Emission Testing Report - 27 November 2019

Cargill Newcastle

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5 December 2019

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Document Control						
Project ID	Revision	Author	Reviewer	Position	Signature	Date
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Table of Contents

List of Figures

List of Tables

1 Introduction

MJM Environmental was commissioned by Cargill Newcastle to conduct stationary air monitoring on 27 November 2019. Cargill Newcastle is licensed with the NSW Environment Protection Authority (EPA) under Environment Protection Licence (EPL) number 5810.

The monitoring was performed at the following locations for the pollutants presented in Table 1-1.

Table 1-1: Monitoring performed at Cargill Newcastle

EPL Point ID	Point Description	Pollutant	Licence Limit
1	15 MW Boiler	Moisture	N/A
		Nitrogen Oxides	350 mg/m^3
		Oxygen	N/A
		Temperature	N/A
		Volumetric Flowrate	N/A
10	High Pressure Boiler	Moisture	N/A
		Nitrogen Oxides	350 mg/m^3
		Oxygen	N/A
		Temperature	N/A
		Volumetric Flowrate	N/A

2 Methodology

Table 2-1 summarises the test methods performed at Cargill Newcastle.

Table 2-1: Test methods

Parameter	Sampling Method	Reference Method	Unit	Uncertainty[1]	Uncertainty %
Moisture	TM-22	USEPA Method 4	%vol	0.12	1
Nitrogen Oxides	TM-11	USEPA Method 7E (Instrumental Analyzer – Electrochemical Sensor)	mg/m^3	3.7	3
Oxygen	TM-25	USEPA Method 3A (Instrumental Analyzer – Electrochemical Sensor)	mg/m^3	0.39	2
Volumetric Flowrate (2D Pitot Tube)	TM-2	USEPA Method 2	m/s	0.35	11

[1] Measurement of Uncertainty (MU) values cited in this table are calculated at the 95% confidence level (coverage factor = 2) including both sampling and laboratory analytical factors.

3 Quality Assurance / Quality Control Information

MJM Environmental performed stack emission testing in accordance with the *Protection of the Environment Operations (Clean Air) Regulation 2010*, and the EPA's *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (2007)*.

4 Results

A summary of the results obtained for Cargill Newcastle are provided in the following sections of the report. Emission concentrations and emission rates are converted to standard conditions (STP) of 0°C, dry gas and 1 atmosphere pressure for comparison with appropriate guideline levels. The results presented only relate to the monitoring points tested.

4.1 EPL Point 1 (15 MW Boiler)

Figure 4-1 shows EPL Point 1.

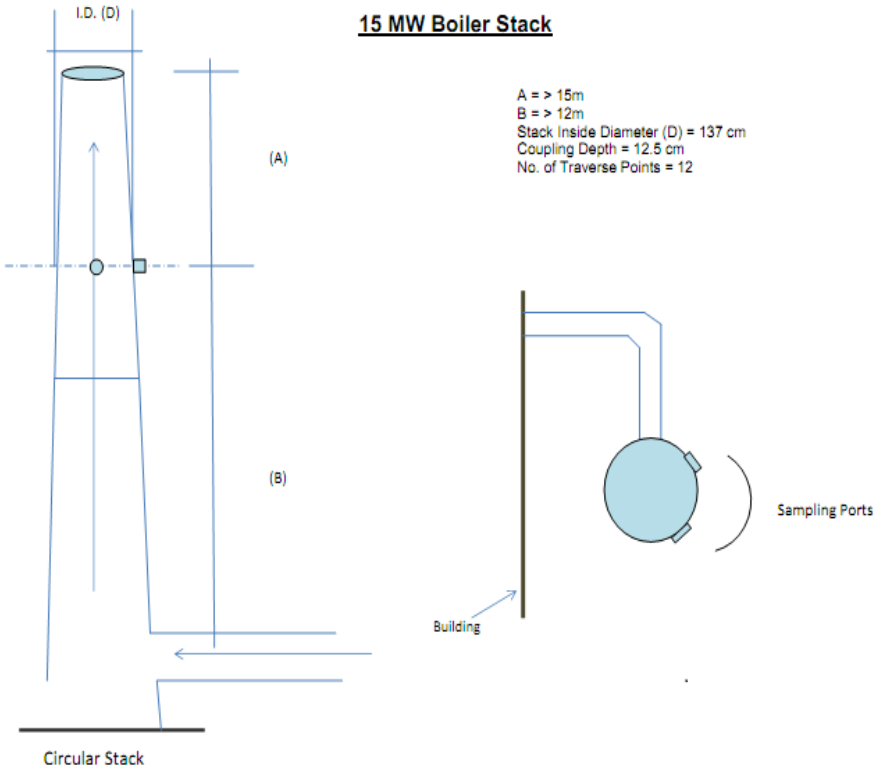

Figure 4-1: EPL Point 1 (15 MW Boiler)

Table 4-1 shows the testing information for the sampling plane.

Table 4-1: Sampling plane information EPL Point 1 (15 MW Boiler)

Parameter	Unit	Information	Comments
Date	-	27/11/2019	
Sampling start and end time(s)	-	13:11 – 13:41	
Number of sampling runs performed	-	1	
Sampling duration	min	30	
Process conditions at time of sampling	-	Steady state	
Sample plane diameter	mm	1,365	
Sample plane area	m^2	1.46	
Sample port diameter and depth	mm	76, 265	
Number of sample ports	-	2	
Duct orientation and shape	-	Vertical, circular	
Number of traverse points sampled	-	12	
Sample port compliant with AS4323.1	-	Yes	

Table 4-2 shows the volumetric and continuous gaseous parameters measured during testing.

Table 4-2: Results for EPL Point 1 (15 MW Boiler)

Parameter	Unit	Result	EPL Limit	Compliant with EPL
Temperature	°C	115	N/A	N/A
Carbon dioxide	%	2.2	N/A	N/A
Oxygen	%	17.0	N/A	N/A
Moisture content	%	13	N/A	/A
Molecular weight dry	g/gmol	29	N/A	N/A
Velocity at sampling plane	m/s	3.1	N/A	N/A
Volumetric flow rate (wet, actual)	m^3/s	4.5	N/A	N/A
Volumetric flow rate (dry, STP)	m^3/s	2.8	N/A	N/A

Table 4-3 shows the concentration and emission rate results of testing.

Table 4-3: Results for EPL Point 1 (15 MW Boiler)

Pollutant	Run	Concentration mg/m^3	Emission rate g/s	EPL Limit	Compliant with EPL
Nitrogen Dioxide [1]	1	66	0.18	350 mg/m^3	✓

[1] Emission concentration corrected at 7% O_2 reference gas as specified in EPL 5810 under condition L2.

4.2 EPL Point 10 (High Pressure Boiler)

Figure 4-2 shows EPL Point 10.

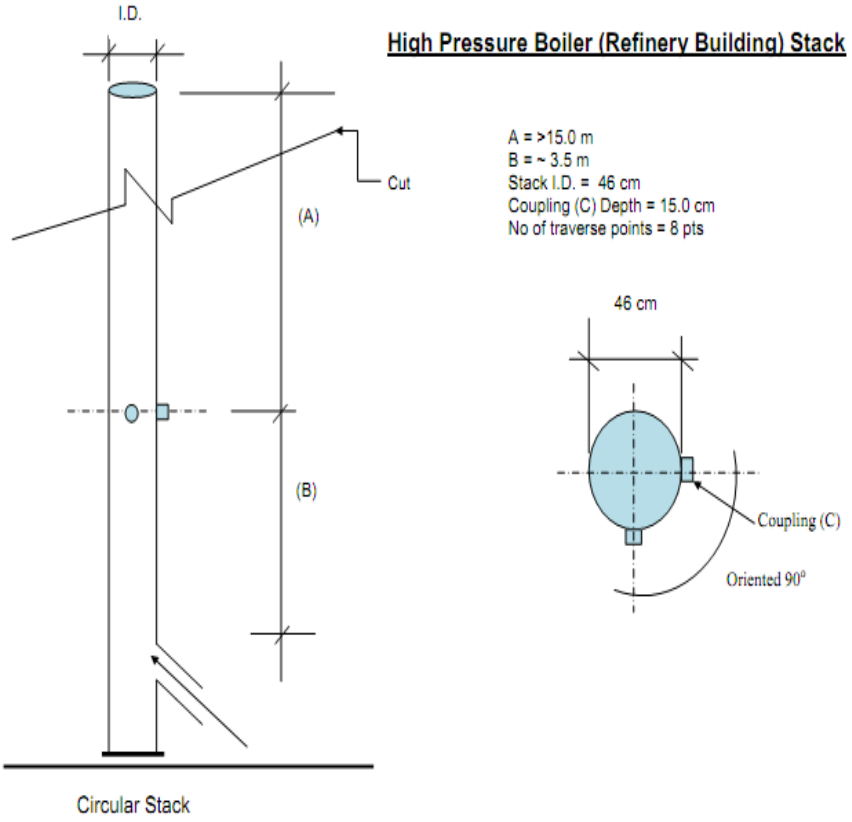

Figure 4-2: EPL Point 10

Table 4-4 shows the testing information for the sampling plane.

Table 4-4: Sampling plane information EPL Point 10 (High Pressure Boiler)

Parameter	Unit	Information	Comments
Date	-	27/11/2019	
Sampling start and end time(s)	-	11:46 – 12:16	
Number of sampling runs performed	-	1	
Sampling duration	min	30	
Process conditions at time of sampling	-	Steady state	
Sample plane diameter	mm	460	
Sample plane area	m^2	0.17	
Sample port diameter and depth	mm	102, 150	
Number of sample ports	-	2	
Duct orientation and shape	-	Vertical, circular	
Number of traverse points sampled	-	8	
Sample port compliant with AS4323.1	-	Yes	

Table 4-5 shows the volumetric and continuous gaseous parameters measured during testing.

Table 4-5: Results for EPL Point 10 (High Pressure Boiler)

Parameter	Unit	Result	EPL Limit	Compliant with EPL
Temperature	°C	174	N/A	N/A
Carbon dioxide	%	0	N/A	N/A
Oxygen	%	20.9	N/A	N/A
Moisture content	%	12	N/A	N/A
Molecular weight dry	g/gmol	29	N/A	N/A
Velocity at sampling plane	m/s	4.8	N/A	N/A
Volumetric flow rate (wet, actual)	m^3/s	0.80	N/A	N/A
Volumetric flow rate (dry, STP)	m^3/s	0.43	N/A	N/A

Table 4-6 shows the concentration and emission rate results of testing.

Table 4-6: Results for EPL Point 10 (High Pressure Boiler)

Pollutant	Run	Concentration mg/m^3	Emission rate g/s	EPL Limit	Compliant with EPL
Nitrogen Dioxide [1]	1	105	0.00019	350 mg/m^3	✓

[1] Emission concentration corrected at 7% O_2 reference gas as specified in EPL 5810 under condition L2.

5 Discussion

Testing for emission compliance was executed on 27 November 2019. During sampling the facility was operating under normal plant operating conditions.

Results for all parameters were compared with the emission concentration limits specified in Cargill Newcastle's EPL 5810.

All parameters were below the emission concentration limits specified and thus were compliant with the EPL conditions.