



**GEOTHERMAL
RESOURCES**

Geothermal Resources Ltd

ABN 45 115 281 144

ANNUAL REPORT

**GEOHERMAL EXPLORATION LICENCES
214, 215, 216 and 217**

FOR THE PERIOD

11 July 2007 to 10 July 2008

August 2008

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1. Introduction

GELs 214-217 were granted to Geothermal Resources Limited on 11 July 2006. The licences are granted in the Otway Basin, South Australia. This report details the work conducted during Licence Year 2 of the licences (11 July 2007 – 10 July 2008 inclusive), in accordance with Regulation 33 of the Petroleum Act 2000.

A floating work program has been accepted by PIRSA for the entire GEL block.

In the first year of tenure a data review was undertaken. This work confirmed the original geological concept of buried granite bodies being progressively buried under the northern margin of the Otway Basin (Figure 1). Temperature gradient modelling, based on the work of Beardsmore and Matthews (2007), indicated a particularly high geothermal gradient in the region of Crower – comparable to the high gradients in the Cooper Basin.

This is the second year of tenure and the minimum work commitment was to carry out thermal resource modelling, further data interpretation, and selection of possible drill sites, which has been achieved.

2. Work Completed

In accordance with the proposed work program in Table 1, Geothermal Resources has updated its GIS data base by purchasing from PIRSA all available seismic data for the Otway basin, along with all open file well completion reports. PIRSA's assistance in this regard is gratefully acknowledged.

Seismic coverage of the Gels is extensive (Figure 2) and seismic data interpretations, combined with gravity and aeromagnetic modelling is helping to select zones that fit key requirements of the model, in particular, where the depth of cover lies in the optimal 3-4 km depth range (Figure 3). This in turn has assisted with the siting of the planned first round drillholes to a nominal depth of 500 metres.

The well completion reports have also proven useful in accurately fixing the depths of Tertiary aquifers that are likely to affect shallow temperature data (500 metres or less). The initial 500m drillholes will aim to go beyond the deepest Tertiary aquifers in the Dilwyn Formation and penetrate into the underlying Cretaceous sediments as far as possible in order to achieve reliable bottom of hole temperature measurements that are truly representative of the geothermal gradient in the region.

Drilling through these aquifers requires considerable expertise. The consequences of having drilling problems are serious cost blow outs and unsuccessful holes, as has been the experience of other geothermal explorers in the region. Some considerable effort and time has therefore been expended in selecting the best drilling contractor for the job and in formulating a suitable casing approach for the 500 metre holes.

In parallel, experimentation with various simple temperature probes for use in the shallow holes has been conducted. Water pressure at a depth of 500 metres is fifty one times atmospheric pressure, which means the temperature probe must be housed within a strong casing. Continuing trials with four different types of temperature probe and three different housing designs have enabled development of a system that reliably and accurately allows measurement and recording of temperatures in drillholes exceeding 1000 metres depth and currently to temperatures of around 75 degrees Celsius. Future refinements may allow downhole temperatures greater than 100 degrees Celsius to be measured. These successful temperature probe developments were finally achieved and tested in late June 2008, meaning that no further temperature data has been generated for these GELs during the reporting period. It is planned that additional borehole temperature measurements using the new temperature probe will be achieved in the next twelve months.

3. Reporting Against Requirements of the Petroleum Act 2000

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

Geothermal Resources did not embark on any regulated activities under the Petroleum Act 2000 in Gels 214-217 during the period.

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

As no regulated activities were undertaken much of the regulations have no bearing on this Annual Report. The proposed temperature logging work program failed because of equipment failure under pressure. These problems have been solved and temperature logging will now be completed in Year 3 of the program.

(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

The proposed Year 2 thermal resource modelling will be completed in Year 3 as our equipment is now proven.

(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

Not applicable

(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 Annual Report	10/09/2007	September 2007	Compliant
2008 Annual Report	10/09/2008	August 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

During Year 3 it is proposed to complete temperature logging of as many open holes as possible (with TD exceeding 300 metres). Land access, poor coordinates and cover will mean that some holes will not be able to be logged.

In addition, subject to funding, it is proposed to drill some holes to 500 metres depth for temperature logging, stratigraphic correlation and thermal insulation purposes.

Expenditure for Year 2

Commercial in Confidence

TABLE 1: Work Program for GELs 214-217

A floating work program has been accepted by PIRSA for GELs 214-217 as follows

Year	Work Commitment	Work Completed
One	<ul style="list-style-type: none"> • Review of all 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. <p>Estimated budget \$30,000</p>	<ul style="list-style-type: none"> • Compilation of database from review of all available information. • Preliminary 3D modelling • Testing temperature probes
Two	<ul style="list-style-type: none"> • Thermal resource modelling and rock fracture studies. • Interpretation of all data to determine optimum drill site locations. <p>Estimated budget \$40,000</p>	<ul style="list-style-type: none"> • Acquisition of seismic data for Otway Basin • Further testing of temperature probes • Refinement of geological models and selection prelim shallow drill sites
Three	<ul style="list-style-type: none"> • 3-4 Shallow drill holes to an aggregate depth of at least 2000 metres to measure detailed geothermal gradients and obtain information regarding cover sequence. • Re-evaluation of theoretical thermal resources and fracture / permeability models based on drilling results. <p>Estimated budget \$150,000</p>	

<p>Four</p>	<ul style="list-style-type: none"> • 1 deep pilot drillhole 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. <p>Estimated budget \$500,000</p>	
<p>Five</p>	<ul style="list-style-type: none"> • Drilling 1 production and 1 injection well to set up a circulation cell. • Measurement key parameters to determine viability of project. • If positive, detailed planning for full scale exploitation. <p>Estimated budget > \$1,000,000</p>	

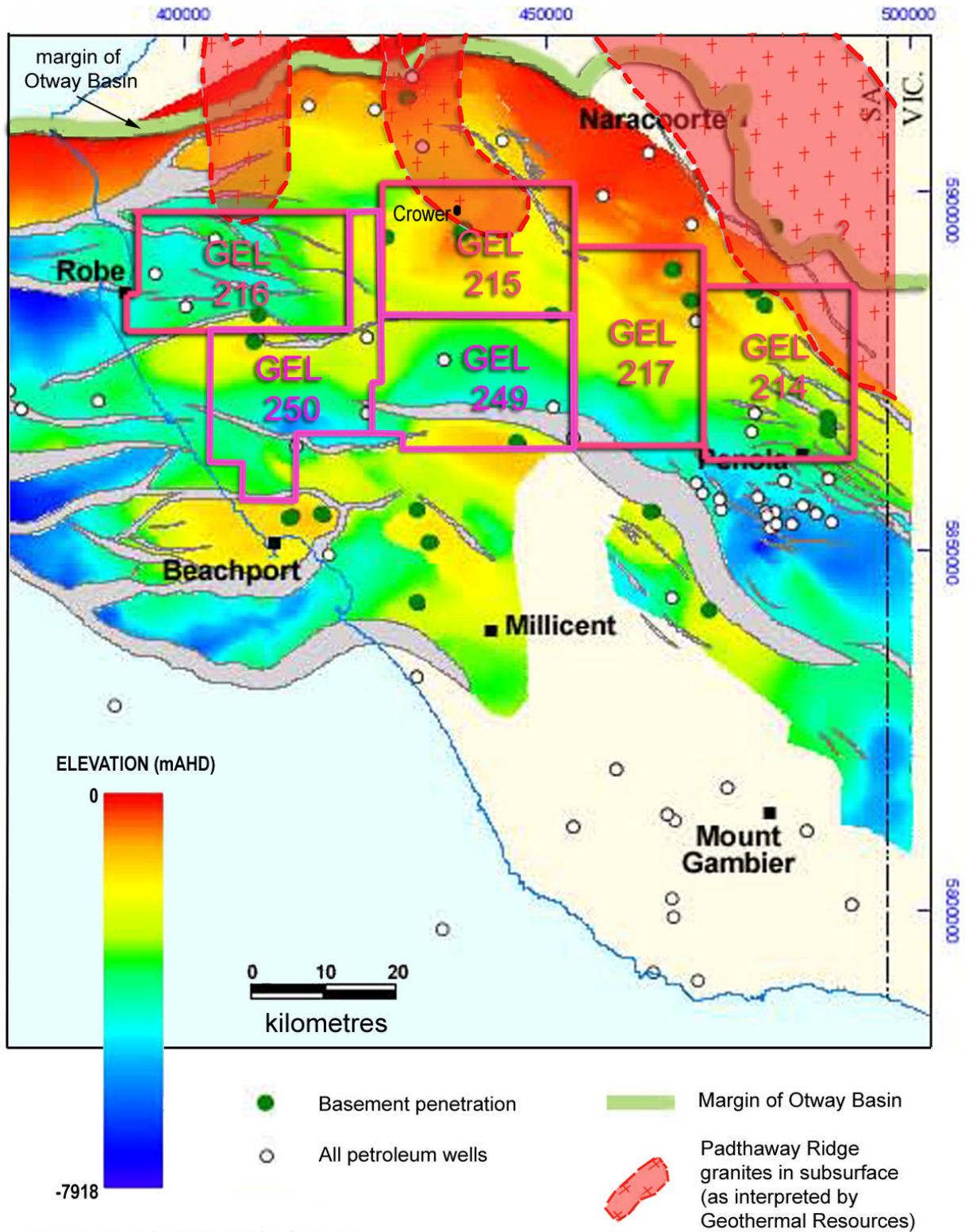


Figure 1. Location and geological interpretation of GELs 214 – 217

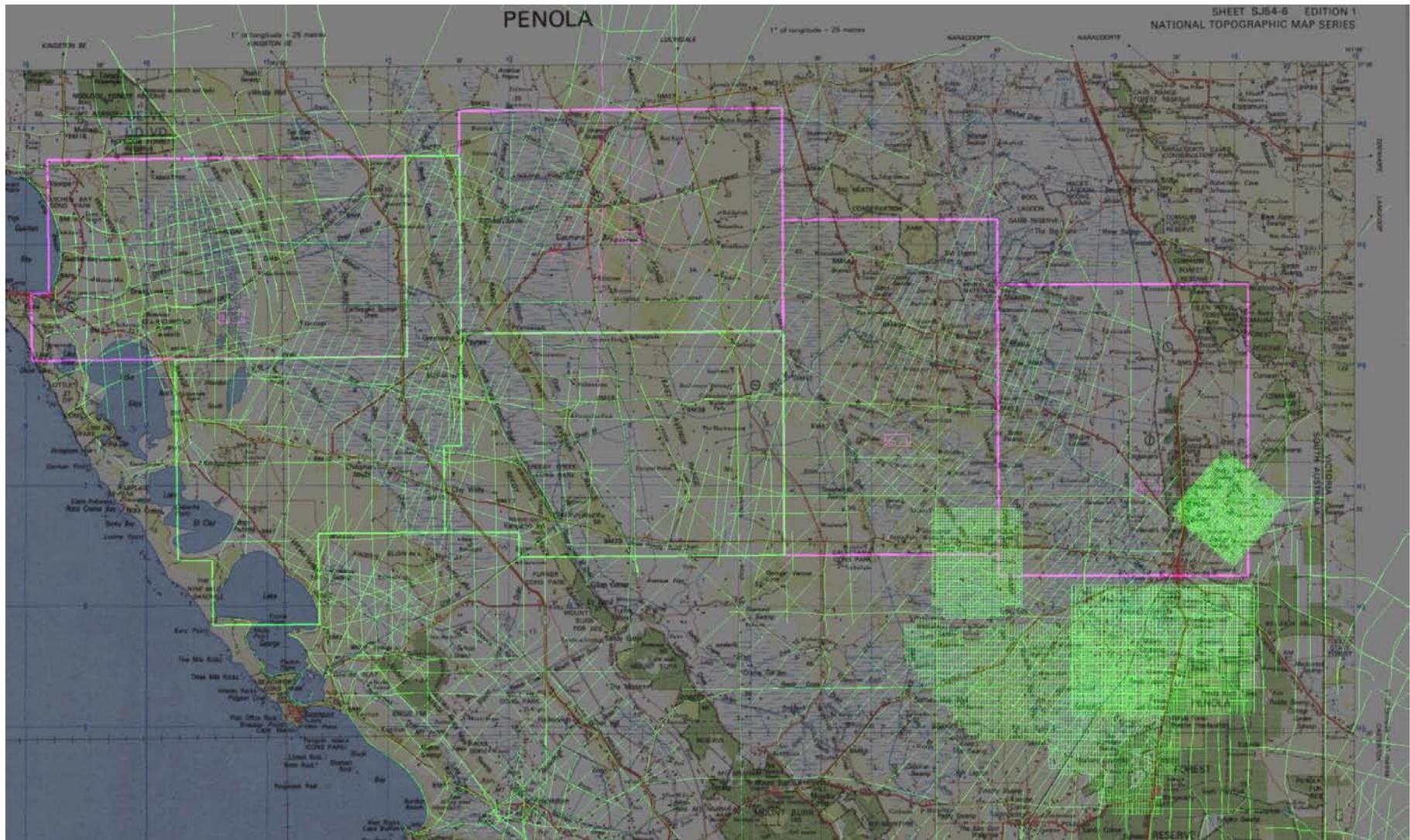


Figure 2. Seismic coverage (thin green lines) for the Crower project GELs (heavier pink and green lines)



Figure 3. Some loaded seismic profiles for portion of GEL 215, used to construct a 3D model to assist with planning of new drillhole