



# DIGGING IN THE DIRT

“Responsible management for the future of the industry and region”.

# GEMG

Volume 4, Issue 2  
March 2011

## President’s Address

With the festive season a distant memory to most, 2011 has gotten off to a busy start for a lot of Enviro’s as well as the GEMG committee. Even though 2011 is a non-conference year, the GEMG plan to host a function every quarter to ensure that members meet regularly to discuss environmental issues and share information. I encourage everyone to support these events as the GEMG is a voluntary committee who offer up their free time to arrange these events and the conferences.

## CELEBRATING 20 YEARS OF ENVIRONMENTAL EXCELLENCE

The Golden Gecko Awards this year celebrates 20 years! The awards were originally instigated by the Department of Mines and Petroleum to recognise excellence and leadership and to acknowledge the outstanding contribution recipients have made to balance environmental responsibility with the successful development of WA mineral and petroleum resources. The awards also provide an opportunity to pass knowledge on to others, helping improve environmental performance across the industry – which is what the GEMG is also all about.

Entries for the 2011 Golden Gecko awards opened online in February.

For more information visit

[www.dmp.wa.gov.au/goldengecko](http://www.dmp.wa.gov.au/goldengecko)



**GOLDEN GECKO**  
Awards for Environmental Excellence

## WAYNE MOVES ON



If you somehow missed the news on the rumour mill, Department of Environment and Conservation’s Industry Regulation Regional Leader Wayne Astill has stepped down from his post to join the dark side – industry. Mr Astill started in his new position at Paddington Gold Mine as a new enviro in early February, after 9 years and nearly as many name changes for the DEC. In his farewell speech to his colleagues he reiterated his passion for environmental conservation when he said “we are custodians of the planet and people around us. As those custodians we need to find a way to balance the natural resources, with using those resources in a way that provides for current and future generations.” We wish Wayne good luck with his new career adventure and he will be sorely missed as everyone’s favourite Goldfields regulator.

## RECYCLING FORUM – 15 APRIL 3PM

You asked for it and the GEMG committee is proud to present the official Goldfields recycling questionnaire. Find your copy attached to this month’s newsletter. The GEMG hopes that this can be used as a valuable resource to better understand the issues and gaps surrounding recycling in the Goldfields and to help sites begin planning a strategy to improve it. The results of the survey will then be presented at a recycling forum. Recycling contractors will be invited to attend and it will be a great opportunity to network and talk with others about your waste management issues.

### So join us at Amy’s Restaurant

**(1 MacDonal Street, Kalgoorlie) 3pm on 15<sup>th</sup> of April**

The afternoon will conclude with social nibbles, drinks and a showing of the film “Lake Eyre – Australia’s Wonder Outback.” Please express your interest when you send back your completed questionnaire.



## CHAMBER OF MINERALS AND ENERGY (CME) GOLDFIELDS ENVIRONMENTAL FORUM (GEF) – 15 APRIL 10-12pm

If you are in town that day why not also head to the first meeting of the year for the CME at their Kalgoorlie Office (115 Egan Street). The GEF provides environmental practitioners from CME member companies with the opportunity to discuss environmental issues and approvals reform. Meetings are generally held quarterly. Existing members are encouraged to attend the meeting by sending their RSVP to Amanda Joseph, CME Environment Project Coordinator, on (08) 92208507 or [a.joseph@cmewa.com](mailto:a.joseph@cmewa.com) by 1 April. Should other member companies wish to nominate for the Forum please send your details to Amanda.



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## ARTICLE OF THE MONTH – “ACID METALLIFEROUS DRAINAGE”

AMD, or Acid and Metalliferous Drainage is now known internationally, and nationally as one of the most serious and potentially enduring problems for the mining industry. The ability to identify in advance any mine materials that could potentially produce AMD is essential for timely implementation of mine waste management strategies and AMD control.

A number of procedures have been developed to determine the characteristics of mine waste materials. The most widely used assessment methods for AMD characterisation are the Acid-Base Accounting (ABA) and the Net Acid Generation (NAG) test.

These methods are referred to as static procedures because each involves a single measurement in time. Kinetic test procedures involve a number of measurements over time, and are used to assess a range of AMD issues including sulphide reactivity, oxidation kinetics, metal solubility and the leaching behaviour of test materials. Kinetic NAG and Leach column tests are examples of kinetic procedures.

The AMIRA guidelines recommend a three staged approach:

### Stage 1: Screening

Samples are screened and categorised using relatively rapid and inexpensive static tests.

The pH (1:2) and electrical conductivity (EC (1:2)) of a sample is determined giving an indication of the inherent acidity and salinity of the waste material when initially exposed in a waste emplacement area.

Net Acid Generation (NAG) and Net Acid Production Potential (NAPP) are used to determine if a sample is Non-Acid Forming (NAF), Potentially Acid Forming (PAF) or Uncertain (UC)

A material categorised non-acid forming (NAF) may still have existing acidity and salinity risks that make it unsuitable for surface or uncontrolled placement due to potential effects on drainage and vegetation.

### Stage 2: Follow up testing

To obtain more information on acid forming capacities and resolve samples with uncertain classifications. A variety of static test methods and kinetic NAG tests are carried out at this stage

This testing is used to provide better definition of the AMD characteristics of samples and also to resolve issues of uncertainty identified in AMD screening tests. Detailed geochemical tests commonly used are as follows - Sequential NAG, Kinetic NAG, Acid Buffering Characteristic Curve (ABCC), Mineralogy and elemental composition. Site specific testing may also be required, such as Cation Exchange Capacity (CEC), Particle size distribution (PSD) or Emerson testing.

These tests may be used in various combinations depending on the nature of the sample material and what information is required. Each of these tests is described below and their application discussed.

### Stage 3: Leach Column testing

Longer term kinetic column testing to provide data on reaction rates and leachate chemistry.

Leach columns are used to complement the other geochemical investigations described above.

Leach columns are normally loaded with 2-3 kg of crushed (not pulverised) waste rock or tailings and subjected to wetting and drying cycles to encourage oxidation and flushing of oxidation products. Water flushed through the column sample is collected and analysed for a variety of parameters to provide information on a range of issues including sulphide reactivity, oxidation kinetics, metal solubility and leaching behaviour. Sub-samples of leached solids may also be geochemically and mineralogically tested to track changes in mineral constituents with time.

The leach column test period varies depending on material characteristics and the investigation needs, usually the results are reviewed on a 6 monthly basis.

The consequence of AMD is the formation of acidic or metalliferous minewater and is commonly associated with, but not confined to, gold, nickel, copper, iron ore, lead and coal deposits. The drainage of acid and metalliferous water has the potential to impact on the quality of water resources. In Western Australia, most mine sites are located in arid to semi-arid climates. The low annual rainfall and extended drought periods are likely to reduce the risk of acid mine drainage. Even so, there is still potential to impact nearby rehabilitation sites, native vegetation, local groundwater and streams.

For more information on the above contact Michael Sharp from MPL Laboratories at [msharp@mpl.com.au](mailto:msharp@mpl.com.au)

**If you have an interesting article that you think members of the GEMG should be reading please send them in to [secretary@gemg.org.au](mailto:secretary@gemg.org.au)**