AP42 Section: 11.1

Reference Number: 280

Title: Source Sampling For Particulate Emissions, R. E. Hazard Contracting Co., San Diego, CA,

San Diego County Air Pollution Control District, San Diego, CA,

September 5, 1991.

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

October 1, 1992

Attn: Plant Supervisor
R.E. Hazard Construction
P.O. Box 229000
San Diego, CA 92129

SUBJECT: **RENEWAL TEST REPORTS**

The enclosed test reports are the result of testing done at your facilities.

If you have any questions, please call me at (619) 694-3359.

Robert Yelenosky
Senior Air Pollution Chemist

CWR:jo

Enclosures

9150 Chesapeake Drive • San Diego • California 92123-1096 • (619) 694-3307
FAX (619) 694-2730 • Smoking Vehicle Hotline 1-800-28-SMOKE

R.E. HAZARD on 8/26/92 P.O.#442 TEST #92239

SAN DIEGO AIR POLLUTION CONTROL DISTRICT, 9150 CHESAPEAKE DRIVE, SAN DIEGO, CA. 92123

SOURCE TEST OF PARTICULATE EMISSIONS TO THE ATMOSPHERE

TEST SITE: R.E. Hazard
10050 Black Mountain Road
San Diego, CA 92126

TEST #: 92239 P.O.#: 442 TEST DATE: 8/26/92

Type of plant (Asphalt/Perlite/Combustion): ASPHALT

UNIT TESTED: Baghouse

EQUIPMENT: Asphalt Batch Plant

TESTED BY:	David N. Shina & Guy Allphin III	DATE: 8/26/92
SITE PERSONNEL:	Al Tilley	DATE: 8/26/92
APCD ENGINEER:	Austen D'Lima & John McCafferty	DATE: 8/26/92
LAB ANALYSIS BY:	David N. Shina	DATE: 9/3/92
REPORT BY:	David N. Shina	DATE: 9/3/92
REVIEWED BY:		DATE: 9/30/92
APPROVED BY:	Robert Yelenosky	DATE: 9/30/92

ROBERT YELENOSKY, SENIOR AIR POLLUTION CHEMIST

This report has been reviewed and found to be representative of the testing that was performed.

SDAPCD RULES

TEST	LIMIT	MEASURED	EXCEEDANCE/NON-EXCEEDANCE
RULE 54 DUST & FUMES	40 lbs/hr	6.935 lbs/hr	NON-EXCEEDANCE

TEST RESULTS SUMMARY:

ITEM	I	Cs	E
UNITS	%	gr/dscf	lbs/hr
VALUE	104	0.0251	6.94

ENGINEERING SUMMARY

Qstd	Fuel	RATE	Asphalt Production
dscfm	—		tons/hr
32194	Nat Gas		229

TEST PARAMETERS:

SYSTEM DESCRIPTION:

This asphalt plant combines crushed rock and and sand with asphalt oil in batch loads of varying sizes. The rock and sand are heated in a rotary drum to dry them. The exhaust from this dryer is routed through a baghouse and finally to a stack. It is the emissions from this stack that are the subject of this report.

PROCEDURES:

The procedures utilized in these tests are based on EPA's 40 CFR, July 1, 1991, Part 60, Appendix A, Methods 1-5 inclusive. The sampling train was modified to utilize a back-end filter (fig. 1), as outlined in the SDAPCD QA manual.

CALCULATIONS

All equations are from the EPA's 40 CFR, July 1, 1991, Part 60, Appendix A, Methods 1-5 inclusive. All preliminary assumptions and calculations are based on data obtained from previous tests.

PARTICULATE SAMPLING:

The test consisted of sampling at 24 traverse points, 12 from each of 2 sample ports (fig.2), collected from ?? inches below the stack (fig.3). All field data was transferred to the computer printout. All calculations were done by the computer and the emissions were compared to rule 54 of the SDAPCD.

ANALYSES:

Gas: An integrated bag sample was collected during the test and analyzed at the APCD lab.

Particulate: All procedures follow EPA guidelines, except where noted in the SDAPCD QA manual.

EQUIPMENT:

All testing and analysis equipment was calibrated according to EPA guidelines (40 CFR, July 1, 1991, Part 60, Appendix A, Methods 1-5).

Analysis:	Collection:	Sampling:	Temp./Press.:
CO2-Anarad AR400	Filter-Gelman	L/S Box-Napp	Thermocouples-Omega
O2-Teledyne Ryan 320 P4	Holder-Gelman	Umbilical cord-Napp	Temp. read out-Omega
Macrobalance-Sargent Welch	Beakers-Pyrex	Cold/Hot box-Napp	Aneroid Barometer-Taylor
Microbalance-Sartorious	Impingers-Ace	Pitobe tube-Napp	Press. devices-Dwyer magnehelic

R.E. HAZARD on 8/26/92 — P.O.#442 TEST #92239

FIELD DATA:

Trav. Pt	Vm (ft^3) 807.220	ΔP (in H2O)	ΔH (in H2O)	Stack Temp (°F)	Box Temp (°F)	Imp Temp (°F)	t 1 (in) (°F)	t 2 (out) (°F)	velocity (ft/sec)
1		1.44	1.70	212		63	81.00	101.00	079.95
2		1.70	2.00	212		58	80.00	102.00	086.87
3		1.62	1.90	200		58	79.00	105.00	084.04
4		1.51	1.70	210		61	81.00	108.00	081.75
5		1.13	1.30	213		61	81.00	110.00	070.88
6		0.85	1.00	212		61	81.00	111.00	061.43
7		0.68	0.75	212		61	82.00	112.00	054.94
8		0.68	0.80	208		62	84.00	113.00	054.70
9		0.62	0.70	210		61	84.00	113.00	052.38
10		0.63	0.73	211		63	85.00	114.00	052.84
11		0.70	0.80	213		63	85.00	115.00	055.78
12		0.63	0.73	212		65	85.00	115.00	052.88
1		1.00	1.15	216		64	86.00	109.00	066.82
2		1.05	1.20	215		64	87.00	108.00	068.42
3		1.11	1.30	215		65	87.00	111.00	070.35
4		1.13	1.30	215		65	87.00	113.00	070.98
5		1.15	1.30	215		65	87.00	113.50	070.98
6		1.22	1.40	216		64	87.50	116.00	073.81
7		1.31	1.50	217		62	87.00	116.00	076.64
8		1.42	1.65	222		66	87.50	118.00	079.98
9		1.48	1.70	216		60	87.50	118.50	081.30
10		1.63	1.90	218		61	88.00	119.00	085.44
11		1.62	2.10	219		61	88.00	119.50	090.35
12	846.608	1.88	2.20	221		61	88.50	120.00	091.96

	Vm ft^3	ΔP (in H2O)	ΔH (in H2O)	ts (°F)	tbox (°F)	ti (°F)	t 1 (in) (°F)	t 2 (out) (°F)	vs (ft/sec)
Average:	39.388	1.15	1.37	214	N/A	62	84.92	112.52	71.47

DATA SUMMARY:

LABORATORY DATA:

IMPINGER CATCH:

Silica gel ? = YES
Vlc = 238.69 ml

GAS ANALYSIS:

CO2 = 2.50 %
O2 = 14.90 %
CO = 0.00 %
N2 = 82.60 %

PARTICULATE ANALYSIS:

mn(front) = 0.023708 g
mn(back) = 0.036292 g
mn(total) = 0.06000 g

SAMPLING PARAMETERS:

METER BOX:

Box ID = C138
ΔH@ = 1.8883
Y = 0.9924

STACK DIMENSIONS:

Circular ? = YES
Ds = 4.00 ft
Length = N/A ft
As = 12.56 ft^2

NOZZLE & PROBE

Dn = 0.205 in
An = 0.0330 in^2
Cp = 0.8435

SAMPLING DATA:

VOLUME & TIME:

Ø (total time) = 60.0 min
Final leak rate = 0.001 cfm
Pass/Fail = PASS
Vm = 39.388 ft^3

PRESSURES:

Pbar = 29.73 in Hg
Pg = 0.80 in H2O
Vpw @ ts = 29.92 in Hg
Vpw @ ti = N/A in Hg

TEMPERATURES:

t1 = 84.92 °F ti = 62 °F
t2 = 112.52 °F tbox = N/A °F
tm = 98.72 °F ts = 214 °F

CALCULATIONS:

TEMPERATURES:

01)	ts = (Σ ts[n])/total n's		214 °F
02)	Ts = ts+460		674 °R
03)	tm= [Σ [(t1[n]+t2[n])/2]/total n's=(t1+t2)/2		99 °F
04)	Tm= (t1+t2)/2 + 460		559 °R
05)	tl= [Σ tl[n]]/total n's		62 °F
06)	Tstd		528 °R

PRESSURES:

07)	Pbar= [(P @ S.L.)+(ft. above S.L.*(-0.1 in Hg/100ft))]		29.73 in Hg
08)	Pg= read from pressure sensing device		0.80 in H2O
09)	Ps= Pbar + (Pg/13.6)		29.79 in Hg
10)	ΔH		1.37 in H20
11)	Pm= Pbar+(ΔH/13.6)		29.89 in Hg
12)	Pstd		29.92 in Hg
13)	ΔP		1.1475 in H2O

VOLUME:

14)	Vm= Vm(end)-Vm(begin)		99.388 ft^3
15)	Y		0.9924
16)	Vm = Vm*Y		39.089 ft^3
17)	Vm std = [Vm*(Tstd/Tm)*(Pm/Pstd)]		36.829 ft^3
18)	Vlc= Σ Volume of [impingers]		236.69 ml
19)	∂	0.002201	lb/ml
20)	R		21.85 in Hg-ft^3/°R-lb-mo
21)	MwH2O		18.00 g/g-mo
22)	Vw std = [[Vlc*∂*R*Tstd]/[Pstd*MwH2O]]		11.2351 ft^3

MOISTURE:

23)	Bws(1) =(Vw std)/(Vw std+Vm std)100	23.38 %	
24)	Vpw @ ts = from appendix	29.92 in Hg	
25)	Bws(2) =[(Vpw @ ts)/Ps]*100	100.44 %	
26)	Bws = lower value of equation 24 or 26		23.38 %

MOLECULAR WEIGHT:

27)	%O2	14.90 %
28)	%CO2	2.50 %
29)	%N2+inerts+%CO	82.60 %
30)	Md=[0.440[%CO2]]+[0.320*[%O2]]+[0.280[%N2+inerts+%CO]]	29.00 g/g*mole
31)	Ms=Md*(1-Bws)+18.0*(Bws)	26.43 g/g*mole

VELOCITY:

32)	Cp	0.844
33)	Ds=	4.000 ft
34)	vs= 85.49*Cp*[[Ts*ΔP]/(Ps*Ms)]^.5]	71.475 ft/sec
35)	As=3.14*[(Ds)^2/4]	12.560 ft^2
36)	Qs = [vs]*As*60	53863 acfm
37)	Qstd =17.64*Qs*(1-Bws)*Ps/Ts	32194 dscfm

EMISSIONS:

FRONT HALF

38)	mn (front)	0.02371 g
39)	Cs (front) =15.43*mn(front)/Vm std	0.00993 grains/dscf
40)	7000grains=1lb, 60min=1hr, 60min/hr/7000grains/lb=	0.00857 lbs-min/grains-hr
41)	E (front) = (0.00857)*(Qstd)*Cs (front)	2.74 lbs/hr

BACK HALF

42)	mn (back)	0.03629 g
43)	Cs (back) =15.43*mn(back)/Vm std	0.01520 grains/dscf
44)	7000grains=1lb, 60min=1hr, 60min/hr/7000grains/lb=	0.00857 lbs-min/grains-hr
45)	E (back) = (0.00857)*(Qstd)*Cs (back)	4.20 lbs/hr

TOTAL

46)	mn (total) = mn(front)+mn(back)	0.06000 g
47)	Cs (total) =15.43*mn(total)/Vm std	0.02514 grains/dscf
48)	7000grains=1lb, 60min=1hr, 60min/hr/7000grains/lb=	0.00857 lbs-min/grains-hr
49)	E (total) = (0.00857)*(Qstd)*Cs (total)	6.94 lbs/hr

ISOKINETICS:

50)	Dn=	0.205 in
51)	An=3.14*[(Dn)^2/4]	0.0330 in^2
52)	Ø	60 min
53)	I=.09450[Ts*Vm std]/Ps*vs*An*Ø[1-Bws] 104.50 % =	104 %

R.E. Hazard on 8/26/92 — P.O. #:442 TEST#: 92239

SAN DIEGO AIR POLLUTION CONTROL DISTRICT, 9150 CHESAPEAKE DRIVE, SAN DIEGO, CA 92123

PARTICULATE TEST LABORATORY ANALYSIS DATA SHEET

TEST SITE: RE HAZARD
10050 Black Mountain Road
San Diego, CA 92126

TEST #: 92239 P.O.#: 442 TEST DATE: 8/26/92

LAB ANALYSIS BY: David N. Shina DATE: 9/3/92

LAB REPORT BY: David N. Shina DATE: 9/3/92

REVIEWED BY: DATE:

(1) IMPINGER VOLUMES

	FINAL WGT.		INIT WGT.		NET WGT.
#1	744.15 g	-	574.05 g	=	170.10 g
#2	618.70 g	-	573.88 g	=	44.82 g
#3	496.56 g	-	485.97 g	=	10.59 g
#4	644.90 g	-	631.72 g	=	13.18 g
#5	g	-	g	=	N/A g
#6	g	-	g	=	N/A g

Total impinger charge= 200.00 ml

Partiulates from impinger charge
(Total impinger charge * H(water blank) = 0.00013 g

Total weight collected= 238.69 g

Total volume collected,Vlc= 238.69 ml

(2) BLANKS

A	B	C	D	E	F	G	H	I	J	K	L
AREA	SOLVENT	ID	END WGT g	INIT WGT g	NET WGT. (E-F) g	RINSES ml	g/ml (G/D)	% (H*100)	ppm (H*10^6)	PASS FAIL	LIMITS
BLANK	ACETONE	92025	49.4864	49.4837	0.00270	325.00	0.0000083	0.0008308	8.3	P	0.0010%=10ppm
BLANK	WATER	92001	30.8198	30.8196	0.00020	300.00	0.0000007	0.0000667	0.7	P	0.0004%=4ppm
BLANK	ORGANIC	N/A									

(3) WEIGHTS & RINSES

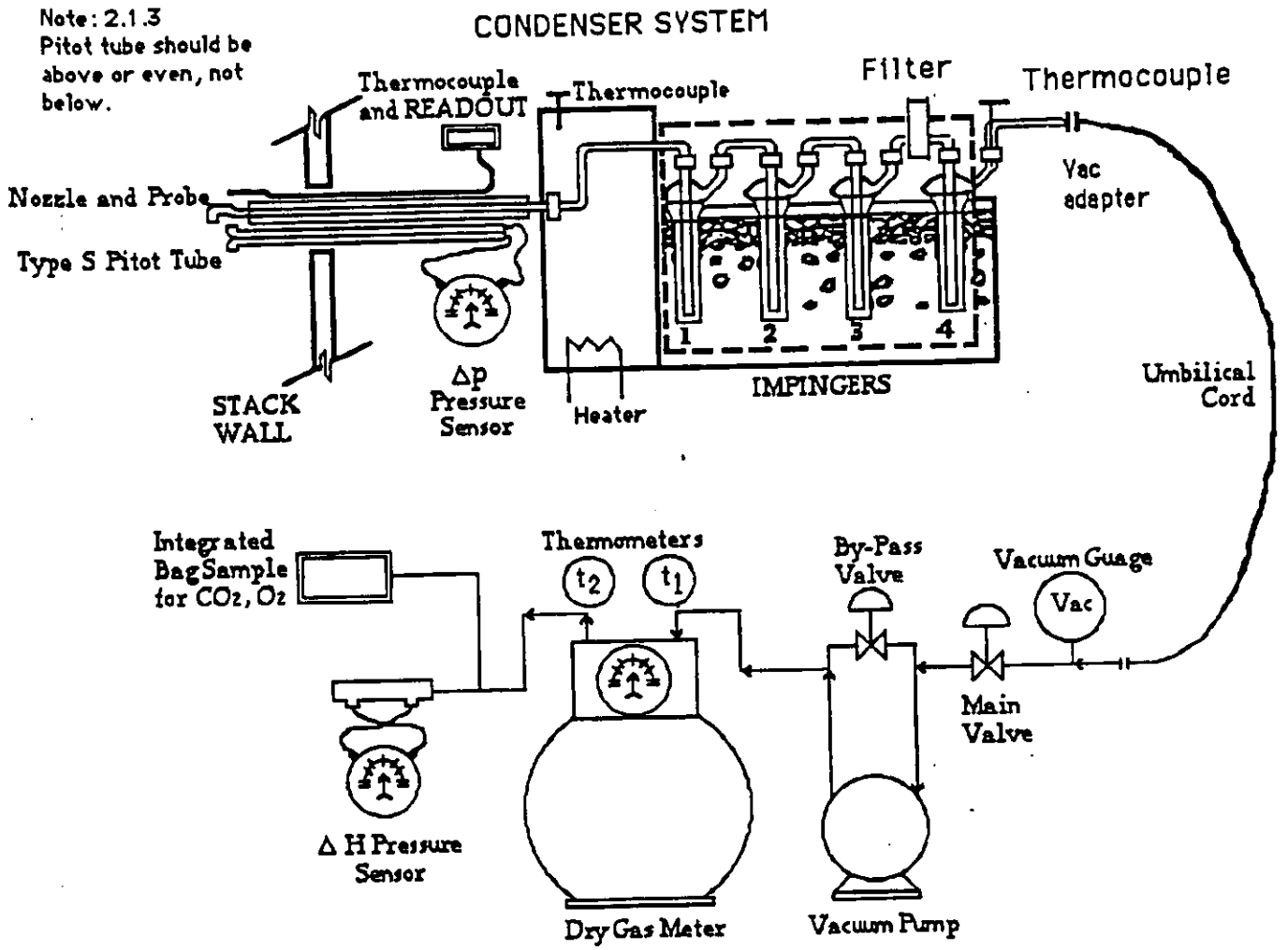
a	b	c	d	e	f	g	h	i	j	k
AREA	SOLVENT	ID	END WGT g	INIT. WGT g	NET WGT. (e-f) g	RINSES ml	SOLV. WGT (g*H) g	WGT (corr) (f-h) g	Subtotal (mn (AREA)) (Σi) g	Total (mn (tot)) (Σj) g
F	ACETONE	92086	29.3092	29.2998	0.0094	300.00	0.002492	0.00691		
R	WATER	92078	28.8605	28.8435	0.0170	300.00	0.000200	0.01680		
O	ORGANIC	N/A								
N	FILTER	N/A								
T								mn(front) =	0.023708 g	
B	ACETONE	92084	29.2592	29.2421	0.0171	330.00	0.002742	0.01436		
A	WATER **	92003	30.2476	30.2254	0.0222	350.00	0.000367	0.02183		
C	ORGANIC	N/A								
K	FILTER	92099	1.6008	1.6007	0.0001	--------	----------	0.00010		
								mn(back) =	0.036292 g	
TOTAL										mn(total) = 0.06000 g

** The Back Water-SOLV.WGT is corrected for the initial impinger charge
{ [g(back water) * H(blank water)] + [Partiulates from impinger charge] }.

SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT

FIGURE

CONDENSER SYSTEM



LEGEND

No. 1 Mod-100 ML Deionized Water

No. 2 Std - 100 ML Deionized Water

No. 3 Mod- Dry

No. 4 Mod- Silica gel

Mod - Modified Type Greenburg-Smith
Std - Standard Type " "

FIELD DATA ABBREVIATIONS

PT = Point Number
T_s = Stack Temperature
Δp = Pitot Tube Pressure Differential, in H_2O
V_s = Stack Velocity, fps
ΔH = Orifice Meter Pressure Drop, in H_2O
t_1 = Meter Inlet Temperature, °F
t_2 = Meter Outlet Temperature, °F
Pm = Pump Vacuum, in Hg
ti = Impinger Temperature
P_{bar} = Barometric Pressure

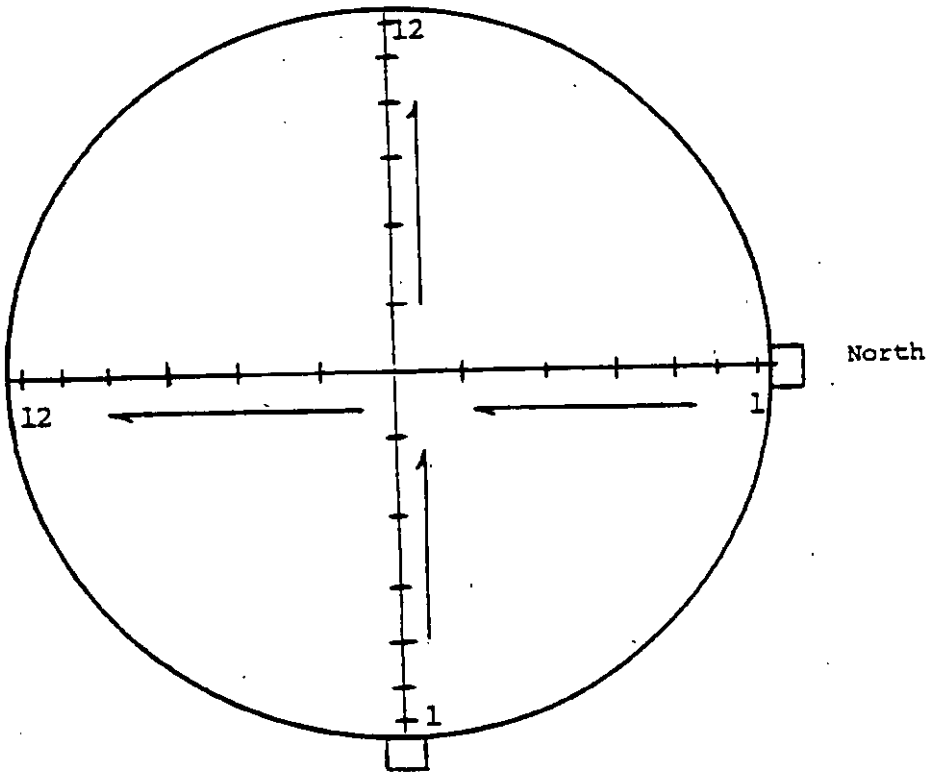
FIGURE : PARTICULATE MATTER SAMPLING TRAIN

TEST NO.

SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT

TRAVERSE POINTS

STACK DIAMETER 48"

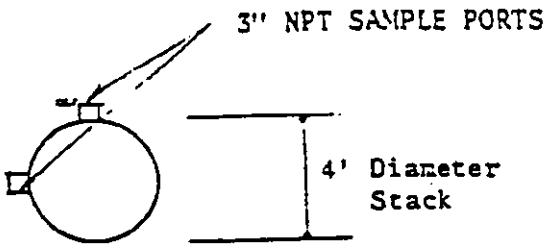


POINT	DISTANCE	POINT	DISTANCE
1	47.0"	7	17.1"
2	44.8"	8	12.0"
3	42.3"	9	8.5"
4	39.5"	10	5.7"
5	36.0"	11	3.2"
6	30.9"	12	1.0"

FIGURE 2

SITE DESCRIPTION

HAZARD ASPHALT



Top View

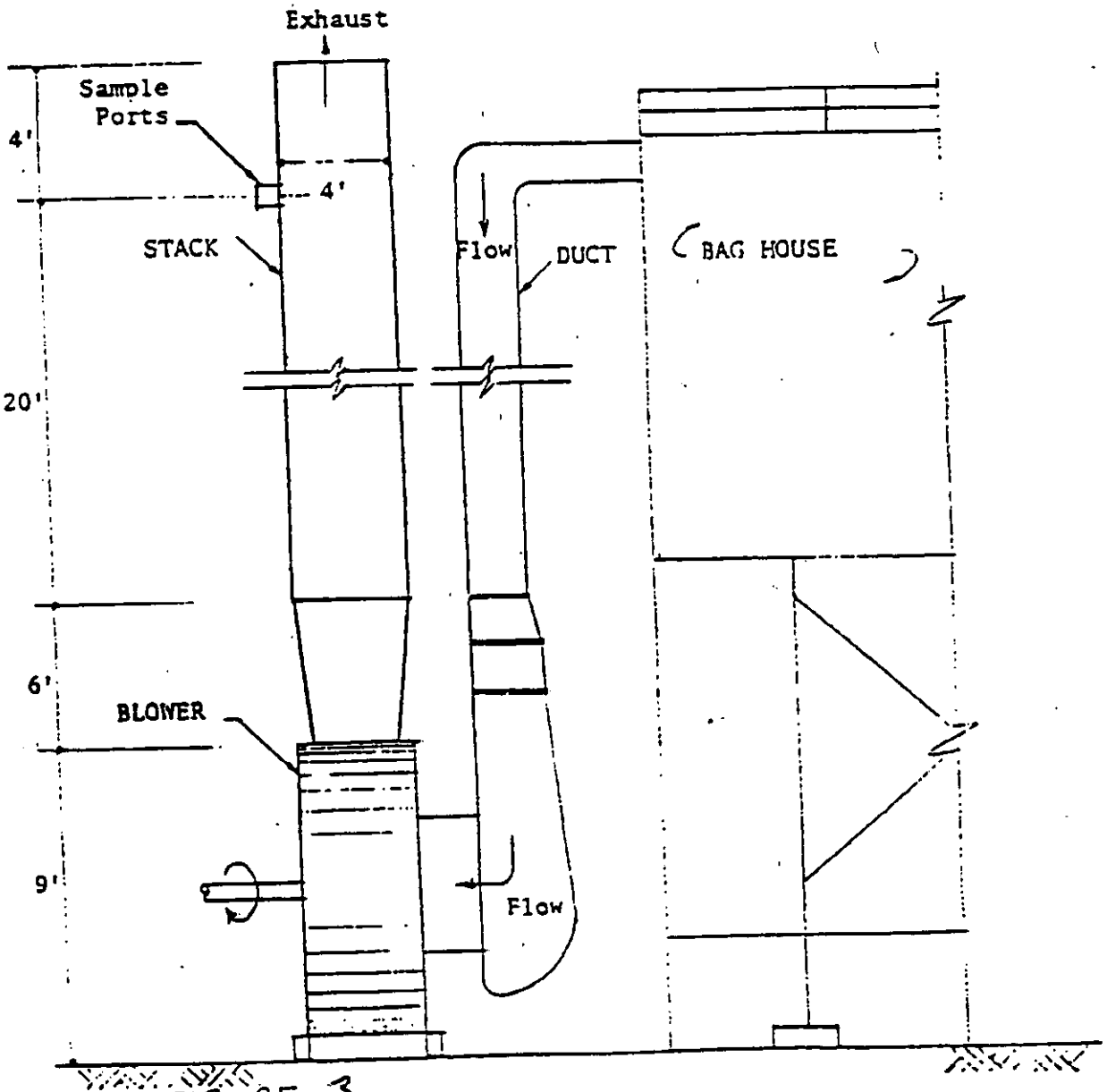


FIGURE 3

SIDE VIEW - No Scale

NOMENCLATURE

symbol	units	explanation	equation
	A		
An	in^2	nozzle area	π/4((Dn)^2)
As	ft^2	stack area	π/4((Ds)^2) or LxW
	B		
Bws(1)	%	fractional stack gas moisture-equ 1	((Vw std)/(Vw std+Vm std))100
Bws(2)	%	fractional stack gas moisture-equ 2	((Vpw @ ts)/Ps)100
Bws	%	water vapor in the gas stream	lower of Bws(1) and Bws(2)
	C		
CO	%	carbon monoxide	read from measuring device(0 for Asphalt plants)
CO2	%	carbon dioxide	read from measuring device
Corr Vwm	ft^3	correction for Vw w/o silica gel	((Vm*(Vpw@ts)/Ps)*Pm*Tstd)/ (Tm*Pstd)
Cp	none	pitot tube correction factor	see EPA method 3
Cs(front)	gr/dscf	concentration of particulate in stack gas, corrected to STP-for front	(15.43*mn(front))/(Vm std)
Cs(back)	gr/dscf	concentration of particulate in stack gas, corrected to STP-for back	(15.43*mn(back))/(Vm std)
Cs(total)	gr/dscf	concentration of particulate in stack gas, corrected to STP-for total	(15.43*mn(total))/(Vm std)
Cs12(front, back,total)		same as Cs(front,back,total) except- corrected for grain loading at 12% CO2	(12/ %CO2)*(15.43*mn(fr, back,total))/(Vm std)
	D		
∂ (density)	lb/ml	density of water at STP	0.002201 (see CRC)
Ds	*in or ft*	stack diameter	measure at site
Dn	in	nozzle diameter	avg of at least three measurements
	E		
E.A.	%	Excess air (for combustion)	((%O2-.5%CO)*100)/ (.264*%N2-%O2-.5*%CO)
E(front)	lbs/hr	part. emissions rate-front	(0.00857)(Qad*Cs(front))
E(back)	lbs/hr	part. emissions rate-back	(0.00857)(Qad*Cs(back))
E(total)	lbs/hr	part. emissions rate-total	(0.00857)(Qad*Cs(total))
	H		
ΔH	in H2O	average differential pressure across the orifice meter	avg of the readings from the pressure measuring device
ΔH@	none	orifice pressure differential at STP	see EPA Method 5 Appendix
	I		
I	%	isokinetics	[0.09450*Ts*Vm std]/ [Ps*vs*∅*(An/144)*(1-(Bws/100))]
	M		
Md	g/g-mole	dry stack gas molecular wgt	0.44(%CO2)+0.320(%O2)+0.280 (%N2+inerts+CO)
mn(back)	g	particulate in impingers	measurement from lab analysis
mn(front)	g	particulate in nozzle & probe	measurement from lab analysis
mn(total)	g	total particulate collected	measurement from lab analysis
Ms	g/g-mole	wet stack gas molecular wgt	Md(1-Bws)+18.0(Bws)
MW CO2	g/mole	mo. wgt of carbon dioxide	44 (see periodic table)
MW N2	g/mole	mo. wgt of nitrogen	28 (see periodic table)
MW O2	g/mole	mo. wgt of oxygen	32 (see periodic table)
MW H2O	g/mole	mo. wgt of water	18 (see periodic table)
	N		
N2	%	percent nitrogen	100-(%CO2+%O2+%CO+inerts)
	O		
O2	%	percent oxygen	read from measuring device

NOMENCLATURE (cont.)

MECHANICAL ENGINEERING

SOURCE TEST REPORT

PERMIT RENEWAL TEST

TEST DATE: WEDNESDAY, AUGUST 26, 1992

TESTER: APCD; DAVID SHINA, GUY ALPHIN, ENGINEERS: JOHN MCCAFFERTY, AUSTEN D'UMA

TEST: PARTICULATES APPLICABLE RULES: 50(d)(1), 50(d)(2), 51, 54

SOURCE: R.E. HAZARD CONTRACTING CO., 10050 BLACK MTN. RD., SAN DIEGO

SITE PERSONNEL: AL TILLEY, SUPT AND "WILLIE", OPERATOR.

PERMIT TO OPERATE: 000442, EXPIRES NOV. 1, 1992

EQUIPMENT DESCRIPTION: HOT-MIX ASPHALT BATCH PLANT, 300 TONS/HR RATED CAPACITY

P/O CONDITIONS: ATTACHED

OBSERVATIONS:

- THE RATED THROUGHPUT ON THE PERMIT IS 300 TONS/HR; DURING THE TESTS IT WAS 204 TONS/HR FOR THE FIRST (30 MIN) TEST AND 252 TONS/HR FOR THE SECOND (23 MIN) TEST, WITH AN AVERAGE OF 229 TONS/HR.

- THE ROTARY DRUM DRYER AGGREGATE OUTPUT TEMPERATURE DROPPED FROM 317-321°F, AT THE EARLY LOW PRODUCTION RATES, TO 263-282°F AT THE FINAL HIGH PRODUCTION RATES.

- THE BLUE SMOKE EXITED THE TRUCK TUNNEL AT APPROX. 20% OPACITY. NO FAN-VENTILATION WAS OCCURRING IN THE TUNNEL.

- THE MANHOLE LIDS ATOP THE UNDERGROUND ASPHALT OIL STORAGE TANKS HAD NO METHOD OF SEALING VAPOR; SEVERAL WERE LEAKING FUMES WITH APPROX. 20 % OPACITY.

- SILO-TOP EMISSIONS AT THE DRAG-SLAT CONVEYOR WERE STEADILY VISIBLE AT APPROX 10% OPACITY.

- OCCASIONAL EMISSIONS WERE ESCAPING IN THE TOWER AREA ABOVE THE PUGMILL AND EXCEEDED 20% OPACITY.

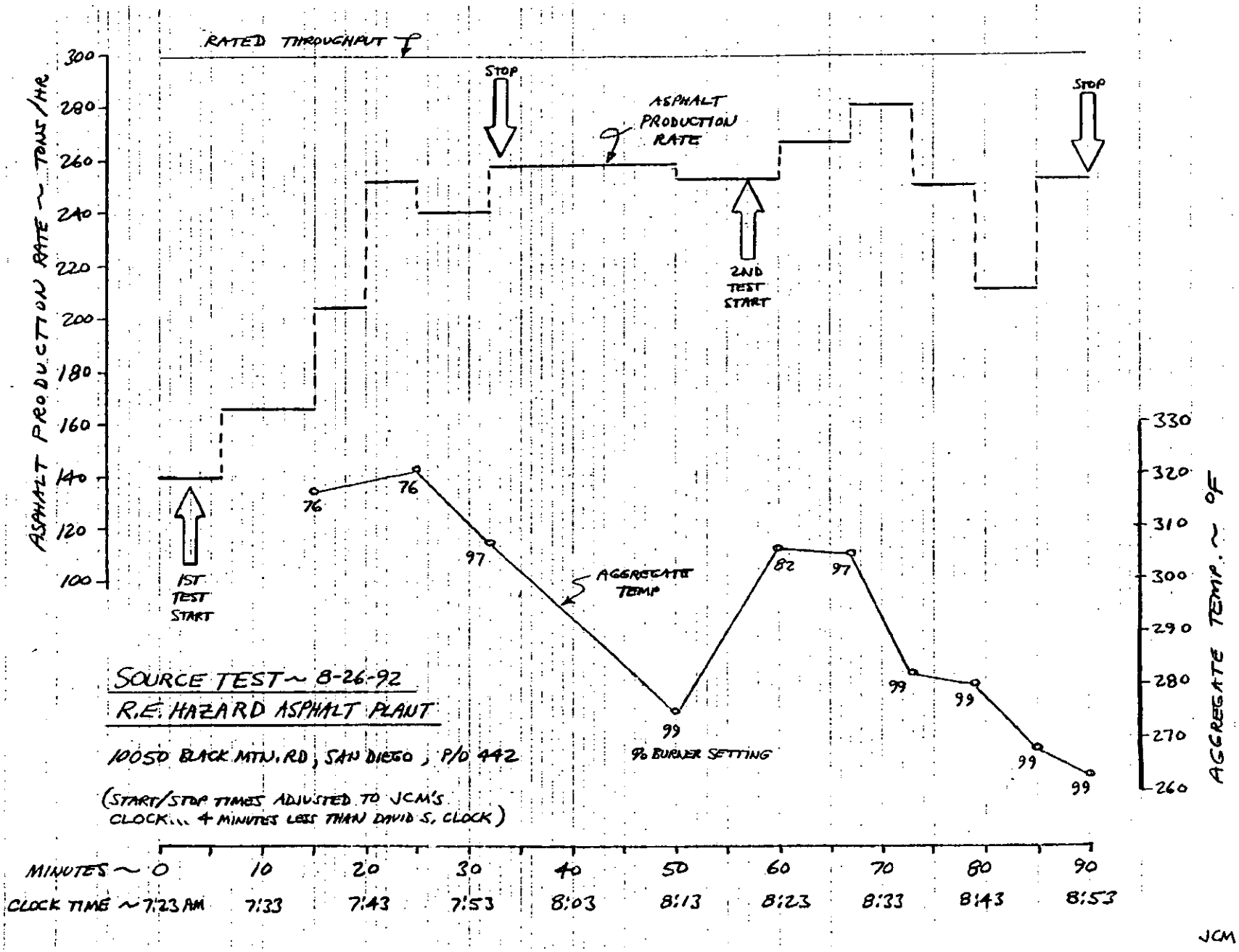
COMMENTS:

- THIS PLANT HAS NOT DEMONSTRATED OR BEEN TESTED AT ITS RATED PRODUCTION RATE (300 TONS/HR) FOR SEVERAL YEARS. THE DRYER'S BURNER MAY BE UNDERSIZED FOR THE REMAINDER OF THE PLANT.

- NO DUST WAS OBSERVED FROM THE TRUCK TRAFFIC; ALL UNPAVED ROAD SECTIONS APPEARED TO BE DAMP OR WET.

- RULE 50.(d)(2) ALLOWS 40 % OPACITY SMOKE READINGS AT THE ASPHALT DROP ZONE, INCLUDING THE TRUCK TUNNEL OPENINGS. OTHER FUGITIVE EMISSIONS ARE LIMITED TO 20 % OPACITY BY RULE 50(d)(1); SOME OF THESE ARE CLOSE TO EXCEEDING THE RULE LIMITS.

- RULE 54 SHALL BE APPLIED TO THE RENEWAL TEST RESULTS, WHICH WILL BE IN COMPLIANCE IF THE STACK PARTICULATE EMISSIONS DO NOT EXCEED 40 LB/HR.


RATED THROUGHPUT
STOP
ASPHALT PRODUCTION RATE
STOP
2ND TEST START
1ST TEST START
ASPHALT PRODUCTION RATE ~ TONS/HR
300
280
260
240
220
200
180
160
140
120
100
76
76
97
AGGREGATE TEMP
99
% BURNER SETTING
82
97
99
99
99
99
330
320
310
300
290
280
270
260
AGGREGATE TEMP. ~ °F
SOURCE TEST ~ 8-26-92
R.E. HAZARD ASPHALT PLANT
10050 BLACK MTN. RD, SAN DIEGO, P/O 442
(START/STOP TIMES ADJUSTED TO JCM'S CLOCK... 4 MINUTES LESS THAN DAVID S. CLOCK)
MINUTES ~ 0 10 20 30 40 50 60 70 80 90
CLOCK TIME ~ 7:23 AM 7:33 7:43 7:53 8:03 8:13 8:23 8:33 8:43 8:53

JCM

APCD 32 REV. 11/85

63267
CONTROL NO.

COUNTY OF SAN DIEGO
AIR POLLUTION CONTROL DISTRICT
9150 CHESAPEAKE DRIVE SAN DIEGO, CA 92123-1096
(619) 694-3307

PERMIT TO OPERATE

PERMIT NO.
000442
EXPIRES
NOVEMBER 1, 1991

THE FOLLOWING IS HEREBY GRANTED A PERMIT TO OPERATE THE ARTICLE, MACHINE, EQUIPMENT OR CONTRIVANCE DESCRIBED BELOW. THIS PERMIT IS NOT TRANSFERABLE TO A NEW OWNER, NOR IS IT VALID FOR OPERATION OF THE EQUIPMENT AT ANOTHER LOCATION, EXCEPT FOR PORTABLE EQUIPMENT.

HAZARD R E CONTRACTING CO
PLANT SUPERINTENDENT
P O BOX 229000
SAN DIEGO CA 92122

EQUIPMENT ADDRESS

10050 BLACK MTN RD
SAN DIEGO CA 92126

EQUIPMENT DESCRIPTION

REVISED COPY **FEE PAID**

ASPHALT BATCH PLANT(300-TON/HR CAPACITY: STANDARD HOT MIX 3000 LB. BATCHER; 109M BTU/HR INPUT ROT-DRYER; STANDARD HAVENS BAGHOUSE, 9660 SQ FT CLOTH AREA; 50,000 SCFM BLOWER; SUSPENDED OIL PARTICLE CONTROL; ENCLOSURE FOR THREE (3) ASTEC HB 200 TON STORAGE SILOS; ENCLOSED CONVEYOR TO SILO LOAD-IN AREA; THREE SILO BATCHERS; ONE 10,000 CFM BLOWER AND ASSOCIATED VENT DUCTING TO THE PLANT KNOCK-OUT BOX. RL201/91 900119
H 00182A 000442 0139J 04A01 92A01

THIS PERMIT HAS BEEN ISSUED SUBJECT TO THE FOLLOWING CONDITIONS. FAILURE TO COMPLY WITH THESE CONDITIONS IS A MISDEMEANOR.

1. AIR POLLUTION CONTROL EQUIPMENT SHALL BE MAINTAINED IN GOOD OPERATING CONDITION AND SHALL BE IN FULL OPERATION IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AT ALL TIMES WHEN THE PROCESS EQUIPMENT IS IN OPERATION.
2. ALL PROCESS EQUIPMENT SHALL BE MAINTAINED AND OPERATED SO THAT THERE IS NO LEAKAGE OF AIR CONTAMINANTS TO THE ATMOSPHERE PRIOR TO THEIR TREATMENT IN THE AIR POLLUTION CONTROL SYSTEM.
3. ACCESS ROADS AND YARDS IN THE GENERAL AREA OF THIS EQUIPMENT SHALL BE [illegible]TERED OR OTHERWISE TREATED TO PREVENT DUST GENERATED BY PLANT MOBILE TRAFFIC FROM EXCEEDING THE EMISSION STANDARDS OF RULE 30.
4. PERMITTEE SHALL PROVIDE ACCESS, FACILITIES, UTILITIES AND ANY NECESSARY SAFETY EQUIPMENT FOR SOURCE TESTING AND INSPECTION UPON REQUEST OF THE AIR POLLUTION CONTROL DISTRICT.
5. DAILY RECORDS OF HOT MIX ASPHALT PRODUCTION AND DELIVERY RATES SHALL BE MAINTAINED AND MADE AVAILABLE TO THE DISTRICT UPON REQUEST.
6. OPERATION MUST BE IN COMPLIANCE WITH ALL INFORMATION INCLUDED IN APPLICATIONS FOR THIS PERMIT TO OPERATE, AS APPROVED BY THE DISTRICT, AND WITH ALL CONDITIONS LISTED ABOVE.

WITHIN 10 DAYS AFTER RECEIPT OF THIS PERMIT, THE APPLICANT MAY PETITION THE HEARING BOARD TO REVIEW ANY CONDITION THAT HAS BEEN MODIFIED OR ADDED TO THE PERMIT. (RULE 25 AND REGULATION V)

IN ACCORDANCE WITH RULE 10C THIS PERMIT TO OPERATE OR A COPY MUST BE POSTED ON OR WITHIN 25 FEET OF THE EQUIPMENT, OR MAINTAINED READILY AVAILABLE AT ALL TIMES ON THE OPERATING PREMISES.

ANY AND ALL CONDITIONS WHICH HAVE BEEN APPLIED TO THIS EQUIPMENT SHALL REMAIN IN FULL FORCE AND EFFECT UNLESS EXPRESSLY MODIFIED BY THE AIR POLLUTION CONTROL DISTRICT.

THIS AIR POLLUTION CONTROL DISTRICT PERMIT DOES NOT RELIEVE THE HOLDER FROM OBTAINING PERMITS OR AUTHORIZATIONS WHICH MAY BE REQUIRED BY OTHER GOVERNMENTAL AGENCIES.

R.J. Sommerville
AIR POLLUTION CONTROL OFFICER

Dashiu
8/26/98

P.O. #442
041
TEST # 92239

R.E. Hazard

(1) IMPINGERS:

Date	NO	CONTENTS	WGT	Date	WGT	DIFF
8/25	1	100 mL H_2O	574.05	8/26	744.15	170.10
↓	2	100 mL H_2O	573.88	↓	618.70	44.82
	3	MT	485.97		496.56	10.59
	4	MT	631.72		644.90	13.18

TOTAL = 200 mL TOTAL = 238.69

(2) GAS ANALYSIS:

CO_2: Arunid AR400: #1 = 2.6%, #2 = 2.5%, #3 = 2.5%, AVG = 2.5%
O_2: Teledyne: #1 = 14.9%, #2 = 14.9%, AVG = 14.9%

(3) Cp:

ΔP (above) = 1.01 Cp (above) = .8452
ΔP (test) = 1.15 Cp (test) = ?
ΔP (below) = 1.95 Cp (below) = .8337

$$\{[(1.15-1.01)/(1.45-1.01)] \times (.8337-.8452)\} + .8452 = .8435$$

(4) WGT: WASHINGS

	ID	RINSES	TARE	#1	#2	#3	AVG
BLANKS:							
Acetone	(92025)	250+75	49.4837	49.4868	.4864	.4864	49.4864
Water	(92001)	250+50	30.8196	30.8196	.8198	.8198	30.8198
FRONT							
Ac	(92080)	250+50	29.2998	29.3092	.3092	.3092	29.3092
Water	(92078)	250+50	28.8435	28.8605	.8605	.8605	28.8605
BACK							
Ac	(92084)	280+50	29.2421	29.2590	.2592	.2591	29.2592
Water	(92003)	300+50	30.2254	30.2477	.2475	.2477	30.2476
FILTER							
Back	(9004)	—	1.6007	1.6008	1.6008	1.6008	1.6008

??SITE NAME?? on ??TEST DATE?? P.O.#????? TEST #?????

SAN DIEGO AIR POLLUTION CONTROL DISTRICT, 9150 CHESAPEAKE DRIVE, SAN DIEGO, CA. 92123

SOURCE TEST OF PARTICULATE EMISSIONS TO THE ATMOSPHERE

TEST SITE: RE hazard

TEST #: P.O.#: TEST DATE:

Type of plant (Asphalt/Perlite/Combustion): ASPHALT

UNIT TESTED:

EQUIPMENT:

TESTED BY:	DATE:
SITE PERSONNEL:	DATE:
APCD ENGINEER:	DATE:
LAB ANALYSIS BY:	DATE:
REPORT BY:	DATE:
REVIEWED BY:	DATE:
APPROVED BY:	DATE:

ROBERT YELENOSKY, SENIOR AIR POLLUTION CHEMIST

This report has been reviewed and found to be representative of the testing that was performed.

SDAPCD RULES

TEST	LIMIT	MEASURED	EXCEEDANCE/NON-EXCEEDANCE
RULE 54 DUST & FUMES	40 lbs/hr	6.928 lbs/hr	NON-EXCEEDANCE

TEST RESULTS SUMMARY:

ITEM	I	Cs	E
UNITS	%	gr/dscf	lbs/hr
VALUE	105	0.0251	6.93

ENGINEERING SUMMARY

Qstd	Fuel	Fuel Rate	Asphalt Production
dscfm	type	CFH	tons/hr
32201			

TEST PARAMETERS:

SYSTEM DESCRIPTION:

This asphalt plant combines crushed rock and and sand with asphalt oil in batch loads of varying sizes. The rock and sand are heated in a rotary drum to dry them. The exhaust from this dryer is routed through a baghouse and finally to a stack. It is the emissions from this stack that are the subject of this report.

PROCEDURES:

The procedures utilized in these tests are based on EPA's 40 CFR, July 1, 1991, Part 60, Appendix A, Methods 1-5 inclusive. The sampling train was modified to utilize a back-end filter (fig. 1), as outlined in the SDAPCD QA manual.

CALCULATIONS

All equations are from the EPA's 40 CFR, July 1, 1991, Part 60, Appendix A, Methods 1-5 inclusive. All preliminary assumptions and calculations are based on data obtained from previous tests.

PARTICULATE SAMPLING:

The test consisted of sampling at 24 traverse points, 12 from each of 2 sample ports (fig.2), collected from ?? inches below the stack (fig.3). All field data was transferred to the computer printout. All calculations were done by the computer and the emissions were compared to rule ?? of the SDAPCD.

ANALYSES:

Gas: An integrated bag sample was collected during the test and analyzed at the APCD lab.

Particulate: All procedures follow EPA guidelines, except where noted in the SDAPCD QA manual.

EQUIPMENT:

All testing and analysis equipment was calibrated according to EPA guidelines (40 CFR, July 1, 1991, Part 60, Appendix A, Methods 1-5).

Analysis:	Collection:	Sampling:	Temp./Press.:
CO2-Anarad AR400	Filter-Gelman	L/S Box-Napp	Thermocouples-Omega
O2-Teledyne Ryan 320 P4	Holder-Gelman	Umbilical cord-Napp	Temp. read out-Omega
Macrobalance-Sargent Welch	Beakers-Pyrex	Cold/Hot box-Napp	Aneroid Barometer-Taylor
Microbalance-Sartorious	Impingers-Ace	Pitobe tube-Napp	Press. devices-Dwyer magnehelic

??SITE NAME?? on ??TEST DATE??

P.O.#????? TEST #?????

FIELD DATA:

Trav. Pt	Vm (ft^3)	ΔP (in H2O)	ΔH (in H20)	Stack Temp (°F)	Box Temp (°F)	Imp Temp (°F)	t 1 (in) (°F)	t 2 (out) (°F)	velocity (ft/sec)
START	807.220								
		1.440	1.700	212		63	81.00	101.00	079.89
		1.700	2.000	212		58	80.00	102.00	086.81
		1.620	1.900	200		58	79.00	105.00	083.98
		1.510	1.700	210		61	81.00	108.00	081.69
		1.130	1.300	213		61	81.00	110.00	070.63
		0.850	1.000	212		61	81.00	111.00	061.38
		0.650	0.750	212		61	82.00	112.00	053.68
		0.680	0.800	206		62	84.00	113.00	054.66
		0.620	0.700	210		61	84.00	113.00	052.35
		0.630	0.730	211		63	85.00	114.00	052.81
		0.700	0.800	213		63	85.00	115.00	055.74
		0.630	0.730	212		65	85.00	115.00	052.84
		1.000	1.150	216		64	86.00	109.00	066.78
		1.050	1.200	215		64	87.00	108.00	068.37
		1.110	1.300	215		65	87.00	111.00	070.39
		1.130	1.300	215		65	87.00	113.00	070.93
		1.150	1.300	215		65	87.00	113.50	070.93
		1.220	1.400	216		64	87.50	116.00	073.76
		1.310	1.500	217		62	87.00	116.00	076.49
		1.420	1.650	222		66	87.50	116.00	079.93
		1.480	1.700	216		60	87.50	116.50	081.24
		1.630	1.900	218		61	88.00	119.00	085.38
		1.820	2.100	219		61	88.00	119.50	090.29
	846.608	1.880	2.200	221		61	88.50	120.00	091.90

	Vm ft^3	ΔP (in H2O)	ΔH (in H20)	ts (°F)	tbox (°F)	ti (°F)	t 1 (in) (°F)	t 2 (out) (°F)	vs (ft/sec)
Average:	39.388	1.146	1.367	214	na	62	84.92	112.52	71.37

DATA SUMMARY:

LABORATORY DATA:	SAMPLING PARAMETERS:	SAMPLING DATA:
IMPINGER CATCH:	**METER BOX:**	**VOLUME & TIME:**
Silica gel ? = YES	Box ID = c138	Ø (total time) = 60.0 min
Vlc = 238.69 ml	ΔH@ = 1.8883	Final leak rate = 0.001 cfm
	Y = 0.9924	Pass/Fail = PASS
		Vm = 39.388 ft^3
GAS ANALYSIS:	**STACK DIMENSIONS:**	**PRESSURES:**
CO2 = 2.50 %	Circular ? = YES	Pbar = 29.77 in Hg
O2 = 14.90 %	Ds = 4.00 ft	Pg = 0.80 in H2O
CO = 0.00 %	Length = N/A ft	Vpw @ ts = 29.9200 in Hg
N2 = 82.60 %	As = 12.56 ft^2	Vpw @ ti = N/A in Hg
PARTICULATE ANALYSIS:	**NOZZLE & PROBE**	**TEMPERATURES:**
mn(front) = 0.023708 g	Dn = 0.205 in	t1 = 84.92 °F ti = 62 °F
mn(back) = 0.036292 g	An = 0.0330 in^2	t2 = 112.52 °F tbox = na °F
mn(total) = 0.06000 g	Cp = 0.8435	tm = 98.72 °F ts = 214 °F

CALCULATIONS:

TEMPERATURES:

01)	ts = (Σ ts[n])/total n's		214 °F
02)	Ts = ts+460		674 °R
03)	tm= (Σ [(t1[n]+t2[n])/2]/total n's=(t1+t2)/2		99 °F
04)	Tm= (t1+t2)/2 + 460		559 °R
05)	ti= (Σ ti[n])/total n's		62 °F
06)	Tstd		528 °R

PRESSURES:

07)	Pbar= [P @ S.L.]+[ft. above S.L.*(-0.1 in Hg/ 100ft)]		29.77 in Hg
08)	Pg= read from pressure sensing device		0.80 in H2O
09)	Ps= Pbar + [Pg/ 13.6]		29.83 in Hg
10)	ΔH		1.37 in H20
11)	Pm= Pbar+(ΔH/ 13.6)		29.87 in Hg
12)	Pstd		29.92 in Hg

VOLUME & MOISTURE:

13)	Vm= Vm(end)-Vm(begin)		39.388 ft^3
14)	Y		0.9924
15)	Vm= Vm*Y		39.089 ft^3
16)	Vm std = [(Vm*(Tstd/Tm)*(Pm/Pstd)]		36.878 ft^3
19)	Vlc= (Σ Volume of Impingers)		238.69 ml
20)	∂		0.002201 lb/ml
21)	R		21.85 in Hg-ft^3/°R-lb-mo
22)	MwH2O		18.00 g/g-mo
23)	Vw std = [(Vlc*∂*R*Tstd)/(Pstd*MwH2O)]		11.2351 ft^3
24)	Bws(1) =(Vw std)/(Vw std+Vm std)100	23.35 %	
25)	Vpw @ ts = from appendix	29.92 in Hg	
26)	Bws(2) =[(Vpw @ ts)/Ps]*100	100.31 %	
27)	Bws = lower value of equation 24 or 26		23.35 %

VELOCITY:

28)	%O2		14.90 %
29)	%CO2		2.50 %
30)	%N2+Inerts+%CO		82.60 %
31)	Md=[0.440*%CO2]]+[0.320*(%O2)]+[0.280(%N2+Inerts+%CO		29.00 g/g*mole
32)	Ms=Md*(1-Bws)+18.0*(Bws)		26.43 g/g*mole
33)	ΔP		1.1459 in H2O
34)	Cp		0.844
35)	vs= 85.49*Cp*[(Ts*ΔP)/(Ps*Ms)]^.5)		71.372 ft/sec
36)	As=3.14*[(Ds)^2/4]		12.560 ft^2
37)	Qs = (vs)*As*60		53786 acfm
38)	Qstd =17.64*Qs*(1-Bws)*Ps/Ts		32201 dscfm

EMISSIONS:

FRONT HALF

39)	mn (front)		0.02371 g
40)	Cs (front) =15.43*mn(front)/Vm std		0.00992 grains/dscf
41)	7000grains=1lb; 60min=1hr; 60min/hr/7000grains/lb=		0.00857 lbs-min/grains-hr
42)	E (front) = (0.00857)*(Qstd)*Cs (front)		2.74 lbs/hr

BACK HALF

43)	mn (back)		0.03629 g
44)	Cs (back) =15.43*mn(back)/Vm std		0.01518 grains/dscf
45)	7000grains=1lb; 60min=1hr; 60min/hr/7000grains/lb=		0.00857 lbs-min/grains-hr
46)	E (back) = (0.00857)*(Qstd)*Cs (back)		4.19 lbs/hr

TOTAL

47)	mn (total) = mn(front)+mn(back)		0.06000 g
48)	Cs (total) =15.43*mn(total)/Vm std		0.02510 grains/dscf
49)	7000grains=1lb; 60min=1hr; 60min/hr/7000grains/lb=		0.00857 lbs-min/grains-hr
50)	E (total) = (0.00857)*(Qstd)*Cs (total)		6.93 lbs/hr

ISOKINETICS:

51)	Dn=		0.205 in
52)	An=3.14*[(Dn)^2/4]		0.0330 in^2
53)	I=.09450(Ts*Vm std)/Ps*VsAnØ(1-Bws) 104.61 % =		105 %

??Test Site Name?? on ??Test Date?? P.O. #:???? TEST#: ??????

SAN DIEGO AIR POLLUTION CONTROL DISTRICT, 9150 CHESAPEAKE DRIVE, SAN DIEGO, CA 92123

PARTICULATE TEST LABORATORY ANALYSIS DATA SHEET

TEST SITE: R.E. HAZARD, Q A

TEST #: P.O.#: TEST DATE:

LAB ANALYSIS BY: David N. Shina DATE:

LAB REPORT BY: David N. Shina DATE:

REVIEWED BY: DATE:

(1) IMPINGER VOLUMES

	FINAL WGT.		INIT WGT.		NET WGT.
#1	744.15 g	-	574.05 g	=	170.10 g
#2	618.70 g	-	573.88 g	=	44.82 g
#3	496.56 g	-	485.97 g	=	10.59 g
#4	644.90 g	-	631.72 g	=	13.18 g
#5	g	-	g	=	N/A g
#6	g	-	g	=	N/A g

Total impinger charge= 200.00 ml

Particulates from impinger charge (Total impinger charge * H(water blank) = 0.00013 g

Total weight collected= 238.69 g

Total volume collected,Vlc= 238.69 ml

(2) BLANKS

A	B	C	D	E	F	G	H	I	J	K	L
AREA	SOLVENT	ID	END WGT g	INIT WGT g	NET WGT. (E-F) g	RINSES ml	g/ml (G/D)	% (H*100)	ppm (H*10^6)	PASS FAIL	LIMITS
BLANK	ACETONE	92025	49.4864	49.4837	0.00270	325.00	0.0000083	0.0008308	8.3	P	0.0010%=10ppm
BLANK	WATER	92001	30.8198	30.8196	0.00020	300.00	0.0000007	0.0000667	0.7	P	0.0004%=4ppm
BLANK	ORGANIC	N/A									

(3) WEIGHTS & RINSES

a	b	c	d	e	f	g	h	i	j	k
AREA	SOLVENT	ID	END WGT g	INIT. WGT g	NET WGT. (e-f) g	RINSES ml	SOLV. WGT (g*H) g	WGT (corr) (f-h) g	Subtotal (mn (AREA)) (Σj) g	Total (mn (tot)) (Σj) g
F	ACETONE	92086	29.3092	29.2998	0.0094	300.00	0.002492	0.00691		
R	WATER	92078	28.8605	28.8435	0.0170	300.00	0.000200	0.01680		
O	ORGANIC	N/A								
N	FILTER	N/A								
T								mn(front) =	0.023788 g	
B	ACETONE	92084	29.2592	29.2421	0.0171	330.00	0.002742	0.01436		
A	WATER **	92003	30.2476	30.2254	0.0222	350.00	0.000367	0.02183		
C	ORGANIC	N/A								
K	FILTER	91009	1.0008	1.0007	0.0001	----	----	0.00010		
								mn(back) =	0.05292 g	
TOTAL										mn(total) = 0.08000 g

** The Back Water-SOLV.WGT is corrected for the initial impinger charge
{ [g(back water) * H(blank water)] + [Partiulates from impinger charge] }.

METHOD 5 EQUIPMENT CHECKLIST

SITE: L & Hoffard TEST#: 92234 P.O.#: 442 DATE: 8/26/92

MISCELLANEOUS
- Camera & film
- Ice chest
- Ice
- 8 Tedlar bags
- Duct tape

CALCULATION EQUIP.
- Source Test briefcase
- Calib. notebook
- Stopwatch
- Nomograph
- Calculator
- Assorted pens
- Tape measure
- White out
- Labels
- Scissors
- Teflon tape
- L/S Box fuses

LAB/FIELD EQUIPMENT
- Acetone
- Foil
- Parafilm
- Distilled water
- Kimwipes
- Vac. grease
- 100 ml grad. cylinder
- Sample coll. bottles
- Nozzle brush
- Probe brush

SAMPLING EQUIPMENT (reserve)
- L/S Box
- Pitot tube leak test equipment
- Umbilical cord
- Cold/Hot box
- Impingers (Impingers 1-4)
- Imp-imp connections
- Imp-probe connections
- 100ml of water in 1st 2 imp.
- Impinger clips
- Silica gel imp. with vac. adapter
- Filter & Filter holder
- Heating coil

SAMPLING EQUIPMENT (main)
- L/S Box
- Pitot tube leak test equipment
- Thermocouple - read-out
- Electrical cords (50' & 100')
- Umbilical cord
- Cold/Hot box
- Impingers (Impingers 1-4)
- Imp-imp connections
- Imp-probe connections
- Spare set of connections
- 100ml of water in 1st 2 imp.
- Impinger clips
- Silica gel imp. with vac. adapter
- Filter & Filter holder
- Spare filter & filter holder
- Heating coil
- Probe
- Spare probe
- Nozzle boxes with nuts

TOOL BOX
- Assorted monkey wrenches
- Assorted open-end wrenches
- Assorted screwdrivers
- 3' pipe wrench
- Port (wire) brush
- Tape measure

STACK EQUIPMENT
- Unirail
- Port/nipple adapters
- 2 C-clamps
- 2 unirails with rollers
- Chains
- 2 nylon straps
- Rope (25' and 50')
- Pail
- Gloves (leather)
- Gloves (heat resistant)
- Rags and diapers

MISCELLANEOUS EQUIPMENT
- Nomograph-reserve
- Calculator-reserve
- Inclinometer-reserve (cyclonic flow)
- Filter-reserve (high moisture)
- Large pipe wrench
- Cold/hot box rollers for SDG&E sites

SAFETY
- First aid box
- Ear plugs
- Safety shoes and hat
- Safety cones

EQUIPMENT DATA SHEET

	MAIN					RESERVE				
	TYPE	ID#	SIZE	CLEANED	CAL DATE	TYPE	ID#	SIZE	CLEANED	CAL DATE
Nozzle Dia.	Nupp	.205	7	DM	6/92					
Pitot Tube	Nupp	SN872	S	DM	7/92					
Tedlar Bag	SKC	—	—	DM	—	SKC	—	—	DM	—
L/S Box	C138	C138	—	✓	6/92					
Stack Sensor	Omega	—	K	—	6/92	Omega	—	K	—	6/92
Box Sensor	↓	—	K	—	6/92	↓	—	K	—	6/92
Imp. Sensor	↓	—	K	—	6/92	↓	—	K	—	6/92
ΔP Sensor	Dwyer	—	0-5	—	6/92	~~Dwyer~~				
ΔH Sensor	Dwyer	—	0-5	—	6/92	—				
Cold Box	Nupp	G3	—	—	—	B3	Nupp	—		
Hot Box	Nupp	G3	—	—	—	B3	Nupp	—		
Temp Disp.	Omega	—	—	—	—	Omega	—	—	—	—

SIGNATURE: DM DATE: 8/25/92 TIME: 1430

IMPINGER COLLECTION, GAS ANALYSIS DATA SHEET

SITE: | P.O.#: | TEST #: | DATE:

IMPINGER COLLECTION MEASUREMENTS:

PRE-TEST

A DATE	B IMP No.	C CONTENTS of IMPINGER	D CHARGE AMT (g)	E WGT of IMPINGER +CHARGE (g)
8/25	1	H_2O	100	574.95
	2	H_2O	100	573.88
	3	—	—	485.97
	4	Silica	—	631.72

TTL WGT OF CHARGE (ΣD): 200 g

POST-TEST

F DATE	G WGT of IMPINGER +CHARGE (g)	H H2O collected (G-E) (g)	I COMMENTS
8/26	744.15	170.10	
	618.70	44.82	
	496.56	10.59	
	644.90	13.18	

TTL WGT GAIN FROM IMP (ΣH): 238.69 g

BLANKS:

TYPE	LOT NUMBER	BRAND	PREVIOUS	%PPT	IF YES, TEST SITE
WATER			YES (NO)		
ACETONE	9312	omnisolve EM Sci	YES (NO)	.1ppm	
			YES NO		

GAS ANALYSIS:

GAS= CO2	INSTRUMENT: AUBAR AR400		Cal. Gas%= — %	Cal. No.= 23.6
DATE: 8/26	RUN #1= 2.6 %	RUN #2= 2.5 %	RUN #3= 2.5 %	AVG= 2.5 %

GAS= O2	INSTRUMENT: Teledyne		Cal. Gas%= 7.9 %	Cal. No.=
DATE:	RUN #1= 14.96 %	RUN #2= 14.90 %	RUN #3= %	AVG= 14.90 %

FILTERS:

DATE	LOCATION	LABEL	PRE-TEST WEIGHT
—	FRONT	N/A	g
8/26	BACK	91099	1.6009 g

Cp CALCULATION:

ΔP (above)	1.01	Cp(above)	.8452
ΔP (test)	1.15	**Cp(test)**	?
ΔP (below)	1.95	Cp(below)	.8337

Pitot Tube S/N: SN 530

Cal. Date: 6/12

Cp (test)= .8435

Cp(test)= {{[ΔP (test) -ΔP (above)] / [ΔP (below) -ΔP (above)]} * [Cp (below) -Cp (above)]} + Cp (above)

$$\left(\frac{1.15-1.01}{1.95-1.01}\right) \times (.8337-.8452) + .8452$$

$$.1489 \times (-.1015) + .8452 = .8435$$

METER ORIFICE CHECK

SITE: L.E. Harland TEST#: 92234 P.O#: 442 DATE: 8/26/92

L/S Box=_____ ΔH@= _____ Y= _____ Cal. Date= _____

Yc=(time/Vm) * {[(0.0319*Tm)/Pb]^0.5} run L/S box at ΔH@ for at least 5 minutes

PRE-TEST ~~5 MINUTE Y CHECK~~ POST-TEST ONLY

	TIME	VOLUME	t1 (in)	t2 (out)	tm=(t1+t2)/2
INITIAL	0	848.269	89	100.5	94.75
	min	ft^3	°F	°F	°F
	8:17.20				
	8:22.20				
FINAL	5	852.195	89	119	104
	min	ft^3	°F	°F	°F

Pbar= 29.68

Y= .9924

.97*Y= .9623

Yc= .9875

1.03*Y= 1.022

~~0.97*Y~~ < Yc < 1.03*Y

~~PASS~~ FAIL

t(final)-t(initial)	Vm(final)- Vm(initial)	tm-avg = (tm(initial) + tm(final)) /2	Tm = tm-avg + 460°R
5 min	ft^3	99.38 °F	559.38 °R

Yc=(5 min/ 3.426 ft^3)*{[(.0319* 559.38 °R)/ 29.68 in Hg]^0.5}= .9875 Yc

time Vm Tm Pbar

SIGNATURE: _____ DATE: 8/26/92 TIME: 9:30

POST-TEST 5 MINUTE Y CHECK

	TIME	VOLUME	t1 (in)	t2 (out)	tm=(t1+t2)/2
INITIAL					
	min	ft^3	°F	°F	°F
FINAL					
	min	ft^3	°F	°F	°F

Pbar= _____

Y= _____

.97*Y= _____

Yc= _____

1.03*Y= _____

0.97*Y < Yc < 1.03*Y

PASS FAIL

t(final)-t(initial)	Vm(final)- Vm(initial)	tm-avg = (tm(initial) + tm(final)) /2	Tm = tm-avg + 460°R
min	ft^3	°F	°R

Yc=(_____ min/ _____ ft^3)*{[(.0319* _____ °R)/ _____ in Hg]^0.5}= _____ Yc

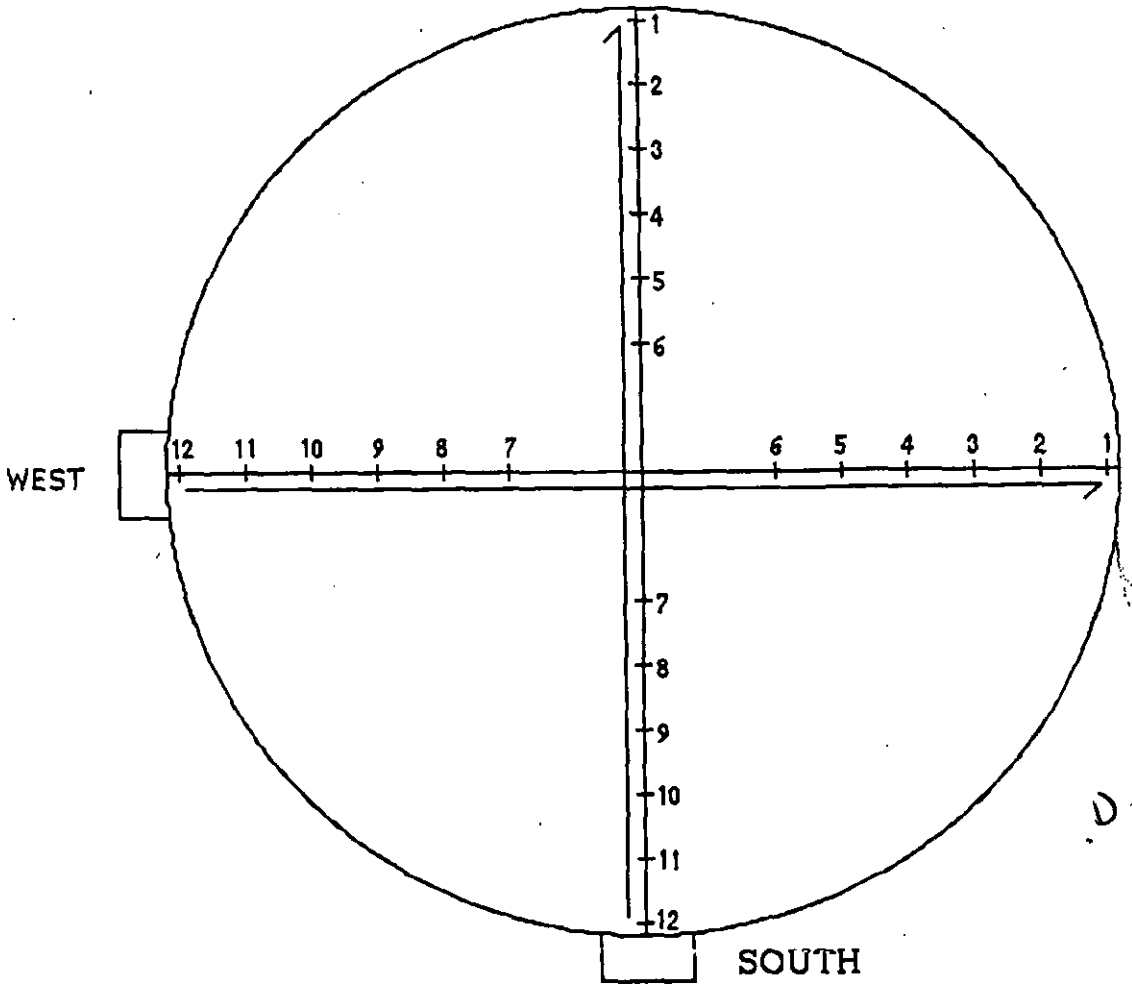
time Vm Tm Pbar

SIGNATURE: _____ DATE: _____ TIME: _____

SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT

Figure

TRAVERSE POINTS



D = 48"

POINT	PERC%	DIST.	POINT	PERC%	DIST.
1	2.1%=	1.0	7	64.4%=	30.9
2	6.7%=	3.2	8	75%=	36
3	11.8%=	5.7	9	82.3%=	39.5
4	17.7%=	8.5	10	88.2%=	42.3
5	25.0%=	12.0	11	93.3%=	44.8
6	35.6%=	17.1	12	97.9%=	47

AP-42 Section 11.1
Reference
Report Sect. 4
Reference ~~279~~ 280

apcd

County of San Diego

R. J. Sommerville
Air Pollution Control Officer

October 17, 1991

R .E. Hazard Contracting Co.
Attention: Plant Superintendent
P.O. Box 229000
San Diego, CA 92122

SUBJECT: **RENEWAL TEST REPORT**

The enclosed test report is the result of testing done at your facility.

If you have any questions, please call me at (619) 694-3359.

Robert Yelenosky for CWR
C. W. Ridenour
Senior Air Pollution Chemist

CWR:jo

Enclosures

AIR POLLUTION CONTROL DISTRICT
9150 Chesapeake Drive, San Diego, California 92123-1095
(619) 694-3307 FAX (619) 694-2730

R.E. Hazard on 9/5/91 P.O.#442 TEST #91248

SAN DIEGO AIR POLLUTION CONTROL DISTRICT, 9150 CHESAPEAKE DRIVE, SAN DIEGO, CA. 92123

SOURCE TEST OF PARTICULATE EMISSIONS TO THE ATMOSPHERE

TEST SITE: R.E. Hazard
10050 Black Mountain Road
San Diego, CA 92126

TEST #: 91248 P.O.# 442 TEST DATE: 9/5/91

Type of plant (Asphalt /Perlite / Combustion): asphalt

UNIT TESTED: Baghouse

EQUIPMENT: Asphalt Batch Plant

TESTED BY: David Shina DATE: 9/5/91

SITE PERSONNEL: Al Tilley DATE: 9/5/91

APCD ENGINEER: John McCafferty DATE: 9/5/91

LAB ANALYSIS BY: David Shina DATE: 9/18/91

REPORT BY: David Shina DATE: 9/18/91

REVIEWED BY: Linda Twaddle DATE: 9/23/91

APPROVED BY: Robert Zelenny for CWR DATE: 10/9/91

C.W. RIDENOUR, SENIOR AIR POLLUTION CHEMIST

This report has been reviewed and found to be representative of the testing that was performed.

TEST	PERMIT LIMIT	MEASURED	PERFORMANCE
RULE 54 DUST & FUMES	40 lbs/hr	18.50 lbs/hr	PASSED

SUMMARY:

ITEM	Vm	Bws	Cs	E	I	Qstd	ts	PROD RATE
UNITS	ft^3	%	gr/dscf	lbs/hr	%	dscfm	°F	tons/hr
VALUE	53.306	21.66	0.051	18.497	96	4.21E+04	217	† 277.5

† No APCD engineer was at the site, so the engineering data was provided by R.E. Hazard and interpreted by the District.

SYSTEM DESCRIPTION:

This asphalt plant combines crushed rock and and sand with asphalt oil in batch loads of varying sizes. The rock and sand are heated in a rotary drum to dry them. The exhaust from this dryer is routed through a baghouse and finally to a stack. It is the emissions from this stack that are the subject of this report.

PROCEDURES:

The procedures and equipment utilized in these tests are based on EPA New Source Performance Standards Method 5. The sampling train was modified to use a back-end filter only and a fifth impinger filled with silica gel (fig. 1), as outlined by the SDAPCD QA manual

CALCULATIONS

All preliminary assumptions and calculations are based on data obtained from previous tests. All equations are from EPA CFR 40, July 1, 1990, Parts 53-60, Appendix A, Methods 1-5 inclusive.

PARTICULATE SAMPLING:

The test consisted of sampling at 24 traverse points, 12 from each of 2 sample ports (fig.2), collected from 48 inches below the stack (fig.3). All field data was transferred to the computer printout. All calculations were done by the computer and the emissions were compared to rule 54 of the SDAPCD.

ANALYSES:

Gas: An integrated bag sample was collected during the test and analyzed at the APCD lab.

Particulate: All procedures follow EPA guidelines, except where noted in the SDAPCD QA manual.

EQUIPMENT:

All testing and analysis equipment was calibrated according to EPA guidelines.

Analysis:	*Collection:*	*Sampling:*	*Temp./Press.:*
CO2-Anarad AR400	Filter-Gelman	L/S Box-Napp	Thermocouples-Omega
O2-Teledyne Ryan 320 P4	Holder-Gelman	Umbilical cord-Napp	Read out-Omega
Macrobalance-Sargent Welch	Beakers-Pyrex	Cold/Hot box-Napp	Barometric-calc. by APCD
Microbalance-Sartorious	Impingers-Ace	Pitobe tube-Napp	L/S box-Dwyer magnehelic

R.E. Hazard on 9/5/91 — P.O.#442 TEST #91248

Trav. Pt	Vm (ft^3)	ΔP	ΔH	t 1(unc)	t 2(unc)	Stack Temp	Imp Temp	velocity
	150.816	(in H2O)	(in H20)	(°F)	(°F)	†† (°F)	(°F)	(ft/sec)
1		1.600	2.370	83.00	99.00	217	58	85.45
2		1.110	2.620	82.00	114.00	224	57	71.54
3		1.920	2.840	82.00	118.00	226	56	94.22
4		2.150	3.180	82.00	118.00	226	61	99.70
5		2.210	3.270	81.50	120.00	216	61	100.50
6		2.320	3.430	83.00	120.00	217	64	102.89
7		2.120	3.140	84.00	120.50	213	63	98.06
8		1.950	2.890	84.00	120.50	215	59	94.19
9		1.600	2.370	84.00	120.50	216	56	85.32
10		1.620	2.340	84.00	120.50	216	55	85.91
11		1.750	2.600	84.00	120.50	216	55	89.23
12		1.380	2.000	84.00	120.00	193	54	77.93
1		1.620	2.400	84.50	99.00	221	56	86.23
2		1.720	2.500	84.50	112.00	*218*	59	88.66
3		1.820	2.700	84.00	116.00	*218*	55	91.20
4		1.780	2.630	84.00	119.00	*218*	45	90.19
5		1.760	2.600	84.50	120.50	*218*	48	89.68
6		1.900	2.800	84.50	121.00	*218*	48	93.18
7		2.230	3.300	84.50	121.50	215	47	100.73
8		2.350	3.480	84.00	122.50	*218*	50	103.63
9		2.420	3.580	84.00	124.00	*218*	49	105.18
10		2.150	3.180	86.50	124.50	*218*	49	99.12
11		2.300	3.400	86.00	124.50	*218*	51	102.62
12	204.122	2.050	3.030	86.00	125.50	*218*	52	96.79

†† The thermocouple wires were loose and some read-out problems were experienced. To get velocity data for points 2-6 and points 8-12, on the second traverse, the average of the stack temperatures between points 1 and 7 were used. This average is 218°F.

	Vm (ft^3)	ΔP (in H2O)	ΔH (in H2O)	t 1 (°F)	t 2 (°F)	ts (°F)	ti (°F)	vs (ft/sec)
Average:	53.306	1.895	2.860	84.10	118.27	217	54	93.00

MISCELLANEOUS:
- Ø = 66.0 min
- tn = 24 points
- ø = 2.8 min

NOZZLE & PROBE:
- Dn = 0.205 in
- An = 0.0330 in^2
- Cp = 0.851

METER BOX PARAMETERS:
- ΔH@ = 2.7254
- Y = 0.9782
- Box ID = D337

PRESSURES:
- Pbar = 29.46 in Hg
- Pg = -0.63 in H2O
- Vpw @ ts 33.02 in Hg
- Silica (yes/no) yes
- Vpw @ ti = 0.0000 in Hg

VOLUME:
- start leak rate = 0.000 cfm
- Pass/Fail PASS
- final leak rate = 0.000 cfm
- Pass/Fail PASS
- Vm 53.306 ft^3

TEMPERATURES:
- t1 corr = 0.40 °F
- t2 corr = 0.10 °F
- tm = 101 °F
- ts = 217 °F
- ti = 54 °F

STACK PARAMETERS:
- circular (yes/no) yes
- Ds = 4.00 f t
- Length = N/A
- As = 12.56 ft^2

LAB DATA:
- mn(front) = 0.10224 g
- mn(back) = 0.05944 g
- mn(total) = 0.1617 g
- Vlc 284.84 ml

STACK GAS MEASUREMENTS:
- CO2 = 3.27 %
- O2 = 14.47 %
- CO = 0.00 %
- N2 = 82.26 %

TEMPERATURES:

01)	ts = (Σ ts(n))/total n's		217 °F
02)	Ts = ts+460		677 °R
03)	tm= (Σ {(t 1(n)+t 2t(n))/2)/total n's		101 °F
04)	Tm= (t1+t2)/2 + 460		561 °R
05)	ti= (Σ ti(n))/total n's		54 °F
06)	Tstd		528 °R

PRESSURES:

07)	Pbar= {(P @ S.L.)+[ft. above S.L.*(-0.1 in Hg/100ft)]}		29.46 in Hg
08)	Pg= read from pressure sensing device		-0.63 in H2O
09)	Ps= Pbar + (Pg/13.6)		29.41 in Hg
10)	ΔH		2.86 in H20
11)	Pm= Pbar+(ΔH/13.6)		29.67 in Hg
12)	Pstd		29.92 in Hg

VOLUME:

13)	Vm= Vm(end)-Vm(begin)		53.306 ft^3
14)	Y		0.9782
15)	Vm'= Vm*Y		52.144 ft^3
16)	Vpw @ ti = from appendix		0.0000 in Hg
17)	corr Vwm = {[(Vm'*Vpw@imp/Ps)*Pm*Tstd]/(Tm*Pstd)}		0.0000 ft^3
18)	Vm std = {[Vm'*(Tstd/Tm)*(Pm/Pstd)]-corr Vwm}		48.629 ft^3
19)	Vlc= (Σ Volume of impingers)		284.84 ml
20)	∂		0.002201 lb/ml
21)	R		21.85 Hg-ft^3/°R-lb-mo
22)	MwH2O		18.00 g/g-mo
23)	Vw std = {[(Vlc*∂*R*Tstd)/(Pstd*MwH2O)]+corr Vwm}		13.4444 ft^3

CALCULATIONS:

MOISTURE-

24)	Bws(1) =(Vw std)/(Vw std+Vm std)100	21.66 %	
25)	Vpw @ ts = from appendix	33.02 in Hg	
26)	Bws(2) =[(Vpw @ ts)/Ps]*100	112.26 %	
27)	Bws = lower value of equation 24 or 26		21.66 %

MOLECULAR WEIGHT-

28)	%O2		14.47 %
29)	%CO2		3.27 %
30)	%N2+inerts+%CO		82.26 %
31)	Md=[0.440(%CO2)]+[0.320*(%O2)]+[0.280(%N2+inerts+%CO)]		29.10 g/g*mole
32)	Ms=Md*(1-Bws)+18.0*(Bws)		26.70 g/g*mole

FLOW-

33)	ΔP		1.895 in H2O
34)	Cp		0.851
35)	vs= 85.49*Cp*{[(Ts*ΔP)/(Ps*Ms)]^.5}		93.001 ft/s
36)	As=3.14*[(Ds)^2/4]		12.56 ft^2
37)	Qs = (vs)*As*60		7.01E+04 acfm
38)	Qstd =17.64*Qs*(1-Bws)*Ps/Ts		4.21E+04 dscfm

EMISSIONS-

FRONT HALF

39)	mn (front)		0.10224 g
40)	Cs (front) =15.43*mn(front)/Vm std	0.0296 gr/dscf=	0.030 grains/dscf
41)	E (front) = (0.00857)*(Qsd)*Cs (front)		10.67 lbs/hr

BACK HALF

42)	mn (back)		0.05944 g
43)	Cs (back) =15.43*mn(back)/Vm std	0.0189 gr/dscf=	0.019 grains/dscf
44)	E (back) = (0.00857)*(Qsd)*Cs (back)		6.80 lbs/hr

TOTAL

45)	mn (total) = mn(front)+mn(back)		0.1617 g
46)	Cs (total) =15.43*mn(total)/Vm std	0.051 gr/dscf=	0.05 grains/dscf
47)	E (total) = (0.00857)*(Qsd)*Cs (total)		18.50 lbs/hr

ISOKINETICS:

48)	An=3.14*[(Dn)^2/4]		0.0330 in^2
49)	I=.09450(Ts*Vm std)/Ps*vsAnØ(1-Bws)	95.98 %=	96 %

APPENDIX

R.E. Hazard on 9/5/91 P.O.#442 TEST#91248

SAN DIEGO AIR POLLUTION CONTROL DISTRICT, 9150 CHESAPEAKE DRIVE, SAN DIEGO, CA 92123

LABORATORY ANALYSIS OF PARTICULATE TEST

TEST SITE: R.E. Hazard
10050 Black Mountain Road
San Diego, CA 92126

TEST # 91248.0	P.O.# 442	TEST DATE: 9/5/91
LAB ANALYSIS BY:	David Shina	DATE: 9/18/91
LAB REPORT BY:	David Shina	DATE: 9/18/91
REVIEWED BY:	Linda Twaddle	DATE: 9/23/91

(1) IMPINGER VOLUMES

	FINAL WEIGHT		INITIAL WEIGHT		NET WEIGHT
#1	848.74 g	-	592.63 g	=	256.11 g
#2	567.92 g	-	564.94 g	=	2.98 g
#3	483.98 g	-	474.02 g	=	9.96 g
#4	477.46 g	-	474.15 g	=	3.31 g
SILICA GEL CONTAINER:					
#5	877.40 g	-	864.92 g	=	12.48 g

Tot. Vol. = 284.84 g

(2) BLANKS

STD = Net Wgt(solv) / Tot. Vol(solv. used)

ACETONE:	WATER:	ORGANIC:
VOLUMES:	*VOLUMES:*	*VOLUMES:*
BKR ID = 91035	BKR ID = 91082	BKR ID =
Initial = 500.00 ml	Initial = 500.00 ml	Initial = ml
tot. Rinses = 45.00 ml	tot. Rinses = 15.00 ml	tot. Rinses = ml
Tot. Vol = 545.00 ml	Tot. Vol = 515.00 ml	Tot. Vol = 0.00 ml
WEIGHTS:	*WEIGHTS:*	*WEIGHTS:*
final = 29.1141 g	final = 49.5474 g	final = g
initial = 29.1121 g	initial = 49.5461 g	initial = g
net = 0.0020 g	net = 0.0013 g	net = 0.0000 g
LIMIT: 0.001% = 10 ppm = 0.000010g/ml	LIMIT: 4ppm = 4mg/L = 0.000004g/ml	LIMIT: 0.001% = 10 ppm = 0.000010g/ml
STD = 3.66972E-06 g/ml	STD = 2.52427E-06 g/ml	STD = N/A g/ml
0.000367 %	0.000252 %	N/A %
= 3.67 ppm	2.52 ppm	N/A ppm
The Blank PASSED	The Blank PASSED	The Blank N/A

R.E. Hazard on 9/5/91

P.O.#442 TEST#91248

(3) WEIGHT

FRONT HALF	BACK HALF
ACETONE	**ACETONE**
WEIGHT (uncorrected):	*WEIGHT (uncorrected):*
BKR ID= 91034	BKR ID= 91032
final= 30.8342 g	final= 29.4142 g
initial= 30.7514 g Wgt. Ac= 0.0828 g	initial= 29.4070 g Wgt. Ac.= 0.0072 g
VOLUME:	*VOLUME:*
initial= 182.00 ml	initial= 220.00 ml
tot. rinses= 45.00 ml	tot. Rinses= 45.00 ml
Sep funnel= ml Tot. Vol= 227.00 ml	Sep. funnel= ml Tot. Vol= 265.00 ml
WEIGHT FROM SOLVENT:	*WEIGHT FROM SOLVENT:*
Total Vol * Acetone STD = 0.000833 g	Total Vol * Acetone STD = 0.000972 g
WEIGHT (corrected):	*WEIGHT (corrected):*
Wgt(corr)= Wgt(unc)-Wgt from solvents= 0.081967 g	Wgt(corr)= Wgt(unc)-Wgt from solvents= 0.006228 g
WATER:	**WATER:**
WEIGHT (uncorrected):	*WEIGHT (uncorrected):*
BKR ID= 91029	BKR ID= 91021
final= 29.2235 g	final= 29.9084 g
initial= 29.2023 g Wgt. Water= 0.0212 g	initial= 29.9538 g Wgt. Water= 0.0546 g
VOLUMES:	*VOLUMES:*
initial= 322.00 ml	initial= 428.00 ml
tot. Rinses= 45.00 ml	tot. Rinses= 45.00 ml
Tot. Vol = 367.00 ml	Imp. charge= 196.60 ml Tot. Vol= 669.60 ml
WEIGHT FROM SOLVENT:	*WEIGHT FROM SOLVENT:*
Total Vol * Water STD = 0.000926 g	Total Vol * Water STD = 0.001690 g
WEIGHT (corrected):	*WEIGHT (corrected):*
Wgt(corr)= Wgt(unc)-Wgt from solvents= 0.020274 g	Wgt(corr)= Wgt(unc)-Wgt from solvents= 0.052910 g
ORGANIC:	**ORGANIC:**
WEIGHT (uncorrected):	*WEIGHT (uncorrected):*
BKR ID=	BKR ID=
final= g	final= g
initial= g Wgt. Org= 0.0000 g	initial= g Wgt. Org= 0.0000 g
VOLUMES:	*VOLUMES:*
tot. Rinses= ml Tot. Vol= 0.00 ml	tot. Rinses= ml Tot. Vol= 0.00 ml
WEIGHT FROM SOLVENT:	*WEIGHT FROM SOLVENT:*
Total Vol * Organic STD = N/A g	Total Vol * Organic STD = N/A g
WEIGHT (corrected):	*WEIGHT (corrected):*
Wgt(corr)= Wgt(unc)-Wgt from solvents= N/A g	Wgt(corr)= Wgt(unc)-Wgt from solvents= N/A g
FILTERS:	**FILTERS:**
WEIGHT:	*WEIGHT:*
ID No.=	ID No.= 89081
final= g	final= 1.8099 g
initial= g Wgt. Filter= 0.0000 g	initial= 1.8096 g Wgt. Filter= 0.0003 g

PARTICULATE COLLECTED (front half):

ΣWgt corrected + Wgt filters mn (front)= 0.10224 g

PARTICULATE COLLECTED (back half):

ΣWgt corrected + Wgt filter= mn (back)= 0.05944 g

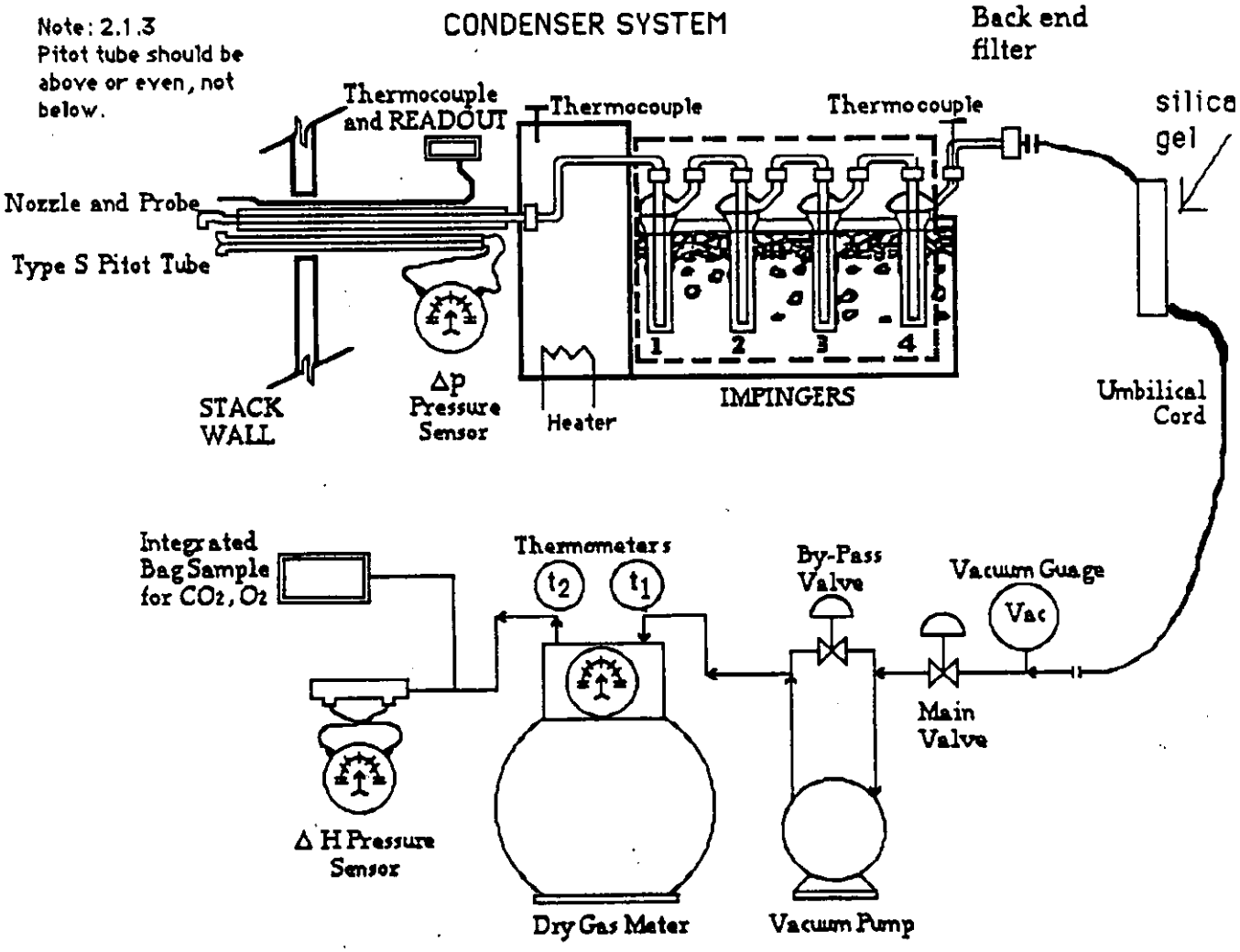
TOTAL PARTICULATE COLLECTED:

mn(front) + mn(back) = 0.16168 g

SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT

FIGURE

CONDENSER SYSTEM



LEGEND

No. 1 Mod-100 ML Deionized Water

No. 2 Std - 100 ML Deionized Water

No. 3 Mod- Dry

No. 4 Mod- Dry

Mod - Modified Type Greenburg-Smith
Std - Standard Type " "

FIELD DATA ABBREVIATIONS

PT = Point Number
T_s = Stack Temperature
Δp = Pitot Tube Pressure Differential, in H_2O
V_s = Stack Velocity, fps
ΔH = Orifice Meter Pressure Drop, in H_2O
t_1 = Meter Inlet Temperature, °F
t_2 = Meter Outlet Temperature, °F
Pm = Pump Vacuum, in Hg
ti = Impinger Temperature
P_{bar} = Barometric Pressure

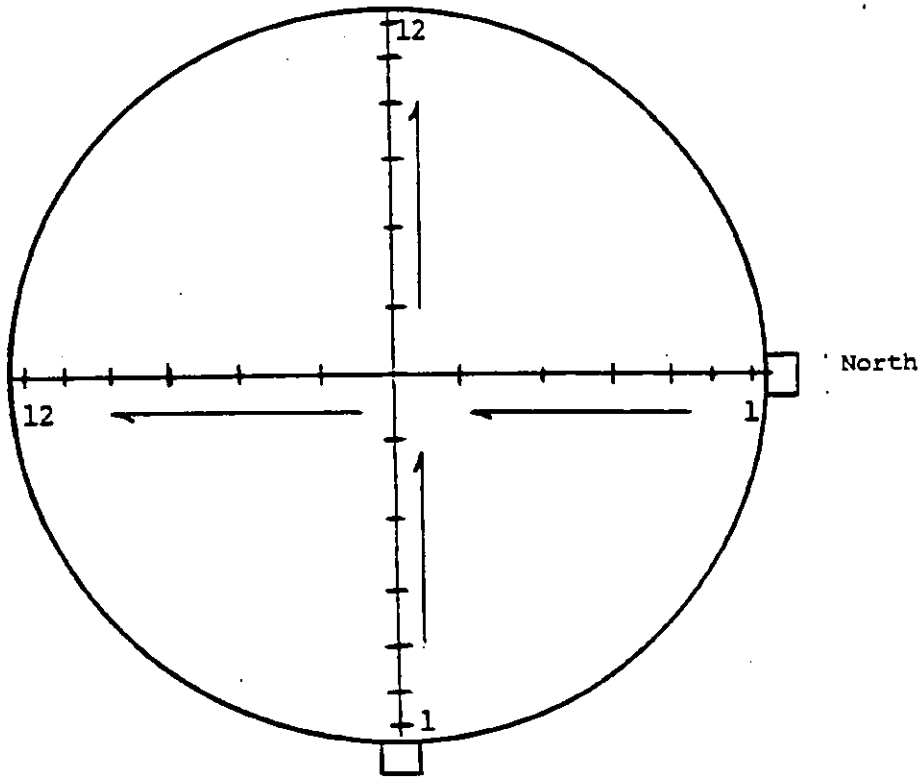
FIGURE 1 : PARTICULATE MATTER SAMPLING TRAIN

TEST NO.

SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT

TRAVERSE POINTS

STACK DIAMETER 48"

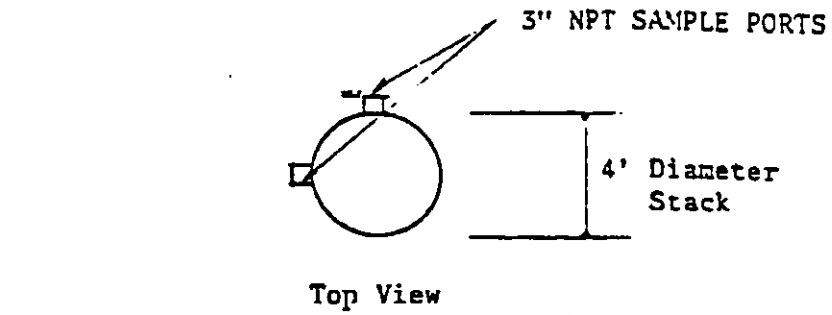


POINT	DISTANCE	POINT	DISTANCE
1	47.0"	7	17.1"
2	44.8"	8	12.0"
3	42.3"	9	8.5"
4	39.5"	10	5.7"
5	36.0"	11	3.2"
6	30.9"	12	1.0"

FIGURE 2

SITE DESCRIPTION

HAZARD ASPHALT



Top View

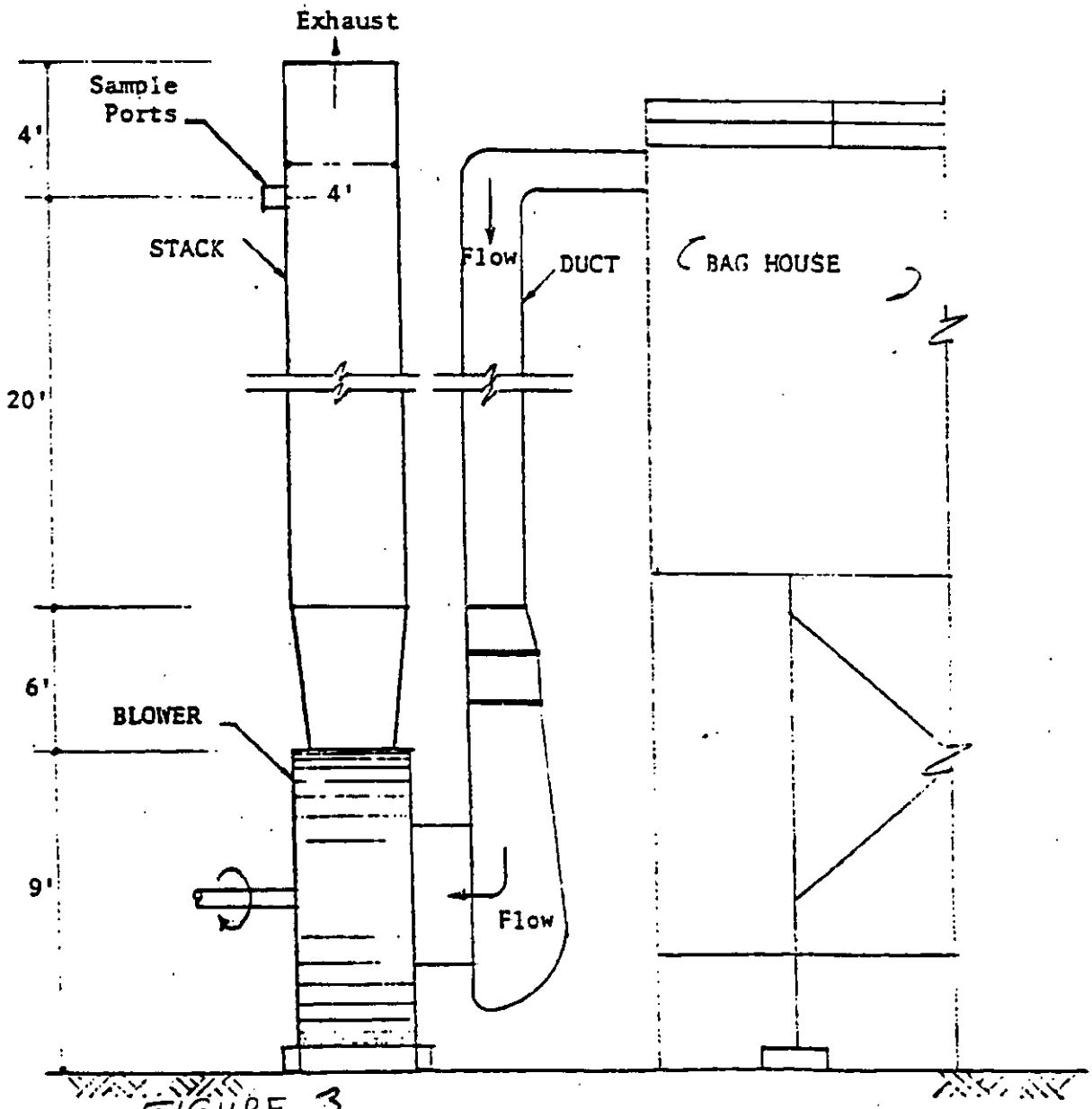


FIGURE 3

SIDE VIEW - No Scale

NOMENCLATURE

symbol	units	explanation	equation
	A		
An	in^2	nozzle area	π/4(Dn)^2
As	ft^2	stack area	π/4(Ds)^2 or LxW
	B		
Bws(1)	%	fractional stack gas moisture-equ 1	((Vw std)/(Vw std+Vm std))100
Bws(2)	%	fractional stack gas moisture-equ 2	((Vpw @ ts)/Ps)100
Bws	%	water vapor in the gas stream	lower of Bws(1) and Bws(2)
	C		
C12	gr/dscf	corr for grain loading at 12% CO2	(12*Cs)/(%CO2)
CO	%	carbon monoxide	read from measuring device(0 for Asphalt plants)
CO2	%	carbon dioxide	read from measuring device
Corr Vwm	ft^3	correction for Vw w/o silica gel	((Vm*(Ypw@td)/Ps)*Pm*Tstd)/(Tm*Pstd)
Cp	none	pitot tube correction factor	see EPA method 2
Cs(front)	gr/dscf	concentration of particulate in stack gas, corrected to STP-for front	(15.43*mn(front))/(Vm std)
Cs(back)	gr/dscf	concentration of particulate in stack gas, corrected to STP-for back	(15.43*mn(back))/(Vm std)
Cs(total)	gr/dscf	concentration of particulate in stack gas, corrected to STP-for total	(15.43*mn(total))/(Vm std)
	D		
∂ (density)	lb/ml	density of water at STP	0.002201 (see CRC)
Ds	in or ft	stack diameter	measure at site
Dn	in	nozzle diameter	avg of at least three measurements
	E		
EA	%	Excess air (for combustion)	((%O2-.5*%CO)*100)/(.264*%N2-%O2+.5*%CO)
E(front)	lbs/hr	part. emissions rate-front	(0.00857)(Qsd*Cs(front))
E(back)	lbs/hr	part. emissions rate-back	(0.00857)(Qsd*Cs(back))
E(total)	lbs/hr	part. emissions rate-total	(0.00857)(Qsd*Cs(total))
	H		
ΔH	in H2O	average differential pressure across the orifice meter	avg of the readings from the pressure measuring device
ΔH@	none	orifice pressure differential at STP	see EPA Method 5 Appendix
	I		
I	%	isokinetics	[0.09450*Ts*Vm std]/[Ps*vs*∅*(An/144)*(1-(Bws/100))]
	M		
Md	g/g-mole	dry stack gas molecular wgt	0.44(%CO2)+0.320(%O2)+0.280(%N2+inerts+CO)
mn(back)	g	particulate in impingers	measurement from lab analysis
mn(front)	g	particulate in nozzle & probe	measurement from lab analysis
mn(total)	g	total particulate collected	measurement from lab analysis
Ms	g/g-mole	wet stack gas molecular wgt	Md(1-Bws)+18.0(Bws)
MW CO2	g/mole	mo. wgt of carbon dioxide	44 (see periodic table)
MW N2	g/mole	mo. wgt of nitrogen	28 (see periodic table)
MW O2	g/mole	mo. wgt of oxygen	32 (see periodic table)
MW H2O	g/mole	mo. wgt of water	18 (see periodic table)
	N		
N2	%	percent nitrogen	100-(%CO2+%O2+%CO+inerts)
	O		
O2	%	percent oxygen	read from measuring device

NOMENCLATRE (cont.)

NOMENCLATRE (concl.)

symbol	units	explanation	equation
	P		
ΔP	in H2O	pitot diff. press.-velocity head of stack gas	read from measuring device
Pbar	in Hg	barometric pressure at sampling pt.	read from press.measuring device
π(pi)	none	the ratio of the circumference of a circle to its diameter	3.14168 (see CRC)
Pm	in Hg	absolute meter pressure	Pbar+(ΔH/13.6)
Ps	in Hg	absolute stack pressure	Pbar+(Pstatic/13.6)
Pg	in H2O	static pressure of stack	read from pressure sensing device
Pstd	in Hg	press.at std conditions (29.92)	see CFR
	Q		
Qs	acfm	flow rate	vs*Ao*60
Qstd	dscfm	dry volumetric stack gas flow rate, corrected to STP	17.64*Qs(1-Bws)*(Ps/Ts)
	R		
R	in Hg-ft^3/°R-lb-mo	ideal gas constant	21.85 (see CRC)
	S		
S.L.	none	Sea Level	read from a relief map
	T		
t1	°F	dry gas meter inlet temp, uncorrected	read from temp.sensing device
t2	°F	dry gas meter outlet temp, uncorrected	read from temp.sensing device
t1 corr	°F	dry gas meter outlet temp, corrected	t1 + temperature correction
t2 corr	°F	dry gas meter outlet temp, corrected	t2 + temperature correction
θ(theta)	min	sampling time/point	Θ/tn
Θ(Theta)	min	total sampling time	none
ti	°F	impinger outlet temp	read from temp.sensing device
tm	°F	dry gas meter temp in F	(t1+t2)/2
Tm	°R	dry gas meter temp in R	tm+460
tn	none	ttl number of traverse pts	summation of the traverse points
ts	°F	stack temp in F	read from temp.sensing device
Ts	°R	stack temp in R	ts+460
Tstd	°R	temp at std conditions (528)	see CFR
	U		
Vlc	ml	water collected from impingers and the silica gel (if applicable)	from lab analysis
Vm	ft^3	sample gas volume, uncorrected	read from dry gas meter
Vm'	ft^3	sample gas volume, corrected	Vm*Y
Vm std	ft^3	volume of gas sample by the dry gas meter, corrected to STP	((Vm'*Tstd)Pm)/((Pstd*Tm)-corr Vm)
Vpw@ts	in Hg	vapor pressure of water at ts	see CRC water vapor press. tables
Vpw@ti	in Hg	vapor pressure of water at ti	see CRC water vapor press. tables
vs	ft/sec	stack gas velocity	85.49*Cp((Ts*ΔP)/(Ps*Ms))^0.5
Vw std	ft^3	Vol. of water vapor in gas sample, corrected to STP	(Vlc*∂*R*Tstd)/(Pstd*MW H2O)+corr Vwm
	Y		
Y	none	dry gas meter calibration factor	see CFR 40, parts 53-60

Conversion Factors

(multiply by the number)			
0.002669	in Hg-ft^3/°R-ml	conversion to get in Hg-ft^3/R	see CRC
0.00857	lb/gr-min/hr	conv from gr/min to lb/hr	see Lange's Handbook of Chemistry
0.04707	ft^3/ml	conversion from ml to ft^3	see Lange's Handbook of Chemistry
15.43	gr/g	conversion from g to gr	see Lange's Handbook of Chemistry
85.49	(ft/sec)-(lb-in Hg/lb-mo-°R-in H20))^.5	conversion factor to get velocity in ft/sec	see CRC
(divide by the number)			
144	in^2/ft^2	conversion from in^2 to ft^2	see CRC
13.6	in H20/in Hg	conversion from in H20 to in Hg	see CRC
(add to the number)			
460	°R/°F	conversion from F to R	see CRC

MECHANICAL ENGINEERING

SOURCE TEST REPORT

PERMIT RENEWAL TEST

TEST DATE: THURSDAY, SEPT. 5, 1991 ENGINEER: JOHN McCAFFERTY

TESTER: APCD (DAVID SHINAE & CREW)

TEST: PARTICULATES

SOURCE: R.E. HAZARD CONTRACTING CO., 10050 BLACK MTN RD, SAN DIEGO

PERMIT TO OPERATE: 000442, EXPIRES NOV. 1, 1991

EQUIPMENT DESCRIPTION: ASPHALT BATCH PLANT, HOT-MIX, 300 TONS/HR CAPACITY

P/O CONDITIONS: P/O COPY ATTACHED

OBSERVATIONS:

- ENGINEER McCAFFERTY DID NOT VISIT THE SITE DURING THE SCHEDULED TEST BECAUSE OF UNAVAILABILITY OF A COUNTY POOL CAR.

- AL TILLEY (HOT PLANT SUP'T) WAS PHONED AS THE TEST ENDED AND WAS ASKED TO FAX THE ASPHALT PRODUCTION DATA TO THE DISTRICT FOR THE TEST TIME PERIOD. THE TEST DATA INDICATED THAT THE SILO DISPENSING RATE FOR THE TWO "1/2-HOUR TESTS" WAS 333 TONS/HR. THAT RATE EXCEEDED THE PLANT'S RATED CAPACITY, HOWEVER THE PERMIT TO OPERATE LIMITS NEITHER THE PRODUCTION RATE NOR THE SILO DISPENSING RATE. THE ACTUAL PRODUCTION RATE DATA WERE NOT AVAILABLE BUT THE OPERATOR ESTIMATED A "LOWER-THAN-NORMAL" 275-280 TONS/HR WHICH IS ACCEPTABLE FOR THE PARTICULATES TEST — OVER 90% OF NORMAL.

RAW DATA SHEETS