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These are the source test reports for AP 42 section 11.17 Lime Manufacturing.
They are referenced in the database as a group, Lime Manufacturing source tests.

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63

**SOURCE TEST REPORT
ATTACHMENT IX
TO
AB 2588 AIR TOXICS
EMISSION INVENTORY REPORT
FOR THE
HOLLY SUGAR CORPORATION
TRACY, CALIFORNIA**

JULY 27, 1990



McLaren

June 28, 1990

Mr. Robert W. Strickland
Operations Manager, Western Division
Holly Sugar Corporation
Watergate Towers
2000 Powel Street
Suite 800
Emeryville, CA 94608-1804

Dear Mr. Strickland:

Enclosed is our draft report for emissions monitoring conducted at the Holly Sugar Plant in Santa Maria, California, on May 13-May 19, 1990. Results for the second run of dioxins/furans are still being reviewed and the problems associated with the testing are being investigated. When the issues are adequately resolved we will issue a final report discussing the findings.

If you have any questions, please feel free to contact us.

Sincerely,

PACE, Inc.

Stephen F. Nackord
Director, Sampling and Analytical Services

SFN:wtg22

cc: Dave Duncan
Joel I. Reisman, REA McLaren

Enclosure

Emissions Monitoring Report
for Compliance with AB2588

Prepared for:

Mr. Robert W. Strickland
Holly Sugar Corporation
Emeryville, California

June 28, 1990

Submitted by:

PACE, Inc.
11 Digital Drive
Novato, California 94949

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1.0 INTRODUCTION

Source sampling was performed at the Holly Sugar Plant in Santa Maria, California. Sampling was conducted on the first carbonation tank outlet and flow rates determinations were taken on the second carbonation tank outlet.

Testing on the first carbonation tank consisted of three runs for the following compounds: hexavalent and total chromium, metals (AS, Be, Cd, Cu, Pb, Mn, Hg, Ni, Se, Zn), BTEX (benzene, toluene, ethylbenzene and total xylenes), formaldehyde, polynuclear aromatic hydrocarbons (PAH), dioxins/furans and hydrochloric acid (HCl).

The measurements of stack gas flow rates and pollutant concentrations were made according to California Air Resources Board Methods and recommendations. The following sections of the report detail results, processes, field data, locations of the sampling points, and sampling and analytical procedures used.

2.0 SUMMARY OF RESULTS

Tables 1-1 through 1-8 present the results from the source sampling and analysis. These results should satisfy the AB2588 requirements for source testing at the Holly Sugar plant locations in Santa Maria, California.

Laboratory results for the second dioxins/furans run are not yet available. This report will be updated with these results as soon as they are available.

TABLE 1
SUMMARY OF THE RESULTS

METALS TESTING

first carb

PARAMETER	Run 1	Run 2	Run 3	AVERAGE
Date of Run	5/14/90	5/14/90	5/14/90	
Time of Run	950-1110	1225-1420	1551-1750	
Volumetric Flow Rate				
ACFM	4300	4300	4800	4500
DSCFM	1900	1900	2100	2000
Gas Temperature (F)	177	177	178	177
Gas Moisture Content (%v/v)	46.4	46.1	46.7#	46.4
Gas Composition (%v/v, Dry)				
CO2	5.0	5.0	5.0	5.0
O2	20.4	20.4	20.4	20.4
N2	74.6	74.6	74.6	74.6
Isokinetic Variation (%)	92.5	92.6	91.8	92.3
Emission Rate (lb/hr)				
AS	LT 1.03E-04	LT 7.74E-05	LT 8.06E-05#	LT 8.70E-05
Be	LT 9.81E-06	LT 7.45E-06	LT 7.77E-06#	LT 8.34E-06
Cd	LT 4.10E-05	LT/EQ 5.77E-05	LT/EQ 4.54E-05#	LT 4.81E-05
Cu	LT 2.78E-05	LT 2.09E-05	LT 2.13E-05#	LT 2.33E-05
Pb	LT 8.61E-05	LT 6.34E-05	LT 6.52E-05#	LT 7.16E-05
Mn	LT/EQ 7.90E-05	LT/EQ 1.24E-04	LT/EQ 1.76E-04#	LT/EQ 1.26E-04
Hg	LT/EQ 5.30E-04	LT/EQ 3.70E-04	LT/EQ 3.59E-04#	LT/EQ 4.20E-04
Ni	LT 4.04E-05	LT/EQ 4.06E-05	LT 3.27E-05#	LT 3.79E-05
Se	LT 1.98E-04	LT 1.49E-04	LT 1.56E-04#	LT 1.67E-04
Zn	LT/EQ 2.78E-04	LT/EQ 2.44E-04	5.07E-04#	LT/EQ 3.43E-04

LT=Less Than

LT/EQ=Less Than or Equal to

#=Estimation

TABLE 1
(continued)

SUMMARY OF THE RESULTS

METALS TESTING

first carb

PARAMETER	Run 1	Run 2	Run 3	AVERAGE
Date of Run	5/14/90	5/14/90	5/14/90	
Time of Run	950-1110	1225-1420	1551-1750	
Metals Concentrations				
AS GR/ACF	LT 2.80E-06	LT 2.09E-06	LT 1.98E-06#	LT 2.29E-06
AS GR/DSCF	LT 6.24E-06	LT 4.72E-06	LT 4.44E-06#	LT 5.13E-06
Be GR/ACF	LT 2.67E-07	LT 2.01E-07	LT 1.90E-07#	LT 2.19E-07
Be GR/DSCF	LT 5.95E-07	LT 4.54E-07	LT 4.28E-07#	LT 4.92E-07
Cd GR/ACF	LT 1.12E-06	LT/EQ1.56E-06	LT/EQ1.11E-06#	LT 1.26E-06
Cd GR/DSCF	LT 2.49E-06	LT/EQ3.52E-06	LT/EQ2.50E-06#	LT 2.84E-06
Cu GR/ACF	LT 7.56E-07	LT 5.64E-07	LT 5.23E-07#	LT 6.14E-07
Cu GR/DSCF	LT 1.69E-06	LT 1.27E-06	LT 1.17E-06#	LT 1.38E-06
Pb GR/ACF	LT 2.34E-06	LT 1.71E-06	LT 1.60E-06#	LT 1.89E-06
Pb GR/DSCF	LT 5.23E-06	LT 3.86E-06	LT 3.59E-06#	LT 4.23E-06
Mn GR/ACF	LT/EQ2.15E-06	LT/EQ3.34E-06	LT/EQ4.32E-06#	LT/EQ3.27E-06
Mn GR/DSCF	LT/EQ4.80E-06	LT/EQ7.54E-06	LT/EQ9.72E-06#	LT/EQ7.35E-06
Hg GR/ACF	LT/EQ1.44E-05	LT/EQ9.98E-05	LT/EQ8.80E-05#	LT/EQ1.11E-05
Hg GR/DSCF	LT/EQ3.22E-05	LT/EQ2.25E-05	LT/EQ1.98E-05#	LT/EQ2.48E-05
Ni GR/ACF	LT 1.10E-06	LT/EQ1.09E-06	LT 8.02E-07#	LT 9.99E-07
Ni GR/DSCF	LT 2.45E-06	LT/EQ2.47E-06	LT 1.80E-06#	LT 2.24E-06
Se GR/ACF	LT 5.38E-06	LT 4.02E-06	LT 3.82E-06#	LT 4.41E-06
Se GR/DSCF	LT1.20E-05	LT 9.07E-06	LT 8.85E-06#	LT 9.89E-06
Zn GR/ACF	LT/EQ7.56E-06	LT/EQ6.59E-06	LT/EQ1.24E-05#	LT/EQ8.86E-06
Zn GR/DSCF	LT/EQ1.69E-05	LT/EQ1.49E-05	LT/EQ2.80E-05#	LT/EQ1.99E-05

LT=Less Than

LT/EQ=Less Than or Equal to

#=Estimation

* Lab results not yet available.

TABLE 2
SUMMARY OF THE RESULTS
CARB METHOD 425 CHROMIUM TESTING
first carb

PARAMETER	Run 1	Run 2	Run 3	AVERAGE
Date of Run	5/15/90	5/15/90	5/15/90	
Time of Run	1123-1230	1255-1405	1426-1535	
Volumetric Flow Rate				
ACFM	5500	5600	5000	5400
DSCFM	2100	2300	2100	2200
Gas Temperature (F)	180	181	180	180
Gas Moisture Content (%v/v)	53.3	50.4	49.5	51.1
Gas Composition (%v/v, Dry)				
CO2	5.0	5.0	5.0	5.0
O2	20.4	20.4	20.4	20.4
N2	74.6	74.6	74.6	74.6
Isokinetic Variation (%)	105.8	100.1	98.5	101.5
Cr (total)				
Emission Rate (lb/hr)	4.41E-05	LT/EQ8.13E-05	4.97E-05	5.84E-05
Cr (VI) Emission Rate (lb/hr)	LT 3.41E-04	LT 2.08E-04	LT 1.88E-04	LT 2.46E-04
Cr (total) Concentration				
GR/ACF	9.38E-07	LT/EQ1.70E-06	1.17E-06	1.27E-06
CR/DSCF	2.43E-06	LT/EQ4.16E-06	2.79E-06	3.12E-06
Cr (VI) Concentration				
GR/ACF	LT 7.26E-06	LT 4.35E-06	Lt 4.42E-06	LT 5.34E-06
GR/DSCF	LT 1.88E-05	LT 1.06E-05	Lt 1.06E-05	LT 1.33E-05

LT-Less Than
LT/EQ - Less than or equal to.

TABLE 3
 SUMMARY OF THE RESULTS

HCL TESTING

first carb

PARAMETER	Run 1	Run 2	Run 3	AVERAGE
Date of Run	5/14/90	5/15/90	5/15/90	
Time of Run	1841-1950	1225-1420	1551-1750	
Volumetric Flow Rate				
ACFM	4400	4300	4800	4500
DSCFM	2000	1900	2100	2000
Gas Temperature (F)	176	177	178	177
Gas Moisture Content (%v/v)	46.0	46.7	46.4	46.4
Gas Composition (%v/v, Dry)				
CO2	5.0	5.0	5.0	5.0
O2	20.4	20.4	20.4	20.4
N2	74.6	74.6	74.6	74.6
Isokinetic Variation (%)	91.3	92.6	91.8	
HCl Emission Rate (lb/hr)	4.06E-01	2.13E-01	2.87E-01	3.02E-01
HCl Concentration				
GR/ACF	1.07E-02	5.74E-03	7.57E-03	7.82E-03
GR/DSCF	2.37E-02	1.30E-02	1.58E-02	1.75E-02

TABLE 4
SUMMARY OF THE RESULTS
DIOXIN/FURAN TESTING

first carb

PARAMETER	Run 1	Run 2	Run 3	AVERAGE
Date of Run	5/16/90	5/17/90	5/17/90	
Time of Run	1520-1800	942-1406	1623-2100	
Volumetric Flow Rate				
ACFM	3700	3600	4400	3900
DSCFM	1600	1600	2000	1700
Gas Temperature (F)	172	174	173	173
Gas Moisture Content (%v/v)	48.4	46.1	45.7	46.7
Gas Composition (%v/v, Dry)				
CO2	5.0	2.0	2.0	3.0
O2	20.7	17.9	17.9	18.8
N2	74.3	80.1	80.1	78.2
Isokinetic Variation (%)	94.7	92.3	91.6	92.9
Dioxin/Furan				
Emission Rate (lb/hr)				
TCDFs (total)	2.16E-07	1.85E-06	1.23E-07	7.30E-07
2,3,7,8 TCDF	4.31E-08	4.03E-07	2.43E-08	1.57E-07
PeCDFs (total)	6.6E-08	*	6.53E-08	6.57E-08
1,2,3,7,8 PeCDF	7.48E-09	*	5.60E-09	6.54E-09
2,3,4,7,8 PeCDF	9.24E-09	*	7.47E-09	8.36E-09
HxCDFs (total)	1.10E-08	*	7.00E-09	9.00E-09
1,2,3,4,7,8 HxCDF	4.09E-09	*	3.87E-09	3.98E-09
1,2,3,6,7,8 HxCDF	1.36E-09	*	3.87E-09	2.62E-09
2,3,4,6,7,8 HxCDF	2.11E-09	*	3.87E-09	2.99E-09
1,2,3,7,8,9 HxCDF	6.16E-10	*	1.49E-10	3.83E-10
HpCDFs (total)	LT9.24E-10	*	LT2.1E-09	LT1.51E-09
1,2,3,4,6,7,8 HpCDF	9.24E-10	*	LT2.10E-09	LT1.51E-09
1,2,3,4,7,8,9 HpCDF	9.24E-10	*	LT2.10E-09	LT1.51E-09
OCDF	2.77E-10	*	6.53E-10	4.64E-10
TCDDs (total)	1.19E-08	6.02E-08	5.13E-09	2.57E-08
2,3,7,8 TCDD	5.28E-10	*	2.38E-10	3.38E-10
PeCDDs (total)	1.01E-08	6.95E-08	7.00E-09	2.89E-08
1,2,3,7,8 PeCDD	1.10E-09	9.27E-09	5.60E-10	3.64E-09

Holly Corp.
Santa Maria
PACE Project No. 400504.400

PACE, Inc.
June 28, 1990

TABLE 4
SUMMARY OF THE RESULTS
(CONTINUED)
DIOXIN/FURAN TESTING

first carb

PARAMETER	Run 1	Run 2	Run 3	AVERAGE
Date of Run	5/16/90	5/17/90	5/17/90	
Time of Run	1520-1800	942-1406	1623-2100	
Dioxin/Furan				
Emission Rate (lb/hr)				
HxCDDs (total)	6.60E-09	6.49E-07	6.07E-09	
1,2,3,4,7,8 HxCDD	1.80E-10	*	1.40E-10	1.60E-10
1,2,3,6,7,8 HxCDD	7.04E-10	*	7.00E-10	7.02E-10
1,2,3,7,8,9 HxCDD	5.28E-10	*	6.53E-10	5.91E-10
HpCDDs (total)	4.40E-08	6.49E-08	6.07E-08	5.65E-08
1,2,3,4,6,7,8 HpCDD	2.64E-08	3.61E-07	3.64E-08	1.41E-07
OCDD	1.32E-07	2.27E-06	1.68E-07	8.57E-07

* Unable to calculate due to severe chemical interferences.

TABLE 5
 SUMMARY OF RESULTS

CARB METHOD 429 PAH (total) TESTING

first carb

PARAMETER	Run 1	Run 2	Run 3	AVERAGE
Date of Run	5/18/90	5/18/90	5/19/90	
Time of Run	1012-1225	1545-1800	844-955	
Volumetric Flow Rate				
ACFM	4100	4200	3500	3900
DSCFM	1800	2000	1600	1800
Gas Temperature (F)	178	175	174	176
Gas Moisture Content (%v/v)	46.7	44.1	45.6	45.5
Gas Composition (%v/v, Dry)				
CO2	4.0	4.0	5.0	4.3
O2	21.4	21.4	20.4	21.1
N2	74.6	74.6	74.6	74.6
Isokinetic Variation (%)	93.4	89.8	92.4	
PAH (total)				
Emission Rate (lb/hr)	LT 1.92E-02	LT 2.86E-02	LT 9.53E-03	LT 1.92E-02
PAH Concentration				
GR/ACF	LT 5.47E-04	LT 7.91E-04	LT 3.16E-04	LT 5.51E-04
CR/DSCF	LT 1.23E-03	LT 1.71E-03	LT 6.94E-04	LT 1.21E-03
LT=Less Than				

TABLE 6
SUMMARY OF THE RESULTS

BTEX TESTING

first carb

PARAMETER	Run 1	Run 2	Run 3	AVERAGE
Date of Run	5/17/90	5/17/90	5/17/90	
Time of Run	1403-1503	1645-1745	1800-1900	
Sample Volume (cu.meter)	5.92E-02	5.92E-02	5.92E-02	5.92E-02
Volumetric Flow Rate Stack Gas DSCFM	1600	1600	1600	1600
Benzene concentration (ppbv/v)	330	350	240	307
Toluene concentration (ppbv/v)	340	230	170	247
Ethylbenzene concentration (ppbv/v)	170	79	220	156
Xylenes concentration (ppbv/v)	880	330	280	497
Benzene emission rate (lb/hr)	6.52E-03	6.91E-03	4.74E-03	6.06E-03
Toluene emission rate (lb/hr)	6.72E-03	4.54E-03	3.36E-03	4.87E-03
Ethylbenzene emission rate (lb/hr)	3.36E-03	1.56E-03	4.35E-03	3.09E-03
Xylenes emission rate (lb/hr)	1.74E-02	6.52E-03	5.53E-03	9.81E-03

Holly Corp.
Santa Maria
PACE Project No. 400504.400

PACE, Inc.
June 28, 1990

TABLE 7
SUMMARY OF THE RESULTS
FORMALDEHYDE TESTING

first carb

PARAMETER	Run 1	Run 2	Run 3	AVERAGE
Date of Run	5/17/90	5/17/90	5/18/90	
Time of Run	1315-1415	1615-1715	1100-1200	
Sample Volume (cu.meter)	5.92E-02	5.92E-02	5.92E-02	5.92E-02
Volumetric Flow Rate Stack Gas DSCFM	1600	1600	1600	1600
HCHO mass collected (ug)	20.0	4.4	6.4	10.3
HCHO Emission Rate (lb/hr)	2.89E-04	6.35E-05	9.24E-05	1.48E-04

Holly Corp.
Santa Maria
PACE Project No. 400504.400

PACE, Inc.
June 28, 1990

TABLE 8
SUMMARY OF THE RESULTS
FLOW DETERMINATIONS

Second Carb

Date of Run	5/13/90	5/14/90	5/15/90	5/16/90	5/17/90	5/18/90	5/19/90
Time of Run	1607	1730	1900	2023	2139	1957	1005
Volumetric Flow Rate							
ACFM	7890	2180	3750	2890	3430	3770	3370
DSCFM	1200	970	1520	1230	1540	1690	1510
Gas Temperature (oF)	188	181	181	181	180	180	183
Gas Moisture Content	49	46.4	51.1	48.4	45.9	45.8	45.6

First carb

Date of Run	5/13/90
Time of Run	1725
Volumetric Flow Rate	
ACFM	3740
DSCFM	1570
Gas Temperature (oF)	184
Gas Moisture Content	49

3.0 PROCESS DESCRIPTION AND OPERATION

Coke and limestone rock are charged to vertical kilns. Exhaust gases pass through a wet scrubber system, venturi, compressor and carbonators before being exhausted to the atmosphere. Figure 1 presents a schematic of the process common to all plants. During all sampling the process operated under normal conditions with no known process updates.

4.0 SAMPLING AND ANALYTICAL PROCEDURES

All sampling and analytical procedures used were those recommended by the California Air Resources Board or the U.S. Environmental Protection Agency. Sample point locations and velocity measurements were conducted in accordance with CARB Methods 1 and 2, EPA multi-element train for metals, CARB Method 410A for BTEX, CARB Method 430 for formaldehyde, CARB Method 429 for PAH's, CARB Method 425 for hexavalent and total chromium, CARB Method 421 for HCL and CARB 428 for dioxins/furans.

To accomplish the necessary testing a sampling location that did not meet the six and two criteria was used on the first carbonation tank. Subsequent flow traverses proved the flow to be laminar. The port locations on the second carbonation tank did meet the eight and two criteria. Flow was also laminar in this stack. Both carbonation tank outlets had internal diameters of 29.0 inches with 2-inch port extensions.

During sampling some small difficulties were encountered. The pressure drop across the dioxin/furan resin traps was unusually high. This necessitated using a smaller nozzle and sampling for a longer period of time. The leak checks performed for these

dioxin/furan runs were all above 15 inches of mercury but all passed the 0.02 CFM criteria. At the conclusion of the third metals run the condensate volumes were not recorded on the data sheet (and therefore lost) and so an average moisture content from the other two metals runs was used for calculation purposes. The filter for the third metal run was destroyed during shipment to the laboratory, therefore, for reasons of comparison the average value of each metal filter from the first two metals runs was used to calculate emissions rates for the third run. The data is denoted as approximate for this run. The dessicant impinger for the first PAH run broke during weighing. An average value for moisture weight in the dessicant was used for calculation purposes (less than 2% of condensate volume). Lastly, the orsat results for PAH run number three were not obtainable, an average number from the five previous days of sampling was used.

During the laboratory analysis of the collected samples some difficulties were also encountered. High levels of organic compounds that are not of interest for the PAH analysis caused the samples to be run diluted. This caused the field spikes and extraction surrogates to be diluted out. The laboratory did try analyzing the spike sample at no dilution to determine surrogate recoveries. Two surrogates were able to be quantified, terphenyl-d14 and Benzo-a-anthracene-d10. Their recoveries were 93% and 79%, respectively. All other surrogates were obscured by the high levels of unknown organic matter.

For the metals and inorganic analysis, no difficulties were encountered. However, if the levels found in the blanks for AS, Be, Cu, and Pb were subtracted from the sample results, emission rates would be even lower. Refer to Appendix C, Laboratory Data for a quantitative comparison.

This blank subtraction also holds true for the formaldehyde analysis. The blank was higher than two of the runs. Review of the formaldehyde sampling and analysis indicated no explanation of contamination and therefore the blank value is considered to be an anomaly.

The Dioxin/Furan analysis also encountered matrix interference. A detailed letter from the sub-contract laboratory, Cal Analytical, will follow as soon as it is provided.

APPENDICES

APPENDIX A

SUMMARY OF RESULTS

TABLE 9
RESULTS OF METALS LOADING DETERMINATIONS

first carb

PARAMETER	Run 1	Run 2	Run 3
Date of Run	5/14/90	5/14/90	5/14/90
Time of Run	950-1110	1225-1420	1551-1750
Sample Duration (Min.)	72.0	108.0	108.0
Average Flue Gas Temperature (F)	176.8	176.7	177.8
Moisture Content of Flue Gas (%v/v)	46.40	46.05	46.66
Metals Collected (Mg)			
AS	LT 8.65E-03	LT 9.79E-03	LT 1.01E-02#
Be	LT 8.26E-04	LT 9.42E-04	LT 9.73E-04#
Cd	3.45E-03	LT/EQ 7.30E-03	LT/EQ 5.69E-03#
Cu	LT 2.34E-03	LT 2.64E-03	LT 2.67E-03#
Pb	LT 7.25E-03	LT 8.02E-03	LT 8.17E-03#
Mn	LT/EQ 6.65E-03	LT/EQ 1.57E-02	LT/EQ 2.21E-02#
Hg	LT/EQ 4.46E-02	LT/EQ 4.68E-02	LT/EQ 4.50E-02#
Ni	LT 3.40E-03	LT 5.13E-03	LT 4.10E-03#
Se	LT 1.66E-02	LT 1.88E-02	LT 1.95E-02#
Zn	LT/EQ 2.34E-02	LT/EQ 3.09E-02	LT/EQ 6.36E-02#
Volumetric Flow Rate			
ACFM	4280	4320	4760
DSCFM	1920	1920	2120
Sample Volume (Cubic Feet)			
Meter Conditions	21.50	32.58	35.41
Dry Standard	21.40	32.04	35.07
Isokinetic Variation (%)	92.5	92.6	91.8

LT=Less Than

LT/EQ=Less Than or Equal to

#=Estimation

*=Laboratory results not yet available.

TABLE 9
(continued)

SUMMARY OF THE RESULTS

METALS TESTING

first carb

PARAMETER	Run 1	Run 2	Run 3
Date of Run	5/14/90	5/14/90	5/14/90
Time of Run	950-1110	1225-1420	1551-1750
Sample Duration (Min.)	72.0	108.0	108.0
Metals Concentrations			
AS GR/ACF	LT 2.80E-06	LT 2.09E-06	LT 1.98E-06#
AS GR/DSCF	LT 6.24E-06	LT 4.72E-06	LT 4.44E-06#
Be GR/ACF	LT 2.67E-07	LT 2.01E-07	LT 1.90E-07#
Be GR/DSCF	LT 5.95E-07	LT 4.54E-07	LT 4.28E-07#
Cd GR/ACF	LT 1.12E-06	LT/EQ 1.56E-06	LT/EQ 1.11E-06#
Cd GR/DSCF	LT 2.49E-06	LT/EQ 3.52E-06	LT/EQ 2.50E-06#
Cu GR/ACF	LT 7.56E-07	LT 5.64E-07	LT 5.23E-07#
Cu GR/DSCF	LT 1.69E-06	LT 1.27E-06	LT 1.17E-06#
Pb GR/ACF	LT 2.34E-06	LT 1.71E-06	LT 1.60E-06#
Pb GR/DSCF	LT 5.23E-06	LT 3.86E-06	LT 3.59E-06#
Mn GR/ACF	LT/EQ 2.15E-06	LT/EQ 3.34E-06	LT/EQ 4.32E-06#
Mn GR/DSCF	LT/EQ 4.80E-06	LT/EQ 7.54E-06	LT/EQ 9.72E-06#
Hg GR/ACF	LT/EQ 1.44E-05	LT/EQ 9.98E-05	LT/EQ 8.80E-05#
Hg GR/DSCF	LT/EQ 3.22E-05	LT/EQ 2.25E-05	LT/EQ 1.98E-05#
Ni GR/ACF	LT 1.10E-06	LT/EQ 1.09E-06	LT 8.02E-07#
Ni GR/DSCF	LT 2.45E-06	LT/EQ 2.47E-06	LT 1.80E-06#
Se GR/ACF	LT 5.38E-06	LT 4.02E-06	LT 3.82E-06#
Se GR/DSCF	LT 1.20E-05	LT 9.07E-06	LT 8.85E-06#
Zn GR/ACF	LT/EQ 7.56E-06	LT/EQ 6.59E-06	LT/EQ 1.24E-05#
Zn GR/DSCF	LT/EQ 1.69E-05	LT/EQ 1.49E-05	LT/EQ 2.80E-05#

Metals Emission Rates (lb/hr)

AS	LT 1.03E-04	LT 7.74E-05	LT 8.06E-05#
Be	LT 9.81E-06	LT 7.45E-06	LT 7.77E-06#
Cd	LT 4.10E-05	LT/EQ 5.77E-05	LT/EQ 4.54E-05#
Cu	LT 2.78E-05	LT 2.09E-05	LT 2.13E-05#
Pb	LT 8.61E-05	LT 6.34E-05	LT 6.52E-05#
Mn	LT/EQ 7.90E-05	LT/EQ 1.24E-04	LT/EQ 1.76E-04#
Hg	LT/EQ 5.30E-04	LT/EQ 3.70E-04	LT/EQ 3.59E-04#
Ni	LT 4.04E-05	LT/EQ 4.06E-05	LT 3.27E-05#
Se	LT 1.98E-04	LT 1.49E-04	LT 1.56E-04#
Zn	LT/EQ 2.78E-04	LT/EQ 2.44E-04	5.07E-04#

LT=Less Than

LT/EQ=Less Than or Equal to

#=Estimation

*=Lab results not yet available.

TABLE 10
RESULTS OF CHROMIUM LOADING DETERMINATIONS

first carb

PARAMETER	Run 1	Run 2	Run 3
Date of Run	5/15/90	5/15/90	5/15/90
Time of Run	1123-1230	1255-1405	1426-1535
Sample Duration (Min.)	60.0	60.0	60.0
Average Flue Gas Temperature (F)	180.4	180.5	180.0
Moisture Content of Flue Gas (%v/v)	53.27	50.45	49.46
Cr (total) Collected (Mg)	0.006 LT/EQ	0.011 LT/EQ	0.007 LT/EQ
Cr (VI) collected (Mg)	LT 0.049	LT 0.028	LT 0.025
Volumetric Flow Rate			
ACFM	5490	5570	4970
DSCFM	2120	2280	2080
Sample Volume (Cubic Feet)			
Meter Conditions	40.82	41.59	37.00
Dry Standard	40.03	40.73	36.50
Isokinetic Variation (%)	105.8	100.1	98.5
Cr (total) Concentration (mg/ACF)	9.38E-07 LT/EQ	1.70E-06	1.17E-06
Cr (total) Concentration (mg/DSCF)	2.43E-06 LT/EQ	4.16E-06	2.79E-06
Cr (VI) Concentration (mg/ACF)	LT 7.26E-06	LT 4.35E-06	LT 4.42E-06
Cr (VI) Concentration (mg/DSCF)	LT 1.88E-05	LT 1.06E-05	LT 1.06E-05
Cr (total) Emission Rate (lb/hr)	4.41E-05 LT/EQ	8.13E-05	4.97E-05
Cr (VI) Emission Rate (lb/hr)	LT 3.41E-04	LT 2.08E-04	LT 1.88E-04

LT=Less Than

LT/EQ = Less than or equal to.

TABLE 11
 RESULTS OF HCL LOADING DETERMINATIONS

first carb

PARAMETER	Run 1	Run 2	Run 3
Date of Run	5/14/90	5/15/90	5/15/90
Time of Run	1841-1950	1225-1420	1551-1750
Sample Duration (Min.)	60.0	108.0	108.0
Average Flue Gas Temperature (F)	180.4	180.5	180.0
Moisture Content of Flue Gas (%v/v)	53.27	50.45	49.46
HCl collected (Mg)	50.200	26.900	36.000
Volumetric Flow Rate			
ACFM	4450	4320	4760
DSCFM	2000	1920	2120
Sample Volume (Cubic Feet)			
Meter Conditions	32.59	32.58	35.41
Dry Standard	32.64	32.04	35.07
Isokinetic Variation (%)	91.3	92.6	91.8
HCl Concentration (mg/ACF)	1.07E-02	5.74E-03	7.57E-03
HCl Concentration (mg/DSCF)	2.37E-02	1.30E-02	1.58E-02
HCl Emission Rate (lb/hr)	4.06E-01	2.13E-01	2.87E-01

TABLE 12
RESULTS OF DIOXINS/FURANS LOADING DETERMINATIONS

first carb

PARAMETER	Run 1	Run 2	Run 3
Date of Run	5/17/90	5/18/90	5/18/90
Time of Run	1520-1800	942-1406	1623-2100
Sample Duration (Min.)	270.0	264.0	264.0
Average Flue Gas Temperature (F)	172.4	174.1	173.0
Moisture Content of Flue Gas (%v/v)	48.39	46.11	45.73
Dioxin/Furan (total) collected (Mg)	*	*	*
Volumetric Flow Rate			
ACFM	3670	3620	4430
DSCFM	1580	1630	2010
Sample Volume (Cubic Feet)			
Meter Conditions	47.76	47.02	57.45
Dry Standard	47.50	46.49	57.07
Isokinetic Variation (%)	94.7	92.3	91.6

TABLE 13

RESULTS OF PAH (total) LOADING DETERMINATIONS

first carb

PARAMETER	Run 1	Run 2	Run 3
Date of Run	5/18/90	5/18/90	5/19/90
Time of Run	1012-1225	1545-1800	844-955
Sample Duration (Min.)	120.0	120.0	60.0
Average Flue Gas Temperature (F)	177.9	174.6	174.0
Moisture Content of Flue Gas (%v/v)	46.66	44.07	45.62
PAH (total) collected (Mg)	LT 4.8	LT 7.0	LT 2.4
Volumetric Flow Rate			
ACFM	4090	4210	3520
DSCFM	1820	1970	1600
Sample Volume (Cubic Feet)			
Meter Conditions	61.04	64.94	53.38
Dry Standard	60.43	63.12	53.35
Isokinetic Variation (%)	93.4	89.8	92.4
PAH (total) Concentration (mg/ACF)	LT 5.47E-04	LT 7.91E-04	LT 3.16E-04
PAH (total) Concentration (mg/DSCF)	LT 1.23E-03	LT 1.71E-03	LT 6.94E-04
PAH (total) Emission Rate (lb/hr)	LT 1.92E-02	LT 2.86E-02	LT 9.53E-03

LT=Less Than

TABLE 14
 RESULTS OF ORSAT AND MOISTURE DETERMINATIONS

METALS TESTING

first carb

PARAMETER	Run 1	Run 2	Run 3
Date of Run	5/14/90	5/14/90	5/14/90
Time of Run	950-1110	1225-1420	1551-1750
ORSAT (%v/v)			
Dry Basis			
Carbon Dioxide	5.00	5.00	5.00
Oxygen	20.40	20.40	20.40
Carbon Monoxide	*	*	*
Nitrogen	74.60	74.60	74.60
Wet Basis			
Carbon Dioxide	2.70	2.67	2.68
Oxygen	11.01	10.88	10.93
Carbon Monoxide	*	*	*
Nitrogen	40.25	39.79	39.99
Portable Oxygen Monitor Result			
Time Weighted Average (% O ₂)	20.4	20.4	20.4
Moisture Collected (ml)	388.0	595.5	645.0
Moisture Content (% v/v)	46.05	46.66	46.4
Molecular Weight of Flue Gas (lb/lb-mole)			
Dry	29.62	29.62	29.62
Wet	24.27	24.2	24.23

* Carbon monoxide was not measured, assumed concentrations less than 0.005%.

TABLE 15
RESULTS OF ORSAT AND MOISTURE DETERMINATIONS
CHROMIUM TESTING

first carb

PARAMETER	Run 1	Run 2	Run 3
Date of Run	5/15/90	5/15/90	5/15/90
Time of Run	1123-1230	1255-1405	1426-1535
ORSAT (%v/v)			
Dry Basis			
Carbon Dioxide	5.00	5.00	5.00
Oxygen	20.40	20.40	20.40
Carbon Monoxide	*	*	*
Nitrogen	74.60	74.60	74.60
Wet Basis			
Carbon Dioxide	2.34	2.48	2.53
Oxygen	9.53	10.11	10.31
Carbon Monoxide	*	*	*
Nitrogen	34.86	36.97	37.70
Portable Oxygen Monitor Result			
Time Weighted Average (% O2)	20.4	20.4	20.4
Moisture Collected (ml)	969.3	881.0	759.0
Moisture Content (% v/v)	53.27	50.45	49.46
Molecular Weight of Flue Gas (lb/lb-mole)			
Dry	29.62	29.62	29.62
Wet	24.43	23.76	23.87

* Carbon monoxide was not measured, assumed concentrations less than 0.005%.

TABLE 16
 RESULTS OF ORSAT AND MOISTURE DETERMINATIONS

HCL TESTING

first carb

PARAMETER	Run 1	Run 2	Run 3
Date of Run	5/14/90	5/15/90	5/15/90
Time of Run	1841-1950	1255-1420	1551-1750
ORSAT (%v/v)			
Dry Basis			
Carbon Dioxide	5.00	5.00	5.00
Oxygen	20.40	20.40	20.40
Carbon Monoxide	*	*	*
Nitrogen	74.60	74.60	74.60
Wet Basis			
Carbon Dioxide	2.70	2.68	2.68
Oxygen	11.01	10.88	10.93
Carbon Monoxide	*	*	*
Nitrogen	40.28	39.79	39.99
Portable Oxygen Monitor Result			
Time Weighted Average (% O ₂)	20.4	20.4	20.4
Moisture Collected (ml)	591.0	595.5	645.0
Moisture Content (% v/v)	46.01	46.66	46.40
Molecular Weight of Flue Gas (lb/lb-mole)			
Dry	29.62	29.62	29.62
Wet	24.27	24.20	24.23

* Carbon monoxide was not measured, assumed concentrations less than 0.005%.

TABLE 17
 RESULTS OF ORSAT AND MOISTURE DETERMINATIONS
 DIOXIN/FURAN TESTING

first carb				
PARAMETER	Run 1	Run 2	Run 3	
Date of Run	5/17/90	5/17/90	5/17/90	
Time of Run	1520-1800	942-1406	1623-2100	
ORSAT (%v/v)				
Dry Basis				
Carbon Dioxide	5.00	5.00	5.00	
Oxygen	20.70	17.90	17.90	
Carbon Monoxide	*	*	*	
Nitrogen	74.30	80.10	80.10	
Wet Basis				
Carbon Dioxide	2.58	1.08	1.09	
Oxygen	10.68	9.65	9.71	
Carbon Monoxide	*	*	*	
Nitrogen	38.34	43.16	43.47	
Portable Oxygen Monitor Result				
Time Weighted Average (% O2)	20.7	17.9	17.9	
Moisture Collected (ml)	946.3	845.1	1021.5	
Moisture Content (% v/v)	48.39	46.11	45.73	
Molecular Weight of Flue Gas (lb/lb-mole)				
Dry	29.63	29.04	29.04	
Wet	24.00	23.95	23.99	

* Carbon monoxide was not measured, assumed concentrations less than 0.005%.

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TABLE 18
RESULTS OF ORSAT AND MOISTURE DETERMINATIONS

PAH TESTING

first carb

PARAMETER	Run 1	Run 2	Run 3
Date of Run	5/18/90	5/18/90	5/19/90
Time of Run	1012-1225	1545-1800	844-955
ORSAT (%v/v)			
Dry Basis			
Carbon Dioxide	4.00	4.00	5.00
Oxygen	21.40	21.40	20.40
Carbon Monoxide	*	*	*
Nitrogen	74.60	74.60	74.60
Wet Basis			
Carbon Dioxide	2.13	2.24	2.72
Oxygen	11.42	11.97	11.09
Carbon Monoxide	*	*	*
Nitrogen	39.79	41.72	40.57
Portable Oxygen Monitor Result			
Time Weighted Average (% O2)	21.4	21.4	20.4
Moisture Collected (ml)	1123.0	1056.7	950.9
Moisture Content (% v/v)	46.66	44.07	45.62
Molecular Weight of Flue Gas (lb/lb-mole)			
Dry	29.50	29.50	29.62
Wet	24.13	24.43	24.32

* Carbon monoxide was not measured, assumed concentrations less than 0.005%.

TABLE 19

EPA MULTI METAL METHOD CALCULATION SUMMARY

TEST metals

first carb

PARAMETER	Run 1	Run 2	Run 3
Sample Duration (Minutes)	72	108	108
Barometric Pressure (Inches Hg)	29.99	29.99	29.99
Static Pressure of Duct (Inches H2O)	0.02	0.02	0.02
Absolute Pressure of Duct (Inches Hg)	29.99	29.99	29.99
Meter Coefficient	0.9971	0.9971	0.9971
Pitot Tube Coefficient	0.84	0.84	0.84
Nozzle Diameter (Inches)	0.375	0.375	0.375
Area of Nozzle Opening (Square Feet)	0.000767	0.000767	0.000767
Average AAEP	0.2318	0.2335	0.2571
Average AEH	0.29	0.30	0.35
Average Stack Temperature (oR)	636.79	636.71	637.79
Average Meter Temperature (oR)	530.73	537.10	533.21
Meter Volume (Cubic Feet)	21.503	32.585	35.407
Dry Standard Sample Volume (Cubic Feet)	21.40	32.04	35.07
Collected Condensate Volume (mls)	388.0	595.5	645.0
Volume of Water Vapor (Standard Cubic Feet)	18.26	28.03	30.36
Moisture Content of Flue Gas (% v/v)	46.05	46.66	46.40
Mass of metals (mg)			
AS	LT 8.65E-03	LT 9.79E-03	LT 1.01E-02#
Be	LT 8.26E-04	LT 9.42E-04	LT 9.73E-04#
Cd	3.45E-03	LT/EQ7.30E-03	LT/EQ5.69E-03#
Cu	LT 2.34E-03	LT 2.64E-03	LT 2.67E-03#
Pb	LT 7.25E-03	LT 8.02E-03	LT 8.17E-03#
Mn	LT/EQ6.65E-03	LT/EQ1.57E-02	LT/EQ2.21E-02#
Hg	LT/EQ4.46E-02	LT/EQ4.68E-02	LT/EQ4.50E-02#
Ni	LT3.40E-03	LT5.13E-03	LT4.10E-03#
Se	LT1.66E-02	LT1.88E-02	LT1.95E-02#
Zn	LT/EQ2.34E-02	LT/EQ3.09E-02	LT/EQ6.36E-02#
Source Gas Velocity (Feet per Second)	15.6	15.7	17.3
Isokinetic Variation (%)	92.5	92.6	91.8

LT=Less Than

LT/EQ=Less Than or Equal to

#=Estimation

* Laboratory results not yet available.

TABLE 20

CARB METHOD 425 (Cr, Cr VI) CALCULATION SUMMARY

TEST Cr, Cr VI

first carb

PARAMETER	Run 1	Run 2	Run 3
Sample Duration (Minutes)	60	60	60
Barometric Pressure (Inches Hg)	30.03	30.03	30.03
Static Pressure of Duct (Inches H2O)	0.02	0.02	0.02
Absolute Pressure of Duct (Inches Hg)	30.03	30.03	30.03
Meter Coefficient	0.9971	0.9971	0.9971
Pitot Tube Coefficient	0.84	0.84	0.84
Nozzle Diameter (Inches)	0.5	0.5	0.5
Area of Nozzle Opening (Square Feet)	0.001364	0.001364	0.001364
Average AAEP	0.2911	0.2975	0.2660
Average AEH	1.47	1.54	1.23
Average Stack Temperature (oR)	640.42	640.54	639.96
Average Meter Temperature (oR)	540.81	541.52	537.17
Meter Volume (Cubic Feet)	40.82	41.585	36.997
Dry Standard Sample Volume (Cubic Feet)	40.03	40.73	36.50
Collected Condensate Volume (mls)	969.3	881.0	759.0
Volume of Water Vapor (Standard Cubic Feet)	45.62	41.47	35.73
Moisture Content of Flue Gas (% v/v)	53.27	50.45	49.46
Mass of Cr (total) (mg)	0.006	LT/EQ 0.011	0.007
Mass of Cr (VI) (mg)	LT 0.049	LT 0.028	LT 0.025
Source Gas Velocity (Feet per Second)	19.9	20.2	18.0
Isokinetic Variation (%)	105.8	100.1	98.5

LT=Less Than

LT/EQ=Less Than or Equal to

TABLE 21

CARB METHOD 421 CALCULATION SUMMARY

TEST HCL

first carb

PARAMETER	Run 1	Run 2	Run 3
Sample Duration (Minutes)	60	108	108
Barometric Pressure (Inches Hg)	29.99	29.99	29.99
Static Pressure of Duct (Inches H2O)	0.02	0.02	0.02
Absolute Pressure of Duct (Inches Hg)	29.99	29.99	29.99
Meter Coefficient	0.9971	0.9971	0.9971
Pitot Tube Coefficient	0.84	0.84	0.84
Nozzle Diameter (Inches)	0.501	0.501	0.501
Area of Nozzle Opening (Square Feet)	0.001369	0.000767	0.000767
Average AAEP	0.2408	0.2335	0.2571
Average AEH	0.96	0.30	0.35
Average Stack Temperature (oR)	636.42	636.71	637.79
Average Meter Temperature (oR)	528.04	537.10	533.21
Meter Volume (Cubic Feet)	32.585	32.585	35.407
Dry Standard Sample Volume (Cubic Feet)	32.64	32.04	35.07
Collected Condensate Volume (mls)	591.0	595.5	645.0
Volume of Water Vapor (Standard Cubic Feet)	27.82	28.03	30.36
Moisture Content of Flue Gas (% v/v)	46.01	46.66	46.40
Mass of HCl (mg)	50.200	26.900	36.000
Source Gas Velocity (Feet per Second)	16.2	15.7	17.3
Isokinetic Variation (%)	91.3	92.6	91.8

TABLE 22

CARB METHOD 428 (Dioxin) CALCULATION SUMMARY

TEST Dioxin

first carb

PARAMETER	Run 1	Run 2	Run 3
Sample Duration (Minutes)	270	264	264
Barometric Pressure (Inches Hg)	30.02	30.02	30.02
Static Pressure of Duct (Inches H2O)	0.02	0.02	0.02
Absolute Pressure of Duct (Inches Hg)	30.02	30.02	30.02
Meter Coefficient	0.9971	0.9971	0.9971
Pitot Tube Coefficient	0.84	0.84	0.84
Nozzle Diameter (Inches)	0.314	0.314	0.314
Area of Nozzle Opening (Square Feet)	0.000538	0.000538	0.000538
Average AAEP	0.1980	0.1949	0.2393
Average AEH	0.11	0.10	0.15
Average Stack Temperature (oR)	632.44	634.08	633.00
Average Meter Temperature (oR)	531.28	534.42	531.92
Meter Volume (Cubic Feet)	47.76	47.02	57.445
Dry Standard Sample Volume (Cubic Feet)	47.50	46.49	57.07
Collected Condensate Volume (mls)	946.3	845.1	1021.5
Volume of Water Vapor (Standard Cubic Feet)	44.54	39.78	48.08
Moisture Content of Flue Gas (% v/v)	48.39	46.11	45.73
Source Gas Velocity (Feet per Second)	13.3	13.1	16.1
Isokinetic Variation (%)	94.7	92.3	91.6

TABLE 23

CARB METHOD 429 (PAH) CALCULATION SUMMARY

TEST PAH

first carb

PARAMETER	Run 1	Run 2	Run 3
Sample Duration (Minutes)	120	120	120
Barometric Pressure (Inches Hg)	30.07	30.07	30.07
Static Pressure of Duct (Inches H2O)	0.02	0.02	0.02
Absolute Pressure of Duct (Inches Hg)	30.07	30.07	30.07
Meter Coefficient	0.9971	0.9971	0.9971
Pitot Tube Coefficient	0.84	0.84	0.84
Nozzle Diameter (Inches)	0.5	0.5	0.711
Area of Nozzle Opening (Square Feet)	0.001364	0.001364	0.002757
Average AAEP	0.2207	0.2295	0.1912
Average AEH	0.86	0.94	2.61
Average Stack Temperature (oR)	637.88	634.58	634.04
Average Meter Temperature (oR)	535.56	545.63	532.77
Meter Volume (Cubic Feet)	61.042	64.938	53.382
Dry Standard Sample Volume (Cubic Feet)	60.43	63.12	53.35
Collected Condensate Volume (mls)	1123.0	1056.7	950.9
Volume of Water Vapor (Standard Cubic Feet)	52.86	49.74	44.76
Moisture Content of Flue Gas (% v/v)	46.66	44.07	45.62
Mass of PAH (total mg)	LT 4.8	LT 7.0	LT 2.4
Source Gas Velocity (Feet per Second)	14.9	15.3	12.8
Isokinetic Variation (%)	93.4	89.8	92.4

LT=Less Than

TABLE 24
RESULTS OF AIR FLOW DETERMINATIONS

first carb

Date of Run	5/13/90
Time of Measurement	1725
Number of Sampling Ports	2
Number of Points Sampled	24
Barometric Pressure (In. Hg)	30.03
Static Pressure (In. WC)	0.02
Absolute Flue Gas Pressure (In. Hg)	30.03
Average Flue Gas Temperature (F)	184
Average Moisture Content (%v/v)	49
Flue Gas Average Velocity (Feet/Second)	13.61
Duct Dimension (Inches)	29
Duct Cross-sectional Area (Square Feet)	4.59
Volumetric Flow Rate	
ACFM	3740
DSCFM	1570

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TABLE 25

RESULTS OF AIR FLOW DETERMINATIONS

second carb

Date of Run	5/13/90
Time of Measurement	1607
Number of Sampling Ports	2
Number of Points Sampled	24
Barometric Pressure (In. Hg)	30.03
Static Pressure (In. WC)	0.02
Absolute Flue Gas Pressure (In. Hg)	30.03
Average Flue Gas Temperature (F)	188
Average Moisture Content (%v/v)	49
Flue Gas Average Velocity (Feet/Second)	10.49
Duct Dimension (Inches)	29
Duct Cross-sectional Area (Square Feet)	4.59
Volumetric Flow Rate	
ACFM	2890
DSCFM	1200

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TABLE 26
RESULTS OF AIR FLOW DETERMINATIONS

second carb

Date of Run	5/14/90
Time of Measurement	1730
Number of Sampling Ports	2
Number of Points Sampled	12
Barometric Pressure (In. Hg)	30.03
Static Pressure (In. WC)	0.02
Absolute Flue Gas Pressure (In. Hg)	30.03
Average Flue Gas Temperature (F)	181
Average Moisture Content (%v/v)	46.4
Flue Gas Average Velocity (Feet/Second)	7.92
Duct Dimension (Inches)	29
Duct Cross-sectional Area (Square Feet)	4.59
Volumetric Flow Rate	
ACFM	2180
DSCFM	970

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TABLE 27

RESULTS OF AIR FLOW DETERMINATIONS

second carb

Date of Run	5/15/90
Time of Measurement	1900
Number of Sampling Ports	2
Number of Points Sampled	12
Barometric Pressure (In. Hg)	30.03
Static Pressure (In. WC)	0.02
Absolute Flue Gas Pressure (In. Hg)	30.03
Average Flue Gas Temperature (F)	181
Average Moisture Content (%v/v)	51.1
Flue Gas Average Velocity (Feet/Second)	13.62
Duct Dimension (Inches)	29
Duct Cross-sectional Area (Square Feet)	4.59
Volumetric Flow Rate	
ACFM	3750
DSCFM	1520

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TABLE 28
RESULTS OF AIR FLOW DETERMINATIONS

	second carb
Date of Run	5/16/90
Time of Measurement	2023
Number of Sampling Ports	2
Number of Points Sampled	12
Barometric Pressure (In. Hg)	30.03
Static Pressure (In. WC)	0.02
Absolute Flue Gas Pressure (In. Hg)	30.03
Average Flue Gas Temperature (F)	181
Average Moisture Content (%v/v)	48.4
Flue Gas Average Velocity (Feet/Second)	10.51
Duct Dimension (Inches)	29
Duct Cross-sectional Area (Square Feet)	4.59
Volumetric Flow Rate	
ACFM	2890
DSCFM	1230

Holly Corp.
Santa Maria
PACE Project No. 400504.400

PACE, Inc.
June 28, 1990

TABLE 29
RESULTS OF AIR FLOW DETERMINATIONS

	second carb
Date of Run	5/17/90
Time of Measurement	2139
Number of Sampling Ports	2
Number of Points Sampled	12
Barometric Pressure (In. Hg)	30.03
Static Pressure (In. WC)	0.02
Absolute Flue Gas Pressure (In. Hg)	30.03
Average Flue Gas Temperature (F)	180
Average Moisture Content (%v/v)	45.9
Flue Gas Average Velocity (Feet/Second)	12.45
Duct Dimension (Inches)	29
Duct Cross-sectional Area (Square Feet)	4.59
Volumetric Flow Rate	
ACFM	3430
DSCFM	1540

Holly Corp.
Santa Maria
PACE Project No. 400504.400

PACE, Inc.
June 28, 1990

TABLE 30
RESULTS OF AIR FLOW DETERMINATIONS

second carb	
Date of Run	5/18/90
Time of Measurement	1957
Number of Sampling Ports	2
Number of Points Sampled	12
Barometric Pressure (In. Hg)	30.03
Static Pressure (In. WC)	0.02
Absolute Flue Gas Pressure (In. Hg)	30.03
Average Flue Gas Temperature (F)	180
Average Moisture Content (%v/v)	45.8
Flue Gas Average Velocity (Feet/Second)	13.69
Duct Dimension (Inches)	29
Duct Cross-sectional Area (Square Feet)	4.59
Volumetric Flow Rate	
ACFM	3770
DSCFM	1690

Holly Corp.
Santa Maria
PACE Project No. 400504.400

PACE, Inc.
June 28, 1990

TABLE 31

RESULTS OF AIR FLOW DETERMINATIONS

second carb

Date of Run	5/19/90
Time of Measurement	1005
Number of Sampling Ports	2
Number of Points Sampled	12
Barometric Pressure (In. Hg)	30.03
Static Pressure (In. WC)	0.02
Absolute Flue Gas Pressure (In. Hg)	30.03
Average Flue Gas Temperature (F)	183
Average Moisture Content (%v/v)	45.6
Flue Gas Average Velocity (Feet/Second)	12.26
Duct Dimension (Inches)	29
Duct Cross-sectional Area (Square Feet)	4.59
Volumetric Flow Rate	
ACFM	3370
DSCFM	1510

APPENDIX B

FIELD DATA

APPENDIX C

LABORATORY DATA

APPENDIX B

FIELD DATA

0/2 Dist for 24 points

Distance from end
of probu

1	1.1	2.32	→ 3.00	1
2	3.5	3.45		2
3	6.0	3.74		3
4	8.7	4.52		4
5	11.6	5.36		5
6	14.6	6.23		6
7	18.0	7.22	6	7
8	21.8	8.32	7	8
9	26.2	9.60	8	9
10	31.5	11.14	4	10
11	37.3	13.40	10	11
12	60.7	19.6		
13	66.5	21.29		
14	73.8	23.4		
15	78.2	24.68		
16	82.0	25.78		
17	85.4	26.77		
18	88.4	27.64		
19	91.3	28.48		
20	94.0	29.20		
21	96.5	29.94		
22	98.9	30.68	→ 31.0	



laboratories, inc.

Client _____ By _____ Date _____

Project _____ Sheet No. _____ of _____

Subject _____ Project No. _____

5/13/01
Start 17:25

Print AP cyclonic FIRST carb tank #1 (west)

AP cyclonic AP cyclonic AP cyclonic

1	.05 no	.05 no	19	.05 no
2	.04 no	.045 no	20	.045 no
3	.04 no	.05 no	21	.05 no
4	.04 no	.05 no	22	.05 no
5	.04 no	.05 no	23	.05 no
6	.04 no	.06 no	24	.0
7	.04 no		25	
8	.04 no		26	
9	.04 no		27	
10	.04 no		28	
11	.045 no		29	
12	.04 no		30	
13	.0		31	
14	.04 no		32	
15	.04 no		33	
16	.045 no		34	
17	.05 no		35	
18	.05 no		36	

same

Dry bulb attach
184
wet bulb 179°F
Dry bulb
hand held 170°F
wet bulb 170°F
Static pressure
+ 0.02



laboratories, inc.

Client _____ By _____ Date _____

Project _____ Sheet No. _____ of _____

Subject _____ Project No. _____

3/13/40

Second carb tank

16:07

Static pressure

Method 2		Static pressure	
Point #		Static pressure	Static pressure
1	0.03	0.03	0.03
2	0.03	0.03	0.03
3	0.03	0.03	0.03
4	0.03	0.03	0.03
5	0.03	0.03	0.03
6	0.03	0.03	0.03
7	0.03	0.03	0.03
8	0.03	0.03	0.03
9	0.03	0.03	0.03
10	0.03	0.03	0.03
11	0.03	0.03	0.03
12	0.03	0.03	0.03
13	0.03	0.03	0.03
14	0.03	0.03	0.03
15	0.03	0.03	0.03
16	0.03	0.03	0.03
17	0.03	0.03	0.03
18	0.03	0.03	0.03
19	0.03	0.03	0.03
20	0.03	0.03	0.03
21	0.03	0.03	0.03
22	0.03	0.03	0.03
23	0.03	0.03	0.03
24	0.03	0.03	0.03

7/14/40
 T 12125 motor count 0.947
 initial check-out 0.84
 initial imp #1 475
 initial imp #2 215
 initial imp #3 100
 initial imp #4 1
 initial imp #5 0

point	DT	ΔP	ΔH actual	meter readings	3' diff. readings	vacuum Hg	static temp	probe temp	filter temp	imp temp	deg H temp	deg C out room
1	4.5	6.06	0.314	937.	937.824	2.5	178	256	246	58	73	74
2	4.0	0.07	0.366	939.341	939.345	2.5	179	257	233	58	73	74
3	12.5	0.08	0.449	940.940	940.468	2.5	178	261	254	57	74	75
4	18.0	0.07	0.37	942.450	942.489	2.5	178	260	232	57	74	76
5	22.5	0.07	0.37	943.960	944.007	2.5	178	260	233	58	76	76
6	27.0	0.07	0.37	945.460	945.523	2.5	179	260	233	58	76	76
7	31.5	0.07	0.37	947.000	947.052	2.5	179	261	253	57	76	75
8	36.0	0.06	0.32	948.32	948.461	2.5	177	259	254	58	77	76
9	40.5	0.06	0.32	949.82	949.872	2.5	176	260	254	58	77	76
10	45.0	0.06	0.32	951.28	951.285	2.5	175	259	255	60	78	78
11	49.5	0.04	0.21	952.55	952.444	2.5	175	263	257	63	78	78
12	54.0	0.03	0.10	953.60	953.453	2.5	168	263	257	63	78	78
13	58.5	0.04	0.21	954.90	954.816	2.5	176	260	253	66	77	77
14	63	0.04	0.21	955.5	955.724	2.5	178	265	254	60	79	78
15	67.5	0.04	0.21	957.28	957.184	2.5	178	263	254	58	79	80
16	72	0.05	0.26	958.56	958.432	2.5	177	262	253	57	79	80
17	76.5	0.05	0.26	959.91	959.781	2.5	177	262	252	55	79	80
18	81	0.05	0.26	961.5	961.024	2.5	172	263	254	58	80	80
19	85.5	0.05	0.26	962.58	962.441	2.5	177	263	255	57	79	80
20	90	0.06	0.32	963.96	963.538	2.5	177	261	254	58	79	80
21	94.5	0.06	0.314	964.96	964.517	3.5	177	263	254	58	79	80
22	99	0.07	0.372	966.94	966.709	3.5	176	264	254	58	79	80
23	103.5	0.05	0.266	968.159	967.608	3.0	176	263	254	60	79	80
24	108	0.09	0.154	969.129	969.011	2.5	176	261	252	62	77	78

ORSAI results 20.466 Oz
 50% 102

Final imp #1 475
 initial imp #1 0
 net 475
 Final imp #2 215
 initial imp #2 0
 net 215
 Final imp #3 100
 initial imp #3 0
 net 100
 Final imp #4 1
 initial imp #4 0
 net 1
 Final imp #5 0
 initial imp #5 0
 net 0
 Final constant 683.5
 initial constant 628.0
 net 55.5
 net 420 = 596.5g

EPA Method 5 Field Data Sheet

Project Hell
Sample Location California Coast
Date 11/14/80 Test 3 Run 2
Operators B3 750

Tech No. 0.447
Meter Cool. 1.935
Nozzle No. D₃ 375

Pilot Tube No. 2542
Bar. Pres. 29.92
Static Pres. 29.92
Estimated MC 51

Look Check: 17
Post-test 2
69602

Operators _____														
Point Number	Time ΔT	Meter Vol. cu. ft.	Velocity Head-ΔP in. H ₂ O	Orifice Head-ΔP in. H ₂ O	Dischd ΔV in	Dischd Running Vm	Vacuum in. Hg	Stack Temp. °F	Sampling Train Temperatures - °F				Oxygen 320 p %	
									Filter	Probe	Imp. Out	M/in		M/Out
(4.5) (970.398)														
1	4.5	971.552	0.06	0.316	971.806	2.5	176	256	259	54	73	74		
2	9	973.254	0.06	0.314	973.209	2.5	177	256	254	55	73	74		
3	13.5	974.050	0.06	0.315	974.415	2.5	175	259	251	56	74	74		
4	18.0	975.919	0.05	0.362	977.353	2.5	174	260	253	57	74	75		
5	22.5	977.310	0.06	0.315	978.335	2.5	174	254	251	56	74	74		
6	27.0	978.608	0.05	0.287	979.434	2.5	180	260	258	58	75	75		
7	31.5	979.971	0.055	0.314	981.334	2.5	180	261	258	58	75	75		
8	36.0	981.355	0.06	0.314	983.057	3.0	180	259	252	55	75	75		
9	40.5	983.054	0.09	0.472	984.770	3.0	174	261	252	56	75	75		
10	45.0	984.784	0.09	0.472	986.301	2.5	178	251	251	56	75	75		
11	49.5	986.273	0.07	0.365	986.301	2.5	178	251	251	56	75	75		
12	54.0	987.524	0.07	0.567	987.819	2.5	175	241	250	57	74	74		
13	58.5	988.432	0.05	0.420	988.408	3.0	177	245	250	58	73	74		
14	63.0	990.495	0.07	0.367	988.408	3.0	178	241	252	54	73	74		
15	67.5	992.436	0.07	0.367	992.477	3.0	177	241	251	53	73	73		
16	72.0	993.870	0.07	0.367	993.413	3.0	177	240	252	54	72	72		
17	76.5	995.414	0.065	0.367	995.452	3.0	177	240	251	55	72	72		
18	81.0	996.973	0.07	0.367	996.426	3.5	177	241	251	55	72	72		
19	85.5	998.435	0.075	0.367	998.426	3.5	176	251	250	56	72	72		
20	90.0	999.967	0.07	0.367	999.941	3.5	176	258	247	57	72	72		
21	94.5	1001.498	0.07	0.366	1001.454	3.5	177	258	247	57	71	72		
22	99.0	1003.029	0.06	0.314	1002.454	3.5	177	258	251	59	71	71		
23	103.5	1004.559	0.06	0.313	1004.454	3.5	177	258	251	59	71	71		
24	108.0	1006.085	0.07	0.365	1006.454	4.0	177	258	252	59	71	71		
ΔH = 2.348 ΔP = 0.257 T _{in} = 177.750 T _{out} = 73.375														
φ = 108 V _{avg} = 35.407														

Sample Recovered: Filter Number 5 : ☐ Probe Wash : ☐ Wet Catch : ☐ 5 F 100

Gas Sampling Date: 10/8 3.5.407 ΔP=2.348 ΔV=0.257 T=177.750 MP=73.375

Box No. 1
Bag No. 1
Bag Vol. 1 liters

Bag Material 15" Hg
Leak Check 15" Hg
Post Test O₂ Reading 15

Moisture Recovery Data:

Impinger No.	1	2	3	4	Recovery	Total
Imp Vol.						
Initial Vol.						
Difference						



Pace
Laboratories, Inc.

EPA Method 5 Field Data Sheet

Project Field
Sample Location California 4-97
Date 5/14/86 Test TC Ref TC
Operators JS, JSC

Train No. 0-99-11
Meter Const. 1.848
 ΔH 0.00
Nozzle No. 0.2.50

Pilot Tube No. 29.44 C_p 84
Bar. Pres. 29.44 in. Hg
Static Pres. 29.44 in. Hg
Estimated MC 51 %

Leak Check: 20.490 15 in. Hg
Post-test: 2.00 15 in. Hg

Start 18:41

NO₂ & NO_x Calibration

0.503 0.500
0.501
0.502
0.499

Avg = 0.501

OSAT nos 1-15
20.490, 3.080

Operator's _____														
Point Number	Time ΔT	Meter Vel. V_m cm./hr.	Velocity Head- ΔP in. H ₂ O	Orifice Head- ΔH in. H ₂ O	Dashed ΔV_m	Dashed Running V_m	Vacuum in. Hg	Stack Temp. $^{\circ}F$	Sampling Train Temperatures - $^{\circ}F$				Oxygen 320 p %	
									Filter	Probe	Imp. Out	M/in		M/Out
(2.5) (6.525)														
1	7.5	6051	0.07	1.157		8.014	3.5	174	729	260	55	66	67	
2	5	9.548	0.08	1.321		9.605	4.0	177	234	261	53	62	67	
3	7.5	1.915	0.07	1.158		11.044	4.0	177	260	258	53	68	67	
4	12	12.470	0.07	1.159		12.585	4.0	176	260	258	53	69	67	
5	0.5	13.167	0.06	0.942		13.964	3.5	177	259	256	55	69	67	
6	15.0	15.144	0.04	0.814		15.344	3.5	176	259	256	55	70	68	
7	17.5	16.434	0.05	0.830		16.605	3.5	177	259	254	55	71	68	
8	2.0	17.169	0.05	0.844		17.869	3.5	177	259	254	55	70	67	
9	2.5	19.148	0.06	0.944		19.350	4.0	177	259	254	55	70	67	
10	25.0	20.579	0.06	0.944		20.632	4.0	177	259	254	55	71	67	
11	27.5	22.156	0.07	1.166		22.129	4.5	175	260	258	57	71	67	
12	3.0	23.421	0.05	0.926		23.840	3.5	177	258	258	57	70	67	
13	3.5	24.779	0.06	0.946		24.778	4.0	176	258	256	55	69	67	
14	3.5	26.154	0.06	0.946		26.536	4.0	176	258	256	55	70	68	
15	3.5	27.579	0.06	0.946		27.536	4.0	176	258	251	55	70	67	
16	4.0	29.020	0.05	0.830		29.055	4.0	176	256	242	55	69	67	
17	4.5	30.050	0.05	0.825		30.317	4.0	176	256	251	55	69	67	
18	4.5	31.244	0.05	0.828		32.577	4.0	176	256	254	57	69	67	
19	4.5	32.530	0.05	0.828		33.936	4.0	177	258	254	58	69	67	
20	5.0	34.194	0.04	0.842		34.862	4.0	177	258	254	58	69	67	
21	5.5	36.272	0.06	0.942		36.841	4.5	177	258	253	59	69	66	
22	5.5	37.714	0.06	0.944		37.724	4.5	176	258	253	59	69	66	
23	6.0	39.113	0.06	0.944		39.109	4.5	176	257	253	60	69	66	

$\phi = 6.10$
 $V_m = 32.585$
 $\Delta H = 0.966$
 $W_{H_2O} = 0.241$
 $T = 173.417$
 $T_m = 63.325$

Samples Recovered: Filter Number _____

Probe Tech: ☐ Wet Catch: ☐

Gas Sampling Data:

Box No. _____
Bag No. _____
Bag Vol. _____ Liters

Bag Material _____
Leak Check _____ @ 15" Hg
Post Test O₂ Reading _____ %

Molten Recovery Data:

Impinger No.	1	2	3	4	Bottom	Total
Final Vol.	331	253	112	-	1070	
Initial Vol.	-	100	100	-	1090.0	
Difference	331	153	12	-	20	

PACE

laboratories, inc.

START 04/18

End 10:25

20.4% $\pm$ 5.0%
for 5/14/87

needed to find results
find gas that was
6.0 2.5

EPA Method 5 Field Data Sheet

Project HO 114
Sample Location Carbon 4 & 5
Date 5/15/90 Test 2 Run 141
Operators B2, JSC

Train No.
Meter Coef. γ 0.9911
 ΔH $\odot$ 1.838
Nozzle No. D_n SD1

Pilot Tube No. Cp
Bar. Pres. 30.06 Ina. Hg
Static Pres. 0.02 Ina. H₂O
Estimated MC 5.1 %

Lock Checks:
Pretest: 4.4 $\odot$ 15 Ina. Hg
Post-test: 4.22 $\odot$ 15 Ina. Hg

0.5 AT RESULTS

Point Number	Time ΔT	Meter Vol. V_m cu. ft.	Velocity Head- ΔP Ina. H ₂ O	Orifice Meter- ΔH Ina. H ₂ O	Desired ΔV_m	Desired Running V_m	Vacuum Ina. Hg	Stack Temp. $^{\circ}F$	Sampling Train Temperatures -- $^{\circ}F$					Oxygen 320 P %	
									Filter	Probe	Inp. Out	M/in	M/Out		
(2.5)	(39.65)														
1	2.5	41.175	0.08	1.5736		41.238	4.5	178	251	252	58	66	66		6
2	5.0	42.741	0.05	1.314		42.820	5.0	174	252	257	53	67	67		
3	7.5	44.165	0.07	1.154		44.305	4.5	174	252	255	51	68	68		
4	10.0	45.641	0.07	1.158		45.745	4.5	178	252	253	50	69	69		
5	12.5	47.041	0.06	0.983		47.177	4.5	178	251	252	49	69	68		
6	15.0	48.529	0.07	1.158		48.666	5.0	178	252	253	49	70	68		
7	17.5	50.044	0.07	1.158		50.155	5.0	178	251	251	49	72	69		
8	20.0	51.542	0.07	1.162		51.654	5.5	178	252	251	49	71	68		
9	22.5	53.072	0.07	1.162		53.144	5.5	178	252	252	49	72	68		
10	25.0	54.584	0.07	1.162		54.674	5.5	178	251	251	49	73	70		
11	27.5	56.091	0.07	1.165		56.136	5.5	178	251	251	51	73	69		
12	30.0	57.060	0.05	0.445		57.115	3.0	178	251	250	53	70	70		
1	32.5	58.761	0.04	1.442		58.807	6.0	176	247	245	47	70	68		
2	35.0	60.412	0.04	1.444		60.444	6.0	177	249	244	46	70	69		
3	37.5	62.139	0.08	1.328		62.095	6.0	177	249	244	47	71	65		
4	40.0	63.752	0.08	1.328		63.441	6.0	176	242	247	47	71	68		
5	42.5	65.161	0.07	1.164		65.156	5.5	176	249	245	48	72	69		
6	45.0	66.541	0.06	0.998		66.571	5.0	177	249	249	44	71	69		
7	47.5	67.984	0.06	0.996		67.453	5.0	178	251	253	44	72	70		
8	50.0	69.356	0.06	0.994		69.338	5.5	177	250	248	51	73	69		
9	52.5	70.827	0.07	1.164		70.814	5.5	177	251	251	52	74	70		
10	55.0	72.359	0.08	1.333		72.416	6.0	177	249	248	52	75	71		
11	57.5	73.782	0.06	1.003		73.845	5.5	176	249	248	53	76	71		
12	60.0	75.190	0.06	1.005		75.222	5.5	176	250	250					
$\Phi = 60.0$ V_m 35.525									$T_a = 177.458$					$T_m = 70.125$	

Samples Recovered: Filter Number : Probe Vial: : Wet Catch: :

Gas Sampling Data:

Box No.
Bag No.
Bag Vol. Liters

Bag Material
Lock Check $\odot$ 15" Hg
Part Test O₂ Reading %

Molalure Recovery Data:

Impinger No.
Final Vol.
Initial Vol.
Difference

1	2	3	4	5	Total
4.95	3.45	1.15			6.55
4.95	1.00	1.00			6.95
4.95					6.95

PACE

laboratories, inc.

START 04/15

End 10:25

20.4% $\pm$ 5.0%
6/5/14

needed to find position
find gas there 490
6/5/14 25 smuckers

EPA Method 5 Field Data Sheet

Project HOLLY Train No. Pilot Tube No. Cp Leak Check:
Sample Location Carbon 4 & 5 Meter Cool. Y 0.2411 Bar. Pres. 21.00 Ina. Hg Pretest: 4.4L $\bullet$ 15 Ina. Hg
Date 5/15/90 Test 2 Run 101 Δ H $\bullet$ 1.538 Static Pres. 0.02 Ina. H₂O Post-test: 2.22 $\bullet$ 4.5 Ina. Hg
Operator B2, JSC Nozzle No. D_n SD1 Estimated MC 51 %

Point Number	Time Δ T	Water Vol. V _W cu. ft.	Velocity Head- Δ P Ina. H ₂ O	Orifice Meter- Δ H Ina. H ₂ O	Desired Δ V _m	Desired Running V _m	Vacuum Ina. Hg	Stack Temp. °F	Sampling Train Temperatures - °F				Oxygen 320 P %
									Filter	Probe Inp. Out	M/in	M/Out	
1	2.5	41.115	0.08	1.57316		41.238	4.5	178	251	252	58	66	6
2	5.0	42.741	0.08	1.314		42.820	5.0	174	252	257	53	67	
3	7.5	44.105	0.07	1.154		44.305	4.5	174	252	255	51	68	
4	10.0	45.641	0.07	1.158		45.745	4.5	178	252	253	50	67	
5	12.5	47.041	0.06	0.983		47.177	4.5	178	251	252	53	69	
6	15.0	48.529	0.07	1.158		48.666	5.0	178	252	253	49	68	
7	17.5	50.044	0.07	1.158		50.125	5.0	178	252	251	49	70	
8	20.0	51.542	0.07	1.162		51.630	5.5	178	251	251	49	71	
9	22.5	53.072	0.07	1.162		53.144	5.5	179	251	252	49	72	
10	25.0	54.584	0.07	1.162		54.634	5.5	178	251	251	49	73	
11	27.5	56.091	0.07	1.165		56.136	5.5	178	251	251	51	73	
12	30.0	57.060	0.05	0.448		57.115	3.0	178	251	245	53	70	
1	32.5	58.741	0.04	1.442		58.807	6.0	176	249	245	47	70	
2	35.0	60.412	0.04	1.444		60.444	6.0	177	250	244	46	70	
3	37.5	62.139	0.08	1.328		62.095	6.0	177	249	248	47	71	
4	40.0	63.752	0.08	1.328		63.641	6.0	176	247	247	47	71	
5	42.5	65.161	0.07	1.164		65.150	5.5	177	247	247	48	72	
6	45.0	66.541	0.06	0.448		66.571	5.0	177	249	248	49	72	
7	47.5	67.984	0.06	0.446		67.453	5.0	178	251	253	44	73	
8	50.0	69.356	0.06	0.444		69.338	5.0	177	250	248	51	73	
9	52.5	70.827	0.07	1.164		70.814	5.5	177	251	251	52	74	
10	55.0	72.359	0.08	1.338		72.416	6.0	176	249	248	52	75	
11	57.5	73.782	0.06	1.003		73.848	5.5	176	249	248	53	76	
12	60.0	75.190	0.06	1.005		75.323	5.5	176	250	250	53	76	
Total									70.125				

$\Phi = 40.0$ $V_{W} = 35.525$ $\Delta H = 1.154$ $N_{500} = 0.263$ $T = 112.458$

Samples Recovered: Filter Number ; ☐ Probe Wash: ☐ Wet Catch: ☐

Gas Sampling Date:

Box No.
Bag No.
Bag Vol. Liters

Bag Material
Leak Check $\bullet$ 15" Hg
Post Test O₂ Reading %

Moisture Recovery Data:

Impinger No.	1	2	3	4	Total
Final Vol.	4.05	3.45	1.15	-	8.65
Initial Vol.	-	1.00	1.00	-	2.00
Difference	4.05	2.45	0.15	-	6.65

pac

laboratories, inc

EPA Method 5 Field Data Sheet

20.4% O₂

Project Holly Train No. CP-84 Leak Check: Pretest: 0.011 • 15 hrs. Hg
Sample Location Carbonate Unit Bar. Pres. 20.00 Ina. Hg
Date 5/15/90 Test 3 Run HCL ΔH • 1.835 Ina. H₂O
Operators BB, JSC Nozzle No. D₉ 501 Estimated MC 51 %
Pilot Tube No. 20.00 Ina. Hg
Post-test: 0.005 • 8 Ina. Hg

Point Number	Time ΔT	Meter Vol. V _m cu. ft.	Velocity Head-ΔP Ina. H ₂ O	Orifice Meter-ΔH Ina. H ₂ O	Desired ΔV _m	Desired Running V _m	Vacuum Ina. Hg	Stock Temp. °F	Sampling Train Temperatures - °F				Oxygen 320 P %	
									Filter	Probe	Insp. Out	M/in		M/Out
62.5)(195.609)														
1	7.5	192.88	0.05	1.367		191.227	6.5	18.0	2541	249	5.7	6.9	6.9	
2	7.5	198.924	0.07	1.535		198.144	5.5	18.0	257	257	5.1	6.8	6.9	
3	7.5	200.779	0.10	1.706		200.152	4.0	18.1	759	254	4.9	6.9	6.9	
4	10.0	202.431	0.09	1.539		202.428	5.5	18.1	250	253	4.9	7.1	6.9	
5	12.5	204.022	0.08	1.370		204.093	5.0	18.1	253	248	5.0	7.2	6.9	
	15.0	205.624	0.08	1.373		205.714	5.0	18.1	251	250	5.1	7.3	7.0	
	17.5	207.244	0.09	1.373		207.345	5.0	18.1	251	249	5.1	7.4	7.0	
	20.0	208.840	0.09	1.375		208.975	5.0	18.1	251	248	5.1	7.5	7.0	
	22.5	210.654	0.09	1.547										
	25.0	212.408	0.09	1.553		212.435	5.5	18.0	252	248	5.2	7.6	7.1	
	27.5	214.181	0.09	1.550		214.160	6.0	18.1	248	249	5.3	7.7	7.1	
	30.0	215.779	0.07	1.383		215.823	5.5	18.0	250	249	5.4	7.7	7.2	
	32.5	217.298	0.07	1.202		217.327	5.0	18.1	249	248	5.8	7.5	7.1	
	35.0	218.810	0.07	1.200		218.854	5.5	18.1	248	248	5.6	7.5	7.2	
	37.5	220.426	0.05	1.378		220.480	6.0	18.1	750	249	5.7	7.5	7.2	
	40.0	222.034	0.05	1.585		222.120	6.0	18.0	247	248	5.7	7.5	7.3	
	42.5	223.651	0.07	1.210		223.658	6.0	18.1	248	247	5.6	7.6	7.3	
	45.0	225.214	0.07	1.210		225.241	6.0	18.1	249	248	5.5	7.8	7.3	
	47.5	226.644	0.06	1.039		226.641	5.5	18.0	247	248	5.7	7.8	7.3	
	50.0	228.230	0.08	1.283		228.244	6.0	18.1	248	249	5.8	7.8	7.3	
	52.5	230.075	0.10	1.732		230.083	7.0	18.0	247	247	5.8	7.9	7.3	
	55.0	231.514	0.07	1.214		231.619	6.0	18.0	246	247	5.9	5.0	7.3	
	57.5	233.146	0.08	1.390		233.203	6.5	17.9	247	247	6.0	7.9	7.4	
	60.0	234.796	0.08	1.390		234.807	6.5	17.9	248	248	6.1	7.9	7.4	
Φ = 6.0 V _m 29.187 ΔH = 1.392 V _m = 0.284 V _m = 180.5 V _m = 73.208														

Samples Recovered: Filter Number _____; Probe Vial: ☐ Wet Catch: ☐ _____

Gas Sampling Date: _____

Box No. _____
Bag No. _____
Run Vol. _____ Liters

Bag Material _____
Leak Check _____ cc @ 15" Hg
Port Test O₂ Reading _____ %

Molecule Recovery Data:

Impinger No.	1	2	3	4	Subtotal	Total
Find Vol.	38.2	30.0	21.5		6.840	
Initial Vol.		10.1	10.0		6.540	

01503
0.503
0.497
0.499
0.499
0.500

01503
0.503
0.497
0.499
0.499
0.500

Start 1123

End

01503

01503
0.503
0.497
0.499
0.499
0.500

End

01503

01503

EPA Method 5 Field Data Sheet

Project: Holly Train No. 3000 Pilot Tube No. 3000 Cp 34 Leak Check: Pretest: 0.02 15 hrs. Hg
Sample Location: Carbon Meter Cool. Y 0.471 Bar. Pres. 0.03 Ina. Hg
Date: 5/15/00 Test: 1 Run 5 Δ H 0 Static Pres. 0.03 Ina. H₂O
Operators: B. J. D. G. Nozzle No. 0.500 Estimated MC 31 % Post-test: 0 Ina. Hg

Point Number	Time ΔT	Meter Vol. Vm cu. ft.	Velocity Head-ΔP Meter-ΔH Ina. H ₂ O	Orifice Meter-ΔH Ina. H ₂ O	Desired Δ Vm	Desired Running Vm	Vacuum Ina. Hg	Stack Temp. °F	Sampling Train Temperatures - °F				Oxygen 320 p %	
									Filter	Probe	Insp. Out	M/n		M/Out
(2.5) X 75.600														
1	2.5	77.174	0.09	1.541		77.183	5.0	181	253	256	53	74	75	
2	5.0	78.495	0.09	1.546		78.478	5.5	180	260	270	51	76	76	
3	7.5	80.674	0.08	1.718		80.743	5.5	181	252	247	53	77	76	
4	10.0	82.281	0.08	1.372		82.374	5.0	181	254	258	54	80	78	
5	12.5	83.910	0.08	1.380		84.020	5.0	181	253	252	54	81	78	
6	15.0	85.551	0.08	1.352		85.664	5.5	181	255	252	54	82	78	
7	17.5	87.114	0.07	1.210		87.202	5.5	181	252	253	55	82	78	
8	20.0	88.900	0.09	1.555		88.947	6.0	180	252	247	56	82	79	
9	22.5	90.594	0.08	1.385		90.595	5.5	181	252	242	60	83	79	
10	25.0	92.271	0.08	1.385		92.201	5.5	181	252	247	59	83	78	
11	27.5	93.763	0.07	1.216		93.784	5.5	179	253	244	59	83	79	
12	30.0	95.405	0.08	1.387		95.432	5.5	180	251	246	58	83	79	
13	32.5	97.205	0.09	1.540		97.181	6.0	180	251	247	57	82	79	
14	35.0	98.961	0.1	1.741		98.931	6.0	181	254	243	55	83	82	
15	37.5	100.72	0.09	1.500		100.735	6.0	180	253	241	54	84	81	
16	40.0	102.50	0.09	1.563		102.537	6.0	180	250	253	55	84	81	
17	42.5	104.27	0.09	1.509		104.295	6.0	180	250	252	55	85	82	
18	45.0	105.94	0.08	1.375		105.95	6.0	180	249	253	56	86	81	
19	47.5	107.60	0.08	1.39		107.60	6.0	180	250	252	56	86	81	
20	50.0	109.40	0.09	1.57		109.36	6.0	180	250	253	56	87	82	
21	52.5	111.16	0.09	1.576		111.12	6.0	181	250	260	56	87	82	
22	55.0	112.90	0.09	1.57		112.87	6.0	181	250	260	56	85	82	
23	57.5	114.86	0.10	1.74		114.71	6.0	180	250	260	57	85	82	
24	60.0	116.275	0.06	1.04		116.151	6.0	180	251	260	56	85	82	
		40.520	R = 2.91	H = 1.473				180.333				80.98		
		Σ = 60.0 Vm		ΔH =				180						

Samples Recovered: Filter Number 0 : 0 Probe Wash: 0 Wet Catch: 0

Gas Sampling Data:

Box No.	Bag No.	Bag Vol.	Bag Material	Leak Check	Part Test O ₂ Reading	120.0 p.p.m.

Molass Recovery Data:

Impinger No.	Final Vol.	Initial Vol.	Difference
402	408	250	0
	150	100	-

Total: 408

EPA Method 5 Field Data Sheet

Project: Holly Pitot Tube No. CP-80 Leak Check: Pretest: 0.12 15 in. Hg
 Sample Location: Carbonx west Bar. Pres. 30.00 in. Hg Post-test: 0.00 10 in. Hg
 Date: 5/15/90 Test 2 Ren 2 Static Pres. 0.02 in. Hg
 Operators: BS, JSC Nozzle No. Dp 4.70c Estimated MC 5 %

Point Number	Time ΔT	Meter Vol. V_m cu. ft.	Velocity Head- ΔP in. H ₂ O	Orifice Meter- ΔH in. H ₂ O	Desired ΔV_m	Desired Running V_m	Vacuum in. Hg	Stack Temp. °F	Sampling Train Temperatures - °F					Oxygen 320 p %
									Filter	Probe	Imp. Out	M/in	M/Out	
(2.5)(116.528)														
1	2.5	118.44	0.10	1.734	118.371	7.0	18.1	18.1	254	255	57	57	82	80
2	5.0	120.1	.10	1.73	120.21	7.0	18.0	18.0	253	255	57	57	82	82
3	7.5	122.14	.09	1.56	121.97	7.0	18.0	18.0	253	257	57	57	83	82
4	10.1	124.0	.10	1.74	123.81	7.0	18.0	18.0	250	256	56	56	83	83
5	12.5	125.8	.10	1.74	125.063	7.0	18.1	18.1	252	257	57	57	83	83
6	15.1	127.52	.09	1.56	127.424	7.0	18.1	18.1	250	257	57	57	83	83
7	17.5	129.3	.09	1.56	129.17	7.0	18.1	18.1	254	262	58	58	81	82
8	20.1	131.06	.09	1.56	130.93	7.0	18.0	18.0	252	259	57	57	82	81
9	22.5	132.8	.09	1.56	132.68	7.0	18.0	18.0	249	258	58	58	82	81
10	25.1	134.47	.08	1.39	134.337	7.0	18.0	18.0	249	260	60	60	83	81
11	27.5	136.1	.09	1.26	136.04	7.0	18.1	18.1	250	260	61	61	83	81
12	30.0	137.905	.08	1.39	137.77	7.0	17.9	17.9	250	243	64	64	80	80
1	32.5	139.664	0.10	1.734	139.558	7.0	18.1	18.1	257	254	60	60	80	80
2	35.0	141.402	0.10	1.728	141.116	7.0	18.1	18.1	254	252	55	55	80	80
3	37.5	143.166	0.10	1.728	143.254	7.0	18.1	18.1	257	252	56	56	81	80
4	40.0	144.956	0.10	1.731	145.095	7.0	18.1	18.1	254	254	58	58	81	80
5	42.5	146.714	0.08	1.385	146.743	7.0	18.1	18.1	258	251	59	59	82	80
6	45.0	148.354	0.05	1.385	149.012	7.0	18.1	18.1	253	251	60	60	82	80
7	47.5	150.029	0.08	1.385	150.577	7.0	18.1	18.1	251	252	61	61	82	80
8	50.0	151.568	0.07	1.212	151.577	7.0	18.1	18.1	252	255	61	61	82	80
9	52.5	153.261	0.09	1.556	153.324	7.0	18.0	18.0	251	252	62	62	82	81
10	55.0	154.934	0.08	1.381	154.913	7.0	17.9	17.9	250	244	62	62	82	81
11	57.5	156.526	0.07	1.278	156.514	6.5	18.1	18.1	252	242	62	62	82	81
12	60.0	158.113	0.08	1.325	158.114	7.0	18.1	18.1	252	242	62	62	82	81
$\phi =$ V_m ΔH T_m														

Samples Recovered: Filter Number _____; Probe Vial: ☐ Wet Catch: ☐ _____

Gas Sampling Date:

Box No. _____
 Bag No. _____
 Bag Vol. _____ Liters

Moisture Recovery Data:

Impinger No.	1	2	3	4	Balance	Total
Final Vol.	32.5	41.2	2.1	1.0	64.5	64.5
Initial Vol.	1.0	1.0	1.0	1.0	4.0	4.0

Bag Material _____
 Leak Check _____ cc @ 15" Hg
 Post Test O₂ Reading _____ %



Start 15:20
ORsat results 207062
0.314
0.312
0.313
0.315 Avg = 0.314

laboratories, inc

EPA Method 5 Field Data Sheet

Project hilly Train No. 84 Leak Checks Pretest: 15 hrs. Hg
Sample Location Carbonate West Meter Cool. 0.9971 Bar. Pres. 30.02 Ins. Hg Post-test: 15 hrs. Hg
Date 5/15/90 Test Run 1 ΔH 1.838 Static Pres. 0.02 Ins. H₂O 20.40/0.02
Operators B2, JSC Nozzle No. Dh 0.314 Estimated MC 51 X

Point Number	Time ΔT	Meter Vol. V_m cu. ft.	Velocity Head- ΔP Ins. H ₂ O	Orifice Meter- ΔH Ins. H ₂ O	Desired ΔV_m	Desired Running V_m	Vacuum Ins. Hg	Stack Temp. $^{\circ}F$	Sampling Train Temperatures - $^{\circ}F$				Oxygen 320 p %	
									Filter	Probe	Imp. Out	M/in		M/Out
/														
1	10	242270	0.03	0.081		242774	12.0	173	258	256	57	74	74	
2	20	243965	0.035	0.094		245844	12.0	174	257	253	57	75	75	
3	30	245634	0.035	0.094		245844	12.0	174	253	251	57	75	75	
4	40	247235	0.03	0.081		247128	11.5	173	253	252	57	75	75	
5	50	248713	0.03	0.081		248711	11.5	172	255	252	54	74	74	
6	60	250389	0.03	0.081		250344	11.0	174	254	253	60	75	75	
7	70	251935	0.04	0.108		251880	11.0	174	252	251	59	76	76	
8	80	253656	0.04	0.108		253712	12.5	174	254	252	60	76	76	
9	90	255389	0.04	0.108		255305	12.5	173	252	252	59	75	75	
10	100	257286	0.04	0.108		257374	15.0	172	254	252	58	74	74	
11	110	259145	0.04	0.108		259202	15.0	172	252	252	58	73	73	
12	120	261073	0.04	0.108		261026	15.0	172	253	252	57	73	73	
E 1	130	262941	0.04	0.108		262850	15.0	172	253	249	58	71	70	
2	140	264778	0.04	0.107		264689	15.0	173	254	252	57	71	71	
3	150	266659	0.045	0.120		266590	15.0	173	254	251	57	71	71	
4	160	268527	0.045	0.121		268431	15.0	172	253	251	57	71	71	
5	170	270375	0.04	0.107		270337	14.5	173	253	251	57	71	71	
6	180	272176	0.04	0.107		272134	14.5	172	254	251	57	71	71	
7	190	273981	0.04	0.107		273940	14.5	173	254	251	57	71	71	
8	200	275715	0.035	0.093		275664	14.0	173	254	249	57	70	70	
9	210	277251	0.03	0.080		277235	11.5	173	252	252	57	70	70	
10	220	279090	0.04	0.107		279048	15.0	173	254	249	57	70	70	
11	230	280816	0.035	0.094		280740	14.0	172	250	248	57	69	70	
12	240	282719	0.015	0.120		282660	15.0	171	249	250	57	69	69	
Σ = 240 V_m = ΔH = ΔP =														

Samples Recovered: Filter Number _____; Probe Wash: ☐ Wet Catch: ☐ _____

Gas Sampling Date: _____

Box No. _____ Bag Material _____ Bag Metered _____
Bag No. _____ Leak Check _____ as @ 15" Hg _____
Bag Vol. _____ Liters _____ Post Test O₂ Reading _____ %

Moisture Recovery Date: _____

Impinger No.	1	2	3	4	Substrate	Total
Final Vol.						
Initial Vol.						
Difference						

from
5/15/90
0.314/49
0.314

Continued

8748

Cont. 'Inval' $\rightarrow$ per liter gasoline every other point clear for 2.5 minutes
no got necessary volume

EPA Method 5 Field Data Sheet

Project HULLY
 Sample Location Carbone kus
 Date 5/16/40 Test 210v, in Run 1
 Operators BA, RS

Train No. _____
 Meter Coef. γ 0.477
 ΔH $\bullet$ 1.835
 Nozzle No. _____ D_n 314

Pitot Tube No. _____ Cp _____
 Bar. Pres. 30.2 Ina. H₂O _____
 Static Pres. 0.03 Ina. H₂O _____
 Estimated MC 51 % _____

Leak Check: _____
 Pretest: _____
 Post-test: _____

28
 10.4%

[illegible]

Samples Recovered: Filter Number _____: ☐ Probe Vial: ☐ Wet Catch: ☐ _____

Cost Sampling Date:

Box No. _____
 Box No. _____
 Box No. _____

Buy Material _____ cs @ 15¢ Hg
Lack Check _____
Print Test O₂ Reading _____

Moisture Recovery Date:

Employer No.	1	2	3	4	Subtotal	Total
Final Vol.	420	370		100	1694.4	
Initial Vol.					871.6	
Difference						

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5/17/90

1:00 PM

Start 09:42

orsat @

EPA Method 5 Field Data Sheet

orsat Results 17.9% O₂
27.2% CO₂

Project Holly

Sample Location Carbonone West

Date 5/17/90 Test 072X Run 2

Operators RJS, JSG

Train No. ---

Meter Coef. 0.977

ΔH 0.838

Nozzle No. --- D_n 314

Pilot Tube No. --- Cp ---

Bar. Pres. 30.03 Ina. Hg

Static Pres. 0.02 Ina. H₂O

Estimated MC 5.1 %

Leak Check:

Pretest: ad17 $\odot$ 18 Ina. Hg

Post-test: 017 $\odot$ 15 Ina. Hg

Point Number	Time ΔT	Meter Vol. V_m cu. ft.	Velocity Head- ΔP Ina. H ₂ O	Orifice Meter- ΔH Ina. H ₂ O	Desired ΔV_m	Desired Running V_m	Vacuum Ina. Hg	Stock Temp. $^{\circ}F$	Sampling Train Temperatures $^{\circ}F$				Oxygen 320 P %
									Filter	Probe	Insp. Out	M/in	M/Out
1	11	241.347	0.044	0.105		241.340	7.0	17.1	249	253	59/53	65	65
2	22	242.273	0.044	0.106		242.273	7.0	17.6	259	257	54/51	67	66
3	33	245.262	0.044	0.106		245.262	7.0	17.7	253	249	54/51	68	67
4	44	247.445	0.044	0.119		247.442	8.0	17.7	250	249	52/51	70	69
5	55	249.416	0.044	0.106		249.410	7.5	17.6	250	244	50/51	70	69
6	66	249.411	0.044	0.107		249.403	8.0	17.5	251	249	52/51	71	71
7	77	248.346	0.044	0.107		248.340	8.0	17.5	251	250	54/53	71	72
8	88	248.342	0.044	0.107		248.340	8.0	17.4	251	248	56/51	73	73
9	99	248.347	0.044	0.107		248.340	8.0	17.4	251	249	55/51	73	74
10	110	249.330	0.044	0.108		249.322	8.0	17.2	249	245	53/53	73	73
11	121	248.339	0.044	0.108		248.331	7.5	17.2	250	246	50/55	77	76
12	132	248.319	0.044	0.108		248.312	8.0	17.5	250	245	59/55	76	76
13	143	248.313	0.044	0.108		248.305	8.0	17.4	247	240	55/54	73	75
14	154	247.142	0.044	0.108		247.134	8.5	17.4	250	252	57/55	74	75
15	165	249.248	0.044	0.108		249.240	8.5	17.6	251	251	59/	76	76
16	176	248.235	0.044	0.108		248.227	8.5	17.6	250	244	60/55	77	76
17	187	248.176	0.044	0.108		248.168	8.0	17.4	251	251	61/55	80	79
18	198	248.041	0.044	0.108		248.033	8.0	17.4	251	250	60/55	78	79
19	209	248.071	0.044	0.108		248.063	8.0	17.4	250	250	60/56	79	79
20	220	248.078	0.044	0.109		248.070	8.0	17.4	249	248	60/56	79	80
21	231	248.078	0.044	0.109		248.070	8.5	17.3	249	249	61/57	80	81
22	242	248.078	0.044	0.109		248.070	8.5	17.2	249	248	61/59	80	81
23	253	248.078	0.044	0.109		248.070	8.5	17.1	248	248	62/59	82	83
24	264	248.078	0.044	0.109		248.070	8.5	17.1	249	249	62/59	82	83
$\Phi = 2.54$ $V_m = 172.020$ $\Delta H = 0.102$ 174.08 174.08									Temp 74.563				

Samples Recovered: Filter Number ---; Probe Vial: ☐ Wat Catch: ☐ ---

Gas Sampling Date:

Box No. ---

Bag No. ---

Bag Vol. --- Liters

Bag Material ---

Leak Check --- cc @ 15" Hg

Post Test O₂ Reading --- %

Molature Recovery Data:

Inspinger No. ---

Final Vol. ---

Initial Vol. ---

Difference ---

1	2	3	4	Subtotal	Total
47.0	2.64	1.00	63.7		
---	---	XAD	1.00	62.1.6	
47.0	2.64				

Start 16:23

01510 16.45

5 or SAT results 17.9% or 20.962

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EPA Method 5 Field Data Sheet

Booklet
Holly

Booklet
Holly

Doc No.	Tally	Inch No.	7
---------	-------	----------	---

Date Recd. 10/1/54
 From No. 2047
 Pilot Tube No. 2053

Train No. 10114 Pitot Tube No. 2153 Cp. 86
 Date 11/1

Train No. Pilot Tube No. Cp 184 Leak Check: 28
 Buckle 10/14 Ins Hg 19 ins. Hg
 Pressure 21.53 21.53

Project: _____
Sample Location: Carb and Wesi
Date: 5/17/98 **Test by:** Ran 3

Project: _____
 Sample: _____
 Location: Carb and 4451
 Date: 5/17/90 Test Dist. Run 3
 Meter: Coil 8
 ΔH: 0.838

Sample	Location	Carb. Δ & Δ wss!	Meter	Coef. γ	Bar. Pres.	Static Pres.
5	11/7/96	Test Δ & Δ Run 3	Δ H	0.938	0.0	0.0

[illegible]

Project _____
 Sample Location Carb and wss
 Date 5/17/96 Test dyk Run 3
 Meter Coed. 8 0.040
 Bar. Pres. 3
 Static Pres. 0.02 Ina. H₂O
 ΔH ● 6.538 Ina. H₂O
 Post-test 2.22 Ina. Hg

Point Number	Time ΔT	Meter Vol. V_m cu. ft.	Velocity Head- ΔP Meter- ΔH Ins. H ₂ O	Orifice Ins. H ₂ O	Desired ΔV_m	Desired Running V_m	Vacuum Ins. Hg	Stack Temp. °F	Sampling Train Temperatures -- °F				Oxygen 320 p %	
									Filter	Probe	Imp. Out	M/in		M/Out
(11)	(22.5)													
1	11	342.493	0.05	0.135		343.471	6.0	172	744	250	50/54	74	74	
2	22	345.903	0.06	0.161		345.927	6.5	172	253	251	57/53	73	73	
3	33	348.342	0.06	0.161		348.383	6.5	172	251	251	57/53	72	72	
4	44	350.730	0.06	0.161		350.833	6.5	171	253	252	56/53	73	73	
5	55	353.348	0.07	0.188		353.448	7.5	174	254	254	56/53	73	74	
6	66	356.058	0.07	0.188		356.141	7.5	174	249	251	57/53	74	74	
7	77	358.807	0.07	0.188		358.745	8.0	174	250	251	57/55	75	76	
8	88	361.562	0.06	0.161		361.551	7.0	173	248	246	57/55	75	76	
9	99	364.311	0.06	0.161		364.312	7.0	173	248	251	56/54	76	76	
10	110	367.061	0.05	0.134		367.063	6.5	172	248	247	57/55	72	73	
11	121	369.811	0.05	0.134		369.813	6.5	173	248	250	57/55	72	73	
12	132	372.564	0.05	0.134		372.562	6.5	173	251	254	57/56	70	70	
1	143	375.314	0.06	0.160		375.313	8.0	173	250	254	57/56	70	70	
2	154	378.064	0.05	0.134		378.062	7.0	173	250	253	54/52	71	71	
3	165	379.409	0.05	0.134		379.560	7.0	173	250	253	54/52	70	71	
4	176	379.655	0.05	0.134		379.560	6.0	173	249	253	57/52	71	71	
5	187	381.012	0.06	0.160		381.560	6.0	173	249	253	57/51	70	70	
6	198	384.034	0.06	0.160		384.000	8.0	173	250	253	54/51	70	70	
7	209	386.462	0.06	0.160		386.440	8.0	173	249	252	54/51	70	70	
8	220	388.841	0.06	0.160		388.851	5.0	173	250	253	54/51	70	70	
9	231	391.261	0.06	0.160		391.323	8.0	173	249	253	54/51	71	71	
10	242	393.704	0.06	0.160		393.700	9.0	173	251	253	54/51	71	71	
11	253	396.102	0.06	0.160		396.258	9.0	173	249	253	54/51	70	70	
12	264	398.500	0.06	0.160		398.649	9.0	173	250	253	55/53	70	70	
									Avg = 71.917					
									71.917					

Sampled: _____
 Recorder: _____
 Filter Number: _____
 Probe Vash: ☐ Wet Catch: ☐

Est Sampling Date:

Box No. _____

Bay Material 08 @ 15' Ho

Moisture Recovery Date:

Impinger No.	1	2	3	4	Subtotal	Total
Fined Vol.	452	424		100	650	X
Initial Vol.	—	—	440	100	670	
Difference	452	424				



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Start @ 10:12

ORsat Q

EPA Method 5 Field Data Sheet

ORsat results

21.0% O₂ 4.9% CO₂

Project Holly
Sample Location Carbonate West
Date 5/18/96 Test RAH Run 1
Operators BH JS

Train No. 30.07
Meter Coef. 0.447
 ΔH 1.838
Nozzle No. D₀ 500

Pilot Tube No. 84
Bar. Pres. 30.07 Ina. Hg
Static Pres. 0.02 Ina. H₂O
Estimated MC 51 %

Leak Check: 0.01 15 Ina. Hg
Pretest: 0.01 15 Ina. Hg
Post-test: 0.01 15 Ina. Hg
22.0% O₂

Point Number	Time ΔT	Meter Vol. V_m cu. ft.	Velocity Head- ΔP Ina. H ₂ O	Orifices Meter- ΔH Ina. H ₂ O	Desired ΔV_m	Desired Running V_m	Vacuum Ina. Hg	Stack Temp. °F	Sampling Train Temperature - °F				Oxygen 320 P %
									Filter	Probe	Inp. Out	M/In	M/Out
1	5	402.269	0.05	0.845	114.805	11.0	178	253	253	251	58/245	66	66
2	10	407.559	0.06	1.012	110.582	11.5	174	252	252	254	118/245	66	66
3	15	410.331	0.06	1.013	410.360	4.5	174	251	251	250	118/245	67	67
4	20	412.785	0.05	0.848	412.866	4.0	178	250	250	247	48/245	67	67
5	25	415.550	0.06	1.017	415.693	5.0	178	253	246	246	50/245	68	66
6	30	418.432	0.06	1.017	418.428	5.0	177	248	248	245	50/245	68	66
7	35	420.902	0.05	0.848	421.004	4.5	178	249	248	248	50/245	69	67
8	40	423.990	0.05	0.854	423.590	5.0	179	250	249	249	55/245	75	70
9	45	426.951	0.05	0.855	426.661	5.0	180	251	249	249	56/245	77	71
10	50	428.397	0.05	0.859	428.741	5.0	179	249	249	248	56/245	79	74
11	55	430	0.05	0.862	433.331	5.0	174	250	249	249	55/245	81	75
12	60	433.500	0.05	0.863	433.495	5.0	179	250	248	248	55/245	79	77
13	65	436.630	0.06	1.035	439.612	6.0	179	249	248	248	55/245	81	78
14	70	439.686	0.06	1.038	442.249	6.0	177	248	238	238	56/245	80	70
15	75	442.498	0.06	1.038	445.002	5.5	175	247	246	246	57/245	75	75
16	80	445.021	0.05	0.863	447.702	5.5	174	249	249	249	59/245	77	74
17	85	447	0.05	0.854	450.449	5.0	178	250	250	250	59/245	85	84
18	90	449.875	0.04	0.693	452.297	5.5	178	248	248	248	58/245	81	79
19	95	452.171	0.04	0.700	454.639	6.0	177	249	249	249	58/245	82	80
20	100	454.520	0.04	0.645	456.961	6.5	177	250	249	249	58/245	82	81
21	105	456.871	0.04	0.646	459.306	7.0	176	247	250	250	59/245	85	82
22	110	459.244	0.04	0.644	461.741	6.0	175	250	251	251	60/245	86	83
23	115	461.351	0.03	0.526	463.128	6.0	176	249	250	250	60/245	86	83
24	120	463.311	0.03	0.526									
Σ		V _m	ΔH	ΔP									

after run broke

Samples Recovered: Filter Number: : Probe Wash: : Wet Catch: :

Gas Sampling Data:

Box No.
Bag No.
Bag Vol. Liters

Bag Material
Leak Check cc @ 15" Hg
Post Test O₂ Reading %

Moisture Recovery Data:

Impinger No.	1	2	3	4	Total
Final Vol.	4.64	4.97			2.50
Initial Vol.	-	-	4.10		
Difference					



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EPA Method 5 Field Data Sheet

Project 40114 501k4
 Sample Location Carbonate WST
 Date 5/18/90 Test PAH Run 2
 Operators BZ, JSC

Train No. 184
 Meter Cool. 9911
 ΔH @ 1.858
 Nozzle No. Dn 500

Pilot Tube No. 30.07 Ins. Hg
 Bar. Pres. 20.2 Ins. H₂O
 Static Pres. 20.2 Ins. H₂O
 Estimated MC 51 %
 Leak Checks: Pretest: 0.003 @ 15" Ins. Hg
Post-test: 0.003 @ 9" Ins. Hg

Start 15:45

OPSGT results:
 21.4% O₂, 4.09% CO₂

Point Number	Time ΔT	Meter Vol. V_m cu. ft.	Velocity Head- ΔP Ins. H ₂ O	Orifice Meter- ΔH Ins. H ₂ O	Desired ΔV_m	Desired Running V_m	Vacuum Ins. Hg	Stack Temp. °F	Sampling Train Temperatures - °F					Oxygen 320 P %
									Filter	Probe	Insp. Out	M/In	M/Out	
/														
1	5	466.864	0.06	1.052		466.864	4.0	177	744	744	50/245	85	85	
2	10	449.762	0.06	1.052		449.762	4.5	177	250	245	50/245	85	85	
3	15	472.619	0.06	1.054		472.619	4.5	176	251	247	51/245	85	85	
4	20	475.255	0.05	0.881		475.255	4.5	176	254	245	51/245	85	85	
5	25	477.821	0.05	0.881		477.821	4.5	176	250	245	53/245	85	85	
6	30	480.106	0.05	0.882		480.106	4.5	176	251	248	50/245	85	85	
7	35	483.101	0.05	0.884		483.101	4.5	175	251	241	50/245	85	85	
8	40	485.712	0.05	0.883		485.712	5.0	176	250	247	55/245	85	85	
9	45	488.030	0.04	0.706		488.030	4.5	176	248	242	55/245	85	85	
10	50	490.860	0.04	0.707		490.860	4.5	175	250	246	50/245	85	85	
11	55	492.001	0.04	0.707		492.001	4.5	175	251	247	50/245	85	85	
12	60	495.152	0.04	0.708		495.152	4.5	174	250	247	50/245	85	85	
13	65	495.181	0.06	0.859		495.181	5.5	174	252	248	52/245	85	85	
14	70	501.125	0.06	1.056		501.074	5.5	174	251	248	51/245	85	85	
15	75	501.125	0.06	1.054		503.972	5.5	174	250	247	51/245	85	85	
16	80	501.125	0.05	0.853		506.610	6.0	174	250	242	51/245	85	85	
17	85	501.125	0.05	0.887		501.250	5.0	173	250	240	54/245	85	85	
18	90	501.125	0.05	0.881		511.680	5.0	174	251	246	55/245	85	85	
19	95	501.125	0.05	0.880		514.520	5.5	174	251	247	50/245	85	85	
20	100	501.125	0.06	1.056		517.011	6.0	174	251	246	54/245	85	85	
21	105	501.125	0.06	1.055		520.241	6.0	173	250	246	54/245	85	85	
22	110	501.125	0.06	1.056		523.172	6.5	172	251	242	55/245	85	85	
23	115	501.125	0.06	1.054		526.049	8.0	173	252	246	57/245	85	85	
24	120	501.125	0.06	1.052		528.920	8.0	172	251	246	57/245	85	85	
/														

Samples Recovered: Filter Number _____ : _____ Wet Catch : ☐ Probe Vial : ☐ _____

Gas Sampling Date:

Box No. _____
 Bag No. _____
 Bag Vol. _____ Liters

Bag Material _____
 Leak Check _____
 Post Test O₂ Reading _____ %

Moisture Recovery Data:

Impinger No.	1	2	3	4	Subtotal	Total
Final Vol.	4.46	1.46		6.64	6.64	
Initial Vol.						

PACE

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Call Kalpn Neasum at 1121-1121
Start 0844 @ 905 for original results
Lab has bag - all 798
exhaustively left - 0.711
0507 @
0902

EPA Method 5 Field Data Sheet

Project: Holly Train No. 184 Leak Check: 0.16 73
Sample Location: cut and 4051 Meter Cool. 0.997 Ina. Hg 0.15 Ina. Hg
Date: 5/14/90 Test Run 3 ΔH @ 1.838 Static Pres. 0.02 Post-test: 0.1 @ 12 Ina. Hg
Operators: AB, JSC Nozzle No. 0.711 Estimated MC 51 %

Point Number	Time ΔT	Meter Vol. V _m ca. ft.	Velocity Head-ΔP Meter-ΔH Ina. H ₂ O	Orifice Meter-ΔH Ina. H ₂ O	Desired ΔV _m	Desired Running V _m	Vacuum Ina. Hg	Stock Temp. °F	Sampling Train Temperatures - °F				Oxygen 320 P %
									Filter	Probe	Inp. Out	M/n	M/Out
1	7.5	54.1751	0.05	3.464		541800	9.0	74	241	255	43/45	65	65
2	5.0	54.17271	0.05	3.476		544022	9.5	74	250	258	43/45	66	66
3	7.5	54.1901	0.06	4.174		547262	10.0	74	250	252	42/45	68	68
4	10.0	54.1514	0.05	3.484		549846	10.0	74	251	249	46/45	70	66
5	12.5	55.2036	0.05	3.505		552441	10.0	74	251	251	46/45	74	67
6	15.0	55.4589	0.05	3.515		555040	10.0	74	251	250	46/45	76	68
7	17.5	55.7020	0.04	2.814		557372	9.0	73	250	249	46/45	76	67
8	20.0	55.9366	0.04	2.814		559698	9.0	74	252	250	47/45	78	67
9	22.5	56.1545	0.03	2.119		561734	8.0	74	252	251	40/45	80	69
10	25.0	56.3852	0.04	2.832		564002	9.0	73	252	251	46/45	80	70
11	27.5	56.6981	0.03	2.134		566104	8.0	72	253	251	47/45	82	71
12	30.0	56.9200	0.03	2.137		568142	8.0	71	254	251	47/45	82	71
13	32.5	57.0019	0.04	2.145		570468	9.0	76	253	244	46/45	71	70
14	35.0	57.2402	0.03	2.106		572475	8.0	75	254	255	41/45	72	71
15	37.5	57.4571	0.03	2.100		574484	8.0	75	252	251	42/45	73	71
16	40.0	57.6400	0.03	2.109		576506	8.0	74	251	247	42/45	74	70
17	42.5	57.8036	0.03	2.113		578520	8.0	74	251	245	44/45	75	71
18	45.0	58.0381	0.03	2.118		580552	8.0	75	253	250	44/45	78	72
19	47.5	58.2432	0.03	2.118		582578	8.0	76	249	238	44/45	78	72
20	50.0	58.4451	0.03	2.115		584600	8.0	74	251	243	45/45	76	71
21	52.5	58.6525	0.03	2.118		586624	8.0	76	253	249	47/45	74	73
22	55.0	58.8556	0.03	2.120		588648	8.0	75	252	247	47/45	80	73
23	57.5	59.0600	0.03	2.130		590672	8.0	75	252	247	47/45	82	74
24	60.0	59.2677	0.03	2.140		592714	8.0	72	251	241	45/45	82	74
Σ = 60		573.362		ΔH = 2.607		ΔV _m = 0.14		Σ = 174.042					72.721

Samples Recovered: Filter Number : Probe Wash : Wet Catch : 0

Gas Sampling Date:

Box No.
Bag No.
Liters

Bag Material
Leak Check as @ 15" Hg
Part Test O₂ Reading %

Molecule Recovery Data:

Impinger No.	Final Vol.	Initial Vol.	Reference
1	14.2	14.96	100
2	14.2	14.96	100
3	14.2	14.96	100
4	14.2	14.96	100
Total	56.8	59.84	1000

Formaldohyde Sampling

Left hand	Right hand
10.1	0.1
10.1	5.1
10.1	0.1
10.1	5.1
10.1	0.1
10.1	5.1
10.1	0.1
10.1	5.1

Route	Time
101	60
101	65
101	70
101	75
101	80

Run #2 Date 3/17
Start Time 16:15
Reverse Time 16:50

10.1	0.9
10.1	0.7
10.1	0.5
10.1	0.5
10.1	0

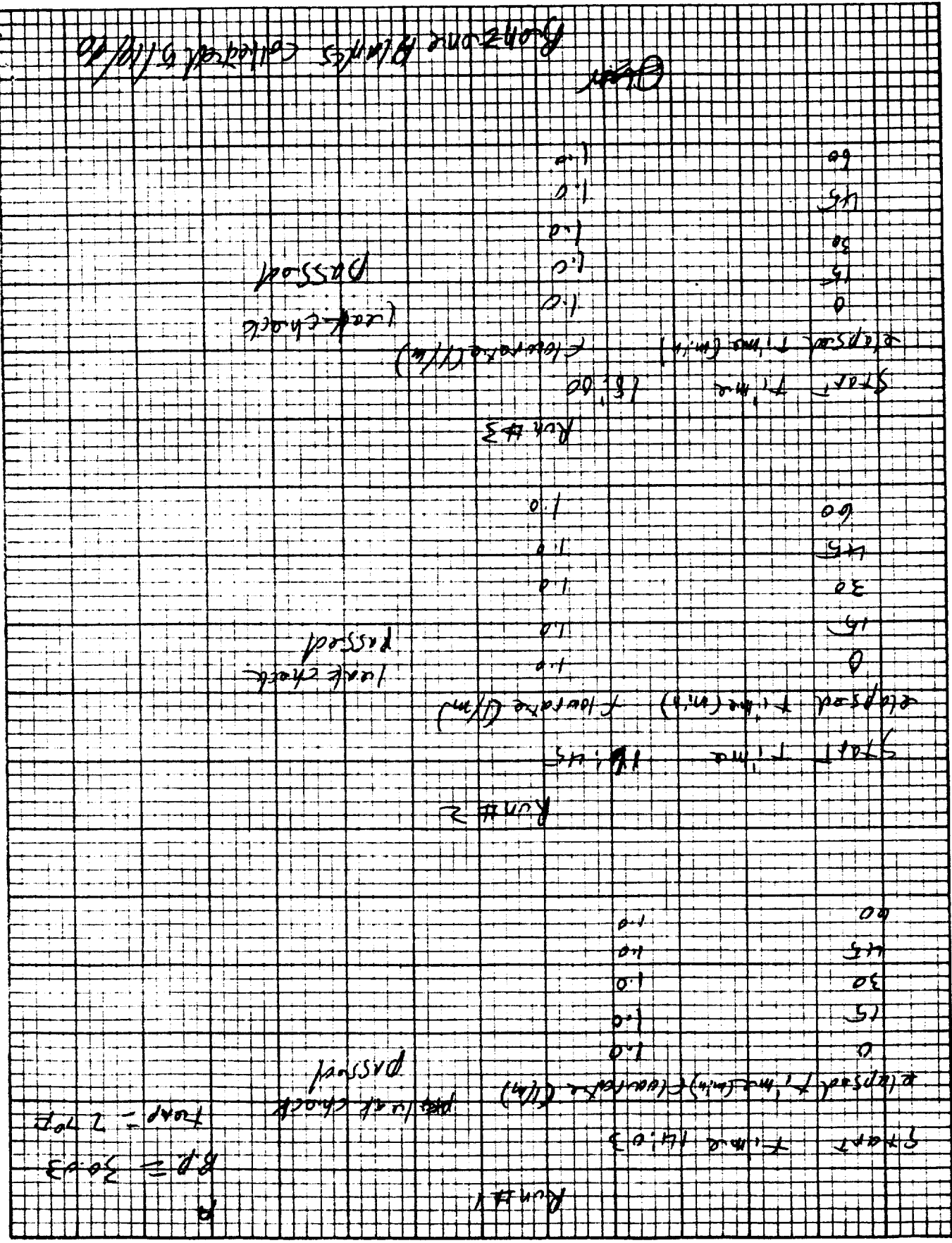
Rentil Drake 6/17
 700-11-13
 13/15

Notepad
Date-Chair

$$\frac{1}{2} \text{ mol} = 0.5 \text{ mol}$$

Banzene Sampling

Subject Project No. 440544.000



Banzene Blanks collected 5/17/90

pacel laboratories, inc.

EPA Method 5 Field Data Sheet

Project 10114
 Sample Location Sand Kerb west
 Date 5/15/90 Test Run
 Operators _____
 Train No. _____
 Meter Cool. Y _____
 ΔH ● _____
 Nozzle No. _____ Dn _____
 Pitot Tube No. _____ Cp _____
 Bar. Pres. _____ Ina. Hg _____
 Static Pres. _____ Ina. H₂O _____
 Estimated MC _____ %
 Leak Check: _____
 Pretest: _____ ● 15 Ina. Hg _____
 Post-test: _____ ● _____ Ina. Hg _____

Point Number	Time ΔT	Meter Vol. V_m cu. ft.	Velocity Head- ΔP in. H ₂ O	Orifice Meter- ΔH in. H ₂ O	Desired ΔV_m	Desired Running V_m	Vacuum in. Hg	Stock Temp. °F	Sampling Train Temperatures - °F				Oxygen 320 p %	
									Filter	Probe	Inp. Out	M/in M/Out		
10-14-6														
N 1	(X)		0.03					180						
2			0.04											
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
E 1			0.03											
2			0.04											
3			0.02											
4														
5														
6														
7														
8														
9														
10														
11														
12														
10-15-6														
10-16-6														
10-17-6														
10-18-6														
10-19-6														
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10-47-6														
10-48-6														
10-49-6														
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10-94-6														
10-95-6														
10-96-6														
10-97-6														
10-98-6														
10-99-6														
10-100-6														

Samples Recovered: Filter Number : ☐ Probe Vash : ☐ Wet Catch : ☐

Cos Sampling Date:

Box No. _____ Bag Material _____
 Box No. _____ Leak Check _____ cs ● 15° Hg _____
 Box Vol. _____ Post Test O₂ Reading _____%

Moisture Recovery Date: _____

Employer No.	1	2	3	4	Deductible	Taxable
Fired Vol.						
Initial Vol.						

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Project HOLLY
 Sample Location 2nd Carrs
 Date 5/16/70 Test Run
 Operators _____
 Train No. _____
 Meter Cool. Y _____
 ΔH $\bullet$ _____
 Nozzle No. _____ D_n _____
 Pilot Tube No. _____ C_p _____
 Bar. Pres. _____ Ina. Hg _____
 Static Pres. _____ Ina. H₂O _____
 Estimated MC _____ %
 Leak Check:
 Pretest: _____ $\bullet$ 15 Ina. Hg
 Post-test: _____ $\bullet$ _____ Ina. Hg

[illegible]

Samples Recovered: Filler Number _____: ☐ Probe Vash: ☐ Wet Catch: ☐ _____

Gas Sampling Date:

Box No. _____ Bag Material _____
Bag No. _____ Look Check _____ cc @ 15" Hg _____
Tare _____ Gross Total Pounds _____

Molture Recovery Date: _____

Impinger No.	1	2	3	4	Duplicate Total
Final Vol.					
Initial Vol.					



EPA Method 5 Field Data Sheet

Project: H014 Train No. Pitot Tube No. Cp Leak Check:
 Sample Location: Gate Two East Meter Coef. γ Bar. Pres. Ina. Hg Pretest: ● 15 Ina. Hg
 Date: 5/17/90 Test Run ΔH ● Static Pres. Ina. H₂O Post-test: ● Ina. Hg
 Operators: Nozzle No. D₉ Estimated MC %

Point Number	Time ΔT	Meter Vol. V _m cu. ft.	Velocity Hood-ΔP Meter-ΔH Ina. H ₂ O	Orifice Meter-ΔH Ina. H ₂ O	Desired Δ V _m	Desired Running V _m	Vacuum Ina. Hg	Stack Temp. °F	Sampling Train Temperatures - °F				Oxygen 320 p %		
									Filter	Probe	Insp. Out	M/in		M/Out	
1															
2															
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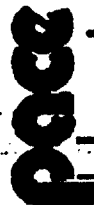
Samples Recovered: Filter Number : ☐ Probe Wash : ☐ Wet Catch : ☐

Gas Sampling Date:

Box No. Bag Material
 Bag No. Leak Check cc @ 15" Hg
 Run Vol (Name)

Moisture Recovery Date:

Impinger No.	1	2	3	4	Subtotal	Total
Final Vol.						
Initial Vol.						



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EPA Method 5 Field Data Sheet

Project: Holly Q 415 Pitot Tube No. Cp Leak Check:
Sample Location: Carb Turb Est Meter No. Bar. Pres. Ina. Hg Pretest: ● 15 Ina. Hg
Date: 5/15/90 Test: Run: ΔH ● Static Pres. Ina. H₂O Post-test: ● Ina. Hg
Operators: Nozzle No. D_h Estimated MC %

Point Number	Time ΔT	Meter Vol. V _m cu. ft.	Velocity Head-ΔP Ina. H ₂ O	Orifice Ina. H ₂ O	Desired ΔV _m	Desired Running V _m	Vacuum Ina. Hg	Stock Temp. °F	Sampling Train Temperatures - °F				Oxygen %	
									Filter	Probe Inp. Out	M/in	M/Out		
1		0.03						188						
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
F1		0.0105												
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
Σ		V _m	ΔP	ΔP	ΔV _m	V _m		T _g					T _{sp}	

Samples Recovered: Filter Number : ☐ Probe Vash: ☐ Wet Catch: ☐

Gas Sampling Data:

Box No. Bag Material
Bag No. Leak Check cc @ 15" Hg
Box Vol. Liters Post Test O₂ Reading %

Moisture Recovery Data:

Impinger No.	1	2	3	4	Bottom	Total
Final Vol.						
Initial Vol.						

pace
laboratories, inc

EPA Method 5 Field Data Sheet

10405

Project U11Y Test Run Train No. Pilot Tube No. Leak Check: 15 in. Hg
 Sample Location Meter Coal Bar. Pres. in. Hg
 Date 5/14/66 Needle Δ H State Pres. in. Hg
 Operators WJ, JSC Needle No. D_h Estimated MC %

Point Number	Time ΔT	Meter Vel. ca. V _m	Velocity Head-Δp _{static} in. H ₂ O	Orifice ΔH in. H ₂ O	Dashed ΔV _m	Dashed Running V _m	Vacuum in. Hg	Stack Temp. °F	Sampling Train Temperatures - °F				Oxygen 320 p	
									Filter	Probe	Inp. Out	M/In		M/Out
1			0.35					183						
2			0.35											
3			0.35											
4			0.35											
5			0.35											
6			0.35											
7			0.35											
8			0.35											
9			0.35											
10			0.35											
11			0.35											
12			0.35											

APPENDIX C

LABORATORY DATA

REPORT OF LABORATORY ANALYSIS

Holly Sugar
2 North Cascade
Colorado Springs, CO 80903

June 27, 1990
PACE Project
Number: 400504400

Attn: Mr. Tim Robbins

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

751860	751890	751900
05/15/90	05/15/90	05/15/90
05/16/90	05/16/90	05/16/90
Cr+6 run #1	Cr+6 run #1	Cr+6 run #2
P.W.	filter	P.W.

Parameter

Units

MDL

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Chromium	ug	0.30	0.60	2.2	0.66
Chromium, Hexavalent	mg	0.001	LT 0.003	LT 0.001	LT 0.003

MDL Method Detection Limit
LT Less than.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
Page 2

June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:	751940	751950	751990
Date Collected:	05/15/90	05/15/90	05/15/90
Date Received:	05/16/90	05/16/90	05/16/90
	Cr+6 run #2	Cr+6 run #3	Cr+6 run #3
<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>filter</u>
		<u>P.W.</u>	<u>filter</u>

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Chromium	ug	0.30	2.2	1.2	2.3
Chromium, Hexavalent	mg	0.001	LT 0.001	LT 0.002	LT 0.001

MDL Method Detection Limit
LT Less than.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
Page 3

June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

	752010	756140	756190
	05/15/90	05/18/90	05/18/90
	05/16/90	05/21/90	05/21/90
Cr+6 Blank	PAH Run #1	PAH Run #2	
filter	Cont. 1	Cont. 1	

Parameter

Units

MDL

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Parameter	Units	MDL	752010	756140	756190
Chromium	ug	0.30	2.4	-	-
Chromium, Hexavalent	mg	0.0010	LT 0.001	-	-

ORGANIC ANALYSIS

POLYNUCLEARS BY GC/MS (EPA 8270)

Parameter	Units	MDL	752010	756140	756190
Naphthalene	mg	0.001	-	0.60	0.64
Acenaphthylene	mg	0.001	-	LT 0.10	LT 0.10
Acenaphthene	mg	0.001	-	LT 0.10	LT 0.10
Fluorene	mg	0.001	-	LT 0.10	LT 0.10
Phenanthrene	mg	0.001	-	LT 0.10	LT 0.10
Anthracene	mg	0.001	-	LT 0.10	LT 0.10

Fluoranthene	mg	0.001	-	LT 0.10	LT 0.10
Pyrene	mg	0.001	-	LT 0.10	LT 0.10
Benzo(a)anthracene	mg	0.001	-	LT 0.10	LT 0.10
Chrysene	mg	0.001	-	LT 0.10	LT 0.10
Benzo(b)fluoranthene	mg	0.001	-	LT 0.10	LT 0.10
Benzo(k)fluoranthene	mg	0.001	-	LT 0.10	LT 0.10

Benzo(a)pyrene	mg	0.001	-	LT 0.10	LT 0.10
Ideno(1,2,3-cd)pyrene	mg	0.001	-	LT 0.10	LT 0.10
Dibenzo(a,h)anthracene	mg	0.001	-	LT 0.10	LT 0.10
Benzo(g,h,i)perylene	mg	0.001	-	LT 0.10	LT 0.10
Nitrobenzene-d5 (Surrogate Recovery)		-		130%	104%
2-Fluorobiphenyl (Surrogate Recovery)		-		96%	89%

Terphenyl-d14 (Surrogate Recovery)		-		74%	64%
Date Extracted for GCMS Semi-volatiles		-		05/31/90	05/31/90

MDL Method Detection Limit
LT Less than.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins

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June 27, 1990

PACE Project

Number: 400504400

Holly Sugar AB2588

PACE Sample Number:

Date Collected:

Date Received:

756240

05/19/90

05/21/90

756290

05/19/90

05/21/90

756310

05/18/90

05/21/90

PAH Filter

Parameter	Units	MDL	PAH Run #3 Cont. 1	Blank Cont. 1	PAH Run 1 XAD
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ORGANIC ANALYSIS

POLYNUCLEARS BY GC/MS (EPA 8270)

Naphthalene	mg	0.001	0.59	0.003	-
Acenaphthylene	mg	0.001	LT 0.10	ND	-
Acenaphthene	mg	0.001	LT 0.10	ND	-
Fluorene	mg	0.001	LT 0.10	ND	-
Phenanthrene	mg	0.001	LT 0.10	ND	-
Anthracene	mg	0.001	LT 0.10	ND	-
Fluoranthene	mg	0.001	LT 0.10	ND	-
Pyrene	mg	0.001	LT 0.10	ND	-
Benzo(a)anthracene	mg	0.001	LT 0.10	ND	-
Chrysene	mg	0.001	LT 0.10	ND	-
Benzo(b)fluoranthene	mg	0.001	LT 0.10	ND	-
Benzo(k)fluoranthene	mg	0.001	LT 0.10	ND	-
Benzo(a)pyrene	mg	0.001	LT 0.10	ND	-
Ideno(1,2,3-cd)pyrene	mg	0.001	LT 0.10	ND	-
Dibenzo(a,h)anthracene	mg	0.001	LT 0.10	ND	-
Benzo(g,h,i)perylene	mg	0.001	LT 0.10	ND	-
Nitrobenzene-d5 (Surrogate Recovery)			115%	80%	-
2-Fluorobiphenyl (Surrogate Recovery)			107%	60%	-
Terphenyl-d14 (Surrogate Recovery)			65%	86%	-
Date Extracted for GCMS Semi-volatiles			05/31/90	05/31/90	05/31/90

MDL Method Detection Limit
LT Less than.
ND Not detected at or above the MDL.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
Page 5

June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

756320	756330	756340
05/18/90	05/19/90	05/19/90
05/21/90	05/21/90	05/21/90
PAH Run 2	PAH Run 3	
<u>XAD Spike</u>	<u>XAD</u>	<u>XAD Blank</u>

Parameter

Units

MDL

ORGANIC ANALYSIS

POLYNUCLEARS BY GC/MS (EPA 8270)
Date Extracted for GCMS Semi-volatiles

05/31/90	05/31/90	05/31/90
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MDL Method Detection Limit

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
Page 6

June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

756350	756390	756460
05/14/90	05/14/90	05/14/90
05/21/90	05/21/90	05/21/90

Metals	Metals	
Run #1	Run #2	Filter
Filter	Filter	Blank

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Filter</u>	<u>Filter</u>	<u>Blank</u>
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INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Arsenic	mg	0.0050	LT 0.00079	LT 0.00074	LT 0.00074
Beryllium	ug	0.040	ND	ND	ND
Cadmium	ug	0.005	-	7.1	-
Cadmium	ug	0.0050	3.1	-	LT 0.007
Copper	ug	0.070	0.77	0.83	ND
Lead	ug	0.20	2.5	2.6	ND
Manganese	ug	0.1	2.5	2.1	0.2
Mercury	ug	0.040	1.5	5.7	0.06

MDL Method Detection Limit
LT Less than.
ND Not detected at or above the MDL.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
Page 7

June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

751870	751880	751910
05/15/90	05/15/90	05/15/90
05/16/90	05/16/90	05/16/90
Cr+6 run #1	Cr+6 run #1	Cr+6 run #2
<u>Imp. W.</u>	<u>Imp. pt. 2</u>	<u>Imp. W.</u>

Parameter

Units

MDL

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Chromium

ug	0.30	0.36	0.38	LT 0.46
----	------	------	------	---------

MDL Method Detection Limit
LT Less than.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
Page 8

June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

751920	751930	751960
05/15/90	05/15/90	05/15/90
05/16/90	05/16/90	05/16/90
Cr+6 run	Cr+6 run	Cr+6 run
#2	#2	#3
<u>Imp. pt.</u>	<u>Imp. pt. 2</u>	<u>Imp. W.</u>

Parameter

Units

MDL

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Chromium	ug	0.30	1.0	6.6	0.62
Chromium, Hexavalent	mg	0.001	-	LT 0.024	-

MDL Method Detection Limit
LT Less than.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
Page 9

June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

751970	751980	752000
05/15/90	05/15/90	05/15/90
05/16/90	05/16/90	05/16/90
Cr+6 run	Cr+6 run	Cr+6 run
#3	#3	#1
<u>Imp. pt. 1</u>	<u>Imp. pt. 2</u>	<u>Imp. pt. 2</u>

Parameter

Units

MDL

Imp. pt. 1

Imp. pt. 2

Imp. pt. 2

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Chromium	ug	0.30	1.9	0.58	2.8
Chromium, Hexavalent	mg	0.001	LT 0.023	-	-
Chromium, Hexavalent	mg	0.0010	-	-	LT 0.045

MDL Method Detection Limit
LT Less than.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
Page 10

June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:	752020	755260	755270
Date Collected:	05/15/90	05/17/90	05/17/90
Date Received:	05/16/90	05/21/90	05/21/90
		Formaldehy.	Formaldehy.
	Cr+6 Imp.	Run 1:	Run 1:
<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Solution</u>
			<u>Imp.1</u>
			<u>Imp.2</u>

SUBCONTRACT ANALYSIS

INDIVIDUAL PARAMETERS
Formaldehyde

ug	0.66	-	ND	20
----	------	---	----	----

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS
Chromium
Chromium, Hexavalent

ug	0.30	3.6	-	-
mg	0.0010	LT 0.090	-	-

MDL Method Detection Limit
ND Not detected at or above the MDL.
LT Less than.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
Page 11

June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

755280	755290	755300
05/17/90	05/17/90	05/18/90
05/21/90	05/21/90	05/21/90
Formaldehy.	Formaldehy.	Formaldehy.
Run 2:	Run 2:	Run 3:
Imp.1	Imp.2	Imp.1

Parameter

Units

MDL

Imp.1

Imp.2

Imp.1

SUBCONTRACT ANALYSIS

INDIVIDUAL PARAMETERS

Formaldehyde

ug

0.66

ND

4.4

ND

MDL
ND

Method Detection Limit
Not detected at or above the MDL.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
Page 12

June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:	755310	755320	755330
Date Collected:	05/18/90	05/18/90	05/18/90
Date Received:	05/21/90	05/21/90	05/21/90

	Formaldehy.			
	Run 3:			Field
<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Imp.2</u>	<u>Blank</u>
				<u>Spike</u>

SUBCONTRACT ANALYSIS

INDIVIDUAL PARAMETERS

Formaldehyde	ug	0.66	6.4	9.1	12
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MDL Method Detection Limit

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
Page 13

June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:	756150	756160	756170
Date Collected:	05/18/90	05/18/90	05/18/90
Date Received:	05/21/90	05/21/90	05/21/90
	PAH Run #1	PAH Run #1	PAH Run #1
<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Cont. 2</u> <u>Cont. 3</u> <u>Cont. 4</u>

ORGANIC ANALYSIS

POLYNUCLEARS BY GC/MS (EPA 8270)

Naphthalene	mg	0.001	LT 0.10	-	-
Acenaphthylene	mg	0.001	LT 0.10	-	-
Acenaphthene	mg	0.001	LT 0.10	-	-
Fluorene	mg	0.001	LT 0.10	-	-
Phenanthrene	mg	0.001	LT 0.10	-	-
Anthracene	mg	0.001	LT 0.10	-	-
Fluoranthene	mg	0.001	LT 0.10	-	-
Pyrene	mg	0.001	LT 0.10	-	-
Benzo(a)anthracene	mg	0.001	LT 0.10	-	-
Chrysene	mg	0.001	LT 0.10	-	-
Benzo(b)fluoranthene	mg	0.001	LT 0.10	-	-
Benzo(k)fluoranthene	mg	0.001	LT 0.10	-	-
Benzo(a)pyrene	mg	0.001	LT 0.10	-	-
Ideno(1,2,3-cd)pyrene	mg	0.001	LT 0.10	-	-
Dibenzo(a,h)anthracene	mg	0.001	LT 0.10	-	-
Benzo(g,h,i)perylene	mg	0.001	LT 0.10	-	-
Nitrobenzene-d5 (Surrogate Recovery)			(*)	-	-
2-Fluorobiphenyl (Surrogate Recovery)			(*)	-	-
Terphenyl-d14 (Surrogate Recovery)			(*)	-	-
Date Extracted for GCMS Semi-volatiles			05/31/90	05/31/90	05/31/90

MDL Method Detection Limit
LT Less than.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
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June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:	756180	756200	756210
Date Collected:	05/18/90	05/18/90	05/18/90
Date Received:	05/21/90	05/21/90	05/21/90
	PAH Run #1	PAH Run #2	PAH Run #2
<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Cont. 5</u> <u>Cont. 2</u> <u>Cont. 3</u>

ORGANIC ANALYSIS

POLYNUCLEARS BY GC/MS (EPA 8270)

Naphthalene	mg	0.001	-	LT 0.10	-
Acenaphthylene	mg	0.001	-	LT 0.10	-
Acenaphthene	mg	0.001	-	LT 0.10	-
Fluorene	mg	0.001	-	LT 0.10	-
Phenanthrene	mg	0.001	-	LT 0.10	-
Anthracene	mg	0.001	-	LT 0.10	-
Fluoranthene	mg	0.001	-	LT 0.10	-
Pyrene	mg	0.001	-	LT 0.10	-
Benzo(a)anthracene	mg	0.001	-	LT 0.10	-
Chrysene	mg	0.001	-	LT 0.10	-
Benzo(b)fluoranthene	mg	0.001	-	LT 0.10	-
Benzo(k)fluoranthene	mg	0.001	-	LT 0.10	-
Benzo(a)pyrene	mg	0.001	-	LT 0.10	-
Ideno(1,2,3-cd)pyrene	mg	0.001	-	LT 0.10	-
Dibenzo(a,h)anthracene	mg	0.001	-	LT 0.10	-
Benzo(g,h,i)perylene	mg	0.001	-	LT 0.10	-
Nitrobenzene-d5 (Surrogate Recovery)		-		(*)	-
2-Fluorobiphenyl (Surrogate Recovery)		-		(*)	-
Terphenyl-d14 (Surrogate Recovery)		-		(*)	-
Date Extracted for GCMS Semi-volatiles			05/31/90	05/31/90	05/31/90

MDL Method Detection Limit
LT Less than.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
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June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

756220	756230	756250
05/18/90	05/18/90	05/19/90
05/21/90	05/21/90	05/21/90
PAH Run #2	PAH Run #2	PAH Run #3
Cont. 4	Cont. 5	Cont. 2

Parameter	Units	MDL	Cont. 4	Cont. 5	Cont. 2
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ORGANIC ANALYSIS

POLYNUCLEARS BY GC/MS (EPA 8270)

Naphthalene	mg	0.001	-	-	LT 0.10
Acenaphthylene	mg	0.001	-	-	LT 0.10
Acenaphthene	mg	0.001	-	-	LT 0.10
Fluorene	mg	0.001	-	-	LT 0.10
Phenanthrene	mg	0.001	-	-	LT 0.10
Anthracene	mg	0.001	-	-	LT 0.10
Fluoranthene	mg	0.001	-	-	LT 0.10
Pyrene	mg	0.001	-	-	LT 0.10
Benzo(a)anthracene	mg	0.001	-	-	LT 0.10
Chrysene	mg	0.001	-	-	LT 0.10
Benzo(b)fluoranthene	mg	0.001	-	-	LT 0.10
Benzo(k)fluoranthene	mg	0.001	-	-	LT 0.10
Benzo(a)pyrene	mg	0.001	-	-	LT 0.10
Ideno(1,2,3-cd)pyrene	mg	0.001	-	-	LT 0.10
Dibenzo(a,h)anthracene	mg	0.001	-	-	LT 0.10
Benzo(g,h,i)perylene	mg	0.001	-	-	LT 0.10
Nitrobenzene-d5 (Surrogate Recovery)		-	-	-	(*)
2-Fluorobiphenyl (Surrogate Recovery)		-	-	-	(*)
Terphenyl-d14 (Surrogate Recovery)		-	-	-	(*)
Date Extracted for GCMS Semi-volatiles		05/31/90	05/31/90	05/31/90	

MDL Method Detection Limit
LT Less than.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
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June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

756260	756270	756280
05/19/90	05/19/90	05/19/90
05/21/90	05/21/90	05/21/90
PAH Run #3	PAH Run #3	PAH Run #3
Cont. 3	Cont. 4	Cont. 5

Parameter

Units

MDL

ORGANIC ANALYSIS

POLYNUCLEARS BY GC/MS (EPA 8270)
Date Extracted for GCMS Semi-volatiles

05/31/90	05/31/90	05/31/90
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MDL Method Detection Limit

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
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June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

756300	756360	756370
05/19/90	05/14/90	05/14/90
05/21/90	05/21/90	05/21/90
PAH Reag.	Metals	Metals
Blank	Run #1	Run #1
Cont. 3	Probe Wash	Imp. Wash

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Cont. 3</u>	<u>Probe Wash</u>	<u>Imp. Wash</u>
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INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Arsenic	mg	0.0050	-	LT 0.0020	LT 0.0023
Beryllium	ug	0.040	-	LT 0.20	LT 0.23
Cadmium	ug	0.0050	-	0.082	0.14
Copper	ug	0.070	-	LT 0.41	LT 0.46
Lead	ug	0.20	-	1.2	LT 1.4
Manganese	ug	0.1	-	3.2	LT 0.2
Mercury	ug	0.040	-	LT 0.07	ND

ORGANIC ANALYSIS

POLYNUCLEARS BY GC/MS (EPA 8270)

Naphthalene	mg	0.001	LT 0.10	-	-
Acenaphthylene	mg	0.001	LT 0.10	-	-
Acenaphthene	mg	0.001	LT 0.10	-	-
Fluorene	mg	0.001	LT 0.10	-	-
Phenanthrene	mg	0.001	LT 0.10	-	-
Anthracene	mg	0.001	LT 0.10	-	-
Fluoranthene	mg	0.001	LT 0.10	-	-
Pyrene	mg	0.001	LT 0.10	-	-
Benzo(a)anthracene	mg	0.001	LT 0.10	-	-
Chrysene	mg	0.001	LT 0.10	-	-
Benzo(b)fluoranthene	mg	0.001	LT 0.10	-	-
Benzo(k)fluoranthene	mg	0.001	LT 0.10	-	-
Benzo(a)pyrene	mg	0.001	LY 0.10	-	-
Ideno(1,2,3-cd)pyrene	mg	0.001	LT 0.10	-	-
Dibenzo(a,h)anthracene	mg	0.001	LT 0.10	-	-
Benzo(g,h,i)perylene	mg	0.001	LT 0.10	-	-

MDL Method Detection Limit
LT Less than.
ND Not detected at or above the MDL.

REPORT OF LABORATORY ANALYSIS

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June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

756300	756360	756370
05/19/90	05/14/90	05/14/90
05/21/90	05/21/90	05/21/90
PAH Reag.	Metals	Metals
Blank	Run #1	Run #1
Cont. 3	Probe Wash	Imp. Wash

Parameter

Units

MDL

ORGANIC ANALYSIS

POLYNUCLEARS BY GC/MS (EPA 8270)
Nitrobenzene-d5 (Surrogate Recovery)
2-Fluorobiphenyl (Surrogate Recovery)
Terphenyl-d14 (Surrogate Recovery)
Date Extracted for GCMS Semi-volatiles

(*)	-	-
(*)	-	-
(*)	-	-
05/31/90	-	-

MDL Method Detection Limit

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
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June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:	756380	756400	756410
Date Collected:	05/14/90	05/14/90	05/14/90
Date Received:	05/21/90	05/21/90	05/21/90

	Metals	Metals	Metals
	Run #1	Run #2	Run #2
<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>KMnO4</u> <u>Probe Wash</u> <u>Imp. Wash</u>

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Arsenic	mg	0.0050 -	LT 0.0022	LT 0.0025
Beryllium	ug	0.040 -	LT 0.22	LT 0.25
Cadmium	ug	0.0050 -	0.044	LT = 0.050
Copper	ug	0.070 -	LT 0.44	LT 0.50
Lead	ug	0.20 -	LT 1.3	1.5
Manganese	ug	0.1 -	13	LT 0.2
Mercury	ug	0.04 43	-	-
Mercury	ug	0.040 -	0.04	ND

MDL Method Detection Limit
LT Less than.
ND Not detected at or above the MDL.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
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June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

756420	756430	756440
05/14/90	05/14/90	05/14/90
05/21/90	05/21/90	05/21/90
Metals	Metals	Metals
Run #2	Run #3	Run #3

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>KMnO4</u>	<u>Probe Wash</u>	<u>Imp. Wash</u>
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INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Arsenic	mg	0.0050	-	LT 0.0028	LT 0.0022
Beryllium	ug	0.040	-	LT 0.28	LT 0.22
Cadmium	ug	0.0050	-	0.28	0.22
Copper	ug	0.070	-	LT 0.55	LT 0.45
Lead	ug	0.20	-	LT 1.6	LT 1.4
Manganese	ug	0.1	-	19	0.2
Mercury	ug	0.04	41	-	-
Mercury	ug	0.040	-	0.06	LT 0.05

MDL Method Detection Limit
LT Less than.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
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June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

756450	756470	756480
05/14/90	05/14/90	05/14/90
05/21/90	05/21/90	05/21/90

Metals	Metals	
Run #3	Reagent	KMnO4
KMnO4	Blank	Blank

Parameter

Units

MDL

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Arsenic	mg	0.0050	-	LT 0.0067	-
Beryllium	ug	0.040	-	LT 0.67	-
Cadmium	ug	0.0050	-	LT = 0.13	-
Copper	ug	0.070	-	LT 1.3	-
Lead	ug	0.20	-	LT 4.0	-
Manganese	ug	0.1	-	LT 0.7	-
Mercury	ug	0.04	41	-	0.13
Mercury	ug	0.040	-	LT 0.27	-

MDL Method Detection Limit
LT Less than.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
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June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:	756490	756500	756510
Date Collected:	05/14/90	05/14/90	05/14/90
Date Received:	05/21/90	05/21/90	05/21/90

	Metals	Metals	Metals
<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Run 1: Imp</u> <u>Run 2: Imp</u> <u>Run 3: Imp</u>

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Arsenic	mg	0.0050	LT 0.0035	LT 0.0044	LT 0.0044
Beryllium	ug	0.040	LT 0.35	LT 0.44	LT 0.44
Cadmium	ug	0.0050	0.14	LT 0.087	LT 0.087
Copper	ug	0.070	LT 0.70	LT 0.87	LT 0.87
Lead	ug	0.20	LT 2.1	LT 2.6	LT 2.6
Manganese	ug	0.1	0.8	LT 0.4	LT 0.4
Mercury	ug	0.040	0.31	0.38	0.38

MDL Method Detection Limit
LT Less than.

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
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June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

756520	756530	756540
05/14/90	05/14/90	05/15/90
05/21/90	05/21/90	05/21/90
HCl Run #1	HCl Run #1	HCl Run #2
Imp. Wash	Imp.	Imp. Wash

Parameter

Units

MDL

INORGANIC ANALYSIS

CHLORIDE, AIR SAMPLES, IMPINGERS

Impinger Volume, total
Chloride Concentration in Impinger
Total Chloride in Impinger

mL		100	830	230
mg/L	1	2	60	4
mg	0.1	0.2	50	0.9

MDL Method Detection Limit

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
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June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number:
Date Collected:
Date Received:

756550	756560	756570
05/15/90	05/15/90	05/15/90
05/21/90	05/21/90	05/21/90
HCl Run #2	HCl Run #3	HCl Run #3
Imp.	Imp. Wash	Imp.

Parameter

Units

MDL

INORGANIC ANALYSIS

CHLORIDE, AIR SAMPLES, IMPINGERS

Impinger Volume, total
Chloride Concentration in Impinger
Total Chloride in Impinger

mL		870	100	1000
mg/L	1	30	4	36
mg	0.1	26	0.4	36

MDL Method Detection Limit

REPORT OF LABORATORY ANALYSIS

Mr. Tim Robbins
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June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number: 756580
Date Collected: 05/15/90
Date Received: 05/21/90

Parameter

Units

MDL

Reagent
Blank

INORGANIC ANALYSIS

CHLORIDE, AIR SAMPLES, IMPINGERS

Impinger Volume, total	mL		1500
Chloride Concentration in Impinger	mg/L	1	2
Total Chloride in Impinger	mg	0.1	3.0

MDL Method Detection Limit

Mr. Tim Robbins
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June 27, 1990
PACE Project
Number: 400504400

Holly Sugar AB2588

PACE Sample Number: 755520
Date Collected: 05/19/90
Date Received: 05/21/90

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>BTEX</u> <u>Blank</u>
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INORGANIC ANALYSIS

GASOLINE AND AROMATICS IN AIR

Volatile Aromatic Compounds (EPA 8020M):

- Benzene	ug/L	0.5	ND	4.7
- Ethylbenzene	ug/L	0.5	ND	2.2
- Toluene	ug/L	0.5	ND	
- Xylenes, Total	ug/L	0.5	ND	

MDL Method Detection Limit
ND Not detected at or above the MDL.

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my supervision.

Robert P. Chrin
Inorganic Chemistry Manager

Ruth J. Siegmund
Organic Chemistry Manager

900519

IR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 900519-02A

Level Benzene

MS

Date of Collection: 5/19/90

Date of Analysis: 5/21/90

Source Test Method - Low Level Benzene

(CARB Method 410A)

Defocusing Full Scan GC/MS

102

2

Date of Collection: NA

Date of Analysis: 5/21/90

Amount (ppbv)

4.7

ND

2.2

ND

MDL (ppbv)

2.0

2.0

2.0

2.0

Amount (ppbv)

ND

ND

ND

ND

900518

AIR TOXICS LTD.

SAMPLE NAME: RUN #1

ID#: 900518-01A

Stationary Source Test Method - Low Level Benzene

(CARB Method 410A)

Cryofocusing Full Scan GC/MS

File Name: 1051904

Date of Collection:

5/17/90

Dil. Factor: 10

Date of Analysis:

5/19/90

	<u>MDL (ppbv)</u>	<u>Amount (ppbv)</u>
Benzene	100	330
Toluene	100	340
Ethyl Benzene	100	170
Total Xylenes	100	880

900518

AIR TOXICS LTD.

SAMPLE NAME: RUN #2

ID#: 900518-02A

Stationary Source Test Method - Low Level Benzene

(CARB Method 410A)

Cryofocusing Full Scan GC/MS

File Name: 1051908

Date of Collection:

5/17/90

Dil. Factor: 7.4

Date of Analysis:

5/19/90

	<u>MDL (ppbv)</u>	<u>Amount (ppbv)</u>
Benzene	7.4	350
Toluenes	7.4	230
Ethyl Benzene	7.4	79
Total Xylenes	7.4	330

900518

AIR TOXICS LTD.

SAMPLE NAME: RUN #3

ID#: 900518-03A

Stationary Source Test Method - Low Level Benzene

(CARB Method 410A)

Cryofocusing Full Scan GC/MS

File Name: 1051907

Date of Collection:

Dil. Factor: 50

Date of Analysis:

	<u>MDL (ppbv)</u>	<u>Amount (ppbv)</u>
Benzene	50	240
Toluene	50	170
Ethyl Benzene	50	220
Total Xylenes	50	280

900518

AIR TOXICS LTD.

SAMPLE NAME: LAB BLANK

ID#: 900518-04A

Stationary Source Test Method - Low Level Benzene

(CARB Method 410A)

Cryofocusing Full Scan GC/MS

File Name: 1051902

Date of Collection: NA

Dil. Factor: 2

Date of Analysis: 5/19/90

	MDL (ppbv)	Amount (ppbv)
Benzene	2.0	ND
Toluene	2.0	ND
Ethyl Benzene	2.0	ND
Total Xylenes	2.0	ND

900518

AIR TOXICS LTD.

SAMPLE NAME: METHOD SPIKE

ID#: 900518-04B

Stationary Source Test Method - Low Level Benzene

(CARB Method 410A)

Cryofocusing Full Scan GC/MS

File Name: 1051903

Date of Collection: NA

Dil. Factor: 2

Date of Analysis: 5/19/90

	MDL (ppbv)	% Recovery
Benzene	2.0	106
Toluene	2.0	106
Ethyl Benzene	2.0	128
Total Xylenes	2.0	124

900518

AIR TOXICS LTD.

SAMPLE NAME: NSI Audit Canister - JANUARY 1990

ID#: 900518-04C

Stationary Source Test Method - Low Level Benzene

(CARB Method 410A)

Cryofocusing Full Scan GC/MS

	<u>MDL (ppbv)</u>	<u>Spike Amount</u>	<u>Measured Amount</u>
Benzene	1.0	2.1	2.6
Toluene	1.0	4.1	5.4
Ethyl Benzene	1.0	3.7	4.6
Total Xylenes	1.0	3.6	5.1



July 26, 1990

Bill Guyton
Pace Laboratories, Inc.
11 Digital Drive
Novato, CA 94949

Dear Bill:

In our report dated June 28, 1990 which reported four samples for your P.O. Number 8106, we discussed the analysis problems encountered with sample "Dioxin-2, 75539-43". As stated in the cover letter, the sample was scheduled to be re-extracted using a smaller aliquot to reduce the interference problems which affected the initial analysis. This re-analysis was recently completed and the results are attached. Once again we had problems with matrix interferences in the penta, hexa, and hepta furan level as well as the hexa dioxin region. These interferences affected both the native and internal standard peaks, making it impossible to calculate any positives or detection limits for these compounds. The analytes which could be calculated do match fairly well with the levels calculated in runs 1 and 3.

At this point we have tried all of our normal cleanup options without success on this particular sample. Additional work on the sample could be performed in an attempt to achieve values for the penta-hexa furans and hexa dioxins; including a full scan analysis to identify the interference, but this is beyond the scope of the method and would require special instructions from the client.

We apologize for the delay in obtaining these results, but this has proven to be a very challenging sample set with a host of unexpected problems.

Thank you for your patience.

Sincerely,

A handwritten signature in dark ink, appearing to read "Michael J. Mittle".

Michael J. Mittle Ph.D.
Division Director

MJM:nc