RAMCON
ENVIRONMENTAL CORPORATION

Source Sampling for Particulate Emissions

H&B Batch-Mix Baghouse / Permit No. 1192-006

FRED WEBER, INC.
PEVELY, MISSOURI
August 19, 1993

Doug Weible
Fred Weber, Inc.

William Joseph Sewell, II
Vice President
RAMCON Environmental Corporation

RAMCON BUILDING, 6707 FLETCHER CREEK COVE, MEMPHIS, TENNESSEE 38133
TELEPHONE 800/458-4567 IN TENNESSEE 901/387-0500 FAX 901/387-0400

Fred Weber, Inc.
COMPLETE CONSTRUCTION SERVICES
(314) 344-0070

Mr. Randy Raymond
Chief, New Source Review
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102

RE: Permit #1192-006
Facility I.D. #[redacted]

Dear Mr. Raymond,

We received your letter dated November 9, 1992 for our Permit to Construct. Per your instructions, a Bag House was installed on our plant. We have not operated the plant at full production because the business demand has not been that great.

Therefore, we respectfully request permission to extend the performance test until the start of our 1993 season, which we anticipate to start April 1, 1993. The plant will be shut down during the winter of 1992 and 1993.

Your approval will be appreciated.

Sincerely,

FRED WEBER, INC.
Materials Division

David L. Poe
Vice President,
Asphalt Operations

pch

2320 CREVE COEUR MILL ROAD, P.O. BOX 2501, MARYLAND HEIGHTS, MISSOURI 63043-8501

DE

JOHN ASHCROFT
Governor

RON KUCERA
Acting Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176 Jefferson City, MO 65102

December 16, 1992

Mr. David Poe
Fred Weber, Inc./Materials Div.
2320 Creve Coeur Mill Road
P.O. Box 2501
Maryland Heights, MO 63043

Dear Mr. Poe:

In answer to your request to delay emission testing of the asphalt plant constructed under authority of Permit #1192-006, due to the seasonal nature of the business we will allow the required testing to be delayed until the start-up of production in the spring of 1993.

Please arrange a test date with Mr. Doug Elley (314-751-4817) of this program no later than April 1, 1993.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Steven Feeler

Steve Feeler
Compliance Unit Chief

SF/deb

Source Sampling Observation Report Sheet (Particulates)

Company FRED WEBER, INC. Ref. No. ______
Source I.D. MO. DNR/APCP Permit #1192-006
Person in Charge of Test TOMMY CROOK
Observer DOUG ELLEY
Run Number Observed ______

Date JUNE 8, 1993 Time Test Observed ______

THIS REPORT SHEET IS AN EVALUATION OF SAMPLING PROCEDURES CONDUCTED AT THE ABOVE MENTIONED SITE. THIS EVALUATION COVERS ONLY GENERAL ITEMS OBVIOUS TO THE OBSERVER. THIS DOES NOT IN ANY WAY IMPLY THAT ALL TEST PROCEDURES ARE ACCURATE, EVEN THOUGH THE FIELD PROCEDURE MAY BE ACCEPTABLE, THIS REPORT APPLIES ONLY TO THE TESTS ACTUALLY OBSERVED.

PRELIMINARY DETERMINATIONS

Sampling Location	OK
Number of sample points	30
Velocity traverse	
Method of moisture determination	

SAMPLING

Leak Check:	
Pretest (Specify ___)	OK
Posttest (Specify ___)	Failed
Probe tip orientation	OK
Filter heated to minimum temperature	OK
Time sampled each point	2 min.
Accurately monitored train temperatures	Run #1 Impingers too warm @ 88°F
Initial readings recorded	
Readings recorded if shut down	OK
Final readings recorded	
Gas analysis (specify ___)	

SAMPLING TRAIN

Basic Construction	} unacceptable alignment > 1/4" @ 1/2"
Probe Design	
Nozzle Condition	OK
Pitot Condition	OK
Filter	
Correct amount H_2O and Silica Gel in impingers	

TRAIN BREAK-DOWN

Probe moved so as not to lose material	No
Probe washed and brushed	
Acceptable container to store washings	
Reagent grade acetone used	
Blank of solutions taken	
Train re-set acceptably	

CALIBRATION DATA

Proper calibration data available on site	Yes

thermocouple form unreadable

PROCESS INFORMATION

Engineer Present (Name: ______)
Pretest Agreement/Protocol ______
Observer: ______ Team Leader: ______
Copy to Observer; original to Team Leader (to be submitted with Test Report)

D:\DONNA\SUMNER\OBSERVE.RPT

Fred Weber, Inc.
COMPLETE CONSTRUCTION SERVICES (314) 344-0070

Vice President

CERTIFIED MAIL

'93 JUL 12 PM 11 30

July 7, 1993

Mr. Doug Elley
Missouri Department of Natural Resources
Division of Environmental Quality
P. O. Box 176
Jefferson City, MO 65102

RE: Fred Weber, Inc. Trautman Plant Particulate Emission Test

Dear Mr. Elley,

Please find enclosed two copies of the Particulate Emissions Test of the Fred Weber, Inc. Trautman Asphalt Plant performed on June 9, 1993. The test results indicate the average grain loading exceeds the standards set by the State of Missouri. The results state further that the opacity test did not meet requirements, but review of the permit to construct shows the facility to be well under the maximum percent opacity allowed.

We shall make a thorough examination of the baghouse including black light testing and all related air pollution control components. Since the results indicate our facility to be slightly over the compliance level, we would like to schedule another stack test at your earliest convenience.

Please call me when you have reviewed the report to discuss the matter further.

Sincerely,
FRED WEBER, INC.
Materials Division

David L. Poe

David L. Poe
Vice President
Asphalt Operations

enclosures

DLP/jhd

2320 CREVE COEUR MILL ROAD, P.O. BOX 2501, MARYLAND HEIGHTS, MISSOURI 63043-8501

Fred Weber, Inc.
COMPLETE CONSTRUCTION SERVICES
(314) 344-0070

93 SEP 7 AM 9 39

September 2,1993

Mr. Peter Yronwode
Air Pollution Control Program
Missouri Department of Natural Resources
Division of Environmental Quality
205 Jefferson
Jefferson City, Missouri 65102

Dear Mr. Yronwode:

Enclosed please find two copies of the report on the particulate emissions test conducted by RAMCON Environmental Corporation on August 19, 1993 at Fred Weber, Inc.'s Trautman Asphalt Plant.

If you have any questions regarding this matter please contact me at (314) 344-0070.

Sincerely,

FRED WEBER, INC.
Materials Division

Douglas K. Weible
Environmental Engineer

dkw

2320 CREVE COEUR MILL ROAD, P.O. BOX 2501, MARYLAND HEIGHTS, MISSOURI 63043-8501

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MEMORANDUM

DATE: September 13, 1993

TO: Jefferson County File, SLRO

FROM: Peter Yronwode P.Y.

SUBJECT: Fred Weber, Inc. asphalt plant test
Permit # 1192-006

RAMCON tested this facility on June 9, 1993 near Peveley. Doug Elley observed serious deviations from correct test procedures, and emissions exceeded NSPS limits. After modifications to the fan and baghouse repairs, the source was retested on August 19. Emissions measured at the second test averaged 0.0121 gr/DSCF and opacity was reported to be less than 5%. The plant was found at the time of the test to be in compliance with permit # 1192-006 and Federal NSPS standards of 0.040 gr/DSCF and 20% opacity. Production rate averaged 150 tons/hour. The maximum production rate permitted at this facility shall be within 10% of 150 T/hr. Baghouse pressure drop during the test averaged 2 inches of water. No more than 90,000 tons of asphalt may be produced at this facility during any calendar year,

STATE OF MISSOURI Mel Carnahan, Governor • David A. Shorr, Director
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176 Jefferson City, MO 65102-0176

September 13, 1993

Re: permit # 1192-006

Fred Weber, Inc.
Douglas K. Weible, Environmental Engineer
P. O. Box 2501
Maryland Heights, MO 63043-8501

Dear Mr. Weible:

My staff has reviewed the report of testing conducted by RAMCOM Environmental Corporation on the H & B stationary asphalt plant (TBA36-75-OX-16, # 924244R1505) located at your facility near Peveley on August 19, 1993. This test followed modifications to the fan after a test performed on June 9, 1993 indicated inadequate control of particulate emissions. Doug Elley observed the June 9 test and noted serious problems in testing procedures. Most of these problems were corrected in the August test, and my staff is in substantial agreement with the results reported by RAMCON.

Particulate emissions over three runs averaged 0.0121 grains per dry standard cubic foot (gr/DSCF) and opacity was below 5%. This emission level meets the limits of 0.04 gr/DSCF and 20% opacity established by New Source Performance Standards (NSPS), Subpart I. At the time of the test, the plant was found to be in compliance with permit # 1192-006 and Federal NSPS standards. Average production during the test was 150 tons/hour. Exceeding this level by more than ten percent (10%) will be a violation of your permit. Pressure drop across the baghouse averaged 2 inches of water. A comparable level of control device function must be maintained during operations. No more than 90,000 tons of asphalt may be produced at this facility during any calendar year.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Steven Feeler

Steven Feeler
Acting Chief of Enforcement

SF/py
cc: DNR St. Louis Regional Office

RECYCLED PAPER

RAMCON

ENVIRONMENTAL CORPORATION

August 26, 1993

Mr. Doug Weible
Fred Weber, Inc.
2320 Creve Couer Mill Road
Maryland Heights, Missouri 63043

RE: Particulate Emissions Test: August 19, 1993

Dear Mr. Weible:

Enclosed you will find four (4) copies of our report on the particulate emissions test we conducted pursuant to permit no. 1192-006 at your asphalt plant located in Pevely, Missouri. Based on our test results, the average grain loading of the three test runs do pass both the EPA New Source Performance Standards and those set by the State of Missouri. Therefore, the plant is operating in compliance with both Federal and State standards.

You will want to sign the report covers and send two copies to:

Mr. Peter Ironwood
Air Pollution Control Program
Missouri Department of Natural Resources
Division of Environmental Quality
205 Jefferson
Jefferson City, Missouri 65102

You will need to keep one copy of the report at the plant.

We certainly have enjoyed working with you. Please let us know if we can be of further assistance.

Sincerely,

William Joseph Sewell, II
Vice President

WJSii:wpc
Enclosures

RAMCON BUILDING, 6707 FLETCHER CREEK COVE, MEMPHIS, TENNESSEE 38133
TELEPHONE 800/458-4567 IN TENNESSEE 901/387-0500 FAX 901/387-0400

TABLE OF CONTENTS

SECTION A:
1. INTRODUCTION
2. TEST RESULTS
3. TEST PROCEDURES

SECTION B:
THE SOURCE

SECTION C:
EQUIPMENT USED

SECTION D:
LABORATORY PROCEDURES AND RESULTS

SECTION E:
CALCULATIONS

SECTION F:
FIELD DATA

SECTION G:
CALIBRATIONS

SECTION H:
RAMCON PERSONNEL

SECTION I:
VISIBLE EMISSIONS

SECTION A:

1. INTRODUCTION
2. TEST RESULTS
3. TEST PROCEDURES

SECTION A.

1. INTRODUCTION

On August 19, 1993 personnel from RAMCON Environmental Corporation conducted a source emissions test for particulate emissions compliance at Fred Weber, Inc.'s H&B batch-mix asphalt plant located in Pevely, Missouri. RAMCON personnel conducting the test were Allen Turner, Team Leader, Charles Dicks and Earl Crook. Tommy South was responsible for the laboratory analysis including taring the beakers and filters and recording final data in the laboratory record books. Custody of the samples was limited to Mr. Turner and Mr. South.

The purpose of the test was to determine if the rate of particulate emissions from this plant's baghouse is below or equal to the allowable N.S.P.S. emissions limit set by US EPA and the State of Missouri.

2. TEST RESULTS

Table I summarizes the test results. The grain loading limitation for EPA is .04 gr/dscf as specified in 39 FR 9314, March 8, 1974, 60.92 Standards for Particulate Matter (1), as amended. The allowable emissions for the State of Missouri are the same as those set by EPA.

Mr. Peter Ironwood of Missouri's Air Conservation Committee, Department of Natural Resources observed the testing conducted by RAMCON Environmental Corporation. Earl Crook of RAMCON Environmental conducted the opacity test which readings never exceeded zero (0) percent on all three (3) runs and therefore meets N.S.P.S. requirements.

PLANT NAME:Fred Weber Asphalt UNIT: H & B batch asphalt plant
LOCATION: Peveley, MO DATE: 8/19/93 RUN NO:3

NUMBER OF POINTS	30		PERCENT OXYGEN	14.33
TIME (minutes/point)	2.00		PERCENT CARBON DIOXIDE	3.10
LEAK RATE (ft3/min)	0.000		PERCENT CARBON MONOXIDE	0.00
STACK DIAMETER (in)	49.39		PITOT COEFFICIENT (Cp)	0.840
BAR PRESS (in Hg)	29.15		NOZZLE DIAMETER (in)	0.300
STATIC PRESS (in H2O)	0.01		INITIAL METER VOL (ft3)	280.100
PARTIC COLLECTED (mg)	21.10		FINAL METER VOL (ft3)	319.051
IMPINGER H2O (ml)	201.0		METER CORR FACT (Ym)	0.9910
SILICA GEL H2O (g)	5.7			

POINT NUMBER	STACK TEMP (Ts)	VELOCITY PRESS (dPs)	ORIFICE PRESS (dH)	METER TEMP INLET (Tmi)	METER TEMP OUTLET (Tmo)	STACK VEL ft/sec	"K" "FACTOR" dPs/dH	VELOCITY PRESS SQRT (dPs)^.5
1	265	0.32	1.50	92	90	39.2	4.69	0.566
2	265	0.32	1.50	92	90	39.2	4.69	0.566
3	268	0.20	0.96	92	90	31.1	4.80	0.447
4	268	0.15	0.72	92	90	26.9	4.80	0.387
5	265	0.15	0.72	96	90	26.8	4.80	0.387
6	265	0.15	0.72	96	90	26.8	4.80	0.387
7	263	0.15	0.72	96	92	26.8	4.80	0.387
8	263	0.25	1.20	96	92	34.6	4.80	0.500
9	263	0.25	1.20	96	92	34.6	4.80	0.500
10	263	0.25	1.20	96	92	34.6	4.80	0.500
11	265	0.25	1.20	100	92	34.6	4.80	0.500
12	268	0.20	0.96	100	92	31.1	4.80	0.447
13	268	0.30	1.40	100	92	38.0	4.67	0.548
14	274	0.25	1.20	100	92	34.9	4.80	0.500
15	274	0.25	1.20	100	92	34.9	4.80	0.500
16	274	0.15	0.72	100	92	27.0	4.80	0.387
17	274	0.38	1.80	100	93	43.0	4.74	0.616
18	274	0.72	3.50	100	94	59.2	4.86	0.849
19	265	0.20	0.96	100	94	31.0	4.80	0.447
20	268	0.20	0.96	100	94	31.1	4.80	0.447
21	268	0.30	1.40	100	94	38.0	4.67	0.548
22	269	0.44	2.10	100	94	46.1	4.77	0.663
23	269	0.47	2.30	100	94	47.6	4.89	0.686
24	269	0.40	1.90	100	94	43.9	4.75	0.632
25	268	0.30	1.40	100	94	38.0	4.67	0.548
26	268	0.30	1.40	100	94	38.0	4.67	0.548
27	268	0.20	0.96	100	94	31.1	4.80	0.447
28	268	0.20	0.96	100	94	31.1	4.80	0.447
29	268	0.45	2.20	100	94	46.6	4.89	0.671
30	268	0.45	2.20	100	94	46.6	4.89	0.671
AVG	267.8	0.287	1.372	98.13	92.50	36.412		0.432

STACK GAS MOL WEIGHT, WET	26.71	AVG ABS STACK TEMP (deg R)	727.8
STACK VELOCITY (ft/sec)	29.96	AVG ABS METER TEMP (deg R)	555.3
STAND VOL SAMPLED (std ft3)	35.87	METER LEAKAGE RATE (ft3/min)	0.000
AVG GAS METER TEMP (deg F)	95.3	SAMPLE VOL LEAK CORR'D (ft3)	38.95
PERCENT MOISTURE (%)	21.34	AVG ABS STACK PRESS (in Hg)	29.1507
STD STACK FLOW RATE (DSCFM)	13296	VOL H2O IN METER GAS (SCF)	9.73
		H2O VAPOR IN GAS (vol frac)	0.2134
ISOKINETIC VARIATION (%)	121.91	NOZZLE AREA (ft2)	0.00049
PARTIC. EMISSION RATE (lb/hr)	1.0347	STACK AREA (ft2)	13.303
PARTICULATE CONC (gr/DSCF)	0.0091	STACK GAS MOL WEIGHT, DRY	29.07
PARTIC CONC @ 7% O2 (gr/DSCF)	0.0192		
FUEL F FACTOR DRY (Fd)			
POUNDS PER MILLION BTU	0		

PLANT NAME:Fred Weber Asphalt
LOCATION: Peveley, MO
TEST UNIT: H & B batch asphalt plant
TEST DATE: 8/19/93 RUN NO:2

NUMBER OF POINTS	30	PERCENT OXYGEN	14.07
TIME (minutes/point)	2.00	PERCENT CARBON DIOXIDE	3.40
LEAK RATE (ft3/min)	0.015	PERCENT CARBON MONOXIDE	0.00
STACK DIAMETER (in)	49.39	PITOT COEFFICIENT (Cp)	0.840
BAR PRESS (in Hg)	29.15	NOZZLE DIAMETER (in)	0.300
STATIC PRESS (in H20)	0.01	INITIAL METER VOL (ft3)	242.200
PARTIC COLLECTED (mg)	32.10	FINAL METER VOL (ft3)	279.439
IMPINGER H20 (ml)	192.0	METER CORR FACT (Ym)	0.9910
SILICA GEL H20 (g)	6.8		

POINT NUMBER	STACK TEMP (Ts)	VELOCITY PRESS (dPs)	ORIFICE PRESS (dH)	METER TEMP INLET (Tmi)	METER TEMP OUTLET (Tmo)	STACK VEL ft/sec	"K" "FACTOR" dPs/dH	VELOCITY PRESS SQRT (dPs)^.5
1	270	0.25	1.20	93	85	34.7	4.80	0.500
2	270	0.25	1.20	93	85	34.7	4.80	0.500
3	271	0.25	1.20	93	86	34.8	4.80	0.500
4	271	0.30	1.40	93	86	38.1	4.67	0.548
5	268	0.56	2.70	93	87	51.9	4.82	0.748
6	268	0.80	2.90	95	87	62.1	3.62	0.894
7	268	0.20	0.96	95	87	31.0	4.80	0.447
8	263	0.20	0.96	95	88	30.9	4.80	0.447
9	263	0.15	0.72	95	88	26.8	4.80	0.387
10	260	0.43	2.10	95	88	45.3	4.88	0.656
11	263	0.43	2.10	95	88	45.4	4.88	0.656
12	263	0.55	2.60	95	89	51.3	4.73	0.742
13	264	0.18	0.86	95	89	29.4	4.78	0.424
14	265	0.15	0.72	95	90	26.8	4.80	0.387
15	265	0.20	0.96	95	90	31.0	4.80	0.447
16	265	0.20	0.96	95	90	31.0	4.80	0.447
17	268	0.35	1.70	95	90	41.1	4.86	0.592
18	265	0.55	2.60	95	90	51.4	4.73	0.742
19	265	0.15	0.72	93	90	26.8	4.80	0.387
20	265	0.15	0.72	93	90	26.8	4.80	0.387
21	265	0.15	0.72	93	90	26.8	4.80	0.387
22	272	0.15	0.72	94	90	27.0	4.80	0.387
23	272	0.18	0.86	94	90	29.5	4.78	0.424
24	272	0.25	1.20	94	90	34.8	4.80	0.500
25	272	0.25	1.20	94	90	34.8	4.80	0.500
26	274	0.30	1.40	94	90	38.2	4.67	0.548
27	270	0.25	1.20	94	90	34.7	4.80	0.500
28	270	0.15	0.72	94	90	26.9	4.80	0.387
29	271	0.15	0.72	94	90	26.9	4.80	0.387
30	271	0.15	0.72	94	90	26.9	4.80	0.387
AVG	267.6	0.276	1.291	94.17	88.77	35.261		0.435

STACK GAS MOL WEIGHT, WET	26.74	AVG ABS STACK TEMP (deg R)	727.6
STACK VELOCITY (ft/sec)	30.15	AVG ABS METER TEMP (deg R)	551.5
STAND VOL SAMPLED (std ft3)	34.52	METER LEAKAGE RATE (ft3/min)	0.000
AVG GAS METER TEMP (deg F)	91.5	SAMPLE VOL LEAK CORR'D (ft3)	37.24
PERCENT MOISTURE (%)	21.33	AVG ABS STACK PRESS (in Hg)	29.1507
STD STACK FLOW RATE (DSCFM)	13387	VOL H20 IN METER GAS (SCF)	9.36
		H20 VAPOR IN GAS (vol frac)	0.2133
ISOKINETIC VARIATION (%)	116.55	NOZZLE AREA (ft2)	0.00049
PARTIC. EMISSION RATE (lb/hr)	1.6465	STACK AREA (ft2)	13.303
PARTICULATE CONC (gr/DSCF)	0.0143	STACK GAS MOL WEIGHT, DRY	29.11
PARTIC CONC @ 7% O2 (gr/DSCF)	0.0292		
FUEL F FACTOR DRY (Fd)			
POUNDS PER MILLION BTU	0		

PLANT NAME:Fred Weber Asphalt UNIT: [illegible] & G BATCH PLANT
LOCATION: Peveley, MO DATE: 8/19/93 RUN NO: 1

NUMBER OF POINTS	30	PERCENT OXYGEN (%)	14.00
TIME (min/point)	2.00	PERCENT CARBON DIOXIDE (%)	3.00
LEAK RATE (ft3/min)	0.006	PERCENT CARBON MONOXIDE (%)	0.00
BAR PRESS (in Hg)	29.15	Cp (PITOT COEFFICIENT)	0.840
STATIC PRESS (in H2O)	0.01	NOZZLE DIAMETER (inches)	0.300
STACK EXIT LENGTH (in)	58.00	INITIAL METER VOL (ft3)	202.500
STACK EXIT WIDTH (in)	43.00	FINAL METER VOL (ft3)	241.938
IMPINGER H20 (ml)	190.0	METER CORR FACT (Y)	0.991
SILICA GEL H20 (grams)	7.1	PARTIC COLLECTED (mg)	30.90

POINT NO	STACK TEMP (Ts)	VELOCITY PRESS (dPs)	ORIFICE PRESS (dH)	METER TEMP INLET (Tmi)	METER TEMP OUTLET (Tmo)	METER START 202.500 PER POINT (ft3)	ISOKINETIC (percent)	STACK VEL ft/sec	STANDARD MTR VOL std ft3
1	250	0.25	1.20	80	79	203.600	89.4	34.2	1.04
2	240	0.25	1.20	79	79	205.000	113.1	34.0	1.33
3	241	0.27	1.30	79	79	206.200	93.4	35.3	1.14
4	241	0.55	2.70	79	79	208.100	104.0	50.4	1.81
5	242	0.60	2.90	79	79	209.600	78.7	52.7	1.43
6	242	0.75	3.70	84	80	212.000	112.2	58.9	2.28
7	245	0.20	0.98	84	80	213.200	108.1	30.5	1.13
8	259	0.20	0.98	85	80	214.200	90.9	30.8	0.94
9	255	0.30	1.50	85	80	215.600	103.8	37.6	1.32
10	255	0.50	2.50	85	80	217.200	92.1	48.6	1.51
11	255	0.50	2.50	85	80	219.100	109.4	48.6	1.80
12	268	0.70	3.40	91	80	221.200	102.7	58.0	1.98
13	267	0.15	0.72	90	80	222.200	105.0	26.8	0.94
14	271	0.15	0.72	91	80	223.100	94.7	26.9	0.84
15	271	0.17	0.82	90	80	224.100	98.9	28.6	0.94
16	277	0.30	1.40	91	85	225.200	81.9	38.2	1.03
17	277	0.45	2.20	92	85	226.900	103.5	46.8	1.59
18	276	0.45	2.20	94	85	228.600	103.2	46.7	1.59
19	276	0.15	0.72	92	85	229.600	105.0	27.0	0.93
20	276	0.15	0.72	92	85	230.400	84.0	27.0	0.74
21	276	0.15	0.72	92	85	231.300	94.5	27.0	0.84
22	276	0.15	0.72	92	85	232.400	115.5	27.0	1.02
23	276	0.30	1.40	92	85	233.500	81.8	38.2	1.03
24	276	0.36	1.70	92	87	235.200	115.3	41.8	1.58
25	276	0.35	1.70	92	87	236.400	82.5	41.2	1.12
26	276	0.30	1.40	92	87	237.800	103.9	38.2	1.30
27	274	0.20	0.96	92	87	238.900	99.7	31.1	1.02
28	274	0.15	0.72	92	87	240.000	115.1	26.9	1.02
29	274	0.15	0.72	92	87	240.800	83.7	26.9	0.74
30	274	0.15	0.72	92	87	241.938	119.1	26.9	1.06
AVG	264.5	0.3100	1.504	88.23	82.80	12/30	99.5	37.1	1.23

STACK GAS MOLE WEIGHT (wet)	26.82	AVG ABS STACK TEMP (deg R)	724.5
STACK VELOCITY (ft/sec)	37.14	AVG ABS METER TEMP (deg R)	545.5
STAND VOL SAMPLED (std ft3)	36.84	METER LEAKAGE RATE (ft3/min)	0.000
AVG GAS METER TEMP (deg F)	85.5	SAMPLE VOL LEAK CORRECTED (ft3)	39.44
PERCENT MOISTURE (%)	20.12	AVG ABS STACK PRESS (in Hg)	29.1507
STD STACK FLOW RATE (DSCFM)	21889	TOT VOL H20 IN METER GAS (SCF)	9.28
		VOL METERED GAS (SCF)	36.84
ISOKINETIC SAMPLING RATE (%)	99.03	H20 VAPOR IN GAS (vol frac)	0.201
PARTIC EMISSION RATE (lb/hr)	2.4285	H20 VAPOR IN GAS (%)	20.12
PARTICULATE CONC (gr/DSCF)	0.0129	STACK GAS MOLE WEIGHT (wet)	26.82
PARTIC CONC @ 7% 02 (gr/DSCF)	0.0261	NOZZLE AREA (ft2)	0.00049
STACK EQUIVALENT DIAMETER (in)	49.38614	STACK AREA (ft2)	17.319

SUMMARY OF TEST RESULTS

TABLE I

August 19, 1993

Test Run	Time	Actual Emissions gr/dscf	Emissions lbs/hr	Isokinetic Variation %
1	08:17 - 09:25	0.0129	2.43	98.8
2	10:38 - 11:44	0.0143	2.46	101.3
3	12:47 - 13:35	0.0091	1.62	101.2
Avg:		0.0121	2.17	

On the basis of these test results, the average grain loading of the three test runs is below the .04 gr/DSCF allowable emissions limitation set by EPA and the State of Missouri. Therefore, the plant is operating in compliance with State and Federal standards.

3. TEST PROCEDURES

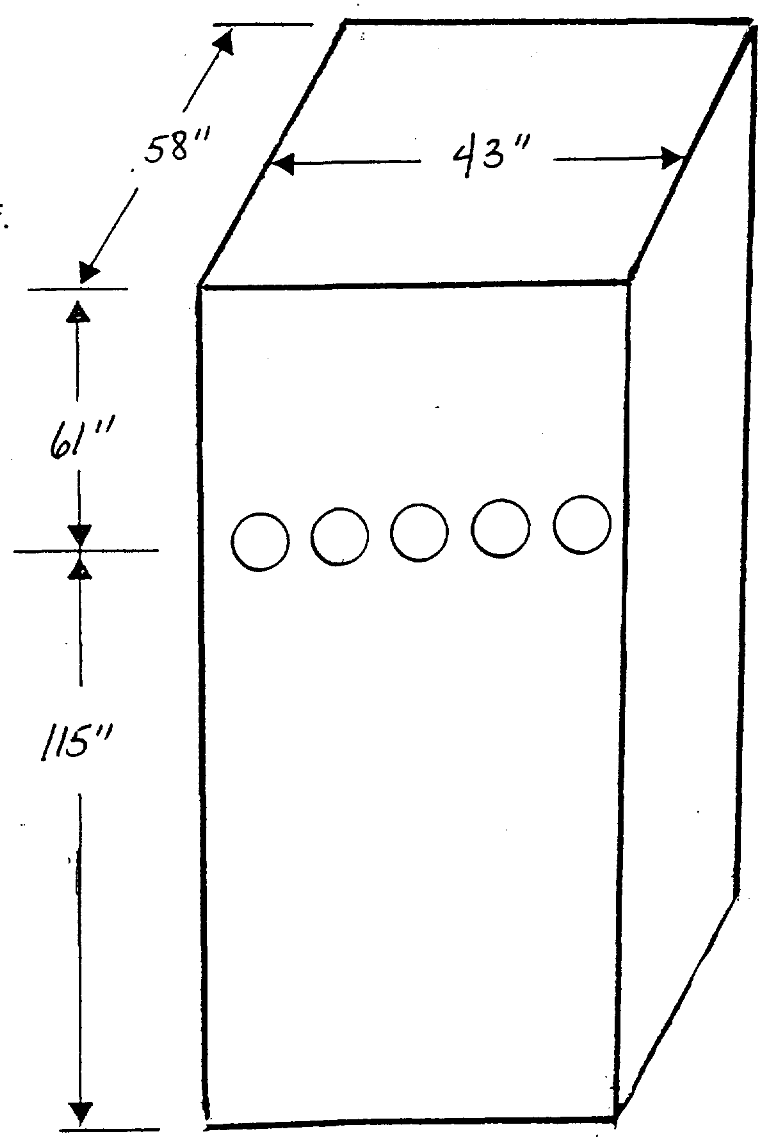
(a) Method Used: Method 5 source sampling was conducted in accordance with requirements of the U.S. Environmental Protection Agency as set forth in 39 FR 9314, March 8, 1974, 60.93, as amended.

(b) Problems Encountered: No problems were encountered that affected testing.

(c) Sampling Site: The emissions test was conducted after a baghouse on a rectangular stack measuring 58" x 43" with an equivalent diameter of 49.38". Five (5) sampling ports were placed 61" down (1.2 diameters upstream) from the top of the stack and 115" up (2.3 diameters downstream) from the last flow disturbance. The ports were evenly spaced on 8.6" centers. The two outside ports are 4.3" from the side walls of the stack. Thirty (30) points were sampled, six (6) through each port for two (2) minutes each for a total testing time of sixty (60) minutes.

Points on a Diameter	Probe Mark*
1	10.8"
2	20.5"
3	30.2"
4	39.8"
5	49.5"
6	59.1"

* Measurements include a 6" standoff.



SECTION B:

THE SOURCE

THE SOURCE

Fred Weber, Inc. employs an H&B batch mix asphalt plant which is used to manufacture hot mix asphalt for road pavement. The process consists of blending prescribed portions of cold feed materials (sand, gravel, screenings, chips, etc.) uniformly and adding sufficient hot asphalt oil to bind the mixture together. After the hot asphalt mix is manufactured at the plant, it is transported to the location where it is to be applied. The hot asphalt mix is spread evenly over the surface with a paver then compacted with a heavy roller to produce the final product.

The following is a general description of the plant's manufacturing process: The cold feed materials (aggregate) are dumped into separate bins which in turn feed a common continuous conveyor. The aggregate is dispensed from the bins in accordance with the desired formulation onto the cold feed system conveyor, to an inclined weigh conveyor, then to a rotating drum for continuous mixing and drying at approximately 300°F. When recycled asphalt mix is used, it is added directly into the pugmill. The dried aggregate is pulled by a bucket elevator to the top of a gradation control unit which separates and stores the aggregate by size. The required amount of each aggregate is dispensed into a weigh-hopper and from there into a pugmill where the hot liquid asphalt pavement is mixed thoroughly with the aggregate. The hot asphalt mix is then discharged from the storage silo through a slide gate into waiting dump trucks which transports the material to a final destination for spreading. The rated capacity of the plant will vary with each aggregate mix and moisture content with a 5% surface moisture removal.

The mixer uses a burner fired with propane to heat air to dry the aggregate. The air is drawn into the system via an exhaust fan. After passing through the gas burner, the air passes through a baghouse. The baghouse is manufactured by H&B. The exhaust gas is drawn through the baghouse and discharged to the atmosphere through the stack. The design pressure drop across the tube sheet is 2 - 6 inches of water. The particulate matter, which is removed by the baghouse, is reinjected into the pugmill.

rm C#0

DATA ON FACILITY BEING STACK TESTED

TODAY'S DATE: 8/19/93

COMPANY NAME: Fred Weber, Inc. COMPANY REP.: Matt Kinsella PHONE: (314) 344-0070

LOCATION OF FACILITY: Pevely, MO. ORIGINAL START-UP DATE: ________ DESIGNED CAPACITY: ________

OEM: H+B MODEL NO.: 850-8832 TYPE: Batch AC TYPE: AC-20

1 Time (24 HR) NOTE: check small box in column when moisture sample is taken	2 Fuel Use #Fuel Oil / Nat. Gas / Propane ✓ / Coal / other	3 Burner Setting	4 Blower Pressure	5 Production Rate ✓ Mix Aggregate TPH	5 Production Rate RAP TPH	6 Asphalt Cement %	7 set pt. Mix Temp. °F	8 Exhaust Gas Temp. °F	9 ~~Venturi Scrubber~~ ✓ Baghouse Pressure Drop in w.g.	9 Water Pressure psi	10 Ambient Temp. °F	11 Relative Humidity %	12 Exhaust Damper Position
8:19		16%		150		5.3	365	260	2		77	80	50%
8:35		22%		150		"	378	267	2		"	"	"
8:50		28%		"		"	373	277	2		"	"	50%
9:05		23%		"		"	379	279	2		"	"	50%
9:20		19%		"		"	378	265	2		79	80	50%
10:40		18%		150		5.3	365	240	2		83	75	50%
10:55		20%		"		5.3	373	261	2		83	75	50%
11:10		21%		150		"	375	265	2		85	70	50%
11:25		18%		150		"	379	270	2		85	70	50%
11:40		19%		150		5.3	375	272	2		85	70	"
12:50		23%		150		5.3	383	251	2		93	65	50%
1:05		18%		"		"	369	265	2		93	60	50%
1:20		20%		150		5.3	378	272	2		94	60	50%
1:35		19%		150		5.3	377	267	2		94	60	50%
1:50		26%		"		"	376	272	2		94	"	"

DATA SUMMARY ON STACK BEING TESTED

AGGREGATE

1. Name/type of mix Commercial mix
2. Name/type of 2nd mix (if used) Commercial "C" mix
3. Type/temperature of Liquid Asphalt ______ / 320°F
4. Sieve/Screening analysis: ______ % Passing; ______ Moisture on Aggregate

	1st mix / 2nd mix		1st mix / 2nd mix		1st mix / 2nd mix
1"	___ / ___	3/8"	___ / ___	# 8	49 / 45
3/4"	___ / ___	#200	8 / 7	# 30	23 / 21
1/2"	100 / 98	# 4	72 / 65	# ___	___ / ___

CONTROL SYSTEM

Manufacturer: Webcom (Fred Weber, Inc)

A. Baghouse:

1. Type of bags: 14 oz. nomex # of bags 520 Sq. ft. of bags 6812
2. Air to cloth ratio: 5.9 to 1 Designed ACFM 40,100
3. Type of cleaning - pulse jet ✓ reverse air ______ plenum pulse ______ other ______
4. Cleaning cycle time: ______ Interval between cleaning cycle: 17 sec.
5. Pulse pressure on cleaning cycle: 110 psi

B. Scrubber:

1. Type - Venturi: ______ Wet Washer: ______
   Spray Booth: ______ Other: ______
2. Gallons per minute through system: ______
3. Water source: ______ (i.e., pond, lagoon, etc.)
4. Number of spray nozzles: ______

Company Name: ______ Date: ______

Company Representative: ______

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SECTION C:

EQUIPMENT USED

EQUIPMENT USED

Equipment used to conduct the particulate emissions test was:

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

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

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

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

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

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

SECTION D:

LABORATORY PROCEDURES AND RESULTS

LABORATORY PROCEDURES FOR PARTICULATE SAMPLING

I. Field Preparation

A. FILTERS: Fiberglass 4" sampling filters are prepared as follows:

Filters are removed from their box and numbered on the back side with a felt pen. The numbering system is continuous from job to job. The filters are placed in a desiccator to dry for at least 24 hours. Clean plastic petri dishes, also numbered, top and bottom, are placed in the desiccator with the filters. After desiccation, the filters are removed, one at a time, and weighed on the Sartorius analytical balance then placed in the correspondingly numbered petri dish. Weights are then recorded in the lab record books. Three filters are used for each complete particulate source emissions test and there should be several extra filters included as spares.

B. SILICA GEL: Silica Gel used for the test is prepared as follows:

Approximately 200 g of silica gel is placed in a wide mouth "Mason" type jar and dried in an oven at 175°C for two hours. The open jars are removed and placed in a desiccator until cool for two hours and then tightly sealed. The jars are then numbered and weighed on the triple beam balance to the closest tenth of a gram. This weight is recorded for each sealed jar. The number of silica gel jars used is the same as the number of filters. Silica gel should be indicating type, 6-16 mesh.

II. Post - Testing Lab Analysis

A. FILTERS: The filters are returned to the lab in their sealed petri dishes. In the lab, the dishes are opened and placed into a desiccator for at least 24 hours. Then the filters are weighed continuously every six hours until a constant weight is achieved. All data is recorded on the laboratory forms that will be bound in the test report.

B. SILICA GEL: The silica gel used in the stack test is returned to the appropriate mason jar and sealed for transport to the laboratory where it is reweighed to a constant weight on a triple beam balance to the nearest tenth of a gram.

C. PROBE RINSINGS: In all tests where a probe washout analysis is necessary, this is accomplished in accordance with procedures specified in "EPA Reference Method 5". These samples are returned to the lab in sealed mason jars for analysis. The front half of the filter holder is washed in accordance with the same procedures and included with the probe wash. Reagent or ACS grade acetone is used as the solvent. The backhalf of the filter holder is washed with deionized water into the impinger catch for appropriate analysis.

D. IMPINGER CATCH: In some testing cases, the liquid collected in the impingers must be analyzed for solid content. This involves a similar procedure to the probe wash solids determination, except that the liquid is deionized water.

E. ACETONE: A blank analysis of acetone is conducted from the one gallon glass container used in the field preparation. This acetone was used in the field for rinsing the probe, nozzle, and top half of the filter holder. A blank analysis is performed prior to testing on all new containers of acetone received from the manufacturer to insure that the quality of the acetone used will be exceed the .001% residual purity standard.

SPECIAL NOTE

When sampling sources high in moisture content, (such as asphalt plants) the filter paper sometimes sticks to the filter holder. When removing the filter, it may tear. In order to maintain control of any small pieces of filter paper which may be easily lost, they are washed with acetone into the probe washing. This makes the filter weight light (sometimes negative) and the probe wash correspondingly heavier. this laboratory procedure is taught by EPA in the "Quality Assurance for Source Emissions Workshop" at Research Triangle Park and is approved by EPA.

WEIGHING PROCEDURE - SARTORIUS ANALYTICAL BALANCE

The Sartorius balance is accurate to 0.1 mg and has a maximum capacity of 200 grams. The balance precision (standard deviation) is 0.05 mg. Before weighing an item, the balance should first be zeroed. This step should be taken before every series of weighings. To do this, the balance should have all weight adjustments at the "zero" position. The beam arrest lever (on the lower left hand side toward the rear of the balance) is then slowly pressed downward to the full release position. The lighted vernier scale on the front of the cabinet should align with the "zero" with the mark on the cabinet. If it is not so aligned, the adjustment knob on the right hand side (near the rear of the cabinet) should be turned carefully until the marks align. Now return the beam arrest to the horizontal arrest position. The balance is now "zeroed".

To weigh an item, it is first placed on the pan. And the sliding doors are closed to avoid air current disturbance. The weight adjustment knob on the right hand side must be at "zero". The beam arrest is then slowly turned upward. The lighted scale at the front of the cabinet will now indicate the weight of the item in grams. If the scale goes past the divided area, the item then exceeds 100 g weight (about 3-1/2 ounces) and it is necessary to arrest the balance (beam arrest lever) and move the lever for 100 g weight away from you. It is located on the left hand side of the cabinet near the front, and is the knob closest to the side of the cabinet. The balance will not weigh items greater than 200 grams in mass, and trying to do this might harm the balance. Remember, this is a delicate precision instrument.

After the beam is arrested in either weight range, the procedure is the same. When the weight of the item in grams is found, "dial in" that amount with the two knobs on the left hand side (near the 100 g lever) color coded yellow and green. As you dial the weight, the digits will appear on the front of the cabinet. When the proper amount is dialed, carefully move the arrest lever down with a slow, steady turn of the wrist. The lighted dial will appear, and the right hand side knob (front of cabinet) is turned to align the mark with the lower of the two lighted scale divisions which the mark appears between. when these marks are aligned, the two lighted digits along with the two indicated on the right hand window on the cabinet front are fractional weight in grams (the decimal would appear before the lighted digits) and the whole number of grams weight is the amount "dialed in" on the left.

In general, be sure that the beam is in "arrest" position before placing weight on or taking weight off of the pan. Don't "dial in" weight unless the beam is arrested. The balance is sensitive to even a hand on the table near the balance, so be careful and painstaking in every movement while weighing.

Form REC#8

SAMPLE ANALYTICAL DATA FORM

Company Name Fred Webber

Sample Location ____________________

Relative Humidity in Lab __

Blank Volume (V_a) 100 ml

Density of Acetone (ρ_a) .7857 [illegible]

Date/Time wt. blank 8/23 8:00A

Gross wt. 100.0192 g

Date/Time wt. blank 8/24 8:00A

Gross wt. 100.0191 g

Ave. Gross wt. 100.0192 g

Tare wt. 100.0191 g

Weight of blank (m_{ab}) .0001 g

Acetone blank residue concentration (C_a) : (C_a) = (m_{ab}) / (V_a) (ρ_a) = (.000001 mg/g)

Acetone Blank Wt. : $W_a = C_a V_{aw} \rho_a$ = (.000001) (400) (.7857) = (.0003 g)

		Run # 1	Run # 2	Run # 3
Acetone rinse volume (V_{aw})	ml	400	400	400
Date/Time of wt. 8/23 8:00A Gross wt.	g	164.6925	155.9670	155.1820
Date/Time of wt. 8/4 8:00A Gross wt.	g	164.6920	155.9665	155.1815
Average Gross wt.	g	164.6923	155.9668	155.1818
Tare wt.	g	164.6652	155.9371	155.1624
Less Acetone blank wt. (W_a)	g	.0003	.0003	.0003
Weight of particulate in acetone rinse (m_a)	g	.0268	.0294	.0191

Filter Numbers	#	TJ00307	TJ00388	TJ00387
Date/Time of wt. 8/23 8:00A Gross wt.	g	.5865	.5819	.5850
Date/Time of wt. 8/24 8:00A Gross wt.	g	.5863	.5817	.5848
Average Gross wt.	g	.5864	.5818	.5849
Tare wt.	g	.5823	.5791	.5829

Weight of particulate on filter (m_f)	g	.0041	.0027	.0020
Weight of particulate in acetone rinse (m_a)	g	.0268	.0294	.0191
Total weight of particulate (m_n)	g	.0309	.0321	.0211

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

Remarks: ____________________

Signature of Analyst Thomas South Signature of Reviewer ____________________

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SECTION E:

CALCULATIONS

NAME: Fred Weber, Inc.
LOCATION: Peveley, Missouri

DATE: August 19, 1993

SUMMARY OF TEST DATA

			08-19-93	08-19-93	08-19-93
			Run #1	Run #2	Run #3
		start	08:17	10:38	12:47
		finish	09:25	11:44	13:35
	SAMPLING TRAIN DATA				
1.	Sampling time, minutes	Θ	60.00	60.00	60.00
2.	Sampling nozzle diameter, inches	D_n	0.300	0.300	0.300
3.	Sampling nozzle cross-section area, ft^2	A_n	0.000491	0.000491	0.000491
4.	Isokinetic variation	I	98.8	101.3	101.2
5.	Sample gas volume — meter condition, cf	V_m	39.438	37.259	38.951
6.	Average meter temperature, °R	T_m	546	551	555
7.	Average orifice pressure drop, inches H_2O	ΔH	1.50	1.29	1.37
8.	Total particulate collected, mg.	M_n	30.90	32.10	21.10
	VELOCITY TRAVERSE DATA				
9.	Stack area, ft^2	A	17.32	17.32	17.32
10.	Absolute stack gas pressure, inches Hg.	P_s	29.15	29.15	29.15
11.	Barometric pressure, inches Hg.	P_{bar}	29.15	29.15	29.15
12.	Average absolute stack temperature, R°	T_s	725	727	728
13.	Average √vel. head, (C_p = .84)	√dP	0.54	0.50	0.52
14.	Average stack gas velocity, ft/second	V_s	37.33	34.67	36.10
	STACK MOISTURE CONTENT				
15.	Total water collected by train, ml	V_{ic}	197.10	198.80	206.70
16.	Moisture in stack gas, percent (%)	B_{ws}	19.94	21.20	21.45
	EMISSIONS DATA				
17.	Stack gas flow rate, dscf/hr	Q_{sd}	1,322,122.7	1,205,263.1	1,249,275.5
18.	Stack gas flow rate, cfm	acfm	38,791	36,027	37,513
19.	Particulate concentration, gr/dscf	C_s	0.0129	0.0143	0.0091
20.	Particulate concentration, lb/hr	E	2.43	2.46	1.62
	ORSAT DATA				
21.	Percent CO_2 by volume	CO_2	3.0	3.4	3.3
22.	Percent O_2 by volume	O_2	14.1	14.1	14.3
23.	Percent CO by volume	CO	0.0	0.0	0.0
24.	Percent N_2 by volume	N_2	82.9	82.5	82.4

Format: summryR3/19-000

NAME: Fred Weber, Inc. **DATE:** August 19, 1993
LOCATION: Peveley, Missouri

DRY GAS VOLUME

$$V_{m(std)} = V_m \left[\frac{T_{(std)}}{T_m}\right] \left[\frac{P_{bar} + \frac{\Delta H}{13.6}}{P_{std}}\right] = 17.64 \frac{°R}{\text{in. Hg}} Y V_m \left[\frac{P_{bar} + \frac{\Delta H}{13.6}}{T_m}\right]$$

Where:

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

Run #1:

$$V_{m(std)} = (17.64)\ (0.991)\ (39.438) \left[\frac{(29.15) + \frac{1.50}{13.6}}{546}\right] = 36.946 \quad \text{dscf}$$

Run #2:

$$V_{m(std)} = (17.64)\ (0.991)\ (37.259) \left[\frac{(29.15) + \frac{1.29}{13.6}}{551}\right] = 34.570 \quad \text{dscf}$$

Run #3:

$$V_{m(std)} = (17.64)\ (0.991)\ (38.951) \left[\frac{(29.15) + \frac{1.37}{13.6}}{555}\right] = 35.887 \quad \text{dscf}$$

NAME: Fred Weber, Inc. **DATE:** August 19, 1993
LOCATION: Peveley, Missouri

TOTAL CONTAMINANTS BY WEIGHT: GRAIN LOADING

Particulate Concentration: C_s' gr/dscf

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

Where:

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

M_n = Total amount of particulate matter collected, mg.

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

Run #1:

$$C_s' = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{30.90}{36.946}\right] = 0.0129 \text{ gr/dscf}$$

Run #2:

$$C_s' = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{32.10}{34.570}\right] = 0.0143 \text{ gr/dscf}$$

Run #3:

$$C_s' = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{21.10}{35.887}\right] = 0.0091 \text{ gr/dscf}$$

NAME: Fred Weber, Inc.
LOCATION: Peveley, Missouri

DATE: August 19, 1993

DRY MOLECULAR WEIGHT

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

Where:

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

Run #1:

$$M_d = \mathbf{0.44\ (3.0\%) + 0.32\ (14.1\%) + 0.28\ (.00\% + 82.9\%) = 29.04}\ \frac{\mathbf{lb}}{\mathbf{lb\text{-}mole}}$$

Run #2:

$$M_d = \mathbf{0.44\ (3.4\%) + 0.32\ (14.1\%) + 0.28\ (.00\% + 82.5\%) = 29.11}\ \frac{\mathbf{lb}}{\mathbf{lb\text{-}mole}}$$

Run #3:

$$M_d = \mathbf{0.44\ (3.3\%) + 0.32\ (14.3\%) + 0.28\ (.00\% + 82.4\%) = 29.10}\ \frac{\mathbf{lb}}{\mathbf{lb\text{-}mole}}$$

NAME: Fred Weber, Inc. **DATE:** August 19, 1993
LOCATION: Peveley, Missouri

WATER VAPOR CONDENSED

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

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

Where:

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

Run #1:

$$V_{wc(std)} = (0.04707)\ (\ 190.00\ ) = 8.9 \text{ cu. ft}$$
$$V_{wsg(std)} = (0.04715)\ (\ 7.10\ ) = 0.3 \text{ cu. ft}$$

Run #2:

$$V_{wc(std)} = (0.04707)\ (\ 192.00\ ) = 9.0 \text{ cu. ft}$$
$$V_{wsg(std)} = (0.04715)\ (\ 6.80\ ) = 0.3 \text{ cu. ft}$$

Run #3:

$$V_{wc(std)} = (0.04707)\ (\ 201.00\ ) = 9.5 \text{ cu. ft}$$
$$V_{wsg(std)} = (0.04715)\ (\ 5.70\ ) = 0.3 \text{ cu. ft}$$

NAME: Fred Weber, Inc. **DATE:** August 19, 1993
LOCATION: Peveley, Missouri

MOISTURE CONTENT OF STACK GASES

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

Where:

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

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

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

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

Run #1:

$$B_{ws} = \frac{8.9 + 0.3}{8.9 + 0.3 + 36.946} \times 100 = 19.94\ \%$$

Run #2:

$$B_{ws} = \frac{9.0 + 0.3}{9.0 + 0.3 + 34.570} \times 100 = 21.20\ \%$$

Run #3:

$$B_{ws} = \frac{9.5 + 0.3}{9.5 + 0.3 + 35.887} \times 100 = 21.45\ \%$$

MOLECULAR WEIGHT OF STACK GASES

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

Where:

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

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

Run #1:

$$M_s = 29.04 \ (1 - 0.1994) + 18 \ (0.1994) = 26.84 \ \frac{lb}{lb\text{-}mole}$$

Run #2:

$$M_s = 29.11 \ (1 - 0.2120) + 18 \ (0.2120) = 26.75 \ \frac{lb}{lb\text{-}mole}$$

Run #3:

$$M_s = 29.10 \ (1 - 0.2145) + 18 \ (0.2145) = 26.72 \ \frac{lb}{lb\text{-}mole}$$

NAME: Fred Weber, Inc.
LOCATION: Peveley, Missouri

DATE: August 19, 1993

STACK GAS VELOCITY

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

Where:

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

Run #1:

$$V = (85.49) \ (0.84) \ (0.54) \sqrt{\frac{725}{(29.15) \ (26.84)}} = 37.33 \text{ ft/sec}$$

Run #2:

$$V = (85.49) \ (0.84) \ (0.50) \sqrt{\frac{727}{(29.15) \ (26.75)}} = 34.67 \text{ ft/sec}$$

Run #3:

$$V = (85.49) \ (0.84) \ (0.52) \sqrt{\frac{728}{(29.15) \ (26.72)}} = 36.10 \text{ ft/sec}$$

NAME: Fred Weber, Inc. **DATE:** August 19, 1993
LOCATION: Peveley, Missouri

STACK GAS FLOW RATE

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

Where:

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

Run #1: Q_{sd} =

$$3600 \; (1 - 0.1994) \; (37.33) \; (17.32) \left[\frac{528}{725} \right] \left[\frac{29.15}{29.92} \right] = 1{,}322{,}122.7 \; \frac{dscf}{hr}$$

Run #2: Q_{sd} =

$$3600 \; (1 - 0.2120) \; (34.67) \; (17.32) \left[\frac{528}{727} \right] \left[\frac{29.15}{29.92} \right] = 1{,}205{,}263.1 \; \frac{dscf}{hr}$$

Run #3: Q_{sd} =

$$3600 \; (1 - 0.2145) \; (36.10) \; (17.32) \left[\frac{528}{728} \right] \left[\frac{29.15}{29.92} \right] = 1{,}249{,}275.5 \; \frac{dscf}{hr}$$

NAME: Fred Weber, Inc. **DATE:** August 19, 1993
LOCATION: Peveley, Missouri

EMISSIONS RATE FROM STACK

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

Where:

E = Emissions rate, lbs/hr.

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

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

Run #1:

$$\mathbf{E = \frac{(0.0129)\ (1{,}322{,}122.7)}{7000} = 2.43\ lb/hr}$$

Run #2:

$$\mathbf{E = \frac{(0.0143)\ (1{,}205{,}263.1)}{7000} = 2.46\ lb/hr}$$

Run #3:

$$\mathbf{E = \frac{(0.0091)\ (1{,}249{,}275.5)}{7000} = 1.62\ lb/hr}$$

NAME: Fred Weber, Inc. **DATE:** August 19, 1993
LOCATION: Peveley, Missouri

ISOKINETIC VARIATION

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

Where:

I	=	Percent isokinetic sampling.
100	=	Conversion to percent.
T_s	=	Absolute average stack gas temperature, °R.
0.002669	=	Conversion factor, Hg - ft³/ml - °R.
V_{ic}	=	Total volume of liquid collected in impingers and silica gel, ml.
T_m	=	Absolute average dry gas meter temperature, °R.
P_{bar}	=	Barometric pressure at sampling site, in. Hg.
ΔH	=	Average pressure differential across the orifice meter, in. H_2O.
13.6	=	Specific gravity of mercury.
60	=	Conversion seconds to minutes.
Θ	=	Total sampling time, minutes.
V_s	=	Stack gas velocity, ft/sec.
P_s	=	Absolute stack gas pressure, in. Hg.
A_n	=	Cross sectional area of nozzle, ft².
Y_i	=	Calibration factor.

Run #1:

$$I = (100)\ (725) \left[\frac{(0.002669)\ (197.10) + \frac{(0.991)\ (39.438)}{546}\left[29.15 + \frac{1.50}{13.6}\right]}{60\ \ (60.00)\ \ (37.33)\ \ (29.15)\ \ (0.000491)} \right] = 98.8\%$$

Run #2:

$$I = (100)\ (727) \left[\frac{(0.002669)\ (198.80) + \frac{(0.991)\ (37.259)}{551}\left[29.15 + \frac{1.29}{13.6}\right]}{60\ \ (60.00)\ \ (34.67)\ \ (29.15)\ \ (0.000491)} \right] = 101.3\%$$

Run #3:

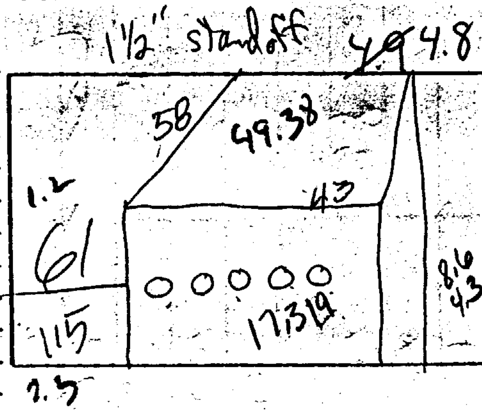
$$I = (100)\ (727) \left[\frac{(0.002669)\ (206.70) + \frac{(0.991)\ (38.951)}{555}\left[29.15 + \frac{1.37}{13.6}\right]}{60\ \ (60.00)\ \ (36.10)\ \ (29.15)\ \ (0.000491)} \right] = 101.2\%$$

SECTION F:

FIELD DATA

RAMCON ENVIRONMENTAL CORPORATION

Plant: Fred Weber
Location: Pevely Mo.
Operator: Allen Turner
Date: 8-19-93
Run No.: 1
Sample Box No.: 1
Meter Box No.: nutech
Meter H @: 1.94
C Factor: .991
Pitot Tube Coefficient Cp: .84



Schematic of Stack Cross Section

Ambient Temperature: 77
Barometric Pressure: 29.15
Assumed Moisture, %: 2
Probe Length, m(ft): 6 ft
Nozzle Identification No.: .0004909
Avg. Calibrated Nozzle Dia., (in.): .30/.30/.30
Probe Heater Setting: 250
Leak Rate, m^3/min. (cfm): .006 at 8 in Hg
Probe Liner Material: Stainless steel
Static Pressure, mm Hg (in. Hg): +.01
Filter No.: TS-00307

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	390	438.5
INITIAL	200	431.4
DIFFERENCE	190	7.1

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_S) °F	VELOCITY HEAD (P_S) in H20	PRESSURE DIFF. ORF. MTR in H20	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	GAS SAMPLE TEMP. AT DRY GAS METER °F Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
1	8:17 / 8:19	3	250	.25	1.2	202.5 / 203.6	80	79	246	68
2	8:21	3	240	.25	1.2	205.0	79	79	247	65
3	8:23	3	241	.27	1.3	206.2	79	79	251	60
4	8:25	3	241	.55	2.7	208.1	79	79	251	60
5	8:27	3	242	.60	2.9	209.6	79	79	251	61
6	8:29	5	242	.75	3.7	212.0	84	80	254	61
1	8:32 / 8:34	2	245	.20	.98	213.2	84	80	252	63
2	8:36	2	259	.20	.98	214.2	85	80	257	65
3	8:38	3	255	.30	1.5	215.6	85	80	258	65
4	8:40	3	255	.50	2.5	217.2	85	80	258	65
5	8:42	8	255	.50	2.5	219.1	85	80	258	65
6	8:44	5	268	.70	3.4	221.2	91	80	258	65
1	8:46 / 8:48	2	267	.15	.72	222.2	90	80	257	65

Form #REC-05

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 8-19-93 LOCATION Purdy/mo TEST NO. 1

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM ~~mm~~ Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft^3)	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
2	8:50	2	271	.15	.72	223.1	91	80	256	65
3	8:52	2	271	.17	.82	224.1	90	80	256	65
4	8:54	3	277	.30	1.4	225.2	91	85	252	65
5	8:56	5	277	.45	2.2	226.9	92	85	252	65
6	8:58	5	276	.45	2.2	228.6	94	85	252	66
1	9:00/9:02	2	276	.15	.72	229.6	92	85	254	65
2	9:04	2	276	.15	.72	230.4	92	85	254	65
3	9:06	2	276	.15	.72	231.3	92	85	252	67
4	9:08	2	276	.15	.72	232.4	92	85	252	67
5	9:10	3	276	.30	1.4	233.5	92	85	252	67
6	9:12	3	276	.36	1.7	235.2	92	87	252	67
1	9:13/9:15	3	276	.35	1.7	236.4	92	97	252	67
2	9:17	3	276	.30	1.4	237.8	92	87	252	67
3	9:19	2	274	.20	.96	238.9	92	87	250	67
4	9:21	2	274	.15	.72	240.0	92	87	250	67
5	9:23	2	274	.15	.72	240.8	92	87	250	67
6	9:25	2	274	.15	.72	241.938	92	87	250	67

RAMCON ENVIRONMENTAL CORPORATION

Plant: Fred Weber 4.8
Location: Pevely, Mo.
Operator: Allen Turner
Date: 8-19-93
Run No.: 2
Sample Box No.: 1
Meter Box No.: Nutech
Meter H @: 1.94
C Factor: .991
Pitot Tube Coefficient Cp: .84

Schematic of Stack Cross Section

Ambient Temperature: 72
Barometric Pressure: 29.15
Assumed Moisture, %: 28
Probe Length, m(ft): 6 ft
Nozzle Identification No.: .0004909
Avg. Calibrated Nozzle Dia., (in.): .30/.35/.30
Probe Heater Setting: Low
Leak Rate, m3/min.(cfm): .015 at 8 in Hg
Probe Liner Material: stainless steel
Static Pressure, mm Hg(in.Hg): +.01
Filter No.: TS-00388

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	392	418.2
INITIAL	200	412.4
DIFFERENCE	192	6.8

TRAV. PT NO.	SAMPLING TIME (θ)min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H20	PRESSURE DIFF. ORF. MTR in H20	GAS SAMPLE VOLUME ft3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	GAS SAMPLE TEMP. AT DRY GAS METER °F Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
1	10:38 / 10:40	2	270	.25	1.2	242.2 / 243.5	93	85	258	60
2	10:42	2	270	.25	1.2	244.4	93	85	258	60
3	10:44	3	271	.25	1.2	245.6	93	86	260	64
4	10:46	3	271	.30	1.4	247.2	93	86	260	65
5	10:48	5	268	.56	2.7	248.6	93	87	260	68
6	10:50	5	268	.60	2.9	250.8	95	87	254	65
1	10:51 / 10:53	2	268	.20	.96	251.9	95	87	254	65
2	10:55	2	263	.20	.96	253.0	95	88	254	65
3	10:57	2	263	.15	.72	254.2	95	88	260	63
4	10:59	2	260	.43	2.1	255.2	95	88	260	63
5	11:01	3	263	.43	2.1	256.7	95	88	260	63
6	11:03	4	263	.55	2.6	258.7	95	89	260	63
1	11:04 / 11:06	2	264	.18	.86	260.1	95	89	260	63

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 9-19-93 LOCATION [illegible] TEST NO. 2

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft^3)	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
2	11:08	2	265	.15	.72	261.1	95	90	254	63
3	11:10	2	265	.20	.96	261.8	95	90	254	63
4	11:12	2	265	.20	.96	262.8	95	90	254	63
5	11:14	2	268	.35	1.7	264.4	95	90	254	63
6	11:16	2	268	.55	~~1.7~~ 2.6	266.3	95	90	254	63
1	~~11:18~~ 11:20	2	265	.15	.72	267.3	93	90	254	63
2	11:22	2	265	.15	.72	268.2	93	90	254	63
3	11:24	2	265	.15	.72	269.2	93	90	254	63
4	11:26	2	265	.15	.72	270.2	94	90	258	63
5	11:28	2	272	.18	.86	271.2	94	90	268	63
6	11:30	2	272	.25	1.2	272.6	94	×90	268	65
1	~~11:32~~ 11:34	2	272	.25	1.2	273.8	94	90	268	65
2	11:36	2	274	.30	1.4	274.9	94	90	268	67
3	11:38	2	270	.25	1.2	276.3	94	90	268	67
4	11:40	2	270	.15	.72	277.4	94	90	268	67
5	11:42	2	271	.15	.72	278.3	94	90	265	66
6	11:44	2	271	.15	.72	279.459	94	90	265	66

RAMCON ENVIRONMENTAL CORPORATION

Plant: Fred Weber
Location: Pevely Mo.
Operator: Albert Jones
Date: 8-19-93
Run No.: 3
Sample Box No.: 1
Meter Box No.: Nutech
Meter H @: 1.94
C Factor: .991
Pitot Tube Coefficient Cp: .84

4.8

Schematic of Stack Cross Section

Ambient Temperature: 77
Barometric Pressure: 29.15
Assumed Moisture, %: 21
Probe Length, m(ft): 6 ft
Nozzle Identification No.: 0004909
Avg. Calibrated Nozzle Dia., (in.): .30/.30/.30
Probe Heater Setting: Low
Leak Rate, m^3/min. (cfm): 0 at 8 in
Probe Liner Material: stainless steel
Static Pressure, mm Hg (in. Hg): +.01
Filter No.: TS-00387

	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	401	334.6
INITIAL	200	328.9
DIFFERENCE	201	5.7

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H20	PRESSURE DIFF. ORF. MTR in H20	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	GAS SAMPLE TEMP. AT DRY GAS METER °F Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
1	12:47 / 12:49	3	265	.32	1.5	280.1 / 281.4	92	90	225	60
2	12:51	3	265	.32	1.5	282.7	92	90	225	60
3	12:53	3	268	.20	.96	284.0	92	90	225	60
4	12:55	3	268	.15	.72	285.0	92	90	225	63
5	12:57	3	265	.15	.72	286.0	96	90	225	63
6	12:59	3	265	.15	.72	287.1	96	90	240	63
1	1:00-30 / 1:02-30	3	263	.15	.72	287.9	96	92	248	63
2	1:04-30	3	263	.25	1.2	289.4	96	92	244	64
3	1:06-30	3	263	.25	1.2	290.6	96	92	244	64
4	1:08-30	3	263	.25	1.2	291.6	96	92	244	64
5	1:10-30	3	265	.25	1.2	293.0	100	92	244	64
6	1:12-30	3	268	.20	.96	294.1	100	92	244	63
1	1:14 / [illegible]	3	268	.30	1.4	295.3	100	92	244	63

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 8-19-93 LOCATION [illegible] TEST NO. 3

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft^3)	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
2	1:19	3	274	.25	1.2	296.4	100	92	252	68
3	1:20	3	284	.25	1.2	297.6	100	92	252	68
4	1:22	3	274	.15	.72	298.8	100	92	252	68
5	1:24	3	274	.38	1.8	300.1	100	93	254	68
6	1:26	5	274	.72	3.5	302.3	100	94	255	63
1	~~1:29~~ 1:31	3	265	.20	.96	303.3	100	94	255	63
2	1:33	3	268	.20	.96	304.4	100	94	255	63
3	1:35	4	268	.30	1.4	305.8	100	94	254	63
4	1:37	4	269	.44	2.1	307.3	100	94	254	63
5	1:39	4	269	.47	2.3	309.2	100	94	254	63
6	1:41	4	269	.40	1.9	310.8	100	94	254	63
1	~~1:42-30~~ 1:44-30	4	268	.30	1.4	312.1	100	94	254	60
2	1:46-30	4	268	.30	1.4	313.3	100	94	254	60
3	1:48-30	3	268	.20	.96	314.5	100	94	247	61
4	1:50-30	3	268	.20	.96	315.6	100	94	247	61
5	1:52-30	3	268	.45	2.2	317.6	100	94	247	63
6	1:54-30	3	268	.45	2.2	319.051	100	94	247	63

Fred Weber
Company Name

8-19-93
Date

REFERENCE METHOD 3: GAS ANALYSIS BY FYRITE

FUEL	F_o FACTORS
WOOD	1.0540
BARK	1.0830
ANTHRACITE	1.0699
BITUMINOUS	1.1398
LIGNITE	1.0761
OIL	1.3465
GAS	1.7489
PROPANE	1.5095
BUTANE	1.4791

$$O_2\% = 20.9 - [F_o \times CO_2\%]$$

RUN #1: ____ = 20.9 - [____ x ____]

RUN #2: ____ = 20.9 - [____ x ____]

RUN #3 ____ = 20.9 - [____ x ____]

RUN 1:	$CO_{2\%}$	3.0	$CO_{2\%}$	3.0	$CO_{2\%}$	3.0	AVG.	
	$O_{2\%}$	14.0	$O_{2\%}$	14.2	$O_{2\%}$	14.0	AVG.	
	$N_{2\%}$		$N_{2\%}$		$N_{2\%}$		AVG.	
RUN 2:	$CO_{2\%}$	3.4	$CO_{2\%}$	3.4	$CO_{2\%}$	3.4	AVG.	
	$O_{2\%}$	13.8	$O_{2\%}$	14.0	$O_{2\%}$	14.4	AVG.	
	$N_{2\%}$		$N_{2\%}$		$N_{2\%}$		AVG.	
RUN 3:	$CO_{2\%}$	3.1	$CO_{2\%}$	3.2	$CO_{2\%}$	3.0	AVG.	
	$O_{2\%}$	14.2	$O_{2\%}$	14.4	$O_{2\%}$	14.4	AVG.	
	$N_{2\%}$		$N_{2\%}$		$N_{2\%}$		AVG.	

SECTION G:

CALIBRATION

4A

TYPE S PITOT TUBE INSPECTION DATA FORM

Pitot tube assembly level? ✓ yes ______ no

Pitot tube openings damaged? ______ yes (explain below) ✓ no

α_1 = 1.3 ° (<10°), α_2 = 0.8 ° (<10°), β_1 = 0.5 ° (<5°),
β_2 = 1.8 ° (<5°)

γ = 2.9 °, θ = 1.7 °, A = .97 cm (in.)

$z = A \sin \gamma$ = .05 cm (in.); <0.32 cm (<1/8 in.),
$w = A \sin \theta$ = .03 cm (in.); <.08 cm (<1/32 in.)

P_A .48 cm (in.) P_b .49 cm (in.)

D_t = .38 cm (in.)

Comments: ____

Calibration required? ______ yes ✓ no

4B

TYPE S PITOT TUBE INSPECTION DATA FORM

Pitot tube assembly level? ✓ yes ______ no

Pitot tube openings damaged? ______ yes (explain below) ______ no

α_1 = 2.3 ° (<10°), α_2 = .5 ° (<10°), β_1 = 1.8 ° (<5°),
β_2 = 1.8 ° (<5°)

γ = 3.2 °, θ = 1.0 °, A = .98 cm (in.)

$z = A \sin \gamma$ = .05 cm (in.); <0.32 cm (<1/8 in.),
$w = A \sin \theta$ = .02 cm (in.); <.08 cm (<1/32 in.)

P_A .49 cm (in.) P_b .49 cm (in.)

D_t = .38 cm (in.)

Comments: ______

Calibration required? ______ yes ✓ no

RAMCON ENVIRONMENTAL CORPORATION

Lear Siegler Stack Sampler

Nozzle Diameter Calibration

Date ____________________ Signature ____________________

Nozzle No.	Average Diameter	Nozzle No.	Average Diameter
1		7	
2		8	
3		9	
4		10	
5		11	
6		12	

Pitot Tube Calibration (S Type)

Pitot Tube Identification No. 6-4 Date 6-9-91

Calibrated by: S Buch

"A" SIDE CALIBRATION

Run No.	Δp std cm H_2O (in. H_2O)	Δp (s) cm H_2O (in. H_2O)	$C_p(s)$	DEVIATION $C_p(s)-\bar{C}_p(A)$
1	2.2	3.2	.829	.001
2	1.8	2.6	.832	.002
3	1.1	1.6	.829	.001
		$\bar{C}_p$ (SIDE A)	.830	

"B" SIDE CALIBRATION

Run No.	Δp std cm H_2O (in. H_2O)	$\Delta p(s)$ cm H_2O in. H_2O)	$C_p(s)$	DEVIATION $C_p(s)-\bar{C}_p(B)$
1	2.2	3.2	.829	.001
2	1.8	2.6	.832	.002
3	1.1	1.6	.829	.001
		$\bar{C}_p$ (SIDE B)	.830	

$$\text{AVERAGE DEVIATION} = \sigma(\text{A OR B}) = \frac{\sum_{1}^{3} |C_p(s)-\bar{C}_p(\text{A OR B})|}{3} \leftarrow \text{MUST BE} \leq 0.01$$

$$|\bar{C}_p(\text{SIDE A})-\bar{C}_p(\text{SIDE B})| \leftarrow \text{MUST BE} \leq 0.01$$

$$C_{p(s)} = C_{p(std)}\sqrt{\frac{\Delta p\ std}{\Delta p_s}}$$

Form No. EED-17-1

RAMCON

Lear Siegler Stack Sampler

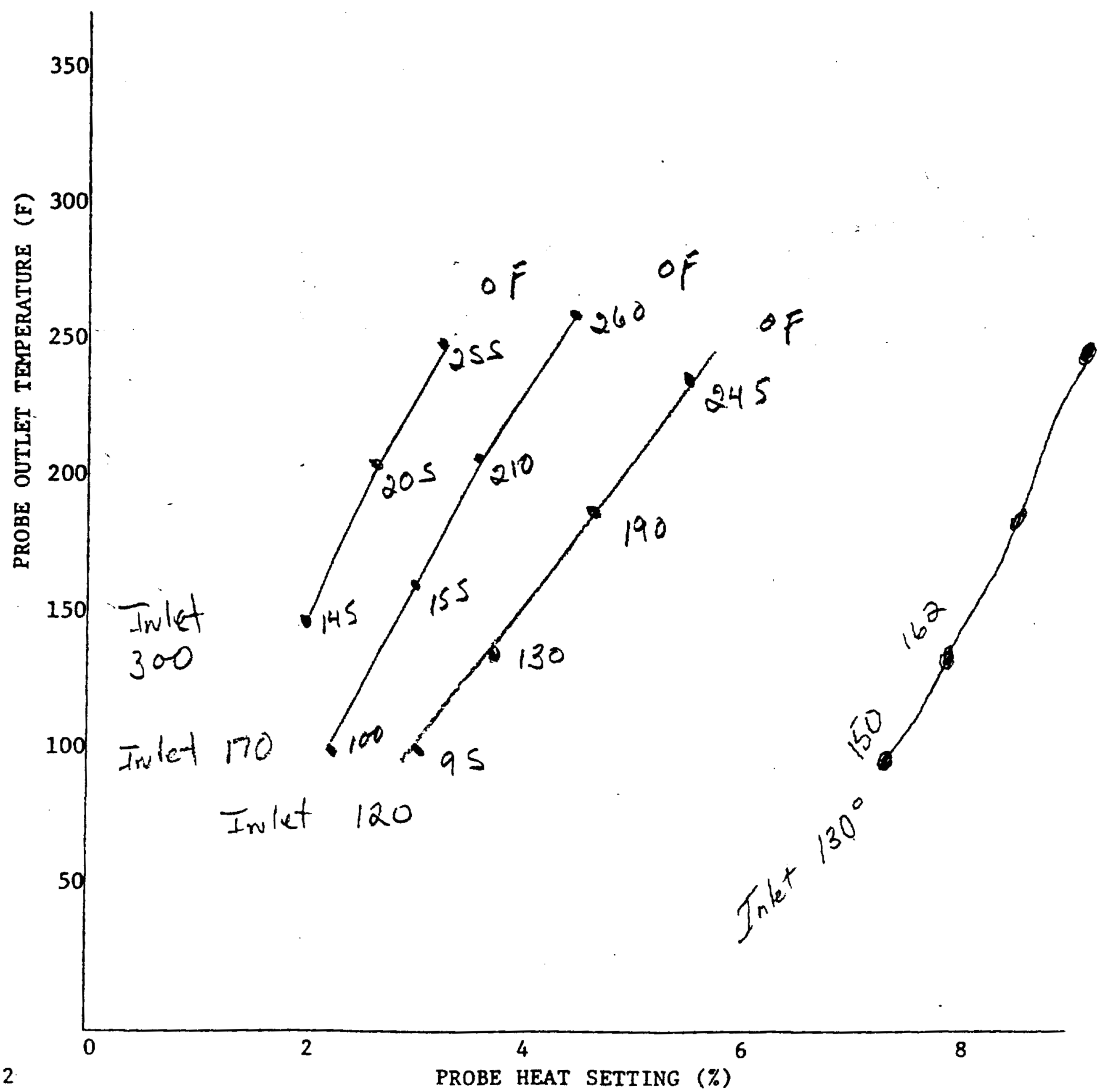
Heating Probe Calibration

Probe No. 64 Probe Length 6'

Date of Calibration 5-7-90 Signature Sam Turner

Name of Company to be tested ______

Note: 3 ft. probe - 5 min. warmup
6 ft. probe - 15 min. warmup
10 ft. probe - 30 min. warmup
Calibration flow rate = .75 CFM



Form No. EED-17-2

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date 5-5-90 Thermocouple number 64

Ambient temperature 20 °C Barometric pressure 29.88 in. Hg

Calibrator S Turner Reference: mercury-in-glass ✓

other ______

Reference point number	Source[a] (specify)	Reference thermometer temperature, °C	Thermocouple potentiometer temperature, °C	Temperature difference,[b] %
A	Ice Bath	32	32	0
B	Boiling water	212	211	.005
C	Boiling oil	381	378	.008
D	Ambient			

[a]Type of calibration system used.

[b] $\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \le 1.5\%.$

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English Units)

Test No. ______ Date 8-20-93 Meter Box No. NU Asef Plant No. ______

Barometric Pressure P_b = 29.94 in.Hg Dry Gas Meter No. ______ Pretest Y ______

Orifice Manometer Setting (ΔH), in. H_2O	Gas Volume: Wet Test Meter (V_w) ft³	Gas Volume: Dry Gas Meter (V_d) ft³	Temperature: Wet Test Meter (t_w) °F	Temperature: Dry Gas Meter Inlet (t_{d_i}) °F	Temperature: Dry Gas Meter Outlet (t_{d_o}) °F	Temperature: Dry Gas Meter Avg.† (t_d) °F	Time (Θ) min	Vacuum Setting in. Hg	Y_i	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
3.0	10	337.171 / 347.517	79	95 / 99	90 / 90	93.5	11.03		.986	2.03
2.0	10	347.660 / 358.014	79	96 / 102	91 / 93	95.5	13.42		.991	1.99
1.0	~~10~~ 5	358.170 / 363.344	79	99 / 101	93 / 94	96.75	9.30		.996	1.91
									Y = .991	1.977

† If there is only one thermometer on the dry gas meter, record the temperature under t_d where:

- V_w = Gas volume passing through the wet test meter, ft³.
- V_d = Gas volume passing through the dry gas meter, ft³.
- t_w = Temperature of the gas in the wet test meter, °F.
- t_{d_i} = Temperature of the inlet gas of the dry gas meter, °F.
- t_{d_o} = Temperature of the outlet gas of the dry gas meter, °F.
- t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d_i} and t_{d_o}, °F.
- ΔH = Pressure differential across orifice, in. H_2O.
- Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.
- Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y ± 0.05Y.
- P_b = Barometric pressure, in. Hg.
- Θ = Time of calibration run, minutes.

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English Units)

Test No. ____________ Date 8-11-93 Meter Box No. ____________ Plant No. ____________

Barometric Pressure P_b = 30.10 in.Hg Dry Gas Meter No. ____________ Pretest Y ____________

BK

Orifice Manometer Setting (ΔH), in. H_2O	Gas Volume: Wet Test Meter (V_w) ft³	Gas Volume: Dry Gas Meter (V_d) ft³	Temperature: Wet Test Meter (t_w) °F	Temperature: Dry Gas Meter Inlet (t_{d_i}) °F	Temperature: Dry Gas Meter Outlet (t_{d_o}) °F	Temperature: Dry Gas Meter Avg.† (t_d) °F	Time (Θ) min	Vacuum Setting in. Hg	Y_i	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
3.0	10	997.569 / 1007.838	77	88 / 91	87 / 88	86	10.71		.983	1.91
2.0	10	8.057 / 18.347	77	90 / 97	88 / 89	91	13.58		.992	2.03
1.0	10	18.554 / 23.7005	77	96 / 99	90 / 91	94	9.26		.999	1.89
									Y = .991	1.94

† If there is only one thermometer on the dry gas meter, record the temperature under t_d where:

- V_w = Gas volume passing through the wet test meter, ft³.
- V_d = Gas volume passing through the dry gas meter, ft³.
- t_w = Temperature of the gas in the wet test meter, °F.
- t_{d_i} = Temperature of the inlet gas of the dry gas meter, °F.
- t_{d_o} = Temperature of the outlet gas of the dry gas meter, °F.
- t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d_i} and t_{d_o}, °F.
- ΔH = Pressure differential across orifice, in. H_2O.
- Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.
- Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y ± 0.05Y.
- P_b = Barometric pressure, in. Hg.
- Θ = Time of calibration run, minutes.

SECTION H:

RAMCON PERSONNEL

Name: Mr. Sumner Buck
Title: President

Qualifications: Mr. Buck is a graduate of the University of Mississippi with graduate studies at Memphis State University and State Technical Institute of Memphis. He is a graduate of the EPA 450 "Source Sampling for Particulate Pollutant's" course and the 474 "Continuous Emissions Monitoring" courses outlined by EPA at Research Triangle Park, N.C. He has been directly involved in conducting and supervising air emission testing for over 15 years. He has personally conducted over 400 air emission tests. He currently sponsors and directs visual emission certification schools for US EPA Method 9.

Project Duties: Mr. Buck is responsible for the overall supervision of each testing project. This includes the correspondence to the State Regulatory Agency and the plant personnel regarding scheduling, testing requirements, etc. He will assist in supervision of the project preparation for each team involved and the overall organization between the testing crew(s) and facility.

Name: Mr. Joe Sewell
Title: Vice President

Qualifications: Mr. Sewell is currently serving as the Vice President of RAMCON Environmental Corporation. Mr. Sewell is a graduate of Christian Brothers University in Memphis, Tennessee where he obtained a Bachelor of Science degree in Chemical Engineering. He has conducted and supervised air emissions testing projects ranging a broad spectrum of facility process categories. His accomplishments include the development of the instrumental branch of emissions testing utilizing continuous emission monitors and gas chromatography. Mr. Sewell performs a major role in the upgrading of testing capabilities and professional quality that RAMCON Environmental Corporation offers.

Project Duties: Mr. Sewell provides staff engineering and project administration to ensure the integrity of the requested services. He serves as the primary contact person for RAMCON Environmental Corporation handling all correspondence between the facility personnel involved in the project and respective state agency representative(s). He provides project leadership to

RAMCON Environmental Corporation field supervisors and managers involved in the testing project.

Name: Mr. Ray Jenkins
Title: Source Sampling Director

Qualifications: Mr. Jenkins is serving as the Source Sampling Director for RAMCON Environmental Corporation. He was promoted to this leadership position after gaining a significant amount of experience in conducting and providing field supervision of a variety of air testing projects. Mr. Jenkins has personally conducted and/or supervised all of the prevalent EPA approved procedures with expertise in the instrumental analyzer procedures. He graduated from Memphis State University obtaining a Bachelor of Science degree in Biology. He is also currently certified to conduct US EPA Reference Method 9 for the visual determination of emission opacity.

Project Duties: Mr. Jenkins provides project leadership to the Team Leaders and Field Technicians. He ensures the test crew(s) involved in the test project will be properly informed to his respective duties and responsibilities during the testing process. Mr. Jenkins also serves as the Quality Assurance/Quality Control Coordinator and provides guidance in QA/QC to each Team Leader with regard to sample integrity.

Name: Mr. Tommy South
Title: Laboratory Technician

Qualifications: Mr. South is currently serving as Laboratory Technician. He is proficient in conducting many analysis procedures such as front and back-half particulate analysis, titrations, extractions, etc.

Project Duties: Mr. South conducts the laboratory analysis on the particulate samples. He is also responsible for accepting the remaining field samples from the Field Sample Bank Manager and performing inspection as to integrity. He documents the transfer on the chain of custody forms and distributed the subcontracted samples to the respective laboratories.

Name: Mr. Allen Turner
Title: Team Leader

Qualifications: Mr. Turner has been employed with RAMCON Environmental Corporation for five years. Altogether, he has sampled approximately 300 stacks of all types. Mr. Turner became qualified for a Team Leader in 1988 and has served as such since that time. He is a current V.E. reader and continues his studies at State Technical Institute in Memphis, Tennessee. Mr. Turner has extensive experience in EPA Methods 1-9.

Project Duties: Mr. Turner is responsible for isokinetic sampling procedures, including but not limited to, Method 5 for particulate, multi-metals, PAH, calibration and cleaning of necessary equipment for his testing. His duties on-site include assembling the sample train, leak checking the system, operation of the train and recording the test data on the field data forms.

SECTION I:

VISIBLE EMISSIONS

RUN # 1

SOURCE NAME: Fred Weber Inc

ADDRESS: 2320 Creve Couer Mill Rd

CITY: Maryland Heights **STATE:** Mo **ZIP:** 63043

PHONE: 314/344-0070 **SOURCE ID NUMBER:** ,

PROCESS EQUIPMENT: Asphalt Plant / Batch Blk **OPERATING MODE:** 150 T. Per Hr

CONTROL EQUIPMENT: Baghouse **OPERATING MODE:**

DESCRIBE EMISSION POINT: Metal Rectangular Stack

HEIGHT ABOVE GROUND LEVEL: 48' **HEIGHT RELATIVE TO OBSERVER:** 48'

DISTANCE FROM OBSERVER: 141' **DIRECTION FROM OBSERVER:** WNW

DESCRIBE EMISSIONS: N/A

EMISSION COLOR: Clear - N/A **PLUME TYPE:** CONTINUOUS ☐ FUGITIVE ☐ INTERMITTENT ☐ N/A

WATER DROPLETS PRESENT: NO ☒ YES ☐ **IS WATER DROPLET PLUME:** ATTACHED ☐ DETACHED ☐ N/A

AT WHAT POINT IN THE PLUME WAS OPACITY DETERMINED: Stack Outlet

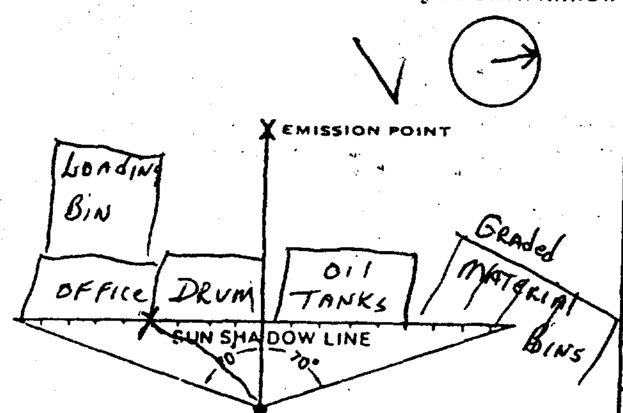
DESCRIBE BACKGROUND: Sky

BACKGROUND COLOR: Blue **SKY CONDITIONS:** Clear

WIND SPEED: 5-8 mph **WIND DIRECTION:** SW

AMBIENT TEMPERATURE: 78° F **RELATIVE HUMIDITY:**

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW



OBSERVATION DATE: Aug 19, 1993 **START TIME:** 8:23 AM **STOP TIME:** 9:23 AM

M \ SEC	0	15	30	45	M \ SEC	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

AVERAGE OPACITY FOR HIGHEST PERIOD: 0% **NUMBER OF READINGS ABOVE** 0 **% WERE** 0

RANGE OF OPACITY READINGS: MINIMUM 0 MAXIMUM 0

COMMENTS: Sunglasses Worn

OBSERVER'S NAME (PRINT): Earl Crook

OBSERVER'S SIGNATURE: Earl Crook **DATE:** 8-19-93

ORGANIZATION: Ramcon Environmental Corp

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SIGNATURE:

TITLE: **DATE:**

CERTIFIED BY: **DATE:**

VERIFIED BY: **DATE:**

REC#14

RUN # 2

SOURCE NAME: Fred Weber Inc

ADDRESS: 2320 Creve Couer Mill Rd.

CITY: Maryland Heights | **STATE:** Mo | **ZIP:** 63043

PHONE: 314/344-0070 | **SOURCE ID NUMBER:**

PROCESS EQUIPMENT: Asphalt Plant/Batch-BH | **OPERATING MODE:** 150 T. Per Hr

CONTROL EQUIPMENT: Baghouse | **OPERATING MODE:**

DESCRIBE EMISSION POINT: Rectangular Metal Stack

HEIGHT ABOVE GROUND LEVEL: 48' | **HEIGHT RELATIVE TO OBSERVER:** 48'

DISTANCE FROM OBSERVER: 141' | **DIRECTION FROM OBSERVER:** WNW

DESCRIBE EMISSIONS: N/A

EMISSION COLOR: Clear | **PLUME TYPE:** CONTINUOUS ☐ FUGITIVE ☐ INTERMITTENT ☐ N/A

WATER DROPLETS PRESENT: NO ☒ YES ☐ | **IS WATER DROPLET PLUME:** ATTACHED ☐ DETACHED ☐

AT WHAT POINT IN THE PLUME WAS OPACITY DETERMINED: Stack Outlet

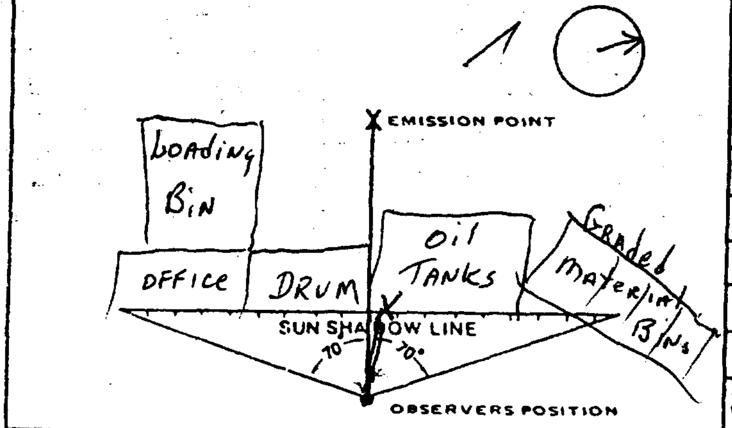
DESCRIBE BACKGROUND: Sky

BACKGROUND COLOR: Blue | **SKY CONDITIONS:** Clear

WIND SPEED: 3-5 mph | **WIND DIRECTION:** SE

AMBIENT TEMPERATURE: 91° F | **RELATIVE HUMIDITY:**

SOURCE LAYOUT SKETCH | **DRAW NORTH ARROW**



COMMENTS: Sunglasses Worn

OBSERVATION DATE: Aug 19, 1993 | **START TIME:** 10:45 AM | **STOP TIME:** 11:45 AM

M	0	15	30	45	M	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

AVERAGE OPACITY FOR HIGHEST PERIOD: 0% | **NUMBER OF READINGS ABOVE** 0 **% WERE** 0

RANGE OF OPACITY READINGS: MINIMUM 0 MAXIMUM 0

OBSERVER'S NAME (PRINT): Earl Crook

OBSERVER'S SIGNATURE: Earl Crook | **DATE:** 8-19-93

ORGANIZATION: Ramcon Environmental Corp

CERTIFIED BY: | **DATE:**

VERIFIED BY: | **DATE:**

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SIGNATURE:

TITLE: | **DATE:**

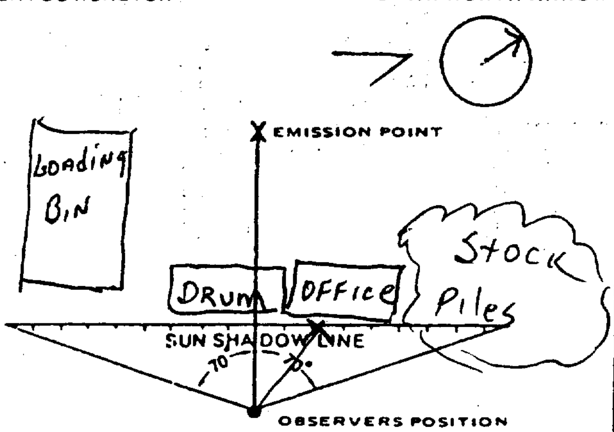
EPA 1R 0301

REC#14

RUN #3

SOURCE NAME	Fred Weber Inc
ADDRESS	2320 Creve Cover Mill Rd.
CITY	Maryland Heights
STATE	Mo.
ZIP	63043
PHONE	314/344-0070
SOURCE ID NUMBER	-
PROCESS EQUIPMENT	Asphalt Plant/Batch BH
OPERATING MODE	150 T. Per Hr
CONTROL EQUIPMENT	Baghouse
OPERATING MODE	
DESCRIBE EMISSION POINT	Metal Rectangular Stack
HEIGHT ABOVE GROUND LEVEL	48'
HEIGHT RELATIVE TO OBSERVER	48'
DISTANCE FROM OBSERVER	138'
DIRECTION FROM OBSERVER	NW
DESCRIBE EMISSIONS	N/A
EMISSION COLOR	Clear
PLUME TYPE: CONTINUOUS ☐ FUGITIVE ☐ INTERMITTENT ☐	N/A
WATER DROPLETS PRESENT	NO ☒ YES ☐
IS WATER DROPLET PLUME ATTACHED ☐ DETACHED ☐	N/A
AT WHAT POINT IN THE PLUME WAS OPACITY DETERMINED	Stack Outlet
DESCRIBE BACKGROUND	Sky
BACKGROUND COLOR	Blue
SKY CONDITIONS	Clear
WIND SPEED	7-8 mph
WIND DIRECTION	SW
AMBIENT TEMPERATURE	92° %
RELATIVE HUMIDITY	

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW



COMMENTS: Sunglasses Worn

OBSERVATION DATE	Aug 19, 1993
START TIME	12:42 pm
STOP TIME	1:42 pm

M \ SEC	0	15	30	45	M \ SEC	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
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13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

AVERAGE OPACITY FOR HIGHEST PERIOD	0%
NUMBER OF READINGS ABOVE % WERE	0 / 0
RANGE OF OPACITY READINGS — MINIMUM	0
RANGE OF OPACITY READINGS — MAXIMUM	0
OBSERVER'S NAME (PRINT)	Earl Crook
OBSERVER'S SIGNATURE	Earl Crook
DATE	8-19-93
ORGANIZATION	Ramcon Environmental Corp
CERTIFIED BY	
DATE	
VERIFIED BY	
DATE	

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SIGNATURE

TITLE

DATE

EPA 1B 0101

REC#14

Visible Emissions Evaluator

This certifies that

EARL T. CROOK

Met the specifications of Federal Reference Method "9" and qualified as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by the Arkansas Department of Pollution Control and Ecology.

Mark A. Gomel [signature]
Field Instructor

James B. Jones Jr. [signature]
FOR Director

GREAT SEAL OF THE STATE OF ARKANSAS

APRIL 21, 1993
Date

LITTLE ROCK, AR
Location