



**LAKES OIL N.L.**

(A.C.N. 004 247 214)

**As Operator for**

**MIRBOO RIDGE PTY LTD**

(A.C.N. 060 663 934)

**MAGNETO-TELLURIC SURVEY PROPOSAL**

**FOR**

**PEP 163**

**Rev: 2**




**SEPTEMBER 2010**


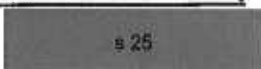
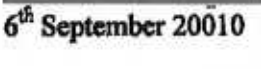
**AUTHORISATION**

Hereto signed for and on behalf of:


**MIRBOO RDIGE PTY LTD  
ACN 060 663 934**

By its duly appointed authority:

 s 25  
 Name:   
 Position:   
 Date: 6<sup>th</sup> September 2010

  
 Witness Name:  s 25  
 Position:   
 Date: 6<sup>th</sup> September 2010

## List of Revisions:

Revision Number	Revision Date	Revised Section	Revision Details	Revised By
0	July 2010	Original	Complete Survey Program	 s 33(1)
1	August 2010	2, 9, 13, 16	Amended as per DPI & VWA Comments	
2	September 2010	9	Reporting section updated	

BRIDGING DOCUMENT  
MIRBOO RIDGE PTY LTD TO LAKES OIL N.L.

**MIRBOO RIDGE PTY LTD**

A.B.N. 040 663 934

*Registered Office:*

Level 14,  
500 Collins Street,  
Melbourne, Vic. 3000  
Phone: (03) 9629 1566

*Postal Address*

PO Box 301,  
Collins Street West  
Melbourne Vic. 3007  
Fax: (03) 9629 1624

20<sup>th</sup> August 2010

s 25

Lakes Oil N.L.  
Level 14, 500 Collins St.  
Melbourne 3000

Dear s 25

**RE: Conducting MT Survey Operations in PEP 163 on behalf of Mirboo Ridge Pty Ltd**

On behalf of Mirboo Ridge Pty Ltd, as Title Holder of PEP 163, I authorize Lakes Oil N.L. to act as operator in relation to conducting a MT survey within our exploration permit PEP 163. As operator you will be responsible for all relevant activities in relation to the conduction of the Magneto-Telluric (MT) survey and ensure that we meet the requirements of the Petroleum Act 1998 and the Petroleum Regulations 2000. We look forward to receiving the recommendations arising from this work.

This will include the duties necessary as the survey operator including, but not limited to, the contracting of the required personnel to perform the survey duties, negotiating and obtaining access with the relevant landowners, notifying and working with the relevant authorities to obtain the necessary approvals and supervising the acquisition and processing of the survey.

We look forward to receiving a report on the results and please keep me advised on the progress of this survey operation.

Yours sincerely,

s 25

s 25

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**SURVEY PROPOSAL****1. Survey Data Sheet**

**Survey Name:** Otway Basin, Lakes Oil, Magneto-telluric Survey

**Permit Holder:** Mirboo Ridge Pty Ltd 100%

**Category:** Magneto-Telluric (MT) Survey

**Reference Maps:** Mount Moriac, 1:25000, Topographic, 7721-4-1  
Paraparap, 1:25000, Topographic, 7721-3-1  
Anglesea, 1:25,000, Topographic. 7721-3-2

**Location:** PEP 163, southwest of Geelong. (See Figure 1)

**Line Description:** 26 stations covering approx 25kms running north-south from Barrabool to Anglesea with 1 remote station near Mt Gellibrand

**Permit Commitments:** 2<sup>nd</sup> year commitment 25km of MT acquisition required, approximately 25km (26 stations + 1 remote station survey being conducted).

**Program Goals:** To tie in with the 2008 MT survey, conducted by Greenerth Energy, to help gain a better understanding of the deeper structures which may be present, and to help define basement in this under-explored area.

**Timing:** The survey is expected to commence in November and is expected to take about 1-2 weeks to complete including preparation and rehabilitation work. The processing of the data is expected to take a further 1-2 months.

**Estimated Survey Cost:** [REDACTED]

## 2. Introduction

Mirboo Ridge Pty Ltd is a wholly owned subsidiary of Lakes Oil N.L., a Victorian based oil and gas exploration company listed on the ASX (ASX Code: LKO). Lakes Oil has been exploring across Victoria since its inception in 1946. Under its subsidiaries Lakes currently holds a number of exploration permits across Victoria and is the most active explorer onshore in Victoria.

In this operations plan Lakes proposes to conduct a non-invasive, ground geophysical survey technique known as magneto-telluric ground resistivity measurement (MT). The MT survey aims at defining resistivity contrasts in the subsurface geology to try and better constrain the subsurface basinal and basement structures. The survey will be conducted over cleared, relatively flat ground used predominantly for farming practices. The line will run north-south from the Barrabool Hills on the northern boundary of the permit down to just north of the Anglesea Township on the coast along the southern boundary of the permit. The elevation ranges from just over 150m in the Barrabool Hills down to under 50m near Anglesea. No earthworks, fencing or removal of vegetation will be required for the survey to proceed.

The purpose of this document is to provide:

- Relevant background information to the project
- A description of the existing environment
- An assessment of the potential impacts of risks associated with the survey operations
- An environment management plan which outlines mitigation and reporting procedures for potential risks

This document has been compiled to address the specific requirements of the Petroleum Act (1999) and the Petroleum regulations (2000). A Safety Management System (SMS) has been prepared to support these proposed operations and accompanies this document. It takes the form of the Moombarriga Geoscience Pty. Ltd. Standard Operating Procedures. A bridging document between Mirboo Ridge Pty. Ltd. and Moombarriga Geoscience Pty. Ltd. is included in Attachment 3 of this document.

For this survey the MT measurements will be undertaken as a series of 26 discrete survey points, spaced approximately 1km apart, set out along one straight traverse (coordinates for each point are included in Attachment 2). The survey is expected to begin in late July 2010 and will be conducted by Moombarriga Geoscience Pty Ltd. Company details and contacts are:

Moombarriga Geoscience  
32 Townshend Road  
Subiaco WA 6008

Name	Company	Role	Contact Number
§ 25	Moombarriga Geoscience P/L		§ 25
§ 25	Lakes Oil N.L.		

**Table 1.** Contact details for Moombarriga Geoscience Pty Ltd & Lakes Oil N.L.

PEP 163 MT Survey Route Map  
Department of Primary Industries



Figure 1. Location Map for PEP 163 MT Survey



Map Scale 1:110,000  
NOT FOR NAVIGATION

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PEP 163 MT Survey Map 1  
Department of Primary Industries



Figure 2. Location map and cultural heritage sensitivity areas for PEP 163 MT Survey sites 1-6

PEP 163 MT Survey Map 2  
Department of Primary Industries



Figure 3. Location map and cultural heritage sensitivity areas for PEP 163 MT Survey sites 7-12

PEP 163 MT Survey Map 3  
Department of Primary Industries



Figure 4. Location map and cultural heritage sensitivity areas for PEP 163 MT Survey sites 13-18

PEP 163 MT Survey Map 4  
Department of Primary Industries



Figure 5. Location map and cultural heritage sensitivity areas for PEP 163 MT Survey sites 18-23

PEP 163 MT Survey Map 5  
Department of Primary Industries



Figure 6. Location map and cultural heritage sensitivity areas for PEP 163 MT Survey sites 24-26

PEP 163 MT Survey Remote Site  
Department of Primary Industries



Figure 7. Location map and cultural heritage sensitivity areas for PEP 163 MT Survey remote site

Lakes' is in the process of meeting with each landowner and occupier on whose property an MT survey site is to be located. Through consultation with each landholder, Lakes has:

- Sited each proposed survey point only in agreement with the respective landholder
- Offered each landholder the opportunity to be engaged in site preparation and rehabilitation
- Agreed to rehabilitate the land in accordance with the reasonable requirements of each landholder.

In accordance with the provisions of the act, signed letters of consent are currently being obtained from each landowner.

Additionally, Lakes has liaised with DPI, DSE, Aboriginal Affairs Victoria (AAV), Corangamite Catchment Management Authority and Dial-Before-You-Dig to advise and establish their requirements in respect of the proposed MT survey. Lakes will ensure operations proceed only in accordance with the conditions imposed upon the activities by these authorities. To ensure ongoing compliance with such requirements, Lakes is committed to ongoing liaison with each of these organisations.

### **3. Legislative Framework**

The proposed MT operation must meet the requirements of the Petroleum Act 1999 and the Petroleum Regulations 2000 before any physical operation begins in the project area. The program will also be required to adhere to Commonwealth and State environmental legislation. The relevant acts of which are listed below:

#### **3.1 Commonwealth Legislation**

Environmental Protection and Biodiversity Act 1999

#### **3.2 Victorian Legislation**

Petroleum Act 1998

Environmental Protection Act 1970

National Environment Protection Council (Victoria) Act 1995

Aboriginal Heritage Act 2006

Occupational Health and Safety Act 2004

Dangerous Goods Act 1985

Water Act 1989

Water Industry Act 1994

#### **3.3 RAMSAR Convention on Wetlands**

Contracting parties to the RAMSAR Convention are obliged to nominate wetlands that comply with the Convention's criteria for Wetlands of International Importance. Once wetlands have been designated, the nominating countries are required to prepare management plans for the wetlands, which will promote their wise use and the conservation of their ecological character.

#### 4. Regional Geology

The Otway Basin formed as a series of west-northwest trending extensional half-grabens along the south-eastern margin of the Australian continent as a result of the onset of rifting between Australia and Antarctica during the Late Jurassic. The basin covers an area of over 150,000 km<sup>2</sup>, of which two-thirds is offshore, stretching from Cape Jaffa in the west to the Mornington Peninsula High (a NE-SW trending basement feature) in the east. The northern margin is taken as the limit of the Early Cretaceous/Tertiary deposition, roughly 60km onshore from the coast. The southern margin is generally accepted as the continental shelf, as the margin lies some 200-300km offshore in deep water and is, at present, poorly defined by seismic.

The stratigraphy, especially in the eastern Otway Basin, is poorly constrained due to a lack of deep (basement penetrating) wells and is based on outcrops of Eumeralla Formation in the uplifted areas and from the few deep wells drilled in the eastern half of the basin. Wedge shaped packages of locally derived, fluvial, quartz-rich arkosic sands (Pretty Hill Formation) were the first sediments deposited, in the lows formed by the developing half-grabens, before the basin was flooded with volcanoclastic sediments (Eumeralla Formation) transported into the basin from the east via a major fluvial braided river system. These sediments include both channel sandstones and overbank/floodplain and lacustrine mudstones.

The Pebble Point Formation represents the earliest Tertiary sediment in the Otway Basin, and occurs as a pebbly conglomerate often directly overlying Otway Group. The Pember Mudstone of the Dilwyn Formation overlies the Pebble Point Formation, and occurs as a tan brown to grey shale which is dolomitic and slightly carbonaceous. The Dilwyn itself occurs as clear quartz sandstone. The Mepunga, Narrawaturk and Clifton Formations of the Oligocene Nirranda Group overlie the Dilwyn Formation. Within the Torquay area the Nirranda Group is represented by the Demons Bluff Formation.

The Gellibrand Marl and Port Campbell Limestone of the Heytesbury Group, and the Point Addis Limestone, Jan Juc Marl and Puebla Clay of the Torquay Group overlie the above, and represent open marine cool water carbonate conditions within the Otway Basin and Torquay Sub-Basin. These sediments were overlain by Eocene and Oligocene volcanics followed by Pliocene to Recent aged gravels and ferruginous sands.

#### 5. Permit PEP 163

Lakes Oil N.L. (Mirboo Ridge Pty Ltd) acquired PEP163 in July 2002 covering an area of approximately 1057km<sup>2</sup>. The completed five-year work program for the permit included the drilling of the Bellarine-1 well, the acquisition of the Bellarine Seismic Survey and the acquisition of the Gore-Sorber Geochemistry survey along with geological and geophysical studies of the new and existing datasets. Following the first five year period 50% of the permit was relinquished (predominantly the area covering the Bellarine Peninsula) and an area of 542km<sup>2</sup> was retained for a further five years in 2008. The five-year work commitment following the relinquishment includes the drilling of one well along with conducting a 25km seismic survey which has been altered to a 25km MT survey and data reviews. This survey will satisfy the 2<sup>nd</sup> year work commitment for the permit.

## 6. Exploration History

The earliest work in the Colac Trough-Bellarine Block was done by private coal companies and the Geological Survey of Victoria primarily in an unsuccessful search for economic black coal. Some deep bores were drilled for black coal in the 1880's and reached 457m still in the Otway Group e.g. Bellarine No.1 at Portarlington.

Brown coals were discovered in 1899 around the Otway Ranges and mined at Wensleydale, Deans Marsh and Benwerrin. Later emphasis on brown coal exploration was focused in the Anglesea area, and a significant deposit was found near the Anglesea Township in 1958. Currently ALCOA operates a 1.2 million tonne/year open cut mine extracting brown coal as a feed stock for the Anglesea power station providing electrical generation for their Geelong Aluminum Smelter at Point Henry.

Western Mining Corporation examined the Anglesea area (EL 659) for additional brown coal reserves over the period 1978 - 1983 and also black coal prospects in the Otway Group. They drilled a number of bores at this time. CRA explored the Bacchus Marsh to Bellarine area (EL807-809) for brown coal potential in 1981 and drilled 4 bores on the Bellarine Peninsula to top Mesozoic.

Petroleum exploration, in the Tertiary and Otway Group, commenced near Torquay with the drilling of Geelong Oil Flow No.1 in 1950. Later wells in the nearby area include Jan Juc 1 and 2. Alliance Oil Dev. drilled Anglesea No.1 to a depth of 3068 m in 1962. Pursuit Oil drilled Hindhaugh Creek 1 to a depth of 2372 m in 1970. Neither of these wells reached Pretty Hill Sandstone. Offshore in the Torquay Basin three wells: Nerita No.1 (1967), Snail No.1 (1973) and Wild Dog-1(1993) tested the prospectivity of the Upper Cretaceous - Tertiary.

In 1960 Alliance Oil acquired 50 km of seismic near Anglesea and later drilled Anglesea-1, Pursuit Oil NL then drilled Hindhaugh Creek-1 in 1970, and then Shell Development and Pursuit Oil carried out seismic surveys in the Hindhaugh Creek area in 1972 and ran some seismic lines up onto the Paraparap Anticline. In 1982 Gas and Fuel Exploration acquired the adjacent petroleum lease of PEP 100 and later joined by Hartogen Energy Limited carried out seismic surveys with follow up drilling of wells testing the Otway Group/Pretty Hill Sandstone at Olangolah-1 (1982), Stoneyford-1 (1989), Tirrengowa-1 (1988) and Tertiary plays at Ingelby-1 and Nalangil-1 (1990). Their focus has been primarily in the north of PEP 100 and along strike to the Bellarine Peninsula in the Colac Trough area, and only the eastern ends of their seismic lines go near the Bellarine-Torquay area. In 1992 as part of a seismic farm-in AGL shot the 302 km Barwon Seismic Survey that includes 5 lines over the Barrabool Hills to Anglesea area (OGF92A 400-409) within PEP163.

Shell carried out seismic work in 1972 in the Port Campbell Embayment which extends to the east as far as the Barongarook High and the Barwon Downs Graben. Shell's seismic work also delineated the half graben setting where the Warracbarunah-2 government stratigraphic bore was located on the northern edge of the Otway Basin. Later Shell (1988) shot high quality seismic throughout the Torquay Basin (Vic P28) with a number of lines running close in to the Bellarine Peninsula but to date no seismic surveys have been conducted over the Bellarine Peninsula. This led to the drilling of Wild dog-1 in 1993

Gas and Fuel carried out regional seismic in 1983 which identified the Stoneyford and Tirrengowa structures. These lines infilled the Shell coverage and conformed to the same grid direction. Hartogen acquired regional-semi detail seismic in 1983 which consolidated the seismic coverage. Lines were confined to the Port Campbell Embayment and did not go into the Torquay Embayment. Further seismic was acquired in 1986.

These surveys led to the drilling of the Pretty Hill Sandstone at Stoneyford-1 and Tirrengowa-1 and the base Tertiary Pebble Point Formation tests at Ingleby-1 and Nalangil-1.

In 1988 and 1989 Shell acquired seismic (and gravity) data in the offshore Torquay Embayment (Vic P28) and drilled the Wild Dog-1 well prospect in the southern area of the Sub-Basin. In the 1990-1998 period five more surveys were shot including the Barwon survey that covers into PEP163.

In 1993 Capital Energy acquired the former Bellarine Block of PEP 130 block covering the Bellarine Peninsula, carried out gravity surveys in 1995 and surrendered it in 1996. In 1996 Basin Oil acquired part of the old PEP100 area (as PEP 133), drilled Irrewarra-1 to 553 m in 1998 as a base-Tertiary test, later Basin Oil was acquired by Origin Energy Resources Ltd and PEP 100 was relinquished in 2000.

Lakes Oil N.L. (on behalf of Mirboo Ridge) acquired the permit in 2002 and conducted a Gore-Sorber geochemistry survey across the entire permit in early 2005. In August 2005 Lakes drilled the Bellarine-1 well near Paraparap to a depth of 2139m. Lakes also conducted the Bellarine Seismic Survey in 2006 across the Bellarine Peninsula.

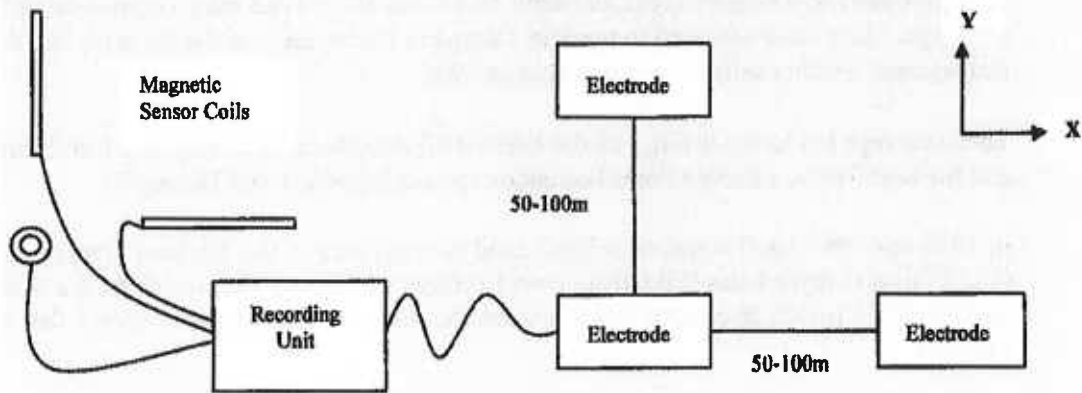
## 7. MT Survey Procedure

Magneto-telluric resistivity (MT) is an electromagnetic, geophysical technique that can be used to map variations in the resistivity structure of the earth. The technique has been used successfully to define the nature of resistive basement rocks beneath more conductive overlying sediments and to map the lateral extent of geothermal resources.

The technique measures naturally occurring electric (telluric) currents, and their associated magnetic fields induced in the earth by natural variations in the earth's magnetic field through solar and atmospheric activity. The flow of these currents is influenced by the properties of the subsurface through which they are propagating including the rock type, porosity, permeability, fluid content and temperature. Surveying involves measuring the local magnetic field through the use of induction coils and magnetometers, and the electric field through the deployment of grounded dipoles (Figure 2).

These instruments are buried at shallow depths in the ground and left to record for long periods (typically 24 hours). Frequencies are generally measured in the bandwidth of 0.001Hz to 20KHz, allowing the resistivity structure to be determined from shallow, near surface depths to 10's of kilometers deep.

Computer modeling procedures applied to the MT resistivity data, provides a model of the electrical resistivity distribution beneath the MT stations.



**Figure 8. MT Field Setup.**

Three electrodes (either porous electrolyte pots, or stainless steel plates) are placed in small pits dug in the ground by hand approximately 100m from, and orthogonal to each other (figure 2). The pits are approximately 15cm deep and 20cm diameter. The electrodes are connected by wires, in order to create a circuit in which to measure the small electric current flowing through the ground in their vicinity. No electric current is passed along the wires; they are used for measurement only.

Three magnetometers are dug into the ground at the central location. The magnetometers are approximately 1.0m long. One is placed vertically into a slim "post hole" (1.0m deep, 15cm wide) dug by a mechanical auger. The other two coils are laid in shallow trenches dug by hand at right angles to each other (figure 3). The magnetometers do not generate a magnetic field; they only measure the variation in the earth's natural field. The equipment is installed away from existing infrastructure to avoid interference with the recordings and to avoid interfering with the general farming practices.

Each component of the measurement system is attached to a recording device (a small box 20cm x 15cm) and measurements are recorded over a 12-24 hour period for each station. It is common to deploy 3-4 of these stations at a time.

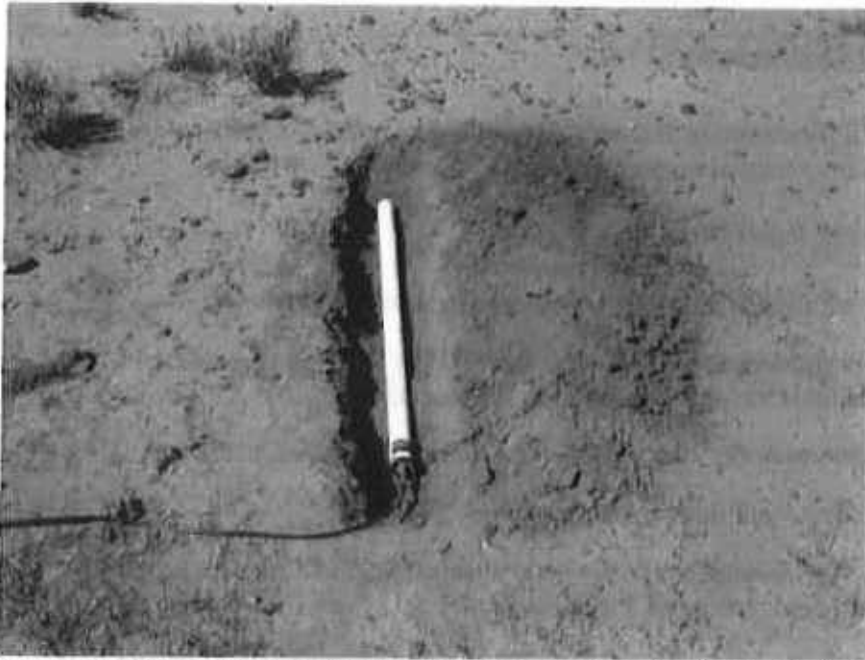
Once an acceptable reading has been obtained, the equipment is removed and the holes backfilled. Figure 4 shows a site immediately following rehabilitation.

For this survey, it is planned to obtain MT measurements at 26 discrete locations within the Barrabool to Anglesea area. A N-S trending line with a 1km station interval has been proposed.

A remote reference site is to be established a large distance from the survey area. This site records magnetic field variations only. Lakes will use a site within its existing PEP 164 tenement for the remote reference.

The field acquisition crew will consist of three to four people, two 4WD vehicles and the MT equipment.





**Figure 9.** Magnetometer coil in hand dug trench. Trenches are in-filled whilst recording.



**Figure 10.** Rehabilitated site immediately following reading completion.

## 8. Existing Environment and Environmental Impact Statement

### Lakes Oil Environmental Policy

Lakes Oil is committed to minimising environmental impacts and applying best practice environmental management to all aspects of its operations.

Specifically, Lakes Oil will:

- Comply with applicable laws, regulations, standards and guidelines.
- Ensure all employees and contractors are aware of their environmental responsibilities through training and site inductions.
- Safely and responsibly dispose of all hazardous substances.
- Promote waste minimisation and recycling on all sites.
- Identify and minimise environmental impacts through best practice mitigation, management and monitoring techniques.
- Continually improve environmental management and monitoring systems.
- Communicate with stakeholders and local communities about its activities.

### 8.1 Regional Description of the existing environment

The location of the proposed MT survey in PEP 163 is shown in Figure 1 and the approximate coordinates of all 26 discrete survey points can be found in Attachment 2. Detailed maps of all survey points have been included in Figures 2-7. Most of the survey sites are located on private land with only 3 sites being on crown land. All sites have been located outside of areas of cultural heritage sensitivity (eg within 200m of watercourses or listed areas). Various stakeholders have been contacted regarding the survey. These include Aboriginal Affairs Victoria (AAV), Corangamite Catchment Management Authority (CCMA), DPI, Parks Victoria (managing for DSE), Dial before you dig and all of the affected landowners.

The survey procedure outlined in Section 7 is deemed a low impact, non-invasive technique used to find more information about the sub-surface geology. Additionally, it requires equipment to be installed away from sources of electrical interference (buildings, built-up areas, powerlines, generators, electrical fences etc), therefore it is anticipated that no known aesthetic aspects of the survey site will be affected. Certain aspects of the existing environment may be affected and these may include:

- Ecological – Farmland, native vegetation, RAMSAR listed wetlands
- Biological – Local wildlife and stock (mainly cattle)
- Social – Dust and noise
- Recreational – Tourism in the area
- Economic – Farming operations
- Cultural – Areas of cultural sensitivity

Most of the land has been cleared for grazing, improved pasture and cropping. Only minor disturbances will be made to the local landscape during the survey. Its effects are anticipated to be minimal and of a temporary nature (no more than two days at each measurement site). All of the sites have been selected on the basis that they will cause minimum disturbance to the existing environment. The sites located on private land are all in the middle of paddocks which are currently either grazed or cropped so the installation of the equipment will not cause any greater disturbance than the day-to-day usage of the paddock already causes. The three sites located within the Parks Victoria managed area to the north of Anglesea are located along existing access tracks and the installation of the equipment will not disturb any ground which has not been previously disturbed. A Parks Victoria representative will be present during the installation to ensure that no native vegetation is disturbed and that the sites selected are appropriate.

## **8.2 Regional Geology and Soils**

The Otway Basin is a Mesozoic rift basin established during the rifting and separation of Gondwana. It stretches over 500km east west along the southern margin of Australia from Cape Jaffa in the west to the Mornington Peninsula in the east. The basin has an areal extent of 155,000km<sup>2</sup> of which about two thirds is located offshore. It contains a predominantly sedimentary sequence (mostly volcanoclastic sandstones and shales) that can be upwards of 10km thick. These Early Cretaceous sedimentary sequences lie directly on basement in the Otway region.

The MT survey comprises one straight, north-south traverse and is to be conducted in the Southern Uplands geomorphological region of Victoria. Relief here is moderate and drainage divides trend northeast, paralleling the coast in the eastern Otway Ranges. The proposed survey area has relatively low topography with rounded hill slopes and broad open valleys. The elevation ranges from approx 150m in the Barrabool Hills down to less than 50m on the northern edge of the township of Anglesea.

The Southern Uplands experience relatively high rainfall though recent drought conditions have prevailed. Soils here are fertile clay-rich soils ideal for farming, the soil of which was formed mainly by erosion of the basic-intermediate volcanoclastic rocks of the Early Cretaceous.

## **8.3 Local Flora and Fauna**

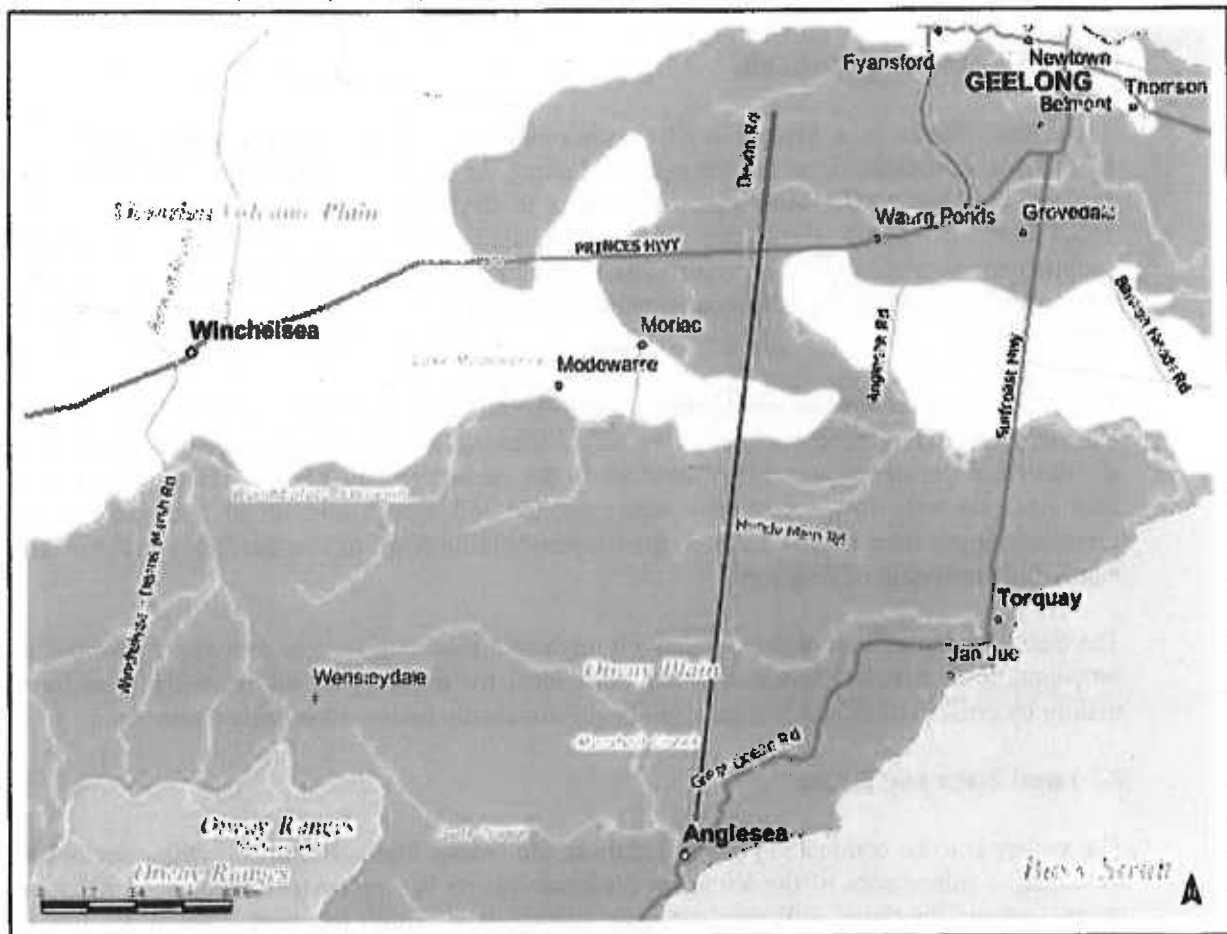
The survey is to be conducted predominantly in the Otway Plains Bioregion, with a section also traversing a minor area of the Victorian Volcanic plains Bioregion (see Figure 11) All survey points, except for three, will take place on private land which has been cleared for farming, livestock grazing and cropping. The three sites which fall within areas of crown land are just to the north of the Anglesea Township in an area covered by the Alcoa Coal Mine Mining Lease. The sites within this area will be sited along the Barwon Water pipeline track which runs north-south through the area. Any instrumentation or vehicles will be placed clear of trees, where possible) to avoid interference with the electromagnetic signal.

### ***Otway Plain Bioregion***

The majority of the proposed survey area lies within the Otway Plains bioregion, which comprises a series of coastal plains, river valleys and foothills, mainly sedimentary in origin. Since European settlement, there has been extensive clearing of all vegetation types particularly those on the deeper more fertile soils. Seventy percent of the bioregion is privately owned and the major uses on the freehold are grazing, cropping and dairy farming.

The soils associated with the upper terrain are texture contrast soils (Dermosols and Chromosols), supporting Lowland Forest and Heathy Woodland ecosystems. The dunes are predominantly sandy soils (Podosols and Tenosols) and the floodplains and swamps are earths and pale yellow and grey texture contrast soils (Hydrosols) supporting predominantly Grassy Woodland and Plains Grassy Woodland ecosystems (taken from Conservation and Environment section of the DSE website, 2010).

### PEP 163 MT Survey Bioregion Map



**Figure 11. PEP 163 MT Survey Bioregion Map**

#### ***Victorian Volcanic Plain Bioregion***

The less dominant (within the survey area) Victorian Volcanic Plain bioregion is an extensive basaltic plain with numerous volcanic cones and eruption points and is dotted with both salt and freshwater lakes. Vegetation formerly consisted of damp sclerophyll forests, woodlands and grasslands, now mostly long cleared.

The soils are variable ranging from red texture contrast soils (Kurosols and Ferosols) on the higher fertile plain and scoraceous material supports Plains Grassy Woodland, Plains Grassland/Plains Grassy Woodland mosaic and Plains Grassland. Calcereous sodic texture contrast soils grading to yellow acidic earths (Calcarosols, Sodosols and Dermosols), on the