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Accreditation No 2013



Certificate of Analysis

Santos Limited
GPO Box 2319
ADELAIDE SA 5000
Australia

Attention: Noel Dowdell

Project 08PEAD0018636
Client Ref: 849485-101

| | |
|---------------------------|----------------------|
| Customer Sample ID | West Merreeie |
| | 17 |
| Sample Type | Gas |
| Date Sampled | 27/05/2008 |
| Time Sampled | 1400-1430h |
| Pressure | 2012kPag |
| Temperature | 32°C |
| Cylinder ID | 11N01 |
| Test/Reference | Unit |

Hydrotesting Cyl
Hydrotesting* Pass

GAS ANALYSIS

Test/Reference Unit

Gas Analysis ASTM D 1945-96 (modified)

| | | |
|---------------------------------|-------|--------|
| Nitrogen | Mol % | 7.91 |
| Carbon Dioxide | Mol % | 0.09 |
| Methane | Mol % | 70.80 |
| Ethane | Mol % | 13.03 |
| Propane | Mol % | 4.92 |
| I-Butane | Mol % | 0.51 |
| N-Butane | Mol % | 1.40 |
| I-Pentane | Mol % | 0.37 |
| N-Pentane | Mol % | 0.43 |
| Hexanes | Mol % | 0.34 |
| Heptanes | Mol % | 0.15 |
| Octanes and higher hydrocarbons | Mol % | 0.05 |
| Total | Mol % | 100.00 |

Gas Parameters ASTM D 1945-96 (modified)

| | | |
|------------------------------------|-------------------|--------|
| Average Molecular Weight | | 21.89 |
| Lower Flammability Limit | | 4.27 |
| Upper Flammability Limit | | 15.09 |
| Ratio Of Upper To Lower | | 3.54 |
| Wobbe Index | | 51.16 |
| Compressibility Factor (Z) | | 0.9967 |
| Ideal Gas Density (Rel to Air = 1) | | 0.756 |
| Real Gas Density (Rel to Air = 1) | | 0.758 |
| Ideal Nett Calorific Value | MJ/m ³ | 40.37 |
| Ideal Gross Calorific Value | MJ/m ³ | 44.48 |
| Real Nett Calorific Value | MJ/m ³ | 40.50 |
| Real Gross Calorific Value | MJ/m ³ | 44.63 |
| Gross Calorific Val Water-Sat Gas | MJ/m ³ | 43.70 |

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 ISO 6976 and the physical constants from the GPSA SI Engineering Data Handbook 11 th Ed.

Authorised By

Neil Thomas

Chemist

Michelle Fordham

Chemist

Accreditation No 2013

Laboratory Manager

Diane Cass

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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NATIONAL HYDRO TESTING SERVICES

1 ELLEMSEA CCT. LONSDALE SA 5160
PH 8326 7755 MOBILE 0418 804 144

REGISTERED MARK

REF # ND 102 (Santos Ref: 11NO1)

| | |
|------------------------|------|
| Date of Test: | 8/08 |
| Previous Test Date: | |
| Reference Temperature: | 14 |
| Service: | I |

TESTED IN COMPLIANCE WITH AS2030.1

CERTIFICATE OF TEST

29599

S.A.A. APPROVED

TEST STATION No.: 308A

Client: AMDEL

Serial No.: 2EK084

Specification No.: DOT 3E 1800

Water Capacity: 5L Test Pressure: 2925 PSI Working Pressure: 1800 PSI

| | | | |
|---------------------|---------------------|---|---------------------|
| Condition: External | Condition: Internal | HYDROSTATIC/VISUAL TEST RESULT: <u>Passed</u> | WEIGHT TEST: Passed |
| <u>Good</u> | <u>Good</u> | Recommendation or Remarks: | |
| Average | Average | | |
| Poor | Poor | | |

Approved Signatory: 