

Exhibit C

Exhibit C



STATE OF NEVADA
BUREAU OF AIR POLLUTION CONTROL

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ENVIRONMENTAL PROTECTION
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SOURCE TEST/RELATIVE ACCURACY TEST AUDIT DEC 26 2023

BAPC/BAQP

INSTRUCTIONS: Select one or both options in the first field and one of the options from the second field. Complete this form for any source test and/or relative accuracy test audit (RATA) protocol or source test and/or RATA report. Submit a hard copy of this form along with any supporting documentation to the Compliance Branch. This form should be provided as a cover sheet. (NRS 445B.230, NAC 445B.252)

Source Test <input checked="" type="checkbox"/>	RATA <input type="checkbox"/>
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Protocol <input type="checkbox"/>	Report <input checked="" type="checkbox"/>
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A. GENERAL INFORMATION

1. Identifying Information

Company Name: Reck Brothers LLC

Facility Name: Reck Brothers LLC

Facility Identification Number: A0480

Facility Class: Class 2

Air Quality Operating Permit Number: AP1611-0835.03

Facility County: White Pine

Mailing Address: P.O. Box 151372

City: Ely State: Nevada ZIP: 89301

Contact Person: Terry Reck Contact Title: First Member

Phone Number: (775) 289-3300

Additional Contact Information: NA

rev 04/22

STATE OF NEW YORK

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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Station	Instrument
1	PM10
2	PM10
3	PM10
4	PM10
5	PM10
6	PM10
7	PM10
8	PM10
9	PM10
10	PM10
11	PM10
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19	PM10
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94	PM10
95	PM10
96	PM10
97	PM10
98	PM10
99	PM10
100	PM10

**SOURCE TEST REPORT
FOR INITIAL COMPLIANCE TESTING OF A
DRUM MIXER AT RECK BROTHERS LLC
ELY, NEVADA**

**Permit No. AP1611-0835.03, Facility ID A0480
System 03, Emission Unit S2.001**

Test Date: November 4, 2023

Prepared For:

Reck Brothers, LLC
P.O. Box 151372
1502 Aultman Ave
Ely, Nevada 89315

Prepared By:

Broadbent & Associates, Inc.
8 West Pacific Avenue
Henderson, Nevada 89015
(702) 563-0600

Report Date: December 18, 2023

Project 23-09-130



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FROM OFFICE OF THE GOVERNOR
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SOURCE TEST DEVIATIONS

- A gaseous stratification check was not performed due to the limited production time. The exhaust gases from the drum drier pass through a centrifugal exhaust fan that thoroughly mixes the gases prior to discharge to the stack. Gaseous stratification is not expected to be present.
- There was a excessive leak rate found during the posttest leak check on run 2. Despite the run being invalid, the analysis of the sample was consistent with a mass emission rate in excess of the 2.06 lb/hr limit.

APPENDIX 2: DATA TABLES

The following tables provide a summary of the data collected during the study. The data are presented in a tabular format, with the following columns: Date, Location, Species, and Count. The data are presented in a tabular format, with the following columns: Date, Location, Species, and Count. The data are presented in a tabular format, with the following columns: Date, Location, Species, and Count.

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1.0 INTRODUCTION

1.1 Summary of Test Program

At the request of Reck Brothers, LLC, Broadbent & Associates, Inc. (Broadbent) conducted emission tests on the System 03 drum mixer (S2.001) at the Ely, Nevada asphalt plant. The purpose of these tests was to demonstrate initial compliance of the propane gas fired drum mixer with the particulate matter (PM/PM₁₀/PM_{2.5}), NO_x, SO₂, CO, and VOC emission limits contained in NDEP Class II operating permit AP1611-0835.03. All collected PM has been counted as PM_{2.5}. The tests were performed on November 4, 2023.

1.1.1 System 03 (S2.001) – Drum Mixer

Since production at the plant was very limited, NDEP approved conducting the following shortened tests while production lasted. Triplicate 60-minute tests were conducted using EPA Methods 7E, 6C, 10, 3A, and 25A/18 tests for NO_x, SO₂, CO, CO₂, O₂, and VOC at the propane gas fired drum mixer scrubber exhaust. Triplicate 60-minute, 31.8 dscf EPA Method 5/202 tests were conducted to measure PM/PM₁₀/PM_{2.5} (all PM counted as PM₁₀ or PM_{2.5}) flowrate, and moisture. Triplicate 6-minute EPA Method 9 tests for opacity were conducted during each PM/PM₁₀/PM_{2.5} tests.

1.2 Test Program Organization

Table 1 presents the project organization and contact information.

Table 1. Project Organization

Task	Organization	Contact
Production Data Recording	Reck Brothers, LLC	Mr. Terry Reck (775) 289-3300
Project Management	Broadbent & Associates, Inc.	Mr. Wayne Johnson (702) 563-0600
Source Testing	Broadbent & Associates, Inc.	Mr. Kevin Vo (702) 563-0600

2.0 SOURCE DESCRIPTION

2.1 Process and Control System Description

Reck Brothers, LLC owns and operates an asphalt plant in Ely, Nevada, which produces asphalt paving material. The propane gas fired drum mixer has a maximum throughput capacity of 150 tons/hour at lower elevations. Typical operation occurs at about 75 tons/hour or less. Emissions are controlled by a wet scrubber using water as the scrubbing medium.

2.2 Flue Gas Sampling Location

Figure 1 shows the drum mixer scrubber exhaust sampling locations. The 13-foot vertical rectangular stack is 27 inches deep by 24 inches wide. The equivalent diameter of the stack is 25.41 inches. The existing test ports (four 3-inch female ports and one 3-inch male center port) are located 4.7 equivalent diameters (120 inches) downstream of the centrifugal fan and 1.4 diameters (36 inches) upstream of the stack outlet. PM/PM₁₀/PM_{2.5} were sampled at 25 points (5 points per traverse, 2.4 minutes per point, 5 traverses). This sampling location meets the EPA Method 1 sampling point location criteria.

All gaseous pollutant measurements were done at a single point since the exhaust gases are well mixed having passed through a scrubber and ID fan. A cyclonic flow check was conducted prior to testing to confirm the absence of cyclonic flow. The average cyclonic flow angle was determined to be 4.1°.

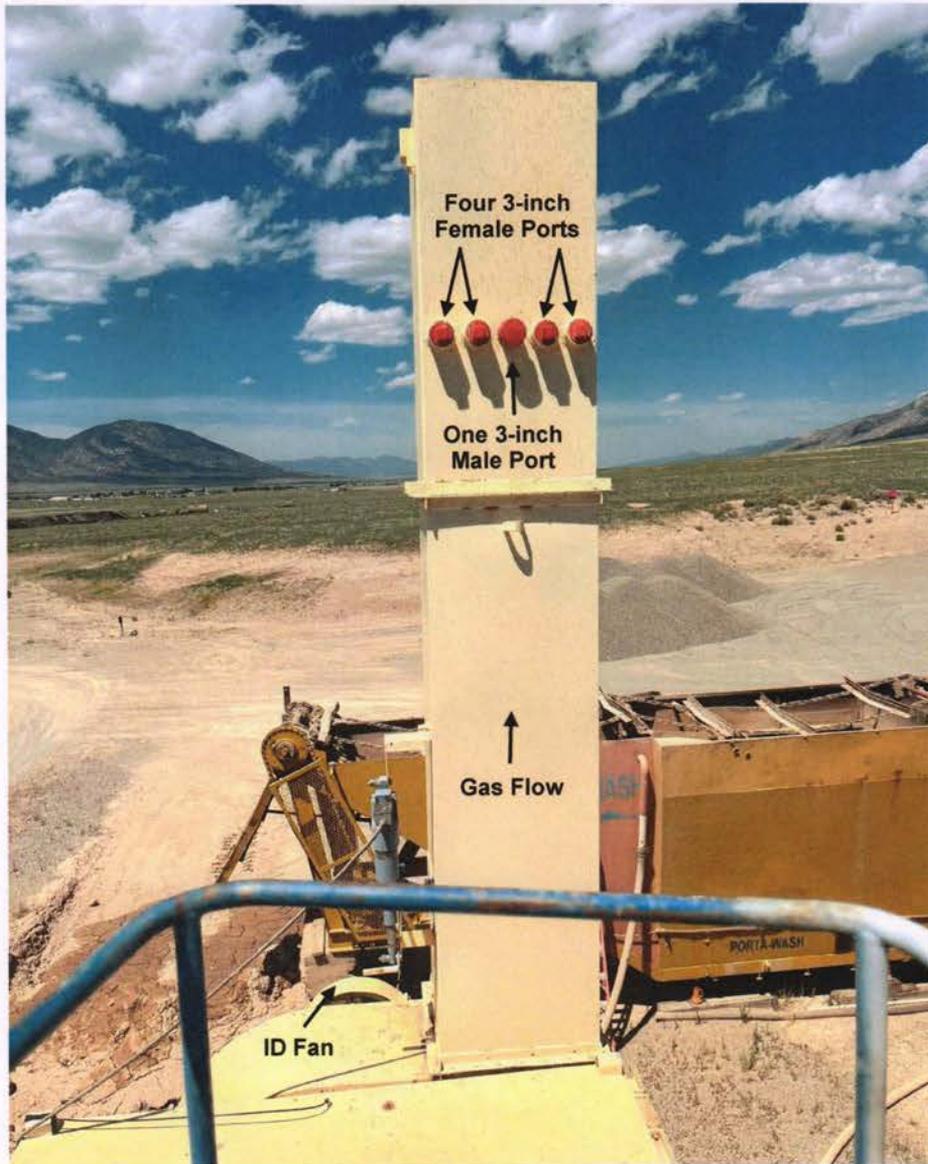


Figure 1. Photograph of Rectangular Exhaust Stack

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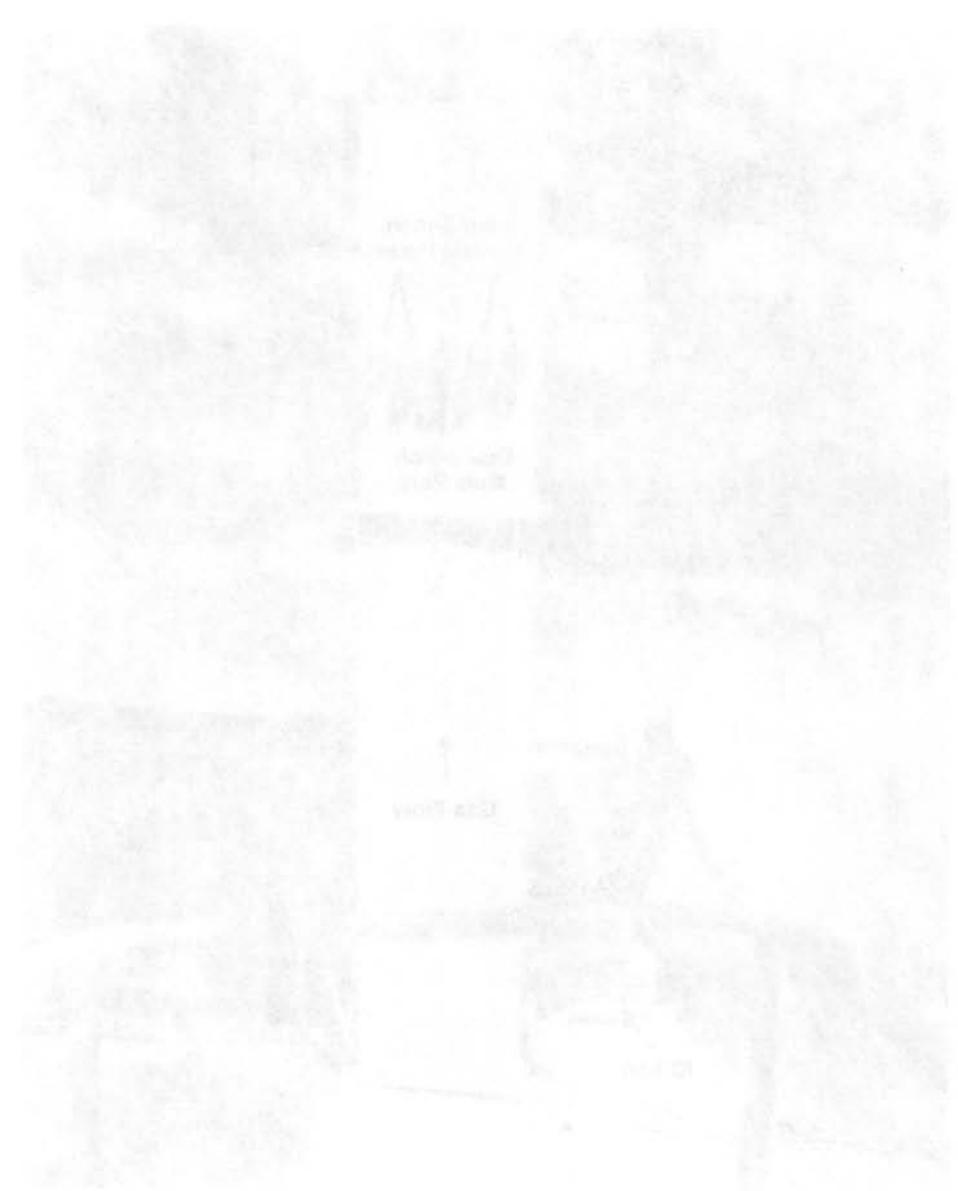


Figure 1 - [Illegible text]

3.0 TEST PROGRAM

3.1 Objectives

The primary purpose of these tests was to determine emission rates of PM/PM₁₀/PM_{2.5}, NO_x, SO₂, CO, and VOC from the propane gas fired drum mixer scrubber exhaust. All collected particulate matter has been counted as PM_{2.5}. The specific objectives were to:

- Measure the NO_x, SO₂, CO, O₂, CO₂, and THC concentrations at the scrubber exhaust stack.
- Collect integrated Tedlar bag samples for methane and ethane analysis by EPA M18.
- Measure PM/PM₁₀/PM_{2.5}, flowrate, and moisture content at the scrubber exhaust stack.
- Measure opacity during the PM/PM₁₀/PM_{2.5} tests.
- Obtain plant operating data during each test run.

3.2 Test Matrix and Run Log

Table 2 presents the test matrix and run log for this test program. The NO_x, SO₂, CO, O₂, CO₂, and THC measurements were made simultaneously with the PM/PM₁₀/PM_{2.5}, flowrate, and moisture measurements while the plant was operating at the typical production rate. Opacity measurements were made during each PM/PM₁₀/PM_{2.5} run. Table 3 presents a summary of the measured emissions and Table 4 compares measured emissions against the permit limits.

Table 2. System 03, S2.001 Drum Mixer Test Matrix and Run Log

Source	Run Duration	Test Parameter	Run No.	EPA Test Method
Scrubber Exhaust Stack	M5/202 ^a	PM/PM ₁₀ /PM _{2.5} , Flow/ H ₂ O	1	09:48 – 10:48
			2	11:52 – 13:01
			3	13:53 – 15:03
	M7E, 6C, 10, 3A, 25A/18	NO _x /SO ₂ /CO/CO ₂ /O ₂ , THC/VOC	1	09:53 – 10:56
			2	11:58 – 13:02
			3	13:55 – 14:59
	M9	Opacity	1	09:46 – 09:52
			2	11:52 – 11:58
			3	13:54 – 14:00

^a All PM caught in the Method 5/202 train was counted as PM₁₀ and/or PM_{2.5}

Table 3. Emission Results Summary – Drum Mixer Wet Scrubber Stack

Run No.:	1	2	3	Average
Date:	4-Nov-23	4-Nov-23	4-Nov-23	
Test Condition, tons/hour	75	75	75	75
Barometric Pressure (in. Hg)	24.05	24.05	24.05	24.05
Stack Pressure (in. Hg)	24.04	24.04	24.04	24.04
Stack Area (ft ²)	4.50	4.50	4.50	4.50
Sampling Time (min.)	60.0	60.0	60.0	60.0
Volume Gas Sampled (dscf)	38.465	44.473	49.990	44.309
Gas Data				
Average Gas velocity (fps)	40.02	43.62	50.71	44.78
Average Gas Temperature (°F)	153.92	151.68	157.68	154.43
Gas Flowrate (dscfm)	6,128	6,563	7,092	6,594
Gas Analysis (Volume %)				
Carbon Dioxide	6.76	6.05	6.65	6.49
Oxygen	11.01	11.99	11.17	11.39
Water	17.94	19.67	24.59	20.73
Emission Concentration				
Filterable Particulate (gr/dscf)	0.1912	0.0886	0.1199	0.1332
Condensable Particulate (gr/dscf)	0.0015	0.0035	0.0105	0.0051
Total Particulate (gr/dscf)	0.1926	0.0921	0.1304	0.1383
CO (ppm)	83.54	109.98	77.90	90.47
SO ₂ (ppm)	0.00	0.00	0.00	0.00
NO _x (ppm as NO ₂)	61.62	53.65	62.19	59.15
THC (ppm)	269.04	242.55	259.97	257.19
VOC (ppm)	265.62	238.73	256.74	253.70
Emission Rate - lb/hr				
Filterable Particulate	10.04	4.98	7.28	7.44
Condensable Particulate	0.08	0.20	0.64	0.30
Total Particulate	10.12	5.18	7.92	7.74
CO	2.23	3.15	2.41	2.60
SO ₂	0.00	0.00	0.00	0.00
NO _x (as NO ₂)	2.71	2.52	3.16	2.80
THC	4.12	3.98	4.61	4.23
VOC	4.07	3.91	4.55	4.18
Emission Concentration ppm @ 3 %O₂ Correction				
CO	151.14	220.95	143.31	171.80
SO ₂	0.00	0.00	0.00	0.00
NO _x (as NO ₂)	111.48	107.78	114.41	111.22
THC	486.74	487.28	478.27	484.09
VOC	480.56	479.60	472.32	477.49
Opacity, %	6.0	4.6	8.5	6.4

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Table 2. Estimated Results (continued) - Dioxin/Furans (continued)

Sample ID	Concentration (pg/g)	Concentration (pg/g)	Concentration (pg/g)	Concentration (pg/g)
101	1.2	1.2	1.2	1.2
102	1.5	1.5	1.5	1.5
103	1.8	1.8	1.8	1.8
104	2.1	2.1	2.1	2.1
105	2.4	2.4	2.4	2.4
106	2.7	2.7	2.7	2.7
107	3.0	3.0	3.0	3.0
108	3.3	3.3	3.3	3.3
109	3.6	3.6	3.6	3.6
110	3.9	3.9	3.9	3.9
111	4.2	4.2	4.2	4.2
112	4.5	4.5	4.5	4.5
113	4.8	4.8	4.8	4.8
114	5.1	5.1	5.1	5.1
115	5.4	5.4	5.4	5.4
116	5.7	5.7	5.7	5.7
117	6.0	6.0	6.0	6.0
118	6.3	6.3	6.3	6.3
119	6.6	6.6	6.6	6.6
120	6.9	6.9	6.9	6.9
121	7.2	7.2	7.2	7.2
122	7.5	7.5	7.5	7.5
123	7.8	7.8	7.8	7.8
124	8.1	8.1	8.1	8.1
125	8.4	8.4	8.4	8.4
126	8.7	8.7	8.7	8.7
127	9.0	9.0	9.0	9.0
128	9.3	9.3	9.3	9.3
129	9.6	9.6	9.6	9.6
130	9.9	9.9	9.9	9.9
131	10.2	10.2	10.2	10.2
132	10.5	10.5	10.5	10.5
133	10.8	10.8	10.8	10.8
134	11.1	11.1	11.1	11.1
135	11.4	11.4	11.4	11.4
136	11.7	11.7	11.7	11.7
137	12.0	12.0	12.0	12.0
138	12.3	12.3	12.3	12.3
139	12.6	12.6	12.6	12.6
140	12.9	12.9	12.9	12.9
141	13.2	13.2	13.2	13.2
142	13.5	13.5	13.5	13.5
143	13.8	13.8	13.8	13.8
144	14.1	14.1	14.1	14.1
145	14.4	14.4	14.4	14.4
146	14.7	14.7	14.7	14.7
147	15.0	15.0	15.0	15.0
148	15.3	15.3	15.3	15.3
149	15.6	15.6	15.6	15.6
150	15.9	15.9	15.9	15.9
151	16.2	16.2	16.2	16.2
152	16.5	16.5	16.5	16.5
153	16.8	16.8	16.8	16.8
154	17.1	17.1	17.1	17.1
155	17.4	17.4	17.4	17.4
156	17.7	17.7	17.7	17.7
157	18.0	18.0	18.0	18.0
158	18.3	18.3	18.3	18.3
159	18.6	18.6	18.6	18.6
160	18.9	18.9	18.9	18.9
161	19.2	19.2	19.2	19.2
162	19.5	19.5	19.5	19.5
163	19.8	19.8	19.8	19.8
164	20.1	20.1	20.1	20.1
165	20.4	20.4	20.4	20.4
166	20.7	20.7	20.7	20.7
167	21.0	21.0	21.0	21.0
168	21.3	21.3	21.3	21.3
169	21.6	21.6	21.6	21.6
170	21.9	21.9	21.9	21.9
171	22.2	22.2	22.2	22.2
172	22.5	22.5	22.5	22.5
173	22.8	22.8	22.8	22.8
174	23.1	23.1	23.1	23.1
175	23.4	23.4	23.4	23.4
176	23.7	23.7	23.7	23.7
177	24.0	24.0	24.0	24.0
178	24.3	24.3	24.3	24.3
179	24.6	24.6	24.6	24.6
180	24.9	24.9	24.9	24.9
181	25.2	25.2	25.2	25.2
182	25.5	25.5	25.5	25.5
183	25.8	25.8	25.8	25.8
184	26.1	26.1	26.1	26.1
185	26.4	26.4	26.4	26.4
186	26.7	26.7	26.7	26.7
187	27.0	27.0	27.0	27.0
188	27.3	27.3	27.3	27.3
189	27.6	27.6	27.6	27.6
190	27.9	27.9	27.9	27.9
191	28.2	28.2	28.2	28.2
192	28.5	28.5	28.5	28.5
193	28.8	28.8	28.8	28.8
194	29.1	29.1	29.1	29.1
195	29.4	29.4	29.4	29.4
196	29.7	29.7	29.7	29.7
197	30.0	30.0	30.0	30.0
198	30.3	30.3	30.3	30.3
199	30.6	30.6	30.6	30.6
200	30.9	30.9	30.9	30.9

Table 4. Measured Emissions versus Allowable

Parameter	Measured	Allowable
PM/PM ₁₀ , lb/hr	7.74	2.06
SO ₂ , lb/hr	0.00	0.51
NO _x , lb/hr	2.80	3.90
CO, lb/hr	2.60	19.50
VOC, lb/hr	4.18	4.80

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 PM/PM₁₀/PM_{2.5} Sampling

4.1.1 Preliminary Measurements

Before conducting the stack tests a series of preliminary measurements were made to determine:

- The location of the sampling site and the number and location of the sampling points to be used (EPA Method 1)
- Verify absence of cyclonic flow (EPA Method 1)
- The velocity, temperature, and pressure of the gases in the stack (EPA Method 2)
- The composition of the stack gases (Method 3A)
- The moisture content of the stack gases (Method 4)

Using the results of these preliminary measurements and the calibration constants for the sampling train, a series of calculations were made to determine the value of K, a constant, and N_d, ideal nozzle diameter, required to run an isokinetic test according to the equation:

$$\Delta H = \left[\frac{60^2 \pi^2 (K_p)^2 (C_p)^2 (1 - B_{wo})^2 P_s MW_d}{576^2 (K_o)^2 MW_s P_m} \right] (N_d)^4 \left[\frac{T_m}{T_s} \right] (\Delta P)$$

Where

$$K = \left[\frac{60^2 \pi^2 (K_p)^2 (C_p)^2 (1 - B_{wo})^2 P_s MW_d}{576^2 (K_o)^2 MW_s P_m} \right]$$

An actual nozzle, whose diameter is as close as possible to the ideal nozzle diameter, is selected for the test. Isokinetic sampling rates for each sampling point in the stack were computed using the equation:

$$\Delta H = (K)(N_d)^4 \left[\frac{T_m}{T_s} \right] (\Delta P)$$

Since K and N_d were known, and remain constant during a test, the only variables were the meter temperatures, the stack gas temperature, and the velocity pressure for each sampling point.

1. The first part of the problem is to find the value of the function $f(x)$ at $x = 0$. This is done by substituting $x = 0$ into the given equation.

2. The second part of the problem is to find the value of the function $f(x)$ at $x = 1$. This is done by substituting $x = 1$ into the given equation.

3. The third part of the problem is to find the value of the function $f(x)$ at $x = 2$. This is done by substituting $x = 2$ into the given equation.

4. The fourth part of the problem is to find the value of the function $f(x)$ at $x = 3$. This is done by substituting $x = 3$ into the given equation.

5. The fifth part of the problem is to find the value of the function $f(x)$ at $x = 4$. This is done by substituting $x = 4$ into the given equation.

6. The sixth part of the problem is to find the value of the function $f(x)$ at $x = 5$. This is done by substituting $x = 5$ into the given equation.

7. The seventh part of the problem is to find the value of the function $f(x)$ at $x = 6$. This is done by substituting $x = 6$ into the given equation.

8. The eighth part of the problem is to find the value of the function $f(x)$ at $x = 7$. This is done by substituting $x = 7$ into the given equation.

$$f(x) = \frac{1}{\pi} \int_{-\infty}^{\infty} \frac{2\pi i \omega (1 - e^{-i\omega})}{\omega^2 + 1} e^{i\omega x} d\omega$$

9. The ninth part of the problem is to find the value of the function $f(x)$ at $x = 8$. This is done by substituting $x = 8$ into the given equation.

$$f(x) = \frac{1}{\pi} \int_{-\infty}^{\infty} \frac{2\pi i \omega (1 - e^{-i\omega})}{\omega^2 + 1} e^{i\omega x} d\omega$$

10. The tenth part of the problem is to find the value of the function $f(x)$ at $x = 9$. This is done by substituting $x = 9$ into the given equation.

$$f(x) = \frac{1}{\pi} \int_{-\infty}^{\infty} \frac{2\pi i \omega (1 - e^{-i\omega})}{\omega^2 + 1} e^{i\omega x} d\omega$$

11. The eleventh part of the problem is to find the value of the function $f(x)$ at $x = 10$. This is done by substituting $x = 10$ into the given equation.

4.1.2 Preparation of the EPA M5/202 Sampling Train

All sampling train components were cleaned in the laboratory (soap and water, tap water rinse, deionized water rinse, acetone rinse and hexane rinse) to eliminate previous contamination. The cleaned glassware is then baked in an oven for 6 hours at 300°C (572°F). The sampling train components are sealed and transported to the sampling site in a mobile lab. The EPA Method 5/202 equipment (Figure 2) used to measure particulate matter (filterable and condensable) consists of:

- A calibrated 316 stainless steel nozzle for isokinetic sampling
- A heated borosilicate glass lined sampling probe equipped with a Type S pitot tube and a thermocouple to measure stack velocity, pressure, and temperature.
- A heated borosilicate glass filter holder containing a weighed 82.6-mm Whatman® 934 AH glass fiber filter.
- A heated 10-foot Teflon line to connect the outlet of the filter holder to the inlet of the impinger train.
- A glass condenser to cool the gases to $\leq 85^{\circ}\text{F}$ but $> 65^{\circ}\text{F}$.
- A borosilicate glass impinger train in a partitioned box: knockout 1 and impinger 2 were in a water bath maintained at $> 65^{\circ}\text{F}$ and $\leq 85^{\circ}\text{F}$; a 3-inch glass filter holder containing a 90-mm Teflon filter with a thermocouple at the outlet; impinger 3 contains 100 ml of deionized water; impinger 4 contains silica gel; impingers 3 and 4 were in an ice/water bath at $< 68^{\circ}\text{F}$.
- An umbilical to connect the probe and sample box to the control module.
- A control module containing a leak-free vacuum pump, a calibrated dry gas meter and a calibrated orifice meter to measure the pressure, temperature, and flowrate throughout the train.

The sampling train is charged in the mobile lab. Each impinger is weighed to the nearest 0.1 gm on a calibrated electronic balance. Blanks of all filters and reagents are retained for subsequent analysis. The sampling point locations are marked on the probe and the sampling train is assembled and lifted to the sampling site.

4.1.3 Sampling Procedures for EPA M5/202 Sampling Train

Prior to a test, the sampling train is heated, and leak checked at 15 in. Hg to ensure leakage is less than 0.02 cfm or 4 percent of the average sampling rate. The Type S pitot tube is also leak checked. The probe is inserted into the duct at the farthest point. An isokinetic sampling rate is calculated for each sampling point. Each point is sampled for an equal period and all pertinent data were recorded for each point.

10/15/2010
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10/15/2010

Section 101 - General Provisions

The purpose of this act is to provide for the protection of the public health and safety of the State of New Jersey. It is the policy of the State to ensure that the highest quality of care is provided to all patients, and that the safety and health of the public are protected. This act shall be construed to effectuate these purposes.

Section 102 - Definitions
As used in this act, the following definitions shall apply: (a) "Patient" means any individual who is receiving or is to receive medical services from a health care provider. (b) "Health care provider" means any individual who is licensed or certified to practice a health care profession in this State.

Section 103 - Standards of Care
Every health care provider shall adhere to the standards of care established by the State Board of Health. These standards shall be based on the current best practices in the field of health care, and shall be updated periodically to reflect advances in medical knowledge and technology.

Section 104 - Patient Rights
Every patient has the right to be treated with dignity and respect, and to be fully informed of their medical condition and the risks and benefits of any proposed treatment. Patients shall have the right to refuse or to discontinue medical treatment at any time, and to be free from discrimination on the basis of race, ethnicity, or religion.

Section 105 - Confidentiality
All information concerning a patient's medical history, diagnosis, or treatment shall be kept confidential, and shall not be disclosed to any third party without the patient's written consent. This act shall not be construed to limit the ability of health care providers to share information for the purpose of providing the best possible care to a patient.

The probe and filter were maintained at 250 °F throughout the traverse. The condensable particulate matter (CPM) portion of the impinger train is maintained at >65°F and ≤85°F. The gases leaving the impinger train were maintained below 68°F. At the end of a traverse, the probe is withdrawn from the stack and the sampling train is transferred intact to the next sampling port. The remaining traverses of the stack were completed, and the sampling train was withdrawn for the final leak check. This leak check is performed at 15 in. Hg or at the highest vacuum achieved during the test. The Type S pitot tube is also checked. The filter holder and impinger train were sealed and lowered to the mobile lab for purging and sample recovery. In the mobile lab, the CPM portion of the sampling train is immediately pressure purged with ultra-high purity nitrogen at 14-lpm for 1 hour keeping the CPM filter between 65°F and 85°F (Figure 3).

4.1.4 Sample Recovery Procedures for EPA M5/202 Sampling Train

Figure 4 is a flowchart illustrating the sample recovery procedure for the EPA Method 5/202 sampling train. Sample recovery for the nozzle and probe occurs on the stack. The nozzle and probe were brushed and rinsed three times with ACS reagent grade acetone into a polyethylene sample bottle. Sample recovery of the filter holder and impinger train occurs in the mobile lab. The glass fiber filter is removed from the filter holder and sealed in its container. Any glass fibers stuck to the gasket were scraped off and put into the thimble filter. The front half of the filter holder is brushed and rinsed with acetone.

After completion of the nitrogen purge, each impinger is removed from the partitioned box, wiped dry and weighed to the nearest 0.1 gm. The contents of the condenser, knockout and impingers were transferred to a polyethylene sample bottle. The back half of hot 3-inch filter holder, condenser, impingers, the front half of the cold 3-inch filter holder and the glass connectors were rinsed twice with deionized water into this same bottle. The components were then rinsed once with acetone and twice with hexane into a glass sample bottle. All sample bottles and petri dishes were marked and labeled, a chain-of-custody log is completed, and the field data sheet were labeled with the sample ID numbers. The sampling train is then recharged for the next test.

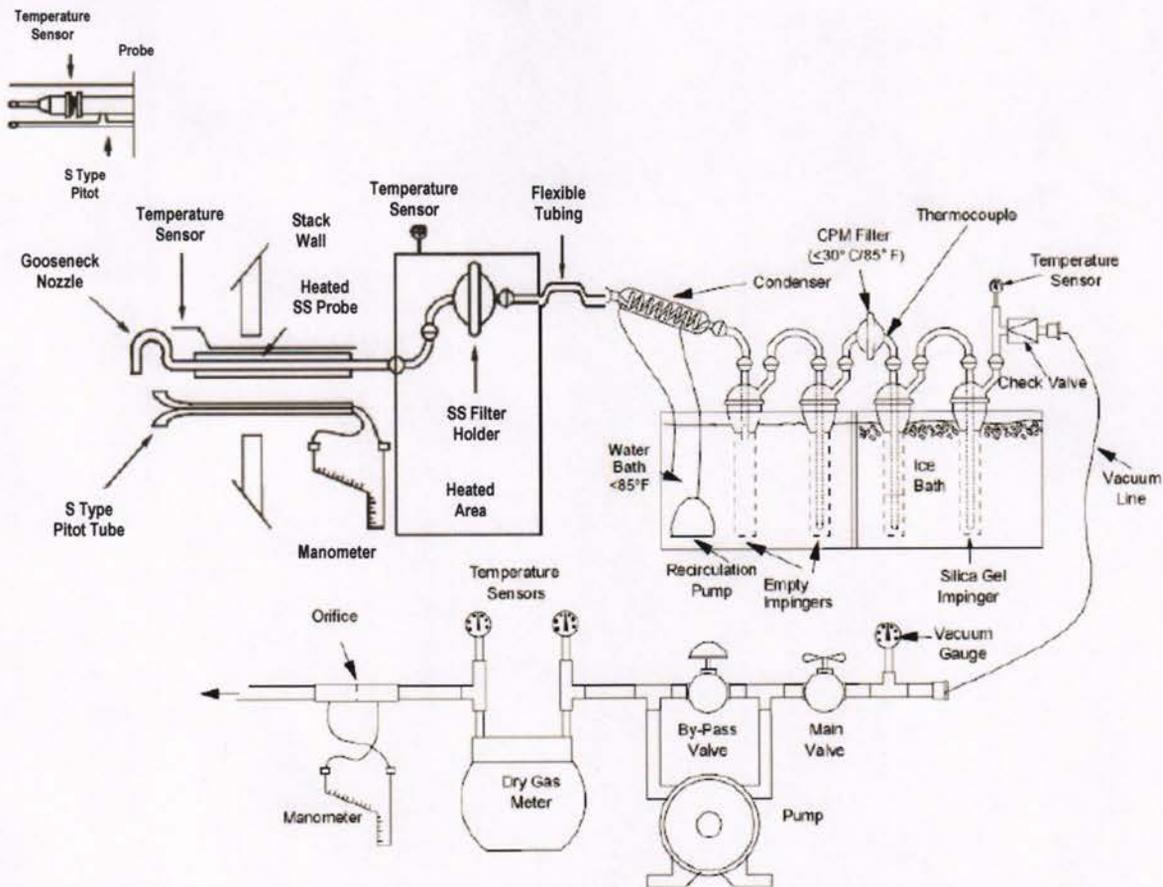


Figure 2. Schematic of EPA Method 5/202 Sampling Train

1. The first step is to identify the problem or goal of the project. This involves understanding the requirements and constraints of the system.

2. The second step is to design a solution. This involves creating a detailed plan that outlines the architecture, components, and data flow of the system.

3. The third step is to implement the solution. This involves writing the code, configuring the hardware, and testing the system to ensure it meets the requirements.

4. The final step is to maintain the system. This involves monitoring the system's performance, updating it as needed, and troubleshooting any issues that arise.

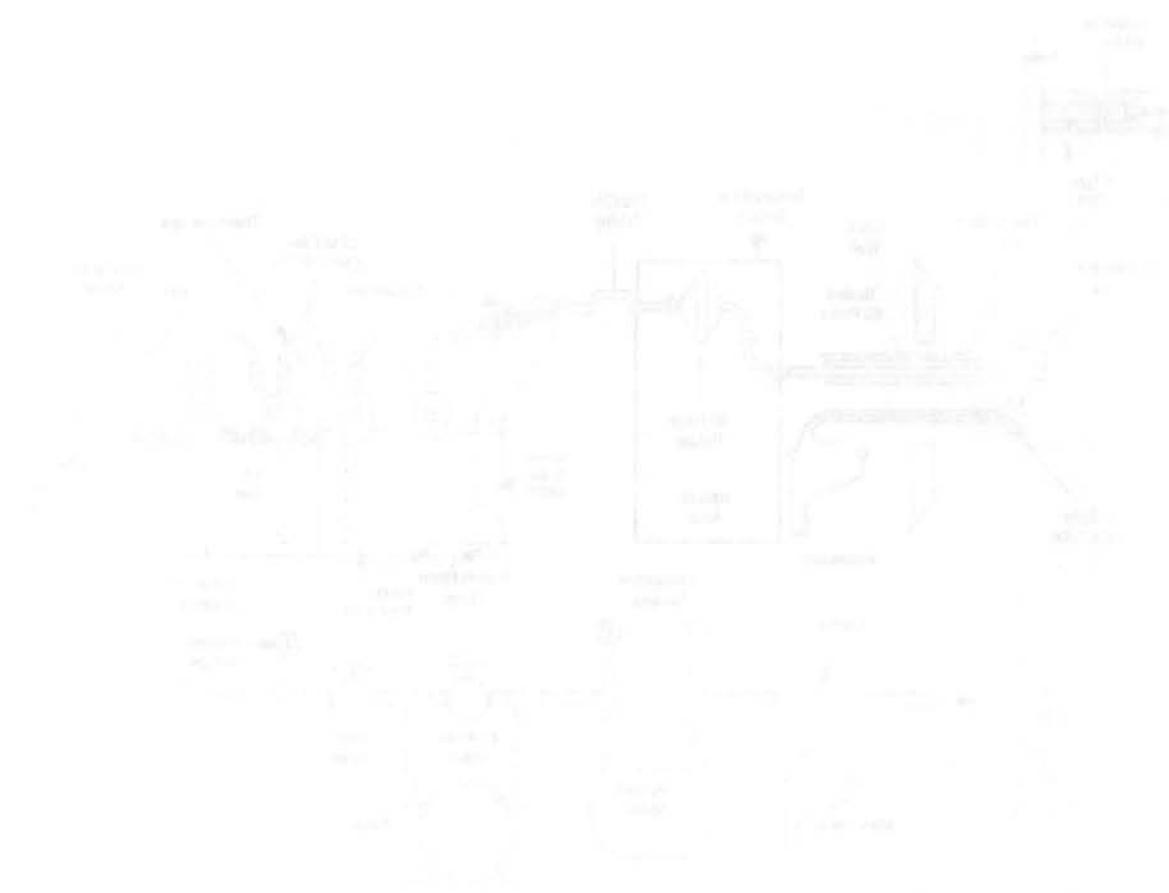


Figure 1: Diagram of the system architecture showing the flow of data and control signals between various components.

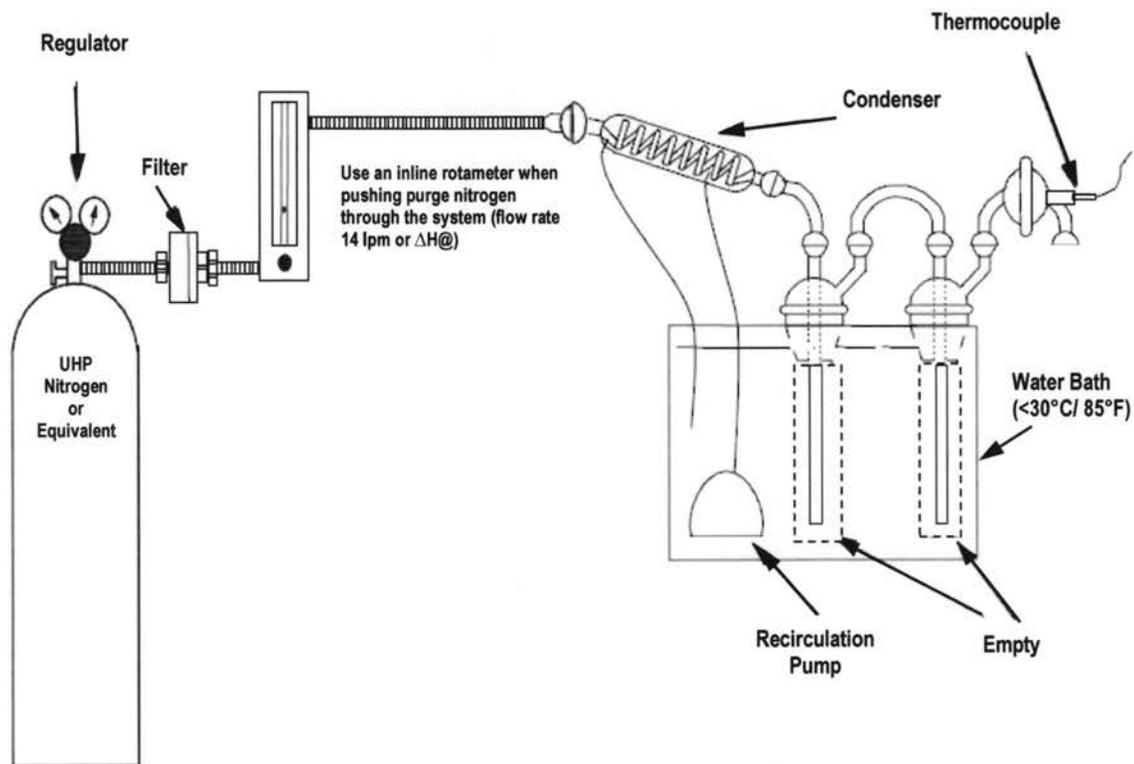


Figure 3. Nitrogen Purge Train Configuration.

Figure 1
Schematic Diagram
of the
System



Figure 1. Schematic Diagram of the System

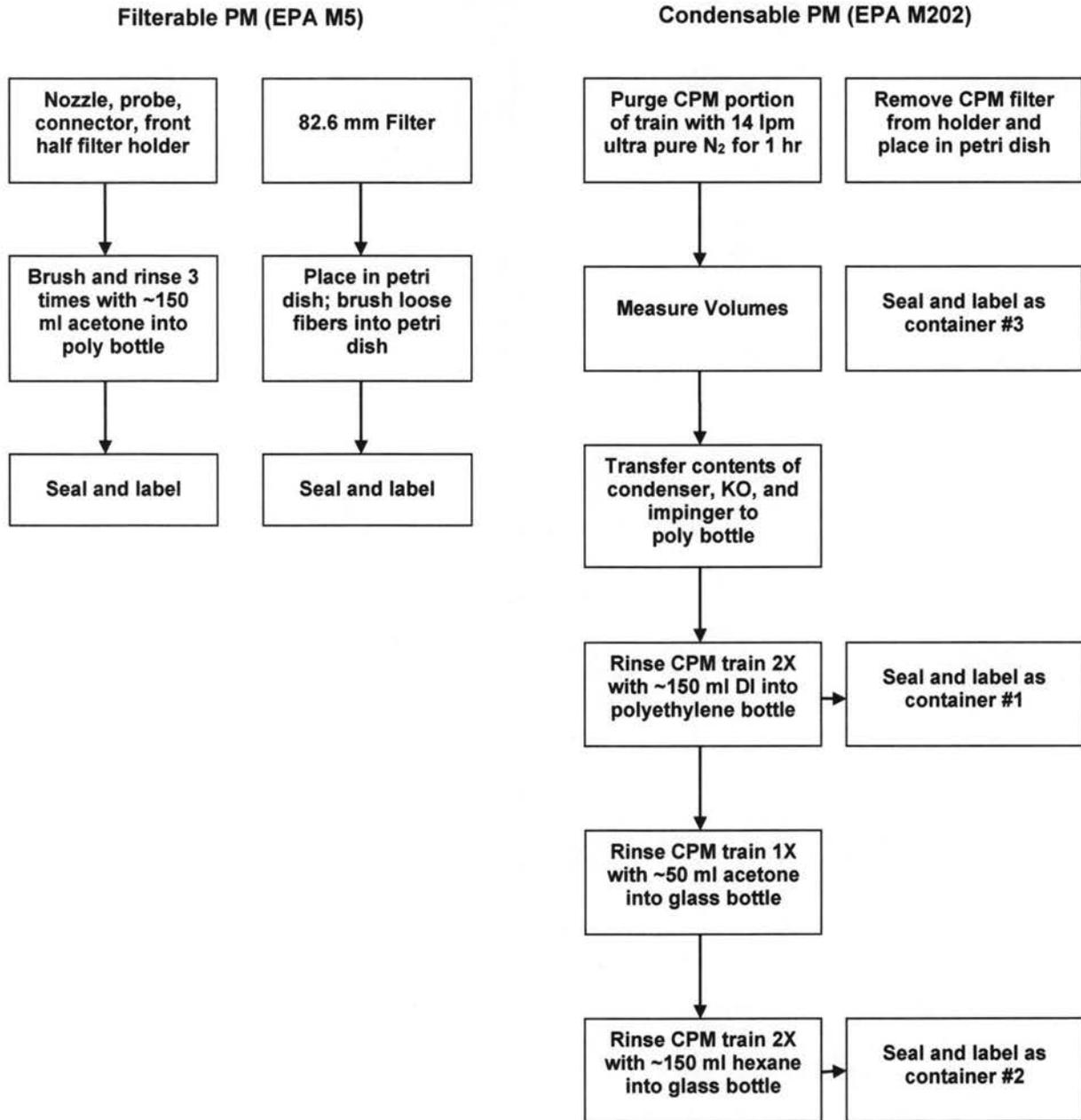


Figure 4. Sample Recovery Scheme for EPA Method 5/202.

4.2 PM/PM/PM_{2.5} Analysis Procedures

4.2.1 Nozzle, Probe, Filter Holder Wash

The volumes of the acetone rinses were measured and transferred to clean, tared, aluminum weighing dishes. The dishes were placed on a temperature-controlled hotplate under a fume hood and gently heated to dryness (<85°F). The dishes with the dry residue were desiccated and weighed repeatedly at 6-hour intervals until a constant weight is achieved (to the nearest 0.01 mg with a tolerance of <0.1 mg between weights). The ACS reagent grade acetone blank is treated in the same manner.

4.2.2 Filter

The filters were removed from the petri dishes and heated for 2 hours in a 105°C oven. The filters were then desiccated and weighed repeatedly at 6-hour intervals until a constant weight is achieved (to nearest 0.01 mg with a tolerance of <0.1 mg between weights). The filter blank is treated in the same manner.

4.2.3 Condensable Particulate Matter (CPM)

The inorganic CPM from the CPM filter is extracted three times with 10 ml of deionized water for 2 minutes using a 50 ml extraction tube and a sonicator. The extracts were added to the polyethylene bottle containing the water rinses of the CPM train. This water is then extracted three times with 30 ml of hexane. The water volume is measured and returned to the polyethylene sample bottle. The organic portion is returned to the glass sample bottles containing the organic washes of the CPM train. The water is evaporated in a tared glass dish at 105°C on a hot plate until 10 ml remain in the tin. The tin is placed in an oven at 85°F to complete the evaporation to dryness.

The organic CPM from the CPM filter is extracted three times with 10 ml of deionized water for 2 minutes using a 50 ml extraction tube and an ultra-sonic bath. The extracts were added to the glass bottle containing the hexane rinses of the CPM train. The volume of liquid is measured and then evaporated in a tared aluminum dish in an oven at 85°F. The residues in the tins and dishes were desiccated and weighed to a constant weight (nearest 0.01 mg with a tolerance of less than 0.1 mg between weights) using an OHAUS® Discovery 5-place analytical balance. Blanks of the deionized water and hexane were treated in an identical manner.

Figures 5 and 6 are flowcharts of the analysis procedures for the filterable and condensable particulate samples.

Section 1: Introduction

The purpose of this document is to provide a comprehensive overview of the project's objectives, scope, and timeline. This document will serve as a guide for all stakeholders involved in the project.

Section 2: Objectives

The primary objectives of this project are to identify key areas for improvement, develop a strategic plan, and implement effective solutions. The project will focus on enhancing operational efficiency and reducing costs.

Section 3: Scope

The scope of the project includes all activities related to the identification, analysis, and implementation of solutions. This includes conducting research, developing a strategic plan, and executing the plan. The project will be completed within a six-month period.

The project team consists of members from various departments, including operations, finance, and marketing. The team will work closely together to ensure the successful completion of the project. Regular communication and reporting will be maintained throughout the project.

This document is intended for all project stakeholders and will be updated as the project progresses. Any changes to the project plan or objectives will be communicated through this document.

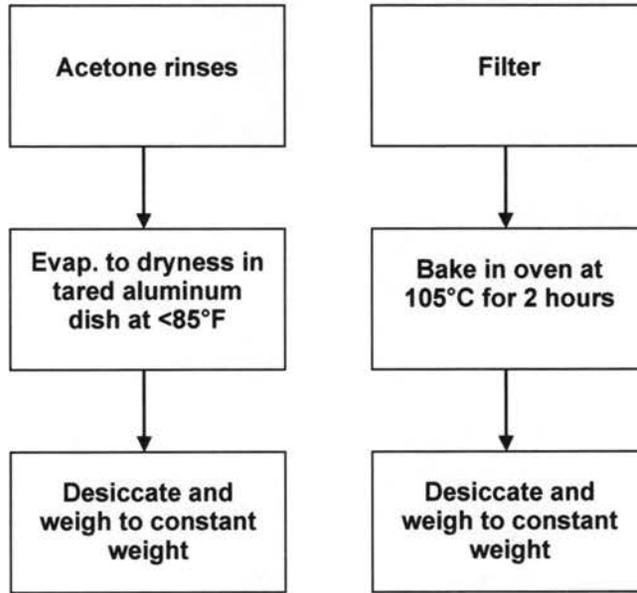


Figure 5. Filterable Particulate Analysis.

1. The weight of the sample is measured.
 2. The sample is placed in a container.
 3. The container is sealed.
 4. The container is placed in a desiccator.
 5. The container is left in the desiccator for 24 hours.
 6. The container is removed from the desiccator.
 7. The weight of the sample is measured again.
 8. The difference in weight is the weight loss.

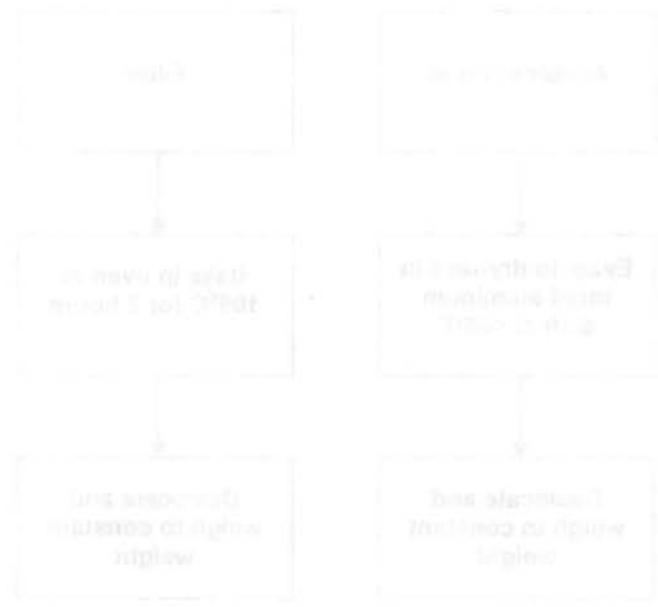


Figure 2. The weight loss of a sample.

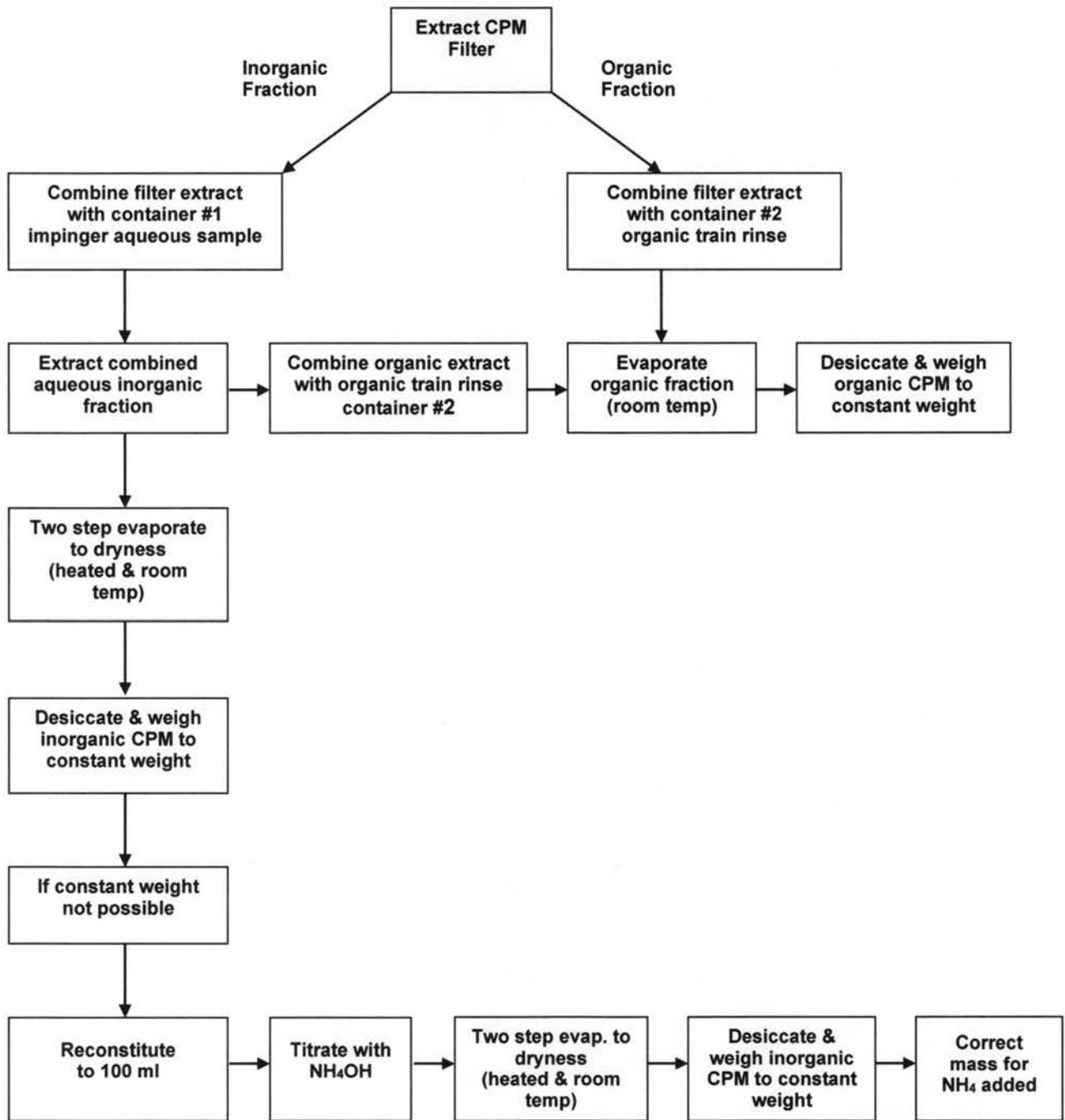


Figure 6. Condensable PM Sample Analysis

4.3 Sampling Procedures for Continuous Monitoring

Figure 7 is a schematic of the Broadbent continuous emissions monitoring system (CEMS). The procedures used to continuously monitor stack gases for NO_x, CO, CO₂, O₂, and THC strictly follow EPA Methods 7E, 10, 3A, and 25A. EPA Method 205, EPA Protocol high-concentration supply gases, and an Environics Model 2020 gas dilution system were used to generate all the calibration gases used for each of the analyzers. The performance of the gas dilution system is evaluated prior to the tests in accordance with Section 3.2 of Method 205. Once the gas dilution system passes the evaluation, it is audited using an EPA Protocol mid-level supply gas. If this audit is successful, the gas dilution system is then used to generate individual calibration gases.

Prior to the test program, the CEMS is assembled and leak checked. The sample probe is sealed with a cap and the flow through each rotameter is observed. The leak check is successful if the pressure at the analyzer system and the flow through the rotameters all drop to zero. A leak check of the entire CEMS is performed before and after each test to ensure no leaks occurred during movement of the sample probe from port to port.

High-level EPA Protocol calibration gases for NO_x, CO, CO₂, O₂ and THC were introduced into each analyzer to calibrate the analyzer and recorder. Once these adjustments were completed, the analyzer calibration error checks were performed. Zero, mid-level, and high-level calibration gases were introduced to the gas analyzers. No adjustments were made to the system except what is necessary to achieve the proper calibration gas flowrate. The analyzer responses to the calibration gases were recorded by the STRATA data acquisition system (DAS). When calibration gas is introduced directly to each analyzer, the difference between the analyzer display and the known concentration of each calibration gas must not exceed 2.0% of the calibration span.

Next, a sampling system bias check is performed by introducing calibration gases at the sample probe. A zero gas and a mid-range or high-range calibration gas, whichever most closely approximates the stack gas concentrations, is used for this check. No adjustments were made to the system except what is necessary to achieve the proper calibration gas flowrate. At the same time, the measurement system response time (95% of gas value) is determined for both the zero and upscale gases. The sampling system bias check is valid if the difference between the gas concentrations for the analyzer calibration error check and the sampling system bias check do not exceed 5% of the calibration span.

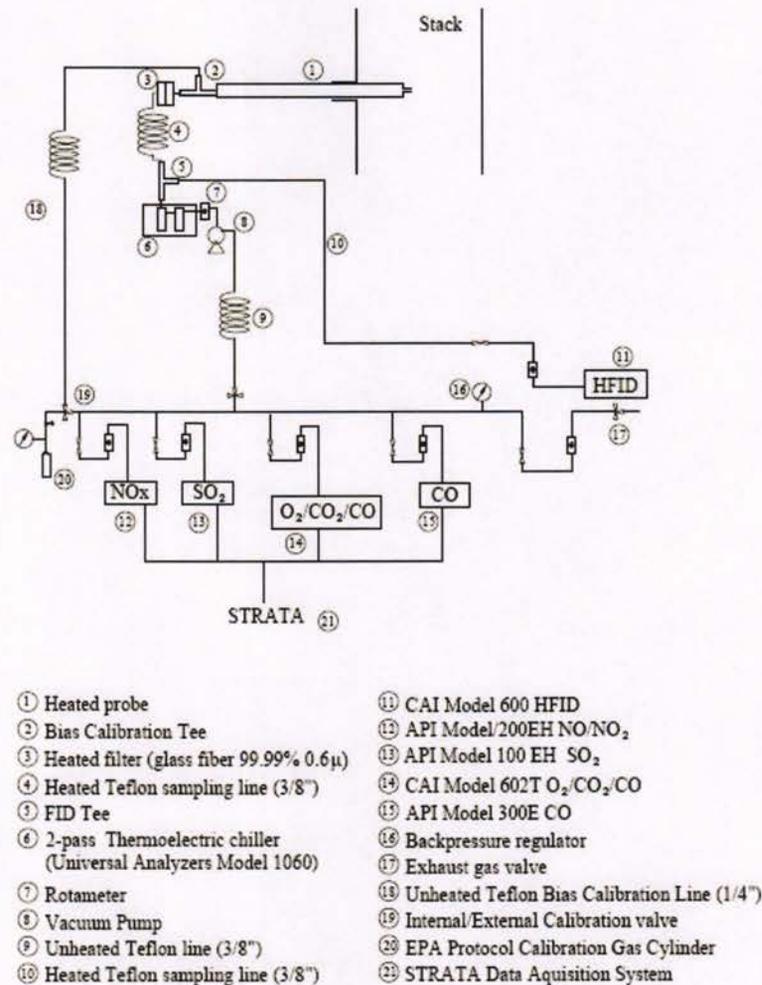


Figure 7. Schematic of Continuous Analyzer System.

The CEMS is now ready for the interference response test for NO_x, CO, CO₂, and O₂, which is performed in accordance with EPA Method 7E. Each high-range calibration gas is introduced into the measurement system and the individual analyzer responses were recorded. If the sum of the analyzer responses to the other interfering gases does not exceed 2.50% of the calibration span, the system is considered interference-free.

A NO_x converter check was also performed. A certified gas (NO₂ in N₂) is introduced into the NO_x analyzer with the analyzer set in the "NO_x" mode until a stable reading is obtained. The converter conversion efficiency is calculated by dividing the measured NO₂ concentration by the certified gas concentration. The converter demonstrated an efficiency of 90.7% and testing was able to proceed.

A sample is taken from the stack at a single point (since the gases were well-mixed having passed through the baghouse ID fan) using a heated 316 stainless steel sampling probe. A heated Balston filter holder and a fiberglass filter (99.9999 percent efficiency retention of 0.6-micron particles) were connected to the outlet of the probe. Sample gas is transported through heated Teflon sample line (maintained at >250°F) by a Teflon-lined diaphragm pump to a Kynar and Teflon chiller (Universal Analyzers Model 1060). The sample gas passes through the chiller under vacuum before entering the pump. The clean, dry sample gas (approximately 37°F) is then transported to the continuous analyzer system through an unheated Teflon line. A series of flow meters, valves, and regulators maintain constant flow through the system at a constant pressure. A separate sample is taken from the heated line, before the chiller, and sent directly to the FID for THC measurement.

The continuous analyzers were calibrated with EPA Protocol calibration gases. All pertinent data such as date, time, test locations, analyzer range, and cal gas value were recorded by the DAS. At the end of each run, the zero and upscale sampling system bias check were repeated. Zero drift and calibration drift were determined by calculating the difference between the initial and final calibration response for both the zero and upscale gases. In either case, the drift must not exceed 3.0% of the calibration span to be acceptable. The sampling system bias check must not exceed 5.0% of the calibration span to be valid. The measured gas concentrations were corrected for sampling system bias in accordance with Section 12, equation 7E-5 of EPA Method 7E.

4.4 VOC

The real time total hydrocarbon measurements made by the FID analyzer have been corrected to VOC concentrations by subtracting integrated methane and ethane concentrations analyzed by AtmAA Labs in Calabasas, California. The EPA Method 18 sampling train for methane and ethane consisted of a stainless-steel probe, a 4-foot Teflon sample line, an SKC Model 222-3 personal sample pump, and a 3-liter Tedlar bag (Figure 8). The entire train was purged with stack gas before collecting a sample. An integrated grab sample of the stack gases was collected over the test period. After sample collection, the Tedlar bag was lowered to the mobile lab for subsequent analysis.

4.5 Process Data

Process data was collected by Reck Brothers personnel during the source tests and has been included in the final report. The process data will include plant production data, water flow to the scrubber and propane usage to determine the plant operating rate during each test run.

1. The first part of the document discusses the importance of maintaining accurate records of all activities related to the project. This includes keeping track of dates, times, and locations of all observations and measurements.

2. The second part of the document describes the various methods used to collect and analyze data. This includes field observations, laboratory analyses, and computer modeling. Each method is described in detail, including the equipment used, the procedures followed, and the results obtained.

3. The third part of the document presents the results of the study. This includes a detailed description of the data collected, a comparison of the results with previous studies, and a discussion of the implications of the findings. The results are presented in a clear and concise manner, using tables and figures to illustrate the data.

4. The fourth part of the document discusses the conclusions of the study and the recommendations for future research. This includes a summary of the key findings, a discussion of the limitations of the study, and a list of specific recommendations for further work. The conclusions are presented in a clear and concise manner, using bullet points to highlight the key points.

5. The fifth part of the document is a list of references, which includes all of the sources cited in the document. This list is organized alphabetically by author name, and includes the full citation for each source. The references are presented in a clear and concise manner, using a standard format for citations.

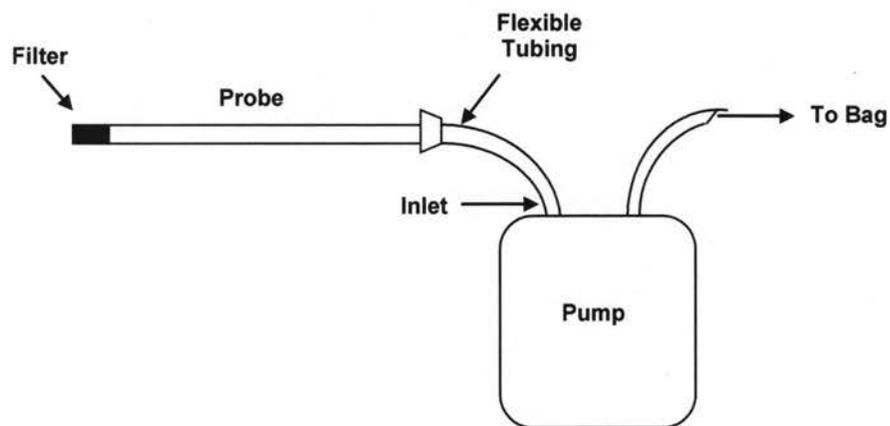


Figure 8. Schematic of VOC Sampling Train.



Figure 10. Schematic of the piping system.

5.0 QUALITY ASSURANCE

5.1 Manual Sampling Equipment

Detailed records of repair and maintenance to the sampling equipment are kept. Preventive maintenance to each system is performed periodically to avoid component failure during a field test. A detailed record of monitoring system calibrations is also kept. Calibrations for the sampling nozzles, pitot tubes, dry gas meters, and orifice meters are available for review. The calibrations for equipment used on this program are included in the test report.

5.2 Lab Analysis

All field samples are assigned a label and ID number. This ID is affixed to the chain-of-custody log and the field data sheet to prevent sample mix-up. Prior to analysis, all glassware is thoroughly cleaned (soap and water, tap water rinse, deionized water rinse, and IPA rinse) to eliminate any contamination.

Reagents are ACS reagent grade and blanks of these reagents are evaluated for every set of tests. Blanks are taken in the field from the squeeze bottles and not the original container. Records are kept on these blanks to ensure consistent quality of the reagents.

5.3 Gas Blender Audit

The results of the checks performed on the Broadbent CEMS during the test program appear in the appendix of this report. An Environics Model 2020 gas dilution system and high concentration EPA Protocol gas are used to generate the calibration gases used on this program. EPA Method 205 requires a field evaluation of the gas dilution system once during each field test using a calibrated analyzer and high range EPA Protocol supply gas. Two dilutions (20% and 60%) within the range of each mass flow controller are selected and triplicate injections of the dilution gas are injected into the calibrated analyzer. For each injection made at each of the dilution levels, an individual injection cannot differ by more than 2% from the three-injection average. In addition, the three-injection average at each dilution level cannot differ by more than 2% from predicted concentration of the gas dilution system. Finally, EPA Method 205 requires an independent check of the analyzer used for the gas dilution system check using a mid-level EPA Protocol supply gas. The audit gas is injected directly into the analyzer three times. The average of the three injections cannot differ by more than 2% from the certified concentration in the tank. The results of the gas blender audit for this test program are shown in Table 5.

Table 5. Gas Blender QA/QC Checks – NO_x Analyzer 0 – 300 ppm

Dilution Level (ppm)	Injection 1		Injection 2		Injection 3		Average		Allowable Difference (%)
	ppm	Percent Difference ^a	Ppm	Percent Difference ^a	ppm	Percent Difference ^a	ppm	Percent Difference	
270	270.35	0.1	270.22	0.2	270.45	1.7	270.34	0.2	±2
180	181.66	0.9	179.14	-0.6	179.20	-0.4	180.00	-0.6	±2
90	88.86	-1.3	88.86	-1.3	89.01	-1.1	88.91	-0.5	±2
Mid-Level Supply 90.0 ^b	91.67	1.9	91.23	1.4	91.30	1.4	91.40	1.6 ^b	±2

^a $\frac{\text{Dilution Level ppm} - \text{Injection ppm}}{\text{Dilution Level ppm}} \times 100$

^b $\frac{\text{Mid-Level Supply ppm} - \text{Average ppm}}{\text{Mid-Level Supply ppm}} \times 100$

Source Test Report
Reck Brothers, LLC
2023 Performance Testing
Initial Compliance on System 03
Test Date: November 4, 2023

APPENDIX A

FIELD DATA, LAB RESULTS, CALCULATIONS, AND RESULTS SUMMARY

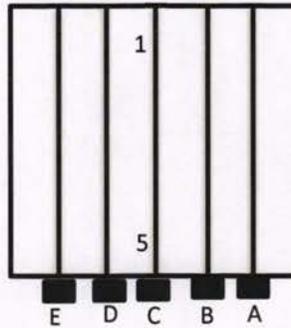
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10/1/87

10/1/87

SAMPLE POINT LOCATION DATA SHEET

Plant Reck Brothers
 Test Location Scrubber Exhaust Stack
 Date 11/4/23



<i>Units</i>			
Upstream Distance	<i>in</i>	36.00	
Upstream Diameter	-	1.4	
Downstream Distance	<i>in</i>	120.00	
Downstream Diameter	-	4.7	
No. of Sampling Points		25	
	Traverse:	<i>width</i>	<i>length</i>
Stack Dimension	<i>in</i>	24.00	27.00
Stack Dimension, equivalent	<i>in</i>	25.41	
Coupling Length	<i>in</i>	7.50	
	4,3 -inch	FPT	

Sample Point	Distance
	<i>in</i>
5	9.9
4	14.7
3	19.5
2	24.3
1	29.1

Comments: Harness for boom lift. Outside four ports are 3 in. female NPT; Center port is 3 in. male NPT. Back trailer into East side of drum dryer. Use large Caterpillar Generator for power. Splice transfer then run 100 ft. extension cord to boom lift basket. 50 ft. HSL for CEMS to Chiller adjacent to trailer. Heated jumper for FID.



CYCLONIC FLOW CHECK

Source: Scrubber Exhaust ^{Stack} Test Location: Reet Brothers
 Date: 11-3-23 Time: 1730-1750 By: KV

Port	Sample Point	ΔP	Yaw Angle (Degree)
A	1	0.65	8
	2	0.78	5
	3	0.74	5
	4	0.69	6
	5	0.63	8
B	1	0.25	4
	2	0.26	2
	3	0.19	0
	4	0.16	1
	5	0.15	3
C	1	0.24	3
	2	0.19	4
	3	0.18	6
	4	0.16	2
	5	0.14	4
D	1	0.26	2
	2	0.23	2
	3	0.20	1
	4	0.19	6
	5	0.18	3
E	1	0.53	5
	2	0.74	8
	3	0.73	9
	4	0.64	7
	5	0.55	5

Calibration Error Test at Run 1 . STRATA Version 3.2

		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	08:14:04	7.366	0.203	0.47	1.59	0.03	0.2
11/4/2023	08:15:04	-0.003	0.012	0.45	0.35	0.03	0.2
11/4/2023	08:16:05	2.815	0.015	0.31	-0.17	0.035	0.14
11/4/2023	08:17:04	22.014	0.018	0.34	-0.37	0.036	0.11
11/4/2023	08:18:05	13.273	1.16	0.35	-0.38	0.033	0.1
11/4/2023	08:19:04	-0.001	17.654	0.36	-0.04	0.031	0.2
11/4/2023	08:20:04	0.071	13.188	0.36	0.02	0.035	0.38
11/4/2023	08:21:05	0.053	0.599	13.87	0.18	0.035	0.33
11/4/2023	08:22:04	0.013	-0.145	177.83	0.28	0.035	0.37
11/4/2023	08:23:04	0.007	0.011	186.3	0.31	0.036	0.36
11/4/2023	08:24:04	0.003	0.008	190.68	0.05	0.038	0.3
11/4/2023	08:25:04	-0.002	0.013	130.48	-0.03	0.272	0.37
11/4/2023	08:26:04	10.329	0.048	91.17	-0.07	0.565	0.42
11/4/2023	08:27:05	11.545	0.051	30.12	0.22	0.037	0.41
11/4/2023	08:28:04	7.451	0.041	1.66	60.12	0.039	0.38
11/4/2023	08:29:05	0.032	0.014	1.21	264.26	0.033	0.38
11/4/2023	08:30:04	0.019	0.009	0.78	277.75	0.032	0.38
11/4/2023	08:31:04	0.012	0.006	0.73	174.07	0.039	0.59
11/4/2023	08:32:04	0.502	0.004	0.77	154.3	0.037	0.38
11/4/2023	08:33:05	0.198	0.001	0.67	59.44	21.267	0.38
11/4/2023	08:34:04	-0.007	-0.002	0.53	1.34	39.069	0.38
11/4/2023	08:35:05	-0.01	-0.003	0.53	0.11	44.891	0.38
11/4/2023	08:36:04	-0.009	-0.004	0.47	0.06	48.527	0.37
11/4/2023	08:37:05	-0.01	-0.003	0.44	-0.05	36.737	0.38
11/4/2023	08:38:04	-0.011	-0.001	0.44	-0.11	24.96	0.33
11/4/2023	08:39:05	5.508	0.014	0.39	-0.18	24.027	0.34
11/4/2023	08:40:05	1.424	0.01	0.41	-0.2	7.342	-0.41
11/4/2023	08:41:04	0.227	0.015	0.47	-0.07	0.033	142.61
11/4/2023	08:42:05	0.056	0.016	0.48	-0.06	0.029	186.1
11/4/2023	08:43:04	0.054	0.018	0.46	0.05	0.032	122.52
11/4/2023	08:44:04	0.054	0.02	0.46	0.17	0.031	77.61

Calibration Error Test at Run 1

Operator: Wayne Johnson
 Plant Name: Reck Brothers HMA
 Location: Drum Dryer Stack

Reference Cylinder Numbers

	Zero	Low-range	Mid-range	High-range
O2	EB0019116		CC101523	CC101523
CO2	EB0019116		CC329527	CC329527
NOx	EB0019116		CC162032	CC162032
CO	EB0019116		SA5009	SA5009
SO2	EB0019116	SA11784	CC702450	CC702450
THC	EB0019116	ALM001705	ALM001705	ALM001705

Date/Time 11/4/2023 08:44:04 PASSED

Analyte	O2	CO2	NOx	CO	SO2	THC
Units	%	%	ppm	ppm	ppm	ppm
Zero Ref Cyl	0	0	0	0	0	0
Zero Avg	-0.012	0.013	0.3	-0.06	0.035	0.14
Zero Error%	0	0.1	0.2	0	0.1	0.1
Low Ref Cyl						60
Low Avg						60.73
Low Error%						0.4
Mid Ref Cyl	12.5	10	100	150	25	120
Mid Avg	12.473	10.213	99.27	155.12	24.732	122.08
Mid Error%	0.1	1.1	0.4	1.7	0.5	1
High Ref Cyl	22.03	17.88	190	290	49	190
High Avg	22.025	17.896	190.31	290.82	48.706	192.44
High Error%	0	0.1	0.2	0.3	0.6	1.2

DATE	TIME	DEPTH	TEMP	WIND	WAVE	SEA	WIND DIR	WAVE DIR
10/11	0000	10	10.0	0	0	0	0	0
10/11	0100	10	10.0	0	0	0	0	0
10/11	0200	10	10.0	0	0	0	0	0
10/11	0300	10	10.0	0	0	0	0	0
10/11	0400	10	10.0	0	0	0	0	0
10/11	0500	10	10.0	0	0	0	0	0
10/11	0600	10	10.0	0	0	0	0	0
10/11	0700	10	10.0	0	0	0	0	0
10/11	0800	10	10.0	0	0	0	0	0
10/11	0900	10	10.0	0	0	0	0	0
10/11	1000	10	10.0	0	0	0	0	0
10/11	1100	10	10.0	0	0	0	0	0
10/11	1200	10	10.0	0	0	0	0	0
10/11	1300	10	10.0	0	0	0	0	0
10/11	1400	10	10.0	0	0	0	0	0
10/11	1500	10	10.0	0	0	0	0	0
10/11	1600	10	10.0	0	0	0	0	0
10/11	1700	10	10.0	0	0	0	0	0
10/11	1800	10	10.0	0	0	0	0	0
10/11	1900	10	10.0	0	0	0	0	0
10/11	2000	10	10.0	0	0	0	0	0
10/11	2100	10	10.0	0	0	0	0	0
10/11	2200	10	10.0	0	0	0	0	0
10/11	2300	10	10.0	0	0	0	0	0
10/11	2400	10	10.0	0	0	0	0	0
10/11	2500	10	10.0	0	0	0	0	0
10/11	2600	10	10.0	0	0	0	0	0
10/11	2700	10	10.0	0	0	0	0	0
10/11	2800	10	10.0	0	0	0	0	0
10/11	2900	10	10.0	0	0	0	0	0
10/11	3000	10	10.0	0	0	0	0	0

10/11 0000 10 10.0 0 0 0 0 0
 10/11 0100 10 10.0 0 0 0 0 0
 10/11 0200 10 10.0 0 0 0 0 0
 10/11 0300 10 10.0 0 0 0 0 0
 10/11 0400 10 10.0 0 0 0 0 0
 10/11 0500 10 10.0 0 0 0 0 0
 10/11 0600 10 10.0 0 0 0 0 0
 10/11 0700 10 10.0 0 0 0 0 0
 10/11 0800 10 10.0 0 0 0 0 0
 10/11 0900 10 10.0 0 0 0 0 0
 10/11 1000 10 10.0 0 0 0 0 0
 10/11 1100 10 10.0 0 0 0 0 0
 10/11 1200 10 10.0 0 0 0 0 0
 10/11 1300 10 10.0 0 0 0 0 0
 10/11 1400 10 10.0 0 0 0 0 0
 10/11 1500 10 10.0 0 0 0 0 0
 10/11 1600 10 10.0 0 0 0 0 0
 10/11 1700 10 10.0 0 0 0 0 0
 10/11 1800 10 10.0 0 0 0 0 0
 10/11 1900 10 10.0 0 0 0 0 0
 10/11 2000 10 10.0 0 0 0 0 0
 10/11 2100 10 10.0 0 0 0 0 0
 10/11 2200 10 10.0 0 0 0 0 0
 10/11 2300 10 10.0 0 0 0 0 0
 10/11 2400 10 10.0 0 0 0 0 0
 10/11 2500 10 10.0 0 0 0 0 0
 10/11 2600 10 10.0 0 0 0 0 0
 10/11 2700 10 10.0 0 0 0 0 0
 10/11 2800 10 10.0 0 0 0 0 0
 10/11 2900 10 10.0 0 0 0 0 0
 10/11 3000 10 10.0 0 0 0 0 0

Initial System Bias Check for Run 1 . STRATA Version 3.2

		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	08:45:19	3.632	0.031	0.41	0.1	0.032	14.02
11/4/2023	08:46:19	1.846	0.025	0.42	-0.16	0.029	0.72
11/4/2023	08:47:20	11.811	0.033	0.41	-0.07	0.029	1.49
11/4/2023	08:48:19	15.552	1.597	0.41	0.04	0.029	0.96
11/4/2023	08:49:19	0.092	7.129	0.41	0.17	0.03	1.36
11/4/2023	08:50:19	0.064	0.053	41.09	0.48	0.026	0.46
11/4/2023	08:51:18	0.059	0.044	96.47	1.2	0.03	0.03
11/4/2023	08:52:19	0.053	0.039	68.94	96.49	0.029	0.12
11/4/2023	08:53:19	0.164	0.059	2.35	141.34	0.032	0.36
11/4/2023	08:54:20	0.05	0.031	0.61	34.23	0.208	0.32
11/4/2023	08:55:18	0.046	0.027	0.55	0.61	7.109	0.32
11/4/2023	08:56:18	0.046	0.027	0.48	0.13	14.994	0.32
11/4/2023	08:57:19	0.043	0.026	0.45	0.1	19.376	0.32
11/4/2023	08:58:18	0.042	0.026	0.41	0.01	19.826	0.32
11/4/2023	08:59:19	0.041	0.026	0.41	-0.02	24.649	1.42

Initial System Bias Check for Run 1

Operator: Wayne Johnson
 Plant Name: Reck Brothers HMA
 Location: Drum Dryer Stack
 Reference Cylinder Numbers

	Zero	Span
O2	EB0019116	CC101523
CO2	EB0019116	CC329527
NOx	EB0019116	CC162032
CO	EB0019116	SA5009
SO2	EB0019116	CC702450
THC	EB0019116	ALM001705

Date/Time	11/4/2023	09:00:07	PASSED			
Analyte	O2	CO2	NOx	CO	SO2	THC
Units	%	%	ppm	ppm	ppm	ppm
Zero Ref Cyl	0	0	0	0	0	0
Zero Cal	-0.012	0.013	0.3	-0.06	0.035	0.14
Zero Avg	0.053	0.024	0.4	-0.16	0.028	-0.71
Zero Bias%	0.3	0.1	0	0	0	0.4
Zero Drift%						
Span Ref Cyl	12.5	10	100	150	25	120
Span Cal	12.473	10.213	99.27	155.12	24.732	122.08
Span Avg	12.277	10.343	97.11	148.63	24.381	123.42
Span Bias%	0.8	0.6	1.1	2.2	0.7	0.7
Span Drift%						

Test Run 1 Begin. STRATA Version 3.2

Operator: Wayne Johnson
 Plant Name: Reck Brothers HMA
 Location: Drum Dryer Stack

		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	09:01:08	14.138	0.062	0.37	0.48	2.518	56.09
11/4/2023	09:02:08	20.808	0.084	0.41	0.52	0.124	1.46
11/4/2023	09:03:08	20.77	0.082	0.47	0.15	0.033	1.5
11/4/2023	09:04:08	20.758	0.079	0.46	0.1	0.034	1.51
11/4/2023	09:05:08	20.756	0.075	0.42	0.09	0.035	1.51
11/4/2023	09:06:08	20.758	0.073	0.42	-0.02	0.032	1.5
11/4/2023	09:07:08	20.758	0.071	0.41	-0.07	0.033	1.54
11/4/2023	09:08:08	20.754	0.071	0.44	-0.06	0.032	1.57
11/4/2023	09:09:08	20.754	0.069	0.47	0.02	0.036	1.57
11/4/2023	09:10:08	20.753	0.068	0.48	0.02	0.029	1.58
11/4/2023	09:11:08	20.753	0.068	0.42	0	0.032	1.51
11/4/2023	09:12:08	20.75	0.068	0.43	0.01	0.029	1.55
11/4/2023	09:13:08	20.751	0.066	0.45	0	0.033	1.54
11/4/2023	09:14:08	20.752	0.065	0.47	0.07	0.031	1.56
11/4/2023	09:15:08	20.752	0.064	0.43	0.04	0.031	1.59
11/4/2023	09:16:08	20.754	0.062	0.41	0.01	0.032	1.63
11/4/2023	09:17:08	20.756	0.057	0.42	0.02	0.027	1.58
11/4/2023	09:18:08	20.754	0.054	0.41	0.09	0.03	1.49
11/4/2023	09:19:08	20.754	0.05	0.37	0.09	0.029	1.46
11/4/2023	09:20:08	20.753	0.047	0.36	0.09	0.03	1.46
11/4/2023	09:21:08	20.756	0.045	0.36	0.05	0.028	1.43
11/4/2023	09:22:08	20.755	0.044	0.36	0.06	0.028	1.4
11/4/2023	09:23:08	20.755	0.044	0.37	0.03	0.028	1.47
11/4/2023	09:24:08	20.755	0.044	0.36	0.09	0.029	1.54
11/4/2023	09:25:08	20.757	0.041	0.4	0.16	0.029	1.51
11/4/2023	09:26:08	20.769	0.04	0.4	0.12	0.025	1.52
11/4/2023	09:27:08	20.777	0.036	0.39	0.03	0.029	1.53
11/4/2023	09:28:08	20.777	0.034	0.4	0	0.028	1.51
11/4/2023	09:29:08	20.776	0.031	0.41	0.06	0.028	1.48
11/4/2023	09:30:08	20.76	0.029	0.41	0.09	0.029	1.5
11/4/2023	09:31:08	20.761	0.026	0.41	0.11	0.028	1.51
11/4/2023	09:32:08	20.769	0.022	0.45	0.11	0.028	1.5
11/4/2023	09:33:08	20.769	0.021	0.41	0.13	0.032	1.49
11/4/2023	09:34:08	20.769	0.017	0.39	0.06	0.029	1.49
11/4/2023	09:35:08	20.768	0.015	0.37	0.05	0.032	1.52
11/4/2023	09:36:08	20.769	0.013	0.37	0.08	0.029	1.57
11/4/2023	09:37:08	20.764	0.012	0.37	0.08	0.03	1.53
11/4/2023	09:38:08	20.761	0.012	0.37	0.03	0.03	1.53
11/4/2023	09:39:08	20.758	0.01	0.39	0.1	0.032	1.53
11/4/2023	09:40:08	20.753	0.01	0.39	0.09	0.036	1.51
11/4/2023	09:41:08	20.742	0.009	0.42	0.04	0.03	1.54
11/4/2023	09:42:08	20.736	0.008	0.42	0.08	0.032	1.56
11/4/2023	09:43:08	20.736	0.007	0.37	0.11	0.031	1.53

Plant Name: Reck Brothers HMA

Location: Drum Dryer Stack

		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	09:44:08	20.738	0.008	0.36	0.07	0.034	2.12
11/4/2023	09:45:08	20.739	0.009	0.36	0.08	0.033	2.63
11/4/2023	09:46:08	18.252	1.787	0.49	155.86	0.031	149.23
11/4/2023	09:47:08	17.206	2.5	7.8	310.5	0.031	208
11/4/2023	09:48:08	12.36	5.968	12.28	298.99	0.03	74.47
11/4/2023	09:49:08	10.545	7.226	42.88	119.34	0.028	9.07
11/4/2023	09:50:08	7.165	9.68	53.39	235.14	0.028	14.8
11/4/2023	09:51:08	8.129	8.922	68.84	310.5	0.028	31.06
Begin calculating run averages							
11/4/2023	09:53:06	9.477	7.998	70.82	98.35	0.029	43.23
11/4/2023	09:54:06	9.776	7.792	70.74	86.67	0.028	47.08
11/4/2023	09:55:07	10.104	7.544	69.13	79.93	0.024	50.79
11/4/2023	09:56:07	10.872	6.988	65.29	76.01	0.029	52.92
11/4/2023	09:57:07	11.499	6.556	55.16	88	0.028	54.01
11/4/2023	09:58:06	11.502	6.556	53.44	94.79	0.031	55.04
11/4/2023	09:59:06	11.503	6.556	53.28	94.08	0.025	56
11/4/2023	10:00:08	11.555	6.523	53.24	93.98	0.025	57.31
11/4/2023	10:01:08	11.554	6.518	53.14	97.55	0.026	58.1
11/4/2023	10:02:06	11.699	6.414	52.86	94.8	0.027	58.68
11/4/2023	10:03:07	12.11	6.128	52.1	106.27	0.029	60.36
11/4/2023	10:04:06	12.134	6.129	49.76	112.79	0.026	60.58
11/4/2023	10:05:07	12.155	6.128	47.81	116.19	0.026	61.3
11/4/2023	10:06:07	11.559	6.566	48.74	111.87	0.023	60.14
11/4/2023	10:07:07	10.987	6.96	56.63	93.38	0.028	59.57
11/4/2023	10:08:07	10.975	6.975	59.28	90.67	0.028	61.44
11/4/2023	10:09:07	11.016	6.952	60.1	95.39	0.027	63.23
11/4/2023	10:10:07	11.037	6.941	60.18	97.74	0.029	64.02
11/4/2023	10:11:06	11.047	6.935	59.91	98.15	0.025	65.18
11/4/2023	10:12:07	11.011	6.969	60.31	99.19	0.026	66.57
11/4/2023	10:13:07	11.055	6.934	60.98	98.09	0.025	67.89
11/4/2023	10:14:07	11.048	6.947	61.99	96.8	0.025	69.34
11/4/2023	10:15:06	11.069	6.933	62.27	96.06	0.022	70.44
11/4/2023	10:16:06	11.064	6.924	61.91	94.68	0.026	72.08
11/4/2023	10:17:07	11.253	6.745	61	93.52	0.023	73.13
11/4/2023	10:18:07	11.198	6.761	59.34	87.44	0.028	73.18
11/4/2023	10:19:06	11.153	6.78	57.8	86.13	0.024	73.74
11/4/2023	10:20:06	11.102	6.815	57.35	82.5	0.027	73.74
11/4/2023	10:21:07	11.112	6.804	57.23	80.2	0.025	74.42
11/4/2023	10:22:07	11.105	6.807	57.03	77.92	0.026	74.05
11/4/2023	10:23:07	11.097	6.818	56.88	74.86	0.026	73.51
11/4/2023	10:24:07	11.092	6.824	56.63	73.78	0.026	73.8
11/4/2023	10:25:07	11.092	6.824	56.48	71.91	0.022	74.71
11/4/2023	10:26:06	11.053	6.859	56.56	71.63	0.024	75.57
11/4/2023	10:27:06	11.054	6.864	56.65	74.52	0.025	77.12
11/4/2023	10:28:07	11.026	6.887	56.52	74.13	0.028	78.03

Plant Name: Reck Brothers HMA

Location: Drum Dryer Stack

		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	10:29:07	11.028	6.884	56.63	75.36	0.026	79.06
11/4/2023	10:30:07	10.874	6.982	56.83	72.53	0.025	79
11/4/2023	10:31:07	10.7	7.103	57.3	65.12	0.029	79.93
11/4/2023	10:32:07	10.673	7.119	58.14	64.71	0.028	80.72
11/4/2023	10:33:07	10.67	7.132	59.01	65.3	0.024	80.94
11/4/2023	10:34:07	10.676	7.15	59.23	67.6	0.032	81.09
11/4/2023	10:35:07	10.44	7.377	61.22	72.12	0.028	80.84
11/4/2023	10:36:06	10.368	7.426	66.76	80.61	0.03	80.49
11/4/2023	10:37:07	10.39	7.4	67.4	79.72	0.033	80.05
11/4/2023	10:38:07	10.365	7.428	67.25	79.08	0.035	81.09
11/4/2023	10:39:08	10.383	7.44	66.39	83.04	0.03	82.96
11/4/2023	10:40:07	10.399	7.421	66.07	84.06	0.041	83.27
11/4/2023	10:41:07	10.402	7.407	66.38	81.47	0.031	83.28
11/4/2023	10:42:07	10.374	7.415	66.74	76.84	0.027	83.41
11/4/2023	10:43:07	10.299	7.449	66.23	75.9	0.034	84.05
11/4/2023	10:44:07	10.258	7.463	65.7	71.69	0.037	85.11
11/4/2023	10:45:06	10.272	7.438	65.74	71.89	0.034	85.66
11/4/2023	10:46:07	10.243	7.435	66.28	73.3	0.026	86.56
11/4/2023	10:47:06	10.23	7.431	66.71	73.14	0.033	87.87
Pause							
11/4/2023	10:48:06	10.28	7.408	66.66	76.68	0.03	91.71
11/4/2023	10:49:07	20.401	0.158	42.2	38.67	0.031	56.3
11/4/2023	10:50:06	15.859	3.564	1.99	8.97	0.033	40.84
End Pause							
11/4/2023	10:51:06	10.215	7.407	48.87	59.84	0.03	70.72
11/4/2023	10:52:07	10.2	7.422	67.39	68.2	0.035	71.11
11/4/2023	10:53:07	10.168	7.447	70.29	68.38	0.032	65.03
11/4/2023	10:54:07	10.139	7.475	69.58	70.18	0.031	68.91
11/4/2023	10:55:07	10.137	7.479	69.63	70.67	0.034	71.91
11/4/2023	10:56:07	10.137	7.477	69.33	72.85	0.033	73.24
Average of Test Run							
		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	10:56:12	10.852	7.029	60.65	83.71	0.028	70.75
Test Run 1 End							

Final System Bias Check for Run 1 - STRATA Version 3.2

		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	10:57:16	4.588	3.169	64.26	57.71	0.024	55.51
11/4/2023	10:58:16	0.054	-0.023	16.8	6.15	0.037	16.38
11/4/2023	10:59:15	0.045	-0.029	2.57	-0.16	0.032	10.23
11/4/2023	11:00:16	0.041	-0.016	2.34	-0.35	0.03	7.58
11/4/2023	11:01:16	0.041	0.01	2.08	-0.2	0.03	6.13
11/4/2023	11:02:15	0.039	0.01	1.89	-0.11	0.027	5.06
11/4/2023	11:03:15	0.514	0.124	1.69	0.17	0.035	9.83
11/4/2023	11:04:16	4.457	0.021	2.91	22.15	0.028	17.27
11/4/2023	11:05:16	1.322	0.014	1.46	1.34	0.035	3.83
11/4/2023	11:06:15	12.001	0.019	1.41	-0.2	0.037	3.82
11/4/2023	11:07:15	16.183	0.653	1.35	-0.02	0.033	5.51
11/4/2023	11:08:16	0.182	9.684	1.34	0.45	0.032	5.24
11/4/2023	11:09:16	0.06	0.083	20.84	0.65	0.029	4.87
11/4/2023	11:10:16	0.046	0.027	95.58	0.51	0.032	3.95
11/4/2023	11:11:16	0.057	0.03	92.74	34.51	0.033	3.91
11/4/2023	11:12:15	0.041	0.025	18.26	141.29	0.033	3.85
11/4/2023	11:13:15	0.078	0.049	1.5	92.77	0.033	3.89
11/4/2023	11:14:15	0.039	0.026	1.49	4.67	0.033	4.02
11/4/2023	11:15:16	0.039	0.027	1.68	0.06	0.035	4.26
11/4/2023	11:16:15	0.038	0.029	1.89	0.1	1.792	4.58
11/4/2023	11:17:16	0.04	0.03	2.05	0.05	8.444	5.01
11/4/2023	11:18:16	0.039	0.031	2.05	0.06	13.753	5.5
11/4/2023	11:19:16	0.038	0.029	1.97	0.02	15.824	5.88
11/4/2023	11:20:15	0.039	0.026	1.89	-0.02	17.428	6.26
11/4/2023	11:21:15	0.038	0.024	1.75	-0.07	19.723	6.74
11/4/2023	11:22:16	0.038	0.023	1.59	-0.1	21.03	7.28
11/4/2023	11:23:16	0.038	0.022	1.43	-0.2	21.838	7.96
11/4/2023	11:24:15	0.04	0.023	1.2	-0.24	23.269	8.67
11/4/2023	11:25:16	0.043	0.025	1.05	-0.12	24.481	21.95
11/4/2023	11:26:16	0.04	0.025	0.87	0.26	17.141	125.94

Final System Bias Check for Run 1

Operator: Wayne Johnson
 Plant Name: Reck Brothers HMA
 Location: Drum Dryer Stack

Reference Cylinder Numbers

	Zero	Span
O2	EB0019116	CC101523
CO2	EB0019116	CC329527
NOx	EB0019116	CC162032
CO	EB0019116	SA5009
SO2	EB0019116	CC702450
THC	EB0019116	ALM001705

Date/Time	11/4/2023	11:26:37 PASSED					
Analyte	O2	CO2	NOx	CO	SO2	THC	
Units	%	%	ppm	ppm	ppm	ppm	
Zero Ref Cyl	0	0	0	0	0	0	
Zero Cal	-0.012	0.013	0.3	-0.06	0.035	0.14	
Zero Avg	0.043	0.013	1.45	1.15	0.034	3.83	
Zero Bias%	0.2	0	0.6	0.4	0	1.8	
Zero Drift%	0	-0.1	0.5	0.4	0	2.3	
Span Ref Cyl	12.5	10	100	150	25	120	
Span Cal	12.473	10.213	99.27	155.12	24.732	122.08	
Span Avg	12.36	10.444	98.58	151.19	24.806	126.59	
Span Bias%	0.5	1.2	0.3	1.3	0.1	2.3	
Span Drift%	0.3	0.5	0.7	0.9	0.8	1.6	
Ini Zero Avg	0.053	0.024	0.4	-0.16	0.028	-0.71	
Ini Span Avg	12.277	10.343	97.11	148.63	24.381	123.42	
Run Avg	10.852	7.029	60.65	83.71	0.028	70.75	
Co	0.048	0.018	0.93	0.49	0.031	1.56	
Cm	12.318	10.393	97.85	149.91	24.593	125.01	
Correct Avg	11.006	6.757	61.62	83.54	-0.003	67.26	

Test Run 2 Begin. STRATA Version 3.2

Operator: Wayne Johnson

Plant Name: Reck Brothers HMA

Location: Drum Dryer Stack

		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	11:27:37	13.77	0.06	0.71	0.36	0.981	68.55
11/4/2023	11:28:37	20.708	0.078	0.78	0.15	0.031	17.2
11/4/2023	11:29:37	20.723	0.078	0.94	0.09	0.032	18.25
11/4/2023	11:30:38	20.727	0.08	1.04	0.18	0.036	19.43
11/4/2023	11:31:37	20.731	0.082	1.01	0.24	0.034	20.16
11/4/2023	11:32:37	20.731	0.083	0.95	0.23	0.032	20
11/4/2023	11:33:37	20.729	0.085	0.87	0.27	0.035	19.62
11/4/2023	11:34:37	20.731	0.085	0.81	0.33	0.041	19.13
11/4/2023	11:35:37	20.73	0.086	0.75	0.38	0.037	18.62
11/4/2023	11:36:37	20.732	0.087	0.73	0.36	0.035	18.08
11/4/2023	11:37:37	20.731	0.088	0.71	0.35	0.03	17.52
11/4/2023	11:38:38	20.731	0.088	0.68	0.3	0.035	16.98
11/4/2023	11:39:37	20.733	0.088	0.65	0.28	0.032	16.39
11/4/2023	11:40:37	20.73	0.087	0.62	0.28	0.032	15.94
11/4/2023	11:41:37	20.73	0.088	0.61	0.28	0.033	15.51
11/4/2023	11:42:38	20.73	0.088	0.56	0.21	0.037	14.98
11/4/2023	11:43:37	20.728	0.087	0.56	0.25	0.036	14.65
11/4/2023	11:44:37	20.727	0.087	0.57	0.28	0.035	14.24
11/4/2023	11:45:37	20.728	0.086	0.52	0.34	0.034	13.81
11/4/2023	11:46:37	20.728	0.085	0.51	0.39	0.036	13.4
11/4/2023	11:47:37	20.731	0.085	0.47	0.33	0.035	13.1
11/4/2023	11:48:37	20.733	0.086	0.45	0.19	0.035	12.81
11/4/2023	11:49:37	20.732	0.086	0.42	0.14	0.032	12.41
11/4/2023	11:50:37	20.731	0.085	0.41	0.22	0.036	12.05
11/4/2023	11:51:37	20.73	0.083	0.41	0.32	0.031	11.64
11/4/2023	11:52:37	20.731	0.082	0.38	0.33	0.038	11.48
11/4/2023	11:53:37	17.538	2.335	0.54	184.76	0.033	167.15
11/4/2023	11:54:37	8.661	8.683	13.17	310.5	0.034	103.02
11/4/2023	11:55:38	9.21	8.114	56.18	310.5	0.034	46.05
11/4/2023	11:56:37	11.603	6.523	53.49	236.86	0.036	45.38
Begin calculating run averages							
11/4/2023	11:58:05	11.396	6.668	54.54	113.36	0.036	50.1
11/4/2023	11:59:04	11.369	6.69	56.06	110.06	0.032	52.7
11/4/2023	12:00:04	11.316	6.725	57.55	104.77	0.033	54.92
11/4/2023	12:01:05	11.291	6.735	58.3	105.22	0.032	55.11
11/4/2023	12:02:06	11.255	6.754	58.73	102.11	0.037	54.39
11/4/2023	12:03:05	11.474	6.593	58.82	97.7	0.034	55.35
11/4/2023	12:04:05	11.512	6.567	58.27	98.33	0.037	56.68
11/4/2023	12:05:04	11.591	6.515	57.47	105.84	0.038	59.09
11/4/2023	12:06:04	11.574	6.529	56.85	109.18	0.035	61.36
11/4/2023	12:07:04	11.546	6.567	56.79	111.3	0.033	63.16
11/4/2023	12:08:04	11.789	6.378	57.34	112.59	0.034	63.99
11/4/2023	12:09:05	12.006	6.223	54.47	125.65	0.031	64.18

1. The following information is provided for the purpose of the public hearing. The information is provided for the purpose of the public hearing. The information is provided for the purpose of the public hearing.

Case No.	Applicant	Address	City	County	State	Zip	Phone	Fax	E-mail
1001	John Doe	123 Main St	Springfield	Illinois	USA	62701	217-555-1234		john.doe@email.com
1002	Jane Smith	456 Oak Ave	Springfield	Illinois	USA	62702	217-555-5678		jane.smith@email.com
1003	Bob Johnson	789 Pine Rd	Springfield	Illinois	USA	62703	217-555-9012		bob.johnson@email.com
1004	Alice Brown	101 Elm St	Springfield	Illinois	USA	62704	217-555-3456		alice.brown@email.com
1005	Charlie White	202 Maple Dr	Springfield	Illinois	USA	62705	217-555-7890		charlie.white@email.com
1006	Diana Green	303 Cedar Ln	Springfield	Illinois	USA	62706	217-555-2345		diana.green@email.com
1007	Frank Black	404 Birch St	Springfield	Illinois	USA	62707	217-555-6789		frank.black@email.com
1008	Grace King	505 Walnut Ave	Springfield	Illinois	USA	62708	217-555-0123		grace.king@email.com
1009	Henry Lee	606 Chestnut Rd	Springfield	Illinois	USA	62709	217-555-4567		henry.lee@email.com
1010	Ivy Hall	707 Spruce Dr	Springfield	Illinois	USA	62710	217-555-8901		ivy.hall@email.com
1011	Jack Adams	808 Ash St	Springfield	Illinois	USA	62711	217-555-2345		jack.adams@email.com
1012	Karen Baker	909 Hickory Ln	Springfield	Illinois	USA	62712	217-555-6789		karen.baker@email.com
1013	Liam Clark	1010 Sycamore Ave	Springfield	Illinois	USA	62713	217-555-0123		liam.clark@email.com
1014	Mia Evans	1011 Dogwood Rd	Springfield	Illinois	USA	62714	217-555-4567		mia.evans@email.com
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1016	Olivia Gibson	1013 Magnolia St	Springfield	Illinois	USA	62716	217-555-2345		olivia.gibson@email.com
1017	Peter Harris	1014 Tulip Ave	Springfield	Illinois	USA	62717	217-555-6789		peter.harris@email.com
1018	Quinn King	1015 Poplar Rd	Springfield	Illinois	USA	62718	217-555-0123		quinn.king@email.com
1019	Rachel Lee	1016 Birch Ln	Springfield	Illinois	USA	62719	217-555-4567		rachel.lee@email.com
1020	Samuel Hall	1017 Elm St	Springfield	Illinois	USA	62720	217-555-8901		samuel.hall@email.com
1021	Tina Adams	1018 Oak Ave	Springfield	Illinois	USA	62721	217-555-2345		tina.adams@email.com
1022	Uma Baker	1019 Pine Rd	Springfield	Illinois	USA	62722	217-555-6789		uma.baker@email.com
1023	Victor Clark	1020 Cedar Ln	Springfield	Illinois	USA	62723	217-555-0123		victor.clark@email.com
1024	Wendy Evans	1021 Walnut St	Springfield	Illinois	USA	62724	217-555-4567		wendy.evans@email.com
1025	Xavier Foster	1022 Chestnut Ave	Springfield	Illinois	USA	62725	217-555-8901		xavier.foster@email.com
1026	Yara Gibson	1023 Spruce Rd	Springfield	Illinois	USA	62726	217-555-2345		yara.gibson@email.com
1027	Zoe Harris	1024 Ash Dr	Springfield	Illinois	USA	62727	217-555-6789		zoe.harris@email.com
1028	Adam King	1025 Hickory St	Springfield	Illinois	USA	62728	217-555-0123		adam.king@email.com
1029	Bella Lee	1026 Sycamore Ln	Springfield	Illinois	USA	62729	217-555-4567		bella.lee@email.com
1030	Chris Hall	1027 Dogwood Ave	Springfield	Illinois	USA	62730	217-555-8901		chris.hall@email.com
1031	Diana Adams	1028 Redwood Rd	Springfield	Illinois	USA	62731	217-555-2345		diana.adams@email.com
1032	Ethan Baker	1029 Magnolia St	Springfield	Illinois	USA	62732	217-555-6789		ethan.baker@email.com
1033	Fiona Clark	1030 Tulip Ave	Springfield	Illinois	USA	62733	217-555-0123		fiona.clark@email.com
1034	Gavin Evans	1031 Poplar Rd	Springfield	Illinois	USA	62734	217-555-4567		gavin.evans@email.com
1035	Hannah Foster	1032 Birch Ln	Springfield	Illinois	USA	62735	217-555-8901		hannah.foster@email.com
1036	Ian Gibson	1033 Elm St	Springfield	Illinois	USA	62736	217-555-2345		ian.gibson@email.com
1037	Jessica Harris	1034 Oak Ave	Springfield	Illinois	USA	62737	217-555-6789		jessica.harris@email.com
1038	Kyle King	1035 Pine Rd	Springfield	Illinois	USA	62738	217-555-0123		kyle.king@email.com
1039	Laura Lee	1036 Cedar Ln	Springfield	Illinois	USA	62739	217-555-4567		laura.lee@email.com
1040	Mason Hall	1037 Walnut St	Springfield	Illinois	USA	62740	217-555-8901		mason.hall@email.com
1041	Nora Adams	1038 Chestnut Ave	Springfield	Illinois	USA	62741	217-555-2345		nora.adams@email.com
1042	Oscar Baker	1039 Spruce Rd	Springfield	Illinois	USA	62742	217-555-6789		oscar.baker@email.com
1043	Pamela Clark	1040 Ash Dr	Springfield	Illinois	USA	62743	217-555-0123		pamela.clark@email.com
1044	Quinn Evans	1041 Hickory Ln	Springfield	Illinois	USA	62744	217-555-4567		quinn.evans@email.com
1045	Rachel Foster	1042 Sycamore St	Springfield	Illinois	USA	62745	217-555-8901		rachel.foster@email.com
1046	Samuel Gibson	1043 Dogwood Ave	Springfield	Illinois	USA	62746	217-555-2345		samuel.gibson@email.com
1047	Tina Harris	1044 Redwood Rd	Springfield	Illinois	USA	62747	217-555-6789		tina.harris@email.com
1048	Uma King	1045 Magnolia St	Springfield	Illinois	USA	62748	217-555-0123		uma.king@email.com
1049	Victor Lee	1046 Tulip Ave	Springfield	Illinois	USA	62749	217-555-4567		victor.lee@email.com
1050	Wendy Hall	1047 Poplar Rd	Springfield	Illinois	USA	62750	217-555-8901		wendy.hall@email.com

Plant Name: Reck Brothers HMA

Location: Drum Dryer Stack

		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	12:10:05	11.995	6.23	53.89	123.63	0.03	63.12
11/4/2023	12:11:06	11.978	6.241	53.97	124.86	0.029	63.64
11/4/2023	12:12:05	11.988	6.237	53.99	124.05	0.035	65.37
11/4/2023	12:13:06	11.998	6.227	53.57	126.01	0.032	70.93
11/4/2023	12:14:05	11.975	6.242	52.73	124.33	0.035	67.36
11/4/2023	12:15:05	11.967	6.242	51.99	119.03	0.033	65.23
11/4/2023	12:16:05	11.958	6.241	51.67	117.34	0.032	65.58
11/4/2023	12:17:05	11.948	6.243	51.39	118.05	0.037	66.11
11/4/2023	12:18:05	11.928	6.263	51.15	116.35	0.034	66.93
11/4/2023	12:19:05	11.944	6.247	51.03	114.98	0.034	66.94
11/4/2023	12:20:05	11.952	6.242	50.93	111.49	0.034	66.25
11/4/2023	12:21:05	11.929	6.256	50.67	107.7	0.031	66.53
11/4/2023	12:22:05	11.943	6.25	50.57	108.71	0.037	67.45
11/4/2023	12:23:05	11.991	6.218	50.65	109.3	0.035	68.13
11/4/2023	12:24:05	11.992	6.217	50.56	110.69	0.03	68.31
11/4/2023	12:25:05	11.99	6.22	50.42	108.77	0.036	69.23
11/4/2023	12:26:06	12.082	6.156	50.42	112.6	0.03	70.46
11/4/2023	12:27:05	12.124	6.132	49.86	122.96	0.032	72.99
11/4/2023	12:28:06	11.936	6.264	49.09	119.14	0.034	74.37
11/4/2023	12:29:05	11.896	6.285	49.44	112.17	0.035	75.73
11/4/2023	12:30:05	11.904	6.282	50.84	111.09	0.037	74.19
11/4/2023	12:31:05	11.985	6.241	51.55	112.52	0.034	78.12
11/4/2023	12:32:05	12.106	6.165	51.76	117	0.031	80
11/4/2023	12:33:04	12.151	6.139	51.41	125.87	0.034	79.81
11/4/2023	12:34:04	12.159	6.136	50.63	124.57	0.034	79.13
11/4/2023	12:35:04	12.136	6.161	49.97	122.83	0.038	78.99
11/4/2023	12:36:04	12.113	6.176	49.7	121.62	0.033	79.57
11/4/2023	12:37:05	12.086	6.194	49.69	118.78	0.037	79.46
11/4/2023	12:38:05	12.033	6.223	49.48	118.28	0.034	80.71
11/4/2023	12:39:05	12.002	6.241	49.13	116.7	0.029	79.82
11/4/2023	12:40:05	11.993	6.245	48.99	114.08	0.034	80.02
11/4/2023	12:41:05	11.973	6.259	48.8	111.53	0.032	79.67
11/4/2023	12:42:05	11.968	6.264	48.69	109.85	0.035	80.41
11/4/2023	12:43:05	11.983	6.255	48.75	110.21	0.035	82.37
11/4/2023	12:44:05	11.975	6.26	48.81	105.98	0.034	82.65
11/4/2023	12:45:04	11.997	6.239	48.81	104.43	0.034	82.76
11/4/2023	12:46:04	12.019	6.226	48.45	103.9	0.035	82.79
11/4/2023	12:47:04	12.045	6.215	47.7	106.63	0.033	82.06
11/4/2023	12:48:05	11.996	6.253	47.13	109.35	0.037	81.13
11/4/2023	12:49:05	11.902	6.322	47.2	108	0.037	83.08
Pause							
11/4/2023	12:50:06	11.786	6.407	47.69	110.39	0.034	81.62
11/4/2023	12:51:05	13.681	5.029	48.45	102.44	0.035	78.58
11/4/2023	12:52:05	20.672	0.182	32.83	30.28	0.035	39.34
11/4/2023	12:53:05	15.976	3.568	2.39	14.91	0.034	38.72

Plant Name: Reck Brothers HMA

Location: Drum Dryer Stack

		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	12:54:06	11.637	6.521	42.93	91.91	0.035	63.69
End Pause							
11/4/2023	12:55:04	11.608	6.539	51.76	108.77	0.035	74.05
11/4/2023	12:56:05	11.557	6.552	52.16	106.93	0.033	83.24
11/4/2023	12:57:05	11.494	6.586	52	95.69	0.038	88.29
11/4/2023	12:58:05	11.501	6.583	51.31	92.7	0.033	89.53
11/4/2023	12:59:05	11.51	6.575	51.07	94.92	0.038	87.1
11/4/2023	13:00:05	11.533	6.555	51.38	96.04	0.039	85.48
11/4/2023	13:01:04	11.536	6.547	51.71	95.99	0.041	83.31
11/4/2023	13:02:05	11.538	6.534	51.71	93.41	0.038	85.46
Average of Test Run							
		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	13:02:11	11.84	6.343	51.89	111.39	0.034	72.27
Test Run 2 End							

DATE	TIME	LOCATION	DEPTH	WIND	WAVE	TEMP	WIND DIR	WAVE DIR	WAVE PERIOD	WAVE HEIGHT	WAVE LENGTH	WAVE PERIOD	WAVE HEIGHT	WAVE LENGTH
12/11	12:00	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	12:05	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	12:10	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	12:15	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	12:20	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	12:25	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	12:30	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	12:35	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	12:40	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	12:45	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	12:50	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	12:55	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	13:00	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	13:05	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	13:10	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	13:15	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	13:20	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	13:25	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	13:30	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	13:35	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	13:40	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	13:45	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	13:50	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	13:55	1000	10	10	10	10	10	10	10	10	10	10	10	10
12/11	14:00	1000	10	10	10	10	10	10	10	10	10	10	10	10

Final System Bias Check for Run 2 . STRATA Version 3.2

		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	13:03:13	4.903	2.716	51.44	74.23	0.035	63.35
11/4/2023	13:04:12	0.056	0.103	11.34	7.69	0.035	19.84
11/4/2023	13:05:12	0.049	0.097	0.95	0.51	0.038	13.5
11/4/2023	13:06:12	0.046	0.096	0.87	0.68	0.036	11.06
11/4/2023	13:07:13	0.044	0.094	0.76	0.55	0.038	9.6
11/4/2023	13:08:12	0.043	0.091	0.69	0.38	0.041	8.57
11/4/2023	13:09:12	0.042	0.09	0.68	0.32	0.035	7.9
11/4/2023	13:10:12	0.105	0.089	0.69	0.28	0.036	7.79
11/4/2023	13:11:12	11.641	0.096	0.7	0.29	0.04	8.74
11/4/2023	13:12:12	15.587	0.407	0.76	0.61	0.034	10.01
11/4/2023	13:13:12	13.608	3.818	0.83	1.09	0.041	12.66
11/4/2023	13:14:13	0.043	10.244	0.93	1.17	0.037	11.73
11/4/2023	13:15:12	0.059	0.21	10.79	0.76	0.035	12.93
11/4/2023	13:16:13	0.05	0.099	91.9	0.52	0.032	12.53
11/4/2023	13:17:12	0.048	0.092	93.01	0.49	0.035	13.81
11/4/2023	13:18:12	0.054	0.095	86.72	32.29	0.033	15.02
11/4/2023	13:19:13	0.044	0.088	17.64	140.3	0.035	15.57
11/4/2023	13:20:13	0.265	0.104	1.19	111.73	0.036	16.27
11/4/2023	13:21:13	0.044	0.085	1.43	8.2	0.036	17.49
11/4/2023	13:22:12	0.044	0.079	2.29	0.33	2.146	19.54
11/4/2023	13:23:13	0.043	0.073	3.63	0.27	14.128	21.44
11/4/2023	13:24:13	0.041	0.067	4.36	0.13	23.758	22.93
11/4/2023	13:25:12	2.679	0.072	3.9	0.12	22.079	38.05
11/4/2023	13:26:13	0.049	0.062	2.97	0.43	13.68	132.51

Final System Bias Check for Run 2

Operator: Wayne Johnson
 Plant Name: Reck Brothers HMA
 Location: Drum Dryer Stack

Reference Cylinder Numbers

	Zero	Span
O2	EB0019116	CC101523
CO2	EB0019116	CC329527
NOx	EB0019116	CC162032
CO	EB0019116	SA5009
SO2	EB0019116	CC702450
THC	EB0019116	ALM001705

Date/Time	11/4/2023	13:26:39	PASSED			
Analyte	O2	CO2	NOx	CO	SO2	THC
Units	%	%	ppm	ppm	ppm	ppm
Zero Ref Cyl	0	0	0	0	0	0
Zero Cal	-0.012	0.013	0.3	-0.06	0.035	0.14
Zero Avg	0.043	0.09	0.7	0.28	0.039	7.68
Zero Bias%	0.2	0.4	0.2	0.1	0	3.8
Zero Drift%	0	0.4	-0.4	-0.3	0	1.9
Span Ref Cyl	12.5	10	100	150	25	120
Span Cal	12.473	10.213	99.27	155.12	24.732	122.08
Span Avg	12.329	10.468	93.02	152.15	25.309	130.71
Span Bias%	0.6	1.3	3.1	1	1.2	4.3
Span Drift%	-0.1	0.1	-2.8	0.3	1	2.1
Ini Zero Avg	0.043	0.013	1.45	1.15	0.034	3.83
Ini Span Avg	12.36	10.444	98.58	151.19	24.806	126.59
Run Avg	11.84	6.343	51.89	111.39	0.034	72.27
Co	0.043	0.051	1.07	0.71	0.037	5.75
Cm	12.345	10.456	95.8	151.67	25.057	128.65
Correct Avg	11.987	6.047	53.65	109.98	-0.002	64.95

Year	Value	Year	Value	Year	Value
1987	100	1992	100	1997	100
1988	105	1993	105	1998	105
1989	110	1994	110	1999	110
1990	115	1995	115	2000	115
1991	120	1996	120	2001	120
1992	125	1997	125	2002	125
1993	130	1998	130	2003	130
1994	135	1999	135	2004	135
1995	140	2000	140	2005	140
1996	145	2001	145	2006	145
1997	150	2002	150	2007	150
1998	155	2003	155	2008	155
1999	160	2004	160	2009	160
2000	165	2005	165	2010	165
2001	170	2006	170	2011	170
2002	175	2007	175	2012	175
2003	180	2008	180	2013	180
2004	185	2009	185	2014	185
2005	190	2010	190	2015	190
2006	195	2011	195	2016	195
2007	200	2012	200	2017	200
2008	205	2013	205	2018	205
2009	210	2014	210	2019	210
2010	215	2015	215	2020	215
2011	220	2016	220		
2012	225	2017	225		
2013	230	2018	230		
2014	235	2019	235		
2015	240	2020	240		

1. The following table shows the number of...
 2. The following table shows the number of...
 3. The following table shows the number of...
 4. The following table shows the number of...
 5. The following table shows the number of...
 6. The following table shows the number of...
 7. The following table shows the number of...
 8. The following table shows the number of...
 9. The following table shows the number of...
 10. The following table shows the number of...

Year	Value	Year	Value	Year	Value
1987	100	1992	100	1997	100
1988	105	1993	105	1998	105
1989	110	1994	110	1999	110
1990	115	1995	115	2000	115
1991	120	1996	120	2001	120
1992	125	1997	125	2002	125
1993	130	1998	130	2003	130
1994	135	1999	135	2004	135
1995	140	2000	140	2005	140
1996	145	2001	145	2006	145
1997	150	2002	150	2007	150
1998	155	2003	155	2008	155
1999	160	2004	160	2009	160
2000	165	2005	165	2010	165
2001	170	2006	170	2011	170
2002	175	2007	175	2012	175
2003	180	2008	180	2013	180
2004	185	2009	185	2014	185
2005	190	2010	190	2015	190
2006	195	2011	195	2016	195
2007	200	2012	200	2017	200
2008	205	2013	205	2018	205
2009	210	2014	210	2019	210
2010	215	2015	215	2020	215
2011	220	2016	220		
2012	225	2017	225		
2013	230	2018	230		
2014	235	2019	235		
2015	240	2020	240		

Test Run 3 Begin. STRATA Version 3.2

Operator: Wayne Johnson

Plant Name: Reck Brothers HMA

Location: Drum Dryer Stack

		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	13:27:39	0.046	0.061	1.16	0.22	0.067	132.31
11/4/2023	13:28:39	9.024	0.083	0.66	0.11	0.044	61.53
11/4/2023	13:29:40	20.68	0.113	0.67	0.17	0.035	28.29
11/4/2023	13:30:39	20.701	0.114	0.75	0.28	0.03	25.21
11/4/2023	13:31:39	20.707	0.115	0.79	0.36	0.037	23.22
11/4/2023	13:32:40	20.709	0.115	0.79	0.32	0.036	21.82
11/4/2023	13:33:39	20.709	0.115	0.73	0.35	0.037	20.66
11/4/2023	13:34:40	20.71	0.115	0.72	0.35	0.036	19.73
11/4/2023	13:35:39	20.712	0.113	0.68	0.3	0.037	18.88
11/4/2023	13:36:39	20.711	0.113	0.67	0.27	0.036	18.08
11/4/2023	13:37:39	20.711	0.112	0.64	0.19	0.036	17.46
11/4/2023	13:38:39	20.71	0.113	0.58	0.19	0.037	16.95
11/4/2023	13:39:39	20.71	0.113	0.58	0.19	0.036	16.89
11/4/2023	13:40:39	20.71	0.111	0.58	0.2	0.035	16.78
11/4/2023	13:41:40	20.713	0.109	0.56	0.25	0.037	16.55
11/4/2023	13:42:40	20.712	0.11	0.52	0.23	0.031	16.19
11/4/2023	13:43:39	20.713	0.11	0.53	0.22	0.033	15.43
11/4/2023	13:44:40	20.713	0.11	0.52	0.27	0.034	14.76
11/4/2023	13:45:39	20.714	0.11	0.49	0.29	0.031	14.22
11/4/2023	13:46:39	20.714	0.111	0.47	0.33	0.042	14.54
11/4/2023	13:47:40	20.715	0.112	0.48	0.34	0.036	13.75
11/4/2023	13:48:39	20.715	0.115	0.47	0.29	0.037	12.9
11/4/2023	13:49:40	20.715	0.117	0.46	0.34	0.029	12.31
11/4/2023	13:50:39	20.716	0.12	0.44	0.36	0.023	12.01
11/4/2023	13:51:39	19.866	0.741	0.44	32.33	0.035	73.91
11/4/2023	13:52:40	13.018	5.552	7.59	285.32	0.034	97.21
11/4/2023	13:53:40	11.539	6.527	42.14	129.87	0.033	37.97
Begin calculating run averages							
11/4/2023	13:55:04	10.517	7.232	55.78	77.8	0.031	44.21
11/4/2023	13:56:05	10.33	7.365	59.38	73.16	0.032	48.62
11/4/2023	13:57:04	10.009	7.577	60.76	71.85	0.035	52.61
11/4/2023	13:58:05	9.96	7.614	63.46	66.11	0.036	58.48
11/4/2023	13:59:05	9.968	7.608	65.45	67.37	0.033	67.09
11/4/2023	14:00:04	9.924	7.643	66.44	65.45	0.032	77.52
11/4/2023	14:01:04	9.93	7.647	67	67.86	0.038	89.42
11/4/2023	14:02:05	9.96	7.625	67.28	70.31	0.037	86.46
11/4/2023	14:03:04	9.953	7.625	67.14	69.14	0.033	82.93
11/4/2023	14:04:06	9.959	7.626	66.99	65.33	0.035	83.37
11/4/2023	14:05:04	10.039	7.573	66.95	64.33	0.029	83.53
11/4/2023	14:06:05	10.621	7.184	66.61	66.55	0.036	81.61
11/4/2023	14:07:05	10.673	7.155	64.48	69.86	0.032	79.27
11/4/2023	14:08:05	10.687	7.146	62.36	72.93	0.036	77.37
11/4/2023	14:09:05	10.688	7.144	61.72	73.51	0.031	76.02

Plant Name: Reck Brothers HMA

Location: Drum Dryer Stack

		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	14:10:06	10.723	7.119	61.58	73.57	0.032	76.39
11/4/2023	14:11:05	10.719	7.132	61.42	74.34	0.029	77.03
11/4/2023	14:12:04	10.745	7.113	61.5	77.83	0.035	76.65
11/4/2023	14:13:05	10.8	7.074	61.72	80.17	0.034	75.11
11/4/2023	14:14:05	10.687	7.157	61.84	79.72	0.031	78.99
11/4/2023	14:15:04	10.616	7.214	62.12	77.01	0.034	80.35
11/4/2023	14:16:05	10.585	7.239	62.68	75.45	0.036	81.28
11/4/2023	14:17:05	10.585	7.249	63.3	74.82	0.033	82.1
11/4/2023	14:18:05	11.35	6.712	62.74	78.74	0.031	82.92
11/4/2023	14:19:04	11.776	6.429	52.98	93.95	0.038	83.23
11/4/2023	14:20:04	11.803	6.41	51.96	95.51	0.03	78.41
11/4/2023	14:21:05	11.813	6.404	51.65	92.66	0.033	79.73
11/4/2023	14:22:05	11.81	6.414	51.28	94.33	0.026	76.7
11/4/2023	14:23:05	11.813	6.42	51.26	96.43	0.039	74.79
11/4/2023	14:24:05	11.815	6.433	51.67	101.6	0.035	72.61
11/4/2023	14:25:05	11.81	6.446	52.31	103.18	0.031	73.25
11/4/2023	14:26:05	11.853	6.417	53.04	99.23	0.03	73.58
11/4/2023	14:27:05	11.85	6.421	53.49	90.88	0.033	73.28
11/4/2023	14:28:04	11.83	6.444	53.77	93.4	0.03	74.45
11/4/2023	14:29:04	11.847	6.433	54.08	96.57	0.032	71.21
11/4/2023	14:30:05	11.824	6.446	53.96	96.07	0.033	74.24
11/4/2023	14:31:04	11.808	6.456	53.73	91.89	0.029	75.25
11/4/2023	14:32:05	11.77	6.481	53.9	91.32	0.031	75.66
11/4/2023	14:33:05	11.753	6.483	54.08	87.66	0.032	74.72
11/4/2023	14:34:05	11.738	6.49	53.96	87.45	0.033	73.14
11/4/2023	14:35:05	11.72	6.501	53.79	86.64	0.03	72.14
11/4/2023	14:36:05	11.703	6.511	53.88	87.09	0.035	71.43
11/4/2023	14:37:05	11.693	6.524	54.08	88.12	0.035	70.65
11/4/2023	14:38:05	11.641	6.565	54.34	87.69	0.035	69.99
11/4/2023	14:39:05	11.216	6.852	55.1	78.75	0.037	70.29
11/4/2023	14:40:04	11.193	6.86	56.94	71.97	0.036	70.83
11/4/2023	14:41:04	11.168	6.876	58.25	65.96	0.033	70.74
11/4/2023	14:42:04	11.124	6.905	58.42	66.34	0.034	70.19
11/4/2023	14:43:05	11.123	6.898	58.62	68.63	0.04	70.14
11/4/2023	14:44:06	11.094	6.91	58.88	68.02	0.034	70.32
11/4/2023	14:45:05	11.059	6.928	59.37	65.55	0.036	71.84
11/4/2023	14:46:05	10.993	6.966	59.8	64.37	0.035	73.1
11/4/2023	14:47:05	10.916	7.021	60.28	61.49	0.033	74.94
Pause							
11/4/2023	14:48:04	10.882	7.041	60.73	61.75	0.033	75.45
11/4/2023	14:49:05	10.878	7.043	61.04	62.8	0.035	75.34
11/4/2023	14:50:05	18.815	1.388	58.36	42.05	0.034	56.54
11/4/2023	14:51:05	17.359	2.587	7.62	5.86	0.032	38.51
11/4/2023	14:52:05	10.814	7.077	40.3	48.02	0.034	57.95

End Pause

Plant Name: Reck Brothers HMA

Location: Drum Dryer Stack

		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	14:53:04	10.82	7.08	60.39	62.58	0.033	65.27
11/4/2023	14:54:05	10.843	7.061	60.58	64.79	0.033	71.04
11/4/2023	14:55:05	10.841	7.071	60.69	64.11	0.032	75.28
11/4/2023	14:56:05	10.862	7.079	60.78	66.53	0.034	77.61
11/4/2023	14:57:05	10.87	7.062	60.7	68.51	0.033	77.71
11/4/2023	14:58:05	10.824	7.075	60.62	66.38	0.032	78.03
11/4/2023	14:59:05	10.766	7.11	60.8	64.25	0.034	78.46
Average of Test Run		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	14:59:12	11.019	6.947	58.96	77.63	0.033	74.45

Test Run 3 End

DATE	TIME	LOCATION	DEPTH	PARAMETER	VALUE	UNIT
10/15/88	0800	STATION 1	0.5	TEMPERATURE	15.2	°C
10/15/88	0800	STATION 1	1.0	TEMPERATURE	14.8	°C
10/15/88	0800	STATION 1	2.0	TEMPERATURE	14.5	°C
10/15/88	0800	STATION 1	3.0	TEMPERATURE	14.2	°C
10/15/88	0800	STATION 1	4.0	TEMPERATURE	13.9	°C
10/15/88	0800	STATION 1	5.0	TEMPERATURE	13.6	°C
10/15/88	0800	STATION 1	6.0	TEMPERATURE	13.3	°C
10/15/88	0800	STATION 1	7.0	TEMPERATURE	13.0	°C
10/15/88	0800	STATION 1	8.0	TEMPERATURE	12.7	°C
10/15/88	0800	STATION 1	9.0	TEMPERATURE	12.4	°C
10/15/88	0800	STATION 1	10.0	TEMPERATURE	12.1	°C
10/15/88	0800	STATION 1	11.0	TEMPERATURE	11.8	°C
10/15/88	0800	STATION 1	12.0	TEMPERATURE	11.5	°C
10/15/88	0800	STATION 1	13.0	TEMPERATURE	11.2	°C
10/15/88	0800	STATION 1	14.0	TEMPERATURE	10.9	°C
10/15/88	0800	STATION 1	15.0	TEMPERATURE	10.6	°C
10/15/88	0800	STATION 1	16.0	TEMPERATURE	10.3	°C
10/15/88	0800	STATION 1	17.0	TEMPERATURE	10.0	°C
10/15/88	0800	STATION 1	18.0	TEMPERATURE	9.7	°C
10/15/88	0800	STATION 1	19.0	TEMPERATURE	9.4	°C
10/15/88	0800	STATION 1	20.0	TEMPERATURE	9.1	°C
10/15/88	0800	STATION 1	21.0	TEMPERATURE	8.8	°C
10/15/88	0800	STATION 1	22.0	TEMPERATURE	8.5	°C
10/15/88	0800	STATION 1	23.0	TEMPERATURE	8.2	°C
10/15/88	0800	STATION 1	24.0	TEMPERATURE	7.9	°C
10/15/88	0800	STATION 1	25.0	TEMPERATURE	7.6	°C
10/15/88	0800	STATION 1	26.0	TEMPERATURE	7.3	°C
10/15/88	0800	STATION 1	27.0	TEMPERATURE	7.0	°C
10/15/88	0800	STATION 1	28.0	TEMPERATURE	6.7	°C
10/15/88	0800	STATION 1	29.0	TEMPERATURE	6.4	°C
10/15/88	0800	STATION 1	30.0	TEMPERATURE	6.1	°C
10/15/88	0800	STATION 1	31.0	TEMPERATURE	5.8	°C
10/15/88	0800	STATION 1	32.0	TEMPERATURE	5.5	°C
10/15/88	0800	STATION 1	33.0	TEMPERATURE	5.2	°C
10/15/88	0800	STATION 1	34.0	TEMPERATURE	4.9	°C
10/15/88	0800	STATION 1	35.0	TEMPERATURE	4.6	°C
10/15/88	0800	STATION 1	36.0	TEMPERATURE	4.3	°C
10/15/88	0800	STATION 1	37.0	TEMPERATURE	4.0	°C
10/15/88	0800	STATION 1	38.0	TEMPERATURE	3.7	°C
10/15/88	0800	STATION 1	39.0	TEMPERATURE	3.4	°C
10/15/88	0800	STATION 1	40.0	TEMPERATURE	3.1	°C
10/15/88	0800	STATION 1	41.0	TEMPERATURE	2.8	°C
10/15/88	0800	STATION 1	42.0	TEMPERATURE	2.5	°C
10/15/88	0800	STATION 1	43.0	TEMPERATURE	2.2	°C
10/15/88	0800	STATION 1	44.0	TEMPERATURE	1.9	°C
10/15/88	0800	STATION 1	45.0	TEMPERATURE	1.6	°C
10/15/88	0800	STATION 1	46.0	TEMPERATURE	1.3	°C
10/15/88	0800	STATION 1	47.0	TEMPERATURE	1.0	°C
10/15/88	0800	STATION 1	48.0	TEMPERATURE	0.7	°C
10/15/88	0800	STATION 1	49.0	TEMPERATURE	0.4	°C
10/15/88	0800	STATION 1	50.0	TEMPERATURE	0.1	°C

Final System Bias Check for Run 3 - STRATA Version 3.2

		O2	CO2	NOx	CO	SO2	THC
		%	%	ppm	ppm	ppm	ppm
11/4/2023	15:00:14	4.701	3.047	57.85	54.6	0.035	63.73
11/4/2023	15:01:14	0.06	0.107	15.71	6.2	0.033	22.35
11/4/2023	15:02:14	0.05	0.1	1.19	0.3	0.037	13.41
11/4/2023	15:03:14	0.047	0.095	1.04	0.38	0.037	11.69
11/4/2023	15:04:15	0.046	0.094	0.87	0.29	0.036	11.7
11/4/2023	15:05:15	0.044	0.091	0.74	0.19	0.036	11.02
11/4/2023	15:06:14	0.043	0.087	0.67	0.17	0.038	10.83
11/4/2023	15:07:14	0.043	0.087	0.64	0.1	0.035	10.48
11/4/2023	15:08:15	0.043	0.092	0.59	0.09	0.038	10.42
11/4/2023	15:09:15	0.043	0.09	0.58	0.07	0.041	10.52
11/4/2023	15:10:15	0.043	0.086	0.59	0.03	0.038	10.76
11/4/2023	15:11:14	0.043	0.086	0.59	0.01	0.034	10.62
11/4/2023	15:12:14	0.044	0.083	0.59	-0.05	0.034	9.71
11/4/2023	15:13:14	8.227	0.073	0.6	0.02	0.034	10.58
11/4/2023	15:14:14	3.83	7.146	0.61	0.18	0.037	9.17
11/4/2023	15:15:15	0.068	0.345	21.82	0.4	0.038	8.78
11/4/2023	15:16:14	0.05	0.037	92.31	0.59	0.037	8.23
11/4/2023	15:17:14	0.053	0.028	91.64	36.16	0.036	9.42
11/4/2023	15:18:15	0.046	0.015	7.12	139.19	0.037	10.86
11/4/2023	15:19:15	0.049	0.023	1.04	129.58	0.04	12.7
11/4/2023	15:20:15	0.045	0.005	1.11	17.9	0.039	12.89
11/4/2023	15:21:15	0.046	0.001	1.54	0.3	0.036	13.25
11/4/2023	15:22:14	0.045	0	2.68	0.16	6.805	13.8
11/4/2023	15:23:14	0.045	0	3.5	0.09	16.688	13.56
11/4/2023	15:24:14	0.046	-0.001	3.6	0.06	19.782	12.56
11/4/2023	15:25:15	0.046	-0.001	3.13	0.06	20.884	12.2
11/4/2023	15:26:15	0.046	-0.001	2.57	0.03	22.753	11.43
11/4/2023	15:27:14	0.046	-0.002	2.07	0.05	27.054	10.75
11/4/2023	15:28:15	0.047	-0.004	1.71	0.02	21.824	10.69
11/4/2023	15:29:14	0.047	-0.003	1.35	-0.06	12.452	9.7
11/4/2023	15:30:15	0.05	-0.003	1.08	-0.16	1.718	48.54
11/4/2023	15:31:15	0.049	-0.004	0.9	0.22	0.043	109.87
11/4/2023	15:32:14	0.048	-0.005	0.78	0.3	0.04	122.43

Final System Bias Check for Run 3

Operator: Wayne Johnson
 Plant Name: Reck Brothers HMA
 Location: Drum Dryer Stack

Reference Cylinder Numbers

	Zero	Span
O2	EB0019116	CC101523
CO2	EB0019116	CC329527
NOx	EB0019116	CC162032
CO	EB0019116	SA5009
SO2	EB0019116	CC702450
THC	EB0019116	ALM001705

Date/Time	11/4/2023	15:32:26	PASSED			
Analyte	O2	CO2	NOx	CO	SO2	THC
Units	%	%	ppm	ppm	ppm	ppm
Zero Ref Cyl	0	0	0	0	0	0
Zero Cal	-0.012	0.013	0.3	-0.06	0.035	0.14
Zero Avg	0.045	0.082	0.6	-0.05	0.035	9.46
Zero Bias%	0.2	0.3	0.1	0	0	4.7
Zero Drift%	0	0	0	-0.1	0	0.9
Span Ref Cyl	12.5	10	100	150	25	120
Span Cal	12.473	10.213	99.27	155.12	24.732	122.08
Span Avg	12.324	10.332	95.78	146.62	24.741	128.38
Span Bias%	0.6	0.6	1.7	2.8	0	3.1
Span Drift%	0	-0.7	1.4	-1.8	-1.1	-1.2
Ini Zero Avg	0.043	0.09	0.7	0.28	0.039	7.68
Ini Span Avg	12.329	10.468	93.02	152.15	25.309	130.71
Run Avg	11.019	6.947	58.96	77.63	0.033	74.45
Co	0.044	0.086	0.65	0.11	0.037	8.57
Cm	12.327	10.4	94.4	149.39	25.025	129.54
Correct Avg	11.17	6.652	62.19	77.9	-0.004	65.35

Year	1980	1981	1982	1983	1984	1985	1986	1987
1980	1000	1000	1000	1000	1000	1000	1000	1000
1981	1000	1000	1000	1000	1000	1000	1000	1000
1982	1000	1000	1000	1000	1000	1000	1000	1000
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1984	1000	1000	1000	1000	1000	1000	1000	1000
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1986	1000	1000	1000	1000	1000	1000	1000	1000
1987	1000	1000	1000	1000	1000	1000	1000	1000
1988	1000	1000	1000	1000	1000	1000	1000	1000
1989	1000	1000	1000	1000	1000	1000	1000	1000
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1991	1000	1000	1000	1000	1000	1000	1000	1000
1992	1000	1000	1000	1000	1000	1000	1000	1000
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2014	1000	1000	1000	1000	1000	1000	1000	1000
2015	1000	1000	1000	1000	1000	1000	1000	1000
2016	1000	1000	1000	1000	1000	1000	1000	1000
2017	1000	1000	1000	1000	1000	1000	1000	1000
2018	1000	1000	1000	1000	1000	1000	1000	1000
2019	1000	1000	1000	1000	1000	1000	1000	1000
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2028	1000	1000	1000	1000	1000	1000	1000	1000
2029	1000	1000	1000	1000	1000	1000	1000	1000
2030	1000	1000	1000	1000	1000	1000	1000	1000

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 86. 2108-2109
 87. 2109-2110
 88. 2110-2111
 89. 2111-2112
 90. 2112-2113
 91. 2113-2114
 92. 2114-2115
 93. 2115-2116
 94. 2116-2117
 95. 2117-2118
 96. 2118-2119
 97. 2119-2120
 98. 2120-2121
 99. 2121-2122
 100. 2122-2123

Plant	Reck Brothers		Test Type	M 5/202	Impinger Volumes/Weights			Post-Test Calibration	
Test Location	Scrubber Exhaust Stack		Barometric Pressure	24.05	Contents	Final Wt	Initial Wt.	Net Wt.	Yqa
Date	11/4/2023		Static in. Wg	-0.10	KO	518.6	363.6	155.0	1.011
Run Number	1		Probe Type/Length	GLASS / 4 ft	DRY	618.6	613.8	4.8	-1.2%
Stack Diameter	24.00	* 27.00	Pitot Coefficient	0.84	FILTER	546.0	545.9	0.1	Pass
Operator	KV		Meter Box No./y	No.: 1 / 0.9987	DI	700.3	697.1	3.2	
Filter No.	82-765		Nozzle No./Size	No.: 9-3 / 0.3010					
Initial Leak Rate	0.010	(cfm)	15	(in. Hg)	Initial Pitot	√	OK		
Final Leak Rate	0.001	(cfm)	10	(in. Hg)	Final Pitot	√	OK		
					Silica Gel	925.2	910.0	15.2	
					Box No.:	2	Total:	178.3	

Point	Time	ΔP, in. Wg	ΔH, in. Wg	DGM, volume, ft ³	Temperature, °F							Pump in. Hg	√ΔP	Point Isokinetic %	Cumulative Isokinetic %	Comments		
					Front Filter	Stack	Probe	Oven	Back Filter	Exit	Tm							
A	Start time	9:48	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	1	0.0	0.630	3.95	542.565	-	126	251	248	69	60	62	4.0	0.7937	99.89	99.89	5867	
	2	2.4	0.760	4.79	545.320	-	126	250	248	71	46	65	5.0	0.8718	99.90	99.90	STACK-1	
	3	4.8	0.720	4.49	548.356	-	133	250	256	67	44	66	5.0	0.8485	101.57	100.46	ACE	
	4	7.2	0.660	4.01	551.351	-	148	250	257	68	43	66	6.0	0.8124	98.46	99.96	5868	
	5	9.6	0.610	3.69	554.100	-	153	252	251	69	45	67	6.0	0.7810	97.43	99.45	STACK-1	
	-	12.0	-	-	556.712	-	-	-	-	-	-	-	-	-	-	-	MF	
B	Start time	10:02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1	0.0	0.260	1.57	556.712	-	154	251	260	71	48	69	3.0	0.5099	95.14	98.73	5869	
	2	2.4	0.220	1.33	558.393	-	155	251	254	72	48	69	2.0	0.4690	99.01	98.77	STACK-1	
	3	4.8	0.150	0.91	560.002	-	154	252	251	75	47	68	2.0	0.3873	94.77	98.27	SHW	
	4	7.2	0.140	0.85	561.274	-	155	252	252	73	49	69	2.0	0.3742	98.28	98.27		
	5	9.6	0.130	0.79	562.550	-	157	252	253	71	50	70	1.0	0.3606	96.27	98.07		
	-	12.0	-	-	563.755	-	-	-	-	-	-	-	-	-	-	-		
C	Start time	10:16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1	0.0	0.220	1.33	563.755	-	154	252	254	70	51	69	1.0	0.4690	89.89	97.33		
	2	2.4	0.180	1.09	565.217	-	156	252	255	71	47	70	2.0	0.4243	96.22	97.24		
	3	4.8	0.170	1.03	566.634	-	160	250	251	69	49	74	2.0	0.4123	95.23	97.08		
	4	7.2	0.150	0.91	568.003	-	160	251	250	70	48	76	2.0	0.3873	89.32	96.53		
	5	9.6	0.140	0.85	569.214	-	161	249	251	72	50	76	3.0	0.3742	91.74	96.21		
	-	12.0	-	-	570.415	-	-	-	-	-	-	-	-	-	-	-		
D	Start time	10:30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1	0.0	0.250	1.52	570.415	-	161	247	249	73	55	78	3.0	0.5000	97.36	96.28		
	2	2.4	0.210	1.29	572.121	-	161	246	250	74	53	81	3.0	0.4583	94.98	96.21		
	3	4.8	0.180	1.09	573.656	-	162	251	252	73	55	77	3.0	0.4243	97.79	96.29		
	4	7.2	0.200	1.22	575.108	-	157	252	251	72	52	74	3.0	0.4472	94.94	96.22		
	5	9.6	0.170	1.04	576.591	-	157	254	253	74	55	76	2.0	0.4123	93.34	96.08		
	-	12.0	-	-	577.941	-	-	-	-	-	-	-	-	-	-	-		
E	Start time	10:46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1	0.0	0.520	3.17	577.941	-	162	255	257	75	52	80	5.0	0.7211	91.04	95.84		
	2	2.4	0.720	4.41	580.237	-	161	248	256	75	53	81	6.0	0.8485	89.64	95.56		
	3	4.8	0.710	4.36	582.894	-	160	249	255	74	53	82	6.0	0.8426	94.21	95.50		
	4	7.2	0.620	3.83	585.675	-	158	251	254	75	54	83	5.0	0.7874	93.10	95.40		
	5	9.6	0.530	3.27	588.256	-	157	252	253	76	56	82	4.0	0.7280	94.27	95.35		
	-	12.0	-	-	590.674	-	-	-	-	-	-	-	-	-	-	-		
	-	60	-	1.89	48.109	-	153.92	-	-	-	-	73.20	-	0.5778	-	-		

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FIELD TEST DATA SHEET

Plant Reck Brothers

Test Type MS/202

(Page 1 of 3)

Date <u>11-4-23</u>	Barometric Pressure <u>24.05</u>	Impinger Volumes/Weights			
Test Location <u>Scrubber Exhaust Stack</u>	Static in. wg. <u>-0.10</u>	Contents	Final Wt	Initial Wt.	Net Wt.
Run Number <u>1</u>	Probe Type/Length <u>Glass / 4ft</u>	<u>KO</u>	<u>518.6</u>	<u>363.6</u>	<u>155.0</u>
Stack Diameter <u>24 x 27 in.</u>	Pitot Coefficient <u>0.84</u>	<u>Dry</u>	<u>618.6</u>	<u>613.8</u>	<u>4.8</u>
Operator <u>KV</u>	Meter Box No./y <u>1 / 0.9987</u>	<u>Filter</u>	<u>546.0</u>	<u>545.9</u>	<u>0.1</u>
Filter No. <u>82-765</u>	Nozzle No./Size <u>0.3010</u>	<u>DI</u>	<u>700.3</u>	<u>697.1</u>	<u>3.2</u>
Initial Leak Rate <u>0.01</u> (cfm) <u>15</u> (in. Hg)	Initial Pitot <input checked="" type="checkbox"/>	Silica Gel	<u>925.2</u>	<u>910.0</u>	<u>15.2</u>
Final Leak Rate <u>0.001</u> (cfm) <u>10</u> (in. Hg)	Final Pitot <input checked="" type="checkbox"/>	Total	<u>178.3</u>		

Point	Time	ΔP in. Wg	ΔH in. Wg	DGM Volume Ft ³	Temperature °F						Pump In. Hg	√ΔP	Comments	
					Stack	Probe	Oven	Back Filter	Imp	DGM				
A	Start	9:48	-	-	-	-	-	-	-	-	-	-	-	
	1	0.0	0.63	3.95	542.565	126	251	248	69	60	62	4	0.7937	
	2	2.4	0.76	4.79	545.320	126	250	248	71	46	65	5	0.8718	
	3	4.8	0.72	4.49	548.356	133	250	256	67	44	66	5	0.8485	
	4	7.2	0.66	4.01	551.351	148	250	257	68	43	66	6	0.8124	
	5	9.6	0.61	3.69	554.100	153	252	251	69	45	67	6	0.7810	
	-	12.0	-	-	556.712	-	-	-	-	-	-	-	-	
B	Start	10:02	-	-	-	-	-	-	-	-	-	-	-	
	1	0.0	0.26	1.57	556.712	154	260	260	71	48	69	3	0.5099	
	2	2.4	0.22	1.33	558.393	155	254	254	72	48	69	2	0.4690	
	3	4.8	0.15	0.91	560.002	154	251	251	75	47	68	2	0.3873	
	4	7.2	0.14	0.85	561.274	155	252	252	73	49	69	2	0.3742	
	5	9.6	0.13	0.79	562.550	157	253	253	71	50	70	1	0.3606	
	-	12.0	-	-	570.415	-	-	-	-	-	-	-	-	

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FIELD TEST DATA SHEET

Plant Reck Brothers

Test Location Scrubber Exhaust Stack

Date 11-4-23 Test Type MS/202

Run No. 1 Operator KV

Point	Time	ΔP in. Wg	ΔH in. Wg	DGM Volume Ft ³	Temperature °F						Pump In. Hg	√ΔP	Comments
					Stack	Probe	Oven	Back Filter	Imp	DGM			
(Start	1016	-	-	-	-	-	-	-	-	-	-	-	
1	0.6	0.22	0.22	563.755	154	252	254	70	51	69	1	0.4690	
2	2.4	0.18	0.18	565.217	156	252	255	71	47	70	2	0.4243	
3	4.8	0.17	0.17	566.634	160	250	251	69	49	74	2	0.4123	
4	7.2	0.15	0.15	568.003	160	251	250	70	48	76	2	0.3873	
5	9.6	0.14	0.14	569.214	161	249	251	72	50	76	3	0.3742	
-	12.0	-	-	570.415	-	-	-	-	-	-	-	-	
D Start	1030	-	-	-	-	-	-	-	-	-	-	-	
1	0.6	0.25	1.52	570.415	161	247	249	73	55	78	3	0.506	
2	2.4	0.21	1.29	572.121	161	246	250	74	53	81	3	0.4583	
3	4.8	0.18	1.09	573.656	162	251	252	73	55	77	3	0.4243	
4	7.2	0.20	1.22	575.108	157	252	251	72	52	74	3	0.4472	
5	9.6	0.17	1.04	576.591	157	254	253	74	55	76	2	0.4123	
-	12.0	-	-	577.941	-	-	-	-	-	-	-	-	

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WATER QUALITY MONITORING REPORT

DATE	TIME	DEPTH	TEMP	PH	D.O.	TURB	COND	CHLOR	CO ₂	AMMONIA	NITRATES	PHOSPHATE	SILICA	IRON	COPPER	ZINC	LEAD	CADMIUM	CHROMIUM	MANGANESE	BARIUM	STRONTIUM	FLUORIDE	CLORIDE	SULFATE	TOTAL SOLIDS
10/15/88	08:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	09:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	10:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	11:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	12:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	13:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	14:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	15:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	16:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	17:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	18:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	19:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	20:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	21:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	22:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10/15/88	23:00	1.0m	12.5	7.2	1.5	15	150	0.5	0.5	0.5	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

FIELD TEST DATA SHEET

Plant Reck Buthers

Test Location Scrubber Exhaust Stack

Date 11-4-23 Test Type INS/202

Run No. 1 Operator KV

E

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Point	Time	ΔP in. Wg	ΔH in. Wg	DGM Volume Ft ³	Temperature °F						Pump In. Hg	√ΔP	Comments
					Stack	Probe	Oven	Back Filter	Imp	DGM			
start	1046	-	-	-	-	-	-	-	-	-	-	-	
1	0.0	0.52	3.17	577.941	162	255	257	75	52	80	5	0.7211	
2	2.4	0.72	4.41	580.237	161	248	256	75	53	81	6	0.8485	
3	4.8	0.71	4.36	582.894	166	249	255	74	53	82	6	0.8426	
4	7.2	0.62	3.83	585.675	158	251	254	75	54	83	5	0.7874	
5	9.6	0.53	3.27	588.256	157	252	253	76	56	82	4	0.7280	
-	12.0	-	-	590.674	-	-	-	-	-	-	-	-	
-	60	-	1.89	48.109	153.92	-	-	-	-	73.20	-	0.5778	

Plant	Reck Brothers	Test Type	M 5/202	Impinger Volumes/Weights				Post-Test Calibration	
Test Location	Scrubber Exhaust Stack	Barometric Pressure	24.05	Contents	Final Wt	Initial Wt.	Net Wt.	Yqa	
Date	11/4/2023	Static in. Wg	-0.10	KO	580.5	366.5	214.0	0.997	
Run Number	2	Probe Type/Length	GLASS / 4 ft	DRY	618.0	615.4	2.6	0.2%	
Stack Diameter	24.00 * 27.00	Pitot Coefficient	0.84	FILTER	564.3	562.5	1.8	Pass	
Operator	KV	Meter Box No./y	No.: 1 / 0.9987	DI	694.9	697.9	-3.0		
Filter No.	82-765	Nozzle No./Size	No.: 9-3 / 0.3010						
Initial Leak Rate	0.003 (cfm)	15 (in. Hg)	Initial Pitot ✓	OK					
Final Leak Rate	0.080 (cfm)	10 (in. Hg)	Final Pitot ✓	OK	Silica Gel	930.4	914.9	15.5	
					Box No.:	5	Total:	230.9	

Point	Time	ΔP, in. Wg	ΔH, in. Wg	DGM, volume, ft ³	Temperature, °F							Pump in. Hg	ΔVP	Point Isokinetic %	Cumulative Isokinetic %	Comments	
					Front Filter	Stack	Probe	Oven	Back Filter	Exit	Tm						
A	Start time	11:52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1	0.0	0.410	2.62	593.878	-	129	251	252	66	56	75	7.0	0.6403	102.12	102.12	5870 STACK-2 ACU
	2	2.4	0.500	3.19	596.210	-	130	252	253	67	50	76	8.0	0.7071	102.02	102.07	
	3	4.8	0.440	2.81	598.781	-	132	253	254	68	52	77	6.0	0.6633	102.90	102.35	
	4	7.2	0.390	2.44	601.217	-	144	254	255	68	53	78	5.0	0.6245	98.65	101.42	
	5	9.6	0.350	2.21	603.400	-	145	255	249	67	57	83	5.0	0.5916	103.09	101.75	5871 STACK-2 MYF
	-	12.0	-	-	605.581	-	-	-	-	-	-	-	-	-	-	-	
B	Start time	12:06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1	0.0	0.570	3.57	605.581	-	150	251	251	69	61	83	8.0	0.7550	101.99	101.79	
	2	2.4	0.480	2.99	608.312	-	150	249	252	70	57	81	7.0	0.6928	100.92	101.67	
	3	4.8	0.340	2.12	610.787	-	153	248	253	71	59	84	8.0	0.5831	101.26	101.62	5872 STACK-2 BAW
	4	7.2	0.270	1.69	612.889	-	153	247	251	72	59	86	4.0	0.5196	101.82	101.64	
	5	9.6	0.240	1.51	614.782	-	153	245	254	71	60	87	4.0	0.4899	101.36	101.61	
	-	12.0	-	-	616.563	-	-	-	-	-	-	-	-	-	-	-	
C	Start time	12:20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1	0.0	0.610	3.82	616.563	-	152	243	255	72	61	85	9.0	0.7810	100.84	101.54	
	2	2.4	0.450	2.81	619.360	-	154	242	256	73	60	86	7.0	0.6708	98.87	101.32	
	3	4.8	0.300	1.88	621.723	-	154	253	254	74	54	87	4.0	0.5477	100.84	101.28	
	4	7.2	0.260	1.62	623.700	-	155	257	252	73	54	86	4.0	0.5099	101.66	101.31	
	5	9.6	0.240	1.50	625.552	-	151	254	251	73	52	85	-	0.4899	101.23	101.30	
	-	12.0	-	-	627.327	-	-	-	-	-	-	-	-	-	-	-	
D	Start time	12:34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1	0.0	0.650	4.04	627.327	-	157	253	253	72	53	86	10.0	0.8062	102.25	101.36	
	2	2.4	0.460	2.86	630.246	-	159	252	252	71	52	87	7.0	0.6782	101.79	101.39	
	3	4.8	0.380	2.36	632.700	-	158	251	251	71	54	87	6.0	0.6164	101.63	101.40	
	4	7.2	0.350	2.18	634.932	-	157	247	253	72	54	86	6.0	0.5916	101.72	101.42	
	5	9.6	0.290	1.82	637.075	-	156	249	252	70	56	89	6.0	0.5385	99.44	101.32	
	-	12.0	-	-	638.996	-	-	-	-	-	-	-	-	-	-	-	
E	Start time	12:49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1	0.0	0.590	3.67	638.996	-	160	248	255	71	61	89	10.0	0.7681	100.21	101.27	
	2	2.4	0.510	3.17	641.733	-	160	249	251	73	57	89	8.0	0.7141	102.75	101.33	
	3	4.8	0.360	2.24	644.346	-	161	247	248	72	57	89	5.0	0.6000	102.57	101.39	
	4	7.2	0.330	2.05	646.542	-	160	250	249	74	56	88	5.0	0.5745	99.95	101.33	
	5	9.6	0.300	1.86	648.590	-	159	251	250	75	57	86	5.0	0.5477	102.40	101.37	
	-	12.0	-	-	650.586	-	-	-	-	-	-	-	-	-	-	-	
	-	60	-	2.50	56.708	-	151.68	-	-	-	-	84.60	-	0.6281	-	-	

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FIELD TEST DATA SHEET

Plant Rect Broth

Test Type MS/202

(Page 1 of 3)

Date <u>11-4-23</u>	Barometric Pressure <u>24.05</u>	Impinger Volumes/Weights			
Test Location <u>Scrubber Exhaust Stack</u>	Static in. wg. <u>-0.16</u>	Contents	Final Wt	Initial Wt.	Net Wt.
Run Number <u>2</u>	Probe Type/Length <u>glass / 4 ft</u>	KO	580.5	366.5	214.0
Stack Diameter <u>24 +27 in.</u>	Pitot Coefficient <u>0.84</u>	Dry	618.6	615.4	2.6
Operator <u>KV</u>	Meter Box No./V <u>1 / 0.9987</u>	Filter	564.3	562.5	1.8
Filter No. <u>82-765</u>	Nozzle No./Size <u>9-3 / 0.3016</u>	DI	594.9	697.9	-3.0
		Silica Gel	970.4	914.5	155
		Total			230.9

Initial Leak Rate <u>0.003</u> (cfm)	<u>5</u> (in. Hg)	Initial Pitot <input checked="" type="checkbox"/>
Final Leak Rate <u>0.080</u> (cfm)	<u>10</u> (in. Hg)	Final Pitot <input checked="" type="checkbox"/>

Point	Time	ΔP in. Wg	ΔH in. Wg	DGM Volume Ft ³	Temperature °F						Pump In. Hg	√ΔP	Comments	
					Stack	Probe	Oven	Back Filter	Imp	DGM				
A Start	11:52	-	-	-	-	-	-	-	-	-	-	-	-	
1	0.0	0.41	2.62	593.878	129	251	252	66	56	75	7	0.6403		
2	2.4	0.50	3.19	596.216	130	252	257	67	56	76	8	0.7071		
3	4.8	0.44	2.81	598.781	132	257	254	68	52	77	6	0.6637		
4	7.2	0.39	2.44	601.217	144	254	255	68	53	78	5	0.6245		
5	9.6	0.35	2.21	603.400	145	255	249	67	57	83	5	0.5916		
-	12.0	-	-	605.581	-	-	-	-	-	-	-	-	-	
B Start	12:06	-	-	-	-	-	-	-	-	-	-	-	-	
1	0.6	0.57	3.57	605.581	150	251	251	69	61	83	8	0.7550		
2	2.4	0.48	2.99	608.312	150	249	252	70	57	81	7	0.6928		
3	4.8	0.34	2.12	610.787	153	248	257	71	59	84	8	0.5831		
4	7.2	0.27	1.69	612.889	153	247	251	72	59	86	4	0.5196		
5	9.6	0.24	1.51	614.782	153	245	254	71	60	87	4	0.4899		
-	12.0	-	-	616.563	-	-	-	-	-	-	-	-	-	

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A

B

FIELD TEST DATA SHEET

Plant Reck Brothers

Test Location Sunbhar Exhaust Stack

Date 11-4-23 Test Type MS/202

Run No. 2 Operator KV

Point	Time	ΔP in. Wg	ΔH in. Wg	DGM Volume Ft ³	Temperature °F						Pump In. Hg	√ΔP	Comments
					Stack	Probe	Oven	Back Filter	Imp	DGM			
C Start	1220	-	-	-	-	-	-	-	-	-	-	-	
1	0.6	0.61	3.82	626.563	152	248	255	72	61	85	9	0.7810	
2	2.4	0.48	2.81	619.360	154	242	256	77	60	86	7	0.6708	
3	4.8	0.36	1.88	621.723	154	253	254	74	54	87	4	0.5477	
4	7.2	0.26	1.62	623.706	158	257	252	73	54	86	4	0.5099	
5	9.6	0.24	1.50	625.252	151	254	251	73	52	85	4	0.4899	
-	12.0	-	-	627.327	157	-	-	-	-	-	-	-	
D Start	1234	-	-	-	-	-	-	-	-	-	-	-	
1	0.6	0.65	4.04	627.327	157	253	253	72	57	86	10	0.8062	
2	2.4	0.46	2.86	630.241	159	252	252	71	52	87	7	0.6782	
3	4.8	0.38	2.36	632.766	158	251	251	71	54	87	6	0.6164	
4	7.2	0.35	2.18	634.932	158	247	253	72	54	86	6	0.5916	
5	9.6	0.29	1.82	637.075	156	249	252	70	56	89	6	0.5385	
-	12.0	-	-	638.996	-	-	-	-	-	-	-	-	

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FIELD TEST DATA SHEET

Plant Rect Brothers

Test Location Scrubber Exhaust Stack

Date 11-4-23 Test Type MS/202

Run No. 2 Operator KV

Point	Time	ΔP in. Wg	ΔH in. Wg	DGM Volume Ft ³	Temperature °F						Pump In. Hg	√ΔP	Comments
					Stack	Probe	Oven	Back Filter	Imp	DGM			
Start	1249	-	-	-	-	-	-	-	-	-	-	-	
1	0.6	0.59	3.67	638.996	166	248	255	71	61	89	10	0.7681	
2	2.4	0.57	3.17	641.737	166	249	251	73	57	89	8	0.7141	
3	4.8	0.36	2.24	644.346	161	247	248	72	57	89	5	0.6000	
4	7.2	0.33	2.05	646.542	166	250	249	74	56	88	5	0.5745	
5	9.6	0.30	1.86	648.506	159	251	250	75	57	86	5	0.5477	
-	12.0	-	-	650.586	-	-	-	-	-	-	-	-	
-	60	-	250	56.708	151.68	-	-	-	-	8466	-	0.6281	

E

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FIELD TEST DATA SHEET

Plant Rect Brothery

Test Type MS/202

(Page 1 of 2)

Date <u>11-4-23</u>	Barometric Pressure <u>29.15</u>	Impinger Volumes/Weights			
Test Location <u>Scrubber Exhaust Stack</u>	Static in. wg. <u>-0.10</u>	Contents	Final Wt	Initial Wt.	Net Wt.
Run Number <u>3</u>	Probe Type/Length <u>Glass 14ft</u>	KO	670.6	358.4	312.2
Stack Diameter <u>24 + 27 in.</u>	Pitot Coefficient <u>0.84</u>	Dry	608.2	600.9	7.3
Operator <u>KV</u>	Meter Box No./y <u>1 / 0.9987</u>	Filbr	563.3	563.1	0.2
Filter No. <u>82-770</u>	Nozzle No./Size <u>9-3 / 0.3010</u>	DJ	707.8	700.9	6.9
		Silica Gel	945.0	925.9	19.1
		Total			345.7

Initial Leak Rate <u>0.016</u> (cfm)	<u>15</u> (in. Hg)	Initial Pitot <input checked="" type="checkbox"/>
Final Leak Rate <u>0.005</u> (cfm)	<u>10</u> (in. Hg)	Final Pitot <input checked="" type="checkbox"/>

Point	Time	ΔP in. Wg	ΔH in. Wg	DGM Volume Ft ³	Temperature °F						Pump In. Hg	√ΔP	Comments
					Stack	Probe	Oven	Back Filter	Imp	DGM			
A start	1353	-	-	-	-	-	-	-	-	-	-	-	
1	0.0	0.66	4.15	652.247	141	251	251	68	61	77	10	0.8124	
2	2.4	0.68	4.26	655.134	142	257	250	68	55	77	10	0.8246	
3	4.8	0.58	3.63	658.114	144	255	256	69	57	77	9	0.7616	
4	7.2	0.46	2.87	660.788	145	249	249	70	53	77	7	0.6787	
5	9.6	0.44	2.75	663.226	146	248	249	70	51	78	7	0.6633	
-	12.0	-	-	665.827	-	-	-	-	-	-	-	-	
B start	1406	-	-	-	-	-	-	-	-	-	-	-	
1	0.0	0.58	3.59	665.527	149	252	253	71	58	76	9	0.7616	
2	2.4	0.61	3.77	668.176	151	253	252	71	57	77	10	0.7810	
3	4.8	0.51	3.16	670.453	154	257	251	72	57	76	8	0.7141	
4	7.2	0.41	2.48	673.456	163	252	250	73	59	76	6	0.6403	
5	9.6	0.37	2.24	675.779	162	253	253	72	60	76	5	0.6083	
-	12.0	-	-	677.901	-	-	-	-	-	-	-	-	

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FIELD TEST DATA SHEET

Plant Reet Butlers

Test Location Scrubber Exhaust Stack

Date 11-4-23 Test Type MS/202

Run No. 3 Operator KV

Point	Time	ΔP in. Wg	ΔH in. Wg	DGM Volume Ft ³	Temperature °F						Pump In. Hg	√ΔP	Comments
					Stack	Probe	Oven	Back Filter	Imp	DGM			
C start	1420	-	-	-	-	-	-	-	-	-	-	-	
1	0.0	0.53	3.22	677.016	166	248	249	71	59	76	8	0.7256	
2	2.4	0.48	2.92	679.523	161	247	249	71	58	77	8	0.6928	
3	4.8	0.38	2.31	682.011	161	248	250	71	57	77	5	0.6164	
4	7.2	0.33	2.07	684.247	159	247	252	74	57	78	5	0.5748	
5	9.6	0.36	1.83	686.302	159	249	251	73	57	78	5	0.5477	
-	12.0	-	-	688.305	-	-	-	-	-	-	-	-	
D start	1435	-	-	-	-	-	-	-	-	-	-	-	
1	0	0.63	3.86	688.305	158	251	253	71	57	78	11	0.7937	
2	2.4	0.61	3.73	691.086	161	252	255	71	55	80	11	0.7810	
3	4.8	0.49	3.06	693.883	161	253	254	76	53	80	9	0.7006	
4	7.2	0.29	1.77	696.435	162	257	283	76	54	81	6	0.5365	
5	9.6	0.24	1.47	698.381	164	250	251	69	54	83	5	0.4899	
-	12.0	-	-	700.196	-	-	-	-	-	-	-	-	

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STATION: 100-100-100-100

DATE	TIME	DEPTH	TEMP	SPEC	COND	PH	DO	TDS	TURB	CHL	CO ₂	O ₂	SAL	DENSITY	SOUND	WIND	WAVE	SEA	CLOUD	VISIB	MOON	STAR	REMARKS	
																								TEMP
10/10/00	10:00	100	10.0	100	100	10.0	10.0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10/10/00	10:05	100	10.0	100	100	10.0	10.0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10/10/00	10:10	100	10.0	100	100	10.0	10.0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10/10/00	10:15	100	10.0	100	100	10.0	10.0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10/10/00	10:20	100	10.0	100	100	10.0	10.0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10/10/00	10:25	100	10.0	100	100	10.0	10.0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10/10/00	10:30	100	10.0	100	100	10.0	10.0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10/10/00	10:35	100	10.0	100	100	10.0	10.0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10/10/00	10:40	100	10.0	100	100	10.0	10.0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10/10/00	10:45	100	10.0	100	100	10.0	10.0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10/10/00	10:50	100	10.0	100	100	10.0	10.0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10/10/00	10:55	100	10.0	100	100	10.0	10.0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10/10/00	11:00	100	10.0	100	100	10.0	10.0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

FIELD TEST DATA SHEET

Plant Rock Bottom

Test Location Scrubber Exhaust Stack

Date 11-4-23 Test Type MS/20

Run No. 3 Operator KV

E

Point	Time	ΔP in. Wg	ΔH in. Wg	DGM Volume Ft ³	Temperature °F						Pump In. Hg	√ΔP	Comments
					Stack	Probe	Oven	Back Filter	Imp	DGM			
Start	1451	-	-	-	-	-	-	-	-	-	-	-	
1	0.6	0.83	5.06	706.196	165	250	252	64	57	87	11	0.9110	
2	2.4	0.88	5.35	703.394	167	251	251	68	55	82	12	0.9381	
3	4.8	0.76	4.62	706.672	167	253	244	68	54	82	11	0.8718	
4	7.2	0.65	3.96	709.744	167	252	251	69	54	83	16	0.8062	
5	9.6	0.57	3.46	712.575	168	254	252	64	56	82	10	0.7556	
-	12.0	-	-	715.207	-	-	-	-	-	-	-	-	
-	60	-	2.95	62.960	152.68	-	-	-	-	78.64	-	0.7196	

A-29

Run 1 Calcs

Client: Reck Brothers
Source: 150 tph HMA Unit

Date: 4-Nov-23
Run No.: 1

Field Data

Standard Pressure, P(std)	29.92 in. Hg	Nozzle Diameter	0.3010 inch
Standard Temperature, T(std)	68 °F	Pitot Coefficient, Cp	0.84
Meter Temperature, Tm	73.20 °F	Stack I.D.or Equiv.	0.00 inches
Stack Temperature, Ts	153.92 °F	Duct Length	24.00 inches
√ΔP	0.5778	Duct Width	27.00 inches
Meter Orifice, ΔH	1.89 in. H ₂ O	Test Time	60.0 min.
Meter Volume, Vm	48.109 ft ³	Area of the nozzle, An	0.000494 ft ²
Meter Correction, Y	0.9987	Stack Gas O ₂	11.01 % O ₂
Barometric Pressure, Pbar	24.05 in. Hg	Stack Gas CO ₂	6.76 % CO ₂
Static Pressure, Pstatic	-0.10 in. H ₂ O	Stack Gas CO	0.01 % CO
Condensate, Vlc	178.3 grams	Stack Gas N ₂	82.22 % N ₂
Meter Orifice Calibration, dH@	1.9844	Stack Area, As	4.500 ft ²

Calculations

$Vm(std) = [T(std) + 460 / Pstd] \times Vm \times y \times (Pbar + (\Delta H / 13.6)) / (Tm + 460)$	38.465	dscf
$Vw(std) = (0.04715 \text{ ft}^3/\text{g}) / 528 \times [T(std) + 460] \times Vlc$	8.407	scf
$Bws \text{ (measured)} = Vw(std) / [Vm(std) + Vw(std)]$	0.1794	
$Bws \text{ (@ saturation)} = (1 / P(Stack)) \times 10^{(6.6911 - (3144/(Ts+390.86)))}$	0.3459	
$Mwd = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + [0.28 \times (\%N_2 + \%CO)]$	29.52	lb/lb-mole
$Mws = (Mwd \times (1-Bws)) + (18.0 \times Bws)$	27.46	lb/lb-mole
$P(Stack) = Pbar + [Pstatic / 13.6]$	24.04	in. Hg
$Vs = 85.49 \times Cp \times \sqrt{\Delta P} \times \sqrt{[(Ts + 460) / (Mws \times P(stack))]}$	40.02	ft/sec
$Qs = Vs \times As \times 60$	10,804	acfm
$Qs(std) = Qs \times (1-Bws) \times [(T(std) + 460) / (Ts + 460)] \times (P(stack) / Pstd)$	6,128	dscfm
$I = 100 \times Ts [0.002669 \times Vlc + (Vm \times Y / (Tm + 460)) (Pbar + \Delta H / 13.6)] /$ $(\text{Test time} \times vs \times Pstack \times An \times 60)$	95.26	%
$Yqa = \theta/Vm \times ((0.0319 \times (Tm + 460) \times 29)/(dH@ \times (Pbar + dH/13.6) \times Mwd))^{0.5} \times dH^{0.5}$	1.01158	

2000-2001
2001-2002

Year	Category	Value
2000-2001
2001-2002

Year	Category	Value
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2001-2002
2002-2003
2003-2004
2004-2005
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2006-2007
2007-2008
2008-2009
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2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
2017-2018
2018-2019
2019-2020
2020-2021
2021-2022

Run 2 Calcs

Client: Reck Brothers
Source: 150 tph HMA Unit

Date: 4-Nov-23
Run No.: 2

Field Data

Standard Pressure, P(std)	29.92 in. Hg	Nozzle Diameter	0.3010 inch
Standard Temperature, T(std)	68 °F	Pitot Coefficient, Cp	0.84
Meter Temperature, Tm	84.60 °F	Stack I.D.or Equiv.	0.00 inches
Stack Temperature, Ts	151.68 °F	Duct Length	24.00 inches
√ΔP	0.6281	Duct Width	27.00 inches
Meter Orifice, ΔH	2.50 in. H ₂ O	Test Time	60.0 min.
Meter Volume, Vm	56.708 ft ³	Area of the nozzle, An	0.000494 ft ²
Meter Correction, Y	0.9987	Stack Gas O ₂	11.99 % O ₂
Barometric Pressure, Pbar	24.05 in. Hg	Stack Gas CO ₂	6.05 % CO ₂
Static Pressure, Pstatic	-0.10 in. H ₂ O	Stack Gas CO	0.01 % CO
Condensate, Vlc	230.9 grams	Stack Gas N ₂	81.95 % N ₂
Meter Orifice Calibration, dH@	1.9844	Stack Area, As	4.500 ft ²

Calculations

$Vm(std) = [T(std) + 460 / Pstd] \times Vm \times y \times (Pbar + (\Delta H / 13.6)) / (Tm + 460)$	44.473	dscf
$Vw(std) = (0.04715 \text{ ft}^3/\text{g}) / 528 \times [T(std) + 460] \times Vlc$	10.887	scf
$Bws \text{ (measured)} = Vw(std) / [Vm(std) + Vw(std)]$	0.1967	
$Bws \text{ (@ saturation)} = (1 / P(\text{Stack})) \times 10^{(6.6911 - (3144/(Ts+390.86)))}$	0.3275	
$Mwd = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + [0.28 \times (\%N_2 + \%CO)]$	29.45	lb/lb-mole
$Mws = (Mwd \times (1-Bws)) + (18.0 \times Bws)$	27.20	lb/lb-mole
$P(\text{Stack}) = Pbar + [Pstatic / 13.6]$	24.04	in. Hg
$Vs = 85.49 \times Cp \times \sqrt{\Delta P} \times \sqrt{[(Ts + 460) / (Mws \times P(\text{stack}))]}$	43.62	ft/sec
$Qs = Vs \times As \times 60$	11,779	acfm
$Qs(std) = Qs \times (1-Bws) \times [(T(std) + 460) / (Ts + 460)] \times (P(\text{stack}) / Pstd)$	6,563	dscfm
$I = 100 \times Ts [0.002669 \times Vlc + (Vm \times Y / (Tm + 460)) (Pbar + \Delta H / 13.6)] /$ $(\text{Test time} \times vs \times Pstack \times An \times 60)$	102.82	%
$Yqa = \theta/Vm \times (((0.0319 \times (Tm + 460) \times 29)/(dH@ \times (Pbar + dH/13.6) \times Mwd))^{0.5} \times dH^{0.5}$	0.99827	

Run 3 Calcs

Client: Reck Brothers
Source: 150 tph HMA Unit

Date: 4-Nov-23
Run No.: 3

Field Data

Standard Pressure, P(std)	29.92 in. Hg	Nozzle Diameter	0.3010 inch
Standard Temperature, T(std)	68 °F	Pitot Coefficient, Cp	0.84
Meter Temperature, Tm	78.64 °F	Stack I.D.or Equiv.	0.00 inches
Stack Temperature, Ts	157.68 °F	Duct Length	24.00 inches
√ΔP	0.7196	Duct Width	27.00 inches
Meter Orifice, ΔH	2.95 in. H ₂ O	Test Time	60.0 min.
Meter Volume, Vm	62.960 ft ³	Area of the nozzle, An	0.000494 ft ²
Meter Correction, Y	0.9987	Stack Gas O ₂	11.17 % O ₂
Barometric Pressure, Pbar	24.05 in. Hg	Stack Gas CO ₂	6.65 % CO ₂
Static Pressure, Pstatic	-0.10 in. H ₂ O	Stack Gas CO	0.01 % CO
Condensate, Vlc	345.7 grams	Stack Gas N ₂	82.17 % N ₂
Meter Orifice Calibration, dH@	1.9844	Stack Area, As	4.500 ft ²

Calculations

$Vm(std) = [T(std) + 460 / Pstd] \times Vm \times y \times (Pbar + (\Delta H / 13.6)) / (Tm + 460)$	49.990	dscf
$Vw(std) = (0.04715 \text{ ft}^3/\text{g}) / 528 \times [T(std) + 460] \times Vlc$	16.300	scf
$Bws \text{ (measured)} = Vw(std) / [Vm(std) + Vw(std)]$	0.2459	
$Bws \text{ (@ saturation)} = (1 / P(\text{Stack})) \times 10^{(6.6911 - (3144/(Ts+390.86)))}$	0.3789	
$Mwd = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + [0.28 \times (\%N_2 + \%CO)]$	29.51	lb/lb-mole
$Mws = (Mwd \times (1-Bws)) + (18.0 \times Bws)$	26.68	lb/lb-mole
$P(\text{Stack}) = Pbar + [Pstatic / 13.6]$	24.04	in. Hg
$Vs = 85.49 \times Cp \times \sqrt{\Delta P} \times \sqrt{[(Ts + 460) / (Mws \times P(\text{stack}))]}$	50.71	ft/sec
$Qs = Vs \times As \times 60$	13,691	acfm
$Qs(std) = Qs \times (1-Bws) \times [(T(std) + 460) / (Ts + 460)] \times (P(\text{stack}) / Pstd)$	7,092	dscfm
$I = 100 \times Ts [0.002669 \times Vlc + (Vm \times Y / (Tm + 460)) (Pbar + \Delta H / 13.6)] /$ $(\text{Test time} \times vs \times Pstack \times An \times 60)$	106.95	%
$Yqa = \theta/Vm \times ((0.0319 \times (Tm + 460) \times 29)/(dH@ \times (Pbar + dH/13.6) \times Mwd))^{0.5} \times dH^{0.5}$	0.96887	

Item	Description	Quantity	Unit Price	Total Price
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Plant: Reck Brothers
 Test Location: 150 tph HMA Unit
 Test Type: M5/202
 Test Date: 4-Nov-23

Date: 20-Nov-23
 Analyst: WM
 Lab: 462

ACE	Small Tin #	Sample #	Final Wt. (gm)	Initial Wt. (gm)	Net Wt. (gm)	Blank Wt. (gm)		Vol	Blank Correction	Results (gm)	Results (mg)
1	119	5867	1.31036	1.24558	0.06478	0.00009	---	230	0.00014	0.06464	64.64
2	120	5870	1.26759	1.23420	0.03339	0.00009	---	240	0.00014	0.03325	33.25
3	121	5873	1.28557	1.23337	0.05220	0.00009	---	220	0.00013	0.05207	52.07
Blank	122	5877	1.23714	1.23705	0.00009			150			
Filter	Filter #	Sample #	Final Wt. (gm)	Initial Wt. (gm)	Net Wt. (gm)	Blank Wt. (gm)		Vol	Blank Correction	Results (gm)	Results (mg)
1	82-765	5868	0.77082	0.35886	0.41196	0.00009	---		0.00009	0.41187	411.87
2	82-766	5871	0.58230	0.36023	0.22207	0.00009	---		0.00009	0.22198	221.98
3	82-770	5874	0.69302	0.35674	0.33628	0.00009	---		0.00009	0.33619	336.19
Blank	82-749		0.35816	0.35807	0.00009						
Hexane	Large Tin #	Sample #	Final Wt. (gm)	Initial Wt. (gm)	Net Wt. (gm)	Blank Wt. (gm)		Vol	Blank Correction	Results (gm)	Results (mg)
1	621	5869	2.27782	2.27623	0.00159	0.00035	---	210	0.00037	0.00122	1.22
2	622	5872	2.28631	2.27805	0.00826	0.00035	---	230	0.00040	0.00786	7.86
3	623	5875	2.31338	2.28200	0.03138	0.00035	---	230	0.00040	0.03098	30.98
Blank	624	5879	2.27552	2.27517	0.00035			200			
DI	Dish #	Sample #	Final Wt. (gm)	Initial Wt. (gm)	Net Wt. (gm)	Blank Wt. (gm)	Total DI Vol.	Vol of DI Rinse	Blank Correction	Results (gm)	Results (mg)
1	96	5869	71.29217	71.29017	0.00200	-0.00017	400	240.2	-0.00041	0.00241	2.41
2	97	5872	70.64339	70.64153	0.00186	-0.00017	415	198.4	-0.00034	0.00220	2.20
3	98	5875	67.57539	67.57270	0.00269	-0.00017	515	195.5	-0.00033	0.00302	3.02
Blank	102	5879	70.36568	70.36585	-0.00017			100			

The field train recovery blank is well below the 2.0 mg requirement, therefore each component has been corrected according to it's result.
 Total DI rinse volume is the total DI sample volume minus the weight gain from the KO and Dry impingers.

Station	Date	Time	Depth	Parameter	Value	Unit	Notes
101	10/15/01	08:00	0.5	Temp	15.2	°C	
101	10/15/01	08:00	1.0	Temp	14.8	°C	
101	10/15/01	08:00	2.0	Temp	14.5	°C	
101	10/15/01	08:00	3.0	Temp	14.2	°C	
101	10/15/01	08:00	4.0	Temp	14.0	°C	
101	10/15/01	08:00	5.0	Temp	13.8	°C	
101	10/15/01	08:00	6.0	Temp	13.6	°C	
101	10/15/01	08:00	7.0	Temp	13.4	°C	
101	10/15/01	08:00	8.0	Temp	13.2	°C	
101	10/15/01	08:00	9.0	Temp	13.0	°C	
101	10/15/01	08:00	10.0	Temp	12.8	°C	
101	10/15/01	08:00	11.0	Temp	12.6	°C	
101	10/15/01	08:00	12.0	Temp	12.4	°C	
101	10/15/01	08:00	13.0	Temp	12.2	°C	
101	10/15/01	08:00	14.0	Temp	12.0	°C	
101	10/15/01	08:00	15.0	Temp	11.8	°C	
101	10/15/01	08:00	16.0	Temp	11.6	°C	
101	10/15/01	08:00	17.0	Temp	11.4	°C	
101	10/15/01	08:00	18.0	Temp	11.2	°C	
101	10/15/01	08:00	19.0	Temp	11.0	°C	
101	10/15/01	08:00	20.0	Temp	10.8	°C	
101	10/15/01	08:00	21.0	Temp	10.6	°C	
101	10/15/01	08:00	22.0	Temp	10.4	°C	
101	10/15/01	08:00	23.0	Temp	10.2	°C	
101	10/15/01	08:00	24.0	Temp	10.0	°C	
101	10/15/01	08:00	25.0	Temp	9.8	°C	
101	10/15/01	08:00	26.0	Temp	9.6	°C	
101	10/15/01	08:00	27.0	Temp	9.4	°C	
101	10/15/01	08:00	28.0	Temp	9.2	°C	
101	10/15/01	08:00	29.0	Temp	9.0	°C	
101	10/15/01	08:00	30.0	Temp	8.8	°C	
101	10/15/01	08:00	31.0	Temp	8.6	°C	
101	10/15/01	08:00	32.0	Temp	8.4	°C	
101	10/15/01	08:00	33.0	Temp	8.2	°C	
101	10/15/01	08:00	34.0	Temp	8.0	°C	
101	10/15/01	08:00	35.0	Temp	7.8	°C	
101	10/15/01	08:00	36.0	Temp	7.6	°C	
101	10/15/01	08:00	37.0	Temp	7.4	°C	
101	10/15/01	08:00	38.0	Temp	7.2	°C	
101	10/15/01	08:00	39.0	Temp	7.0	°C	
101	10/15/01	08:00	40.0	Temp	6.8	°C	
101	10/15/01	08:00	41.0	Temp	6.6	°C	
101	10/15/01	08:00	42.0	Temp	6.4	°C	
101	10/15/01	08:00	43.0	Temp	6.2	°C	
101	10/15/01	08:00	44.0	Temp	6.0	°C	
101	10/15/01	08:00	45.0	Temp	5.8	°C	
101	10/15/01	08:00	46.0	Temp	5.6	°C	
101	10/15/01	08:00	47.0	Temp	5.4	°C	
101	10/15/01	08:00	48.0	Temp	5.2	°C	
101	10/15/01	08:00	49.0	Temp	5.0	°C	
101	10/15/01	08:00	50.0	Temp	4.8	°C	
101	10/15/01	08:00	51.0	Temp	4.6	°C	
101	10/15/01	08:00	52.0	Temp	4.4	°C	
101	10/15/01	08:00	53.0	Temp	4.2	°C	
101	10/15/01	08:00	54.0	Temp	4.0	°C	
101	10/15/01	08:00	55.0	Temp	3.8	°C	
101	10/15/01	08:00	56.0	Temp	3.6	°C	
101	10/15/01	08:00	57.0	Temp	3.4	°C	
101	10/15/01	08:00	58.0	Temp	3.2	°C	
101	10/15/01	08:00	59.0	Temp	3.0	°C	
101	10/15/01	08:00	60.0	Temp	2.8	°C	
101	10/15/01	08:00	61.0	Temp	2.6	°C	
101	10/15/01	08:00	62.0	Temp	2.4	°C	
101	10/15/01	08:00	63.0	Temp	2.2	°C	
101	10/15/01	08:00	64.0	Temp	2.0	°C	
101	10/15/01	08:00	65.0	Temp	1.8	°C	
101	10/15/01	08:00	66.0	Temp	1.6	°C	
101	10/15/01	08:00	67.0	Temp	1.4	°C	
101	10/15/01	08:00	68.0	Temp	1.2	°C	
101	10/15/01	08:00	69.0	Temp	1.0	°C	
101	10/15/01	08:00	70.0	Temp	0.8	°C	
101	10/15/01	08:00	71.0	Temp	0.6	°C	
101	10/15/01	08:00	72.0	Temp	0.4	°C	
101	10/15/01	08:00	73.0	Temp	0.2	°C	
101	10/15/01	08:00	74.0	Temp	0.0	°C	
101	10/15/01	08:00	75.0	Temp	-0.2	°C	
101	10/15/01	08:00	76.0	Temp	-0.4	°C	
101	10/15/01	08:00	77.0	Temp	-0.6	°C	
101	10/15/01	08:00	78.0	Temp	-0.8	°C	
101	10/15/01	08:00	79.0	Temp	-1.0	°C	
101	10/15/01	08:00	80.0	Temp	-1.2	°C	
101	10/15/01	08:00	81.0	Temp	-1.4	°C	
101	10/15/01	08:00	82.0	Temp	-1.6	°C	
101	10/15/01	08:00	83.0	Temp	-1.8	°C	
101	10/15/01	08:00	84.0	Temp	-2.0	°C	
101	10/15/01	08:00	85.0	Temp	-2.2	°C	
101	10/15/01	08:00	86.0	Temp	-2.4	°C	
101	10/15/01	08:00	87.0	Temp	-2.6	°C	
101	10/15/01	08:00	88.0	Temp	-2.8	°C	
101	10/15/01	08:00	89.0	Temp	-3.0	°C	
101	10/15/01	08:00	90.0	Temp	-3.2	°C	
101	10/15/01	08:00	91.0	Temp	-3.4	°C	
101	10/15/01	08:00	92.0	Temp	-3.6	°C	
101	10/15/01	08:00	93.0	Temp	-3.8	°C	
101	10/15/01	08:00	94.0	Temp	-4.0	°C	
101	10/15/01	08:00	95.0	Temp	-4.2	°C	
101	10/15/01	08:00	96.0	Temp	-4.4	°C	
101	10/15/01	08:00	97.0	Temp	-4.6	°C	
101	10/15/01	08:00	98.0	Temp	-4.8	°C	
101	10/15/01	08:00	99.0	Temp	-5.0	°C	
101	10/15/01	08:00	100.0	Temp	-5.2	°C	

PARTICULATE EMISSIONS

Client: Reck Brothers
Source: 150 tph HMA Unit

Standard Temp. °F: 68

Run No.:	<u>1</u>	<u>2</u>	<u>3</u>	<u>Average</u>
Date:	4-Nov-23	4-Nov-23	4-Nov-23	
Vm (std), dscf	38.465	44.473	49.990	44.309
Vw (std), scf	8.407	10.887	16.300	11.865
Qs (std), dscfm	6,128	6,563	7,092	6,594
Bws	0.1794	0.1967	0.2459	0.2073
O ₂ (%)	11.01	11.99	11.17	11.39
CO ₂ (%)	6.76	6.05	6.65	6.49
Front Half Wash (mg.)	64.64	33.25	52.07	
Mass Filter (mg.)	411.87	221.98	336.19	
Back Half Wash (mg.)	3.63	10.06	34.00	
Filterable Particulate				
gr/scf	0.1569	0.0711	0.0904	0.1061
gr/dscf	0.1912	0.0886	0.1199	0.1332
gr/dscf @ 12% CO ₂	0.3394	0.1757	0.2163	0.2438
lb/hr	10.04	4.98	7.28	7.44
Condensable Particulate				
gr/scf	0.0012	0.0028	0.0079	0.0040
gr/dscf	0.0015	0.0035	0.0105	0.0051
gr/dscf @ 12% CO ₂	0.0026	0.0069	0.0189	0.0095
lb/hr	0.08	0.20	0.64	0.30
Total Particulate				
gr/scf	0.1581	0.0740	0.0983	0.1101
gr/dscf	0.1926	0.0921	0.1304	0.1383
gr/dscf @ 12% CO ₂	0.3420	0.1826	0.2352	0.2533
lb/hr	10.12	5.18	7.92	7.74

Calculations

$$\begin{aligned} \text{gr/dscf} &= 0.015432 \times ((\text{Mass}) / \text{Vmstd}) \\ \text{gr/scf} &= 0.015432 \times ((\text{Mass}) / (\text{Vm}_{\text{std}} + \text{Vw}_{\text{std}})) \\ \text{gr/dscf@ 12\% CO}_2 &= \text{gr/dscf} \times (12 / \% \text{CO}_2) \\ \text{lb/hr} &= 0.00857 \times \text{Qs(std)} \times \text{gr/dscf} \end{aligned}$$

TABLE 1.1 - 1998

Year	Number of...			...
	1	2	3	
1998	10000	20000	30000	...
1999	10000	20000	30000	...
2000	10000	20000	30000	...
2001	10000	20000	30000	...
2002	10000	20000	30000	...
2003	10000	20000	30000	...
2004	10000	20000	30000	...
2005	10000	20000	30000	...
2006	10000	20000	30000	...
2007	10000	20000	30000	...
2008	10000	20000	30000	...
2009	10000	20000	30000	...
2010	10000	20000	30000	...
2011	10000	20000	30000	...
2012	10000	20000	30000	...
2013	10000	20000	30000	...
2014	10000	20000	30000	...
2015	10000	20000	30000	...
2016	10000	20000	30000	...
2017	10000	20000	30000	...
2018	10000	20000	30000	...
2019	10000	20000	30000	...
2020	10000	20000	30000	...



LABORATORY ANALYSIS REPORT

Speciated Hydrocarbons Analysis in Tedlar Bag Samples

Report Date: November 30, 2023
Client: Broadbent
Project Location: Reck Brothers - Drum Mixer Stack
Project No.: 23-09-130
Date Received: November 7, 2023
Date Analyzed: November 8, 2023

Laboratory Temp: 77.5 °F
Barometric Pressure: 30.01 inHg

ANALYSIS DESCRIPTION

Hydrocarbon speciation analysis was performed by flame ionization detection/gas chromatography (FID/GC), modified EPA-18.

AtmAA Lab No.: Sample ID:	23113-1	23113-2	23113-3
	DM Stack-1	DM Stack-2	DM Stack-3
	5878	5879	5880
<u>Component</u>	<i>(Concentration in ppmv, component)</i>		
Methane	2.43	2.80	2.13
Ethene	1.31	3.96	1.25
Acetylene	0.54	0.82	0.53
Ethane	0.44	0.45	0.50
 Non-methane hydrocarbons analysis by carbon number grouping			
C3	1.11	3.37	0.97
C4	10.6	7.99	6.51
C5	3.43	2.75	2.89
C6	1.26	0.78	1.00
>C6	3.70	2.94	4.36
	<i>(Concentration in ppmvC)</i>		
TNMNE	105	94.3	89.2
TNMHC	105	95.2	90.2

TNMNE - total non-methane, non-ethane, hydrocarbons as ppmvC.
TNMHC - total non-methane hydrocarbons as ppmvC.
Actual analysis results are reported on a "wet" basis.

Brian W. Fung
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analyses)

Project Location: Reck Brothers - Drum Mixer Stack
Date Received: November 7, 2023
Date Analyzed: November 8, 2023

Component	Sample ID	Repeat Analysis		Mean Conc.	% RPD
		Run #1	Run #2		
<i>(Conc. in ppmv, component)</i>					
Methane	DM Stack-1	2.46	2.41	2.43	1.8
Ethene	DM Stack-1	1.30	1.32	1.31	1.4
Acetylene	DM Stack-1	0.56	0.53	0.54	5.4
Ethane	DM Stack-1	0.41	0.47	0.44	15
<u>non-methane hydrocarbons analysis by carbon number grouping</u>					
C3	DM Stack-1	1.10	1.13	1.11	2.4
C4	DM Stack-1	10.7	10.6	10.6	1.1
C5	DM Stack-1	3.41	3.46	3.43	1.6
C6	DM Stack-1	1.30	1.23	1.26	5.0
>C6	DM Stack-1	3.71	3.70	3.70	0.24
<i>(Concentration in ppmvC)</i>					
TNMHC	DM Stack-1	106	105	105	0.40

Three Tedlar bag samples, laboratory numbers 23113-(1-3), were analyzed for hydrocarbon speciation, EPA Method 18. Agreement between repeat analyses is a measure of precision and is shown above in the column "% RPD". The % RPD for 10 repeat measurement from three Tedlar bag samples is 3.4%.



STATE OF NEW YORK
 DEPARTMENT OF ENVIRONMENTAL CONSERVATION

WATER QUALITY CONTROL ACT
 SECTION 15(2)(b)
 WATER QUALITY CONTROL PLAN

Pollutant	Concentration (mg/l)	Load (kg/day)		Point Source	Non-Point Source
		1985	1990		
Biochemical Oxygen Demand (BOD ₅)	2.5	100	100	100	0
Chemical Oxygen Demand (COD)	100	4000	4000	4000	0
Total Suspended Solids (TSS)	100	4000	4000	4000	0
Total Phosphorus (TP)	0.1	40	40	40	0
Total Nitrogen (TN)	1.0	400	400	400	0
Ammonia Nitrogen (NH ₃ -N)	0.5	200	200	200	0
Orthophosphate (PO ₄ -P)	0.05	20	20	20	0
Calcium (Ca)	100	4000	4000	4000	0
Magnesium (Mg)	100	4000	4000	4000	0
Sulfate (SO ₄)	100	4000	4000	4000	0
Chloride (Cl)	100	4000	4000	4000	0
Total Hardness (Ca + Mg)	200	8000	8000	8000	0

The above table shows the estimated loads of various pollutants from the watershed for the years 1985 and 1990. The loads are expressed in kilograms per day (kg/day). The point source loads are shown in the fourth column, and the non-point source loads are shown in the fifth column. The total loads are shown in the third column.



SAMPLE LOG / CHAIN-OF-CUSTODY

Date 11-4-23 Plant Reek Brothers HMA

Test Location Drum Mixer Stack Test Type EPA MIE for Methane/Ethane/CO-CO₂

AtmAA #
23113-1
-2
-3

No.	Sample Type	Volume	Comments
1	5878 <small>EPA MIE Method</small> <small>Seal Bag Sample</small> <small>Stack-1 Test</small>	3l	Drum Mixer Stack DM Stack-1
2	5879 <small>EPA MIE Method</small> <small>Seal Bag Sample</small> <small>Stack-2 Test</small>	3l	DM Stack-2
3	5880 <small>EPA MIE Method</small> <small>Seal Bag Sample</small> <small>Stack-3 Test</small>	3l	DM Stack-3
4			
5			
6			
7			
8			
9			
10			
11			
12			

Received By	Date	Time	Relinquished By	Date	Time
<u>_____</u>	<u>_____</u>	<u>_____</u>	<u>W. J. _____</u>	<u>11-6-23</u>	<u>13:20</u>
<u>Fred E.</u>	<u>11-6-23</u>	<u>13:20</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>
<u>[Signature]</u>	<u>11-7-23</u>	<u>10:00</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>

THC/VOC CONVERSION

Client: Reck Brothers Std. Temperature: 68 °F
 Source: 150 tph HMA Unit O₂ Correction (%): 15

Run No.:	Method	Run 1	Run 2	Run 3
Date:		4-Nov-23	4-Nov-23	4-Nov-23
Test Data				
THC (ppm wet, as C ₃)	25A	67.26	64.95	65.35
Methane (ppm wet)	18	2.43	2.80	2.13
Ethane (ppm wet, as C ₂)	18	0.44	0.45	0.50
B _{ws}		0.2500	0.1967	0.2459
B _{lab}		0.0317	0.0317	0.0317
$T_{lab} = 77.50 \text{ }^{\circ}\text{F}$ $P_{lab} = 30.01 \text{ in. Hg}$				
>C₂ Determination				
THC (ppm dry, as C ₃)		89.68	80.85	86.66
THC (ppm dry, as C ₁)		269.04	242.55	259.97
Methane (ppm dry)		2.51	2.89	2.20
Ethane (ppm dry, as C ₂)		0.45	0.46	0.52
Ethane (ppm dry, as C ₁)		0.91	0.93	1.03
>C₂ HC (ppm)		265.62	238.73	256.74

THC (ppm dry, as C₃) = THC (ppm wet, as C₃) / (1-B_{ws})
 THC (ppm dry, as C₁) = THC (ppm dry, as C₃) * 3
 CH₄ (ppm dry, as C₁) = (ppm wet, as C₁) / (1-B_{lab})
 C₂H₆ (ppm dry, as C₂) = (ppm wet, as C₂) / (1-B_{lab})
 C₂H₆ (ppm dry, as C₁) = THC (ppm dry, as C₂) * 2

TABLE 1. SUMMARY

Location	1997		1998	
	Mean	SD	Mean	SD
1.00	1.00	0.00	1.00	0.00
1.01	1.00	0.00	1.00	0.00
1.02	1.00	0.00	1.00	0.00
1.03	1.00	0.00	1.00	0.00
1.04	1.00	0.00	1.00	0.00
1.05	1.00	0.00	1.00	0.00
1.06	1.00	0.00	1.00	0.00
1.07	1.00	0.00	1.00	0.00
1.08	1.00	0.00	1.00	0.00
1.09	1.00	0.00	1.00	0.00
1.10	1.00	0.00	1.00	0.00
1.11	1.00	0.00	1.00	0.00
1.12	1.00	0.00	1.00	0.00
1.13	1.00	0.00	1.00	0.00
1.14	1.00	0.00	1.00	0.00
1.15	1.00	0.00	1.00	0.00
1.16	1.00	0.00	1.00	0.00
1.17	1.00	0.00	1.00	0.00
1.18	1.00	0.00	1.00	0.00
1.19	1.00	0.00	1.00	0.00
1.20	1.00	0.00	1.00	0.00
1.21	1.00	0.00	1.00	0.00
1.22	1.00	0.00	1.00	0.00
1.23	1.00	0.00	1.00	0.00
1.24	1.00	0.00	1.00	0.00
1.25	1.00	0.00	1.00	0.00
1.26	1.00	0.00	1.00	0.00
1.27	1.00	0.00	1.00	0.00
1.28	1.00	0.00	1.00	0.00
1.29	1.00	0.00	1.00	0.00
1.30	1.00	0.00	1.00	0.00
1.31	1.00	0.00	1.00	0.00
1.32	1.00	0.00	1.00	0.00
1.33	1.00	0.00	1.00	0.00
1.34	1.00	0.00	1.00	0.00
1.35	1.00	0.00	1.00	0.00
1.36	1.00	0.00	1.00	0.00
1.37	1.00	0.00	1.00	0.00
1.38	1.00	0.00	1.00	0.00
1.39	1.00	0.00	1.00	0.00
1.40	1.00	0.00	1.00	0.00
1.41	1.00	0.00	1.00	0.00
1.42	1.00	0.00	1.00	0.00
1.43	1.00	0.00	1.00	0.00
1.44	1.00	0.00	1.00	0.00
1.45	1.00	0.00	1.00	0.00
1.46	1.00	0.00	1.00	0.00
1.47	1.00	0.00	1.00	0.00
1.48	1.00	0.00	1.00	0.00
1.49	1.00	0.00	1.00	0.00
1.50	1.00	0.00	1.00	0.00

1.00 = 1.00
 1.01 = 1.00
 1.02 = 1.00
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 1.04 = 1.00
 1.05 = 1.00
 1.06 = 1.00
 1.07 = 1.00
 1.08 = 1.00
 1.09 = 1.00
 1.10 = 1.00
 1.11 = 1.00
 1.12 = 1.00
 1.13 = 1.00
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 1.31 = 1.00
 1.32 = 1.00
 1.33 = 1.00
 1.34 = 1.00
 1.35 = 1.00
 1.36 = 1.00
 1.37 = 1.00
 1.38 = 1.00
 1.39 = 1.00
 1.40 = 1.00
 1.41 = 1.00
 1.42 = 1.00
 1.43 = 1.00
 1.44 = 1.00
 1.45 = 1.00
 1.46 = 1.00
 1.47 = 1.00
 1.48 = 1.00
 1.49 = 1.00
 1.50 = 1.00

Source Test Report
Reck Brothers, LLC
2023 Performance Testing
Initial Compliance on System 03
Test Date: November 4, 2023

APPENDIX B
CALIBRATIONS

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BUREAU OF WATER

WATER QUALITY
CONTROL ACT

Test Run 1 Begin. STRATA Version 3.2
 Operator: Wayne Johnson
 Plant Name: Reck Brothers HMA
 Location: Drum Dryer Stack

Ser. No.

Audit Cylinder 90.0 ppm NOx DT0009937
 Blended Cylinder 904 ppm NOx CC162032
 NO2 Cylinder 152.8 ppm NO2 CC506284
 EnviroNics Model 2020 4558

		NOx	
		ppm	
Start Averaging			
Average	5 samples	0.84	Zero
11/2/2023	18:42:46	0.89	
11/2/2023	18:43:47	0.83	
11/2/2023	18:44:46	185.9	
11/2/2023	18:45:47	299.58*	
11/2/2023	18:46:46	300.59*	
11/2/2023	18:47:46	259.97*	
11/2/2023	18:48:46	236.41	
11/2/2023	18:49:46	268.78	
11/2/2023	18:50:46	269.24	
Start Averaging			
Average	21 samples	270	Span
11/2/2023	18:51:47	269.91	
11/2/2023	18:52:46	256.15	
11/2/2023	18:53:47	182.43	
Start Averaging			
11/2/2023	18:54:47	178.47	
11/2/2023	18:55:47	129.17	
11/2/2023	18:56:47	3.33	
11/2/2023	18:57:46	1.81	
11/2/2023	18:58:47	44.78	
Average	240 samples	64.02	
Start Averaging			
Average	4 samples	88.22	
Start Averaging			
11/2/2023	18:59:46	88.21	
Average	53 samples	88.2	
11/2/2023	19:00:47	88.21	
11/2/2023	19:01:46	70.52	
11/2/2023	19:02:46	10.51	
11/2/2023	19:03:46	66.32	
Start Averaging			
Average	18 samples	91.66	
11/2/2023	19:04:47	91.8	
11/2/2023	19:05:46	196.31	
Start Averaging			
Average	23 samples	270.35	270 ppm - First Pass
11/2/2023	19:06:46	270.42	
11/2/2023	19:07:46	257.79	
Start Averaging			
Average	20 samples	178.5	
11/2/2023	19:08:46	181.66	180 ppm - First Pass
Start Averaging			
11/2/2023	19:09:47	155.01	
Average	26 samples	88.86	90 ppm - First Pass
11/2/2023	19:10:47	88.76	
11/2/2023	19:11:46	38.19	
11/2/2023	19:12:46	3.18	
11/2/2023	19:13:46	12.33	
11/2/2023	19:14:47	9.74	
11/2/2023	19:15:46	7.81	
11/2/2023	19:16:47	54.81	
Start Averaging			
Average	18 samples	91.67	90.0 ppm NOx Audit
11/2/2023	19:17:47	91.83	
11/2/2023	19:18:47	131.02	
Start Averaging			
Average	18 samples	270.22	270 ppm - Second Pass
11/2/2023	19:19:47	269.57	
Start Averaging			
11/2/2023	19:20:46	230.23	
Average	19 samples	179.14	180 ppm - Second Pass
11/2/2023	19:21:47	169.3	
Start Averaging			
11/2/2023	19:22:47	108.49	
Average	22 samples	88.86	90 ppm - Second Pass
11/2/2023	19:23:46	88.48	
Start Averaging			
11/2/2023	19:24:47	89.38	
Average	22 samples	91.23	90.0 ppm NOx Audit
11/2/2023	19:25:46	95.5	
11/2/2023	19:26:46	221.12	

		NOx	
		ppm	
Start Averaging			
Average	23 samples	270.45	270 ppm - Third Pass
11/2/2023	19:27:47	270.42	
11/2/2023	19:28:47	242.08	
Start Averaging			
Average	20 samples	179.2	180 ppm - Third Pass
11/2/2023	19:29:46	179.17	
Start Averaging			
11/2/2023	19:30:46	135.72	
Average	21 samples	89.01	90 ppm - Third Pass
11/2/2023	19:31:47	88.89	
11/2/2023	19:32:47	64.21	
Start Averaging			
Average	23 samples	91.3	90.0 ppm NOx Audit
11/2/2023	19:33:46	92.16	
11/2/2023	19:34:47	81.11	
11/2/2023	19:35:47	129.73	
11/2/2023	19:36:47	138.26	
Start Averaging			
11/2/2023	19:37:46	138.44	
Average	28 samples	138.66	152.8 ppm NO2
11/2/2023	19:38:47	113.76	
11/2/2023	19:39:47	3.63	
11/2/2023	19:40:46	2.07	
11/2/2023	19:41:46	1.69	
11/2/2023	19:42:47	1.47	
Test Run 1 End			

Station	Date	Time	Depth	Parameter	Value	Unit
Station 1	1/15/01	10:00	10m	Temperature	10.5	°C
				Salinity	27.5	PSU
				Density	1.023	kg/m³
				Chlorophyll a	0.5	µg/L
				Chlorophyll b	0.2	µg/L
				Chlorophyll c	0.1	µg/L
				Chlorophyll total	0.8	µg/L
				Phaeophytin	0.1	µg/L
				Phaeopigment	0.2	µg/L
				Particulate Matter	0.3	µg/L
Station 2	1/15/01	10:05	10m	Temperature	10.8	°C
				Salinity	27.8	PSU
				Density	1.024	kg/m³
				Chlorophyll a	0.6	µg/L
				Chlorophyll b	0.3	µg/L
				Chlorophyll c	0.2	µg/L
				Chlorophyll total	1.1	µg/L
				Phaeophytin	0.2	µg/L
				Phaeopigment	0.3	µg/L
				Particulate Matter	0.4	µg/L
Station 3	1/15/01	10:10	10m	Temperature	11.0	°C
				Salinity	28.0	PSU
				Density	1.025	kg/m³
				Chlorophyll a	0.7	µg/L
				Chlorophyll b	0.4	µg/L
				Chlorophyll c	0.3	µg/L
				Chlorophyll total	1.4	µg/L
				Phaeophytin	0.3	µg/L
				Phaeopigment	0.4	µg/L
				Particulate Matter	0.5	µg/L
Station 4	1/15/01	10:15	10m	Temperature	11.2	°C
				Salinity	28.2	PSU
				Density	1.026	kg/m³
				Chlorophyll a	0.8	µg/L
				Chlorophyll b	0.5	µg/L
				Chlorophyll c	0.4	µg/L
				Chlorophyll total	1.7	µg/L
				Phaeophytin	0.4	µg/L
				Phaeopigment	0.5	µg/L
				Particulate Matter	0.6	µg/L
Station 5	1/15/01	10:20	10m	Temperature	11.5	°C
				Salinity	28.5	PSU
				Density	1.027	kg/m³
				Chlorophyll a	0.9	µg/L
				Chlorophyll b	0.6	µg/L
				Chlorophyll c	0.5	µg/L
				Chlorophyll total	2.0	µg/L
				Phaeophytin	0.5	µg/L
				Phaeopigment	0.6	µg/L
				Particulate Matter	0.7	µg/L
Station 6	1/15/01	10:25	10m	Temperature	11.8	°C
				Salinity	28.8	PSU
				Density	1.028	kg/m³
				Chlorophyll a	1.0	µg/L
				Chlorophyll b	0.7	µg/L
				Chlorophyll c	0.6	µg/L
				Chlorophyll total	2.3	µg/L
				Phaeophytin	0.6	µg/L
				Phaeopigment	0.7	µg/L
				Particulate Matter	0.8	µg/L
Station 7	1/15/01	10:30	10m	Temperature	12.0	°C
				Salinity	29.0	PSU
				Density	1.029	kg/m³
				Chlorophyll a	1.1	µg/L
				Chlorophyll b	0.8	µg/L
				Chlorophyll c	0.7	µg/L
				Chlorophyll total	2.6	µg/L
				Phaeophytin	0.7	µg/L
				Phaeopigment	0.8	µg/L
				Particulate Matter	0.9	µg/L
Station 8	1/15/01	10:35	10m	Temperature	12.2	°C
				Salinity	29.2	PSU
				Density	1.030	kg/m³
				Chlorophyll a	1.2	µg/L
				Chlorophyll b	0.9	µg/L
				Chlorophyll c	0.8	µg/L
				Chlorophyll total	2.9	µg/L
				Phaeophytin	0.8	µg/L
				Phaeopigment	0.9	µg/L
				Particulate Matter	1.0	µg/L
Station 9	1/15/01	10:40	10m	Temperature	12.5	°C
				Salinity	29.5	PSU
				Density	1.031	kg/m³
				Chlorophyll a	1.3	µg/L
				Chlorophyll b	1.0	µg/L
				Chlorophyll c	0.9	µg/L
				Chlorophyll total	3.2	µg/L
				Phaeophytin	0.9	µg/L
				Phaeopigment	1.0	µg/L
				Particulate Matter	1.1	µg/L
Station 10	1/15/01	10:45	10m	Temperature	12.8	°C
				Salinity	29.8	PSU
				Density	1.032	kg/m³
				Chlorophyll a	1.4	µg/L
				Chlorophyll b	1.1	µg/L
				Chlorophyll c	1.0	µg/L
				Chlorophyll total	3.5	µg/L
				Phaeophytin	1.0	µg/L
				Phaeopigment	1.1	µg/L
				Particulate Matter	1.2	µg/L



69 Industrial Park Rd E, Tolland CT 06084
<https://www.environics.com/service-request>
 (860) 872-1111 info@environics.com

ENVIRONICS FLOW CONTROLLER CALIBRATION REPORT

Unit Summary		Std Conditions		MFC Summary	
Model #:	2020	Temp:	32°F	MFC #:	1
Unit SN :	4558	Pressure:	29.92 in. Hg	MFC FS Flow:	15000
		Gas:	NITROGEN	MFC S/N:	4951900001

Flow Calibration Data is not performance data. This data is used by the system operating mode to improve the flow accuracy. The Flow Verification Data is performance data.

Flow Calibration Data

	Set Flow	True Flow
5%	750	795.250
10%	1500	1618.033
20%	3000	3226.024
30%	4500	4763.783
40%	6000	6295.213
50%	7500	7745.893
60%	9000	9220.556
70%	10500	10699.506
80%	12000	12222.519
90%	13500	13830.328
100%	15000	15543.073

All values in SCCM

Flow Verification Data

	Set Flow	True Flow	% dev
99%	14850	14852.620	0.02%
85%	12750	12737.349	-0.10%
55%	8250	8246.778	-0.04%
25%	3750	3744.995	-0.13%
10%	1500	1506.843	0.46%

All values in SCCM

This calibration complies with ISO 17025-2005 [non-accredited] and is traceable to the National Institute of Standards and Technology (NIST). Calibration and verification are accomplished exclusively by qualified personnel following controlled procedures under ISO 9001:2015. For questions or concerns, contact Customer Service via our website, email or by phone, weekdays from 8AM - 4PM.

Verified by: Paul Stuebel

Date: 6/9/23



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<https://www.environics.com/service-request>
 (860) 872-1111 info@environics.com

ENVIRONICS FLOW CONTROLLER CALIBRATION REPORT

Unit Summary		Std Conditions		MFC Summary	
Model #:	2020	Temp:	32°F	MFC #:	2
Unit SN :	4558	Pressure:	29.92 in. Hg	MFC FS Flow:	12000
		Gas:	NITROGEN	MFC S/N:	4951800001

Flow Calibration Data is not performance data. This data is used by the system operating mode to improve the flow accuracy. The Flow Verification Data is performance data.

Flow Calibration Data

	Set Flow	True Flow
5%	600	583.572
10%	1200	1178.093
20%	2400	2384.943
30%	3600	3584.786
40%	4800	4781.538
50%	6000	5948.157
60%	7200	7177.936
70%	8400	8366.930
80%	9600	9604.649
90%	10800	10879.393
100%	12000	12203.361

All values in SCCM

Flow Verification Data

	Set Flow	True Flow	% dev
99%	11880	11885.656	0.05%
85%	10200	10214.968	0.15%
55%	6600	6600.982	0.01%
25%	3000	2989.628	-0.35%
10%	1200	1200.009	0.00%

All values in SCCM

This calibration complies with ISO 17025-2005 [non-accredited] and is traceable to the National Institute of Standards and Technology (NIST). Calibration and verification are accomplished exclusively by qualified personnel following controlled procedures under ISO 9001:2015. For questions or concerns, contact Customer Service via our website, email or by phone, weekdays from 8AM - 4PM.

Verified by: Paul Stael

Date: 6/9/23



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<https://www.environics.com/service-request>
 (860) 872-1111 info@environics.com

ENVIRONICS FLOW CONTROLLER CALIBRATION REPORT

Unit Summary		Std Conditions		MFC Summary	
Model #:	2020	Temp:	32°F	MFC #:	3
Unit SN :	4558	Pressure:	29.92 in. Hg	MFC FS Flow:	2000
		Gas:	NITROGEN	MFC S/N:	4951700001

Flow Calibration Data is not performance data. This data is used by the system operating mode to improve the flow accuracy. The Flow Verification Data is performance data.

Flow Calibration Data

	Set Flow	True Flow
5%	100	99.872
10%	200	202.397
20%	400	405.938
30%	600	609.141
40%	800	811.762
50%	1000	1013.592
60%	1200	1209.823
70%	1400	1412.175
80%	1600	1616.638
90%	1800	1835.497
100%	2000	2054.184

All values in SCCM

Flow Verification Data

	Set Flow	True Flow	% dev
99%	1980	1971.623	-0.42%
85%	1700	1702.223	0.13%
55%	1100	1101.422	0.13%
25%	500	498.910	-0.22%
10%	200	199.606	-0.20%

All values in SCCM

This calibration complies with ISO 17025-2005 [non-accredited] and is traceable to the National Institute of Standards and Technology (NIST). Calibration and verification are accomplished exclusively by qualified personnel following controlled procedures under ISO 9001:2015. For questions or concerns, contact Customer Service via our website, email or by phone, weekdays from 8AM - 4PM.

Verified by: Paul Stansel

Date: 4/9/23



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 https://www.environics.com/service-request
 (860) 872-1111 info@environics.com

ENVIRONICS FLOW CONTROLLER CALIBRATION REPORT

Unit Summary		Std Conditions		MFC Summary	
Model #:	2020	Temp:	32°F	MFC #:	4
Unit SN :	4558	Pressure:	29.92 in. Hg	MFC FS Flow:	500
		Gas:	NITROGEN	MFC S/N:	4796400001

Flow Calibration Data is not performance data. This data is used by the system operating mode to improve the flow accuracy. The Flow Verification Data is performance data.

Flow Calibration Data

	Set Flow	True Flow
5%	25	25.335
10%	50	51.421
20%	100	103.529
30%	150	155.316
40%	200	206.516
50%	250	257.665
60%	300	308.651
70%	350	358.021
80%	400	409.037
90%	450	460.449
100%	500	514.757

All values in SCCM

Flow Verification Data

	Set Flow	True Flow	% dev
99%	495	494.162	-0.17%
85%	425	424.800	-0.05%
55%	275	274.991	0.00%
25%	125	125.029	0.02%
10%	50	49.889	-0.22%

All values in SCCM

This calibration complies with ISO 17025-2005 [non-accredited] and is traceable to the National Institute of Standards and Technology (NIST). Calibration and verification are accomplished exclusively by qualified personnel following controlled procedures under ISO 9001:2015. For questions or concerns, contact Customer Service via our website, email or by phone, weekdays from 8AM - 4PM.

Verified by: Paul Stansel

Date: 6/9/23



CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

BROADBENT & ASSOCIATES INC
8 W PACIFIC AVE
HENDERSON NV 89015

Certificate Modification Date: 08/01/2018

Praxair Order Number: 61404029
Part Number: NI SD90ME-AS
Customer PO Number: 18-08-000

Fill Date: 07/19/2018

Lot Number: 70086820004
Cylinder Style & Outlet: AS* CGA 650
Cylinder Pressure and Volume: 2000 psig 144 ft3

Certified Concentration

Expiration Date:	08/01/2026	NIST Traceable
Cylinder Number:	CC702450	Expanded Uncertainty
90.0 ppm	Sulfur dioxide	± 1 %
Balance	Nitrogen	

ProSpec EZ Cert



Certification Information:

Certification Date: 08/01/2018

Term: 96 Months

Expiration Date: 08/01/2026

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.
Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. **Component:** Sulfur dioxide
Requested Concentration: 90 ppm
Certified Concentration: 90.0 ppm
Instrument Used: Horiba VIA-510, 5203551011
Analytical Method: NDIR
Last Multipoint Calibration: 07/14/2018

Reference Standard: Type / Cylinder #: NTRM / SA16843
Concentration / Uncertainty: 95.17 ppm ±1%
Expiration Date: 03/30/2020
Traceable to: SRM # / Sample # / Cylinder #: NTRM#SA16843 / 120702 / NTRM#SA16843
SRM Concentration / Uncertainty: 95.17 PPM / ±1.00 PPM
SRM Expiration Date: 03/30/2020

First Analysis Data:				Date			
Z:	0	R:	95.2	C:	89.9	Conc:	89.9
R:	95.2	Z:	0	C:	90	Conc:	90
Z:	0	C:	90.1	R:	95.2	Conc:	90.1
UOM: ppm				Mean Test Assay: 90 ppm			

Second Analysis Data:				Date			
Z:	0	R:	95.2	C:	89.9	Conc:	89.8
R:	95.4	Z:	0	C:	90.1	Conc:	90
Z:	0	C:	90.3	R:	95.3	Conc:	90.2
UOM: ppm				Mean Test Assay: 90 ppm			

Analyzed By

Quinn Hailes

Certified By

Leeanna Rodriguez



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DocNumber: 534707



Linde Gas & Equipment Inc.
5700 S. Alameda Street
Los Angeles CA 90058
Tel: 323-585-2154
Fax: 714-542-6689
PGVP ID: F22023

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

BROADBENT & ASSOCIATES INC
8 W PACIFIC AVE
HENDERSON NV 89015

Certificate Issuance Date: 03/01/2023
Linde Order Number: 90961146
Part Number: NI NO90MZ3E-AS
Customer PO Number: ROSS HIPPLE

Fill Date: 02/17/2023
Lot Number: 70086304801
Cylinder Style & Outlet: AS CGA 660
Cylinder Pressure and Volume: 2000 psig 140 ft3

Certified Concentration

Expiration Date:	03/01/2031	NIST Traceable
Cylinder Number:	DT0009937	Expanded Uncertainty
89.8 ppm	Nitric oxide	± 0.5 ppm
90.0 ppm	Nitric oxide (as NOx)	± 0.5 ppm
Balance	Nitrogen	

ProSpec EZ Cert



Certification Information:

Certification Date: 03/01/2023 Term: 96 Months Expiration Date: 03/01/2031

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Uncertainty above is expressed as absolute expanded uncertainty at a level of confidence of approximately 95% with a coverage factor k = 2. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: Nitric oxide
Requested Concentration: 90 ppm
Certified Concentration: 89.8 ppm
Instrument Used: Thermo Electron 42i-HL S/N 1030545087
Analytical Method: Chemiluminescence
Last Multipoint Calibration: 02/28/2023

First Analysis Data:		Date		02/22/2023	
Z: 0	R: 96.7	C: 89.8	Conc: 89.8		
R: 96.7	Z: 0	C: 89.8	Conc: 89.8		
Z: 0	C: 90	R: 96.7	Conc: 90		
UOM: ppm		Mean Test Assay: 89.9 ppm			

Reference Standard: Type / Cylinder #: GMIS / CC7:4395
Concentration / Uncertainty: 96.7 ppm ±0.5 ppm
Expiration Date: 01/15/2028
Traceable to: SRM # / Sample # / Cylinder #: SRM# 1684b / 44-T-89 / FF6010
SRM Concentration / Uncertainty: 99.75 ppm / ±0.5 ppm
SRM Expiration Date: 01/25/2020

Second Analysis Data:		Date		03/01/2023	
Z: 0	R: 96.7	C: 89.5	Conc: 89.5		
R: 96.7	Z: 0	C: 89.8	Conc: 89.8		
Z: 0	C: 90	R: 96.7	Conc: 90		
UOM: ppm		Mean Test Assay: 89.8 ppm			

2. Component: Nitric oxide (as NOx)
Requested Concentration: 90 ppm
Certified Concentration: 90.0 ppm
Instrument Used: Thermo Electron 42i-HL S/N 1030545087
Analytical Method: Chemiluminescence
Last Multipoint Calibration: 02/17/2023

First Analysis Data:		Date		02/22/2023	
Z: 0	R: 96.8	C: 90	Conc: 90		
R: 96.8	Z: 0	C: 90	Conc: 90		
Z: 0	C: 90.2	R: 96.8	Conc: 90.2		
UOM: ppm		Mean Test Assay: 90.1 ppm			

Reference Standard: Type / Cylinder #: GMIS / CC724395
Concentration / Uncertainty: 96.8 ppm ±0.5 ppm
Expiration Date: 01/15/2028
Traceable to: SRM # / Sample # / Cylinder #: SRM# 1684b / 44-T-89 / FF6010
SRM Concentration / Uncertainty: 99.75 ppm / ±0.5 ppm
SRM Expiration Date: 01/25/2020

Second Analysis Data:		Date		03/01/2023	
Z: 0	R: 96.8	C: 89.7	Conc: 89.7		
R: 96.8	Z: 0	C: 90	Conc: 90		
Z: 0	C: 90.2	R: 96.8	Conc: 90.2		
UOM: ppm		Mean Test Assay: 90 ppm			

Analyzed By

Nelson Ma

Certified By

Muneeb Abdelrahman



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DocNumber: 474966



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CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

BROADBENT & ASSOCIATES INC
8 W PACIFIC AVE
HENDERSON NV 89015

Certificate Issuance Date: 05/26/2022

Linde Order Number: 69185083

Part Number: NI NO900E-AS

Customer PO Number: ROSS HIPPLE

Fill Date: 05/05/2022

Lot Number: 70086212405

Cylinder Style & Outlet: AS

CGA 660

Cylinder Pressure and Volume: 2000 psig 140 ft3

Certified Concentration

Expiration Date:	05/26/2030	NIST Traceable
Cylinder Number:	CC162032	Expanded Uncertainty
904 ppm	Nitric oxide	± 5 ppm
Balance	Nitrogen	

ProSpec EZ Cert



For Reference Only: NOx 904 ppm

Certification Information: Certification Date: 05/26/2022 Term: 96 Months Expiration Date: 05/26/2030

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Uncertainty above is expressed as absolute expanded uncertainty at a level of confidence of approximately 95% with a coverage factor k = 2. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component:

Nitric oxide

Requested Concentration: 900 ppm
Certified Concentration: 904 ppm
Instrument Used: Thermo Electron 42i S/N 0726024326
Analytical Method: Chemiluminescence
Last Multipoint Calibration: 04/29/2022

Reference Standard: Type / Cylinder #: GMIS / ND10467

Concentration / Uncertainty: 1021 ppm ±5 ppm

Expiration Date: 10/15/2029

Traceable to: SRM # / Sample # / Cylinder #: 1687b / 41-M-17 / FF55459

SRM Concentration / Uncertainty: 996.7 PPM / ±5.0 PPM

SRM Expiration Date: 04/13/2025

First Analysis Data:				Date	
Z:	0	R:	1021	C: 902	Conc: 902
R:	1021	Z:	0	C: 904	Conc: 904
Z:	0	C:	902	R: 1021	Conc: 902
UOM: ppm		Mean Test Assay:		903	ppm

Second Analysis Data:				Date	
Z:	0	R:	1021	C: 906	Conc: 906
R:	1021	Z:	0	C: 906	Conc: 906
Z:	0	C:	904	R: 1021	Conc: 904
UOM: ppm		Mean Test Assay:		905	ppm

Analyzed By

Nelson Ma

Certified By

Lisette Morales

Information contained herein has been prepared at your request by qualified experts within Linde Gas & Equipment Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Linde Gas & Equipment Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Application for a permit under Article 17 of the Environmental Conservation Law to discharge pollutants into the waters of the State.

Project Name:
Location:
Applicant:

Discharge Point	Discharge Type	Discharge Category

Applicant's Name: _____
Address: _____
City: _____ State: _____ Zip: _____

Project Description: _____
Purpose of Discharge: _____

Parameter	Concentration	Frequency

Parameter	Concentration	Frequency

Signature: _____
Date: _____

Signature: _____
Date: _____

This permit is issued under the authority of Article 17 of the Environmental Conservation Law, which requires that all discharges of pollutants into the waters of the State be controlled to protect the health of the people and the environment.



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Linde Gas & Equipment Inc.
5700 S. Alameda Street
Los Angeles, CA 90058
Tel: 323-585-2154
Fax: 714-542-6689

Customer & Order Information:

BROADBENT & ASSOCIATES INC
8 W PACIFIC AVE,
HENDERSON, NV 89015

Linde Order Number: **80069291**
Customer PO Number: **VERBAL ROSS HIPPLE**

Certificate Issuance Date: **11/14/2022**

Certification Date: **11/14/2022**
Lot Number: **70086230605**
Part Number: **NI NX150N-AS**
DocNumber: **627590**
Expiration Date: **11/11/2023**

CERTIFICATE OF ANALYSIS
Primary Master

Component	Requested Concentration (Molar)	Certified Concentration (Molar)	Analytical Reference	Analytical Uncertainty
Nitrogen dioxide (as NOx)	150 ppm	152.8 ppm	1	± 1 %
Nitrogen	Balance	Balance		

Cylinder Style: **AS**
Cylinder Pressure @ 70 F: **2000 psig**
Cylinder Volume: **142 ft3**
Valve Outlet Connection: **CGA 660**
Cylinder Number(s): **CC506284**

Fill Date: **11/2/2022**
Analysis Date: **11/11/2022**

Filling Method: **Gravimetric**

Comments: **This mixture contains 2% Oxygen.**

Analyst: **Henry Koung**

Approved Signer: **Lissette Morales-Chemist**

Key to Analytical Techniques:

Reference	Analytical Instrument - Analytical Principle	Reference Standard
1	MKS 2 MultiGas 2031 FTIR - FTIR	NO2(as NOx) /AIR 251.2 ppm GMIS# ND1591, Expiration Date: 01/19/2024, Traceable to PRM# D887379

The gas calibration cylinder standard prepared by Linde Gas & Equipment Inc. is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Linde Gas & Equipment Inc. Reference Materials which are traceable to the International System of Units (SI) through either weights traceable to the National Institute of Standards and Technology (NIST) or Measurement Canada, or through NIST Standard Reference Materials or equivalent where available.

Note: All expressions for concentration (e.g., % or ppm) are for gas phase, by mole unless otherwise noted. Analytical uncertainty is expressed as a Relative % unless otherwise noted.

IMPORTANT

The information contained herein has been prepared at your request by personnel within Linde Gas & Equipment Inc. While we believe the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall liability of Linde Gas & Equipment Inc. arising out of the use of the information contained herein exceed the fee established for providing such information.



CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

BROADBENT & ASSOCIATES INC
8 W PACIFIC AVE
HENDERSON NV 89015

Certificate Issuance Date: 06/08/2021

Praxair Order Number: 42703100

Part Number: NI C0900E-AS

Customer PO Number: 21-09-104

Fill Date: 05/20/2021

Lot Number: 70086114004

Cylinder Style & Outlet: AS CGA 350

Cylinder Pressure and Volume: 2000 psig 140 ft3

Certified Concentration

Expiration Date:	06/08/2029	NIST Traceable
Cylinder Number:	SA5009	Expanded Uncertainty
908 ppm	Carbon monoxide	± 3 ppm
Balance	Nitrogen	

ProSpec EZ Cert



Certification Information:

Certification Date: 06/08/2021

Term: 96 Months

Expiration Date: 06/08/2029

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Uncertainty above is expressed as absolute expanded uncertainty at a level of confidence of approximately 95% with a coverage factor k = 2. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: Carbon monoxide
Requested Concentration: 900 ppm
Certified Concentration: 908 ppm
Instrument Used: Horiba VIA-510 S/N 576676015
Analytical Method: NDIR
Last Multipoint Calibration: 06/03/2021

Reference Standard: Type / Cylinder #: GMIS / CC700822
Concentration / Uncertainty: 991 ppm ±2 ppm
Expiration Date: 05/02/2027
Traceable to: SRM # / Sample # / Cylinder #: SRM 1881b / 1-L-38 / FF20632
SRM Concentration (enter with units) / 993.1 ppm / ±2.1 ppm
SRM Expiration Date: 09/26/2021

First Analysis Data:				Date			
Z:	0	R:	991	C:	908	Conc:	908
R:	991	Z:	0	C:	908	Conc:	908
Z:	0	C:	909	R:	992	Conc:	909
UOM:	ppm	Mean Test Assay:	908	ppm			

Second Analysis Data:				Date			
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	ppm	Mean Test Assay:		ppm			

Analyzed By

Jose Vasquez

Certified By

Amalia Real



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DocNumber: 534358



Linde Gas & Equipment Inc.
5700 S. Alameda Street
Los Angeles CA 90058
Tel: 323-585-2154
Fax: 714-542-6689
PGVP ID: F22023

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

BROADBENT & ASSOCIATES INC
8 W PACIFIC AVE
HENDERSON NV 89015

Certificate Issuance Date: 02/16/2023

Linde Order Number: 90961146

Part Number: NI PR900E-AS

Customer PO Number: ROSS HIPPLE

Fill Date: 02/06/2023

Lot Number: 70086303702

Cylinder Style & Outlet: AS

CGA 350

Cylinder Pressure and Volume: 2000 psig 140 ft3

Certified Concentration

Expiration Date:	02/16/2031	NIST Traceable
Cylinder Number:	ALM-001705	Expanded Uncertainty
915 ppm	Propane	± 8 ppm
Balance	Nitrogen	

ProSpec EZ Cert



Certification Information:

Certification Date: 02/16/2023

Term: 96 Months

Expiration Date: 02/16/2031

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Uncertainty above is expressed as absolute expanded uncertainty at a level of confidence of approximately 95% with a coverage factor k = 2. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: Propane

Requested Concentration: 900 ppm
 Certified Concentration: 915 ppm
 Instrument Used: Horiba FIA-510, 851135122
 Analytical Method: FID Total Hydrocarbon Analyzer
 Last Multipoint Calibration: 01/28/2023

Reference Standard: Type / Cylinder #: GMIS / AAL069074

Concentration / Uncertainty: 1001 ppm ± 7 ppm

Expiration Date: 01/03/2027

Traceable to: SRM # / Sample # / Cylinder #: SRM 2646a / 103-C-39 / XF000892B

SRM Concentration / Uncertainty: 979.1 ppm / ± 6.6 ppm

SRM Expiration Date: 03/04/2019

First Analysis Data:				Date				
Z:	0	R:	2627	C:	2397	Conc:	917	02/16/2023
R:	2610	Z:	11	C:	2388	Conc:	914	
Z:	9	C:	2387	R:	2611	Conc:	913	
UOM:	ppm		Mean Test Assay:		915		ppm	

Second Analysis Data:				Date				
Z:	0	R:	0	C:	0	Conc:	0	
R:	0	Z:	0	C:	0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0	
UOM:	ppm		Mean Test Assay:				ppm	

Analyzed By

Courtney Zieike

Certified By

Yang Yu

Information contained herein has been prepared at your request by qualified experts within Linde Gas & Equipment Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Linde Gas & Equipment Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

Page 1 of 1



CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

BROADBENT & ASSOCIATES INC
8 WPACIFIC AVE
HENDERSON NV 89015

Certificate Issuance Date: 06/01/2021
Praxair Order Number: 42703100
Part Number: NI OX22E-AS
Customer PO Number: 21-09-104

Fill Date: 05/18/2021
Lot Number: 70086113802
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure and Volume: 2000 psig 140 ft3

Certified Concentration

Expiration Date:	06/01/2029	NIST Traceable
Cylinder Number:	CC101523	Expanded Uncertainty
22.03 %	Oxygen	± 0.04 %
Balance	Nitrogen	

ProSpec EZ Cert



Certification Information:

Certification Date: 06/01/2021

Term: 96 Months

Expiration Date: 06/01/2029

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Uncertainty above is expressed as absolute expanded uncertainty at a level of confidence of approximately 95% with a coverage factor k = 2. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component:

Oxygen

Requested Concentration: 22 %
Certified Concentration: 22.03 %
Instrument Used: 7MB20211AA000CA1
Analytical Method: Paramagnetic
Last Multipoint Calibration: 05/14/2021

Reference Standard:

Type / Cylinder #: GMIS / ND29287

Concentration / Uncertainty: 20.90 % ±0.02 %

Expiration Date: 09/01/2028

Traceable to: SRM # / Sample # / Cylinder #: SRM 2659a / 71-E-19 / FF22331

SRM Concentration (enter with units) / 20.863% / ±0.021%

SRM Expiration Date: 08/23/2021

First Analysis Data:				Date
Z: 0	R: 20.9	C: 22.03	Conc: 22.03	06/01/2021
R: 20.9	Z: 0	C: 22.04	Conc: 22.04	
Z: 0	C: 22.04	R: 20.91	Conc: 22.04	
UOM: %			Mean Test Assay: 22.03 %	

Second Analysis Data:				Date
Z: 0	R: 0	C: 0	Conc: 0	
R: 0	Z: 0	C: 0	Conc: 0	
Z: 0	C: 0	R: 0	Conc: 0	
UOM: %			Mean Test Assay: %	

Analyzed By

Jose Vasquez

Certified By

Amalia Real

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
625 WEST COAST AVENUE
ALBANY, NEW YORK 12242-1200
TEL: 518/474-2100
FAX: 518/474-2100



STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
625 WEST COAST AVENUE
ALBANY, NEW YORK 12242-1200
TEL: 518/474-2100
FAX: 518/474-2100

PERFORMANCE TEST REPORT

Project Name: [Faint text]
Client: [Faint text]
Date: [Faint text]
Location: [Faint text]



Test Item	Method	Result
Temperature	ASTM D 1171	23.5°C
Humidity	ASTM D 1171	65%
Light Intensity	ASTM D 1171	1000 lux
Soil Moisture	ASTM D 1171	15%

Test Results Summary: [Faint text]

Test Procedure: [Faint text]

Parameter	Value
Temperature	23.5°C
Humidity	65%
Light Intensity	1000 lux
Soil Moisture	15%

Parameter	Value
Temperature	23.5°C
Humidity	65%
Light Intensity	1000 lux
Soil Moisture	15%





Making our world more productive



Linde Gas & Equipment Inc.
5700 S. Alameda Street
Los Angeles CA 90058
Tel: 323-585-2154
Fax: 714-542-6689
PGVP ID: F22023

DocNumber: 533913

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

BROADBENT & ASSOCIATES INC
8 W PACIFIC AVE
HENDERSON NV 89015

Certificate Issuance Date: 02/10/2023

Linde Order Number: 90961146

Part Number: NI CD18E-AS

Customer PO Number: ROSS HIPPLE

Fill Date: 02/03/2023

Lot Number: 70086303405

Cylinder Style & Outlet: AS

CGA 580

Cylinder Pressure and Volume: 2000 psig 152 ft3

Certified Concentration

Expiration Date:	02/08/2031	NIST Traceable
Cylinder Number:	CC329527	Expanded Uncertainty
17.88 %	Carbon dioxide	± 0.06 %
Balance	Nitrogen	

ProSpec EZ Cert



Certification Information:

Certification Date: 02/08/2023

Term: 96 Months

Expiration Date: 02/08/2031

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Uncertainty above is expressed as absolute expanded uncertainty at a level of confidence of approximately 95% with a coverage factor k = 2. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component:

Carbon dioxide

Requested Concentration: 18 %

Certified Concentration: 17.88 %

Instrument Used: Floris VIA-510 S/N 20C194WK

Analytical Method: NDIR

Last Multiport Calibration: 01/27/2023

Reference Standard:

Type / Cylinder #: NTRM / CC725979

Concentration / Uncertainty: 19.34 % ±0.03 %

Expiration Date: 01/12/2027

Traceable to:

SRM # / Sample # / Cylinder #: NTRM / 190701 / CC725973

SRM Concentration / Uncertainty: 19.34 % ±0.031%

SRM Expiration Date: 01/12/2027

First Analysis Data:				Date			
Z:	0	R:	19.34	C:	17.9	Conc:	17.87
R:	19.37	Z:	0	C:	17.93	Conc:	17.9
Z:	0	C:	17.92	R:	19.42	Conc:	17.89
UOM:	%	Mean Test Assay:		17.88	%		

Second Analysis Data:				Date			
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%	Mean Test Assay:			%		

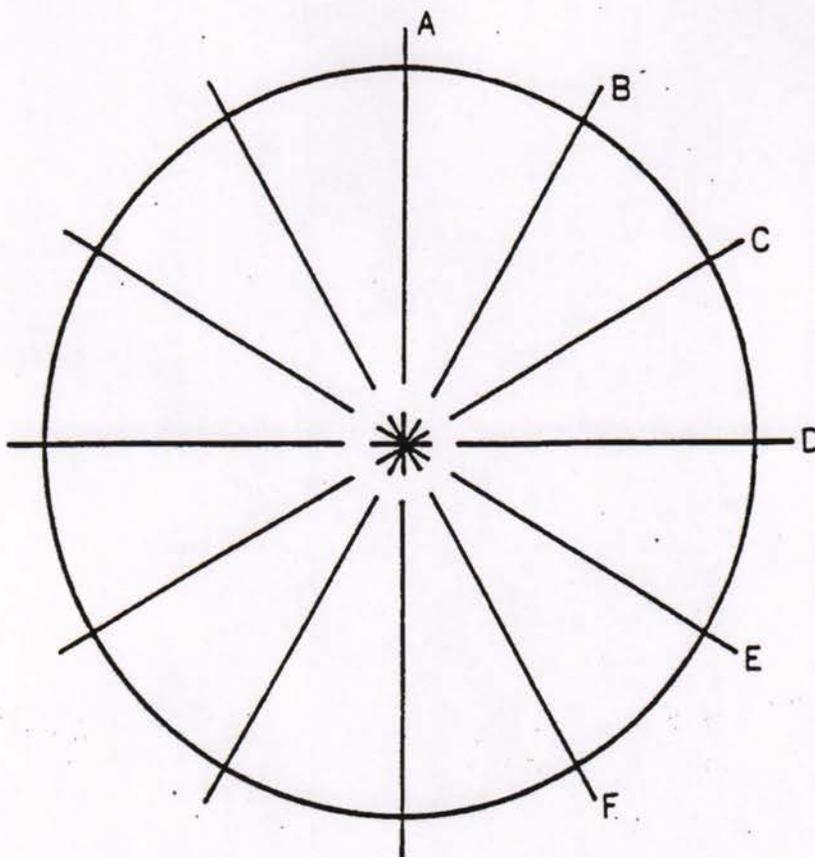
Analyzed By

Courtney Zieker

Certified By

Henry Koung

NOZZLE CALIBRATION



DIAMETER (in.)

A. .3025

B. .3019

C. .2975

D. .3021

Avg. .3010

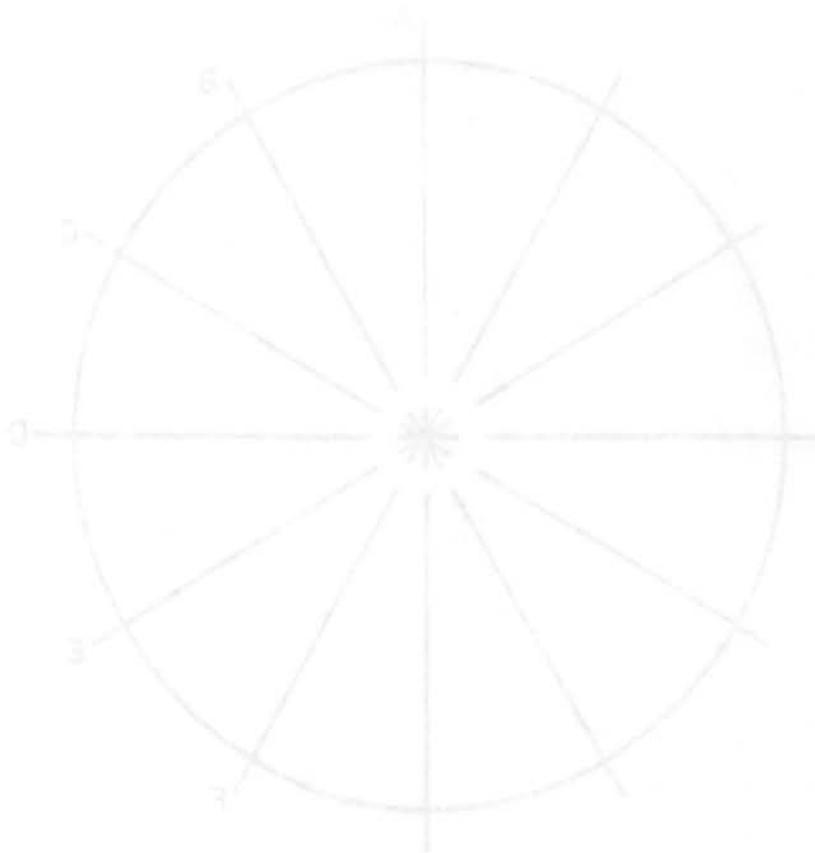
CALIBRATION DATE 1/11/2023

CALIBRATED BY DF

NOZZLE ID NO. E3 9-3

Jan 2023

NOZZLE CALIBRATION



DIAMETER (in.)	
A	_____
B	_____
C	_____
D	_____
Avg	_____
NOZZLE ID NO. E3 85 _____	
CALIBRATED BY _____	
CALIBRATION DATE _____	

4305-101

AMERICAN SOCIETY OF MECHANICAL ENGINEERS
 1801 L STREET, N.W., WASHINGTON, D.C. 20036

W.O.

Date: 09/29/23
 Barometer: 27.65
 Meter Console #: 1

DGM #: 274184
 Standard Meter #: 26241860
 Operator: Ross Hipple

STANDARD TEST METER			DRY TEST METER				
Pressure dHs	Temp. Ts	Volume Vs	Pressure dH	Temp. Tdi	Temp. Tdo	Volume Vd	Time
(in. H ₂ O)	(°F)	(Ft ³)	(in. H ₂ O)	(°F)	(°F)	(Ft ³)	(min.)
-2.3 Avg./Net:	89.0	502.637	1.0	n/a	83.0	974.055	18.5
	84.0	492.357			80.0	963.789	
	86.5	10.280			81.5	10.266	
-4.2 Avg./Net:	91.0	513.220	2.0	n/a	85.0	984.496	13.0
	89.0	502.755			83.0	974.167	
	90.0	10.465			84.0	10.329	
-5.1 Avg./Net:	92.0	523.870	2.5	n/a	87.0	994.981	11.5
	91.0	513.502			85.0	984.768	
	91.5	10.368			86.0	10.213	
-6.1 Avg./Net:	93.0	534.560	3.0	n/a	89.0	1005.500	10.5
	92.0	524.097			87.0	995.206	
	92.5	10.463			88.0	10.294	
-7.8 Avg./Net:	93.0	545.055	4.0	n/a	90.0	15.712	9.0
	93.0	534.755			88.0	5.681	
	93.0	10.300			89.0	10.031	

$$y = V_s \times (P_{bar}) \times (Avg. T_{do} + 460) / (V_d \times (P_{bar} + (dH / 13.6)) \times (T_s + 460))$$

$$K_o = ((M \times (T_{do} + 460) \times P_{bar} \times (V_s / t)^2) / (dH \times (T_s + 460)^2))^{0.5}$$

$$dH@ = 0.0319 \times dH \times ((T_s + 460)^2 \times Time^2) / (P_{bar} \times (T_m + 460) \times V_s^2)$$

dH:	1.0	2.0	2.5	3.0	4.0	Avg.	Std. Dev.
y:	0.9896	0.9968	0.9984	1.0002	1.0087	0.9987	0.0069
Ko	0.6700	0.6835	0.6841	0.6903	0.6866	0.6829	0.0077
dH@	2.0608	1.9800	1.9767	1.9416	1.9627	1.9844	0.0453

y: 0.69 % Relative Standard Deviation
 Ko 1.12 % Relative Standard Deviation
 dH@ 2.28 % Relative Standard Deviation

Year	1999	2000	2001	2002	2003	2004	2005
1999	1000	1000	1000	1000	1000	1000	1000
2000	1000	1000	1000	1000	1000	1000	1000
2001	1000	1000	1000	1000	1000	1000	1000
2002	1000	1000	1000	1000	1000	1000	1000
2003	1000	1000	1000	1000	1000	1000	1000
2004	1000	1000	1000	1000	1000	1000	1000
2005	1000	1000	1000	1000	1000	1000	1000

10/1/01
 10/1/01
 10/1/01

Year	1999	2000	2001	2002	2003	2004	2005
1999	1000	1000	1000	1000	1000	1000	1000
2000	1000	1000	1000	1000	1000	1000	1000
2001	1000	1000	1000	1000	1000	1000	1000
2002	1000	1000	1000	1000	1000	1000	1000
2003	1000	1000	1000	1000	1000	1000	1000
2004	1000	1000	1000	1000	1000	1000	1000
2005	1000	1000	1000	1000	1000	1000	1000

Broadbent & Associates

TEMPERATURE DISPLAY CALIBRATION FORM

Meter Console Number: 1
 Reference Calibrator Make: Extech Model: Oyster Serial No.: 975229
 Operator: Ross Hipple Date: 9/29/2023
 Pretest: x Posttest: x

TC Channel ID	Reference Temp 1, °F	Temp. Reading 1, °F	Criteria (1.5% of °R)	Criteria Met	Reference Temp 2, °F	Temp. Reading 2, °F	Criteria (1.5% of °R)	Criteria Met
Stack	32	32	0.00	pass				
	250	252	-0.28	pass				
	500	499	0.10	pass				
	1000	1003	-0.21	pass				
	1500	1502	-0.10	pass				
	1800	1802	-0.09	pass				

Criteria: Percent difference between the Reference Temperature and the Average Temperature can be only $\pm 1.5\%R$.

Equation:
$$\frac{[(\text{Ref. Temp.} + 460) - (\text{Temp. Reading} + 460)]}{(\text{Ref. Temp.} + 460)} \times 100$$

QA/QC Check By: _____
 Date: _____

