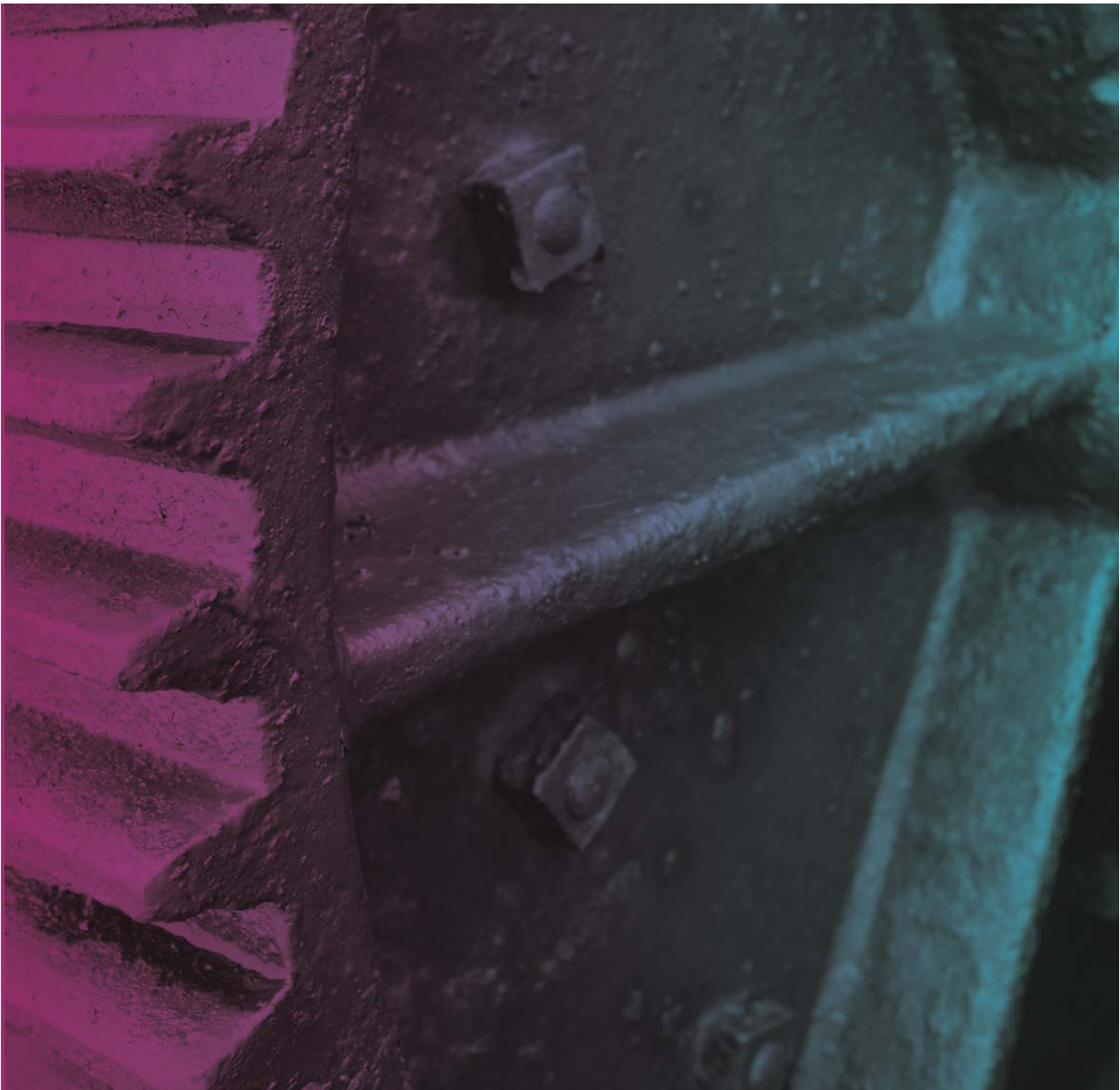


1st Quarter Emissions Testing Report 2016

OneSteel Recycling Hexham



NATA ACCREDITATION No. 2778 (14391)

Accredited for compliance with ISO/IEC 17025

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1st Quarter Emissions Testing Report 2016

OneSteel Recycling Hexham

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1.0 Introduction

AECOM was appointed by OneSteel Recycling Pty Ltd to conduct a series of measurements to determine air emissions from the Shredder Bag house Stack (EPL Point 1) at the Hexham facility. Measurements were required for NSW EPA licence compliance (EPL No. 5345).

Testing was undertaken on 5 April 2016 to investigate emission concentrations for the following parameters:

- Fine Particulates (PM₁₀);
- Total Particulate (TP); and
- Hazardous Substances (Metals) including Lead and Mercury.

Laboratory analysis was undertaken by the following laboratories which hold NATA accreditation for the specified tests:

- Steel River Testing, laboratory NATA accreditation number 18079, performed the following analysis detailed in report number 11003-0-M & 11003-0-P:
 - Total Particulate (TP);
 - Fine Particulates (PM₁₀); and
 - Moisture.
- SGS Leeder Consulting laboratory NATA accreditation number 14429, performed the following analysis detailed in report number M160775:
 - Hazardous Substances (Metals).

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2.0 Sampling Plane Requirements

The criteria for sampling planes are specified in AS 4323.1-1995 (R2014).

Table 1 Criteria for Selection of Sampling Planes (AS 4323.1)

Type of flow disturbance	Minimum distance upstream from disturbance, diameters (D)	Minimum distance downstream from disturbance, diameters (D)
Bend, connection, junction, direction change	>2D	>6D
Louvre, butterfly damper (partially closed or closed)	>3D	>6D
Axial fan	>3D	>8D (see Note)
Centrifugal fan	>3D	>6D

NOTE: The plane should be selected as far as practicable from a fan. Flow straighteners may be required to ensure the position chosen meets the check criteria listed in Items (a) to (f) below.

- a) *The gas flow is basically in the same direction at all points along each sampling traverse;*
- b) *The gas velocity at all sampling points is greater than 3 m/s;*
- c) *The gas flow profile at the sampling plane shall be steady, evenly distributed and not have a cyclonic component which exceeds an angle of 15° to the duct axis, when measured near the periphery of a circular sampling plane;*
- d) *The temperature difference between adjacent points of the survey along each sampling traverse is less than 10% of the absolute temperature, and the temperature at any point differs by less than 10% from the mean;*
- e) *The ratio of the highest to lowest pitot pressure difference shall not exceed 9:1 and the ratio of highest to lowest gas velocities shall not exceed 3:1. For isokinetic testing with the use of impingers, the gas velocity ratio across the sampling plane should not exceed 1.6:1; and*
- f) *The gas temperature at the sampling plane should preferably be above the dewpoint.*

With the exception of point 'b', the sampling plane was in accordance with AS4323.1. The gas stream velocities at each sampling point were found to be 2.4 m/s. Please note that the bag house was not running at full capacity at the time of testing.

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3.0 Methodology

3.1 NATA Accredited Methods

The following methods are accredited with the National Association of Testing Authorities (NATA) (accreditation number 2778 (14391)) and are approved for the sampling and analysis of gases. Specific details of the methods are available on request.

All sampling and analysis is conducted according to the methods in **Table 2**.

Table 2 AECOM NATA Endorsed Methods

NSW EPA Approved Methods	USEPA Methods	Method Title
AS4323.1 (NSW EPA TM-1)	USEPA (2000) Method 1	Selection of sampling positions
AS4323.2 (NSW EPA TM-15)	USEPA (2000) Method 5 under approved circumstances	Determination of total particulate matter – isokinetic manual sampling – gravimetric method
NSW EPA TM-2	USEPA (2000) Method 2 or 2C or USEPA (1999) Method 2F or 2G or 2H (as appropriate)	Determination of stack gas velocity and volumetric flow rate (type s pitot tube)
NSW EPA TM-22	USEPA (2000) Method 4	Determination of moisture content in stack gases
NSW EPA TM-23	USEPA (2000) Method 3	Gas analysis for the determination of dry molecular weight
NSW EPA OM-5	USEPA (1997) Method 201 or 201A (as appropriate)	Determination of PM ₁₀ emissions
NSW EPA TM-12,13 and 14	USEPA Method 29	Determination of metal emissions from stationary sources

All parameters are reported adjusted to 0°C at 1 atmosphere and dry gas.

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4.0 Sampling Location

4.1 Sampling Location Summary

Table 3 provides a summary of the location sampled by AECOM on 5 April 2016.

Table 3 Sampling Location Summary

Discharge Description	Shredder Baghouse Stack (EPL Point 1)
Duct Shape	Circular
Construction Material	Metal
Duct Diameter (mm)	760
Minimum No. Sampling Points	12
Sampling Ports	2
Min. Points/Traverse	6
Disturbance	No
Distance from Upstream Disturbance	6.6D
Type of Disturbance	Bend
Distance from Downstream Disturbance	2.6D
Type of Disturbance	Stack Exit
Ideal Sampling Location	Yes ²
Correction Factors Applied	No
Total No. Points Sampled	12
Points/Traverse	6
Sampling Performed to Standard ¹	Yes ²

¹ AS 4323.1 Section 4.1

² The sampling location was ideal in terms of flow disturbances, but did not comply with AS 4323.1 point b) as the corrected velocity of the gas at all sampling points was found to be 2.4 m/s (minimum 3m/s).

D = Diameters

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5.0 Equipment Calibration

AECOM has a calibration schedule to ensure the emission testing equipment is maintained in good order and with known calibration. Equipment used in this project was calibrated according to the procedures and frequency identified in the AECOM calibration schedule. Details of the schedule and the calibration calculations are available on request.

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6.0 Results

A summary of air emission test results is shown in **Table 4**. Detailed results along with gas stream properties during the testing period can be found in **Table 5**. Speciated Hazardous Substances (Metals) results are presented in **Table 6**. Emission concentrations are converted to standard conditions of 0°C, dry gas and 1 atm pressure for comparison with regulatory limits.

Field sheets and final calculations recorded during the project are attached as **Appendix A**. Laboratory reports can be referred to in **Appendix B**.

AECOM has a calculated limit of uncertainty in regards to results. The estimation of measurement uncertainty in source testing is conducted to provide an indication of the precision of the measurement result and a degree of confidence in the range of values the reported result may represent. The measurement of uncertainty has been calculated at $\pm 13.6\%$.

Table 4 Shredder Baghouse Emission Results Summary, 5 April 2016

Parameter	Emission Concentration (EPL Point 1)	Emission Concentration Limit
Total Particulate (TP) (mg/m ³)	0.26	100
Fine Particulate (PM ₁₀) (mg/m ³)	<0.2	NA
Lead (mg/m ³)	0.0049	5.0
Mercury (mg/m ³)	<0.00016	1.0
Total Hazardous Substances (Metals) (mg/m ³)	0.055	NA

Results from testing conducted on EPL Point 1 on 5 April 2016 are below the regulatory limits listed in EPL 5345.

Table 5 Fine Particulate (PM₁₀), Total Particulate and Hazardous Substance (Metals) Results, 5 April 2016

Sampling Conditions:		
Stack internal diameter at test location	760 mm	
Stack gas temperature (average)	23.5 °C	296.7 K
Stack pressure (average)	1020 hPa	
Stack gas velocity (average, stack conditions)	2.4 m/s	
Stack gas flowrate (stack conditions)	1.1 m ³ /s	
Stack gas flowrate (0°C, dry gas, 1 atm pressure)	0.99 m ³ /s	
Fine Particulate (PM₁₀) Testing		
Test Period	9:55 -	11:16
Fine Particulate (PM ₁₀) Mass	<0.2 mg	
Gas Volume Sampled	1.02 m ³	
Fine Particulate (PM ₁₀) Emission* ¹	<0.2 mg/m ³	
Fine Particulate (PM ₁₀) Mass Emission Rate* ²	<0.2 mg/s	
Regulatory Limit	NA	
Total Particulate Testing		
Test Period	9:55 -	11:16
Total Particulate Mass	0.2 mg	
Gas Volume Sampled	0.76 m ³	
Total Particulate Emission* ¹	0.26 mg/m ³	
Total Particulate Mass Emission Rate* ²	0.26 mg/s	
Regulatory Limit	100 mg/m ³	
Hazardous Substances (Metals) Testing		
Test Period	9:55 -	11:16
Hazardous Substances (Metals) Mass	0.069 mg	
Gas Volume Sampled	1.26 m ³	
Hazardous Substances (Metals) Emission* ¹	0.055 mg/m ³	
Hazardous Substances (Metals) Mass Emission Rate* ²	0.054 mg/s	
Regulatory Limit	NA	
Moisture Content (%)	2.4	
Gas Density (dry at 1 atmosphere)	1.29 kg/m³	
Dry Molecular Weight	28.8 g/g-mole	

Notes *1 Emission concentration at Standard conditions of 0°C, 1 atm, dry gas

*2 Mass emission rate determined from pre and post-test sampling flow measurements and the respective test moisture content. See Q_{std} in field sheets and final calculations "Stack Analysis - Final Calculations" for each test.

Table 6 Hazardous Substances (Metals) Elemental Analysis Results, 5 April 2016

Sample	Total Particulate Metals (mg)	Total Particulate Metals (mg/m ³)	Total Gaseous Metals (mg)	Total Gaseous Metals (mg/m ³)	Total Oxidisable Mercury (mg)	Total Oxidisable Mercury (mg/m ³)	Total (mg)	Total (mg/m ³)	Mass Emission Rate (mg/s)
Antimony	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Arsenic	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Beryllium	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Cadmium	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Chromium	0.0006	0.00048	0.0016	0.0013			0.002	0.0016	0.0016
Cobalt	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Copper	0.011	0.0087	0.00047	0.00037			0.01	0.0079	0.0078
Lead	0.0062	0.0049	<0.0002	<0.00016			0.0062	0.0049	0.0048
Magnesium	0.012	0.0095	0.00089	0.0007			0.01	0.0079	0.0078
Manganese	<0.0038	<0.003	0.06	0.048			0.06	0.048	0.047
Mercury	<0.0002	<0.00016	<0.0002	<0.00016	<0.0002	<0.00016	<0.0002	<0.00016	<0.00016
Nickel	0.0005	0.0004	0.00079	0.00063			0.001	0.00079	0.00078
Selenium	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Thallium	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Tin	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Vanadium	<0.004	<0.0032	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Zinc	0.13	0.1	0.0033	0.0026			0.1	0.079	0.078
Total Hazardous Metals*	0.0073	0.0058	0.062	0.05	<0.0002	<0.00016	0.069	0.055	0.054
Total Metals	0.16	0.12	0.067	0.054			0.19	0.15	0.15

* Total does not include Copper, Magnesium and Zinc as they are classed non-hazardous

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Appendix A

Field Sheets (17 pages)

Appendix A Field Sheets (17 pages)

Emission Measurement Calculations Spreadsheet**OneSteel Hexham**

AECOM's Project Number: 60493017

Emission Source: Shredder Baghouse

Date Sampled: 5-Apr-16

ANALYTE(S)	METHOD
Fine Particulate (PM10)	NSW EPA OM - 5
Total Particulate	NSW EPA TM - 15
Hazardous Substances (Metals)	NSW EPA TM - 12, 13 & 14

Observations made during testing period:

Sampling Performed By:



Vilai Kelemete-Manua



Dylan Turnbull



ANZ

Emission Measurement Calculations Spreadsheet

Q4AN(EV)-332-FM31

STACK ANALYSIS - PRE-SAMPLING

Date: 5-Apr-16
 Client: OneSteel Hexham
 AECOM's Project No: 60493017
 Stack/Duct Description: Shredder Baghouse
 Test 1: Fine Particulate (PM10)
 Test 2: Total Particulate
 Test 3: Hazardous Substances (Metals)

Measurement/Observations				
Stack Internal Dimensions:				
Diameter	760 mm	Cross Sectional Area :		0.45 m ²
OR	Length Width			
Length/Width (mm)		Minimum No. of		
Equivalent Diameter	N/A mm	sampling points=		12
Distance from sampling plane to nearest disturbances:		Total No. of sampling points = 12		
Upstream (m) =	5	PM2.5/10=		12
No. Diameters =	6.6	No. of sampling traverses/ports sampled =		2
Type of Upstream Disturbance:	Fan Entry	PM2.5/10=		2
Downstream (m) =	2	No. of sampling points on each traverse/port =		6
No. Diameters =	2.6	PM2.5/10=		6
Type of Down Stream Disturbance:	Stack exit	Exclusion of any sample point numbers - comments:		
Position of each sampling point, for each traverse:				
	A	B	PM10/2.5 A	PM2.5/10 B
No.	Distance from wall	S-type Pitot distances	Distance from wall	S-Type Pitot distances
1	33	3	33	3
2	111	81	111	81
3	225	195	225	195
4	535	505	535	505
5	649	619	649	619
6	727	697	727	697
7				
8				
9				
10			Check of total points against minimum, (yes/no) - comments:	
11				
12				
13				
14				
15				
16				
17				
18				
19			General Comments:	
20				
Signed: 		Checked: 		

ANZ

Emission Measurement Calculations Spreadsheet

Q4AN(EV)-332-FM31

STACK ANALYSIS - GAS COMPOSITION AND DENSITY PRE-SAMPLING

Date: 5-Apr-16
 Client: OneSteel Hexham
 AECOM's Project No: 60493017
 Stack/Duct Description: Shredder Baghouse
 Test 1: Fine Particulate (PM10)
 Test 2: Total Particulate
 Test 3: Hazardous Substances (Metals)

Sampling time start: 9:48		Sampling port No.: 1		
Measurement No.	Time sampled	CO (ppm), (dry)	O ₂ (%), (dry)	CO ₂ (%), (dry)
1	9:48	0	20.9	0.0
2	9:49	0	20.9	0.0
3	9:50	0	20.9	0.0
4	9:51	0	20.9	0.0
5	9:52	0	20.9	0.0
6	9:53	0	20.9	0.0
7	9:54	0	20.9	0.0
8	9:55	0	20.9	0.0
Averages:		0.0 ppm	20.9 %	0.0 %

Moisture content (M3): 0.99
 Moisture percentage (M2): 1.50 %

Measurements

CO: 0.0000 %,(dry)	N ₂ : 79.1 %,(dry)
CO ₂ : 0.0 %,(dry)	O ₂ : 20.9 %,(dry)
Gas Compositions converted to wet basis:	
CO: 0.0000 %,(wet)	N ₂ : 77.9 %,(wet)
CO ₂ : 0.0 %,(wet)	O ₂ : 20.6 %,(wet)
H ₂ O: 1.50 % (=M2)	
Therefore, stack gas density (GD) =	1.28 kg/m ³ (0°C, wet, 1 atm pressure)
Therefore, stack gas density (GD) =	1.29 kg/m ³ (0°C, dry, 1 atm pressure)

STACK ANALYSIS - GAS COMPOSITION AND DENSITY POST-SAMPLING

Date: 5-Apr-16
 Client: OneSteel Hexham
 AECOM's Project No: 60493017
 Stack/Duct Description: Shredder Baghouse
 Test 1: Fine Particulate (PM10)
 Test 2: Total Particulate
 Test 3: Hazardous Substances (Metals)

Sampling time start: 11:09		Sampling port No.: 1		
Measurement No.	Time sampled	CO (ppm), (dry)	O ₂ (%), (dry)	CO ₂ (%), (dry)
1	11:09	0	20.9	0.0
2	11:10	0	20.9	0.0
3	11:11	0	20.9	0.0
4	11:12	0	20.9	0.0
5	11:13	0	20.9	0.0
6	11:14	0	20.9	0.0
7	11:15	0	20.9	0.0
8	11:16	0	20.9	0.0
Averages:		0.0 ppm	20.9 %	0.0 %

Moisture content (M3): 0.98
 Moisture percentage (M2): 2.22 %

Measurements

CO: 0.0000 %,(dry)	N ₂ : 79.1 %,(dry)
CO ₂ : 0.0 %,(dry)	O ₂ : 20.9 %,(dry)
Gas Compositions converted to wet basis:	
CO: 0.0000 %,(wet)	N ₂ : 77.3 %,(wet)
CO ₂ : 0.0 %,(wet)	O ₂ : 20.4 %,(wet)
H ₂ O: 2.22 % (=M2)	
Therefore, stack gas density (GD) =	1.28 kg/m ³ (0°C, wet, 1 atm pressure)
Therefore, stack gas density (GD) =	1.29 kg/m ³ (0°C, dry, 1 atm pressure)

Stack Analysis - Pre Sampling Pitot Tube and Temperature Traverses

Date: 5-Apr-16
 Client: OneSteel Hexham
 AECOM's Project No: 60493017
 Stack/Duct Description: Shredder Baghouse
 Test 1: Fine Particulate (PM10)
 Test 2: Total Particulate
 Test 3: Hazardous Substances (Metals)

Time :	9:45	Barometric Pressure :	1020	hPa	
Page No. :	1 of 1	Pitot Correction Factor :	0.84		
Sampling Port No:	1 to 2	Stack Gas Density:	1.28	kg/m ³	
Pitot Tube Type :	S	(0 °C, Wet, 1 Atm)			
Sampling Position No.	Distance from far wall (mm)	Max. Differential Pressure ΔP, kilo Pascals	Max Temp. °C	Max Temp. (Ts) K	Corrected Velocity (Vs) m/s
1/1	3	0.005	22.0	295.2	2.4
1/2	81	0.005	22.0	295.2	2.4
1/3	195	0.005	22.0	295.2	2.4
1/4	505	0.005	22.0	295.2	2.4
1/5	619	0.005	22.0	295.2	2.4
1/6	697	0.005	22.0	295.2	2.4
2/1	3	0.005	22.0	295.2	2.4
2/2	81	0.005	22.0	295.2	2.4
2/3	195	0.005	22.0	295.2	2.4
2/4	505	0.005	22.0	295.2	2.4
2/5	619	0.005	22.0	295.2	2.4
2/6	697	0.005	22.0	295.2	2.4
Average			22.0	295.2	2.4

Static Pressure (Dwyer) (Pa): kPa
 Static Pressure (U-tube, if required) : -0.5 mm
 Absolute pressure in stack (hPa) : 1019.95 hPa

Emission Measurement Calculations Spreadsheet

Stack Analysis - Hazardous Substances Elemental Analysis Results

Date: 5-Apr-16 Client: OneSteel Hexham
 AECOM's Project No: 60493017 Stack/Duct Description: Shredder Baghouse

Metal	Particulate Metals Results	Gaseous Metals Results	Oxidisable Mercury Results		
	Front Half, Filter, Acetone Rinses and Acid Rinses (mg). Containers 1, 2 and 3	Back Half, Impingers + Acid Rinses (mg) Container 4	KO Impinger + Acid Rinses (mg) (5A)	KMnO ₄ /H ₂ SO ₄ + Rinses (mg) (5B)	Residue Rinse 8N HCl (mg) (If Required) (5C)
Antimony	<0.0002	<0.0002			
Arsenic	<0.0002	<0.0002			
Beryllium	<0.0002	<0.0002			
Cadmium	<0.0002	<0.0002			
Chromium	0.0006	0.0016			
Cobalt	<0.0002	<0.0002			
Copper	0.011	0.00047			
Lead	0.0062	<0.0002			
Magnesium	0.012	0.00089			
Manganese	<0.0038	0.06			
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	0.0005	0.00079			
Selenium	<0.0002	<0.0002			
Thallium	<0.0002	<0.0002			
Tin	<0.0002	<0.0002			
Vanadium	<0.004	<0.0002			
Zinc	0.13	0.0033			

Note: Where the blank has returned a less than value, half of this value was subtracted from the sample result as a blank correction ie for a blank value of <0.0005, 0.00025 was subtracted from the sample result.

* Total does not include Copper, Magnesium and Zinc as they are classed non-hazardous

Stack Analysis - Hazardous Substances Elemental Analysis Results Continued

Date: 5-Apr-16 Client: OneSteel Hexham
 AECOM's Project No: 60493017 Stack/Duct Description: Shredder Baghouse

Sample	Total Particulate Metals (mg)	Total Particulate Metals (mg/m ³)	Total Gaseous Metals (mg)	Total Gaseous Metals (mg/m ³)	Total Oxidisable Mercury (mg)	Total Oxidisable Mercury (mg/m ³)	Total (mg)	Total (mg/m ³)	Mass Emission Rate (mg/s)
Antimony	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Arsenic	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Beryllium	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Cadmium	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Chromium	0.0006	0.00048	0.0016	0.0013			0.002	0.0016	0.0016
Cobalt	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Copper	0.011	0.0087	0.00047	0.00037			0.01	0.0079	0.0078
Lead	0.0062	0.0049	<0.0002	<0.00016			0.0062	0.0049	0.0048
Magnesium	0.012	0.0095	0.00089	0.0007			0.01	0.0079	0.0078
Manganese	<0.0038	<0.003	0.06	0.048			0.06	0.048	0.047
Mercury	<0.0002	<0.00016	<0.0002	<0.00016	<0.0002	<0.00016	<0.0002	<0.00016	<0.00016
Nickel	0.0005	0.0004	0.00079	0.00063			0.001	0.00079	0.00078
Selenium	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Thallium	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Tin	<0.0002	<0.00016	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Vanadium	<0.004	<0.0032	<0.0002	<0.00016			<0.0002	<0.00016	<0.00016
Zinc	0.13	0.1	0.0033	0.0026			0.1	0.079	0.078
Total Hazardous Metals*	0.0073	0.0058	0.062	0.05	<0.0002	<0.00016	0.069	0.055	0.054
Total Metals	0.16	0.12	0.067	0.054			0.19	0.15	0.15

* Total does not include Copper, Magnesium and Zinc as they are classed non-hazardous

STACK ANALYSIS - FINAL CALCULATIONS

Fine Particulate (PM10)

(Calculations performed in accordance with relevant test method as defined on cover page)

Date: 5-Apr-16 Client: OneSteel Hexham
 AECOM's Project No: 60493017 Stack/Duct Description: Shredder Baghouse

(A) Sample gas volume at standard conditions

Metered volume (MV₃): 1.1843 m³ Average barometric pressure (P_{BARO}) 1020 hPa
 Average gas meter temp. (T_{M,2}): 47.0 °C
 320.2 K Average pressure at meter (P_{M,2}) 1020.00 hPa

Sample gas volume (MV₄); (0°C, dry gas, 1 atm pressure): 1.0172 m³

(B) PM10 concentration at standard conditions

Blank thimble No.: 0 Blank weight: g
 Thimble No. used: T407 PM10 Weight: <0.0002 g
 Final PM10 Weight (Mp1): <0.0002 g
 PM10 Concentration (C1): =M_{p1}/MV₄= <0.0002 g/m³ (0°C, dry gas, 1atm pressure)

;and C₂ = <0.2 mg/m³ (0°C, dry gas, 1atm pressure)
 CO₂ Basis 12 %
 Average CO₂%: 0.0 %

Therefore, C_c: = C_a x 12/CO₂% = <0.0002 g/m³ (0°C, dry gas, 1atm pressure, 12% CO₂)
 ;and C_{c1} = <0.2 mg/m³ (0°C, dry gas, 1atm pressure, 12% CO₂)

O₂ Basis 7 %
 Average O₂%: 20.9 %

Therefore, C_b: =C_a x (21 - O_{2ref}%)/(21 - O_{2mea}%) <0.028 g/m³ (0°C, dry gas, 1atm pressure, 7% O₂)
 ;and C_{b1} = <28 mg/m³ (0°C, dry gas, 1atm pressure, 7% O₂)

(C) Moisture content

Silica Gel Number: P1
 V_v = 9.9 g (from laboratory report) V_w = 5 mL (=grams) (recorded on Laboratory Form 108)
 Volume of Water Vapour Condensed (V_{wc(std)}) = 0.0067
 Volume of Water Vapour Condensed (V_{wsg(std)}) = 0.0132

Therefore, B_{ws} = $\frac{(V_{wc(std)} + V_{wsg(std)})}{(V_{wc(std)} + V_{wsg(std)} + V_{m(std)})}$

B_{ws} = 1.92 %

Emission Measurement Calculations Spreadsheet

STACK ANALYSIS - FINAL CALCULATIONS CONTINUED

Fine Particulate (PM10)

(D) Gas Composition and Density (Re-calculation)

(i) Initial gas density for sampling:	1.28 kg/m ³ (from Laboratory Form 107)
(ii) Re-calculated gas density based on moisture content in (c):	1.28 kg/m ³ (0°C, wet, 1 atm pressure) 1.29 kg/m ³ (0°C, dry, 1 atm pressure)
(iii) Gas density at stack conditions =	(ii) x $\frac{(273.2)}{(273.2+T_s)} \times \frac{(P_s)}{(1013.25)}$
=	1.186 kg/m ³ (stack conditions, wet)

(E) Gas Velocities

(i) Average of pre-sampling velocities:	2.40 m/s
(ii) Average of post-sampling velocities:	2.40 m/s
(iii) Average of while-sampling velocities:	N/A m/s
(iv) Overall average of pre-sampling and post-sampling velocities (Vs):	2.40 m/s (stack conditions, wet) N/A m/s (stack conditions, wet)

(Note: (Vs) is from all individual data, **not** from (i) and (ii) alone.)

(F) Volumetric Flowrates (Reference Method US-EPA Method 2, NSW-EPA TM-2)

Q _{stack} =	V _s x A =	1.09 m ³ /s (stack conditions)
Q _{std} =	Q _{stack} x $\frac{P_s}{(P_{std})} \times \frac{(T_{std})}{(T_s)} \times \frac{(100 - B_w)}{100}$	
Q _{std} =	1.0 m ³ /s (0°C, dry gas, 1 atm pressure)	

(G) Mass Emission Rate

R _m =	C _{1a} x Q _{std} =	<0.0002	g/s (0°C, dry gas, 1 atm pressure)	
	=	<0.2	mg/s (0°C, dry gas, 1 atm pressure)	
	C _{1a} x Q _{std} =	<0.0002	g/s (0°C, dry gas, 1 atm pressure	12% CO ₂)
	=	<0.2	mg/s (0°C, dry gas, 1 atm pressure	12% CO ₂)
	C _{1a} x Q _{std} =	<0.028	g/s (0°C, dry gas, 1 atm pressure	7% O ₂)
	=	<28	mg/s (0°C, dry gas, 1 atm pressure	7% O ₂)

STACK ANALYSIS - FINAL CALCULATIONS

Total Particulate

(Calculations performed in accordance with relevant test method as defined on cover page)

Date: 5-Apr-16 Client: OneSteel Hexham
 AECOM's Project No: 60493017 Stack/Duct Description: Shredder Baghouse

(A) Sample gas volume at standard conditions

Metered volume (MV ₃):	0.8559 m ³	Average barometric pressure (P _{BARO}):	1020 hPa
Average gas meter temp. (T _{M,2}):	36.5 °C	Average pressure at meter (P _{M,2}):	1020.00 hPa
	309.7 K		
Sample gas volume (MV ₄); (0°C, dry gas, 1 atm pressure):	0.7601 m ³		

(B) Total Particulate concentration at standard conditions

Blank thimble No.:		Blank weight:	g
Thimble No. used:	T414	Total Particulate Weight:	0.0002 g
Final Total Particulate Weight (Mp1):	0.00020 g		
Total Particulate Concentration (C1):	=M _{p1} /MV ₄ =		0.00026 g/m ³ (0°C, dry gas, 1atm pressure)

;and C₂ = 0.26 mg/m³ (0°C, dry gas, 1atm pressure)

CO ₂ Basis:	12 %
Average CO ₂ %:	0.0 %

Therefore, C_c: = C_a x 12/CO₂% = 0.00026 g/m³ (0°C, dry gas, 1atm pressure, 12% CO₂)

;and C_{c1} = 0.26 mg/m³ (0°C, dry gas, 1atm pressure, 12% CO₂)

O ₂ Basis:	7 %
Average O ₂ %:	20.9 %

Therefore, C_b: =C_a x (21 - O_{2ref}%)/(21 - O_{2mea}%) = 0.036 g/m³ (0°C, dry gas, 1atm pressure, 7% O₂)

;and C_{b1} = 36 mg/m³ (0°C, dry gas, 1atm pressure, 7% O₂)

(C) Moisture content

Silica Gel Number:	FA7		
V _v =	9.1 g (from laboratory report)	V _w =	6 mL (=grams) (recorded on Laboratory Form 108)
Volume of Water Vapour Condensed (V _{wc(std)}) =	0.0080		
Volume of Water Vapour Condensed (V _{wsg(std)}) =	0.0121		

Therefore, B_{ws} = $\frac{(V_{wc(std)}+V_{wsg(std)})}{(V_{wc(std)}+V_{wsg(std)}+V_{m(std)})}$

B_{ws} = 2.58 %

Emission Measurement Calculations Spreadsheet

STACK ANALYSIS - FINAL CALCULATIONS CONTINUED

Total Particulate

(D) Gas Composition and Density (Re-calculation)

- (i) Initial gas density for sampling: 1.28 kg/m³ (from Laboratory Form 107)
- (ii) Re-calculated gas density based on moisture content in (c):
 - 1.29 kg/m³ (0°C, wet, 1 atm pressure)
 - 1.29 kg/m³ (0°C, dry, 1 atm pressure)
- (iii) Gas density at stack conditions = $(ii) \times \frac{(273.2)}{(273.2+T_s)} \times \frac{(P_s)}{(1013.25)}$
 = 1.196 kg/m³ (stack conditions, wet)

(E) Gas Velocities

- (i) Average of pre-sampling velocities: 2.40 m/s
 - (ii) Average of post-sampling velocities: 2.40 m/s
 - (iii) Average of while-sampling velocities: N/A m/s
 - (iv) Overall average of pre-sampling and post-sampling velocities (Vs):
 - 2.40 m/s (stack conditions, wet)
 - N/A m/s (stack conditions, wet)
- (Note: (Vs) is from all individual data, **not** from (i) and (ii) alone.)

(F) Volumetric Flowrates (Reference Method US-EPA Method 2, NSW-EPA TM-2)

Qstack = Vs x A = 1.09 m³/s (stack conditions)

Qstd = Qstack x $\frac{P_s}{(P_{std})} \times \frac{(T_{std})}{(T_s)} \times \frac{(100 - B_w)}{100}$

Qstd = 1.0 m³/s (0°C, dry gas, 1 atm pressure)

(G) Mass Emission Rate

Rm =	C _{1a} x Qstd =	0.00026	g/s (0°C, dry gas, 1 atm pressure)		
	=	0.26	mg/s (0°C, dry gas, 1 atm pressure)		
	C _{1a} x Qstd =	0.00026	g/s (0°C, dry gas, 1 atm pressure	12%	CO ₂)
	=	0.26	mg/s (0°C, dry gas, 1 atm pressure	12%	CO ₂)
	C _{1a} x Qstd =	0.036	g/s (0°C, dry gas, 1 atm pressure	7%	O ₂)
	=	36	mg/s (0°C, dry gas, 1 atm pressure	7%	O ₂)

STACK ANALYSIS - FINAL CALCULATIONS

Hazardous Substances (Metals)

(Calculations performed in accordance with relevant test method as defined on cover page)

Date: 5-Apr-16 Client: OneSteel Hexham
 AECOM's Project No: 60493017 Stack/Duct Description: Shredder Baghouse

(A) Sample gas volume at standard conditions

Metered volume (MV₃): 1.4167 m³ Average barometric pressure (P_{BARO}) 1020 hPa
 Average gas meter temp. (T_{M,2}): 35.4 °C
 308.6 K Average pressure at meter (P_{M,2}) 1020.00 hPa

Sample gas volume (MV₄); (0°C, dry gas, 1 atm pressure): 1.2625 m³

(B) Metals concentration at standard conditions

Blank thimble No.: Blank weight: g
 Thimble No. used: 0 Metals Weight: 0.000069 g
 Final Metals Weight (M_{p1}): 0.00007 g
 Metals Concentration (C₁): =M_{p1}/MV₄= 0.000055 g/m³ (0°C, dry gas, 1atm pressure)

;and C₂ = 0.055 mg/m³ (0°C, dry gas, 1atm pressure)
 CO₂ Basis 12 %
 Average CO₂%; 0.0 %

Therefore, C_c: = C_a x 12/CO₂% = 0.000055 g/m³ (0°C, dry gas, 1atm pressure, 12% CO₂)
 ;and C_{c1} = 0.055 mg/m³ (0°C, dry gas, 1atm pressure, 12% CO₂)

O₂ Basis 7 %
 Average O₂%; 20.9 %

Therefore, C_b: =C_a x (21 - O_{2ref}%)/(21 - O_{2mea}%) 0.0077 g/m³ (0°C, dry gas, 1atm pressure, 7% O₂)
 ;and C_{b1} = 7.7 mg/m³ (0°C, dry gas, 1atm pressure, 7% O₂)

(C) Moisture content

Silica Gel Number: Z6
 V_v = 12 g (from laboratory report) V_w = g mL (=grams) (recorded on Laboratory Form 108)
 Volume of Water Vapour Condensed (V_{wc(std)}) = 0.0120
 Volume of Water Vapour Condensed (V_{wsg(std)}) = 0.0160

Therefore, B_{ws} =
$$\frac{(V_{wc(std)} + V_{wsg(std)})}{(V_{wc(std)} + V_{wsg(std)} + V_{m(std)})}$$

B_{ws} = 2.17 %

Emission Measurement Calculations Spreadsheet

STACK ANALYSIS - FINAL CALCULATIONS CONTINUED

Hazardous Substances (Metals)

(D) Gas Composition and Density (Re-calculation)

- (i) Initial gas density for sampling: 1.28 kg/m³ (from Laboratory Form 107)
- (ii) Re-calculated gas density based on moisture content in (c):
 - 1.29 kg/m³ (0°C, wet, 1 atm pressure)
 - 1.29 kg/m³ (0°C, dry, 1 atm pressure)
- (iii) Gas density at stack conditions =
 - (ii) x $\frac{(273.2)}{(273.2+T_s)} \times \frac{(P_s)}{(1013.25)}$
 - = 1.196 kg/m³ (stack conditions, wet)

(E) Gas Velocities

- (i) Average of pre-sampling velocities: 2.40 m/s
 - (ii) Average of post-sampling velocities: 2.40 m/s
 - (iii) Average of while-sampling velocities: N/A m/s
 - (iv) Overall average of pre-sampling and post-sampling velocities (Vs):
 - 2.40 m/s (stack conditions, wet)
 - N/A m/s (stack conditions, wet)
- (Note:** (Vs) is from all individual data, **not** from (i) and (ii) alone.)

(F) Volumetric Flowrates (Reference Method US-EPA Method 2, NSW-EPA TM-2)

Q_{stack} = V_s x A = 1.09 m³/s (stack conditions)

Q_{std} = Q_{stack} x $\frac{P_s}{(P_{std})} \times \frac{(T_{std})}{(T_s)} \times \frac{(100 - B_w)}{100}$

Q_{std} = 1.0 m³/s (0°C, dry gas, 1 atm pressure)

(G) Mass Emission Rate

R _m =	C _{1a} x Q _{std} =	0.000054	g/s (0°C, dry gas, 1 atm pressure)		
	=	0.054	mg/s (0°C, dry gas, 1 atm pressure)		
	C _{1a} x Q _{std} =	0.000054	g/s (0°C, dry gas, 1 atm pressure	12%	CO ₂)
	=	0.054	mg/s (0°C, dry gas, 1 atm pressure	12%	CO ₂)
	C _{1a} x Q _{std} =	0.0076	g/s (0°C, dry gas, 1 atm pressure	7%	O ₂)
	=	7.6	mg/s (0°C, dry gas, 1 atm pressure	7%	O ₂)

EMISSION MONITORING RESULTS, SHREDDER BAGHOUSE ONESTEEL HEXHAM 5-Apr-16 FINE PARTICULATE (PM10) TOTAL PARTICULATE HAZARDOUS SUBSTANCES (METALS)		
Sampling Conditions:		
Stack internal diameter at test location	760 mm	
Stack gas temperature (average)	23.5 °C	296.7 K
Stack pressure (average)	1020 hPa	
Stack gas velocity (average, stack conditions)	2.4 m/s	
Stack gas flowrate (stack conditions)	1.1 m ³ /s	
Stack gas flowrate (0°C, dry gas, 1 atm pressure)	0.99 m ³ /s	
Fine Particulate (PM10) Testing		
Test Period	9:55	- 11:16
Fine Particulate (PM10) Mass	<0.2 mg	
Gas Volume Sampled	1.02 m ³	
Fine Particulate (PM10) Emission*1	<0.2 mg/m ³	
Fine Particulate (PM10) Mass Emission Rate*2	<0.2 mg/s	
Regulatory Limit	NA mg/m ³	
Total Particulate Testing		
Test Period	9:55	- 11:16
Total Particulate Mass	0.2 mg	
Gas Volume Sampled	0.76 m ³	
Total Particulate Emission*1	0.26 mg/m ³	
Total Particulate Mass Emission Rate*2	0.26 mg/s	
Regulatory Limit	100 mg/m ³	
Hazardous Substances (Metals) Testing		
Test Period	9:55	- 11:16
Hazardous Substances (Metals) Mass	0.069 mg	
Gas Volume Sampled	1.26 m ³	
Hazardous Substances (Metals) Emission*1	0.055 mg/m ³	
Hazardous Substances (Metals) Mass Emission Rate*2	0.054 mg/s	
Regulatory Limit	NA mg/m ³	
Moisture Content (%)	2.4	
Gas Density (dry at 1 atmosphere)	1.29 kg/m ³	
Dry Molecular Weight	28.8 g/g-mole	

Notes *1 Emission concentration at Standard conditions of 0°C, 1 atm, dry gas

*2 Mass emission rate determined from pre and post test sampling flow measurements and the respective test moisture content. See Q_{std} in field sheets and final calculations "Stack Analysis - Final Calculations" for each test.

Appendix B

Laboratory Results (11 pages)

Appendix B Laboratory Results (11 pages)

Steel River Testing

5/11 McIntosh Drive, Mayfield West, NSW 2304

Phone: 02 49677880

STACK EMISSION - PARTICULATES REPORT

Origin: AECOM - Newcastle
Project: 60493017

Report : 11003-0-P

Page 1 of 1

Description : Stack Emission Samples
Received: 07-Apr-16

Date : 12-Apr-16

Report To : Cye Buckland
17 Warabrook Blvd, Warabrook NSW 2304

Copy to: FILE

Thimble ID		Volume (mL)	Total Particulate Matter (g)
T407	Filter	-	<0.0002
T414	Filter	-	0.0002



NATA Accredited Laboratory 18079
Accredited for compliance with
ISO/IEC 17025

Note : Sampled by Client

Reported By: 

Robert Dawson

Determined in Accordance With:
Particulate matter - total in stack gases by
gravimetric using in-house M300;
Acetone/Water Rinse using AS4323.2

Steel River Testing

5/11 McIntosh Drive, Mayfield West, NSW 2304
Phone: 02 49677880

STACK EMISSION - MOISTURE REPORT

Origin: AECOM - Newcastle
Project: 60493017
Report : 11003-0-M Page 1 of 1
Description : Stack Emission Samples
Received: 07-Apr-16
Date : 12-Apr-16
Report To : Cye Buckland
17 Warabrook Blvd, Warabrook NSW 2304
Copy to: FILE

Jar ID	Moisture (g)
FA7	9.1
P1	9.9
Z6	12.0



NATA Accredited Laboratory 18079
Accredited for compliance with
ISO/IEC 17025

Reported By: 

Robert Dawson

Determined in Accordance With:
Moisture content in stack gases by gravimetric
using in-house M301



**LEEDER
CONSULTING**

A.B.N. 44 000 964 278
3 - 5, 18 Redland Drive
Mitcham, Vic, 3132
Telephone: (03) 9874 1988
Fax: (03) 9874 1933

Chartered Chemists

19-Apr-2016

AECOM

17 Warabrook Bvde
Warabrook

NSW 2304
Attention: Cye Buckland

REPORT NUMBER: M160775

Site/Client Ref: 60493017/1.1

Order No: 60493017/1.1

CERTIFICATE OF ANALYSIS

SAMPLES: Twelve samples were received for analysis

DATE RECEIVED: 6-Apr-2016

DATE COMMENCED: 6-Apr-2016

METHODS: See Attached Results

RESULTS: Please refer to attached pages for results.

Note: Results are based on samples as received at SGS Leeder Consulting's laboratories

REPORTED BY:

MING

Ming Dai
Senior Chemist



NATA Accredited Laboratory Number: 14429

Accredited for compliance
with ISO/IEC 17025.



Matrix: Filter

Method: USEPA M29 (Analysis only) - MA-1400.FL.M29.02

Sample units are expressed in µg total

Test Started: 18/04/2016

Analyte Name	Leader ID	2016010602	2016010603	2016010604
	Client ID	Metals 1	Metals 12	Method
	Sampled Date	5/04/2016	5/04/2016	
	PQL			Blank
Sb	0.2	nd	nd	nd
As	0.2	nd	nd	nd
Be	0.2	nd	nd	nd
Cd	0.2	nd	nd	nd
Cr	0.2	0.4	0.5	nd
Co	0.2	nd	nd	nd
Cu	0.2	0.2	0.2	nd
Pb	0.2	0.2	nd	nd
Mg	2	37	29	nd
Mn	0.2	0.4	3.5	nd
Hg	0.2	nd	nd	nd
Ni	0.2	nd	nd	nd
Se	0.2	nd	nd	nd
Tl	0.2	nd	nd	nd
Sn	0.2	nd	nd	nd
V	0.2	3.7	4.0	nd
Zn	0.2	460	370	nd



Matrix: Impinger Solution

Method: USEPA M29 (Analysis only) - MA-1400.IMP.M29.06 Metals in Impingers (ug total)

Sample units are expressed in µg total

Test Started: 18/04/2016

Analyte Name	Leader ID Client ID	2016010605	2016010606	2016010607
		Metals 3	Metals 4	Metals 8A
Sampled Date	PQL	5/04/2016	5/04/2016	5/04/2016
Sb	0.1	nd	nd	nd
As	0.1	nd	nd	nd
Be	0.1	nd	nd	nd
Cd	0.1	0.1	nd	nd
Cr	0.1	0.7	1.7	nd
Co	0.1	nd	nd	nd
Cu	0.1	11	1.0	nd
Pb	0.1	6.1	nd	nd
Mg	0.1	5.7	2.6	1.4
Mn	0.1	0.9	61	0.3
Hg	0.1	nd	nd	nd
Ni	0.1	0.6	0.9	nd
Se	0.1	nd	nd	nd
Ti	0.1	nd	nd	nd
Sn	0.1	nd	nd	nd
V	0.1	nd	nd	nd
Zn	0.1	39	3.6	0.3
Sample Volume		95	320	300



Matrix: Impinger Solution

Method: USEPA M29 (Analysis only) - MA-1400.IMP.M29.06 Metals in Impingers (ug total)

Sample units are expressed in µg total

Test Started: 18/04/2016

		Leader ID Client ID	2016010608 Metals 9	2016010609 Metals 5A	2016010610 Metals 5C	2016010611 Metals 8B	2016010612 Metals 11	2016010613 Method
Analyte Name	Sampled Date		5/04/2016	5/04/2016	5/04/2016	5/04/2016	5/04/2016	Blank
	PQL							
Sb	0.1		nd					nd
As	0.1		nd					nd
Be	0.1		nd					nd
Cd	0.1		nd					nd
Cr	0.1		nd					nd
Co	0.1		nd					nd
Cu	0.1		0.5					nd
Pb	0.1		nd					nd
Mg	0.1		0.2					nd
Mn	0.1		0.4					nd
Hg	0.1		nd	nd	nd	nd	nd	nd
Ni	0.1		nd					nd
Se	0.1		nd					nd
Tl	0.1		nd					nd
Sn	0.1		nd					nd
V	0.1		nd					nd
Zn	0.1		nd					nd
Sample Volume			200	98	250	100	250	

Matrix: KMnO4

Method: USEPA M29 (Analysis only) - MA-1400.IMP.M29.04 Mercury in Impingers (ug total)

Sample units are expressed in µg total

Test Started: 18/04/2016

		Leader ID Client ID	2016010614 Metals 5B	2016010615 Metals 10	2016010616 Method
Analyte Name	Sampled Date		5/04/2016	5/04/2016	Blank
	PQL				
Hg	0.5		nd	nd	nd
Sample Volume			400	100	



Matrix: Filter

Method: USEPA M29 (Analysis only) - MA-1400.FL.M29.02

Quality Control Results are expressed in Percent Recovery of expected result

Test Started: 18/04/2016

Analyte Name	Sampled Date	Leader ID	2016010617	2016010618
		Client ID	Method	Method
	PQL		Spike	Spike Dup
Sb			97	101
As			98	98
Be			103	102
Cd			99	98
Cr			108	108
Co			112	113
Cu			101	102
Pb			114	115
Mg			106	109
Mn			103	107
Hg			99	101
Ni			101	99
Se			94	92
Tl			116	117
Sn			102	102
V			106	104
Zn			102	102

Matrix: Impinger Solution

Method: USEPA M29 (Analysis only) - MA-1400.IMP.M29.06 Metals in Impingers (ug total)

Quality Control Results are expressed in Percent Recovery of expected result

Test Started: 18/04/2016

Analyte Name	Sampled Date PQL	Leader ID Client ID	2016010619 Method	2016010620 Method
			Spike	Spike Dup
Sb			105	105
As			100	100
Be			98	104
Cd			100	101
Cr			108	108
Co			114	113
Cu			110	110
Pb			123	124
Mg			104	107
Mn			103	102
Hg			104	105
Ni			102	102
Se			98	102
Tl			1175	1197
Sn			88	92
V			113	114
Zn			93	93

Matrix: KMnO4

Method: USEPA M29 (Analysis only) - MA-1400.IMP.M29.04 Mercury in Impingers (ug total)

Quality Control Results are expressed in Percent Recovery of expected result

Test Started: 18/04/2016

Analyte Name	Sampled Date PQL	Leader ID Client ID	2016010621 Method	2016010622 Method
			Spike	Spike Dup
Hg			110	109

QUALIFIERS / NOTES FOR REPORTED RESULTS

PQL	Practical Quantitation Limit
nd	Not Detected – The analyte was not detected above the reported PQL.
is	Insufficient Sample to perform this analysis.
T	Tentative identification based on computer library search of mass spectra.
NC	Not calculated and/or Results below PQL
NV	No Vacuum, Canister received above standard atmospheric pressure
nr	Not Requested for analysis.
R	Rejected Result – results for this analysis failed QC checks.
SQ	Semi-Quantitative result – quantitation based on a generic response factor for this class of analyte.
IM	Inappropriate method of analysis for this compound
U	Unable to provide Quality Control data – high levels of compounds in sample interfered with analysis of QC results.
UF	Unable to provide Quality Control data- Surrogates failed QC checks due to sample matrix effects
L	Analyte detected at a level above the linear response of calibration curve.
E	Estimated result. NATA accreditation does not cover estimated results.
C1	These compounds co-elute.
--	Parameter Not Determined
CT	Elevated concentration. Results reported from carbon tube analysis
**	Sample shows non-petroleum hydrocarbon profile

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SGS

**LEEDER
CONSULTING**

APPENDIX ONE.

CHAIN OF CUSTODY DOCUMENT

**Chain of Custody Record -
SGS Leeder Consulting**

Dispatch samples to: Unit 5/18 Redland Drive, Mitcham, VIC, 3132

Handwritten initials/signature

Attn: Lyndall Stevens - Contact Ph: (03) 9874 1988 Fax: (03) 9874 1933 Email: au.samplereceipt.mitcham@sgs.com

CLIENT NAME: AECOM

CONTACT PHONE No: 02 4911 4900

Sample Disposal (Please X) After: 4 Weeks () 6 Weeks ()

CLIENT ADDRESS: 17 Warabrook I

CONTACT FAX No: 02 4911 4999

Warabrook NSW 2304

RESULTS REQUIRED BY: Standard

CONTACT: Cye Buckland

EMAIL REPORT TO: cye.buckland@aecom.com

SAMPLED BY: DT VK

LAB QUOTE NUMBER:

PROJECT REF. / ORDER No: 60493017/1.1

Containers/Preservation (please tick) (G=glass, P=plastic)

Analyses Required (Analyte + Method Code)												
Metals -USEPA Method 29*	Mercury											
Metals 1												
Metals 3												
Metals 4												
Metals 5A												
Metals 5B												
Metals 5C												
Metals 8A												
Metals 8B												
Metals 9												
Metals 10												
Metals 11												
Metals 12												
Totals:	2	8	2	2	2	8						

CHAIN OF CUSTODY RECORD

RELEASED BY: (Name) (Signature) (Date / Time)
 Dylan Turnbull
 RECEIVED BY: (Name) (Signature) (Date / Time)
 Beatrix Robinson 6/4/16 2:30pm

Custody Seals Intact? Yes No
 Samples Received Chilled? Yes No

Please Note: Dissolved metals require filtering in the field.
 Please indicate whether the HNO3 acidified sample has been filtered.
 Comments: (eg. Highly contaminated samples, reporting requirements etc)
 *Sb, As, Be, Cd, Cr, Co, Cu, Pb, Mg, Mn, Hg, Ni, Se, Ti, Sn, V, Zn

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