

Flight to find new energy resources

Airborne geophysical survey marks major milestone

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The Australia-wide airborne geophysical tie-line survey (AWAGS 2) was one of the world's largest airborne geophysical surveys.

The project, flown under contract by UTS Geophysics, was part of the five-year Onshore Energy Security Program (OESP), which commenced 18 months ago.

Data acquisition for AWAGS 2 began from Albany, Western Australia in March and flying was completed in December 2007. The survey, across the entire Australian mainland and Tasmania, included the acquisition of more than 145 000 kilometres of radiometric and magnetic data on north–south flight lines spaced 75 kilometres apart, with a nominal flying height of 80 metres above ground level (figure 1).

The survey acquired radiometric data from a single aircraft,

calibrated to international standards. The specially prepared aircraft flew at about 260 kilometres per hour, acquiring radiometric readings every 70 metres and magnetic readings every 7 metres (figure 2). The aircraft flew for eight or nine hours each day using a crew of two pilots. The survey was planned and executed such that flights were continuous on most days.

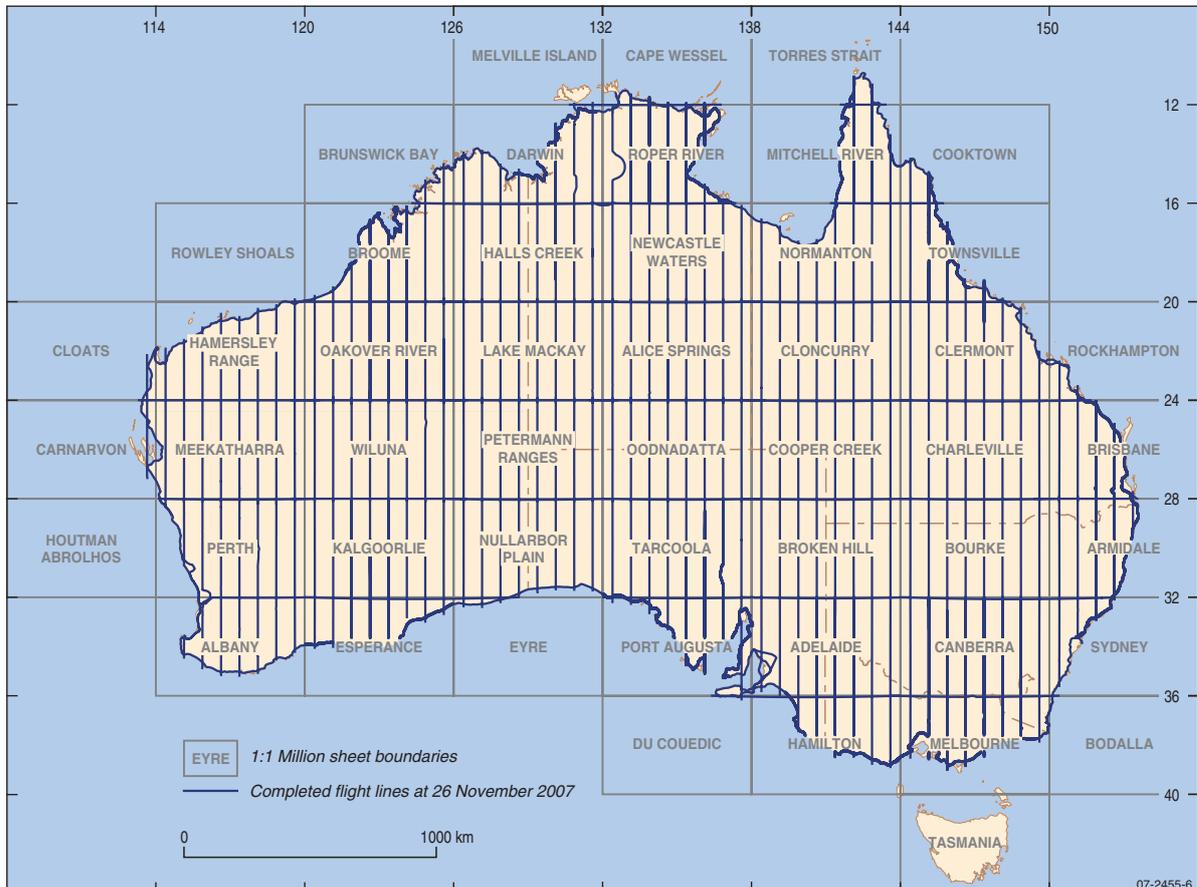


Figure 1. Flight-line pattern for the AWAGS 2 magnetics and radiometrics survey to back-calibrate the national radiometric database.



Figure 2. UTS' highly modified Fletcher aircraft, purpose-built for the slow, low level survey flying required by AWAGS 2.

With completion of the survey the contractor will process the acquired data and expects to supply the final processed data to Geoscience Australia by March 2008. The processed radiometric data from AWAGS 2 will form the Australian radioelement datum and be used to adjust data in the national radiometric database (all Commonwealth and state public-domain data) to the standard. The survey will also be the datum for airborne radiometric data acquired in the future.

The processed magnetic data will increase the resolution of the Australian magnetic anomaly map and will be incorporated into continental-scale datasets. These will fill the gap between wavelengths of about 100 kilometres from airborne surveys and those exceeding 400 kilometres from satellites.

Regional surveys update

Other OESP work involved the acquisition of gravity, airborne electromagnetic (AEM) and seismic data in Queensland.

Geoscience Australia released new gravity data, acquired over parts of the Cooper Basin in the state's southwest, through the Geophysical Archive Data Delivery System in October 2007. The data are an important component of the OESP and will help in the assessment of hydrocarbon potential in the region, and in the identification of granites with possible geothermal energy potential in areas beneath the basin.

The first AEM survey to be conducted under the OESP started in the Paterson Province of Western Australia in September 2007. The survey is scheduled to be completed in mid-2008, with results to be released later that year. As outlined in *AusGeo News 86*, the results of the work are keenly awaited: they will give hints on the region's uranium potential.

The next AEM survey, planned for the Pine Creek Province in the Northern Territory, is expected to start in the second half of 2008. The province is prospective for several styles of uranium deposits. AEM data should make it possible to construct a 3D model of the basin architecture, map graphitic conductors in the basement, regolith thickness, and locate major structures and possible mineralising fluid pathways. Other AEM surveys are being scoped to target uranium and thorium systems elsewhere across the continent. In some areas, AEM data may also help in land and water management.

In September 2007, Geoscience Australia completed a major program of deep seismic data acquisition transecting northeast from the Mt Isa – Cloncurry region in Queensland towards Georgetown and then southeast to about 100 kilometres south of Charters Towers (figure 3). In total, 1175 kilometres of reflection data were acquired. The results of the survey will be released progressively from early 2008. The survey will help in the assessment of uranium, geothermal energy and hydrocarbon resource potential in the state's northwest.

The next seismic survey under the OESP is scheduled to start in mid-2008 in the Rankin Springs and Yathong troughs of the Darling Basin in western New South Wales. There is virtually no

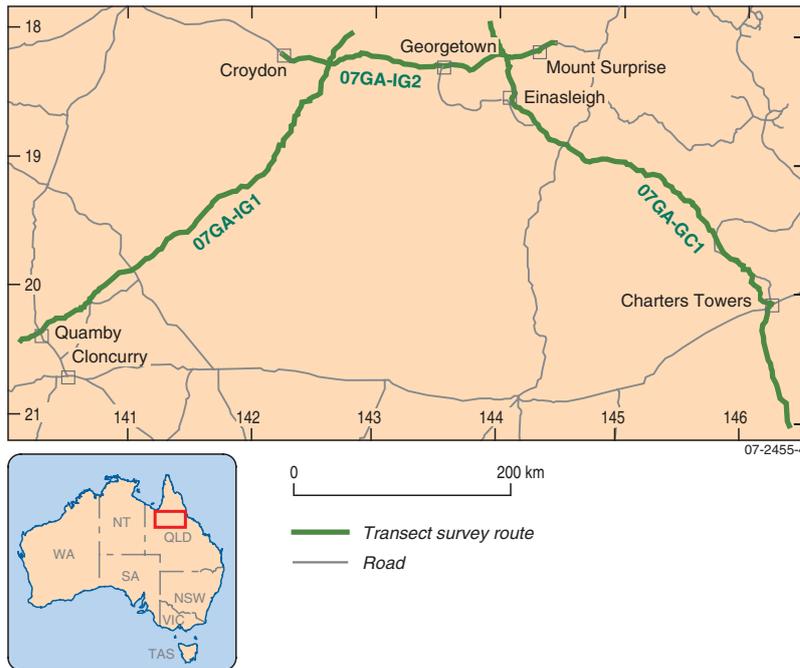


Figure 3. Completed transect routes for deep seismic reflection survey in Cloncurry – Georgetown – Charters Towers regions, Queensland.

seismic coverage in the troughs, but they have been identified as one of the regions with the highest petroleum prospectivity in the basin. Geoscience Australia wants to assess the petroleum potential of the area by identifying potential source rocks in the troughs, along with structures and stratigraphy significant for hydrocarbon migration and entrapment. Seismic data acquisition projects will follow in South Australia in 2009 and northern Western Australia in 2010.

National projects underway

Meanwhile, planning and early work under the national projects (uranium, petroleum and geothermal energy) began in mid-2007:

- The uranium systems project aims to map the distribution of known uranium-enriched and related rocks, get insights into the processes that control where and how uranium mineral systems develop, and assess potential for undiscovered uranium mineralisation at regional to national scales.
- The petroleum project is a staged program of dataset acquisition involving the collection of airborne magnetics and radiometrics, magnetotellurics and, where appropriate, gravity and then seismic reflection data. It will focus on selected areas in the Cooper and Pedirka basins, and the Lander Trough and Kidson Sub-basin in South Australia, Western Australia and the Northern Territory.
- The geothermal energy project aims to shed light on the type and location of geothermal resources on a national scale, and is designed to encourage exploration and investment in this

renewable energy sector.

The project will integrate existing data and acquire new data to map temperature in the continent's upper crust. Geoscience Australia expects to release results towards the end of the OESP.

National geoscience agreements under the National Geochemistry Survey of Australia project are now in place with all states and the Northern Territory. The training of field teams is complete in most places, and more than 130 catchments (about 10% of the total) have been sampled.

Updates on the OESP will continue in *AusGeo News*, in Geoscience Australia's monthly *Minerals Alert*, and on the program's website.

For more information

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