



# **ANNUAL REPORT**

**GEL 128, 129, 161, 162, 163, 206  
& 213**

**2 June 2006 to 1 June 2007**

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## **Olympic Dam Geothermal Project**

**GEL 128, 129, 161, 162, 163, 206, 213**

**2 June 2006 to 1 June 2007**

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## **1. INTRODUCTION**

### **1.1 Background**

Exploration for geothermal energy stored in buried hot rocks in the licences was focussed near the Olympic Dam mine and existing high voltage power line.

### **1.2 Period**

Exploration Licences GEL 128 (308 km<sup>2</sup>), 129 (408 km<sup>2</sup>), 161 (496 km<sup>2</sup>), 162 (488 km<sup>2</sup>), 163 (497 km<sup>2</sup>), were granted on 2 June 2004, GEL 206 (494 km<sup>2</sup>) and GEL 213 (206 km<sup>2</sup>) on 21 April 2005 and 22 September 2005 respectively for an initial term for each of 5 years.

This report covers the activities in respect of GEL 128, 129, 161, 162 and 163 for Year 3, GEL 206 for year 2 and GEL 213 for year 1 being the period from 2 June 2006 to 1 June 2007.

### **1.2 Licence Data**

There was no change in the area of the licences during the year.

### **1.3 Licencee**

GEL 128, GEL 129, GEL 161, GEL 162, GEL 163 and GEL 206 are held in equal shares by Green Rock Geothermal Pty Ltd and Green Heat Resources Pty Ltd respectively. Both companies are wholly owned subsidiaries of Green Rock Energy Limited. GEL 213 is held solely by Green Rock Energy Limited.

There was no change in working interests for any of the licences during the period.

## **2. WORK REQUIREMENTS**

A variation to the work program conditions for GEL 128, 129, 161, 162, 163, 206 and 213 to provide a floating work program over common licence years was requested. The request was approved and entered on the public register on 30 May 2007.

As a result the exploratory operations required to be conducted in GEL 128, GEL 129, GEL 161, GEL 162, GEL 163 and GEL 206 are:

Year	Minimum Work Requirements	Estimated Cost \$
1	Review existing geological data & assessment of the technical application of HDR technology Evaluation of electric power market and preliminary economic assessment of the technology	\$25,000
2	Drill Blanche No 1 stratigraphic well (1,500 -2,000m) to evaluate temperatures, stress regimes & rock characteristics at depth.	\$1,500,000
3	Borehole breakout analysis of Blanche No 1 well to ascertain direction and magnitude of principal horizontal stresses. Geological and geophysical studies <i>Year 3 program to be conducted anywhere within the boundaries of GELs 128, 129, 161, 162, 163, 206 and 213.</i>	\$50,000
4	Mini-hydro fracture stimulation in Blanche No 1 Geological and geophysical studies <i>Year 4 program to be conducted anywhere within the boundaries of GELs 128, 129, 161, 162, 163, 206 and 213.</i>	\$400,000
5	Drill a deep well (4,500 to 6,000 metres) Fracture stimulation Microseismic monitoring <i>Year 5 program to be conducted anywhere within the boundaries of GELs 128, 129, 161, 162, 163, 206 and 213.</i>	\$5,000,000

### 3. WORK CONDUCTED

As a result of the approved variations to the work program for GELs 128, 129, 161, 162, 163, 206 and 213 the following work conducted during the year fulfilled the minimum Work Requirements for those GELs for the year ended 1 June 2007:

#### 3.1 Data & Technical Reviews

##### a. Water Requirements

Further discussions were held with BHP Billiton concerning potential use of mine waste water for the deep water circulation requirements to recover heat from the hot granites to generate electricity.

##### b. Acquisition & Review of Geological, Geophysical & Thermal Data

The Company re-entered Blanche No 1 and measured the temperature and pressures in the well using its high temperature Kuster temperature tool. This temperature profile was virtually the same as already reported in the Blanche No 1 well completion report submitted to PIRSA in the previous year.

By agreement with BHP Billiton, temperatures and pressures in two diamond drill holes (RD2773 to 1,956.1 metres & RD2785 to 2,100.4 metres) drilled by BHP Billiton in their Special Mining Lease were recorded by Green Rock Energy at Green Rock Energy's own cost and risk using its Kuster temperature tool and the results supplied to BHP Billiton. BHP Billiton supplied the drill rig and cable for this work which was supervised at Green Rock Energy's cost and risk by Southern Geoscience. This survey showed temperatures and gradients in the BHP Billiton drill holes at the depths measured which were only slightly higher than recorded in Blanche No 1.

**c. Expert Review**

The Company commissioned a review by international geothermal energy expert organisation GeothermEx of electricity generation potential of the hot granites near Blanche No 1. This work is in progress at the time of this Annual Report.

**4. YEAR'S EXPENDITURE (commercial in confidence)**

**5. WORK PROGRAM**

**5.1 CSIRO Study of Blanche No 1 Stress Regime**

In preparation for the mini-hydro fracture program to be carried out in Blanche No 1, the CSIRO carried out analysis on core and breakout analysis from well logs (acoustic televiewer). This showed a compressional stress with the maximum principal stress being East West. BHP Billiton also provided a copy to the Company of a report analysing the stress field at the Olympic Dam. The CSIRO concluded in the draft report (still awaiting final report) that, "the vertical stress being the minimum stress implies that hydraulic fracture orientation and fluid flow in a stimulated zone are most likely to be in a sub-horizontal direction. The ratio of the horizontal stresses to vertical stress is estimated to fall into the range of  $sH_{max}/sH_{min}/sV = (2.5-2.75)/(1.25-1.5)/1.0$ . This is an ideal situation for generating an optimal heat exchange reservoir that would allow a maximum distance between injection and production wells". This will be tested with the planned mini hydro fracc.

**5.2 Preparations for Mini-Hydro Fracc**

Planning and preparations for the mini hydro fracture program commenced after a contract was entered into with CSIRO to carry out the mini-frac during the next licence year.

**6. COMPLIANCE WITH PETROLEUM ACT**

**6.1 Regulated Activities**

Field activities carried out in the GELs involved re-entering Blanche No 1 to re-measure the temperature profile of the well to determine if the original temperature recordings were stabilised temperatures. This work was carried out with the Company's Kuster temperature tool using a winch and cable supplied by Sirtron. The survey was supervised by the geophysical contractor Southern Geosciences.

## **6.2 Compliance**

No instances of non-compliance were noted.

Green Rock Energy advised PIRSA that the surface seal to Blanche No 1 had been welded in place without our permission probably by BHP Billiton staff who may have mistakenly thought the well was one of their own. Green Rock Energy had to arrange for this cap to be cut off and replaced with a new one including a lock. This was done at Green Rock Energy's own expense. Green Rock Energy requested that PIRSA should advise BHP Billiton of their mistake and ask them to avoid this happening in the future.

## **6.3 Management Systems**

Green Rock Energy is committed to implementing the highest standards of corporate governance. In determining what those high standards should involve, the Company has been guided by the ASX Corporate Governance Council's Principles of Good Corporate Governance and Best Practice Recommendations. The Company has in place a detailed Health, Safety and Environment Management Plan, Occupation Health and Safety Procedures and Emergency Response Procedures to cover the activities of the Company, its contractors and visitors. No significant change was made to these procedures which were implemented in the first licence year.

## **6.4 Relevant Reports and Data**

No reports (other than statutory reports) or data have been submitted to PIRSA during the course of the year.

## **6.5 Reportable Incidents**

There were no reportable incidents.

## **6.6 Foreseeable Threats**

No threats have been identified.

Date prepared: 10 July 2007