

First Report of the Independent Monitoring Panel – February 2005

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 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.

Construction activities commenced at the mine site in January 2004. Site Visits were made to the mine site by members of the IMP before (Allen Kearns, September 16-17, 2003) and after (Clive Bell, December 14-15, 2004) the commencement of construction.

The Director-General has not specified any requirements under condition 8.8(b)(ii) for the preparation of this report.

Overview of the Independent Environmental Audit (IEA)

An independent environmental audit of the mining and infrastructure areas and construction works was conducted by Trevor Brown & Associates applied environmental management consultants (aemc) between 28 June and 2 July 2004 to assess the status of the development activities in the first six months. They reviewed the available documentation covering licenses and approvals granted by Government for the project as well as the documentation held by Barrick at the mine site office in order to verify compliance with the conditions of approval.

At the time of the IEA the construction works that had been commenced included:

- the establishment of the temporary mine site administration and infrastructure area,
- the earthworks for the temporary isolation bund between the lake and future mine pit, and
- the laying of a below-ground pipeline in a trench across Lake Cowal from the production bores to the mine site

The independent auditors established a logical framework for verifying compliance by setting out the entire list of requirements, in the thirteen 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
- Flora and Fauna Management Plan
- Erosion and Sediment Control Management Plan
- Soil Stripping Management Plan
- Landscape Management Plan
- Bushfire Management Plan
- Land Management Plan
- Compensatory Wetland Management Plan
- Site Water Management Plan
- Hazardous Waste and Chemical management Plan
- Dust Management Plan
- Blast Management Plan
- Noise Management Plan
- Traffic Noise Management Plan

The compliance by Barrick against the requirements of the above-listed plans was assessed by the independent auditors and comments were made against those approval conditions that had been activated.

The independent auditors made the following assessments in their Independent Environmental Audit report (27 August 2004) about the ease of access to site environmental information and compliance with the approval conditions:

“The documentation held by Barrick at the Cowal Gold Project site was provided to the auditors in an efficient manner and made the verification of compliance with the conditions of approval and other statutory approvals a straight forward exercise.”

“The documentation, reporting and activities at the Cowal Gold Project for the first six months of construction demonstrate a high degree of compliance with the conditions attached to the approvals granted to Barrick for the project.”

The IMP has reviewed the Independent Environmental Audit report and was impressed by the thoroughness of the auditing approach, the reported ease of access to environmental management information at the site and the degree of compliance with conditions of approval by Barrick as reported by the independent auditors.

We note that as the pace, scale and complexity of the mining operation and infrastructure development increases at Lake Cowal it will be essential that Barrick continues to maintain an efficient and effective environmental information management system at the mine site to allow timely verification of environmental compliance.

Review of Environmental Monitoring Procedures and Monitoring Results

The IMP has conducted a brief review of the background material that informed the design and development of the environmental monitoring procedures for the Cowal Gold Project. The Operational Environmental Monitoring Programmes are described in Section 6.5 of the Cowal Gold Project Environmental Impact Statement prepared by Resource Strategies (1998). More recently, Barrick (2003) has prepared a comprehensive description of the surface water, groundwater, meteorological and biological monitoring programme activities to be undertaken during the construction phase. The original design of the biological monitoring program was undertaken by CSIRO in 1991 (Humphries et al., 1991). At that early time in mine site planning and design, there was less understanding of baseline conditions than we have available now and no clear idea about the final design and operational environment of the mining project. Consequently, the IMP has focussed some attention on reviewing the rationale behind the original 1991 CSIRO design and its adoption by Barrick in 2003 in order to assess its continuing relevance.

The **Before-After-Control-Impact (BACI)** design put forward by CSIRO (Humphries et al., 1991) was well-informed by the likely difficulties of sampling in an ephemeral lake and the problems of establishing a suitable design to handle spatial and temporal variability and control sites. CSIRO proposed a set of four radiating transects with replicated impact sites close to the mine and replicated control sites on the opposite side of the lake, in lieu of any realistic control sites in other regional lakes. This BACI design was used for the baseline environmental sampling and analysis program in the early 90s that resulted in a sound understanding of the very low background levels of heavy metals in soils and sediments and of the complex dynamics of an ephemeral lake. The CSIRO BACI design was adopted by Resource Strategies (1998) in the preparation of the biological monitoring components of the Cowal Gold Project Environmental Impact Statement.

Resource Strategies (1998) proposed that there would be two main components of the biological monitoring programme, namely:

- *Continued baseline monitoring within the Lake; and*
- *Project-specific monitoring, notably tailings storages.*

Resource Strategies (1998) identified the following technical objectives of the programme:

- *Characterise the natural fluctuations of the aquatic ecosystem;*
- *Identify existing anthropogenic influences on the Lake;*
- *Apply long term monitoring programme results to enable detection of significant changes in the Lake ecosystem and the identification of the mining operation's role in such changes;*
- *Establish the basis from which any short term effects (eg. An accident at the mine, or elsewhere in the catchment), or any mortality of birds or fish for whatever reason, could be immediately investigated and assesses in terms of prior conditions.*

The BACI-based design was subsequently adopted by Barrick (2003) for the Cowal Gold Project as part of their activities on the surface water, groundwater, meteorological and biological monitoring programme during the construction phase.

Since the development of the CSIRO BACI design in 1991, the IMP believes that there is now a clear understanding of the water management system as summarised by Resource Strategies (1998). In addition, the design of mine site infrastructure and operations include many water management controls. For example:

- Consent Condition 4.5 states that there will be no disposal of water from the Internal Catchment Drainage System to Lake Cowal, meaning that contaminated mine site water is effectively held within a separate catchment to Lake Cowal, barring catastrophic failure of mine structures that would be immediately evident to site operators
- The Up-catchment Diversion System will divert surface flows away from the mine site and so reduce the accumulation of clean water within the mine site entering the internally draining catchment, and
- Surface water quality monitoring will be in place to analyse the water quality in the surface flows before entering Lake Cowal.

The BACI design for ambient monitoring in Lake Cowal, particularly the four radiating gradients from the mine site and the location of the control sites across the lake, provide an effective means for detecting large scale environmental change if that was expected from mine site operations. A baseline has already been established that shows very low levels of ambient concentrations of heavy metals making it easy to detect change if significant quantities of heavy metals were to be released from the site. For example, the original CSIRO BACI design would be very effective in detecting change over a large area if the mine site was producing constant discharges of mine site effluent into the lake or there were periodic releases of large volumes of contaminated water as a result of some failure of the internally draining catchment system. However, neither of these cases is going to occur and the question in the mind of the IMP after reviewing the environmental monitoring procedures and survey design is:

“What possible mechanisms could release significant amounts of toxic discharges from the mine site that would not be immediately evident from operational and ongoing baseline monitoring?”

Over the last decade since the development of the original BACI design in 1991 for ambient monitoring, the ecologically-driven design of the mine site in the late 1990s by North Limited has resulted in a water management system that is better understood and most unlikely to release any contamination to the lake. Given that the lake is currently dry and there is a window of climatic opportunity, it is prudent to consider the overall aims and goals, and scale, of the original BACI design for the environmental monitoring program, with a view to reviewing options and possibly developing a more useful and effective scaled-down environmental monitoring system.

The IMP also strongly suggests adopting the ANZECC/ARMCANZ Water Quality Guidelines introduced in 2000, instead of using the approach from the 1992 guidelines. Importantly, this would involve looking at a more risk-based approach to environmental monitoring with the use of more ecosystem understanding than a reliance on water quality indicators. In addition, Batley et al. (2003) provide a thorough guide to the application of the ANZECC/ARMCANZ water quality guidelines in the minerals industry. The IMP considers that there is little risk in undertaking this review of the existing ambient monitoring program and proposing suitable changes because if there was a catastrophic failure or unintended discharge to the lake it would be immediately evident to the mine operators and regulators and an assessment could be easily made of damage to the lake against the already existing ambient baseline levels.

Finally, the IMP has noted the Independent Environmental Audit comments on progress and a high level of compliance during the construction phase with the implementation of various environmental management plans and environmental monitoring procedures. We have briefly reviewed the available water quality information, provided to us in three spreadsheets, for the start up of the groundwater monitoring program. The data appears to be well managed and clearly presented in a format that will allow interpretation of baseline trends and impacts in the future.

Annual State of the Environment Report for Lake Cowal

The aim of this activity is to provide an annual state of the environment report with particular reference to the on-going interaction between the mine and Lake Cowal.

Apart from the observations made by the Independent Auditors, there is insufficient data and other information available to make informed comments about the status of Lake Cowal and any interactions with the mine site during the construction phase. The lake remains largely dry and this has enabled the site works for the pipeline trench and the temporary isolation bund to be undertaken in favourable construction conditions. Therefore, there has been relatively little disturbance to Lake Cowal from mine site construction in 2004. Due to prolonged drought in central west NSW, the lake remains in a continuing dry phase of the lake's ephemeral filling and drying cycles.

Finally, Condition 8.8(b)(ii)(c) refers to "requirements of the Director General". To date, we have not been provided with any information on other "requirements of the Director General".

References

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Independent Monitoring Panel

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