Geothermal Resources Ltd

ABN 45 115 281 144

ANNUAL REPORT

GEOTHERMAL EXPLORATION LICENCE 222

FOR THE PERIOD

20 March 2008 to 28 June 2009

September 2009

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1. Introduction

GEL 222 was granted to Geothermal Resources Limited ('Geothermal Resources') on 20th March 2006. The licence is located in the Arrowie Basin, South Australia. This report details the work conducted during Licence Year 3 of the licence, in accordance with Regulation 33 of the Petroleum Act 2000. Year 3 is taken to run from 20th March 2008 – 28th June 2009 inclusive. The period is greater than 12 months for this reporting year owing to the fact that GEL 222 was suspended from 19th March 2009 to 27th June 2009 to enable changes to the work program and to achieve a common anniversary with adjoining GEL 280. These changes were granted on 9th December 2008.

Geothermal Resources work program commitment for the first year was a review of all open file geophysical and drilling data to obtain accurate cover depth and bedrock lithology information (Table 1). This was to be supplemented by 3D modelling to determine the location of possible buried granite bodies and measuring of geothermal gradients in any accessible drill holes.

The above work was completed, and in addition a pre-collar percussion drillhole (Frome 8) was bored to 201 metres. This effectively brought forward a part of the Year 3 shallow drilling program to Year 1 (see Table 1).

Geothermal Resources work program commitment for Year 2 included thermal modelling and determination of optimum drill site location. This work was completed and exceeded by the drilling of Frome 8 to 500m, temperature logging and thermal modelling.

Near to GELs 222 and 280 Geothermal Resources also holds existing GELs 181, 208, 209, and 210. An overall or 'grouped' exploration approach to the entire Frome GEL block has been taken.

2. Work Completed

2.1 Drilling

During the preceding year (Year 2 of the GEL) **Frome 8** (436500E 6491459N, GDA 94 co-ordinate system) was completed by diamond coring to a depth of 500m. This meant that the Year 3 requirement of completing a shallow drillhole to a depth of 500m had already been met. No further drilling was carried on GEL 222 during Year 3 pending release of Geoscience Australia's north-south 2008 Seismic Survey, which passed through the GEL. It was considered premature to drill without first carefully studying and interpreting this data.

2.2 Temperature logging

During the preceding year (Year 2 of GEL 222) downhole temperature logging of Frome 8 was carried out. In Year 3 no mineral hole was successfully temperature logged, although several attempts were made. The common problem was downhole obstruction.

3. Reporting Against Requirements of the Petroleum Act 2000

(a) Summary of regulated activities conducted under the licence during the year

No regulated activities were conducted under the licence during the year. As mentioned previously this occurred because the Year 3 regulated activities had already been met in Year 2, and the Geoscience Australia 2008 Seismic Survey data was not released (the latest release time is end September 2009).

(b) Report for the year on compliance with the Act, these regulations, the licence and any relevant statement of environmental objectives

Geothermal Resources carried out its field activities in accordance with the Cooper Basin Drilling SEO, dated November 2003. All relevant prevention and remediation measures, as listed in the SEO, were followed. Geothermal Resources is not aware of any SEO non-compliance issues.

Further, all reporting obligations were also complied with.

(c) Actions to rectify non-compliance with obligations imposed by the Act, these regulations or the licence, and to minimise the likelihood of the recurrence of any such non-compliance

No further actions deemed necessary as no non-compliance issues.

(d) A summary of any management system audits undertaken during the relevant licence year, including information on any failure or deficiency identified by the audit and any corrective action that has, or will be, taken

Management closely monitored all activities and did not detect any reportable deficiencies or incidents.

(e) List all reports and data relevant to the operation of the Act during the relevant licence year

Report	Due date	Date submitted	Statement of compliance
2007-08 Annual Report	19/05/2008	April 2008	Compliant

(f) Report of incidents reportable to the Minister under the Act and regulations

No incidents occurred and therefore none were reported.

(g) Report on any reasonably foreseeable threats that reasonably present, or may present, a hazard to facilities or activities under the licence, and a report on any corrective action that has, or will be, taken.

No threats identified.

(h) Operations proposed for the ensuing year

Geoscience Australia's 2008 Seismic Survey data and / or interpretation of the north south line in the Curnamona region will be purchased as soon as it becomes available (release date end September). This data will be assessed in combination with all other test results and modelling and a decision on whether to drill further shallow holes will be made.

4. Expenditure for Year 2

Commercial in Confidence.

TABLE 1: 'Old' Work Program for GEL 222

Year	Work Commitment	Work completed
One	Review of open file geophysical and drilling data to obtain accurate cover depth and bedrock lithology information. 3D modelling to determine subsurface geology and location of possible buried granite bodies. Measure detailed geothermal gradients in any accessible water wells and oil wells. **Estimated Budget $30,000**	Acquisition of existing gravity, aeromag, seismic and drilling data. Database compilation. 3D modelling, using Vulcan software.
Two	Thermal resource modelling and rock fracture studies. Interpretation of all data to determine optimum drill site locations. **Estimated Budget $40,000**	Temperature logging followed by thermal modelling. Optimum drill site located. Frome 8 drilled to 500m and temperature logged.
Three	3-4 shallow drill holes to an aggregate depth of at least 2000 metres to measure detailed geothermal gradients and obtain information regarding cover sequences. Re-evaluation of theoretical thermal resources and fracture / permeability models based on drilling results. **Estimated Budget $150,000**	
Four	1 deep pilot drill hole to intersect top of hot dry rock source. Measure detailed temperature gradient. Measure reservoir temperature. Analysis of reservoir properties. Analysis of reservoir fracturing. Evaluation of thermal data and fracture / permeability models. **Estimated Budget $500,000**	

Five	Drilling 1 production and 1 injection well to set up circulation cell. Measurement key parameters to determine viability of project. If positive, detailed planning for full scale exploitation. **Estimated Budget >$1,000,000**	

TABLE 2: 'New' Work Program for GEL 222

Year of Term of Licence	Minimum Work Requirements	Work Completed
One	• Review of existing geophysical data; • 3D Modelling to determine subsurface geology and location of possible granite bodies; and • Measure detailed geothermal gradients in any accessible water wells and oil wells.	
Two	• Thermal resource modelling and rock fracture studies; and • Interpretation of all data to determine optimum drill site locations.	
Three	• Review of open file geophysical and drilling data to obtain depth of cover and bedrock lithology information; • 3D modelling to determine subsurface geology and location of possible buried granite bodies; • Temperature measurements in any accessible mineral drill holes; and • Completion of 1 shallow drill hole to a depth of 500m. *Year 3 work program to be conducted anywhere within the boundaries of GELs 222 and 280.*	• Open file data reviewed • 3-D modelling of subsurface geology completed (without new seismic data) • Further temperature logging unsuccessful (old wells blocked) • Frome 8 completed to 500m in previous year.

Four	• Assessment of test results and decision on whether to drill further shallow holes. *Year 4 work to be conducted anywhere within the boundaries of GELs 222 and 280.*	
Five	• Assessment of test results and decisions on whether to drill 1 deep pilot hole to 1800m depth; and • Temperature logging. *Year 5 work program to be conducted anywhere within the boundaries of GELs 222 and 280.*	

Figure 1. Frome 8, GEL Boundaries and Pastoral Leases