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Mining, Exploration & Geoscience

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New Cobar Complex Project (SSD-10419)

Resource & Economic Assessment

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More information

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Executive summary

Mining, Exploration and Geoscience (MEG) assessed the New Cobar Complex Project (SSD-10419) (the Project). MEG considers the Project will provide an appropriate return to the NSW Government including:

- around $5.5 Million (M) in total royalties (current dollars).

Parameter	$M (2021 dollars)
Total royalties received	42
Net Present Value (NPV) royalties (7% discount rate, real)	23
Annual estimated royalties (average)	5.5 (Approximate)

In addition, the Project will generate:

- the continued employment of 342 direct FTE jobs ($604M in wages) over its ten year life and 141 FTE construction jobs ($25M in wages).
- Over the four year construction phase (2022/23 2025/26), there is expected to be approximately $32.8M in Gross Regional Product (GRP) into the local regional economy, and an additional $19.7M in Gross State Product (GSP) for the rest of NSW.
- During peak production (2026/27 – 2032/33), there is expected an average of $73.4M in GRP for the region, and an additional $18.2M in GSP in the rest of NSW.

The Project is considered to be an efficient use of resources.

If approved, MEG has estimated that over the life of the Project the value of the metals produced would be of the order of $1,270M in current dollars, with the net present value of this revenue stream at around $710M at a discount rate of seven per cent.

The additional export income from the Project would contribute to the around $6 billion (B) of metallic and processed metals exported from NSW (2019/20 total). In general, additional export income contributes a positive impact on both the credit rating of both NSW and Australia and has benefits to the A$/US exchange rate.

If the Project does not proceed the economic benefits outlined above will not be realised.

The Project

The Project is seeking to include the Great Cobar and Gladstone deposits under a single State Significant Development approval. Mining under this new consent would take place from 2023/24

to 2033/34. Currently, all mining at the Peak gold mine and associated satellite mines operate under approvals from Cobar Shire Council.

The Project is particularly important in that it would provide an extension of existing operations at the New Cobar and Peak complexes, with mining activity of the Great Cobar and Gladstone deposits ramping up as mining at other existing deposits wind down.

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 New Cobar Complex Project (SSD-10419) 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

Peak Gold Mines Pty Ltd (PGM), a wholly-owned and operated subsidiary of Aurelia Metals Limited (Aurelia), owns and operates the Peak Gold Mines operation south-east of Cobar, far western NSW.

The PGM operation comprises the New Cobar Complex located 3 kilometres to the southeast of Cobar town centre and the Peak Complex located 10 kilometres southeast of the town centre. Both complexes are located adjacent to Kidman Way, which connects Cobar to Hillston to the north and Griffith to the south.

Geologically, the area around Cobar comprises a series of polymetallic high-grade ore bodies dominated by gold, silver, copper, lead and zinc, with a long history of stable, large-scale, low cost production that has produced more than 200,000 tonnes of copper and three million ounces of gold since mining began in the area in 1870.

PGM has been operational since modern mining commenced at the Peak Complex in 1991 and all current mining operates under development approvals issued by Cobar Shire Council (CSC).

Existing and proposed development

The Project is an amalgamation of underground mining at New Cobar, Chesney and Jubilee deposits and development of new underground workings of the Great Cobar and Gladstone deposits to create the New Cobar Complex Project.

PGM is also seeking to consolidate all existing development approvals applicable to the New Cobar Complex, into a single modern consent issued by the Department of Planning, Industry and Environment DPIE. Approval is being sought for project elements accessed from, and undertaken within, the existing New Cobar Complex located within Consolidated Mining Lease CML 6, Mining Purposes Lease 854, Mining lease 1483 and Mining Lease 1805.

PGM has been operational since mining commenced at the Peak deposit in 1991 producing gold, copper, lead, zinc and silver. Mining at the New Cobar Complex commenced with the open cut mine in 2000, then transitioned to underground mining in 2004.

The current CSC development approvals at Peak Complex and New Cobar Complex allow for the operations to continue indefinitely and process up to 800,000 tonnes per annum (tpa) of ore. Ore processing, tailings storage and concentrate handling is undertaken at the Peak Complex with ore from the New Cobar Complex trucked by public road to processing facilities at the Peak Complex. Both the processing plant and the tailings storage facility (TSF) are located at the Peak Complex, and activities at those facilities are outside the scope of this project.

PGM has identified the Gladstone and Great Cobar deposits as targets for further mining to extend the life of operations at the New Cobar Complex. The Great Cobar deposit was historically exploited

by surface and shallow underground mining between 1870 and 1919, but no mining of that deposit has been undertaken since that time.

PGM has obtained conditional approval for development of an exploration decline to facilitate exploration activities within the Great Cobar deposit. The objectives of the exploration activities are to:

- further define the mineral resource through underground drilling from an exploration decline; and
- taking of a bulk sample to provide further samples for metallurgical, geotechnical and associated test work

All surface works associated with the project will be located underground or in an existing, operational mining complex (the New Cobar Complex) except for a short (no more than 400 metre) powerline from an existing 22 kilovolt line servicing PGM to a compact substation within the exploration box cut.

PGM proposes to use the decline, infrastructure and intake and exhaust ventilation elements developed for the Great Cobar exploration decline (approved, but not yet constructed) to facilitate project development. Ventilation fans are not required during the development of exploration activities, however as they will be necessary during operation of mining, construction of a new powerline and compact substation, to be located adjacent to the fresh air intake is required. The powerline will continue to the exhaust air rise where a ventilation fan will be installed at a depth of approximately 100 metres or greater below ground level. An emergency egress winder headframe and winder house will be installed at the fresh air intake for the purpose of mine rescue in the event of an incident below ground preventing evacuation by conventional means. No additional new surface infrastructure is proposed.

The existing surface infrastructure and facilities at the New Cobar Complex currently support underground mining of the New Cobar, Chesney and Jubilee deposits, and will continue to be used for this project. Access to all underground workings in the complex is from a portal and decline at the base of the New Cobar open cut. SSD approval is sought for the following project elements accessed from, and undertaken within, the existing New Cobar Complex:

- Underground mining of the New Cobar Complex including, but not limited to, New Cobar, Jubilee and Chesney (presently operating under an existing development approval issued by CSC).
- Underground mining of the New Cobar Complex including Great Cobar and Gladstone (not yet approved).
- Groundwater dewatering of the relevant historic and proposed underground workings via the historic Great Cobar Shaft (existing development approval issued by CSC).

- Increase of the number of ore haulage trucks between the New Cobar Complex and Peak Complex from 25 loaded trips per day (50 movements in and out) to 50 loaded trips (100 movements in and out) per day (daylight hours only) averaged over a calendar year. The increase of daily truck movements will provide flexibility to PGM if there are unforeseen production disruptions (for example, bad weather).
- Crushing and screening of ore within the existing surface Run-Of-Mine pad at the New Cobar Complex (existing approval by CSC).
- Transportation of ore to the Peak Complex via Kidman Way for processing, using road registered heavy vehicles (existing approval by CSC).
- Harvesting of waste rock and immediately deploying the material underground for use in stope backfilling operations (waste rock will remain underground and will not be transported to the surface as a preference).
- Transportation of non-acid forming material to the surface for use across the complexes for construction / rehabilitation tasks (e.g. tailings dam lifts).
- Deposition of potentially acid forming waste rock brought to the surface and stored within the waste rock emplacements where at end of mine life it would be capped, or progressively returned underground for disposal.
- Continuation of all other approved activities within the New Cobar Complex.

Processing will remain at the existing approved rate of up to 800,000 tpa, with production of ore from the Great Cobar and Gladstone deposits making up for the future decrease in production from other workings across PGM.

Additionally, there are remaining resources in the New Cobar, Jubilee and Chesney deposits that are mineral rich, but which are currently not economical to mine in isolation. Keeping the New Cobar Complex operational and gaining access to Great Cobar and Gladstone deposits will lead to increases in economies of scale and maximise opportunities to mine these resources and keep PGM operational until 2035.

Size and quality of the resource

The eastern margin of the Cobar Basin presently hosts three major gold and base metal operations and is highly prospective. The New Cobar complex proposal is covered by CML 6 and ML 1483 which consolidation tenements over the central and northern Cobar Gold Field (CGF).

The CGF contains the Peak, Pearce, Chronos, Perseverance and New Occidental mines in the southern gold field, and the New Cobar, Jubilee, Chesney, Gladstone and Great Cobar deposits in the central and northern gold field.

The CGF lies on the eastern margin of the Siluro-Devonian Cobar Basin. At PGMs operations, near Cobar, gold, copper, lead and zinc mineralisation are hosted by Nurri Group metasediments namely the Great Cobar Slate and Chesney Formation which dip steeply to the west. All mineralisation in the New Cobar Complex is hosted by the Great Cobar Slate.

Mineralisation is typically associated with extensive silicification, chlorite alteration including gangue mineralogy dominated by pyrrhotite, pyrite and to a lesser extent, magnetite (mainly in early-stage veins). High-grade copper mineralisation is associated with significant chlorite, stipnomelane and sometimes magnetite. Base metal mineralisation is present along most of the shear systems, including discrete lead and zinc-rich zones. The gold mineralisation occurs in discrete high-grade bodies focused in the zones of maximum dilation.

The mineralisation is structurally-controlled, hosted by veins within a major north to north-northwest striking, steeply dipping shear zone — the Great Chesney Fault. The deposits mainly occur in dilational sites including fault flexures. Geometrically they occur as steeply plunging sulphide-rich pods. Significant resources at Great Cobar and Chesney occur beneath and are extensions to historic workings (Figure 1).

The Great Cobar mine operated from 1870 to 1919 producing over 5150 tonnes of copper and 8.6 tonnes (276,000 Oz) of gold.

The Chesney Mine produced about 5,800 tonnes of copper and 0.7 tonnes (22,500 Oz) of gold during several historical phases of mining until 1919 and during the current phase. PGM has obtained approval for development of an exploration decline to facilitate exploration activities within the Great Cobar deposit. Numerous phases of exploratory and resource definition drilling were completed during the 1940’s, and since the 1970’s.

Preliminary indications are that gold, copper, silver, lead and zinc and will be produced from the Great Cobar and Gladstone deposits.

Class	Deposit	Tonnes (kt)	NSR (A$/t)	Cu (%)	Au (g/t)	Pb (%)	Zn (%)	Ag (g/t)
Measured	Chesney	459	178	2.1	0.7	0.0	0.0	7
	New Cobar	83	171	1.0	1.8	0.1	0.1	7
	Jubilee	171	180	1.9	0.9	0.0	0.0	9
	Total Measured	**712.688**	**178**	**1.9**	**0.9**	**0.0**	**0.0**	**7**
Indicated	Chesney	638	164	1.6	1.0	0.0	0.0	5
	New Cobar	286	176	1.0	1.9	0.0	0.0	5
	Jubilee	472	170	1.8	0.9	0.0	0.0	8
	Great Cobar	2090	186	2.2	0.8	0.1	0.2	5
	Total Indicated	**3,486**	**179**	**1.9**	**0.9**	**0.1**	**0.1**	**6**
Inferred	Chesney	359	145	1.4	0.9	0.0	0.0	5
	New Cobar	108	151	1.0	1.5	0.2	0.1	10
	Jubilee	55	144	2.0	0.2	0.1	0.1	10
	Great Cobar	2,012	187	2.3	0.7	0.1	0.3	7
	Total Inferred	**2,534**	**179**	**2.1**	**0.8**	**0.1**	**0.2**	**7**
New Cobar Complex Total		**6,733**	**179**	**2.0**	**0.9**	**0.1**	**0.2**	**6**

Table 1 - Latest Mineral Resources (ASX 22 July 2020) 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). Resource estimation and modelling for the NCC deposits included geological and block modelling, statistical analysis of the data, variography and grade interpolation. The Resource Estimate utilised A$120/tonne net smelter return cut-off for mineable shapes that include internal dilution.

At the EIS stage, MEG usually recommends that at that stage only a small proportion of resources be at inferred category.

Inferred resources for all deposits by tonnage are 37.64%

New Cobar 26.4% of ore; Au 23.38%; Cu 29.3%

Chesney – 24.6% of ore; Au 33.7%; Cu 25.3%

Jubilee – 7.88% of ore; Au 6.6%; Cu 9.4%

Great Cobar – 49%; Au 45.7%; Cu 50.1% - no measured resources

Gladstone — Resources for Gladstone are expected by July 2021. Preliminary indications are that the mineralisation is of similar style and grade to Chesney. The proportions of inferred resources are greater than some copper-gold deposits, but are not unusual at Cobar.

Separate ore reserves for individual deposits for this proposal have not yet been reported.

The resources to date are marginal in terms of confidence overall, but includes rich zones of gold and copper mineralisation and the ore is not very nuggety. No resource information has been provided in the EIS, for Gladstone to support the proposed production of 783,037 tonnes of ore over the life of the project.

Further exploration is ongoing to improve these results, including;

• further defining the mineral resource through underground drilling from an exploration decline; and

• taking of a bulk sample to provide further samples for metallurgical, geotechnical and associated test work.

It should be noted that the geology, grades and nature of mineralisation at Gladstone are very similar to Chesney and hence, mainly economic for gold and copper.

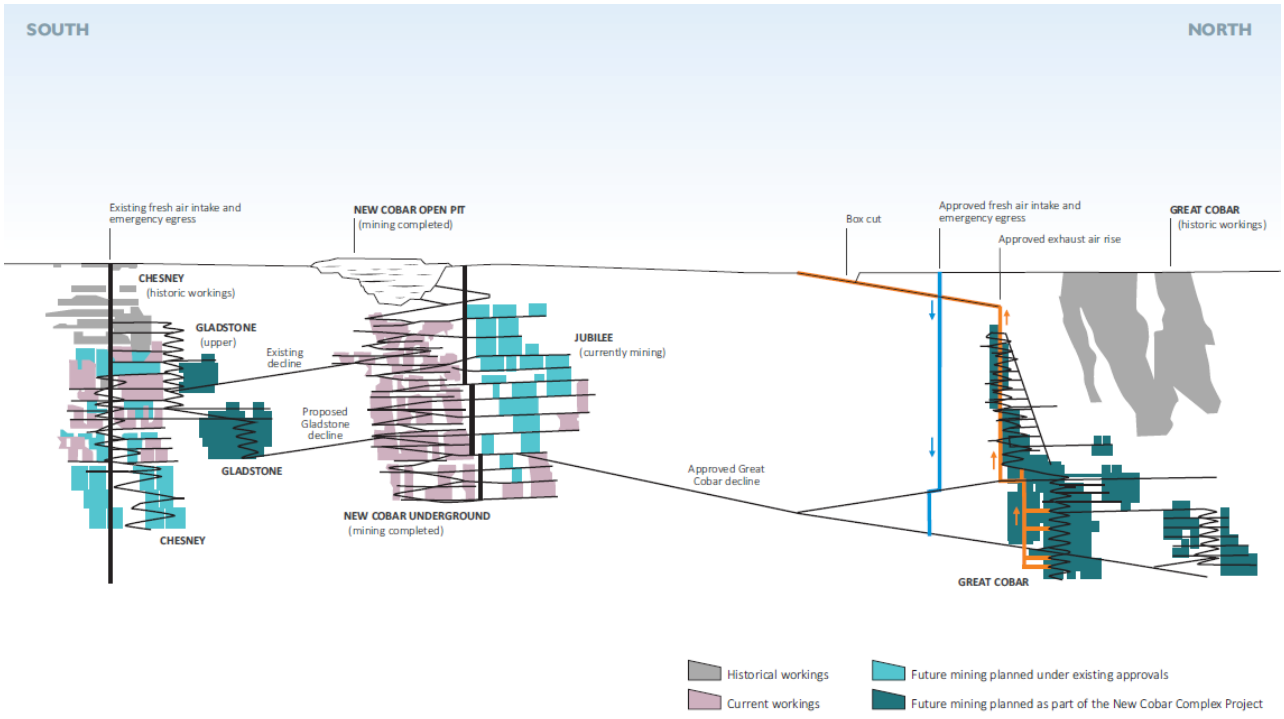

Figure 1.

Resource recovery

The New Cobar Complex proposal is designed to supplement the other mines, extending the life of operations until about 2035, with the proposed ramp down of Jubilee and Chesney deposits as they near exhaustion. Development of underground mining operations to access the Great Cobar and Gladstone deposits will use the current underground stope mining methods. Ore processing, tailings storage and concentrate handling is undertaken at the Peak Complex. Both the processing

plant and the tailings storage facility are located at the Peak Complex, and activities at those facilities are outside the scope of this project.

Open stope mining as currently used by PGM and was the only feasible method worthy of consideration.

Ore production from the New Cobar Complex for the period July 2019 to 2035 is expected to be (based on) current market assumptions):

- Jubilee – 638,246 t (already approved);
- Chesney – 572,811 t (already approved);
- Great Cobar – 4,022,040 t; and
- Gladstone – 783,037 t * *resource not yet calculated – expected by July 2021.*
- **Total – 6,016,134 t**

Mineral production from the New Cobar Complex for the period July 2019 to 2035 is expected to be (based on current market assumptions):

- gold – 148,000 oz;
- silver – 3,970,000 oz;
- copper – 127,350 t;
- zinc – 55,800 t; and
- lead – 30,064 t.

Mineral recovery should be a seamless continuation of mining and milling operations to date. Discrete lodes of high-grade gold, copper and lead+zinc are present and will continue to be extracted and processed separately to maximise recoveries. Processing will involve, gravity separation three-stage froth floatation idealised for treatment of both copper-gold and lead and zinc-rich ores to produce concentrates of copper, lead and zinc, along with electrowinning and carbon in pulp recovery of gold and silver.

Oxidised mineralisation is present in the upper parts of the Gladstone, New Cobar (Jubilee). The EIS outlines that there is no commitment yet regarding whether they will be processed and if so, what effect this may have on metal recoveries and on tailings.

The geology, grades and tenor of ore of all the deposits of New Cobar Complex (including preliminary indications for Gladstone) are very similar to those presently mined by PGM — and therefore should be able to be mined successfully.

Economic benefits of the resource

Over the life of the Project, MEG has estimated that the value of the metals produced would be of the order of $1,270M in current dollars, with the net present value of this revenue stream at around $710M at a discount rate of seven per cent.

Based on current operations at the Cobar mining complex, it is expected that the gold and silver ore produced from the Project would be sold to domestic customers for further refinement and processing mostly at the Perth mint. All concentrates produced from the Project would be exported from the NSW ports of either Newcastle or Port Kembla for further refining in smelters in East Asia. If approved the additional export income from the Project would contribute to the around $6B of metallic and processed metals exported from NSW (2019/20 total). In general, additional export income contributes a positive impact on both the credit rating of both NSW and Australia and has benefits to the A$/US exchange rate.

The Project is seeking to include the Great Cobar and Gladstone deposits under a single State Significant Development approval. Mining under this new consent would take place from 2023/24 to 2033/34. Currently, all mining at the Peak gold mine and associated satellite mines operate under approvals from Cobar Shire Council. The Project is particularly important in that it would provide an extension of existing operations at the New Cobar and Peak complexes, with mining activity of the Great Cobar and Gladstone deposits ramping up as mining at other existing deposits wind down.

The Project would ensure the continued employment of 342 direct FTE jobs ($604M in wages) over its ten-year life and 141 FTE construction jobs ($25M in wages). The Project is not expected to result in any significant changes in labour for mining, processing and maintenance at the Peak and New Cobar complexes from existing levels. Capital expenditure for the Project would be of the order of $66M.

MEG notes the following from the Economic Impact Assessment (AEC Group Ltd) on the Project relating to economic growth:

- Over the four-year construction phase (2022/23 2025/26), there is expected to be approx. $32.8M in Gross Regional Product (GRP) into the local regional economy, and an additional $19.7M in Gross State Product (GSP) for the rest of NSW.
- During peak production (2026/27 – 2032/33), there is expected an average of $73.4M in GRP for the region, and an additional $18.2 M in GSP in the rest of NSW.

Royalty calculation

Assumptions

The Project is an extension to an existing operation that produces gold, copper, silver, lead and zinc. A royalty rate of four per cent applies to the value of all metals produced. For these metals deductions are allowed on the price received and include; onsite treatment expenses, realisation expenses, onsite administration and depreciation. The net value after these deductions is called the ex-mine value, the four percent royalty rate is applied to the ex-mine value amount.

One of the most important assumptions in the calculation of future royalty is the future metals prices over the life of a Project. In general MEG agrees with the metals price assumptions provided by the Proponent. The prices used are all below current prices but are in line with MEG's view on metals prices going forward.

Another important aspect of the future royalty calculation for a proposed metallic Project is the estimation of future annual production of each of the metals to be produced form the Project. After an analysis of the geological information provided by the Proponent (noting that resource data for Gladstone are not yet available – see "Size and quality of the resource"), MEG is of the opinion that if the Project is approved, the metals output in each of the project years as provided by Aurelia would most likely be achieved.

Total royalties estimate

Using the above assumptions and parameters, MEG has calculated that the State will receive:

Parameter	$m (2021 dollars)
Total royalties received	42
Net Present Value (NPV) royalties (7% discount rate, real)	23
Annual estimated royalties (average per year)	5.5 (Approximate)

Departmental Assessment

Assessed by	Unit	Branch
Assessing Officer: Dr David Forster Senior Geologist	Mineral Resource Assessment - Geoscience Assessment & Advice (GAA)	Geological Survey of NSW
Assessing Officer: Bryan Whitlock Senior Resources Analyst	Resource Economics	Resources Policy, Planning & Programs
Assessing Officer: Adam W. Banister Senior Advisor	Assessment Coordination Unit – Resource Assessments	Resource Operations

Approvals

Approved by	Signature	Date
Approving Officer: Dr Phillip Blevin Director Geoscience Assessment & Advice	Approved in CM9	24/03/2021
Approving Officer: Tamsin Martin Director Resources Planning & Programs	Approved in CM9	22/3/2021
Endorsing Officer: Param Dogra A/Executive Director Resource Operations		25/3/2021