Workshop:

Groundwater Resource Assessment in Western Australia - The Role of Airborne Hydrogeophysical Methods

Date: Wednesday 22nd Feb 2012

AN INVITATION TO CONTRIBUTE, EXHIBIT AND PARTICIPATE

Background

Western Australia's sustained economic growth and development over the past decade has been accompanied by an increased demand for water. Drivers for that demand include new industries, new mines, the need to secure urban and regional water supply, environmental protection and a requirement to secure and develop the states' agricultural base. Total water demand in WA is anticipated to increase at a rate of 4% per year, from 2500 gigalitres per year in 2009 to 3820GL per year by 2020, with growth in demand from the minerals and energy sectors likely to reach 422 GL/year by 2015. Given that WA's surface water resources are limited, demand is being met in large part by accessing its groundwater resources, detail about which, for many parts of the State, we know relatively little. Consequently we are witnessing a marked increase in the use of a range of hydrogeophysical techniques to help assess these resources. Hydrogeophysical methods have a demonstrated role to play in groundwater resource assessment by assisting in both groundwater and aquifer characterisation most notably in, but not limited to, data-poor areas. With both government and industry driving the innovative application of airborne geophysical methods, with particular emphasis on airborne electromagnetics (AEM), it is perhaps timely to review some of the more recent developments associated with the use of technologies. The availability of calibrated systems capable of seeing near surface and at depth, new fast, robust, inversion procedures and joint inversion approaches, all provide for the more effective application of airborne electromagnetics in groundwater characterisation and management, but not everyone is acquainted with these, nor are they familiar with their potential or their limits.

Workshop Purpose:

This workshop will explore recent developments in airborne electromagnetic technologies applied to the assessment of groundwater resources *in* Western Australia, including aquifer and groundwater characterisation. It aims to examine the experiences of those working in the mining, agriculture and natural resources sectors in Western Australia, and identify some of the limiting factors in the wider application of the technology. It will also review results from recent surveys and examine how airborne EM could be better deployed in the assessment and management of this important natural resource. Case studies from Government agencies (Water Corp, DfW, DAFWA, GA), the mining sector (and consultants), and the research community will be presented, and the visit to WA of leading international experts from the US and Europe will provide the opportunity to couch WA experiences in an international context, by drawing on their knowledge and experience in the use of these technologies.

By bringing together the hydrologists, hydrogeologists, geologists and geophysicists, the workshop aims to update our collective knowledge on technology developments; to identify impediments to the use of AEM derived data/products in groundwater modelling and management, but also to flag areas for further research and development. In drawing on the experiences of hydrogeologists tasked with developing groundwater models and assessing groundwater resources, particularly those who have also employed AEM data to assist in that, this workshop aims to improve the dialogue between disciplines and perhaps provide a reality check on what expectations.

Workshop themes:

1. Review developments in technology - hardware and software (inversion etc)
    a. *Hardware-AEM system developments – examine capabilities in range of hydrogeological settings/conditions*
    b. *Software – developments in data processing and inversion*;
2. Explore consequences of more accurate and constrained inversion on improved aquifer characterisation;
3. Report on recent case studies applied to groundwater characterisation and management.
4. Report on case studies undertaken to support mining, agriculture, irrigation, and urban water supply;
5. Discuss/define developments might be encouraged to make the technology and its outputs more relevant and readily incorporated in groundwater/aquifer characterisation (predictive models) and management;
6. Take in perspectives from hydrogeologists, modellers, and geophysicists; and
7. Hear of experiences from overseas and ask whether there are lessons we can learn and employ here in WA.

Workshop Format:

1. Keynote papers to target key developments in:
    a. technology (hardware and software - to give context for potential and limits)
    b. application
2. WA focussed case studies on aquifer characterisation in the mining, agric and natural resource sectors etc, drawing on contractors (eg Fugro, GroundProbe, Aeoquest, Geotek and others), policy people in Government, researchers etc
3. Extended, facilitated review and discussion session to draw out key messages

Audience:

Researchers, consultants, industry (mining, agriculture, and environmental), government agencies (Department of Water; Department of Environment and Conservation; Department of Agriculture WA); water supply agencies (Water Corp.) etc.

Commercial Exhibition:

Contractors and consultants

Workshop Outputs:

CD with abstracts and follow-up document on key workshop findings

Venue: **To be advised**

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Sponsors: ASEG, IAH, CSIRO Water for a Healthy Country

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