

Certificate of Analysis



**BUREAU
VERITAS**

Origin Energy Resources Ltd
GPO Box 148
Brisbane QLD 4001

Attention: Kim Burette

Project 13PEBR0015131
Collected by P.Marty
Client Ref: -

Customer Sample ID	Talinga Gas Plant	Peat Gas Plant
Sample Type	CSG Sales Gas	CSG Sales Gas
Date Sampled	22/11/2013	23/11/2013
Time Sampled	1446 h	1319 h
Pressure	11610 kPag	8907 kPag
Temperature	32°C	37.4°C
Cylinder ID	#325, Q824	#400, Q814
Description	Sales Gas D/S PCV	Sales Gas U/S PCV 8100-0142
Test/Reference	Unit	
Water Dewpoints		
H2O Dewpt Temp (meas)*	°C	-15
H2O Dewpt Press (meas)*	kPag	11700
H2O Dewpt Temp (slide calc)*	°C	-58
H2O Dewpt Press (slide calc)*	kPa	0
H2O Vap (slide calc) ppm v/v*	mL/m ³	14.0
H2O Vap (calc) ppm w/v*	mg/m ³	15.5
Dräger Tube Test		
Mercaptans (ppm v/v)*	mL/m ³	< 0.10
Name Of Component*	Carbon Disulphide	Carbon Disulphide
Component (ppm v/v)*	mL/m ³	< 0.10
Name Of Component*	Carbonyl Sulphide	Carbonyl Sulphide
Component (ppm v/v)*	mL/m ³	<0.40
H2S by Wet Chemistry ASTM D2385		
Total H2S @ 15°C*	mg/m ³	0.09
Total H2S (ml/ cu m (ppm)) @ 20°C*	mL / Cu m	0.06
Methanol and Glycol		
Triethylene Glycol*	mg/m ³	< 0.5
Radioactive Material OS-03-01		
Radioactivity*	Bq/m ³	131 +/- 33
Total Sulphur ASTM D1072		
Total Sulphur*	mg/m ³	0.04
GAS ANALYSIS		
Test/Reference	Unit	
Gas Analysis In-house Method GC-01		
Nitrogen*	Mol %	1.80
Carbon Dioxide*	Mol %	0.13
Methane*	Mol %	98.061
Ethane*	Mol %	0.009
Propane*	Mol %	<0.001
Total*	Mol %	100.000
Gas Parameters		
Average Molecular Weight*		16.30



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		8100-0142

GAS ANALYSIS

Test/Reference	Unit		
Lower Flammability Limit*		5.10	5.05
Upper Flammability Limit*		15.29	15.16
Ratio Of Upper To Lower*		3.00	3.00
Wobbe Index*		49.31	49.86
Compressibility Factor (Z)*		0.9980	0.9980
Ideal Gas Density (Rel to Air = 1)*		0.563	0.561
Real Gas Density (Rel to Air = 1)*		0.564	0.561
Ideal Nett Calorific Value*	MJ/m ³	33.30	33.61
Ideal Gross Calorific Value*	MJ/m ³	36.98	37.33
Real Nett Calorific Value*	MJ/m ³	33.36	33.68
Real Gross Calorific Value*	MJ/m ³	37.06	37.40
Gross Calorific Val Water-Sat Gas*	MJ/m ³	36.33	36.67

Test Description

Gas Parameters

The above results are calculated on an air and water free basis assuming only the measured constituents are present. The following parameters are calculated from the above composition at 15°C and 101.325 kPa (abs) using ISO6976 and the physical constants from the GPSA SI Engineering Data Handbook 11th Ed. Measured as Radon-222 in the gas phase at 101.3 kPa abs @ 15°C.

Radioactive Material

Water Dewpoints

Water Dewpoint is calculated @ 101.3 kPa abs and the Water Vapour Content is calculated @ 101.3 kPa abs, 15°C. Water Vapour Content is calculated assuming "ideal gas" behaviour.

Sample Comments

Talinga Gas Plant

Sample time listed is for GC sample, other tests conducted from 0730h to 1610h 22/11/13
Water content converted to mg/m³ at 15°C, 101.325 kPa abs using PhyMetrix conversion program with a MW of 16.30

Peat Gas Plant

Sample time listed is for GC sample, other tests conducted from 1050h to 1700h 23/11/13
Water content converted to mg/m³ at 15°C, 101.325 kPa abs using PhyMetrix conversion program with a MW of 16.23

Authorised By

Paul Marty Technical Manager, Petroleum Services

Laboratory Manager

James Dennett Operations Manager

Final Report

- Indicates Not Requested * Indicates NATA accreditation does not cover the performance of this service

Samples will be discarded after 30 days unless otherwise notified.

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