Greenearth Energy Ltd.
A.C.N 120 710 625

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Inferred Geothermal Resource offers Onshore Gippsland Area a "Green Energy Alternative"

- **Inferred Geothermal Resource of 3,600PJ**
- **Second Published Geothermal Resource Play in Victoria**
- **Hot Sedimentary Aquifer (HSA) Geothermal System Opportunity**
- **Significant Renewable Energy opportunity in Onshore Gippsland**

Greenearth Energy Limited ("GER") wishes to announce the results of its Inferred Resource work, completed for the Seaspray area contained within its Geothermal Exploration Permit GEP13, which encompasses the Onshore Gippsland Region. The results of the work completed for Greenearth Energy by consultants Hot Dry Rocks Pty Ltd have produced an estimation of a significant inferred resource of approximately 3,600 petajoules (PJ) encompassing a Hot Sedimentary Aquifer (HSA) geothermal "play".

This resource estimation is the second geothermal resource published for a Victorian geothermal play (the first being published by Greenearth Energy on December 4 2008) and has the potential to host a producing geothermal field. The Inferred Resource Estimate complies with the Australian Code for Reporting Exploration Results, Geothermal Resources and Geothermal Reserves (2008 Edition). The Statement of Estimated Geothermal Resources for the Wombat Geothermal Play, GEP13 is attached and a full report can be supplied on request.

The inferred resource is confined to the area of the Wombat 3D seismic survey carried out in early 2008 that covered an area of 29km^2 which represents **only 0.54% of Greenearth Energy's GEP13 permit area**. The inferred resource of 3,600PJ covers an area of 27.5km^2 and encompasses an area of stored heat energy that is contained in a 14.5km^3 volume of rock. Only 2.8% of the stored heat would have to be recovered over a 30 year project life to generate a constant flow of 10MWe.

Greenearth Energy's Managing Director, Mark Miller commented, "This is a second Victorian geothermal find in as many months by Greenearth Energy and once again represents a step forward in our quest for renewable, sustainable, base load, emissions free energy. Given its location close to townships, intersecting with existing infrastructure the possibilities it presents for the region, the State and the company are very exciting. Again we have here the potential to deliver clean, safe, renewable energy to townships and industries alike in this most picturesque part of Victoria. Additionally, the geological nature of this find being a Hot Sedimentary Aquifer (HSA) may well afford Greenearth Energy and its partners a view of the potential for these systems to provide onshore CO_2 storage at depth."

"A genuine win-win whereby we may not only be able to produce emissions free renewable geothermal energy, we may also at the same time be able to store CO_2 at depth in a relatively cost effective manner"

"Following on from our Greater Geelong region find only last month we are delighted at the potential and proximity of this renewable energy resource and will endeavour to bring this play to fruition by way of partnering with community, industry and government. Our inferred resource estimate at Seaspray of 3,600PJ represents for Greenearth Energy and its partners, a significant long-term renewable energy proposition that demands further exploration and development. We believe that the rock units that contain the inferred resource identified in the area of the small Wombat 3D survey extend under the Gippsland Basin including the emissions challenged Latrobe Valley area. We will be actively working to partner with government and industry alike to map these zones and significantly extend not only our understanding of this area geologically but also our resource base. With 3600PJ discovered in only 0.54% of GEP13 this augers well for our combined onshore Gippsland and Latrobe Valley (GEP12) permit areas"

"Progression to the next stage has already begun with the inclusion of this estimation work as part of our Geothermal Drilling Program (GDP) application. We are also aware that this opportunity fulfils the requirements specified by the Victorian Government's Sustainable Energy Large Scale Demonstration Funding and will be pursuing this avenue as well in 2009"

Mark Miller
Managing Director
Greenearth Energy Limited
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GREENEARTH ENERGY LIMITED
Statement of Estimated Geothermal Resources
Wombat, GEP13 as at 18 December 2008

Wombat Geothermal Play, Victoria (GER 100%)

Greenearth Energy Limited is the 100% holder of Geothermal Exploration Permit (GEP) 13, which was granted on 14 May 2007 for 5 years and is 5,155 km^2 in area. The permit is being explored for both Hot Sedimentary Aquifer (HSA) electricity generation and 'direct use' applications.

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Location and Geological Setting

The Wombat Geothermal Play lies within the northeast portion of Geothermal Exploration Permit GEP 13, approximately 200 km ESE of Melbourne, and is within the Gippsland Basin, an asymmetrical graben that covers approximately 16,000 km^2 of southeast onshore Victoria. (Fig. 1).

Two major tectonic phases define the evolution of the Gippsland Basin: Early Cretaceous extension and Late Cretaceous rifting which opened the Tasman Sea.

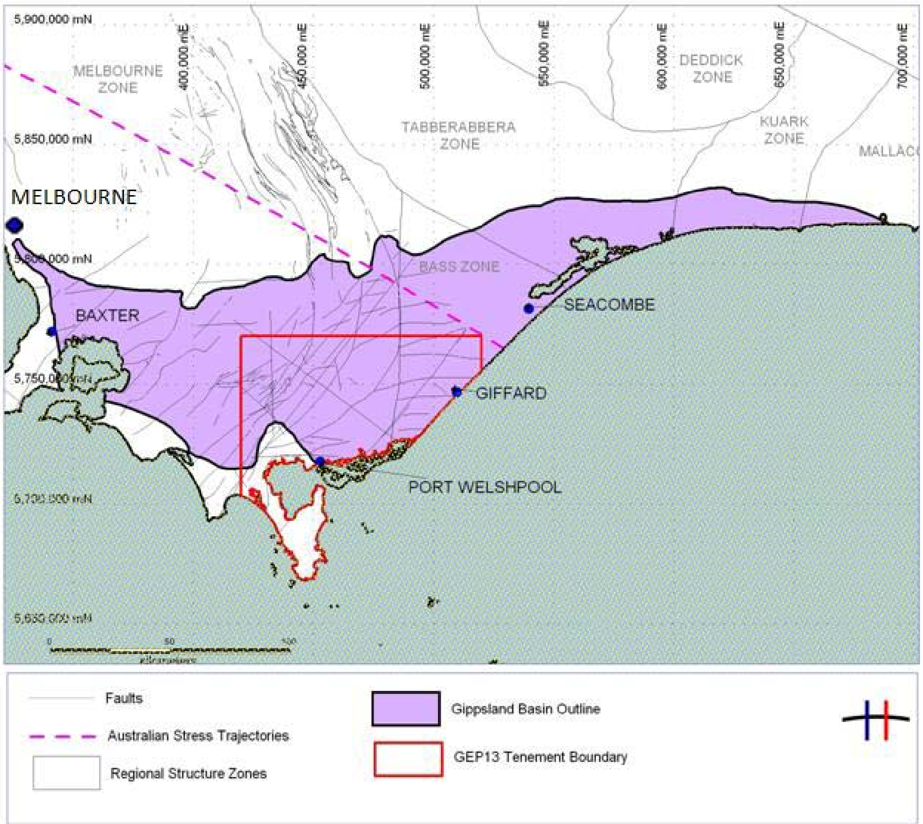

Figure 1. Location of GEP13 and the onshore Gippsland Basin.

The Early Cretaceous rifting event led to the accumulation of thick deposits of terrestrial quartzose and volcaniclastic sediments, the Strzelecki Group. This unit comprises the bulk of the onshore section of the basin. Later, the depositional style of the basin had changed to an internally drained system, within which the deep lacustrine shales and coarse-grained fluvial deltaic siliciclastics of the Emperor Subgroup were deposited.

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The Eocene to Oligocene succession is more or less confined to the present-day onshore Gippsland Basin and comprises a series of coal-bearing sediments termed, in ascending stratigraphic order, the Traralgon, the Morwell and the Yallourn Formations. This Subgroup, the Latrobe Valley Group, is a lateral facies equivalent of the Seaspray Group, a marine carbonate sequence covering the present day offshore Gippsland Basin and parts of the coastal fringe near Lakes Entrance. The Latrobe Valley Group occupies a broadly east–west trending graben that has been folded by motions of underlying faults into anticlinal, synclinal and monoclinal regional structures, all of which control deposition and thickness of the coal-bearing strata.

The upper portion of the Seaspray Group is elsewhere represented in the onshore section by marine to partially marine units, including the Lakes Entrance Formation.

Unconformably overlying the Seaspray Group is a sequence of non-marine to marginal marine clastics and carbonates of Late Miocene to Pliocene age, termed the Sale Group.

Hot Sedimentary Aquifer Target

Principle of Hot Sedimentary Aquifer (HSA) geothermal plays

Certain rock formations, particularly coarser grained sedimentary rocks such as sandstones, grits and conglomerates are permeable to waters and gasses (‘fluids’) under pressure and the fluids may move laterally through the formation, including up or down if the formation is not flat lying. Where they hold such fluids, such formations may be called a reservoir. Faults may also channel fluids between reservoirs or even close to the surface.

Generally, the temperature of rocks increases with depth so fluids in deeper buried rocks are usually hotter than shallower reservoirs. The effect can be greater in the presence of recent volcanic rocks or naturally heated granites. A well penetrating the hot reservoir can bring hot water to the surface, where it can be used to generate electricity or be used directly in heating and drying applications. The heat depleted fluid can then be returned ‘downstream’ in the reservoir via a second well.

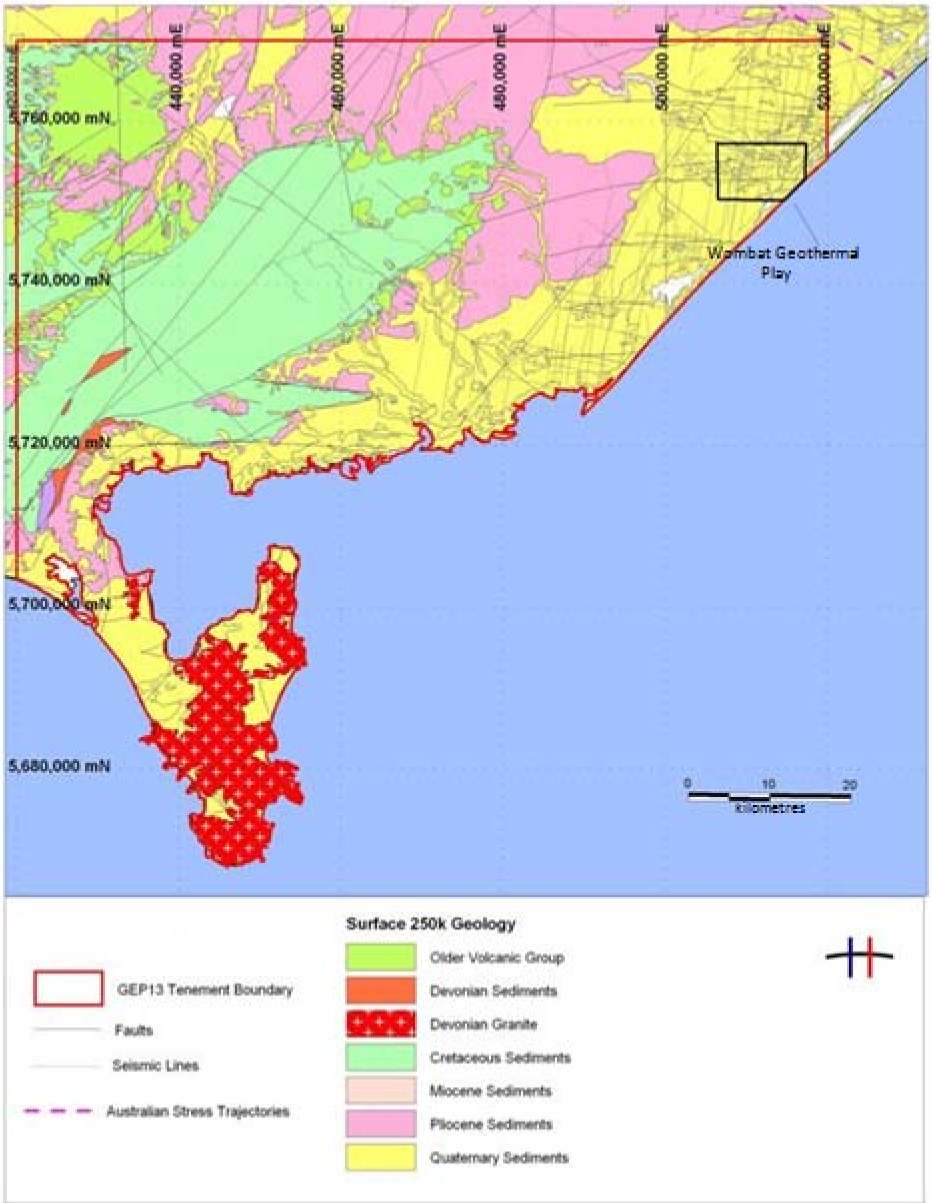

Figure 2. Surface geology in GEP13

HSA reservoir within GEP13

Greenearth Energy Limited is targeting a HSA geothermal play within the basal units of the Strzelecki Group—the Tyers River Subgroup . The Tyers River Subgroup is divided into two main stratigraphic units—Tyers Conglomerate and the Rintouls Creek Formation. The latter has been described as thick fluvial quartzose sediments that formed in response to rapid tectonic extension as rifting between Antarctica and Australia. The units are particularly well developed adjacent to basin margins, where large volumes of detritus were shed from palaeo-topographic highs.

The company considers the Tyers River Subgroup prospective for permeability and porosity parameters sufficient to support geothermal development and the company's geothermal consultants, Hot Dry Rocks P/L (HDRPL) believe this to be a reasonable expectation. Figure 3 illustrates the exploration model underpinning the Wombat Geothermal Play.

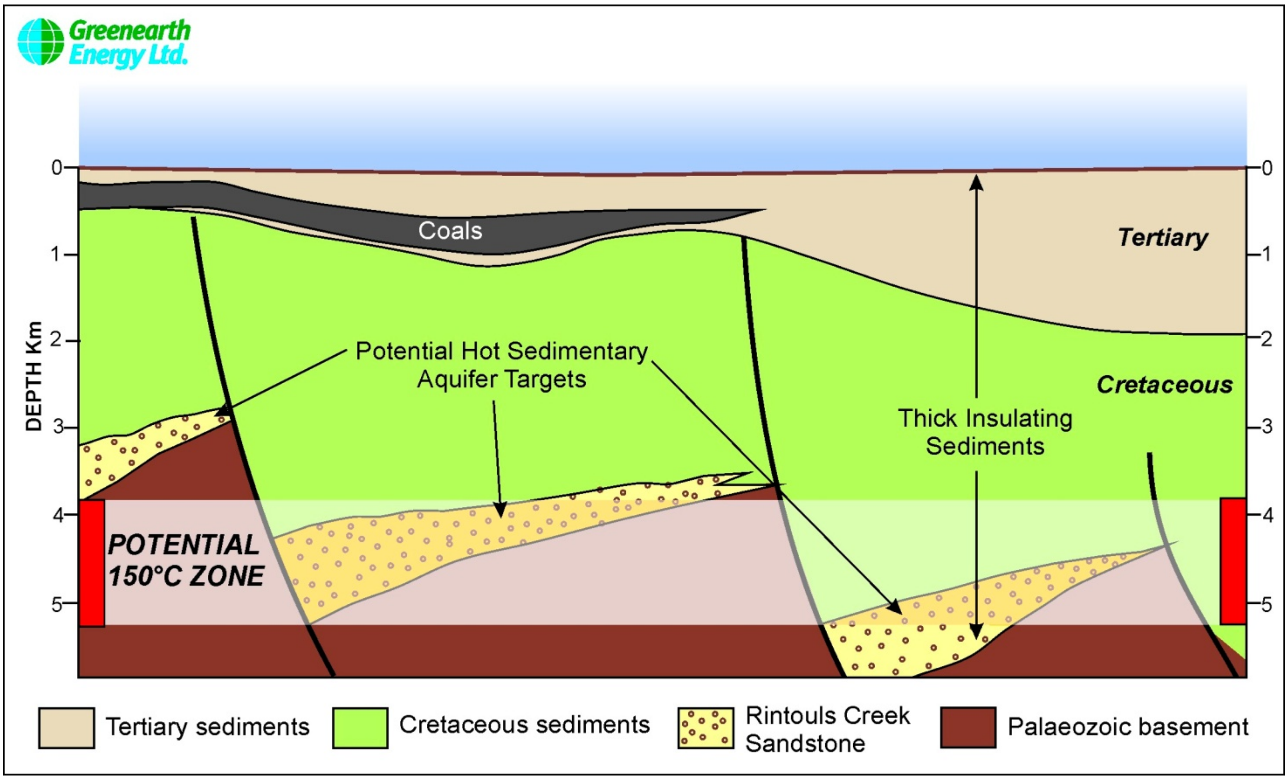

Figure 3. Schematic interpretative cross section showing relationships within the Wombat Geothermal Play.

Seismic data through the Geothermal Play area define an Early Cretaceous syn-rift succession thickening towards the Wombat and Macalister Faults. Seismic data quality deteriorates at depth due to signal attenuation by the Latrobe Coal Measures, but the data are of sufficient quality to enable the interpretation of Basement and the top of the Tyers Sub-group in the hanging wall of the Wombat Fault. Although not well imaged by the Wombat 3D seismic survey due to noise, there is reasonable evidence, based on reflection characteristics, to suggest that the Rintouls Creek Formation is present at a depth ~300m beneath the top Tyers Sub-group unconformity.

The HSA target reservoir for this model comprises the Rintouls Creek Formation in the hanging wall of the Wombat Fault. The fault defines the edge of an Early Cretaceous half graben with thickening succession towards the southwest. The interpreted Rintouls Creek Formation is therefore a wedge shape that ranges from a thickness of approximately 1000 metres in the southwest to steadily pinch out in the northeast (Fig.4).

Resource Estimation

Methodology

HDRPL used a ‘stored heat’ method to estimate the geothermal resource in the sedimentary reservoir units that make up the geothermal play. This is a technique for estimating the total heat energy contained within a target volume, for which a realistic chance exists for economic extraction. The method requires the estimation of the volume, density, specific heat capacity and temperature of the target reservoir units, a consideration of the realistic lowest economically extractable temperature (‘cut-off temperature’) and the amount of thermal energy that might be extracted from the resource fluids (related to the ‘rejection temperature’).

The principal tool HDRPL used to estimate the geothermal resource is a numerical three-dimensional temperature inversion algorithm. This algorithm populates a numerical 3D model of the geothermal play with values of rock density, specific heat, thermal conductivity and heat generation. The software then solves the steady state conductive heat flow equation throughout the model space, constrained by surface heat flow and surface temperature data. The inferred equilibrium temperature distribution within the reservoir units was subsequently used for a volumetric calculation of stored heat.

Geological model and thermal properties

Interpretation of the Wombat 3D seismic data provided the framework for a 3D numerical geological model. The model consists of six units representing stratigraphic groupings from the Basement (oldest unit) up to the Tertiary (youngest unit). Mean thermal conductivity values for the units were derived from values measured on samples from the Gippsland Basin.

A 3D view of the EGS reservoir geological model is shown in Figure 4.

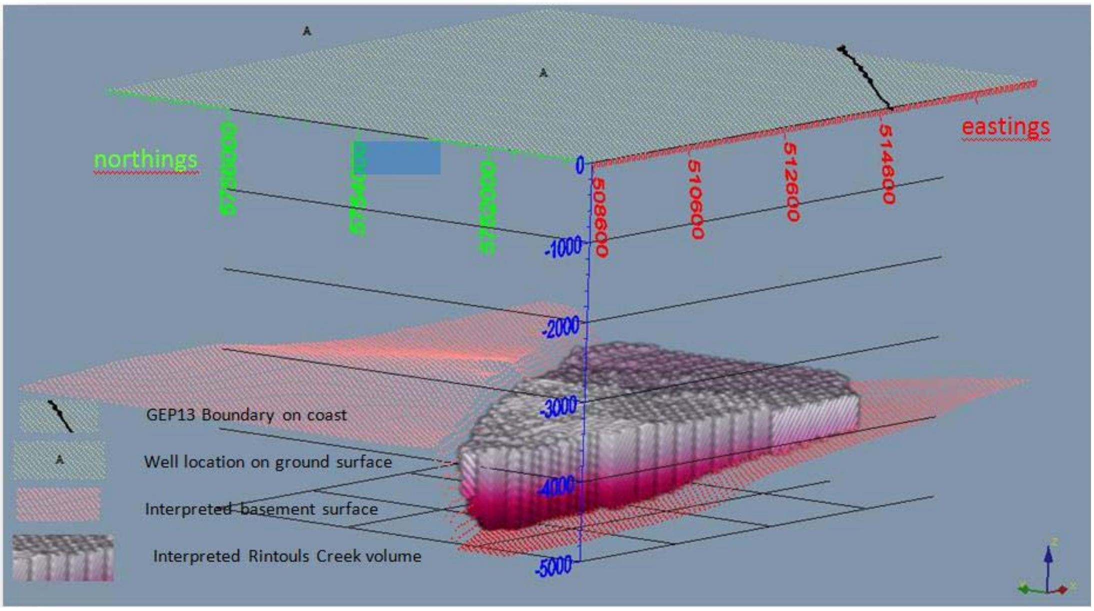

Figure 4 Example output from the reservoir 3D geological model, looking north-east, showing as solid the Rintouls Creek formation.

Heat flow

Heat flow has been constrained via down hole temperature measurements and related thermal conductivity values for the stratigraphy in the Wombat 1, Wombat 2, Wombat 3 and McCreesh 1 petroleum wells in the resource area. An assessment of the data indicated that heat flow in the Wombat Geothermal Play is 70 ± 7 mW/m^2, where the uncertainty limit was a 'one sigma' estimate derived from the uncertainties in the thermal conductivity estimates. Location of these wells on surface projection of the inferred reservoir is shown on Figure 5.

Cut-off and rejection temperatures

The 'cut-off temperature' is the *minimum economic reservoir fluid temperature for commercial energy extraction*. The cut-off isotherm may therefore define the upper surface of a resource volume and is an essential input to the volumetric calculations required to infer a resource.
The geothermal resources in this report have been estimated assuming a cut-off temperature of 125°C and a rejection temperature of 70°C. A rejection temperature of 70°C is commonly assumed in pre-feasibility studies for geothermal developments as it is the average temperature at which an air-cooled binary cycle geothermal plant rejects the geothermal fluid. Both cut-off and rejection temperatures are strongly dependent on the technology used to convert thermal energy into electrical energy. Greenearth Energy Limited and Dr G. Beardsmore believe the above values are appropriate for currently available air cooled organic rankine cycle (ORC) technology assisted with down hole pumps.

Reservoir volume

The lateral extent of the geothermal resource for all reservoir units is defined by the reasonable limit of interpretation that the available seismic data allows. The maximum vertical extent of the reservoir is constrained by the top and bottom surfaces of the Rintouls Creek unit in the Tyers sub Group. For the resource estimation, the top surface is the deepest of: a) the top of the reservoir unit, or b) the intersection of the unit with the 125°C isotherm. The base of the reservoir is the base of the interpreted Rintouls Creek Formation, as it is not interpreted to extend below reasonable drilling depth (5000 m). The estimated volume of the reservoir is 14.8 km^3.

Reservoir density and specific heat

The density and specific heat of the HSA reservoir were derived from measurements on four core specimens of Crayfish Group sandstone from the Otway Basin. Greenearth Energy and Dr G. Beardsmore consider that the Rintouls Creek Formation may have similar characteristics to sandstones from the Crayfish group in the Otway Basin. Three samples of each core were measured.

The mean density of the twelve samples was 2,523 kg/m^3; the mean specific heat, measured at an average 68°C, was 927 J/kgK.

Heat generation

The modelled temperature (thus the geothermal resource) in a reservoir depends on the amount of internal heat generation in the particular reservoir and also in the overlying units. Greenearth Energy Limited consultants HDRPL relied on published data to estimate heat generation of 1 $\mu W/m^3$ within the overlying Strzelecki Formation, and 0 $\mu W/m^3$ for all other units except the basement.In the absence of direct measurements from the basement, the value for Ordovician pelites (2.52 $\mu W/m^3$) from the Lachlan Fold Belt was used for the heat generation capacity of the basement.

Reservoir temperature

HDRPL utilised a numerical three-dimensional temperature inversion algorithm to estimate the store heat within the reservoir(s).

The algorithm ‘voxelated’ the earth model; that is, divided it into discrete rectangular prismatic cells, with the thermal properties of each cell determined by the geological unit within which the cell lay. The dimensions of the individual cells were 200 x 200 x 40 m in the E–W, N–S and vertical directions, respectively. A numerical iterative process then computed in three dimensions the simplest distribution of temperature that fit the observations, while respecting the laws of conductive heat transfer and the thermal properties of the geological strata. The temperature dependence of thermal conductivity was also taken into account.

A total of three models were run, using the ‘high’, ‘median’ and ‘low’ heat flow estimates, respectively. These models returned corresponding ‘high’, ‘mean’ and ‘low’ Inferred Resource estimates.

Classification of Resource

Taking into account the density of data, the level of confidence in the data used in the estimation, and the requirements of the *Australian Code for Reporting of Exploration Results, Geothermal Resources and Geothermal Reserves (2008 Edition)*, it is appropriate to classify the HSA resource at the Wombat geothermal play as an Inferred Geothermal Resource.

Wombat Inferred Geothermal Resource (100% Greenearth Energy)

For the model parameters and constraints given above, the geothermal algorithm computed the simplest temperature distribution to explain the observed surface heat flow value. For each discrete modelled cell of the HSA reservoir the Inferred Geothermal Resource was calculated from the volume, density, specific heat and temperature of the cell. The total inferred stored heat (thermal energy in place) for the target reservoir was found from the sum of all individual cells within that unit. The estimated Inferred Geothermal Resource is given in Table 1.

Table 1. **Wombat** Geothermal play inferred geothermal resource (100% GER)

Reservoir	**Inferred Geothermal Resource Estimated thermal energy in place petaJoules (PJ)**
Rintouls Creek Formation	3,600 +/- 800

Greenearth Energy has made no estimate of the recoverable thermal energy or the net generating potential of its Inferred Geothermal Resources.

The above estimates assume that commercially available air cooled, organic rankine cycle binary plants would be used to harness the thermal energy brought to the surface and that no additional energy is conducted or convected into the respective reservoirs during future possible production.

The location of the surface projection of the Inferred Geothermal Resource is shown in Figure 5, together with relevant infrastructure and features used in estimating the resource. Appendix 1 summarises the key assumptions and parameters involved in the above estimate and selected terms are explained in Appendix 2.

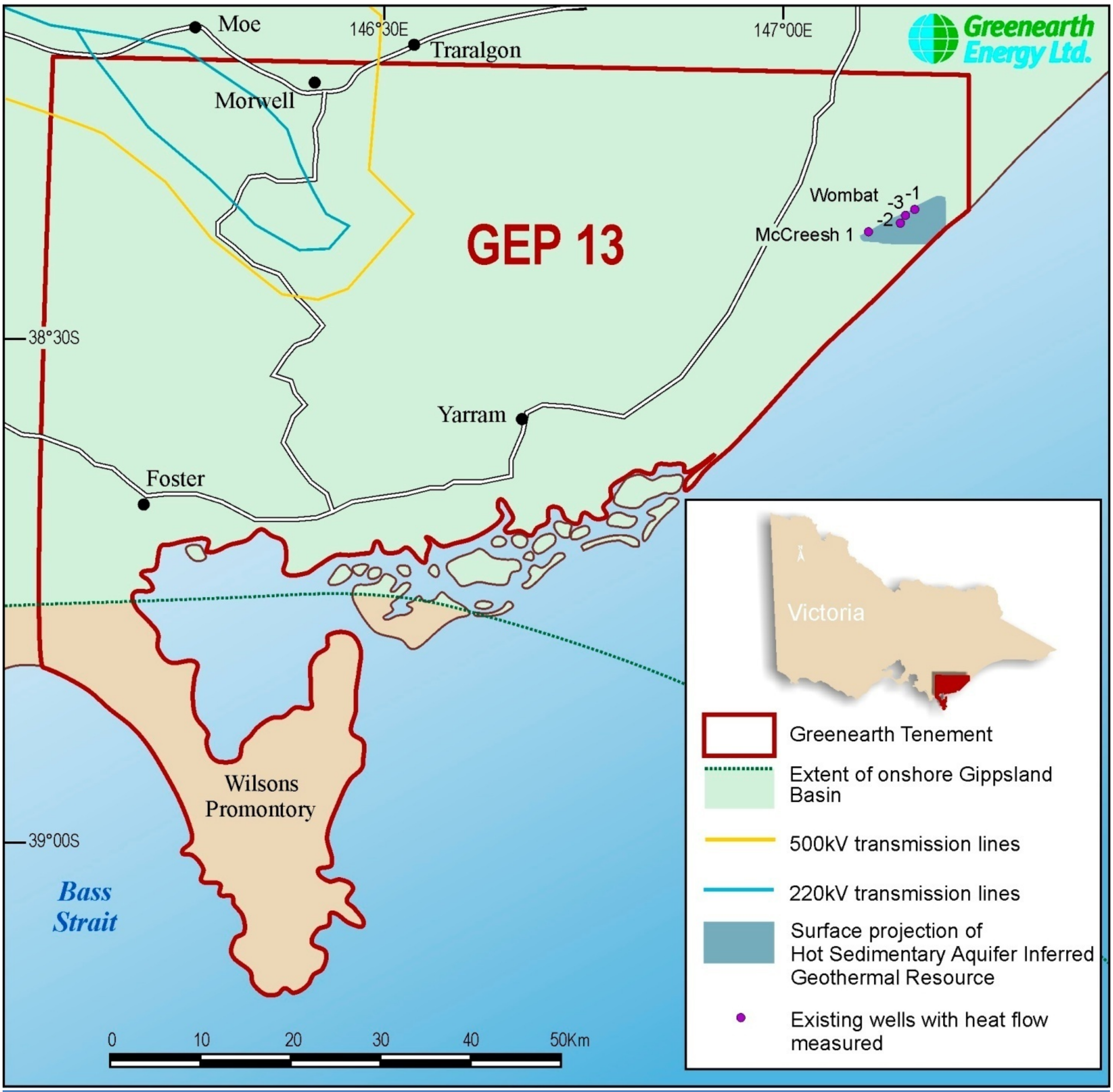

Figure 5. GEP13 showing surface projection of the Inferred Geothermal Resource, wells with measured heat flow, major transmission lines and roads.

The information in this report that related to Geothermal Resources has been compiled by Dr Graeme Beardsmore, an employee of Hot Dry Rocks Pty Ltd. Dr Beardsmore has over 15 years experience in the determination of crustal temperatures relevant to the style of geothermal play under consideration, is a member of the Australian Society of Exploration Geophysicists and abides by the Code of Ethics of that organization.

Dr Beardsmore qualifies as a Competent Person as defined in the *Australian Code for Reporting of Exploration Results, Geothermal Resources and Geothermal Reserves (2008 Edition).* Dr Beardsmore consents to the public release of this report in the form and context in which it appears.

Appendix 1 Summary of key assumptions and parameters used in the estimate

	Value
Cut-off temperature	125°C
Rejection temperature	70°C
Base of reservoir	5.0 km
Heat flow	70 ± 7 mW/m^2
Reservoir volume	14.8 km^3
Density of reservoir	2,523 kg/m^3
Specific heat @ 68°C	927 J/kgK
Average reservoir temperature	157°C

Appendix 2. Selected glossary

Basalt	A type of volcanic rock.
Basement	The lowest most horizon considered in a geological assessment.
Basin	A three dimensional accumulation of sediments, usually thicker in the middle than on the edges.
Cover sequence	A series of rocks which over-lie the horizons of principal interest.
Cut off temperature	The minimum economic reservoir fluid temperature for commercial energy extraction.
Density	A physical property of matter such as rocks measured in mass per unit volume (eg tonnes per per cubic metre, t/m^3).
Fault	A planar break in geological strata.
Heat flow	The amount of thermal energy passing through a standard area, usually expressed as milliWatts per square metre (mW/m^2).
Isotherm	A line or surface joining points of equal temperature
Organic rankine cycle	A process whereby heat can be exchanged from a hot fluid to a cooler one and vice versa via the use of a liquid organic compound which has a lower boiling point than the source fluid. Used in certain geothermal electricity generating plants where the fluid temperature is suitable.
Rejection temperature	The temperature of the geothermal fluid once it has passed through a power conversion process, prior to reinjection.
Reservoir	A body of rock with certain permeability and porosity characteristics which enable it to hold fluids of economic interest.
Sandstone	A coarse grained sedimentary rock chiefly composed of silica grains.
Seismic line	A line across the ground surface along which a seismic survey (involving the reading of vibrations induced in the shallow earth by a source) has or will be read.
Specific heat	The amount of energy required to raise the temperature of 1kg of substance by 1°C; otherwise known as relative heat capacity, usually measured in Joules per kilogram per degree Kelvin ($J/kg^{-1}K^{-1}$)
Turbidite	A coarse grained sedimentary rock, interpreted to have been deposited in oceans.
Well	A bore hole

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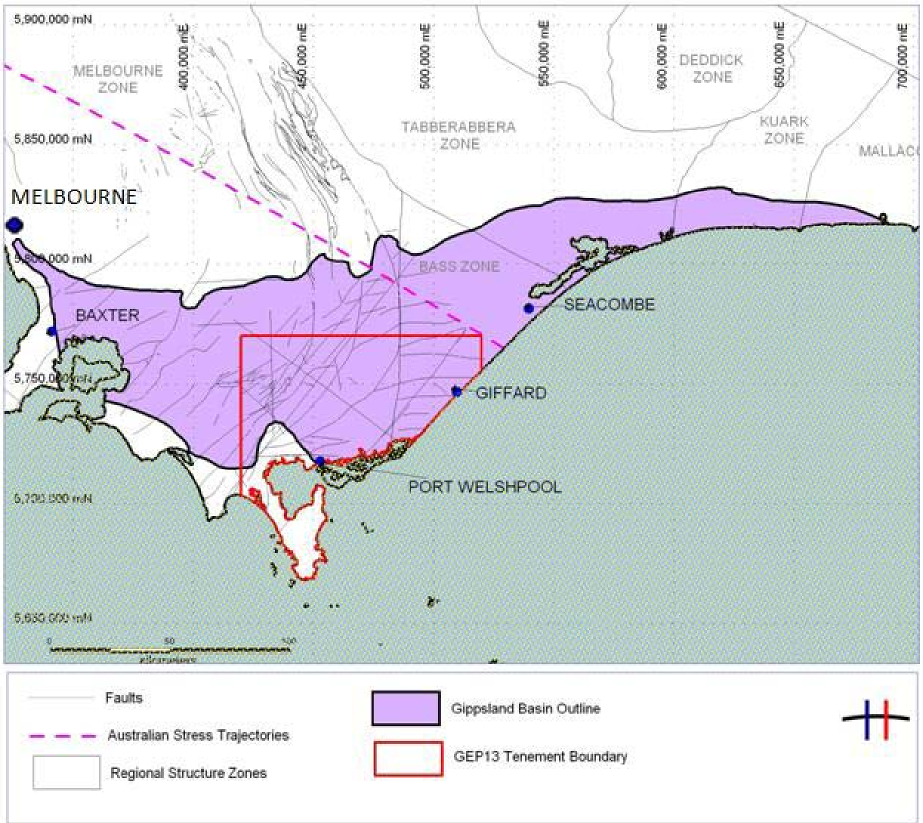

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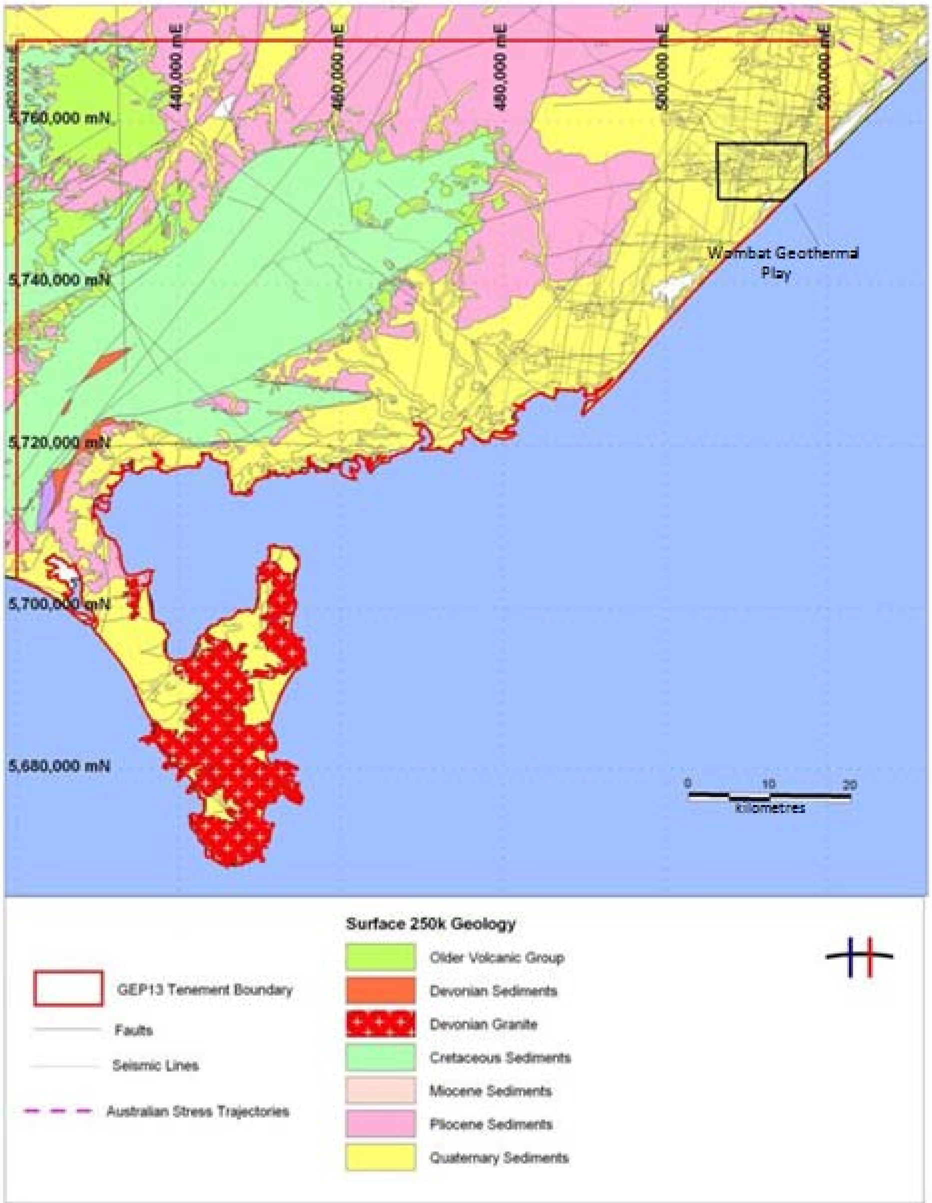

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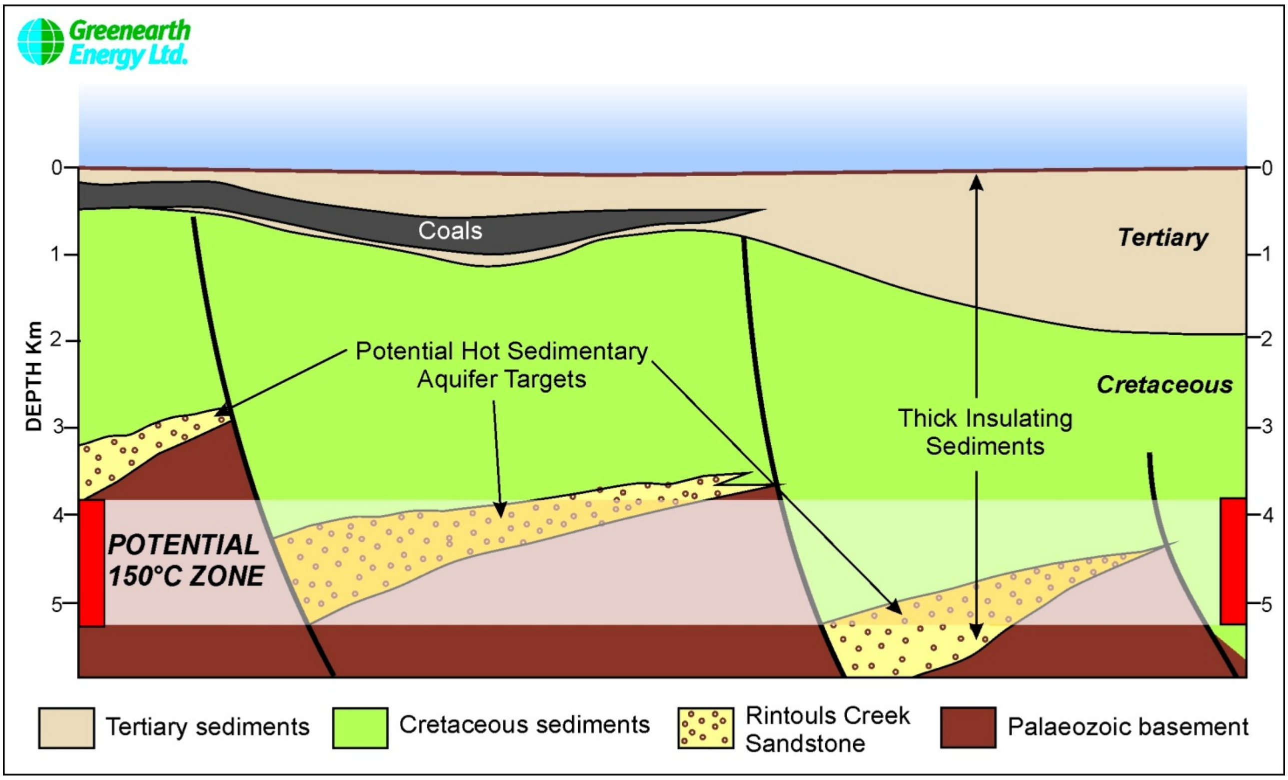

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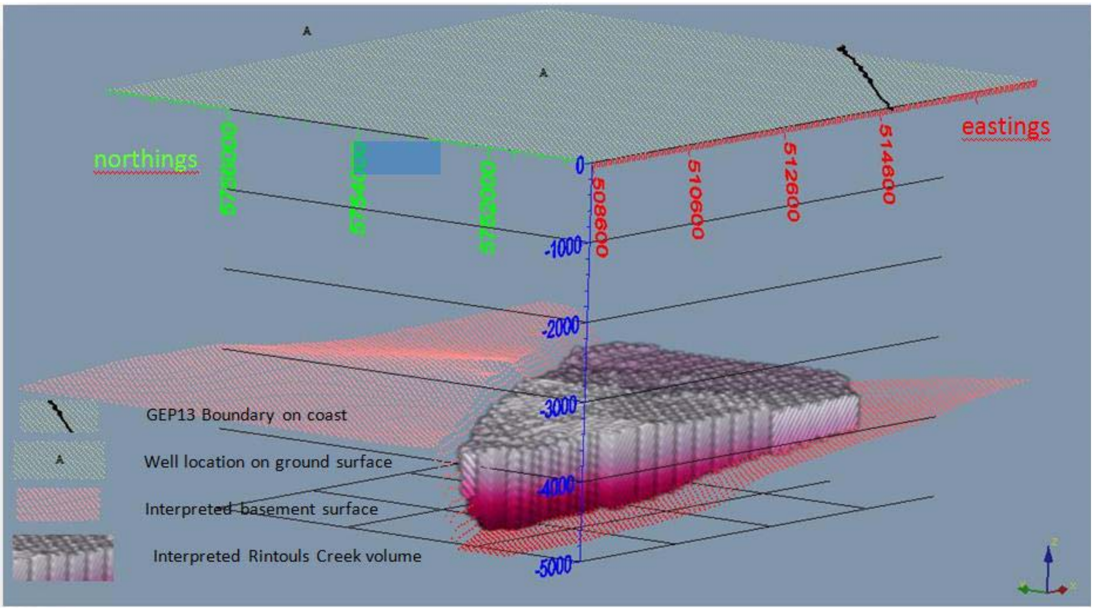

Figure 4 Example output from the reservoir 3D geological model, looking north-east, showing as solid the Rintouls Creek formation.

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The mean density of the twelve samples was 2,523 kg/m^3; the mean specific heat, measured at an average 68°C, was 927 J/kgK.

Heat generation

The modelled temperature (thus the geothermal resource) in a reservoir depends on the amount of internal heat generation in the particular reservoir and also in the overlying units. Greenearth Energy Limited consultants HDRPL relied on published data to estimate heat generation of 1 $\mu W/m^3$ within the overlying Strzelecki Formation, and 0 $\mu W/m^3$ for all other units except the basement.In the absence of direct measurements from the basement, the value for Ordovician pelites (2.52 $\mu W/m^3$) from the Lachlan Fold Belt was used for the heat generation capacity of the basement.

Reservoir temperature

HDRPL utilised a numerical three-dimensional temperature inversion algorithm to estimate the store heat within the reservoir(s).

The algorithm ‘voxelated’ the earth model; that is, divided it into discrete rectangular prismatic cells, with the thermal properties of each cell determined by the geological unit within which the cell lay. The dimensions of the individual cells were 200 x 200 x 40 m in the E–W, N–S and vertical directions, respectively. A numerical iterative process then computed in three dimensions the simplest distribution of temperature that fit the observations, while respecting the laws of conductive heat transfer and the thermal properties of the geological strata. The temperature dependence of thermal conductivity was also taken into account.

A total of three models were run, using the ‘high’, ‘median’ and ‘low’ heat flow estimates, respectively. These models returned corresponding ‘high’, ‘mean’ and ‘low’ Inferred Resource estimates.

Classification of Resource

Taking into account the density of data, the level of confidence in the data used in the estimation, and the requirements of the *Australian Code for Reporting of Exploration Results, Geothermal Resources and Geothermal Reserves (2008 Edition)*, it is appropriate to classify the HSA resource at the Wombat geothermal play as an Inferred Geothermal Resource.

Wombat Inferred Geothermal Resource (100% Greenearth Energy)

For the model parameters and constraints given above, the geothermal algorithm computed the simplest temperature distribution to explain the observed surface heat flow value. For each discrete modelled cell of the HSA reservoir the Inferred Geothermal Resource was calculated from the volume, density, specific heat and temperature of the cell. The total inferred stored heat (thermal energy in place) for the target reservoir was found from the sum of all individual cells within that unit. The estimated Inferred Geothermal Resource is given in Table 1.

Table 1. **Wombat** Geothermal play inferred geothermal resource (100% GER)

Reservoir	**Inferred Geothermal Resource Estimated thermal energy in place petaJoules (PJ)**
Rintouls Creek Formation	3,600 +/- 800

Greenearth Energy has made no estimate of the recoverable thermal energy or the net generating potential of its Inferred Geothermal Resources.

The above estimates assume that commercially available air cooled, organic rankine cycle binary plants would be used to harness the thermal energy brought to the surface and that no additional energy is conducted or convected into the respective reservoirs during future possible production.

The location of the surface projection of the Inferred Geothermal Resource is shown in Figure 5, together with relevant infrastructure and features used in estimating the resource. Appendix 1 summarises the key assumptions and parameters involved in the above estimate and selected terms are explained in Appendix 2.

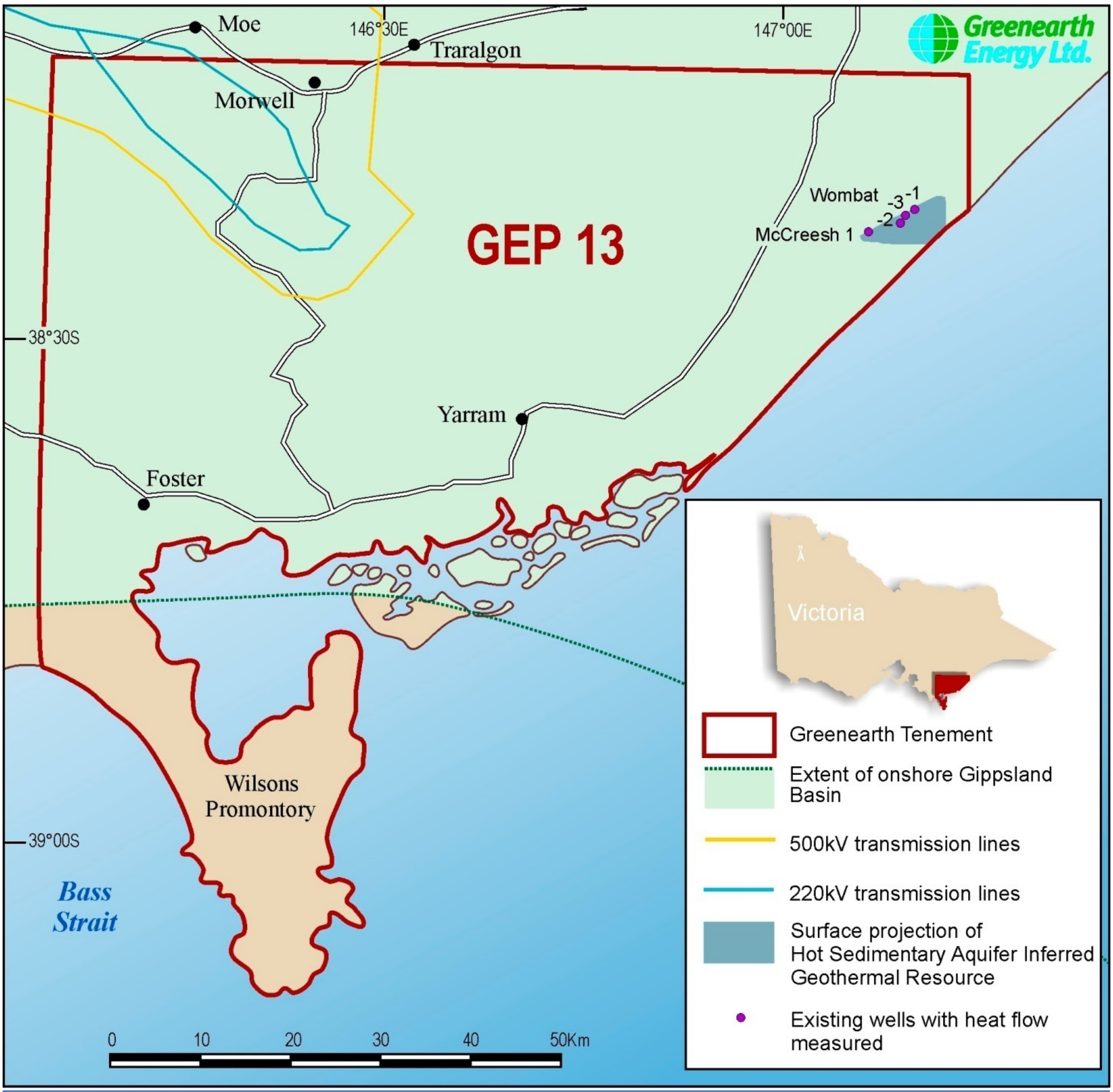

Figure 5. GEP13 showing surface projection of the Inferred Geothermal Resource, wells with measured heat flow, major transmission lines and roads.

The information in this report that related to Geothermal Resources has been compiled by Dr Graeme Beardsmore, an employee of Hot Dry Rocks Pty Ltd. Dr Beardsmore has over 15 years experience in the determination of crustal temperatures relevant to the style of geothermal play under consideration, is a member of the Australian Society of Exploration Geophysicists and abides by the Code of Ethics of that organization.

Dr Beardsmore qualifies as a Competent Person as defined in the *Australian Code for Reporting of Exploration Results, Geothermal Resources and Geothermal Reserves (2008 Edition).* Dr Beardsmore consents to the public release of this report in the form and context in which it appears.

Appendix 1 Summary of key assumptions and parameters used in the estimate

	Value
Cut-off temperature	125°C
Rejection temperature	70°C
Base of reservoir	5.0 km
Heat flow	70 ± 7 mW/m^2
Reservoir volume	14.8 km^3
Density of reservoir	2,523 kg/m^3
Specific heat @ 68°C	927 J/kgK
Average reservoir temperature	157°C

Appendix 2. Selected glossary

Basalt	A type of volcanic rock.
Basement	The lowest most horizon considered in a geological assessment.
Basin	A three dimensional accumulation of sediments, usually thicker in the middle than on the edges.
Cover sequence	A series of rocks which over-lie the horizons of principal interest.
Cut off temperature	The minimum economic reservoir fluid temperature for commercial energy extraction.
Density	A physical property of matter such as rocks measured in mass per unit volume (eg tonnes per per cubic metre, t/m^3).
Fault	A planar break in geological strata.
Heat flow	The amount of thermal energy passing through a standard area, usually expressed as milliWatts per square metre (mW/m^2).
Isotherm	A line or surface joining points of equal temperature
Organic rankine cycle	A process whereby heat can be exchanged from a hot fluid to a cooler one and vice versa via the use of a liquid organic compound which has a lower boiling point than the source fluid. Used in certain geothermal electricity generating plants where the fluid temperature is suitable.
Rejection temperature	The temperature of the geothermal fluid once it has passed through a power conversion process, prior to reinjection.
Reservoir	A body of rock with certain permeability and porosity characteristics which enable it to hold fluids of economic interest.
Sandstone	A coarse grained sedimentary rock chiefly composed of silica grains.
Seismic line	A line across the ground surface along which a seismic survey (involving the reading of vibrations induced in the shallow earth by a source) has or will be read.
Specific heat	The amount of energy required to raise the temperature of 1kg of substance by 1°C; otherwise known as relative heat capacity, usually measured in Joules per kilogram per degree Kelvin ($J/kg^{-1}K^{-1}$)
Turbidite	A coarse grained sedimentary rock, interpreted to have been deposited in oceans.
Well	A bore hole