

## **Drilling Summary:**

Buttress-1 was spudded on the 8/01/02 and a 250.825mm surface hole was drilled to 383 meters (Drlr). 193.675mm surface casing was run and cemented from surface to 378 meters. A 171.45 mm main hole was then drilled to a Total Depth of 1732 meters which was reached on 17/01/02. Buttress-1 was cased and suspended with 88.9mm 13Cr95 casing. The well was subsequently found (from analysis of gas recovered from the wireline pressure testing tool) to contain significant amounts (approximately 85%) of carbon dioxide.

## **Lost Time:**

The Total Lost time for Buttress-1 was 24 hours.

### **TROUBLE TIME**

4.5 hrs Treat losses of up to 160 bbl/hr. Spot 2 x 30 bbl LCM pills. Control pump rate.

1.5 hrs Loose circulation during top up cement job (cement losses). Cut window in conductor and top up manually.

2.5 hrs Pressure testing. Blown kookey line, replace and service lines. Leaking HCR valve serviced.

11.5 hrs Rig repair - leaking valves on choke manifold.

0.5 hrs Drawworks clutch rig repair.

1.0 hr Misruns on surveys.

0.5 hr Ream 767-790m.

2.0 hrs Logging - repair voltage problem inside unit.

## **Water Supply:**

Water was supplied from a waterbore on location. Additionally, water was hauled for the Mains supply some 3 km from the rig.

## **Mudlogging:**

Geoservices (Australia) provided Mudlogging services. Samples were collected, washed and described at 10m intervals from 1000m to surface and at 3m intervals from 1000m to TD at 1730m RT. Through the objective sections, samples were collected at specific intervals depending on the drilling rate. Samples were checked for oil fluorescence under ultraviolet light. Total gas and composition was recorded from surface to total depth using flame ionisation detectors.

One unit of total gas is equal to 200 ppm of methane equivalent in air. One percent of total gas is equal to 50 units. Gas composition in the range C1 through to C4 (methane, ethane, propane, normal and iso-butane) was determined by a FID chromatograph. In addition, rate of penetration, pump strokes, pit levels, rotary torque and weight on bit were recorded for the duration of drilling. Carbon Dioxide was monitored with an infra red CO<sub>2</sub> detector. The mudlog is attached as Enclosure 1.

## **Electric Logging**

Reeves provided the electric logging services for Buttress-1. The electric logging consisted of two logging runs. Run #1 comprised GR-SONIC(LCS)-RESISTIVITY(DLL)-MICRORESISTIVITY(MLL)-CAL-DENSITY(PDL)-NEUTRON(CNL) with Full Waveform up to 30m above the top Flaxman Formation. The maximum recorded temperature on this run was 66°C @ 1700 m.

Run #2 comprised a Pressure Survey (GR-RFS) over 20 sample points in the Waarre sandstone. Most sample points gave good drawdown and buildup pressures with the exception of two sample points which curtailed. A formation sample was taken (in a segregated chamber) at 1619.1m RT.

## **Hole Deviation**

Buttress-1 was essentially drilled as a vertical well with deviation constraints being set to within 25m radius of correct surface location with a preferred direction of north-east. Deviation was monitored during drilling with single shot surveys every 150 meters or as required. The maximum deviation measured in this well was 2.12° at an azimuth of 021 degrees. The TVD at 1711m was 1710m with a maximum calculated offset from vertical of 9.9m.

## **Results of Drilling:**

Buttress-1 was drilled as an Otway Basin near field gas exploration well in the PEP 154. Buttress-1 was essentially drilled as a vertical well to a Total Depth of 1732 meters (Drlr), which was 30 meters deeper than proposed Total Depth. All the formations, including the primary objective, came in from 11 meters to 101 meters low to prognosis. The exception was the Skull Creek mudstone and the Belfast mudstone which came in 62 meters and 17meters high to prognosis respectively.

Significant gas shows were penetrated in the Waarre C and Warre A units. No oil shows were penetrated.

## **Geothermal Gradient:**

An estimated static bottom hole temperature of 68.4° C at 1732 meters, and a geothermal gradient of 2.73° C/100m was calculated from bottom hole temperatures recorded during logging runs 1 and 2.

## **Status:**

Buttress-1 was cased and suspended as a future CO<sub>2</sub> producer.

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