

**Pinnacle Renewable Energy Inc.
Smithers, B.C.**

**Dryer Stacks 1-4
Total Particulate Testing
Permit 06099
September 12, 2024**

Our Job Number: ME2425-068

Report Author: Matt McCall
McCall Environmental



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October 9, 2024

Smithers Pellet Limited Partnership
1723 Dahlie Rd
PO Box 699
Smithers BC
V0J 2N0

Attention: Joel Martens/Wayne Kooy
RE: Air Emission Testing Sept 12, 2024
RA-6099, ME2425-068

As requested our firm provided a series of air emission tests at your facility in Smithers, B.C. The purpose of these tests was to satisfy testing requirements as stated in your permit RA-6099.

Testing Parameters

- Total Particulate and Condensable Organics (4 Sources)
 - o State of Oregon Method

Key Personnel

- Report Generation: Matt McCall 250-542-5118
- Sr Field Tech: David Brandle 250-301-5712
- Plant Personnel: Joel Martens 250-847-1431

All stacks have been examined for cyclonic flow and determined to be tested as laminar in nature.

Test results are summarized immediately following this cover letter.

Lab analysis for condensable organic fractions was carried out by Element Labs in Surrey, B.C. A copy of their report is included in the Appendix of this report.

If you have any questions or concerns please don't hesitate to contact us at your earliest convenience.

Sincerely,

MCCALL ENVIRONMENTAL

Matt McCall

Summary of Test Results

Parameter	Average of Triplicate Tests				Avg/ Comb	Permit	Prev Test
	Stack 1	Stack2	Stack 3	Stack 4			25-Jun-24
Test Date	12-Sep-24	12-Sep-24	12-Sep-24	12-Sep-24	N/A		N/A
Gas Temperature (°C)	29.7	32.1	32.5	37.0	32.8		33.55
% Moisture	2.44	3.00	3.32	3.43	3.05		3.03
Velocity (m/sec)	9.29	9.28	9.81	9.36	9.43		9.57
ACFM	60657	60622	64074	61131	246484		249980
Std. Dry Flow Rate (m ³ /sec)	25.65	25.29	26.60	24.99	102.53	*132	103.76
Tot Part. Dry Basis ref. Cond. (mg/m ³)	5.73	11.31	8.72	34.35	14.86	15.00	11.11
Front Half Particulate (mg/m ³)	3.13	4.81	2.74	7.26	4.48		6.42
Back Half Condensibles (mg/m ³)	2.61	6.49	5.98	27.09	10.54		4.68
Mass Emission Rate (kg/hr)	0.53	1.03	0.83	3.09	5.48	7.67	4.15

* Note: ACFM, m³/sec, and kg/hr, are combined as opposed to averaged.

* Permitted flow rate is 33.0 m³/sec per stack, combined flow rate of 132

* Standard reference conditions are on a dry basis, 20 deg C and pressure at sea level 29.92 inches Hg.

**Average Total Particulate across the four stacks is weighted against individual stack flow

Discussion of Test Results

Test results from the last set of compliance testing was performed in June of this year. Those results are included in the summary tables above for comparison purposes.

Field personnel didn't notice any abnormalities during testing. To the best of our knowledge the plant was operating normally during testing.

Plant production data is included in this report.

All stacks are non-cyclonic and are tested with standard testing methodology.

Pinnacle Renewable Energy Inc
Dryer1 Stack 1
Smithers BC

12-Sep-24

Permit Number: RA-6099

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	85 ° F	30 ° C
Moisture Content (by volume):	2.44 %	
Average Stack Gas Velocity:	30.5 ft/sec	9.3 m/sec
Total Actual Gas Flow Rate:	60657 ACFM	
Dry Gas flow Rate at Reference Conditions:	54349 SCFM	25.6 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.003 gr/ft ³	5.73 mg/m ³
Front Half Particulate	0.001 gr/ft ³	3.1 mg/m ³
Back Half Condensibles	0.001 gr/ft ³	2.6 mg/m ³
Mass Emission Rate	1.17 lbs/hr	0.53 kg/hr

SUMMARY OF AIR EMISSION TESTS

TEST 1:

Gas Temperature:	84 ° F	29 ° C
Moisture Content (by volume):	2.5 %	
Average Stack Gas Velocity:	30.5 ft/sec	9.3 m/sec
Total Actual Gas Flow Rate:	60700 ACFM	
Dry Gas flow Rate at Reference Conditions:	54556 SCFM	25.7 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.003 gr/ft ³	6.2 mg/m ³
Front Half Particulate	.001 gr/ft ³	3.0 mg/m ³
Back Half Condensibles	.001 gr/ft ³	3.2 mg/m ³
Mass Emission Rate	1.26 lbs/hr	0.57 kg/hr

TEST 2:

Gas Temperature:	86 ° F	30 ° C
Moisture Content (by volume):	2.5 %	
Average Stack Gas Velocity:	30.5 ft/sec	9.3 m/sec
Total Actual Gas Flow Rate:	60739 ACFM	
Dry Gas flow Rate at Reference Conditions:	54359 SCFM	25.7 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.003 gr/ft ³	6.1 mg/m ³
Front Half Particulate	.002 gr/ft ³	3.8 mg/m ³
Back Half Condensibles	.001 gr/ft ³	2.3 mg/m ³
Mass Emission Rate	1.25 lbs/hr	0.57 kg/hr

TEST 3:

Gas Temperature:	87 ° F	31 ° C
Moisture Content (by volume):	2.3 %	
Average Stack Gas Velocity:	30.4 ft/sec	9.3 m/sec
Total Actual Gas Flow Rate:	60534 ACFM	
Dry Gas flow Rate at Reference Conditions:	54130 SCFM	25.5 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.002 gr/ft ³	4.9 mg/m ³
Front Half Particulate	.001 gr/ft ³	2.6 mg/m ³
Back Half Condensibles	.001 gr/ft ³	2.3 mg/m ³
Mass Emission Rate	1.00 lbs/hr	0.45 kg/hr

DATA FOR TESTS 1 TO 3

Client: Pinnacle Renewable Energy Inc
Plant Location: Smithers BC
Process: Dryer1 Stack 1
Permit Number: RA-6099
Job Number: ME2425-068
Pollution Control Permit: 15.0 mg/m3 49.5 m3/sec
Number of Tests: 3 tests
Minutes per Point: 2.5 minutes

Filter Number:
Date of Test:
Start Time:
Stop Time:
On-line Sampling Time:
Testing Personnel:
Sampler Model:
Barometric Pressure("Hg):
Static Pressure("H₂O):
%CO₂:
%O₂:
%CO:
%N₂:
Diameter of Nozzle(inches):
Meter Factor:
Type-S Pitot Tube Coefficient:
Cross Sectional Area of Stack(ft²):
Impinger Condensate(g):
Weight of Moisture in Silica Gel(g):
Weight of Filter Particulate(g):
Weight of Probe Washings(g):
Weight of Impinger Content Organic(g):
Total Weight of Particulate(g):

TEST 1	TEST 2	TEST 3
M55	M56	M57
12-Sep-24	12-Sep-24	12-Sep-24
13:31	14:46	16:00
14:33	15:48	17:02
60	60	60
DB/CB	DB/CB	DB/CB
980	980	980
28.40	28.40	28.40
-0.16	-0.16	-0.16
0.0	0.0	0.0
21.0	21.0	21.0
0.0	0.0	0.0
79.0	79.0	79.0
0.290	0.290	0.290
0.998	0.998	0.998
0.84182	0.84182	0.84182
33.18	33.18	33.18
22	23	21
2.0	2.0	2.0
0.0007	0.0008	0.0009
0.0031	0.0041	0.0024
0.0040	0.0030	0.0030
0.0078	0.0079	0.0063

Sampling Data for - *TEST 1*
 Pinnacle Renewable Energy Inc
 Dryer1 Stack 1
 Smithers BC

12-Sep-24

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.27	1.72	72	72	83	68.00	1.00
A-11	0.26	1.67	82	73	84	70.00	1.01
A-10	0.26	1.68	87	73	84	72.01	1.01
A-9	0.25	1.62	89	74	84	74.02	1.03
A-8	0.24	1.55	90	75	84	76.05	0.98
A-7	0.26	1.69	92	76	85	77.94	0.99
A-6	0.25	1.63	94	77	85	79.92	0.99
A-5	0.27	1.76	95	78	84	81.88	0.99
A-4	0.27	1.77	96	78	83	83.91	0.99
A-3	0.28	1.84	98	80	83	85.95	0.96
A-2	0.32	2.11	98	82	83	87.98	0.99
A-1	0.31	2.04	99	83	83	90.22	0.98
B-12	0.26	1.71	100	83	84	92.41	0.99
B-11	0.26	1.71	101	84	84	94.42	0.98
B-10	0.25	1.65	101	84	84	96.43	1.00
B-9	0.25	1.65	101	84	84	98.44	0.99
B-8	0.24	1.59	102	85	84	100.43	1.00
B-7	0.25	1.66	103	86	83	102.39	0.99
B-6	0.25	1.66	104	87	83	104.38	1.00
B-5	0.26	1.73	105	88	83	106.39	0.98
B-4	0.27	1.80	104	88	83	108.41	0.99
B-3	0.29	1.93	104	88	83	110.49	0.96
B-2	0.31	2.06	104	89	84	112.58	0.95
B-1	0.31	2.06	105	89	84	114.72	0.99
						116.94	

Sampling Data for - TEST 2
Pinnacle Renewable Energy Inc
Dryer1 Stack 1
Smithers BC

12-Sep-24

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
B-12	0.25	1.65	83	83	84	17.10	1.04
B-11	0.25	1.66	94	85	86	19.14	1.03
B-10	0.26	1.73	95	85	86	21.18	1.04
B-9	0.27	1.80	96	85	86	23.29	1.04
B-8	0.26	1.73	96	85	86	25.44	1.01
B-7	0.26	1.73	97	86	86	27.50	1.02
B-6	0.25	1.67	99	86	86	29.58	1.02
B-5	0.25	1.67	101	86	86	31.61	0.99
B-4	0.27	1.81	103	86	85	33.60	1.00
B-3	0.27	1.81	104	86	85	35.68	1.00
B-2	0.28	1.88	105	86	86	37.76	1.00
B-1	0.29	1.96	106	88	86	39.89	0.97
A-12	0.26	1.76	106	90	86	41.99	1.01
A-11	0.26	1.76	107	91	86	44.06	1.01
A-10	0.25	1.69	106	90	86	46.15	1.02
A-9	0.24	1.62	107	90	86	48.21	1.00
A-8	0.25	1.69	108	91	86	50.18	1.00
A-7	0.26	1.76	108	91	86	52.20	0.99
A-6	0.27	1.83	108	92	86	54.24	0.99
A-5	0.27	1.84	108	93	85	56.33	1.01
A-4	0.28	1.90	109	93	85	58.45	1.00
A-3	0.30	2.04	109	93	85	60.60	0.99
A-2	0.31	2.11	110	93	85	62.81	1.00
A-1	0.31	2.11	111	94	85	65.07	1.00
						67.34	

Sampling Data for - TEST 3
Pinnacle Renewable Energy Inc
Dryer1 Stack 1
Smithers BC

12-Sep-24

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.24	1.59	88	88	87	67.80	1.03
A-11	0.25	1.66	96	88	88	69.81	1.05
A-10	0.25	1.67	100	89	88	71.90	1.00
A-9	0.26	1.74	101	90	88	73.90	1.01
A-8	0.27	1.81	102	91	89	75.96	1.03
A-7	0.25	1.68	103	91	88	78.11	1.06
A-6	0.25	1.68	103	92	88	80.25	1.02
A-5	0.26	1.75	103	93	87	82.31	1.01
A-4	0.27	1.82	104	91	87	84.38	1.00
A-3	0.28	1.88	104	92	88	86.47	1.00
A-2	0.29	1.95	104	91	89	88.60	1.01
A-1	0.27	1.82	104	91	87	90.78	1.00
B-12	0.25	1.69	104	92	87	92.87	1.02
B-11	0.25	1.69	106	92	87	94.92	1.03
B-10	0.26	1.76	106	92	87	97.01	0.98
B-9	0.26	1.76	107	92	87	99.04	0.99
B-8	0.28	1.90	107	92	86	101.08	0.97
B-7	0.27	1.83	108	93	86	103.16	0.99
B-6	0.26	1.76	108	93	86	105.25	1.00
B-5	0.27	1.83	108	93	86	107.32	1.00
B-4	0.27	1.83	108	94	86	109.43	1.02
B-3	0.28	1.90	108	94	86	111.58	1.01
B-2	0.28	1.90	109	94	88	113.74	1.01
B-1	0.29	1.97	109	95	86	115.90	1.02
						118.14	



Pinnacle Renewable Energy Inc
Dryer1 Stack 1
Pinnacle Renewable Energy Inc

Data for TEST 1

OVERALL ISOKINETICS - TEST 1 0.990

Delta P:	0.268 "H₂O	Us avg:	30.49 ft/sec
Delta H:	1.762	ACFM:	60700 ft³/min
Tm avg:	549.2 °R	SDCFM:	54556 ft³/min
Ts avg:	543.7 °R	Vm std:	44.77 ft³
Bwo:	0.025	Vm corr:	48.84 ft³
Md:	28.84	Vm:	48.94 ft³
Ms:	28.57	MF:	0.9980
Pb:	28.40 "Hg	PCON:	6.15 mg/m³
Pm:	28.53 "Hg	ERAT:	0.57 kg/hr
Ps:	28.39 "Hg		

Data for TEST 2

OVERALL ISOKINETICS - TEST 2 1.008

Delta P:	0.267 "H₂O	Us avg:	30.51 ft/sec
Delta H:	1.800	ACFM:	60739 ft³/min
Tm avg:	555.9 °R	SDCFM:	54359 ft³/min
Ts avg:	545.6 °R	Vm std:	45.41 ft³
Bwo:	0.025	Vm corr:	50.14 ft³
Md:	28.84	Vm:	50.24 ft³
Ms:	28.57	MF:	0.9980
Pb:	28.40 "Hg	PCON:	6.14 mg/m³
Pm:	28.53 "Hg	ERAT:	0.57 kg/hr
Ps:	28.39 "Hg		

Data for TEST 3

OVERALL ISOKINETICS - TEST 3 1.010

Delta P:	0.265 "H₂O	Us avg:	30.41 ft/sec
Delta H:	1.786	ACFM:	60534 ft³/min
Tm avg:	558.0 °R	SDCFM:	54130 ft³/min
Ts avg:	547.2 °R	Vm std:	45.33 ft³
Bwo:	0.023	Vm corr:	50.24 ft³
Md:	28.84	Vm:	50.34 ft³
Ms:	28.59	MF:	0.9980
Pb:	28.40 "Hg	PCON:	4.91 mg/m³
Pm:	28.53 "Hg	ERAT:	0.45 kg/hr
Ps:	28.39 "Hg		

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	90 ° F	32 ° C
Moisture Content (by volume):	3.00 %	
Average Stack Gas Velocity:	30.5 ft/sec	9.3 m/sec
Total Actual Gas Flow Rate:	60622 ACFM	
Dry Gas flow Rate at Reference Conditions:	53585 SCFM	25.3 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.005 gr/ft ³	11.3 mg/m ³
Front Half Particulate	0.002 gr/ft ³	4.8 mg/m ³
Back Half Condensibles	0.003 gr/ft ³	6.5 mg/m ³
Mass Emission Rate	2.27 lbs/hr	1.03 kg/hr

SUMMARY OF AIR EMISSION TESTS
TEST 1:

Gas Temperature:	89 ° F	32 ° C
Moisture Content (by volume):	3.2 %	
Average Stack Gas Velocity:	30.3 ft/sec	9.2 m/sec
Total Actual Gas Flow Rate:	60411 ACFM	
Dry Gas flow Rate at Reference Conditions:	53393 SCFM	25.2 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.006 gr/ft ³	13.3 mg/m ³
Front Half Particulate	.002 gr/ft ³	4.4 mg/m ³
Back Half Condensibles	.004 gr/ft ³	8.9 mg/m ³
Mass Emission Rate	2.66 lbs/hr	1.20 kg/hr

TEST 2:

Gas Temperature:	90 ° F	32 ° C
Moisture Content (by volume):	2.9 %	
Average Stack Gas Velocity:	30.5 ft/sec	9.3 m/sec
Total Actual Gas Flow Rate:	60754 ACFM	
Dry Gas flow Rate at Reference Conditions:	53682 SCFM	25.3 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.005 gr/ft ³	10.4 mg/m ³
Front Half Particulate	.002 gr/ft ³	5.2 mg/m ³
Back Half Condensibles	.002 gr/ft ³	5.3 mg/m ³
Mass Emission Rate	2.10 lbs/hr	0.95 kg/hr

TEST 3:

Gas Temperature:	90 ° F	32 ° C
Moisture Content (by volume):	2.9 %	
Average Stack Gas Velocity:	30.5 ft/sec	9.3 m/sec
Total Actual Gas Flow Rate:	60700 ACFM	
Dry Gas flow Rate at Reference Conditions:	53679 SCFM	25.3 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.004 gr/ft ³	10.2 mg/m ³
Front Half Particulate	.002 gr/ft ³	4.8 mg/m ³
Back Half Condensibles	.002 gr/ft ³	5.4 mg/m ³
Mass Emission Rate	2.05 lbs/hr	0.93 kg/hr

DATA FOR TESTS 1 TO 3

Client: Pinnacle Renewable Energy Inc
Plant Location: Smithers BC
Process: Dryer1 Stack 2
Permit Number: RA-6099
Job Number: ME2425-068
Pollution Control Permit: 15.0 mg/m3 49.5 m3/sec
Number of Tests: 3 tests
Minutes per Point: 2.5 minutes

Filter Number:
Date of Test:
Start Time:
Stop Time:
On-line Sampling Time:
Testing Personnel:
Sampler Model:
Barometric Pressure("Hg):
Static Pressure("H₂O):
%CO₂:
%O₂:
%CO:
%N₂:
Diameter of Nozzle(inches):
Meter Factor:
Type-S Pitot Tube Coefficient:
Cross Sectional Area of Stack(ft²):
Impinger Condensate(g):
Weight of Moisture in Silica Gel(g):
Weight of Filter Particulate(g):
Weight of Probe Washings(g):
Weight of Impinger Content Organic(g):
Total Weight of Particulate(g):

TEST 1	TEST 2	TEST 3
M58	M59	M60
12-Sep-24	12-Sep-24	12-Sep-24
13:25	14:38	15:51
14:27	15:40	16:53
60	60	60
DB/CB	DB/CB	DB/CB
1021	1021	1021
28.40	28.40	28.40
-0.15	-0.15	-0.15
0.0	0.0	0.0
21.0	21.0	21.0
0.0	0.0	0.0
79.0	79.0	79.0
0.275	0.275	0.275
0.9945	0.9945	0.9945
0.83829	0.83829	0.83829
33.18	33.18	33.18
25	23	22
3.0	2.8	2.8
0.0010	0.0009	0.0010
0.0040	0.0050	0.0044
0.0100	0.0060	0.0060
0.0150	0.0119	0.0114

Sampling Data for - TEST 1
Pinnacle Renewable Energy Inc
Dryer1 Stack 2
Smithers BC

12-Sep-24

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.29	1.90	78	78	88	64.05	1.03
A-11	0.26	1.70	76	76	88	65.97	0.97
A-10	0.25	1.64	80	76	88	67.68	1.09
A-9	0.25	1.65	83	76	87	69.58	0.91
A-8	0.26	1.72	84	77	88	71.17	1.02
A-7	0.27	1.80	86	78	88	72.99	0.98
A-6	0.30	1.99	88	79	88	74.77	0.95
A-5	0.26	1.73	89	79	88	76.59	1.02
A-4	0.27	1.80	91	80	88	78.42	0.98
A-3	0.25	1.67	92	82	89	80.21	1.00
A-2	0.25	1.67	92	83	89	81.98	1.04
A-1	0.24	1.66	93	84	90	83.81	0.94
B-12	0.28	1.88	94	85	88	85.43	1.02
B-11	0.27	1.82	95	86	88	87.34	0.98
B-10	0.26	1.75	96	86	88	89.15	1.04
B-9	0.25	1.68	97	88	89	91.03	1.04
B-8	0.26	1.75	98	89	90	92.89	1.09
B-7	0.27	1.82	99	89	89	94.87	0.98
B-6	0.25	1.69	98	89	89	96.69	1.01
B-5	0.26	1.68	99	92	93	98.49	0.93
B-4	0.27	1.82	100	91	91	100.18	0.99
B-3	0.30	2.04	101	93	88	102.02	1.00
B-2	0.27	1.83	101	92	89	103.98	1.08
B-1	0.26	1.77	102	93	88	105.99	0.94
						107.72	

Sampling Data for - *TEST 2*
 Pinnacle Renewable Energy Inc
 Dryer1 Stack 2
 Smithers BC

12-Sep-24

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
B-12	0.29	1.93	87	87	90	8.01	1.05
B-11	0.28	1.86	90	88	92	10.00	1.01
B-10	0.25	1.67	94	88	91	11.89	1.01
B-9	0.28	1.74	96	88	91	13.68	0.90
B-8	0.27	1.82	96	89	90	15.37	1.02
B-7	0.25	1.67	97	94	91	17.25	1.05
B-6	0.30	2.02	98	90	90	19.13	1.00
B-5	0.29	1.96	100	91	90	21.09	0.94
B-4	0.28	1.89	100	91	90	22.91	1.04
B-3	0.25	1.69	100	92	90	24.89	0.98
B-2	0.25	1.69	101	92	90	26.64	0.98
B-1	0.24	1.63	101	93	90	28.40	1.04
A-12	0.28	1.89	102	94	91	30.23	0.97
A-11	0.27	1.83	103	94	91	32.08	1.02
A-10	0.26	1.75	104	95	90	33.98	1.02
A-9	0.27	1.83	104	95	90	35.85	1.01
A-8	0.26	1.77	104	96	90	37.75	1.02
A-7	0.25	1.70	104	96	90	39.63	1.05
A-6	0.24	1.64	105	97	90	41.53	1.01
A-5	0.26	1.77	105	97	91	43.32	0.95
A-4	0.27	1.78	105	98	90	45.08	1.00
A-3	0.28	1.92	106	98	90	46.97	1.02
A-2	0.27	1.85	106	98	90	48.92	1.01
A-1	0.27	1.84	107	99	91	50.82	1.03
						52.77	

Sampling Data for - TEST 3
 Pinnacle Renewable Energy Inc
 Dryer1 Stack 2
 Smithers BC

12-Sep-24

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.28	1.88	92	93	91	52.92	1.03
A-11	0.29	1.81	93	93	92	54.87	0.93
A-10	0.27	1.82	97	94	91	56.66	0.97
A-9	0.26	1.75	99	93	91	58.47	0.99
A-8	0.27	1.83	99	92	90	60.28	0.97
A-7	0.26	1.76	100	93	90	62.09	1.04
A-6	0.29	1.97	101	93	90	63.99	0.96
A-5	0.29	1.97	103	94	90	65.84	0.98
A-4	0.28	1.90	104	95	91	67.75	1.06
A-3	0.25	1.70	105	95	91	69.78	0.94
A-2	0.25	1.70	104	96	90	71.48	1.00
A-1	0.26	1.77	105	97	91	73.29	0.99
B-12	0.28	1.91	105	97	91	75.12	0.96
B-11	0.26	1.91	105	97	90	76.95	0.98
B-10	0.25	1.71	106	98	90	78.75	1.06
B-9	0.27	1.85	106	98	90	80.67	0.94
B-8	0.26	1.78	107	99	90	82.44	1.02
B-7	0.27	1.85	107	99	90	84.33	1.01
B-6	0.24	1.65	108	100	90	86.23	1.00
B-5	0.25	1.72	107	100	90	88.02	0.96
B-4	0.26	1.79	108	101	90	89.77	0.94
B-3	0.28	1.92	108	100	90	91.51	0.91
B-2	0.27	1.86	108	101	89	93.27	1.07
B-1	0.26	1.80	110	101	88	95.29	0.97
						97.10	



**Pinnacle Renewable Energy Inc
 Dryer1 Stack 2
 Pinnacle Renewable Energy Inc**

Data for TEST 1

OVERALL ISOKINETICS - TEST 1 1.002

Delta P:	0.264 "H₂O	Us avg:	30.35 ft/sec
Delta H:	1.769	ACFM:	60411 ft³/min
Tm avg:	548.2 °R	SDCFM:	53393 ft³/min
Ts avg:	548.7 °R	Vm std:	39.89 ft³
Bwo:	0.032	Vm corr:	43.43 ft³
Md:	28.84	Vm:	43.67 ft³
Ms:	28.49	MF:	0.9945
Pb:	28.40 "Hg	PCON:	13.28 mg/m³
Pm:	28.53 "Hg	ERAT:	1.20 kg/hr
Ps:	28.39 "Hg		

Data for TEST 2

OVERALL ISOKINETICS - TEST 2 1.005

Delta P:	0.267 "H₂O	Us avg:	30.52 ft/sec
Delta H:	1.798	ACFM:	60754 ft³/min
Tm avg:	557.0 °R	SDCFM:	53682 ft³/min
Ts avg:	550.4 °R	Vm std:	40.24 ft³
Bwo:	0.029	Vm corr:	44.51 ft³
Md:	28.84	Vm:	44.76 ft³
Ms:	28.52	MF:	0.9945
Pb:	28.40 "Hg	PCON:	10.44 mg/m³
Pm:	28.53 "Hg	ERAT:	0.95 kg/hr
Ps:	28.39 "Hg		

Data for TEST 3

OVERALL ISOKINETICS - TEST 3 0.987

Delta P:	0.266 "H₂O	Us avg:	30.49 ft/sec
Delta H:	1.817	ACFM:	60700 ft³/min
Tm avg:	560.1 °R	SDCFM:	53679 ft³/min
Ts avg:	550.3 °R	Vm std:	39.50 ft³
Bwo:	0.029	Vm corr:	43.94 ft³
Md:	28.84	Vm:	44.18 ft³
Ms:	28.53	MF:	0.9945
Pb:	28.40 "Hg	PCON:	10.19 mg/m³
Pm:	28.53 "Hg	ERAT:	0.93 kg/hr
Ps:	28.39 "Hg		

Pinnacle Renewable Energy Inc
Dryer1 Stack 3
Smithers BC

12-Sep-24

Permit Number: RA-6099

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	91 ° F	33 ° C
Moisture Content (by volume):	3.32 %	
Average Stack Gas Velocity:	32.2 ft/sec	9.8 m/sec
Total Actual Gas Flow Rate:	64074 ACFM	
Dry Gas flow Rate at Reference Conditions:	56373 SCFM	26.6 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.004 gr/ft ³	8.7 mg/m ³
Front Half Particulate	0.001 gr/ft ³	2.7 mg/m ³
Back Half Condensibles	0.003 gr/ft ³	6.0 mg/m ³
Mass Emission Rate	1.84 lbs/hr	0.83 kg/hr

SUMMARY OF AIR EMISSION TESTS

TEST 1:

Gas Temperature:	88 ° F	31 ° C
Moisture Content (by volume):	2.5 %	
Average Stack Gas Velocity:	32.5 ft/sec	9.9 m/sec
Total Actual Gas Flow Rate:	64688 ACFM	
Dry Gas flow Rate at Reference Conditions:	57612 SCFM	27.2 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.003 gr/ft ³	6.1 mg/m ³
Front Half Particulate	.001 gr/ft ³	1.7 mg/m ³
Back Half Condensibles	.002 gr/ft ³	4.4 mg/m ³
Mass Emission Rate	1.32 lbs/hr	0.60 kg/hr

TEST 2:

Gas Temperature:	91 ° F	33 ° C
Moisture Content (by volume):	4.2 %	
Average Stack Gas Velocity:	32.2 ft/sec	9.8 m/sec
Total Actual Gas Flow Rate:	64161 ACFM	
Dry Gas flow Rate at Reference Conditions:	55856 SCFM	26.4 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.005 gr/ft ³	11.0 mg/m ³
Front Half Particulate	.002 gr/ft ³	4.2 mg/m ³
Back Half Condensibles	.003 gr/ft ³	6.8 mg/m ³
Mass Emission Rate	2.30 lbs/hr	1.04 kg/hr

TEST 3:

Gas Temperature:	92 ° F	33 ° C
Moisture Content (by volume):	3.2 %	
Average Stack Gas Velocity:	31.8 ft/sec	9.7 m/sec
Total Actual Gas Flow Rate:	63371 ACFM	
Dry Gas flow Rate at Reference Conditions:	55651 SCFM	26.3 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.004 gr/ft ³	9.1 mg/m ³
Front Half Particulate	.001 gr/ft ³	2.3 mg/m ³
Back Half Condensibles	.003 gr/ft ³	6.8 mg/m ³
Mass Emission Rate	1.89 lbs/hr	0.86 kg/hr

DATA FOR TESTS 1 TO 3

Client: Pinnacle Renewable Energy Inc
Plant Location: Smithers BC
Process: Dryer1 Stack 3
Permit Number: RA-6099
Job Number:
Pollution Control Permit: 15.0 mg/m3 49.5 m3/sec
Number of Tests: 3 tests
Minutes per Point: 2.5 minutes

Filter Number:
Date of Test:
Start Time:
Stop Time:
On-line Sampling Time:
Testing Personnel:
Sampler Model:
Barometric Pressure("Hg):
Static Pressure("H₂O):
%CO₂:
%O₂:
%CO:
%N₂:
Diameter of Nozzle(inches):
Meter Factor:
Type-S Pitot Tube Coefficient:
Cross Sectional Area of Stack(ft²):
Impinger Condensate(g):
Weight of Moisture in Silica Gel(g):
Weight of Filter Particulate(g):
Weight of Probe Washings(g):
Weight of Impinger Content Organic(g):
Total Weight of Particulate(g):

TEST 1	TEST 2	TEST 3
M21	M22	M23
12-Sep-24	12-Sep-24	12-Sep-24
9:14	10:31	11:41
10:16	11:33	12:43
60	60	60
CB/DB	CB/DB	CB/DB
980	980	980
28.40	28.40	28.40
-0.14	-0.14	-0.14
0.0	0.0	0.0
21.0	21.0	21.0
0.0	0.0	0.0
79.0	79.0	79.0
0.290	0.290	0.290
0.998	0.998	0.998
0.84182	0.84182	0.84182
33.18	33.18	33.18
24	38	31
2.5	5.6	2.5
0.0010	0.0029	0.0017
0.0013	0.0027	0.0014
0.0060	0.0090	0.0090
0.0083	0.0146	0.0121

Sampling Data for - *TEST 1*
 Pinnacle Renewable Energy Inc
 Dryer1 Stack 3
 Smithers BC

12-Sep-24

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.20	1.22	51	51	88	12.56	1.04
A-11	0.21	1.28	65	52	88	14.28	0.93
A-10	0.22	1.40	65	53	88	15.88	0.99
A-9	0.25	1.60	70	56	88	17.62	1.00
A-8	0.32	2.06	72	56	87	19.51	0.95
A-7	0.35	2.26	74	56	87	21.55	1.01
A-6	0.37	2.39	75	57	88	23.82	1.02
A-5	0.34	2.20	77	58	89	26.18	1.02
A-4	0.35	2.27	78	59	89	28.44	0.97
A-3	0.36	2.33	80	61	89	30.62	1.04
A-2	0.36	2.35	82	63	89	33.00	1.02
A-1	0.35	2.29	85	65	89	35.34	1.04
B-12	0.21	1.38	86	66	89	37.70	1.00
B-11	0.21	1.38	87	68	89	39.48	1.00
B-10	0.23	1.52	88	69	89	41.26	0.99
B-9	0.24	1.59	89	70	88	43.11	1.03
B-8	0.29	1.92	90	71	88	45.07	1.01
B-7	0.33	2.19	91	71	87	47.20	1.00
B-6	0.35	2.33	92	72	88	49.44	1.01
B-5	0.36	2.40	93	73	88	51.78	1.01
B-4	0.36	2.40	93	74	89	54.14	1.01
B-3	0.35	2.33	94	75	89	56.52	1.02
B-2	0.36	2.41	96	75	88	58.88	1.00
B-1	0.35	2.34	97	76	88	61.23	0.98
						63.52	

Sampling Data for - TEST 2
Pinnacle Renewable Energy Inc
Dryer1 Stack 3
Smithers BC

12-Sep-24

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
B-12	0.20	1.29	70	70	92	63.90	1.05
B-11	0.22	1.44	83	71	91	65.66	1.03
B-10	0.22	1.44	85	71	91	67.51	1.01
B-9	0.24	1.58	88	72	91	69.32	1.04
B-8	0.28	1.85	89	73	91	71.27	1.02
B-7	0.30	1.98	90	74	91	73.34	1.03
B-6	0.34	2.25	92	74	91	75.50	0.99
B-5	0.36	2.39	93	75	91	77.72	1.00
B-4	0.35	2.32	95	75	91	80.04	1.01
B-3	0.35	2.32	96	75	92	82.35	0.97
B-2	0.34	2.27	97	76	91	84.57	1.02
B-1	0.34	2.27	98	77	91	86.88	1.05
A-12	0.22	1.47	99	79	91	89.25	1.02
A-11	0.22	1.48	99	80	91	91.11	1.05
A-10	0.23	1.54	99	80	91	93.04	1.05
A-9	0.25	1.68	99	81	91	95.00	1.03
A-8	0.28	1.88	100	82	92	97.01	1.02
A-7	0.31	2.08	100	83	92	99.11	1.02
A-6	0.34	2.23	100	83	92	101.34	1.00
A-5	0.35	2.30	101	84	92	103.62	1.00
A-4	0.35	2.30	101	84	92	105.94	1.01
A-3	0.34	2.24	102	85	92	108.27	0.97
A-2	0.34	2.24	102	85	92	110.48	0.98
A-1	0.33	2.17	102	85	91	112.71	0.97
						114.90	

Sampling Data for - TEST 3
 Pinnacle Renewable Energy Inc
 Dryer1 Stack 3
 Smithers BC

12-Sep-24

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.21	1.36	78	78	96	15.40	1.01
A-11	0.22	1.46	92	81	94	17.18	1.01
A-10	0.23	1.53	94	81	94	19.02	1.06
A-9	0.24	1.60	95	81	94	21.00	1.04
A-8	0.27	1.80	96	82	93	23.00	1.02
A-7	0.29	1.94	97	82	93	25.08	0.99
A-6	0.33	2.21	98	82	93	27.18	1.00
A-5	0.35	2.35	101	83	93	29.44	1.02
A-4	0.35	2.35	102	84	93	31.81	1.02
A-3	0.34	2.29	103	85	94	34.18	1.02
A-2	0.34	2.29	103	85	92	36.52	1.02
A-1	0.33	2.23	103	85	91	38.88	1.02
B-12	0.21	1.42	103	86	91	41.20	1.01
B-11	0.22	1.49	103	87	91	43.04	1.05
B-10	0.23	1.56	103	87	91	45.00	1.05
B-9	0.24	1.63	104	88	91	47.01	1.02
B-8	0.25	1.70	105	89	91	49.00	1.01
B-7	0.28	1.91	106	90	90	51.01	1.01
B-6	0.32	2.18	106	90	90	53.15	0.99
B-5	0.34	2.32	106	91	90	55.38	0.99
B-4	0.35	2.39	106	90	90	57.69	1.03
B-3	0.35	2.39	106	91	91	60.11	1.02
B-2	0.34	2.32	106	91	91	62.51	1.00
B-1	0.31	2.11	107	91	91	64.83	1.07
						67.20	



Pinnacle Renewable Energy Inc
 Dryer1 Stack 3
 Pinnacle Renewable Energy Inc

Data for **TEST 1**

OVERALL ISOKINETICS - TEST 1 1.004

Delta P:	0.302 "H ₂ O	Us avg:	32.49 ft/sec
Delta H:	1.993	ACFM:	64688 ft ³ /min
Tm avg:	533.3 °R	SDCFM:	57612 ft ³ /min
Ts avg:	548.3 °R	Vm std:	48.04 ft ³
Bwo:	0.025	Vm corr:	50.86 ft ³
Md:	28.84	Vm:	50.96 ft ³
Ms:	28.57	MF:	0.9980
Pb:	28.40 "Hg	PCON:	6.10 mg/m ³
Pm:	28.55 "Hg	ERAT:	0.60 kg/hr
Ps:	28.39 "Hg		

Data for **TEST 2**

OVERALL ISOKINETICS - TEST 2 1.014

Delta P:	0.293 "H ₂ O	Us avg:	32.23 ft/sec
Delta H:	1.959	ACFM:	64161 ft ³ /min
Tm avg:	546.5 °R	SDCFM:	55856 ft ³ /min
Ts avg:	551.4 °R	Vm std:	46.91 ft ³
Bwo:	0.042	Vm corr:	50.90 ft ³
Md:	28.84	Vm:	51.00 ft ³
Ms:	28.39	MF:	0.9980
Pb:	28.40 "Hg	PCON:	10.99 mg/m ³
Pm:	28.54 "Hg	ERAT:	1.04 kg/hr
Ps:	28.39 "Hg		

Data for **TEST 3**

OVERALL ISOKINETICS - TEST 3 1.020

Delta P:	0.287 "H ₂ O	Us avg:	31.83 ft/sec
Delta H:	1.951	ACFM:	63371 ft ³ /min
Tm avg:	553.4 °R	SDCFM:	55651 ft ³ /min
Ts avg:	552.0 °R	Vm std:	47.05 ft ³
Bwo:	0.032	Vm corr:	51.70 ft ³
Md:	28.84	Vm:	51.80 ft ³
Ms:	28.49	MF:	0.9980
Pb:	28.40 "Hg	PCON:	9.08 mg/m ³
Pm:	28.54 "Hg	ERAT:	0.86 kg/hr
Ps:	28.39 "Hg		

Pinnacle Renewable Energy Inc.
Dryer1 Stack 4
Smithers BC

12-Sep-24
Permit Number: RA-6099

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	99 ° F	37 ° C
Moisture Content (by volume):	3.43 %	
Average Stack Gas Velocity:	30.7 ft/sec	9.4 m/sec
Total Actual Gas Flow Rate:	61131 ACFM	
Dry Gas flow Rate at Reference Conditions:	52942 SCFM	25.0 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.015 gr/ft ³	34.3 mg/m ³
Front Half Particulate	0.003 gr/ft ³	7.3 mg/m ³
Back Half Condensibles	0.012 gr/ft ³	27.1 mg/m ³
Mass Emission Rate	6.81 lbs/hr	3.09 kg/hr

SUMMARY OF AIR EMISSION TESTS

TEST 1:

Gas Temperature:	97 ° F	36 ° C
Moisture Content (by volume):	2.2 %	
Average Stack Gas Velocity:	30.7 ft/sec	9.4 m/sec
Total Actual Gas Flow Rate:	61097 ACFM	
Dry Gas flow Rate at Reference Conditions:	53694 SCFM	25.3 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.014 gr/ft ³	32.7 mg/m ³
Front Half Particulate	.003 gr/ft ³	7.5 mg/m ³
Back Half Condensibles	.011 gr/ft ³	25.2 mg/m ³
Mass Emission Rate	6.58 lbs/hr	2.98 kg/hr

TEST 2:

Gas Temperature:	100 ° F	38 ° C
Moisture Content (by volume):	4.0 %	
Average Stack Gas Velocity:	30.8 ft/sec	9.4 m/sec
Total Actual Gas Flow Rate:	61288 ACFM	
Dry Gas flow Rate at Reference Conditions:	52646 SCFM	24.8 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.014 gr/ft ³	32.0 mg/m ³
Front Half Particulate	.001 gr/ft ³	3.4 mg/m ³
Back Half Condensibles	.013 gr/ft ³	28.6 mg/m ³
Mass Emission Rate	6.31 lbs/hr	2.86 kg/hr

TEST 3:

Gas Temperature:	98 ° F	37 ° C
Moisture Content (by volume):	4.1 %	
Average Stack Gas Velocity:	30.6 ft/sec	9.3 m/sec
Total Actual Gas Flow Rate:	61009 ACFM	
Dry Gas flow Rate at Reference Conditions:	52485 SCFM	24.8 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.017 gr/ft ³	38.3 mg/m ³
Front Half Particulate	.005 gr/ft ³	10.8 mg/m ³
Back Half Condensibles	.012 gr/ft ³	27.5 mg/m ³
Mass Emission Rate	7.54 lbs/hr	3.42 kg/hr

DATA FOR TESTS 1 TO 3

Client: Pinnacle Renewable Energy Inc.
Plant Location: Smithers BC
Process: Dryer1 Stack 4
Permit Number: RA-6099
Job Number: ME2425-068
Pollution Control Permit: 15.0 mg/m3 49.5 m3/sec
Number of Tests: 3 tests
Minutes per Point: 2.5 minutes

Filter Number:
Date of Test:
Start Time:
Stop Time:
On-line Sampling Time:
Testing Personnel:
Sampler Model:
Barometric Pressure("Hg):
Static Pressure("H₂O):
%CO₂:
%O₂:
%CO:
%N₂:
Diameter of Nozzle(inches):
Meter Factor:
Type-S Pitot Tube Coefficient:
Cross Sectional Area of Stack(ft²):
Impinger Condensate(g):
Weight of Moisture in Silica Gel(g):
Weight of Filter Particulate(g):
Weight of Probe Washings(g):
Weight of Impinger Content Organic(g):
Total Weight of Particulate(g):

TEST 1	TEST 2	TEST 3
M24	M25	M54
12-Sep-24	12-Sep-24	12-Sep-24
9:07	10:21	11:33
10:09	11:23	12:35
60	60	60
DB/CB	DB/CB	DB/CB
1021	1021	1021
28.40	28.40	28.40
-0.21	-0.21	-0.21
0.0	0.0	0.0
21.0	21.0	21.0
0.0	0.0	0.0
79.0	79.0	79.0
0.275	0.275	0.275
0.9945	0.9945	0.9945
0.83829	0.83829	0.83829
33.18	33.18	33.18
17	32	33
2.8	2.6	3.1
0.0018	0.0010	0.0006
0.0069	0.0028	0.0116
0.0290	0.0320	0.0310
0.0377	0.0358	0.0432

Sampling Data for - TEST 1
Pinnacle Renewable Energy Inc.
Dryer1 Stack 4
Smithers BC

12-Sep-24

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.25	1.56	50	50	96	32.10	1.07
A-11	0.23	1.44	57	53	96	33.86	1.07
A-10	0.22	1.42	61	54	96	35.57	1.10
A-9	0.22	1.39	64	55	97	37.29	1.09
A-8	0.25	1.59	66	56	97	39.00	0.92
A-7	0.26	1.66	67	59	98	40.55	0.98
A-6	0.27	1.73	71	58	97	42.23	1.02
A-5	0.29	1.86	72	59	98	44.02	1.02
A-4	0.30	1.93	74	61	99	45.87	1.01
A-3	0.31	2.00	76	63	100	47.74	1.01
A-2	0.31	2.00	78	64	99	49.65	1.00
A-1	0.32	2.01	79	65	98	51.55	1.03
B-12	0.24	1.56	81	67	98	53.54	1.04
B-11	0.23	1.50	81	68	98	55.29	1.06
B-10	0.23	1.50	81	70	99	57.04	1.09
B-9	0.22	1.44	82	72	99	58.84	1.08
B-8	0.24	1.57	82	72	99	60.60	1.08
B-7	0.25	1.64	84	73	97	62.43	0.94
B-6	0.28	1.85	86	75	96	64.07	0.99
B-5	0.29	1.92	88	75	96	65.89	0.98
B-4	0.30	1.99	88	76	95	67.73	0.95
B-3	0.30	2.00	88	77	94	69.55	0.94
B-2	0.32	2.14	90	78	95	71.36	0.99
B-1	0.31	2.07	91	81	96	73.33	1.00
						75.29	

Sampling Data for - TEST 2
Pinnacle Renewable Energy Inc.
Dryer1 Stack 4
Smithers BC

12-Sep-24

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
B-12	0.25	1.63	75	75	98	76.20	1.04
B-11	0.24	1.57	80	76	99	77.96	0.93
B-10	0.22	1.44	82	76	100	79.52	1.02
B-9	0.21	1.38	84	77	99	81.15	1.02
B-8	0.22	1.45	84	77	97	82.76	1.00
B-7	0.24	1.32	86	77	98	84.37	0.94
B-6	0.27	1.78	86	78	99	85.96	1.01
B-5	0.29	1.92	89	79	99	87.76	1.01
B-4	0.30	1.99	91	80	100	89.64	1.01
B-3	0.30	1.99	91	81	101	91.56	1.03
B-2	0.31	2.06	93	82	100	93.51	1.02
B-1	0.32	2.13	94	83	101	95.48	1.01
A-12	0.32	2.13	94	83	102	97.46	1.07
A-11	0.25	1.66	95	84	102	99.55	0.97
A-10	0.23	1.54	96	85	101	101.24	1.02
A-9	0.21	1.39	94	85	104	102.94	0.99
A-8	0.22	1.46	93	86	103	104.52	1.01
A-7	0.25	1.66	94	87	103	106.16	0.99
A-6	0.27	1.80	95	87	103	107.89	1.03
A-5	0.28	1.88	97	88	100	109.75	1.01
A-4	0.28	1.89	102	88	99	111.63	1.00
A-3	0.30	2.03	101	89	97	113.49	0.97
A-2	0.31	2.10	98	89	97	115.37	1.02
A-1	0.32	2.10	99	90	99	117.37	1.00
						119.35	

Sampling Data for - TEST 3
 Pinnacle Renewable Energy Inc.
 Dryer1 Stack 4
 Smithers BC

12-Sep-24

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.25	1.66	87	87	98	119.80	1.06
A-11	0.24	1.60	89	88	100	121.64	1.03
A-10	0.23	1.54	93	88	100	123.39	1.03
A-9	0.22	1.47	93	88	100	125.12	1.00
A-8	0.22	1.47	93	87	99	126.76	1.01
A-7	0.25	1.67	93	88	100	128.41	1.00
A-6	0.28	1.88	94	88	99	130.15	1.00
A-5	0.29	1.66	95	88	97	131.99	1.06
A-4	0.29	1.96	96	89	98	133.99	0.98
A-3	0.31	2.09	97	89	98	135.84	1.09
A-2	0.3	2.02	98	89	99	137.97	1.00
A-1	0.31	2.09	98	90	98	139.89	0.97
B-12	0.24	1.61	98	90	102	141.78	1.04
B-11	0.22	1.49	99	91	99	143.56	1.04
B-10	0.23	1.55	99	91	98	145.28	1.03
B-9	0.22	1.46	98	91	98	147.02	0.95
B-8	0.24	1.62	98	92	98	148.59	1.03
B-7	0.26	1.76	98	92	98	150.37	0.92
B-6	0.28	1.90	99	92	97	152.02	1.03
B-5	0.28	1.91	100	93	97	153.95	1.02
B-4	0.29	1.98	101	93	96	155.85	1.01
B-3	0.30	2.04	101	94	97	157.77	0.98
B-2	0.31	2.11	103	94	98	159.67	1.03
B-1	0.30	2.04	102	93	98	161.69	1.09
						163.79	



Pinnacle Renewable Energy Inc.
 Dryer1 Stack 4
 Pinnacle Renewable Energy Inc.

Data for **TEST 1**

OVERALL ISOKINETICS - TEST 1 1.018

Delta P:	0.267 "H ₂ O	Us avg:	30.69 ft/sec
Delta H:	1.740	ACFM:	61097 ft ³ /min
Tm avg:	531.2 °R	SDCFM:	53694 ft ³ /min
Ts avg:	557.2 °R	Vm std:	40.71 ft ³
Bwo:	0.022	Vm corr:	42.95 ft ³
Md:	28.84	Vm:	43.19 ft ³
Ms:	28.60	MF:	0.9945
Pb:	28.40 "Hg	PCON:	32.71 mg/m ³
Pm:	28.53 "Hg	ERAT:	2.98 kg/hr
Ps:	28.38 "Hg		

Data for **TEST 2**

OVERALL ISOKINETICS - TEST 2 1.005

Delta P:	0.266 "H ₂ O	Us avg:	30.79 ft/sec
Delta H:	1.763	ACFM:	61288 ft ³ /min
Tm avg:	547.0 °R	SDCFM:	52646 ft ³ /min
Ts avg:	560.0 °R	Vm std:	39.50 ft ³
Bwo:	0.040	Vm corr:	42.91 ft ³
Md:	28.84	Vm:	43.15 ft ³
Ms:	28.41	MF:	0.9945
Pb:	28.40 "Hg	PCON:	32.01 mg/m ³
Pm:	28.53 "Hg	ERAT:	2.86 kg/hr
Ps:	28.38 "Hg		

Data for **TEST 3**

OVERALL ISOKINETICS - TEST 3 1.016

Delta P:	0.264 "H ₂ O	Us avg:	30.65 ft/sec
Delta H:	1.774	ACFM:	61009 ft ³ /min
Tm avg:	553.5 °R	SDCFM:	52485 ft ³ /min
Ts avg:	558.4 °R	Vm std:	39.80 ft ³
Bwo:	0.041	Vm corr:	43.75 ft ³
Md:	28.84	Vm:	43.99 ft ³
Ms:	28.40	MF:	0.9945
Pb:	28.40 "Hg	PCON:	38.34 mg/m ³
Pm:	28.53 "Hg	ERAT:	3.42 kg/hr
Ps:	28.38 "Hg		

Air Emission Monitoring Procedure **State Of Oregon Method 7**

Particulate Sampling (Napp-Baldwin Model 31 Sampler)

Particulate sampling and gas velocity measurements were conducted using a Napp-Baldwin Model 31 stack sampler in accordance with the methods specified in State of Oregon Method 7 (See Figure 1). The State of Oregon Method 7 sampling train is a modified Method 5 sample train with the addition of a non heated filter in-between the third and fourth impinger.

The air discharge was sampled isokinetically at the centroid of a series of equal area segments across the duct or stack. The stack gas velocity and temperature were recorded during the sample collection period with a calibrated pitot tube and thermocouple mounted on the sampling probe. The sample was delivered from the probe to a cyclone and a filter holder containing a 110mm Type A glass fiber filter. The gas sample was then drawn in through a series of four glass impingers which condensed and absorbed the water from the gas. A leakless vacuum pump carried the sampled gas through a dry gas test meter where the volume, temperature, and pressure were measured; and finally through a flow indicating orifice which allowed for the rapid adjustment to isokinetic sampling rates.

At the end of each test, the probe interior, cyclone and connecting tubing from the probe to the filter housing were rinsed with distilled water and acetone. These washings were evaporated to dryness and the resulting solids were weighed. The weight of the cyclone flask and the filter was used together with the weight of solids in the washings to calculate the filterable particulate concentration. The moisture content of the stack gas was determined from the quantity of water condensed in the impingers and absorbed in the silica gel.

Condensable Organics are collected in the impinger train and a rinsing procedure is employed utilizing solvents such as Hexane or Methylene Chloride in between tests. The rinsings and condensate are forwarded to a laboratory accredited to perform the analysis in accordance with the method and a copy of that report is included in the Appendix of any report issued.

O₂, CO₂, CO (where applicable)

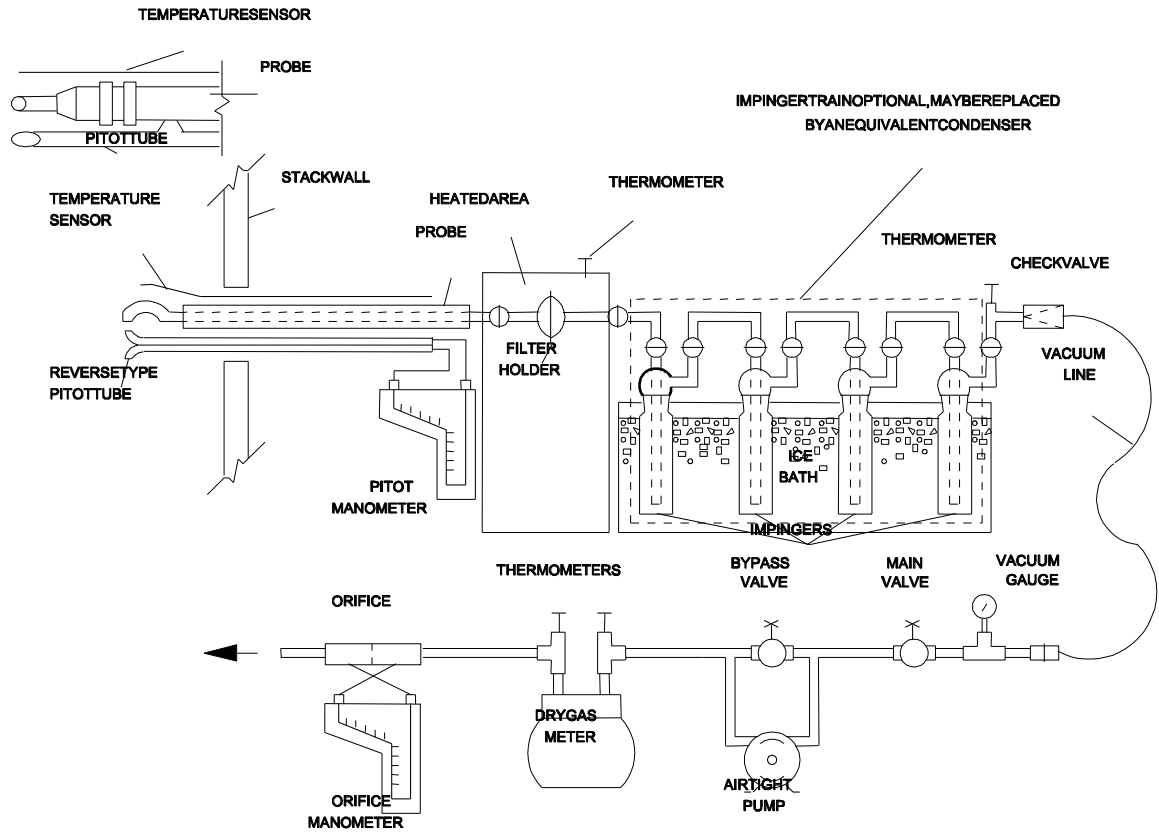
O₂, CO₂, and CO were found using either Fuji Analytical Analyzer by means of infrared and paramagnetic technology (EPA 3A) or by fyrite (EPA Method 3).

NO_x (where applicable)

NO_x was found using and API Model 252 NO_x analyzer that utilizes chemiluminescent technology. Stack gas was Samples were taken over a minimum period of three hours.

VOC's (where applicable)

Hydrocarbons were measured in accordance with EPA method 25A. Samples were drawn in one hour test runs using a total hydrocarbon analyzer that utilizes Flame Ionization Technology.



Modified EPA Method 5 Diagram (State of Oregon Method 7)- Figure 1

GENERAL CALCULATIONS

Carry out calculations, retaining at least one extra decimal figure beyond that of the acquired data. Round off figures after the final calculation. Other forms of the equations may be used as long as they give equivalent results.

Nomenclature.

- A_n = Cross-sectional area of nozzle, m^2 (ft^2).
 B_{ws} = Water vapor in the gas stream, proportion by volume.
 C_a = Acetone blank residue concentration, mg/g .
 c_s = Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, $g/dscm$ ($g/dscf$).
 I = Percent of isokinetic sampling.
 L_a = Maximum acceptable leakage rate for either a pretest leak check or for a leak check following a component change; equal to $0.00057 m^3/min$ ($0.02 cfm$) or 4 percent of the average sampling rate, whichever is less.
 L_i = Individual leakage rate observed during the leak check conducted prior to the " i^{th} " component change ($i = 1, 2, 3...n$), m^3/min (cfm).
 L_p = Leakage rate observed during the post-test leak check, m^3/min (cfm).
 m_a = Mass of residue of acetone after evaporation, mg .
 m_n = Total amount of particulate matter collected, mg .
 M_w = Molecular weight of water, $18.0 g/g\text{-mole}$ ($18.0 lb/lb\text{-mole}$).
 P_{bar} = Barometric pressure at the sampling site, $mm Hg$ ($in. Hg$).
 P_s = Absolute stack gas pressure, $mm Hg$ ($in. Hg$).
 P_{std} = Standard absolute pressure, $760 mm Hg$ ($29.92 in. Hg$).
 R = Ideal gas constant, $0.06236 \frac{[(mmHg)(m^3)]}{[(^{\circ}K)(g\text{-mole})]}$
 $\{21.85 \frac{[(in. Hg)(ft^3)]}{[(^{\circ}R)(lb\text{-mole})]}\}$.
 T_m = Absolute average DGM temperature (see Figure 5-2), $^{\circ}K$ ($^{\circ}R$).
 T_s = Absolute average stack gas temperature (see Figure 5-2), $^{\circ}K$ ($^{\circ}R$).
 T_{std} = Standard absolute temperature, $293^{\circ}K$ ($528^{\circ}R$).
 V_a = Volume of acetone blank, ml .
 V_{aw} = Volume of acetone used in wash, ml .
 V_{lc} = Total volume liquid collected in impingers and silica gel (see Figure 5-3), ml .
 V_m = Volume of gas sample as measured by dry gas meter, dcm (dcf).
 $V_{m(std)}$ = Volume of gas sample measured by the dry gas meter, corrected to standard conditions, $dscm$ ($dscf$).
 $V_{w(std)}$ = Volume of water vapor in the gas sample, corrected to standard conditions, scm (scf).
 v_s = Stack gas velocity, calculated by Method 2, Equation 2-9, using data obtained from Method 5, m/sec (ft/sec).
 W_a = Weight of residue in acetone wash, mg .
 Y = Dry gas meter calibration factor.
 ΔH = Average pressure differential across the orifice meter (see Figure 5-2), $mm H_2O$ ($in. H_2O$).
 ρ_a = Density of acetone, mg/ml (see label on bottle).
 ρ_w = Density of water, $0.9982 g/ml$ ($0.002201 lb/ml$).
 θ = Total sampling time, min .
 θ_1 = Sampling time interval, from the beginning of a run until the first component change, min .
 θ_i = Sampling time interval, between two successive component changes, beginning with the interval between the first and second changes, min .
 θ_p = Sampling time interval, from the final (n^{th}) component change until the end of the sampling run, min .
 13.6 = Specific gravity of mercury.
 60 = Sec/min .
 100 = Conversion to percent.

Average Dry Gas Meter Temperature and Average Orifice Pressure Drop.

Dry Gas Volume. Correct the sample volume measured by the dry gas meter to standard conditions (20°C, 760 mm Hg or 68°F, 29.92 in. Hg) by using Equation 5-1.

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

$$= K_1 V_m Y \frac{P_{\text{bar}} + \left(\frac{\Delta H}{13.6} \right)}{T_m}$$

Eq. 5-1

where:

$$K_1 = 0.3858 \text{ } ^\circ\text{K/mm Hg for metric units,}$$

$$= 17.64 \text{ } ^\circ\text{R/in. Hg for English units.}$$

NOTE: Equation 5-1 can be used as written unless leakage rate observed during any of the mandatory leak checks (i.e., the post-test leak check or leak checks conducted prior to component changes) exceeds L_a . If L_p or L_i exceeds L_a , Equation 5-1 must be modified as follows:

(a) Case I. No component changes made during sampling run. In this case, replace V_m in Equation 5-1 with the expression:

$$[V_m - (L_p - L_a) \theta]$$

(b) Case II. One or more component changes made during the sampling run. In this case, replace V_m in Equation 5-1 by the expression:

$$\left[V_m - (L_1 - L_a) \theta_1 - \sum_{i=2}^n (L_i - L_a) \theta_i - (L_p - L_a) \theta_p \right]$$

and substitute only for those leakage rates (L_i or L_p) which exceed L_a .

Volume of Water Vapor.

$$V_{w(\text{std})} = \frac{V_{lc} \rho_w R T_{\text{std}}}{M_w P_{\text{std}}} = K_2 V_{lc}$$

Eq. 5-2

where:

$$K_2 = 0.001333 \text{ m}^3/\text{ml for metric units,}$$

$$= 0.04707 \text{ ft}^3/\text{ml for English units.}$$

Moisture Content.

$$B_{ws} = \frac{V_{w(std)}}{V_{m(std)} + V_{w(std)}} \quad \text{Eq. 5-3}$$

Acetone Blank Concentration.

$$C_a = \frac{m_a}{V_a \rho_a} \quad \text{Eq. 5-4}$$

Acetone Wash Blank.

$$W_a = C_a V_{aw} \rho_a \quad \text{Eq. 5-5}$$

Total Particulate Weight. Determine the total particulate matter catch from the sum of the weights obtained from Containers 1 and 2 less the acetone blank (see Figure 5-3).

Particulate Concentration.

$$C_s = (0.001 \text{ g/mg})(m_n / V_{m(std)}) \quad \text{Eq. 5-6}$$

Conversion Factors:

<u>From</u>	<u>To</u>	<u>Multiply by</u>
scf	m ³	0.02832
g/ft ³	gr/ft ³	15.43
g/ft ³	lb/ft ³	2.205 x 10 ⁻³
g/ft ³	g/m ³	35.31

Isokinetic Variation.

Calculation from Raw Data.

$$I = \frac{100 T_s [K_3 V_{1c} + (V_m Y / T_m)(P_{bar} + \Delta H / 13.6)]}{60 \theta V_s P_s A_n} \quad \text{Eq. 5-7}$$

where:

$$\begin{aligned} K_3 &= 0.003454 [(\text{mm Hg})(\text{m}^3)]/[(\text{ml})(^\circ\text{K})] \text{ for metric units,} \\ &= 0.002669 [(\text{in. Hg})(\text{ft}^3)]/[(\text{ml})(^\circ\text{R})] \text{ for English units.} \end{aligned}$$

Calculation from Intermediate Values.

$$I = \frac{100 T_s V_{m(\text{std})} P_{\text{std}}}{60 T_{\text{std}} v_s \theta A_n P_s (1 - B_{\text{ws}})}$$

$$= \frac{K_4 T_s V_{m(\text{std})}}{P_s v_s A_n \theta (1 - B_{\text{ws}})}$$

Eq.5-8

where:

$K_4 = 4.320$ for metric units,

$= 0.09450$ for English units.

Acceptable Results. If 90 percent $\leq I \leq 110$ percent, the results are acceptable. If the PM results are low in comparison to the standard, and "I" is over 110 percent or less than 90 percent, the Administrator may opt to accept the results. Citation 4 in the Bibliography may be used to make acceptability judgments. If "I" is judged to unacceptable, reject the results, and repeat the test.

Average Stack Gas Velocity.

$$v_s = K_p C_p (\sqrt{\Delta p})_{\text{avg}} \sqrt{\frac{T_{s(\text{avg})}}{P_s M_s}}$$

Average Stack Gas Dry Volumetric Flow Rate.

$$Q_{\text{sd}} = 3,600(1 - B_{\text{ws}}) v_s A \frac{T_{\text{std}}}{T_{s(\text{avg})}} \frac{P_s}{P_{\text{std}}}$$

where:

- A = Cross-sectional area of stack, m² (ft²).
- B_{ws} = Water vapor in the gas stream (from Method 5 or Reference Method 4), proportion by volume.
- C_p = Pitot tube coefficient, dimensionless.
- K_p = Pitot tube constant,
- M_d = Molecular weight of stack gas, dry basis (see Section 3.6), g/gmole (lb/lb-mole).
- M_s = Molecular weight of stack gas, wet basis, g/g-mole (lb/lb-mole).

$$= M_d (1 - B_{\text{ws}}) + 18.0 B_{\text{ws}} \tag{Eq. 2-5}$$

- P_{bar} = Barometric pressure at measurement site, mm Hg (in. Hg).
- P_g = Stack static pressure, mm Hg (in. Hg).
- P_s = Absolute stack pressure, mm Hg (in. Hg),

$$= P_{\text{bar}} + P_g$$

- P_{std} = Standard absolute pressure, 760 mm Hg (29.92 in. Hg).
- Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, dsm³/hr (dscf/hr).
- t_s = Stack temperature, °C (°F).
- T_s = Absolute stack temperature, °K (°R).

Calibration Certificate for S-Type Pitot Tube

Date: 10-Jan-24 *Barometric Pressure ("Hg):* 30.05
Pitot I.D.: **140** *Wind Tunnel Temperature (°F):* 70.0
Nozzle: 0.250

<i>Wind Velocity (ft/sec)</i>	<i>Ref.Pitot ("H₂O)</i>	<i>S-Type Pitot ("H₂O)</i>	<i>Pitot Factor</i>
13.96	0.04470	0.05733	0.87412
19.79	0.08982	0.12082	0.85361
42.36	0.41144	0.58576	0.82971
59.59	0.81441	1.17118	0.82555
80.40	1.48260	2.12088	0.82773
101.66	2.37016	3.46311	0.81901

Average= 0.83829

Note: The new pitot tip should be installed so that the serial number engraved is aligned directly into the gas stream.

Calibrating Technician Signature:



Calibration Certificate for S-Type Pitot Tube

Date: 10-Jan-24 Barometric Pressure ("Hg): 29.9
Pitot I.D.: **107** Wind Tunnel Temperature ($^{\circ}$ F): 66.0
Nozzle: 0.250

Wind Velocity (ft/sec)	Ref.Pitot ("H ₂ O)	S-Type Pitot ("H ₂ O)	Pitot Factor
11.72	0.03161	0.04242	0.85459
26.28	0.15880	0.22190	0.83748
42.45	0.41433	0.57741	0.83863
58.04	0.77446	1.06033	0.84609
82.87	1.57900	2.18794	0.84102
98.54	2.23250	3.15269	0.83309

Average= 0.84182

Note: The new pitot tip should be installed so that the serial number engraved is aligned directly into the gas stream.

Calibrating Technician Signature:



**CALIBRATION CERTIFICATE
DRY GAS METER**

DATE: 03-Jul-24
 CONSOLE MANUF.: NAPP MODEL 31
 CONSOLE I.D.: C-980

PARAMETER SUMMARY	RUN #1	RUN #2	RUN #3
Ta = Ambient (WTM) Temperature (oF.)	68.0	68.0	68.0
P=Pres. Differential at WTM ("Hg)	0.0809	0.1471	0.2133
Pb= Atmospheric Pressure ("Hg)	28.25	28.25	28.25
Pv= Vapour Pressure Water at Temp. Ta ("Hg)	0.6900	0.6900	0.6900
H=Pres. Differential at Orifice	1.0	2.0	3.0
Ti= Dry Test Meter Inlet Temp. (oF.)	91.0	93.0	98.0
To= Dry Test Meter Outlet Temp. (oF.)	77.0	77.0	78.0
Ri= Initial Dry Test volume (ft3)	26.34	15.50	34.24
Rf= Final Dry Test Volume (ft3)	31.30	20.45	39.21
Vi= Initial Wet Test Volume (ft3)	0.0	0.0	0.0
Vf= Final Wet Test Volume (ft3)	5.000	5.000	5.000
Pw= Pb - (^P/13.59) "Hg	28.1691	28.1029	28.0367
Pd= Pb + (^H/13.59) "Hg	28.3236	28.3972	28.4708
Tw= Ta +460 (oR.)	528.0	528.0	528.0
Td= [(Ti + To)/2] + 460 (oR.)	544.0	545.0	548.0
Bw= Pv/Pb ("Hg)	0.0244	0.0244	0.0244
WET TEST METER FACTOR (WTMF)	0.9922	0.9922	0.9922
ated Y Value)(WTMF)	0.9999	0.9988	0.9953
Y (MEAN)(WTMF) =	0.9980		

N.R. MCCALL & ASSOCIATES LTD.
 Calibrating Technician Signature:



ORIFICE METER CALIBRATION

DATE: July 3 2024

CONSOLE I.D. C-980

	RUN 1	RUN 2	RUN 3
MD= mol. wt. dry air	28.967	28.967	28.967
Pb=bar. pressure "Hg	28.25	28.25	28.25
Y=gas meter factor	0.9999	0.9999	0.9988
Delta H=	0.5	1	1.5
Ri=int. gas meter vol.	42.3	45.4	49.4
Rf=final gas meter vol.	44.43	48.47	53.1
min. samp	5	5	5
Qm=Y(Rf-Ri)/^T(FT3/MIN)	0.4259574	0.6139386	0.739112
To=meter outlet Temp (oF)	77	77	77
Tm=meter out temp. (oR)	537	537	537
Pm=Pb + ^H	28.286792	28.3235835	28.3603753
SQRT(Tm/Pm*H/Md)	0.5724381	0.80902377	0.9902048
Ko=orifice const.	0.7441108	0.75886349	0.74642337

Ko MEAN = 0.7497992

Ko*4*144= 431.88436

McCALL ENVIRONMENTAL LTD.



Calibrating Technician Signature:

ORIFICE METER CALIBRATION

DATE: July 3 2024

CONSOLE I.D. C-980

	RUN 4	RUN 5	RUN 6
MD= mol. wt. dry air	28.967	28.967	28.967
Pb=bar. pressure "Hg	28.25	28.25	28.25
Y=gas meter factor	0.9988	0.9953	0.9953
Delta H=	2	2.5	3
Ri=int. gas meter vol.	57.1	62.6	68.1
Rf=final gas meter vol.	61.33	67.31	73.25
min. samp	5	5	5
Qm=Y(Rf-Ri)/^T(FT3/MIN)	0.8449848	0.9375726	1.025159
Tm=meter out temp. (oF)	78	78	78
Tm=meter out temp. (oR.)	538	538	538
Pm=Pb + ^H	28.397167	28.433959	28.470751
SQRT(Tm/Pm*H/Md)	1.1437125	1.2778819	1.3989447
Ko=orifice const.	0.7388087	0.7336927	0.7328088

Ko MEAN = 0.7351034

Ko*4*144= 423.41957

McCALL ENVIRONMENTAL LTD.

Calibrating Technician Signature:



**CALIBRATION CERTIFICATE
DRY GAS METER**

DATE: 09-Jan-24
 CONSOLE MANUF.: NAPP MODEL 31
 CONSOLE I.D.: C-1021

PARAMETER SUMMARY	RUN #1	RUN #2	RUN #3
Ta = Ambient (WTM) Temperature (oF.)	68.0	68.0	68.0
P=Pres. Differential at WTM ("Hg)	0.0699	0.1250	0.1839
Pb= Atmospheric Pressure ("Hg)	28.25	28.25	28.25
Pv= Vapour Pressure Water at Temp. Ta ("Hg)	0.6900	0.6900	0.6900
H=Pres. Differential at Orifice	1.0	2.0	3.0
Ti= Dry Test Meter Inlet Temp. (oF.)	84.0	85.0	89.0
To= Dry Test Meter Outlet Temp. (oF.)	76.0	76.0	77.0
Ri= Initial Dry Test volume (ft3)	2.90	95.04	8.80
Rf= Final Dry Test Volume (ft3)	7.82	99.99	13.75
Vi= Initial Wet Test Volume (ft3)	0.0	0.0	0.0
Vf= Final Wet Test Volume (ft3)	5.000	5.000	5.000
Pw= Pb - (^P/13.59) "Hg	28.1801	28.1250	28.0661
Pd= Pb + (^H/13.59) "Hg	28.3236	28.3972	28.4708
Tw= Ta +460 (oR.)	528.0	528.0	528.0
Td= [(Ti + To)/2] + 460 (oR.)	540.0	540.5	543.0
Bw= Pv/Pb ("Hg)	0.0244	0.0244	0.0244
WET TEST METER FACTOR (WTMF)	0.9922	0.9922	0.9922
(Calculated Y Value)(WTMF)	1.0010	0.9913	0.9912
Y (MEAN)(WTMF) =	0.9945		

MCCALL ENVIRONMENTAL

Calibrating Technician Signature:



ORIFICE METER CALIBRATION

DATE: 03-Jul-24

CONSOLE I.D. C-1021

	RUN 1	RUN 2	RUN 3
MD= mol. wt. dry air	28.967	28.967	28.967
Pb=bar. pressure "Hg	28.25	28.25	28.25
Y=gas meter factor	1.001	1.0010	0.9913
Delta H=	0.5	1	1.5
Ri=int. gas meter vol.	14.4	16.6	19.8
Rf=final gas meter vol.	16.3	19.3	23.14
min. samp	5	5	5
Qm=Y(Rf-Ri)/^T(FT3/MIN)	0.38038	0.54054	0.6621884
To=meter outlet Temp (oF)	77	77	77
Tm=meter out temp. (oR)	537	537	537
Pm=Pb + ^H	28.286792	28.323584	28.360375
SQRT(Tm/Pm*H/Md)	0.5724381	0.8090238	0.9902048
Ko=orifice const.	0.664491	0.6681386	0.6687388

Ko MEAN = 0.6671228

Ko*4*144= 384.26275

McCALL ENVIRONMENTAL LTD.



Calibrating Technician Signature:

ORIFICE METER CALIBRATION

DATE: 03-Jul-24

CONSOLE I.D. C-1021

	RUN 4	RUN 5	RUN 6
MD= mol. wt. dry air	28.967	28.967	28.967
Pb=bar. pressure "Hg	28.25	28.25	28.25
Y=gas meter factor	0.9913	0.9912	0.9912
Delta H=	2	2.5	3
Ri=int. gas meter vol.	23.5	27.8	32.7
Rf=final gas meter vol.	27.38	32.16	37.51
min. samp	5	5	5
$Q_m = Y(R_f - R_i) / \sqrt{T(FT^3/MIN)}$	0.7692488	0.8643264	0.9535344
To=meter outlet Temp (oF)	77	77	77
Tm=meter out temp. (oR)	537	537	537
$P_m = P_b + \Delta H$	28.397167	28.433959	28.470751
$SQRT(T_m / P_m * H / M_d)$	1.1426491	1.2766937	1.397644
Ko=orifice const.	0.6732153	0.6770037	0.6822441

Ko MEAN = 0.6774877

$K_o * 4 * 144 = 390.23292$

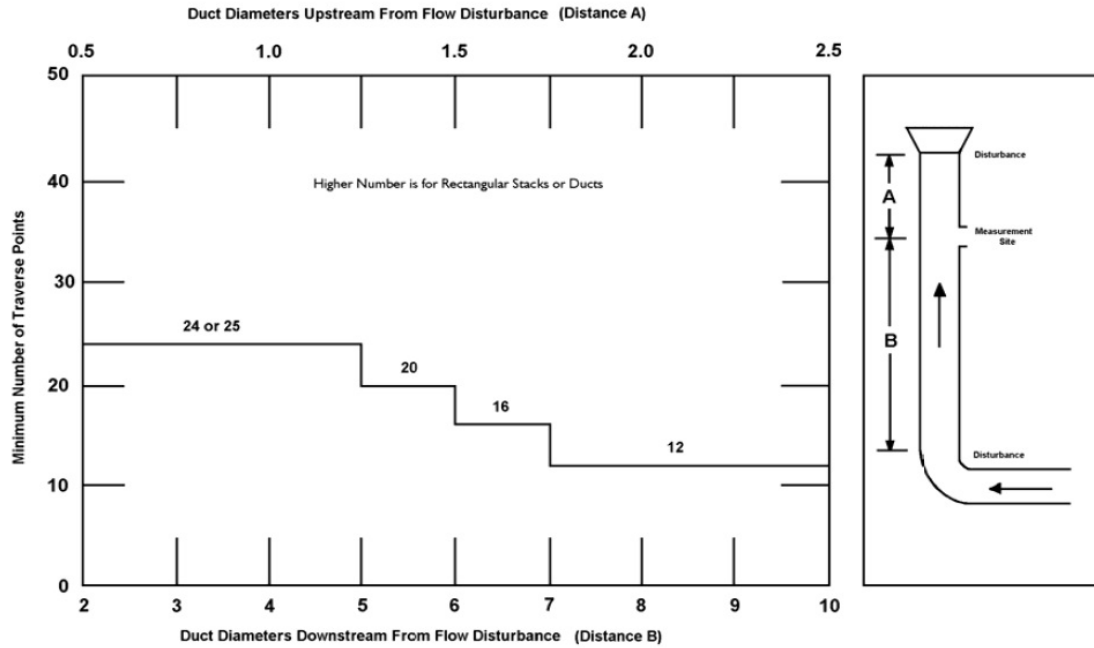
McCALL ENVIRONMENTAL LTD.



Calibrating Technician Signature:



Site Diagram & Sample Point Selection



Client: Pinnacle Pellet Smithers
 Source: Dryer Stackls 1-4
 Pollution Abatement Equipment:
 Duct Diameters Up (A): >2
 Duct Diameters Down (B): 4
 Area of Stack (ft): 33.18
 Stack Diameter (in): 78
 Zero (in): 4
 Number of Points: 24

Traverse Points (in):
 PT-1 1.64
 PT-2 5.22
 PT-3 9.21
 PT-4 13.8
 PT-5 19.5
 PT-6 27.69
 PT-7 50.31
 PT-8 58.5
 PT-9 64.19
 PT-10 68.8
 PT-11 70.7
 PT-12 76.36

Cyclonic Angle: 5°



Smithers Pellet Limited Partnership

Production rate during stack test (Sept 12, 2024)

14.8 MT/hr

Average for the previous calendar month

14.5 MT/hr

90th percentile production rate

19.7 MT/hr

Average hourly dryer exit temperature during testing:

Included in report

Client Name: Drax
Smithers
 Process: Dryer Stack 1
 Test Number: 1
 Date: Sept 12/24
 Start Time: 1:31
 Finish Time: 2:33
 Starting Vol.: 300
 Final Vol.: 322
 Flask: M-55
 Console: C-980
 Stack Diameter

BP 28.40
 DN .290
 CP .84102
 MF .9980
 Moist. .04
 PM 28.31
 AS
 Ko .7497
 Pitot 107
 Port
 Static -.16
 PS 28.38

CO ₂	O ₂	CO	N ₂
0	21		

Duct Diameters
 Up-Stream

Duct Diameters
 Downstream

Personnel: DB/CB/CB Mean Yaw Angle

Leakage Rate @ 15 inches Start: .002 Finish: .001

Load:

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A-12	.27	1.72	72	72	83	68.00	0	270	116.17	
11	.26	1.67	82	73	84	70.00	0			
10	.26	1.68	87	73	84	72.01				
9	.25	1.62	89	74	84	74.02				
8	.24	1.55	90	75	84	76.05				
7	.26	1.69	92	76	85	77.74	0			
6	.25	1.63	94	77	85	79.92	1			
5	.27	1.76	95	78	84	81.88				
4	.27	1.77	96	79	83	83.91				
3	.28	1.84	98	80	83	85.95				
2	.32	2.11	98	82	83	87.98				
1	.31	2.04	99	83	83	90.22	1			
B-12	.26	1.71	100	83	84	92.41				
11	.26	1.71	101	84	84	94.42				
10	.25	1.65	101	84	84	96.43				
9	.25	1.65	101	84	84	98.44	1			
8	.24	1.59	102	85	84	100.43				
7	.25	1.66	103	86	83	102.39				
6	.25	1.66	104	87	83	104.38				
5	.26	1.73	105	88	83	106.39	1			
4	.27	1.80	104	88	83	108.41				
3	.29	1.93	104	88	83	110.49				
2	.31	2.06	104	87	84	112.58				
1	.31	2.06	105	89	84	114.72	1	270	116.17	
						116.94				

Client Name: Drax
Smithers
 Process: Dryer Stack 1
 Test Number: 2
 Date: Sept 12/24
 Start Time 2:46
 Finish Time 3:48
 Starting Vol. 300
 Final Vol. 323
 Flask: M-56
 Console: C-990
 Stack Diameter _____

BP 28.40
 DN .290
 CP .84180
 MF .9980
 Moist. .03
 PM 28.51
 AS _____
 Ko .7497
 Pitot 107
 Port _____
 Static -.16
 PS 28.38

CO ₂	O ₂	CO	N ₂
0	21		

Duct Diameters
 Up-Stream _____

Duct Diameters
 Downstream _____

Personnel: DB/CB/CB

Mean Yaw Angle _____

Leakage Rate @ 15 inches _____

Start: .003 Finish: .00

Load: _____

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A-12	.25	1.65	83	83	84	17.10	0	270	iced	
11	.25	1.66	94	85	86	19.14				
10	.26	1.73	95	85	86	21.18				
9	.27	1.80	96	85	86	23.29	0			
8	.26	1.73	96	85	86	25.44				
7	.20	1.73	97	86	86	27.50				
6	.25	1.67	99	86	86	29.58				
5	.25	1.67	101	86	86	31.61				
4	.27	1.81	103	86	85	33.60				
3	.27	1.81	104	86	85	35.68	0			
2	.28	1.88	105	86	86	37.76	1			
1	.29	1.96	106	88	86	39.89				
B-12	.26	1.76	106	90	86	41.99				
11	.26	1.76	107	91	86	44.06	1			
10	.25	1.69	106	90	86	46.15				
9	.24	1.62	107	90	86	48.21				
8	.25	1.69	108	91	86	50.18				
7	.26	1.76	108	91	86	52.20	1			
6	.27	1.83	109	92	86	54.24				
5	.27	1.84	108	93	85	56.33				
4	.28	1.90	109	93	85	58.45				
3	.30	2.04	109	93	85	60.60	1			
2	.31	2.11	110	93	85	62.81				
1	.31	2.11	111	94	85	65.07	1	270	iced	
						67.34				

Client Name: Drax
Smithers
 Process: Dryer Stack 1
 Test Number: 3
 Date: Sept 12/21
 Start Time 4:00
 Finish Time 5:02
 Starting Vol. 300
 Final Vol. 321
 Flask: M-57
 Console: C-980
 Stack Diameter _____

BP 28.40
 DN .290
 CP .84182
 MF .01980
 Moist. .03
 PM 28.91
 AS _____
 Ko .7497
 Pitot 107
 Port _____
 Static -.16
 PS 28.30

CO ₂	O ₂	CO	N ₂
0	21		

Duct Diameters
 Up-Stream _____
 Duct Diameters
 Downstream _____
 Mean Yaw Angle _____

Personnel: DB/CB/CS

Leakage Rate @ 15 inches Start: .003 Finish: .001

Load: _____

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A-12	.24	1.59	88	88	87	67.80	0	270	ICED	
11	.25	1.66	96	88	88	69.81				
10	.25	1.67	100	89	88	71.90				
9	.26	1.74	101	90	88	73.90				
8	.27	1.81	102	91	89	75.96				
7	.25	1.68	103	91	89	78.11				
6	.25	1.68	103	92	89	80.25				
5	.26	1.75	103	93	87	82.31				
4	.27	1.82	104	91	87	84.38				
3	.28	1.88	104	92	88	86.47				
2	.29	1.95	104	91	89	88.60				
1	.27	1.82	104	91	87	90.78				
B-12	.25	1.69	104	92	87	92.87				
11	.25	1.69	106	92	87	94.92				
10	.26	1.76	106	92	87	97.01				
9	.26	1.76	107	92	87	99.04				
8	.28	1.90	107	92	86	101.08				
7	.27	1.83	108	93	86	103.16				
6	.26	1.76	108	93	86	105.25				
5	.27	1.83	108	93	86	107.32				
4	.27	1.83	108	94	86	109.43				
3	.28	1.90	108	94	86	111.58				
2	.28	1.90	109	94	88	113.74				
1	.29	1.97	109	95	86	115.90		1020	ICED	
						118.14				

Client Name: Dray
Smithers
 Process: Dryer Stack 2
 Test Number: 1
 Date: Sept 12 2024
 Start Time: 1:25 pm
 Finish Time: 2:27 pm
 Starting Vol.: 300 ml
 Final Vol.: 325 ml
 Flask: M58
 Console: 1021
 Stack Diameter

BP 28.40
 DN 275
 CP 83829
 MF 9945
 Moist. 3%
 PM 28.51
 AS
 Ko .6671
 Pitot 140
 Port
 Static -.157
 PS 28.39

CO ₂	O ₂	CO	N ₂
0	20.9		

Duct Diameters
 Up-Stream
 Duct Diameters
 Downstream

Personnel: DB CB CB

Mean Yaw Angle

Leakage Rate @ 15 inches Start: .001 Finish: .002

Load:

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A12	.29	1.910	78	78	88	64.05	0			
11	.26	1.70	76	76	88	65.97				
10	.25	1.64	80	76	88	67.68				
9	.25	1.65	83	76	87	69.58				
8	.26	1.72	84	77	88	71.17				
7	.27	1.80	86	88	88	72.99				
6	.30	1.99	88	79	88	74.77	3			
5	.26	1.73	89	79	88	76.59				
4	.27	1.80	91	80	88	78.42				
3	.25	1.67	92	82	89	80.21				
2	.25	1.67	92	83	89	81.98				
1	.24	1.66	93	84	90	83.81				
B12	.29	1.88	94	85	88	85.43	3			
11	.27	1.82	95	86	88	87.34				
10	.26	1.75	96	86	88	89.15				
9	.25	1.68	97	88	89	91.03				
8	.26	1.75	98	89	90	92.89				
7	.27	1.82	99	89	89	94.87				
6	.25	1.69	98	89	89	96.69	3			
5	.26	1.68	99	92	93	98.49				
4	.27	1.82	100	91	91	100.18				
3	.30	2.04	101	93	88	102.02				
2	.27	1.83	101	92	89	103.98				
1	.26	1.77	102	93	88	105.99				
						107.72	3			

Client Name: Drax Smithers
 Process: Dryer Stack 2
 Test Number: 2
 Date: Sept 12 2024
 Start Time: 2:38 PM
 Finish Time: 3:40
 Starting Vol.: 300 mL
 Final Vol.: 323 mL
 Flask: M59
 Console: 1021
 Stack Diameter

BP 28.40
 DN
 CP .83829
 MF .9945
 Moist.
 PM 28.51
 AS
 Ko .6671
 Pitot: 140
 Port
 Static
 PS

CO ₂	O ₂	CO	N ₂
0	20.9		

Duct Diameters
 Up-Stream
 Duct Diameters
 Downstream

Personnel:

Mean Yaw Angle

Leakage Rate @ 15 inches

Start: 01 Finish: 009

Load:

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A12	.29	1.93	87	97	90	8.01	0			
11	.28	1.86	90	98	92	10.00				
10	.25	1.67	94	98	91	11.89				
9	.28	1.74	96	98	91	13.68				
8	.27	1.82	96	99	90	15.37				
7	.25	1.67	97	94	91	17.25				
6	.30	2.02	98	90	90	19.13	3			
5	.29	1.96	100	91	90	21.09				
4	.28	1.99	100	91	90	22.91				
3	.25	1.69	100	92	90	24.89				
2	.25	1.69	101	92	90	26.64				
1	.24	1.63	101	93	90	28.40				
B12	.28	1.89	102	94	91	30.23	3			
11	.27	1.83	103	94	91	32.08				
10	.26	1.77	104	95	90	33.98				
9	.27	1.83	104	95	90	35.85				
8	.26	1.77	104	96	90	37.75				
7	.25	1.70	104	96	90	39.63				
6	.24	1.64	105	97	90	41.53				
5	.26	1.77	105	97	91	43.32	3			
4	.27	1.79	105	98	90	45.08				
3	.28	1.92	106	98	90	46.97				
2	.27	1.85	106	98	90	48.92				
1	.27	1.84	107	99	91	50.82				
						52.77				

Client Name: Drax
Smithers
 Process: Drier Stack 2
 Test Number: 3
 Date: Sept 12 2011
 Start Time: 3:51 PM
 Finish Time: 4:57
 Starting Vol.: 300 mL
 Final Vol.: 382
 Flask: M60
 Console: 1021
 Stack Diameter

BP 28.40
 DN
 CP .83829
 MF .9945
 Moist.
 PM 28.51
 AS
 Ko .6671
 Pitot 140
 Port
 Static -
 PS

CO ₂	O ₂	CO	N ₂
0	20.7		

Duct Diameters
 Up-Stream
 Duct Diameters
 Downstream

Personnel:

Mean Yaw Angle

Leakage Rate @ 15 inches

Start: .001 Finish: .01

Load:

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A/2	.128	1.88	92	93	91	52.92	0			
11	.127	1.81	93	93	92	54.87				
10	.129	1.82	97	94	91	56.60				
9	.126	1.75	96	93	91	58.47				
8	.127	1.83	99	92	90	60.28				
7	.126	1.76	100	93	90	62.09				
6	.129	1.97	101	93	90	63.99	1			
5	.124	1.97	103	94	90	65.84				
4	.128	1.90	104	95	91	67.75				
3	.125	1.70	105	95	91	69.78				
2	.125	1.70	104	96	90	71.48				
1	.126	1.77	105	97	91	73.29				
B/2	.128	1.91	105	97	91	75.12	1			
11	.126	1.91	105	97	90	76.95				
10	.125	1.71	106	98	90	78.75				
9	.127	1.85	106	98	90	80.67				
8	.126	1.78	107	99	90	82.44				
7	.127	1.85	107	99	90	84.33				
6	.124	1.65	108	100	90	86.23	1			
5	.125	1.72	107	100	90	88.02				
4	.120	1.79	108	101	90	89.77				
3	.128	1.92	108	100	90	91.51				
2	.127	1.86	108	101	89	93.27				
1	.126	1.80	110	101	88	95.29				
						97.10	1			

Client Name: Drax
Smithers
 Process: Dryer Stack 3
 Test Number: 1
 Date: Sept 12/24
 Start Time 9:14
 Finish Time 10:16
 Starting Vol. 300
 Final Vol. 324
 Flask: M-21
 Console: C-980
 Stack Diameter

BP 28.40
 DN 290
 CP 84182
 MF 9980
 Moist. 21
 PM 28.51
 AS
 Ko 7497
 Pitot 107
 Port
 Static -0.14
 PS 28.38

CO ₂	O ₂	CO	N ₂

Duct Diameters
 Up-Stream
 Duct Diameters
 Downstream
 Mean Yaw Angle

Personnel: DB/CB/CB

Leakage Rate @ 15 inches Start: 003 Finish: 002

Load:

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A-12	1.20	1.22	51	51	88	12.56	0	270	1060	
11	1.21	1.28	65	52	88	14.28				
10	.22	1.40	65	53	88	15.80				
9	1.25	1.60	70	56	88	17.62	0			
8	1.32	2.06	72	56	87	19.51	1			
7	1.35	2.26	74	56	87	21.55				
6	1.37	2.39	75	57	88	23.82				
5	1.34	2.20	77	58	89	26.18				
4	1.35	2.27	78	59	89	28.44	1			
3	1.36	2.33	80	61	89	30.62				
2	1.36	2.35	82	63	89	33.00				
1	1.35	2.29	85	65	89	35.34				
B-12	.21	1.38	86	66	89	37.70	1			
11	.21	1.38	87	68	89	39.48				
10	.23	1.52	88	69	89	41.26				
9	.24	1.59	89	70	88	43.11				
8	.29	1.92	90	71	88	45.07	1			
7	.33	2.19	91	71	87	47.20				
6	.35	2.33	92	72	89	49.44	1			
5	.36	2.40	93	73	88	51.78				
4	.36	2.40	93	74	89	54.14	1			
3	.35	2.33	94	75	89	56.52	1			
2	.36	2.41	96	75	88	59.00	1			
1	.35	2.34	97	76	88	61.23	1	4270	4100	
						63.52				

Client Name: Drax
Smithers
 Process: Dryer Stack 3
 Test Number: 2
 Date: Sept 12/24
 Start Time 10:31
 Finish Time 11:33
 Starting Vol. 300
 Final Vol. 338
 Flask: M.22
 Console: C-980
 Stack Diameter

BP 28.40
 DN .290
 CP .84182
 MF 99900
 Moist. 27
 PM 28.51
 AS
 Ko .7497
 Pitot 107
 Port
 Static -.14
 PS 28.39

CO ₂	O ₂	CO	N ₂

Duct Diameters
 Up-Stream

Duct Diameters
 Downstream

Personnel: DB/CB/CB Mean Yaw Angle

Leakage Rate @ 15 inches Start: .002 Finish: .001

Load:

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A-12	.20	1.29	70	70	92	63.90	0	270	ICED	
11	.22	1.44	83	71	91	68.66	1			
10	.22	1.44	85	71	91	67.91				
9	.24	1.58	88	72	91	69.32				
8	.28	1.85	97	73	91	71.27				
7	.30	1.98	910	74	91	73.34				
6	.34	2.25	92	74	91	75.50				
5	.36	2.39	93	75	91	77.72	1			
4	.35	2.32	95	75	91	80.04				
3	.35	2.32	96	75	92	82.35				
2	.34	2.27	97	76	91	84.57				
1	.34	2.27	98	77	91	86.88	1			
B-12	.22	1.47	99	79	91	89.25				
11	.22	1.48	99	80	91	91.11				
10	.23	1.54	99	80	91	93.04				
9	.25	1.68	99	81	91	95.00				
8	.28	1.88	100	82	92	97.01				
7	.31	2.08	100	83	92	99.11	1			
6	.34	2.23	100	83	92	101.34				
5	.39	2.30	101	84	92	103.62				
4	.35	2.30	101	84	92	105.94	1			
3	.34	2.24	102	85	92	108.27				
2	.34	2.24	102	85	92	110.48				
1	.33	2.17	102	85	71	112.71	1	2276	ICED	
						114.90				

Client Name: Drax
Smithers
 Process: Dryer Stack 3
 Test Number: 3
 Date: Sept 12/24
 Start Time 11:41
 Finish Time 12:43
 Starting Vol. 300
 Final Vol. 331
 Flask: M-23
 Console: C-980
 Stack Diameter _____

BP 28.40
 DN 290
 CP 24182
 MF 9980
 Moist. 2%
 PM 28.91
 AS _____
 Ko .7497
 Pitot 107
 Port _____
 Static -.14
 PS 28.30

CO ₂	O ₂	CO	N ₂
0	21		

Duct Diameters
 Up-Stream _____

Duct Diameters
 Downstream _____

Personnel: DB/CB/CB Mean Yaw Angle _____

Leakage Rate @ 15 inches Start: .002 Finish: .000

Load: _____

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A-12	.21	1.36	78	78	96	19.40	0	270	1000	
11	.22	1.46	92	81	94	17.18				
10	.23	1.53	94	81	94	19.02				
9	.24	1.60	95	81	94	21.00				
8	.27	1.80	96	82	93	23.00				
7	.29	1.94	97	82	93	25.08	0			
6	.33	2.21	98	82	93	27.18				
5	.35	2.35	101	83	93	29.44				
4	.38	2.35	102	84	93	31.81				
3	.34	2.29	103	85	94	34.18				
2	.34	2.29	103	85	92	36.52	0			
1	.33	2.23	103	85	91	38.88				
B-12	.21	1.42	103	86	91	41.20				
11	.22	1.49	103	87	91	43.04	0			
10	.23	1.56	103	87	91	45.00				
9	.24	1.63	104	88	91	47.01	1			
8	.25	1.70	105	89	91	49.00				
7	.28	1.91	106	90	90	51.01				
6	.32	2.18	106	90	90	53.15	1			
5	.34	2.32	106	91	90	55.38				
4	.35	2.39	106	90	90	57.69				
3	.35	2.39	106	91	91	60.11				
2	.34	2.32	106	91	91	62.51	1			
1	.31	2.11	107	91	91	64.83	1	270	1000	
						67.20				

Client Name: Drax
Smithers
 Process: Dryer Stack 4
 Test Number: 1
 Date: Sept 12/24
 Start Time: 9:07
 Finish Time: 10:09
 Starting Vol.: 300
 Final Vol.: 317
 Flask: M-24
 Console: C-1021
 Stack Diameter

BP 28.40
 DN .275
 CP .83829
 MF .9945
 Moist. 21
 PM 28.91
 AS
 Ko .6671
 Pitot 140
 Port
 Static -0.21
 PS 28.30

CO ₂	O ₂	CO	N ₂
0	21		

Duct Diameters
 Up-Stream
 Duct Diameters
 Downstream
 Mean Yaw Angle

Personnel: JB/CB/CS

Leakage Rate @ 15 inches Start: .004 Finish: .003

Load:

100

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A-12	.25	1.56	50	50	96	32.10	0	270	ICED	
11	.23	1.44	57	53	96	33.86				
10	.22	1.42	61	74	96	35.57				
9	.22	1.35	64	55	92	37.29				
8	.25	1.59	66	56	97	39.00				
7	.26	1.66	67	59	98	40.55				
6	.27	1.73	71	58	97	42.23	1			
5	.29	1.86	72	59	98	44.02				
4	.30	1.93	74	61	99	45.87				
3	.31	2.00	76	63	100	47.74				
2	.31	2.00	78	64	99	49.65				
1	.32	2.01	79	65	98	51.55				
B-12	.24	1.56	81	67	98	53.54	1			
11	.23	1.50	81	68	98	55.29				
10	.23	1.50	81	70	99	57.04				
9	.22	1.44	82	72	99	58.84				
8	.24	1.57	82	72	99	60.60				
7	.25	1.64	84	73	97	62.43				
6	.28	1.85	86	75	96	64.02	2			
5	.29	1.92	88	75	96	65.89				
4	.30	1.99	88	76	95	67.73				
3	.30	2.00	88	77	94	69.55				
2	.32	2.14	90	78	95	71.36				
1	.31	2.07	91	81	96	73.33				
						75.29				

Client Name: Drax
Smithers
 Process: Dryer stack 4
 Test Number: 2
 Date: Sept 12 2024
 Start Time 10:21
 Finish Time 11:23
 Starting Vol. 300
 Final Vol. 332
 Flask: M25
 Console: 1021
 Stack Diameter

BP 28.40
 DN 275
 CP 183829
 MF 19945
 Moist. .02
 PM 28.51
 AS
 Ko 16671
 Pitot 140
 Port
 Static -.21
 PS 28.38

CO ₂	O ₂	CO	N ₂
0	20.9		

Duct Diameters
 Up Stream
 Duct Diameters
 Downstream
 Mean Yaw Angle

Personnel: CB CB DB

Leakage Rate @ 15 inches

Start: .002 Finish: .003

Load:

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A12	.25	1.63	75	75	98	76.20	0	270	1CED	
11	.24	1.57	80	76	99	77.96				
10	.27	1.44	82	76	100	79.52				
9	.21	1.38	84	77	99	81.15	0			
8	.22	1.45	84	77	97	82.76	1			
7	.24	1.32	86	77	98	84.37				
6	.27	1.78	86	78	99	85.96				
5	.29	1.92	89	79	99	87.76	1			
4	.30	1.99	91	80	100	89.64				
3	.30	1.99	91	81	101	91.56				
2	.31	2.06	93	82	100	93.51				
1	.32	2.13	94	83	101	95.48				
B12	.32	2.13	94	83	102	97.46	1			
11	.25	1.66	95	84	102	99.85				
10	.23	1.54	96	85	101	101.24				
9	.21	1.39	94	85	104	102.94	1			
8	.27	1.46	93	86	103	104.52				
7	.25	1.66	94	87	103	106.16				
6	.27	1.80	95	87	103	107.89	1			
5	.28	1.88	97	88	100	109.75				
4	.28	1.89	102	88	99	111.63	1			
3	.30	2.03	101	89	97	113.49				
2	.31	2.10	98	89	97	115.37				
1	.32	2.16	99	90	99	117.32	1	270	1CED	
						119.35				

Client Name: Drax
Smithers
 Process: Dryer Stack 4
 Test Number: 3
 Date: Sept 12 2024
 Start Time: 11:33 am
 Finish Time: 12:35
 Starting Vol.: 300
 Final Vol.: 333
 Flask: M-54
 Console: C-9021
 Stack Diameter

BP 28.40
 DN 275
 CP .83829
 MF .9945
 Moist. 21
 PM 28.51
 AS
 Ko .16671
 Pitot 140
 Port
 Static -.21
 PS 28.38

CO ₂	O ₂	CO	N ₂
0	20.9		

Duct Diameters
 Up-Stream
 Duct Diameters
 Downstream
 Mean Yaw Angle

Personnel: CB CB DB

Leakage Rate @ 15 inches Start: 1001 Finish: 1002

Load:

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A12	.25	1.66	87	87	98	119.80	0	270	100	
11	.24	1.60	89	88	100	121.64				
10	.23	1.54	93	88	100	123.39				
9	.21	1.47	93	88	100	125.12				
8	.22	1.47	93	87	99	126.76				
7	.25	1.67	94	88	100	128.41				
6	.28	1.88	95	88	99	130.15	3			
5	.29	1.96	96	88	97	131.99				
4	.29	1.96	97	89	98	133.99				
3	.31	2.09	98	89	98	135.84				
2	.30	2.02	98	89	99	137.97				
1	.31	2.09	98	90	98	139.89				
B17	.29	1.61	99	90	102	141.78	3			
11	.27	1.49	99	91	99	143.56				
10	.23	1.55	98	91	98	145.28				
9	.22	1.49	98	91	98	147.02				
8	.24	1.62	98	92	98	148.59				
7	.26	1.76	99	92	98	150.37				
6	.28	1.90	100	92	97	152.02	3			
5	.28	1.91	101	93	97	153.95				
4	.29	1.98	101	93	96	155.85				
3	.30	2.04	101	94	97	157.77				
2	.31	2.11	103	94	98	159.67				
1	.30	2.04	102	93	98	161.69	3			
						163.79				

Report Transmission Cover Page

Bill To: McCall Environmental 6733 Buchanan Road Coldstream, BC, Canada V1B 3C5	Project ID: Project Name: Drax Project Location: Smithers LSD: P.O.:	Lot ID: 1759972 Control Number: Date Received: Sep 16, 2024 Date Reported: Sep 17, 2024 Report Number: 3046124 Report Type: Final Report
Attn: Accounts Payable Sampled By: McCall Company: McCall	Proj. Acct. code:	

Contact	Company	Address
Accounts Payable	McCall Environmental	6733 Buchanan Road Coldstream, BC V1B 3C5 Phone: (250) 542-5118 Fax: Email: invoicing@mccallenvironmental.net
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge	PDF	COC / Invoice
Matt McCall	McCall Environmental	6733 Buchanan Road Coldstream, BC V1B 3C5 Phone: (250) 542-5118 Fax: Email: matt@mccallenvironmental.net
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge	PDF	COA / COC
Email - Merge	PDF	COC / Test Report

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Analytical Report

Bill To: McCall Environmental 6733 Buchanan Road Coldstream, BC, Canada V1B 3C5	Project ID: Project Name: Drax Project Location: Smithers LSD: P.O.:	Lot ID: 1759972 Control Number: Date Received: Sep 16, 2024 Date Reported: Sep 17, 2024 Report Number: 3046124 Report Type: Final Report
Attn: Accounts Payable Sampled By: McCall Company: McCall	Proj. Acct. code:	

Reference Number	1759972-1	1759972-2	1759972-3
Sample Date	Sep 12, 2024	Sep 12, 2024	Sep 12, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Dryer Stack 1 Test 1 / 17.7 °C / Filter M55	Dryer Stack 1 Test 2 / 17.7 °C / Filter M56	Dryer Stack 1 Test 3 / 17.7 °C / Filter M57
Matrix	Water	Water	Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total	mg/sample	4	3	3
Volume	Sample volume	mL	316	317	312
pH adjustment	required prior to O&G extraction		Yes	Yes	Yes

Analytical Report

Bill To: McCall Environmental 6733 Buchanan Road Coldstream, BC, Canada V1B 3C5	Project ID: Project Name: Drax Project Location: Smithers LSD: P.O.:	Lot ID: 1759972 Control Number: Date Received: Sep 16, 2024 Date Reported: Sep 17, 2024 Report Number: 3046124 Report Type: Final Report
Attn: Accounts Payable	Proj. Acct. code:	
Sampled By: McCall		
Company: McCall		

Reference Number	1759972-4	1759972-5	1759972-6
Sample Date	Sep 12, 2024	Sep 12, 2024	Sep 12, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Dryer Stack 2 Test 1 / 17.7 °C / Filter M58	Dryer Stack 2 Test 2 / 17.7 °C / Filter M59	Dryer Stack 2 Test 3 / 17.7 °C / Filter M60
Matrix	Water	Water	Water


Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total	mg/sample	10	6	6
Volume	Sample volume	mL	317	322	318
pH adjustment	required prior to O&G extraction		Yes	Yes	Yes

Analytical Report

Bill To: McCall Environmental 6733 Buchanan Road Coldstream, BC, Canada V1B 3C5	Project ID: Project Name: Drax Project Location: Smithers LSD: P.O.:	Lot ID: 1759972 Control Number: Date Received: Sep 16, 2024 Date Reported: Sep 17, 2024 Report Number: 3046124 Report Type: Final Report
Attn: Accounts Payable Sampled By: McCall Company: McCall	Proj. Acct. code:	

Reference Number	1759972-7	1759972-8
Sample Date	Sep 12, 2024	Sep 12, 2024
Sample Time	NA	NA
Sample Location		
Sample Description	Dryer Stack 3 Test 1 / 17.7 °C / Filter M21	Dryer Stack 3 Test 2 / 17.7 °C / Filter M22
Matrix	Water	Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total	mg/sample	6	9	2
Volume	Sample volume	mL	331	329	
pH adjustment	required prior to O&G extraction		Yes	Yes	

Approved by: 
 Rachel Eden, B. Sc.
 Operations Manager

Analytical Report

Bill To: McCall Environmental 6733 Buchanan Road Coldstream, BC, Canada V1B 3C5	Project ID: Project Name: Drax Project Location: Smithers & Houston LSD: P.O.:	Lot ID: 1759976 Control Number: Date Received: Sep 16, 2024 Date Reported: Sep 17, 2024 Report Number: 3046129 Report Type: Final Report
Attn: Accounts Payable Sampled By: McCall Company: McCall	Proj. Acct. code:	


	Reference Number	1759976-1	1759976-2	1759976-3	
	Sample Date	Sep 12, 2024	Sep 12, 2024	Sep 12, 2024	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	Smithers / Dryer Stack 3 Test 3 / 16.1 °C / Filter M23	Smithers / Dryer Stack 4 Test 1 / 16.1 °C / Filter M24	Smithers / Dryer Stack 4 Test 2 / 16.1 °C / Filter M25	
	Matrix	Water	Water	Water	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total	mg/sample	9	29	32
Volume	Sample volume	mL	331	320	336
pH adjustment	required prior to O&G extraction		Yes	Yes	Yes

Analytical Report

Bill To: McCall Environmental 6733 Buchanan Road Coldstream, BC, Canada V1B 3C5	Project ID: Project Name: Drax Project Location: Smithers & Houston LSD: P.O.:	Lot ID: 1759976 Control Number: Date Received: Sep 16, 2024 Date Reported: Sep 17, 2024 Report Number: 3046129 Report Type: Final Report
Attn: Accounts Payable Sampled By: McCall Company: McCall	Proj. Acct. code:	

Reference Number 1759976-4
Sample Date Sep 12, 2024
Sample Time NA
Sample Location
Sample Description Smithers / Dryer
 Stack 4 Test 3 / 16.1
 °C / Filter M54
Matrix Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total	mg/sample	31		2
Volume	Sample volume	mL	329		
pH adjustment	required prior to O&G extraction		Yes		


Approved by: 
 Rachel Eden, B. Sc.
 Operations Manager



This is to verify that
Matthew McCall
has successfully completed
a course of study in
Source Testing for Particulates
(35 hours)

Endorsed by
The B.C. Ministry of Environment

Dated at Burnaby, British Columbia, Canada
December 14, 1990


DEAN


REGISTRAR

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY



MOUNT ROYAL COLLEGE

Faculty of Continuing Education and Extension

David Brandle

has successfully completed

The program of studies and is awarded the certificate in

STACK SAMPLING

May 3 – May 7, 2004

May, 2004
Date

Doreen Brandle
Dean
Faculty of Continuing Education and Extension

MOUNT ROYAL UNIVERSITY

Faculty of Continuing Education and Extension

Chris Bodden

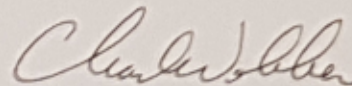
has successfully completed

Stack Sampling Seminar

35 Hours / 2017

June 23, 2017

Date



Dean

Faculty of Continuing Education and Extension

