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Mining, Exploration & Geoscience

Mandalong Southern Extension – Modification 10 (SSD-5144-Mod-10)

Resource & Economic Assessment

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More information

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Executive summary

Determination

Mining, Exploration and Geoscience (MEG) has assessed the Mandalong Southern Extension – Modification 10 (SSD-5144-Mod-10) (the Modification). MEG considers the Modification to be appropriate as it will enable the Mandalong mine to maintain continuity of production in the short term.

Parameter	\$m (2021 dollars)
Total royalties received	8.3
Net Present Value (NPV) royalties (7% discount rate, real)	Not calculated – as mined in 2022.
Annual estimated royalties (average)	8.3

In addition, the Modification will provide:

- approximately 660 full time equivalent (FTE) continuing jobs during operations
- approximately \$120 million in current dollars (total value of the coal to be produced from Long Wall 34)
- an additional \$45 million in export income to contribute to the around A\$18 billion (2019-2020 financial year total) of coal exports annually from NSW.

Over the remaining life of the Mandalong mine, excluding Modification 10, based on current production rates and prices, the total revenue from the mine would be approximately A\$5 billion and the total royalty of the order of \$350 million (2021 dollars).

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

Without this Modification, coal production could be curtailed for a large portion of the 2022 calendar year, in turn contributing to financial challenges which could impact the viability of the Mandalong mine.

Without the Modification, it is anticipated that about 80 of the up to 660 full time equivalent staff (longwall crew) could be stood down.

The Modification is considered to be an efficient use of resources given the constraints encountered.

The Modification

Centennial Mandalong Pty Ltd (Mandalong or the Proponent), has submitted an application for an additional Long Wall (LW) Panel 34 to maintain coal production and improve mining conditions

resulting from removing LW33 and reducing LW30, LW31 and LW32 due to a fault zone and igneous sill, resulting in the sterilisation of around 2Mt of coal.

The Modification would include the extraction of an additional 1.2 million tonnes (Mt) of coal from the West Wallarah Seam, to replace coal resources lost due to the reduction of other LW's from within the existing Mandalong mining operations.

The Modification would support additional extraction of coal by changing the layout of the western long wall's in the Southern Extension Project area due to geological constraints. The orientation of the mains will also be altered to allow for an extra panel (LW34) on the western side. There is no significant change to the approved mine disturbance footprint.

The Modification would:

- allow for continued production in 2022
- extract an additional 1.2 Mt of product coal, therefore reducing the production losses due to the newly discovered unfavourable geological conditions.

The Modification would involve the continued use of existing and approved infrastructure at the Mandalong mine, with a staged extraction, handling and processing of ROM, and continued employment of the existing workforce.

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 a Modification Report (MRT).

This Resource & Economic Assessment (REA) conducted for the Modification by MEG has assessed:

- the social and economic benefits to NSW including royalties, capital investment, revenues and jobs.
- the resource/reserve estimates stated in the proponent's MRT.
- 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.

Modification overview

Current mine history and ownership

The existing Mandalong mine is situated in the Hunter Coalfield of the Sydney Basin, approximately 35 kilometres southwest of Newcastle in the Lake Macquarie local government area.

The Mandalong mine produces thermal coal using underground mining methods and has an approved operational capacity of up to 6.5 million tonnes per annum (Mtpa) of coal until 31 December 2040 under Development Consent SSD 5144 which was granted on 12 October 2015.

Mandalong mine comprises the underground workings and surface infrastructure of:

- the Mandalong mine underground workings including longwall panels, development units and surface infrastructure located near Morisset
- the Cooranbong Entry Site, consisting of the Cooranbong Colliery underground workings and surface infrastructure located near Dora Creek
- the Mandalong South Surface Site located off Mandalong Road
- the Delta Entry Site, which encompasses an entry and coal delivery system, located near Wyee at the Vales Point Rail Unloader Facility.

Coal will be transported by underground conveyor from Mandalong to Cooranbong where it will be either transported by rail to Eraring power station or onto Newstan Colliery for washing where it will progress to the Port of Newcastle for export. Underground mining, the handling and processing of Run-of-Mine (ROM) coal at the Mandalong mine, and the rail transport of coal products is undertaken 24 hours per day, seven days per week.

The Mandalong Southern Extension Modification 10 – Longwall 34

The Modification involves an additional LW Panel 34 to maintain coal production and improve mining conditions resulting from the removal of LW33 and shortening LW30, LW31 and LW32 due to geological factors. It will also allow for an additional 1.2 Mt of product coal from the West Wallarah Seam, to replace coal resources lost.

The Modification, if approved, would support the continued employment of the existing Mandalong mine workforce of about 660 FTE operational workers. Without MOD 10 it is anticipated Mandalong mine will not extract coal from its longwall mining area for a large portion of the 2022 calendar year. This could result in standing down about 80 FTE longwall crew.

MEG notes that this REA has been undertaken in accordance with commercial-in-confidence resource and mine schedule data supplied by the Proponent.

The Modification, if approved, would have the following changes or impacts:

- reduction in coal recovery by 1.64 Mt between the previous Modification 9 and this modification
- changed layout of the western longwalls in the Southern Extension Project area as well as a change to the orientation of the mains to allow for an extra panel (LW34) on the western side
- the removal of LW33 to ensure an aboriginal heritage site (cave) is not impacted by longwall subsidence
- supports continuity of production and employment in the short term
- an additional 1.2Mt of product coal mined from LW34 in 2022 calendar year
- extraction will be achieved using existing infrastructure and is within the development consent boundary.

Size and quality of the resource

Mandalong mine will continue to mine the West Wallarah Seam in LW34. This seam is between 300 to 450 metres in depth. The bedding dips towards the southwest at one to two degrees. The extraction height will vary between 3.6 and 3.8 metres.

The West Wallarah Seam has a ROM raw ash of around 18% and a specific energy of 25 MJ/Kcal. Mandalong produces an export thermal coal product.

MEG have received a copy of the 2020 coal resource and reserve estimation for the Modification. This was done in accordance with the Australasian Code for Reporting Exploration results, Mineral Resources and Ore Reserves (the JORC Code). The JORC Code is an industry-standard professional code of practice that sets minimum standards for public reporting of mineral exploration results, mineral resources and ore reserves.

Due to the newly encountered geological conditions and subsequent required changes in the mine plan the proponent has reduced the recovery by 1.64 Mt between Modification 9 and Modification 10.

Resource recovery

Due to geological conditions at Mandalong mine, it has been necessary to change the layout of the western longwalls in the Southern Extension Project area. It was known prior to mining that in this area there was a sill, that replaces the coal, but the location and extent of this sill was uncertain due to constraints on surface exploration. The sill extent has now been defined by in-seam boreholes drilled from the southwest mains, tailgate 30 and maingates 30 and 31. The sill extent covers the southern end of LW30 to 33. The in-seam drilling also encountered a diatreme located in the proposed mains area for the eastern longwalls.

The proponent has previously submitted updated extraction plans to shorten LW30 and LW31. This Modification aims to shorten LW32 due to the sill and also removes LW33 due to an aboriginal heritage site (cave) which would likely be destroyed by longwall subsidence. Overall, this has reduced the number of tonnes expected to be recovered by 2.84 Mt (Table 1).

The Modification also proposes a change to the orientation of the mains to allow for an extra panel (LW34) on the western side. It is expected that LW34 will recover 1.2 Mt.

Table 1 Mandalong changes in resource recovery

Panel	MOD 9	MOD 10	Difference
LW 30	1,919,791	1,474,864	-444,927
LW 31	1,880,927	1,120,573	-760,354
LW 32	1,902,780	838,808	-1,063,972
LW 33	572,042	0	-572,042
Total Loss			-2,841,295
LW 34	0	1,203,298	1,203,298
Loss + LW34	6,275,540	4,637,543	-1,637,997

Economic benefits of the resource

Over the life of the Modification, the majority of production (75 percent) would be sold on the domestic thermal market (coal-fired generation to the nearby Eraring power station) and the remaining 25 percent sold on the export thermal market. MEG has estimated that the value of the coal produced would be around \$120 million in current dollars. If approved, the additional \$45 million in export income from the Modification would contribute to the around A\$14.5 billion (2020-2021 financial year total) of coal exports annually from NSW. Export income provides benefits to the NSW and Australian economies. The balance of trade of any country is a crucial driver of any world economy.

The major benefit of the Modification relates to ensuring that the Mandalong mine can maintain continuity of production in the short term. Without the proposed modification, coal production could be curtailed for a large portion of the 2022 calendar year, in turn contributing to financial challenges which could impact the viability of the Mandalong mine.

Without the Modification it is anticipated that about 80 of the up to 660 full time equivalent staff (longwall crew) could be stood down.

The Modification is operationally important as an interim measure between the operation acquiring a new low seam height longwall that would be installed in 2023. The low seam height equipment is required due to the thicker working section reserves at Mandalong being near to exhaustion. The remaining life of Mandalong (at around 11 years) will utilise the new low seam height longwall to extract coal until it closes in 2032. Currently, total employment at the Mandalong mine is around 660 FTE employees. These jobs would be maintained until 2032 if the operation continues to produce coal at around the 5 Mtpa level of product.

Royalty calculation

Assumptions

The Modification is a proposed underground mine, where the potential coal to be extracted is above 400 metres in depth; therefore, a royalty rate of 7.2% applies to all saleable production. This rate is applicable to the net disposal value. Net disposal value is the price received per tonne minus any allowable deductions. The main allowable deduction is for coal beneficiation. As ROM coal from the operation would be subject to only crushing and screening, a deduction of A\$0.50 per tonne from the value of coal produced applies. A deduction for levies also applies which would amount to no more than A\$1.00 per tonne. Hence allowable deductions for royalty for the Modification of A\$1.50 per tonne are applicable.

The majority of coal from the Modification is expected to be sold into the domestic coal-fired generation market (75 percent to Eraring power station) and the remaining 25 percent to the export thermal market. A review of coal quality information by MEG suggests this is achievable, especially for the proposed Modification period.

The current average Q3 2021 price for export thermal coal is around A\$150 per tonne. As the Modification is for coal extracted in the short term, sometime in the calendar year 2022, this price has been used for the export thermal portion of coal produced. It is anticipated that the domestic thermal coal to be sold to Eraring power station would attract a price of around A\$80 per tonne.

MEG has estimated that if the Modification is approved, around 1.2Mt of additional product coal would be mined in 2022 calendar year.

Total royalties estimate

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

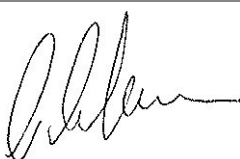
Parameter	\$m (2021 dollars)
Total royalties received	8.3
Net Present Value (NPV) royalties (7% discount rate, real)	Not calculated – as mined in 2022.
Annual estimated royalties (average)	8.3

MEG has estimated that over the remaining life of the Mandalong mine, excluding this Modification, based on current production rates and prices, total revenue from the mine would be approximately A\$5 billion and the total royalty of the order of \$350 million (2021 dollars).

Departmental Assessment

Assessed by	Unit	Branch
Assessing Officer: Gwen Stefani Senior Geologist	Assessment & Advice (A&A)	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 – Industry Development	Strategy Performance & Industry Development

Approvals

Approved by	Signature	Date
Approving Officer: Dr Mark Armstrong Acting Director Assessment & Advice Geological Survey of NSW		9/11/2021
Approving Officer: Kristina Erzikov Director Performance Strategy, Performance and Industry Development		17/11/2021
Endorsing Officer: Chris Celovic Director Industry Development Strategy, Performance and Industry Development		19/11/2021