



16. 22 January 2009 Notation of Paralana Energy Farmin Agreement dated 15 January 2009 between MNGI Pty Ltd and TRUenergy Geothermal Pty Ltd is hereby entered on the public register.  
Ref: SA 2009-01
17. 22 January 2009 Notation of Paralana Tripartite Agreement dated 19 January 2009 between Beach Petroleum Limited, MNGI Pty Ltd, Petratherm Limited and TRUenergy Geothermal Pty Ltd is hereby entered on the public register.  
Ref: SA 2009-02
18. 21 September 2009 Memorandum entering notation of extension of time to 31 October 2009 by which the licensee must apply for renewal of licence.
19. 23 December 2009 Variation of licence conditions.
20. 23 December 2009 Memorandum entering variation of licence conditions on the public register.
21. 8 February 2010 Consolidation of licence area with GELs 156, 178 and 180 and subsequent revocation of licence.
22. 8 February 2010 Memorandum entering consolidation and revocation of licence on the public register.

**Petroleum and Geothermal Energy Act 2000  
S.115**

**MEMORANDUM**

**GEOHERMAL EXPLORATION LICENCES  
GELs 156, 178 and 180**

1. Consolidation with effect from 21 November 2009, of the adjacent licence areas of GELs 156, 178 and 180 whereby the consolidated licence area is now designated as GEL 156 is hereby entered on the public register.

The total area of GEL 156 is now 1,496 square kilometres approximately.

2. Revocation of GELs 178 and 180 with effect from 21 November 2009, is hereby entered on the public register.



**BARRY A. GOLDSTEIN  
Director Petroleum and Geothermal  
Minerals and Energy Resources  
Primary Industries and Resources SA  
Delegate of the Minister for Mineral Resources  
Development**

Date: 8 February 2010

Ref: 27/2/261  
27/2/301  
27/2/305

# Petroleum and Geothermal Energy Act 2000

## Consolidation of licence areas Geothermal Exploration Licences GELs 156, 178 and 180

## Revocation of licences Geothermal Exploration Licences GELs 178 and 180

I, BARRY ALAN GOLDSTEIN, Director Petroleum and Geothermal, Minerals and Energy Resources, Department of Primary Industries and Resources, in the State of South Australia, pursuant to section 82 of the *Petroleum and Geothermal Energy Act 2000* and all other enabling powers, for and on behalf of Paul Holloway, Minister for Mineral Resources Development (Minister), pursuant to delegated powers dated 1 October 2009, hereby;

1. consolidate with effect from 21 November 2009, the adjacent areas of Geothermal Exploration Licences GELs 156, 178 and 180 held by –

**MNGI Pty Ltd**  
ACN 091 525 361

The consolidated licence area shall be designated as:

### **Geothermal Exploration Licence GEL 156**

#### DESCRIPTION OF CONSOLIDATED AREA

All that part of the State of South Australia, bounded as follows:-

Commencing at a point being the intersection of latitude 30°03'00"S GDA94 and longitude 139°29'00"E GDA94, thence east to longitude 139°50'00"E GDA94, south to latitude 30°20'00"S GDA94, west to longitude 139°41'00"E GDA94, south to latitude 30°21'00"S GDA94, west to longitude 139°39'00"E GDA94, south to latitude 30°23'00"S GDA94, west to longitude 139°38'00"E GDA94, south to latitude 30°25'00"S GDA94, west to longitude 139°37'00"E GDA94, south to latitude 30°26'00"S GDA94, west to longitude 139°36'00"E GDA94, south to latitude 30°28'00"S GDA94, west to longitude 139°35'00"E GDA94, south to latitude 30°31'00"S GDA94, west to longitude 139°24'00"E GDA94, north to latitude 30°27'00"S GDA94, east to longitude 139°26'00"E GDA94, north to latitude 30°26'00"S GDA94, east to longitude 139°27'00"E GDA94, north to latitude 30°24'00"S GDA94, east to longitude 139°28'00"E GDA94, north to latitude 30°23'00"S GDA94, east to longitude 139°29'00"E GDA94, north to latitude 30°22'00"S GDA94, east to longitude 139°30'00"E GDA94, north to latitude 30°21'00"S GDA94, east to longitude 139°31'00"E GDA94, north to latitude 30°19'00"S GDA94, east to longitude 139°33'00"E GDA94, north to latitude 30°17'00"S GDA94, east to longitude 139°34'00"E GDA94, north to latitude 30°16'00"S GDA94, east to longitude 139°35'00"E GDA94, north to latitude 30°13'00"S GDA94, west to longitude 139°32'00"E GDA94, south to latitude 30°15'00"S GDA94, west to longitude 139°29'00"E GDA94,

south to latitude 30°17'00"S GDA94, west to the National Estate Register boundary, then north and west along the said boundary to longitude 139°22'00"E GDA94, then north to latitude 30°10'00"S GDA94, east to longitude 139°25'00"E GDA94, north to the National Estate Register boundary, then east, north and west along the said boundary to longitude 139°25'00"E GDA94, north to latitude 30°08'00"S GDA94, east to longitude 139°27'00"E GDA94, north to latitude 30°05'00"S GDA94, east to longitude 139°29'00"E GDA94 and north to the point of commencement.

AREA: **1,496** square kilometres approximately.

2. consequently revoke Geothermal Exploration Licences GELs 178 and 180, with effect from 21 November 2009.

As a consequence of the consolidation, the work program forming 'condition 1' of the consolidated GEL 156 comprises:

Year of Term of Licence	Minimum Work Requirements
One	<ul style="list-style-type: none"> <li>• Geological and geophysical review;</li> <li>• Modelling and interpretation of geophysical data;</li> <li>• Historical bore hole thermal data collection (where possible) and analysis;</li> <li>• Shallow geothermal gradient test well (500m depth); and</li> <li>• Down hole temperature gradient and wireline logging.</li> </ul>
Two	<ul style="list-style-type: none"> <li>• Commercial negotiations for funding;</li> <li>• Magneto-tellurics trial survey;</li> <li>• Diamond tail extension to geothermal gradient test well (1500m TD approximately);</li> <li>• Down hole temperature and wireline logging; and</li> <li>• Injection well design process underway.</li> </ul>
Three	<ul style="list-style-type: none"> <li>• Geological and geophysical review.</li> </ul>
Four and Five	<ul style="list-style-type: none"> <li>• Complete injection well design; and</li> <li>• Drill 1st injection well.</li> </ul>

Dated: 8 Feb '10



**BARRY A. GOLDSTEIN**  
**Director Petroleum and Geothermal**  
**Minerals and Energy Resources**  
**Primary Industries and Resources SA**  
**Delegate of the Minister for Mineral Resources**  
**Development**

The following signature evidences the consent of the licensee to the consolidation of GELs 156, 178 and 180 as set out in this document and made pursuant to Section 82 of the *Petroleum and Geothermal Energy Act 2000*.

Signed for and on behalf of **MNGI Pty Ltd** by its authorised representative:

Date: 28/1/10 .....

 .....

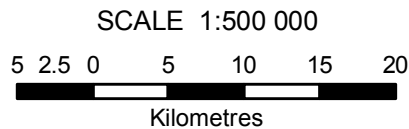
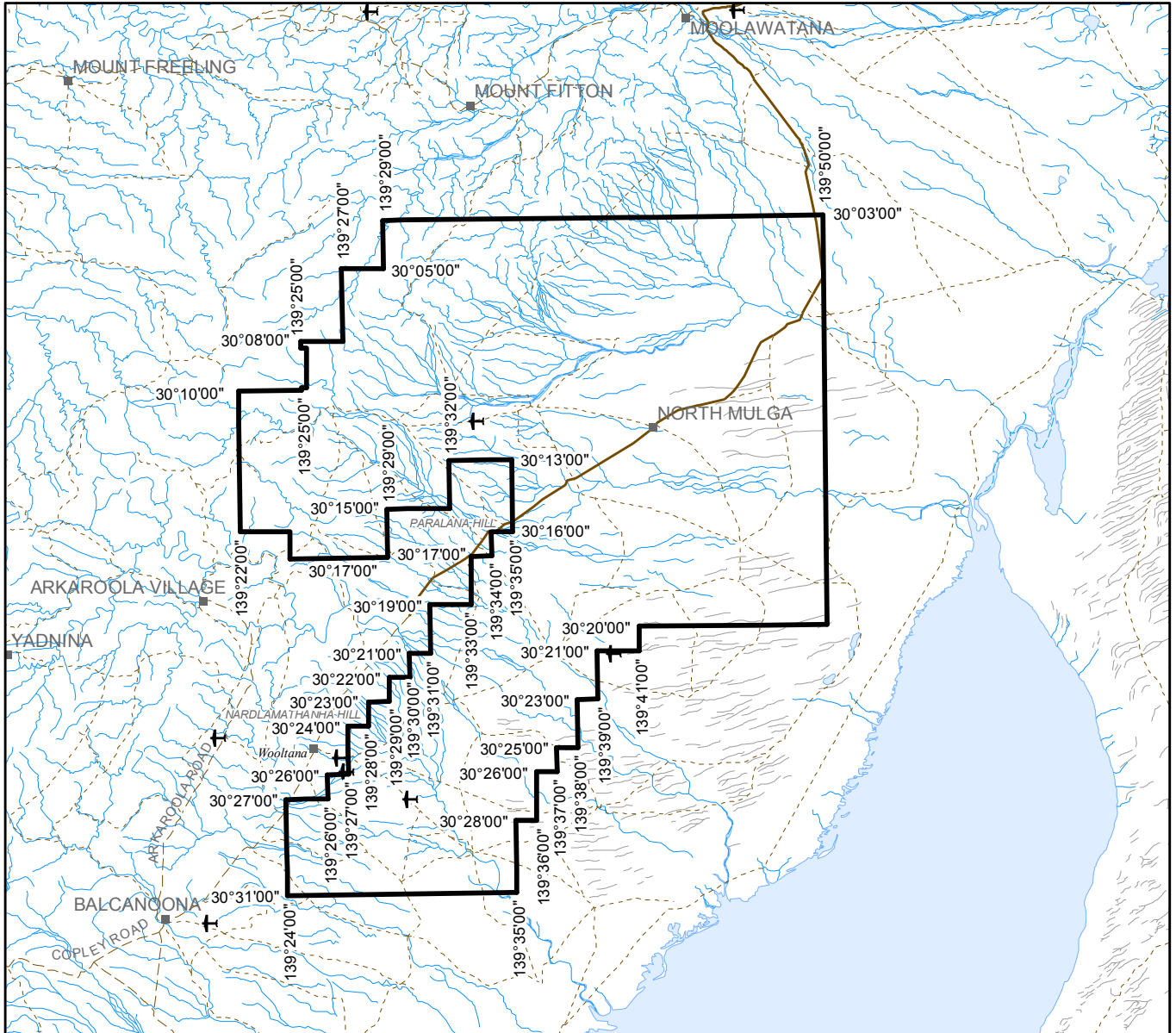
Authorised Representative

Peter Reid .....

Name

Exploration Manager .....

Position



Note: There is no warranty that the boundary of this licence is correct in relation to other features of the map. The boundary is to be ascertained by reference to the Geocentric Datum of Australia (GDA94) and the schedule.

THE PLAN HEREINBEFORE REFERRED TO

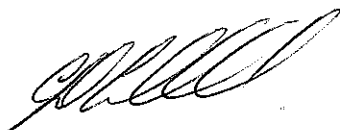
**GEOHERMAL EXPLORATION LICENCE NO: 156**

**Petroleum and Geothermal Energy Act 2000  
S.115**

**MEMORANDUM**

**GEOHERMAL EXPLORATION LICENCES  
GELs 156, 178, 180, 254 AND 336**

1. Variation of licence conditions is hereby entered on the public register.



**C.D. COCKSHELL  
A/Director Petroleum and Geothermal  
Minerals and Energy Resources  
Primary Industries and Resources SA  
Delegate of the Minister for Mineral Resources Development**

Date: 23 December 2009

Ref: 27/2/261  
27/2/302  
27/2/305  
27/2/413  
27/2/504

# Petroleum and Geothermal Energy Act 2000

## VARIATION OF GEOTHERMAL EXPLORATION LICENCES GELs 156, 178 AND 180

I, CYRIL DAVID COCKSHELL, Acting Director Petroleum and Geothermal, Minerals and Energy Resources, Department of Primary Industries and Resources in the State of South Australia, pursuant to section 25 of the *Petroleum and Geothermal Energy Act 2000* and all other enabling powers, for and on behalf of Paul Holloway, Minister for Mineral Resources Development (Minister), pursuant to delegated powers dated 1 October 2009, vary the conditions of geothermal exploration licences GELs 156, 178 and 180 held by -

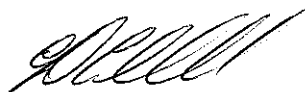
**MNGI Pty Ltd**  
ACN 091 525 361

Condition 1 of the licence is omitted and the following substituted:

- “ 1. During the term of the licence, the Licensee shall carry out or cause to be carried out exploratory operations on the area comprised in the licence in accordance with such work programs as are approved by the Minister from time to time. Years one to five exploratory operations are guaranteed. These exploratory operations shall include but not necessarily be limited to:-

Year of Term of Licence	Minimum Work Requirements
One	<ul style="list-style-type: none"><li>• Geological and Geophysical Review;</li><li>• Modelling and interpretation of geophysical data;</li><li>• Historical bore hole thermal data collection (where possible) and analysis;</li><li>• Shallow geothermal gradient test well (500m depth); and</li><li>• Down hole temperature gradient and wireline logging.</li></ul>
Two	<ul style="list-style-type: none"><li>• Commercial negotiations for funding;</li><li>• Magneto-tellurics trial survey;</li><li>• Diamond tail extension to geothermal gradient test well (1500m TD approximately);</li><li>• Down hole temperature and wireline logging; and</li><li>• Injection well design process underway</li></ul>
Three	<ul style="list-style-type: none"><li>• Geological and Geophysical Review</li></ul>
Four and Five	<ul style="list-style-type: none"><li>• Complete injection well design; and</li><li>• Drill 1<sup>st</sup> injection well.</li></ul> <p><i>Year 4 and 5 work program may be conducted anywhere within the boundaries of GELs 156, 178, 180, 254 and 336</i></p>

Dated: 23 December 2009



C.D. COCKSHELL  
A/Director Petroleum and Geothermal  
Minerals and Energy Resources  
Primary Industries and Resources SA  
Delegate of the Minister for Mineral Resources Development

***Petroleum Act 2000***  
**S.134**

**MEMORANDUM**

**GEOHERMAL EXPLORATION LICENCES  
GELs 156, 178 AND 180**

1. Notation of extension of time to 31 October 2009, by which the licensee must apply for the renewal of GELs 156, 178 and 180 is entered on the public register of licences.



**BARRY A. GOLDSTEIN**  
**Director Petroleum and Geothermal**  
**Minerals and Energy Resources**  
**Primary Industries and Resources SA**  
**Delegate of the Minister for Mineral Resources**  
**Development**

Date: 21 September 2009

File: 27/2/261  
27/2/301  
27/2/305

***Petroleum Act 2000***  
**S.115**

**MEMORANDUM**

**GEOHERMAL EXPLORATION LICENCES  
GEL 156; GEL 178; GEL 180; GEL 254; GEL 336**

- SA 2009-01      Notation of registrable dealing as evidenced by Paralana Energy Farmin Agreement dated 15 January 2009 between MNGI Pty Ltd and TRUenergy Geothermal Pty Ltd, is hereby entered on the public register.
- SA 2009-02      Notation of registrable dealing as evidenced by Paralana Tripartite Agreement dated 19 January 2009 between Beach Petroleum Limited, MNGI Pty Ltd, Petrathern Limited and TRUenergy Geothermal Pty Ltd, is hereby entered on the public register.



**MICHAEL MALAVAZOS**  
**Acting Director Petroleum and Geothermal**  
**Minerals and Energy Resources**  
**Primary Industries and Resources SA**  
**Delegate of the Minister for Mineral Resources**  
**Development**

Date: 22 January 2009


27/2/261  
27/2/301  
27/2/305  
27/2/413  
27/2/504

**Petroleum Act 2000**  
**S.115**

**MEMORANDUM**

**GEOHERMAL EXPLORATION LICENCES**  
**GEL 156; GEL 178; GEL 180; GEL 254; GEL 336**

- SA 2008-22      Notation of registrable dealing as evidenced by Deed of Variation - Paralana Energy Farmin Agreement dated 11 August 2008 between MNGI Pty Ltd and Beach Petroleum Limited is hereby entered on the public register.
- SA 2008-23      Notation of registrable dealing as evidenced by Paralana Joint Venture Joint Operating and Production Agreement dated 11 August 2008 between Beach Petroleum Limited, MNGI Pty Ltd and Petratherm Limited is hereby entered on the public register.



**BARRY A. GOLDSTEIN**  
**Director Petroleum and Geothermal**  
**Minerals and Energy Resources**  
**Primary Industries and Resources SA**  
**Delegate of the Minister for Mineral Resources**  
**Development**

Date: 11 September 2008

27/2/261  
27/2/301  
27/2/305  
27/2/413  
27/2/504

## PETROLEUM ACT 2000

## SECTION 25 (5) (b)

*Variation of Petroleum Exploration Licence—  
GELs 156, 178 and 180*

NOTICE is hereby given that under the provisions of the Petroleum Act 2000, pursuant to delegated powers dated 28 March 2002, *Gazetted* 11 April 2002, page 1573, the conditions of the abovementioned Exploration Licences have been varied as follows:

Condition 1 of each licence is omitted and the following substituted:

'1. During the term of the licence, the licensee shall carry out or cause to be carried out exploratory operations on the area comprised in the licence in accordance with such work programs as are approved by the Minister from time to time. Years one to five exploratory operations are guaranteed. These exploratory operations shall include but not necessarily be limited to:

Year of Term of Licence	Minimum Work Requirements
One	Geological and Geophysical Review. Modelling and interpretation of geophysical data. Historical bore hole thermal data collection (where possible) and analysis. Shallow geothermal gradient test well (500 m depth). Down hole temperature gradient and wireline logging.
Two	Commercial negotiations for funding. Magneto-tellurics trial survey. Diamond tail extension to geothermal gradient test well (1 500 m TD approximately). Down hole temperature and wireline logging. Injection well design process underway.
Three	Geological and Geophysical Review.
Four and Five	Injection well design completed. Drill 1st injection well. Down hole thermal analysis. Down hole stress analysis. Reservoir development and modelling. Drill 1st production well (3.5 km). Circulation testing. Commercial feasibility and development study. Commercial negotiation for further funding. Drill 2nd production well to complete triplet (3.5 km). Reservoir stimulation. Circulation testing. Commercial feasibility and development study. (The year four and five work program may be conducted anywhere within the boundaries of GELs 156, 178, 180, 254 and 336).

Dated 26 March 2008.

B. A. GOLDSTEIN,  
Director Petroleum and Geothermal  
Minerals and Energy Resources  
Primary Industries and Resources SA  
Delegate of the Minister for Mineral  
Resources Development

**Petroleum Act 2000  
S.115**

**MEMORANDUM**

**GEOHERMAL EXPLORATION LICENCE  
GELs 156, 178, 180, 254 & 336**

1. Variation of licence conditions is hereby entered on the public register.



**BARRY A. GOLDSTEIN  
Director Petroleum and Geothermal  
Minerals and Energy Resources  
Primary Industries and Resources SA  
Delegate of the Minister for Mineral Resources Development**

Date: 26 March 2008

Ref: 27/2/261  
27/2/302  
27/2/305  
27/2/413  
27/2/504

# Petroleum Act 2000

## VARIATION OF GEOHERMAL EXPLORATION LICENCES GELs 156, 178 and 180

I, BARRY ALAN GOLDSTEIN, Director Petroleum and Geothermal, Minerals and Energy Resources, Department of Primary Industries and Resources in the State of South Australia, pursuant to section 25 of the *Petroleum Act 2000* and all other enabling powers, for and on behalf of Paul Holloway, Minister for Mineral Resources Development (Minister), pursuant to delegated powers dated 28 March 2002, Gazetted 11 April 2002, page 1573 vary the conditions of geothermal exploration licences GELs 156, 178 and 180 held by -

MNGI Pty Ltd

Condition 1 of the licence is omitted and the following substituted:

- “ 1. During the term of the licence, the Licensee shall carry out or cause to be carried out exploratory operations on the area comprised in the licence in accordance with such work programs as are approved by the Minister from time to time. Years one to five exploratory operations are guaranteed. These exploratory operations shall include but not necessarily be limited to:-

Year of Term of Licence	Minimum Work Requirements
One	<ul style="list-style-type: none"> <li>• Geological and Geophysical Review</li> <li>• Modelling and interpretation of geophysical data</li> <li>• Historical bore hole thermal data collection (where possible) and analysis</li> <li>• Shallow geothermal gradient test well (500m depth)</li> <li>• Down hole temperature gradient and wireline logging.</li> </ul>
Two	<ul style="list-style-type: none"> <li>• Commercial negotiations for funding</li> <li>• Magneto-tellurics trial survey</li> <li>• Diamond tail extension to geothermal gradient test well (1500m TD approximately)</li> <li>• Down hole temperature and wireline logging</li> <li>• Injection well design process underway.</li> </ul>
Three	<ul style="list-style-type: none"> <li>• Geological and Geophysical Review</li> </ul>
Four and Five	<ul style="list-style-type: none"> <li>• Injection well design completed</li> <li>• Drill 1<sup>st</sup> injection well</li> <li>• Down hole thermal analysis</li> <li>• Down hole stress analysis</li> <li>• Reservoir development &amp; modelling</li> <li>• Drill 1<sup>st</sup> production well (3.5 km)</li> <li>• Circulation testing</li> <li>• Commercial feasibility &amp; development study</li> <li>• Commercial negotiation for further funding</li> <li>• Drill 2<sup>nd</sup> production well to complete triplet (3.5 km)</li> <li>• Reservoir stimulation</li> <li>• Circulation testing</li> <li>• Commercial feasibility and development study</li> </ul> <p>(The year four and five work program may be conducted anywhere within the boundaries of GELs 156, 178, 180, 254 and 336).</p>

Dated: 26 March 2008

A handwritten signature in black ink, appearing to read 'BAG', with a long horizontal flourish extending to the right.

**BARRY A. GOLDSTEIN**  
**Director Petroleum and Geothermal**  
**Minerals and Energy Resources**  
**Primary Industries and Resources SA**  
**Delegate of the Minister for Mineral Resources Development**

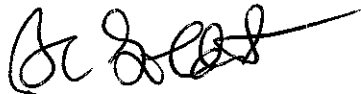
**Petroleum Act 2000  
S.115**

**MEMORANDUM**

**GEOHERMAL EXPLORATION LICENCES  
GEL 156; GEL 178; GEL 180; GEL 254**

SA 2007-22

Notation of registrable dealing as evidenced by Paralana Energy Farming Agreement dated 3 April 2007 between MNGI Pty Ltd and Beach Petroleum Limited is hereby entered on the public register.



**BARRY A. GOLDSTEIN  
Director Petroleum and Geothermal  
Minerals and Energy Resources  
Primary Industries and Resources SA  
Delegate of the Minister for Mineral Resources  
Development**

Date: 28 June 2007

27/2/261  
27/2/301  
27/2/305  
27/2/413

## PETROLEUM ACT 2000

## SECTION 25 (5) (b)

*Variation of Geothermal Exploration Licences—GELs 156, 178 and 180*

NOTICE is hereby given that under the provisions of the Petroleum Act 2000, pursuant to delegated powers dated 28 March 2002, *Gazetted*, 11 April 2002, page 1573, the conditions of the abovementioned Geothermal Exploration Licences have been varied as follows:

Condition 1 of the licence is omitted and the following substituted:

‘1. During the term of the licence, the Licensee shall carry out or cause to be carried out exploratory operations on the area comprised in the licence in accordance with such work programs as are approved by the Minister from time to time. Year one exploratory operations are guaranteed and any subsequent licence year becomes guaranteed upon entry into that year. These exploratory operations shall include but not necessarily be limited to:

Year of Term of Licence	Minimum Work Requirements
One	<ul style="list-style-type: none"> <li>• Geological and Geophysical Review</li> <li>• Modelling and interpretation of geophysical data</li> <li>• Historical bore hole thermal data collection (where possible) and analysis</li> <li>• Shallow geothermal gradient test well (500 m depth)</li> <li>• Down hole temperature gradient and wireline logging</li> </ul>
Two	<ul style="list-style-type: none"> <li>• Commercial negotiations for funding</li> <li>• Magneto-tellurics trial survey</li> <li>• Diamond tail extension to geothermal gradient test well (1 500 m TD approximately)</li> <li>• Down hole temperature and wireline logging</li> <li>• Injection well design process underway</li> </ul>
Three	<ul style="list-style-type: none"> <li>• Injection well design completed</li> <li>• Drill first injection well</li> <li>• Down hole thermal analysis</li> </ul> <p>(The year three work program may be conducted anywhere within the boundaries of GELs 156, 178, 180 and 254)</p>
Four	<ul style="list-style-type: none"> <li>• Reservoir development</li> <li>• Reservoir modelling</li> <li>• Drill first production well (3.5 km)</li> <li>• Circulation Testing</li> <li>• Commercial feasibility and development study</li> <li>• Commercial negotiation for further funding</li> </ul> <p>(The year four work program may be conducted anywhere within the boundaries of GELs 156, 178, 180 and 254)</p>
Five	<ul style="list-style-type: none"> <li>• Drill second production well to complete triplet (3.5 km)</li> <li>• Reservoir stimulation</li> <li>• Circulation testing</li> <li>• Commercial feasibility and development study</li> </ul> <p>(The year five work program may be conducted anywhere within the boundaries of GELs 156, 178, 180 and 254)</p>

Dated 23 November 2006.

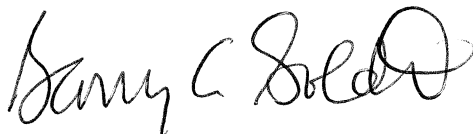
B. A. GOLDSTEIN,  
 Director Petroleum and Geothermal  
 Minerals and Energy Resources  
 Primary Industries and Resources SA  
 Delegate of the Minister for Mineral  
 Resources Development

**Petroleum Act 2000  
S.115**

**MEMORANDUM**

**GEOHERMAL EXPLORATION LICENCES  
GELS 156, 178 AND 180**

1. Variation of licence conditions is hereby entered on the public register.



**BARRY A. GOLDSTEIN  
Director Petroleum and Geothermal  
Minerals and Energy Resources  
Primary Industries and Resources SA  
Delegate of the Minister for Mineral Resources Development**

Date: 23 November 2006

Ref: 27/2/301  
27/2/305  
27/2/261

# Petroleum Act 2000

## VARIATION OF GEOTHERMAL EXPLORATION LICENCES GELS 156, 178 AND 180

I, BARRY ALAN GOLDSTEIN, Director Petroleum and Geothermal, Minerals and Energy Division, Department of Primary Industries and Resources in the State of South Australia, pursuant to section 25 of the *Petroleum Act 2000* and all other enabling powers, for and on behalf of Paul Holloway, Minister for Mineral Resources Development (Minister), pursuant to delegated powers dated 28 March 2002, Gazetted 11 April 2002, page 1573 vary the conditions of geothermal exploration licences GELs 156, 178 and 180, held by -

MNGI Pty Ltd

Condition 1 of the licence is omitted and the following substituted:

- “ 1. During the term of the licence, the Licensee shall carry out or cause to be carried out exploratory operations on the area comprised in the licence in accordance with such work programs as are approved by the Minister from time to time. Year one exploratory operations are guaranteed, and any subsequent licence year work program becomes guaranteed upon entry into any such licence year. These exploratory operations shall include but not necessarily be limited to:-

Year of Term of Licence	Minimum Work Requirements
One	<ul style="list-style-type: none"> <li>• Geological and Geophysical Review</li> <li>• Modelling and interpretation of geophysical data</li> <li>• Historical bore hole thermal data collection (where possible) and analysis</li> <li>• Shallow geothermal gradient test well (500m depth)</li> <li>• Down hole temperature gradient and wireline logging</li> </ul>
Two	<ul style="list-style-type: none"> <li>• Commercial negotiations for funding</li> <li>• Magneto-tellurics trial survey</li> <li>• Diamond tail extension to geothermal gradient test well (1500m TD approximately)</li> <li>• Down hole temperature and wireline logging</li> <li>• Injection well design process underway</li> </ul>
Three	<ul style="list-style-type: none"> <li>• Injection well design completed</li> <li>• Drill 1<sup>st</sup> injection well</li> <li>• Down hole thermal analysis</li> </ul> <p>(The year three work program may be conducted anywhere within the boundaries of GELs 156, 178, 180 and 254)</p>
Four	<ul style="list-style-type: none"> <li>• Reservoir development</li> <li>• Reservoir modelling</li> <li>• Drill 1<sup>st</sup> production well (3.5 km)</li> <li>• Circulation Testing</li> <li>• Commercial feasibility and development study</li> <li>• Commercial negotiation for further funding</li> </ul> <p>(The year four work program may be conducted anywhere within the boundaries of GELs 156, 178, 180 and 254)</p>

Five	<ul style="list-style-type: none"><li>• Drill 2<sup>nd</sup> production well to complete triplet (3.5 km)</li><li>• Reservoir stimulation</li><li>• Circulation testing</li><li>• Commercial feasibility and development study</li></ul> <p>(The year five work program may be conducted anywhere within the boundaries of GELs 156, 178, 180 and 254)</p>
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Dated: 23 November 2006



**BARRY A. GOLDSTEIN**  
**Director Petroleum and Geothermal**  
**Minerals and Energy Resources**  
**Primary Industries and Resources SA**  
**Delegate of the Minister for Mineral Resources Development**

**Petroleum Act 2000  
S.115**

**MEMORANDUM**

**GEOHERMAL EXPLORATION LICENCES  
GELs 156, 178 and 180**

1. Variation of licence conditions is hereby entered on the public register.



**BARRY A. GOLDSTEIN  
Director Petroleum  
Minerals and Energy Resources  
Primary Industries and Resources SA  
Delegate of the Minister for Mineral Resources Development**

Date: 17 January 2006

Ref: 27/2/261  
27/2/301  
27/2/305

# Petroleum Act 2000

## VARIATION OF GEOTHERMAL EXPLORATION LICENCES GELs 156, 178 and 180

I, BARRY ALAN GOLDSTEIN, Director Petroleum, Minerals and Energy Resources, Department of Primary Industries and Resources in the State of South Australia, pursuant to section 25 of the *Petroleum Act 2000* and all other enabling powers, for and on behalf of Paul Holloway, Minister for Mineral Resources Development (Minister), pursuant to delegated powers dated 28 March 2002, Gazetted 11 April 2002, page 1573 hereby vary the conditions of Geothermal Exploration Licences GELs 156, 178 and 180 held by -

MNGI Pty Ltd

Condition 1 of the licences is omitted and the following substituted:

- " 1. During the term of the licence, the Licensee shall carry out or cause to be carried out, exploratory operations on the area comprised in the licence in accordance with such work programs as are approved by the Minister from time to time. Year one exploratory operations are guaranteed, and any subsequent licence year work program becomes guaranteed upon entry into any such licence year. These exploratory operations may be undertaken anywhere within the area covered by GELs 156, 178 or 180 and shall include but not necessarily be limited to:-

Year of Term of Licence	Minimum Work Requirements
One	<ul style="list-style-type: none"><li>• Geological and Geophysical review</li><li>• Modelling and interpretation of geophysical data</li><li>• Historical bore hole thermal data collection (where possible) and analysis</li><li>• Shallow geothermal gradient test well (500m depth)</li><li>• Down hole temperature and wireline logging</li></ul>
Two	<ul style="list-style-type: none"><li>• Commercial negotiations for funding</li><li>• Magneto-tellurics trial survey</li><li>• Diamond tail extension to geothermal gradient test well (1500m TD approximately)</li><li>• Down hole temperature and wireline logging</li><li>• Injection well design process underway</li></ul>
Three	<ul style="list-style-type: none"><li>• Injection well design completed</li><li>• Drill 1<sup>st</sup> injection well</li><li>• Down hole thermal analysis</li><li>• Down hole stress analysis</li></ul>
Four	<ul style="list-style-type: none"><li>• Reservoir development</li><li>• Reservoir modelling</li><li>• Drill 1<sup>st</sup> production well (3.5 km)</li><li>• Circulation Testing</li><li>• Commercial feasibility and development study</li><li>• Commercial negotiations for further funding</li></ul>

Five	<ul style="list-style-type: none"><li>• Drill 2<sup>nd</sup> production well to complete triplet (3.5 km)</li><li>• Reservoir stimulation</li><li>• Circulation Testing</li><li>• Commercial feasibility and development study</li></ul>
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Dated: 17 January 2006

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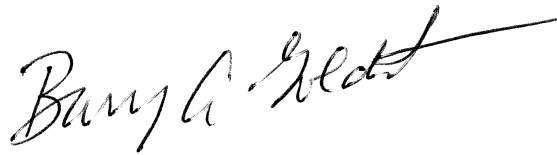
**BARRY A. GOLDSTEIN**  
**Director Petroleum**  
**Minerals and Energy Resources**  
**Primary Industries and Resources SA**  
**Delegate of the Minister for Mineral Resources**  
**Development**

***Petroleum Act 2000***  
**S.115**

**MEMORANDUM**

**GEOHERMAL EXPLORATION LICENCES**  
**GELs 156, 157, 158, 178, 180**

1. Notation of receipt of Security on 24 January 2005 is entered on the public register.



**BARRY A. GOLDSTEIN**  
**Director Petroleum**  
**Minerals and Energy Division**  
**Primary Industries and Resources SA**  
**Delegate of the Minister for Mineral Resources**  
**Development**

Date: 25 January 2005

File: 27/2/261  
27/2/262  
27/2/267  
27/2/301  
27/2/305

## PETROLEUM ACT 2000

*Surrender of Geothermal Exploration Licences—GEL 156 and GEL 157, dated 21 January 2004 and GEL 178 and GEL 180, dated 31 August 2004*

*Grant of Geothermal Exploration Licences—GEL 156, GEL 157, GEL 178 and GEL 180, effective from 23 November 2004*

NOTICE is hereby given that the undermentioned Geothermal Exploration Licences have been granted under the provisions of the Petroleum Act 2000, pursuant to delegated powers dated 28 March 2002, *Gazetted* 11 April 2002, page 1573. These licences supersede those of the same designation, granted on 21 January 2004 and 31 August 2004 and *Gazetted* 29 January 2004, page 282 and 9 September 2004, page 3606, which have been surrendered concurrently with the grant of the undermentioned Geothermal Exploration Licences effective from 23 November 2004.

No of Licence	Licenses	Locality	Area in km <sup>2</sup>	Reference
GEL 156	MNGI Pty Ltd	Arrowie Basin of South Australia	498	27/02/261
GEL 157	MNGI Pty Ltd	Arrowie Basin of South Australia	496	27/02/262
GEL 178	MNGI Pty Ltd	Arrowie Basin of South Australia	498	27/02/301
GEL 180	MNGI Pty Ltd	Arrowie Basin of South Australia	500	27/02/305

*Description of Area—GEL 156*

All that part of the State of South Australia, bounded as follows: Commencing at a point being the intersection of latitude 30°03'00"S GDA94 and longitude 139°29'00"E GDA94, thence east to longitude 139°41'00"E GDA94, south to latitude 30°07'00"S GDA94, west to longitude 139°40'00"E GDA94, south to latitude 30°10'00"S GDA94, west to longitude 139°37'00"E GDA94, south to latitude 30°12'00"S GDA94, west to longitude 139°34'00"E GDA94, south to latitude 30°13'00"S GDA94, west to longitude 139°32'00"E GDA94, south to latitude 30°15'00"S GDA94, west to longitude 139°29'00"E GDA94, south to latitude 30°17'00"S GDA94, west to the eastern boundary of the Arkaroola Gorge (National Estate Register), thence northerly and westerly along the boundary of the said Arkaroola Gorge to longitude 139°22'00"E GDA94, north to latitude 30°10'00"S GDA94, east to longitude 139°25'00"E GDA94, north to the southern boundary of the Freeling Heights Mythological Site (National Estate Register), thence easterly, northerly and westerly along the boundary of the said Mythological Site to longitude 139°25'00"E GDA94, north to latitude 30°08'00"S GDA94, east to longitude 139°27'00"E GDA94, north to latitude 30°05'00"S GDA94, east to longitude 139°29'00"E GDA94 and north to the point of commencement, but excluding Yudnamutana Gorge and Paralana Hot Springs areas (National Estate Register).

Area: 498 km<sup>2</sup> approximately.

*Description of Area—GEL 157*

All that part of the State of South Australia, bounded as follows: Commencing at a point being the intersection of latitude 29°36'00"S GDA94 and longitude 139°41'00"E GDA94, thence east to longitude 139°43'00"E GDA94, north to latitude 29°34'00"S GDA94, east to longitude 139°47'00"E GDA94, north to latitude 29°33'00"S GDA94, east to longitude 139°52'00"E GDA94, north to latitude 29°32'00"S GDA94, east to the western boundary of Strzelecki Regional Reserve, thence generally southerly along the boundary of the said Regional Reserve and the western boundary of Lake Callabonna Fossil Reserve (G.G. 5.12.1901) to latitude 29°42'00"S GDA94, west to longitude 139°42'00"E GDA94, north to latitude 29°41'00"S GDA94, west to longitude 139°41'00"E GDA94 and north to the point of commencement.

Area: 496 km<sup>2</sup> approximately.

*Description of Area—GEL 178*

All that part of the State of South Australia, bounded as follows: Commencing at a point being the intersection of latitude 30°03'00"S GDA94 and longitude 139°41'00"E GDA94, thence east to longitude 139°50'00"E GDA94, south to latitude 30°17'00"S GDA94, west to longitude 139°35'00"E GDA94, north to latitude 30°13'00"S GDA94, west to longitude 139°34'00"E GDA94, north to latitude 30°12'00"S GDA94, east to longitude 139°37'00"E GDA94, north to latitude 30°10'00"S GDA94, east to longitude 139°40'00"E GDA94, north to latitude 30°07'00"S GDA94, east to longitude 139°41'00"E GDA94 and north to the point of commencement.

Area: 498 km<sup>2</sup> approximately.

*Description of Area—GEL 180*

All that part of the State of South Australia, bounded as follows: Commencing at a point being the intersection of latitude 30°16'00"S GDA94 and longitude 139°34'00"E GDA94, thence east to longitude 139°35'00"E GDA94, south to latitude 30°17'00"S GDA94, east to longitude 139°50'00"E GDA94, south to latitude 30°20'00"S GDA94, west to longitude 139°41'00"E GDA94, south to latitude 30°21'00"S GDA94, west to longitude 139°39'00"E GDA94, south to latitude 30°23'00"S GDA94, west to longitude 139°38'00"E GDA94, south to latitude 30°25'00"S GDA94, west to longitude 139°37'00"E GDA94, south to latitude 30°26'00"S GDA94, west to longitude 139°36'00"E GDA94, south to latitude 30°28'00"S GDA94, west to longitude 139°35'00"E GDA94, south to latitude 30°31'00"S GDA94, west to longitude 139°24'00"E GDA94, north to latitude 30°27'00"S GDA94, east to longitude 139°26'00"E GDA94, north to latitude 30°26'00"S GDA94, east to longitude 139°27'00"E GDA94, north to latitude 30°24'00"S GDA94, east to longitude 139°28'00"E GDA94, north to latitude 30°23'00"S GDA94, east to longitude 139°29'00"E GDA94, north to latitude 30°22'00"S GDA94, east to longitude 139°30'00"E GDA94, north to latitude 30°21'00"S GDA94, east to longitude 139°31'00"E GDA94, north to latitude 30°19'00"S GDA94, east to longitude 139°33'00"E GDA94, north to latitude 30°17'00"S GDA94, east to longitude 139°34'00"E GDA94 and north to the point of commencement.

Area: 500 km<sup>2</sup> approximately.

Dated 23 November 2004.

B. A. GOLDSTEIN, Director Petroleum  
Minerals and Energy Division  
Primary Industries and Resources SA  
Delegate of the Minister for Mineral Resources Development

**Petroleum Act 2000  
S.115**

**MEMORANDUM**

**GEOHERMAL EXPLORATION LICENCES  
GELs 156, 157, 178 & 180**

1. These Licences granted on 23 November 2004 are hereby entered on the public register.
2. Interests in the licence are:-

MNGI Pty Ltd	100%
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**BARRY A. GOLDSTEIN  
Director Petroleum  
Minerals and Energy Division  
Primary Industries and Resources SA  
Delegate of the Minister for Mineral Resources  
Development**

Date: 23 November 2004

Ref: 27/2/261  
27/2/262  
27/2/301  
27/2/305

# PETROLEUM ACT 2000

## GEOHERMAL EXPLORATION LICENCE

### GEL 180

I, BARRY ALAN GOLDSTEIN, Director Petroleum, Minerals and Energy Division, Primary Industries and Resources, in the State of South Australia pursuant to the provisions of the *Petroleum Act 2000* and all other enabling powers, for and on behalf of Paul Holloway, Minister for Mineral Resources Development (Minister), pursuant to delegation dated 28 March 2002, (refer Government Gazette dated 11 April 2002 page 1573), HEREBY GRANT to:

**MNGI Pty Ltd**  
ACN 091 525 361

(hereinafter referred to as the Licensee) an Exploration Licence in relation to a source of geothermal energy in respect of the area set out below, to have effect for a period of five years and to expire on <sup>22 November</sup> 2009 but carrying the right of renewal under the *Petroleum Act 2000*.

*BAV*

### DESCRIPTION OF AREA

The land comprised in this licence is that part of the State of South Australia described in the Schedule hereto:

### CONDITIONS

1. During the term of the licence, the Licensee shall carry out or cause to be carried out, exploratory operations on the area comprised in the licence in accordance with such work programs as are approved by the Minister from time to time. Year one exploratory operations are guaranteed, and any subsequent licence year work program becomes guaranteed upon entry into any such licence year. These exploratory operations shall include but not necessarily be limited to:-

Year of Term of Licence	Minimum Work Requirements
One	<ul style="list-style-type: none"><li>• Geological and Geophysical review</li><li>• Modelling and interpretation of geophysical data</li><li>• Historical bore hole thermal data collection (where possible) and analysis</li><li>• Historical bore hole conductivity study</li><li>• Theoretical modelling of thermal and stress regimes</li></ul>
Two	<ul style="list-style-type: none"><li>• Commercial negotiations for funding</li><li>• Magneto-tellurics trial survey</li><li>• Final target selection</li><li>• Drill shallow test well</li></ul>
Three	<ul style="list-style-type: none"><li>• Drill and complete one test hole</li><li>• Down hole thermal analysis</li><li>• Down hole stress analysis</li><li>• Reservoir modelling</li></ul>

<b>Four</b>	<ul style="list-style-type: none"> <li>• Commercial feasibility and development study</li> <li>• Commercial negotiations for further funding</li> </ul>
<b>Five</b>	<ul style="list-style-type: none"> <li>• Convert test well to injection well</li> <li>• Hydraulic stimulation of granite</li> <li>• Drilling of trial production well</li> <li>• Fracture, circulation and recovery tests</li> <li>• Model theoretical power production using well data</li> </ul>

2. The Licensee must take all reasonable precautions to minimise the risks of its activities resulting in a significant loss of petroleum reserves or a significant reduction in the recovery of petroleum reserves.
3. The Licensee must:
  - (a) upon commencement of regulated activities under this licence, maintain in force during the term of this licence public liability insurance to cover regulated activities under this licence (including sudden and accidental pollution) in the name of the Licensee for a sum not less than twenty million dollars (\$20,000,000.00) or such greater sum as specified by the Minister and make such amendments to the terms and conditions of the insurance as the Minister may from time to time require;
  - (b) maintain in force during the drilling of any well or operation in any well, control of well insurance in the name of the Licensee for a sum not less than ten million dollars (\$10,000,000.00) or such greater sum as specified by the Minister and make such amendments to the terms and conditions of the insurance as the Minister may from time to time require;
  - (c) upon request by the Minister, provide the Minister with a cover note or certificate of currency of each insurance policy referred to in paragraphs (a) and (b).
4. The Minister in specifying the levels of insurance accepts no liability for the completeness of their listing, the adequacy of the sum insured, the limit of liability, the scoped coverage, the conditions or exclusions of these insurances in respect to how they may or may not respond to any loss, damage or liability.
5. The Licensee will ensure, when preparing an Environmental Impact Report under Part 12 of the *Petroleum Act 2000*, that the report also includes an assessment of the potential economic consequences for other licensees under the *Petroleum Act 2000* or *Mining Act 1971* and owners of land, arising out of proposed regulated activities to be carried out in the licence area.
6. The Licensee must keep confidential any measurements made in a well which would enable the estimation of petroleum reserves ("Confidential Information") and must not disclose the Confidential Information without first obtaining the written consent of the licensee of the overlapping compatible licence, unless:
  - (a) it is a disclosure required under the Act, this licence or any other law;
  - (b) it is a disclosure which is for the purposes of prosecuting or defending any legal proceedings; or
  - (c) it is information which is or becomes public knowledge other than by breach of this licence condition.
7. A contract or agreement entered into by the licensee to transfer or accept liability for any well or facility constructed for the purpose of undertaking a regulated activity

under the *Petroleum Act 1940* or *2000* cannot transfer, limit or exclude liability under the *Petroleum Act 2000* unless written consent of the Minister is obtained.

8. In the event that the Licensee during any year of the term of this licence (a year being the period of twelve calendar months ending on the anniversary of the date upon which the licence comes into force) fails to comply with the work program requirements of this licence, it is an express term of this licence that the Minister then may use discretion to either cancel this licence or authorise such variation to these requirements as the Minister thinks fit.
9. The Licensee shall during periods determined by the Minister, lodge and maintain with the Minister, for the satisfaction of obligations arising under the Act or this licence, a security of \$50,000 (fifty thousand dollars) or such greater sum as specified by the Minister from time to time.

("the Security").

- 9.1 The Security shall be lodged in the form of either;
  - (a) cash; or
  - (b) an unconditional, irrevocable bank guarantee or letter of credit in a form, and from a financial institution, approved by the Minister,
- 9.2 Interest will not be payable by the Minister to the Licensee on any cash Security.
- 9.3 All charges incurred by the Licensee in obtaining and maintaining the Security shall be met by the Licensee.
- 9.4 If upon expiry, this Licence is not renewed and the Minister is satisfied that there are no further obligations under this Licence or the Act, the Minister will return the Security to the Licensee.

Date: 23 November.....2004



.....  
**BARRY A. GOLDSTEIN**  
**Director Petroleum**  
**Minerals and Energy Division**  
**Primary Industries and Resources SA**  
**Delegate of the Minister for Mineral Resources Development**

Signed by the said LICENSEE

Date:.....19/11.....2004

.....*P. Reid*.....

Authorised Representative

.....Peter Reid.....

Name

.....CEO.....

Position

.....Petratherm.....

Company

.....*Derek Carter*.....

Authorised Representative

.....DEREK CARTER.....

Name

.....DIRECTOR.....

Position

.....PETRATHERM LTD.....

Company

# GEOTHERMAL EXPLORATION LICENCE

## GEL 180

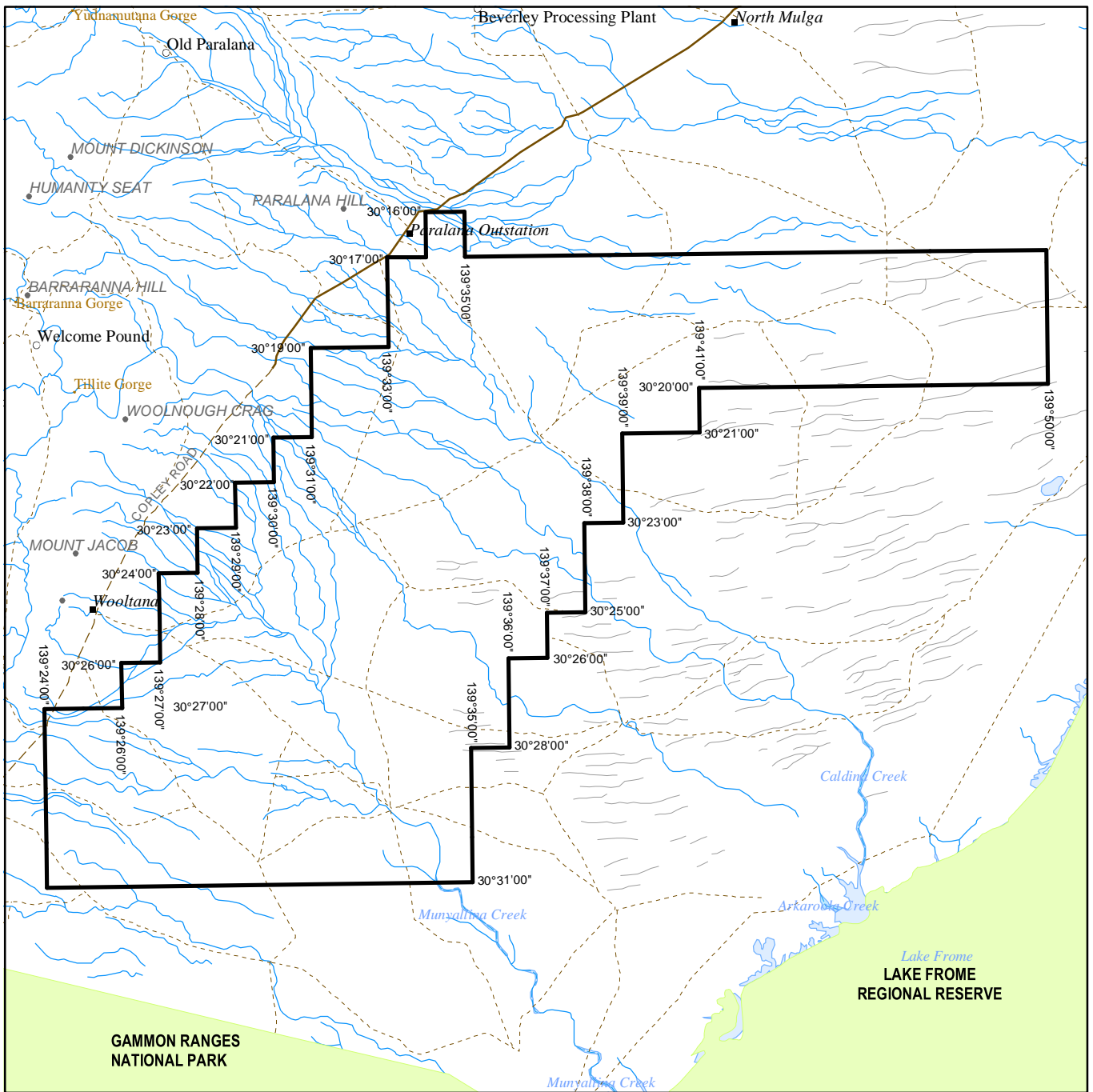
### THE SCHEDULE

#### Description of Area

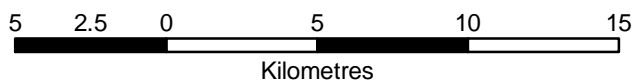
All that part of the State of South Australia, bounded as follows:-

Commencing at a point being the intersection of latitude 30°16'00"S GDA94 and longitude 139°34'00"E GDA94, thence east to longitude 139°35'00"E GDA94, south to latitude 30°17'00"S GDA94, east to longitude 139°50'00"E GDA94, south to latitude 30°20'00"S GDA94, west to longitude 139°41'00"E GDA94, south to latitude 30°21'00"S GDA94, west to longitude 139°39'00"E GDA94, south to latitude 30°23'00"S GDA94, west to longitude 139°38'00"E GDA94, south to latitude 30°25'00"S GDA94, west to longitude 139°37'00"E GDA94, south to latitude 30°26'00"S GDA94, west to longitude 139°36'00"E GDA94, south to latitude 30°28'00"S GDA94, west to longitude 139°35'00"E GDA94, south to latitude 30°31'00"S GDA94, west to longitude 139°24'00"E GDA94, north to latitude 30°27'00"S GDA94, east to longitude 139°26'00"E GDA94, north to latitude 30°26'00"S GDA94, east to longitude 139°27'00"E GDA94, north to latitude 30°24'00"S GDA94, east to longitude 139°28'00"E GDA94, north to latitude 30°23'00"S GDA94, east to longitude 139°29'00"E GDA94, north to latitude 30°22'00"S GDA94, east to longitude 139°30'00"E GDA94, north to latitude 30°21'00"S GDA94, east to longitude 139°31'00"E GDA94, north to latitude 30°19'00"S GDA94, east to longitude 139°33'00"E GDA94, north to latitude 30°17'00"S GDA94, east to longitude 139°34'00"E GDA94, and north to point of commencement.

AREA: **500** square kilometres approximately.



SCALE 1:250 000



Note: There is no warranty that the boundary of this licence is correct in relation to other features of the map. The boundary is to be ascertained by reference to the Geocentric Datum of Australia (GDA94) and the schedule.

THE PLAN HEREINBEFORE REFERRED TO

**PETROLEUM EXPLORATION LICENCE NO: 180**