Essential Petroleum Resources Limited

# PEP 159

# ONSHORE OTWAY BASIN, VICTORIA

# WELL COMPLETION REPORT

# Findra 1

**August 2006**

# TABLE OF CONTENTS

# FIGURES



# TABLES



# APPENDICES

# ENCLOSURES

1 Mudlog

2 Composite Log

3 Wireline Logs

# 1 SUMMARY

Findra 1 was drilled as an exploration well. It is located in southern PEP 159, approximately 25km north-northwest of the township of Port Fairy. It is midway between the exploration wells Pretty Hill 1 and Taralea 1, with exploration well Banganna 1 to the northeast (Figure 1). The primary exploration objective was to test for light hydrocarbon liquids and gas in sandstones of the Flaxman (intra-Belfast) Formation (Figure 2). Sandstones in the Pebble Point and Paaratte Formation were secondary objectives. The prospect was sited on a closed anticlinal structure, with crestal faulting, developed along the southern (downthrown) side of the Tyrendarra Fault (Figure 3). In the target zones the interpreted throw of crestal faulting was less than the thickness of the sealing horizons over the area of mapped closure.

Formation tops and stratigraphy were prognosed from the exploration wells Pretty Hill 1 and Taralea 1. The target sands in the Findra prospect were expected to be higher in the anticlinal structure than the equivalent sands were in the nearby wells (Figure 4), and seismic amplitudes indicated that the Flaxman sands could be better-developed in Findra 1 than they were in Pretty Hill 1. The intersection at Banganna 1 well was also encouraging.

Findra 1 was drilled in June 2004. The precollar hole was drilled by a waterbore rig from Sides Engineering, and the remainder of the hole was drilled by Hunt Drilling Rig 2. The surface basalt the upper part of the Point Campbell Limestone was drilled to 62 m, and a 13⅜ ” conductor was cemented at 39 m. 12 ¼” hole was drilled to 153 m and cased with 9⅝ ” casing. The remainder of the hole to total depth of 889 m was drilled at 8½”. All drilling and casing operations proceeded without significant delays.

The formation tops were approximately as prognosed for the upper half of the well. Due to their characteristic lithologies, in Findra 1 the Timboon Sandstone and the Massacre Shale are differentiated from the Pebble Point Formation and Paaratte Formation respectively, a distinction that has not been made in other nearby wells. In the lower half of the well the formation tops were ~10-20 m higher than prognosed.. Good to excellent porosity was developed in the Dilwyn Formation, the Timboon Sandstone, and the Pebble Point Formation. Background gas (methane) was present in the lower half of the well, but there were no oil shows and the sequence is water-saturated throughout.

No further testing took place and the well was plugged and abandoned.

Figure 1: Findra 1 Location Map

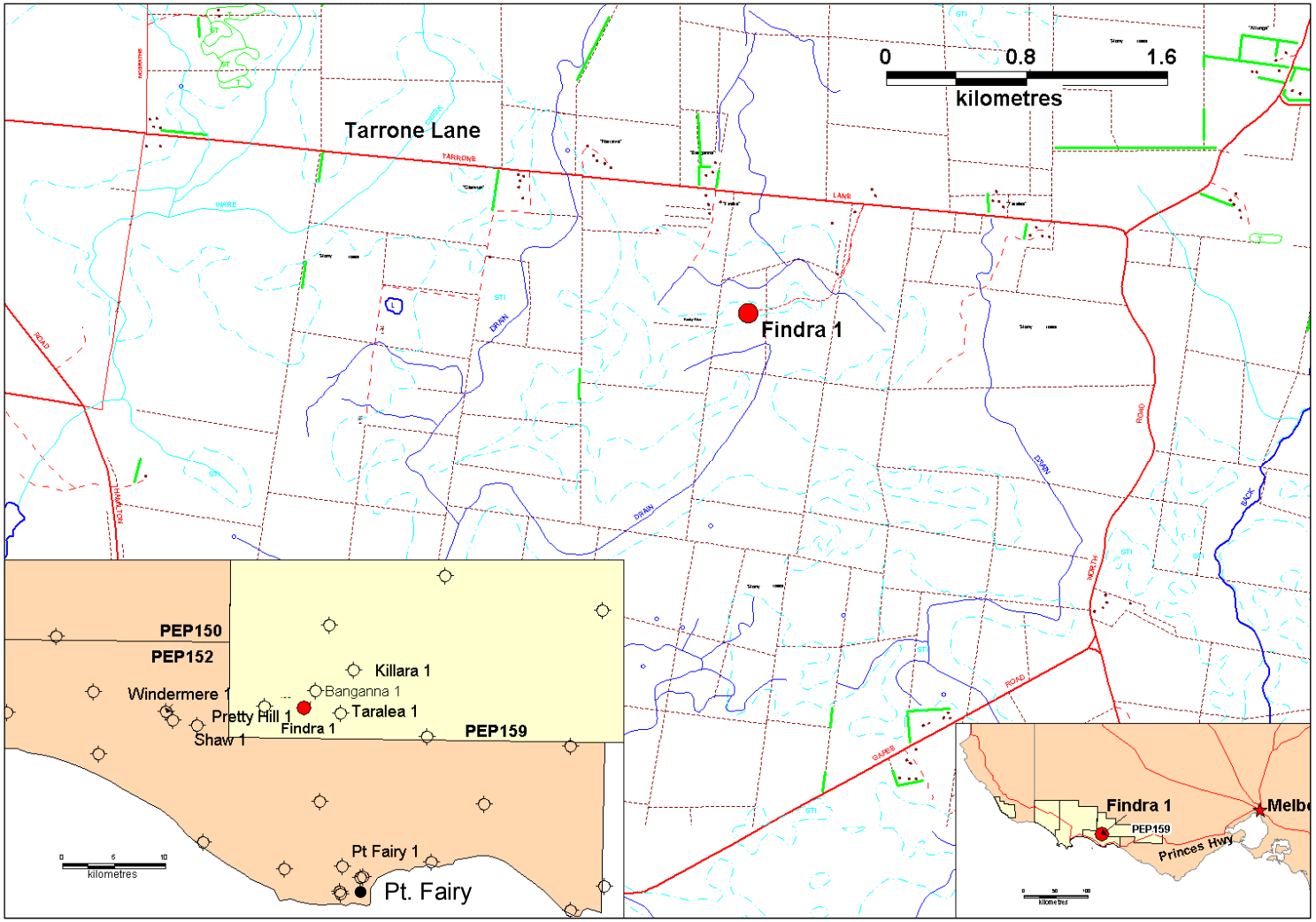


Figure 2: Regional Stratigraphy

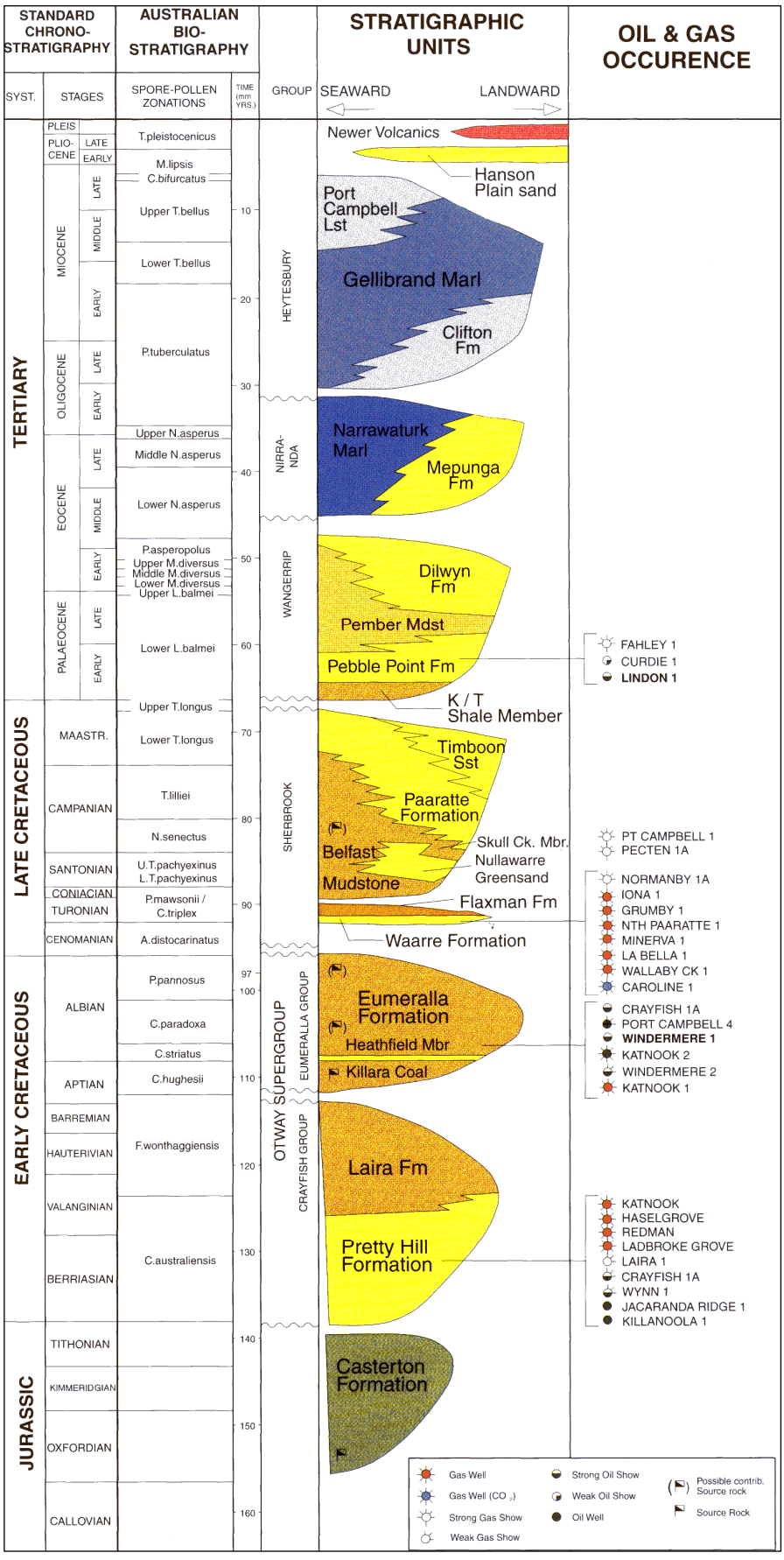


Figure 3: Anticlinal structure

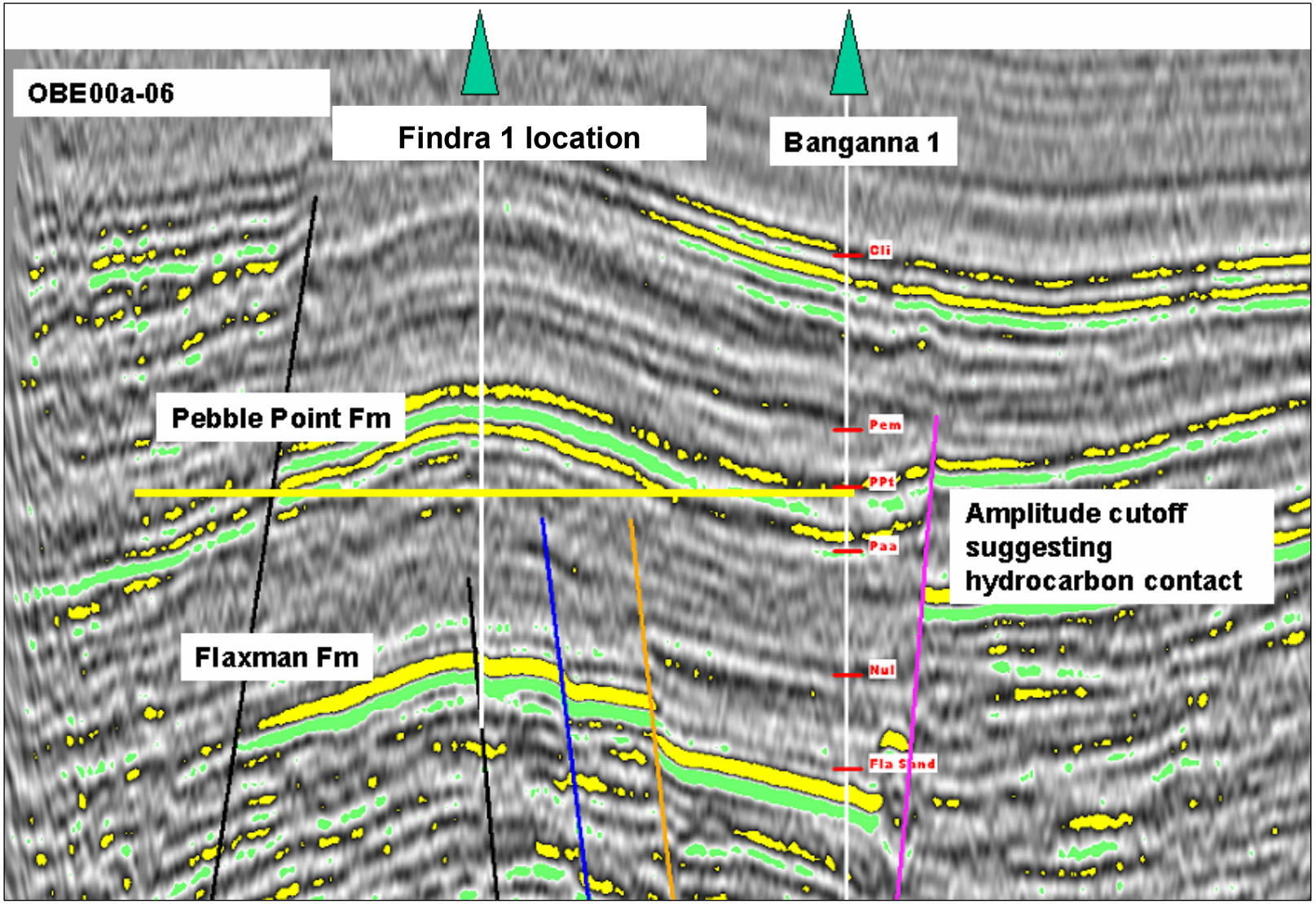
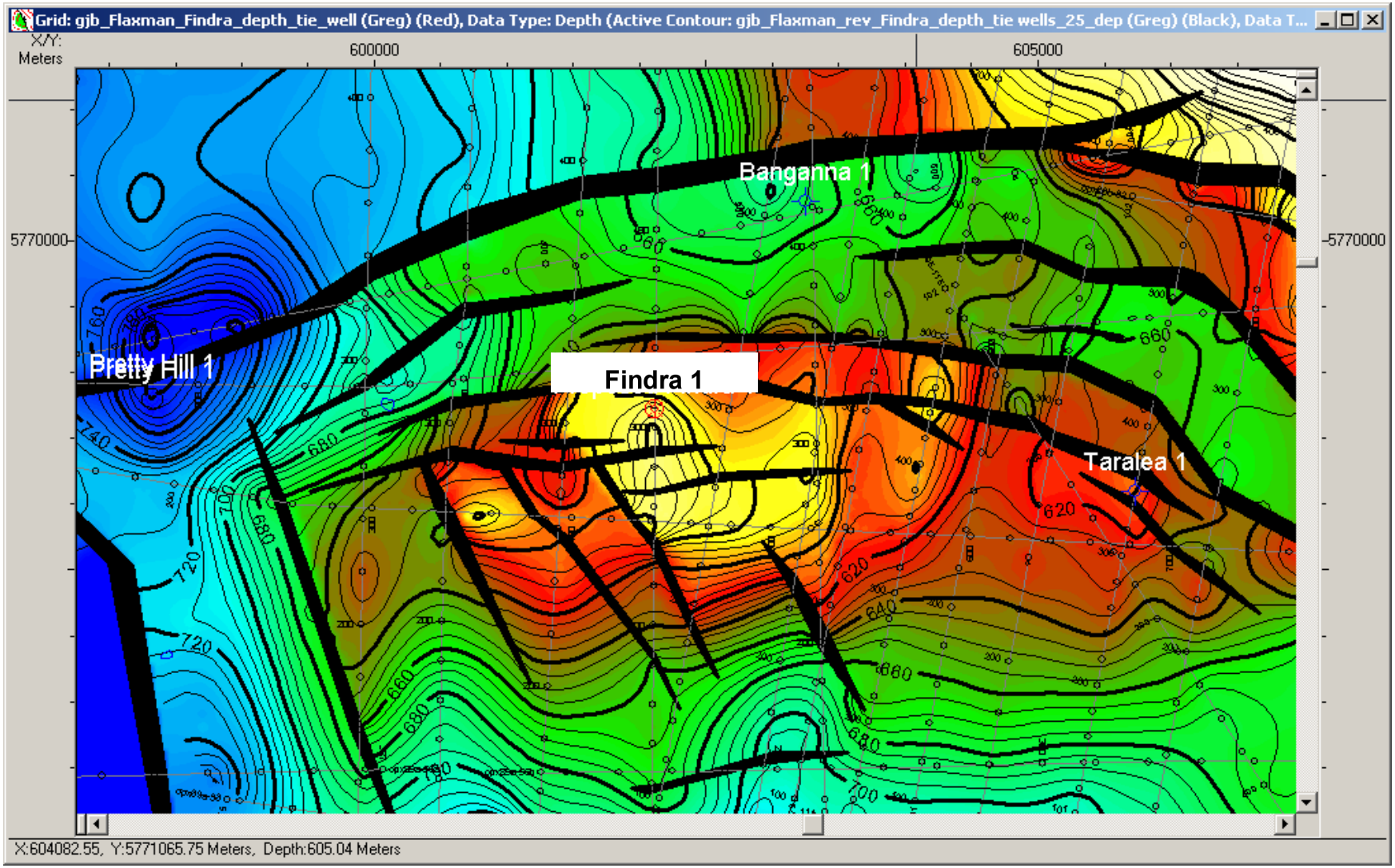


Figure 4 Findra: top Flaxman depth.



# 2 WELL HISTORY

## 2.1 GENERAL DATA

General well data are given in Table 1, and the location shown in Figure 1. The surveyor's report is shown in Appendix 1.

Table 1: General Well Data

| | |
|---|---|
| Well name: | Findra 1 |
| Classification: | Exploration |
| Permit operator: | Essential Petroleum Resources Limited |
| Well operator: | Essential Petroleum Resources Limited<br>Level 2, 226 Albert Rd<br>South Melbourne, Victoria 3205 |
| Participants: | Essential Petroleum Resources Limited<br>Level 2, 226 Albert Road<br>South Melbourne, Victoria 3205 |
| Basin: | Otway Basin, onshore western Victoria |
| Lease: | PEP 159 |
| Seismic location: | 110 m at 342° (mag) from Line OBE00a-05, SP 309.5 |
| Coordinates:<br>Datum GDA94 | Latitude 38º 13' 18.91", Longitude 142º 10' 04.84"<br>Easting 602,240.4m, Northing 5,768,902.6m,<br>MGA Zone 54 |
| Elevation: | Ground Level (GL): 58.60 metres AHD<br>Rotary Table (RT): 62.51 metres AHD<br>(All depths relate to RT unless otherwise stated) |
| Property owner: | RJ & JM Moloney<br>Bootahpool Block, 10 Tarrone Estate<br>C.A. 10 Section C.212_1 |
| Nearest town: | The coastal township of Port Fairy, approximately 25 km south-southeast of the well. |
| Nearest wells: | Pretty Hill 1, Taralea 1, Banganna 1 |
| Measured depth: | 889 m (Driller)<br>879 m (Logger) |
| Spud date: | 12:30:00 on 26/06/2004. |
| TD reached: | 22:00:00 on 29/06/2004. |
| Days to Drill: | 3.5 days |
| Drill rig released: | 10:00 on 2/07/2004 |
| Well status: | Plugged and Abandoned. |

## *2.2 CONTRACTORS*

Table 2: List of Contractors

| Service | Contractor |
|---|---|
| Operator | Essential Petroleum Resources Limited |
| Drilling Manager | Jim Slater, Kelly Down Consultants Pty Ltd |
| Environmental Site Assessment | Enesar Environmental Consultants Pty Ltd. |
| Precollar Drilling | Sides Engineering |
| Drilling Rig | Hunt Drilling Rig 2 |
| Location Survey | Vincent Land Surveying, Warrnambool |
| Site Construction | Walter Mellis, Waldoo Pty. Ltd. |
| Water Well | P. Mahoney, Pt Fairy |
| Cementing | Halliburton |
| Mud | RMN Drilling Fluids |
| Mud Logging | Geoservices |
| Electric Logging | Schlumberger |
| Drilling Tools | Hunt Energy |
| Casing | Halliburton |
| Wellheads | Wood Group |
| Accommodation | Rig camp at Killarney location |
| Communications | South West Communications |

# 3 ENGINEERING DATA

## *3.1 WELL STATUS*

After logging the well was plugged and abandoned on 2/07/04.

## *3.2 OPERATIONAL SUMMARY*

### 3.2.1 Logistics and Planning

Kelly Down Consultants Pty Ltd managed the drilling on behalf of Essential Petroleum Resources Limited. Supply and service contractors are listed in Table 2.

### 3.2.2 Site Preparation

The well location as picked on seismic was in a black-soil paddock, which would have become boggy in wet conditions. It was considered that bringing in enough fill to construct a drilling pad secure in wet weather would have been prohibitively expensive, and the well location was shifted on to a nearby basalt rise (Fig. 5).

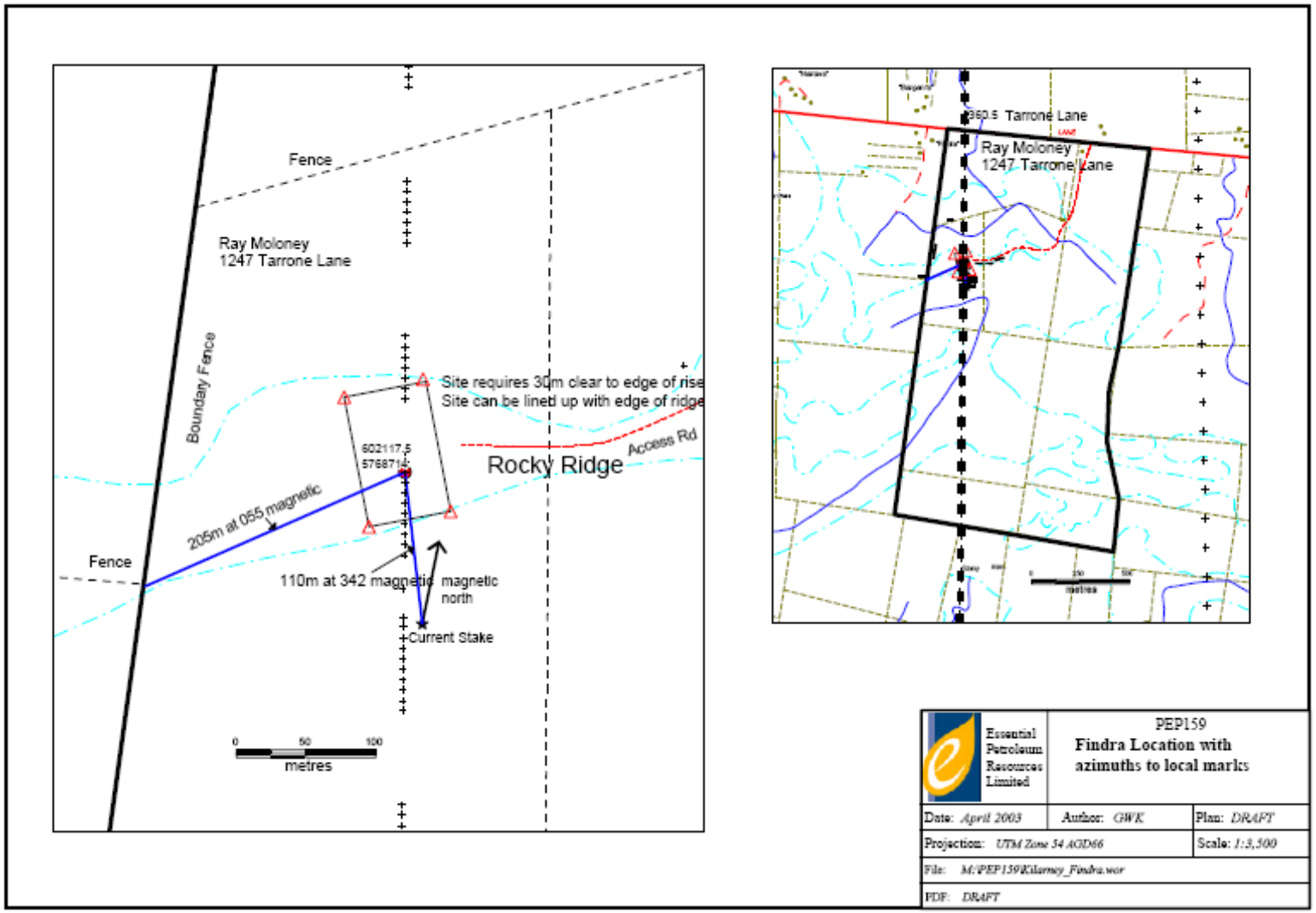



Figure. 5. Well location on basalt rise.

Due to basalt formation at the surface, Sides Engineering were mobilised with a Bourne rig equipped with air compressors and hammers to set the conductor and drill the mousehole and rathole. The precollar hole was air hammered to the base of the basalt, then clay and limestone were mud rotary drilled to a depth of 62 m (RT Sides rig). 13⅜" conductor casing was run and cemented to 39mRT.

### 3.2.3 Mobilisation and Pre Spud

Hunt Rig 2 was mobilised from the Killarney 1 site. Rig setup was completed 11:30 25 June 2004. The BHA was run in and hard cement tagged inside the conductor pipe at 39m, and the surface lines pressure-tested. A pre-spud safety meeting was held on the rig at 23:30hrs on June 25, 2004.

### 3.2.4 12¼" Hole section

Findra 1 was spudded at 00:30 hrs on the June 26, 2004. Cement was drilled out from 37 to 60m. The 12 ¼" hole section was drilled using gel caustic spud mud at 8.7ppg. From 60 to 79m drilling took place with reduced parameters to minimise hole washout. 12 ¼ " hole was drilled to 153m (section TD) without incident. Surveys were recorded of 1.5° at 68m, and 1.0° at 141m. A wiper trip was run, and the hole circulated clean before casing.

### 3.2.5 9⅝" Surface String

A string of 9⅝" 36 ppf K55 BTC casing was run to a shoe depth of 153m. The string was cemented to surface with 200 sacks of class A cement (15.6 ppg plus 2% CaCl) and displaced with 34.9 BBL water. Cement returns to surface were noted after 33 bbl displaced. Plugs were bumped with 230 psi and pressure tested to 1600psi. After waiting on cement for 18 hours, the BOPs were installed, nippled up and tested successfully at 300 and 2000psi. Pressure testing of the choke manifold, pipe rams and kill line valve to 300psi and 2500psi was successful.

### 3.2.6 8 ½" Hole Section

The 8½" BHA were made up and run in. Cement was tagged at 132 mRT, the rathole cleaned to 153 m and the plug and shoe drilled to 156 m. The hole was displaced to 8.65 ppg PHPA KCl mud and circulated. A successful formation integrity test was conducted to 12.54 ppg mud weight equivalent, using 8.65 ppg mud with 100 psi surface pressure. New 8 ½" hole drilled without incident to 534 m using a tricone (IADC code 417) bit with 10-15Klb WoB. The rate of penetration averaged between 21.4 and 28 m/hr. A survey was recorded of 1.5° at 348m, and samples were circulated up after drilling breaks at 474m and 506m. The weight on bit was reduced to 8-10Klbs above and through the target zones, and from 534m to 889 mRT (TD) the rate of penetration was 16.2-17.1 m/hr. A survey was recorded of 2.0° at 596m, and sample circulated up after a drilling break at 632 m.

The hole was circulated clean after reaching TD. The drill string was pulled back to the casing, during which tight spots were encountered between 380 and 250 mRT. The string was run back in and a tight spot at 505 mRT was washed and reamed to 516 m. The drill string run in, fill was tagged at 873 m, and the hole was washed 16 m to the bottom. The hole was circulated clean and Schlumberger rigged for logging.

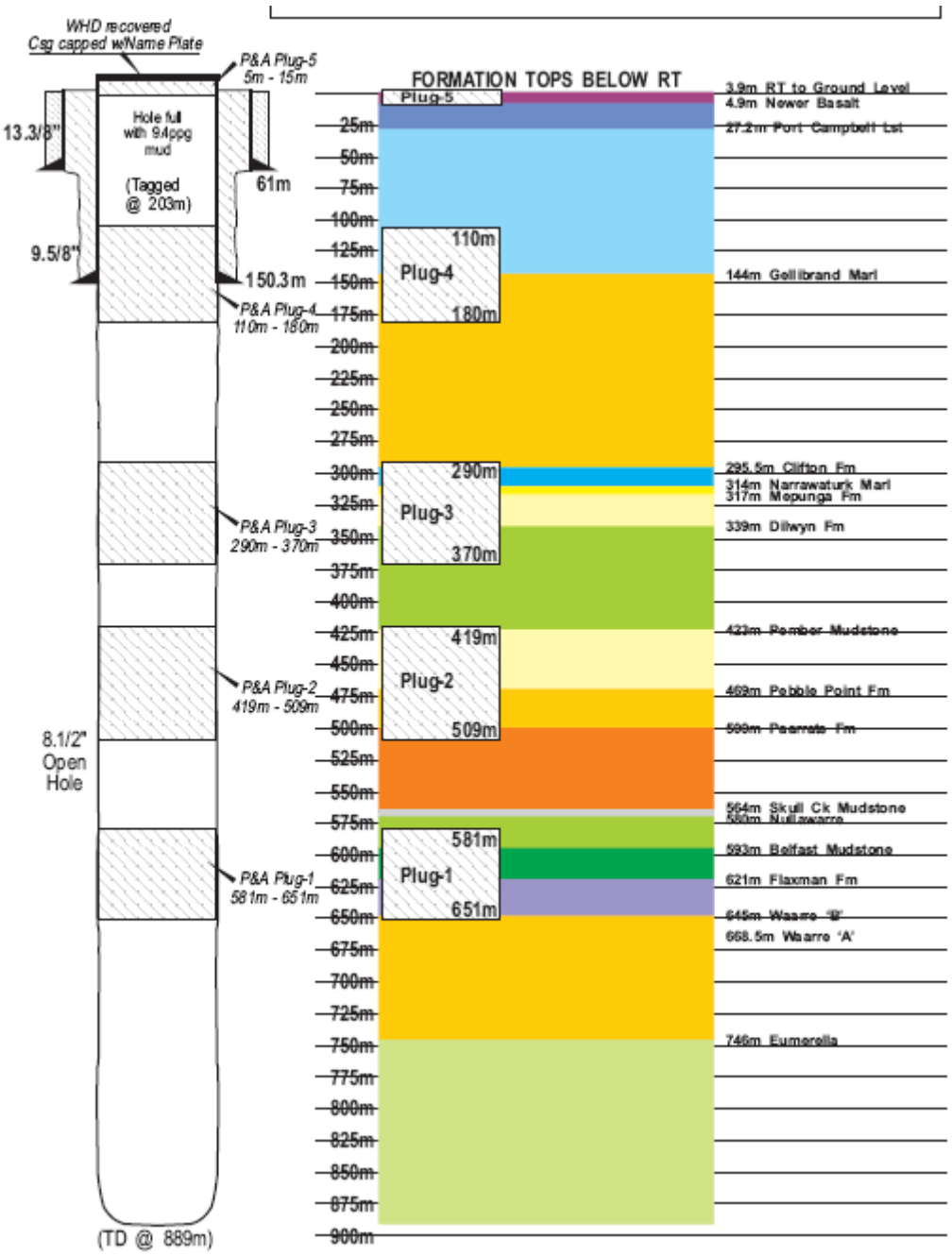



Figure 6. Findra 1 abandonment schematic.

### 3.2.7 Plug and Abandon

Findra 1 was plugged and abandoned. The abandonment schematic is shown in Fig. 6. The drill string was run in open-ended to 1428m. Plugs were set:

- Plug #1, across the Flaxman Formation 651-581 m, with 88 sx class A cement.
- Plug #2, across the Pebble Point Formation 509-419 m, with 113 sx class A cement.
- Plug #3, across the Dilwyn Formation 370m to 290 m, with 101 sx class A cement
- Plug #4, across the 9⅝ casing shoe 180-110 m, with 101 sx class A cement

After waiting on cement Plug #4 was tagged at 112 m with 5Klb. The drill string was pulled out, BOP nippled down and the wellhead recovered. Surface 10m cement plug was set. The rig was released at 10:00 2/07/2004.

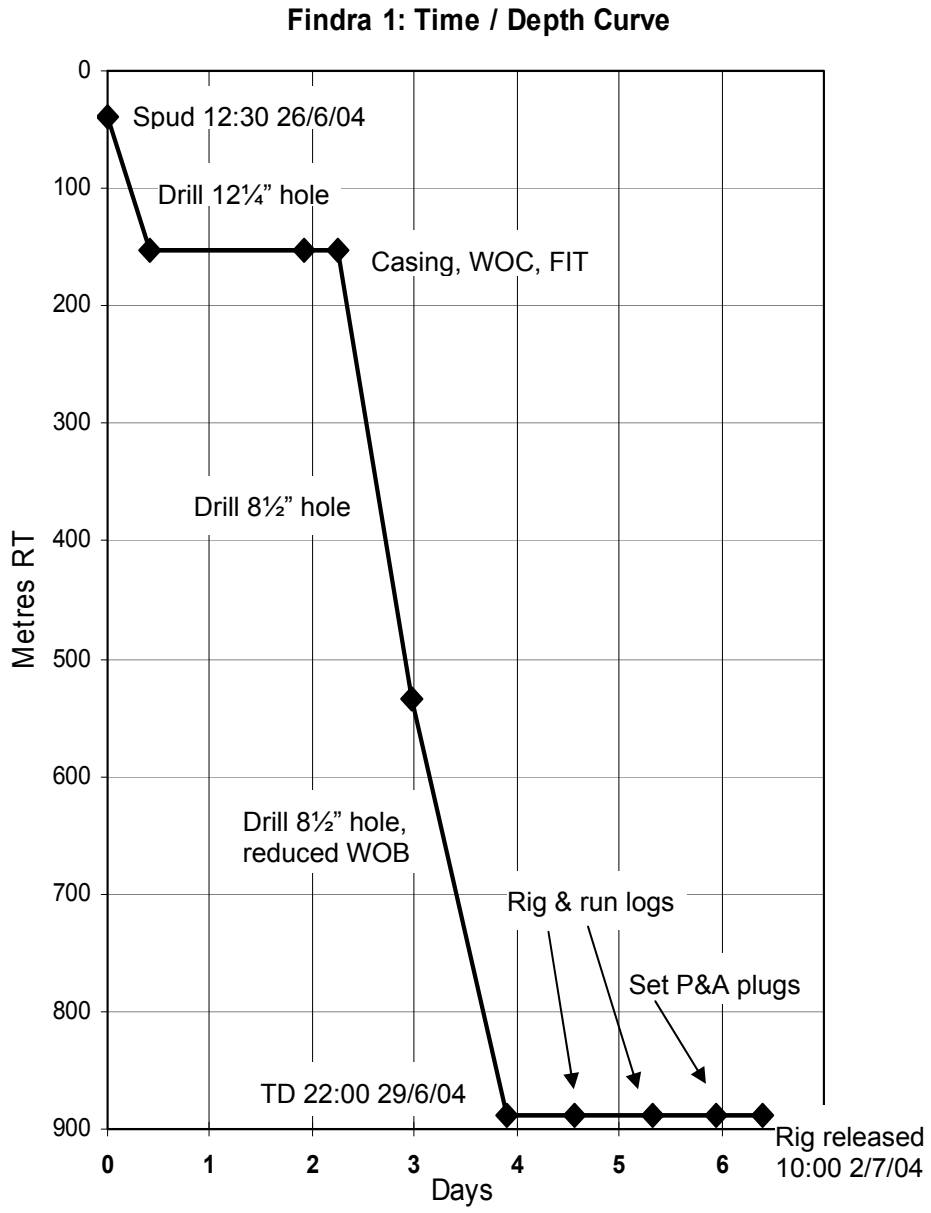



Figure 7: Findra 1 time-depth curve

## 3.3 DAILY OPERATIONS

### 3.3.1 Daily Drilling Reports

The details of the daily activities during rig up and drilling operations for the Findra 1 well are presented in the Daily Drilling reports in Appendix 2.

### 3.3.2 Time Performance

The time – depth curve for Findra 1 is presented in Figure 7 and a time breakdown is presented in Table 3. No delays occurred. In the lower half of the 8 ½" section, the weight on bit was reduced to facilitate lithological description above and through the target zones. The rate of penetration was slightly reduced but this did not slow the well's progress significantly.

| OPERATION | HOURS | % |
|---|---|---|
| Drill Actual | 48.5 | 27.2 |
| Rig up/down | 34 | 19.1 |
| Reaming / Washing | 1 | 0.6 |
| Rig Repairs | 9 | 5.1 |
| Logging | 20.5 | 11.5 |
| Condition Mud, Circulate Samples | 6.5 | 3.7 |
| Casing & Cementing | 14 | 7.9 |
| Tripping for Bit / TD / condition hole | 18.5 | 10.4 |
| Tripping to Evaluate Well | 0 | 0.0 |
| Hole Problems | 0 | 0.0 |
| Deviation Surveys | 2 | 1.1 |
| Install wellhead / BOP / LOT | 17 | 9.6 |
| Abandon Well | 6 | 3.4 |
| Routine HSE | 1 | 0.6 |
| HSE Related Incidents | 0 | 0.0 |
| TOTAL | 178 | 100 |

Table 3 Findra 1 completion time summary.

### 3.3.3 Surveys

Deviation measured in the well did not exceed 2.0°. Surveys are shown in Table 4.

| Depth | Deviation |
|---|---|
| 68 | 1.5° |
| 141 | 1.0° |
| 348 | 1.5° |
| 596 | 2.0° |

Table 4: Deviation Surveys

## *3.4 BHA AND BIT SUMMARIES*

| Bit No | In | mm | Jets | Make | Type | IADC code | In | Out | Made | Hrs | Cond | Reason Pulled |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 17 ½ | 445 | | | | | 3.9 | 61 | 57 | | | Casing point |
| | Notes | | Pre-collar hole was air hammered to base basalt then mud rotary drilled to section TD | | | | | | | | | |
| 1rr | 12 ¼ | 311 | 3 x 18 | HTC | M22 | 117 | 61 | 153 | 92 | 5 | 3-3-WT-A-E-1-NO-TD | Casing point |
| | BHA | | 12 ¼" Bit + F?Sub+ 1x 8" DC + X-over + 8x 6½" DC + 4x HWDC = 132.4m | | | | | | | | | |
| 2rr | 8 ½ | 216 | 3 x 13 | Varel | CH04MS | 417 | 153 | 889 | 736 | 37 | 4-2-BT-L-E-I-LT-TD | TD |
| | BHA | | 8 ½ TCI Bit + F/Sub + 1x 6¼" DC + Stab + 12x 6¼" DC + Jars + 6x 6¼" DC + 6 HWDP = 244.9m | | | | | | | | | |

Table 5: Bit and BHA Record

## *3.5 CASING AND CEMENTING SUMMARY*

The casing and cementing program is summarised in Table 6, and the casing running list and plugging program are presented in Appendix 3.

| Hole Size (in) | Hole Depth (mRT) | Cas-ing Size (in) | Shoe Depth (mRT) | Casing type | Cas-ing Eqpt | Cementing | Comment |
|---|---|---|---|---|---|---|---|
| 17 ½ | 61.0 | 13 ⅜" | 61.0 | 68 ppf K55 BTC | | To surface | |
| 12 ¼ | 153 | 9 $^{5}/_{8}$" | 150.3 | 36 ppf K55 BTC | Float shoe, float collar | To surface with 200 sx Class A at 15.6 ppg plus 2% CaCl. Displaced with 34.9bbl water. Cement returns observed. Plugs bumped with 1600 psi. | FIT: held 12.54 ppg MWE with 8.65 ppg drilling fluid. |

Table 6: Casing and Cementing Details

### *3.6 DRILLING FLUIDS*

Drilling fluid details are summarised in the Operational summaries (Section 3.2). The drilling fluid contractor's mud recap is provided in Appendix 4. Drilling fluid chemistry was effective throughout the well.

# 4 FORMATION SAMPLING AND TESTING

### *4.1 CUTTINGS*

Cuttings were collected at 10 m intervals to a depth of 450 mRT, at 3 or 6 m intervals from 450 to 714 mRT, and at 9 m intervals from 714 to 889 mRT (TD). Cuttings descriptions are presented in Appendix 5.

### *4.2 CORES*

No sidewall cores or conventional cores were cut.

### *4.3 TESTING*

Zones exhibiting log porosity were investigated by MDT pressure testing (see 4.5 Wireline Logging). Fifteen pretests were attempted, of which 13 were good. The results are presented in Enclosure 3, and summarised in Fig. 8. The pressure gradients derived from the MDT indicated a water gradient in Findra 1. No other testing was carried out.

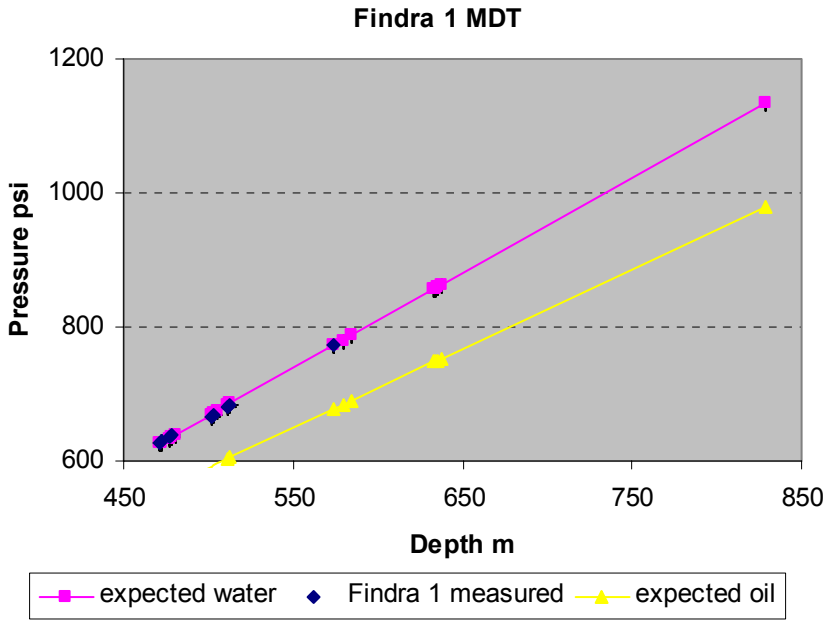



Figure 8 Summary results of MDT testing.

## 4.4 MUD LOGGING

Geoservices provided a skid mounted mudlogging unit. Depth, penetration rate, mud gas, pump rate, and mud volume data as well as mud chromatographic analysis was recorded from 62m RT to total depth. Rate of penetration, weight on bit, total gas and chromatography were recorded and plotted on the Formation Evaluation Log (Mud Log) and are presented in Enclosure 1.

## 4.5 WIRELINE LOGGING

Wireline logging was carried out using a Schlumberger MAXIS unit. The logging suite consisted of three logging runs. During the second logging run, an electrical fault was observed with the CSAT tool, which was unable to be fixed. A composite log is provided in Enclosure 2. Individual Logs are presented in Enclosure 3. Details of the log depth intervals for each log run are presented in Table 7.

| Run | Depth (mRT) | Log | Top Log Interval | Bottom Log Interval | BHT Deg. C |
|---|---|---|---|---|---|
| 1 | 879 | GR | 42 | 876.7 | 48 |
| | | SP | 150 | 850 | |
| | | HALS | 155 | 879 | |
| | | PEX | 155 | 868 | |
| | | BHC | 140 | 870 | |
| | | HNGS | 455 | 863 | |
| 2 | unsuccessful | CSAT | - | - | |
| | 879 | MDT | 471 | 637.5 | 48 |

Table 7 Wireline logging.

## 4.6 VELOCITY SURVEY

A velocity check shot survey was attempted but the CSAT tool's shot firing circuitry failed and could not be replaced. No log was taken and no synthetic seismogram was constructed.

## 4.7 PETROPHYSICAL ANALYSIS

A petrophysical analysis of the wireline logs is presented in Appendix 7, and a summary of the results is given below.

> "The purpose of this study was to examine the reservoir characteristics of the sands encountered in the Findra-1. The wireline logs were quantitatively interpreted over the interval 290m to 850m to determine shale volume, porosity and water saturation.
>
> Findra-1 was spudded on 26th June, 2004, by Essential Petroleum Pty Ltd and drilled to a total depth of 879m. No fluorescence associated with sands was recorded throughout the reservoir section and no significant gas shows were recorded. The well was plugged and abandoned as a dry well on 2nd July, 2004.
>
> The Dilwyn Formation (332-416m) consisted of excellent quality reservoir sandstones interbedded with shale. The sands are described as clean, very fine to very coarse grained and quartzose. A total of 29.1m of net sand is interpreted over the gross interval 338.5-386.5m with an average porosity of 28.2%. There were no visual or significant gas shows observed during drilling and the high resistivity of 18 ohm over this interval is indicative of fresh water. The sands are interpreted to be entirely water saturated.
>
> The interval 469-482m, within the Pebble Point Formation is interpreted to consist of good quality reservoir sands interbedded with shales. A total of 8.2m of net reservoir sand is interpreted over the gross interval 469.0-482.0m with an average porosity 18.8%. There were no visual or gas shows observed during drilling and the interval is interpreted to be entirely water saturated. Resistivities are slightly lower (approximately 10 ohm) which correspond to the slightly more saline formation waters as indicated by the SP response (+20mV)
>
> The Paaratte Formation (498-565m) is interpreted to consist of good reservoir quality sandstones over the interval 500.0-513.5m. A total of 8.8m of net reservoir sand is interpreted with an average porosity of 30.3%. The entire Paaratte Formation is interpreted to be water saturated.
>
> The Flaxman Formation (615-647m) consists of interbedded glauconitic sandstone and siltstone. The PEF varies between 2.5 and 3.8 reflecting the strong presence of glauconite. The sands are described as fine to medium grained with poor visual porosity. A total of 9.3m of net reservoir sand is interpreted over the interval 630.0-640.0m with an average porosity of 24.5% and is interpreted to be entirely water saturated. Resistivities have reduced further to 2-3ohmm over this interval, indicating an increase in formation water salinity."

# 5 GEOLOGY

## *5.1 STRATIGRAPHY*

The stratigraphic section penetrated in Findra 1 is shown in Table 8 below. Formation tops were picked by reference to Pretty Hill 1 and Taralea 1.

| Stratigraphic Unit | | Depth RT (m) | Thickness (m) | Elevation AHD (m) |
|---|---|---|---|---|
| Newer Basalt | | 0.0 | 30.0 | 62.5 |
| Pt Campbell Lst | Heytesbury | 30.0 | 141.0 | 32.5 |
| Gellibrand Marl | | 171.0 | 124.5 | -108.5 |
| Clifton Fm | | 295.5 | 18.5 | -233.0 |
| Narrawaturk Marl | Nirran-da | 314.0 | 3.0 | -251.5 |
| Mepunga Fm | | 317.0 | 22.0 | -254.5 |
| Dilwyn Fm | Wangerrip | 339.0 | 84.0 | -276.5 |
| Pember Mudstone | | 423.0 | 42.0 | -360.5 |
| Pebble Pt Formation | | 465.0 | 18.0 | -402.5 |
| Massacre Shale | | 483.0 | 17.0 | -420.5 |
| Timboon Sst | Sherbrook | 500.0 | 16.0 | -437.5 |
| Paaratte Fm | | 516.0 | 48.5 | -453.5 |
| Skull Ck Mbr | | 564.5 | 3.5 | -502.0 |
| Nullawarre Gsnd | | 568.0 | 24.0 | -505.5 |
| Belfast Mdst | | 592.0 | 29.0 | -529.5 |
| Flaxman Fm | | 621.0 | 32.5 | -558.5 |
| (Flaxman Fm Sst) | | (630.0-641.0) | 11.0 | (-567.5) |
| Waarre Fm (B) | | 653.5 | 46.5 | -591.0 |
| Waarre Fm (A) | | 700.0 | 73.0 | -637.5 |
| Eumeralla Fm | | 773.0 | 106.0 | -710.5 |
| TD (wireline) | | 879.0 | | -816.5 |

Table 8 Stratigraphic Table

## *5.2 LITHOLOGY*

The full cutting descriptions are provided in Appendix 5 and summarised by interval on the Composite Well Log. Formations encountered in Findra 1 are described below.

**Newer Basalt and unnamed Quaternary sediments (0-30.0m)**

Newer Basalt from 4 to 20 m was underlain by mottled red and yellow clays to a depth of 27 m. (Depths are to the Sides Engineering rotary table.)

**Heytesbury Group, Late Eocene to Pliocene**

**Port Campbell Limestone (30.0–171.0m)**

The upper section (27-62 mRT) of the Port Campbell Limestone, drilled by the precollar contractor, is off-white to yellow calcarenite, hard at the bottom and producing water near the top. Much of the remainder of the Port Campbell Limestone is fine to coarse grained pale calcarenite, friable to occasionally hard, and a light grey sandy micritic calcisiltite containing abundant fossils (shells, bryozoans, forams, and rare shark teeth). In the bottom 30 metres, the calcisiltite becomes increasingly marly, and the lower part of the Port Campbell Limestone is marl with thin interbeds of calcarenite.

**Gellibrand Marl (171.0– 295.5m)**

The Gellibrand Marl consists of light to medium grey-brown, occasionally light greenish and bluish grey finely sandy/silty micritic marl, containing fine to very coarse fossil material (echinoid and bryozoan) with occasional traces of very finely dispersed glauconite. The marl becomes increasingly clay-rich with depth. The top of the Gellibrand Marl is picked on the geophysical logs where the limestone stringers cease.

**Clifton Formation (295.5–314.0 m)**

In the Clifton Formation, marl (as above) is interbedded with mottled yellow to medium grey calcarenite, becoming mottled orange and reddish grey at the base. The calcarenite is very fine to medium grained, micritic, microcrystalline, with minor very fine quartz silt in the matrix. The top of the Clifton Formation is defined by a break towards faster sonic on the geophysical logs, reflecting increasing cementation.

**Nirranda Group, Middle Eocene to Early Oligocene**

**Narrawaturk Marl (314.0–317.0 m)**

The Narrawaturk Marl is thin at this location, and was not apparent in cuttings, but is represented by a high-gamma, low sonic interval on the geophysical logs which is correlated with the Narrawaturk Marl on the basis of its stratigraphic position between quartz clastics (below) and calcarenites (above).

**Mepunga Formation (317.0–339.0 m)**

In the Mepunga Formation, soft brown dispersive claystone containing abundant brown very fine quartz grains is interbedded with a medium brown silty to very fine grained sucrosic quartzose sandstone, in firm aggregates with moderate to dense dolomitic and calcareous cement, with traces of loose coarse and very coarse quartz grains. The proportion of sandy claystone increases with depth.

**Wangerrip Group, Palaeocene to Middle Eocene**

**Dilwyn Formation (339.0–423.0 m)**

The Dilwyn Formation consists of interbedded sandstone, silty claystone, and siltstone. The sandstone appears in cuttings as clean loose fine to very coarse quartzose grains, clear to white, with traces of brown silty matrix. The sandy interbeds are largest and most common in the top of two-thirds of the interval. The siltstone and silty claystone a light brown, dark brown, or brownish grey, soft and dispersive, and contain common pyrite nodules. The top of the Dilwyn Formation is picked on a change from the

overlying sandy claystone to the top of the first clean massive porous quartzose sandstone. The base of the Dilwyn Formation is picked on the last sandstone interbed, and a decrease in sonic velocity down into the Pember Mudstone.

**Pember Mudstone (423.0–465.0 m)**

The Pember Mudstone is a lithologically uniform silty claystone, light to dark brown but mottled brick-red at the top of the interval, soft, very finely sandy in part, and with traces of fossil fragments. The homogenous nature of the mudstone is reflected in the consistent sonic, density, and gamma geophysical log character.

**Pebble Point Formation (465.0–483.0 m)**

The top of the Pebble Point Formation is picked on the first appearance of glauconite in the cuttings, and a corresponding change in log character: especially the PEF curve but also reflected in a sonic break towards faster velocities. The top four meters of the formation is a glauconitic mudstone. The remainder of the Pebble Point Formation is a brown to translucent fine to very coarse poorly sorted sandstone, in which the subangular to subrounded loose grains have an abundant silty matrix washing out. The inferred porosity is poor to occasionally good.

**Massacre Shale (483.0–500.0 m)**

The Massacre Shale is a dark grey very finely sandy glauconitic siltstone. It has a characteristic high gamma ray log signature, with high PEF and a fast sonic due to cementation by the glauconite.

**Sherbrook Group, Late Cretaceous**

**Timboon Sandstone (500.0–516.0 m)**

In the Timboon Sandstone, sandstone and minor interbeds of shale occur in two coarsening-upwards cycles. The sandstone is fine to coarse but predominantly medium grained, occurring as clear to white of light grey loose sub angular quartzose grains, with traces of grey lithic grains and composite quartz grains. Porosity is inferred to be poor in the presence of the common dense pyrite cement, but otherwise good.

**Paaratte Formation (516.0–564.5 m)**

The Paaratte Formation consists of mudstones (siltstones and silty claystones) with interbedded muddy sandstones. The top of the formation is picked at the base of the high gamma ray signature of the lowermost coarsening-upwards cycle of the Timboon Sandstone. The speckled light grey to brown siltstone is soft, micaceous, friable, and very pyritic in parts; pyritic streaks in the formation are evident on the geophysical logs as PEF peaks. The silty claystone is homogenous, medium to greyish brown, soft but occasionally hard when silicified. It is very finely silty and sandy, and rarely glauconitic. The sandstone appears as loose clear to translucent grains with abundant clay matrix washing out.

**Skull Creek Mudstone (564.5–568.0 m)**

The Skull Creek Mudstone is represented in Findra 1 by a 3 m interval of medium greyish brown finely sandy silty claystone which is soft and dispersive. It grains upwards into the Paaratte Formation siltstone.

**Nullawarre Greensand (568.0 –592.0 m)**

The Nullawarre Greensand consists of interbedded sandstone and siltstone. Geophysical logs indicate that the Nullawarre is sandy in the upper 5 m, including a 1 m tightly cemented band centred around 572 m. The bottom half of the Nullawarre Greensand is dominated by siltstone. Two types of sandstone occur: one presenting as loose clear very fine to fine quartz grains, and the other (comprising 80% of the sample) being mottled grey, brown, or speckled greenish grey very fine grained sucrosic aggregates. A dense silica cement is present, and the aggregates are hard with no visual porosity. The light brown to brownish grey siltstone is very finely sandy and contains traces of glauconite. It is dispersive and predominantly soft although in part it is silicified and very hard.

**Belfast Mudstone (592.0–621.0 m)**

The Belfast Mudstone is a homogeneous medium to dark brownish grey silty claystone, soft and sticky, with common pyrite nodules, traces of shelly fossil fragments, and occasional discrete very coarse quartz grains. The top of the Belfast Mudstone is picked at a return to consistent mudstone lithology in samples and on the gamma ray log.

**Flaxman Formation (intra -Belfast sandstone) (621.0–653.5 m)**

The Flaxman Formation consists of glauconitic sandstone and silty claystone, and it is top was picked on the appearance of glauconite in the samples and the corresponding changes to the PEF log character. The top and bottom of the Flaxman Formation consist of greyish brown, speckled green and black, or greenish to yellowish grey silty claystone containing abundant fine glauconite. There is a central sandy 11 m interval in which fine to medium (occasionally coarse and very coarse) loose grains contain 70% quartz, 30% glauconite, with the proportion of glauconite decreasing in clean high ROP sections. The grains are clear, green, or yellow, moderately sorted, angular to subrounded, predominantly clean but in part with a silty matrix which increases towards the base of the interval. The inferred porosity is fair to good. At the base of the Flaxman Formation, a hard to very hard glauconitic sandstone, consisting of 50-90% very fine to coarse glauconite in a dense silty glauconitic matrix, grades into a firm to hard glauconitic siltstone. There is no visual porosity. This glauconitic hardground causes a very high response on the PEF log. The base of this interval marks the base of the Flaxman Formation.

**Waarre Formation (unit B) (653.5–700.0 m)**

The Waarre Formation (unit B) contains medium greyish and greenish brown sandy siltstone with loose quartz, glauconite, a trace of pyrite nodules and a trace of yellow mineral fluorescence, and off-white, light grey, greyish brown or occasionally read mottled and Fe stained sandy and silty claystone in which there are minor pyrite nodules and traces of carbonaceous material and blocky brown coal.

**Waarre Formation (Unit A) (700.0–773.0 m)**

The Waarre Formation (unit A) is predominantly silty sandstone, interbedded with minor siltstone and silty claystone. The micaceous silty sandstone is poorly sorted, very fine grained, pale grey or greyish and greenish brown, in loose grains and silty aggregates and including abundant cherty and consolidated siltstone lithic grains, common coarse pyrite nodules, and traces of brick-red lithic grains and glauconite. The siltstone is very light grey or brown with occasionally medium brown laminations, and

rarely dark grey and pale bluish grey. It is very soft, very finely sandy in parts, and contains traces of pyrite. The top of the Waarre (A) is picked on the first appearance of lithic clasts in the samples.

**Eumeralla Formation (773.0–879.0 m (logger) TD)**

The portion of the Eumeralla Formation penetrated in Findra 1 consists of an upper litharenite sandstone, an interval of sandy claystone, and a lower interval in which litharenite sandstone grades downwards into sandy siltstone and claystone. The sandstone is a grey or greenish grey quartz litharenite containing abundant lithic grains (grey, green, occasionally black and red), predominantly as loose grains with a fine clay matrix washing out, but occasionally as calcareous cemented aggregates. The light brown sandy siltstone and sandy claystone contains very fine or fine and medium sand, and lithic grains. The claystone is light to dark brown or grey and contains sandy and carbonaceous laminations and traces of pyrite nodules. The top of the Eumeralla Formation was picked on the appearance of abundant lithic grains.

## *5.3 RESERVOIR QUALITY AND HYDROCARBON INDICATIONS*

The observed and interpreted porosity and hydrocarbon indications in individual zones of interest are detailed in Table 9.

Few very porous zones, as demonstrated by neutron/density crossover in the geophysical logs, exist in Findra 1. The Dilwyn Formation shows 30 m of porosity between 338 and 396m. Porous bands (1-2 m in thickness) exist in the lower Dilwyn (405-415 m) and the Timboon Sandstone (500-513 m). Petrophysics indicates excellent to good quality reservoir sandstones interbedded with shales in both the Dilwyn and the Pebble Point Formations. The Timboon Sandstone has good reservoir quality sandstones from 500 to 513.5 m; in the petrophysical report this interval is described as being part of the Paaratte Formation as the Timboon was not differentiated at the time of that report. The Paaratte Formation is more shaly with only thin tight sands. The Skull Creek Mudstone has some minor interbeds of thin sands with an average porosity of 21.3%. A 9.3 m sandy unit within the Flaxman Formation has good porosity. Sands within the Waarre Formation (A) are argillaceous so the effective porosity is low. Sands within the Eumeralla Formation are also argillaceous.

No shows were observed during the drilling of Findra 1. A trace of yellow mineral fluorescence was noted at 657 m in the Paaratte Formation. Intermittent gas was measured from 550 m (10-100 ppm), becoming more common with depth. From 647 m background gas was consistently present, with the average rising steadily with depth from ~200 ppm to ~2000 ppm at TD. Methane was the only gas type present. Gas background increased slightly during drilling breaks consistent with the increased drilling rate.

| Formation | Interval (m RT) | Drill Porosity | Drill HC (maximum) | Petrophysical analysis |
|---|---|---|---|---|
| Dilwyn | 338.5-386.5 | nil to good | nil | Sw 98.6%<br>2.9m@28.2% |
| Pebble Point | 469-482 | fair | nil | Sw 99.3%<br>8.2m@18.8% |
| Timboon Sandstone | 500-513.5 | poor to good | nil | Sw 95.9 %<br>8.8m@30.3% |
| Paaratte Fm | 551-464.5 | nil | 600 ppm | - |
| Skull Ck | 569.5-579 | nil | 300 ppm | SW 99.5 %<br>2.9 m@ 21.3% Øeff |
| Nullawarre Greensand | 585-592 | nil | 200 ppm | SW 100%<br>0.3 m@ 21.2 Øeff |
| Belfast Mudstone | 592-621 | nil | 2000 ppm | - |
| Flaxman Fm | 630-640 | trace to fair | 300 ppm | Sw 98%<br>9.3m@ 24.5% Øeff |
| | 640-653.5 | trace to nil | 500 ppm | - |
| Waarre Fm (B) | 653.5-700 | trace | 2500 ppm (C1 2500 ppm) | - |
| Waarre Fm (A) | 700-773 | nil | 5000 ppm (C1 5000 ppm) | - |
| Eumeralla Fm | 773-780.5 | trace | 5000 ppm (C1 5000 ppm) | - |
| | 780.5-786.5 | trace to nil | 5000 ppm (C1 5000 ppm) | SW 97.2%<br>0.8m@15.2% Øeff |
| | 786.5-889 | nil | 5000 ppm (C1 5000 ppm) | - |

Table 9: Reservoir Quality and Hydrocarbon Indications

## *5.4 CONTRIBUTION TO GEOLOGICAL KNOWLEDGE*

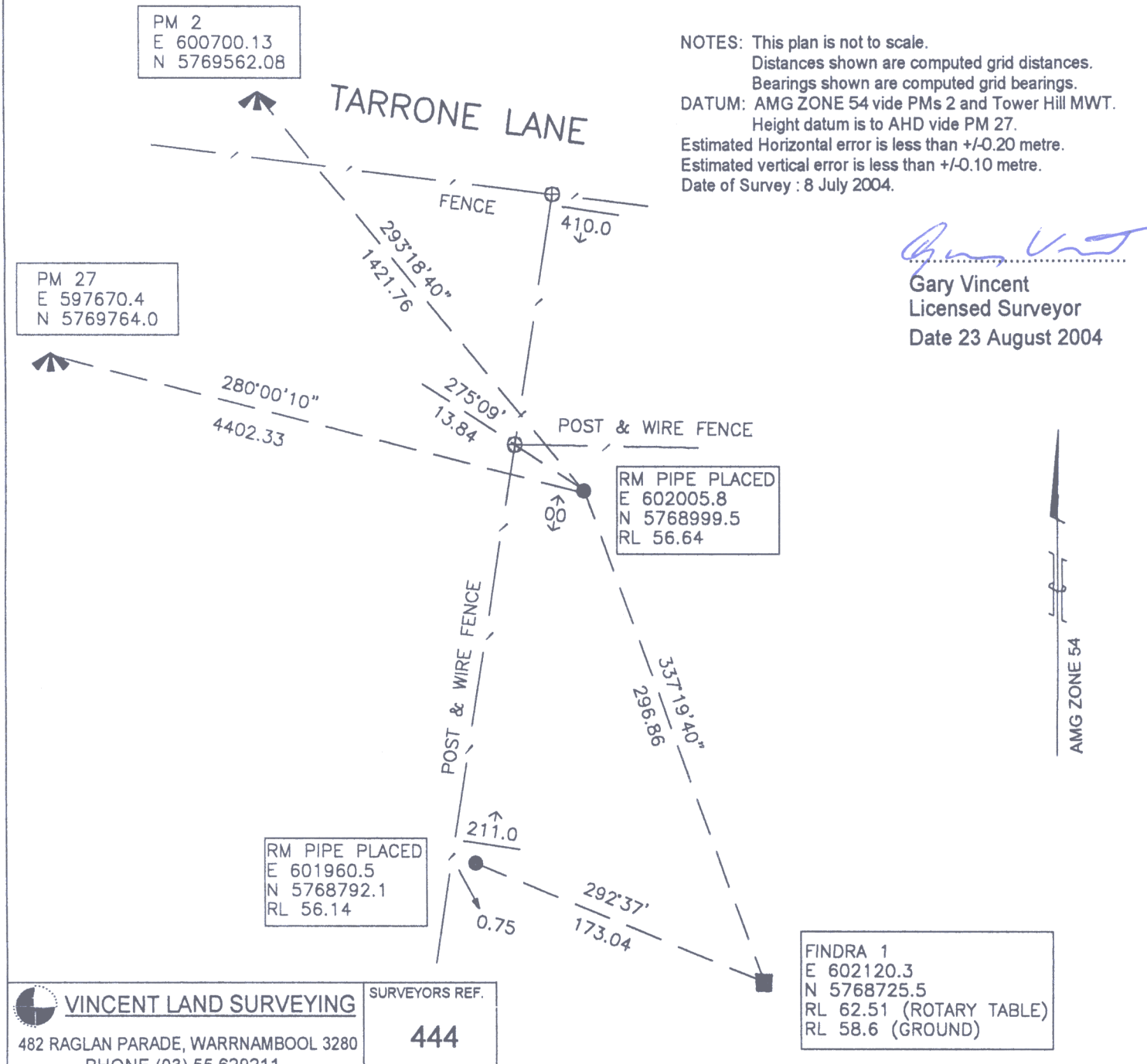
1. In Findra 1 the sequence is attenuated; units are much thinner than here than elsewhere, and some are only present as beds of a few meters thickness.
2. The Pebble Point Formation sandstones are better developed in Findra 1 than they are in the nearby Taralea 1 well, and this is one of the few occurrences of reservoir-quality sandstones in this formation within PEP 159.
3. The Timboon Sandstone and the Massacre Shale were not differentiated in the prognosis for this well, however their lithological character is well-developed in Findra 1, leading to their identification.
4. The absence of shows in porous sections of the target zones suggests a failure of the charge mechanism.
5. The seismic amplitude anomaly mapped in the Flaxman Formation appears to be a product of the hard diagenetically-altered carbonate-cemented horizon immediately below then porous zone in the target sandstone.

# Appendix 1: Location Survey

# VICTORIA
# GAS WELL LOCATION
## REFERENCE MARKS SKETCH PLAN
## Well Name : Findra 1

| AMG Zone 54 on AGD-66 | MGA Zone 54 on GDA-94 |
|---|---|
| Easting 602 120.3 | Easting 602 240.4 |
| Northing 5 768 725.5 | Northing 5 768 902.6 |
| LATITUDE S 38°13'24.70" | LATITUDE S 38°13'18.91" |
| LONGITUDE 142°09'59.99" | LONGITUDE 142°10'04.84" |

Elevation of rotary table 62.51 (AHD)
Ground level 58.6 (AHD)

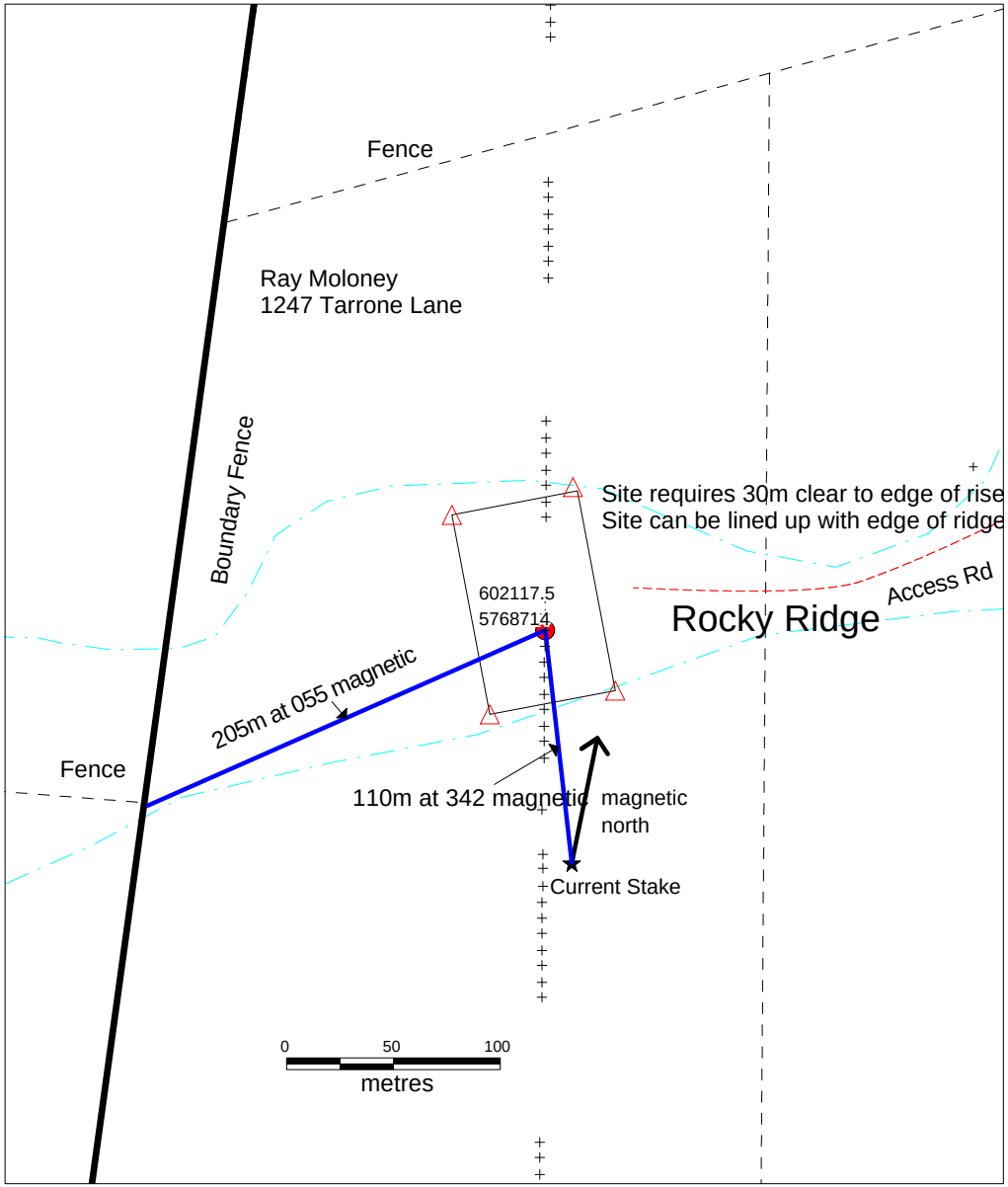


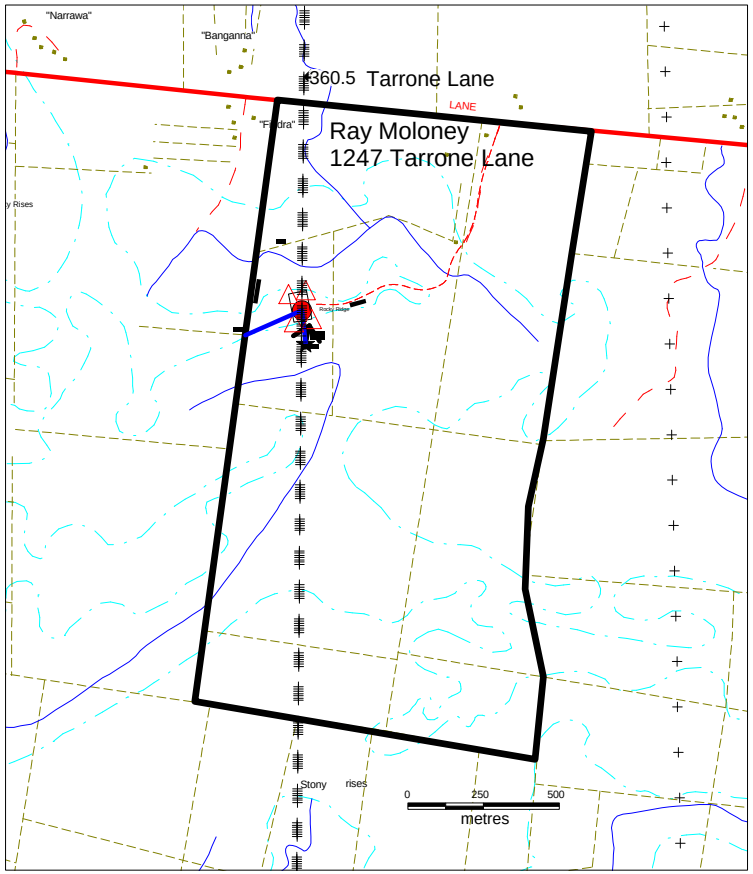

NOTES: This plan is not to scale.
Distances shown are computed grid distances.
Bearings shown are computed grid bearings.
DATUM: AMG ZONE 54 vide PMs 2 and Tower Hill MWT.
Height datum is to AHD vide PM 27.
Estimated Horizontal error is less than +/-0.20 metre.
Estimated vertical error is less than +/-0.10 metre.
Date of Survey : 8 July 2004.

Gary Vincent
Licensed Surveyor
Date 23 August 2004

VINCENT LAND SURVEYING
482 RAGLAN PARADE, WARRNAMBOOL 3280
PHONE (03) 55 629211

SURVEYORS REF.
444




| | | |
|---|---|---|
| Essential Petroleum Resources Limited | PEP159<br>**Findra Location with azimuths to local marks** | |
| Date: *April 2003* | Author: *GWK* | Plan: *DRAFT* |
| Projection: *UTM Zone 54 AGD66* | | Scale: *1:3,500* |
| File: *M:\PEP159\Kilarney_Findra.wor* | | |
| PDF: *DRAFT* | | |

Appendix 2: Daily Drilling Reports

Essential Petroleum Resources Limited

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 25-Jun-04 |
| REPORT No: | 1 |
| D.F.S: | 0.0 |
| SHOE L.O.T: | |

| | | | |
|---|---|---|---|
| **WELL NAME:** | **FINDRA-1** | **STATUS @ 2400 HRS:** | Finish pre-spud meeting - pick up Kelly & prep to spud. |

| | | | | | |
|---|---|---|---|---|---|
| DEPTH - 2400 HRS: | 39 m | FORMATION: | Pt Campbell Lst | RT - GL (m): | 3.95 m |
| DEPTH - PREVIOUS: | 39 m | HOLE SIZE: | 12.1/4" | SHOE DEPTH: | 61.0 mRT |
| 24 HR PROGRESS: | 0 m | ACCIDENTS: | Nil | LAST CASING: | 13.3/8" Conductor |
| SAFETY MEETINGS: | Held Pre-Spud & Safety meeting with crews. | | | | |

| MUD PROPERTIES | | ADDITIVES |
|---|---|---|
| DENSITY (ppg) | 8.50 | 84sx Aus-Gel |
| VISCOSITY | 60 | 1dr Caustic Soda |
| pH | 8.5 | |
| PV / YP | 10 / 22 | |
| GELS 10s/10m | 9 / 19 | |
| WL API / FC (cc) | - | |
| SOLIDS % | 1.1 | |
| SAND % | - | |
| CHLORIDES | 800 | |
| KCL (% WT) | - | |
| MBT (ppb) | 25 | |
| Pm Pm/Mf | 0 0.05 / 0.9 | |
| TEMP (degC) | - | |
| HOLE VOL (bbls) | 28 | |
| SURFACE VOL (bbls) | 180 | |
| HOLE LOSSES (bbls) | - | |
| MUD CO | RMN | |
| MUD ENGINEER | N. Kybird | |

| SOLIDS CONTROL | | |
|---|---|---|
| UNIT | GPM / HRS | UF / OF |
| DESILTER | | |
| DESANDER | | |
| MUDCLEANER | | |
| CENTRIFUGE | | |
| SHAKER SCREENS: | | |

| PUMPS | 1 | 2 |
|---|---|---|
| TYPE | TSM-500 | DB-550 |
| STROKE (") | 16 | 16 |
| LINER (") | 5 1/2 | 5 1/2 |
| SPM | | |
| PRESSURE | | |
| GPM | | |
| AV (DP - ft/min) | | |
| AV (DC - ft/min) | | |
| SPR | | |
| SPR PRESS | | |

| INVENTORY | |
|---|---|
| BARITE | 350 sx |
| GEL | 0 sx |
| CEMENT | 20 tonnes |
| SALT | 0 sx |
| KCL | 427 sx |
| DRILLWATER | 80 % |
| DIESEL FUEL | 5,000 lts |

| DRILLS / BOPS | |
|---|---|
| LAST BOP DRILL | |
| LAST FIRE DRILL | |
| LAST ABN.RIG DRILL | |
| LAST BOP TEST | |
| NEXT BOP TEST | |
| DAYS SINCE LAST LTA | 532 |

| BIT DATA | | |
|---|---|---|
| BIT No. | 1RR | |
| SIZE (ins) | 12.1/4" | |
| TYPE | M22 | |
| IADC CODE | | |
| SERIAL No. | 6003062 | |
| NOZZLES | 3 x 18 | |
| OUT (m) | - | |
| IN (m) | 61.0 | |
| DRILLED (m) | -22.0 | |
| HOURS | | |
| CONDITION | In | |
| AVG ROP (m/hr) | | |
| WOB (x1000 lbs) | | |
| RPM | | |
| JET VEL (ft/sec) | | |
| HHP @ BIT (HSI) | | |

| SURVEYS | | |
|---|---|---|
| **DEPTHS** | **Inc (deg)** | **Azimuth** |
| **MD/ ( TVD )** | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| FORMATION DATA | |
|---|---|
| TRIP GAS (%) | |
| CONN.GAS (%) | |
| B.GAS (%) | |
| P.PRESS (ppg) | |
| ECD (ppg) | |

| TIME ANALYSIS | |
|---|---|
| 1. MOVE RIG | |
| 2. RIG UP | 23.5 |
| 3. DRILLING | |
| 4. BIT TRIP | |
| 5. WIPER TRIP | |
| 6. SURVEY | |
| 7. CIRC / COND | |
| 8. CHANGE BHA | |
| 9. CASE & CEMENT | |
| 10. WELLHEAD | |
| 11. BOP'S | |
| 12. L.O.T. | |
| 13. CORING | |
| 14. LOGGING | |
| 15. REAM / WASH | |
| 16. FISH / STUCK | |
| 17. LOSS CIRC | |
| 18. KICK CONTROL | |
| 19. SIDETRACK | |
| 20. REP. SUBSURFACE | |
| 21. REP. SURFACE | |
| 22. WELL TEST | |
| 23. W.O. WEATHER | |
| 24. WAIT - OTHER | 0.5 |
| 25. ABANDON / SUSP | |
| 26. RIG DOWN | |
| 27. W.O. CEMENT | |
| 28. DRILL CEMENT | |
| 29. RIG SERVICE | |
| 30. SLIP & CUT LINE | |
| **TOTAL** | **24** |

BHA.: 12.1/4" Bit + Float Sub + 1x 8" DC + Stab + 1x 8" DC + X-over + 1x 6.1/2" DC.

| | | | |
|---|---|---|---|
| BHA WEIGHT : | lbs | STRING WT.: | lbs |
| | (buoyed weight) | | (buoyed weight) |
| DP RATING : | lbs - 'G' Grade | MARGIN : | 0 lbs @ 75% |
| DP RATING : | 595,000 lbs - 'S' Grade | MARGIN : | 446,250 lbs @ 75% |
| TORQUE ON BTM : | Kft.lbs | DRAG UP : | lbs |
| TORQUE OFF BTM : | Kft.lbs | DRAG DOWN : | lbs |

*CONTINUED ../2*

Essential Petroleum Resources Limited

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 25-Jun-04 |
| REPORT No: | 1 |
| D.F.S: | 0.0 |

**WELL NAME:** FINDRA-1 **STATUS @ 2400 HRS:** Finish pre-spud meeting - pick up Kelly & prep to spud.

| FROM | TO | HRS | 24 HOUR SUMMARY |
|---|---|---|---|
| 0:00 | 1:00 | 1.0 | Wait on Crew hours to break Tour and continue rigging up. |
| 1:00 | 23:00 | 22.0 | Rig up Rotary case & chain, Standpipe manifold & continue rigging up mud tanks. Rig up Pboy |
| | | | Degasser, slip 9m drill line, rig up V-Door and Catwalks. Pick up Swivel, Kelly & rathole sock. |
| | | | Continue rigging up rig floor & handling equipment, string Geolograph & survey lines. Dress off |
| | | | Conductor & prep for Riser. Load racks with BHA, strap & calliper. Weld on Riser & make up |
| | | | Flow line. Mix mud to prepare spud mud. Wash 2m fill at bottom of Mousehole and install sock. |
| 23:00 | 23:30 | 0.5 | Make up bit and BHA, tag hard cement at 39m, pressure test surface lines to 1500psi & fix |
| | | | leaks - retest to 1500psi - OK. |
| 23:30 | 0:00 | 0.5 | Hold Pre-spud & Safety meeting with rig crews. |
| | | | Incidents in last 24 Hours Y/N: No incidents no accidents |
| | | | ( If yes see separate report) |
| | | | **- Weather:** |
| | | | Daylight:- cool, frequent heavy showers, windy; |
| | | | Night:- cold, occ heavy showers, windy. |

| DOWNHOLE TOOLS | | |
|---|---|---|
| **Hours** | **Serial No.** | **Tool** |
| | T-1587-0 | String Stabiliser |

**FORMATION TOPS :**

**OPERATION TO 0600 HRS :** Secure floor plates, check mud flow path & pump rates. Spud well at 0030hrs and drill hard cement from 39m to 60m. Circulate to clear cuttings and loose gravel from shoe. Drill ahead in 12.1/4" open hole to 72m. @ 0600hrs: Drilling ahead at 72m at 42m/hr.

**PROGRAM - NEXT 24 HRS :** *Drill ahead in 12.1/4" surface hole to casing point; wiper trip, POOH, run 9.5/8" casing and cement. WOCement, slack off, lay out landing joint and nipple up BOP stack.*

| TRANSPORTATION | |
|---|---|
| TRANSPORT-1 | 1x K&S semi w/csg & mud in. |
| TRANSPORT-2 | 1x K&S p.mover w/Howco unit in. |
| TRANSPORT-3 | 1x K&S p.mover w/Howco bulker in. |
| FORKLIFT | |
| WATER HAULER | |
| ROAD WORK | |

| PERSONNEL | |
|---|---|
| CONTRACTOR | 19 |
| OPERATOR | 1 |
| SERVICE CO | 5 |
| | |
| | |
| **TOTAL :** | **25** |

| PROGRAMME COSTS | |
|---|---|
| DAILY AU $ : | |
| CUMULATIVE AU $ : | $267,444 |
| +10% GST to Cum.Total = | $294,188 total cost to date |
| REPORTED TO : | J. Slater |
| REPORTED BY : | V. Ozolins |

*END OF REPORT*

Essential Petroleum Resources Limited

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 26-Jun-04 |
| REPORT No: | 2 |
| D.F.S: | 1.0 |
| SHOE L.O.T: | |

| | | | |
|---|---|---|---|
| **WELL NAME:** | **FINDRA-1** | **STATUS @ 2400 HRS:** | WOCement - rig down casing tongs, clean mud tanks. |

| | | | | | |
|---|---|---|---|---|---|
| DEPTH - 2400 HRS: | 153 m | FORMATION: | Gellibrand Marl | RT - GL (m): | 3.95 m |
| DEPTH - PREVIOUS: | 39 m | HOLE SIZE: | 12.1/4" | SHOE DEPTH: | 150.3 mRT |
| 24 HR PROGRESS: | 114 m | ACCIDENTS: | Nil | LAST CASING: | 9.5/8" Conductor |
| SAFETY MEETINGS: | Crews held pre-Tour Safety meetings & 2x JSA's, Held Pre-Casing and Pre-Cementing job meetings. | | | | |

| MUD PROPERTIES | | ADDITIVES |
|---|---|---|
| DENSITY (ppg) | 8.70 | 6sx S.A.P.P. |
| VISCOSITY | 32 | |
| pH | 8.8 | |
| PV / YP | 5 / 9 | |
| GELS 10s/10m | 5 / 11 | |
| WL API / FC (cc) | - | |
| SOLIDS % | 2.5 | |
| SAND % | - | |
| CHLORIDES | 800 | |
| KCL (% WT) | - | |
| MBT (ppb) | 15 | |
| Pm Pm/Mf | 0 0.10 / 0.70 | |
| TEMP (degC) | - | |
| HOLE VOL (bbls) | 60 | |
| SURFACE VOL (bbls) | 380 | |
| HOLE LOSSES (bbls) | - | |
| MUD CO | RMN | |
| MUD ENGINEER | N. Kybird | |

| SOLIDS CONTROL | | |
|---|---|---|
| UNIT | GPM / HRS | UF / OF |
| DESILTER | | |
| DESANDER | | |
| MUDCLEANER | | |
| CENTRIFUGE | | |
| SHAKER SCREENS: | 3x S55 | |

| PUMPS | 1 | 2 |
|---|---|---|
| TYPE | TSM-500 | DB-550 |
| STROKE (") | 16 | 16 |
| LINER (") | 5 1/2 | 5 1/2 |
| SPM | 54 | 54 |
| PRESSURE (psi) | 900 | |
| GPM | 617 | |
| AV (DP - ft/min) | 114 | |
| AV (DC - ft/min) | 134 / 145 | |
| SPR | 40 | 43 |
| SPR PRESS | 200 | 200 |

| INVENTORY | |
|---|---|
| BARITE | 350 sx |
| GEL | 0 sx |
| CEMENT | 11.4 tonnes |
| SALT | 0 sx |
| KCL | 427 sx |
| DRILLWATER | 100 % |
| DIESEL FUEL | 9,700 lts |

| DRILLS / BOPS | |
|---|---|
| LAST BOP DRILL | |
| LAST FIRE DRILL | |
| LAST ABN.RIG DRILL | |
| LAST BOP TEST | |
| NEXT BOP TEST | |
| DAYS SINCE LAST LTA | 533 |

| BIT DATA | | |
|---|---|---|
| BIT No. | 1RR | |
| SIZE (ins) | 12.1/4" | |
| TYPE | M22 | |
| IADC CODE | | |
| SERIAL No. | 6003062 | |
| NOZZLES | 3 x 18 | |
| OUT (m) | 153.0 | |
| IN (m) | 61.0 | |
| DRILLED (m) | 92.0 | |
| HOURS | 5 | |
| CONDITION | 3-3-WT-A-E-1-NO-TD | |
| AVG ROP (m/hr) | 18.40 | |
| WOB (x1000 lbs) | 5 - 15 | |
| RPM | 90 - 110 | |
| JET VEL (ft/sec) | 276 | |
| HHP @ BIT (HSI) | 2.54 | |

| SURVEYS | | |
|---|---|---|
| **DEPTHS** | **Inc (deg)** | **Azimuth** |
| **MD/ ( TVD )** | | |
| 68.0 | 1.50 | - |
| 141 | 1.00 | - |
| | | |
| | | |
| | | |
| | | |
| | | |

| FORMATION DATA | |
|---|---|
| TRIP GAS (%) | |
| CONN.GAS (%) | 0 |
| B.GAS (%) | 0 |
| P.PRESS (ppg) | |
| ECD (ppg) | |

| TIME ANALYSIS | |
|---|---|
| 1. MOVE RIG | |
| 2. RIG UP | 0.5 |
| 3. DRILLING | 5 |
| 4. BIT TRIP | 1 |
| 5. WIPER TRIP | 2 |
| 6. SURVEY | 1 |
| 7. CIRC / COND | 2 |
| 8. CHANGE BHA | 0.5 |
| 9. CASE & CEMENT | 6 |
| 10. WELLHEAD | |
| 11. BOP'S | |
| 12. L.O.T. | |
| 13. CORING | |
| 14. LOGGING | |
| 15. REAM / WASH | |
| 16. FISH / STUCK | |
| 17. LOSS CIRC | |
| 18. KICK CONTROL | |
| 19. SIDETRACK | |
| 20. REP. SUBSURFACE | |
| 21. REP. SURFACE | |
| 22. WELL TEST | |
| 23. W.O. WEATHER | |
| 24. WAIT - OTHER | 0.5 |
| 25. ABANDON / SUSP | |
| 26. RIG DOWN | |
| 27. W.O. CEMENT | 1.5 |
| 28. DRILL CEMENT | 4 |
| 29. RIG SERVICE | |
| 30. SLIP & CUT LINE | |
| **TOTAL** | **24** |

BHA.: 12.1/4" Bit + Float Sub + 1x 8" DC + Stab + 1x 8" DC + X-over + 8x 6.1/2" DC + 4x HWDP = 132.4m

| | | | |
|---|---|---|---|
| BHA WEIGHT : | 33,440 lbs (buoyed weight) | STRING WT.: | 36,000 lbs (buoyed weight) |
| DP RATING : | lbs - 'G' Grade | MARGIN : | 0 lbs @ 75% |
| DP RATING : | 595,000 lbs - 'S' Grade | MARGIN : | 446,250 lbs @ 75% |
| TORQUE ON BTM : | Kft.lbs | DRAG UP : | lbs |
| TORQUE OFF BTM : | Kft.lbs | DRAG DOWN : | lbs |

*CONTINUED ../2*

Essential Petroleum Resources Limited

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 26-Jun-04 |
| REPORT No: | 2 |
| D.F.S: | 1.0 |

**WELL NAME:** FINDRA-1 **STATUS @ 2400 HRS:** WOCement - rig down casing tongs, clean mud tanks.

| FROM | TO | HRS | 24 HOUR SUMMARY |
|---|---|---|---|
| 0:00 | 0:30 | 0.5 | Rig up trip tank fill-up line, make up lower Kelly cock and saver sub - break circulation. |
| 0:30 | 4:30 | 4.0 | Spud Findra-1 and drill cement from 39m to 60m with reduced parameters. |
| 4:30 | 6:00 | 1.5 | Drill ahead in 12.1/4" hole from 60m to 79m with reduced parameters to minimise hole washout. |
| 6:00 | 6:30 | 0.5 | Circulate and run wireline survey at 68m = 1.50deg deviation. |
| 6:30 | 9:00 | 2.5 | Drill ahead in 12.1/4" hole from 79m to 134m at avg 22m/hr. |
| 9:00 | 9:30 | 0.5 | Circulate and build mud volume. |
| 9:30 | 10:30 | 1.0 | Drill ahead in 12.1/4" hole from 134m to 153m section TD at avg 19m/hr. |
| 10:30 | 11:00 | 0.5 | Circulate and run wireline survey at 141m = 1.0deg deviation. |
| 11:00 | 13:00 | 2.0 | Wiper trip - strap out (no corr), max 5K o/pull. Check bit, RIH to bottom - no fill. |
| 13:00 | 15:00 | 2.0 | Circulate hole clean - clean and drift 9.5/8" casing, install float shoe and float collar on casing. |
| 15:00 | 16:00 | 1.0 | POOH to run casing. |
| 16:00 | 16:30 | 0.5 | Lay out 2x 8" drill collars and 12.1/4" stabiliser. |
| 16:30 | 18:00 | 1.5 | Rig up to run 9.5/8" casing. |
| 18:00 | 18:30 | 0.5 | Hold pre-job safety meeting. Pick up shoe track and test floats - okay. |
| 18:30 | 20:30 | 2.0 | Run 9.5/8" 36# K55 BTC R3 casing to 145m (total of 12 joints). |
| 20:30 | 21:00 | 0.5 | Pick up Landing jnt, make up circulating swage, RIH to 150.34m - circulate 150% casing volume. |
| 21:00 | 21:30 | 0.5 | Hold pre-Cement job safety meeting. Make up cement Head with Bottom and Top Plugs installed. |
| | | | Halliburton pump water Spacer, p/test cementing lines to 4000psi and pump remaining Spacer. |
| 21:30 | 22:30 | 1.0 | Mix & pump 200sx class 'A' cement at 15.6ppg w/2% CaCl at 4 bpm. Drop top Plug & displace |
| | | | cement w/34.9bbl H2O at 5 bpm. Cement returns to surface after 33bbl displaced. Bumped Plug |
| | | | at 2225hrs w/230psi & then test casing to 1600psi for 10min. Bled back 1/4bbl - floats held. |
| 22:30 | 0:00 | 1.5 | WOCement - centre casing in R-Table and nipple down Flowline. Rig down casing tongs and |
| | | | prepare to cut conductor pipe. Dump & clean mud tanks. |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | Incidents in last 24 Hours Y/N: No incidents no accidents |
| | | | ( If yes see separate report) |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | **- Weather:** |
| | | | Daylight:- cool, occ showers, light winds; |
| | | | Night:- cold, mainly fine, light winds. |

**DOWNHOLE TOOLS**

| Hours | Serial No. | Tool |
|---|---|---|
| | T-1587-0 | String Stabiliser |

**FORMATION TOPS :**

**OPERATION TO 0600 HRS :** WOCement - cut conductor pipe. Lay out Cement Head, slack off casing & lay out Landing joint. Prepare to install wellhead.

@06:00hrs: Preparing to install wellhead.

**PROGRAM - NEXT 24 HRS :** *Install wellhead, nipple up BOP stack and ancillary lines & equipment. P/test equipment, make up new bit & BHA, RIH and drill out cement. Conduct FIT and drill ahead in 8.1/2" hole.*

| TRANSPORTATION | |
|---|---|
| TRANSPORT-1 | |
| TRANSPORT-2 | |
| TRANSPORT-3 | |
| FORKLIFT | |
| WATER HAULER | |
| ROAD WORK | |

| PERSONNEL | |
|---|---|
| CONTRACTOR | 19 |
| OPERATOR | 1 |
| SERVICE CO | 5 |
| | |
| | |
| **TOTAL :** | **25** |

| PROGRAMME COSTS | |
|---|---|
| DAILY AU $ : | $66,345 |
| CUMULATIVE AU $ : | $383,911 |
| +10% GST to Cum.Total = | $420,474 total cost to date |
| REPORTED TO : | J. Slater |
| REPORTED BY : | V. Ozolins |

*END OF REPORT*

Essential Petroleum Resources Limited

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 27-Jun-04 |
| REPORT No: | 3 |
| D.F.S: | 2.0 |
| SHOE L.O.T: | |

| | | | |
|---|---|---|---|
| **WELL NAME:** | **FINDRA-1** | **STATUS @ 2400 HRS:** | Preparing new BHA.(move to racks, measure & calliper). |

| | | | | | |
|---|---|---|---|---|---|
| DEPTH - 2400 HRS: | 153 m | FORMATION: | Gellibrand Marl | RT - GL (m): | 3.95 m |
| DEPTH - PREVIOUS: | 153 m | HOLE SIZE: | 8.1/2" | SHOE DEPTH: | 150.3 mRT |
| 24 HR PROGRESS: | 0 m | ACCIDENTS: | Nil | LAST CASING: | 9.5/8" Conductor |
| SAFETY MEETINGS: | Crews held pre-Tour Safety meetings & 2x JSA's, Held Pre-Casing and Pre-Cementing job meetings. | | | | |

| MUD PROPERTIES | | ADDITIVES |
|---|---|---|
| DENSITY (ppg) | 8.60 | 4sx AMC-Pac R |
| VISCOSITY | 38 | 2sx PHPA |
| pH | 8.5 | 20sx KCl |
| PV / YP | 3 / 8 | 95sx KCl (EPRL) |
| GELS 10s/10m | 1 / 2 | 1sk Xan-Bore |
| WL API / FC (cc) | 8.0 | |
| SOLIDS % | 0.7 | |
| SAND % | - | |
| CHLORIDES | 20,000 | |
| KCL (% WT) | 4.00 | |
| MBT / PHPA (ppb) | - / 0.15 | |
| Pm Pm/Mf | 0 0.10 / 0.60 | |
| TEMP (degC) | - | |
| HOLE VOL (bbls) | 60 | |
| SURFACE VOL (bbls) | 380 | |
| HOLE LOSSES (bbls) | - | |
| MUD CO | RMN | |
| MUD ENGINEER | N. Kybird | |

| SOLIDS CONTROL | | |
|---|---|---|
| UNIT | GPM / HRS | UF / OF |
| DESILTER | | |
| DESANDER | | |
| MUDCLEANER | | |
| CENTRIFUGE | | |
| SHAKER SCREENS: | 3x S55 | |

| PUMPS | 1 | 2 |
|---|---|---|
| TYPE | TSM-500 | DB-550 |
| STROKE (") | 16 | 16 |
| LINER (") | 5 1/2 | 5 1/2 |
| SPM | | 50 |
| PRESSURE (psi) | | 1000 |
| GPM | | 285 |
| AV (DP - ft/min) | | |
| AV (DC - ft/min) | | |
| SPR | | |
| SPR PRESS | | |

| INVENTORY | |
|---|---|
| BARITE | 350 sx |
| GEL | 0 sx |
| CEMENT | 11.4 tonnes |
| SALT | 0 sx |
| KCL | 427 sx |
| DRILLWATER | 100 % |
| DIESEL FUEL | 8,500 lts |

| DRILLS / BOPS | |
|---|---|
| LAST BOP DRILL | |
| LAST FIRE DRILL | |
| LAST ABN.RIG DRILL | |
| LAST BOP TEST | 27-Jun-04 |
| NEXT BOP TEST | 11-Jul-04 |
| DAYS SINCE LAST LTA | 534 |

| BIT DATA | | |
|---|---|---|
| BIT No. | 2RR | |
| SIZE (ins) | 8.1/2" | |
| TYPE | CH04MS | |
| IADC CODE | 4-1-7 | |
| SERIAL No. | 172489 | |
| NOZZLES | 3 x 13 | |
| OUT (m) | - | |
| IN (m) | 153.0 | |
| DRILLED (m) | 0.0 | |
| HOURS | | |
| CONDITION | In | |
| AVG ROP (m/hr) | | |
| WOB (x1000 lbs) | 5 - 15 | |
| RPM | 80 | |
| JET VEL (ft/sec) | 282 | |
| HHP @ BIT (HSI) | 2.33 | |

| SURVEYS | | |
|---|---|---|
| **DEPTHS** | **Inc (deg)** | **Azimuth** |
| **MD/ ( TVD )** | | |
| 68.0 | 1.50 | - |
| 141 | 1.00 | - |
| | | |
| | | |
| | | |
| | | |
| | | |

| FORMATION DATA | |
|---|---|
| TRIP GAS (%) | |
| CONN.GAS (%) | 0 |
| B.GAS (%) | 0 |
| P.PRESS (ppg) | |
| ECD (ppg) | |

| TIME ANALYSIS | |
|---|---|
| 1. MOVE RIG | |
| 2. RIG UP | |
| 3. DRILLING | |
| 4. BIT TRIP | |
| 5. WIPER TRIP | |
| 6. SURVEY | |
| 7. CIRC / COND | |
| 8. CHANGE BHA | 1.5 |
| 9. CASE & CEMENT | 0.5 |
| 10. WELLHEAD | 0.5 |
| 11. BOP'S | 11.5 |
| 12. L.O.T. | |
| 13. CORING | |
| 14. LOGGING | |
| 15. REAM / WASH | |
| 16. FISH / STUCK | |
| 17. LOSS CIRC | |
| 18. KICK CONTROL | |
| 19. SIDETRACK | |
| 20. REP. SUBSURFACE | |
| 21. REP. SURFACE | 6.5 |
| 22. WELL TEST | |
| 23. W.O. WEATHER | |
| 24. WAIT - OTHER | |
| 25. ABANDON / SUSP | |
| 26. RIG DOWN | |
| 27. W.O. CEMENT | 3.5 |
| 28. DRILL CEMENT | |
| 29. RIG SERVICE | |
| 30. SLIP & CUT LINE | |
| **TOTAL** | **24** |

BHA.: 8.1/2" TCI Bit + Float Sub + 1x 6.1/4" DC + Stab + 12x 6.1/4" DC = 133.66m

| | | | |
|---|---|---|---|
| BHA WEIGHT : | 35,000 lbs (buoyed weight) | STRING WT.: | 35,000 lbs (buoyed weight) |
| DP RATING : | lbs - 'G' Grade | MARGIN : | 0 lbs @ 75% |
| DP RATING : | 595,000 lbs - 'S' Grade | MARGIN : | 446,250 lbs @ 75% |
| TORQUE ON BTM : | Kft.lbs | DRAG UP : | lbs |
| TORQUE OFF BTM : | Kft.lbs | DRAG DOWN : | lbs |

*CONTINUED ../2*

Essential Petroleum Resources Limited

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 27-Jun-04 |
| REPORT No: | 3 |
| D.F.S: | 2.0 |

**WELL NAME:** FINDRA-1 **STATUS @ 2400 HRS:** Preparing new BHA.(move to racks, measure & calliper).

| FROM | TO | HRS | 24 HOUR SUMMARY |
|---|---|---|---|
| 0:00 | 2:00 | 2.0 | WOCement - nipple down Flowline. Rig down casing tongs, dump and clean mud tanks. |
| 2:00 | 3:30 | 1.5 | Cut conductor, rig down Cement Head and lines and lay out same. |
| 3:30 | 4:00 | 0.5 | Slack off 9.5/8" casing, back out Landing joint and lay out same. |
| 4:00 | 10:30 | 6.5 | Remove oxy damaged casing collar from top joint and replace with new collar. |
| 10:30 | 11:00 | 0.5 | Install screw on WHD and make up same. |
| 11:00 | 16:30 | 5.5 | Install and nipple up BOP stack, Choke & Kill lines and Choke manifold. |
| 16:30 | 19:00 | 2.5 | Function test Rams & P/test Blind Rams against casing to 300psi low and 2000psi high. Pick up |
| | | | cup-tester and p/test Annular to 300psi low & 1500psi high; all remaining equipment (Pipe Rams, |
| | | | Kill line/valves, Choke manifold, HCR) to 300psi low and 2500psi high - OK. |
| 19:00 | 22:30 | 3.5 | Respot Catwalks, pipe racks, V-door and Mousehole. Rig up Flare line. |
| 22:30 | 0:00 | 1.5 | Lay out excess pipe from derrick; spot, measure and calliper new BHA. |

| DOWNHOLE TOOLS | | |
|---|---|---|
| Hours | Serial No. | Tool |
| | | |
| 0 | T1350 | Str.Stabiliser |
| 0 | DJ 002 | Drlg.Jars |

Incidents in last 24 Hours Y/N: No incidents no accidents

( If yes see separate report)

**- Weather:**

Daylight:- cool, fine, light winds;

Night:- cold, fine, increasingly windy.

**FORMATION TOPS :**

**OPERATION TO 0600 HRS :** Prepare new BHA, make up rerun 8.1/2" bit & float sub. RIH picking up new BHA, tag cement at 132m. Kelly up, circulate & drill out plugs, shoe track and clean out rathole to 153m. Drill 3m new hole to 156m. Displace to KCL/PHPA mud and circulate to balance mud. @06:00hrs: Circulate - preparing to do FIT.

**PROGRAM - NEXT 24 HRS :** *Conduct FIT and drill ahead in 8.1/2" hole - evaluate shows.*

| TRANSPORTATION | |
|---|---|
| TRANSPORT-1 | Vacuum truck for Camp & Rig septic. |
| TRANSPORT-2 | |
| TRANSPORT-3 | |
| FORKLIFT | |
| WATER HAULER | |
| ROAD WORK | |

| PERSONNEL | |
|---|---|
| CONTRACTOR | 20 |
| OPERATOR | 2 |
| SERVICE CO | 8 |
| | |
| | |
| **TOTAL :** | **30** |

| PROGRAMME COSTS | |
|---|---|
| DAILY AU $ : | $53,024 |
| CUMULATIVE AU $ : | $436,935 |
| +10% GST to Cum.Total = | $478,548 total cost to date |
| REPORTED TO : | J. Slater |
| REPORTED BY : | V. Ozolins |

*END OF REPORT*

Essential Petroleum Resources Limited

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 28-Jun-04 |
| REPORT No: | 4 |
| D.F.S: | 3.0 |
| SHOE L.O.T: | 12.48 |

| | | | |
|---|---|---|---|
| **WELL NAME:** | **FINDRA-1** | **STATUS @ 2400 HRS:** | Drilling ahead in 8.1/2" hole at 534m. |

| | | | | | |
|---|---|---|---|---|---|
| DEPTH - 2400 HRS: | 534 m | FORMATION: | Paarrate Fm | RT - GL (m): | 3.95 m |
| DEPTH - PREVIOUS: | 153 m | HOLE SIZE: | 8.1/2" | SHOE DEPTH: | 150.3 mRT |
| 24 HR PROGRESS: | 381 m | ACCIDENTS: | Nil | LAST CASING: | 9.5/8" Conductor |
| SAFETY MEETINGS: | Crews held pre-Tour Safety meetings & 2x JSA's & Kick Drills. | | | | |

| MUD PROPERTIES | | ADDITIVES |
|---|---|---|
| DENSITY (ppg) | 9.00 | 9sx AMC-Pac R |
| VISCOSITY | 39 | 5sx PHPA |
| pH | 8.8 | 55sx KCl |
| PV / YP | 11 / 15 | 6sx Soda Ash |
| GELS 10s/10m | 2 / 4 | 1sk Xan-Bore |
| WL API / FC (cc) | 6.5 | 2sx Sod.Sulphite |
| SOLIDS % | 3.5 | 1dr AMC Biocide G |
| SAND % | - | |
| CHLORIDES | 21,000 | |
| KCL (% WT) | 4.10 | |
| MBT / PHPA (ppb) | 7.5 / 0.5 | |
| Pm Pm/Mf | 0 0.15 / 1.20 | |
| TEMP (degC) | - | |
| HOLE VOL (bbls) | 101 | |
| SURFACE VOL (bbls) | 380 | |
| HOLE LOSSES (bbls) | 72 | |
| MUD CO | RMN | |
| MUD ENGINEER | N. Kybird | |

| SOLIDS CONTROL | | |
|---|---|---|
| UNIT | GPM / HRS | UF / OF |
| DESILTER | 0.5 / 17 | 11.1 / 8.7 |
| DESANDER | | |
| MUDCLEANER | | |
| CENTRIFUGE | | |
| SHAKER SCREENS: | 3x S84 | |

| PUMPS | 1 | 2 |
|---|---|---|
| TYPE | TSM-500 | DB-550 |
| STROKE (") | 16 | 16 |
| LINER (") | 5 1/2 | 5 1/2 |
| SPM | | 60 |
| PRESSURE (psi) | | 900 |
| GPM | | 342 |
| AV (DP - ft/min) | (Csg) 145, (OH) 161 | |
| AV (DC - ft/min) | (OH) 279 | |
| SPR | 30 | 30 |
| SPR PRESS | 300 | 300 |

| INVENTORY | |
|---|---|
| BARITE | 350 sx |
| GEL | 0 sx |
| CEMENT | 11.4 tonnes |
| SALT | 0 sx |
| KCL | 257 sx |
| DRILLWATER | 100 % |
| DIESEL FUEL | 9,200 lts |

| DRILLS / BOPS | |
|---|---|
| LAST BOP DRILL | 28-Jun-04 |
| LAST FIRE DRILL | |
| LAST ABN.RIG DRILL | |
| LAST BOP TEST | 27-Jun-04 |
| NEXT BOP TEST | 11-Jul-04 |
| DAYS SINCE LAST LTA | 534 |

| BIT DATA | | |
|---|---|---|
| BIT No. | 2RR | |
| SIZE (ins) | 8.1/2" | |
| TYPE | CH04MS | |
| IADC CODE | 4-1-7 | |
| SERIAL No. | 172489 | |
| NOZZLES | 3 x 13 | |
| OUT (m) | - | |
| IN (m) | 153.0 | |
| DRILLED (m) | 381.0 | |
| HOURS | 16 | |
| CONDITION | In | |
| AVG ROP (m/hr) | 23.81 | |
| WOB (x1000 lbs) | 10 - 15 | |
| RPM | 90 - 110 | |
| JET VEL (ft/sec) | 282 | |
| HHP @ BIT (HSI) | 2.33 | |

| SURVEYS | | |
|---|---|---|
| **DEPTHS** | **Inc (deg)** | **Azimuth** |
| **MD/ ( TVD )** | | |
| 68 | 1.50 | - |
| 141 | 1.00 | - |
| 348 | 1.50 | - |
| | | |
| | | |
| | | |
| | | |

| FORMATION DATA | |
|---|---|
| TRIP GAS (%) | |
| CONN.GAS (%) | 0 |
| B.GAS (%) | 0 |
| P.PRESS (ppg) | |
| ECD (ppg) | |

| TIME ANALYSIS | |
|---|---|
| 1. MOVE RIG | |
| 2. RIG UP | |
| 3. DRILLING | 16 |
| 4. BIT TRIP | 0.5 |
| 5. WIPER TRIP | |
| 6. SURVEY | 0.5 |
| 7. CIRC / COND | 2 |
| 8. CHANGE BHA | 2 |
| 9. CASE & CEMENT | |
| 10. WELLHEAD | |
| 11. BOP'S | |
| 12. L.O.T. | 0.5 |
| 13. CORING | |
| 14. LOGGING | |
| 15. REAM / WASH | |
| 16. FISH / STUCK | |
| 17. LOSS CIRC | |
| 18. KICK CONTROL | |
| 19. SIDETRACK | |
| 20. REP. SUBSURFACE | |
| 21. REP. SURFACE | |
| 22. WELL TEST | |
| 23. W.O. WEATHER | |
| 24. WAIT - OTHER | |
| 25. ABANDON / SUSP | |
| 26. RIG DOWN | |
| 27. W.O. CEMENT | |
| 28. DRILL CEMENT | 2.5 |
| 29. RIG SERVICE | |
| 30. SLIP & CUT LINE | |
| **TOTAL** | **24** |

BHA.: 8.1/2" TCI Bit + Float Sub + 1x 6.1/4" DC + Stab + 12x 6.1/4" DC + D.Jars + + 6x 6.1/4" DC + 6x HWDP = 244.9m

| | | | |
|---|---|---|---|
| BHA WEIGHT : | 56,600 lbs (buoyed weight) | STRING WT.: | 68,000 lbs (buoyed weight) |
| DP RATING : | lbs - 'G' Grade | MARGIN : | lbs @ 75% |
| DP RATING : | 595,000 lbs - 'S' Grade | MARGIN : | 446,250 lbs @ 75% |
| TORQUE ON BTM : | Kft.lbs | DRAG UP : | 4,000 lbs |
| TORQUE OFF BTM : | Kft.lbs | DRAG DOWN : | 2,000 lbs |

*CONTINUED ../2*

Essential Petroleum Resources Limited

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 28-Jun-04 |
| REPORT No: | 4 |
| D.F.S: | 3.0 |

**WELL NAME:** FINDRA-1 **STATUS @ 2400 HRS:** Drilling ahead in 8.1/2" hole at 534m.

| FROM | TO | HRS | 24 HOUR SUMMARY |
|---|---|---|---|
| 0:00 | 0:30 | 0.5 | Prepare BHA - measure and calliper new BHA. |
| 0:30 | 2:00 | 1.5 | Pick up 1x 6.1/4" DC and make up 8.1/2" bit-2. Make up float and pick up 6x 6.1/4" DC. |
| 2:00 | 2:30 | 0.5 | RIH with BHA from Derrick and pick up Drilling Jars - tag top of cement at 132m. |
| 2:30 | 3:00 | 0.5 | Kelly up and break circulation. |
| 3:00 | 5:30 | 2.5 | Drill out cement, Plugs & shoe track to, clean out rathole to 153m and drill 3m new hole to 156m. |
| 5:30 | 6:00 | 0.5 | Displace hole to KCl/PHPA mud and circulate to balance mud weight. |
| 6:00 | 6:30 | 0.5 | Pull back to shoe, conduct FIT to 12.48ppg MWE with 8.65ppg mud and 100psi surface pressure. |
| 6:30 | 15:30 | 9.0 | Drill ahead in 8.1/2" hole from 156m to 360m at avg ROP of 22.7m/hr. |
| 15:30 | 16:00 | 0.5 | Circulate and survey at 348m = 1.5deg. |
| 16:00 | 20:30 | 4.5 | Drill ahead in 8.1/2" hole from 360m to 474m at avg ROP of 25.4m/hr. |
| 20:30 | 21:00 | 0.5 | Circulate up sample after 2m drill break - no gas, no shows. |
| 21:00 | 22:30 | 1.5 | Drill ahead in 8.1/2" hole from 474m to 506m at avg ROP of 21.4m/hr. |
| 22:30 | 23:00 | 0.5 | Circulate up sample after 2m drill break - no gas, no shows. |
| 23:00 | 0:00 | 1.0 | Drill ahead in 8.1/2" hole from 506m to 534m at avg ROP of 28m/hr. |

Incidents in last 24 Hours Y/N: No incidents no accidents
( If yes see separate report)

**- Weather:**
Daylight:- cool, fine, light winds increasing;
Night:- cold, mainly fine, increasingly windy.

| DOWNHOLE TOOLS | | |
|---|---|---|
| **Hours** | **Serial No.** | **Tool** |
| 20 | T1350 | Str.Stabiliser |
| 20 | DJ 002 | Drlg.Jars |

**FORMATION TOPS :** Clifton= 298m (3.3mH); Narrawaturk= 312m (0.7mL); Mepunga= 316m (3.3mH); Dilwyn= 332m (6.7mL); Pebble Pt= 465m (12.3mH); Paarrate= 498m (12.7mL); Skull Ck= 565m (58.3mH); Nullawaarre = 580m (41.3mH); Belfast= 598m (37.3mH); Flaxman= 615m (46.3mH); Pzone= 631m.

**OPERATION TO 0600 HRS :** Drill ahead in 8.1/2" hole to 607m at avg ROP 16.2m/hr, circulate & survey at 596m = 2deg. Drill ahead fto 625m at avg ROP 18m/hr. **Using lower WOB of 8-10Klbs above & through targets at Geo request. @06:00hrs: Drilling ahead in 8.1/2" hole at 625m..

**PROGRAM - NEXT 24 HRS :** *Drill ahead in 8.1/2" hole - evaluate shows.*

| TRANSPORTATION | |
|---|---|
| TRANSPORT-1 | 1x T-West truck w/Metals Skip in. |
| TRANSPORT-2 | |
| TRANSPORT-3 | |
| FORKLIFT | |
| WATER HAULER | |
| ROAD WORK | |

| PERSONNEL | |
|---|---|
| CONTRACTOR | 20 |
| OPERATOR | 3 |
| SERVICE CO | 6 |
| | |
| | |
| **TOTAL :** | **29** |

| PROGRAMME COSTS | |
|---|---|
| DAILY AU $ : | $41,593 |
| CUMULATIVE AU $ : | $478,528 |
| +10% GST to Cum.Total = | $524,102 total cost to date |
| REPORTED TO : | J. Slater |
| REPORTED BY : | V. Ozolins |

*END OF REPORT*

Essential Petroleum Resources Limited

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 29-Jun-04 |
| REPORT No: | 5 |
| D.F.S: | 4.0 |
| SHOE L.O.T: | 12.48 |

| | | | |
|---|---|---|---|
| **WELL NAME:** | **FINDRA-1** | **STATUS @ 2400 HRS:** | Pulling out of hole for wiper trip prior to E-logs. |

| | | | | | |
|---|---|---|---|---|---|
| DEPTH - 2400 HRS: | 889 m | FORMATION: | Eumerella Fm | RT - GL (m): | 3.95 m |
| DEPTH - PREVIOUS: | 534 m | HOLE SIZE: | 8.1/2" | SHOE DEPTH: | 150.3 mRT |
| 24 HR PROGRESS: | 355 m | ACCIDENTS: | Nil | LAST CASING: | 9.5/8" Conductor |
| SAFETY MEETINGS: | Crews held pre-Tour Safety meetings & 1x JSA's & Kick Drill. | | | | |

| MUD PROPERTIES | | ADDITIVES |
|---|---|---|
| DENSITY (ppg) | 9.20 | 2sx AMC-Pac R |
| VISCOSITY | 39 | 3sx AMC-Pac LV |
| pH | 8.8 | 60sx KCl |
| PV / YP | 11 / 15 | 4sx Sod.Sulphite |
| GELS 10s/10m | 2 / 4 | 1dr AMC Biocide G |
| WL API / FC (cc) | 6.8 | 40sx Barite |
| SOLIDS % | 5.0 | |
| SAND % | - | |
| CHLORIDES | 19,000 | |
| KCL (% WT) | 3.90 | |
| MBT / PHPA (ppb) | 7.5 / 0.4 | |
| Pm Pm/Mf | 0 0.05 / 0.60 | |
| TEMP (degC) | - | |
| HOLE VOL (bbls) | 178 | |
| SURFACE VOL (bbls) | 380 | |
| HOLE LOSSES (bbls) | 80 | |
| MUD CO | RMN | |
| MUD ENGINEER | N. Kybird | |

| SOLIDS CONTROL | | |
|---|---|---|
| UNIT | GPM / HRS | UF / OF |
| DESILTER | 0.7 / 23 | 11.3 / 8.9 |
| DESANDER | | |
| MUDCLEANER | | |
| CENTRIFUGE | | |
| SHAKER SCREENS: | 3x S84 | |

| PUMPS | 1 | 2 |
|---|---|---|
| TYPE | TSM-500 | DB-550 |
| STROKE (") | 16 | 16 |
| LINER (") | 5 1/2 | 5 1/2 |
| SPM | | 60 |
| PRESSURE (psi) | | 1000 |
| GPM | | 342 |
| AV (DP - ft/min) | (Csg) 145, (OH) 161 | |
| AV (DC - ft/min) | (OH) 279 | |
| SPR | 30 | 30 |
| SPR PRESS | 350 | 350 |

| INVENTORY | |
|---|---|
| BARITE | 350 sx |
| GEL | 0 sx |
| CEMENT | 11.4 tonnes |
| SALT | 0 sx |
| KCL | 197 sx |
| DRILLWATER | 100 % |
| DIESEL FUEL | 9,050 lts |

| DRILLS / BOPS | |
|---|---|
| LAST BOP DRILL | 28-Jun-04 |
| LAST FIRE DRILL | |
| LAST ABN.RIG DRILL | |
| LAST BOP TEST | 27-Jun-04 |
| NEXT BOP TEST | 11-Jul-04 |
| DAYS SINCE LAST LTA | 536 |

| BIT DATA | | |
|---|---|---|
| BIT No. | 2RR | |
| SIZE (ins) | 8.1/2" | |
| TYPE | CH04MS | |
| IADC CODE | 4-1-7 | |
| SERIAL No. | 172489 | |
| NOZZLES | 3 x 13 | |
| OUT (m) | - | |
| IN (m) | 153.0 | |
| DRILLED (m) | 736.0 | |
| HOURS | 37 | |
| CONDITION | In | |
| AVG ROP (m/hr) | 19.89 | |
| WOB (x1000 lbs) | 10 - 15 | |
| RPM | 100 - 110 | |
| JET VEL (ft/sec) | 282 | |
| HHP @ BIT (HSI) | 2.33 | |

| SURVEYS | | |
|---|---|---|
| **DEPTHS** | **Inc (deg)** | **Azimuth** |
| **MD/ ( TVD )** | | |
| 68 | 1.50 | - |
| 141 | 1.00 | - |
| 348 | 1.50 | - |
| 596 | 2.00 | - |
| | | |
| | | |
| | | |

| FORMATION DATA | |
|---|---|
| TRIP GAS (%) | |
| CONN.GAS (%) | 0 |
| B.GAS (%) | 2 |
| P.PRESS (ppg) | |
| ECD (ppg) | 9.4 ppg |

| TIME ANALYSIS | |
|---|---|
| 1. MOVE RIG | |
| 2. RIG UP | |
| 3. DRILLING | 21 |
| 4. BIT TRIP | |
| 5. WIPER TRIP | 1 |
| 6. SURVEY | 0.5 |
| 7. CIRC / COND | 1.5 |
| 8. CHANGE BHA | |
| 9. CASE & CEMENT | |
| 10. WELLHEAD | |
| 11. BOP'S | |
| 12. L.O.T. | |
| 13. CORING | |
| 14. LOGGING | |
| 15. REAM / WASH | |
| 16. FISH / STUCK | |
| 17. LOSS CIRC | |
| 18. KICK CONTROL | |
| 19. SIDETRACK | |
| 20. REP. SUBSURFACE | |
| 21. REP. SURFACE | |
| 22. WELL TEST | |
| 23. W.O. WEATHER | |
| 24. WAIT - OTHER | |
| 25. ABANDON / SUSP | |
| 26. RIG DOWN | |
| 27. W.O. CEMENT | |
| 28. DRILL CEMENT | |
| 29. RIG SERVICE | |
| 30. SLIP & CUT LINE | |
| **TOTAL** | **24** |

BHA.: 8.1/2" TCI Bit + Float Sub + 1x 6.1/4" DC + Stab + 12x 6.1/4" DC + D.Jars + + 6x 6.1/4" DC + 6x HWDP = 244.9m

| | | | |
|---|---|---|---|
| BHA WEIGHT : | 56,600 lbs (buoyed weight) | STRING WT.: | 88,000 lbs (buoyed weight) |
| DP RATING : | lbs - 'G' Grade | MARGIN : | lbs @ 75% |
| DP RATING : | 595,000 lbs - 'S' Grade | MARGIN : | 446,250 lbs @ 75% |
| TORQUE ON BTM : | Kft.lbs | DRAG UP : | 4,000 lbs |
| TORQUE OFF BTM : | Kft.lbs | DRAG DOWN : | 2,000 lbs |

*CONTINUED ../2*

Essential Petroleum Resources Limited

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 29-Jun-04 |
| REPORT No: | 5 |
| D.F.S: | 4.0 |

**WELL NAME:** FINDRA-1 **STATUS @ 2400 HRS:** Pulling out of hole for wiper trip prior to E-logs.

| FROM | TO | HRS | 24 HOUR SUMMARY |
|---|---|---|---|
| 0:00 | 4:30 | 4.5 | Drill ahead in 8.1/2" hole from 534m to 607m at avg ROP of 16.2m/hr. |
| 4:30 | 5:00 | 0.5 | Circulate and survey at 596m = 2deg. |
| 5:00 | 6:30 | 1.5 | Drill ahead in 8.1/2" hole from 607m to 632m at avg ROP of 16.7m/hr. |
| 6:30 | 7:00 | 0.5 | Circulate up sample after 2m drill break - no gas, no shows. |
| 7:00 | 22:00 | 15.0 | Drill ahead in 8.1/2" hole from 632m to 889m (TD) at avg ROP of 17.1m/hr. |
| 22:00 | 23:00 | 1.0 | Circulate hole clean - pump slug. |
| 23:00 | 0:00 | 1.0 | Wiper trip - flow check, OK. Commence POH to shoe |

| DOWNHOLE TOOLS | | |
|---|---|---|
| **Hours** | **Serial No.** | **Tool** |
| 42.5 | T1350 | Str.Stabiliser |
| 42.5 | DJ 002 | Drlg.Jars |

Incidents in last 24 Hours Y/N: No incidents no accidents

( If yes see separate report)

**- Weather:**

Daylight:- cool, mainly fine, light winds increasing;

Night:- cold, mainly fine, increasingly windy.

**FORMATION TOPS :** Clifton=298m(3.3mH); Narrawaturk=312m(0.7mL); Mepunga=316m(3.3mH); Dilwyn=332m(6.7mL); Pebble Pt=465m(12.3mH); Paarrate=498m(12.7mL), Skull Ck=565m(58.3mH); Nullawaarre=580m(41.3mH); Belfast=598m(37.3mH); Flaxman=615m(46.3mH); Pzone=631m; Waarre B=648m, A=666m, Eumerella=744m(40.3mH).

**OPERATION TO 0600 HRS :** Wiper trip back to casing shoe - intermittent tight spots from 380m to 250m. RIH, work through tight spot from 505-516m and tag up at 873m. Wash 16m to bottom & circulate hole clean. Drop survey, pump slug & POH (strap out) to run E-logs. @06:00hrs: Commenced POH to run E-logs.

**PROGRAM - NEXT 24 HRS :** *POH, lay out Jars and Str.stab, break out bit and recover survey. Rig up Schlumberger, hold pre-job Safety meeting and run E-logs.*

| TRANSPORTATION | |
|---|---|
| TRANSPORT-1 | Vacuum truck for Camp & Rig septic. |
| TRANSPORT-2 | 1x Hotshot with Schlum E-log tools. |
| TRANSPORT-3 | |
| FORKLIFT | |
| WATER HAULER | |
| ROAD WORK | |

| PERSONNEL | |
|---|---|
| CONTRACTOR | 20 |
| OPERATOR | 2 |
| SERVICE CO | 6 |
| | |
| | |
| **TOTAL :** | **28** |

| PROGRAMME COSTS | |
|---|---|
| DAILY AU $ : | $40,350 |
| CUMULATIVE AU $ : | $518,878 |
| +10% GST to Cum.Total = | $568,295 total cost to date |
| REPORTED TO : | J. Slater |
| REPORTED BY : | V. Ozolins |

*END OF REPORT*

Essential Petroleum Resources Limited

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 30-Jun-04 |
| REPORT No: | 6 |
| D.F.S: | 5.0 |
| SHOE L.O.T: | 12.48 |

| | | | |
|---|---|---|---|
| **WELL NAME:** | **FINDRA-1** | **STATUS @ 2400 HRS:** | Schlumberger laying out CSAT tool to pick up MDT tool. |

| | | | | | |
|---|---|---|---|---|---|
| DEPTH - 2400 HRS: | 889 m | FORMATION: | Eumerella Fm | RT - GL (m): | 3.95 m |
| DEPTH - PREVIOUS: | 889 m | HOLE SIZE: | 8.1/2" | SHOE DEPTH: | 150.3 mRT |
| 24 HR PROGRESS: | 0 m | ACCIDENTS: | Nil | LAST CASING: | 9.5/8" Conductor |
| SAFETY MEETINGS: | Crews held pre-Tour Safety meetings & 2x JSA's, Pre-logging safety meeting. | | | | |

| MUD PROPERTIES | | ADDITIVES |
|---|---|---|
| DENSITY (ppg) | 9.20 | |
| VISCOSITY | 41 | |
| pH | 8.8 | |
| PV / YP | 11 / 15 | |
| GELS 10s/10m | 2 / 4 | |
| WL API / FC (cc) | 7.0 | |
| SOLIDS % | 5.0 | |
| SAND % | - | |
| CHLORIDES | 19,000 | |
| KCL (% WT) | 3.90 | |
| MBT / PHPA (ppb) | 7.5 / 0.4 | |
| Pm Pm/Mf | 0 0.05 / 0.50 | |
| TEMP (degC) | - | |
| HOLE VOL (bbls) | 207 | |
| SURFACE VOL (bbls) | 233 | |
| HOLE LOSSES (bbls) | - | |
| MUD CO | RMN | |
| MUD ENGINEER | N. Kybird | |

| SOLIDS CONTROL | | |
|---|---|---|
| UNIT | GPM / HRS | UF / OF |
| DESILTER | | |
| DESANDER | | |
| MUDCLEANER | | |
| CENTRIFUGE | | |
| SHAKER SCREENS: | 3x S84 | |

| PUMPS | 1 | 2 |
|---|---|---|
| TYPE | TSM-500 | DB-550 |
| STROKE (") | 16 | 16 |
| LINER (") | 5 1/2 | 5 1/2 |
| SPM | | 60 |
| PRESSURE (psi) | | 1000 |
| GPM | | 342 |
| AV (DP - ft/min) | (Csg) 145, (OH) 161 | |
| AV (DC - ft/min) | (OH) 279 | |
| SPR | 30 | 30 |
| SPR PRESS | 360 | 360 |

| INVENTORY | |
|---|---|
| BARITE | 350 sx |
| GEL | 0 sx |
| CEMENT | 11.4 tonnes |
| SALT | 0 sx |
| KCL | 197 sx |
| DRILLWATER | 100 % |
| DIESEL FUEL | 8,000 lts |

| DRILLS / BOPS | |
|---|---|
| LAST BOP DRILL | 30-Jun-04 |
| LAST FIRE DRILL | |
| LAST ABN.RIG DRILL | |
| LAST BOP TEST | 27-Jun-04 |
| NEXT BOP TEST | 11-Jul-04 |
| DAYS SINCE LAST LTA | 537 |

| BIT DATA | | |
|---|---|---|
| BIT No. | 2RR | |
| SIZE (ins) | 8.1/2" | |
| TYPE | CH04MS | |
| IADC CODE | 4-1-7 | |
| SERIAL No. | 172489 | |
| NOZZLES | 3 x 13 | |
| OUT (m) | - | |
| IN (m) | 153.0 | |
| DRILLED (m) | 736.0 | |
| HOURS | 37 | |
| CONDITION | In | |
| AVG ROP (m/hr) | 19.89 | |
| WOB (x1000 lbs) | 10 - 15 | |
| RPM | 100 - 110 | |
| JET VEL (ft/sec) | 282 | |
| HHP @ BIT (HSI) | 2.33 | |

| SURVEYS | | |
|---|---|---|
| **DEPTHS** | **Inc (deg)** | **Azimuth** |
| **MD/ ( TVD )** | | |
| 68 | 1.50 | - |
| 141 | 1.00 | - |
| 348 | 1.50 | - |
| 596 | 2.00 | - |
| 877 | 0.75 | - |
| | | |
| | | |

| FORMATION DATA | |
|---|---|
| TRIP GAS (%) | 5.00 |
| CONN.GAS (%) | 0 |
| B.GAS (%) | 1 |
| P.PRESS (ppg) | |
| ECD (ppg) | 9.4 ppg |

| TIME ANALYSIS | |
|---|---|
| 1. MOVE RIG | |
| 2. RIG UP | |
| 3. DRILLING | |
| 4. BIT TRIP | 3 |
| 5. WIPER TRIP | 4.5 |
| 6. SURVEY | |
| 7. CIRC / COND | 0.5 |
| 8. CHANGE BHA | 0.5 |
| 9. CASE & CEMENT | |
| 10. WELLHEAD | |
| 11. BOP'S | |
| 12. L.O.T. | |
| 13. CORING | |
| 14. LOGGING | 7.5 |
| 15. REAM / WASH | 1 |
| 16. FISH / STUCK | |
| 17. LOSS CIRC | |
| 18. KICK CONTROL | |
| 19. SIDETRACK | |
| 20. REP. SUBSURFACE | 2.5 |
| 21. REP. SURFACE | |
| 22. WELL TEST | |
| 23. W.O. WEATHER | |
| 24. WAIT - OTHER | 4.5 |
| 25. ABANDON / SUSP | |
| 26. RIG DOWN | |
| 27. W.O. CEMENT | |
| 28. DRILL CEMENT | |
| 29. RIG SERVICE | |
| 30. SLIP & CUT LINE | |
| **TOTAL** | **24** |

BHA.: 8.1/2" TCI Bit + Float Sub + 1x 6.1/4" DC + Stab + 12x 6.1/4" DC + D.Jars + + 6x 6.1/4" DC + 6x HWDP = 244.9m

| | | | |
|---|---|---|---|
| BHA WEIGHT : | 56,600 lbs (buoyed weight) | STRING WT.: | 92,000 lbs (buoyed weight) |
| DP RATING : | lbs - 'G' Grade | MARGIN : | lbs @ 75% |
| DP RATING : | 595,000 lbs - 'S' Grade | MARGIN : | 446,250 lbs @ 75% |
| TORQUE ON BTM : | Kft.lbs | DRAG UP : | 4,000 lbs |
| TORQUE OFF BTM : | Kft.lbs | DRAG DOWN : | 2,000 lbs |

*CONTINUED ../2*

Essential Petroleum Resources Limited

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 30-Jun-04 |
| REPORT No: | 6 |
| D.F.S: | 5.0 |

**WELL NAME:** FINDRA-1 **STATUS @ 2400 HRS:** Schlumberger laying out CSAT tool to pick up MDT tool.

| FROM | TO | HRS | 24 HOUR SUMMARY |
|---|---|---|---|
| 0:00 | 3:30 | 3.5 | Wiper trip - POH, and work through intermittent tight hole from 470m to 250m. Flow check at shoe. |
| | | | RIH and tag up at 507m. |
| 3:30 | 4:00 | 0.5 | Kelly up, break circulation and wash/ream through tight spot to 516m. |
| 4:00 | 5:00 | 1.0 | RIH and tag up at 873m. |
| 5:00 | 5:30 | 0.5 | Kelly up, break circulation and wash 16m to bottom. |
| 5:30 | 6:00 | 0.5 | Circulate hole clean and drop survey. |
| 6:00 | 9:00 | 3.0 | POH - strap out to run E-logs. |
| 9:00 | 9:30 | 0.5 | Lay out Jars and stabiliser, break out bit and recover survey. |
| 9:30 | 14:00 | 4.5 | Wait on Schlumberger for E-logging. |
| 14:00 | 16:00 | 2.0 | Rig up Schlumberger, pick up tools for run-1: HALS-BHC-PEX-HNGS and hold safety meeting. |
| 16:00 | 19:30 | 3.5 | Schlumberger conduct E-log run-1: HALS-BHC-PEX-HNGS and POH. |
| 19:30 | 20:30 | 1.0 | Lay out tools and pick up CSAT tools for run-2. |
| 20:30 | 23:00 | 2.5 | Schlumberger RIH with CSAT tool - observe electrical fault with tool. |
| 23:00 | 23:30 | 0.5 | POH with CSAT tool, inspect and attempt to troubleshoot problem. |
| 23:30 | 0:00 | 0.5 | Lay out CSAT tool and make up MDT tool. |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | Incidents in last 24 Hours Y/N: No incidents no accidents |
| | | | ( If yes see separate report) |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | **- Weather:** |
| | | | Daylight:- cool, mainly fine, blustery; |
| | | | Night:- cold, fine, increasingly windy. |

**DOWNHOLE TOOLS**

| Hours | Serial No. | Tool |
|---|---|---|
| | | |
| 44 | T1350 | Str.Stabiliser |
| 44 | DJ 002 | Drlg.Jars |

**FORMATION TOPS :** Clifton=298m(3.3mH); Narrawaturk=312m(0.7mL); Mepunga=316m(3.3mH); Dilwyn=332m(6.7mL); Pebble Pt=465m(12.3mH); Paarrate=498m(12.7mL), Skull CK=565m(58.3mH); Nullawaarre=580m(41.3mH); Belfast=598m(37.3mH); Flaxman=615m(46.3mH); Pzone=631m; Waarre B=648m, A=666m, Eumerella=744m(40.3mH).

**OPERATION TO 0600 HRS :** Make up MDT tool, RIH and calibrate. RIH and run E-log-3: MDT (16 points).
@06:00hrs: Running MDT tool with Schlumberger.

**PROGRAM - NEXT 24 HRS :** *Finish E-lloing and rig down Schlumberger. RIH and lay out BHA.RIH with OEDP and set P&A cement plugs*

| TRANSPORTATION | |
|---|---|
| TRANSPORT-1 | 1x Schlumbrger logging unit. |
| TRANSPORT-2 | |
| TRANSPORT-3 | |
| FORKLIFT | |
| WATER HAULER | |
| ROAD WORK | |

| PERSONNEL | |
|---|---|
| CONTRACTOR | 20 |
| OPERATOR | 2 |
| SERVICE CO | 9 |
| | |
| | |
| **TOTAL :** | **31** |

| PROGRAMME COSTS | |
|---|---|
| DAILY AU $ : | $98,577 |
| CUMULATIVE AU $ : | $617,455 |
| +10% GST to Cum.Total = | $676,260 total cost to date |
| REPORTED TO : | J. Slater |
| REPORTED BY : | V. Ozolins |

*END OF REPORT*

Essential Petroleum Resources Limited

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 1-Jul-04 |
| REPORT No: | 7 |
| D.F.S: | 6.0 |
| SHOE L.O.T: | 12.48 |

| | | | |
|---|---|---|---|
| **WELL NAME:** | **FINDRA-1** | **STATUS @ 2400 HRS:** | Laying out DP after tagging Plug-4, dump mud tanks. |

| | | | | | |
|---|---|---|---|---|---|
| DEPTH - 2400 HRS: | 889 m | FORMATION: | Eumeralla Fm | RT - GL (m): | 3.95 m |
| DEPTH - PREVIOUS: | 889 m | HOLE SIZE: | 8.1/2" | SHOE DEPTH: | 150.3 mRT |
| 24 HR PROGRESS: | 0 m | ACCIDENTS: | Nil | LAST CASING: | 9.5/8" Conductor |
| SAFETY MEETINGS: | Crews held pre-Tour Safety meetings & 2x JSA's, Pre-cementing safety meeting. | | | | |

| MUD PROPERTIES | | ADDITIVES |
|---|---|---|
| DENSITY (ppg) | 9.20 | 3sx AMC-Pac R |
| VISCOSITY | 41 | written off/used & |
| pH | 8.8 | not charged prev. |
| PV / YP | 11 / 15 | |
| GELS 10s/10m | 2 / 4 | |
| WL API / FC (cc) | 7.0 | |
| SOLIDS % | 5.0 | |
| SAND % | - | |
| CHLORIDES | 19,000 | |
| KCL (% WT) | 3.90 | |
| MBT / PHPA (ppb) | 7.5 / 0.4 | |
| Pm Pm/Mf | 0 0.05 / 0.50 | |
| TEMP (degC) | - | |
| HOLE VOL (bbls) | 207 | |
| SURFACE VOL (bbls) | 233 | |
| HOLE LOSSES (bbls) | - | |
| MUD CO | RMN | |
| MUD ENGINEER | N. Kybird | |

| SOLIDS CONTROL | | |
|---|---|---|
| UNIT | GPM / HRS | UF / OF |
| DESILTER | | |
| DESANDER | | |
| MUDCLEANER | | |
| CENTRIFUGE | | |
| SHAKER SCREENS: | 3x S84 | |

| PUMPS | 1 | 2 |
|---|---|---|
| TYPE | TSM-500 | DB-550 |
| STROKE (") | 16 | 16 |
| LINER (") | 5 1/2 | 5 1/2 |
| SPM | | |
| PRESSURE (psi) | | |
| GPM | | |
| AV (DP - ft/min) | | |
| AV (DC - ft/min) | | |
| SPR | | |
| SPR PRESS | | |

| INVENTORY | |
|---|---|
| BARITE | 350 sx |
| GEL | 0 sx |
| CEMENT | 0.5 tonnes |
| SALT | 0 sx |
| KCL | 197 sx |
| DRILLWATER | 100 % |
| DIESEL FUEL | 6,240 lts |

| DRILLS / BOPS | |
|---|---|
| LAST BOP DRILL | 30-Jun-04 |
| LAST FIRE DRILL | |
| LAST ABN.RIG DRILL | |
| LAST BOP TEST | 27-Jun-04 |
| NEXT BOP TEST | 11-Jul-04 |
| DAYS SINCE LAST LTA | 538 |

| BIT DATA | | |
|---|---|---|
| BIT No. | 2RR | |
| SIZE (ins) | 8.1/2" | |
| TYPE | CH04MS | |
| IADC CODE | 4-1-7 | |
| SERIAL No. | 172489 | |
| NOZZLES | 3 x 13 | |
| OUT (m) | - | |
| IN (m) | 153.0 | |
| DRILLED (m) | 736.0 | |
| HOURS | 37 | |
| CONDITION | 4-2-BT-L-E-I-LT-TD | |
| AVG ROP (m/hr) | 19.89 | |
| WOB (x1000 lbs) | 10 - 15 | |
| RPM | 100 - 110 | |
| JET VEL (ft/sec) | 282 | |
| HHP @ BIT (HSI) | 2.33 | |

| SURVEYS | | |
|---|---|---|
| **DEPTHS** | **Inc (deg)** | **Azimuth** |
| **MD/ ( TVD )** | | |
| 68 | 1.50 | - |
| 141 | 1.00 | - |
| 348 | 1.50 | - |
| 596 | 2.00 | - |
| 877 | 0.75 | - |
| | | |
| | | |

| FORMATION DATA | |
|---|---|
| TRIP GAS (%) | |
| CONN.GAS (%) | |
| B.GAS (%) | |
| P.PRESS (ppg) | |
| ECD (ppg) | |

| TIME ANALYSIS | |
|---|---|
| 1. MOVE RIG | |
| 2. RIG UP | |
| 3. DRILLING | |
| 4. BIT TRIP | |
| 5. WIPER TRIP | 4 |
| 6. SURVEY | |
| 7. CIRC / COND | 0.5 |
| 8. CHANGE BHA | 3.5 |
| 9. CASE & CEMENT | |
| 10. WELLHEAD | |
| 11. BOP'S | |
| 12. L.O.T. | |
| 13. CORING | |
| 14. LOGGING | 8.5 |
| 15. REAM / WASH | |
| 16. FISH / STUCK | |
| 17. LOSS CIRC | |
| 18. KICK CONTROL | |
| 19. SIDETRACK | |
| 20. REP. SUBSURFACE | |
| 21. REP. SURFACE | |
| 22. WELL TEST | |
| 23. W.O. WEATHER | |
| 24. WAIT - OTHER | |
| 25. ABANDON / SUSP | 5 |
| 26. RIG DOWN | |
| 27. W.O. CEMENT | 2.5 |
| 28. DRILL CEMENT | |
| 29. RIG SERVICE | |
| 30. SLIP & CUT LINE | |
| **TOTAL** | **24** |

BHA.:

| | | | |
|---|---|---|---|
| BHA WEIGHT : | lbs (buoyed weight) | STRING WT.: | lbs (buoyed weight) |
| DP RATING : | lbs - 'G' Grade | MARGIN : | lbs @ 75% |
| DP RATING : | 595,000 lbs - 'S' Grade | MARGIN : | 446,250 lbs @ 75% |
| TORQUE ON BTM : | Kft.lbs | DRAG UP : | lbs |
| TORQUE OFF BTM : | Kft.lbs | DRAG DOWN : | lbs |

*CONTINUED ../2*

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 1-Jul-04 |
| REPORT No: | 7 |
| D.F.S: | 6.0 |

**WELL NAME:** FINDRA-1 **STATUS @ 2400 HRS:** Laying out DP after tagging Plug-4, dump mud tanks.

| FROM | TO | HRS | 24 HOUR SUMMARY |
|---|---|---|---|
| 0:00 | 2:00 | 2.0 | Make up MDT tool. |
| 2:00 | 8:00 | 6.0 | Run e-log #3: MDT (pressure measuring + sampling tool) and lay out tool. |
| 8:00 | 8:30 | 0.5 | Rig down Schlumberger e-loggers. |
| 8:30 | 10:00 | 1.5 | RIH with BHA. |
| 10:00 | 13:30 | 3.5 | Lay out BHA. |
| 13:30 | 15:30 | 2.0 | RIH with open-ended DP to 651m P&A plug-1 depth). |
| 15:30 | 16:00 | 0.5 | Rig up line and circulate, rig up Halliburton cementing line and hold pre-job meeting. |
| 16:00 | 17:00 | 1.0 | Pump 3bbl H2O spacer, p/test line to 3000psi. Pump 2bbl spacer, 18.6bbl (88sx 'A') cement @ |
| | | | 15.6ppg & 1.2bbl H2O spacer. Displace w/25.9bbl mud to set balanced plug-1 from 651-581m. |
| 17:00 | 17:30 | 0.5 | POH w/6 stands DP and circulate to flush pipe; POH w/2 stands to plug-2 depth. |
| 17:30 | 18:00 | 0.5 | Pump 3bbl H2O spacer, p/test line to 3000psi. Pump 2bbl spacer, 23.8bbl (113sx 'A') cement @ |
| | | | 15.6ppg & 1.2bbl H2O spacer. Displace w/18.4bbl mud to set balanced plug-2 from 509-419m. |
| 18:00 | 18:30 | 0.5 | POH w/7 stands DP and circulate to flush pipe; POH to plug-3 depth. |
| 18:30 | 19:00 | 0.5 | Pump 3bbl H2O spacer, p/test line to 3000psi. Pump 2bbl spacer, 21.2bbl (101sx 'A') cement @ |
| | | | 15.6ppg & 1.2bbl H2O spacer. Displace w/12.4bbl mud to set balanced plug-3 from 370-290m. |
| 19:00 | 19:30 | 0.5 | POH w/7 stands DP and circulate to flush pipe; POH to plug-4 depth. |
| 19:30 | 20:00 | 0.5 | Pump 3bbl H2O spacer, p/test line. Pump 2bbl spacer, 19.7bbl (92sx 'A') cement w/2% CaCl @ |
| | | | 15.6ppg & 1.1bbl H2O spacer. Displace w/4.1bbl mud to set balanced plug-4 from 180-110m. |
| 20:00 | 20:30 | 0.5 | POH w/7 stands DP and circulate to flush pipe. |
| 20:30 | 22:30 | 2.0 | While WOCement - lay out excess drill pipe, break Kelly connections, rig down mud loggers. |
| 22:30 | 23:00 | 0.5 | Tag top of plug-4 at 112m with 5Klbs, pull back 1 stand and circulate to ensure pipe clear. |
| 23:00 | 0:00 | 1.0 | Continue laying out remaining drill pipe, dump & clean mud tanks. |

| DOWNHOLE TOOLS | | |
|---|---|---|
| Hours | Serial No. | Tool |
| | | |
| | | |
| | | |
| | | |

Incidents in last 24 Hours Y/N: No incidents no accidents

( If yes see separate report)

**- Weather:**

Daylight:- cool, occ.showers, blustery;

Night:- cold, rain squalls, gusting winds.

**FORMATION TOPS :** Clifton=298m(3.3mH); Narrawaturk=312m(0.7mL); Mepunga=316m(3.3mH); Dilwyn=332m(6.7mL); Pebble Pt=465m(12.3mH); Paarrate=498m(12.7mL), Skull Ck=565m(58.3mH); Nullawaarre=580m(41.3mH); Belfast=598m(37.3mH); Flaxman=615m(46.3mH); Pzone=631m; Waarre B=648m, A=666m, Eumerella=744m(40.3mH).

**OPERATION TO 0600 HRS :** Lay out remaining drill pipe, lay out Swivel, Kelly and Sock. Remove Catwalks and V-Door. Nipple down BOP stack. @06:00hrs: Nippling down BOP stack.

**PROGRAM - NEXT 24 HRS :** *Nipple down BOP stack and lay out, remove wellhead, set surface cement plug and weld cap on 9.5/8" casing stub to secure well - Release rig to rig down and move operations.*

| TRANSPORTATION | |
|---|---|
| TRANSPORT-1 | 1x K&S semi, mud/BHA tools to Adel. |
| TRANSPORT-2 | 1x Schlumberger off location. |
| TRANSPORT-3 | 1x (2) DST Hands off location. |
| TRANSPORT-4 | 1x (2) Halliburton Hands on location. |
| FORKLIFT | |
| ROAD WORK | |

| PERSONNEL | |
|---|---|
| CONTRACTOR | 20 |
| OPERATOR | 2 |
| SERVICE CO | 6 |
| | |
| | |
| **TOTAL :** | **28** |

| PROGRAMME COSTS | |
|---|---|
| DAILY AU $ : | $58,081 |
| CUMULATIVE AU $ : | $675,536 |
| +10% GST to Cum.Total = | $739,873 total cost to date |
| REPORTED TO : | J. Slater |
| REPORTED BY : | V. Ozolins |

*END OF REPORT*

Essential Petroleum Resources Limited

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 2-Jul-04 |
| REPORT No: | 8 |
| D.F.S: | 6.4 |
| SHOE L.O.T: | 12.48 |

| | | | | | |
|---|---|---|---|---|---|
| **WELL NAME:** | **FINDRA-1** | **STATUS @ 2400 HRS:** | Rig Released - shut down for night at 1800hrs. | | |
| DEPTH - 2400 HRS: | 5 m | FORMATION: | | RT - GL (m): | 3.95 m |
| DEPTH - PREVIOUS: | 5 m | HOLE SIZE: | | SHOE DEPTH: | 150.3 mRT |
| 24 HR PROGRESS: | 0 m | ACCIDENTS: | Nil | LAST CASING: | 9.5/8" Conductor |
| SAFETY MEETINGS: | Crews held pre-Tour Safety meetings & 2x JSA's, Pre-cementing safety meeting. | | | | |

| MUD PROPERTIES | | ADDITIVES |
|---|---|---|
| DENSITY (ppg) | | |
| VISCOSITY | | |
| pH | | |
| PV / YP | | |
| GELS 10s/10m | | |
| WL API / FC (cc) | | |
| SOLIDS % | | |
| SAND % | | |
| CHLORIDES | | |
| KCL (% WT) | | |
| MBT / PHPA (ppb) | | |
| Pm Pm/Mf | | |
| TEMP (degC) | | |
| HOLE VOL (bbls) | | |
| SURFACE VOL (bbls) | | |
| HOLE LOSSES (bbls) | | |
| MUD CO | | |
| MUD ENGINEER | | |

| SOLIDS CONTROL | | |
|---|---|---|
| UNIT | GPM / HRS | UF / OF |
| DESILTER | | |
| DESANDER | | |
| MUDCLEANER | | |
| CENTRIFUGE | | |
| SHAKER SCREENS: | | |

| PUMPS | 1 | 2 |
|---|---|---|
| TYPE | TSM-500 | DB-550 |
| STROKE (") | 16 | 16 |
| LINER (") | 5 1/2 | 5 1/2 |
| SPM | | |
| PRESSURE (psi) | | |
| GPM | | |
| AV (DP - ft/min) | | |
| AV (DC - ft/min) | | |
| SPR | | |
| SPR PRESS | | |

| INVENTORY | |
|---|---|
| BARITE | 0 sx |
| GEL | 0 sx |
| CEMENT | 0.0 tonnes |
| SALT | 0 sx |
| KCL | 0 sx |
| DRILLWATER | 0 % |
| DIESEL FUEL | 5,500 lts |

| DRILLS / BOPS | |
|---|---|
| LAST BOP DRILL | 30-Jun-04 |
| LAST FIRE DRILL | |
| LAST ABN.RIG DRILL | |
| LAST BOP TEST | |
| NEXT BOP TEST | |
| DAYS SINCE LAST LTA | 539 |

| BIT DATA | | |
|---|---|---|
| BIT No. | | |
| SIZE (ins) | | |
| TYPE | | |
| IADC CODE | | |
| SERIAL No. | | |
| NOZZLES | | |
| OUT (m) | | |
| IN (m) | | |
| DRILLED (m) | | |
| HOURS | | |
| CONDITION | | |
| AVG ROP (m/hr) | | |
| WOB (x1000 lbs) | | |
| RPM | | |
| JET VEL (ft/sec) | | |
| HHP @ BIT (HSI) | | |

| SURVEYS | | |
|---|---|---|
| **DEPTHS** | **Inc (deg)** | **Azimuth** |
| **MD/ ( TVD )** | | |
| 68 | 1.50 | - |
| 141 | 1.00 | - |
| 348 | 1.50 | - |
| 596 | 2.00 | - |
| 877 | 0.75 | - |
| | | |
| | | |

| FORMATION DATA | |
|---|---|
| TRIP GAS (%) | |
| CONN.GAS (%) | |
| B.GAS (%) | |
| P.PRESS (ppg) | |
| ECD (ppg) | |

| TIME ANALYSIS | |
|---|---|
| 1. MOVE RIG | |
| 2. RIG UP | |
| 3. DRILLING | |
| 4. BIT TRIP | |
| 5. WIPER TRIP | 2.5 |
| 6. SURVEY | |
| 7. CIRC / COND | |
| 8. CHANGE BHA | |
| 9. CASE & CEMENT | |
| 10. WELLHEAD | 1 |
| 11. BOP'S | 3.5 |
| 12. L.O.T. | |
| 13. CORING | |
| 14. LOGGING | |
| 15. REAM / WASH | |
| 16. FISH / STUCK | |
| 17. LOSS CIRC | |
| 18. KICK CONTROL | |
| 19. SIDETRACK | |
| 20. REP. SUBSURFACE | |
| 21. REP. SURFACE | |
| 22. WELL TEST | |
| 23. W.O. WEATHER | |
| 24. WAIT - OTHER | |
| 25. ABANDON / SUSP | 1 |
| 26. RIG DOWN | 2 |
| 27. W.O. CEMENT | |
| 28. DRILL CEMENT | |
| 29. RIG SERVICE | |
| 30. SLIP & CUT LINE | |
| **TOTAL** | **10** |

BHA.:

| | | | |
|---|---|---|---|
| BHA WEIGHT : | lbs (buoyed weight) | STRING WT.: | lbs (buoyed weight) |
| DP RATING : | lbs - 'G' Grade | MARGIN : | lbs @ 75% |
| DP RATING : | 595,000 lbs - 'S' Grade | MARGIN : | 446,250 lbs @ 75% |
| TORQUE ON BTM : | Kft.lbs | DRAG UP : | lbs |
| TORQUE OFF BTM : | Kft.lbs | DRAG DOWN : | lbs |

*CONTINUED ../2*

# DAILY DRILLING REPORT

**RIG : Hunt Energy Rig-2**

**PERMIT : PEP 159, Otway Basin**

| | |
|---|---|
| DATE: | 2-Jul-04 |
| REPORT No: | 8 |
| D.F.S: | 6.4 |

**WELL NAME:** FINDRA-1 **STATUS @ 2400 HRS:** Rig Released - shut down for night at 1800hrs.

| FROM | TO | HRS | 24 HOUR SUMMARY |
|---|---|---|---|
| 0:00 | 2:30 | 2.5 | POH layiing down remaining pipe - clean mud tanks. |
| 2:30 | 4:30 | 2.0 | Lay out Kelly, Swivel, Kelly sock & Mousehole. |
| 4:30 | 8:00 | 3.5 | Lay out V-Door, remove Catwalks, clear rig floor, remove hydraulic lines and nipple down BOP |
| | | | stack, Kill and Choke lines and lay out same - finish cleaning tanks. |
| 8:00 | 10:00 | 2.0 | Unscrew 11" Bradenhead and cut 9.5/8" casing 0.3m above cellar floor. Mix and place 10m |
| | | | cement plug-5 at surface w/9sx 'A' @15.6ppg. A steel plate was then welded over the cut-off to |
| | | | seal the casing stub. **Rig Released @ 1000hrs on Friday, 02/07/2004.** |
| 10:00 | 18:00 | 8.0 | Rig down and prepare derrick - lay over mast at 1500hrs and continue rigging down. |
| | | | Load out 3x trucks with DST/Coring tools, mud, casing and wellhead items to return as necessary. |
| 18:00 | 0:00 | 6.0 | SDFN - Wait on Daylight to resume rigging down and preparing to move rig. |

1x Mud Engineer off location at 9am.

2x Mud Loggers off location at 7am.

Incidents in last 24 Hours Y/N: No incidents no accidents

( If yes see separate report)

**- Weather:**

Daylight:- cool, fine, light breeze;

Night:- cold, fine, light winds.

| DOWNHOLE TOOLS | | |
|---|---|---|
| **Hours** | **Serial No.** | **Tool** |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**FORMATION TOPS :**

**OPERATION TO 0600 HRS :** Rig released - WODaylight to continue rigging down and preparing to move rig.

**PROGRAM - NEXT 24 HRS :** *Rig down and prepare loads to move rig to next site.*

| TRANSPORTATION | |
|---|---|
| TRANSPORT-1 | 1x K&S semi, mud/Mlog Unit to Adel. |
| TRANSPORT-2 | 1x K&S semi, Misc items to Portland |
| TRANSPORT-3 | 1x K&S semi, DST/Core/WHD to QLD |
| TRANSPORT-4 | 1x (3) Halliburton Hands off location. |
| FORKLIFT | 6hrs loading 3x semis wi/various |
| ROAD WORK | |

| PERSONNEL | |
|---|---|
| CONTRACTOR | 18 |
| OPERATOR | 1 |
| SERVICE CO | 0 |
| | |
| | |
| **TOTAL :** | **19** |

| PROGRAMME COSTS | |
|---|---|
| DAILY AU $ : | $86,451 |
| CUMULATIVE AU $ : | $761,987 |
| +10% GST to Cum.Total = | $834,557 est.final total cost |
| REPORTED TO : | J. Slater |
| REPORTED BY : | V. Ozolins |

*END OF REPORT*

# Appendix 3: Casing and Cement

| Essential Petroleum Resources Limited | CASING AND CEMENTING REPORT | FORM CAC-01 |
|---|---|---|
| | Well Name: FINDRA-1 | |

**Casing type:** [x] Surface casing [ ] Intermediate Casing [ ] Production Casing [ ] Completion tubing

| | | | | | |
|---|---|---|---|---|---|
| **Originated by:** | V. Ozolins | **Checked by:** | | **Date:** | 26/06/2004 |
| **Hole Size:** | 12.25 | **T.D.:** | 153m | **Date:** | 26/06/2004 |
| **Contractor:** | Halliburton | | | | |

**PRE-FLUSH** bbls. @ ppg.
Additives:

**SPACER** 20 bbls@ 8.33 ppg.

| CEMENT | | | ADDITIVES | Product | % | Amount |
|---|---|---|---|---|---|---|
| **LEAD SLURRY:** | | sacks class | | | %BWOC | 0 lbs |
| Slurry Yield: | | cu.ft./sack | | | %BWOC | 0 lbs |
| Mixwater Req't: | | gal./sack | | | % BWOC | 0 lbs |
| Actual Slurry Pumped: | | bbls @ ppg | | | gal/sx | 0 gal |
| **TAIL SLURRY:** | 200 | sacks class | A' | **Calcium Chloride** | 2 % BWOC | 376 lbs |
| Slurry Yield: | 1.21 | cu.ft./sack | | | % BWOC | 0 lbs |
| Mixwater Req't: | 5.45 | gal./sack | | | % BWOC | 0 lbs |
| Actual Slurry Pumped: | 43 | bbls @ 15.6 ppg | | **NF-6** | 0.03 gal/bbl | 1 gal |

**DISPLACEMENT** Fluid: **Water** @ **8.33** ppg

| | | | | | |
|---|---|---|---|---|---|
| Theoretical Displ.: | 34.86 | bbl. | | Bumped plug with | 230 psi |
| Actual Displ. | 34.9 | bbl @ 5 bpm | | Pressure Tested to: | 1600 psi |
| Displaced via | | | | Bleed back: | 0.25 bbls |

| ACTIVITY | | Time |
|---|---|---|
| Start Running csg. | 26-Jun | 18:00 |
| Casing on Bottom | 26-Jun | 20:28 |
| Start Circulation | 26-Jun | 20:30 |
| Start Pressure test | 26-Jun | 21:38 |
| Pump Preflush | 26-Jun | 21:43 |
| | | |
| Start Mixing | 26-Jun | 21:50 |
| Finish Mixing | 26-Jun | 22:12 |
| Start Displacing | 26-Jun | 22:15 |
| Stop Displ./Bump | 26-Jun | 22:22 |
| Press. test | 26-Jun | 22:23 |

Returns to Surface: all bbls mud (no losses) 2 bbls cmt.
Reciprocate / Rotate Casing: Only during circulation - then chained down casing to avoid floating
Top Up Job run: Yes / No Initially n 5 sx class A'
Plug Set Make / Type: Halliburton
Centraliser Placement, type/dtl 147m, 134m.

Remarks: Good returns throughout job - clean cement returns to surface after 33 bbl displacement (ie. Approx 2 bbl cement to surface).

| No. JOINTS | SIZE OD | WT lb/ft | GRADE | THREAD | MTS | FROM | TO |
|---|---|---|---|---|---|---|---|
| | Stick Up (Enter as negative number) | | | | -1.53 | -1.53 | 0.00 |
| | Rotary - Top of Bradenhead | | | | 3.90 | 0.00 | 3.90 |
| 1 | Bradenhead, Screw-in type c/w 8rd x BTC PxP pup, Wood Group Pressure Control | | | | 0.60 | 3.90 | 4.50 |
| 11 | Casing, 9-5/8 36ppf K55 BTC R3 Casing | | | | 133.02 | 4.50 | 137.52 |
| 1 | Float Collar, BTC, Halliburton PDC drillable | | | | 0.34 | 137.52 | 137.86 |
| 1 | Casing, 9-5/8 40ppf K55 BTC R3 Casing | | | | 12.05 | 137.86 | 149.91 |
| 1 | Float Shoe, BTC, Halliburton PDC drillable | | | | 0.43 | 149.91 | 150.34 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| | | | |
|---|---|---|---|
| Theoretical Buoyed wt of casing (klb): | 15.4 Klbs | Bradenhead Height above GL | 0.00 m |
| Actual wt of casing (last joint run-block wt, klb) | 18 Klbs | Casing wt just prior to landing csg/ | 8 Klbs |
| Landing WT (after cementing and pressure bleed off) | 8 Klbs | setting slips | |

# Essential Petroleum Resources Limited

# CASING TALLY

FORM CT-CRL KDC-SURF-01

| WELL NAME: | CASING TYPE: | Page # |
|---|---|---|
| FINDRA-1 | Surface | 1 |

EPSL REP(S) : V. Ozolins | DEPTH (m) : 153.00 | SHOE DEPTH : 150.34 m RT | DATE: 26/06/2004

| Joint Number | | Depth (m) | | CASING | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| From | To | From | To | Size | Grade | Weight | | Coupling | Maximum | Minimum | Optimum |
| 1 | 14 | 173.6 | 4.5 | 9-5/8" | K55 | 36 | | BTC | | | |
| | | | | | | | | | | | |
| | | There are a total of 14 full joints plus 1 pup on location | | | | | | | | | |

| JOINT NO. | CEN | LENGTH Metres | TOTAL LENGTH | Comments | Off bottom (m RT) | JOINT NO. | CEN | LENGTH Metres | TOTAL LENGTH | Comments | Tally (m RT) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 36# | X | 12.05 | 12.05 | 3m above shoe | 138.29 | 41 | | | | | |
| 2 36# | X | 12.18 | 24.23 | Across centre | 126.11 | 42 | | | | | |
| 3 36# | na | 12.20 | 36.43 | Across centre | 113.91 | 43 | | | | | |
| 4 36# | na | 11.73 | 48.16 | Across centre | 102.18 | 44 | | | | | |
| 5 36# | | 12.13 | 60.29 | | 90.05 | 45 | | | | | |
| 6 36# | | 11.89 | 72.18 | | 78.16 | 46 | | | | | |
| 7 36# | | 12.00 | 84.18 | | 66.16 | 47 | | | | | |
| 8 36# | | 12.15 | 96.33 | | 54.01 | 48 | | | | | |
| 9 36# | | 12.23 | 108.56 | | 41.78 | 49 | | | | | |
| 10 36# | | 12.11 | 120.67 | | 29.67 | 50 | | | | | |
| 1st. TOTAL | | 120.67 | | | | 5th. TOTAL | | | | | |

| JOINT NO. | CEN | LENGTH Metres | TOTAL LENGTH | Comments | Tally (m RT) | JOINT NO. | CEN | LENGTH Metres | TOTAL LENGTH | Comments | Tally (m RT) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 36# | | 12.20 | 132.87 | | 17.47 | 51 | | | | | |
| 12 36# | | 12.20 | 145.07 | | 5.27 | 52 | | | | | |
| 13 36# | | 12.04 | 157.11 | | -6.77 | 53 | | | | | |
| 14 36# | | 12.00 | 169.11 | | -18.77 | 54 | | | | | |
| 15 | | | | | | 55 | | | | | |
| 16 | | | | | | 56 | | | | | |
| 17 | | | | | | 57 | | | | | |
| 18 | | | | | | 58 | | | | | |
| 19 | | | | | | 59 | | | | | |
| 20 | | | | | | 60 | | | | | |
| 2nd. TOTAL | | 48.44 | | | | 6th. TOTAL | | | | | |

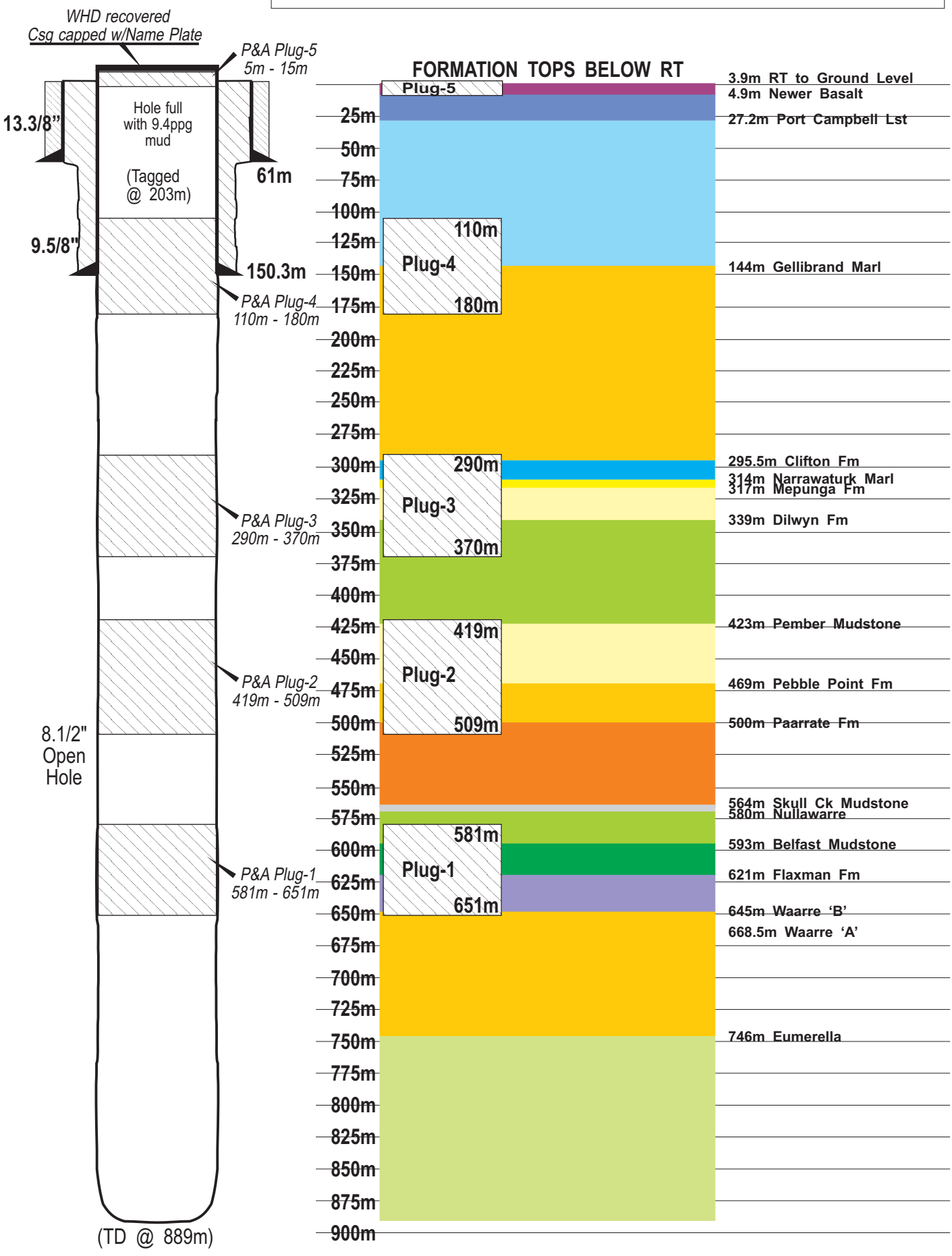
| JOINT NO. | CEN | LENGTH Metres | TOTAL LENGTH | Comments | Tally (m RT) | JOINT NO. | CEN | LENGTH Metres | TOTAL LENGTH | Comments | Tally (m RT) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | | | | | | 61 | | | | | |
| 22 | | | | | | 62 | | | | | |
| 23 | | | | | | 63 | | | | | |
| 24 | | | | | | 64 | | | | | |
| 25 | | | | | | 65 | | | | | |
| 26 | | | | | | 66 | | | | | |
| 27 | | | | | | 67 | | | | | |
| 28 | | | | | | 68 | | | | | |
| 29 | | | | | | 69 | | | | | |
| 30 | | | | | | 70 | | | | | |
| 3rd. TOTAL | | | | | | 7th. TOTAL | | | | | |

| JOINT NO. | CEN | LENGTH Metres | TOTAL LENGTH | Comments | Tally (m RT) | JOINT NO. | CEN | LENGTH Metres | TOTAL LENGTH | Comments | Tally (m RT) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | 71 | | | | | |
| 32 | | | | | | 72 | | | | | |
| 33 | | | | | | 73 | | | | | |
| 34 | | | | | | 74 | | | | | |
| 35 | | | | | | 75 | | | | | |
| 36 | | | | | | 76 | | | | | |
| 37 | | | | | | 77 | | | | | |
| 38 | | | | | | 78 | | | | | |
| 39 | | | | | | 79 | | | | | |
| 40 | | | | | | 80 | | | | | |
| 4th. TOTAL | | | | | | 8th. TOTAL | | | | | |

Page Total 169.11 m | Carried Forward: 0 | Cum.Total : 169.11 m

Essential Petroleum Resources Limited

**Well:** FINDRA-1 **Date:** 30-Jun-04 **Total Depth:** 889mRT
**Permit:** PEP 159 **Easting:** 602 242m **Northing:** 5 768 896m
**Operator:** Essential Petroleum Resources Limited
**Status:** Plug & Abandonment **Spud:** 26-Jun-04
**Dwg:** Cement plug placement schematic **Rig Release:** xx-Jun-04



# CASING SEAT PRESSURE TEST (9.5/8")

**ESSENTIAL PETROLEUM RESOURCES LIMITED**

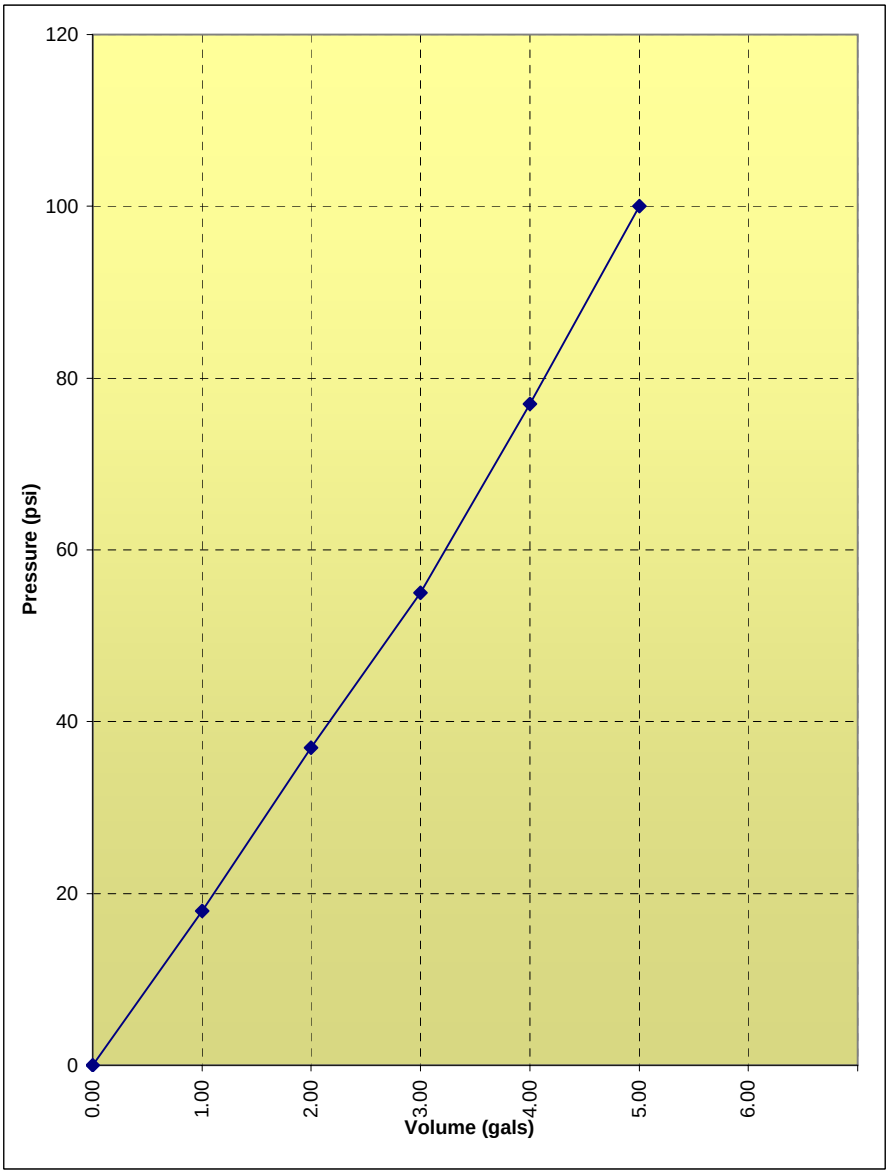
**Well:** FINDRA-1 **Rig:** HUNT ENERGY-2 **Date:** 28-Jun-04

**Test ( FIT / LOT ):** FIT (No leak off obtained)

| Mud Properties | | Well Depth (m) | 153 | Vol pumped (bbl) | 0.12 |
|---|---|---|---|---|---|
| Weight (ppg) | 8.65 | Shoe TVD (m) | 150.34 | Vol lost (bbl) | 0.00 |
| PV (cp) | 8 | Casing size | 9.5/8" 36# K55 | Final/LO pressure (psi) | 100 |
| YP(lb/100ft^2) | 12 | Shoe Depth (m) | 150.34 | Pump rate(bbl/min) | 0.024 |
| WL (ml) | n/a | Min.Burst (psi) | 3,520 | FIT/LOT-SG (EMW)* | 12.54 |

*FIT/LOT(EMW - SG) = Leak-off pressure (psi) + Test Mud weight
Shoe Depth (mTVD) x 0.052

| Time | Vol (gals) | Ps (psi) |
|---|---|---|
| | 0.00 | 0 |
| | 1.00 | 18 |
| | 2.00 | 37 |
| | 3.00 | 55 |
| | 4.00 | 77 |
| | 5.00 | 100 |
| | 6.00 | |




Ps = Surface pressure

# Appendix 4: Mud Recap

# DRILLING FLUID SUMMARY

# FOR : ESSENTIAL PETROLEUM RESOURCES LTD

# WELL : FINDRA # 1

# OTWAY BASIN

# VICTORIA

Prepared by : Neil Kyberd
Andre Skujins

Date : July 2004

R M N
Drilling Fluids

# CONTENTS

**Operator** : **Essential Petroleum Resources LTD**
**Well** : **Findra # 1**
**Rig** : **Hunt Energy # 2**
**Spud** : **26th June 2004**

# 1. SUMMARY OF OPERATIONS

Findra # 1 was spudded in at 00:30 hours on the 26th June 2004 utilising Hunt Energy # 2 and reached a total depth of 889 m on the 29th June 2004.

Make up water was sourced from a local evaporation pond and had the following properties :

| | | |
|---|---|---|
| pH | : | 8.5 |
| Pf / Mf | : | Tr / 0.35 |
| Chlorides | : | 300 mg/l |
| Hardness | : | Tr |

**HOLE SIZE** : **12¼"**
**MUD TYPE** : **Gel Spud Mud**
**INTERVAL** : **61 - 153 m**
**CASING** : **9-5/8" @ 150 m**

All tanks were filled with water. The Pill tank and trough were isolated and lined up to drill cement from the conductor shoe. Into the suction tank, 180 bbls of 25ppb Gel-Caustic Spud mud was mixed and allowed to yield. S55 mesh shaker screens were fitted to the single shaker.

The well was spudded and drilling continued (slowly initially) with the thick gel spud mud. Once the 8" collar was below the conductor shoe, the entire mud system was used by gradually blending the spud mud into the remainder of the water filled tanks. This diluted and thinned the mud back, (viscosity of 36 sec/qt and yield point of 8 lb/100ft²) but as drilling continued, native clays started bringing the viscosity back up.

Water was added to maintain volume and control the viscosity and mud weight. From the top of the Gellibrand marl formation SAPP was added to the system to aid clay dispersion and prevent mud rings from occurring.

The mud weight reached 9.1 ppg and the yield point was 27 lb/100ft² by 110 m, but by the time the section TD of 153 m was reached, the weight had been watered back to 8.7 ppg and the yield point was 9 lb/100ft².

At casing point, the hole was circulated clean and the pipe pulled out to run casing. 9-5/8" surface casing was then run in the hole. The casing was circulated to bottom and the hole was circulated clean. The casing was then cemented, with good returns to surface.

**Operator** : **Essential Petroleum Resources LTD**
**Well** : **Findra # 1**
**Rig** : **Hunt Energy # 2**
**Spud** : **26th June 2004**

**HOLE SIZE** : **8½" Production hole**
**MUD TYPE** : **4% KCl PHPA Polymer**
**INTERVAL** : **153 m - 889 m (TD)**

While nippling up BOP's the tanks were dumped, cleaned and refilled with water. The pill tank and trough were again isolated for drilling cement. The coarsest shaker screens ( S55 ) used on surface hole were left on the shaker.

Into the remaining tanks 450bbls of KCL-PHPA fluid was prepared with :

- 4% KCl,
- 0.15ppb PHPA,
- 0.5ppb Pac-R and
- 0.1ppb Xanvis.

The system was then continually circulated via the hopper and gun line to shear up the fluid as much as possible before use. This low concentration of polymers was intentionally mixed to prevent major mud loss over the single shaker due to unsheared polymer blinding.

An 8½" bit and BHA was run into the hole and tagged cement at 132m. The cement was drilled with water via the trough and pill tank and while drilling on the shoe the hole was displaced to the stored KCl-PHPA fluid.

After the F.I.T. was performed, drilling resumed, with a circulation rate of 336 gpm. Further Polymer additions, both from premix addition and direct to the system to build up the PHPA concentration and other fluid properties were made. Due to the small sump size, all premixes made thereafter were built with recycled sump water which required treatment for hardness and Biocide additions.

Once the system was within spec's and the new polymers sheared, the shaker screens were upgraded to 84 - 84 - 84 mesh.

Drilling continued with fluid properties and volume controlled with premix additions. The sand trap was dumped of solids when required, and the Desilter run continuously. Mud losses to various sand formations occurred, but were self-healing. Losses over the shaker due to polymer blinding also occurred due to the speed in which the polymers were added in the effort to gain optimum fluid properties before the first target zone was drilled.

AMC Pac-R was the primary additive by this stage as it aided in increasing the yield point to 10 - 15 lb/100ft² and reducing the fluid loss to 6 - 7 cc's. KCl additions were also maintained to keep a 4% concentration.

Drilling continued to 889m where the hole was circulated clean and the pipe slugged with Barytes. The pipe was pulled out for a wiper trip to the shoe which found tight hole from 470m through to 250m. While running back to bottom a bridge was tagged

at 505m and was washed & reamed to 516m. Fill was tagged at 873m and the bit was washed to bottom. The hole was circulated clean and the pipe slugged, and pulled out of the hole for logging. No tight hole was recorded on this trip out.

Logging tools were made up and run into the hole successfully to bottom (9m of fill ) and the full logging program completed without hole problems.

Open ended drill-pipe was then run in to bottom and the hole circulated clean. Cement plugs were then set as per the P & A program.

# 2. OBSERVATIONS, RECOMMENDATIONS AND WELL ANALYSIS

Findra # 1 was drilled to a total depth of 889 m for a mud cost of $9,867.80 or $11.10 per metre. The well was drilled problem free from a mud viewpoint and hole conditions were good throughout.

As on the previous well, the rigs solids control equipment worked well. The linear motion shaker worked well as expected and both the desander and desilter put out underflows indicating that the equipment was working fairly optimally.

## 12¼" Surface Hole 61m – 153m

This section of hole was drilled for a mud cost of $1,314.70 or $8.59 per metre, slightly higher than expected. Again, as on the previous well, extra gel was mixed at the start to fill the larger suction tank as the spud mud couldn't be mixed into the smaller intermediate tank.

Once again SAPP was used to great effect in the problematic Gellibrand Marl formation, and successfully removed the threat of Mud Rings and pack-offs.

## 8½" Production Hole 153m – 889m

This section of hole was drilled for a mud cost of $8,553.10 or $11.62 per metre.

The main thing to note in this section is the lower circulation rate used (336 gpm) as compared to the previous well in this program (Killarney #1, 448 gpm.) The calliper shows a good gauge hole throughout. Polymers were able to be added faster without excessive screen blinding, which was a requirement to get the fluid properties up before the first target zone was intersected. The only other variable which relates to the difference in the calliper logs would be the short time that this well was "open".

Some tight hole was seen and a bridge was encountered on the wiper trip prior to logging, but the hole was in good condition after being wiped, with only some fill (9 m) preventing logs reaching bottom.

The mud program worked well again and achieved its aims of helping drill the hole quickly, efficiently and without undue amounts of hole problems.

# 3. INTERVAL COSTS

| Product | Cost | Unit Size | 12-1/4" Surface Hole<br>Interval : 0 - 153 m<br>Used | Cost | %Cost | 8-1/2" Main Hole<br>153 m - 889 m<br>Used | Cost | %Cost | Total Well Consumption<br>0 - 889 m (TD)<br>Used | Cost | %Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AMC Biocide G | $ 210.00 | 25 lt | | | | 2 | $420.00 | 4.9% | 2 | $420.00 | 4.3% |
| AMC Pac L | $ 148.20 | 25 kg | | | | 3 | $444.60 | 5.2% | 3 | $444.60 | 4.5% |
| AMC Pac R | $ 148.20 | 25 kg | | | | 17 | $2,519.40 | 29.5% | 17 | $2,519.40 | 25.5% |
| Aus-Gel 25kg (Aust) | $ 11.10 | 25 kg | 84 | $932.40 | 70.9% | | | | 84 | $932.40 | 9.4% |
| Baryte | $ 6.30 | 25 kg | | | | 40 | $252.00 | 2.9% | 40 | $252.00 | 2.6% |
| Caustic Soda | $ 37.30 | 25 kg | 1 | $37.30 | 2.8% | | | | 1 | $37.30 | 0.4% |
| PHPA | $ 105.70 | 25 kg | | | | 7 | $739.90 | 8.7% | 7 | $739.90 | 7.5% |
| Potassium Chloride | $ 13.80 | 25 kg | | | | 230 | $3,174.00 | 37.1% | 230 | $3,174.00 | 32.2% |
| SAPP | $ 57.50 | 25 kg | 6 | $345.00 | 26.2% | | | | 6 | $345.00 | 3.5% |
| Soda Ash | $ 19.50 | 25 kg | | | | 6 | $117.00 | 1.4% | 6 | $117.00 | 1.2% |
| Sodium Sulphite | $ 32.50 | 25 kg | | | | 6 | $195.00 | 2.3% | 6 | $195.00 | 2.0% |
| Xan-Bore | $ 345.60 | 25 kg | | | | 2 | $691.20 | 8.1% | 2 | $691.20 | 7.0% |
| **Totals :** | | | | **$1,314.70** | **100.0%** | | **$8,553.10** | **100.0%** | | **$9,867.80** | **100.0%** |
| **Cost per Metre :** | | | | **$8.59** | | | **$11.62** | | | **$11.10** | |

# 4. MATERIALS RECONCILIATION

**Previous Well :** **Kilarney # 1**
**Well :** **Findra # 1**
**Transferred to :** **Adelaide Stores**

| PRODUCT | UNIT | TOTAL RECEIVED | TOTAL USED | TRANSFER BALANCE |
|---|---|---|---|---|
| AMC Biocide G | 25 lt | 7 | 2 | 5 |
| AMC Defoamer | 25 lt | 8 | | 8 |
| AMC Pac - Low | 25 kg | 17 | 3 | 14 |
| AMC Pac - Reg | 25 kg | 19 | 17 | 2 |
| Aus-Gel | 25 kg | 84 | 84 | |
| Barytes | 25 kg | 290 | 40 | 250 |
| Calcium Carbonate (ESS) | 25 kg | 40 | | 40 |
| Calcium Chloride (ESS) | 25 kg | 80 | | 80 |
| Caustic Soda | 25 kg | 17 | 1 | 16 |
| Kwikseal Fine | 40 lb | 21 | | 21 |
| Kwikseal Med | 40 lb | 28 | | 28 |
| Lime | 25 kg | 6 | | 6 |
| PHPA | 25 kg | 49 | 7 | 42 |
| Potassium Chloride | 25 kg | 336 | 135 | |
| Potassium Chloride (ESS) | 25 kg | 95 | 95 | |
| Rod-Free | 208 lt | 1 | | 1 |
| Salt (ESS) | 25 kg | 144 | | 144 |
| SAPP | 25 kg | 18 | 6 | 12 |
| Soda Ash | 25 kg | 25 | 6 | 19 |
| Sodium Sulphite | 25 kg | 22 | 6 | 16 |
| Xan-Bore | 25 kg | 4 | 2 | 2 |
| | | | | |

# 5. FLUID PROPERTIES SUMMARY

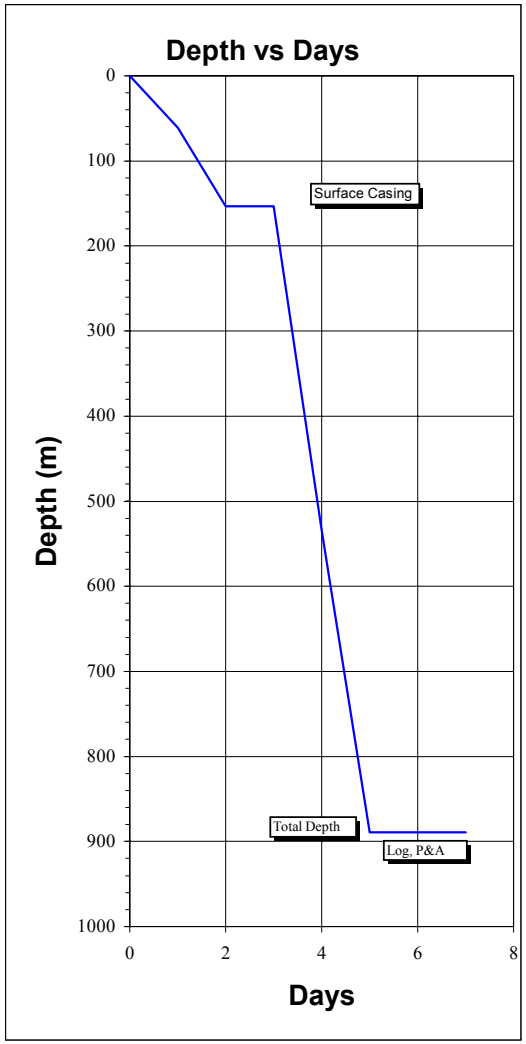
| | | | | | | | Gels | | Filtrate | | Solids | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Mud Type | Depth | Weight | Vis | PV | YP | 10 sec | 10 min | API | Cake | Solids | Water | MBT | pH | Pm | Pf | Mf | Cl- | Ca++ | K+ | KCl | PHPA |
| 25-Jun-04 | Spud Mud | 61 | 8.50 | 60 | 10 | 22 | 9 | 19 | | | 1.1 | 98.9 | 25.0 | 8.5 | 0.05 | 0.05 | 0.90 | 800 | 80 | | | |
| 26-Jun-04 | Spud Mud | 110 | 9.10 | 47 | 11 | 27 | 12 | 27 | | | 5.4 | 94.6 | 32.0 | 9.0 | | 0.10 | 0.70 | 800 | 80 | | | |
| | Spud Mud | 153 | 8.70 | 32 | 5 | 9 | 5 | 11 | | | 2.5 | 97.5 | 15.0 | 8.8 | | 0.10 | 0.70 | 800 | 280 | | | |
| 27-Jun-04 | 4%KCL PHPA Polymer | 153 | 8.60 | 38 | 3 | 5 | 1 | 2 | 8 | 1 | 0.7 | 99.3 | | 8.5 | | 0.10 | 0.60 | 20,000 | 120 | 21,616 | 4.0 | 0.15 |
| 28-Jun-04 | 4%KCL PHPA Polymer | 330 | 8.70 | 37 | 8 | 12 | 1 | 2 | | 1 | 1.2 | 98.8 | 5.0 | 9.0 | | 0.20 | 1.20 | 22,000 | 320 | | | 0.30 |
| | 4%KCL PHPA Polymer | 534 | 9.00 | 39 | 11 | 15 | 2 | 4 | 7 | 1 | 3.5 | 96.5 | 7.5 | 8.8 | | 0.15 | 1.20 | 21,000 | 260 | 22,156 | 4.1 | 0.50 |
| 29-Jun-04 | 4%KCL PHPA Polymer | 730 | 9.10 | 39 | 12 | 15 | 2 | 4 | 6.2 | 1 | 4.2 | 95.8 | 7.5 | 8.8 | | 0.10 | 0.70 | 20,000 | 80 | 21,616 | 4.0 | 0.50 |
| | 4%KCL PHPA Polymer | 889 | 9.20 | 39 | 11 | 15 | 2 | 4 | 6.8 | 1 | 5.0 | 95.0 | 7.5 | 8.8 | | 0.05 | 0.60 | 19,000 | 40 | 21,076 | 3.9 | 0.40 |
| 30-Jun-04 | 4%KCL PHPA Polymer | 889 | 9.20 | 41 | 11 | 15 | 2 | 4 | 7.0 | 1 | 5.0 | 95.0 | 7.5 | 8.8 | | 0.05 | 0.50 | 19,000 | 40 | 21,076 | 3.9 | 0.40 |
| 1-Jul-04 | 4%KCL PHPA Polymer | 889 | 9.20 | 41 | 11 | 15 | 2 | 4 | 7.0 | 1 | 5.0 | 95.0 | 7.5 | 8.8 | | 0.05 | 0.50 | 19,000 | 40 | 21,076 | 3.9 | 0.40 |

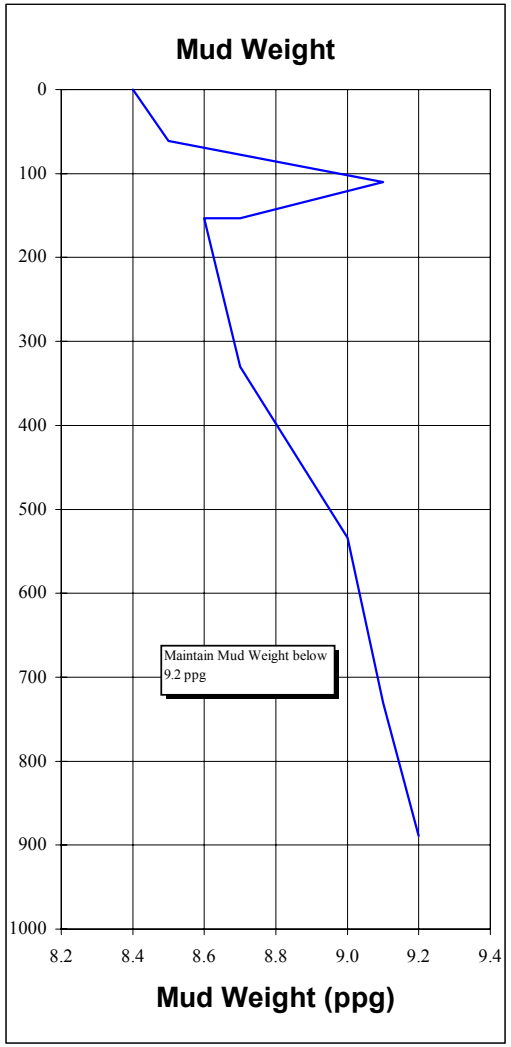
# 6. Mud Volume Analysis

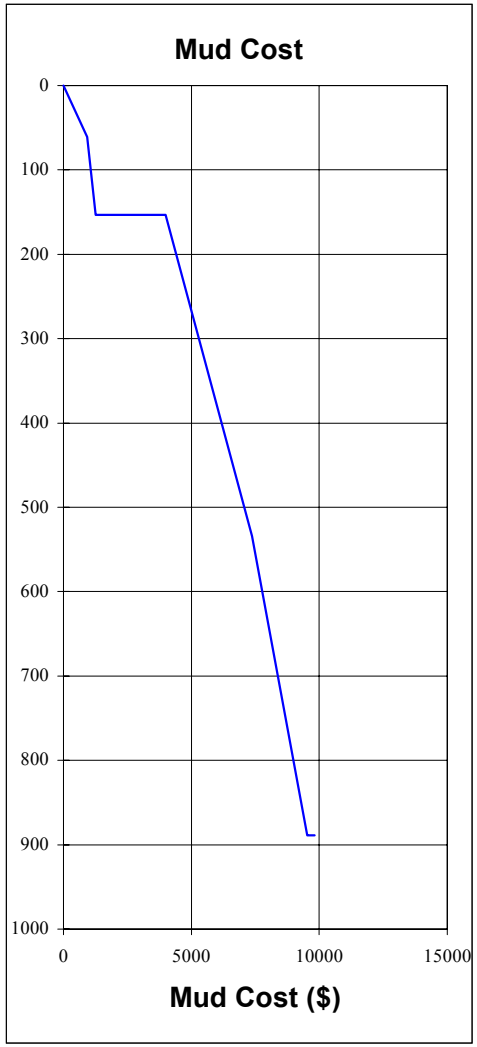
| Date | Hole Size | Interval From | Interval To | Mud Type | Fluid Built & Received: Fresh Premix | Sump Premix | Direct Recirc | Water | Other | Fluid Disposed: De-sander | De-silter | Down-hole | Dumped | Other | Summary: Initial | Received | Disposed | Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25-Jun-04 | 12-1/4" | 0 m | 61 m | Spud Mud | 180 | | | 28 | | | | | | | 0 | 208 | 0 | 208 |
| 26-Jun-04 | 12-1/4" | 61 m | 153 m | Spud Mud | | | | 400 | | | | | 100 | 68 | 208 | 400 | 168 | 440 |
| **Sub Total** | | | | | **180** | **0** | **0** | **428** | **0** | **0** | **0** | **0** | **100** | | | **608** | **168** | |
| 27-Jun-04 | 8-1/2" | 153 m | 153 m | KCl PHPA | 450 | | | | | | | | | | | 450 | 0 | 450 |
| 28-Jun-04 | 8-1/2" | 153 m | 534 m | KCl PHPA | 45 | 180 | | 30 | | | 12 | 72 | 45 | 95 | 450 | 255 | 224 | 481 |
| 29-Jun-04 | 8-1/2" | 534 m | 889 m | KCl PHPA | | 225 | | | | | 23 | 80 | | 45 | 481 | 225 | 148 | 558 |
| 30-Jun-04 | 8-1/2" | 889 m | 889 m | KCl PHPA | | | | | | | | | | | 558 | 0 | 0 | 558 |
| 1-Jul-04 | 8-1/2" | 889 m | 889 m | KCl PHPA | | | | | | | | | | | 558 | 0 | 0 | 558 |
| **Sub Total** | | | | | **495** | **405** | **0** | **30** | **0** | **0** | **35** | **152** | **45** | **140** | | **930** | **372** | |
| **Well Total** | | | | | **675** | **405** | **0** | **458** | **0** | **0** | **35** | **152** | **145** | **140** | | **1538** | **540** | |

| Dilution Factors | | | |
|---|---|---|---|
| | **Interval Length** | **Dilution Vol** | **Dilution Factor** |
| **12¼" Surface Hole** | 153 m | 428 bbls | 2.8 bbls/m |
| **8½" Mudded Up Hole** | 736 m | 480 bbls | 0.7 bbls/m |

# 7. Graphs


Depth vs Days
Depth (m)
0
100
200
300
400
500
600
700
800
900
1000
Surface Casing
Total Depth
Log, P&A
0
2
4
6
8
Days

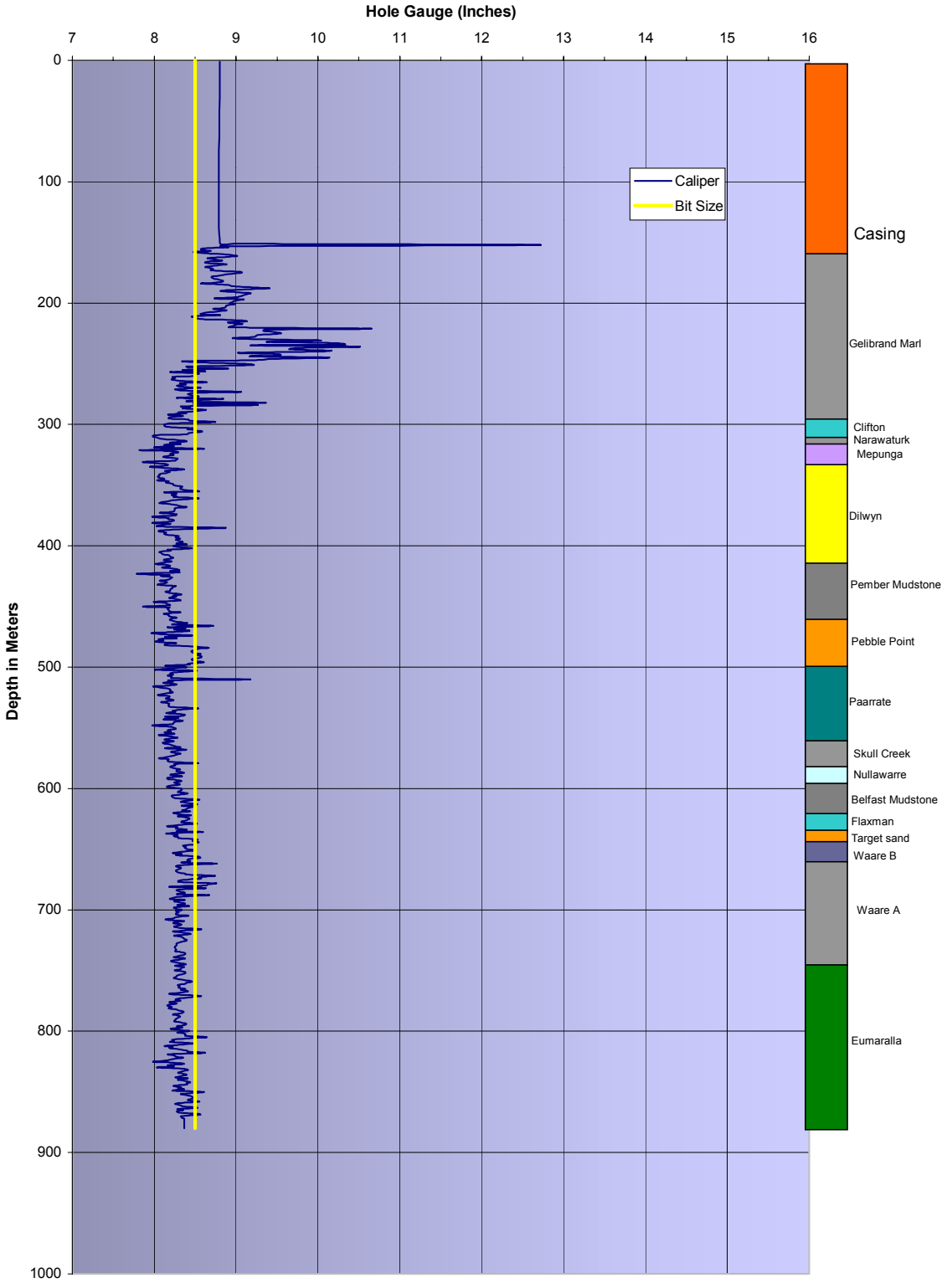

Mud Weight
0
100
200
300
400
500
600
700
800
900
1000
Maintain Mud Weight below 9.2 ppg
8.2
8.4
8.6
8.8
9.0
9.2
9.4
Mud Weight (ppg)


Mud Cost
0
100
200
300
400
500
600
700
800
900
1000
0
5000
10000
15000
Mud Cost ($)

# 8. Bit & Hydraulics Record

| Bit # | Size | Make | Type | Jets | | | Depth Out | Depth Drilled | Hours | Cumm Hours | WOB | RPM | GPM | Mud Wt | Jet Vel | HHPb/sq" | Impact Force |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12 1/4" | HTC | M22 | 18 | 18 | 18 | 153 | 153 | 5 | 5 | 15 | 110 | 615 | 8.7 | 264 | 196 | 732 |
| 2 | 8 1/2" | Varel | CH04MS | 13 | 13 | 13 | 889 | 736 | 37 | 42 | 2 | 120 | 340 | 9.2 | 280 | 128 | 453 |

# Findra # 1 Caliper



# 10. Daily Drilling Fluid Reports

# DRILLING FLUID REPORT

RMN Drilling Fluids

| | | | |
|---|---|---|---|
| Report # | 1 | Date : | 25-Jun-2004 |
| Rig No | 2 | Spud : | 26-Jun-2004 |
| Depth | | to 61 | Metres |

| | | | |
|---|---|---|---|
| OPERATOR | Essential Petroleum Recourses Ltd | CONTRACTOR | Hunt Energy |
| REPORT FOR | Vilnis Ozlins | REPORT FOR | Noel Mills |
| WELL NAME AND No | Findra # 1 | FIELD: PEP 159 | LOCATION: Otway Basin / STATE: Victoria |

| DRILLING ASSEMBLY | | JET SIZE | | | CASING | | MUD VOLUME (BBL) | | CIRCULATION DATA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE | TYPE | 18 | 18 | 18 | SURFACE / SET @ | ft / M | HOLE | PITS | PUMP SIZE | | CIRCULATION PRESS (PSI) | psi |
| 12.25 | Var M22 | | | | | | 28 | 180 | 5.5 X 6 Inches | | | |
| DRILL PIPE SIZE | TYPE | Length | | | INT. / SET @ | ft / M | TOTAL CIRCULATING VOL. | | PUMP MODEL | ASSUMED EFF | BOTTOMS UP (min) | min |
| 4.5 | # | 61 Mtrs | | | | | 208 | | Emsco DB550 | 95 % | #DIV/0! | |
| DRILL PIPE SIZE | TYPE | Length | | | PROD. or LNR Set @ | ft / M | IN STORAGE | | BBL/STK | STK / MIN | TOTAL CIRC. TIME (min) | min |
| | HW | Mtrs | | | | | | | 0.1404 | | #DIV/0! | |
| DRILL COLLAR SIZE ( " ) | | Length | | | MUD TYPE | | | | BBL/MIN | GAL / MIN | ANN VEL. (ft/min) DP / DCs | |
| 6.25 | 8.00 | Mtrs | | | Spud Mud | | | | | | | |

## MUD PROPERTIES

| | | | |
|---|---|---|---|
| SAMPLE FROM | | Pit | Pit |
| TIME SAMPLE TAKEN | | 23:00 | |
| DEPTH (ft) - (m) | Metres | 61 | |
| FLOWLINE TEMPERATURE | $^0$C / $^0$F | | |
| WEIGHT | ppg / SG | 8.50 1.020 | |
| FUNNEL VISCOSITY (sec/qt) API @ | $^0$C | 60 | |
| PLASTIC VISCOSITY cP @ | $^0$C | 10 | |
| YIELD POINT (lb/100ft$^2$) | | 22 | |
| GEL STRENGTHS (lb/100ft$^2$) 10 sec/10 min | | 9 19 | |
| FILTRATE API (cc's/30 min) | | | |
| HPHT FILTRATE (cc's/30 min) @ | $^0$F | | |
| CAKE THICKNESS API : HPHT (32nd in) | | | |
| SOLIDS CONTENT (% by Volume) | | 1.1 | |
| LIQUID CONTENT (% by Volume) OIL/WATER | | 98.9 | |
| SAND CONTENT (% by Vol.) | | | |
| METHYLENE BLUE CAPACITY (ppb equiv.) | | 25.0 | |
| pH | | 8.5 | |
| ALKALINITY MUD (Pm) | | 0 | |
| ALKALINITY FILTRATE (Pf / Mf) | | 0.05 0.90 | |
| CHLORIDE (mg/L) | | 800 | |
| TOTAL HARDNESS AS CALCIUM (mg/L) | | 80 | |
| SULPHITE (mg/L) | | | |
| K+ (mg/L) | | | |
| KCl (% by Wt.) | | | |
| PHPA (ppb) | | | |

## MUD PROPERTY SPECIFICATIONS

| | | | | | |
|---|---|---|---|---|---|
| Mud Weight | 8.8 - 9.4 | API Filtrate | N/C | HPHT Filtrate | |
| Plastic Vis | min | Yield Point | 12 - 25 | pH | 8.0 - 9.5 |
| KCl | | PHPA | | Sulphites | |

## OBSERVATIONS

Built 180 bbls of 25ppb Gel Caustic Spud mud and allow to Yield.

## OPERATIONS SUMMARY

Complete Rig up over Findra # 1

Make Up BHA

## Mud Accounting (bbls)

| FLUID BUILT & RECEIVED | | FLUID DISPOSED | | SUMMARY | |
|---|---|---|---|---|---|
| Premix (drill water) | 180 | Desander | | INITIAL VOLUME | 0 |
| Premix (recirc from sump) | | Desilter | | | |
| Drill Water | 28 | Downhole | | + FLUID RECEIVED | 208 |
| Direct Recirc Sump | | Dumped | | -FLUID LOST | |
| Other (eg Diesel) | | Other | | + FLUID IN STORAGE | |
| TOTAL RECEIVED | 208 | TOTAL LOST | | FINAL VOLUME | 208 |

## Solids Control Equipment

| | Type | Hrs | | Cones | Hrs | | Size | Hrs |
|---|---|---|---|---|---|---|---|---|
| Centrifuge | Nil | | Desander | 2 | | Shaker #1 | 3x54 | |
| Degasser | P-B | | Desilter | 8 | | Shaker #2 | n/a | |

| | Overflow (ppg) | Underflow (ppg) | Output (Gal/Min.) |
|---|---|---|---|
| Desander | | 0 | |
| Desilter | | 0 | |

| Product | Price | Start | Received | Used | Close | Cost |
|---|---|---|---|---|---|---|
| Aus-Gel | $ 10.50 | 84 | | 84 | | $ 882.00 |
| Caustic Soda | $ 37.30 | 17 | | 1 | 16 | $ 37.30 |

| Solids Analysis | PPB | % |
|---|---|---|
| High Grav solids | | |
| Total LGS | | |
| Bentonite | | |
| Drilled Solids | | |
| Salt | | |
| n @ Hrs | | |
| K @ Hrs | | |

| Bit Hydraulics & Pressure Data |
|---|
| Jet Velocity |
| Impact force |
| HHP |
| HSI |
| Bit Press Loss |
| CSG Seat Frac Press |
| Equiv. Mud Wt. |
| ECD |
| Max Pressure @ Shoe : |

| DAILY COST | CUMULATIVE COST |
|---|---|
| $919.30 | $919.30 |

RMN ENGINEER Neil Kyberd CITY Adelaide Office TELEPHONE 08 8338 7266

# DRILLING FLUID REPORT

RMN Drilling Fluids

| | | | |
|---|---|---|---|
| Report # | 2 | Date : | 26-Jun-2004 |
| Rig No | 2 | Spud : | 26-Jun-2004 |
| Depth | 61 to 153 | | Metres |

| | | | |
|---|---|---|---|
| OPERATOR | Essential Petroleum Recourses Ltd | CONTRACTOR | Hunt Energy |
| REPORT FOR | Vilnis Ozlins | REPORT FOR | Dave Hair |
| WELL NAME AND No | Findra # 1 | FIELD: PEP 159 | LOCATION: Otway Basin / STATE: Victoria |

| DRILLING ASSEMBLY | | JET SIZE | | | CASING | | MUD VOLUME (BBL) | | CIRCULATION DATA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE | TYPE | 18 | 18 | 18 | SURFACE ft | | HOLE | PITS | PUMP SIZE | | CIRCULATION PRESS (PSI) | 900 psi |
| 12.25 | Var M22 | | | | SET @ M | | 60 | 380 | 5.5 X 6 Inches | | | |
| DRILL PIPE SIZE 4.5 | TYPE # | Length 21 Mtrs | | | INT. ft | | TOTAL CIRCULATING VOL. | | PUMP MODEL | ASSUMED EFF | BOTTOMS UP (min) | 3 min |
| | | | | | SET @ M | | 440 | | Emsco DB550 | 95 % | | |
| DRILL PIPE SIZE 4.5 | TYPE HW | Length 37 Mtrs | | | PROD. or ft | | IN STORAGE | | BBL/STK | STK / MIN | TOTAL CIRC. TIME (min) | 30 min |
| | | | | | LNR Set @ M | | | | 0.1404 | 110 | | |
| DRILL COLLAR SIZE ( " ) | | Length | | | MUD TYPE | | | | BBL/MIN | GAL / MIN | ANN VEL. DP | 116 |
| 6.25 | 8.00 | 75 | 21 | Mtrs | Spud Mud | | | | 14.67 | 616 | (ft/min) DCs | 136 175 |

| MUD PROPERTIES | | | |
|---|---|---|---|
| SAMPLE FROM | | Pit | Pit |
| TIME SAMPLE TAKEN | | 05:00 | 09:00 |
| DEPTH (ft) - (m) | Metres | 110 | 153 |
| FLOWLINE TEMPERATURE | $^0$C / $^0$F | | |
| WEIGHT | ppg / SG | 9.10 1.092 | 8.70 1.044 |
| FUNNEL VISCOSITY (sec/qt) API @ | $^0$C | 47 | 32 |
| PLASTIC VISCOSITY cP @ | $^0$C | 11 | 5 |
| YIELD POINT (lb/100ft$^2$) | | 27 | 9 |
| GEL STRENGTHS (lb/100ft$^2$) 10 sec/10 min | | 12 27 | 5 11 |
| FILTRATE API (cc's/30 min) | | | |
| HPHT FILTRATE (cc's/30 min) @ | $^0$F | | |
| CAKE THICKNESS API : HPHT (32nd in) | | | |
| SOLIDS CONTENT (% by Volume) | | 5.4 | 2.5 |
| LIQUID CONTENT (% by Volume) OIL/WATER | | 94.6 | 97.5 |
| SAND CONTENT (% by Vol.) | | | |
| METHYLENE BLUE CAPACITY (ppb equiv.) | | 32.0 | 15.0 |
| pH | | 9.0 | 8.8 |
| ALKALINITY MUD (Pm) | | | |
| ALKALINITY FILTRATE (Pf / Mf) | | 0.10 0.70 | 0.10 0.70 |
| CHLORIDE (mg/L) | | 800 | 800 |
| TOTAL HARDNESS AS CALCIUM (mg/L) | | 80 | 280 |
| SULPHITE (mg/L) | | | |
| K+ (mg/L) | | | |
| KCl (% by Wt.) | | | |
| PHPA (ppb) | | | |

| MUD PROPERTY SPECIFICATIONS | | | | | |
|---|---|---|---|---|---|
| Mud Weight | 8.8 - 9.4 | API Filtrate | N/C | HPHT Filtrate | |
| Plastic Vis | min | Yield Point | 12 - 25 | pH | 8.0 - 9.5 |
| KCl | | PHPA | | Sulphites | |

**OBSERVATIONS**

Fitted 3 x S55 shaker screens to the single shaker.
Drilled out cement and new formation with "short system" to maintain the High Vis until the 8" collars were below the conductor shoe.
From 70m began blending the spud mud with stored water in the other tanks.
From 110m circulated "long" using the full tank system.

Drilled ahead through mud making clays, adding water for new volume and viscosity control.
SAPP added to reduce clay sticking and mud rings. 2 sx damaged beyond use and written off.

**OPERATIONS SUMMARY**

Spud well at 00:30 Hrs and drill out conductor cement.
Drill ahead with surveys to 153m
POOH wiper trip to surface.
RIH and circulate hole clean. POOH.
Run 9 5/8" casing.
Circulate casing and cement as per program with cement returned to surface.

**Mud Accounting (bbls)**

| FLUID BUILT & RECEIVED | | FLUID DISPOSED | | SUMMARY | |
|---|---|---|---|---|---|
| Premix (drill water) | | Desander | | INITIAL VOLUME | 208 |
| Premix (recirc from sump) | | Desilter | | | |
| Drill Water | 400 | Downhole | 0 | + FLUID RECEIVED | 400 |
| Direct Recirc Sump | | Dumped | 100 | -FLUID LOST | 168 |
| Other (eg Diesel) | | Other | 68 | + FLUID IN STORAGE | |
| TOTAL RECEIVED | 400 | TOTAL LOST | 168 | FINAL VOLUME | 440 |

**Solids Control Equipment**

| | Type | Hrs | | Cones | Hrs | | Size | Hrs |
|---|---|---|---|---|---|---|---|---|
| Centrifuge | Nil | | Desander | 2 | | Shaker #1 | 3x54 | 9 |
| Degasser | P-B | | Desilter | 8 | | Shaker #2 | n/a | |

| | Overflow (ppg) | Underflow (ppg) | Output (Gal/Min.) |
|---|---|---|---|
| Desander | | 0 | |
| Desilter | | 0 | |

| Product | Price | Start | Received | Used | Close | Cost |
|---|---|---|---|---|---|---|
| SAPP | $ 57.50 | 18 | | 6 | 12 | $ 345.00 |

**Solids Analysis**

| | PPB | % |
|---|---|---|
| High Grav solids | | |
| Total LGS | 23.1 | 2.5 |
| Bentonite | 15.0 | 1.6 |
| Drilled Solids | 8.1 | 0.9 |
| Salt | | |
| n @ 09:00 Hrs | 0.44 | |
| K @ 09:00 Hrs | 0.90 | |

**Bit Hydraulics & Pressure Data**

| | |
|---|---|
| Jet Velocity | 264 |
| Impact force | 735 |
| HHP | 197 |
| HSI | 1.7 |
| Bit Press Loss | 547 |
| CSG Seat Frac Press | |
| Equiv. Mud Wt. | |
| ECD | |
| Max Pressure @ Shoe : | |

| DAILY COST | CUMULATIVE COST |
|---|---|
| $345.00 | $1,264.30 |

RMN ENGINEER Neil Kyberd CITY Adelaide Office TELEPHONE 08 8338 7266

# DRILLING FLUID REPORT

RMN Drilling Fluids

| | | | |
|---|---|---|---|
| Report # | 3 | Date : | 27-Jun-2004 |
| Rig No | 2 | Spud : | 26-Jun-2004 |
| Depth | 153 to 153 | | Metres |

| | | | |
|---|---|---|---|
| OPERATOR | Essential Petroleum Recourses Ltd | CONTRACTOR | Hunt Energy |
| REPORT FOR | Vilnis Ozlins | REPORT FOR | Dave Hair |
| WELL NAME AND No | Findra # 1 | FIELD: PEP 159 | LOCATION: Otway Basin / STATE: Victoria |

| DRILLING ASSEMBLY | | | JET SIZE | | | CASING | | | MUD VOLUME (BBL) | | CIRCULATION DATA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE 8.5 | TYPE | | | | | 9 5/8" SURFACE | 492 | ft | HOLE | PITS | PUMP SIZE 5.5 X 6 Inches | | CIRCULATION PRESS (PSI) | psi |
| DRILL PIPE SIZE 4.5 | TYPE # | Length 42 Mtrs | | | | SET @ | 150 | M | 29 | 450 | | | | |
| DRILL PIPE SIZE 4.5 | TYPE HW | Length 37 Mtrs | | | | INT. SET @ | | ft / M | TOTAL CIRCULATING VOL. 450 | | PUMP MODEL Emsco DB550 | ASSUMED EFF 95 % | BOTTOMS UP (min) | min |
| DRILL COLLAR SIZE ( " ) 6.25 | | Length 75 Mtrs | | | | PROD. or LNR Set @ | | ft / M | IN STORAGE -29 | | BBL/STK 0.1404 | STK / MIN | TOTAL CIRC. TIME (min) | min |
| | | | | | | MUD TYPE 4%KCL PHPA Polymer | | | | | BBL/MIN | GAL / MIN | ANN VEL. (ft/min) DP DCs | |

| MUD PROPERTIES | | Pit | Pit |
|---|---|---|---|
| SAMPLE FROM | | | |
| TIME SAMPLE TAKEN | | | 21:00 |
| DEPTH (ft) - (m) | Metres | | 153 |
| FLOWLINE TEMPERATURE | $^0$C / $^0$F | | |
| WEIGHT | ppg / SG | | 8.60 1.032 |
| FUNNEL VISCOSITY (sec/qt) API @ | $^0$C | | 38 |
| PLASTIC VISCOSITY cP @ | $^0$C | | 3 |
| YIELD POINT (lb/100ft$^2$) | | | 5 |
| GEL STRENGTHS (lb/100ft$^2$) 10 sec/10 min | | | 1 2 |
| FILTRATE API (cc's/30 min) | | | 8.0 |
| HPHT FILTRATE (cc's/30 min) @ | $^0$F | | |
| CAKE THICKNESS API : HPHT (32nd in) | | | 1 |
| SOLIDS CONTENT (% by Volume) | | | 0.7 |
| LIQUID CONTENT (% by Volume) OIL/WATER | | | 99.3 |
| SAND CONTENT (% by Vol.) | | | |
| METHYLENE BLUE CAPACITY (ppb equiv.) | | | |
| pH | | | 8.5 |
| ALKALINITY MUD (Pm) | | | |
| ALKALINITY FILTRATE (Pf / Mf) | | | 0.10 0.60 |
| CHLORIDE (mg/L) | | | 20,000 |
| TOTAL HARDNESS AS CALCIUM (mg/L) | | | 120 |
| SULPHITE (mg/L) | | | |
| K+ (mg/L) | | | 21,616 |
| KCl (% by Wt.) | | | 4.0 |
| PHPA (ppb) | | | 0.15 |

| MUD PROPERTY SPECIFICATIONS | | | | | |
|---|---|---|---|---|---|
| Mud Weight | 8.8 - 9.4 | API Filtrate | 6 - 8 | HPHT Filtrate | |
| Plastic Vis | min | Yield Point | 12 - 25 | pH | 8.0 - 9.5 |
| KCl | 4% | PHPA | 1.00 ppb | Sulphites | 80 - 120 |

**OBSERVATIONS**

Dumped and cleaned all tanks.
Prepared 450bbls of KCL-PHPA fluid with:
4% KCl, 0.15 ppb PHPA, 0.5ppb PAC-R and 0.1 ppb Xanvis.
Circulating all tanks via gun lines and hopper to aid in shearing the new fluid.
Once the New fluid has sheared and the shaker can handle the fluid further
PHPA and Yield Point building polymers will be added.

**OPERATIONS SUMMARY**

Nipple up BOP's
Pressure test all surface equipment
Make up 8 1/2" BHA

**Mud Accounting (bbls)**

| FLUID BUILT & RECEIVED | | FLUID DISPOSED | | SUMMARY | |
|---|---|---|---|---|---|
| Premix (drill water) | 450 | Desander | | INITIAL VOLUME | |
| Premix (recirc from sump) | | Desilter | | | |
| Drill Water | | Downhole | 0 | + FLUID RECEIVED | 450 |
| Direct Recirc Sump | | Dumped | | -FLUID LOST | 0 |
| Other (eg Diesel) | | Other | | + FLUID IN STORAGE | -29 |
| TOTAL RECEIVED | 450 | TOTAL LOST | 0 | FINAL VOLUME | 421 |

**Solids Control Equipment**

| | Type | Hrs | | Cones | Hrs | | Size | Hrs |
|---|---|---|---|---|---|---|---|---|
| Centrifuge | Nil | | Desander | 2 | | Shaker #1 | 3x54 | |
| Degasser | P-B | | Desilter | 8 | | Shaker #2 | n/a | |

| | Overflow (ppg) | Underflow (ppg) | Output (Gal/Min.) |
|---|---|---|---|
| Desander | | 0 | |
| Desilter | | 0 | |

| Product | Price | Start | Received | Used | Close | Cost |
|---|---|---|---|---|---|---|
| AMC Pac - Reg | $ 148.20 | 19 | | 4 | 15 | $ 592.80 |
| PHPA | $ 105.70 | 49 | | 2 | 47 | $ 211.40 |
| Pot. Chloride | $ 13.80 | 336 | | 20 | 316 | $ 276.00 |
| Pot. Chloride (ESS) | $ 13.80 | 95 | | 95 | | $ 1,311.00 |
| Xan-Bore | $ 345.60 | 4 | | 1 | 3 | $ 345.60 |

| Solids Analysis | PPB | % |
|---|---|---|
| High Grav solids | | |
| Total LGS | 6.0 | 0.7 |
| Bentonite | | |
| Drilled Solids | 6.0 | 0.7 |
| Salt | | |
| n @ 21:00 Hrs | 0.46 | |
| K @ 21:00 Hrs | 0.46 | |

| Bit Hydraulics & Pressure Data |
|---|
| Jet Velocity |
| Impact force |
| HHP |
| HSI |
| Bit Press Loss |
| CSG Seat Frac Press |
| Equiv. Mud Wt. |
| ECD |
| Max Pressure @ Shoe : |

| DAILY COST | CUMULATIVE COST |
|---|---|
| $2,736.80 | $4,001.10 |

RMN ENGINEER Neil Kyberd CITY Adelaide Office TELEPHONE 08 8338 7266

# DRILLING FLUID REPORT

RMN Drilling Fluids

| | | | |
|---|---|---|---|
| Report # | 4 | Date : | 28-Jun-2004 |
| Rig No | 2 | Spud : | 26-Jun-2004 |
| Depth | 153 to 534 | | Metres |

| | | | |
|---|---|---|---|
| OPERATOR | Essential Petroleum Recourses Ltd | CONTRACTOR | Hunt Energy |
| REPORT FOR | Vilnis Ozlins | REPORT FOR | Dave Hair |
| WELL NAME AND No | Findra # 1 | FIELD | PEP 159 |
| LOCATION | Otway Basin | STATE | Victoria |

| DRILLING ASSEMBLY | | JET SIZE | | |
|---|---|---|---|---|
| BIT SIZE | TYPE | 13 | 13 | 13 |
| 8.5 | CHO4MS | | | |
| DRILL PIPE SIZE 4.5 | TYPE # | Length 289 Mtrs | | |
| DRILL PIPE SIZE 4.5 | TYPE HW | Length 55 Mtrs | | |
| DRILL COLLAR SIZE ( " ) | | Length | | |
| 6.25 | | 190 Mtrs | | |

| CASING | | |
|---|---|---|
| 9 5/8" SURFACE | 492 | ft |
| SET @ | 150 | M |
| INT. | | ft |
| SET @ | | M |
| PROD. or LNR Set @ | | ft |
| | | M |
| MUD TYPE | 4%KCL PHPA Polymer | |

| MUD VOLUME (BBL) | |
|---|---|
| HOLE | PITS |
| 101 | 380 |
| TOTAL CIRCULATING VOL. | 481 |
| IN STORAGE | |

| CIRCULATION DATA | | | |
|---|---|---|---|
| PUMP SIZE | | CIRCULATION PRESS (PSI) | 850 psi |
| 5.5 X 6 Inches | | | |
| PUMP MODEL | ASSUMED EFF | BOTTOMS UP (min) | 9 min |
| Emsco DB550 | 95 % | | |
| BBL/STK | STK / MIN | TOTAL CIRC. TIME (min) | 60 min |
| 0.1404 | 60 | | |
| BBL/MIN | GAL / MIN | ANN VEL. DP | 158 |
| 8.00 | 336 | (ft/min) DCs | 248 |

| MUD PROPERTIES | | Pit | Pit |
|---|---|---|---|
| SAMPLE FROM | | Pit | Pit |
| TIME SAMPLE TAKEN | | 14:00 | 24:00 |
| DEPTH (ft) - (m) | Metres | 330 | 534 |
| FLOWLINE TEMPERATURE | $^0$C $^0$F | | |
| WEIGHT | ppg / SG | 8.70 1.044 | 9.00 1.080 |
| FUNNEL VISCOSITY (sec/qt) API @ | $^0$C | 37 | 39 |
| PLASTIC VISCOSITY cP @ | $^0$C | 8 | 11 |
| YIELD POINT (lb/100ft$^2$) | | 12 | 15 |
| GEL STRENGTHS (lb/100ft$^2$) 10 sec/10 min | | 1 2 | 2 4 |
| FILTRATE API (cc's/30 min) | | | 6.5 |
| HPHT FILTRATE (cc's/30 min) @ | $^0$F | | |
| CAKE THICKNESS API : HPHT (32nd in) | | 1 | 1 |
| SOLIDS CONTENT (% by Volume) | | 1.2 | 3.5 |
| LIQUID CONTENT (% by Volume) OIL/WATER | | 98.8 | 96.5 |
| SAND CONTENT (% by Vol.) | | | |
| METHYLENE BLUE CAPACITY (ppb equiv.) | | 5.0 | 7.5 |
| pH | | 9.0 | 8.8 |
| ALKALINITY MUD (Pm) | | | |
| ALKALINITY FILTRATE (Pf / Mf) | | 0.20 1.20 | 0.15 1.20 |
| CHLORIDE (mg/L) | | 22,000 | 21,000 |
| TOTAL HARDNESS AS CALCIUM (mg/L) | | 320 | 260 |
| SULPHITE (mg/L) | | | |
| K+ (mg/L) | | | 22,156 |
| KCl (% by Wt.) | | | 4.1 |
| PHPA (ppb) | | 0.3 | 0.5 |

| MUD PROPERTY SPECIFICATIONS | | | | | |
|---|---|---|---|---|---|
| Mud Weight | 8.8 - 9.4 | API Filtrate | 6 - 8 | HPHT Filtrate | |
| Plastic Vis | min | Yield Point | 12 - 25 | pH | 8.0 - 9.5 |
| KCl | 4% | PHPA | 1.00 ppb | Sulphites | 80 - 120 |

## OBSERVATIONS

Displaced hole to new KCL-PHPA fluid
once the fluid had sheared sufficiently, shaker screens upgraded to 84 mesh.
Further Polymer additions made to build Yield Point, PHPA conc, and lower water loss.
Soda Ash additions to treat hardness from sump water.
All premixes built with recycled sump water.
OTHER losses from shakers due to Polymer blinding, Sand Blinding and cuttings overloading.
during fast ROP.

## OPERATIONS SUMMARY

RIH with 8 1/2" bit and BHA, Tag cement at 132m
Drill Shoe track with water to 153m
Displace hole to Stored KCL-PHPA fluid while drilling to 156m
Circulate hole clean and perform L.O.T
Drill ahead with surveys to 534m, circulating samples as required.

## Mud Accounting (bbls)

| FLUID BUILT & RECEIVED | | FLUID DISPOSED | | SUMMARY | |
|---|---|---|---|---|---|
| Premix (drill water) | 45 | Desander | | INITIAL VOLUME | 450 |
| Premix (recirc from sump) | 180 | Desilter | 12 | | |
| Drill Water | 30 | Downhole | 72 | + FLUID RECEIVED | 255 |
| Direct Recirc Sump | | Dumped | 45 | -FLUID LOST | 224 |
| Other (eg Diesel) | | Other | 95 | + FLUID IN STORAGE | |
| TOTAL RECEIVED | 255 | TOTAL LOST | 224 | FINAL VOLUME | 481 |

## Solids Control Equipment

| | Type | Hrs | | Cones | Hrs | | Size | Hrs |
|---|---|---|---|---|---|---|---|---|
| Centrifuge | Nil | | Desander | 2 | | Shaker #1 | 3x84 | 20 |
| Degasser | P-B | | Desilter | 8 | 17 | Shaker #2 | n/a | |

| | Overflow (ppg) | Underflow (ppg) | Output (Gal/Min.) |
|---|---|---|---|
| Desander | | 0 | |
| Desilter | 8.7 | 11.1 | 0.50 |

| Product | Price | Start | Received | Used | Close | Cost |
|---|---|---|---|---|---|---|
| AMC Biocide G | $ 210.00 | 7 | | 1 | 6 | $ 210.00 |
| AMC Pac - Reg | $ 148.20 | 15 | | 9 | 6 | $ 1,333.80 |
| PHPA | $ 105.70 | 47 | | 5 | 42 | $ 528.50 |
| Pot. Chloride | $ 13.80 | 316 | | 55 | 261 | $ 759.00 |
| Soda Ash | $ 19.50 | 25 | | 6 | 19 | $ 117.00 |
| Sodium Sulphite | $ 32.50 | 22 | | 2 | 20 | $ 65.00 |
| Xan-Bore | $ 345.60 | 3 | | 1 | 2 | $ 345.60 |

| Solids Analysis | PPB | % |
|---|---|---|
| High Grav solids | | |
| Total LGS | 31.5 | 3.5 |
| Bentonite | 7.5 | 0.8 |
| Drilled Solids | 24.0 | 2.6 |
| Salt | | |
| n @ 24:00 Hrs | 0.51 | |
| K @ 24:00 Hrs | 1.09 | |

| Bit Hydraulics & Pressure Data | |
|---|---|
| Jet Velocity | 277 |
| Impact force | 434 |
| HHP | 121 |
| HSI | 2.1 |
| Bit Press Loss | 619 |
| CSG Seat Frac Press | |
| Equiv. Mud Wt. | |
| ECD | |
| Max Pressure @ Shoe : | |

| DAILY COST | CUMULATIVE COST |
|---|---|
| $3,358.90 | $7,360.00 |

RMN ENGINEER Neil Kyberd CITY Adelaide Office TELEPHONE 08 8338 7266

# DRILLING FLUID REPORT

RMN Drilling Fluids

| | | | |
|---|---|---|---|
| Report # | 5 | Date : | 29-Jun-2004 |
| Rig No | 2 | Spud : | 26-Jun-2004 |
| Depth | 534 to 889 | | Metres |

| | | | |
|---|---|---|---|
| OPERATOR | Essential Petroleum Recourses Ltd | CONTRACTOR | Hunt Energy |
| REPORT FOR | Vilnis Ozlins | REPORT FOR | Dave Hair |
| WELL NAME AND No | Findra # 1 | FIELD: PEP 159 | LOCATION: Otway Basin / STATE: Victoria |

| DRILLING ASSEMBLY | | JET SIZE | | | CASING | | MUD VOLUME (BBL) | | CIRCULATION DATA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE 8.5 | TYPE CHO4MS | 13 | 13 | 13 | 9 5/8" SURFACE 492 ft | | HOLE 178 | PITS 380 | PUMP SIZE 5.5 X 6 Inches | | CIRCULATION PRESS (PSI) | 1110 psi |
| DRILL PIPE SIZE 4.5 | TYPE # | Length 644 Mtrs | | | INT. ft SET @ M | | TOTAL CIRCULATING VOL. 558 | | PUMP MODEL Emsco DB550 | ASSUMED EFF 95 % | BOTTOMS UP (min) | 18 min |
| DRILL PIPE SIZE 4.5 | TYPE HW | Length 55 Mtrs | | | PROD. or LNR Set @ ft M | | IN STORAGE | | BBL/STK 0.1404 | STK / MIN 60 | TOTAL CIRC. TIME (min) | 70 min |
| DRILL COLLAR SIZE ( " ) 6.25 | | Length 190 Mtrs | | | MUD TYPE 4%KCL PHPA Polymer | | | | BBL/MIN 8.00 | GAL / MIN 336 | ANN VEL. (ft/min) DP | 158 |
| | | | | | | | | | | | DCs | 248 |

| MUD PROPERTIES | | | |
|---|---|---|---|
| SAMPLE FROM | | Pit | Pit |
| TIME SAMPLE TAKEN | | 14:00 | 22:30 |
| DEPTH (ft) - (m) | Metres | 730 | 889 |
| FLOWLINE TEMPERATURE | $^0$C / $^0$F | / | / |
| WEIGHT | ppg / SG | 9.10 / 1.092 | 9.20 / 1.104 |
| FUNNEL VISCOSITY (sec/qt) API @ | $^0$C | 39 | 39 |
| PLASTIC VISCOSITY cP @ | $^0$C | 12 | 11 |
| YIELD POINT (lb/100ft$^2$) | | 15 | 15 |
| GEL STRENGTHS (lb/100ft$^2$) 10 sec/10 min | | 2 / 4 | 2 / 4 |
| FILTRATE API (cc's/30 min) | | 6.2 | 6.8 |
| HPHT FILTRATE (cc's/30 min) @ | $^0$F | | |
| CAKE THICKNESS API : HPHT (32nd in) | | 1 / | 1 / |
| SOLIDS CONTENT (% by Volume) | | 4.2 | 5.0 |
| LIQUID CONTENT (% by Volume) OIL/WATER | | / 95.8 | / 95.0 |
| SAND CONTENT (% by Vol.) | | | |
| METHYLENE BLUE CAPACITY (ppb equiv.) | | 7.5 | 7.5 |
| pH | | 8.8 | 8.8 |
| ALKALINITY MUD (Pm) | | | |
| ALKALINITY FILTRATE (Pf / Mf) | | 0.10 / 0.70 | 0.05 / 0.60 |
| CHLORIDE (mg/L) | | 20,000 | 19,000 |
| TOTAL HARDNESS AS CALCIUM (mg/L) | | 80 | 40 |
| SULPHITE (mg/L) | | | |
| K+ (mg/L) | | 21,616 | 21,076 |
| KCl (% by Wt.) | | 4.0 | 3.9 |
| PHPA (ppb) | | 0.5 | 0.4 |

| MUD PROPERTY SPECIFICATIONS | | | | | |
|---|---|---|---|---|---|
| Mud Weight | 8.8 - 9.4 | API Filtrate | 6 - 8 | HPHT Filtrate | |
| Plastic Vis | min | Yield Point | 12 - 25 | pH | 8.0 - 9.5 |
| KCl | 4% | PHPA | 1.00 ppb | Sulphites | 80 - 120 |

**OBSERVATIONS**

Maintained volume and properties with premix additions.
Recycled sump water used for building premixes.
Biocide used to treat sump water.

**OPERATIONS SUMMARY**

Drill ahead from 534m to a Total depth of 889m with surveys
Circulate hole clean,
POOH for wiper trip to the shoe.

**Mud Accounting (bbls)**

| FLUID BUILT & RECEIVED | | FLUID DISPOSED | | SUMMARY | |
|---|---|---|---|---|---|
| Premix (drill water) | | Desander | | INITIAL VOLUME | 481 |
| Premix (recirc from sump) | 225 | Desilter | 23 | | |
| Drill Water | | Downhole | 80 | + FLUID RECEIVED | 225 |
| Direct Recirc Sump | | Dumped | | -FLUID LOST | 148 |
| Other (eg Diesel) | | Other | 45 | + FLUID IN STORAGE | |
| TOTAL RECEIVED | 225 | TOTAL LOST | 148 | FINAL VOLUME | 558 |

**Solids Control Equipment**

| | Type | Hrs | | Cones | Hrs | | Size | Hrs |
|---|---|---|---|---|---|---|---|---|
| Centrifuge | Nil | | Desander | 2 | | Shaker #1 | 3x84 | 23 |
| Degasser | P-B | | Desilter | 8 | 23 | Shaker #2 | n/a | |

| | Overflow (ppg) | Underflow (ppg) | Output (Gal/Min.) |
|---|---|---|---|
| Desander | | 0 | |
| Desilter | 8.9 | 11.3 | 0.70 |

| Product | Price | Start | Received | Used | Close | Cost |
|---|---|---|---|---|---|---|
| AMC Biocide G | $ 210.00 | 6 | | 1 | 5 | $ 210.00 |
| AMC Pac - Low | $ 148.20 | 17 | | 3 | 14 | $ 444.60 |
| AMC Pac - Reg | $ 148.20 | 6 | | 2 | 4 | $ 296.40 |
| Barytes | $ 6.30 | 290 | | 40 | 250 | $ 252.00 |
| Pot. Chloride | $ 13.80 | 261 | | 60 | 201 | $ 828.00 |
| Sodium Sulphite | $ 32.50 | 20 | | 4 | 16 | $ 130.00 |

| Solids Analysis | PPB | % |
|---|---|---|
| High Grav solids | | |
| Total LGS | 45.5 | 5.0 |
| Bentonite | 7.5 | 0.8 |
| Drilled Solids | 38.0 | 4.2 |
| Salt | | |
| n @ 22:30 Hrs | 0.51 | |
| K @ 22:30 Hrs | 1.09 | |

| Bit Hydraulics & Pressure Data | |
|---|---|
| Jet Velocity | 277 |
| Impact force | 443 |
| HHP | 124 |
| HSI | 2.2 |
| Bit Press Loss | 633 |
| CSG Seat Frac Press | |
| Equiv. Mud Wt. | |
| ECD | |
| Max Pressure @ Shoe : | |

| DAILY COST | CUMULATIVE COST |
|---|---|
| $2,161.00 | $9,521.00 |

RMN ENGINEER Neil Kyberd CITY Adelaide Office TELEPHONE 08 8338 7266

# DRILLING FLUID REPORT

RMN Drilling Fluids

| | | | |
|---|---|---|---|
| Report # | 6 | Date : | 30-Jun-2004 |
| Rig No | 2 | Spud : | 26-Jun-2004 |
| Depth | 889 to 889 | | Metres |

| | | | |
|---|---|---|---|
| OPERATOR | Essential Petroleum Recourses Ltd | CONTRACTOR | Hunt Energy |
| REPORT FOR | Vilnis Ozlins | REPORT FOR | Dave Hair |
| WELL NAME AND No | Findra # 1 | FIELD | PEP 159 |
| LOCATION | Otway Basin | STATE | Victoria |

| DRILLING ASSEMBLY | | | JET SIZE | | |
|---|---|---|---|---|---|
| BIT SIZE | TYPE | | | | |
| 8.5 | | | | | |
| DRILL PIPE SIZE 4.5 | TYPE # | Length 644 Mtrs | | | |
| DRILL PIPE SIZE 4.5 | TYPE HW | Length 55 Mtrs | | | |
| DRILL COLLAR SIZE ( " ) | | Length | | | |
| 6.25 | | 190 Mtrs | | | |

| CASING | | |
|---|---|---|
| 9 5/8" SURFACE | 492 | ft |
| SET @ | 150 | M |
| INT. | | ft |
| SET @ | | M |
| PROD. or LNR Set @ | | ft |
| | | M |
| MUD TYPE | 4%KCL PHPA Polymer | |

| MUD VOLUME (BBL) | |
|---|---|
| HOLE | PITS |
| 178 | 380 |
| TOTAL CIRCULATING VOL. | |
| 558 | |
| IN STORAGE | |

| CIRCULATION DATA | | |
|---|---|---|
| PUMP SIZE | | CIRCULATION PRESS (PSI) psi |
| 5.5 X 6 Inches | | |
| PUMP MODEL | ASSUMED EFF | BOTTOMS UP (min) min |
| Emsco DB550 | 95 % | |
| BBL/STK | STK / MIN | TOTAL CIRC. TIME (min) min |
| 0.1404 | | |
| BBL/MIN | GAL / MIN | ANN VEL. DP (ft/min) DCs |

| MUD PROPERTIES | | | |
|---|---|---|---|
| SAMPLE FROM | | Pit | Pit |
| TIME SAMPLE TAKEN | | | 21:00 |
| DEPTH (ft) - (m) | Metres | | 889 |
| FLOWLINE TEMPERATURE | $^0$C $^0$F | | |
| WEIGHT | ppg / SG | | 9.20 1.104 |
| FUNNEL VISCOSITY (sec/qt) API @ | $^0$C | | 41 |
| PLASTIC VISCOSITY cP @ | $^0$C | | 11 |
| YIELD POINT (lb/100ft$^2$) | | | 15 |
| GEL STRENGTHS (lb/100ft$^2$) 10 sec/10 min | | | 2 4 |
| FILTRATE API (cc's/30 min) | | | 7.0 |
| HPHT FILTRATE (cc's/30 min) @ | $^0$F | | |
| CAKE THICKNESS API : HPHT (32nd in) | | | 1 |
| SOLIDS CONTENT (% by Volume) | | | 5.0 |
| LIQUID CONTENT (% by Volume) OIL/WATER | | | 95.0 |
| SAND CONTENT (% by Vol.) | | | |
| METHYLENE BLUE CAPACITY (ppb equiv.) | | | 7.5 |
| pH | | | 8.8 |
| ALKALINITY MUD (Pm) | | | |
| ALKALINITY FILTRATE (Pf / Mf) | | | 0.05 0.50 |
| CHLORIDE (mg/L) | | | 19,000 |
| TOTAL HARDNESS AS CALCIUM (mg/L) | | | 40 |
| SULPHITE (mg/L) | | | |
| K+ (mg/L) | | | 21,076 |
| KCl (% by Wt.) | | | 3.9 |
| PHPA (ppb) | | | 0.4 |

| MUD PROPERTY SPECIFICATIONS | | | | | |
|---|---|---|---|---|---|
| Mud Weight | 8.8 - 9.4 | API Filtrate | 6 - 8 | HPHT Filtrate | |
| Plastic Vis | min | Yield Point | 12 - 25 | pH | 8.0 - 9.5 |
| KCl | 4% | PHPA | 1.00 ppb | Sulphites | 80 - 120 |

**OBSERVATIONS**

Monitor Hole for static losses.

**OPERATIONS SUMMARY**

Continue POOH to the shoe for wiper trip.
Pulled through tight hole from 470 to 250m
RIH and tag bridge at 505m
Circulate and wash through tight hole to 516m
RIH and tag fill at 873m, wash to bottom and circulate hole clean.
POOH to log.
Rig up and run Logging tools to bottom finding 9m of Fill.
Logging continues.

**Mud Accounting (bbls)**

| FLUID BUILT & RECEIVED | | FLUID DISPOSED | | SUMMARY | |
|---|---|---|---|---|---|
| Premix (drill water) | | Desander | | INITIAL VOLUME | 558 |
| Premix (recirc from sump) | | Desilter | | | |
| Drill Water | | Downhole | | + FLUID RECEIVED | |
| Direct Recirc Sump | | Dumped | | -FLUID LOST | |
| Other (eg Diesel) | | Other | | + FLUID IN STORAGE | |
| TOTAL RECEIVED | | TOTAL LOST | | FINAL VOLUME | 558 |

**Solids Control Equipment**

| | Type | Hrs | | Cones | Hrs | | Size | Hrs |
|---|---|---|---|---|---|---|---|---|
| Centrifuge | Nil | | Desander | 2 | | Shaker #1 | 3x84 | |
| Degasser | P-B | | Desilter | 8 | | Shaker #2 | n/a | |

| | Overflow (ppg) | Underflow (ppg) | Output (Gal/Min.) |
|---|---|---|---|
| Desander | | 0 | |
| Desilter | | 0 | |

| Product | Price | Start | Received | Used | Close | Cost |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Solids Analysis | PPB | % |
|---|---|---|
| High Grav solids | | |
| Total LGS | 45.5 | 5.0 |
| Bentonite | 7.5 | 0.8 |
| Drilled Solids | 38.0 | 4.2 |
| Salt | | |
| n @ 21:00 Hrs | 0.51 | |
| K @ 21:00 Hrs | 1.09 | |

| Bit Hydraulics & Pressure Data |
|---|
| Jet Velocity |
| Impact force |
| HHP |
| HSI |
| Bit Press Loss |
| CSG Seat Frac Press |
| Equiv. Mud Wt. |
| ECD |
| Max Pressure @ Shoe : |

| DAILY COST | CUMULATIVE COST |
|---|---|
| | $9,521.00 |

RMN ENGINEER Neil Kyberd CITY Adelaide Office TELEPHONE 08 8338 7266

# DRILLING FLUID REPORT

RMN Drilling Fluids

| | | | |
|---|---|---|---|
| Report # | 7 | Date : | 1-Jul-2004 |
| Rig No | 2 | Spud : | 26-Jun-2004 |
| Depth | 889 | to 889 | Metres |

| | | | |
|---|---|---|---|
| OPERATOR | Essential Petroleum Recourses Ltd | CONTRACTOR | Hunt Energy |
| REPORT FOR | Vilnis Ozlins | REPORT FOR | Dave Hair |
| WELL NAME AND No | Findra # 1 | FIELD | PEP 159 |
| LOCATION | Otway Basin | STATE | Victoria |

| DRILLING ASSEMBLY | | | JET SIZE | | | CASING | | | MUD VOLUME (BBL) | | CIRCULATION DATA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BIT SIZE | TYPE | | | | | 9 5/8" SURFACE | 492 | ft | HOLE | PITS | PUMP SIZE | | CIRCULATION | |
| 8.5 | | | | | | SET @ | 150 | M | 178 | 380 | 5.5 X 6 | Inches | PRESS (PSI) | psi |
| DRILL PIPE | TYPE | Length | | | | INT. | | ft | TOTAL CIRCULATING VOL. | | PUMP MODEL | ASSUMED EFF | BOTTOMS | |
| SIZE 4.5 | # | 644 | Mtrs | | | SET @ | | M | 558 | | Emsco DB550 | 95 % | UP (min) | min |
| DRILL PIPE | TYPE | Length | | | | PROD. or | | ft | IN STORAGE | | BBL/STK | STK / MIN | TOTAL CIRC. | |
| SIZE 4.5 | HW | 55 | Mtrs | | | LNR Set @ | | M | | | 0.1404 | | TIME (min) | min |
| DRILL COLLAR SIZE ( " ) | | Length | | | | MUD TYPE | | | | | BBL/MIN | GAL / MIN | ANN VEL. DP | |
| 6.25 | | 190 | Mtrs | | | 4%KCL PHPA Polymer | | | | | | | (ft/min) DCs | |

| MUD PROPERTIES | | | |
|---|---|---|---|
| SAMPLE FROM | | Pit | Pit |
| TIME SAMPLE TAKEN | | | 13:00 |
| DEPTH (ft) - (m) | Metres | | 889 |
| FLOWLINE TEMPERATURE | $^0$C $^0$F | | |
| WEIGHT | ppg / SG | | 9.20 1.104 |
| FUNNEL VISCOSITY (sec/qt) API @ | $^0$C | | 41 |
| PLASTIC VISCOSITY cP @ | $^0$C | | 11 |
| YIELD POINT (lb/100ft$^2$) | | | 15 |
| GEL STRENGTHS (lb/100ft$^2$) 10 sec/10 min | | | 2 4 |
| FILTRATE API (cc's/30 min) | | | 7.0 |
| HPHT FILTRATE (cc's/30 min) @ | $^0$F | | |
| CAKE THICKNESS API : HPHT (32nd in) | | | 1 |
| SOLIDS CONTENT (% by Volume) | | | 5.0 |
| LIQUID CONTENT (% by Volume) OIL/WATER | | | 95.0 |
| SAND CONTENT (% by Vol.) | | | |
| METHYLENE BLUE CAPACITY (ppb equiv.) | | | 7.5 |
| pH | | | 8.8 |
| ALKALINITY MUD (Pm) | | | |
| ALKALINITY FILTRATE (Pf / Mf) | | | 0.05 0.50 |
| CHLORIDE (mg/L) | | | 19,000 |
| TOTAL HARDNESS AS CALCIUM (mg/L) | | | 40 |
| SULPHITE (mg/L) | | | |
| K+ (mg/L) | | | 21,076 |
| KCl (% by Wt.) | | | 3.9 |
| PHPA (ppb) | | | 0.4 |

| MUD PROPERTY SPECIFICATIONS | | | | | |
|---|---|---|---|---|---|
| Mud Weight | 8.8 - 9.4 | API Filtrate | 6 - 8 | HPHT Filtrate | |
| Plastic Vis | min | Yield Point | 12 - 25 | pH | 8.0 - 9.5 |
| KCl | 4% | PHPA | 1.00 ppb | Sulphites | 80 - 120 |

**OBSERVATIONS**

Pac- R written off damaged during loading.

**OPERATIONS SUMMARY**

Continue logging without hole problems

RIH open ended to set plugs as per P & A program

**Mud Accounting (bbls)**

| FLUID BUILT & RECEIVED | | FLUID DISPOSED | | SUMMARY | |
|---|---|---|---|---|---|
| Premix (drill water) | | Desander | | INITIAL VOLUME | 558 |
| Premix (recirc from sump) | | Desilter | | | |
| Drill Water | | Downhole | | + FLUID RECEIVED | |
| Direct Recirc Sump | | Dumped | | -FLUID LOST | |
| Other (eg Diesel) | | Other | | + FLUID IN STORAGE | |
| TOTAL RECEIVED | | TOTAL LOST | | FINAL VOLUME | 558 |

**Solids Control Equipment**

| | Type | Hrs | | Cones | Hrs | | Size | Hrs |
|---|---|---|---|---|---|---|---|---|
| Centrifuge | Nil | | Desander | 2 | | Shaker #1 | 3x84 | |
| Degasser | P-B | | Desilter | 8 | | Shaker #2 | n/a | |

| | Overflow (ppg) | Underflow (ppg) | Output (Gal/Min.) |
|---|---|---|---|
| Desander | | 0 | |
| Desilter | | 0 | |

| Product | Price | Start | Received | Used | Close | Cost |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Solids Analysis | PPB | % |
|---|---|---|
| High Grav solids | | |
| Total LGS | 45.5 | 5.0 |
| Bentonite | 7.5 | 0.8 |
| Drilled Solids | 38.0 | 4.2 |
| Salt | | |
| n @ 13:00 Hrs | 0.51 | |
| K @ 13:00 Hrs | 1.09 | |

| Bit Hydraulics & Pressure Data |
|---|
| Jet Velocity |
| Impact force |
| HHP |
| HSI |
| Bit Press Loss |
| CSG Seat Frac Press |
| Equiv. Mud Wt. |
| ECD |
| Max Pressure @ Shoe : |

| DAILY COST | CUMULATIVE COST |
|---|---|
| | $9,817.40 |

| RMN ENGINEER | Neil Kyberd | CITY | Adelaide Office | TELEPHONE | 08 8338 7266 |
|---|---|---|---|---|---|

# Appendix 5: Cuttings Description

Essential Petroleum Resources Limited

# Findra 1

| Depth m | | SAMPLE DESCRIPTIONS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| From | To | Sst | Slt | Clayst | Lst | Marl | Co | Vis Por | Description and shows: |
| 4 | 20 | | | | | | | | Basalt |
| 20 | 27 | | | | | | | | mottled red and yellow clay |
| 27 | 62 | | | | | | | | LIMESTONE: off white to yellow calcarenite |
| 62 | 90 | | | | 100 | | | | CALCARENITE: off white to light grey and light brown, fine to coarse grained, firm friable to occasionally hard. |
| 90 | 144 | | | | 100 | | | | CALCARENITE: as above becoming finer grained grading to 50% CALCISILTITE: light grey, calcareous-sandy micrite, abundantly fossiliferous with fragments of shells, byrozoans, forams and rare shark teeth. |
| 144 | 150 | | | | 90 | 10 | | | CALCISILTITE as above grading to MARL: light grey, 20-40% clay. Extremely fossiliferous ? Coquina or fossil frgament lag deposit at base of Pt C lst. |
| 150 | 160 | | | | | | | | cement contamination |
| 160 | 170 | | | | 30 | 70 | | | MARL: light grey, calcareous-silty and very finely calcareous-sandy, trace fossiliferous markedly less fossil than above, grades to CALCISILTITE |
| 170 | 180 | | | | 20 | 80 | | | MARL: silty sandy, grades to CALCILSILTE: as above, minor echinoid spines. |
| 180 | 190 | | | | | 100 | | | MARL: light grey to greyish brown, sticky, soft, minor echinoid spines. |
| 190 | 200 | | | | 10 | 90 | | | MARL: as above grades to calcisiti |
| 200 | 210 | | | | 10 | 90 | | | MARL as above |
| 210 | 220 | | | | | 100 | | | MARL: light grey to greyish brown, occasionally medium greyish brown, 30-40% clay, very sticky, common echinoid fragments and forams. |
| 220 | 230 | | | | | 100 | | | |
| 230 | 240 | | | | | 100 | | | MARL as above, fine to occasionally very coarse fossil material in marl matrix. |
| 240 | 250 | | | | | 100 | | | MARL: very light grey to very light grenenish to bluish grey, very fine ley dspersed glauconite? fossiliferous as above, |
| 250 | 260 | | | | | 100 | | | MARL: as above |
| 260 | 270 | | | | | 100 | | | |
| 270 | 280 | | | | 20 | 80 | | | MARL: as above, grades to CALCISILTITE. |
| 280 | 290 | | | | 5 | 95 | | | MARL: light grey to light brownish grey, as above, grades to trace CALCARENITE, glauconitic, micritic, hard. |
| 290 | 300 | | | | 60 | 40 | | | CALCARENITE: mottled yellow to medium grey, very fine to medium grained, micritic ,microcrystalline, minor very fine quartz silt in matrix. MARL: as above |
| 300 | 310 | | | | 60 | 40 | | | CALCARENITE: as above becoming greyish orange, very densely cemented, hard aggregates, minor fossils. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 310 | 320 | | 30 | | 50 | 20 | | | CALCARENITE: as above becoming red to grey mottled, very well cemented. SANDSTONE: medium brown, silty to very fine grained, moderately sorted, subangular to subrounded, quartzose, sucrosic, firm aggregates with moderate to dense dolomitic and calcareous cement. trace loose coarse and very coarse quartz grains. |
| 320 | 330 | | | 80 | 20 | | | | CALCARENITE: as above SANDY CLAYSTONE: brown, soft, dispersive with abundant brown very fine quartz grains. |
| 330 | 340 | 80 | | 20 | | | | | SANDSTONE: clear to translucent, brown, very fine to ver coarse grained, poorly sorted, angular to subrounded, infrerred porisity, nil. |
| 340 | 350 | 70 | | 30 | | | | | SANDSTONE: as above, occasionally perfectly rounded quartz grains |
| 350 | 360 | 50 | 50 | | | | | | SILTSTONE: light grey to brownish grey, calcareous in part. SANDSTONE: as above |
| 360 | 370 | 100 | | | | | | g | SANDSTONE: as loose grains, clear to white, fine to very coarse, subangular to well rounded, clean, trace brown silty matrix, inferred porosity good, in part poor |
| 370 | 380 | 100 | | | | | | g | SANDSTONE: as above becoming cleaner |
| 380 | 390 | 40 | | 60 | | | | | SANDSTONE: as above, SILTY CLAYSTONE: dark brown, soft, dispersive, common pyrite nodules. |
| 390 | 400 | 20 | | 80 | | | | | SANDSTONE: loose grians washing out |
| 400 | 410 | 5 | 80 | 15 | | | | | SILTSTONE: greyish brown, very clayey, very finely micaceous, grades to SILTY CLAYSTONE, |
| 410 | 420 | 5 | 70 | 25 | | | | | SILTSTONE: two types, greyish brown, with mottled brick red pacthes and ?laminae, also moderate brown, grades to SILTY CLAYSTONE: very soft, amorphous. |
| 420 | 430 | 5 | | 95 | | | | | SILTY CLAYSTONE: light brown to moderate occasionally dark brown to reddish brown, very finely sandy in part, soft. SANDSTONE: as loose grains, coarse to very coarse, |
| 430 | 440 | | | 100 | | | | | SILTY CLAYSTONE: light brown to moderate brown to reddish brown, very finely sandy in part, soft. |
| 440 | 450 | | | 100 | | | | | SILTY CLAYSTONE: moderate brown, soft, amorphous, sticky, fossiliferous in part, |
| 450 | 459 | | | 100 | | | | | SILTY CLAYSTONE: moderate brown, soft, amorphous, sticky, fossiliferous in part, |
| 459 | 468 | 80 | 20 | | | | | p-g | SANDSTONE: brown, translucent as loose grains, fine to very coarse poorly sorted, subangular to subrounded, abundant silty matrix washing out, occasionally clean, inferred porosity, poor to occasionally good. no shows |
| 468 | 474 | 90 | 10 | | | | | fair | SANDSTONE: as above, predominantly very caorse grained, becoming clean, common composite quartz grains, patchy silty & pyritic matrix in part. |
| 474 | 477 | 90 | 10 | | | | | fair | SANDSTONE: grey to yellowish brown, loose grains, fine to very coarse, subangular to angular, quartzose, minor lithic and common composite quartz grains, SILTSTONE: dark grey, pyritic , hard. |
| 477 | 480 | 60 | 40 | | | | | fair | SANDSTONE: as above SILTSTONE: dark grey, firm to hard, non calcareous, finely sandy, common black glauconite grains. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 480 | 483 | 20 | 60 | 20 | | | | p | SANDSTONE: as above, dark brown silt adhering to grains, inferred porosity poor. SILTSTONE grades to GLAUCONITIC CLAYSTONE: black to very dark grey, olive black, firm to hard, non calcareous. Common fine to coasre black irregular to spherical glauconite pellets. |
| 483 | 486 | 60 | 40 | | | | | | SANDSTONE: as loose grains, grey, yellowsh grey, fine to coarse grained, SILTSTONE: dark grey, very finely sandy, firm to friable, common black glauconite grains. |
| 486 | 489 | 40 | 60 | | | | | | SANDSTONE: as loose grains, fine to coarse, silty matrix washing out. GLAUCONITIC SILTSTONE as above |
| 489 | 492 | 20 | 50 | 30 | | | | | Glauconitic CLAYSTONE: silty, abundant black glauconite grains, grades to SANDSTONE, and SILTSONE: very dark brown, firm to hard cememted aggregates in part, in part dispersive, |
| 492 | 498 | 10 | 90 | | | | | | SANDSTONE: dark brown, ?chamositic & glauconitic nodules in dark brown dispersive silty matrix, grades to SANDY SILTSTONE, very finely quartz sandy, clayey, commonly very pyritic, common dark brown to black glauconite pellets washing out. |
| 498 | 501 | 80 | 20 | | | | | p-g | SANDSTONE: as loose grains, clr to white, occasionally light grey, fine to coarse predominantly medium, moderate sorting, subangular, quartzose with trace grey lithic grains and composite quartz grains, commonly with dense pyrite cement. Inferred porosity good, poor where cemented.n/s. Grades at base of interval to SILTSTONE: sandy, speckled light to dark greyish brown, micaceous, friable, very pyritic in part and to SILTY CLAYSTONE. |
| 501 | 504 | 90 | 10 | | | | | g | SANDSTONE: as loose grains, clr to white, occasionally light grey, fine to very coarse, moderate sorting, subangular, quartzose with trace grey lithic grains and composite quartz grains, occasionally with dense pyrite cement. Inferred porosity good. Circulated sample at 504 m, no shows, no gas. |
| 504 | 507 | 95 | 5 | | | | | g | SANDSTONE: as above, trace pyrite cement, predominantly loose, trace silty matrix washing out |
| 507 | 513 | 60 | | 30 | | | | fair | SANDSTONE: as above trace pyrite cement, predominantly loose, abundant light brown argillaceous matrix washing out. SILTY CLAYSTONE: light brown to greyish brown, speckled, very finely sandy, pyritic in part, very soft. |
| 513 | 516 | 20 | | 80 | | | | | SILTY CLAYSTONE: as above |
| 516 | 522 | 20 | | 80 | | | | | SILTY CLAYSTONE: as above, soft, sticky, SANDSTONE: as loose grains washing out. |
| 522 | 531 | 30 | | 70 | | | | | SILTY CLAYSTONE: medium brown, very finely silty and sandy, soft, SANDSTONE: two types, fine to very coarse loose quartz as above, also very fine pyritic aggregates with |
| 531 | 537 | 20 | 30 | 50 | | | | | SILTY CLAYSTONE: as above, grades to SILTSTONE:, brown to reddish brown, , hard to very hard, cemented with silica. SANDSTONE: loose and pyrite cemented as above |
| 537 | 543 | 40 | 30 | 30 | | | | | as above |
| 543 | 549 | 30 | 40 | 30 | | | | | SANDSTONE: as loose grains, clear to translucent, abundant clay matrix washing out, SILTSTONE: light grey to brown, speckled, soft, grades in SILTY CLAYSTONE in part, very hard, silicified. |
| 549 | 555 | 10 | 20 | 70 | | | | | SILTY CLAYSTONE: as above |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 555 | 561 | | 20 | 80 | | | | | SILTY CLAYSTONE: medium greyish brown, as above soft, homogenous, rarely sandy, glauconitic, grades to SILTSONE: |
| 561 | 567 | | 20 | 80 | | | | | SILTSTONE: light brown, sandy, trace glauconite, in part very hard, silicified, grades to SILTY CLAYSTONE: soft, as above, finely sandy |
| 567 | 573 | 40 | 60 | | | | | p | SANDSTONE: as loose grains, clear, very fine to fine grained, well sorted, quartzose, silty matrix washing out. SILTSTONE: light brownish grey, very finely sandy, very soft, dispersive, |
| 573 | 579 | 30 | 70 | | | | | | as above, occasional fine grained well cememted sandstone aggregates, trace fine black glauconite grains washing out |
| 579 | 585 | 70 | 30 | | | | | n | SANDSTONE: two types, 1. loose clear quartz as above, 20% of sample. 2. mottled grey, brown, speckled greenish grey, very fine grained, sucrosic, well cemented aggregates, hard, nil visual porosity. SILTSTONE: light gryeish brown very finely sandy, dispersive. |
| 585 | 591 | 10 | 90 | | | | | n | SILTSTONE as above becoming very finely sandy grades to silty sandstone, |
| 591 | 597 | 40 | 60 | | | | | | SANDSTONE: two types as above, |
| 597 | 603 | 10 | | 90 | | | | | SILTY CLAYSTONE: medium brown, very silty, very finely sandy, soft, sticky, trace forams, |
| 603 | 609 | | | 100 | | | | | SILTY CLAYSTONE: medium to dark brownish grey, soft sticky, trace fossil fragments, common pyrite nodules. |
| 609 | 615 | | | 100 | | | | | SILTY CLAYSTONE: as above, minor shelly fossils, occasional very coarse quartz grain as discrete inclusion in claystone. |
| 615 | 621 | 5 | | 95 | | | | | SILTY CLAYSTONE: greyish brown speckled green and black, finely glauconitic. Trace fine sand washing out. no shows |
| 621 | 627 | 5 | | 95 | | | | | SILTY CLAYSTONE: greyish brown to greenish grey, glauconitic, trace fine quartz sand washing out. |
| 627 | 633 | 80 | | 20 | | | | fair | CBU at 633m SANDSTONE: as loose grains, clear, green, yellow, quartz 70% glauconite 30% fine to medium grained, well sorted, angular to subrounded, clean in part, in part washing out of SILTY CLAYSTONE: greenish to yellowish grey, glauconitic as above. No shows. NB glauconite common in top of interval. |
| 633 | 639 | 70 | 30 | | | | | fair | SANDSTONE: as loose grains, clear, yellow, yellowish green. Predominantly clean loose grains, fine to medium occasionally coarse and very coarse grained, moderately sorted, angular, common composite grains. |
| 639 | 645 | 80 | 20 | | | | | t | SANDSTONE: as above, abundant glauconite, no shows, SILTSTONE: darkn grey to greenish grey, glauconitic, pyritic, |
| 645 | 648 | 70 | 30 | | | | | n | Glauconitic SANDSTONE: black, quartz 50% glauconite 50%,very fine to coarse grained in silty glauconitic/chamositic matrix, hard. Grades to GLAUCONITIC SILTSTONE: firm to hard, |
| 648 | 651 | 70 | 30 | | | | | | GLAUCONITE SANDSTONE: olive black greensand, quartz 10%, black glauconite pellets in black, silty/glauconitic matrix, firm to friable occasionally very hard. |
| 651 | 657 | 10 | 70 | | | | | | SANDSTONE: as above, SANDY SILTSTONE: medium greyish brown, soft, very finely sandy, |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 657 | 663 | 20 | 40 | 40 | | | | | SANDY SILTSTONE: medium greyish brown, trace yellow mineral fluorescence, no cut, SANDSTONE: loose, quartz and glauconite as above washing out of claystone? , trace pyrite nodules. |
| 663 | 669 | 50 | 40 | 10 | | | | n | SANDSTONE: pale grey to greyish brown, very fine grained, silty, poorly sorted, micaceous, as loose grains and silty aggregates, trace glauconite, common coarse pyrite nodules, grades to SANDY SILTSTONE and SILTY CLAYSTONE: very light grey, massive, |
| 669 | 675 | | | | | | | | |
| 675 | 681 | 70 | | | | | | | SANDSTONE: light grey, light green,very fine to fine grained, silty, poorly sorted trace carbonaceous specks, trace red lithic grains, SILTONE: light grey, calcareous, firm to hard, blocky. |
| 681 | 687 | 90 | | 10 | | | | t | SANDSTONE: as above, very fine to fine grained, silty in part, in part moderately well sorted, grey and green lithic grains becoming abundant. no shows SILTY CLAYSTONE:, off-white to very light grey, to greyish brown, occasionally red mottled,Iron stained, minor pyrite nodules. |
| 687 | 693 | 80 | | 20 | | | | t | SANDSTONE: as loose grains, clear, white, black, green, biotite, grades to SANDY CLAYSTONE> off white, sticky. |
| 693 | 699 | 90 | | 10 | | | | t | SANDSTONE: greenish grey as above, friable silica cement, abundant cherty and consolidated siltstone lithic grains, trace brick-red lithic grains. SILTY CLAYSTONE: as above |
| 699 | 702 | 80 | | 20 | | | | t | SANDSTONE: greyish greenish brown, predominantly loose grains, fine to coarse predominantly medium grained, angular to subangular, SANDY CLAYSTONE: as above |
| 702 | 708 | 100 | | | | | | t | SANDSTONE: as above abundant black, grey, green, white, rare red, silty and cherty lithics, trace mica, slight calcareous cement and silica cement.trace BROWN COAL. |
| 708 | 714 | 10 | | 90 | | | | | SILTY CLAYSTONE: very light brownish grey, predominantly homogenous, occasionally with trace irregular carbonaceous material, soft to firm, trace fine pyrite, |
| 714 | 723 | 100 | | | | | | | SANDSTONE: greenish grey, loose abundant multicoloured lithic grains as above |
| 723 | 732 | 10 | | 90 | | | | | SANDY CLAYSTONE: very light brown, speckled, very fine quartz and lithic grains, blocky, soft, trace carbonaceous material. |
| 732 | 741 | 10 | 40 | 50 | | | | | SANDY CLAYSTONE: very light grey to very light brown, off-white, rarely very pale bluish grey, very silty grades to thinly laminated SILTSTONE. |
| 741 | 750 | | 50 | 50 | | | | | as above |
| 750 | 759 | | 20 | 80 | | | | | SILTY CLAYSTONE: very light grey, very light brown, occasionally medium brown, dark grey, very soft, rarely pale bluish grey, predomianntly homogenous, very finely sandy in part. Trace pyrite |
| 759 | 768 | | 20 | 80 | | | | | laminated SILTY CLAYSTONE as above, soft, very finle sandy in part |
| 768 | 777 | 100 | | | | | | t | Quartz lithic-arenite, grey, greenish grey, abundant lithic grains as above, fine clay matrix washing out |
| 777 | 786 | 100 | | | | | | t | Quartz lithic-arenite, grey, greenish grey, abundant lithic grains as above, lithics 70% lithics 30% |
| 786 | 795 | 70 | | 30 | | | | n | arenite as above inerlaminated with SANDY CALYSTONE as above |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 795 | 804 | 100 | | | | | | | quartz lithic arenite as above, light grey clay, matrix washing out, trace biotite. |
| 804 | 813 | 100 | | | | | | | SANDSTONE: as above |
| 813 | 822 | 90 | 10 | | | | | | SANDSTONE: as above becoming argillaceous, grey and multicoloured lithic grains. |
| 822 | 831 | 10 | | 90 | | | | | SANDY CLAYSTONE: light brown, very finely sandy, occasionally fine and medium sand. Lithic grains washing out. |
| 831 | 849 | | | 100 | | | | | SANDY CLAYSTONE: grades to CLAYSTONE: light brown, light grey, occasionally darker colurs, trace pyrite nodules. Sandy/carbonaceous laminations. |
| 849 | 858 | 30 | 20 | 50 | | | | | SANDSTONE: grey, brown, very fine grained to fine grained, poorly soretd, predominantly firm calcareous aggregates with carbonaceous/micaceous laminae, grades to snady SILTSTONE and CLAYSTONE: a/a |
| 858 | 867 | 10 | 50 | 40 | | | | | |
| 867 | 876 | | 40 | 60 | | | | | |
| 876 | 885 | | 30 | 70 | | | | | |
| 885 | 889 | | 30 | 70 | | | | | laminated silt and clay as above |
| 889 | | | | | | | | | TD |

Appendix 6: Petrophysical Report

# Findra-1 Petrophysical Analysis


**Summary**

The purpose of this study was to examine the reservoir characteristics of the sands encountered in the Findra-1. The wireline logs were quantitatively interpreted over the interval 290m to 850m to determine shale volume, porosity and water saturation.

Findra-1 was spudded on 26th June, 2004, by Essential Petroleum Pty Ltd and drilled to a total depth of 879m. No fluorescence associated with sands was recorded throughout the reservoir section and no significant gas shows were recorded. The well was plugged and abandoned as a dry well on 2nd July, 2004.

The Dilwyn Formation (332-416m) consisted of excellent quality reservoir sandstones interbedded with shale. The sands are described as clean, very fine to very coarse grained and quartzose. A total of 29.1m of net sand is interpreted over the gross interval 338.5-386.5m with an average porosity of 28.2%. There were no visual or significant gas shows observed during drilling and the high resistivity of 18 ohmm over this interval is indicative of fresh water. The sands are interpreted to be entirely water saturated.

The interval 469-482m, within the Pebble Point Formation is interpreted to consist of good quality reservoir sands interbedded with shales. A total of 8.2m of net reservoir sand is interpreted over the gross interval 469.0-482.0m with an average porosity 18.8%. There were no visual or gas shows observed during drilling and the interval is interpreted to be entirely water saturated. Resistivities are slightly lower (approximately 10 ohmm) which correspond to the slightly more saline formation waters as indicated by the SP response (+20mV)

The Paarrate Formation (498-565m) is interpreted to consist of good reservoir quality sandstones over the interval 500.0-513.5m. A total of 8.8m of net reservoir sand is interpreted with an average porosity of 30.3%. The entire Paarrate Formation is interpreted to be water saturated.

The Flaxman Formation (615-647m) consists of interbedded glauconitic sandstone and siltstone. The PEF varies between 2.5 and 3.8 reflecting the strong presence of glauconite. The sands are described as fine to medium grained with poor visual porosity. A total of 9.3m of net reservoir sand is interpreted over the interval 630.0-640.0m with an average porosity of 24.5% and is interpreted to be entirely water saturated. Resistivities have reduced further to 2-3ohmm over this interval, indicating an increase in formation water salinity.



**Anne Locke**

**Consultant Petrophysicist**


**September 2004**

**Introduction**

A request was made by Essential Energy Resources Ltd to determine the porosity and water saturation of the sands encountered in the Findra-1 well. The wireline logs were analysed for these properties over the interval 290-850m.

Findra-1, operated by Essential Energy Resources Ltd, was spudded on 26th June 2004. It was drilled vertically to a total depth of 879m and plugged and abandoned. The interpreted section was drilled with an 8-1/2" bit and a KCl-polymer-PHPA mud system. A maximum bottom hole temperature of 48°C at 879m was measured during the final logging operations

The well did not encounter any significant hydrocarbon shows while drilling.

**Available Data**

The digital data-set was provided in LAS format by Essential Petroleum Resources. Both sonic and neutron/density logs were provided for the porosity determination. A list of the wireline logs run in the well is given as **Table 1**.

No conventional cores were cut in the Findra-1 well.

**Hole Conditions**

Hole conditions through the interpreted interval are good with mudcake buildup across permeable sands.

**Interpretation Model**

Based on the description of well cuttings, it has been assumed that the section of interest consists of quartzose sandstone with glauconite and shale. The volume of shale was calculated using the gamma ray log. A comparison was made with the shale volume determined from the neutron/density logs to confirm the consistency of the measurements.

Porosity was primarily calculated from the neutron-density logs. The Raymer-Hunt-Gardner equation was used to calculate porosity from the sonic log and used in zones with bad hole conditions.

Water saturation, Sw, was calculated using the Juhasz equation.

**Input Parameters**

A summary of the parameters used for this interpretation is given in **Table 2**. In the absence of special core analysis data a cementation exponent, m, of 2.00 was assumed with the coefficient, a, set to 1.00. A saturation exponent, n, of 2.00 was also used to calculate water saturation.

**Water Salinity**

The formation water salinity is extremely fresh as shown by the large positive SP deflection of +30mV. A Pickett Plot over the interval 332-416m (**Figure 1**) indicates an Rw of 1.75 ohmm at 26°C, which equates to a formation water salinity of 3,000 ppm NaCl equivalent.

The formation water salinity becomes more saline with depth as evidenced by a reduction of the positive SP deflection to +25mV. **Figure 2** is a Pickett plot within the Paarrate Formation (500-515m) and indicates an Rw of 0.55 ohmm at 33°C. This equates to a formation water salinity of 9,000 ppm NaCl equivalent.

**Figure 3** is a Pickett plot within the Flaxman Formation and indicates an Rw of 0.290 ohmm at 38°C. This equates to a formation water salinity of 16,000 ppm NaCl equivalent. The further increase in formation water salinity is reflected by the +18mV SP deflection.

**Reservoir Determination**

For the purposes of this study a porosity cutoff of 10% and a Vsh cutoff of 40% were used to determine net reservoir. A summary of the results is given as **Table 3**. Permeability information would be needed to further refine appropriate cutoffs.

*Anne Locke*
*Consultant Petrophysicist*

*September, 2004*

**Discussion of Interpretation Results**

The purpose of this study is to interpret the porosity and saturation of sands in the Findra-1 well over the interval 290-850m. The primary objective of the well was sands within the Flaxman Formation intersected at 631m.

The Dilwyn Formation (332-416m) consisted of excellent quality reservoir sandstones interbedded with shale. The sands are described as clean, very fine to very coarse grained and quartzose. A total of 29.1m of net sand is interpreted over the gross interval 338.5-386.5m, with an average porosity of 28.2%. There were no visual or significant gas shows observed during drilling and the high resistivity of 18 ohmm over the interval is indicative of fresh water. The sands are interpreted to be entirely water saturated.

The interval 469-482m, within the Pebble Point Formation, is interpreted to consist of good quality reservoir sands interbedded with shales. A total of 8.2m of net reservoir sand is interpreted over the gross interval 469.0-482.0m, with an average porosity of 18.8%. There were no visual or gas shows observed during drilling and the interval is interpreted to be entirely water saturated.

The Paarrate Formation (498-565m) is interpreted to consist of good reservoir quality sandstones over the interval 500.0-513.5m. Below 513.5m the section becomes more shaly with only thin, tight sands present. A total of 8.8m of net reservoir sand is interpreted over the gross interval 500.0-513.5m, with an average porosity of 30.3%. The entire Paarrate Formation is interpreted to be water saturated.

The Skull Creek Mudstone (565-580m) consists essentially of shale with some minor interbeds of thin sands. A total of 2.9m of net sand is interpreted over the interval 569.5-579.0m with an average porosity of 21.3%. The sand has a high clay content with an average of 31.4%.

The Nullawarre Greensand (580-598m) consists of a tight argillaceous glauconitic siltstone, which grades to claystone. No visual porosity was described in the cuttings.

The Flaxman Formation (615-647m) consists of interbedded glauconitic sandstone and siltstone. The PEF varies between 2.5 and 3.8 reflecting the strong presence of glauconite. The sands are described as fine to medium grained with poor visual porosity. A total of 9.3m of net reservoir sand is interpreted over the interval 630-640m with an average porosity of 24.5% and is interpreted to be entirely water saturated.

The Waare (A) Formation (666-744m) consists of interbedded claystone and argillaceous sandstone. The sands are described as medium grained with abundant lithic fragments and traces of pyrite and mica. The neutron and density logs indicate that the sands are argillaceous.

The Eumeralla Formation was intersected over the interval 744m-TD and consists of a quartz litharenite. The section is described as fine to medium grained, clear to translucent, light green, greenish grey and orange, with a very pale grey silty matrix. The neutron/density log indicates an argillaceous sandstone, with very poor reservoir characteristics.

**Table 1 : Wireline Logs Run (Schlumberger)**

| Date | Hole Size (inches) | Interval (mRT) | Logs Run | Comments |
|---|---|---|---|---|
| 30/6/04 | 8-½ | 876.7 - 150.0 | HALS/BHC/PEX/HNG | Run OK<br>GR to surface |
| n/a | n/a | n/a | MDT/GR | n/a |

**Table 2 : Input Parameters**

| Interval (mRT) | 290-465 | 465-498 | 498-615 | 615-744 | 744-850 |
|---|---|---|---|---|---|
| **GRmin (api)** | 20 | 25 | 25 | 30 | 30 |
| **GTmax (api)** | 90 | 130 | 130 | 120 | 120 |
| **DTsh (usec/ft)** | 145 | 145 | 145 | 140 | 145 |
| **DTma (usec/ft)** | 55.5 | 55.5 | 55.5 | 55.5 | 55.5 |
| **RHOsh (g/cc)** | 2.00 | 2.15 | 2.15 | 2.10 | 2.15 |
| **NPHIsh (lst)** | 0.53 | 0.51 | 0.51 | 0.55 | 0.55 |
| **Rsh (ohmm)** | 8 | 7 | 3 | 3 | 1.5 |

**Table 3 : Reservoir Summary**

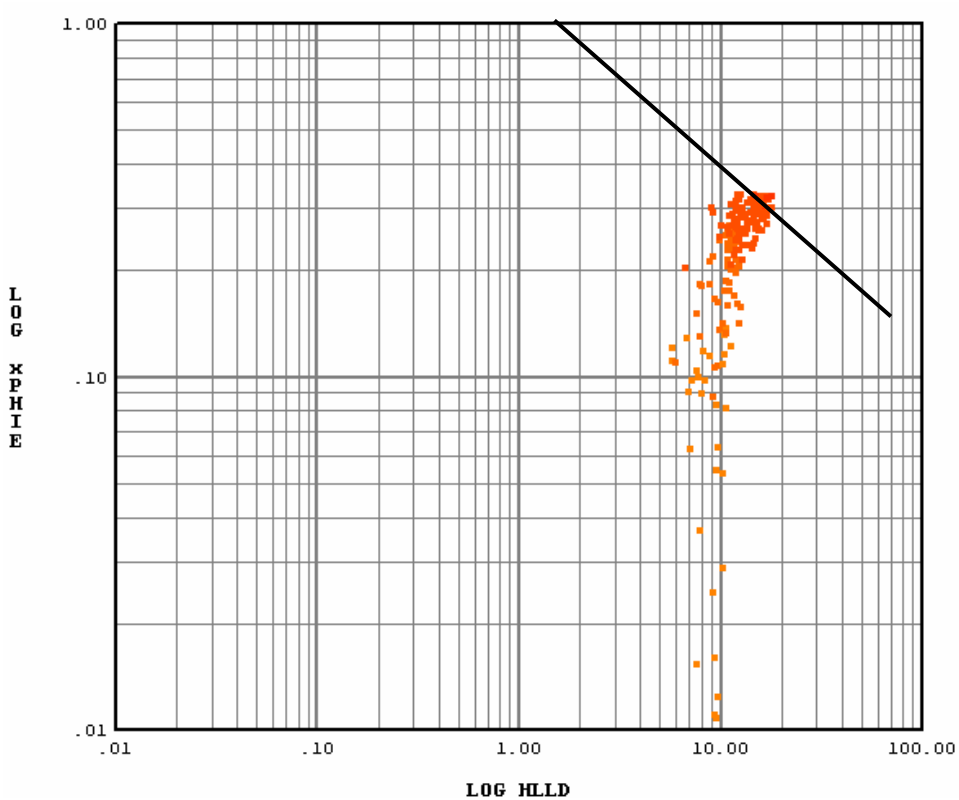
| Formation | Gross Interval (mRT) | Net Thickness (m) | Average Porosity (%) | Average Vsh (%) | Average Sw (%) |
|---|---|---|---|---|---|
| Dilwyn | 338.5 - 386.5 | 29.1 | 28.2 | 14.0 | 98.6 |
| Pebble Point | 469.0 - 482.0 | 8.2 | 18.8 | 33.6 | 99.3 |
| Paarrate | 500.0 - 513.5 | 8.8 | 30.3 | 14.3 | 95.9 |
| Skull Creek | 569.5 - 579.0 | 2.9 | 21.3 | 31.4 | 99.5 |
| Nullawarre Greensand | 585.0 - 592.0 | 0.3 | 21.2 | 36.5 | 100.0 |
| Flaxman | 630.0 - 640.0 | 9.3 | 24.5 | 19.0 | 98.0 |
| Eumeralla | 780.5 - 786.5 | 0.8 | 15.2 | 37.8 | 97.2 |

Note: Cutoffs used: Vsh <= 40% and Porosity >=10%.

## Figure 1 : Pickett Plot 338-385m

**Rw = 1.750 ohmm at 26ºC**

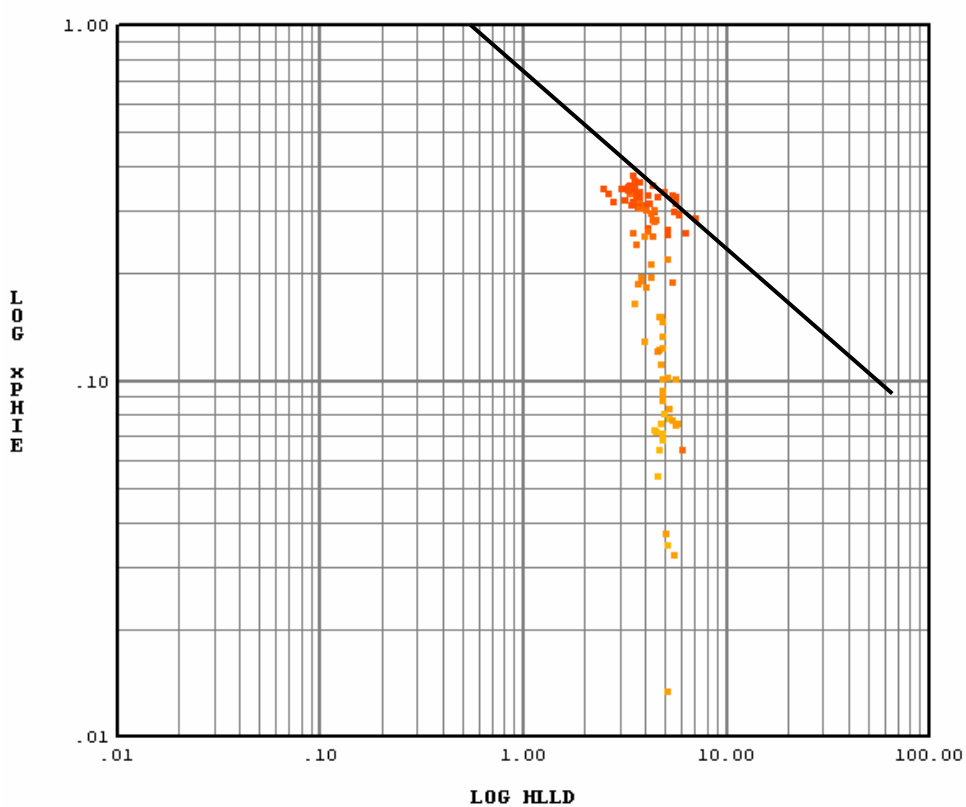
**m = 2.00**



## Figure 2 : Pickett Plot 500-515m

**Rw = 0.550 ohmm at 33ºC**

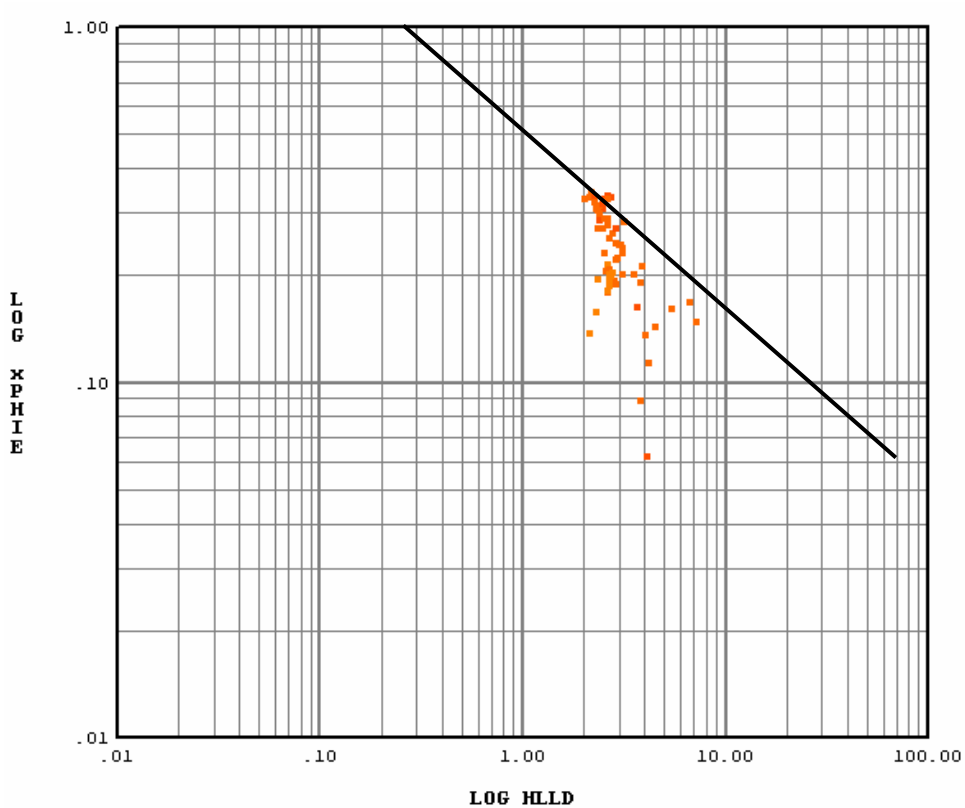
**m = 2.00**



## Figure 3 : Pickett Plot 630-640m

**Rw = 0.290 ohmm at 33ºC**

**m = 2.00**



Enclosure 1 Mudlog

Enclosure 2 Composite Log

Enclosure 3 Wireline Logs