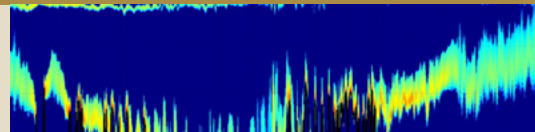




Onshore Energy Security Program update

Delivering data and improved scientific understanding

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Geoscience Australia's Onshore Energy Security Program (OESP) is a five-year program announced in August 2006 designed to reduce risk in exploration and support development of Australia's onshore energy resources.

A full description of OESP projects can be found on the Geoscience Australia website and new data releases and updates are announced through Geoscience Australia's monthly newsletter *Minerals Alert*.

Kombolgie airborne electromagnetic survey goes deeper

Geoscience Australia's Onshore Energy Security Program (OESP) has acquired airborne electromagnetic (AEM) data in areas considered to have potential for uranium or thorium mineralisation. These surveys, which are managed and interpreted by scientists at Geoscience Australia, are designed to reveal new geological information at a regional scale rather than deposit-scale.

The Pine Creek AEM survey area (figure 1) is comprised of three survey areas: Woolner Granite, Rum Jungle and Kombolgie. The TEMPEST™ AEM system was used for the Woolner Granite and Rum Jungle surveys whilst the Versatile Time Domain Electromagnetics (VTEM™) system was used for the Kombolgie survey.

The main geological target in the Kombolgie survey area, which contains the Nabarlek uranium deposit, was the Paleoproterozoic Katherine River Group metasediment unconformity. The survey covered sections of the Alligator River, Cobourg Peninsula, Junction Bay, Katherine, Milingimbi and

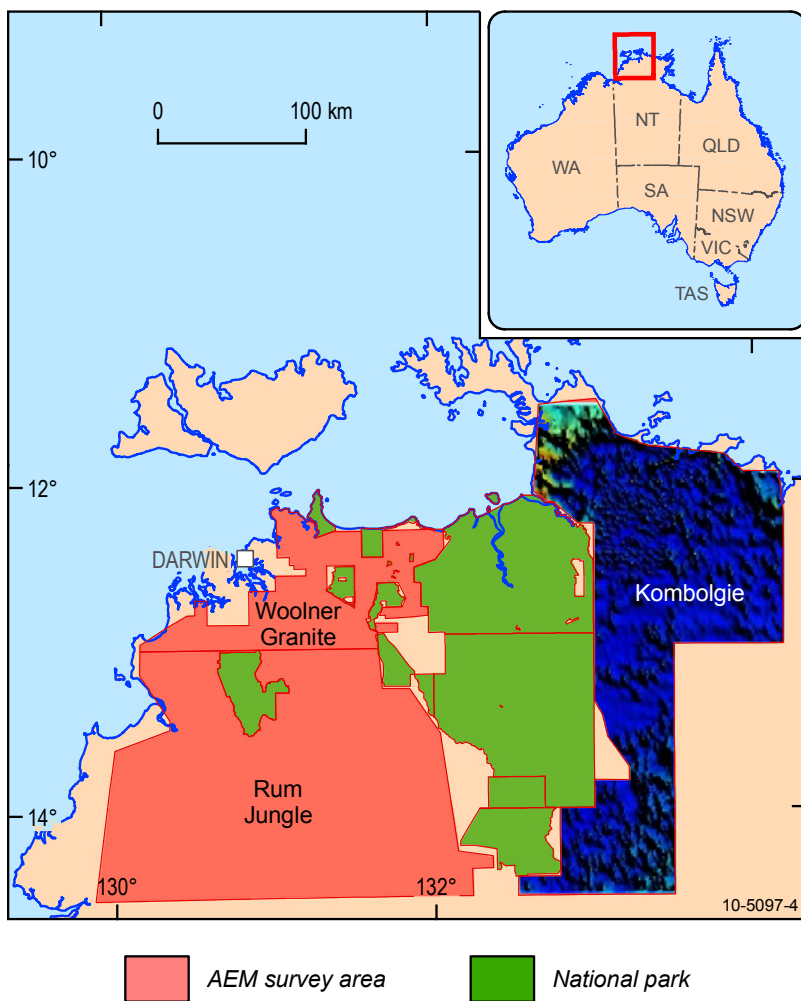


Figure 1. Pine Creek Survey boundary locations. The Kombolgie Survey area is highlighted with an image of the estimated conductance to 2000 metres. Geoscience Australia funded 5000 metre line spacing across the entire Kombolgie survey and an infill area at 1666 metre line spacing.

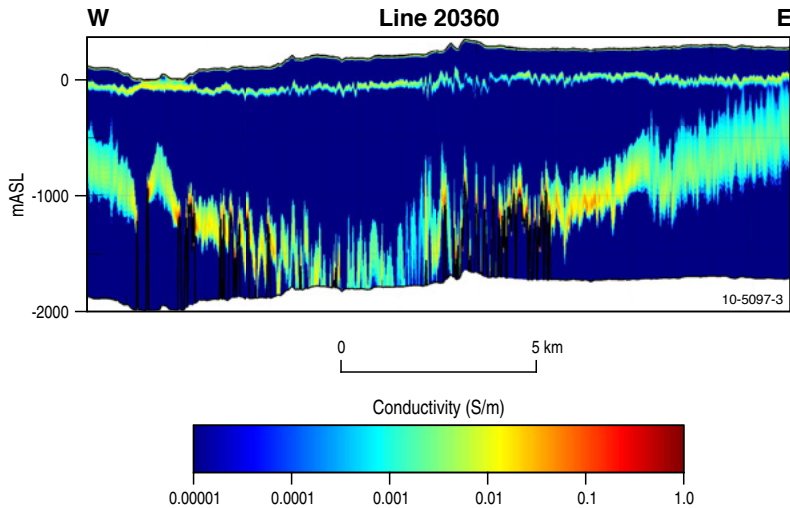


Figure 2. Conductivity for a portion of Kombolgie survey line 20360 section showing a coherent conductivity feature to 2000 metres.

Mount Evelyn 1:250 000 map sheets (Costelloe et al 2009). In the Kombolgie survey, flown during 2008, 8800 line kilometres of VTEM™ data were acquired, covering an area of 32 000 square kilometres.

In 2009 the processed response data and conductivity estimates to 600 metres depth were produced by the survey contractor Geotech Airborne using commercial version (3.30) of EM Flow™ (Macnae et al 1998; Stolz and Macnae 1998). The Phase-1 Kombolgie conductivity estimates were made available through the Geoscience Australia Sales Centre.

Further research was carried out in order to extract additional value from the electromagnetic data. In this process, Richard Lane of Geoscience Australia and Professor James Macnae of the Royal Melbourne Institute of Technology, discovered that in parts of the survey area geologically plausible conductivity estimates could be generated to depths exceeding 1500 metres (figure 2).

Consequently, reprocessing of the Kombolgie AEM data by Geoscience Australia, using a more recent version (5.23-13) of EM Flow™, has produced an enhanced set of conductivity estimates. These reveal new geological information including subsurface geological features that are associated with unconformity-related as well as sandstone-hosted Westmoreland-type and Vein-type uranium mineralisation. The datasets are also suitable for interpretation focussed on other commodities including metals and potable water as well as for landscape evolution studies. The improved understanding of the regional geology to depths greater than 1500 metres in selected areas will be of considerable benefit to mining and mineral exploration companies.

Full results and interpretation from the Pine Creek Airborne Electromagnetic Project, including the Kombolgie VTEM™ Survey, will be presented at an industry workshop immediately after the

Northern Territory Geological Survey's Annual Geoscience Exploration Seminar to be held in Alice Springs on 24 March 2010. A one-day workshop for industry and other stakeholders will be held in Perth on 7 June.

The new conductivity sections are now available through the Geoscience Australia website free of charge.

References

Costelloe M, Sorensen C & English P. 2009. Pine Creek Airborne Electromagnetic Survey, Onshore Energy and Minerals, Geoscience Australia. ASEG 2009 Extended Abstracts.

Macnae J & Baron-Hay S. 2010. Reprocessing strategy to obtain quantitative early time data from historic VTEM surveys. ASEG 2010 Extended Abstracts.

Stolz E & Macnae J. 1998. Evaluating EM waveforms by singular-value decomposition of exponential basis functions. *Geophysics* 63.

Related websites/articles

Enhanced set of conductivity estimates for the Kombolgie region within the Pine Creek survey area

www.ga.gov.au/products/servlet/controller?event=GEOCAT_DETAILS&catno=71371

Kombolgie Phase-1 VTEM™ data and processing report.

www.ga.gov.au/products/servlet/controller?event=GEOCAT_DETAILS&catno=71372

The Versatile Time Domain Electromagnetics (VTEM™) system operated by Geotech

www.geotech.ca/index.php?option=com_content&task=view&id=2&Itemid=53

Geoscience Australia's Onshore Energy Security Program

www.ga.gov.au/energy/energy-security-program/onshore-energy-security.html

Onshore seismic program

Regional scale, deep crustal seismic surveys have been a major component of the Onshore Energy Security Program (OESP). To date, thirteen seismic surveys have been conducted as part of the Program and the datasets and products from these surveys are being released progressively as processing and interpretation is completed. These data are accessible via the Geoscience Australia website.

A major survey was proposed to image the Kidson Sub-basin, an under-explored depocentre of the Canning Basin in Western Australia, as the final seismic acquisition under the OESP (see *AusGeo News* 97). However this survey had to be deferred because it was not certain that land access negotiations could be completed for the data acquisition to commence before the end of the OESP.

Instead seismic data will now be acquired over the South Carnarvon Basin and the Officer Basin in Western Australia. The South Carnarvon survey aims to image the Byro Sub-basin, an under-explored depocentre with both hydrocarbon and geothermal energy potential. The sub-basin is in the onshore section of the Carnarvon Basin, Australia's premier petroleum producing province (figure 3). The acquisition phase of this survey is scheduled to commence in April 2011 and the resulting datasets will link with data acquired by Geoscience Australia during the offshore Southwest Frontiers Project in late 2008 and early 2009.

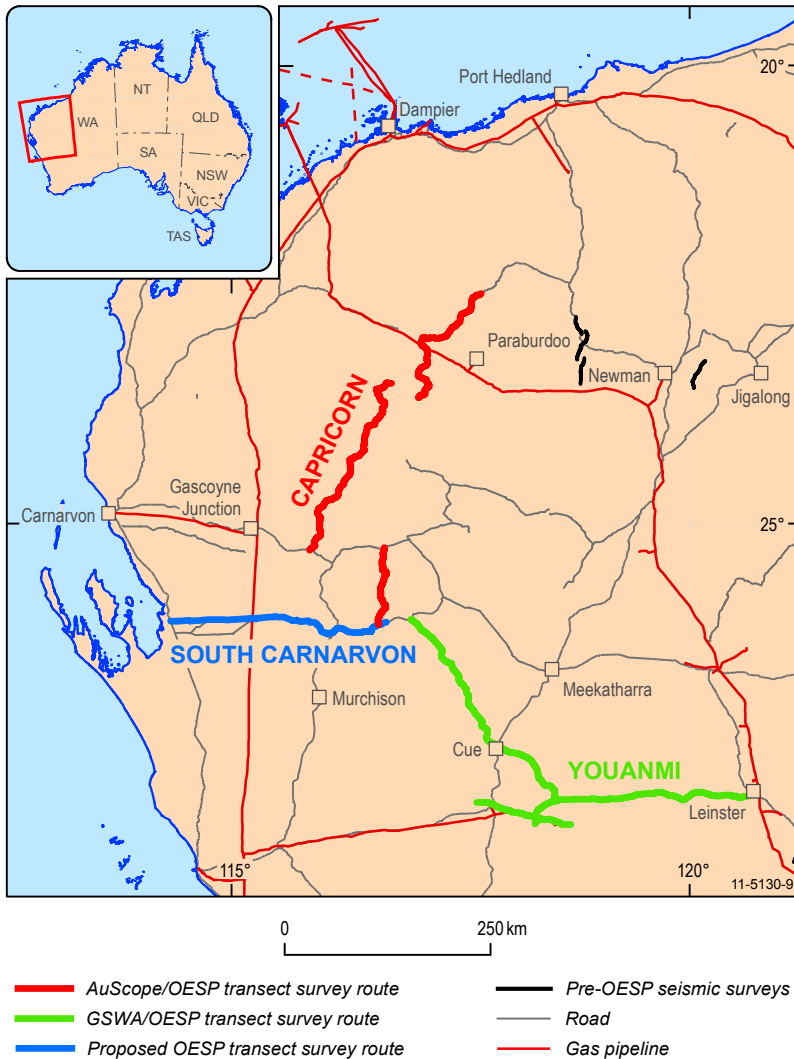


Figure 3. Location map for the planned South Carnarvon Basin seismic survey in Western Australia (in blue). The Capricorn Seismic Line (in red) and the Youanmi Seismic Line (in green) were acquired in 2010.



Figure 4. Seismic trucks during the Capricorn seismic survey in WA.

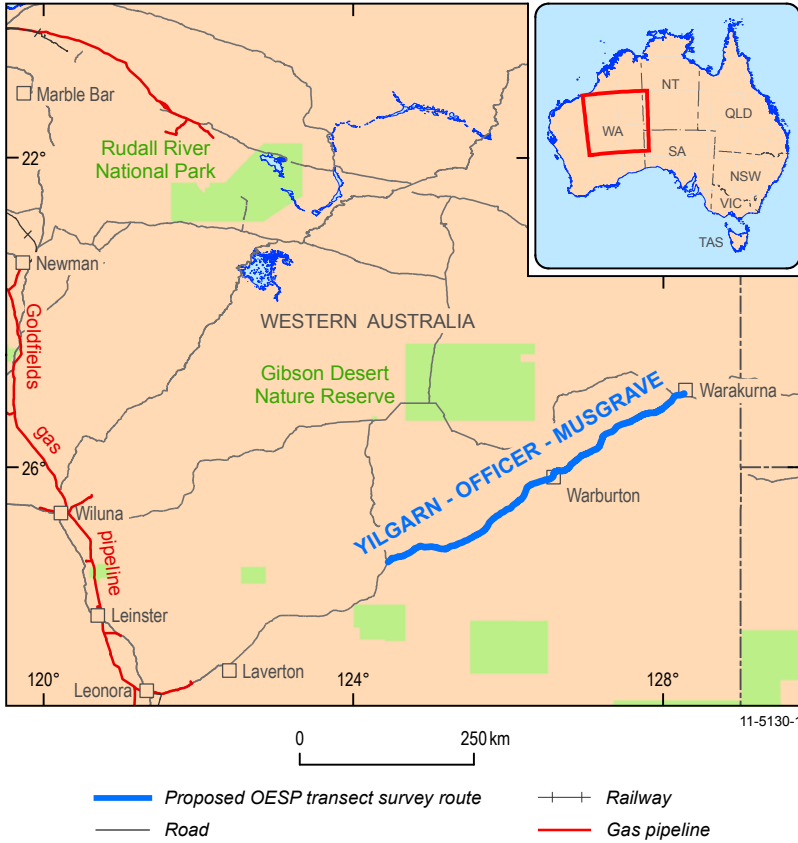


Figure 5. Location map for the planned Yilgarn–Officer–Musgrave seismic survey in Western Australia.

The Yilgarn–Officer–Musgrave survey aims to image the western Officer Basin, another of Australia’s under-explored sedimentary basins with hydrocarbon potential (figure 5). The survey data will

also build on the geoscientific knowledge of the architecture of Australia’s crust and the region’s relationship with the western Yilgarn and central Musgrave cratons.

Acquisition of seismic data in this area is planned to commence in May 2011.

For more information

email ausgeo@ga.gov.au

Related websites/articles

Seismic Acquisition & Processing.

www.ga.gov.au/minerals/projects/current-projects/seismic-acquisition-processing.html

AusGeo News 97: Onshore Energy Security Program maintains momentum

www.ga.gov.au/ausgeonews/ausgeonews201003/oesp.jsp

Southwest Frontiers Project

www.ga.gov.au/energy/projects/southwest-frontiers.html

