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Title: Test Report For Air Pollution Source Testing At Macasphalt, Cross City, Florida,

Ramcon Environmental Corporation, Memphis, TN,

December 7-9, 1992.

AP-42 Section	11.1
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Report Sect.	4
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RAMCON

ENVIRONMENTAL CORPORATION

Test Report for Air Pollution Source Testing

at

MACASPHALT
CROSS CITY, FLORIDA

and

NATIONAL ASPHALT PAVEMENT ASSOCIATION
5100 FORBES BLVD., NAPA BUILDING
LANHAM, MARYLAND

submitted by:

RAMCON ENVIRONMENTAL CORPORATION
6707 FLETCHER CREEK COVE
MEMPHIS, TENNESSEE 38133

December 7-9, 1992

Mr. Tom Brumagin
National Asphalt Pavement
Association

W J Sewell

William Joseph Sewell, II
Vice President

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Additionally stack gas moisture, velocity, and volumetric flow rate were determined to provide data enabling conversion of flue gas concentrations to emission data. These determinations were conducted in conjunction with each of the isokinetic testing procedures.

Where possible, the testing was conducted simultaneously. This provides correlations of the various stack effluents relationships with one another. Three (3) test runs were conducted for each isokinetic testing procedure. Eleven test runs were conducted utilizing the CEM instrumental procedures for SO_2, CO, THC, NO_x, CO_2, and O_2. Nine (9) test periods were conducted for the semi-continuous GC procedure.

The purpose of the testing project was to provide air emissions information for developing a database of information using various types of hot mix asphalt plants.

Mr. Thomas E. Brumagin representing the National Asphalt Pavement Association was present during the testing procedure(s) conducted by RAMCON Environmental Corporation.

II. TEST RESULTS

The test results are summarized in Tables I through III. Each summary table represents the test results for particulate, formaldehyde, and PAH's respectively. The gaseous pollutants of interest, THC, SO_2, CO_2, CO, NO_x, O_2, CH_4, and BTEX, test results are listed in each summary table. The test results for these gaseous compounds listed on each summary table were correlated to the isokinetic tests according to date and times. This provides a direct comparison of the test data for a specific targeted pollutant to other operational and emission data.

The summary tables provide the test results in concentration values of milligrams per dry standard cubic meter (mg/dscm) and parts per million (ppm), volume basis. The emission values of all targeted compounds are listed in pounds per hour (lb/hr).

I. INTRODUCTION

On December 7, 8, & 9, 1992, personnel from RAMCON Environmental Corporation conducted source emissions determinations at Macasphalt located in Perry, Florida. The testing was conducted according to the National Asphalt Pavement Association (NAPA) guidelines entitled, "Protocol for Air Pollution Source Testing".

The scope of work involved testing this facility for filterable and condensible particulate matter, formaldehyde, and polynuclear aromatic hydrocarbons. These compounds were sampled according to specified isokinetic testing procedures. Reference Method 202 was employed for the particulate matter including condensibles. Method 0011/8315 issued in SW-846 was utilized for the formaldehyde extraction, collection, and analysis. The polynuclear aromatic hydrocarbons were sampled using Modified Method 5.

In addition, "real-time" continuous emission monitor (CEM) instrumentation was utilized to conduct on-site analysis for oxygen, carbon dioxide, total volatile organics, sulfur dioxide, carbon monoxide, and NO_x. Reference Methods 3A, 6C, 7E, 10, and 25A were employed for the analysis of oxygen and carbon dioxide, sulfur dioxide, nitrogen oxides, carbon monoxide, and total hydrocarbons respectively. These testing procedures utilize a sampling system to continuously extract sample gas from the source. This sample stream is routed to individual CEM's for analysis of the various targeted pollutants and diluent gases. The test results are based on the average value of one minute averages generated by the CEM instrument data acquisition during the test periods.

Methane, benzene, toluene, ethyl benzene, and xylene compounds were analyzed on a semi-continuous basis by employing a gas chromatograph to the sampling location. Reference Method 18 was used for these determinations. The gas stream is continuously sampled during the testing period(s). Periodically, a sample of the extracted gas stream is injected into the gas chromatograph for analysis. The test results are based on the average value of the injections performed during each test period.

The SO_2 instrument failed in its operation during the performance test. Sulfur dioxide results are provided for particulate and PAH sampling, however the formaldehyde summary table does not include SO_2 results.

TABLE I — Summary of Results

Test Performed: Run No.: Date: Time: Production Rate: Amount of RAP:	Part. 1 12-07-92 1259-1403 198	Part. 2 12-07-92 1452-1607 208	Part. 3 12-08-92 0830-1024 181	Part. Average tph %	Part. 1 12-07-92 1259-1403 198	Part. 2 12-07-92 1452-1607 208	Part. 3 12-08-92 0830-1024 181	Part. Average tph %	Part. 1 12-07-92 1259-1403 198	Part. 2 12-07-92 1452-1607 208	Part. 3 12-08-92 0830-1024 181	Part. Average tph %
Volumetric Flow Rate (acfm)	53479	57827	60079	57128	53479	57827	60079	57128	53479	57827	60079	57128
Volumetric Flow Rate (dscfm)	20962	24641	28678	24760	20962	24641	28678	24760	20962	24641	28678	24760
Stack Temperature (°F)	410	356	341	369	410	356	341	369	410	356	341	369
Percent Moisture	35.80	34.54	27.97	32.77	35.80	34.54	27.97	32.77	35.80	34.54	27.97	32.77
% CO_2	8.6	7.0	5.5	7.0	8.6	7.0	5.5	7.0	8.6	7.0	5.5	7.0
% O_2	11.0	11.7	13.0	11.9	11.0	11.7	13.0	11.9	11.0	11.7	13.0	11.9
% CO	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1
% Excess Air	106.8	119.0	151.6	125.8	106.8	119.0	151.6	125.8	106.8	119.0	151.6	125.8
	mg/m³				ppm_v				lbs/hr			
CO	>1165.1	>1165.1	>1165.1	>1165.1	>1000	>1000	>1000	>1000	>91.2	>107.3	>124.8	>107.8
SO_2	16.8	18.9	28.8	21.5	6.3	7.1	10.8	8.1	1.31	1.74	3.08	2.0
NO_x	226.2	148.5	155.0	176.6	118.2	77.6	81.0	92.3	17.72	13.67	16.61	16.00
Total Hydrocarbon (as CH_4)	65.7	85.4	92.6	81.2	98.4	128.0	138.8	121.7	5.14	7.86	9.92	7.64
Methane	12.82	21.06	29.44	21.11	19.21	31.56	44.13	31.63	1.00	1.94	3.15	2.03
Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethyl Benzene	1.59	BDL	BDL	0.53	0.36	BDL	BDL	0.12	0.12	BDL	BDL	0.04
Xylene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Particulate Matter	6.88	7.57	4.59	6.35	N/A	N/A	N/A	N/A	0.54	0.70	0.49	0.58
Condensible Particulate	58.01	37.60	29.58	41.73	N/A	N/A	N/A	N/A	4.55	3.46	3.17	3.73

TABLE II — Summary of Results

Test Performed: Run No.: Date: Time: Production Rate: Amount of RAP:	Form. 1 12-09-92 1248-1353 194	Form. 2 12-09-92 1424-1534 214	Form. 3 12-09-92 1611-1706 222	Form. Average tph %	Form. 1 12-09-92 1248-1353 194	Form. 2 12-09-92 1424-1553 214	Form. 3 12-09-92 1611-1706 222	Form. Average tph %	Form. 1 12-09-92 1248-1353 194	Form. 2 12-09-92 1424-1534 214	Form. 3 12-09-92 1611-1706 222	Form. Average tph %
Volumetric Flow Rate (acfm)	54532	53115	52891	53513	54532	53115	52891	53513	54532	53115	52891	53513
Volumetric Flow Rate (dscfm)	28810	26682	24521	26671	28810	26682	24521	26671	28810	26682	24521	26671
Stack Temperature (°F)	267	276	336	293	267	276	336	293	267	276	336	293
Percent Moisture	27.74	30.44	30.57	29.58	27.74	30.44	30.57	29.58	27.74	30.44	30.57	29.58
% CO_2	6.5	7.2	8.0	7.233	6.5	7.2	8.0	7.233	6.5	7.2	8.0	7.233
% O_2	12.6	11.7	10.5	11.6	12.6	11.7	10.5	11.6	12.6	11.7	10.5	11.6
% CO	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1
% Excess Air	142.9	119.7	94.7	119.1	142.9	119.7	94.7	119.1	142.9	119.7	94.7	119.1
	mg/m³				ppm_v				lbs/hr			
CO	>1165.1	>1165.1	>1165.1	>1165.1	>1000	>1000	>1000	>1000	>125.4	>116.1	>106.7	>116.7
SO_2	—	—	—	—	—	—	—	—	—	—	—	—
NO_x	151.6	158.3	150.2	153.4	79.2	82.7	78.5	80.1	16.31	15.78	13.76	15.28
Total Hydrocarbon (as CH_4)	83.0	67.1	79.5	76.5	124.4	100.5	119.1	114.7	8.93	6.68	7.28	7.63
Methane	27.0	24.0	49.3	33.4	40.53	35.94	73.84	50.10	2.91	2.39	4.51	3.27
Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Xylene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Formaldehyde	5.96	5.73	5.27	5.65	4.78	4.61	4.20	4.53	0.64	0.57	0.48	0.56

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TABLE III-A — Summary of Results

Test Performed: Run No.: Date: Time: Production Rate: Amount of RAP:	PAH 1 12-08-92 1124-1237 185 ·	PAH 2 12-08-92 1334-1711 188	PAH 3 12-09-92 0946-1216 182	PAH Average tph %	PAH 1 12-08-92 1124-1237 185	PAH 2 12-08-92 1334-1711 188	PAH 3 12-09-92 0946-1216 182	PAH Average tph %	PAH 1 12-08-92 1124-1237 185	PAH 2 12-08-92 1334-1711 188	PAH 3 12-09-92 0946-1216 182	PAH Average tph %
Volumetric Flow Rate (acfm)	54857	53521	53657	54011	54857	53521	53657	54011	54857	53521	53657	54011
Volumetric Flow Rate (dscfm)	28779	28057	28391	28409	28779	28057	28391	28409	28779	28057	28391	28409
Stack Temperature (°F)	259	264	270	264	259	264	270	264	259	264	270	264
Percent Moisture	28.94	28.50	27.33	28.26	28.94	28.50	27.33	28.26	28.94	28.50	27.33	28.26
% CO_2	6.6	7.1	6.5	6.7333	6.6	7.1	6.5	6.7333	6.6	7.1	6.5	6.7333
% O_2	12.8	13.3	12.8	13.0	12.8	13.3	12.8	13.0	12.8	13.3	12.8	13.0
% CO	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1
% Excess Air	150.0	171.2	149.5	156.9	150.0	171.2	149.5	156.9	150.0	171.2	149.5	156.90
	mg/m^3				ppm_v				lbs/hr			
CO	>1165.1	>1165.1	>1165.1	>1165.1	>1000	>1000	>1000	>1000	>125.3	>122.1	>123.6	>123.7
SO_2	18.12	20.25	—	19.19	6.8	7.6	—	7.2	1.95	2.12	—	2.04
NO_x	168.0	158.8	136.1	154.3	87.8	83.0	71.1	80.6	18.07	16.65	14.43	16.38
Total Hydrocarbon (as CH_4)	73.79	59.18	81.13	71.37	110.6	88.7	121.6	107.0	7.93	6.20	8.61	7.58
Methane	30.40	24.42	29.92	28.2467	45.57	36.60	44.85	42.34	3.27	2.56	3.17	3.0000
Benzene	BDL	1.40	BDL	0.4667	BDL	0.43	BDL	0.1433	BDL	0.15	BDL	0.0500
Toluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Xylene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE III-B — Summary of Results

Test Performed: Run No.: Date: Time: Production Rate: Amount of RAP:	PAH 1 12-08-92 1124-1237 185	PAH 2 12-08-92 1334-1711 188	PAH 3 12-09-92 0946-1216 182	PAH Average tph %	PAH 1 12-08-92 1124-1237 185	PAH 2 12-08-92 1334-1711 188	PAH 3 12-09-92 0946-1216 182	PAH Average tph %	PAH 1 12-08-92 1124-1237 185	PAH 2 12-08-92 1334-1711 188	PAH 3 12-09-92 0946-1216 182	PAH Average tph %
PAH's	mg/m³				ppmv				lbs/hr			
Naphthalene	0.2493	0.2590	0.2909	0.0632	0.0468	0.0486	0.0547	0.0119	0.0268	0.0271	0.0309	0.0283 ~~0.0066~~
2-Methylnaphthalene	0.2882	0.2969	0.3016	0.0843	0.0488	0.0503	0.0511	0.0143	0.0310	0.0311	0.0320	0.0314 ~~0.0088~~
2-Chloronaphthalene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Acenaphthylene	0.0346	0.0339	0.0469	0.0385	0.0055	0.0054	0.0074	0.0061	0.0037	0.0036	0.0050	0.0041
Fluorene	0.0286	0.0290	0.0327	0.0301	0.0041	0.0042	0.0047	0.0043	0.0030	0.0030	0.0034	0.0031
Phenanthrene	0.0909	0.0926	0.1033	0.0956	0.0123	0.0125	0.0140	0.0129	0.0098	0.0097	0.0110	0.0102
Anthracene	0.0059	0.0060	0.0076	0.0065	0.0008	0.0008	0.0010	0.0009	0.0006	0.0006	0.0008	0.0007
Fluoranthene	BDL	BDL	0.0072	0.0024	BDL	BDL	0.0009	0.0003	BDL	BDL	0.0008	0.0003
Pyrene	BDL	0.0035	0.0064	0.0033	BDL	0.0004	0.0008	(0.0094)	BDL	0.0004	0.0007	0.0004 (0.0083)
Benzo(a)anthracene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chrysene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(b)fluoranthene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(k)fluoranthene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(e)pyrene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(a)pyrene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Perylene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Indeno(1,2,3-cd)pyrene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dibenz(a,h)anthracene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(g,h,i)perylene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Total PAH's	0.6975	0.7209	0.7966	0.3239	0.1183	0.1222	0.1346	0.0601	0.0749	0.0755	0.0846	0.0421 ?

0.0783

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III. SAMPLING & ANALYTICAL PROCEDURES

The following is a description of each of the test methods that were conducted during the performance test(s). In this description, a discussion of the pertinent segments including preparation, sampling, and analysis is addressed. This section will provide information supporting the validity of the samples.

A. Determination of Carbon Dioxide and Oxygen Emissions From Stationary Sources (Instrumental Analyzer Procedure) - US EPA Method 3A:

The collection and analysis of carbon dioxide and oxygen content at the test location was performed by US EPA Reference Method 3A. This procedure utilizes continuous emissions monitors that provide the data results from the source on a "real-time" or instantaneous basis.

All of the CEM instrumental procedures that were conducted at the outlet testing location were extracted and analyzed with similar testing strategies. Because of this similarity, a detailed description of the calibration and operation procedures of the CEM procedures is provided in the discussion of Method 3A and is referred to in the other sections concerning the additional procedures.

1. Calibration.

The calibration of the instruments is performed using certified gas standards composed of a known concentration of carbon dioxide and oxygen in zero grade nitrogen. These gas standards are prepared using partial pressure/volumetric and gravimetric methods.

The prepared gas mixture is analyzed and the certification tolerance is not greater than 2% of the pollutant component. A copy of the analysis certificate for each of the certified gas mixtures used during the testing is included in the test report.

The oxygen instrument utilizes an paramagnetic detector and the carbon dioxide instrument utilizes a nondispersive infrared detector. The minimum detection limit for both gas analyzers is 0.1 %. The fullscale limitations of the oxygen and carbon dioxide analyzers is 25 and 20 % respectively.

Immediately prior to each compliance test series, a complete calibration of the instrument is performed. Each instrument has zero grade nitrogen injected into it and the zero potentiometer is adjusted, if necessary, until the proper voltage output from the analyzer is achieved.

Then a high range pollutant gas mixture, that has been prepared in the specified range percentage of the span or fullscale, is injected. After the system stabilizes, the span or fullscale potentiometer is adjusted until the voltage output from analyzer corresponds to the certification of analysis for the respective calibration gas.

When this procedure is complete and the system has responded properly to a zero and fullscale reading, a mid and/or low range certified calibration gas is injected into the system. No adjustments are made to the system except to achieve proper flow rate through the analyzer. The analyzer, after reaching a stable value, must correspond to the certified value of the calibration gas within a specified percentage of the fullscale.

This mid range calibration gas serves two purposes of quality control and quality assurance. The first is to show that the instrument analyzes and outputs data on a linear scale. The second purpose is to validate that the zero and fullscale values of the instrument are properly set.

Prior to sampling, a single calibration gas was injected into the probe inlet. This calibration gas is usually a mixture of oxygen and carbon dioxide in a balance of zero nitrogen. The system is not adjusted except to achieve proper flow through the analyzers. The calibration standard is allowed to traverse the sampling system. The response of the analyzer during this bias check must agree with the initial analyzer response of this standard within the specified tolerances set forth in the test method. This system bias check serves to demonstrate that the sample train is leak free and causes no interference to the integrity of the sample.

2. Sampling.

After calibration, the system is purged with zero grade nitrogen to remove any pollutants that were injected as calibration gas. Once the system indicates that the pollutant gases have been removed, the calibration valve assembly is positioned to allow stack gas to flow through the instrument.

The sample gas is filtered at the stack position to remove any particulate matter. This prevents instruments from being contaminated and ensures reliable data acquisition.

All samples injected to the instruments are removed from the stack and delivered to the instruments via a heated probe and sample line. This prevents any condensation of water vapor and/or pollutant in the gas stream. Once the sample gas exits the sample line, the stream is separated in a sample gas manifold. The split stream enables analysis of the CEM instrumentation on both wet and dry basis as necessary.

The portion of the sample gas dedicated to the dry basis analyzers is directed into a gas conditioning system where the moisture content of the stream is removed. The sample gas that exits the gas conditioning system is then routed to the instruments for analysis on a dry basis.

To demonstrate that the instrument did not exhibit any deviation from the calibrated values set at the beginning of a test period, a sample of certified calibration gas is injected into the sampling system at the conclusion of each test run. The sample system must respond within specified tolerance limits according to the initial system bias check.

This post-test calibration serves two purposes: (1) it demonstrates that excessive calibration drift of the instrument(s) did not occur during the test period and, (2) that the system was not contaminated with any foreign material from the source to alter any results during the test period.

3. Data Acquisition.

The CEM monitors utilized in the testing project output a voltage signal corresponding to the pollutant concentration determined by the detector. This signal is relayed to a computerized datalogger system. This system retrieves the output signal from each monitor every 10 seconds. This data is then averaged on a per minute basis and stored on the hard drive of the computer. Additionally, a strip chart recorder is employed to record the data. This device records the instrument output on a one minute, instantaneous basis.

The data listing for all of the analyzers, for each testing period, is provided in another section. This listing provides the data results as recorded by the computerized datalogger system.

B. Determination of Nitrogen Oxides Emissions From Stationary Sources (Instrumental Analyzer Procedure) - US EPA Method 7E:

The calibration, sampling, and data acquisition procedures are similar to that of Method 3A. Listed below are any deviations or differences that were incurred specifically in this testing procedure.

The calibration of the instruments is performed using certified gas standards composed of a known concentration of nitrogen oxide in zero grade nitrogen. These gas standards are prepared using partial pressure/volumetric and gravimetric methods.

The prepared gas mixture is analyzed and the certification tolerance is not greater than 2% of the pollutant component. A copy of the analysis certificate for each of the certified gas mixtures used during the testing is included in the test report.

The instrument utilizes an chemiluminescent detector. The detection limitation of the analyzer is 0.1 ppm. Multiple fullscale ranges are available for operation. A 250, 1000, 2500, and 10,000 ppm fullscale may be selected according to the concentrations of NO_x present in the gas steam. The analyzers were calibrated using standards that were the appropriate percentage of fullscale according to Method 7E.

The pre-test calibration, system bias, and post-test calibration procedures are identical to those discussed in Reference Method 3A.

C. Determination of Carbon Monoxide Emissions From Stationary Sources (Instrumental Analyzer Procedure) - US EPA Method 10:

1. Calibration.

The calibration of the instruments is performed using certified gas standards composed of a known concentration of carbon monoxide in zero grade nitrogen. These gas standards are prepared using partial pressure/volumetric and gravimetric methods.

The prepared gas mixture is analyzed and the certification tolerance is not greater than 2% of the pollutant component. A copy of the analysis certificate for each of the certified gas mixtures used during the testing is included in the test report.

The instrument utilizes a Luft-type nondispersive infrared detector. Immediately prior to each compliance test series, a complete calibration of the instrument is performed. Each instrument has zero grade nitrogen injected into it and the zero potentiometer is adjusted, if necessary, until the proper voltage output from the analyzer is achieved.

Then a high range pollutant gas mixture, that has been prepared in the specified range percentage of the span or fullscale, is injected. After the system stabilizes, the span or fullscale potentiometer is adjusted until the voltage output from analyzer corresponds to the certification of analysis for the respective calibration gas.

When this procedure is complete and the system has responded properly to a zero and fullscale reading, a mid and low range certified calibration gas is injected into the system. No adjustments are made to the system except to achieve proper flow rate through the analyzer. The analyzer, after reaching a stable value, must correspond to the certified value of the calibration gas within a specified percentage of the fullscale. This mid and low range calibration gas serves two purposes of quality control and quality assurance. The first is to show that the instrument analyzes and outputs data on a linear scale. The second purpose is to validate that the zero and fullscale values of the instrument are properly set.

2. Sampling.

After calibration of the instrument(s) has been completed, a sample bias check is performed. This involves injecting calibration gas into the sample probe inlet and allowing the calibration gas to traverse through the sample train to the analyzer(s) where it is analyzed. This analysis will correspond to the pre-test calibration analysis value of the standard within the tolerances set forth in the reference method.

Once the system indicates that the calibration gases have been removed, the calibration valve assembly is positioned to allow stack gas to flow through the instrument. The sample gas is filtered at the stack position to remove any particulate matter. This prevents instruments from being contaminated and ensures reliable data acquisition.

All samples injected to the instruments are removed from the stack and delivered to the instruments via a heated probe and sample line. This prevents any condensation of water vapor and/or pollutant in the gas stream.

To demonstrate that the instrument did not exhibit any deviation from the calibrated values set at the beginning of a test period, a sample of certified calibration gas is injected into the sampling system at the conclusion of each test run. The sample system must respond within specified tolerance limits according to the initial system bias check.

This post-test calibration serves two purposes: (1) it demonstrates that excessive calibration drift of the instrument(s) did not occur during the test period and, (2) that the system was not contaminated with any foreign material from the source to alter any results during the test period.

D. Determination of Total Gaseous Organic Emissions From Stationary Sources (Instrumental Analyzer Procedure) - US EPA Method 25A:

1. Calibration.

The calibration of the instruments is performed using certified gas standards composed of a known concentration of methane in zero grade nitrogen. These gas standards are prepared using partial pressure/volumetric and gravimetric methods.
The prepared gas mixture is analyzed and the certification tolerance is not greater than 2% of the pollutant component. A copy of the analysis certificate for each of the certified gas mixtures used during the testing is included in the test report.

The instrument utilizes an flame ionization detector. Immediately prior to each compliance test series, a complete calibration of the instrument is performed. Each instrument has zero grade nitrogen injected into it and the zero potentiometer is adjusted, if necessary, until the proper voltage output from the analyzer is achieved.

Then a high range pollutant gas mixture, that has been prepared in the specified range percentage of the span or fullscale, is injected. After the system stabilizes, the span or fullscale potentiometer is adjusted until the voltage output from analyzer corresponds to the certification of analysis for the respective calibration gas.

When this procedure is complete and the system has responded properly to a zero and fullscale reading, a mid and low range certified calibration gas is injected into the system. No adjustments are made to the system except to achieve proper flow rate through the analyzer. The analyzer, after reaching a stable value, must correspond to the certified value of the calibration gas within a specified percentage of the fullscale. This mid and low range calibration gas serves two purposes of quality control and quality assurance. The first is to show that the instrument analyzes and outputs data on a linear scale. The second purpose is to validate that the zero and fullscale values of the instrument are properly set.

2. Sampling.

After calibration, the system is purged with zero grade nitrogen to remove any pollutants that were injected as calibration gas. Once the system indicates that the pollutant gases have been removed, the calibration valve assembly is positioned to allow stack gas to flow through the instrument.

The sample gas is filtered at the stack position to remove any particulate matter. This prevents instruments from being contaminated and ensures reliable data acquisition. All samples injected to the instruments are removed from the stack and delivered to the instruments via a heated probe and sample line. This prevents any condensation of water vapor and/or pollutant in the gas stream. The data obtained from the THC analyzer is therefore on a "wet basis". The data listing must be corrected to a "dry basis" for use in emission determinations, e.g. lb/hr. This correction is conducted utilizing the moisture percentage of the flue gas stream as determined during the test run.

To demonstrate that the instrument did not exhibit any deviation from the calibrated values set at the beginning of a test period, a sample of certified calibration gas is injected into the sampling system at the conclusion of each test run. The sample system must respond within specified tolerance limits according to the initial system bias check.

This post-test calibration serves two purposes: (1) it demonstrates that excessive calibration drift of the instrument(s) did not occur during the test period and, (2) that the system was not contaminated with any foreign material from the source to alter any results during the test period.

E. Total Particulate - US EPA Reference Methods 5:

1. Preparation.

All glassware utilized in each sampling train was thoroughly cleaned and dried prior to each test series. A glass fiber filter was used that had been labeled, desiccated for a minimum of 24 hours and pre-weighed.

The impinger system configuration was assembled using the procedure outlined in Method 5. One hundred ml of deionized water was placed in the first two impingers. The third impinger was initially empty and the fourth impinger contained a pre-weighed amount of silica gel for complete moisture removal.

A stainless steel probe liner and nozzle system was utilized for the total particulate determinations. The probe housed a set of calibrated S-type pitot tubes and a calibrated thermocouple for monitoring stack temperature.

2. Sampling.

The probe and sample box were heated to an approximate temperature of 250 F. These temperatures were monitored throughout the testing. An ice bath was prepared to submerse the impinger system. The temperature of the last impinger was monitored throughout the testing to ensure adequate condensation of the water vapor in the flue gases.

A leak check was performed prior to each test run. The sample train system was subjected to a vacuum that did not exceed 0.02 cfm leakage rate. The vacuum that was established during the pre-test leak check was not exceeded during the test period(s).

When a test run had been completed, a post-test leak check was conducted prior to dismantling of the sampling train. Once this had been successfully achieved, the sample train was dismantled for sample recovery.

The probe and connecting glassware were washed with acetone. The contents of the impingers were volumetrically measured for moisture gain and transferred to a labeled sample container. The glass fiber filter was carefully transferred to its sample container.

3. Analysis.

The glass fiber filter was desiccated for 24 hours prior to any weighing. The acetone probe wash was transferred to a tared beaker and evaporated to dryness. The resultant residue was also desiccated prior to gravimetric analysis.

The first weighing was performed after this initial period of drying. The weights were recorded to 0.0001 g. After a minimum of 6 additional hours of desiccating, a second weighing was conducted. The weights must agree within 0.0005 g or further desiccation must be conducted until the weights stabilize.

Sample field blanks of acetone were collected, contained, labeled and analyzed in conjunction with the samples. The blank weight was deducted from the acetone probe wash residue weight determinations.

F. EPA Draft Method 202, "Determination of Filterable and Condensible Particulate Matter"

The testing procedure was conducted according to Reference Method 5 for particulate matter determination. This testing procedure was covered in a previous section. The filterable portion of the particulate matter was determined via this procedure. The condensible fraction of the sample was determined by analyzing the back half impinger catch with a methylene chloride extraction.

This extraction procedure will yield fractions of inorganic and organic condensible matter. The concentrations and emission values of both filterable particulate and condensible particulate matter have been summarized in the test results section.

G. Polynuclear Aromatic Hydrocarbons - Method SW846 8270 "Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS): Capillary Column Technique:

1. Preparation.

All glassware utilized in each sampling train was thoroughly cleaned with hot soapy water and dried prior to each test series. All residue silicon grease was removed from glassware upstream of the absorbent module. A glass fiber filter was used that has been properly labeled.

The absorbent traps was packed by the analytical laboratory that conducted the final analysis.

The impinger system was assembled using 100 ml of D.I. water in impingers 1 and 2. The third impinger was initially empty and the fourth impinger contained silica gel.

In assembling the sample train, teflon tape was placed on the ball joints to ensure adequate sealing upstream of the absorbent module. All connections downstream of the module were sealed with silicon grease.

A glass probe liner and nozzle system was utilized for the collection train. The probe housed a set of calibrated S-type pitot tubes and a calibrated thermocouple for monitoring stack temperature.

2. Sampling.

The probe and sample box was heated to an approximate temperature of 250 F. These temperatures were monitored throughout the testing.

The probe was connected to the heated filter system with connecting glassware. This filter system was connected to the condenser by a teflon line. The condenser and absorbent module are directly connected via ground glass ball and socket.

An ice bath was prepared to submerse the impinger system into. The temperature of the last impinger was monitored throughout the testing to ensure adequate condensation of the water vapor in the flue gases.

The condenser cooling fluid was recirculated through the system by a veristaltic pump. This pump is to be started prior to the start up of the sampling system to ensure that the temperature of the absorbent material in the module does not exceed its thermal decomposition temperature. The temperature of gas entering the module was monitored to ensure that the temperature did not exceed the recommended limitation for efficient capture.

A leak check was performed prior to each test run. The entire sample train system was subjected to a vacuum that did not exceed 0.02 cfm leakage rate. The vacuum that was established during the pre-test leak check was not exceeded during the test period.

Three sample runs were conducted to constitute a complete test. The sample time was be a minimum of one hour.

When a test run had been completed, a post-test leak check was conducted prior to any dismantling of the sampling train. Once this had been successfully achieved, the sample train was dismantled for sample recovery.

3. Sample Analysis.

Method 8270 is used to determine the concentration of semivolatile organic compounds in extracts prepared from all types of solid waste matrices. Each compound present in the sample is separated by gas chromatography and quantified by mass spectrometry.

The detection limitation of this type of sample has been determined to be 1.0 microgram. If the samples are separated for further analysis, the detection limit will be 2.0 micrograms.

H. EPA Draft Method 0011, "Determination of Formaldehyde":

This sampling procedure is similar to the operational procedures found in Reference Method 5. Described in this section are the differences set forth from Method 5 to ensure that the integrity of the formaldehyde sample is maintained.

Prior to any sampling, all glassware shall be rinsed with methylene chloride to remove any contamination that may be initially on the glassware such as stopcock grease. This includes the rinsing of the glass probe liner material required for the collection of the sample.

In collecting the sample, a minimum of 45 cubic feet must be pulled isokinetically such that the extracted sample is transferred through the DNPH absorption solution. All samples should be placed into glass amber sample containers to avoid the alteration of the sample by sunlight.

The analysis of the formaldehyde samples shall be conducted according to the procedures outlined in Method 8315. This analysis procedure provides guidance in the evaluation of formaldehyde samples by High Performance Liquid Chromatography (HPLC).

I. Determination of Gaseous Organic Emissions From Stationary Sources By Gas Chromatography - US EPA Method 18:

This procedure utilizes the technology of gas chromatography to separate, identify, and quantitate various volatile organic compounds that co-exist in a flue gas stream. In this testing project, methane and the BTEX compounds were targeted.

The gas chromatograph was first conditioned in the laboratory where ideal conditions exist for this initial calibration. This consists of conditioning the column, if necessary, and creating calibration curves based on actual data from the GC with known concentration standards. As required by EPA, three (3) standards of known concentration were used in creating the calibration curves. The concentrations of the standards bracketed the expected concentration of pollutant at the source level.

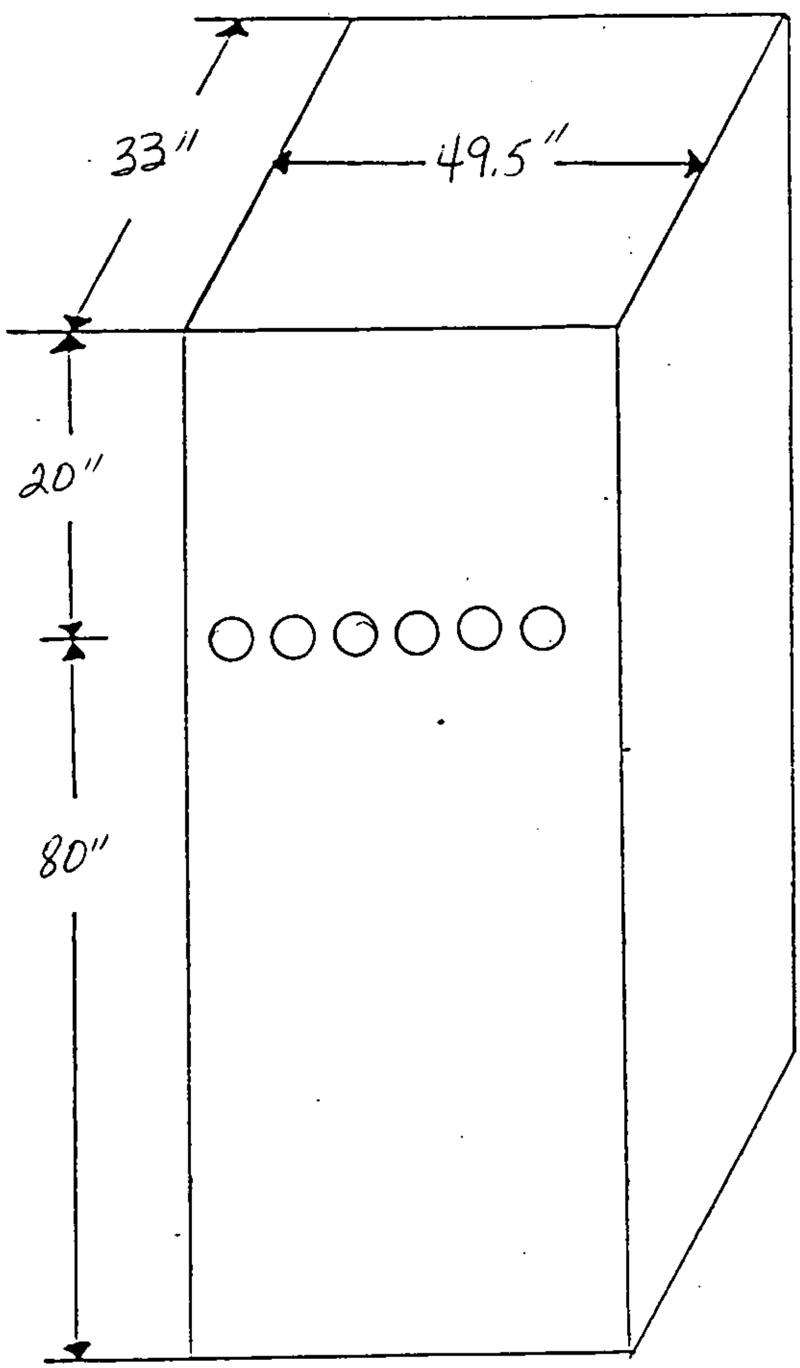
A field calibration check was performed prior to introducing any sample into the gas chromatograph. This is performed by injecting one of the known standards into the GC and comparing the result to the calibration curve. It must agree within 5 % of the previously determined response.

Analysis of the samples follow a successful field calibration. Collecting the sample consisted of extracting the sample from the stack via a heated sample line. The sample was introduced directly into the sample loop, where it was periodically injected to the instrument for analysis. This type of sampling is termed "semi-continuous".

IV. SOURCE INFORMATION

The emissions test was conducted after a baghouse on a stack measuring measuring 33" x 49.5" with an equivalent diameter of 39.6". Six (6) sampling ports were placed 20" down (.5 diameters upstream) from the top of the stack and 80" up (2.0 diameters downstream) from the last flow disturbance. The ports were evenly spaced on 8.25" centers. The two outside ports are 4.125" from the side walls of the stack. Thirty (30) points were sampled, five (5) through each port for two (2) minutes each for a total testing time of sixty (60) minutes.

Points on a Diameter	Probe Mark
1	3.3"
2	9.9"
3	16.5"
4	23.1"
5	29.7"



EQUIPMENT USED

Equipment used to conduct the particulate emissions test was:

A. A Lear Siegler PM-100 stack sampler with appropriate auxiliary equipment and glassware (with train set up according to the schematic on the next page).

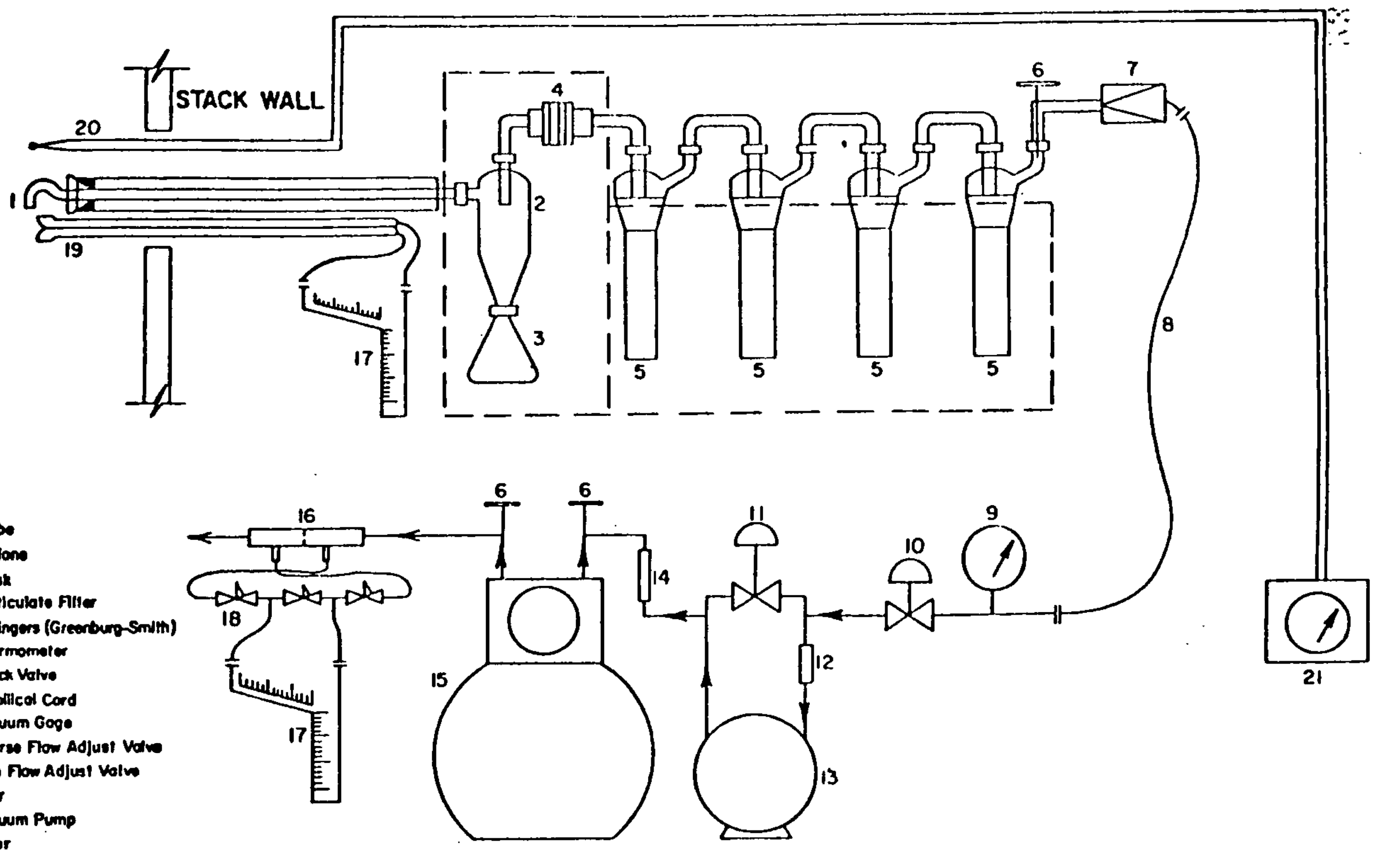
B. An Airguide Instruments Model 211-B (uncorrected) aneroid barometer for checking the barometric pressure.

C. Weston dial thermometers to check meter temperatures or an Analogic Model 2572 Digital Thermocouple to check stack temperatures.

D. A Hays 621 Analyzer to measure the oxygen, carbon dioxide and carbon monoxide content of the stack gases or, for non-combustion sources, a Bacharach Instrument Company Fyrite for gas analysis.

E. Schleicher and Schuell Type 1-HV filters with a porosity of .03 microns.

F. Reagent- or ACS-grade acetone with a residue of ≤ .001.



SAMPLING TRAIN
USED FOR ISOKINETIC SAMPLING

1) Probe
2) Cyclone
3) Flask
4) Particulate Filter
5) Impingers (Greenburg-Smith)
6) Thermometer
7) Check Valve
8) Umbilical Cord
9) Vacuum Gage
10) Course Flow Adjust Valve
11) Fine Flow Adjust Valve
12) Oiler
13) Vacuum Pump
14) Filter
15) Dry Gas Meter
16) Orifice Tube
17) Incline Manometer
18) Solenoid Valves
19) Pitot
20) Thermocouple
21) Pyrometer

MODEL 10 FOR CONTINUOUS SOURCE GAS MONITORING

CHEMILUMINESCENT NO/NO_x ANALYZER

Thermo Electron's Model 10 NO/NO_x Analyzer is based on the chemiluminescent reaction between nitric oxide (NO) and ozone (O_3) according to the reaction: $NO + O_3 \rightarrow NO_2 + O_2 + h\nu$

Light emission results when the electronically excited NO_2 molecules revert to their ground state.

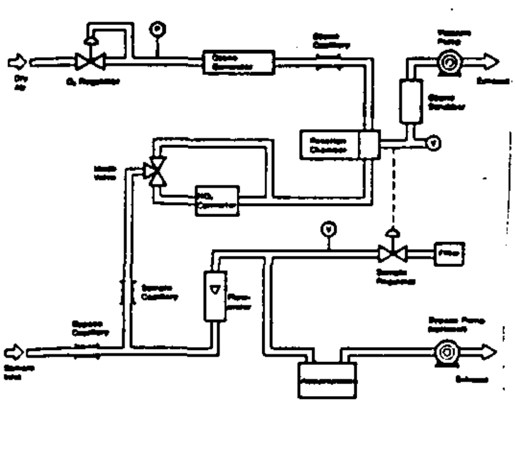
A front panel mode switch provides for either a direct readout of the NO concentration in the sample being analyzed ('NO' mode) or the total NO_x concentration ('NO_x' mode). When the Model 10 is placed in the 'NO_x' mode, the sample stream passes through a NO_x-to-NO converter prior to entering the reaction chamber for subsequent analysis.

Key Features

- *Selective detection of NO or NO_x*
- *Eight ranges, from 2.5 to 10,000 ppm FS*
- *Continuous monitoring with rapid response*
- *Linear on all ranges*
- *Field proven reliability*
- *Insensitive to changes in sample flow*

As illustrated in the diagram, sample gas enters the Model 10, flows through the bypass capillary, and divides. Most of the sample flows through the flowmeter, accumulator, bypass pump, and exhausts. Only a small amount of sample flows through the sample capillary for analysis. The bypass pump in conjunction with the sample regulator maintain a constant pressure differential across the sample capillary, thus maintaining constant sample flow for analysis. This plumbing network makes the analyzer insensitive to pressure fluctuation in the sample inlet.

From the sample capillary, the sample to be analyzed is either directed through the NO_x to NO converter or around it, depending on the choice of the operator. In the reaction chamber the sample reacts with ozone to produce the light emission and is exhausted. The ozone is produced internally from dry air entering through the oxygen regulator and ozonator. The light emission is sensed by the photomultiplier tube and amplified.



Model 10 Specifications*

Ranges	0-2.5	ppm	0-250	ppm
	0-10	ppm	0-1000	ppm
	0-25	ppm	0-2500	ppm
	0-100	ppm	0-10,000	ppm
Minimum Detectable Concentration	.05 ppm			
Noise	Less than 1% of FS			
Reproducibility	1% of FS			
Operating Temperature Extremes	0-40°C			
Response Time (0-90%)	~1.5 second NO mode ~1.7 second NO_x mode			
Zero Stability	± 1 ppm in 24 hours			
Span Stability	± 1% in 24 hours			
Linearity	± 1% from 0.05 to 10,000 ppm**			
Power Requirements	1000 watts, 115 ± 10 volts, 60 Hz standard. Also available in 115V 50 Hz, and 210 ± 15 volts, 50 Hz versions			
Physical Dimensions	19" wide x 17" high x 20" deep			
Instrument Weight	75 lbs. (including pump)			
Outputs	Two standard outputs supplied: 1) 0-10V; 2) Field selectable from 0-10V, 5V, 1V, 100mV or 10mV. (ma options available.)			

*Specifications are typical and subject to change without notice.
**With O_2 Feed; With dry air, linearity to 2000 ppm.

FUJI 730
NDIR SINGLE GAS ANALYZER

This unique Mass Flow Sensor used in the Fuji 730 Single Gas Analyzer provides significant advantages over other sensors used for this purpose. The design of the Mass Flow Detector minimizes the adverse effects of vibration which is often present in harsh environments. In addition the Mass Flow Sensor System virtually eliminates interference making the Fuji 730 a powerful analytical tool for monitoring burner and boiler efficiency heat treatment fermentation well logging and many other applications which require exceptional accuracy stability high sensitivity and reliabililty.

PRINCIPLE OF OPERATION

The Fuji 730 Series Analyzers use the infared adsorption characteristic of gases to measure the concentration of gas samples. An efficient single beam design which incorporates a unique mass flow sensor system insures accurate and interference free analysis for a wide variety of applications.

A single beam of infrared energy is chopped and passed through a sample cell containing the flowing as sample. Due to the adsorption characteristic, the amount of energy in the beam is reduced by the concentration of the measured gas in the sample. The attenuated infrared beam is passed serially through the twocavities of the mass flow sensor which contain a high concentration of the gas species the analyzer is intended to measure. The two cavity sensor performs two functions in the analyzing process, it first eliminates interference caused by other gases and water vapor by detecting and subtracting the interference component from the detector output, and secondly, produces an output signal which represents an accurate duplication of the relative infrared energy adsorption. This resultant signal is electronically processed and lineraized to provide an electrical signal which drives meters and other output devices.

STANDARD GASES:
Carbon Monoxide (CO)
Cardon Dioxide (CO_2)
Methane (CH_4)

STANDARD RANGES:
0-500/1000 ppm
0-1000/2000 ppm
0-2000/5000 ppm
0-2500/5000 ppm

0-0.5/1.0%
0-1/2%
0-2/5%
0-5/10%
1-10/20%

PURGE GAS FITTING
Standard Equipment

INTERNAL SPAN CHECK FEATURE
Calibration check without the use of span gases.
Conserves gas and reduces operating costs.

SPECIFICATIONS

Repeatability:	±0.5% of full scale (low range) ±1.0% of full scale (high range)
Zero Drift*:	±1% of full scale per 24 hours
Span Drift*:	±1% of full scale per 24 hours
Linearity:	±2% of full scale (within linearizer)
Noise Level:	0.5% of full scale
Speed of Response:	90% indication
Electrical:	2, 3 or 5 seconds (field selectable)
Pneumatic:	Less than 15 seconds (depending on cell length)
Warm-Up:	Two hours (to ±2% full scale)
Internal Span Check:	Manually activated from front panel
Outputs:	0 to 1V DC, linear & 4-20mA DC, linear
Ambient Temperature Range:	23 to 113°F (-5 to 45°C)
Ambient Humidity:	To 90% R.H. (non-condensing)
Sample Gas Temperature:	32 to 122°F (0 to 50°C)
Sample Gas Flow Rate:	2 ± 1 scfh (1.0 ± .05 slpm)
Purge Gas Rate (where necessary):	2 scfh (1 slpm) when required
Power Requirements:	115V AC ± 10%, 60 Hz, 30VA
Gas Connections:	All ¼" compression-type tube fittings
Size and Weight:	7.9 (H) x 9.8 (W) x 21.3 (D) inches (200 x 250 x 541 mm) 24.2 pounds (11 kg)

***constant conditions**

FUJI 760
NDIR GAS ANALYZER

- *Unique Mass Flow Sensor System Eliminates Interference*
- *Wide Dynamic Range Permits Ultra-Sensitive and High Concentration Gas Analysis*
- *Designed for Continuous Operation and Low Maintenance*
- *Measures:*
  - → *Carbon Monoxide (CO)*
  - → *Carbon Dioxide (CO_2)*
  - → *Sulfur Dioxide (SO_2)*
  - → *Nitric Oxide (NO)*
  - → *Methane (CH_4)*
- *Insensitive to Vibration*

This instrument is designed for stack monitoring and process control applications. It's remarkable accuracy and fast response makes it an ideal instrument for CEMS, boiler control equipment, research labs and many other monitoring applications. For usage requiring ultra sensitive measurement, the Fuji 760 delivers superior performance. Using the Non-Dispersive Infrared (NDIR) Mass Flow Detector, low concentration measurements are accurate and reliable. The Fuji 760 incorporates an Interference Compensating Detector which minimizes the effects of other gases, particularly when operating in ranges of high sensitivity.

FEATURES OF THE FUJI-760

The Fuji 760 Analyzre uses infrared adsorption techniques to measure gas concentrations, however, many innovative patented features make this instrument far superior to conventional Non Dispersive Infrared Analyzers. Among its unique features are an optical chopper design which virtually eliminates the effects of vibration and resultant optical noise; a mass flow sensor system which reduces the effects of interfering gases to insignificant levels, thus permitting gas analysis at low concentration ranges; and a dual beam optical system derived from a single infrared source which enhances long term stability.

PRINCIPAL OF OPERATION

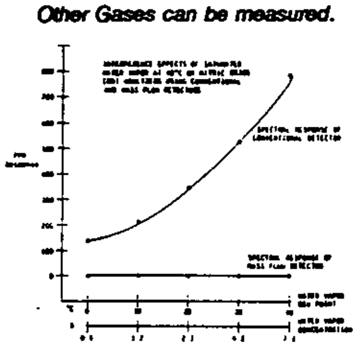
A single beam of infrared energy is modulated and split into two parallel beams by a distribution cell. One beam is passed through a reference cell containing a non-absorbing gas, and the other beam is passed through a cell containing the sample gas being measured. The beam passing through the sample cell is attenuated by the amount of gas concentration in the sample and compared against the unattenuated reference beam by the mass flow detector system. One set of detectors sense the amount of sample gas as compared against the reference, the second set of detectors measure and cancel interferents in the sample. The outputs of the detectors are electronically processed and conditioned into useable signals for indicators and other output devices.

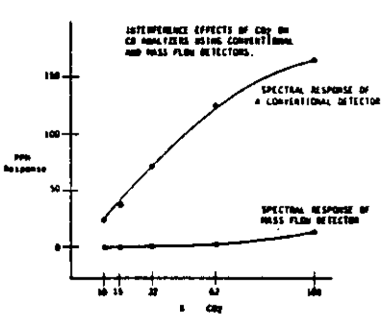
DETECTABLE GAS RANGES

Standard Configuration

Component	***Minimum Range***
Carbon Monoxide (CO)	*0 to 100 ppm*
Carbon Dioxide (CO_2)	*0 to 50 ppm*
Nitric Oxide (NO)	*0 to 100 ppm*
Sulfur Dioxide (SO_2)	*0 to 100 ppm*
Total Hydrocarbons	*0 to 500 ppm*

Other Gases can be measured.





Specifications
(Standard Configuration)

Repeatability: *±0.5% of full scale*
Zero Drift: *±2 % of full scale per week*
Span Drift: *±2% of full scale per week*
Linearity: *±2% of full scale*
Speed of Response: *90% indication within 5 seconds (Electronic Response)*
Range Selection: *Either of two ranges selected by front panel switch or external contact closure.*
Warm-Up: *Four hours minimum*
Outputs: *0 to 1V DC, linear and 4-20mA DC, linear*
Ambient Temperature Range: *23 to 113°F (-5 to 45°C)*
Ambient Humidity: *To 90% R.H. (non-condensing)*
Sample Gas Temperature: *32 to 122° F (0 to 50°C)*
Sample Gas Flow Rate: *1.0 ±0.5 scfh (0.50±0.25 slpm) for standard configuration*
Materials in Contact with Sample: *304 Stainless steel, neoprene rubber, silicone rubber, CaF2/ sapphire, Teflon®*
Power Requirements: *115V AC±10%, 50/60 Hz (switch selectable)*
110 VA max. (200VA max with converter)
220V AC available
Gas Connections: *All ¼" compression-type tube fittings*
Size and Weight:
8.66 (H) x 17.44 (W) x 16.78 (D) inches (220 x 443 x 350 mm)
37.4 pounds (17 kg)

8610 GAS CHROMATOGRAPH

Miniature Lab GC
At a fraction of the cost, the SRI 8610 Gas Chromatograph provides the capabilities and sophistication of vastly larger and more expensive instruments in a small, lightweight and attractive package. More of a miniature laboratory GC than a true portable, the 8610 is the perfect size and weight for easy field use without sacrificing big GC features. In the lab or in the field, the 8610 Gas Chromatograph gives you up to five detectors plus a built-in purge and trap in a simple to operate, easy to trouble-shoot, and unbelievably low cost package. And, the Peaksimple Data System, provided free with every 8610 GC turns your IBM PC into a powerful chromatography integrator which also controls the 8610's temperature program and purge and trap.

Multi-Level Temperature Programming
Temperature programming is a standard feature on every 8610 GC. Up to 15 ramp/plateau segments permit maximum flexibility. Because the temperature program is controlled by the data system, an unlimited number of different temperature programs may be permanently stored on disk and activated with a few keystrokes. The 8610's temperature program can be controlled either by the Peaksimple Data System (included free with every GC) or by any other data system or integrator which has the ability to close relay contacts at specified times during the run.

Ultra Low Mass Column Oven
The SRI 8610's large easily accessible column oven is designed to fit all standard packed and capillary columns with diameters up to eight inches. The ultra-low mass design allows rapid heat-up and cool-down from ambient to 250 degrees centigrade. Interchangeable screw-in heater elements allow power consumption to be reduced for low temperature battery powered applications, or easy heater replacement in the event of a failure. Squirrel-cage type oven fan insures uniform heat distribution and stability to within .1 degree.

Low Cost GC • Free Data System/Integrator

Field Portable • Built-In Purge and Trap

Temperature Programmable • Multiple Detectors

Digital Gas Flow Controllers
The carrier gas flow rate is regulated by a unique Digital Flow Controller. Precise and reproducible even at capillary flow rates below 1 cc/per minute, the carrier gas flow controller is standard equipment on every SRI 8610 GC (except low-cost student model). Digital dial allows flow rates to be adjusted without having to measure actual flows with a bubblemeter. A column head pressure gauge is provided to alert the operator to leaks or blockages in the column. The same flow controller is optionally available for hydrogen and air combustion gas flows (recommended for NPD operation). In addition, inlet pressure regulators are supplied for each gas to isolate the GC from fluctuations in gas supply pressure.

Direct Cool On Column Injection
The zero-dead volume on-column injector is designed for state of the art, cool on-column injections using both packed and wide-bore capillary (.53 mm). A special wide-bore adapter positions the .53 mm column so the syringe smoothly deposits the sample in the bore of the column itself. This provides a totally inert, metal and glass free sample path. Peaks are exceptionally sharp and well resolved.

Detectors

Thermal Conductivity (TCD)	*Photo-Ionization (PID)*
Flame Ionization (FID)	*Electron Capture (ECD)*
Nitrogen-Phosphorus (NPD)	*Hall Detector (HALL or ELCD)*
Thermionic Ionization (TID)	*Flame Photometric (FPD)*

Up to 3 detectors may be mounted simultaneously and plumbed in series so that one injection passes through each detector and into the next. Common series configurations include:

(PID-FID), (TCD-FID), (PID-ECD), (PID-HALL) and (PID-ECD-FID).

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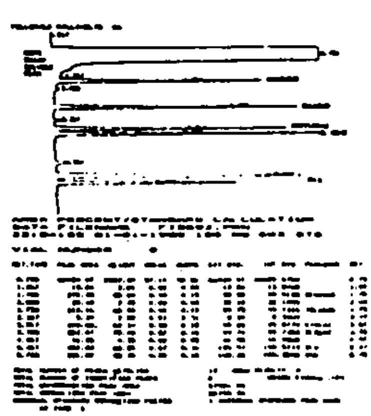


100 NG. 602 STD. Data plotted using Peaksimple Data System.

J.U.M.® ENGINEERING

HEATED TOTAL HYDROCARBON ANALYZER MODEL VE7

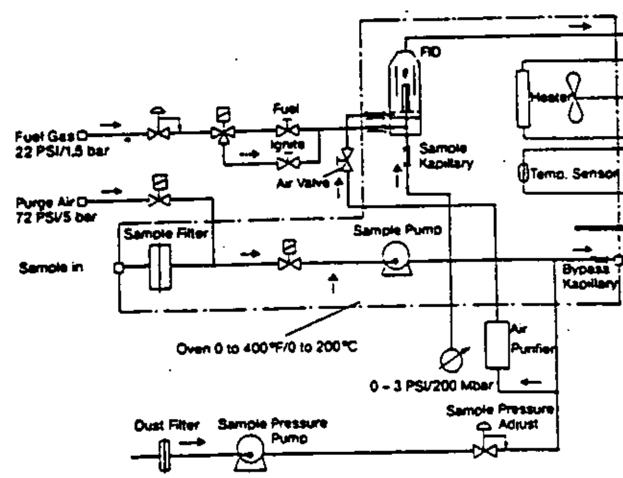
The J.U.M. Engineering Model VE7 is a high accuracy Total Hydrocarbon Analyzer for the measurement and analysis of organic vapors.

The VE7 utilizes a Hydrogen Flame Ionization Detector (FID) in a thermostatically controlled oven to prevent the loss of high molecular weight hydrocarbons.

Options

Digital display with BCD output/without BCD output Remote range control and range I.D.
Recorder output of oven temperature

- *All heated components*
- *Integrated heated sample pump*
- *Permanent heated stainless steel 2 micron sample filter*
- *Built in burner air supply - no extra bottles needed*
- *Automatic fuel enrichment for ignition*
- *19 inch relay rack mount*
- *1% precision full scale*
- *Response time - 90% full scale within 1 second*



STANDARD SPECIFICATIONS:

Analysis Method:	*Flame Ionization Detector (FID)*
Sensitivity:	*Max. 1 ppm CH*
Response Time:	*90% of full scale in less than one second*
Zero Drift:	*1% of full scale per 24 hours*
Span Drift:	*1% of full scale per 24 hours*
Linearity:	*Within 1%*
Oxygen Synergism:	*Less than 1% of selected range*
Ranges:	*Any three of the following:* *0 - 10, 100, 1000, 10,000, 100,000 ppm*
Outputs:	*0 - 10 Volts D.C.*
Display:	*Analog Meter in ppm Hydrocarbon or in % LEL*
Zero/Span Adjust:	*Manual on front panel*
Fuel Consumption:	*Hydrogen 20 cc/min at 22 psig (1.5 Bar)* *Hydrogen/Helium 40/60 mix: 80 cc/min.*
Air Consumption:	*None Integral Air generator*
Zero & Span Gas:	*3 psig (200 m Bar)*
Sample Pump:	*All Stainless Steel, heated, 3 liters per minute at operating temperature*
Sample Pressure:	*By Integral Pump 3 psig (200 m Bar)*
Sample Filter:	*Permanent all stainless steel 2 micron back-purged for cleaning*
Analysis Temperature:	*Adjustable 200 to 400°F (93 to 204°C)*
Power Requirements:	*110 Volts, 60 Hertz AC 800 Watts (others on request)*
Ambient Temperature:	*32°F to 110°F (0 to 43°C)*
Dimensions:	*Width 483 mm (19 inches), Depth 460 mm (18-1/8 inches), Height 221 mm (8-3/4 inches)*
Weight:	*38.6 lbs (17,5 kg)*
Shipping Weight:	*53 lbs (24 kg)*

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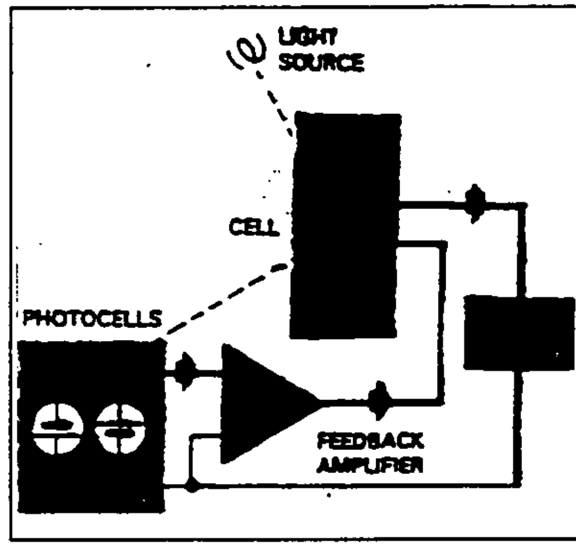
PRINCIPLES OF OPERATION

SERVOMEX 1400 SERIES GAS ANALYZERS

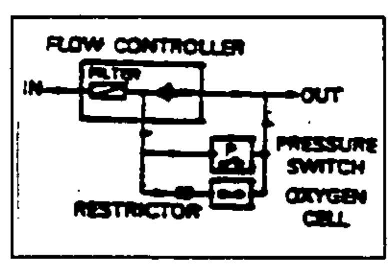
SPECIFICATION	*OXYGEN*
Principle	Magneto-dynamic
Linearity	±0.2% O_2
Repeatability	±0.2% $_2$
Zero Drift (Per Week)	<0.2% O_2
Signal Output	0-1V non-isolated for 0-100% O_2
Alarms	Flow alarm. 4 sets of changeover relay contacts rated at 3A/120V AC, 1A/240V AC or 1A/28V DC
Display	3½ digit LCD reading 0 to 100% O_2
Response Time	Less than 15 seconds to 90%
Operating Ambient Temperature	32 - 104°F (0-40°C)
Relative Humidity	0 - 85%, non-condensing
Sample Pressure	0.2 to 0.6 barg
Sample Contact Materials	Stainless steel, pyrex, glass, brass, platinum, epoxy resin, viton, polypropylene and glass fibre
AC Supply	110 to 120V AC, or 220 to 240V AC, ±10%, 48 to 62Hz, 15VA maximum
Dimensions	19" Rack - 4U case Bench top - 7.1" (180mm) hi gh, 10.1" (256mm) wide, 15.4" (390mm) deep 22 lbs (10kg) approximately



PARAMAGNETIC OXYGEN

The oxygen analyzer measures the paramagnetic susceptibility of the sample gas by means of a magneto-dynamic type measuring cell.

Oxygen is virtually unique in being a paramagnetic gas, this means that it is attracted into a magnetic field. In the Servomex measuring cell, the oxygen concentration is detected by means of a dumb-bell mounted on a torque suspension in a strong, non-linear magnetic field. The higher the concentration of oxygen, the greater the dumb-bell is deflected from its rest position. this deflection is detected by an optical system and twin photocells connected to an amplifier. Around the dumb-bell is a coil of wire. A current is passed through this coil to return the dumb-bell to its original position. The current is measured and is proportional to the oxygen concentration.



Gas Flow Diagram

Advantages

- Not cross sensitive to most common gases
- Long lifetime
- Rugged Design
- No routine cell maintenance

VI. CALCULATIONS

A. Particulate — Condensibles

NAME: APAC/MACASPHALT
LOCATION: CROSS CITY, FLORIDA

DATE: December 7 and 8, 1992
SOURCE: BAGHOUSE

SUMMARY OF TEST DATA

		Run #1 12-07-92	Run #2 12-07-92	Run #3 12-08-92
SAMPLING TRAIN DATA	Start	12:59	14:52	08:30
	Finish	14:03	16:07	10:24
1. Sampling time, minutes	θ	60.0	60.0	60.0
2. Sampling nozzle diameter, in.	D_n	.2500	.2500	.2500
3. Sampling nozzle cross-sect. area, ft^2	A_n	.000340	.000340	.000340
4. Isokinetic variation	I	110	95	91
5. Sample gas volume - meter cond., cf.	V_m	44.679	45.880	48.867
6. Average meter temperature, °R	T_m	561	570	545
7. Avg. orifice pressure drop, in. H_2O	ΔH	1.57	1.93	2.22
8. Total particulate collected, mg.	M_n	8.00	8.90	6.20
VELOCITY TRAVERSE DATA				
9. Stack area, $ft.^2$	A	11.34	11.34	11.34
10. Absolute stack gas pressure, in. Hg.	P_s	30.10	30.10	30.08
11. Barometric pressure, in. Hg.	P_{bar}	30.10	30.10	30.08
12. Avg. absolute stack temperature, R°	T_s	870	816	801
13. Average √vel. head, (C_p = .84)	√dp	1.03	1.15	1.22
14. Average stack gas velocity, ft./sec.	V_s	78.60	84.99	88.30
STACK MOISTURE CONTENT				
15. Total water collected by train, ml.	V_{lc}	492.50	471.50	386.80
16. Moisture in stack gas, %	B_{ws}	35.80	34.54	27.97
EMISSION DATA				
17. Stack gas flow rate, dscf/hr.	Q_{sd}	1258	1478	1721
18. Stack gas flow rate, cfm	acfm	53479	57827	60079
19. Particulate concentration, gr/dscf	C_s	0.0030	0.0033	0.0020
20. Particulate concentration, lb/hr	E	0.54	0.70	0.49
21. Particulate concentration, lb/mBtu	E'	0.00000	0.00000	0.00000
ORSAT DATA				
22. Percent CO_2 by volume	CO_2	8.60	7.00	5.50
23. Percent O_2 by volume	O_2	11.00	11.70	13.00
24. Percent CO by volume	CO	.00	.00	.00
25. Percent N_2 by volume	N_2	80.40	81.30	81.50

Format: summryR3/19-000

NAME: APAC/MACASPHALT
LOCATION: CROSS CITY, FLORIDA

DATE: December 7 and 8, 1992
SOURCE: BAGHOUSE

MOISTURE DETERMINATION
DRY GAS VOLUME

$$V_{m(std)} =$$

$$V_m \left[\frac{T_{(std)}}{T_m}\right] \left[\frac{P_{bar} + \frac{\Delta H}{13.6}}{P_{std}}\right] - 17.64 \ \frac{°R}{\epsilon.\ Hg}\ Y\ V_m \left[\frac{P_{bar} + \frac{\Delta H}{13.6}}{T_m}\right]$$

Where:

$V_{m(std)}$	=	Dry gas volume through meter at standard conditions, ft^3.
V_m	=	Dry gas volume measured by meter, ft^3.
P_{bar}	=	Barometric pressure at orifice meter, in. Hg.
P_{std}	=	Standard absolute pressure, (29.92 in. Hg.).
T_m	=	Absolute temperature at meter, °R.
T_{std}	=	Standard absolute temperature, (528°R).
ΔH	=	Avg. pressure drop across orifice meter, in. H_2O.
Y	=	Dry gas meter calibration factor.
13.6	=	Inches of water per Hg.

Run #1:

$$V_{m(std)} - (17.64)(.980)(44.679) \left[\frac{30.10 + \frac{1.57}{13.6}}{561}\right] - 41.600 \text{ dscf}$$

Run #2:

$$V_{m(std)} - (17.64)(.980)(45.880) \left[\frac{30.10 + \frac{1.93}{13.6}}{570}\right] - 42.081 \text{ dscf}$$

Run #3:

$$V_{m(std)} - (17.64)(.980)(48.867) \left[\frac{30.08 + \frac{2.22}{13.6}}{545}\right] - 46.878 \text{ dscf}$$

NAME: APAC/MACASPHALT
LOCATION: CROSS CITY, FLORIDA

DATE: December 7 and 8, 1992
SOURCE: BAGHOUSE

TOTAL CONTAMINANTS BY WEIGHT: GRAIN LOADING

Particulate Concentration: C_S' gr/dscf

$$C_s' - \left[0.0154 \frac{gr}{mg}\right] \left[\frac{M_n}{V_{m(std)}}\right]$$

Where:

C_s' = Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, gr/dscf.

M_n = Total amount of particulate matter collected, mg.

$V_{m(std)}$ = Dry gas volume through meter at standard conditions, cu. ft.

Run #1:

$$C_s' - \left[0.0154 \frac{gr}{mg}\right] \left[\frac{8.00}{41.600}\right] - 0.0030 \text{ gr/dscf}$$

Run #2:

$$C_s' - \left[0.0154 \frac{gr}{mg}\right] \left[\frac{8.90}{42.081}\right] - 0.0033 \text{ gr/dscf}$$

Run #3:

$$C_s' - \left[0.0154 \frac{gr}{mg}\right] \left[\frac{6.20}{46.878}\right] - 0.0020 \text{ gr/dscf}$$

NAME: APAC/MACASPHALT
LOCATION: CROSS CITY, FLORIDA

DATE: December 7-9, 1992
SOURCE: BAGHOUSE

Particulate Matter
CONVERSION TO mg/m³

$$C,mg/m^3 = (C,gr/dscf)\left(\frac{35.31\ ft^3}{m^3}\right)\left(\frac{mg}{0.0154\ gr}\right)$$

Where:

$C,mg/m^3$	=	Concentration as milligrams per cubic meter
$C,gr/dscf$	=	Concentration as grains per cubic foot
35.31	=	Conversion of ft^3 to m^3
0.0154	=	Conversion from grains to milligrams

Run #1:

$$C,mg/m^3 = (0.0030)\left(\frac{35.31\ ft^3}{m^3}\right)\left(\frac{mg}{0.0154\ gr}\right) = 6.88$$

Run #2:

$$C,mg/m^3 = (0.0033)\left(\frac{35.31\ ft^3}{m^3}\right)\left(\frac{mg}{0.0154\ gr}\right) = 7.57$$

Run #3:

$$C,mg/m^3 = (0.0020)\left(\frac{35.31\ ft^3}{m^3}\right)\left(\frac{mg}{0.0154\ gr}\right) = 4.59$$

NAME: APAC/MACASPHALT
LOCATION: CROSS CITY, FLORIDA

DATE: December 7-9, 1992
SOURCE: BAGHOUSE

TOTAL CONTAMINANTS BY WEIGHT: GRAIN LOADING

Condensible Particulate Concentration: C_S gr/dscf

$$C_s' = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{M_n}{V_{m(std)}}\right]$$

Where:

C_s' = Concentration of condensibles in stack gas, dry basis, corrected to standard conditions, gr/dscf.

M_n = Total amount of condensible matter collected, mg.

$V_{m(std)}$ = *Dry gas volume through meter at standard conditions,* cu. ft.

Run #1:

$$Cs = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{68.4}{41.600}\right] = 0.0253 \text{ gr/dscf}$$

Run #2:

$$Cs = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{44.9}{42.081}\right] = 0.0164 \text{ gr/dscf}$$

Run #3:

$$Cs = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{39.2}{46.878}\right] = 0.0129 \text{ gr/dscf}$$

NAME: APAC/MACASPHALT
LOCATION: CROSS CITY, FLORIDA

DATE: December 7-9, 1992
SOURCE: BAGHOUSE

Condensible Particulate
CONVERSION TO mg/m³

$$C,mg/m^3 = (C,gr/dscf)\left(\frac{35.31\ ft^3}{m^3}\right)\left(\frac{mg}{0.0154\ gr}\right)$$

Where:

$C,mg/m^3$	=	Concentration as milligrams per cubic meter
$C,gr/dscf$	=	Concentration as grains per cubic foot
35.31	=	*Conversion of ft^3 to m^3*
0.0154	=	Conversion from grains to milligrams

Run #1:

$$C,mg/m^3 = (0.0253)\left(\frac{35.31\ ft^3}{m^3}\right)\left(\frac{mg}{0.0154\ gr}\right) = 58.01$$

Run #2:

$$C,mg/m^3 = (0.0164)\left(\frac{35.31\ ft^3}{m^3}\right)\left(\frac{mg}{0.0154\ gr}\right) = 37.60$$

Run #3:

$$C,mg/m^3 = (0.0129)\left(\frac{35.31\ ft^3}{m^3}\right)\left(\frac{mg}{0.0154\ gr}\right) = 29.58$$

NAME: APAC/MACASPHALT
LOCATION: CROSS CITY, FLORIDA

DATE: December 7 and 8, 1992
SOURCE: BAGHOUSE

DRY MOLECULAR WEIGHT

$$M_d - 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%CO + \%N_2)$$

Where:

M_d	=	Dry molecular weight, lb/lb-mole.
$\%CO_2$	=	Percent carbon dioxide by volume, dry basis.
$\%O_2$	=	Percent oxygen by volume, dry basis.
$\%N_2$	=	Percent nitrogen by volume, dry basis.
$\%CO$	=	Percent carbon monoxide by volume, dry basis.
0.264	=	Ratio of O_2 to N_2 in air, v/v.
0.28	=	Molecular weight of N_2 or CO, divided by 100.
0.32	=	Molecular weight of O_2 divided by 100.
0.44	=	Molecular weight of CO_2 divided by 100.

Run #1:

$$M_d - 0.44\ (8.60\%) + 0.32\ (11.00\%) + 0.28\ (0.00\% + 80.40\%) - 29.82\ \frac{lb}{lb\text{-}mole}$$

Run #2:

$$M_d - 0.44\ (7.00\%) + 0.32\ (11.70\%) + 0.28\ (0.00\% + 81.30\%) - 29.59\ \frac{lb}{lb\text{-}mole}$$

Run #3:

$$M_d - 0.44\ (5.50\%) + 0.32\ (13.00\%) + 0.28\ (0.00\% + 81.50\%) - 29.40\ \frac{lb}{lb\text{-}mole}$$

NAME: APAC/MACASPHALT **DATE:** December 7 and 8, 1992
LOCATION: CROSS CITY, FLORIDA **SOURCE:** BAGHOUSE

WATER VAPOR CONDENSED

$$V_{wc_{std}} - [V_f - V_i] \left[\frac{P_w \; R \; T_{(std)}}{M_w \; P_{(std)}}\right] - 0.04707 \; [V_f - V_i]$$

$$V_{wsg_{std}} - [W_f - W_i] \left[\frac{R \; T_{(std)}}{M_w \; P_{(std)}}\right] - 0.04715 \; [W_f - W_i]$$

Where:

0.04707	=	Conversion factor, ft^3/ml.
0.04715	=	Conversion factor, ft^3/g.
Vwc_{std}	=	Volume of water vapor condensed (std. cond.), ml.
$Vwsg_{std}$	=	Volume of water vapor collected in silica gel (standard conditions), ml.
$V_f - V_i$	=	Final volume of impinger contents less initial volume, ml.
$W_f - W_i$	=	Final weight of silica gel less initial weight, g.
P_w	=	Density of water, 0.002201 lb/ml.
R	=	Ideal gas constant, 21.85 in.Hg. (cu.ft./lb-mole)(°R).
M_w	=	Molecular weight of water vapor, 18.0 lb/lb-mole.
T_{std}	=	Absolute temperature at standard conditions, 528°R.
P_{std}	=	Absolute pressure at standard conditions, 29.92 inches Hg.

Run 1:

$V_{wc_{std}}$ - (0.04707) (480.0) - 22.6 cu.ft
$V_{wsg_{std}}$ - (0.04715) (12.5) - 0.6 cu.ft

Run 2:

$V_{wc_{std}}$ - (0.04707) (470.0) - 22.1 cu.ft
$V_{wsg_{std}}$ - (0.04715) (1.5) - 0.1 cu.ft

Run 3:

$V_{wc_{std}}$ - (0.04707) (386.0) - 18.2 cu.ft
$V_{wsg_{std}}$ - (0.04715) (.8) - 0.0 cu.ft

Format: vaporR3/24-001

NAME: APAC/MACASPHALT
LOCATION: CROSS CITY, FLORIDA

DATE: December 7 and 8, 1992
SOURCE: BAGHOUSE

MOISTURE CONTENT OF STACK GASES

$$B_{ws} - \left[\frac{V_{wc_{std}} + V_{wsg_{std}}}{V_{wc_{std}} + V_{wsg_{std}} + V_{mstd}}\right] \times 100$$

Where:

B_{ws} = Proportion of water vapor, by volume, in the gas stream.

V_m = Dry gas volume measured by dry gas meter, dcf.

Vwc_{std} = Volume of water vapor condensed, corrected to standard conditions, scf.

$Vwsg_{std}$ = Volume of water vapor collected in silica gel corrected to std. cond., scf.

Run 1:

$$B_{ws} - \left[\frac{22.6 + 0.6}{22.6 + 0.6 + 41.600}\right] \times 100 - 35.80\%$$

Run 2:

$$B_{ws} - \left[\frac{22.1 + 0.1}{22.1 + 0.1 + 42.081}\right] \times 100 - 34.54\%$$

Run 3:

$$B_{ws} - \left[\frac{18.2 + 0.0}{18.2 + 0.0 + 46.878}\right] \times 100 - 27.97\%$$

NAME: APAC/MACASPHALT
LOCATION: CROSS CITY, FLORIDA

DATE: December 7 and 8, 1992
SOURCE: BAGHOUSE

MOLECULAR WEIGHT OF STACK GASES

$$M_s - M_d (1 - B_{ws}) + 18 (B_{ws})$$

Where:

M_s = Molecular weight of stack gas, wet basis (lb./lb.-mole).

M_d = Molecular weight of stack gas, dry basis (lb./lb.-mole).

Run #1:

$$M_s - 29.82 (1 - 35.80) + 18 (35.80) - 25.59 \text{ (lb./lb.-mole)}$$

Run #2:

$$M_s - 29.59 (1 - 34.54) + 18 (34.54) - 25.59 \text{ (lb./lb.-mole)}$$

Run #1:

$$M_s - 29.40 (1 - 27.97) + 18 (27.97) - 26.21 \text{ (lb./lb.-mole)}$$

NAME: APAC/MACASPHALT
LOCATION: CROSS CITY, FLORIDA

DATE: December 7 and 8, 1992
SOURCE: BAGHOUSE

STACK GAS VELOCITY

$$V_s - K_p \ C_p \ [\sqrt{\Delta P}] \text{ avg} \ \sqrt{\frac{T_s(\text{avg})}{P_s \ M_s}}$$

Where:

V_s = Average velocity of gas stream in stack, ft/sec.
K_p = 85.49 ft/sec [(g/g-mole) - (mm Hg)/(°K)(mm H_2O]$^{1/2}$
C_p = Pitot tube coefficient, dimensionless.
ΔP = Velocity head of stack gas, in. H_2O.
P_{bar} = Barometric pressure at measurement site, in. Hg.
P_g = Stack static pressure, in. Hg.
P_s = Absolute stack gas pressure, in. Hg. = $P_{bar} + P_g$
P_{std} = Standard absolute pressure, 29.92 in. Hg.
t_s = Stack temperature, °F.
T_s = Absolute stack temperature, °R. = 460 + t_s.
M_s = Molecular weight of stack gas, wet basis, lb/lb-mole.

Run #1:

$$V - (85.49)\ (.84)\ (1.03) \sqrt{\frac{870}{(30.10)(25.59)}} - 78.60 \text{ ft/sec}$$

Run #2:

$$V - (85.49)\ (.84)\ (1.15) \sqrt{\frac{816}{(30.10)(25.59)}} - 84.99 \text{ ft/sec}$$

Run #3:

$$V - (85.49)\ (.84)\ (1.22) \sqrt{\frac{801}{(30.08)(26.21)}} - 88.30 \text{ ft/sec}$$

NAME: APAC/MACASPHALT
LOCATION: CROSS CITY, FLORIDA

DATE: December 7 and 8, 1992
SOURCE: BAGHOUSE

STACK GAS FLOW RATE

$$Q_{sd} - 3600 \left[1 - B_{wc} \right] V_s \ A \left[\frac{T_{std}}{T_{stk}} \right] \left[\frac{P_s}{P_{std}} \right]$$

Where:

Q_{sd} =	Dry volumetric stack gas flow rate corrected to standard conditions (dscf/hr).
A =	Cross sectional area of stack (ft^2).
3600 =	Conversion factor (sec/hr).
T_{stk} =	Absolute stack temperature (°R).
T_{std} =	Standard absolute temperature (528°R).
P_{bar} =	Barometric pressure at measurement site (in. Hg.).
P_g =	Stack static pressure (in. Hg.).
P_s =	Absolute stack gas pressure (in. Hg.) = $P_{bar} + P_g$
P_{std} =	Standard absolute pressure (29.92 in. Hg.).

Run #1:

$$Q_{sd} - 3600\ (1 - .3580)\ (78.60)\ (11.34) \left[\frac{528}{870} \right] \left[\frac{30.10}{29.92} \right] - 1257745.3\ \frac{dscf}{hr}$$

Run #2:

$$Q_{sd} - 3600\ (1 - .3454)\ (84.99)\ (11.34) \left[\frac{528}{816} \right] \left[\frac{30.10}{29.92} \right] - 1478454.8\ \frac{dscf}{hr}$$

Run #3:

$$Q_{sd} - 3600\ (1 - .2797)\ (88.30)\ (11.34) \left[\frac{528}{801} \right] \left[\frac{30.08}{29.92} \right] - 1720708.6\ \frac{dscf}{hr}$$

NAME: APAC/MACASPHALT
LOCATION: CROSS CITY, FLORIDA

DATE: December 7 and 8, 1992
SOURCE: BAGHOUSE

EMISSIONS RATE FROM STACK

$$E = \left[\frac{(C_s)\ (Q_{sd})}{7{,}000\ gr/lb}\right] = 0.0000\ lb/hr$$

Where:

E = Emissions rate, lbs/hr.

C_s = Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, gr/dscf.

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

Run #1:

$$E = \left[\frac{(0.0030)\ (1257745.3)}{7{,}000}\right] = 0.54\ lbs/hr$$

Run #2:

$$E = \left[\frac{(0.0033)\ (1478454.8)}{7{,}000}\right] = 0.70\ lbs/hr$$

Run #3:

$$E = \left[\frac{(0.0020)\ (1720708.6)}{7{,}000}\right] = 0.49\ lbs/hr$$

NAME: APAC/MACASPHALT
LOCATION: CROSS C ᵀʸ, FLORIDA

DATE: December 7-9, 1992
SOURCE: BAGHOUSE

Condensible Particulate
EMISSIONS RATE FROM STACK

$$E = \left[\frac{(C_s)\ \ (Q_{sd})}{7{,}000\ gr/lb}\right] = 0.0000\ lb/hr$$

Where:

E = Emissions rate, lbs/hr.

C_s = Concentration of Condensibles in stack gas, dry basis, corrected to standard conditions, gr/dscf.

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

Run #1:

$$E = \frac{(0.0253)\ \ (1{,}257{,}745.3)}{7{,}000} = 4.55$$

Run #2:

$$E = \frac{(0.0164)\ \ (1{,}478{,}454.8)}{7{,}000} = 3.46$$

Run #3:

$$E = \frac{(0.0129)\ \ (1{,}720{,}708.6)}{7{,}000} = 3.17$$

NAME: APAC/MACASPHALT
LOCATION: CROSS CITY, FLORIDA

DATE: December 7 and 8, 1992
SOURCE: BAGHOUSE

ISOKINETIC VARIATION

$$I - 100\ T_s \left[\frac{(0.002669)\ (V_{ic} + (V_m/T_m)\ (P_{bar} + \Delta H/13.6)}{60 \quad \theta \quad V_s \quad P_s \quad A_n} \right]$$

Where:

I	=	Percent isokinetic sampling.
100	=	Conversion to percent.
T_s	=	Absolute average stack gas temperature, °R.
0.002669	=	Conversion factor, Hg - ft^3/ml - °R.
V_{ic}	=	Total volume of liquid collected in impingers and silica gel, ml.
T_m	=	Absolute average dry gas meter temperature, °R.
P_{bar}	=	Barometric pressure at sampling site, in. Hg.
ΔH	=	Average pressure differential across the orifice meter, in. H_2O.
13.6	=	Specific gravity of mercury.
60	=	Conversion seconds to minutes.
θ	=	Total sampling time, minutes.
V_s	=	Stack gas velocity, ft/sec.
P_s	=	Absolute stack gas pressure, in. Hg.
A_n	=	Cross sectional area of nozzle, ft^2.

Run #1:

$$I - (100)\ (870) \left[\frac{(0.002669)\ (492.50) + \frac{44.679}{561} \left[30.10 + \frac{1.57}{13.6} \right]}{60 \quad (60.0) \quad (78.60) \quad (30.10) \quad (.000340)} \right] - 110\%$$

Run #2:

$$I - (100)\ (816) \left[\frac{(0.002669)\ (471.50) + \frac{45.880}{570} \left[30.10 + \frac{1.93}{13.6} \right]}{60 \quad (60.0) \quad (84.99) \quad (30.10) \quad (.000340)} \right] - 95\%$$

Run #3:

$$I - (100)\ (801) \left[\frac{(0.002669)\ (386.80) + \frac{48.867}{545} \left[30.08 + \frac{2.22}{13.6} \right]}{60 \quad (60.0) \quad (88.30) \quad (30.08) \quad (.000340)} \right] - 91\%$$

VI. CALCULATIONS

B. Formaldehyde

NAME: MACASPHALT (Formaldehyde)
LOCATION: CROSS CITY, FLORIDA

DATE: December 9, 1992

SUMMARY OF TEST DATA

		Run #1 12-09-92	Run #2 12-09-92	Run #3 12-09-92
SAMPLING TRAIN DATA	Start	12:48	14:24	16:11
	Finish	13:53	15:34	17:06
1. Sampling time, minutes	θ	60.0	60.0	50.0
2. Sampling nozzle diameter, in.	D_n	.2610	.2610	.2610
3. Sampling nozzle cross-sect. area, ft^2	A_n	.000371	.000371	.000371
4. Isokinetic variation	I	91.8	102.8	97.2
5. Sample gas volume - meter cond., cf.	V_m	56.029	57.583	41.790
6. Average meter temperature, °R	T_m	567	563	563
7. Avg. orifice pressure drop, in. H_2O	ΔH	3.04	3.16	2.36
8. Total formaldehyde collected, mg.	M_n	8.80	8.80	5.80
VELOCITY TRAVERSE DATA				
9. Stack area, $ft.^2$	A	11.30	11.30	11.30
10. Absolute stack gas pressure, in. Hg.	P_s	30.12	30.12	30.12
11. Barometric pressure, in. Hg.	P_{bar}	30.12	30.12	30.12
12. Avg. absolute stack temperature, R°	T_s	727	736	796
13. Average $\sqrt{}$vel. head, (C_p = .84)	$\sqrt{dp}$	1.17	1.13	1.08
14. Average stack gas velocity, ft./sec.	V_s	80.43	78.34	78.01
STACK MOISTURE CONTENT				
15. Total water collected by train, ml.	V_{lc}	424.90	503.40	366.60
16. Moisture in stack gas, %	B_{ws}	27.74	30.44	30.57
EMISSION DATA				
17. Stack gas flow rate, dscf/hr.	Q_{sd}	1728	1600	1471
18. Stack gas flow rate, cfm	acfm	54532	53115	52891
19. Formaldehyde concentration, gr/dscf	C_s	0.0026	0.0025	0.0023
20. Formaldehyde concentration, lb/hr	E	0.64	0.57	0.48
ORSAT DATA				
21. Percent CO_2 by volume	CO_2	6.50	7.20	8.00
22. Percent O_2 by volume	O_2	12.60	11.70	10.50
23. Percent CO by volume	CO	.00	.00	.00
24. Percent N_2 by volume	N_2	80.90	81.80	81.50

NAME: MACASPHALT (Formaldehyde)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 9, 1992

MOISTURE DETERMINATION
DRY GAS VOLUME

$$V_{m(std)} =$$

$$V_m \left[\frac{T_{(std)}}{T_m}\right] \left[\frac{P_{bar} + \frac{\Delta H}{13.6}}{P_{std}}\right] - 17.64 \frac{°R}{\epsilon.\ Hg}\ Y\ V_m \left[\frac{P_{bar} + \frac{\Delta H}{13.6}}{T_m}\right]$$

Where:

$V_{m(std)}$	=	Dry gas volume through meter at standard conditions, ft^3.
V_m	=	Dry gas volume measured by meter, ft^3.
P_{bar}	=	Barometric pressure at orifice meter, in. Hg.
P_{std}	=	Standard absolute pressure, (29.92 in. Hg.).
T_m	=	Absolute temperature at meter, °R.
T_{std}	=	Standard absolute temperature, (528°R).
ΔH	=	Avg. pressure drop across orifice meter, in. H_2O.
Y	=	Dry gas meter calibration factor.
13.6	=	Inches of water per Hg.

Run #1:

$$V_{m(std)} - (17.64)(.985)(56.029)\left[\frac{30.12 + \frac{3.04}{13.6}}{567}\right] - 52.099 \text{ dscf}$$

Run #2:

$$V_{m(std)} - (17.64)(.985)(57.583)\left[\frac{30.12 + \frac{3.16}{13.6}}{563}\right] - 53.940 \text{ dscf}$$

Run #3:

$$V_{m(std)} - (17.64)(.985)(41.790)\left[\frac{30.12 + \frac{2.36}{13.6}}{563}\right] - 39.070 \text{ dscf}$$

NAME: MACASPHALT (Formaldehyde)
LOCATION: CROSS CITY, FLORIDA

DATE: December 9, 1992

TOTAL CONTAMINANTS BY WEIGHT: GRAIN LOADING

Formaldehyde Concentration: C_S' gr/dscf

$$C_s' - \left[0.0154 \frac{gr}{mg}\right] \left[\frac{M_n}{V_{m(std)}}\right]$$

Where:

C_s' = Concentration of formaldehyde in stack gas, dry basis, corrected to standard conditions, gr/dscf.

M_n = Total amount of formaldehyde collected, mg.

$V_{m(std)}$ = Dry gas volume through meter at standard conditions, cu. ft.

Run #1:

$$C_s' - \left[0.0154 \frac{gr}{mg}\right] \left[\frac{8.80}{52.099}\right] - 0.0026 \text{ gr/dscf}$$

Run #2:

$$C_s' - \left[0.0154 \frac{gr}{mg}\right] \left[\frac{8.80}{53.940}\right] - 0.0025 \text{ gr/dscf}$$

Run #3:

$$C_s' - \left[0.0154 \frac{gr}{mg}\right] \left[\frac{5.80}{39.070}\right] - 0.0023 \text{ gr/dscf}$$

NAME: MACASPHALT (Formaldehyde)
LOCATION: CROSS CITY, FLORIDA

DATE: December 9, 1992

Formaldehyde
CONVERSION TO mg/m³

$$C,mg/m^3 = (C,gr/dscf)\left(\frac{35.31\ ft^3}{m^3}\right)\left(\frac{mg}{0.0154\ gr}\right)$$

Where:

$C,mg/m^3$	=	Concentration as milligrams per cubic meter
$C,gr/dscf$	=	Concentration as grains per cubic foot
35.31	=	Conversion of ft^3 to m^3
0.0154	=	Conversion from grains to milligrams

Run #1:

$$C,mg/m^3 = (0.0026)\left(\frac{35.31\ ft^3}{m^3}\right)\left(\frac{mg}{0.0154\ gr}\right) = 5.96$$

Run #2:

$$C,mg/m^3 = (0.0025)\left(\frac{35.31\ ft^3}{m^3}\right)\left(\frac{mg}{0.0154\ gr}\right) = 5.73$$

Run #3:

$$C,mg/m^3 = (0.0023)\left(\frac{35.31\ ft^3}{m^3}\right)\left(\frac{mg}{0.0154\ gr}\right) = 5.27$$

NAME: MACASPHALT (Formaldehyde)
LOCATION: CROSS CITY, FLORIDA

DATE: December 9, 1992

Emissions of Formaldehyde: PPM (PARTS PER MILLION)

$$E = \frac{C_S}{} \cdot \frac{g}{1{,}000\ mg} \cdot \frac{MOL}{30.03g} \cdot \frac{22.4\ \ell}{MOL} \cdot \frac{293°K}{273°K} \cdot \frac{ft^3}{28.317} \cdot 1{,}000{,}000$$

Where:

C_S = Concentration of formaldehyde in mg/dscf.
1000 mg/g = Conversion to grams.
30.03 g/MOL = Molar conversion for formaldehyde.
22.4 ℓ/MOL = Volumetric molar conversion @ 273°K.
293°K/273°K = Temperature correction to standard conditions.
28.317/ft^3 = Conversion to liters.
1,000,000 = Conversion to parts per million.

Run #1:

$$\frac{8.8\ mg}{52.099\ dscf} \cdot \frac{g}{1{,}000\ mg} \cdot \frac{MOL}{30.03\ g} \cdot \frac{22.4\ \ell}{MOL} \cdot \frac{293°K}{273°K} \cdot \frac{ft^3}{28.317} \cdot 1{,}000{,}000 = 4.78\ ppm$$

Run #2:

$$\frac{8.8\ mg}{53.940\ dscf} \cdot \frac{g}{1{,}000\ mg} \cdot \frac{MOL}{30.03\ g} \cdot \frac{22.4\ \ell}{MOL} \cdot \frac{293°K}{273°K} \cdot \frac{ft^3}{28.317} \cdot 1{,}000{,}000 = 4.61\ ppm$$

Run #3:

$$\frac{5.8\ mg}{39.070\ dscf} \cdot \frac{g}{1{,}000\ mg} \cdot \frac{MOL}{30.03\ g} \cdot \frac{22.4\ \ell}{MOL} \cdot \frac{293°K}{273°K} \cdot \frac{ft^3}{28.317} \cdot 1{,}000{,}000 = 4.20\ ppm$$

NAME: MACASPHALT (Formaldehyde)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 9, 1992

DRY MOLECULAR WEIGHT

$$M_d - 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%CO + \%N_2)$$

Where:

M_d	=	Dry molecular weight, lb/lb-mole.
$\%CO_2$	=	Percent carbon dioxide by volume, dry basis.
$\%O_2$	=	Percent oxygen by volume, dry basis.
$\%N_2$	=	Percent nitrogen by volume, dry basis.
$\%CO$	=	Percent carbon monoxide by volume, dry basis.
0.264	=	Ratio of O_2 to N_2 in air, v/v.
0.28	=	Molecular weight of N_2 or CO, divided by 100.
0.32	=	Molecular weight of O_2 divided by 100.
0.44	=	Molecular weight of CO_2 divided by 100.

Run #1:

$$M_d - 0.44\ (6.50\%) + 0.32\ (12.60\%) + 0.28\ (0.00\% + 80.90\%) - 29.54\ \frac{lb}{lb\text{-}mole}$$

Run #2:

$$M_d - 0.44\ (7.20\%) + 0.32\ (11.70\%) + 0.28\ (0.00\% + 81.80\%) - 29.82\ \frac{lb}{lb\text{-}mole}$$

Run #3:

$$M_d - 0.44\ (8.00\%) + 0.32\ (10.50\%) + 0.28\ (0.00\% + 81.50\%) - 29.70\ \frac{lb}{lb\text{-}mole}$$

NAME: MACASPHALT (Formaldehyde)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 9, 1992

WATER VAPOR CONDENSED

$$V_{wc_{std}} - [V_f - V_i] \left[\frac{P_w\ R\ T_{(std)}}{M_w\ P_{(std)}}\right] - 0.04707\ [V_f - V_i]$$

$$V_{wsg_{std}} - [W_f - W_i] \left[\frac{R\ T_{(std)}}{M_w\ P_{(std)}}\right] - 0.04715\ [W_f - W_i]$$

Where:

0.04707	=	Conversion factor, ft^3/ml.
0.04715	=	Conversion factor, ft^3/g.
Vwc_{std}	=	Volume of water vapor condensed (std. cond.), ml.
$Vwsg_{std}$	=	Volume of water vapor collected in silica gel (standard conditions), ml.
$V_f - V_i$	=	Final volume of impinger contents less initial volume, ml.
$W_f - W_i$	=	Final weight of silica gel less initial weight, g.
P_w	=	Density of water, 0.002201 lb/ml.
R	=	Ideal gas constant, 21.85 in.Hg. (cu.ft./lb-mole)(°R).
M_w	=	Molecular weight of water vapor, 18.0 lb/lb-mole.
T_{std}	=	Absolute temperature at standard conditions, 528°R.
P_{std}	=	Absolute pressure at standard conditions, 29.92 inches Hg.

Run 1:

$$V_{wc_{std}} - (0.04707)\ (419.0)\ -\ 19.7\ \text{cu.ft}$$
$$V_{wsg_{std}} - (0.04715)\ (5.9)\ -\ 0.3\ \text{cu.ft}$$

Run 2:

$$V_{wc_{std}} - (0.04707)\ (496.0)\ -\ 23.3\ \text{cu.ft}$$
$$V_{wsg_{std}} - (0.04715)\ (7.4)\ -\ 0.3\ \text{cu.ft}$$

Run 3:

$$V_{wc_{std}} - (0.04707)\ (360.0)\ -\ 16.9\ \text{cu.ft}$$
$$V_{wsg_{std}} - (0.04715)\ (6.6)\ -\ 0.3\ \text{cu.ft}$$

NAME: MACASPHALT (Formaldehyde)
LOCATION: CROSS CITY, FLORIDA

DATE: December 9, 1992

MOISTURE CONTENT OF STACK GASES

$$B_{ws} = \left[\frac{V_{wc_{std}} + V_{wsg_{std}}}{V_{wc_{std}} + V_{wsg_{std}} + V_{mstd}}\right] \times 100$$

Where:

B_{ws} = Proportion of water vapor, by volume, in the gas stream.

V_m = Dry gas volume measured by dry gas meter, dcf.

Vwc_{std} = Volume of water vapor condensed, corrected to standard conditions, scf.

$Vwsg_{std}$ = Volume of water vapor collected in silica gel corrected to std. cond., scf.

Run 1:

$$B_{ws} = \left[\frac{19.7 + 0.3}{19.7 + 0.3 + 52.099}\right] \times 100 = 27.74\%$$

Run 2:

$$B_{ws} = \left[\frac{23.3 + 0.3}{23.3 + 0.3 + 53.940}\right] \times 100 = 30.44\%$$

Run 3:

$$B_{ws} = \left[\frac{16.9 + 0.3}{16.9 + 0.3 + 39.070}\right] \times 100 = 30.57\%$$

Format: bwsR3/19-001

NAME: MACASPHALT (Formaldehyde)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 9, 1992

MOLECULAR WEIGHT OF STACK GASES

$$M_s - M_d (1 - B_{ws}) + 18 (B_{ws})$$

Where:

M_s = Molecular weight of stack gas, wet basis (lb./lb.-mole).

M_d = Molecular weight of stack gas, dry basis (lb./lb.-mole).

Run #1:

$$M_s - 29.54 (1 - 27.74) + 18 (27.74) - 26.34 \text{ (lb./lb.-mole)}$$

Run #2:

$$M_s - 29.82 (1 - 30.44) + 18 (30.44) - 26.22 \text{ (lb./lb.-mole)}$$

Run #1:

$$M_s - 29.70 (1 - 30.57) + 18 (30.57) - 26.12 \text{ (lb./lb.-mole)}$$

NAME: MACASPHALT (Formaldehyde)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 9, 1992

STACK GAS VELOCITY

$$V_s - K_p \ C_p \ [\sqrt{\Delta P}] \text{ avg} \ \sqrt{\frac{T_s(\text{avg})}{P_s \ M_s}}$$

Where:

V_s = Average velocity of gas stream in stack, ft/sec.
K_p = 85.49 ft/sec [(g/g-mole) - (mm Hg)/(°K)(mm H_2O]$^{1/2}$
C_p = Pitot tube coefficient, dimensionless.
ΔP = Velocity head of stack gas, in. H_2O.
P_{bar} = Barometric pressure at measurement site, in. Hg.
P_g = Stack static pressure, in. Hg.
P_s = Absolute stack gas pressure, in. Hg. = $P_{bar} + P_g$
P_{std} = Standard absolute pressure, 29.92 in. Hg.
t_s = Stack temperature, °F.
T_s = Absolute stack temperature, °R. = 460 + t_s.
M_s = Molecular weight of stack gas, wet basis, lb/lb-mole.

Run #1:

$$V - (85.49)\ (.84)\ (1.17)\ \sqrt{\frac{727}{(30.12)(26.34)}} - 80.43 \text{ ft/sec}$$

Run #2:

$$V - (85.49)\ (.84)\ (1.13)\ \sqrt{\frac{736}{(30.12)(26.22)}} - 78.34 \text{ ft/sec}$$

Run #3:

$$V - (85.49)\ (.84)\ (1.08)\ \sqrt{\frac{796}{(30.12)(26.12)}} - 78.01 \text{ ft/sec}$$

NAME: MACASPHALT (Formaldehyde)
LOCATION: CROSS CITY, FLORIDA

DATE: December 9, 1992

STACK GAS FLOW RATE

$$Q_{sd} = 3600 \left[1 - B_{wc} \right] V_s \; A \left[\frac{T_{std}}{T_{stk}} \right] \left[\frac{P_s}{P_{std}} \right]$$

Where:

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions (dscf/hr).
A = Cross sectional area of stack (ft^2).
3600 = Conversion factor (sec/hr).
T_{stk} = Absolute stack temperature (°R).
T_{std} = Standard absolute temperature (528°R).
P_{bar} = Barometric pressure at measurement site (in. Hg.).
P_g = Stack static pressure (in. Hg.).
P_s = Absolute stack gas pressure (in. Hg.) = $P_{bar} + P_g$
P_{std} = Standard absolute pressure (29.92 in. Hg.).

Run #1:

$$Q_{sd} = 3600\,(1-.2774)\,(80.43)\,(11.30) \left[\frac{528}{727}\right] \left[\frac{30.12}{29.92}\right] = 1728581.5\ \frac{dscf}{hr}$$

Run #2:

$$Q_{sd} = 3600\,(1-.3044)\,(78.34)\,(11.30) \left[\frac{528}{736}\right] \left[\frac{30.12}{29.92}\right] = 1600934.5\ \frac{dscf}{hr}$$

Run #3:

$$Q_{sd} = 3600\,(1-.3057)\,(78.01)\,(11.30) \left[\frac{528}{796}\right] \left[\frac{30.12}{29.92}\right] = 1471270.8\ \frac{dscf}{hr}$$

NAME: MACASPHALT (Formaldehyde)
LOCATION: CROSS CITY, FLORIDA

DATE: December 9, 1992

EMISSIONS RATE FROM STACK

$$E - \left[\frac{(C_s^{`})\ \ (Q_{sd})}{7{,}000\ \mathrm{gr/lb}}\right] - 0.0000\ \mathrm{lb/hr}$$

Where:

E = Emissions rate, lbs/hr.

C_s = Concentration of formaldehyde in stack gas, dry basis, corrected to standard conditions, gr/dscf.

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

Run #1:

$$E - \left[\frac{(0.0026)\ \ (1728581.5)}{7{,}000}\right] - 0.64\ \mathrm{lbs/hr}$$

Run #2:

$$E - \left[\frac{(0.0025)\ \ (1600934.5)}{7{,}000}\right] - 0.57\ \mathrm{lbs/hr}$$

Run #3:

$$E - \left[\frac{(0.0023)\ \ (1471270.8)}{7{,}000}\right] - 0.48\ \mathrm{lbs/hr}$$

NAME: MACASPHALT (Formaldehyde)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 9, 1992

ISOKINETIC VARIATION

$$I - 100\ T_s \left[\frac{(0.002669)\ (V_{lc} + (V_m/T_m)\ (P_{bar} + \Delta H/13.6)}{60\ \ \theta\ \ V_s\ \ P_s\ \ A_n} \right]$$

Where:

I	=	Percent isokinetic sampling.
100	=	Conversion to percent.
T_s	=	Absolute average stack gas temperature, °R.
0.002669	=	Conversion factor, Hg - ft^3/ml - °R.
V_{ic}	=	Total volume of liquid collected in impingers and silica gel, ml.
T_m	=	Absolute average dry gas meter temperature, °R.
P_{bar}	=	Barometric pressure at sampling site, in. Hg.
ΔH	=	Average pressure differential across the orifice meter, in. H_2O.
13.6	=	Specific gravity of mercury.
60	=	Conversion seconds to minutes.
Θ	=	Total sampling time, minutes.
V_s	=	Stack gas velocity, ft/sec.
P_s	=	Absolute stack gas pressure, in. Hg.
A_n	=	Cross sectional area of nozzle, ft^2.

Run #1:

$$I - (100)\ (727) \left[\frac{(0.002669)\ (424.90) + \dfrac{56.029}{567} \left[30.12 + \dfrac{3.04}{13.6} \right]}{60\ \ (60.0)\ \ (80.43)\ \ (30.12)\ \ (.000371)} \right] - 91.8\%$$

Run #2:

$$I - (100)\ (736) \left[\frac{(0.002669)\ (503.4) + \dfrac{57.583}{563} \left[30.12 + \dfrac{3.16}{13.6} \right]}{60\ \ (60.0)\ \ (78.34)\ \ (30.12)\ \ (.000371)} \right] - 102.8\%$$

Run #3:

$$I - (100)\ (796) \left[\frac{(0.002669)\ (366.6) + \dfrac{41.790}{563} \left[30.12 + \dfrac{2.36}{13.6} \right]}{60\ \ (50.0)\ \ (78.01)\ \ (30.12)\ \ (.000371)} \right] - 97.2\%$$

VI. CALCULATIONS

C. PAH

NAME: MACASPHALT (PAH)
LOCATION: CROSS CITY, FLORIDA

DATE: December 8-9, 1992

SUMMARY OF TEST DATA

		Run #1 12-08-92	Run #2 12-08-92	Run #3 12-09-92
SAMPLING TRAIN DATA	Start	11:24	13:34	09:46
	Finish	12:37	17:11	12:16
1. Sampling time, minutes	θ	60.0	90.0	90.0
2. Sampling nozzle diameter, in.	D_n	.2500	.2500	-.2500
3. Sampling nozzle cross-sect. area, ft^2	A_n	.000340	.000340	.000340
4. Isokinetic variation	I	96.5	99.5	90.7
5. Sample gas volume - meter cond., cf.	V_m	53.020	80.649	75.812
6. Average meter temperature, °R	T_m	557	562	573
7. Avg. orifice pressure drop, in. H_2O	ΔH	2.71	2.73	2.56
8. Total PAH's collected, mg.	M_n	0.99	1.54	1.57
VELOCITY TRAVERSE DATA				
9. Stack area, $ft.^2$	A	11.30	11.30	11.30
10. Absolute stack gas pressure, in. Hg.	P_s	30.08	30.08	30.12
11. Barometric pressure, in. Hg.	P_{bar}	30.08	30.08	30.12
12. Avg. absolute stack temperature, R°	T_s	719	724	730
13. Average √vel. head, (C_p = .84)	√dp	1.18	1.15	1.15
14. Average stack gas velocity, ft./sec.	V_s	80.91	78.94	79.14
STACK MOISTURE CONTENT				
15. Total water collected by train, ml.	V_{lc}	434.20	641.10	557.30
16. Moisture in stack gas, %	B_{ws}	28.94	28.50	27.33
EMISSION DATA				
17. Stack gas flow rate, dscf/hr.	Q_{sd}	1726	1683	1703
18. Stack gas flow rate, cfm	acfm	54857	53521	53657
19. PAH concentration, gr/dscf	C_s	0.0003	0.0003	0.0003
20. PAH concentration, lb/hr	E	0.074	0.072	0.073
21. PAH concentration, lb/mBtu	E'	0.00000	0.00000	0.00000
ORSAT DATA				
22. Percent CO_2 by volume	CO_2	6.60	7.10	6.50
23. Percent O_2 by volume	O_2	12.80	13.30	12.80
24. Percent CO by volume	CO	.00	.00	.00
25. Percent N_2 by volume	N_2	80.60	79.60	80.70

Format: summryR3/19-000

NAME: MACASPHALT (PAH)
LOCATION: CROSS CITY, FLORIDA

DATE: December 8-9, 1992

MOISTURE DETERMINATION
DRY GAS VOLUME

$$V_{m(std)} =$$

$$V_m \left[\frac{T_{(std)}}{T_m}\right] \left[\frac{P_{bar} + \dfrac{\Delta H}{13.6}}{P_{std}}\right] - 17.64 \; \frac{°R}{\epsilon.\ Hg} \; Y \, V_m \left[\frac{P_{bar} + \dfrac{\Delta H}{13.6}}{T_m}\right]$$

Where:

$V_{m(std)}$	=	Dry gas volume through meter at standard conditions, ft^3.
V_m	=	Dry gas volume measured by meter, ft^3.
P_{bar}	=	Barometric pressure at orifice meter, in. Hg.
P_{std}	=	Standard absolute pressure, (29.92 in. Hg.).
T_m	=	Absolute temperature at meter, °R.
T_{std}	=	Standard absolute temperature, (528°R).
ΔH	=	Avg. pressure drop across orifice meter, in. H_2O.
Y	=	Dry gas meter calibration factor.
13.6	=	Inches of water per Hg.

Run #1:

$$V_{m(std)} - (17.64)(.985)(53.020)\left[\frac{30.08 + \dfrac{2.71}{13.6}}{557}\right] - 50.080 \text{ dscf}$$

Run #2:

$$V_{m(std)} - (17.64)(.985)(80.649)\left[\frac{30.08 + \dfrac{2.73}{13.6}}{562}\right] - 75.503 \text{ dscf}$$

Run #3:

$$V_{m(std)} - (17.64)(.985)(75.812)\left[\frac{30.12 + \dfrac{2.56}{13.6}}{573}\right] - 69.675 \text{ dscf}$$

NAME: MACASPHALT (PAH)
LOCATION: CROSS CITY, FLORIDA

DATE: December 8-9, 1992

TOTAL CONTAMINANTS BY WEIGHT: GRAIN LOADING

PAH Concentration: C_S' gr/dscf

$$C_s' - \left[0.0154 \frac{gr}{mg}\right] \left[\frac{M_n}{V_{m(std)}}\right]$$

Where:

C_s' = Concentration of PAH's in stack gas, dry basis, corrected to standard conditions, gr/dscf.

M_n = Total amount of PAH's collected, mg.

$V_{m(std)}$ = Dry gas volume through meter at standard conditions, cu. ft.

Run #1:

$$C_s' - \left[0.0154 \frac{gr}{mg}\right] \left[\frac{0.99}{50.080}\right] - 0.0003 \text{ gr/dscf}$$

Run #2:

$$C_s' - \left[0.0154 \frac{gr}{mg}\right] \left[\frac{1.54}{75.503}\right] - 0.0003 \text{ gr/dscf}$$

Run #3:

$$C_s' - \left[0.0154 \frac{gr}{mg}\right] \left[\frac{1.57}{69.675}\right] - 0.0003 \text{ gr/dscf}$$

NAME: MACASPHALT (PAH)
LOCATION: CROSS CITY, FLORIDA

DATE: December 8-9, 1992

DRY MOLECULAR WEIGHT

$$M_d - 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%CO + \%N_2)$$

Where:

M_d	=	Dry molecular weight, lb/lb-mole.
$\%CO_2$	=	Percent carbon dioxide by volume, dry basis.
$\%O_2$	=	Percent oxygen by volume, dry basis.
$\%N_2$	=	Percent nitrogen by volume, dry basis.
$\%CO$	=	Percent carbon monoxide by volume, dry basis.
0.264	=	Ratio of O_2 to N_2 in air, v/v.
0.28	=	Molecular weight of N_2 or CO, divided by 100.
0.32	=	Molecular weight of O_2 divided by 100.
0.44	=	Molecular weight of CO_2 divided by 100.

Run #1:

$$M_d - 0.44\ (6.60\%) + 0.32\ (12.80\%) + 0.28\ (0.00\% + 80.60\%) - 29.57\ \frac{lb}{lb\text{-}mole}$$

Run #2:

$$M_d - 0.44\ (7.10\%) + 0.32\ (13.30\%) + 0.28\ (0.00\% + 79.60\%) - 29.67\ \frac{lb}{lb\text{-}mole}$$

Run #3:

$$M_d - 0.44\ (6.50\%) + 0.32\ (12.80\%) + 0.28\ (0.00\% + 80.70\%) - 29.55\ \frac{lb}{lb\text{-}mole}$$

NAME: MACASPHALT (PAH)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 8-9, 1992

WATER VAPOR CONDENSED

$$V_{wc_{std}} - [V_f - V_i] \left[\frac{P_w\ R\ T_{(std)}}{M_w\ P_{(std)}}\right] - 0.04707\ [V_f - V_i]$$

$$V_{wsg_{std}} - [W_f - W_i] \left[\frac{R\ T_{(std)}}{M_w\ P_{(std)}}\right] - 0.04715\ [W_f - W_i]$$

Where:

0.04707	=	Conversion factor, ft^3/ml.
0.04715	=	Conversion factor, ft^3/g.
Vwc_{std}	=	Volume of water vapor condensed (std. cond.), ml.
$Vwsg_{std}$	=	Volume of water vapor collected in silica gel (standard conditions), ml.
$V_f - V_i$	=	Final volume of impinger contents less initial volume, ml.
$W_f - W_i$	=	Final weight of silica gel less initial weight, g.
P_w	=	Density of water, 0.002201 lb/ml.
R	=	Ideal gas constant, 21.85 in.Hg. (cu.ft./lb-mole)(°R).
M_w	=	Molecular weight of water vapor, 18.0 lb/lb-mole.
T_{std}	=	Absolute temperature at standard conditions, 528°R.
P_{std}	=	Absolute pressure at standard conditions, 29.92 inches Hg.

Run 1:

$$V_{wc_{std}} - (0.04707)\ (427.0) - 20.1 \text{ cu.ft}$$
$$V_{wsg_{std}} - (0.04715)\ (7.2) - 0.3 \text{ cu.ft}$$

Run 2:

$$V_{wc_{std}} - (0.04707)\ (632.0) - 29.7 \text{ cu.ft}$$
$$V_{wsg_{std}} - (0.04715)\ (9.1) - 0.4 \text{ cu.ft}$$

Run 3:

$$V_{wc_{std}} - (0.04707)\ (549.0) - 25.8 \text{ cu.ft}$$
$$V_{wsg_{std}} - (0.04715)\ (8.3) - 0.4 \text{ cu.ft}$$

Format: vaporR3/24-001

NAME: MACASPHALT (PAH)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 8-9, 1992

MOISTURE CONTENT OF STACK GASES

$$B_{ws} = \left[\frac{V_{wc_{std}} + V_{wsg_{std}}}{V_{wc_{std}} + V_{wsg_{std}} + V_{mstd}}\right] \times 100$$

Where:

B_{ws} = Proportion of water vapor, by volume, in the gas stream.

V_m = Dry gas volume measured by dry gas meter, dcf.

Vwc_{std} = Volume of water vapor condensed, corrected to standard conditions, scf.

$Vwsg_{std}$ = Volume of water vapor collected in silica gel corrected to std. cond., scf.

Run 1:

$$B_{ws} = \left[\frac{20.1 + 0.3}{20.1 + 0.3 + 50.080}\right] \times 100 = 28.94\%$$

Run 2:

$$B_{ws} = \left[\frac{29.7 + 0.4}{29.7 + 0.4 + 75.503}\right] \times 100 = 28.50\%$$

Run 3:

$$B_{ws} = \left[\frac{25.8 + 0.4}{25.8 + 0.4 + 69.675}\right] \times 100 = 27.33\%$$

NAME: MACASPHALT (PAH)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 8-9, 1992

MOLECULAR WEIGHT OF STACK GASES

$$M_s - M_d (1 - B_{ws}) + 18 (B_{ws})$$

Where:

M_s = Molecular weight of stack gas, wet basis (lb./lb.-mole).

M_d = Molecular weight of stack gas, dry basis (lb./lb.-mole).

Run #1:

$$M_s - 29.57 (1 - 28.94) + 18 (28.94) - 26.22 \text{ (lb./lb.-mole)}$$

Run #2:

$$M_s - 29.67 (1 - 28.50) + 18 (28.50) - 26.34 \text{ (lb./lb.-mole)}$$

Run #1:

$$M_s - 29.55 (1 - 27.33) + 18 (27.33) - 26.39 \text{ (lb./lb.-mole)}$$

NAME: MACASPHALT (PAH)
LOCATION: CROSS CITY, FLORIDA

DATE: December 8-9, 1992

STACK GAS VELOCITY

$$V_s - K_p \ C_p \ [\sqrt{\Delta P}] \text{ avg } \sqrt{\frac{T_s(\text{avg})}{P_s \ M_s}}$$

Where:

V_s = Average velocity of gas stream in stack, ft/sec.
K_p = 85.49 ft/sec [(g/g·mole) - (mm Hg)/(°K)(mm H_2O]$^{1/2}$
C_p = Pitot tube coefficient, dimensionless.
ΔP = Velocity head of stack gas, in. H_2O.
P_{bar} = Barometric pressure at measurement site, in. Hg.
P_g = Stack static pressure, in. Hg.
P_s = Absolute stack gas pressure, in. Hg. = $P_{bar} + P_g$
P_{std} = Standard absolute pressure, 29.92 in. Hg.
t_s = Stack temperature, °F.
T_s = Absolute stack temperature, °R. = 460 + t_s.
M_s = Molecular weight of stack gas, wet basis, lb/lb·mole.

Run #1:

$$V - (85.49)\ (.84)\ (1.18) \sqrt{\frac{719}{(30.08)(26.22)}} - 80.91 \text{ ft/sec}$$

Run #2:

$$V - (85.49)\ (.84)\ (1.15) \sqrt{\frac{724}{(30.08)(26.34)}} - 78.94 \text{ ft/sec}$$

Run #3:

$$V - (85.49)\ (.84)\ (1.15) \sqrt{\frac{730}{(30.12)(26.39)}} - 79.14 \text{ ft/sec}$$

NAME: MACASPHALT (PAH)
LOCATION: CROSS CITY, FLORIDA
DATE: December 8-9, 1992

STACK GAS FLOW RATE

$$Q_{sd} = 3600 \left[1 - B_{wc} \right] V_s \; A \left[\frac{T_{std}}{T_{stk}} \right] \left[\frac{P_s}{P_{std}} \right]$$

Where:

- Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions (dscf/hr).
- A = Cross sectional area of stack (ft^2).
- 3600 = Conversion factor (sec/hr).
- T_{stk} = Absolute stack temperature (°R).
- T_{std} = Standard absolute temperature (528°R).
- P_{bar} = Barometric pressure at measurement site (in. Hg.).
- P_g = Stack static pressure (in. Hg.).
- P_s = Absolute stack gas pressure (in. Hg.) = $P_{bar} + P_g$
- P_{std} = Standard absolute pressure (29.92 in. Hg.).

Run #1:

$$Q_{sd} = 3600\ (1 - .2894)\ (80.91)\ (11.30) \left[\frac{528}{719} \right] \left[\frac{30.08}{29.92} \right] = 1726750.6\ \frac{dscf}{hr}$$

Run #2:

$$Q_{sd} = 3600\ (1 - .2850)\ (78.94)\ (11.30) \left[\frac{528}{724} \right] \left[\frac{30.08}{29.92} \right] = 1683432.5\ \frac{dscf}{hr}$$

Run #3:

$$Q_{sd} = 3600\ (1 - .2733)\ (79.14)\ (11.30) \left[\frac{528}{730} \right] \left[\frac{30.12}{29.92} \right] = 1703478.2\ \frac{dscf}{hr}$$

NAME: MACASPHALT (PAH)
LOCATION: CROSS CITY, FLORIDA

DATE: December 8-9, 1992

EMISSIONS RATE FROM STACK

$$E - \left[\frac{(C_s)\ (Q_{sd})}{7{,}000\ gr/lb}\right] - 0.0000\ lb/hr$$

Where:

E = Emissions rate, lbs/hr.

C_s = Concentration of PAH's in stack gas, dry basis, corrected to standard conditions, gr/dscf.

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

Run #1:

$$E - \left[\frac{(0.0003)\ (1726750.6)}{7{,}000}\right] - 0.074\ lbs/hr$$

Run #2:

$$E - \left[\frac{(0.0003)\ (1683432.5)}{7{,}000}\right] - 0.072\ lbs/hr$$

Run #3:

$$E - \left[\frac{(0.0003)\ (1703478.2)}{7{,}000}\right] - 0.073\ lbs/hr$$

NAME: MACASPHALT (PAH)
LOCATION: CROSS CITY, FLORIDA

DATE: December 8-9, 1992

ISOKINETIC VARIATION

$$I - 100\ T_s \left[\frac{(0.002669)\ (V_{lc} + (V_m/T_m)\ (P_{bar} + \Delta H/13.6)}{60\ \ \theta\ \ V_s\ \ P_s\ \ A_n} \right]$$

Where:

I	=	Percent isokinetic sampling.
100	=	Conversion to percent.
T_s	=	Absolute average stack gas temperature, °R.
0.002669	=	Conversion factor, Hg - ft^3/ml - °R.
V_{ic}	=	Total volume of liquid collected in impingers and silica gel, ml.
T_m	=	Absolute average dry gas meter temperature, °R.
P_{bar}	=	Barometric pressure at sampling site, in. Hg.
ΔH	=	Average pressure differential across the orifice meter, in. H_2O.
13.6	=	Specific gravity of mercury.
60	=	Conversion seconds to minutes.
θ	=	Total sampling time, minutes.
V_s	=	Stack gas velocity, ft/sec.
P_s	=	Absolute stack gas pressure, in. Hg.
A_n	=	Cross sectional area of nozzle, ft^2.

Run #1:

$$I - (100)\ (719) \left[\frac{(0.002669)\ (434.20) + \frac{53.020}{557} \left[30.08 + \frac{2.71}{13.6} \right]}{60\ \ (60.0)\ \ (80.91)\ \ (30.08)\ \ (.000340)} \right] - 96.5\%$$

Run #2:

$$I - (100)\ (724) \left[\frac{(0.002669)\ (641.10) + \frac{80.649}{562} \left[30.08 + \frac{2.73}{13.6} \right]}{60\ \ (90.0)\ \ (78.94)\ \ (30.08)\ \ (.000340)} \right] - 99.5\%$$

Run #3:

$$I - (100)\ (730) \left[\frac{(0.002669)\ (557.30) + \frac{75.812}{2.56} \left[30.12 + \frac{2.56}{13.6} \right]}{60\ \ (90.0)\ \ (79.14)\ \ (30.12)\ \ (.000340)} \right] - 90.7\%$$

VI. CALCULATIONS

D. SO_2, THC, CO, NO_x AND CH_4

NAME: MACASPHALT (Gaseous Compounds)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 7-9, 1992

TOTAL HYDROCARBON EMISSIONS - Convert ppm (wet) to ppm (dry)

$$ppm_d = ppm_w \left(\frac{100}{100 - B_{ws}} \right)$$

Where:

ppm_d = Parts per million, dry basis, as carbon.

ppm_w = Parts per million, wet basis, as carbon.

B_{ws} = Proportion of water vapor, by volume, in the gas stream.

Run #1 =

$$(89.9) \left(\frac{100}{100 - 27.74} \right) = 124.4 \ ppm_d$$

Run #2 =

$$(69.9) \left(\frac{100}{100 - 30.44} \right) = 100.5 \ ppm_d$$

Run #3 =

$$(82.7) \left(\frac{100}{100 - 30.57} \right) = 119.1 \ ppm_d$$

NAME: MACASPHALT (Gaseous Compounds)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 7-9, 1992

TOTAL METHANE EMISSIONS - Convert ppm (wet) to ppm (dry)

$$ppm_d = ppm_w\left(\frac{100}{100 - B_{ws}}\right)$$

Where:

ppm_d = Parts per million, dry basis, as carbon.

ppm_w = Parts per million, wet basis, as carbon.

B_{ws} = Proportion of water vapor, by volume, in the gas stream.

Run #1 =

$$(29.29)\left(\frac{100}{100 - 27.74}\right) = 40.53 \ ppm_d$$

Run #2 =

$$(25.00)\left(\frac{100}{100 - 30.44}\right) = 35.94 \ ppm_d$$

Run #3 =

$$(51.27)\left(\frac{100}{100 - 30.57}\right) = 73.84 \ ppm_d$$

NAME: MACASPHALT (Gaseous Compounds)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 7-9, 1992

CO
GASEOUS CONCENTRATION CONVERSION TO mg/m³

Example Calculation

ppm	1	28.317 ℓ	35.3145 ft³	273°K	mole	28.01 g	1,000 mg	= mg
	1x10⁻⁶	ft³	m³	293°K	22.4 ℓ	mole	g	m³

Where:

ppm	=	Parts per million, dry basis
$1x10^{-6}$	=	Conversion form parts per million
28.317	=	Conversion of liters to ft³
35,3145	=	Conversion of ft³ to m³
273/293°K	=	Temperature correction to standard conditions
22.4ℓ	=	Volumetric molar conversion @ 273°K
28.01 g/mole	=	Molecular weight of pollutant
1,000 mg/g	=	Conversion to milligrams

Run #1:

>1000	1	28.317 ℓ	35.3145 ft³	273°K	mole	28.01 g	1000 mg	=	>1165.1 mg
ppm	1x10⁻⁶	ft³	m³	293°K	22.4 ℓ	mole	g		m³

Run #2:

>1000	1	28.317 ℓ	35.3145 ft³	273°K	mole	28.01 g	1000 mg	=	>1165.1 mg
ppm	1x10⁻⁶	ft³	m³	293°K	22.4 ℓ	mole	g		m³

Run #3:

>1000	1	28.317 ℓ	35.3145 ft³	273°K	mole	28.01 g	1000 mg	=	>1165.1 mg
ppm	1x10⁻⁶	ft³	m³	293°K	22.4 ℓ	mole	g		m³

NAME: MACASPHALT (Gaseous Compounds)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 7-9, 1992

NO_x
GASEOUS CONCENTRATION CONVERSION TO mg/m^3

Example Calculation

ppm	1	28.317 ℓ	35.3145 ft^3	273°K	mole	46.01 g	1,000 mg	= $\frac{mg}{m^3}$
	$1x10^{-6}$	ft^3	m^3	293°K	22.4 ℓ	mole	g	

Where:

ppm	=	Parts per million, dry basis
$1x10^{-6}$	=	Conversion form parts per million
28.317	=	Conversion of liters to ft^3
35,3145	=	Conversion of ft^3 to m^3
273/293°K	=	Temperature correction to standard conditions
22.4ℓ	=	Volumetric molar conversion @ 273°K
46.01 g/mole	=	Molecular weight of pollutant
1,000 mg/g	=	Conversion to milligrams

Run #1:

79.2 ppm	1	28.317 ℓ	35.3145 ft^3	273°K	mole	46.01 g	1000 mg	= 151.6 $\frac{mg}{m^3}$
	$1x10^{-6}$	ft^3	m^3	293°K	22.4 ℓ	mole	g	

Run #2:

82.7 ppm	1	28.317 ℓ	35.3145 ft^3	273°K	mole	46.01 g	1000 mg	= 158.3 $\frac{mg}{m^3}$
	$1x10^{-6}$	ft^3	m^3	293°K	22.4 ℓ	mole	g	

Run #3:

78.5 ppm	1	28.317 ℓ	35.3145 ft^3	273°K	mole	46.01 g	1000 mg	= 150.2 $\frac{mg}{m^3}$
	$1x10^{-6}$	ft^3	m^3	293°K	22.4 ℓ	mole	g	

NAME: MACASPHALT (Gaseous Compounds)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 7-9, 1992

TOTAL HYDROCARBONS (as CH_4)
GASEOUS CONCENTRATION CONVERSION TO mg/m³

Example Calculation

$$\text{ppm}\ \frac{1}{1\times10^{-6}}\cdot\frac{28.317\ \ell}{\text{ft}^3}\cdot\frac{35.3145\ \text{ft}^3}{\text{m}^3}\cdot\frac{273°\text{K}}{293°\text{K}}\cdot\frac{\text{mole}}{22.4\ \ell}\cdot\frac{16.04\ \text{g}}{\text{mole}}\cdot\frac{1{,}000\ \text{mg}}{\text{g}} = \frac{\text{mg}}{\text{m}^3}$$

Where:

ppm	=	Parts per million, dry basis
1×10^{-6}	=	Conversion form parts per million
28.317	=	Conversion of liters to ft³
35,3145	=	Conversion of ft³ to m³
273/293°K	=	Temperature correction to standard conditions
22.4ℓ	=	Volumetric molar conversion @ 273°K
16.04 g/mole	=	Molecular weight of pollutant (CH_4)
1,000 mg/g	=	Conversion to milligrams

Run #1:

$$124.4\ \text{ppm}\ \frac{1}{1\times10^{-6}}\cdot\frac{28.317\ \ell}{\text{ft}^3}\cdot\frac{35.3145\ \text{ft}^3}{\text{m}^3}\cdot\frac{273°\text{K}}{293°\text{K}}\cdot\frac{\text{mole}}{22.4\ \ell}\cdot\frac{16.04\ \text{g}}{\text{mole}}\cdot\frac{1000\ \text{mg}}{\text{g}} = 83.0\ \frac{\text{mg}}{\text{m}^3}$$

Run #2:

$$100.5\ \text{ppm}\ \frac{1}{1\times10^{-6}}\cdot\frac{28.317\ \ell}{\text{ft}^3}\cdot\frac{35.3145\ \text{ft}^3}{\text{m}^3}\cdot\frac{273°\text{K}}{293°\text{K}}\cdot\frac{\text{mole}}{22.4\ \ell}\cdot\frac{16.04\ \text{g}}{\text{mole}}\cdot\frac{1000\ \text{mg}}{\text{g}} = 67.1\ \frac{\text{mg}}{\text{m}^3}$$

Run #3:

$$119.1\ \text{ppm}\ \frac{1}{1\times10^{-6}}\cdot\frac{28.317\ \ell}{\text{ft}^3}\cdot\frac{35.3145\ \text{ft}^3}{\text{m}^3}\cdot\frac{273°\text{K}}{293°\text{K}}\cdot\frac{\text{mole}}{22.4\ \ell}\cdot\frac{16.04\ \text{g}}{\text{mole}}\cdot\frac{1000\ \text{mg}}{\text{g}} = 79.5\ \frac{\text{mg}}{\text{m}^3}$$

NAME: MACASPHALT (Gaseous Compounds)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 7-9, 1992

METHANE
GASEOUS CONCENTRATION CONVERSION TO mg/m³

Example Calculation

$$\text{ppm} \left| \frac{1}{1\times10^{-6}} \right| \frac{28.317\ \ell}{\text{ft}^3} \left| \frac{35.3145\ \text{ft}^3}{\text{m}^3} \right| \frac{273°\text{K}}{293°\text{K}} \left| \frac{\text{mole}}{22.4\ \ell} \right| \frac{16.04\ \text{g}}{\text{mole}} \left| \frac{1{,}000\ \text{mg}}{\text{g}} \right| = \frac{\text{mg}}{\text{m}^3}$$

Where:

ppm	=	Parts per million; dry basis
1×10^{-6}	=	Conversion form parts per million
28.317	=	Conversion of liters to ft³
35,3145	=	Conversion of ft³ to m³
273/293°K	=	Temperature correction to standard conditions
22.4ℓ	=	Volumetric molar conversion @ 273°K
16.04 g/mole	=	Molecular weight of pollutant (CH_4)
1,000 mg/g	=	Conversion to milligrams

Run #1:

$$40.53\ \text{ppm} \left| \frac{1}{1\times10^{-6}} \right| \frac{28.317\ \ell}{\text{ft}^3} \left| \frac{35.3145\ \text{ft}^3}{\text{m}^3} \right| \frac{273°\text{K}}{293°\text{K}} \left| \frac{\text{mole}}{22.4\ \ell} \right| \frac{16.04\ \text{g}}{\text{mole}} \left| \frac{1000\ \text{mg}}{\text{g}} \right| = 27.0\ \frac{\text{mg}}{\text{m}^3}$$

Run #2:

$$35.94\ \text{ppm} \left| \frac{1}{1\times10^{-6}} \right| \frac{28.317\ \ell}{\text{ft}^3} \left| \frac{35.3145\ \text{ft}^3}{\text{m}^3} \right| \frac{273°\text{K}}{293°\text{K}} \left| \frac{\text{mole}}{22.4\ \ell} \right| \frac{16.04\ \text{g}}{\text{mole}} \left| \frac{1000\ \text{mg}}{\text{g}} \right| = 24.0\ \frac{\text{mg}}{\text{m}^3}$$

Run #3:

$$73.84\ \text{ppm} \left| \frac{1}{1\times10^{-6}} \right| \frac{28.317\ \ell}{\text{ft}^3} \left| \frac{35.3145\ \text{ft}^3}{\text{m}^3} \right| \frac{273°\text{K}}{293°\text{K}} \left| \frac{\text{mole}}{22.4\ \ell} \right| \frac{16.04\ \text{g}}{\text{mole}} \left| \frac{1000\ \text{mg}}{\text{g}} \right| = 49.3\ \frac{\text{mg}}{\text{m}^3}$$

NAME: MACASPHALT (Gaseous Compounds)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 7-9, 1992

TOTAL CARBON MONOXIDE EMISSIONS: POUNDS PER HOUR

$$E = (2.59 \times 10^{-9})(M_d)(ppm_d)(Q_{sd})(K)$$

Where:

E = CO emissions rate, lbs/hr.

2.59×10^{-9} = Conversion factor, lbs/dscf.

M_d = Dry molecular weight (CO = 28.01).

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

ppm_d = Parts per million, dry basis.

K = Constant (typically 1).

Run #1:

$E = (2.59 \times 10^{-9})\ (28.01)\ (>1000)\ (1,728,581.5)\ \ =>125.4$ lbs/hr

Run #2:

$E = (2.59 \times 10^{-9})\ (28.01)\ (>1000)\ (1,600,934.5)\ \ =>116.1$ lbs/hr

Run #3:

$E = (2.59 \times 10^{-9})\ (28.01)\ (>1000)\ (1,471,270.8)\ \ =>106.7$ lbs/hr

NAME: MACASPHALT (Gaseous Compounds)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 7-9, 1992

TOTAL NO_x EMISSIONS: POUNDS PER HOUR

$$E = (2.59 \times 10^{-9})(M_d)(ppm_d)(Q_{sd})(K)$$

Where:

E = NO_x as NO_2 emissions rate, lbs/hr.

2.59×10^{-9} = Conversion factor, lbs/dscf.

M_d = Dry molecular weight (NO_2 = 46.01).

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

ppm_d = Parts per million, dry basis.

K = Constant (typically 1).

Run #1:

$E = (2.59 \times 10^{-9})\ (46.01)\ (79.2)\ (1{,}728{,}581.5) = 16.31$ lbs/hr

Run #2:

$E = (2.59 \times 10^{-9})\ (46.01)\ (82.7)\ (1{,}600{,}934.5) = 15.78$ lbs/hr

Run #3:

$E = (2.59 \times 10^{-9})\ (46.01)\ (78.5)\ (1{,}471{,}270.8) = 13.76$ lbs/hr

NAME: MACASPHALT (Gaseous Compounds)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 7-9, 1992

TOTAL HYDROCARBON EMISSIONS: POUNDS PER HOUR

$$E = (2.59 \times 10^{-9})(M_d)(ppm_d)(Q_{sd})(K)$$

Where:

E = THC as CH_4 emissions rate, lbs/hr.

2.59×10^{-9} = Conversion factor, lbs/dscf.

M_d = Dry molecular weight (CH_4 = 16.04).

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

ppm_d = Parts per million, dry basis.

K = Constant (typically 1).

Run #1:

$E = (2.59 \times 10^{-9})\ (16.04)\ (124.4)\ (1{,}728{,}581.5) = 8.93$ lbs/hr

Run #2:

$E = (2.59 \times 10^{-9})\ (16.04)\ (100.5)\ (1{,}600{,}934.5) = 6.68$ lbs/hr

Run #3:

$E = (2.59 \times 10^{-9})\ (16.04)\ (119.1)\ (1{,}471{,}270.8) = 7.28$ lbs/hr

NAME: MACASPHALT (Gaseous Compounds)
LOCATION: CROSS CITY, FLORIDA **DATE:** December 7-9, 1992

TOTAL METHANE EMISSIONS: POUNDS PER HOUR

$$E = (2.59 \times 10^{-9})(M_d)(ppm_d)(Q_{sd})(K)$$

Where:

E = CH_4 emissions rate, lbs/hr.

2.59×10^{-9} = Conversion factor, lbs/dscf.

M_d = Dry molecular weight (CH_4 = 16.04).

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

ppm_d = Parts per million, dry basis.

K = Constant (typically 1).

Run #1:

$E = (2.59 \times 10^{-9})\ (16.04)\ (40.53)\ (1{,}728{,}581.5) = 2.91$ lbs/hr

Run #2:

$E = (2.59 \times 10^{-9})\ (16.04)\ (35.94)\ (1{,}600{,}934.5) = 2.39$ lbs/hr

Run #3:

$E = (2.59 \times 10^{-9})\ (16.04)\ (73.84)\ (1{,}471{,}270.8) = 4.51$ lbs/hr

VII. LABORATORY ANALYSIS RESULTS

A. Formaldehyde Analysis Results

AMERICAN INTERPLEX CORPORATION
LABORATORIES

8600 Kanis Road
Little Rock, AR 72204-2322
(501) 224-5060

RECEIVED DEC 31 1992

Ramcon Environmental Corporation (C-488)
6707 Fletcher Creek Cove
Memphis, TN 38134

December 28, 1992

ATTN: Mr. Joe Sewell

Control No. 11643

Sample Description: Six (6) impinger solutions received on 12/17/92
Plant: Mac Asphalt - NAPA; P.O. Nos. 080102, 080103

Results:

Sample Identification	Volume, ml	Formaldehyde, mg
Run 1, 12/9/92	530	8.8
Run 2, 12/9/92	700	8.8
Run 3, 12/9/92	685	5.8
Run 1, 12/4/92	495	0.063
Run 2, 12/4/92	495	4.2
Run 3, 12/4/92	575	0.60

Method: 40 CFR Part 266, Appendix IX Section 3.6 Method 0011A

AMERICAN INTERPLEX CORPORATION

By Steven Lovell
Steven Lovell
Technical Director

SL/td

VII. LABORATORY ANALYSIS RESULTS

B. PAH Analysis Results

Triangle Laboratories of RTP, Inc.
801 Capitola Dr.
Durham, NC 27713
(919) 544-5729

Sample File : GL502
Response File : GL500
Date Analyzed : 01/03/93
Date Reported : 01/06/93
Project Number: 22651

Sample ID: RUN#1

TLI ID: 62.25.2A-I
Dilution Factor: 10.00

Quantitation Results Method 8270

Analyte	Area	RF	SCAN	ISID #	Amt. (ug)	Code	Quan Limit	FLAG
1,4-Dichlorobenzene-d4	3036		420	1		I		
Naphthalene-d8	12952		599	2		I		
2-Methylnaphthalene	8987	0.679	704	2	408.75	D	100.0	___
Naphthalene	11458	1.001	602	2	353.52	D	100.0	___
Acenaphthene-d10	7070		856	3		I		
Acenaphthene	0	0.957	0	3	1.18	ND	100.0	___
Fluorene	847	1.180	938	3	40.62	E	100.0	___
2-Chloronaphthalene	0	0.971	0	3	1.17	ND	100.0	___
Acenaphthylene	1455	1.680	835	3	49.02	E	100.0	___
Phenanthrene-d10	13791		1076	4		I		
Phenanthrene	4093	0.921	1079	4	128.90	D	100.0	___
Anthracene	271	0.944	1086	4	8.34	E	100.0	___
Fluoranthene	0	1.115	0	4	0.52	ND	100.0	___
Chrysene-d12	14855		1470	5		I		
Chrysene	0	0.995	0	5	0.54	ND	100.0	___
Pyrene	0	1.167	0	5	0.46	ND	100.0	___
Benzo(a)anthracene	0	0.978	0	5	0.55	ND	100.0	___
Perylene-d12	8969		1740	6		I		
Benzo(b)fluoranthene	0	1.380	0	6	0.65	ND	100.0	___
Benzo(k)fluoranthene	0	1.785	0	6	0.50	ND	100.0	___
Benzo(e)pyrene	0	1.423	0	6	0.63	ND	100.0	___
Benzo(a)pyrene	0	1.321	0	6	0.68	ND	100.0	___
Perylene	0	0.688	0	6	1.30	ND	100.0	___
Indeno(1,2,3-cd)pyrene	0	0.876	0	6	1.02	ND	100.0	___
Dibenz(a,h)anthracene	0	0.875	0	6	1.02	ND	100.0	___
Benzo(g,h,i)perylene	0	1.068	0	6	0.84	ND	100.0	___

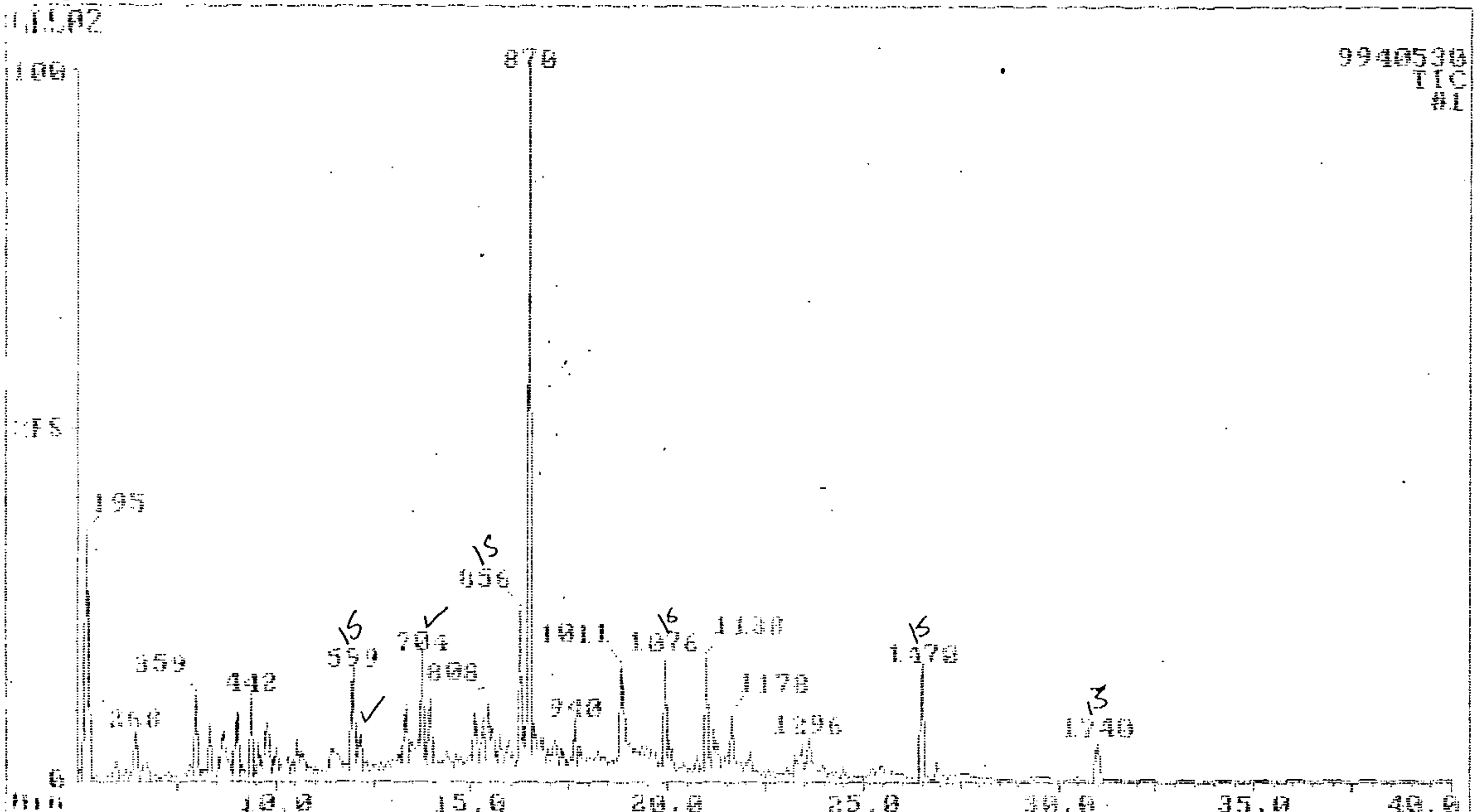
Surrogate Summary	Area	RF	SCAN	ISID	Amount (ug)	Code	%REC
Anthracene-d10	1904	0.508	1084	4	108.72	D	108.7
Pyrene-d10	2762	1.066	1285	5	69.77	D	69.8

Reveiwed by GL Date 1/6/93
ND -Not Detected; D- Detected; E- Estimated; I- Internal Standard

Orgrep v2.5

03 Jan 93 21:18 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: RUN #1 (1:10 DIL.) 22651 Instrument G

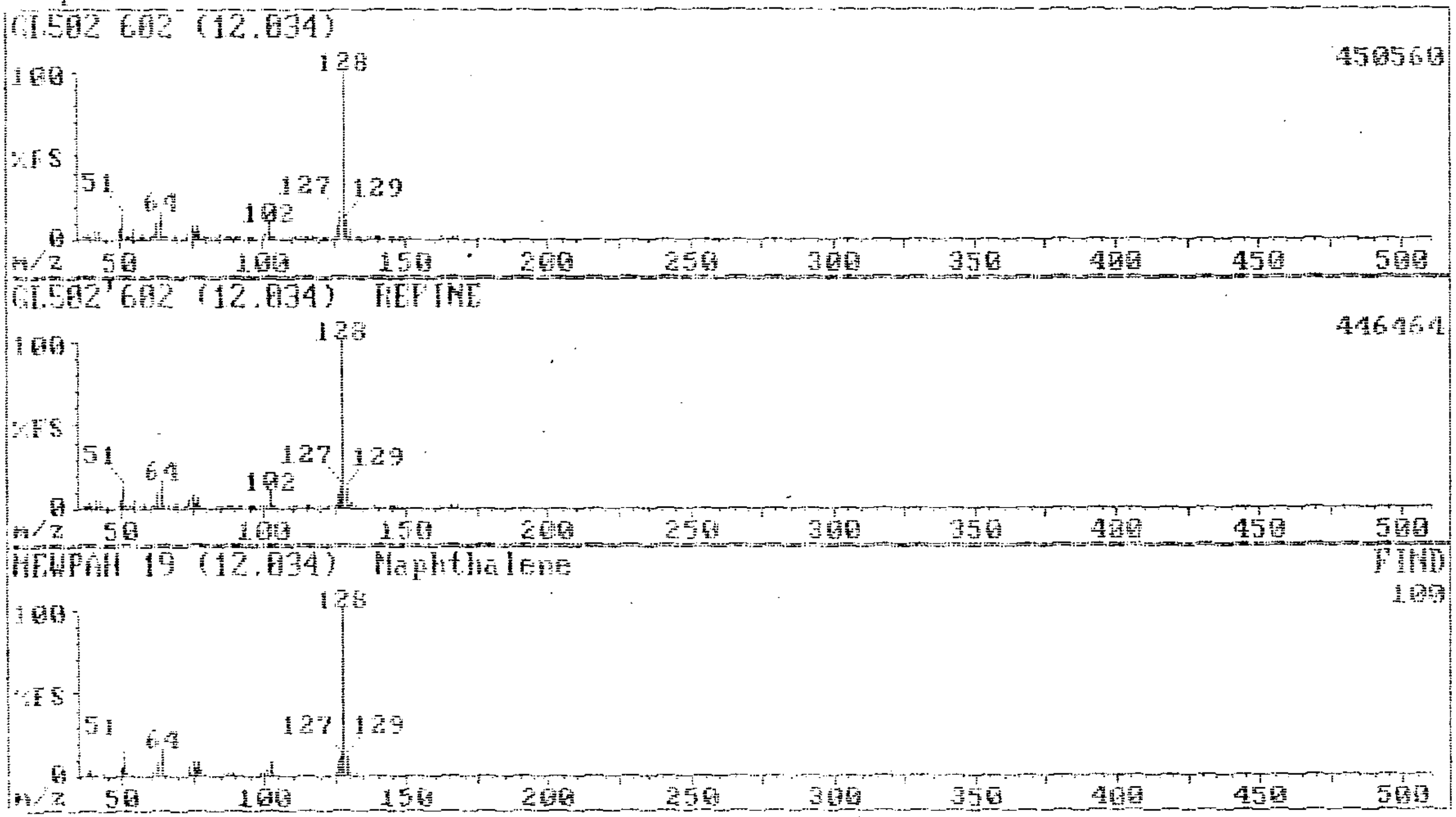


Jf
1-5-93

[illegible]	[illegible]	74	100	0	303600	bb	420	152	1,4-Dichlorobenzene-d4
[illegible]	100	77	93	0	1295300	bb	599	136	Naphthalene-d8
3	88	55	90	-1	707000	bb	856	164	Acenaphthene-d10
4	99	76	95	1	1379100	bv	1076	188	Phenanthrene-d10
5	[illegible]	85	95	-2	1485500	bb	1470	240	Chrysene-d12
6	100	85	93	0	896900	bb	1740	264	Perylene-d12
7	0	0	0	0	0		0	112	2-Fluorophenol
8	0	0	0	0	0		0	132	2-Chlorophenol-d4
9	0	0	0	0	0		0	99	Phenol-d5
10	0	0	0	0	0		0	152	1,2-Dichlorobenzene-d4
11	0	0	0	0	0		0	82	Nitrobenzene-d5
12	0	0	0	0	0		0	185	1,3,5-Trichlorobenzene-d3
13	0	0	0	0	0		0	240	1,4-Dibromobenzene-d4
14	0	0	0	0	0		0	172	2-Fluorobiphenyl
15	0	0	0	0	0		0	330	2,4,6-Tribromophenol
16	91	45	95	-1	190430	vb	1084	188	Anthracene-d10
17	98	61	95	0	276210	bb	1785	212	Pyrene-d10
18	0	0	0	0	0		0	244	Terphenyl-d14
19	100	74	99	0	1145900	vv	602	128	Naphthalene
20	100	80	93	-1	898720	vb	704	142	2-Methylnaphthalene
21	0	0	0	0	0		0	162	2-Chloronaphthalene
22	71	32	91	1	145590	vb	835	152	Acenaphthylene
23	67	30	77	0	38769 ~~[illegible]~~	~~[illegible]~~	~~[illegible]~~ 861	154	Acenaphthene
24	74	34	84	0	84733 ~~[illegible]~~	~~vv~~	~~[illegible]~~ 938	166	Fluorene
25	0	0	0	0	0		0	266	Pentachlorophenol
26	84	48	97	-1	409310	bv	1079	178	Phenanthrene
[illegible]	54	20	73	-2	27111	vv	1086	178	Anthracene
[illegible]	0	0	0	0	0		0	202	Fluoranthene
29	0	0	0	0	0		0	202	Pyrene
30	0	0	0	0	0		0	228	Benzo(a)anthracene
31	0	0	0	0	0		0	228	Chrysene
32	0	0	0	0	0		0	252	Benzo(b)fluoranthene
33	0	0	0	0	0		0	252	Benzo(k)fluoranthene
34	0	0	0	0	0		0	252	Benzo(e)pyrene
35	0	0	0	0	0		0	252	Benzo(a)pyrene
36	0	0	0	0	0		0	252	Perylene
37	0	0	0	0	0		0	276	Indeno(1,2,3-cd)pyrene
38	0	0	0	0	0		0	278	Dibenz(a,h)anthracene
39	0	0	0	0	0		0	276	Benzo(g,h,i)perylene

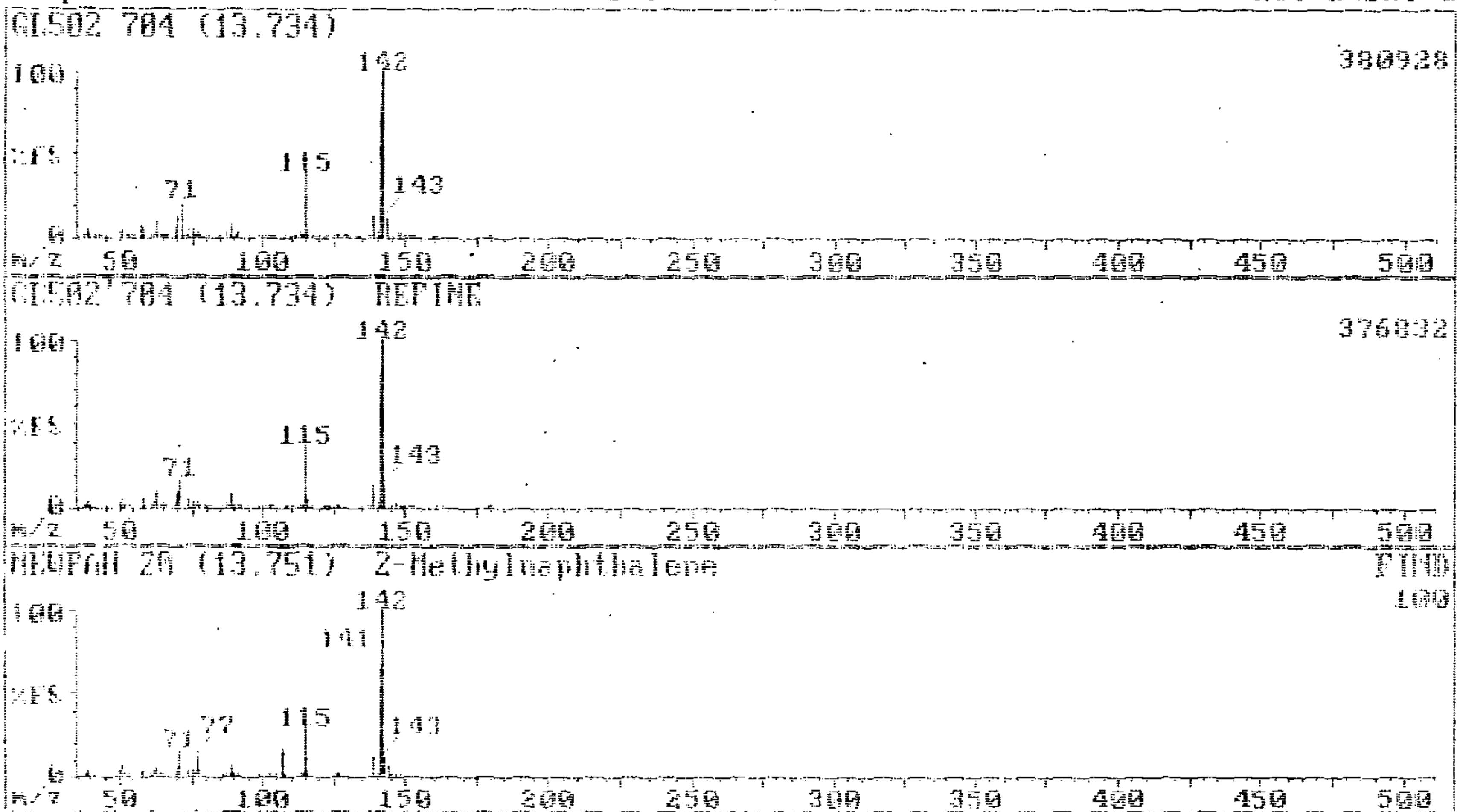
JL
1-5-93

03-Jan-93 21:18 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: RUN #1 (1:10 DIL.) 22651 Instrument G



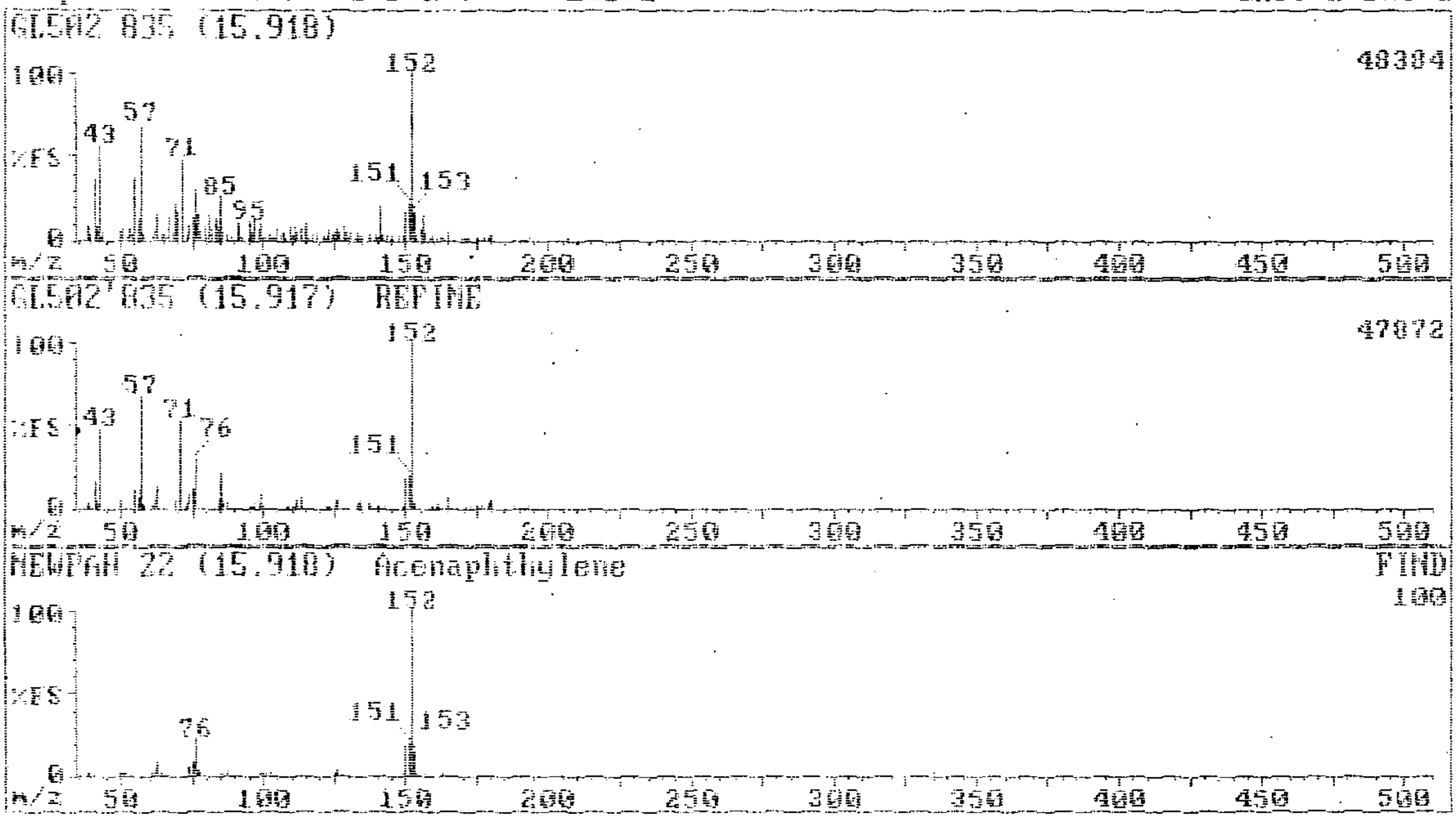
03-Jan-93 21:18 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: RUN #1 (1:10 DIL.) 22651 Instrument G



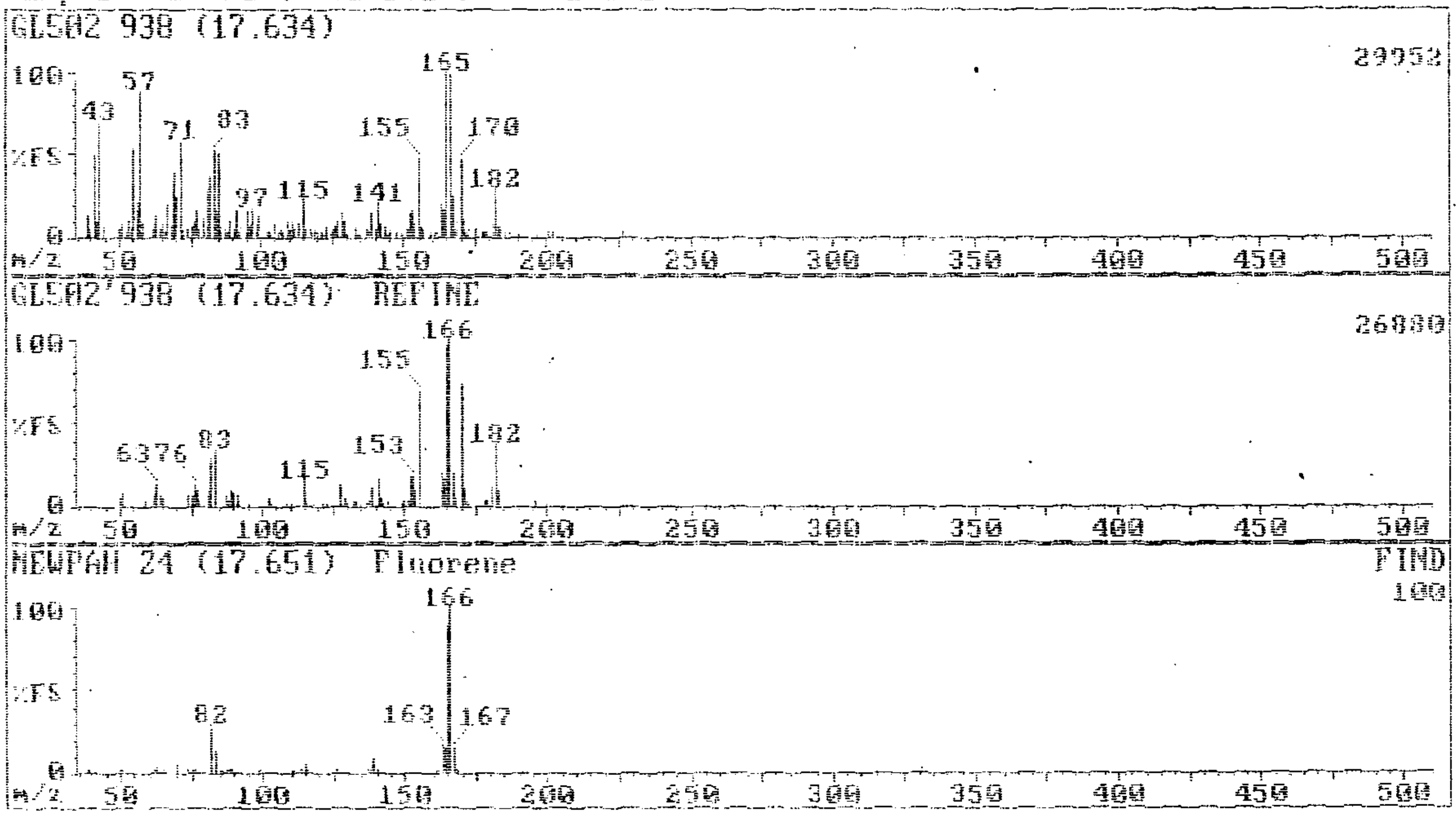
03-Jan-93 21:18 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: RUN #1 (1:10 DIL.) 22651 Instrument G

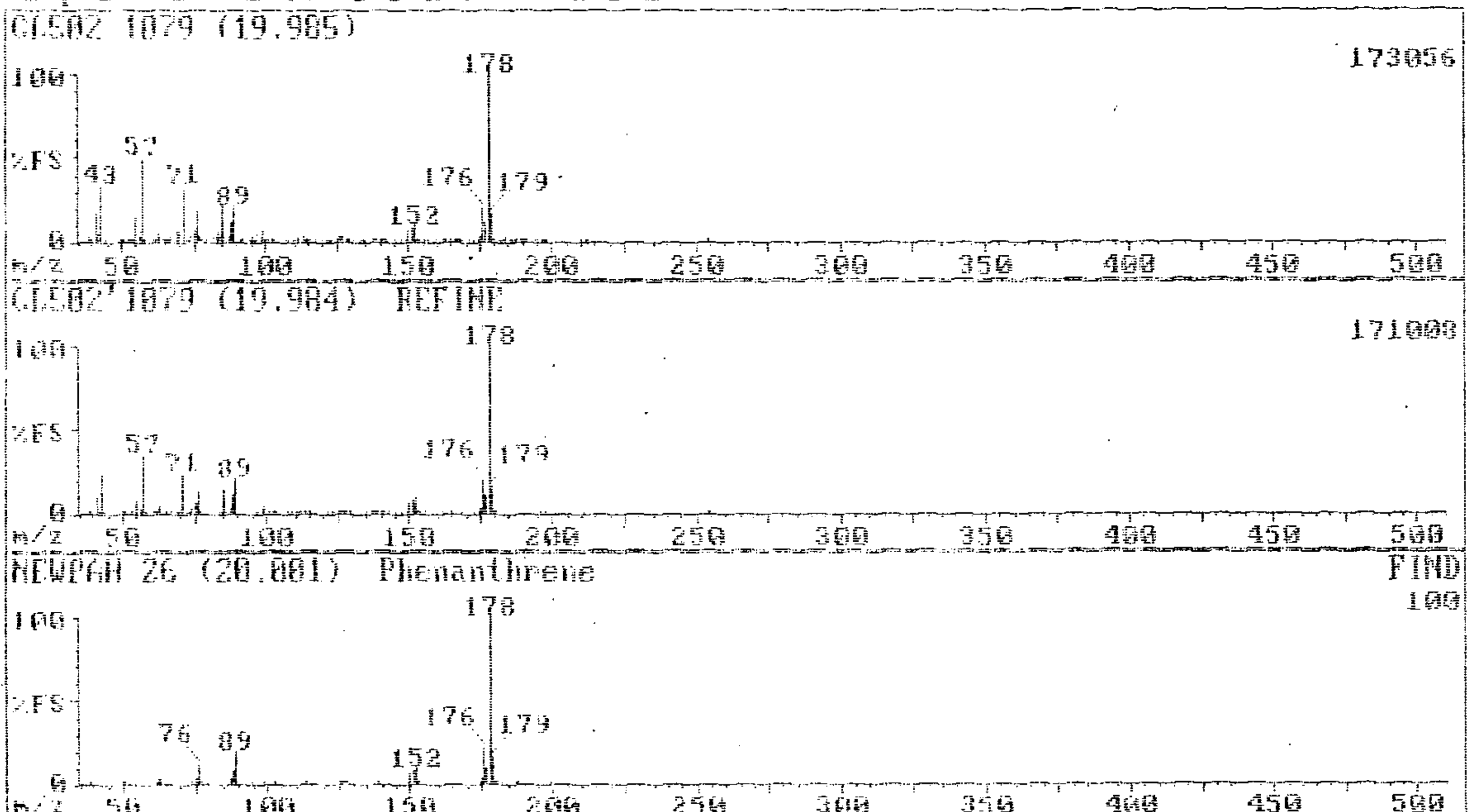


03-Jan-93 21:18 Triangle Laboratories of RTP, Inc. (919) 544-5729

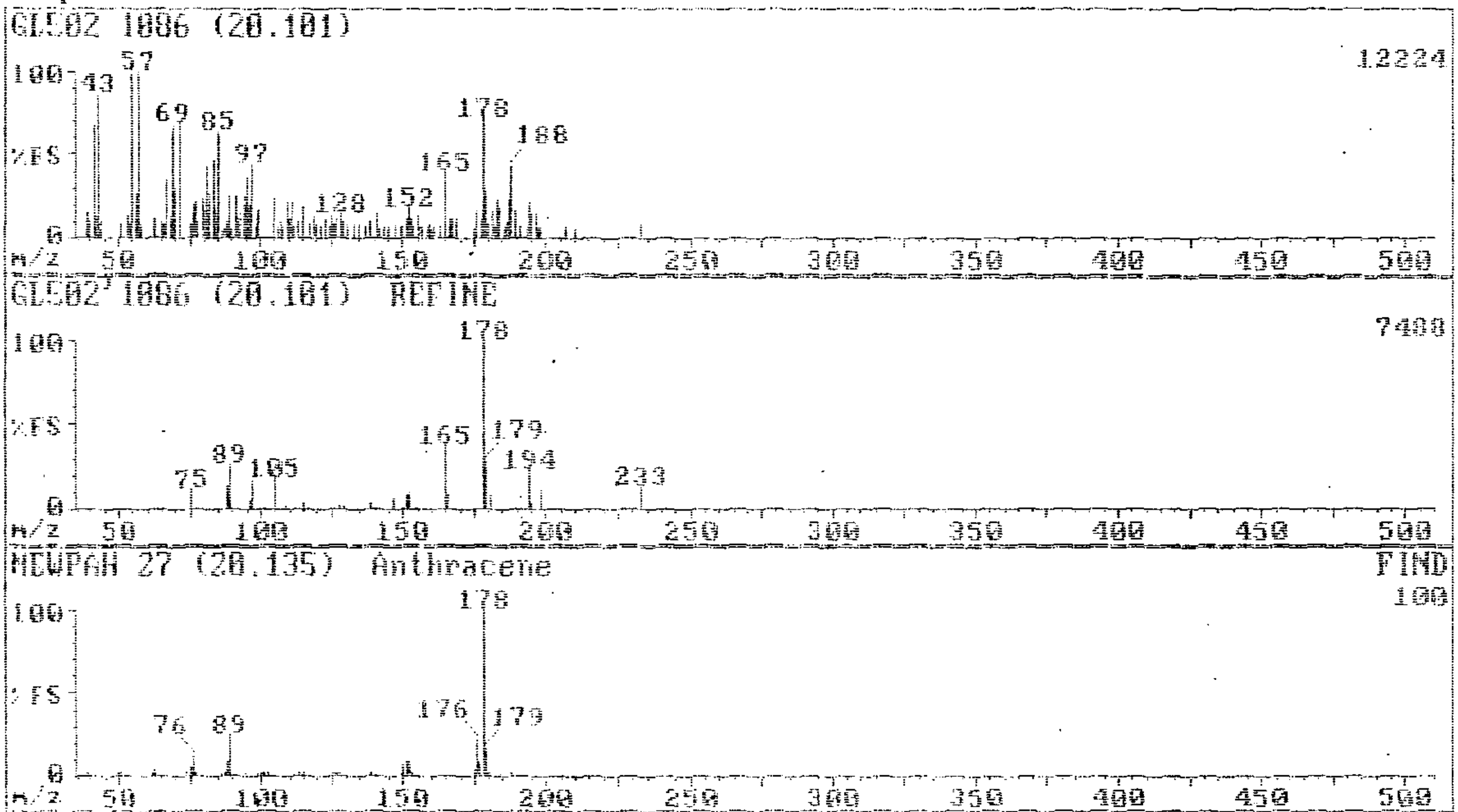
Sample: RUN #1 (1:10 DIL.) 22651 Instrument G



03-Jan-93 21:18 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: RUN #1 (1:10 DIL.) 22651 Instrument G



03-Jan-93 21:10 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: RUN #1 (1:10 DIL.) 22651 Instrument G



Triangle Laboratories of RTP, Inc.
801 Capitola Dr.
Durham, NC 27713
(919) 544-5729

Sample File : GL503
Response File : GL500
Date Analyzed : 01/03/93
Date Reported : 01/06/93
Project Number: 22651

Sample ID: RUN#2
TLI ID: 62.25.3A-I
Dilution Factor: 10.00

Quantitation Results Method 8270

Analyte	Area	RF	SCAN	ISID	Amt. (ug)	Code	Quan Limit	FLAG
1,4-Dichlorobenzene-d4	3046		420	1		I		
Naphthalene-d8	13706		599	2		I		
2-Methylnaphthalene	14772	0.679	704	2	634.94	D	100.0	___
Naphthalene	18993	1.001	602	2	553.75	D	100.0	___
Acenaphthene-d10	7068		856	3		I		
Acenaphthene	0	0.957	0	3	1.18	ND	100.0	___
Fluorene	1293	1.180	938	3	62.05	E	100.0	___
2-Chloronaphthalene	0	0.971	0	3	1.17	ND	100.0	___
Acenaphthylene	2151	1.680	834	3	72.46	E	100.0	___
Phenanthrene-d10	13767		1076	4		I		
Phenanthrene	6279	0.921	1079	4	198.07	D	100.0	___
Anthracene	415	0.944	1086	4	12.77	E	100.0	___
Fluoranthene	0	1.115	0	4	0.52	ND	100.0	___
Chrysene-d12	16042		1470	5		I		
Chrysene	0	0.995	0	5	0.50	ND	100.0	___
Pyrene	352	1.167	1287	5	7.54	E	100.0	___
Benzo(a)anthracene	0	0.978	0	5	0.51	ND	100.0	___
Perylene-d12	9631		1740	6		I		
Benzo(b)fluoranthene	0	1.380	0	6	0.60	ND	100.0	___
Benzo(k)fluoranthene	0	1.785	0	6	0.47	ND	100.0	___
Benzo(e)pyrene	0	1.423	0	6	0.58	ND	100.0	___
Benzo(a)pyrene	0	1.321	0	6	0.63	ND	100.0	___
Perylene	0	0.688	0	6	1.21	ND	100.0	___
Indeno(1,2,3-cd)pyrene	0	0.876	0	6	0.95	ND	100.0	___
Dibenz(a,h)anthracene	0	0.875	0	6	0.95	ND	100.0	___
Benzo(g,h,i)perylene	0	1.068	0	6	0.78	ND	100.0	___

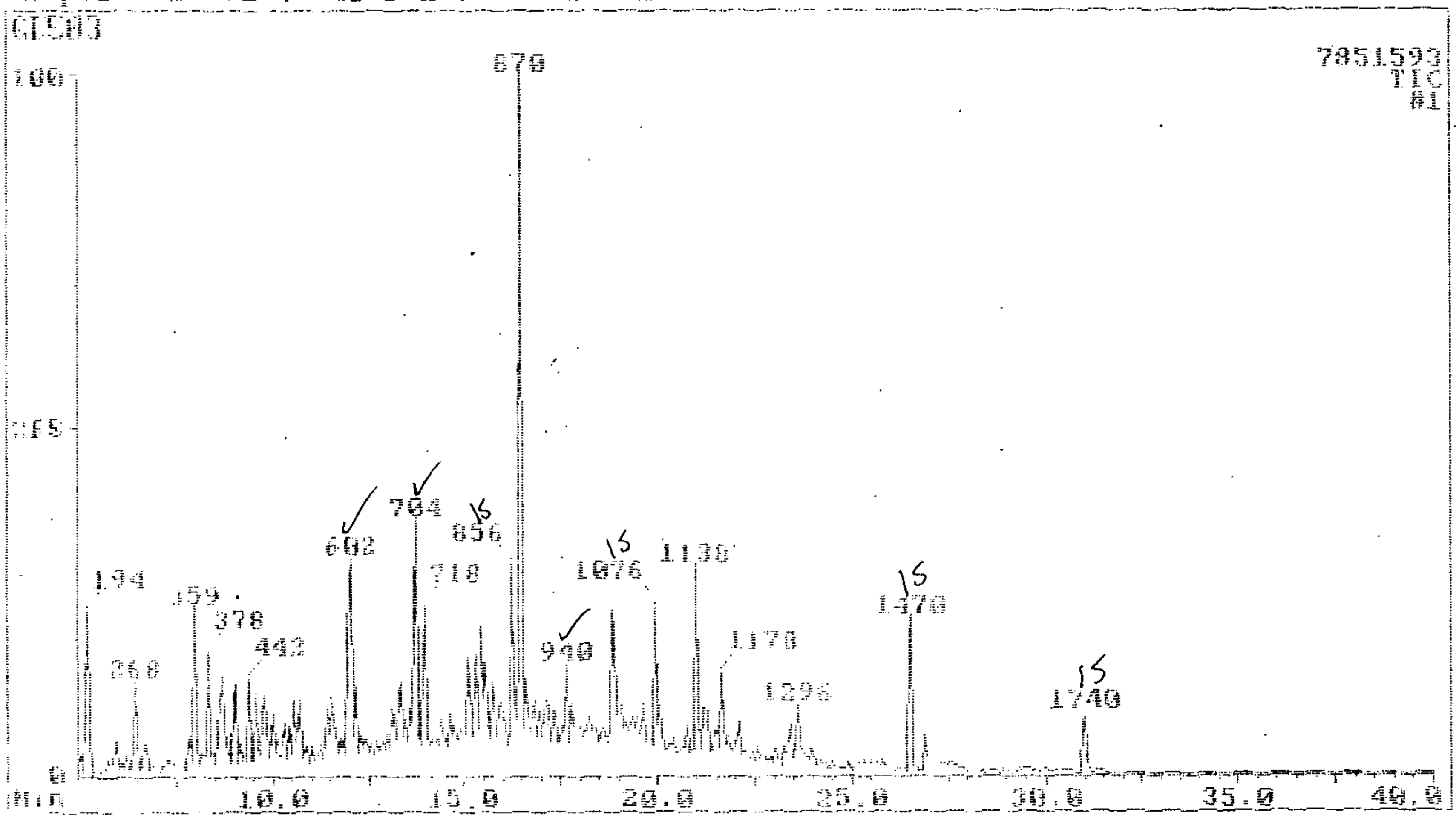
Surrogate Summary	Area	RF	SCAN	ISID	Amount (ug)	Code	%REC
Anthracene-d10	1881	0.508	1084	4	107.61	D	107.6
Pyrene-d10	2952	1.066	1285	5	69.05	D	69.1

Reveiwed by JL Date 1/6/93

ND -Not Detected; D- Detected; E- Estimated; I- Internal Standard

Orgrep v2.5

03-Jan-93 22:07 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: RHM #2 (1:10 DIL.) 22651 Instrument G

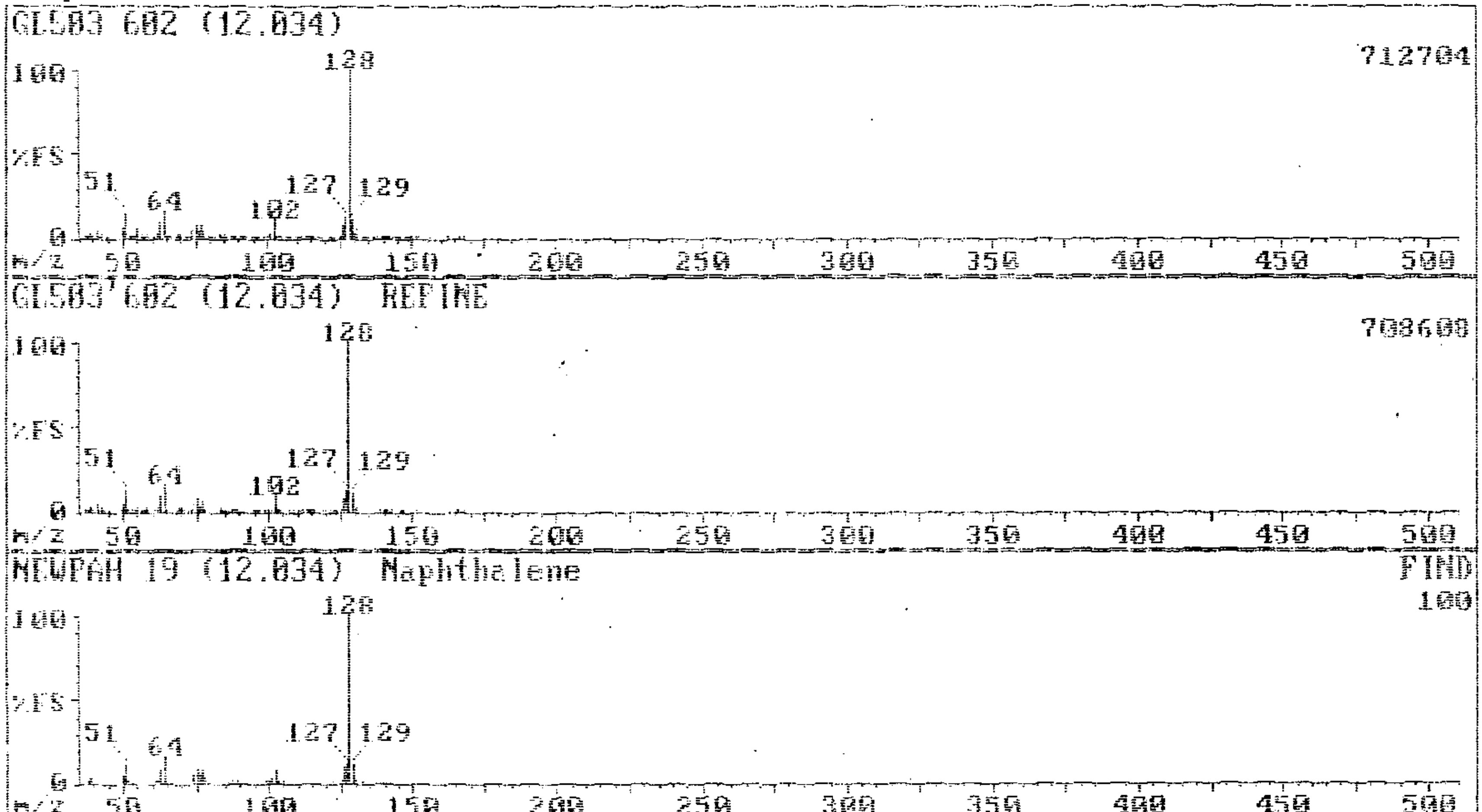


Df 1-5-93

No.	M.I	FOR	FI.	Delta	Area	P.Flags	Scan	QM	Name
[illegible]	100	70	94	0	304620	bb	[illegible]	152	1,4-Dichlorobenzene-d4
2	98	75	94	0	1370600	bv	599	136	Naphthalene-d8
3	89	59	95	-1	706850	bv	856	164	Acenaphthene-d10
4	100	72	97	1	1376800	bv	1076	188	Phenanthrene-d10
5	97	85	96	-2	1604200	hb	1470	240	Chrysene-d12
6	100	83	93	0	963150	bv	1740	264	Perylene-d12
7	0	0	0	0	0		0	112	2-Fluorophenol
8	0	0	0	0	0		0	132	2-Chlorophenol-d4
9	0	0	0	0	0		0	99	Phenol-d5
10	0	0	0	0	0		0	152	1,2-Dichlorobenzene-d4
11	0	0	0	0	0		0	82	Nitrobenzene-d5
12	0	0	0	0	0		0	185	1,3,5-Trichlorobenzene-d3
13	0	0	0	0	0		0	240	1,4-Dibromobenzene-d4
14	0	0	0	0	0		0	172	2-Fluorobiphenyl
15	0	0	0	0	0		0	330	2,4,6-Tribromophenol
16	74	36	91	-1	188160	vb	1084	188	Anthracene-d10
17	96	59	95	0	295220	vb	1285	212	Pyrene-d10
18	0	0	0	0	0		0	244	Terphenyl-d14
19	100	78	99	0	1899400	vv	602	128	Naphthalene
20	100	81	93	-1	1477300	vv	704	142	2-Methylnaphthalene
21	0	0	0	0	0		0	162	2-Chloronaphthalene
22	71	32	90	0	215130	vv	834	152	Acenaphthylene
23	69	32	79	0	~~[illegible]~~	~~[illegible]~~ JL	~~[illegible]~~	154	Acenaphthene
24	71	32	82	0	129400	vv	938	166	Fluorene
25	0	0	0	0	0		0	266	Pentachlorophenol
26	85	50	97	-1	627900	bv	1079	178	Phenanthrene
[illegible]	50	20	74	-2	41504	vv	1086	178	Anthracene
28	0	0	0	0	0		0	202	Fluoranthene
29	48	20	62	-1	35288	bb	1267	202	Pyrene
30	0	0	0	0	0		0	228	Benzo(a)anthracene
31	0	0	0	0	0		0	228	Chrysene
32	0	0	0	0	0		0	252	Benzo(b)fluoranthene
33	0	0	0	0	0		0	252	Benzo(k)fluoranthene
34	0	0	0	0	0		0	252	Benzo(e)pyrene
35	0	0	0	0	0		0	252	Benzo(a)pyrene
36	0	0	0	0	0		0	252	Perylene
37	0	0	0	0	0		0	276	Indeno(1,2,3-cd)pyrene
38	0	0	0	0	0		0	278	Dibenz(a,h)anthracene
39	0	0	0	0	0		0	276	Benzo(g,h,i)perylene

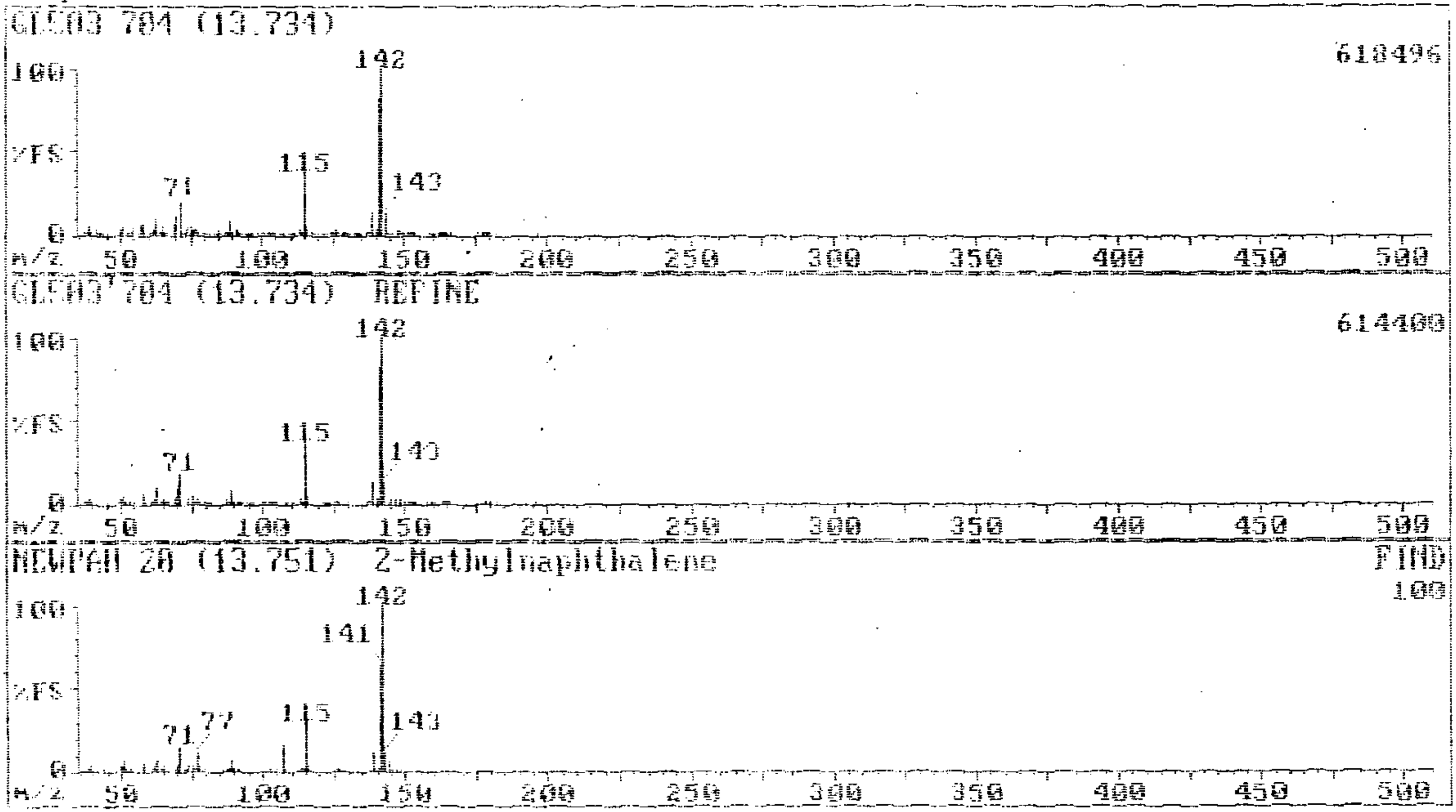
JL
1-5-93

03-Jan-93 22:07 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: RUN #2 (1:10 DIL.) 22651 Instrument G

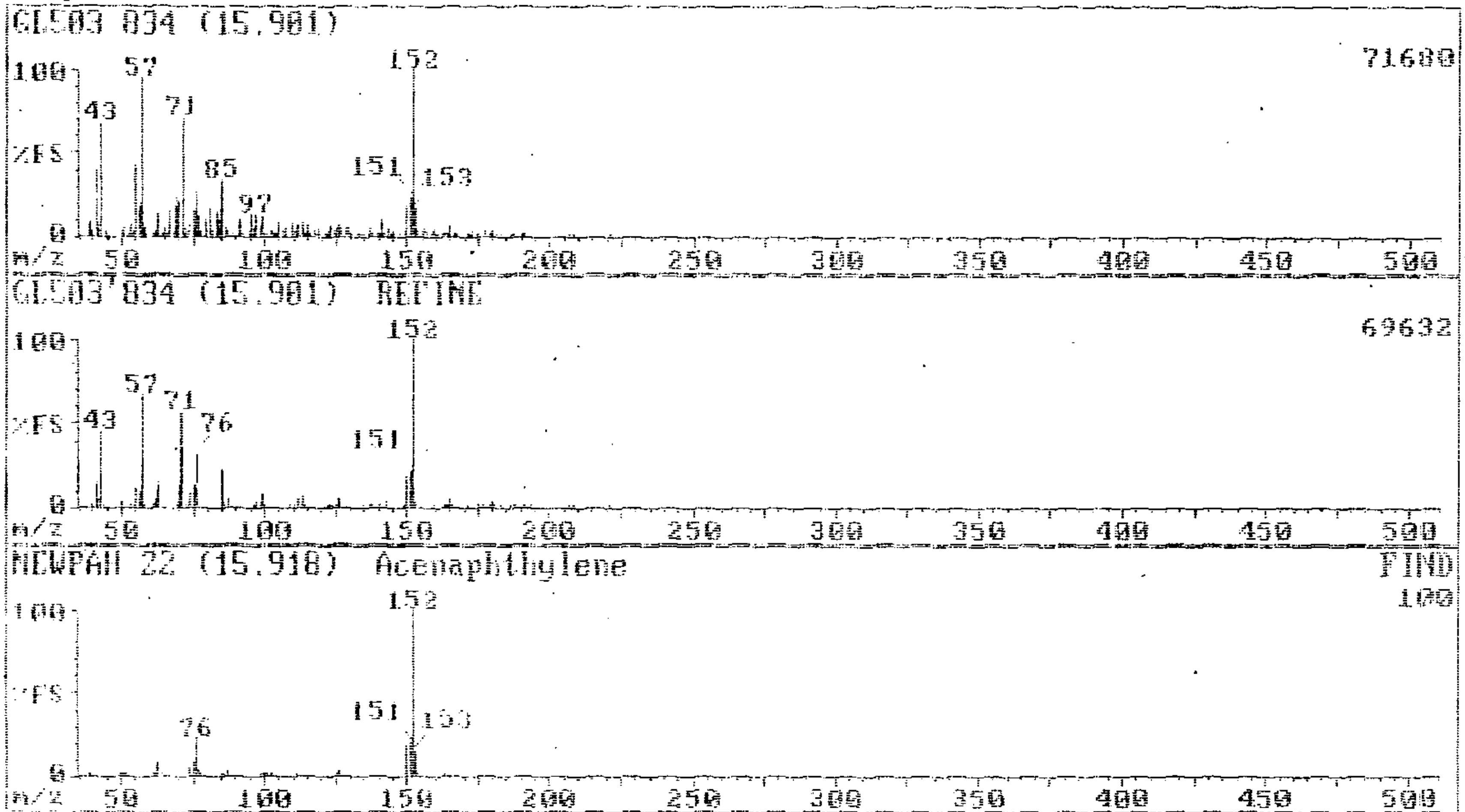


03-Jan-93 22:07 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: RUN #2 (1:10 DIL.) 22651 Instrument G

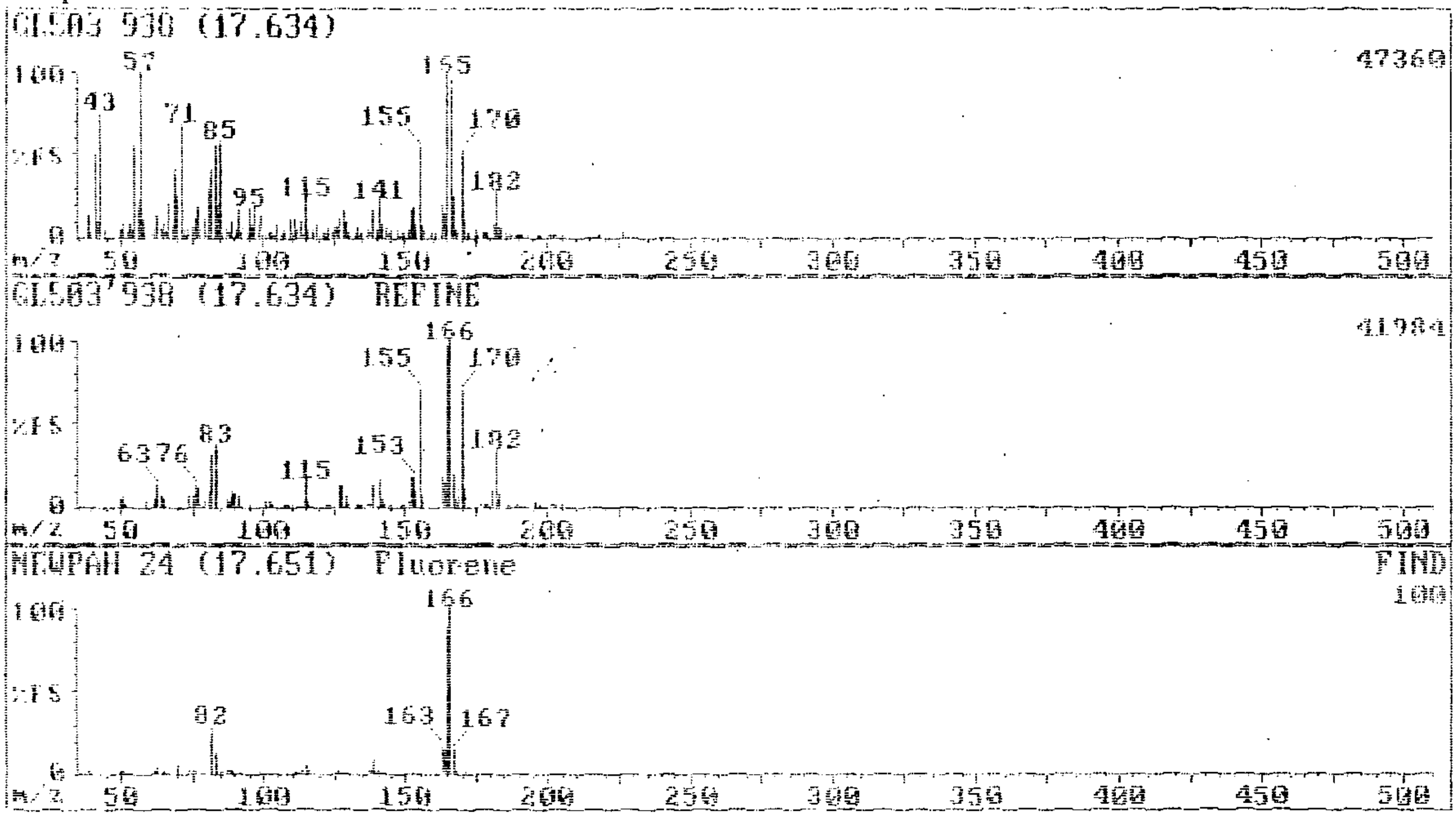


03-Jan-93 22:07 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: RUN #2 (1:10 DIL.) 22651 Instrument G



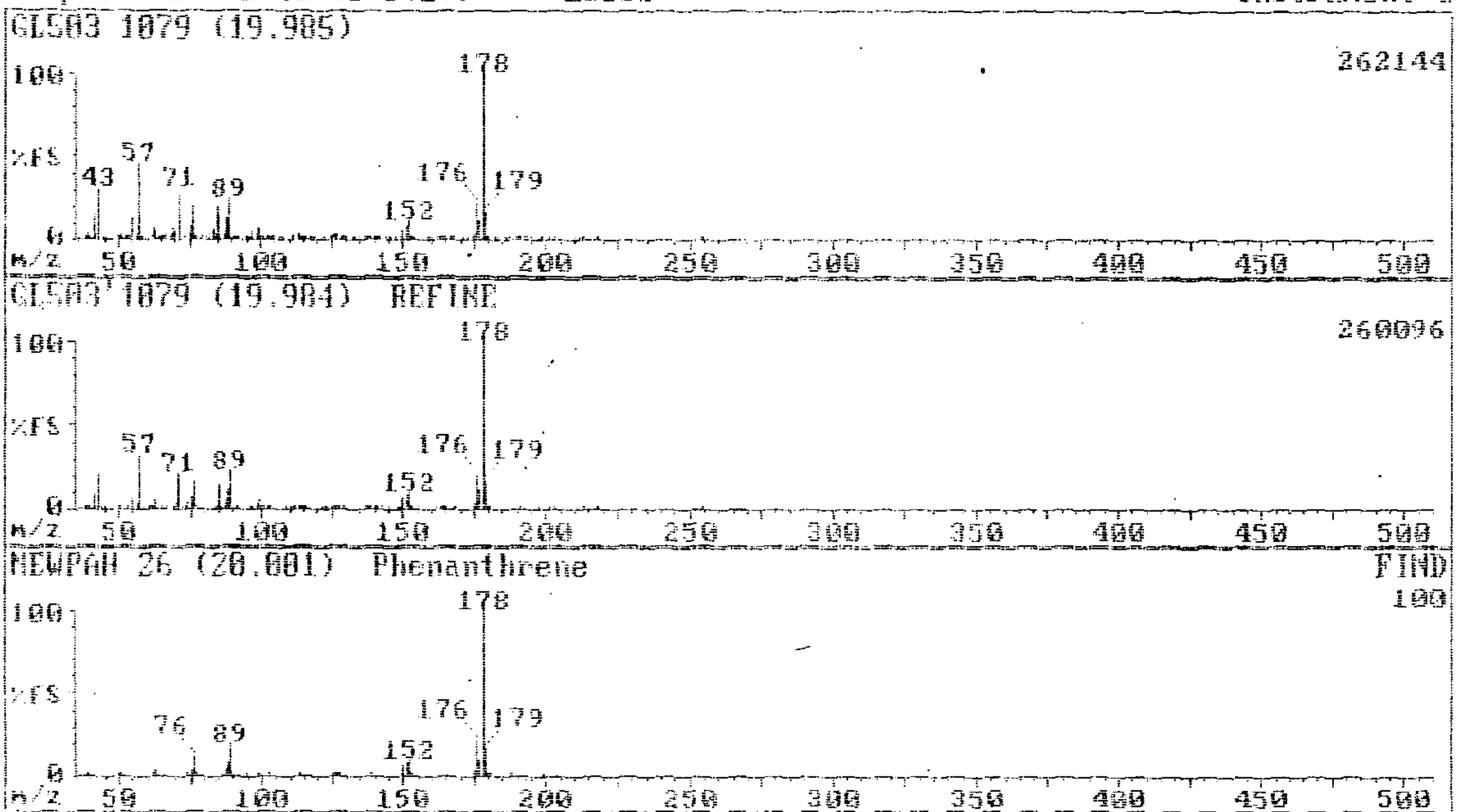
03-Jan-93 22:07 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: RUN #2 (1:10 DIL.) 22651 Instrument G



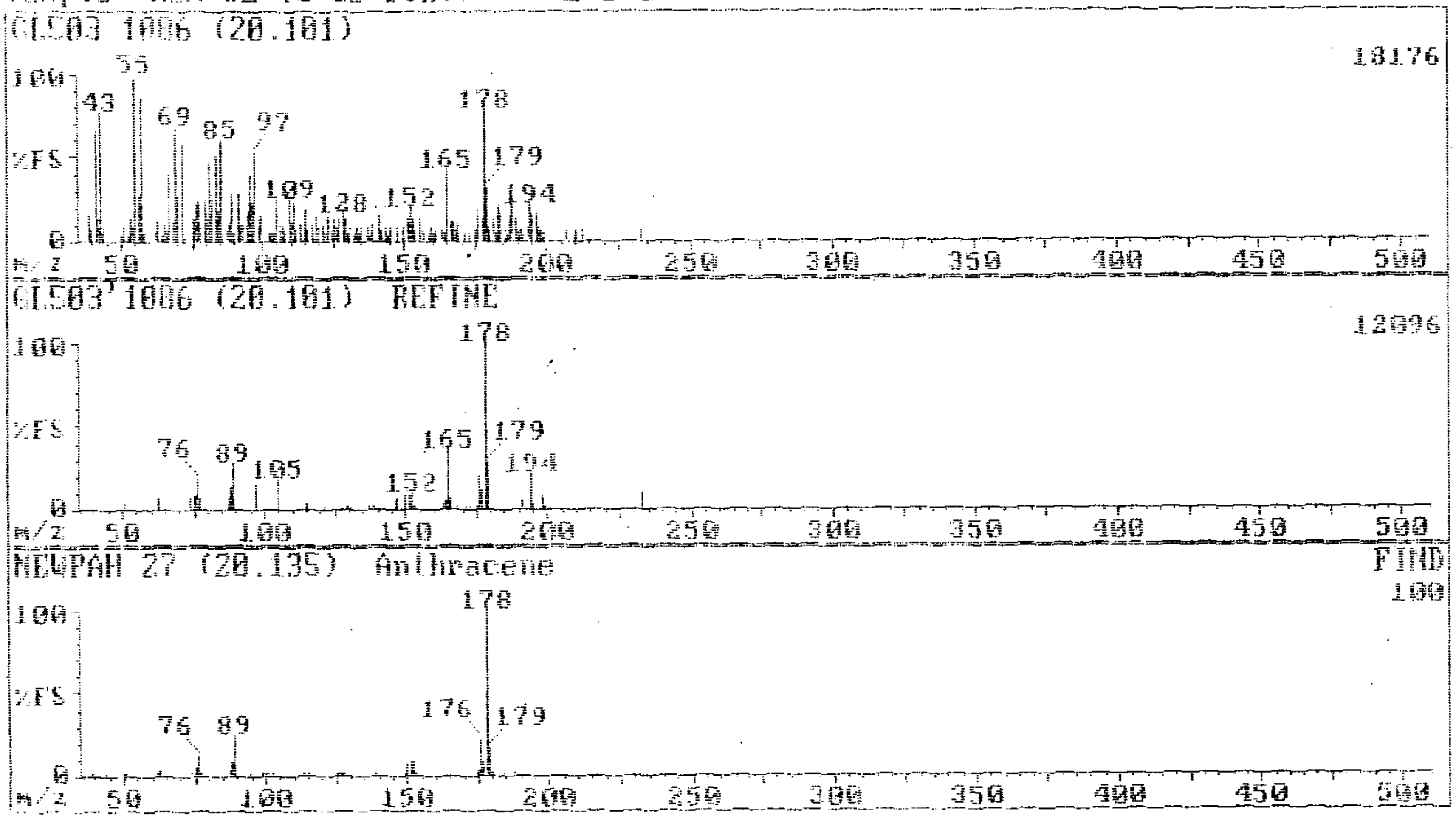
03-Jan-93 22:07 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: RUN #2 (1:10 DIL.) 22651 Instrument G

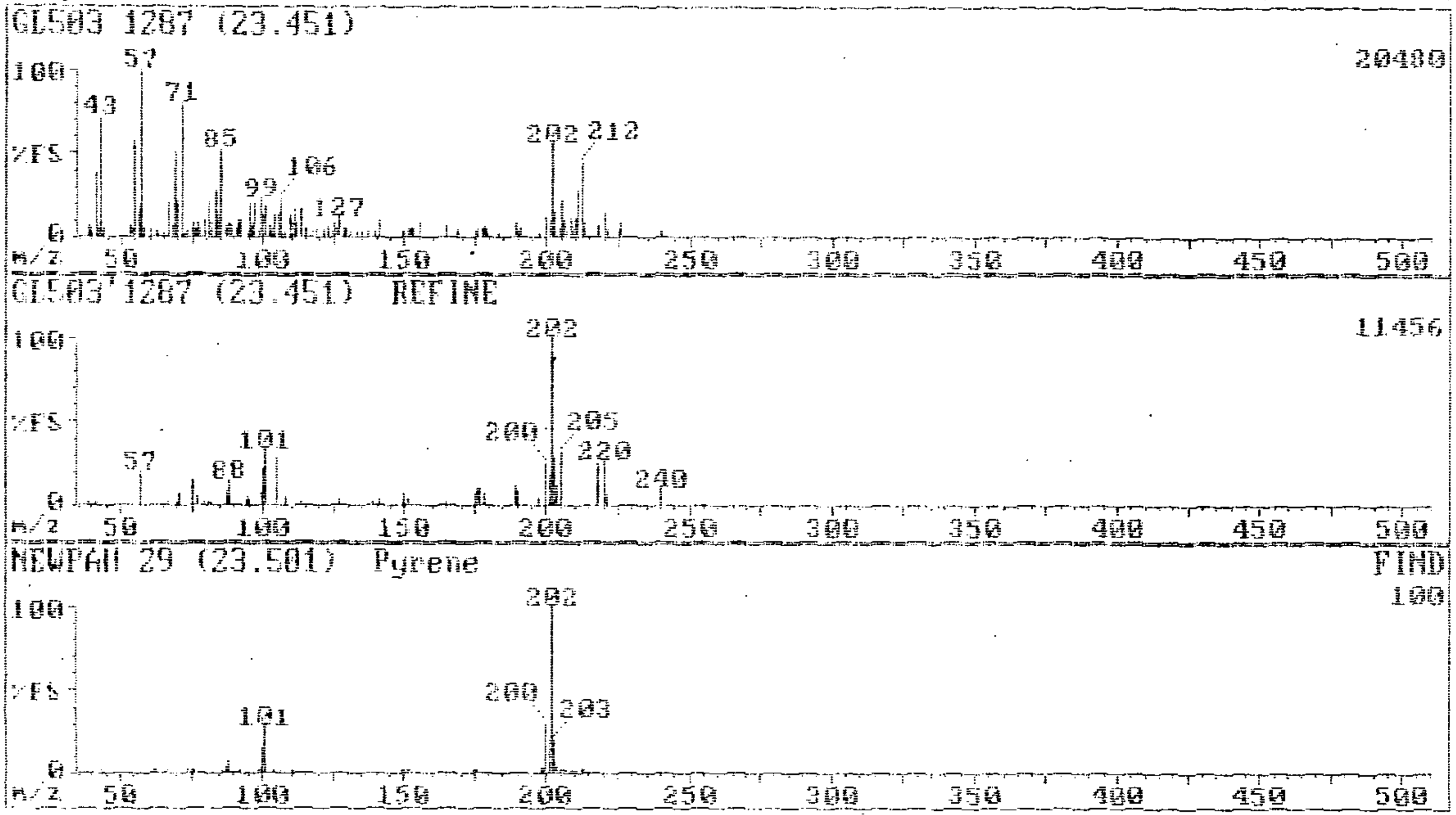


03-Jan-93 22:07 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: RUN #2 (1:10 DIL.) 22651 Instrument G



03-Jan-93 22:07 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: RUN #2 (1:10 DIL.) 22651 Instrument G



Triangle Laboratories of RTP, Inc.
801 Capitola Dr.
Durham, NC 27713
(919) 544-5729

Sample File : GL504
Response File : GL500
Date Analyzed : 01/03/93
Date Reported : 01/06/93
Project Number: 22651

Sample ID: RUN#3

TLI ID: 62.25.4A-I
Dilution Factor: 10.00

Quantitation Results Method 8270

Analyte	Area	RF	SCAN	ISID	Amt. (ug)	Code	Quan Limit	FLAG
1,4-Dichlorobenzene-d4	2984		420	1		I		
Naphthalene-d8	13620		599	2		I		
2-Methylnaphthalene	13758	0.679	704	2	595.05	D	100.0	___
Naphthalene	19568	1.001	602	2	574.10	D	100.0	___
Acenaphthene-d10	6883		856	3		I		
Acenaphthene	0	0.957	0	3	1.21	ND	100.0	___
Fluorene	1311	1.180	938	3	64.56.	E	100.0	___
2-Chloronaphthalene	0	0.971	0	3	1.20	ND	100.0	___
Acenaphthylene	2678	1.680	835	3	92.63	E	100.0	___
Phenanthrene-d10	13214		1076	4		I		
Phenanthrene	6203	0.921	1079	4	203.89	D	100.0	___
Anthracene	467	0.944	1086	4	14.99	E	100.0	___
Fluoranthene	520	1.115	1255	4	14.13	E	100.0	___
Chrysene-d12	16696		1470	5		I		
Chrysene	0	0.995	0	5	0.48	ND	100.0	___
Pyrene	617	1.167	1287	5	12.67	E	100.0	___
Benzo(a)anthracene	0	0.978	0	5	0.49	ND	100.0	___
Perylene-d12	10898		1740	6		I		
Benzo(b)fluoranthene	0	1.380	0	6	0.53	ND	100.0	___
Benzo(k)fluoranthene	0	1.785	0	6	0.41	ND	100.0	___
Benzo(e)pyrene	0	1.423	0	6	0.52	ND	100.0	___
Benzo(a)pyrene	0	1.321	0	6	0.56	ND	100.0	___
Perylene	0	0.688	0	6	1.07	ND	100.0	___
Indeno(1,2,3-cd)pyrene	0	0.876	0	6	0.84	ND	100.0	___
Dibenz(a,h)anthracene	0	0.875	0	6	0.84	ND	100.0	___
Benzo(g,h,i)perylene	0	1.068	0	6	0.69	ND	100.0	___

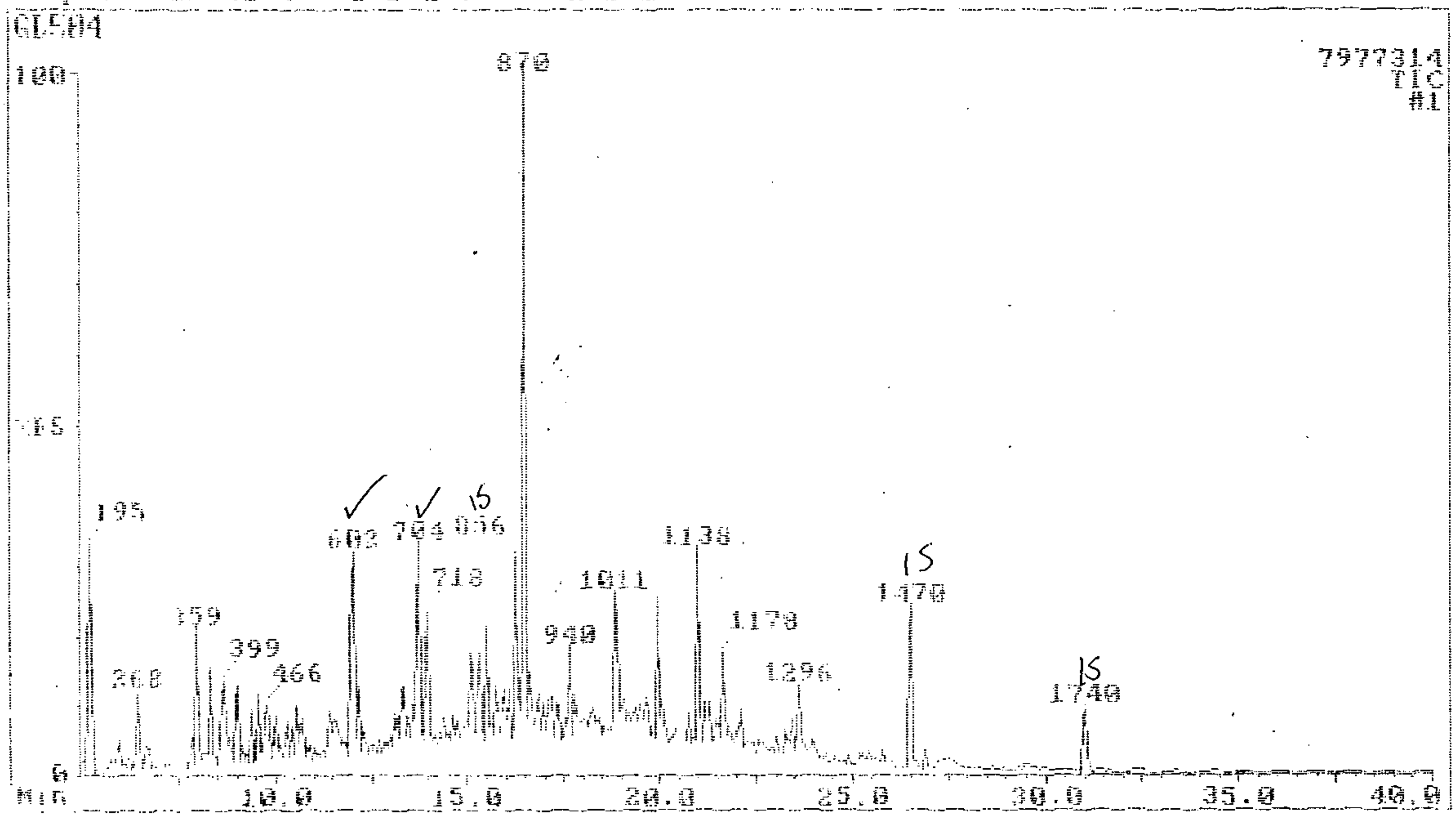
Surrogate Summary	Area	RF	SCAN	ISID	Amount (ug)	Code	%REC
Anthracene-d10	1867	0.508	1084	4	111.31	D	111.3
Pyrene-d10	2897	1.066	1285	5	65.12	D	65.1

Reveiwed by JL Date 1/6/93

ND -Not Detected; D- Detected; E- Estimated; I- Internal Standard

Orgrep v2.5

03-Jan-93 22:59 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: RUN #3 (1:10 DIL.) 22651 Instrument G
GL504



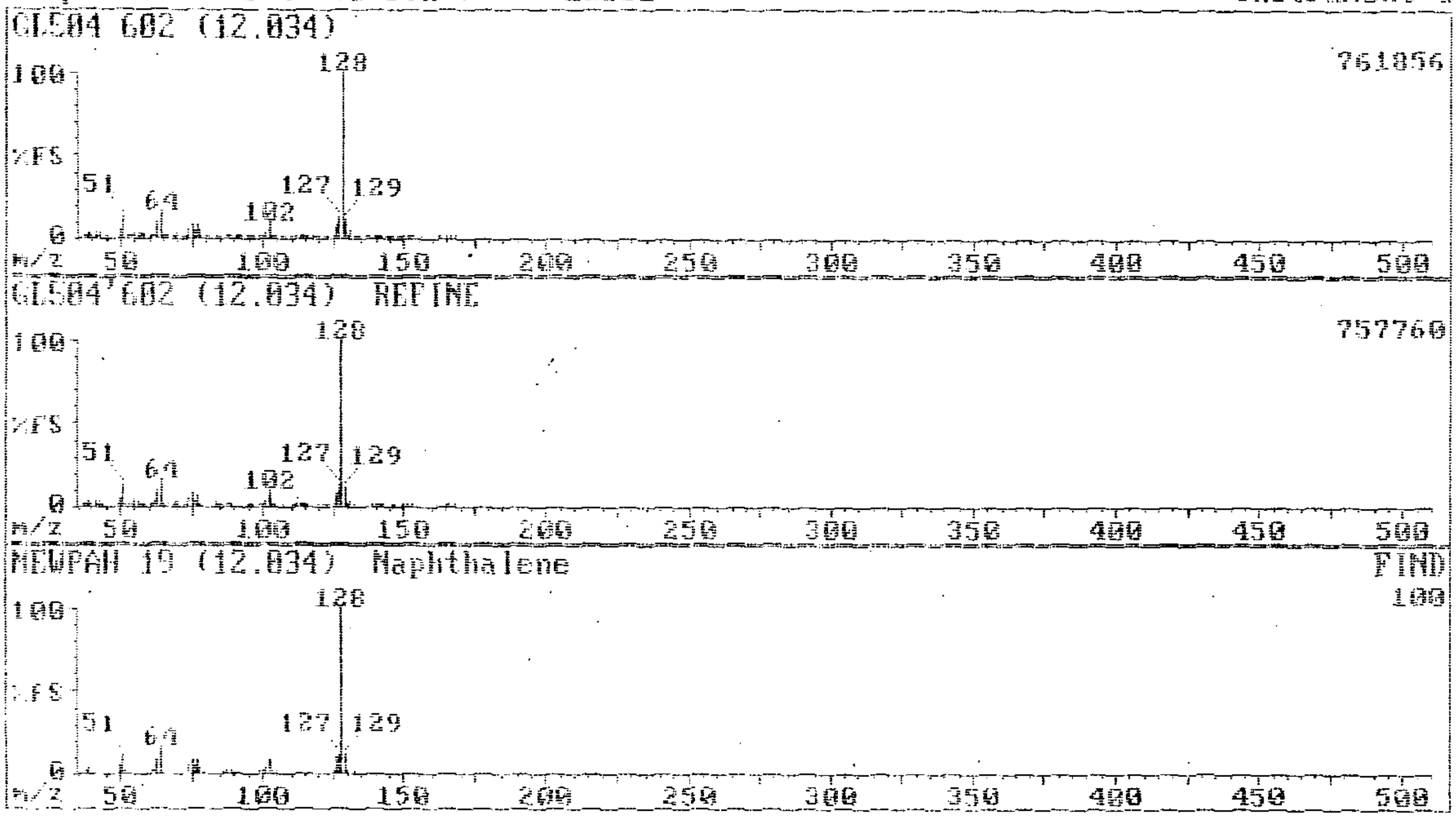
Jf
1-5-93

No.	MAT	FOF	Pct	Delta	Area	Flags	Scn	QM	Name
1	100	71	100	0	298400	bb	410	152	1,4-Dichlorobenzene-d4
2	100	72	93	0	1362100	bv	599	136	Naphthalene-d8
3	88	56	95	-1	688400	vv	856	164	Acenaphthene-d10
4	95	69	95	1	1321400	bv	1076	188	Phenanthrene-d10
5	97	84	96	-2	1669600	bb	1470	240	Chrysene-d12
6	100	82	93	0	1089800	bv	1740	264	Perylene-d12
7	0	0	0	0	0		0	112	2-Fluorophenol
8	0	0	0	0	0		0	132	2-Chlorophenol-d4
9	0	0	0	0	0		0	99	Phenol-d5
10	0	0	0	0	0		0	152	1,2-Dichlorobenzene-d4
11	0	0	0	0	0		0	82	Nitrobenzene-d5
12	0	0	0	0	0		0	185	1,3,5-Trichlorobenzene-d3
13	0	0	0	0	0		0	240	1,4-Dibromobenzene-d4
14	0	0	0	0	0		0	172	2-Fluorobiphenyl
15	0	0	0	0	0		0	330	2,4,6-Tribromophenol
16	72	34	90	-1	186790	vb	1084	188	Anthracene-d10
17	94	55	95	0	285760	vv	1285	212	Pyrene-d10
18	0	0	0	0	0		0	244	Terphenyl-d14
19	100	76	99	0	1956900	vv	602	128	Naphthalene
20	100	80	93	-1	1375800	vv	704	142	2-Methylnaphthalene
21	0	0	0	0	0		0	162	2-Chloronaphthalene
22	73	34	92	1	367820	vb	835	152	Acenaphthylene
23	70	32	80	0	~~[illegible]~~	~~vv~~ JL	~~[illegible]~~	154	Acenaphthene
24	71	32	82	0	131120	vb	938	166	Fluorene
25	0	0	0	0	0		0	266	Pentachlorophenol
26	83	47	96	-1	620330	bv	1079	178	Phenanthrene
[illegible]	51	20	75	-2	46734	vv	1086	178	Anthracene
28	60	24	87	-2	52044	vb	1255	202	Fluoranthene
29	65	25	79	-1	61736	bb	1287	202	Pyrene
30	0	0	0	0	0		0	228	Benzo(a)anthracene
31	0	0	0	0	0		0	228	Chrysene
32	0	0	0	0	0		0	252	Benzo(b)fluoranthene
33	0	0	0	0	0		0	252	Benzo(k)fluoranthene
34	0	0	0	0	0		0	252	Benzo(e)pyrene
35	0	0	0	0	0		0	252	Benzo(a)pyrene
36	0	0	0	0	0		0	252	Perylene
37	0	0	0	0	0		0	276	Indeno(1,2,3-cd)pyrene
38	0	0	0	0	0		0	278	Dibenz(a,h)anthracene
39	0	0	0	0	0		0	276	Benzo(g,h,i)perylene

JL 1-5-93

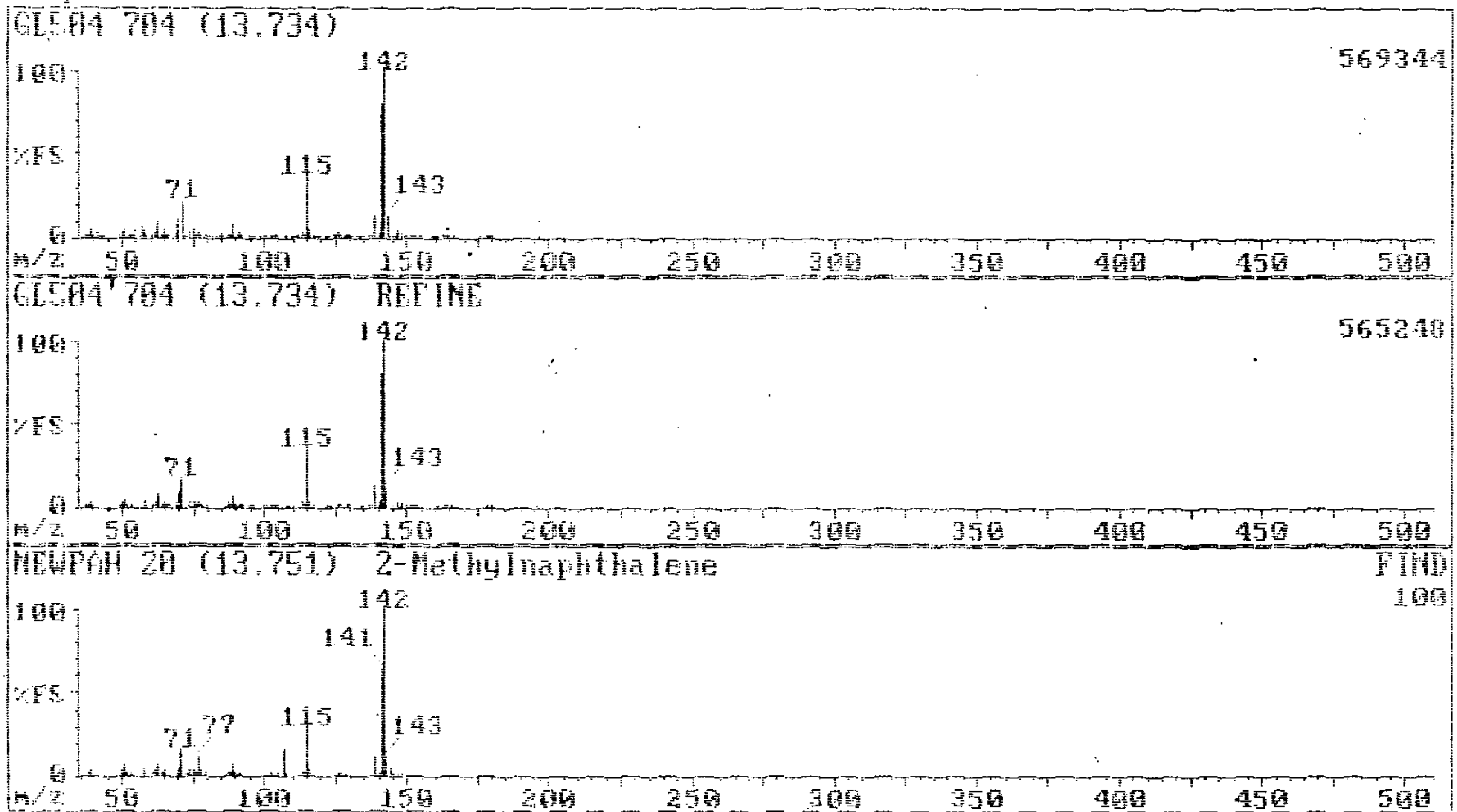
03-Jan-93 22:59 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: RUN #3 (1:10 DIL.) 22651 Instrument G



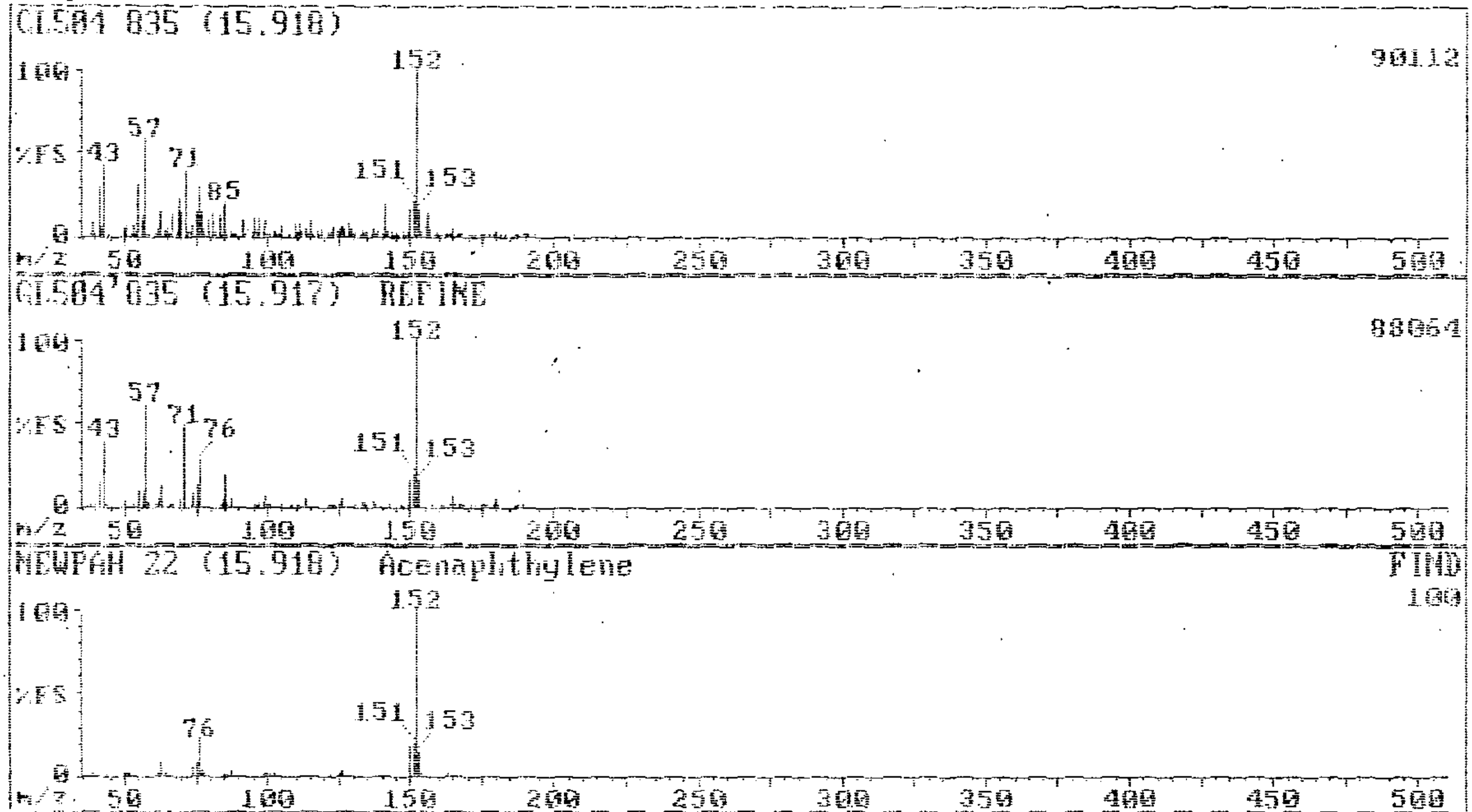
03-Jan-93 22:59 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: RUN #3 (1:10 DIL.) 22651 Instrument G



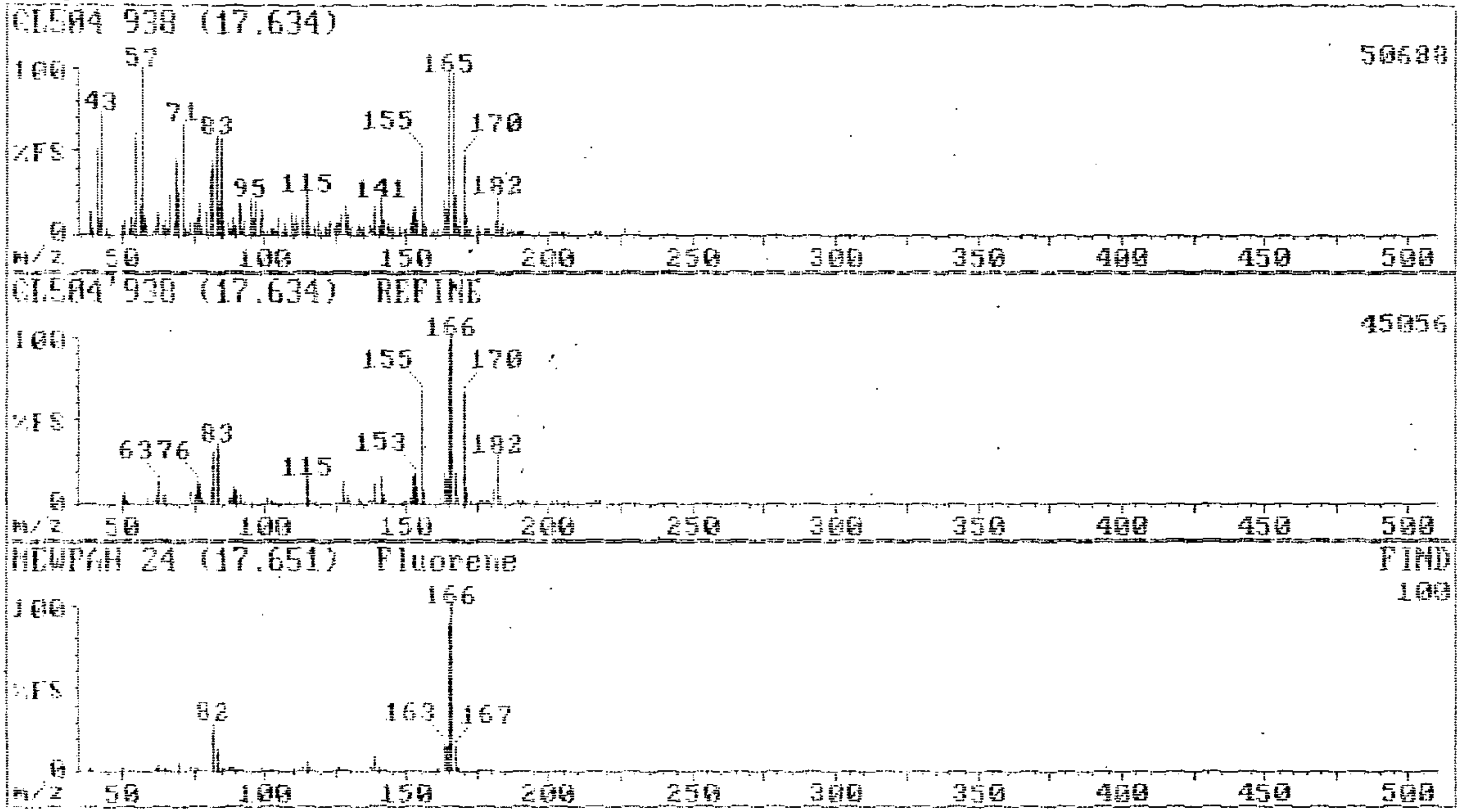
03-Jan-93 22:59 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: RUN #3 (1:10 DIL.) 22651 Instrument G



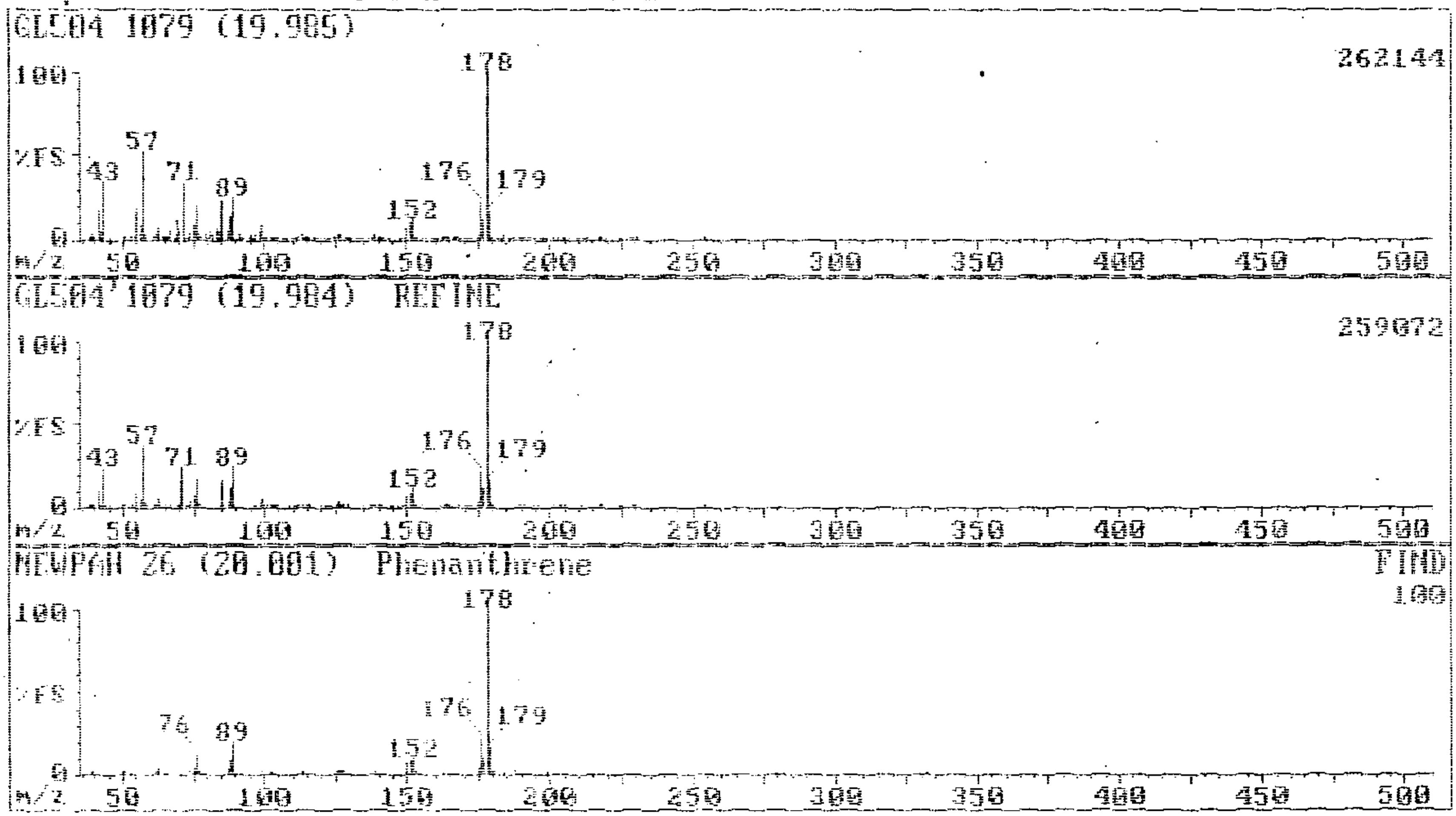
03-Jan-93 22:59 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: RUN #3 (1:10 DIL.) 22651 Instrument G

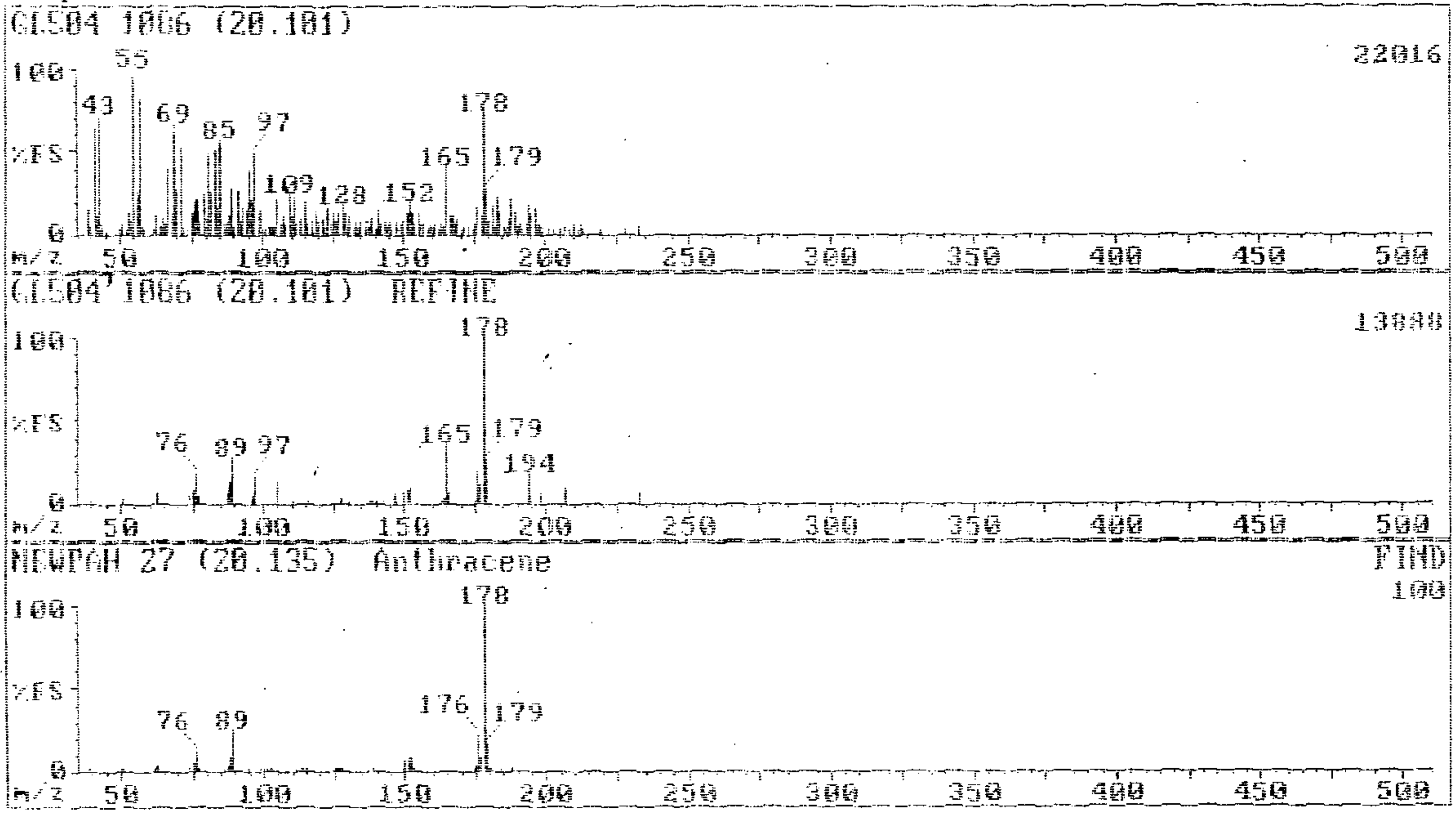


03-Jan-93 22:59 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: RUN #3 (1:10 DIL.) 22651 Instrument G

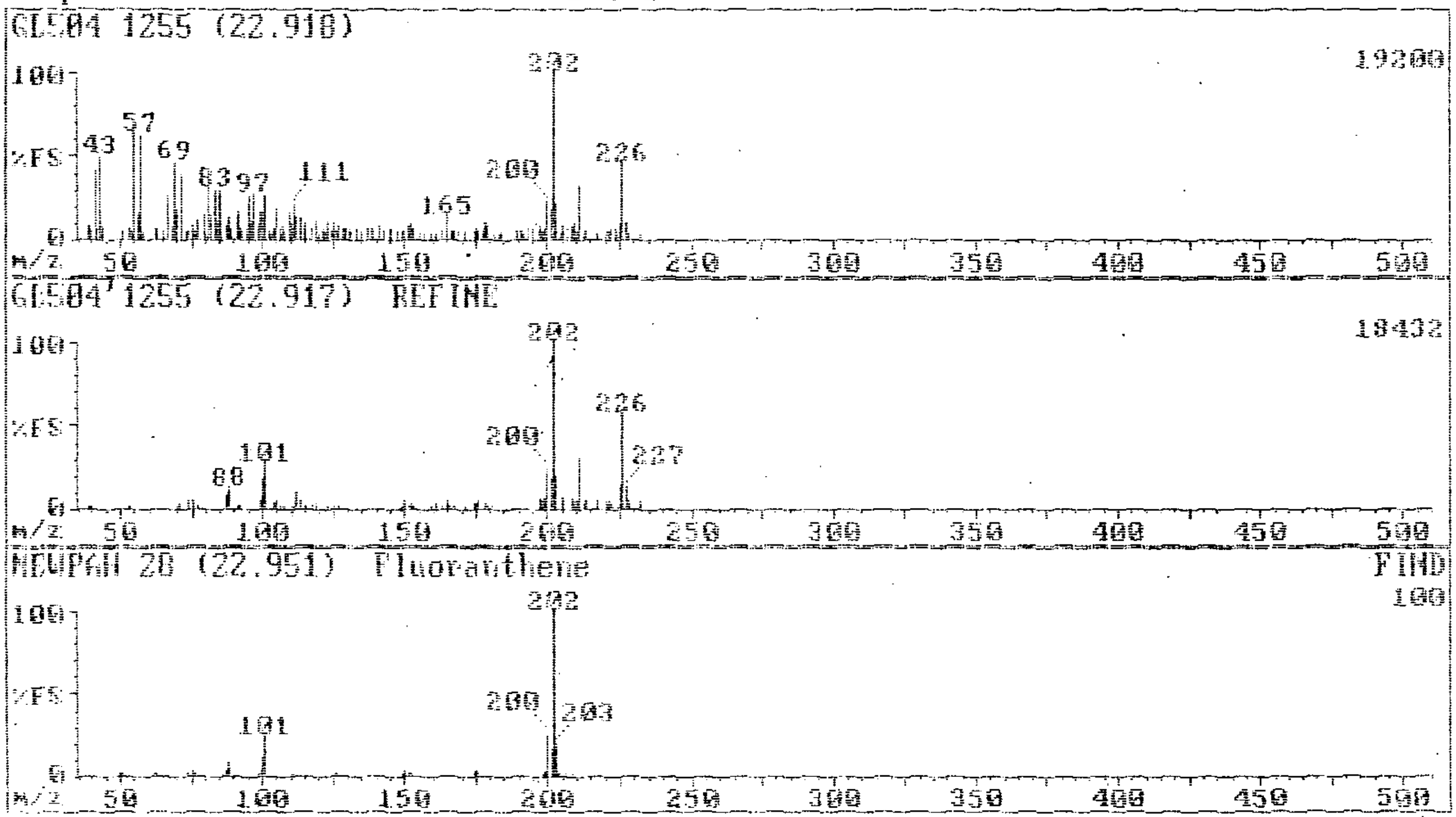


03-Jan-93 22:59 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: RUN #3 (1:10 DIL.) 22651 Instrument G



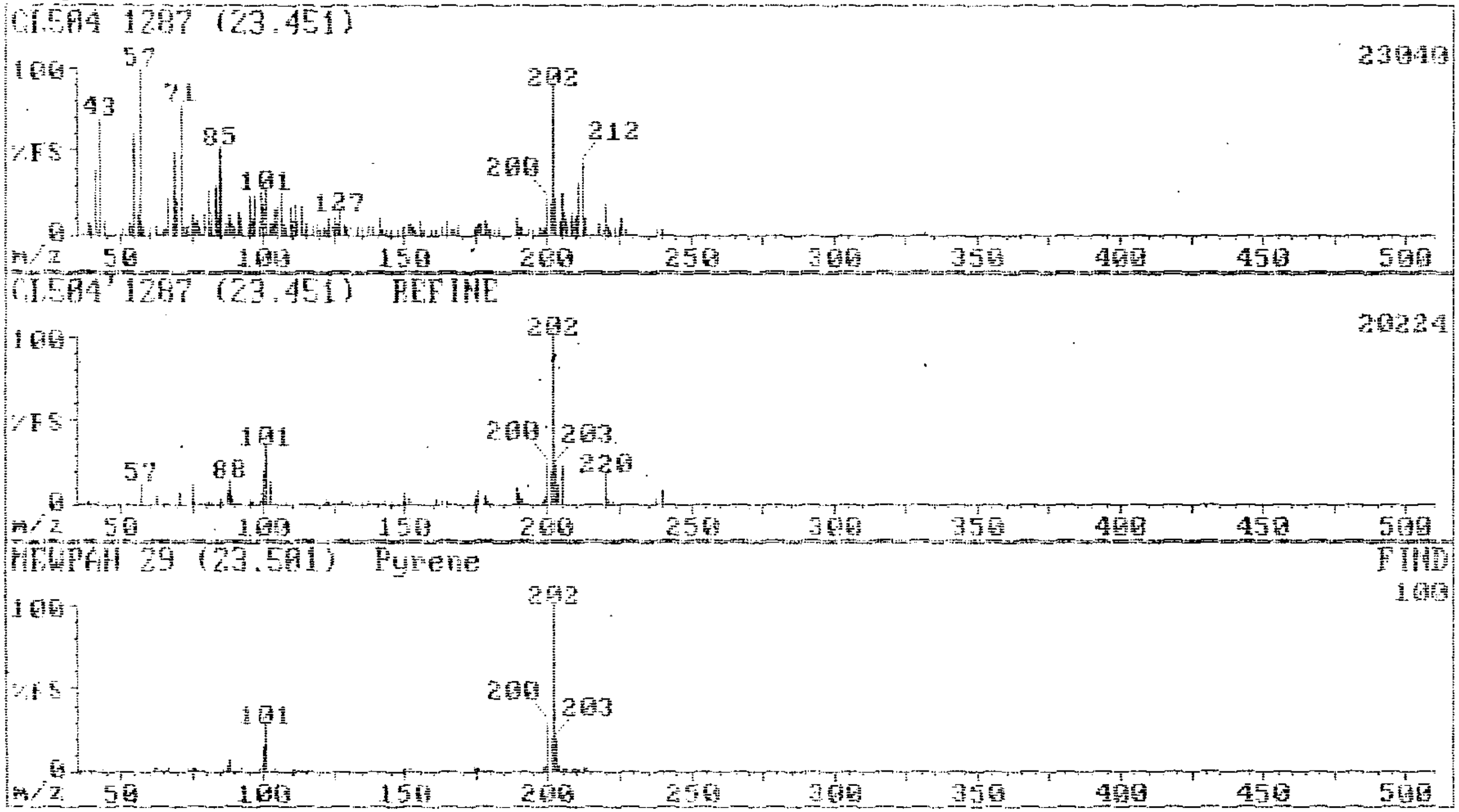
03-Jan-93 22:59 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: RUN #3 (1:10 DIL.) 22651 Instrument G



03-Jan-93 22:59 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: RUN #3 (1:10 DIL.) 22651 Instrument G



Triangle Laboratories of RTP, Inc.
801 Capitola Dr.
Durham, NC 27713
(919) 544-5729

Sample File : GL471
Response File : GL467
Date Analyzed : 12/30/92
Date Reported : 01/06/93
Project Number: 22651

Sample ID: BLANK
TLI ID: 62.25.1A-I
Dilution Factor: 1.00

Quantitation Results Method 8270

Analyte	Area	RF	SCAN	ISID	Amt. (ug)	Code	Quan Limit	FLAG
1,4-Dichlorobenzene-d4	9674		433	1		I		
Naphthalene-d8	36186		612	2		I		
2-Methylnaphthalene	738	0.449	718	2	1.82	E	10.0	___
Naphthalene	1548	0.574	615	2	2.98	E	10.0	___
Acenaphthene-d10	27440		871	3		I		
Acenaphthene	0	0.578	0	3	0.05	ND	10.0	___
Fluorene	0	0.745	0	3	0.04	ND	10.0	___
2-Chloronaphthalene	0	0.600	0	3	0.05	ND	10.0	___
Acenaphthylene	0	1.001	0	3	0.03	ND	10.0	___
Phenanthrene-d10	60865		1091	4		I		
Phenanthrene	0	0.552	0	4	0.02	ND	10.0	___
Anthracene	0	0.568	0	4	0.02	ND	10.0	___
Fluoranthene	0	0.653	0	4	0.02	ND	10.0	___
Chrysene-d12	73106		1488	5		I		
Chrysene	0	0.539	0	5	0.02	ND	10.0	___
Pyrene	0	0.759	0	5	0.01	ND	10.0	___
Benzo(a)anthracene	0	0.576	0	5	0.02	ND	10.0	___
Perylene-d12	34786		1769	6		I		
Benzo(b)fluoranthene	0	0.709	0	6	0.03	ND	10.0	___
Benzo(k)fluoranthene	0	0.870	0	6	0.03	ND	10.0	___
Benzo(e)pyrene	0	0.691	0	6	0.03	ND	10.0	___
Benzo(a)pyrene	0	0.666	0	6	0.03	ND	10.0	___
Perylene	0	0.395	0	6	0.06	ND	10.0	___
Indeno(1,2,3-cd)pyrene	0	0.612	0	6	0.04	ND	10.0	___
Dibenz(a,h)anthracene	0	0.446	0	6	0.05	ND	10.0	___
Benzo(g,h,i)perylene	0	0.540	0	6	0.04	ND	10.0	___

Surrogate Summary	Area	RF	SCAN	ISID	Amount (ug)	Code	%REC
Anthracene-d10	44920	0.301	1099	4	98.08	D	98.1
Pyrene-d10	70459	0.672	1302	5	57.37	D	57.4

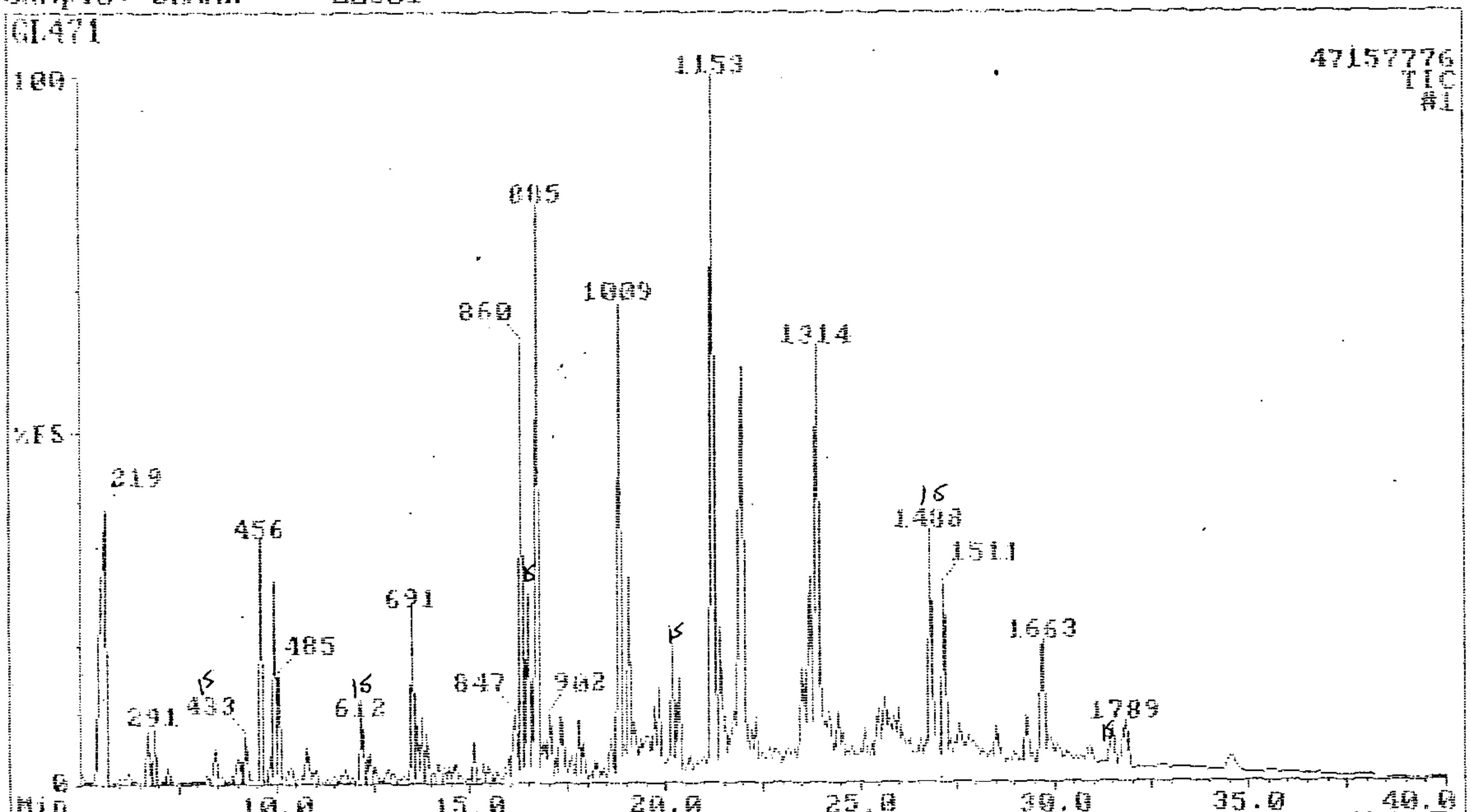
Reveiwed by [signature] Date 1,6,93

ND -Not Detected; D- Detected; E- Estimated; I- Internal Standard

Orgrep v2.5

30-Dec-92 15:24 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: BLANK 22651 Instrument G



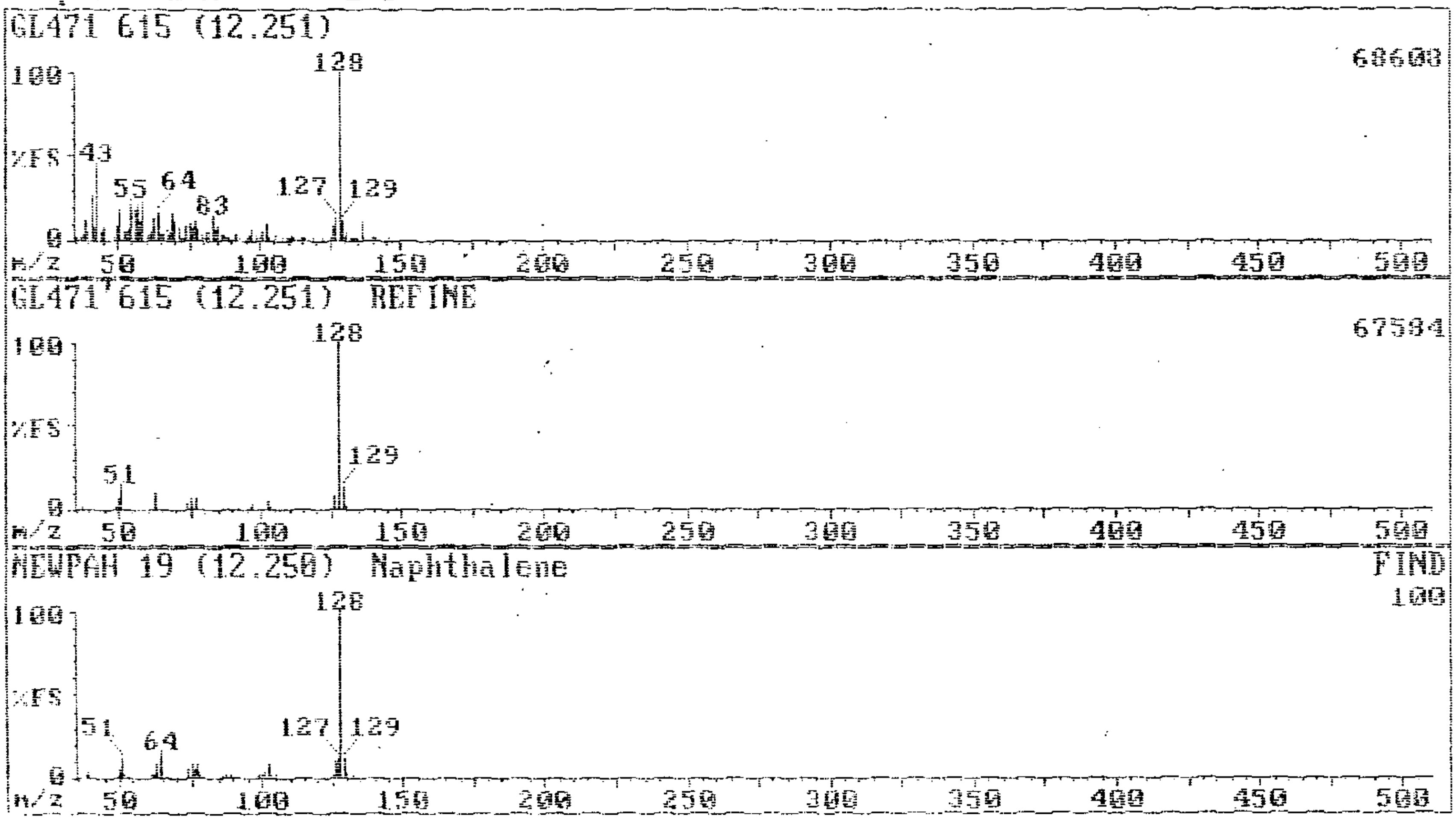
JF 1-5-93

No.	Fit	[illegible]	REV	Delta	Area	Flags	Scan	QM	Name
[illegible]	100	79	99	1	[illegible]7470	bb	433	152	1,4-Dichlorobenzene-d4
[illegible]	100	79	90	0	5618700	bv	612	136	Naphthalene-d8
3	[illegible]	56	95	1	2744000	vv	871	164	Acenaphthene-d10
4	100	66	95	0	6086500	vv	1091	188	Phenanthrene-d10
5	92	61	98	0	7310600	vv	1488	240	Chrysene-d12
6	89	57	96	1	3478600	bv	1769	264	Perylene-d12
7	0	0	0	0	0		0	112	2-Fluorophenol
8	0	0	0	0	0		0	132	2-Chlorophenol-d4
9	0	0	0	0	0		0	99	Phenol-d5
10	0	0	0	0	0		0	152	1,2-Dichlorobenzene-d4
11	0	0	0	0	0		0	82	Nitrobenzene-d5
12	0	0	0	0	0		0	185	1,3,5-Trichlorobenzene-d3
13	0	0	0	0	0		0	240	1,4-Dibromobenzene-d4
14	0	0	0	0	0		0	172	2-Fluorobiphenyl
15	0	0	0	0	0		0	330	2,4,6-Tribromophenol
16	100	74	96	0	4492000	vv	1099	188	Anthracene-d10
17	91	63	94	1	7046000	vv	1302	212	Pyrene-d10
18	0	0	0	0	0		0	244	Terphenyl-d14
19	89	45	97	0	154860	bv	615	128	Naphthalene
20	87	53	86	0	73828	bb	718	142	2-Methylnaphthalene
21	0	0	0	0	0		0	162	2-Chloronaphthalene
22	0	0	0	0	0		0	152	Acenaphthylene
23	0	0	0	0	0		0	154	Acenaphthene
24	0	0	0	0	0		0	166	Fluorene
25	0	0	0	0	0		0	266	Pentachlorophenol
26	0	0	0	0	0		0	178	Phenanthrene
[illegible]	0	0	0	0	0		0	178	Anthracene
[illegible]	0	0	0	0	0		0	202	Fluoranthene
29	0	0	0	0	0		0	202	Pyrene
30	0	0	0	0	0		0	228	Benzo(a)anthracene
31	0	0	0	0	0		0	228	Chrysene
32	31	21	32	1	~~22072~~	~~vv~~ gf	~~1888~~	252	Benzo(b)fluoranthene
33	0	0	0	0	0		0	252	Benzo(K)fluoranthene
34	0	0	0	0	0		0	252	Benzo(e)pyrene
35	0	0	0	0	0		0	252	Benzo(a)pyrene
36	0	0	0	0	0		0	252	Perylene
37	0	0	0	0	0		0	276	Indeno(1,2,3-cd)pyrene
38	0	0	0	0	0		0	278	Dibenz(a,h)anthracene
39	0	0	0	0	0		0	276	Benzo(g,h,i)perylene

gf
1-5-93

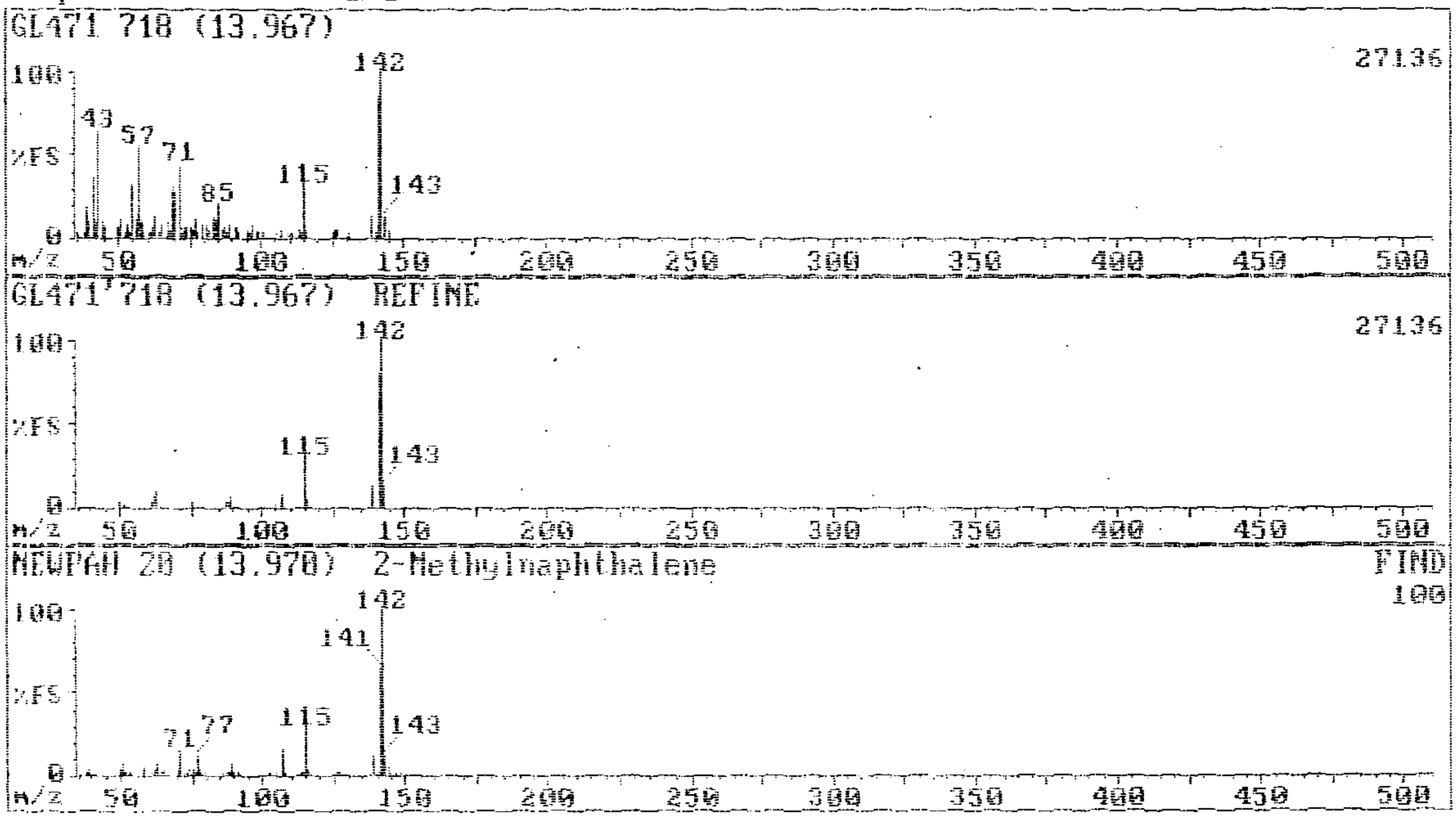
30-Dec-92 15:24 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: BLANK 22651 Instrument G



30-Dec-92 15:24 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: BLANK 22651 Instrument G



Triangle Laboratories of RTP, Inc.
801 Capitola Dr.
Durham, NC 27713
(919) 544-5729

Sample File : GL469
Response File : GL467
Date Analyzed : 12/30/92
Date Reported : 01/06/93
Project Number: 22651

Sample ID: SBLK 122192
TLI ID: N/A
Dilution Factor: 1.00

Quantitation Results Method 8270

Analyte	Area	RF	SCAN	ISID	Amt. (ug)	Code	Quan Limit	FLAG
1,4-Dichlorobenzene-d4	11104		433	1		I		
Naphthalene-d8	37296		612	2		I		
2-Methylnaphthalene	0	0.449	0	2	0.05	ND	10.0	___
Naphthalene	715	0.574	615	2	1.34	E	10.0	___
Acenaphthene-d10	27609		870	3		I		
Acenaphthene	0	0.578	0	3	0.05	ND	10.0	___
Fluorene	0	0.745	0	3	0.04	ND	10.0	___
2-Chloronaphthalene	0	0.600	0	3	0.05	ND	10.0	___
Acenaphthylene	0	1.001	0	3	0.03	ND	10.0	___
Phenanthrene-d10	60480		1090	4		I		
Phenanthrene	0	0.552	0	4	0.02	ND	10.0	___
Anthracene	0	0.568	0	4	0.02	ND	10.0	___
Fluoranthene	0	0.653	0	4	0.02	ND	10.0	___
Chrysene-d12	60536		1487	5		I		
Chrysene	0	0.539	0	5	0.02	ND	10.0	___
Pyrene	0	0.759	0	5	0.02	ND	10.0	___
Benzo(a)anthracene	0	0.576	0	5	0.02	ND	10.0	___
Perylene-d12	34363		1767	6		I		
Benzo(b)fluoranthene	0	0.709	0	6	0.03	ND	10.0	___
Benzo(k)fluoranthene	0	0.870	0	6	0.03	ND	10.0	___
Benzo(e)pyrene	0	0.691	0	6	0.03	ND	10.0	___
Benzo(a)pyrene	0	0.666	0	6	0.03	ND	10.0	___
Perylene	0	0.395	0	6	0.06	ND	10.0	___
Indeno(1,2,3-cd)pyrene	0	0.612	0	6	0.04	ND	10.0	___
Dibenz(a,h)anthracene	0	0.446	0	6	0.05	ND	10.0	___
Benzo(g,h,i)perylene	0	0.540	0	6	0.04	ND	10.0	___

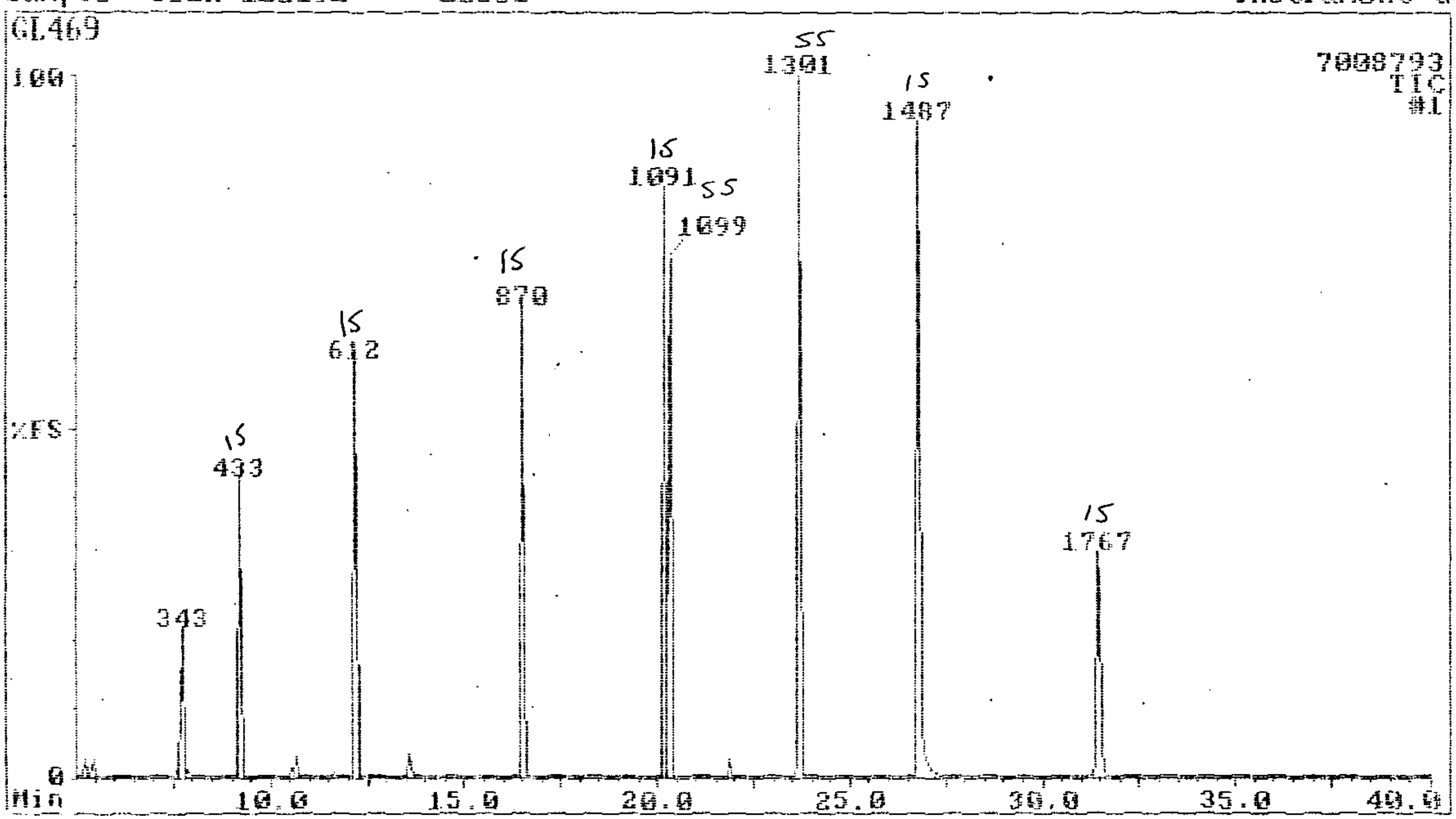
Surrogate Summary	Area	RF	SCAN	ISID	Amount (ug)	Code	%REC
Anthracene-d10	42571	0.301	1099	4	93.54	D	93.5
Pyrene-d10	58100	0.672	1301	5	57.13	D	57.1

Reveiwed by *[signature]* Date 1/6/93

ND -Not Detected; D- Detected; E- Estimated; I- Internal Standard

Orgrep v2.5

30-Dec-92 13:41 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: SBLK 122192 22651 Instrument G

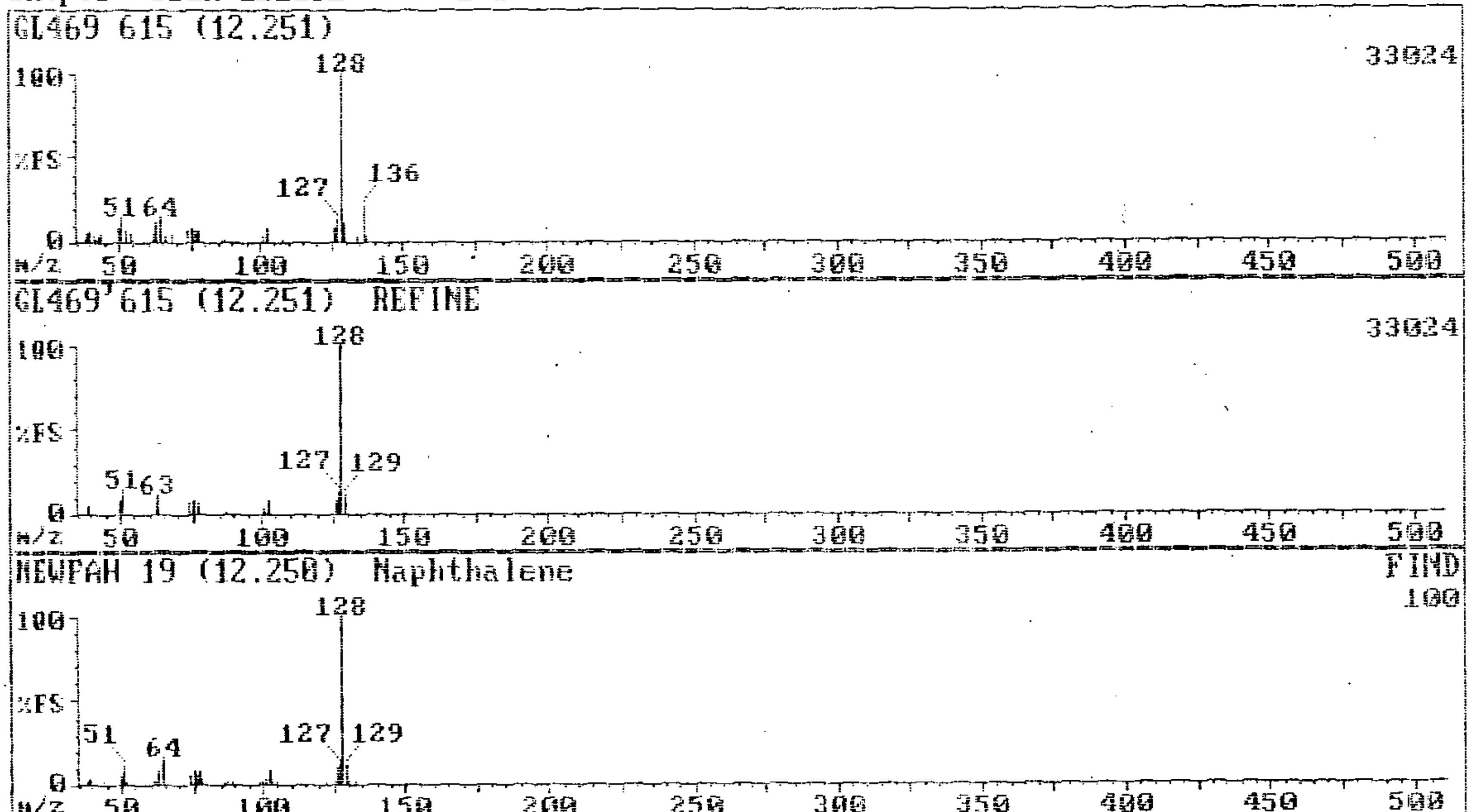


JL
1-5-93

No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	82	99	1	1110500	bb	433	152	1,4-Dichlorobenzene-d4
[illegible]	100	86	91	0	3729700	bv	612	136	Naphthalene-d8
3	100	95	98	0	2760900	bb	870	164	Acenaphthene-d10
4	100	91	97	-1	6048000	bv	1090	188	Phenanthrene-d10
5	100	84	95	-1	6053700	bv	1487	240	Chrysene-d12
6	100	88	94	-1	3436300	bv	1767	264	Perylene-d12
7	0	0	0	0	0		0	112	2-Fluorophenol
8	0	0	0	0	0		0	132	2-Chlorophenol-d4
9	0	0	0	0	0		0	99	Phenol-d5
10	0	0	0	0	0		0	152	1,2-Dichlorobenzene-d4
11	0	0	0	0	0		0	82	Nitrobenzene-d5
12	0	0	0	0	0		0	185	1,3,5-Trichlorobenzene-d3
13	0	0	0	0	0		0	240	1,4-Dibromobenzene-d4
14	0	0	0	0	0		0	172	2-Fluorobiphenyl
15	0	0	0	0	0		0	330	2,4,6-Tribromophenol
16	100	87	95	0	4257100	vv	1099	188	Anthracene-d10
17	100	89	96	0	5810100	bv	1301	212	Pyrene-d10
18	0	0	0	0	0		0	244	Terphenyl-d14
19	100	75	93	0	71584	bb	615	128	Naphthalene
20	0	0	0	0	0		0	142	2-Methylnaphthalene
21	0	0	0	0	0		0	162	2-Chloronaphthalene
22	0	0	0	0	0		0	152	Acenaphthylene
23	0	0	0	0	0		0	154	Acenaphthene
24	0	0	0	0	0		0	166	Fluorene
25	0	0	0	0	0		0	266	Pentachlorophenol
26	0	0	0	0	0		0	178	Phenanthrene
[illegible]	0	0	0	0	0		0	178	Anthracene
[illegible]	0	0	0	0	0		0	202	Fluoranthene
29	0	0	0	0	0		0	202	Pyrene
30	0	0	0	0	0		0	228	Benzo(a)anthracene
31	0	0	0	0	0		0	228	Chrysene
32	0	0	0	0	0		0	252	Benzo(b)fluoranthene
33	0	0	0	0	0		0	252	Benzo(k)fluoranthene
34	0	0	0	0	0		0	252	Benzo(e)pyrene
35	0	0	0	0	0		0	252	Benzo(a)pyrene
36	0	0	0	0	0		0	252	Perylene
37	0	0	0	0	0		0	276	Indeno(1,2,3-cd)pyrene
38	0	0	0	0	0		0	278	Dibenz(a,h)anthracene
39	0	0	0	0	0		0	276	Benzo(g,h,i)perylene

JL
1-5-93

30-Dec-92 13:41 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: SBLK 122192 22651 Instrument G



Triangle Laboratories of RTP, Inc.
Continuing Calibration Curve

CCAL File: GL500 Date of Analysis :01/03/93 Analyte List: PAH
ICAL File: ICALGJ03

Analyte	Flag	RF50	RFMEAN	%D
1,4-Dichlorobenzene-d4	I			
Naphthalene-d8	I			
2-Methylnaphthalene		0.679	0.729	6.9
Naphthalene		1.001	1.058	5.4
Acenaphthene-d10	I			
Acenaphthene	C	0.957	1.019	6.1
Fluorene		1.180	1.253	5.8
2-Chloronaphthalene		0.971	1.048	7.3
Acenaphthylene		1.680	1.791	6.2
Phenanthrene-d10	I			
Phenanthrene		0.921	0.950	3.1
Anthracene		0.944	0.959	1.6
Fluoranthene	C	1.115	1.152	3.2
Chrysene-d12	I			
Chrysene		0.995	1.011	1.6
Pyrene		1.167	1.176	0.8
Benzo(a)anthracene		0.978	1.048	6.7
Perylene-d12	I			
Benzo(b)fluoranthene		1.380	1.575	12.4
Benzo(k)fluoranthene		1.785	1.704	-4.8
Benzo(e)pyrene		1.423	1.497	4.9
Benzo(a)pyrene	C	1.321	1.424	7.2
Perylene		0.688	0.755	8.9
Indeno(1,2,3-cd)pyrene		0.876	1.057	17.1
Dibenz(a,h)anthracene		0.875	1.047	16.4
Benzo(g,h,i)perylene		1.068	1.193	10.5

Surrogate	Flag	RF50	RFMEAN	%D
Anthracene-d10	S	0.508	0.527	3.6
Pyrene-d10	S	1.066	1.103	3.4

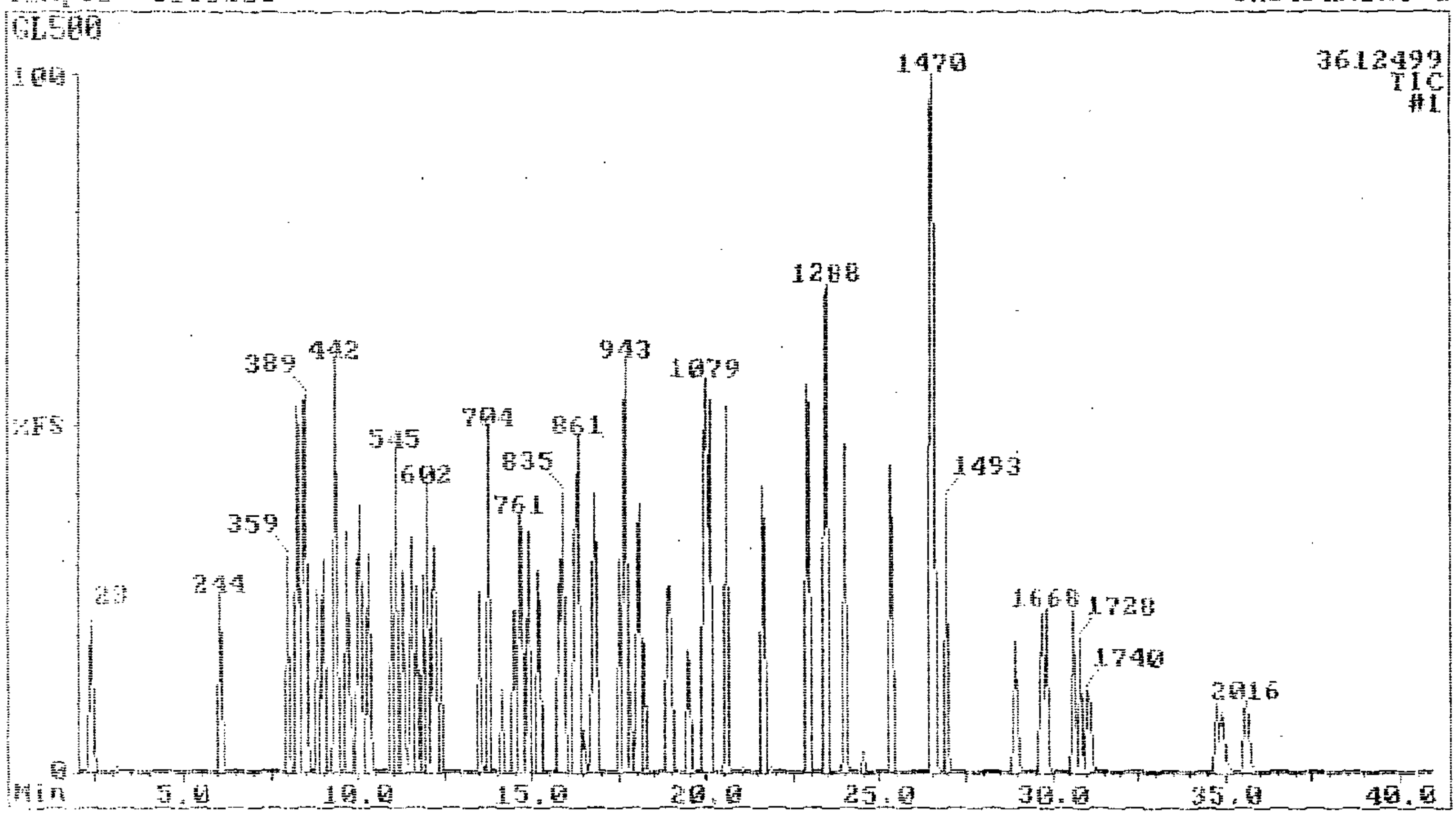
Approved by: [signature] Date 1/5/93

*- Fails QC Criteria for %D; << - Rf less then minimum QC RF; >>- RF greater than maximum QC RF CCAL.EXE v2.5

~ 1/3/97

03-Jan-93 19:23 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: SSTD050 Instrument G

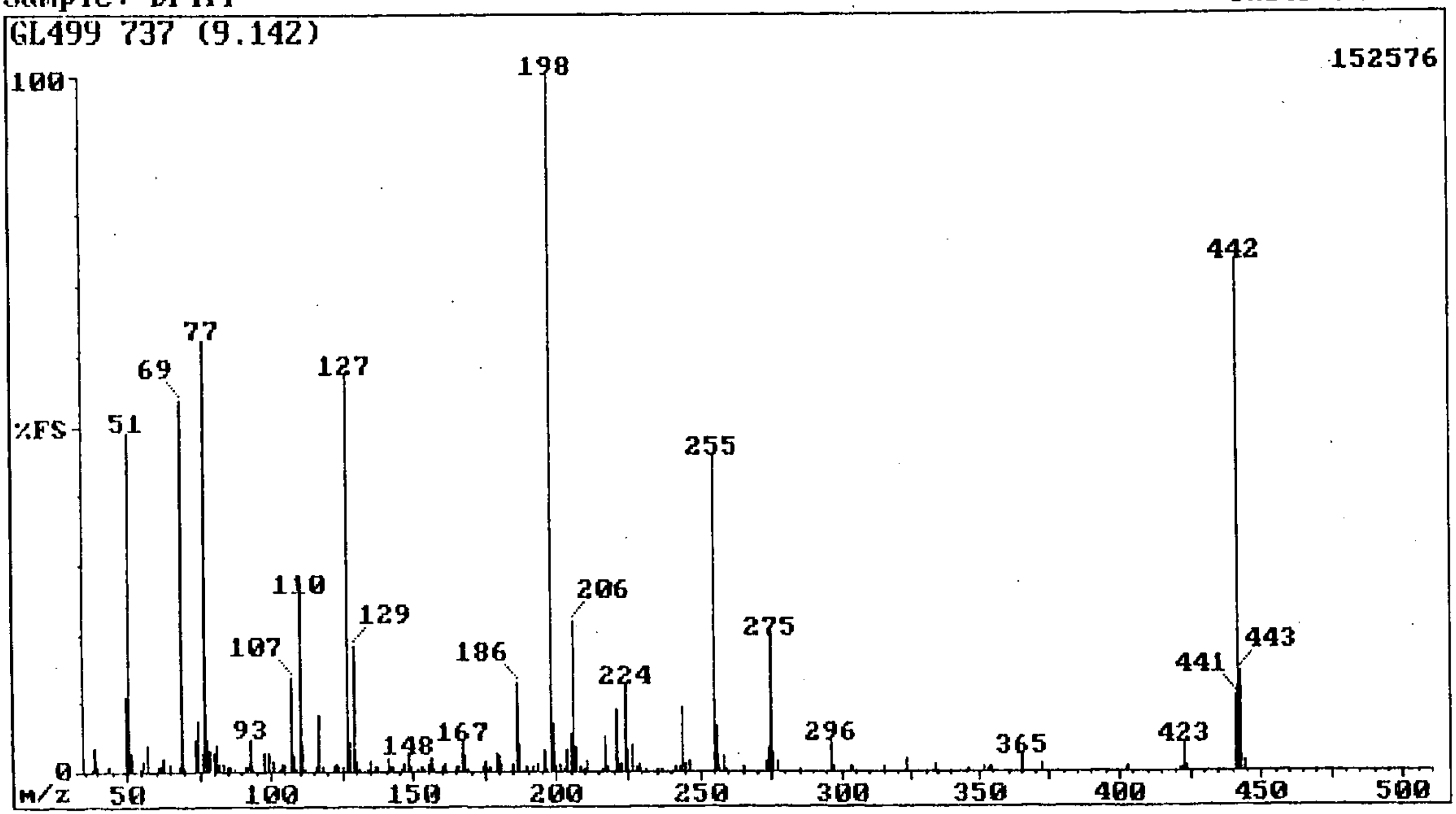


55TD050

[illegible] [illegible] BE-BASE QUAN 03-Jan-93 11:34 ✓ 1/3/93

No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	85	100	-1	305790	bb	419	152	1,4-Dichlorobenzene-d4
2	100	86	93	1	1287900	bb	599	136	Naphthalene-d8
3	100	93	98	-1	712780	bb	856	164	Acenaphthene-d10
4	100	91	96	-1	1491100	bv	1076	188	Phenanthrene-d10
5	78	49	96	-2	1498800	bb	1470	240	Chrysene-d12
6	100	89	93	0	671400	bb	1740	264	Perylene-d12
7	100	96	97	0	718060	bb	244	112	2-Fluorophenol
8	93	61	99	0	635450	bb	388	132	2-Chlorophenol-d4
9	94	62	99	-1	882900	bv	376	99	Phenol-d5
10	100	95	99	1	377340	bb	440	152	1,2-Dichlorobenzene-d4
11	100	85	99	-1	822920	bb	497	82	Nitrobenzene-d5
12	91	58	99	-1	454030	bb	545	185	1,3,5-Trichlorobenzene-d3
13	100	94	99	0	310990	bb	606	240	1,4-Dibromobenzene-d4
14	100	91	98	0	1025600	bb	761	172	2-Fluorobiphenyl
15	100	80	99	0	185340	bb	973	330	2,4,6-Tribromophenol
16	100	94	96	-1	947030	vb	1084	188	Anthracene-d10
17	100	88	97	0	1997200	bb	1285	212	Pyrene-d10
18	100	88	97	1	1361400	bb	1319	244	Terphenyl-d14
19	100	97	98	0	1610700	bb	602	128	Naphthalene
20	100	89	91	-1	1092700	vb	704	142	2-Methylnaphthalene
21	100	97	99	0	864960	bb	774	162	2-Chloronaphthalene
22	100	94	97	1	1496600	bb	835	152	Acenaphthylene
23	100	88	90	0	852700	vb	861	154	Acenaphthene
24	100	90	98	0	1051000	bb	938	166	Fluorene
25	100	85	99	-1	202210	bb	1049	266	Pentachlorophenol
26	100	93	97	-1	1716600	bv*	1079	178	Phenanthrene
27	100	94	98	-1	1759100	vb	1087	178	Anthracene
28	100	96	99	-2	2078800	bb	1255	202	Fluoranthene
29	100	95	99	0	2185800	bb	1288	202	Pyrene
30	100	90	99	1	1832600	bv*	1469	228	Benzo(a)anthracene
31	100	93	99	0	1865000	vv	1474	228	Chrysene
32	86	67	71	0	1159500	bv	1662	252	Benzo(b)fluoranthene
33	100	94	97	-2	1500100	vb*	1667	252	Benzo(k)fluoranthene
34	100	95	98	-1	1195800	bv	1717	252	Benzo(e)pyrene
35	100	96	99	-2	1110400	vv	1728	252	Benzo(a)pyrene
36	100	98	99	-1	578120	vb	1745	252	Perylene
37	100	97	100	-1	736080	bv	1966	276	Indeno(1,2,3-cd)pyrene
38	100	94	97	-1	735290	bv	1974	278	Dibenz(a,h)anthracene
39	96	96	99	-3	897850	bv	2016	276	Benzo(g,h,i)perylene

03-Jan-93 18:54 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: DFTPP Instrument G



Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int
	38	504	0.33	34	94	716	0.47	67	147	1696	1.11	100	200	1248	0.82	133	259	648	0.42
2	39	5184	3.40	35	98	4416	2.89	68	148	3360	2.20	101	201	1520	1.00	134	263	1392	0.91
3	40	928	0.61	36	99	4288	2.81	69	149	900	0.59	102	203	740	0.49	135	273	2320	1.52
4	44	1056	0.69	37	101	2560	1.68	70	151	692	0.45	103	204	4864	3.19	136	274	5632	3.69
5	50	16640	10.91	38	103	864	0.57	71	153	968	0.63	104	205	8576	5.62	137	275	29952	19.63
6	51	74752	48.99	39	104	1584	1.04	72	154	828	0.54	105	206	33280	21.81	138	276	4080	2.67
7	52	4160	2.73	40	105	1504	0.99	73	155	1856	1.22	106	207	5056	3.31	139	277	2352	1.54
8	55	840	0.55	41	107	20992	13.76	74	156	3088	2.02	107	208	1296	0.85	140	295	688	0.45
9	56	2454	1.61	42	108	3360	2.20	75	157	712	0.47	108	210	724	0.47	141	296	6784	4.45
10	57	5696	3.73	43	109	648	0.42	76	160	904	0.59	109	211	2096	1.37	142	297	1104	0.72
11	61	956	0.63	44	110	39168	25.67	77	161	1696	1.11	110	216	680	0.45	143	303	1040	0.68
12	62	1016	0.67	45	111	5824	3.82	78	165	1168	0.77	111	217	7808	5.12	144	315	904	0.59
13	63	2752	1.80	46	112	836	0.55	79	166	964	0.63	112	218	1248	0.82	145	323	2976	1.95
14	65	1872	1.23	47	116	1200	0.79	80	167	6464	4.24	113	221	13888	9.10	146	334	1872	1.23
15	68	1083	0.71	48	117	12608	8.26	81	168	3760	2.46	114	222	1920	1.26	147	346	796	0.52
16	69	81920	53.69	49	118	1312	0.86	82	169	648	0.42	115	223	2064	1.35	148	352	1040	0.68
17	70	765	0.50	50	122	1328	0.87	83	174	1136	0.74	116	224	18944	12.42	149	353	708	0.46
18	74	7104	4.66	51	123	1984	1.30	84	175	2464	1.61	117	225	4800	3.15	150	354	1104	0.72
19	75	11456	7.51	52	124	996	0.65	85	176	836	0.55	118	227	6208	4.07	151	365	3376	2.21
20	76	4160	2.73	53	125	1004	0.66	86	177	1120	0.73	119	228	960	0.63	152	372	1696	1.11
21	77	95232	62.42	54	127	87040	57.05	87	179	3920	2.57	120	229	1712	1.12	153	402	640	0.42
22	78	7168	4.70	55	128	6464	4.24	88	180	3360	2.20	121	231	812	0.53	154	403	896	0.59
23	79	4928	3.23	56	129	27904	18.29	89	181	1616	1.06	122	235	676	0.44	155	421	772	0.51
24	80	3904	2.56	57	130	2592	1.70	90	185	2032	1.33	123	237	692	0.45	156	422	780	0.51
25	81	5696	3.73	58	131	688	0.45	91	186	19712	12.92	124	242	1088	0.71	157	423	5952	3.90
	82	1744	1.14	59	134	856	0.56	92	187	5760	3.78	125	243	956	0.63	158	424	1264	0.83
27	83	1936	1.27	60	135	2336	1.53	93	189	948	0.62	126	244	14144	9.27	159	441	16384	10.74
28	85	1168	0.77	61	136	988	0.65	94	192	1392	0.91	127	245	2000	1.31	160	442	111616	73.15
29	86	1328	0.87	62	137	1472	0.96	95	193	1584	1.04	128	246	2240	1.47	161	443	21760	14.26
30	87	784	0.51	63	141	3072	2.01	96	196	4544	2.98	129	255	69632	45.64	162	444	2400	1.57
31	91	1152	0.76	64	142	1200	0.79	97	197	784	0.51	130	256	10176	6.67				
32	92	1200	0.79	65	143	900	0.59	98	198	152576	100.00	131	257	940	0.62				
33	93	7040	4.61	66	146	724	0.47	99	199	10688	7.01	132	258	3328	2.18				

DFTPP TUNE CHECK REPORT

Raw Data File: 01A99
Date: 05-Jan-95
Time: 10:54

M/E	ION ABUNDANCE CRITERIA	RELATIVE ABUNDANCE	TUNE
51	30.0 - 60.0% of mass 198	48.99	PASS
68	Less than 2.0% of mass 69	0.71(1.3)1	PASS
69	Mass 69 relative abundance	53.69	PASS
70	Less then 2.0% of mass 69	0.50(0.9)1	PASS
127	40.0 - 60.0% of mass 198	57.05	PASS
197	Less than 1% of mass 198	0.51	PASS
198	Base peak, 100% relative abundance	100.00	PASS
199	5 - 9% of mass 198	7.01	PASS
275	10 - 30% of mass 198	19.63	PASS
365	Greater than 1% of mass 198	2.21	PASS
441	Present, but less then mass 443	10.74	PASS
442	Greater than 40% of mass 198	73.15	PASS
443	17 - 23% of mass 442	14.26(19.5)2	PASS

Triangle Laboratories of RTP, Inc.
Initial Calibration Curve

ICAL File: ICALGD30 Date of Analysis :12/30/92 Analyte List: PAH
RF20 GL462 RF50 GL467 RF80 GL463
RF120 GL464 RF160 GL465

Analyte	Flag	RF20	RF50	RF80	RF120	RF160	RFMEAN	%RSD
1,4-Dichlorobenzene-d4	I							
Naphthalene-d8	I							
2-Methylnaphthalene		0.591	0.449	0.472	0.472	0.484	0.493	11.3
Naphthalene		0.782	0.574	0.600	0.590	0.573	0.624	14.3
Acenaphthene-d10	I							
Acenaphthene	C	0.722	0.578	0.573	0.581	0.593	0.609	10.4
Fluorene		0.920	0.745	0.761	0.758	0.766	0.790	9.3
2-Chloronaphthalene		0.778	0.600	0.625	0.625	0.645	0.655	10.8
Acenaphthylene		1.219	1.001	0.987	0.994	0.959	1.032	10.2
Phenanthrene-d10	I							
Phenanthrene		0.694	0.552	0.553	0.507	0.478	0.557	14.9
Anthracene		0.695	0.568	0.567	0.498	0.468	0.559	15.7
Fluoranthene	C	0.769	0.653	0.648	0.590	0.535	0.639	13.6
Chrysene-d12	I							
Chrysene		0.705	0.539	0.562	0.554	0.524	0.577	12.7
Pyrene		0.948	0.759	0.791	0.621	0.519	0.727	22.6
Benzo(a)anthracene		0.687	0.576	0.597	0.575	0.560	0.599	8.5
Perylene-d12	I							
Benzo(b)fluoranthene		0.644	0.709	0.734	0.835	0.882	0.761	12.7
Benzo(k)fluoranthene		1.200	0.870	0.966	0.942	0.904	0.977	13.4
Benzo(e)pyrene		0.740	0.691	0.745	0.794	0.831	0.760	7.1
Benzo(a)pyrene	C	0.770	0.666	0.728	0.764	0.780	0.742	6.3
Perylene		0.670	0.395	0.431	0.431	0.393	0.464	25.1
Indeno(1,2,3-cd)pyrene		0.478	0.612	0.668	0.763	0.875	0.679	22.2
Dibenz(a,h)anthracene		0.286	0.446	0.477	0.566	0.649	0.485	28.2
Benzo(g,h,i)perylene		0.459	0.540	0.601	0.659	0.718	0.595	16.9

Surrogate	Flag	RF20	RF50	RF80	RF120	RF160	RFMEAN	%RSD
Anthracene-d10	S	0.362	0.301	0.315	0.309	0.316	0.321	7.5
Pyrene-d10	S	0.823	0.672	0.753	0.655	0.575	0.695	13.7

Approved by: J Lyon Date 1/5/93

*- Fails QC Criteria for %RSD; << - Rf less then minimum QC RF; >>- RF greater than maximum QC RF ICAL.EXE v2.5

Triangle Laboratories of RTP, Inc.
Continuing Calibration Curve

CCAL File: GL467 Date of Analysis :12/30/92 Analyte List: PAH
ICAL File: ICALGD30

Analyte	Flag	RF50	RFMEAN	%D
1,4-Dichlorobenzene-d4	I			
Naphthalene-d8	I			
2-Methylnaphthalene		0.449	0.493	8.9
Naphthalene		0.574	0.624	8.0
Acenaphthene-d10	I			
Acenaphthene	C	0.578	0.609	5.1
Fluorene		0.745	0.790	5.7
2-Chloronaphthalene		0.600	0.655	8.4
Acenaphthylene		1.001	1.032	3.0
Phenanthrene-d10	I			
Phenanthrene		0.552	0.557	0.9
Anthracene		0.568	0.559	-1.6
Fluoranthene	C	0.653	0.639	-2.2
Chrysene-d12	I			
Chrysene		0.539	0.577	6.6
Pyrene		0.759	0.727	-4.4
Benzo(a)anthracene		0.576	0.599	3.8
Perylene-d12	I			
Benzo(b)fluoranthene		0.709	0.761	6.8
Benzo(k)fluoranthene		0.870	0.977	11.0
Benzo(e)pyrene		0.691	0.760	9.1
Benzo(a)pyrene	C	0.666	0.742	10.2
Perylene		0.395	0.464	14.9
Indeno(1,2,3-cd)pyrene		0.612	0.679	9.9
Dibenz(a,h)anthracene		0.446	0.485	8.0
Benzo(g,h,i)perylene		0.540	0.595	9.2

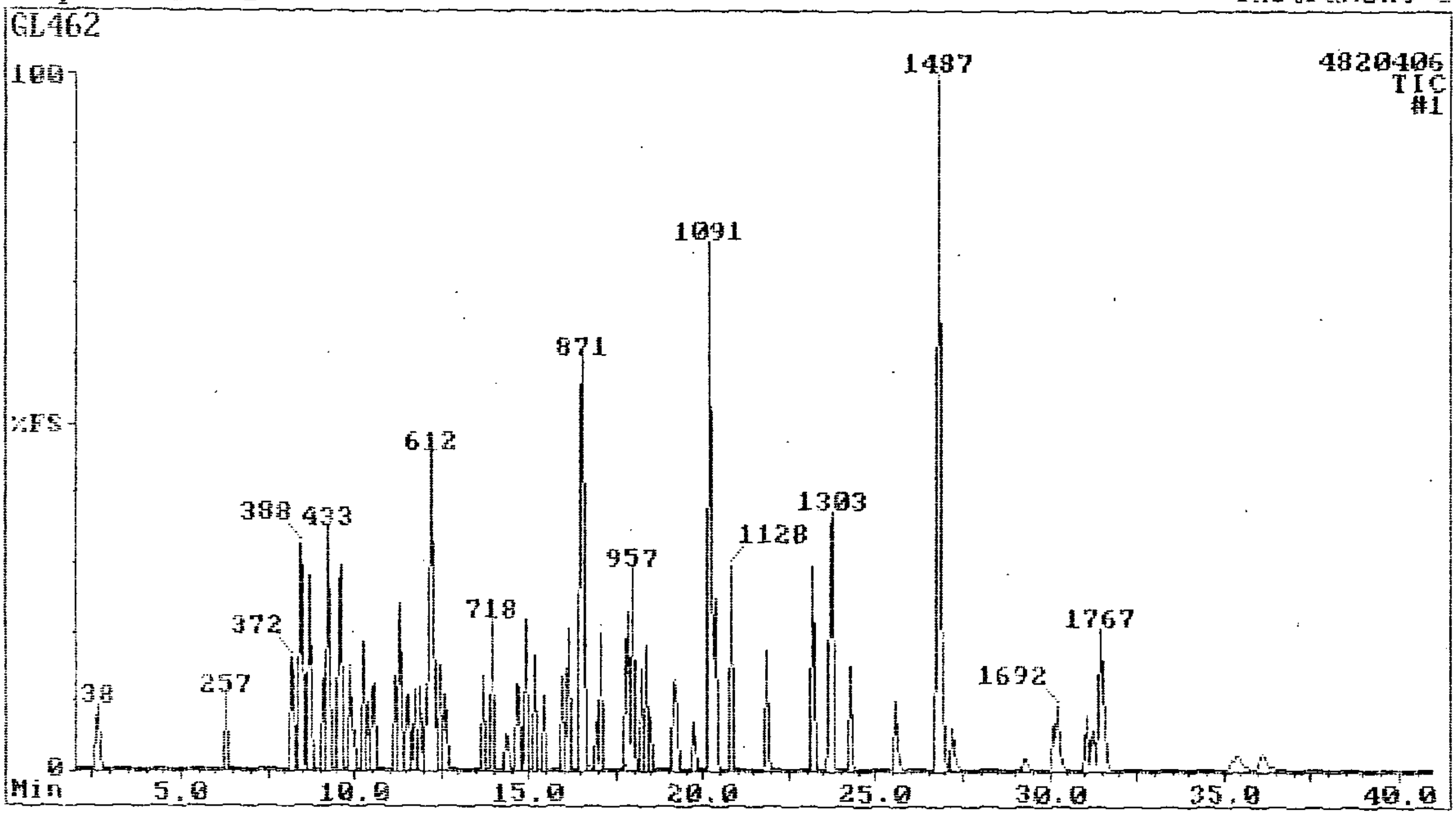
Surrogate	Flag	RF50	RFMEAN	%D
Anthracene-d10	S	0.301	0.321	6.2
Pyrene-d10	S	0.672	0.695	3.3

Approved by: J Lyon Date 1/5/93

*- Fails QC Criteria for %D; << - Rf less then minimum QC RF; >>- RF greater than maximum QC RF CCAL.EXE v2.5

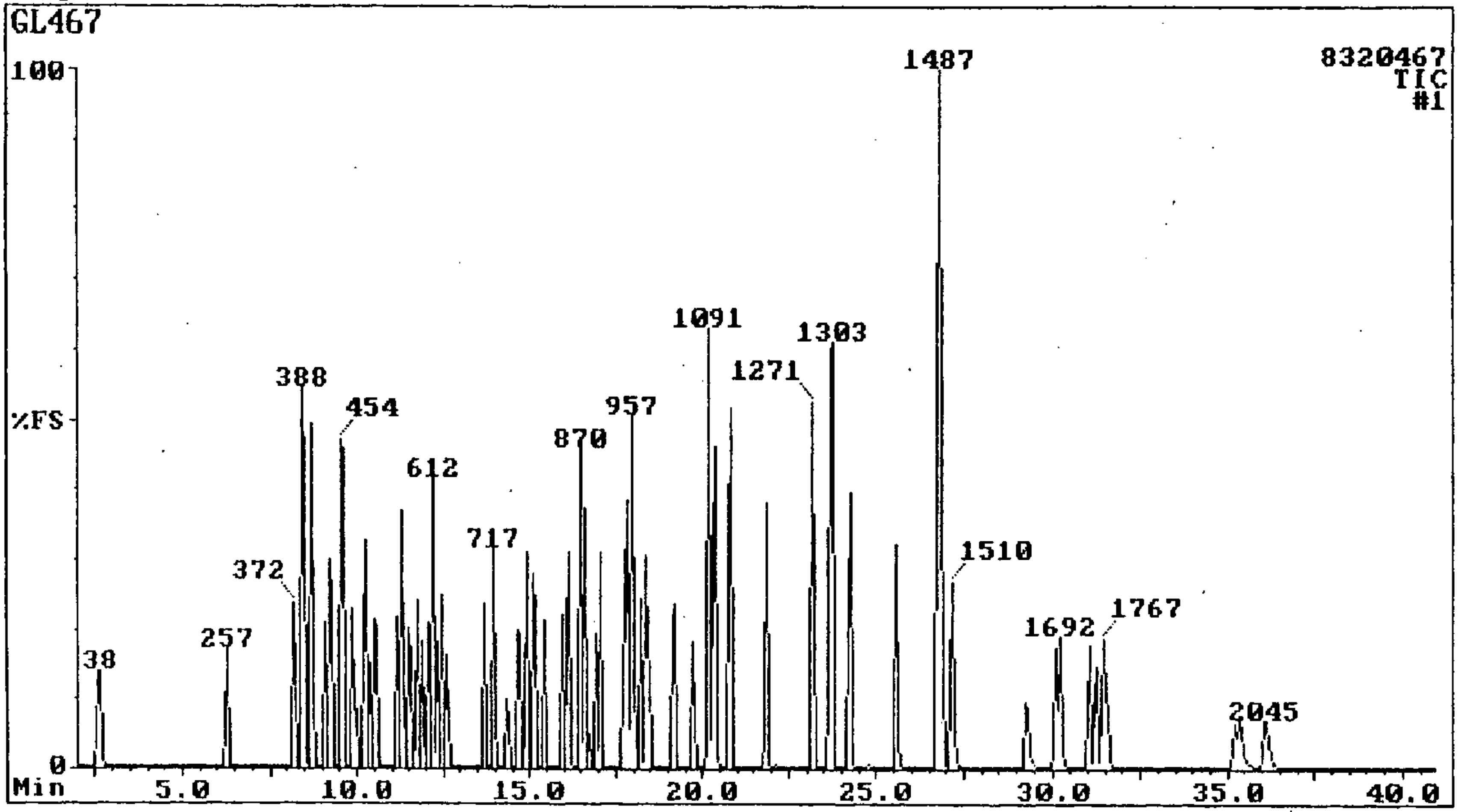
30-Dec-92 08:13 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: SSTD020 Instrument G



No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	82	99	1	605760	bb	433	152	1,4-Dichlorobenzene-d4
2	100	89	94	0	2338500	bb	612	136	Naphthalene-d8
3	100	95	99	1	1642400	bb	871	164	Acenaphthene-d10
4	100	90	97	0	3708600	bv	1091	188	Phenanthrene-d10
5	97	69	98	-1	3466100	bv	1487	240	Chrysene-d12
6	100	88	98	-1	1596700	bv	1767	264	Perylene-d12
7	100	96	98	0	307160	bb	257	112	2-Fluorophenol
8	86	41	97	0	354030	bb	401	132	2-Chlorophenol-d4
9	86	52	96	-1	379160	bb	388	99	Phenol-d5
10	100	89	98	0	284160	bb	453	152	1,2-Dichlorobenzene-d4
11	100	83	99	0	352780	bb	510	82	Nitrobenzene-d5
12	100	64	97	0	348400	bb	559	185	1,3,5-Trichlorobenzene-d3
13	100	93	98	0	204100	bb	620	240	1,4-Dibromobenzene-d4
14	100	91	98	0	762820	bb	775	172	2-Fluorobiphenyl
15	100	81	99	-1	93724	bb	987	330	2,4,6-Tribromophenol
16	100	86	97	0	672030	vb*	1099	188	Anthracene-d10
17	100	85	97	0	1426300	bb	1301	212	Pyrene-d10
18	100	89	98	0	720310	bb	1334	244	Terphenyl-d14
19	100	95	98	0	914460	bb	615	128	Naphthalene
20	100	88	90	0	690750	bb	718	142	2-Methylnaphthalene
21	100	96	98	0	639110	bb	788	162	2-Chloronaphthalene
22	100	94	97	0	1001000	bb	849	152	Acenaphthylene
23	100	86	88	0	592620	vb	875	154	Acenaphthene
24	100	93	98	0	755790	bb	952	166	Fluorene
25	100	84	98	0	92748	bv	1064	266	Pentachlorophenol
26	100	93	98	0	1287500	bv	1094	178	Phenanthrene
27	100	95	98	-1	1289400	vb*	1101	178	Anthracene
28	100	95	99	0	1426100	bb	1271	202	Fluoranthene
29	100	91	98	-1	1642600	bb	1303	202	Pyrene
30	86	62	75	0	1189700	bv	1486	228	Benzo(a)anthracene
31	97	75	92	-1	1222400	vv	1491	228	Chrysene
32	81	68	71	-1	514370	b!✓ JMO 12-30-92	1686	252	Benzo(b)fluoranthene
33	100	92	97	-1	958380	!v✓	1692	252	Benzo(k)fluoranthene
34	100	94	98	-1	590460	bv	1743	252	Benzo(e)pyrene
35	100	94	97	-1	614730	vv	1754	252	Benzo(a)pyrene
36	91	69	77	0	534550	vv	1773	252	Perylene
37	98	76	92	-1	381320	M	1993	276	Indeno(1,2,3-cd)pyrene
38	95	75	88	-1	228260	A	2002	278	Dibenz(a,h)anthracene
39	93	80	94	-2	366580	bv	2046	276	Benzo(g,h,i)perylene

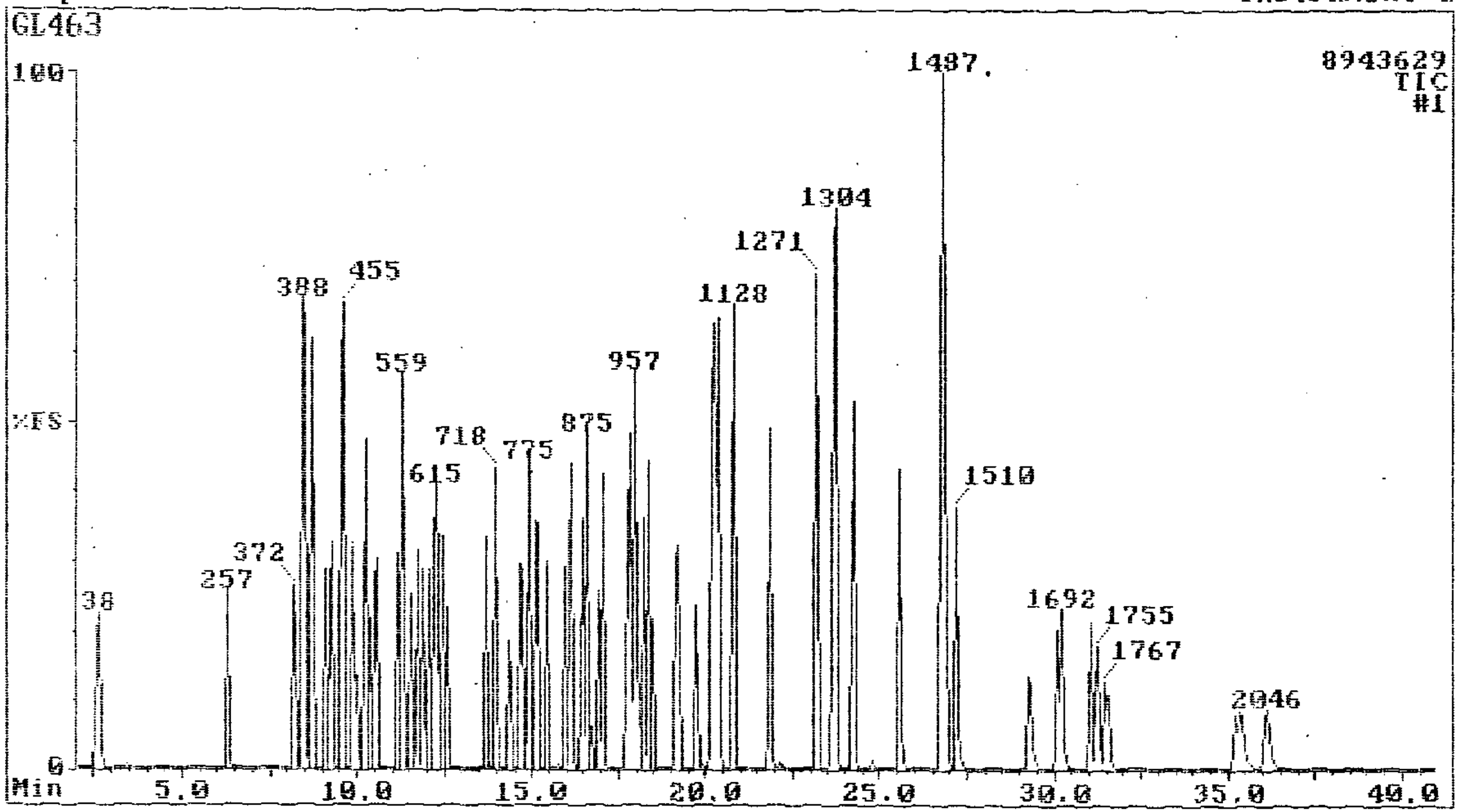
30-Dec-92 11:55 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: SSTD050 Instrument G



No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	78	99	1	882830	bb	433	152	1,4-Dichlorobenzene-d4
2	100	85	93	0	3297000	bv	612	136	Naphthalene-d8
3	100	95	99	0	2183300	bb	870	164	Acenaphthene-d10
4	100	90	97	-1	5186300	bv	1090	188	Phenanthrene-d10
5	88	56	96	-1	4784200	bv	1487	240	Chrysene-d12
6	100	85	93	-1	2429100	bv	1767	264	Perylene-d12
7	100	95	97	0	933830	bb	257	112	2-Fluorophenol
8	84	46	98	0	959140	bb	401	132	2-Chlorophenol-d4
9	85	50	97	-1	1234900	bb	388	99	Phenol-d5
10	100	80	94	0	729440	bb	453	152	1,2-Dichlorobenzene-d4
11	100	83	99	0	1237100	bb	510	82	Nitrobenzene-d5
12	98	59	98	0	852670	bb	559	185	1,3,5-Trichlorobenzene-d3
13	100	92	98	0	540100	bb	620	240	1,4-Dibromobenzene-d4
14	100	90	98	0	1905000	bb	775	172	2-Fluorobiphenyl
15	100	80	99	-1	371440	bb	987	330	2,4,6-Tribromophenol
16	100	83	96	0	1949800	vb	1099	188	Anthracene-d10
17	100	85	97	0	4016200	bb	1301	212	Pyrene-d10
18	100	86	97	0	2578100	bb	1334	244	Terphenyl-d14
19	100	96	99	0	2364900	bb	615	128	Naphthalene
20	100	89	91	-1	1848900	bb	717	142	2-Methylnaphthalene
21	100	96	98	0	1638500	bb	788	162	2-Chloronaphthalene
22	100	94	97	0	2732300	bb	849	152	Acenaphthylene
23	100	88	90	0	1576600	vb	875	154	Acenaphthene
24	100	96	99	0	2032500	bb	952	166	Fluorene
25	100	85	99	-1	453910	bv	1063	266	Pentachlorophenol
26	100	93	98	0	3581700	bv*	1094	178	Phenanthrene
27	100	94	98	0	3684800	vv*	1102	178	Anthracene
28	100	95	99	0	4231300	bv	1271	202	Fluoranthene
29	100	93	99	-1	4536900	vv	1303	202	Pyrene
30	100	85	97	0	3446200	bv	1486	228	Benzo(a)anthracene
31	100	89	99	-1	3222900	vv	1491	228	Chrysene
32	81	67	72	-1	2151900	bv	1686	252	Benzo(b)fluoranthene
33	100	92	97	-1	2643000	vv	1692	252	Benzo(k)fluoranthene
34	100	93	98	-1	2098300	vv	1743	252	Benzo(e)pyrene
35	100	94	99	-1	2023500	vv	1754	252	Benzo(a)pyrene
36	100	89	96	0	1198900	vv	1773	252	Perylene
37	100	94	100	-2	1857500	b?✓	1992	276	Indeno(1,2,3-cd)pyrene
38	100	90	97	-2	1352900	b?✓	2001	278	Dibenz(a,h)anthracene
39	95	94	99	-3	1639700	bv	2045	276	Benzo(g,h,i)perylene

30-Dec-92 09:02 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: SSTD080 Instrument G

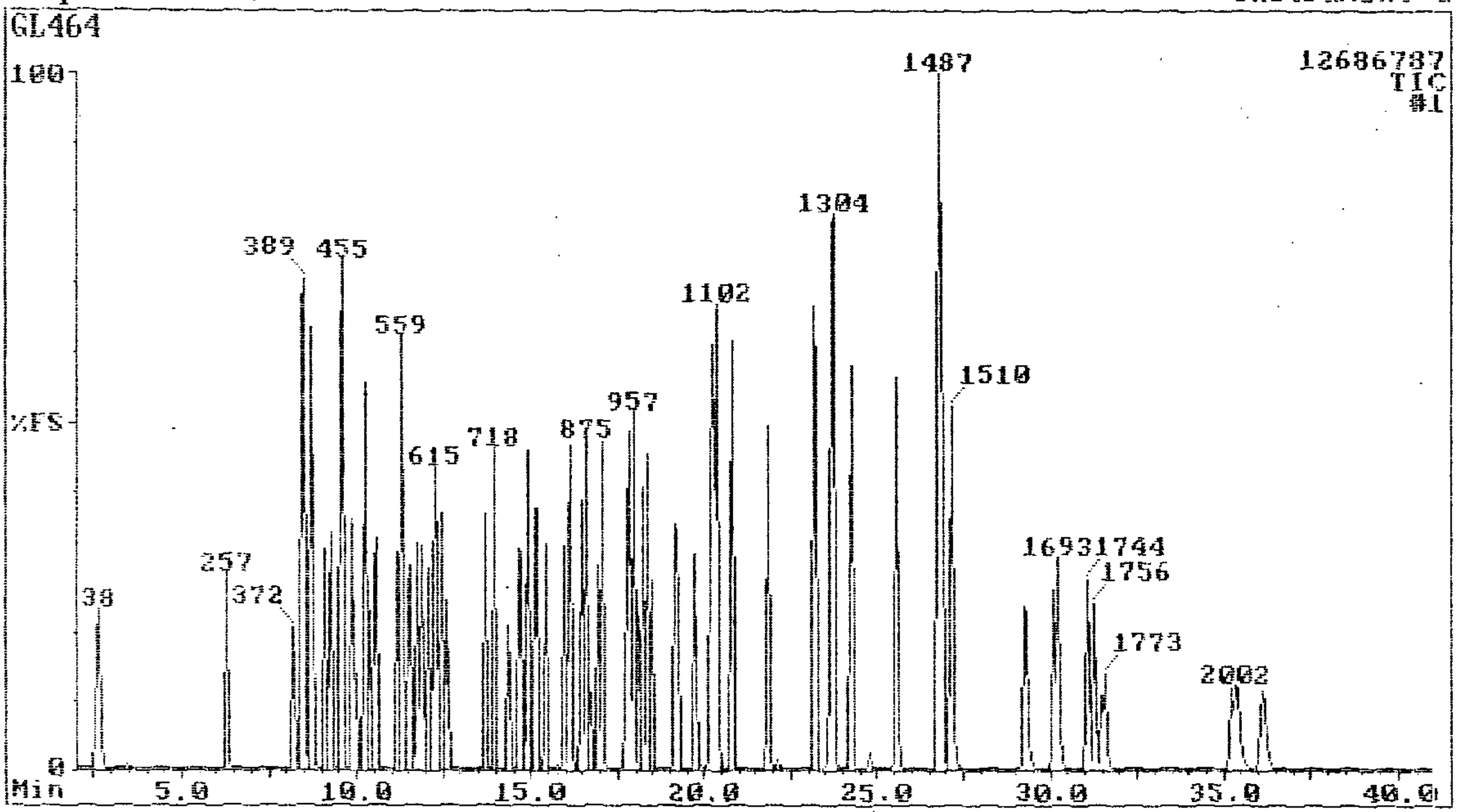


Jmd

No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	76	99	1	764300	bb	433	152	1,4-Dichlorobenzene-d4
[illegible]	100	87	93	0	2708100	bb	612	136	Naphthalene-d8
3	100	95	99	0	2006700	bv	870	164	Acenaphthene-d10
4	100	88	97	0	4760500	bv	1091	188	Phenanthrene-d10
5	96	58	96	-1	4054900	bv	1487	240	Chrysene-d12
6	100	82	93	-1	1814200	bv	1767	264	Perylene-d12
7	100	94	96	0	1161700	bb	257	112	2-Fluorophenol
8	84	39	96	0	1294600	bb	401	132	2-Chlorophenol-d4
9	84	49	95	-1	1518700	bv	388	99	Phenol-d5
10	100	85	96	0	1041500	bb	453	152	1,2-Dichlorobenzene-d4
11	100	82	98	0	1781400	bb	510	82	Nitrobenzene-d5
12	98	59	98	0	1386900	bb	559	185	1,3,5-Trichlorobenzene-d3
13	100	92	98	0	881960	bb	620	240	1,4-Dibromobenzene-d4
14	100	90	98	0	2981600	bb	775	172	2-Fluorobiphenyl
15	100	78	99	-1	468710	bb	987	330	2,4,6-Tribromophenol
16	100	84	96	0	3001400	vv	1099	188	Anthracene-d10
17	100	86	96	0	6102800	bv	1301	212	Pyrene-d10
18	100	86	97	0	3738300	bb	1334	244	Terphenyl-d14
19	100	95	98	0	3251500	bb	615	128	Naphthalene
20	100	89	91	0	2557500	bb	718	142	2-Methylnaphthalene
21	100	95	98	0	2506600	bb	788	162	2-Chloronaphthalene
22	100	93	97	0	3961900	bb	849	152	Acenaphthylene
23	100	88	90	0	2301500	bb	875	154	Acenaphthene
24	100	95	99	0	3052200	vb	952	166	Fluorene
25	100	84	99	0	594490	bv	1064	266	Pentachlorophenol
26	100	93	98	0	5266600	bv*	1094	178	Phenanthrene
27	100	93	98	0	5394700	vb*	1102	178	Anthracene
[illegible]	100	94	99	0	6173200	bb	1271	202	Fluoranthene
29	100	94	99	0	6414000	vv	1304	202	Pyrene
30	100	77	94	0	4844500	bv	1486	228	Benzo(a)anthracene
31	100	89	99	-1	4559800	vv	1491	228	Chrysene
32	83	69	74	-1	2662000	bv	1686	252	Benzo(b)fluoranthene
33	100	92	98	-1	3506200	vv	1692	252	Benzo(k)fluoranthene
34	100	93	98	-1	2702100	bv	1743	252	Benzo(e)pyrene
35	100	94	99	-1	2643100	vv	1754	252	Benzo(a)pyrene
36	100	91	97	0	1564400	vv	1773	252	Perylene
37	100	94	99	-1	2425500	b3 ✓	1993	276	Indeno(1,2,3-cd)pyrene
38	100	88	97	-1	1732500	bv - JMO 12-30-92	2002	278	Dibenz(a,h)anthracene
39	100	94	99	-2	2181100	b? ✓	2046	276	Benzo(g,h,i)perylene

30-Dec-92 09:54 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: SSTD120 Instrument G



No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	99	71	99	1	766540	bb	433	152	1,4-Dichlorobenzene-d4
2	100	87	93	0	2795600	bv	612	136	Naphthalene-d8
3	100	93	99	0	1970900	bv	870	164	Acenaphthene-d10
4	100	86	97	0	4722600	bv	1091	188	Phenanthrene-d10
5	88	46	95	0	4362400	bv	1488	240	Chrysene-d12
6	100	82	93	0	2102900	bv	1768	264	Perylene-d12
7	100	94	96	0	1884100	bb	257	112	2-Fluorophenol
8	84	39	96	0	1982200	bb	401	132	2-Chlorophenol-d4
9	91	49	96	0	2575800	bv	389	99	Phenol-d5
10	100	84	95	0	1561900	bb	453	152	1,2-Dichlorobenzene-d4
11	100	82	98	0	2939500	bb	510	82	Nitrobenzene-d5
12	96	56	98	0	2003500	bb	559	185	1,3,5-Trichlorobenzene-d3
13	100	92	98	0	1325900	bb	620	240	1,4-Dibromobenzene-d4
14	100	90	98	0	4310300	bb	775	172	2-Fluorobiphenyl
15	100	80	99	0	813340	bv	988	330	2,4,6-Tribromophenol
16	100	84	96	0	4382700	vv	1099	188	Anthracene-d10
17	100	86	97	0	8571700	bb	1301	212	Pyrene-d10
18	100	86	97	0	6000300	bv	1334	244	Terphenyl-d14
19	100	95	98	0	4952300	bv	615	128	Naphthalene
20	100	88	91	0	3956800	vb	718	142	2-Methylnaphthalene
21	100	95	98	0	3695300	bb	788	162	2-Chloronaphthalene
22	100	93	97	0	5875400	bb	849	152	Acenaphthylene
23	100	87	90	0	3434300	bv	875	154	Acenaphthene
24	100	95	99	0	4482800	bb	952	166	Fluorene
25	100	82	98	0	1063900	bv	1064	266	Pentachlorophenol
26	100	92	97	0	7180800	bv*	1094	178	Phenanthrene
27	100	93	99	0	7059400	vv*	1102	178	Anthracene
28	100	93	98	0	8357300	bv	1271	202	Fluoranthene
29	100	92	98	0	8125200	bv	1304	202	Pyrene
30	100	81	99	0	7526200	bv	1486	228	Benzo(a)anthracene
31	100	92	99	0	7249100	vv	1492	228	Chrysene
32	89	68	74	0	5265400	bv	1687	252	Benzo(b)fluoranthene
33	100	91	97	0	5940900	v? ✓	1693	252	Benzo(k)fluoranthene
34	100	93	98	0	5011200	vv	1744	252	Benzo(e)pyrene
35	100	94	99	0	4819800	vv	1755	252	Benzo(a)pyrene
36	100	92	99	0	2719800	v? ✓	1773	252	Perylene
37	100	94	99	0	4816000	b? ✓	1994	276	Indeno(1,2,3-cd)pyrene
38	100	90	98	0	3567700	bb	2003	278	Dibenz(a,h)anthracene
39	100	94	99	0	4160600	bv	2048	276	Benzo(g,h,i)perylene

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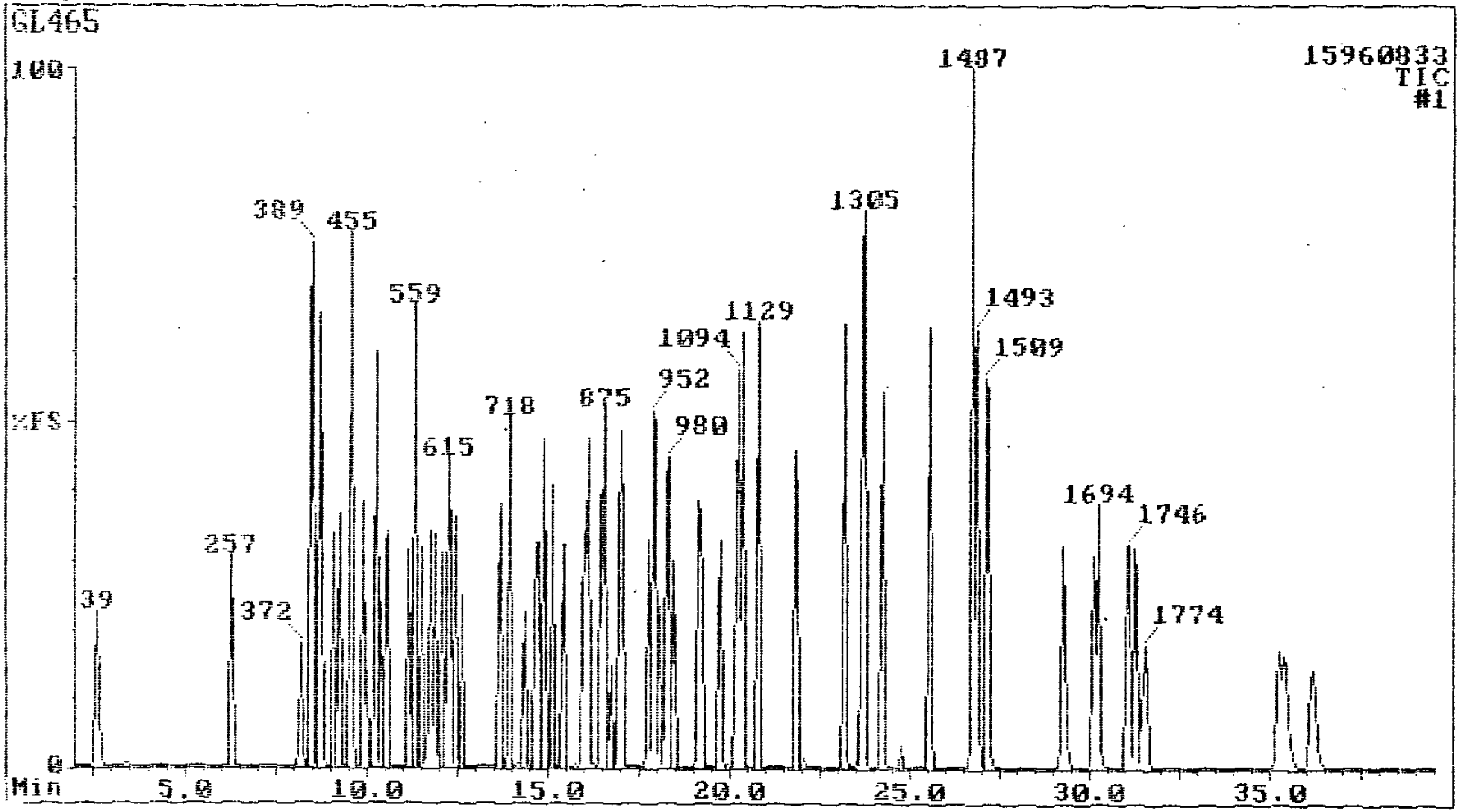
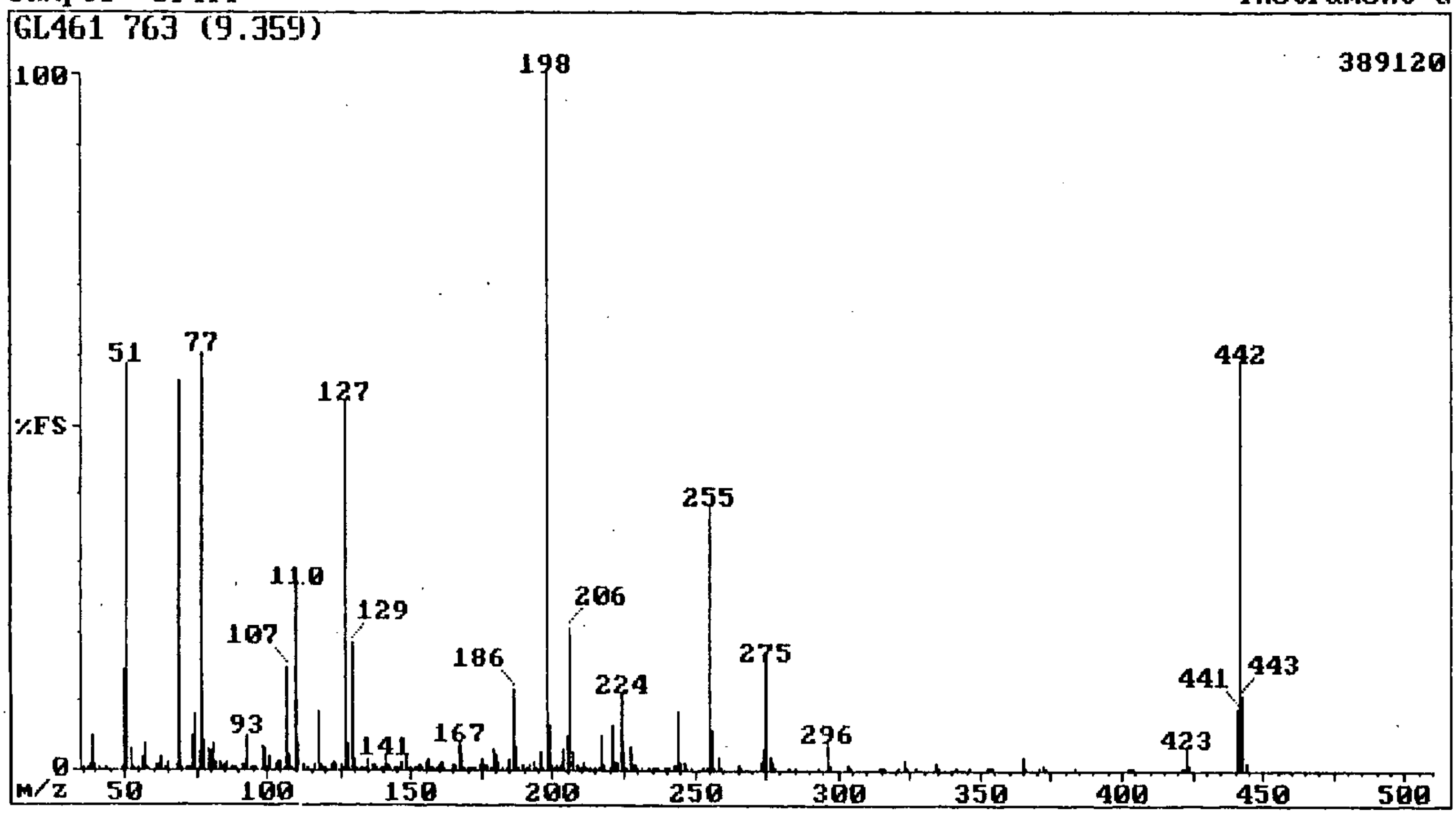
Sample: SSTD160 Instrument G



No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	82	99	1	758980	bb	433	152	1,4-Dichlorobenzene-d4
2	100	86	94	0	2826100	bv	612	136	Naphthalene-d8
3	100	90	98	0	1906200	bv	870	164	Acenaphthene-d10
4	100	87	97	-1	4492300	bv	1090	188	Phenanthrene-d10
5	86	53	95	0	4440200	bv	1488	240	Chrysene-d12
6	100	84	95	1	2587000	vv	1769	264	Perylene-d12
7	100	94	96	0	2789900	bb	257	112	2-Fluorophenol
8	85	40	96	0	2786400	bb	401	132	2-Chlorophenol-d4
9	93	51	97	0	3948100	bv	389	99	Phenol-d5
10	100	83	95	0	2128800	bb	453	152	1,2-Dichlorobenzene-d4
11	100	77	98	1	4036800	bb	511	82	Nitrobenzene-d5
12	95	54	98	0	2583100	bb	559	185	1,3,5-Trichlorobenzene-d3
13	100	91	98	0	1739900	bb	620	240	1,4-Dibromobenzene-d4
14	100	89	98	0	5551900	bb	775	172	2-Fluorobiphenyl
15	100	76	98	0	1248800	bv	988	330	2,4,6-Tribromophenol
16	100	85	97	0	5675000	vb	1099	188	Anthracene-d10
17	100	86	97	1	10205000	vv	1302	212	Pyrene-d10
18	100	85	97	0	7211700	bv	1334	244	Terphenyl-d14
19	100	95	98	0	6481300	bv	615	128	Naphthalene
20	100	88	91	0	5471700	vv	718	142	2-Methylnaphthalene
21	100	95	98	0	4920700	bb	788	162	2-Chloronaphthalene
22	100	93	97	0	7310800	bb	849	152	Acenaphthylene
23	100	88	90	0	4524100	bv	875	154	Acenaphthene
24	100	91	97	0	5841900	bv	952	166	Fluorene
25	100	82	98	0	1469400	bv	1064	266	Pentachlorophenol
26	100	91	97	0	8596200	bv*	1094	178	Phenanthrene
27	100	92	98	0	8404800	vv*	1102	178	Anthracene
28	100	92	97	0	9614400	vv	1271	202	Fluoranthene
29	100	90	96	1	9222100	bv	1305	202	Pyrene
30	100	82	99	0	9945500	bv	1486	228	Benzo(a)anthracene
31	100	91	98	1	9301300	vv	1493	228	Chrysene
32	81	67	73	1	9129500	b!	1688	252	Benzo(b)fluoranthene
33	100	91	97	1	9354000	vv	1694	252	Benzo(k)fluoranthene
34	100	92	98	1	8601700	bv	1745	252	Benzo(e)pyrene
35	100	93	99	2	8073700	vv	1757	252	Benzo(a)pyrene
36	100	93	99	1	4063300	vv	1774	252	Perylene
37	100	93	99	2	9050200	b?	1996	276	Indeno(1,2,3-cd)pyrene
38	100	89	98	1	6710900	bb	2004	278	Dibenz(a,h)anthracene
39	100	94	99	2	7424800	bv	2050	276	Benzo(g,h,i)perylene

30-Dec-92 07:56 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: DFTPP Instrument G



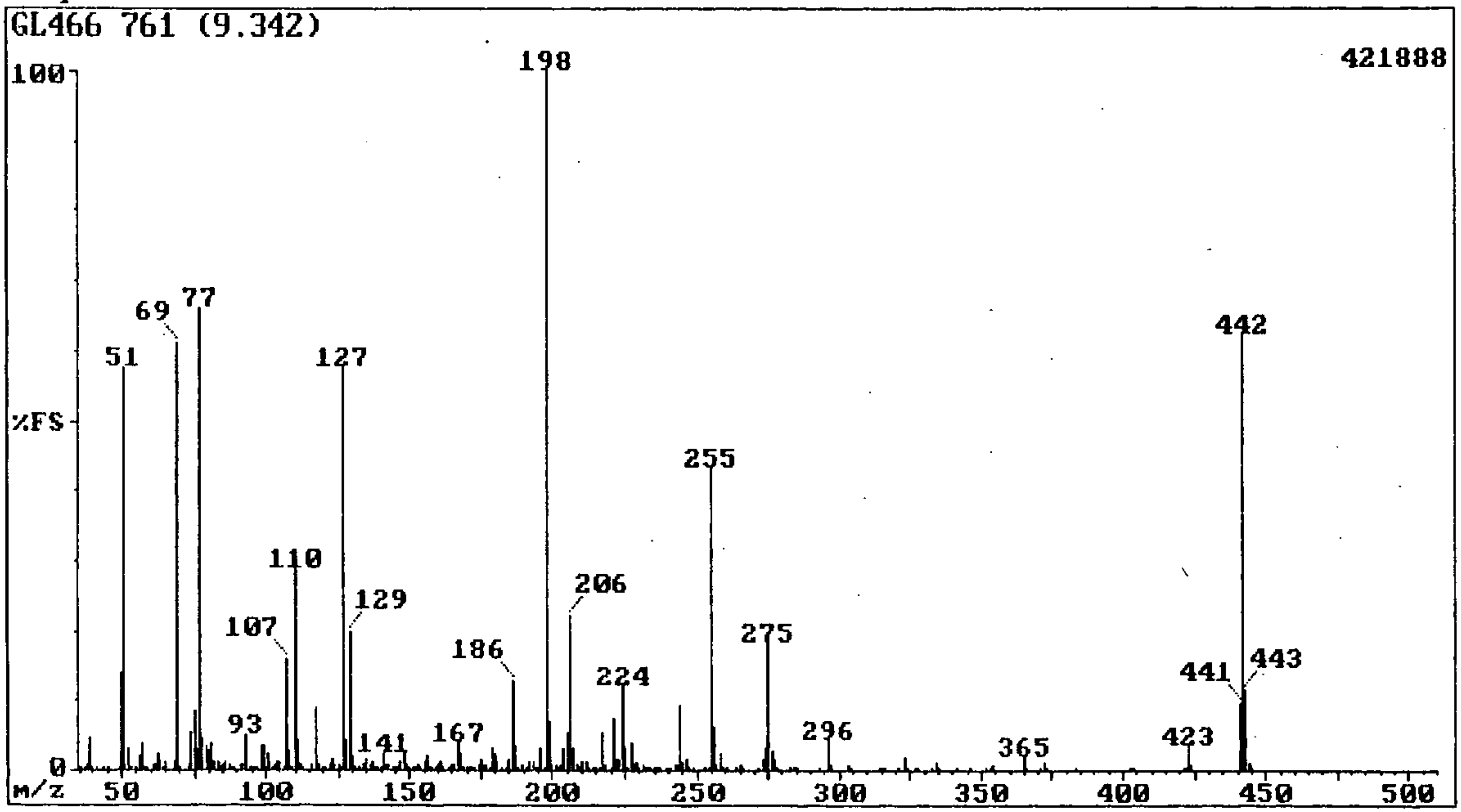
Pk#	mass	Abs Int	Rel Int	Pk#	mass	Abs Int	Rel Int	Pk#	mass	Abs Int	Rel Int	Pk#	mass	Abs Int	Rel Int	Pk#	mass	Abs Int	Rel Int
1	36	1440	0.37	49	96	1328	0.34	97	149	2240	0.58	145	202	3008	0.77	193	258	7424	1.91
2	37	1136	0.29	50	98	13440	3.45	98	150	792	0.20	146	202	676	0.17	194	259	1536	0.39
3	38	1196	0.31	51	99	12224	3.14	99	151	1440	0.37	147	203	2816	0.72	195	265	2880	0.74
4	39	19200	4.93	52	100	1296	0.33	100	152	876	0.23	148	204	12288	3.16	196	266	744	0.19
5	40	2384	0.61	53	101	7296	1.39	101	153	2624	0.67	149	205	20224	5.20	197	273	4864	1.25
6	41	812	0.21	54	103	2368	0.61	102	154	2176	0.56	150	206	79872	20.53	198	274	11392	2.93
7	44	1680	0.43	55	104	4224	1.09	103	155	4928	1.27	151	207	10944	2.81	199	275	60672	15.59
8	49	1712	0.44	56	105	3824	0.98	104	156	6784	1.74	152	208	3136	0.81	200	276	8064	2.07
9	50	56320	14.47	57	106	1792	0.46	105	157	1648	0.42	153	209	1408	0.36	201	277	4544	1.17
10	51	228352	58.68	58	107	58112	14.93	106	158	1824	0.47	154	210	2128	0.55	202	278	1056	0.27
11	52	12672	3.26	59	108	9216	2.37	107	159	1408	0.36	155	211	4800	1.23	203	283	800	0.21
12	53	928	0.24	60	109	1824	0.47	108	160	2752	0.71	156	212	1408	0.36	204	285	1232	0.32
13	55	1296	0.33	61	110	103424	26.58	109	161	4032	1.04	157	213	748	0.19	205	293	1360	0.35
14	56	6912	1.78	62	111	15872	4.08	110	162	1504	0.39	158	215	1344	0.35	206	296	14784	3.80
15	57	14848	3.82	63	112	2592	0.67	111	165	2656	0.68	159	216	1872	0.48	207	297	2352	0.60
16	58	1104	0.28	64	113	1120	0.29	112	166	2368	0.61	160	217	19712	5.07	208	303	2320	0.60
17	61	2480	0.64	65	116	3408	0.88	113	167	14848	3.82	161	218	3088	0.79	209	304	680	0.17
18	62	3056	0.79	66	117	33792	8.68	114	168	9024	2.32	162	220	732	0.19	210	314	894	0.23
19	63	7680	1.97	67	118	3216	0.83	115	169	1680	0.43	163	221	26112	6.71	211	315	1760	0.45
20	64	1328	0.34	68	119	764	0.20	116	170	900	0.23	164	222	4928	1.27	212	316	1168	0.30
21	65	4672	1.20	69	120	1072	0.28	117	171	848	0.22	165	223	4928	1.27	213	321	764	0.20
22	68	2992	0.77	70	122	3232	0.83	118	172	1376	0.35	166	224	41984	10.79	214	323	6400	1.64
23	69	220160	56.58	71	123	5056	1.30	119	173	2128	0.55	167	225	10752	2.76	215	324	1216	0.31
24	70	1840	0.47	72	124	2576	0.66	120	174	3184	0.82	168	226	1472	0.38	216	327	1072	0.28
25	71	1120	0.29	73	125	2448	0.63	121	175	6336	1.63	169	227	14208	3.65	217	334	3936	1.01
26	72	780	0.20	74	126	916	0.24	122	176	2384	0.61	170	228	2352	0.60	218	335	1104	0.28
27	73	1376	0.35	75	127	206848	53.16	123	177	3152	0.81	171	229	3552	0.91	219	341	688	0.18
28	74	19456	5.00	76	128	15552	4.00	124	178	1024	0.26	172	230	784	0.20	220	346	1200	0.31
29	75	31232	8.03	77	129	70656	18.16	125	179	11904	3.06	173	231	2256	0.58	221	352	1824	0.47
30	76	11200	2.88	78	130	6464	1.66	126	180	8640	2.22	174	234	1168	0.30	222	353	1344	0.35
31	77	234496	60.26	79	131	1888	0.49	127	181	4480	1.15	175	235	1360	0.35	223	354	1936	0.50
32	78	17408	4.47	80	132	904	0.23	128	182	732	0.19	176	236	1104	0.28	224	365	7360	1.89
33	79	11904	3.06	81	133	832	0.21	129	184	1008	0.26	177	237	1568	0.40	225	366	988	0.25
34	80	10496	2.70	82	134	2064	0.53	130	185	5888	1.51	178	239	848	0.22	226	371	728	0.19
35	81	14720	3.78	83	135	5312	1.37	131	186	45824	11.78	179	240	772	0.20	227	372	3360	0.86
36	82	4224	1.09	84	136	2672	0.69	132	187	13120	3.37	180	241	776	0.20	228	373	820	0.21
37	83	4288	1.10	85	137	3504	0.90	133	188	1472	0.38	181	242	2496	0.64	229	383	872	0.22
38	84	1088	0.28	86	138	1072	0.28	134	189	2384	0.61	182	243	2288	0.59	230	402	1200	0.31
39	85	2416	0.62	87	139	1296	0.33	135	191	1280	0.33	183	244	32768	8.42	231	403	1936	0.50
40	86	3984	1.02	88	140	844	0.22	136	192	3776	0.97	184	245	4416	1.13	232	404	684	0.18
41	87	2208	0.57	89	141	7936	2.04	137	193	4032	1.04	185	246	5120	1.32	233	421	1456	0.37
42	88	1264	0.32	90	142	2992	0.77	138	194	980	0.25	186	247	1504	0.39	234	422	1520	0.39
43	89	1120	0.29	91	143	2224	0.57	139	196	11264	2.89	187	249	1296	0.33	235	423	11712	3.01
44	91	3344	0.86	92	144	808	0.21	140	197	1584	0.41	188	253	712	0.18	236	424	2496	0.64
45	92	3200	0.82	93	145	876	0.23	141	198	389120	100.00	189	254	760	0.20	237	441	35328	9.08
46	93	19200	4.93	94	146	1728	0.44	142	199	26112	6.71	190	255	148480	38.16	238	442	229376	58.95
47	94	1856	0.48	95	147	4160	1.07	143	200	2976	0.76	191	256	22016	5.66	239	443	42240	10.86
48	95	856	0.22	96	148	8256	2.12	144	201	808	0.21	192	257	2160	0.56	240	444	4608	1.18

DFTPP TUNE CHECK REPORT

Raw Data File: GL461
Date: 30-Dec-92
Time: 07:56

M/E	ION ABUNDANCE CRITERIA	RELATIVE ABUNDANCE	TUNE
51	30.0 - 60.0% of mass 198	58.68	PASS
68	Less than 2.0% of mass 69	0.77(1.4)1	PASS
69	Mass 69 relative abundance	56.58	PASS
70	Less then 2.0% of mass 69	0.47(0.8)1	PASS
127	40.0 - 60.0% of mass 198	53.16	PASS
197	Less than 1% of mass 198	0.41	PASS
198	Base peak, 100% relative abundance	100.00	PASS
199	5 - 9% of mass 198	6.71	PASS
275	10 - 30% of mass 198	15.59	PASS
365	Greater than 1% of mass 198	1.89	PASS
441	Present, but less then mass 443	9.08	PASS
442	Greater than 40% of mass 198	58.95	PASS
443	17 - 23% of mass 442	10.86(18.4)2	PASS

30-Dec-92 11:38 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: DFTPP Instrument G



9L466 761 (9.342) 421333

Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int
1	36	1856	0.44	52	99	14208	3.37	103	154	2384	0.57	154	208	3696	0.88	205	274	13888	3.29
2	37	1040	0.25	53	100	1776	0.42	104	155	5504	1.30	155	209	1680	0.40	206	275	77824	18.45
3	38	3632	0.86	54	101	9088	2.15	105	156	7808	1.85	156	210	4416	1.05	207	276	10816	2.56
4	39	19456	4.61	55	102	944	0.22	106	157	2320	0.55	157	211	4160	0.99	208	277	5760	1.37
5	40	2448	0.58	56	103	3136	0.74	107	158	2224	0.53	158	212	688	0.16	209	278	1360	0.32
6	41	788	0.19	57	104	5440	1.29	108	159	1488	0.35	159	214	716	0.17	210	283	988	0.23
7	44	1424	0.34	58	105	5056	1.20	109	160	3088	0.73	160	215	1312	0.31	211	284	860	0.20
8	45	708	0.17	59	106	2032	0.48	110	161	4416	1.05	161	216	1984	0.47	212	285	1456	0.35
9	49	1472	0.35	60	107	67584	16.02	111	162	1648	0.39	162	217	23040	5.46	213	293	1744	0.41
10	50	58624	13.90	61	108	10944	2.59	112	164	796	0.19	163	218	3696	0.88	214	296	18688	4.43
11	51	242688	57.52	62	109	2288	0.54	113	165	3488	0.83	164	220	712	0.17	215	297	2672	0.63
12	52	13248	3.14	63	110	121856	28.88	114	166	2976	0.71	165	221	30720	7.28	216	303	2912	0.69
13	53	1328	0.31	64	111	18432	4.37	115	167	16640	3.94	166	222	5824	1.38	217	304	832	0.20
14	55	1488	0.35	65	112	2864	0.68	116	168	10496	2.49	167	223	5888	1.40	218	314	1280	0.30
15	56	7616	1.81	66	113	1376	0.33	117	169	2096	0.50	168	224	51200	12.14	219	315	2448	0.58
16	57	16896	4.00	67	116	3744	0.89	118	170	864	0.20	169	225	12736	3.02	220	316	1456	0.35
17	58	1264	0.30	68	117	38144	9.04	119	171	1040	0.25	170	226	1472	0.35	221	321	1008	0.24
18	59	864	0.20	69	118	3792	0.90	120	172	1792	0.42	171	227	17152	4.07	222	323	7936	1.88
19	61	2928	0.69	70	119	1020	0.24	121	173	2336	0.55	172	228	2864	0.68	223	324	1520	0.36
20	62	3520	0.83	71	120	864	0.20	122	174	3744	0.89	173	229	4672	1.11	224	327	1312	0.31
21	63	9088	2.15	72	122	3968	0.94	123	175	7360	1.74	174	230	1056	0.25	225	328	808	0.19
22	64	1824	0.43	73	123	5952	1.41	124	176	2528	0.60	175	231	2528	0.60	226	333	796	0.19
23	65	5568	1.32	74	124	2800	0.66	125	177	3456	0.82	176	232	808	0.19	227	334	4928	1.17
24	68	4352	1.03	75	125	2736	0.65	126	178	1216	0.29	177	233	804	0.19	228	335	1328	0.31
	69	258048	61.17	76	126	1392	0.33	127	179	13184	3.13	178	234	1328	0.31	229	341	960	0.23
	70	1696	0.40	77	127	243712	57.77	128	180	9408	2.23	179	235	1952	0.46	230	346	1600	0.38
27	73	2512	0.60	78	128	18176	4.31	129	181	4928	1.17	180	236	1248	0.30	231	352	2432	0.58
28	74	22784	5.40	79	129	83968	19.90	130	182	1072	0.25	181	237	1968	0.47	232	353	1872	0.44
29	75	36864	8.74	80	130	7744	1.84	131	184	1280	0.30	182	239	1040	0.25	233	354	2640	0.63
30	76	13952	3.31	81	131	2272	0.54	132	185	6656	1.58	183	240	700	0.17	234	365	9024	2.14
31	77	278528	66.02	82	132	1744	0.41	133	186	53504	12.68	184	241	1232	0.29	235	366	1376	0.33
32	78	20480	4.85	83	134	2800	0.66	134	187	15104	3.58	185	242	2880	0.68	236	371	856	0.20
33	79	14144	3.35	84	135	6656	1.58	135	188	1872	0.44	186	243	2944	0.70	237	372	4480	1.06
34	80	12288	2.91	85	136	3040	0.72	136	189	3008	0.71	187	244	39168	9.28	238	373	1088	0.26
35	81	16896	4.00	86	137	4224	1.00	137	191	1632	0.39	188	245	5312	1.26	239	383	1168	0.28
36	82	4992	1.18	87	138	1552	0.37	138	192	4608	1.09	189	246	5824	1.38	240	402	1680	0.40
37	83	5056	1.20	88	139	1004	0.24	139	193	4864	1.15	190	247	1456	0.35	241	403	2176	0.52
38	84	1328	0.31	89	140	1520	0.36	140	194	1104	0.26	191	249	1664	0.39	242	404	820	0.19
39	85	3040	0.72	90	141	9664	2.29	141	195	796	0.19	192	253	840	0.20	243	421	2080	0.49
40	86	4416	1.05	91	142	3504	0.83	142	196	13696	3.25	193	254	956	0.23	244	422	1664	0.39
41	87	2576	0.61	92	143	2800	0.66	143	197	1024	0.24	194	255	182272	43.20	245	423	14016	3.32
42	88	1728	0.41	93	144	1024	0.24	144	198	421888	100.00	195	256	26624	6.31	246	424	2816	0.67
43	89	1216	0.29	94	145	1088	0.26	145	199	29440	6.98	196	257	2672	0.63	247	441	41216	9.77
44	91	3952	0.94	95	146	2000	0.47	146	200	3264	0.77	197	258	9280	2.20	248	442	262144	62.14
45	92	4000	0.95	96	147	4928	1.17	147	201	3104	0.74	198	259	1968	0.47	249	443	48640	11.53
46	93	21248	5.04	97	148	9664	2.29	148	202	2080	0.49	199	261	1020	0.24	250	444	5440	1.29
47	94	2032	0.48	98	149	2688	0.64	149	203	3040	0.72	200	264	820	0.19	251	445	960	0.23
48	95	1168	0.28	99	150	1020	0.24	150	204	13760	3.26	201	265	3824	0.91				
49	96	2032	0.48	100	151	2016	0.48	151	205	23552	5.58	202	266	1168	0.28				
50	97	928	0.22	101	152	1248	0.30	152	206	93184	22.09	203	272	820	0.19				
	98	14784	3.50	102	153	3216	0.76	153	207	12800	3.03	204	273	6080	1.44				

DFTPP TUNE CHECK REPORT

Raw Data File: GL466
Date: 30-Dec-92
Time: 11:38

M/E	ION ABUNDANCE CRITERIA	RELATIVE ABUNDANCE	TUNE
51	30.0 - 60.0% of mass 198	57.52	PASS
68	Less than 2.0% of mass 69	1.03(1.7)1	PASS
69	Mass 69 relative abundance	61.17	PASS
70	Less then 2.0% of mass 69	0.40(0.7)1	PASS
127	40.0 - 60.0% of mass 198	57.77	PASS
197	Less than 1% of mass 198	0.24	PASS
198	Base peak, 100% relative abundance	100.00	PASS
199	5 - 9% of mass 198	6.98	PASS
275	10 - 30% of mass 198	18.45	PASS
365	Greater than 1% of mass 198	2.14	PASS
441	Present, but less then mass 443	9.77	PASS
442	Greater than 40% of mass 198	62.14	PASS
443	17 - 23% of mass 442	11.53(18.6)2	PASS

Triangle Laboratories of RTP, Inc.
Initial Calibration Curve

ICAL File: ICALGJ03 Date of Analysis :01/03/93 Analyte List: PAH
RF20 GL497 RF50 GL496 RF80 GL495
RF120 GL494 RF160 GL498

Analyte	Flag	RF20	RF50	RF80	RF120	RF160	RFMEAN	%RSD
1,4-Dichlorobenzene-d4	I							
Naphthalene-d8	I							
2-Methylnaphthalene		0.684	0.672	0.714	0.773	0.802	0.729	7.7
Naphthalene		1.028	0.975	1.032	1.109	1.148	1.058	6.6
Acenaphthene-d10	I							
Acenaphthene	C	0.975	0.951	1.015	1.097	1.057	1.019	5.8
Fluorene		1.225	1.176	1.234	1.320	1.310	1.253	4.9
2-Chloronaphthalene		1.033	0.982	1.035	1.114	1.078	1.048	4.8
Acenaphthylene		1.705	1.683	1.766	1.952	1.848	1.791	6.2
Phenanthrene-d10	I							
Phenanthrene		0.976	0.919	0.922	0.987	0.947	0.950	3.2
Anthracene		0.981	0.937	0.940	1.005	0.934	0.959	3.3
Fluoranthene	C	1.143	1.117	1.143	1.214	1.143	1.152	3.2
Chrysene-d12	I							
Chrysene		1.038	0.984	0.975	1.020	1.041	1.011	3.0
Pyrene		1.208	1.189	1.250	1.179	1.057	1.176	6.1
Benzo(a)anthracene		1.052	0.989	1.058	1.072	1.068	1.048	3.2
Perylene-d12	I							
Benzo(b)fluoranthene		1.392	1.436	1.587	1.719	1.740	1.575	10.1
Benzo(k)fluoranthene		1.624	1.727	1.720	1.718	1.733	1.704	2.7
Benzo(e)pyrene		1.378	1.419	1.505	1.560	1.623	1.497	6.7
Benzo(a)pyrene	C	1.286	1.343	1.399	1.505	1.585	1.424	8.5
Perylene		0.756	0.711	0.753	0.766	0.787	0.755	3.7
Indeno(1,2,3-cd)pyrene		0.733	0.877	1.046	1.234	1.396	1.057	25.2
Dibenz(a,h)anthracene		0.770	0.890	1.007	1.217	1.349	1.047	22.6
Benzo(g,h,i)perylene		0.923	1.046	1.193	1.341	1.462	1.193	18.2

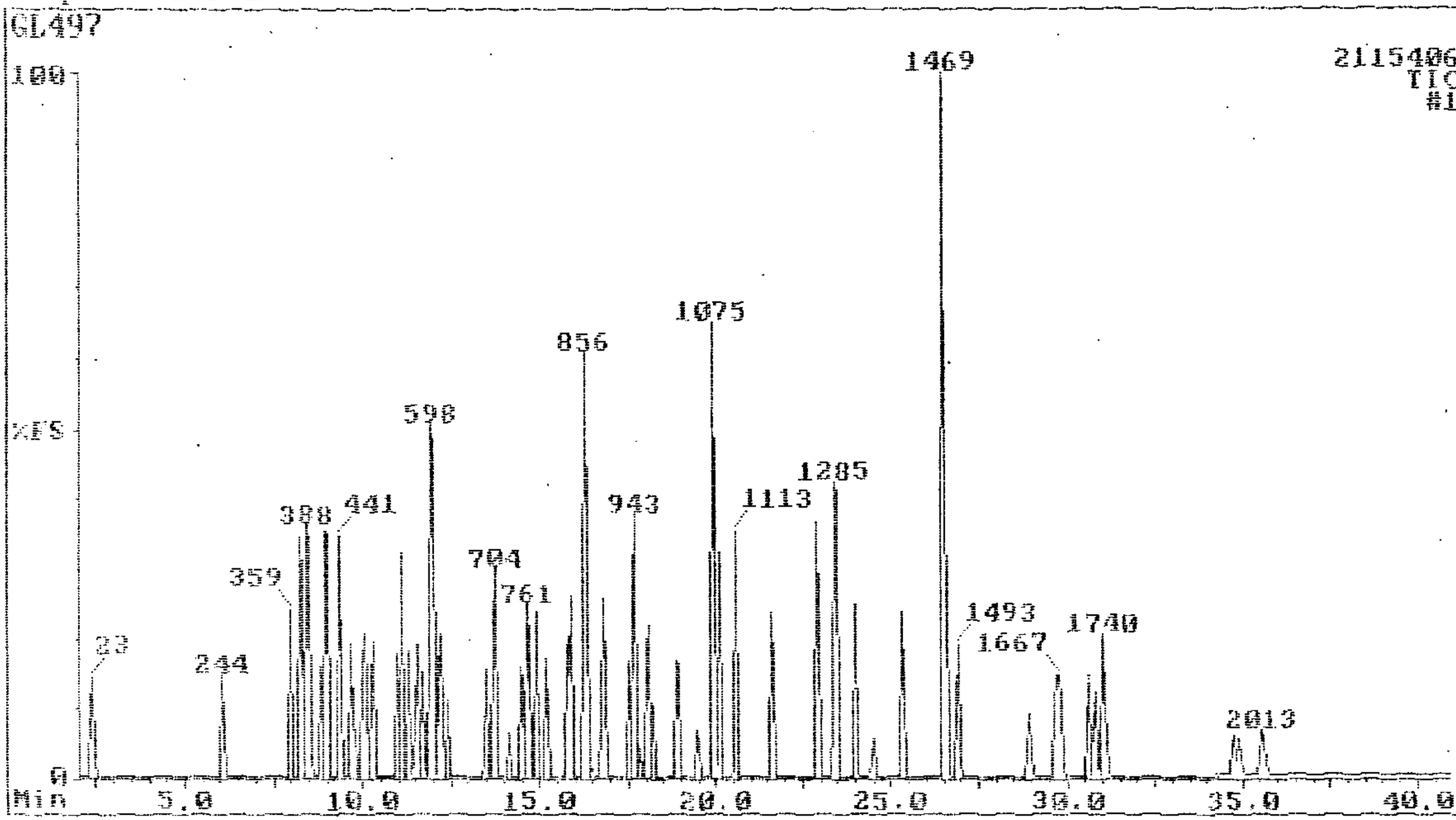
Surrogate	Flag	RF20	RF50	RF80	RF120	RF160	RFMEAN	%RSD
Anthracene-d10	S	0.522	0.508	0.516	0.553	0.537	0.527	3.4
Pyrene-d10	S	1.081	1.081	1.162	1.125	1.065	1.103	3.6

Approved by: Lyon Date 1/5/93

*- Fails QC Criteria for %RSD; << - Rf less then minimum QC RF; >>- RF greater than maximum QC RF ICAL.EXE v2.5

r 1/3/13

03-Jan-93 16:59 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: SSTD020 Instrument G

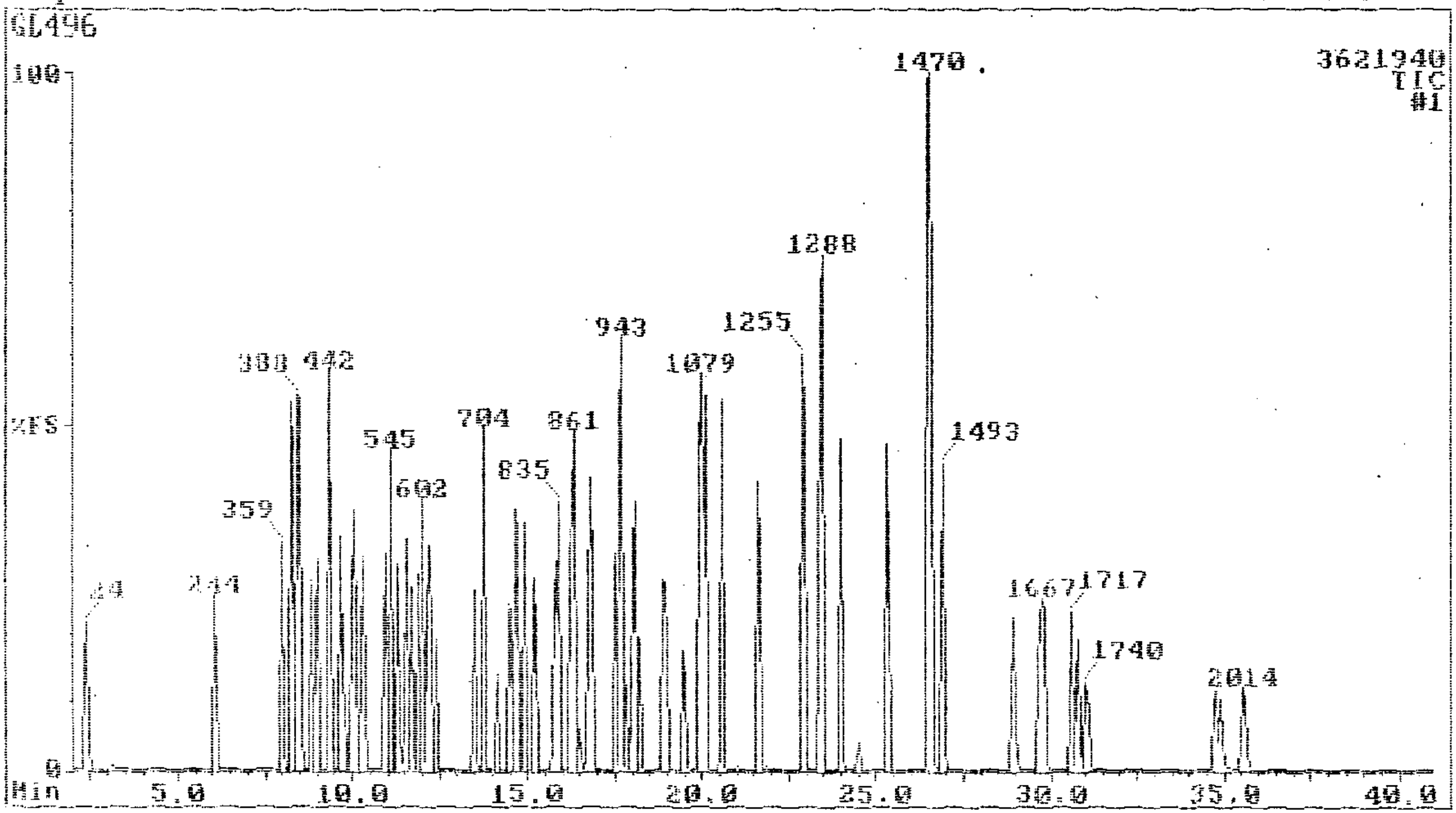


No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	85	100	-1	270610	bb	419	152	1,4-Dichlorobenzene-d4
2	100	89	93	0	1154500	bb	598	136	Naphthalene-d8
3	100	94	97	0	630640	bb	856	164	Acenaphthene-d10
4	100	92	97	0	1301700	bv	1075	188	Phenanthrene-d10
5	95	68	96	-2	1327100	bb	1469	240	Chrysene-d12
6	99	90	95	1	667600	bb	1739	264	Perylene-d12
7	100	97	97	-1	263320	bb	243	112	2-Fluorophenol
8	90	56	99	-1	235130	bb	387	132	2-Chlorophenol-d4
9	95	64	99	-1	327920	bb	376	99	Phenol-d5
10	100	95	99	0	144270	bb	439	152	1,2-Dichlorobenzene-d4
11	100	84	99	0	306170	bb	497	82	Nitrobenzene-d5
12	98	60	97	0	180130	bb	545	185	1,3,5-Trichlorobenzene-d3
13	100	96	99	0	117180	bb	606	240	1,4-Dibromobenzene-d4
14	100	93	98	0	400560	bb	761	172	2-Fluorobiphenyl
15	100	81	98	0	56244	bb	973	330	2,4,6-Tribromophenol
16	100	93	97	-1	339660	vb	1083	188	Anthracene-d10
17	100	87	96	1	717080	bb	1285	212	Pyrene-d10
18	100	91	97	2	440590	bb	1319	244	Terphenyl-d14
19	100	96	98	0	593060	bb	601	128	Naphthalene
20	100	89	90	0	395050	bb	704	142	2-Methylnaphthalene
21	100	98	98	0	325760	bb	774	162	2-Chloronaphthalene
22	100	96	98	0	537570	bb	834	152	Acenaphthylene
23	100	87	88	0	307360	bb	861	154	Acenaphthene
24	100	97	99	-1	386320	bb	937	166	Fluorene
25	100	96	99	0	48328	bb	1049	266	Pentachlorophenol
26	100	95	97	0	635560	bv*	1079	178	Phenanthrene
27	100	96	99	-1	638590	vb*	1086	178	Anthracene
28	100	97	99	-1	743660	bb	1255	202	Fluoranthene
29	100	96	99	0	801330	bb	1287	202	Pyrene
30	97	79	88	1	697820	bv	1468	228	Benzo(a)anthracene
31	100	91	98	0	688860	vb	1473	228	Chrysene
32	83	65	67	0	464780	bv	1661	252	Benzo(b)fluoranthene
33	100	95	95	-1	542140	vb*	1667	252	Benzo(k)fluoranthene
34	100	97	98	-1	459930	bv	1716	252	Benzo(e)pyrene
35	100	96	96	-2	429150	vv	1727	252	Benzo(a)pyrene
36	100	89	91	0	252270	vb	1745	252	Perylene
37	98	89	94	-2	244740	bv	1964	276	Indeno(1,2,3-cd)pyrene
38	100	86	92	-1	257020	vb	1973	278	Dibenz(a,h)anthracene
39	73	87	94	-5	307970	bb	2013	276	Benzo(g,h,i)perylene

~ 1/3/93

03-Jan-93 16:10 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: SSTD050 Instrument G



SSrD650 ~ 1/2/92

QU-N OR GLANG LAC-BACE QUAN 03-Jan-92 21:28

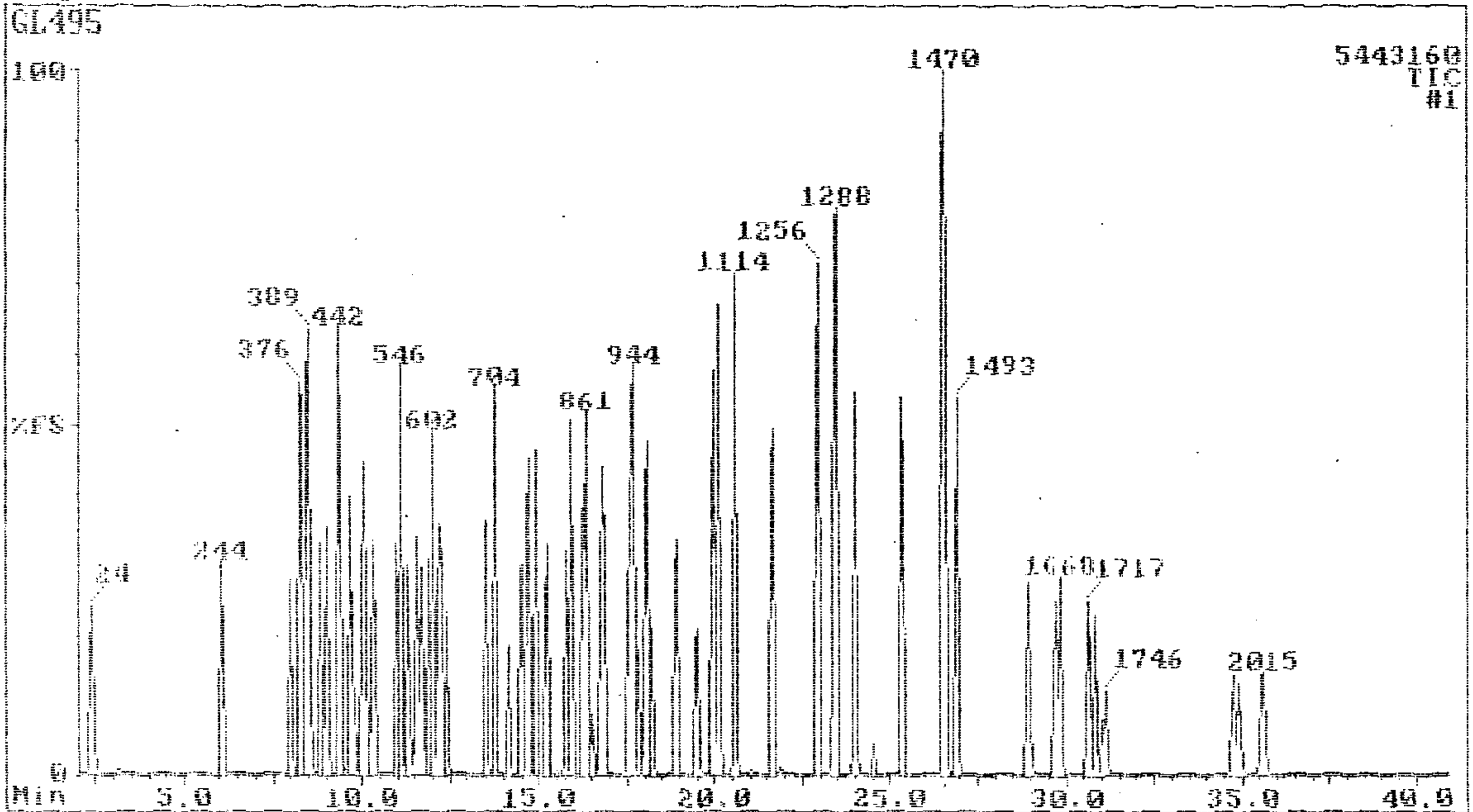
147

No.	MaT	FOR	REV	Delta	Area	P Flags	Scan	QM	Name
1	100	85	100	-1	317900	bb	419	152	1,4-Dichlorobenzene-d4
2	100	90	94	0	1500600	bb	598	136	Naphthalene-d8
3	100	93	98	0	716270	bb	856	164	Acenaphthene-d10
4	100	91	97	0	1555900	bv	1075	188	Phenanthrene-d10
5	83	49	94	-1	1342700	bb	1470	240	Chrysene-d12
6	100	89	95	0	671920	bb	1740	264	Perylene-d12
7	100	96	97	0	728240	bb	244	112	2-Fluorophenol
8	93	61	99	0	651270	bb	388	132	2-Chlorophenol-d4
9	94	62	99	-1	894450	bv	376	99	Phenol-d5
10	100	95	99	1	389120	bb	440	152	1,2-Dichlorobenzene-d4
11	100	85	99	0	825660	bb	497	82	Nitrobenzene-d5
12	99	59	99	0	462560	bb	545	185	1,3,5-Trichlorobenzene-d3
13	100	94	99	0	311620	bb	606	240	1,4-Dibromobenzene-d4
14	100	91	98	0	1038800	bb	761	172	2-Fluorobiphenyl
15	100	79	99	0	182360	bb	973	330	2,4,6-Tribromophenol
16	100	84	96	0	987970	vb	1084	188	Anthracene-d10
17	100	88	97	0	2083800	bb	1285	212	Pyrene-d10
18	100	88	97	1	1421800	bb	1319	244	Terphenyl-d14
19	100	97	99	0	1584500	bb	601	128	Naphthalene
20	100	89	91	0	1092900	vb	704	142	2-Methylnaphthalene
21	100	97	99	0	878850	bb	774	162	2-Chloronaphthalene
22	100	95	98	0	1506600	bb	834	152	Acenaphthylene
23	100	88	89	0	851310	vb	861	154	Acenaphthene
24	100	95	98	0	1053000	bb	938	166	Fluorene
25	100	86	99	0	195430	bb	1049	266	Pentachlorophenol
26	100	93	97	0	1788000	bv*	1079	178	Phenanthrene
27	100	94	98	0	1822400	vb*	1087	178	Anthracene
28	100	96	99	-1	2172400	bb	1255	202	Fluoranthene
29	100	95	99	0	2292200	bb	1288	202	Pyrene
30	100	90	99	0	1907600	bv*	1468	228	Benzo(a)anthracene
31	100	94	99	0	1897700	vv	1474	228	Chrysene
32	81	68	71	-1	1206000	bv	1661	252	Benzo(b)fluoranthene
33	100	94	97	-2	1450600	vv	1667	252	Benzo(k)fluoranthene
34	100	96	98	-1	1192100	bv	1717	252	Benzo(e)pyrene
35	96	96	99	-3	1127800	vv	1727	252	Benzo(a)pyrene
36	100	98	99	-1	597010	vb	1745	252	Perylene
37	96	96	99	-3	736640	bv	1964	276	Indeno(1,2,3-cd)pyrene
38	100	94	98	-2	747280	vb	1973	278	Dibenz(a,h)anthracene
39	70	96	99	-6	878350	bv	2013	276	Benzo(g,h,i)perylene

~ 1/3/93

03-Jan-93 15:17 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: SSTD080 Instrument G



55TD081 ~ 1/3/93

[illegible] LAB-BASE QUAN [illegible] 21:13

No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	Qm	Name
1	100	55	100	0	329710	bb	420	152	1,4-Dichlorobenzene-d4
2	100	87	91	0	1353500	bb	599	136	Naphthalene-d8
3	100	88	97	-1	737980	bb	856	164	Acenaphthene-d10
4	100	87	96	1	1633600	bv	1076	188	Phenanthrene-d10
5	81	45	94	-2	1549800	bb	1470	240	Chrysene-d12
6	100	87	93	0	665170	bb	1740	264	Perylene-d12
7	100	95	97	-1	1244700	bb	244	112	2-Fluorophenol
8	85	49	99	-1	1124600	bb	389	132	2-Chlorophenol-d4
9	96	66	99	-1	1498300	bv	377	99	Phenol-d5
10	100	86	97	0	677300	bb	440	152	1,2-Dichlorobenzene-d4
11	100	86	99	-1	1412100	bb	497	82	Nitrobenzene-d5
12	97	57	98	0	778180	bb	546	185	1,3,5-Trichlorobenzene-d3
13	100	94	100	-1	531860	bb	606	240	1,4-Dibromobenzene-d4
14	100	90	98	1	1768300	bb	762	172	2-Fluorobiphenyl
15	100	80	100	0	339710	bb	973	330	2,4,6-Tribromophenol
16	100	86	97	-1	1688000	vb	1084	188	Anthracene-d10
17	100	84	97	1	3601800	vb	1286	212	Pyrene-d10
18	100	88	97	1	2551600	bb	1319	244	Terphenyl-d14
19	100	96	98	0	2756600	bb	602	128	Naphthalene
20	100	89	92	-1	1906600	vb	704	142	2-Methylnaphthalene
21	100	95	98	1	1527100	bb	775	162	2-Chloronaphthalene
22	100	94	97	1	2606600	bb	835	152	Acenaphthylene
23	100	88	90	0	1498300	bb	861	154	Acenaphthene
24	100	95	98	0	1821500	bb	938	166	Fluorene
25	100	86	99	-1	389840	bv	1049	266	Pentachlorophenol
26	100	93	98	-1	3015800	bv*	1079	178	Phenanthrene
27	100	93	98	-1	3075000	vb	1087	178	Anthracene
28	100	95	98	-1	3740300	bb	1256	202	Fluoranthene
29	100	93	98	1	3874800	bb	1289	202	Pyrene
30	100	85	98	1	3278900	bv*	1469	228	Benzo(a)anthracene
31	100	93	99	0	3021200	vv	1474	228	Chrysene
32	88	68	72	0	2105500	bv	1662	252	Benzo(b)fluoranthene
33	100	93	97	-1	2280600	vv	1668	252	Benzo(k)fluoranthene
34	100	95	98	-1	1996400	bv	1717	252	Benzo(e)pyrene
35	100	96	99	-2	1856100	vv	1728	252	Benzo(a)pyrene
36	100	97	99	0	999390	vv	1746	252	Perylene
37	100	96	100	-2	1387200	bv	1965	276	Indeno(1,2,3-cd)pyrene
38	100	93	99	-2	1336200	vv	1973	278	Dibenz(a,h)anthracene
39	87	96	99	-4	1582100	bv	2015	276	Benzo(g,h,i)perylene

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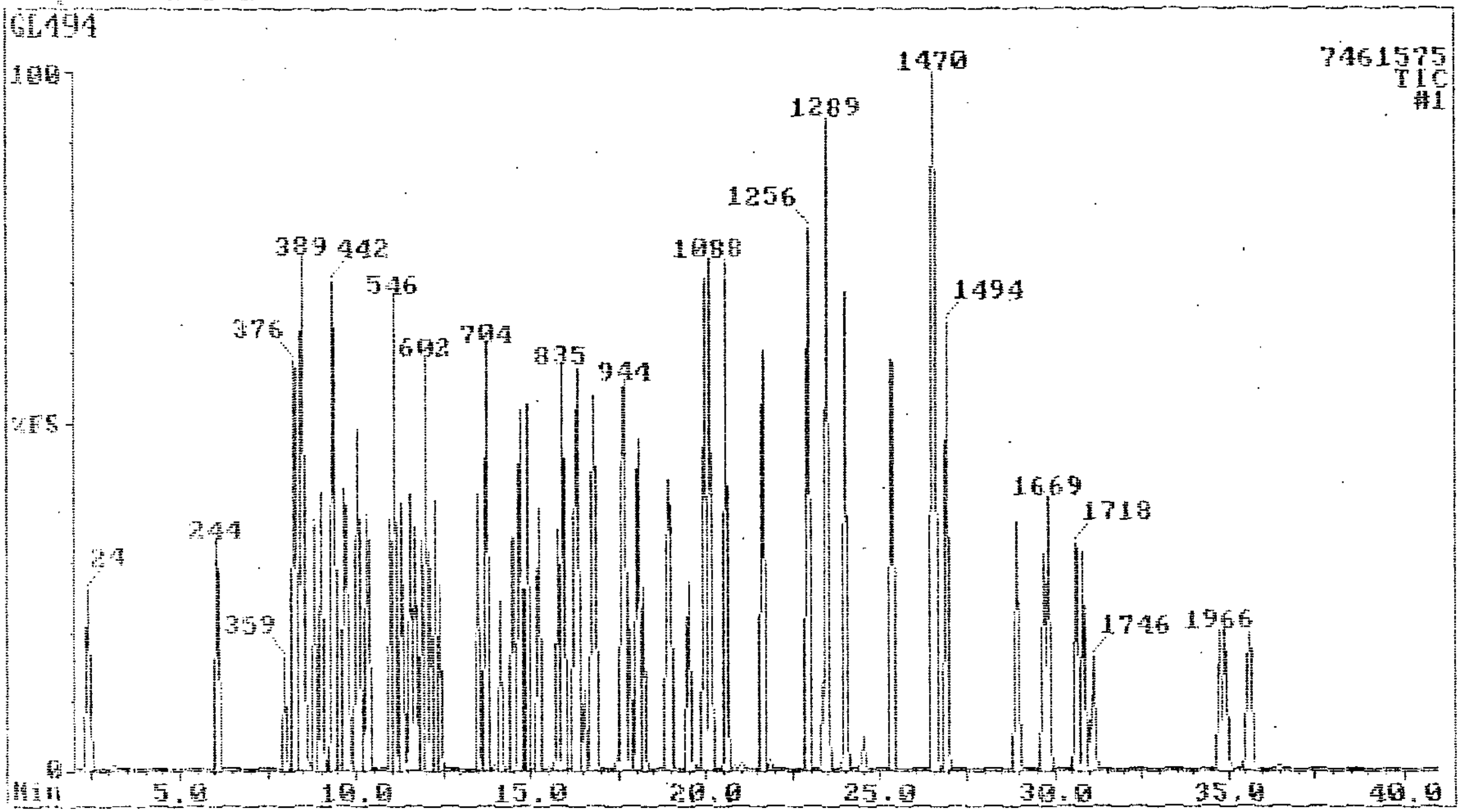
03-Jan-93 14:13 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: SSTD120 Instrument G

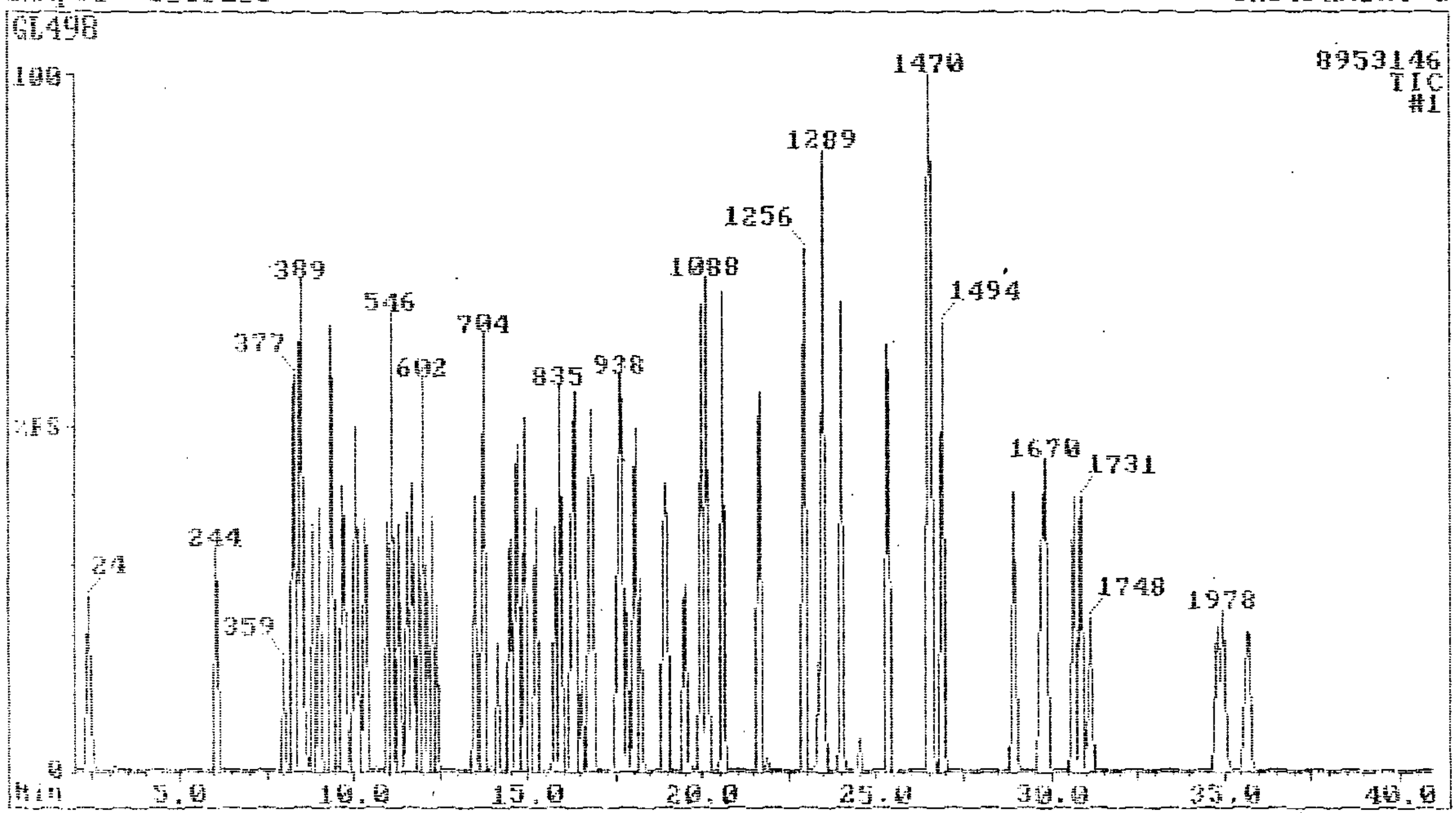


No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	83	100	0	312460	bb	420	152	1,4-Dichlorobenzene-d4
[illegible]	100	86	94	0	1536300	bb	599	136	Naphthalene-d8
3	100	90	97	0	703760	bb	857	164	Acenaphthene-d10
4	100	85	96	0	1512300	bv	1076	188	Phenanthrene-d10
5	73	32	94	-1	1559600	bb	1471	240	Chrysene-d12
6	100	86	95	0	776940	bb	1741	264	Perylene-d12
7	100	95	97	-1	1967600	bv	244	112	2-Fluorophenol
8	89	54	99	-1	1814700	bb	388	132	2-Chlorophenol-d4
9	95	65	99	-1	2378600	bv	377	99	Phenol-d5
10	100	87	98	0	1073100	bb	440	152	1,2-Dichlorobenzene-d4
11	100	81	99	0	2239200	bb	498	82	Nitrobenzene-d5
12	96	55	98	0	1177200	bb	546	185	1,3,5-Trichlorobenzene-d3
13	100	92	99	0	858080	bb	607	240	1,4-Dibromobenzene-d4
14	100	89	98	0	2656800	bb	762	172	2-Fluorobiphenyl
15	100	77	99	0	544160	bb	974	330	2,4,6-Tribromophenol
16	100	86	97	0	2510600	vb	1085	188	Anthracene-d10
17	100	86	97	0	5262000	vb	1286	212	Pyrene-d10
18	100	85	96	1	3952700	vb	1320	244	Terphenyl-d14
19	100	96	98	0	4445700	bb	602	128	Naphthalene
20	100	89	92	-1	3098300	vb	704	142	2-Methylnaphthalene
21	100	95	98	0	2351600	bb	775	162	2-Chloronaphthalene
22	100	94	97	0	4120900	bb	835	152	Acenaphthylene
23	100	88	90	0	2316000	bb	862	154	Acenaphthene
24	100	95	98	-1	2786400	bb	938	166	Fluorene
25	100	83	99	0	637220	bv	1050	266	Pentachlorophenol
26	100	92	97	0	4475700	bv*	1080	178	Phenanthrene
27	100	93	97	0	4558200	vv*	1088	178	Anthracene
28	100	94	98	-1	5509800	bb	1256	202	Fluoranthene
29	100	94	99	0	5514500	vb	1289	202	Pyrene
30	100	88	99	0	5017300	bv	1469	228	Benzo(a)anthracene
31	100	93	99	0	4770100	vv	1475	228	Chrysene
32	88	68	72	0	4006500	bv	1663	252	Benzo(b)fluoranthene
33	100	93	97	-1	4003400	vv	1669	252	Benzo(k)fluoranthene
34	100	94	98	-1	3635900	bv	1718	252	Benzo(e)pyrene
35	100	95	99	-2	3508900	vv	1729	252	Benzo(a)pyrene
36	100	95	99	-1	1785900	vv	1746	252	Perylene
37	100	96	100	-2	2875900	bv	1966	276	Indeno(1,2,3-cd)pyrene
38	100	92	99	-2	2837300	bv	1974	278	Dibenz(a,h)anthracene
39	87	96	99	-4	3126000	b? ~~bv~~ AS	2016	276	Benzo(g,h,i)perylene

~ 1/3/93

03-Jan-93 18:00 Triangle Laboratories of RTP, Inc. (919) 544-5729

Sample: SSTD160 Instrument G

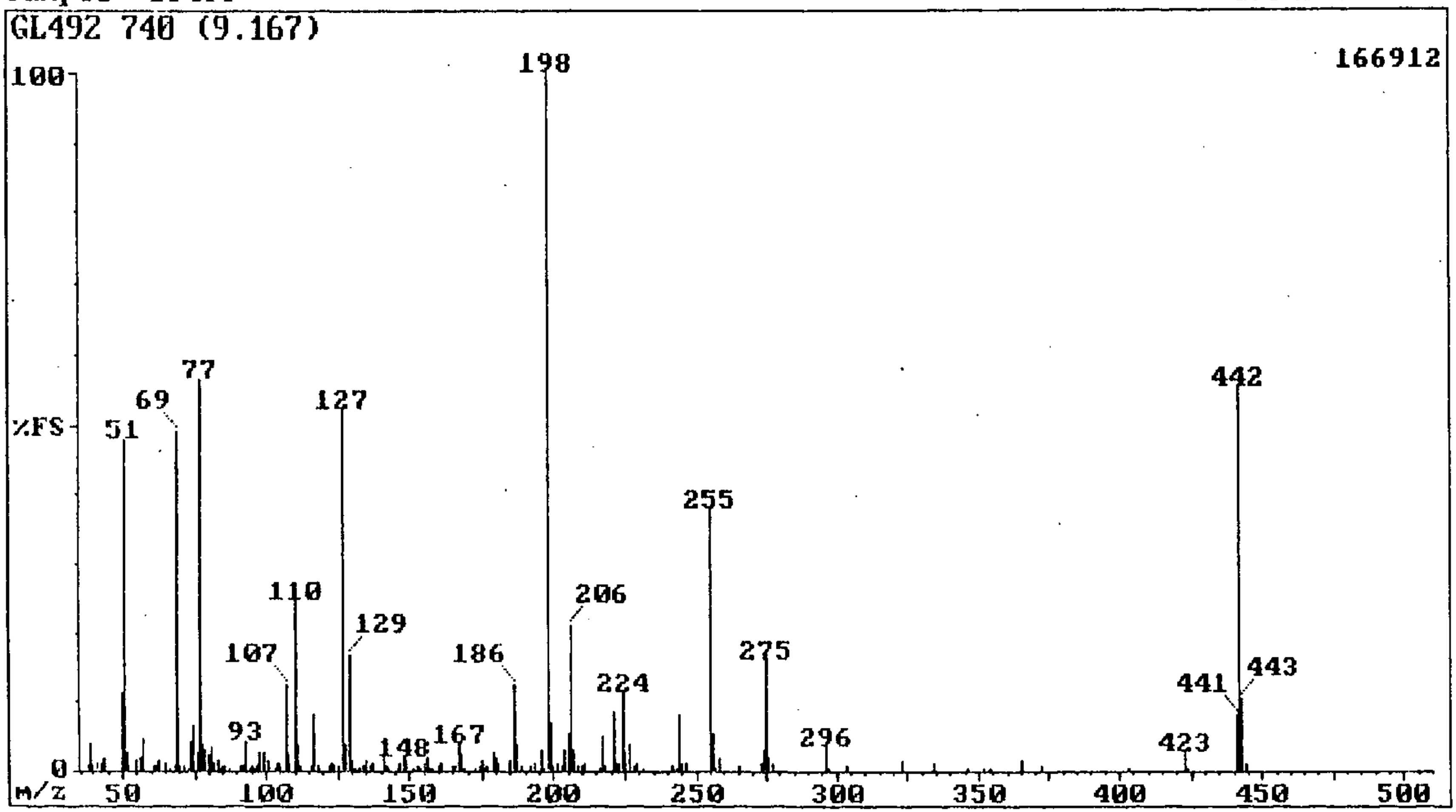


SST016 ~ 1/3/93

[illegible] UNI-BASE QUAN 05-Jan-93 11:27

No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	Qr	Name
1	100	80	100	-1	262340	bb	419	152	1,4-Dichlorobenzene-d4
2	100	80	93	1	1093400	bb	599	136	Naphthalene-d8
3	100	86	96	-1	643100	bb	856	164	Acenaphthene-d10
4	100	82	96	1	1458000	bv	1076	188	Phenanthrene-d10
5	67	24	92	-1	1546600	bb	1471	240	Chrysene-d12
6	100	86	94	1	875380	bb	1742	264	Perylene-d12
7	100	95	97	0	2240900	bb	244	112	2-Fluorophenol
8	94	52	98	0	1995900	bb	388	132	2-Chlorophenol-d4
9	100	61	99	0	2784000	bv	377	99	Phenol-d5
10	100	84	96	1	1187700	bb	440	152	1,2-Dichlorobenzene-d4
11	100	79	99	0	2622900	bb	498	82	Nitrobenzene-d5
12	95	54	98	0	1440000	bb	546	183	1,3,5-Trichlorobenzene-d3
13	100	94	99	0	937220	bb	606	240	1,4-Dibromobenzene-d4
14	100	89	98	1	3225400	bb	762	172	2-Fluorobiphenyl
15	100	76	98	1	632330	bb	974	330	2,4,6-Tribromophenol
16	100	85	97	-1	3129800	vb	1084	188	Anthracene-d10
17	100	85	96	0	6587000	vb	1286	212	Pyrene-d10
18	100	85	96	1	4753100	vb	1320	244	Terphenyl-d14
19	100	96	98	0	5023000	bb	602	128	Naphthalene
20	100	89	92	-1	3509500	vb	704	142	2-Methylnaphthalene
21	100	95	98	1	2773900	bb	775	162	2-Chloronaphthalene
22	100	93	97	1	4754400	bb	835	152	Acenaphthylene
23	100	88	90	0	2718200	bb	861	154	Acenaphthene
24	100	94	98	0	3370400	bb	938	166	Fluorene
25	100	84	99	-1	763020	bv	1049	266	Pentachlorophenol
26	100	91	97	0	5521400	bv*	1080	178	Phenanthrene
27	100	92	97	0	5447000	vb*	1088	178	Anthracene
28	100	94	98	-1	6663900	vv	1256	202	Fluoranthene
29	100	93	98	0	6540600	vv	1289	202	Pyrene
30	100	89	99	0	6604700	bv	1469	228	Benzo(a)anthracene
31	100	92	98	1	6439600	vv	1476	228	Chrysene
32	86	67	71	0	6094000	b! ✓ 1/11/93	1664	252	Benzo(b)fluoranthene
33	100	92	97	-1	6066800	vv	1670	252	Benzo(k)fluoranthene
34	100	93	98	0	5683500	bv	1720	252	Benzo(e)pyrene
35	100	94	99	-1	5551300	vv	1731	252	Benzo(a)pyrene
36	100	94	97	0	2755300	vv	1748	252	Perylene
37	100	95	99	0	4887900	bv	1969	276	Indeno(1,2,3-cd)pyrene
38	100	92	99	1	4723700	bb	1978	278	Dibenz(a,h)anthracene
39	100	96	99	0	5120900	bv	2021	276	Benzo(g,h,i)perylene

03-Jan-93 12:23 Triangle Laboratories of RTP, Inc. (919) 544-5729
Sample: DFTPP Instrument G



[illegible] TUNE CHECK REPORT

Raw Data File: GL490
Date: 03-Jan-93
Time: 13:03

M/E	ION ABUNDANCE CRITERIA	RELATIVE ABUNDANCE	TUNE
51	30.0 - 60.0% of mass 198	47.85	PASS
68	Less than 2.0% of mass 69	0.62(1.3)1	PASS
69	Mass 69 relative abundance	47.08	PASS
70	Less then 2.0% of mass 69	0.68(1.4)1	PASS
127	40.0 - 60.0% of mass 198	52.15	PASS
197	Less than 1% of mass 198	0.42	PASS
198	Base peak, 100% relative abundance	100.00	PASS
199	5 - 9% of mass 198	7.02	PASS
275	10 - 30% of mass 198	15.80	PASS
365	Greater than 1% of mass 198	1.56	PASS
441	Present, but less then mass 443	8.24	PASS
442	Greater than 40% of mass 198	55.21	PASS
443	17 - 23% of mass 442	10.43(18.9)2	PASS

Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int
1	38	1093	0.65	34	85	1584	0.95	67	133	684	0.41	100	181	1664	1.00	133	242	1104	0.66
2	39	6400	3.83	35	86	1312	0.79	68	134	992	0.59	101	185	2304	1.38	134	243	940	0.56
3	40	1040	0.62	36	87	784	0.47	69	135	2320	1.39	102	186	20992	12.58	135	244	13568	8.13
4	41	1952	1.17	37	91	1424	0.85	70	136	1120	0.67	103	187	6208	3.72	136	245	1920	1.15
5	43	2160	1.29	38	92	1536	0.92	71	137	1648	0.99	104	189	984	0.59	137	246	2240	1.34
6	44	3120	1.87	39	93	6976	4.18	72	141	3312	1.98	105	192	1440	0.86	138	255	62976	37.73
7	50	18688	11.20	40	94	804	0.49	73	142	1456	0.87	106	193	1728	1.04	139	256	9152	5.48
8	51	79872	47.85	41	95	1000	0.60	74	143	832	0.50	107	196	4928	2.95	140	257	808	0.48
9	52	4416	2.65	42	96	792	0.47	75	146	728	0.44	108	197	704	0.42	141	259	3152	1.89
10	55	2560	1.53	43	97	1040	0.62	76	147	1952	1.17	109	198	166912	100.00	142	265	1216	0.73
11	56	3152	1.89	44	98	4864	2.91	77	148	3472	2.08	110	199	11712	7.02	143	273	2096	1.26
12	57	7680	4.60	45	99	4736	2.84	78	149	2768	1.66	111	200	1360	0.81	144	274	4928	2.95
13	61	1056	0.63	46	101	2592	1.55	79	151	680	0.41	112	201	1840	1.10	145	275	26368	15.80
14	62	1104	0.66	47	103	904	0.54	80	153	1072	0.64	113	203	1184	0.71	146	276	3424	2.05
15	63	2832	1.70	48	104	1648	0.99	81	154	908	0.54	114	204	5056	3.03	147	277	2016	1.21
16	65	2096	1.26	49	105	1808	1.08	82	155	1872	1.12	115	205	9344	5.60	148	296	5760	3.45
17	67	864	0.52	50	107	20992	12.58	83	156	3120	1.87	116	206	35328	21.17	149	297	860	0.52
18	68	1040	0.62	51	108	3616	2.17	84	157	820	0.49	117	207	4992	2.99	150	303	976	0.58
19	69	81920	49.08	52	110	40960	24.54	85	159	736	0.44	118	208	1376	0.82	151	323	2416	1.45
20	70	1136	0.68	53	111	6528	3.91	86	160	1136	0.68	119	210	1232	0.74	152	334	1696	1.02
21	71	1296	0.78	54	112	1040	0.62	87	161	1712	1.03	120	211	2160	1.29	153	346	692	0.41
22	73	912	0.55	55	115	1200	0.72	88	163	1232	0.74	121	216	788	0.47	154	352	800	0.48
23	74	7232	4.33	56	117	13504	8.09	89	166	1040	0.62	122	217	8256	4.95	155	354	944	0.57
24	75	11328	6.79	57	118	1280	0.77	90	167	6720	4.03	123	218	1312	0.79	156	365	2608	1.56
25	76	4224	2.53	58	122	1568	0.94	91	168	4016	2.41	124	221	14208	8.51	157	372	1296	0.78
26	77	94208	56.44	59	123	2256	1.35	92	169	704	0.42	125	222	2160	1.29	158	403	736	0.44
27	78	6592	3.95	60	124	1120	0.67	93	173	820	0.49	126	223	2272	1.36	159	423	4800	2.88
28	79	4992	2.99	61	125	1168	0.70	94	174	1408	0.84	127	224	18688	11.20	160	424	916	0.55
29	80	3840	2.30	62	127	87040	52.15	95	175	2560	1.53	128	225	4672	2.80	161	441	13760	8.24
30	81	6080	3.64	63	128	6592	3.95	96	176	936	0.56	129	227	6336	3.80	162	442	92160	55.21
31	82	2000	1.20	64	129	27648	16.56	97	177	1136	0.68	130	228	1024	0.61	163	443	17408	10.43
32	83	2624	1.57	65	130	2576	1.54	98	179	4288	2.57	131	229	1664	1.00	164	444	1808	1.08
33	84	716	0.43	66	131	968	0.58	99	180	3472	2.08	132	231	876	0.52				

VII. LABORATORY ANALYSIS RESULTS

C. Particulate Analysis Results

Form REC#8

SAMPLE ANALYTICAL DATA FORM

Company Name NAPA METHOD 202 PW

Sample Location PERRY

Relative Humidity in Lab 44 %

Blank Volume (V_a) 100 ml

Density of Acetone (ρ_a) .7857 mg/ml

Date/Time wt. blank 12/21 8:30A

Gross wt. 99.1794 g

Date/Time wt. blank 12/21 2:30P

Gross wt. 99.1793 g

Ave. Gross wt. 99.1794 g

Tare wt. 99.1792 g

Weight of blank (m_{ab}) .0002 g

Acetone blank residue concentration (C_a) : (C_a) = (m_{ab}) / (V_a) (ρ_a) = (.000003 mg/g)

Acetone Blank Wt. : $W_a = C_a V_{aw} \rho_a$ = (.000003)(200)(.7857) = (.0005 g)

		Run # 1	Run # 2	Run # 3
Acetone rinse volume (V_{aw})	ml	200	200	200
Date/Time of wt. 12/21 8:30A Gross wt.	g	104.6589	101.2928	98.6834
Date/Time of wt. 12/21 2:30P Gross wt.	g	104.6589	101.2924	98.6831
Average Gross wt.	g	104.6589	101.2926	98.6833
Tare wt.	g	104.6540	101.2868	98.6791
Less Acetone blank wt. (W_a)	g	.0005	.0005	.0005
Weight of particulate in acetone rinse (m_a)	g	.0044	.0053	.0037

Filter Numbers	#	TS6569	TS6570	TS6568
Date/Time of wt. 12/21 8:30A Gross wt.	g	.5775	.5748	.5733
Date/Time of wt. 12/21 2:30P Gross wt.	g	.5775	.5747	.5732
Average Gross wt.	g	.5775	.5748	.5732
Tare wt.	g	.5739	.5722	.5707

Weight of particulate on filter (m_f)	g	.0036	.0026	.0025
Weight of particulate in acetone rinse (m_a)	g	.0044	.0053	.0037
Total weight of particulate (m_n)	g	.0080	.0089	.0062

NOTE: *In no case should a blank residue greater than 0.01 mg/g (or 0.001% of the blank weight) be subtracted from the sample weight.*

Remarks:

Signature of Analyst Thomas Smith Signature of Reviewer WJS

D:\DONNA\FORMS\LAB\SAMPLE.TBL

COMPANY NAME: NAPA - PERRY, FL METHOD 202
Methylene Chloride Extraction for EPA Method

Relative humidity in lab 42 %
Density of Methylene Chloride 1.3255 g/ml

		RUN 1	RUN 2	RUN 3
Methylene Chloride rinse volume	ml	170	280	240
Volume of Solution		800	710	700
Date/time of wt 12/21 8:30A	Gross wt. g	101.7932	104.6465	101.1910
Date/time of wt 12/21 2:30P	Gross wt. g	101.7931	104.6465	101.1910
	Avg. Gross wt. g	101.7932	104.6465	101.1910
	Tare wt. g	101.7757	104.6390	101.1732
Less Methylene Chloride Blank		.0001	.0001	.0001
Wt./particulate: Methylene Chloride rinse	g	.0174	.0074	.0177
Water evaporation				
Date/time of wt. 12/23 9:30A	Gross wt. g	103.8117	98.3579	94.5994
Date/time of wt. 12/23 3:30P	Gross wt. g	103.8117	98.3574	94.5992
	Avg. Gross wt. g	103.8117	98.3577	94.5993
	Tare wt. g	103.7605	98.3200	94.5776
Less H_2O blank wt.	g	.0002	.0002	.0002
Weight of particulate from water ($m\_$)	g	.0510	.0375	.0215
Wt./particulate: Methylene Chloride rinse	g	.0174	.0074	.0177
Total weight of particulate (m_n)	g	.0684	.0449	.0392

NOTE: In no case should a blank residue 0.02 mg/g or 0.001% of the weight of Methylene Chloride used be subtracted from the sample weight.

Remarks:

Signature of Analyst: Thomas Soutz

Signature of Reviewer:

VII. LABORATORY ANALYSIS RESULTS

D. Fuel Analysis Results

THORNTON LABORATORIES, INC.
MARINE, ANALYTICAL AND ENVIRONMENTAL SERVICES

1145 EAST CASS STREET, TAMPA, FLORIDA 33602
P.O. BOX 2880 TAMPA, FLORIDA 33601-2880
HRS# 84147 HRS# E84100

TELEPHONE (813) 223-9702
FAX (813) 223-9332

24-Dec-1992
Page 1

Report For: National Asphalt Pavement
5100 Forbes rd.
Lanham, MD. 20706-4413

Sample Identification:

Diesel/APAC Dixie Co. plant Attn: Tom Brumagin

Date Received: 11-Dec-1992

Laboratory Number: 843620

CERTIFICATE OF ANALYSIS

Method	Parameter	Result	Units
ASTM D287	API Gravity @ 60 oF	30.9	
	Specific Gravity @ 60/60 oF	0.8713	
ASTM D93	Flash Point, (PMCC)	144	oF
ASTM D240	Heating Value (BTU)	19206	BTU/lb
	Heating Value (BTU)	139340	BTU/gal
ASTM D129	Sulfur (S)	0.37	%

THORNTON LABORATORIES, INC.
Fred Hartlage, Jr. Ph.D.

Bob Crawford
Commissioner

THE STATE OF FLORIDA
DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

Rec 11/17/92
TO Chuck Ros

ANALYSES OF OFFICIAL PETROLEUM SAMPLES UNDER CHAPTER 525, FLORIDA STATUTES

TAKEN FROM:

LOUIS DREYFUS ENERGY CORP
P O BOX 38
ST MARKS FL 32355

ATTN: Don Everett
11/24/92

SUPPLIED FROM	DATE TAKEN	DATE RECEIVED	DATE REPORTED	INSPECTOR'S NAME	FACILITY #
CHEVRON USA	09/08/92	09/08/92	11/12/92	HALL	144893

SAMPLE NO.	PRODUCT NAME	PUMP OR TANK NAME AND NO.	GALLONS	Flash Point °F	DISTILLATION TEMPERATURE °F 10 % EVAPORATED	DISTILLATION TEMPERATURE °F 90 % EVAPORATED	DISTILLATION °F END POINT	COLOR	SULFUR WT %	VISCOSITY cSt	FO... ANA...
MD254241	DIESEL	7	389,350	170					.37		LEG

REMARKS

Division Of Standards
Bureau Of Petroleum Inspection
3125 Conner Blvd., Bldg. 1
Tallahassee, FL 32399-1650
Phone: 904/488-9740

Bob Crawford
Bob Crawford
Commissioner Of Agriculture

Rev. 09/91

160

Bob Crawford
Commissioner

THE STATE OF FLORIDA
DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

ANALYSES OF OFFICIAL PETROLEUM SAMPLES UNDER CHAPTER 525, FLORIDA STATUTES

TAKEN FROM:

MURPHY CORP
P O BOX 98
ST MARKS FL 32055

SUPPLIED FROM	DATE TAKEN	DATE RECEIVED	DATE REPORTED	INSPECTOR'S NAME	FACILITY #
CHEVRON USA	11/16/92	11/16/92	12/03/92	HALL	144883

SAMPLE NO.	PRODUCT NAME	PUMP OR TANK NAME AND NO.	GALLONS	Flash Point °F	DISTILLATION TEMPERATURE °F 10 % EVAPORATED	DISTILLATION TEMPERATURE °F 90 % EVAPORATED	°F END POINT	COLOR	SULFUR WT. %	VISCOSITY cSt	FOUND BY ANALYSIS
D259841	DIESEL	30-1	403,332	154					.38		LEGAL

RES

Division Of Standards
Bureau Of Petroleum Inspection
3125 Conner Blvd., Bldg. 1
Tallahassee, FL 32399-1650
Phone: 904/488-9740

Bob Crawford
Bob Crawford
Commissioner Of Agriculture

161

09/91

VIII. EQUIPMENT CALIBRATION DATA

A. GC Calibration Data

ANALYSIS OF METHOD 18 FIELD SAMPLES

BENZENE

Date: 12-7-92 Analyst: O.S. Plant: MAC ASPHALT
Location: PERRY FL Sample Type: GAS
Type of Calibration Standard: CYLINDER Target Compound: BETX
Number of Standards: 2 Date Prepared: ______ Prepared By: ______

GC Used: SRI Column Used: 5% SP1200 / 1.75% BENTONE 34
Carrier Gas Used: N_2 Carrier Gas Flow Rate: 40CC/MIN
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1CC Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: ___ Auxiliary Gases: ______

Calibration Data PRE First analysis/second analysis	Standard 1	Standard 2	Standard 3
Standard concentration (C_{act})	1.05	10.5	
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	1.483/1.50	1.514/1.514	/
Peak retention time range (min)	1.483	1.514	
Peak area	6.31/6.10	64.18/59.91	/
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	6.2	62.05	
Percent deviation from average	<5%	<5%	
Calculated concentration (C_{std})	1.05	10.5	
% deviation from actual ($\%D_{act}$)	0	0	

Linear regression equation: slope (m): 5.91 y-intercept (b): .006

Sample Analysis Data POST First analysis/second analysis	Sample 1	Sample 2	Sample 3
Sample identification	1.05	10.5	
Interface dilution factor			
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	1.483/1.50	1.514/1.514	/
Peak retention time range (min)	1.483	1.514	
Peak area	6.54/6.32	64.18/61.19	/
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	6.43	62.69	
% deviation from average ($\%D_{avg}$)	<5%	<5%	
Calculated concentration (C_s)	1.09	10.61	

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left| \frac{A_1 - Y}{Y} \right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

ANALYSIS OF METHOD 18 FIELD SAMPLES

ETHYL - BENZENE

Date: 12-7-92 Analyst: DS Plant: MAC ASPHALT
Location: PERRY FL Sample Type: GAS
Type of Calibration Standard: CYLINDER Target Compound: BETX
Number of Standards: 2 Date Prepared: ______ Prepared By: ______

GC Used: SRI Column Used: 5% SP1200 / 1.75% BENTON 34
Carrier Gas Used: N_2 Carrier Gas Flow Rate: 40 CC/min
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1cc Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: ___ Auxiliary Gases: ______

Calibration Data PRE First analysis/second analysis	Standard 1	Standard 2	Standard 3
Standard concentration (C_{act})	1.28	9.7	
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	2.833/2.883	2.883/2.883	/
Peak retention time range (min)	2.833	2.883	
Peak area	6.91/6.86	73.31/70.94	/
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	6.89	72.125	
Percent deviation from average	<5%	<5%	
Calculated concentration (C_{std})	1.28	9.7	
% deviation from actual ($\%D_{act}$)	0	0	

Linear regression equation; slope (m): 7.75 y-intercept (b): -3.027

Sample Analysis Data POST First analysis/second analysis	Sample 1	Sample 2	Sample 3
Sample identification	1.28	9.7	
Interface dilution factor			
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	2.833/2.883	2.883/2.883	/
Peak retention time range (min)	2.833	2.883	
Peak area	7.13/6.92	74.25/72.52	/
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	7.03	73.39	
% deviation from average ($\%D_{avg}$)	2%	1.7%	
Calculated concentration (C_s)	1.30	9.86	

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left|\frac{A_1 - Y}{Y}\right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

ANALYSIS OF METHOD 18 FIELD SAMPLES

TOLUENE

Date: 12-7-92 Analyst: D.S. Plant: MAC ASPHALT
Location: PERRY FL Sample Type: GAS
Type of Calibration Standard: CYLINDER Target Compound: BETX
Number of Standards: 2 Date Prepared: ______ Prepared By: ______

GC Used: SRI Column Used: 5% SP1200 / 1.75% BENTONE 34
Carrier Gas Used: N_2 Carrier Gas Flow Rate: 40 CC/MIN.
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1cc Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: ___ Auxiliary Gases: ______

Calibration Data PRE First analysis/second analysis	Standard 1	Standard 2	Standard 3
Standard concentration (C_{act})	1.18	11	
Flow rate through loop (ml/min)	600 / 600	600 / 600	/
Liquid injection volume (tubes)	NA /	NA /	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA /	NA /	/
Detector attenuation	32 / 32	32 / 32	/
Peak retention time (min)	5.216 / 5.283	5.30 / 5.266	/
Peak retention time range (min)	5.216	5.266	
Peak area	9.62 / 9.39	75.61 / 73.67	/
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	9.51	74.64	
Percent deviation from average	< 5%	< 5%	
Calculated concentration (C_{std})	1.18	11	
% deviation from actual ($\%D_{act}$)	0	0	

Linear regression equation: slope (m): 6.632 y-intercept (b): 1.684

Sample Analysis Data POST First analysis/second analysis	Sample 1	Sample 2	Sample 3
Sample identification	1.18	11	
Interface dilution factor			
Flow rate through loop (ml/min)	600 / 600	600 / 600	/
Liquid injection volume (tubes)	NA /	NA /	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA /	NA /	/
Detector attenuation	32 / 32	32 / 32	/
Peak retention time (min)	7.183 / 7.316	7.316 / 7.266	/
Peak retention time range (min)	7.183	7.266	
Peak area	10.64 / 11.14	76.70 / 74.36	/
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	10.9	75.53	
% deviation from average ($\%D_{avg}$)	12.8%	1.2%	
Calculated concentration (C_s)	1.39	11.13	

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left| \frac{A_1 - Y}{Y} \right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

ANALYSIS OF METHOD 18 FIELD SAMPLES

ORTHO - XYLENE

Date: 12-7-92 Analyst: D.S. Plant: N/ACASPHALT
Location: PERRY FL Sample Type: / GAS
Type of Calibration Standard: CYLINDER Target Compound: BETX
Number of Standards: 2 Date Prepared: ______ Prepared By: ______

GC Used: SRI Column Used: 5% SP 1200 / 1.75% BENTONE 34
Carrier Gas Used: N2 Carrier Gas Flow Rate: / 40 CC/MIN
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1CC Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: ___ Auxiliary Gases: ______

Calibration Data PRE First analysis/second analysis	Standard 1	Standard 2	Standard 3
Standard concentration (C_{act})	1.18	10.2	
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	7.183/7.314	7.314/7.264	/
Peak retention time range (min)	7.183	7.264	
Peak area	8.34/8.49	77.27/75.64	/
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	8.42	76.46	
Percent deviation from average	< 5%	< 5%	
Calculated concentration (C_{std})	1.18	10.2	
% deviation from actual ($\%D_{act}$)	0	0	

Linear regression equation; slope (m): 7.54 y-intercept (b): -.481

Sample Analysis Data POST First analysis/second analysis	Sample 1	Sample 2	Sample 3
Sample identification	1.18	10.2	
Interface dilution factor			
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	7.183/7.314	7.314/7.264	/
Peak retention time range (min)	7.183	7.264	
Peak area	8.74/8.95	77.54/75.64	/
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	8.85	76.6	
% deviation from average ($\%D_{avg}$)	4.9%	.2%	
Calculated concentration (C_s)	1.24	10.22	

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left|\frac{A_1 - Y}{Y}\right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

ANALYSIS OF METHOD 18 FIELD SAMPLES

METHANE

Date: 12-7-92 Analyst: D.S. Plant: MACASPHALT
Location: PERRY FL Sample Type: GAS
Type of Calibration Standard: CYLINDER Target Compound: METHANE
Number of Standards: 2 Date Prepared: ________ Prepared By: ________

GC Used: SRI Column Used: 5% SP1200 / 1.75% BENTONE 34
Carrier Gas Used: N_2 Carrier Gas Flow Rate: 40 CC/MIN
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1CC Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: ___ Auxiliary Gases: ________

Calibration Data PRE First analysis/second analysis	Standard 1	Standard 2	Standard 3
Standard concentration (C_{act})	11	310	495
Flow rate through loop (ml/min)	600/600	600/600	600/600
Liquid injection volume (tubes)	NA/	NA/	NA/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	NA/
Detector attenuation	32/32	32/32	32/32
Peak retention time (min)	.45/.45	.45/.45	.46/.45
Peak retention time range (min)	.45	.45	.45
Peak area	13.61/14.04	380.88/395.84	593.85/606.70
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	13.83	388.37	600.28
Percent deviation from average	<5%	<5%	<5%
Calculated concentration (C_{std})	8.48	316.60	490.93
% deviation from actual (%D_{act})	18.2%	1.7%	.7%

Linear regression equation; slope (m): 1.214 y-intercept (b): 3.52

Sample Analysis Data POST First analysis/second analysis	Sample 1	Sample 2	Sample 3
Sample identification	11	310	495
Interface dilution factor			
Flow rate through loop (ml/min)	600/600	600/600	600/600
Liquid injection volume (tubes)	NA/	NA/	NA/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	NA/
Detector attenuation	32/32	32/32	32/32
Peak retention time (min)	.45/.45	.45/.45	.46/.45
Peak retention time range (min)	.45	.45	.45
Peak area	13.51/13.54	381.22/395.79	591.05/604.30
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	13.53	388.51	597.68
% deviation from average (%D_{avg})	2.2%	.03%	.4%
Calculated concentration (C_s)	8.23	316.71	488.78

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left|\frac{A_1 - Y}{Y}\right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

ANALYSIS OF METHOD 18 FIELD SAMPLES

BENZENE

Date: 12-8-92 Analyst: O.S. Plant: MACASPHALT
Location: PERRY FL Sample Type: GAS
Type of Calibration Standard: CYLINDER Target Compound: BETX
Number of Standards: 2 Date Prepared: ________ Prepared By: ________

GC Used: SRI Column Used: 5% SP1200 / 1.75% BENTONE 34
Carrier Gas Used: N_2 Carrier Gas Flow Rate: 40 cc/MIN
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1cc Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: ___ Auxiliary Gases: ________

Calibration Data PRE First analysis/second analysis	Standard 1	Standard 2	Standard 3
Standard concentration (C_{act})	1.05	10.5	
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	1.333/1.35	1.35/1.35	/
Peak retention time range (min)	1.333	1.35	
Peak area	7.33/7.13	69.50/70.25	/
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	7.23	69.88	
Percent deviation from average	< 5%	< 5%	
Calculated concentration (C_{std})	1.05	10.5	
% deviation from actual (%D_{act})	0	0	

Linear regression equation: slope (m): 6.63 y-intercept (b): .269

Sample Analysis Data POST First analysis/second analysis	Sample 1	Sample 2	Sample 3
Sample identification	1.05	10.5	
Interface dilution factor			
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	1.333/1.35	1.35/1.35	/
Peak retention time range (min)	1.33	1.35	
Peak area	7.60/7.44	73.63/72.81	/
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	7.53	73.22	
% deviation from average (%D_{avg})	4%	4.6%	
Calculated concentration (C_s)	1.00	11.01	

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left| \frac{A_i - Y}{Y} \right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

ANALYSIS OF METHOD 18 FIELD SAMPLES

ETHYL BENZENE

Date: 12-8-92 Analyst: D.S. Plant: MAC ASPHALT
Location: PERRY FL Sample Type: GAS
Type of Calibration Standard: CYLINDER Target Compound: ______
Number of Standards: 2 Date Prepared: ______ Prepared By: ______

GC Used: SRI Column Used: 5% SP1200 / 1.75% BENTONE 34
Carrier Gas Used: N_2 Carrier Gas Flow Rate: 40 cc/min
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1cc Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: ___ Auxiliary Gases: ______

Calibration Data PRE	Standard 1	Standard 2	Standard 3
First analysis/second analysis			
Standard concentration (C_{act})	1.28	9.7	
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	2.516/2.550	2.566/2.564	/
Peak retention time range (min)	2.516	2.566	
Peak area	7.37/7.84	76.03/74.75	/
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	7.61	75.39	
Percent deviation from average	<5%	<5%	
Calculated concentration (C_{std})	1.28	9.7	
% deviation from actual (%D_{act})	0	0	

Linear regression equation; slope (m): 8.05 y-intercept (b): -2.7

Sample Analysis Data POST	Sample 1	Sample 2	Sample 3
First analysis/second analysis			
Sample identification	1.28	9.7	
Interface dilution factor			
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	2.516/2.55	2.566/2.566	/
Peak retention time range (min)	2.516	2.566	
Peak area	8.66/8.79	82.95/81.30	/
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	8.73	82.13	
% deviation from average (%D_{avg})	12.8%	8.2%	
Calculated concentration (C_s)	1.42	10.54	

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left| \frac{A_1 - Y}{Y} \right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

ANALYSIS OF METHOD 18 FIELD SAMPLES

TOLUENE

Date: 12-8-92 Analyst: DS Plant: MACASPHALT
Location: PERRY FL Sample Type: GAS
Type of Calibration Standard: CYLINDER Target Compound: BETX
Number of Standards: 2 Date Prepared: ______ Prepared By: ______

GC Used: SRI Column Used: 5% SP1200 / 1.75% BENTONE 34
Carrier Gas Used: N_2 Carrier Gas Flow Rate: 40 cc/min
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1cc Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: ___ Auxiliary Gases: ______

Calibration Data PRE First analysis/second analysis	Standard 1	Standard 2	Standard 3
Standard concentration (C_{act})	1.18	11	
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	4.6/4.64	4.733/4.733	/
Peak retention time range (min)	4.6	4.733	
Peak area	11.43/11.51	66.44/66.93	/
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	11.47	66.69	
Percent deviation from average	< 5%	< 5%	
Calculated concentration (C_{std})	1.18	11	
% deviation from actual ($\%D_{act}$)	0	0	

Linear regression equation; slope (m): 5.623 y-intercept (b): 4.835

Sample Analysis Data POST First analysis/second analysis	Sample 1	Sample 2	Sample 3
Sample identification	1.18	11	
Interface dilution factor			
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	4.6/4.66	4.733/4.733	/
Peak retention time range (min)	4.6	4.733	
Peak area	12.30/12.41	78.47/78.07	/
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	12.36	78.27	
% deviation from average ($\%D_{avg}$)	7.2%	14.8%	
Calculated concentration (C_s)	1.34	13.06	

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left|\frac{A_1 - Y}{Y}\right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

ANALYSIS OF METHOD 18 FIELD SAMPLES

ORTHO - XYLENE

Date: 12-8-92 Analyst: D.S. Plant: MACASPHALT
Location: PERRY FL. Sample Type: GAS
Type of Calibration Standard: CYLINDER Target Compound:
Number of Standards: 2 Date Prepared: Prepared By:

GC Used: SRI Column Used: 5% SP 1200 / 1.75 % BENTONE 34
Carrier Gas Used: N_2 Carrier Gas Flow Rate: 40 CC/MIN
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1CC Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: Auxiliary Gases:

Calibration Data PRE First analysis/second analysis	Standard 1	Standard 2	Standard 3
Standard concentration (C_{act})	1.18	10.2	
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	6.314/6.44	6.514/6.516	/
Peak retention time range (min)	6.316	6.516	
Peak area	11.35/10.97	63.92/61.83	/
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	11.16	62.88	
Percent deviation from average	<5%	<5%	
Calculated concentration (C_{std})	1.18	10.2	
% deviation from actual (%D_{act})	0	0	

Linear regression equation: slope (m): 5.733 y-intercept (b): 4.4

Sample Analysis Data POST First analysis/second analysis	Sample 1	Sample 2	Sample 3
Sample identification	1.18	10.2	
Interface dilution factor			
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	6.316/6.46	6.516/6.516	/
Peak retention time range (min)	6.316	6.516	
Peak area	12.04/12.35	77.72/77.53	/
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	12.2	77.63	
% deviation from average (%D_{avg})	8.5%	19%	
Calculated concentration (C_s)	1.36	12.77	

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left| \frac{A_1 - Y}{Y} \right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

ANALYSIS OF METHOD 18 FIELD SAMPLES

METHANE

Date: 12-8-92 Analyst: D.S Plant: MAC ASPHALT
Location: PERRY FL. Sample Type: GAS
Type of Calibration Standard: CYLINDER Target Compound: METHANE
Number of Standards: 3 Date Prepared: ____ Prepared By: ____

GC Used: SRI Column Used: 5% SP1200 / 1.75% BENTONE34
Carrier Gas Used: N_2 Carrier Gas Flow Rate: 40 CC/min
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1cc Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: ___ Auxiliary Gases: ____

Calibration Data First analysis/second analysis	Standard 1	Standard 2	Standard 3
Standard concentration (C_{act})	11	310	495
Flow rate through loop (ml/min)	600/600	600/600	600/600
Liquid injection volume (tubes)	NA/	NA/	NA/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	NA/
Detector attenuation	32/32	32/32	32/32
Peak retention time (min)	.4/.383	.416/.416	.416/.416
Peak retention time range (min)	.383	.416	.416
Peak area	15.03/15.61	432.00/437.44	701.76/704.55
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	15.32	434.72	703.16
Percent deviation from average	<5%	<5%	<5%
Calculated concentration (C_{std})	11.97	307.45	496.58
% deviation from actual (%D_{act})	6.3%	.6%	.2%

Linear regression equation: slope (m): 1.42 y-intercept (b): -1.68

Sample Analysis Data First analysis/second analysis	Sample 1	Sample 2	Sample 3
Sample identification	11.	310	495
Interface dilution factor			
Flow rate through loop (ml/min)	600/600	600/600	600/600
Liquid injection volume (tubes)	NA/	NA/	NA/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	NA/
Detector attenuation	32/32	32/32	32/32
Peak retention time (min)	.4/.383	.416/.416	.416/.416
Peak retention time range (min)	.383	.416	.416
Peak area	15.05/16.39	432/436.24	699.56/699.85
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	15.72	434.12	699.71
% deviation from average (%D_{avg})	2.5%	.1%	.5%
Calculated concentration (C_s)	12.26	307.03	494.13

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left| \frac{A_1 - Y}{Y} \right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

ANALYSIS OF METHOD 18 FIELD SAMPLES

BENZENE

Date: 12-9-92 Analyst: D.S. Plant: MAC ASPHALT
Location: PERRY FL Sample Type: GAS
Type of Calibration Standard: CYLINDER Target Compound: BETX
Number of Standards: 2 Date Prepared: ______ Prepared By: ______

GC Used: SRI Column Used: 5% SP1200 / 1.75% BENTONE 34
Carrier Gas Used: N2 Carrier Gas Flow Rate: 40 cc/min.
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1cc Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: ___ Auxiliary Gases: ______

Calibration Data PRE	Standard 1	Standard 2	Standard 3
First analysis/second analysis			
Standard concentration (C_{act})	1.05	10.5	
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	1.35/1.35	1.364/1.364	/
Peak retention time range (min)	1.35	1.364	
Peak area	8.61/9.03	67.52/66.33	/
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	8.82	66.93	
Percent deviation from average	<5%	<5%	
Calculated concentration (C_{std})	1.05	10.5	
% deviation from actual ($\%D_{act}$)	0	0	

Linear regression equation: slope (m): 6.15 y-intercept (b): 2.36

Sample Analysis Data POST	Sample 1	Sample 2	Sample 3
First analysis/second analysis			
Sample identification	1.05	10.5	
Interface dilution factor			
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	1.35/1.35	1.364/1.364	/
Peak retention time range (min)	1.35	1.364	
Peak area	8.86/8.33	76.91/76.91	/
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	8.6	76.91	
% deviation from average ($\%D_{avg}$)	2.6%	13.00%	
Calculated concentration (C_s)	1.01	12.12	

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left| \frac{A_1 - Y}{Y} \right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

ANALYSIS OF METHOD 18 FIELD SAMPLES

ETHYL BENZENE

Date: 12-9-92 Analyst: D.S Plant: MAC ASPHALT
Location: PERRY FL Sample Type: / GAS
Type of Calibration Standard: CYLINDER Target Compound: BETX
Number of Standards: 2 Date Prepared: ______ Prepared By: ______

GC Used: SRI Column Used: 5% SP 1200 / 1.75 % BENTONE 34
Carrier Gas Used: N2 Carrier Gas Flow Rate: 40 cc/min
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1cc Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: ___ Auxiliary Gases: ______

Calibration Data PRE	Standard 1	Standard 2	Standard 3
First analysis/second analysis			
Standard concentration (C_{act})	1.28	9.7	
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	2.566/2.566	2.600/2.600	/
Peak retention time range (min)	2.566	2.600	
Peak area	9.16/9.35	73.62/72.96	/
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	9.26	73.29	
Percent deviation from average	<5%	<5%	
Calculated concentration (C_{std})	1.28	9.7	
% deviation from actual (%D_{act})	0	0	

Linear regression equation: slope (m): 7.61 y-intercept (b): -.48

Sample Analysis Data POST	Sample 1	Sample 2	Sample 3
First analysis/second analysis			
Sample identification	1.28	9.7	
Interface dilution factor			
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	2.566/2.566	2.60/2.60	/
Peak retention time range (min)	2.566	2.60	
Peak area	9.60/8.90	85.48/83.58	/
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	9.25	84.53	
% deviation from average (%D_{avg})	1%	13.3%	
Calculated concentration (C_s)	1.28	11.18	

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left| \frac{A_1 - Y}{Y} \right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

ANALYSIS OF METHOD 18 FIELD SAMPLES

TOLUENE

Date: 12-9-93 Analyst: D.S. Plant: MACASPHALT
Location: PERRY FL Sample Type: GAS
Type of Calibration Standard: CYLINDER Target Compound: ______
Number of Standards: 2 Date Prepared: ______ Prepared By: ______

GC Used: SRI Column Used: 5% SP 1200 / 1.75% BENTONE 34
Carrier Gas Used: N2 Carrier Gas Flow Rate: 40 cc/min
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1cc Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: ___ Auxiliary Gases: ______

Calibration Data PRE First analysis/second analysis	Standard 1	Standard 2	Standard 3
Standard concentration (C_{act})	1.18	11	
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32 / 32	32 / 32	/
Peak retention time (min)	4.666/4.666	4.783/4.783	/
Peak retention time range (min)	4.666	4.783	
Peak area	12.85 / 12.82	73.86/72.06	/
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	12.84	72.96	
Percent deviation from average	< 5%	< 5%	
Calculated concentration (C_{std})	1.18	11	
% deviation from actual ($\%D_{act}$)	0	0	

Linear regression equation; slope (m): 6.12 y-intercept (b): 5.62

Sample Analysis Data POST First analysis/second analysis	Sample 1	Sample 2	Sample 3
Sample identification	1.18	11	
Interface dilution factor			
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32 / 32	32 / 32	/
Peak retention time (min)	4.66/4.66	4.783/4.783	/
Peak retention time range (min)	4.66	4.783	
Peak area	12.11 / 11.23	78.43/75.55	/
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	11.67	76.99	
% deviation from average ($\%D_{avg}$)	10%	3.2%	
Calculated concentration (C_s)	.989	11.66	

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left| \frac{A_i - Y}{Y} \right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

ANALYSIS OF METHOD 18 FIELD SAMPLES

ORTHO - XYLENE

Date: 12-9-92 Analyst: D.S. Plant: MACASPHALT
Location: PERRY FL Sample Type: GAS
Type of Calibration Standard: CYLINDER Target Compound: BETX
Number of Standards: 2 Date Prepared: ____ Prepared By: ____

GC Used: SRI Column Used: 5% SP1200/1.75% BENTONE 34
Carrier Gas Used: N2 Carrier Gas Flow Rate: 40 cc/min
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1cc Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: ____ Auxiliary Gases: ____

Calibration Data PRE First analysis/second analysis	Standard 1	Standard 2	Standard 3
Standard concentration (C_{act})	1.18	10.2	/
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	6.433/6.433	6.583/6.583	/
Peak retention time range (min)	6.433	6.583	
Peak area	12.36/12.51	69.59/68.65	/
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	12.44	69.12	
Percent deviation from average	<5%	<5%	
Calculated concentration (C_{std})	1.18	10.2	
% deviation from actual ($\%D_{act}$)	0	0	

Linear regression equation: slope (m): 6.284 y-intercept (b): 5.02

Sample Analysis Data POST First analysis/second analysis	Sample 1	Sample 2	Sample 3
Sample identification	1.18	10.2	
Interface dilution factor			
Flow rate through loop (ml/min)	600/600	600/600	/
Liquid injection volume (tubes)	NA/	NA/	/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	/
Detector attenuation	32/32	32/32	/
Peak retention time (min)	6.433/6.433	6.583/6.583	/
Peak retention time range (min)	6.433	6.583	
Peak area	10.91/11.23	73.72/73.72	/
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	11.07	73.72	
% deviation from average ($\%D_{avg}$)	12.4%	6.2%	
Calculated concentration (C_s)	.963	10.93	

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left|\frac{A_1 - Y}{Y}\right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

ANALYSIS OF METHOD 18 FIELD SAMPLES

METHANE

Date: 12-9-92 Analyst: D.S Plant: MAC ASPHALT
Location: PERRY FL. Sample Type: GAS
Type of Calibration Standard: CYLINDER Target Compound: METHANE
Number of Standards: 3 Date Prepared: ______ Prepared By: ______

GC Used: SRI Column Used: 5% SP1200/1.75% BENTONE 34
Carrier Gas Used: N2 Carrier Gas Flow Rate: 40 cc/min
Column Temperatures, Initial: 75C Program Rate: — Final: 75C
Sample Loop Volume: 1cc Loop Temperature: 75C Inject. Port Temp.: 75C
Detector Temp.: ___ Auxiliary Gases: ______

Calibration Data PRE First analysis/second analysis	Standard 1	Standard 2	Standard 3
Standard concentration (C_{act})	11	310	495
Flow rate through loop (ml/min)	600/600	600/600	600/600
Liquid injection volume (tubes)	NA/	NA/	NA/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	NA/
Detector attenuation	32/32	32/32	32/32
Peak retention time (min)	.383/.400	.416/.416	.416/.416
Peak retention time range (min)	.383	.416	.416
Peak area	12.06/17.64	489.55/471.45	708.53/757.90
Peak area x attenuation factor	/	/	/
Average peak area value (Y)	17.35	480.5	733.72
Percent deviation from average	<5%	<5%	<5%
Calculated concentration (C_{std})	7.53	319.071	489.4
% deviation from actual (%D_{act})	20%	1.9%	.8%

Linear regression equation: slope (m): 1.487 y-intercept (b): 6.151

Sample Analysis Data POST First analysis/second analysis	Sample 1	Sample 2	Sample 3
Sample identification	11	310	495
Interface dilution factor			
Flow rate through loop (ml/min)	600/600	600/600	600/600
Liquid injection volume (tubes)	NA/	NA/	NA/
Injection time (24-hr clock)	/	/	/
Chart speed (cm/min)	NA/	NA/	NA/
Detector attenuation	32/32	32/32	32/32
Peak retention time (min)	.383/.400	.416/.416	.416/.416
Peak retention time range (min)	.416	.416	.416
Peak area	15.67/15.76	425.88/425.64	652.89/709.53
Peak area x atten. factor (A_1/A_2)	/	/	/
Average peak area value (Y)	15.72	425.76	681.21
% deviation from average (%D_{avg})	10.4%	12.9%	7.7%
Calculated concentration (C_s)	6.43	282.25	454.68

$$C_{std} \text{ or } C_s = \frac{(Y - b)}{m} \qquad \%D_{avg} = \left| \frac{A_1 - Y}{Y} \right| \times 100\% \qquad \%D_{act} = \frac{C_{std} - C_{act}}{Y} \times 100\%$$

VIII. EQUIPMENT CALIBRATION DATA

B. CEMS Calibration Data

INSTRUMENTAL ANALYSIS CALIBRATION DATA

SO_2 MONITORS

Plant NAPA - Mac Asphalt Location Perry, Fla.

Date 12-7-92 Operator TM

Initial Calibration (Accuracy: ± 2% Span)

Gas Type	Actual Concentration	Analyzer Response
SO_2-Zero	0.0	0.9
SO_2-High	78	77.7
SO_2-Mid	55	54.5

System Bias Reponse: Analyzer Response-Initial Bias = ± 5% Span
Final Bias - Initial Bias = ± 3% Span

Run # 1 Time: 11:45-11:47 + 12:59-14:03

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.9	1.1	
SO_2	77.7	77.9	

Run # 2 Time: 14:52-16:07

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	1.1	1.9	
SO_2	77.9	79.1	

12-8-92 Run # 3 Time: 8:30-8:40 + 9:30-10:24

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	1.0	30.0	
SO_2	78.1	49.0	

12-8-92 Run # 4 Time: 11:24-12:37

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.7	1.1	
SO_2	73.4	74.5	

INSTRUMENTAL ANALYSIS CALIBRATION DATA

SO_2 MONITORS

Plant NAPA - Mac Asphalt   Location Perry, Fla.

Date 12-8-92   Operator TM

Initial Calibration   (Accuracy: ± 2% Span)

Gas Type	Actual Concentration	Analyzer Response
SO_2-Zero		
SO_2-High		
SO_2-Mid		

System Bias Reponse: Analyzer Response-Initial Bias = ± 5% Span
Final Bias - Initial Bias = ± 3% Span

Run # 5   Time: 13:43 - 13:52 + 15:45 - 17:11

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	1.0	-0.6	
SO_2	76.2	72.4	

12-9-92   Run # 6   Time: 9:46 - 12:16

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.9	0.3	
SO_2	77.4	76.8	

Run #   Time:

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero			
SO_2			

Run #   Time:

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero			
SO_2			

INSTRUMENTAL ANALYSIS CALIBRATION DATA

CARBON MONOXIDE

Plant NAPA-Mac Asphalt Location Perry, Fla.

Date 12-7-92 Operator TM

CO Range 0-1000 ppm

Initial Calibration: (Accuracy: ± 5% Span)

Gas Type	Actual Concentration	Anayzer Response
CO-Zero	0	1.0
CO-High	904	909
CO-Mid	536	530
CO-Low	290	283

Zero & Span Drift: (Accuracy ± 5% Span)

End Run # 1 Time: 11:45-11:47 + 12:59-14:03

Gas Type	Initial Response	Final Response	Drift
CO-Zero	1.0	-3.1	
CO- 290	283	291	

End Run # 2 Time: 14:52-16:07

Gas Type	Initial Response	Final Response	Drift
CO-Zero	0.3	-2.1	
CO- 904	906	904	

12-8-92 End Run # 3 Time: 8:30-8:40 + 9:30-10:24

Gas Type	Initial Response	Final Response	Drift
CO-Zero	1.0	-1.9	
CO- 904	906	900	

12-8-92 End Run # 4 Time: 11:24-12:37

Gas Type	Initial Response	Final Response	Drift
CO-Zero	2.0	-2.3	
CO- 904	904	894	

INSTRUMENTAL ANALYSIS CALIBRATION DATA

CARBON MONOXIDE

Plant NAPA - Mac Asphalt Location Perry, Fla.

Date 12-8-92 Operator TM

CO Range 0-1000 ppm

Initial Calibration: (Accuracy: ± 5% Span)

Gas Type	Actual Concentration	Anayzer Response
CO-Zero	0	
CO-High		
CO-Mid		
CO-Low		

Zero & Span Drift: (Accuracy ± 5% Span)

End Run # 5 Time: 13:43-13:52 + 15:45-17:11

Gas Type	Initial Response	Final Response	Drift
CO-Zero	1.2	-4.2	
CO- 904	911	924	

12-9-92 End Run # 6 Time: 9:46-12:16

Gas Type	Initial Response	Final Response	Drift
CO-Zero	0.8	-7.0	
CO- 904	903	924	

12-9-92 End Run # 7 Time: 12:48 -13:53

Gas Type	Initial Response	Final Response	Drift
CO-Zero	1.1	-5.0	
CO- 904	908	921	

12-9-92 End Run # 8 Time: 14:24-15:34

Gas Type	Initial Response	Final Response	Drift
CO-Zero	-0.9	-11.9	
CO- 904	907	919	

INSTRUMENTAL ANALYSIS CALIBRATION DATA

CARBON MONOXIDE

Plant NAPA - Mac Asphalt Location Perry, Fla.

Date 12-9-92 Operator TM

CO Range 0-1000 ppm

Initial Calibration: (Accuracy: ± 5% Span)

Gas Type	Actual Concentration	Anayzer Response
CO-Zero	0	
CO-High		
CO-Mid		
CO-Low		

Zero & Span Drift: (Accuracy ± 5% Span)

End Run # 9 Time: 16:11 - 17:00

Gas Type	Initial Response	Final Response	Drift
CO-Zero	2.0	-12.7	
CO-	920	930	

End Run # Time:

Gas Type	Initial Response	Final Response	Drift
CO-Zero			
CO-			

End Run # Time:

Gas Type	Initial Response	Final Response	Drift
CO-Zero			
CO-			

End Run # Time:

Gas Type	Initial Response	Final Response	Drift
CO-Zero			
CO-			

INSTRUMENTAL ANALYSIS CALIBRATION DATA

TOTAL HYDROCARBONS

PLANT NAPA - MacAsphalt LOCATION Perry, Fla.

DATE 12-7-92 OPERATOR TM

H C RANGE 0-1000 ppm Methane RESPONSE TIME

INITIAL CALIBRATION: (Accuracy ±5% of calibration gas value)

Gas Type	Actual Concentration	Analyzer	Gas Type	Actual Concentration	Analyzer
HC - Zero	0	0.4	HC - Mid	495	500
HC - High	999	995	HC - Low	310	309

ZERO & SPAN DRIFT: (Accuracy ±3% of span)

Run # 1	Time: 11:45+11:47 + 12:59-14:0[illegible]	
Gas Type	Initial Response	Final Response
HC - Zero	0.4	-2.3
HC - 495	500	496

Run # 2	Time: 14:52-16:07	
Gas Type	Initial Response	Final Response
HC - Zero	0.2	-1.0
HC - 495	499	497

12-8-92

Run # 3	Time: 8:30-8:40+ 9:30-10:24	
Gas Type	Initial Response	Final Response
HC - Zero	0.1	3.0
HC - 495	496	503

12-8-92

Run # 4	Time: 11:24-12:37	
Gas Type	Initial Response	Final Response
HC- Zero	0.9	1.9
HC - 495	500	499

12-8-92

Run # 5	Time: 13:43-13:52+15:45-17:4[illegible]	
Gas Type	Initial Response	Final Response
HC- Zero	1.1	-3.2
HC - 495	495	479.9

12-9-92

Run # 6	Time: 9:46-12:16	
Gas Type	Initial Response	Final Response
HC- Zero	0.3	-4.0
HC -	499	496

INSTRUMENTAL ANALYSIS CALIBRATION DATA

TOTAL HYDROCARBONS

PLANT NAPA - Mac Asphalt LOCATION Perry, Fla.

DATE 12-9-92 OPERATOR TM

H C RANGE 0-1000 ppm Methane RESPONSE TIME

INITIAL CALIBRATION: (Accuracy ±5% of calibration gas value)

Gas Type	Actual Concentration	Analyzer	Gas Type	Actual Concentration	Analyzer
HC - Zero	0		HC - Mid		
HC - High			HC - Low		

ZERO & SPAN DRIFT: (Accuracy ±3% of span)

Run # 7 Time: 12:48 - 13:53

Gas Type	Initial Response	Final Response
HC - Zero	0.5	2.7
HC - 495	498	492

Run # Time:

Gas Type	Initial Response	Final Response
HC- Zero		
HC -		

Run # 8 Time: 14:24 - 15:34

Gas Type	Initial Response	Final Response
HC - Zero	-0.3	-1.7
HC - 495	490	487

Run # Time:

Gas Type	Initial Response	Final Response
HC- Zero		
HC -		

Run # 9 Time: 16:11 - 17:00

Gas Type	Initial Response	Final Response
HC - Zero	1.0	-0.2
HC - 495	502	492

Run # Time:

Gas Type	Initial Response	Final Response
HC- Zero		
HC -		

INSTRUMENTAL ANALYSIS CALIBRATION DATA

NO_x MONITOR

Plant NAPA - Mac Asphalt Location Perry, Fla.

Date 12-7-92 Operator TM

Initial Calibration (Accuracy: ± 2% Span)

Gas Type	Actual Concentration	Analyzer Response
NO_x-Zero	0.0	0.9
NO_x-High	200	202
NO_x-Mid	143	144

System Bias Reponse: Analyzer Response-Initial Bias = ± 5% Span
Final Bias - Initial Bias = ± 3% Span

Run # 1 Time: 11:45→11:47 + 12:59 - 14:03

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.9	12.1	
NO_x	144	172	

Run # 2 Time: 14:52 - 16:07

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.4	14.0	
NO_x	143.4	177.1	

12-8-92 Run # 3 Time: 8:36 - 8:40 + 9:30 - 10:24

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	1.0	5.4	
NO_x	143.1	151	

12-8-92 Run # 4 Time: 11:24 - 12:37

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.9	6.2	
NO_x	144.1	153.2	

INSTRUMENTAL ANALYSIS CALIBRATION DATA

NO_x MONITOR

Plant NAPA-MacAsphalt Location Perry, Fla.

Date 12-8-92 Operator TM

Initial Calibration (Accuracy: ± 2% Span)

Gas Type	Actual Concentration	Analyzer Response
NO_x-Zero		
NO_x-High		
NO_x-Mid		

System Bias Reponse: Analyzer Response-Initial Bias = ± 5% Span
Final Bias - Initial Bias = ± 3% Span

Run # 5 Time: 13:43 - 13:52 + 15:45 - 17:11

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.7	6.7	
NO_x	143.5	149.9	

12-9-92 Run # 6 Time: 9:46 - 12:16

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	1.1	12.0	
NO_x	143.3	159.2	

12-9-92 Run # 7 Time: 12:48 - 13:53

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.7	9.1	
NO_x	144.0	151.0	

12-9-92 Run # 8 Time: 14:24 - 15:34

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	1.2	4.5	
NO_x	142.9	149.6	

INSTRUMENTAL ANALYSIS CALIBRATION DATA

NO_x MONITOR

Plant NADA - Mac Asphalt   Location Perry, Fla.

Date 12-9-92   Operator TM

Initial Calibration   (Accuracy: ± 2% Span)

Gas Type	Actual Concentration	Analyzer Response
NO_x-Zero		
NO_x-High		
NO_x-Mid		

System Bias Reponse: Analyzer Response-Initial Bias = ± 5% Span
Final Bias - Initial Bias = ± 3% Span

Run # 9   Time: 16:11 - 17:00

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.3	5.1	
NO_x	143.1	148.3	

Run #   Time:

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero			
NO_x			

Run #   Time:

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero			
NO_x			

Run #   Time:

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero			
NO_x			

INSTRUMENTAL ANALYSIS CALIBRATION DATA

DILUENT O_2 AND CO_2 MONITORS

Plant NAPA MacAsphalt   Location Perry, Fla.

Date 12-7-92   Operator TM

Initial Calibration   (Accuracy: ± 2% Span)

O_2 Gas Type	Actual Concentration	Analyzer Response	CO_2 Gas Type	Actual Concentration	Analyzer Response
O_2-Zero	0.0	0.0	CO_2-Zero	0.0	0.1
O_2-High	20.9	21.1	CO_2-High	17.1	17.2
O_2-Mid	10.0	10.0	CO_2-Mid	10.0	10.0

System Bias Reponse: Analyzer Response-Initial Bias = ± 5% Span
Final Bias - Initial Bias = ± 3% Span

Run # 1   Time: 11:45-11:47 + 12:59-14:03

Gas Type	Initial Bias Response		Final Bias Response		Drift
Zero	0.0	0.0	0.1	0.1	
CO_2/O_2	10.0	10.0	10.1	10.1	

Run # 2   Time: 14:52-16:07

Gas Type	Initial Bias Response		Final Bias Response		Drift
Zero	0.1	0.1	0.3	0.1	
CO_2/O_2	10.1	10.1	10.4	10.6	

12-8-92   Run # 3   Time: 8:30-8:40 + 9:30-10:24

Gas Type	Initial Bias Response		Final Bias Response		Drift
Zero	0.0	0.0	0.3	-0.3	
CO_2/O_2	10.0	10.0	10.1	9.8	

12-8-92   Run # 4   Time: 11:24-12:37

Gas Type	Initial Bias Response		Final Bias Response		Drift
Zero	0.0	0.1	0.2	0.2	
CO_2/O_2	10.1	10.0	10.1	10.2	

INSTRUMENTAL ANALYSIS CALIBRATION DATA

DILUENT O_2 AND CO_2 MONITORS

Plant NAPA - Mac Asphalt   Location Perry, Fla.

Date 12-8-92   Operator TM

Initial Calibration   (Accuracy: ± 2% Span)

O_2 Gas Type	Actual Concentration	Analyzer Response	CO_2 Gas Type	Actual Concentration	Analyzer Response
O_2-Zero			CO_2-Zero		
O_2-High			CO_2-High		
O_2-Mid			CO_2-Mid		

System Bias Reponse: Analyzer Response-Initial Bias = ± 5% Span
Final Bias - Initial Bias = ± 3% Span

Run # 5   Time: 13:43-13:52 + 15:45-17:11

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.1 0.0	0.3 0.1	
CO_2/O_2	10.1 10.0	10.2 10.0	

12-9-92   Run # 6   Time: 9:46-12:16

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.1 0.1	0.3 0.2	
CO_2/O_2	10.1 10.1	10.2 10.1	

12-9-92   Run # 7   Time: 12:48-13:53

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.0 0.0	0.3 -0.1	
CO_2/O_2	10.1 10.0	10.3 9.8	

12-9-92   Run # 8   Time: 14:24-15:34

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.1 0.1	0.2 -0.1	
CO_2/O_2	10.0 10.1	10.2 9.9	

INSTRUMENTAL ANALYSIS CALIBRATION DATA

DILUENT O_2 AND CO_2 MONITORS

Plant NAPA - Mac Asphalt Location Perry, Fla.

Date 12-9-92 Operator TM

Initial Calibration (Accuracy: ± 2% Span)

O_2 Gas Type	Actual Concentration	Analyzer Response	CO_2 Gas Type	Actual Concentration	Analyzer Response
O_2-Zero			CO_2-Zero		
O_2-High			CO_2-High		
O_2-Mid			CO_2-Mid		

System Bias Reponse: Analyzer Response-Initial Bias = ± 5% Span
Final Bias - Initial Bias = ± 3% Span

Run # 9 Time: 16:11-17:00

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.0 0.0	-0.2 0.2	
CO_2/O_2	10.0 10.1	9.9 10.2	

Run # Time:

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero			
CO_2/O_2			

Run # Time:

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero			
CO_2/O_2			

Run # Time:

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero			
CO_2/O_2			

VIII. EQUIPMENT CALIBRATION DATA

C. Particulate Calibration Data

TYPE S PITOT TUBE INSPECTION DATA FORM

Pitot tube assembly level? ✓ yes ______ no

Pitot tube openings damaged? ______ yes (explain below) ✓ no

α_1 = 1.3 ° (<10°), α_2 = 0.8 ° (<10°), β_1 = 0.5 ° (<5°),
β_2 = 1.8 ° (<5°)

γ = 2.9 °, θ = 1.7 °, A = .97 cm (in.)

$z = A \sin \gamma$ = .05 cm (in.); <0.32 cm (<1/8 in.),
$w = A \sin \theta$ = .03 cm (in.); <.08 cm (<1/32 in.)

P_A .48 cm (in.) P_b .49 cm (in.)

D_t = .38 cm (in.)

Comments: ______

Calibration required? ______ yes ✓ no

4B

TYPE S PITOT TUBE INSPECTION DATA FORM

Pitot tube assembly level? ✓ yes ______ no

Pitot tube openings damaged? ______ yes (explain below) ______ no

α_1 = 2.3 ° (<10°), α_2 = .5 ° (<10°), β_1 = 1.8 ° (<5°),
β_2 = 1.8 ° (<5°)

γ = 3.2 °, θ = 1.0 °, A = .98 cm (in.)

z = A sin γ = .05 cm (in.); <0.32 cm (<1/8 in.),
w = A sin θ = .02 cm (in.); <.08 cm (<1/32 in.)

P_A .49 cm (in.) P_b .49 cm (in.)

D_t = .38 cm (in.)

Comments: ______________________________

Calibration required? ______ yes ✓ no

RAMCON ENVIRONMENTAL CORPORATION

Lear Siegler Stack Sampler

Nozzle Diameter Calibration

Date ____________ Signature ____________

Nozzle No.	Average Diameter	Nozzle No.	Average Diameter
1		7	
2		8	
3		9	
4		10	
5		11	
6		12	

Pitot Tube Calibration (S Type)

Pitot Tube Identification No. 44 Date 6-9-91

Calibrated by: S Buck

"A" SIDE CALIBRATION

Run No.	Δp std cm H_2O (in. H_2O)	Δp (s) cm H_2O (in. H_2O)	$C_p(s)$	DEVIATION $C_{p(s)}-\bar{C}_p(A)$
1	2.2	3.3	.816	.004
2	1.8	2.7	.816	.004
3	1.1	1.6	.829	.009
		$\bar{C}_p$ (SIDE A)	.820	

"B" SIDE CALIBRATION

Run No.	Δp std cm H_2O (in. H_2O)	$\Delta p(s)$ cm H_2O in. H_2O)	$C_p(s)$	DEVIATION $C_p(s)-\bar{C}_p(B)$
1	2.2	3.3	.816	.004
2	1.8	2.7	.816	.004
3	1.1	1.6	.829	.009
		$\bar{C}_p$ (SIDE B)	.820	

$$\text{AVERAGE DEVIATION} = \sigma(\text{A OR B}) = \frac{\sum_{1}^{3} |C_p(s)-\bar{C}_p(\text{A OR B})|}{3} \leftarrow \text{MUST BE} \leq 0.01$$

$$|\bar{C}_p(\text{SIDE A})-\bar{C}_p(\text{SIDE B})| \leftarrow \text{MUST BE} \leq 0.01$$

$$C_p(s) = C_p(std)\sqrt{\frac{\Delta p\ std}{\Delta p_s}}$$

Form No. EED-17-1

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date 5-5-90 Thermocouple number 44

Ambient temperature 20 °C Barometric pressure 29.88 in. Hg

Calibrator S Tuma Reference: mercury-in-glass ✓

other ____

Reference point number	Source[a] (specify)	Reference thermometer temperature, °C	Thermocouple potentiometer temperature, °C	Temperature difference,[b] %
A	Ice Bath	32	32	0
B	Boiling water	218	218	0
C	Boiling oil	381	381	0
D	ambient			

[a]Type of calibration system used.

[b] $\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \leq 1.5\%.$

RAMCON

Lear Siegler Stack Sampler

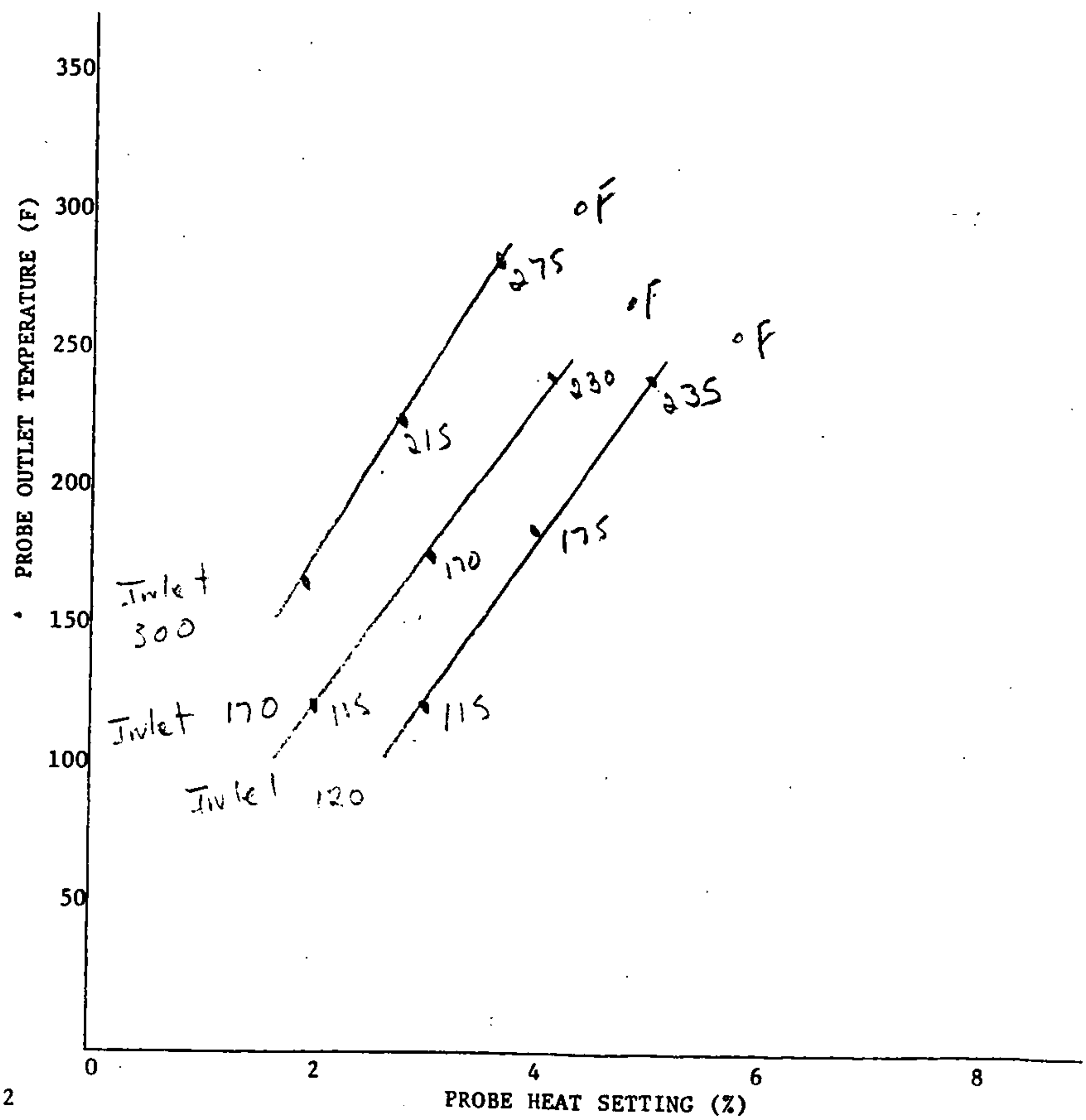
Heating Probe Calibration

Probe No. 44 Probe Length 4'

Date of Calibration 5-7-89 Signature Sam Turner

Name of Company to be tested ______

Note: 3 ft. probe - 5 min. warmup
6 ft. probe - 15 min. warmup
10 ft. probe - 30 min. warmup
Calibration flow rate = .75 CFM



Form No. EED-17-2

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English units)

Test number ________ Date 1/2/93 Meter box number Anderson 90-800 Plant ________

Barometric pressure, P_b = 30.36 in. Hg Dry gas meter number 26940 Pretest Y ________

Orifice manometer setting, (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperature: Wet test meter (t_w), °F	Temperature: Dry gas meter: Inlet (t_{d_i}), °F	Temperature: Dry gas meter: Outlet (t_{d_o}), °F	Temperature: Dry gas meter: Average[a] (t_d), °F	Time (θ), min	Vacuum setting, in. Hg	Y_i	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
1.0	10	342.143 / 352.883	64°	104 / 118	85 / 88	98.75	19.2	6"	.99	1.89
2.0	10	330.616 / 341.298	64°	105 / 120	79 / 85	97.25	13.73	5"	.99	1.94
3.0	10	317.841 / 328.402	64°	96 / 117	69 / 75	89.25	11.13	7"	.985	1.94
									Y =	

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d

where

V_w = Gas volume passing through the wet test meter, ft^3.

V_d = Gas volume passing through the dry gas meter, ft^3.

t_w = Temperature of the gas in the wet test meter, °F.

t_{d_i} = Temperature of the inlet gas of the dry gas meter, °F.

t_{d_o} = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d_i} and t_{d_o}, °F.

ΔH = Pressure differential across orifice, in. H_2O.

Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y $\pm$0.05Y.

P_b = Barometric pressure, in. Hg.

θ = Time of calibration run, min.

F..n #REC-01

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English units)

Test number ________ Date 11/28 Meter box number Anderson Plant Napa

Barometric pressure, P_b = 30.18 in. Hg Dry gas meter number ________ Pretest Y ________

Orifice manometer setting, (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperature: Wet test meter (t_w), °F	Temperature: Dry gas meter Inlet (t_{d_i}), °F	Temperature: Dry gas meter Outlet (t_{d_o}), °F	Temperature: Dry gas meter Average (t_d),[a] °F	Time (θ), min	Vacuum setting, in. Hg	Y_i	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$ 517 553 583
10.917 3 0	10	940.565 / 951.282	63°	92° / 110	85° / 85	93	11.1	5	.979	1.920
5.374 .50	~~10~~ 5	951.663 / 956.582	63	85 / 94	84 / 82	87	13.1	2	.981	1.843
1.5	10	957.345 / 965.035	63	93 / 100	82 / 86	90.3	15.3	3	.971	1.833
									Y =	1.852

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d

where

V_w = Gas volume passing through the wet test meter, ft^3.

V_d = Gas volume passing through the dry gas meter, ft^3.

t_w = Temperature of the gas in the wet test meter, °F.

t_{d_i} = Temperature of the inlet gas of the dry gas meter, °F.

t_{d_o} = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d_i} and t_{d_o}, °F.

ΔH = Pressure differential across orifice, in. H_2O.

Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y $\pm$0.05Y.

P_b = Barometric pressure, in. Hg.

θ = Time of calibration run, min.

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English units)

Test number ________ Date 12-11-92 Meter box number C-185 Plant ________

Barometric pressure, P_b = 30.10 in. Hg Dry gas meter number 638809 Pretest Y ________

Orifice manometer setting, (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperature: Wet test meter (t_w), °F	Temperature: Dry gas meter: Inlet (t_{d_i}), °F	Temperature: Dry gas meter: Outlet (t_{d_o}), °F	Temperature: Dry gas meter: Average[a] (t_d), °F	Time (Θ), min	Vacuum setting, in. Hg	Y_i	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$ 543 541 541.5 526
5.105 .50	~~10~~ 5	862.314 / 867.419	66	90 / 93	70 / 71	81	11.98	1	1.006	1.546
10.225 1	10	868.162 / 878.387	66	93 / 96	72 / 72	83	16.9	3	1.007	1.532
3	10	852.036 / 862.022	66	90 / 98	68 / 90	81.5	9.65	6	1.023	1.503
									Y = 1.012	1.527

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d

where

V_w = Gas volume passing through the wet test meter, ft^3.

V_d = Gas volume passing through the dry gas meter, ft^3.

t_w = Temperature of the gas in the wet test meter, °F.

t_{d_i} = Temperature of the inlet gas of the dry gas meter, °F.

t_{d_o} = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d_i} and t_{d_o}, °F.

ΔH = Pressure differential across orifice, in. H_2O.

Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y $\pm 0.05Y$.

P_b = Barometric pressure, in. Hg.

Θ = Time of calibration run, min.

Form #REC-01

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English units)

Test number ________ Date 11-23-92 Meter box number C-185 Plant ________

Barometric pressure, P_b = 29.90 in. Hg Dry gas meter number 658805 Pretest Y ________

	Orifice manometer setting, (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperature: Wet test meter (t_w), °F	Temperature: Dry gas meter: Inlet (t_{d_i}), °F	Temperature: Dry gas meter: Outlet (t_{d_o}), °F	Temperature: Dry gas meter: Average[a] (t_d), °F	Time (Θ), min	Vacuum setting, in. Hg	Y_i	$\frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$ 539 541 525
5.159	.50	~~10~~ 5	514.442 / 519.601	65	92 / 92	70 / 70	81	12.0	2	.997	1.555
10.363	1.0	10	519.632 / 530.295	65	86 / 88	72 / 70	79	16.75	4	.988	1.515
10.27	3.0	10	[illegible] / 515.948	65	88 / 98	70 / 70	81	9.7	7	.996	1.524
										Y = .994	1.531

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d

where

V_w = Gas volume passing through the wet test meter, ft^3.

V_d = Gas volume passing through the dry gas meter, ft^3.

t_w = Temperature of the gas in the wet test meter, °F.

t_{d_i} = Temperature of the inlet gas of the dry gas meter, °F.

t_{d_o} = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d_i} and t_{d_o}, °F.

ΔH = Pressure differential across orifice, in. H_2O.

Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y ± 0.05Y.

P_b = Barometric pressure, in. Hg.

Θ = Time of calibration run, min.

IX. FIELD DATA

A. CEMS

PPM 00 5 = 21. % 02 6 = 9. PPM NOX

1 = 5 PPM HC 2 = 4.6 PPM SO2 3 = 8.5 % CO2

17 16

7 PPM 00 5 = 21.7 % 02 6 = 9.6 PPM NOX

4 PPM HC 2 = 5.6 PPM SO2 3 = 8.6 % CO2

DEC/92 9 46 16

PPM HC 2 = 5.6 PPM SO2 3 = 8.6 % CO2

DEC/92 9 46 3

1 PPM 00 5 = 21.6 % 02 6 = 9.5 PPM NOX

1 = 2 PPM HC 2 = 0.1 PPM SO2 3 = 8.7 % CO2

46 11

START RUN 6

PPM 00 5 = 21.1 % 02 6 = 14.3 PPM NOX

1 PPM HC 2 = 9.5 PPM SO2 3 = 1.0 % CO2

DEC/92 9 45 11

1 = 1710.7 PPM 00 5 = 12.6 % 02 6 = 88.9 PPM NOX

1 = 136.3 PPM HC 2 = 5.6 PPM SO2 3 = 7.8 % CO4

9/DEC/92 9 44 11

4 = 1216.4 PPM 00 5 = 13.3 % 02 6 = 105.7 PPM NOX

1 = 56.1 PPM HC 2 = 8.9 PPM SO2 3 = 6.2 % CO2

9/DEC/92 9 43 11

~~RUN 5 RUN 3~~

100 90 80 70 60 50 40 30 20 10 0

4 = 23.1 PPM 00 5 = 20.7 % 02 6 = 13.5 PPM NOX

1 = 6.2 PPM HC 2 = 3.7 PPM SO2 3 = 0.7 % CO2

0 10 20 30 40 50 60 70 80 90 100

9/JUL/ 9 22 48 16

RECORDER/DATA LOGGER VRS 3E

RECORDER/DATA LOGGER VRS 3E

4 = 1702.0 PPM CO	5 = 11.4 % O2	6 = 116.9 PPM NOX	
1 = 116.6 PPM HC	2 = 8.5 PPM SO2	3 = 7.5 % CO2	
7 DEC 92 16 6 46			
4 = 1562.8 PPM CO	5 = 11.9 % O2	6 = 111.7 PPM NOX	
1 = 101.0 PPM HC	2 = 8.1 PPM SO2	3 = 7.1 % CO2	
[illegible] DEC 92 9 59 46			
4 = 1467.0 PPM CO	5 = 12.4 % O2	6 = 104.5 PPM NOX	
1 = 105.6 PPM HC	2 = 8.5 PPM SO2	3 = 7.1 % CO2	
5 DEC 92 9 58 46			
4 = 1215.1 PPM CO	5 = 12.2 % O2	6 = 112.5 PPM NOX	
[illegible]1.7 PPM HC	2 = 8.5 PPM SO2	3 = 7.1 % CO2	
[illegible] DEC 92 9 57 46			
[illegible]7.9 PPM CO	5 = 10.9 % O2	6 = 100.5 PPM NOX	
[illegible]5.8 PPM HC	2 = 9.5 PPM SO2	3 = 8.3 % CO2	
[illegible] 92 [illegible] 56 46			
[illegible]538.1 PPM CO	5 = 10.9 % O2	6 = 125.0 PPM NOX	
105.7 PPM HC	2 = 8.5 PPM SO2	3 = 8.0 % CO2	
[illegible] 92 9 55 46			
1531.7 PPM CO	5 = 11.6 % O2	6 = 106.1 PPM NOX	
[illegible].1 PPM HC	2 = 7.8 PPM SO2	3 = 7.5 % CO2	
[illegible] DEC 92 9 54 46			
[illegible].1 PPM CO	5 = 12.2 % O2	6 = 101.6 PPM NOX	
94.9 PPM HC	2 = 6.3 PPM SO2	3 = 6.9 % CO2	
[illegible] 9 53 46			
[illegible] PPM CO	5 = 13.6 % O2	6 = 87.4 PPM NOX	
[illegible]3 PPM HC	2 = 4.6 PPM SO2	3 = 5.7 % CO2	
[illegible] 46			
[illegible] PPM CO	5 = 16.9 % O2	6 = 72.2 PPM NOX	
[illegible] PPM HC	2 = 3.5 PPM SO2	3 = 4.9 % CO2	
[illegible] 46			
[illegible] PPM CO	5 = 21.6 % O2	6 = 16.5 PPM NOX	
[illegible] PPM HC	2 = 3.6 PPM SO2	3 = 0.3 % CO2	
[illegible] 92 9 50 46			
[illegible] PPM CO	5 = 21.7 % O2	6 = 7.2 PPM NOX	
[illegible] PPM HC	2 = 3.6 PPM SO2	3 = 0.4 % CO2	
[illegible] 92 [illegible] 49 46			
[illegible] PPM CO	5 = 21.7 % O2	6 = 7.4 PPM NOX	
[illegible] PPM HC	2 = 3.5 PPM SO2	3 = 0.4 % CO2	
[illegible] 48 46			

1 = 1[illegible]5.[illegible]	PPM	HC	2 = 9.5	PPM	SO2	3 = 6.8	%	CO2			
9/DEC/92	16	14 46									
4 = 1395.6	PPM	CO	5 = 12.5	%	O2	6 = 104.6	PPM	NOX			
1 = 166.7	PPM	HC	2 = 9.6	PPM	SO2	3 = 6.8	%	CO2			
9/DEC/92	16	13 46									
4 = 1473.7	PPM	CO	5 = 12.9	%	O2	6 = 96.5	PPM	NOX			
1 = 113.0	PPM	HC	2 = 9.8	PPM	SO2	3 = 6.9	%	CO2			
9/DEC/92	16	12 46									
4 = 1352.8	PPM	CO	5 = 12.5	%	O2	6 = 102.6	PPM	NOX			
1 = 117.0	PPM	HC	2 = 9.5	PPM	SO2	3 = 7.3	%	CO2			
9/DEC/92	16	11 46									
4 = 1327.5	PPM	CO	5 = 13.3	%	O2	6 = 105.6	PPM	NOX			
1 = 109.5	PPM	HC	2 = 9.0	PPM	SO2	3 = 6.5	%	CO2			
[illegible]	16	10 46									
4 = 1568.2	PPM	CO	5 = 13.6	%	O2	6 = 92.8	PPM	NOX			
1 = 135.0	PPM	HC	2 = 9.6	PPM	SO2	3 = 6.9	%	CO2			
[illegible]	[illegible]	9 46									
4 = [illegible]88.[illegible]	PPM	CO	5 = 12.[illegible]	%	O2	6 = 98.9	PPM	NOX			
1 = [illegible]33.3	PPM	HC	2 = 9.6	PPM	SO2	3 = 6.9	%	CO2			
[illegible]92	16	8 46									
4 = [illegible]1.6	PPM	CO	5 = 12.6	%	O2	6 = 108.5	PPM	NOX			
1 = 125.4	PPM	HC	2 = 9.3	PPM	SO2	3 = 7.0	%	CO2			
[illegible]	16	7 46									
4 = 1777.3	PPM	CO	5 = 12.4	%	O2	6 = 168.0	PPM	NOX			
1 = 142.5	PPM	HC	2 = 6.5	PPM	SO2	3 = 7.4	%	CO2			
[illegible]92	16	6 46									
4 = 1516.9	PPM	CO	5 = 13.5	%	O2	6 = 88.2	PPM	NOX			
1 = 116.9	PPM	HC	2 = 9.8	PPM	SO2	3 = 6.6	%	CO2			
[illegible]DEC/92	16	5 46									
4 = 152[illegible].1	PPM	CO	5 = 13.1	%	O2	6 = 99.2	PPM	NOX			
1 = 150.1	PPM	HC	2 = 8.6	PPM	SO2	3 = 6.7	%	CO2			
9/DEC/92	16	4 46									
4 = 1272.7	PPM	CO	5 = 11.9	%	O2	6 = 120.4	PPM	NOX			
1 = 90.5	PPM	HC	2 = 9.1	PPM	SO2	3 = 7.7	%	CO2			
[illegible]92	16	3 46									
4 = 1595.8	PPM	CO	5 = 12.0	%	O2	6 = 107.8	PPM	NOX			
1 = 195.6	PPM	HC	2 = 8.5	PPM	SO2	3 = 7.6	%	CO2			
[illegible]DEC/92	16	2 46									
4 = [illegible]2	PPM	CO	5 = 11.9	%	O2	6 = 108.0	PPM	NOX			
1 = [illegible]	PPM	[illegible]	2 = [illegible]	PPM	[illegible]	3 = [illegible]	%	[illegible]			

100 90 80 70 60 50 40 30 20 10 0

0 10 20 30 40 50 60 70 80 90 100

```
4 = [illegible] PPM CO    5 = [illegible] % O2    6 = [illegible] PPM NOX
1 = 102.9 PPM HC    2 = 10.5 PPM SO2    3 = 6.6 % CO2
9/DEC/92 16:27:46
4 = 1421.1 PPM CO    5 = 12.7 % O2    6 = 99.4 PPM NOX
1 = 99.0 PPM HC    2 = 10.3 PPM SO2    3 = 6.9 % CO2
9/DEC/92 16:26:46
4 = 1195.5 PPM CO    5 = 12.8 % O2    6 = 108.8 PPM NOX
1 = 95.[illegible] PPM HC    2 = 9.7 PPM SO2    3 = 6.9 % CO2
9/DEC/92 16:25:46
4 = 1237.9 PPM CO    5 = 13.0 % O2    6 = 106.5 PPM NOX
1 = 166.4 PPM HC    2 = 9.7 PPM SO2    3 = 6.7 % CO2
9/DEC/92 16:24:46
4 = 1372.4 PPM CO    5 = 13.5 % O2    6 = 102.8 PPM NOX
1 = 114.2 PPM HC    2 = 9.8 PPM SO2    3 = 6.8 % CO2
9/DEC/92 16:23:46
4 = 1445.2 PPM CO    5 = 12.7 % O2    6 = 106.7 PPM NOX
1 = [illegible].7 PPM HC    2 = 9.6 PPM SO2    3 = 7.0 % CO2
9/DEC/92 16:22:46
4 = 1441.5 PPM CO    5 = 13.3 % O2    6 = 91.5 PPM NOX
1 = 1[illegible].3 PPM HC    2 = 10.0 PPM SO2    3 = 6.6 % CO2
9/DEC/92 16:21:46
4 = 1195.1 PPM CO    5 = 12.7 % O2    6 = 104.7 PPM NOX
1 = 1[illegible].4 PPM HC    2 = 8.4 PPM SO2    3 = 7.0 % CO2
9/DEC/92 16:20:46
4 = 1457.5 PPM CO    5 = 13.2 % O2    6 = 96.4 PPM NOX
1 = 103.8 PPM HC    2 = 9.3 PPM SO2    3 = 6.5 % CO2
9/DEC/92 16:19:46
4 = 1364.3 PPM CO    5 = 12.8 % O2    6 = 104.5 PPM NOX
1 = 91.7 PPM HC    2 = 9.0 PPM SO2    3 = 6.9 % CO2
9/DEC/92 16:18:46
4 = 1306.2 PPM CO    5 = 13.[illegible] % O2    6 = 98.0 PPM NOX
1 = [illegible] PPM HC    2 = 9.0 PPM SO2    3 = 6.8 % CO2
9/DEC/92 16:17:46
4 = [illegible].6 PPM CO    5 = 12.3 % O2    6 = 99.5 PPM NOX
1 = [illegible].7 PPM HC    2 = 9.1 PPM SO2    3 = 6.6 % CO2
9/DEC/92 16:16:46
4 = 1561.1 PPM CO    5 = 13.8 % O2    6 = 95.1 PPM NOX
1 = 116.5 PPM HC    2 = 9.3 PPM SO2    3 = 6.7 % CO2
9/DEC/92 16:15:46
```

[illegible] 16 [illegible] 46

4 = [illegible]	PPM	CO	5 = 12.7	%	O2	6 = 102.8	PPM	NOX
1 = 94.4	PPM	HC	2 = 9.5	PPM	SO2	3 = 6.9	%	CO2
DEC 92 16 40 46								
4 = 1351.8	PPM	CO	5 = 12.7	%	O2	6 = 101.4	PPM	NOX
1 = 94.1	PPM	HC	2 = 9.6	PPM	SO2	3 = 6.8	%	CO2
DEC 92 16 39 46								
4 = 1316.[illegible]	PPM	CO	5 = 12.8	%	O2	6 = 95.8	PPM	NOX
1 = 89.4	PPM	HC	2 = 9.8	PPM	SO2	3 = 6.6	%	CO2
DEC/92 16 38 46								
4 = 1432.0	PPM	CO	5 = 13.6	%	O2	6 = 103.5	PPM	NOX
1 = [illegible]	PPM	HC	2 = 5.0	PPM	SO2	3 = [illegible]	%	CO2
[illegible] 92 16 37 46								
4 = 1317.6	PPM	CO	5 = 12.9	%	O2	6 = 100.4	PPM	NOX
1 = 88.6	PPM	HC	2 = 9.7	PPM	SO2	3 = 6.7	%	CO2
9/DEC 92 16 36 46								
4 = 1402.5	PPM	CO	5 = 13.2	%	O2	6 = 96.2	PPM	NOX
1 = [illegible]	PPM	HC	2 = 16.9	PPM	SO2	3 = 6.4	%	CO2
5/DEC/92 16 35 46								
4 = 1521.6	PPM	CO	5 = 12.6	%	O2	6 = 99.0	PPM	NOX
1 = [illegible]	PPM	HC	2 = 10.4	PPM	SO2	3 = 6.7	%	CO2
DEC 92 16 34 46								
4 = [illegible]	PPM	CO	5 = 12.7	%	O2	6 = 102.0	PPM	NOX
1 = 102.5	PPM	HC	2 = 10.3	PPM	SO2	3 = 6.9	%	CO2
5/DEC/92 16 33 46								
4 = 1223.8	PPM	CO	5 = 13.0	%	O2	6 = 98.1	PPM	NOX
1 = 95.4	PPM	HC	2 = 10.2	PPM	SO2	3 = 6.7	%	CO2
[illegible] 16 32 46								
[illegible]	PPM	CO	5 = 13.3	%	O2	6 = 99.3	PPM	NOX
[illegible]	PPM	HC	2 = 9.7	PPM	SO2	3 = 6.5	%	CO2
[illegible] 16 31 46								
[illegible]	PPM	CO	5 = 12.9	%	O2	6 = 95.5	PPM	NOX
1 = 109.0	PPM	HC	2 = 10.5	PPM	SO2	3 = 6.7	%	CO2
[illegible]/92 16 30 46								
4 = [illegible]	PPM	CO	5 = 12.6	%	O2	6 = 97.2	PPM	NOX
1 = 97.7	PPM	HC	2 = 9.6	PPM	SO2	3 = 6.8	%	CO2
3/DEC/92 16 29 46								
[illegible]	PPM	CO	5 = 13.1	%	O2	6 = 95.2	PPM	NOX
1 = 95.[illegible]	PPM	HC	2 = 5.5	PPM	SO2	3 = 6.7	%	CO2

[illegible]	PPM	CO	5	=	12.7	%	O2	6	=	73.3	PPM	NOX	
141 6	PPM	HC	2	=	22.3	PPM	SO2	3	=	6.5	%	CO2	
15 54 46													
177 2	PPM	CO	5	=	12.5	%	O2	6	=	31.0	PPM	NOX	
159 4	PPM	HC	2	=	21.5	PPM	SO2	3	=	6.7	%	CO2	
16 57 46													
[illegible] 4	PPM	CO	5	=	12.4	%	O2	6	=	85.8	PPM	NOX	
[illegible]	PPM	HC	2	=	20.4	PPM	SO2	3	=	6.8	%	CO2	
72 46													
[illegible]	PPM	CO	5	=	12.2	%	O2	6	=	76.9	PPM	NOX	
[illegible]	PPM	HC	2	=	18.5	PPM	SO2	3	=	3.1	%	CO2	
51 46													
[illegible] 7	PPM	CO	5	=	14.4	%	O2	6	=	59.4	PPM	NOX	? SO2
[illegible] 1	PPM	HC	2	=	11.1	PPM	SO2	3	=	5.2	%	CO2	
52 10 58 46													
1845 6	PPM	CO	5	=	10.3	%	O2	6	=	91.9	PPM	NOX	
136 8	PPM	HC	2	=	11.3	PPM	SO2	3	=	7.6	%	CO2	
11 49 46													
1145 6	PPM	CO	5	=	12.5	%	O2	6	=	91.6	PPM	NOX	
487 4	PPM	HC	2	=	15.8	PPM	SO2	3	=	6.7	%	CO2	
16 46 46													
1514 99	PPM	CO	5	=	13.60	%	O2	6	=	93.5	PPM	NOX	
51 8 10	PPM	HC	2	=	9.80	PPM	SO2	3	=	60.6	%	CO2	
10 47 46													
1558 5	PPM	CO	5	=	12.9	%	O2	6	=	94.7	PPM	NOX	
95 5	PPM	HC	2	=	5.5	PPM	SO2	3	=	6.7	%	CO2	
46 46													
1309 4	PPM	CO	5	=	12.8	%	O2	6	=	102.5	PPM	NOX	
251 4	PPM	HC	2	=	9.2	PPM	SO2	3	=	6.8	%	CO2	
92 16 45 46													
1574 5	PPM	CO	5	=	12.8	%	O2	6	=	97.6	PPM	NOX	
87 0	PPM	HC	2	=	9.3	PPM	SO2	3	=	5.7	%	CO2	
92 13 44 46													
1544 1	PPM	CO	5	=	13.0	%	O2	6	=	97.5	PPM	NOX	
76 3	PPM	HC	2	=	9.5	PPM	SO2	3	=	6.6	%	CO2	
16 46													
1477 2	PPM	CO	5	=	12.8	%	O2	6	=	96.9	PPM	NOX	
[illegible] 5	PPM	HC	2	=	5.6	PPM	SO2	3	=	6.7	%	CO2	
16 42 46													
[illegible]	PPM	CO	5	=	12.8	%	O2	6	=	98.8	PPM	NOX	
[illegible]	PPM	HC	2	=	[illegible]	PPM	SO2	3	=	[illegible]	%	CO2	

[illegible] PPM HO 2 = 0.0 PPM SO2 3 = 6.2 % CO2
11 2 43
165.90 PPM CO0 5 = 1260 % SO2 6 = 89.3 PPM NOX
120.80 PPM HC0 2 = 0.00 PPM SO2 3 = 602 % CO2
[illegible] 11 7 46
[illegible]61.9 PPM CO 5 = 12.8 % O2 6 = 88.1 PPM NOX
[illegible].7 PPM HO 2 = 6.0 PPM SO2 3 = 6.2 % CO2
[illegible] 11 6 46
[illegible].2 PPM CO 5 = 12.8 % O2 6 = 85.2 PPM NOX
135.0 PPM HO 2 = 6.0 PPM SO2 3 = 6.2 % CO2
[illegible] 11 5 46
1[illegible]2.5 PPM CO 5 = 12.8 % O2 6 = 85.5 PPM NOX
139.8 PPM HO 2 = 0.6 PPM SO2 3 = 6.2 % CO2
[illegible] 92 11 1 46
1861.8 PPM CO 5 = 12.8 % O2 6 = 84.2 PPM NOX
1[illegible].5 PPM HO 2 = 0.0 PPM SO2 3 = 6.2 % CO2
[illegible] 92 11 3 46
[illegible].9 PPM CO 5 = 12.2 % O2 6 = 90.0 PPM NOX
[illegible].7 PPM HO 2 = 6.1 PPM SO2 3 = 6.3 % CO2
[illegible] 11 2 46
[illegible].9 PPM CO 5 = 12.9 % O2 6 = 70.7 PPM NOX
[illegible].8 PPM HO 2 = 368.5 PPM SO2 3 = 6.3 % CO2
[illegible] 11 1 46
[illegible].0 PPM CO 5 = 12.7 % O2 6 = 69.5 PPM NOX
130.8 PPM HO 2 = 72.4 PPM SO2 3 = 6.7 % CO2
[illegible] 11 0 46
1[illegible]35.4 PPM CO 5 = 13.3 % O2 6 = 81.9 PPM NOX
117.8 PPM HO 2 = 26.5 PPM SO2 3 = 3.8 % CO2
[illegible] 16 59 46
1851.3 PPM CO 5 = 12.4 % O2 6 = 73.8 PPM NOX
135.1 PPM HO 2 = 374.1 PPM SO2 3 = 6.6 % CO2
[illegible] 16 58 46
1[illegible]61.90 PPM CO0 5 = 1260 % SO2 6 = 76.9 PPM NOX
1[illegible]5.70 PPM HC0 2 = 9.90 PPM SO2 3 = 606 % CO2
[illegible] 16 57 46
1861.5 PPM CO 5 = 12.5 % O2 6 = 78.2 PPM NOX
124.6 PPM HO 2 = 30.3 PPM SO2 3 = 6.6 % CO2
[illegible] 16 56 46
[illegible]53.8 PPM CO 5 = 12.9 % O2 6 = 84.5 PPM NOX
[illegible] PPM HO 2 = 37.1 PPM [illegible] 3 = 6.3 % CO2

[illegible] 92 11 22 46
1 = [illegible] PPM CO 5 = 12.9 % O2 6 = 7.9 PPM NOX
1 = 51.8 PPM HC 2 = 0.0 PPM SO2 3 = 6.1 % CO2
[illegible] 11 21 46
4 = 1866.8 PPM CO 5 = 12.9 % O2 6 = 8.0 PPM NOX
1 = 76.8 PPM HC 2 = 0.0 PPM SO2 3 = 6.1 % CO2
DEC 92 11 20 46
1 = 1863.8 PPM CO 5 = 12.9 % O2 6 = 8.1 PPM NOX
1 = 3.0 PPM HC 2 = 0.0 PPM SO2 3 = 6.1 % CO2
[illegible] 11 19 46
1 = [illegible] 4 PPM CO 5 = 12.8 % O2 6 = 8.2 PPM NOX
1 = [illegible] PPM HC 2 = 0.0 PPM SO2 3 = 6.1 % CO2
[illegible] 11 18 43
100 70 40 10 0
1 = 1863.9 PPM CO 5 = 12.9 % O2 6 = 8.3 PPM NOX
1 = [illegible] 10 PPM HC 2 = [illegible] PPM SO2 3 = 6.1 % CO2
0 30 60 90 100
[illegible] 92 11 17 46
1 = 1862.8 PPM CO 5 = 12.9 % O2 6 = 8.8 PPM NOX
1 = 7.6 PPM HC 2 = 0.0 PPM SO2 3 = 6.1 % CO2
DEC/92 11 16 46
4 = 1862.0 PPM CO 5 = 12.9 % O2 6 = 8.9 PPM NOX
1 = 7.5 PPM HC 2 = 0.0 PPM SO2 3 = 6.1 % CO2
DEC 92 11 15 46
1 = 1862.8 PPM CO 5 = 12.8 % O2 6 = 8.9 PPM NOX
1 = 7.6 PPM HC 2 = 0.0 PPM SO2 3 = 6.1 % CO2
[illegible] 11 14 46
1 = [illegible] 4 PPM CO 5 = 12.9 % O2 6 = 9.1 PPM NOX
1 = [illegible] PPM HC 2 = 0.0 PPM SO2 3 = 6.2 % CO2
[illegible] 92 11 13 46
1 = 1863.6 PPM CO 5 = 12.9 % O2 6 = 9.8 PPM NOX
1 = 4.3 PPM HC 2 = 0.0 PPM SO2 3 = 6.2 % CO2
DEC/92 11 12 46
1 = 1862.5 PPM CO 5 = 12.9 % O2 6 = 11.6 PPM NOX
1 = 4.0 PPM HC 2 = 0.0 PPM SO2 3 = 6.2 % CO2
DEC 92 11 11 46
1 = 1863.0 PPM CO 5 = 12.9 % O2 6 = 13.9 PPM NOX
1 = [illegible] PPM HC 2 = 0.0 PPM SO2 3 = 6.2 % CO2
[illegible] 11 10 46
1 = [illegible] 8 PPM CO 5 = 12.[illegible] % O2 6 = 19.0 PPM NOX
1 = [illegible] PPM HC 2 = 0.0 PPM SO2 3 = 6.2 % CO2
[illegible] 11 [illegible] 46

1 = P.[illegible]	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.9	%	CO2
[illegible]/92	11	35	46					
4 = 1862.2	PPM	CO	5 = 12.9	%	O2	6 = 7.6	PPM	NOX
1 = 2.6	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.0	%	CO2
9/DEC/92	11	34	46					
4 = 1865.9	PPM	CO	5 = 12.9	%	O2	6 = 7.8	PPM	NOX
1 = 2.9	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.0	%	CO2
9/DEC/92	11	33	46					
4 = 1863.5	PPM	CO	5 = 12.9	%	O2	6 = 7.9	PPM	NOX
1 = 2.6	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.0	%	CO2
9/DEC/92	11	32	46					
4 = 1864.5	PPM	CO	5 = 12.9	%	O2	6 = 7.5	PPM	NOX
1 = 5.6	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.0	%	CO2
9/DEC/92	11	31	46					
4 = 1862.7	PPM	CO	5 = 12.9	%	O2	6 = 8.7	PPM	NOX
1 = 13.5	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.0	%	CO2
9/DEC/92	11	30	46					
4 = 1864.1	PPM	CO	5 = 12.9	%	O2	6 = 8.8	PPM	NOX
1 = 66.2	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.0	%	CO2
9/DEC/92	11	29	46					
4 = 1866.7	PPM	CO	5 = 12.5	%	O2	6 = 9.5	PPM	NOX
1 = 71.7	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.0	%	CO2
9/DEC/92	11	28	46					
4 = 1862.2	PPM	CO	5 = 12.9	%	O2	6 = 10.2	PPM	NOX
1 = 76.6	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.0	%	CO2
9/DEC/92	11	27	46					
4 = 1863.7	PPM	CO	5 = 12.9	%	O2	6 = 9.0	PPM	NOX
1 = 78.9	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.0	%	CO2
9/DEC/92	11	26	46					
4 = 1866.7	PPM	CO	5 = 12.5	%	O2	6 = 8.5	PPM	NOX
1 = 62.7	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.0	%	CO2
9/DEC/92	11	25	46					
4 = 1864.7	PPM	CO	5 = 12.9	%	O2	6 = 8.6	PPM	NOX
1 = 71.6	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.0	%	CO2
9/DEC/92	11	24	46					
4 = 1864.8	PPM	CO	5 = 12.8	%	O2	6 = 7.8	PPM	NOX
1 = 67.7	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.1	%	CO2
[illegible] 92	11	23	46					
4 = [illegible]	PPM	CO	5 = 12.9	%	O2	6 = 7.9	PPM	NOX

4 = 2..2 PPM CO 5 = 3.1 % O2 6 = 31.0 PPM NOX
1 = 12.4 PPM HC 2 = 0.0 PPM SO2 3 = 6.4 % CO2
9/DEC/92 12:24: 0
4 = 10.3 PPM CO 5 = 5.1 % O2 6 = 12.4 PPM NOX
1 = 3.0 PPM HC 2 = 0.0 PPM SO2 3 = 6.4 % CO2
9/DEC/92 12:23: 0
100 4 = 48.7 90 PPM CO 70 5 = 0.0 80 % 50 O2 40 6 = 16.5 PPM 20 NOX 10 0
0 1 = 5.7 10 PPM HC 20 30 2 = 5.0 40 PPM 50 SO2 60 3 = 5.3 70 % 80 CO2 90 100
9/DEC/92 12:22: 0
4 = 1767.3 PPM CO 5 = 13.3 % O2 6 = 76.3 PPM NOX
1 = 19.4 PPM HC 2 = 0.0 PPM SO2 3 = 5.2 % CO2
9/DEC/92 12:21: 0
4 = 1761.0 PPM CO 5 = 14.3 % O2 6 = 67.9 PPM NOX
1 = 106.2 PPM HC 2 = 2.5 PPM SO2 3 = 5.1 % CO2
9/DEC/92 12:20: 0
4 = 1867.5 PPM CO 5 = 14.3 % O2 6 = 67.3 PPM NOX
1 = 102.8 PPM HC 2 = 6.0 PPM SO2 3 = 5.1 % CO2
9/DEC/92 12:19: 0
4 = 1617.1 PPM CO 5 = 14.3 % O2 6 = 67.5 PPM NOX
1 = 161.7 PPM HC 2 = 6.0 PPM SO2 3 = 5.1 % CO2
9/DEC/92 12:18: 0
4 = 1777.6 PPM CO 5 = 14.2 % O2 6 = 74.2 PPM NOX
1 = 96.9 PPM HC 2 = 6.0 PPM SO2 3 = 5.2 % CO2
9/DEC/92 12:17: 0

VA

4 = 1664.1 PPM CO 5 = 12.9 % O2 6 = 7.4 PPM NOX
1 = 28.5 PPM HC 2 = 0.5 PPM SO2 3 = 5.9 % CO2
9/DEC/92 11:39:46
4 = 1665.2 PPM CO 5 = 12.9 % O2 6 = 7.4 PPM NOX
1 = 19.0 PPM HC 2 = 0.0 PPM SO2 3 = 5.9 % CO2
9/DEC/92 11:38:46
4 = 1865.4 PPM CO 5 = 12.6 % O2 6 = 7.5 PPM NOX
100 1 = 17.0 90 PPM HC 70 2 = 0.0 80 PPM 50 SO2 40 3 = 5.9 % 20 CO2 10 0
0 9/DEC/92 11:37:46 20 30 40 50 60 70 80 90 100
4 = 1866.7 PPM CO 5 = 12.9 % O2 6 = 7.7 PPM NOX
1 = 2.2 PPM HC 2 = 6.0 PPM SO2 3 = 5.9 % CO2
9/DEC/92 11:36:46

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4 = 8.8      PPM  CO     5 = 8.1    %    O2     6 = 2.3    PPM  NOX
1 = 8.8      PPM  HC     2 = 0.0    PPM  SO2    3 = 0.1    %    CO2
9/DEC/92 12 37  0
4 = 48.2     PPM  CO     5 = 8.2    %    O2     6 = 0.3    PPM  NOX
1 = 2.6      PPM  HC     2 = 0.0    PPM  SO2    3 = 0.5    %    CO2
9/DEC/92 12 36  0
4 = 985.8    PPM  CO     5 = 2.3    %    O2     6 = 2.4    PPM  NOX
1 = 5.6      PPM  HC     2 = 0.0    PPM  SO2    3 = 1.8    %    CO2
9/DEC/92 12 35  0
4 = 1766.4   PPM  CO     5 = 12.5   %    O2     6 = 14.0   PPM  NOX
1 = 11.7     PPM  HC     2 = 0.6    PPM  SO2    3 = 6.1    %    CO2
9/DEC/92 12 34  0
4 = 1776.2   PPM  CO     5 = 12.7   %    O2     6 = 71.1   PPM  NOX
1 = 183.2    PPM  HC     2 = 0.0    PPM  SO2    3 = 6.1    %    CO2
9/DEC/92 12 33  0
4 = 1841.9   PPM  CO     5 = 12.6   %    O2     6 = 87.1   PPM  NOX
1 = 50.1     PPM  HC     2 = 0.0    PPM  SO2    3 = 6.3    %    CO2
9/DEC/92 12 32  0
4 = 1839.6   PPM  CO     5 = 12.3   %    O2     6 = 64.5   PPM  NOX
1 = 122.0    PPM  HC     2 = 0.0    PPM  SO2    3 = 6.3    %    CO2
9/DEC/92 12 31  0
4 = 1836.4   PPM  CO     5 = 12.8   %    O2     6 = 59.8   PPM  NOX
1 = 113.5    PPM  HC     2 = 0.0    PPM  SO2    3 = 6.3    %    CO2
9/DEC/92 12 30  0
4 = 1835.3   PPM  CO     5 = 12.8   %    O2     6 = 65.5   PPM  NOX
1 = 128.1    PPM  HC     2 = 0.0    PPM  SO2    3 = 6.3    %    CO2
9/DEC/92 12 29  0
4 = 7.8      PPM  CO     5 = 10.1   %    O2     6 =-2.4    PPM  NOX
1 = 25.0     PPM  HC     2 = 0.0    PPM  SO2    3 = 9.6    %    CO2
9/DEC/92 12 28  0
4 = 37.1     PPM  CO     5 = 16.5   %    O2     6 =-2.0    PPM  NOX
1 = 2.5      PPM  HC     2 = 0.0    PPM  SO2    3 = 9.4    %    CO2
9/DEC/92 12 27  0
4 = 1456.4   PPM  CO     5 = 7.5    %    O2     6 = 16.7   PPM  NOX
1 = 7.2      PPM  HC     2 = 0.0    PPM  SO2    3 = 4.1    %    CO2
9/DEC/92 12 26  0
4 = 513.7    PPM  CO     5 = 6.2    %    O2     6 = 11.5   PPM  NOX
1 = 4.       PPM  HC     2 = 0.0    PPM  SO2    3 = 8.5    %    CO2
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4 = 1761.2   PPM   CO      5 = 13.3   %     O2      6 = 71.9   PPM   NOX
1 = 167.5    PPM   HC      2 = 0.6    PPM   SO2     3 = 5.9    %     CO2
9/DEC/92  12:55:34
4 = 1765.8   PPM   CO      5 = 13.[illegible] %  O2  6 = 74.5  PPM   NOX
1 = 102.8    PPM   HC      2 = 0.0    PPM   SO2     3 = 5.7    %     CO2
9/DEC/92  12:54:34
4 = 1748.3   PPM   CO      5 = 13.5   %     O2      6 = 63.6   PPM   NOX
1 = 111.3    PPM   HC      2 = 0.6    PPM   SO2     3 = 5.6    %     CO2
9/DEC/92  12:53:34
4 = 1722.5   PPM   CO      5 = 13.5   %     O2      6 = 71.0   PPM   NOX
1 = 110.9    PPM   HC      2 = 0.0    PPM   SO2     3 = 5.5    %     CO2
9/DEC/92  12:52:34
4 = 1684.5   PPM   CO      5 = 13.4   %     O2      6 = 64.5   PPM   NOX
1 = 123.6    PPM   HC      2 = 0.0    PPM   SO2     3 = 5.6    %     CO2
9/DEC/92  12:51:34
4 = 1653.7   PPM   CO      5 = 13.3   %     O2      6 = 69.5   PPM   NOX
1 = 16[illegible].4  PPM  HC  2 = 0.3  PPM   SO2     3 = 5.3    %     CO2
9/DEC/92  12:50:34
4 = 1547.4   PPM   CO      5 = 13.5   %     O2      6 = 73.0   PPM   NOX
1 = 101.6    PPM   HC      2 = 0.0    PPM   SO2     3 = 5.6    %     CO2
9/DEC/92  12:49:34
4 = 1469.4   PPM   CO      5 = 14.0   %     O2      6 = 62.2   PPM   NOX
1 = 95.8     PPM   HC      2 = 0.0    PPM   SO2     3 = 5.2    %     CO2
9/DEC/92  12:48:34
4 = 1704.2   PPM   CO      5 = 13.2   %     O2      6 = 65.0   PPM   NOX
1 = 125.6    PPM   HC      2 = 0.0    PPM   SO2     3 = 5.9    %     CO2
9/DEC/92  12:47:34
4 = 1311.[illegible] PPM CO  5 = 13.0  %     O2      6 = 74.5   PPM   NOX
1 = 113.5    PPM   HC      2 = 0.0    PPM   SO2     3 = 5.5    %     CO2
9/DEC/92  12:46:34
4 = 1691.2   PPM   CO      5 = 12.7   %     O2      6 = 63.0   PPM   NOX
1 = 128.7    PPM   HC      2 = 0.3    PPM   SO2     3 = 6.1    %     CO3
9/DEC/92  12:45:34
4 = 1799.7   PPM   CO      5 = 12.5   %     O2      6 = 67.3   PPM   NOX
1 = 126.5    PPM   HC      2 = 0.0    PPM   SO2     3 = 5.7    %     CO2
9/DEC/92  12:44:34

START RN 7
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100 90 80 70 60 50 40 30 20 10 0

0 10 20 30 40 50 60 70 80 90 100

1 = 85.1	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.5	%	CO2			
[illegible]/92	13	9:34									
4 = 1866.1	PPM	CO	5 = 12.6	%	O2	6 = 76.3	PPM	NOX			
1 = 102.8	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.5	%	CO2			
[illegible]/92	13	8:34									
4 = 1802.6	PPM	CO	5 = 12.6	%	O2	6 = 81.0	PPM	NOX			
1 = 91.1	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.5	%	CO2			
[illegible]/92	13	7:34									
4 = 1871.5	PPM	CO	5 = 12.6	%	O2	6 = 80.2	PPM	NOX			
1 = 85.8	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.5	%	CO2			
DEC/92	13	6:34									
4 = 1861.2	PPM	CO	5 = 12.3	%	O2	6 = 81.6	PPM	NOX			
1 = 97.6	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.8	%	CO2			
[illegible]/92	13	5:34									
4 = 1878.7	PPM	CO	5 = 12.3	%	O2	6 = 78.9	PPM	NOX			
1 = 51.6	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.7	%	CO2			
[illegible]/92	13	4:34									
4 = 1746.7	PPM	CO	5 = 12.7	%	O2	6 = 83.7	PPM	NOX			
1 = 85.6	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.8	%	CO2			
DEC/92	13	3:34									
4 = 1764.2	PPM	CO	5 = 12.5	%	O2	6 = 82.7	PPM	NOX			
1 = 85.4	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.6	%	CO2			
DEC/92	13	2:34									
4 = 1663.2	PPM	CO	5 = 12.6	%	O2	6 = 84.9	PPM	NOX			
1 = 87.7	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.6	%	CO2			
DEC/92	13	1:34									
4 = 1719.9	PPM	CO	5 = 12.8	%	O2	6 = 79.6	PPM	NOX			
1 = 96.8	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.4	%	CO2			
DEC/92	13	0:34									
4 = [illegible].1	PPM	CO	5 = 12.9	%	O2	6 = 82.5	PPM	NOX			
1 = 90.8	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.3	%	CO2			
[illegible]	12	23:34									
4 = 1755.5	PPM	CO	5 = 13.3	%	O2	6 = 72.8	PPM	NOX			
1 = 98.5	PPM	HC	2 = 0.0	PPM	SO2	3 = 5.9	%	CO2			
[illegible]	12	22:34									
4 = [illegible].0	PPM	CO	5 = 13.3	%	O2	6 = 72.3	PPM	NOX			
1 = 102.7	PPM	HC	2 = 0.0	PPM	SO2	3 = 5.9	%	CO2			
DEC/92	12	21:34									
4 = 1771.2	PPM	CO	5 = 13.3	%	O2	6 = 72.2	PPM	NOX			
1 = [illegible]	PPM	HC	2 = 0.0	PPM	SO2	3 = [illegible]	%	CO2			

[illegible] PPM HC 2 = 0.0 PPM SO2 3 = 6.5 % CO2
[illegible] 13 24 34
4 = 1777.2 PPM CO 5 = 12.4 % O2 6 = 74.4 PPM NOX
1 = 96.5 PPM HC 2 = 0.0 PPM SO2 3 = 6.7 % CO2
DEC 92 13 22 34
4 = 1784.8 PPM CO 5 = 12.5 % O2 6 = 95.3 PPM NOX
1 = 75.3 PPM HC 2 = 6.0 PPM SO2 3 = 6.6 % CO2
DEC 92 13 21 34
4 = 1821.4 PPM CO 5 = 12.5 % O2 6 = 80.6 PPM NOX
1 = 71.2 PPM HC 2 = 0.0 PPM SO2 3 = 6.6 % CO2
DEC 92 13 20 34
4 = 1772.0 PPM CO 5 = 12.5 % O2 6 = 82.9 PPM NOX
1 = 81.9 PPM HC 2 = 0.0 PPM SO2 3 = 6.7 % CO2
9/DEC/92 13 19 34
4 = 1764.3 PPM CO 5 = 12.7 % O2 6 = 90.6 PPM NOX
1 = 76.5 PPM HC 2 = 0.0 PPM SO2 3 = 6.5 % CO2
9/DEC/92 13 18 34
4 = 1801.7 PPM CO 5 = 12.8 % O2 6 = 74.9 PPM NOX
1 = 87.6 PPM HC 2 = 0.0 PPM SO2 3 = 6.4 % CO2
DEC 92 13 17 34
4 = 1857.7 PPM CO 5 = 12.8 % O2 6 = 74.7 PPM NOX
1 = 96.0 PPM HC 2 = 6.0 PPM SO2 3 = 6.3 % CO2
DEC 92 13 16 34
4 = 1731.2 PPM CO 5 = 12.4 % O2 6 = 74.5 PPM NOX
1 = 107.7 PPM HC 2 = 0.0 PPM SO2 3 = 6.7 % CO2
9/DEC/92 13 15 34
4 = 1585.6 PPM CO 5 = 13.0 % O2 6 = 66.3 PPM NOX
1 = 80.8 PPM HC 2 = 0.0 PPM SO2 3 = 5.5 % CO2
DEC 92 13 14 34
4 = 1836.5 PPM CO 5 = 12.1 % O2 6 = 72.0 PPM NOX
1 = 111.5 PPM HC 2 = 0.0 PPM SO2 3 = 6.9 % CO2
DEC 92 13 13 34
4 = 1667.6 PPM CO 5 = 12.3 % O2 6 = 52.1 PPM NOX
1 = 79.4 PPM HC 2 = 0.0 PPM SO2 3 = 6.9 % CO2
DEC 92 13 12 34
4 = 1767.5 PPM CO 5 = 12.6 % O2 6 = 86.9 PPM NOX
1 = 61.3 PPM HC 2 = 6.0 PPM SO2 3 = 6.6 % CO2
DEC/92 13 11 34
4 = 1798.6 PPM CO 5 = 12.6 % O2 6 = 77.3 PPM NOX
1 = 98.[illegible] PPM HC 2 = 0.0 PPM SO2 3 = 6.5 % CO2
DEC 92 13 10 34

5/DEC/92 13:37:34
4 = 1820.0 PPM CO 5 = 12.5 % O2 6 = 81.2 PPM NOX
1 = 38.4 PPM HC 2 = 0.0 PPM SO2 3 = 6.6 % CO2
5/DEC/92 13:36:34
4 = 1862.1 PPM CO 5 = 12.5 % O2 6 = 80.6 PPM NOX
1 = 86.4 PPM HC 2 = 0.0 PPM SO2 3 = 6.5 % CO2
5/DEC/92 13:35:34
4 = 1864.9 PPM CO 5 = 12.5 % O2 6 = 77.5 PPM NOX
1 = 55.6 PPM HC 2 = 0.0 PPM SO2 3 = 6.5 % CO2
5/DEC/92 13:34:34
4 = 1854.5 PPM CO 5 = 12.5 % O2 6 = 78.2 PPM NOX
1 = 87.9 PPM HC 2 = 0.0 PPM SO2 3 = 6.5 % CO2
5/DEC/92 13:33:34
4 = 1824.5 PPM CO 5 = 12.5 % O2 6 = 77.7 PPM NOX
1 = 61.4 PPM HC 2 = 0.0 PPM SO2 3 = 6.5 % CO2
5/DEC/92 13:32:34
4 = 1822.9 PPM CO 5 = 12.5 % O2 6 = 81.0 PPM NOX
1 = 88.8 PPM HC 2 = 0.0 PPM SO2 3 = 6.5 % CO2
5/DEC/92 13:31:34
4 = 1766.6 PPM CO 5 = 12.5 % O2 6 = 86.9 PPM NOX
1 = 52.6 PPM HC 2 = 0.0 PPM SO2 3 = 6.6 % CO2
5/DEC/92 13:30:34
4 = 1752.2 PPM CO 5 = 12.5 % O2 6 = 84.0 PPM NOX
1 = 75.0 PPM HC 2 = 0.0 PPM SO2 3 = 6.6 % CO2
5/DEC/92 13:29:34
4 = 1845.8 PPM CO 5 = 12.5 % O2 6 = 82.3 PPM NOX
1 = 75.6 PPM HC 2 = 0.0 PPM SO2 3 = 6.5 % CO2
5/DEC/92 13:28:34
4 = 1818.4 PPM CO 5 = 12.5 % O2 6 = 78.0 PPM NOX
1 = 38.8 PPM HC 2 = 0.0 PPM SO2 3 = 6.5 % CO2
5/DEC/92 13:27:34
4 = 1887.8 PPM CO 5 = 12.5 % O2 6 = 79.8 PPM NOX
1 = 82.2 PPM HC 2 = 0.0 PPM SO2 3 = 6.5 % CO2
5/DEC/92 13:26:34
4 = 1826.8 PPM CO 5 = 12.5 % O2 6 = 78.8 PPM NOX
1 = 62.7 PPM HC 2 = 0.0 PPM SO2 3 = 6.5 % CO2
5/DEC/92 13:25:34
4 = 1865.4 PPM CO 5 = 12.5 % O2 6 = 80.1 PPM NOX
1 = 82.4 PPM HC 2 = 0.0 PPM SO2 3 = 6.6 % CO2
5/DEC/92 13:24:34
4 = [illegible] PPM CO 5 = 12.5 % O2 6 = 75.6 PPM NOX

4 = 1754.2	PPM	CO	5 = 12.2	%	O2	6 = 87.6	PPM	NOX
1 = 80.1	PPM	HC	2 = 6.6	PPM	SO2	3 = 6.9	%	CO2
5/DEC/92	13:50:34							
4 = 1758.2	PPM	CO	5 = 12.2	%	O2	6 = 93.3	PPM	NOX
1 = 76.4	PPM	HC	2 = 0.6	PPM	SO2	3 = 6.6	%	CO2
?/DEC/92	13:49:34							
4 = 1668.5	PPM	CO	5 = 12.1	%	O2	6 = 91.8	PPM	NOX
1 = 73.8	PPM	HC	2 = 6.0	PPM	SO2	3 = 6.5	%	CO2
9/DEC/92	13:48:34							
4 = 1866.4	PPM	CO	5 = 12.3	%	O2	6 = 85.5	PPM	NOX
1 = 79.0	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.7	%	CO2
?/DEC/92	13:47:34							
4 = 1751.2	PPM	CO	5 = 12.3	%	O2	6 = 89.3	PPM	NOX
1 = 83.1	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.8	%	CO2
?/DEC/92	13:46:34							
4 = 1676.0	PPM	CO	5 = 12.5	%	O2	6 = 77.1	PPM	NOX
1 = 72.6	PPM	HC	2 = 0.0	PPM	SO2	3 = 5.5	%	CO2
?/DEC/92	13:45:34							
4 = 956.0	PPM	CO	5 = 12.3	%	O2	6 = 84.2	PPM	NOX
1 = 86.4	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.5	%	CO2
5/DEC/92	13:44:34							
4 = 1665.5	PPM	CO	5 = 12.3	%	O2	6 = 91.4	PPM	NOX
1 = 85.5	PPM	HC	2 = 6.5	PPM	SO2	3 = 7.0	%	CO2
9/DEC/92	13:43:34							
4 = 1628.5	PPM	CO	5 = 12.0	%	O2	6 = 84.1	PPM	NOX
1 = 64.8	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.9	%	CO2
9/DEC/92	13:42:34							
4 = 1885.3	PPM	CO	5 = 11.9	%	O2	6 = 93.0	PPM	NOX
1 = 88.1	PPM	HC	2 = 6.6	PPM	SO2	3 = 7.0	%	CO2
?/DEC/92	13:41:34							
4 = 1881.3	PPM	CO	5 = 11.8	%	O2	6 = 86.4	PPM	NOX
1 = 73.7	PPM	HC	2 = 0.0	PPM	SO2	3 = 7.0	%	CO2
5/DEC/92	13:40:34							
4 = 1798.8	PPM	CO	5 = 12.0	%	O2	6 = 87.0	PPM	NOX
1 = 81.7	PPM	HC	2 = 0.0	PPM	SO2	3 = 7.0	%	CO2
5/DEC/92	13:39:34							
4 = 1844.3	PPM	CO	5 = 12.4	%	O2	6 = 81.3	PPM	NOX
1 = 76.5	PPM	HC	2 = 0.0	PPM	SO2	3 = 6.5	%	CO2
5/DEC/92	13:38:34							
4 = 1[illegible]7	PPM	CO	5 = 12.4	%	[illegible]	6 = 78.5	PPM	NOX

9/DEC/92 14:38:38
4 = 1516.4 PPM CO 5 = 11.4 % O2 6 = 87.0 PPM NOX
1 = 58.9 PPM HC 2 = 0.0 PPM SO2 3 = 7.4 % CO2
9/DEC/92 14:37:38
4 = 1516.1 PPM CO 5 = 11.5 % O2 6 = 86.1 PPM NOX
1 = 58.9 PPM HC 2 = 0.5 PPM SO2 3 = 7.3 % CO2
9/DEC/92 14:36:38
4 = 1906.0 PPM CO 5 = 11.7 % O2 6 = 84.6 PPM NOX
1 = 56.2 PPM HC 2 = 0.0 PPM SO2 3 = 7.2 % CO2
9/DEC/92 14:35:38
4 = 1912.2 PPM CO 5 = 11.6 % O2 6 = 81.8 PPM NOX
1 = 61.8 PPM HC 2 = 0.5 PPM SO2 3 = 7.1 % CO2
9/DEC/92 14:34:38
4 = 1914.6 PPM CO 5 = 11.5 % O2 6 = 81.4 PPM NOX
1 = 62.6 PPM HC 2 = 0.0 PPM SO2 3 = 7.1 % CO2
9/DEC/92 14:33:38
4 = 1902.6 PPM CO 5 = 11.8 % O2 6 = 79.6 PPM NOX
1 = 65.[illegible] PPM HC 2 = 0.0 PPM SO2 3 = 7.0 % CO2
9/DEC/92 14:32:38
4 = 1892.2 PPM CO 5 = 11.9 % O2 6 = 83.1 PPM NOX
1 = 66.3 PPM HC 2 = 0.0 PPM SO2 3 = 7.0 % CO2
9/DEC/92 14:31:38
4 = 1883.6 PPM CO 5 = 12.1 % O2 6 = 79.9 PPM NOX
1 = 67.9 PPM HC 2 = 0.0 PPM SO2 3 = 6.9 % CO2
9/DEC/92 14:30:38
4 = 1882.0 PPM CO 5 = 12.0 % O2 6 = 79.9 PPM NOX
1 = 76.1 PPM HC 2 = 0.0 PPM SO2 3 = 6.8 % CO2
9/DEC/92 14:29:38
4 = 1881.9 PPM CO 5 = 12.1 % O2 6 = 80.4 PPM NOX
1 = 69.8 PPM HC 2 = 0.0 PPM SO2 3 = 6.7 % CO2
9/DEC/92 14:28:38
4 = 1515.6 PPM CO 5 = 12.2 % O2 6 = 75.7 PPM NOX
1 = 73.3 PPM HC 2 = 0.0 PPM SO2 3 = 6.5 % CO2
9/DEC/92 14:27:38
START RUN 8
END RUN 7
4 = 1792.9 PPM CO 5 = 12.2 % O2 6 = 80.3 PPM NOX
1 = 75.[illegible] PPM HC 2 = 0.0 PPM SO2 3 = 6.6 % CO2

9/DEC/92 14:52:38

4 = 1917.2	PPM CO	5 = 11.5	% O2	6 = 83.0	PPM NOX
1 = 59.7	PPM HC	2 = 0.0	PPM SO2	3 = 7.5	% CO2
9/DEC/92 14:51:38					
4 = 1913.3	PPM CO	5 = 11.5	% O2	6 = 81.5	PPM NOX
1 = 57.4	PPM HC	2 = 0.0	PPM SO2	3 = 7.4	% CO2
9/DEC/92 14:50:38					
4 = 1912.8	PPM CO	5 = 11.4	% O2	6 = 79.2	PPM NOX
1 = 58.8	PPM HC	2 = 0.0	PPM SO2	3 = 7.4	% CO2
9/DEC/92 14:49:38					
4 = 1915.0	PPM CO	5 = 11.4	% O2	6 = 80.9	PPM NOX
1 = 64.4	PPM HC	2 = 6.0	PPM SO2	3 = 7.4	% CO2
9/DEC/92 14:48:38					
4 = 1927.0	PPM CO	5 = 11.4	% O2	6 = 80.3	PPM NOX
1 = 65.7	PPM HC	2 = 0.0	PPM SO2	3 = 7.4	% CO2
9/DEC/92 14:47:38					
4 = 1922.6	PPM CO	5 = 11.4	% O2	6 = 83.1	PPM NOX
1 = 67.6	PPM HC	2 = 0.0	PPM SO2	3 = 7.4	% CO2
9/DEC/92 14:46:38					
4 = 1921.6	PPM CO	5 = 11.4	% O2	6 = 83.7	PPM NOX
1 = 66.7	PPM HC	2 = 0.0	PPM SO2	3 = 7.4	% CO2
9/DEC/92 14:45:38					
4 = 1923.3	PPM CO	5 = 11.5	% O2	6 = 81.8	PPM NOX
1 = 71.6	PPM HC	2 = 0.0	PPM SO2	3 = 7.4	% CO2
9/DEC/92 14:44:38					
4 = 1922.6	PPM CO	5 = 11.5	% O2	6 = 80.6	PPM NOX
1 = 68.6	PPM HC	2 = 0.0	PPM SO2	3 = 7.4	% CO2
9/DEC/92 14:43:38					
4 = 1925.5	PPM CO	5 = 11.5	% O2	6 = 80.0	PPM NOX
1 = 75.9	PPM HC	2 = 0.0	PPM SO2	3 = 7.3	% CO2
9/DEC/92 14:42:38					
4 = 1922.5	PPM CO	5 = 11.5	% O2	6 = 78.1	PPM NOX
1 = 38.6	PPM HC	2 = 0.0	PPM SO2	3 = 7.3	% CO2
9/DEC/92 14:41:38					
4 = 1924.8	PPM CO	5 = 11.4	% O2	6 = 81.5	PPM NOX
1 = 71.9	PPM HC	2 = 0.0	PPM SO2	3 = 7.4	% CO2
9/DEC/92 14:40:38					
4 = 1921.0	PPM CO	5 = 11.4	% O2	6 = 80.9	PPM NOX
1 = 65.1	PPM HC	2 = 0.0	PPM SO2	3 = 7.5	% CO2
9/DEC/92 14:39:38					

1 = 1964.1 PPM CO 5 = 11.5 % O2 6 = 88.2 PPM NOX
1 = 63.9 PPM HC 2 = 0.0 PPM SO2 3 = 7.3 % CO2
7 DEC/92 15 5 38
1 = 1966.5 PPM CO 5 = 11.5 % O2 6 = 84.4 PPM NOX
1 = 62.5 PPM HC 2 = 0.0 PPM SO2 3 = 7.3 % CO2
7 DEC/92 15 4 38
1 = 1552.5 PPM CO 5 = 11.5 % O2 6 = 85.5 PPM NOX
1 = 61.9 PPM HC 2 = 0.0 PPM SO2 3 = 7.4 % CO2
7 DEC/92 15 3 38
1 = 1900.9 PPM CO 5 = 11.8 % O2 6 = 83.0 PPM NOX
1 = 67.1 PPM HC 2 = 0.0 PPM SO2 3 = 7.2 % CO2
7 DEC/92 15 2 38
1 = 1906.0 PPM CO 5 = 11.8 % O2 6 = 80.1 PPM NOX
1 = 70.1 PPM HC 2 = 0.0 PPM SO2 3 = 7.2 % CO2
7 DEC/92 15 1 38
1 = 1506.2 PPM CO 5 = 11.9 % O2 6 = 81.0 PPM NOX
1 = 76.1 PPM HC 2 = 0.0 PPM SO2 3 = 7.2 % CO2
7 DEC/92 15 0 38
1 = [illegible] PPM CO 5 = 11.4 % O2 6 = 79.2 PPM NOX
1 = 69.0 PPM HC 2 = 0.0 PPM SO2 3 = 7.1 % CO2
7 DEC/92 14 59 38
1 = 1903.6 PPM CO 5 = 11.5 % O2 6 = 81.6 PPM NOX
1 = 74.9 PPM HC 2 = 0.0 PPM SO2 3 = 7.3 % CO2
7/DEC/92 14 58 38
1 = 1512.2 PPM CO 5 = 11.6 % O2 6 = 78.3 PPM NOX
1 = 75.7 PPM HC 2 = 0.0 PPM SO2 3 = 7.3 % CO2
7 DEC/92 14 57 38
1 = 1911.4 PPM CO 5 = 11.5 % O2 6 = 82.0 PPM NOX
1 = 73.7 PPM HC 2 = 0.0 PPM SO2 3 = 7.3 % CO2
7 DEC/92 14 56 38
1 = 15[illegible].8 PPM CO 5 = 11.5 % O2 6 = 80.5 PPM NOX
1 = [illegible].7 PPM HC 2 = 0.0 PPM SO2 3 = 7.3 % CO2
7 DEC/92 14 55 38
1 = 1570.4 PPM CO 5 = 11.5 % O2 6 = 72.3 PPM NOX
1 = 72.5 PPM HC 2 = 0.0 PPM SO2 3 = 7.3 % CO2
7/DEC/92 14 54 38
1 = 1516.3 PPM CO 5 = 11.5 % O2 6 = 79.9 PPM NOX
1 = 79.8 PPM HC 2 = 0.0 PPM SO2 3 = 7.3 % CO2
7 DEC/92 14 53 38
1 = 1[illegible].6 PPM CO 5 = 11.5 % O2 6 = 85.2 PPM NOX

1 = 93.6 PPM HC	2 = 0.0 PPM SO2	3 = 6.8 % CO2	
9/DEC/92 15 19:38			
4 = 1800.3 PPM CO	5 = 11.8 % O2	6 = 81.0 PPM NOX	
1 = 82.1 PPM HC	2 = 0.0 PPM SO2	3 = 7.1 % CO2	
9/DEC/92 15 18:38			
4 = 1851.7 PPM CO	5 = 11.9 % O2	6 = 83.2 PPM NOX	
1 = 78.7 PPM HC	2 = 0.0 PPM SO2	3 = 7.2 % CO2	
9/DEC/92 15 17:38			
4 = 1592.9 PPM CO	5 = 11.8 % O2	6 = 84.8 PPM NOX	
1 = 72.1 PPM HC	2 = 0.0 PPM SO2	3 = 7.2 % CO2	
9/DEC/92 15 16:38			
4 = 1895.9 PPM CO	5 = 11.9 % O2	6 = 83.5 PPM NOX	
1 = 65.6 PPM HC	2 = 0.0 PPM SO2	3 = 7.2 % CO2	
9/DEC/92 15 15:38			
4 = 1580.0 PPM CO	5 = 11.7 % O2	6 = 85.7 PPM NOX	
1 = 68.3 PPM HC	2 = 0.0 PPM SO2	3 = 7.2 % CO2	
9/DEC/92 15 14:38			
4 = 1584.2 PPM CO	5 = 11.7 % O2	6 = 89.3 PPM NOX	
1 = 65.7 PPM HC	2 = 0.0 PPM SO2	3 = 7.2 % CO2	
9/DEC/92 15 13:38			
4 = 1899.0 PPM CO	5 = 11.8 % O2	6 = 84.4 PPM NOX	
1 = 62.8 PPM HC	2 = 0.0 PPM SO2	3 = 7.2 % CO2	
9/DEC/92 15 12:38			
4 = 1954.1 PPM CO	5 = 11.8 % O2	6 = 82.1 PPM NOX	
1 = 83.5 PPM HC	2 = 0.0 PPM SO2	3 = 7.1 % CO2	
9/DEC/92 15 11:38			
4 = 1596.2 PPM CO	5 = 11.7 % O2	6 = 83.8 PPM NOX	
1 = 73.1 PPM HC	2 = 0.0 PPM SO2	3 = 7.3 % CO2	
9/DEC/92 15 10:38			
4 = 1656.5 PPM CO	5 = 11.[illegible] % O2	6 = 82.4 PPM NOX	
1 = 77.1 PPM HC	2 = 0.0 PPM SO2	3 = 7.2 % CO2	
9/DEC/92 15 9:38			
4 = 1951.1 PPM CO	5 = 11.5 % O2	6 = 84.1 PPM NOX	
1 = 65.8 PPM HC	2 = 0.0 PPM SO2	3 = 7.4 % CO2	
9/DEC/92 15 8:38			
4 = 1855.0 PPM CO	5 = 11.6 % O2	6 = 85.9 PPM NOX	
1 = 56.1 PPM HC	2 = 0.6 PPM SO2	3 = 7.3 % CO2	
9/DEC/92 15 7:38			
4 = 1580.1 PPM CO	5 = 11.6 % O2	6 = 86.2 PPM NOX	
1 = [illegible] PPM HC	2 = 0.0 PPM SO2	3 = 7.3 % CO2	

100 90 80 70 60 50 40 30 20 10 0

0 10 20 30 40 50 60 70 80 90 100

9/DEC/92 15:33:38											
4 =	1899.1	PPM	CO	5 =	11.5	%	O2	6 =	84.4	PPM	NOX
1 =	54.1	PPM	HC	2 =	6.9	PPM	SO2	3 =	7.3	%	CO2
9/DEC/92 15:32:38											
4 =	1899.2	PPM	CO	5 =	11.5	%	O2	6 =	83.7	PPM	NOX
1 =	57.6	PPM	HC	2 =	0.6	PPM	SO2	3 =	7.3	%	CO2
9/DEC/92 15:31:38											
4 =	1961.5	PPM	CO	5 =	11.6	%	O2	6 =	82.7	PPM	NOX
1 =	71.7	PPM	HC	2 =	0.0	PPM	SO2	3 =	7.2	%	CO2
9/DEC/92 15:30:38											
4 =	1897.9	PPM	CO	5 =	11.[illegible]	%	O2	6 =	[illegible]	PPM	NOX
1 =	75.3	PPM	HC	2 =	0.5	PPM	SO2	3 =	7.2	%	CO2
9/DEC/92 15:29:38											
4 =	1857.9	PPM	CO	5 =	11.6	%	O2	6 =	83.4	PPM	NOX
1 =	85.6	PPM	HC	2 =	0.0	PPM	SO2	3 =	7.2	%	CO2
9/DEC/92 15:28:38											
4 =	1853.1	PPM	CO	5 =	11.6	%	O2	6 =	82.8	PPM	NOX
1 =	77.5	PPM	HC	2 =	0.0	PPM	SO2	3 =	7.2	%	CO2
9/DEC/92 15:27:38											
4 =	1859.4	PPM	CO	5 =	11.7	%	O2	6 =	79.6	PPM	NOX
1 =	80.6	PPM	HC	2 =	6.6	PPM	SO2	3 =	7.2	%	CO2
9/DEC/92 15:26:38											
4 =	1659.5	PPM	CO	5 =	11.4	%	O2	6 =	83.0	PPM	NOX
1 =	75.0	PPM	HC	2 =	0.0	PPM	SO2	3 =	7.3	%	CO2
9/DEC/92 15:25:38											
4 =	1904.4	PPM	CO	5 =	11.4	%	O2	6 =	87.1	PPM	NOX
1 =	78.7	PPM	HC	2 =	0.0	PPM	SO2	3 =	7.4	%	CO2
9/DEC/92 15:24:38											
4 =	1905.0	PPM	CO	5 =	11.4	%	O2	6 =	87.7	PPM	NOX
1 =	57.7	PPM	HC	2 =	6.0	PPM	SO2	3 =	7.4	%	CO2
9/DEC/92 15:23:38											
4 =	1888.6	PPM	CO	5 =	11.7	%	O2	6 =	85.7	PPM	NOX
1 =	57.5	PPM	HC	2 =	0.0	PPM	SO2	3 =	7.3	%	CO2
9/DEC/92 15:22:38											
4 =	1865.2	PPM	CO	5 =	11.8	%	O2	6 =	85.6	PPM	NOX
1 =	63.3	PPM	HC	2 =	0.0	PPM	SO2	3 =	7.2	%	CO2
9/DEC/92 15:21:38											
4 =	1573.2	PPM	CO	5 =	12.1	%	O2	6 =	86.1	PPM	NOX
1 =	58.7	PPM	HC	2 =	0.0	PPM	SO2	3 =	7.0	%	CO2
9/DEC/92 15:20:38											

100 80 70 60 50 40 30 20 10 0

0 20 30 40 50 60 70 80 90 100

4 = 1884.1 PPM CO	5 = 10.4 % O2	6 = 84.2 PPM NOX
1 = 56.4 PPM HC	2 = 0.0 PPM SO2	3 = 9.2 % CO2
9/DEC/92 16:19:38		
4 = 1884.9 PPM CO	5 = 10.2 % O2	6 = 83.1 PPM NOX
1 = 52.4 PPM HC	2 = 0.0 PPM SO2	3 = 8.1 % CO2
9/DEC/92 16:18:38		
4 = 1897.0 PPM CO	5 = 10.2 % O2	6 = 82.7 PPM NOX
1 = 66.1 PPM HC	2 = 0.0 PPM SO2	3 = 8.1 % CO2
9/DEC/92 16:17:38		
4 = 1889.6 PPM CO	5 = 10.2 % O2	6 = 82.6 PPM NOX
1 = 52.8 PPM HC	2 = 0.0 PPM SO2	3 = 8.1 % CO2
9/DEC/92 16:16:38		
4 = 1887.1 PPM CO	5 = 10.3 % O2	6 = 82.8 PPM NOX
1 = 55.6 PPM HC	2 = 0.5 PPM SO2	3 = 8.0 % CO2
9/DEC/92 16:15:38		
4 = 1887.5 PPM CO	5 = 10.5 % O2	6 = 81.0 PPM NOX
1 = 70.6 PPM HC	2 = 0.0 PPM SO2	3 = 7.5 % CO2
9/DEC/92 16:14:38		
4 = 1896.2 PPM CO	5 = 10.7 % O2	6 = 82.8 PPM NOX
1 = 52.3 PPM HC	2 = 0.0 PPM SO2	3 = 7.7 % CO2
9/DEC/92 16:13:38		
4 = 1891.9 PPM CO	5 = 11.3 % O2	6 = 76.7 PPM NOX
1 = 56.2 PPM HC	2 = 0.0 PPM SO2	3 = 7.4 % CO2
9/DEC/92 16:12:38		
4 = 1893.2 PPM CO	5 = 11.4 % O2	6 = 70.4 PPM NOX
1 = 76.1 PPM HC	2 = 0.0 PPM SO2	3 = 7.1 % CO2
9/DEC/92 16:11:38		
4 = 1894.9 PPM CO	5 = 11.3 % O2	6 = 72.2 PPM NOX
1 = 55.2 PPM HC	2 = 0.0 PPM SO2	3 = 7.2 % CO2
9/DEC/92 16:10:38		
4 = 1893.4 PPM CO	5 = 11.3 % O2	6 = 73.0 PPM NOX
1 = 64.0 PPM HC	2 = 0.0 PPM SO2	3 = 7.1 % CO2
9/DEC/92 16: 9:38		
4 = 1892.5 PPM CO	5 = 11.4 % O2	6 = 71.5 PPM NOX
1 = 55.7 PPM HC	2 = 0.0 PPM SO2	3 = 7.1 % CO2
9/DEC/92 16: 8:38		
START RUN 9		
END RUN 8		
4 = [illegible] PPM CO	5 = 11.5 % O2	6 = 96.4 PPM NOX

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1 = [illegible] PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2
9/DEC/92 16:33:38
4 = 1878.5 PPM CO 5 = 10.5 % O2 6 = 80.0 PPM NOX
1 = 79.7 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2
9/DEC/92 16:32:38
4 = 1882.2 PPM CO 5 = 10.5 % O2 6 = 80.7 PPM NOX
1 = 74.2 PPM HC 2 = 0.0 PPM SO2 3 = 8.2 % CO2
9/DEC/92 16:31:38
4 = 1886.8 PPM CO 5 = 10.5 % O2 6 = 82.3 PPM NOX
1 = 68.1 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2
9/DEC/92 16:30:38
4 = 1886.0 PPM CO 5 = 10.5 % O2 6 = 81.2 PPM NOX
1 = 81.5 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2
9/DEC/92 16:29:38
4 = 1877.8 PPM CO 5 = 10.5 % O2 6 = 79.1 PPM NOX
1 = 82.5 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2
9/DEC/92 16:28:38
4 = 1878.4 PPM CO 5 = 10.5 % O2 6 = 78.5 PPM NOX
1 = 85.9 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2
9/DEC/92 16:27:38
4 = 1875.8 PPM CO 5 = 10.5 % O2 6 = 79.2 PPM NOX
1 = 94.5 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2
9/DEC/92 16:26:38
4 = 1878.7 PPM CO 5 = 10.5 % O2 6 = 79.4 PPM NOX
1 = 86.5 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2
9/DEC/92 16:25:38
4 = 1875.3 PPM CO 5 = 10.5 % O2 6 = 78.5 PPM NOX
1 = 76.3 PPM HC 2 = 0.0 PPM SO2 3 = 8.0 % CO2
9/DEC/92 16:24:38
4 = 1887.3 PPM CO 5 = 10.5 % O2 6 = 78.9 PPM NOX
1 = 86.4 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2
9/DEC/92 16:23:38
4 = 1880.7 PPM CO 5 = 10.5 % O2 6 = 80.0 PPM NOX
1 = 75.9 PPM HC 2 = 0.0 PPM SO2 3 = 8.0 % CO2
9/DEC/92 16:22:38
4 = 1881.8 PPM CO 5 = 10.5 % O2 6 = 80.4 PPM NOX
1 = 76.6 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2
9/DEC/92 16:21:38
4 = 1885.9 PPM CO 5 = 10.4 % O2 6 = 80.5 PPM NOX
1 = [illegible]4 PPM HC 2 = 0.0 PPM SO2 3 = 8.2 % CO2

1 = 81.0 PPM HC 2 = 0.0 PPM SO2

9/DEC/92 16 46 38
4 = 1878.7 PPM CO 5 = 10.4 % O2 6 = 81.6 PPM NOX
1 = 81.6 PPM HC 2 = 0.0 PPM SO2 3 = 8.2 % CO2

9/DEC/92 16 45 38
4 = 1879.1 PPM CO 5 = 10.5 % O2 6 = 86.8 PPM NOX
1 = 72.2 PPM HC 2 = 0.0 PPM SO2 3 = 8.2 % CO2

9/DEC/92 16 44 38
4 = 1882.0 PPM CO 5 = 10.4 % O2 6 = 81.4 PPM NOX
1 = 71.6 PPM HC 2 = 0.0 PPM SO2 3 = 8.2 % CO2

9/DEC/92 16 43 38
4 = 1878.2 PPM CO 5 = 10.5 % O2 6 = 75.2 PPM NOX
1 = 66.8 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2

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

9/DEC/92 16 42 38
4 = 1878.0 PPM CO 5 = 10.5 % O2 6 = 79.5 PPM NOX
1 = 84.1 PPM HC 2 = 0.0 PPM SO2 3 = 8.2 % CO2

9/DEC/92 16 41 38
4 = 1878.1 PPM CO 5 = 10.5 % O2 6 = 77.2 PPM NOX
1 = 83.5 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2

9/DEC/92 16 40 38
4 = 1877.0 PPM CO 5 = 10.5 % O2 6 = 72.5 PPM NOX
1 = 88.3 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2

9/DEC/92 16 39 38
4 = 1877.0 PPM CO 5 = 10.5 % O2 6 = 76.7 PPM NOX
1 = 85.2 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2

9/DEC/92 16 38 38
4 = 1878.5 PPM CO 5 = 10.5 % O2 6 = 74.8 PPM NOX
1 = 87.8 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2

9/DEC/92 16 37 38
4 = 1878.2 PPM CO 5 = 10.5 % O2 6 = 75.9 PPM NOX
1 = 87.1 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2

9/DEC/92 16 36 38
4 = 1877.8 PPM CO 5 = 10.5 % O2 6 = 76.5 PPM NOX
1 = 84.9 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2

9/DEC/92 16 35 38
4 = 1876.9 PPM CO 5 = 10.5 % O2 6 = 76.8 PPM NOX
1 = 75.6 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2

9/DEC/92 16 34 38
4 = 1879.1 PPM CO 5 = 10.5 % O2 6 = 76.3 PPM NOX

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1 = 88.9 PPM HC 2 = 0.0 PPM SO2 6 = 73.6 PPM NOX 3 = 8.2 % CO2
9 DEC/92 16 59 38
4 = 1874.2 PPM CO 5 = 10.4 % O2 6 = 76.8 PPM NOX
1 = 88.1 PPM HC 2 = 0.0 PPM SO2 3 = 8.2 % CO2
9 DEC/92 16 58 38
4 = 1875.8 PPM CO 5 = 10.4 % O2 6 = 75.3 PPM NOX
1 = 87.1 PPM HC 2 = 0.0 PPM SO2 3 = 8.2 % CO2
9 DEC/92 16 57 38
4 = 1872.2 PPM CO 5 = 10.4 % O2 6 = 76.6 PPM NOX
1 = 85.4 PPM HC 2 = 0.0 PPM SO2 3 = 8.2 % CO2
9 DEC/92 16 56 38
4 = 1874.1 PPM CO 5 = 10.4 % O2 6 = 75.7 PPM NOX
1 = 92.0 PPM HC 2 = 0.0 PPM SO2 3 = 8.2 % CO2
9 DEC/92 16 55 38
4 = 1878.8 PPM CO 5 = 10.4 % O2 6 = 75.5 PPM NOX
1 = 85.6 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2
9 DEC/92 16 54 38
4 = 1876.8 PPM CO 5 = 10.4 % O2 6 = 74.9 PPM NOX
1 = 88.6 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2
9 DEC/92 16 53 38
4 = 1874.7 PPM CO 5 = 10.4 % O2 6 = 76.0 PPM NOX
1 = 161.0 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2
9 DEC/92 16 52 38
4 = 1875.6 PPM CO 5 = 10.4 % O2 6 = 77.6 PPM NOX
1 = 88.7 PPM HC 2 = 0.0 PPM SO2 3 = 8.2 % CO2
9 DEC/92 16 51 38
4 = 1877.6 PPM CO 5 = 10.4 % O2 6 = 77.8 PPM NOX
1 = 106.6 PPM HC 2 = 0.0 PPM SO2 3 = 8.2 % CO2
9 DEC/92 16 50 38
4 = 1878.8 PPM CO 5 = 10.4 % O2 6 = 79.1 PPM NOX
1 = 96.5 PPM HC 2 = 0.0 PPM SO2 3 = 8.2 % CO2
9 DEC/92 16 49 38
4 = 1873.1 PPM CO 5 = 10.4 % O2 6 = 77.8 PPM NOX
1 = 87.0 PPM HC 2 = 0.0 PPM SO2 3 = 8.1 % CO2
9 DEC/92 16 48 38
4 = 1876.5 PPM CO 5 = 10.4 % O2 6 = 80.0 PPM NOX
1 = 91.1 PPM HC 2 = 0.0 PPM SO2 3 = 8.2 % CO2

```
1 = 6.5     PPM  HC     2 = 0.0   PPM  SO2     3 = -0.2   %    CO2
DEC/82 17  7:38
4 = 5.5     PPM  CO     5 = 0.6   %    O2      6 = -5.0   PPM  NOX
1 = 1.8     PPM  HC     2 = 0.0   PPM  SO2     3 = -0.1   %    CO2
DEC/82 17  6:38
4 = 12.3    PPM  CO     5 = 21.7  %    O2      6 = 0.4    PPM  NOX
1 = [illegible].7   PPM  HC     2 = 0.0   PPM  SO2     3 = 0.1    %    CO2
DEC/82 17  5:38
4 = 71.7    PPM  CO     5 = 21.9  %    O2      6 = -0.9   PPM  NOX
1 = 57.8    PPM  HC     2 = 0.0   PPM  SO2     3 = 0.3    %    CO2
DEC/82 17  4:38
4 = 157.5   PPM  CO     5 = 18.6  %    O2      6 = 25.4   PPM  NOX
1 = 105.5   PPM  HC     2 = 0.0   PPM  SO2     3 = 3.3    %    CO2
DEC/82 17  3:38
4 = 531.7   PPM  CO     5 = 16.3  %    O2      6 = 35.6   PPM  NOX
1 = 116.6   PPM  HC     2 = 0.0   PPM  SO2     3 = 4.0    %    CO2
DEC/82 17  2:38
4 = [illegible]  PPM  CO     5 = 14.[illegible]  %    O2  [illegible]
```

TTP RUN 2

1 =	1646.6	PPM	CO	5 =	12.7	%	O2	6 =	63.6	PPM	NO
1 =	116.4	PPM	HC	2 =	6.9	PPM	SO2	3 =	6.5	%	CO2

7 DEC 92 16 10 26

4 =	1674.0	PPM	CO	5 =	12.7	%	O2	6 =	63.3	PPM	NO
1 =	112.1	PPM	HC	2 =	7.0	PPM	SO2	3 =	6.6	%	CO2

7 DEC/92 16 9 26

[illegible]	1674.9	PPM	CO	5 =	12.7	%	O2	6 =	63.5	PPM	NO
[illegible] =	117.5	PPM	HC	2 =	7.0	PPM	SO2	3 =	6.6	%	CO2

END

[illegible] 92 16 8 36

[illegible]	1672.9	PPM	CO	5 =	12.5	%	O2	6 =	63.7	PPM	NO
[illegible] =	[illegible]6	PPM	HC	2 =	7.1	PPM	SO2	3 =	6.7	%	CO2

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4 = 1682.2	PPM	CO	5 = 12.2	%	O2	6 = 69.8	PPM	NO
1 = 115.6	PPM	HC	2 = 7.0	PPM	SO2	3 = 7.0	%	CO2
7/DEC/92	16	6:26						
4 = 1746.9	PPM	CO	5 = 11.7	%	O2	6 = 74.5	PPM	NO
1 = 91.8	PPM	HC	2 = 7.1	PPM	SO2	3 = 7.3	%	CO2
7/DEC/92	16	5:26						
4 = 1782.6	PPM	CO	5 = 11.5	%	O2	6 = 74.6	PPM	NO
1 = 93.4	PPM	HC	2 = 7.2	PPM	SO2	3 = 7.4	%	CO2
7/DEC/92	16	4:26						
4 = 1825.6	PPM	CO	5 = 11.3	%	O2	6 = 77.5	PPM	NO
1 = 67.8	PPM	HC	2 = 7.2	PPM	SO2	3 = 7.6	%	CO2
7/DEC/92	16	3:26						
4 = 1814.1	PPM	CO	5 = 11.3	%	O2	6 = 77.3	PPM	NO
1 = 61.1	PPM	HC	2 = 6.9	PPM	SO2	3 = 7.6	%	CO2
7/DEC/92	16	2:26						
4 = 1796.0	PPM	CO	5 = 11.4	%	O2	6 = 76.2	PPM	NO
1 = 61.9	PPM	HC	2 = 7.1	PPM	SO2	3 = 7.5	%	CO2
7/DEC/92	16	1:26						
4 = 1743.3	PPM	CO	5 = 11.3	%	O2	6 = 77.0	PPM	NO
1 = 73.3	PPM	HC	2 = 7.4	PPM	SO2	3 = 7.6	%	CO2
7/DEC/92	16	0:26						
4 = 1567.4	PPM	CO	5 = 11.2	%	O2	6 = 84.9	PPM	NO
1 = 78.6	PPM	HC	2 = 6.7	PPM	SO2	3 = 7.7	%	CO2
7/DEC/92	15	59:26						
4 = 1534.1	PPM	CO	5 = 11.3	%	O2	6 = 85.4	PPM	NO
1 = 55.7	PPM	HC	2 = 6.4	PPM	SO2	3 = 7.6	%	CO2
7/DEC/92	15	58:26						
4 = 1541.6	PPM	CO	5 = 11.3	%	O2	6 = 84.9	PPM	NO
1 = 46.0	PPM	HC	2 = 6.3	PPM	SO2	3 = 7.6	%	CO2
7/DEC/92	15	57:26						
4 = 1557.6	PPM	CO	5 = 11.3	%	O2	6 = 83.7	PPM	NO
1 = 53.1	PPM	HC	2 = 6.5	PPM	SO2	3 = 7.6	%	CO2
7/DEC/92	15	56:26						
4 = 1563.7	PPM	CO	5 = 11.3	%	O2	6 = 82.5	PPM	NO
1 = 74.2	PPM	HC	2 = 7.3	PPM	SO2	3 = 7.5	%	CO2
7/DEC/92	15	55:26						
4 = 1522.6	PPM	CO	5 = 11.3	%	O2	6 = 82.3	PPM	NO
1 = 52.6	PPM	HC	2 = 6.7	PPM	SO2	3 = 7.4	%	CO2
7/DEC/92	15	54:26						
4 = 161[illegible].0	PPM	CO	5 = 11.4	%	O2	6 = 81.0	PPM	NO
1 = [illegible]	PPM	HC	2 = [illegible]	PPM	SO2	3 = 7.7	%	CO2

```
1 = 1548.6  PPM  CO    5 = 11.5  %    O2     6 = 79.3  PPM  NO
  = 5?.7    PPM  HC    2 = 6.3   PPM  SO2    3 = 7.2   %    CO2
    92 15 52 26
  = 1293.8  PPM  CO    5 = 12.2  %    O2     6 = 7?.1  PPM  NO
  = 56.1    PPM  HC    2 = 5.3   PPM  SO2    3 = 6.7   %    CO2
7 DEC/92 15 51 26

START
INTERRUPT
1 = 1566.5  PPM  CO    5 = 12.4  %    O2     6 = 35.7  PPM  NO
1 = 106.2   PPM  HC    2 = 8.5   PPM  SO2    3 = 7.3   %    CO2
7 DEC/92 15 46 13
4 = 1535.1  PPM  CO    5 = 11.9  %    O2     6 = 78.1  PPM  NO
1 = 75.5    PPM  HC    2 = 8.1   PPM  SO2    3 = 7.3   %    CO2
7 DEC/92 15 45 13
4 = 1583.5  PPM  CO    5 = 11.8  %    O2     6 = 77.4  PPM  NO
1 = 74.2    PPM  HC    2 = 8.3   PPM  SO2    3 = 7.3   %    CO2
7 DEC/92 15 44 13
4 = 1581.9  PPM  CO    5 = 11.9  %    O2     6 = 76.6  PPM  NO
1 = 78.9    PPM  HC    2 = 8.1   PPM  SO2    3 = 7.3   %    CO2
7 DEC/92 15 43 13
    1508.9  PPM  CO    5 = 12.0  %    O2     6 = 74.3  PPM  NO
  = 65.1    PPM  HC    2 = 8.3   PPM  SO2    3 = 7.1   %    CO2
7 DEC/92 15 42 13
    1527.6  PPM  CO    5 = 12.0  %    O2     6 = 75.1  PPM  NO
    93.5    PPM  HC    2 = 8.5   PPM  SO2    3 = 7.1   %    CO2
       2 15 41 13
    1545.8  PPM  CO    5 = 12.1  %    O2     6 = 75.6  PPM  NO
    84.1    PPM  HC    2 = 8.8   PPM  SO2    3 = 7.1   %    CO2
7 DEC 92 15 40 13
4 = 1467.0  PPM  CO    5 = 12.1  %    O2     6 = 75.7  PPM  NO
1 = 86.6    PPM  HC    2 = 8.8   PPM  SO2    3 = 7.1   %    CO2
7 DEC 92 15 39 13
4 = 1479.2  PPM  CO    5 = 12.1  %    O2     6 = 79.8  PPM  NO
1 = 85.8    PPM  HC    2 = 9.4   PPM  SO2    3 = 7.1   %    CO2
7 DEC/92 15 38 13
4 = 1480.9  PPM  CO    5 = 12.1  %    O2     6 = 76.0  PPM  NO
1 = 82.6    PPM  HC    2 = 9.9   PPM  SO2    3 = 7.1   %    CO2
7 DEC/92 15 37 13
4 = 1[illegible].5  PPM  CO    5 = 12.1  %    O2     6 = 75.7  PPM  NO
```

7 DEC/92 15:36:13														
4 =	1675.7	PPM	CO	5 =	12.2	%	O2	6 =	75.9	PPM	NO			
1 =	82.4	PPM	HC	2 =	9.9	PPM	SO2	3 =	7.0	%	CO2			
7 DEC/92 15:35:13														
4 =	1678.5	PPM	CO	5 =	12.1	%	O2	6 =	71.6	PPM	NO			
1 =	94.4	PPM	HC	2 =	6.0	PPM	SO2	3 =	7.0	%	CO2			
7 DEC/92 15:34:13														
4 =	1796.1	PPM	CO	5 =	12.2	%	O2	6 =	71.3	PPM	NO			
1 =	161.4	PPM	HC	2 =	5.9	PPM	SO2	3 =	7.0	%	CO2			
7 DEC/92 15:33:13														
4 =	1657.6	PPM	CO	5 =	12.1	%	O2	6 =	71.5	PPM	NO			
1 =	161.2	PPM	HC	2 =	5.7	PPM	SO2	3 =	7.0	%	CO2			
7 DEC/92 15:32:13														
4 =	1683.5	PPM	CO	5 =	12.1	%	O2	6 =	72.1	PPM	NO			
1 =	161.6	PPM	HC	2 =	6.2	PPM	SO2	3 =	7.0	%	CO2			
7 DEC/92 15:31:13														
4 =	1685.3	PPM	CO	5 =	12.2	%	O2	6 =	72.4	PPM	NO			
1 =	183.7	PPM	HC	2 =	6.1	PPM	SO2	3 =	7.0	%	CO2			
7 DEC/92 15:30:13														
4 =	1677.0	PPM	CO	5 =	12.1	%	O2	6 =	72.9	PPM	NO			
1 =	181.5	PPM	HC	2 =	6.1	PPM	SO2	3 =	7.0	%	CO2			
7 DEC/92 15:29:13														
4 =	1696.2	PPM	CO	5 =	12.1	%	O2	6 =	72.2	PPM	NO			
1 =	183.9	PPM	HC	2 =	6.3	PPM	SO2	3 =	7.0	%	CO2			
7 DEC/92 15:28:13														
4 =	1713.1	PPM	CO	5 =	12.1	%	O2	6 =	72.4	PPM	NO			
1 =	185.0	PPM	HC	2 =	6.3	PPM	SO2	3 =	7.0	%	CO2			
7 DEC/92 15:27:13														
4 =	1668.6	PPM	CO	5 =	12.1	%	O2	6 =	72.2	PPM	NO			
1 =	189.9	PPM	HC	2 =	6.5	PPM	SO2	3 =	7.0	%	CO2			
7 DEC/92 15:26:13														
4 =	1551.2	PPM	CO	5 =	12.3	%	O2	6 =	76.1	PPM	NO			
1 =	181.6	PPM	HC	2 =	6.7	PPM	SO2	3 =	6.9	%	CO2			
7 DEC/92 15:25:13														
4 =	1702.8	PPM	CO	5 =	12.1	%	O2	6 =	73.6	PPM	NO			
1 =	182.5	PPM	HC	2 =	6.9	PPM	SO2	3 =	7.1	%	CO2			
7 DEC/92 15:24:13														
4 =	1795.6	PPM	CO	5 =	11.8	%	O2	6 =	73.6	PPM	NO			
1 =	180.8	PPM	HC	2 =	7.3	PPM	SO2	3 =	7.2	%	CO2			
7 DEC/92 15:23:13														

CHART NO. 414446

1 = 93.1 PPM HC	2 = 7.4 PPM SO2	3 = 7.5 % CO2
7/DEC/92 15 22:13		
4 = 1815.9 PPM CO	5 = 11.4 % O2	6 = 78.8 PPM NO
1 = 81.0 PPM HC	2 = 7.5 PPM SO2	3 = 7.5 % CO2
7/DEC/92 15 21:13		
4 = 1834.8 PPM CO	5 = 11.3 % O2	6 = 79.8 PPM NO
1 = 84.5 PPM HC	2 = 7.5 PPM SO2	3 = 7.6 % CO2
7/DEC/92 15 20:13		
4 = 1832.6 PPM CO	5 = 11.4 % O2	6 = 75.3 PPM NO
1 = 85.5 PPM HC	2 = 7.1 PPM SO2	3 = 7.5 % CO2
7/DEC/92 15 19:13		
4 = 1814.4 PPM CO	5 = 11.4 % O2	6 = 79.4 PPM NO
1 = 88.5 PPM HC	2 = 7.1 PPM SO2	3 = 7.5 % CO2
7/DEC/92 15 18:13		
4 = 1806.9 PPM CO	5 = 11.4 % O2	6 = 75.0 PPM NO
1 = 88.0 PPM HC	2 = 7.1 PPM SO2	3 = 7.4 % CO2
7/DEC/92 15 17:13		
4 = 1801.6 PPM CO	5 = 11.6 % O2	6 = 77.0 PPM NO
1 = 96.9 PPM HC	2 = 7.3 PPM SO2	3 = 7.4 % CO2
7/DEC/92 15 16:13		
4 = 1773.7 PPM CO	5 = 11.6 % O2	6 = 78.1 PPM NO
1 = 84.0 PPM HC	2 = 7.2 PPM SO2	3 = 7.3 % CO2
7/DEC/92 15 15:13		
4 = 1745.6 PPM CO	5 = 11.0 % O2	6 = 86.6 PPM NO
1 = 57.8 PPM HC	2 = 6.5 PPM SO2	3 = 7.8 % CO2
7/DEC/92 15 14:13		
4 = 1754.1 PPM CO	5 = 11.0 % O2	6 = 85.4 PPM NO
1 = 45.7 PPM HC	2 = 6.7 PPM SO2	3 = 7.7 % CO2
7/DEC/92 15 13:13		
4 = 1731.2 PPM CO	5 = 11.0 % O2	6 = 87.9 PPM NO
1 = 47.8 PPM HC	2 = 6.8 PPM SO2	3 = 7.7 % CO2
7/DEC/92 15 12:13		
4 = 1709.8 PPM CO	5 = 11.0 % O2	6 = 88.4 PPM NO
1 = 50.9 PPM HC	2 = 5.6 PPM SO2	3 = 7.7 % CO2
7/DEC/92 15 11:13		
4 = 1696.0 PPM CO	5 = 11.0 % O2	6 = 87.4 PPM NO
1 = 56.5 PPM HC	2 = 5.3 PPM SO2	3 = 7.6 % CO2
7/DEC/92 15 10:13		
4 = 1711.9 PPM CO	5 = 11.1 % O2	6 = 85.9 PPM NO
1 = 5[illegible] PPM HC	2 = 5.6 PPM SO2	3 = 7.5 % CO2

4 = 1495.4	PPM	CO	5 = 11.6	%	O2	6 = 80.7	PPM	NO			
1 = 62.4	PPM	HC	2 = 4.7	PPM	SO2	3 = 7.2	%	CO2			
7/DEC/92 15:8:13											
4 = 1282.9	PPM	CO	5 = 12.5	%	O2	6 = 75.1	PPM	NO			
1 = 89.5	PPM	HC	2 = 4.7	PPM	SO2	3 = 6.1	%	CO2			
7/DEC/92 15:7:13											
RESTART											
INTERRUPT											
4 = 1702.4	PPM	CO	5 = 12.2	%	O2	6 = 61.8	PPM	NO			
1 = 165.8	PPM	HC	2 = 7.3	PPM	SO2	3 = 7.1	%	CO2			
7/DEC/92 15:6:33											
4 = 1714.7	PPM	CO	5 = 12.1	%	O2	6 = 76.8	PPM	NO			
1 = 88.4	PPM	HC	2 = 7.6	PPM	SO2	3 = 7.1	%	CO2			
7/DEC/92 14:59:33											
4 = 1715.2	PPM	CO	5 = 12.8	%	O2	6 = 77.1	PPM	NO			
1 = 86.7	PPM	HC	2 = 7.6	PPM	SO2	3 = 7.2	%	CO2			
7/DEC/92 14:58:33											
4 = 1720.6	PPM	CO	5 = 12.6	%	O2	6 = 77.7	PPM	NO			
1 = 81.9	PPM	HC	2 = 7.9	PPM	SO2	3 = 7.2	%	CO2			
7/DEC/92 14:57:33											
4 = 1744.3	PPM	CO	5 = 12.5	%	O2	6 = 77.1	PPM	NO			
1 = 97.4	PPM	HC	2 = 8.2	PPM	SO2	3 = 7.2	%	CO2			
7/DEC/92 14:56:33											
4 = 1726.8	PPM	CO	5 = 12.8	%	O2	6 = 78.3	PPM	NO			
1 = 54.5	PPM	HC	2 = 10.8	PPM	SO2	3 = 7.3	%	CO2			
7/DEC/92 14:55:33											
4 = 1755.6	PPM	CO	5 = 12.8	%	O2	6 = 78.2	PPM	NO			
1 = 96.0	PPM	HC	2 = 8.3	PPM	SO2	3 = 7.3	%	CO2			
7/DEC/92 14:54:33											
4 = 1773.[illegible]	PPM	CO	5 = 11.4	%	O2	6 = 80.5	PPM	NO			
1 = 62.8	PPM	HC	2 = 6.2	PPM	SO2	3 = 7.5	%	CO2			
7/DEC/92 14:53:33											
4 = 1762.7	PPM	CO	5 = 11.7	%	O2	6 = 81.1	PPM	NO			
1 = 88.6	PPM	HC	2 = 4.9	PPM	SO2	3 = 7.6	%	CO2			
7/DEC/92 14:52:33											
4 = 1799.0	PPM	CO	5 = 11.5	%	O2	6 = 81.0	PPM	NO			
1 = 82.4	PPM	HC	2 = 4.9	PPM	SO2	3 = 7.6	%	CO2			
7/DEC/92 14:51:33											
4 = [illegible]4.4	PPM	CO	5 = 11.6	%	O2	6 = 89.3	PPM	NO			
1 = [illegible]4	PPM	HC	2 = 4.6	PPM	SO2	3 = 8.1	%	CO2			

100 90 80 70 60 50 40 30 20 10 0

0 10 30 40 50 60 70 80 90 100

START

CHART NO. 414445

4 = 1878.9 PPM CO 5 = 18.9 % O2 6 = 87.8 PPM NO
1 = 59.5 PPM HC 2 = 4.8 PPM SO2 3 = 6.1 % CO2
7/DEC/92 14 49 33
4 = 1881.9 PPM CO 5 = 16.3 % O2 6 = 96.4 PPM NO
1 = 55.8 PPM HC 2 = 4.7 PPM SO2 3 = 8.5 % CO2
7/DEC/92 14 48 33

LN 2 CONDENSABLES RUN #2

END RUN 1
4 = 1775.6 PPM CO 5 = 9.5 % O2 6 = 130.9 PPM NO
1 = 34.1 PPM HC 2 = 7.4 PPM SO2 3 = 9.9 % CO2
7/DEC/92 14 3 37
4 = 1780.3 PPM CO 5 = 9.6 % O2 6 = 133.9 PPM NO
1 = 34.0 PPM HC 2 = 7.5 PPM SO2 3 = 9.9 % CO2
7/DEC/92 14 2 37
4 = 1726.7 PPM CO 5 = 9.6 % O2 6 = 131.1 PPM NO
1 = 32.4 PPM HC 2 = 8.7 PPM SO2 3 = 9.8 % CO2
7/DEC/92 14 1 37
4 = 1767.0 PPM CO 5 = 9.9 % O2 6 = 132.3 PPM NO
1 = 32.6 PPM HC 2 = 7.1 PPM SO2 3 = 9.9 % CO2
7/DEC/92 14 0 37
4 = 1658.8 PPM CO 5 = 9.5 % O2 6 = 131.7 PPM NO
1 = 34.6 PPM HC 2 = 5.8 PPM SO2 3 = 9.9 % CO2
7/DEC/92 13 59 37
4 = 1698.8 PPM CO 5 = 9.7 % O2 6 = 131.4 PPM NO
1 = 36.9 PPM HC 2 = 4.6 PPM SO2 3 = 9.8 % CO2
7/DEC/92 13 58 37
4 = 1669.2 PPM CO 5 = 9.9 % O2 6 = 128.5 PPM NO
1 = 35.0 PPM HC 2 = 4.2 PPM SO2 3 = 9.6 % CO2
7/DEC/92 13 57 37
4 = 1633.1 PPM CO 5 = 9.9 % O2 6 = 131.3 PPM NO
1 = 34.8 PPM HC 2 = 4.3 PPM SO2 3 = 9.6 % CO2
7/DEC/92 13 56 37
4 = 1586.2 PPM CO 5 = 9.9 % O2 6 = 131.7 PPM NO
1 = 34.2 PPM HC 2 = 4.3 PPM SO2 3 = 9.6 % CO2
7/DEC/92 13 55 37
4 = 1646.8 PPM CO 5 = 9.9 % O2 6 = 131.7 PPM NO
1 = 32.7 PPM HC 2 = 4.4 PPM SO2 3 = 9.7 % CO2
7/DEC/92 13 54 37
4 = [illegible]3.8 PPM CO 5 = 9.8 % O2 6 = 129.4 PPM NO

1 = 36.6 PPM HC 2 = 4.9 PPM SO2 3 = 9.7 % CO2
7 DEC/92 13:53:37
4 = 1533.9 PPM CO 5 = 9.9 % O2 6 = 127.9 PPM NO
1 = 36.2 PPM HC 2 = 4.5 PPM SO2 3 = 9.6 % CO2
7 DEC/92 13:52:37
4 = 1559.6 PPM CO 5 = 9.9 % O2 6 = 126.7 PPM NO
1 = 36.6 PPM HC 2 = 4.6 PPM SO2 3 = 9.6 % CO2
7 DEC/92 13:51:37
4 = 1565.0 PPM CO 5 = 9.8 % O2 6 = 126.2 PPM NO
1 = 37.9 PPM HC 2 = 4.5 PPM SO2 3 = 9.6 % CO2
7 DEC/92 13:50:37
4 = 1562.2 PPM CO 5 = 9.9 % O2 6 = 126.5 PPM NO
1 = 38.4 PPM HC 2 = 4.5 PPM SO2 3 = 9.6 % CO2
7 DEC/92 13:49:37
4 = [illegible]19.8 PPM CO 5 = 10.0 % O2 6 = 127.7 PPM NO
1 = [illegible].4 PPM HC 2 = 4.6 PPM SO2 3 = 9.5 % CO2
7 DEC/92 13:48:37
4 = 1127.6 PPM CO 5 = 10.5 % O2 6 = 125.6 PPM NO
1 = 36.6 PPM HC 2 = 4.9 PPM SO2 3 = 8.9 % CO2
7 DEC/92 13:47:37
4 = 1535.0 PPM CO 5 = 10.5 % O2 6 = 122.3 PPM NO
1 = 42.8 PPM HC 2 = 5.0 PPM SO2 3 = 8.9 % CO2
7/DEC/92 13:46:37
4 = 1519.1 PPM CO 5 = 10.5 % O2 6 = 123.4 PPM NO
1 = 46.2 PPM HC 2 = 5.7 PPM SO2 3 = 9.0 % CO2
7 DEC/92 13:46:37
4 = 1538.6 PPM CO 5 = 10.5 % O2 6 = 127.3 PPM NO
1 = 41.8 PPM HC 2 = 5.0 PPM SO2 3 = 8.9 % CO2
7 DEC/92 13:44:37
4 = 1566.7 PPM CO 5 = 10.6 % O2 6 = 121.8 PPM NO
1 = 45.0 PPM HC 2 = 5.3 PPM SO2 3 = 8.9 % CO2
7 DEC/92 13:43:37
4 = 1511.5 PPM CO 5 = 10.6 % O2 6 = 122.8 PPM NO
1 = 45.2 PPM HC 2 = 5.7 PPM SO2 3 = 8.9 % CO2
7 DEC/92 13:42:37
4 = 1479.6 PPM CO 5 = 10.5 % O2 6 = 123.6 PPM NO
1 = 49.4 PPM HC 2 = 5.7 PPM SO2 3 = 8.9 % CO2
7 DEC/92 13:41:37
4 = [illegible] PPM CO 5 = 10.4 % O2 6 = 103.7 PPM NO
1 = [illegible].7 PPM HC 2 = 5.6 PPM SO2 3 = 8.8 % CO2
7 DEC/92 13:46:37

CHART NO. 41446

```
            13 39 37
        8   PPM   CO     5 = 10.7   %    O2     6 = 121.5  PPM  NO
  = 59.0    PPM   HC     2 = 5.7    PPM  SO2    3 = 8.8    %    CO2
        92  13 38 37
4 = 1448.5  PPM   CO     5 = 10.8   %    O2     6 = 122.5  PPM  NO
1 = 53.3    PPM   HC     2 = 6.6    PPM  SO2    3 = 8.7    %    CO2
        92  13 37 37
4 = 1465.5  PPM   CO     5 = 11.6   %    O2     6 = 121.0  PPM  NO
1 = 55.7    PPM   HC     2 = 7.1    PPM  SO2    3 = 8.5    %    CO2
7/DEC/92    13 36 37
4 = 1308.1  PPM   CO     5 = 11.0   %    O2     6 = 121.0  PPM  NO
1 = 57.7    PPM   HC     2 = 7.6    PPM  SO2    3 = 8.5    %    CO2
        92  13 35 37
    1744.4  PPM   CO     5 = 11.0   %    O2     6 = 121.9  PPM  NO
    51.8    PPM   HC     2 = 7.7    PPM  SO2    3 = 8.5    %    CO2
        92  13 34 37
        0   PPM   CO     5 = 11.1   %    O2     6 = 115.7  PPM  NO
    52.0    PPM   HC     2 = 7.5    PPM  SO2    3 = 8.5    %    CO2
       /92  13 33 37
     561.8  PPM   CO     5 = 11.2   %    O2     6 = 120.5  PPM  NO
1 = 52.4    PPM   HC     2 = 7.4    PPM  SO2    3 = 8.4    %    CO2
   DEC/92   13 32 37
4 = 1283.4  PPM   CO     5 = 11.2   %    O2     6 = 121.1  PPM  NO
1 = 46.5    PPM   HC     2 = 7.6    PPM  SO2    3 = 9.4    %    CO2
   DEC/92   13 31 37
    1387.0  PPM   CO     5 = 11.4   %    O2     6 = 119.7  PPM  NO
1 = 48.0    PPM   HC     2 = 8.2    PPM  SO2    3 = 8.4    %    CO2
   DEC/92   13 30 37
4 = 1438.0  PPM   CO     5 = 11.1   %    O2     6 = 117.6  PPM  NO
1 = 55.1    PPM   HC     2 = 8.8    PPM  SO2    3 = 8.5    %    CO2
        92  13 29 37
4 = 1361.9  PPM   CO     5 = 11.1   %    O2     6 = 118.6  PPM  NO
1 = 54.6    PPM   HC     2 = 8.4    PPM  SO2    3 = 8.4    %    CO2
        92  13 28 37
4 = 1517.0  PPM   CO     5 = 11.1   %    O2     6 = 118.2  PPM  NO
1 = 57.7    PPM   HC     2 = 8.6    PPM  SO2    3 = 8.4    %    CO2
7/DEC/92    13 27 37
4 = 1549.0  PPM   CO     5 = 11.4   %    O2     6 = 114.8  PPM  NO
1 = 72.2    PPM   HC     2 = 8.4    PPM  SO2    3 = 8.2    %    CO2
7/DEC/92    13 26 37
```

4 = 1471.4 PPM CO 5 = 11.4 % O2 6 = 115.1 PPM NO
1 = 72.8 PPM HC 2 = 5.5 PPM SO2 3 = 8.2 % CO2
7 DEC/92 13 25 37
4 = 1486.7 PPM CO 5 = 11.5 % O2 6 = 114.5 PPM NO
1 = 71.1 PPM HC 2 = 9.4 PPM SO2 3 = 8.1 % CO2
7 DEC/92 13 24 37
4 = 1463.2 PPM CO 5 = 11.5 % O2 6 = 114.9 PPM NO
1 = 73.4 PPM HC 2 = 9.6 PPM SO2 3 = 8.1 % CO2
7 DEC/92 13 23 37
4 = 1426.7 PPM CO 5 = 11.5 % O2 6 = 114.4 PPM NO
1 = 74.0 PPM HC 2 = 5.2 PPM SO2 3 = 8.1 % CO2
7 DEC/92 13 22 37
4 = 1417.8 PPM CO 5 = 11.5 % O2 6 = 113.6 PPM NO
1 = 73.4 PPM HC 2 = 5.3 PPM SO2 3 = 8.1 % CO2
7 DEC/92 13 21 37
4 = 1431.5 PPM CO 5 = 11.4 % O2 6 = 1[illegible]2.2 PPM NO
1 = 78.0 PPM HC 2 = 5.2 PPM SO2 3 = 8.1 % CO2
7 DEC/92 13 20 37
4 = 1414.7 PPM CO 5 = 11.5 % O2 6 = 111.6 PPM NO
1 = 75.6 PPM HC 2 = 5.1 PPM SO2 3 = 8.1 % CO2
7 DEC/92 13 19 37
4 = 1442.6 PPM CO 5 = 11.5 % O2 6 = 111.2 PPM NO
1 = 77.2 PPM HC 2 = 5.2 PPM SO2 3 = 8.1 % CO2
7 DEC/92 13 18 37
4 = 1464.7 PPM CO 5 = 11.5 % O2 6 = 111.8 PPM NO
1 = 76.7 PPM HC 2 = 5.1 PPM SO2 3 = 8.1 % CO2
7 DEC/92 13 17 37
4 = 1418.4 PPM CO 5 = 11.5 % O2 6 = 112.2 PPM NO
1 = 80.7 PPM HC 2 = 5.5 PPM SO2 3 = 8.1 % CO2
7 DEC/92 13 16 37
4 = [illegible].0 PPM CO 5 = 11.5 % O2 6 = 110.4 PPM NO
1 = 78.0 PPM HC 2 = 5.7 PPM SO2 3 = 8.1 % CO2
7 DEC/92 13 15 37
4 = 1371.4 PPM CO 5 = 11.5 % O2 6 = 109.8 PPM NO
1 = 83.8 PPM HC 2 = 5.8 PPM SO2 3 = 8.1 % CO2
7 DEC/92 13 14 37
4 = 1413.1 PPM CO 5 = 11.5 % O2 6 = 105.7 PPM NO
1 = 87.2 PPM HC 2 = 5.7 PPM SO2 3 = 8.1 % CO2
7 DEC/92 13 13 37
4 = [illegible]1.6 PPM CO 5 = 11.5 % O2 6 = 103.6 PPM NO

7/DEC/92 13:12:37
4 = 1404.8 PPM CO 5 = 11.5 % O2 6 = 109.5 PPM NO
1 = 88.3 PPM HC 2 = 5.9 PPM SO2 3 = 8.1 % CO2

100 80 70 60 50 40 30 20 10 0
7/DEC/92 13:11:37
0 30 40 50 60 70 80 90 100
4 = 1382.1 PPM CO 5 = 11.4 % O2 6 = 103.1 PPM NO
1 = 92.6 PPM HC 2 = 6.0 PPM SO2 3 = 8.8 % CO2

7/DEC/92 13:10:37
4 = 1328.6 PPM CO 5 = 11.7 % O2 6 = 108.0 PPM NO
1 = 91.8 PPM HC 2 = 6.2 PPM SO2 3 = 8.8 % CO2

7/DEC/92 13:9:37
4 = 1358.9 PPM CO 5 = 11.7 % O2 6 = 107.4 PPM NO
1 = 93.2 PPM HC 2 = 6.2 PPM SO2 3 = 8.6 % CO2

7/DEC/92 13:8:37
4 = 1295.4 PPM CO 5 = 11.8 % O2 6 = 106.4 PPM NO
1 = 92.2 PPM HC 2 = 6.3 PPM SO2 3 = 7.9 % CO2

7/DEC/92 13:7:37
4 = 1256.8 PPM CO 5 = 11.8 % O2 6 = 106.4 PPM NO
1 = 94.1 PPM HC 2 = 6.4 PPM SO2 3 = 7.9 % CO2

7/DEC/92 13:6:37
4 = 1269.1 PPM CO 5 = 11.9 % O2 6 = 105.6 PPM NO
1 = 95.0 PPM HC 2 = 6.2 PPM SO2 3 = 7.8 % CO2

7/DEC/92 13:5:37
4 = 1278.9 PPM CO 5 = 12.0 % O2 6 = 106.4 PPM NO
1 = 99.1 PPM HC 2 = 6.6 PPM SO2 3 = 7.7 % CO2

7/DEC/92 13:4:37
4 = 1264.5 PPM CO 5 = 12.1 % O2 6 = 104.5 PPM NO
1 = 97.3 PPM HC 2 = 6.9 PPM SO2 3 = 7.7 % CO2

7/DEC/92 13:3:37
4 = 1267.4 PPM CO 5 = 12.1 % O2 6 = 103.8 PPM NO
1 = 94.2 PPM HC 2 = 7.0 PPM SO2 3 = 7.6 % CO2

7/DEC/92 13:2:37
4 = 1225.4 PPM CO 5 = 12.2 % O2 6 = 102.9 PPM NO
1 = 98.9 PPM HC 2 = 7.2 PPM SO2 3 = 7.5 % CO2

100 80 70 60 50 40 30 20 10 0
7/DEC/92 13:1:37
0 30 40 50 60 70 80 90 100
4 = 1209.1 PPM CO 5 = 12.4 % O2 6 = 101.1 PPM NO
1 = 99.0 PPM HC 2 = 7.3 PPM SO2 3 = 7.4 % CO2

7/DEC/92 13:0:37
4 = 1256.7 PPM CO 5 = 12.5 % O2 6 = 96.0 PPM NO
1 = 155.8 PPM HC 2 = 8.0 PPM SO2 3 = 7.2 % CO2

START RUN 1
7/DEC/92 12:59:37

CHART NO. 414446

7/DEC/92 12 58 37

4 =	1387.4	PPM	CO	5 =	12.2	%	O2	6 =	95.5	PPM	NO
1 =	54.8	PPM	HC	2 =	8.2	PPM	SO2	3 =	7.5	%	CO2

7/DEC/92 12 57 37

4 =	1886.2	PPM	CO	5 =	9.3	%	O2	6 =	189.1	PPM	NO
1 =	77.0	PPM	HC	2 =	8.8	PPM	SO2	3 =	9.6	%	CO2

7/DEC/92 12 56 37

START RN 1 (=CONDENSABLES RM 5 RUN #1)
MAEC/MACASPHALT / SHAMROCK, FL

UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUIIIIII

100 90 80 70 60 50 40 30 20 10 0

0 10 20 30 40 50 60 70 80 90 100

PRINTED IN U.S.A

Intake

[illegible] 1159.0	PPM	CO	5 = 14.[illegible]	%	O2	6 = [illegible]2.2	PPM	NO			
[illegible] 1	PPM	HC	2 = 11.7	PPM	SO2	3 = 5.2	%	CO2			
[illegible]/92	8:36:37										
[illegible] 1177.5	PPM	CO	5 = 13.1	%	O2	6 = 76.6	PPM	NO			
[illegible] 135.7	PPM	HC	2 = 10.7	PPM	SO2	3 = 6.0	%	CO2			
[illegible]DEC/92	8:35:37										
[illegible] 1167.7	PPM	CO	5 = 13.[illegible]	%	O2	6 = 75.3	PPM	NO			
[illegible] = 115.6	PPM	HC	2 = 10.7	PPM	SO2	3 = 6.2	%	CO2			
[illegible]C/92	8:34:37										
4 = 1393.1	PPM	CO	5 = 13.3	%	O2	6 = 74.2	PPM	NO			
[illegible] 123.8	PPM	HC	2 = 10.[illegible]	PPM	SO2	3 = 5.[illegible]	%	CO2			
[illegible]DEC/92	8:33:37										
[illegible] 1394.5	PPM	CO	5 = 13.3	%	O2	6 = 74.4	PPM	NO			
[illegible]21.7	PPM	HC	2 = 10.5	PPM	SO2	3 = 5.9	%	CO2			
[illegible]	8:32:37										
[illegible]25.9	PPM	CO	5 = 13.3	%	O2	6 = 73.7	PPM	NO			
[illegible]	PPM	HC	2 = 10.5	PPM	SO2	3 = 5.9	%	CO2			
[illegible]/92	8:31:37										
[illegible]379.0	PPM	CO	5 = 13.4	%	O2	6 = 70.2	PPM	NO			
[illegible]20.0	PPM	HC	2 = 10.4	PPM	SO2	3 = 5.2	%	CO2			
[illegible]/92	8:30:37										
4 = 1361.8	PPM	CO	5 = 13.4	%	O2	6 = 72.5	PPM	NO			
1 = 127.6	PPM	HC	2 = 10.8	PPM	SO2	3 = 5.8	%	CO2			
8/DEC/92	8:29:37										
4 = 1326.4	PPM	CO	5 = 13.3	%	O2	6 = 71.2	PPM	NO			
1 = 122.6	PPM	HC	2 = 11.1	PPM	SO2	3 = 5.9	%	CO2			
8/DEC/92	8:28:37										
4 = 1331.8	PPM	CO	5 = 13.3	%	O2	6 = 71.1	PPM	NO			
1 = 124.4	PPM	HC	2 = 11.0	PPM	SO2	3 = 5.9	%	CO2			
8/DEC/92	8:27:37										

START RUN 3 (RM 202 RUN #3)

Start

4 = 866.9 PPM CO 5 = 13.3 % O2 6 = 73.9 PPM NO
1 = 94.7 PPM HC 2 = 10.5 PPM SO2 3 = 5.5 % CO2
8/DEC/92 9:36:16
4 = 855.0 PPM CO 5 = 13.6 % O2 6 = 76.2 PPM NO
1 = 96.5 PPM HC 2 = 10.7 PPM SO2 3 = 5.2 % CO2
8/DEC/92 9:35:16
4 = 866.7 PPM CO 5 = 13.6 % O2 6 = 75.5 PPM NO
1 = 106.5 PPM HC 2 = 10.0 PPM SO2 3 = 5.2 % CO2
8/DEC/92 9:34:16
4 = 873.7 PPM CO 5 = 13.8 % O2 6 = 70.3 PPM NO
1 = 107.4 PPM HC 2 = 10.4 PPM SO2 3 = 5.0 % CO2
8/DEC/92 9:33:16
4 = 968.2 PPM CO 5 = 13.8 % O2 6 = 69.5 PPM NO
1 = 108.1 PPM HC 2 = 10.4 PPM SO2 3 = 5.0 % CO2
8/DEC/92 9:32:16
4 = 965.4 PPM CO 5 = 13.8 % O2 6 = 65.9 PPM NO
1 = 106.6 PPM HC 2 = 10.1 PPM SO2 3 = 5.0 % CO2
8/DEC/92 9:31:16
4 = 882.0 PPM CO 5 = 14.0 % O2 6 = 63.9 PPM NO
1 = 105.9 PPM HC 2 = 10.1 PPM SO2 3 = 4.5 % CO2
8/DEC/92 9:30:16
RESTART
4 = 1146.0 PPM CO 5 = 14.0 % O2 6 = 63.7 PPM NO
1 = 104.8 PPM HC 2 = 15.2 PPM SO2 3 = 4.8 % CO2
8/DEC/92 9:29:16
4 = 1126.0 PPM CO 5 = 14.1 % O2 6 = 61.8 PPM NO
1 = 107.5 PPM HC 2 = 10.2 PPM SO2 3 = 4.8 % CO2
8/DEC/92 9:28:16
4 = 1162.8 PPM CO 5 = 14.3 % O2 6 = 62.0 PPM NO
1 = 111.8 PPM HC 2 = 16.4 PPM SO2 3 = 4.9 % CO2
8/DEC/92 9:27:16
4 = 1157.3 PPM CO 5 = 14.4 % O2 6 = 61.4 PPM NO
1 = 117.4 PPM HC 2 = 10.5 PPM SO2 3 = 4.9 % CO2
8/DEC/92 9:26:16
4 = 1167.5 PPM CO 5 = 14.0 % O2 6 = 62.3 PPM NO
1 = 113.5 PPM HC 2 = 11.2 PPM SO2 3 = 4.9 % CO2
8/DEC/92 9:25:16
RESTART

CHART NO. 414446

4 = 839.6 PPM CO		5 = 13.1 % O2		6 = 82.8 PPM NO	
1 = 124.5 PPM HC		2 = 10.9 PPM SO2		3 = 5.1 % CO2	
8/DEC/92	9:50:16				
4 = 860.9 PPM CO		5 = 13.2 % O2		6 = 81.5 PPM NO	
1 = 106.9 PPM HC		2 = 11.0 PPM SO2		3 = 5.4 % CO2	
8/DEC/92	9:49:16				
4 = 866.2 PPM CO		5 = 13.2 % O2		6 = 81.4 PPM NO	
1 = 167.2 PPM HC		2 = 10.9 PPM SO2		3 = 5.4 % CO2	
8/DEC/92	9:48:15				
4 = 883.2 PPM CO		5 = 13.2 % O2		6 = 82.4 PPM NO	
1 = 168.7 PPM HC		2 = 11.1 PPM SO2		3 = 5.1 % CO2	
8/DEC/92	9:47:15				
4 = 921.8 PPM CO		5 = 13.2 % O2		6 = 81.3 PPM NO	
1 = 168.8 PPM HC		2 = 11.5 PPM SO2		3 = 5.4 % CO2	
8/DEC/92	9:46:16				
4 = 932.2 PPM CO		5 = 13.1 % O2		6 = 81.4 PPM NO	
1 = 111.4 PPM HC		2 = 11.4 PPM SO2		3 = 5.4 % CO2	
8/DEC/92	9:45:16				
4 = 948.7 PPM CO		5 = 13.1 % O2		6 = 82.0 PPM NO	
1 = 166.2 PPM HC		2 = 11.4 PPM SO2		3 = 5.1 % CO2	
8/DEC/92	9:44:16				
4 = 896.5 PPM CO		5 = 13.2 % O2		6 = 81.5 PPM NO	
1 = 101.5 PPM HC		2 = 11.0 PPM SO2		3 = 5.4 % CO2	
8/DEC/92	9:43:16				
4 = 797.1 PPM CO		5 = 13.2 % O2		6 = 81.1 PPM NO	
1 = 104.0 PPM HC		2 = 10.9 PPM SO2		3 = 5.1 % CO2	
8/DEC/92	9:42:16				
4 = 889.1 PPM CO		5 = 13.2 % O2		6 = 81.7 PPM NO	
1 = 57.9 PPM HC		2 = 10.8 PPM SO2		3 = 5.4 % CO2	
8/DEC/92	9:41:16				
4 = 848.5 PPM CO		5 = 13.2 % O2		6 = 82.0 PPM NO	
1 = 109.0 PPM HC		2 = 11.0 PPM SO2		3 = 5.1 % CO2	
8/DEC/92	9:40:16				
4 = 795.6 PPM CO		5 = 12.8 % O2		6 = 81.4 PPM NO	
1 = 98.5 PPM HC		2 = 11.0 PPM SO2		3 = 5.1 % CO2	
8/DEC/92	9:39:16				
4 = 786.0 PPM CO		5 = 13.8 % O2		6 = 80.6 PPM NO	
1 = 57.5 PPM HC		2 = 10.5 PPM SO2		3 = 5.3 % CO3	
8/DEC/92	9:38:16				
4 = [illegible]8 PPM CO		[illegible]			

CHART NO. 41446

1 = 55.9 PPM HC	3 = 34.5 PPM SO2	3 = 5.6 % CO2
8/DEC/92 10: 4:16		
4 = 825.8 PPM CO	5 = 12.7 % O2	6 = 84.8 PPM NO
1 = 92.3 PPM HC	2 = 33.5 PPM SO2	3 = 5.6 % CO2
8/DEC/92 10: 3:16		
4 = 801.5 PPM CO	5 = 12.7 % O2	6 = 85.3 PPM NO
1 = 90.6 PPM HC	2 = 32.7 PPM SO2	3 = 5.7 % CO2
8/DEC/92 10: 2:16		
4 = 776.7 PPM CO	5 = 12.8 % O2	6 = 85.7 PPM NO
1 = 93.5 PPM HC	2 = 33.7 PPM SO2	3 = 5.6 % CO2
8/DEC/92 10: 1:16		
4 = 815.7 PPM CO	5 = 12.8 % O2	6 = 85.7 PPM NO
1 = 93.0 PPM HC	2 = 33.1 PPM SO2	3 = 5.5 % CO2
8/DEC/92 10: 0:16		
4 = 876.7 PPM CO	5 = 12.9 % O2	6 = 86.1 PPM NO
1 = 88.4 PPM HC	2 = 23.4 PPM SO2	3 = 5.5 % CO2
8/DEC/92 9:59:16		
4 = 814.1 PPM CO	5 = 12.8 % O2	6 = 85.7 PPM NO
1 = 92.5 PPM HC	2 = 24.2 PPM SO2	3 = 5.5 % CO2
8/DEC/92 9:58:16		
4 = 770.3 PPM CO	5 = 12.8 % O2	6 = 84.2 PPM NO
1 = 88.4 PPM HC	2 = 24.1 PPM SO2	3 = 5.5 % CO2
8/DEC/92 9:57:16		
4 = 853.5 PPM CO	5 = 12.8 % O2	6 = 84.1 PPM NO
1 = 86.5 PPM HC	2 = 23.5 PPM SO2	3 = 5.5 % CO2
8/DEC/92 9:56:16		
4 = 783.0 PPM CO	5 = 13.6 % O2	6 = 81.0 PPM NO
1 = 82.9 PPM HC	2 = 23.6 PPM SO2	3 = 5.5 % CO2
8/DEC/92 9:55:16		
4 = 835.0 PPM CO	5 = 13.2 % O2	6 = 77.9 PPM NO
1 = 92.9 PPM HC	3 = 19.6 PPM SO2	3 = 5.8 % CO2
8/DEC/92 9:54:16		
4 = 867.6 PPM CO	5 = 13.2 % O2	6 = 76.6 PPM NO
1 = 97.0 PPM HC	2 = 13.7 PPM SO2	3 = 5.1 % CO2
8/DEC/92 9:53:16		
4 = 856.9 PPM CO	5 = 13.4 % O2	6 = 81.4 PPM NO
1 = 99.5 PPM HC	2 = 13.5 PPM SO2	3 = 5.4 % CO2
8/DEC/92 9:52:16		
1 = 887.6 PPM CO	5 = 13.2 % O2	6 = 82.5 PPM NO
1 = [illegible] PPM HC	2 = 16.5 PPM [illegible]	[illegible]

SO2 invalid

[illegible]/92 1[illegible] 1[illegible]:16
4 = 1029.1 PPM CO   5 = 12.5 % O2   6 = 85.1 PPM NO
1 = [illegible] PPM HC   2 = 31.1 PPM SO2   3 = 5.8 % CO2
[illegible]92 16 17:16
4 = [illegible]002.2 PPM CO   5 = 12.5 % O2   6 = 85.7 PPM NO
1 = 97.1 PPM HC   2 = 30.9 PPM SO2   3 = 5.8 % CO2
7 DEC/92 16 16:16
4 = 946.6 PPM CO   5 = 12.5 % O2   6 = 85.5 PPM NO
1 = 93.6 PPM HC   2 = 30.7 PPM SO2   3 = 5.7 % CO2
7 DEC/92 16 15:16
4 = 955.2 PPM CO   5 = 12.5 % O2   6 = 84.8 PPM NO
1 = 95.2 PPM HC   2 = 31.4 PPM SO2   3 = 5.7 % CO2
7/DEC/92 16 14:16
4 = 915.6 PPM CO   5 = 12.6 % O2   6 = 85.9 PPM NO
1 = 94.9 PPM HC   2 = 31.9 PPM SO2   3 = 5.7 % CO2
7 DEC/92 16 13:16
4 = 974.3 PPM CO   5 = 12.6 % O2   6 = 85.4 PPM NO
1 = 94.5 PPM HC   2 = 32.0 PPM SO2   3 = 5.7 % CO2
7 DEC/92 16 12:16
4 = 873.0 PPM CO   5 = 12.6 % O2   6 = 85.9 PPM NO
1 = 95.5 PPM HC   2 = 32.2 PPM SO2   3 = 5.7 % CO2
7 DEC/92 16 11:16
4 = 945.4 PPM CO   5 = 12.7 % O2   6 = 85.3 PPM NO
1 = 97.9 PPM HC   2 = 32.9 PPM SO2   3 = 5.7 % CO2
7/DEC/92 16 10:16
4 = 919.2 PPM CO   5 = 12.5 % O2   6 = 85.2 PPM NO
1 = 93.7 PPM HC   2 = 33.1 PPM SO2   3 = 5.7 % CO2
7 DEC/92 16 9:16
4 = 944.5 PPM CO   5 = 12.7 % O2   6 = 84.3 PPM NO
1 = 96.8 PPM HC   2 = 32.5 PPM SO2   3 = 5.7 % CO2
7 [illegible]/92 16 8:16
4 = 885.4 PPM CO   5 = 12.7 % O2   6 = 85.8 PPM NO
1 = 92.8 PPM HC   2 = 33.5 PPM SO2   3 = 5.7 % CO2
7 DEC/92 16 7:16
4 = 888.0 PPM CO   5 = 12.[illegible] % O2   6 = 85.2 PPM NO
1 = 95.3 PPM HC   2 = 33.8 PPM SO2   3 = 5.7 % CO2
7 [illegible]/92 16 6:16
4 = 955.8 PPM CO   5 = 12.7 % O2   6 = 85.7 PPM NO
1 = [illegible] PPM HC   2 = 34.[illegible] PPM SO2   3 = 5.6 % CO2
[illegible] 16 5:16

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MOLYTEK

CHART NO. 41446

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

[illegible] RUN 4 [illegible] RUN [illegible]

END

[illegible]	1 [illegible] 3.4	PPM	CO	5	=	12.5	%	O2	6	=	86.0	PPM	NO
[illegible]	[illegible] 3	PPM	HC	2	=	31.3	PPM	SO2	3	=	5.8	%	CO2
[illegible] 10 21 16													
[illegible]	[illegible] 4	PPM	CO	5	=	12.5	%	O2	6	=	85.9	PPM	NO
[illegible]	[illegible] 5	PPM	HC	2	=	31.0	PPM	SO2	3	=	5.8	%	CO2
[illegible] 10 23 16													
[illegible]	[illegible] 9	PPM	CO	5	=	12.5	%	O2	6	=	87.8	PPM	NO
[illegible]	[illegible] 5	PPM	HC	2	=	30.4	PPM	SO2	3	=	5.8	%	CO2
[illegible] 10 15 16													

END

6

1337.6 PPM CO 5 = 14.2 % O2 6 = 59.7 PPM NO

= 62.9 PPM HC 2 = 7.9 PPM SO2 3 = 6.5 % CO2

52 17 7 17

1295.9 PPM CO 5 = 14.1 % O2 6 = 64.3 PPM NO

= 78.6 PPM HC 2 = 7.9 PPM SO2 3 = 6.6 % CO2

09 17 7 17

85.8 PPM HC 2 = 7.7 PPM SO2 3 = 6.5 % CO2
17 6 17
[illegible] PPM CO 5 = 14.0 % O2 6 = 67.5 PPM NO
74.2 PPM HC 2 = 7.8 PPM SO2 3 = 6.6 % CO2
17 5 17
[illegible] PPM CO 5 = 14.3 % O2 6 = 63.6 PPM NO
76.5 PPM HC 2 = 7.6 PPM SO2 3 = 6.4 % CO2
17 4 17
[illegible].9 PPM CO 5 = 14.3 % O2 6 = 63.8 PPM NO
76.6 PPM HC 2 = 7.3 PPM SO2 3 = 6.4 % CO2
17 3 17
1217.2 PPM CO 5 = 14.0 % O2 6 = 60.1 PPM NO
[illegible] PPM HC 2 = 7.8 PPM SO2 3 = 6.7 % CO2
17 2 17
1266.5 PPM CO 5 = 14.2 % O2 6 = 68.4 PPM NO
77.4 PPM HC 2 = 7.5 PPM SO2 3 = 6.4 % CO2
17 1 17
1258.5 PPM CO 5 = 14.1 % O2 6 = 62.0 PPM NO
82.1 PPM HC 2 = 8.2 PPM SO2 3 = 6.6 % CO2
17 0 17
[illegible].2 PPM CO 5 = 14.0 % O2 6 = 64.5 PPM NO
75.6 PPM HC 2 = 8.1 PPM SO2 3 = 6.5 % CO2
16 59 17
[illegible] PPM CO 5 = 14.0 % O2 6 = 63.3 PPM NO
[illegible].7 PPM HC 2 = 8.1 PPM SO2 3 = 6.5 % CO2
16 58 17
[illegible] PPM CO 5 = 14.0 % O2 6 = 67.0 PPM NO
75.2 PPM HC 2 = 8.1 PPM SO2 3 = 6.6 % CO2
92 16 57 17
1285.1 PPM CO 5 = 14.1 % O2 6 = 62.7 PPM NO
75.1 PPM HC 2 = 7.9 PPM SO2 3 = 6.5 % CO2
DEC 52 16 56 17
1820.8 PPM CO 5 = 14.2 % O2 6 = 53.9 PPM NO
75.6 PPM HC 2 = 7.8 PPM SO2 3 = 6.4 % CO2
16 55 17
[illegible] PPM CO 5 = 14.1 % O2 6 = 60.5 PPM NO
78.9 PPM HC 2 = 8.2 PPM SO2 3 = 6.5 % CO2
16 54 17
[illegible].9 PPM CO 5 = 14.0 % O2 6 = 62.9 PPM NO
[illegible] PPM HC 2 = 8.5 PPM SO2 3 = 6.6 % CO2

Time	CO	HC	O2	SO2	NO	CO2
[illegible]	[illegible] PPM CO	[illegible] PPM HC	5 = [illegible] % O2	2 = 9.4 PPM SO2	[illegible]	3 = 6.6 % CO2
8/DEC/92 16:51:17	4 = 1214.8 PPM CO	1 = 77.8 PPM HC	5 = 13.9 % O2	2 = 7.4 PPM SO2	6 = 76.9 PPM NO	3 = 6.7 % CO2
8/DEC/92 16:50:17	4 = 1159.8 PPM CO	1 = 77.4 PPM HC	5 = 14.2 % O2	2 = 7.2 PPM SO2	6 = 72.9 PPM NO	3 = 6.4 % CO2
8/DEC/92 16:49:17	4 = 1421.0 PPM CO	1 = 75.0 PPM HC	5 = 14.1 % O2	2 = 7.5 PPM SO2	6 = 60.3 PPM NO	3 = 6.5 % CO2
8/DEC/92 16:48:17	4 = 1383.8 PPM CO	1 = 76.1 PPM HC	5 = 13.8 % O2	2 = 7.8 PPM SO2	6 = 66.1 PPM NO	3 = 6.5 % CO2
8/DEC/92 16:47:17	4 = 1320.1 PPM CO	1 = 72.9 PPM HC	5 = 13.6 % O2	2 = 7.6 PPM SO2	6 = 70.9 PPM NO	3 = 6.9 % CO2
8/DEC/92 16:46:17	4 = 1316.5 PPM CO	1 = 72.9 PPM HC	5 = 13.8 % O2	2 = 7.9 PPM SO2	6 = 69.5 PPM NO	3 = 6.9 % CO2
8/DEC/92 16:45:17	4 = 1232.1 PPM CO	1 = 74.1 PPM HC	5 = 13.6 % O2	2 = 7.5 PPM SO2	6 = 65.5 PPM NO	3 = 6.9 % CO2
8/DEC/92 16:44:17	4 = 1315.5 PPM CO	1 = 77.6 PPM HC	5 = 13.7 % O2	2 = 7.7 PPM SO2	6 = 71.3 PPM NO	3 = 6.5 % CO2
8/DEC/92 16:43:17	4 = 1105.7 PPM CO	1 = 69.1 PPM HC	5 = 13.6 % O2	2 = 7.2 PPM SO2	6 = 74.5 PPM NO	3 = 6.9 % CO2
8/DEC/92 16:42:17	4 = 1331.8 PPM CO	1 = 75.6 PPM HC	5 = 14.1 % O2	2 = 7.9 PPM SO2	6 = 63.8 PPM NO	3 = 6.6 % CO2
8/DEC/92 16:41:17	4 = 1283.7 PPM CO	1 = 71.1 PPM HC	5 = 13.3 % O2	2 = 7.3 PPM SO2	6 = 66.9 PPM NO	3 = 7.3 % CO2
8/DEC/92 16:40:17	4 = 1461.1 PPM CO	[illegible]	5 = 13.5 % O2	[illegible]	6 = 63.4 PPM NO	[illegible]

100 90 80 70 60 50 40 30 20 10 0

0 10 20 30 40 50 60 70 80 90 100

1 = 57.7	PPM	HC	2 = 7.5	PPM	SO2	3 = 6.9	%	CO2			
8/DEC/92	16	38	17								
4 = 1529.3	PPM	CO	5 = 12.5	%	O2	6 = 87.3	PPM	NO			
1 = 62.7	PPM	HC	2 = 6.3	PPM	SO2	3 = 8.1	%	CO2			
8/DEC/92	16	37	17								
4 = 1507.7	PPM	CO	5 = 13.4	%	O2	6 = 37.7	PPM	NO			
1 = 63.3	PPM	HC	2 = 8.4	PPM	SO2	3 = 7.1	%	CO2			
8/DEC/92	16	36	17								
4 = 1843.4	PPM	CO	5 = 12.6	%	O2	6 = 91.0	PPM	NO			
1 = 58.9	PPM	HC	2 = 7.7	PPM	SO2	3 = 7.7	%	CO2			
8/DEC/92	16	35	17								
4 = 1465.2	PPM	CO	5 = 12.8	%	O2	6 = 77.8	PPM	NO			
1 = 73.7	PPM	HC	2 = 8.7	PPM	SO2	3 = 7.5	%	CO2			
8/DEC/92	16	34	17								
4 = 1526.1	PPM	CO	5 = 13.4	%	O2	6 = 75.7	PPM	NO			
1 = 44.1	PPM	HC	2 = 6.1	PPM	SO2	3 = 7.5	%	CO2			
8/DEC/92	16	33	17								
4 = 1330.6	PPM	CO	5 = 12.3	%	O2	6 = 66.2	PPM	NO			
1 = 68.5	PPM	HC	2 = 8.8	PPM	SO2	3 = 6.8	%	CO2			
8/DEC/92	16	32	17								
4 = 1565.8	PPM	CO	5 = 12.9	%	O2	6 = 71.2	PPM	NO			
1 = 77.4	PPM	HC	2 = 9.7	PPM	SO2	3 = 7.6	%	CO2			
8/DEC/92	16	31	17								
4 = 1552.6	PPM	CO	5 = 13.1	%	O2	6 = 91.2	PPM	NO			
1 = 39.1	PPM	HC	2 = 7.8	PPM	SO2	3 = 7.0	%	CO2			
8/DEC/92	16	30	17								
4 = 1461.2	PPM	CO	5 = 12.4	%	O2	6 = 93.1	PPM	NO			
1 = 56.9	PPM	HC	2 = 7.7	PPM	SO2	3 = 8.0	%	CO2			
8/DEC/92	16	29	17								
4 = 1556.7	PPM	CO	5 = 12.8	%	O2	6 = 75.0	PPM	NO			
1 = 72.9	PPM	HC	2 = 8.2	PPM	SO2	3 = 7.7	%	CO2			
8/DEC/92	16	28	17								
4 = 1356.6	PPM	CO	5 = 12.9	%	O2	6 = 55.0	PPM	NO			
1 = 35.8	PPM	HC	2 = 7.2	PPM	SO2	3 = 7.4	%	CO2			
8/DEC/92	16	27	17								
4 = 1157.9	PPM	CO	5 = 12.6	%	O2	6 = 84.1	PPM	NO			
1 = [illegible].4	PPM	HC	2 = 7.5	PPM	SO2	3 = 7.9	%	CO2			

Date / time	CO (4), PPM	HC (1), PPM	O2 (5), %	SO2 (2), PPM	NO (6), PPM	CO2 (3), %
[illegible]	1367.5	45.8	12.6	7.5	[illegible]	7.7
8 DEC/92 16:24:17	1404.9	58.9	12.6	7.5	85.5	7.0
8 DEC/92 16:23:17	1335.4	45.1	13.0	7.2	86.4	7.4
8 DEC/92 16:22:17	1361.0	59.4	12.9	7.3	81.8	7.5
8 DEC/92 16:21:17	1371.3	56.0	13.1	7.3	84.2	7.3
8 DEC/92 16:20:17	1484.4	59.6	12.5	7.5	81.5	7.7
8 DEC/92 16:19:17	1477.5	52.9	13.3	7.5	75.7	7.1
8 DEC/92 16:18:17	1457.8	45.6	12.8	7.3	85.7	7.6
8 DEC/92 16:17:17	1418.8	57.7	13.0	7.4	75.3	7.6
8 DEC/92 16:16:17	1386.5	78.6	12.8	7.5	85.4	7.5
8 DEC/92 16:15:17	[illegible]	71.6	12.8	7.2	84.5	7.6
8 DEC/92 16:14:17	1373.0	61.9	12.4	7.7	90.8	7.5
8 DEC/92 16:13:17	[illegible]	[illegible]	12.5	[illegible]	84.5	[illegible]

```
4 = 1425.9   PPM   CO     5 = 12.9   %     O2      6 = 86.4   PPM   NO
    58.4     PPM   HC     2 = 7.5    PPM   SO2     3 = 7.5    %     CO2
  DEC/82 16 11 17
    1569.8   PPM   CO     5 = 13.0   %     O2      6 = 89.2   PPM   NO
1 = 45.0     PPM   HC     2 = 7.4    PPM   SO2     3 = 7.4    %     CO2
  DEC/82 16 10 17
    [illegible]  PPM   CO     5 = 13.1   %     O2      6 = 82.7   PPM   NO
    56.6     PPM   HC     2 = 7.5    PPM   SO2     3 = 7.3    %     CO2
  DEC/82 16 9 17
4 = 1311.4   PPM   CO     5 = 13.1   %     O2      6 = 81.5   PPM   NO
1 = 53.7     PPM   HC     2 = 7.4    PPM   SO2     3 = 7.3    %     CO2
  DEC/82 16 8 17
4   1853.9   PPM   CO     5 = 12.8   %     O2      6 = 84.9   PPM   NO
    [illegible]  PPM   HC     2 = 7.5    PPM   SO2     3 = 7.5    %     CO2
  [illegible]82 16 7 17
    [illegible]  PPM   CO     5 = 12.5   %     O2      6 = 87.7   PPM   NO
    37.4     PPM   HC     2 = 7.1    PPM   SO2     3 = 7.4    %     CO2
  [illegible] 16 6 17
    [illegible]  PPM   CO     5 = 12.9   %     O2      6 = 82.8   PPM   NO
    56.6     PPM   HC     2 = 7.5    PPM   SO2     3 = 7.5    %     CO2
  [illegible] 16 5 17
    1461.5   PPM   CO     5 = 12.9   %     O2      6 = 83.1   PPM   NO
  = 55.4     PPM   HC     2 = 7.2    PPM   SO2     3 = 7.4    %     CO2
100  [illegible]82 16 4 17   80   70   60   50   40   30   20   10   0
0    [illegible]   PPM   CO     5 = 12.4   %     O2      6 = [illegible]   PPM   NO
    [illegible]  PPM   HC     2 = 7.4    PPM   SO2     3 = 7.5    %     CO2
  [illegible] 16 3 17
    [illegible]  PPM   CO     5 = 12.9   %     O2      6 = 83.3   PPM   NO
    [illegible]  PPM   HC     2 = 7.8    PPM   SO2     3 = 7.4    %     CO2
  [illegible] 16 2 17
    [illegible]  PPM   CO     5 = 12.7   %     O2      6 = 86.8   PPM   NO
    [illegible]  PPM   HC     2 = 7.3    PPM   SO2     3 = 7.6    %     CO2
  [illegible] 16 1 17
    [illegible]  PPM   CO     5 = 12.8   %     O2      6 = 83.8   PPM   NO
    [illegible]  PPM   HC     2 = 6.9    PPM   SO2     3 = 7.5    %     CO2
  DEC/82 16 0 17
    1365.5   PPM   CO     5 = 12.5   %     O2      6 = 84.4   PPM   NO
    53.6     PPM   HC     2 = 7.1    PPM   SO2     3 = 7.4    %     CO2
  [illegible] 15 59 17
```

415.1 PPM CO	5 = 12.9 % O2	3 = 7.4 % CO2	
57.5 PPM HC	2 = 7.5 PPM SO2		
02 15 57 17		6 = 85.0 PPM NO	
1286.2 PPM CO	5 = 12.9 % O2	3 = 7.4 % CO2	
53.9 PPM HC	2 = 7.5 PPM SO2		
02 15 56 17		6 = 77.5 PPM NO	
1124.6 PPM CO	5 = 13.1 % O2	3 = 7.4 % CO2	
58.5 PPM HC	2 = 6.7 PPM SO2		
02 15 55 17		6 = 76.8 PPM NO	
1322.7 PPM CO	5 = 13.3 % O2	3 = 7.0 % CO2	
54.1 PPM HC	2 = 7.0 PPM SO2		
02 15 54 17		6 = 80.5 PPM NO	
1277.9 PPM CO	5 = 13.4 % O2	3 = 7.2 % CO2	
58.7 PPM HC	2 = 7.3 PPM SO2		
02 15 53 17		6 = 79.4 PPM NO	
1156.9 PPM CO	5 = 13.3 % O2	3 = 7.1 % CO2	
53.1 PPM HC	2 = 7.2 PPM SO2		
02 15 52 17		6 = 79.9 PPM NO	
1272.7 PPM CO	5 = 13.3 % O2	3 = 7.0 % CO2	
58.6 PPM HC	2 = 7.1 PPM SO2		
02 15 51 17		6 = 82.6 PPM NO	
1205.8 PPM CO	5 = 13.2 % O2	3 = 7.1 % CO2	
58.3 PPM HC	2 = 7.2 PPM SO2		
02 15 50 17		6 = 88.5 PPM NO	
[illegible]9.8 PPM CO	5 = 13.3 % O2	3 = 7.0 % CO2	
53.[illegible] PPM HC	2 = 6.9 PPM SO2		
02 15 49 17		6 = 78.5 PPM NO	
[illegible] PPM CO	5 = 13.4 % O2	3 = 6.9 % CO2	
[illegible]6 PPM HC	2 = 7.1 PPM SO2		
02 15 48 17		6 = 87.5 PPM NO	
[illegible]6 PPM CO	5 = 12.6 % O2	3 = 7.4 % CO2	
55.5 PPM HC	2 = 7.8 PPM SO2		
02 15 47 17		6 = 75.8 PPM NO	
[illegible]8 PPM CO	5 = 13.2 % O2	3 = 7.0 % CO2	
[illegible] PPM HC	2 = 7.6 PPM SO2		
02 15 46 17		6 = 90.3 PPM NO	
[illegible]9.6 PPM CO	5 = 13.9 % O2	3 = 7.1 % CO2	
70.8 PPM HC	2 = 7.4 PPM SO2		

250

DEC/92 905 44 17

4 = 818.4 PPM CO   5 = 14.5 % O2   6 = 96.8 PPM NO
1 = 94.6 PPM HC   2 = 7.7 PPM SO2   3 = 5.3 % CO2

DEC/92 14:50:25

PPM 5 PPM CO   6 = 13.9 % O2   6 = 84.2 PPM NO
[illegible] 6 PPM HC   2 = 7.4 PPM SO2   3 = 5.6 % CO2

DEC/92 14:49:25

PPM 8 PPM CO   5 = 13.4 % O2   6 = 78.5 PPM NO
PPM 8 PPM HC   2 = 5.8 PPM SO2   4 = 6.1 % CO2

DEC/92 14:48:40

START RUN 5

[illegible] 4 PPM CO   5 = 12.6 % O2   6 = 96.2 PPM NO
63 8 PPM HC   2 = 16.2 PPM SO2   3 = 6.8 % CO2

12:31:13

[illegible] PPM CO   5 = 12.5 % O2   6 = 94.3 PPM NO
65 9 PPM HC   2 = 11.1 PPM SO2   3 = 6.8 % CO2

[illegible] 12:37:13

[illegible] 6 PPM CO   5 = 12.3 % O2   6 = 98.1 PPM NO
62 8 PPM HC   2 = 9.1 PPM SO2   3 = 7.0 % CO2

[illegible] 12:36:13

[illegible] 6 PPM CO   5 = 12.7 % O2   6 = 93.3 PPM NO
69 8 PPM HC   2 = 5.7 PPM SO2   3 = 6.7 % CO2

12:35:13

[illegible] 1 PPM CO   5 = 12.5 % O2   6 = 92.6 PPM NO
82 1 PPM HC   2 = 6.1 PPM SO2   3 = 6.8 % CO2

[illegible] 34:13

[illegible] 4 PPM CO   5 = 12.6 % O2   6 = 90.4 PPM NO
[illegible] 8 PPM HC   2 = 6.2 PPM SO2   3 = 6.7 % CO2

12:33:13

[illegible] 1 PPM CO   5 = 12.4 % O2   6 = 95.9 PPM NO
77.3 PPM HC   2 = 6.6 PPM SO2   3 = 7.0 % CO2

12:32:13

[illegible] 2 PPM CO   5 = 12.7 % O2   6 = 91.1 PPM NO
71 [illegible] PPM HC   2 = [illegible] PPM SO2   3 = 6.7 % CO2

8/DEC/92 12 36 13
4 = 775.5 PPM CO   5 = 12.5 % O2   6 = 95.4 PPM NO
1 = 71.8 PPM HC   2 = 6.9 PPM SO2   3 = 6.8 % CO2
8/DEC/92 12 25 13
4 = 771.4 PPM CO   5 = 12.5 % O2   6 = 93.4 PPM NO
1 = 75.6 PPM HC   2 = 6.9 PPM SO2   3 = 6.8 % CO2
8/DEC/92 12 18 13
4 = 775.1 PPM CO   5 = 12.5 % O2   6 = 97.8 PPM NO
1 = 72.8 PPM HC   2 = 7.1 PPM SO2   3 = 6.9 % CO2
8/DEC/92 12 27 13
4 = 917.6 PPM CO   5 = 12.8 % O2   6 = 51.4 PPM NO
1 = 74.8 PPM HC   2 = 6.7 PPM SO2   3 = 6.7 % CO2
8/DEC/92 12 28 13
4 = 857.2 PPM CO   5 = 12.5 % O2   6 = 98.5 PPM NO
1 = 55.7 PPM HC   2 = 6.7 PPM SO2   3 = 6.5 % CO2
8/DEC/92 12 25 13
4 = 1113.7 PPM CO   5 = 12.5 % O2   6 = 94.3 PPM NO
1 = 73.2 PPM HC   2 = 6.6 PPM SO2   3 = 6.5 % CO2
8/DEC/92 12 24 13
4 = 1109.1 PPM CO   5 = 12.6 % O2   6 = 96.3 PPM NO
1 = 57.1 PPM HC   2 = 6.9 PPM SO2   3 = 6.8 % CO2
8/DEC/92 12 23 13
4 = 524.3 PPM CO   5 = 12.5 % O2   6 = 98.2 PPM NO
1 = 53.1 PPM HC   2 = 5.8 PPM SO2   3 = 6.5 % CO2
8/DEC/92 12 22 13
4 = 936.1 PPM CO   5 = 12.6 % O2   6 = 93.5 PPM NO
1 = 56.7 PPM HC   2 = 5.6 PPM SO2   3 = 6.8 % CO2
8/DEC/92 12 21 13
4 = 1008.1 PPM CO   5 = 12.5 % O2   6 = 96.3 PPM NO
1 = 53.6 PPM HC   2 = 6.8 PPM SO2   3 = 6.9 % CO2
8/DEC/92 12 26 13
4 = 1146.2 PPM CO   5 = 12.5 % O2   6 = 96.3 PPM NO
1 = 58.1 PPM HC   2 = 6.3 PPM SO2   3 = 6.9 % CO2
8/DEC/92 12 19 13
4 = 999.6 PPM CO   5 = 12 % O2   6 = 96.1 PPM NO
1 = 58.3 PPM HC   2 = 6.5 PPM SO2   3 = 7.0 % CO2
8/DEC/92 12 18 13
4 = 1228.1 PPM CO   5 = 12.5 % O2   6 = 90.8 PPM NO

4 = 1228.0 PPM CO | 5 = 12.2 % O2 | 6 = 96.5 PPM NO
1 = 65.5 PPM HC | 2 = 5.8 PPM SO2 | 3 = 7.2 % CO2
8/DEC/92 12:16:13

4 = 1186.4 PPM CO | 5 = 12.7 % O2 | 6 = 85.2 PPM NO
1 = 71.5 PPM HC | 2 = 5.6 PPM SO2 | 3 = 6.7 % CO2
8/DEC/92 12:15:13

4 = 1051.0 PPM CO | 5 = 12.6 % O2 | 6 = 98.7 PPM NO
1 = 80.6 PPM HC | 2 = 5.4 PPM SO2 | 3 = 6.8 % CO2
8/DEC/92 12:14:13

4 = 1259.1 PPM CO | 5 = 12.2 % O2 | 6 = 93.1 PPM NO
1 = 84.1 PPM HC | 2 = 5.2 PPM SO2 | 3 = 6.5 % CO2
8/DEC/92 12:13:13

4 = 1167.[illegible] PPM CO | 5 = 12.5 % O2 | 6 = 92.5 PPM NO
1 = 74.5 PPM HC | 2 = 5.5 PPM SO2 | 3 = 7.8 % CO2
8/DEC/92 12:12:13

4 = 1189.7 PPM CO | 5 = 13.2 % O2 | 6 = 82.2 PPM NO
1 = 76.6 PPM HC | 2 = 5.6 PPM SO2 | 3 = 6.3 % CO2
8/DEC/92 12:11:13

4 = 1082.0 PPM CO | 5 = 12.8 % O2 | 6 = 88.5 PPM NO
1 = 74.1 PPM HC | 2 = 5.6 PPM SO2 | 3 = 6.7 % CO2
8/DEC/92 12:10:13

4 = 1111.7 PPM CO | 5 = 12.8 % O2 | 6 = 86.5 PPM NO
1 = 79.8 PPM HC | 2 = 5.3 PPM SO2 | 3 = 6.7 % CO2
8/DEC/92 12:9:13

4 = 1045.5 PPM CO | 5 = 13.5 % O2 | 6 = 84.7 PPM NO
1 = 79.7 PPM HC | 2 = 5.7 PPM SO2 | 3 = 6.4 % CO2
8/DEC/92 12:8:13

4 = 1061.9 PPM CO | 5 = 12.5 % O2 | 6 = 94.5 PPM NO
1 = 88.0 PPM HC | 2 = 5.4 PPM SO2 | 3 = 6.5 % CO2
8/DEC/92 12:7:13

4 = 1628.7 PPM CO | 5 = 13.0 % O2 | 6 = 95.5 PPM NO
1 = 75.1 PPM HC | 2 = 5.9 PPM SO2 | 3 = 5.2 % CO2
8/DEC/92 12:6:13

4 = 1155.2 PPM CO | 5 = 12.8 % O2 | 6 = 83.0 PPM NO
1 = 83.6 PPM HC | 2 = 7.0 PPM SO2 | 3 = 6.5 % CO2
8/DEC/92 12:5:13

4 = 1056.2 PPM CO | 5 = 13.1 % O2 | 6 = 82.0 PPM NO
1 = 77.2 PPM HC | 2 = 7.1 PPM SO2 | 3 = 6.4 % CO2
8/DEC/92 12:4:13

4 = 1045.5	PPM	CO	5 = 13.6	%	O2	6 = 83.2	PPM	NO
1 = 81.5	PPM	HC	2 = 7.2	PPM	SO2	3 = 6.5	%	CO2
8/DEC/92 12:2:13								
4 = 867.7	PPM	CO	5 = 13.0	%	O2	6 = 82.8	PPM	NO
1 = 75.6	PPM	HC	2 = 6.8	PPM	SO2	3 = 6.6	%	CO2
8/DEC/92 12:1:13								
4 = 1117.6	PPM	CO	5 = 12.5	%	O2	6 = 82.3	PPM	NO
1 = 74.7	PPM	HC	2 = 7.3	PPM	SO2	3 = 6.7	%	CO2
8/DEC/92 12:0:13								
4 = 1050.7	PPM	CO	5 = 13.0	%	O2	6 = 85.8	PPM	NO
1 = 76.6	PPM	HC	2 = 6.9	PPM	SO2	3 = 6.5	%	CO2
8/DEC/92 11:59:13								
4 = 938.2	PPM	CO	5 = 13.1	%	O2	6 = 83.5	PPM	NO
1 = 88.5	PPM	HC	2 = 6.2	PPM	SO2	3 = 6.5	%	CO2
8/DEC/92 11:58:13								
4 = 996.4	PPM	CO	5 = 13.2	%	O2	6 = 83.9	PPM	NO
1 = 79.7	PPM	HC	2 = 6.5	PPM	SO2	3 = 6.4	%	CO2
8/DEC/92 11:57:13								
4 = 1097.8	PPM	CO	5 = 12.9	%	O2	6 = 83.7	PPM	NO
1 = 85.6	PPM	HC	2 = 7.4	PPM	SO2	3 = 6.7	%	CO2
8/DEC/92 11:56:13								
4 = 1188.7	PPM	CO	5 = 13.2	%	O2	6 = 82.6	PPM	NO
1 = 73.8	PPM	HC	2 = 7.2	PPM	SO2	3 = 6.8	%	CO2
8/DEC/92 11:55:13								
[illegible] 5.6	PPM	CO	5 = 12.8	%	O2	6 = 89.3	PPM	NO
[illegible] 85.9	PPM	HC	2 = 7.3	PPM	SO2	3 = 6.8	%	CO2
[illegible] 11:54:13								
[illegible]	PPM	CO	5 = 13.0	%	O2	6 = 82.0	PPM	NO
[illegible]	PPM	HC	2 = 7.1	PPM	SO2	3 = 6.5	%	CO2
[illegible] 11:53:13								
[illegible]	PPM	CO	5 = 12.8	%	O2	6 = 85.8	PPM	NO
98 [illegible]	PPM	HC	2 = 7.2	PPM	SO2	3 = 6.7	%	CO2
[illegible] 11:52:13								
[illegible]	PPM	CO	5 = 13.0	%	O2	6 = 84.9	PPM	NO
[illegible]	PPM	HC	2 = 7.2	PPM	SO2	3 = 6.6	%	CO2
[illegible] 11:51:13								
[illegible]	PPM	CO	[illegible]	%	O2	6 = 82.7	PPM	NO

100 90 80 70 60 50 40 30 20 10 0

0 10 20 30 40 50 60 70 80 90 100

Left	Middle	Right
7(E PPM HC	3 = 7.6 PPM SO2	6 = 84.2 PPM NO
45 13		3 = 6.6 % CO2
PPM CO	5 = 13.0 % O2	
PPM HC	2 = 7.3 PPM SO2	6 = 86.4 PPM NO
DEC 92 11 48 13		3 = 6.6 % CO2
4 = 1126.7 PPM CO	5 = 13.0 % O2	
1 = 58.4 PPM HC	2 = 7.5 PPM SO2	6 = 88.9 PPM NO
5 DEC 92 11 47 13		3 = 6.5 % CO2
4 = 985.5 PPM CO	5 = 13.6 % O2	
1 = 74.5 PPM HC	2 = 7.[illegible] PPM SO2	6 = 88.3 PPM NO
5 DEC 92 11 46 13		3 = 6.7 % CO2
4 = 1276.6 PPM CO	5 = 13.0 % O2	
1 = 55.[illegible] PPM HC	2 = 7.7 PPM SO2	6 = 85.5 PPM NO
5 DEC 92 11 45 13		3 = 6.3 % CO2
4 = 1165.6 PPM CO	5 = 13.2 % O2	
1 = 72.6 PPM HC	2 = 7 PPM SO2	6 = 86.8 PPM NO
5 DEC 92 11 44 13		3 = 6.6 % CO2
4 = 885.6 PPM CO	5 = 12.9 % O2	
1 = 76.7 PPM HC	2 = 7.3 PPM SO2	6 = 88.4 PPM NO
11 43 13		3 = 6.5 % CO2
PPM CO	5 = 13.1 % O2	
PPM HC	2 = 7.7 PPM SO2	6 = 86.4 PPM NO
DEC 92 11 42 13		3 = 6.7 % CO2
PPM CO	5 = 12.9 % O2	
PPM HC	2 = 7.E PPM SO2	6 = 87.6 PPM NO
92 11 41 13		3 = 6.6 % CO2
PPM CO	5 = 12.9 % O2	
90.0 PPM HC	2 = 7.9 PPM SO2	6 = 84.2 PPM NO
11 40 13		3 = 6.5 % CO2
PPM CO	5 = 13.5 % O2	
86.4 PPM HC	2 = 5.6 PPM SO2	6 = 86.0 PPM NO
11 39 13		3 = 6.5 % CO2
PPM CO	5 = 13.3 % O2	
78.1 PPM HC	2 = 5.6 PPM SO2	6 = 87.8 PPM NO
11 38 13	5 = 13.0 % O2	3 = 6.5 % CO2
PPM CO	2 = 6.3 PPM SO2	
PPM HC		

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1 = 82.8	PPM	HC	2 = 6.0	PPM	SO2	3 = 6.5	%	CO2
8/DEC/92	11:36:13							
4 = 771.2	PPM	CO	5 = 13.4	%	O2	6 = 76.3	PPM	NO
1 = 83.4	PPM	HC	2 = 6.3	PPM	SO2	3 = 6.2	%	CO2
8/DEC/92	11:35:13							
4 = 817.0	PPM	CO	5 = 13.6	%	O2	6 = 89.5	PPM	NO
1 = 83.6	PPM	HC	2 = 5.7	PPM	SO2	3 = 6.4	%	CO2
8/DEC/92	11:34:13							
4 = 1202.2	PPM	CO	5 = 13.3	%	O2	6 = 78.7	PPM	NO
1 = 79.8	PPM	HC	2 = 5.9	PPM	SO2	3 = 6.1	%	CO2
8/DEC/92	11:33:13							
4 = 826.5	PPM	CO	5 = 13.1	%	O2	6 = 85.0	PPM	NO
1 = 86.8	PPM	HC	2 = 6.2	PPM	SO2	3 = 6.3	%	CO2
8/DEC/92	11:32:13							
4 = 965.6	PPM	CO	5 = 13.1	%	O2	6 = 95.3	PPM	NO
1 = 86.8	PPM	HC	2 = 6.8	PPM	SO2	3 = 6.2	%	CO2
8/DEC/92	11:31:13							
[illegible]	PPM	CO	5 = 13.1	%	O2	6 = 83.9	PPM	NO
90.	PPM	HC	2 = 6.6	PPM	SO2	3 = 6.2	%	CO2
[illegible]	11:30:13							
[illegible]	PPM	CO	5 = 13.3	%	O2	6 = 76.2	PPM	NO
87.7	PPM	HC	2 = 7.0	PPM	SO2	3 = 6.0	%	CO2
[illegible]	11:29:13							
[illegible]	PPM	CO	5 = 12.[illegible]	%	O2	6 = 82.2	PPM	NO
78.7	PPM	HC	2 = 7.5	PPM	SO2	3 = 6.3	%	CO2
[illegible]	11:28:13							
4 = 1127.6	PPM	CO	5 = 13.4	%	O2	6 = 77.5	PPM	NO
1 = 88.3	PPM	HC	2 = 8.3	PPM	SO2	3 = 6.6	%	CO2
8/DEC/92	11:27:13							
4 = 928.2	PPM	CO	5 = 12.8	%	O2	6 = 88.1	PPM	NO
1 = 88.1	PPM	HC	2 = 7.5	PPM	SO2	3 = 6.3	%	CO2
[illegible]	11:26:13							
4 = 1132.5	PPM	CO	5 = 13.3	%	O2	6 = 71.2	PPM	NO
1 = 81.6	PPM	HC	2 = 10.1	PPM	SO2	3 = 5.7	%	CO2
8/DEC/92	11:25:13							

START RUN HC=PAH (UN2#1)

-1427

IX. FIELD DATA

B. Gas Chromatography

FIELD ANALYSIS DATA SHEETS

Plant MAC ASPHALT Date 12-7-92

Location PERRY FL

1. General Information:

Source temp. (°C)		Columnar temperature:	
Probe temp. (°C)		Initial (°C)/time (min)	75 C
Ambient temp. (°C)		Program rate (°C/min)	—
Atmospheric press. (in. Hg)		Final (°C)/time (min)	75 C
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	40 mL/min
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)	.600L/min	Injection time (24-hr basis)	
Sample loop volume (ml)	1 mL	Chart speed (mm/min)	NA
Sample loop temp. (°C)	75 C	Dilution ratio	NA
Dilution gas flow rate (ml/min)	—	Dilution gas used (symbol)	NA

2. Field Analysis Data: 1st CONDENSABLE

Run # 1 Time

	Components	Area	Attenuation	A x A Factor	Concentration (ppm)
INJ 1	METHANE	23.23	32	—	16.212
2	METHANE, ETHYLBENZENE	21.95, 12.95	32	—	15.159, 2.062
3	METHANE	23.43	32	—	16.376
4	METHANE	24.21	32	—	17.018
5	METHANE	22.24	32	—	15.397

Run # 1 Time

	Components	Area	Attenuation	A x A Factor	Concentration (ppm)
6	METHANE	15.76	32	—	10.046
7	METHANE	14.83	32	—	9.301
8	METHANE	11.50	32	—	6.562
9	METHANE	9.45	32	—	4.876

Run # Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)

FIELD ANALYSIS DATA SHEETS

Plant MACASPHALT Date 12-7-92

Location PERRY FL

1. General Information:

Source temp. (°C)		Columnar temperature:	
Probe temp. (°C)		Initial (°C)/time (min)	75 C
Ambient temp. (°C)		Program rate (°C/min)	–
Atmospheric press. (in. Hg)		Final (°C)/time (min)	75 C
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	40ml/min
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)	.600 l/min	Injection time (24-hr basis)	
Sample loop volume (ml)	1ml	Chart speed (mm/min)	NA
Sample loop temp. (°C)	75C	Dilution ratio	NA
Dilution gas flow rate (ml/min)	–	Dilution gas used (symbol)	NA

2. Field Analysis Data: 2nd CONDENSABLE

Run # 2 Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)
INJ 1 METHANE	34.88	32	–	25.796
2 METHANE	6.28	32	–	2.268
3 METHANE	32.61	32	–	23.928
4 METHANE	37.12	32	–	27.628
5 METHANE	30.79	32	–	22.431

Run # 2 Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)
6 METHANE	29.19	32	–	21.115
7 METHANE	19.87	32	–	13.448
8 METHANE	25.42	32	–	18.013
9 METHANE	41.55	32	–	31.283

Run # Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)

FIELD ANALYSIS DATA SHEETS

Plant MACASPHALT Date 12-8-92

Location PERRY FL

1. General Information:

Source temp. (°C)		Columnar temperature:	
Probe temp. (°C)		Initial (°C)/time (min)	75C
Ambient temp. (°C)		Program rate (°C/min)	–
Atmospheric press. (in. Hg)		Final (°C)/time (min)	75C
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	40ML/MIN
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)	600 L/MIN	Injection time (24-hr basis)	
Sample loop volume (ml)	1ML	Chart speed (mm/min)	NA
Sample loop temp. (°C)	75C	Dilution ratio	NA
Dilution gas flow rate (ml/min)	–	Dilution gas used (symbol)	NA

2. Field Analysis Data: 3rd CONDENSABLE

Run # 3 Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)
INJ 1 METHANE	56.95	32	–	43.689
2 METHANE	45.29	32	–	35.915
3 METHANE	45.29	32	–	35.902
4 METHANE	44.91	32	–	35.642
5 METHANE	40.99	32	–	33.048

Run # 3 Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)
6 METHANE	45.61	32	–	36.128
7 METHANE	44.94	32	–	35.695
8 METHANE	19.43	32	–	18.674
9 METHANE	8.47	32	–	11.367

Run # Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)

FIELD ANALYSIS DATA SHEETS

Plant MACASPHALT Date 12-8-92 **259**

Location PERRY FL

1. General Information:

Source temp. (°C)		Columnar temperature:	
Probe temp. (°C)		Initial (°C)/time (min)	75C
Ambient temp. (°C)		Program rate (°C/min)	—
Atmospheric press. (in. Hg)		Final (°C)/time (min)	75C
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	40 mL/min
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)	.600 L/min	Injection time (24-hr basis)	
Sample loop volume (ml)	1mL	Chart speed (mm/min)	NA
Sample loop temp. (°C)	75C	Dilution ratio	NA
Dilution gas flow rate (ml/min)	—	Dilution gas used (symbol)	NA

2. Field Analysis Data: 1st DAH

Run # 1 Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)
INJ 1 METHANE	44.95	32	—	35.688
2 METHANE	35.80	32	—	29.588
3 METHANE	42.28	32	—	33.908
4 METHANE	40.87	32	—	32.968
5 METHANE	40.70	32	—	32.855

Run # 1 Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)
6 METHANE	41.52	32	—	33.401
7 METHANE	36.64	32	—	30.148
8 METHANE	36.98	32	—	30.375
9 METHANE	40.22	32	—	32.535
		32	—	

Run # Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)

FIELD ANALYSIS DATA SHEETS

Plant MACASPHALT Date 12-8-92 260

Location PERRY FL

1. General Information:

Source temp. (°C)		Columnar temperature:	
Probe temp. (°C)		Initial (°C)/time (min)	75 C
Ambient temp. (°C)		Program rate (°C/min)	—
Atmospheric press. (in. Hg)		Final (°C)/time (min)	75 C
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	40 ml/min
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)	.600 L/min	Injection time (24-hr basis)	
Sample loop volume (ml)	1ml	Chart speed (mm/min)	NA
Sample loop temp. (°C)	75C	Dilution ratio	NA
Dilution gas flow rate (ml/min)	—	Dilution gas used (symbol)	NA

2. Field Analysis Data: 2nd PAH

Run # 2 Time

	Components	Area	Attenuation	A x A Factor	Concentration (ppm)
INJ 1	METHANE/BENZENE	42.43/18.58	32	—	34.008 / 2.742
2	METHANE	50.30	32	—	36.618
3	METHANE	39.00	32	—	28.657
4	METHANE	36.25	32	—	26.720
5	METHANE	36.01	32	—	26.551

Run # 2 Time

	Components	Area	Attenuation	A x A Factor	Concentration (ppm)
6	METHANE	32.31	32	—	27.467
7	METHANE	34.11	32	—	25.212
8	METHANE	41.28	32	—	30.264
9	METHANE	0.00	32	—	BTDL

Run # Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)

FIELD ANALYSIS DATA SHEETS

Plant MACASPHALT Date 12-9-92 261

Location PERRY FL.

1. General Information:

Source temp. (°C)		Columnar temperature:	
Probe temp. (°C)		Initial (°C)/time (min)	75C
Ambient temp. (°C)		Program rate (°C/min)	—
Atmospheric press. (in. Hg)		Final (°C)/time (min)	75C
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	40 mL/min
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)	600 L/min	Injection time (24-hr basis)	
Sample loop volume (ml)	1mL	Chart speed (mm/min)	NA
Sample loop temp. (°C)	75C	Dilution ratio	NA
Dilution gas flow rate (ml/min)	—	Dilution gas used (symbol)	NA

2. Field Analysis Data: 3rd PAH

Run # 3 Time

	Components	Area	Attenuation	A x A Factor	Concentration (ppm)
INT1	METHANE	57.46	32	—	34.513
2	METHANE	64.59	32	—	39.309
3	METHANE	61.01	32	—	36.901
4	METHANE	58.84	32	—	35.441
5	METHANE	47.84	32	—	28.042

Run # 3 Time

	Components	Area	Attenuation	A x A Factor	Concentration (ppm)
6	METHANE	50.55	32	—	29.865
7	METHANE	52.10	32	—	30.908
8	METHANE	68.93	32	—	42.228
9	METHANE	66.58	32	—	40.648
10	METHANE	18.18	32	—	8.092

Run # Time

	Components	Area	Attenuation	A x A Factor	Concentration (ppm)
11					
12					

FIELD ANALYSIS DATA SHEETS

Plant MACASPHALT Date 12-9-92 262

Location PERRY FL

1. General Information:

Source temp. (°C)		Columnar temperature:	
Probe temp. (°C)		Initial (°C)/time (min)	75C
Ambient temp. (°C)		Program rate (°C/min)	—
Atmospheric press. (in. Hg)		Final (°C)/time (min)	75C
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	5/6 ML/MIN
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)	.600 L/MIN	Injection time (24-hr basis)	
Sample loop volume (ml)	1mL	Chart speed (mm/min)	NA
Sample loop temp. (°C)	75C	Dilution ratio	NA
Dilution gas flow rate (ml/min)	—	Dilution gas used (symbol)	NA

2. Field Analysis Data: 1st FORMALDEHYDE

Run # 1 Time

	Components	Area	Attenuation	A x A Factor	Concentration (ppm)
INJ 1	METHANE	55.62	32	—	33.276
2	METHANE	47.24	32	—	27,652
3	METHANE	51.87	32	—	30,767
4	METHANE	46.03	32	—	26.825
5	METHANE	46.85	32	—	27.376

Run # 1 Time

	Components	Area	Attenuation	A x A Factor	Concentration (ppm)
6	METHANE	50.53	32	—	29.852

Run # Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)

FIELD ANALYSIS DATA SHEETS

Plant MACASPHALT Date 12-9-92 263

Location PERRY FL

1. General Information:

Source temp. (°C)		Columnar temperature:	
Probe temp. (°C)		Initial (°C)/time (min)	75C
Ambient temp. (°C)		Program rate (°C/min)	—
Atmospheric press. (in. Hg)		Final (°C)/time (min)	75C
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	40 mL/min
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)	600 ml/min	Injection time (24-hr basis)	
Sample loop volume (ml)	1mL	Chart speed (mm/min)	NA
Sample loop temp. (°C)	75C	Dilution ratio	NA
Dilution gas flow rate (ml/min)	—	Dilution gas used (symbol)	NA

2. Field Analysis Data: 2nd FORMALDEHYDE

Run # 2 Time

	Components	Area	Attenuation	A x A Factor	Concentration (ppm)
INJ 1	METHANE	24.94	32	—	12.639
2	METHANE	40.21	32	—	22.91
3	METHANE	37.79	32	—	21.282
4	METHANE	47.74	32	—	27.975
5	METHANE	54.43	32	—	32.475

Run # 2 Time

	Components	Area	Attenuation	A x A Factor	Concentration (ppm)
6	METHANE	54.77	32	—	32.704

Run # Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)

FIELD ANALYSIS DATA SHEETS

Plant MACASPHALT Date 12-9-92 264

Location PERRY FL

1. General Information:

Source temp. (°C)		Columnar temperature:	
Probe temp. (°C)		Initial (°C)/time (min)	75 C
Ambient temp. (°C)		Program rate (°C/min)	—
Atmospheric press. (in. Hg)		Final (°C)/time (min)	75 C
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	40 mL/min
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)	.600 L/min	Injection time (24-hr basis)	
Sample loop volume (ml)	1mL	Chart speed (mm/min)	NA
Sample loop temp. (°C)	75C	Dilution ratio	NA
Dilution gas flow rate (ml/min)	—	Dilution gas used (symbol)	NA

2. Field Analysis Data: 3rd FORMALDEHYDE

Run # 3 Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)
INJ 1 METHANE	61.33	32	—	37.116
2 METHANE	78.33	32	—	48.551
3 METHANE	65.25	32	—	39.753
4 METHANE	96.56	32	—	60.814
5 METHANE	88.78	32	—	55.580

Run # 3 Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)
6 METHANE	104.01	32	—	65.825

Run # Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)

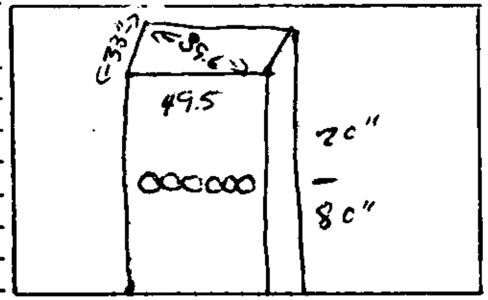
IX. FIELD DATA

C. PAH

RAMCON ENVIRONMENTAL CORPORATION

Plant MAC ASPHALT

Location CROSS CITY, FLA
Operator T.CROSS
Date 12-8-92
Run No. 1
Sample Box No. 1
Meter Box No. ANDERSON
Meter H @ 1.852
C Factor .980
Pitot Tube Coefficient Cp .84



Schematic of Stack Cross Section

Ambient Temperature 60
Barometric Pressure 30.08
Assumed Moisture, % 28
Probe Length, m(ft) 4 FT
Nozzle Identification No.
Avg. Calibrated Nozzle Dia., (in.) .250
Probe Heater Setting 4
Leak Rate, m^3/min. (cfm) .021 AT 24"
Probe Liner Material PYREX
Static Pressure, mm Hg (in. Hg)
Filter No.

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	627	325.1
INITIAL	200	317.9
DIFFERENCE	427	7.2

PAH

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (Ps) in H2O	PRESSURE DIFF. ORF. MTR in H2O	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	GAS SAMPLE TEMP. AT DRY GAS METER °F Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	11:24 / 11:26	15	267	1.7	3.2	406.739 / 408.6	78	70	270	58
2	11:28	23	269	2.0	3.8	410.7	87	70	268	53
3	11:30	19	269	1.9	3.7	412.8	92	70	265	54
4	11:32	16	269	1.4	2.7	414.6	99	71	248	55
5	11:34	12	268	1.1	2.1	416.2	103	72	241	55
B 1 HOT BOX OUT	11:35 / 11:37	15	268	1.5	2.9	418.0	105	73	231	58
2	11:~~45~~ 1:47	15	267	1.5	2.9	419.7	89	74	264	62
3	11:49	14	268	1.3	2.5	421.5	99	74	271	59
4	11:51	12	260	1.0	1.9	423.0	104	75	268	57
5	11:53	12	267	1.0	1.9	424.5	107	74	267	56

Form #REC-05

MACASFT5

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Form #REC-06

RAMCON emissions test log sheet, cont. DATE 12-8-92 LOCATION Macasphalt Cove City, FLA TEST NO. 1
PAH

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP [redacted]	VELOCITY HEAD [redacted]	ORFICE DIFF. PRESSURE [redacted]	GAS VOLUME Vm (ft^3)	GAS SAMPLE TEMP. (°F) [redacted]		SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C 1	11:54 / 11:56	13	268	1.3	2.5	426.1	106	77	272	59
2	11:58	13	267	1.3	2.5	427.9	109	78	262	57
3	12:00	12	257	1.1	2.1	429.5	114	79	253	56
4	12:02	11	252	.95	1.8	431.0	114	80	251	57
5	12:04	12	252	1.1	2.1	432.5	115	81	249	58
D 1	12:05 / 12:07	13	268	1.3	2.5	434.2	111	83	251	59
2	12:09	14	253	1.4	2.7	435.9	118	84	242	56
3	12:11	14	239	1.3	2.5	437.7	121	85	242	59
4	12:13	12	247	1.0	1.9	439.3	122	86	236	56
5	12:15	12	245	.93	1.8	440.7	121	87	234	55
E 1	12:16 / 12:18	15	258	1.5	2.9	442.4	119	89	234	57
2	12:20	15	254	1.5	2.9	444.3	123	89	236	55
3	12:22	15	234	1.5	2.9	446.2	127	90	238	55
4	12:24	12	238	1.0	1.9	447.7	126	91	233	56
5	12:26	12	248	1.0	1.9	449.2	125	92	239	57
F 1	12:27 / 12:29	20	269	2.1	4.0	451.5	123	93	246	59
2	12:31	20	269	2.1	4.0	453.5	127	94	248	57
3	12:33	21	258	2.0	3.9	455.6	129	94	245	56
4	12:35	18	261	1.8	3.5	457.7	131	95	241	55
5	12:37	18	259	1.8	3.5	459.759	133	96	240	55

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RAMCON ENVIRONMENTAL CORPORATION

Plant MACASPHALT

Location CROSS CITY, FLA
Operator T. Roush
Date 12-8-92
Run No. 2
Sample Box No. 1
Meter Box No. ANDERSEN
Meter H @ 1.852
C Factor .980
Pitot Tube Coefficient Cp .84

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	832	491.4
INITIAL	200	482.3
DIFFERENCE	632	9.1

Ambient Temperature 60
Barometric Pressure 30.08
Assumed Moisture, % 28
Probe Length, m(ft) 4FT
Nozzle Identification No.
Avg. Calibrated Nozzle Dia., (in.) .250
Probe Heater Setting 4
Leak Rate, m^3/min. (cfm) .015 AT 20"
Probe Liner Material PYREX
Static Pressure, mm Hg (in. Hg)
Filter No.

Schematic of Stack Cross Section

PAH

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (ΔP) in H2O	PRESSURE DIFF. ORF. MTR in H2O	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	GAS SAMPLE TEMP. AT DRY GAS METER °F Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	13:43 / 13:46	13	261	1.6	3.3	460.615 / 463.5	79	75	232	66
2	13:49	17	271	2.0	4.1	466.8	99	75	233	57
3 PLANT DOWN	13:52	11	269	1.3	2.7	469.4	106	76	245	57
4	15:45 / 15:48	12	251	1.3	2.7	472.2	77	73	224	67
5	15:51	10	258	1.0	2.1	474.6	89	72	227	62
B 1	15:52 / 15:55	12	261	1.5	3.0	477.5	97	73	235	62
2	15:58	12	264	1.5	3.0	480.3	106	75	230	59
3	16:01	10	264	1.1	2.3	482.7	110	76	226	60
4	16:04	9	265	.95	1.9	485.1	111	78	238	62
5	16:07	10	265	1.0	2.1	487.3	113	79	232	62

Form #REC-05

MACASFT 5

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 12-8-92 LOCATION MACASPHALT TEST NO. 2
PAH CROSS CITY, FLA

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in H_2O)	ORFICE DIFF. PRESSURE ΔH (in H_2O)	GAS VOLUME Vm (ft.^{3})	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C1	16:08 / 16:11	10	264	1.1	2.3	489.7	109	82	258	63
2	16:14	12	269	1.4	2.8	492.4	117	84	273	63
3	16:17	11	268	1.3	2.5	495.1	121	86	261	60
4	16:20	9	267	.95	1.9	497.3	122	87	261	60
5	16:23	9	266	.95	1.9	499.6	121	89	260	61
D1	16:24 / 16:27	11	266	1.3	2.5	502.3	117	91	248	61
2	16:30	11	269	1.3	2.5	504.9	123	92	258	59
3	16:33	9	264	.92	1.9	507.2	124	93	259	59
4	16:36	9	264	.90	1.8	509.4	123	94	258	60
5	16:39	9	264	.85	1.7	511.5	123	94	253	60
E1	16:40 / 16:43	11	267	1.3	2.5	514.1	115	95	248	61
2	16:46	13	267	1.5	3.1	517.0	124	95	248	59
3	16:49	11	264	1.3	2.5	519.6	128	96	240	60
4	16:52	10	261	1.0	2.1	522.0	126	96	242	60
5	16:55	10	260	1.0	2.1	524.4	126	97	242	60
F1	16:56 / 16:59	18	266	2.2	4.5	527.9	128	97	261	58
2	17:02	18	266	2.3	4.7	531.5	134	98	256	57
3	17:05	17	262	2.1	4.3	534.9	136	99	258	56
4	17:08	15	263	1.8	3.7	538.1	138	100	263	57
5	17:11	14	262	1.7	3.5	541.264	138	101	257	57

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RAMCON ENVIRONMENTAL CORPORATION

Plant MACASPHALT
Location CROSS CITY, FLA
Operator T. CROOK
Date 12-9-92
Run No. 3
Sample Box No. ~~ANDERSEN~~ 1
Meter Box No. ~~1852~~ ANDERSEN
Meter H @ 1.852
C Factor .980
Pitot Tube Coefficient Cp .84

Ambient Temperature 50
Barometric Pressure 30.12
Assumed Moisture, % 25
Probe Length, m(ft) 4FT
Nozzle Identification No.
Avg. Calibrated Nozzle Dia., (in.) .250
Probe Heater Setting 4
Leak Rate, m^3/min. (cfm) .018 AT 24"
Probe Liner Material PYREX
Static Pressure, mm Hg (in. Hg)
Filter No.

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	749	431.1
INITIAL	200	422.8
DIFFERENCE	549	8.3

Schematic of Stack Cross Section

PAH

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_s)	VELOCITY HEAD (P_s)	PRESSURE DIFF. ORF. MTR	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1 (PLANT DOWN)	9:46 / 9:49	17	250	1.6	3.0	552.583 / 555.3	94	73	268	67
2	10:00 / 10:03	20	251	2.0	3.8	557.8	102	81	254	50
3	10:25 / 10:28	14	245	.95	1.8	560.1	96	90	255	57
4	10:31	16	251	1.2	2.3	562.6	104	88	257	55
5	10:34	23	258	1.8	3.4	565.5	117	88	259	57
B 1	10:55 / 10:58	18	266	1.4	2.6	565.925 / 568.4	98	82	265	56
2	11:01	17	273	1.4	2.6	571.0	111	83	269	53
3	11:04	12	272	1.2	2.3	573.5	122	86	268	54
4	11:07	10	271	.90	1.7	575.6	125	89	271	57
5	11:10	12	271	.85	1.6	577.6	127	91	289	57

Form #REC-05

MACASFT5

m #REC-06

RAMCON emissions test log sheet, cont. DATE 12-9-92 LOCATION MACOSPHALT TEST NO. 5
PDH CROSS CITY, FLA

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD	ORFICE DIFF. PRESSURE	GAS VOLUME Vm (ft.³)	GAS SAMPLE TEMP. (°F)		SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C 1	11:11 / 11:14	15	276	1.1	2.1	580.0	128	96	267	59
2	11:17	15	275	1.2	2.3	582.4	135	98	269	58
3	11:20	13	273	1.0	1.9	584.8	137	100	258	60
4	11:23	10	269	.85	1.6	587.0	137	102	254	59
5	11:26	13	268	.95	1.8	589.1	136	103	249	58
D 1	11:28 / 11:31	17	273	1.3	2.5	591.5	132	107	255	43
2	11:34	18	274	1.3	2.5	594.0	137	106	257	40
3	11:37	16	272	1.1	2.1	596.7	137	107	258	46
4	11:40	15	273	.95	1.8	598.8	140	107	258	55
5	11:43	13	275	.77	1.5	599.8	139	106	260	58
E 1	11:44 / 11:47	21	278	1.5	2.8	603.7	136	107	269	62
2	11:50	21	281	1.5	2.8	606.5	139	107	272	58
3	11:53	19	280	1.3	2.5	609.1	141	107	272	58
4	11:56	14	276	.95	1.8	611.4	141	108	269	61
5	11:59	13	273	.90	1.7	613.5	139	108	267	63
F 1	12:00 / 12:03	22	283	2.2	4.2	616.7	138	109	271	62
2	12:04 / 12:07	22	281	2.5	4.7	619.6	135	109	268	62
3	12:10	22	268	2.3	4.3	622.5	136	109	265	62
4	12:13	22	267	2.0	3.8	625.5	136	109	265	65
5	12:16	22	264	1.4	3.0	628.395	137	108	258	67

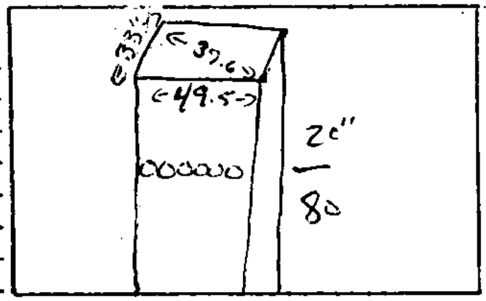
IX. FIELD DATA

D. Particulate

RAMCON ENVIRONMENTAL CORPORATION

Plant MCASPHALT

Location CROSS CITY, FLA
Operator T.C.Rock
Date 12-7-92
Run No. 1
Sample Box No. ~~C-185~~ 1
Meter Box No. C-185
Meter H @ 1.531
C Factor .987
Pitot Tube Coefficient Cp .84



Schematic of Stack Cross Section

Ambient Temperature
Barometric Pressure 30.10
Assumed Moisture, % .30
Probe Length, m(ft) 4 FT
Nozzle Identification No. .0003408
Avg. Calibrated Nozzle Dia., (in.) .250/.250/.250
Probe Heater Setting ✓
Leak Rate, m^3/min.(cfm) .01 AT 22"
Probe Liner Material PYREX
Static Pressure, mm Hg(in.Hg)
Filter No. TS 6569

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	780	236.5
INITIAL	300	224.0
DIFFERENCE	480	12.5

CONDENSABLES

TRAV. PT NO.	SAMPLING TIME (θ)min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H20	PRESSURE DIFF. ORF. MTR in H20	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1 (SHUT DOWN)	11:45 / 11:47	12	275	1.5	2.2	768.510 / 770.2	96	88	272	68
2	12:59 / 13:01	8	250	1.0	1.4	771.6	92	86	225	68
3	13:03	8	253	1.2	1.7	773.2	96	86	234	66
4	13:05	8	259	1.2	1.7	774.8	100	86	239	63
5	13:07	8	264	1.1	1.6	776.3	102	86	254	62
B 1	13:08 / 13:10	7	269	.95	1.4	777.8	102	88	261	66
2	13:12	9	279	1.3	1.9	779.3	106	88	265	64
3	13:14	9	282	1.1	1.6	780.9	108	88	262	63
4	13:16	8	284	.93	1.3	782.3	110	90	262	63
5	13:18	8	285	.90	1.3	783.7	110	90	261	64

Form #REC-05

MACASFLT

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 12-7-92 LOCATION MAGASPHALT TEST NO. 1

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in H_2O)	ORFICE DIFF. PRESSURE ΔH (in H_2O)	GAS VOLUME V_m (ft^3)	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C 1	13:19 / 13:21	8	287	1.0	1.5	785.1	110	92	238	65
2	13:23	8	288	.93	1.3	786.5	112	92	235	63
3	13:25	5	285	.60	.87	787.7	112	92	231	63
4	13:27	5	352	.60	.87	788.8	112	92	240	64
5	13:29	4	352	.40	.58	789.7	114	94	252	65
D 1	13:31 / 13:33	8	345	1.0	1.5	791.2	114	94	258	67
2	13:35	8	356	.95	1.4	792.6	114	94	267	64
3	13:37	7	355	.85	1.2	794.0	114	94	255	65
4	13:39	5	352	.60	.87	795.2	116	96	253	65
5	13:41	5	346	.71	1.0	796.3	116	96	247	67
E 1	13:42 / 13:44	7	340	1.3	1.9	797.7	116	96	247	63
2	13:46	12	338	1.5	2.2	799.4	116	96	247	62
3	13:48	10	337	1.2	1.7	801.0	116	96	246	61
4	13:50	8	353	.95	1.4	802.5	116	96	246	61
5	13:52	7	349	.80	1.2	803.9	116	96	239	63
F 1	13:53 / 13:55	17	323	1.8	2.6	806.0	116	96	237	61
2	13:57	14	305	1.5	2.2	807.7	116	96	233	59
3	13:59	14	291	1.5	2.2	809.5	116	96	231	59
4	14:01	14	296	1.6	2.3	811.3	116	96	230	59
5	14:03	15	352	1.6	2.3	813.219	116	96	238	59

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RAMCON ENVIRONMENTAL CORPORATION

Plant MACASPHALT
Location CROSS CITY, FLA
Operator T. CROOK
Date 12-7-92
Run No. 2
Sample Box No. 1
Meter Box No. ANDERSON
Meter H @ 1.852
C Factor .980
Pitot Tube Coefficient Cp .84

Ambient Temperature 70
Barometric Pressure 30.10
Assumed Moisture, % .35
Probe Length, m(ft) 4 FT
Nozzle Identification No. .0003408
Avg. Calibrated Nozzle Dia., (in.) .250/.250/.250
Probe Heater Setting 4
Leak Rate, m^3/min. (cfm) .013 AT 10"
Probe Liner Material PYREX
Static Pressure, mm Hg (in. Hg)
Filter No. TS6570

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	770	197.6
INITIAL	300	196.1
DIFFERENCE	470	1.5

Schematic of Stack Cross Section

CONDENSABLES

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_s)	VELOCITY HEAD (P_s) in H2O	PRESSURE DIFF. ORF. MTR in H2O	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	GAS SAMPLE TEMP. AT DRY GAS METER °F Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	14:52 / 14:54	6	281	1.5	2.1	309.412 / 311.0	91	86	235	68
2	14:56	9	285	2.0	2.9	312.7	100	86	239	67
3	14:58	8	283	1.6	2.3	314.3	105	86	239	67
4	15:00	6	279	1.1	1.6	315.8	109	86	240	67
5	15:02	6	276	1.0	1.4	317.1	112	87	239	67
B 1 PLANT DOWN	15:03 / 15:05	6	270	1.4	2.0	318.8	111	88	240	65
2	~~15:07~~ 15:13	7	250	1.5	2.1	320.4	108	92	246	64
3	15:15	7	258	1.3	1.8	321.8	114	93	252	64
4	15:17	5	261	.95	1.3	323.2	117	93	254	64
5	15:19	5	267	.97	1.4	324.4	119	94	255	65

MACASFLT

Form #REC-05

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 12-7-92 LOCATION MACASPHALT CROSS CITY, FLA TEST NO. 2

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME Vm (ft^3)	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C1	15:20 / 15:22	6	267	1.2	1.7	325.9	117	96	254	65
2	15:24	7	274	1.4	2.0	327.6	123	97	251	63
3	15:26	6	274	1.1	1.6	328.9	125	98	247	63
4	15:28	5	273	.93	1.3	330.2	126	99	248	64
5	15:30	5	271	.90	1.3	331.5	126	100	249	65
D1	15:31 / 15:33	6	263	1.1	1.6	332.7	125	102	245	66
2	15:35	7	272	1.5	2.1	334.2	128	102	245	65
3	15:37	6	271	1.1	1.6	335.6	129	102	244	66
4	15:39	6	267	.92	1.3	337.0	130	103	241	66
5	15:41	5	266	.88	1.2	338.2	130	104	247	67
E1	15:42 / 15:44	7	267	1.5	2.1	339.8	128	105	253	67
2	15:46	7	270	1.5	2.1	341.5	131	105	251	63
3	15:48	7	269	1.4	2.0	343.1	134	106	248	62
4	15:50	6	267	1.0	1.4	344.5	134	107	245	63
5 PLANT DOWN	15:54 / 15:56	5	247	.80	1.1	345.8	116	107	258	67
F1	15:57 / 15:59	9	262	2.0	2.9	347.7	126	108	263	67
2	16:01	10	267	2.2	3.2	349.6	134	108	264	65
3	16:03	10	268	2.2	3.2	351.6	136	108	261	64
4	16:05	9	269	1.8	2.6	353.6	138	109	261	65
5	16:07	9	269	1.8	2.6	355.242	138	109	262	66

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RAMCON ENVIRONMENTAL CORPORATION

Plant MACASPHALT
Location CROSS CITY, FLA
Operator T. [illegible]
Date 10-8-92
Run No. [illegible]
Sample Box No. 1
Meter Box No. ANDERSON
Meter H @ 1.852
C Factor .980
Pitot Tube Coefficient Cp .84

Ambient Temperature 50
Barometric Pressure 30.08
Assumed Moisture, % 1.35
Probe Length, m(ft) 4 FT
Nozzle Identification No. .0003408
Avg. Calibrated Nozzle Dia., (in.) .250/.250/.250
Probe Heater Setting 4
Leak Rate, m^3/min. (cfm) .013 AT 16"
Probe Liner Material PYREX
Static Pressure, mm Hg (in. Hg)
Filter No. TS6568

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	686	237.5
INITIAL	300	237.5
DIFFERENCE	386	0.0

Schematic of Stack Cross Section

CONDENSABLES

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H20	PRESSURE DIFF. ORF. MTR in H20	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	8:30 / 8:32	7	258	1.7	2.5	355.860 / 357.5	64	60	270	56
2	8:34	10	264	2.1	3.1	359.4	70	60	255	53
3	8:36	9	265	1.8	2.7	361.1	81	60	241	52
4	8:38	7	264	1.2	1.8	362.7	84	60	242	52
5 PLANT DOWN	8:40	6	260	1.1	1.6	364.1	86	61	246	52
B 1	9:30 / 9:32	6	255	1.5	2.2	365.7	66	65	242	57
2	9:34	9	257	1.7	2.5	367.4	75	64	243	48
3	9:36	8	256	1.6	2.4	369.1	83	64	244	49
4	9:38	6	255	1.1	1.6	370.5	87	64	254	49
5	9:40	6	251	1.1	1.6	371.9	84	65	247	49

MACASFLT

Form #REC-05

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 12-8-92 LOCATION MACASPHALT CROSS CITY TEST NO. 3

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft^3)	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C1	9:41 / 9:43	6	250	1.3	1.9	373.4	83	66	225	50
2	9:45	8	253	1.7	2.5	375.1	89	66	226	50
3	9:47	7	257	1.3	1.9	376.6	96	67	228	50
4	9:49	6	255	1.1	1.6	378.0	94	66	230	50
5	9:51	6	254	1.0	1.5	379.4	97	66	232	50
D1	9:52 / 9:54	7	250	1.5	2.2	381.0	94	66	235	50
2	9:56	7	257	1.5	2.2	382.5	102	68	240	49
3	9:58	7	256	1.3	1.9	384.1	107	70	240	51
4	10:00	6	254	.95	1.4	385.4	109	74	238	53
5	10:02	6	253	.95	1.4	386.7	109	76	245	53
E1	10:03 / 10:05	8	257	1.5	2.2	388.4	104	79	246	55
2	10:07	8	261	1.6	2.4	390.0	112	81	257	56
3	10:09	8	261	1.5	2.2	391.7	115	82	256	56
4	10:11	6	259	1.1	1.6	393.1	116	83	248	55
5	10:13	6	256	1.1	1.6	394.5	114	85	246	55
F1	10:14 / 10:16	12	265	2.3	3.4	396.5	112	86	266	56
2	10:18	12	264	2.3	3.4	398.6	117	87	272	58
3	10:20	12	268	2.3	3.4	400.6	120	87	267	59
4	10:22	11	265	2.0	2.9	402.4	122	88	264	60
5	10:24	11	263	2.0	2.9	404.727	122	90	248	60

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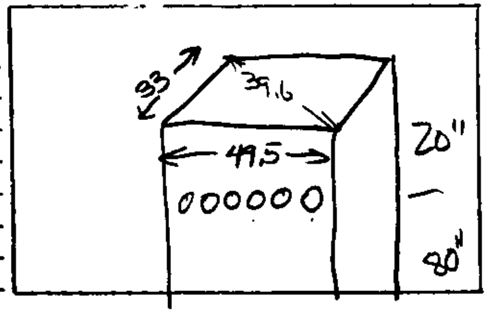
IX. FIELD DATA

E. Formaldehyde

RAMCON ENVIRONMENTAL CORPORATION

Plant MACASPHALT
Location CROSS CITY, FLA
Operator TDCook
Date 12-9-92
Run No. 1
Sample Box No. 1
Meter Box No. ANDERSEN
Meter H @ ~~1.832~~ 1.6325
C Factor .980
Pitot Tube Coefficient Cp .84



Schematic of Stack Cross Section

Ambient Temperature 60
Barometric Pressure 30.12
Assumed Moisture, % .29
Probe Length, m(ft) 4 FT
Nozzle Identification No.
Avg. Calibrated Nozzle Dia., (in.) [illegible]
Probe Heater Setting
Leak Rate, m^3/min. (cfm) .005 @ 15"
Probe Liner Material PYREX
Static Pressure, mm Hg (in. Hg)
Filter No.

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	[illegible]	344.3
INITIAL	[illegible]	338.4
DIFFERENCE	[illegible]	5.9

FORMALDEHYDE

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H20	PRESSURE DIFF. ORF. MTR in H20	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	12:48 / 11:50	7	260	1.8	3.9	629.012 / 630.7	93	87	NA	66
2	12:52	8	269	2.0	4.4	632.9	101	87	NA	63
3	12:54	7	268	1.7	3.7	635.0	106	86	NA	59
4	12:54	6	268	1.3	2.8	638.9	109	86	NA	60
5	12:58	5	264	1.1	2.4	638.5	112	86	NA	57
B 1	12:59 / 13:01	6	264	1.6	3.5	640.5	111	87	NA	61
2	13:03	6	265	1.5	3.3	642.5	115	87	NA	58
3	13:05	5	268	1.0	2.2	644.2	118	88	NA	58
4	13:07	4	266	.90	~~2.0~~ 1.9	645.6	117	89	NA	57
5	13:09	4	267	.90	1.9	647.1	118	90	NA	58

MACASFT4

For[illegible]REC-06

RAMCON emissions test log sheet, cont. DATE 12-9-92 LOCATION [illegible] Cross City, Fla TEST NO. 1

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD [redacted]	ORFICE DIFF. PRESSURE [redacted]	GAS VOLUME V_m (ft.^{3})	GAS SAMPLE TEMP. (°F) [redacted]		SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C1	13:10 / 13:12	5	258	1.2	2.6	684.9	117	92	NA	60
2	13:14	6	270	1.4	3.1	650.8	120	92	NA	58
3	13:16	5	270	1.2	2.6	652.5	122	92	NA	57
4	13:18	4	269	.92	2.0	654.2	122	93	NA	57
5	13:20	4	264	.80	1.8	655.5	122	93	NA	57
D1	13:21 / 13:23	6	268	1.4	3.1	657.5	115	94	NA	63
2	13:25	6	268	1.5	3.3	659.5	124	94	NA	58
3	13:27	6	268	1.7	2.6	661.2	126	95	NA	58
4	13:29	5	268	1.0	2.2	662.9	126	96	NA	59
5	13:31	4	266	.85	1.8	664.3	125	96	NA	60
E1	13:32 / 13:34	6	269	1.4	3.1	666.4	115	96	NA	63
2	13:36	7	270	1.6	3.5	668.4	127	97	NA	53
3	13:38	6	265	1.3	2.9	670.2	129	98	NA	58
4	13:40	5	263	1.1	2.4	671.9	129	98	NA	58
5	13:42	4	261	1.0	2.2	673.6	127	98	NA	59
F1	13:43 / 13:45	11	269	2.3	5.1	676.0	126	99	NA	60
2	13:47	11	273	2.3	5.1	678.5	130	99	NA	60
3	13:49	9	272	2.0	4.4	680.8	133	99	NA	60
4	13:51	8	268	1.7	3.7	682.9	134	99	NA	61
5	13:53	8	264	1.7	3.7	685.041	133	100	NA	62

RAMCON ENVIRONMENTAL CORPORATION

Plant MACASPWACT

Location CROSS CITY, FLA
Operator T. CROOK
Date 12-9-92
Run No. 2
Sample Box No. 1
Meter Box No. ANDERSEN
Meter H @ 1852
C Factor .980
Pitot Tube Coefficient Cp .84

Ambient Temperature 60
Barometric Pressure 30.12
Assumed Moisture, % .29
Probe Length, m(ft) 4FT
Nozzle Identification No. .0003713
Avg. Calibrated Nozzle Dia., (in.) .261
Probe Heater Setting 4
Leak Rate, m^3/min.(cfm) .004 AT 9"
Probe Liner Material PYREX
Static Pressure, mm Hg (in. Hg)
Filter No.

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	690	426.6
INITIAL	200	419.2
DIFFERENCE	490	7.4

Schematic of Stack Cross Section

FORMALDEHYDE

TRAV. PT NO.	SAMPLING TIME (θ)min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H20	PRESSURE DIFF. ORF. MTR in H20	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	GAS SAMPLE TEMP. AT DRY GAS METER °F Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	14:24 / 14:26	4	251	1.7	4.1	685.445 / 687.6	85	85	NA	67
2	14:31 / 14:33	5	270	2.2	5.3	690.1	93	84	NA	66
3	14:35	4	277	1.8	4.3	692.3	102	83	NA	64
4	14:37	3	277	1.1	2.6	694.0	106	83	NA	67
5	14:39	3	276	.97	2.3	695.7	108	86	NA	62
B 1	14:40 / 14:42	4	274	1.5	3.6	69~~8.8~~ 7.8*	107	84	NA	62
2	14:44	4	278	1.5	3.6	699.9	114	85	NA	59
3	14:46	3	278	1.1	2.6	701.6	115	86	NA	60
4	14:48	3	277	.85	2.0	703.2	115	86	NA	61
5	14:50	3	273	.95	2.3	704.8	116	88	NA	60

Form #REC-05

MACASPT4

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 12-9-92 LOCATION MacAsphalt TEST NO. 2

FORMALDEHYDE Cross City, FLA

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP	VELOCITY HEAD	ORFICE DIFF. PRESSURE	GAS VOLUME Vm (ft^3)	GAS SAMPLE TEMP. (°F)		SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C1	14:51 / 14:53	3	275	1.1	2.6	706.6	112	89	NA	63
2	14:55	3	277	1.2	2.9	708.5	116	89	NA	63
3	14:57	3	278	.90	2.2	710.1	119	89	NA	64
4	14:59	3	277	.80	1.9	711.6	118	90	NA	64
5	15:01	3	277	.97	2.3	713.3	119	91	NA	66
D1	15:02 / 15:04	4	278	1.5	3.6	715.4	113	91	NA	68
2	15:06	4	280	1.4	3.4	717.4	120	92	NA	60
3	15:08	3	280	1.1	2.6	719.2	122	92	NA	63
4	15:10	3	278	1.0	2.4	721.8	122	93	NA	63
5	15:12	3	275	.87	2.1	722.4	122	94	NA	63
E1	15:13 / 15:15	4	277	1.4	3.4	724.5	116	95	NA	67
2	15:17	4	279	1.5	3.6	726.6	123	95	NA	63
3	15:19	4	276	1.2	2.9	728.5	124	96	NA	61
4	15:21	3	272	.93	2.4	730.3	123	96	NA	62
5	15:23	3	271	.85	2.0	731.7	122	97	NA	62
F1	15:24 / 15:26	6	277	2.2	5.3	734.1	121	97	NA	64
2	15:28	5	279	2.0	4.8	736.6	125	97	NA	58
3	15:30	5	279	2.0	4.8	738.9	126	98	NA	59
4	15:32	4	276	1.5	3.6	741.0	126	98	NA	60
5	15:34	4	276	1.4	3.4	743.026	126	98	NA	61

RAMCON ENVIRONMENTAL CORPORATION

Plant MACASPHALT
Location CROSS CITY, FLA
Operator T. CROOK
Date 12-9-92
Run No. 3
Sample Box No. 1
Meter Box No. ANDERSEN
Meter H @ 1.852
C Factor .580
Pitot Tube Coefficient Cp .84

Schematic of Stack Cross Section

Ambient Temperature 65
Barometric Pressure 30.12
Assumed Moisture, % .29
Probe Length, m(ft) 4 FT
Nozzle Identification No. .0003713
Avg. Calibrated Nozzle Dia., (in.) .261
Probe Heater Setting 4
Leak Rate, m^3/min. (cfm) .017 AT 10"
Probe Liner Material PYREX
Static Pressure, mm Hg (in. Hg)
Filter No.

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	560	405.3
INITIAL	200	398.7
DIFFERENCE	360	6.6

FORMALDEHYDE

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s)	PRESSURE DIFF. ORF. MTR in H2O	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	16:11 / 16:13	8	340	1.9	3.8	743.328 / 745.1	94	84	NA	67
2	16:15	8	340	2.0	4.0	747.2	97	84	NA	60
3	16:17	5	339	1.2	2.4	748.9	104	84	NA	59
4	16:19	4	338	.97	1.9	750.4	106	84	NA	59
5	16:21	4	338	.97	1.9	751.9	109	85	NA	59
B 1	16:22 / 16:24	5	335	1.4	2.8	753.8	106	85	NA	65
2	16:26	5	340	1.4	2.8	755.6	113	86	NA	57
3	16:28	6	340	1.1	2.2	757.5	116	87	NA	58
4	16:30	4	339	.90	1.8	758.8	117	88	NA	58
5	16:32	4	337	.90	1.8	760.4	117	89	NA	60

MACASFT4

Form #REC-05

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 12-5-92 LOCATION MADASPHALT CROSS CITY, FLA TEST NO. 3

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft^3)	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C 1	16:34 / 16:36	5	338	1.2	2.4	762.1	109	91	NA	65
2	16:38	5	337	1.2	2.4	763.9	115	91	NA	61
3	16:40	4	337	.92	1.8	765.3	119	92	NA	60
4	16:42	4	336	.85	1.7	766.8	119	92	NA	62
5	16:44	4	337	.90	1.8	768.3	120	93	NA	62
D 1	16:45 / 16:47	5	336	1.3	2.6	770.1	115	94	NA	56
2	16:49	5	337	1.3	2.6	771.7	122	94	NA	54
3	16:51	5	337	1.1	2.2	773.3	123	95	NA	54
4	16:53	4	334	.85	1.7	774.9	122	95	NA	57
5	16:55	4	331	.83	1.7	776.3	122	96	NA	58
E 1	16:56 / 16:58	6	335	1.5	3.0	778.3	121	97	NA	59
2	17:00	8	337	1.9	3.8	780.4	126	98	NA	57
3	17:02	4	335	1.1	2.2	782.0	125	98	NA	58
4	17:04	4	331	.87	1.7	783.5	124	98	NA	59
5	17:06	4	328	.93	1.9	785.118	124	98	NA	60
F 1										
2										
3										
4										
5										

OPERATING INFORMATION FOR STACK TESTED HOT MIX ASPHALT FACILITY

DATE: [illegible]/7/[illegible]

COMPANY NAME: APAC / Mc Asphalt Division			
COMPANY REP.:		PHONE:	
LOCATION OF HMA FACILITY: Dixie County, Florida		AC Type:	Mix Type:
OEM:	MODEL: Astec Dbl Barrel		
The loader operator was observed removing aggregate from the stockpiles at (circle): bottom side			
TYPE OF CONTROL EQUIPMENT:			
TYPE OF FUEL USED DURING TESTING:		FUEL UNIT:	

WEATHER INFORMATION

Record Ambient Temperature At:		
Startup	Mid-day	Shutdown

Record Relative Humidity (%) at:		
Startup	Mid-day	Shutdown

Name & Phone of Individual(s) recording operating information:

Baghouse
<< Remember to generate PRINT-OUTS >> ☐ Not available

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1	2	3	4	5	6	7	8	9	10	11	12	13	14
		MATERIALS PROCESSED (cumulated tons produced/used)					(Inlet)	(Outlet)		COMBUSTION MONITORING DATA			
Time	Fuel Used (cumulated)	Aggregate	RAP	AC	Mix ~~Exhaust Gas Temperature~~	Mix ~~Mixer~~ Temperature	Stack ~~Baghouse~~ Temp	Baghouse ~~Damper~~ Position	Burner setting	Burner Suction	Ambient Air Draft		Other
24 hour	1/2 Diesel	tons/hr	tons/hr	tons/hr	+ph	°F	°F	% closed	%	" H_2O		THC (ppm)	
11:05		112.4	66.0	12.0	200	303	390	310	47	0.20	4		
11:15		116.0	71.1	12.4	202	308	394	317	47	0.16	4		
Speed Up 11:30	11:30 310 tph	122	68	12	205	292	341	316	47	.18	4		
11:45		122	65	12	207	285	396	319	51	.18	4		
Shut Down 12:00	11:47	Restarted 12:55 100	62	10.8	172	307	369	270	46	.16	4		
1:15		107	60	11.3	188	325	413	317	48	.16	4		
Speed up 1:30		115	70	12	200	310	406	323	48	.18	4		
Speed 1:45	1:39	129	74	13	210	295	408	329	52	.19	4		
Speed 2:00	1:50	130	74	13	220	295	411		55	.19	3.5		
2:15		[illegible]	80	13.5	222	305	424	339	57	.16	3.5		
2:30		128	79	13.8	230	312	422	339	57	.18	3.5		

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Time	Fuel Used (cumulated)	MATERIALS PROCESSED (cumulated tons produced/used) Aggregate	RAP	AC	Mix Temperature	Mix Materials Temperature	Stack Temp	Baghouse Temp	COMBUSTION MONITORING DATA O_2 (%)	CO_2 (%)	CO (ppm)	THC (ppm)	Other
24 hour		tons/hr	tons/hr	tons/hr	°F	°F							
Ignited 2:36 2:45		142	77	14.69	234	297	390	327	56	.00	3.5		
3:00													
3:15		117	73	12.2	207	320	382	306	45	.12	4		
3:30		120	63	12.0	193	314	374	304	41	.14	4		
3:45		118	65	12.1	204	292	370	298	48	.14	4		
4:00		118	68	12.3	201	315	381	302	45	.14	4		
Turned Down @ 4:00 4:30		110	66	11.7	189	305	374	301	47	.16	4		

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DATE: [illegible]/18/[illegible]

OPERATING INFORMATION FOR STACK TESTED HOT MIX A[illegible]LT FACILITY

COMPANY NAME: APAC / McAsphalt Division

COMPANY REP.: PHONE:

LOCATION OF HMA FACILITY: Dixie County, FL AC Type: Mix Type:

OEM: MODEL:

The loader operator was observed removing aggregate from the stockpiles at (circle): bottom side

TYPE OF CONTROL EQUIPMENT:

TYPE OF FUEL USED DURING TESTING: FUEL UNIT:

WEATHER INFORMATION

Record Ambient Temperature At: Startup / Mid-day / Shutdown

Record Relative Humidity (%) at: Startup / Mid-day / Shutdown

Name & Phone of Individual(s) recording operating information:

<< Remember to generate PRINT-OUTS >> ☐ Not available

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1	2	3	4	5	6	7	8	9	10	11	12	13	14
Time	Fuel Used (cumulative)	MATERIALS PROCESSED (cumulated tons produced/used) Aggregate	RAP	AC	Mix Temperature	Mix Temperature	Baghouse Inlet Stack Temp	Baghouse Outlet Temp	Burner setting	COMBUSTION MONITORING DATA Burner Suction	Baghouse Pressure	THC (ppm)	Other
24 hour	No. 2 Diesel	tons	tons	tons	°F	°F	°F	°F	%	in H_2O	in H_2O		
8:30	[illegible]	101	59	10.	175	330	371	295	38	.14	4		
Shut-Down 8:40 Blowout	Restarted 9:15												
9:30		103	60	11	177	285	285	350	38	.16	4		
9:45		102	58	10.7	178	300	359	289	42	.14	4		
10:00		109	64	11.4	182	298	357	290	44	.14	4		
10:15													
10:30		112	66	11.9	194	291	353	286	45	.15	4		
Shut Down 10:35 / 10:45		Restarted 10:39 / 110	64	11.7	191	310	361	290	45	.14	4		
11:00		[illegible]											
11:15		106	59	11.0	185	307	369	300	35	.14	4		
11:30		107	65	11.2	181	310	367	301	44	.14	4		285

Remember to generate PRINT-OUTS >> ☐ Not available

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Time	Fuel Used (cumulated)	MATERIALS PROCESSED (cumulated tons produced/used) Aggregate	RAP	AC	Mix Exhaust Gas Temperature	Mix Materials Temperature	Stack Pressure Drop	Baghouse Damper Position	Burner Setting O2 (%)	COMBUSTION MONITORING DATA CO2	CO (ppm)	THC (ppm)	Other
24 hour		tons	tons	tons	°F	°F		% Closed					
11:45		106	65	11.3	184	312	364	300	44	0.15	4		
12:00		106	68	11.4	180	313	367	300	41	0.16	4		
12:15	Increase Production 12:17	104	55	12.0	180	303	364	297	44	.16	4		
12:30		112	62	11.69	190	317	366	299	43	.16	4		
12:45	Smaller Reduction	113	62	11.5	192	314	367	302	44	.12	4		
1:00		119	66	11.8	190	312	365	300	42	.14	4		
1:15		117	64	11.7	193	315	364	296	44	.14	4		
1:30		118	65	11.9	190	310	359	301	43	.16	4		
1:45	~~Plant Down @ 1:50 PM~~	116	64	11.8	189	315	365	300	42	.14	4		
2:00	Plant Shut Down @ 1:50 PM 1 hr Down from 2:10 to 2:18												
3:45	Plant Restarted @ 3:40 Restarted Plant @ 3:45	110	66	11.4	187	319	366	295	43	.16	4		
4:00		111	63	11.9	202	315	366	297	42	.14	4		
4:15		116	72	11.9	194	315	365	296	43	.14	4		
4:30		115	71	12.3	195	319	362	298	48	.12	4		
4:40 4:45	Slow Down Plant	113	72	12.2	190	309	360	297	38	.15	4		
5:00		108	61	10.7	175	316	359	293	39	.14	4		
5:20		104	60	10.9	170	322	364	294	41	.14	4		
5:25	Plant Shut Down												

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OPERATING INFORMATION FOR STACK TESTED HOT MIX ASPHALT FACILITY — DATE: [illegible]

COMPANY NAME: APAC / MacAsphalt Division			
COMPANY REP.:		PHONE:	
LOCATION OF HMA FACILITY: Dixie County, FL		AC Type:	Mix Type:
OEM:	MODEL:		
The loader operator was observed removing aggregate from the stockpiles at (circle): bottom side			
TYPE OF CONTROL EQUIPMENT:			
TYPE OF FUEL USED DURING TESTING:		FUEL UNIT:	

WEATHER INFORMATION		
Record Ambient Temperature At:		
Startup	Mid-day	Shutdown
Record Relative Humidity (%) at:		
Startup	Mid-day	Shutdown

Name & Phone of Individual(s) recording operating information:

<< Remember to generate PRINT-OUTS >> ☐ Not available Page ___ of ___

Baghouse Inlet Outlet

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Time	Fuel Used (cumulated)	MATERIALS PROCESSED (cumulated tons produced/used) Aggregate	RAP	AC	Mix Exhaust Gas Temperature	Mix Materials Temperature	Stack Pressure Temp Drop	Baghouse Damper Position	Burner Setting	Burner COMBUSTION Suction	Baghouse MONITORING DATA Press Drop		Other
24 hour		ton/hr	ton/hr	ton/hr	+ ph	°F	in. wg.	% closed	(%)	in. H_2O	in. H_2O CO (ppm)	THC (ppm)	
9:15 9:30	Plant	Started 103	up 58	10.7	172	312	367	282	49.7	0.14	4		
9:45	Burner Kicked	Out 105	4:58 59	Relit 9:41 11.0	178	295	357	274	68	0.12	3.5		
10:00	Burner Kicked	Out 107	9:48 65	Relit 9:55 11.6	181	287	367	270	56	0.10	6.0		
10:15		105	59	10.9	178	306	385	301	52	0.14	4		
10:30		102	60	10.8	176	302	378	307	51	0.12	4		
10:45		98	57	10.6	177	307	383	310	52	0.14	4		
11:00		102	63	11.1	177	315	385	313	50	0.12	4		
11:15		111	66	11.4	181	313	383	312	47	0.13	4		
11:30		113	65	11.7	194	309	381	312	49	0.12	4		
11:45		115	69	12.0	194	311	394	320	55	0.12	4.5		
12:00		117	67	11.7	184	290	355	305	53	0.12	3.5		

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Time	Fuel Used (cumulated)	MATERIALS PROCESSED (cumulated tons produced/used) Aggregate	RAP	AC	Mix Exhaust Gas Temperature	Mix Materials Temperature	Stack Pressure Temp	Baghouse Damper Position	Burner Setting	COMBUSTION MONITORING DATA Burner Suction	Pre Bag	THC (ppm)	Other
24 hour		tons	tons	tons	°F	°F	in. wg	% closed	(%)	in. H_2O	in. H_2O		
12:15		103	67	11.6	183	307	370	301	49	0.12	4		
12:30		[illegible]	70	11.9	186	308	371	302	50	0.14	4		
12:45		107	62	11.2	184	339	370	303	49	0.14	4		
1:00		109	64	11.4	185	313	356	296	49	0.14	4.5		
Increased Production 1:15		114	70	12.2	193	312	367	301	53	0.14	4.5		
1:30		116	69	12	197	290	365	302	50	.14	4.5		
1:45		119	68	12.3	201	299	368	304	51	0.14	4.5		
2:00		118	70	12	202	307	370	308	51	.14	4.5		
2:15													
2:30		121	70	12.8	210	301	376	312	55	0.14	4		
2:45		125	75	13	215	304	380	314	54	.14	4		
3:00		124	76	13	215	304	380	311	55	.14	4		
3:15		126	75	13.3	217	302	380	313	54	.14	4		
3:30		125	79	13	214	294	378	314	55	.14	4		
3:45		126	79	13.4	210	301	379	314	55	.14	4		
4:00		127	76	13	214	302	379	311	55	.14	4		
4:15		130	77	13	226	294	380	301	55	.15	4		
4:30		133	79	14	225	297	378	334	Calibrated 60	250 .14	4		
4:45		137	72	14	223	311	379	370	60.9	.14	4		
5:00		134	81	14.1	224	295	377	329	61	0.14	4		

Name: Mr. Sumner Buck
Title: President

Qualifications: Mr. Buck is a graduate of the University of Mississippi with graduate studies at Memphis State University and State Technical Institute of Memphis. He is a graduate of the EPA 450 "Source Sampling for Particulate Pollutant's" course and the 474 "Continuous Emissions Monitoring" courses outlined by EPA at Research Triangle Park, N.C. He has been directly involved in conducting and supervising air emission testing for over 15 years. He has personally conducted over 400 air emission tests. He currently sponsors and directs visual emission certification schools for US EPA Method 9.

Project Duties: Mr. Buck is responsible for the overall supervision of each testing project. This includes the correspondence to the State Regulatory Agency and the plant personnel regarding scheduling, testing requirements, etc. He will assist in supervision of the project preparation for each team involved and the overall organization between the testing crew(s) and facility.

Name: Mr. Joe Sewell
Title: Vice President

Qualifications: Mr. Sewell is currently serving as the Vice President of RAMCON Environmental Corporation. Mr. Sewell is a graduate of Christian Brothers University in Memphis, Tennessee where he obtained a Bachelor of Science degree in Chemical Engineering. He has conducted and supervised air emissions testing projects ranging a broad spectrum of facility process categories. His accomplishments include the development of the instrumental branch of emissions testing utilizing continuous emission monitors and gas chromatography. Mr. Sewell performs a major role in the upgrading of testing capabilities and professional quality that RAMCON Environmental Corporation offers.

Project Duties: Mr. Sewell provides staff engineering and project administration to ensure the integrity of the requested services. He serves as the primary contact person for RAMCON Environmental Corporation handling all correspondence between the facility personnel involved in the project and respective state agency representative(s). He provides project leadership to RAMCON Environmental Corporation field supervisors and managers involved in the testing project.

Name: Mr. Ray Jenkins
Title: Source Sampling Director

Qualifications: Mr. Jenkins is serving as the Source Sampling Director for RAMCON Environmental Corporation. He was promoted to this leadership position after gaining a significant amount of experience in conducting and providing field supervision of a variety of air testing projects. Mr. Jenkins has personally conducted and/or supervised all of the prevalent EPA approved procedures with expertise in the instrumental analyzer procedures. He graduated from Memphis State University obtaining a Bachelor of Science degree in Biology. He is also currently certified to conduct US EPA Reference Method 9 for the visual determination of emission opacity.

Project Duties: Mr. Jenkins provides project leadership to the Team Leaders and Field Technicians. He ensures the test crew(s) involved in the test project will be properly informed to his respective duties and responsibilities during the testing process. Mr. Jenkins also serves as the Quality Assurance/Quality Control Coordinator and provides guidance in QA/QC to each Team Leader with regard to sample integrity.

Name: Mr. Tommy South
Title: Laboratory Technician

Qualifications: Mr. South is currently serving as Laboratory Technician. He is proficient in conducting many analysis procedures such as front and back-half particulate analysis, titrations, extractions, etc.

Project Duties: Mr. South conducts the laboratory analysis on the particulate samples. He is also responsible for accepting the remaining field samples from the Field Sample Bank Manager and performing inspection as to integrity. He documents the transfer on the chain of custody forms and distributed the subcontracted samples to the respective laboratories.

Name: Mr. Tommy Crook
Title: Team Leader

Qualifications: Mr. Crook has been employed by RAMCON Environmental Corporation for three years. He has completed Team Leader training in isokinetic and proportional test methods. He currently is certified in conducting US EPA Reference Method 9 for opacity. He has been involved in conducting tests on process stacks, incinerators, boilers, etc. He has served as a Field Technician for over two years.

Project Duties: Mr. Crook is responsible for conducting isokinetic sampling procedures at the facility(s). He is responsible for preparation, calibration and cleaning of the necessary equipment for this testing. His duties on-site include assembling the sample train, leak checking the system, operation of the train and recording the test data on the field data forms.

Name: Mr. Mickey Phillips
Title: Team Leader

Qualifications: Mr. Phillips has been employed by RAMCON Environmental Corporation for one year. He is proficient in isokinetic and proportional test methods. He currently is certified in conducting Method 9 for opacity. He has conducted over 100 stack tests on process stacks, incinerators, boilers, etc. and is qualified as a Team Leader.

Project Duties: Mr. Phillips is responsible for conducting isokinetic sampling procedures at the facility(s). He is responsible for preparation, calibration and cleaning of the necessary equipment for this testing. His duties on-site include assembling the sample train, leak checking the system, operation of the train and recording the test data on the field data forms.

Name: Mr. Michael Winkler
Title: Team Leader

Qualifications: Mr. Winkler is a Team Leader and has completed training in isokinetic and proportional test methods. He received an Associate degree in Mechanical Engineering from State Technical Institute at Memphis, Tennessee.

Project Duties: Mr. Winkler is responsible for conducting isokinetic sampling procedures at the facility(s). He is also responsible for preparation, calibration and cleaning of the necessary equipment for this testing. His duties on-site include assembling the sample train, leak checking the system, operation of the train and recording the test data on the field data forms.