

Lakes Oil N.L.
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Australia



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Accreditation No 2013

Attention: Margaret Rhodes

Project 04PEAD03791

| | Cylinder #369 | Cylinder #455 | Cylinder #334 |
|--------------------|-----------------|-----------------|-----------------|
| Customer Sample ID | Wombat-2, DST-2 | Wombat-2, DST-2 | Wombat-2, DST-2 |
| Well ID | Gas | Gas | Gas |
| Sample Type | 18/04/2004 | 19/04/2004 | 20/04/2004 |
| Date Sampled | 1948 h | 0700 h | 0800 h |
| Time Sampled | 840 kPag | 1378 kPag | 11368 kPag |
| Pressure | 14°C | 14°C | 14°C |
| Temperature | Floor Manifold | Sample Chamber | Sample Chamber |
| Description | Bubble Hose | | |

GAS ANALYSIS

| Test/Reference | Unit | | | |
|---|-------------------|--------|--------|--------|
| Gas Analysis ASTM D 1945-96 (modified) | | | | |
| Nitrogen* | Mol % | 1.27 | 73.01 | 1.49 |
| Carbon Dioxide* | Mol % | 0.09 | 4.36 | 0.07 |
| Methane* | Mol % | 92.87 | 7.67 | 92.78 |
| Ethane* | Mol % | 3.51 | 0.30 | 3.61 |
| Propane* | Mol % | 1.31 | 0.12 | 1.25 |
| I-Butane* | Mol % | 0.21 | 0.02 | 0.20 |
| N-Butane* | Mol % | 0.32 | 0.04 | 0.31 |
| I-Pentane* | Mol % | 0.08 | 0.01 | 0.08 |
| N-Pentane* | Mol % | 0.08 | 0.04 | 0.07 |
| Hexanes* | Mol % | 0.16 | 0.06 | 0.09 |
| Heptanes* | Mol % | 0.10 | 0.08 | 0.03 |
| Octanes and higher hydrocarbons | Mol % | < 0.01 | < 0.01 | 0.02 |
| Total* | Mol % | 100.00 | 85.71 | 100.00 |
| Gas Parameters ASTM D 1945-96 (modified) | | | | |
| Average Molecular Weight* | | 17.59 | 28.53 | 17.50 |
| Lower Flammability Limit* | | 4.73 | 52.15 | 4.76 |
| Upper Flammability Limit* | | 14.89 | 172.08 | 14.95 |
| Ratio Of Upper To Lower* | | 3.15 | 3.30 | 3.14 |
| Wobbe Index* | | 51.26 | 3.67 | 51.01 |
| Compressibility Factor* | | 0.9977 | 0.9994 | 0.9977 |
| Ideal Gas Density (Rel to Air = 1)* | | 0.607 | 0.985 | 0.604 |
| Real Gas Density (Rel to Air = 1)* | | 0.609 | 0.985 | 0.606 |
| Ideal Nett Calorific Value* | MJ/m ³ | 36.06 | 3.30 | 35.79 |
| Ideal Gross Calorific Value* | MJ/m ³ | 39.95 | 3.64 | 39.66 |
| Real Nett Calorific Value* | MJ/m ³ | 36.14 | 3.30 | 35.87 |
| Real Gross Calorific Value* | MJ/m ³ | 40.04 | 3.65 | 39.75 |
| Gross Calorific Val Water-Sat Gas | MJ/m ³ | 39.25 | 3.55 | 38.96 |

| | | |
|--------------------|-----------------|-----------------|
| Customer Sample ID | Cylinder #SS-2 | Cylinder #482 |
| Well ID | Wombat-2, DST-2 | Wombat-2, DST-3 |
| Sample Type | Gas | Gas |
| Date Sampled | 20/04/2004 | 21/04/2004 |
| Time Sampled | 1915 h | 1010 h |
| Pressure | 2033 kPag | 2273 kPag |
| Temperature | 20°C | |
| Description | Bubble Hose | |

GAS ANALYSIS

Test/Reference Unit

Gas Analysis ASTM D 1945-96 (modified)

| | | | |
|---------------------------------|-------|--------|--------|
| Nitrogen* | Mol % | 1.23 | 1.72 |
| Carbon Dioxide* | Mol % | 0.02 | 0.04 |
| Methane* | Mol % | 93.19 | 92.70 |
| Ethane* | Mol % | 3.41 | 3.36 |
| Propane* | Mol % | 1.26 | 1.24 |
| I-Butane* | Mol % | 0.20 | 0.20 |
| N-Butane* | Mol % | 0.30 | 0.30 |
| I-Pentane* | Mol % | 0.08 | 0.08 |
| N-Pentane* | Mol % | 0.07 | 0.07 |
| Hexanes* | Mol % | 0.14 | 0.15 |
| Heptanes* | Mol % | 0.07 | 0.09 |
| Octanes and higher hydrocarbons | Mol % | 0.03 | 0.05 |
| Total* | Mol % | 100.00 | 100.00 |

Gas Parameters ASTM D 1945-96 (modified)

| | | | |
|-------------------------------------|-------------------|--------|--------|
| Average Molecular Weight* | | 17.51 | 17.59 |
| Lower Flammability Limit* | | 4.74 | 4.76 |
| Upper Flammability Limit* | | 14.89 | 14.96 |
| Ratio Of Upper To Lower* | | 3.14 | 3.15 |
| Wobbe Index* | | 51.28 | 50.97 |
| Compressibility Factor* | | 0.9977 | 0.9977 |
| Ideal Gas Density (Rel to Air = 1)* | | 0.605 | 0.607 |
| Real Gas Density (Rel to Air = 1)* | | 0.606 | 0.609 |
| Ideal Nett Calorific Value* | MJ/m ³ | 35.98 | 35.85 |
| Ideal Gross Calorific Value* | MJ/m ³ | 39.87 | 39.72 |
| Real Nett Calorific Value* | MJ/m ³ | 36.06 | 35.93 |
| Real Gross Calorific Value* | MJ/m ³ | 39.96 | 39.82 |
| Gross Calorific Val Water-Sat Gas | MJ/m ³ | 39.17 | 39.03 |

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.

Cylinder #455

Please note that the pressure in this sample was very low, although 200 psi was written on the cylinder. The absence of teflon tape around the thread suggests that the sample may have leaked after sampling, accounting for the high air content detected.

Authorised by: Michelle Fordham
Petroleum Chemist

Signature:



Accreditation No 2013

Final Report

- Indicates Not Requested

* Indicates NATA Accredited Test

Samples will be discarded after 30 days unless otherwise notified.

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The samples were not collected by Amdel staff.