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Narrabri Underground Mine Stage 3 Extension Project (SSD10269)

Resource & Economic Assessment

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More information

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Determination

The Department of Regional NSW - Mining, Exploration and Geoscience (MEG) has assessed the Narrabri Underground Mine Stage 3 Extension Project (the Project). MEG determined the Project will:

- extend the life of the existing Narrabri Mine from 2034 to 2044.
- ensure an appropriate return to the NSW Government including;
  - $726 million royalties (current dollars)
  - $10.7 billion in total revenue (current dollars)
- support the employment of the existing workforce of up to 520 full-time employees (FTE) at the Narrabri Mine, employing an average of 370 FTE operational workers between 2022 and 2044.
- improve resource recovery and be an efficient use of resources.

MEG notes that without the Project, the existing Narrabri Mine would cease operations in 2034.

The project

Narrabri Coal Operations Pty Limited, a wholly-owned subsidiary of Whitehaven Coal Limited (Whitehaven or the Proponent), through SSD10269 seek a southern extension to the existing underground coal mining operations at Narrabri Mine. The extension will:

- extend the life of mine from 2034 to 2044.
- extract an additional 107.4 million tonnes (Mt) of Run-of-Mine (ROM) coal.
- extract an additional 104.7 Mt of product coal.

The Project would involve the continued use of existing and approved underground and surface infrastructure at the Narrabri Mine, the existing workforce, and continued use of existing/approved drifts and underground main roads.

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 Narrabri Underground Mine Stage 3 Extension 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 Narrabri Mine is an existing underground coal mining operation situated in the Gunnedah Coalfield, approximately 25 kilometres southeast of Narrabri and approximately 60 kilometres northwest of Gunnedah, within the Narrabri Shire Council (NSC) Local Government Area (LGA). The Narrabri Mine is operated under Mining Lease 1609 (Act 1992) (ML 1609).

Stage 1 of the Narrabri Mine was approved under Part 3A of the *Environmental Planning and Assessment Act 1979* in 2007 and involved initial site establishment activities and continuous miner underground mining operations.

Stage 2 of the Narrabri Mine was issued as Project Approval 08_0144 under Part 3A of the *Environmental Planning and Assessment Act 1979* in 2010, and allowed the Narrabri Mine to convert to a longwall underground mining operation. Project Approval 08_0144 allows for the production and processing of up to 11 million tonnes per annum (Mtpa) of ROM coal until July 2031. The approved Narrabri Mine comprises 20 longwall panels.

The Narrabri Mine, incorporating Stages 1 and 2, extracts coal from the Hoskissons Coal Seam. ROM coal is processed at the Narrabri Mine Coal Handling and Preparation Plant (CHPP) to produce thermal and pulverised coal injection (PCI) coal products.

The proposed Narrabri Underground Coal Mine Stage 3 Project

The Project involves a southern extension to the approved underground Narrabri Mine, to gain access to additional coal reserves located within Exploration Licence 6243 (Act 1992) (EL 6243).

The Development Application for the Project seeks to consolidate and replace the existing Project Approval 08_0144.

The Project would involve the continued use of existing and approved underground and surface infrastructure at the Narrabri Mine, existing workforce, and continued use of existing/approved drifts and underground main roads.

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

The Proponent indicates a LOM extension to the Narrabri Mine of 10 years from 2034 to 2044, and additional recovery of 107.4 Mt ROM coal and 104.7 Mt of product coal.

Based on current mine planning, the approved Narrabri Mine is expected to produce a total of approximately 145 Mt of ROM coal (i.e. approximately 25 Mt less than the approved limit of 170 Mt).

The project, if approved, would support the continued employment of the existing Narrabri Mine workforce of up to 520 Full Time Equivalent (FTE). The Project is estimated to employ an average of 370 FTE operational workers between 2022 and 2044 if approved.

The Project would include the following activities:

- continued longwall mining of the Hoskissons Coal Seam, including:
  - an extension of Longwalls 203 to 209 into EL 6243, up to 10 kilometres long
  - an additional longwall (Longwall 210) within EL 6243
- continued development of underground roadways within the Hoskissons Coal Seam and adjacent strata to access mining areas.

Size and quality of the resource

The Project proposes to continue mining the Hoskissons Coal Seam of the Black Jack Formation, which contains six distinct plies. The Project proposes to continue mining only the HSK2 ply, which is the thickest and only economic ply. The cutting height of the operations will be 4.3 metres. The strata dips gently to the west. The raw ash of the working section varies from 8 to 30 per cent. The southern extent of the coal resource is constrained by a seam split in the HSK2 ply to the south of the proposed longwalls 203 to 209.

MEG has verified that the Project, if approved, will produce an additional 107.4 Mt of ROM coal, and 104.7 Mt of product coal.

The Proponent has completed coal resource and reserve estimation for the Project 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.

The Narrabri Mine currently sells thermal and PCI coal to export markets. Coal quality in the Project area changes slightly, when compared to the existing Narrabri Mine extraction area. The moisture is lower and the ash higher. The Proponent intends to produce the same products in the Project area as the current operation.

Two products are expected to be produced from the Project:

- Low ash thermal product (101.3 Mt)
- PCI product (3.4 Mt)

All coal will be processed in accordance with current operational procedures at the Narrabri Mine Coal CHPP. The product coal is then railed to Newcastle for export. A review of coal quality data confirms the proposed product quality, target export market split, and yield are achievable.

The mine plan proposed by the Proponent, if approved, has a cumulative ROM coal of 195.2 Mt, and cumulative product coal of 192.1 Mt for the existing Narrabri Mine and the Project combined (Table 1).

The Project alone, if approved, will produce an additional 107.4 Mt of ROM coal, and 104.7 Mt of product coal on top of the coal that will be produced from the Narrabri Mine over the remainder of operations.

Table 1: Indicative schedule comparison between current Narrabri Mine and the projected cumulative production if the Stage 3 Project is approved

Year	Current approval (Narrabri Mine)			Stage 3 Project (the Project) *Cumulative production, including production from the existing Narrabri Mine*		
	ROM Coal (Mt)	Thermal Coal (Mt)	PCI Coal (Mt)	ROM Coal (Mt)	Thermal Coal (Mt)	PCI Coal (Mt)
2022	7.7	7.1	0.5	7.7	7.1	0.5
2023	6.9	6.3	0.6	7.1	6.5	0.6
2024	6.4	5.8	0.6	6.6	6.0	0.5
2025	8.8	8.4	0.4	10.9	9.8	0.9
2026	8.5	8.1	0.3	10.9	10.1	0.5
2027	7.5	7.3	0.2	9.4	8.8	0.5
2028	7.6	7.4	0.1	10.8	9.9	0.7
2029	7.6	7.5	0.1	9.0	8.6	0.3
2030	7.5	7.4	0.1	10.4	9.5	0.7
2031	7.1	7.0	0.1	8.4	8.2	0.1
2032	5.9	5.2	0.6	10.3	9.3	0.8
2033	6.1	4.8	1.2	9.4	9.0	0.3
2034	0.4	0.4	0.0	8.3	7.8	0.4
2035				9.4	9.2	0.1
2036				8.1	7.9	0.1
2037				9.2	8.8	0.2
2038				9.2	9.0	0.0
2039				7.7	7.5	0.1
2040				8.4	8.3	0.0
2041				7.5	7.4	0.1
2042				9.1	8.5	0.4
2043				6.1	5.6	0.5
2044				1.3	1.2	0.1
TOTAL	**87.8**	**82.5**	**4.9**	**195.2**	**183.8**	**8.3**

Resource recovery

The Proponent assessed several mine designs and determined the mine design in the Project is the most appropriate. Many factors constrain a mine plan and extraction methodology and therefore the resource recovery at the Project. These include geological features, environmental constraints, and commercial viability.

The Project involves a southern extension to the approved Narrabri Mine to gain access to additional coal reserves within EL 6243. This would involve an increase in the mine life to 2044 and development of supporting surface infrastructure.

After examination of the Proponent's EIS, MEG considers the Project an efficient development of coal resources that provides an appropriate return to the State, within the mine footprint, giving due consideration to the constraints of the location.

Risks to resource recovery

Geological constraints in the Project area require further assessment. Unanticipated geological features such as faulting and dykes may have significant impacts on the project and overall resource recovery.

Several faults have been identified over the Project area. Displacements of the faults in the Project area are not well understood, and the Proponent concedes that more intensive work needs to be done to understand these structures. A significant fault was intersected in the existing Narrabri Mine area which resulted in reduced extraction of two longwall panels. If throws of faults in the Project area are larger than 5 metres, there may be impacts on the Project extraction plan and resource recovery.

Dykes have been encountered during development of the existing Narrabri Mine, causing temporary relocation of longwalls and delayed extraction. If more dykes like this are located in the Project area, they could have a similar impact.

Economic benefits of the resource

Over the life of the Project, assuming the majority of production would be sold on the export thermal market, MEG has estimated that the value of the coal produced would be around $10.7 billion in current 2020 dollars, with the net present value (NPV) of this revenue stream at around $3.7 billion at a real discount rate of seven per cent.

If approved, the additional export income from the Project would contribute to the around $18 billion (2019-2020 total) of coal exports annually from NSW. Coal exports are the largest value export from NSW, representing over 35 per cent of the state's merchandise goods exports.

The Project, if approved, would provide an average operational workforce of 370 FTE jobs over the period 2022 to 2044. MEG estimates that these direct mine jobs would result in around an additional 1,500 indirect jobs in both mine and non-mine related services. Capital investment over the life of the Project would be of the order of $530 million. Without the Project the existing Narrabri Mine would close in 2034, with the resultant loss of all FTE positions from the mine.

MEG also notes from the Economic Assessment prepared by the Proponent's economic consultant (AnalytEcon) that it is estimated that the Project would deliver:

- incremental net benefits to NSW in NPV terms of $599 million.
- operating expenditures to NSW suppliers in NPV terms of $775 million (this amount is exclusive of the net benefits to NSW referred to above).
- total operating expenditure over the life of the Project of $4.1 billion, with some of this expenditure being sourced from local regional suppliers (estimated in NPV terms at $247 million).

Royalty calculation

The Project is a proposed underground coal mine which is mostly less than 400 metres in depth; therefore a royalty rate of 7.2 per cent 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, which is either $3.50 per tonne for coal subjected to a full washing cycle, $2.00 per tonne for coal subjected to a simple washing process, or $0.50 per tonne for coal that is washed and screened.

As a majority of ROM coal from the operation is subject to a simple washing process (and some is by-passed), a deduction of $2.00 per tonne from the value of coal produced applies. A deduction for levies also applies which would amount to no more than $1.00 per tonne. Hence allowable deductions for royalty for the Project are $3.00 per tonne.

One of the most important assumptions in the calculation of future royalty is the estimate of a future coal price over the life of a project. Coal from the Project is expected to be mostly sold into the export thermal market (95 per cent) and a small portion into the PCI market (5 per cent). A review of coal quality information by MEG suggests this is achievable. Coal from the Project typically has a higher energy content than most export thermal coal mines in NSW and therefore would attract a higher average price.

Coal price forecasting is inherently difficult and over the project life variations in coal prices are expected. For the Project, MEG has used short and medium-term prices (out to 2025) in the range of A$90 to A$100 per tonne for export thermal coal, with longer-term prices anticipated at around A$100 per tonne. The small amount of export PCI coal is expected to attract a premium of around A$25 per tonne on top of export thermal prices.

Another important aspect of future royalty calculation for a proposed coal project is the estimation of future annual production. MEG has estimated that if the Project is approved, around 107.4 Mt of ROM coal (producing around 104.7 Mt of product coal) would be able to be economically mined from the Project. Also the Proponent proposes that longwalls of potentially around 10km in length would be mined from the Project. This would ensure that the mine remained one of the most highly productive longwall mines in NSW. Over the past six years the Narrabri Mine has consistently produced in excess of 6 Mtpa of ROM coal. MEG is of the opinion that the tonnages as outlined in the Proponent's production schedule are achievable.

Using the above parameters, MEG has calculated that the State would receive around $726 million in current dollars, and around $251 million in NPV terms (at a real discount rate of 7 per cent) in royalty from the Project. In a typical year at full production the NSW Government would receive around $60 million in royalties from the Project.

Departmental Assessment

Assessed by	Unit	Branch
Assessing Officer: Gwen Stefani Senior Geologist – Coal 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 Geoscience Assessment & Advice		3/12/2020
Approving Officer: Dr Minh Ho A/Director Resources Planning & Programs		3/12/2020
Endorsing Officer: Stephen Wills Executive Director Resource Operations		4/12/2020