTRUMENT BLANK	Aqueous				
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE	
Di-n-butylphthalate	(84742)	5.	ND		
1,2-Dichlorobenzene	(95501)	5.	ND		
1,3-Dichlorobenzene	(541731)	5.	ND		
1,4-Dichlorobenzene	(106467)	5.	ND		
3,3-Dichlorobenzidine	(91941)	10.	ND		
Diethylphthalate	(84662)	5.	ND		
Dimethylphthalate	(131113)	10.	ND		
2,4-Dinitrotoluene	(121142)	10.	ND		
2,6-Dinitrotoluene	(606202)	10.	ND		
Di-n-octylphthalate	(117840)	10.	ND		
Fluoranthene	(206440)	5.	ND		
Fluorene	(86737)	5.	ND		
Hexachlorobenzene	(118741)	5.	ND		
Hexachlorobutadiene	(87683)	5.	ND		
Hexachlorocyclopentadiene	(77474)	10.	ND		
Hexachloroethane	(67721)	5.	ND		
2-Nitroaniline	(88744)	50.	ND		
3-Nitroaniline	(99092)	50.	ND		
4-Nitroaniline	(100016)	50.	ND		
Indeno(1,2,3-cd)pyrene	(193395)	10.	ND		
Isophorone	(78591)	5.	ND		
Naphthalene	(91203)	5.	ND		
Nitrobenzene	(98953)	5.	ND		

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/113003A
DET/edtedt/lc
CK5384-2



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

QC Batch ID: BNAW8270-017

CLIENT: PACE Incorporated

Analyzed : 11/30/94
Analyzed by: LC
Method : EPA 8270

INSTRUMENT BLANK
REPORT OF ANALYTICAL RESULTS

Page 3 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED	
INSTRUMENT BLANK	Aqueous			
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
N-Nitrosodimethylamine	(62759)	10.	ND	
N-Nitrosodiphenylamine	(86306)	10.	ND	
N-Nitrosodi-n-propylamine	(621647)	10.	ND	
Phenanthrene	(85018)	5.	ND	
Pyrene	(129000)	5.	ND	
1,2,4-Trichlorobenzene	(108703)	5.	ND	
Aldrin	(309002)	50.	ND	
delta-BHC	(319868)	50.	ND	
gamma BHC (Lindane)	(58899)	50.	ND	
p,p'-DDD	(72548)	50.	ND	
p,p'-DDE	(72559)	50.	ND	
p,p'-DDT	(50293)	50.	ND	
Dieldrin	(60571)	50.	ND	
Endrin Aldehyde	(7421934)	50.	ND	
Heptachlor	(76448)	50.	ND	
Heptachlor Epoxide	(1024573)	50.	ND	
4-Chloro-3-methylphenol	(59507)	10.	ND	
2-Chlorophenol	(95578)	10.	ND	
2,4-Dichlorophenol	(120832)	10.	ND	
2,4-Dimethylphenol	(105679)	10.	ND	
2,4-Dinitrophenol	(51285)	10.	ND	
2-Methyl-4,6-dinitrophenol	(534521)	10.	ND	
2-Nitrophenol	(88755)	10.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/113003A
DET/edtedt/lc
CK5384-2



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

QC Batch ID: BNAW8270-017

CLIENT: PACE Incorporated

Analyzed : 11/30/94
Analyzed by: LC
Method : EPA 8270

INSTRUMENT BLANK
REPORT OF ANALYTICAL RESULTS

Page 4 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED		
INSTRUMENT BLANK	Aqueous				
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE	
4-Nitrophenol	(100027)	10.	ND		
Pentachlorophenol	(87865)	10.	ND		
Phenol	(108952)	5.	ND		
2,4,6-Trichlorophenol	(88062)	10.	ND		
2-Methylphenol	(95487)	10.	ND		
3- and 4-Methylphenol	(106445)	10.	ND		
Methylnaphthalenes		5.	ND		
Dibenzofuran	(132649)	10.	ND		
2,4,5-Trichlorophenol	(95954)	10.	ND		

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/113003A
DET/edtedt/lc
CK5384-2



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

QC Batch ID: BNAW8270-017

CLIENT: PACE Incorporated

Analyzed : 11/29/94
Analyzed by: LC
Method : EPA 8270

QC SPIKE
REPORT OF ANALYTICAL RESULTS

Page 1 of 1

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED			
QC SPIKE	Aqueous					
CONSTITUENT		*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	NOTE
SVOA PRIORITY POLLUTANTS						1
Acenaphthene		5.	100.	78.2	78.	
1,4-Dichlorobenzene		5.	100.	76.0	76.	
2,4-Dinitrotoluene		10.	100.	75.0	75.	
N-Nitrosodi-n-propylamine		10.	100.	89.2	89.	
Pyrene		5.	100.	87.2	87.	
1,2,4-Trichlorobenzene		5.	100.	70.4	70.	
4-Chloro-3-methylphenol		10.	200.	94.4	47.	
2-Chlorophenol		10.	200.	105.	53.	
4-Nitrophenol		10.	200.	72.2	36.	
Pentachlorophenol		10.	200.	100.	50.	
Phenol		5.	200.	86.8	43.	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 11/21/94 by EKB using EPA 3520

12/06/94
MSD8/112903A
DET/edtedt/lc
CK5384-2



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

CLIENT: PACE Incorporated

QC Batch ID: BNAW8270-017

Analyzed : 11/29/94
Analyzed by: LC
Method : EPA 8270

QC SPIKE
REPORT OF ANALYTICAL RESULTS

Page 1 of 1

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED			
QC SPIKE DUPLICATE	Aqueous					
CONSTITUENT	*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	%DIFF	NOTE
SVOA PRIORITY POLLUTANTS						1
Acenaphthene	5.	100.	77.2	77.	1.3	
1,4-Dichlorobenzene	5.	100.	72.0	72.	5.4	
2,4-Dinitrotoluene	10.	100.	77.2	77.	2.9	
N-Nitrosodi-n-propylamine	10.	100.	79.8	80.	11.	
Pyrene	5.	100.	79.6	80.	9.1	
1,2,4-Trichlorobenzene	5.	100.	69.1	69.	1.9	
4-Chloro-3-methylphenol	10.	200.	118.	59.	22.	
2-Chlorophenol	10.	200.	132.	66.	23.	
4-Nitrophenol	10.	200.	125.	63.	54.	
Pentachlorophenol	10.	200.	136.	68.	31.	
Phenol	5.	200.	129.	65.	39.	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 11/21/94 by EKB using EPA 3520

12/06/94
MSD8/112905A
DET/edtedt/lc
CK5384-2



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

QC Batch ID: BNAW-018

CLIENT: PACE Incorporated

Analyzed : 12/01/94
Analyzed by: LC
Method : EPA 625

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

Page 1 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED		
METHOD BLANK	Aqueous				
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE	
SVOA PRIORITY POLLUTANTS				1	
Acenaphthylene	(208968)	5.	ND		
Acenaphthene	(83329)	5.	ND		
Anthracene	(120127)	5.	ND		
Benzidine	(92875)	10.	ND		
Benz (a) anthracene	(56553)	5.	ND		
Benzo (b) fluoranthene	(205992)	5.	ND		
Benzo (k) fluoranthene	(207089)	5.	ND		
Benzo (a) pyrene	(50328)	10.	ND		
Benzo (ghi) perylene	(191242)	10.	ND		
Bis (2-chloroethoxy) methane	(111911)	5.	ND		
Bis (2-chloroethyl) ether	(111444)	5.	ND		
Bis (2-chloroisopropyl) ether	(39638329)	5.	ND		
Bis (2-ethylhexyl) phthalate	(117817)	10.	ND		
4-Bromophenylphenylether	(101553)	5.	ND		
Butylbenzylphthalate	(85687)	5.	ND		
2-Chloronaphthalene	(91587)	5.	ND		
4-Chlorophenylphenylether	(7005723)	5.	ND		
Chrysene	(218019)	5.	ND		
Dibenz (a,h) anthracene	(53703)	10.	ND		
Di-n-butylphthalate	(84742)	5.	ND		
1,2-Dichlorobenzene	(95501)	5.	ND		

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 11/22/94 by AL using EPA 625

12/06/94
MSD8/113018A
DET/edtedt/lc
CK5517-2

SAN MARCOS FLARE
 DATE 11/16/94 11/17/94
 LOCATION SAN MARCOS CA
 RATOR AP, JT, RC
 CE FLARE #12
 O 2 - SDCARD WITH S
 OX NO. 15
 OX NO. 5
 R A H @ 1.908
0.990
 IE START 1042

AMBIENT TEMPERATURE 70
 BARO. PRESS. 29.53
 ASSUMED MOISTURE, % 8
 PROBE LENGTH, in. 7' CONTINUOUS QUARTZ
 NOZZLE DIAMETER, in. 0.666
 STACK DIAMETER, in. 136
 PROBE HEATER SETTING NT
 HEATER BOX SETTING NT
 Δ Cp FACTOR 0.84 7-1
 FILTER NO. Q-339
 STATIC PRESSURE -0.07

PAGE 1 of 2

PRE TEST LEAK CHECKS
 METER 0.003 @ 15 in. Hg
 PITOTS 0/0 @ 4-4 in. Hg
 ORSAT

	TIME	T _s °F	Δ P in H ₂ O	Δ P	Δ H in H ₂ O	V _m ft ³	T _{min} °F	T _{out} °F	BOVEN NT SPEC. TAP PRELIMINARY	IMP. OUT °F	VAC. (in. Hg)	ΔP Prelim
6	1042.00	1650	0.013 *		0.62	149.088	72	70	NA	50	1	
5	1049.25	1610	0.013		0.62	149.800	75	71		50	1	
4	1113.50	1640	0.013		0.62	151.005	78	72		50	1	.31
3	7.5	1590	0.013		0.62	152.100	79	72		50	1	.24
2	1123.10.0	1566	0.013		0.62	152.9	74	73	1598	52	1	.26
1	12.5	1599	0.013		0.62	153.7	76	73		52	1	
6	1204.15.0	1518	0.013		0.62	154.44/154.66	80	73		55	1	
5	17.5	1545	0.013		0.62	156.5	84	74		53	1	
4	20.0	1522	0.013		0.62	157.2	84	75		56	1	
3	22.5	1582	0.013		0.62	158.1	79	74		57	1	
2	25.0	1601	0.013		0.62	159.1	80	74		57	1	
1	27.5	1594	0.013		0.62	160.2	82	74		54	1	
6	12:50 30.0	1620	0.013		0.62	161.300/161.300	80	72		50	1	
5	32.5	1641	0.013		0.62	162.410	81	72		50	1	
4	35.0	1675	0.013		0.62	163.340	81	72		52	1	
3	37.5	1675	0.013		0.62	164.400	82	72		54	1	
2	40.0	1654	0.013		0.62	165.470	82	72		55	1	
1	42.5	1716	0.013		0.62	166.540	82	73		56	1	
6	13:17 45.0	1674	0.013		0.62	167.518/167.488	81	72		50	1	
5	47.5	1599	0.013		0.62	168.850	81	72		50	1	
4	50.0	1588	0.013		0.62	169.920	81	72		52	1	
3	52.5	1695	0.013		0.62	171.010	82	72		52	1	
2	55.0	1626	0.013		0.62	172.080	81	72		53	1	
1	57.5	1573	0.013		0.62	173.140	82	72		53	1	
avg.	60	1544 AP	0.013 AP		0.62 AP	174.216	81	72 AP		53 AP	1	
						25.128						

END = (1558) * INCLUDE Retraverse on next data sheet. ALL TORQUES/AUG. ON NEXT PAGE.

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	
Final	208	102	0		266.7
Initial	100	100	0		259.5
Liquid Collected	108	2	0		7.2
Vol. Collected	108	2	0		117.2

POST TEST LEAK CHECKS
 Meter 0.001 @ 1 in. Hg
 Pitots - @ - in. Hg
 Orsat

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					
Nozzle Cal	D ₁	D ₂	D ₃	Average	
	0.666	0.666	0.666	0.666	

ZON AIR MEASUREMENT SERVICES, INC.

REPRESENTS AVG. ΔP or preliminary traverse

NT SAN MARCOS LANDFILL
 E AP. 11/14/94
 LOCATION SAN MARCOS CA
 OPERATOR AP. J. J. R. C.
 SOURCE FLARE #12 CURT
 NO. 2 WITH S. CALM
 BOX NO. 8
 FILTER BOX NO. 5
 TER & H @ 1,908
 ME START 0-190

AMBIENT TEMPERATURE _____
 BARO. PRESS. _____
 ASSUMED MOISTURE, % 2
 PROBE LENGTH, in. 71 (CONTINUOUS) CANCE
 NOZZLE DIAMETER, in. 0.660
 STACK DIAMETER, in. 136
 PROBE HEATER SETTING NA
 HEATER BOX SETTING NA
 Δ Cp FACTOR 0.84 6-1
 FILTER NO. _____
 STATIC PRESSURE _____

PRE TEST LEAK CHECKS

METER @ _____ in. Hg
 PITOTS @ _____ in. Hg
 ORSAT _____

PH	TIME	T _s °F	Δ P in. H ₂ O	√ Δ P	Δ H in. H ₂ O	V _m ft ³	T _{m IN} °F	T _{m OUT} °F	OVEN °F	IMP. OUT °F	VAC. (in. Hg)
-6	1421 00	1650	0.013		0.62	174.216	79	70		55	1
5	25	1695	0.013		0.62	175.330	81	71		50	1
4	50	1655	0.013		0.62	176.410	81	71		50	1
3	75	1648	0.013		0.62	177.490	82	72		52	1
2	100	1647	0.013		0.62	178.590	82	71		53	1
1	125	1651	0.013		0.62	179.780	82	72		53	1
6	1456 150	1648	0.013		0.62	180.123	82	72		52	1
5	1456 1750	1703	0.013		0.62	181.620	80	71		54	1
4	200	1704	0.013		0.62	182.840	81	71		54	1
3	225	1681	0.013		0.62	183.930	81	71		55	1
2	250	1651	0.013		0.62	185.050	81	71		54	1
1	275	1655	0.013		0.62	186.080	81	71		56	1
6	1521 30.0	1697	0.013		0.62	187.151	81	71		56	1
5	32.5	1613	0.013		0.62	188.230	79	71		57	
	35.0	1658				189.300	79	70		58	1
5	37.5	1630				190.360	79	70		58	1
2	40.0	1625				191.430	79	70		59	1
1	42.5	1628				192.480	81	70		59	1
6	1543 45.0	1616				193.565	80	70		62	1
5	47.5	1632				194.630	81	69		55	1
4	50.0	1657				195.700	79	69		54	1
3	52.5	1648				196.880	79	69		53	1
2	55.0	1657				197.870	80	70		53	1
1	57.5	1650				198.950	79	70		53	1
AVG	120	1635.5	0.1140	0.62	50.953	75.8					

END OF PREVIOUS PAGE ALSO

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	5
Final	NA	NA	NA	NA	NA
Initial					
Liquid Collected					
Total Vol. Collected					113.24

POST TEST LEAK CHECKS

Meter @ _____ in. Hg
 Pitots @ _____ in. Hg
 Orsat _____

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					
Nozzle Cal	D ₁	D ₂	D ₃	Average	

NT San Marcos Cement Mill
 DATE 11/17/94
 LOCATION Carlsbad, CA
 OPERATOR R.C. JT
 SOURCE FLAZIF #2 OUTLET
 ID 3 METHOD 5
 BOX NO. 1651
 TEST BOX NO. 115
 TESTER AH @ 1908
 TIME START 1651

AMBIENT TEMPERATURE 60
 BARO. PRESS. 29.30
 ASSUMED MOISTURE, % 8
 PROBE LENGTH, in. 7' CONTINUOUS
 NOZZLE DIAMETER, in. 1.060
 STACK DIAMETER, in. 136
 PROBE HEATER SETTING VIA
 HEATER BOX SETTING VIA
 Δ Cp FACTOR 0.89
 FILTER NO. Q-35
 STATIC PRESSURE -0.07

INDEX = 250

PRE TEST LEAK CHECKS
 METER 0.013 @ 13 in. Hg
 PITOTS NA/NA @ - in. Hg
 ORSAT -

P#	TIME	T _s °F	Δ P in H ₂ O	√ Δ P	Δ H in H ₂ O	V _m ft ³	T _{m IN} °F	T _{m OUT} °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
5	1651 0.0	1605	0.013		3.2	200.192	78	66		49	4
	2.5	1620	0.013		3.2	203.020	82	66		48	4
	5.0	1597	0.013		3.2	205.380	86	67		51	4
	7.5	1604	0.013		3.2	207.730	87	68		51	4
2	10.0	1607	0.013		3.2	200.020	89	68		52	4
	12.5	1597	0.013		3.2	211.9	88	69		51	4
6	15.0	1611	0.013		3.2	218.15/213.965	83	70		52	4
5	17.5	1646	0.013		3.2	216.260	82	68		55	4
4	20.0	1638	0.013		3.2	218.500	84	69		60	4
3	22.5	1650	0.013		3.2	220.910	84	69		60	4
2	25.0	1637	0.013		3.2	223.230	85	69		59	4
1	27.5	1648	0.013		3.2	225.590	86	69		58	4
6	30.0	1636	0.013		3.2	227.870	86	69		59	4
5	32.5	1677	0.013		3.2	230.250	86	67		49	4
	35.0	1674	0.013		3.2	232.590	88	68		52	4
5	37.5	1700	0.013		3.2	235.810	88	69		56	4
2	40.0	1690	0.013		3.2	237.220	88	71		55	4
1	42.5	1677	0.013		3.2	239.530	88	70		55	4
6	45.0	1687	0.013		3.2	241.985	88	70		56	4
5	47.5	1689	0.013		3.2	244.140	85	69		52	4
4	50.0	1703	0.013		3.2	246.450	87	69		53	4
3	52.5	1662	0.013		3.2	248.760	87	70		54	4
2	55.0	1685	0.013		3.2	251.080	86	70		54	4
1	57.5	1680	0.013		3.2	253.420	85	70		53	4
Avg.	60.0	1651	0.013	0.1140	3.2	255.620	85	70		53	4

END = 1920

Volume of Liquid Water Collected	Impinger Volume					Silica Gel Wght.
	1	2	3	4	5	
Final	193	112	0			214.0
Initial	180	100	0			205.9
Liquid Collected	93	12				8.1
al Vol. Collected						172.0

113.1

POST TEST LEAK CHECKS

Meter 0.013 @ 8 in. Hg
 Pitots NA/NA @ - in. Hg
 Orsat -

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					

Nozzle Cal	D ₁	D ₂	D ₃	Average
	1.060	1.060	1.060	1.060

1.060/1.061

CHAIN OF CUSTODY RECORD

Client/Project Name SAN MARCOS LANDFILL / SD County			Project Location SAN MARCOS, CA			METHANE / ETHANAL TOTAL SPECIMEN ORGANICS GC/MS TOTAL HYDROCARBONS FID OZ SPECIAL HYDROCARBONS FID PRESERVATION REAGENT ANALYSES * include Calibration & QC					
Project No. 522-001			Field Logbook No.								
Sampler: (Signature) <i>[Signature]</i>			Chain of Custody Tape No.								

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	METHANE / ETHANAL	TOTAL SPECIMEN ORGANICS GC/MS	TOTAL HYDROCARBONS FID	OZ	SPECIAL HYDROCARBONS FID	PRESERVATION REAGENT	REMARKS
Summa #8	11/17/94		93224-23	6L Summa Canister	X	X	X	X	X	+	FLARE #2 Inlet
Summa #12			24		X	X	X	X	X	+	" " Run #2
Summa #1			25		X	X	X		X	+	FLARE #2 OUTLET
Summa #5			26		X	X	X		X	+	" Run #2
Summa #3			27		X	X	X		X	+	" Run #3

Relinquished by: (Signature) <i>[Signature]</i>		Date 11/18/94	Time 1120	Received by: (Signature) <i>[Signature]</i>		Date 11/18/94	Time 1120
Relinquished by: (Signature) ROBERT D. CARREIR <i>[Signature]</i>		Date 11/18/94	Time 14:30	Received by: (Signature)		Date	Time
Relinquished by: (Signature)		Date	Time	Received for Laboratory: (Signature) <i>[Signature]</i>		Date 11/18/94	Time 1430
Sample Disposal Method:		Disposed of by: (Signature)				Date	Time

SAMPLE COLLECTOR HORIZON AIR MEASUREMENT SERVICES 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781	ANALYTICAL LABORATORY Atm. A.A. Calabasas, CA
Nº 3139	

LABORATORY ANALYSIS REPORT
**environmental consultants
laboratory services**
Selected Components Analysis in Summa Canister Samples

Report Date: December 6, 1994
Client: Horizon
Site: San Marcos Landfill
Date Received: November 21, 1994
Date Analyzed: November (21-23, & 24), 1994

ANALYSIS DESCRIPTION

Oxygen, carbon dioxide, and methane in inlet samples were measured by thermal conductivity detection/gas chromatography (TCD/GC). Ethane and methane in outlet samples were measured by flame ionization detection/gas chromatography (FID/GC). Selected volatile organics were measured by gas chromatography/mass spec. (GC/MS) modified method TO-14.

AtmAA Lab No.:	93254-18	93254-19	93254-20	93254-21	93254-22
Sample I.D.:	Outlet Run #1	Outlet Run #2	Outlet Run #3	Inlet Run #2	Inlet Run #1
	S 4	S 6	S 7	S 10	S 11
Initial Pressure:	631.4	627.6	606	496.7	496.7
Final Pressure:	800	800	800	800	815
Components	(Concentration in ppmv)				
Oxygen	NR	NR	NR	6000	11800
Carbon Dioxide	NR	NR	NR	395000	376000
Methane	4.75	3.43	8.66	500000	473000
Ethane	0.091	0.0764	0.15	3.31	3.12
	(Concentration in ppbv)				
Benzene	0.70	5.14	0.25	2500	2220
Vinyl Chloride	<0.2	<0.2	<0.2	831	684
1,2-dibromoethane	<0.5	<0.5	<0.5	<5	<5
1,2-dichloroethane	<0.2	<0.2	<0.2	125	121
Benzyl chloride	<1	<1	<1	<20	<20
*Dichlorobenzenes	<1.1	<1.1	<1.1	2890	2600
1,1-dichloroethylene	<0.5	<0.5	<0.5	208	200
Chlorobenzene	<0.2	<0.2	<0.2	195	169
Dichloromethane	0.51	0.88	0.28	16100	15000
Perchloroethene	0.18	0.086	0.070	3620	3300
Carbon Tetrachloride	0.096	<0.06	<0.06	<5	<5
m+p- xylenes	0.48	0.38	0.13	22900	20400
o-xylene	0.36	0.17	<0.1	7960	7140
Toluene	56.4	25.3	24.0	47000	41900
1,1,1-trichloroethane	18.9	19.2	21.9	1450	1360
Trichloroethene	<0.1	<0.1	<0.1	1820	1680
Chloroform	<0.08	<0.08	<0.08	<8	<8
1,1,2,2- tetrachloroethane	<0.05	<0.05	<0.05	<5	<5
Styrene	0.079	1.27	<0.03	1740	1580

The reported oxygen concentration includes any argon present in the sample, calibration is based on a standard atmosphere containing 20.95% oxygen and 0.93% argon.

** total amount containing meta, para, and ortho isomers*

Initial and final pressures measured in mm Hg.

NR - analysis not requested

QUALITY ASSURANCE SUMMARY
(Repeat Analysis)

Site: San Marcos Landfill
Project No.: S22-001
Date Received: November 21, 1994
Date Analyzed: November (21-23 & 24), 1994

Components	Sample ID	Repeat Analysis		Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
(Concentration in ppmv)					
Oxygen	S 11	11700	11900	11800	0.85
Carbon Dioxide	S 10	395000	395000	395000	0.0
Methane	S 4	4.76	4.74	4.75	0.21
	S 10	500000	501000	500000	0.10
Ethane	S 7	0.15	0.15	0.15	0.0
(Concentration in ppbv)					
Benzene	S 4	0.84	0.56	0.70	20
Vinyl Chloride	S 4	<0.2	<0.2	—	—
1,2-dibromoethane	S 4	<0.5	<0.5	—	—
1,2-dichloroethane	S 4	<0.2	<0.2	—	—
Benzyl chloride	S 4	<1	<1	—	—
*Dichlorobenzenes	S 4	<1.1	<1.1	—	—
1,1-dichloroethylene	S 4	<0.5	<0.5	—	—
Chlorobenzene	S 4	<0.2	<0.2	—	—
Dichloromethane	S 4	0.64	0.38	0.51	25
Perchloroethene	S 4	0.25	0.12	0.18	35
Carbon Tetrachloride	S 4	0.11	0.082	0.096	15
m+p- xylenes	S 4	0.48	0.48	0.48	0.0



QUALITY ASSURANCE SUMMARY
(Repeat Analysis)
(continued)

Components	Sample ID	(Concentration in ppbv)			
		Repeat	Analysis	Mean	% Diff.
		Run #1	Run #2	Conc.	From Mean
o-xylene	S 4	0.36	0.36	0.36	0.0
Toluene	S 4	59.8	52.9	56.4	6.1
1,1,1-trichloroethane	S 4	19.5	18.3	18.9	3.2
Trichloroethene	S 4	<0.1	<0.1	—	—
Chloroform	S 4	<0.08	<0.08	—	—
1,1,2,2- tetrachloroethane	S 4	<0.05	<0.05	—	—
Styrene	S 4	0.079	<0.03	—	—

A set of 5 Summa Canister samples, laboratory numbers 93254-(18-22) was analyzed for selected components. Agreement between repeat analysis 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 13 repeat measurements from the sample set of 5 Summa Canister samples is 8.1%.





AtmAA Inc.

23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250

LABORATORY ANALYSIS REPORT

environmental consultants
laboratory services

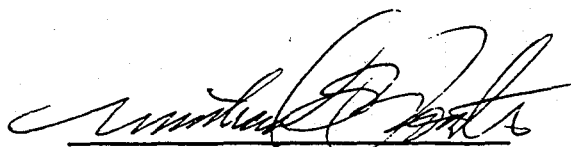
Total Gaseous Non Methane Organics Analysis by FID,
Method 25 Modified Without Catalysts

Report Date: December 6, 1994
Client: Horizon
Site: San Marcos Landfill
Date Received: November 21, 1994
Date Analyzed: November (21-23, & 24), 1994

AtmAA Lab No.:	93254-18	93254-19	93254-20	93254-21	93254-22
Sample I.D.:	Outlet	Outlet	Outlet	Inlet	Inlet
	Run #1	Run #2	Run #3	Run #2	Run #1
	S 4	S 6	S 7	S 10	S 11
Initial Pressure:	631.4	627.6	606	496.7	496.7
Final Pressure:	800	800	800	800	815

Components	(Concentration in ppmv)				
TGNMO	8.62	13.2	5.87	4510	4860

TGNMO is total gaseous non-methane organics reported as ppm methane.
Initial and final pressures measured in mm Hg.


Michael L. Porter
Laboratory Director

CHAIN OF CUSTODY RECORD

Client/Project Name SAN MARCOS LANDFILL			Project Location SAN MARCOS, CA			ANALYSES METHANE / ETHANE TOTAL SPECIFIED ORGANICS GC/MS-FID TOTAL HYDROCARBONS FID O₂ / CO₂ Hold samples after analysis with those samples out of tank on Horizon COC #3139 received by Atm. A.A. 11/18/94. Takes to					
Project No. S22-001			Field Logbook No.								
Sampler: (Signature) W.D. Alt			Chain of Custody Tape No.								

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	METHANE	ETHANE	TOTAL SPECIFIED	TOTAL HYDROCARBONS FID	O ₂ / CO ₂	REMARKS
Summa # 4	11/18/94		93254-18	6L Summa Canister	X	X	X		X	FLARE #1 Outlet Row #1
" 6			-19		X	X	X		X	" #2
" 7			-20		X	X	X		X	" #3
" 10			-21		X	X	X	X	X	FLARE #1 Inlet Row #2
" 11			-22		X	X	X	X	X	" #1

Relinquished by: (Signature) W.D. Alt		Date 11/21/94	Time 0800	Received by: (Signature) Robert Ciri		Date 11/21/94	Time 0800
Relinquished by: (Signature) Robert Ciri		Date 11/21/94	Time 13:15	Received by: (Signature)		Date	Time
Relinquished by: (Signature)		Date	Time	Received for Laboratory: (Signature) FD		Date 11-21-94	Time 13:15
Sample Disposal Method:				Disposed of by: (Signature) FD		Date	Time

SAMPLE COLLECTOR HORIZON AIR MEASUREMENT SERVICES 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781	ANALYTICAL LABORATORY Atm. A.A. Calabasas, CA
Nº 3014	

Client/Project Name SAN MARCOS LANDFILL			Project Location SAN MARCOS, CA			ANALYSES									
Project No. 922-001			Field Logbook No.												
Sampler: (Signature) <i>Ar D. R. A.</i>			Chain of Custody Tape No.												
Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	1	2	3	4	5	6	7	8	9	10	REMARKS
Summa # 4	11/18/94		93254-18	122 Summa	1.3	631.4	800								
# 6			19		1.3	627.6	800								
# 7			20		1.3	606.0	800								
# 10			21		1.3	496.7	800								
# 11			22		1.3	496.7	815								
Relinquished by: (Signature) <i>Ar D. R. A.</i>				Date 11/21/94	Time 0800	Received by: (Signature) <i>Robert Curin</i>				Date 11/21/94	Time 0800				
Relinquished by: (Signature) <i>Robert Curin</i>				Date 11/21/94	Time 13:15	Received by: (Signature)				Date	Time				
Relinquished by: (Signature)				Date	Time	Received for Laboratory: (Signature) <i>BRJ</i>				Date 11-21-94	Time 13:15				
Sample Disposal Method:				Disposed of by: (Signature)				Date	Time						
SAMPLE COLLECTOR HORIZON AIR MEASUREMENT SERVICES 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781				ANALYTICAL LABORATORY Atm. A. A. Calabasas, CA				Nº 3015							

Facility: SAN MARCOS LANDFILL

Source: Landfill Flare #2

Job No.: S22-001

Test Date: 11/16-11/17/94

DATA SHEET FOR PARTICULATE MATTER SDCAPCD METHOD 5.1-A

DATE SAMPLED: 11/16-11/17/94

RUN #1

DATE EXTRACTED: 11/21/94

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
A - FILTER CATCH	S22-01-F2-M5-PF-1	Q-712	NA	0.1628	0.1628	0.0000
FILTER BLANK	S22-01-M5-PF-FB	Q-732	NA	0.1673	0.1674	0.0001
B-WATER RINSE/IMPINGERS	S22-01-F2-M5-H2O-1	116	762	30.1522	30.1649	0.0127
WATER BLANK	S22-01-H2O-FB	121	769	28.4088	28.4089	9.91E-05
C-ACETONE RINSE	S22-01-F2-M5-ACE-1	118	707	29.9042	29.9085	0.0043
ACETONE BLANK	S22-01-ACE-FB	104	530	29.5885	29.5887	2.67E-04
TOTAL PARTICULATE	(A+B+C)					0.0170
BLANK CORRECTED						0.0165

DATE SAMPLED: 11/17/94

RUN #2

DATE EXTRACTED: 11/21/94

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
FILTER CATCH	S22-01-F2-M5-PF-2	Q-734	NA	0.1618	0.1627	0.0009
FILTER BLANK	S22-01-M5-PF-FB	Q-732	NA	0.1673	0.1674	0.0001
B-WATER RINSE/IMPINGERS	S22-01-F2-M5-H2O-2	111	756	28.1928	28.2300	0.0372
WATER BLANK	S22-01-H2O-FB	121	769	28.4088	28.4089	9.83E-05
C-ACETONE RINSE	S22-01-F2-M5-ACE-2	112	418	28.4399	28.4412	0.0013
ACETONE BLANK	S22-01-ACE-FB	104	530	29.5885	29.5887	1.58E-04
TOTAL PARTICULATE	(A+B+C)					0.0394
BLANK CORRECTED						0.0390

DATE SAMPLED: 11/17/94

RUN #3

DATE EXTRACTED: 11/21/94

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
A - FILTER CATCH	S22-01-F2-M5-PF-3	Q-715	NA	0.1627	0.1632	0.0005
	S22-01-M5-PF-FB	Q-732	NA	0.1673	0.1674	0.0001
B-WATER RINSE/IMPINGERS	S22-01-F2-M5-H2O-3	103	870	30.1446	30.1644	0.0198
WATER BLANK	S22-01-H2O-FB	121	769	28.4088	28.4089	1.13E-04
C-ACETONE RINSE	S22-01-F2-M5-ACE-3	107	828	30.2424	30.2455	0.0031
ACETONE BLANK	S22-01-ACE-FB	104	530	29.5885	29.5887	3.12E-04
TOTAL PARTICULATE	(A+B+C)					0.0234
BLANK CORRECTED						0.0229

Facility: SAN MARCOS LANDFILL

Source: Landfill Flare #1

Job No.: S22-001

Test Date: 11/18/94

DATA SHEET FOR PARTICULATE MATTER SDCAPCD METHOD 5.1-A

DATE SAMPLED: 11/18/94

RUN #1

DATE EXTRACTED: 11/21/94

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
A - FILTER CATCH	S22-01-F1-M5-PF-1	Q-733	NA	0.1633	0.1664	0.0031
FILTER BLANK	S22-01-M5-FB	Q-732	NA	0.1673	0.1674	0.0001
B-WATER RINSE/IMPINGERS	S22-01-F1-M5-H2O-1	108	615	29.8238	29.8406	0.0168
WATER BLANK	S22-01-H2O-FB	121	769	28.4088	28.4089	8.00E-05
C-ACETONE RINSE	S22-01-F1-M5-ACE-1	115	234	30.4440	30.4453	0.0013
ACETONE BLANK	S22-01-ACE-FB	104	530	29.5885	29.5887	8.83E-05
TOTAL PARTICULATE	(A+B+C)					0.0212
BLANK CORRECTED						0.0209

DATE SAMPLED: 11/18/94

RUN #3

DATE EXTRACTED: 11/21/94

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
- FILTER CATCH	S22-01-F1-M5-PF-3	Q-742	NA	0.1658	0.1668	0.0010
FILTER BLANK	S22-01-M5-PF-FB	Q-732	NA	0.1673	0.1674	0.00E+00
B-WATER RINSE/IMPINGERS	S22-01-F1-M5-H2O-3	117	526	30.2275	30.2523	0.0248
WATER BLANK	S22-01-H2O-FB	121	769	28.4088	28.4089	6.84E-05
C-ACETONE RINSE	S22-01-F1-M5-ACE-3	113	373	28.3324	28.3331	0.0007
ACETONE BLANK	S22-01-ACE-FB	104	530	29.5885	29.5887	1.41E-04
TOTAL PARTICULATE	(A+B+C)					0.0265
BLANK CORRECTED						0.0263

Client: SAN MARGOS LANDFILL

Job Number: 522-001

Date Sampled: 11/16/94 - 11/18/94

Date Extracted: 11/21/94

Pg. 1

DATE/TIME	INITIAL	AUDIT 1	AUDIT 2	FINAL	AUDIT 1	AUDIT 2	NET WT.
TEMPERATURE	11/21/94 72.7°F	11/30/94 65.1°F	11/30/94 73.2°F	11/30/94 54%	12/15/94 66.7°F		
RELATIVE HUMIDITY (%)	51%	54%		54%	54%		
CALIBRATIONS: 10 MG	500mg						
100 MG	99.9mg	99.9mg		100.2mg	100.1mg		
500 MG	500mg	500mg		500.0mg	500.0mg		
BY:	R.C.	R.C.		R.C.	R.C.		
Sample ID	Volume	Beaker/ Filler ID	Sample ID	Volume	Beaker/ Filler ID	Sample ID	Volume
522-01-F1-M5-H2O-1	615 mL	10B	522-01-F1-M5-H2O-1	615 mL	10B	522-01-F1-M5-H2O-1	615 mL
ACE-1	234	115	ACE-1	234	115	ACE-1	234
H2O-3	526	117	H2O-3	526	117	H2O-3	526
ACE-3	373	113	ACE-3	373	113	ACE-3	373
522-01-F2-M5-H2O-1	762	116	522-01-F2-M5-H2O-1	762	116	522-01-F2-M5-H2O-1	762
ACE-1	707	118	ACE-1	707	118	ACE-1	707
H2O-2	756	111	H2O-2	756	111	H2O-2	756
ACE-2	418	112	ACE-2	418	112	ACE-2	418
H2O-3	870	103	H2O-3	870	103	H2O-3	870
ACE-3	828	107	ACE-3	828	107	ACE-3	828
522-01-H2O-FB	769	767	522-01-H2O-FB	769	767	522-01-H2O-FB	769
ACE-FB	530	530	ACE-FB	530	530	ACE-FB	530

Pg 2

Date Sampled: 11/16/94

Date Extracted: 11/21/91

R-L

CHAIN OF CUSTODY RECORD

PAGE ONE OF THREE

Client/Project Name COUNTY OF SAN DIEGO/ SAN MARCOS LANDFILL			Project Location CARLSBAD, CA			ANALYSES								
Project No. 522-001			Field Logbook No. AP						SDAPCO 5					
Sampler: (Signature) M D - Rd			Chain of Custody Tape No.											
Sample No./ Identification	Date	DATE Time	Lab Sample Number	Type of Sample									REMARKS	
522-01-F2	MS-PF-1	11/16/94		FILTER	X								RUN 1 FLARE #2	
	H2O-1	↓		H2O RINSES	X								↓	
	ACE-1	↓		ACETONE RINSES	X								↓	
	PF-2	11/17/94			X								RUN 2	
	H2O-2	↓			X								↓	
	ACE-2	↓			X								↓	
	PF-3				X								RUN 3	
	H2O-3				X								↓	
Relinquished by: (Signature) M D - Rd				Date 11/21/94	Time	Received by: (Signature) Robert W.				Date 11/21/94	Time 0800			
Relinquished by: (Signature)				Date	Time	Received by: (Signature)				Date	Time			
Relinquished by: (Signature)				Date	Time	Received for Laboratory: (Signature)				Date	Time			
Sample Disposal Method:				Disposed of by: (Signature)						Date	Time			
SAMPLE COLLECTOR HORIZON AIR MEASUREMENT SERVICES 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781				ANALYTICAL LABORATORY HORIZON - IN HOUSE						No 2475				

Client/Project Name COUNTY OF SAN DIEGO/ SAN MARCOS LAZDFILL			Project Location CARLSBAD, CA			ANALYSES SDAPCD 5					
Project No. 522-001			Field Logbook No. AP								
Sampler: (Signature) <i>MLR</i>			Chain of Custody Tape No.								
Sample No./ Identification	Date	DATE Time	Lab Sample Number	Type of Sample	REMARKS						
522-01-F2	MS-AG3				X						RUD 3 FLASK #2
522-01-MS	PF-F3										FIELD FILTER
	H2O-FB										WATER
	ACE-FB										CH ₂ COCH ₃
Relinquished by: (Signature) <i>MLR</i>			Date 11/21/94	Time	Received by: (Signature) <i>Robert</i>			Date 11/21/94	Time 0800		
Relinquished by: (Signature)			Date	Time	Received by: (Signature)			Date	Time		
Relinquished by: (Signature)			Date	Time	Received for Laboratory: (Signature)			Date	Time		
Sample Disposal Method:			Disposed of by: (Signature)					Date	Time		
SAMPLE COLLECTOR HORIZON AIR MEASUREMENT SERVICES 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781				ANALYTICAL LABORATORY HORIZON - IN HOUSE							
										Nº 2476	

Client/Project Name COUNTY OF SAN DIEGO SAN MARCOS LANDFILL		Project Location SAN MARCOS, CA		ANALYSES											
Project No. S22-001		Field Logbook No.													
Sampler: (Signature) <i>[Signature]</i>		Chain of Custody Tape No.													
Sample No./ Identification	Date	DATE Time	Lab Sample Number	Type of Sample	SCAPED MATHS					ORGANIC EXTRACTION NOT REQUIRED					REMARKS
S22-01-F1-MS-FF-1		11/18/94		FILTER	X				X					Run#1 FLARE#1	
+H2O-1				H2O + Ruses	X				X						
+AC-1				ACETONE Ruse	X				X						
+PF-3					X				X					Run#3 FLARE#1	
+H2O-3					X				X						
+AC-3					X				X						
Relinquished by: (Signature) <i>[Signature]</i>				Date 11/21/94	Time 0800	Received by: (Signature) <i>[Signature]</i>				Date 11/21/94	Time 0800				
Relinquished by: (Signature)				Date	Time	Received by: (Signature)				Date	Time				
Relinquished by: (Signature)				Date	Time	Received for Laboratory: (Signature)				Date	Time				
Sample Disposal Method:				Disposed of by: (Signature)				Date				Time			
SAMPLE COLLECTOR HORIZON AIR MEASUREMENT SERVICES 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781				ANALYTICAL LABORATORY HORIZON - In House				No: 3016							

REPORT OF LABORATORY ANALYSIS

December 6, 1994

Andrew Pecaut
Horizon Air Measurement Services
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Re: PACE Project No.: CK5517
Client Reference: S22-001, San Marcos Landfill

Dear Andrew Pecaut:

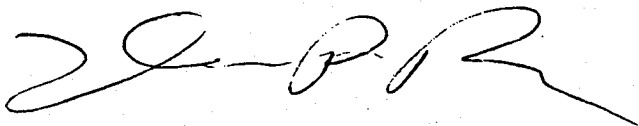
Enclosed is a report of laboratory analysis for the above referenced project. Samples were received under chain-of-custody at the Pace - Southern California Laboratory in Camarillo, California, on 11/19/94.

This report has been reviewed for accuracy and completeness and conforms to your analytical requirements.

If you have any questions regarding this report, require sampling supplies, field services or information on our analytical services, please call me at (805) 389-1353.

Sincerely,

Pace, Inc. - Southern California Laboratory



David P. Ravani
Project Manager

This Cover Page is an integral part of the Analytical Report



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

CLIENT: Andrew Pecaut
Horizon Air Measurement Services
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Lab Number : CK-5517-1
Project : S22-001, San Marcos
Landfill
Analyzed : 11/23/94
Analyzed by: JY
Method : EPA 624

REPORT OF ANALYTICAL RESULTS

Page 1 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-A	Aqueous	Andrew Pecaut	11/17/94	11/19/94

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Volatile Organics by GC/MS				
Acetone	(67641)	200.	ND	1
Acrolein	(107028)	4000.	ND	
Acrylonitrile	(107131)	4000.	ND	
Benzene	(71432)	40.	ND	
Bromodichloromethane	(75274)	40.	ND	
Bromoform	(75252)	40.	ND	
Bromomethane (Methyl bromide)	(74839)	40.	ND	
2-Butanone (MEK)	(78933)	400.	ND	
Carbon disulfide	(75150)	40.	ND	
Carbon tetrachloride	(56235)	40.	ND	
Chlorobenzene	(108907)	40.	ND	
Chloroethane (Ethyl chloride)	(75003)	40.	ND	
2-Chloroethyl vinyl ether	(110758)	80.	ND	
Chloroform	(67663)	40.	ND	
Chloromethane (Methyl chloride)	(74873)	40.	ND	
Dibromochloromethane	(124481)	40.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) High concentration of some analytes caused the sample to be run diluted resulting in raised Practical Quantitation Limits (PQL's) for analytes. Refer to the blank for undiluted PQL's.

12/06/94
MSD7/CS788
DI/eicmo(dw)/yl
CK55171327V



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

CLIENT: Andrew Pecaut
Horizon Air Measurement Services
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Lab Number : CK-5517-1
Project : S22-001, San Marcos
Landfill
Analyzed : 11/23/94
Analyzed by: JY
Method : EPA 624

REPORT OF ANALYTICAL RESULTS

Page 2 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-A	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Dibromomethane	(74953)	40.	ND	
1,2-Dibromoethane (EDB)	(106934)	40.	ND	
1,4-Dichloro-2-butene	(764410)	40.	ND	
Dichlorodifluoromethane (Freon 12)	(75718)	40.	ND	
1,1-Dichloroethane	(75343)	40.	ND	
1,2-Dichloroethane (EDC)	(107062)	40.	ND	
1,1-Dichloroethene	(75354)	40.	ND	
cis-1,2-Dichloroethene	(156592)	40.	ND	
trans-1,2-Dichloroethene	(156605)	40.	ND	
1,2-Dichloropropane	(78875)	40.	ND	
cis-1,3-Dichloropropene	(10061015)	40.	ND	
trans-1,3-Dichloropropene	(10061026)	40.	ND	
Ethylbenzene	(100414)	40.	320.	
Ethyl methacrylate	(97632)	400.	ND	
2-Hexanone	(591786)	400.	ND	
Iodomethane	(74884)	40.	ND	
Methylene chloride	(75092)	80.	260.	
4-Methyl-2-pentanone (MIBK)	(108101)	200.	ND	
Styrene	(100425)	40.	ND	
1,1,2,2-Tetrachloroethane	(79345)	40.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD7/CS788
DI/eicmo(dw)/yl
CK55171327V



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

CLIENT: Andrew Pecaut
Horizon Air Measurement Services
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Lab Number : CK-5517-2
Project : S22-001, San Marcos
Landfill
Analyzed : 11/23/94
Analyzed by: JY
Method : EPA 624

REPORT OF ANALYTICAL RESULTS

Page 1 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-B	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Volatile Organics by GC/MS				1,2
Acetone	(67641)	200.	ND	
Acrolein	(107028)	4000.	ND	
Acrylonitrile	(107131)	4000.	ND	
Benzene	(71432)	40.	ND	
Bromodichloromethane	(75274)	40.	ND	
Bromoform	(75252)	40.	ND	
Bromomethane (Methyl bromide)	(74839)	40.	ND	
2-Butanone (MEK)	(78933)	400.	ND	
Carbon disulfide	(75150)	40.	ND	
Carbon tetrachloride	(56235)	40.	ND	
Chlorobenzene	(108907)	40.	ND	
Chloroethane (Ethyl chloride)	(75003)	40.	ND	
2-Chloroethyl vinyl ether	(110758)	80.	ND	
Chloroform	(67663)	40.	ND	
Chloromethane (Methyl chloride)	(74873)	40.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) High recovery for 1,2-dichloroethane-d4 is attributed to the matrix.
(2) High concentration of some analytes caused the sample to be run diluted resulting in raised Practical Quantitation Limits (PQL's) for analytes. Refer to the blank for undiluted PQL's.

12/06/94
MSD7/CS786
DI/eiei/yl
CK55171327V



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

CLIENT: Andrew Pecaut
Horizon Air Measurement Services
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Lab Number : CK-5517-2
Project : S22-001, San Marcos
Landfill
Analyzed : 11/23/94
Analyzed by: JY
Method : EPA 624

REPORT OF ANALYTICAL RESULTS

Page 2 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-B	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Dibromochloromethane	(124481)	40.	ND	
Dibromomethane	(74953)	40.	ND	
1,2-Dibromoethane (EDB)	(106934)	40.	ND	
1,4-Dichloro-2-butene	(764410)	40.	ND	
Dichlorodifluoromethane (Freon 12)	(75718)	40.	ND	
1,1-Dichloroethane	(75343)	40.	ND	
1,2-Dichloroethane (EDC)	(107062)	40.	ND	
1,1-Dichloroethene	(75354)	40.	ND	
cis-1,2-Dichloroethene	(156592)	40.	ND	
trans-1,2-Dichloroethene	(156605)	40.	ND	
1,2-Dichloropropane	(78875)	40.	ND	
cis-1,3-Dichloropropene	(10061015)	40.	ND	
trans-1,3-Dichloropropene	(10061026)	40.	ND	
Ethylbenzene	(100414)	40.	350.	
Ethyl methacrylate	(97632)	400.	ND	
2-Hexanone	(591786)	400.	ND	
Iodomethane	(74884)	40.	ND	
Methylene chloride	(75092)	80.	280.	
4-Methyl-2-pentanone (MIBK)	(108101)	200.	ND	
Styrene	(100425)	40.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD7/CS786
DI/eiei/yl
CK55171327V



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

CLIENT: Andrew Pecaut
Horizon Air Measurement Services
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Lab Number : CK-5517-2
Project : S22-001, San Marcos
Landfill
Analyzed : 11/23/94
Analyzed by: JY
Method : EPA 624

REPORT OF ANALYTICAL RESULTS

Page 3 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-B	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
1,1,2,2-Tetrachloroethane	(79345)	40.	ND	
Tetrachloroethene (PCE)	(127184)	40.	ND	
Toluene	(108883)	40.	810.	
1,1,1-Trichloroethane (TCA)	(71556)	40.	ND	
1,1,2-Trichloroethane	(79005)	40.	ND	
Trichloroethene (TCE)	(79016)	40.	ND	
Trichlorofluoromethane (Freon 11)	(75694)	40.	ND	
1,2,3-Trichloropropane	(96184)	40.	ND	
Vinyl acetate	(108054)	400.	ND	
Vinyl chloride	(75014)	40.	ND	
Xylenes	(1330207)	40.	1100.	
1,2-Dichlorobenzene	(95501)	40.	ND	
1,3-Dichlorobenzene	(541731)	40.	ND	
1,4-Dichlorobenzene	(106467)	40.	270.	
Hexachlorobutadiene	(87683)	40.	ND	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	(76131)	40.	ND	
1,2-Dichloroethane-d4 spike level		30.	35.	
1,2-Dichloroethane-d4 (Surrogate Percent Recovery)			117.	
Toluene-d8 spike level		30.	29.	
Toluene-d8 (Surrogate Percent Recovery)			97.	
p-Bromofluorobenzene spike level		30.	30.	
p-Bromofluorobenzene (Surrogate Percent Recovery)			100.	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
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DI/eiei/yl
CK55171327V



REPORT OF LABORATORY ANALYSIS

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Lab Number : CK-5517-3
Project : S22-001, San Marcos
Landfill
Analyzed : 11/23/94
Analyzed by: JY
Method : EPA 624

REPORT OF ANALYTICAL RESULTS

Page 1 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-C	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Volatile Organics by GC/MS				1
Acetone	(67641)	200.	ND	
Acrolein	(107028)	4000.	ND	
Acrylonitrile	(107131)	4000.	ND	
Benzene	(71432)	40.	ND	
Bromodichloromethane	(75274)	40.	ND	
Bromoform	(75252)	40.	ND	
Bromomethane (Methyl bromide)	(74839)	40.	ND	
2-Butanone (MEK)	(78933)	400.	ND	
Carbon disulfide	(75150)	40.	ND	
Carbon tetrachloride	(56235)	40.	ND	
Chlorobenzene	(108907)	40.	ND	
Chloroethane (Ethyl chloride)	(75003)	40.	ND	
2-Chloroethyl vinyl ether	(110758)	80.	ND	
Chloroform	(67663)	40.	ND	
Chloromethane (Methyl chloride)	(74873)	40.	ND	
Dibromochloromethane	(124481)	40.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) High concentration of some analytes caused the sample to be run diluted resulting in raised Practical Quantitation Limits (PQL's) for analytes. Refer to the blank for undiluted PQL's.

12/06/94
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REPORT OF LABORATORY ANALYSIS

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Lab Number : CK-5517-3
Project : S22-001, San Marcos
Landfill
Analyzed : 11/23/94
Analyzed by: JY
Method : EPA 624

REPORT OF ANALYTICAL RESULTS

Page 2 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-C	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Dibromomethane	(74953)	40.	ND	
1,2-Dibromoethane (EDB)	(106934)	40.	ND	
1,4-Dichloro-2-butene	(764410)	40.	ND	
Dichlorodifluoromethane (Freon 12)	(75718)	40.	ND	
1,1-Dichloroethane	(75343)	40.	ND	
1,2-Dichloroethane (EDC)	(107062)	40.	ND	
1,1-Dichloroethene	(75354)	40.	ND	
cis-1,2-Dichloroethene	(156592)	40.	ND	
trans-1,2-Dichloroethene	(156605)	40.	ND	
1,2-Dichloropropane	(78875)	40.	ND	
cis-1,3-Dichloropropene	(10061015)	40.	ND	
trans-1,3-Dichloropropene	(10061026)	40.	ND	
Ethylbenzene	(100414)	40.	340.	
Ethyl methacrylate	(97632)	400.	ND	
2-Hexanone	(591786)	400.	ND	
Iodomethane	(74884)	40.	ND	
Methylene chloride	(75092)	80.	290.	
4-Methyl-2-pentanone (MIBK)	(108101)	200.	ND	
Styrene	(100425)	40.	ND	
1,1,2,2-Tetrachloroethane	(79345)	40.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

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Project : S22-001, San Marcos
Landfill
Analyzed : 11/23/94
Analyzed by: JY
Method : EPA 624

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-C	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Tetrachloroethene (PCE)	(127184)	40.	ND	
Toluene	(108883)	40.	800.	
1,1,1-Trichloroethane (TCA)	(71556)	40.	ND	
1,1,2-Trichloroethane	(79005)	40.	ND	
Trichloroethene (TCE)	(79016)	40.	ND	
Trichlorofluoromethane (Freon 11)	(75694)	40.	ND	
1,2,3-Trichloropropane	(96184)	40.	ND	
Vinyl acetate	(108054)	400.	ND	
Vinyl chloride	(75014)	40.	ND	
Xylenes	(1330207)	40.	1000.	
1,2-Dichlorobenzene	(95501)	40.	ND	
1,3-Dichlorobenzene	(541731)	40.	ND	
1,4-Dichlorobenzene	(106467)	40.	250.	
Hexachlorobutadiene	(87683)	40.	ND	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	(76131)	40.	ND	
1,2-Dichloroethane-d4 spike level		30.	31.	
1,2-Dichloroethane-d4 (Surrogate Percent Recovery)			104.	
Toluene-d8 spike level		30.	29.	
Toluene-d8 (Surrogate Percent Recovery)			98.	
p-Bromofluorobenzene spike level		30.	29.	
p-Bromofluorobenzene (Surrogate Percent Recovery)			98.	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
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CK55171327V



REPORT OF LABORATORY ANALYSIS

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Lab Number : CK-5517-1
Project : S22-001, San Marcos
Landfill
Analyzed : 12/01/94
Analyzed by: LC
Method : EPA 625

REPORT OF ANALYTICAL RESULTS

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SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-A	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
SVOA PRIORITY POLLUTANTS				1,2,3
Acenaphthylene	(208968)	500.	ND	
Acenaphthene	(83329)	500.	ND	
Anthracene	(120127)	500.	ND	
Benzidine	(92875)	1000.	ND	
Benz(a)anthracene	(56553)	500.	ND	
Benzo(b)fluoranthene	(205992)	500.	ND	
Benzo(k)fluoranthene	(207089)	500.	ND	
Benzo(a)pyrene	(50328)	1000.	ND	
Benzo(ghi)perylene	(191242)	1000.	ND	
Bis(2-chloroethoxy)methane	(111911)	500.	ND	
Bis(2-chloroethyl)ether	(111444)	500.	ND	
Bis(2-chloroisopropyl)ether	(39638329)	500.	ND	
Bis(2-ethylhexyl)phthalate	(117817)	1000.	ND	
4-Bromophenylphenylether	(101553)	500.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 11/21/94 by EKB using EPA 625
(2) Surrogates were not recovered due to sample dilution.
(3) High concentration of some non-target analytes caused the sample to be run diluted
resulting in raised Practical Quantitation Limits (PQL's) for analytes. Refer to the
method blank for undiluted PQL's.

12/06/94
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Lab Number : CK-5517-1
Project : S22-001, San Marcos
Landfill
Analyzed : 12/01/94
Analyzed by: LC
Method : EPA 625

REPORT OF ANALYTICAL RESULTS

Page 2 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-A	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Butylbenzylphthalate	(85687)	500.	ND	
2-Chloronaphthalene	(91587)	500.	ND	
4-Chlorophenylphenylether	(7005723)	500.	ND	
Chrysene	(218019)	500.	ND	
Dibenz(a,h)anthracene	(53703)	1000.	ND	
Di-n-butylphthalate	(84742)	500.	ND	
1,2-Dichlorobenzene	(95501)	500.	ND	
1,3-Dichlorobenzene	(541731)	500.	ND	
1,4-Dichlorobenzene	(106467)	500.	ND	
3,3-Dichlorobenzidine	(91941)	1000.	ND	
Diethylphthalate	(84662)	500.	ND	
Dimethylphthalate	(131113)	1000.	ND	
2,4-Dinitrotoluene	(121142)	1000.	ND	
2,6-Dinitrotoluene	(606202)	1000.	ND	
1,2-Diphenylhydrazine (as Azobenzene)	(122667)	2000.	ND	
Di-n-octylphthalate	(117840)	1000.	ND	
Fluoranthene	(206440)	500.	ND	
Fluorene	(86737)	500.	ND	
Hexachlorobenzene	(118741)	500.	ND	
Hexachlorobutadiene	(87683)	500.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

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Landfill
Analyzed : 12/01/94
Analyzed by: LC
Method : EPA 625

REPORT OF ANALYTICAL RESULTS

Page 3 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-A	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Hexachlorocyclopentadiene	(77474)	1000.	ND	
Hexachloroethane	(67721)	500.	ND	
Indeno(1,2,3-cd)pyrene	(193395)	1000.	ND	
Isophorone	(78591)	500.	ND	
Naphthalene	(91203)	500.	ND	
Nitrobenzene	(98953)	500.	ND	
N-Nitrosodimethylamine	(62759)	1000.	ND	
N-Nitrosodiphenylamine	(86306)	1000.	ND	
N-Nitrosodi-n-propylamine	(621647)	1000.	ND	
Phenanthrene	(85018)	500.	ND	
Pyrene	(129000)	500.	ND	
1,2,4-Trichlorobenzene	(108703)	500.	ND	
4-Chloro-3-methylphenol	(59507)	1000.	ND	
2-Chlorophenol	(95578)	1000.	ND	
2,4-Dichlorophenol	(120832)	1000.	ND	
2,4-Dimethylphenol	(105679)	1000.	ND	
2,4-Dinitrophenol	(51285)	1000.	ND	
2-Methyl-4,6-dinitrophenol	(534521)	1000.	ND	
2-Nitrophenol	(88755)	1000.	ND	
4-Nitrophenol	(100027)	1000.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/120103A
DET/edtcmo(dw)/lc
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REPORT OF LABORATORY ANALYSIS

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Lab Number : CK-5517-1
Project : S22-001, San Marcos
Landfill
Analyzed : 12/01/94
Analyzed by: LC
Method : EPA 625

REPORT OF ANALYTICAL RESULTS

Page 4 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-A	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Pentachlorophenol	(87865)	1000.	ND	
Phenol	(108952)	500.	2200.	
2,4,6-Trichlorophenol	(88062)	1000.	ND	
2-Methylphenol	(95487)	1000.	ND	
3- and 4-Methylphenol	(106445)	1000.	3500.	
Methylnaphthalenes		500.	ND	
Nitrobenzene-d5 spike level		10000.	ND	
2-Fluorobiphenyl spike level			ND	
4-Terphenyl-d14 spike level			ND	
Phenol-d5 spike level			ND	
2-Fluorophenol spike level			ND	
2,4,6-Tribromophenol spike level			ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/120103A
DET/edtcmo(dw)/lc
BNAW-017



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Lab Number : CK-5517-2
Project : S22-001, San Marcos
Landfill
Analyzed : 12/01/94
Analyzed by: LC
Method : EPA 625

REPORT OF ANALYTICAL RESULTS

Page 1 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-B	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
SVOA PRIORITY POLLUTANTS				1,2,3
Acenaphthylene	(208968)	1000.	ND	
Acenaphthene	(83329)	1000.	ND	
Anthracene	(120127)	1000.	ND	
Benzidine	(92875)	2000.	ND	
Benz(a)anthracene	(56553)	1000.	ND	
Benzo(b)fluoranthene	(205992)	1000.	ND	
Benzo(k)fluoranthene	(207089)	1000.	ND	
Benzo(a)pyrene	(50328)	2000.	ND	
Benzo(ghi)perylene	(191242)	2000.	ND	
Bis(2-chloroethoxy)methane	(111911)	1000.	ND	
Bis(2-chloroethyl) ether	(111444)	1000.	ND	
Bis(2-chloroisopropyl) ether	(39638329)	1000.	ND	
Bis(2-ethylhexyl)phthalate	(117817)	2000.	ND	
4-Bromophenylphenylether	(101553)	1000.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2IA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 11/22/94 by AL using EPA 625
(2) Surrogates were not recovered due to sample dilution.
(3) High concentration of some non-target analytes caused the sample to be run diluted
resulting in raised Practical Quantitation Limits (PQL's) for analytes. Refer to the
method blank for undiluted PQL's.

12/06/94
MSD8/120104A
DET/edtedt/lc
BNAW-018



REPORT OF LABORATORY ANALYSIS

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996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Lab Number : CK-5517-2
Project : S22-001, San Marcos
Landfill
Analyzed : 12/01/94
Analyzed by: LC
Method : EPA 625

REPORT OF ANALYTICAL RESULTS

Page 2 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-B	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Butylbenzylphthalate	(85687)	1000.	ND	
2-Chloronaphthalene	(91587)	1000.	ND	
4-Chlorophenylphenylether	(7005723)	1000.	ND	
Chrysene	(218019)	1000.	ND	
Dibenz (a, h) anthracene	(53703)	2000.	ND	
Di-n-butylphthalate	(84742)	1000.	ND	
1,2-Dichlorobenzene	(95501)	1000.	ND	
1,3-Dichlorobenzene	(541731)	1000.	ND	
1,4-Dichlorobenzene	(106467)	1000.	ND	
3,3-Dichlorobenzidine	(91941)	2000.	ND	
Diethylphthalate	(84662)	1000.	ND	
Dimethylphthalate	(131113)	2000.	ND	
2,4-Dinitrotoluene	(121142)	2000.	ND	
2,6-Dinitrotoluene	(606202)	2000.	ND	
Di-n-octylphthalate	(117840)	2000.	ND	
1,2-Diphenylhydrazine (as Azobenzene)	(122667)	4000.	ND	
Fluoranthene	(206440)	1000.	ND	
Fluorene	(86737)	1000.	ND	
Hexachlorobenzene	(118741)	1000.	ND	
Hexachlorobutadiene	(87683)	1000.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

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REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

CLIENT: Andrew Pecaut
Horizon Air Measurement Services
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Lab Number : CK-5517-2
Project : S22-001, San Marcos
Landfill
Analyzed : 12/01/94
Analyzed by: LC
Method : EPA 625

REPORT OF ANALYTICAL RESULTS

Page 3 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-B	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
Hexachlorocyclopentadiene	(77474)	2000.	ND	
Hexachloroethane	(67721)	1000.	ND	
Indeno(1,2,3-cd)pyrene	(193395)	2000.	ND	
Isophorone	(78591)	1000.	ND	
Naphthalene	(91203)	1000.	ND	
Nitrobenzene	(98953)	1000.	ND	
N-Nitrosodimethylamine	(62759)	2000.	ND	
N-Nitrosodiphenylamine	(86306)	2000.	ND	
N-Nitrosodi-n-propylamine	(621647)	2000.	ND	
Phenanthrene	(85018)	1000.	ND	
Pyrene	(129000)	1000.	ND	
1,2,4-Trichlorobenzene	(108703)	1000.	ND	
4-Chloro-3-methylphenol	(59507)	2000.	ND	
2-Chlorophenol	(95578)	2000.	ND	
2,4-Dichlorophenol	(120832)	2000.	ND	
2,4-Dimethylphenol	(105679)	2000.	ND	
2,4-Dinitrophenol	(51285)	2000.	ND	
2-Methyl-4,6-dinitrophenol	(534521)	2000.	ND	
2-Nitrophenol	(88755)	2000.	ND	
4-Nitrophenol	(100027)	2000.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/120104A
DET/edtedt/lc
BNAW-018



REPORT OF LABORATORY ANALYSIS

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Lab Number : CK-5517-2
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Landfill
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REPORT OF ANALYTICAL RESULTS

Page 4 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-B	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL μg/L	RESULT μg/L	NOTE
Pentachlorophenol	(87865)	2000.	ND	
Phenol	(108952)	1000.	3500.	
2,4,6-Trichlorophenol	(88062)	2000.	ND	
2-Methylphenol	(95487)	2000.	ND	
3- and 4-Methylphenol	(106445)	2000.	3000.	
Methylnaphthalenes		1000.	ND	
Nitrobenzene-d5 spike level			ND	
2-Fluorobiphenyl spike level			ND	
4-Terphenyl-d14 spike level			ND	
Phenol-d5 spike level			ND	
2-Fluorophenol spike level			ND	
2,4,6-Tribromophenol spike level			ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/120104A
DET/edtedt/lc
BNAW-018



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
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CLIENT: Andrew Pecaut
Horizon Air Measurement Services
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320

Lab Number : CK-5517-3
Project : S22-001, San Marcos
Landfill
Analyzed : 12/05/94
Analyzed by: LC
Method : EPA 625

REPORT OF ANALYTICAL RESULTS

Page 1 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	RECEIVED
LFGC-C	Aqueous	Andrew Pecaut	11/17/94	11/19/94
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
SVOA PRIORITY POLLUTANTS				1,2,3
Acenaphthylene	(208968)	1000.	ND	
Acenaphthene	(83329)	1000.	ND	
Anthracene	(120127)	1000.	ND	
Benzidine	(92875)	2000.	ND	
Benz (a) anthracene	(56553)	1000.	ND	
Benzo (b) fluoranthene	(205992)	1000.	ND	
Benzo (k) fluoranthene	(207089)	1000.	ND	
Benzo (a) pyrene	(50328)	2000.	ND	
Benzo (ghi) perylene	(191242)	2000.	ND	
Bis (2-chloroethoxy) methane	(111911)	1000.	ND	
Bis (2-chloroethyl) ether	(111444)	1000.	ND	
Bis (2-chloroisopropyl) ether	(39638329)	1000.	ND	
Bis (2-ethylhexyl) phthalate	(117817)	2000.	ND	
4-Bromophenylphenylether	(101553)	1000.	ND	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 11/22/94 by AL using EPA 625
(2) Surrogates were not recovered due to sample dilution.
(3) High concentration of some non-target analytes caused the sample to be run diluted
resulting in raised Practical Quantitation Limits (PQL's) for analytes. Refer to the
method blank for undiluted PQL's.

12/06/94
MSD8/120506A
DET/edtedt
BNAW-018



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
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QC Batch ID: BNAW-018

CLIENT: PACE Incorporated

Analyzed : 12/01/94
Analyzed by: LC
Method : EPA 625

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

Page 2 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED		
METHOD BLANK	Aqueous				
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE	
1,3-Dichlorobenzene	(541731)	5.	ND		
1,4-Dichlorobenzene	(106467)	5.	ND		
3,3-Dichlorobenzidine	(91941)	10.	ND		
Diethylphthalate	(84662)	5.	ND		
Dimethylphthalate	(131113)	10.	ND		
2,4-Dinitrotoluene	(121142)	10.	ND		
2,6-Dinitrotoluene	(606202)	10.	ND		
Di-n-octylphthalate	(117840)	10.	ND		
1,2-Diphenylhydrazine (as Azobenzene)	(122667)	20.	ND		
Fluoranthene	(206440)	5.	ND		
Fluorene	(86737)	5.	ND		
Hexachlorobenzene	(118741)	5.	ND		
Hexachlorobutadiene	(87683)	5.	ND		
Hexachlorocyclopentadiene	(77474)	10.	ND		
Hexachloroethane	(67721)	5.	ND		
Indeno (1,2,3-cd) pyrene	(193395)	10.	ND		
Isophorone	(78591)	5.	ND		
Naphthalene	(91203)	5.	ND		
Nitrobenzene	(98953)	5.	ND		
N-Nitrosodimethylamine	(62759)	10.	ND		
N-Nitrosodiphenylamine	(86306)	10.	ND		
N-Nitrosodi-n-propylamine	(621647)	10.	ND		
Phenanthrene	(85018)	5.	ND		

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/113018A
DET/edtedt/lc
CK5517-2



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
4765 Calle Quetzal, Camarillo, California 93012

(805) 389-1353
FAX (805) 389-1438

QC Batch ID: BNAW-018

CLIENT: PACE Incorporated

Analyzed : 12/01/94
Analyzed by: LC
Method : EPA 625

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

Page 3 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED		
METHOD BLANK	Aqueous				
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE	
Pyrene	(129000)	5.	ND		
1,2,4-Trichlorobenzene	(108703)	5.	ND		
4-Chloro-3-methylphenol	(59507)	10.	ND		
2-Chlorophenol	(95578)	10.	ND		
2,4-Dichlorophenol	(120832)	10.	ND		
2,4-Dimethylphenol	(105679)	10.	ND		
2,4-Dinitrophenol	(51285)	10.	ND		
2-Methyl-4,6-dinitrophenol	(534521)	10.	ND		
2-Nitrophenol	(88755)	10.	ND		
4-Nitrophenol	(100027)	10.	ND		
Pentachlorophenol	(87865)	10.	ND		
Phenol	(108952)	5.	ND		
2,4,6-Trichlorophenol	(88062)	10.	ND		
2-Methylphenol	(95487)	10.	ND		
3- and 4-Methylphenol	(106445)	10.	ND		
Methylnaphthalenes		5.	ND		
Nitrobenzene-d5 spike level		100.	73.3		
2-Fluorobiphenyl spike level		100.	74.4		
4-Terphenyl-d14 spike level		100.	85.3		
Phenol-d5 spike level		200.	94.9		
2-Fluorophenol spike level		200.	128.		
2,4,6-Tribromophenol spike level		200.	128.		

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
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12/06/94
MSD8/113018A
DET/edtedt/lc
CK5517-2



REPORT OF LABORATORY ANALYSIS

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QC Batch ID: BNAW-018

CLIENT: PACE Incorporated

Analyzed : 12/01/94
Analyzed by: LC
Method : EPA 625

INSTRUMENT BLANK
REPORT OF ANALYTICAL RESULTS

Page 1 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED		
INSTRUMENT BLANK			Aqueous		
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE	
SVOA PRIORITY POLLUTANTS					
Acenaphthylene	(208968)	5.	ND		
Acenaphthene	(83329)	5.	ND		
Anthracene	(120127)	5.	ND		
Benzidine	(92875)	10.	ND		
Benz (a) anthracene	(56553)	5.	ND		
Benzo (b) fluoranthene	(205992)	5.	ND		
Benzo (k) fluoranthene	(207089)	5.	ND		
Benzo (a) pyrene	(50328)	10.	ND		
Benzo (ghi) perylene	(191242)	10.	ND		
Bis (2-chloroethoxy) methane	(111911)	5.	ND		
Bis (2-chloroethyl) ether	(111444)	5.	ND		
Bis (2-chloroisopropyl) ether	(39638329)	5.	ND		
Bis (2-ethylhexyl) phthalate	(117817)	10.	ND		
4-Bromophenylphenylether	(101553)	5.	ND		
Butylbenzylphthalate	(85687)	5.	ND		
2-Chloronaphthalene	(91587)	5.	ND		
4-Chlorophenylphenylether	(7005723)	5.	ND		
Chrysene	(218019)	5.	ND		
Dibenz (a,h) anthracene	(53703)	10.	ND		
Di-n-butylphthalate	(84742)	5.	ND		
1,2-Dichlorobenzene	(95501)	5.	ND		
1,3-Dichlorobenzene	(541731)	5.	ND		

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
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12/06/94
MSD8/120102A
DET/edtedt/lc
CK5517-2



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
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(805) 389-1353
FAX (805) 389-1438

QC Batch ID: BNAW-018

CLIENT: PACE Incorporated

Analyzed : 12/01/94
Analyzed by: LC
Method : EPA 625

INSTRUMENT BLANK
REPORT OF ANALYTICAL RESULTS

Page 2 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED		
INSTRUMENT BLANK	Aqueous				
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE	
1,4-Dichlorobenzene	(106467)	5.	ND		
3,3-Dichlorobenzidine	(91941)	10.	ND		
Diethylphthalate	(84662)	5.	ND		
Dimethylphthalate	(131113)	10.	ND		
2,4-Dinitrotoluene	(121142)	10.	ND		
2,6-Dinitrotoluene	(606202)	10.	ND		
Di-n-octylphthalate	(117840)	10.	ND		
1,2-Diphenylhydrazine (as Azobenzene)	(122667)	20.	ND		
Fluoranthene	(206440)	5.	ND		
Fluorene	(86737)	5.	ND		
Hexachlorobenzene	(118741)	5.	ND		
Hexachlorobutadiene	(87683)	5.	ND		
Hexachlorocyclopentadiene	(77474)	10.	ND		
Hexachloroethane	(67721)	5.	ND		
Indeno (1,2,3-cd) pyrene	(193395)	10.	ND		
Isophorone	(78591)	5.	ND		
Naphthalene	(91203)	5.	ND		
Nitrobenzene	(98953)	5.	ND		
N-Nitrosodimethylamine	(62759)	10.	ND		
N-Nitrosodiphenylamine	(86306)	10.	ND		
N-Nitrosodi-n-propylamine	(621647)	10.	ND		
Phenanthrene	(85018)	5.	ND		
Pyrene	(129000)	5.	ND		

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2IA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/120102A
DET/edtedt/lc
CK5517-2



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QC Batch ID: BNAW-018

CLIENT: PACE Incorporated

Analyzed : 12/01/94
Analyzed by: LC
Method : EPA 625

INSTRUMENT BLANK
REPORT OF ANALYTICAL RESULTS

Page 3 of 3

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED		
INSTRUMENT BLANK	Aqueous				
CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE	
1,2,4-Trichlorobenzene	(108703)	5.	ND		
4-Chloro-3-methylphenol	(59507)	10.	ND		
2-Chlorophenol	(95578)	10.	ND		
2,4-Dichlorophenol	(120832)	10.	ND		
2,4-Dimethylphenol	(105679)	10.	ND		
2,4-Dinitrophenol	(51285)	10.	ND		
2-Methyl-4,6-dinitrophenol	(534521)	10.	ND		
2-Nitrophenol	(88755)	10.	ND		
4-Nitrophenol	(100027)	10.	ND		
Pentachlorophenol	(87865)	10.	ND		
Phenol	(108952)	5.	ND		
2,4,6-Trichlorophenol	(88062)	10.	ND		
2-Methylphenol	(95487)	10.	ND		
3- and 4-Methylphenol	(106445)	10.	ND		
Methylnaphthalenes		5.	ND		

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

12/06/94
MSD8/120102A
DET/edtedt/lc
CK5517-2



REPORT OF LABORATORY ANALYSIS

Southern California Laboratory
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(805) 389-1353
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QC Batch ID: BNAW-018

CLIENT: PACE Incorporated

Analyzed : 11/30/94
Analyzed by: LC
Method : EPA 625

QC SPIKE
REPORT OF ANALYTICAL RESULTS

Page 1 of 1

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED			
QC SPIKE	Aqueous					
CONSTITUENT	*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	NOTE	
SVQA PRIORITY POLLUTANTS					1	
Acenaphthene	5.	100.	62.6	63.		
1,4-Dichlorobenzene	5.	100.	56.0	56.		
2,4-Dinitrotoluene	10.	100.	49.1	49.		
N-Nitrosodi-n-propylamine	10.	100.	69.4	69.		
Pyrene	5.	100.	67.8	68.		
1,2,4-Trichlorobenzene	5.	100.	56.4	56.		
4-Chloro-3-methylphenol	10.	200.	76.8	38.		
2-Chlorophenol	10.	200.	105.	53.		
4-Nitrophenol	10.	200.	81.6	41.		
Pentachlorophenol	10.	200.	91.6	46.		
Phenol	5.	200.	95.8	48.		
Nitrobenzene-d5 spike level	100.	100.	68.0	68.		
2-Fluorobiphenyl spike level	100.	100.	69.0	69.		
4-Terphenyl-d14 spike level	100.	100.	77.6	78.		
Phenol-d5 spike level	200.	200.	46.0	23.		
2-Fluorophenol spike level	200.	200.	123.	62.		
2,4,6-Tribromophenol spike level	200.	200.	129.	65.		

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 11/22/94 by AL using EPA 625

12/06/94
MSD8/113016A
DET/editedt/lc
CK5517-2



REPORT OF LABORATORY ANALYSIS

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(805) 389-1353
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QC Batch ID: BNAW-018

CLIENT: PACE Incorporated

Analyzed : 12/01/94
Analyzed by: LC
Method : EPA 625

QC SPIKE
REPORT OF ANALYTICAL RESULTS

Page 1 of 1

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED			
QC SPIKE DUPLICATE	Aqueous					
CONSTITUENT	*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	%DIFF	NOTE
SVQA PRIORITY POLLUTANTS						
Acenaphthene	5.	100.	63.2	63.	0.95	1
1,4-Dichlorobenzene	5.	100.	56.6	57.	1.1	
2,4-Dinitrotoluene	10.	100.	55.4	55.	12.	
N-Nitrosodi-n-propylamine	10.	100.	67.0	67.	3.5	
Pyrene	5.	100.	70.0	70.	3.2	
1,2,4-Trichlorobenzene	5.	100.	56.2	56.	0.36	
4-Chloro-3-methylphenol	10.	200.	101.	51.	27.	
2-Chlorophenol	10.	200.	120.	60.	13.	
4-Nitrophenol	10.	200.	89.6	45.	9.3	
Pentachlorophenol	10.	200.	110.	55.	18.	
Phenol	5.	200.	88.6	44.	7.8	
Nitrobenzene-d5 spike level	100.	100.	67.1	67.	1.3	
2-Fluorobiphenyl spike level	100.	100.	70.4	70.	2.	
4-Terphenyl-d14 spike level	100.	100.	77.6	78.	0.	
Phenol-d5 spike level	200.	200.	34.4	17.	29.	
2-Fluorophenol spike level	200.	200.	141.	71.	14.	
2,4,6-Tribromophenol spike level	200.	200.	142.	71.	9.6	

Lab Certifications: CAELAP #1598; UTELAP #E-142; AZELAP #AZ0162; A2LA #0136-01; L.A.Co.CSD #10187
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) Sample Preparation on 11/22/94 by AL using EPA 625

12/06/94
MSD8/113017A
DET/edtedt/lc
CK5517-2

CHAIN OF CUSTODY RECORD

Client/Project Name SAN MARCOS LANDFILL			Project Location SAN MARCOS, CA			ANALYSES EPA Method 624 EPA Method 625 USE AS BACKUP IF STORE COLD Run #					
Project No. S22-001			Field Logbook No.								
Sampler: (Signature) AD-76t			Chain of Custody Tape No.								

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample						Run #	REMARKS
LFGC-A	11/19/94			40ml Landfill Gas Condensate	X			X		1	LANDFILL GAS CONDENSATE VOLATILE ANALYSIS
LFGC-B				"	X			X		2	"
LFGC-C				"	X			X		3	"
LFGC-DA				1L Landfill Gas Condensate		X		X		1	LANDFILL GAS CONDENSATE SEMI-VOLATILE ANALYSIS
LFGC-TEB				"		X	X	X		2	"
LFGC-TFC				"		X	X	X		3	"

Relinquished by: (Signature) AD-76t		Date 11/19/94	Time 1245	Received by: (Signature) [Signature]		Date 11/19/94	Time 1:45
Relinquished by: (Signature)		Date	Time	Received by: (Signature)		Date	Time
Relinquished by: (Signature)		Date	Time	Received for Laboratory: (Signature)		Date	Time
Sample Disposal Method:		Disposed of by: (Signature)				Date	Time

SAMPLE COLLECTOR HORIZON AIR MEASUREMENT SERVICES 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781	ANALYTICAL LABORATORY PACE Analytical Camarillo, CA NOTE: client wants sample A run for 624 and 625 and B and C on hold.	Nº 2640
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VV 11/19/94 - CM

11/19/94
1:45 PM

EXPANSION AND F-FACTOR CALC. METHOD

Client: <u>County of San Diego</u>	Date: <u>11/17/1994</u>
Location: <u>San Marcos Landfill</u>	Job #: <u>S22-001</u>
Unit: <u>Flare #2</u>	Test Run #: <u>3</u>

Fuel temperature	<u>na</u>	deg F	Std. Temp.	<u>68</u>
Fuel Pressure	<u>na</u>	psi		
Fuel Flow Rate	<u>na</u>	cfm	Fuel Flow	<u>2462.3</u> dscfm
Exhaust Outlet O2	<u>11.5</u>	%		
Barometric Pressure	<u>na</u>			

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		0.685			0.007
Nitrogen		17.36			0.174
Carbon Dioxide		37.45			0.375
Methane		44.5	449.45	404.68	3.814
Ethane	C2	0.0004	0.01	0.01	0.000
Propane	C3	0	0.00	0.00	0.000
Iso-Butane	C4	0	0.00	0.00	0.000
N-Butane		0	0.00	0.00	0.000
Iso-Pentane	C5	0	0.00	0.00	0.000
N-Pentane		0	0.00	0.00	0.000
Hexane	C6	0	0.00	0.00	0.000
Heptane	C7	0	0.00	0.00	0.000
Octane	C8	0	0.00	0.00	0.000
Nonane	C9	0	0.00	0.00	
Total		100.00	449.46	404.69	4.37

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92/20.92-%O2)

23889.1 DSCFM

F - FACTOR = (Exp Fac*10^6)/(hhv*((460+Tstd)/528))*(20.92/(20.92-%O2))

21258.9 SCF/MMBtu

Facility: San Marcos Landfill
Source: Flare #2 Inlet
Job No.: S22-001
Test Date(s):11/16-17/94

SCAQMD Method 307

Sulfur Compounds
Run #1

Species	Concentration ppm	# S	Total # S	SO2 Conc. mg/dscf	Flowrate dscfm	SO2 Rate lb/hr
Hydrogen Sulfide	42.95	1	42.95	3.29	2453	1.067
Carbonyl Sulfide	0.015	1	0.01	0.00	2453	0.000
Methyl mercaptan	0.93	1	0.93	0.07	2453	0.023
Ethyl mercaptan	0.24	1	0.24	0.02	2453	0.006
Dimethyl sulfide	6.63	1	6.63	0.51	2453	0.165
Carbon disulfide	0.14	2	0.27	0.02	2453	0.007
Dimethyl disulfide	0.10	2	0.21	0.02	2453	0.005
iso-propyl mercaptan	0.19	1	0.19	0.01	2453	0.005
n-propyl mercaptan	0.21	1	0.21	0.02	2453	0.005
					Total	1.282

Facility: San Marcos Landfill
Source: Flare #2 Inlet
Job No.: S22-001
Test Date(s):11/16-17/94

SCAQMD Method 307

Sulfur Compounds
Run #2

Species	Concentration ppm	# S	Total # S	SO2 Conc. mg/dscf	Flowrate dscfm	SO2 Rate lb/hr
Hydrogen Sulfide	42.95	1	42.95	3.29	2440	1.062
Carbonyl Sulfide	0.015	1	0.01	0.00	2440	0.000
Methyl mercaptan	0.93	1	0.93	0.07	2440	0.023
Ethyl mercaptan	0.24	1	0.24	0.02	2440	0.006
Dimethyl sulfide	6.63	1	6.63	0.51	2440	0.164
Carbon disulfide	0.14	2	0.27	0.02	2440	0.007
Dimethyl disulfide	0.10	2	0.21	0.02	2440	0.005
iso-propyl mercaptan	0.19	1	0.19	0.01	2440	0.005
n-propyl mercaptan	0.21	1	0.21	0.02	2440	0.005
Total						1.276

Facility: San Marcos Landfill
Source: Flare #2 Inlet
Job No.: S22-001
Test Date(s):11/16-17/94

SCAQMD Method 307

Sulfur Compounds
Run #3

Species	Concentration ppm	# S	Total # S	SO2 Conc. mg/dscf	Flowrate dscfm	SO2 Rate lb/hr
Hydrogen Sulfide	42.95	1	42.95	3.29	2462	1.071
Carbonyl Sulfide	0.015	1	0.01	0.00	2462	0.000
Methyl mercaptan	0.93	1	0.93	0.07	2462	0.023
Ethyl mercaptan	0.24	1	0.24	0.02	2462	0.006
Dimethyl sulfide	6.63	1	6.63	0.51	2462	0.165
Carbon disulfide	0.14	2	0.27	0.02	2462	0.007
Dimethyl disulfide	0.10	2	0.21	0.02	2462	0.005
iso-propyl mercaptan	0.19	1	0.19	0.01	2462	0.005
n-propyl mercaptan	0.21	1	0.21	0.02	2462	0.005
Total						1.287

Table
Trace Organic Species Destruction Efficiency Results
San Marcos Landfill
Flare #2, Run #1
November 16, 1994

Species	INLET				OUTLET			DEST. EFF. (%)	Mol. Wiegth
	Flow rate	2453	dscfm		Flow rate	24312.2	dscfm		
	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)		Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)		
Benzene	2340.0	2.15E-01	6.99E-02		1.50	1.38E-04	4.44E-04	99.3646	78
Vinyl Chloride	859.0	6.33E-02	2.05E-02	<	0.10	7.36E-06	2.37E-05	> 99.8846	63
1,2-dibromoethane	< 2.5	5.53E-04	1.80E-04	<	0.25	5.53E-05	1.78E-04	> NA	188
1,2-dichloroethane	146.0	1.70E-02	5.52E-03	<	0.10	1.17E-05	3.75E-05	> 99.3211	99
Benzyl chloride	< 10.0	1.49E-03	4.84E-04	<	0.50	7.46E-05	2.40E-04	> NA	127
*Dichlorobenzenes	2105.0	3.65E-01	1.18E-01	<	0.55	9.53E-05	3.06E-04	> 99.7410	147
1,1-dichloroethylene	308.5	3.52E-02	1.14E-02	<	0.25	2.86E-05	9.18E-05	> 99.1967	97
Chlorobenzene	168.5	2.23E-02	7.25E-03		0.33	4.38E-05	1.41E-04	98.0587	113
Dichloromethane	12600.0	1.26E+00	4.09E-01		1.01	1.01E-04	3.25E-04	99.9205	85
Perchloroethene	3280.0	9.15E-01	2.97E-01		0.22	6.14E-05	1.97E-04	99.9335	237
Carbon Tetrachloride	< 2.5	4.53E-04	1.47E-04	<	0.03	5.44E-06	1.75E-05	> NA	154
m+p-xylenes	18950.0	2.37E+00	7.69E-01		0.52	6.50E-05	2.09E-04	99.9728	106
o-xylene	6535.0	8.17E-01	2.65E-01		0.25	3.13E-05	1.01E-04	99.9621	106
Toluene	41700.0	4.53E+00	1.47E+00		146.00	1.58E-02	5.10E-02	96.5295	92
1,1,1-trichloroethane	3020.0	4.75E-01	1.54E-01		0.93	1.46E-04	4.70E-04	99.6947	133
Trichloroethene	1780.0	2.76E-01	8.94E-02	<	0.05	7.74E-06	2.49E-05	> 99.9722	131
Chloroform	< 4.0	5.63E-04	1.83E-04		0.13	1.83E-05	5.88E-05	NA	119
1,1,2,2-tetrachloroethane	< 2.5	4.94E-04	1.60E-04	<	0.03	4.94E-06	1.59E-05	NA	168
Styrene	1525.0	1.87E-01	6.07E-02		0.16	1.96E-05	6.31E-05	99.8960	104
Ethane	4385.0	1.55E-01	5.04E-02		130	4.61E-03	1.48E-02	70.6131	30
TOTAL NON-METHANE HYDROCARBONS			3.7970				0.0687	98.1902	
Methane	445000000.0	8.41E+03	2.73E+03		12200.00	2.31E-01	7.41E-01	99.9728	16
TGNMO (C2-C13)*	3735000.0	7.06E+01	2.29E+01		6950.00	1.31E-01	4.22E-01	98.1555	16
TOTAL HYDROCARBONS			2751.20				1.1638	99.9577	

NOTE - Values preceded by < represent 1/2 the quantifiable limit. Destruction efficiency is not calculated for compounds with inlet concentration values below the detection limit.

* TGNMO analyzed by FID without catalyst, values reported as methane.

Table
Trace Organic Species Destruction Efficiency Results
San Marcos Landfill
Flare #2, Run #2
November 17, 1994

Species	INLET			OUTLET			DEST. EFF. (%)	Mol. Weight
	Flow rate	2440	dscfm	Flow rate	23927.7	dscfm		
	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)		
Benzene	2340.0	2.15E-01	6.95E-02	3.12	2.87E-04	9.09E-04	98.6925	78
Vinyl Chloride	859.0	6.33E-02	2.04E-02	< 0.10	7.36E-06	2.33E-05	> 99.8858	63
1,2-dibromoethane	< 2.5	< 5.53E-04	1.79E-04	< 0.25	5.53E-05	1.75E-04	NA	188
1,2-dichloroethane	146.0	1.70E-02	5.49E-03	< 0.10	1.17E-05	3.69E-05	> 99.3284	99
Benzyl chloride	< 10.0	< 1.49E-03	4.81E-04	< 0.50	7.46E-05	2.36E-04	NA	127
*Dichlorobenzenes	2105.0	3.65E-01	1.18E-01	< 0.55	9.53E-05	3.02E-04	> 99.7438	147
1,1-dichloroethylene	308.5	3.52E-02	1.14E-02	< 0.25	2.86E-05	9.04E-05	> 99.2053	97
Chlorobenzene	168.5	2.23E-02	7.21E-03	< 0.10	1.33E-05	4.20E-05	> 99.4180	113
Dichloromethane	12600.0	1.26E+00	4.07E-01	0.17	1.70E-05	5.38E-05	99.9868	85
Perchloroethene	3280.0	9.15E-01	2.95E-01	0.10	2.79E-05	8.83E-05	99.9701	237
Carbon Tetrachloride	< 2.5	< 4.53E-04	1.46E-04	< 0.03	5.44E-06	1.72E-05	NA	154
p-xylenes	18950.0	2.37E+00	7.65E-01	0.18	2.25E-05	7.13E-05	99.9907	106
o-xylene	6535.0	8.17E-01	2.64E-01	< 0.50	6.25E-05	1.98E-04	> 99.9250	106
Toluene	41700.0	4.53E+00	1.46E+00	183.00	1.99E-02	6.29E-02	95.6966	92
1,1,1-trichloroethane	3020.0	4.75E-01	1.53E-01	0.13	2.04E-05	6.47E-05	99.9578	133
Trichloroethene	1780.0	2.76E-01	8.89E-02	< 0.50	7.74E-05	2.45E-04	> 99.7245	131
Chloroform	< 4.0	< 5.63E-04	1.82E-04	< 0.04	5.63E-06	1.78E-05	NA	119
1,1,2,2-tetrachloroethane	< 2.5	< 4.94E-04	1.60E-04	< 0.03	4.94E-06	1.56E-05	NA	168
Styrene	1525.0	1.87E-01	6.04E-02	0.10	1.23E-05	3.88E-05	99.9357	104
Ethane	4385.0	1.55E-01	5.01E-02	< 2.50	8.86E-05	2.80E-04	> 99.4409	30
TOTAL NON-METHANE HYDROCARBONS			3.7775			0.0658	98.2588	
Methane	445000000.0	8.41E+03	2.71E+03	< 500.00	9.45E-03	2.99E-02	> 99.9989	16
TGNMO (C2-C13)*	3735000.0	7.06E+01	2.28E+01	10600.00	2.00E-01	6.34E-01	97.2170	16
TOTAL HYDROCARBONS			2737.07			0.6639	99.9757	

*E - Values preceded by < represent 1/2 the quantifiable limit. Destruction efficiency is not calculated for compounds with inlet concentration values below the detection limit.

* TGNMO analyzed by FID without catalyst, values reported as methane.

Table
Trace Organic Species Destruction Efficiency Results
San Marcos Landfill
Flare #2, Run #3
November 17, 1994

Species	INLET					OUTLET			DEST. EFF. (%)	Mol. Wieght
	Flow rate	2462	dscfm	Flow rate	23889.1	dscfm				
Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)					
Benzene	2340.0	2.15E-01	7.01E-02	0.20	1.84E-05	5.82E-05	99.9171	78		
Vinyl Chloride	859.0	6.33E-02	2.06E-02	< 0.10	7.36E-06	2.33E-05	> 99.8871	63		
1,2-dibromoethane	< 2.5	< 5.53E-04	1.80E-04	< 0.25	5.53E-05	1.75E-04	NA	188		
1,2-dichloroethane	146.0	1.70E-02	5.54E-03	< 0.10	1.17E-05	3.68E-05	> 99.3355	99		
Benzyl chloride	< 10.0	< 1.49E-03	4.86E-04	< 0.50	7.46E-05	2.36E-04	NA	127		
*Dichlorobenzenes	2105.0	3.65E-01	1.19E-01	< 0.55	9.53E-05	3.01E-04	> 99.7465	147		
1,1-dichloroethylene	308.5	3.52E-02	1.15E-02	< 0.25	2.86E-05	9.02E-05	> 99.2138	97		
Chlorobenzene	168.5	2.23E-02	7.28E-03	< 0.10	1.33E-05	4.19E-05	> 99.4242	113		
Dichloromethane	12600.0	1.26E+00	4.11E-01	0.23	2.30E-05	7.27E-05	99.9823	85		
Perchloroethene	3280.0	9.15E-01	2.98E-01	0.08	2.23E-05	7.05E-05	99.9763	237		
Carbon Tetrachloride	< 2.5	< 4.53E-04	1.48E-04	< 0.03	5.44E-06	1.72E-05	NA	154		
+p-xylenes	18950.0	2.37E+00	7.72E-01	0.16	2.00E-05	6.32E-05	99.9918	106		
o-xylene	6535.0	8.17E-01	2.66E-01	< 0.05	6.25E-06	1.98E-05	> 99.9926	106		
Toluene	41700.0	4.53E+00	1.47E+00	81.80	8.88E-03	2.81E-02	98.0968	92		
1,1,1-trichloroethane	3020.0	4.75E-01	1.55E-01	0.31	4.89E-05	1.54E-04	99.9001	133		
Trichloroethene	1780.0	2.76E-01	8.98E-02	< 0.05	7.74E-06	2.45E-05	> 99.9727	131		
Chloroform	< 4.0	< 5.63E-04	1.83E-04	< 0.04	5.63E-06	1.78E-05	NA	119		
1,1,2,2-tetrachloroethane	< 2.5	< 4.94E-04	1.61E-04	< 0.03	4.94E-06	1.56E-05	NA	168		
Styrene	1525.0	1.87E-01	6.09E-02	0.05	6.63E-06	2.09E-05	99.9656	104		
Ethane	4385.0	1.55E-01	5.06E-02	< 2.50	8.86E-05	2.80E-04	> 99.4469	30		
TOTAL NON-METHANE HYDROCARBONS			3.8119			0.0298	99.2189			
Methane	445000000.0	8.41E+03	2.74E+03	< 500.00	9.45E-03	2.99E-02	99.9989	16		
TGNMO (C2-C13)*	3735000.0	7.06E+01	2.30E+01	5530.00	1.05E-01	3.30E-01	98.5635	16		
TOTAL HYDROCARBONS			2761.97			0.3601	99.9870			

NOTE - Values preceded by < represent 1/2 the quantifiable limit. Destruction efficiency is not calculated for compounds with inlet concentration values below the detection limit.

* TGNMO analyzed by FID without catalyst, values reported as methane.

CONDENSA.XLS

Landfill Gas Condensate
Volatile / Semi-volatile organic Injection Rate
San Marcos Landfill - Flare #2

Run #1	Condensate injection rate	2 Gallons / minute
SPECIES ID	CONCENTRATION ug/L	EMISSION RATE lb/hr
Ethylbenzene	320	3.20E-04
Methylene chloride	260	2.60E-04
Toluene	770	7.71E-04
Xylenes	970	9.71E-04
1,4-Dichlorobenzene	250	2.50E-04
Phenol*	2200	2.20E-03
3- and 4-Methylphenol*	3500	3.51E-03
	TOTAL	8.28E-03

Run #2	Condensate injection rate	2 Gallons / minute
SPECIES ID	CONCENTRATION ug/L	EMISSION RATE lb/hr
Ethylbenzene	350	3.51E-04
Methylene chloride	280	2.80E-04
Toluene	810	8.11E-04
Xylenes	1100	1.10E-03
1,4-Dichlorobenzene	270	2.70E-04
Phenol*	3500	3.51E-03
3- and 4-Methylphenol*	3000	3.00E-03
	TOTAL	9.32E-03

Run #3	Condensate injection rate	2 Gallons / minute
SPECIES ID	CONCENTRATION ug/L	EMISSION RATE lb/hr
Ethylbenzene	340	3.41E-04
Methylene chloride	290	2.90E-04
Toluene	800	8.01E-04
Xylenes	1000	1.00E-03
1,4-Dichlorobenzene	250	2.50E-04
Phenol*	3100	3.10E-03
3- and 4-Methylphenol*	2900	2.90E-03
	TOTAL	8.69E-03

NOTE: Compounds listed and values reported have been detected and quantified using EPA methods 624 & 625. Those compounds below detection limit values are not listed.
* Compounds identified using EPA method 625.

Client: COUNTY OF SAN DIEGO
Job No: S22-001
Site : SAN MARCOS LANDFILL
Unit : FLARE #2

Date: 11-16-94
Run #: 1
Fuel: LANDFILL GAS
Std O2: 15

	O2	CO2	NOx	CO
	%	%	ppm	ppm
	%	%	ppm	ppm
Range:	25	15	25	500
Span:	12.54	7.077	9.36	250.8
Low:				
High:				

** POST-TEST DRIFT **

Values
Zero:
Span:

Percent Drift

Zero:	0.0	0.0	0.0	0.0
Span:	-50.2	-47.2	-37.4	-50.2

** AVERAGE CONCENTRATION **

Average:	11.7	8.4	10.0	140.9
2 adjust 15.0			6.4	89.9

	O2	CO2	NOx	CO
	%	%	ppm	ppm
SMLF2R1				
Date Time	MT25	MT18	MT26	MT19
16-Nov-94 15:02:51				
16-Nov-94 15:05:1	10.1	8.4	12	61
16-Nov-94 15:07:4	11.0	9.2	11	0
16-Nov-94 15:10:1	10.7	10.5	14	0
16-Nov-94 15:12:4	9.8	8.7	11	24
16-Nov-94 15:15:1	11.3	8.1	11	80
16-Nov-94 15:17:4	11.2	9.4	12	-4
16-Nov-94 15:30:38				
16-Nov-94 15:33:0	9.7	8.3	11	143
16-Nov-94 15:35:3	10.5	7.8	10	374
16-Nov-94 15:38:0	11.1	7.9	9	99
16-Nov-94 15:40:3	12.9	7.7	9	127
16-Nov-94 15:43:0	11.8	8.3	10	23
16-Nov-94 15:45:3	12.2	8.4	10	38
16-Nov-94 16:14:55				
16-Nov-94 16:17:2	11.1	8.0	9	39
16-Nov-94 16:19:5	12.8	6.7	6	282
16-Nov-94 16:22:2	13.6	8.7	10	112
16-Nov-94 16:24:5	12.4	9.1	10	66
16-Nov-94 16:27:2	10.7	9.2	12	328
16-Nov-94 16:29:5	9.6	8.6	10	305
16-Nov-94 16:47:21				
16-Nov-94 16:49:4	10.7	7.8	9	268
16-Nov-94 16:52:1	10.5	7.6	9	340
16-Nov-94 16:54:4	12.5	8.4	9	201
16-Nov-94 16:57:1	13.8	8.1	8	73
16-Nov-94 16:59:4	14.7	8.8	10	204
16-Nov-94 17:02:1	15.0	8.1	8	199

Client: COUNTY OF SAN DIEGO
Job No: S22-001
Site : SAN MARCOS LANDFILL
Unit : FLARE #2

Date: 11-17-94
Run #: 2
Fuel: LANDFILL GAS
Std O2 15

	O2 %	CO2 %	NOx ppm ppm	CO ppm ppm
Range:	25	15	25	500
Span:	12.54	7.077	9.36	250.8
Low:				
High:				

** POST-TEST DRIFT **

Values	O2 %	CO2 %	NOx ppm ppm	CO ppm ppm
Zero:	0.1	0.0	0.2	2.0
Span:	12.5	7.1	9.4	255.0

Percent Drift

Zero:	0.4	0.0	0.8	0.4
Span:	-0.2	0.2	0.1	0.8

** AVERAGE CONCENTRATION **

Average:	11.6	8.2	10.6	64.7
2 adjust 15.0			6.7	40.9

O2 %	CO2 %	NOx ppm ppm	CO ppm ppm
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SMLF2R2

Date	Time	MT25	MT18	MT26	MT19
17-Nov-94	10:48:41				
17-Nov-94	10:51:0	11.5	8.0	10	12
17-Nov-94	10:53:3	12.4	7.8	9	28
17-Nov-94	11:12:5	11.9	7.9	10	50
17-Nov-94	11:15:2	12.1	7.8	10	25
17-Nov-94	11:17:5	11.9	8.2	11	22
17-Nov-94	11:22:2	12.3	8.2	11	11
17-Nov-94	11:24:4	11.4	8.1	11	107
17-Nov-94	11:27:1	11.3	8.5	12	0
17-Nov-94	12:04:00				
17-Nov-94	12:06:2	12.6	7.1	8	189
17-Nov-94	12:08:5	13.1	7.1	8	212
17-Nov-94	12:11:2	13.4	7.0	7	393
17-Nov-94	12:13:5	13.1	7.2	8	238
17-Nov-94	12:21:3	12.2	7.0	8	45
17-Nov-94	12:23:5	12.8	7.0	9	114
17-Nov-94	12:57:34				
17-Nov-94	12:59:5	9.2	9.4	13	0
17-Nov-94	13:02:2	9.9	9.7	14	0
17-Nov-94	13:04:5	9.5	9.9	14	0
17-Nov-94	13:16:4	10.7	8.9	12	4
17-Nov-94	13:19:13				
17-Nov-94	13:21:4	10.0	8.9	13	3
17-Nov-94	13:24:1	10.9	9.0	12	1
17-Nov-94	13:26:4	11.5	8.8	11	0
17-Nov-94	13:29:1	11.3	8.5	11	13
17-Nov-94	13:31:4	11.2	8.6	11	20

Client: COUNTY OF SAN DIEGO
Job No: S22-001
Site : SAN MARCOS LANDFILL
Unit : FLARE #2

Date: 11-17-94
Run #: 3
Fuel: LANDFILL GAS
Std O2: 15

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25	15	25	500
Span:	12.54	7.077	9.36	250.8
Low:				
High:				

** POST-TEST DRIFT **

Values				
Zero:	0.4	0.0	0.0	0.1
Span:	12.4	7.1	9.4	260.0

Percent Drift

Zero:	1.6	0.0	0.0	0.0
Span:	-0.8	-0.2	0.3	1.8

** AVERAGE CONCENTRATION **

Average:	11.5	8.4	11.0	26.9
2 adjust 15.0			6.9	16.8

	O2 %	CO2 %	NOx ppm	CO ppm
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SMLF2R3

Date	Time				
------	------	--	--	--	--

17-Nov-94	16:51:00				
17-Nov-94	16:53:3	12.4	7.8	10	28
17-Nov-94	16:56:0	12.8	7.0	8	50
17-Nov-94	16:58:3	12.7	7.2	8	95
17-Nov-94	17:01:0	12.3	7.6	9	100
17-Nov-94	17:03:3	12.0	7.8	10	68
17-Nov-94	17:06:0	12.5	7.7	8	205
17-Nov-94	17:22:00				
17-Nov-94	17:24:3	12.6	7.7	9	12
17-Nov-94	17:27:0	12.5	7.5	9	13
17-Nov-94	17:29:3	12.0	7.4	10	10
17-Nov-94	17:32:0	12.6	7.7	11	33
17-Nov-94	17:34:3	11.4	8.2	11	7
17-Nov-94	17:37:0	11.6	7.7	11	11
17-Nov-94	18:37:00				
17-Nov-94	18:39:3	10.9	8.4	12	4
17-Nov-94	18:42:0	10.8	9.1	13	0
17-Nov-94	18:44:3	10.0	9.8	13	0
17-Nov-94	18:47:0	10.0	10.3	13	1
17-Nov-94	18:49:3	9.9	10.1	14	0
17-Nov-94	18:52:0	10.9	8.8	12	2
17-Nov-94	19:05:00				
17-Nov-94	19:07:3	12.8	7.6	9	4
17-Nov-94	19:10:0	11.4	8.4	10	6
17-Nov-94	19:12:3	10.5	9.3	13	0
17-Nov-94	19:15:0	10.5	9.2	13	0
17-Nov-94	19:17:3	10.3	9.4	13	0
17-Nov-94	19:20:0	10.1	9.4	14	0

Facility: San Marcos Landfill

Method 5.1 Particulate Emissions

Source: Flare #2

Job No.: S22-001

Test Date: 11/16 11/17/94

RUN NUMBER	*****	1	2	4
DATE OF RUN	*****	11/16/94	11/17/94	11/17/94
CLOCK TIME: INITIAL	*****	1503	1336	1651
CLOCK TIME: FINAL	*****	1652	1500	1920
AVG. STACK TEMPERATURE	Degrees F	1641	1636	1651
AVG. SQUARE DELTA P	Inches H2O	0.1660	0.1140	0.1140
NOZZLE DIAMETER	Inches	0.666	0.666	0.666
BAROMETRIC PRESSURE	Inches HG	29.31	29.30	29.30
SAMPLING TIME	Minutes	60	120	60
SAMPLE VOLUME	Cubic Feet	31.868	50.953	54.928
AVG. METER TEMP.	Degrees F	72	76	77
AVG. DELTA H	Inches H2O	0.67	0.62	3.20
DGM CALIB. FACTOR [Y]	*****	0.9900	0.9900	0.9900
WATER COLLECTED	Milliliters	68.3	117.2	113.1
CO 2	Percent	8.4	8.2	8.3
O 2	Percent	11.5	11.6	11.5
CO	Percent	0.0	0.0	0.0
CH4	Percent	0	0	0
N 2	Percent	80.1	80.2	80.2
STACK AREA	Square Inches	14526.7	14526.7	14526.7
STATIC PRESSURE	Inches WG.	-0.070	-0.070	-0.070
PITOT COEFFICIENT	*****	0.84	0.84	0.84
SAMPLE VOLUME DRY	DSCF	30.71	48.75	52.75
WATER AT STD.	SCF	3.2	5.5	5.3
MOISTURE	Percent	9.5	10.2	9.2
MOLE FRACTION DRY GAS	*****	0.91	0.90	0.91
MOLECULAR WT. DRY	lb/lb Mole	29.80	29.78	29.79
EXCESS AIR	Percent	119	121	119
MOLECULAR WT. WET	lb/lb Mole	28.68	28.58	28.71
STACK GAS PRESSURE	Inches HG	29.30	29.29	29.29
STACK VELOCITY	AFPM	NM	NM	NM
VOLUMETRIC FLOWRATE, DRY STD	DSCFM	24312	23928	23889
VOLUMETRIC FLOWRATE, ACTUAL	ACFM	NM	NM	NM
ISOKINETIC RATIO	Percent	NA	NA	NA

STD TEMP: 68

CALCULATIONS FOR GRAIN LOADING AND EMISSION RATES

TOTAL PARTICULATE	mg	16.5	39.0	22.9
PARTICULATE CONCENTRATION	gr/dscf	0.00827	0.01232	0.00669
PARTICULATE EMISSION RATE	lb/hr	1.724	2.527	1.369

NM - Not Measured. Flare exhaust rate calculated stoicometrically

NA - Not Applicable. Sample collected nonisokinetically due to imeasurable velocity.

Facility: San Marcos Landfill

Source: Flare #2

Job No.: S22-001

Test Date: 11/16-17/94

RUN NUMBER	*****	1	2	3
DATE OF RUN	*****	11/16/94	11/17/94	11/17/94
LOAD CONDITION	*****	Normal	Normal	Normal

OXIDES OF NITROGEN

POLLUTANT CONCENTRATION	ppm	10.0	10.6	11.0
CONCENTRATION @ 3 %O2	ppm	19.5	20.4	20.9
POLLUTANT CONCENTRATION	lb/dscf	1.19E-06	1.27E-06	1.31E-06
STACK FLOWRATE	dscfm	24312	23928	23889
OXYGEN CONTENT	percent	11.7	11.6	11.5
EPA F-FACTOR	scf/MMBtu			
EMISSION RATE	lb/MMBtu	0.0000	0.0000	0.0000
EMISSION RATE	lb/hr	1.743	1.818	1.884

CARBON MONOXIDE

POLLUTANT CONCENTRATION	ppm	140.9	64.7	26.9
CONCENTRATION @ 3 %O2	ppm	274.1	124.5	51.2
POLLUTANT CONCENTRATION	lb/dscf	1.02E-05	4.71E-06	1.96E-06
STACK FLOWRATE	dscfm	24312	23928	23889
OXYGEN CONTENT	percent	11.7	11.6	11.5
EPA F-FACTOR	scf/MMBtu			
EMISSION RATE	lb/MMBtu	0.0000	0.0000	0.0000
EMISSION RATE	lb/hr	14.948	6.755	2.804

EXPANSION AND F-FACTOR CALC. METHOD

Client: County of San Diego
 Location: San Marcos Landfill
 Unit: Flare #1

Date: 11/18/1994
 Job #: S22-001
 Test Run #: 2

Fuel temperature	<u>na</u>	deg F	Std. Temp.	<u>68</u>
Fuel Pressure	<u>na</u>	psi		
Fuel Flow Rate	<u>na</u>	cfm	Fuel Flow	<u>589.4</u> dscfm
Exhaust Outlet O2	<u>12.6</u>	%		
Barometric Pressure	<u>na</u>			

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		0.89			0.009
Nitrogen		11.91			0.119
Carbon Dioxide		38.55			0.386
Methane		48.65	491.37	442.42	4.169
Ethane	C2	0.0003	0.01	0.00	0.000
Propane	C3	0	0.00	0.00	0.000
Iso-Butane	C4	0	0.00	0.00	0.000
N-Butane		0	0.00	0.00	0.000
Iso-Pentane	C5	0	0.00	0.00	0.000
N-Pentane		0	0.00	0.00	0.000
Hexane	C6	0	0.00	0.00	0.000
Heptane	C7	0	0.00	0.00	0.000
Octane	C8	0	0.00	0.00	0.000
Nonane	C9	0	0.00	0.00	0.000
Total		100.00	491.37	442.43	4.68

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92/20.92-%O2)

6940.0 DSCFM

F - FACTOR = (Exp Fac*10^6)/(hhv*((460+Tstd)/528))(20.92/(20.92-%O2))

23599.8 SCF/MMBtu

EXPANSION AND F-FACTOR CALC. METHOD

Client: <u>County of San Diego</u>	Date: <u>11/18/1994</u>
Location: <u>San Marcos Landfill</u>	Job #: <u>S22-001</u>
Unit: <u>Flare #1</u>	Test Run #: <u>3</u>

Fuel temperature	<u>na</u>	deg F	Std. Temp.	<u>68</u>
Fuel Pressure	<u>na</u>	psi		
Fuel Flow Rate	<u>na</u>	cfm	Fuel Flow	<u>582.9</u> dscfm
Exhaust Outlet O2	<u>12.4</u>	%		
Barometric Pressure	<u>na</u>			

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		0.89			0.009
Nitrogen		11.91			0.119
Carbon Dioxide		38.55			0.386
Methane		48.65	491.37	442.42	4.169
Ethane	C2	0.0003	0.01	0.00	0.000
Propane	C3	0	0.00	0.00	0.000
Iso-Butane	C4	0	0.00	0.00	0.000
N-Butane		0	0.00	0.00	0.000
Iso-Pentane	C5	0	0.00	0.00	0.000
N-Pentane		0	0.00	0.00	0.000
Hexane	C6	0	0.00	0.00	0.000
Heptane	C7	0	0.00	0.00	0.000
Octane	C8	0	0.00	0.00	0.000
Nonane	C9	0	0.00	0.00	0.000
Total		100.00	491.37	442.43	4.68

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92/20.92-%O2)

6702.3 DSCFM

F - FACTOR = (Exp Fac*10^6)/(hhv*((460+Tstd)/528))*(20.92/(20.92-%O2))

23045.9 SCF/MMBtu

Facility: San Marcos Landfill
Source: Flare #1 Inlet
Job No.: S22-001
Test Date(s):11/18/94

SCAQMD Method 307

Sulfur Compounds
Run #1

Species	Concentration ppm	# S	Total # S	SO2 Conc. mg/dscf	Flowrate dscfm	SO2 Rate lb/hr
Hydrogen Sulfide	51.80	1	51.80	3.97	589	0.309
Carbonyl Sulfide	0.195	1	0.20	0.01	589	0.001
Methyl mercaptan	1.19	1	1.19	0.09	589	0.007
Ethyl mercaptan	0.30	1	0.30	0.02	589	0.002
Dimethyl sulfide	7.67	1	7.67	0.59	589	0.046
Carbon disulfide	0.11	2	0.21	0.02	589	0.001
Dimethyl disulfide	0.09	2	0.18	0.01	589	0.001
iso-propyl mercaptan	0.30	1	0.30	0.02	589	0.002
n-propyl mercaptan	0.18	1	0.18	0.01	589	0.001
Total						0.370

Facility: San Marcos Landfill
Source: Flare #1 Inlet
Job No.: S22-001
Test Date(s):11/18/94

SCAQMD Method 307

Sulfur Compounds
Run #2

Species	Concentration ppm	# S	Total # S	SO2 Conc. mg/dscf	Flowrate dscfm	SO2 Rate lb/hr
Hydrogen Sulfide	51.80	1	51.80	3.97	589	0.309
Carbonyl Sulfide	0.195	1	0.20	0.01	589	0.001
Methyl mercaptan	1.19	1	1.19	0.09	589	0.007
Ethyl mercaptan	0.30	1	0.30	0.02	589	0.002
Dimethyl sulfide	7.67	1	7.67	0.59	589	0.046
Carbon disulfide	0.11	2	0.21	0.02	589	0.001
Dimethyl disulfide	0.09	2	0.18	0.01	589	0.001
iso-propyl mercaptan	0.30	1	0.30	0.02	589	0.002
n-propyl mercaptan	0.18	1	0.18	0.01	589	0.001
					Total	0.370

Facility: San Marcos Landfill
Source: Flare #1 Inlet
Job No.: S22-001
Test Date(s):11/18/94

SCAQMD Method 307

Sulfur Compounds
Run #3

Species	Concentration ppm	# S	Total # S	SO2 Conc. mg/dscf	Flowrate dscfm	SO2 Rate lb/hr
Hydrogen Sulfide	51.80	1	51.80	3.97	583	0.306
Carbonyl Sulfide	0.195	1	0.20	0.01	583	0.001
Methyl mercaptan	1.19	1	1.19	0.09	583	0.007
Ethyl mercaptan	0.30	1	0.30	0.02	583	0.002
Dimethyl sulfide	7.67	1	7.67	0.59	583	0.045
Carbon disulfide	0.11	2	0.21	0.02	583	0.001
Dimethyl disulfide	0.09	2	0.18	0.01	583	0.001
iso-propyl mercaptan	0.30	1	0.30	0.02	583	0.002
n-propyl mercaptan	0.18	1	0.18	0.01	583	0.001
					Total	0.366

Table
Trace Organic Species Destruction Efficiency Results
San Marcos Landfill
Flare #1, Run#1
November 18, 1994

Species	INLET			OUTLET			DEST. EFF. (%)	Mol. Weight
	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)		
Benzene	2360.0	2.17E-01	1.69E-02	0.70	6.44E-05	8.45E-05	99.5007	78
Vinyl Chloride	757.5	5.58E-02	4.35E-03	< 0.10	7.36E-06	9.66E-06	> 99.7778	63
1,2-dibromoethane	< 2.5	< 5.53E-04	4.31E-05	< 0.25	5.53E-05	7.26E-05	NA	188
1,2-dichloroethane	123.0	1.43E-02	1.12E-03	< 0.10	1.17E-05	1.53E-05	> 98.6315	99
Benzyl chloride	< 10.0	< 1.49E-03	1.16E-04	< 0.50	7.46E-05	9.79E-05	NA	127
*Dichlorobenzenes	2745.0	4.75E-01	3.71E-02	< 0.55	9.53E-05	1.25E-04	> 99.6627	147
1,1-dichloroethylene	204.0	2.33E-02	1.82E-03	< 0.25	2.86E-05	3.75E-05	> 97.9372	97
Chlorobenzene	182.0	2.41E-02	1.88E-03	< 0.10	1.33E-05	1.74E-05	> 99.0751	113
Dichloromethane	15550.0	1.56E+00	1.21E-01	0.51	5.10E-05	6.70E-05	99.9448	85
Perchloroethene	3460.0	9.65E-01	7.52E-02	0.18	5.02E-05	6.59E-05	99.9124	237
Carbon Tetrachloride	< 2.5	< 4.53E-04	3.53E-05	0.10	1.74E-05	2.28E-05	NA	154
m+p-xylenes	21650.0	2.71E+00	2.11E-01	0.48	6.00E-05	7.88E-05	99.9627	106
o-xylene	7550.0	9.44E-01	7.36E-02	0.36	4.50E-05	5.91E-05	99.9197	106
Toluene	44450.0	4.82E+00	3.76E-01	56.40	6.12E-03	8.03E-03	97.8642	92
1,1,1-trichloroethane	1405.0	2.21E-01	1.72E-02	18.90	2.97E-03	3.90E-03	77.3569	133
Trichloroethene	1750.0	2.71E-01	2.11E-02	< 0.05	7.74E-06	1.02E-05	> 99.9519	131
Chloroform	< 4.0	< 5.63E-04	4.39E-05	< 0.04	5.63E-06	7.38E-06	NA	119
1,1,2,2-tetrachloroethane	< 2.5	< 4.94E-04	3.85E-05	< 0.03	4.94E-06	6.49E-06	NA	168
Styrene	1660.0	2.04E-01	1.59E-02	0.08	9.69E-06	1.27E-05	99.9199	104
Ethane	3315.0	1.17E-01	9.16E-03	91.00	3.22E-03	4.23E-03	53.7930	30
TOTAL NON-METHANE HYDROCARBONS			0.9843			0.0170	98.2775	
Methane	48650000.0	9.19E+03	7.17E+02	4750.00	8.98E-02	1.18E-01	99.9836	16
TGNMO (C2-C13)*	4685000.0	8.85E+01	6.90E+00	8620.00	1.63E-01	2.14E-01	96.9030	16
TOTAL HYDROCARBONS			723.67			0.3316	99.9542	

NOTE - Values preceded by < represent 1/2 the quantifiable limit. Destruction efficiency is not calculated for compounds with inlet concentration values below the detection limit.

* TGNMO analyzed by FID without catalyst, values reported as methane.
Horizon Air Measurement Services, Inc.

VOCEFF1B.XLS

Table
Trace Organic Species Destruction Efficiency Results
San Marcos Landfill
Flare #1, Run#2
November 18, 1994

Species	INLET			OUTLET			DEST. EFF. (%)	Mol. Weight
	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)		
Benzene	2360.0	2.17E-01	1.69E-02	5.14	4.73E-04	4.34E-04	97.4355	78
Vinyl Chloride	757.5	5.58E-02	4.35E-03	< 0.10	7.36E-06	6.76E-06	> 99.8446	63
1,2-dibromoethane	< 2.5	< 5.53E-04	4.31E-05	< 0.25	5.53E-05	5.08E-05	NA	188
1,2-dichloroethane	123.0	1.43E-02	1.12E-03	< 0.10	1.17E-05	1.07E-05	> 99.0427	99
Benzyl chloride	< 10.0	< 1.49E-03	1.16E-04	< 0.50	7.46E-05	6.85E-05	NA	127
*Dichlorobenzenes	2745.0	4.75E-01	3.71E-02	< 0.55	9.53E-05	8.74E-05	> 99.7641	147
1,1-dichloroethylene	204.0	2.33E-02	1.82E-03	< 0.25	2.86E-05	2.62E-05	> 98.5570	97
Chlorobenzene	182.0	2.41E-02	1.88E-03	< 0.10	1.33E-05	1.22E-05	> 99.3530	113
Dichloromethane	15550.0	1.56E+00	1.21E-01	0.88	8.81E-05	8.08E-05	99.9334	85
Perchloroethene	3460.0	9.65E-01	7.52E-02	0.09	2.40E-05	2.20E-05	99.9707	237
Carbon Tetrachloride	< 2.5	< 4.53E-04	3.53E-05	< 0.03	5.44E-06	4.99E-06	NA	154
m+p-xylenes	21650.0	2.71E+00	2.11E-01	0.38	4.75E-05	4.36E-05	99.9793	106
o-xylene	7550.0	9.44E-01	7.36E-02	0.17	2.13E-05	1.95E-05	99.9735	106
Toluene	44450.0	4.82E+00	3.76E-01	25.30	2.75E-03	2.52E-03	99.3298	92
1,1,1-trichloroethane	1405.0	2.21E-01	1.72E-02	19.20	3.02E-03	2.77E-03	83.9093	133
Trichloroethene	1750.0	2.71E-01	2.11E-02	< 0.05	7.74E-06	7.11E-06	> 99.9664	131
Chloroform	< 4.0	< 5.63E-04	4.39E-05	< 0.04	5.63E-06	5.17E-06	NA	119
1,1,2,2-tetrachloroethane	< 2.5	< 4.94E-04	3.85E-05	< 0.03	4.94E-06	4.54E-06	NA	168
Styrene	1660.0	2.04E-01	1.59E-02	1.27	1.56E-04	1.43E-04	99.0992	104
Ethane	3315.0	1.17E-01	9.16E-03	76.40	2.71E-03	2.48E-03	72.8632	30
TOTAL NON-METHANE HYDROCARBONS			0.9843			0.0088	99.1055	
Methane	48650000.0	9.19E+03	7.17E+02	3430.00	6.48E-02	5.95E-02	99.9917	16
TGNMO (C2-C13)*	4685000.0	8.85E+01	6.90E+00	13200.00	2.49E-01	2.29E-01	96.6825	16
TOTAL HYDROCARBONS			723.67			0.2885	99.9601	

NOTE - Values preceded by < represent 1/2 the quantifiable limit. Destruction efficiency is not calculated for compounds with inlet concentration values below the detection limit.

* TGNMO analyzed by FID without catalyst, values reported as methane.

Table
Trace Organic Species Destruction Efficiency Results
San Marcos Landfill
Flare #1, Run #3
November 18, 1994

Species	INLET			OUTLET			DEST. EFF. (%)	Mol. Wight
	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)		
Benzene	2360.0	2.17E-01	1.67E-02	0.25	2.30E-05	2.04E-05	99.8782	78
Vinyl Chloride	757.5	5.58E-02	4.30E-03	< 0.10	7.36E-06	6.53E-06	> 99.8482	63
1,2-dibromoethane	< 2.5	< 5.53E-04	4.27E-05	< 0.25	5.53E-05	4.91E-05	NA	188
1,2-dichloroethane	123.0	1.43E-02	1.11E-03	< 0.10	1.17E-05	1.03E-05	> 99.0652	99
Benzyl chloride	< 10.0	< 1.49E-03	1.15E-04	< 0.50	7.46E-05	6.61E-05	NA	127
*Dichlorobenzenes	2745.0	4.75E-01	3.67E-02	< 0.55	9.53E-05	8.45E-05	> 99.7696	147
1,1-dichloroethylene	204.0	2.33E-02	1.80E-03	< 0.25	2.86E-05	2.53E-05	> 98.5909	97
Chlorobenzene	182.0	2.41E-02	1.86E-03	< 0.10	1.33E-05	1.18E-05	> 99.3682	113
Dichloromethane	15550.0	1.56E+00	1.20E-01	0.28	2.80E-05	2.48E-05	99.9793	85
Perchloroethene	3460.0	9.65E-01	7.44E-02	0.07	1.95E-05	1.73E-05	99.9767	237
Carbon Tetrachloride	< 2.5	< 4.53E-04	3.49E-05	< 0.03	5.44E-06	4.82E-06	NA	154
p-xylenes	21650.0	2.71E+00	2.09E-01	0.13	1.63E-05	1.44E-05	99.9931	106
o-xylene	7550.0	9.44E-01	7.28E-02	< 0.05	6.25E-06	5.54E-06	> 99.9924	106
Toluene	44450.0	4.82E+00	3.72E-01	24.00	2.61E-03	2.31E-03	99.3792	92
1,1,1-trichloroethane	1405.0	2.21E-01	1.70E-02	21.90	3.44E-03	3.05E-03	82.0775	133
Trichloroethene	1750.0	2.71E-01	2.09E-02	< 0.05	7.74E-06	6.86E-06	> 99.9671	131
Chloroform	< 4.0	< 5.63E-04	4.34E-05	< 0.04	5.63E-06	4.99E-06	NA	119
1,1,2,2-tetrachloroethane	< 2.5	< 4.94E-04	3.81E-05	< 0.03	4.94E-06	4.38E-06	NA	168
Styrene	1660.0	2.04E-01	1.57E-02	< 0.02	1.84E-06	1.63E-06	> 99.9896	104
Ethane	3315.0	1.17E-01	9.06E-03	150.00	5.31E-03	4.71E-03	47.9720	30
TOTAL NON-METHANE HYDROCARBONS			0.9734			0.0104	98.9284	
Methane	486500000.0	9.19E+03	7.09E+02	8660.00	1.64E-01	1.45E-01	99.9795	16
TGNMO (C2-C13)*	4685000.0	8.85E+01	6.83E+00	5870.00	1.11E-01	9.83E-02	98.5594	16
TOTAL HYDROCARBONS			715.69			0.2434	99.9660	

TE - Values preceded by < represent 1/2 the quantifiable limit. Destruction efficiency
not calculated for compounds with inlet concentration values below the detection limit.

* TGNMO analyzed by FID without catalyst, values reported as methane.

Client: COUNTY OF SAN DIEGO
Job No: S22-001
Site : SAN MARCOS LANDFILL
Unit : FLARE #1

Date: 11-18-94
Run #: 1
Fuel: LANDFILL GAS
Std O2 15

	O2 %	CO2 %	NOx ppm ppm	CO ppm ppm
Range:	25	15	25	500
Span:	12.54	7.077	9.36	250.8
Low:				
High:				

** POST-TEST DRIFT **

Values				
Zero:	0.1	0.0	-0.2	1.0
Span:	12.6	7.1	9.4	248.0

Percent Drift

Zero:	0.4	0.0	-0.8	0.2
Span:	0.2	0.2	0.2	-0.6

** AVERAGE CONCENTRATION **

Average:	15.1	5.3	7.6	26.3
2 adjust 15.0			7.8	26.7

	O2 %	CO2 %	NOx ppm	CO ppm
SMLF1R1				
Date Time				
18-Nov-94 12:00:14				
18-Nov-94 12:02:4	15.8	4.7	7	0
18-Nov-94 12:05:0	15.1	4.9	8	1
18-Nov-94 12:07:4	16.4	5.0	7	0
18-Nov-94 12:10:1	15.6	4.9	8	3
18-Nov-94 12:12:3	15.7	5.3	8	1
18-Nov-94 12:15:0	14.8	5.0	8	6
18-Nov-94 12:17:4	14.5	4.7	8	16
18-Nov-94 12:20:0	15.9	5.1	8	4
18-Nov-94 12:22:3	15.4	4.8	7	30
18-Nov-94 12:25:1	14.8	4.4	6	26
18-Nov-94 12:27:4	16.0	5.3	7	73
18-Nov-94 12:30:1	15.9	4.5	6	170
18-Nov-94 12:44:00				
18-Nov-94 12:46:2	14.8	5.5	8	6
18-Nov-94 12:48:5	14.2	4.7	6	15
18-Nov-94 12:51:2	15.4	5.3	8	18
18-Nov-94 12:53:5	14.9	5.2	7	2
18-Nov-94 12:56:2	15.5	4.8	6	11
18-Nov-94 12:58:5	14.7	4.9	7	8
18-Nov-94 13:01:2	14.7	5.5	8	7
18-Nov-94 13:03:5	15.1	6.4	9	5
18-Nov-94 13:06:2	14.5	6.3	10	70
18-Nov-94 13:08:5	14.6	6.8	9	17
18-Nov-94 13:11:2	14.5	6.0	8	119
18-Nov-94 13:13:5	13.5	6.2	9	23

Client: COUNTY OF SAN DIEGO
Job No: S22-001
Site : SAN MARCOS LANDFILL
Unit : FLARE #1

Date: 11-18-94
Run #: 2
Fuel: LANDFILL GAS
Std O2: 15

	O2 %	CO2 %	NOx ppm ppm	CO ppm ppm
Range:	25	15	25	500
Span:	12.54	7.077	9.36	250.8
Low:				
High:				

** POST-TEST DRIFT **

Values				
Zero:	0.0	-0.1	-0.2	2.5
Span:	12.4	7.1	9.4	245.0

Percent Drift

Zero:	0.0	-0.7	-0.8	0.5
Span:	-0.6	-0.2	0.2	-1.2

** AVERAGE CONCENTRATION **

Average:	12.6	6.1	9.1	158.1
2 adjust 15.0			6.5	112.4

	O2 %	CO2 %	NOx ppm	CO ppm
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SMLF1R2

18-Nov-94 13:52:53

18-Nov-94 13:55:1	16.0	4.4	7	0
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18-Nov-94 13:57:4	15.9	4.1	6	0
-------------------	------	-----	---	---

18-Nov-94 14:00:1	15.9	4.3	6	0
-------------------	------	-----	---	---

18-Nov-94 14:02:4	15.5	4.7	7	0
-------------------	------	-----	---	---

18-Nov-94 14:05:1	14.5	4.8	7	9
-------------------	------	-----	---	---

18-Nov-94 14:07:4	15.4	5.0	7	5
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18-Nov-94 14:10:19

18-Nov-94 14:12:49

18-Nov-94 14:15:19

This data has been
deleted due to a leak
the sample line.

18-Nov-94 14:17:4	10.7	1.7	6	-1
-------------------	------	-----	---	----

18-Nov-94 14:20:1	9.1	9.5	18	33
-------------------	-----	-----	----	----

18-Nov-94 14:22:4	10.9	9.3	15	18
-------------------	------	-----	----	----

18-Nov-94 14:54:46

18-Nov-94 14:57:1	12.8	7.2	10	28
-------------------	------	-----	----	----

18-Nov-94 14:59:4	13.0	7.1	10	4
-------------------	------	-----	----	---

18-Nov-94 15:02:1	13.2	6.9	10	9
-------------------	------	-----	----	---

18-Nov-94 15:04:4	13.0	6.9	9	25
-------------------	------	-----	---	----

18-Nov-94 15:07:1	12.2	7.0	10	12
-------------------	------	-----	----	----

18-Nov-94 15:09:4	11.0	7.8	11	2
-------------------	------	-----	----	---

18-Nov-94 15:12:1	12.0	8.0	12	163
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18-Nov-94 15:14:4	13.1	7.2	10	330
-------------------	------	-----	----	-----

18-Nov-94 15:17:1	13.4	7.0	10	645 Entered manually-overs
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18-Nov-94 15:19:4	14.2	6.3	7	1099 Entered manually-overs
-------------------	------	-----	---	-----------------------------

18-Nov-94 15:22:1	13.0	7.1	11	634 Entered manually-overs
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18-Nov-94 15:24:4	12.4	7.2	11	464
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Client: COUNTY OF SAN DIEGO
Job No: S22-001
Site : SAN MARCOS LANDFILL
Unit : FLARE #1

Date: 11-18-94
Run #: 3
Fuel: LANDFILL GAS
Std O2: 15

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25	15	25	500
Span:	12.54	7.077	9.36	250.8
Low:				
High:				

** POST-TEST DRIFT **

Values	O2	CO2	NOx	CO
Zero:	0.0	0.2	0.1	5.0
Span:	12.6	7.1	8.9	250.0

Percent Drift	O2	CO2	NOx	CO
Zero:	0.0	1.3	0.4	1.0
Span:	0.2	0.2	-1.8	-0.2

** AVERAGE CONCENTRATION **

Average:	12.4	7.8	11.0	189.7
2 adjust 15.0			7.6	131.4

	O2 %	CO2 %	NOx ppm	CO ppm
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SMLF1R3

Date	Time
18-Nov-94	16:58:58
18-Nov-94	17:01:2
18-Nov-94	17:03:5
18-Nov-94	17:06:2
18-Nov-94	17:08:5
18-Nov-94	17:11:2
18-Nov-94	17:13:5
18-Nov-94	17:16:2
18-Nov-94	17:18:5
18-Nov-94	17:21:2
18-Nov-94	17:23:5
18-Nov-94	17:26:2
18-Nov-94	17:28:5
18-Nov-94	17:41:57
18-Nov-94	17:43:1
18-Nov-94	17:45:3
18-Nov-94	17:48:0
18-Nov-94	17:50:3
18-Nov-94	17:53:0
18-Nov-94	17:55:3
18-Nov-94	17:58:0
18-Nov-94	18:00:3
18-Nov-94	18:03:0
18-Nov-94	18:05:3
18-Nov-94	18:08:0
18-Nov-94	18:10:3
18-Nov-94	18:13:0

12.4	7.5	10	217
12.6	7.4	10	269
12.6	7.7	11	160
12.7	7.5	10	196
12.9	7.5	10	160
13.1	7.6	11	206
12.8	8.0	11	191
12.3	8.1	12	179
13.3	8.1	11	281
11.6	7.9	11	294
11.1	7.8	11	292
11.7	8.1	11	195
14.2	6.9	9	
13.9	6.5	9	
13.7	6.7	9	695
14.3	6.4	7	464
13.2	6.8	9	464
11.6	7.7	12	54
11.3	8.9	14	7
10.6	9.0	14	10
11.6	8.9	13	6
11.5	8.7	13	5
11.8	8.7	13	8
11.4	8.7	13	8
11.3	8.6	12	3

Entered manual1
Entered manual1
Entered manual1

Facility: San Marcos Landfill

SCAQMD Method 5.1 Particulate Emissions

Source: Flare #1

Job No.: S22-001

Test Date: 11/18/94

RUN NUMBER	*****	1	2	3
DATE OF RUN	*****	11/18/94	11/18/94	11/18/94
CLOCK TIME: INITIAL	*****	1201	1354	1700
CLOCK TIME: FINAL	*****	1315	1525	1813
AVG. STACK TEMPERATURE	Degrees F	1598	1558	1553
AVG. SQUARE DELTA P	Inches H2O	0.2832	0.2523	0.2798
NOZZLE DIAMETER	Inches	0.666	0.666	0.666
BAROMETRIC PRESSURE	Inches HG	29.35	29.29	29.31
SAMPLING TIME	Minutes	60	60	60
SAMPLE VOLUME	Cubic Feet	65.208	58.920	64.883
AVG. METER TEMP.	Degrees F	65	74	69
AVG. DELTA H	Inches H2O	4.14	3.30	4.10
DGM CALIB. FACTOR [Y]	*****	0.9900	0.9900	0.9900
WATER COLLECTED	Milliliters	145	131	144
CO 2	Percent	5.2	5.8	7.4
O 2	Percent	15.1	13.3	12.5
CO	Percent	0.0	0.0	0.0
CH4	Percent	0	0	0
N 2	Percent	79.7	80.9	80.1
STACK AREA	Square Inches	2827.4	2827.4	2827.4
STATIC PRESSURE	Inches WG.	-0.09	-0.08	-0.10
PITOT COEFFICIENT	*****	0.84	0.84	0.84
SAMPLE VOLUME DRY	DSCF	64.32	56.94	63.42
WATER AT STD.	SCF	6.8	6.2	6.8
MOISTURE	Percent	9.6	9.8	9.7
MOLE FRACTION DRY GAS	*****	0.90	0.90	0.90
MOLECULAR WT.DRY	lb/lb Mole	29.44	29.46	29.68
EXCESS AIR	Percent	254	165	145
MOLECULAR WT. WET	lb/lb Mole	28.34	28.34	28.55
STACK GAS PRESSURE	Inches HG	29.34	29.28	29.30
STACK VELOCITY	AFPM	NM	NM	NM
VOLUMETRIC FLOWRATE, DRY STD	DSCFM	9921	6940	6702
VOLUMETRIC FLOWRATE, ACTUAL	ACFM	NM	NM	NM
ISOKINETIC RATIO	Percent	NA	NA	NA

STD TEMP: 68

CALCULATIONS FOR GRAIN LOADING AND EMISSION RATES

TOTAL PARTICULATE	mg	20.9	NM	26.3
PARTICULATE CONCENTRATION	gr/dscf	0.0050	0.0000	0.0064
PARTICULATE EMISSION RATE	lb/hr	0.426	0.000	0.367

NM - Not Measured. Flare exhaust rate calculated stoicometrically. Total particulate not measured for run #2 due to a failed post leak check.

NA - Not Applicable. Sample collected nonisokinetically due to imeasurable velocity.

Facility: San Marcos Landfill

SCAQMD Method 5.1 Particulate Emissions

Source: Flare #1

Job No.: S22-001

Test Date: 11/18/94

RUN NUMBER	*****	1	2	3
DATE OF RUN	*****	11/18/94	11/18/94	11/18/94
CLOCK TIME: INITIAL	*****	1201	1354	1700
CLOCK TIME: FINAL	*****	1315	1525	1813
AVG. STACK TEMPERATURE	Degrees F	1598	1558	1553
AVG. SQUARE DELTA P	Inches H2O	0.2832	0.2523	0.2798
NOZZLE DIAMETER	Inches	0.666	0.666	0.666
BAROMETRIC PRESSURE	Inches HG	29.35	29.29	29.31
SAMPLING TIME	Minutes	60	60	60
SAMPLE VOLUME	Cubic Feet	65.208	58.920	64.883
AVG. METER TEMP.	Degrees F	65	74	69
AVG. DELTA H	Inches H2O	4.14	3.30	4.10
DGM CALIB. FACTOR [Y]	*****	0.9900	0.9900	0.9900
WATER COLLECTED	Milliliters	145	131	144
CO 2	Percent	5.2	5.8	7.4
O 2	Percent	15.1	13.3	12.5
CO	Percent	0.0	0.0	0.0
CH4	Percent	0	0	0
N 2	Percent	79.7	80.9	80.1
STACK AREA	Square Inches	2827.4	2827.4	2827.4
STATIC PRESSURE	Inches WG.	-0.09	-0.08	-0.10
PITOT COEFFICIENT	*****	0.84	0.84	0.84
SAMPLE VOLUME DRY	DSCF	64.35	56.93	63.45
WATER AT STD.	SCF	6.8	6.2	6.8
MOISTURE	Percent	9.6	9.8	9.7
MOLE FRACTION DRY GAS	*****	0.90	0.90	0.90
MOLECULAR WT.DRY	lb/lb Mole	29.44	29.46	29.68
EXCESS AIR	Percent	254	165	145
MOLECULAR WT. WET	lb/lb Mole	28.34	28.34	28.55
STACK GAS PRESSURE	Inches HG	29.34	29.28	29.30
STACK VELOCITY	AFPM	1920	1695	1870
VOLUMETRIC FLOWRATE, DRY ST	DSCFM	8574	7690	8521
VOLUMETRIC FLOWRATE, ACTUAL	ACFM	37696	33289	36720
ISOKINETIC RATIO	Percent	102	100	101

STD TEMP: 68

CALCULATIONS FOR GRAIN LOADING AND EMISSION RATES

	mg	20.9	NM	26.3
TOTAL PARTICULATE				
PARTICULATE CONCENTRATION	gr/dscf	0.0050	0.0000	0.0064
PARTICULATE EMISSION RATE	lb/hr	0.368	0.000	0.466

NM - Not Measured. Particulate analysis not performed due to failed post leak check.

Facility: San Marcos Landfill
Source: Flare #1
Job No.: S22-001
Test Date: 11/16/94

RUN NUMBER	*****	1	2	3
DATE OF RUN	*****	11/18/94	11/18/94	11/18/94
LOAD CONDITION	*****	Normal	Normal	Normal

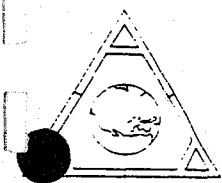
OXIDES OF NITROGEN

POLLUTANT CONCENTRATION	ppm	7.6	9.1	11.0
CONCENTRATION @ 3 %O2	ppm	23.5	19.6	23.2
POLLUTANT CONCENTRATION	lb/dscf	9.08E-07	1.09E-06	1.31E-06
STACK FLOWRATE	dscfm	9921	6940	6702
OXYGEN CONTENT	percent	15.1	12.6	12.4
EPA F-FACTOR	scf/MMBtu			
EMISSION RATE	lb/MMBtu	0.0000	0.0000	0.0000
EMISSION RATE	lb/hr	0.541	0.453	0.529

CARBON MONOXIDE

POLLUTANT CONCENTRATION	ppm	26.3	158.1	189.7
CONCENTRATION @ 3 %O2	ppm	22.5	135.4	162.5
POLLUTANT CONCENTRATION	lb/dscf	1.91E-06	1.15E-05	1.38E-05
STACK FLOWRATE	dscfm	9921	6940	6702
OXYGEN CONTENT	percent			
EPA F-FACTOR	scf/MMBtu			
EMISSION RATE	lb/MMBtu	0.0000	0.0000	0.0000
EMISSION RATE	lb/hr	1.139	4.788	5.548

APPENDIX B
Laboratory Data



AtmAA Inc.

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environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Hydrogen Sulfide & Reduced Sulfur Compounds Analysis in Tedlar Bag Samples

Report Date: November 22, 1994
Client: Horizon / San Marcos
P. O. No.: Verbal
Client Project No.: S22-001
Source Location: San Marcos, CA
Source ID: Not Given

Date Received: November 18, 1994
Date Analyzed: November 18, 1994

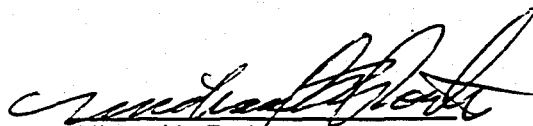
ANALYSIS DESCRIPTION

Hydrogen sulfide was analyzed by gas chromatography with a Hall electrolytic conductivity detector operated in the oxidative sulfur mode. All other components were measured by GC/Mass Spec.

AtmAA Lab No.: 93224-19 93224-20 93224-21 93224-22
Sample I.D.: F2-TRS-1 | F2-TRS-2 | F1-TRS-1 | F1-TRS-2

Components	(Concentration in ppmv)			
Hydrogen sulfide	44.6	41.3	51.8	51.8
Carbonyl sulfide	0.14	0.15	0.16	0.23
Methyl mercaptan	0.80	1.05	1.06	1.31
Ethyl mercaptan	0.21	0.26	0.28	0.32
Dimethyl sulfide	5.83	7.42	7.34	8.00
Carbon disulfide	0.12	0.15	0.10	0.11
isopropyl mercaptan	0.16	0.21	0.28	0.31
n-propyl mercaptan	0.18	0.23	0.18	0.18
Dimethyl disulfide	0.079	0.13	0.096	0.083
TRS	52.3	51.2	61.4	62.5

iso-propyl and n-propyl-mercaptans are calculated based on ethyl mercaptan standard.
TRS - total reduced sulfur


Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analysis)

Client Project No.: S22-001
Source Location : San Marcos, CA
Date Received: November 18, 1994
Date Analyzed: November 18, 1994

Components	Sample ID	Repeat Analysis		Mean	% Diff.
		Run #1	Run #2	Conc.	From Mean
		(Concentration in ppmv)			
Hydrogen sulfide	F2-TRS-1	44.5	44.8	44.6	0.34
	F1-TRS-1	50.2	53.3	51.8	3.0
Carbonyl sulfide	F1-TRS-1	0.16	0.17	0.16	1.9
Methyl mercaptan	F1-TRS-1	1.02	1.11	1.06	4.2
Ethyl mercaptan	F1-TRS-1	0.28	0.27	0.28	1.8
Dimethyl sulfide	F1-TRS-1	7.28	7.40	7.34	0.82
Carbon disulfide	F1-TRS-1	0.10	0.11	0.10	4.8
iso-propyl mercaptan	F1-TRS-1	0.28	0.29	0.28	1.8
n-propyl mercaptan	F1-TRS-1	0.18	0.18	0.18	0.0
Dimethyl disulfide	F1-TRS-1	0.096	0.097	0.096	0.52

A set of 4 Tedlar bag samples, laboratory numbers 93224-(19-22) was analyzed for hydrogen sulfide and reduced sulfur compounds. 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 10 repeat measurements from the sample set of 4 Tedlar bag samples is 1.9%.



Client Project Name SAN MARCOS LANDFILL/SDCamp			Project Location SAN MARCOS, CA			TOTAL REDUCED SULFUR H₂S ANALYSES MUST BE ANALYZED WITHIN 24 hrs of sampling.							
Project No. SZZ-001			Field Logbook No.										
Sampler: (Signature) AD - Rdt			Chain of Custody Tape No.										
Sample No./ Identification			Date	SAMPLE TAKEN @ Time	Lab Sample Number							Type of Sample	REMARKS
FZ-TRS-1	11/17/94	1830	93224-19	102 TEDLAR BAG	+	x		x				FLARE #2 Inlet	R-
FZ-TRS-2	"	1900	20		x	x		x				" Run #2	
FI-TRS-1	11/18/94	1100	21		x	x		x				FLARE #1 Inlet	R-
FI-TRS-2	"	1115	22		+	x		x				" Run #2	
Relinquished by: (Signature) AD - Rdt					Date 11/18/94	Time 1120	Received by: (Signature) Robert Carriz					Date 11/18/94	Time 1120
Relinquished by: (Signature) 1205 EST D. CARRIEZ Robert Carriz					Date 11/18/94	Time 14:30	Received by: (Signature)					Date	Time
Relinquished by: (Signature)					Date	Time	Received for Laboratory: (Signature) Robert Carriz					Date 11/18/94	Time 1430
Sample Disposal Method:					Disposed of by: (Signature)					Date	Time		
SAMPLE COLLECTOR HORIZON AIR MEASUREMENT SERVICES 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781					ANALYTICAL LABORATORY Atm. A.A. Calabasas, CA					Nº 2974			



AtmAA Inc.

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LABORATORY ANALYSIS REPORT

environmental consultants
laboratory services

Selected Components Analysis in Summa Canister Samples

Report Date: December 7, 1994
Client: Horizon / San Marcos Landfill
Site: San Marcos, CA
Date Received: November 18, 1994
Date Analyzed: November 18, 1994

ANALYSIS DESCRIPTION

Oxygen, carbon dioxide, and methane in inlet samples were measured by thermal conductivity detection/gas chromatography (TCD/GC). Ethane and methane in outlet samples were measured by flame ionization detection/gas chromatography (FID/GC). Selected volatile organics were measured by gas chromatography/mass spec. (GC/MS) modified method TO-14.

AtmAA Lab No.: Sample I.D.:	93224-23 Inlet Run #1 S 8	93224-24 Inlet Run #2 S 12	93224-25 Outlet Run #1 S 1	93224-26 Outlet Run #2 S 5	93224-27 Outlet Run #3 S 3
Initial Pressure:	475	454	694	652	702
Final Pressure:	797	797	814	813	812
Components	(Concentration in ppmv)				
Oxygen	8300	5400	NR	NR	NR
Carbon Dioxide	373000	376000	NR	NR	NR
Methane	444000	446000	12.2	<1	<1
Ethane	4.02	4.75	0.13	<0.005	<0.005
	(Concentration in ppbv)				
Benzene	2300	2380	1.50	3.12	0.20
Vinyl Chloride	831	887	<0.2	<0.2	<0.2
1,2-dibromoethane	<5	<5	<0.5	<0.5	<0.5
1,2-dichloroethane	145	147	<0.2	<0.2	<0.2
Benzyl chloride	<20	<20	<1	<1	<1
*Dichlorobenzenes	1910	2300	<1.1	<1.1	<1.1
1,1-dichloroethylene	302	315	<0.5	<0.5	<0.5
Chlorobenzene	159	178	0.33	<0.2	<0.2
Dichloromethane	11800	13400	1.01	0.17	0.23
Perchloroethene	3140	3420	0.22	0.10	0.080
Carbon Tetrachloride	<5	<5	<0.06	<0.06	<0.06
m+p- xylenes	18000	19900	0.52	0.18	0.16
o-xylene	6250	6820	0.25	<0.1	<0.1
Toluene	40400	43000	146	183	81.8
1,1,1-trichloroethane	3040	3000	0.93	0.13	0.31
Trichloroethene	1730	1830	<0.1	<0.1	<0.1
Chloroform	<8	<8	0.13	<0.08	<0.08
1,1,2,2- tetrachloroethane	<5	<5	<0.05	<0.05	<0.05
Styrene	1420	1630	0.16	0.10	0.054

The reported oxygen concentration includes any argon present in the sample, calibration is based on a standard atmosphere containing 20.95% oxygen and 0.93% argon.

* total amount containing meta, para, and ortho isomers

Initial and final pressures measured in mm Hg.

NR - analysis not requested

QUALITY ASSURANCE SUMMARY
(Repeat Analysis)

Site: San Marcos Landfill
Date Received: November 21, 1994
Date Analyzed: November (21-23 & 24), 1994

Components	Sample ID	Repeat Analysis		Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
		(Concentration in ppmv)			
Oxygen	S 8	8200	8400	8300	1.2
Carbon Dioxide	S 12	375000	377000	376000	0.26
Methane	S 12	444000	448000	446000	0.45
	S 1	12.2	12.1	12.2	0.41
	S 3	<1	<1	—	—
Ethane	S 2	<0.005	<0.005	—	—
(Concentration in ppbv)					
Benzene	S 12	2410	2360	2380	1.0
	S 3	0.22	0.17	0.20	12
Vinyl Chloride	S 12	906	867	887	2.2
	S 3	<0.2	<0.2	—	—
1,2-dibromoethane	S 12	<5	<5	—	—
	S 3	<0.5	<0.5	—	—
1,2-dichloroethane	S 12	149	145	147	1.4
	S 3	<0.2	<0.2	—	—
Benzyl chloride	S 12	<20	<20	—	—
	S 3	<1	<1	—	—
*Dichlorobenzenes	S 12	2450	2160	2300	6.3
	S 3	<1.1	<1.1	—	—
1,1-dichloroethylene	S 12	318	312	315	0.95
	S 3	<0.5	<0.5	—	—
Chlorobenzene	S 12	186	170	178	4.6
	S 3	<0.2	<0.2	—	—
Dichloromethane	S 12	13600	13200	13400	1.6
	S 3	0.25	0.21	0.23	9.1



QUALITY ASSURANCE SUMMARY
(Repeat Analysis)
(continued)

Components	Sample ID	Repeat		Analysis	Mean	% Diff.
		Run #1	Run #2	Run #2	Conc.	From Mean
		(Concentration in ppbv)				
Perchloroethene	S 12	3500	3350	3420	2.2	
	S 3	0.091	0.076	0.080	9.0	
Carbon Tetrachloride	S 12	<5	<5	—	—	
	S 3	<0.06	<0.06	—	—	
m+p- xylenes	S 12	20400	19400	19900	2.6	
	S 3	0.18	0.14	0.16	13	
o-xylene	S 12	6890	6760	6820	1.0	
	S 3	<0.1	<0.1	—	—	
Toluene	S 12	43700	42200	43000	1.7	
	S 3	81.4	82.1	81.8	0.50	
1,1,1-trichloroethane	S 12	3020	3000	3005	0.40	
	S 3	0.34	0.28	0.31	11	
Trichloroethene	S 12	1860	1800	1830	1.6	
	S 3	<0.1	<0.1	—	—	
Chloroform	S 12	<8	<8	—	—	
	S 3	<0.08	<0.08	—	—	
1,1,2,2- tetrachloroethane	S 12	<5	<5	—	—	
	S 3	<0.05	<0.05	—	—	
Styrene	S 12	1680	1570	1630	3.4	
	S 3	0.055	0.053	0.054	2.3	

A set of 5 Summa Canister samples, laboratory numbers 93224-(23-27) was analyzed for selected components. Agreement between repeat analysis 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 25 repeat measurements from the sample set of 5 Summa Canister samples is 3.6%.





AtmAA Inc.

23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250

environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Total Gaseous Non Methane Organics Analysis by FID,
Method 25 Modified Without Catalysts

Report Date: December 7, 1994
Client: Horizon / San Marcos Landfill
Site: San Marcos, CA
Date Received: November 18, 1994
Date Analyzed: November 18, 1994

AtmAA Lab No.:	93224-23	(Repeat)	93224-24	93224-25	(Repeat)	93224-26	93224-27
Sample I.D.:	Inlet	Inlet	Inlet	Outlet	Outlet	Outlet	Outlet
	Run #1	Run #1	Run #2	Run #1	Run #1	Run #2	Run #3
	S 8	S 8	S 12	S 1	S 1	S 5	S 3
Initial Pressure:	475	475	454	694	694	652	702
Final Pressure:	797	797	797	814	814	813	812

Components

(Concentration in ppmv)

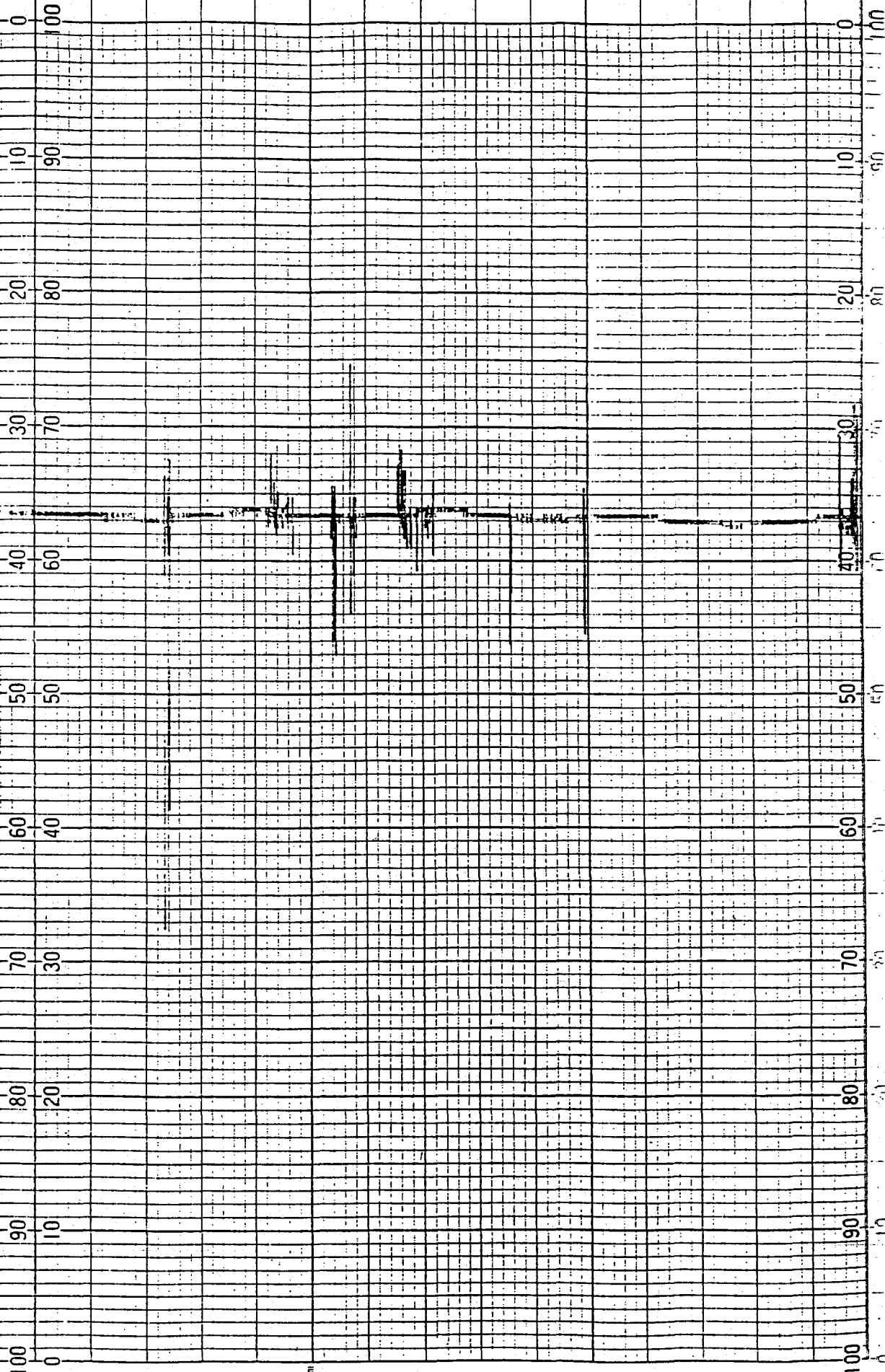
TGNMO	3340	3680	4130	6.95	7.17	10.6	5.53
-------	------	------	------	------	------	------	------

*TGNMO is total gaseous non-methane organics reported as ppm methane.
Initial and final pressures measured in mm Hg.*

Michael L. Porter
Laboratory Director

SOLEC.

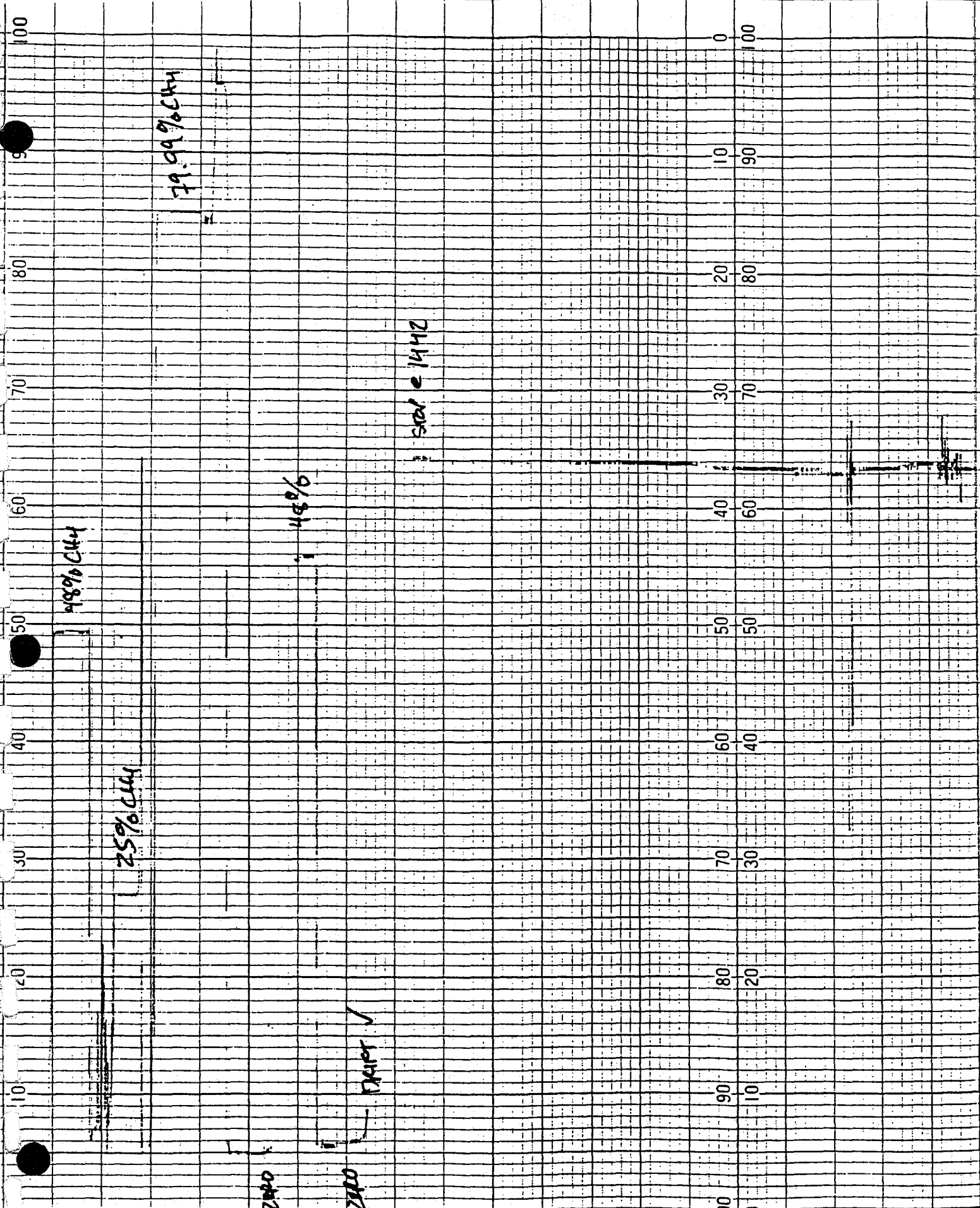
600cm



(12189)

CHART NO. RN2-01-25-20M

SOLTEC



APPENDIX F
Test Plan Correspondences



AIR MEASUREMENT SERVICES, INC.

S22-001-TP-R1

November 11, 1994

Mr. Ian Morris
San Diego County Air Pollution Control District
9150 Chesapeake Drive
San Diego, California 92123

Dear Mr. Morris:

Please find enclosed Attachment A providing an itemized response to the SDCAPCD's Test Plan comments, which we discussed yesterday. Please review HORIZON's response. If our response meets your approval, please notify us as soon as possible so that we can initiate the testing program. HORIZON will be on site at the San Marcos Landfill flare on November 16 and 17, 1994 to conduct compliance emissions testing on flares #2 and #1, respectively.

Please call me at (805)498-8781 if you have any questions.

Sincerely,

HORIZON AIR MEASUREMENT SERVICES, INC.

Andrew D. Pecaut
Air Quality Scientist

AP:lmg

ATTACHMENT A

1. All pertinent calibration data, analytical laboratory data and quality control information will be signed, dated and included in the final report. Calibration data for the inlet landfill gas flow meter will be provided by the facility and included in the final report.
2. All sampling procedures and equipment utilized in the determination of NO_x , CO and associated diluent gases will strictly adhere to those specifications provided by SDCAPCD Method 20, "Test Procedures for the Determination of Nitrogen Oxides, Carbon Monoxide and Diluent Gases by Continuous Emissions Monitoring".
 - 2.1 A stratification check will be performed prior to sampling utilizing eight of the twenty-four traverse points required for Method 5 sampling. Time-averaged values of the oxygen concentration at each of the eight stack locations will be recorded. The maximum and minimum values of the results will be compared with the average of those two values. If either of those values differ by more than ten percent from their average, stratification will be deemed present and sampling will be conducted at each of twenty-four traverse points in conjunction with Method 5 sampling. If the average differs from those maximum/minimum values by ten percent or less, Method 20 sampling will be conducted at a single point near the center of the stack as per SDCAPCD Method 20 Section 5.1.13 Stratification.
 - 2.2 Should HORIZON encounter exhaust gases containing more than five percent of the total NO_x as NO_2 all special procedures and requirements outlined in Sections 3.1, 4.1.3 and 5.2.2 of SDCAPCD Method 20 will be observed. Percent NO_2 in exhaust gas determinations will be made in conjunction with the stratification check. At each traverse point utilized, two values (NO_x & NO) will be recorded by switching the NO_x converter off (from NO_x to NO) and then on again (from NO to NO_x). From these values the percent NO_2 will be determined.



Air Pollution Control Board
Brian P. Bilbray District 1
Dianne Jacob District 2
Pamela Slater District 3
Leon L. Williams District 4
John MacDonald District 5

Air Pollution Control Officer
R. J. Sommerville

November 17, 1994

ANDREW D PECAUT
HORIZON AIR MEASUREMENT SERVICES INC
996 LAWRENCE DRIVE SUITE #108
NEWBURY PARK CA 91320

SAN MARCOS LANDFILL GAS FLARE COMPLIANCE TESTING
S/A No. 930492

The Horizon source test protocol dated October, 1994 has been reviewed.

The protocol, including the written amendments of November 11, 1994, is now acceptable for the emission compliance testing of both landfill gas flares located at the San Marcos landfill.

The compliance test is currently scheduled to begin at 8:00 a.m. on November 16, 1994 and will be witnessed by SDAPCD personnel. Please contact me if there is any change to the test schedule in order to ensure that I can be on site to witness all relevant test procedures.

If there are any questions please contact me at (619) 694-8853 or by FAX at (619) 694-2730.

Ian K. Morris.

IAN K. MORRIS
Associate Air Pollution Control Chemist

IKM:jcs

San Diego Air Pollution Control District

9150 Chesapeake Drive
San Diego, CA 92123-1095
PHONE: (619) 694-3307
FAX (619) 694-2730

TO:

CARL NIIZAWASAN DIEGO COUNTY SOLID WASTE DIVISION

FAX:

() 974 - 2636TOTAL PAGES (including this cover sheet): 1

.....

Sender's Information

FROM:

Ian Morris

Associate Air Pollution Control Chemist
Monitoring and Technical Services

TIME/DATE:

November 22, 1994

COMMENTS:

Carl,

In answer to your voice-mail message, the number of speciated analyses required would be two total speciation (including Calderon list) analyses per flare for the inlet and three Calderon list analyses per flare for the outlet. One analysis per canister sampled. However, I think we also agreed on some duplicate analyses for QA/QC purposes.

Because of the failure of Horizon's FID equipment during the test, Horizon agreed to pay for flare outlet canister analysis for both non-methane hydrocarbon and total speciation. Unfortunately if you want to discuss this further I shall be field testing today until approx 4-5.00 p.m. Leave a voice mail message if you want any specific questions answered.

Please contact me at (619) 694-8853 if you have questions

Post-It® Fax Note	7571	Date 11/22	# of pages 1
To	Andrew Recart	From	C. Niizawa
Co./Dept.		Co.	C. SD.
Phone #		Phone #	
Fax #	(805) 498-3173	Fax #	

APPENDIX G
Calibration Data

Field DGM QC Check

Meter Box No. Box #5 SW#40624

ΔH_0 1.908

γ 0.990

Calibration Date ~~11/19/94~~ 7/26/94

Operate metering system for 10 minutes at the ΔH_0 value. Record the volume metered, dgm temperature and barometric pressure.

Final: DGM Reading 454.510 Temp 78 BP 29.30

Initial: DGM Reading 462.317 Temp 77

V_m = 7.807 T_m = 77.5

$$\gamma_c = \frac{10}{V_m} \left[\frac{0.0319 (T_m + 460)}{B_p 29.30} \right]^{1.2}$$

77.5

If $0.97\gamma < \gamma_c < 1.03\gamma$ (meets ✓ exceeds)

$$.97 (0.990) < \underline{0.9799} < 1.03 (0.990)$$

0.9603 1.0197

Units not meeting this criteria should be considered questionable and corrective action initiated.

Performed by: *[Signature]*

Date: 11/19/94

Checked by: *[Signature]*

Date: 11/5/94

RAC BOX #5

APEX INSTRUMENTS
EPA METHOD 5
Meter Box Calibration

Model #: 522
Serial #: 40624

Date: 7/26/94
Barometric Pressure 29.60

dH	T i m e	DRY GAS METER VOLUME					CALIBRATION METER VOLUME (Yc= 1.0000)				
		Initial	Final	Total	Temp		Initial	Final	Total	Temp.	
					Tmi	Tmo				Init.	Final
0.50	16.00	47.682	54.048	6.366	83	81	322.898	329.232	6.334	80	80
					87	81					
1.00	12.00	54.048	60.805	6.757	87	81	329.232	335.905	6.673	80	80
					88	82					
2.00	10.00	60.805	68.654	7.849	88	82	335.905	343.622	7.717	80	80
					88	83					
3.00	10.00	68.654	78.275	9.621	88	83	343.622	353.071	9.449	80	80
					92	83					
5.00	9.00	78.275	89.335	11.060	85	83	353.071	363.940	10.869	80	80
					92	84					

METER Y		DEL H	
0.9993	0.01	1.842	-0.07
0.9933	0.00	1.865	-0.04
0.9878	-0.00	1.933	0.02
0.9866	-0.00	1.932	0.02
0.9815	-0.01	1.970	0.06

AVG. 0.990

AVG. 1.908

Field DGM QC Check

SN# 40624
Meter Box No. 522 (APEX #1) Box # 5

ΔH @ 1.908

γ 0.990

Calibration Date 07/26/94

Operate metering system for 10 minutes at the ΔH @ value. Record the volume metered, DGM temperature and barometric pressure.

Final: DGM Reading 337.232 Temp. 85 BP 29.18 "Hg

Initial: DGM Reading 329.487 Temp. 83

$V_m =$ 7.745 $T_m =$ 84

$$\gamma_o = \frac{10}{V_m} \left(\frac{0.0319 (T_m + 460)}{BP} \right)^{1/2} \quad (1)$$

7.745 29.18

If $0.97\gamma < \gamma_c < 1.03\gamma$ (meets ☒ exceeds ☐)

$$.97 (.990) < \underline{0.9957} < 1.03 (.990)$$

Units not meeting this criteria should be considered questionable and corrective action initiated.

Performed by: [Signature] Date: 08/12/94

Checked by: [Signature] Date: 8/12/94

7-1

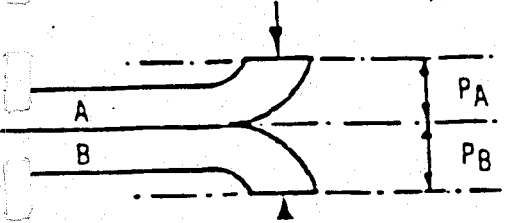
TYPE S PITOT TUBE INSPECTION DATA FORM

Tubing diameter, D_t .380 in.

Pitot Tube Assembly Level? (Yes) / No

Pitot Tube Openings Damaged? Yes / (No)

A-SIDE PLANE

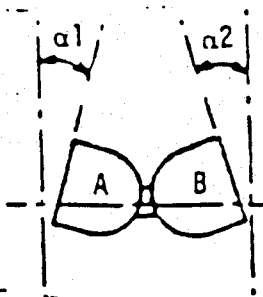


NOTE:

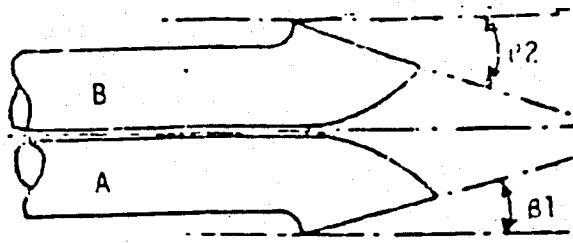
$$\begin{cases} 1.05 D_t < P < 1.50 D_t \\ P_A = P_B \end{cases}$$

$P_A =$.490 in.

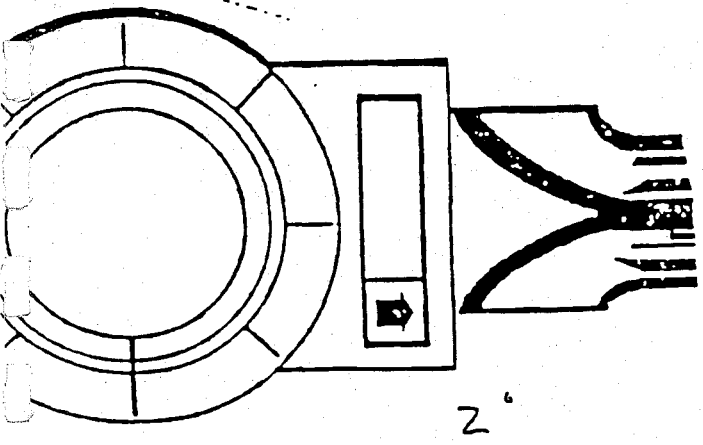
$P_B =$.489 in.



$$\begin{aligned} \alpha_1 &= \underline{3}^\circ \\ \alpha_2 &= \underline{2}^\circ \\ &(< 10^\circ) \end{aligned}$$

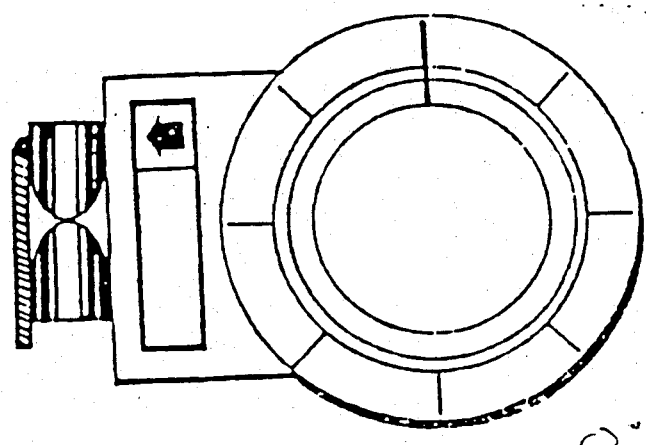


$$\begin{aligned} \beta_1 &= \underline{0}^\circ \\ \beta_2 &= \underline{1}^\circ \\ &(< 5^\circ) \end{aligned}$$



Level Position to Find γ

$$Z = A \sin \gamma \underline{.017} \text{ in. } (< 1/8 \text{ in.})$$



Level Position to find θ

$$W = A \sin \theta \underline{0} \text{ in. } (< 1/32 \text{ in.})$$

Comments _____

Checked by: ES

Date: 9/23/94

Calibration Required? ND

Thermocouple Calibration Data

Date:
Calibrated by:
Barometric Pressure:

7/5/94
E. Swede
29.30

Termocouple ID	Ice Water		Ambient		Boiling Water	
	Reference	Tc	Reference	Tc	Reference	Tc
3-1	2	2	18	18	96	95
3-2	2	2	18	18	96	95
3-3(rule 1174 STACK)	2	3	18	20	96	98
3-4(rule 1174 4 inch)	2	3	18	20	96	98
3-5	2	3	18	18	96	95
5-1	2	2	18	18	96	95
5-5	2	3	18	18	96	96
6-1	2	3	18	18	96	96
7-1	2	2	18	18	96	94
7-2	2	2	18	18	96	96
10-1	2	3	18	18	96	94

Calibrated by:

Reviewed by:



Scott Specialty Gases, Inc.

Shipped
From:

2800 CAJON BLVD.

SAN BERNARDINO

CA 92411

Phone: 909-887-2571

Fax: 909-887-0549

CERTIFICATE OF ANALYSIS

HORIZON AIR MEASUREMENT

LORI GULLIUM

998 LAWRENCE DRIVE

SUITE 108

NEWBERRY PARK

CA 91320

PROJECT #: 02-28692-003

PO#: 5010

ITEM #: 02022753 2A

DATE: 11/24/93

CYLINDER #: A1541

ANALYTICAL ACCURACY: +-1%

FILL PRESSURE: 1825 PSIG

BLEND TYPE : ACUBLEND MASTER GAS

COMPONENT

METHANE

NITROGEN

REQUESTED GAS

CONC MOLES

25.

PCT

BAL

ANALYSIS

(MOLES)

25.00

PCT

BAL

825 PSIG BIN #7 11-29

ANALYST:



Scott Specialty Gases, Inc.

Shipped

2600 CAJON BLVD.

SAN BERNARDINO

CA 92411

Phone: 909-887-2571

Fax: 909-887-0549

C E R T I F I C A T E O F A N A L Y S I S

HORIZON AIR MEASUREMENT

ORI GULLIUM

996 LAWRENCE DRIVE

SUITE 108

EWBERRY PARK

CA 91320

PROJECT #: 02-28692-002

PO#: 5010

ITEM #: 02022753 2A

DATE: 11/24/93

CYLINDER #: A9889

ANALYTICAL ACCURACY: +-1%

FILL PRESSURE: 1825 PSIG

BLEND TYPE : ACUBLEND MASTER GAS

COMPONENT

REQUESTED GAS

ANALYSIS

CONC MOLES

(MOLES)

ETHANE

48.

PCT

48.00

PCT

NITROGEN

BAL

BAL

1825 PSIG BIN #7 11-29

ANALYST:



Scott Specialty Gases, Inc.

Shipped

2600 CAJON BLVD.

SAN BERNARDINO

CA 92411

Phone: 909-887-2571

Fax: 909-887-0549

C E R T I F I C A T E O F A N A L Y S I S

HORIZON AIR MEASUREMENT

DRI GALLIUM

596 LAWRENCE DRIVE

SUITE 108

LEWIS PARK

CA 91320

PROJECT #: 02-28692-001

PO#: 5010

ITEM #: 0202275301 2A

DATE: 11/24/93

CYLINDER #: A11580

ANALYTICAL ACCURACY: +-1%

FILL PRESSURE: 2000 PSIG

BLEND TYPE : ACUBLEND MASTER GAS

COMPONENT

ETHANE

NITROGEN

REQUESTED GAS

CONC MOLES

80.

PCT

BAL

ANALYSIS

(MOLES)

79.99

PCT

BAL

2000 PSIG

BIN #7 11-29

ANALYST:

SEMI-ANNUAL NO_x LINEARITY
2nd Half 1994

Range = 0-250

Point #	1	2	3	4	5
Instrument	192.00	78.80	50.00		
Cylinder	191.70	78.30	49.80		
Cylinder ID	ALMO05445	ALMO14448	ALMO25535		
% difference	<u>0.12</u>	<u>0.20</u>	<u>0.08</u>	-	

Range = 0-100

Point #	1	2	3	4	5
Instrument	50.00	22.00	78.50		
Cylinder	49.83	22.27	79.30		
Cylinder ID	ALMO25535	ALMO34130	ALMO14448		
% difference	<u>0.17</u>	<u>-0.27</u>	<u>-0.80</u>	-	

Range = 0-25

Point #	1	2	3	4	5
Instrument	22.25	9.38			
Cylinder	22.27	9.36			
Cylinder ID	ALMO34130	ALMO04285			
% difference	<u>-0.08</u>	<u>0.08</u>	-		

NO₂ TO NO CONVERSION

PPM AT START	37.50
PPM AFTER 30 MIN.	38.00
% CONVERSION	101%
% CHANGE	0

RESPONSE TIMES

	Run #1	Run #2	Run #3	Average
UPSCALE (sec.)	20.0	21.0	22.0	21.0
OWNSCALE (sec.)	22.0	21.0	21.0	21.3

INSTRUMENT ID. Serial No. 29291-234DATE: 7/11/94

SEMI-ANNUAL CARBON MONOXIDE LINEARITY
2nd Half 1994

Range = 0-1000

Point #	1	2	3	4	5
Instrument	249.00	402.00	765.00		
Cylinder	250.80	397.60	761.30		
Cylinder ID	AAL7948	ALM5453	ALM18877		
% difference	<u>-0.18</u>	<u>0.44</u>	<u>0.37</u>		

Range = 0-600

Point #	1	2	3	4	5
Instrument	400.00	77.00	245.00		
Cylinder	397.60	77.90	250.80		
Cylinder ID	ALM5453	ALMO38242	AAL7948		
% difference	<u>0.48</u>	<u>-0.18</u>	<u>-1.16</u>		

Range = 0-100

Point #	1	2	3	4	5
Instrument	52.50	77.80	27.50		
Cylinder	51.80	77.90	26.97		
Cylinder ID	ALMO25535	ALMO38242	ALMO35686		
% difference	<u>0.70</u>	<u>-0.10</u>	<u>0.53</u>		

Point #	1	2	3	4	5
---------	---	---	---	---	---

RESPONSE TIMES

	Run #1	Run #2	Run #3	Average
UPSCALE (sec.)	92.0	91.0	94.0	92.3
DOWNSCALE (sec.)	70.0	65.0	68.0	67.7

INSTRUMENT ID. Serial No. 48N-29677-236DATE: 7/11/94

TELEDYNE
Range =

25

Point #	1	2	3	4	5
Instrument	14.00	4.90	20.50		
Cylinder	14.00	5.00	20.90		
Cylinder ID	ALM4279	ALM10539	AMBIENT		
% difference	<u>0.00</u>	<u>-0.40</u>	<u>-1.60</u>		

SEMI-ANNUAL CARBON DIOXIDE LINEARITY
2nd Half 1994Range =

25

Point #	1	2	3	4	5
Instrument	14.00	4.00			
Cylinder	14.00	4.00			
Cylinder ID	ALM010539	ALM4279			
% difference	<u>0.00</u>	<u>0.00</u>	-	-	

RETEST					
K CHECK		P			
** LINEARITY CHECK **					
GE :	25	25	500	15	
	NOx	O2	CO	CO2	
LOW LEVEL					
Instrument	0.0	0.0	0.0	0.0	0.0
Cylinder	0.0	0.0	0.0	0.0	0.0
Difference (%)	0.0	0.0	0.0	0.0	0.0
HIGH LEVEL					
Instrument	9.4	12.5	250.0	7.1	
Cylinder	9.4	12.5	250.8	7.1	
Difference (%)	0.1	-0.2	-0.2	-0.2	
LOW LEVEL					
Instrument	22.5	16.8	397.0	14.2	
Cylinder	22.3	17.0	397.6	14.2	
Difference (%)	0.9	-0.8	-0.1	0.0	
HIGH LEVEL					
Instrument	9.0	12.6	250.0	7.2	
Cylinder	9.4	12.5	250.8	7.1	
Difference (%)	-1.4	0.2	-0.2	0.8	
LOW LEVEL					
Instrument	22.5	17.0	395.0	14.3	
Cylinder	22.3	17.0	397.6	14.2	
Difference (%)	0.9	0.0	-0.5	0.5	

[illegible]

STRATIFICATION TEST		
SAMPLE POINT	CONCENTRATION	
	NOX	CO
A-1		
2		
3		
4		
5		
6		
B-1		
2		
3		
4		
5		
6		
AVERAGE	#DIV/0!	#DIV/0!
SAMP. PT.		

System Response Time (seconds)			
	#1	#2	#3
Upscale			
NOx			
CO			
O2			
CO2			
Downscale			
NOx			
CO			
O2			
CO2			

NO2 to NO Converter Efficiency (%)			
	initial	final	effeciency
ppm	46.66	45.5	97.51393

Test Date: 11-18-94

Method 100 Performance

RETEST					
AK CHECK		P			
** LINEARITY CHECK **					
RANGE :		25	25	500	15
		NOx	O2	CO	CO2
ZERO					
Instrument		0.0	0.0	0.0	0.0
Cylinder		0.0	0.0	0.0	0.0
Difference (%)		0.0	0.0	0.0	0.0
LOW LEVEL					
Instrument					
Cylinder					
Difference (%)		0.0	0.0	0.0	0.0
MID LEVEL					
Instrument		9.3	12.6	249.0	7.1
Cylinder		9.4	12.5	250.8	7.1
Difference (%)		-0.4	0.2	-0.4	-0.2
HIGH LEVEL					
Instrument		22.3	16.9	402.0	14.2
Cylinder		22.3	17.0	397.6	14.2
Difference (%)		-0.1	-0.4	0.9	0.2
POST TEST					
AK CHECK		P			
		NOx	O2	CO	CO2
ZERO					
Instrument		-0.1	-0.2	4.0	0.0
Cylinder		0.0	0.0	0.0	0.0
Difference (%)		-0.4	-0.8	0.8	0.0
LOW LEVEL					
Instrument					
Cylinder					
Difference (%)		0.0	0.0	0.0	0.0
MID LEVEL					
Instrument		9.5	12.4	250.0	7.1
Cylinder		9.4	12.5	250.8	7.1
Difference (%)		0.4	-0.6	-0.2	-0.2
HIGH LEVEL					
Instrument		22.8	16.9	401.0	14.3
Cylinder		22.3	17.0	397.6	14.2
Difference (%)		1.9	-0.4	0.7	0.9

SYSTEM BIAS	
PreTest	
21.75	
22.27	
-2.1	
P	
Post test	
9.125	
9.36	
-0.9	
P	

STRATIFICATION TEST		
SAMPLE POINT	CONCENTRATION NOX	CO
A-1		
2		
3		
4		
5		
6		
B-1		
2		
3		
4		
5		
6		
AVERAGE SAMP. PT.	#DIV/0!	#DIV/0!

System Response Time (seconds)			
	#1	#2	#3
Upscale			
NOx			
CO			
O2			
CO2			
Downscale			
NOx			
CO			
O2			
CO2			

NO2 to NO Converter Efficiency (%)			
	initial	final	efficiency
ppm	46.66	45.5	97.51393



Scott Specialty Gases, Inc.

2600 CAJON BOULEVARD, SAN BERNARDINO, CA 92411

(909) 887-2571 FAX: (909) 887-0549

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
HORIZON AIR MEASUREMENT
LORI
996 LAWRENCE DRIVE
SUITE 108
NEWBERRY PARK, CA 91320

Assay Laboratory
Scott Specialty Gases
2600 Cajon Boulevard
San Bernardino, CA 92411

Purchase Order 4960
Project # 27090.002

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure #G1, Section Number 3.0.4

Cylinder Number ALM004285
Cylinder Pressure 1800 psig

Certification Date 08-27-93

GENERAL Date 08-27-95

ACID RAIN DATE

ANALYZED CYLINDER

Components
NITRIC OXIDE

Certified Concentration
9.352 PPM

Analytical Uncertainty*
± 1 % NIST Traceable

Balance Gas: Nitrogen
NOX

9.361 PPM

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type SRM2627A
Expiration Date 09-94

Cylinder Number
CAL10865

Concentration
4.570 ppm

INSTRUMENTATION

Instrument/Model/Serial #
TECO / 10AR / 38644-258

Last Date Calibrated
06-23-93

Analytical Principle
Chemi-Luminescent

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components

First Triad Analysis

Second Triad Analysis

Calibration Curve

Nitric Oxide

Date: 08-20-93 **Response Units:** mvv
Z1= 0.00 R1= 45.3 T1= 90.6
R2= 45.5 Z2= 0.00 T2= 90.4
Z3= 0.00 T3= 90.2 R3= 45.3
Avg. Conc. of Cust Cyl. 9.299 ppm

Date: 08-27-93 **Response Units:** mvv
Z1= 0.00 R1= 45.3 T1= 91.9
R2= 45.3 Z2= 0.00 T2= 91.5
Z3= 0.00 T3= 90.9 R3= 45.3
Avg. Conc. of Cust Cyl. 9.406 ppm

Concentration= Ax + B
A = 0.1040
B = -0.1072

Date: **Response Units:** mvv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Date: **Response Units:** mvv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Concentration=

Date: **Response Units:** mvv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Date: **Response Units:** mvv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Concentration=

SPECIAL NOTES: IF THIS PRODUCT IS USED FOR ACID RAIN COMPLIANCE, THE ACID RAIN EXPIRATION DATE NOTED ABOVE APPLIES PER 40 CFT PART 75, APPENDIX H. OTHERWISE THE GENERAL EXPIRATION DATE APPLIES.

Thomas Wilson
Analyst



Scott Specialty Gases, Inc.

2600 CAJON BOULEVARD, SAN BERNARDINO, CA 92411

(909) 887-2571 FAX: (909) 887-0549

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
HORIZON AIR MEASUREMENT
LORI
996 LAWRENCE DRIVE
SUITE 108
NEWBERRY PARK, CA 91320

Assay Laboratory
Scott Specialty Gases
2600 Cajon Boulevard
San Bernardino, CA 92411

Purchase Order 4960
Project # 27090.001

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure #G1, Section Number 3.0.4

Cylinder Number ALM034130
Cylinder Pressure 1850 psig

Certification Date 08-24-93

GENERAL Date 08-24-95

ACID RAIN DATE

ANALYZED CYLINDER

Components
NITRIC OXIDE

Certified Concentration
22.11 PPM

Analytical Uncertainty*
± 1 % NIST Traceable

Balance Gas: Nitrogen
NOX

22.27 PPM

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type
GMIS

Expiration Date
11-94

Cylinder Number
ALM033911

Concentration
24.97 ppm

INSTRUMENTATION

Instrument/Model/Serial #
TECO / 10AR / 38644-258

Last Date Calibrated
07-26-93

Analytical Principle
Chemi-Luminescent

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components

First Triad Analysis

Second Triad Analysis

Calibration Curve

Nitric Oxide

Date: 08-17-93 Response Units: mv
Z1= 0.00 R1= 24.2 T1= 21.3
R2= 24.2 Z2= 0.00 T2= 21.3
Z3= 0.00 T3= 21.3 R3= 24.2
Avg. Conc. of Cust Cyl. 22.06 ppm

Date: 08-24-93 Response Units: mv
Z1= 0.00 R1= 24.2 T1= 21.4
R2= 24.2 Z2= 0.00 T2= 21.4
Z3= 0.00 T3= 21.4 R3= 24.2
Avg. Conc. of Cust Cyl. 22.17 ppm

Concentration= Ax + B
A=1.001
B=0.05283

Date: Response Units: mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Date: Response Units: mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Concentration=

Date: Response Units: mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Date: Response Units: mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Concentration=

SPECIAL NOTES: IF THIS PRODUCT IS USED FOR ACID RAIN COMPLIANCE, THE ACID RAIN EXPIRATION DATE NOTED ABOVE APPLIES PER 40 CFT PART 75, APPENDIX H. OTHERWISE THE GENERAL EXPIRATION DATE APPLIES.

Thomas Wilson
Analyst



Scott Specialty Gases, Inc.

2600 CAJON BOULEVARD, SAN BERNARDINO, CA 92411

(909) 887-2571

Fax: (909) 887-0549

C E R T I F I C A T E O F A N A L Y S I S

HORIZON AIR MEASUREMENT
LORI GILLUM
996 LAWRENCE DRIVE
SUITE 108
NEWBERRY PARK

CA 91320

PROJECT #: 02-33352-001
PO#: 5211
ITEM #: 0202C3000701AL
DATE: 9/21/94

CYLINDER #: AAL17437
FILL PRESSURE: 2000 PSIG
BLEND TYPE : GRAVIMETRIC MASTER GAS

ANALYTICAL ACCURACY: +/- .02 ABS

COMPONENT

CARBON DIOXIDE
OXYGEN
NITROGEN

REQUESTED GAS
CONC MOLES

7. %
12.5 %
BALANCE

ANALYSIS
(MOLES)

7.077 %
12.54 %
BALANCE

2000 PSIG BIN#10 09-23 JDLT
CERTIFIED TO HAVE BEEN BLENDED
AND VERIFIED TO BE CORRECT BY
ANALYSIS.

GRAVIMETRIC MASTER GAS
AGAINST NIST CERTIFIED WEIGHT
INDEPENDENT LABORATORY

ANALYST:

FREMONT, CALIFORNIA ♦ SAN BERNARDINO, CALIFORNIA ♦ LONGMONT, COLORADO ♦ CHICAGO, ILLINOIS ♦ BATON ROUGE, LOUISIANA
WAKEFIELD, MASSACHUSETTS ♦ TROY, MICHIGAN ♦ DURHAM, NORTH CAROLINA ♦ SOUTH PLAINFIELD, NEW JERSEY
AVON LAKE, OHIO ♦ SARNIA, ONTARIO ♦ HOUSTON, TEXAS ♦ PLUMSTEADVILLE, PENNSYLVANIA ♦ BREDA, THE NETHERLANDS



Scott Specialty Gases, Inc.

Shipped from: 2600 CAJON BLVD.
SAN BERNARDINO CA 92411
Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ANALYSIS

HORIZON AIR MEASUREMENT

PROJECT #: 02-27366-001

6 LAWRENCE DRIVE
SUITE 108
NEWBERRY PARK

CA 91320

PO#: 4967
ITEM #: 0202C3000712AL
DATE: 9/03/93

CYLINDER #: AAL570

ANALYTICAL ACCURACY: +-1%

FILL PRESSURE: 2000 PSIG

BLEND TYPE : ACUBLEND MASTER GAS

COMPONENT

BON DIOXIDE
OXYGEN
NITROGEN

REQUESTED GAS

CONC	MOLES
3.	PCT
17.	PCT
	BAL

ANALYSIS

(MOLES)
3.000 PCT
17.00 PCT
BAL

10 BIN#2 2000 PSIG

ANALYST:

MAYNARD JOHNSON

PLUMSTEADVILLE, PENNSYLVANIA TROY, MICHIGAN HOUSTON, TEXAS DURHAM, NORTH CAROLINA
SOUTH PLAINFIELD, NEW JERSEY FREMONT, CALIFORNIA WAKEFIELD, MASSACHUSETTS LONGMONT, COLORADO
BATON ROUGE, LOUISIANA



Scott Specialty Gases, Inc.

2600 CAJON BOULEVARD, SAN BERNARDINO, CA 92411

(909) 887-2571

Fax: (909) 887-0549

C E R T I F I C A T E O F A N A L Y S I S

HORIZON AIR MEASUREMENT

996 LAWRENCE DRIVE
SUITE 108
NEWBERRY PARK

CA 91320

PROJECT #: 02-32586-001
PO#: 5175
ITEM #: 0202C3000701AL
DATE: 7/27/94

CYLINDER #: AAL4757

FILL PRESSURE: 2000 PSIG

BLEND TYPE : GRAVIMETRIC MASTER GAS

ANALYTICAL ACCURACY: +/- .02%

COMPONENT

CARBON DIOXIDE
OXYGEN
NITROGEN

REQUESTED GAS CONC MOLES

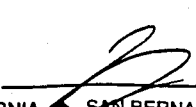
14.	PCT
4.	PCT
	BAL

ANALYSIS (MOLES)

14.17	PCT
3.981	PCT
	BAL

2000 PSIG BIN# 10 08-05 JDLT
CERTIFIED TO HAVE BEEN BLENDED
AND VERIFIED TO BE CORRECT BY
ANALYSIS.

GRAVIMETRIC MASTER GAS
AGAINST NIST CERTIFIED WEIGHT
INDEPENDENT LABORATORY

ANALYST: 

FREMONT, CALIFORNIA ♦ SAN BERNARDINO, CALIFORNIA ♦ LONGMONT, COLORADO ♦ CHICAGO, ILLINOIS ♦ BATON ROUGE, LOUISIANA
WAKEFIELD, MASSACHUSETTS ♦ TROY, MICHIGAN ♦ DURHAM, NORTH CAROLINA ♦ SOUTH PLAINFIELD, NEW JERSEY
AVON LAKE, OHIO ♦ SARNIA, ONTARIO ♦ HOUSTON, TEXAS ♦ PLUMSTEADVILLE, PENNSYLVANIA ♦ BREDA, THE NETHERLANDS



Scott Specialty Gases, Inc.

2600 CAJON BOULEVARD, SAN BERNARDINO, CA 92411

(909) 887-2571 FAX: (909) 887-0549

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
HORIZON AIR MEASUREMENT
LORI GILLUM
996 LAWRENCE DR
SUITE 108
NEWBERRY PARK, CA 91320

Assay Laboratory
Scott Specialty Gases
2600 Cajon Boulevard
San Bernardino, CA 92411

Purchase Order 5070
Project # 30106.004

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure #G1, Section Number 3.0.4

Cylinder Number ALM005453
Cylinder Pressure 2000 psig

Certification Date 03-02-94

Exp. Date 03-02-97

ANALYZED CYLINDER

Components

CARBON MONOXIDE

Certified Concentration

397.6 PPM

Analytical Uncertainty*

± 1 % NIST Traceable

Balance Gas: Nitrogen

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type
GMIS

Expiration Date
06-94

Cylinder Number
ALM011622

Concentration
974.7 ppm

INSTRUMENTATION

Instrument/Model/Serial #
Horiba / OPE-135D / 56565502

Last Date Calibrated
02-19-94

Analytical Principle
NDIR

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components

First Triad Analysis

Carbon Monoxide

Date: 02-19-94 **Response Units:** mv
Z1= 0.00 R1= 97.4 T1= 51.4
R2= 97.4 Z2= 0.00 T2= 51.5
Z3= 0.00 T3= 51.5 R3= 97.4
Avg. Conc. of Cust Cyl. 397.6 ppm

Second Triad Analysis

Date: 03-02-94 **Response Units:** mv
Z1= 0.00 R1= 97.4 T1= 51.5
R2= 97.4 Z2= 0.00 T2= 51.4
Z3= 0.00 T3= 51.5 R3= 97.4
Avg. Conc. of Cust Cyl. 397.6 ppm

Calibration Curve

Concentration= Ax^3+Bx^2+Cx+D
A=0.0002105
B=-0.01799
C=6.250
D=-0.5313

Date: **Response Units:** mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Date: **Response Units:** mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Concentration=

Date: **Response Units:** mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Date: **Response Units:** mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Concentration=

SPECIAL NOTES: IF THIS PRODUCT IS USED FOR ACID RAIN COMPLIANCE,
THE ACID RAIN EXPIRATION DATE NOTED ABOVE APPLIES PER 40 CFT PART
75, APPENDIX H. OTHERWISE THE GENERAL EXPIRATION DATE APPLIES.

ANALYST

Th Wil



Scott Specialty Gases, Inc.

2600 CAJON BOULEVARD, SAN BERNARDINO, CA 92411

(909) 887-2571 FAX: (909) 887-0549

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
HORIZON AIR MEASUREMENT
996 LAWRENCE DRIVE
SUITE 108
NEWBERRY PARK, CA 91320

Assay Laboratory
Scott Specialty Gases
2600 Cajon Boulevard
San Bernardino, CA 92411

Purchase Order 4918
Project # 25535.001

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure #G1, Section Number 3.0.4

Cylinder Number AAL-7948
Cylinder Pressure 1950 psig

Certification Date 05-17-93
Previous Certification Dates NONE

Expiration Date * 11-17-94
**** 05-17-96**

ANALYZED CYLINDER

Components
CARBON MONOXIDE

Certified Concentration
250.8 ppm

Analytical Uncertainty*
± 1 % NIST Traceable

Balance Gas: Nitrogen

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type GMIS
Expiration Date 06-94

Cylinder Number
ALM011622

Concentration
974.7 PPM

INSTRUMENTATION

Instrument/Model/Serial #
Horiba / OPE-135D / 56565502

Last Date Calibrated
04-21-93

Analytical Principle
NDIR

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components

First Triad Analysis

Date: 05-10-93 **Response Units:** mv
Z1= 0.00 R1= 95.0 T1= 34.0
R2= 95.0 Z2= 0.00 T2= 34.0
Z3= 0.00 T3= 34.0 R3= 95.0
Avg. Conc. of Cust Cyl. 250.8 ppm

Second Triad Analysis

Date: 05-17-93 **Response Units:** mv
Z1= 0.00 R1= 95.0 T1= 34.0
R2= 95.0 Z2= 0.00 T2= 34.0
Z3= 0.00 T3= 34.0 R3= 95.0
Avg. Conc. of Cust Cyl. 250.8 ppm

Calibration Curve

Ax^2+Bx+C
A=0.00049356
B=0.94401939
C=0.00188426

Date: **Response Units:** mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Date: **Response Units:** mv
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Concentration=

Date: **Response Units:**
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Date: **Response Units:**
Z1= R1= T1=
R2= Z2= T2=
Z3= T3= R3=
Avg. Conc. of Cust Cyl.

Concentration=

Special Notes : * Acid Rain Certification Period
** Non-Acid Rain Certification Period

Joseph De La Torre
Analyst Joseph De La Torre

