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Cowal Gold Operations – Underground Project (SSD-10367)

Resource & Economic Assessment

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More information

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Determination

Mining, Exploration and Geoscience (MEG) assessed the Cowal Gold Operations - Underground Project (Cowal Gold or Proposal). MEG determined the Project will:

- establish an underground mine extension to support continued operations at Cowal Gold until 2040.
- extract up to 1.8 million ounces (Moz) of gold over the project life
- provide 230 full-time equivalent (FTE) jobs during operation
- without the Project the existing Cowal Gold would cease operations in 2031.
- ensure an appropriate return to the NSW Government including;
  - $124 million royalties (current dollars)
  - $3.9 billion total revenue (current dollars)
  - In a typical year at full production the NSW Government would receive around $8 to $9 million in royalties from the Project.
- be an efficient use of resources.

The Project

Evolution Mining Pty Ltd (Evolution or the Proponent) through State Significant Development (SSD) 10367 seek approval to develop an underground gold mine about 35 kilometres northeast of West Wyalong that will:

- involve the development and operation of an underground mine accessed via a portal on the existing open-cut pit
- involve construction of a paste back fill plant and re-design of the mine surface infrastructure area
- extend life of mine operations from 2031 to 2040, including underground mine life of about 15 years
- support an additional 160 jobs during construction and 230 operational jobs; and
- provide a platform for further exploration activities

Introduction

State significant development is regulated under the *Environmental Planning and Assessment Act 1979*, which requires a proponent to apply to the Department of Planning, Industry and Environment for development consent, supported by an Environmental Impact Assessment (EIS).

This Resource & Economic Assessment (REA) conducted for the Cowal Gold Operations Underground Project by MEG assessed:

- the social and economic benefits to NSW including royalties, capital investment, revenues and jobs.
- the resource/reserve estimates stated in the proponent's EIS.
- if the Proposal is an efficient development of the resource, that resource recovery is optimised and waste minimised.
- if the Proposal will provide an appropriate return to NSW.

The objects of the *Mining Act 1992* are to encourage and facilitate the discovery and efficient development of mineral resources in NSW.

Of particular relevance to this REA are Section 3A Objects:

- to recognise and foster the significant social and economic benefits to NSW that result from the efficient development of mineral resources.
- to ensure an appropriate return to the State from mineral resources.

The relevant section of the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 is Part 3, Clause 15: Resource Recovery requires that resource recovery is efficient, optimised and minimises waste.

Project overview

Current mine history and ownership

The existing Cowal Gold Operations (Cowal Gold) open cut mine is located 35 kilometres from West Wyalong and has been operating since 2005. The Cowal Gold Project is a proposed underground gold mine extension with an expected operating mine life of 15 years. The Project is operated by Evolution.

The Proposal for this underground gold mine includes:

- a 'box cut' entry to the underground mine
- stope mining methods will be used to extract the ore
- construction of a paste backfill plant
- re-design of the mine surface infrastructure area; and
- one metre hight increase to the final rehabilitated height of the integrated waste landform for the Cowal Gold Operation.

Geological Background

The Project resource is situated within the Ordovician Lake Cowal Volcanic Complex (LCVC), east of the Gilmore Fault Zone within the metallogenic province of the Lachlan Orogen. The LCVC is an assemblage of massive and stratified, nonwelded pyroclastic debris, overlying a partly brecciated lava sequence and volcanic conglomerate interbedded with siltstone and mudstone.

Within the LCVC are diorite and gabbro intrusions, one of which is intersected by the CGO open-cut pit. Within the ore body there are several north-south oriented, near-vertically dipping faults and fractured dykes.

Overlying the Ordovician host rock is a Tertiary age laterite, which averages approximately 20 meters (m) and varies in thickness across the CGO site, from approximately 15 metres to 55 metres. Quaternary age sediments of predominantly lacustrine clay characteristically cover the Tertiary laterite. The depth of sediments across the CGO site and surrounds ranges from approximately 14 metres to 55 metres.

Gold mineralisation in the Project area is concentrated in a north-south orientated corridor hosted by second and third order structures marginal to and parallel to the Gilmore Suture. The gold deposits are hosted by a shallowing-upwards sequence of semi-conformable sedimentary, volcaniclastic, and volcanic rocks of trachydacitic and trachyandesitic composition that have been intruded by a diorite sill, andesite dome, and various dykes. The sequence strikes northeast–southwest and dips moderately 30° to 40° to the northwest.

Conclusion

MEG has no issues with the Proponent's understanding of the Project geology.

Size and quality of the resource

The total underground Mineral Resource (Indicated and Inferred) at GRE46 is 36.51 Mt grading 2.48 g/t Au for 2.9 Moz Au. Full details, including the previous years comparison are provided in Table 1. The Ore Reserve (Probable) has been estimated from Indicated Resources and totals 9.96 Mt grading 2.51 g/t Au for 804,000 oz Au. Mineral Resources and Ore Reserves have been prepared in accordance with the 2012 Edition of the Australasian Code for reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code 2012).

Table 1 - Summary of GRE46 Mineral Resources

Indicated Resource			Inferred Resource			Total Resource			Cut-off	Year
Tonnes (Mt)	*Gold Grade (g/t)*	*Metal Content (koz)*	*Tonnes (Mt)*	*Gold Grade (g/t)*	*Metal Content (koz)*	*Tonnes (Mt)*	*Gold Grade (g/t)*	*Metal Content (koz)*	*(g/t Au)*	
17.46	2.61	1,461	19.08	2.37	1,451	36.51	2.48	2,912	1.5	April 2020
-	-	-	13.55	3.24	1,411	13.55	3.24	1,411	2.0	April 2019
-	-	-	5.90	3.17	603	5.90	3.17	603	3	April 2018

The GRE46 orebody trends northsouth, dipping approximately 70 degrees towards the west, and extending along strike for at least 2 kilometres. The cross-strike thickness is up to 200m, with a known down-dip extent of up to 1 kilometres. The orebody is made up of a series of individual lenses that consist of narrow high-grade quartz-carbonate, pyrite and base metal veins controlled within the structural corridor and a direct correlation between gold and sulphides is evident.

The mineral resource has been defined by majority diamond core, with approximately 35,000 metres of drilling conducted via the underground exploration decline and 80,000 metres of drilling from surface. The decline was developed for the purpose of drilling the resource at better drill angels and depths, while allowing validation of the geological model via mapping of the development drive and sill drives. Drilling from underground has also improved confidence with grade continuity while increasing geo metallurgical and geotechnical knowledge.

The resource growth since 2017 reflects intensified drilling activities, especially from underground. Drilling is ongoing with an expected update to the Mineral Resource and Ore Reserve estimate due December 2020. Further resource potential exists with mineralisation currently open at depth and along strike from the current orebodies. Mineral Resource growth is expected to be delivered via

continued surface exploration drilling, while growth in the Mineral Reserve will be achieved with further underground drilling.

Conclusion

MEG has no issues with the Proponent's understanding of the size and quality of the mineral resource.

Resource recovery

Pre-feasibility studies conducted for development of the GRE46 underground project defined a Maiden Ore Reserve of 9.96 Mt grading 2.51 g/t Au for 804,000 oz Au (Table 2). Reserves are based on Indicated Resources only and a cut-off grade of 1.8 g/t Au was used for stope shape generation. All stopes above the 1080 mRL have been excluded from the design to ensure the oxide boundary is not intersected, reducing the likelihood of surface subsidence.

Table 2 - Summary of GRE46 Ore Reserves

Proved Reserve			Probable Reserve			Total Reserve			Cut-off	Year
Tonnes (Mt)	*Gold Grade (g/t)*	*Metal Content (koz)*	*Tonnes (Mt)*	*Gold Grade (g/t)*	*Metal Content (koz)*	*Tonnes (Mt)*	*Gold Grade (g/t)*	*Metal Content (koz)*	*(g/t Au)*	
-	-	-	9.96	2.51	804	9.96	2.51	804	1.8	April 2020

The GRE46 underground project is proposed to be mined by sub-level open stoping with paste fill, a technique typical of current Evolution underground operations. Underground ore will supplement the open-cut feed at an expected mining rate of 1.5-2.0 Mtpa. Once development is approved, ore could be mined within 12 months. The proposed life of mine will extend to 2040 with inclusion of the underground project.

Ore processing will continue through the existing on-site flotation CIL/CIP processing plant and newly built float tails leach circuit with minor modifications to the process plant required. The current average gold recovery rate is 84%. Metallurgical testing conducted during the pre-feasibility study indicates 87% recovery for the GRE46 underground project. There is no change to the processing rate and ore is expected to be of a similar nature to the current primary ore from the open-cut.

Conclusion

MEG finds that there will be no significant sterilisation of resource and has no objections to the Proposal.

Economic benefits of the resource

Over the life of the Project MEG has estimated that the value of the gold produced would be around $3.9 billion in current 2020 dollars, with the net present value of this revenue stream at around $1.9 billion at a real discount rate of seven percent.

On the basis of current operations at the mine we would expect refined gold from the Project to be processed on site into doré bars (a semi pure alloy of gold and silver) which would then be transported by road to Sydney for further refining into higher quality gold. Some of this gold would be exported and a proportion would remain in Australia. If approved, the additional export income from the Project would contribute to the around $6 billion of metallic and processed metals exported from NSW in 2019-2020.

The Project, if approved, would provide an average of 230 full-time operational jobs from 2024 to 2040. Without the Project the existing Cowal open cut mine would close at the end of 2031. MEG estimates that these direct mine jobs would result in around an additional 900 indirect jobs in both mine and non-mine related services. Capital investment for the Project would be of the order of $320 million.

MEG also notes from the Economic Assessment prepared by the Proponent's economic consultant (AEC) that the Project would deliver an estimated net economic benefit to NSW of $314 million in NPV terms.

Royalty calculation

As the Project is a proposed gold mine, a royalty rate of four percent applies to the value of all gold (refined metal) production. For gold operations deductions are allowable on the price received and include: onsite treatment expenses, realisation expenses, onsite administration and depreciation. The net value after these deductions is called ex-mine value; the 4 percent royalty rate is applied on the ex-mine value amount.

One of the most important assumptions in the calculation of future royalty is the estimate of a future gold price over the life of a project. In the EIS the Proponent's economic consultant (AEC) has used a future gold price of around A$2,000 per ounce based on an Australian dollar/US dollar exchange rate assumptions and around the mid-point of the US dollar gold price over the past five years. MEG has used a slightly higher gold price in its royalty calculations of around A$2,100 per ounce. MEG believes that although the current surge in the US dollar gold price has peaked, gold prices will remain buoyant due to global economic conditions being somewhat unstable going forward.

Another important aspect of any future royalty calculation for a proposed gold project is the estimation of future annual production. The Proponent has estimated that around 1.8Moz of gold would be able to be economically mined from the Project up to 2040. MEG believes that this is a reasonable total based on a rigorous analysis of the geological information available.

Using the above parameters, MEG has calculated that the State will receive around $124 million in current 2020 dollars, and around $61 million in NPV terms (at a real discount rate of 7 percent) in royalty from the Project. In a typical year at full production the NSW Government would receive around $8 to $9 million in royalties from the Project based on the assumed gold price.

Departmental Assessment

Assessed by	Unit	Branch
Assessing Officer: Dr David Forster Senior Geologist	Mineral Resource Assessment, Geoscience Assessment & Advice	Geological Survey of NSW
Assessing Officer: Bryan Whitlock Senior Resources Analyst	Resource Economics	Resources Policy, Planning & Programs
Assessing Officer: Scott Anson Manager Assessment Coordination	Assessment Coordination Unit – Resource Assessments	Resource Operations

Approvals

Approved by	Signature	Date
Approving Officer: Dr Phillip Blevin A/Director Strategic Geoscience Assessment & Advice	Approved in CM9	27/11/2020
Approving Officer: Dr Minh Ho A/Director Resources Planning & Programs	Approved in CM9	25/11/2020
Endorsing Officer: Stephen Wills Executive Director Resource Operations		30/11/2020