

**Pinnacle Renewable Energy
Smithers Pellet Limited Partnership**

**Smithers, B.C.
Emissions Testing**

**Permit 6099
June 25, 2024**

Our Job Number: ME2425-043

Report Author: Matt McCall
McCall Environmental



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July 11, 2024

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

Attention: Joel Martens/Wayne Kooy
RE: Air Emission Testing June 25, 2024
RA-6099, ME2425-043

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					Permit	Prev Test
	Stack 1	Stack2	Stack 3	Stack 4	Avg/ Comb		16-Apr-24
Test Date	25-Jun-24	25-Jun-24	25-Jun-24	25-Jun-24	N/A		N/A
Gas Temperature (°C)	31.0	33.7	33.0	36.4	33.5		33.28
% Moisture	3.17	3.55	2.54	2.85	3.03		2.28
Velocity (m/sec)	9.73	9.30	9.53	9.71	9.57		10.01
ACFM	63583	60740	62261	63397	249980		261503
Std. Dry Flow Rate (m ³ /sec)	26.57	25.06	26.02	26.11	103.76	*132	111.59
Tot Part. Dry Basis ref. Cond. (mg/m ³)	10.45	10.46	7.95	15.54	11.11	15.00	72.86
Front Half Particulate (mg/m ³)	7.99	6.46	5.33	5.91	6.42		70.36
Back Half Condensibles (mg/m ³)	2.46	4.00	2.62	9.63	4.68		2.41
Mass Emission Rate (kg/hr)	1.00	0.94	0.74	1.46	4.15	7.67	29.26

* 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 April 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.

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	88 ° F	31 ° C
Moisture Content (by volume):	3.17 %	
Average Stack Gas Velocity:	31.9 ft/sec	9.7 m/sec
Total Actual Gas Flow Rate:	63583 ACFM	
Dry Gas flow Rate at Reference Conditions:	56298 SCFM	26.6 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.005 gr/ft ³	10.45 mg/m ³
Front Half Particulate	0.003 gr/ft ³	8.0 mg/m ³
Back Half Condensibles	0.001 gr/ft ³	2.5 mg/m ³
Mass Emission Rate	2.20 lbs/hr	1.00 kg/hr

SUMMARY OF AIR EMISSION TESTS
TEST 1:

Gas Temperature:	87 ° F	31 ° C
Moisture Content (by volume):	3.2 %	
Average Stack Gas Velocity:	31.9 ft/sec	9.7 m/sec
Total Actual Gas Flow Rate:	63428 ACFM	
Dry Gas flow Rate at Reference Conditions:	56203 SCFM	26.5 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.005 gr/ft ³	10.9 mg/m ³
Front Half Particulate	.004 gr/ft ³	8.2 mg/m ³
Back Half Condensibles	.001 gr/ft ³	2.7 mg/m ³
Mass Emission Rate	2.30 lbs/hr	1.04 kg/hr

TEST 2:

Gas Temperature:	88 ° F	31 ° C
Moisture Content (by volume):	3.6 %	
Average Stack Gas Velocity:	32.0 ft/sec	9.8 m/sec
Total Actual Gas Flow Rate:	63700 ACFM	
Dry Gas flow Rate at Reference Conditions:	56151 SCFM	26.5 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.004 gr/ft ³	9.0 mg/m ³
Front Half Particulate	.003 gr/ft ³	7.2 mg/m ³
Back Half Condensibles	.001 gr/ft ³	1.9 mg/m ³
Mass Emission Rate	1.90 lbs/hr	0.86 kg/hr

TEST 3:

Gas Temperature:	88 ° F	31 ° C
Moisture Content (by volume):	2.8 %	
Average Stack Gas Velocity:	32.0 ft/sec	9.7 m/sec
Total Actual Gas Flow Rate:	63620 ACFM	
Dry Gas flow Rate at Reference Conditions:	56541 SCFM	26.7 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.005 gr/ft ³	11.4 mg/m ³
Front Half Particulate	.004 gr/ft ³	8.6 mg/m ³
Back Half Condensibles	.001 gr/ft ³	2.8 mg/m ³
Mass Emission Rate	2.41 lbs/hr	1.09 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:
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
J53	J54	J72
25-Jun-24	25-Jun-24	25-Jun-24
13:04	14:31	15:40
14:07	15:34	16:42
60	60	60
DB/CB	DB/CB	DB/CB
1021	1021	1021
28.40	28.40	28.40
-0.20	-0.20	-0.20
0.0	0.0	0.0
21.0	21.0	21.0
0.0	0.0	0.0
79.0	79.0	79.0
0.265	0.265	0.265
1.0175	1.0175	1.0175
0.84182	0.84182	0.84182
33.18	33.18	33.18
25	28	21
1.9	2.0	2.0
0.0015	0.0005	0.0009
0.0075	0.0072	0.0084
0.0030	0.0020	0.0030
0.0120	0.0097	0.0123

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

25-Jun-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	0.34	2.02	88	87	90	1.14	1.00
A-11	0.31	1.85	88	87	86	3.01	1.00
A-10	0.26	1.56	92	87	87	4.80	1.04
A-9	0.27	1.62	95	88	87	6.51	0.99
A-8	0.29	1.75	96	88	87	8.18	0.98
A-7	0.28	1.69	98	90	87	9.89	0.97
A-6	0.32	1.94	100	91	87	11.56	0.99
A-5	0.33	2.00	103	92	87	13.39	0.95
A-4	0.31	1.89	104	93	87	15.17	1.00
A-3	0.33	2.01	105	94	87	17.00	0.98
A-2	0.27	1.65	107	95	87	18.85	0.97
A-1	0.24	1.47	107	97	87	20.51	1.02
B-12	0.30	1.84	108	97	87	22.17	1.10
B-11	0.32	1.97	109	98	87	24.17	0.93
B-10	0.25	1.53	111	99	89	25.92	1.01
B-9	0.26	1.60	111	101	88	27.59	0.98
B-8	0.27	1.67	112	100	87	29.26	0.98
B-7	0.29	1.79	112	102	87	30.96	1.03
B-6	0.30	1.85	112	102	87	32.81	0.99
B-5	0.31	1.92	114	104	87	34.62	0.99
B-4	0.30	1.86	115	105	89	36.47	0.94
B-3	0.32	1.98	116	106	88	38.19	0.96
B-2	0.26	1.61	116	106	88	40.02	1.07
B-1	0.24	1.49	117	106	88	41.86	1.03
						43.55	

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

25-Jun-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	0.33	1.96	96	96	89	44.26	1.00
B-11	0.32	1.90	97	94	88	46.13	0.98
B-10	0.25	1.49	100	95	88	47.94	0.98
B-9	0.26	1.55	101	96	89	49.54	0.98
B-8	0.30	1.80	103	98	88	51.17	0.91
B-7	0.28	1.68	104	98	88	52.80	0.98
B-6	0.31	1.86	106	98	88	54.50	0.97
B-5	0.33	1.99	108	99	88	56.27	1.00
B-4	0.32	1.94	110	100	88	58.17	0.97
B-3	0.31	1.87	110	100	88	59.98	1.04
B-2	0.26	1.58	112	101	87	61.90	0.93
B-1	0.25	1.52	111	102	87	63.48	0.99
A-12	0.29	1.76	113	103	88	65.13	0.98
A-11	0.33	2.01	114	104	88	66.88	0.97
A-10	0.26	1.59	115	105	88	68.74	0.99
A-9	0.25	1.53	115	105	88	70.42	1.02
A-8	0.28	1.71	116	106	88	72.13	0.99
A-7	0.30	1.83	116	106	88	73.88	0.96
A-6	0.30	1.84	118	108	88	75.63	0.98
A-5	0.32	1.97	119	109	88	77.44	0.96
A-4	0.31	1.90	118	109	88	79.26	0.97
A-3	0.31	1.90	119	109	87	81.07	1.01
A-2	0.27	1.66	119	109	88	82.96	1.00
A-1	0.27	1.48	118	110	87	84.71	0.91
						86.31	

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

25-Jun-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	0.34	2.05	104	104	88	87.18	1.03
A-11	0.29	1.76	111	107	89	89.17	0.95
A-10	0.26	1.58	112	107	89	90.88	1.00
A-9	0.28	1.71	113	107	89	92.59	0.93
A-8	0.28	1.71	115	107	88	94.24	0.93
A-7	0.31	1.90	115	108	88	95.89	1.02
A-6	0.33	2.02	117	108	88	97.80	0.99
A-5	0.34	2.09	118	109	88	99.72	1.03
A-4	0.3	1.84	119	110	88	101.75	0.92
A-3	0.32	1.97	120	110	88	103.45	0.99
A-2	0.27	1.66	119	110	87	105.34	0.99
A-1	0.25	1.54	119	111	87	107.09	0.97
B-12	0.31	1.90	120	111	88	108.73	0.95
B-11	0.32	1.97	121	112	89	110.54	0.94
B-10	0.32	1.97	121	112	88	112.35	0.99
B-9	0.26	1.60	121	112	88	114.25	0.97
B-8	0.26	1.61	121	113	88	115.94	0.98
B-7	0.28	1.73	121	113	88	117.64	0.97
B-6	0.29	1.79	122	114	88	119.39	0.99
B-5	0.30	1.86	122	114	88	121.21	0.96
B-4	0.31	1.92	122	114	88	123.00	0.96
B-3	0.30	1.86	122	114	88	124.83	0.97
B-2	0.25	1.55	121	114	88	126.65	0.98
B-1	0.24	1.48	121	114	88	128.32	0.98
						129.96	



Pinnacle Renewable Energy Inc
 Dryer1 Stack 1
 Pinnacle Renewable Energy Inc

Data for **TEST 1**

OVERALL ISOKINETICS - TEST 1 0.996

Delta P:	0.290 "H ₂ O	Us avg:	31.86 ft/sec
Delta H:	1.773	ACFM:	63428 ft ³ /min
Tm avg:	561.1 °R	SDCFM:	56203 ft ³ /min
Ts avg:	547.4 °R	Vm std:	38.72 ft ³
Bwo:	0.032	Vm corr:	43.15 ft ³
Md:	28.84	Vm:	42.41 ft ³
Ms:	28.50	MF:	1.0175
Pb:	28.40 "Hg	PCON:	10.94 mg/m ³
Pm:	28.53 "Hg	ERAT:	1.04 kg/hr
Ps:	28.39 "Hg		

Data for **TEST 2**

OVERALL ISOKINETICS - TEST 2 0.978

Delta P:	0.291 "H ₂ O	Us avg:	32.00 ft/sec
Delta H:	1.763	ACFM:	63700 ft ³ /min
Tm avg:	566.6 °R	SDCFM:	56151 ft ³ /min
Ts avg:	547.9 °R	Vm std:	38.02 ft ³
Bwo:	0.036	Vm corr:	42.79 ft ³
Md:	28.84	Vm:	42.05 ft ³
Ms:	28.45	MF:	1.0175
Pb:	28.40 "Hg	PCON:	9.01 mg/m ³
Pm:	28.53 "Hg	ERAT:	0.86 kg/hr
Ps:	28.39 "Hg		

Data for **TEST 3**

OVERALL ISOKINETICS - TEST 3 0.974

Delta P:	0.292 "H ₂ O	Us avg:	31.96 ft/sec
Delta H:	1.795	ACFM:	63620 ft ³ /min
Tm avg:	574.4 °R	SDCFM:	56541 ft ³ /min
Ts avg:	548.1 °R	Vm std:	38.16 ft ³
Bwo:	0.028	Vm corr:	43.53 ft ³
Md:	28.84	Vm:	42.78 ft ³
Ms:	28.54	MF:	1.0175
Pb:	28.40 "Hg	PCON:	11.38 mg/m ³
Pm:	28.53 "Hg	ERAT:	1.09 kg/hr
Ps:	28.39 "Hg		

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	93 ° F	34 ° C
Moisture Content (by volume):	3.55 %	
Average Stack Gas Velocity:	30.5 ft/sec	9.3 m/sec
Total Actual Gas Flow Rate:	60740 ACFM	
Dry Gas flow Rate at Reference Conditions:	53090 SCFM	25.1 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.005 gr/ft ³	10.5 mg/m ³
Front Half Particulate	0.003 gr/ft ³	6.5 mg/m ³
Back Half Condensibles	0.002 gr/ft ³	4.0 mg/m ³
Mass Emission Rate	2.08 lbs/hr	0.94 kg/hr

SUMMARY OF AIR EMISSION TESTS
TEST 1:

Gas Temperature:	92 ° F	33 ° C
Moisture Content (by volume):	3.1 %	
Average Stack Gas Velocity:	30.5 ft/sec	9.3 m/sec
Total Actual Gas Flow Rate:	60768 ACFM	
Dry Gas flow Rate at Reference Conditions:	53403 SCFM	25.2 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.004 gr/ft ³	10.2 mg/m ³
Front Half Particulate	.003 gr/ft ³	6.0 mg/m ³
Back Half Condensibles	.002 gr/ft ³	4.3 mg/m ³
Mass Emission Rate	2.05 lbs/hr	0.93 kg/hr

TEST 2:

Gas Temperature:	92 ° F	34 ° C
Moisture Content (by volume):	4.0 %	
Average Stack Gas Velocity:	30.6 ft/sec	9.3 m/sec
Total Actual Gas Flow Rate:	60968 ACFM	
Dry Gas flow Rate at Reference Conditions:	53054 SCFM	25.0 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.004 gr/ft ³	9.1 mg/m ³
Front Half Particulate	.002 gr/ft ³	5.7 mg/m ³
Back Half Condensibles	.001 gr/ft ³	3.4 mg/m ³
Mass Emission Rate	1.81 lbs/hr	0.82 kg/hr

TEST 3:

Gas Temperature:	94 ° F	34 ° C
Moisture Content (by volume):	3.5 %	
Average Stack Gas Velocity:	30.4 ft/sec	9.3 m/sec
Total Actual Gas Flow Rate:	60485 ACFM	
Dry Gas flow Rate at Reference Conditions:	52813 SCFM	24.9 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.005 gr/ft ³	12.0 mg/m ³
Front Half Particulate	.003 gr/ft ³	7.7 mg/m ³
Back Half Condensibles	.002 gr/ft ³	4.3 mg/m ³
Mass Emission Rate	2.38 lbs/hr	1.08 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:
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
J73	J80	J81
25-Jun-24	25-Jun-24	25-Jun-24
12:50	14:20	15:28
13:52	15:22	16:30
60	60	60
KS/DB	KS/DB	KS/DB
980	980	980
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
0.280	0.280	0.280
1.0027	1.0027	1.0027
0.83829	0.83829	0.83829
33.18	33.18	33.18
26	35	29
2.4	2.1	2.3
0.0001	0.0003	0.0002
0.0069	0.0064	0.0087
0.0050	0.0040	0.0050
0.0120	0.0107	0.0139

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

25-Jun-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	0.31	1.75	89	88	93	40.61	1.01
A-11	0.29	1.65	95	87	93	42.65	1.06
A-10	0.27	1.54	98	87	92	44.73	0.97
A-9	0.28	1.60	100	88	92	46.58	1.00
A-8	0.27	1.55	102	88	92	48.52	1.09
A-7	0.29	1.66	104	89	92	50.60	0.97
A-6	0.28	1.61	106	89	92	52.52	0.96
A-5	0.25	1.44	105	90	92	54.39	1.00
A-4	0.27	1.56	106	91	92	56.24	1.02
A-3	0.25	1.44	108	92	92	58.20	0.96
A-2	0.22	1.27	108	92	92	59.97	0.98
A-1	0.20	1.15	108	93	92	61.68	0.98
B-12	0.30	1.74	108	94	92	63.30	1.00
B-11	0.28	1.62	110	94	92	65.34	0.99
B-10	0.26	1.51	111	95	93	67.29	1.03
B-9	0.29	1.69	113	96	93	69.25	0.99
B-8	0.28	1.63	113	96	93	71.23	1.01
B-7	0.30	1.75	113	97	93	73.22	1.03
B-6	0.29	1.69	114	97	92	75.32	0.99
B-5	0.26	1.52	114	98	92	77.32	0.94
B-4	0.28	1.63	114	98	92	79.12	1.01
B-3	0.24	1.40	114	98	91	81.11	1.05
B-2	0.23	1.34	114	98	91	83.04	0.99
B-1	0.21	1.22	112	98	92	84.82	1.04
						86.60	

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

25-Jun-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	0.32	1.78	87	87	91	87.61	1.00
B-11	0.30	1.68	98	87	93	89.65	0.99
B-10	0.28	1.57	100	88	93	91.61	0.98
B-9	0.27	1.52	103	90	92	93.50	0.97
B-8	0.26	1.47	103	89	90	95.35	1.00
B-7	0.28	1.58	105	90	92	97.22	1.02
B-6	0.29	1.64	107	91	92	99.20	0.98
B-5	0.26	1.48	110	92	92	101.13	0.99
B-4	0.28	1.59	109	93	92	102.98	1.04
B-3	0.26	1.48	111	94	92	105.00	1.05
B-2	0.23	1.31	112	96	93	106.98	1.00
B-1	0.21	1.20	111	95	93	108.75	1.01
A-12	0.31	1.77	11	95	93	110.46	1.06
A-11	0.29	1.66	113	96	93	112.45	1.09
A-10	0.27	1.55	115	96	93	114.63	0.99
A-9	0.30	1.72	114	97	93	116.54	1.08
A-8	0.27	1.55	115	98	93	118.73	1.01
A-7	0.29	1.67	115	98	92	120.68	0.95
A-6	0.28	1.61	116	99	92	122.58	1.06
A-5	0.25	1.44	116	100	92	124.67	1.01
A-4	0.27	1.56	117	101	92	126.56	1.01
A-3	0.23	1.23	117	101	92	128.51	0.95
A-2	0.22	1.27	118	102	93	130.22	0.99
A-1	0.20	1.15	118	102	93	131.96	0.99
						133.61	

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

25-Jun-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	0.31	1.72	98	97	93	34.21	1.04
A-11	0.29	1.62	107	98	94	36.34	0.96
A-10	0.27	1.51	109	97	94	38.25	1.07
A-9	0.26	1.46	112	98	94	40.32	1.03
A-8	0.27	1.52	113	98	94	42.28	1.00
A-7	0.29	1.63	113	98	93	44.22	0.97
A-6	0.3	1.69	112	98	93	46.17	0.95
A-5	0.25	1.41	114	99	93	48.11	1.01
A-4	0.27	1.53	115	100	93	50.00	1.01
A-3	0.25	1.41	116	100	94	51.96	0.96
A-2	0.22	1.24	117	100	94	53.75	0.96
A-1	0.2	1.13	117	101	94	55.43	1.06
B-12	0.32	1.81	117	101	94	57.21	1.07
B-11	0.30	1.70	119	102	93	59.48	0.98
B-10	0.28	1.59	119	103	94	61.50	1.02
B-9	0.29	1.64	118	103	94	63.52	0.98
B-8	0.26	1.47	119	103	95	65.51	1.01
B-7	0.28	1.59	118	105	94	67.44	1.02
B-6	0.27	1.53	119	104	94	69.48	0.96
B-5	0.24	1.36	119	104	94	71.35	1.00
B-4	0.26	1.47	118	104	94	73.19	1.00
B-3	0.22	1.25	119	104	94	75.11	1.03
B-2	0.21	1.19	118	105	93	76.93	0.98
B-1	0.21	1.19	118	105	93	78.62	0.94
						80.24	



Pinnacle Renewable Energy Inc
 Dryer1 Stack 2
 Pinnacle Renewable Energy Inc

Data for **TEST 1**

OVERALL ISOKINETICS - TEST 1 1.003

Delta P:	0.266 "H ₂ O	Us avg:	30.52 ft/sec
Delta H:	1.540	ACFM:	60768 ft ³ /min
Tm avg:	560.3 °R	SDCFM:	53403 ft ³ /min
Ts avg:	552.2 °R	Vm std:	41.42 ft ³
Bwo:	0.031	Vm corr:	46.11 ft ³
Md:	28.84	Vm:	45.99 ft ³
Ms:	28.50	MF:	1.0027
Pb:	28.40 "Hg	PCON:	10.23 mg/m ³
Pm:	28.51 "Hg	ERAT:	0.93 kg/hr
Ps:	28.38 "Hg		

Data for **TEST 2**

OVERALL ISOKINETICS - TEST 2 1.010

Delta P:	0.267 "H ₂ O	Us avg:	30.62 ft/sec
Delta H:	1.520	ACFM:	60968 ft ³ /min
Tm avg:	560.4 °R	SDCFM:	53054 ft ³ /min
Ts avg:	552.3 °R	Vm std:	41.41 ft ³
Bwo:	0.040	Vm corr:	46.12 ft ³
Md:	28.84	Vm:	46.00 ft ³
Ms:	28.40	MF:	1.0027
Pb:	28.40 "Hg	PCON:	9.12 mg/m ³
Pm:	28.51 "Hg	ERAT:	0.82 kg/hr
Ps:	28.38 "Hg		

Data for **TEST 3**

OVERALL ISOKINETICS - TEST 3 1.001

Delta P:	0.262 "H ₂ O	Us avg:	30.38 ft/sec
Delta H:	1.486	ACFM:	60485 ft ³ /min
Tm avg:	568.1 °R	SDCFM:	52813 ft ³ /min
Ts avg:	553.7 °R	Vm std:	40.87 ft ³
Bwo:	0.035	Vm corr:	46.15 ft ³
Md:	28.84	Vm:	46.03 ft ³
Ms:	28.46	MF:	1.0027
Pb:	28.40 "Hg	PCON:	12.01 mg/m ³
Pm:	28.51 "Hg	ERAT:	1.08 kg/hr
Ps:	28.38 "Hg		

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	91 ° F	33 ° C
Moisture Content (by volume):	2.54 %	
Average Stack Gas Velocity:	31.3 ft/sec	9.5 m/sec
Total Actual Gas Flow Rate:	62261 ACFM	
Dry Gas flow Rate at Reference Conditions:	55131 SCFM	26.0 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.003 gr/ft ³	8.0 mg/m ³
Front Half Particulate	0.002 gr/ft ³	5.3 mg/m ³
Back Half Condensibles	0.001 gr/ft ³	2.6 mg/m ³
Mass Emission Rate	1.64 lbs/hr	0.74 kg/hr

SUMMARY OF AIR EMISSION TESTS
TEST 1:

Gas Temperature:	90 ° F	32 ° C
Moisture Content (by volume):	2.1 %	
Average Stack Gas Velocity:	31.3 ft/sec	9.5 m/sec
Total Actual Gas Flow Rate:	62352 ACFM	
Dry Gas flow Rate at Reference Conditions:	55579 SCFM	26.2 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.004 gr/ft ³	8.6 mg/m ³
Front Half Particulate	.003 gr/ft ³	5.9 mg/m ³
Back Half Condensibles	.001 gr/ft ³	2.6 mg/m ³
Mass Emission Rate	1.78 lbs/hr	0.81 kg/hr

TEST 2:

Gas Temperature:	91 ° F	33 ° C
Moisture Content (by volume):	2.5 %	
Average Stack Gas Velocity:	31.2 ft/sec	9.5 m/sec
Total Actual Gas Flow Rate:	62212 ACFM	
Dry Gas flow Rate at Reference Conditions:	55127 SCFM	26.0 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.003 gr/ft ³	7.8 mg/m ³
Front Half Particulate	.002 gr/ft ³	5.2 mg/m ³
Back Half Condensibles	.001 gr/ft ³	2.6 mg/m ³
Mass Emission Rate	1.62 lbs/hr	0.73 kg/hr

TEST 3:

Gas Temperature:	92 ° F	34 ° C
Moisture Content (by volume):	3.1 %	
Average Stack Gas Velocity:	31.3 ft/sec	9.5 m/sec
Total Actual Gas Flow Rate:	62218 ACFM	
Dry Gas flow Rate at Reference Conditions:	54688 SCFM	25.8 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.003 gr/ft ³	7.4 mg/m ³
Front Half Particulate	.002 gr/ft ³	4.8 mg/m ³
Back Half Condensibles	.001 gr/ft ³	2.6 mg/m ³
Mass Emission Rate	1.53 lbs/hr	0.69 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
J85	J86	J87
25-Jun-24	25-Jun-24	25-Jun-24
8:45	9:55	11:03
9:47	10:57	12:05
60	60	60
CB/DB	CB/DB	CB/DB
1021	1021	1021
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
0.275	0.275	0.275
1.0175	1.0175	1.0175
0.84182	0.84182	0.84182
33.18	33.18	33.18
16	20	25
2.1	2.0	2.1
0.0009	0.0002	0.0001
0.0059	0.0058	0.0054
0.0030	0.0030	0.0030
0.0098	0.0090	0.0085

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

25-Jun-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	0.23	1.48	61	61	92	67.29	1.01
A-11	0.25	1.62	64	62	89	68.90	0.95
A-10	0.26	1.69	68	62	88	70.49	0.93
A-9	0.29	1.89	72	62	89	72.08	0.94
A-8	0.32	2.10	75	64	88	73.79	1.01
A-7	0.33	2.18	79	68	90	75.73	1.00
A-6	0.30	1.99	81	67	89	77.69	0.92
A-5	0.31	2.06	84	69	90	79.40	0.98
A-4	0.29	1.93	85	70	89	81.27	0.98
A-3	0.28	1.87	87	72	90	83.08	0.99
A-2	0.26	1.74	89	74	92	84.88	0.98
A-1	0.26	1.74	90	76	92	86.61	0.96
B-12	0.23	1.55	91	79	89	88.30	0.99
B-11	0.24	1.63	93	83	90	89.95	1.00
B-10	0.27	1.83	94	81	90	91.66	0.92
B-9	0.30	2.03	96	82	91	93.33	0.95
B-8	0.31	2.10	97	84	92	95.14	0.97
B-7	0.33	2.25	100	87	92	97.04	0.97
B-6	0.31	2.11	101	87	92	99.01	1.01
B-5	0.30	2.05	104	88	93	101.00	0.95
B-4	0.29	1.98	103	89	93	102.83	0.98
B-3	0.27	1.86	103	93	90	104.70	0.95
B-2	0.26	1.79	103	91	90	106.46	1.05
B-1	0.24	1.66	103	92	90	108.37	0.96
						110.05	

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

25-Jun-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	0.23	1.59	90	90	92	10.31	1.02
B-11	0.24	1.66	93	90	92	12.01	0.95
B-10	0.25	1.73	97	90	92	13.64	1.00
B-9	0.30	2.09	99	91	92	15.39	0.98
B-8	0.32	2.23	102	91	92	17.27	1.00
B-7	0.33	2.31	103	92	90	19.26	1.00
B-6	0.31	2.18	104	93	90	21.29	0.95
B-5	0.30	2.11	106	94	90	23.17	1.00
B-4	0.28	1.97	107	96	91	25.11	1.05
B-3	0.27	1.90	107	95	92	27.09	0.96
B-2	0.25	1.76	107	96	92	28.86	0.95
B-1	0.26	1.83	108	97	92	30.56	1.00
A-12	0.24	1.70	109	98	91	32.38	0.96
A-11	0.24	1.70	109	98	90	34.06	0.98
A-10	0.28	1.98	109	99	91	35.78	1.00
A-9	0.30	2.13	111	100	91	37.67	0.99
A-8	0.29	2.06	112	101	91	39.61	0.99
A-7	0.33	2.35	113	102	91	41.52	0.99
A-6	0.32	2.27	113	102	92	43.56	1.03
A-5	0.30	2.14	114	103	92	45.65	0.96
A-4	0.28	2.00	114	104	92	47.54	1.02
A-3	0.27	1.93	114	104	91	49.48	0.97
A-2	0.26	1.86	115	105	91	51.30	0.99
A-1	0.23	1.65	114	106	91	53.13	0.98
						54.83	

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

25-Jun-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	1.68	99	99	91	55.64	1.07
A-11	0.25	1.74	103	92	93	57.49	0.96
A-10	0.27	1.89	106	93	93	59.18	0.99
A-9	0.28	1.96	109	94	94	60.99	1.00
A-8	0.3	2.11	110	97	93	62.87	0.99
A-7	0.33	2.34	113	100	93	64.79	0.99
A-6	0.31	2.20	113	102	93	66.82	0.98
A-5	0.3	2.14	113	106	93	68.78	1.07
A-4	0.29	2.07	114	103	92	70.89	0.91
A-3	0.28	1.99	114	104	93	72.65	0.99
A-2	0.25	1.78	115	104	94	74.52	1.01
A-1	0.26	1.86	115	105	91	76.34	0.96
B-12	0.23	1.64	116	105	92	78.10	0.98
B-11	0.24	1.72	115	106	92	79.79	0.99
B-10	0.26	1.86	116	106	92	81.53	0.98
B-9	0.29	2.07	117	106	93	83.34	0.97
B-8	0.30	2.15	118	108	92	85.22	0.98
B-7	0.32	2.29	118	108	93	87.16	0.98
B-6	0.31	2.23	119	109	93	89.17	0.99
B-5	0.31	2.23	119	109	93	91.17	0.96
B-4	0.29	2.09	119	109	92	93.10	1.00
B-3	0.26	1.87	119	109	91	95.05	1.06
B-2	0.25	1.80	119	109	91	97.01	0.92
B-1	0.23	1.65	118	109	92	98.67	0.98
						100.37	



Pinnacle Renewable Energy Inc
 Dryer1 Stack 3
 Pinnacle Renewable Energy Inc

Data for TEST 1		OVERALL ISOKINETICS - TEST 1 0.974	
Delta P:	0.280 "H₂O	Us avg:	31.32 ft/sec
Delta H:	1.880	ACFM:	62352 ft³/min
Tm avg:	542.6 °R	SDCFM:	55579 ft³/min
Ts avg:	550.4 °R	Vm std:	40.38 ft³
Bwo:	0.021	Vm corr:	43.51 ft³
Md:	28.84	Vm:	42.76 ft³
Ms:	28.62	MF:	1.0175
Pb:	28.40 "Hg	PCON:	8.57 mg/m³
Pm:	28.54 "Hg	ERAT:	0.81 kg/hr
Ps:	28.39 "Hg		

Data for TEST 2		OVERALL ISOKINETICS - TEST 2 0.987	
Delta P:	0.277 "H₂O	Us avg:	31.25 ft/sec
Delta H:	1.964	ACFM:	62212 ft³/min
Tm avg:	562.2 °R	SDCFM:	55127 ft³/min
Ts avg:	551.3 °R	Vm std:	40.59 ft³
Bwo:	0.025	Vm corr:	45.30 ft³
Md:	28.84	Vm:	44.52 ft³
Ms:	28.57	MF:	1.0175
Pb:	28.40 "Hg	PCON:	7.83 mg/m³
Pm:	28.54 "Hg	ERAT:	0.73 kg/hr
Ps:	28.39 "Hg		

Data for TEST 3		OVERALL ISOKINETICS - TEST 3 0.988	
Delta P:	0.276 "H₂O	Us avg:	31.25 ft/sec
Delta H:	1.973	ACFM:	62218 ft³/min
Tm avg:	568.9 °R	SDCFM:	54688 ft³/min
Ts avg:	552.5 °R	Vm std:	40.30 ft³
Bwo:	0.031	Vm corr:	45.51 ft³
Md:	28.84	Vm:	44.73 ft³
Ms:	28.51	MF:	1.0175
Pb:	28.40 "Hg	PCON:	7.45 mg/m³
Pm:	28.55 "Hg	ERAT:	0.69 kg/hr
Ps:	28.39 "Hg		

Pinnacle Renewable Energy Inc.
Dryer1 Stack 4
Smithers BC

25-Jun-24

Permit Number: RA-6099

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	98 ° F	36 ° C
Moisture Content (by volume):	2.85 %	
Average Stack Gas Velocity:	31.8 ft/sec	9.7 m/sec
Total Actual Gas Flow Rate:	63397 ACFM	
Dry Gas flow Rate at Reference Conditions:	55329 SCFM	26.1 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.007 gr/ft ³	15.5 mg/m ³
Front Half Particulate	0.003 gr/ft ³	5.9 mg/m ³
Back Half Condensibles	0.004 gr/ft ³	9.6 mg/m ³
Mass Emission Rate	3.22 lbs/hr	1.46 kg/hr

SUMMARY OF AIR EMISSION TESTS

TEST 1:

Gas Temperature:	105 ° F	41 ° C
Moisture Content (by volume):	2.8 %	
Average Stack Gas Velocity:	32.2 ft/sec	9.8 m/sec
Total Actual Gas Flow Rate:	64041 ACFM	
Dry Gas flow Rate at Reference Conditions:	55191 SCFM	26.0 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.007 gr/ft ³	16.3 mg/m ³
Front Half Particulate	.002 gr/ft ³	4.8 mg/m ³
Back Half Condensibles	.005 gr/ft ³	11.5 mg/m ³
Mass Emission Rate	3.37 lbs/hr	1.53 kg/hr

TEST 2:

Gas Temperature:	94 ° F	35 ° C
Moisture Content (by volume):	3.3 %	
Average Stack Gas Velocity:	31.7 ft/sec	9.7 m/sec
Total Actual Gas Flow Rate:	63035 ACFM	
Dry Gas flow Rate at Reference Conditions:	55095 SCFM	26.0 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.007 gr/ft ³	16.6 mg/m ³
Front Half Particulate	.003 gr/ft ³	7.6 mg/m ³
Back Half Condensibles	.004 gr/ft ³	9.1 mg/m ³
Mass Emission Rate	3.43 lbs/hr	1.56 kg/hr

TEST 3:

Gas Temperature:	93 ° F	34 ° C
Moisture Content (by volume):	2.5 %	
Average Stack Gas Velocity:	31.7 ft/sec	9.7 m/sec
Total Actual Gas Flow Rate:	63114 ACFM	
Dry Gas flow Rate at Reference Conditions:	55700 SCFM	26.3 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.006 gr/ft ³	13.7 mg/m ³
Front Half Particulate	.002 gr/ft ³	5.4 mg/m ³
Back Half Condensibles	.004 gr/ft ³	8.3 mg/m ³
Mass Emission Rate	2.85 lbs/hr	1.29 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:
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
J88	K73	K74
25-Jun-24	25-Jun-24	25-Jun-24
8:54	10:07	11:15
9:56	11:09	12:17
60	60	60
KS/DB	KS/DB	KS/DB
980	980	980
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
0.280	0.280	0.280
1.0027	1.0027	1.0027
0.83829	0.83829	0.83829
33.18	33.18	33.18
24	29	21
1.8	2.2	2.1
0.0007	0.0003	0.0002
0.0051	0.0089	0.0063
0.0140	0.0110	0.0100
0.0198	0.0202	0.0165

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

25-Jun-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	1.35	63	63	88	93.67	1.03
A-11	0.23	1.25	69	62	92	95.46	1.00
A-10	0.24	1.30	73	62	95	97.13	0.99
A-9	0.26	1.40	77	63	99	98.83	0.99
A-8	0.28	1.51	81	64	102	100.59	1.04
A-7	0.29	1.56	85	67	108	102.51	1.02
A-6	0.32	1.72	87	68	110	104.43	0.99
A-5	0.33	1.77	88	69	112	106.40	0.98
A-4	0.34	1.85	91	70	107	108.38	0.95
A-3	0.32	1.77	93	72	112	110.33	0.97
A-2	0.31	1.67	94	74	115	112.27	1.04
A-1	0.31	1.67	94	75	117	114.31	0.97
B-12	0.24	1.29	95	76	118	116.22	1.03
B-11	0.24	1.30	96	78	115	118.00	1.09
B-10	0.23	1.24	96	79	117	119.90	0.96
B-9	0.27	1.47	97	80	113	121.53	1.03
B-8	0.29	1.59	99	81	111	123.44	1.10
B-7	0.30	1.68	100	82	99	125.56	0.93
B-6	0.33	1.86	101	83	99	127.40	1.01
B-5	0.34	1.92	103	84	98	129.52	1.00
B-4	0.33	1.86	103	85	101	131.64	0.99
B-3	0.31	1.75	103	85	100	133.72	0.99
B-2	0.30	1.70	104	86	99	135.74	1.03
B-1	0.30	1.70	104	87	98	137.80	1.00
						139.80	

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

25-Jun-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	0.26	1.42	87	86	100	43.81	1.01
B-11	0.22	1.22	95	86	96	45.65	1.08
B-10	0.25	1.39	95	85	94	47.48	0.98
B-9	0.27	1.50	96	85	93	49.26	1.05
B-8	0.29	1.62	100	85	93	51.24	0.97
B-7	0.28	1.57	102	86	94	53.15	0.96
B-6	0.31	1.75	104	87	94	55.00	1.04
B-5	0.34	1.92	106	88	94	57.13	0.99
B-4	0.33	1.86	106	89	93	59.25	1.05
B-3	0.31	1.75	108	90	93	61.46	0.97
B-2	0.30	1.70	108	90	94	63.45	1.01
B-1	0.30	1.66	108	91	94	65.49	0.93
A-12	0.23	1.29	107	92	96	67.36	1.01
A-11	0.23	1.29	106	92	96	69.15	0.98
A-10	0.22	1.24	108	92	96	70.88	1.01
A-9	0.26	1.46	107	93	97	72.63	1.04
A-8	0.28	1.57	110	94	95	74.58	1.06
A-7	0.31	1.76	109	94	94	76.66	0.94
A-6	0.32	1.82	110	94	93	78.59	1.02
A-5	0.33	1.89	111	95	92	80.73	0.97
A-4	0.32	1.82	111	95	93	82.81	1.01
A-3	0.30	1.71	111	96	93	84.93	1.06
A-2	0.31	1.78	112	96	91	87.08	1.07
A-1	0.29	1.66	112	96	91	89.29	0.97
						91.24	

Sampling Data for - TEST 3

25-Jun-24

Pinnacle Renewable Energy Inc.

Dryer1 Stack 4

Smithers BC

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	1.40	94	91	93	92.39	1.05
A-11	0.23	1.29	102	93	97	94.31	0.94
A-10	0.24	1.34	104	93	98	95.98	1.10
A-9	0.28	1.58	107	93	97	97.98	0.98
A-8	0.3	1.70	108	93	95	99.90	0.94
A-7	0.29	1.64	110	94	95	101.82	1.00
A-6	0.32	1.82	110	94	94	103.83	0.95
A-5	0.33	1.88	110	94	93	105.84	1.01
A-4	0.32	1.83	111	95	92	108.00	0.98
A-3	0.3	1.71	112	95	93	110.08	1.00
A-2	0.29	1.66	112	95	92	112.12	0.97
A-1	0.31	1.77	111	96	92	114.08	0.94
B-12	0.24	1.38	113	97	91	116.04	1.06
B-11	0.22	1.26	111	97	92	118.00	0.93
B-10	0.23	1.32	112	98	92	119.63	1.04
B-9	0.27	1.54	112	98	93	121.50	0.95
B-8	0.29	1.66	113	98	93	123.35	1.01
B-7	0.30	1.72	114	98	93	125.39	1.01
B-6	0.33	1.89	114	98	93	127.47	1.01
B-5	0.34	1.95	115	99	93	129.64	0.95
B-4	0.33	1.90	115	99	93	131.72	0.97
B-3	0.31	1.78	115	99	93	133.82	1.00
B-2	0.30	1.72	115	99	93	135.92	0.96
B-1	0.29	1.66	115	99	93	137.90	1.01
						139.94	



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

Data for **TEST 1**

OVERALL ISOKINETICS - TEST 1 1.005

Delta P:	0.289 "H ₂ O	Us avg:	32.17 ft/sec
Delta H:	1.591	ACFM:	64041 ft ³ /min
Tm avg:	543.1 °R	SDCFM:	55191 ft ³ /min
Ts avg:	565.2 °R	Vm std:	42.86 ft ³
Bwo:	0.028	Vm corr:	46.25 ft ³
Md:	28.84	Vm:	46.13 ft ³
Ms:	28.54	MF:	1.0027
Pb:	28.40 "Hg	PCON:	16.32 mg/m ³
Pm:	28.52 "Hg	ERAT:	1.53 kg/hr
Ps:	28.38 "Hg		

Data for **TEST 2**

OVERALL ISOKINETICS - TEST 2 1.007

Delta P:	0.285 "H ₂ O	Us avg:	31.66 ft/sec
Delta H:	1.610	ACFM:	63035 ft ³ /min
Tm avg:	558.0 °R	SDCFM:	55095 ft ³ /min
Ts avg:	554.1 °R	Vm std:	42.89 ft ³
Bwo:	0.033	Vm corr:	47.56 ft ³
Md:	28.84	Vm:	47.43 ft ³
Ms:	28.48	MF:	1.0027
Pb:	28.40 "Hg	PCON:	16.63 mg/m ³
Pm:	28.52 "Hg	ERAT:	1.56 kg/hr
Ps:	28.38 "Hg		

Data for **TEST 3**

OVERALL ISOKINETICS - TEST 3 0.990

Delta P:	0.287 "H ₂ O	Us avg:	31.70 ft/sec
Delta H:	1.642	ACFM:	63114 ft ³ /min
Tm avg:	563.3 °R	SDCFM:	55700 ft ³ /min
Ts avg:	553.5 °R	Vm std:	42.60 ft ³
Bwo:	0.025	Vm corr:	47.68 ft ³
Md:	28.84	Vm:	47.55 ft ³
Ms:	28.57	MF:	1.0027
Pb:	28.40 "Hg	PCON:	13.68 mg/m ³
Pm:	28.52 "Hg	ERAT:	1.29 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)

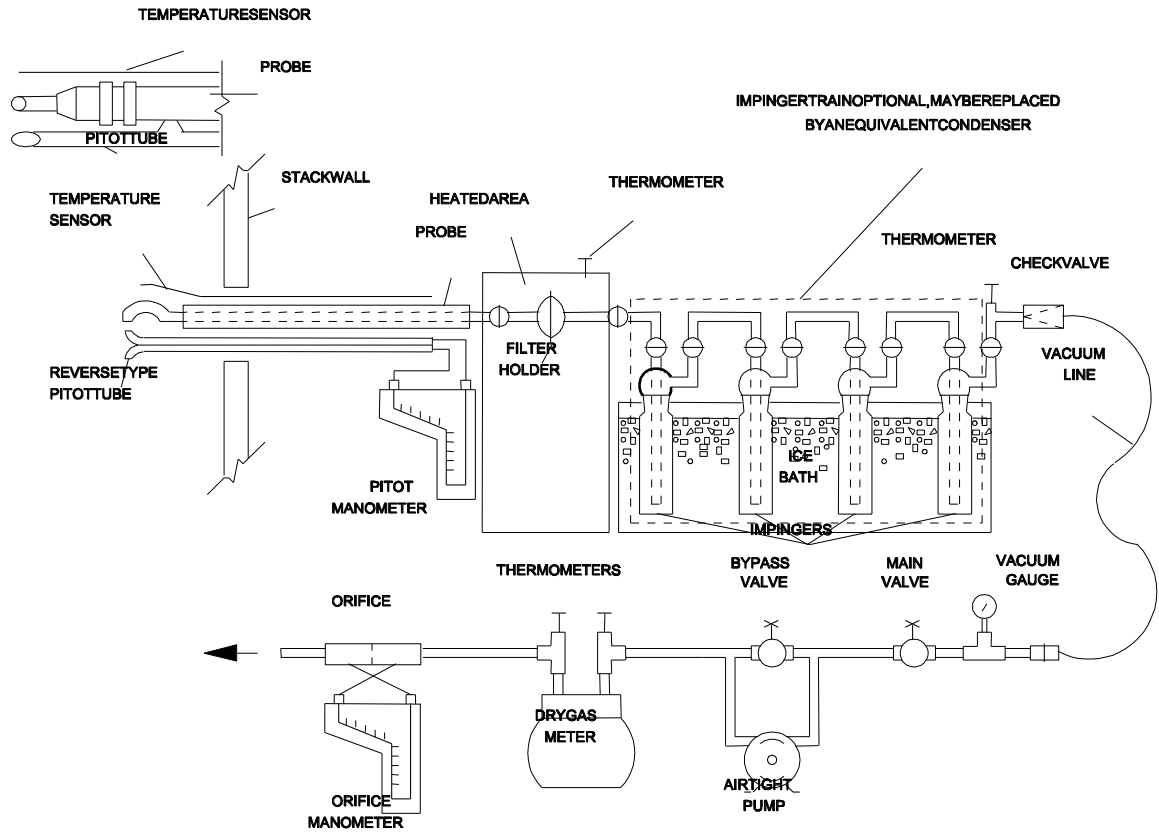
O₂, CO₂, and CO were found using either Fuji Analytical Analyzer by means of infrared and paramagnetic technology (EPA 3A) or by fyrite (EPA Method 3).

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.

$$V_{m(\text{std})} = V_m Y \left(\frac{T_{\text{std}}}{T_m} \right) \left[\frac{P_{\text{bar}} + \frac{\Delta H}{13.6}}{P_{\text{std}}} \right] \quad \text{Eq. 5-1}$$

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

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.

$$V_{w(\text{std})} = \frac{V_{lc} \rho_w R T_{\text{std}}}{M_w P_{\text{std}}} = K_2 V_{lc} \quad \text{Eq. 5-2}$$

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.

$$I = \frac{100 T_s V_{m(\text{std})} P_{\text{std}}}{60 T_{\text{std}} v_s \theta A_n P_s (1 - B_{\text{ws}})} \quad \text{Eq.5-8}$$

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

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).

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

- 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 ($^{\circ}$ F): 70.0
Nozzle: 0.250

Wind Velocity (ft/sec)	Ref.Pitot ("H ₂ O)	S-Type Pitot ("H ₂ O)	Pitot Factor
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: 10-Jan-24

CONSOLE MANUF.: NAPP MODEL 31

CONSOLE I.D.: C-980

PARAMETER SUMMARY	RUN #1	RUN #2	RUN #3
Ta = Ambient (WTM) Temperature (oF.)	64.0	64.0	64.0
P=Pres. Differential at WTM ("Hg)	0.0883	0.1471	0.2133
Pb= Atmospheric Pressure ("Hg)	27.95	27.95	27.95
Pv= Vapour Pressure Water at Temp. Ta ("Hg)	0.6006	0.6006	0.6006
H=Pres. Differential at Orifice	1.0	2.0	3.0
Ti= Dry Test Meter Inlet Temp. (oF.)	90.0	90.0	97.0
To= Dry Test Meter Outlet Temp. (oF.)	75.0	74.0	76.0
Ri= Initial Dry Test volume (ft3)	82.34	75.42	88.32
Rf= Final Dry Test Volume (ft3)	87.31	80.35	93.33
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	27.8617	27.8029	27.7367
Pd= Pb + (^H/13.59) "Hg	28.0236	28.0972	28.1708
Tw= Ta +460 (oR.)	524.0	524.0	524.0
Td= [(Ti + To)/2] + 460 (oR.)	542.5	542.0	546.5
Bw= Pv/Pb ("Hg)	0.0215	0.0215	0.0215
WET TEST METER FACTOR (WTMF)	0.9922	0.9922	0.9922
ated Y Value)(WTMF)	1.0054	1.0078	0.9950
Y (MEAN)(WTMF) =	1.0027		

N.R. MCCALL & ASSOCIATES LTD.

Calibrating Technician Signature:



ORIFICE METER CALIBRATION

DATE: January 10 /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	27.95	27.95	27.95
Y=gas meter factor	1.0054	1.0054	1.0078
Delta H=	0.5	1	1.5
Ri=int. gas meter vol.	94.3	97.2	0.8
Rf=final gas meter vol.	96.47	100.33	4.62
min. samp	5	5	5
Qm=Y(Rf-Ri)/^T(FT3/MIN)	0.4363436	0.6293804	0.7699592
To=meter outlet Temp (oF)	75	76	77
Tm=meter out temp. (oR)	535	536	537
Pm=Pb + ^H	27.986792	28.0235835	28.0603753
SQRT(Tm/Pm*H/Md)	0.5744253	0.812585	0.99548398
Ko=orifice const.	0.7596176	0.774541	0.77345213

Ko MEAN = 0.7692036

Ko*4*144= 443.06127

McCALL ENVIRONMENTAL LTD.



Calibrating Technician Signature:

ORIFICE METER CALIBRATION

DATE: January 10 /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	27.95	27.95	27.95
Y=gas meter factor	1.0078	0.995	0.995
Delta H=	2	2.5	3
Ri=int. gas meter vol.	5.5	10.9	16.2
Rf=final gas meter vol.	9.87	15.72	21.51
min. samp	5	5	5
$Q_m=Y(R_f-R_i)/\Delta T(FT^3/MIN)$	0.8808172	0.95918	1.05669
Tm=meter out temp. (oF)	77	77	78
Tm=meter out temp. (oR.)	537	537	538
$P_m=P_b + \Delta H$	28.097167	28.133959	28.170751
$SQRT(T_m/P_m \cdot H/M_d)$	1.148733	1.2834825	1.4063739
Ko=orifice const.	0.7667728	0.7473261	0.7513578

Ko MEAN = 0.7551522

$Ko^4 \cdot 144 = 434.96768$

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.)	64.0	64.0	64.0
P=Pres. Differential at WTM ("Hg)	0.0669	0.1250	0.1839
Pb= Atmospheric Pressure ("Hg)	27.90	27.90	27.90
Pv= Vapour Pressure Water at Temp. Ta ("Hg)	0.6006	0.6006	0.6006
H=Pres. Differential at Orifice	1.0	2.0	3.0
Ti= Dry Test Meter Inlet Temp. (oF.)	81.0	83.0	86.0
To= Dry Test Meter Outlet Temp. (oF.)	72.0	69.0	70.0
Ri= Initial Dry Test volume (ft3)	73.67	66.93	80.43
Rf= Final Dry Test Volume (ft3)	78.52	71.76	85.27
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	27.8331	27.7750	27.7161
Pd= Pb + (^H/13.59) "Hg	27.9736	28.0472	28.1208
Tw= Ta +460 (oR.)	524.0	524.0	524.0
Td= [(Ti + To)/2] + 460 (oR.)	536.5	536.0	538.0
Bw= Pv/Pb ("Hg)	0.0215	0.0215	0.0215
WET TEST METER FACTOR (WTMF)	0.9922	0.9922	0.9922
(Calculated Y Value)(WTMF)	1.0196	1.0181	1.0149
Y (MEAN)(WTMF) =	1.0175		

MCCALL ENVIRONMENTAL

Calibrating Technician Signature:



ORIFICE METER CALIBRATION

DATE: 09-Jan-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	27.9	27.9	27.9
Y=gas meter factor	1.0196	1.0196	1.0181
Delta H=	0.5	1	1.5
Ri=int. gas meter vol.	91.2	93.6	97
Rf=final gas meter vol.	93.05	96.23	100.22
min. samp	5	5	5
Qm=Y(Rf-Ri)/^T(FT3/MIN)	0.377252	0.5363096	0.6556564
To=meter outlet Temp (oF)	69	69	69
Tm=meter out temp. (oR)	529	529	529
Pm=Pb + ^H	27.936792	27.973584	28.010375
SQRT(Tm/Pm*H/Md)	0.5717061	0.8079826	0.9889225
Ko=orifice const.	0.6598705	0.6637638	0.6630008

Ko MEAN = 0.6622117

Ko*4*144= 381.43394

McCALL ENVIRONMENTAL LTD.



Calibrating Technician Signature:

ORIFICE METER CALIBRATION

DATE: 09-Jan-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	27.9	27.9	27.9
Y=gas meter factor	1.0181	1.0149	1.0149
Delta H=	2	2.5	3
Ri=int. gas meter vol.	1.1	5.7	10.5
Rf=final gas meter vol.	4.8	9.88	15.1
min. samp	5	5	5
$Q_m = Y(R_f - R_i) / \sqrt{T(FT^3/MIN)}$	0.753394	0.8484564	0.933708
To=meter outlet Temp (oF)	69	69	70
Tm=meter out temp. (oR)	529	529	530
$P_m = P_b + \Delta H$	28.047167	28.083959	28.120751
$SQRT(T_m / P_m * H / M_d)$	1.1411601	1.2750198	1.3971188
Ko=orifice const.	0.6602001	0.6654457	0.6683096

Ko MEAN = 0.6646518

$Ko * 4 * 144 = 382.83944$

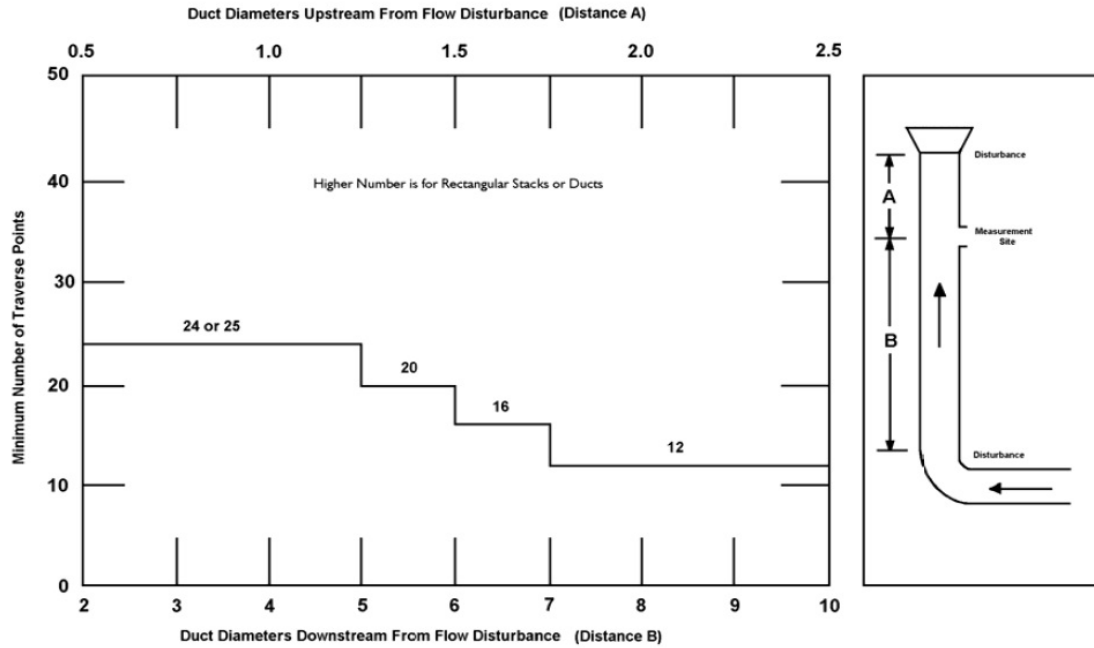
McCALL ENVIRONMENTAL LTD.



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 (June 25, 2024)

15.3 MT/hr

Average for the previous calendar month

13.4 MT/hr

90th percentile production rate

16.8 MT/hr

Average hourly dryer exit temperature during testing:

Included in report

Client Name: Drax
Smithers
 Process: Dryer Stack 1
 Test Number: 1
 Date: June 25 2024
 Start Time: 104
 Finish Time: 207
 Starting Vol.: 300
 Final Vol.: 325
 Flask: 253
 Console: 1021
 Stack Diameter: _____

BP 28.40
 DN .265
 CP .84182
 MF 1.0175
 Moist. 29.
 PM 28.51
 AS _____
 Ko .6646
 Pitot 107
 Port _____
 Static -.20
 PS 28.38

CO ₂	O ₂	CO	N ₂
0	21		
0	21		
0	21		
0	21		

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

Personnel: DB CB KS

Leakage Rate @ 15 inches _____

Start: 1005 Finish: 1005

Load: _____

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A12	.34	2.02	88	87	90	1.14	1	276	1005	
11	.31	1.85	88	87	86	3.01				
10	.26	1.56	92	87	87	4.80				
9	.27	1.62	95	88	87	6.51				
8	.29	1.75	96	88	87	8.18				
7	.28	1.69	98	90	87	9.89				
6	.32	1.94	100	91	87	11.56	1			
5	.33	2.00	103	92	87	13.39				
4	.31	1.89	104	93	87	15.17				
3	.33	2.01	105	94	87	17.00				
2	.27	1.65	107	95	87	18.85				
1	.24	1.47	107	97	87	20.51				
B12	.30	1.84	108	97	87	22.17	1			
11	.32	1.97	109	98	87	24.17				
10	.25	1.53	111	99	89	25.92				
9	.26	1.60	111	101	88	27.59				
8	.27	1.67	112	100	87	29.26				
7	.29	1.79	112	102	87	30.96				
6	.30	1.85	112	102	87	32.81	1			
5	.31	1.92	114	104	87	34.62				
4	.30	1.86	115	105	88	36.47				
3	.32	1.98	116	106	88	38.19				
2	.26	1.61	116	106	88	40.07				
1	.24	1.49	117	106	88	41.86				
						43.55				

Client Name: Drax Smithers

Process: Dryer Stack 1

Test Number: 2

Date: June 25 2024

Start Time: 2:31

Finish Time: 3:34

Starting Vol.: 300

Final Vol.: 328

Flask: 554

Console: 1021

Stack Diameter

BP 28.40

DN .265

CP .84182

MF 1.0175

Moist. 3%

PM 28.51

AS

Ko .6646

Pitot 107

Port

Static -1.20

PS 28.38

CO ₂	O ₂	CO	N ₂
0	21		
0	21		
0	21		
0	21		

Personnel: CB KS DB

Leakage Rate @ 15 inches

Load:

Duct Diameters

Up-Stream

Duct Diameters

Downstream

Mean Yaw Angle

Start: 1004 Finish: 1006

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A12	.33	1.96	96	96	89	44.26	3	270	iced	
11	.32	1.90	97	94	88	46.13				
10	.25	1.49	100	95	88	47.94				
9	.26	1.55	101	96	89	49.54				
8	.30	1.80	103	98	88	51.17				
7	.28	1.68	104	98	88	52.80				
6	.31	1.86	106	98	88	54.50	3			
5	.33	1.99	108	99	88	56.27				
4	.32	1.94	110	100	88	58.17				
3	.31	1.87	110	100	88	59.98				
2	.26	1.58	112	101	87	61.90				
1	.25	1.52	111	102	87	63.48				
B12	.29	1.76	113	103	88	65.13	3			
11	.33	2.01	114	104	88	66.88				
10	.26	1.59	115	105	88	68.74				
9	.25	1.53	115	105	88	70.42				
8	.28	1.71	116	106	88	72.13				
7	.30	1.83	116	106	88	73.88				
6	.30	1.84	118	108	88	75.63	2			
5	.32	1.97	119	109	88	77.44				
4	.31	1.90	118	109	88	79.26				
3	.31	1.90	119	109	87	81.07				
2	.27	1.86	119	109	88	82.96				
1	.24	1.48	118	110	87	84.71				
						86.31				

Client Name: Drax
Smithers
 Process: Dryer Stack-1
 Test Number: 3
 Date: June 25 2024
 Start Time: 3:10
 Finish Time: 4:42
 Starting Vol.: 300
 Final Vol.: 321
 Flask: J72
 Console: 104
 Stack Diameter: _____

BP 28.40
 DN .265
 CP .84182
 MF 1.0175
 Moist. 3%
 PM 28.51
 AS _____
 Ko .6646
 Pitot 107
 Port _____
 Static -20
 PS 28.38

CO ₂	O ₂	CO	N ₂
0	21		
0	21		
0	21		
0	21		

Duct Diameters
 Up-Stream

Duct Diameters
 Downstream

Personnel: DB KS CB

Mean Yaw Angle

Leakage Rate @ 15 inches

Start: .008 Finish: .007

Load:

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A12	.34	2.05	104	104	88	87.18	3	270	iced	
11	.29	1.76	111	107	89	89.17				
10	.26	1.58	112	107	89	90.88				
9	.28	1.71	113	107	89	92.59				
8	.28	1.71	115	107	88	94.24				
7	.31	1.90	115	108	88	95.89				
6	.33	2.02	117	108	88	97.80	4			
5	.34	2.09	118	109	88	99.72				
4	.30	1.84	119	110	88	101.75				
3	.32	1.97	119	110	88	103.45				
2	.27	1.66	120	110	87	105.34				
1	.25	1.54	119	111	87	107.09				
B12	.31	1.90	119	111	88	108.73	3			
11	.32	1.97	120	112	89	110.54				
10	.32	1.97	121	112	88	112.35				
9	.26	1.60	121	113	88	114.25				
8	.26	1.61	121	113	88	115.94				
7	.28	1.73	121	113	88	117.64				
6	.29	1.79	122	114	88	119.39	3			
5	.30	1.86	122	114	88	121.21				
4	.31	1.92	122	114	88	123.00				
3	.30	1.86	122	114	88	124.83				
2	.25	1.55	121	114	88	126.65				
1	.24	1.48	121	114	88	128.32				
						129.96				

Client Name: Drax
Smither
 Process: Dryer Stack 2
 Test Number: Test 1
 Date: June 25 124
 Start Time 12:50
 Finish Time 1:52
 Starting Vol. 300
 Final Vol. 326
 Flask: 573
 Console: 980
 Stack Diameter

BP 28.40
 DN 280
 CP 0.83829
 MF 1.0027
 Moist. 2.
 PM 28.51
 AS
 Ko 0.7551
 Pitot 140
 Port
 Static -21 -23
 PS 28.38

CO ₂	O ₂	CO	N ₂
0	21		
0	21		
0	21		
0	21		

Duct Diameters
Up-Stream
 Duct Diameters
Downstream
 Mean Yaw Angle

Personnel: KS IDB / CB

Leakage Rate @ 15 inches Start: .003 Finish: .005

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	.31	1.75	89	88	93	40.61	2	270	ICEP	
11	.29	1.65	95	87	93	42.65				
10	.27	1.54	98	87	92	44.73				
9	.28	1.60	100	88	92	46.58				
8	.27	1.55	102	88	92	48.52	2			
7	.29	1.66	104	89	92	50.60				
6	.28	1.61	106	89	92	52.52				
5	.25	1.44	105	90	92	54.39				
4	.27	1.56	106	91	92	56.24	2			
3	.25	1.44	108	92	92	58.20				
2	.22	1.27	108	92	92	59.97				
1	.20	1.15	108	93	92	61.68				
B 12	.30	1.74	108	94	92	63.30				
11	.28	1.62	110	94	92	65.34	2			
10	.26	1.51	111	95	93	67.29				
9	.29	1.69	113	96	93	69.25				
8	.28	1.63	113	96	93	71.23				
7	.30	1.75	113	97	93	73.22	3			
6	.29	1.69	114	97	92	75.32				
5	.26	1.52	114	98	92	77.32				
4	.28	1.63	114	98	92	79.17				
3	.24	1.40	114	98	91	81.11				
2	.23	1.34	114	98	91	83.04				
1	.21	1.22	112	98	92	84.82				
						86.80				

Client Name: Drax
Smithers
 Process: Dryer Stack 2
 Test Number: 2
 Date: June 25 12th
 Start Time 2:20
 Finish Time 3:20
 Starting Vol. 300
 Final Vol. 335
 Flask: 580
 Console: 980
 Stack Diameter

BP 28.40
 DN 0.280
 CP 2.83829
 MF 1.0027
 Moist. 3%
 PM 28.51
 AS
 Ko 0.7551
 Pitot 140
 Port
 Static -21
 PS 28.38

CO ₂	O ₂	CO	N ₂
0	21		

Duct Diameters
 Up-Stream
 Duct Diameters
 Downstream

Personnel: KS / CB / DB

Mean Yaw Angle

Leakage Rate @ 15 inches

Start: .005 Finish: .007

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	.32	1.78	87	87	91	87.61	2	270	ICPD	
11	.30	1.68	98	87	93	89.65				
10	.28	1.57	100	88	93	91.61				
9	.27	1.52	103	90	92	93.50				
8	.26	1.47	103	89	90	95.35	2			
7	.28	1.58	105	90	92	97.22				
6	.29	1.64	107	91	92	99.20				
5	.26	1.48	110	92	92	101.13				
4	.28	1.59	109	93	92	102.98	2			
3	.26	1.48	111	94	92	105.00				
2	.23	1.31	112	96	93	106.98				
1	.21	1.20	111	95	93	108.75				
B 12	.31	1.77	111	95	93	110.46				
11	.29	1.66	113	96	93	112.45	2			
10	.27	1.55	115	96	93	114.63				
9	.30	1.72	114	97	93	116.54				
8	.27	1.55	115	98	93	118.73				
7	.29	1.67	115	98	92	120.68				
6	.28	1.61	116	99	92	122.58	2			
5	.25	1.44	116	100	92	124.67				
4	.27	1.56	117	101	92	126.56				
3	.23	1.23	117	101	92	128.51				
2	.22	1.27	118	102	93	130.22				
1	.20	1.15	118	102	93	131.96				
						133.61				

Client Name: Drax
Smithers
 Process: Dryer Stack 2
 Test Number: 3
 Date: June 25/24
 Start Time 3.29
 Finish Time 4.30
 Starting Vol. 300
 Final Vol. 329
 Flask: 581
 Console: 900
 Stack Diameter

BP 28.90
 DN 280
 CP 083829
 MF 10027
 Moist. 4%
 PM 26.51
 AS
 Ko 0.7551
 Pitot 140
 Port
 Static -21
 PS 28.38

CO ₂	O ₂	CO	N ₂
0	21		
0	21		

Duct Diameters
 Up-Stream

Duct Diameters
 Downstream

Personnel: KS/CR/DB

Mean Yaw Angle

Leakage Rate @ 15 inches

Start: .002 Finish: .004

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	.31	1.72	96	97	93	34.21	2	270	ICED	
11	.29	1.62	107	98	94	36.34				
10	.27	1.51	109	97	94	38.25				
9	.26	1.46	112	98	94	40.32				
8	.27	1.52	113	98	94	42.28				
7	.29	1.63	113	98	93	44.22	2			
6	.30	1.69	112	98	93	46.17				
5	.25	1.41	114	99	93	48.11				
4	.27	1.53	115	100	93	50.00				
3	.25	1.41	116	100	94	51.96				
2	.22	1.24	117	100	94	53.75	2			
1	.20	1.13	117	101	94	55.48				
B0	.32	1.81	117	101	94	57.21				
11	.30	1.70	119	102	93	59.48				
10	.28	1.59	119	103	94	61.50				
9	.29	1.64	118	103	94	63.52				
8	.26	1.47	119	103	95	65.51	2			
7	.28	1.59	118	105	94	67.44				
6	.27	1.53	119	104	94	69.48				
5	.24	1.36	119	104	94	71.35				
4	.26	1.47	118	104	94	73.14				
3	.22	1.25	119	104	94	75.11	2			
2	.21	1.19	118	105	93	76.03				
1	.21	1.19	118	105	93	76.62				
						80.24				

Client Name: Drax
Smithers
 Process: Dryer Stack 3
 Test Number: 1
 Date: June 25 2024
 Start Time: 845
 Finish Time: 947
 Starting Vol.: 300
 Final Vol.: 316
 Flask: 385
 Console: 1021
 Stack Diameter

BP 28.40
 DN 275
 CP .84182
 MF 1.0175
 Moist. 3%
 PM 28.51
 AS
 Ko .6646
 Pitot 107
 Port
 Static -16
 PS 28.39

CO ₂	O ₂	CO	N ₂
0	21		
0	21		
0	21		
0	21		

Duct Diameters
 Up-Stream

Duct Diameters
 Downstream

Personnel: CB DB KS

Mean Yaw Angle

Leakage Rate @ 15 inches

Start: 1011 Finish: 1010

Load:

29-33

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A 2	.23	1.48	61	61	92	67.29	1	270	iced	
11	.25	1.62	64	62	89	68.90				
10	.26	1.69	68	62	88	70.49				
9	.29	1.89	72	62	89	72.08				
8	.32	2.10	75	64	88	73.79				
7	.33	2.18	79	68	90	75.73				
6	.30	1.99	81	67	89	77.69	1			
5	.31	2.06	84	69	90	79.40				
4	.29	1.93	85	70	89	81.27				
3	.28	1.87	87	72	90	83.08				
2	.26	1.74	89	74	92	84.88				
1	.26	1.74	90	76	92	86.61				
B 12	.23	1.55	91	79	89	88.30	1			
11	.24	1.63	93	83	90	89.95				
10	.27	1.83	94	81	90	91.66				
9	.30	2.03	96	82	91	93.33				
8	.31	2.10	97	84	92	95.14				
7	.33	2.25	100	87	92	97.04				
6	.31	2.11	101	87	92	99.01	2			
5	.30	2.05	104	88	93	101.00				
4	.29	1.98	103	89	93	102.83				
3	.27	1.86	103	93	90	104.70				
2	.26	1.79	103	91	90	106.46				
1	.24	1.66	103	92	90	108.37				
						110.05				

Client Name: Drax
Smithers
 Process: Drier Stack 3
 Test Number: 2
 Date: June 25 2024
 Start Time: 955
 Finish Time: 1057
 Starting Vol.: 300
 Final Vol.: 320
 Flask: J86
 Console: 1021
 Stack Diameter: _____

BP 28.40
 DN 275
 CP .84182
 MF 1.0175
 Moist. 29%
 PM 28.51
 AS _____
 Ko .6646
 Pitot 107
 Port _____
 Static -.16
 PS 28.39

CO ₂	O ₂	CO	N ₂
0	21		
0	21		
0	21		
0	21		

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

Personnel: DB CB KS

Leakage Rate @ 15 inches _____

Start: .006 Finish: .007

Load: _____

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A12	.23	1.59	90	90	92	10.31	1	270	1 cea	
11	.24	1.66	93	90	92	12.01				
10	.25	1.73	97	90	92	13.64				
9	.30	2.09	99	91	92	15.39				
8	.32	2.23	102	91	92	17.27				
7	.33	2.31	103	92	90	19.26				
6	.31	2.18	104	93	90	21.29	1			
5	.30	2.11	106	94	90	23.17				
4	.28	1.97	107	96	91	25.11				
3	.27	1.90	107	95	92	27.09				
2	.25	1.76	107	96	92	28.86				
1	.26	1.83	108	97	92	30.56				
B12	.24	1.70	109	98	91	32.38	1			
11	.24	1.70	109	98	90	34.06				
10	.28	1.98	109	99	91	35.78				
9	.30	2.13	111	100	91	37.67				
8	.29	2.06	112	101	91	39.61				
7	.33	2.35	113	102	91	41.52				
6	.32	2.27	113	102	92	43.56	1			
5	.30	2.14	114	103	92	45.65				
4	.28	2.00	114	104	92	47.54				
3	.27	1.93	114	104	91	49.48				
2	.26	1.86	115	105	91	51.30				
1	.23	1.65	114	106	91	53.13				
						54.83				

Client Name: Drax
Smithers
 Process: Dryer Stack 3
 Test Number: 3
 Date: 2 June 25 2024
 Start Time: 1103
 Finish Time: 1205
 Starting Vol.: 300
 Final Vol.: 325
 Flask: J87
 Console: 1021
 Stack Diameter: _____

BP 28.40
 DN .275
 CP .84182
 MF 1.0175
 Moist. 2%
 PM 28.51
 AS _____
 Ko 6646
 Pitot 107
 Port _____
 Static -.16
 PS 28.39

CO ₂	O ₂	CO	N ₂
0	21		
0	21		
0	21		
0	21		

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

Personnel: CB KCS DP

Leakage Rate @ 15 inches _____

Start: 007 Finish: 008

Load: _____

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A12	.24	1.68	99	99	91	55.64	1	270	iced	
11	.25	1.74	103	97	93	57.49				
10	.27	1.89	106	93	93	59.18				
9	.28	1.96	109	94	94	60.99				
8	.30	2.11	110	97	93	62.87				
7	.33	2.34	113	100	93	64.79				
6	.31	2.20	113	102	93	66.82	1			
5	.30	2.14	113	106	93	68.78				
4	.29	2.07	114	103	92	70.89				
3	.28	1.99	114	104	93	72.66				
2	.25	1.78	115	104	94	74.52				
1	.26	1.86	115	105	91	76.34				
B12	.23	1.64	116	105	92	78.10	1			
11	.24	1.72	115	106	92	79.79				
10	.26	1.86	116	106	92	81.53				
9	.29	2.07	117	106	93	83.34				
8	.30	2.15	118	108	92	85.22				
7	.32	2.29	118	108	93	87.16				
6	.31	2.23	119	109	93	89.17	1			
5	.31	2.23	119	109	93	91.17				
4	.29	2.09	119	109	92	93.10				
3	.26	1.87	119	109	91	95.05				
2	.25	1.80	119	109	91	97.01				
1	.23	1.65	118	109	92	98.67				
						100.37				

Client Name: Dray
Smithers
 Process: Dryer stack 4
 Test Number: 1
 Date: June 25/24
 Start Time 8.54
 Finish Time 9.56
 Starting Vol. 300
 Final Vol. 324
 Flask: J88
 Console: 980
 Stack Diameter

BP 28.40
 DN 0.280
 CP 0.83829
 MF 1.0027
 Moist. 2%
 PM 28.51
 AS
 Ko .7551
 Pitot 140
 Port
 Static -21
 PS 28.38

CO ₂	O ₂	CO	N ₂
0	21		

Duct Diameters
 Up-Stream
 Duct Diameters
 Downstream
 Mean Yaw Angle

Personnel: KS / DB / CB

Leakage Rate @ 15 inches Start: .003 Finish: .005

Load:

98

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	1.35	63	63	88	93.67	1	270	2100	
11	.23	1.25	69	62	92	95.46				
10	.24	1.30	73	62	95	97.13				
9	.26	1.40	77	63	99	98.83				
8	.28	1.51	81	64	102	100.59	2			
7	.29	1.56	85	67	108	102.51				
6	.32	1.72	67	68	110	104.43				
5	.33	1.77	88	69	112	106.40				
4	.34	1.85	91	70	107	108.38	2			
3	.32	1.77	93	72	112	110.33				
2	.31	1.67	94	74	115	112.27				
1	.31	1.67	94	75	117	114.31				
B 12	.24	1.29	95	76	118	116.22	2			
11	.24	1.30	96	78	115	118.00				
10	.23	1.24	96	79	117	119.90				
9	.27	1.47	97	80	113	121.53				
8	.29	1.59	99	81	111	123.44	2			
7	.30	1.68	100	82	99	125.46				
6	.33	1.86	101	83	99	127.40				
5	.34	1.92	103	84	98	129.52				
4	.33	1.86	103	85	101	131.64	2			
3	.31	1.75	103	85	100	133.72				
2	.30	1.70	104	86	99	135.74				
1	.30	1.70	104	87	98	137.80				
						139.80				

Client Name: Dray
Smithens
 Process: Dryer stack 4
 Test Number: 2
 Date: June 25
 Start Time 10.07
 Finish Time 11.09
 Starting Vol. 300
 Final Vol. 329
 Flask: K73
 Console: 980
 Stack Diameter _____

BP 28.40
 DN .280
 CP .83829
 MF 1.0027
 Moist. 3%
 PM 28.51
 AS _____
 Ko 0.7551
 Pitot 140
 Port _____
 Static -.21
 PS 28.38

CO ₂	O ₂	CO	N ₂
0	21		

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

Personnel: KS / BB / CB

Leakage Rate @ 15 inches _____

Start: .005 Finish: .007

Load: _____

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pnmp Vacuum	Box Temp.	Last Imp. Temp.	Points
A 12	.26	1.42	87	86	100	43.81	1	270	± CED	
11	.22	1.22	95	86	96	45.65				
10	.25	1.39	95	85	94	47.48				
9	.27	1.50	96	85	93	49.26				
8	.29	1.62	100	85	93	51.24	1			
7	.28	1.57	102	86	94	53.15				
6	.31	1.75	104	87	94	55.00				
5	.34	1.92	106	88	94	57.13				
4	.33	1.86	106	89	93	59.25				
3	.31	1.75	108	90	93	61.46	1			
2	.30	1.70	108	90	94	63.45				
1	.30	1.66	108	91	94	65.49				
B 12	.23	1.29	107	92	96	67.36				
11	.23	1.29	106	92	96	69.15	1			
10	.22	1.24	108	92	96	70.88				
9	.26	1.46	107	93	97	72.63				
8	.28	1.59	110	94	95	74.58				
7	.31	1.76	109	94	94	76.66	1			
6	.32	1.82	110	94	93	78.59				
5	.33	1.89	111	95	92	80.73				
4	.32	1.82	111	95	93	82.81				
3	.30	1.71	111	96	93	84.93	1			
2	.31	1.78	112	96	91	87.08				
1	.29	1.66	112	96	91	89.29				
						91.24				

Client Name: Drax
Smithen
 Process: Pryer Stack 4
 Test Number: 3
 Date: June 25/2025
 Start Time: 11.15
 Finish Time: 12.17
 Starting Vol.: 300
 Final Vol.: 321
 Flask: K74
 Console: 980
 Stack Diameter: _____

BP 28.40
 DN .280
 CP 0.83829
 MF 1.0024
 Moist. 3%
 PM 28.51
 AS _____
 Ko 0.7551
 Pitot 140
 Port _____
 Static -.21
 PS 28.38

CO ₂	O ₂	CO	N ₂
0	21		

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

Personnel: KS / PB / CB

Leakage Rate @ 15 inches _____ Start: 1002 Finish: 1004

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	1.40	94	91	93	92.39	1	270	ICED	
11	.23	1.29	102	93	97	94.31				
10	.24	1.34	104	93	98	95.98				
9	.28	1.58	107	93	97	97.98				
8	.30	1.70	108	93	95	99.90	1			
7	.29	1.64	110	94	95	101.82				
6	.32	1.82	110	94	94	103.83				
5	.33	1.88	110	94	93	105.84				
4	.32	1.83	111	95	92	108.00				
3	.30	1.71	112	95	93	110.08	1			
2	.29	1.66	112	95	92	112.12				
1	.31	1.77	111	96	92	114.08				
B12	.24	1.38	113	97	91	116.04				
11	.22	1.26	111	97	92	118.00	1			
10	.23	1.32	112	98	92	119.63				
9	.27	1.54	112	98	93	121.50				
8	.29	1.66	113	98	93	123.35				
7	.30	1.72	114	98	93	125.39	1			
6	.33	1.89	114	98	93	127.147				
5	.24	1.95	115	99	93	129.64				
4	.33	1.90	115	99	93	131.72				
3	.31	1.78	115	99	93	133.82				
2	.30	1.72	115	99	93	135.92	1			
1	.29	1.66	115	99	93	137.90				
						139.94				

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: 1742138 Control Number: Date Received: Jun 27, 2024 Date Reported: Jun 28, 2024 Report Number: 3020108 Report Type: Final Report
Attn: Accounts Payable	Proj. Acct. code:	
Sampled By:		
Company:		

Reference Number	1742138-1	1742138-2	1742138-3
Sample Date	Jun 25, 2024	Jun 25, 2024	Jun 25, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Filter J53 / Dryer Stack 1 Test 1 / 19.1 °C	Filter J54 / Dryer Stack 1 Test 2 / 19.1 °C	Filter J72 / Dryer Stack 1 Test 3 / 19.1 °C
Matrix	Water	Water	Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total	mg/sample	3	2	3
Volume	Sample volume	mL	323	329	320
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: 1742138 Control Number: Date Received: Jun 27, 2024 Date Reported: Jun 28, 2024 Report Number: 3020108 Report Type: Final Report
Attn: Accounts Payable	Proj. Acct. code:	
Sampled By:		
Company:		

Reference Number	1742138-4	1742138-5	1742138-6
Sample Date	Jun 25, 2024	Jun 25, 2024	Jun 25, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Filter J73 / Dryer Stack 2 Test 1 / 19.1 °C	Filter J80 / Dryer Stack 2 Test 2 / 19.1 °C	Filter J81 / Dryer Stack 2 Test 3 / 19.1 °C
Matrix	Water	Water	Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total	mg/sample	5	4	5
Volume	Sample volume	mL	329	333	331
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: 1742138 Control Number: Date Received: Jun 27, 2024 Date Reported: Jun 28, 2024 Report Number: 3020108 Report Type: Final Report
Attn: Accounts Payable	Proj. Acct. code:	
Sampled By:		
Company:		

	Reference Number	1742138-7	1742138-8	1742138-9
Sample Date	Jun 25, 2024	Jun 25, 2024	Jun 25, 2024	Jun 25, 2024
Sample Time	NA	NA	NA	NA
Sample Location				
Sample Description	Filter J85 / Dryer Stack 3 Test 1 / 19.1 °C	Filter J86 / Dryer Stack 3 Test 2 / 19.1 °C	Filter J87 / Dryer Stack 3 Test 3 / 19.1 °C	
Matrix	Water	Water	Water	

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total	mg/sample	3	3	3
Volume	Sample volume	mL	318	319	320
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: 1742138 Control Number: Date Received: Jun 27, 2024 Date Reported: Jun 28, 2024 Report Number: 3020108 Report Type: Final Report
Attn: Accounts Payable	Proj. Acct. code:	
Sampled By:		
Company:		

	Reference Number	1742138-10	1742138-11	1742138-12
Sample Date	Jun 25, 2024	Jun 25, 2024	Jun 25, 2024	Jun 25, 2024
Sample Time	NA	NA	NA	NA
Sample Location				
Sample Description	Filter J88 / Dryer Stack 4 Test 1 / 19.1 °C	Filter K73 / Dryer Stack 4 Test 2 / 19.1 °C	Filter K74 / Dryer Stack 4 Test 3 / 19.1 °C	
Matrix	Water	Water	Water	


Analyte	Units	Results	Results	Results	Nominal Detection Limit	
Aggregate Organic Constituents						
Oil and Grease	Total	mg/sample	14	11	10	2
Volume	Sample volume	mL	328	322	321	
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: 1742138 Control Number: Date Received: Jun 27, 2024 Date Reported: Jun 28, 2024 Report Number: 3020108 Report Type: Final Report
Attn: Accounts Payable Sampled By: Company:	Proj. Acct. code:	

Reference Number 1742138-13
Sample Date Jun 25, 2024
Sample Time NA
Sample Location
Sample Description H2O Blank / 19.1 °C
Matrix Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total	mg/sample	<2		2
Volume	Sample volume	mL	342		
pH adjustment	required prior to O&G extraction		Yes		

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

Methodology and Notes

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: 1742138 Control Number: Date Received: Jun 27, 2024 Date Reported: Jun 28, 2024 Report Number: 3020108 Report Type: Final Report
Attn: Accounts Payable Sampled By: Company:	Proj. Acct. code:	

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Oil and Grease in water (VAN)	BCELM	* Oil & Grease in Water - Direct Hexane Extraction (2023), Oil & Grease <i>* Reference Method Modified</i>	Jun 27, 2024	Element Vancouver

References

BCELM	B.C. Environmental Laboratory Manual
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 Results relate only to samples as submitted.


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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


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David Brandle

has successfully completed

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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

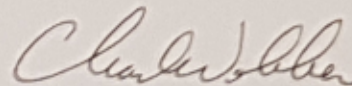
has successfully completed

Stack Sampling Seminar

35 Hours / 2017

June 23, 2017

Date



Dean

Faculty of Continuing Education and Extension

