

Geothermal Energy: Latrobe Valley / Onshore Gippsland (GEP 12/13)

Magnetotelluric (MT) Resistivity Survey

Greenearth Energy contracted geophysical survey company Moombarriga Geoscience to undertake a Magnetotelluric (MT) geophysical survey in GEP12 and GEP13 which was conducted in November 2010.

MT data was acquired along a profile between Glengarry North (GEP12) and Willung South (GEP13) at a nominal station interval of 1km for a total of 38 stations and over the frequency range .0003Hz – 300Hz. Signal to noise levels were improved through the utilization of remote reference data collection at a site further east near the town of Seaspray.



Greenearth Energy's 2010 MT Survey in the Latrobe Valley

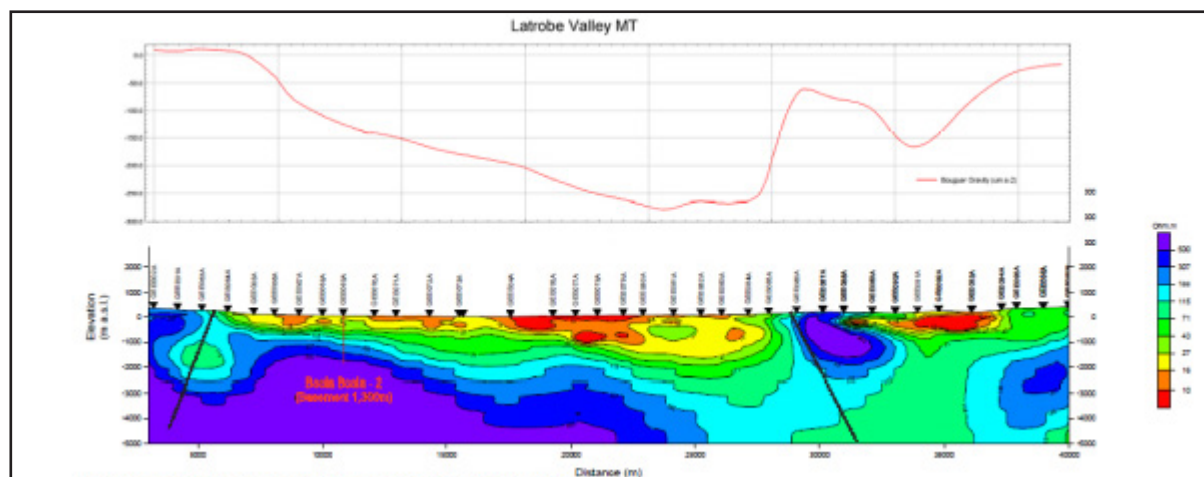
A traverse across the Latrobe Valley from the outcropping Palaeozoic at Glengarry Nth in the north to the uplifted Cretaceous, Strzelecki units sub-cropping over the Baragwanath anticline at Gormandale and Willung has enabled a full profile across the Latrobe Valley to be obtained.

The primary objectives of the MT survey were to assess the viability of using the MT method in this relatively high noise environment, to map the potential resistivity contrast between the Palaeozoic basement and the overlying Cretaceous and Tertiary basin fill sediments as well as any controlling structures (faults) and to identify any anomalous response(s) that may be due to the presence of a geothermal reservoir at depth.

The results obtained from this survey were pleasing. Despite high noise levels, meaningful data was obtained that appears consistent with the inferred geological model for the area, and compared favourably with the overall geological architecture of the Latrobe Valley depression.

Modelling of the data using 2D inversion algorithms has shown low resistivity (<20 ohm.m) layering associated with the uppermost Latrobe Valley Group sediments. This sits atop a region of higher resistivities (<100 ohm.m) which appears to map the Cretaceous Strzelecki Group which in turn overlies high resistivity units (>100 ohm.m) interpreted as the Palaeozoic basement. The section shows a gradual thickening of the basement from the north to approximately 3,0m at the Rosedale Fault in the south. A region of near surface high resistivity is evident consistent with the Baragwanath anticline although this interpretation is speculative given that this section of the line is in close proximity to the HVDC Bass Link line, which may be influencing the data at this location.

A zone of near surface low resistivity is again evident in the vicinity of Gormandale. This is likely due to Latrobe Valley Group sediments and coal. Whilst the deeper sections to the south of the Rosedale fault show resistivities in the order of 50-100ohm.m, consistent with interpreted resistivities for the Strzelecki Group, no clear relationship between this and Paleozoic basement can be established.



Latrobe Valley Gravity Profile (top) and 2D MT Profile

Following the relative success of the MT survey undertaken across the Latrobe Valley, Greenearth Energy may look to expand the coverage of MT survey data throughout the Latrobe Valley/Onshore Gippsland area.