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

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

AP42 Section: 11.1

Reference Number: 338

Title: Emission Testing, July 9-11, 1996, Job Number 1030,

AIRx Testing, Ventura, CA,

July 23, 1996.

Ref. 338
(see also Ref. 36A)

ASTEC
4101 Jerome Avenue
Chattanooga, TN 37407

Attn: Mark Gault

EMISSION TESTING

July 9-11, 1996

Prepared By:

AIRx Testing
2175 Goodyear Avenue Unit 105
Ventura, CA 93003

Job Number
1030
Laboratory Report Number
296-094 - (Revision #1 10/17/96)

Test Team Leader
David Whitcomb/Ken Kennepohl

Results Verified By
Tom Porter
Partner

Submitted
July 23, 1996

AIRx Testing

July 23, 1996

Job Number: 1030
Lab Number: 296-094

Astec, Inc.
4101 Jerome Avenue
Chattanooga, TN 37405

ATTENTION: Mark Gault

REGARDING: Emission Testing the Inlet Duct and Outlet Exhaust to the Smog Hog Control Device at the

Dear Mr. Gault:

On July 9-11, 1996, AIRx Testing performed emission testing on the inlet duct and the outlet exhaust of the Smog Hog electrostatic precipitator contol device. The testing was conducted to determine the total particulate, total hydrocarbons, flowrate, moisture content and the collection efficiency fo the control device of the exhaust gases exiting from the truck loading building.

On July 9, 1996, testing was conducted for total particulates entering and exiting the Smog Hog control device. Three (3) 60 minute CARB Method 5 runs were conducted simultaneously at the inlet duct and the oulet exhaust stack. The inlet duct was 36" in diameter and a 12 point horizontal traverse was conducted for the isokinetic particulte sampling. The outlet exhaust stack was 25"x36" and a 24 point (8 points per port) was conducted for the isokinetic particulate sampling. The molecular weight of the stack gases was calculated assuming it to be ambient air (O_2 = 20.9% and CO_2 = 0.05%).

On July 11, 1996, total hydrocarbons were simultaneous sampled at the inlet and outlet of the Smog Hog. The sampling was conducted according to EPA Method 25A. A heated Teflon line was used to transport the appropriate stack gases to the two (2) total hydrocarbon (FID) analyzers. The sampling was conducted with the "Top Opened & The Top Closed". Sampling was conducted for two (2) hours at each condition with data continuously recorded on a 10" strip charp recorder and data entered at 10 minute entervals. The results were reported in ppmv and lb/hr as propane. An attempt was made to collect total hydrocarbon data on July 10; however one (1) of the analyzers failed to operate correctly thus the data obtained was assumed to be of no value.

Operation data was collected by Astec personnel during the testing.

The results of the test can be found on the attached sheets.

If you have any questions regarding the testing procedures or the calculations, please contact the undersigned at (805) 644-1099.

Respectfully submitted,
AIRx Testing

Tom Porter

Tom Porter
Partner

AIRx TESTING

SUMMARY OF SOURCE TEST RESULTS
7/9/96

CONSTITUENT	RUN #1 Outlet	RUN #2 Outlet	RUN #3 Outlet
Start Time	9:55 AM	11:35 AM	1:15 PM
Moisture, %	0.8	2.8	1.5
Exhaust Flowrate			
DSCFM	13011	13125	13473
ACFM	13939	14472	14628
Stack Temperature, °F	93.8	97.4	95.8
Total Particulate			
grains/dscf	0.0048	0.0024	0.0022
lb/hr	0.53	0.27	0.26
% Reduction	0	15.6	7.1

SUMMARY OF SOURCE TEST RESULTS
7/9/96

CONSTITUENT	RUN #1 Inlet	RUN #2 Inlet	RUN #3 Inlet
Start Time	9:50 AM	11:40 AM	1:10 PM
Moisture, %	1.3	3.4	1.7
Exhaust Flowrate (Outlet)			
DSCFM	13011	13125	13473
ACFM	13939	14472	14628
Stack Temperature, °F	91.5	94.7	96.0
Total Particulate			
grains/dscf	0.0034	0.0029	0.0024
lb/hr	0.38	0.32	0.28

AIR TESTING

SUMMARY OF SOURCE TEST RESULTS
7/11/96

CONSTITUENT	RUN #1 Outlet Top Open	RUN #2 Outlet Top Closed	RUN #3 Outlet Top Open	RUN #4 Outlet Top Closed
Start Time	7:20 AM	9:45 AM	12:00 PM	2:10 PM
Moisture, %	2.4	0.6	-	-
Exhaust Flowrate (Outlet)				
DSCFM	12348	11008	12348	11008
ACFM	13442	11765	13442	11765
Stack Temperature, °F	91.7	92	-	-
Total Hydrocarbons As Propane				
ppmv	21	10	18	3
lb/hr	1.8	0.77	1.55	0.23
% Reduction	41.7	56.2	46.9	70.1

SUMMARY OF SOURCE TEST RESULTS
7/11/96

CONSTITUENT	RUN #1 Inlet Top Open	RUN #2 Inlet Top Closed	RUN #3 Inlet Top Open	RUN #4 Inlet Top Closed
Start Time	7:20 AM	9:45 AM	12:00 PM	2:10 PM
Moisture, %	-	-	-	-
Exhaust Flowrate (Outlet)				
DSCFM	12348	11008	12348	11008
ACFM	13442	11765	13442	11765
Stack Temperature, °F	-	-	-	-
Total Hydrocarbons As Propane				
ppmv	36	23	34	10
lb/hr	3.09	1.76	2.92	0.77

AIR TESTING

ATTACHMENTS

Client: Astec
Site:
Unit: Smog Hog

Date: 7/9/96
Type: *T std = 60 F*
Run: 1-Outlet

FIELD DATA & CALCULATIONS SUMMARY

Wlc	Water Condensate Weight	4.0	g		
Vlc	Water Condensate Volume	4.0	ml		
Vm	Metered Sample Gas Volume	35.321	dcf		
Lp	Avg. Leak Rate	0.002	cf		
Vn	Leak Corrected Sample Gas Volume	35.321	dcf		
Y	Dry Gas Meter Calibration Factor	0.974			
Pbar	Barometric Pressure	29.93	in. Hg		
Pg	Static Pressure	-0.2	in. H2O		
Ps	Stack Pressure, Absolute	29.92	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	1.317	in. H2O		
Tm	Dry Gas Meter Temperature, Average	99.2	deg. F	559.2	deg. R
Vm(std)	Sample Gas Volume	32.0916	dscf		
Vm(wet)	Sample Gas Volume, Wet	32.2777	scf		
Vw(std)	Water Vapor Volume	0.1861	scf		
Bws	Water Content of Stack Gas	0.006		0.576	%
CO2	Carbon Dioxide, Dry	0.1	%		
O2	Oxygen, Dry	20.9	%		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	28.844	lb/lb mole		
Ms	Molecular Wt. of Stack Gas, Wet	28.781	lb/lb mole		
Cp	Pitot Calibration Factor	0.834			
Del. P	Velocity Head, Average Square Root	0.650	in. H20		
Ts	Stack Gas Temperature, Average	93.8	deg. F	553.8	deg. R
As	Area of Stack	6.25	sq ft	33.85	in. dia.
Vs	Stack Gas Velocity	37.17	ft/sec		
Qa	Actual Flow Rate	13,939	cfm		
Qad	Actual Flow Rate, Dry	13,859	dcfm		
Q(std)	Stack Gas Flow Rate	13,011	dscfm		
An	Nozzle Area	0.00027858	sq ft	0.226	in. dia.
Theta	Sampling Time	60	min.		
I	Isokinetics	94.7	%		

Client: **Astec**
Site:
Unit: **Smog Hog**

Date: **7/9/96**
Type: ***T std = 60 F***
Run: **2-Outlet**

FIELD DATA & CALCULATIONS SUMMARY

Wlc	Water Condensate Weight	20.3	g		
Vlc	Water Condensate Volume	20.3	ml		
Vm	Metered Sample Gas Volume	36.788	dcf		
Lp	Avg. Leak Rate	0.002	cf		
Vn	Leak Corrected Sample Gas Volume	36.788	dcf		
Y	Dry Gas Meter Calibration Factor	0.974			
Pbar	Barometric Pressure	29.93	in. Hg		
Pg	Static Pressure	-0.2	in. H2O		
Ps	Stack Pressure, Absolute	29.92	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	1.386	in. H2O		
Tm	Dry Gas Meter Temperature, Average	104.8	deg. F	564.8	deg. R
Vm(std)	Sample Gas Volume	33.1040	dscf		
Vm(wet)	Sample Gas Volume, Wet	34.0483	scf		
Vw(std)	Water Vapor Volume	0.9443	scf		
Bws	Water Content of Stack Gas	0.028		2.773	%
CO2	Carbon Dioxide, Dry	0.1	%		
O2	Oxygen, Dry	20.9	%		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	28.844	lb/lb mole		
Ms	Molecular Wt. of Stack Gas, Wet	28.543	lb/lb mole		
Cp	Pitot Calibration Factor	0.834			
Del. P	Velocity Head, Average Square Root	0.670	in. H20		
Ts	Stack Gas Temperature, Average	97.4	deg. F	557.4	deg. R
As	Area of Stack	6.25	sq ft	33.85	in. dia.
Vs	Stack Gas Velocity	38.60	ft/sec		
Qa	Actual Flow Rate	14,472	cfm		
Qad	Actual Flow Rate, Dry	14,071	dcfm		
Q(std)	Stack Gas Flow Rate	13,125	dscfm		
An	Nozzle Area	0.00027858	sq ft	0.226	in. dia.
Theta	Sampling Time	60	min.		
I	Isokinetics	96.8	%		

Client: **Astec**
Site:
Unit: **Smog Hog**

Date: **7/9/96**
Type: *T std = 60 F*
Run: **3-Outlet**

FIELD DATA & CALCULATIONS SUMMARY

Wlc	Water Condensate Weight	11.5	g		
Vlc	Water Condensate Volume	11.5	ml		
Vm	Metered Sample Gas Volume	38.115	dcf		
Lp	Avg. Leak Rate	0.002	cf		
Vn	Leak Corrected Sample Gas Volume	38.115	dcf		
Y	Dry Gas Meter Calibration Factor	0.974			
Pbar	Barometric Pressure	29.93	in. Hg		
Pg	Static Pressure	-0.2	in. H2O		
Ps	Stack Pressure, Absolute	29.92	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	1.436	in. H2O		
Tm	Dry Gas Meter Temperature, Average	107.9	deg. F	567.9	deg. R
Vm(std)	Sample Gas Volume	34.1173	dscf		
Vm(wet)	Sample Gas Volume, Wet	34.6523	scf		
Vw(std)	Water Vapor Volume	0.5350	scf		
Bws	Water Content of Stack Gas	0.015		1.544	%
CO2	Carbon Dioxide, Dry	0.1	%		
O2	Oxygen, Dry	20.9	%		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	28.844	lb/lb mole		
Ms	Molecular Wt. of Stack Gas, Wet	28.677	lb/lb mole		
Cp	Pitot Calibration Factor	0.834			
Del. P	Velocity Head, Average Square Root	0.680	in. H20		
Ts	Stack Gas Temperature, Average	95.8	deg. F	555.8	deg. R
As	Area of Stack	6.25	sq ft	33.85	in. dia.
Vs	Stack Gas Velocity	39.01	ft/sec		
Qa	Actual Flow Rate	14,628	cfm		
Qad	Actual Flow Rate, Dry	14,402	dcfm		
Q(std)	Stack Gas Flow Rate	13,473	dscfm		
An	Nozzle Area	0.00027858	sq ft	0.226	in. dia.
Theta	Sampling Time	60	min.		
I	Isokinetics	97.2	%		

Client: **Astec**	Date: **7/9/96**
Site:	Type: ***T std = 60 F***
Unit: **Smog Hog**	Run: **1-Outlet**

CALCULATED EMISSION RESULTS

Ws	Particulate Weight	0.0099	g
Cs	Particulate Emissions	0.0048	grain/dscf
CFs	Particulate Flow Rate	0.53	lb/hr

Client: **Astec**	Date: **7/9/96**
Site:	Type: ***T std = 60 F***
Unit: **Smog Hog**	Run: **2-Outlet**

CALCULATED EMISSION RESULTS

Ws	Particulate Weight	0.0051	g
Cs	Particulate Emissions	0.0024	grain/dscf
CFs	Particulate Flow Rate	0.27	lb/hr

Client: **Astec**	Date: **7/9/96**
Site:	Type: ***T std = 60 F***
Unit: **Smog Hog**	Run: **3-Outlet**

CALCULATED EMISSION RESULTS

Ws	Particulate Weight	0.0049	g
Cs	Particulate Emissions	0.0022	grain/dscf
CFs	Particulate Flow Rate	0.26	lb/hr

Client: Astec
Site:
Unit: Smog Hog

Date: 7/9/96
Type: *T std = 60 F*
Run: 1-Inlet

FIELD DATA & CALCULATIONS SUMMARY

Wlc	Water Condensate Weight	9.7	g		
Vlc	Water Condensate Volume	9.7	ml		
Vm	Metered Sample Gas Volume	37.063	dcf		
Lp	Avg. Leak Rate	0.002	cf		
Vn	Leak Corrected Sample Gas Volume	37.063	dcf		
Y	Dry Gas Meter Calibration Factor	1.011			
Pbar	Barometric Pressure	29.93	in. Hg		
Pg	Static Pressure	-4.95	in. H2O		
Ps	Stack Pressure, Absolute	29.57	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	1.728	in. H2O		
Tm	Dry Gas Meter Temperature, Average	111.8	deg. F	571.8	deg. R
Vm(std)	Sample Gas Volume	34.2405	dscf		
Vm(wet)	Sample Gas Volume, Wet	34.6917	scf		
Vw(std)	Water Vapor Volume	0.4512	scf		
Bws	Water Content of Stack Gas	0.013		1.301	%
CO2	Carbon Dioxide, Dry	0.1	%		
O2	Oxygen, Dry	20.9	%		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	28.844	lb/lb mole		
Ms	Molecular Wt. of Stack Gas, Wet	28.703	lb/lb mole		
Cp	Pitot Calibration Factor	0.817			
Del. P	Velocity Head, Average Square Root	0.578	in. H20		
Ts	Stack Gas Temperature, Average	91.5	deg. F	551.5	deg. R
As	Area of Stack	7.07	sq ft	36.00	in. dia.
Vs	Stack Gas Velocity	32.56	ft/sec		
Qa	Actual Flow Rate	13,939	cfm		
Qad	Actual Flow Rate, Dry	13,859	dcfm		
Q(std)	Stack Gas Flow Rate	13,011	dscfm	Outlet Value	
An	Nozzle Area	0.00035466	sq ft	0.255	in. dia.
Theta	Sampling Time	60	min.		
I	Isokinetics	88.6	%		

Client: **Astec**
Site:
Unit: **Smog Hog**

Date: 7/9/96
Type: *T std = 60 F*
Run: **2-Inlet**

FIELD DATA & CALCULATIONS SUMMARY

Wlc	Water Condensate Weight	28.8	g		
Vlc	Water Condensate Volume	28.9	ml		
Vm	Metered Sample Gas Volume	41.275	dcf		
Lp	Avg. Leak Rate	0.002	cf		
Vn	Leak Corrected Sample Gas Volume	41.275	dcf		
Y	Dry Gas Meter Calibration Factor	1.011			
Pbar	Barometric Pressure	29.93	in. Hg		
Pg	Static Pressure	-4.95	in. H2O		
Ps	Stack Pressure, Absolute	29.57	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	1.810	in. H2O		
Tm	Dry Gas Meter Temperature, Average	113.3	deg. F	573.3	deg. R
Vm(std)	Sample Gas Volume	38.0451	dscf		
Vm(wet)	Sample Gas Volume, Wet	39.3848	scf		
Vw(std)	Water Vapor Volume	1.3397	scf		
Bws	Water Content of Stack Gas	0.034		3.402	%
CO2	Carbon Dioxide, Dry	0.1	%		
O2	Oxygen, Dry	20.9	%		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	28.844	lb/lb mole		
Ms	Molecular Wt. of Stack Gas, Wet	28.475	lb/lb mole		
Cp	Pitot Calibration Factor	0.817			
Del. P	Velocity Head, Average Square Root	0.589	in. H20		
Ts	Stack Gas Temperature, Average	94.7	deg. F	554.7	deg. R
As	Area of Stack	7.07	sq ft	36.00	in. dia.
Vs	Stack Gas Velocity	33.42	ft/sec		
Qa	Actual Flow Rate	14,472	cfm		
Qad	Actual Flow Rate, Dry	14,071	dcfm		
Q(std)	Stack Gas Flow Rate	13,125	dscfm	Outlet Value	
An	Nozzle Area	0.00035466	sq ft	0.255	in. dia.
Theta	Sampling Time	60	min.		
I	Isokinetics	98.6	%		

Client: Astec
Site:
Unit: Smog Hog

Date: 7/9/96
Type: *T std = 60 F*
Run: 3-Inlet

FIELD DATA & CALCULATIONS SUMMARY

Wlc	Water Condensate Weight	14.8	g		
Vlc	Water Condensate Volume	14.8	ml		
Vm	Metered Sample Gas Volume	42.041	dcf		
Lp	Avg. Leak Rate	0.002	cf		
Vn	Leak Corrected Sample Gas Volume	42.041	dcf		
Y	Dry Gas Meter Calibration Factor	1.011			
Pbar	Barometric Pressure	29.93	in. Hg		
Pg	Static Pressure	-4.95	in. H2O		
Ps	Stack Pressure, Absolute	29.57	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	1.984	in. H2O		
Tm	Dry Gas Meter Temperature, Average	114.0	deg. F	574.0	deg. R
Vm(std)	Sample Gas Volume	38.7198	dscf		
Vm(wet)	Sample Gas Volume, Wet	39.4083	scf		
Vw(std)	Water Vapor Volume	0.6885	scf		
Bws	Water Content of Stack Gas	0.017		1.747	%
CO2	Carbon Dioxide, Dry	0.1	%		
O2	Oxygen, Dry	20.9	%		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	28.844	lb/lb mole		
Ms	Molecular Wt. of Stack Gas, Wet	28.655	lb/lb mole		
Cp	Pitot Calibration Factor	0.817			
Del. P	Velocity Head, Average Square Root	0.609	in. H20		
Ts	Stack Gas Temperature, Average	96.0	deg. F	556.0	deg. R
As	Area of Stack	7.07	sq ft	36.00	in. dia.
Vs	Stack Gas Velocity	34.44	ft/sec		
Qa	Actual Flow Rate	14,628	cfm		
Qad	Actual Flow Rate, Dry	14,402	dcfm		
Q(std)	Stack Gas Flow Rate	13,473	dscfm	Outlet Value	
An	Nozzle Area	0.00035466	sq ft	0.255	in. dia.
Theta	Sampling Time	60	min.		
I	Isokinetics	95.9	%		

Client: **Astec**	Date: **7/9/96**
Site:	Type: ***T std = 60 F***
Unit: **Smog Hog**	Run: **1-Inlet**

CALCULATED EMISSION RESULTS

Ws	Particulate Weight	0.0076	g
Cs	Particulate Emissions	0.0034	grain/dscf
CFs	Particulate Flow Rate	0.38	lb/hr

Client: **Astec**	Date: **7/9/96**
Site:	Type: ***T std = 60 F***
Unit: **Smog Hog**	Run: **2-Inlet**

CALCULATED EMISSION RESULTS

Ws	Particulate Weight	0.0071	g
Cs	Particulate Emissions	0.0029	grain/dscf
CFs	Particulate Flow Rate	0.32	lb/hr

Client: **Astec**	Date: **7/9/96**
Site:	Type: ***T std = 60 F***
Unit: **Smog Hog**	Run: **3-Inlet**

CALCULATED EMISSION RESULTS

Ws	Particulate Weight	0.0061	g
Cs	Particulate Emissions	0.0024	grain/dscf
CFs	Particulate Flow Rate	0.28	lb/hr

Client: **Astec**
Site:
Unit: **Smog Hog**

Date: 7/11/96
Type: *T std = 60 F*
Run: 1-Outlet

FIELD DATA & CALCULATIONS SUMMARY

Wlc	Water Condensate Weight	21.1	g		
Vlc	Water Condensate Volume	21.1	ml		
Vm	Metered Sample Gas Volume	42.338	dcf		
Lp	Avg. Leak Rate	0.002	cf		
Vn	Leak Corrected Sample Gas Volume	42.338	dcf		
Y	Dry Gas Meter Calibration Factor	0.974			
Pbar	Barometric Pressure	29.90	in. Hg		
Pg	Static Pressure	-0.16	in. H2O		
Ps	Stack Pressure, Absolute	29.89	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	1.500	in. H2O		
Tm	Dry Gas Meter Temperature, Average	88.4	deg. F	548.4	deg. R
Vm(std)	Sample Gas Volume	39.2024	dscf		
Vm(wet)	Sample Gas Volume, Wet	40.1839	scf		
Vw(std)	Water Vapor Volume	0.9815	scf		
Bws	Water Content of Stack Gas	0.024		2.443	%
CO2	Carbon Dioxide, Dry	0.1	%		
O2	Oxygen, Dry	20.9	%		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	28.844	lb/lb mole		
Ms	Molecular Wt. of Stack Gas, Wet	28.579	lb/lb mole		
Cp	Pitot Calibration Factor	0.834			
Del. P	Velocity Head, Average Square Root	0.626	in. H20		
Ts	Stack Gas Temperature, Average	91.7	deg. F	551.7	deg. R
As	Area of Stack	6.25	sq ft	33.85	in. dia.
Vs	Stack Gas Velocity	35.85	ft/sec		
Qa	Actual Flow Rate	13,442	cfm		
Qad	Actual Flow Rate, Dry	13,114	dcfm		
Q(std)	Stack Gas Flow Rate	12,348	dscfm		
Theta	Sampling Time	60	min.		

Client: **Astec**	Date: 7/11/96
Site:	Type: *T std = 60 F*
Unit: **Smog Hog**	Run: **2-Outlet**

FIELD DATA & CALCULATIONS SUMMARY

Wlc	Water Condensate Weight	4.7	g		
Vlc	Water Condensate Volume	4.7	ml		
Vm	Metered Sample Gas Volume	41.927	dcf		
Lp	Avg. Leak Rate	0.002	cf		
Vn	Leak Corrected Sample Gas Volume	41.927	dcf		
Y	Dry Gas Meter Calibration Factor	0.974			
Pbar	Barometric Pressure	29.90	in. Hg		
Pg	Static Pressure	-0.15	in. H2O		
Ps	Stack Pressure, Absolute	29.89	in. Hg		
Del. H	Dry Gas Meter Press. Differential, Average	1.500	in. H2O		
Tm	Dry Gas Meter Temperature, Average	97.3	deg. F	557.3	deg. R
Vm(std)	Sample Gas Volume	38.2064	dscf		
Vm(wet)	Sample Gas Volume, Wet	38.4251	scf		
Vw(std)	Water Vapor Volume	0.2186	scf		
Bws	Water Content of Stack Gas	0.006		0.569	%
CO2	Carbon Dioxide, Dry	0.1	%		
O2	Oxygen, Dry	20.9	%		
N2	Nitrogen, Dry	79.1	%		
Md	Molecular Wt. of Stack Gas, Dry	28.844	lb/lb mole		
Ms	Molecular Wt. of Stack Gas, Wet	28.782	lb/lb mole		
Cp	Pitot Calibration Factor	0.834			
Del. P	Velocity Head, Average Square Root	0.549	in. H20		
Ts	Stack Gas Temperature, Average	92.0	deg. F	552.0	deg. R
As	Area of Stack	6.25	sq ft	33.85	in. dia.
Vs	Stack Gas Velocity	31.37	ft/sec		
Qa	Actual Flow Rate	11,765	cfm		
Qad	Actual Flow Rate, Dry	11,698	dcfm		
Q(std)	Stack Gas Flow Rate	11,008	dscfm		
Theta	Sampling Time	60	min.		

TOTAL HYDROCARBONS - EPA METHOD 25A

Client : Astec
Site :
Unit : Smog Hog-Top Open

Date : 7/11/96
Job# : 1030
Lab# : 296-094

OUTLET RESULTS - Drift Corrected Emissions Data

Test Length 120 mins. Points 13

	INLET-1	OUTLET-1
THC, ppm	36	21
Q , sdcfm	12348	12348

**Inlet Monitor Span Drift = 3.1 %
**Outlet Monitor Span Drift = -5.8 %

CALCULATED EMISSIONS

THC, lb/hr	3.09	1.80

Equations used;
lb/hr = ppm * (MW * (1.581*10^-7/60)) * Q * 60
MW = THC as Propane - 44

TOTAL HYDROCARBONS - EPA METHOD 25A

Client : Astec
Site :
Unit : Smog Hog-Top Closed

Date : 7/11/96
Job# : 1030
Lab# : 296-094

OUTLET RESULTS - Drift Corrected Emissions Data

Test Length 120 mins. Points 13

	INLET-2	OUTLET-2
THC, ppm	23	10
Q , sdcfm	11008	11008

**Inlet Monitor Span Drift = -4.6 %
**Outlet Monitor Span Drift = 4.0 %

CALCULATED EMISSIONS

THC, lb/hr	1.76	0.77

Equations used;
lb/hr = ppm * (MW * (1.581*10^-7/60)) * Q * 60
MW = THC as Propane - 44

TOTAL HYDROCARBONS - EPA METHOD 25A

Client :	Astec	Date :	7/11/96
Site :		Job# :	1030
Unit :	Smog Hog-Top Open	Lab# :	296-094

OUTLET RESULTS - Drift Corrected Emissions Data

Test Length 120 mins. Points 13

	INLET-3	OUTLET-3
THC, ppm	34	18
Q , sdcfm	12348	12348

CALCULATED EMISSIONS

THC, lb/hr	2.92	1.55

Equations used;

lb/hr = ppm * (MW * (1.581*10^-7/60)) * Q * 60

MW = THC as Propane - 44

TOTAL HYDROCARBONS - EPA METHOD 25A

Client : Astec
Site :
Unit : Smog Hog-Top Closed

Date : 7/11/96
Job# : 1030
Lab# : 296-094

OUTLET RESULTS - Drift Corrected Emissions Data

Test Length 120 mins. Points 13

	INLET-4	OUTLET-4
THC, ppm	10	3
Q , sdcfm	11008	11008

CALCULATED EMISSIONS

THC, lb/hr	0.77	0.23

Equations used;
lb/hr = ppm * (MW * (1.581*10^-7/60)) * Q * 60
MW = THC as Propane - 44

EMISSION TEST - EPA METHOD 25A

Date: 7/11/96

**** Test Information ****

Client: Astec
County: Orange
Site(s):
Unit(s): Smog Hog

**** Personnel ****

AIRx: Ken Kennepohl
Client: Mark Gault
APCD: -

Run Length:	120	Inlet (X)	Outlet (X)	Fuel ( )	HC's ( )	
No. Points:	13	S.T. ( )	E.I. ( )	Data ( )	H2S ( )	NH3 ( )

	Time	Baro.	Temp.	Weather.
Arrive:	6:30 AM	29.87	80	Clear
Depart:	5:00 PM	29.84	80	Clear

**** Instrument Information ****

Instrument	"On"	Unit#	Make/Model
Outlet HC:	1	1	CAI-300-HFID
Inlet HC	1	2	Eagle EM-700

Recorders: Soltec / 2 pens cm/hr

**** Calibration Information ****

	Units	Zero	Span	Range	Gas Cyl.#	Gas Flow
Outlet HC:	ppmv		15.62		CC28357	3.2
Inlet HC:	ppmv		154.8		CC56426	3.2

**** Recorder Information ****

		Chanl.	Pen Type	Color
Outlet HC:	ppmv	1	Cont.	Black
Inlet HC:	ppmv	2	Cont.	Green

EMISSION TEST - EPA METHOD 25A

Date: 7/11/96
Client: Astec
Site:

Unit: Smog Hog
Run: 1-Top Open

Start Calibrations @: 7:15 Start Run @: 7:20
Finish Calibrations @: 9:24 End Run @: 9:20

**** Measured Emissions Components ****

Source:	Outlet	Inlet
Component:	HC	HC
Units:	ppmv	ppmv

**** Instrument Cal Range, Span & Data Range ****

C. Range:	50	200
Span:	15.62	154.8
D. Range:	50	200

**** Raw Emission Data ****

7:20 AM	12	18	
7:30 AM	6	12	
7:40 AM	7	17	
7:50 AM	10	22	
8:00 AM	13	40	
8:10 AM	32	66	Changed inlet to 200 scale
8:20 AM	31	59	
8:30 AM	42	80	
8:40 AM	26	52	
8:50 AM	18	36	
9:00 AM	14	28	
9:10 AM	20	34	
9:20 AM	18	36	
Raw Avg:	**19**	**38**	
Maximum:	42	80	
Minimum:	6	12	

**** Calibration Adjustments ****

Zero:	0.2	-3.0
Span:	2.9	-6.2
% **zero drift**	-0.4	1.5
% **span drift**	-5.8	3.1

**** Drift Corrected Emissions ****

Average:	21	36

DCAvg= (RawAvg+(ZeroAdj/2)*(Data Rng/CalDng))*(1+(SpanAdj/(2*CalSpan)))

EMISSION TEST - EPA METHOD 25A

Date: 7/11/96
Client: Astec
Site:

page: 3 of 5
Unit: Smog Hog
Run: 2-Top Closed

Start Calibrations @: 9:40 Start Run @: 9:45
Finish Calibrations @: 11:49 End Run @: 11:45

**** Measured Emissions Components ****

Source:	Outlet	Inlet
Component:	HC	HC
Units:	ppmv	ppmv

**** Instrument Cal Range, Span & Data Range ****

C. Range:	25	200
Span:	15.62	154.8
D. Range:	25	200

**** Raw Emission Data ****

9:45 AM	12	20	45 cm/hr
9:55 AM	15	30	
10:05 AM	10	14	
10:15 AM	11	24	
10:25 AM	12	19	
10:35 AM	9	18	
10:45 AM	8	30	Changed chart spc 10cm/hr
10:55 AM	15	26	
11:05 AM	11	12	
11:15 AM	9	20	
11:25 AM	10	20	
11:35 AM	11	12	
11:45 AM	3	30	
Raw Avg:	**10**	**21**	
Maximum:	15	30	
Minimum:	3	12	

**** Calibration Adjustments ****

Zero:	0.2	2.0
Span:	-1.0	9.2
% **zero drift**	-0.8	-1.0
% **span drift**	4.0	-4.6

**** Drift Corrected Emissions ****

Average:	**10**	23

DCAvg= (RawAvg+(ZeroAdj/2)*(Data Rng/CalDng))*(1+(SpanAdj/(2*CalSpan)))

EMISSION TEST - EPA METHOD 25A

Date: 7/11/96
Client: Astec
Site:

Unit: Smog Hog
Run: 3-Top Open

Start Calibrations @: 11:55 Start Run @: 12:00
Finish Calibrations @: 14:04 End Run @: 14:00

**** Measured Emissions Components ****

Source:	Outlet	Inlet
Component:	HC	HC
Units:	ppmv	ppmv

**** Instrument Cal Range, Span & Data Range ****

C. Range:	200	200
Span:	15.62	154.8
D. Range:	200	200

**** Raw Emission Data ****

12:00 PM	1	20	
12:10 PM	2	50	
12:20 PM	32	61	Changed outlet tc 200 scale
12:30 PM	21	56	
12:40 PM	32	50	
12:50 PM	19	30	
1:00 PM	19	26	
1:10 PM	20	26	
1:20 PM	20	30	
1:30 PM	16	24	
1:40 PM	14	26	
1:50 PM	19	26	
2:00 PM	19	26	
Raw Avg:	**18**	**35**	
Maximum:	32	61	
Minimum:	1	20	

**** Calibration Adjustments ****

Zero:	0.4	0.0
Span:	-0.2	-2.2
% **zero drift**	-0.2	0.0
% **span drift**	0.1	1.1

**** Drift Corrected Emissions ****

Average:	**18**	**34**

DCAvg= (RawAvg+(ZeroAdj/2)*(Data Rng/CalDng))*(1+(SpanAdj/(2*CalSpan)))

EMISSION TEST - EPA METHOD 25A

Date: 7/11/96
Client: Astec
Site:

Unit: Smog Hog
Run: 4-Top Closed

Start Calibrations @: 14:05 Start Run @: 14:10
Finish Calibrations @: 16:14 End Run @: 16:10

**** Measured Emissions Components ****

Source:	Outlet	Inlet
Component:	HC	HC
Units:	ppmv	ppmv

**** Instrument Cal Range, Span & Data Range ****

C. Range:	200	200
Span:	15.62	154.8
D. Range:	200	200

**** Raw Emission Data ****

2:10 PM	10	14	
2:20 PM	10	14	
2:30 PM	8	10	
2:40 PM	4	8	
2:50 PM	4	6	
3:00 PM	5	7	
3:10 PM	4	8	
3:20 PM	6	8	
3:30 PM	10	12	
3:40 PM	4	7	Open Top
3:50 PM	5	10	
4:00 PM	8	12	
4:10 PM	0	0	
Raw Avg:	**6**	**9**	
Maximum:	10	14	
Minimum:	0	0	

**** Calibration Adjustments ****

%	Zero:	-6.0	2.0
%	Span:	2.8	-1.0
	zero drift	3.0	-1.0
	span drift	-1.4	0.5

**** Drift Corrected Emissions ****

Average:	3	**10**

DCAvg= (RawAvg+(ZeroAdj/2)*(Data Rng/CalDng))*(1+(SpanAdj/(2*CalSpan)))

PARTICULATE WEIGHTS : DATA & CALCULATIONS

Client :	Astec	Run #:	1-Outlet	Date :	7/9/96
Site :		Box #:	6	Job #:	1030
Unit :	Smog Hog	Filter #:	D-42	Lab #:	296-094

SOLUTION BLANKS

Acetone -				Volume:	200	ml
	Gross:	80.2523 g	Tare: 80.2523 g	Residue:	0.0000	g
MeCl2				Volume:	200	ml
	Gross:	80.8752 g	Tare: 80.8751 g	Residue:	0.0001	g
DI Water -				Volume:	200	ml
	Gross:	77.5768 g	Tare: 77.5762 g	Residue:	0.0006	g

WEIGHTS & VOLUMES

A : Filter Catch -

Gross: 0.5733 g Tare: 0.5721 g Net: **0.0012 g**

C : Probe Catch -

Acetone:	40	ml *	0	g/ml	0.0000	g
DI Water:	45	ml *	3E-06	g/ml	-0.0001	g
Gross:	80.6032 g		Tare: 80.5970 g		0.0062	g
				Net:	**0.0061**	**g**

E : Impinger Catch -

DI Water:	390	ml *	3E-06	g/ml	-0.0012	g
Total:	400	ml	Aliquot:	400 ml		
Gross:	81.5428 g		Tare: 81.5411 g		0.0017	g
				Net:	**0.0005**	**g**

G : Organic Extract -

MeCl2:	75	ml *	5E-07	g/ml	0.0000	g
Gross:	80.4474 g		Tare: 80.4453 g		0.0021	g
				Net:	**0.0021**	**g**

Total Particulate Weight, (A+C+E+G) = 0.0099 g

PARTICULATE WEIGHTS : DATA & CALCULATIONS

Client :	Astec	Run #:	2-Outlet	Date :	7/9/96
Site :		Box #:	6	Job #:	1030
Unit :	Smog Hog	Filter #:	D-52	Lab #:	296-094

SOLUTION BLANKS

Acetone -				Volume:	200	ml
	Gross:	80.2523 g	Tare:	80.2523 g	Residue:	0.0000 g
MeCl2				Volume:	200	ml
	Gross:	80.8752 g	Tare:	80.8751 g	Residue:	0.0001 g
DI Water -				Volume:	200	ml
	Gross:	77.5768 g	Tare:	77.5762 g	Residue:	0.0006 g

WEIGHTS & VOLUMES

A : Filter Catch -

Gross: 0.5852 g Tare: 0.5842 g Net: **0.0010 g**

C : Probe Catch -

Acetone:	40 ml	*	0 g/ml		0.0000 g
DI Water:	45 ml	*	3E-06 g/ml		-0.0001 g
Gross:	70.0342 g	Tare:	70.0319 g		0.0023 g
				Net:	**0.0022 g**

E : Impinger Catch -

DI Water:	375 ml	*	3E-06 g/ml		-0.0011 g
Total:	395 ml	Aliquot:	395 ml		
Gross:	73.4861 g	Tare:	73.4850 g		0.0011 g
				Net:	**0.0000 g**

G : Organic Extract -

MeCl2:	75 ml	*	5E-07 g/ml		0.0000 g
Gross:	80.3184 g	Tare:	80.3164 g		0.0020 g
				Net:	**0.0020 g**

Total Particulate Weight, (A+C+E+G) = 0.0051 g

PARTICULATE WEIGHTS : DATA & CALCULATIONS

Client :	Astec	Run #:	3-Outlet	Date :	7/9/96
Site :		Box #:	6	Job #:	1030
Unit :	Smog Hog	Filter #:	D-54	Lab #:	296-094

SOLUTION BLANKS

Acetone -				Volume:	200	ml
	Gross:	80.2523 g	Tare:	80.2523 g	Residue:	0.0000 g
MeCl2				Volume:	200	ml
	Gross:	80.8752 g	Tare:	80.8751 g	Residue:	0.0001 g
DI Water -				Volume:	200	ml
	Gross:	77.5768 g	Tare:	77.5762 g	Residue:	0.0006 g

WEIGHTS & VOLUMES

A : Filter Catch -

Gross:	0.5814 g	Tare:	0.5812 g	Net: **0.0002 g**

C : Probe Catch -

Acetone:	35 ml	*	0 g/ml		0.0000 g
DI Water:	40 ml	*	3E-06 g/ml		-0.0001 g
Gross:	80.9185 g	Tare:	80.9140 g		0.0045 g
				Net:	**0.0044 g**

E : Impinger Catch -

DI Water:	265 ml	*	3E-06 g/ml		-0.0008 g
Total:	275 ml	Aliquot:	275 ml		
Gross:	79.4700 g	Tare:	79.4690 g		0.0010 g
				Net:	**0.0002 g**

G : Organic Extract -

MeCl2:	75 ml	*	5E-07 g/ml		0.0000 g
Gross:	80.4952 g	Tare:	80.4950 g		0.0002 g
				Net:	**0.0002 g**

Total Particulate Weight, (A+C+E+G) = 0.0049 g

PARTICULATE WEIGHTS : DATA & CALCULATIONS

Client :	Astec	Run #:	1-Inlet	Date :	7/9/96
Site :		Box #:	5	Job #:	1030
Unit :	Smog Hog	Filter #:	D-41	Lab #:	296-094

SOLUTION BLANKS

Acetone -				Volume:	200 ml
	Gross: 80.2523 g	Tare:	80.2523 g	Residue:	0.0000 g
MeCl2				Volume:	200 ml
	Gross: 80.8752 g	Tare:	80.8751 g	Residue:	0.0001 g
DI Water -				Volume:	200 ml
	Gross: 77.5768 g	Tare:	77.5762 g	Residue:	0.0006 g

WEIGHTS & VOLUMES

A : Filter Catch -

Gross: 0.5648 g Tare: 0.5636 g Net: **0.0012 g**

C : Probe Catch -

Acetone:	45 ml	*	0 g/ml		0.0000 g
DI Water:	45 ml	*	3E-06 g/ml		-0.0001 g
Gross:	78.8301 g		Tare: 78.8244 g		0.0057 g
				Net:	**0.0056 g**

E : Impinger Catch -

DI Water:	400 ml	*	3E-06 g/ml		-0.0012 g
Total:	410 ml		Aliquot: 410 ml		
Gross:	78.8036 g		Tare: 78.8030 g		0.0006 g
				Net:	**-0.0006 g**

G : Organic Extract -

MeCl2:	75 ml	*	5E-07 g/ml		0.0000 g
Gross:	80.0687 g		Tare: 80.0672 g		0.0015 g
				Net:	**0.0015 g**

Total Particulate Weight, (A+C+E+G) = 0.0076 g

PARTICULATE WEIGHTS : DATA & CALCULATIONS

Client :	Astec	Run #:	2-Inlet	Date :	7/9/96
Site :		Box #:	5	Job #:	1030
Unit :	Smog Hog	Filter #:	D-43	Lab #:	296-094

SOLUTION BLANKS

Acetone -				Volume:	200	ml
	Gross:	80.2523 g	Tare:	80.2523 g	Residue:	0.0000 g
MeCl2				Volume:	200	ml
	Gross:	80.8752 g	Tare:	80.8751 g	Residue:	0.0001 g
DI Water -				Volume:	200	ml
	Gross:	77.5768 g	Tare:	77.5762 g	Residue:	0.0006 g

WEIGHTS & VOLUMES

A : Filter Catch -

Gross:	0.5870 g	Tare:	0.5851 g	Net:	**0.0019 g**

C : Probe Catch -

Acetone:	50 ml	*	0 g/ml		0.0000 g
DI Water:	50 ml	*	3E-06 g/ml		-0.0002 g
Gross:	79.1014 g	Tare:	79.0976 g		0.0038 g
				Net:	**0.0036 g**

E : Impinger Catch -

DI Water:	305 ml	*	3E-06 g/ml		-0.0009 g
Total:	330 ml	Aliquot:	330 ml		
Gross:	80.0381 g	Tare:	80.0374 g		0.0007 g
				Net:	**-0.0002 g**

G : Organic Extract -

MeCl2:	75 ml	*	5E-07 g/ml		0.0000 g
Gross:	80.1766 g	Tare:	80.1748 g		0.0018 g
				Net:	**0.0018 g**

Total Particulate Weight, (A+C+E+G) = 0.0071 g

PARTICULATE WEIGHTS : DATA & CALCULATIONS

Client :	Astec	Run #:	3-Inlet	Date :	7/9/96
Site :		Box #:	5	Job #:	1030
Unit :	Smog Hog	Filter #:	D-53	Lab #:	296-094

SOLUTION BLANKS

Acetone -				Volume:	200	ml
	Gross:	80.2523 g	Tare:	80.2523 g	Residue:	0.0000 g
MeCl2				Volume:	200	ml
	Gross:	80.8752 g	Tare:	80.8751 g	Residue:	0.0001 g
DI Water -				Volume:	200	ml
	Gross:	77.5768 g	Tare:	77.5762 g	Residue:	0.0006 g

WEIGHTS & VOLUMES

A : Filter Catch -

Gross:	0.5674 g	Tare:	0.5645 g	Net:	**0.0029**	**g**

C : Probe Catch -

Acetone:	45 ml	*	0 g/ml		0.0000	g
DI Water:	50 ml	*	3E-06 g/ml		-0.0002	g
Gross:	80.2072 g	Tare:	80.2045 g		0.0027	g
				Net:	**0.0026**	**g**

E : Impinger Catch -

DI Water:	420 ml	*	3E-06 g/ml		-0.0013	g
Total:	435 ml	Aliquot:	435 ml			
Gross:	79.4707 g	Tare:	79.4698 g		0.0009	g
				Net:	**-0.0004**	**g**

G : Organic Extract -

MeCl2:	75 ml	*	5E-07 g/ml		0.0000	g
Gross:	80.2472 g	Tare:	80.2462 g		0.0010	g
				Net:	**0.0010**	**g**

Total Particulate Weight, (A+C+E+G) = 0.0061 g

IMPINGER WEIGHTS

Client : Astec
Site :
Unit: Inlet to Smog Hog

Date : 7/9/96
Job #: 1030
Lab #: 296-094

Run#/Box#: 1

Imp. #1:	gross	630.8
	tare	622.0
	final	8.8
Imp. #2:	gross	619.8
	tare	618.7
	final	1.1
Imp. #3:	gross	475.7
	tare	476.5
	final	-0.8
Imp. #4:	gross	485.3
	tare	484.7
	final	0.6
	TOTAL	**9.7**

Run#/Box#: 2

Imp. #1:	gross	651.5
	tare	629.6
	final	21.9
Imp. #2:	gross	607.4
	tare	604.3
	final	3.1
Imp. #3:	gross	478.6
	tare	476.5
	final	2.1
Imp. #4:	gross	487.0
	tare	485.3
	final	1.7
	TOTAL	**28.8**

Run#/Box#: 3

Imp. #1:	gross	652.8
	tare	641.1
	final	11.7
Imp. #2:	gross	633.1
	tare	631.1
	final	2.0
Imp. #3:	gross	479.0
	tare	478.6
	final	0.4
Imp. #4:	gross	487.7
	tare	487.0
	final	0.7
	TOTAL	**14.8**

Run#/Box#:

Imp. #1:	gross	
	tare	
	final	
Imp. #2:	gross	
	tare	
	final	
Imp. #3:	gross	
	tare	
	final	
Imp. #4:	gross	
	tare	
	final	
	TOTAL	

IMPINGER WEIGHTS

Client : Astec
Site :
Unit: Outlet of Smog Hog

Date : 7/9/96
Job #: 1030
Lab #: 296-094

Run#/Box#: 1

Imp. #1:	gross	620.9
	tare	613.6
	final	7.3
Imp. #2:	gross	612.8
	tare	613.2
	final	-0.4
Imp. #3:	gross	458.6
	tare	459.5
	final	-0.9
Imp. #4:	gross	658.6
	tare	660.6
	final	-2.0
	TOTAL	**4.0**

Run#/Box#: 2

Imp. #1:	gross	647.2
	tare	630.6
	final	16.6
Imp. #2:	gross	591.9
	tare	588.3
	final	3.6
Imp. #3:	gross	459.1
	tare	458.6
	final	0.5
Imp. #4:	gross	658.2
	tare	658.6
	final	-0.4
	TOTAL	**20.3**

Run#/Box#: 3

Imp. #1:	gross	606.4
	tare	598.8
	final	7.6
Imp. #2:	gross	614.8
	tare	611.9
	final	2.9
Imp. #3:	gross	459.0
	tare	459.1
	final	-0.1
Imp. #4:	gross	659.3
	tare	658.2
	final	1.1
	TOTAL	**11.5**

Run#/Box#:

Imp. #1:	gross	
	tare	
	final	
Imp. #2:	gross	
	tare	
	final	
Imp. #3:	gross	
	tare	
	final	
Imp. #4:	gross	
	tare	
	final	
	TOTAL	

IMPINGER WEIGHTS

Client : Astec
Site :
Unit: Outlet of Smog Hog

Date : 7/11/96
Job #: 1030
Lab #: 296-094

Run#/Box#: 1-System Open

Imp. #1:	gross	629.0
	tare	613.3
	final	15.7
Imp. #2:	gross	600.6
	tare	598.9
	final	1.7
Imp. #3:	gross	478.4
	tare	477.1
	final	1.3
Imp. #4:	gross	490.4
	tare	488.0
	final	2.4
	TOTAL	**21.1**

Run#/Box#: 2-Top Closed

Imp. #1:	gross	634.5
	tare	629.0
	final	5.5
Imp. #2:	gross	600.1
	tare	600.6
	final	-0.5
Imp. #3:	gross	477.8
	tare	478.4
	final	-0.6
Imp. #4:	gross	490.7
	tare	490.4
	final	0.3
	TOTAL	**4.7**

Run#/Box#:

Imp. #1:	gross	
	tare	
	final	
Imp. #2:	gross	
	tare	
	final	
Imp. #3:	gross	
	tare	
	final	
Imp. #4:	gross	
	tare	
	final	
	TOTAL	

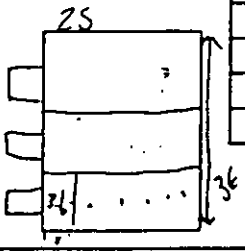
Run#/Box#:

Imp. #1:	gross	
	tare	
	final	
Imp. #2:	gross	
	tare	
	final	
Imp. #3:	gross	
	tare	
	final	
Imp. #4:	gross	
	tare	
	final	
	TOTAL	

Plant:		Filter:	D-42	Box Heat:	–
Location:	Irvine	Am Temp:	85	Nozzel:	.226
Unit:	Smog Hog	Pbar:	29.93	Prob Heat:	–
Date:	2/9/96	Pitot:	3-0.8371	Wind Vel:	Calm
Run#:	1 - Outlet	Pyro:	4	Static Ps:	-.20
Cold Box:	6	Mag ΔP:	M-4	O2:	
Meter#:	0	Mag ΔH:	M-5	CO2:	
Meter Fac:	9738	%H2O:	5%	Testers:	KK DW CD

Stack Dia: 25¼
"A": Wall
"B": 3ft
Port Size: 3 M (F)
offset 3½

Stack Sampling Port Location



Equiv Dia 23.25

Imp	Gross	Tare	Total
1	620.9	613.6	
2	612.8	613.2	
3	458.6	459.5	
4	658.6	660.6	

3.13

START 9:55 K=2.92

	Trav Dist	O2 %	CO2 %	Time Min	Stack °F	ΔP	√ΔP	ΔH	Dry Gas Meter Volume	Inlet °F	Outlet °F	Vac
1	1.8	20.9	0.05	0.0	89	.08		.23	463.734	93	93	1
2	4.7			2.5	90	.18		.59	464.491	98	93	1
3	7.9			5.0	91	.15		.43	465.064	98	94	1
4	11.0			7.5	92	.32		.93	466.083	104	93	1
5	14.2			10	92	.47		1.37	466.932	104	93	1
6	17.4			12.5	92	.38		1.10	467.639	104	94	1
7	20.5			15	91	.28		.81	469.981	106	95	1
8	23.6			17.5	91	.23		.67	471.350	107	95	1
9				20	91	.42		1.22	472.152	103	95	1
10				22.5	91	.27		.78	473.643	110	95	1
11				25	92	.27		.78	474.690	109	97	1
12				27.5	92	.47		1.37	475.932	108	95	1
13				30	92	.72		2.11	477.381	111	96	4
14				32.5	.95	.80		2.33	479.569	111	96	5
15				35	.97	.85		2.48	481.351	111	96	5
16				37.5	97	.67		1.95	483.713	111	96	5
17				40	97	.50		1.46	485.467	111	96	5
18				42.5	97	.42		1.22	487.316	109	97	5
19				45	97	.42		1.22	488.776	110	97	4
20				47.5	97	.45		1.31	490.330	110	97	4
21				50	.97	.50		1.46	491.653	110	98	4
22				52.5	97	.70		2.04	493.406	110	98	4
23				55	97	.75		2.19	495.311	109	98	4
24				57.5	97	.64		1.85	497.381	107	98	
25				60					499.055			
Average:		20.9	0.05	60	93.8		0.650	1.317	35.321	97.2		

Leak Checks:

Pre	Top	Bottom
ΔP	OK	OK
ΔP	OK	OK

Pitots

Post	Top	Bottom
ΔP	OK	OK
ΔP		

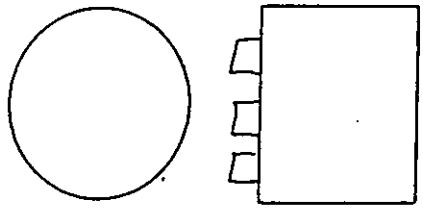
Sample Train Leak Check

CFM: .003 IN. HG 18
CFM: .003 IN. HG 22

Plant:		Filter:	D-52	Box Heat:	–
Location:	Irwin	Am Temp:	84	Nozzel:	.226
Unit:	Outlet	Pbar:	29.93	Prob Heat:	–
Date:	7-9-96	Pitot:	3 0.834	Wind Vel:	Calm
Run#:	2	Pyro:	3	Static Ps:	–.20
Cold Box:	6	Mag ΔP:	M-4	O2:	
Meter#:	0	Mag ΔH:	M-15	CO2:	
Meter Fac:	.9738	%H2O:	5%	Testers:	KK·CD

Stack Dia: 25¼
"A": 12 diameters
"B": 3 ft
Port Size: 3 M (F)
3½ offset

Stack Sampling Port Location



Imp	Gross	Tare	Total
1	647.2	630.6	
2	591.9	588.3	
3	459.1	458.6	
4	658.2	608.6	

START 11:35 K=2.72

	Trav Dist	O2 %	CO2 %	Time Min	Stack °F	ΔP	√ΔP	ΔH	Dry Gas Meter Volume	Inlet °F	Outlet °F	Vac
1		20.9	0.1%	0.0	93	.08		.23	499.478	96	96	1
2				2.5	96	.10		.28	500.032	98	96	1
3				5	98	.18		.52	500.650	101	96	1
4				7.5	102	.36		1.02	501.672	103	96	1
5				10	98	.35		1.02	502.651	105	97	1
6				12.5	95	.42		1.22	504.271	109	97	1
7				15	93	.28		.81	505.725	110	97	1
8				17.5	89	.23		.67	506.773	110	97	1
9				20	84	.38		1.10	507.649	106	98	1
10				22.5	103	.25		.73	509.480	112	98	1
11				25	103	.38		1.10	510.175	112	98	1
12				27.5	104	.62		1.81	511.530	114	98	1
13				30	104	.85		2.48	513.423	115	99	2
14				32.5	104	.85		2.48	515.936	115	100	2
15				35	88	.80		2.33	517.791	116	100	2
16				37.5	80	.72		2.10	520.146	115	100	2
17				40	106	.54		1.57	522.046	116	101	2
18				42.5	107	.42		1.02	524.398	114	101	2
19				45	107	.42		1.02	525.136	114	101	2
20				47.5	107	.57		1.66	526.621	115	102	2
21				50	107	.70		2.04	528.245	115	102	2
22				52.5	108	.75		2.19	530.271	115	102	2
23				55	81	.57		1.66	532.451	115	102	2
24				57.5	80	.75		2.19	534.276	115	102	2
25				60					536.266			
Average:		20.9	0.05	60	97.4		0.670	1.386	36.788	104.8		

Leak Checks:

Pre	Top	Bottom
ΔP		
ΔP		

Pitots

Post	Top	Bottom
ΔP	OK	OK
ΔP		

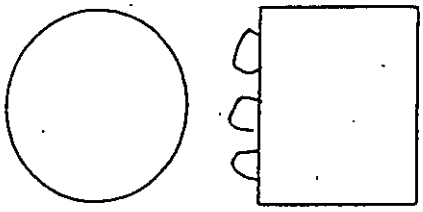
Sample Train Leak Check

CFM: .001 IN. HG 24
CFM: .001 IN. HG 14

Plant:		Filter#	0-54	Box Heat:	–
Location:	Lumine	Am Temp:	81	Nozzel:	.226
Unit:	Outlet	Pbar:	29.93	Prob Heat:	–
Date:	7-9-96	Pitot:	3 0.839	Wind Vel:	Calm
Run#:	3	Pyro:	3	Static Ps:	-.22
Cold Box:	6	Mag ΔP:	M-4	O2:	
Meter#:	D	Mag ΔH:	M-15	CO2:	
Meter Fac:	.9738	%H2O:	5%	Testers:	KL-CD

Stack Dia: 25"
"A": 14"
"B": 5"
Port Size: 5" M (F)
3½ offset

Stack Sampling Port Location



Imp	Gross	Tare	Total
1	606.4	598.7	
2	614.8	611.9	
3	459.0	457.1	
4	659.3	658.2	

START 1:15 K= 2.92

	Trav Dist	O2 %	CO2 %	Time Min	Stack °F	ΔP	√ΔP	ΔH	Dry Gas Meter Volume	Inlet °F	Outlet °F	Vac
1		20.9	0.05	0.0	100	.08		.23	536.552	100	100	1
2				2.5	103	.13		.37	537.161	104	101	1
3				5.0	101	.20		.58	538.026	105	100	1
4				7.5	100	.30		.87	538.913	108	101	1
5				10	100	.48		1.40	540.106	111	100	1
6				12.5	99	.38		1.10	541.631	111	100	1
7				15	93	.25		.73	543.062	113	101	1
8				17.5	85	.22		.64	544.561	113	101	1
9				20	80	.50		1.46	545.395	113	101	1
10				22.5	100	.27		.78	547.469	116	101	1
11				25	99	.35		1.02	548.550	115	102	1
12				27.5	101	.60		1.75	549.961	116	102	1
13				30	101	.80		2.33	551.378	116	102	1
14				32.5	101	.85		2.48	553.235	117	102	1
15				35	99	.80		2.33	555.996	117	103	1
16				37.5	80	.55		1.60	557.691	117	103	1
17				40.	91	.60		1.75	560.094	117	103	1
18				42.5	100	.48		1.40	561.526	117	103	1
19				45	100	.48		1.40	563.150	117	103	1
20				47.5	101	.63		1.83	564.868	117	103	1
21				50	98	.75		2.19	566.571	117	104	1
22				52.5	98	.77		2.24	568.750	118	104	1
23				55	91	.67		1.95	570.869	118	104	1
24				57.5	77	.70		2.03	572.633	117	105	1
25				60					574.667			
Average:		20.9	0.05	60	95.8		0.680	1.436	38.115	107.9		

Leak Checks:

Pre	Top	Bottom
ΔP	OK	OK
ΔP		

Pitots

Post	Top	Bottom
ΔP	OK	OK
ΔP		

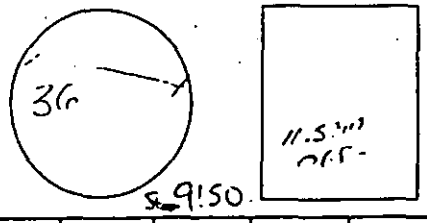
Sample Train Leak Check

CFM: .005 IN. HG 17
CFM: .005 IN. HG 14

Plant:		Filter:	D-41	Box Heat:	-
Location:	Irvine	Am Temp:	85	Nozzel:	.255
Unit:	Survey Hog	Pbar:	29.93	Prob Heat:	-
Date:	7/9/96	Pitot:	4 0.817	Wind Vel:	Calm
Run#:	1- Inlet	Pyro:	3	Static Ps:	-4.85
Cold Box:	5	Mag ΔP:	M-3	O2:	
Meter#:	E	Mag ΔH:	M-14	CO2:	
Meter Fac:	1.0113	%H2O:	58	Testers:	KK DW CD

Stack Dia: 36
"A": 4
"B": 17
Port Size: 3" M/F

Stack Sampling Port Location



Imp	Gross	Tare	Total
1	630.6	622.0	
2	619.8	618.7	
3	475.7	476.5	
4	485.3	484.7	

K=5.14

	Trav Dist	O2 %	CO2 %	Time Min	Stack °F	ΔP	√ΔP	ΔH	Dry Gas Meter Volume	Inlet °F	Outlet °F	Vac
1	.75	20.9	0.05	0.0	88	.28		1.43	999.488	103	106	2
2	2.4			5	88	.38		1.75	2.506	113	105	2
3	4.25			10	89	.42		2.15	5.760	115	106	2
4	6.4			15	90	.42		2.15	9.021	116	107	2
5	9			20	91	.40		2.05	12.702	117	107	2
6	12.5			25	91	.38		1.95	16.448	118	108	2
7	23.2			30	92	.35		1.95	19.675	118	108	2
8	27			35	92	.33		1.69	23.256	119	108	2
9	29.75			40	93	.28		1.43	26.161	118	109	2
10	31.75			45	94	.28		1.43	28.430	118	109	2
11	33.6			50	95	.25		1.28	30.870	118	109	2
12	35.2			55	.95	.25		1.28	33.947	119	110	2
13				60					36.551			
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
Average:		20.9	0.05	60	91.5		0.578	1.728	37.063	111.8		

Leak Checks:

Pre	Top	Bottom
ΔP	OK	OK
ΔP		

Pitots

Post	Top	Bottom
ΔP	OK	OK
ΔP		

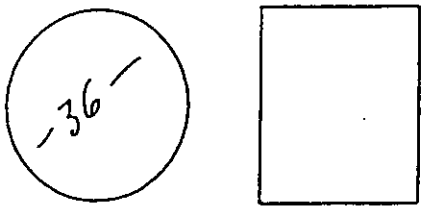
Sample Train Leak Check

CFM: .01 IN. HG 15
CFM: .01 IN. HG 15

Plant:		Filter:	D-43	Box Heat:	-
Location:	Inwire	Am Temp:	85	Nozzel:	.255
Unit:	INLET	Pbar:	29.93	Prob Heat:	-
Date:	7-9-96	Pitot:	4 0.817	Wind Vel:	Calm
Run#:	2	Pyro:	4	Static Ps:	-4.95
Cold Box:	7	Mag ΔP:	M-3	O2:	
Meter#:	E	Mag ΔH:	M-14	CO2:	
Meter Fac:	1.0113	%H2O:	5%	Testers:	KK·DW

Stack Dia: 36 inches
"A": 6 ft
"B": 10 ft
Port Size: 3" M (F)

Stack Sampling Port Location



Imp	Gross	Tare	Total
1	651.5	629.6	
2	607.4	604.3	
3	478.6	476.5	
4	487.0	485.3	

11:40 K=5.19

	Trav Dist	O2 %	CO2 %	Time Min	Stack °F	ΔP	√ΔP	ΔH	Dry Gas Meter Volume	Inlet °F	Outlet °F	Vac
1		20.9	0.05	0.0	95	.38		1.95	38.150	99	100	2
2				5	94	.38		1.95	41.870	113	103	
3				10	98	.42		2.17	45.483	116	105	2
4				15	99	.42		2.17	49.161	117	106	
5				20	100	.45		2.33	53.244	120	107	2
6				25	100	.35		1.81	56.841	120	108	
7				30	101	.40		2.07	60.729	121	110	
8				35	103	.35		1.81	63.767	121	111	
9				40	100	.28		1.45	67.175	123	111	2
10				45	88	.28		1.45	70.393	122	113	
11				50	80	.25		1.28	73.350	122	112	2
12				55	78	.25		1.28	76.730	124	114	
13				60					79.425			
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
Average:		20.9	0.05	60	94.7		0.589	1.810	41.225	113.3		

Leak Checks:

Pre	Top	Bottom
ΔP	OK	OK
ΔP		

Pitots

Post	Top	Bottom
ΔP	OK	OK
ΔP		

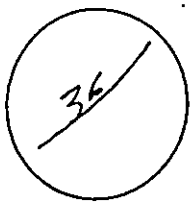
Sample Train Leak Check

CFM: .008 IN, HG 12
CFM: .008 IN, HG 14

Plant:		Filter:	D-53	Box Heat:	–
Location:	Irvine	Am Temp:	80	Nozzel:	.255
Unit:	Inlet	Pbar:	29.93	Prob Heat:	–
Date:	2-9-96	Pitot:	H 0.817	Wind Vel:	Calm
Run#:	3	Pyro:	H	Static Ps:	-4.75
Cold Box:	7	Mag ΔP:	M-3	O2:	
Meter#:	E	Mag ΔH:	M-14	CO2:	
Meter Fac:	1.011	%H2O:	58	Testers:	KL, DW

Stack Dia: 36 in
"A": 6 ft
"B": 10 ft
Port Size: 3 M (F)
offset 3 in

Stack Sampling Port Location



Imp	Gross	Tare	Total
1	652.8	641.1	
2	635.1	631.1	
3	479.0	478.4	
4	487.7	482.0	

START 1:10 K=5.19

	Trav Dist	O2 %	CO2 %	Time Min	Stack °F	ΔP	√ΔP	ΔH	Dry Gas Meter Volume	Inlet °F	Outlet °F	Vac
1		20.9	0.05	0.0	99	.30		1.55	79.618	100	104	2
2				5	98	.32		1.66	82.531	115	105	2
3				10	95	.40		2.07	86.081	116	105	2
4				15	93	.42		2.17	90.016	119	106	2
5				20	94	.45		2.33	94.883	119	107	2
6				25	96	.45		2.33	97.106	122	109	2
7				30	95	.38		1.97	101.692	122	109	2
8				35	98	.40		2.07	104.921	123	110	2
9				40	99	.30		1.55	108.869	123	111	2
10				45	97	.40		2.07	111.235	123	112	2
11				50	96	.30		1.55	114.460	125	112	2
12				55	92	.35		2.49	117.692	125	113	2
13				60					121.659			
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
Average:		20.9	0.05	60	96.0		0.609	1.984	42.041	114.0		

Leak Checks:

Pre	Top	Bottom
ΔP	.1	.1
ΔP		

Pitots

Post	Top	Bottom
ΔP	.1	.1
ΔP		

Sample Train Leak Check

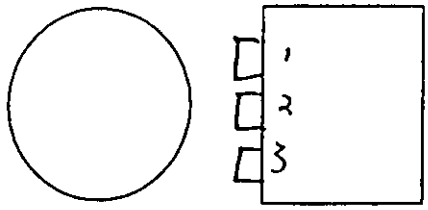
CFM: .003 IN, HG 10
CFM: .003 IN, HG 15

Plant:		Filter:	—	Box Heat:	—
Location:	Irvine	Am Temp:	70	Nozzel:	—
Unit:	Smog bag	Pbar:	29.70	Prob Heat:	—
Date:	7-11-98	Pitot:	3 - 0.834	Wind Vel:	Calm
Run#:	1 M-4	Pyro:	3	Static Ps:	-.16
Cold Box:	7	Mag ΔP:	M-4	O2:	
Meter#:	D	Mag ΔH:	M-15	CO2:	
Meter Fac:	9738	%H2O:	5%	Testers:	KK

System fully open

Stack Dia: [illegible]
"A": 1.54
"B": 3.54
Port Size: 3 M (F)

Stack Sampling Port Location



Imp	Gross	Tare	Total
1	629.0	613.3	15.7
2	600.6	598.9	1.7
3	478.4	477.1	1.3
4	490.4	488.0	2.4

21.1

8:20

	Trav Dist	O2 %	CO2 %	Time Min	Stack °F	ΔP	√ΔP	ΔH	Dry Gas Meter Volume	Inlet °F	Outlet °F	Vac
1		20.9	0.05	0.0	88	.52		1.5	574.007	76	75	
2				10	90	.72		1.5	582.034	89	76	2
3				20	92	.70		1.5	588.993	97	82	
4				30	92	.45		1.5	595.750	99	84	2
5				40	94	.50		1.5	603.726	103	87	
6				50	94	.34			610.320	104	89	2
7				60		.55			616.345			
8						.55						
9						.52						
10						.55						
11						.73						
12						.62						
13						.40						
14						.21						
15						.20						
16						.40						
17						1.9						
18						2.6						
19						4.3						
20						4.5						
21						.32						
22						1.6						
23						.14						
24						.06						
25												
Average:		20.9	0.05	60	91.7		0.624	1.5	42.338	88.4		

Leak Checks:

Pre	Top	Bottom
ΔP	OK	OK
ΔP		

Pitots

Post	Top	Bottom
ΔP	OK	OK
ΔP		

Sample Train Leak Check

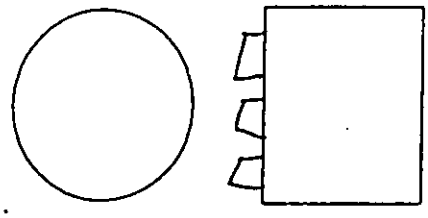
CFM: .003 IN, HG 12
CFM: .002 IN, HG 12

10

Plant:		Filter:	~	Box Heat:	~
Location:	Smog Haz	Am Temp:	77	Nozzel:	~
Unit:	Twin	Pbar:	29.90	Prob Heat:	~
Date:	7-11-96	Pitot:	3-0.837	Wind Vel:	Calm
Run#:	2 Top Board omitted	Pyro:	3	Static Ps:	-.15
Cold Box:	7	Mag ΔP:	M-4	O2:	
Meter#:	D	Mag ΔH:	M-15	CO2:	
Meter Fac:	9738	%H2O:	5%	Testers:	KK

Stack Dia:
"A": 12
"B": 59
Port Size: 3 MIP

Stack Sampling Port Location



Imp	Gross	Tare	Total
1	634.5	629.0	5.5
2	600.1	600.6	-.5
3	477.8	478.4	-.6
4	490.7	490.4	.3

4.7

START 9:35

	Trav Dist	O2 %	CO2 %	Time Min	Stack °F	ΔP	√ΔP	ΔH	Dry Gas Meter Volume	Inlet °F	Outlet °F	Vac
1		20.9	0.05	0.0	90	.42		1.5	616.519	87	85	
2				10	91	.35		1.5	623.840	99	86	2
3				20	92	.34		1.5	630.423	105	89	
4				30	92	.35		1.5	637.361	108	92	2
5				40	94	.38		1.5	644.451	111	95	
6				50	93	.40		1.5	651.568	113	97	2
7				60		.35			658.446			
8						.30						
9						.28						
10						.17						
11						.20						
12						.25						
13						.37						
14						.45						
15						.40						
16						.62						
17						.05						
18						.05						
19						.14						
20						.21						
21						.37						
22						.57						
23						.38						
24						.26						
25												
Average:		20.9	0.05	60	92.0		0.549	1.5	41.927	97.3		

Leak Checks:

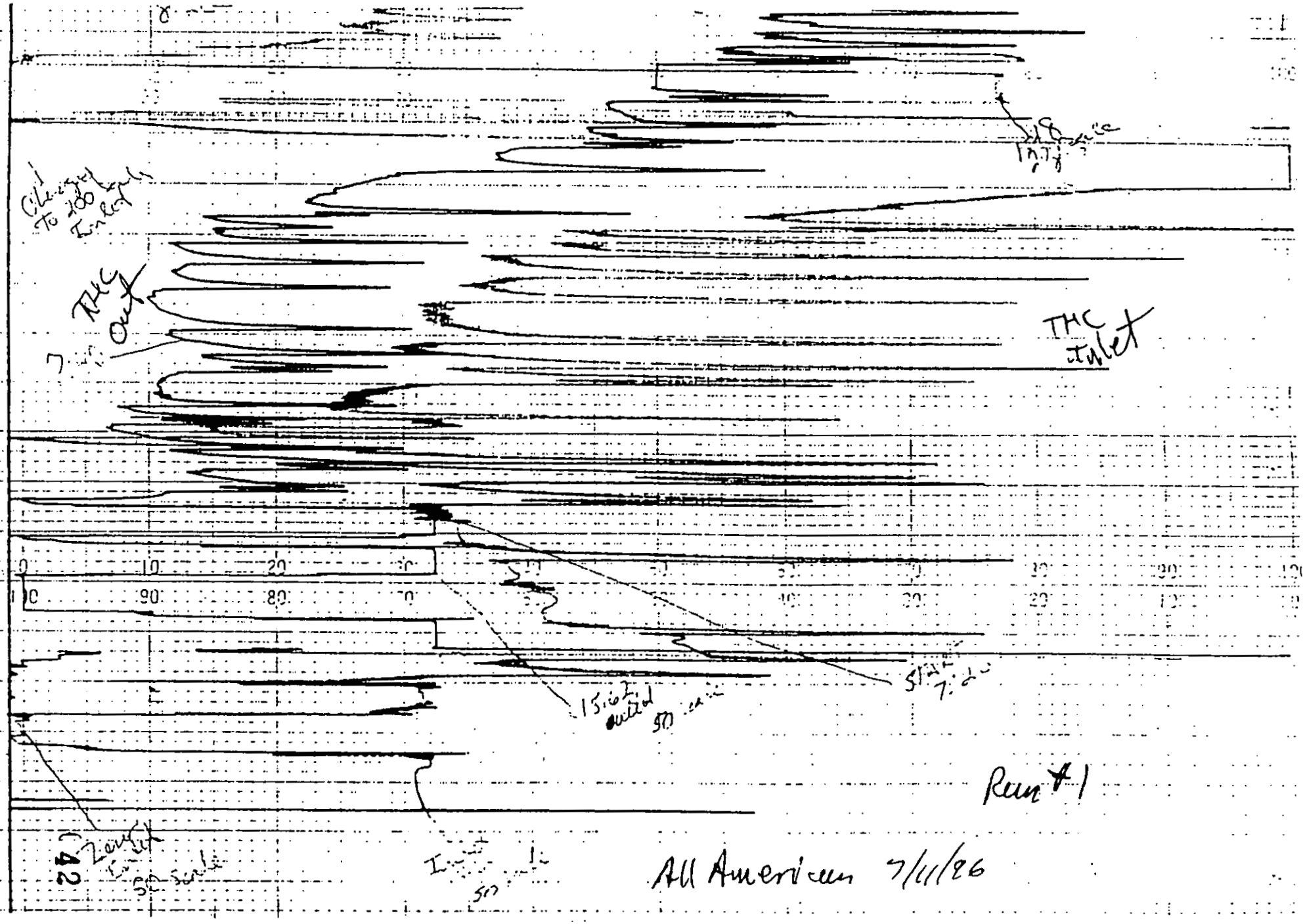
Pre	Top	Bottom
ΔP	OK	OK
ΔP		

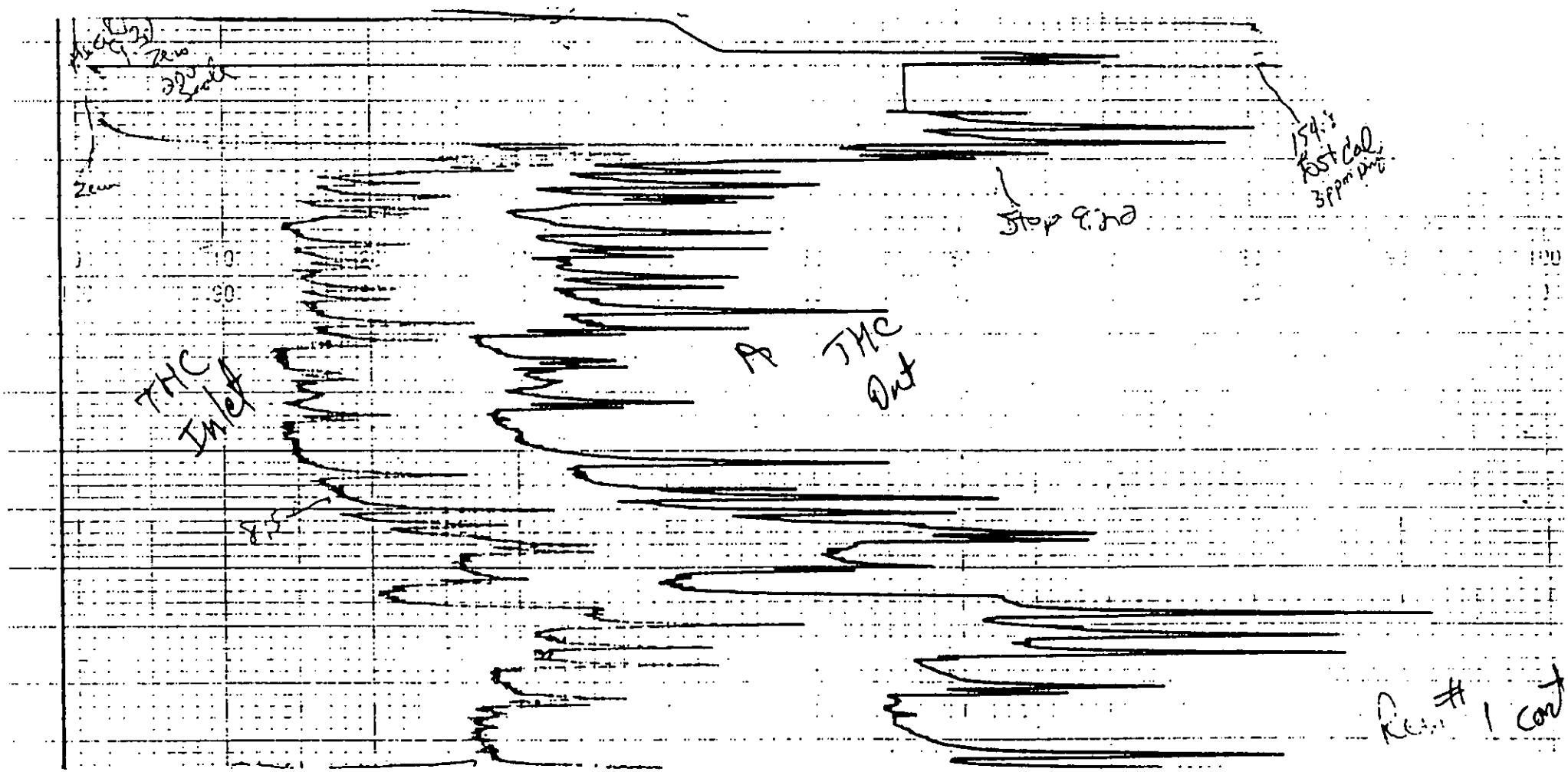
Pitots

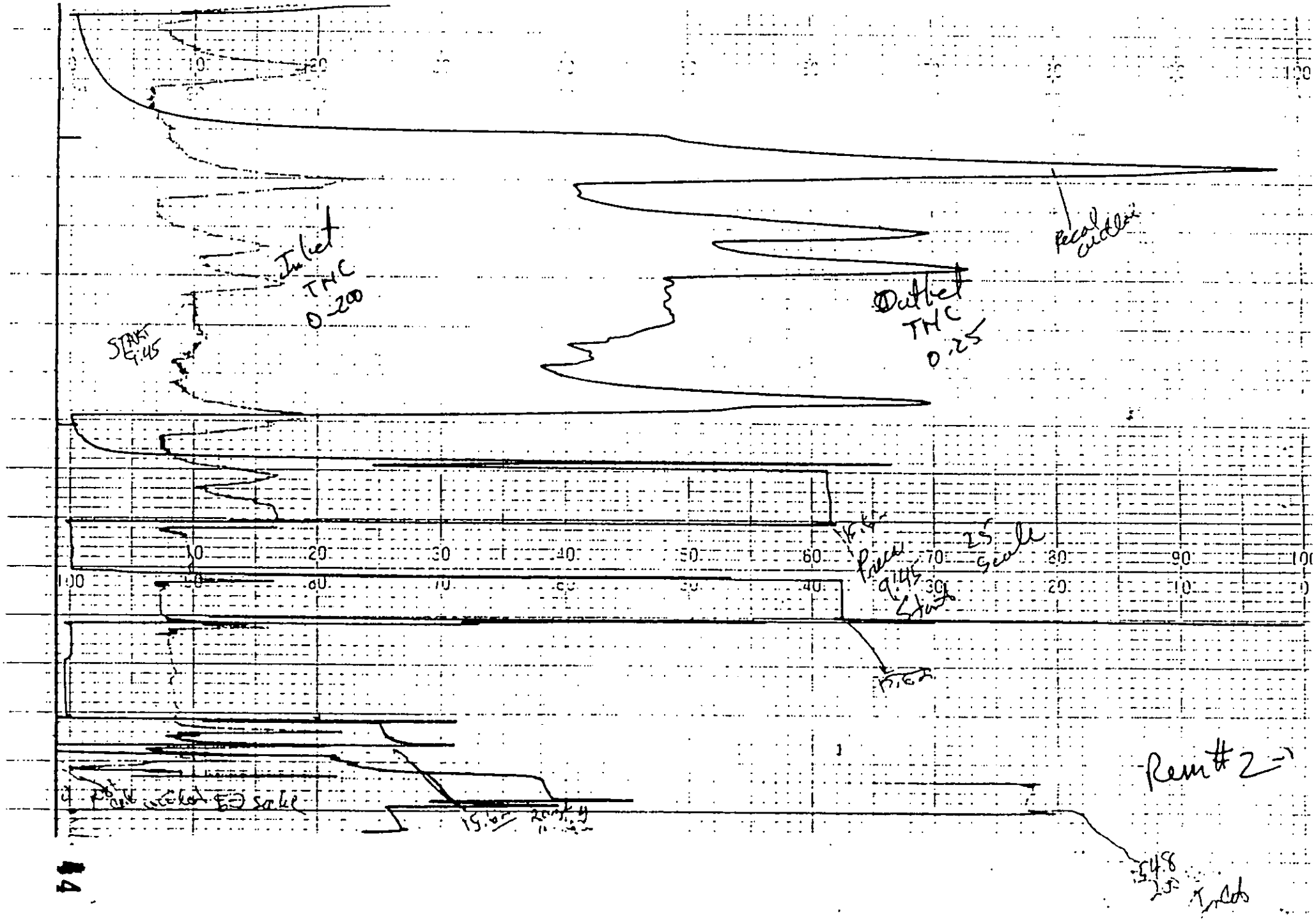
Post	Top	Bottom
ΔP	OK	OK
ΔP		

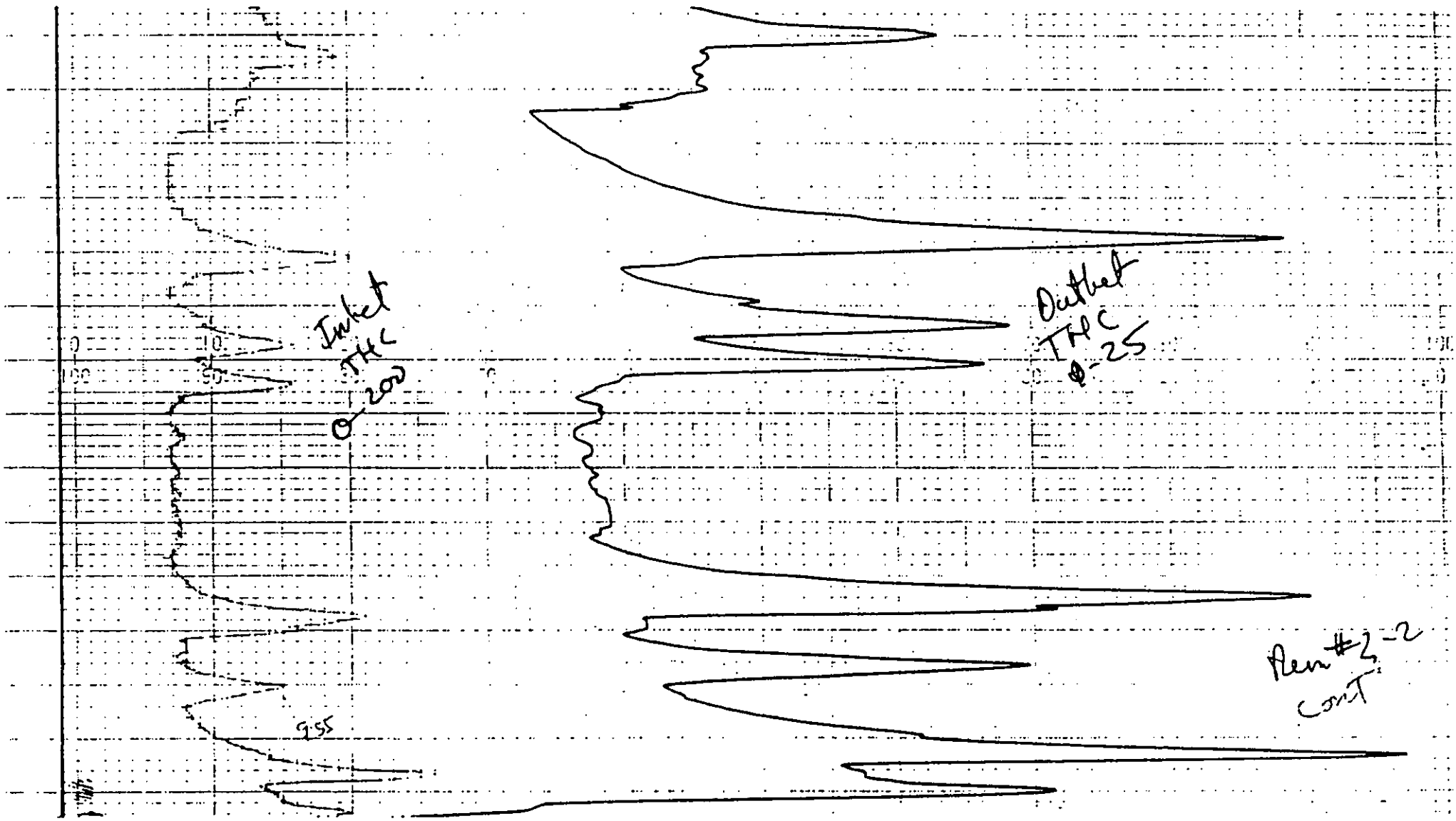
Sample Train Leak Check

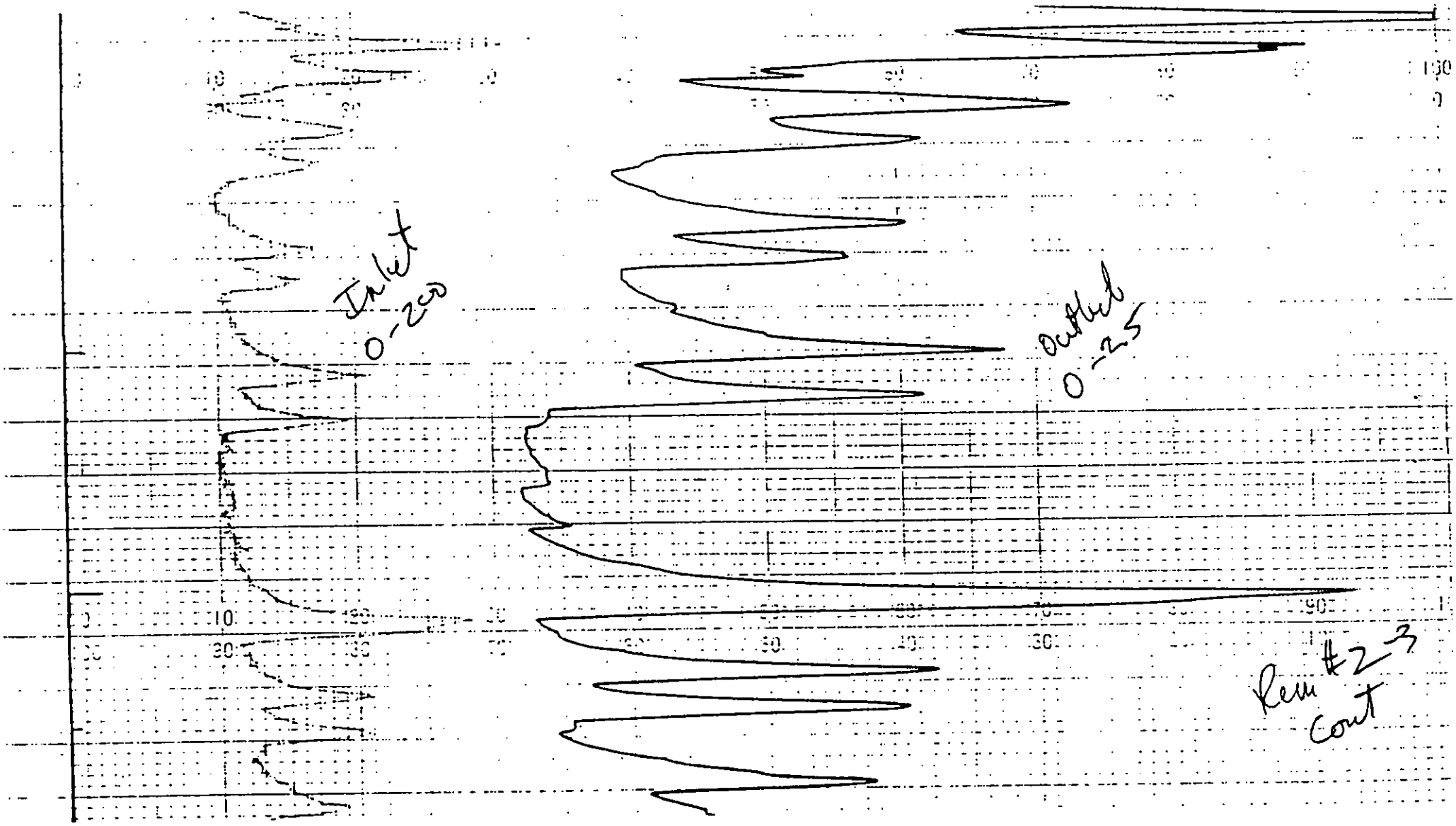
CFM: .004 IN. HG 16
CFM: .004 IN. HG 17


THC Out
THC Inlet
Run #1
All American 7/11/86

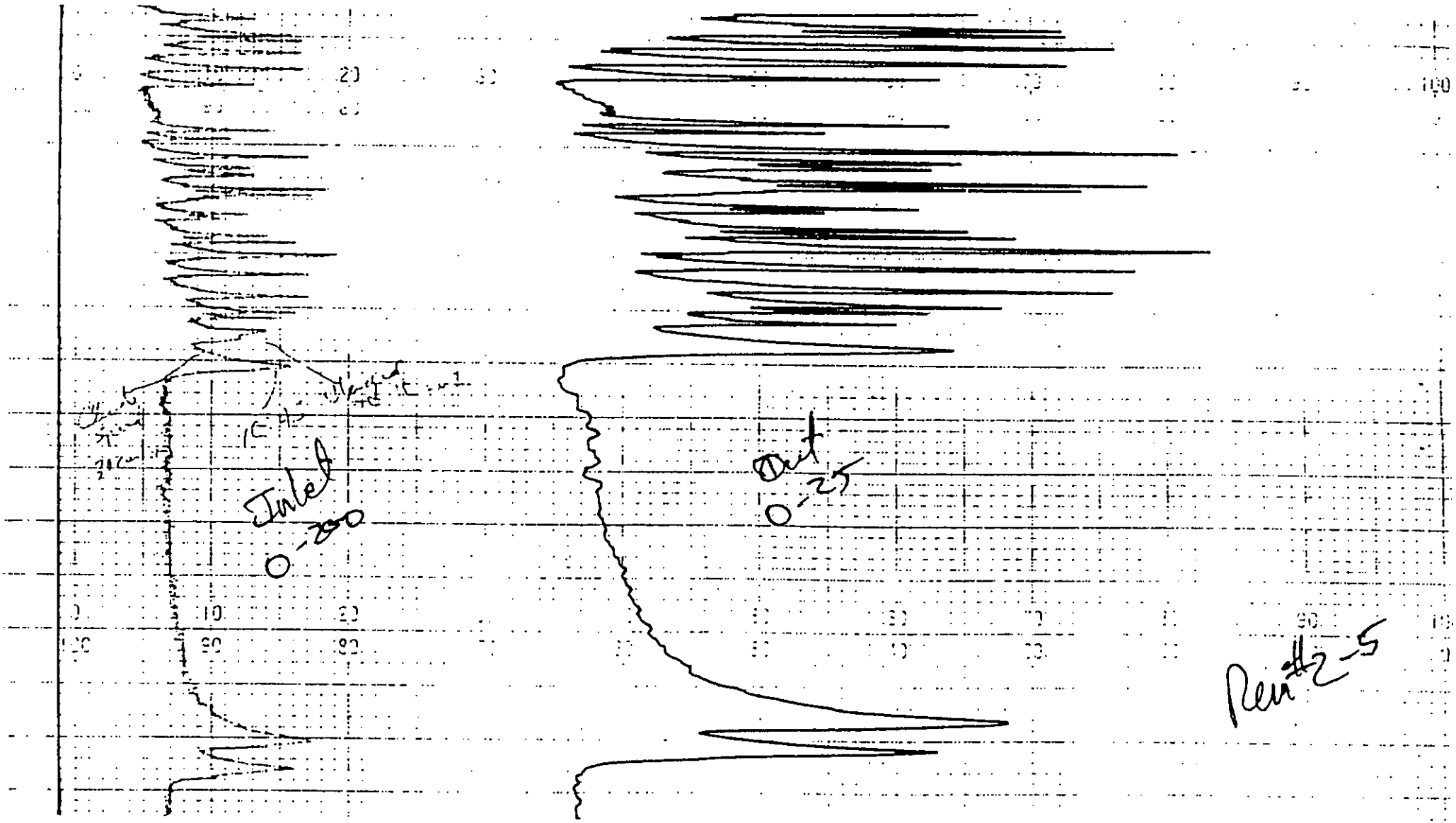

Zero
Zero
THC Inlet
THC Out
Stop Gas
154.3 Post cal 3ppm pine
Run # 1 cont

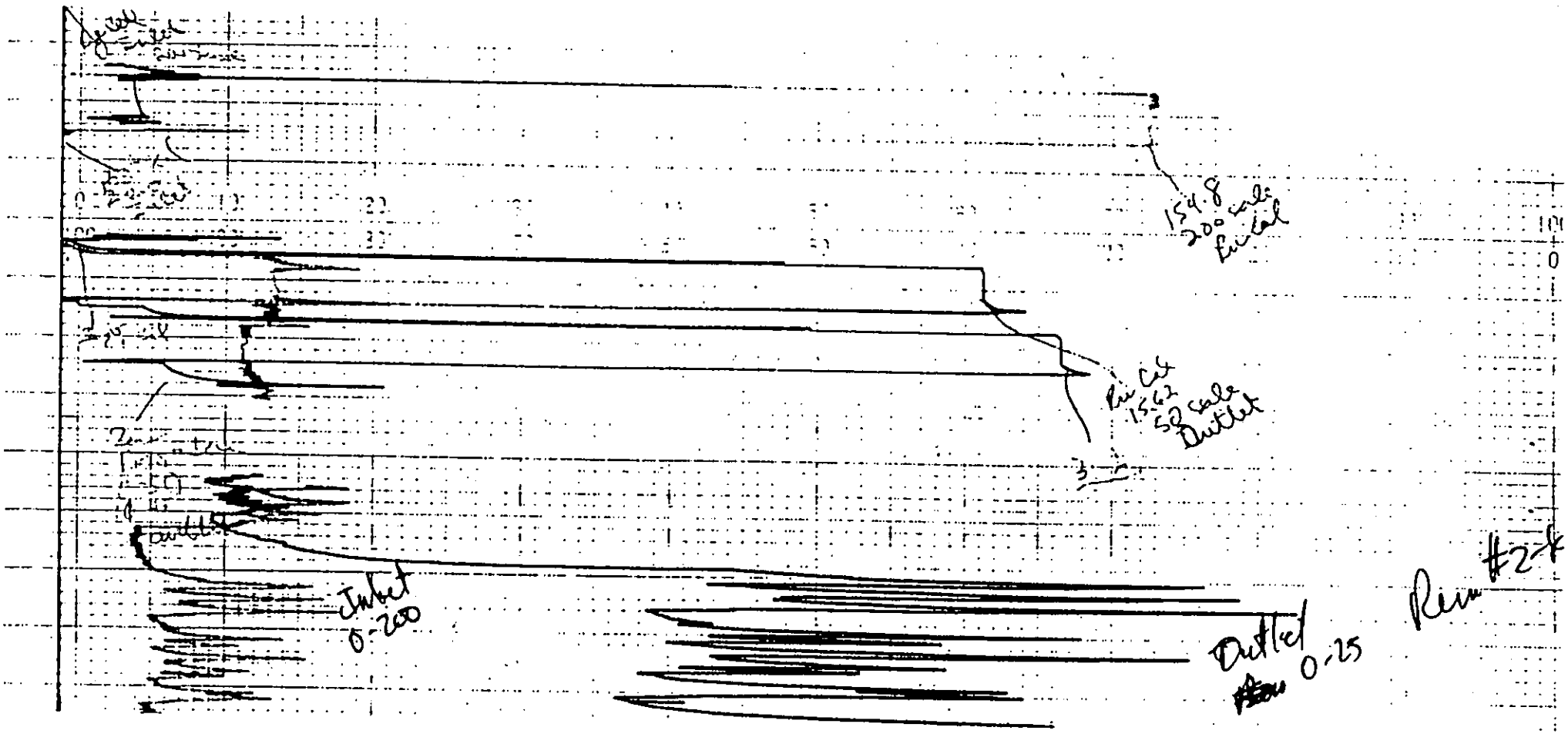

Inlet
THC
0.200
START
9:45
Outlet
THC
0.25
Recal outlet
25 scale
Start
Run #2

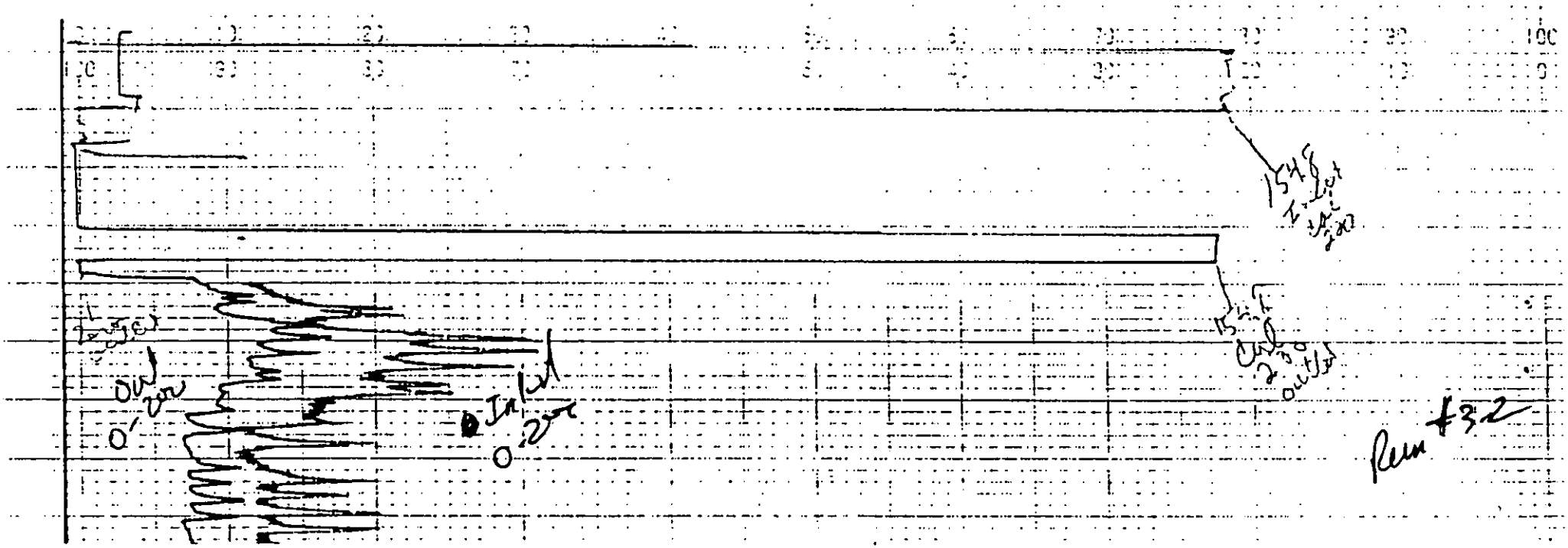

Inlet
THC
200
Outlet
THC
25
Run #2-2
cont
GSS

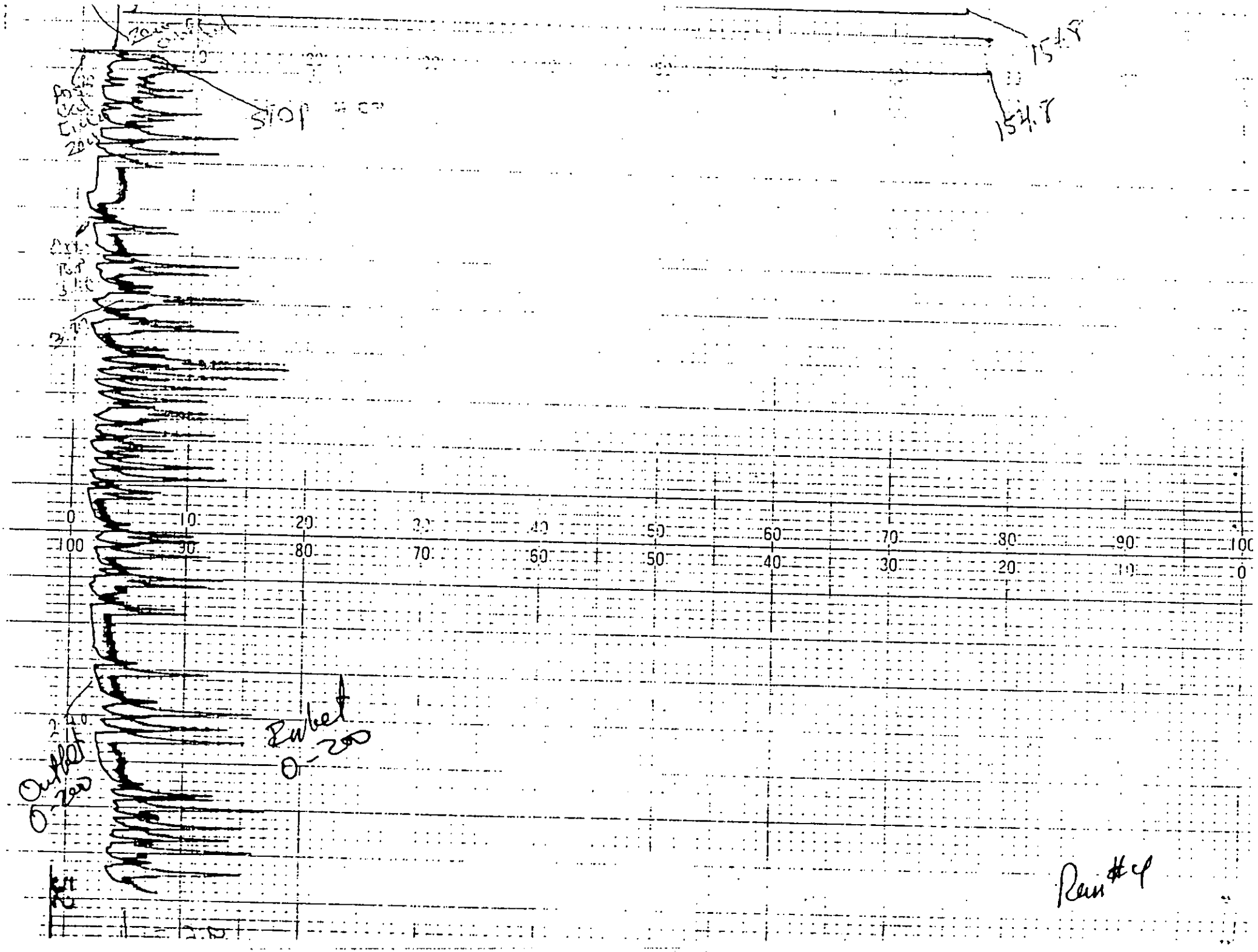

Inlet
0-200
Outlet
0-25
Run #23
Cont

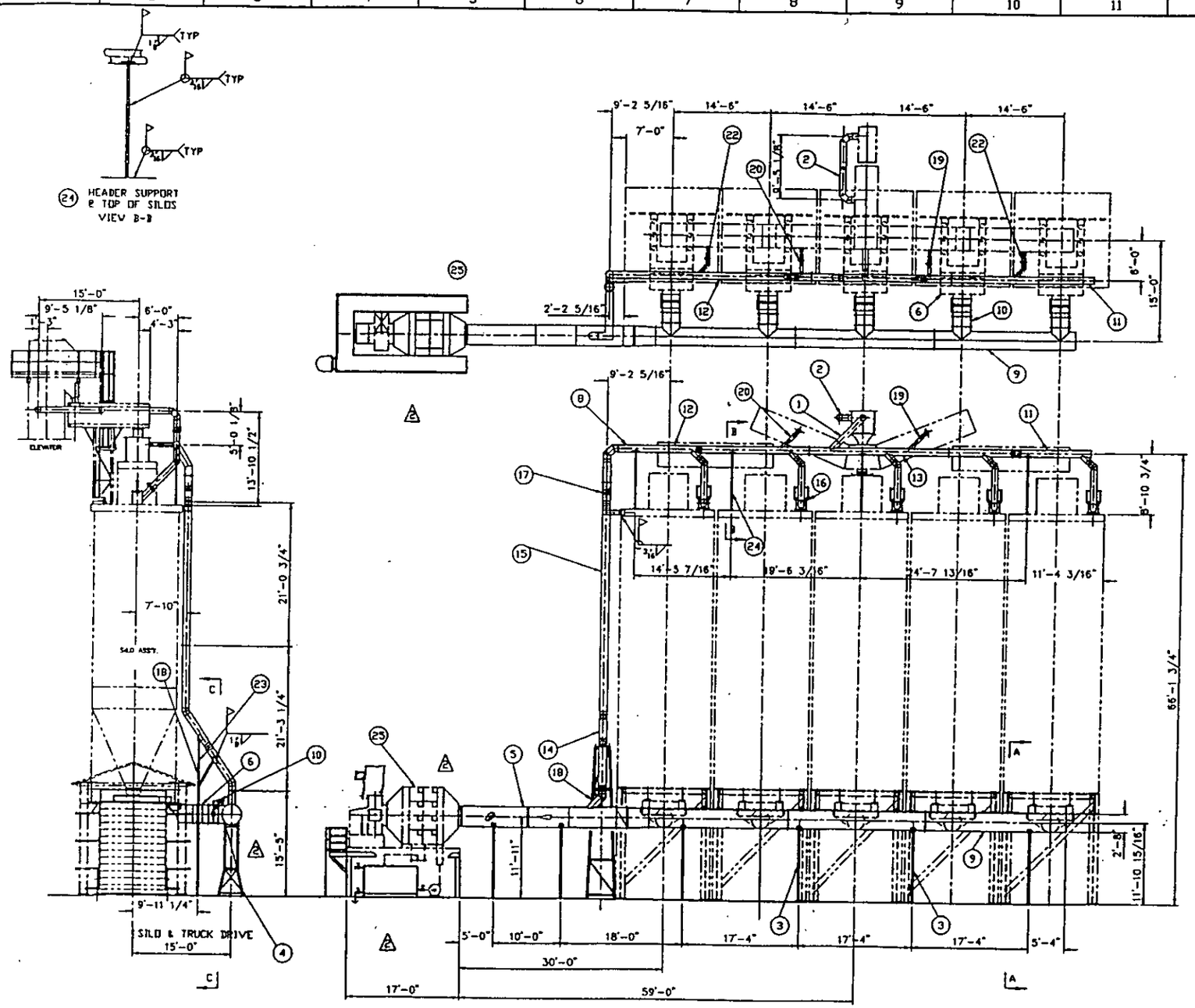
run #2
0.25
0.32


Inlet
0-200
Out
0-25
Run #2-5


154.8
200 scale
Initial
Pre cut
154.2
52 scale
Outlet
Inlet
0-200
Outlet
0-25
Run #2-4


Run #32


STOP
154.8
154.8
Inlet
0-200
Outlet
0-200
Run #4



LIST OF COMPONENTS

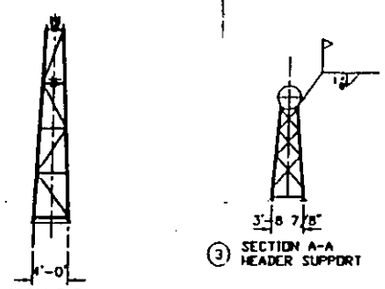
REF.	ITEM NO.	QTY	DESCRIPTION
---	93-106-82	---	BLUE SMOKE DUCT ASS'Y @ SILOS
1	93-106-63	1	10"ø DUCT DETAILS @ TRAVERSE
2	93-106-64	1	10"ø DUCT DETAIL @ ELEVATOR
3	AB-2085	4	32"ø DUCT SUPPORT
4	AB-2085	2	36"ø DUCT SUPPORT
5	93-106-80	1	36"ø SMOKE DUCT DETAILS
6	93-106-76	5	SILO GATE HOOD
7	AB-2086	1	12"ø BULK SMOKE DETAILS
8	AB-2078	1	12"ø ELBOW 90°
9	AB-2088	1	32"ø BLUE SMOKE HEADER
10	AB-2087	5	32"ø DAMPER
11	AB-2081	1	12"ø HEADER END SECTION
12	AB-2079	1	12"ø HEADER SECTION
13	AB-2080	1	12"ø HEADER MID SECTION
14	AB-2084	1	12"ø DOWN SPOUT ELBOW
15	AB-2084	1	12"ø DOWN SPOUT
16	AB-2076	5	10"ø VENT TUBE
17	AB-2082	1	12"ø DAMPER
18	93-106-79	1	12"ø DUCT SUPPORT
19	93-106-73	1	6"ø SMOKE DUCT FROM TRAVERSE (DETAIL-A)
20	93-106-73	1	6"ø SMOKE DUCT FROM TRAVERSE (DETAIL-B)
21	93-106-84	1	36"ø DAMPER
22	93-106-73	2	6"ø SMOKE DUCT FROM TRAVERSE (DETAIL-C)
23	93-106-85	1	12"ø DUCT SUPPORT BRACE
24	AB-2084	4	12"ø DUCT SUPPORT @ TOP OF SILO
25	113368AA	1	SMOG HOG SYSTEM
			NEW YORK BLOWER SIZE 332 16,000 cfm

REF. DWG AB-2077 HEADER ASSEMBLY @ SILO TOP.

AP-919 DUCT & PIPE CONNECTORS SHT. A & SHT. B

- ●93-106-66 CONNECTOR @ ELEVATOR
- ●93-106-67 CONNECTOR @ ELEV. TO TRAVERSE
- ●93-106-68 @ INCLINE TRAVERSE
- ●93-106-71 @ INCLINE TRAVERSE
- ●93-106-72 @ HORIZ. TRAVERSE
- 93-106-77 6" DAMPER
- 93-106-78 10" DAMPER

●CONNECTORS FABRICATED BY & INSTALLED BY ASTEC



(18) VIEW C-C 12"ø DUCT SUPPORT

(3) SECTION A-A HEADER SUPPORT

NO	REVISION	APPR	BY	DATE
2	RAISED SMOG HOG 6'-6 3/8"	JM	DJ	1/10/95
1	ADDED NOTE TO 23		DH	7-12-94

ASTEC INDUSTRIES, INC.
P.O. BOX 72787 • 4101 JEROME AVENUE • CHATTANOOGA, TN 37407

DWN RGS | DATE | APPR | DATE 4-14-93
JOB NO 93-106 | SCALE 1/8 | DWG NO 93-106-82 | REV 2

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IN310682

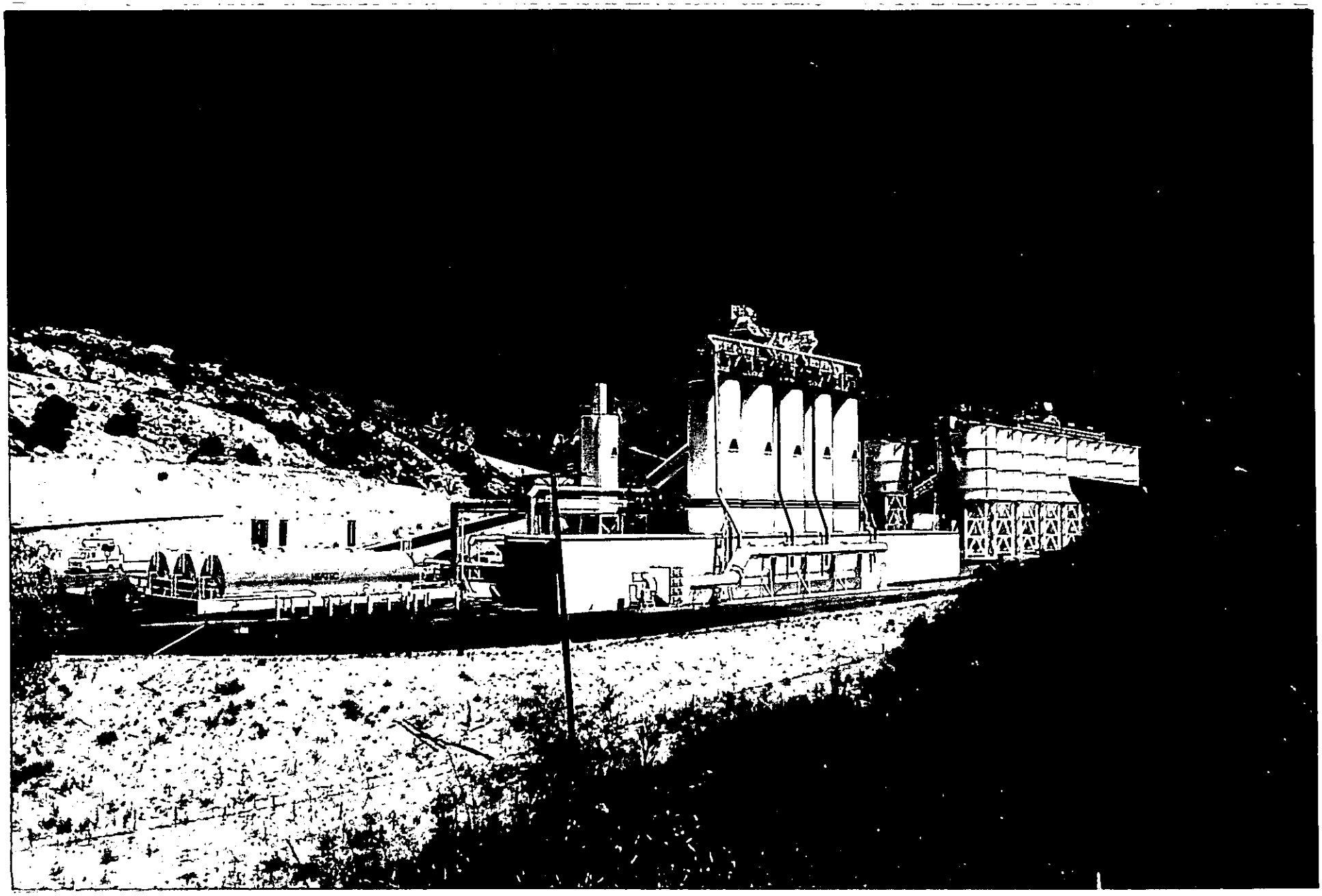
TRUCK LOAD-OUT TEST SUMMARY

METHOD 25A HC ANALYSIS

RUN #	1	2	3	4
Silo/Traverse Damper Position	Open	Closed	Open	Closed
Average Production Rate (tons/hr)	375	500	475	475
▸Truck Load-Out During Test (tons)	862	984	852	603
Test Duration (hours)	2	2	2	2
Average Truck Load-Out (tons/hour)	431	492	426	★301.5
Average # HC/hour	3.09	1.76	2.92	0.77
Average # HC/ton of load-out	0.0072	0.0036	0.0069	0.0026
Annual Emissions (tons) @ National Average (139,000 TPY)	0.50	0.25	0.48	0.18
Annual Emission (tons) @ 750,000 TPY	2.70	1.35	2.59	0.98

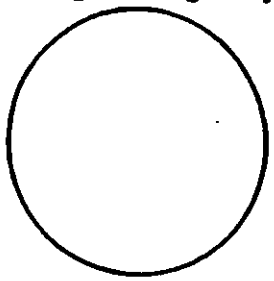
▸Mix temperature averaged between 300° to 310° F.
★Truck load-out for first 1 hour and 19 minutes.

C:\testsum.wpd

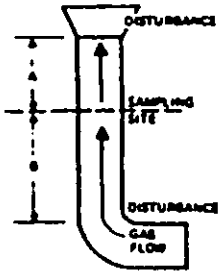


Environmental Technology & Engineering Corp.

PARTICULATE FIELD DATA



CROSS SECTION



PLANT [illegible]
DATE [illegible]
LOCATION [illegible]
OPERATOR [illegible]
STACK NO. [illegible]
RUN NO. 3
SAMPLE BOX NO. 3
METER BOX NO. 1

AMBIENT TEMPERATURE [illegible]
BAROMETRIC PRESSURE [illegible]
ASSUMED MOISTURE, % 25
PROBE LENGTH, in. [illegible]
NOZZLE DIAMETER, in. [illegible]
STACK DIAMETER, in. [illegible]
PROBE HEATER SETTING –
HEATER BOX SETTING –

METER ΔH@ [illegible]
C FACTOR [illegible]
PROCESS WEIGHT RATE [illegible]

ORSAT RESULTS
CO2 6.0
O2 11.2
CO
N2 82.8

LEAK CHECK
Pre
Pitot
Post
Pitot

TRAVERSE POINT NUMBER	SAMPLING TIME (θ), min.	STATIC PRESSURE (in. H_2O)	STACK TEMPERATURE (T_s), °F	VELOCITY HEAD (ΔP_s) ($\sqrt{\Delta P_s}$)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H_2O ACTUAL	DESIRED	GAS SAMPLE VOLUME (V_m), ft³	GAS SAMPLE TEMPERATURE AT DRY GAS METER INLET ($T_{m_{in}}$), °F	OUTLET ($T_{m_{out}}$), °F	SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER F	PUMP VACUUM in. Hg gauge	VELOCITY fps
A 1	1:46		240	.96	0.86		110.00		72	563.00/45	151176	2	
2	2:9		239	.59	1.10		11.6		72	565.00/45	176 1.3		
3	3:6		235	.62	1.15		13.4		73	200/46	25317		
4	3:7		235	.61	1.25		15.2		73				
5	[illegible]	-.52	235	.74	1.40		17.0		73		13 6 f		
6	[illegible]		236	.86	1.60		19.0		73				
7	[illegible]		237	.90	1.70		21.2		73			4	
8	67		237	.90	1.70		23.3		74				
9	[illegible]		237	.85	1.60		25.4		74				
10	[illegible]		235	.81	1.50		27.5		74				
11	8:17		238	.85	1.60		29.4		75				
12	21		237	.90	1.70		31.5		76				
13	23		237	.94	1.75		33.6		77				
14	[illegible]		238	.85	1.60		35.7		77				
15	[illegible]	-.55	239	.82	1.52		37.8		78				
16	[illegible]		237	.65	1.22		39.6		80				
17	[illegible]		237	[illegible]	1.15		41.7		80				
18	[illegible]		237	.65	1.22		43.4		80				
19	41		236	.58	1.10		45.2		80				
20	42		236	.51	1.02		47.0		80				
	[illegible]						148.67						
							(38.67)						

LABORATORY DATA SHEET
PARTICULATE & WATER COLLECTED

JOB NAME P+D Verona (#5) DATE OF TEST 10-24-95

JOB NO. 1980 TEST ENGINEER WJO

RUN NO. 1 STACK Baghouse

Sample Box 1 Filter 7-669 Wash Bottle —

Beaker No. 1

WATER COLLECTED

Impinger No.	Final Wt. g	Initial Wt. g	Collected grams
1	302	100	202
2	205	100	105
3	1	0	1
SIL GEL	684	668	16
		TOTAL	324

PARTICULATE COLLECTED

Blank	Final Wt. g	Tare Wt. g	Collected grams
Filter	1.1886	1.1870	0.0016
Washings (0.0003)	106.3445	106.3426	0.0016
		TOTAL	0.0032

WATER COLLECTED 324 GRAMS

PARTICULATE COLLECTED 0.0032 GRAMS

NOTES:

LABORATORY DATA SHEET
PARTICULATE & WATER COLLECTED

JOB NAME P.D. Yorm #5 DATE OF TEST 10-24-95

JOB NO. 1980 TEST ENGINEER WJD

RUN NO. 2 STACK Baghouse

Sample Box 2 Filter 7-670 Wash Bottle —

Beaker No. 2

WATER COLLECTED

Impinger No.	Final Wt. g	Initial Wt. g	Collected grams
1	287	100	187
2	207	100	107
3	1	0	1
SILICA GEL	644	640	4
		TOTAL	299

PARTICULATE COLLECTED

Blank	Final Wt. g	Tare Wt. g	Collected grams
Filter	1.1729	1.1712	0.0017
Washings (0.0003)	110.5820	110.5804	0.0013
		TOTAL	0.0030

WATER COLLECTED 299 GRAMS

PARTICULATE COLLECTED 0.0030 GRAMS

NOTES:

LABORATORY DATA SHEET
PARTICULATE & WATER COLLECTED

JOB NAME P&D Verona #5 DATE OF TEST 10-24-95

JOB NO. 1980 TEST ENGINEER WJD

RUN NO. 3 STACK Baghouse

Sample Box 3 Filter T.671 Wash Bottle —

Beaker No. 3

WATER COLLECTED

Impinger No.	Final Wt. g	Initial Wt. g	Collected grams
1	271	100	171
2	184	100	84
3	69	0	69
Silica Gel	622	615	7
		TOTAL	331

PARTICULATE COLLECTED

Blank	Final Wt. g	Tare Wt. g	Collected grams
Filter	1.0449	1.0419	0.0030
Washings (0.0003)	94.1788	94.1771	0.0014
		TOTAL	0.0044

WATER COLLECTED 331 GRAMS

PARTICULATE COLLECTED 0.0044 GRAMS

NOTES:

Zorn
608-271-2722

ASPHALT PLANT STACK TEST DATA

Plant Name: VERONA 5

Date: 10-24-95
FID # 113 015 980

Time*	Burner Setting	PSI Fuel Pressure	Production TPH	Aggregate TPH	% Moisture in Aggregate	RAP TPH	Mix Temp	Stack Temp	Photo-helic	Magne-helic	Fuel Flow Rate	CO ppm	CO2 ppm	O2 %
9:00	40%	7	250	200	4.7	50	305	231	.15	3				
9:15	45%	7	275	220	4.7	55	304	233	.20	3				
9:30	45%	7	275	220	4.7	55	302	243	.20	3				
9:45	45%	7	275	220	4.7	55	294	246	.25	3.75				
10:00	45%	7	275	220	4.7	55	303	244	.30	4.0				
10:15	40%	7	275	220	4.7	55	301	242	.25	3.75				
10:30	45%	7	275	220	4.7	55	296	243	.25	3.75				
10:45	40%	7	275	220	4.7	55	300	243	.25	3.75				
11:00	45%	7	275	220	4.7	55	302	238	.30	3.75				
11:15	45%	7	275	220	4.7	55	301	239	.30	4.0				
11:30	40%	7	275	220	4.7	55	307	237	.30	3.75				
11:45	40%	7	275	220	4.7	55	310	241	.30	3.75				
12:00	50%	7	300	240	4.7	60	312	244	.30	4.0				
12:15	45%	7	300	240	4.7	60	301	243	.30	4.0				
12:30	50%	7	300	240	4.7	60	310	248	.30	4.0				
12:45	50%	7	300	240	4.7	60	304	246	.30	4.0				
1:00	50%	7	300	240	4.7	60	306	248	.30	4.0				

Fuel Type NATURAL GAS Sulfur in Fuel N/A %

Plant Drum Type COUNTERFLOW

* Record data in 15-minute intervals during stack test runs.

COMPPLTTESTDATA WK1

APPENDIX B

SAMPLE CALCULATIONS

SAMPLE CALCULATION

BAROMETRIC PRESSURE, in Hg (Pb) = 29.200
STACK PRESSURE, in Hg (Pb + Pg/13.6) = 29.178
TIP DIAMETER, in (An = PI*D^2/576) = .2450
STACK AREA, sq ft (A) = 10.560
SAMPLING TIME PER POINT, min = 2.50
NUMBER OF POINTS = 24
GAS METER VOLUME, acf (Vm) = 66.06
WATER COLLECTED, ml (Vf - Vi) = 86.00
PARTICULATE COLLECTED, grams (Mn) = 0.0755
CO2 = 0.60 O2 = 21.00 CO = 0.00 N2 = 78.40
WET MOLECULAR WEIGHT, lb/mole (Ms) = 28.45

SAMPLING POINT	STACK TEMP deg F	PITOT DEL P inches	ORIFICE DEL H inches	GAS METER OUTLET T deg F	GAS VELOCITY fps
1	110	1.450	4.05	32	72.51
2	110	1.350	3.75	32	69.97
3	110	1.350	3.75	32	69.97
4	110	1.300	3.70	32	68.66
5	110	1.250	3.60	32	67.33
6	110	1.250	3.60	32	67.33
7	110	1.050	2.95	32	61.71
8	110	1.000	2.85	32	60.22
9	110	1.000	2.85	34	60.22
10	110	1.050	2.95	34	61.71
11	110	0.950	2.75	38	58.69
12	115	0.950	2.75	38	58.95
13	115	1.300	3.70	42	68.96
14	115	1.250	3.60	42	67.62
15	115	1.200	3.40	42	66.26
16	115	1.200	3.40	42	66.26
17	115	1.150	3.30	44	64.86
18	115	1.150	3.30	46	64.86
19	115	1.050	2.95	48	61.98
20	115	1.150	3.30	48	64.86
21	115	1.000	2.85	50	60.48
22	115	1.100	3.15	50	63.43
23	115	1.050	2.95	50	61.98
24	115	0.900	2.55	50	57.38
AVG VALUES	113		3.250	40	64.42

TOTAL GAS WITHDRAWN, scf = 69.39
DRY GAS WITHDRAWN, scf (Vmstd) = 65.35
WATER VAPOR WITHDRAWN, scf (Vwstd) = 4.05
PERCENT WATER VAPOR (%H2O) = 5.83
ACTUAL WET FLOW RATE, acfm = 40,819.39
STANDARD DRY FLOW RATE, scfm (Qs) = 34,558.69
PARTICULATE CONCENTRATION, grains/dscf (Cs) = 0.018
PARTICULATE EMISSION RATE, lb/hr (ER) = 5.325
PARTICULATE EMISSIONS, lb/1000 lb (EC) = 0.033
PERCENT OF ISOKINETIC SAMPLING (I) = 101.67

SAMPLE CALCULATIONS

1. DRY MOLECULAR WEIGHT (Md) lb/lb-mole

   Md = .44*% CO2 + .32*%O2 + .282*%N2 + .28*%CO

2. WATER VAPOR PERCENT (%H2O)

   Vw std = 0.04707*(Vf - Vi)

   where: Vw std = standard cubic feet of water vapor
   Vf = Final volume of impingers, ml
   Vi = Initial volume of impingers, ml

   %H2O = Vw std * 100/(Vm std + Vw std)

   where Vm std = standard cubic feet of gas sampled

3. WET MOLECULAR WEIGHT (Ms) lb/lb-mole

   Ms = Md*(1 - %H2O/100) + 18*%H2O/100

4. STACK PRESSURE (Ps) in. Hg

   Ps = Pb + Pg/13.6

   where: Pb = barometric pressure (uncorrected), in. Hg
   Pg = stack gauge pressure, in. H2O
   13.6 = specific gravity of mercury (Hg)

5. AVERAGE STACK VELOCITY (Vs) feet per second

   Vs = Kp*Cp* (DELP) Tsavg/(Ps*Ms)

   where: Kp = 85.49 unit conversion
   Cp = 0.85, pitot tube calibration factor
   DELP = square root of velocity head, in. H2O
   Tsavg = average stack temperature, deg R (460+F)
   Ps = stack pressure
   Ms = wet molecular weight

6. STACK GAS FLOW RATE (Qs) std cubic feet per minute

   Qs = 60*(1 - %H2O/100)*Vs*A*(528*Ps/Tsavg/29.92)

   where: A = stack area, ft2
   528 = std temperature, deg R
   29.92 = std pressure, in. Hg

7. DRY GAS VOLUME (Vm std) std cubic feet

Vm std = GAMA*(Vm-(AL-.02)t)*(Pb+DELH/13.6)/29.92

where: GAMA = dry gas meter calibration factor
Vm = volume of dry gas metered, cubic feet
AL = post test leak rate, cubic feet per minute
t = total time of test, minutes
DELH = average orifice pressure drop, in.H2O

8. PARTICULATE CONCENTRATION (Cs) grains/dry std cubic foot

Cs = Mn * 15.43/Vm std

where: Mn = particulate captured, grams
15.43 = grains per gram

9. EMISSION RATE (ER) pounds per hour

PMRA = Mn*A*60/(t*An*453.6) AREA METHOD lb/hr

PMRC = Cs*Qs*60/(15.43*453.6) CONC. METHOD lb/hr

ER = (PMRA + PMRC)/2

where: An = area of sampling nozzle, square feet

10. EMISSION CONCENTRATION (EC) lb/1000 lb exhaust gas

EC = ER * 386700 * (1-%H2O/100)/(Qs*60*Ms)

where: 386700 = cubic feet per lb mole * 1000

11. ISOKINETIC SAMPLING PERCENTAGE (I) %

I = PMRA/PMRC