T T I

Trace Technologies, Inc.
P.O. Box 6817, 10 Radel Avenue
Bridgewater, New Jersey 08807
Telephone (201) 685-2100

STACK TEST REPORT

FOR

REDI-CRETE CORPORATION

SUBMITTED : 12/19/88

PROJECT: 1423

I CERTIFY THAT THESE TESTS HAVE BEEN CONDUCTED UNDER MY DIRECT SUPERVISION AND THAT ALL RESULTS AND CALCULATIONS HAVE BEEN REVIEWED BY JOHN W. LEATHERDALE, P.E.

John W Leatherdale

Telecopier:
(201) 685-2219

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
CN 027, TRENTON, N.J. 08625-0027

Anthony J. McMahon
Acting Director

(609) 292-5383
Fax # (609) 292-1074

MAY

April 5, 1989

MEMORANDUM

TO: Don Patterson

THROUGH: Edward Choromanski

FROM: Michael Pratt

SUBJECT: Readi-Crete Corporation
APC Plant ID No. 25032
NJ Stack No. 001
Permit/Certificate to Operate (P/Ct) No. 079837

Emission tests were conducted at the above referenced facility on a Rotary Dryer and Shaker screen both controlled by a cyclone and a baghouse.

The purpose of these tests was to determine Particulate, CO and THC (as Methane) emission and then compare them to P/Ct No. 079837 allowables.

Stafford Stewart reviewed the submitted test report. His report indicates that:

1. CO and THC (as Methane) were not detected.
2. Particulate emission rates were lower than P/Ct No. 079837 allowables.

GENERAL NOTES:

1. K.W.L. Han, N.R.O. observer, reported production rates of 70,000 lb/hr for the first test run and 56,800 lb/hr each for test runs No. 2 and 3.

2. P/Ct No. 079837 indicates 170,000 lb/hr production rate. Therefore, during the stack test run No. 1 production was 41.2% of P/Ct No. 079837 production rates. Test runs No. 2 and 3 were purformed with only 33.4% P/Ct No. 079837 production rates.

3. Particulate removal efficiency for the first test run was equal to 99.998%, 99.997% for the second and 99.996% for the third test run.

CONCLUSIONS:

1. Particulates emission rates were well below P/Ct No. 079837 allowables.

2. Raw material production rates were less than half of P/Ct No. 079837 submitted information.

RECOMMENDATIONS:

N.R.O. should either:

1. Resolve the discrepancy between P/Ct No. 079837 submitted information and production rates during subject stack test or.

2. Require another stack test to be performed at P/Ct No. 079837 production rate.

cc/ Milton Polakovic
Lou Mikolajczyk
Michael Papp
Stafford Stewart

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
CN 027, TRENTON, N.J. 08625

JORGE H. BERKOWITZ, Ph.D.
DIRECTOR

(609) 292-5383

February 21, 1989

MEMORANDUM

TO: Michael Pratt

FROM: Stafford Stewart

SUBJECT: Readi-Crete Corporation
Flanders, NJ
DEP ID No. 25032
NJ Stack No. 001

On November 16, 1988 Trace Technologies, Inc. conducted emission tests for Readi-Crete Corporation of Flanders, NJ. These tests were conducted on the plants baghouse to determine the amount of particulate, carbon monoxide, and total hydrocarbon (as methane) emitted. The results of these tests are as follows.

Particulate Emissions

RUN NO.	DATE	EMISSIONS grains/dscf	EMISSIONS lb/hr	ALLOWABLE lb/hr
1	9-16-88	0.00363	0.184	12.75
2	9-16-88	0.00499	0.248	12.75
3	9-16-88	0.0071	0.358	12.75

Results of Gas Sampling (as reported by Trace Technologies Inc.)

RUN NO.	DATE	%02	CO(ppm)	THC (ppm)
1	9-16-88	20.0	ND <20	ND <1
2	9-16-88	20.0	ND <20	ND <1
3	9-16-88	20.5	ND <20	ND <1

NOTE: ND above refers to non-detectable.

Carbon Monoxide Emissions

RUN NO.	DATE	EMISSIONS (LB/HR)	ALLOWABLE (LB/HR)
1	9-16-88	NON-DETECTABLE	0.846
2	9-16-88	NON-DETECTABLE	0.846
3	9-16-88	NON-DETECTABLE	0.846

Total Hydrocarbon (as Methane)

RUN NO.	DATE	EMISSION (LB/HR)	ALLOWABLE (LB/HR)
1	9-16-88	NON-DETECTABLE	0.169
2	9-16-88	NON-DETECTABLE	0.169
3	9-16-88	NON-DETECTABLE	0.169

NOTE: For all tables above allowable cited refer to Certificate No. 079637.

Results of the tests conducted indicated compliance for all emissions.

Calculations performed by the Bureau of Technical Services were in agreement with those of Trace Technologies, also the operating parameters during the test runs were acceptable.

Trace Technologies, Inc.

TABLE OF CONTENTS

Trace Technologies, Inc.

I. SAMPLING DESCRIPTION

Trace Technologies, Inc.

INTRODUCTION

On November 16, 1988 Trace Technologies, Inc. conducted an emissions test for Redi-Crete Corporation, N. J. stack number 001. The control system consisted of a cyclone, followed by a baghouse and finally a fan. The outlet from the fan was sampled for particulate, total hydrocarbons and carbon monoxide. The process operated normally during sampling.

DESCRIPTION OF SAMPLING

The absence of cyclonic flow was verified prior to sampling. The R.A.C. particulate sampling train used was leak checked prior to and after each run. Results were noted on the field data sheets. The rectangular stack had five sample ports, with five (5) traverse points taken at each port, for a total of 25 sample points. There was considerable variation in AP's across the stack, despite the absence of cyclonic flow. This variation lead to a choice of a nozzle smaller than one would select using the average in calculations. A larger nozzle would have required excessive vacuum at the highest . The choice of a smaller nozzle eliminated this problem, however it resulted in reduced total sample volume.

The gas sampling train was operated simultaneously with the particulate train. Gas samples were collected at a rate of 1 liter per minute for 60 minutes. The train included 3 midget impingers, the first two containing distilled water and the third dry. Condensate in these impringers was saved and analyzed for total hydrocarbons. The sample train was leak checked prior to each run, and no leaks were observed. Sample bags were filled with nitrogen and allowed to sit overnight. Bags were then transported to the site and only evacuated immediately prior to use. Bags showing signs of leakage were not used for sampling. The gas sampling probe was placed near the stack centerline and not traversed.

Trace Technologies, Inc.

ANALYSIS

PARTICULATE - The particulate probe was cleaned with acetone between runs. The sample boxes were sealed after use and returned to the laboratory for sample recovery. Impinger contents were measured volumetrically and then discarded. The silicagel was measured gravimetrically. Filters were dessicated and weighed to constant weight.

HYDROCARBONS - Gas samples were analyzed in two steps. The results given represent the sum of the liquid condensate analysis and the gas analysis. Refer to the protocol for details of chromotographic conditions.

CARBON MONOXIDE - Analysis was done with a HORBIA N.D.I.R. Scott calibration gasses were used to set the instrument and ample time was allowed for instrument warm up.

8812111-1423

II. RESULTS

SUMMARY OF STACK TESTING RESULTS

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3
AVERAGE STACK TEMPERATURE	DEGF	122	120	119.7
AVERAGE METER TEMPERATURE	DEGF	66.9	72.9	80.9
PERCENT CARBON DIOXIDE	%	0	0	0
MOISTURE FRACTION	---	8.01	7.13	9.84
MOLECULAR WEIGHT	#/#MOL	27.93	28.02	27.75
NOZZLE DIAMETER	INCHES	.244	.244	.244
DURATION OF SAMPLING	MINUTES	62.5	62.5	62.5
VOLUME OF GAS SAMPLED	CU.FT.	23.86	23.946	25.097
AREA OF STACK	SQ.FT.	5.21	5.21	5.21
PARTICULATE CATCH	MG	5.5	7.5	11
TOTAL WATER	GRAMS	42.9	37.5	55.1
VOL. FLOW RATE	ACFM	7273	7030	7366
VOL. FLOW RATE	SCFM	5915	5791	5894
ISOKINETIC SAMPLING	%	101.2	102.6	104.1
DUST CONCENTRATION	GRAINS/SCF	.00363	.00499	.0071
EMISSION RATE	POUNDS/HR	.184	.248	.358

RESULTS OF GAS SAMPLING

RUN #	% CO2	% O2	CO (PPM)	TOTAL HYDROCARBONS (PPM)
1	0.0	20.0	ND < 20	ND < 1
2	0.0	20.0	ND < 20	ND < 1
3	0.0	20.5	ND < 20	ND < 1

COMPUTERIZED DATA OUTPUT

TRACE TECHNOLOGIES, INC.

RUN NUMBER 1

RESULTS OF EPA METHOD 5 TESTING

TRAV. POINT NUMBER	TOTAL TIME MIN	STACK TEM DEG F	VELOC. HEAD IN H2O	VELOCITY FPS	DELTA METER CU FT	METER TEM DEG F	ISOKINETIC SAMPLING PER-CENT
1	2.5	110	.01	6.01	.389	54	178.26
2	5.08	120	.02	8.58	.389	54	123.22
3	7.6	120	.09	18.21	.495	54	72.76
4	10	115	.34	35.24	1.149	56.5	83.44
5	12.5	110	.25	30.08	1.351	60	107.5
6	15	115	.03	10.46	.458	61	116.96
7	17.5	115	.04	12.08	.639	62	135.01
8	20	120	.13	21.88	.794	63.5	91.21
9	22.5	120	.24	29.73	1.213	66	98.94
10	25	220	.43	43.1	1.723	68	111.24
11	27.5	115	.02	8.54	.375	65.5	120.37
12	30	115	.04	12.08	.538	66	115.34
13	32.5	120	.12	21.02	.866	67	102.21
14	35	120	.27	31.54	1.289	68	98.43
15	37.5	120	.41	38.86	1.603	71.5	97.59
16	40	115	.02	8.54	.44	69.5	136.59
17	42.8	120	.06	14.86	.761	71	113.96
18	45	120	.15	23.51	.835	71.5	99.64
19	47.5	123	.32	34.42	1.404	74	97.24
20	50	120	.39	37.9	1.593	76	98.71
21	52.5	115	.02	8.54	.395	73.5	124.33
22	55.2	120	.07	16.06	.711	73	102.48
23	57.5	120	.19	26.46	.979	74	97.56
24	60	120	.39	37.9	1.583	75	98.24
25	62.5	122	.57	45.9	1.876	78.5	94.84

PARAMETER	UNITS	
AVERAGE STACK TEMPERATURE	DEG F	122
AVERAGE METER TEMPERATURE	DEG F	66.9
PER-CENT CARBON DIOXIDE	%	0
MOISTURE FRACTION	%	8.01
MOLECULAR WEIGHT	#/#MOL	27.93
NOZZLE DIAMETER	INCHES	.244
DURATION OF SAMPLING	MINUTES	62.5
VOLUME OF GAS SAMPLED	CU.FT.	23.86
AREA OF STACK	SQ.FT.	5.21
FILTER CATCH	MG	5.5
TOTAL WATER	GRAMS	42.9
VOLUMETRIC FLOW RATE	ACFM	7273
VOLUMETRIC FLOW RATE	SCFM	5915
ISOKINETIC SAMPLING	PER-CENT	101.2
DUST CONCENTRATION	GRAINS/SCF	.00363
EMISSION RATE	POUNDS/HR	.184

COMPUTERIZED DATA OUTPUT

TRACE TECHNOLOGIES, INC.

RUN NUMBER 2

RESULTS OF EPA METHOD 5 TESTING

TRAV. POINT NUMBER	TOTAL TIME MIN	STACK TEM DEG F	VELOC. HEAD IN H2O	VELOCITY FPS	DELTA METER CU FT	METER TEM DEG F	ISOKINETIC SAMPLING PER-CENT
1	2.5	120	.04	12.12	.569	65	120.27
2	5	120	.04	12.12	.575	66.5	120.9
3	7.5	120	.1	19.16	.794	67	102.4
4	10	120	.16	24.24	1.052	68	104.81
5	12.5	120	.15	23.47	1.034	69.5	106.22
6	15	120	.24	29.68	.944	69.5	77.2
7	17.5	120	.04	12.12	.868	69.5	174.69
8	20	120	.12	20.99	.921	70.5	106.53
9	22.5	120	.14	22.67	.951	72	101.35
10	25	120	.14	22.67	1.043	73.5	110.06
11	27.5	120	.03	10.49	.458	70.5	113.84
12	30	120	.03	10.49	.496	71	121.66
13	32.5	120	.08	17.14	.71	71	102.55
14	35	120	.23	29.06	1.164	72.5	95.49
15	37.5	115	.37	36.7	1.513	75	95.71
16	40	120	.04	12.12	.647	73.5	132.94
17	42.5	120	.04	12.12	.568	74.5	118.19
18	45	120	.16	24.24	.983	75.5	97.09
19	47.5	120	.3	33.19	1.391	76.5	98.29
20	50	125	.45	40.82	1.682	78.5	96.33
21	52.5	122	.05	13.57	.626	77.5	114.72
22	55.2	120	.06	14.84	.73	77.5	111.19
23	57.5	120	.18	25.71	.976	78.5	98.44
24	60	120	.4	38.32	1.464	80	88.89
25	62.5	120	.53	44.11	1.776	81.5	92.68

PARAMETER	UNITS	
AVERAGE STACK TEMPERATURE	DEG F	120
AVERAGE METER TEMPERATURE	DEG F	72.9
PER-CENT CARBON DIOXIDE	%	0
MOISTURE FRACTION	%	7.13
MOLECULAR WEIGHT	#/#MOL	28.02
NOZZLE DIAMETER	INCHES	.244
DURATION OF SAMPLING	MINUTES	62.5
VOLUME OF GAS SAMPLED	CU.FT.	23.946
AREA OF STACK	SQ.FT.	5.21
FILTER CATCH	MG	7.5
TOTAL WATER	GRAMS	37.5
VOLUMETRIC FLOW RATE	ACFM	7030
VOLUMETRIC FLOW RATE	SCFM	5791
ISOKINETIC SAMPLING	PER-CENT	102.6
DUST CONCENTRATION	GRAINS/SCF	.00499
EMISSION RATE	POUNDS/HR	.248

COMPUTERIZED DATA OUTPUT
TRACE TECHNOLOGIES, INC.

RUN NUMBER 3

RESULTS OF EPA METHOD 5 TESTING

TRAV. POINT NUMBER	TOTAL TIME MIN	STACK TEM DEG F	VELOC. HEAD IN H2O	VELOCITY FPS	DELTA METER CU FT	METER TEM DEG F	ISOKINETIC SAMPLING PER-CENT
1	2.5	120	.05	13.61	.706	72.5	133.73
2	5	120	.06	14.91	.706	72.5	122.23
3	7.5	120	.13	21.95	.83	75	95.23
4	10.1	120	.16	24.36	1.105	77.5	106.3
5	12.5	120	.3	33.35	1.355	78	101.46
6	15	110	.05	13.49	.612	79	116.21
7	17.5	120	.06	14.91	.67	80	115.29
8	20	120	.16	24.36	1.026	81.5	102.76
9	22.5	120	.29	32.79	1.352	84	97.7
10	25	115	.38	37.37	1.53	87	95.06
11	27.5	110	.02	8.53	.382	84	124.05
12	30.2	115	.04	12.12	.581	84	114.73
13	32.5	120	.09	18.27	1.054	85	151.62
14	35.1	120	.21	27.9	1.055	86	87.75
15	37.5	120	.37	37.04	1.516	85.5	100.17
16	40	120	.02	8.61	.391	85	127.49
17	42.5	120	.05	13.61	1.58	80.5	273.65
18	45	120	.18	25.83	.031	81	11.98
19	47.5	125	.28	32.36	1.375	82.5	101.83
20	50	125	.43	40.1	1.671	84	98.43
21	52.5	120	.02	8.61	.422	78	136.75
22	55	125	.06	14.98	.673	77.5	116.69
23	57.5	125	.21	28.02	1.162	79.5	101.24
24	60	125	.37	37.2	1.501	82	96.26
25	62.5	120	.54	44.75	1.8	83	94.09

PARAMETER	UNITS	
AVERAGE STACK TEMPERATURE	DEG F	119.7
AVERAGE METER TEMPERATURE	DEG F	80.9
PER-CENT CARBON DIOXIDE	%	0
MOISTURE FRACTION	%	9.84
MOLECULAR WEIGHT	#/#MOL	27.75
NOZZLE DIAMETER	INCHES	.244
DURATION OF SAMPLING	MINUTES	62.5
VOLUME OF GAS SAMPLED	CU.FT.	25.097
AREA OF STACK	SQ.FT.	5.21
FILTER CATCH	MG	11
TOTAL WATER	GRAMS	55.1
VOLUMETRIC FLOW RATE	ACFM	7366
VOLUMETRIC FLOW RATE	SCFM	5894
ISOKINETIC SAMPLING	PER-CENT	104.1
DUST CONCENTRATION	GRAINS/SCF	.0071
EMISSION RATE	POUNDS/HR	.358

Trace Technologies, Inc.

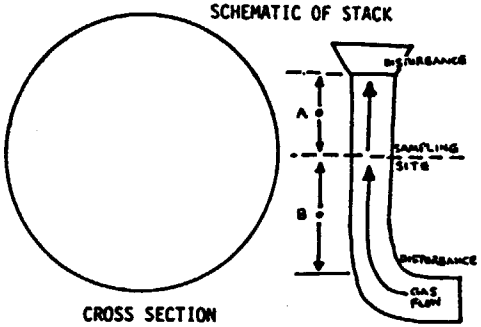
III. FIELD DATA AND CALCULATIONS

PRE-TEST LEAK CHECK .01 CFM @ 15" Hg TO NOZZLE

REDI 1

$3.78\left(\frac{T_M\,^\circ R}{T_S\,^\circ R}\right) = 3.58$

SCHEMATIC OF STACK



CROSS SECTION

PLANT REDI-CRETE
DATE 11/16/88
LOCATION
OPERATOR JF
STACK NO. 001
RUN NO. 1
SAMPLE BOX NO. A
METER BOX NO. 2052

AMBIENT TEMPERATURE 50°F
BAROMETRIC PRESSURE 29.05
ASSUMED MOISTURE, % 5
PROBE LENGTH, in. 5'
NOZZLE DIAMETER, in. .244
STACK DIAMETER, in. 25X30
PROBE HEATER SETTING
HEATER BOX SETTING

TRACE TECHNOLOGIES, INC.
10 RADEL AVENUE
BRIDGEWATER, NEW JERSEY 08807

METER H
C FACTOR 3.58
PROCESS WEIGHT RATE

TRAVERSE POINT NUMBER	SAMPLING TIME (θ), min	STATIC PRESSURE (in H_2O)		STACK TEMPERATURE (T_s), °F	VELOCITY HEAD (ΔP_s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H_2O	GAS SAMPLE VOLUME (Vm), ft^3	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F		TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in Hg gauge
								INLET ($T_{M_{IN}}$)°F	OUTLET ($T_{M_{OUT}}$)°F				
1	0	125	140	110	.01	0.036	190.230	54	54	230	85		1
2	2.5	160	140	120	.02	0.07	~~191.010~~			230	90		1
3	5.08	180		120	.09	0.322	191.010						2
4	7.6	185	200	115	.34	1.22	191.505	58	55	240	100		3
5	10.0	205	200	110	.25	0.895	192.655	64	56	195	120		4
6	12.5	235	200	115	.03	0.107	194.007	64	58	150	105		1
7	15.0	245	200	115	.04	0.14	194.465	66	58	150	110		1
8	17.5	230	205	120	.13	.47	195.104	68	59	210	115		3
9	20.0	230	210	120	.24	.86	195.898	72	60	250	125	61	4
10	22.5	220	208	120	.43	1.54	197.112	75	61	190	130		6
11	25.0	~~245~~ 245	185	115	.02	0.07	198835	69	62	160	100	61	1
12	27.5	215	200	115	.04	0.14	199.210	69	63	195	115	62	2

START 12:04

3.58

BAG 037 = Run 1 @ 1 L/MIN
STOP 1:04

TRACE TECHNOLOGIES, INC.
10 RADEL AVENUE
BRIDGEWATER, NEW JERSEY 08807

DATE 11/16/88

RUN NO. 1

TRAVERSE POINT NUMBER	SAMPLING TIME (θ), min	STATIC PRESSURE (in H_2O) #2	#3	STACK TEMPERATURE (T_s), °F #1	VELOCITY HEAD (ΔP_s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H_2O	GAS SAMPLE VOLUME (Vm), ft^3	GAS SAMPLE TEMPERATURE AT DRY GAS METER INLET (Tm_{IN})°F	OUTLET (Tm_{OUT})°F	SAMPLE BOX TEMPERATURE °F #4	#5	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in Hg gauge
13	30.0	210	215	120	.12	0.43	199.748	71	63	210	125		3
14	32.5	200	208	120	.27	0.97	200.615	72	64	200	150	62	5
15	35.0	210	200	120	.41	1.47	201.905	78	65	195	150		6
16	37.5	210	215	115	.02	0.07	203.508	74	65	185	130		1
17	40.0	210	215	120	.06	0.252	203.948	75	67	200	130		2
18	42.5	210	215	120	.15	0.54	204.710	76	67	200	140		3
19	45.0	210	205	123	.32	1.15	205.545	80	68	200	150		5
20	47.5	205	203	120	.39	1.4	206.950	83	69	205	160		5
21	50.0	205	210	115	.02	0.07	208.544	78	69	180	115	66	1
22	52.5	210	210	120	.07	0.25	208.940	77	69	180	130		2
23	55.2	210	205	120	.19	0.68	209.651	78	70	160	140		4
24	57.5	205	200	120	.39	1.4	210.430/440	80	70	180	150		6
25	60.0	205	200	122	.57	2.04	212.213	86	71	165	160		8
	62.5	STOP 1:20					214.090						

LEAK CHECK @ 9" Hg = .005 CFM

TRACE TECHNOLOGIES, INC.
Environmental Process Technology
10 Radel Avenue
BRIDGEWATER, NEW JERSEY 08807
(201) 685-2100

JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

PARTICULATE CLEAN-UP SHEET

DATE: 11/16/88
RUN NUMBER: 1
OPERATOR: JF
SAMPLE BOX NUMBER: A

PLANT: REDI CRETE
LOCATION OF SAMPLE PORT:
BAROMETRIC PRESSURE:
AMBIENT TEMPERATURE:

FILTER NUMBER	TARE (g)	FINAL (g)	NET (mg)
5	.6265	.6293	2.8

ACETONE WASH - BEAKER NUMBER

VOLUME (ml)	TARE (g)	FINAL (g)	NET (mg)	(BLANK) (mg)	CORRECTED NET (mg)
125	103.0504	103.0552	4.8	2.1	2.7

TOTAL DRY PARTICULATE CATCH 5.5 mg

SILICA GEL

TARE (g)	FINAL (g)	NET (g)
280.0	284.9	4.9

IMPINGER

INITIAL (ml)	FINAL (ml)	NET (g)
200	238	38

TOTAL WATER 42.9 g

IMP 1 132
2 106
3 0
238

TRACE TECHNOLOGIES, INC.
Environmental Process Technology
10 Radel Avenue
BRIDGEWATER, NEW JERSEY 08807
(201) 685-2100

JOB REDI-CRETE

SHEET NO. _____ OF _____

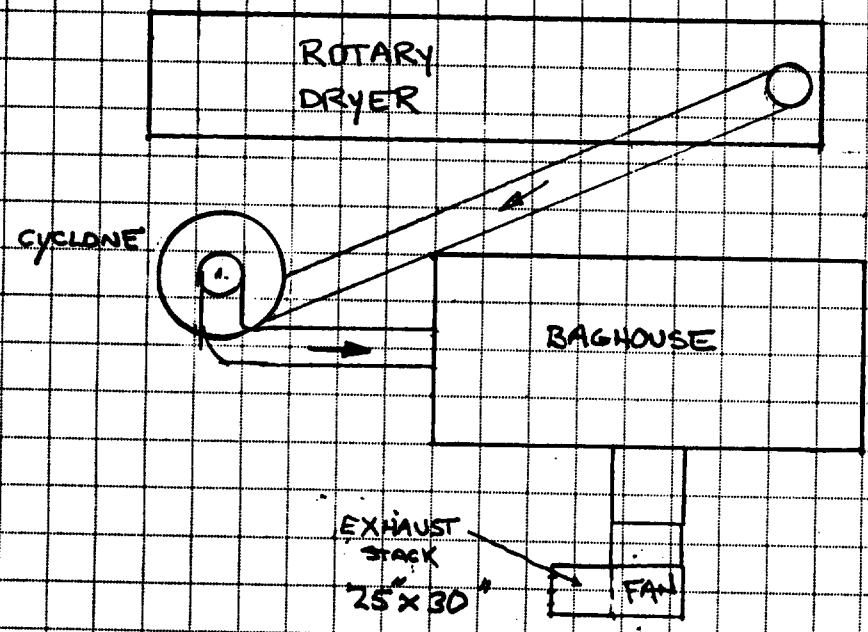
CALCULATED BY JF DATE 7/7/88

CHECKED BY _____ DATE _____

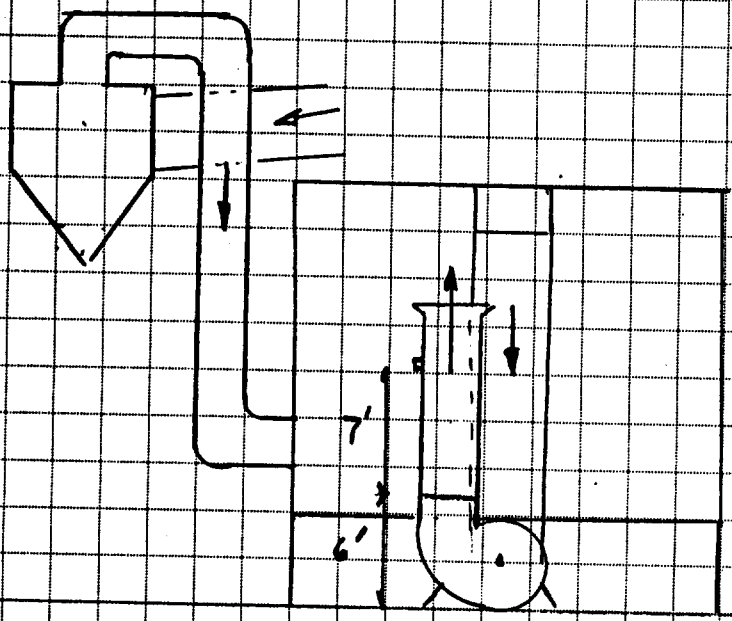
SCALE NOT TO SCALE

STACK DIAGRAM

PLAN



ELEVATION



TRACE TECHNOLOGIES, INC.
Environmental Process Technology
10 Radel Avenue
BRIDGEWATER, NEW JERSEY 08807
(201) 685-2100

JOB REDI-CRETE

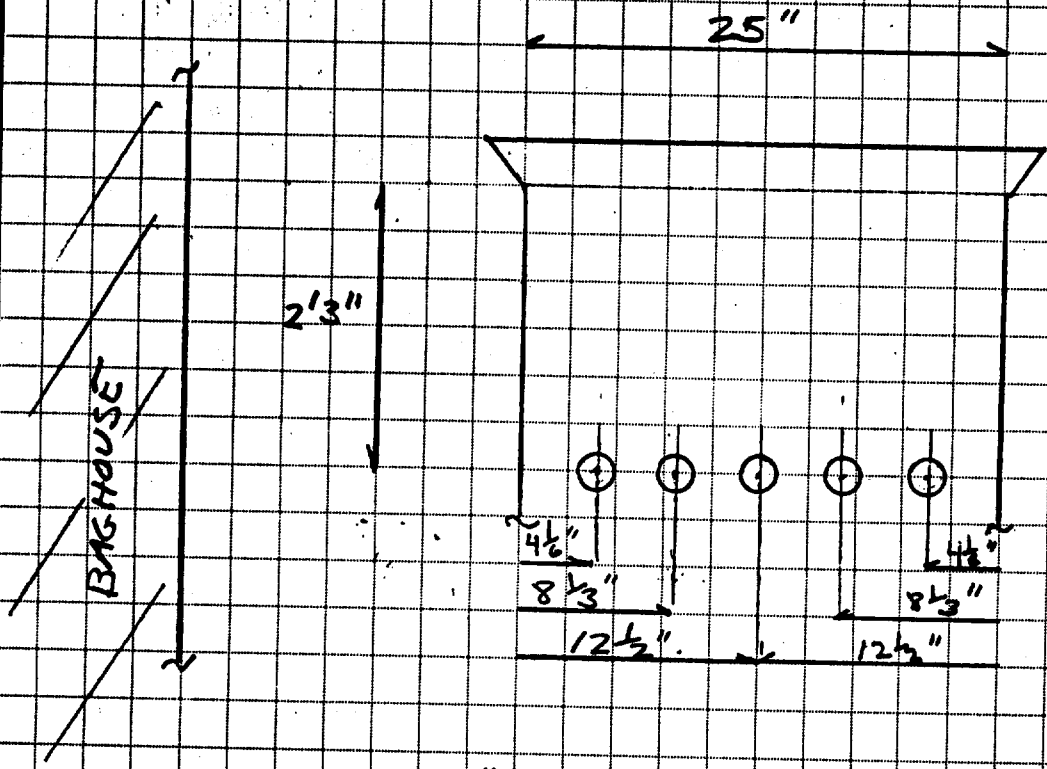
SHEET NO. _____ OF _____

CALCULATED BY JF DATE 9/6/88

CHECKED BY _____ DATE _____

SCALE REVISED SAMPLE PORT LOCATION

NOT TO SCALE



WELD 3" COUPLINGS AT THE CENTERLINE LOCATIONS SHOWN. THIS SKETCH REPLACES A SKETCH SHOWING ONLY 4 SAMPLING PORTS.

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
CN 027, TRENTON, N.J. 08625

JORGE H. BERKOWITZ, Ph.D.
DIRECTOR

(609) 292-5383

August 5, 1988

Mr. John Fritz
Sampling Manager
Trace Technologies, Inc.
P.O. Box 6817
Bridgewater, New Jersey 08807

Re: Readi-Crete Corporation
APC Plant ID No. 25032
NJ Stack No. 001

Dear Mr. Fritz:

We have received the sampling and analytical protocol your company has submitted on behalf of Readi-Crete Corporation. Emission tests are required to be conducted on the Drying Sand and Gravel Source (NJ Stack No. 001) as a condition of approval of Permit No. P-79637.

Our review of the proposed sampling and analytical procedures indicates several items which must be amended into the protocol prior to our approval. These items are as follows.

1. Data on the verification of the absence of cyclonic flow must be presented to the on-site observer from this office on the first day of sampling.

2. Calibration data on all pertinent sampling equipment must be presented to the on-site observer from this office on the first day of sampling.

3. The total hydrocarbon sampling rate must be one liter per minute for a minimum of 60 minutes.

4. The leak check procedure will follow the procedures which I have enclosed.

5. The number of upstream/downstream stack diameters at the outlet sampling location and the number of traverse points must be submitted.

6. A copy of our emission test production report form must be completed by you on a company representative during the tests. The completed form must be submitted to the Regional Office in the area the source is located. A copy of the completed form must be submitted in the final emission test report.

You are required to address each item, in writing, and submit your response to this office. A mutually acceptable test date can be established upon receipt of your response.

If you have any questions please feel free to call me at (609)-530-4041.

Sincerely,

Edward M. Choromanski
Chief
Bureau of Technical Services

c Mike Papp (N.R.O.)
Don Patterson

Enclosure

A.T.M. III LEAK CHECK PROCEDURES FOR RIGID CONTAINER

When a moisture removal system is incorporated in the A.T.M. III Train, it is important to have an accurate value for the total volume sampled. Therefore, it is necessary to have a good leak check procedure for the rigid container. The following method is one acceptable approach.

Procedure:

1. Hook up the rigid container to pump and manometer.
2. Evacuate between 2 - 4" H_2O, and record the initial vacuum .
3. Observe the manometer for a minimum of 1 minute, and record the final vacuum.
4. Using the change in the container pressure and the volume of the container, calculate the change in volume per unit time.

   NOTE: It may be necessary, to monitor the change in temperature for use in the volumetric correction calculations.
5. Bypassing the container, plug the probe and the front end of the sampling train at 15" Hg using a dry gas meter or bubblemeter. (If a rotameter is used, the floats must come to a complete rest. Any "bounce" of the floats is assumed to constitute a leak of an unquantifiable amount and therefore is unacceptable).
6. Add the leak rate from Step 4 and Step 5, the total leak rate cannot exceed 4% of the sampling rate.

Alternate Procedure (Upon Approval of the Administrator)

In order to alleviate the need for the stringent leak check requirements outlined in Steps 1-4 above, the testers may incorporate a rotameter in the sample line prior to the inlet of the container provided the rotameter is:

1. Calibrated against a primary standard.
2. Constructed of glass, teflon and (or) stainless steel.
3. Monitored and recorded at regular intervals (not exceeding 5 minutes) during sampling.

TTI

Trace Technologies, Inc.

P.O. Box 6817, 10 Radel Avenue
Bridgewater, New Jersey 08807
Telephone (201) 685-2100

August 18, 1988

N.J. Dept. of Environmental Protection
Technical Services Section
380 Scotch Road
West Trenton, N.J. 08618

Attn: Mr. E. Choromanski

Re: Stack Sampling Protocol for Redi-Crete
Permit No. P-79637

Dear Mr. Choromanski,

We have recieved your review of the sampling and analytical protocol sumbitted for the Redi-Crete Corporation. Please amend the protocol to include the following items:

1. Data on the varification of the absence of cyclonic flow will be presented to the on-site observer on the first day of sampling.

2. Calibration data for the sampling equipment will also be presented to the on-site observer on the first day of sampling.

3. Total hydrocarbons will be sampled at a rate of one liter per minute for a minimum of 60 minutes.

4. Leak check procedures will conform to those enclosed with your letter.

5. The sampling ports are located 3.2 duct diameters downstream from a flow disturbance, and 1 duct diameter upstream from the outlet. There will be 25 traverse points.

Telecopier:
(201) 685-2219

Trace Technologies, Inc.

P.O. Box 6817, 10 Radel Avenue
Bridgewater, New Jersey 08807
Telephone (201) 685-2100

6. The emissions test production report form will be completed during the test and submitted to the Northern Regional Office. A copy of the emissions test production report will be included in the final test report.

We hope this satisfies your requirements for approval of the sampling and analytical procedures. Thank you for your assistance.

Very truly yours,
Trace Technologies, Inc.

John Fritz
Sampling Manager

don: 8808114

Telecopier:
(201) 685-2219

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
401 East State Street
CN 027
Trenton, N.J. 08625
(609) 984-6721

Jorge H. Berkowitz, Ph.D.
Director

William O'Sullivan, P.E., Assistant Director
Air Quality Engineering and Technology

October 4, 1988

Mr. John Fritz
Sampling Manager
Trace Technologies, Inc.
P.O. Box 6817
Bridgewater, New Jersey 08807

Re: Readi-Crete Corporation
APC Plant ID No. 25032
NJ Stack No. 001

Dear Mr. Fritz:

We received your letter dated August 18, 1988. This letter is in regards to the amendments to the sampling and analytical protocol your company has submitted for the above referenced facility.

Our review of your admendments along with your original submital, indicates the sampling and analytical protocol is now acceptable. Please contact this office to arrange a mutually acceptable test date.

If you have any questions, please feel free to call me at (609) 530-4041.

Sincerely,

Edward M. Choromanski
Chief,
Bureau Technical Services

cc: Mike Papp (N.R.O.)

RECEIVED
OCT - 7 1988
TRACE TECHNOLOGIES, INC.

TTI

Trace Technologies, Inc.

P.O. Box 6817, 10 Radel Avenue
Bridgewater, New Jersey 08807
Telephone (201) 685-2100

July 12, 1988

N.J. Dept. of Environmental Protection
Technical Services Section
380 Scotch Road
West Trenton, N.J. 08618

Attn: Mr. E. Choromanski

Re: Stack Sampling Protocol for Redi-Crete, Flanders, N.J.

Dear Ed,

Trace Technologies, Inc. shall be conducting a stack test for Redi-Crete at their facility in Flanders. Their system consists of a fired rotary dryer, burning #2 fuel oil, for processing sand and gravel. The exhaust gas from the dryer passes first through a cyclone, then a baghouse prior to being discharged. The system outlet will be sampled for particulate, total hydrocarbons and carbon monoxide. The following are the details of the sampling procedure.

I. Preliminary Data

A preliminary traverse and verification of the absense of cyclonic flow shall be done prior to sampling. Moisture and molecular weight data shall be obtained from the particulate and gas sampling trains respectively.

II. Particulate Sampling

An R.A.C. particulate sampling train shall be used to obtain samples in accord with N.J. Reference Method 1. Leak checks will be conducted before and after sampling at the nozzle. Acceptable limits are 0.02 CFM at 15" Hg prior to sampling and 1" Hg above the maximum observed after sampling. Results will be recorded on data sheets. Calibration of the sampling train components will be done according to N.J. Reference Method 1. Calibration data will be available on the day of the test. Sample clean-up at the site will be limited to the probe and nozzle. Sample boxes will be sealed with parafilm and returned to the laboratory for sample recovery.

III. Total Hydrocarbons Sampling

A short teflon line will be inserted at the centerline of the stack. This is connected to a midget impinger/condenser containing 20ml of HC-free water. A dry knock out impinger shall be used to prevent water carry-over to the sampling bag. The sample bag will be Tedlar. The sampling drum will be leak checked after the train is fully assembled. A vacuum of 10 inches of water will be drawn on the drum. The pump will be isolated from the drum and the leak rate observed. A leak rate of less than 0.2 inches of water in 2 minutes will be considered acceptable. Leak checks will be conducted only at the beginning of sampling. The sample line and condensers will be purged by aspirator at the bag inlet valve prior to sampling. Sample will be drawn at a rate of 0.66 LPM for 1.0 hours giving a total of 40 liters of sample. Three samples will be taken concurrently with particulate sampling.

IV. Carbon Monoxide Sampling

The same sampling train used for for hydrocarbon sampling will provide sample for carbon monoxide analysis.

V. Particulate Analysis

The sampling module and probe wash bottle shall be inspected for possible damage during transit to the laboratory. If no damage is observed, the sampling module shall be disassembled for cleaning. The cyclone and flash shall be removed and rinsed thoroughly with acetone to remove any visible particulate. A rubber policeman may be used to remove any particulate not removed with the acetone rinse. The filter assembly shall be opened and the filter quantitatively removed to a petri dish and sealed. The front half of the filter assembly shall be acetone rinsed. The rinses from the cyclone and filter shall be combined with the probe rinse.

The volume of water in the impingers shall be measured using a graduated cylinder and recorded on the data sheet. Silica gel from the last impinger shall be placed in its original weighing bottle and marked for run number.

The filter shall be desiccated and weighed to constant weight to the nearest .1 mg.

Acetone rinses shall be transferred to pre-tared evaporating beakers and placed in a clean fume hood for evaporation. A field blank of acetone shall be evaporated at the same time. The dry beakers shall be desiccated overnight and weighed. Corrections for acetone blank shall be made.

VI. Total Hydrocarbon Analysis

Analysis for total hydrocarbons shall be a two step process consisting of direct gas injection from the tedlar bag, and purge and trap analysis of the condensate. The gas chromatograph shall be configured as follows:

Carrier Gas - Helium
Detector - Flame Ionization
Column - Capillary Jumper
Head Pressure - 20 psig
Injector Temperature - 150 C
Oven Temperature - 140 C
Detector Temperature - 160 C

Hydrogen and air to the detector will be optimized to provide full scale response (1 mv) for a 2 ppmv methane injection of 1 cc.

An electronic integrator shall be used to record the peak areas. Methane standards of 2.0, 10.0 and 50.0 ppmv shall be run to determine the linearity of the detector. Bracketing standards shall be run after the sample is preliminarily quantified. Gas samples shall be injected through either a gas tight syringe, or a gas sampling valve with a 1.0 ml loop. Each sample shall have three successive injections, followed by one 10.0 ppm standard injection.

The condensate shall be analyzed by attaching a purge and trap apparatus (as per EPA Method 624) to the injector of the gas chromatograph using the same operating conditions as the gas analysis. A 5.0 ml aliquot of the condensate shall be placed in the sparging chamber and purged at 35 ml/min for 15 minutes. The trap will then be thermally desorbed to the injection port at 180 C.

The detector response (peak area) may then be used to calculate the VOC fraction of the condensate analyzed and the volume of gas sampled.

The total hydrocarbon content will then be the sum of the liquid and vapor phase concentrations.

Trace Technologies, Inc.

VII. Carbon Monoxide Analysis

Carbon Monoxide analysis shall be as per EPA Reference Method 10 using a Horiba infrared analyzer. The analyzer will be calibrated using standard calibration gasses. Strip chart recordings of the calibration and the sample data will be provided.

VIII. Reporting

The final report shall include:

1. Description of the operating process and conditions
2. Description of sampling and any required deviations
3. Results of sampling and analysis
4. Copies of field data and relevant laboratory data
5. Calibration data
6. Correspondence

Should you require any further information please do not hesitate to contact us directly.

Very truly yours,
TRACE TECHNOLOGIES, INC.

John Fritz

John Fritz
Sampling Manager

enc.
don 8807105

TRACE TECHNOLOGIES, INC.
10 Radel Avenue
Bridgewater, New Jersey 08807
(201) 685-2100

JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

NOZZLE & FLOW RATES

Barometric Pressure	BP		29.05	in. Hg
Stack Pressure	Ps		29.05	in. Hg
Meter Pressure	Pm		29.05	in. Hg
Stack Temperature	Tx	110+460	570	^oR
Meter Temperature	Tm	80+460	540	^oR
Pitot Tube Coef.	Cp		.84	
Orifice Meter Coef.	ΔH@		1.972	
Molecular Weight (stack)	Ms		28.96	
Molecular Weight (meter)	Md		28.96	
Desired Orifice Flow	Qm		.75	CFM
Moisture Fraction	Bsw		.05	
Average ΔP	ΔP avg		.2	in. H_2O

Nozzle diameter selection:

$$D_n = \sqrt{\left(\frac{0.0357 Q_m P_m}{T_m C_p}\right)\left(\frac{1-B_{wm}}{1-B_{ws}}\right)\sqrt{\frac{T_s M_s}{P_s (\Delta P)_{avg}}}}$$

$$D_n = \left[\frac{.0357\ (.75)\ (29.05)\ (1-.05)}{(540)\ (.84)\ (1-.05)}\sqrt{\frac{(570)\ (28.96)}{(29.05)\ (.2)}}\right]^{1/2}$$

D_n = .31 inches

.365

Isokinetic ΔH:

$$\Delta H = K \Delta P \qquad (2)$$

K Factor:

$$K = 849.8 C_p^2 \Delta H_@ D_n^4 \left(\frac{M_m}{M_s}\right)\left(\frac{1-B_{ws}}{1-B_{wm}}\right)^2\left(\frac{T_m}{T_s}\right)\left(\frac{P_s}{P_m}\right) \qquad (3)$$

$$K = 849.8\ (.84)^2\ (1.972)\ (.365)^4 \left(\frac{1}{1}\right)\left(\frac{1-.05}{1-.05}\right)^2 \frac{(540)}{(570)}\left(\frac{1}{1}\right)$$

.244

K = 13.994

28.94 $\left(\frac{T_m\ ^oR}{T_s\ ^oR}\right)$ =

$$K = 3.78\left(\frac{T_M\ ^oR}{T_s\ ^oR}\right)$$

$\Delta H = K \Delta P$

3.95

= 3.58

TRACE TECHNOLOGIES, INC.
10 Radel Avenue
Bridgewater, New Jersey 08807
(201) 685-2100

JOB RLEDI-CRETE
SHEET NO. ______ OF ______
CALCULATED BY JF DATE 11/15/88
CHECKED BY ______ DATE ______
SCALE ______

NON-CYCLONIC FLOW VERIFICATION

STACK ELEVATION

STACK PLAN

TRAVERSE POINT ~~LOCATION~~ (INCHES)	ΔP	ΔP @ 0°	DEGREES		ΔP @ 0° ROTATION	DEGREES OF ROTATION
1	0	0		16		
2	.08	0		17		
3	.18	.05	5	18		
4	.50	.05	5	19		
5	.35	.05	5	20		
6	0	0		21		
7	0	0		22		
8	.05	0		23		
9	.09	0		24		
10	.05	0		25		
11	.01					
12						
13						
14						
15						

ΔP

Σ|ABS| = ______

AVERAGE ROTATION = ______ DEGREES

MAXIMUM ALLOWABLE 10°

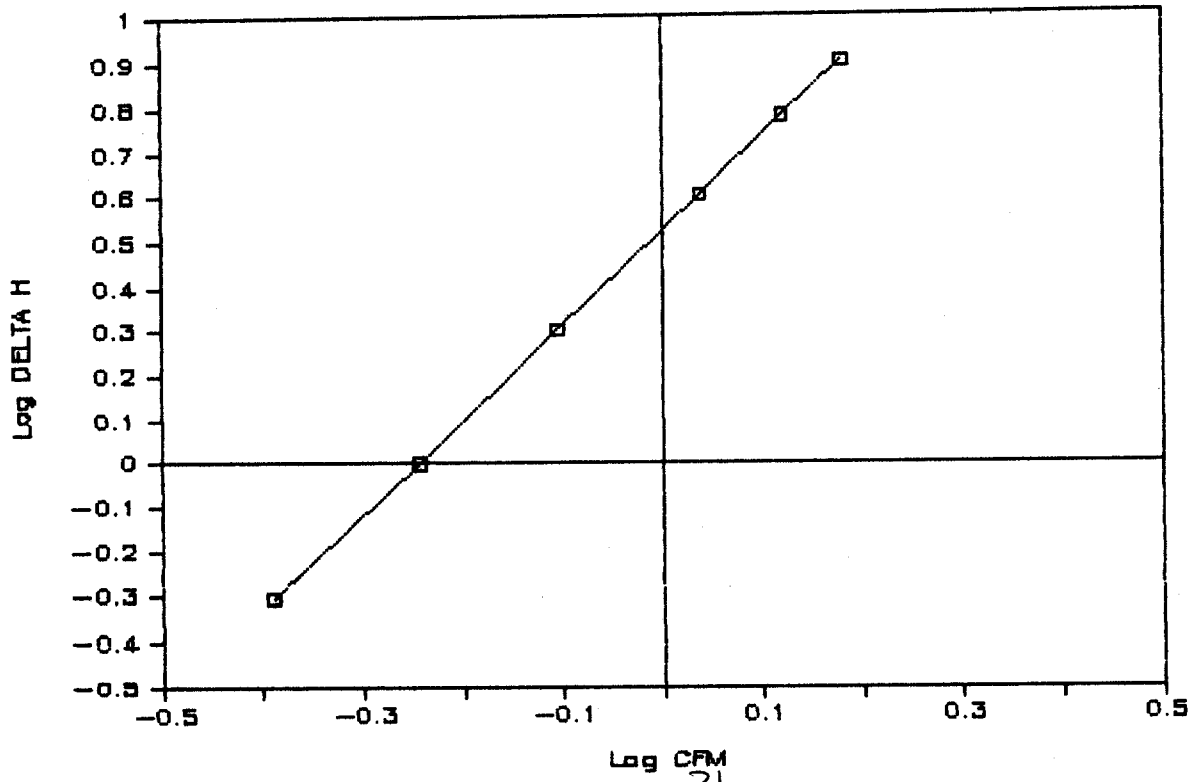
Trace Technologies, Inc.
Computerized data output

Stack Sampler Calibration

METER BOX # `2052
CALIBRATED `9/27/8
BY TG

DELTA H	Vw	Vd	Tw	Tdi	Tdo	Td	TIME	Y	DELTA H@
.5	5	5.223	74.000	98.000	85.000	91.500	12.790	0.987	1.803
1	5	5.256	74.000	105.000	85.000	95.000	9.190	0.986	1.862
2	10	10.564	74.000	119.000	94.000	106.500	13.440	0.999	1.958
4	10	10.616	74.000	128.000	98.000	113.000	9.730	1.001	2.038
6	10	10.625	74.000	132.000	100.000	116.000	8.040	1.001	2.080
8	10	10.606	74.000	134.000	103.000	118.500	7.000	1.002	2.091

Y = 0.996
DELTA H@ = 1.972



TRACE TECHNOLOGIES, INC.
Environmental Process Technology
10 Radel Avenue
BRIDGEWATER, NEW JERSEY 08807
(201) 685-2100

JOB

SHEET NO. OF

CALCULATED BY DATE 9/27/88

CHECKED BY DATE

BAROMETRK PRESSURE 30.1 IN. Hg. SCALE METER BOX CALIBRATION 2052

ORIFICE MANOMETER SETTING ΔH IN. H_2O	GAS VOL. WET TEST METER V_w ft^3	GAS VOL. INITIAL DRY METER V_{di} ft^3	GAS VOL. FINAL DRY METER V_{df} ft^3	TEMPERATURE °F WET METER T_w °F	TEMPERATURE °F DRY METER INLET T_{di} °F	TEMPERATURE °F DRY METER OUTLET T_{do} °F	TIME DECIMAL MINUTES Θ
0.5	5	695.851	701.079	74	98	85	12.79
1.0	5	701.346	706.602	74	105	85	9.19
2.0	10	707.274	717.838	74	119	94	13.44
4.0	10	718.321	728.937	74	128	98	9.73
6.0	10	729.730	740.355	74	132	100	8.04
8.0	10	741.564	752.170	74	134	103	7.00

$$Y = \frac{V_w P_b (T_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(T_w + 460)}$$

P_b = BAR. PRESS.
V_d = DRY METER VOLUME
T_d = AVERAGE DRY METER TEMP.

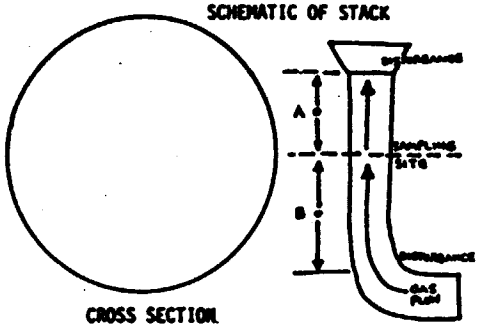
$$\Delta H@ = \frac{0.0317\,(\Delta H)}{P_b (T_{do} + 460)} \left[\frac{(T_w + 460)}{V_w} \cdot \Theta\right]^2$$

Trace Technologies, Inc.

IV. PROTOCOL

Pre-test leak check = .007 @ 15" Hg

SCHEMATIC OF STACK



CROSS SECTION

PLANT REDI-CRETE
DATE 11/16/88
LOCATION
OPERATOR
STACK NO. 001
RUN NO. 2
SAMPLE BOX NO. ~~2~~ E
METER BOX NO. 2052

AMBIENT TEMPERATURE
BAROMETRIC PRESSURE 29.05
ASSUMED MOISTURE, %
PROBE LENGTH, in.
NOZZLE DIAMETER, in.
STACK DIAMETER, in.
PROBE HEATER SETTING
HEATER BOX SETTING

TRACE TECHNOLOGIES, INC.
10 RADEL AVENUE
BRIDGEWATER, NEW JERSEY 08807

METER H
C FACTOR 3.58
PROCESS WEIGHT RATE

TRAVERSE POINT NUMBER	SAMPLING TIME (θ), min	STATIC PRESSURE (in H_2O) #2	#3	STACK TEMPERATURE (T_s), °F #1	VELOCITY HEAD (ΔP_s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in., H_2O	GAS SAMPLE VOLUME (Vm), ft^3	GAS SAMPLE TEMPERATURE AT DRY GAS METER INLET ($T_{m_{IN}}$)°F	OUTLET ($T_{m_{OUT}}$)°F	SAMPLE BOX TEMPERATURE °F #4	#5	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in Hg gauge
1	0	160	205	120	.04	0.14	214.330	65	65	250	100		1
2	2.5	160	205	120	.04	0.14	—	67	66	250	100		1
3	5.0	190	215	120	.10	0.36	215.475	68	66	225	110		2
4	7.5	190	210	120	.16	0.57	216.270	70	66	190	120		3
5	10.0	195	200	120	.15	0.54	217.322	73	66	180	125		3
6	12.5	195	201	120	.24	0.86	218.356	73	66	225	135		4
7	15.0	200	205	120	.04	0.14	—	73	66	200	115		3
8	17.5	200	205	120	.12	0.43	220.168	74	67	235	130		3
9	20.0	200	210	120	.14	.50	221.090	76	68	210	135		3
10	22.5	200	210	120	.14	.50	222.042	79	68	230	135		3
11	25.0	205	215	120	.03	.10	223.085	73	68	240	110		1
12	27.5			120	.03	.10	223.544	73	69	250			1

Bag 043

3.58

TRACE TECHNOLOGIES, INC.
10 RADEL AVENUE
BRIDGEWATER, NEW JERSEY 08807

DATE 11/16

RUN NO. 2

TRAVERSE POINT NUMBER	SAMPLING TIME (θ), min	STATIC PRESSURE (in H_2O) #2	#3	STACK TEMPERATURE (T_s), °F #1	VELOCITY HEAD (ΔP_s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H_2O	GAS SAMPLE VOLUME (Vm), ft^3	GAS SAMPLE TEMPERATURE AT DRY GAS METER INLET (Tm_{IN}) °F	OUTLET (Tm_{OUT}) °F	SAMPLE BOX TEMPERATURE °F #4	#6	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in Hg gauge
13	30.0	210	215	120	.08	0.29	224.040	73	69	200	130		2
14	32.5	210	210	120	.23	0.82	224.750	75	70	230	135		3.5
15	35.0	205	200	115	.37	1.32	225.915	80	70	205	135		5
16	37.5	210	210	120	.04	0.14	227.428	77	70	225	120		1
17	40.0	210	210	120	.04	0.14	228.076	78	71	250	120		1
18	42.5	210	210	120	.16	0.57	228.645	79	72	200	130		3
19	45.0	210	205	120	.30	1.07	229.628	81	72	240	140		4
20	47.5	210	205	125	.45	1.61	231.020	84	73	210	150		5.5
21	50.0	210	210	122	.05	0.18	232.702	82	73	200	130		2
22	52.5	210	210	120	.06	0.21	233.328	82	73	240	130		2
23	55.2	210	210	120	.18	.64	234.058	83	74	230	130		3
24	57.5	210	210	120	0.4	1.43	235.045	86	74	220	140		5
25	60.0	210	210	120	.53	1.897	236.500	88	75	210	130		6
	62.5						238.276						

(32)

Sonde .005 @ 7.5 l/m

TRACE TECHNOLOGIES, INC.
Environmental Process Technology
10 Radel Avenue
BRIDGEWATER, NEW JERSEY 08807
(201) 685-2100

JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

PARTICULATE CLEAN-UP SHEET

DATE: 11/16/84
RUN NUMBER: 2
OPERATOR: JF
SAMPLE BOX NUMBER: E

PLANT: REDI CRETE
LOCATION OF SAMPLE PORT:
BAROMETRIC PRESSURE:
AMBIENT TEMPERATURE:

FILTER NUMBER	TARE (g)	FINAL (g)	NET (mg)
H	.6238	.6280	4.2

ACETONE WASH - BEAKER NUMBER

VOLUME (ml)	TARE (g)	FINAL (g)	NET (mg)	(BLANK) (mg)	CORRECTED NET (mg)
125	100.1177	100.1231	5.4	2.1	3.3

TOTAL DRY PARTICULATE CATCH 7.5 mg

SILICA GEL E

TARE (g)	FINAL (g)	NET (g)
272.1	278.6	6.5

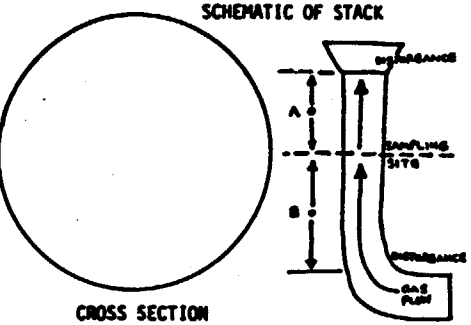
IMP 1 - 123
2 - 108
3 - 0
231

IMPINGER

INITIAL (ml)	FINAL (ml)	NET (g)
200	231	31

TOTAL WATER 37.5 g

SCHEMATIC OF STACK



CROSS SECTION

PLANT _____
DATE _____
LOCATION _____
OPERATOR _____
STACK NO. _____
RUN NO. 3
SAMPLE BOX NO. C
METER BOX NO. 1.052

AMBIENT TEMPERATURE _____
BAROMETRIC PRESSURE _____
ASSUMED MOISTURE, % _____
PROBE LENGTH, in. _____
NOZZLE DIAMETER, in. _____
STACK DIAMETER, in. _____
PROBE HEATER SETTING _____
HEATER BOX SETTING _____

TRACE TECHNOLOGIES, INC.
10 RADEL AVENUE
BRIDGEWATER, NEW JERSEY 08807

METER H 3.58
C FACTOR _____
PROCESS WEIGHT RATE _____

TRAVERSE POINT NUMBER	SAMPLING TIME (θ), min	STATIC PRESSURE (in H_2O)		STACK TEMPERATURE (T_s), °F	VELOCITY HEAD (ΔP_s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in., H_2O	GAS SAMPLE VOLUME (Vm), ft^3	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F		TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in Hg gauge
								INLET (Tm_{IN}) °F	OUTLET (Tm_{OUT}) °F	4	5		
1	0	150	150	120	.05	.12	238.532						2
2	2.5				.06	.21	—	75	70				12
3	5.0	150	172	120	.13	.47 .46	239.945	78	72	240	130		3
4	7.5	160	180	120	.16	.57	240.775	82	73	240	120		4
5	10.1	170	190	120	3.0	1.07	241.880	83	73	250			6
6	12.5	190	210	110	.05	.18	243.235	84	74				2
7	15.0	190	210	120	.06	.21	243848	85	75	240	120		
8	17.5	200	210	120	.16	.57	244.518	88	75	240	120		5
9	20.0	200	205	120	.29	1.04	245.545	92	76	240	130		6
10	22.5	200	200	115	.38	1.37	246.898	98	76	240	150		7.5
11	25.0	210	215	110	.02	.07	248.428	90	78	240	115		1
12	27.5	220	210	115	.04	.14	248.810	90	78	240	120		2

TRACE TECHNOLOGIES, INC.
10 RADEL AVENUE
BRIDGEWATER, NEW JERSEY 08807

DATE _____

RUN NO. 3

TRAVERSE POINT NUMBER	SAMPLING TIME (θ), min	STATIC PRESSURE (in H_2O) #2 (probe)	STATIC PRESSURE (in H_2O) 3 (cyclone before filter)	STACK TEMPERATURE (T_s), °F #1 (stack)	VELOCITY HEAD (ΔP_s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H_2O	GAS SAMPLE VOLUME (Vm), ft^3	GAS SAMPLE TEMPERATURE AT DRY GAS METER: INLET (Tm_{IN})°F	GAS SAMPLE TEMPERATURE AT DRY GAS METER: OUTLET (Tm_{OUT})°F	SAMPLE BOX TEMPERATURE °F #4 (BH)	SAMPLE BOX TEMPERATURE °F #5 (after filter)	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in Hg gauge
13	30.2	220	220	120	.09	0.32	249.392	91	79	225	135		3
14	32.5	220	220	120	.21	0.75	~	93	79	250	140		5
15	35.1	225	220	120	.37	1.32	251.502	92	79	250	190		7
16	37.5	250	215	120	.02	0.07	253.018	92	78	200	110		1
17	40.0	235	215	120	.05	0.18	253.410	83	78	230	125		2
18	42.5		↓	120	.18	0.64	254.991	84	78	250	140		4
19	45.0	220	220	125	.28	1.00	255.022	87	78	225	155		6
20	47.5	220	205	125	.43	1.54	256.397	90	78	190	155		9
21	50.0	215	220	120	.02	0.07	258.068	81	75	235	115		2
22	52.5	215	220	125	.06	0.21	258.491	80	75	240	125		2
23	55.0	216	210	125	.21	0.75	259.164	83	76	200	150		5
24	57.5	210	205	125	.37	1.32	260.327	86	78	240	160		8
25	60.0	200	200	120	.54	1.93	261.828	90	76	240	160		11.
	62.5						263.629						
	5100												

leak check @ 12" Hg = .012 CFM

TRACE TECHNOLOGIES, INC.
Environmental Process Technology
10 Radel Avenue
BRIDGEWATER, NEW JERSEY 08807
(201) 685-2100

JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

PARTICULATE CLEAN-UP SHEET

DATE: 11/16/88
RUN NUMBER: 3
OPERATOR: JF
SAMPLE BOX NUMBER: C

PLANT: REDI CRETE
LOCATION OF SAMPLE PORT:
BAROMETRIC PRESSURE:
AMBIENT TEMPERATURE:

FILTER NUMBER	TARE (g)	FINAL (g)	NET (mg)
6	.6241	.6273	3.2

ACETONE WASH - BEAKER NUMBER

VOLUME (ml)	TARE (g)	FINAL (g)	NET (mg)	(BLANK) (mg)	CORRECTED NET (mg)
125	108.1162	108.1261	9.9	2.1	7.8

TOTAL DRY PARTICULATE CATCH 11.0 mg

SILICA GEL

TARE (g)	FINAL (g)	NET (g)
277.2	284.3	7.1

IMP 1 - 136
2 - 112
3 - 0
248

IMPINGER

INITIAL (ml)	FINAL (ml)	NET (g)
200	248	48

TOTAL WATER 55.1 g

TRACE TECHNOLOGIES, INC.
Environmental Process Technology
10 Radel Avenue
BRIDGEWATER, NEW JERSEY 08807
(201) 685-2100

JOB _____

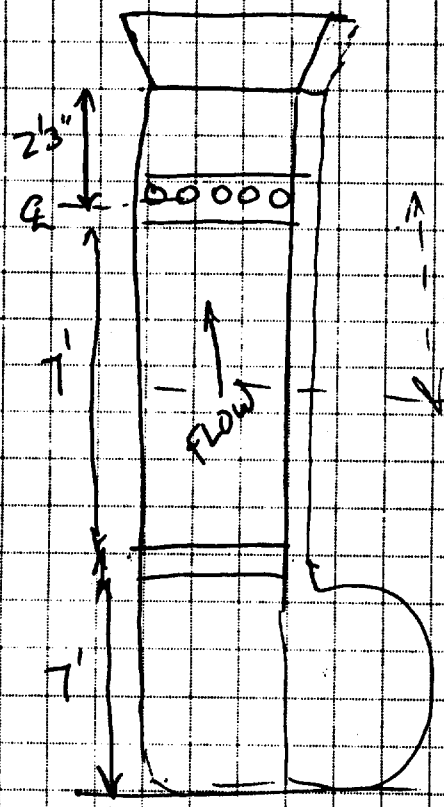
SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Sketch of stack to be sampled showing locations of port openings, water sprayers, flow interferences, dilution air inlets, and scaffolding or platform erection dimensions:



2.5 MIN/PT X 25 PTS
= 62.5 MIN TEST TIME

TRACE TECHNOLOGIES, INC.
Environmental Process Technology
10 Radel Avenue
BRIDGEWATER, NEW JERSEY 08807
(201) 685-2100

PRELIMINARY TRAVERSE

JOB REDI-CRETE
SHEET NO. ____ OF ____
CALCULATED BY JF DATE 11/16/88
CHECKED BY ____ DATE ____
SCALE ____

Sketch of Stack

Stack Pressure P= in. Hg
Dry Bulb Temp. Td= °F
Wet Bulb Temp. T_w = °F
Stack Diameter D= in.

Stack Area A= sq.ft.
Pitot Tube Coefficient Cp = .84
Approximate Molecular Weight M =
BP 29.25

POINT	LOCATION ΔP	LOCATION T_s	ΔP in WC	T_s	ΔPT_s	$\sqrt{\Delta PT_s}$	V
1	.02	100	.07	115			
2	.04	105	.21	125			
3	.18	120	.38	125			
4	.42	125	.01	105			
5	.56	123	.02	110			
6	.01	105	.06	115			
7	.04	115	.20	120			
8	.12	120	.39	125			
9	.30	125	0	98			
10	.48	125	.01	102			
11	0	100	.05	110			
12	.02	108	.19	120			
	25		.35	122			

Σ = 4.15/25
AVG. = .17

VOLUME = (V avg) (A) (60) = ( ) ( ) (60) = ____

SKETCH OF FLOW DISTURBANCES

TRACE TECHNOLOGIES, INC.
Environmental Process Technology
10 Radel Avenue
BRIDGEWATER, NEW JERSEY 08807
(201) 685-2100

JOB _____

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

MOISTURE DETERMINATION BY W.B.-D.B. TECHNIQUE

ABSOLUTE PRESSURE IN STACK $P =$ 29.05 in. Hg

DRY BULB TEMPERATURE $t_d =$ 100 ^oF

WET BULB TEMPERATURE $t_w =$ 95 ^oF

VAPOR PRESSURE AT t_w $SVP =$? 1.175 in. Hg

$$VP = SVP - \left[(0.000367)\ (P)\ (t_d - t_w)\ \left(1 + \frac{t_w - 32}{1571}\right) \right]$$

$$VP = 1.175 - \left[(0.000367)\ (29.05)\ \left(\frac{5}{\quad}\right)\ \left(1 + \frac{95 - 32}{1571}\right) \right]$$

$VP =$ 1.12 in. Hg

$$Bws = \frac{VP}{P} = .039 = 4\%$$