

# **NINTH ANNUAL REPORT OF THE INDEPENDENT MONITORING PANEL FOR THE COWAL GOLD PROJECT – OCTOBER 2013**

## **INTRODUCTION**

The Independent Monitoring Panel (IMP) was established in accordance with condition 8.8(b) of the Development Consent for the Cowal Gold Project. The members of the IMP are:

- Emeritus Professor Clive Bell, University of Queensland; former Executive Director, Australian Centre for Minerals Extension and Research (ACMER)
- Dr Craig Miller, Environmental Scientist, CTM Consulting (Qld)
- a NSW Department of Planning and Infrastructure representative

The IMP was established under the Development Consent to:

- provide an overview of the independent audits required under condition 8.8(a) of the Development Consent;
- regularly review all environmental monitoring procedures undertaken by the Applicant and monitoring results; and
- provide an Annual Statement of the Environment Report for Lake Cowal with particular reference to the ongoing interaction between the mine and the lake and any requirements of the Director-General.

The Director-General (Planning & Infrastructure) has not specified any requirements under condition 8.8(b)(ii) for the preparation of this report. This report covers site activities and environmental monitoring information provided to the IMP in the 2012 Annual Environmental Management Report (AEMR).

This 2013 IMP Report includes the review of the Independent Environmental Audit Report (April 2013) for the 3-year period from April 2010 to April 2013 (Appendix 1). The IMP also assessed additional material provided by Barrick Australia Ltd in the reports listed in Appendix 2.

A report was prepared by Trevor Brown and Associates and provided to the IMP for the period April 2010 to April 2013, the most recent year being the seventh 12 months of operation. The audit was undertaken over the period from 15-19 April 2013.

The 2012 Annual Environmental Management Report (AEMR) was sent to the IMP on 19 August 2013. The 2012 AEMR covers the period 23 December 2011 to 22 December 2012.

The independent environmental auditors reviewed the available documentation covering (1) the implementation of the requirements of the development consent conditions (2) licenses and (3) approvals granted by Government for

the project, as well as the environmental monitoring documentation held by Barrick at the mine site office in order to verify compliance with the conditions of approval.

As mentioned in previous IMP reports, the independent environmental auditors established a logical framework for verifying compliance by setting out the entire list of requirements, in the separate management plans that have been prepared by Barrick, that cover environmental management under the Minister's Conditions of Approval. These separate plans include:

- Indigenous Archaeology and Cultural Heritage Management Plan
- Heritage Management Plan
- Flora and Fauna Management Plan
- Erosion and Sediment Control Management Plan
- Soil Stripping Management Plan
- Rehabilitation and Offset Management Plan (submitted 2010 but not yet approved)
- Bushfire Management Plan
- Land Management Plan
- Compensatory Wetland Management Plan
- Site Water Management Plan
- Cyanide Management Plan
- Hazardous Waste and Chemical Management Plan
- Dust Management Plan
- Blast Management Plan
- Noise Management Plan
- Noise Management Plan

The compliance by Barrick against the requirements of the above-listed plans was assessed by the Independent Environmental Auditors, and comments were made against those approval conditions that had been activated. The scope of the Independent Environmental Audit dated April 2013 included the following components:

- review of the implementation of the requirements of the development consent conditions, licences and approvals for the project for the operation of the mine and process plant;
- conduct of site inspections and review of on-site documentation and monitoring data relevant to the compliance audit;
- discussions held with project staff in relation to the development consent conditions;
- assessment of compliance of the project with the development consent conditions; and
- preparation of an Independent Environmental Audit Report providing assessment of compliance against each consent condition.

The IMP has reviewed the reporting process used in the Independent Environmental Audit Report of April 2013. The IMP was easily able to assess and verify the status of environmental management information at the site and the general compliance with development consent conditions, licences and

approvals granted to Barrick, as reported by the independent environmental auditors. Overall, it is a well-structured and informative report prepared in accordance with the NSW Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy (DTIRIS (DRE)) Guidelines and Format for the Preparation of an Annual Environmental Management Report (DTIRIS 2006) and in consultation with relevant stakeholders.

The Independent Environmental Auditors (aemc) drew the following conclusion in their April 2013 report (p.82) :

*The audit findings confirm overall a high standard of general compliance with the Minister's Conditions of Approval, Environmental Protection Licence conditions and requirements of the conditions attached to the Mining Lease.*

The IMP concurs with this assessment.

## **REVIEW OF CGM'S RESPONSE TO THE 2012 IMP REPORT**

The IMP made six recommendations in the 2012 IMP Report concerning environmental monitoring procedures. These recommendations are assessed below in terms of adequacy of response by Barrick since that report, and new recommendations are made where required.

**2012 IMP Recommendation 1:** *CGM should endeavour to complete the Northern Waste Emplacement Trials as soon as required materials become available.*

In response to the above recommendation, Cowal Gold Mine (CGM) replied (1 February 2013) –

"Barrick (Cowal) Limited (Barrick), with DnA Environmental, has finalised the design for additional replicate trial plots on the northern outer batters of the Northern Waste Rock Emplacement. The trial aims to further assess the effectiveness of various treatments associated with the rock mulch/topsoil/hay rehabilitation cover system. DnA Environmental's trial design is described in the report '*Revised experimental design and implementation plan – Northern waste emplacement rehabilitation trials for Cowal Gold Mine Barrick (Cowal) Limited November 2011*'. DnA Environmental's report:

- outlines the aims of the additional replicate trial plots;
- describes the landform construction philosophy (including landform preparation procedures);
- summarises the revegetation strategy; and
- details the design of the replicate trial plots, quantities of materials required and discusses the proposed monitoring methodology.

Establishment of the trial plots and landform preparation commenced in early 2012. However, as described in the 2012 IMP Report, implementation of the trial was delayed as native pasture hay was not available. When available, native pasture hay will be spread across the trial plots. Barrick will continue to implement the trial (subject to suitable rainfall conditions) in accordance with the design and implementation plan described in DnA Environmental's *Revised experimental design and implementation*

*plan – Northern waste emplacement rehabilitation trials for Cowal Gold Mine Barrick (Cowal) Limited November 2011.*

A proposed schedule of works for the remaining activities associated with implementation of the Northern Waste Rock Emplacement trial plots is provided in Attachment B.

Monitoring of the trial plots will be undertaken by DnA Environmental and an annual weeds survey of all rehabilitation trials will be undertaken by Carnegie Natives.”

### **2013 IMP Assessment 1**

During the mine visit, the IMP assessed the progress in implementing the Northern Waste Emplacement Trials against the schedule shown in Attachment B. It was noted that these trials have not commenced owing to the lack of suitable native pasture hay as a result of erratic rainfall during the previous growing season. Advice was received from mine personnel that reasonable rainfall during autumn/winter has resulted in good native pasture growth, and that hay will be harvested in October 2013.

Concerns have been raised regarding the likelihood of natural regeneration of native woody vegetation on post mining landscapes through processes such as windblown seed, and the need to engage in active revegetation (e.g. email from Michael Young (DRE) to Trevor Brown (Trevor Brown & Associates), dated 8 April 2013). The IMP discussed the trial design with mine staff and stressed the need to consider the inclusion of native shrubs and trees and the need to plan well ahead in terms of native pasture hay and native seed collection for large scale rehabilitation in the future. Direct seeding and planting of tube stock were two options that were discussed, although it was acknowledged that mass planting of tube stock may not be a feasible option for the whole site.

Two other options trialled successfully by mine operations in difficult environments elsewhere include hydroseeding and “fascining”. In the latter option, fascines, or branches of woody pioneer species with ripe seed capsules are laid over topsoil. The fascines provide the seed source, protection of young seedlings from adverse environmental conditions, and organic matter which later becomes part of the topsoil. A number of the shrub species recommended by DnA Environmental as suitable for use in the native seed mix, e.g. Drooping Sheoak and Black Cyprus Pine, may be suitable for this purpose if they can be sustainably harvested. Sourcing of fascines may also be opportunistic, e.g. pruning of shelter belts or land clearing by farmers, and contingent on environmental conditions triggering mass seeding.

**2013 IMP Recommendation 1:** CGM should complete the layout and planting of the Northern Waste Emplacement Trials as soon as possible and ensure that appropriate native species are included as direct seeded, tube stock, or fascine treatments.

**2013 IMP Recommendation 2:** CGM will need to plan well ahead for collection of native pasture hay and native shrub and tree seed or fascines sufficient to meet the needs of large-scale rehabilitation.

**2012 IMP Recommendation 2:** *CGM should continue to monitor existing rehabilitation trials (and those planned for establishment in 2012) with a view to further refining its approach to achieve sustainable, post-mining landscapes.*

In response to the above recommendation, CGM replied –

“Barrick will continue to engage DnA Environmental to monitor the performance of CGM rehabilitation areas including existing (and planned) rehabilitation trials and to prepare an annual rehabilitation report that evaluates the status of rehabilitation at the CGM. In accordance with the CGM’s Rehabilitation and Landscape Management Strategy (Barrick, 2009), Barrick will continue to refine and improve the CGM’s rehabilitation programme based on results from trials, investigations and studies undertaken.”

### **2013 IMP Assessment 2**

The IMP noted in the Monitoring Report by DnA Environmental (January 2013) that the best performing treatments in terms of ecological sustainability appeared to be those that did not include subsoil. However examination of root growth of 2-year old Eucalypts showed that the roots penetrated subsoil but not oxide material. Given the importance of having sufficient satisfactory root growth material for all the future potential rehabilitation on the mine site, it is considered premature to discount the use of subsoil material as a substrate at this stage of investigation. Indeed there would appear to be a good opportunity for the benefits or otherwise of subsoil to be further explored in the Northern Waste Emplacement Trial that is yet to be established.

Wider use of subsoil in rehabilitation may become a necessity should the available supply of topsoil be inadequate to meet the needs of the site. Subsoil ameliorated with organic matter, e.g. biosolids, and gypsum may become a necessary planting medium

**2013 IMP Recommendation 3:** CGM should continue to monitor existing rehabilitation trials (and those planned for 2013) with a view to better define its approach to achieving sustainable, post-mining landscapes. Sampling and monitoring should be such as to provide more information on the benefits or otherwise of subsoil as a component of the root zone.

**2012 IMP Recommendation 3:** *CGM should continue to explore reasons for the anomalous metal concentrations on control soil and overburden samples being obtained from one of the laboratories used for analysis of dust samples.*

In response to the above recommendation, CGM replied -

“Due to unresolved anomalous metals results for monthly depositional dust samples provided by the ALS Laboratory Group (ALS), Barrick commenced dispatching all dust gauge samples to the independent laboratory, the National Measurement Institute (NMI) (Sydney) in mid-2012. Barrick has requested ALS to review the laboratory procedures used for metals analysis and provide a justification for the anomalous metal concentrations provided to Barrick during 2012.

In an effort to resolve the anomalous metals analysis results, Barrick sampled material (soil/rock) from nine potential dust source locations around the CGM (e.g. the crusher area, the southern tailings storage facility, northern waste rock emplacement, soil stockpiles, access roads) and sent the material to NMI. NMI crushed the material from each location to a fine power (similar to the consistency of dust). A composite sample of the crushed material from each location was also prepared. NMI undertook metals analysis on each crushed sample and no anomalous results were received.

Barrick then dispatched two 1 gram samples of material from two locations (i.e. 1 g cut of the Cowal Mine bulk dust standard) to both ALS and NMI for metals analysis. Both laboratories returned very similar metals analysis results, and a mid-range copper assay of about 70 mg/kg.

Barrick will continue this procedure, reducing the volume of material of each batch analysed and review/compare the procedures, sensitivities, sample size thresholds and results provided by each laboratory.

Both laboratories have indicated that it is very difficult to analyse metals on the small volume of dust material that is collected in a sample over a one month period. Therefore, Barrick is currently investigating whether the volume of depositional dust accumulated over a three month period would provide a more suitable sample size for laboratory analysis and therefore provide Barrick more confidence in the metals analysis results of depositional dust samples. Barrick will install an additional sample jar at Depositional Dust Gauge during February 2013 as a trial for determining the volume of dust accumulated over a three month period.

Barrick will detail the outcomes from the above in the 2012 AEMR.”

### **2013 IMP Assessment 3**

The IMP noted in the 2012 AEMR that the values for copper and zinc in dust tended to decrease after about August 2012 when a new analysing laboratory was employed, but that there still tended to be elevated values that require closer scrutiny. The IMP also notes and commends the actions listed in the 2012 AEMR to improve the collection of dust samples and their analysis for metals and the ongoing involvement of the University of Sydney in advising on collection and analysis.

**2013 IMP Recommendation 4:** CGM should continue with its efforts to improve the process of dust sample preparation and metal analysis (including liaising with the University of Sydney where necessary) to ensure valid results.

**2012 IMP Recommendation 4:** *In the 2012 AEMR, CGM should not only provide figures showing groundwater contours around the pit, but discuss the implications for the aquifers of the surrounding environment and groundwater movement.*

In response to this recommendation, CGM replied -

“A description of the regional and local hydrogeological regime surrounding the CGM is provided in the currently approved *Cowal Gold Mine E42 Modification Modified Request Environmental Assessment* (the Modified Request) (Barrick, 2009). The Modified Request also included a hydrogeological assessment of the potential for the hydrogeological regime to change as a result of the Modified Request Project, which concluded that net potential hydrogeological impacts would be less than those described for the E42 Modification Project (Barrick, 2009).

In accordance with Development Consent Conditions 8.2(a)(iv) and 9.2(i)(c) and Section 8.4 of the SWGMBMP, Section 3.4.3.2 of the CGM 2011 AEMR described the Performance Outcomes from the 2011 groundwater monitoring programme. The section included (among other things) a description of the hydrogeological setting,

groundwater levels and quality results, groundwater production bore extraction summaries and survey results from the nine Bland Creek Paleochannel monitoring monuments.

Notwithstanding, as requested by the IMP, Barrick will provide in the 2012 AEMR:

- a clear description of the CGM's regional and local hydrological regime (including groundwater contours surrounding the CGM open pit and relevant figures);
- a specific discussion regarding implications for aquifers in the surrounding environment and groundwater movement; and
- an evaluation of the groundwater monitoring results against the modelling conducted for the Modified Request hydrogeological assessment.

Development Consent Conditions 8.2(a)(iv) and 9.2(i)(c) and the relevant portion of Section 8.4 of the SWGMBMP are reproduced below.

## **8.2 Surface and Ground Water and Cyanide**

### **(a) Water monitoring**

- (iv) *The results and interpretation of surface and ground water monitoring (including biological monitoring) are to be provided by the Applicant in an approved form to the OoW, DECCW and DII(Fisheries) on a three monthly basis during construction and the first 12 months of ore processing operations and thereafter on an annual basis, unless otherwise agreed by the Director-General. The results are also to be contained and analysed in the Annual Environmental Management Report (Condition 9.2(a)).*

## **9.2 Environmental Reporting**

### **Annual Environmental Management Report (AEMR)**

- (i) *The Applicant shall, throughout the life of the mine and for a period of at least five years after the completion of ore processing operations, prepare and submit an Annual Environmental Management Report (AEMR) to the Director-General. The AEMR shall review the performance of the mine against the environmental management plans (refer condition 3.2), Mining Operations Plan (refer condition 2.1), the conditions of this consent, and other licences and approvals relating to the mine. To enable ready comparison with EIS predictions, diagrams and tables, the report shall include, but not be limited to, the following matters:*
- ...
- (c) *results of all environmental monitoring required under this consent or other approvals, which includes interpretation and discussion by a suitably qualified person;*

Relevant portion of Section 8.4 of the SWGMBMP:

**c. Data Analysis and Investigation**

*Data from each of the monitoring programmes detailed in the Monitoring Programme will be analysed by suitably qualified and experienced staff or consultants to the satisfaction of OoW and DECCW, and in the case of biological monitoring, DII (Fisheries). Data analysis will include, but not be limited to:*

*i. ...*

*ii. **Groundwater Monitoring:** Groundwater quantity and quality data will be compared to relevant baseline data, data collected since the commencement of operations and assessment presented in the Project EIS. Where the data analysis indicates that an adverse impact is occurring to the efficiency of surrounding bores an investigation will be undertaken to determine the need and type of ameliorative measures. The scope and timeframe of the investigation will be developed in consultation with the relevant authorities. The results of the investigation will be presented to the relevant authorities and the CEMCC within the agreed timeframe.*

The 2012 AEMR is due for submission to the Department of Planning and Infrastructure (DP&I) by the end of May 2013, with a site visit proposed for July 2013.”

**2013 IMP Assessment 4**

The discussion in the 2012 AEMR on the groundwater surfaces and potential impacts in the pit and tailings storage facilities areas satisfactorily addresses Recommendation 4 of the IMP.

**2012 IMP Recommendation 5:** *CGM should ensure that copper is analysed on all surface water bodies, including Lake Cowal, along with the other metals and metalloids listed) and that these data are reported in the next AEMR.*

In response to this recommendation, CGM replied –

“Barrick’s response to the IMP’s Recommendation 5 has been separated into the following two components which are discussed below: Surface Water Monitoring Programme – Copper Analysis; and Surface Water Monitoring Locations Subject to Metal Analyses.

**Surface Water Monitoring Programme – Copper Analysis**

The IMP’s 2012 Report provides the following regarding metal analyses on surface waters:

*In Section 3.3 (Surface Water) of the AEMR, Table 13 lists the analyses undertaken on various water bodies (including Lake Cowal) in the Surface Water Monitoring Programme. There is no reference to analysis for copper in this table. An analysis for copper is given for the water in D6 in Table 14, but no data for copper is shown for Lake Cowal water in Tables 15, 16 or 17. It is essential that copper be measured in the surface water bodies, and that these data are shown in the AEMR.*



As described in Section 7 of the approved SWGMBMP, the monitoring programme was developed to:

- a) *focus monitoring so it is relevant to the potential impact pathways from the Project to Lake Cowal biology;*

...

Dust and/or metals in dust from active mine areas is identified in the SWGMBMP as a potential impact pathway from the Project to Lake Cowal. Accordingly, development of the SWGMBMP included (among other things) consideration of significant geochemical testwork and assessments that have been undertaken of CGM waste rock samples (e.g. Environmental Geochemistry International [EGi], 1995; 1996; 1997; 2004, O'Kane Consultants Pty Ltd, 2008; Geo-Environmental Management Pty Ltd [GEM], 2008; 2009). Results of geochemical assessments undertaken to date including for the *Cowal Gold Project Environmental Impact Statement* (North Limited, 1998) and the currently approved Modified Request Project, have not identified copper as being enriched in the waste rock samples (EGi, 1997; GEM, 2008; GEM, 2009 respectively).

Additionally, geochemical testing of CGM waste rock indicates the materials are typically non-acid forming and the solubility of enriched elements is expected to remain low due to the neutral pH conditions resulting in a very low likelihood of acid rock drainage (EGi, 1997; 2004; O'Kane Consultants Pty Ltd, 2008; GEM, 2008; GEM, 2009). As described in Section 3.20.4 of the 2008 to 2011 CGM AEMR's and Section 3.3.4 of the 2005 to 2007 AEMR's, no reportable incidents regarding waste geochemistry (i.e. acid rock drainage) have occurred at the CGM.

Barrick recognises that laboratory analysis results of depositional dust samples provided by the ALS laboratory have returned anomalous (very elevated) results for copper. However, Barrick considers these results to be erroneous based on the results of significant geochemical testwork and assessments to date. Barrick has been addressing this issue with ALS for some time and as described in Barrick's response to the IMP's 2012 Recommendation 3 (above), Barrick has commenced dispatching all depositional dust samples to a separate independent laboratory, NMI (since mid-2012). Preliminary results provided by NMI from the analysis of the dust samples indicate low concentrations of copper.

Measures to resolve anomalous laboratory analysis results of depositional dust (and bulk standard soil and waste samples) have previously been described by Barrick in responses to the IMP's Fourth, Fifth and Seventh Annual Reports and have been detailed in the CGM's 2008, 2009, 2010 and 2011 AEMR's. Measures have included discontinuing the use to copper sulphate to eradicate algae accumulation within dust gauges and changing laboratory analysis procedures to include a more sensitive analysis method more able to detect very small concentrations of metals.

In addition, Barrick commenced analysing Lake Cowal surface waters samples for total and dissolved copper during 2011. Since monitoring of Lake Cowal surface water was triggered in November 2010, Barrick has continued to engage DM McMahon Environmental Consultants Pty Ltd to undertake the monitoring programme and prepare an annual report summarising the monitoring results in accordance with the SWGMBMP. Table 5 of the SWGMBMP shows a summary of the Lake Cowal baseline

surface water quality results for several parameters including copper. Table 5 shows an average baseline value of 0.006 milligrams per Litre (mg/L) for total copper across all Lake Cowal monitoring sites during 1991/1992. Section 3.7.2 of the EIS, indicates that the average baseline value for dissolved copper was 0.0026 mg/L across all Lake Cowal monitoring sites (North Limited, 1998). A preliminary review of the monitoring results recorded by DM McMahon Environmental Consultants Pty Ltd for all Lake Cowal monitoring sites between February 2011 and October 2012 provides an average value of 0.0047 mg/L for total copper and an average value of 0.0023 mg/L for dissolved copper.

This comparison of results demonstrates that the average total copper concentration of Lake Cowal surface water during 2011/2012 is lower than the average total copper concentration in 1991/1992 (prior to construction of the CGM) and dissolved copper concentrations have remained relatively unchanged.

Based on the discussions above, Barrick considers the absence of copper as an analyte in the CGM's surface water monitoring programme is valid. Notwithstanding, Barrick will continue to include copper in the Lake Cowal monitoring programme until the anomalous dust analysis results have been resolved with ALS.

### ***Surface Water Monitoring Locations Subject to Metals Analyses***

The IMP has recommended that the CGM monitoring programme include metal analyses for "all surface water bodies" (i.e. all process water and surface water runoff collection storages).

In accordance with Development Consent Condition 8.2(a)(i)(a), the NSW Office of Water and the former Department of Environment, Climate Change and Water were consulted regarding the location of the Project surface water monitoring positions and development of the SWGMBMP.

As described in Section 4.2.5 of the Site Water Management Plan (SWMP), surface waters that collect within the Project's Internal Catchment Drainage System (ICDS) are managed by a series of contained water storages, bunds and drains. The contained water storages for Project runoff comprise storages D1, D2, D3, D4, D5 and D8B. D5 collects surface runoff from the process plant area and accidental spills of processing water or other potentially hazardous liquids. The contained water storages for Project process water include storages D6 and D9. All water collected in storages D1, D2, D3, D4, D5 and D8B is pumped to contained water storage D9. The water collected in contained water storage D9 is then pumped to contained water storage D6 for use in the process plant.

As storage D6 contains process water and D5 collects surface runoff from the process plant area, the water of these storages is subject to metal analyses. In addition, the Lake Cowal monitoring sites and the Lake Cowal inflow sites are also subject to metal analyses to monitor potential surface water quality impacts resulting from the Project.

Barrick considers that including metal analyses for all surface water monitoring locations is unnecessary considering all water contained in the runoff collection storages is pumped to D9 which is then pumped to D6 (which is subject to metals

analyses). Therefore it is considered that all storages within the ICDS are either indirectly or directly subject to metal analyses. Barrick considers the current surface water monitoring programme adequately provides for the assessment of potential surface water quality impacts resulting from the Project. Furthermore, no metal enrichment or acid rock drainage issues at the CGM have occurred to date (as reported in the CGM's AEMR's since construction commenced in 2005) (refer to discussion above).

Additionally, considering contained water storages D6, D9 and D5 are a component of the ICDS and are situated to the west of the open pit, the storages are isolated from Lake Cowal and therefore are not a potential impact pathway from the Project to Lake Cowal.

Based on the above, it is considered that including metal analyses of water samples for the CGM's runoff collection storages is unnecessary."

#### **2013 IMP Assessment 5**

The IMP is satisfied with the comprehensive reply by CGM to this recommendation.

**2012 IMP Recommendation 6:** *CGM should be prepared for operational or advocacy requirements arising from progressive drying and emptying of Lake Cowal.*

In response to this recommendation, CGM replied -

"Barrick considers that the environmental management controls (i.e. environmental management plans including control strategies, monitoring programmes, mitigation measures and reporting requirements) currently in place at the CGM will adequately prepare the CGM for potential ecological occurrences and operational requirements associated with the Lake Cowal drying cycle.

The *Cowal Gold Project Environmental Impact Statement (EIS)* (North Limited, 1998) and subsequent environmental assessments undertaken for the CGM, considered the Lake Cowal filling and drying cycle (refer to Section 6.5 of the EIS and Section 3.5.2 of the Modified Request). The CGM's SWMP and SWGMBMP were subsequently developed based on these assessments (and other relevant assessments and investigations) to monitor the potential impacts to Lake Cowal from the Project and to develop ameliorative/contingency measures based on the results of the monitoring programmes if necessary.

Notwithstanding, Barrick will consult with relevant agencies (e.g. Department of Primary Industries - Fisheries) and the CEMCC regarding any works proposed to address an ecological occurrence that may arise as a result of the Lake Cowal drying cycle as part of Barrick's ongoing commitment to stakeholder engagement if necessary. "

#### **2013 IMP Assessment 6**

The IMP acknowledges the CGM response and awareness, and notes that public concerns regarding aspects of drying dynamics, for example on population viability and health of yabbies, may be misattributed to CGM.

## **ADDITIONAL ISSUES IDENTIFIED BY THE IMP FROM THE 2012 AEMR AND MINE VISIT (11-12 SEPTEMBER 2013)**

### **Attendance at CEMCC Meeting**

The IMP attended the CGM Community Environmental Monitoring and Consultative Committee (CEMCC) at the invitation of the Independent Chair, Margaret MacDonald Hill. The IMP was pleased to observe the engagement of the committee members in the process and the standing invitation for community members to observe or contribute to proceedings.

The IMP noted that the issue of an ongoing noise complaint related to blasting was raised by CGM and discussed by members. The processes undertaken by CGM to address the issue were considered by the IMP to be adequate and appropriate. The IMP notes that the issue may require Government intervention for resolution, although this can only be at the initiation of the complainant.

### **Management Plans Pending**

The IMP notes that a number of management plans have been submitted to Government for approval, but that a number of them are still pending. The IMP considers that the delay in the approval process is undesirable and hopes that action will be taken to fix this situation.

### **Localised Erosion**

The IMP observed localised areas of deep tunnel erosion due to incorrect placement and management of dispersive subsoils. The IMP notes the need to ensure that mine planners are trained to allocate and manage dispersive soil material appropriately. The IMP also notes that MineStar should always be used to guide soil placement by machine operators.

### **Extension Modification Rehabilitation Proposal**

The IMP notes the Rehabilitation Proposal developed for and by CGM as part of the Extension Modification process and considers that it is a conceptually sound document guiding ongoing rehabilitation. The IMP also notes the review of the draft proposal by Dr David Freudenberger, and considers it to be useful.

## **ANNUAL STATE OF THE ENVIRONMENT REPORT FOR LAKE COWAL**

In March 2008 the CGM Development Consent was modified to remove the requirement to conduct baseline biological monitoring and focus on the potential impact pathways from the mine to Lake Cowal, as recommended by the IMP. The process of revising the monitoring programme required the identification of potential pathways, risk assessment, the identification of trigger values requiring a management response, and the development of the monitoring method. The IMP is pleased that Government recognised the validity of the potential pathways to impact approach and allowed the change.

The IMP notes the rigour and utility of the revised *Surface Water, Groundwater, Meteorological and Biological Monitoring Programme* developed by Professor David Goldney and applied by CGM over the last five years.

Lake Cowal filled between the 2010 and 2011 visits of the IMP, and has dropped in level since the 2012 IMP visit.

The IMP is pleased that the operations of CGM during the intervening period of lake filling and emptying have not resulted in any of the trigger values being activated, suggesting that the impact of the CGM on the lake and its biodiversity is currently neutral. The IMP is of the opinion that this is likely due to the best practice operational and environmental management undertaken by CGM.

## **SUMMARY LIST OF IMP RECOMMENDATIONS FOR 2013**

**2013 IMP Recommendation 1:** CGM should complete the layout and planting of the Northern Waste Emplacement Trials as soon as possible and ensure that appropriate native species are included as direct seeded, tube stock or fascine treatments.

**2013 IMP Recommendation 2:** CGM will need to plan well ahead for collection of native pasture hay and native shrub and tree seed or fascines sufficient to meet the needs of large-scale rehabilitation.

**2013 IMP Recommendation 3:** CGM should continue to monitor existing rehabilitation trials (and those planned for 2013) with a view to better define its approach to achieving sustainable, post-mining landscapes. Sampling and monitoring should be such as to provide more information on the benefits or otherwise of subsoil as a component of the root zone.

**2013 IMP Recommendation 4:** CGM should continue with its efforts to improve the process of dust sample preparation and metal analysis (including liaising with the University of Sydney where necessary) to ensure valid results.

## **INDEPENDENT MONITORING PANEL**

**Emer Prof L Clive Bell**

University of Queensland

Former Executive Director, Australian Centre for Minerals Extension and Research (ACMER)

**Dr Craig Miller**

Environmental Scientist, CTM Consulting (Qld)

## **APPENDIX 1 - OVERVIEW OF THE INDEPENDENT ENVIRONMENTAL AUDIT (IEA)**

Under the Minister's Condition of Approval (MCoA) (26 February 1999), an Independent Environmental Audit was to be completed:

- six-monthly during construction;
- 12 months after commencement of ore processing;
- then every three years thereafter until decommissioning of the mine and ore processing operations, respectively, or as otherwise directed by the Director-General.

In its report of August 2007, the IMP recognised that the template-based approach, that had been used by Trevor Brown and Associates applied environmental management consultants (aemc) in the four six-monthly reports leading up to the 2007 IMP reporting period, was well-structured for addressing complex environmental compliance requirements, and was a good example of best practice for easily accessible and updated environmental compliance information. Thus the IMP made the recommendation that "Barrick consider continuing use of the template-based approach established by aemc for environmental auditing of operations in order to regularly and systematically update progress on each of the environmental management and monitoring components. This approach would greatly assist the IMP in its annual review."

## **APPENDIX 2 – LIST OF REPORTS ASSESSED BY INDEPENDENT MONITORING PANEL**

Cowal Gold Project – 2012 Annual Environmental Management Report (19 August 2013). Barrick Australia Limited.

Cowal Gold Project – Independent Environmental Audit (April 2013). Trevor Brown and Associates .

Northern Waste Emplacement Rehabilitation Trials: Experimental Design Prepared for Cowal Gold Mine. Revised August 2013. DnA Environmental.

Cowal Gold Mine Soil Stockpile Characterisation Report (Draft). June 2013. McKenzie Soil Management Pty Ltd.

Seasonal Wildlife Use Patterns of the Cowal Gold Mine Tailings Storage Facility: 1 October 2012 to 31 March 2013 (Draft). Donato Environmental Services. May 2013.

Lake Cowal Waterbird Monitoring Survey. Progress Report. Peter Gell and Paul Peake, Centre for Environmental Management, The University of Ballarat. April 2013.

2012 Rehabilitation Monitoring Report for Cowal Gold Mine (Draft). DnA  
Environmental. January 2013.