November 21, 2017

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

**Attention:** **Paul Pawlowski**
**Re:** **Air Emission Testing of October 20-26, 2017**
**Permit 107369, ME1718-131**

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

Testing Parameters

- Dryer 1 (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: Paul Pawlowski

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

Digitally signed by Matt McCall
DN: cn=Matt McCall, o=McCall Environmental, ou, email=matt@mccallenvironmental.net, c=CA
Date: 2017.11.21 10:42:56 -08'00'

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## Summary of Test Results

### Dryer 1 North Stack: October 20, 2017 Summary of Test Results 1-3

| | | |
|---|---|---|
| Gas Temperature: | 113 ° F | 45 ° C |
| Moisture Content (by volume): | 3.12 % | |
| Average Stack Gas Velocity: | 40.1 ft/sec | 12.2 m/sec |
| Total Actual Gas Flow Rate: | 189126 ACFM | |
| Dry Gas flow Rate at Reference Conditions: | 156873 SCFM | 74.0 $m^3$/sec |
| Total Particulate Concentration: | | |
| Dry Basis Actual at Reference Conditions | 0.004 $gr/ft^3$ | 10.1 $mg/m^3$ |
| Front Half Particulate | 0.002 $gr/ft^3$ | 4.6 $mg/m^3$ |
| Back Half Condensibles | 0.002 $gr/ft^3$ | 5.5 $mg/m^3$ |
| Mass Emission Rate | 5.95 lbs/hr | 2.70 kg/hr |

### Dryer 1 South Stack: October 26, 2017 Summary of Test Results 1-3

| | | |
|---|---|---|
| Gas Temperature: | 81 ° F | 27 ° C |
| Moisture Content (by volume): | 2.46 % | |
| Average Stack Gas Velocity: | 28.2 ft/sec | 8.6 m/sec |
| Total Actual Gas Flow Rate: | 61948 ACFM | |
| Dry Gas flow Rate at Reference Conditions: | 56443 SCFM | 26.6 $m^3$/sec |
| Total Particulate Concentration: | | |
| Dry Basis Actual at Reference Conditions | 0.005 $gr/ft^3$ | 10.9 $mg/m^3$ |
| Front Half Particulate | 0.004 $gr/ft^3$ | 9.3 $mg/m^3$ |
| Back Half Condensibles | 0.001 $gr/ft^3$ | 1.6 $mg/m^3$ |
| Mass Emission Rate | 2.31 lbs/hr | 1.05 kg/hr |

### Average of Dryer 1 North & South

| | North Stack | South Stack | | Avg/Combined |
|---|---|---|---|---|
| Volumetric Flow Rate $m^3$/sec | 74.0 | 26.6 | | 100.6 |
| Total Particulate Concentration $mg/m^3$ | 10.1 | 10.9 | | 10.5 |
| Mass Emission Rate Kg/hr | 2.70 | 1.05 | | 1.88 |

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**Pinnacle Pellet Lavington** **20-Oct-17**
**Dryer 1 North Stack** **Permit Number: 107369**
**Lavington, BC**

## AVERAGE OF AIR EMISSION TESTS 1 TO 3

| | | |
|---|---|---|
| Gas Temperature: | 113 $^{o}$F | 45 $^{o}$C |
| Moisture Content (by volume): | 3.12 % | |
| Average Stack Gas Velocity: | 40.1 ft/sec | 12.2 m/sec |
| Total Actual Gas Flow Rate: | 189126 ACFM | |
| Dry Gas flow Rate at Reference Conditions: | 156873 SCFM | 74.0 $m^3$/sec |
| Total Particulate Concentration: | | |
| Dry Basis Actual at Reference Conditions | 0.004 gr/$ft^3$ | 10.1 mg/$m^3$ |
| Front Half Particulate | 0.002 gr/$ft^3$ | 4.6 mg/$m^3$ |
| Back Half Condensibles | 0.002 gr/$ft^3$ | 5.5 mg/$m^3$ |
| Mass Emission Rate | 5.95 lbs/hr | 2.70 kg/hr |

## SUMMARY OF AIR EMISSION TESTS

### TEST 1:

| | | |
|---|---|---|
| Gas Temperature: | 117 $^{o}$F | 47 $^{o}$C |
| Moisture Content (by volume): | 3.2 % | |
| Average Stack Gas Velocity: | 40.3 ft/sec | 12.3 m/sec |
| Total Actual Gas Flow Rate: | 189889 ACFM | |
| Dry Gas flow Rate at Reference Conditions: | 156399 SCFM | 73.8 $m^3$/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/$ft^3$ | 3.4 mg/$m^3$ |
| Mass Emission Rate | 4.28 lbs/hr | 1.94 kg/hr |

### TEST 2:

| | | |
|---|---|---|
| Gas Temperature: | 112 $^{o}$F | 45 $^{o}$C |
| Moisture Content (by volume): | 3.3 % | |
| Average Stack Gas Velocity: | 40.1 ft/sec | 12.2 m/sec |
| Total Actual Gas Flow Rate: | 189145 ACFM | |
| Dry Gas flow Rate at Reference Conditions: | 156694 SCFM | 74.0 $m^3$/sec |
| Total Particulate Concentration: | | |
| Dry Basis Actual at Reference Conditions | .005 gr/$ft^3$ | 11.5 mg/$m^3$ |
| Front Half Particulate | .004 gr/$ft^3$ | 8.2 mg/$m^3$ |
| Back Half Condensibles | .001 gr/$ft^3$ | 3.3 mg/$m^3$ |
| Mass Emission Rate | 6.73 lbs/hr | 3.05 kg/hr |

### TEST 3:

| | | |
|---|---|---|
| Gas Temperature: | 109 $^{o}$F | 43 $^{o}$C |
| Moisture Content (by volume): | 2.9 % | |
| Average Stack Gas Velocity: | 40.0 ft/sec | 12.2 m/sec |
| Total Actual Gas Flow Rate: | 188343 ACFM | |
| Dry Gas flow Rate at Reference Conditions: | 157527 SCFM | 74.3 $m^3$/sec |
| Total Particulate Concentration: | | |
| Dry Basis Actual at Reference Conditions | .005 gr/$ft^3$ | 11.6 mg/$m^3$ |
| Front Half Particulate | .001 gr/$ft^3$ | 1.7 mg/$m^3$ |
| Back Half Condensibles | .004 gr/$ft^3$ | 9.8 mg/$m^3$ |
| Mass Emission Rate | 6.83 lbs/hr | 3.10 kg/hr |

## DATA FOR TESTS 1 TO 3

| | |
|---|---|
| **Client:** | **Pinnacle Pellet Lavington** |
| **Plant Location:** | **Lavington, BC** |
| **Process:** | **Dryer 1 North Stack** |
| **Permit Number:** | **107369** |
| **Job Number:** | **ME1718-131** |
| **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:** | 87 | 86 | 88 |
| **Date of Test:** | 20-Oct-17 | 20-Oct-17 | 20-Oct-17 |
| **Start Time:** | 10:15 | 11:38 | 12:55 |
| **Stop Time:** | 11:21 | 12:40 | 14:00 |
| **On-line Sampling Time:** | 60 | 60 | 60 |
| **Testing Personnel:** | DL/TW | DL/TW | DL/TW |
| **Sampler Model:** | 1013 | 1013 | 1013 |
| **Barometric Pressure("Hg):** | 27.80 | 27.80 | 27.80 |
| **Static Pressure("$H_2O$):** | -0.20 | -0.20 | -0.20 |
| **%$CO_2$:** | 2.0 | 2.0 | 2.0 |
| **%$O_2$:** | 19.0 | 19.0 | 19.0 |
| **%CO:** | 0.0 | 0.0 | 0.0 |
| **%$N_2$:** | 79.0 | 79.0 | 79.0 |
| **Diameter of Nozzle(inches):** | 0.215 | 0.230 | 0.230 |
| **Meter Factor:** | 0.9961 | 0.9961 | 0.9961 |
| **Type-S Pitot Tube Coefficient:** | 0.84574 | 0.84574 | 0.84574 |
| **Cross Sectional Area of Stack($ft^2$):** | 78.54 | 78.54 | 78.54 |
| **Impinger Condensate(g):** | 20 | 24 | 21 |
| **Weight of Moisture in Silica Gel(g):** | 1.0 | 1.0 | 1.0 |
| **Weight of Filter Particulate(g):** | 0.0015 | 0.0022 | 0.0005 |
| **Weight of Probe Washings(g):** | 0.0019 | 0.0058 | 0.0012 |
| **Weight of Impinger Content Organic(g):** | 0.0029 | 0.0032 | 0.0096 |
| **Total Weight of Particulate(g):** | 0.0063 | 0.0112 | 0.0113 |

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

20-Oct-17

| 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 | 0.40 | 0.91 | 46 | 46 | 114 | 0.00 | 1.01 |
| A-11 | 0.39 | 0.88 | 49 | 44 | 115 | 1.26 | 1.04 |
| A-10 | 0.41 | 0.93 | 47 | 45 | 116 | 2.55 | 0.98 |
| A-9 | 0.38 | 0.86 | 51 | 47 | 116 | 3.78 | 1.04 |
| A-8 | 0.37 | 0.84 | 51 | 50 | 117 | 5.05 | 1.01 |
| A-7 | 0.40 | 0.91 | 55 | 50 | 117 | 6.28 | 1.04 |
| A-6 | 0.40 | 0.91 | 55 | 53 | 117 | 7.60 | 0.99 |
| A-5 | 0.43 | 0.95 | 55 | 55 | 117 | 8.86 | 0.98 |
| A-4 | 0.50 | 1.15 | 60 | 57 | 118 | 10.15 | 0.98 |
| A-3 | 0.56 | 1.30 | 64 | 59 | 115 | 11.55 | 0.95 |
| A-2 | 0.60 | 1.40 | 68 | 61 | 118 | 13.00 | 0.96 |
| A-1 | 0.65 | 1.52 | 66 | 70 | 116 | 14.52 | 0.97 |
| B-12 | 0.55 | 1.31 | 72 | 67 | 114 | 16.13 | 1.01 |
| B-11 | 0.52 | 1.22 | 71 | 67 | 119 | 17.68 | 1.04 |
| B-10 | 0.50 | 1.18 | 69 | 69 | 116 | 19.22 | 1.01 |
| B-9 | 0.45 | 1.06 | 73 | 69 | 118 | 20.70 | 1.03 |
| B-8 | 0.42 | 0.99 | 72 | 70 | 118 | 22.13 | 1.02 |
| B-7 | 0.39 | 0.92 | 75 | 71 | 119 | 23.50 | 1.05 |
| B-6 | 0.32 | 0.91 | 74 | 75 | 115 | 24.86 | 1.10 |
| B-5 | 0.37 | 0.88 | 77 | 74 | 118 | 26.16 | 1.00 |
| B-4 | 0.35 | 0.84 | 75 | 77 | 116 | 27.43 | 1.01 |
| B-3 | 0.35 | 0.84 | 78 | 76 | 118 | 28.68 | 1.00 |
| B-2 | 0.36 | 0.87 | 77 | 77 | 114 | 29.92 | 1.01 |
| B-1 | 0.35 | 0.84 | 78 | 77 | 116 | 31.20 | 0.99 |
| | | | | | | 32.43 | |

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**Sampling Data for - *TEST 2***

**Pinnacle Pellet Lavington**

**Dryer 1 North Stack**

**Lavington, BC**

20-Oct-17

| 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 | 0.53 | 1.67 | 79 | 79 | 116 | 0.00 | 1.03 |
| B-11 | 0.55 | 1.73 | 75 | 79 | 113 | 1.81 | 1.03 |
| B-10 | 0.46 | 1.46 | 78 | 78 | 111 | 3.65 | 1.03 |
| B-9 | 0.40 | 1.26 | 77 | 78 | 113 | 5.34 | 0.99 |
| B-8 | 0.41 | 1.30 | 77 | 78 | 111 | 6.84 | 1.02 |
| B-7 | 0.47 | 1.33 | 78 | 78 | 111 | 8.41 | 0.97 |
| B-6 | 0.37 | 1.18 | 78 | 78 | 110 | 10.01 | 1.01 |
| B-5 | 0.39 | 1.24 | 79 | 79 | 111 | 11.49 | 1.01 |
| B-4 | 0.36 | 1.15 | 80 | 80 | 110 | 13.02 | 1.04 |
| B-3 | 0.37 | 1.16 | 82 | 82 | 112 | 14.53 | 1.00 |
| B-2 | 0.35 | 1.12 | 82 | 82 | 110 | 16.00 | 1.00 |
| B-1 | 0.35 | 1.12 | 82 | 82 | 111 | 17.44 | 1.00 |
| B-12 | 0.40 | 1.28 | 84 | 84 | 111 | 18.88 | 0.97 |
| B-11 | 0.42 | 1.35 | 84 | 84 | 113 | 20.38 | 0.98 |
| B-10 | 0.40 | 1.28 | 85 | 84 | 113 | 21.92 | 0.99 |
| B-9 | 0.38 | 1.22 | 84 | 84 | 110 | 23.45 | 1.01 |
| B-8 | 0.38 | 1.22 | 84 | 84 | 113 | 24.97 | 1.02 |
| B-7 | 0.39 | 1.65 | 85 | 85 | 113 | 26.50 | 1.00 |
| B-6 | 0.41 | 1.31 | 87 | 86 | 115 | 28.02 | 0.99 |
| B-5 | 0.42 | 1.35 | 86 | 86 | 114 | 29.56 | 0.98 |
| B-4 | 0.40 | 1.28 | 87 | 87 | 115 | 31.11 | 0.99 |
| B-3 | 0.55 | 1.76 | 87 | 87 | 113 | 32.64 | 0.98 |
| B-2 | 0.60 | 1.93 | 88 | 88 | 115 | 34.41 | 1.01 |
| B-1 | 0.63 | 2.02 | 88 | 88 | 114 | 36.33 | 1.00 |
| | | | | | | 38.28 | |

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**Sampling Data for - *TEST 3***

**Pinnacle Pellet Lavington**

**Dryer 1 North Stack**

**Lavington, BC**

20-Oct-17

| 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 | 0.38 | 1.22 | 84 | 85 | 112 | 0.00 | 1.03 |
| A-11 | 0.4 | 1.28 | 81 | 86 | 112 | 1.55 | 1.01 |
| A-10 | 0.4 | 1.29 | 81 | 86 | 109 | 3.11 | 0.99 |
| A-9 | 0.42 | 1.34 | 81 | 83 | 111 | 4.65 | 0.98 |
| A-8 | 0.37 | 1.19 | 83 | 84 | 108 | 6.20 | 1.01 |
| A-7 | 0.38 | 1.23 | 82 | 83 | 109 | 7.70 | 0.99 |
| A-6 | 0.42 | 1.35 | 83 | 84 | 109 | 9.19 | 1.03 |
| A-5 | 0.42 | 1.35 | 84 | 84 | 110 | 10.82 | 0.96 |
| A-4 | 0.42 | 1.55 | 83 | 84 | 108 | 12.35 | 1.03 |
| A-3 | 0.54 | 1.73 | 83 | 83 | 111 | 13.98 | 0.97 |
| A-2 | 0.6 | 1.42 | 84 | 85 | 108 | 15.71 | 0.98 |
| A-1 | 0.64 | 2.06 | 85 | 84 | 109 | 17.57 | 0.99 |
| A-12 | 0.50 | 1.61 | 84 | 84 | 111 | 19.50 | 1.02 |
| A-11 | 0.53 | 1.70 | 82 | 83 | 109 | 21.26 | 0.98 |
| A-10 | 0.55 | 1.29 | 81 | 84 | 108 | 23.00 | 0.98 |
| A-9 | 0.45 | 1.44 | 82 | 83 | 110 | 24.77 | 1.01 |
| A-8 | 0.39 | 1.25 | 83 | 84 | 109 | 26.42 | 1.03 |
| A-7 | 0.38 | 1.22 | 83 | 83 | 110 | 28.00 | 0.99 |
| A-6 | 0.38 | 1.22 | 83 | 84 | 109 | 29.49 | 0.99 |
| A-5 | 0.38 | 1.22 | 82 | 82 | 109 | 30.98 | 0.98 |
| A-4 | 0.36 | 1.16 | 82 | 83 | 108 | 32.46 | 0.99 |
| A-3 | 0.37 | 1.19 | 82 | 82 | 108 | 33.91 | 0.99 |
| A-2 | 0.36 | 1.16 | 83 | 84 | 107 | 35.38 | 0.99 |
| A-1 | 0.34 | 1.09 | 83 | 83 | 107 | 36.84 | 1.02 |
| | | | | | | 38.30 | |

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**Pinnacle Pellet Lavington**
**Dryer 1 North Stack**
**Pinnacle Pellet Lavington**

Data for ***TEST 1***

**OVERALL ISOKINETICS - TEST 1: 1.009**

| | | | | | |
|---|---|---|---|---|---|
| **Delta P:** | **0.430** | **"$H_2O$** | **Us avg:** | **40.30** | **ft/sec** |
| **Delta H:** | **1.018** | | **ACFM:** | **189889** | **$ft^3$/min** |
| **Tm avg:** | **523.8** | **$^oR$** | **SDCFM:** | **156399** | **$ft^3$/min** |
| **Ts avg:** | **576.5** | **$^oR$** | **Vm std:** | **30.33** | **$ft^3$** |
| **Bwo:** | **0.032** | | **Vm corr:** | **32.30** | **$ft^3$** |
| **Md:** | **29.08** | | **Vm:** | **32.43** | **$ft^3$** |
| **Ms:** | **28.73** | | **MF:** | **0.9961** | |
| **Pb:** | **27.80** | **"Hg** | **PCON:** | **7.31** | **$mg/m^3$** |
| **Pm:** | **27.87** | **"Hg** | **ERAT:** | **1.94** | **kg/hr** |
| **Ps:** | **27.79** | **"Hg** | | | |

Data for ***TEST 2***

**OVERALL ISOKINETICS - TEST 2: 1.002**

| | | | | | |
|---|---|---|---|---|---|
| **Delta P:** | **0.430** | **"$H_2O$** | **Us avg:** | **40.14** | **ft/sec** |
| **Delta H:** | **1.390** | | **ACFM:** | **189145** | **$ft^3$/min** |
| **Tm avg:** | **542.4** | **$^oR$** | **SDCFM:** | **156694** | **$ft^3$/min** |
| **Ts avg:** | **572.4** | **$^oR$** | **Vm std:** | **34.61** | **$ft^3$** |
| **Bwo:** | **0.033** | | **Vm corr:** | **38.13** | **$ft^3$** |
| **Md:** | **29.08** | | **Vm:** | **38.28** | **$ft^3$** |
| **Ms:** | **28.72** | | **MF:** | **0.9961** | |
| **Pb:** | **27.80** | **"Hg** | **PCON:** | **11.47** | **$mg/m^3$** |
| **Pm:** | **27.90** | **"Hg** | **ERAT:** | **3.05** | **kg/hr** |
| **Ps:** | **27.79** | **"Hg** | | | |

Data for ***TEST 3***

**OVERALL ISOKINETICS - TEST 3: 0.997**

| | | | | | |
|---|---|---|---|---|---|
| **Delta P:** | **0.429** | **"$H_2O$** | **Us avg:** | **39.97** | **ft/sec** |
| **Delta H:** | **1.357** | | **ACFM:** | **188343** | **$ft^3$/min** |
| **Tm avg:** | **543.2** | **$^oR$** | **SDCFM:** | **157527** | **$ft^3$/min** |
| **Ts avg:** | **569.2** | **$^oR$** | **Vm std:** | **34.58** | **$ft^3$** |
| **Bwo:** | **0.029** | | **Vm corr:** | **38.15** | **$ft^3$** |
| **Md:** | **29.08** | | **Vm:** | **38.30** | **$ft^3$** |
| **Ms:** | **28.76** | | **MF:** | **0.9961** | |
| **Pb:** | **27.80** | **"Hg** | **PCON:** | **11.57** | **$mg/m^3$** |
| **Pm:** | **27.90** | **"Hg** | **ERAT:** | **3.10** | **kg/hr** |
| **Ps:** | **27.79** | **"Hg** | | | |

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**Pinnacle Pellet Lavington** **26-Oct-17**
**Dryer 1 South Stack** **Permit Number: 107369**
**Lavington, BC**

## AVERAGE OF AIR EMISSION TESTS 1 TO 3

| | | |
|---|---|---|
| Gas Temperature: | 81 $^{o}$F | 27 $^{o}$C |
| Moisture Content (by volume): | 2.46 % | |
| Average Stack Gas Velocity: | 28.2 ft/sec | 8.6 m/sec |
| Total Actual Gas Flow Rate: | 61948 ACFM | |
| Dry Gas flow Rate at Reference Conditions: | 56443 SCFM | 26.6 $m^3$/sec |
| Total Particulate Concentration: | | |
| Dry Basis Actual at Reference Conditions | 0.005 gr/$ft^3$ | 10.9 mg/$m^3$ |
| Front Half Particulate | 0.004 gr/$ft^3$ | 9.3 mg/$m^3$ |
| Back Half Condensibles | 0.001 gr/$ft^3$ | 1.6 mg/$m^3$ |
| Mass Emission Rate | 2.31 lbs/hr | 1.05 kg/hr |

## SUMMARY OF AIR EMISSION TESTS

### TEST 1:

| | | |
|---|---|---|
| Gas Temperature: | 78 $^{o}$F | 26 $^{o}$C |
| Moisture Content (by volume): | 2.1 % | |
| Average Stack Gas Velocity: | 28.3 ft/sec | 8.6 m/sec |
| Total Actual Gas Flow Rate: | 62182 ACFM | |
| Dry Gas flow Rate at Reference Conditions: | 57167 SCFM | 27.0 $m^3$/sec |
| Total Particulate Concentration: | | |
| Dry Basis Actual at Reference Conditions | .006 gr/$ft^3$ | 13.7 mg/$m^3$ |
| Front Half Particulate | .005 gr/$ft^3$ | 12.0 mg/$m^3$ |
| Back Half Condensibles | .001 gr/$ft^3$ | 1.7 mg/$m^3$ |
| Mass Emission Rate | 2.94 lbs/hr | 1.33 kg/hr |

### TEST 2:

| | | |
|---|---|---|
| Gas Temperature: | 81 $^{o}$F | 27 $^{o}$C |
| Moisture Content (by volume): | 2.7 % | |
| Average Stack Gas Velocity: | 27.9 ft/sec | 8.5 m/sec |
| Total Actual Gas Flow Rate: | 61358 ACFM | |
| Dry Gas flow Rate at Reference Conditions: | 55721 SCFM | 26.3 $m^3$/sec |
| Total Particulate Concentration: | | |
| Dry Basis Actual at Reference Conditions | .004 gr/$ft^3$ | 8.9 mg/$m^3$ |
| Front Half Particulate | .003 gr/$ft^3$ | 7.9 mg/$m^3$ |
| Back Half Condensibles | .000 gr/$ft^3$ | 1.0 mg/$m^3$ |
| Mass Emission Rate | 1.86 lbs/hr | 0.85 kg/hr |

### TEST 3:

| | | |
|---|---|---|
| Gas Temperature: | 84 $^{o}$F | 29 $^{o}$C |
| Moisture Content (by volume): | 2.5 % | |
| Average Stack Gas Velocity: | 28.3 ft/sec | 8.6 m/sec |
| Total Actual Gas Flow Rate: | 62303 ACFM | |
| Dry Gas flow Rate at Reference Conditions: | 56442 SCFM | 26.6 $m^3$/sec |
| Total Particulate Concentration: | | |
| Dry Basis Actual at Reference Conditions | .004 gr/$ft^3$ | 10.0 mg/$m^3$ |
| Front Half Particulate | .003 gr/$ft^3$ | 8.0 mg/$m^3$ |
| Back Half Condensibles | .001 gr/$ft^3$ | 2.0 mg/$m^3$ |
| Mass Emission Rate | 2.12 lbs/hr | 0.96 kg/hr |

## DATA FOR TESTS 1 TO 3

| | |
|---|---|
| **Client:** | **Pinnacle Pellet Lavington** |
| **Plant Location:** | **Lavington, BC** |
| **Process:** | **Dryer 1 South Stack** |
| **Permit Number:** | **107369** |
| **Job Number:** | **ME1718-131** |
| **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:** | 94 | 95 | 96 |
| **Date of Test:** | 26-Oct-17 | 26-Oct-17 | 26-Oct-17 |
| **Start Time:** | 9:50 | 11:25 | 12:45 |
| **Stop Time:** | 10:55 | 12:30 | 13:50 |
| **On-line Sampling Time:** | 60 | 60 | 60 |
| **Testing Personnel:** | DL/TW | DL/TW | DL/TW |
| **Sampler Model:** | 1013 | 1013 | 1013 |
| **Barometric Pressure("Hg):** | 28.65 | 28.65 | 28.65 |
| **Static Pressure("$H_2O$):** | -0.10 | -0.10 | -0.10 |
| **%$CO_2$:** | 2.0 | 2.0 | 2.0 |
| **%$O_2$:** | 19.0 | 19.0 | 19.0 |
| **%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:** | 0.9961 | 0.9961 | 0.9961 |
| **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 | 26 | 24 |
| **Weight of Moisture in Silica Gel(g):** | 1.0 | 1.0 | 1.0 |
| **Weight of Filter Particulate(g):** | 0.0008 | 0.0016 | 0.0004 |
| **Weight of Probe Washings(g):** | 0.0147 | 0.0085 | 0.0099 |
| **Weight of Impinger Content Organic(g):** | 0.0022 | 0.0013 | 0.0026 |
| **Total Weight of Particulate(g):** | 0.0177 | 0.0114 | 0.0129 |

MCCALL ENVIRONMENTAL

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

26-Oct-17

| 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 | 0.29 | 2.69 | 54 | 54 | 77 | 0.00 | 0.99 |
| A-11 | 0.28 | 2.60 | 53 | 51 | 75 | 2.12 | 0.98 |
| A-10 | 0.29 | 2.69 | 54 | 50 | 76 | 4.18 | 0.99 |
| A-9 | 0.33 | 3.09 | 56 | 50 | 76 | 6.30 | 1.00 |
| A-8 | 0.30 | 2.89 | 58 | 52 | 76 | 8.58 | 1.00 |
| A-7 | 0.30 | 2.80 | 59 | 53 | 77 | 10.77 | 1.01 |
| A-6 | 0.25 | 2.34 | 59 | 54 | 76 | 12.99 | 1.04 |
| A-5 | 0.14 | 1.31 | 62 | 57 | 78 | 15.08 | 0.99 |
| A-4 | 0.13 | 1.22 | 64 | 59 | 77 | 16.58 | 1.00 |
| A-3 | 0.10 | 0.94 | 65 | 61 | 80 | 18.05 | 0.99 |
| A-2 | 0.08 | 0.75 | 65 | 60 | 79 | 19.32 | 0.94 |
| A-1 | 0.05 | 0.47 | 66 | 62 | 78 | 20.40 | 0.93 |
| B-12 | 0.32 | 3.02 | 65 | 63 | 78 | 21.25 | 0.99 |
| B-11 | 0.33 | 3.13 | 70 | 65 | 79 | 23.52 | 0.97 |
| B-10 | 0.32 | 3.05 | 71 | 66 | 78 | 25.79 | 1.02 |
| B-9 | 0.30 | 2.86 | 73 | 68 | 80 | 28.15 | 1.04 |
| B-8 | 0.29 | 2.78 | 74 | 70 | 79 | 30.49 | 0.90 |
| B-7 | 0.26 | 2.49 | 76 | 72 | 79 | 32.50 | 1.03 |
| B-6 | 0.25 | 2.40 | 77 | 72 | 80 | 34.67 | 1.00 |
| B-5 | 0.26 | 2.51 | 80 | 76 | 81 | 36.74 | 1.00 |
| B-4 | 0.28 | 2.70 | 79 | 75 | 79 | 38.86 | 1.00 |
| B-3 | 0.26 | 2.51 | 80 | 79 | 81 | 41.06 | 0.99 |
| B-2 | 0.25 | 2.42 | 79 | 79 | 78 | 43.16 | 1.00 |
| B-1 | 0.23 | 2.22 | 80 | 79 | 78 | 45.25 | 0.98 |
| | | | | | | 47.22 | |

MCCALL ENVIRONMENTAL

**Sampling Data for - *TEST 2***

**Pinnacle Pellet Lavington**

**Dryer 1 South Stack**

**Lavington, BC**

26-Oct-17

| 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 | 0.30 | 2.87 | 74 | 74 | 81 | 0.00 | 1.04 |
| B-11 | 0.32 | 3.08 | 74 | 76 | 79 | 2.34 | 1.02 |
| B-10 | 0.31 | 2.98 | 74 | 75 | 81 | 4.73 | 1.00 |
| B-9 | 0.30 | 2.89 | 75 | 75 | 79 | 7.03 | 1.05 |
| B-8 | 0.28 | 2.70 | 75 | 75 | 78 | 9.40 | 0.97 |
| B-7 | 0.28 | 2.70 | 78 | 76 | 80 | 11.52 | 1.04 |
| B-6 | 0.25 | 2.41 | 78 | 77 | 78 | 13.79 | 0.98 |
| B-5 | 0.26 | 2.52 | 83 | 80 | 81 | 15.83 | 1.00 |
| B-4 | 0.25 | 2.43 | 81 | 79 | 81 | 17.95 | 0.99 |
| B-3 | 0.24 | 2.33 | 80 | 80 | 80 | 20.00 | 1.02 |
| B-2 | 0.25 | 2.42 | 80 | 80 | 82 | 22.08 | 0.98 |
| B-1 | 0.23 | 2.23 | 80 | 80 | 82 | 24.12 | 1.03 |
| A-12 | 0.30 | 2.90 | 78 | 79 | 80 | 26.18 | 0.99 |
| A-11 | 0.28 | 2.72 | 82 | 80 | 81 | 28.42 | 1.02 |
| A-10 | 0.28 | 2.72 | 81 | 80 | 82 | 30.66 | 1.01 |
| A-9 | 0.32 | 3.10 | 82 | 80 | 82 | 32.88 | 0.99 |
| A-8 | 0.32 | 3.10 | 83 | 79 | 83 | 35.22 | 0.99 |
| A-7 | 0.29 | 2.82 | 84 | 82 | 82 | 37.55 | 1.05 |
| A-6 | 0.27 | 2.63 | 86 | 81 | 84 | 39.90 | 1.05 |
| A-5 | 0.13 | 1.27 | 87 | 82 | 83 | 42.18 | 1.00 |
| A-4 | 0.13 | 1.27 | 86 | 83 | 82 | 43.70 | 1.02 |
| A-3 | 0.10 | 0.98 | 88 | 84 | 83 | 45.25 | 0.98 |
| A-2 | 0.04 | 0.39 | 87 | 86 | 84 | 46.56 | 0.95 |
| A-1 | 0.03 | 0.29 | 87 | 86 | 84 | 47.36 | 0.97 |
| | | | | | | 48.07 | |

MCCALL ENVIRONMENTAL

**Sampling Data for - *TEST 3***

**Pinnacle Pellet Lavington**

**Dryer 1 South Stack**

**Lavington, BC**

26-Oct-17

| 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 | 0.3 | 2.90 | 82 | 82 | 84 | 0.00 | 1.03 |
| A-11 | 0.31 | 2.99 | 79 | 81 | 84 | 2.35 | 0.98 |
| A-10 | 0.31 | 2.98 | 81 | 82 | 86 | 4.62 | 1.00 |
| A-9 | 0.32 | 3.09 | 81 | 82 | 84 | 6.94 | 1.02 |
| A-8 | 0.28 | 2.71 | 81 | 81 | 82 | 9.33 | 1.03 |
| A-7 | 0.27 | 2.61 | 83 | 83 | 84 | 11.60 | 1.01 |
| A-6 | 0.27 | 2.62 | 84 | 84 | 84 | 13.80 | 1.01 |
| A-5 | 0.15 | 1.45 | 84 | 84 | 83 | 16.00 | 1.02 |
| A-4 | 0.12 | 1.16 | 82 | 83 | 83 | 17.66 | 1.04 |
| A-3 | 0.11 | 1.07 | 83 | 83 | 83 | 19.17 | 0.97 |
| A-2 | 0.07 | 0.68 | 82 | 82 | 82 | 20.52 | 0.95 |
| A-1 | 0.05 | 0.48 | 82 | 83 | 82 | 21.57 | 0.95 |
| B-12 | 0.32 | 3.10 | 83 | 83 | 83 | 22.46 | 0.95 |
| B-11 | 0.30 | 2.91 | 84 | 85 | 83 | 24.70 | 0.95 |
| B-10 | 0.27 | 2.62 | 86 | 86 | 85 | 26.88 | 0.99 |
| B-9 | 0.28 | 2.73 | 87 | 87 | 84 | 29.03 | 1.06 |
| B-8 | 0.30 | 2.93 | 87 | 87 | 83 | 31.40 | 0.98 |
| B-7 | 0.30 | 2.93 | 88 | 88 | 84 | 33.66 | 1.00 |
| B-6 | 0.27 | 2.64 | 89 | 88 | 84 | 35.96 | 1.05 |
| B-5 | 0.25 | 2.44 | 89 | 89 | 83 | 38.26 | 1.01 |
| B-4 | 0.26 | 2.54 | 90 | 90 | 86 | 40.40 | 1.02 |
| B-3 | 0.25 | 2.45 | 91 | 91 | 84 | 42.60 | 1.01 |
| B-2 | 0.24 | 2.35 | 92 | 92 | 87 | 44.75 | 1.03 |
| B-1 | 0.24 | 2.35 | 92 | 92 | 86 | 46.88 | 0.98 |
| | | | | | | 48.91 | |

MCCALL ENVIRONMENTAL

**Pinnacle Pellet Lavington**
**Dryer 1 South Stack**
**Pinnacle Pellet Lavington**

Data for ***TEST 1***

**OVERALL ISOKINETICS - TEST 1: 0.989**

| | | | | | |
|---|---|---|---|---|---|
| **Delta P:** | **0.236** | **"$H_2O$** | **Us avg:** | **28.26** | **ft/sec** |
| **Delta H:** | **2.328** | | **ACFM:** | **62182** | **$ft^3$/min** |
| **Tm avg:** | **525.5** | **$^oR$** | **SDCFM:** | **57167** | **$ft^3$/min** |
| **Ts avg:** | **538.1** | **$^oR$** | **Vm std:** | **45.52** | **$ft^3$** |
| **Bwo:** | **0.021** | | **Vm corr:** | **47.04** | **$ft^3$** |
| **Md:** | **29.08** | | **Vm:** | **47.22** | **$ft^3$** |
| **Ms:** | **28.84** | | **MF:** | **0.9961** | |
| **Pb:** | **28.65** | **"Hg** | **PCON:** | **13.73** | **$mg/m^3$** |
| **Pm:** | **28.82** | **"Hg** | **ERAT:** | **1.33** | **kg/hr** |
| **Ps:** | **28.64** | **"Hg** | | | |

Data for ***TEST 2***

**OVERALL ISOKINETICS - TEST 2: 1.006**

| | | | | | |
|---|---|---|---|---|---|
| **Delta P:** | **0.228** | **"$H_2O$** | **Us avg:** | **27.89** | **ft/sec** |
| **Delta H:** | **2.323** | | **ACFM:** | **61358** | **$ft^3$/min** |
| **Tm avg:** | **540.3** | **$^oR$** | **SDCFM:** | **55721** | **$ft^3$/min** |
| **Ts avg:** | **541.3** | **$^oR$** | **Vm std:** | **45.08** | **$ft^3$** |
| **Bwo:** | **0.027** | | **Vm corr:** | **47.88** | **$ft^3$** |
| **Md:** | **29.08** | | **Vm:** | **48.07** | **$ft^3$** |
| **Ms:** | **28.78** | | **MF:** | **0.9961** | |
| **Pb:** | **28.65** | **"Hg** | **PCON:** | **8.93** | **$mg/m^3$** |
| **Pm:** | **28.82** | **"Hg** | **ERAT:** | **0.85** | **kg/hr** |
| **Ps:** | **28.64** | **"Hg** | | | |

Data for ***TEST 3***

**OVERALL ISOKINETICS - TEST 3: 1.001**

| | | | | | |
|---|---|---|---|---|---|
| **Delta P:** | **0.234** | **"$H_2O$** | **Us avg:** | **28.32** | **ft/sec** |
| **Delta H:** | **2.364** | | **ACFM:** | **62303** | **$ft^3$/min** |
| **Tm avg:** | **545.2** | **$^oR$** | **SDCFM:** | **56442** | **$ft^3$/min** |
| **Ts avg:** | **543.9** | **$^oR$** | **Vm std:** | **45.45** | **$ft^3$** |
| **Bwo:** | **0.025** | | **Vm corr:** | **48.72** | **$ft^3$** |
| **Md:** | **29.08** | | **Vm:** | **48.91** | **$ft^3$** |
| **Ms:** | **28.80** | | **MF:** | **0.9961** | |
| **Pb:** | **28.65** | **"Hg** | **PCON:** | **10.02** | **$mg/m^3$** |
| **Pm:** | **28.82** | **"Hg** | **ERAT:** | **0.96** | **kg/hr** |
| **Ps:** | **28.64** | **"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)

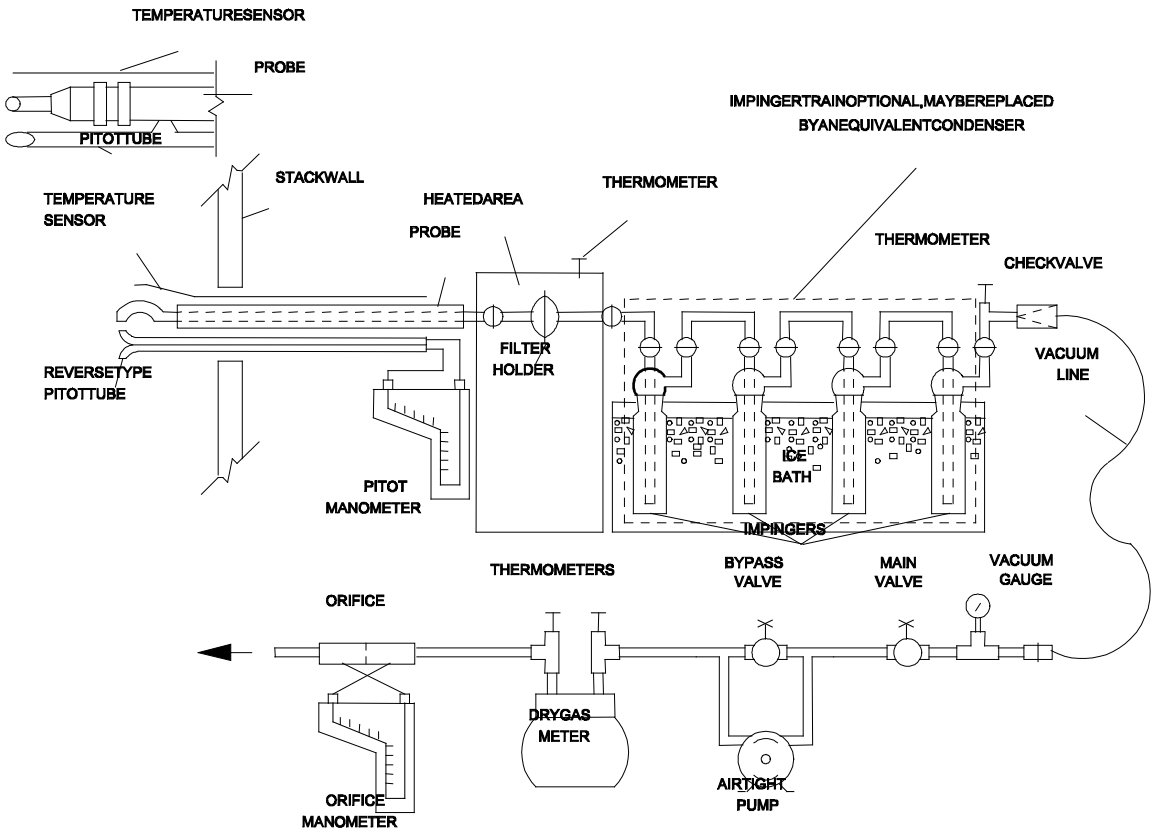
$O_2$, $CO_2$, and CO were found using either Fuji Analytical Analyzer by means of infrared and paramagnetic technology (EPA 3A) or by fyrite (EPA Method 3).

## 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.
$\Delta H$ = Average pressure differential across the orifice meter (see Figure 5-2), mm $H_20$ (in. $H_20$).
$\rho_a$ = Density of acetone, mg/ml (see label on bottle).
$\rho_w$ = Density of water, 0.9982 g/ml (0.00220l lb/ml).
$\theta$ = Total sampling time, min.
$\theta_l$ = Sampling time interval, from the beginning of a run until the first component change, min.
$\theta_i$ = Sampling time interval, between two successive component changes, beginning with the interval between the first and second changes, min.
$\theta_p$ = 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 |
| $g/ft^3$ | $lb/ft^3$ | $2.205 \times 10^{-3}$ |
| $g/ft^3$ | $g/m^3$ | 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 for S-Type Pitot Tube

*Date:* Jan 9/17

*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 9/17

*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 9/17

*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 9/17 *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 9/17

*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 9/17

*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 9/17

*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 9/17

*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.*

# CALIBRATION CERTIFICATE
# DRY GAS METER

DATE: July 7/17

CONSOLE MANUF.: NAPP/MILLENNIUM MODEL 32

CONSOLE I.D.: MU 1013

| PARAMETER SUMMARY | RUN #1 | RUN #2 | RUN #3 |
|---|---|---|---|
| Ta = Ambient (WTM) Temperature (oF.) | 71.0 | 71.0 | 71.0 |
| P=Pres. Differential at WTM ("Hg) | 0.0560 | 0.1619 | 0.2281 |
| Pb= Atmospheric Pressure ("Hg) | 28.85 | 28.85 | 28.85 |
| Pv= Vapour Pressure Water at Temp. Ta ("Hg) | 0.7646 | 0.7646 | 0.7646 |
| H=Pres. Differential at Orifice | 1.0 | 2.0 | 3.0 |
| Ti= Dry Test Meter Inlet Temp. (oF.) | 76.0 | 68.0 | 83.0 |
| To= Dry Test Meter Outlet Temp. (oF.) | 78.0 | 71.0 | 84.0 |
| Ri= Initial Dry Test volume (ft3) | 0.00 | 0.00 | 0.00 |
| Rf= Final Dry Test Volume (ft3) | 4.86 | 4.81 | 4.87 |
| Vi= Initial Wet Test Volume (ft3) | 0.0 | 0.0 | 0.0 |
| Vf= Final Wet Test Volume (ft3) | 5.000 | 5.000 | 4.990 |
| Pw= Pb - (^P/13.59) "Hg | 28.7940 | 28.6881 | 28.6219 |
| Pd= Pb + (^H/13.59) "Hg | 28.9236 | 28.9972 | 29.0708 |
| Tw= Ta +460 (oR.) | 531.0 | 531.0 | 531.0 |
| Td= [(Ti + To)/2] + 460 (oR.) | 537.0 | 529.5 | 543.5 |
| Bw= Pv/Pb ("Hg) | 0.0265 | 0.0265 | 0.0265 |
| WET TEST METER FACTOR (WTMF) | 0.9922 | 0.9922 | 0.9922 |
| ated Y Value)(WTMF) | 1.0005 | 0.9906 | 0.9974 |

Y (MEAN)(WTMF) = 0.9961

N.R. MCCALL & ASSOCIATES LTD.

Calibrating Technician Signature:

# CALIBRATION CERTIFICATE
# DRY GAS METER

DATE: Aug 23/17

CONSOLE MANUF.: NAPP/MILLENNIUM MODEL 32

CONSOLE I.D.: MU 1012

| PARAMETER SUMMARY | RUN #1 | RUN #2 | RUN #3 |
|---|---|---|---|
| Ta = Ambient (WTM) Temperature (oF.) | 74.0 | 74.0 | 74.0 |
| P=Pres. Differential at WTM ("Hg) | 0.1840 | 0.2943 | 0.3863 |
| Pb= Atmospheric Pressure ("Hg) | 28.05 | 28.05 | 28.05 |
| Pv= Vapour Pressure Water at Temp. Ta ("Hg) | 0.8460 | 0.8460 | 0.8460 |
| H=Pres. Differential at Orifice | 1.0 | 2.0 | 3.0 |
| Ti= Dry Test Meter Inlet Temp. (oF.) | 84.0 | 82.0 | 88.0 |
| To= Dry Test Meter Outlet Temp. (oF.) | 86.0 | 83.0 | 89.0 |
| Ri= Initial Dry Test volume (ft3) | 0.00 | 0.00 | 0.00 |
| Rf= Final Dry Test Volume (ft3) | 4.87 | 4.89 | 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 | 27.8660 | 27.7557 | 27.6637 |
| Pd= Pb + (^H/13.59) "Hg | 28.1236 | 28.1972 | 28.2708 |
| Tw= Ta +460 (oR.) | 534.0 | 534.0 | 534.0 |
| Td= [(Ti + To)/2] + 460 (oR.) | 545.0 | 542.5 | 548.5 |
| Bw= Pv/Pb ("Hg) | 0.0302 | 0.0302 | 0.0302 |
| WET TEST METER FACTOR (WTMF) | 0.9922 | 0.9922 | 0.9922 |
| ated Y Value)(WTMF) | 0.9991 | 0.9839 | 0.9869 |

Y (MEAN)(WTMF) = 0.9900

N.R. MCCALL & ASSOCIATES LTD.

Calibrating Technician Signature:

# ORIFICE METER CALIBRATION

DATE: Aug 23/17

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 | 28.05 | 28.05 | 28.05 |
| Y=gas meter factor | 0.9991 | 0.9991 | 0.9839 |
| Delta H= | 0.5 | 1 | 1.5 |
| Ri=int. gas meter vol. | 0 | 0 | 0 |
| Rf=final gas meter vol. | 2.7 | 3.78 | 4.71 |
| min. samp | 5 | 5 | 5 |
| Qm=Y(Rf-Ri)/^T(FT3/MIN) | 0.539514 | 0.7553196 | 0.9268338 |
| To=meter outlet Temp (oF) | 86 | 87 | 88 |
| Tm=meter out temp. (oR) | 546 | 547 | 548 |
| Pm=Pb + ^H | 28.086792 | 28.1235835 | 28.1603753 |
| SQRT(Tm/Pm*H/Md) | 0.5792666 | 0.81942003 | 1.003841 |
| Ko=orifice const. | 0.9313742 | 0.92177342 | 0.92328745 |

Ko MEAN = 0.9254784

Ko*4*144= 533.07554

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Calibrating Technician Signature:

# ORIFICE METER CALIBRATION

DATE: Aug 23/17

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 | 28.05 | 28.05 | 28.05 |
| Y=gas meter factor | 0.9839 | 0.9869 | 0.9869 |
| Delta H= | 2 | 2.5 | 3 |
| Ri=int. gas meter vol. | 0 | 0 | 0 |
| Rf=final gas meter vol. | 5.55 | 6.09 | 6.69 |
| min. samp | 5 | 5 | 5 |
| Qm=Y(Rf-Ri)/^T(FT3/MIN) | 1.092129 | 1.2020442 | 1.3204722 |
| To=meter outlet Temp (oF) | 88 | 90 | 90 |
| Tm=meter out temp. (oR) | 548 | 550 | 550 |
| Pm=Pb + ^H | 28.197167 | 28.2339588 | 28.2707506 |
| SQRT(Tm/Pm*H/Md) | 1.1583793 | 1.29662294 | 1.41945472 |
| Ko=orifice const. | 0.9428078 | 0.92705764 | 0.93026722 |

Ko MEAN = 0.9333775

Ko*4*144= 537.62547

McCALL ENVIRONMENTAL LTD.

Calibrating Technician Signature:

# ORIFICE METER CALIBRATION

DATE: July 7/17

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 | 28.85 | 28.85 | 28.85 |
| Y=gas meter factor | 1.0005 | 1.0005 | 0.9906 |
| Delta H= | 0.5 | 1 | 1.5 |
| Ri=int. gas meter vol. | 0 | 0 | 0 |
| Rf=final gas meter vol. | 1.88 | 2.61 | 3.26 |
| min. samp | 5 | 5 | 5 |
| Qm=Y(Rf-Ri)/^T(FT3/MIN) | 0.376188 | 0.522261 | 0.6458712 |
| To=meter outlet Temp (oF) | 86 | 88 | 88 |
| Tm=meter out temp. (oR) | 546 | 548 | 548 |
| Pm=Pb + ^H | 28.886792 | 28.9235835 | 28.9603753 |
| SQRT(Tm/Pm*H/Md) | 0.5711891 | 0.8087466 | 0.98987888 |
| Ko=orifice const. | 0.658605 | 0.64576593 | 0.65247498 |

Ko MEAN = 0.652282

Ko*4*144= 375.71442

McCALL ENVIRONMENTAL LTD.

Calibrating Technician Signature:

# ORIFICE METER CALIBRATION

DATE: July 7/17

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 | 28.85 | 28.85 | 28.85 |
| Y=gas meter factor | 0.9906 | 0.9974 | 0.9974 |
| Delta H= | 2 | 2.5 | 3 |
| Ri=int. gas meter vol. | 0 | 0 | 0 |
| Rf=final gas meter vol. | 3.86 | 4.3 | 4.77 |
| min. samp | 5 | 5 | 5 |
| Qm=Y(Rf-Ri)/^T(FT3/MIN) | 0.7647432 | 0.857764 | 0.9515196 |
| To=meter outlet Temp (oF) | 89 | 90 | 91 |
| Tm=meter out temp. (oR) | 549 | 550 | 551 |
| Pm=Pb + ^H | 28.997167 | 29.0339588 | 29.0707506 |
| SQRT(Tm/Pm*H/Md) | 1.1433301 | 1.27863463 | 1.40105939 |
| Ko=orifice const. | 0.6688735 | 0.67084371 | 0.67914295 |

Ko MEAN = 0.6729534

Ko*4*144= 387.62115

McCALL ENVIRONMENTAL LTD.

Calibrating Technician Signature:

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E: Surrey@exova.com
W: www.exova.com

## Analytical Report

| | | | | | |
|---|---|---|---|---|---|
| Bill To: | McCall Environmental | Project ID: | Pinnacle Pellet | Lot ID: | **1236129** |
| | 6733 Buchanan Road | Project Name: | | Control Number: | 0071623 |
| | Coldstream, BC, Canada | Project Location: | Lavington, BC | Date Received: | Oct 30, 2017 |
| | V1B 3C5 | LSD: | | Date Reported: | Nov 2, 2017 |
| Attn: | Accounts Payable | P.O.: | | Report Number: | 2237507 |
| Sampled By: | | Proj. Acct. code: | | | |
| Company: | | | | | |

| | | | |
|---|---|---|---|
| **Reference Number** | 1236129-1 | 1236129-2 | 1236129-3 |
| **Sample Date** | Oct 20, 2017 | Oct 20, 2017 | Oct 20, 2017 |
| **Sample Time** | NA | NA | NA |
| **Sample Location** | | | |
| **Sample Description** | Test 1 / Dryer 1 North Stack 1 | Test 2 / Dryer 1 North Stack 2 | Test 3 / Dryer 1 North Stack 3 |
| **Matrix** | Water | Water | Water |

| Analyte | | Units | Results | Results | Results | Nominal Detection Limit |
|---|---|---|---|---|---|---|
| **Aggregate Organic Constituents** | | | | | | |
| Oil and Grease | Total | mg/L | 9 | 10 | 30 | 2 |
| Oil and Grease | Mineral | mg/L | <2 | <2 | <2 | 2 |
| pH adjustment | required prior to O&G extraction | | Yes | Yes | Yes | |

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W: www.exova.com

## Analytical Report

| | | | | | |
|---|---|---|---|---|---|
| Bill To: | McCall Environmental | Project ID: | Pinnacle Pellet | Lot ID: | **1236129** |
| | 6733 Buchanan Road | Project Name: | | Control Number: | 0071623 |
| | Coldstream, BC, Canada | Project Location: | Lavington, BC | Date Received: | Oct 30, 2017 |
| | V1B 3C5 | LSD: | | Date Reported: | Nov 2, 2017 |
| Attn: | Accounts Payable | P.O.: | | Report Number: | 2237507 |
| Sampled By: | | Proj. Acct. code: | | | |
| Company: | | | | | |

| | | | |
|---|---|---|---|
| **Reference Number** | 1236129-4 | 1236129-5 | 1236129-6 |
| **Sample Date** | Oct 26, 2017 | Oct 26, 2017 | Oct 26, 2017 |
| **Sample Time** | NA | NA | NA |
| **Sample Location** | | | |
| **Sample Description** | Test 1 / Dryer 1 South Stack 1 | Test 2 / Dryer 1 South Stack 2 | Test 3 / Dryer 1 South Stack 3 |
| **Matrix** | Water | Water | Water |

| Analyte | | Units | Results | Results | Results | Nominal Detection Limit |
|---|---|---|---|---|---|---|
| **Aggregate Organic Constituents** | | | | | | |
| Oil and Grease | Total | mg/L | 7 | 4 | 8 | 2 |
| Oil and Grease | Mineral | mg/L | <2 | <2 | <2 | 2 |
| pH adjustment | required prior to O&G extraction | | Yes | Yes | Yes | |

Approved by:

Mathieu Simoneau
Operations Manager

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.

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
College of Engineering
North Carolina State University