May 28, 2018

Lavington Pellet Limited Partnership
9900 School Road
Coldstream, B.C.,
V1B 3C7

Attention: **Jamie Colliss**
Re: **Air Emission Testing of April 25, 2018**
Permit 107369, ME1718-239

As requested our firm provided a series of air emission tests at your facility in Lavington BC.

Testing Parameters

- Dryer 2 (North & South Stacks)
  - North and South Stacks: Total Particulate Testing (including Condensable Organics) State of Oregon Method 7

Key Personnel

- Report Generation: Matt McCall
- Field Supervisor: Dave Brandle/Dan Lawrence
- Plant Contact: Jamie Colliss

All testing procedures were conducted in accordance with acceptable methodologies as listed in the latest revision of the BC Field Sampling Manual. A copy of the method and/or Sampling Manual are digitally available upon request. All lab analysis for back half condensable organic fractions was analyzed by EXOVA Laboratories in Surrey BC. A copy of their report can be found in the Appendix of this report.

Results are summarized immediately following this cover letter. Please note that all results are expressed on a dry basis and reference conditions of 20 deg C, 1 atm pressure.

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

Sincerely,

MCCALL ENVIRONMENTAL
Matt McCall
Matt McCall

Digitally signed by Matt McCall
DN: cn=Matt McCall, o=McCall Environmental, ou, email=matt@mccallenvironmental.net, c=CA
Date: 2018.05.28 13:36:41 -07'00'

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Summary of Test Results

Dryer 2 North Stack: April 25, 2018 Summary of Test Results 1-3

Gas Temperature:	108 ° F	42 ° C
Moisture Content (by volume):	4.02 %	
Average Stack Gas Velocity:	38.7 ft/sec	11.8 m/sec
Total Actual Gas Flow Rate:	182371 ACFM	
Dry Gas flow Rate at Reference Conditions:	154606 SCFM	73.0 m^3/sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.003 gr/ft^3	6.3 mg/m^3
Front Half Particulate	0.001 gr/ft^3	2.8 mg/m^3
Back Half Condensibles	0.002 gr/ft^3	3.5 mg/m^3
Mass Emission Rate	3.62 lbs/hr	1.64 kg/hr

Dryer 2 South Stack April 25, 2018 Summary of Test Results 1-3

Gas Temperature:	93 ° F	34 ° C
Moisture Content (by volume):	3.64 %	
Average Stack Gas Velocity:	28.3 ft/sec	8.6 m/sec
Total Actual Gas Flow Rate:	62330 ACFM	
Dry Gas flow Rate at Reference Conditions:	54543 SCFM	25.7 m^3/sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.004 gr/ft^3	8.4 mg/m^3
Front Half Particulate	0.003 gr/ft^3	6.0 mg/m^3
Back Half Condensibles	0.001 gr/ft^3	2.4 mg/m^3
Mass Emission Rate	1.71 lbs/hr	0.78 kg/hr

Average of Dryer 2 North & South

	North Stack	South Stack		Weighted Avg/Combined
Volumetric Flow Rate m^3/sec	73.0	25.7		98.7
Total Particulate Concentration mg/m^3	6.3	8.4		6.84
Mass Emission Rate Kg/hr	1.64	.78		2.42

*Note: Particulate Concentration a Weighted Averaged Based on Flow.

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Pinnacle Pellet Lavington **April 25/18**
Dryer 2 North Stack **Permit Number: 107369**
Lavington, BC

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	108 ^{o}F	42 ^{o}C
Moisture Content (by volume):	4.02 %	
Average Stack Gas Velocity:	38.7 ft/sec	11.8 m/sec
Total Actual Gas Flow Rate:	182371 ACFM	
Dry Gas flow Rate at Reference Conditions:	154606 SCFM	73.0 m^3/sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.003 gr/ft^3	6.3 mg/m^3
Front Half Particulate	0.001 gr/ft^3	2.8 mg/m^3
Back Half Condensibles	0.002 gr/ft^3	3.5 mg/m^3
Mass Emission Rate	3.62 lbs/hr	1.64 kg/hr

SUMMARY OF AIR EMISSION TESTS

TEST 1:

Gas Temperature:	104 ^{o}F	40 ^{o}C
Moisture Content (by volume):	4.4 %	
Average Stack Gas Velocity:	38.7 ft/sec	11.8 m/sec
Total Actual Gas Flow Rate:	182262 ACFM	
Dry Gas flow Rate at Reference Conditions:	154965 SCFM	73.1 m^3/sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.003 gr/ft^3	7.3 mg/m^3
Front Half Particulate	.002 gr/ft^3	4.0 mg/m^3
Back Half Condensibles	.001 gr/ft^3	3.2 mg/m^3
Mass Emission Rate	4.21 lbs/hr	1.91 kg/hr

TEST 2:

Gas Temperature:	108 ^{o}F	42 ^{o}C
Moisture Content (by volume):	3.8 %	
Average Stack Gas Velocity:	38.8 ft/sec	11.8 m/sec
Total Actual Gas Flow Rate:	182661 ACFM	
Dry Gas flow Rate at Reference Conditions:	155301 SCFM	73.3 m^3/sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.002 gr/ft^3	5.4 mg/m^3
Front Half Particulate	.001 gr/ft^3	2.2 mg/m^3
Back Half Condensibles	.001 gr/ft^3	3.2 mg/m^3
Mass Emission Rate	3.12 lbs/hr	1.42 kg/hr

TEST 3:

Gas Temperature:	112 ^{o}F	45 ^{o}C
Moisture Content (by volume):	3.8 %	
Average Stack Gas Velocity:	38.7 ft/sec	11.8 m/sec
Total Actual Gas Flow Rate:	182191 ACFM	
Dry Gas flow Rate at Reference Conditions:	153552 SCFM	72.5 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	2.1 mg/m^3
Back Half Condensibles	.002 gr/ft^3	4.0 mg/m^3
Mass Emission Rate	3.53 lbs/hr	1.60 kg/hr

DATA FOR TESTS 1 TO 3

Client: Pinnacle Pellet Lavington
Plant Location: Lavington, BC
Process: Dryer 2 North Stack
Permit Number: 107369
Job Number: ME1819-
Pollution Control Permit: 15.0 mg/m3
Number of Tests: 3 tests
Minutes per Point: 2.5 minutes

	TEST 1	TEST 2	TEST 3
Filter Number:	98	99	1
Date of Test:	April 25/18	April 25/18	April 25/18
Start Time:	8:45	10:03	11:20
Stop Time:	9:50	11:07	12:25
On-line Sampling Time:	60	60	60
Testing Personnel:	DL/N/A	DL/N/A	DL/N/A
Sampler Model:	1012	1012	1012
Barometric Pressure("Hg):	28.45	28.45	28.45
Static Pressure("H_2O):	-0.30	-0.30	-0.30
%CO_2:	0.0	0.0	3.0
%O_2:	21.0	21.0	21.0
%CO:	0.0	0.0	0.0
%N_2:	79.0	79.0	76.0
Diameter of Nozzle(inches):	0.258	0.258	0.258
Meter Factor:	1.0035	1.0035	1.0035
Type-S Pitot Tube Coefficient:	0.84295	0.84295	0.84295
Cross Sectional Area of Stack(ft^2):	78.54	78.54	78.54
Impinger Condensate(g):	32	25	22
Weight of Moisture in Silica Gel(g):	11.0	12.0	15.0
Weight of Filter Particulate(g):	0.0010	0.0011	0.0016
Weight of Probe Washings(g):	0.0040	0.0016	0.0010
Weight of Impinger Content Organic(g):	0.0040	0.0040	0.0050
Total Weight of Particulate(g):	0.0090	0.0067	0.0076

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Sampling Data for - *TEST 1*
Pinnacle Pellet Lavington
Dryer 2 North Stack
Lavington, BC

April 25/18

SAMPLE POINT	VELOCITY HEAD ("H_2O)	ORIFICE PRESSURE ("H_2O)	DRY GAS METER		STACK GAS TEMP (^oF)	GAS SAMPLE VOLUME (ft^3)	ISOKINETICS
			TEMP IN (^oF)	TEMP OUT (^oF)			
A-12	0.41	1.51	59	58	100	0.00	1.01
A-11	0.42	1.55	63	61	103	1.86	1.00
A-10	0.42	1.56	65	60	101	3.72	1.02
A-9	0.40	1.49	63	61	99	5.63	1.02
A-8	0.39	1.45	66	62	102	7.49	1.03
A-7	0.38	1.42	68	63	101	9.36	1.01
A-6	0.38	1.42	71	65	102	11.17	1.02
A-5	0.37	1.39	72	66	102	13.00	1.03
A-4	0.36	1.36	76	68	103	14.84	1.04
A-3	0.35	1.32	75	69	103	16.67	1.04
A-2	0.32	1.21	80	72	104	18.47	1.03
A-1	0.25	0.95	82	74	102	20.20	1.01
B-12	0.42	1.61	85	79	105	21.70	1.04
B-11	0.42	1.61	85	78	105	23.71	1.02
B-10	0.40	1.54	89	81	106	25.69	1.06
B-9	0.43	1.65	89	83	105	27.71	1.00
B-8	0.46	1.77	92	88	108	29.68	1.03
B-7	0.47	1.83	93	90	105	31.80	1.01
B-6	0.48	1.87	95	91	106	33.90	0.94
B-5	0.50	1.95	96	94	107	35.88	1.01
B-4	0.50	1.95	97	94	107	38.05	1.04
B-3	0.50	1.95	96	95	106	40.30	1.00
B-2	0.48	1.88	99	97	107	42.47	1.02
B-1	0.43	1.69	99	97	107	44.64	1.03
						46.72	

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Sampling Data for - *TEST 2*

Pinnacle Pellet Lavington

Dryer 2 North Stack

Lavington, BC

April 25/18

SAMPLE POINT	VELOCITY HEAD ("H_2O)	ORIFICE PRESSURE ("H_2O)	DRY GAS METER		STACK GAS TEMP (^oF)	GAS SAMPLE VOLUME (ft^3)	ISOKINETICS
			TEMP IN (^oF)	TEMP OUT (^oF)			
B-12	0.40	1.56	95	95	108	0.00	1.01
B-11	0.43	1.66	91	95	110	1.95	1.00
B-10	0.41	1.60	92	96	106	3.95	1.03
B-9	0.44	1.71	93	94	107	5.98	1.01
B-8	0.44	1.72	94	97	106	8.03	1.02
B-7	0.45	1.76	94	96	108	10.10	1.02
B-6	0.48	1.88	95	97	105	12.19	1.04
B-5	0.51	1.99	95	96	107	14.40	1.04
B-4	0.49	1.91	96	98	109	16.67	1.02
B-3	0.50	1.96	98	97	107	18.86	1.01
B-2	0.46	1.81	97	99	106	21.05	1.01
B-1	0.40	1.57	98	98	108	23.16	1.02
A-12	0.42	1.65	98	98	108	25.15	1.09
A-11	0.43	1.69	98	100	106	27.32	1.01
A-10	0.42	1.65	99	100	108	29.36	1.01
A-9	0.40	1.58	100	101	108	31.39	0.98
A-8	0.37	1.45	100	100	109	33.31	1.02
A-7	0.38	1.50	100	102	108	35.22	1.04
A-6	0.36	1.42	101	102	109	37.20	1.08
A-5	0.38	1.50	102	103	109	39.20	1.06
A-4	0.37	1.46	101	102	107	41.22	1.04
A-3	0.37	1.46	101	102	108	43.19	1.04
A-2	0.34	1.34	103	102	109	45.15	1.05
A-1	0.28	1.11	103	104	107	47.05	0.96
						48.64	

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Sampling Data for - *TEST 3*

Pinnacle Pellet Lavington

Dryer 2 North Stack

Lavington, BC

April 25/18

SAMPLE POINT	VELOCITY HEAD ("H_2O)	ORIFICE PRESSURE ("H_2O)	DRY GAS METER		STACK GAS TEMP (^oF)	GAS SAMPLE VOLUME (ft^3)	ISOKINETICS
			TEMP IN (^oF)	TEMP OUT (^oF)			
A-12	0.4	1.57	100	101	110	0.00	1.03
A-11	0.41	1.61	95	103	109	1.99	1.03
A-10	0.42	1.64	95	100	109	4.00	1.05
A-9	0.38	1.49	96	101	108	6.08	1.02
A-8	0.4	1.57	96	100	109	8.01	1.01
A-7	0.37	1.44	96	101	110	9.97	1.07
A-6	0.37	1.44	97	101	111	11.95	1.01
A-5	0.38	1.48	98	100	112	13.82	1.04
A-4	0.35	1.36	100	100	113	15.77	1.04
A-3	0.36	1.41	101	102	112	17.65	1.02
A-2	0.34	1.22	100	101	113	19.53	1.02
A-1	0.27	1.05	102	103	114	21.35	1.07
B-12	0.41	1.59	101	101	115	23.05	0.99
B-11	0.42	1.64	101	102	112	24.99	1.01
B-10	0.42	1.64	102	103	116	26.99	1.04
B-9	0.44	1.72	103	105	115	29.06	0.97
B-8	0.46	1.80	103	103	115	31.04	1.06
B-7	0.46	1.81	105	106	114	33.25	1.00
B-6	0.47	1.85	101	105	115	35.33	1.04
B-5	0.50	1.96	105	106	114	37.52	1.01
B-4	0.51	2.00	104	105	114	39.71	1.02
B-3	0.48	1.89	105	107	112	41.94	1.03
B-2	0.49	1.93	105	106	113	44.15	1.04
B-1	0.45	1.78	107	108	113	46.39	1.02
						48.50	

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Pinnacle Pellet Lavington
Dryer 2 North Stack
Pinnacle Pellet Lavington

Data for ***TEST 1***

OVERALL ISOKINETICS - TEST 1: 1.020

Delta P:	**0.412**	**"H_2O**	**Us avg:**	**38.68 ft/sec**
Delta H:	**1.580**		**ACFM:**	**182262 ft^3/min**
Tm avg:	**539.2**	**^oR**	**SDCFM:**	**154965 ft^3/min**
Ts avg:	**564.0**	**^oR**	**Vm std:**	**43.83 ft^3**
Bwo:	**0.044**		**Vm corr:**	**46.88 ft^3**
Md:	**28.84**		**Vm:**	**46.72 ft^3**
Ms:	**28.36**		**MF:**	**1.0035**
Pb:	**28.45**	**"Hg**	**PCON:**	**7.25 mg/m^3**
Pm:	**28.57**	**"Hg**	**ERAT:**	**1.91 kg/hr**
Ps:	**28.43**	**"Hg**		

Data for ***TEST 2***

OVERALL ISOKINETICS - TEST 2: 1.024

Delta P:	**0.412**	**"H_2O**	**Us avg:**	**38.76 ft/sec**
Delta H:	**1.623**		**ACFM:**	**182661 ft^3/min**
Tm avg:	**558.3**	**^oR**	**SDCFM:**	**155301 ft^3/min**
Ts avg:	**567.6**	**^oR**	**Vm std:**	**44.08 ft^3**
Bwo:	**0.038**		**Vm corr:**	**48.81 ft^3**
Md:	**28.84**		**Vm:**	**48.64 ft^3**
Ms:	**28.43**		**MF:**	**1.0035**
Pb:	**28.45**	**"Hg**	**PCON:**	**5.37 mg/m^3**
Pm:	**28.57**	**"Hg**	**ERAT:**	**1.42 kg/hr**
Ps:	**28.43**	**"Hg**		

Data for ***TEST 3***

OVERALL ISOKINETICS - TEST 3: 1.026

Delta P:	**0.413**	**"H_2O**	**Us avg:**	**38.66 ft/sec**
Delta H:	**1.620**		**ACFM:**	**182191 ft^3/min**
Tm avg:	**561.8**	**^oR**	**SDCFM:**	**153552 ft^3/min**
Ts avg:	**572.4**	**^oR**	**Vm std:**	**43.67 ft^3**
Bwo:	**0.038**		**Vm corr:**	**48.67 ft^3**
Md:	**29.32**		**Vm:**	**48.50 ft^3**
Ms:	**28.89**		**MF:**	**1.0035**
Pb:	**28.45**	**"Hg**	**PCON:**	**6.15 mg/m^3**
Pm:	**28.57**	**"Hg**	**ERAT:**	**1.60 kg/hr**
Ps:	**28.43**	**"Hg**		

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Pinnacle Pellet Lavington **April 25/18**
Dryer 2 South Stack **Permit Number: 107369**
Lavington, BC **AVERAGE OF AIR EMISSION TESTS 1 TO 3**

Gas Temperature:	93 ^{o}F	34 ^{o}C
Moisture Content (by volume):	3.64 %	
Average Stack Gas Velocity:	28.3 ft/sec	8.6 m/sec
Total Actual Gas Flow Rate:	62330 ACFM	
Dry Gas flow Rate at Reference Conditions:	54543 SCFM	25.7 m^3/sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.004 gr/ft^3	8.4 mg/m^3
Front Half Particulate	0.003 gr/ft^3	6.0 mg/m^3
Back Half Condensibles	0.001 gr/ft^3	2.4 mg/m^3
Mass Emission Rate	1.71 lbs/hr	0.78 kg/hr

SUMMARY OF AIR EMISSION TESTS

TEST 1:

Gas Temperature:	91 ^{o}F	33 ^{o}C
Moisture Content (by volume):	3.6 %	
Average Stack Gas Velocity:	28.2 ft/sec	8.6 m/sec
Total Actual Gas Flow Rate:	62138 ACFM	
Dry Gas flow Rate at Reference Conditions:	54539 SCFM	25.7 m^3/sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.003 gr/ft^3	7.0 mg/m^3
Front Half Particulate	.002 gr/ft^3	5.4 mg/m^3
Back Half Condensibles	.001 gr/ft^3	1.6 mg/m^3
Mass Emission Rate	1.42 lbs/hr	0.65 kg/hr

TEST 2:

Gas Temperature:	94 ^{o}F	34 ^{o}C
Moisture Content (by volume):	3.8 %	
Average Stack Gas Velocity:	28.1 ft/sec	8.6 m/sec
Total Actual Gas Flow Rate:	61890 ACFM	
Dry Gas flow Rate at Reference Conditions:	53980 SCFM	25.5 m^3/sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.004 gr/ft^3	9.8 mg/m^3
Front Half Particulate	.003 gr/ft^3	6.6 mg/m^3
Back Half Condensibles	.001 gr/ft^3	3.2 mg/m^3
Mass Emission Rate	1.99 lbs/hr	0.90 kg/hr

TEST 3:

Gas Temperature:	93 ^{o}F	34 ^{o}C
Moisture Content (by volume):	3.5 %	
Average Stack Gas Velocity:	28.6 ft/sec	8.7 m/sec
Total Actual Gas Flow Rate:	62963 ACFM	
Dry Gas flow Rate at Reference Conditions:	55112 SCFM	26.0 m^3/sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.004 gr/ft^3	8.4 mg/m^3
Front Half Particulate	.003 gr/ft^3	5.9 mg/m^3
Back Half Condensibles	.001 gr/ft^3	2.4 mg/m^3
Mass Emission Rate	1.72 lbs/hr	0.78 kg/hr

DATA FOR TESTS 1 TO 3

Client:	**Pinnacle Pellet Lavington**
Plant Location:	**Lavington, BC**
Process:	**Dryer 2 South Stack**
Permit Number:	**107369**
Job Number:	**ME1819-**
Pollution Control Permit:	**15.0 mg/m3**
Number of Tests:	**3 tests**
Minutes per Point:	**2.5 minutes**

	TEST 1	TEST 2	TEST 3
Filter Number:	2	3	4
Date of Test:	April 25/18	April 25/18	April 25/18
Start Time:	12:50	2:04	3:20
Stop Time:	1:55	3:09	4:25
On-line Sampling Time:	60	60	60
Testing Personnel:	DL/NA	DL/NA	DL/NA
Sampler Model:	MU-1012	MU-1012	MU-1012
Barometric Pressure("Hg):	28.45	28.45	28.45
Static Pressure("H_2O):	-0.10	-0.10	-0.10
%CO_2:	0.0	0.0	0.0
%O_2:	21.0	21.0	21.0
%CO:	0.0	0.0	0.0
%N_2:	79.0	79.0	79.0
Diameter of Nozzle(inches):	0.300	0.300	0.300
Meter Factor:	1.0035	1.0035	1.0035
Type-S Pitot Tube Coefficient:	0.84295	0.84295	0.84295
Cross Sectional Area of Stack(ft^2):	36.67	36.67	36.67
Impinger Condensate(g):	20	24	21
Weight of Moisture in Silica Gel(g):	15.0	13.0	13.0
Weight of Filter Particulate(g):	0.0007	0.0006	0.0009
Weight of Probe Washings(g):	0.0060	0.0076	0.0065
Weight of Impinger Content Organic(g):	0.0020	0.0040	0.0030
Total Weight of Particulate(g):	0.0087	0.0122	0.0104

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Sampling Data for - *TEST 1*
Pinnacle Pellet Lavington
Dryer 2 South Stack
Lavington, BC

April 25/18

SAMPLE POINT	VELOCITY HEAD ("H_2O)	ORIFICE PRESSURE ("H_2O)	DRY GAS METER		STACK GAS TEMP (^oF)	GAS SAMPLE VOLUME (ft^3)	ISOKINETICS
			TEMP IN (^oF)	TEMP OUT (^oF)			
A-12	0.20	1.46	97	98	96	0.00	1.01
A-11	0.24	1.76	91	99	92	1.90	0.98
A-10	0.23	1.70	91	99	91	3.93	1.02
A-9	0.23	1.68	91	96	90	5.99	1.05
A-8	0.22	1.62	93	98	91	8.10	0.99
A-7	0.21	1.54	93	96	90	10.05	1.01
A-6	0.20	1.47	94	97	92	12.01	1.01
A-5	0.20	1.42	95	96	92	13.92	1.02
A-4	0.19	1.40	96	98	91	15.85	1.03
A-3	0.19	1.40	96	97	91	17.75	1.02
A-2	0.18	1.33	98	99	90	19.63	1.03
A-1	0.19	1.41	97	98	89	21.49	1.00
B-12	0.22	1.63	99	100	91	23.34	1.01
B-11	0.23	1.70	98	99	90	25.35	1.00
B-10	0.25	1.85	100	101	91	27.39	1.02
B-9	0.23	1.71	100	100	90	29.55	1.00
B-8	0.23	1.71	102	103	92	31.59	1.00
B-7	0.22	1.63	102	104	91	33.64	1.00
B-6	0.22	1.63	102	104	92	35.65	1.02
B-5	0.21	1.56	102	104	92	37.69	1.00
B-4	0.25	1.86	102	103	92	39.65	1.01
B-3	0.28	2.09	102	102	92	41.80	0.98
B-2	0.30	2.23	102	104	92	44.02	1.02
B-1	0.32	2.38	102	103	91	46.40	0.97
						48.73	

MCCALL ENVIRONMENTAL

Sampling Data for - *TEST 2*

Pinnacle Pellet Lavington

Dryer 2 South Stack

Lavington, BC

April 25/18

SAMPLE POINT	VELOCITY HEAD ("H_2O)	ORIFICE PRESSURE ("H_2O)	DRY GAS METER		STACK GAS TEMP (^oF)	GAS SAMPLE VOLUME (ft^3)	ISOKINETICS
			TEMP IN (^oF)	TEMP OUT (^oF)			
B-12	0.21	1.56	105	105	94	0.00	1.03
B-11	0.22	1.62	99	104	96	2.01	1.01
B-10	0.24	1.78	100	104	93	4.01	1.02
B-9	0.25	1.85	100	102	93	6.14	1.01
B-8	0.24	1.78	103	103	93	8.28	0.97
B-7	0.22	1.63	101	102	92	10.31	1.01
B-6	0.22	1.63	102	104	93	12.33	1.04
B-5	0.20	1.48	102	103	93	14.41	1.00
B-4	0.23	1.71	103	105	93	16.32	0.98
B-3	0.26	1.93	104	104	93	18.32	0.95
B-2	0.30	2.23	105	106	94	20.39	1.01
B-1	0.31	2.30	104	105	94	22.75	0.97
A-12	0.19	1.41	106	107	94	25.04	1.03
A-11	0.21	1.56	107	107	94	26.96	1.04
A-10	0.24	1.80	107	108	93	29.00	1.02
A-9	0.23	1.72	106	107	93	31.14	1.02
A-8	0.24	1.79	108	109	95	33.24	1.00
A-7	0.22	1.64	107	108	94	35.35	1.05
A-6	0.20	1.50	108	110	94	37.47	1.01
A-5	0.20	1.50	108	110	93	39.42	1.02
A-4	0.18	1.35	110	111	93	41.38	1.07
A-3	0.18	1.35	108	111	94	43.35	1.01
A-2	0.19	1.43	111	112	93	45.20	1.05
A-1	0.19	1.43	109	110	93	47.18	0.98
						49.03	

MCCALL ENVIRONMENTAL

Sampling Data for - *TEST 3*

Pinnacle Pellet Lavington

Dryer 2 South Stack

Lavington, BC

April 25/18

SAMPLE POINT	VELOCITY HEAD ("H_2O)	ORIFICE PRESSURE ("H_2O)	DRY GAS METER		STACK GAS TEMP (^oF)	GAS SAMPLE VOLUME (ft^3)	ISOKINETICS
			TEMP IN (^oF)	TEMP OUT (^oF)			
A-12	0.20	1.49	112	112	100	0.00	1.00
A-11	0.22	1.63	103	111	98	1.93	1.00
A-10	0.23	1.71	102	111	94	3.93	1.00
A-9	0.23	1.72	102	109	93	5.98	1.02
A-8	0.24	1.79	101	109	91	8.07	1.01
A-7	0.22	1.64	100	107	91	10.20	1.00
A-6	0.20	1.49	102	108	93	12.20	1.00
A-5	0.19	1.42	101	107	91	14.12	1.02
A-4	0.21	1.56	102	107	93	16.02	0.97
A-3	0.2	1.49	102	107	92	17.92	1.00
A-2	0.18	1.34	102	107	92	19.84	1.05
A-1	0.2	1.49	103	105	92	21.76	0.97
B-12	0.21	1.57	105	107	93	23.61	1.00
B-11	0.24	1.79	104	107	92	25.58	0.97
B-10	0.25	1.87	106	108	92	27.63	0.95
B-9	0.24	1.79	105	107	92	29.68	0.97
B-8	0.22	1.65	108	109	93	31.73	1.02
B-7	0.22	1.64	106	108	93	33.80	1.02
B-6	0.23	1.72	108	110	95	35.85	0.94
B-5	0.24	1.79	106	110	93	37.80	0.97
B-4	0.26	1.94	106	110	94	39.85	0.96
B-3	0.30	2.24	106	109	94	41.96	1.03
B-2	0.31	2.31	106	110	94	44.39	0.99
B-1	0.33	2.47	106	110	94	46.76	0.99
						49.20	

MCCALL ENVIRONMENTAL

Pinnacle Pellet Lavington
Dryer 2 South Stack
Pinnacle Pellet Lavington

Data for ***TEST 1***

OVERALL ISOKINETICS - TEST 1: 1.008

Delta P:	**0.225**	**"H_2O**	**Us avg:**	**28.24 ft/sec**
Delta H:	**1.674**		**ACFM:**	**62138 ft^3/min**
Tm avg:	**558.8**	**^oR**	**SDCFM:**	**54539 ft^3/min**
Ts avg:	**551.3**	**^oR**	**Vm std:**	**44.12 ft^3**
Bwo:	**0.036**		**Vm corr:**	**48.90 ft^3**
Md:	**28.84**		**Vm:**	**48.73 ft^3**
Ms:	**28.45**		**MF:**	**1.0035**
Pb:	**28.45**	**"Hg**	**PCON:**	**6.96 mg/m^3**
Pm:	**28.57**	**"Hg**	**ERAT:**	**0.65 kg/hr**
Ps:	**28.44**	**"Hg**		

Data for ***TEST 2***

OVERALL ISOKINETICS - TEST 2: 1.013

Delta P:	**0.223**	**"H_2O**	**Us avg:**	**28.13 ft/sec**
Delta H:	**1.666**		**ACFM:**	**61890 ft^3/min**
Tm avg:	**565.8**	**^oR**	**SDCFM:**	**53980 ft^3/min**
Ts avg:	**553.5**	**^oR**	**Vm std:**	**43.84 ft^3**
Bwo:	**0.038**		**Vm corr:**	**49.20 ft^3**
Md:	**28.84**		**Vm:**	**49.03 ft^3**
Ms:	**28.43**		**MF:**	**1.0035**
Pb:	**28.45**	**"Hg**	**PCON:**	**9.83 mg/m^3**
Pm:	**28.57**	**"Hg**	**ERAT:**	**0.90 kg/hr**
Ps:	**28.44**	**"Hg**		

Data for ***TEST 3***

OVERALL ISOKINETICS - TEST 3: 0.994

Delta P:	**0.231**	**"H_2O**	**Us avg:**	**28.62 ft/sec**
Delta H:	**1.731**		**ACFM:**	**62963 ft^3/min**
Tm avg:	**566.4**	**^oR**	**SDCFM:**	**55112 ft^3/min**
Ts avg:	**553.3**	**^oR**	**Vm std:**	**43.96 ft^3**
Bwo:	**0.035**		**Vm corr:**	**49.37 ft^3**
Md:	**28.84**		**Vm:**	**49.20 ft^3**
Ms:	**28.46**		**MF:**	**1.0035**
Pb:	**28.45**	**"Hg**	**PCON:**	**8.36 mg/m^3**
Pm:	**28.58**	**"Hg**	**ERAT:**	**0.78 kg/hr**
Ps:	**28.44**	**"Hg**		

Air Emission Monitoring Procedure

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 EPA Method 5 (See Figure 1).

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 was 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 he 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 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.

O_2, CO_2, CO (where applicable)

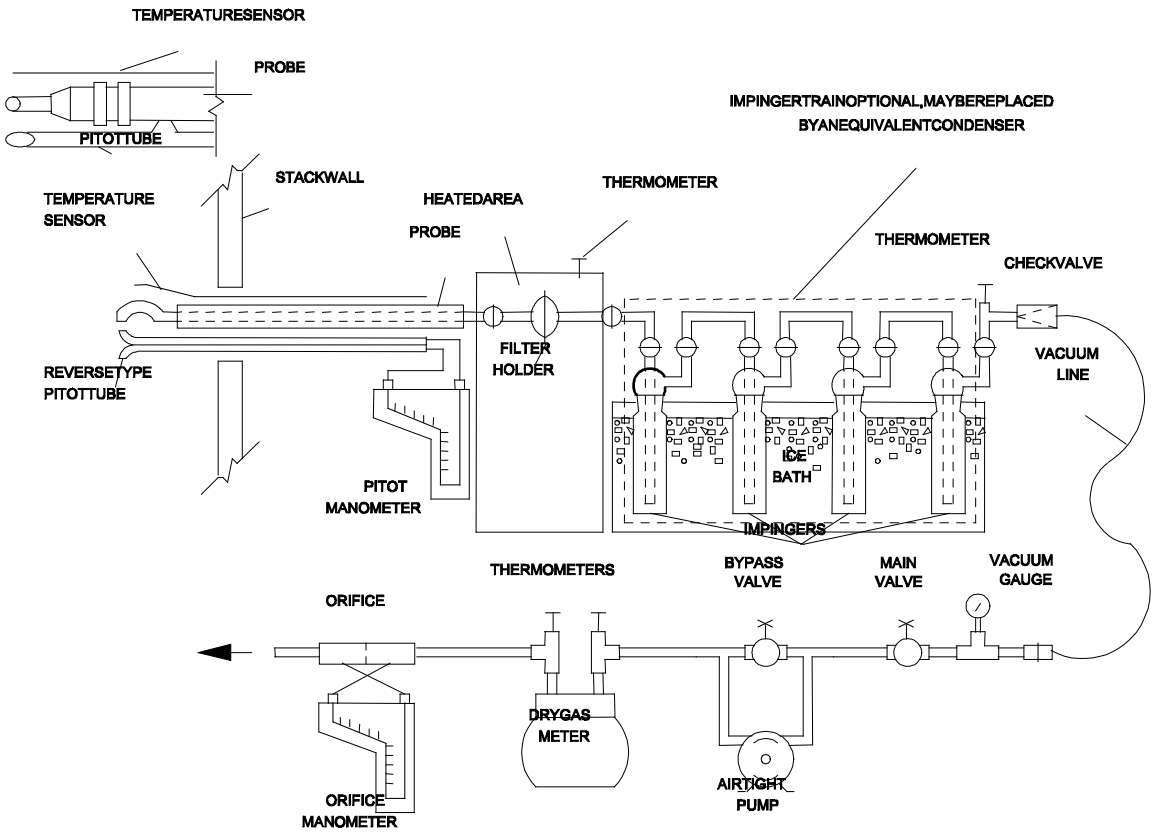
O_2, CO_2, and CO were found using either Fuji Analytical Analyzer by means of infrared and paramagnetic technology (EPA 3A) or by fyrite (EPA Method 3).

NOx (where applicable)

NOx was found using and API Model 252 NOx 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.



EPA Method 5 Diagram- Figure 1

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 = l, 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, l8.0 g/g-mole (l8.0 lb/lb-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 [(mmHg)(m^3)]/[(°K)(g-mole)] {2l.85 [(in. Hg)(ft^3)]/[(°R)(lb-mole)]}.
T_m = Absolute average DGM temperature (see Figure 5-2), °K (°R).
T_s = Absolute average stack gas temperature (see Figure 5-2), °K (°R).
T_{std} = Standard absolute temperature, 293°K (528°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_20 (in. H_20).
ρ_a = Density of acetone, mg/ml (see label on bottle).
ρ_w = Density of water, 0.9982 g/ml (0.00220l lb/ml).
θ = Total sampling time, min.
θ_l = 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.
l3.6 = Specific gravity of mercury.
60 = Sec/min.
l00 = 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-l.

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

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

where:

K_l = 0.3858 °K/mm Hg for metric units,

= l7.64 °R/in. Hg for English units.

NOTE: Equation 5-l 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-l must be modified as follows:

(a) Case I. No component changes made during sampling run. In this case, replace V_m in Equation 5-l 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-l 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.

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

where:

K_2 = 0.00l333 m^3/ml for metric units,

= 0.04707 ft^3/ml for English units.

Moisture Content.

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

Acetone Blank Concentration.

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

Acetone Wash Blank.

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

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

Particulate Concentration.

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

Conversion Factors:

From	To	Multiply by
scf	m^3	0.02832
g/ft^3	gr/ft^3	l5.43
g/ft^3	lb/ft^3	2.205×10^{-3}
g/ft^3	g/m^3	35.3l

Isokinetic Variation.

Calculation from Raw Data.

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

where:

K_3 = 0.003454 [(mm Hg)(m^3)]/[(ml)(°K)] for metric units,

= 0.002669 [(in. Hg)(ft^3)]/[(ml)(°R)] for English units.

Calculation from Intermediate Values.

$$I = \frac{100\, T_s\, V_{m(std)}\, P_{std}}{60\, T_{std}\, v_s\, \theta\, A_n\, P_s\, (1 - B_{ws})} = \frac{K_4\, T_s\, V_{m(std)}}{P_s\, v_s\, A_n\, \theta (1 - B_{ws})} \qquad \text{Eq.5-8}$$

where:

K_4 = 4.320 for metric units,

= 0.09450 for English units.

Acceptable Results. If 90 percent ≤ I ≤ ll0 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.

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

Average Stack Gas Dry Volumetric Flow Rate.

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

where:

A	=	Cross-sectional area of stack, m^2 (ft^2).
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).

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

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),

$$= P_{bar} + P_g$$

P_{std}	=	Standard absolute pressure, 760 mm Hg (29.92 in. Hg).
Q_{sd}	=	Dry volumetric stack gas flow rate corrected to standard conditions, dsm^3/hr (dscf/hr).
t_s	=	Stack temperature, □C (□F).
T_s	=	Absolute stack temperature, □K (□R).

CALIBRATION CERTIFICATE
DRY GAS METER

DATE: Jan 10/18

CONSOLE MANUF.: NAPP/MILLENNIUM MODEL 32

CONSOLE I.D.: MU 1013

PARAMETER SUMMARY	RUN #1	RUN #2	RUN #3
Ta = Ambient (WTM) Temperature (oF.)	63.0	63.0	63.0
P=Pres. Differential at WTM ("Hg)	0.0603	0.1214	0.1692
Pb= Atmospheric Pressure ("Hg)	27.95	27.95	27.95
Pv= Vapour Pressure Water at Temp. Ta ("Hg)	0.5799	0.5799	0.5799
H=Pres. Differential at Orifice	1.0	2.0	3.0
Ti= Dry Test Meter Inlet Temp. (oF.)	76.0	76.0	81.0
To= Dry Test Meter Outlet Temp. (oF.)	74.0	74.0	80.0
Ri= Initial Dry Test volume (ft3)	0.00	0.00	0.00
Rf= Final Dry Test Volume (ft3)	5.00	4.94	4.95
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	27.8897	27.8286	27.7808
Pd= Pb + (^H/13.59) "Hg	28.0236	28.0972	28.1708
Tw= Ta +460 (oR.)	523.0	523.0	523.0
Td= [(Ti + To)/2] + 460 (oR.)	535.0	535.0	540.5
Bw= Pv/Pb ("Hg)	0.0207	0.0207	0.0207
WET TEST METER FACTOR (WTMF)	0.9922	0.9922	0.9922
ated Y Value)(WTMF)	0.9892	0.9964	1.0002

Y (MEAN)(WTMF) = 0.9953

N.R. MCCALL & ASSOCIATES LTD.

Calibrating Technician Signature:

ORIFICE METER CALIBRATION

DATE: Jan 10/18

CONSOLE I.D. MU 1013

	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	0.9892	0.9892	0.9964
Delta H=	0.5	1	1.5
Ri=int. gas meter vol.	0	0	0
Rf=final gas meter vol.	1.85	2.65	3.25
min. samp	5	5	5
Qm=Y(Rf-Ri)/^T(FT3/MIN)	0.366004	0.524276	0.64766
To=meter outlet Temp (oF)	83	82	83
Tm=meter out temp. (oR)	543	542	543
Pm=Pb + ^H	27.986792	28.0235835	28.0603753
SQRT(Tm/Pm*H/Md)	0.5787042	0.81712039	1.00102989
Ko=orifice const.	0.6324544	0.64161414	0.64699366

Ko MEAN = 0.6403541

Ko*4*144= 368.84395

McCALL ENVIRONMENTAL LTD.

Calibrating Technician Signature:

ORIFICE METER CALIBRATION

DATE: Jan 10/18

CONSOLE I.D. MU 1013

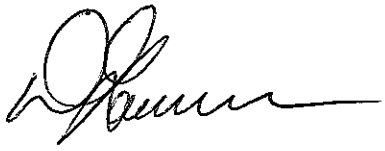
	RUN 4	RUN 5	RUN 6
MD= mol. wt. dry air	28.967	28.967	28.967
Pb=bar. pressure "Hg	27.95	27.95	27.95
Y=gas meter factor	0.9964	1.0002	1.0002
Delta H=	2	2.5	3
Ri=int. gas meter vol.	0	0	0
Rf=final gas meter vol.	3.76	4.18	4.62
min. samp	5	5	5
Qm=Y(Rf-Ri)/^T(FT3/MIN)	0.7492928	0.8361672	0.9241848
To=meter outlet Temp (oF)	86	86	84
Tm=meter out temp. (oR)	546	546	544
Pm=Pb + ^H	28.097167	28.1339588	28.1707506
SQRT(Tm/Pm*H/Md)	1.1583193	1.29419329	1.41419438
Ko=orifice const.	0.6468793	0.64609144	0.6535062

Ko MEAN = 0.6488257

Ko*4*144= 373.72358

McCALL ENVIRONMENTAL LTD.

Calibrating Technician Signature:



CALIBRATION CERTIFICATE
DRY GAS METER

DATE: Jan 9/18

CONSOLE MANUF.: NAPP/MILLENNIUM MODEL 32

CONSOLE I.D.: MU 1012

PARAMETER SUMMARY	RUN #1	RUN #2	RUN #3
Ta = Ambient (WTM) Temperature (oF.)	65.0	65.0	65.0
P=Pres. Differential at WTM ("Hg)	0.0846	0.1692	0.2355
Pb= Atmospheric Pressure ("Hg)	28.20	28.20	28.20
Pv= Vapour Pressure Water at Temp. Ta ("Hg)	0.6219	0.6219	0.6219
H=Pres. Differential at Orifice	1.0	2.0	3.0
Ti= Dry Test Meter Inlet Temp. (oF.)	78.0	75.0	80.0
To= Dry Test Meter Outlet Temp. (oF.)	77.0	74.0	79.0
Ri= Initial Dry Test volume (ft3)	0.00	0.00	0.00
Rf= Final Dry Test Volume (ft3)	4.98	4.80	4.90
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	28.1154	28.0308	27.9645
Pd= Pb + (^H/13.59) "Hg	28.2736	28.3472	28.4208
Tw= Ta +460 (oR.)	525.0	525.0	525.0
Td= [(Ti + To)/2] + 460 (oR.)	537.5	534.5	539.5
Bw= Pv/Pb ("Hg)	0.0221	0.0221	0.0221
WET TEST METER FACTOR (WTMF)	0.9922	0.9922	0.9922
ated Y Value)(WTMF)	0.9918	1.0176	1.0011

Y (MEAN)(WTMF) = 1.0035

N.R. MCCALL & ASSOCIATES LTD.

Calibrating Technician Signature:

ORIFICE METER CALIBRATION

DATE: Jan 9/18

CONSOLE I.D. MU 1012

	RUN 1	RUN 2	RUN 3
MD= mol. wt. dry air	28.967	28.967	28.967
Pb=bar. pressure "Hg	28.2	28.05	28.05
Y=gas meter factor	0.9918	0.9918	1.0176
Delta H=	0.5	1	1.5
Ri=int. gas meter vol.	0	0	0
Rf=final gas meter vol.	2.13	3.11	3.84
min. samp	5	5	5
Qm=Y(Rf-Ri)/^T(FT3/MIN)	0.4225068	0.6168996	0.7815168
To=meter outlet Temp (oF)	80	81	81
Tm=meter out temp. (oR)	540	541	541
Pm=Pb + ^H	28.236792	28.1235835	28.1603753
SQRT(Tm/Pm*H/Md)	0.5745429	0.81491356	0.997409
Ko=orifice const.	0.7353791	0.75701232	0.78354697

Ko MEAN = 0.7586461

Ko*4*144= 436.98016

McCALL ENVIRONMENTAL LTD.

Calibrating Technician Signature:

ORIFICE METER CALIBRATION

DATE: Jan 9/18

CONSOLE I.D. MU 1012

	RUN 4	RUN 5	RUN 6
MD= mol. wt. dry air	28.967	28.967	28.967
Pb=bar. pressure "Hg	28.2	28.2	28.2
Y=gas meter factor	1.0176	1.0011	1.0011
Delta H=	2	2.5	3
Ri=int. gas meter vol.	0	0	0
Rf=final gas meter vol.	4.48	5.04	5.46
min. samp	5	5	5
Qm=Y(Rf-Ri)/^T(FT3/MIN)	0.9117696	1.0091088	1.0932012
To=meter outlet Temp (oF)	82	83	84
Tm=meter out temp. (oR)	542	543	544
Pm=Pb + ^H	28.347167	28.3839588	28.4207506
SQRT(Tm/Pm*H/Md)	1.1489683	1.28493653	1.40796074
Ko=orifice const.	0.793555	0.78533747	0.77644295

Ko MEAN = 0.7851118

Ko*4*144= 452.22441

McCALL ENVIRONMENTAL LTD.

Calibrating Technician Signature:

Calibration Certificate for S-Type Pitot Tube

Date: Jan 11/18

Barometric Pressure ("Hg): 29.8

Pitot I.D.: **14**

Wind Tunnel Temperature (^{O}F): 71.0

Nozzle: 0.250

Wind Velocity (ft/sec)	*Ref.Pitot ("H_2O)*	*S-Type Pitot ("H_2O)*	*Pitot Factor*
12.29	0.03427	0.04839	0.83312
19.68	0.08793	0.12608	0.82678
39.42	0.35272	0.51508	0.81923
63.06	0.90269	1.26316	0.83690
81.38	1.50344	2.11714	0.83426
103.58	2.43563	3.34104	0.84528

Average= 0.83260

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

Calibration Certificate for S-Type Pitot Tube

Date: Jan 11/18

Barometric Pressure ("Hg): 29.8

Pitot I.D.: **15**

Wind Tunnel Temperature (^{O}F): 67.0

Nozzle: 0.250

Wind Velocity (ft/sec)	*Ref.Pitot ("H_2O)*	*S-Type Pitot ("H_2O)*	*Pitot Factor*
12.95	0.03837	0.05383	0.83580
25.27	0.14607	0.21112	0.82348
54.86	0.68828	0.98426	0.82787
76.96	1.35481	1.90537	0.83480
93.23	1.98821	2.76796	0.83905
133.65	4.08556	5.61440	0.84452

Average= 0.83425

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

Calibration Certificate for S-Type Pitot Tube

Date: Jan 11/18

Barometric Pressure ("Hg): 29.85

Pitot I.D.: **148**

Wind Tunnel Temperature (^{O}F): 71.0

Nozzle: 0.250

Wind Velocity (ft/sec)	*Ref.Pitot ("H_2O)*	*S-Type Pitot ("H_2O)*	*Pitot Factor*
13.69	0.04262	0.06065	0.82988
19.13	0.08321	0.11798	0.83141
41.58	0.39311	0.56173	0.82819
63.08	0.90476	1.26630	0.83683
81.24	1.50057	2.07940	0.84100
99.32	2.24318	3.18588	0.83072

Average= 0.83300

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

Calibration Certificate for S-Type Pitot Tube

Date: Jan 11/18

Barometric Pressure ("Hg): 29.85

Pitot I.D.: **242**

Wind Tunnel Temperature (^{O}F): 71.0

Nozzle: 0.250

Wind Velocity (ft/sec)	*Ref.Pitot ("H_2O)*	*S-Type Pitot ("H_2O)*	*Pitot Factor*
12.71	0.03676	0.05091	0.84120
19.02	0.08230	0.11495	0.83765
41.06	0.38343	0.53104	0.84123
62.85	0.89820	1.20776	0.85375
82.67	1.55395	2.11982	0.84763
103.76	2.44808	3.49980	0.82799

Average= 0.84158

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

Calibration Certificate for S-Type Pitot Tube

Date: Jan 11/18

Barometric Pressure ("Hg): 29.83

Pitot I.D.: **248**

Wind Tunnel Temperature (^{O}F): 71.0

Nozzle: 0.250

Wind Velocity (ft/sec)	*Ref.Pitot ("H_2O)*	*S-Type Pitot ("H_2O)*	*Pitot Factor*
12.49	0.03545	0.04995	0.83396
19.92	0.09017	0.12459	0.84223
40.44	0.37165	0.53192	0.82753
62.76	0.89496	1.25108	0.83732
81.58	1.51225	2.12472	0.83521
103.80	2.44834	3.47904	0.83050

Average= 0.83446

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

Calibration Certificate for S-Type Pitot Tube

Date: Jan 11/18

Barometric Pressure ("Hg): 29.85

Pitot I.D.: **270**

Wind Tunnel Temperature (^{O}F): 71.0

Nozzle: 0.250

Wind Velocity (ft/sec)	*Ref.Pitot ("H_2O)*	*S-Type Pitot ("H_2O)*	*Pitot Factor*
12.13	0.03343	0.04760	0.82969
20.29	0.09360	0.13172	0.83456
41.06	0.38326	0.53622	0.83697
63.48	0.91627	1.24964	0.84772
82.85	1.56068	2.12276	0.84887
103.39	2.43039	3.30182	0.84937

Average= 0.84120

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

Calibration Certificate for S-Type Pitot Tube

Date: Jan 11/18

Barometric Pressure ("Hg): 29.85

Pitot I.D.: **286**

Wind Tunnel Temperature (^{O}F): 71.0

Nozzle: 0.250

Wind Velocity (ft/sec)	*Ref.Pitot ("H_2O)*	*S-Type Pitot ("H_2O)*	*Pitot Factor*
11.99	0.03270	0.04571	0.83735
19.99	0.09088	0.12640	0.83946
41.41	0.38986	0.53259	0.84701
62.08	0.87628	1.19016	0.84948
81.76	1.52008	2.05643	0.85116
102.44	2.38606	3.23704	0.84997

Average= 0.84574

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

Calibration Certificate for S-Type Pitot Tube

Date: Jan 11/18

Barometric Pressure ("Hg): 29.85

Pitot I.D.: **294**

Wind Tunnel Temperature (^{O}F): 71.0

Nozzle: 0.250

Wind Velocity (ft/sec)	*Ref.Pitot ("H_2O)*	*S-Type Pitot ("H_2O)*	*Pitot Factor*
12.28	0.03431	0.04849	0.83276
20.62	0.09665	0.13581	0.83517
40.72	0.37711	0.51819	0.84455
63.63	0.92067	1.25359	0.84842
81.73	1.51873	2.06836	0.84833
103.07	2.41538	3.28817	0.84850

Average= 0.84295

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

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

North Carolina State University

Environmental Programs

This certificate awarded to

Danny Lawrence

for satisfactory completion of course and examination for

SI: 414 Quality Assurance for Source Emission Measurements

Inez F. VanArsdall
Manager

Christine E. Murphy
Registrar

May 22, 2000
Date Completed

3.5 CEUs

Awarded under EPA Assistance Agreement CT - 825724

Environmental Programs
Industrial Extension Service
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Exova

Analytical Report

Bill To:	McCall Environmental	Project ID:	Pinnacle Pellet	Lot ID:	**1267448**
	6733 Buchanan Road	Project Name:		Control Number:	C0066919
	Coldstream, BC, Canada	Project Location:	Lavington, BC	Date Received:	Apr 30, 2018
	V1B 3C5	LSD:		Date Reported:	May 4, 2018
Attn:	Accounts Payable	P.O.:		Report Number:	2281451
Sampled By:		Proj. Acct. code:			
Company:					

Reference Number	1267448-1	1267448-2	1267448-3
Sample Date	Apr 25, 2018	Apr 25, 2018	Apr 25, 2018
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Dryer 2 / North Stack Test 1 / 19.4 °C	Dryer 2 / North Stack Test 2 / 19.4 °C	Dryer 2 / North Stack Test 3 / 19.4 °C
Matrix	Water	Water	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents						
Oil and Grease	Total	mg/sample	4	4	5	2
Volume	Sample volume	mL	340	325	320	
pH adjustment	required prior to O&G extraction		Yes	Yes	Yes	

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Analytical Report

Bill To:	McCall Environmental	Project ID:	Pinnacle Pellet	Lot ID:	**1267448**
	6733 Buchanan Road	Project Name:		Control Number:	C0066919
	Coldstream, BC, Canada	Project Location:	Lavington, BC	Date Received:	Apr 30, 2018
	V1B 3C5	LSD:		Date Reported:	May 4, 2018
Attn:	Accounts Payable	P.O.:		Report Number:	2281451
Sampled By:		Proj. Acct. code:			
Company:					

		Reference Number	1267448-4	1267448-5	1267448-6
		Sample Date	Apr 25, 2018	Apr 25, 2018	Apr 25, 2018
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Dryer 2 / South Stack Test 1 / 19.4 °C	Dryer 2 / South Stack Test 2 / 19.4 °C	Dryer 2 / South Stack Test 3 / 19.4 °C
		Matrix	Water	Water	Water
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Aggregate Organic Constituents						
Oil and Grease	Total	mg/sample	2	4	3	2
Volume	Sample volume	mL	320	330	325	
pH adjustment	required prior to O&G extraction		Yes	Yes	Yes	

Approved by:

Carol Nam, Dipl. T.
Quality Officer

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS).
Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Dryer #2

i. Average hourly dryer ODt for the biomass dryer system for the previous month;
12.9 ODT/hr

ii. 90th percentile hourly ODt throughput for the biomass dryer (Section 4.3);
14.9 ODT/hr

iii. Average hourly throughput ODt for the biomass dryer system during stack testing;
13.7 ODT/hr