Regional NSW

CM9 Reference: RDOC22/83468

- Workflow to "Operational Allocation Assessment Group"

COAL EXPLORATION LICENCE APPLICATION FOR OPERATIONAL ALLOCATION PURPOSES

Assessment and Advice	
CM9 Reference:	**RDOC22/83468**
Application number:	**ELA6442**
Application for:	Exploration licence for operational allocation purposes
Applicant:	Narrabri Coal Pty Ltd
Mineral Group/s:	Group 9 (Coal)
Date lodged:	24 February 2022
Dealing Number:	TMS APP-2022-30
Licence type:	Exploration
Area applied for:	1744.5504 hectares
Term applied for:	6 years
Number of separate parts:	1
Location:	About 17 km SSE of Narrabri
Mining Division:	Armidale
Environment Region:	
Nominated TM:	[redacted]
Date of Assessment:	19/05/2022

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Applications against Mining Lease/s
Provide comment on the coal resources of the proposed allocation area. *7.1(a) Guidelines for coal exploration licence applications for operational allocation purposes*

Summary of coal resources

The Narrabri Mine is in the northern part of the Gunnedah Basin. The Black Jack Group, the main coal bearing interval in the Gunnedah Basin, in the allocation area consists of the Melvilles, Hoskissons, Caroona and Howes Hill seams. The Hoskissons Coal is the only seam in the allocation area with sufficient thickness, quality and depth of cover to be commercially viable to mine.

The Hoskissons Coal sub-crop trends in a curved, north-south direction, that generally follows the Kamileroi Highway. The seam sub-crop appears deeper to the north of the Narrabri Mine and appears representative of a geological event whereby the Digby unconformity scoured the seam to a deeper level than to the south. This appears consistent with actual mining observations at the in-bye ends of gate-roads 106 to 110 of the Narrabri Mine where the Hoskissons Coal seam is shown to be thinning.

The Hoskissons Coal is a medium volatile bituminous coal, mostly dull with few bright bands. It is divided into six main plies, HSK1 to HSK6. The basal section (HSK1 and HSK2) forms the working section (Figure 1). It is from four to six metres in thickness and is generally low in ash. The upper section (HSK3 – HSK6) is higher in ash. The increase in ash content is due to the presence of tuffaceous claystone bands and occasional fine-grained sediments together with higher inherent ash coals.

The depth of cover of the Hoskissons Coal ranges from 340 m at the sub-crop to over 500 m. The thickness of the HSK2 ranges from 4.8 m to 3.6 m in the south west corner. Raw ash appears to range from 9% near the sub-crop trending higher to the west and south west up to a high of 19 per cent at DM Gorman 1 borehole, which lies outside and to the south west of the allocation area.

The applicant (Narrabri Coal Pty Ltd) has not provided an estimate of resources for the operational allocation area as the current borehole spacing due to the limited number of boreholes to quantify resources to a high degree of confidence. GSNSW have estimated, based on the limited data, that there is possibly up to 120 Mt of in-situ coal in ELA6442 with a raw ash of 10%.

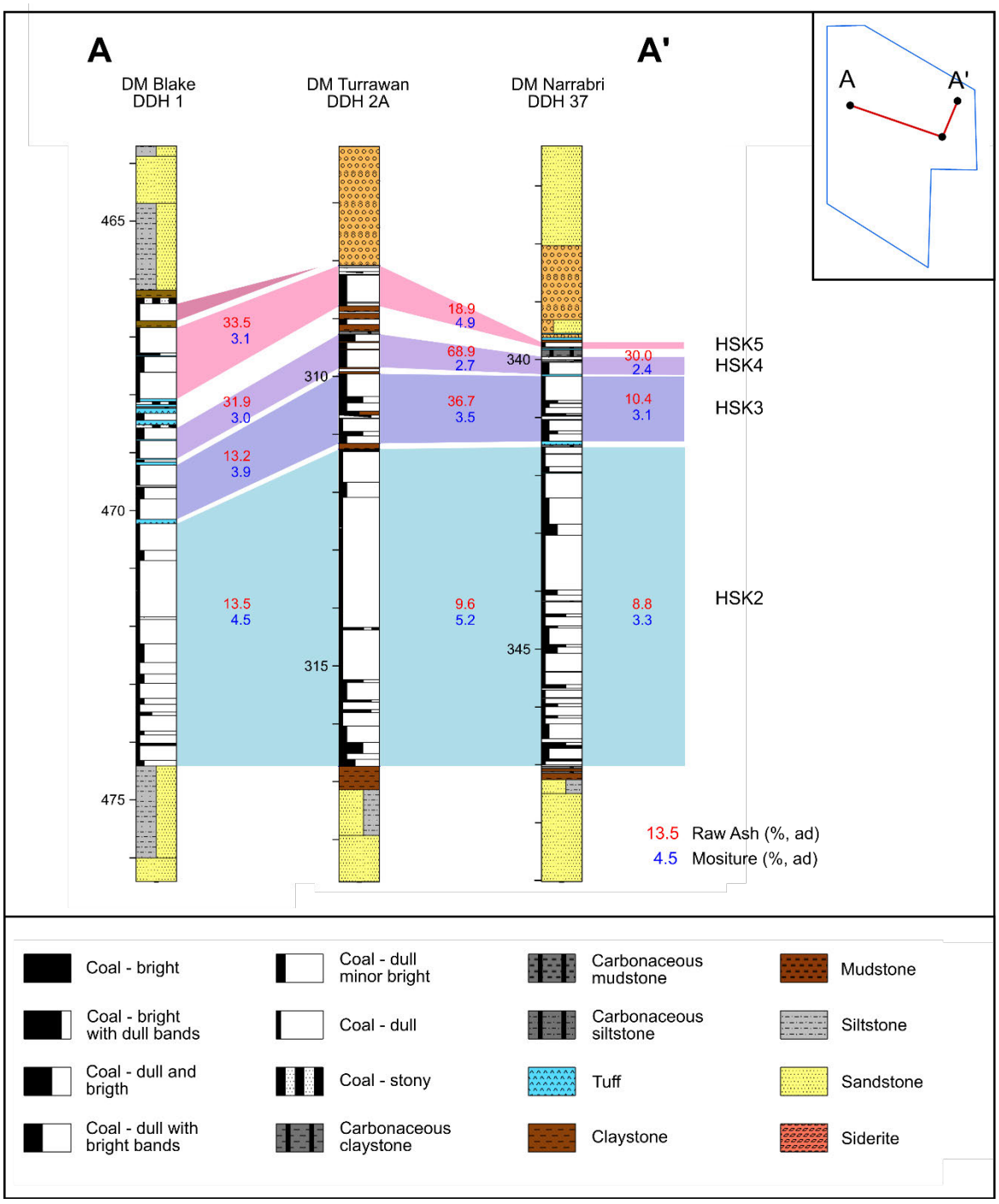

Figure 1: Borehole sections of the Hoskissons Coal profile across the Gorman North (AUTH216) area.

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Has the applicant clearly demonstrated the area of application is likely to contain a resource that would otherwise be likely to be sterilised? Provide details as to how/why. *7.1 (b) Guidelines for coal exploration licence applications for operational allocation purposes*	**NO - limited**

The applicant has provided a commercial viability assessment (CVA) on the part of the larger resource area (AUTH216) which concluded that the resources would not support a standalone mine.

A conceptual layout was designed for a standalone mine with surface to seam drift access based on the following constraints:

- The seam sub-crop to the east
- North west rail line and residential land zoning to the north
- Surface alluvial sediments to the west
- High ash content > 14% to the south
- The Narrabri Mine lease boundary to the south (ML1609).

This CVA concluded that the comparative net present value (NPV) of the standalone option indicated a negative value of -$1.3B. Hence a standalone mine is not shown to be a viable investment based on the consensus pricing over the next ten years.

This CVA was rather limited in the area it contained. It is unclear why it was constrained to north of ML1609 when resources continue to the south into ELA6443. The applicants own conceptual layout for ELA6442 and ELA6443 is more extensive than the area considered in this CVA.

Summary of independent Commercial Viability Assessments

In 2019 GSNSW engaged a consultant to prepare a CVA for the Gorman North area (AUTH216). This high-level independent commercial viability assessment concluded that Gorman North contains a coal resource with the potential to recover up to 240 Mt of run of mine coal, with a Net Present Value (NPV) of $120M as a new standalone mine (base case) and $160M as an addition to the Narrabri mine. The resource may support a new marginally viable underground longwall mining operation of approximately 6.6 million tonnes per annum (Mtpa) over 37 years.

However, the base case scenario had a low capital efficiency ratio (0.1), i.e. the capital investment (project CAPEX) is significantly high compared to the resultant asset value. Consequently, the likelihood of this asset being development on a standalone basis is assessed to be low.

A comparison between the applicant's and the GSNSW conceptual mine designs used in assessing commercial viability are shown in Figure 2.

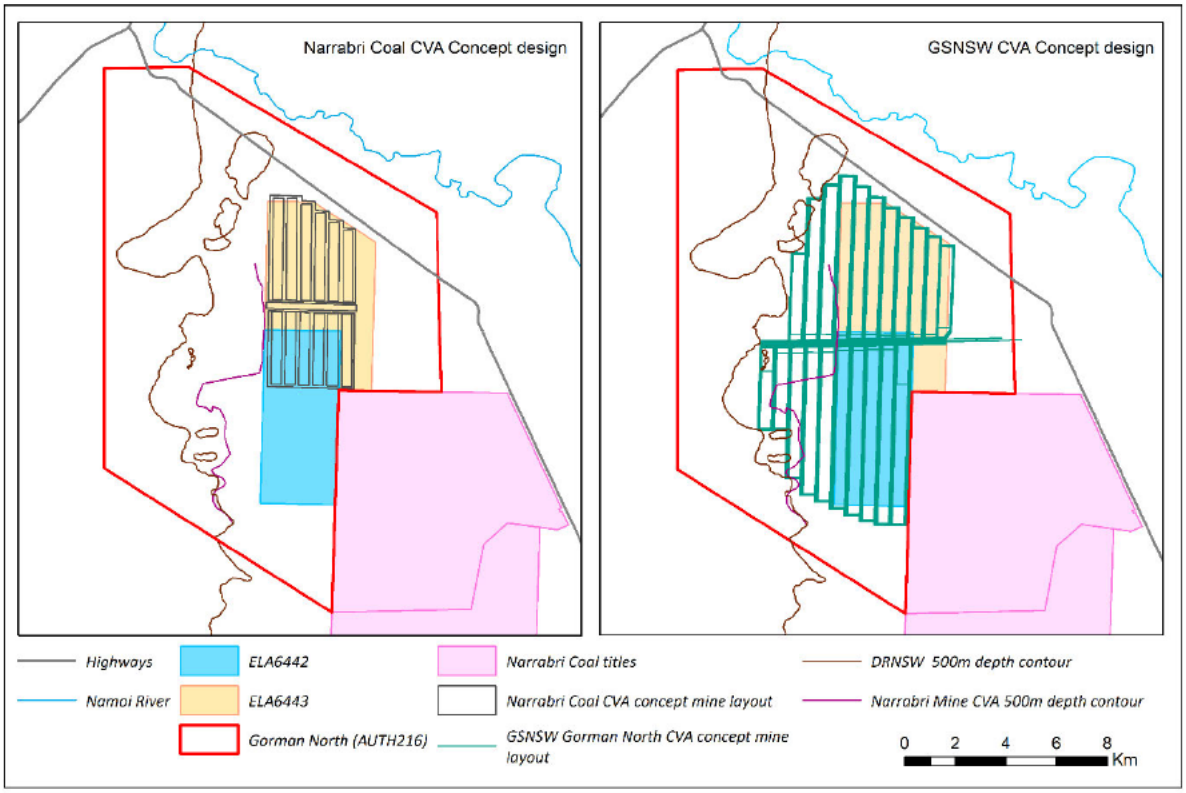

Figure 2: Comparison between the Narrabri Coal Pty Ltd (left) and GSNSW (right) Commercial Viability Assessment conceptual mine designs, also highlighting the difference in the modelled depth of cover.

Where the proposed allocation area could be part of a larger unallocated coal resource that could support a standalone mine, the Coal Resource Operational Allocation Committee will consider

1. the needs of the applicant (i.e. remaining production period of existing mine, timeframes for development etc)
2. any market interest (i.e. was there any valid market interest)
3. the impact on the unallocated area if the application was granted

7.2(a) Guidelines for coal exploration licence applications for operational allocation purposes

If ELA6442 is granted it would allow the applicant to conduct exploration in this area. Pending the exploration results, longwall mining could be extended from the currently operating and adjacent Narrabri Mine, subject to the appropriate development consents. This could add up to 10 – 20 years to the operation.

The Narrabri Mine recently had the Narrabri Underground Mine Stage 3 Extension Project (Stage 3 Extension) approved. This project involves the extension of the underground mining areas at the Narrabri Mine to gain access to additional areas of ROM coal reserves located within Exploration Licence (EL) 6243. This project will extend the mine life to 2044 and will include development of additional supporting infrastructure and continued use of existing infrastructure.

The addition of the coal resources in ELA6442 in conjunction with ELA 6443 could provide the option for the Narrabri Mine to become a dual longwall operation, thereby increasing production from current levels, in the future.

The market interest notification was gazetted on Friday 8th April. This process allows the NSW government to consider if there is sufficient interest from other potential applicants to justify a competitive selection process for the grant of an exploration licence over the application area. The market interest period ended on the 16th of May 2022 and no expressions of interest were submitted.

ELA6442 is within the larger resource area ‘Gorman North’ (Figure 3) which could only be potentially extracted if it were released by the NSW Government under the Strategic Release Framework for Coal and Petroleum Exploration. The Gorman North area is however, unlikely to be commercially viable as a standalone resource, so the allocation of ELA6442 out of the larger Gorman North area would certainly reduce the available coal resource rendering the remaining resources in the Gorman North area unviable to develop as a standalone operation.

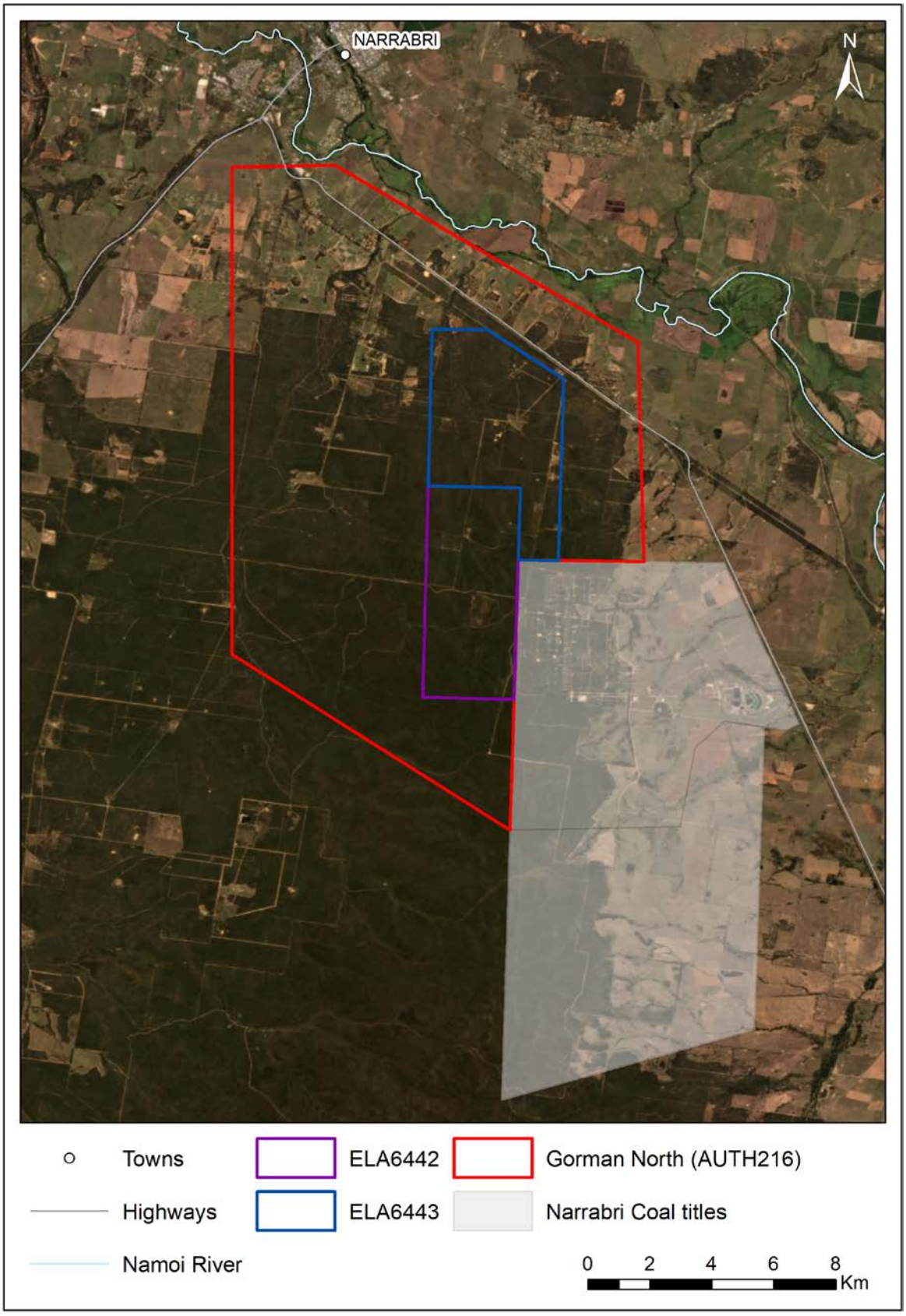

Figure 2. Larger Gorman North resource area (AUTH216).

Has the applicant demonstrated how an allocation will improve a mine design proposal? Provide details as to how/why. Examples of a better mine design could include, but are not limited to: • Any factor that either maintains current productivity or maximizes production from their existing authorities. • For U/G mines – it relates to (ROM) tonnes per person year. • For O/C mines – measure (ROM) tonnes and total material moved (overburden) • A design that decreases Free on Board (FOB) cash costs. • A design that increases the life of the mine. • A design that increases the tonnes per year. *7.1(b) Guidelines for coal exploration licence applications for operational allocation purposes*	YES

The applicant has demonstrated that an allocation would provide opportunities to increase the life of the Narrabri mine and the forecast production. The effect of an allocation on Free on Board (FOB) cash costs is unclear.

Background

The Narrabri Mine has been in operation since 2011 and since that time it has been one of the highest producing longwall mines in NSW. In 2019-20 and 2020-21 it accounted for 2-3 per cent of NSW's saleable production of thermal coal.

Analysis of the applicant's proposed mine design improvements relates to both ELA6442 (the application against ML1609) and ELA6443 (the application against EL6243) as per Figure 4.

The applicant proposes extending the existing development headings to the west to provide earliest access to the coal resources within ELA6442. After extraction of five longwalls in ELA6442 a set of development headings would be extended to the north to gain access to coal resources within the northern part of ELA6442 and the southern part of ELA6443.

The applicant is also exploring the possibility of developing the Stage 3 Extension area within EL6432. That application was approved by the Independent Planning Commission on 1 April 2022. The staging of the development of ELA6442 and ELA6443, and the Stage 3 Extension Area within EL6432, will provide the opportunity to deliver a better mine design for the Narrabri mine overall and maximise coal recovery.

Impact on production and productivity from existing authorities

Allocating EL6442 and EL6443 would have no impact on production and productivity from the applicant's existing authorities (ML1609).

Impact on Free on Board (FOB) cash costs

MEG are of the opinion that the proposed mine design is efficient as capital and depreciation costs from existing infrastructure, and from other common fixed infrastructure (e.g. CHPP, rail, water management) at the Narrabri Mine, could be defrayed over a longer operating life, thereby reducing Free on Board (FOB) cash costs per tonne.

However, the Narrabri Mine has low FOB cash costs per tonne and is competitive with other low cost NSW underground export thermal mines so the potential for significant cost

reductions is limited. The coal quality and geological conditions in ELA6442 and ELA6443 will however be factors in the impact on the current FOB cash costs.

Impact on life of mine

The applicant has estimated that the development of ELA6442 and ELA6443 would add around 15 years to the life of mine and 127 Mt of ROM coal at an average production rate of 8Mt a year. Based on GSNSW's estimate of the total in-situ resource for ELA6442 and ELA6443, the applicants estimate is reasonable. The applicant has not split the total ROM tonnage between the two ELA areas.

The Stage 3 Extension Project (separate to this application) within EL6243 was approved by the Independent Planning Commission on 1 April 2022. There is a current mining lease application (MLA 612) and it is likely that a new Mining Lease will be granted in relation to the Stage 3 Extension Project (as there is now a valid development consent) and this would extend the Narrabri Mine life by approximately 20 years, with 107Mt of ROM coal extracted at an average rate of 5.4 Mt a year.

The Narrabri Mine (within ML1609) would cease operations in around 2031, due to the mine exhausting all available mineable reserves without the extraction of new resource in the areas of ELA6442, ELA6443 and the Stage 3 Extension Project within EL6243.

How the applicant may schedule mining beyond that in ML1609, if ELA6224 and ELA6443 are granted, in conjunction with the Stage 3 Extension area within EL6243 will depend on the results of significant amounts of additional exploration drilling, the results and market conditions.

Figure 4. Conceptual mine plan for ELA6442 and ELA6443 showing proposed extension of longwalls from the Narrabri Mine (supplied by the applicant).

Impact on tonnes produced per year

Production from the Narrabri mine has averaged 6Mt a year since 2011. Average production from ELA6442 and ELA6443 is expected to be 8Mt a year but, this would depend on actual mining conditions.

Impact on Jobs

The Narrabri Mine supports around 400 direct mine-site jobs and these jobs would be maintained with the development of ELA6442 and ELA6443.

Impact on Royalties

Total estimated royalty over the life of coal production from ELA6442 and ELA6443 is around $700 million (current dollars), total estimated export revenue is around A$10 billion (current dollars). These calculations are based on a conservative view of future coal prices of A$85 per tonne. These calculations are based on a total product tonnage of around 120 Mt (total ROM tonnage of 127 Mt with a 95% yield) over the life of the ELA6442 and ELA6443 areas and an average royalty rate of 7%. These dollar values are current dollars only, an NPV calculation has not been completed due to the uncertainty relating to any commencement date of production within the ELA areas.

Has the applicant demonstrated how an allocation will extend the life of mine? Provide details as to how/why.	YES

7.1(b) Guidelines for coal exploration licence applications for operational allocation purposes	
Development of ELA6442 and ELA6443 by the applicant would extend the mine life of the existing Narrabri Mine by approximately 15 years. See previous section for more details.	

3.Additional factors to be considered

The quantity of coal reserves associated with adjoining and/or proximate authorities (jointly) held by the applicant(s). *7.4(a) Guidelines for coal exploration licence applications for operational allocation purposes*
Total Joint Ore Reserves Committee (JORC) coal reserves on adjoining and proximate authorities (ML1609 and EL6243) held by the applicant as at August 2020 are 212 Mt of Marketable Reserves (Proven and Probable).

For applications relating to mining lease/s, remaining production period of the existing mine. *7.4(b) Guidelines for coal exploration licence applications for operational allocation purposes*
Mining at the current Narrabri Mine (ML1609) is scheduled to finish in 2031 based on extraction of around 55 Mt ROM coal at an average rate of 6Mt a year.
Likely time frames for exploration, assessment and mine planning, including proposed time frame for a planning development application to develop the operational exploration licence area. *7.4(c) Guidelines for coal exploration licence applications for operational allocation purposes*
In their submission, the applicant details the normal steps in the approvals process for the mine to progress to operations in the ELA areas but was not specific regarding timeframes. Based on previous timeframes for a coal Exploration Licence to proceed to a Mining Lease this would be a minimum of five years but more likely will take approximately ten years. However, the applicant may decide to develop the Stage 3 Extension area within EL6432 instead of, or before developing ELA6442 and ELA6443.
Is the applicant is taking reasonable steps to move to production or maximise production from their existing authorities. *7.4(d) Guidelines for coal exploration licence applications for operational allocation purposes*
Consistently high production from the Narrabri mine since it commenced production provides an indication that the mine is maximising its production.

Approval

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Approved by	Signature	Date
Assessing Officer: Bryan Whitlock Senior Mineral Economist – Resource Economics	Approved in CM9 From page 8	24/05/2022
Approving Officer: Anton Wood Manager – Resource Economics	Approved in CM9 From page 8	24/05/2022
Assessing Officer: Gwen Stefani Senior Geologist - Coal Resource Assessment	Approved in CM9	19/05/2022
Approving Officer: Erin Holmes Manager - Mining and Exploration Assessment	Approved in CM9	23/05/2022
Approving Officer: Kevin Ruming Director – Assessment and Advice	Approved in CM9	30/05/2022
Approving Officer: Julie Robertson Director - Performance	Approved in CM9 From page 8	27/05/2022

Mining and Exploration Assessment (MEA) Advice
Exploration Licence Application

Mining Exploration and Geoscience

ELA6442

TMS Reference	APP-2022-30
Applicant	Narrabri Coal Pty Ltd, Narrabri Coal Australia Pty Ltd, Upper Horn Investments (Australia) Pty Ltd, J-Power Australia Pty Ltd, Posco Onternational Pty Ltd, Kores Narrabri Pty Ltd
Mineral Group(s)	Group 9 - Coal
Sought Term	6 years
Sought Area	1,744.55 ha
Location	Figure 2 and Figure 3

MEA recommendation

- The Geological Survey supports the grant of ELA6442.
- The Geological Survey recommends the grant of ELA6442 for 6 years and for 1,744.55 hectares.
- The proposed work program meets the work program Minimum Standards.
- The technical manager meets the technical capability Minimum Standards.
- Recovery of public money may be required. Resource Assessment (GSNSW Assessment and Advice) to provide further advice on amount of money recoverable.

Endorsement

	Name and position	Date
Assessing Officer	Paige Kennedy, Geoscientist - MEA	23/03/2022
Approving Officer	Erin Holmes, Manager - MEA	24/03/2022

Mining and Exploration Assessment (MEA) Advice
Exploration Licence Application

Mining Exploration and Geoscience

Key reasons

Assessment summary

Assessing officer

Whitehaven Coal are applying for two operational allocation areas (ELA6442 and ELA6443) to the North West of their current Narrabri Mine (ML1609 and EL6243). The company is seeking these Licences to determine the possibility of extending their existing underground Narrabri Mine into these areas.

Based upon information gained from Narrabri Mine it is likely that the currently mined Hoskissons coal seam will extend throughout the proposed exploration area. A series of existing boreholes drilled by the department of mineral resources throughout the proposed exploration area also shows that the seam appears to continue throughout the proposed areas.

The proposed work program is geoscientifically and technically appropriate to the targeted commodity, exploration rationale and nominated exploration stage/s, and clearly describes the objectives, rationale and intended outcome of the activities proposed.

The nominated technical manager is a Member of a recognised relevant professional organisation and has a tertiary degree related to the geosciences.

The Geological Survey supports grant for the full term and area sought.

Recovery of public money may be required. Resource Assessment (GSNSW Assessment and Advice) to provide further advice on amount of money recoverable.

Approving officer

The approving officer supports the assessing officer's recommendation.

The application is supported by Mining and Exploration Assessment on the basis of the work program and technical manager meeting Minimum Standards.

Resource Assessment (GSNSW Assessment and Advice) to provide further advice on the application against the Operation Allocation Framework with regards to section 7 of the Guidelines for coal exploration licence applications for operational allocation purposes.

Geological context

ELA6442 is located in the northern part of the Gunnedah Basin in the Gunnedah Coalfield. Coal is contained in the Late Permian Blackjack Group which consists of the Melvilles seam, the Hoskissons seam and the Caroona seam. Due to the thickness, quality, and depth of cover, only the Hoskissons seam is considered economic.

The Hoskissons Coal in ML1609 is generally between 6 and 12 metres thick at depths of 120 to 350 metres beneath the surface. The mine is extracting the lower ply of the Hoskissons seam to produce a high energy export thermal coal and a low ash, low sulphur, low phosphorus, mid volatile PCI coal.

Mining and Exploration Assessment (MEA) Advice
Exploration Licence Application

Mining Exploration and Geoscience

Proposed work program

	Requirement	Criteria met	Details
1	The work program describes geoscientifically appropriate exploration rationale, objectives.	Yes	
2	The work program nominates the exploration stage/s to be worked through over the renewal term, and provides timing and estimated expenditure.	Yes	Figure 1

Stages of exploration (indicate all years where activities of any stage are proposed)

Indicative progress	Stage 1 Reconnaissance	Stage 2 Target definition	Stage 3 Prospect testing	Stage 4 Advanced prospect testing	Stage 5 Resource definition
Year 1	☒	☐	☐	☐	☐
Year 2	☒	☐	☐	☐	☐
Year 3	☐	☒	☒	☐	☐
Year 4	☐	☒	☒	☐	☐
Year 5	☐	☐	☐	☒	☐
Year 6	☐	☐	☐	☒	☐

Proposed estimated expenditure for the term (inclusive of exploration, environmental and community activities)	$ 1.0m

Figure 1 Exploration stages and expenditure as nominated in proposed work program

3	The work program describes the nature and extent of proposed exploration activities to be carried out.	Yes	Stage 1: Desktop review of all data in project area, create exploration program and apply for environmental approvals and begin landholder access agreements. Stage 2: Round 1 drilling – widely spaced to gain initial understanding of any potential deposit. Stage 3: Testing of coal extracted from stage 2. Stage 4: Review of Stage 2/3 data to develop a more targeted exploration program and apply for environmental approvals.

Mining and Exploration Assessment (MEA) Advice
Exploration Licence Application

Mining Exploration and Geoscience

Project status

Project status is sought. Project status meets the criteria for consideration for project status as per the Minimum Standards.

Project name: Narrabri North West

Authorities included in project: ELA6442, ELA6443, ML1609 and EL6243

Requirement		Criteria met	Details
1	The work program clearly identifies any other authorities, including MLs, operating in conjunction with the authority as part of a project.	Yes	
2	The work program clearly identifies the geoscientific, spatial and proprietary justification for the project grouping.	Yes	
3	The work program clearly identifies how the proposed work for this licence relates to the schedule of work across the broader project area.	Yes	
4	Project status meets criteria for consideration as per Minimum Standards.	Yes	Same group of minerals. Same geological province. Same mineralisation style. Operated by a common entity/JV. Located within 50 km of one another.

Project work program considerations

Requirement		Criteria met	Details
1	Does the work program satisfy the requirement that all authorities (individually) within the project will demonstrate tangible and authentic progress during the term of the authority?	Yes	
2	Does the work program propose limited exploration activity for a nominated period based on inclusion in a project?	No	
3	Are any of the considerations met to justify acceptance of limited exploration activities for a nominated period on an authority within a project?	N/A	Limited activities are not proposed based on project status.

Technical manager

Requirement		Details
Technical manager name.		3(a) of the Table attached to S.14
1	Professional organisation membership number.	3(a) of the Table attached to S.14 3(a) of the Table attached
2	Geoscience degree information.	BSc (Geology)
1	The technical manager has previously been assessed as meeting Minimum Standards.	Yes
Technical manager acceptance is confirmed.		Yes

Maps

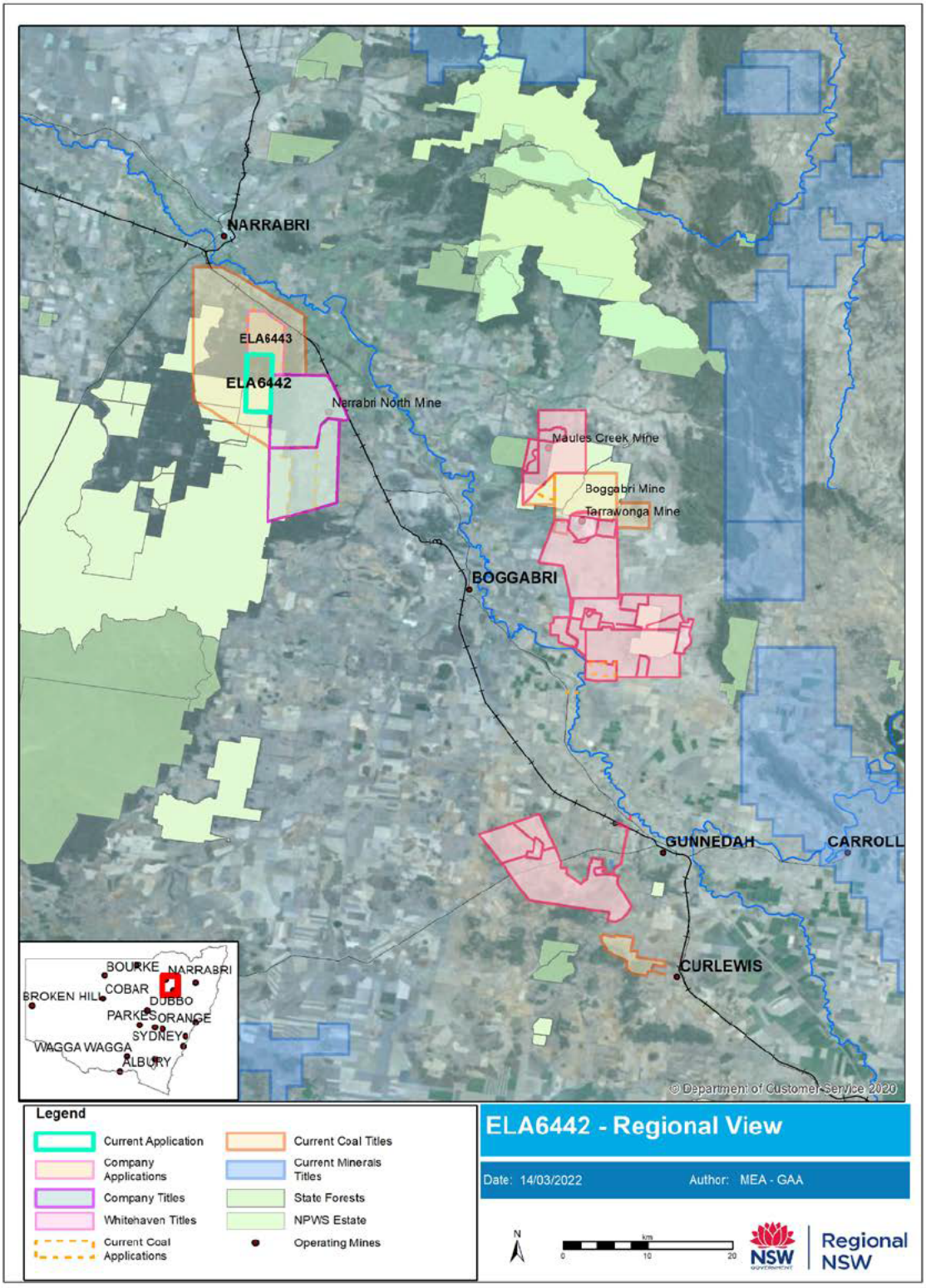

Figure 2 Regional map

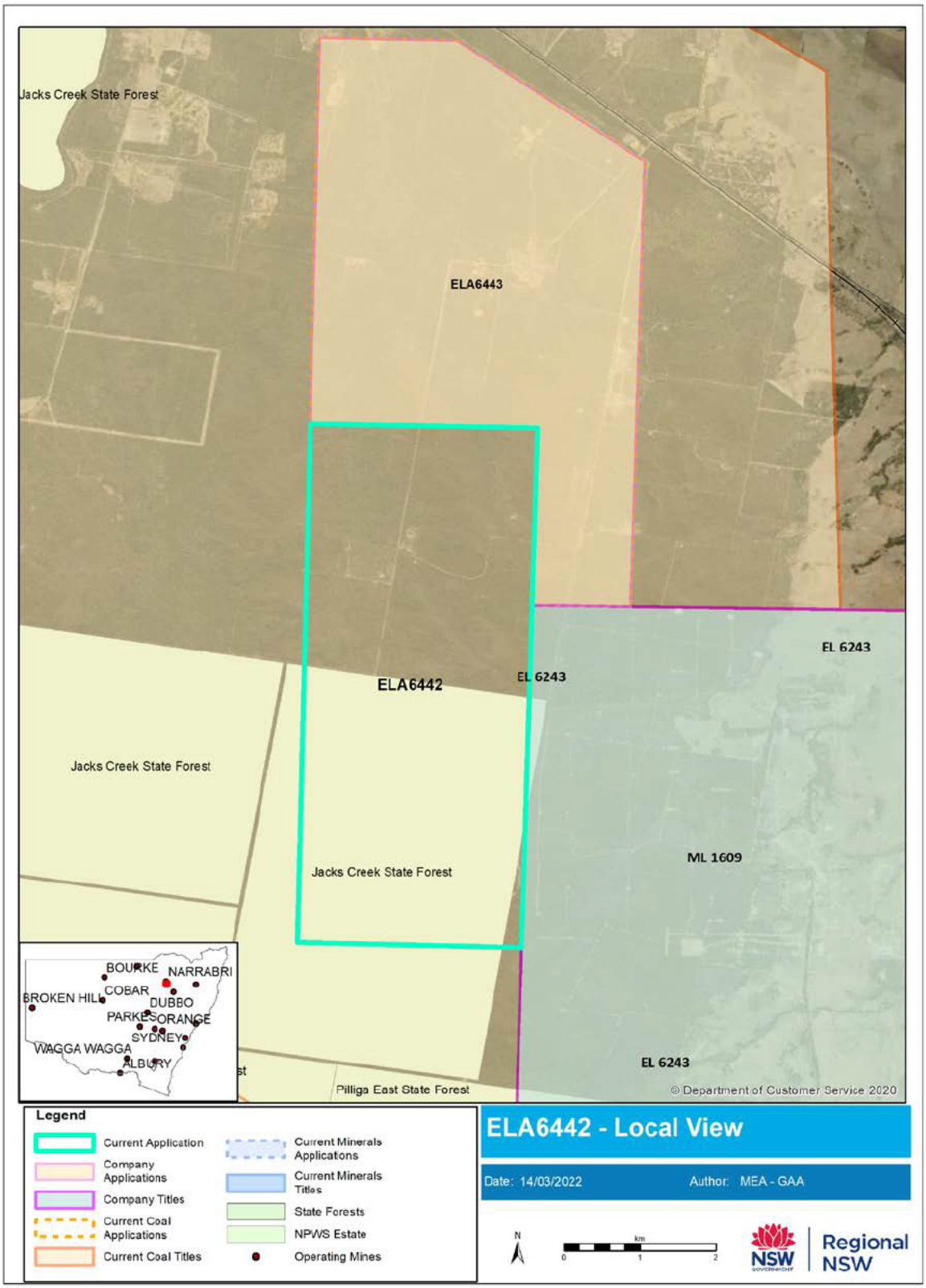

Figure 3 Local map