Successful Sydney Conference

ASEG Conferences provide opportunities to learn about new developments, to explore an exhibition of the industry's wares, to discover what new things the resource service companies are doing, to network with friends and colleagues and to discuss future plans for the ASEG. This conference delivered on all those counts.

Everyone is aware that the application of geophysics, whether it is in the exploration and production of our energy resources, the exploration and production of our mineral resources, the detection and maintaining of our water resources, infrastructure engineering or the solving of environmental problems is vital to the successful completion of those projects. Thus the conference theme: 'Future Discoveries are in Our Hands' reflects our belief that well-applied geophysical approaches will be needed to find the next world-class resources and contribute to new wealth creation. The conference theme provides a challenge to our profession to demonstrate how we have responded to the world financial situation and achieved major commercial and technical outcomes for our industries. This conference gave the leading professionals, explorers, managers, educators and service providers, the opportunity to actively participate in this discussion.

A total of 864 delegates and exhibitors from 38 countries attended with the number of overseas delegates about 25%, which gave the Conference a truly international flavour. A total of 189 papers were presented, of which 121 were in the non-petroleum streams and 68 in the petroleum streams. Students presented 13 papers and we had 70 student delegates, which is an excellent sign for the future of our society. In addition there were 66 posters displayed throughout the Conference, ten workshops attended by approximately 280 people of which 140 attended the gravity workshop and of course the magnificent exhibition where 90 exhibitors filled the Exhibition Hall.

The Conference dinner was a great success with about 350 attendees. 45 secondary students and teachers visited the Conference as well as 25 third year university students from the local universities.

Plenary session

After Mark Lackie, the conference co-chair, and Phil Harman, the ASEG President, welcomed everyone, the society awards were presented to worthy recipients (see pp. 4–7 of this issue). Then, the two Plenary speakers, Chris Pigram, Chief Executive Officer of Geoscience Australia, and John McGagh, Head of Innovation, Rio Tinto gave excellent talks, with Chris focusing on the role of Geoscience Australia and John on the innovation that Rio Tinto undertakes throughout its operations. An article based on Chris Pigram's presentation can be found on pp. 31–33 of this issue.

Conference Awards in Sydney

Best Non-Petroleum Presentation

Jared D. Abraham – *Quantitative hydrogeological framework interpretations using heliborne electromagnetic surveys for the North Platte Valley, Western Nebraska groundwater model*

Best Petroleum Presentation

Russell J. Korsch – *Geological interpretation of the 2008 seismic reflection, refraction and magnetotelluric data from the Northern Eyre Peninsula, Gawler Craton*

Honourable Mentions

Petroleum: Eric Saenger – *The virtual rock physics lab*

Non-petroleum: David M. Johnson – *Discovery case history of the moran massive nickel sulphide deposit, Kambalda, Western Australia*

Best Student Presentation

Cara Danis – *3D thermal modelling versus down-hole temperature extrapolation in the Sydney Gunnedah–Bowen Basin and the implications for targeting potential geothermal anomalies*

Best Poster

Phil Schmidt, Suzanne McEnroe, Peter Robinson, Karl Fabian, Jerome Gattacceca, Fatim Hankard and Florian Heidelbach – *Magnetic moments of fine particles from micromagnetic surveys*

Honourable Mentions

Julian Vrbancich, Bob Whiteley and Don Emerson – *Marine seismic profiling and shallow marine sand resistivity investigations in Jervis Bay, NSW Australia*

Julian Vrbancich, Bob Whiteley and Don Emerson – *Marine seismic profiling and shallow marine sand resistivity investigations in Broken Bay, NSW Australia*

Laurent Ailleres, Peter Betts, Helen Williams and David Milton – *3D combined gravity and magnetics inversion modelling as a guide to target haematitic iron ores – an example from the Koolanooka South (WA) Prospect*

Jim Macnae and Stuart Baron-Hay – *Reprocessing strategy to obtain quantitative early time data from historic VTEM surveys*

Best Exhibit

Alpha Geoscience

Best Large Booth Exhibit

CGG Veritas

Exhibition Honourable Mentions

GeoKinetics
Petroleum Geo Services

Laric Hawkins Award

For the most innovative use of geophysics in a paper presented at the Conference.

M. Andy Kass, Kristofer Davis and Yaoguo Li – *Rapid gravity and gravity gradiometry terrain corrections via a quadtree mesh discretization*

Honourable Mention

Kyle Blay, Keith Leslie, D. Tilbrook, S. Billings and L. Pasion – *Precision geolocation of active electromagnetic sensors using stationary magnetic sensors*

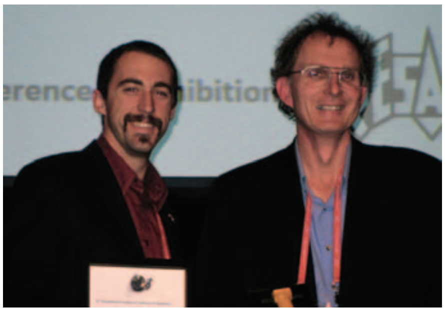
Student Day

Every conference has a student day where high school students are invited to attend the conference to listen to talks by industry geophysicists and view the exhibition and this conference was no different in that aspect. The talks were well received posing questions such as "can bears really fit in windows that small" and "are magnetometer surveys worse than roller coaster rides". However the highlight of the day were the hands-on activities where students found that concrete does have rebar and they can easily find it and that concrete also makes scintillators tick. The students also discovered that rocks are not all they seem to be and that it is easy to decide what is ore and what is not, with geophysical equipment. The geophysical quiz was well answered showing that the next generation of geophysicists will be very capable.

Mark Lackie
Conference Co-Chair

Cara Danis – Best Student Presentation.

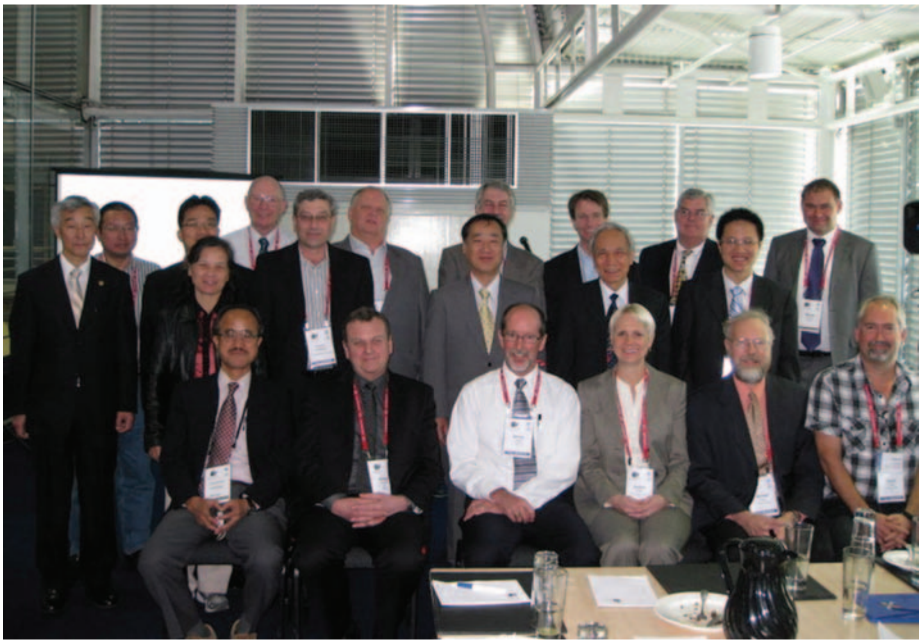
Peter Milligan for Russell Korsch – Best Petroleum Presentation.



M. Andy Kass – Laric Hawkins Award.

Jared D. Abraham – Best Non-Petroleum Presentation.

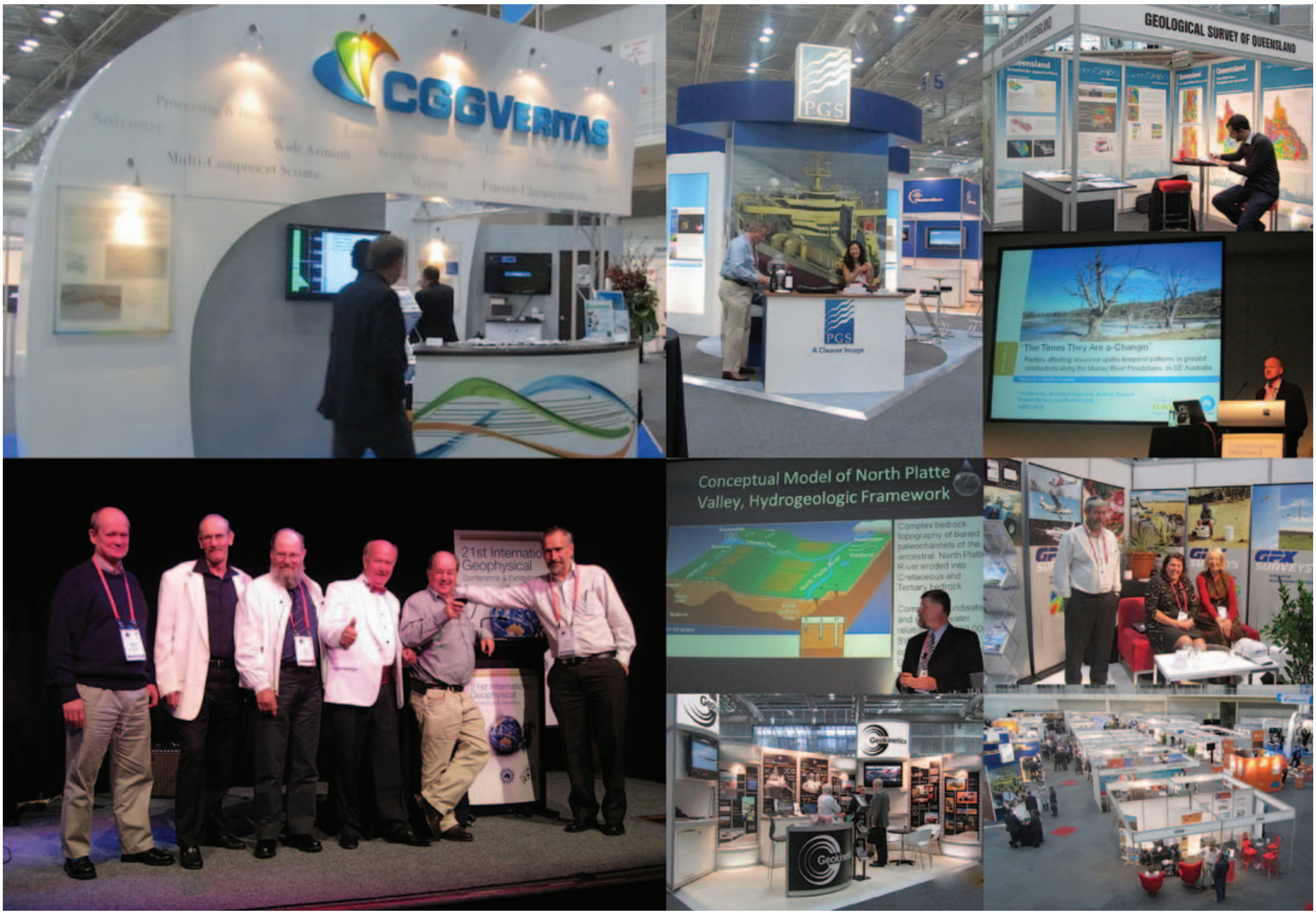
Phil Schmidt – Best Poster.



Guests at the Inter-Society Luncheon.

Kurt Strack (left) opened the day-long EM & MT Symposia in honour of Keeva Vozoff (right).

Pictures from Sydney



ASEG 2012: 22nd ASEG Conference and Exhibition news update (01)

Many thanks to the Sydney Conference Organising Committee for yet another successful ASEG/PESA conference. I know from experience how exhilarating the conference can be, followed by the inner calm knowing it's all over.

This is the first *Preview* update for the Brisbane 2012 conference. The COC was formed earlier this year and has been busy catching up with the conference schedule. The PCO, ARINEX, has been appointed and the initial conference web-site www.aseg2012.com.au has been set up where you can register your interest.

When forming the Brisbane COC we tried to include people from a wide variety of geophysical disciplines, including petroleum, minerals, coal, environmental and engineering. Hopefully you will know at least one of the following people. By the time the conference comes around you definitely will!

Co-Chairs: Wayne Mogg and Andrea Rutley
Technical: Binzhong Zhou
Sponsorship: Ron Palmer and Howard Bassingthwaighte
Exhibition: Gary Butler and Dave Burt/John Donohue
Finance: Noll Moriarty
Workshops: Koya Suto
Publicity: Henk van Paridon
Students: Shaun Strong
Social: Janelle Kuter

The conference theme 'Unearthing New Layers' was chosen to highlight how resources can exist in places that we have already explored and how geophysical data can be re-examined to help see them. The logo is a stylised map of Queensland with a standard colour look-up showing the sea in blue and the earth in red.

News

Update on Geophysical Survey Progress from the Geological Surveys of Western Australia, Northern Territory, New South Wales and Geoscience Australia (information current at 16 September 2010)

Tables 1–3 show the continuing acquisition by the States, the Northern Territory and Geoscience Australia of new gravity, airborne magnetic and radiometrics, and airborne EM over the Australia continent. All surveys are being managed by Geoscience Australia.

There are ten new airborne magnetic and radiometric surveys reported in this issue, all funded under the WA Exploration Incentive Scheme – Phase 2. Figure 1 shows the locality diagram for these new surveys, with Figures 2–11 showing detailed survey boundaries.

In total, more than 1.1 million line kilometres of data will be collected over an area of approximately 307 000 km^2 with line spacings of either 200 m or 400 m.

Table 1. Airborne magnetic and radiometric surveys

Survey name	Client	Contractor	Start flying	Line (km)	Spacing AGL Dir	Area (km^2)	End flying	Final data to GA	Locality diagram (*Preview*)	GADDS release
South Officer 1 (Jubilee)	GSWA	Thomson	1 Jun 10	180 000	200 m 50 m N–S	32 380	TBA	TBA	This issue (Figure 2)	TBA
South Officer 2 (Waigen – Mason)	GSWA	Thomson	28 Jun 10	113 000	400 m 60 m N–S	39 890	TBA	TBA	This issue (Figure 3)	TBA
East Canning 3 (Stansmore)	GSWA	Thomson	14 Jul 10	114 000	200 m (east) 400 m (west) 50 m N–S	25 934	TBA	TBA	This issue (Figure 4)	TBA
Eucla Basin 2 (Loongana)	GSWA	Fugro	20 Jun 10	113 000	200 m 50 m N–S	20 320	TBA	TBA	This issue (Figure 5)	TBA
Eucla Basin 4 (Madura)	GSWA	Fugro	1 Jul 10	102 000	200 m 50 m N–S	18 220	TBA	TBA	This issue (Figure 6)	TBA
Eucla Basin 5N (Forrest)	GSWA	Fugro	16 Jun 10	75 000	200m 50 m N-S	13 040	12 Sep 10	TBA	This issue (Figure 7)	TBA
Eucla Basin 5S (Eucla)	GSWA	Fugro	6 Jul 10	87 500	200 m (onshore) 400 m (offshore) 50 m (onshore) 100 m (offshore) N–S	16 100	TBA	TBA	This issue (Figure 8)	TBA
South Canning 1 (Madley – Herbert)	GSWA	UTS	19 Jul 10	95 000	400 m 60 m N–S	33 520	TBA	TBA	This issue (Figure 9)	TBA
South Canning 2 (Morris – Herbert)	GSWA	UTS	1 Jul 10	125 000	400 m 60 m N–S	45 850	TBA	TBA	This issue (Figure 10)	TBA
North Canning 4 (Lagrange – Munro)	GSWA	UTS	20 Sep 10	103 000	400 m 60 m N–S	36 680	TBA	TBA	This issue (Figure 11)	TBA
Southeast Lachlan	GSNSW	Fugro	1 Mar 10	107 533	250 m (NSW) 500 m (ACT) E–W	24 660	100% on 9 Sep 10	TBA	144 – Feb 10 p15	TBA

TBA, to be advised.

Table 2. Gravity surveys

Survey name	Client	Contractor	Start survey	No. of stations	Station spacing (km)	Area (km²)	End survey	Final data to GA	Locality diagram (*Preview*)	GADDS release
Gascoyne North	GSWA	Atlas	16 Mar 10	7400	2.5 km regular	45 410	100% on 19 May 10	2 Jul 10	144 – Feb 10 p15	15 Jul 10
Albany – Fraser North	GSWA	Atlas	7 Oct 2010	9200	2.5 km regular	50 980	TBA	TBA	146 – Jun 10 p17	TBA
Sandstone	GSWA	IMT	Early Oct 2010	6300	2.5 km regular	35 640	TBA	TBA	146 – Jun 10 p17	TBA
South Gascoyne	GSWA	IMT	9 Aug 2010	9700	2.5 km regular	55 760	26.7%	TBA	146 – Jun 10 p17	TBA
West Arunta	NTGS	Atlas	6 Jun 2010	12 426	4, 2 and 1 km	89 985	100% on 15 Sep 2010	TBA	146 – Jun 10 p18	TBA

TBA, to be advised.

Table 3. AEM surveys

Survey name	Client	Contractor	Start survey	Line (km)	Spacing AGL Dir	Area (km²)	End survey	Final data to GA	Locality diagram (*Preview*)	GADDS release
Frome	GA	TBA	22 May 10	34 986	5000 and 2500 100 m E–W	95,450	65.3% on 12 Sep 2010	TBA	146 – Jun 10 p18	TBA

TBA, to be advised.

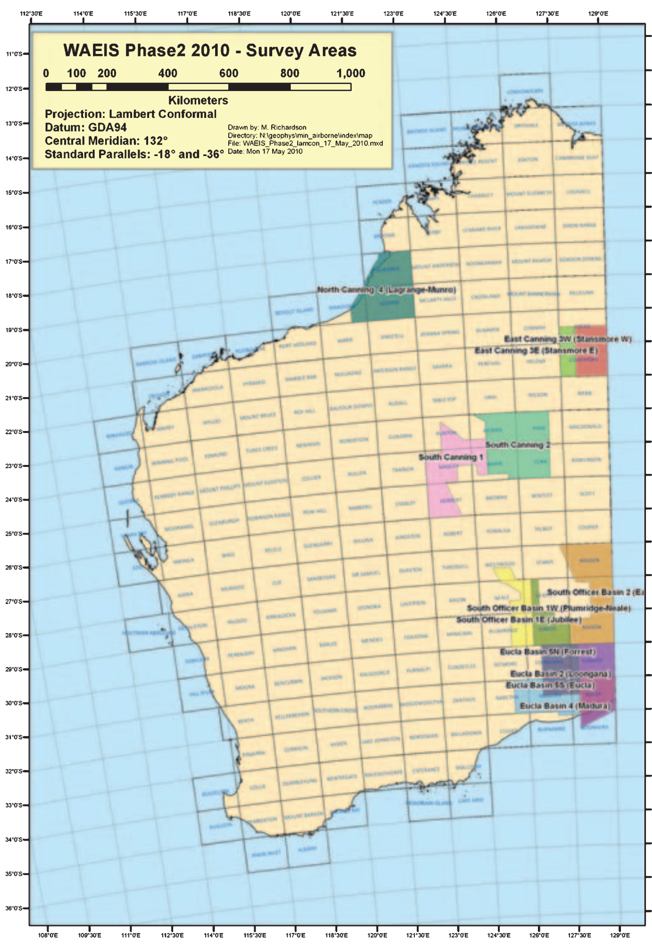


Fig. 1. *Locality diagram for ten new surveys in WA funded under the Exploration Incentive Scheme – Phase 2.*

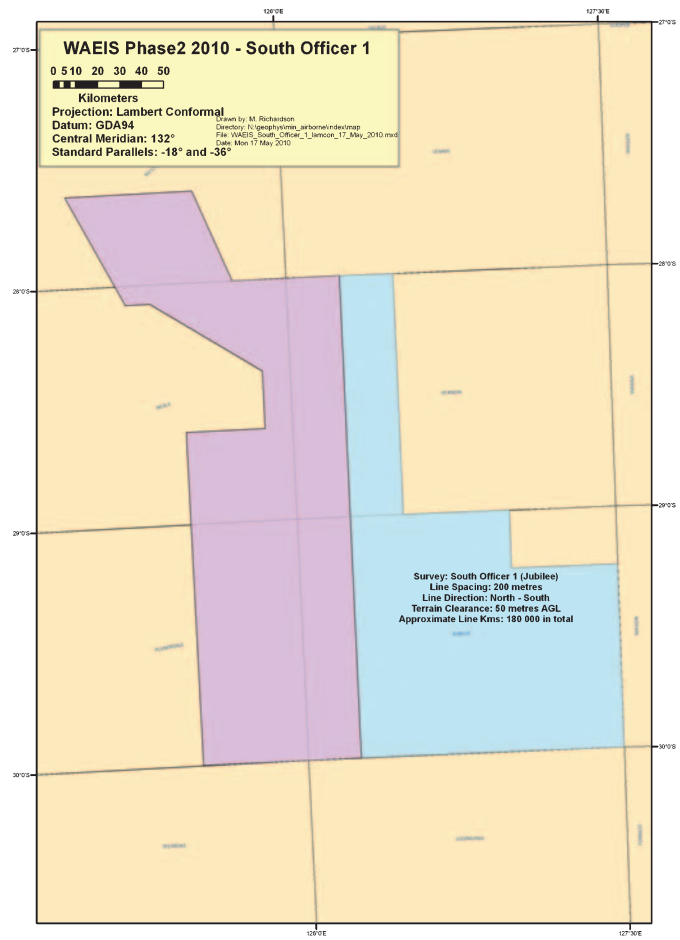


Fig. 2. *Locality diagram for the South Officer 1 airborne mag/rad survey.*

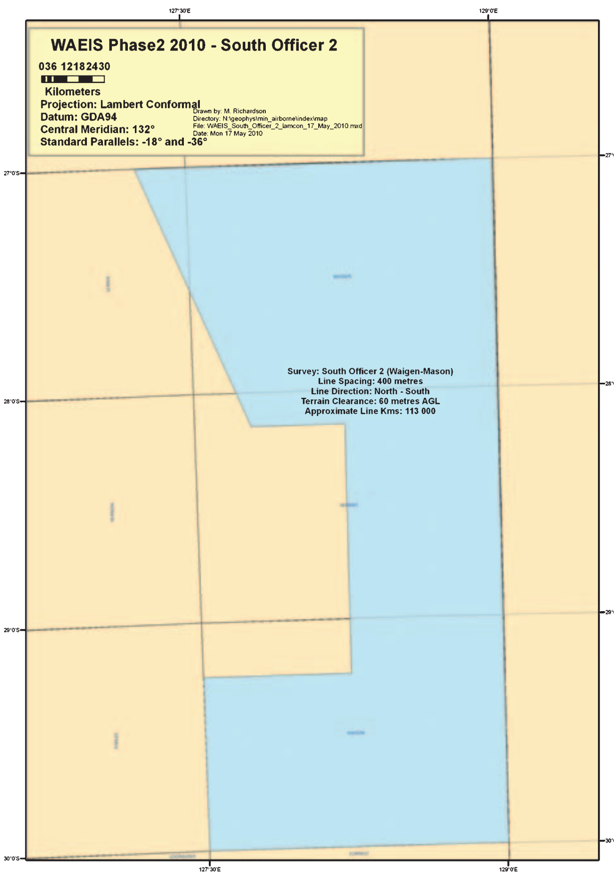


Fig. 3. *Locality diagram for the South Officer 2 airborne mag/rad survey.*

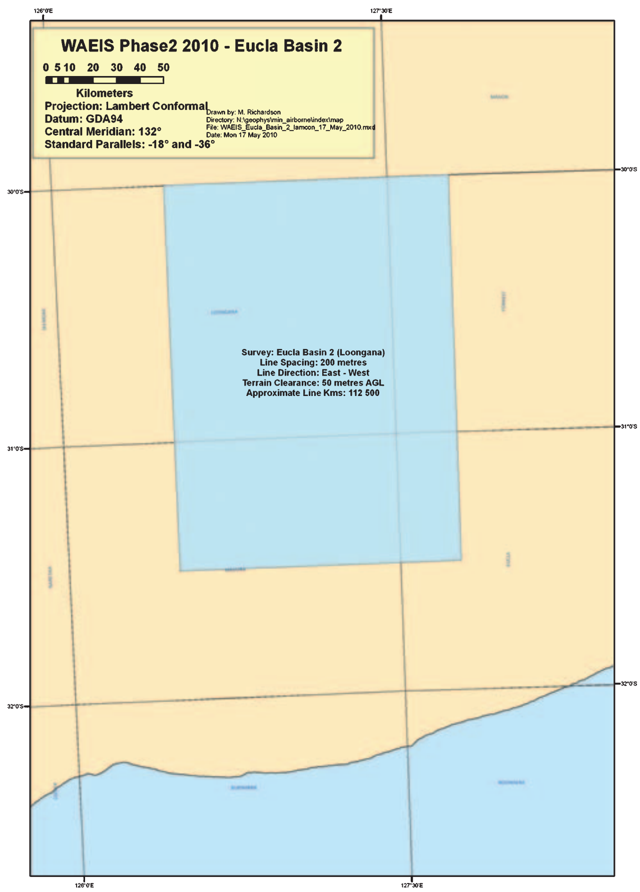


Fig. 5. *Locality diagram for the Eucla Basin 2 airborne mag/rad survey.*

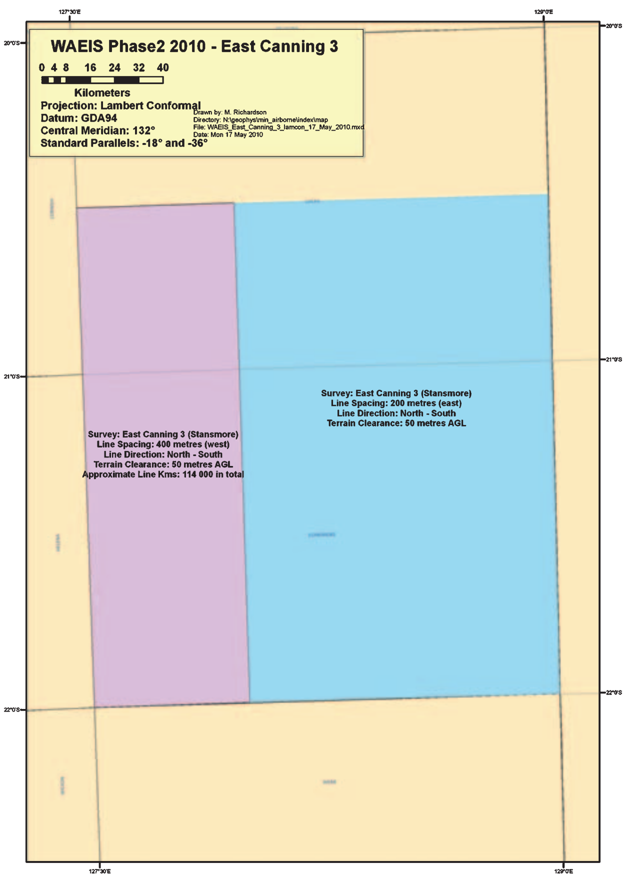


Fig. 4. *Locality diagram for the East Canning 3 airborne mag/rad survey.*

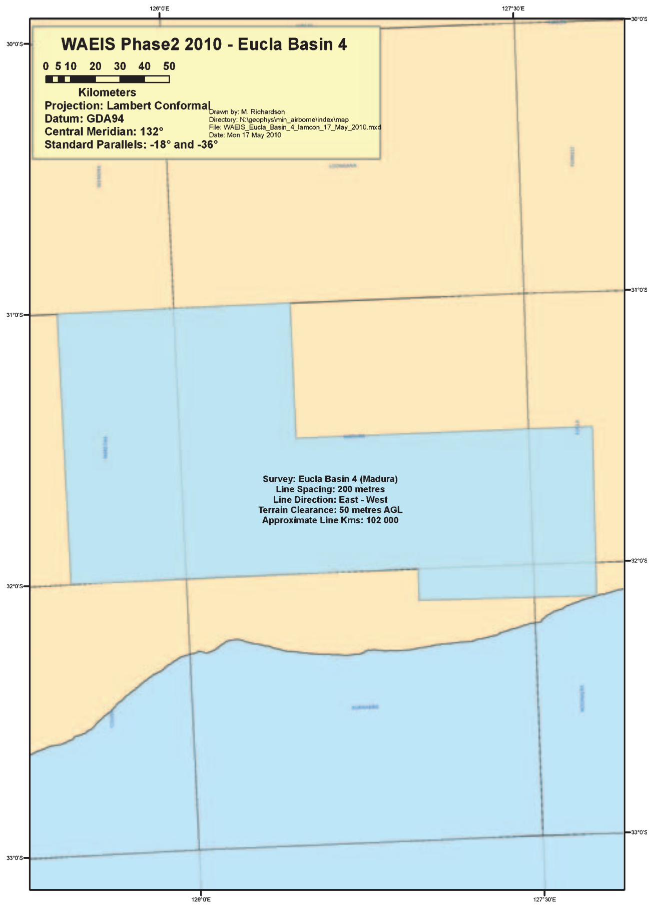


Fig. 6. *Locality diagram for the Eucla Basin 4 airborne mag/rad survey.*

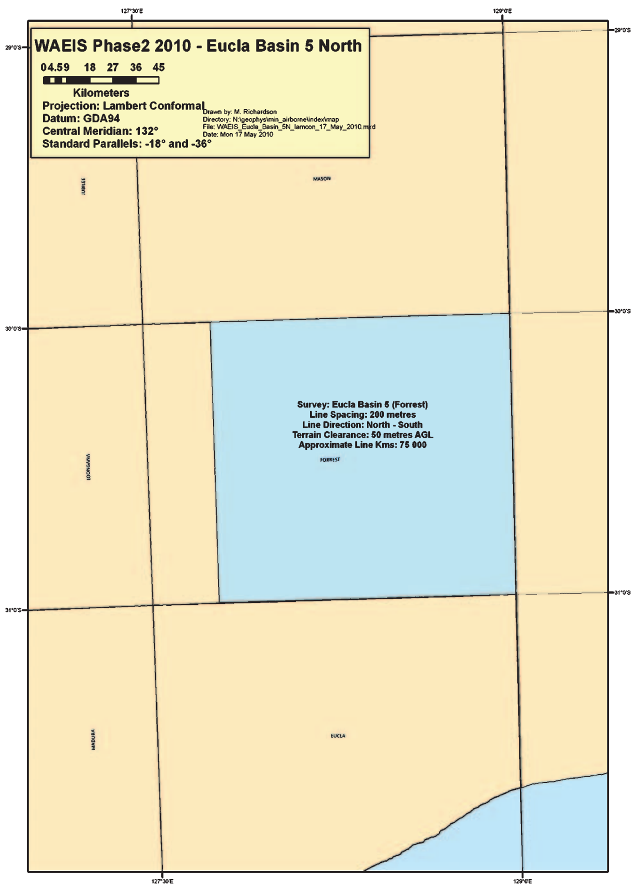


Fig. 7. *Locality diagram for the Eucla Basin 5N airborne mag/rad survey.*

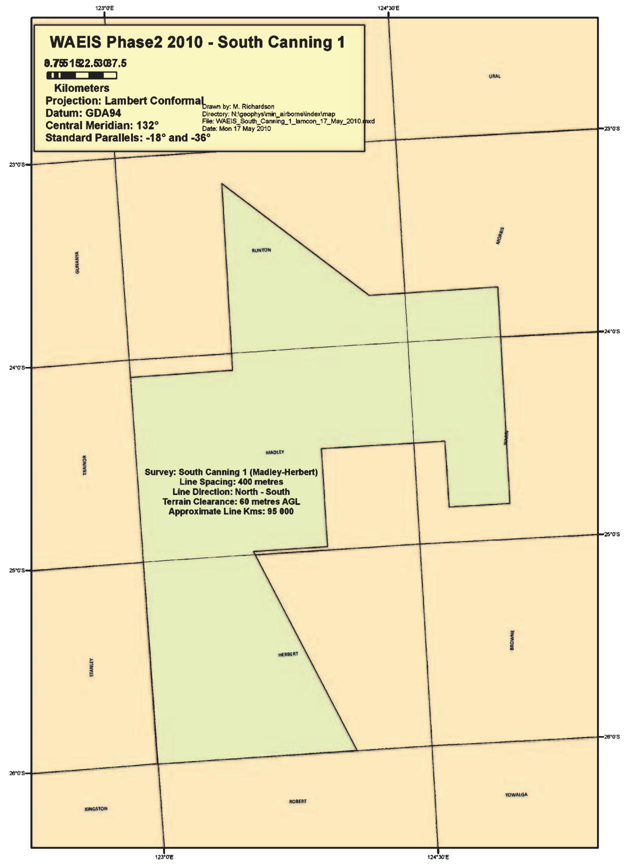


Fig. 9. *Locality diagram for the South Canning 1 airborne mag/rad survey.*

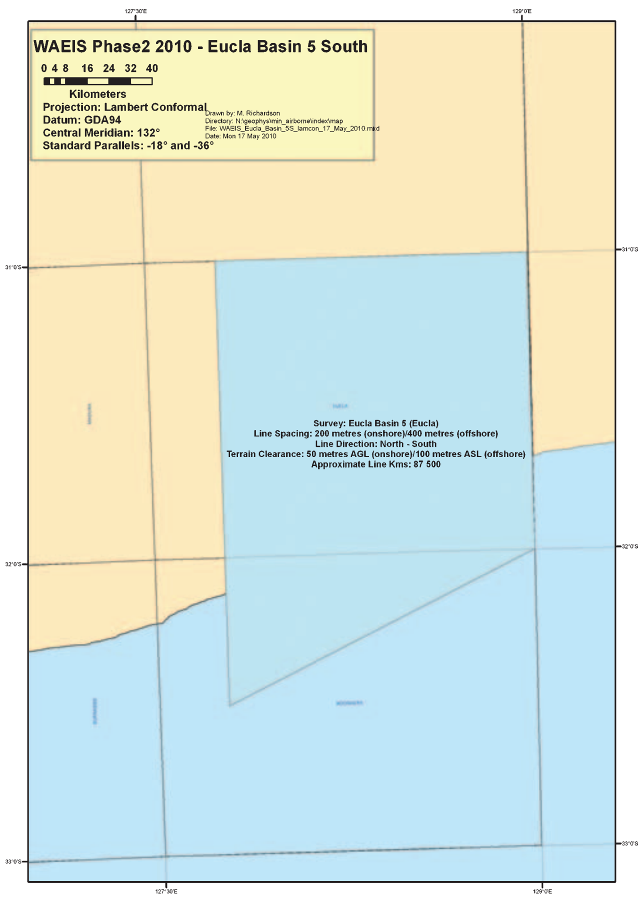


Fig. 8. *Locality diagram for the Eucla Basin 5S airborne mag/rad survey.*

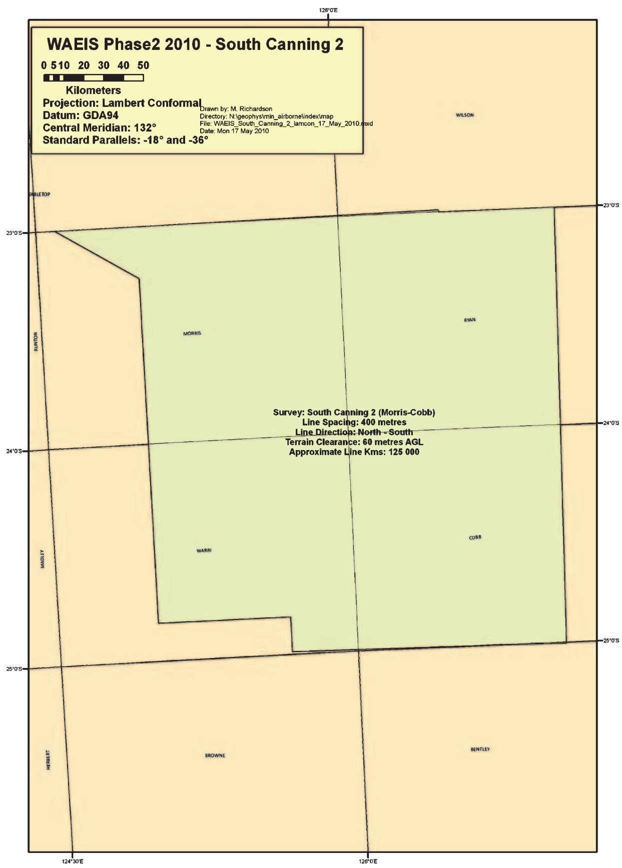


Fig. 10. *Locality diagram for the South Canning 2 airborne mag/rad survey.*

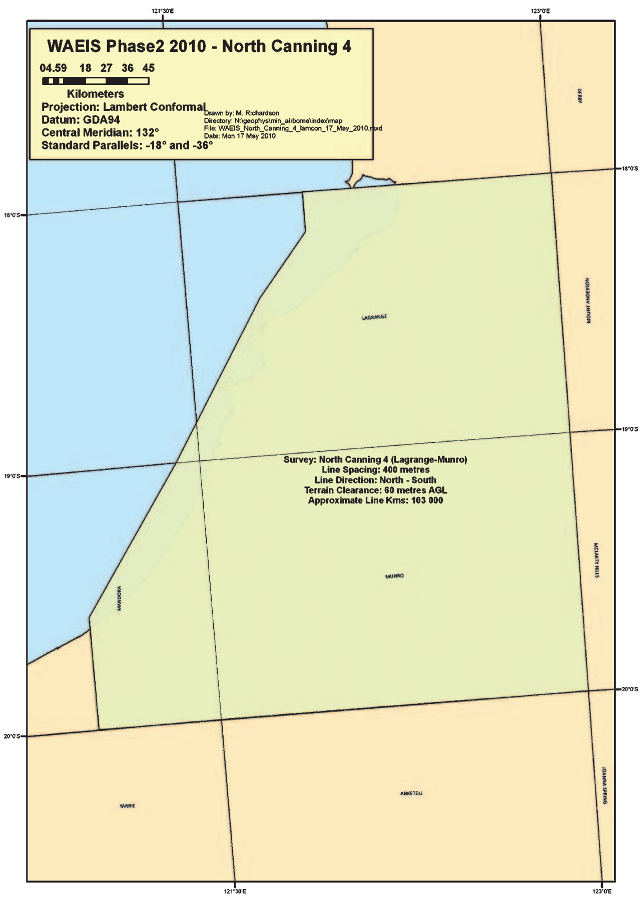


Fig. 11. *Locality diagram for the North Canning 4 airborne mag/rad survey.*

Mineral prospectivity mapping in South Australia

Laszlo Katona[1,2], Martin Fairclough[1] and Philip Heath[1]

[1]*Primary Industries and Resources South Australia, Adelaide, SA*
[2]*Email: laz.katona@sa.gov.au*

The Geological Survey of South Australia (GSSA), as part of Primary Industries and Resources South Australia (PIRSA), has a proactive program to reduce exploration risk through a systematic program of regional mineral potential modelling that provides both the tools and information for prospective area selection. Exploration strategies vary from terrain to terrain, depending largely upon the commodity (or deposit type) being explored for, the degree of outcrop and the distribution of sampled data. In particular, an understanding of which processes are critical (or at least desirable) to ore formation, and how they are manifested in geological and geophysical datasets, allow a predictive approach to exploration targeting. Prospectivity modelling for the northern Flinders Ranges and Musgrave Province regions has been completed, with a third project underway in the eastern Olympic Domain of the Gawler Province. These regions are shown in Figure 12.

Due to the exposed nature of the target lithologies in the northern Flinders Ranges, there is a long history of exploration and discovery. This body of knowledge enabled the project team to model nine commodity classes, incorporating 45 mineral styles. Stratigraphy hosting known mineral styles is the primary geological control, with mapped linear structure and diapirs enhancing prospectivity for certain mineral styles (Cowley and Preiss, 1997; Fabris et al., 2005; Preiss and Robertson, 2006).

The Musgrave Province, located in central Australia, spans three states (South Australia, Western Australia and Northern Territory). In this isolated region there is less historical exploration and fewer known mineral occurrences. The main focus of the project was assessing the prospectivity of mineralisation related to the mafic/ultramafic intrusives of the Warakurna large igneous province. For the fuzzy logic analysis (Bonham-Carter, 1996) a larger number of predictors were used (when compared with northern Flinders Ranges) including mineral occurrences, geochemistry from a number of sources, as well as mapped and interpreted geological features. Aeromagnetic interpretation was an integral part of the knowledge driven modelling process. Among the predictors interpreted from TMI were mafic plugs, magnetic intrusives, basal sequences, mafic sills and linear structures. Magnetic depth to basement and gravity (representing high/low density) were also used.

In the Olympic Domain of the eastern Gawler Province, where thick cover obscures target lithologies and structures, there is a much greater reliance on potential field data and its derivatives.

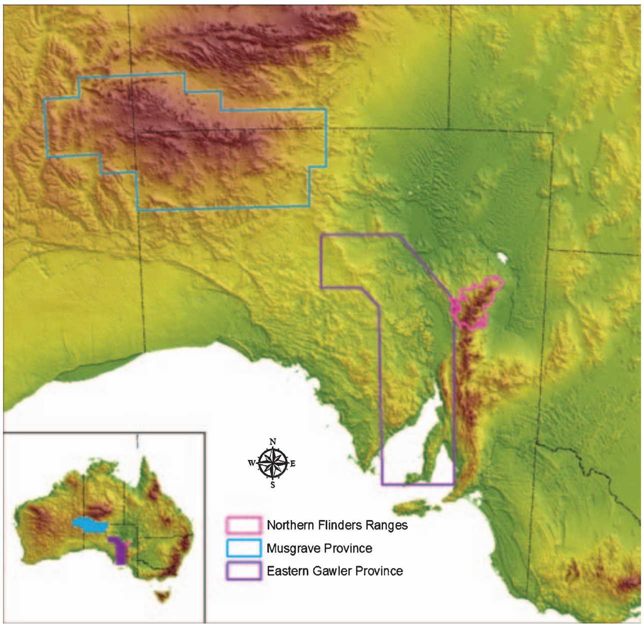


Fig. 12. *Areas targeted by current prospectivity modelling projects.*

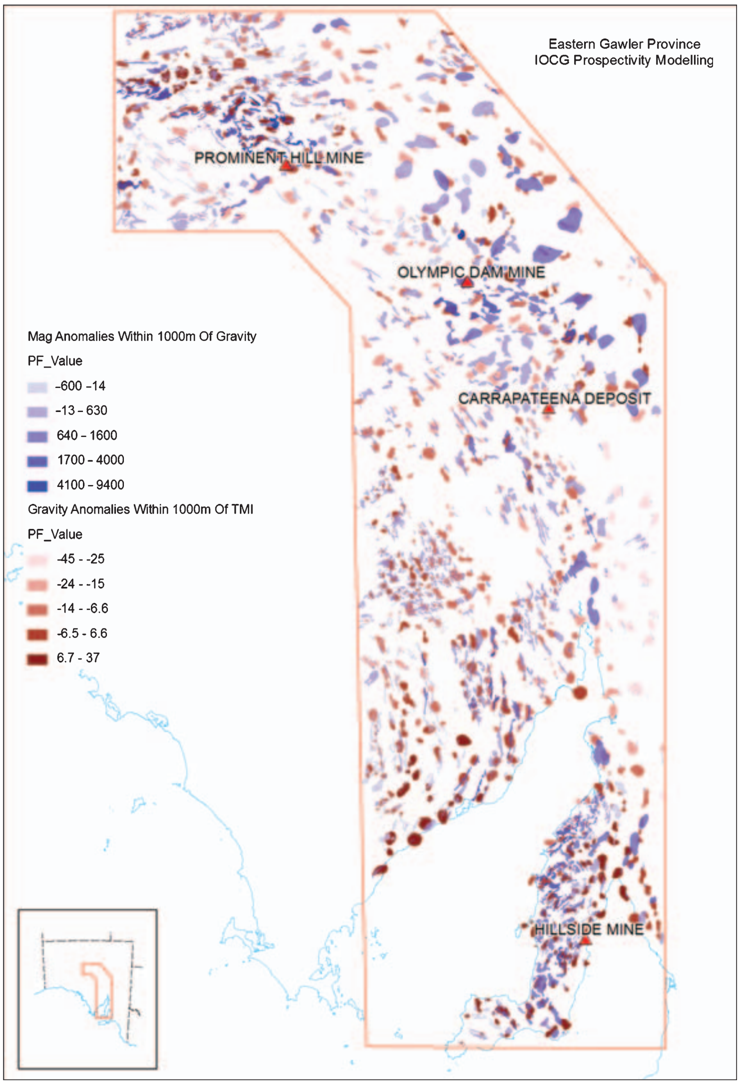


Fig. 13. *Coincident residual TMI and gravity highs.*

The major targets in this region are iron oxide-copper-gold±uranium (IOCG±U) deposits. A fundamentally accepted predictor of these deposits is broadly spatially coincident (although generally offset in detail) gravity and magnetic highs. GIS processing has delineated and mapped the coincident highs from residual RTP TMI and residual gravity datasets, as shown in Figure 13. Gravity and magnetic data will be processed to generate apparent susceptibility and density, used for alteration mapping (Chopping and Henson, 2009). Spectral analysis (HyLogger) of drill core will also be used to map alteration. Proximity to uraniferous sources, used in tandem with gravity and magnetic gradient strings (representing structure and possible fluid conduits) will be used to model structural connectivity. Finally, magnetic data enable the analyst to model depth to crystalline basement, where the IOCG deposits usually occur. Together, these datasets will be used in both knowledge driven and weights of evidence modelling.

As depth of cover increases, the reliance on potential field data and its derivatives also increases. High level decision makers are able to utilise prospectivity maps for both land use decisions and exploration planning, however it is of vital importance that the assumptions, methodologies and conclusions of the modelling process be incorporated into any map product that is released to avoid misinterpretation. These products should not be used in isolation from the supporting data and information. The practice of releasing the maps as a part of a complete information package incorporating report and maps addresses this issue.

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Cowley, W. M. and Preiss, W. V., 1997, Geology and Mineral Potential of Diapiric Inliers in the Northern BURRA 1:250 000 Map Area: *MESA Journal* **5**, 37–45.

Fabris, A., Constable, S., Woodhouse, A., Hore, S., and Fanning, M., 2005, Age, origin, emplacement and mineral potential of the Oodla Wirra Volcanics, Nackara Arc, central Flinders Ranges: *MESA Journal* **37**, 44–52.

Preiss, W. V., and Robertson, R. S., 2006, Adelaide Geosyncline and Stuart Shelf. In: Cooper, B. J., and McGeough, M. A. (Eds), 2006, South Australia mineral explorers guide, 2nd edn, South Australia, Department of Primary Industries and Resources, Mineral Exploration Data Package, 11, Ch. 7.

AuScope awarded $23 million for Australian Geophysical Observing System (AGOS)

Congratulations to AuScope, which was awarded $23 million in June this year by the Australian Government, to develop a new Australian Geophysical Observing System (AGOS).

AuScope Limited is a non-profit company comprising 23 universities, government bodies and research organisations. It was established with a government grant of $42.8 million in 2006 under the National Collaborative Research Infrastructure Strategy (NCRIS) to develop a world-class infrastructure system for earth science in Australia. In addition to its NCRIS funding, over $70 million in co-investment has been committed by the participants in AuScope.

The six components of the original program are:

- AuScope grid and interoperability – *computing and data access*
- Earth composition and evolution – *geochemistry*
- National virtual core library – *rock core information*
- Earth imaging and structure – *seismic and MT equipment*
- Earth simulation and modelling – *inversion and visualisation*
- Geospatial framework and earth dynamics – *geodesy*

AuScope's work has been significantly boosted by the $23 million new funding, which was obtained through Round 3 of the Education Investment Fund (EIF).

The new AGOS infrastructure will include:

The ***Geospatial Observatory*** – involving a Global Navigation Satellite System instrumentation pool of ~100 GPS stations, high precision monuments, corner cube reflectors, establishment of new monitoring sites, a library of remote sensed data, and robotic antenna systems all designed to improve precision and accuracy for geospatial science.

The lead nodes are the Australian National University (ANU) and Geoscience Australia; the equipment budget is ~$5.2 million.

The ***Earth Sounding Network*** – will build new generation seismic recorders, and purchase or build a pool of ~20 ocean-bottom seismometers, ~20 earth data recorders and electric field multichannel loggers for MT research. It will make available 100 new temporary seismometers and a host of other scientific instruments to provide new capability exploring new realms of the continent. All equipment will be made available to the scientific community through ANSIR.

The lead nodes are the ANU and University of Adelaide; the equipment budget is ~$4.0 million.

The ***Subsurface Observatory*** – including infrastructure to facilitate access to deep drill holes and establish equipment for downhole tests, including a downhole logging toolkit, the facility for *in situ* stress measurement and laboratory equipment for acquiring petrophysical measurements on material recovered from depth.

The Universities of Melbourne and Adelaide are the lead nodes; the equipment budget is ~$2.3 million.

The ***Geohistory Laboratory*** – infrastructure for automated thermochronology e.g. AFTA and U-Th-Pb-He analysis by double-dating techniques and an ICP mass spectrometer.

The lead nodes are at the University of Melbourne and the John de Laeter Centre at Curtin University; the equipment budget is $1.3 million.

The ***Inversion Laboratory*** – will create two classes of inversion software for analysing and modelling the physical state of the crust and to allow solution of generic inversion problems.

The lead nodes are the University of Queensland and the ANU; $1.6 million has been allocated for the acquisition of software and equipment.

The ***Geophysical Education Observatory*** – will develop digital real time connection to existing teaching laboratories through the seismometers-in-schools program to use the national observatory. It will provide a unique opportunity for integrating scientific research and education by engaging students, teachers, and the public in a national experiment that is going on across the country.

The lead node is Macquarie University; $1.2 million has been allocated for the acquisition of seismometers and GPS equipment for secondary schools.

These facilities will provide opportunities for new research projects in the geosciences throughout Australia. For example ARC proposals will be able to include the new facilities, provided the operating funding is available. But perhaps the most important factor is that AuScope has provided the environment for integrated multidisciplinary geoscience. All the main players in the game are in Auscope, so if you are a researcher, or prospective researcher at a tertiary institution, get on to the field and start to play.

For more information contact Bob Haydon the CEO of AuScope at rhaydon@unimelb.edu.au, visit the website www.auscope.org.au, or read Bob Haydon's article in the June 2010 *Preview* (Issue 146), pp. 21–24.

Arrow Energy swallowed by Shell and PetroChina

In August 2010, LNG (Liquefied Natural Gas) company Arrow Energy was acquired by Shell and PetroChina. The takeover followed an offer in March to purchase all the shares of Arrow on a 50/50 basis.

Shell and PetroChina can now proceed with their plans for a major LNG facility (named Arrow LNG) on Curtis Island, alongside British Gas QGC (Queensland Curtis LNG), Santos (Gladstone LNG) and Origin/Conoco Phillips (Australia Pacific LNG).

If Shell and PetroChina decide to go ahead, they will use gas resources supplied from the Surat and Bowen basins in South-East and Central Queensland. A pipeline would bring gas from the tenements to the Curtis Island LNG plant, where it would be processed and exported to international markets.

It is of interest to look at the Arrow Energy share price while all this was going on. Figure 1 shows market capital rising steadily from February 2008 until the takeover was initiated in March 2010.

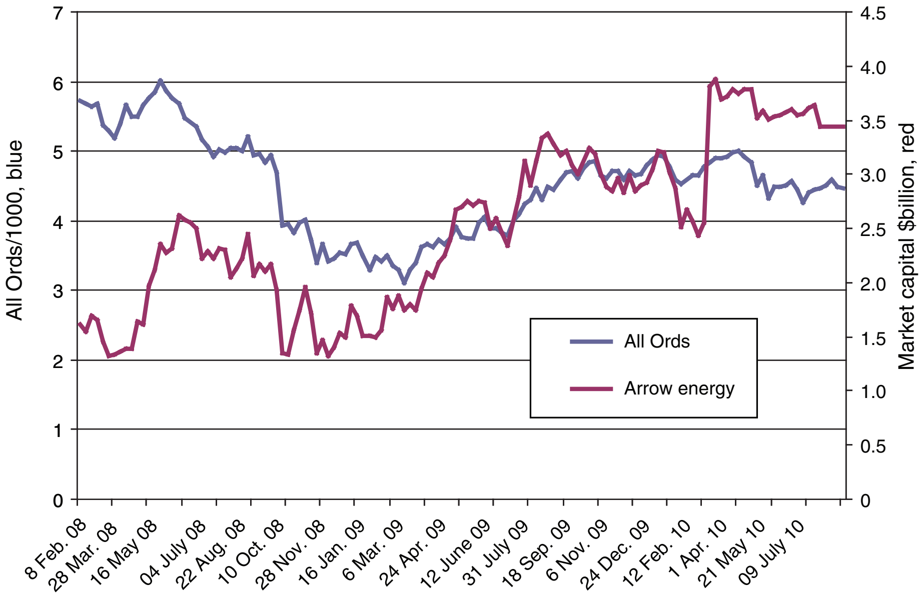

Fig. 1. *Market capital of Arrow Energy on the ASX in A$ billions (in red with right hand axis) and All Ordinaries Index/1000 in blue (left hand axis).*

It then rose dramatically from about $2.5 billion to $3.8 billion in one week; before declining to about $3.4 billion when the takeover was finalised. Arrow Energy was then de-listed from the ASX. Easy money if you knew what was going to happen.

Gold production soars in June quarter 2010

The 2010 June quarter delivered a bonanza production result for gold.

According to Surbiton Associates, quoted by AAP in September, approximately 67 tonnes of the precious metal were produced in that period. This is the highest level since the fourth quarter of 2003 but still short of the 82 tonnes produced in the fourth quarter of 1997.

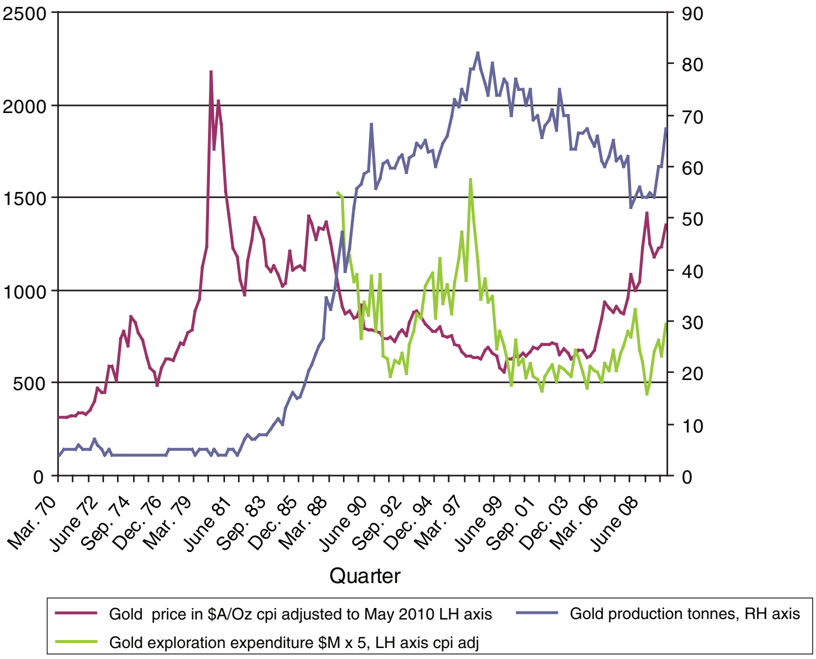

Fig. 2. *Australian quarterly gold production in tonnes from ABARE and USGS (blue and right hand axis); gold price in $A/Oz, adjusted to June 2010 cpi (red and right hand axis); quarterly exploration expenditure for gold from ABS in $million × 5 (green and left hand axis).*

Figure 2 shows the variations in the price of gold (A$), gold production (tonnes) and gold exploration quarterly expenditure, as given by the Australian Bureau of Statistics (ABS). There appears to be very little correlation between exploration investment for gold and how many tonnes were produced. However, there may be a correlation between the price of gold and the level of production, with a time lag of approximately 10 years between the increase in the price and the rise in production.

One other interesting statistic is that the maximum price for gold (in May 2010 dollars) was over $2000 during the March 1980 quarter. So in real terms, the current price has plenty of space to move up.

Energeo expands its Brisbane Office

Cameron Hamilton, ASEG Membership Officer, has this month joined Energeo as its first full time employee. Energeo is a geophysical and geological consultancy set up to service New Guinea Energy and GeoSolve. Cameron joins former ASEG President Henk van Paridon and NGE technical director Dan Kendrick along with two other consultants, Simon Atkinson (data management) and Brett Godden (IT services). Energeo has salubrious offices in Spring Hill, a short walk from the Brisbane CBD. Energeo provides services to the petroleum, coal seam gas and coal industries, specialising in seismic interpretation. Drop in and see us some time.

Australia as a competitive manufacturer of geophysical instruments

There seems to be a view held within the Australian community, often reinforced by gloomy comments from the media, that Australia's manufacturing base is declining and high-value jobs are being lost to overseas competitors. Alpha Geoscience, a local supplier to the Australian geophysical community, put this to the test and decided to commence production of a geophysical instrument previously only offered as an imported product. The instrument is a hand-held magnetic susceptibility meter called the magROCK, a basic meter of the type many geologists and geophysicists would own.

Alpha had a reasonable amount of technical knowledge within its organisation but when it came to laying out a printed circuit board and producing a design which would meet the needs of its customers; this was beyond Alpha's skill base. Alpha found a strong technical partner in Geo Equipment and a 50–50 joint venture partnership was formed.

The team then identified three developers by word-of-mouth recommendation. Each developer submitted a proposal as to how they would achieve the end result: a cutting edge magnetic susceptibility meter. There was a range of both pricing and approaches offered but Alpha decided to go with an individual operator who offered expertise in both designing hardware and writing software. This combined skillset was seen as offering a unique advantage – being able to coordinate these two vital areas and translate technical capability into user benefits.

It is fair to say that from this point not everything went to plan. The technical development proved to be much more complex than originally anticipated and the project timeline doubled. However, having the software and hardware development combined in a single person did lead to some additional benefits. For example, novel ways were found to deliver additional end user features.

Once Alpha had a design with which it was happy, a series of three prototypes were produced, with 'bugs' eliminated at each stage. With development completed, an online search revealed six potential manufacturing companies. Each potential manufacturer responded to a brief and Alpha was amazed at the number of highly professional and flexible manufacturing partners within a 45 minute drive from their location.

Manufacturing subsequently commenced. However, not everything went smoothly as a last-minute design flaw was identified and this meant that the entire production run had to be reworked. (The lesson learned from this experience: make your first production run small – there may be unforseen problems!)

With stock now available, Alpha started the process of marketing the magROCK. The first batch of instruments, 25 in total, sold out quickly using Alpha's database of geophysical customers and some local promotion. A second production run of instruments has commenced with the challenge now to appeal to the international market. The internet is proving useful in this regard, as well as some key agency relationships in various countries.

The pleasant surprise for Alpha Geoscience from this exercise is that there is no shortage of technical or manufacturing skills and means to produce high-value added scientific instruments in Australia. This rings true not only for the magROCK but also the terraTEM, a transient electromagnetic system designed, developed and manufactured by Monex Geoscope in Melbourne. Also, even with a strengthening Australian dollar, Australian manufacturing is cost competitive.

The constraint, as Alpha sees it, is controlling the development cost and time commitment required from key personnel. These can certainly put a strain on any organisation. However, Alpha and its partners stand to reap a long term benefit from their investment in the magROCK and Australian geophysics.

Timothy Pippett
Managing Director, Alpha Geoscience