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***Reservoir Fluid  
Analysis of  
Surface Samples from  
Thylacine #2  
Otway Basin, Victoria***

Prepared for  
**Woodside Energy Limited**

March 2002

File: AFL 2001-053

Reservoir Fluid Laboratory  
Core Laboratories Australia Pty Ltd  
Perth  
Western Australia

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11 March, 2002

Woodside Energy Limited  
1 Adelaide Terrace  
Perth  
Western Australia, 6000

Attention: Mr Werner Ribul

**Subject:** Reservoir Fluid Analysis  
**Well:** Thylacine #2  
**Location:** Otway Basin, Victoria  
**File:** AFL 2001-053

Dear Werner,

Three sets of separator recombination samples, and four separator gas samples, were collected during DST's on the Thylacine #2 well and shipped to our Perth laboratory for validity checks, composition and a limited reservoir fluid analysis study. Presented in the following report are the results of these analyses.

Core Laboratories Australia Pty Ltd appreciates this opportunity to be of service to Woodside Energy Limited. Should you have any questions regarding this report, or if we may be of any further assistance, please feel free to contact me at your convenience.

Yours Faithfully,  
For **CORE LABORATORIES AUSTRALIA PTY LTD**

A handwritten signature in blue ink, appearing to read "K. Daken".

Kevin R. Daken  
**Laboratory Supervisor**

ABN 67 065 540 838

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**Woodside Energy Limited**  
**Thylacine #2**  
**AFL 2001-053**

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## LABORATORY PROCEDURES

### Sample Receipt and Validation

Three sets of Zone 2 separator samples and three Zone 1 separator gas samples were received in our Perth laboratory for use in a compositional and PVT analysis study. As a preliminary quality check, the opening pressure and air content of each separator gas sample was measured. Additionally, the room temperature saturation pressure and sample volumes were determined for each separator condensate sample. The results, summarised on page 3, indicated that all samples were reasonably consistent with reported conditions and were selected for compositional analysis.

Representations are depicted in figures A-1 through A-3.

### Compositional Analysis

The composition of each separator gas was analysed by gas chromatography using the GPA 2286 method. The compositions of Zone 1 gases 1.05, 1.06 and 1.07 are presented on pages 4 through 6 with the extra Zone 2 gas 1.25 composition on page 7.

The composition of the separator condensate samples was determined by flash/separation techniques where a fluid sub-sample was flashed at 120°F and separated into liquid and gas phases. The flashed gas was analysed according to the GPA 2286 method and the flashed liquid using temperature programmed capillary chromatography. These compositions were then mathematically recombined at the measured flash gas-oil ratio and the resultant separator oil composition.

The reported field CGR was used, together with measured separator product compositions, to calculate producing wellstream compositions. All Zone 2 volumetric and compositional data are presented on pages 8 through 11 (1.19 & 1.20), pages 12 through 15 (1.21 & 1.22) and pages 16 through 19 (1.23 & 1.24). Based on equilibrium K data and Hoffman-Crump plots, Sample set 1.19 and 1.20 were selected for physical recombination.

Two atmospheric condensate samples (1.11 from Zone 1 and 1.28 from Zone 2) were selected for compositional analysis. Each sample was analysed through C36+ using temperature programmed capillary chromatography. The resultant compositions are presented on pages 24 and 25.

Additional analyses determined H<sub>2</sub>S, mercaptans and total sulphur for selected gas samples from Zone 1 and Zone 2, BTEX content of recombination sample set 1.19 and 1.20 and hydrogen and helium content of the recombined sample. These analysis results are summarised on page 21.

### Physical Recombination

For the selected set of recombination samples, a known volume of equilibrated separator condensate was charged to a high-pressure laboratory storage cylinder. The appropriate volume of separator gas was added to this cylinder to obtain a reservoir fluid suitable for use in the PVT analyses program. The recombined mixture was equilibrated in single phase and stored at a high laboratory working pressure.

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Thylacine #2

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### LABORATORY PROCEDURES (cont. I-)

#### Pressure Volume Relations

A known volume of recombined reservoir fluid sample was charged to the large volume Sloane-type, high-pressure visual cell and thermally expanded to 114 °C. Once equilibrated in single phase, the fluid was then subjected to the constant composition expansion procedure. During this procedure, a trace of liquid was observed at 2320 psig indicating the dew point for the reservoir gas. The pressure volume relations and a retrograde liquid curve were then completed with resultant volumetric data, pressure volume relation and retrograde liquid measurements presented on page 20. Graphical representations are depicted in figures A-1 through A-3.

#### Water Sample Analysis

A total of four atmospheric water samples were subjected to a series of standard water analysis tests. The results of these analyses are summarised on page 22.

#### High Temperature Distillation Analysis

One separator condensate sample (6802-MA) was selected. The sample was flashed under controlled conditions to a cold trap. The resultant atmospheric sample was subjected to a distillation procedure whereby individual carbon number cuts were collected and their molecular weights and densities were measured. The process was continued until the C11 cut was obtained. Properties of the C12+ residue were also measured and all test results are summarised on page 23.



# Woodside Energy Limited

## Thylacine #2

AFL 2001-053

### General Well Information

|                            |                         |
|----------------------------|-------------------------|
| Company.....               | Woodside Energy Limited |
| Well Name.....             | Thylacine #2            |
| API Well Number.....       | -                       |
| File Number.....           | AFL 2001-053            |
| Date Sample Collected..... | 22-Sep-01               |
| Sample Type.....           | Separator               |
| Geographical Location..... | Otway Basin, Victoria   |
| Field.....                 | Thylacine               |

### Well Description

|                         |                  |
|-------------------------|------------------|
| Formation.....          | Upper Waare Sand |
| Pool (or Zone).....     | *                |
| Date Completed.....     | *                |
| Elevation.....          | *                |
| Producing Interval..... | 2296-2302        |
| Total Depth.....        | *                |
| Tubing Size.....        | *                |
| Tubing Depth.....       | *                |
| Casing Size.....        | *                |
| Casing Depth.....       | *                |

### Pressure Survey Data

#### Data from Original Discovery Well

|                         |   |
|-------------------------|---|
| Date.....               | * |
| Reservoir Pressure..... | * |

#### Data at Sample Collection

|                                   |           |
|-----------------------------------|-----------|
| Date.....                         | 22-Sep-01 |
| Reservoir Pressure.....           | *         |
| Reservoir Temperature.....        | 114       |
| Pressure Tool.....                | *         |
| Flowing Bottom-Hole Pressure..... | 3048      |
| Flowing Tubing Pressure.....      | 1722      |

\* Data not forwarded to Core Laboratories.

# Woodside Energy Limited

Thylacine #2

AFL 2001-053

## Production Data

### Data from Original Discovery Well

|                            |   |         |
|----------------------------|---|---------|
| Location.....              | * |         |
| Date.....                  | * |         |
| Oil Gravity @ STP.....     | * | °API    |
| Separator Pressure.....    | * | psig    |
| Separator Temperature..... | * | °F      |
| Production Rates           |   |         |
| Gas.....                   | * | Mscf/D  |
| Liquid.....                | * | STB/D   |
| Gas/Liquid Ratio.....      | * | scf/bbl |

### Separator Conditions

|  |     |        |
|--|-----|--------|
| Primary Separator Pressure.....            | 369 | psig   |
| Primary Separator Temperature.....         | 31  | °C     |
| Secondary Separator Pressure.....          | -   | psig   |
| Secondary Separator Temperature.....       | -   | °C     |
| Primary Separator Gas Production Rate..... | #   | Mscf/D |

### Gas Factors -

#### Field Values:

|                                   |        |      |
|-----------------------------------|--------|------|
| Pressure Base.....                | 14.696 | psia |
| Temperature Base.....             | 60     | °F   |
| Compressibility Factor (Fpv)..... | *      |      |
| Gas Gravity Factor (Fg).....      | 1.1969 |      |

#### Laboratory Values:

|                                   |        |      |
|-----------------------------------|--------|------|
| Pressure Base.....                | 14.696 | psia |
| Temperature Base.....             | 60     | °F   |
| Compressibility Factor (Fpv)..... | 1.0301 |      |
| Gas Gravity Factor (Fg).....      | 1.2015 |      |

|   |        |           |    |       |
|---|--------|-----------|----|-------|
| Primary Separator Liquid Rate.....              | #      | bbl/D     | at | 31 °C |
| Stock Tank Liquid Rate.....                     | #      | bbl/D     | at | °F    |
| Separator Gas / Separator Liquid Ratio.....     | 311847 | scf/bbl   |    |       |
| Separator Gas / Stock Tank Liquid Ratio.....    | 333333 | scf/bbl   |    |       |
| Stock Tank Liquid / Separator Gas Ratio.....    | 3.00   | bbl/MMscf |    |       |
| Separator Liquid / Stock Tank Liquid Ratio..... | 1.0689 | bbl/bbl   | at | 60 °F |

# Recombination CGR (3 STB/MMscf) specified by Woodside Energy Limited.

\* Data not forwarded to Core Laboratories.

Woodside Energy Limited  
Thylacine #2  
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COMPOSITION OF PRIMARY STAGE SEPARATOR GAS: 1.05

PRELIMINARY CHECKS OF SAMPLE QUALITY  
AND SUMMARY OF SAMPLES RECEIVED

| Separator Gas   |                     |    |                               |    |                     |
|-----------------|---------------------|----|-------------------------------|----|---------------------|
| Cylinder Number | Sampling Conditions |    | Laboratory Opening Conditions |    |                     |
|                 | psig                | °C | psig                          | °C | Air Content (mol %) |

|                |     |    |     |    |      |
|----------------|-----|----|-----|----|------|
| 4345A (1.20) * | 369 | 31 | 397 | 31 | 0.19 |
| 4281A (1.22)   | 369 | 32 | 395 | 32 | 0.06 |
| 3256A (1.24)   | 369 | 33 | 392 | 33 | 0.03 |
| 01352 (1.25)   | 369 | 33 | 393 | 33 | 0.03 |

| Separator Liquid |                     |    |                        |    |                      |
|------------------|---------------------|----|------------------------|----|----------------------|
| Cylinder Number  | Sampling Conditions |    | Laboratory Bubblepoint |    | Water Recovered (cc) |
|                  | psig                | °C | psig                   | °C |                      |

|                  |     |    |     |      |   |
|------------------|-----|----|-----|------|---|
| 6802-MA (1.19) * | 369 | 31 | 326 | 18.3 | 0 |
| 6097-MA (1.21)   | 369 | 32 | 345 | 18.3 | 0 |
| 5960-MA (1.23)   | 369 | 33 | 332 | 19.6 | 0 |

\* These samples selected for recombination and further analysis.



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COMPOSITION OF PRIMARY STAGE SEPARATOR GAS - 1.05  
(by Programmed-Temperature, Capillary Chromatography)

| Component        | Mol %  | Plant Products (GPM) | Liquid Density (gm/cc) | MW     |
|------------------|--------|----------------------|------------------------|--------|
| Hydrogen Sulfide | 0.00   |                      |                        |        |
| Carbon Dioxide   | 9.16   |                      | 0.8172                 | 44.010 |
| Nitrogen         | 1.39   |                      | 0.8086                 | 28.013 |
| Methane          | 80.51  |                      | 0.2997                 | 16.043 |
| Ethane           | 5.50   | 1.021                | 0.3562                 | 30.070 |
| Propane          | 1.83   | 0.305                | 0.5070                 | 44.097 |
| iso-Butane       | 0.34   | 0.062                | 0.5629                 | 58.123 |
| n-Butane         | 0.43   | 0.079                | 0.5840                 | 58.123 |
| iso-Pentane      | 0.17   | 0.033                | 0.6244                 | 72.150 |
| n-Pentane        | 0.12   | 0.022                | 0.6311                 | 72.150 |
| Hexanes          | 0.16   | 0.027                | 0.6850                 | 84.0   |
| Heptanes         | 0.22   | 0.046                | 0.7220                 | 96.0   |
| Octanes          | 0.15   | 0.059                | 0.7450                 | 107    |
| Nonanes          | 0.02   | 0.030                | 0.7640                 | 121    |
| Decanes          | Trace  | 0.005                | 0.7780                 | 134    |
| Undecanes        | Trace  |                      |                        |        |
| Totals .....     | 100.00 | 1.689                |                        |        |

SAMPLING CONDITIONS

166 psig  
81 °C

Gas Cylinder  
5235A

Average Sample Properties

Critical Pressure, psia ..... 699.4  
Critical Temperature, °R ..... 385.3  
Average Molecular Weight ..... 20.99  
Calculated Gas Gravity ( air = 1.000 ) ..... 0.725

at 14.696 psia and 60 °F

Heating Value, Btu/scf dry gas\*  
Gross ..... 1022

Properties of Plus Fractions

| Component     | Mol % | Liquid Density (gm/cc) | Liquid API Gravity | MW    |
|---------------|-------|------------------------|--------------------|-------|
| Heptanes plus | 0.39  | 0.734                  | 61.1               | 101.5 |

Note: Component properties assigned from literature.

\* ref: Gas Producers & Suppliers Association (GPSA) Engineering Data Book

**Woodside Energy Limited**  
**Thylacine #2**  
AFL 2001-053

**COMPOSITION OF PRIMARY STAGE SEPARATOR GAS - 1.06**  
(by Programmed-Temperature, Capillary Chromatography)

| Component        | Mol %         | Plant Products (GPM) | Liquid Density (gm/cc) | MW     |
|------------------|---------------|----------------------|------------------------|--------|
| Hydrogen Sulfide | 0.00          |                      |                        |        |
| Carbon Dioxide   | 9.17          |                      | 0.8172                 | 44.010 |
| Nitrogen         | 1.38          |                      | 0.8086                 | 28.013 |
| Methane          | 80.52         |                      | 0.2997                 | 16.043 |
| Ethane           | 5.50          | 1.466                | 0.3562                 | 30.070 |
| Propane          | 1.80          | 0.494                | 0.5070                 | 44.097 |
| iso-Butane       | 0.34          | 0.111                | 0.5629                 | 58.123 |
| n-Butane         | 0.43          | 0.135                | 0.5840                 | 58.123 |
| iso-Pentane      | 0.17          | 0.062                | 0.6244                 | 72.150 |
| n-Pentane        | 0.12          | 0.043                | 0.6311                 | 72.150 |
| Hexanes          | 0.15          | 0.058                | 0.6850                 | 84.0   |
| Heptanes         | 0.22          | 0.092                | 0.7220                 | 96.0   |
| Octanes          | 0.17          | 0.077                | 0.7450                 | 107    |
| Nonanes          | 0.03          | 0.015                | 0.7640                 | 121    |
| Decanes          | Trace         |                      |                        |        |
| Undecanes        | 0.00          |                      |                        |        |
| <b>Totals</b>    | <b>100.00</b> | <b>2.553</b>         |                        |        |

**SAMPLING CONDITIONS**

166 psig  
81 °C

Gas Cylinder  
3555A

**Average Sample Properties**

Critical Pressure, psia ..... 699.6  
Critical Temperature, °R ..... 385.4  
Average Molecular Weight ..... 21.00  
Calculated Gas Gravity ( air = 1.000 ) ..... 0.725

at 14.696 psia and 60 °F

Heating Value, Btu/scf dry gas\*  
Gross ..... 1023

**Properties of Plus Fractions**

| Component     | Mol % | Liquid Density (gm/cc) | Liquid API Gravity | MW    |
|---------------|-------|------------------------|--------------------|-------|
| Heptanes plus | 0.42  | 0.725                  | 60.8               | 102.2 |

Note: Component properties assigned from literature.

\* ref: Gas Producers & Suppliers Association (GPSA) Engineering Data Book

Woodside Energy Limited  
Thylacine #2  
AFL 2001-053

COMPOSITION OF PRIMARY STAGE SEPARATOR GAS - 1.07  
(by Programmed-Temperature, Capillary Chromatography)

| Component        | Mol %  | Plant<br>Products<br>(GPM) | Liquid<br>Density<br>(gm/cc) | MW     |
|------------------|--------|----------------------------|------------------------------|--------|
| Hydrogen Sulfide | 0.00   |                            |                              |        |
| Carbon Dioxide   | 9.09   |                            | 0.8172                       | 44.010 |
| Nitrogen         | 1.33   |                            | 0.8086                       | 28.013 |
| Methane          | 80.89  |                            | 0.2997                       | 16.043 |
| Ethane           | 5.49   | 1.463                      | 0.3562                       | 30.070 |
| Propane          | 1.80   | 0.494                      | 0.5070                       | 44.097 |
| iso-Butane       | 0.34   | 0.111                      | 0.5629                       | 58.123 |
| n-Butane         | 0.41   | 0.129                      | 0.5840                       | 58.123 |
| iso-Pentane      | 0.16   | 0.058                      | 0.6244                       | 72.150 |
| n-Pentane        | 0.11   | 0.040                      | 0.6311                       | 72.150 |
| Hexanes          | 0.12   | 0.046                      | 0.6850                       | 84.0   |
| Heptanes         | 0.16   | 0.067                      | 0.7220                       | 96.0   |
| Octanes          | 0.09   | 0.041                      | 0.7450                       | 107    |
| Nonanes          | 0.01   | 0.005                      | 0.7640                       | 121    |
| Decanes          | Trace  |                            |                              |        |
| Undecanes        | Trace  |                            |                              |        |
| Totals .....     | 100.00 | 2.454                      |                              |        |

SAMPLING CONDITIONS

163 psig  
71 °C

Gas Cylinder  
03711

Average Sample Properties

Critical Pressure, psia ..... 699.8  
Critical Temperature, °R ..... 383.8  
  
Average Molecular Weight ..... 20.79  
Calculated Gas Gravity ( air = 1.000 ) ..... 0.718

at 14.696 psia and 60 °F

Heating Value, Btu/scf dry gas\*  
Gross ..... 1014

Properties of Plus Fractions

| Component     | Mol % | Liquid<br>Density<br>(gm/cc) | Liquid<br>API<br>Gravity | MW    |
|---------------|-------|------------------------------|--------------------------|-------|
| Heptanes plus | 0.26  | 0.733                        | 61.4                     | 100.8 |
| Decanes plus  |       |                              |                          |       |

Note: Component properties assigned from literature.

\* ref: Gas Producers & Suppliers Association (GPSA) Engineering Data Book

**Woodside Energy Limited**  
Thylacine #2  
AFL 2001-053

**COMPOSITION OF PRIMARY STAGE SEPARATOR GAS - 1.25**  
(by Programmed-Temperature, Capillary Chromatography)

| Component           | Mol %         | Plant Products (GPM) | Liquid Density (gm/cc) | MW     |
|---------------------|---------------|----------------------|------------------------|--------|
| Hydrogen Sulfide    | 0.00          |                      |                        |        |
| Carbon Dioxide      | 8.89          |                      | 0.8172                 | 44.010 |
| Nitrogen            | 1.23          |                      | 0.8086                 | 28.013 |
| Methane             | 84.05         |                      | 0.2997                 | 16.043 |
| Ethane              | 3.85          | 1.026                | 0.3562                 | 30.070 |
| Propane             | 1.17          | 0.321                | 0.5070                 | 44.097 |
| iso-Butane          | 0.19          | 0.062                | 0.5629                 | 58.123 |
| n-Butane            | 0.26          | 0.082                | 0.5840                 | 58.123 |
| iso-Pentane         | 0.09          | 0.033                | 0.6244                 | 72.150 |
| n-Pentane           | 0.06          | 0.022                | 0.6311                 | 72.150 |
| Hexanes             | 0.06          | 0.023                | 0.6850                 | 84.0   |
| Heptanes            | 0.09          | 0.038                | 0.7220                 | 96.0   |
| Octanes             | 0.05          | 0.023                | 0.7450                 | 107    |
| Nonanes             | 0.01          | 0.005                | 0.7640                 | 121    |
| Decanes             | Trace         |                      |                        |        |
| Undecanes           | Trace         |                      |                        |        |
| <b>Totals .....</b> | <b>100.00</b> | <b>1.635</b>         |                        |        |

**SAMPLING CONDITIONS**

369 psig  
33 °C

Gas Cylinder  
01352

**Average Sample Properties**

Critical Pressure, psia ..... 699.8  
Critical Temperature, °R ..... 375.3  
Average Molecular Weight ..... 19.99  
Calculated Gas Gravity ( air = 1.000 ) ..... 0.690

at 14.696 psia and 60 °F

**Properties of Plus Fractions**

| Component     | Mol % | Liquid Density (gm/cc) | Liquid API Gravity | MW    |
|---------------|-------|------------------------|--------------------|-------|
| Heptanes plus | 0.15  | 0.733                  | 61.4               | 101.3 |

Heating Value, Btu/scf dry gas\*

Gross ..... 978

Note: Component properties assigned from literature.

\* ref: Gas Producers & Suppliers Association (GPSA) Engineering Data Book

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Thylacine #2  
AFL 2001-053

COMPOSITION OF PRIMARY STAGE SEPARATOR GAS - 1.20

(by Programmed-Temperature, Capillary Chromatography)

COMPOSITION OF PRIMARY STAGE SEPARATOR LIQUID - 1.19

| Component        | Mol %  | Plant Products (GPM) | Liquid Density (gm/cc) | MW     |
|------------------|--------|----------------------|------------------------|--------|
| Hydrogen Sulfide | 0.00   |                      |                        |        |
| Carbon Dioxide   | 8.87   |                      | 0.8172                 | 44.010 |
| Nitrogen         | 1.40   |                      | 0.8086                 | 28.013 |
| Methane          | 83.84  |                      | 0.2997                 | 16.043 |
| Ethane           | 3.82   | 1.018                | 0.3562                 | 30.070 |
| Propane          | 1.17   | 0.321                | 0.5070                 | 44.097 |
| iso-Butane       | 0.20   | 0.065                | 0.5629                 | 58.123 |
| n-Butane         | 0.26   | 0.082                | 0.5840                 | 58.123 |
| iso-Pentane      | 0.09   | 0.033                | 0.6244                 | 72.150 |
| n-Pentane        | 0.07   | 0.025                | 0.6311                 | 72.150 |
| Hexanes          | 0.08   | 0.031                | 0.6850                 | 84.0   |
| Heptanes         | 0.12   | 0.050                | 0.7220                 | 96.0   |
| Octanes          | 0.07   | 0.032                | 0.7450                 | 107    |
| Nonanes          | 0.01   | 0.005                | 0.7640                 | 121    |
| Decanes          | 0.00   |                      |                        |        |
| Undecanes        | 0.00   |                      |                        |        |
| Totals .....     | 100.00 | 1.662                |                        |        |

SAMPLING CONDITIONS

369 psig

31 °C

Gas Cylinder

4345A

Average Sample Properties

Critical Pressure, psia ..... 699.3

Critical Temperature, °R ..... 375.6

Average Molecular Weight ..... 20.06

Calculated Gas Gravity ( air = 1.000 ) ..... 0.693

at 14.696 psia and 60 °F

Properties of Plus Fractions

| Component     | Mol % | Liquid Density (gm/cc) | Liquid API Gravity | MW    |
|---------------|-------|------------------------|--------------------|-------|
| Heptanes plus | 0.20  | 0.7328                 | 61.4               | 101.1 |

Heating Value, Btu/scf dry gas\*

Gross ..... 980

Note: Component properties assigned from literature.

\* ref: Gas Producers & Suppliers Association (GPSA) Engineering Data Book



## Woodside Energy Limited

Thylacine #2

AFL 2001-053

## WELLSTREAM RECOMBINATION CALCULATION

(Report on Well Production Data)

## COMPOSITION OF PRIMARY STAGE SEPARATOR LIQUID - 1.19

(by Flash/Extended Chromatography)

| Component        | Mol %  | Wt %   | Liquid Density (gm/cc) | MW     |
|------------------|--------|--------|------------------------|--------|
| Hydrogen Sulfide | 0.00   | 0.00   |                        |        |
| Carbon Dioxide   | 2.28   | 0.87   | 0.8172                 | 44.010 |
| Nitrogen         | 0.04   | 0.01   | 0.8086                 | 28.013 |
| Methane          | 8.80   | 1.23   | 0.2997                 | 16.043 |
| Ethane           | 2.15   | 0.56   | 0.3562                 | 30.070 |
| Propane          | 2.00   | 0.77   | 0.5070                 | 44.097 |
| iso-Butane       | 0.72   | 0.36   | 0.5629                 | 58.123 |
| n-Butane         | 1.39   | 0.70   | 0.5840                 | 58.123 |
| iso-Pentane      | 1.14   | 0.72   | 0.6244                 | 72.150 |
| n-Pentane        | 1.12   | 0.70   | 0.6311                 | 72.150 |
| Hexanes          | 3.00   | 2.19   | 0.6850                 | 84.0   |
| Heptanes         | 11.24  | 9.38   | 0.7220                 | 96.0   |
| Octanes          | 21.93  | 20.41  | 0.7450                 | 107    |
| Nonanes          | 13.76  | 14.48  | 0.7640                 | 121    |
| Decanes          | 7.57   | 8.82   | 0.7780                 | 134    |
| Undecanes        | 4.43   | 5.68   | 0.7890                 | 147    |
| Dodecanes plus   | 18.43  | 33.13  | 0.8320                 | 207    |
| Totals .....     | 100.00 | 100.00 |                        |        |

## SAMPLING CONDITIONS

369 psig

31 °C

Liquid Cylinder

6802-MA

## Average Sample Properties

Average Molecular Weight ..... 114.99

Calculated Density at 0 psig and 60 °F ..... 0.7505

## Properties of Plus Fractions

| Plus Fraction  | Mol%  | Wt%   | Liquid Density (gm/cc) | Liquid API Gravity | MW  |
|----------------|-------|-------|------------------------|--------------------|-----|
| Heptanes plus  | 77.36 | 91.88 | 0.7808                 | 49.5               | 137 |
| Decanes plus   | 30.43 | 47.61 | 0.8162                 | 41.7               | 180 |
| Dodecanes plus | 18.43 | 33.13 | 0.8320                 | 38.4               | 207 |

# Woodside Energy Limited

Thylacine #2

AFL 2001-053

## WELLSTREAM RECOMBINATION CALCULATION

(based on field production data)

### COMPOSITION OF RECOMBINED WELLSTREAM

#### Conditions for Recombination Calculations

Primary Stage at 369 psig and 68 °F

Stock Tank at 0 psig and 60 °F

#### Field Gas Rate Correction Factors -

|   |        |
|---|--------|
| Gas Gravity (air=1.000) .....           | **     |
| Gas Gravity Factor, Fg .....            | **     |
| Gas Deviation Factor, Z .....           | **     |
| Super Compressibility Factor, Fpv ..... | **     |
| Pressure Base, psia .....               | 14.696 |

#### Laboratory Gas Rate Correction Factors -

|  |        |
|--|--------|
| Gas Gravity (air=1.000) .....                        | 0.693  |
| Gas Gravity Factor, Fg (not applied) .....           | 1.2015 |
| Gas Deviation Factor*, Z .....                       | 0.942  |
| Supercompressibility Factor, Fpv (not applied) ..... | 1.0301 |
| Pressure Base, psia .....                            | 14.696 |

#### Laboratory Liquid Rate Correction Factors -

|  |        |
|--|--------|
| Liquid Volume Factor, S*bb/STbbl @ 60 °F ..... | 1.0689 |
| Bitumen, Sediment & Water (BS&W) Factor .....  | 1.000  |

#### Field Measured Rates and Ratios -

|   |        |
|---|--------|
| Primary Stage Gas Flow Rate, Mscf/D ..... | **     |
| Stock Tank Liquid Flow Rate, bbl/D .....  | **     |
| Field Gas / Oil Ratio, scf/STbbl .....    | 333333 |

#### Recombination Rates and Ratios -

|   |        |
|---|--------|
| Primary Stage Gas Flow Rate, Mscf/D .....       | **     |
| Primary Stage Liquid Flow Rate, bbl/D .....     | **     |
| Primary Stage Gas / Oil Ratio, scf/S*bbbl ..... | 311847 |
| Stock Tank Liquid Flow Rate, bbl/D .....        | **     |
| Corrected Gas / Oil Ratio, scf/STbbl .....      | 333333 |

#### Wellstream Recombination Ratio

|               |          |
|---------------|----------|
| mol/mol ..... | 360.0373 |
|---------------|----------|

\* From: Standing, M.B., "Volumetric and Phase Behavior of Oil Field Hydrocarbon Systems", SPE (Dallas), 1977, 8th Edition, Appendix II.

\*\* Data not supplied to Core Laboratories

Woodside Energy Limited  
Thylacine #2  
AFL 2001-053

COMPOSITION OF PRIMARY STAGE SEPARATOR GAS - 1.22

COMPOSITION OF RECOMBINED WELLSTREAM

(from calculated recombination of separator products)

| Component        | Mol %  | Plant Products (GPM) | Liquid Density (gm/cc) | MW     |
|------------------|--------|----------------------|------------------------|--------|
| Hydrogen Sulfide | 0.00   |                      |                        |        |
| Carbon Dioxide   | 8.85   |                      | 0.8172                 | 44.010 |
| Nitrogen         | 1.40   |                      | 0.8086                 | 28.013 |
| Methane          | 83.64  |                      | 0.2997                 | 16.043 |
| Ethane           | 3.82   | 1.017                | 0.3562                 | 30.070 |
| Propane          | 1.17   | 0.322                | 0.5070                 | 44.097 |
| iso-Butane       | 0.20   | 0.066                | 0.5629                 | 58.123 |
| n-Butane         | 0.26   | 0.083                | 0.5840                 | 58.123 |
| iso-Pentane      | 0.09   | 0.034                | 0.6244                 | 72.150 |
| n-Pentane        | 0.07   | 0.026                | 0.6311                 | 72.150 |
| Hexanes          | 0.09   | 0.034                | 0.6850                 | 84.0   |
| Heptanes         | 0.15   | 0.063                | 0.7220                 | 96.0   |
| Octanes          | 0.13   | 0.059                | 0.7450                 | 107    |
| Nonanes          | 0.05   | 0.024                | 0.7640                 | 121    |
| Decanes          | 0.02   | 0.011                | 0.7780                 | 134    |
| Undecanes        | 0.01   | 0.007                | 0.7890                 | 147    |
| Dodecanes plus   | 0.05   | 0.040                | 0.8320                 | 207    |
| Totals .....     | 100.00 | 1.787                |                        |        |

RECOMBINATION CONDITIONS

369 psig  
31 °C

Recombination Parameters

Primary Stage Gas / Oil Ratio, scf/S'bbbl  
at recombination conditions ..... 311847  
Wellstream Recombination Ratio  
moles gas / mole liquid ..... 350.0373

Average Wellstream Properties

Average Molecular Weight ..... 20.3  
Gas Gravity (air = 1.000) ..... 0.701

Properties of Plus Fractions

| Plus Fraction  | Mol% | Plant Products (GPM) | Liquid Density (gm/cc) | Liquid API Gravity | MW  |
|----------------|------|----------------------|------------------------|--------------------|-----|
| Heptanes plus  | 0.41 | 0.205                | 0.7601                 | 54.5               | 119 |
| Decanes plus   | 0.08 | 0.059                | 0.8162                 | 41.7               | 180 |
| Dodecanes plus | 0.05 | 0.040                | 0.8320                 | 38.4               | 207 |

Woodside Energy Limited  
Thylacine #2  
AFL 2001-053

COMPOSITION OF PRIMARY STAGE SEPARATOR GAS - 1.22

(by Programmed-Temperature, Capillary Chromatography)

| Component        | Mol %  | Plant Products (GPM) | Liquid Density (gm/cc) | MW     |
|------------------|--------|----------------------|------------------------|--------|
| Hydrogen Sulfide | 0.00   |                      |                        |        |
| Carbon Dioxide   | 8.80   |                      | 0.8172                 | 44.010 |
| Nitrogen         | 1.49   |                      | 0.8086                 | 28.013 |
| Methane          | 83.93  |                      | 0.2997                 | 16.043 |
| Ethane           | 3.81   | 1.016                | 0.3562                 | 30.070 |
| Propane          | 1.15   | 0.316                | 0.5070                 | 44.097 |
| iso-Butane       | 0.19   | 0.062                | 0.5629                 | 58.123 |
| n-Butane         | 0.25   | 0.079                | 0.5840                 | 58.123 |
| iso-Pentane      | 0.09   | 0.033                | 0.6244                 | 72.150 |
| n-Pentane        | 0.07   | 0.025                | 0.6311                 | 72.150 |
| Hexanes          | 0.07   | 0.027                | 0.6850                 | 84.0   |
| Heptanes         | 0.10   | 0.042                | 0.7220                 | 96.0   |
| Octanes          | 0.05   | 0.023                | 0.7450                 | 107    |
| Nonanes          | 0.00   |                      |                        |        |
| Decanes          | 0.00   |                      |                        |        |
| Undecanes        | 0.00   |                      |                        |        |
| Totals .....     | 100.00 | 1.623                |                        |        |

SAMPLING CONDITIONS

369 psig

32 °C

Gas Cylinder

4281A

Average Sample Properties

Critical Pressure, psia ..... 699.0

Critical Temperature, °R ..... 374.8

Average Molecular Weight ..... 19.99

Calculated Gas Gravity (air = 1.000) ..... 0.690

at 14,696 psia and 60 °F

Heating Value, Btu/scf dry gas\*

Gross ..... 976

Properties of Plus Fractions

| Component     | Mol % | Liquid Density (gm/cc) | Liquid API Gravity | MW   |
|---------------|-------|------------------------|--------------------|------|
| Heptanes plus | 0.15  | 0.7301                 | 62.1               | 99.7 |

Note: Component properties assigned from literature.

\* ref: Gas Producers & Suppliers Association (GPSA) Engineering Data Book



# Woodside Energy Limited

Thylacine #2

AFL 2001-053

## WELLSTREAM RECOMBINATION CALCULATION

(Based on full composition analysis)

### COMPOSITION OF PRIMARY STAGE SEPARATOR LIQUID - 1.21

(by Flash/Extended Chromatography)

| Component        | Mol %  | Wt %   | Liquid Density (gm/cc) | MW     |
|------------------|--------|--------|------------------------|--------|
| Hydrogen Sulfide | 0.00   | 0.00   |                        |        |
| Carbon Dioxide   | 2.19   | 0.83   | 0.8172                 | 44.010 |
| Nitrogen         | 0.03   | 0.01   | 0.8086                 | 28.013 |
| Methane          | 8.57   | 1.19   | 0.2997                 | 16.043 |
| Ethane           | 2.05   | 0.53   | 0.3562                 | 30.070 |
| Propane          | 1.90   | 0.72   | 0.5070                 | 44.097 |
| iso-Butane       | 0.70   | 0.35   | 0.5629                 | 58.123 |
| n-Butane         | 1.34   | 0.67   | 0.5840                 | 58.123 |
| iso-Pentane      | 1.11   | 0.69   | 0.6244                 | 72.150 |
| n-Pentane        | 1.09   | 0.68   | 0.6311                 | 72.150 |
| Hexanes          | 2.98   | 2.16   | 0.6850                 | 84.0   |
| Heptanes         | 11.23  | 9.30   | 0.7220                 | 96.0   |
| Octanes          | 21.89  | 20.21  | 0.7450                 | 107    |
| Nonanes          | 13.92  | 14.53  | 0.7640                 | 121    |
| Decanes          | 7.66   | 8.85   | 0.7780                 | 134    |
| Undecanes        | 4.51   | 5.72   | 0.7890                 | 147    |
| Dodecanes plus   | 18.83  | 33.56  | 0.8319                 | 207    |
| Totals .....     | 100.00 | 100.00 |                        |        |

### SAMPLING CONDITIONS

369 psig

32 °C

Liquid Cylinder

6097-MA

### Average Sample Properties

Average Molecular Weight ..... 115.92

Calculated Density at 0 psig and 60 °F ..... 0.7519

### Properties of Plus Fractions

| Plus Fraction  | Mol%  | Wt%   | Liquid Density (gm/cc) | Liquid API Gravity | MW  |
|----------------|-------|-------|------------------------|--------------------|-----|
| Heptanes plus  | 78.04 | 92.17 | 0.7811                 | 49.5               | 137 |
| Decanes plus   | 31.00 | 48.13 | 0.8162                 | 41.7               | 180 |
| Dodecanes plus | 18.83 | 33.56 | 0.8319                 | 38.4               | 207 |



Woodside Energy Limited  
Thylacine #2  
AFL 2001-053

WELLSTREAM RECOMBINATION CALCULATION

(based on field production data)

COMPOSITION OF RECOMBINED WELLSTREAM

Conditions for Recombination Calculations

Primary Stage at 369 psig and 68 °F  
Stock Tank at 0 psig and 60 °F

| Component  | Mole % | Phase  | Density | API      |
|--|--------|--------|---------|----------|
| Gas  | 0.97   | Gas    | 0.6172  | 4.0330   |
| Liquid   | 0.03   | Liquid | 0.6336  | 0.0000   |
| <b>Field Gas Rate Correction Factors -</b>           |        |        |         |          |
| Gas Gravity (air=1.000)                              | 0.73   |        | 0.6336  | 15.03    |
| Gas Gravity Factor, Fg                               |        |        | 0.6336  | 15.03    |
| Gas Deviation Factor, Z                              | 0.73   | 0.002  | 0.6336  | 15.03    |
| Super Compressibility Factor, Fpv                    |        |        |         |          |
| Pressure Base, psia                                  |        |        | 14.696  |          |
| <b>Laboratory Gas Rate Correction Factors -</b>      |        |        |         |          |
| Gas Gravity (air=1.000)                              |        |        | 0.690   |          |
| Gas Gravity Factor, Fg (not applied)                 |        |        | 1.2038  |          |
| Gas Deviation Factor*, Z                             |        |        | 0.943   |          |
| Supercompressibility Factor, Fpv (not applied)       |        |        | 1.0299  |          |
| Pressure Base, psia                                  |        |        | 14.696  |          |
| <b>Laboratory Liquid Rate Correction Factors -</b>   |        |        |         |          |
| Liquid Volume Factor, S <sup>bb</sup> /STbbl @ 60 °F |        |        | 1.0673  |          |
| Bitumen, Sediment & Water (BS&W) Factor              |        |        | 1.000   |          |
| <b>Field Measured Rates and Ratios -</b>             |        |        |         |          |
| Primary Stage Gas Flow Rate, Mscf/D                  |        |        |         | **       |
| Stock Tank Liquid Flow Rate, bbl/D                   |        |        |         | **       |
| Field Gas / Oil Ratio, scf/STbbl                     |        |        |         | 333333   |
| <b>Recombination Rates and Ratios -</b>              |        |        |         |          |
| Primary Stage Gas Flow Rate, Mscf/D                  |        |        |         | **       |
| Primary Stage Liquid Flow Rate, bbl/D                |        |        |         | **       |
| Primary Stage Gas / Oil Ratio, scf/STbbl             |        |        |         | 312324   |
| Stock Tank Liquid Flow Rate, bbl/D                   |        |        |         | **       |
| Corrected Gas / Oil Ratio, scf/STbbl                 |        |        |         | 333333   |
| <b>Wellstream Recombination Ratio</b>                |        |        |         |          |
| mol/mol  |        |        |         | 362.8297 |

\* From: Standing, M.B., "Volumetric and Phase Behavior of Oil Field Hydrocarbon Systems", SPE (Dallas), 1977, 8th Edition, Appendix II.

\*\* Data not supplied to Core Laboratories

# Woodside Energy Limited

Thylacine #2

AFL 2001-053

## COMPOSITION OF PRIMARY STAGE SEPARATOR GAS - 1.24

(By Recombination / Comparative Gas-Liquid Chromatography)

## COMPOSITION OF RECOMBINED WELLSTREAM

(from calculated recombination of separator products)

| Component        | Mol %  | Plant Products (GPM) | Liquid Density (gm/cc) | MW     |
|------------------|--------|----------------------|------------------------|--------|
| Hydrogen Sulfide | 0.00   |                      |                        |        |
| Carbon Dioxide   | 8.78   |                      | 0.8172                 | 44.010 |
| Nitrogen         | 1.49   |                      | 0.8086                 | 28.013 |
| Methane          | 83.73  |                      | 0.2997                 | 16.043 |
| Ethane           | 3.81   | 1.014                | 0.3562                 | 30.070 |
| Propane          | 1.15   | 0.316                | 0.5070                 | 44.097 |
| iso-Butane       | 0.19   | 0.062                | 0.5629                 | 58.123 |
| n-Butane         | 0.25   | 0.080                | 0.5840                 | 58.123 |
| iso-Pentane      | 0.09   | 0.034                | 0.6244                 | 72.150 |
| n-Pentane        | 0.07   | 0.026                | 0.6311                 | 72.150 |
| Hexanes          | 0.08   | 0.030                | 0.6850                 | 84.0   |
| Heptanes         | 0.13   | 0.055                | 0.7220                 | 96.0   |
| Octanes          | 0.11   | 0.050                | 0.7450                 | 107    |
| Nonanes          | 0.04   | 0.019                | 0.7640                 | 121    |
| Decanes          | 0.02   | 0.011                | 0.7780                 | 134    |
| Undecanes        | 0.01   | 0.007                | 0.7890                 | 147    |
| Dodecanes plus   | 0.05   | 0.041                | 0.8319                 | 207    |
| Totals .....     | 100.00 | 1.746                |                        |        |

## SAMPLING CONDITIONS

## RECOMBINATION CONDITIONS

369 psig

32 °C

## Recombination Parameters

Primary Stage Gas / Oil Ratio, scf/S'bbl  
at recombination conditions ..... 312324  
Wellstream Recombination Ratio  
moles gas / mole liquid ..... 362.8297

## Average Wellstream Properties

Average Molecular Weight ..... 20.2  
Gas Gravity (air = 1.000) ..... 0.697

## Properties of Plus Fractions

| Plus Fraction  | Mol% | Plant Products (GPM) | Liquid Density (gm/cc) | Liquid API Gravity | MW  |
|----------------|------|----------------------|------------------------|--------------------|-----|
| Heptanes plus  | 0.36 | 0.183                | 0.7625                 | 53.9               | 121 |
| Decanes plus   | 0.08 | 0.059                | 0.8152                 | 41.7               | 180 |
| Dodecanes plus | 0.05 | 0.041                | 0.8319                 | 38.4               | 207 |

# Woodside Energy Limited

Thylacine #2

AFL 2001-053

## COMPOSITION OF PRIMARY STAGE SEPARATOR GAS - 1.24

(by Programmed-Temperature, Capillary Chromatography)

| Component        | Mol %  | Plant Products (GPM) | Liquid Density (gm/cc) | MW     |
|------------------|--------|----------------------|------------------------|--------|
| Hydrogen Sulfide | 0.00   |                      |                        |        |
| Carbon Dioxide   | 8.88   |                      | 0.8172                 | 44.010 |
| Nitrogen         | 1.24   |                      | 0.8086                 | 28.013 |
| Methane          | 83.97  |                      | 0.2997                 | 16.043 |
| Ethane           | 3.83   | 1.021                | 0.3562                 | 30.070 |
| Propane          | 1.11   | 0.305                | 0.5070                 | 44.097 |
| iso-Butane       | 0.19   | 0.062                | 0.5629                 | 58.123 |
| n-Butane         | 0.25   | 0.079                | 0.5840                 | 58.123 |
| iso-Pentane      | 0.09   | 0.033                | 0.6244                 | 72.150 |
| n-Pentane        | 0.06   | 0.022                | 0.6311                 | 72.150 |
| Hexanes          | 0.07   | 0.027                | 0.6850                 | 84.0   |
| Heptanes         | 0.11   | 0.046                | 0.7220                 | 96.0   |
| Octanes          | 0.13   | 0.059                | 0.7450                 | 107    |
| Nonanes          | 0.06   | 0.030                | 0.7640                 | 121    |
| Decanes          | 0.01   | 0.005                | 0.7780                 | 134    |
| Undecanes        | 0.00   |                      |                        |        |
| Totals           | 100.00 | 1.689                |                        |        |

### SAMPLING CONDITIONS

369 psig

33 °C

Gas Cylinder

3256A

### Average Sample Properties

Critical Pressure, psia ..... 699.3

Critical Temperature, °R ..... 376.2

Average Molecular Weight ..... 20.12

Calculated Gas Gravity ( air = 1.000 ) ..... 0.695

at 14.696 psia and 60 °F

Heating Value, Btu/scf dry gas\*

Gross ..... 985

### Properties of Plus Fractions

| Component     | Mol % | Liquid Density (gm/cc) | Liquid API Gravity | MW    |
|---------------|-------|------------------------|--------------------|-------|
| Heptanes plus | 0.31  | 0.7428                 | 58.8               | 106.7 |
| Decanes plus  | 0.01  | 0.7780                 | 50.2               | 134.0 |

Note: Component properties assigned from literature.

\* ref: Gas Producers & Suppliers Association (GPSA) Engineering Data Book

Woodside Energy Limited  
Thylacine #2  
AFL 2001-053

WELLSTREAM RECOMBINATION CALCULATION

COMPOSITION OF PRIMARY STAGE SEPARATOR LIQUID - 1.23

(by Flash/Extended Chromatography)

| Component        | Mol %  | Wt %   | Liquid Density (gm/cc) | MW     |
|------------------|--------|--------|------------------------|--------|
| Hydrogen Sulfide | 0.00   | 0.00   |                        |        |
| Carbon Dioxide   | 2.21   | 0.84   | 0.8172                 | 44.010 |
| Nitrogen         | 0.04   | 0.01   | 0.8086                 | 28.013 |
| Methane          | 8.74   | 1.21   | 0.2997                 | 16.043 |
| Ethane           | 2.07   | 0.54   | 0.3562                 | 30.070 |
| Propane          | 1.93   | 0.73   | 0.5070                 | 44.097 |
| iso-Butane       | 0.69   | 0.35   | 0.5629                 | 58.123 |
| n-Butane         | 1.33   | 0.67   | 0.5840                 | 58.123 |
| iso-Pentane      | 1.11   | 0.69   | 0.6244                 | 72.150 |
| n-Pentane        | 1.08   | 0.67   | 0.6311                 | 72.150 |
| Hexanes          | 2.91   | 2.11   | 0.6850                 | 84.0   |
| Heptanes         | 11.02  | 9.14   | 0.7220                 | 96.0   |
| Octanes          | 21.88  | 20.22  | 0.7450                 | 107    |
| Nonanes          | 14.03  | 14.68  | 0.7640                 | 121    |
| Decanes          | 7.60   | 8.79   | 0.7780                 | 134    |
| Undecanes        | 4.51   | 5.73   | 0.7890                 | 147    |
| Dodecanes plus   | 18.85  | 33.65  | 0.8320                 | 207    |
| Totals .....     | 100.00 | 100.00 |                        |        |

SAMPLING CONDITIONS

369 psig  
33 °C

Liquid Cylinder  
5960-MA

Average Sample Properties

Average Molecular Weight ..... 115.80  
Calculated Density at 0 psig and 60 °F ..... 0.7517

Properties of Plus Fractions

| Plus Fraction  | Mol%  | Wt%   | Liquid Density (gm/cc) | Liquid API Gravity | MW  |
|----------------|-------|-------|------------------------|--------------------|-----|
| Heptanes plus  | 77.89 | 92.19 | 0.7813                 | 49.4               | 137 |
| Decanes plus   | 30.96 | 48.17 | 0.8164                 | 41.7               | 180 |
| Dodecanes plus | 18.85 | 33.65 | 0.8320                 | 38.4               | 207 |



Woodside Energy Limited  
Thylacine #2  
AFL 2001-053

WELLSTREAM RECOMBINATION CALCULATION

(based on field production data)

COMPOSITION OF RECOMBINED WELLSTREAM

Conditions for Recombination Calculations

Primary Stage at 369 psig and 68 °F  
Stock Tank at 0 psig and 60 °F

Field Gas Rate Correction Factors -

|   |        |
|---|--------|
| Gas Gravity (air=1.000) .....           | **     |
| Gas Gravity Factor, Fg .....            | **     |
| Gas Deviation Factor, Z .....           | **     |
| Super Compressibility Factor, Fpv ..... | **     |
| Pressure Base, psia .....               | 14.696 |

Laboratory Gas Rate Correction Factors -

|  |        |
|--|--------|
| Gas Gravity (air=1.000) .....                        | 0.695  |
| Gas Gravity Factor, Fg (not applied) .....           | 1.1998 |
| Gas Deviation Factor*, Z .....                       | 0.942  |
| Supercompressibility Factor, Fpv (not applied) ..... | 1.0303 |
| Pressure Base, psia .....                            | 14.696 |

Laboratory Liquid Rate Correction Factors -

|  |        |
|--|--------|
| Liquid Volume Factor, S'bb/STbbl @ 60 °F ..... | 1.0587 |
| Bitumen, Sediment & Water (BS&W) Factor .....  | 1.000  |

Field Measured Rates and Ratios -

|   |        |
|---|--------|
| Primary Stage Gas Flow Rate, Mscf/D ..... | **     |
| Stock Tank Liquid Flow Rate, bbl/D .....  | **     |
| Field Gas / Oil Ratio, scf/STbbl .....    | 333333 |

Recombination Rates and Ratios -

|  |        |
|--|--------|
| Primary Stage Gas Flow Rate, Mscf/D .....      | **     |
| Primary Stage Liquid Flow Rate, bbl/D .....    | **     |
| Primary Stage Gas / Oil Ratio, scf/S'bbl ..... | 314859 |
| Stock Tank Liquid Flow Rate, bbl/D .....       | **     |
| Corrected Gas / Oil Ratio, scf/STbbl .....     | 333333 |

Wellstream Recombination Ratio  
mol/mol .....

365.4782

\* From: Standing, M.B., "Volumetric and Phase Behavior of Oil Field Hydrocarbon Systems", SPE (Dallas), 1977, 8th Edition, Appendix II.

\*\* Data not supplied to Core Laboratories



# Woodside Energy Limited

Thylacine #2

AFL 2001-053

## PRESSURE-VOLUME RELATIONS

### COMPOSITION OF RECOMBINED WELLSTREAM

(from calculated recombination of separator products)

| Component        | Mol %  | Plant Products (GPM) | Liquid Density (gm/cc) | MW     |
|------------------|--------|----------------------|------------------------|--------|
| Hydrogen Sulfide | 0.00   |                      |                        |        |
| Carbon Dioxide   | 8.86   |                      | 0.8172                 | 44.010 |
| Nitrogen         | 1.24   |                      | 0.8086                 | 28.013 |
| Methane          | 83.77  |                      | 0.2997                 | 16.043 |
| Ethane           | 3.83   | 1.020                | 0.3562                 | 30.070 |
| Propane          | 1.11   | 0.305                | 0.5070                 | 44.097 |
| iso-Butane       | 0.19   | 0.062                | 0.5629                 | 58.123 |
| n-Butane         | 0.25   | 0.079                | 0.5840                 | 58.123 |
| iso-Pentane      | 0.09   | 0.034                | 0.6244                 | 72.150 |
| n-Pentane        | 0.06   | 0.023                | 0.6311                 | 72.150 |
| Hexanes          | 0.08   | 0.030                | 0.6850                 | 84.0   |
| Heptanes         | 0.14   | 0.059                | 0.7220                 | 96.0   |
| Octanes          | 0.19   | 0.086                | 0.7450                 | 107    |
| Nonanes          | 0.10   | 0.049                | 0.7640                 | 121    |
| Decanes          | 0.03   | 0.017                | 0.7780                 | 134    |
| Undecanes        | 0.01   | 0.007                | 0.7890                 | 147    |
| Dodecanes plus   | 0.05   | 0.040                | 0.8320                 | 207    |
| Totals           | 100.00 | 1.811                |                        |        |

### RECOMBINATION CONDITIONS

369 psig

33 °C

### Recombination Parameters

Primary Stage Gas / Oil Ratio, scf/S'bbbl  
at recombination conditions ..... 314859  
Wellstream Recombination Ratio  
moles gas / mole liquid ..... 365.4782

### Average Wellstream Properties

Average Molecular Weight ..... 20.4  
Gas Gravity (air = 1.000) ..... 0.704

### Properties of Plus Fractions

| Plus Fraction  | Mol% | Plant Products (GPM) | Liquid Density (gm/cc) | Liquid API Gravity | MW  |
|----------------|------|----------------------|------------------------|--------------------|-----|
| Heptanes plus  | 0.52 | 0.258                | 0.7599                 | 54.5               | 119 |
| Decanes plus   | 0.09 | 0.064                | 0.8135                 | 42.3               | 176 |
| Dodecanes plus | 0.05 | 0.040                | 0.8320                 | 38.4               | 207 |

Woodside Energy Limited

Thylacine #2

AFL 2001-053

PRESSURE-VOLUME RELATIONS

(at 114 °C)

| Pressure<br>psig | Relative<br>Volume<br>(A) | Liquid Volume<br>Percent<br>(B) | Deviation Factor<br>Z |
|------------------|---------------------------|---------------------------------|-----------------------|
| 6000             | 0.4557                    |                                 | 1.062                 |
| 5500             | 0.4817                    |                                 | 1.029                 |
| 5000             | 0.5136                    |                                 | 0.998                 |
| 4500             | 0.5542                    |                                 | 0.969                 |
| 4000             | 0.6075                    |                                 | 0.945                 |
| 3600             | 0.6634                    |                                 | 0.929                 |
| 3200             | 0.7360                    |                                 | 0.916                 |
| 3000             | 0.7808                    |                                 | 0.912                 |
| 2800             | 0.8328                    |                                 | 0.908                 |
| 2700             | 0.8620                    |                                 | 0.906                 |
| 2600             | 0.8937                    |                                 | 0.905                 |
| 2500             | 0.9283                    |                                 | 0.904                 |
| 2400             | 0.9663                    |                                 | 0.904                 |
| 2320             | 1.0000                    | 0.00                            | 0.904                 |
| 2200             | 1.0544                    | 0.00                            |                       |
| 2100             | 1.1048                    | 0.00                            |                       |
| 2000             | 1.1605                    | 0.00                            |                       |
| 1900             | 1.2224                    | 0.00                            |                       |
| 1700             | 1.3690                    | 0.00                            |                       |
| 1536             | 1.5186                    | 0.00                            |                       |
| 1394             | 1.6772                    | 0.00                            |                       |
| 1184             | 1.9826                    | 0.00                            |                       |
| 1023             | 2.3022                    | 0.00                            |                       |
| 906              | 2.6057                    | 0.00                            |                       |
| 807              | 2.9306                    | 0.00                            |                       |
| 666              | 3.5579                    | 0.00                            |                       |

Note : Liquid volume percent of 0.00 indicates less than 0.005%

(A) Relative Volume: V/Vsat or volume at indicated pressure per volume at saturation pressure.

(B) Percent of the total volume of gas and liquid at the indicated pressure and 114 °C

Woodside Energy Limited  
Thylacine #2  
AFL 2001-053

MISCELLANEOUS COMPOSITIONAL ANALYSES

Aromatic Content of Recombination Samples (6802-MA and 4345A)

| Component     | Flash Gas<br>Mol % | Flash Liquid<br>Mol % | Separator Liquid<br>Mol % | Separator Gas<br>Mol % | Wellstream<br>Mol % |
|---------------|--------------------|-----------------------|---------------------------|------------------------|---------------------|
| Benzene       | 0.965              | 2.471                 | 2.190                     | 0.026                  | 0.032               |
| Toluene       | 1.170              | 14.632                | 12.118                    | 0.021                  | 0.055               |
| Ethyl Benzene | 0.028              | 1.695                 | 1.384                     | 0.000                  | 0.004               |
| Xylenes       | 0.181              | 10.570                | 8.630                     | 0.001                  | 0.025               |

Hydrogen & Helium in Recombined Sample (6802-MA and 4345A)

| Component | Wellstream<br>Mol % |
|-----------|---------------------|
| Hydrogen  | <0.01               |
| Helium    | 0.02                |

Sulphur Compounds in Gas Samples Zone 1 (Cyl 03711) and Zone 2 (Cyl 01352)

| Component        | Cyl 03711<br>ppm v/v | Cyl 01352<br>ppm v/v | Combined<br>ppm v/v |
|------------------|----------------------|----------------------|---------------------|
| H <sub>2</sub> S | -                    | -                    | <1                  |
| Mercaptans       | -                    | -                    | <1                  |
| Total Sulphur    | <0.7                 | <0.7                 | -                   |

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ROUTINE WATER ANALYSIS

| Sample                        | 1.09   | 1.17  | 1.18  | 1.26  |
|-------------------------------|--------|-------|-------|-------|
| Dissolved Constituent         | mg/L   | mg/L  | mg/L  | mg/L  |
| <b>Ions</b>                   |        |       |       |       |
| Calcium, Ca                   | 600    | 74    | 75    | 64    |
| Magnesium, Mg                 | 140    | 24    | 24    | 26    |
| Iron, Fe (soluble)            | 390.0  | 13.0  | 21.0  | 1.4   |
| Sodium, Na                    | 8000   | 450   | 440   | 500   |
| Potassium, K                  | 49000  | 3300  | 3300  | 3500  |
| Strontium, Sr                 | 24     | 1.2   | 1.1   | 0.9   |
| Barium, Ba                    | 4.7    | 5.2   | 3.8   | 0.4   |
| Chloride, Cl                  | 60000  | 4100  | 4000  | 4200  |
| Sulphate, SO <sub>4</sub>     | 820    | <20   | <20   | 55    |
| Bicarbonate, HCO <sub>3</sub> | 1700   | 310   | 350   | 340   |
| Carbonate, CO <sub>3</sub>    | <1     | <1    | <1    | <1    |
| Hydroxide, OH                 | <1     | <1    | <1    | <1    |
| <b>Other Properties</b>       |        |       |       |       |
| pH                            | 7.4    | 5.0   | 5.3   | 7.8   |
| Resistivity, ohm-m @ 25 °C    | 0.06   | 0.75  | 0.77  | 0.68  |
| Total Dissolved Solids (grav) | 130000 | 9300  | 8100  | 7900  |
| Density, gm/cc @ 20 °C        | 1.082  | 1.005 | 1.005 | 1.005 |

# Woodside Energy Limited

Thylacine #2

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## HIGH TEMPERATURE DISTILLATION OF HEXANES PLUS FRACTION ( Condensate flashed from Cylinder 6802-MA )

| Component<br>Cut Fraction | Cut Temp<br>°C | Mol<br>Percent | Weight<br>Percent | Volume<br>Percent | Density<br>gm/cc<br>@60°F | °API<br>@ 60°F | Molecular<br>Weight |
|---------------------------|----------------|----------------|-------------------|-------------------|---------------------------|----------------|---------------------|
|                           | IBP            | 36             |                   |                   |                           |                |                     |
| Hexanes                   | 69             | 4.43           | 2.86              | 3.36              | 0.6978                    | 71.1           | 82                  |
| Heptanes                  | 99             | 16.00          | 11.26             | 12.10             | 0.7612                    | 54.2           | 90                  |
| Octanes                   | 126            | 25.72          | 20.05             | 20.72             | 0.7920                    | 47.0           | 99                  |
| Nonanes                   | 151            | 16.86          | 14.61             | 14.67             | 0.8149                    | 42.0           | 111                 |
| Decanes                   | 174            | 10.17          | 10.18             | 10.30             | 0.8083                    | 43.4           | 128                 |
| Undecanes                 | 197            | 7.61           | 9.04              | 8.79              | 0.8412                    | 36.6           | 151                 |
| Dodecanes plus            | 197            | 19.21          | 32.00             | 30.06             | 0.8709                    | 30.8           | 212                 |
|                           |                | 100.00         | 100.00            | 100.00            |                           |                |                     |



Woodside Energy Limited

Thylacine #2

AFL 2001-053

COMPOSITION BY CAPILLARY GAS CHROMATOGRAPHY - Sample 1.11

| Component             | Mol%   | Weight% |
|-----------------------|--------|---------|
| Methane               | 0.01   | 0.00    |
| Ethane                | 0.12   | 0.02    |
| Propane               | 0.33   | 0.08    |
| i-Butane              | 0.18   | 0.06    |
| n-Butane              | 0.32   | 0.10    |
| neo-Pentane           | 0.02   | 0.01    |
| i-Pentane             | 0.32   | 0.13    |
| n-Pentane             | 0.30   | 0.12    |
| Hexanes               | 0.78   | 0.37    |
| M-C-Pentane           | 0.41   | 0.19    |
| Benzene               | 0.29   | 0.13    |
| Cyclohexane           | 1.01   | 0.47    |
| Heptanes              | 1.21   | 0.67    |
| M-C-Hexane            | 2.11   | 1.14    |
| Toluene               | 1.72   | 0.88    |
| Octanes               | 2.13   | 1.34    |
| E-Benzene             | 0.21   | 0.12    |
| M/P-Xylene            | 1.97   | 1.16    |
| O-Xylene              | 0.72   | 0.42    |
| Nonanes               | 2.63   | 1.86    |
| T-M-Benzene           | 0.41   | 0.27    |
| Decanes               | 5.16   | 4.05    |
| Undecanes             | 6.80   | 5.53    |
| Dodecanes             | 9.45   | 8.41    |
| Tridecanes            | 13.81  | 13.37   |
| Tetradecanes          | 12.77  | 13.43   |
| Pentadecanes          | 11.52  | 13.12   |
| Hexadecanes           | 7.44   | 9.13    |
| Heptadecanes          | 4.86   | 6.37    |
| Octadecanes           | 4.29   | 5.95    |
| Nonadecanes           | 2.38   | 3.46    |
| Eicosanes             | 1.44   | 2.18    |
| Heneicosanes          | 0.91   | 1.46    |
| Docosanes             | 0.56   | 0.95    |
| Tricosanes            | 0.36   | 0.63    |
| Tetracosanes          | 0.21   | 0.38    |
| Pentacosanes          | 0.12   | 0.23    |
| Hexacosanes           | 0.10   | 0.20    |
| Heptacosanes          | 0.05   | 0.11    |
| Octacosanes           | 0.04   | 0.08    |
| Nonacosanes           | 0.06   | 0.12    |
| Triacosanes           | 0.03   | 0.06    |
| Hentriacontanes       | 0.04   | 0.11    |
| Dotriacontanes        | 0.02   | 0.05    |
| Trtriacontanes        | 0.02   | 0.05    |
| Tetratriacontanes     | 0.04   | 0.09    |
| Pentatriacontanes     | 0.02   | 0.05    |
| Hexatriacontanes plus | 0.30   | 0.89    |
| Totals                | 100.00 | 100.00  |

| Calculated Properties |        |               |
|-----------------------|--------|---------------|
| Whole Sample Density  | 0.8169 | g.cc-1 @ 60°F |
| Whole Sample Mol.Wt.  | 180.9  | g.mol-1       |

| Measured Properties  |        |               |
|----------------------|--------|---------------|
| Whole Sample Density | 0.8365 | g.cc-1 @ 60°F |
| Whole Sample Mol.Wt. | 174.7  | g.mol-1       |

| Plus Fraction         | Density       | Mole Weight |
|-----------------------|---------------|-------------|
| Calculated Properties | g.cc-1 @ 60°F | g.mole-1    |
| Heptanes Plus         | 0.8195        | 183.7       |
| Undecanes Plus        | 0.8290        | 201.3       |
| Eicosanes Plus        | 0.8787        | 321.6       |
| Triacosanes Plus      | 0.9209        | 509.0       |
| Hexatriacontanes Plus | 0.9262        | 543.4       |

| Subtotals | Mole % | Weight % |
|-----------|--------|----------|
| Heptanes  | 2.92   | 1.46     |
| Octanes   | 5.96   | 3.36     |
| Nonanes   | 5.53   | 3.56     |
| Decanes   | 5.57   | 4.32     |

| Notes   |  |
|---|--|
| Calculated properties derived from Katz & Firoozabadi data. |  |

Woodside Energy Limited

Thylacine #2

AFL 2001-053

COMPOSITION BY CAPILLARY GAS CHROMATOGRAPHY - Sample 1.11

| Component             | Mol%   | Weight% |
|-----------------------|--------|---------|
| Methane               | 0.01   | 0.00    |
| Ethane                | 0.12   | 0.02    |
| Propane               | 0.33   | 0.08    |
| i-Butane              | 0.18   | 0.06    |
| n-Butane              | 0.32   | 0.10    |
| neo-Pentane           | 0.02   | 0.01    |
| i-Pentane             | 0.32   | 0.13    |
| n-Pentane             | 0.30   | 0.12    |
| Hexanes               | 0.78   | 0.37    |
| M-C-Pentane           | 0.41   | 0.19    |
| Benzene               | 0.29   | 0.13    |
| Cyclohexane           | 1.01   | 0.47    |
| Heptanes              | 1.21   | 0.67    |
| M-C-Hexane            | 2.11   | 1.14    |
| Toluene               | 1.72   | 0.88    |
| Octanes               | 2.13   | 1.34    |
| E-Benzene             | 0.21   | 0.12    |
| M/P-Xylene            | 1.97   | 1.16    |
| O-Xylene              | 0.72   | 0.42    |
| Nonanes               | 2.63   | 1.86    |
| T-M-Benzene           | 0.41   | 0.27    |
| Decanes               | 5.16   | 4.05    |
| Undecanes             | 6.80   | 5.53    |
| Dodecanes             | 9.45   | 8.41    |
| Tridecanes            | 13.81  | 13.37   |
| Tetradecanes          | 12.77  | 13.43   |
| Pentadecanes          | 11.52  | 13.12   |
| Hexadecanes           | 7.44   | 9.13    |
| Heptadecanes          | 4.86   | 6.37    |
| Octadecanes           | 4.29   | 5.95    |
| Nonadecanes           | 2.38   | 3.46    |
| Eicosanes             | 1.44   | 2.18    |
| Heneicosanes          | 0.91   | 1.46    |
| Docosanes             | 0.56   | 0.95    |
| Tricosanes            | 0.36   | 0.63    |
| Tetracosanes          | 0.21   | 0.38    |
| Pentacosanes          | 0.12   | 0.23    |
| Hexacosanes           | 0.10   | 0.20    |
| Heptacosanes          | 0.05   | 0.11    |
| Octacosanes           | 0.04   | 0.08    |
| Nonacosanes           | 0.06   | 0.12    |
| Triacosanes           | 0.03   | 0.06    |
| Hentriacontanes       | 0.04   | 0.11    |
| Dotriacontanes        | 0.02   | 0.05    |
| Trtriacontanes        | 0.02   | 0.05    |
| Tetratriacontanes     | 0.04   | 0.09    |
| Pentatriacontanes     | 0.02   | 0.05    |
| Hexatriacontanes plus | 0.30   | 0.89    |
| Totals                | 100.00 | 100.00  |

| Calculated Properties |        |               |
|-----------------------|--------|---------------|
| Whole Sample Density  | 0.8169 | g.cc-1 @ 60°F |
| Whole Sample Mol.Wt.  | 180.9  | g.mol-1       |

| Measured Properties  |        |               |
|----------------------|--------|---------------|
| Whole Sample Density | 0.8365 | g.cc-1 @ 60°F |
| Whole Sample Mol.Wt. | 174.7  | g.mol-1       |

| Plus Fraction         | Density       | Mole Weight |
|-----------------------|---------------|-------------|
| Calculated Properties | g.cc-1 @ 60°F | g.mole-1    |
| Heptanes Plus         | 0.8195        | 183.7       |
| Undecanes Plus        | 0.8290        | 201.3       |
| Eicosanes Plus        | 0.8787        | 321.6       |
| Triacosanes Plus      | 0.9209        | 509.0       |
| Hexatriacontanes Plus | 0.9262        | 543.4       |

| Subtotals | Mole % | Weight % |
|-----------|--------|----------|
| Heptanes  | 2.92   | 1.46     |
| Octanes   | 5.96   | 3.36     |
| Nonanes   | 5.53   | 3.56     |
| Decanes   | 5.57   | 4.32     |

| Notes   |  |  |
|---|--|--|
| Calculated properties derived from Katz & Firoozabadi data. |  |  |

Woodside Energy Limited

Thylacine #2

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COMPOSITION BY CAPILLARY GAS CHROMATOGRAPHY - Sample 1.28

| Component             | Mol%   | Weight% |
|-----------------------|--------|---------|
| Methane               | 0.02   | 0.00    |
| Ethane                | 0.18   | 0.04    |
| Propane               | 0.84   | 0.30    |
| i-Butane              | 0.59   | 0.28    |
| n-Butane              | 1.36   | 0.64    |
| neo-Pentane           | 0.03   | 0.02    |
| i-Pentane             | 1.50   | 0.88    |
| n-Pentane             | 1.54   | 0.90    |
| Hexanes               | 4.09   | 2.87    |
| M-C-Pentane           | 2.37   | 1.63    |
| Benzene               | 2.97   | 1.89    |
| Cyclohexane           | 5.02   | 3.44    |
| Heptanes              | 5.48   | 4.47    |
| M-C-Hexane            | 8.64   | 6.90    |
| Toluene               | 12.25  | 9.17    |
| Octanes               | 6.75   | 6.28    |
| E-Benzene             | 0.57   | 0.49    |
| M/P-Xylene            | 7.41   | 6.40    |
| O-Xylene              | 2.00   | 1.73    |
| Nonanes               | 5.64   | 5.89    |
| T-M-Benzene           | 0.64   | 0.62    |
| Decanes               | 6.84   | 7.92    |
| Undecanes             | 4.55   | 5.44    |
| Dodecanes             | 3.73   | 4.89    |
| Tridecanes            | 3.75   | 5.33    |
| Tetradecanes          | 2.74   | 4.23    |
| Pentadecanes          | 2.30   | 3.85    |
| Hexadecanes           | 1.53   | 2.76    |
| Heptadecanes          | 1.02   | 1.98    |
| Octadecanes           | 0.98   | 2.00    |
| Nonadecanes           | 0.68   | 1.45    |
| Eicosanes             | 0.50   | 1.12    |
| Heneicosanes          | 0.37   | 0.87    |
| Docosanes             | 0.28   | 0.70    |
| Tricosanes            | 0.21   | 0.55    |
| Tetracosanes          | 0.16   | 0.43    |
| Pentacosanes          | 0.11   | 0.32    |
| Hexacosanes           | 0.08   | 0.23    |
| Heptacosanes          | 0.05   | 0.17    |
| Octacosanes           | 0.03   | 0.11    |
| Nonacosanes           | 0.02   | 0.08    |
| Triacosanes           | 0.02   | 0.05    |
| Hentriacontanes       | 0.01   | 0.03    |
| Dotriacontanes        | 0.01   | 0.02    |
| Tritriacontanes       | 0.01   | 0.02    |
| Tetracontanes         | 0.00   | 0.02    |
| Pentatriacontanes     | 0.00   | 0.02    |
| Hexatriacontanes plus | 0.13   | 0.57    |
| Totals                | 100.00 | 100.00  |

| Calculated Properties |        |               |
|-----------------------|--------|---------------|
| Whole Sample Density  | 0.7834 | g.cc-1 @ 60°F |
| Whole Sample Mol.Wt.  | 122.9  | g.mol-1       |

| Measured Properties  |        |               |
|----------------------|--------|---------------|
| Whole Sample Density | 0.7995 | g.cc-1 @ 60°F |
| Whole Sample Mol.Wt. | 122.8  | g.mol-1       |

| Plus Fraction         | Density       | Mole Weight |
|-----------------------|---------------|-------------|
| Calculated Properties | g.cc-1 @ 60°F | g.mole-1    |
| Heptanes Plus         | 0.7963        | 128.7       |
| Undecanes Plus        | 0.8265        | 196.6       |
| Eicosanes Plus        | 0.8798        | 325.4       |
| Triacosanes Plus      | 0.9209        | 509.6       |
| Hexatriacontanes Plus | 0.9247        | 533.7       |

| Subtotals | Mole % | Weight % |
|-----------|--------|----------|
| Heptanes  | 15.84  | 11.43    |
| Octanes   | 27.64  | 22.35    |
| Nonanes   | 15.62  | 14.51    |
| Decanes   | 7.48   | 8.54     |

| Notes   |  |
|---|--|
| Calculated properties derived from Katz & Firoozabadi data. |  |

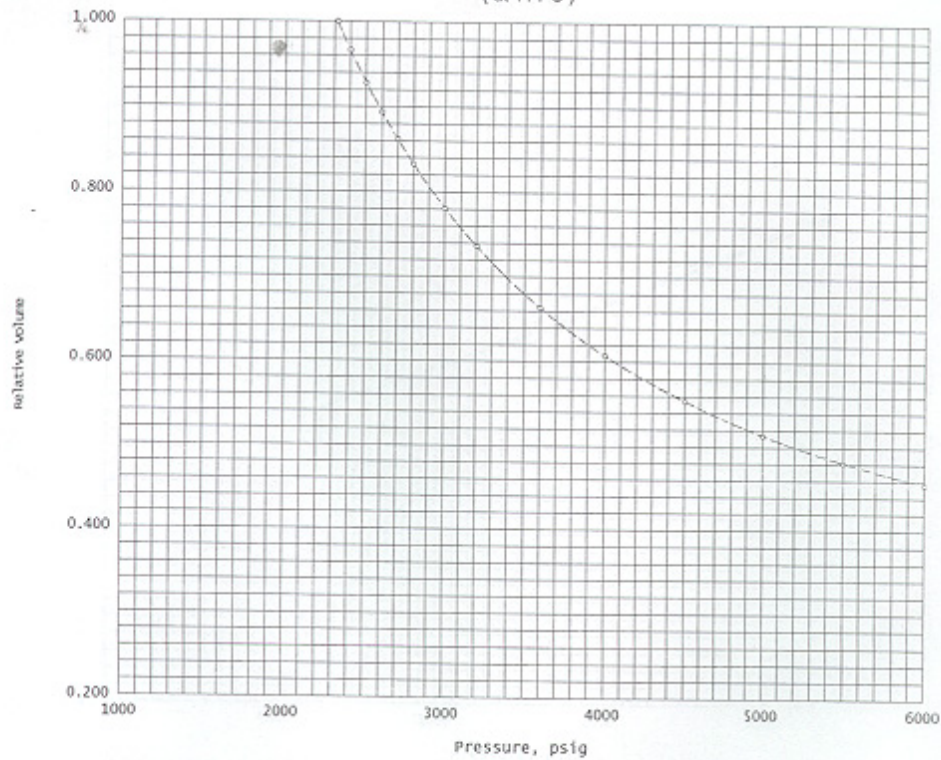


Woodside Energy Limited

Thylacine #2

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RELATIVE VOLUME  
( at 114°C )



|   |            |   |                       |
|---|------------|---|-----------------------|
| <b>Relative Volume Expression:</b><br>$y = a + b (X_d)^i + c (X_d)^j + d (\log(X_d))^k$   |            | <b>LEGEND</b>   |                       |
| where:<br>a= -8.55596e+ 00      i= 0.500<br>b= 1.43453e+ 01      j= 0.750<br>c= -4.78934e+ 00      k= 0.995<br>d= -1.03519e+ 01 |            | ○   | Laboratory Data       |
|   |            | ----  | Confidence Limits     |
|   |            | —   | Analytical Expression |
| Note: $X_d$ (dimensionless 'X') = $P_i / P_{sat}$ , psig  |            | Saturation Pressure: 2320 psig                        |                       |
| Confidence level:   | 99 %       | <b>Pressure-Volume Relations</b><br><b>Figure A-1</b> |                       |
| Confidence interval:  | +/- 0.0001 |   |                       |
| 'r squared':  | 1          |   |                       |

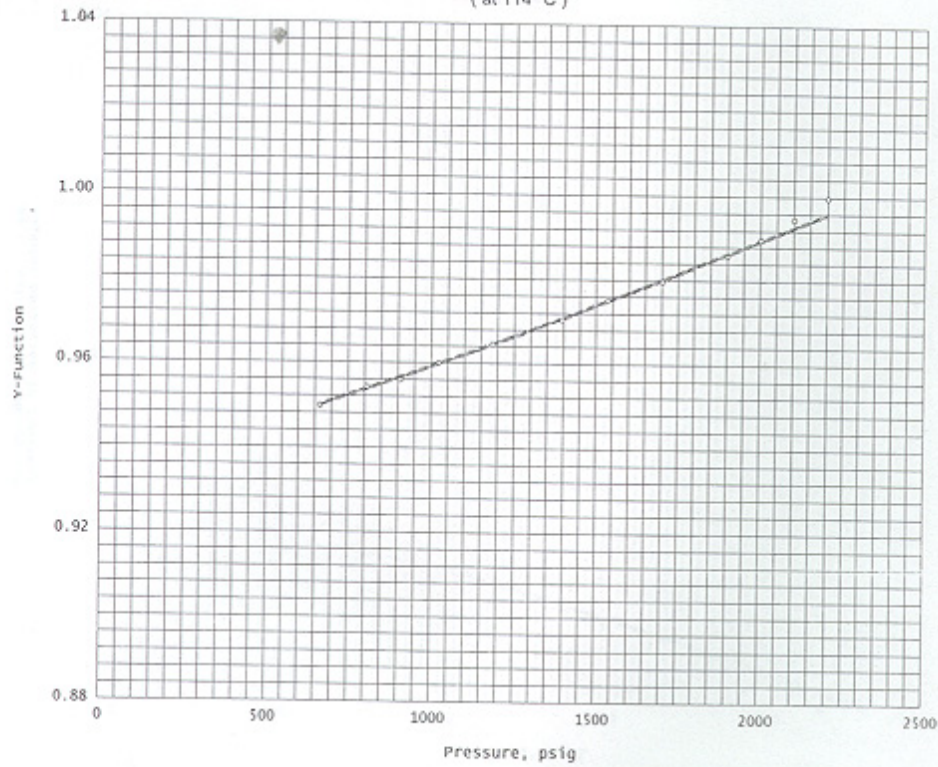
CORE LABORATORIES

# Woodside Energy Limited

Thylacine #2

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## Y-FUNCTION (at 114 °C)



|  |   |
|--|---|
| <b>Y-Function Expression:</b><br>$y = a + b (x_d)^{1/i}$   | <b>LEGEND</b>   |
| where:<br>$a = 9.34745e-01$ $i = 1.164$<br>$b = 6.49744e-02$   | $\circ$ Laboratory Data<br>----- Confidence Limits<br>----- Analytical Expression<br><br>Saturation Pressure: 2320 psig |
| Note: $x_d$ (dimensionless 'X') = $P_i / P_{sat}$ , psig<br><br>Confidence level: 99 %<br>Confidence interval: +/- 0<br>'r squared': .999481 | <b>Pressure-Volume Relations</b><br><b>Figure A-2</b>   |

CORE LABORATORIES



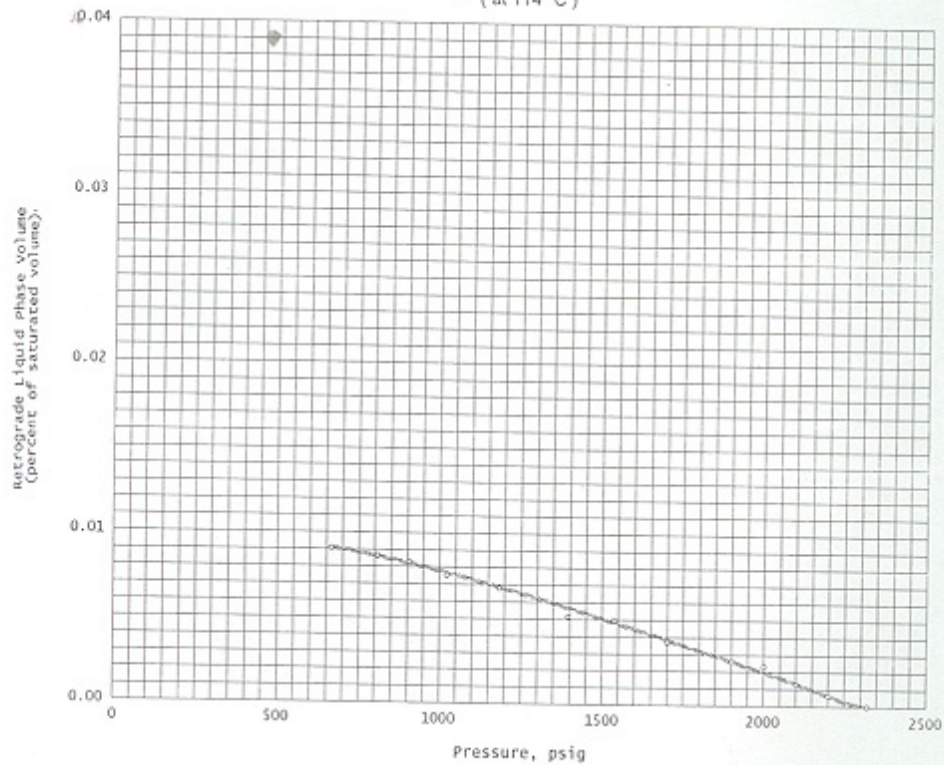
# Woodside Energy Limited

Thylacine #2

AFL 2001-053

## LIQUID PHASE VOLUME

( at 114 °C )



|  |  |
|--|--|
| <b>Retrograde Liquid Curve Expression:</b>               | <b>LEGEND</b>  |
| $\text{sqrt } y = a + b (X_d)^i + c (X_d)^j$             | <div><div>○</div>Laboratory Data</div> <div><div>-----</div>Confidence Limits</div> <div><div>_____</div>Analytical Expression</div> |
| where:   |  |
| a= 1.00462e- 01  | i= 2.163   |
| b= -7.57714e- 02   | j= 20.166  |
| c= -2.46913e- 02   |  |
| Note: $X_d$ (dimensionless 'X') = $P_i / P_{sat}$ , psig | Saturation Pressure: 2320 psig   |
| Confidence level: 99 %                                   | Pressure-Volume Relations<br>Figure A-3  |
| Confidence interval: +/- 0                               |  |
| 'r squared': .999268                                     |  |