AP-42 Section 11.1
Reference
Report Sect. 4
Reference 35

A COMPREHENSIVE EMISSION INVENTORY REPORT AS REQUIRED UNDER THE AIR TOXICS "HOT SPOTS" INFORMATION AND ASSESSMENT ACT OF 1987

PREPARED FOR

CALMAT CO.
FRESNO NO. II FACILITY
FRESNO, CALIFORNIA

SEPTEMBER 14, 1990

SUBMITTED TO

FRESNO COUNTY AIR POLLUTION CONTROL DISTRICT
1221 FULTON MALL
FRESNO, CALIFORNIA 93721

PREPARED BY

ENGINEERING-SCIENCE, INC.
75 North Fair Oaks Avenue
P.O. Box 7107
Pasadena, California 91109

ES ENGINEERING-SCIENCE

FRESNO

INDUSTRIAL ASPHALT PLANT

EMISSION YEAR 19 89	AIR TOXICS EMISSION DATA SYSTEM REVIEW & UPDATE REPORT FACILITY DESCRIPTION	FORM FAC

FACILITY DATA

COMPANY NAME: INDUSTRIAL ASPHALT

ADDRESS: 11099 OLD FRIANT RD.

CITY: FRESNO

ZIP CODE: 93710-

CONTACT PERSON: DWIGHT BEAVERS

TELEPHONE: 818-969-7951

FACILITY SIC: 2951

NUMBER OF EMPLOYEES: 5

MAILING ADDRESS DATA

COMPANY NAME: INDUSTRIAL ASPHALT

ADDRESS: P.O. BOX 2263

CITY: IRWINDALE

STATE: CA

ZIP CODE: 91706-

ATTENTION: DWIGHT BEAVERS

FOR OFFICE USE ONLY

COUNTY ID: 10

FACILITY ID: 403

ACTION CODE: A

DISTRICT: FRE

AIR BASIN CODE: SJV

CITY CODE (OPTIONAL): 2800

AQCR (OPTIONAL): 031

SUBCOUNTY ID:

FACD1 (OPTIONAL):

FACD2 (OPTIONAL):

UTM ZONE: 11

UTM EAST: 2503

UTM NORTH: 40165

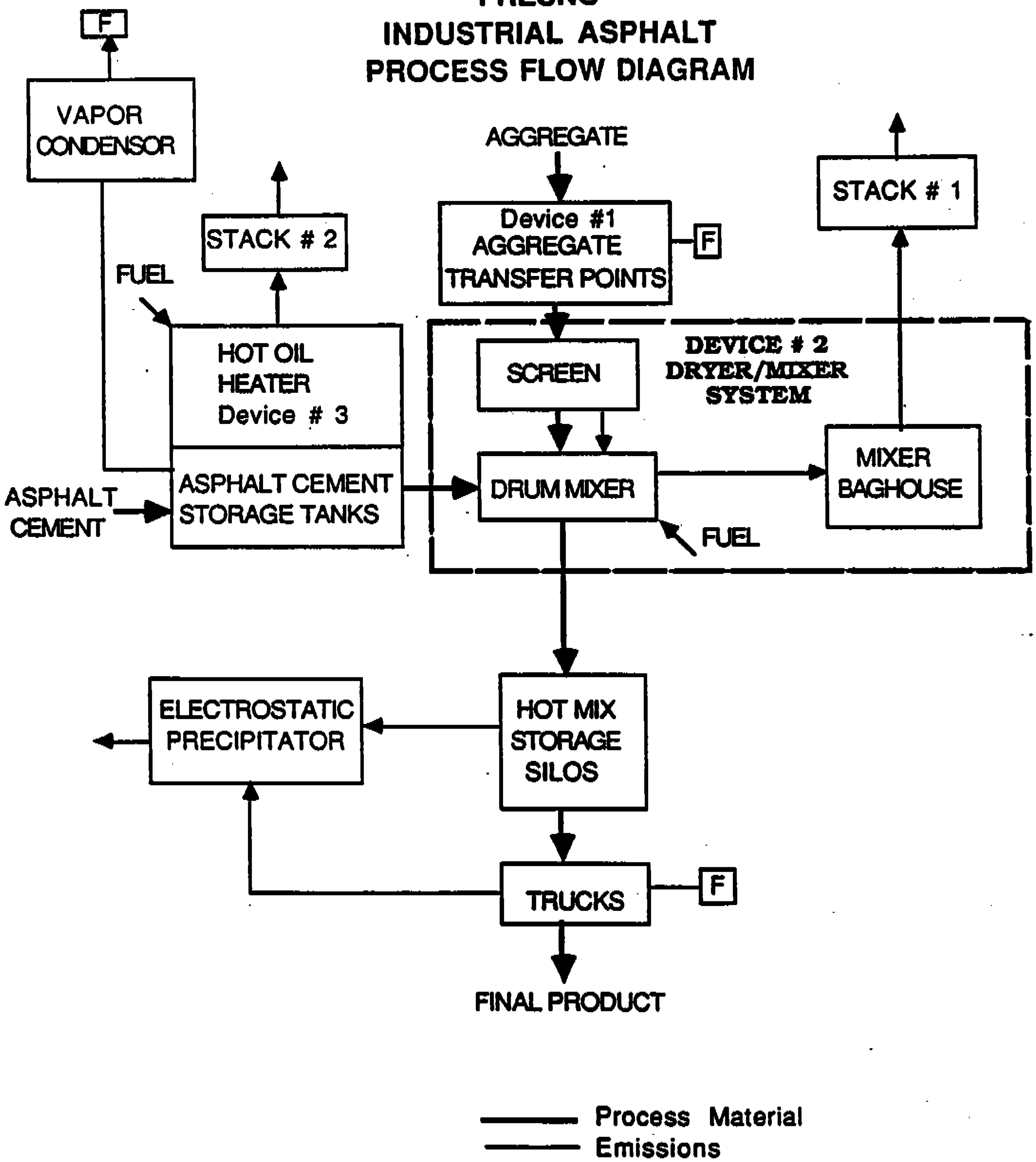
ARB/FAC/880289

NAME: Antoine Assioun

DATE: 5-25-90

Figure 1

FRESNO INDUSTRIAL ASPHALT PROCESS FLOW DIAGRAM



EMISSION YEAR 1989

AIR TOXICS EMISSION DATA SYSTEM REVIEW & UPDATE REPORT
STACK DATA

FORM STK

FOR OFFICE USE ONLY   COUNTY ID: 10   FACILITY ID: 403

DO NOT DELETE STACK IF IT SERVES OTHER DEVICES. SEE INSTRUCTIONS

DESC CODE	STACK/VENT CATEGORY	REQUIRED INFORMATION
	AMBIENT TEMP & LOW-VELOCITY EXHAUST (T W/IN 25 F OF AMBIENT & V LT 750 FPM)	
1	RELEASE POINT(RP) AT GROUND-LEVEL	STACK ID & CODE ONLY
2	RELEASE FROM BLDG HVAC ONLY	STACK ID, CODE, & STACK HEIGHT
3	RP W/IN (2.5 X HB) ABOVE GROUND AND W/IN (5 X HB) SIDEWAYS TO NEAREST BLDG	STACK ID, CODE & STACK HEIGHT
4	OTHER STACK/VENT (LOW T,V)	STACK ID, CODE & STACK HEIGHT
	OTHER TEMP & FLOW CONDITIONS	
5	RP W/IN (2.5 X HB) ABOVE GROUND AND W/IN (5 X HB) SIDEWAYS TO NEAREST BLDG	ALL STACK INFORMATION
6	OTHER STACK/VENT (OTHER T,V)	ALL STACK INFORMATION

WHERE HB = HEIGHT OF NEAREST BUILDING AND HVAC = HEATING, VENTILATING AND AIR CONDITIONING

OFC USE ACTION CODE	STACK ID	DESC CODE	HEIGHT ABOVE GROUND (FEET)	DIAMETER (FEET)	EXHAUST GAS TEMP (F)	EXHAUST GAS FLOW RATE (CFM)	EXHAUST GAS VELOCITY (FPM)	OFC USE ONLY UTM EAST (KILOMETER)	OFC USE ONLY UTM NORTH (KILOMETER)
A	1	6	33.0	3.4	31.6	23420			
A	2	5	6.5	1.0	514	1433			

NAME Antoine Assioun   DATE 5-25-90

ARB/STK/890323

EMISSION YEAR 1989

AIR TOXICS EMISSION DATA SYSTEM REVIEW & UPDATE REPORT
DEVICE DESCRIPTION AND DEVICE-STACK RELATIONS

FORM DEV

FOR OFFICE USE ONLY

COUNTY ID: 16

FACILITY ID: 402

OFFICE USE ONLY — EACH ITEM IS OPTIONAL

ACTION CODE	DEVICE ID	DEVICE NAME	NBR OF DEV.	STACK ID	PERMIT ID (IF AVAILABLE)	DEVD1	DEVD2	DEVICE GROUP
A	1	AGG. TRANSFER	3					
A	2	DRYER/MIXER SYS	1	1				
A	3	HOT OIL HEATER	1	2				

Antonio Arriaga 5-25-90

ARB/DEV/240389

EMISSION YEAR 1989

AIR TOXICS EMISSION DATA SYSTEM REVIEW AND UPDATE REPORT
PROCESS AND EMITTENTS DATA

FORM PRO SIDE A

FOR OFFICE USE ONLY

PROCESS DESCRIPTION	C	SCC NO	COUNTY ID	AIR BASIN
TRANSFER POINT		3-05-025-03	10	SJV

ACTION CODE	PROD1 (OPTIONAL)	PROD2 (OPTIONAL)	FACILITY ID
A			403

STOP FILL OUT ANY SUPPLEMENTAL PROCESS FORM(S) FOR THIS PROCESS FIRST. THEN FILL OUT THIS PAGE. SUBMITTING ONE FOR EACH EMITTING PROCESS IN YOUR FACILITY.

SECTION 1 PROCESS DATA

DEVICE I.D.	SIC	CONFIDENTIAL (Y/N) IF Y CHECK SMALL BOXES AS APPROPRIATE
1	2951	N

PROCESS EQUIPMENT DESCRIPTION	C	FUEL TYPE /OTHER PROCESS INFO	C
AGG TRANSFER			

NOTE USE 1 SPACE FOR EACH DECIMAL POINT

TOTAL YEARLY PROCESS RATE (UNITS/YR)	C	MAXIMUM HOURLY PROCESS RATE (UNITS/HR)	C	PROCESS UNITS	C	HRS/DAY	C	DAYS/WEEK	C	WKS/YEAR	C
1.19 E06		1575		P T 084		8		5		52	

RELATIVE MONTHLY ACTIVITY (%) C

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1.2	2.4	5.0	8.8	6.7	9.6	12.0	18.5	12.0	6.6	11.7	5.5

OFFICE USE ONLY

SECTION 2

EMITTENT DATA — EMISSIONS

ACTION CODE	EMITTENT ID	EST METH	C	ACTUAL EMISSIONS FACTOR(LBS/UNIT)	C	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	1175	6		2.34 E-04		279

ALLOWABLE EMIS LBS/YR(OPTIONAL)	*CONTROL EQPT CODES* PRIMARY	C	SECONDARY	C	OVERALL CONTROL EFF(%)	C	FULL/PART	C	HOURLY MAX EMISSIONS (LBS/HOUR)
	036				90.0		F		0.369

ACTION CODE	EMITTENT ID	EST METH	C	ACTUAL EMISSIONS FACTOR(LBS/UNIT)	C	ANNUAL AVERAGE EMISSIONS (LBS/YR)

ALLOWABLE EMIS LBS/YR(OPTIONAL)	*CONTROL EQPT CODES* PRIMARY	C	SECONDARY	C	OVERALL CONTROL EFF(%)	C	FULL/PART	C	HOURLY MAX EMISSIONS (LBS/HOUR)

ARB/PRO/890327

NAME Antoine Asseioum DATE 5-25-90

EMISSION YEAR 1989

AIR TOXICS EMISSION DATA SYSTEM REVIEW AND UPDATE REPORT
PROCESS AND EMITTENTS DATA

FORM PRO SIDE A

FOR OFFICE USE ONLY

PROCESS DESCRIPTION	C	SCC NO	COUNTY ID	AIR BASIN
ASPHALT DRIER		1-02-005-02	10	SJV

ACTION CODE	PROD1 (OPTIONAL)	PROD2 (OPTIONAL)	FACILITY ID
A			403

STOP FILL OUT ANY SUPPLEMENTAL PROCESS FORM(S) FOR THIS PROCESS FIRST, THEN FILL OUT THIS PAGE, SUBMITTING ONE FOR EACH EMITTING PROCESS IN YOUR FACILITY

SECTION 1 PROCESS DATA

DEVICE I.D.: 2

SIC: 2951

CONFIDENTIAL (Y/N) IF Y CHECK SMALL BOXES AS APPROPRIATE: N

PROCESS EQUIPMENT DESCRIPTION: DRYER/MIXER SYS C

FUEL TYPE/OTHER PROCESS INFO: LPG C

NOTE USE 1 SPACE FOR EACH DECIMAL POINT

TOTAL YEARLY PROCESS RATE (UNITS/YR)	MAXIMUM HOURLY PROCESS RATE (UNITS/HR)	PROCESS UNITS	HRS/DAY	DAYS/WEEK	WKS/YEAR
4.15E+05	550	PT084	8	5	52

RELATIVE MONTHLY ACTIVITY (%) C

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1.2	2.4	5.0	8.8	6.7	9.6	12.0	18.5	12.0	6.6	11.7	5.5

OFFICE USE ONLY

SECTION 2

EMITTENT DATA / EMISSIONS

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	7440382	1	2.53 E-07	0.105

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	012			F	1.39 E-04

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	7440417	1	N.D.	N.D.

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	012			F	N.D.

ARB/PRO/890327

NAME Antoine Assioun DATE 5-24-90

EMISSION YEAR 1989

AIR TOXICS EMISSION DATA SYSTEM REVIEW AND UPDATE REPORT
PROCESS AND EMITTENTS DATA (ADDITIONAL EMITTENTS)

FORM PRO SIDE B

OFFICE USE ONLY
CO: 10
FACID: 403

DEVICE ID: 2

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	7440439 (Bd)	1	2.53 E-07	0.105
A	CHROMIUMT.	1	N.D.	N.D.
A	18540299 (Hex Chrome)	1	N.D.	N.D.
A	7440508 (Copper)	1	N.D.	N.D.
A	7439921 (Lead)	1	6.11 E-07	0.254

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	CONTROL EQPT CODES SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	012			F	1.39 E-04
	012			F	N.D.
	012			F	N.D.
	012			F	N.D.
	012			F	3.36 E-04

Antelope Assigned ... 5-25-89

ARB/PROB/8903176

EMISSION YEAR 1989

AIR TOXICS EMISSION DATA SYSTEM REVIEW AND UPDATE REPORT
PROCESS AND EMITTENTS DATA
(ADDITIONAL EMITTENTS)

FORM PRO SIDE 3

OFFICE USE ONLY
CO: 10
FACID: 403

DEVICE ID: 2

EMITTENT DATA — EMISSIONS

Emittent 1 (Manganese)

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	7439965	1	2.53 E-03	1049

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	012			F	1.39

Emittent 2 (Mercury)

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	7439976	1	7.4 E-09	0.00306

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	012			F	4.05 E-06

Emittent 3 (Nickel)

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	7440020	1	N.D.	N.D.

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	012			F	N.D.

Emittent 4 (Selenium)

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	7782492	1	N.D.	N.D.

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	012			F	N.D.

Emittent 5 (Zinc)

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	7440666	1	3.16 E-05	13.1

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	012			F	0.0174

Antoine Assiran   DATE 5-25-90

ARB/PROB/8903176

EMISSION YEAR 1989

AIR TOXICS EMISSION DATA SYSTEM REVIEW AND UPDATE REPORT
PROCESS AND EMITTENTS DATA (ADDITIONAL EMITTENTS)

FORM PRO SIDE B

OFFICE USE ONLY
CO: 10
FACID: 403

DEVICE ID: 2

EMITTENT DATA — EMISSIONS

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	1150 (PAH)	1	1.77 E-05	7.35
A	56553 (BaA)	1	N.D.	N.D.
A	205992 (Bbf)	1	N.D.	N.D.
A	207089 ✓	1	N.D.	N.D.
A	50328 ✓	1	N.D.	N.D.

EMITTENT ID	ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	CONTROL EQPT CODES SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
1150		012			F	0.00773
56553		012			F	N.D.
205992		012			F	N.D.
207089		012			F	N.D.
50328		012			F	N.D.

Antoine Assiom — 5-25-90

ARB/PROB/8903176

AIR TOXICS EMISSION DATA SYSTEM REVIEW AND UPDATE REPORT
PROCESS AND EMITTENTS DATA (ADDITIONAL EMITTENTS)

EMISSION YEAR: 1989

FORM PRO SIDE 2

OFFICE USE ONLY
CO: 10
FACID: 403

DEVICE ID: 2

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)	CONTROL EQPT CODES PRIMARY	CONTROL EQPT CODES SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
A	53703 ✓	1	N.D.	N.D.	012			F	N.D.
A	193395 ✓	1	N.D.	N.D.	012			F	N.D.
A	91203 ✓	1	1.24 E-05	5.16	012			F	0.00683
A	7783064 ✓	1	N.D.	N.D.	012			F	N.D.
A	50000 ✓	1	6.74 E-04	280	012			F	0.371

ALLOWABLE EMIS LBS/YR (OPTIONAL): (blank for all entries)

CONTROL EQPT CODES

Antoine Assibun 5-25-90

AB/PROB/8903176

EMISSION YEAR 1989

AIR TOXICS EMISSION DATA SYSTEM REVIEW AND UPDATE REPORT
PROCESS AND EMITTENTS DATA (ADDITIONAL EMITTENTS)

FORM PRO SIDE B

OFFICE USE ONLY
CO: 10
FACID: 403

DEVICE ID: 2

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	71432 ✓	1	N.D.	N.D.

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	012			F	N.D.

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	108883 ✓	1	N.D.	N.D.

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	012			F	N.D.

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	1210 ✓	1	N.D.	N.D.

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	012			F	N.D.

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	71556 ✓	1	N.D.	N.D.

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	012			F	N.D.

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	1175 ✓	1	1.43 E-03	5.95

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	012			F	0.788

NAME: Antoine Asiolm DATE: 5-25-90

ARB/PROB/8903176

EMISSION YEAR 1989

AIR TOXICS EMISSION DATA SYSTEM REVIEW AND UPDATE REPORT
PROCESS AND EMITTENTS DATA
(ADDITIONAL EMITTENTS)

FORM **PRO** SIDE B

OFFICE USE ONLY
CO: 10
FACID: 403

DEVICE ID: 2

ARB REFERENCE METAL

EMITTENT DATA / **EMISSIONS**

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	ARB METAL 7440417	1	2.95 E-08	0.0127

ALLOWABLE EMIS LBS/YR (OPTIONAL)	*CONTROL EQPT CODES* PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	012			F	1.62 E-05

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)

ALLOWABLE EMIS LBS/YR (OPTIONAL)	*CONTROL EQPT CODES* PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR(LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)

ALLOWABLE EMIS LBS/YR (OPTIONAL)	*CONTROL EQPT CODES* PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)

ALLOWABLE EMIS LBS/YR (OPTIONAL)	*CONTROL EQPT CODES* PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)

ALLOWABLE EMIS LBS/YR (OPTIONAL)	*CONTROL EQPT CODES* PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)

NAME Antonino Assioun DATE 5-25-90

ARB/PRO8/8903176

EMISSION YEAR 1989

AIR TOXICS EMISSION DATA SYSTEM REVIEW AND UPDATE REPORT
PROCESS AND EMITTENTS DATA

FORM PRO SIDE A

FOR OFFICE USE ONLY

PROCESS DESCRIPTION	C	SCC NO	COUNTY ID	AIR BASIN
HOT OIL HEATER		3-05-002-08	10	SJV

ACTION CODE	PROD1 (OPTIONAL)	PROD2 (OPTIONAL)	FACILITY ID
A			403

STOP FILL OUT ANY SUPPLEMENTAL PROCESS FORM(S) FOR THIS PROCESS FIRST. THEN FILL OUT THIS PAGE, SUBMITTING ONE FOR EACH EMITTING PROCESS IN YOUR FACILITY.

SECTION 1 PROCESS DATA

DEVICE I.D.: 3

SIC: 2951

CONFIDENTIAL (Y/N) IF Y CHECK SMALL BOXES AS APPROPRIATE: N

PROCESS EQUIPMENT DESCRIPTION: HOT OIL HEATER

FUEL TYPE /OTHER PROCESS INFO: DIESEL

NOTE USE 1 SPACE FOR EACH DECIMAL POINT

TOTAL YEARLY PROCESS RATE (UNITS/YR)	MAXIMUM HOURLY PROCESS RATE (UNITS/HR)	PROCESS UNITS	HRS/DAY	DAYS/WEEK	WKS/YEAR
25000.	4.5	PIT060	15	7	52

RELATIVE MONTHLY ACTIVITY (%)

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
8.37	8.33	8.37	8.37	8.33	8.37	8.37	8.33	8.33	8.33	8.33	8.37

SECTION 2

OFFICE USE ONLY

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	1150 ✓	1	2.52 E-05	0.63

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	000		0.00		1.13 E-04

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	56553 ✓	1	N.D.	N.D.

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	000		0.00		N.D.

NAME Antoine Assioun DATE 5-25-90

ARB/PRO/890327

EMISSION YEAR 19 87

AIR TOXICS EMISSION DATA SYSTEM REVIEW AND UPDATE REPORT
PROCESS AND EMITTENTS DATA (ADDITIONAL EMITTENTS)

FORM PRO SIDE B

OFFICE USE ONLY
CO: 10
FACID: 403

DEVICE ID: 3

EMITTENT DATA / EMISSIONS

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)	PRIMARY CONTROL EQPT CODE	SECONDARY CONTROL EQPT CODE	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)	ALLOWABLE EMIS LBS/YR (OPTIONAL)
A	205992	1	1.E-07	0.00025	000		0.00		4.5 E-07	
A	207089	1	N.D.	N.D.	000		0.00		N.D.	
A	50328	1	N.D.	N.D.	000		0.00		N.D.	
A	53703	1	N.D.	N.D.	000		0.00		N.D.	
A	193395	1	N.D.	N.D.	000		0.00		N.D.	

NAME: Antoine Assiom DATE: 5-25-90

ARB/PROB/8903176

EMISSION YEAR 1989

AIR TOXICS EMISSION DATA SYSTEM REVIEW AND UPDATE REPORT
PROCESS AND EMITTENTS DATA (ADDITIONAL EMITTENTS)

FORM PRO SIDE B

OFFICE USE ONLY
CO: 10
FACID: 403

DEVICE ID: 3

EMITTENT DATA / EMISSIONS

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)	*CONTROL EQPT CODES* PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
A	91203 ✓	1	1.68 E-05	0.42	000		0.00		7.5 E-05
A	1086 ✓	1	N.D.	N.D.	000		0.00		N.D.
A	1080 ✓	1	N.D.	N.D.	000		0.00		N.D.
A	50000 ✓	1	0.0272	680	000		0.00	F	0.122
A	71432 ✓	1	N.D	N.D.	000		0.00		N.D.

ALLOWABLE EMIS LBS/YR (OPTIONAL)

NAME: Antoine Assiam DATE: 5-25-90

ARB/PROB/8903176

EMISSION YEAR 1989

AIR TOXICS EMISSION DATA SYSTEM REVIEW AND UPDATE REPORT
PROCESS AND EMITTENTS DATA (ADDITIONAL EMITTENTS)

FORM PRO SIDE B

OFFICE USE ONLY
CO: 10
FACID: 403

DEVICE ID: 3

EMITTENT DATA / EMISSIONS

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	7782505	2	N.D.	N.D.
A	7440382	2	N.D.	N.D.
A	7440417	2	N.D.	N.D.
A	7440439	2	2.92 E-06	0.073
A	CHROMIUNT	2	5.00 E-06	0.125

ALLOWABLE EMIS LBS/YR (OPTIONAL)	*CONTROL EQPT CODES* PRIMARY	SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	000		0.00		N.D.
	000		0.00		N.D.
	000		0.00		N.D.
	000		0.00		1.31 E-05
	000		0.00		2.25 E-05

NAME: Antoine Assioun DATE: 5-25-90

ARB/PROB/8903176

B-5

EMISSION YEAR 1989

AIR TOXICS EMISSION DATA SYSTEM REVIEW AND UPDATE REPORT
PROCESS AND EMITTENTS DATA (ADDITIONAL EMITTENTS)

FORM PRO SIDE B

OFFICE USE ONLY
CO: 10
FACID: 403

DEVICE ID: 3

EMITTENT DATA / EMISSIONS

ACTION CODE	EMITTENT ID	EST METH	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	7440666	2	2.79 E-04	6.97
A	7440508	2	1.34 E-05	0.334
A	7439921	2	2.42 E-05	0.605
A	7439965	2	2.50 E-06	0.0626
A	7439976	2	5.01 E-08	0.00125

ALLOWABLE EMIS LBS/YR (OPTIONAL)	CONTROL EQPT CODES PRIMARY	CONTROL EQPT CODES SECONDARY	OVERALL CONTROL EFF(%)	FULL/PART	HOURLY MAX EMISSIONS (LBS/HOUR)
	000		0.00		0.00125
	000		0.00		6.01 E-05
	000		0.00		1.09 E-04
	000		0.00		1.13 E-05
	000		0.00		2.25 E-07

NAME: Antoine Assiom DATE: 5-25-90

ARB/PROB/4903:76

EMISSION YEAR 1989	AIR TOXICS EMISSION DATA SYSTEM REVIEW AND UPDATE REPORT PROCESS AND EMITTENTS DATA (ADDITIONAL EMITTENTS)	FORM PRO SIDE B

OFFICE USE ONLY
CO: 10
FACID: 408

DEVICE ID: 3

EMITTENT DATA — EMISSIONS

ACTION CODE	EMITTENT ID	EST METH	C	ACTUAL EMISSIONS FACTOR (LBS/UNIT)	C	ANNUAL AVERAGE EMISSIONS (LBS/YR)
A	7440020	2		N.D.		N.D.
A	7782492	2		N.D.		N.D.
A	1165	2		N.D.		N.D.

ALLOWABLE EMIS LBS/YR (OPTIONAL)	*CONTROL EQPT CODES* PRIMARY	C	SECONDARY	C	OVERALL CONTROL EFF(%)	C	FULL/PART	C	HOURLY MAX EMISSIONS (LBS/HOUR)
	000				0.00				N.D.
	000				0.00				N.D.
	000				0.00				N.D.

NAME Antoine Assioun DATE 5-25-90

ARB/PROB/8903178

EMISSION YEAR 1989	AIR TOXICS EMISSION DATA SYSTEM REVIEW & UPDATE REPORT SUPPLEMENTAL PROCESS PARAMETER FORM SUBSTANCES USED, PRODUCED, OR OTHERWISE PRESENT	FORM S-UP

FACILITY NAME FRESNO INDUSTRIAL ASPHALT

FOR OFFICE USE ONLY
CO: 10 AB: SJV
FACID: 4013

PLEASE COPY THIS FORM AS MANY TIMES AS NECESSARY FOR YOUR FACILITY.
PLEASE READ THE INSTRUCTIONS BEFORE COMPLETING THIS FORM.

USE THIS FORM TO REPORT SUBSTANCES IN APPENDIX A-II WHICH ARE USED, PRODUCED, OR OTHERWISE PRESENT.

PLEASE INDICATE (Y/N) UNDER THE APPROPRIATE CATEGORIES (USE, PRODUCTION, OR OTHER PRESENCE WITHIN YOUR FACILITY) OF ANY SUBSTANCE(S) LISTED IN APPENDIX A-11. "USED" REFERS TO SUBSTANCES WHICH ARE INGREDIENTS IN ANY ACTIVITY OR PROCESS AT YOUR FACILITY. "PRODUCED" REFERS TO SUBSTANCES WHICH ARE THE RESULT OF ANY ACTIVITY OR PROCESS TAKING PLACE IN YOUR FACILITY. "OTHERWISE PRESENT" REFERS TO SUBSTANCES PRESENT IN ANY OTHER WAY IN AN ACTIVITY OR PROCESS, SUCH AS BY-PRODUCTS OR REACTION INTERMEDIATES WHICH APPEAR TEMPORARILY DURING PROCESSING. PLEASE SPECIFY THE NATURE OF THE PRESENCE OF THE SUBSTANCE.

ALSO USE THIS FORM TO REPORT SUBSTANCES IN APPENDIX A-I WHICH ARE PRESENT BELOW THE APPLICABLE DEGREE OF ACCURACY.

LISTED SUBSTANCE	USED	PRODUCED	OTHERWISE PRESENT	(SPECIFY)
1210	(Y)	(N)	(N)	ASPHALT STORAGE AND ASPHALTIC CONCRETE LOADING TO SILOS AND TRUCKS.
	( )	( )	( )	
71556	(Y)	(N)	(N)	"
56553	(Y)	(N)	(N)	"
205992	(Y)	(N)	(N)	"
20789	(Y)	(N)	(N)	"
50328	(Y)	(N)	(N)	"
53703	(Y)	(N)	(N)	"
193395	(Y)	(N)	(N)	"
91203	(Y)	(N)	(N)	"
	( )	( )	( )	
	( )	( )	( )	
	( )	( )	( )	
	( )	( )	( )	
	( )	( )	( )	
	( )	( )	( )	

NAME: Antoine Assioun DATE: 5-25-90

ARB/S-UP/89089

EMISSION YEAR 1989	AIR TOXICS EMISSION DATA SYSTEM REVIEW & UPDATE REPORT SUPPLEMENTAL PROCESS PARAMETER FORM STATIONARY COMBUSTION	FORM **S-CMB**

COMPANY NAME: FRESNO INDUSTRIAL ASPHALT

DEVICE ID: 3

FOR OFFICE USE ONLY
CO: 10 AB: SJV
FACID: 403
SCC: 3-05-002-08

PLEASE COPY THIS FORM AS MANY TIMES AS NECESSARY FOR YOUR FACILITY.
PLEASE READ THE INSTRUCTIONS BEFORE COMPLETING THIS FORM.

FUEL & FEEDSTOCK COMPOSITION

UNCONVENTIONAL FUELS & FEEDSTOCKS:

INDICATE WITH A CHECKMARK ANY UNCONVENTIONAL FUELS OR FEEDSTOCKS USED IN YOUR FACILITY AT THE DEVICE ID INDICATED ABOVE. DESCRIBE BRIEFLY THE NATURE OF SUCH FUEL OR FEEDSTOCK IN THE SPACE PROVIDED. ALSO SUMMARIZE THIS FEEDSTOCK INFORMATION IN THE DATA FIELD, "FUEL TYPE/OTHER PROCESS INFO" ON CORE FORM PRO.

___ MUNICIPAL WASTE ___

___ HOSPITAL WASTE ___

___ HAZARDOUS WASTE ___

___ WASTE OIL ___

___ WASTE SOLVENT ___

___ AGRICULTURAL DEBRIS ___

___ TIRES

✓ OTHER (PLEASE SPECIFY): DIESEL

REPORT USE OF AUXILIARY FUEL WITH THESE FEEDSTOCKS IN ACCORDANCE WITH THE STATIONARY COMBUSTION REPORTING INSTRUCTIONS FOR THIS FORM, S-CMB.

FUEL & FEEDSTOCK ANALYSIS

COMPLETE THIS PART FOR EACH FUEL AND FEEDSTOCK USED AT THE DEVICE ID INDICATED ABOVE FOR WHICH A FUEL ANALYSIS WAS PERFORMED.

(IN WEIGHT %):

SULFUR: ___

(IN PARTS-PER-MILLION BY WEIGHT (PPMW) OR MG/KG):

		CHROMIUM VI:		PHOSPHORUS:	
ARSENIC:	N.D.	COPPER:	1.9	RADIONUCLIDES:	N.D.
BERYLLIUM:	N.D.	FLUORINE:		SELENIUM:	N.D.
BROMINE:		LEAD:	3.4	ZINC:	37.5
CADMIUM:	0.4	MANGANESE:	0.4		
CHLORINE:	N.D.	MERCURY:	0.007		
		NICKEL:	N.D.		

REPORT EMISSIONS IN SECTION 2 OF CORE FORM PRO

ARB/S-CMB/89100

NAME: Antoine Azzam DATE: 5-25-90

DOCUMENTATION SUPPORTING THE EMISSIONS CALCULATIONS

The attached documentation consists of printouts from the Lotus 123 spreadsheet program used to calculate emissions from this facility. The printouts are comprehensive in that they show the exact equations used, the input parameter values, as well as the calculated output values for each reported process.

****

Device #1: Aggregate Transfer Points
No. of Devices: 3
Control Equipment: Wet Supression

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Estimation Method: Emission Factor
Gnrl Subst Quantfd: Particulates
Yearly Emis Est Equatn: Ay*Ef*(1-Ce)*Sf/1,000,000
Hourly Emis Est Equatn: Am*Ef*(1-Ce)*Sf/1,000,000
Max Hr Agg Rate Equatn: Am = Ay*(Pm/Py)

Parameter Symbols/Names	Values
Ay = Total Aggregate Material Annual Process Rate	1.19E+06 tons/yr
Hd = Hours per Day	8 hrs/day
Dw = Days per Week	5 days/wk
Wy = Weeks per Year	52 wks/yr
Ah = Aggregate Average Hourly Process Rate	571.8908653 tons/hr
Am = Aggregate Maximum Hourly Process Rate	1575.089017 tons/hr
Py = Total Yrly Asphaltic Concrete Production Rate	415369 tons/yr
Pm = Max Hrly Asphaltic Concrete Production Rate	550 tons/hr
Ef = Gnrl Subs PM10 Emis Factor (uncontrolled)*	0.015 lb/ton
Ce = Control Efficiency	90%
Sf = Speciation Factor	(see below) ppm

* Note: Based on EPA AP-42 p.8.19.1-3 & EPA Particle Size Distribution Interim Report (July '86) p.C.2-10.

Emittent Species Name	Speciation Factor (ppm)	Emission Factor (lbs/ton)	Annual Avg Emissions (lbs/yr)	Hourly Max Emissions (lbs/hr)
Crystalline Silica	156175	0.0002342625	278.6629744	0.368984290
Total Particulates	1,000,000	0.0015	1784.2995	2.362633525

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Device #2: Dryer/Mixer System
No. of Devices: 1
Control Equipment: Baghouse

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Estimation Method: Source Test
Yearly Emis Est Equatn: Py*Ef
Hourly Emis Est Equatn: Pm*Ef
Emission Factor: Ef = Et/Pt

Parameter Symbols/Names	Values	
Py = Total Yearly Asphaltic Concrete Production Rat	4.15E+05	tons/yr
Pm = Max Hrly Asphaltic Concrete Production Rate	550	tons/hr
Ef = Et/Pt = Emission Factor	(see below)	lbs/ton
Pt = Hourly Production Rate during Source Test	475	tons/hr
Et = Tested Emission Rate	(see below)	lbs/hr
Gt = Tested Actual Gas Flow Rate of Stack	55706	cfm
Gn = Gt*P/(Pt*H) = Normal Actual Gas Flow Rate	23419.58048	cfm
T = Tested Stack Gas Temperature	316	degree F

Emittent Species Name	Tested Emis Rate ("Et") (lbs/hr)	Emission Factor (lbs/ton)	Annual Avg Emissions (lbs/yr)	Hourly Max Emissions (lbs/hr)
Heavy Metals:				
Arsenic	1.200E-04	0.0000002526	0.104935326	0.000138947
Beryllium	N.D.	0	0	0
Cadmium	1.200E-04	0.0000002526	0.104935326	0.000138947
Chromium (total)	N.D.	0	0	0
Chromium (hexavalent)	N.D.	0	0	0
Copper	N.D.	0	0	0
Lead	2.900E-04	0.0000006105	0.253593705	0.000335789
Manganese	1.200E+00	0.0025263158	1049.353263	1.389473684
Mercury	3.500E-06	0.0000000074	0.003060613	0.000004052
Nickel	N.D.	0	0	0
Selenium	N.D.	0	0	0
Zinc	1.500E-02	0.0000315789	13.11691578	0.017368421
PAHs:				
Total	8.400E-03	0.0000176842	7.345472842	0.009726315
Benz[a]anthracene	N.D.	0	0	0
Benzo[b]fluranthene	N.D.	0	0	0
Benzo[k]fluoranthene	N.D.	0	0	0
Benzo[a]pyrene	N.D.	0	0	0
Dibenzo[a,h]anthracene	N.D.	0	0	0
Indeno[1,2,3,-cd]pyren	N.D.	0	0	0
Naphthalene	5.900E-03	0.0000124211	5.159320210	0.006831578
Hydrogen Sulfide	N.D.	0	0	0
Formaldehyde	3.200E-01	0.0006736842	279.8275368	0.370526315
Benzene	N.D.	0	0	0
Toluene	N.D.	0	0	0
~~~~~~

Xylene	N.D.	0	0	0
Methyl Chloroform	N.D.	0	0	0

Estimation Method: Emission Factor + Analysis of Fugitive Dust Sample
Yearly Emis Est Equatn: Py*Ef*Sf
Hourly Emis Est Equatn: Pm*Ef*Sf

Parameter Symbols/Names	Values
Ef= Particulate Emission Factor (from source test)	0.00573 lbs/ton
Sf = Speciation Factor	(see below) ppm

Emittent Species Name	Speciation Factor	Emission Factor	Annual Avg Emissions	Hourly Max Emissions
	(ppm)	(lbs/ton)	(lbs/yr)	(lbs/hr)
Crystalline Silica	250,000	0.0014325	595.0160925	0.787875
Total Particulates	1,000,000	0.00573	2380.06437	3.1515

Device #3: Hot Oil Heater
No. of Devices: 1
Control Equipment: None

Estimation Method: Source Test
Yearly Emis Est Equatn: Fy*Ef
Hourly Emis Est Equatn: (Yearly Emissions)/H
Emission Factor: Ef = Et/Ft

Parameter Symbols/Names	Values
Fy = Total Yearly Fuel Consumption	25000 gal/yr
H = Total Yearly Hours of Operation	5,556 hrs/yr
Fh = Average Hourly Fuel Consumption	4.499640028 gal/hr
Ef = Et/Ft = Emission Factor	(see below) lbs/gal
Ft = Hourly Fuel Consumption during Source Test	2.5 gal/hr
Et = Tested Emission Rate	(see below) lbs/hr
Gt = Tested Actual Gas Flow Rate of Stack	796 cfm
Gn = Gt*Fy/(Ft*H) = Normal Actual Gas Flow Rate	1432.685385 cfm
T = Tested Stack Gas Temperature	514 degree F

Emittent Species Name	Tested Emis Rate ("Et") (lbs/hr)	Emission Factor (lbs/gal)	Annual Avg Emissions (lbs/yr)	Hourly Max Emissions (lbs/hr)
PAHs:				
Total	6.300E-05	0.0000252	0.63	0.00011339
Benz[a]anthracene	N.D.	0	0	0
Benzo[b]fluranthene	2.500E-07	0.0000001	0.0025	0.00000045
Benzo[k]fluoranthene	N.D.	0	0	0
Benzo[a]pyrene	N.D.	0	0	0
Dibenzo[a,h]anthracene	N.D.	0	0	0
Indeno[1,2,3,-cd]pyren	N.D.	0	0	0
Naphthalene	4.200E-05	0.0000168	0.42	0.000075594
Dioxins	N.D.	0	0	0
Furans	N.D.	0	0	0
Formaldehyde	6.800E-02	0.0272	680	0.122390208
Benzene	N.D.	0	0	0

Estimation Method: Fuel Analysis
Yearly Emis Est Equatn: Fy*k*C
Hourly Emis Est Equatn: (Yearly Emissions)/H
Emission Factor: k*C

Parameter Symbols/Names	Values
k = 3.785*2.205/1,000,000	0.000008345 (1/gal)(lb/m
Fy = Yearly Fuel Usage	25000 gal/yr

C = Concentration in fuel (see below) mg/liter

Emittent Species Name	Concentratn in Fuel (mg/liter)	Emission Factor (lbs/gal)	Annual Avg Emissions (lbs/yr)	Hourly Max Emissions (lbs/hr)
Chlorine	N.D.	0	0	0
Heavy Metals:				
Arsenic	N.D.	0	0	0
Beryllium	N.D.	0	0	0
Cadmium	3.500E-01	0.0000029211	0.073026843	0.000013143
Chromium (total)	6.000E-01	0.0000050076	0.125188875	0.000022532
Copper	1.600E+00	0.0000133535	0.333837	0.000060085
Lead	2.900E+00	0.0000242032	0.605079562	0.000108905
Manganese	3.000E-01	0.0000025038	0.062594437	0.000011266
Mercury	6.000E-03	0.0000000501	0.001251888	0.000000225
Nickel	N.D.	0	0	0
Selenium	N.D.	0	0	0
Zinc	3.340E+01	0.0002787539	6.968847375	0.001254292
	(pCuries/l)	(mCuries/gal)	(Curies/yr)	(mCurries/hr
Radionuclides	N.D.	0	0	0

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INDUSTRIAL ASPHALT

FUEL ANALYSIS

AND

STACK TEST REPORTS

REPORT OF AB2588 AIR POLLUTION SOURCE TESTING
AT INDUSTRIAL ASPHALT
FRESNO, CALIFORNIA

Conducted at:

INDUSTRIAL ASPHALT
FRESNO, CALIFORNIA

Conducted on:

May 22-24, 1990

Submitted on:

August 23, 1990

Prepared by:

ENGINEERING-SCIENCE, INC.
75 N. Fair Oaks Avenue
P.O. Box 7101
Pasadena, California 91109

REPORT OF AB2588 AIR POLLUTION SOURCE TESTING
AT INDUSTRIAL ASPHALT
FRESNO, CALIFORNIA

Conducted at:

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Pasadena, California 91109

REPORT OF AB2588 AIR POLLUTION SOURCE TESTING
AT INDUSTRIAL ASPHALT
FRESNO, CALIFORNIA

SECTION I
INTRODUCTION

On May 22-24, 1990, Engineering-Science, Pasadena, (ES), conducted air pollution source tests at the Industrial Asphalt facility in Fresno, California. The sources tested were the exhausts of the dryer mixer and hot oil heater plant mixing operations. The testing was conducted to meet the conditions stipulated in California Assembly Bill 2588 (AB 2588). The plant is permitted by the Fresno County Air Pollution Control District (FCAPCD). The test effort was coordinated by Mr. Dan Olivera of Industrial Asphalt. The ES testing team was comprised of Messrs. Mike Edwards (team leader), Rani Sekhon, Tony King, and Greg Burke.

The source testing program included the determination of emission rates of trace elements, poly-aromatic hydrocarbons (PAH), organics, formaldehyde, and hydrogen sulfide for the dryer/mixer stack. For the hot oil heater stack, emission rates for poly-aromatic hydrocarbons, dioxins, dibenzofurans, benzene, and formaldehyde were determined. Fuel analysis included trace elements, chloride, and radionuclides. The tests were conducted in accordance with California Air Resources Board (CARB), and Environmental Protection Agency (EPA) published test procedures.

SECTION II
EQUIPMENT AND PROCESS DESCRIPTION

Industrial Asphalt of Fresno, California, operates a drum mixing asphalt batch plant for production of various grades of road asphalt. The facility is located in a large drainage wash, adjacent to their quarry. All gravels and sands necessary for aphalt production are generated on-site.

The process starts with differentiation of quarry aggregate into different grades of gravel and sand. These materials are stored in large piles at the facility, and as needed, are loaded into hoppers by skip loader for use by the plant.

Beneath the hoppers are belt conveyors, all of which feed a common conveyor belt. By adjusting the belt speeds for the individual hoppers, mixtures of different gravel sizes, sand and rock dust of desired proportions are created. The entire process is controlled by a central computer.

The common conveyor belt feeds materials through a knockout screen (protection against large stones) and into the top of the rotary drum. The materials are dried and heated at the top of the mixing drum by a propane flame. As the mixture falls through the last 15 feet of the drum, it is coated by 300°F asphalt oil. The asphalt which emerges from the mixing drum is carried by drag-slat up into storage silos, from where it is eventually poured into trucks.

To prevent the asphalt oil and asphalt mix from solidifying, a burner fired by low sulfur diesel heats circulating oil. The circulating oil maintains the temperature of the three 125-ton asphalt oil storage tanks and five asphalt mix silos at 300°F.

At maximum capacity, this facility can produce 650 tons of asphalt mix per hour. The plant load fluctuates constantly depending on the contractor demand, and can vary anywhere from complete shutdown to maximum capacity.

SECTION III

TESTING METHODOLOGY

Exhaust Gas Velocity and Moisture Determination

The exhaust gas flow rate was determined using an S-Type pitot tube. A Type-K thermocouple (chromel-alumel) connected to an Omega Model 601, digital temperature readout was used to determine the exhaust gas temperature. Carbon dioxide (CO_2) and oxygen (O_2) used in determining the molecular weight of the exhaust gases were determined by Fyrite analysis of integrated bag samples collected simultaneously with the wet impingement sampling trains. Moisture content was determined gravimetrically by the weight gain of the impingers from the particulate train in accordance with EPA Method 4.

Testing for cyclonic flow was conducted in accordance with EPA Reference Method 1. Absence of cyclonic flow was verified by rotating an S-Type pitot tube so that the planes of the face openings of the pitot tube are perpendicular to the stack cross-sectional plane. This is known as the "0 degree reference" or "null position". A zero reading should be obtained from the manometer. If the manometer did not read zero, the pitot tube was rotated up to a 90° yaw angle or until a zero reading was obtained. The angle of rotation from the initial position was recorded to the nearest degree. The source was considered free of cyclonic flow.

Trace Elements

Trace elements that were analyzed included As, Be, Cd, Cr, Cu, Hg, Pb, Mn, Ni, Se, Zn. Each sample was collected isokinetically using an EPA proposed multiple metals sampling train. The train was configured similar to the sampling train used for determining particulates (Method 5) except the first and second impingers contained nitric acid (HNO_3) in a hydrogen peroxide (H_2O_2) solution. The third impinger was an empty modified Greenberg-Smith. The fourth impinger contained an acidified potassium permanganate ($KMnO_4$) solution. The fifth impinger contained approximately 400 grams of indicating silica gel. A glass fiber filter was located between the fourth and fifth impingers. Sampling train components were recovered in separate HNO_3 and $KMnO_4$ fractions. After the testing, the samples were analyzed by Inductively Coupled Argon Plasma Mass Spectrometry (ICAP-MS).

Total and Hexavalent Chromium

Total and Hexavalent Chromium sampling was conducted in accordance with CARB Method 425. The sampling technique is the same as that for CARB Method 5 for particulates except the impinger solution is sodium bicarbonate. A sample aliquot was analyzed for Cr^{6+} by a colorimetric technique and an aliquot was analyzed for total Cr by AAS with graphite furnace.

Audit metal, Be

The audit metal, Beryllium, was sampled as per EPA Method 104. The method is similar to EPA5 except for analysis.

Poly-aromatic Hydrocarbons, Dioxins, and Dibenzofurans

A modified EPA Reference Method 5 sampling train was used for the determination of Dioxins (PCDD), Dibenzofurans (PCDF), and poly-aromatic hydrocarbons (PAH) which are in accordance with CARB Method 428 and 429. The train design was based on an EPA validated emission collection system with the addition of an adsorbent cartridge of XAD-2 resin to collect vaporous emissions for semi-volatile organics. This train was operated for a period of 4 hours or more during each run and samples were collected using isokinetic sampling techniques. The train recovery was modified from Method 5 procedures to include a sample wash with deionized water followed by a sample wash each with acetone, methylene chloride, and toluene.

A quartz glass sampling probe liner was used. Organics were collected by the adsorbent trap containing a precleaned cartridge of XAD-2 Resin. The resin cartridges were precleaned by California Analytical Laboratory in Sacramento, California at least two weeks prior to the field testing. This glass trap was located in the sample line downstream of a heated filter holder and upstream of the first impinger. The module housing the trap was jacketed, with cold water circulating to maintain an outlet temperature below 60°F. Aluminum foil was wrapped around the sorbent tube to minimize any possible sample reactions caused by ultraviolet light. A glass Hempal-type condenser was located between the filter and the XAD-2 cartridge to ensure that cool stack gas was entering the adsorbent trap.

All solvents used for preparing the sampling train for testing and field sample recovery were stored in glass bottles and were spectrographic grade. The train components that were to be in contact with the sample were handled with clean, bare hands. These components were free of all potential interfering materials, especially silicone grease.

The probe, sample line wash, and glass condenser were rinsed with deionized water, acetone, methylene chloride, and toluene during each rinse. All probe, filter, connecting tubing, and impinger washings were collected in precleaned glass containers. The sample train was separated into front and back halves.

Three composite samples from each sampling run were submitted to the laboratory for analysis. A composite sample of the "front half" was comprised of the nozzle/probe wash, filter wash, and filter. The "back half" composite sample was comprised of the filter back half wash, condenser wash, flexible line wash and XAD-2 cartridge. Another composite consisted of the impinger contents and associated washes. The samples were sealed, labelled and shipped with Chain of Custody forms to California Analytical Laboratories in Sacramento, California for analysis. The dioxins and dibenzofurans were analyzed, as specified by CARB Methods 428 and 429, in accordance with EPA Method 8280. The PAH's were analyzed by gas chromatography mass spectrometery (GC/MS) in accordance with EPA Method 8270. The analysis for PCDD and PCDF included the following compounds:

PCDD	PCDF
Mono-CDD	Mono-CDF
Di-CDD	Di-CDF
Tri-CDD	Tri-CDF
Tetra-CDD	Tetra-CDF
Penta-CDD	Penta-CDF
Hexa-CDD	Hexa-CDF
Hepta-CDD	Hepta-CDF
Octa-CDD	Octa-CDF

Concurrent with the laboratory analyses, the following poly-aromatic hydrocarbons (PAH's) were determined:

PAH's

Fluoranthane
Pyrene
Benzo (a) anthracene
Chrysene
Benzo (a) pyrene
Acenaphthene
Naphthalene
Benzo (b) fluoranthene
Benzo (k) fluoranthene
Acenaphthylene
Anthracene
Benzo (g, h, i) perylene
Fluorene
Phenathrene
Dibenzo (a, h) anthracene
Indeno (1,2,3-cd) pyrene

The samples that were submitted to the laboratory included a sample train blank which was collected on site. A sampling train was prepared as if it were to be used on the stack, but without being used, the train was washed with the appropriate solvents which were collected in the respective containers.

Benzenes

Benzene, dichlorobenzenes, ethylene dichloride and ethylene dibromide samples were collected in accordance with CARB Method 410A.

Three integrated samples were collected into evacuated summa polished canisters. The analysis were performed using a gas chromatrograph (GC) equipped with a photoionization detector (PID).

Hydrogen Chloride

Using CARB method 421, hydrogen chloride samples were collected with wet impingement sampling trains. The first and second impingers were charged with a solution of sodium bicarbonate and sodium carbonate. The samples were collected through a stainless steel probe connected to a teflon sampling line. Analysis of the samples were conducted by ion chromatrography with conductivity detection.

Hydrogen Sulfide

Samples were collected and analyzed in accordance with EPA method 11. A midget impinger train charged with a scrubbing solution of hydrogen peroxide and an absorbing solution of cadmium sulfate.

Formaldehyde

Samples were collected in accordance with CARB Method 430. Three runs each 2 hours in duration were conducted on the stack outlet.

The sampling train consisted of a Teflon lined probe connected to three midget impingers in series. The first two impingers contained 10 mls of 2,4-dinitrophenylhydrazine (DNPH) and the third impinger was empty. A preweighed silica gel cartridge was attached between the third impinger and the pump to prevent moisture entering the pump and for use in determining the moisture content of the stack exhaust gas. Samples were analyzed by high performance liquid chromatography.

Radionuclides Sampling

Gross alpha and beta radioactivity were measured using Methods 601 and 602 of the Intersociety Committee "Methods of Air Sampling and Analysis", third edition. Samples were collected once per hour and composited for each source test run. A total of three composite samples were collected.

SECTION V
RESULTS

The test results are presented in Tables 1-9. Manganese emissions are not deemed reliable because of the possible migration of the highly concentrated permanganate solution in the EPA multiple metal train.

Table 2

Summary of Poly-Aromatic Hydrocarbon Emissions Data

Dryer/Mixer Stack

Industrial Asphalt

Fresno, California

May 22-24, 1990

Parameter	Run #1 lb/hr.	Run #2 lb/hr.	Run #3 lb/hr.	Average lb/hr
Naphthalene	5.6×10^{-3}	5.0×10^{-3}	7.0×10^{-3}	5.9×10^{-3}
Acenaphthylene	3.5×10^{-5}	4.9×10^{-5}	6.4×10^{-5}	4.9×10^{-5}
Acenaphthene	2.4×10^{-4}	2.1×10^{-4}	3.6×10^{-4}	2.7×10^{-4}
Fluorene	3.0×10^{-4}	3.5×10^{-4}	5.1×10^{-4}	3.9×10^{-4}
Phenanthrene	6.0×10^{-4}	3.5×10^{-3}	9.8×10^{-4}	1.7×10^{-3}
Anthracene	2.1×10^{-5}	3.2×10^{-5}	5.1×10^{-5}	3.5×10^{-5}
Fluoranthene	5.0×10^{-6}	$< 7.3 \times 10^{-6}$	1.6×10^{-5}	$< 9.4 \times 10^{-6}$
Pyrene	8.2×10^{-6}	$< 1.3 \times 10^{-5}$	2.6×10^{-5}	$< 1.6 \times 10^{-5}$
Benzo (a) anthracene	$< 2.0 \times 10^{-7}$	$< 4.9 \times 10^{-6}$	$< 3.3 \times 10^{-6}$	$< 2.8 \times 10^{-6}$
Chrysene	2.3×10^{-6}	$< 6.5 \times 10^{-6}$	$< 4.1 \times 10^{-6}$	$< 4.3 \times 10^{-6}$
Benzo (b) fluoranthene	4.5×10^{-5}	3.2×10^{-5}	$< 5.4 \times 10^{-6}$	$< 2.8 \times 10^{-5}$
Benzo (k) fluoranthene	$< 1.5 \times 10^{-6}$	$< 8.4 \times 10^{-6}$	3.3×10^{-5}	$< 1.4 \times 10^{-5}$
Benzo (a) pyrene	$< 2.5 \times 10^{-7}$	$< 1.0 \times 10^{-5}$	$< 4.4 \times 10^{-6}$	$< 4.9 \times 10^{-6}$
Dibenz (a,h) anthracene	$< 3.2 \times 10^{-8}$	$< 4.6 \times 10^{-6}$	$< 2.8 \times 10^{-6}$	$< 2.5 \times 10^{-6}$
Benzo (g,h,i) perylene	$< 8.7 \times 10^{-8}$	$< 1.5 \times 10^{-5}$	$< 7.2 \times 10^{-6}$	$< 7.4 \times 10^{-6}$
Indeno (1,2,3-cd) pyrene	$< 4.7 \times 10^{-8}$	$< 6.5 \times 10^{-6}$	$< 2.8 \times 10^{-6}$	$< 3.1 \times 10^{-6}$

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Table 3

Summary of Organics, Formaldehyde , and Hydrogen Sulfide Emission Data

Dryer/Mixer Stack

Industrial Asphalt

Fresno, California

May 22-24, 1990

Parameter	Run #1 lb/hr.	Run #2 lb/hr.	Run #3 lb/hr.	Average lb/hr
Benzene	< 2.6×10^{-2}	< 2.6×10^{-2}	< 2.6×10^{-2}	<2.6×10^{-2}
Toluene	1.0×10^{-1}	1.3×10^{-1}	< 2.6×10^{-2}	< 8.5×10^{-2}
Xylene	< 2.6×10^{-2}	< 2.6×10^{-2}	< 2.6×10^{-2}	< 2.6×10^{-2}
Methyl Chloroform	< 2.6×10^{-2}	< 2.6×10^{-2}	4.2×10^{-2}	< 3.1×10^{-2}
Formaldehyde	3.7×10^{-2}	5.0×10^{-1}	4.2×10^{-1}	3.2×10^{-1}
Hydrogen Sulfide	< 2.1×10^{-2}	< 3.0×10^{-2}	< 3.4×10^{-2}	< 2.8×10^{-2}

Table 4

Summary of Poly-Aromatic Hydrocarbon Emission Data

Hot Oil Heater Stack

Industrial Asphalt

Fresno, California

May 22-24, 1990

Parameter	Run #1 lb/hr.	Run #2 lb/hr.	Run #3 lb/hr.	Average lb/hr
Naphthalene	5.8 x 10^{-5}	4.2 x 10^{-5}	2.7 x 10^{-5}	4.2 x 10^{-5}
Acenaphthylene	6.3 x 10^{-7}	5.1 x 10^{-7}	3.6 x 10^{-7}	5.0 x 10^{-7}
Acenaphthene	1.4 x 10^{-6}	1.3 x 10^{-6}	1.3 x 10^{-6}	1.3 x 10^{-6}
Fluorene	9.4 x 10^{-6}	3.3 x 10^{-6}	4.8 x 10^{-6}	5.8 x 10^{-6}
Phenanthrene	1.7 x 10^{-5}	1.0 x 10^{-5}	1.0 x 10^{-5}	1.2 x 10^{-5}
Anthracene	4.0 x 10^{-7}	3.4 x 10^{-7}	6.0 x 10^{-7}	4.5 x 10^{-7}
Fluoranthene	1.3 x 10^{-7}	7.1 x 10^{-8}	1.3 x 10^{-7}	1.1 x 10^{-7}
Pyrene	9.7 x 10^{-8}	7.1 x 10^{-8}	6.8 x 10^{-8}	7.9 x 10^{-8}
Benzo (a) anthracene	< 9.5 x 10^{-9}	< 7.8 x 10^{-9}	< 1.9 x 10^{-8}	< 1.2 x 10^{-8}
Chrysene	< 8.5 x 10^{-9}	< 7.4 x 10^{-9}	< 1.9 x 10^{-8}	< 1.2 x 10^{-8}
Benzo (b) fluoranthene	3.7 x 10^{-7}	1.5 x 10^{-7}	2.4 x 10^{-7}	2.5 x 10^{-7}
Benzo (k) fluoranthene	< 1.2 x 10^{-8}	< 1.0 x 10^{-8}	< 9.7 x 10^{-9}	< 1.1 x 10^{-8}
Benzo (a) pyrene	< 6.3 x 10^{-9}	< 5.7 x 10^{-9}	< 8.4 x 10^{-9}	< 6.8 x 10^{-9}
Dibenz (a,h) anthracene	< 1.2 x 10^{-9}	< 2.4 x 10^{-9}	< 1.4 x 10^{-9}	< 1.7 x 10^{-9}
Benzo (g,h,i) perylene	< 2.9 x 10^{-9}	< 2.8 x 10^{-9}	< 5.2 x 10^{-9}	< 3.6 x 10^{-9}
Indeno (1,2,3-cd) pyrene	< 1.5 x 10^{-9}	< 3.1 x 10^{-9}	< 4.2 x 10^{-9}	< 2.9 x 10^{-9}

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Table 5

Summary of Polychlorinated Dibenzofurans Emissions Data

Hot Oil Heater Stack

Industrial Asphalt

Fresno, California

May 22-24, 1990

Parameter	Run #1 lb/hr.	Run #2 lb/hr.	Run #3 lb/hr.	Average lb/hr
TCDFs (total)	$< 2.8 \times 10^{-12}$	6.4×10^{-12}	1.7×10^{-11}	$< 8.7 \times 10^{-12}$
2,3,7,8, -TCDF	$< 1.1 \times 10^{-12}$	$< 2.0 \times 10^{-12}$	$< 4.2 \times 10^{-12}$	$< 2.4 \times 10^{-12}$
PCDFs (total)	$< 9.8 \times 10^{-13}$	$< 1.0 \times 10^{-12}$	2.6×10^{-12}	$< 1.5 \times 10^{-12}$
1,2,3,4,7,8 -PCDF	$< 9.8 \times 10^{-13}$	$< 1.0 \times 10^{-12}$	$< 2.0 \times 10^{-12}$	$< 1.3 \times 10^{-12}$
2,3,4,7,8 -PCDF	$< 1.6 \times 10^{-12}$	$< 1.7 \times 10^{-12}$	$< 2.0 \times 10^{-12}$	$< 1.8 \times 10^{-12}$
HxCDFs (total)	$< 6.6 \times 10^{-13}$	2.7×10^{-12}	1.2×10^{-11}	$< 5.1 \times 10^{-12}$
1,2,3,4,7,8 -HxCDF	$< 1.9 \times 10^{-12}$	$< 2.0 \times 10^{-12}$	$< 5.5 \times 10^{-12}$	$< 3.1 \times 10^{-12}$
1,2,3,4,6,7,8 -HxCDF	$< 7.6 \times 10^{-13}$	$< 8.1 \times 10^{-13}$	$< 2.0 \times 10^{-12}$	$< 1.2 \times 10^{-12}$
2,3,4,6,7,8 -HxCDF	$< 7.6 \times 10^{-13}$	$< 8.1 \times 10^{-13}$	$< 2.0 \times 10^{-12}$	$< 1.2 \times 10^{-12}$
1,2,3,7,8,9 -HxCDF	$< 7.6 \times 10^{-13}$	$< 8.1 \times 10^{-13}$	$< 2.0 \times 10^{-12}$	$< 1.2 \times 10^{-12}$
HpCDFs (total)	$< 1.6 \times 10^{-12}$	1.7×10^{-11}	5.5×10^{-11}	$< 2.5 \times 10^{-11}$
1,2,3,4,6,7,8 -HpCDF	$< 3.8 \times 10^{-12}$	$< 6.7 \times 10^{-12}$	2.1×10^{-11}	$< 1.1 \times 10^{-11}$
1,2,3,4,7,8,9 -HpCDF	$< 1.9 \times 10^{-12}$	$< 6.7 \times 10^{-12}$	$< 3.2 \times 10^{-12}$	$< 3.9 \times 10^{-12}$
OCDF	$< 5.0 \times 10^{-12}$	9.4×10^{-12}	7.8×10^{-11}	$< 3.1 \times 10^{-11}$

Table 6

Summary of Dioxin Emissions Data

Hot Oil Heater Stack

Industrial Asphalt

Fresno, California

May 22-24, 1990

Parameter	Run #1 lb/hr.	Run #2 lb/hr.	Run #3 lb/hr.	Average lb/hr
TCDDs (total)	$< 1.9 \times 10^{-12}$	$< 2.1 \times 10^{-12}$	$< 2.0 \times 10^{-12}$	$< 2.0 \times 10^{-12}$
2,3,7,8 -TCDD	$< 1.5 \times 10^{-12}$	$< 9.8 \times 10^{-13}$	$< 1.7 \times 10^{-12}$	$< 1.4 \times 10^{-12}$
PeCDDs (total)	$< 2.0 \times 10^{-12}$	$< 2.1 \times 10^{-12}$	$< 3.1 \times 10^{-12}$	$< 2.4 \times 10^{-12}$
1,2,3,7,8-PeCDD	$< 2.0 \times 10^{-12}$	$< 2.1 \times 10^{-12}$	$< 3.1 \times 10^{-12}$	$< 2.4 \times 10^{-12}$
HxCDDs (total)	4.7×10^{-12}	1.4×10^{-11}	2.8×10^{-11}	1.6×10^{-11}
1,2,3,6,7,8 -HxCDD	$< 1.6 \times 10^{-12}$	$< 1.8 \times 10^{-12}$	$< 4.5 \times 10^{-12}$	$< 2.6 \times 10^{-12}$
1,2,3,7,8,9 -HxCDD	$< 1.6 \times 10^{-12}$	2.6×10^{-12}	$< 4.5 \times 10^{-12}$	$< 2.9 \times 10^{-12}$
1,2,3,4,7,8 -HxCDD	$< 1.6 \times 10^{-12}$	2.1×10^{-12}	$< 4.5 \times 10^{-12}$	$< 2.7 \times 10^{-12}$
HpCDDs (total)	$< 7.2 \times 10^{-12}$	$< 7.8 \times 10^{-12}$	1.4×10^{-10}	$< 5.2 \times 10^{-11}$
1,2,3,4,6,7,8 -HpCDD	$< 7.2 \times 10^{-12}$	1.2×10^{-11}	9.6×10^{-11}	$< 3.8 \times 10^{-11}$
OCDD	$< 5.0 \times 10^{-11}$	9.4×10^{-11}	1.1×10^{-9}	$< 4.2 \times 10^{-10}$

INDUSTRIAL ASPHALT

CRYSTALLINE SILICA

SOURCE TEST REPORT

The sequence of activities concerned with sample custody together with identification and tracking procedures are described below:

1. Filter preparation by laboratory, high volume sampler calibration and identification by tags and codes.
2. Filters issued to test team and master log filled out. Sample I.D. number stickers issued according to test identification code.
3. Filters recovered when a valid sample was obtained, accompanied by all field data sheets.
4. All samples returned to ES Pasadena laboratory with Chain-of-Custody form.
5. Samples examined at each transfer point for integrity and identity.

Upon completing the required analysis, the analyst returns the Chain-of-Custody form along with results to ES. All samples were accounted for by the ES Laboratory Supervisor and Project Manager. Each laboratory identifies samples in its own laboratory notebooks by the ES I.D. number as well as any internal identification. Notebooks were retained by each laboratory according to usual laboratory practices.

II. Calibration Procedures

The calibration procedures are specific to each analytical procedure. Standards are prepared from the highest grade reagents available, using procedures specified in the methods.

RESULTS

Analysis of all samples was performed by EMS Laboratories in South Pasadena. The results of the fugitive dust and grab sample testing are presented in Tables 1 and 2.

TABLE 1
SUMMARY OF RESULTS FOR ANALYSIS OF FUGITIVE DUST
FOR CRYSTALLINE SILICA CONTENT
AT CALMAT AGGREGATE PLANTS
FROM MAY 30 TO JUNE 27, 1990

Source	Crystalline Silica (mg/kg) Quartz	Crystalobite	Tridymite
Mission Valley Secondary Crusher	275,690	3,750*	3,750*
Final Screen	256,540	2,620*	2,620*
Carol Canyon Secondary Crusher	145,270	3,380*	3,380*
Secondary Screen	169,740	4,060*	4,060*
Sloan Canyon Screen	64,900	6,500*	6,500*
Pala Primary Screen	24,100	6,020*	6,020*
Secondary Crus	100,580	4,260*	4,260*
Fresno Secondary Crusher	56,620	4,480*	4,480*
Secondary Screen	255,730	4,280*	4,280*
Palmdale Secondary Screen	260,400	4,260*	4,260*
Secondary Crusher	100,000	5,000*	5,000*
Bakersfield Secondary Crusher	191,720	23,000	360*
Primary Screen	184,770	16,600	830*
San Bernardino Secondary Crusher	186,000	18,770	430*
Primary Screen	171,000	20,446	2,970*
Sun Valley Secondary Crusher	249,240	3,340*	3,340*
Primary Screen	208,100	3,620*	3,620*
Reliance Secondary Crusher	164,180	7,460*	7,460*
Primary Screen	160,340	4,180*	4,180*
Saticoy Secondary Crusher	193,000	3,510*	3,510*
Primary Screen	168,420	5,260*	5,260*
Durbin Secondary Crusher	239,130	5,430*	5,430*
Secondary Screen	231,680	4,830*	4,830*

* non-detected samples, value represents lower detection limit

TABLE 2

SUMMARY OF RESULTS FOR ANALYSIS OF ROAD, BAGHOUSE, AND STOCKPILE DUST FOR CRYSTALLINE SILICA CONTENT AT CALMAT PLANTS FROM MAY TO SEPTEMBER 1990

Source	Crystalline Silica (mg/kg) Quartz	Crystalobite	Tridymite
Mojave Iron Ore	11,000	2,000*	2,000*
Clinker	3,000*	3,000*	3,000*
Limestone	2,000*	2,000*	2,000*
Silica	430,000	3,000*	3,000*
Bissell Clay	52,000	3,000*	3,000*
Baghouse Dust	49,000	3,000*	3,000*
Kiln Feed	50,000	3,000*	3,000*
Pacific Clay	34,000	3,000*	3,000*
Shale	150.000	3,000*	3,000*
Colton Iron Ore	86,000	3,000*	3,000*
Clinker	3,000*	3,000*	3,000*
Limestone	3,000*	3,000*	3,000*
Silica	920,000	2,000*	2,000*
Baghouse Dust	24,000	3,000*	3,000*
Kiln Feed	69,000	3,000*	3,000*
Catalyst Fines	3,000*	3,000*	3,000*
Shale	310,000	2,000*	2,000*
Mission Valley Solid	140,000	2,000*	2,000*
Haul Road Dust	120,000	3,000*	3,000*
Sloan Canyon Solid	78,000	2,000*	2,000*
Haul Road Dust	160,000	3,000*	3,000*
Carol Canyon Solid	190,000	2,000*	2,000*
Haul Road Dust	150,000	3,000*	3,000*
Pala Solid	90,000	2,000*	2,000*
Haul Road Dust	86,000	3,000*	3,000*
Fresno Industrial Asphalt Baghouse Dust	**250,000**	**2,000***	**2,000***
Fresno Haul Road Dust	**160,000**	**2,000***	**2,000***

* non-detected samples, value represents lower detection limit

Table 6

Summary of Dioxin Emissions Data

Hot Oil Heater Stack

Industrial Asphalt

Fresno, California

May 22-24, 1990

Parameter	Run #1 lb/hr.	Run #2 lb/hr.	Run #3 lb/hr.	Average lb/hr
TCDDs (total)	$< 1.9 \times 10^{-12}$	$< 2.1 \times 10^{-12}$	$< 2.0 \times 10^{-12}$	$< 2.0 \times 10^{-12}$
2,3,7,8 -TCDD	$< 1.5 \times 10^{-12}$	$< 9.8 \times 10^{-13}$	$< 1.7 \times 10^{-12}$	$< 1.4 \times 10^{-12}$
PeCDDs (total)	$< 2.0 \times 10^{-12}$	$< 2.1 \times 10^{-12}$	$< 3.1 \times 10^{-12}$	$< 2.4 \times 10^{-12}$
1,2,3,7,8-PeCDD	$< 2.0 \times 10^{-12}$	$< 2.1 \times 10^{-12}$	$< 3.1 \times 10^{-12}$	$< 2.4 \times 10^{-12}$
HxCDDs (total)	4.7×10^{-12}	1.4×10^{-11}	2.8×10^{-11}	1.6×10^{-11}
1,2,3,6,7,8 -HxCDD	$< 1.6 \times 10^{-12}$	$< 1.8 \times 10^{-12}$	$< 4.5 \times 10^{-12}$	$< 2.6 \times 10^{-12}$
1,2,3,7,8,9 -HxCDD	$< 1.6 \times 10^{-12}$	2.6×10^{-12}	$< 4.5 \times 10^{-12}$	$< 2.9 \times 10^{-12}$
1,2,3,4,7,8 -HxCDD	$< 1.6 \times 10^{-12}$	2.1×10^{-12}	$< 4.5 \times 10^{-12}$	$< 2.7 \times 10^{-12}$
HpCDDs (total)	$< 7.2 \times 10^{-12}$	$< 7.8 \times 10^{-12}$	1.4×10^{-10}	$< 5.2 \times 10^{-11}$
1,2,3,4,6,7,8 -HpCDD	$< 7.2 \times 10^{-12}$	1.2×10^{-11}	9.6×10^{-11}	$< 3.8 \times 10^{-11}$
OCDD	$< 5.0 \times 10^{-11}$	9.4×10^{-11}	1.1×10^{-9}	$< 4.2 \times 10^{-10}$

Table 7

Summary of Benezene and Formaldehyde Emissions Data

Hot Oil Heater Stack

Industrial Asphalt

Fresno, California

May 22-24, 1990

Parameter	Run #1 lb/hr.	Run #2 lb/hr.	Run #3 lb/hr.	Average lb/hr
Benzene	$< 3.8 \times 10^{-4}$	$< 3.8 \times 10^{-4}$	$< 3.8 \times 10^{-4}$	$< 3.8 \times 10^{-4}$
Formaldehyde	4.0×10^{-2}	5.5×10^{-2}	1.1×10^{-1}	6.8×10^{-2}

1.6 -2   4.4 -2 2.7×10^{-2}

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Table 8
Summary of Chloride and Trace Element Data
Fuel Oil to Hot Oil Heater Stack
Industrial Asphalt
Fresno, California
May 22-24, 1990

Parameter	mg/l
As	< 0.1
Be	< 0.1
Cd	0.35
Cl	< 45.0
Cr	0.6
Cu	1.6
Hg	0.006
Mn	0.3
Ni	< 0.2
Pb	2.9
Se	< 0.2
Zn	33.4

Table 9
Summary of Radionuclides Data
Fuel Oil to Hot Oil Heater Stack
Industrial Asphalt
Fresno, California
May 22-24, 1990

Parameter	pico curie/l
Gross Alpha	0 ± 7
Gross Beta	0 ± 13
Gamma Scan:	
K^{40}	$(8.4 \pm 7.8) \times 10^2$
Cs^{137}	< 52
Ra^{226}	< 111
Th^{226}	< 87
Th^{232}	< 216

INDUSTRIAL ASPHALT

CRYSTALLINE SILICA

SOURCE TEST REPORT

REPORT OF FUGITIVE DUST MONITORING FOR CRYSTALLINE SILICA AT CALMAT FRESNO FACILITY

INTRODUCTION

From May 30 to June 27, 1990, personnel from Engineering-Science, Inc. (ES) conducted fugitive dust monitoring for crystalline silica at the following Calmat aggregate plants: Reliance, Fresno, Bakersfield, Pala, Mission Valley, Carol Canyon, Sloan Canyon, Durbin, Saticoy, Sun Valley, San Bernardino, and Palmdale. Grab samples of haul road, baghouse, and stock pile dust were collected in the months of May, June, July, August, and September by Calmat personnel at Fresno, Pala, Mission Valley, Carol Canyon, Sloan Canyon, Mojave and Colton. The samples were delivered to ES for analysis.

The monitoring was conducted at two locations at each plant. Sampling locations were usually the cone crusher and the screen that appear to generate the most dust. The ES testing technician was Mr. Rico Rivera. The grab samples were collected by Calmat personnel. The samples were taken at plant access roadsides, baghouse, and storage piles at the different facilities.

METHODOLOGY OF SAMPLING AND ANALYSIS AT FRESNO FACILITY

I. Sampling Procedure

A. Fugitive Dust Monitoring

High volume air samplers, with PM10 heads, properly located at the measurement site, drew a measured quantity of ambient air into a covered housing and through a tared polycarbonate filter during a 24 hour sampling period. Suspended particulates collected on the filter surface and were subsequently analyzed for crystalline silica content. The sample flow rate, collection times, and the increase in filter weight provided a measurement for the mass calculation.

B. Grab Samples

Grab samples of road haul dust were collected in jars from plant access roadsides. Grab samples of baghouse dust were collected in jars from the dryer/mixer baghouse at the industrial asphalt plant. No special equipment was used in grab sampling.

II. Analytical Procedure

Free Crystalline Silica Analysis (NIOSH Method 7500)

Sample Preparation -

The entire sample or an aliquot portion of the sample dust was suspended in 2-propanol and then agitated in an ultrasonic bath until all agglomerated particles were broken up. This suspension and all subsequent beaker washings were subjected to vacuum filtration through a 25mm silver membrane filter of 0.45μm pore size. This filter was mounted on an x-ray diffraction (XRD) sample holder for analysis.

Standards -

Standards were prepared by suspending 10.00mg and 50.00mg of the standard material, each into a 1 liter volume of 2-propanol. These suspensions were agitated in an ultrasonic bath for 20 minutes each. Aliquots were pipetted out and vacuum filtered onto silver membrane filters to produce working standard filters of varying sample sizes (e.g. 20μg, 30μg, 50μg, 100μg, 250μg, etc.). These working standards were analyzed together with all samples and blanks.

Analysis -

Standards, samples, and blanks were qualitatively scanned from 10 to 80 degrees 2-theta by XRD. The areas under the peaks for each silica polymorph were measured over a long (e.g. 15 minute) scan time for each peak to allow low detection limits. The baseline measurements flanking each peak were taken in 1/2 of the peak scanning time.

Calculations -

Silica concentrations were calculated by comparing the intensity of the sample peak (corrected for background intensity and interferences) to the graph of standard intensities (also corrected for background intensity and interference). Concentration was calculated as the weight fraction of silica in total mass of particulate matter (particulates with diameter of less than 10μm) and reported in mg/kg.

QUALITY ASSURANCE

I. Sample Custody

A specific Chain-of-Custody procedure was used for this project. The elements of this plan include:

- Sample identification
- Sample labels
- Documentation
- Chain of Custody forms

The sequence of activities concerned with sample custody together with identification and tracking procedures are described below:

1. Filter preparation by laboratory, high volume sampler calibration and identification by tags and codes.
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Sloan Canyon Screen	64,900	6,500*	6,500*
Pala Primary Screen	24,100	6,020*	6,020*
Secondary Crus	100,580	4,260*	4,260*
Fresno Secondary Crusher	56,620	4,480*	4,480*
Secondary Screen	255,730	4,280*	4,280*
Palmdale Secondary Screen	260,400	4,260*	4,260*
Secondary Crusher	100,000	5,000*	5,000*
Bakersfield Secondary Crusher	191,720	23,000	360*
Primary Screen	184,770	16,600	830*
San Bernardino Secondary Crusher	186,000	18,770	430*
Primary Screen	171,000	20,446	2,970*
Sun Valley Secondary Crusher	249,240	3,340*	3,340*
Primary Screen	208,100	3,620*	3,620*
Reliance Secondary Crusher	164,180	7,460*	7,460*
Primary Screen	160,340	4,180*	4,180*
Saticoy Secondary Crusher	193,000	3,510*	3,510*
Primary Screen	168,420	5,260*	5,260*
Durbin Secondary Crusher	239,130	5,430*	5,430*
Secondary Screen	231,680	4,830*	4,830*

* non-detected samples, value represents lower detection limit

TABLE 2
SUMMARY OF RESULTS FOR ANALYSIS OF ROAD, BAGHOUSE, AND STOCKPILE DUST FOR CRYSTALLINE SILICA CONTENT AT CALMAT PLANTS FROM MAY TO SEPTEMBER 1990

Source	Crystalline Silica (mg/kg)		
	Quartz	Crystalobite	Tridymite
Mojave Iron Ore	11,000	2,000*	2,0[illegible]*
Clinker	3,000*	3,000*	3,000*
Limestone	2,000*	2,000*	2,000*
Silica	430,000	3,000*	3,000*
Bissell Clay	52,000	3,000*	3,000*
Baghouse Dust	49,000	3,000*	3,000*
Kiln Feed	50,000	3,000*	3,000*
Pacific Clay	34,000	3,000*	3,000*
Shale	150.000	3,000*	3,000*
Colton Iron Ore	86,000	3,000*	3,000*
Clinker	3,000*	3,000*	3,000*
Limestone	3,000*	3,000*	3,000*
Silica	920,000	2,000*	2,000*
Baghouse Dust	24,000	3,000*	3,000*
Kiln Feed	69,000	3,000*	3,000*
Catalyst Fines	3,000*	3,000*	3,000*
Shale	310,000	2,000*	2,000*
Mission Valley Solid	140,000	2,000*	2,000*
Haul Road Dust	120,000	3,000*	3,000*
Sloan Canyon Solid	78,000	2,000*	2,000*
Haul Road Dust	160,000	3,000*	3,000*
Carol Canyon Solid	190,000	2,000*	2,000*
Haul Road Dust	150,000	3,000*	3,000*
Pala Solid	90,000	2,000*	2,000*
Haul Road Dust	86,000	3,000*	3,000*
Fresno Industrial Asphalt Baghouse Dust	**250,000**	**2,000***	**2,000***
Fresno Haul Road Dust	**160,000**	**2,000***	**2,000***

* non-detected samples, value represents lower detection limit