

Geothermal Resources Ltd

ABN 45 115 281 144

ANNUAL REPORT

**GEOHERMAL EXPLORATION LICENCES
208 - 210**

FOR THE PERIOD

11 Aug. 2006 to 10 Aug. 2007

December 2007

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1. Introduction

GELs 208, 209 and 210 were granted to Geothermal Resources Limited ('Geothermal Resources') on 11 August 2005. The licences are granted in the Arrowie Basin, South Australia. This report details the work conducted during Licence Year 2 of the licences (11 August 2006 – 10 August 2007 inclusive), in accordance with Regulation 33 of the Petroleum Act 2000.

Geothermal Resources work program commitment for the second year was comprehensive data review in preparation for completion of one shallow drillhole the following year (Table 1). This program was brought forward with the completion of two drillholes on GEL 210 during the reporting period.

Adjacent to GEL's 208, 209 and 210 Geothermal Resources also holds existing GEL 181, which has been reported separately.

2. Work Completed

In accordance with the proposed work program, Geothermal Resources has compiled a comprehensive data base of all geophysical and borehole data for GELs 208 – 210. This work has confirmed Geothermal Resources original reason for taking out the GELs, namely that the area was underlain by a large gravity low that is probably caused by a buried granite body rather than a thick sequence of Arrowie Basin sediments.

Based on interpretation of all available data, eight drill hole locations were selected for shallow drilling to 500 metres depth during Years 2 and 3 (Figure 1). In anticipation of the Year 2 drilling program and in compliance with the requirements of the Petroleum Act, an Activity Notification document was prepared and lodged with PIRSA in July 2006. Permission for drilling of the eight holes was given at the end of 2006.

Two drillholes were completed in the GEL block in Year 2 with the assistance of a PACE grant (DPY 3-77) of \$100,000. The two holes, namely Frome 1 and Frome 9, were completed on GEL 210. Each hole was drilled by a combination of a percussion drilling rig with 200 metre depth capacity owned by Talager Drilling Pty Ltd and a diamond drilling rig with more than 600 metre NQ coring capability owned by Silver City Drilling.

Drilling of the precollars with the Talager Drilling percussion drill rig commenced on 8 March 2007. For logistical reasons, owing to heavy rain in the region and difficulty of access, the first hole collared was Frome 8 on GEL 222 to the east, which was successfully drilled to 201 metres in dense green NeoProterozoic dolomitic siltstones. The precollar for Frome 1 could not be successfully drilled with the percussion drill rig owing to caving sands in the comparatively thick Tertiary cover sequence. Since the Talager drill rig did not have mud drilling capacity, the holes could not be continued to bedrock.

Silver City Drilling's diamond drill rig was mobilized to Frome 1 in early May. Heavy rains at that time stranded the drill rig for two weeks before drilling could recommence. Unfortunately, under the terms of the drilling contract this resulted in an unavoidable standby charge.

The pre-collar hole at **Frome 1**(390800E 6492617N, AGD 66 co-ordinate system) was not re-entered as it was only shallow and had collapsed. **Frome 1A** (390650E 6492688N) was collared nearby and drilling proved difficult owing to broken ground. After 14 days of persisting, the hole eventually had to be abandoned at 189 metres in vughy, broken Cambrian limestone. In spite of use of various drilling mud additives, water loss could not be prevented in this formation. Even at the terminal depth of 189 metres, there was no water inflow into the hole and several diamond bits were burned owing to lack of water at the drill bit. Unfortunately, HW casing could not be retrieved from this hole and resulted in additional expense. Prior to completion of the current drilling program consideration will be given to cementing the broken Cambrian limestone formation and re-drilling, if it is considered that the Cambrian-Neoproterozoic contact is likely to be close, as ground conditions are expected to be considerably better in the Neoproterozoic sequence.

Frome 9 (388358E 6493103N, AGD 66 co-ordinate system) was drilled as a replacement hole for the unsuccessful Frome 1A. It was decided to collar this hole adjacent to the main track roughly 2.3 kilometres to the west of Frome 1A in order to avoid the extremely broken and vughy Cambrian limestone that caused abandonment of Frome 1A (Figure 2). The hole was mud drilled and cased to base of Tertiary at 92 metres. Thereafter the hole was successfully cored through a sequence of fine-grained, thinly bedded, green shales and grey dolomitic siltstones of probable Neoproterozoic age until the end of the hole at 505 metres. Stromatolitic limestone was observed near 450 metres depth.

TEMPERATURE LOGGING

Downhole temperature logging was carried out a few weeks after completion of drilling in order to allow water in the drillholes to reach thermal equilibrium with the country rocks. The Department for Water, Land and Biodiversity Conservation were contracted to do the logging using extremely accurate and sensitive state of the art logging equipment, which recorded a continuous temperature log for the entire hole.

Frome 9 (and Frome 2 and 3) all recorded abnormally high temperature gradients, with Frome 3, lying roughly midway between Frome 2 and Frome 9, having the highest bottom of hole temperature. The temperature gradient in Frome 3 is only a little lower than in the Cooper Basin. These three holes define an area of at least 400 square kilometers where temperatures over 40 °C exist at 500m indicating a potentially large geothermal heat reservoir at depth. The three holes are **located near the centre of an interpreted large buried granite body** (based on gravity and seismic data, Figure 2).

Conductivity measurements will be made on selected core samples in order to calculate hypothetical heat flows in due course.

Temperature logging of Telechie 1, located in the east of GEL 209 and at the interpreted margin of the granite body, indicated a temperature gradient slightly above the standard crustal gradient.

3. Reporting Against Requirements of the Petroleum Act 2000

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

Completion of drillholes Frome 1, 1A and 9 and temperature logging of these holes.

Drilling:

- Well name: Frome 1A
- Spud date: 1/06/2007
- Rig release: 13/06/2007
- Casing: 100mm PVC 0-136m; 40mm PVC 0-189.3m; capped
- Constructions: None required

- Well name: Frome 9
- Spud date: 14/07/2007
- Rig release: 28/07/2007
- Casing: 100mm PVC 0-92m; 40mm PVC 0-505m; capped
- Constructions: None required

Temperature survey (Frome 9):

- Survey name: Temperature and Gamma survey
- Contractor: DWLBC
- Date: 17/09/2007
- Details: To BoH (505m) @ 50mm increments

(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 (see Appendix 1). All prevention and remediation measures, as listed in Appendix 1, were diligently followed. Geothermal Resources is not aware of any SEO non-compliance issues. Site visits and inspection by PIRSA personnel during drilling operations raised no non-compliance issues. Drill site rehabilitation was commented on favourably by PIRSA personnel.

All obligations were complied with, other than the late submissions for this annual report, one wire-line LAS file and two Well Completion Reports. The annual report was not submitted within 2 months after the end of the licence year as required by Regulation 33. It was submitted within 4 months of the end of the licence year. This was largely due to insufficient staffing to cover both exploration and reporting roles. The LAS file for the wire-line log of Frome 9 was submitted late only through incomplete knowledge of the reporting requirements for geophysical surveys. The Well Completion Reports were submitted late owing to the inability to employ technical staff capable of the task.

(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

Ongoing efforts to find and employ suitably qualified technical staff to assist with tasks including timely submission of all reports.

(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
2006 Annual Report	10/10/2006	Aug. 2006	Compliant (early)
2007 Annual Report	10/10/2007	Dec. 2007	Non-compliant (late)
Notification of Activity	not applicable	Jul. 2006	Compliant (early)
Frome 1/1A: Daily Drilling Reports	19/03/2007 and 2/06/2007 to 14/06/2007	19/03/2007 and 2/06/2007 to 14/06/2007	Compliant
Frome 9: Daily Drilling Reports	15/07/2007 to 29/07/2007	15/07/2007 to 29/07/2007	Compliant
Frome 9 Wire-line log LAS files (Temp. & Gamma)	17/11/2007	May 2008	Non-compliant (late)
WCR for Frome 1/1A	13/12/2007	May 2008	Non-compliant (late)
WCR for Frome 9	28/01/2008	May 2008	Non-compliant (late)

(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 additional shallow drillholes to 200 - 600 metres depth in accordance with the Activity Notification lodged with PIRSA in July 2006 and subsequent addendums. This includes Frome 10 and 11 on GEL 210, and Frome 5 on GEL 181, and possibly Frome 8 and 9 on GELs 208 and 209 respectively, depending on rig availability (Figure 3). Temperature logging of these holes will also be carried out. This will exceed the commitments to the end of Year 3 (see Table 1).

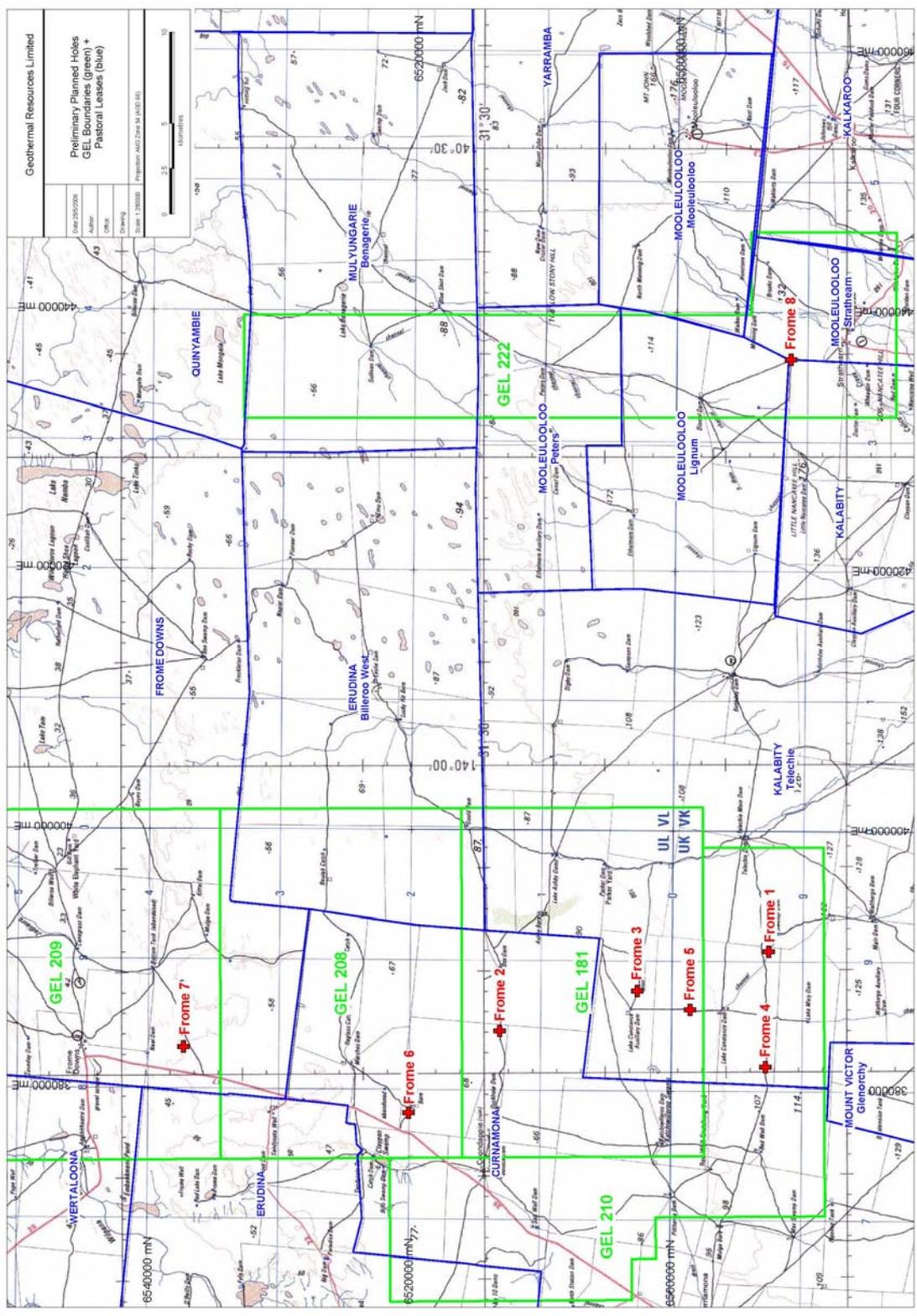
4. Expenditure for Year 2

Commercial in Confidence

TABLE 1: Work Programs for GELs 208 – 210

Year	Work Commitment	Work completed
One	Gravity survey	Database compilation, acquisition existing gravity and seismic data, aboriginal heritage survey, lodgement of activity notification.
Two	Data review	Completion of two drillholes, Frome 1/1A and Frome 9, temperature logging of holes
Three	Drill one shallow hole	
Four	Drill one deep pilot hole	
Five	Drill one production well and one injection well	

Figure 1. GEL boundaries, pastoral leases and planned holes at start of Year 2



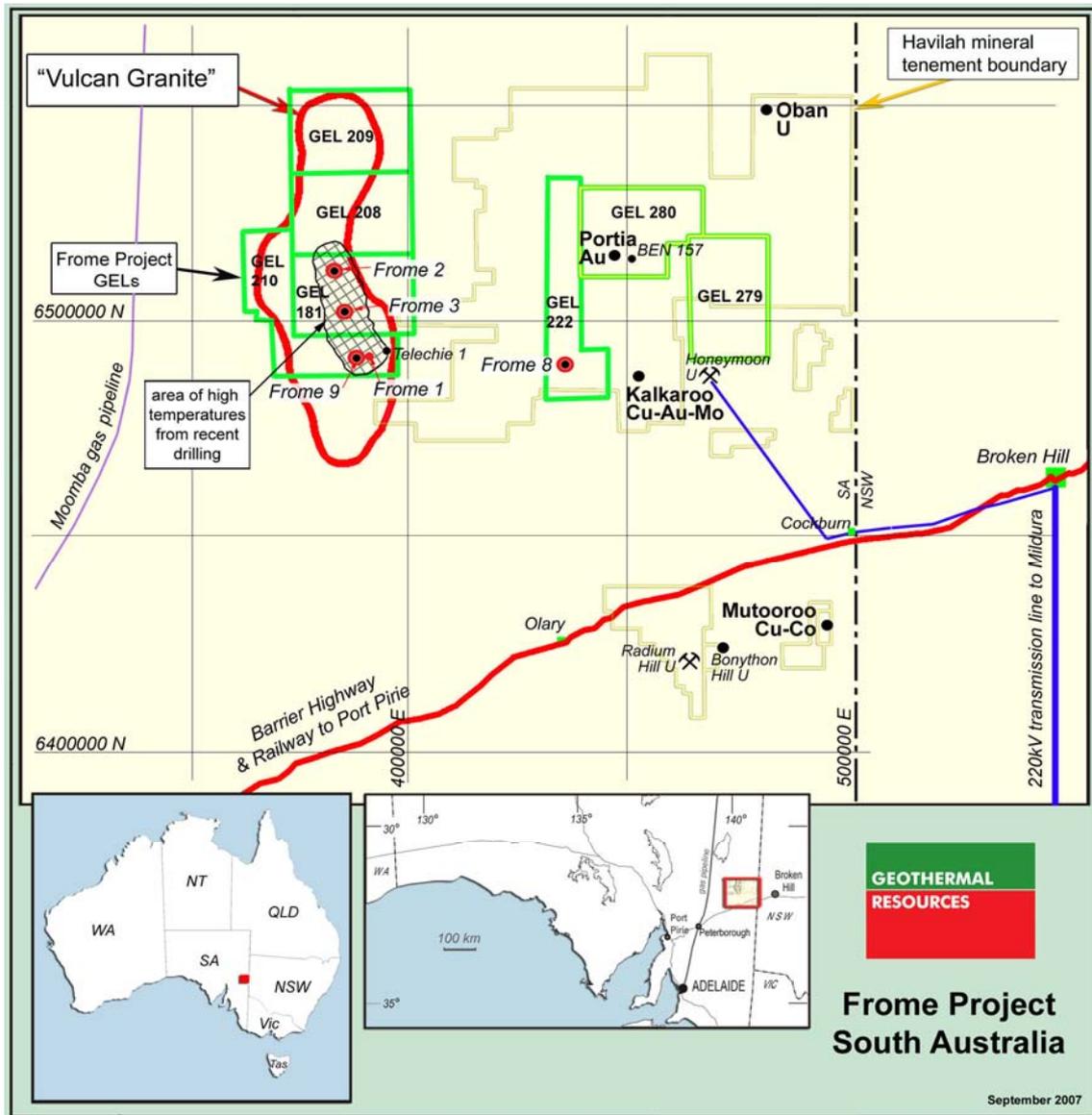


Figure 2. Holes completed during Year 2 on GEL 210 (and GEL 181)

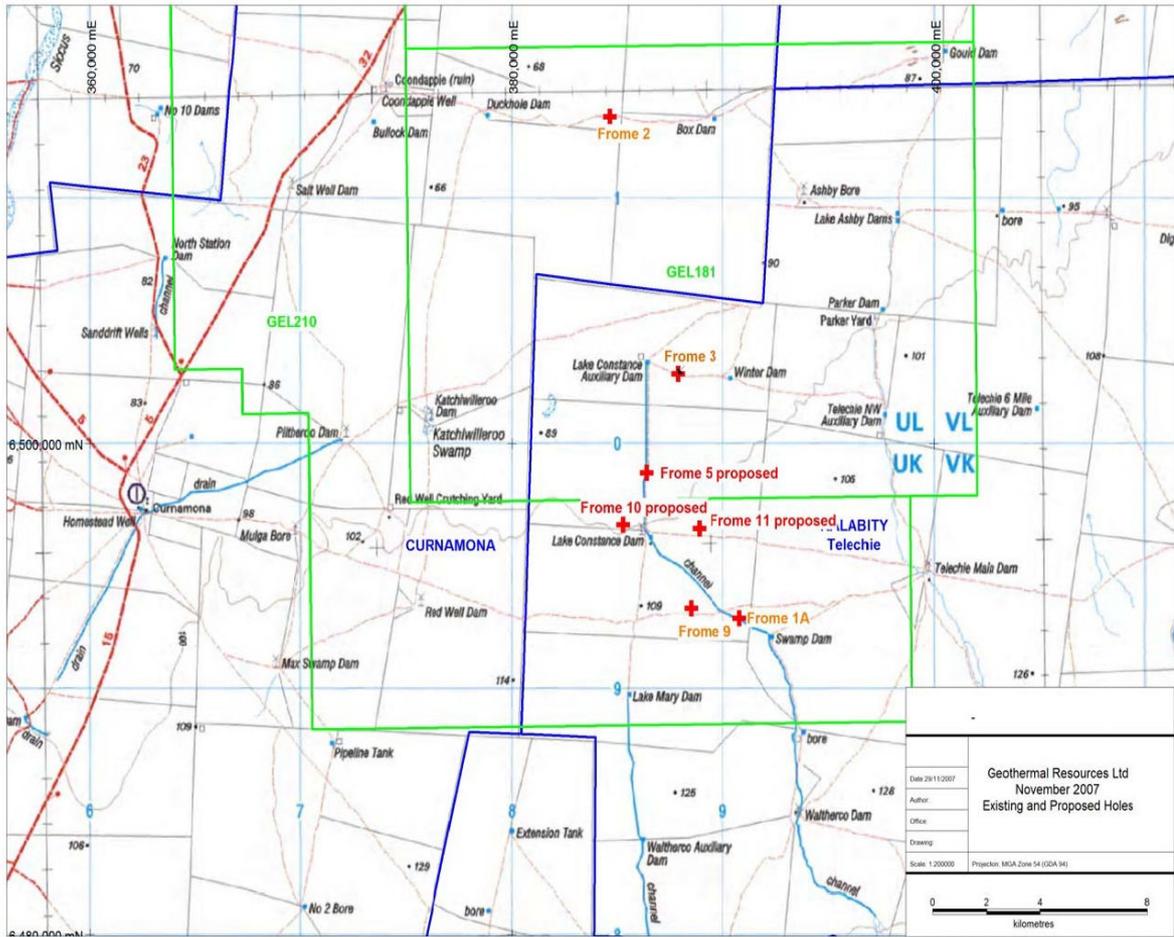


Figure 3. Drillholes (Frome 10 and 11) proposed during Year 3 on GEL 210

APPENDIX 1

ASSESSMENT of GEOTHERMAL RESOURCES

PERFORMANCE IN ACHIEVING

ENVIRONMENTAL OBJECTIVES

(as defined in the **COOPER BASIN DRILLING SEO, 2003**)

for all Drilling and Well Operations

in GELs 208, 209 and 210 (AR 2007)

ASSESSMENT of GEOTHERMAL RESOURCES PERFORMANCE IN ACHIEVING ENVIRONMENTAL OBJECTIVES (as defined in THE COOPER BASIN DRILLING SEO, 2003)

2007 AR: GELs 208, 209 and 210 (all Drilling and Well Operations)

Environmental Objectives	Assessment Criteria	Compliant/ Non-Compliant	Comment
<p>Objective 1:</p> <p>Minimise the risk to public and other third parties.</p>	<ul style="list-style-type: none"> Reasonable measures implemented to ensure no injuries to the public or third parties. 	Compliant	
<p>Objective 2:</p> <p>Minimise disturbance and avoid contamination to soil.</p>	<p><u>Well Site and Access Track Construction</u></p> <ul style="list-style-type: none"> 0, + 1 or + 2 GAS criteria are attained for 'Minimise visual impacts of abandoned well sites and access tracks' objective as listed in Appendix 4 for well lease and access track construction. No unauthorised off-road driving or creation of shortcuts. No construction activities are carried out on salt lakes, steep tableland land systems or wetlands land systems (as defined in EIR). <p><u>Fuel and Chemical Storage and Handling</u></p> <ul style="list-style-type: none"> No spills/leaks outside of areas designed to contain them. Level of hydrocarbon continually decreasing for in situ remediation of spills. Soils remediated to a level as determined by the SHI process. <p><u>Waste Disposal (domestic, sewage and sludges)</u></p> <ul style="list-style-type: none"> All domestic wastes are disposed of in accordance with WPA licensing requirements. 0, + or + 2 GAS criteria for 'Waste material' objective is attained. 	<p><u>Well Site and Access Track Construction:</u></p> <p>Compliant</p> <p>GAS +1</p> <p><u>Fuel and Chemical Storage and Handling:</u></p> <p>Compliant</p> <p><u>Waste Disposal:</u></p> <p>Compliant</p> <p>GAS +2</p>	<p>GAS of +1, rather than +2, because the earthwork disturbance is only beginning to blend with the surroundings.</p>

Environmental Objectives	Assessment Criteria	Compliant/ Non-Compliant	Comment
<p>Objective 3:</p> <p>Avoid the introduction or spread of pest plants and animals and implement control measures as necessary.</p>	<ul style="list-style-type: none"> ▪ No weeds or feral animals are introduced to operational areas. 	Compliant	
<p>Objective 4:</p> <p>Minimise disturbance to drainage patterns and avoid contamination of surface water and shallow ground water resources.</p>	<p><u>Well Lease and Access Track Construction.</u></p> <ul style="list-style-type: none"> ▪ Well leases and access tracks are located and constructed to maintain pre-existing water flows (ie. channel contours are maintained on floodplains and at creek crossings). <p><u>Drilling Mud Sumps and Flare Pits</u></p> <ul style="list-style-type: none"> ▪ No overflow of drill cuttings, mud and other drilling fluids from mud sumps. ▪ No waste material disposal to sumps and flare pits. <p><u>Fuel/Chemical Storage and Handling</u></p> <ul style="list-style-type: none"> ▪ No leaks spills outside of areas designed to contain them. 	Compliant	
<p>Objective 5:</p> <p>Avoid disturbance to sites of cultural and heritage significance.</p>	<ul style="list-style-type: none"> ▪ Proposed well sites and access tracks have been surveyed and any sites of Aboriginal and non-Aboriginal heritage identified. ▪ Any identified cultural and heritage sites have been avoided. 	Compliant	
<p>Objective 6:</p> <p>Minimise loss of aquifer pressure and avoid aquifer contamination.</p>	<p><u>Drilling & Completion Activities</u></p> <ul style="list-style-type: none"> ▪ There is no uncontrolled flow to surface (Blow out). ▪ Sufficient barriers exist in casing annulus to prevent cross flow between separate aquifers of hydrocarbon reservoirs. ▪ Relevant government approval obtained for abandonment of any radioactive tool left down-hole. 	Compliant	

Environmental Objectives	Assessment Criteria	Compliant/ Non-Compliant	Comment
<p>Objective 6 cont. :</p> <p>Minimise loss of aquifer pressure and avoid aquifer contamination.</p>	<p><u>Producing, Injection, Inactive and Abandoned Wells</u></p> <ul style="list-style-type: none"> ▪ No cross-flow behind casing between aquifers, and between aquifers and hydrocarbon reservoirs unless approved by DWLBC. 		
<p>Objective 7:</p> <p>Minimise disturbance to native vegetation and native fauna.</p>	<p><u>Well Lease and Access Track Construction and Restoration</u></p> <ul style="list-style-type: none"> ▪ Any sites with rare, vulnerable and endangered flora and fauna have been identified and avoided. ▪ 0, + 1 or + 2 GAS criteria are attained for 'Minimise impacts on vegetation' objectives as listed in Appendix 2, during well lease and access track site selection and construction and for 'Re-establish natural vegetation on abandoned well sites and access track' objective in Appendix 4. <p><u>Waste Management</u></p> <ul style="list-style-type: none"> ▪ Refer to assessment criteria for Objective 11. <p><u>Fuel and Chemical Storage and Management</u></p> <ul style="list-style-type: none"> ▪ Refer to assessment criteria for Objectives 2 and 4. 	<p>Compliant</p> <p>Appendix 2 GAS: +2</p> <p>Appendix 4 GAS: +1</p>	<p>GAS of +1, rather than +2, because there are no perennials.</p>
<p>Objective 8:</p> <p>Minimise air pollution and greenhouse gas emissions.</p>	<ul style="list-style-type: none"> ▪ Compliance with EPA requirements. 	<p>Compliant</p>	
<p>Objective 9:</p> <p>Maintain and enhance partnerships with the Cooper Basin community.</p>	<ul style="list-style-type: none"> • No unresolved reasonable complaints from the community. 	<p>Compliant</p>	
<p>Objective 10:</p> <p>Avoid or minimise disturbance to stakeholders and/or associated infrastructure.</p>	<ul style="list-style-type: none"> • No reasonable stakeholder complaints left unresolved. 	<p>Compliant</p>	

Environment Objectives	Assessment Criteria	Compliant/ Non- Compliant	Comment
<p>Objective 11:</p> <p>Optimise waste reduction and recovery.</p>	<ul style="list-style-type: none"> ▪ With the exception of drilling fluids, drill cuttings and other fluids disposed during well clean-up, and sewage wastes, all wastes to be disposed of at an EPA licensed facility in accordance with IPA Licence conditions. ▪ Attainment of GAS criteria for 'Site left in clean, tidy and safe conditions after final clean-up' objective during well site restoration (refer Appendix 4). ▪ Attainment of Gas criteria for 'site left in clean, tidy and safe condition' objective during borrow pit restoration (refer Appendix 5). 	<p>Compliant</p> <p>Site cleanliness GAS: 0</p>	<p>A GAS score of 0 is the maximum attainable in this category.</p>
<p>Objective 12:</p> <p>Remediate and rehabilitate operational areas to agreed standards.</p>	<ul style="list-style-type: none"> ▪ No unresolved reasonable stakeholder complaints. <p><u>Contaminated Site Remediation</u></p> <ul style="list-style-type: none"> ▪ Contaminated sites are remediated in accordance with criteria developed with the principals of the National Environment Protection Measure of Contaminated sites and in consultation with the EPA. <p><u>Well Site and Access Track Restoration</u></p> <ul style="list-style-type: none"> ▪ The attainment of 0, + 1 or + 2 GAS criteria for (refer Appendix 4): <ul style="list-style-type: none"> – 'minimise visual impact of abandoned well sites' – 'minimise visual impact of abandoned access tracks' – 're-establish natural vegetation on abandoned well sites and access tracks' <ul style="list-style-type: none"> • <i>Note:</i> Well abandoned issues addressed under objective 6. 	<p>Compliant</p> <p>not applicable</p> <p>GAS: +1</p>	<p>GAS of +1, rather than +2, because the earthwork disturbance is only beginning to blend with the surroundings.</p>