

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

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02\_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.



State of New Jersey  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
DIVISION OF ENVIRONMENTAL QUALITY  
Bureau of Technical Services  
CN 411  
Trenton, N.J. 08625-0411  
(609) 530-4041

March 18, 1992

MEMORANDUM

TO: Joseph DePierro, Regional Enforcement Officer  
Central Regional Enforcement Office

FROM: Edward Choromanski, Chief   
Bureau of Technical Services

SUBJECT: Trap Rock Industries - Mansfield Township, New Jersey  
Stack Emissions Test Program  
APC Plant ID No. 45031  
NJ Stack No. 001  
P/CT No. 15438 (Log No. 90-3337)

Stack emission tests were conducted at the above referenced facility on December 17, 1991. The purpose of these tests was to quantify the emissions of carbon monoxide (CO) and total hydrocarbons (THC) being emitted to the atmosphere from the Batch Mix Asphalt Plant. The emissions are then compared to the allowable emission limits specified in the permit. In addition to the CO and THC tests, nitrogen oxide (NO<sub>x</sub>) emissions were also to be quantified for informational purposes.

Richelle Burkeen reviewed the submitted stack emissions test report. Her review indicates that both carbon monoxide (CO) and total hydrocarbons (THC) emissions were within the allowable concentration limit specified by the permit, for all test runs.

In addition to the CO and THC tests, nitrogen oxides (NO<sub>x</sub>) were also conducted. Based on the reported NO<sub>x</sub> concentration of 49 ppm, the NO<sub>x</sub> emissions rate would be 11.5 lbs/hr (based on ACFM of 41,000, percent moisture of 7.6 and stack temperature of 150°F). Based on 2,000 hours of operation per year would indicate an annual NO<sub>x</sub> emission rate of 11.5 tons/year is realized.

Based on the reported emission results the asphalt plant met the required CO and THC concentration limits. No enforcement action should be taken on the NO<sub>x</sub> data. Specific emission limits for NO<sub>x</sub> are currently under negotiations with the NJAPA. The test results should be accepted as determining compliance with the permit emission limits.

c Milton Polakovic  
Louis Mikolajczyk  
Richelle Burkeen

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 (609) 530-4041

March 6, 1992

MEMORANDUM

TO: Edward Choromanski

FROM: Richelle Burke 

SUBJECT: STA-Seal Industries  
 Florence, New Jersey  
 APC Plant ID No. 45031  
 NJ Stack No. 001  
 P/CT No. 15438 (Log No. 01-90-3337)

On December 17, 1991, stack emission tests were conducted at the above referenced facility. The tests were conducted in accordance with an agreement the New Jersey Department of Environmental Protection and Energy (NJDEPE) has with the New Jersey Asphalt Pavement Association (NJAPA) to determine compliance with applicable permits.

The purpose of these tests was to determine total hydrocarbon, carbon monoxide, and nitrogen oxide emissions. The results of the tests are as follows.

EMISSIONS

	Run 1	Run 2	Run 3	Allowable
Oxygen				
%	16.80	17.00	17.65	
Total Hydrocarbons (as CH <sub>4</sub> )				
ppmvd	41.1	25.2	16.2	
ppmvd @ 7% O <sub>2</sub>	82.7	50.7	32.6	250
Carbon Monoxide				
ppmvd	41.0	41.0	38.3	
ppmvd @ 7% O <sub>2</sub>	77.4	82.4	77.0	500
*Nitrogen Oxides				
ppmvd	48.7			
ppmvd @ 7% O <sub>2</sub>	97.9			

\* Emissions measured for run one only.



**PRODUCTION DATA**

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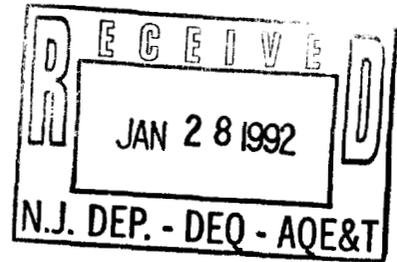
	Run 1	Run 2	Run 3
<b>Production Rate (tph)</b>	239	231	226
<b>Blower Pressure (sq. in)</b>	23.4	23.6	23.2
<b>Asphalt Cement (%)</b>	4.5	4.5	4.5
<b>Mix Temperature (°F)</b>	320	321	322
<b>Exhaust Gas Temp. (°F)</b>	192	183	187
<b>Pressure Drop (in. of H<sub>2</sub>O)</b>	13.7	13.8	13.6
<b>% MOISTURE</b>			
Sand	5.1	4.9	5.3
Stone Sand	2.1	2.0	2.2
3/8 inch	2.5	2.7	2.5

---

The maximum design capacity of the facility is 265 tph. During the three runs the facility operated at 85%- 90% of this rate.

Technical Services review of the raw data supplied indicates substantially the same results. The results indicate that carbon monoxide and total hydrocarbon emissions adhere to the NJDEPE standard allowable emissions limits for all runs.

Project No. 1495



STA Seal, Inc.

Emission Compliance Test Program  
Mansfield Township Facility

APC ID No. 45031  
N.J. Stack No. 001

*Mark W. Wally*

Prepared By

Certified By:

*Robert K. Cutler 1-16-92*

Prepared for:

Mr. Gil Gerard  
Trap Rock Industries, Inc.  
P.O. Box 419  
Kingston, New Jersey 08524

January 1992

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## 1.0 INTRODUCTION

The New Jersey Asphalt Pavement Association (NJAPA) has reached an agreement with the New Jersey Department of Environmental Protection and Energy (NJDEPE) Bureau of Technical Services (BTS) regarding the performance of emission compliance demonstrations at member facilities. It is required that the affected facilities conduct emission sampling in determination of total hydrocarbons (THC) carbon monoxide (CO) and nitrogen oxides (NOx) in demonstration of permit limitations for these parameters.

AirNova, Inc. conducted such an emission compliance program at the STA Steal, Mansfield Township facility located in Florence, New Jersey on December 17, 1991.

This report contains the complete results of the program.

## 2.0 FACILITY DESCRIPTION

The facility under evaluation produces asphaltic hot mix utilizing a batch process. The hot mix is a paving material consisting of a combination of graded aggregate that is dried, heated and evenly coated with hot asphalt cement. The aggregate is dried and heated in a rotary dryer which is fired by No. 2 fuel oil. After further classification, the aggregate is mixed with asphalt pumped from heated storage tanks prior to truck loading the final product. Particulate emissions from the dryer are controlled by a fabric filter baghouse operated at approximately 1.4 in wg. pressure drop.

All emission determinations were conducted at the baghouse exhaust. Sampling was conducted in a vertical section of exhaust duct 36-inches x 31-inch in dimension. Four test ports located 1.7 equivalent duct diameters downstream and 5.8 equivalent duct diameters upstream from the nearest flow disturbance were utilized for all sampling.

### 3.0 TEST RESULTS

The results of the test program are presented on the following page in Table 3-1. The results indicate that the source has met the emission limitation specified by NJDEPE for all parameters. The average emission values as determined are as follows:

<u>Parameter</u>	<u>Average Test Value</u>	<u>NJDEPE Emission Limit</u>
Total Hydrocarbons (ppmV @ 7% O <sub>2</sub> )	55.3	250
Carbon Monoxide (ppmV @ 7% O <sub>2</sub> )	78.9	500
Nitrogen Oxides (ppmV @ 7% O <sub>2</sub> )	97.9*	500

\* Only one test run was conducted for nitrogen oxides

Table 3-1  
Test Results Summary

STA Seal Industries  
Florence, New Jersey

Run No.	1	2	3
Test Date	12/17/91	12/17/91	12/17/91
Test Period	0930-1030	1110-1210	1225-1325
Moisture Content (%)	----	----	7.6
Oxygen (%-Dry)	16.80	17.00	17.65
Total Hydrocarbons (ppmV-dry)	41.1	25.2	16.2
(ppmV-dry @ 7% O <sub>2</sub> )*	82.7	50.7	32.6
Carbon Monoxide (ppmV-dry)	38.5	41.0	38.3
(ppmV-dry @ 7% O <sub>2</sub> )*	77.4	82.4	77.0
Nitrogen Oxides (ppmV-dry)	48.7	----	----
(ppmV-dry @ 7% O <sub>2</sub> )*	97.9	----	----

\* Corrected to a maximum source concentration of 14% O<sub>2</sub>

Standard Conditions: 70°F, 29.92 in Hg.

#### 4.0 SAMPLING AND ANALYTICAL METHODOLOGIES

The emission test program was conducted utilizing the methodologies specified below:

EPA Method 3 - Gas Analysis for the Determination of Dry Molecular Weight

EPA Method 4 - Determination of Moisture Content in Stack Gases

NJ Air Test Method 3.7 - Procedures for the Direct Measurement of Volatile Organics Substances Using a Flame Ionization Detector (FID), a Photoionization Detector (PID), or a Non-Dispersive Infrared Analyzer (NDIR)

EPA Method 7E - Determination of Nitrogen Oxides Emissions from Stationary Sources

EPA Method 10 - Determination of Carbon Monoxide Emissions from Stationary Sources

Triplicate test runs were conducted in determination of total hydrocarbons and carbon monoxide concentrations with each being a minimum of 1 hour in duration. EPA Methods 4 and 7E were conducted during one (1) test run only for the purpose of determining the stack gas moisture content and nitrogen oxides concentration.

A complete description of each test methodology is presented below.

##### 4.1 Carbon Dioxide and Oxygen

Carbon dioxide (CO<sub>2</sub>) and oxygen (O<sub>2</sub>) content were determined by EPA Method 3. The sampling train consisted of a stainless steel probe packed with a plug of glass wool for particulate filtration. The sampling probe was attached to an ice-cooled condenser used to remove excess moisture from the sample stream. The condenser was attached to a leak-free diaphragm pump with an in-line needle valve to adjust the sample flow rate. The sample stream was drawn

through a rotameter to measure the sampling flow rate within  $\pm 5$  percent of the selected flow rate for the test. The sample stream passed through the rotameter into a leak-free Tedlar bag. Analysis was conducted in accordance with EPA Method 3 (ORSAT analysis).

#### 4.2 Moisture Content

Moisture content was determined in accordance with EPA Reference Method 4. Sampling was conducted utilizing large capacity impingers while collecting a minimum sample volume of 30 DSCF. One (1) test run for moisture content was conducted concurrent with the emission determinations during test run No. 3.

#### 4.3 Total Hydrocarbons

Total hydrocarbons were measured continuously using a heated total hydrocarbon analyzer. Sample gas was transported from the test location through a heated glass fiber filter and heated Teflon sample line and directed to the instrument. This instrument uses a Flame Ionization Detector (FID) and a heated sample oven maintained at 320°F to prevent the condensation of high molecular weight hydrocarbons. The detector is fueled with a hydrogen/helium mixture and uses blended air as the oxidant. The instrument was calibrated with NBS traceable mixtures of methane in air of approximately 25%, 50% and 90% of instrument span and zeroed with hydrocarbon free air ( $<0.1$  ppm C) both before and after each test run. System bias checks were conducted before and after each test run utilizing the midpoint calibration standard. The instrument was operated in the 0-500 ppmV range.

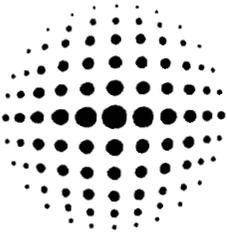
#### 4.4 Carbon Monoxide

Exhaust gas concentrations of carbon monoxide were determined by utilizing EPA Reference Method 10. This method allowed for the continuous instrumental analysis of source gas concentrations by employing a gas filter

correlation analyzer. Exhaust gas sample was extracted from the emission source through a heated (320°F) Teflon sample line and filter and passed through a chilled condenser for moisture removal prior to being introduced to the instrument for immediate analysis. Instrument calibrations occurred by introducing zero and NBS traceable upscale span gases of approximately 25%, 50% and 90% to the instrument span both before and after each sample period. System bias checks were conducted before and after each test run utilizing the midpoint calibration standard. The instrument was operated in the 0-1000 ppm range. Source concentrations were permanently recorded by a strip chart recorder. A leak check was performed from the sample probe prior to the start of testing to ensure the integrity of all system components. (See Figure 3-1).

#### 4.5 Oxides of Nitrogen

A chemiluminescence analyzer with a thermal converter was employed for the analysis of nitric oxide (NO) and total oxides of nitrogen (NOx) in accordance with EPA Reference Method 7E. Exhaust samples were transported to the analyzer through a heated filter and heated (320°F) Teflon sample line. A thermal converter is used to convert nitrogen dioxide (NO<sub>2</sub>) to nitric oxide (NO) so that total oxides of nitrogen (NOx) could be measured. The converter can be switched in and out of the system using solenoid valves permitting selective operation in the NO or NOx mode. The instrument was calibrated using three NBS traceable NO in nitrogen standards of approximately 25%, 50% and 90% of instrument span and zeroed with zero grade nitrogen. Source concentrations were permanently recorded by a strip chart recorder. One 1-hour test run was performed in determination of outlet concentrations of nitrogen oxides. (See Figure 3-1).



# AirNova, Inc.

5845-A Clayton Avenue, Pennsauken, New Jersey 08109  
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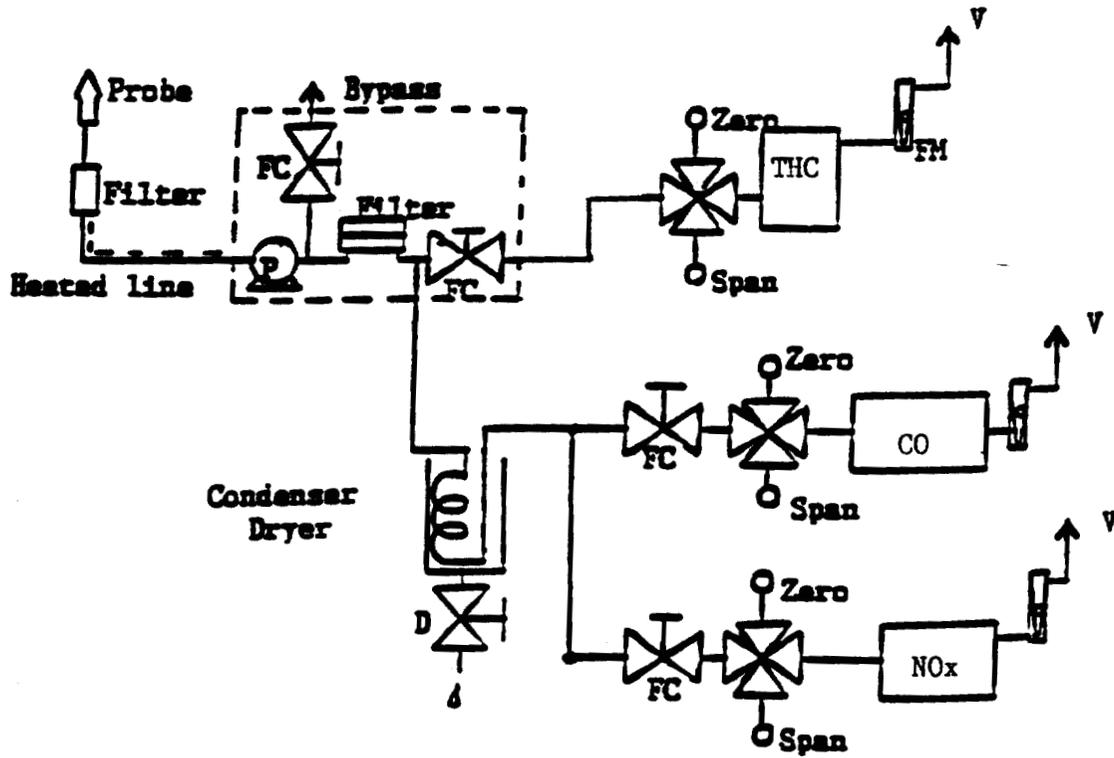


Figure 3-1 Instrumental Analysis System

**Appendix A**  
**Field Data and Calculations**





**AirNova, Inc.**  
AIR QUALITY SAMPLING AND ANALYSIS

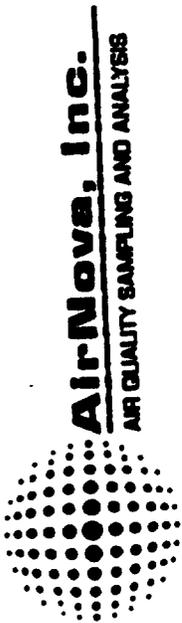
**GAS ANALYSIS DATA FORM**

COMMENTS:

PLANT Tape Rack - FURNACE  
 DATE 12/12/91 TEST NO 1  
 SAMPLING TIME (24-HR CLOCK) \_\_\_\_\_  
 SAMPLING LOCATION BAGHOUSE OUTLET  
 SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) \_\_\_\_\_  
 ANALYTICAL METHOD DRIFT  
 AMBIENT TEMPERATURE 25  
 OPERATOR MC/SC

GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M <sub>d</sub>
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO <sub>2</sub>	3.40	3.40	3.40	3.40	3.40	3.40	44,100		
O <sub>2</sub> (NET IS ACTUAL O <sub>2</sub> READING MINUS ACTUAL CO <sub>2</sub> READING)	20.00	16.60	20.20	16.80	20.20	16.80	32,100		
CO (NET IS ACTUAL CO READING MINUS ACTUAL O <sub>2</sub> READING)	20.20	0.00				0.00	28,100		
N <sub>2</sub> (NET IS 100 MINUS ACTUAL CO READING)						79.80	28,100		
<b>TOTAL</b>									

*MC*



**AirMove, Inc.**  
AIR QUALITY SAMPLING AND ANALYSIS

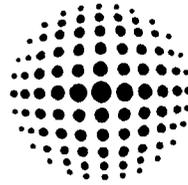
**GAS ANALYSIS DATA FORM**

COMMENTS:

PLANT TRAP BACK - FURNACE 2  
 DATE 12/12/91 TEST NO \_\_\_\_\_  
 SAMPLING TIME (24-HR CLOCK) \_\_\_\_\_  
 SAMPLING LOCATION BAGHOUSE OUTLET  
 SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) \_\_\_\_\_  
 ANALYTICAL METHOD ORIM  
 AMBIENT TEMPERATURE 25F  
 OPERATOR ME/SC

GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M <sub>g</sub>	
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET				
CO <sub>2</sub>	3.30	3.30	3.30	3.30	3.35	3.35	3.35	44.100		
O <sub>2</sub> (NET IS ACTUAL O <sub>2</sub> READING MINUS ACTUAL CO <sub>2</sub> READING)	16.55	13.25	20.00	16.65	20.35	3.35	17.00	32.100		
CO (NET IS ACTUAL CO READING MINUS ACTUAL O <sub>2</sub> READING)	20.35	0.00					0.00	28.100		
N <sub>2</sub> (NET IS 100 MINUS ACTUAL CO READING)							79.65	28.100		
<b>TOTAL</b>										

A3



**AirNova, Inc.**  
AIR QUALITY SAMPLING AND ANALYSIS

**GAS ANALYSIS DATA FORM**

PLANT TRAP ROCK  
DATE 12/12/91 TEST NO 8  
SAMPLING TIME (24-hr CLOCK) \_\_\_\_\_  
SAMPLING LOCATION BOGHOUSE OUTLET  
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) \_\_\_\_\_  
ANALYTICAL METHOD DRSAT  
AMBIENT TEMPERATURE 25°F  
OPERATOR mc/jc

COMMENTS:

RUN GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M <sub>d</sub>
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO <sub>2</sub>	2.40	2.40	2.40	2.40	2.40	2.40	2.40	44/100	
O <sub>2</sub> (NET IS ACTUAL O <sub>2</sub> READING MINUS ACTUAL CO <sub>2</sub> READING)	19.95	17.35	20.05	17.65	20.05	17.65	17.65	32/100	
CO (NET IS ACTUAL CO READING MINUS ACTUAL O <sub>2</sub> READING)	20.05	0.00	~~~~~				0.00	28/100	
N <sub>2</sub> (NET IS 100 MINUS ACTUAL CO READING)			~~~~~				79.95	28/100	
								<b>TOTAL</b>	

44

1495-01

METHOD 4- Moisture Determination

Proj. No. 1495  
Test Date 12/17/91

Run No.	1	2	3	4	5	6
Meter Vol. (DCF)	26.117					
Moisture Gain (g)	47.8					
Avg Meter Temp (F)	38.7					
Std. Temp. (F)	70					
Meter Coeff. (Y)	0.99					
Baro. Press. (in. Hg)	30.01					
Meter Vol. (DSCF)	27.561	0.000	0.000	0.000	0.000	0.000
Water Vapor (SCF)	2.2623	0.0000	0.0000	0.0000	0.0000	0.0000
Stack Moisture (%)	7.6	ERR	ERR	ERR	ERR	ERR

AB

**Appendix B**  
**Calibration Data**

PUBLIC SERVICE ELECTRIC AND GAS COMPANY  
GAS METER SHOP

PROOF TEST RECORD

METER SIZE: CL175

DATE RECEIVED: 10/04/89

INSPECTOR: C. RIZZA

DATE TESTED: 10/05/89

MANUFACTURER: ROCKWELL

PROVER NO. 1264

TEMPERATURE:

OIL : 73° F.

METER NUMBER: 6837018

PROVER AIR: 73° F.

175 C.F.H.  
-----

TEST #	CU. FT.	PERCENT PROOF	
TEST # 1	2.0 CU. FT.	100.0	
TEST # 2	2.0 CU. FT.	100.0	
TEST # 3	2.0 CU. FT.	100.0	

35 C.F.H.  
-----

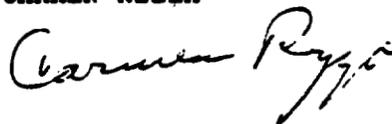
TEST #	CU. FT.	PERCENT PROOF	
TEST # 1	2.0 CU. FT.	100.I	
TEST # 2	2.0 CU. FT.	100.0	
TEST # 3	2.0 CU. FT.	100.0	

A calibration and accuracy test was performed on test meter number 6837018 for:

AirNova Inc  
931 Haddon Avenue  
Collingswood, N.J.  
08108

METER REPAIR SUPERVISOR

CARMEN RIZZA



STACK SAMPLER CALIBRATION SHEET

Calibrated by JAY

Date 10-22-91 Box No. 4

Pump  Pump Oil

Lean Quick Connects  Valves

Manometers  Dry Test Meter

Thermometers

Lights \_\_\_\_\_ Buzzer \_\_\_\_\_

Electrical Check - Amphenol \_\_\_\_\_

Pressure \_\_\_\_\_ Vacuum Gauge \_\_\_\_\_

Leak Check at 27" Hg. - Leakage \_\_\_\_\_ CFM \_\_\_\_\_

Remarks \_\_\_\_\_

CALIBRATION - ORIFICE AND METER

Man Orifice	CF <sub>w</sub>	CF <sub>d</sub>	T <sub>w</sub>	IT <sub>d</sub>	OT <sub>d</sub>	T <sub>d</sub> AVG.	Pb	Time <sub>t</sub>
0.5	6.770	6.816	525	—	—	532	30.40	15
1.0	5.424	5.452	525	—	—	533	30.40	10
2.0	7.666	7.676	526	—	—	533	30.40	10
3.0	9.482	9.469	525	—	—	534	30.40	10
4.0	10.915	10.910	526	—	—	536	30.40	10
5.0	12.120	12.075	527	—	—	536	30.40	10

Tolerances

Y = 0.99 - 1.00 - 1.01

ΔH = 1.6 - 1.84 - 2.1

BS

$P_b$ (Td avg. + 460)	$(T_w + 460)t^2$	Man.	$\Delta H_e$	$CF_w P_b$ ( $T_d$ avg. + 460)	Man.	Y
$CF_w$				$CF_d (P_b + \frac{\text{Man. orifice}}{13.6} (T_w + 460))$		
0.01585	$(65 + 460) / 5^2$	.5	1.83	$5.770 \times 30440 (72 + 460)$	.5	1.004
30440 (72 + 460)	5.770			$6.816 (30440 + 0.0368) (65 + 460)$		
0.0317	$(65 + 460) / 10^2$	1.0	1.83	$5.424 \times 30440 (72 + 460)$	1.0	1.007
30440 (73 + 460)	5.424			$5.452 (30440 + 0.0735) (65 + 460)$		
0.0634	$(66 + 460) / 10^2$	2.0	1.84	$7.666 \times 30440 (73 + 460)$	2.0	1.007
30440 (73 + 460)	7.666			$7.676 (30440 + 0.147) (66 + 460)$		
0.0951	$(65 + 460) / 10^2$	3.0	1.80	$9.482 \times 30440 (74 + 460)$	3.0	1.01
30440 (74 + 460)	9.482			$9.469 (30440 + 0.221) (66 + 460)$		
0.1268	$(66 + 460) / 10^2$	4.0	1.84	$10.915 \times 30440 (75 + 460)$	4.0	1.01
30440 (76 + 460)	10.915			$10.910 (30440 + 0.294) (67 + 460)$		
0.1585	$(67 + 460) / 10^2$	5.0	1.84	$12.120 \times 30440 (76 + 460)$	5.0	1.009
30440 (76 + 460)	12.120			$12.075 (30440 + 0.368) (67 + 460)$		

BB

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date 6-8-91 Thermocouple number Sample box #217F

Ambient temperature 21 °C Barometric pressure \_\_\_\_\_ in. Hg

Calibrator JM Reference: mercury-in-glass ASTM-2F  
other \_\_\_\_\_

Reference point number <sup>a</sup>	Source <sup>b</sup> (specify)	Reference thermometer temperature, °C	Thermocouple potentiometer temperature, °C	Temperature difference, % <sup>c</sup>
1	Ambient	72°	71.5°	.69%
2	Boiling oil	421°F	420°F	.2%
3	Ice/water	35°F	34.5°F	1.4%

<sup>a</sup>Every 30°C (50°F) for each reference point.

<sup>b</sup>Type of calibration system used.

<sup>c</sup>
$$\left[ \frac{(\text{ref temp, } ^\circ\text{C} + 273) - (\text{test thermom temp, } ^\circ\text{C} + 273)}{\text{ref temp, } ^\circ\text{C} + 273} \right] 100 \leq 1.5\%$$

*BJ*

**STACK TEMPERATURE SENSOR CALIBRATION DATA FORM**

Date 6-8-91 Thermocouple number Sample Box #2 FL

Ambient temperature 71 °C Barometric pressure 30.4 in. Hg

Calibrator JM Reference: mercury-in-glass ASTM-2F

other

Reference point number <sup>a</sup>	Source <sup>b</sup> (specify)	Reference thermometer temperature, °C	Thermocouple potentiometer temperature, °C	Temperature difference, % <sup>c</sup>
1	Ambient	71°F	71°F	0.0%
2	boiling oil	422°F	419°F	.7%
3	ice/water	34°F	34°F	0.0%

<sup>a</sup>Every 30°C (50°F) for each reference point.

<sup>b</sup>Type of calibration system used.

<sup>c</sup>
$$\left[ \frac{(\text{ref temp, } ^\circ\text{C} + 273) - (\text{test thermom temp, } ^\circ\text{C} + 273)}{\text{ref temp, } ^\circ\text{C} + 273} \right] 100 \leq 1.5\%$$

85  
11

**STACK TEMPERATURE SENSOR CALIBRATION DATA FORM**

Date 6-7-91 Thermocouple number Box #4 INLET OF UNIT  
 Ambient temperature 70° °C Barometric pressure 30.29 in. Hg  
 Calibrator JIMAY Reference: mercury-in-glass ASTM-2F  
 other

Reference point number <sup>a</sup>	Source <sup>b</sup> (specify)	Reference thermometer temperature, °C	Thermocouple potentiometer temperature, °C	Temperature difference, % <sup>c</sup>
1	Ambient	70° F	70° F	0%
2	boiling oil	420° F	417° F	-0.7%
3	ice/water	35° F	34.5° F	-1.6%

<sup>a</sup> Every 30°C (50°F) for each reference point.

<sup>b</sup> Type of calibration system used.

<sup>c</sup> 
$$\left[ \frac{(\text{ref temp, } ^\circ\text{C} + 273) - (\text{test thermom temp, } ^\circ\text{C} + 273)}{\text{ref temp, } ^\circ\text{C} + 273} \right] 100 < 1.5\%$$

B4

**STACK TEMPERATURE SENSOR CALIBRATION DATA FORM**

Date C-7-91 Thermocouple number Box #4 OUTLET of met

Ambient temperature 70° °C Barometric pressure 30.29 in. Hg

Calibrator Jimax Reference: mercury-in-glass ASTM-2F  
other

Reference point number <sup>a</sup>	Source <sup>b</sup> (specify)	Reference thermometer temperature, °C	Thermocouple potentiometer temperature, °C	Temperature difference, % <sup>c</sup>
1	Ambient	70°F	69°F	1%
2	boiling oil	420°F	419°F	.8%
3	ice/water	35°	35°	0%

<sup>a</sup> Every 30°C (50°F) for each reference point.

<sup>b</sup> Type of calibration system used.

<sup>c</sup> 
$$\left[ \frac{(\text{ref temp, } ^\circ\text{C} + 273) - (\text{test thermom temp, } ^\circ\text{C} + 273)}{\text{ref temp, } ^\circ\text{C} + 273} \right] 100 \leq 1.5\%$$

# **Matheson** Gas Products

World Leader in Specialty Gases & Equipment

POST OFFICE BOX 85  
EAST RUTHERFORD, NEW JERSEY 07073  
TELEPHONE: (201) 933-2400

Air Nova  
5845A Clayton Avenue  
Pennsauken, New Jersey 08109

Date September 14, 1990

Our Invoice # \_\_\_\_\_

Your P.O. # AN635

Ref. No. \_\_\_\_\_

Gentlemen:

Below are the results you requested as reported by our laboratory. Results are in molecular percent, unless otherwise indicated.

## LABORATORY REPORT ON GAS CERTIFICATION

Cyl # SX20103  
Mixture Req 270PPM Meth/Air Certification

288 PPM Methane

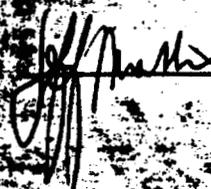
Balance Air Zero

Cyl # SX21127  
Mixture Req 55PPM Meth/Air Certification

58 PPM Methane

Balance Air Zero

Analyst



B8

# Matheson<sup>®</sup> Gas Products

World Leader in Specialty Gases & Equipment

POST OFFICE BOX 85  
EAST RUTHERFORD, NEW JERSEY 07073  
TELEPHONE: (201) 933-2400

Air Nova  
5845A Clayton Avenue  
Pennsauken, NJ 08109

Date March 1, 1991

Our Invoice # \_\_\_\_\_

Your P.O. # AN691

Ref. No. \_\_\_\_\_

Gentlemen:

Below are the results you requested as reported by our laboratory. Results are in molecular percent, unless otherwise indicated.

## LABORATORY REPORT ON GAS CERTIFICATION

Cyl. # SX21267  
Mixture Req. 1800 PPM Methane <sup>C/Air</sup> Certification

1688 PPM Methane

Balance Air Zero

Cyl. # SX 21189  
Mixture Req. 180 PPM Methane <sup>C/Air</sup> Certification

172 PPM Methane

Balance Air Zero

Analyst Marshall

RECEIVED



1399 NEW FORD MILL RD.  
MORRISVILLE, PA 19067  
(800)638-6360

ANALYTICAL REPORT - PRODUCT CERTIFICATION

TO:  
M.G. Industries  
Intracompany Transfer Account  
2300 E Church St.  
Philadelphia, PA 19124

DATE: 10/31/91  
P.O. NO.  
ORDER NO. 780065-001  
REF. # AD-133

CYLINDER NO.	CONSTITUENTS CONCENTRATION:	NOMINAL	ACTUAL
	CERTIFIED MIXTURE		
LL29537	Methane	450 ppm	445.7 ppm
	Air	Balance	Balance

Aaron L. Durr

ANALYST

BO

# Scott Specialty Gases, Inc.

PLUMSTEADVILLE, PA 18949

PHONE: 215-766-8861

FAX: 215-766-0320

Date Shipped 11-14-90

AIRNOVA  
5845 A CLAYTON AVENUE  
PENNSAUKEN NJ 08109

Our Project No: 23894

Your P.O. No: 637

Page 5 of 7

ATTN: JOHN DEEMER

## CERTIFICATE OF ANALYSIS - EPA PROTOCOL GASES\*

(Concentrations are in mole % or ppm)

Cylinder Number ALM 011271 Certified Accuracy ±1 % NBS Traceable Analysis Dates: First 9-6-90 Last 11-8-90  
CP = 1750 psig

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS	
					FIRST	SECOND
CARBON MONOXIDE	848 ppm	5-8-92	NDIR	2636	847.1 ppm	849.2 ppm
					847.1 ppm	849.2 ppm
					847.1 ppm	849.2 ppm
NITROGEN	BALANCE					

Cylinder Number \_\_\_\_\_ Certified Accuracy \_\_\_\_\_ % NBS Traceable Analysis Dates: First \_\_\_\_\_ Last \_\_\_\_\_

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS	
					FIRST	SECOND

\*We hereby certify the cylinder gas has been analyzed according to EPA Protocol No:

1 Procedure G1

Analyst *Robert J. Smith*

Approved By *Mark S. Sirinides*

MARK S. SIRINIDES

The only liability of this Company for gas which fails to comply with this analysis shall be replacement thereof by the Company without extra cost.

CERTIFIED REFERENCE MATERIALS ■ EPA PROTOCOL GASES ■ ACUBLEND® ■ CALIBRATION & SPECIALTY GAS MIXTURES  
PURE GASES ■ ACCESSORY PRODUCTS ■ CUSTOM ANALYTICAL SERVICES

TROY, MICHIGAN / SAN BERNARDINO, CALIFORNIA / HOUSTON, TEXAS  
SOUTH PLAINFIELD, NEW JERSEY / FREMONT, CALIFORNIA / WAKEFIELD, MASSACHUSETTS / LONGMONT, COLORADO

B11

CYLINDER NUMBER ALM 011271

PROJECT NO. 23894

**STANDARD**

**ANALYZER**

TYPE (SRM, CRM, GMIS) GMIS

MAKE HORIBA

CYLINDER NUMBER AAL 17448

MODEL CFA 310A

CONCENTRATION 994.2 ppm CARBON MONOXIDE/NITROGEN

SERIAL NO. 474091

2nd GMIS  
AAL 18874  
1002 ppm CARBON MONOXIDE/NITROGEN

DATE OF CALIBRATION 9-4-90

RAW DATA ( FOR CONCENTRATION LISTED UNDER "REPLICATE ANALYSIS" ON THE OTHER SIDE )

**Z-ZERO GAS**

COMPONENT CARBON MONOXIDE

FIRST ANALYSIS 9-6-90 UNITS mV

Z 0 R 944 T 808

R 945 Z 0 T 808

Z 0 T 808 R 946

SECOND ANALYSIS 11-8-90 UNITS mV

Z 0 R 948 T 810

R 949 Z 0 T 810

Z 0 T 810 R 949

THIS CYLINDER WAS BLENDED, ANALYZED AND SHIPPED FROM SCOTT SPECIALTY GASES  
ROUTE 611  
PLUMSTADVILLE PA 18949

*Bj*

# Scott Specialty Gases, Inc.

PLUMSTEADVILLE, PA 18949

PHONE: 215-766-8861

FAX: 215-766-0320

AIRNOVA  
5845 A CLAYTON AVENUE  
PENNSAUKEN NJ 08109

Date Shipped 11-14-90

Our Project No: 23894

Your P.O. No: 637

Page 2 of 7

ATTN: JOHN DEEMER

## CERTIFICATE OF ANALYSIS - EPA PROTOCOL GASES\*

(Concentrations are in mole % or ppm)

Cylinder Number AAL 1704 Certified Accuracy ±1 % NBS Traceable Analysis Dates: First 9-7-90 Last 11-7-90  
CP = 1800 psig

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS	
					FIRST	SECOND
CARBON MONOXIDE	150.9 ppm	5-7-92	NDIR	2636	151.1 ppm	150.7 ppm
					151.1 ppm	150.7 ppm
					151.1 ppm	150.7 ppm
NITROGEN	BALANCE					

Cylinder Number \_\_\_\_\_ Certified Accuracy \_\_\_\_\_ % NBS Traceable Analysis Dates: First \_\_\_\_\_ Last \_\_\_\_\_

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS	
					FIRST	SECOND

\*We hereby certify the cylinder gas has been analyzed according to EPA Protocol No:

Procedure G1

Analyst *Mark S. Sirinides*

Approved By *Mark S. Sirinides*

MARK S. SIRINIDES

The only liability of this Company for gas which fails to comply with this analysis shall be replacement thereof by the Company without extra cost.

CERTIFIED REFERENCE MATERIALS ■ EPA PROTOCOL GASES ■ ACUBLEND® ■ CALIBRATION & SPECIALTY GAS MIXTURES  
PURE GASES ■ ACCESSORY PRODUCTS ■ CUSTOM ANALYTICAL SERVICES

TROY, MICHIGAN / SAN BERNARDINO, CALIFORNIA / HOUSTON, TEXAS  
SOUTH PLAINFIELD, NEW JERSEY / FREMONT, CALIFORNIA / WAKEFIELD, MASSACHUSETTS / LONGMONT, COLORADO

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CYLINDER NUMBER AAL 1704

PROJECT NO. 23894

**STANDARD**

TYPE (SEM, CRM, GMIS) CRM 2636

CYLINDER NUMBER AAL 3094

CONCENTRATION 244 ppm CARBON MONOXIDE/NITROGEN

2nd GMIS  
AAL 16569  
304 ppm CARBON MONOXIDE/NITROGEN

**ANALYZER**

MAKE HORIBA

MODEL CFA 310A

SERIAL NO. 474091

DATE OF CALIBRATION 9-6-90

RAW DATA ( FOR CONCENTRATION LISTED UNDER "REPLICATE ANALYSIS" ON THE OTHER SIDE )

**Z-ZERO GAS**

COMPONENT CARBON MONOXIDE

FIRST ANALYSIS 9-7-90 UNITS mV

Z 0 R 722 T 447

R 722 Z 0 T 447

Z 0 T 447 R 722

SECOND ANALYSIS 11-7-90 UNITS mV

Z 0 R 903 T 448

R 904 Z 0 T 448

Z 0 T 448 R 903

THIS CYLINDER WAS BLENDED, ANALYZED AND SHIPPED FROM SCOTT SPECIALTY GASES  
ROUTE 611  
PLUMSTEADVILLE PA 18949

*B14*

1315

**MGI Industries**  
**Gas Products**

1399 NEW FORD MILL RD.  
MORRISVILLE, PA 19067  
(800)638-6360

ANALYTICAL REPORT - PRODUCT CERTIFICATION

TO:  
M.G. Industries  
Intracompany Transfer Account  
2300 E Church St.  
Philadelphia, PA 19124

DATE: 10/18/91  
P.O. NO.  
ORDER NO. 780065-001  
REF. # EM-1174-2

CYLINDER NO.	CONSTITUENTS CONCENTRATION:	NOMINAL	ACTUAL
	CERTIFIED MIXTURE		
150-684	Oxide	300 ppm	
	Balance		0 ppm

*E. M. ...*

Eben

# Scott Specialty Gases, Inc.

PLUMSTEADVILLE, PA 18949

PHONE: 215-766-8861

FAX: 215-766-0320

Date Shipped 11-14-90

Our Project No: 23894

Your P.O. No: 637

Page 7 of 7

AIRNOVA  
5845 A CLAYTON AVENUE  
PENNSAUKEN NJ 08109

ATTN: JOHN DEEMER

## CERTIFICATE OF ANALYSIS - EPA PROTOCOL GASES\*

(Concentrations are in mole % or ppm)

Cylinder Number ALM 007004 Certified Accuracy ±1 % NBS Traceable Analysis Dates: First 9-7-90 Last 11-12-90  
CO = 2000 psig

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS	
					FIRST	SECOND
NITRIC OXIDE	851 ppm	5-12-91	CHEMILUMINESCENCE	1687	843.8 ppm	857.1 ppm
NOX	854 ppm				848.6 ppm	852.9 ppm
					852.6 ppm	851.0 ppm
NITROGEN	BALANCE					

Cylinder Number ALM 007004 Certified Accuracy ±1 % NBS Traceable Analysis Dates: First 9-7-90 Last 11-9-90

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS	
					FIRST	SECOND
SULFUR DIOXIDE	416 ppm	5-9-91	NDIR	1662	417.5 ppm	413.0 ppm
					415.7 ppm	415.4 ppm
					417.5 ppm	416.0 ppm
NITROGEN	BALANCE					

\*We hereby certify the cylinder gas has been analyzed according to EPA Protocol No:

Analyst *Mark S. Sirinides*

Approved By *Mark S. Sirinides*

MARK S. SIRINIDES

The only liability of this Company for gas which fails to comply with this analysis shall be replacement thereof by the Company without extra cost.

CERTIFIED REFERENCE MATERIALS ■ EPA PROTOCOL GASES ■ ACUBLEND® ■ CALIBRATION & SPECIALTY GAS MIXTURES  
PURE GASES ■ ACCESSORY PRODUCTS ■ CUSTOM ANALYTICAL SERVICES

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SOUTH PLAINFIELD, NEW JERSEY / FREMONT, CALIFORNIA / WAKEFIELD, MASSACHUSETTS / LONGMONT, COLORADO

*Ble*

# Scott Specialty Gases, Inc.

PLUMSTEADVILLE, PA 18949

PHONE: 215-766-8861

FAX: 215-766-0320

Date Shipped 11-14-90

Our Project No: 23894

Your P.O. No: 637

Page 6 of 7

AIRNOVA  
5845 A CLAYTON AVENUE  
PENNSAUKEN NJ 08109

ATTN: JOHN DEEMER

## CERTIFICATE OF ANALYSIS - EPA PROTOCOL GASES\*

(Concentrations are in mole % or ppm)

Cylinder Number ALM 009377 Certified Accuracy ±1 % NBS Traceable Analysis Dates: First 9-7-90 Last 11-8-90  
CP = 2000 psig

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS	
					FIRST	SECOND
NITRIC OXIDE	510 ppm	5-8-91	CHEMILUMINESCENCE	1687	512.6 ppm	515.9 ppm
NOX	514 ppm				507.0 ppm	513.6 ppm
					504.9 ppm	507.4 ppm

Cylinder Number ALM 009377 Certified Accuracy ±1 % NBS Traceable Analysis Dates: First 9-10-90 Last 11-5-90

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS	
					FIRST	SECOND
SULFUR DIOXIDE	247 ppm	5-5-91	NDIR	1694	246.6 ppm	247.4 ppm
					246.8 ppm	247.1 ppm
					246.8 ppm	247.2 ppm
NITROGEN	BALANCE					

\*We hereby certify the cylinder gas has been analyzed according to EPA Protocol No:

1 Procedure G1

Analyst *Robert Sirinides*

Approved By *Mark S. Sirinides*

MARK S. SIRINIDES

The only liability of this Company for gas which fails to comply with this analysis shall be replacement thereof by the Company without extra cost.

CERTIFIED REFERENCE MATERIALS ■ EPA PROTOCOL GASES ■ ACUBLEND® ■ CALIBRATION & SPECIALTY GAS MIXTURES  
PURE GASES ■ ACCESSORY PRODUCTS ■ CUSTOM ANALYTICAL SERVICES

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**Appendix C**  
**NJDEPE Process Log**

DATA ON FACILITY BEING STACK TESTED

COMPANY NAME Sia Seed Inc COMPANY REP. E. G. Givens PHONE ( ) 609 924 0300  
 LOCATION OF FACILITY Florence ORIGINAL START-UP DATE 7/74 DESIGNED CAPACITY 265 TPH  
 OEM Barber Greene MODEL NO. BE65 TYPE Batch AG TYPE AC 20

1 Time (24 HR)	2 Fuel Use Oil Fuel Oil Nat. Gas Prepared Coal Other	3 Burner Setting %	4 Burner Pressure OZ/ Sq. In	5 Production Rate		6 Asphalt Content %	7 Mix Temp. °F	8 Exhaust Gas Temp. °F	9 Venturi Scrubber W. Baghouse		10 Moisture Sand 3/8 2.5	11 %
				Mix Aggregate TPH	TPH				Pressure Drop in w.g.	Water Pressure psi		
9:30 ✓		40	23			4.5	320	190	13.5	5.1	2.1	
9:45		40	23				320	200	13.5			
10:00		40	24				320	190	13.5			
10:15		40	24				320	190	14.0			
10:30		40	23		(239)		320	190	14.0			
11:10 ✓		40	23			4.5	320	180	14.0	4.9	2.0	2.7
11:25		40	24				320	190	13.5			
11:40		40	24				325	180	13.5			
11:55		40	24				320	180	14.0			
12:10		40	23		(231)		320	185	14.0			
12:25 ✓		35	23			4.5	325	180	13.5	5.3	2.2	2.5
12:40		40	23				320	190	13.5			
12:55		40	24				320	190	14.0			
1:10		40	23				320	190	13.5			
1:25		40	23		(226)		325	185	13.5			