



Boggabri Coal Mine Modification 8

Increase in Depth of Mining

State Significant Development Modification Assessment
(MP09_0182 MOD 8)

December 2023



Published by the NSW Department of Planning and Environment

dpie.nsw.gov.au

Title: Boggabri Coal Mine Modification 8

Subtitle: Increase in Depth of Mining

Cover image: *Boggabri Coal Mine (Source: Boggabri Coal Pty Limited)*

© State of New South Wales through Department of Planning and Environment 2023. You may copy, distribute, display, download and otherwise freely deal with this publication for any purpose, provided that you attribute the Department of Planning and Environment as the owner. However, you must obtain permission if you wish to charge others for access to the publication (other than at cost); include the publication in advertising or a product for sale; modify the publication; or republish the publication on a website. You may freely link to the publication on a departmental website.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (December 2023) and may not be accurate, current or complete. The State of New South Wales (including the NSW Department of Planning and Environment), the author and the publisher take no responsibility, and will accept no liability, for the accuracy, currency, reliability or correctness of any information included in the document (including material provided by third parties). Readers should make their own inquiries and rely on their own advice when making decisions related to material contained in this publication.

Executive Summary

Boggabri Coal Operations Pty Ltd (Boggabri Coal) operates the Boggabri Coal Mine (the project), an open cut coal mine located approximately 15 kilometres (km) north-east of Boggabri in the Narrabri local government area. The Maules Creek and Tarrawonga coal mines, both operated by subsidiaries of Whitehaven Coal Ltd, adjoin the project. The three mines are referred to as the BTM complex.

Mining occurs at the project under a development consented granted in 2012 by the former Planning and Assessment Commission of NSW. That consent allows Boggabri Coal to extract up to 8.6 million tonnes per annum (Mtpa) of Run of Mine (ROM) coal, with a total resource of 145 million tonnes (Mt) of ROM coal until December 2033.

Modification Description

Boggabri Coal is seeking to modify the development consent to allow it to extend the project life by three years until December 2036 and to extract an additional 28.1 Mt of ROM coal (around a 19% increase in overall coal extracted). The coal would be extracted from deeper coal seams rather than extending the mine footprint – that is there would be no increase in the surface disturbance area of the mine. There would also be no change to the production rate. Boggabri Coal is also seeking to remove or modify some prescriptive noise conditions for the site on the basis that the site should be regulated based on meeting the noise limits at receivers.

Statutory Context

The modification application was lodged under Section 4.55(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and was formally amended twice during the assessment process. The first amendment primarily involved a reduction in the amount of additional coal proposed to be extracted (from 61.5 Mt to 28.1 Mt) and a reduction in the proposed mine life extension to 3 years instead of six years. The second amendment involved removing a proposed fauna bridge over the haul road.

The Minister for Planning and Public Spaces (the Minister) is the consent authority for the modification application. However, under the Minister's delegation dated 26 April 2021, the Deputy Secretary, Development Assessment, may determine the application because there were more than 50 submissions objecting to the proposal.

The modified project would also require approval from the Commonwealth government as it has been determined to be a "controlled action" under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) because of potential impacts on water resources. The Department has undertaken the impact assessment on behalf of the Commonwealth government in accordance with the bilateral agreement between the Commonwealth and NSW governments.

Engagement

The Department exhibited the original modification report on its website for 29 days in 2021 and the first amendment report for 49 days from December 2022 to late January 2023. The second amendment was not exhibited.

The Department received a combined total of 65 submissions during the two exhibition periods. The majority of these submissions objected to the modification. The key concerns raised related to impacts on water resources and greenhouse gas (GHG) emissions.

Assessment

The Department considers the key assessment issues for the modification are the potential increase in impacts on water resources due to mining deeper coal seams, increase in GHG emissions through the extraction of additional coal, and noise due to an increase in mobile fleet numbers and the request to modify the noise conditions. The Department has considered these and other potential impacts and considered the social and economic benefits from the continued employment of the mine workforce and ongoing payments of royalties and taxes.

The Department has also considered advice from relevant NSW Government agencies, Narrabri and Gunnedah Shire councils, and sought advice from the *Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development* (IESC), the Independent Expert Panel for Mining, and from an independent expert on the groundwater assessment.

Water Resources

Concerns about impacts on water resources were raised in many of the submissions. The Department considers the key water resource issues include:

- potential groundwater drawdown impacts on surrounding receivers and groundwater dependent ecosystems (GDEs);
- water quality impacts associated with the final landform; and
- site water balance considerations, including water licensing.

The modelled pit groundwater inflows due to the approved project range up to 324 ML/y compared to the modified open cut operations up to 583 ML/y, with an average increase of 64.5 ML each year. Boggabri Coal has sufficient groundwater entitlement for this increased take of water.

As a result of targeting the deeper seams and consequent increased groundwater inflow, drawdown in all coal seams would increase. However, only one privately owned bore, located in the hard rock aquifer associated with the coal seams, is predicted to be impacted in excess of the minimal impact requirements of the NSW Government's *Aquifer Interference Policy* (AIP).

This bore is already predicted to be impacted from the approved mining of the BTM Complex mines. A bore census undertaken by Boggabri Coal showed that the bore was within interburden (to a depth of around 36 metres) and that therefore the predicted impact is considered conservative as it is based on drawdown within underlying coal seams.

The existing 'make good' provisions would continue to apply if there were to be a significant reduction in available water supply at this bore. Boggabri Coal proposes to monitor groundwater levels at this bore location to ensure that make good provisions be applied if there is more than a negligible impact on this bore's water supply.

There are no privately owned water supply bores located in the higher productive Namoi alluvium that are predicted to exceed the minimal impact consideration of the AIP.

In relation to GDEs, the *Poplar Box Grassy Woodland on Alluvial Plains*, a threatened ecological community listed under the EPBC Act, may rely partly on groundwater associated with the Nagero Creek alluvium. However, no significant impacts on the woodland are predicted as the incremental drawdown caused by the project would increase by a maximum of 0.3 metres (m). Further, Boggabri Coal has committed to installing four additional groundwater monitoring bores in the Nagero Creek

alluvium to monitor potential changes during mining operations, along with additional terrestrial GDE monitoring sites along Nagero Creek to monitor change in vegetation condition, including specifically targeting tree canopy health. Boggabri Coal would be required to update its Water Management Plan to reflect these commitments.

Surface water impacts would continue to be managed by the existing water management system, which would have sufficient capacity to accommodate the proposed mine plan changes associated with the modification. Clean and contaminated water would continue to be separated and managed in sediment dams and mine water storages where relevant.

The modification would not change the overall catchment area and disturbance areas would be restricted to within the approved footprint. No changes are expected to the downstream surface flow and flooding regimes, except due to extending mining out to 2036.

Discharges from the site would continue to be regulated by the EPA through the environment protection licence (EPL). Boggabri Coal has committed to implementing additional monitoring points, expanded water quality analysis to cover metals and metalloids, also noting that water quality discharge criteria are already established through the mine's EPL.

Boggabri Coal is required to revise and update its water management plan, including the site water balance, and the Department has included the EPA as a consultee. Boggabri Coal is also required to report on its annual direct and indirect water take in the Annual Review and for the results of this review to confirm impact predictions and assist with its compliance with the *Water Management Act 2000*.

Overall, the Department considers that the modification would not significantly increase impacts on water resources, and that, apart from some additional monitoring and reporting requirements, the conditions remain appropriate to manage potential impacts on water dependent assets.

Greenhouse gas emissions

The Department's Net Zero Emissions Modelling team (NZEM) provided advice about the greenhouse gas (GHG) assessment for the amended modification. NZEM did not identify any significant concerns about the methodology used to estimate emissions, although it requested clarification on underlying assumptions.

Following revisions to incorporate NZEM advice, the total Scope 1 and 2 emissions from the project between 2023 and 2036 is estimated to be around 2.96 Mt of carbon dioxide equivalent (CO₂-^e), which is 0.86 Mt CO₂-^e more than what the approved mine would produce over this period. This is an average of around 0.23 Mt CO₂-^e per year. This represents about 0.06% of Australia's emissions and 0.21% of NSW's annual emissions, based on 2020 reported total GHG emissions.

The emissions are mainly associated with the use of diesel at the mine with fugitive emissions from the mine of minor contribution due to low gas and methane content, estimated to be around 0.00077 t CO₂-^e / t ROM coal. The overall average Scope 1 emissions intensity is around 0.027 t CO₂-^e / t ROM coal.

The existing conditions require that Boggabri Coal minimise GHG emissions and implement an Air Quality and Greenhouse Gas Management Plan. The management and minimisation of GHG emissions would be further strengthened through the regulatory changes being implemented by the EPA through its Climate Change Action Plan and the Commonwealth Government through the Safeguard Mechanism reforms.

Boggabri Coal has proposed measures to reduce Scope 1 and 2 emissions, including by reducing diesel usage, regular maintenance of fleet and equipment, maximising energy efficiency, and using alternative fuels such as biofuels, hydrogen and solar. The Department sought advice on the GHG emissions from the Independent Expert Advisory Panel for Mining, which noted that opportunities to mitigate GHG emissions in open cut mining are limited, but recommended conditions requiring further research and development of mitigation options.

The Department has considered the increase in GHG emissions in the context of NSW and Commonwealth policies and guidelines, including the Net Zero Implementation Plan targets and the recently gazetted *Climate Change (Net Zero Future) Act 2023*. The Department notes the advice from NZEM that the predicted GHG emissions from the modification are already included in the forecast modelling against these targets. The Department considers that the modification is consistent with current NSW and Commonwealth policy settings in regard to GHG emissions.

Noise

The updated noise modelling predicts four privately owned properties would experience noise levels exceeding 35 dB(A), the project noise trigger level (PNTL) identified under the *Noise Policy for Industry (NPfI)*. Three of these receivers currently have acquisition and mitigation rights on request as the original decision on the project the Planning Assessment Commission imposed acquisition rights for any receivers where noise levels were predicted to exceed 35 dB(A). This decision was prior to the introduction of the *Voluntary Land Acquisition and Mitigation Policy (VLAMP)*.

Under contemporary noise policy settings, mitigation rights would only apply to one receiver with a prediction of up to 39 dB(A) during the night time period under adverse meteorological conditions, with two of these receivers predicted to receive a negligible impact of no more than 1 dB(A) above the PNTL. However, in acknowledgement of the reasons of the original decision maker, the Department recommends that the existing mitigation and acquisition conditions continue to apply for these three receivers.

The remaining residence was constructed after the original determination of the project and the consent makes it clear that the noise acquisition and mitigation conditions would only apply to existing dwellings. The noise modelling predicts a negligible 1 dB(A) exceedance during the night time period and the Department has recommended that this predicted night time noise level be applied at this receiver. All other receivers are predicted to meet the PNTL of 35dB(A).

To manage noise levels, the Planning Assessment Commission included a condition requiring new trucks to be noise attenuated and sound power levels on all equipment are equal to or lower than the sound power levels identified in the original environmental assessment for the project. The conditions also require annual testing of the attenuated plant to ensure the attenuation remains effective.

Boggabri Coal requested that these requirements be removed on the basis that there are other reasonable and feasible noise mitigation and management measures that can be applied to ensure compliance with the noise limits set at residences.

The company has been operating in accordance with an approved noise management plan that details these measures, and to date the company has complied with the noise limits set at residences. The EPA in its advice supported the removal of these conditions, as they would be regulating the site based on compliance against receiver noise limits, not the regulation of on-site sound power levels.

The Department agrees that limiting sound power levels of individual noise sources is not the only way to achieve compliance with noise limits and may not be the most reasonable or cost effective measure. The Department also notes that contemporary mining consents do not stipulate the methods to be employed to achieve compliance with the conditions, but rather set the performance standards and rely on the mining company to ensure it complies with those standards.

Nonetheless, Boggabri Coal has advised that all new fleet has been fitted with noise attenuation/suppression and that trials on additional noise attenuation on its Komatsu trucks is ongoing. On this basis, while the Department recommends the removal of specific sound power levels for plant and equipment, it also recommends that Boggabri Coal apply reasonable and feasible noise attenuation for its fleet to minimise noise and ensure that annual testing of plant and equipment continues to be applied.

The proposed modification would not significantly change the predicted noise impacts of the project, noting that the production rate would remain the same, with the proposal to mine deeper coal seams rather than expand into new surface mining areas. The Department considers the existing conditions largely remain fit for purpose and can ensure ongoing compliance with noise limits at private receivers around the mine site.

Economics

The economics analysis indicates that the modification would generate royalty payments and taxes to NSW of around \$111 Million (M) and \$21 M respectively. After accounting for direct environmental and social costs, the modification is expected to have net social benefits to NSW of around \$131 M, and to Australia of \$177 M.

The net social benefits were calculated after accounting for social costs, including global damage costs associated with the GHG emissions from the project. The economic evaluation apportioned the NSW share of the global damage cost based on the State's share of the global population. Based on this estimate, Scope 1 and 2 costs to NSW are estimated at \$0.02 M, which is considerably less than the estimated net production benefits from the modification.

Some economists argue that the full costs of GHG emissions should be attributed to the project and the Department requested further analysis on that basis. Even if the incremental costs of Scope 1 and Scope 2 GHG emissions (estimated at \$24 M), are fully attributed to the project, the modification would still have a net social benefit to NSW of ~\$107 M.

The modification would maintain direct employment for around 740 full time equivalent (FTE) workers for a further three years, noting also that there would be an increase in the peak workforce of around 169 personnel compared to the existing operational workforce. Currently around 61% of the workforce reside in the Narrabri or Gunnedah local government areas, increasing to around 77% of the workforce including workers residing in the Tamworth Regional Council area.

Other issues

The Department has carefully considered the potential impacts of the modification on a range of other issues including air quality, visual and lighting, heritage and biodiversity, traffic and social impacts, rehabilitation and final landform. The Department considers that the existing conditions remain appropriate to manage any incremental impacts associated the modification, with some revisions, such as updating air quality emission limits to reflect contemporary ambient targets for particulate matter.

Evaluation

The Department has carried out a detailed assessment of the merits of the modification, in accordance with the relevant requirements of the EP&A Act. The Department has taken into consideration the issues raised in public submissions, government agency advice and advice provided by the IESC, and the Department's independent expert.

The Department acknowledges the public interest in the modification and the community concerns raised, including impacts on water resources and GHG emissions.

The Department considers that the project (incorporating the modification) would not result in significant impacts to groundwater resources, subject to implementation of the mitigation measures proposed by Boggabri Coal.

The Department has considered the increase in GHG emissions associated with the modification (namely due to the use of diesel). Boggabri Coal has proposed a series of measures to reduce diesel usage and the resultant GHG emissions. NZEM agrees with the proposed measures and supports Boggabri Coal's commitment to conduct regular reviews into the availability and feasibility of low emissions alternatives to diesel equipment.

The modification application was amended to remove the proposed fauna bridge as it was not clear the bridge would result in a net biodiversity gain. Consequently, no additional clearing or ground disturbance would be required, resulting in no additional impacts on biodiversity or Aboriginal and historic heritage.

The modification would provide access to deeper coal seams within the already approved mine disturbance footprint, providing a reasonable balance between recovering a high-quality coal resource of State significance and minimising the potential environmental and social impacts of mining.

The modification would support the intent of the *Strategic Statement on Coal Exploration and Mining in NSW*, supporting the continued benefits that coal production delivers for the State, including an additional three years of employment for the mine workforce and up to an additional \$70 million in royalty estimates.

In summary, the Department considers that the benefits of the modification outweigh its residual costs and that the modification be approved, subject to the recommended amendments to the consent.

Contents

Executive Summary	iii
1 Introduction	1
1.1 Background	1
1.2 Current approval	2
2 Proposed modification	2
3 Statutory context	5
3.1 Scope of modification	5
3.2 Consent authority	5
3.3 Matters for consideration	5
3.4 Objects of the EP&A Act	6
3.5 Commonwealth matters	6
3.6 The reasons for granting consent for the original application	6
4 Engagement	7
4.1 Department’s engagement	7
4.2 Agency advice	7
4.3 Independent expert advice	9
4.4 Public submissions	10
4.5 Submission reports and amendment reports	10
5 Assessment	11
5.1 Water resources	11
5.2 Greenhouse Gas Emissions	21
5.3 Noise	24
5.4 Economic evaluation	28
5.5 Other issues	29
6 Evaluation	34
7 Recommendation	35
8 Determination	36
Appendices	A1
Appendix A – List of referenced documents	A1
Appendix B – Modification amendments	A3
Appendix C – Statutory considerations	A4
Appendix D – Commonwealth assessment	A11
Appendix E – Notice of modification	A14
Appendix F – Consolidated consent	A14

1 Introduction

1.1 Background

The Boggabri Coal Mine (the project) is an open cut coal mine located approximately 15 kilometres (km) north-east of Boggabri (see **Figure 1**) in the Narrabri local government area. Boggabri Coal Operations Pty Ltd (Boggabri Coal) operates the project on behalf of Idemitsu Australia Resources Pty Ltd through its subsidiary company Boggabri Coal Pty Ltd (80%), Chugoku Electric Power Australia Resources Pty Ltd (10%) and NS Boggabri Pty Ltd (10%).

The project forms part of a mining precinct located in and around Leard State Forest, which includes the Maules Creek Coal Mine (Maules Creek) and Tarrawonga Coal Mine (Tarrawonga), both operated by subsidiaries of Whitehaven Coal Ltd. Together the mines are referred to as the BTM complex.

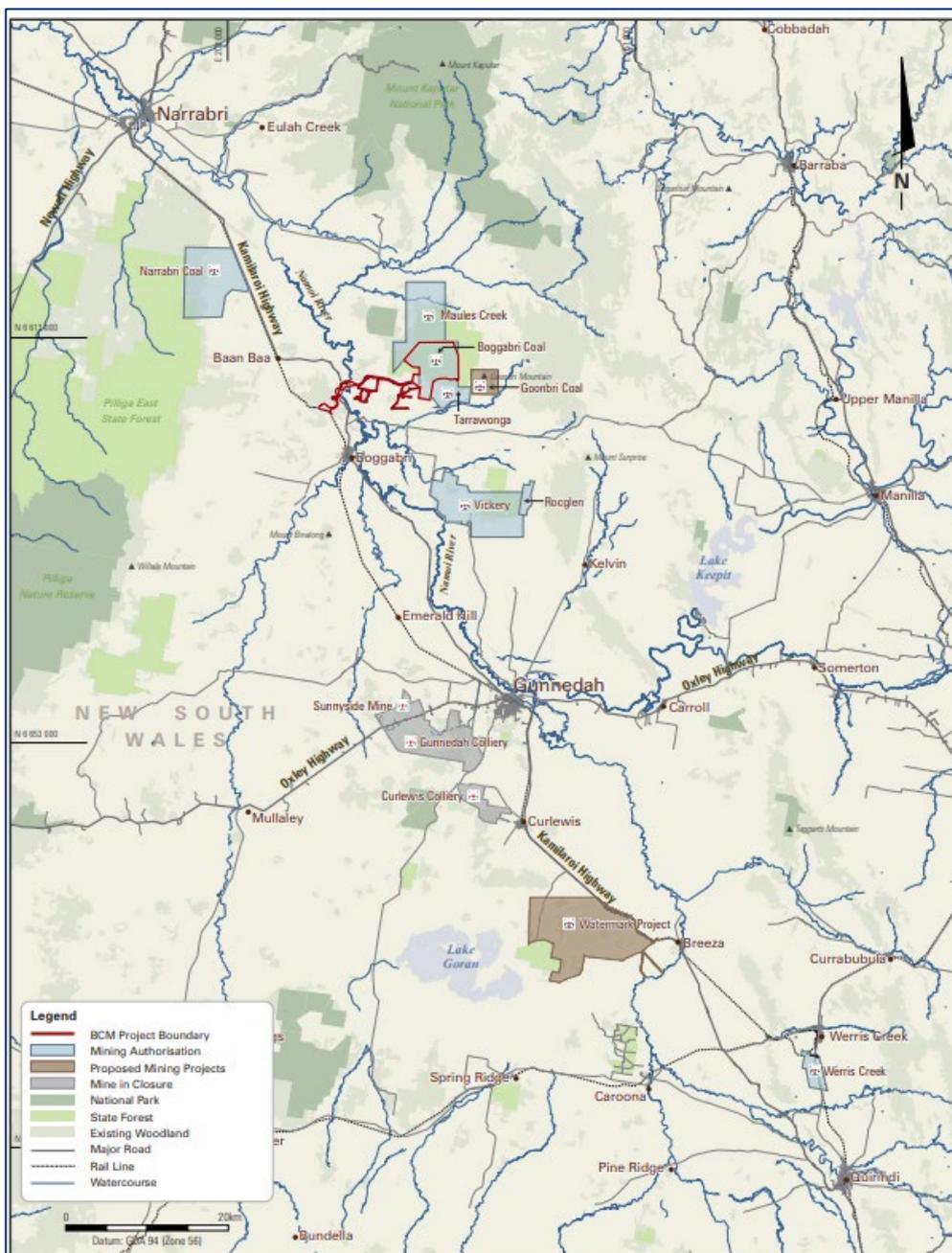


Figure 1 | Regional Context Map

1.2 Current approval

The project was approved on 18 July 2012 by the former Planning and Assessment Commission of NSW and has been modified seven times¹. In summary the approval allows:

- extraction of up to 8.6 million tonnes per annum (Mtpa) of run of mine (ROM) coal by open cut mining methods until December 2033;
- construction and operation of ancillary infrastructure, including a coal handling and preparation plant (CHPP), bypass crusher and associated auxiliary equipment;
- processing up to 4.2 Mtpa of ROM coal onsite; and
- transportation of coal by rail.

2 Proposed modification

The modification involves:

- increasing the maximum depth of the mine to extract coal from deeper coal seams;
- extracting an additional 28.1 million tonnes (Mt) of run of mine (ROM) coal over the life of the mine;
- extending the mine life by three years;
- increasing the final landform height by up to 5 metres (m) to include micro relief features;
- changes to the final landform (see **Figure 2**); and
- removal of conditions limiting the sound power levels of the mining fleet and the meteorological conditions under which noise limits apply.

At the time the modification application was lodged, the proposal involved extending the mine life by six years and extracting an additional 61.5 Mt of coal from the mine. The proposal also involved construction of a fauna bridge over the haul road.

However, Boggabri Coal amended the application on two separate occasions in November 2022 and in March 2023. The first amendment primarily involved a reduction in the amount of additional coal proposed to be extracted (from 61.5 Mt to 28.1 Mt) and a reduction in the proposed mine life extension to 3 years instead of 6 years.

The second amendment involved removing a proposed fauna bridge over the haul road. This was removed in response to concerns that it would not be utilised by fauna and the biodiversity impacts associated with the vegetation clearing required to construct the bridge would potentially outweigh the biodiversity benefits of the bridge.

Based on the amended modification application, there would be no increase in the surface disturbance area of the mine.

The proposed modification is consistent with the intent of the NSW Government's *Strategic Statement on Coal Exploration and Mining in NSW* in that it is a brownfield mine extension within an existing mining precinct.

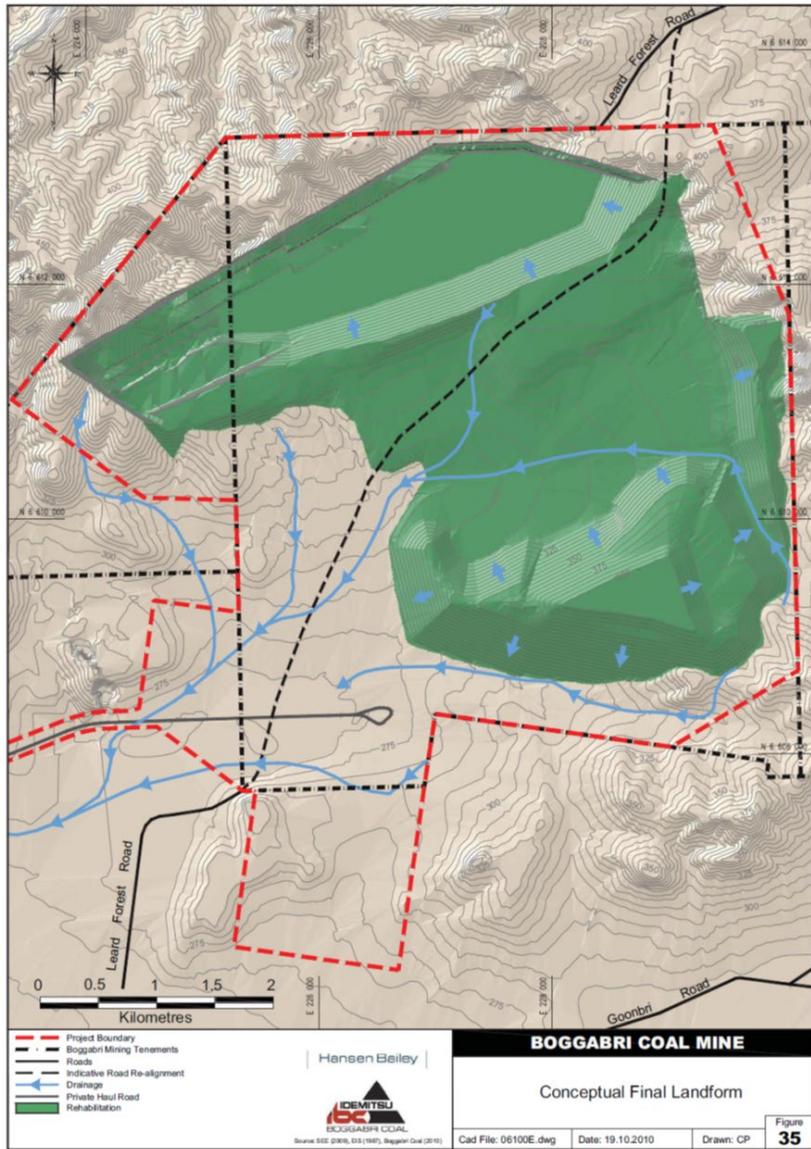
A summary of the proposed modification (as amended) compared to the approved project is outlined in **Table 1** below.

¹ Modification 9 was lodged after Modification 8, but was approved while Modification 8 was under assessment.

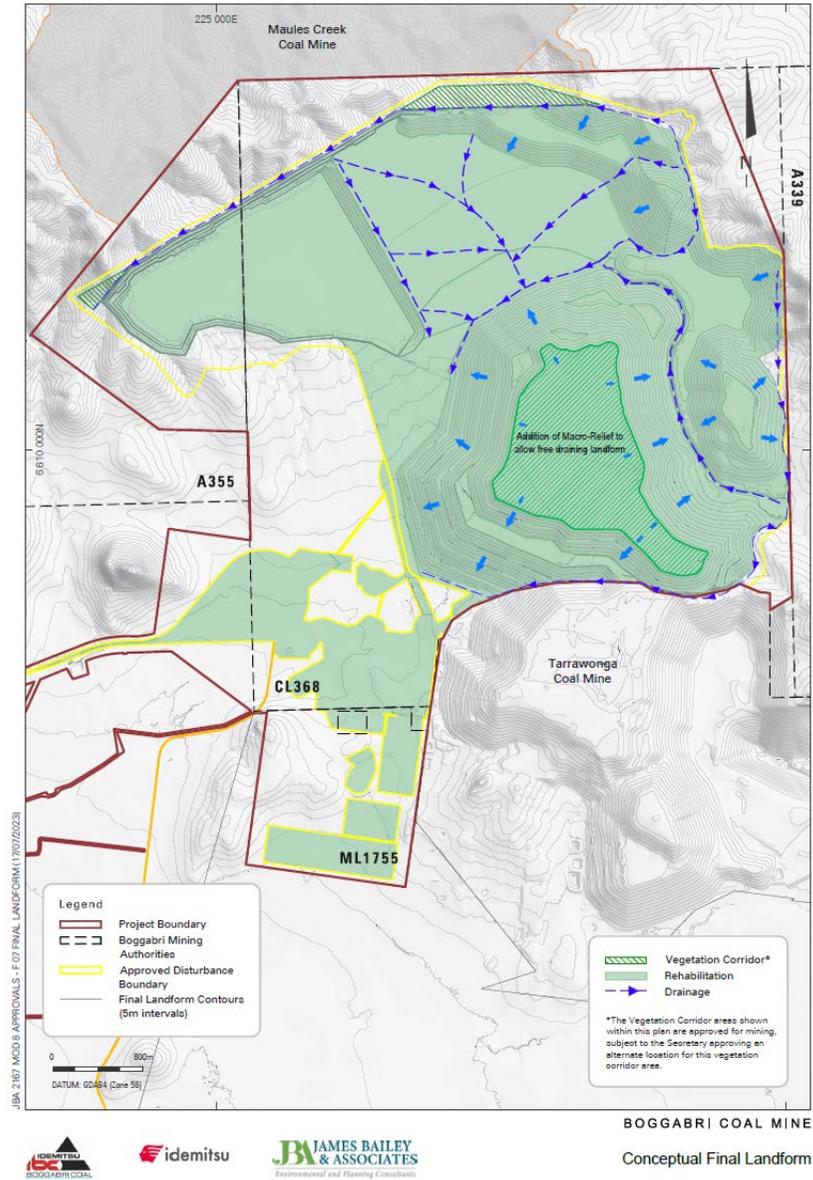
Table 1 | Summary of modification

Aspect	Approved	Proposed
Mining life	2033	2036
Maximum mining depth	180 m (Merriown Coal Seam)	380 m (Templemore Coal Seam)
ROM	145 Mt	173.1 Mt (19% increase)
Coal production	135 Mt	159 Mt (24% increase)
Annual extraction rate	8.6 Mtpa of ROM Coal	No Change
Employment	500 – 762 (FTE) (indicative over the mine life)	740 FTE (average) between 2023 – 2035, with a peak of 876 FTE
Mining method	Open cut using electric shovel, truck and excavator used for overburden, with dragline option.	Dragline option no longer required.
Overburden	59.9 million bank cubic metres (Mbcm) / year (peak)	73.3 Mbcm / year (peak)
Rejects	10 Mt in pit, over life of the project	8.7 Mt in pit (between 2025 – 2036) 17.1 Mt in pit, over life of the project
Water demand	Between 1,110 megalitres/ year (ML/year) to 1,616 ML/year	Between 1,295 ML/year to 1,616 ML/year
Groundwater	Maximum of 537 ML/year (2021)	Maximum of 712 ML/year (2027)
Project disturbance area	2,047 hectares	No change
Final landform	395 m high overburden emplacement area (OEA). Size and depth of the final void minimised and no pit lake. Integrated with the Maules Creek and Tarrawonga mines	400 m high OEA. Size and depth of the final void minimised and no pit lake. Integrated with Tarrawonga mine. Reduced catchment for partially infilled mining void

The modification report and amendment reports are available on the Department's website (see **Appendices A and B**). **Table B.1 of Appendix B** also summarises the amendments to the application.



Approved



Modified

Figure 2 | Approved vs Amended Conceptual Final Landform

3 Statutory context

3.1 Scope of modification

Boggabri Coal was approved under Part 3A of the EP&A Act in July 2012. Under clause 6 of Schedule 2 of the *Environmental Planning and Assessment (Savings, Transitional & Other Provisions) Regulation 2017*, Boggabri Coal was transitioned to State significant development.

The consent authority may modify a consent if it is satisfied that the project as modified would be substantially the same development as approved, including any section 75W modifications that were granted under Part 3A of the EP&A Act.

The Department has considered the scope of the modification and is satisfied that the proposed modification would be substantially the same development as authorised by the consent as last modified under section 75W because:

- there would be no change to the mining method;
- there would be no change to the extraction or processing rate;
- there would be no change to the way waste rock or coal rejects would be handled or the product coal transportation arrangements;
- the key infrastructure would remain largely unchanged and there would be no change to the project disturbance area; and
- the impacts of the development as modified would be overall similar to the impacts of the approved project, acknowledging that these impacts would continue for a longer period, and that there would be an increase in some impacts, such as total greenhouse gas emissions.

Accordingly, the Department considers that the proposed modification is within the scope of section 4.55(2) of the EP&A Act.

3.2 Consent authority

The Minister for Planning and Public Spaces (the Minister) is the consent authority for the modification application under section 4.5(a) of the EP&A Act. However, under the Minister's delegation dated 9 March 2022, the Deputy Secretary, Development Assessment may determine the application. This is because there were more than 50 public objections across both exhibitions (excluding council) and no disclosed reportable political donations by the applicant.

3.3 Matters for consideration

Under Section 4.40 of the EP&A Act, the consent authority is required to consider the matters of relevance set out in section 4.15 of the EP&A Act in its evaluation of a development application. The Department conducted an assessment of the project against the matters for consideration as part of the original assessment of MP09_0182. The Department has also considered the matters as part of its assessment of the modification and concluded that the modification does not result in changes significant enough that they would alter the conclusions of the original assessment in relation to these matters.

Section 5 of this report summarises the Department's consideration of the likely impacts of the modification on the natural and built environments, the social and economic impacts in the locality, and any planning agreements under section 7.4 of the EP&A Act. The Department's assessment also included consideration of submissions.

Appendix C summarises the Department’s consideration of relevant provisions of planning instruments and the public interest, which includes ecologically sustainable development (ESD).

3.4 Objects of the EP&A Act

The objects of the EP&A Act are the underpinning principles for all decision making under the act. They must be considered by the consent authority when determining a development application under the EP&A Act. The Department has assessed the modified project against the objects found in Section 1.3 of the EP&A Act. **Appendix C** summarises how the Department considers that the proposal can be undertaken in a manner that is consistent with these objectives, including ecologically sustainable development (ESD).

3.5 Commonwealth matters

On 28 May 2021, the then Commonwealth Department of Agriculture Water and the Environment (now the Department of Climate Change, Energy, the Environment and Water (DCCEEW) determined that the proposed modification is a ‘controlled action’ (EPBC 2021-8875) under the EPBC Act, due to its potential impacts on water resources from large coal mining developments (sections 24D & 24E). The proposed modification has been assessed under the bilateral agreement with the Commonwealth Government and the Department’s assessment of potential impacts on water resources is provided in **section 6.1** and summary of the assessment on Commonwealth matters in **Appendix D**.

3.6 The reasons for granting consent for the original application

In accordance with section 4.55(3) of the EP&A Act, in determining this modification, the Department has taken into consideration the reasons for the Commission’s original decision on the project. In determining the original Boggabri Coal Project, the Commission concluded that the project had merit subject to the adherence to strict conditions.

4 Engagement

4.1 Department's engagement

The modification report was exhibited on the Department's website from Thursday 12 August 2021 to Thursday 9 September 2021. The Department also publicly exhibited the first amendment report from Wednesday 14 December 2022 to Tuesday 31 January 2023 to allow further opportunity for public input on the amended project given the extent of the changes proposed by Boggabri Coal.

The Department did not exhibit the second amendment report, as that amendment involved a reduction in the scope of the modification and in the environmental impacts.

Summary of submissions

The Department received a total of 65 submissions during the exhibitions of the modification application and the first amendment. Six submitters including two special interest groups, were from the local area², The submissions received during both exhibitions are summarised in **Table 2** below. All submissions received are publicly available on the Department's website (see **Appendix A**).

Table 2 | Summary of public submissions

Application/Amendment	Support	Object	Comment	Total
Modification Application	3	45	1	
Special Interest Groups	1	7	1	49
General Public	2	38	-	
First Amendment	1	14	1	
Special Interest Groups	-	6	1	16
General Public	1	8	-	

4.2 Agency advice

The Department received advice on the modification from eight public authorities. Narrabri Shire Council, Gunnedah Shire Council and Forestry Corporation of NSW also provided comments. Further advice and comments were received on the submissions reports and the first amendment report from some agencies and Narrabri Shire Council.

Table 3 | Summary of agency advice

Agency	Advice
Department of Planning and Environment	
Biodiversity, Conservation and Science Directorate (BCS)	<ul style="list-style-type: none">Requested additional information regarding the fauna bridge and aspects of the biodiversity assessment. However, these matters are no longer relevant as the fauna bridge has been removed from the modification and the amended modification would not change the disturbance area or the biodiversity impacts of the project.

² Boggabri and Maules Creek

Agency	Advice
Crown Lands	<ul style="list-style-type: none"> Noted some minor errors in some figures and names. These were rectified in the submissions report.
DPE Water	<ul style="list-style-type: none"> Initially requested further information on the capture of clean runoff from upstream, quantification of the changes to surface water take, sufficient water entitlement, groundwater modelling, impacts to <i>High Priority Groundwater Ecosystems</i>, and the undertaking of a census of registered bore GW02523. These matters were addressed in the submissions report and a revised assessment of the potential impacts of the MOD 8 Amendment was completed in the surface water impact assessment. Raised subsequent concerns regarding the ability to obtain enough Water Access Licenses (WALs) and requested the full independent review on the application of the numerical groundwater model (version 4.04) be provided. The Department's consideration of the water impacts of the project is detailed in section 5.1.
Net Zero Emissions Modelling (NZEM)	<ul style="list-style-type: none"> NZEM requested further information and clarification regarding the gas content of the working coal seams, likely changes in the fugitive emission factor, the increase in Scope 2 emissions and Boggabri Coal's impact on future operations against NSW emissions. NZEM also noted that Scope 2 and 3 electricity emissions from 2023 to 2036 should be revised using forecasted emission factors from DCCEEW's <i>Australia's Emissions Projections (2022)</i>. These matters were addressed through additional information provided by Boggabri Coal, with NZEM finding the responses and revisions satisfactory. NZEM also agreed with Boggabri Coal's proposal to conduct regular reviews into the availability and feasibility of low emissions alternatives to diesel equipment.
Environment Protection Authority (EPA)	<ul style="list-style-type: none"> Initially requested further information on the noise and blasting and air quality impact assessments, and clarification on the water availability for mitigation measures, clean water catchments and catering for revised operational scenarios. This was provided in the Submissions Report. In its follow up advice, EPA had persisting concerns that the existing water management system would not adequately manage surface water particularly during high rainfall years and periods of flooding and recommended the inclusion of a condition that requires a review of the water management system including the quality of water captured and treated prior to discharge.
Department of Regional NSW	
Mining, Exploration and Geoscience (MEG)	<ul style="list-style-type: none"> MEG considers the modification would be an efficient use of resources and would provide an appropriate economic return to the NSW Government.
Resources Regulator	<ul style="list-style-type: none"> Requested further information on the post-mining final land use(s), final landform design and rehabilitation of the shared boundary with Tarrawonga Mine and asked for a high-definition image of the conceptual final landform figure. This was provided in the submissions report and the resources regulator raised no further concerns, but did request that the figure be included within the development consent.

Agency	Advice
Transport for NSW (TfNSW)	<ul style="list-style-type: none"> Recommended the operational workforce should be limited to 770 employees as a condition of approval, and that the capacity of the Kamilaroi Highway/Rangari Road intersection to accommodate extra traffic accessing the mine should be reviewed TfNSW also advised that the Traffic Management Plans should be revised with emphasis placed on mine commuter traffic. These matters were addressed in the submissions report, which included a revised traffic impact assessment. The Department's consideration of the traffic impacts of the project is detailed in Section 5.2.
Forestry Corporation of NSW	<ul style="list-style-type: none"> Did not raise any concerns.
Councils	
Narrabri Shire Council (NSC)	<ul style="list-style-type: none"> Provided comments in relation to air quality and greenhouse gas, groundwater, surface water, traffic, visual impacts, rehabilitation and soils, biodiversity, Aboriginal and historic heritage, social and economic impact and general commentary. Following its review of the submissions report and amendment report, NSC proved comments on the same matters, primarily in relation to updating the Water Management Plan, Groundwater Management Plan and Social Impact Management Plan in consultation with relevant stakeholders including.
Gunnedah Shire Council (GSC)	<ul style="list-style-type: none"> Raised initial concerns regarding the conditions of consent for the approved coal drag line, impacts to local road networks, ground water, air quality and social and economic impacts. These issues were addressed in the submissions report. GSC also made a request to enter into a VPA with Boggabri Coal.

4.3 Independent expert advice

The Department and the Commonwealth jointly referred the modification report to the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC) for advice on the impacts of the modification on water resources.

The IESC considered that the key potential impacts include: a reduction in flow in ephemeral creeks surrounding the mine (particularly an increase in the number of low and zero flow days); reduced water quality in Nagero Creek from site discharges; and impacts on groundwater-dependent ecosystems (GDEs). The IESC requested additional clarification/ information on these matters. The IESC advice, along with a response from Boggabri Coal (see **Appendix A**) are discussed in **Section 5.1**.

The Department also engaged an independent groundwater expert, Mr. Hugh Middlemiss of Hydrogeologic, to provide advice on the groundwater assessment. Following a response from Boggabri Coal to issues raised during his review, Mr Middlemiss was satisfied the groundwater modelling is consistent with best practice and fit for purpose for informing the groundwater impact assessment, including water licensing and consideration against the *NSW Aquifer Interference Policy (AIP)*.

The Department also sought advice on the GHG emissions from the Independent Expert Advisory Panel for Mining, which noted that opportunities to mitigate GHG emissions in open cut mining are limited, but recommended conditions requiring further research and development of mitigation options.

4.4 Public submissions

The majority of submissions (approximately 90%) received during both exhibitions objected to the modification.

A total of 11 submissions were received from special interest groups across the two exhibitions, including a submission of support from WesTrac NSW, comments from Whitehaven Coal and objections from:

- Knitting Nannas New England Northwest;
- Leard Forest Research Node;
- Lock the Gate Alliance;
- Maules Creek Branch of the Country Women's Association of NSW;
- Maules Creek Community Council Inc;
- National Parks Association of NSW;
- People for the Plains Inc;
- The Australia Institute; and
- Wando Conservation and Cultural Centre Inc

All submissions objecting to the modification raised concerns about GHG emissions. Many of these submissions argue that approving more coal mining would not be consistent with international and Australian targets to reduce GHG emissions and would not represent ecologically sustainable development or result in intergenerational equity.

The potential impacts on water resources was also a key issue raised in many submissions. In this regards, submitters were concerned about impacts on bores and groundwater dependent ecosystems, impacts on surface water, and the illegal take of water by the mine.

Other issues raised in submissions include concerns about agricultural impacts (largely related to water impacts and the final landform) and social and amenity impacts.

The Department's consideration of these matters is summarized in **Section 5** of this report.

Some submissions also raised concerns about the clearing required to construct the fauna bridge. Boggabri Coal has since removed the fauna bridge from the modification and there would be no additional vegetation clearing required for the modification.

4.5 Submission reports and amendment reports

Boggabri Coal responded to agency advice and the matters raised in submissions in two separate submissions reports. All agency advice, submissions and responses to submissions are publicly available on the Department's website (see **Appendix A**).

5 Assessment

The Department has assessed the modification application (as amended) and supporting information in accordance with the relevant requirements of the EP&A Act, including the matters for consideration, as set out in section 4.15(2) of the EP&A Act.

The key assessment issues relate to incremental impacts on water resources, greenhouse gas emissions, noise, along with the economic impacts/ benefits of the proposed modification. Other assessment issues are also considered in **Section 5.6**.

5.1 Water resources

Concerns about impacts on water resources were raised in many of the submissions. The Department considers the key water resource issues include:

- potential groundwater drawdown impacts on surrounding receivers and groundwater dependent ecosystems (GDE);
- water quality impacts associated with the final landform; and
- site water balance considerations, including water licensing.

Groundwater

A groundwater impact assessment was undertaken by Australian Groundwater and Environmental Consultants (AGE) which assessed the incremental and cumulative impacts of the proposed modification on the regional groundwater system.

Groundwater setting

The groundwater system includes two main aquifer systems, comprising:

- highly productive alluvial groundwater within the Upper Namoi Groundwater Source; and
- less productive deeper groundwater within porous hard rock within the Gunnedah Oxley Basin (GOB) Groundwater Source.

The project site is mainly located within the GOB, with only a small area of shallow alluvium associated with Nagero Creek extending towards the southwestern area of the site. Bores within this area of Nagero Creek are on mine owned land and are used for monitoring associated with the mining complex.

Groundwater modelling

The groundwater assessment for the amended project adopted recent updates to the regional groundwater model for the BTM complex mines (BTM Complex Model), also prepared by AGE. The groundwater assessment was peer reviewed for Boggabri Coal by Ms Louisa Rochford, from the Sustainable Minerals Institute of the University of Queensland (SMI). SMI previously provided peer review on the groundwater impact assessment prepared for the modification report.

The IESC sought clarification on modelling parameters and assumptions used for the groundwater modelling undertaken for the modification report including:

- justification and clarification of model boundary conditions;
- consideration of cumulative impacts of mining projects beyond the BTM Complex, particularly with the Vickery coal mine;
- consideration of local faulting in the modelling; and
- surface water groundwater interactions

AGE provided a detailed response to the IESC review comments on groundwater (see **Appendix G** of the submissions report) to justify the modelling parameters and assumptions. AGE also confirmed that cumulative impacts with the Vickery project would be unlikely because the 1 m drawdown contour from the BTM Complex is separated from the 1 m drawdown contour of the Vickery Project by 8.7 km.

AGE also noted that local faulting has resulted in minor displacement only and is widespread within the Maules Creek coal basin and accounted for in the hydraulic properties of the coal seams used in the calibration and validation of the groundwater model. The groundwater monitoring supports the conclusion that these smaller faults are not impeding groundwater flow and the coal seams are acting as continuous features in the areas where localised faults have been mapped.

Further explanation for the interaction between groundwater and the surrounding creeks was also provided, noting that these creeks typically are only recharged by groundwater (gaining stream system) following heavy rainfall where the groundwater level rises above the creek bed. Apart from during these wetter periods, these creeks are losing streams – that is, the groundwater level is usually well below the bed of the creek with no contribution of groundwater baseflow to the creek, and therefore it is predicted there would be no impact on the low flow regime within these surrounding creek systems because of the modification. This is important in that as a consequence of this, there would be unlikely to be impacts from drawdown on aquatic ecology within the surrounding creeks. However, there is the potential for impact on GDEs which is discussed below.

Mr Middlemis considered the advice from the IESC and Boggabri Coal’s response to the issues raised by the IESC, concluding that the response was “reasonable and justified.” However, Mr Middlemis advised he did not have any comment on impacts on stygofauna as this was not his area of expertise. Impacts on stygofauna are discussed further below.

Following a review of the submissions and amendment reports and associated peer reviews, Mr Middlemis noted that the peer review undertaken by SMI did not include a detailed review of the BTM Complex Model itself, rather the application of the model to inform the groundwater assessment. However, Mr Middlemis noted that the BTM Complex Model had gone through extensive consultation with DPE Water as part of the BTM Complex groundwater model calibration and validation process required under the consent conditions. Mr Middlemis is satisfied the groundwater modelling is consistent with best practice and fit for purpose for informing the groundwater impact assessment, including water licensing and consideration against the AIP.

DPE Water also advised that it had no further information requirements regarding the modelling and following the peer review undertaken by SMI. As required under the development consents for the BTM complex mines, a further round of model calibration and validation will commence later in 2023 for the BTM Complex, including further independent peer review of the model.

Groundwater drawdown

Drawdown is predicted to increase in all coal seams, with the most significant drawdown occurring in the deeper Templemore Seam because this would be the first significant mining activity in that seam corresponding with the extraction from the deeper Templemore Seam. Drawdown in the shallower coal seams is less pronounced given these are also already depressurised because of the approved mining operations.

However, given the poorer water quality within the coal seam aquifers, these are not used for water supply and there would be no impact on registered water supply bores as a result of this depressurisation.

Of greater concern is whether the depressurisation of these coal seams would cause an induced effect on overlying higher quality aquifers, predominantly the alluvial aquifer, that are used for water supply or used by GDEs.

However, the effect of the modification on the alluvial aquifer is predicted to be minimal compared to the approved project, with the groundwater assessment predicting drawdown in the alluvium of up to around 1 m as a result of both the approved Boggabri operations and the modification. This drawdown would occur within Nagero Creek to the south west of the mine and Goonbri Creek to the east of the Tarrawonga Mine (see **Figure 3a**). The modification contributes an incremental 0.3 m reduction within Nagero Creek (see **Figure 3b**).

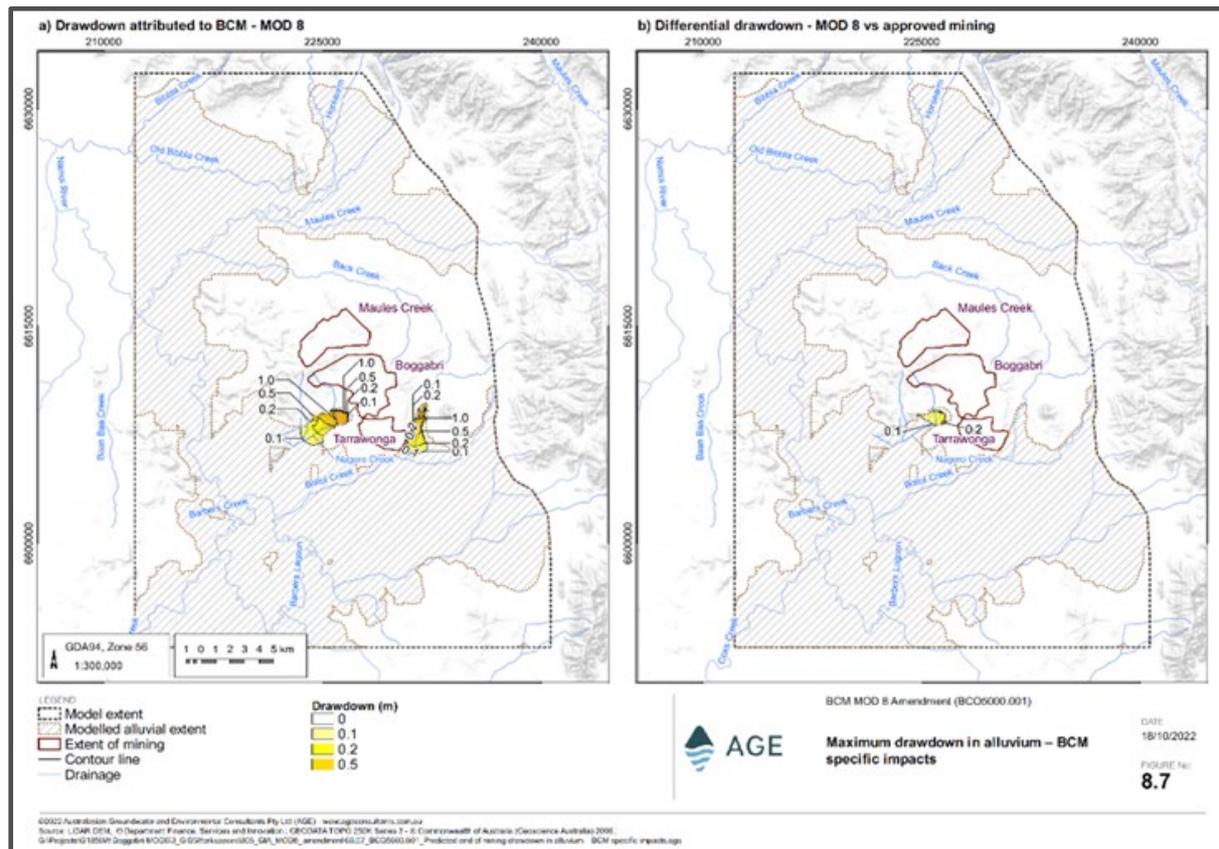


Figure 3 | Incremental drawdown – Alluvium (Source: AGE, 2022)

Potential cumulative impacts from all the BTM complex mines were also modelled, with the main area of drawdown in the alluvium extending to the south of the Tarrawonga mine, and largely associated with mining activities at Tarrawonga. The modification does not increase the predicted impacts in the alluvium compared to approved mining operations, apart from the 0.3 m incremental impact in the alluvium to the south west of the mine.

Figure 4 below shows the predicted cumulative drawdown from approved BTM complex mining operations and the proposed modification, with GDE maps overlaid (see discussion about impacts on GDEs below).

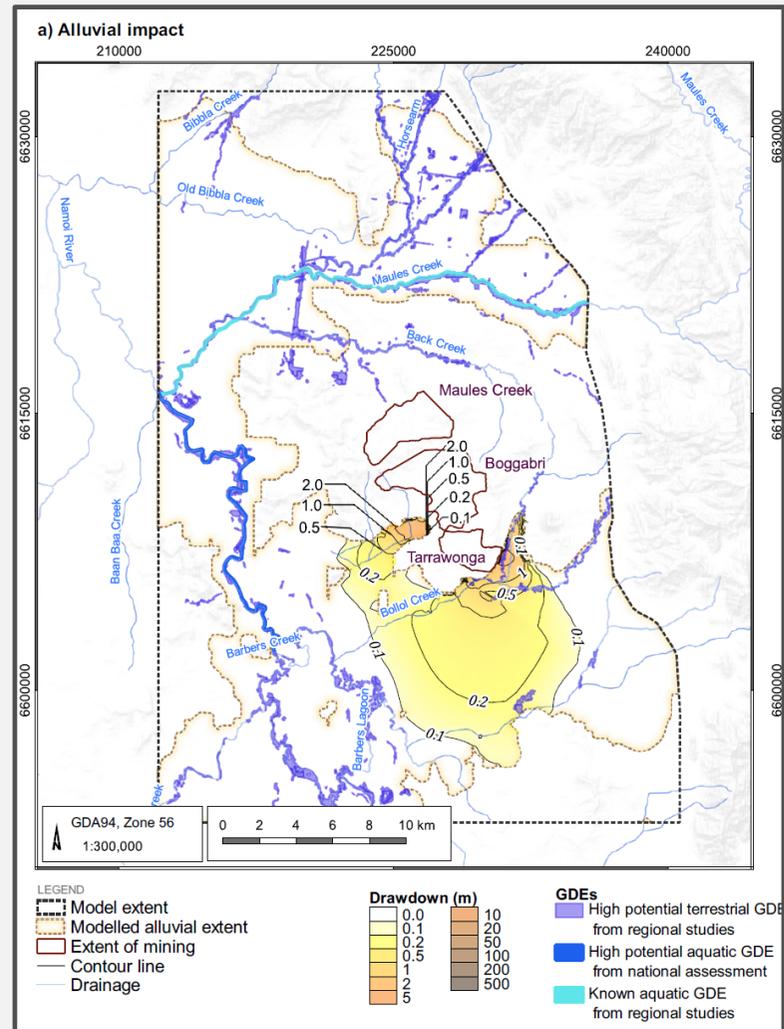
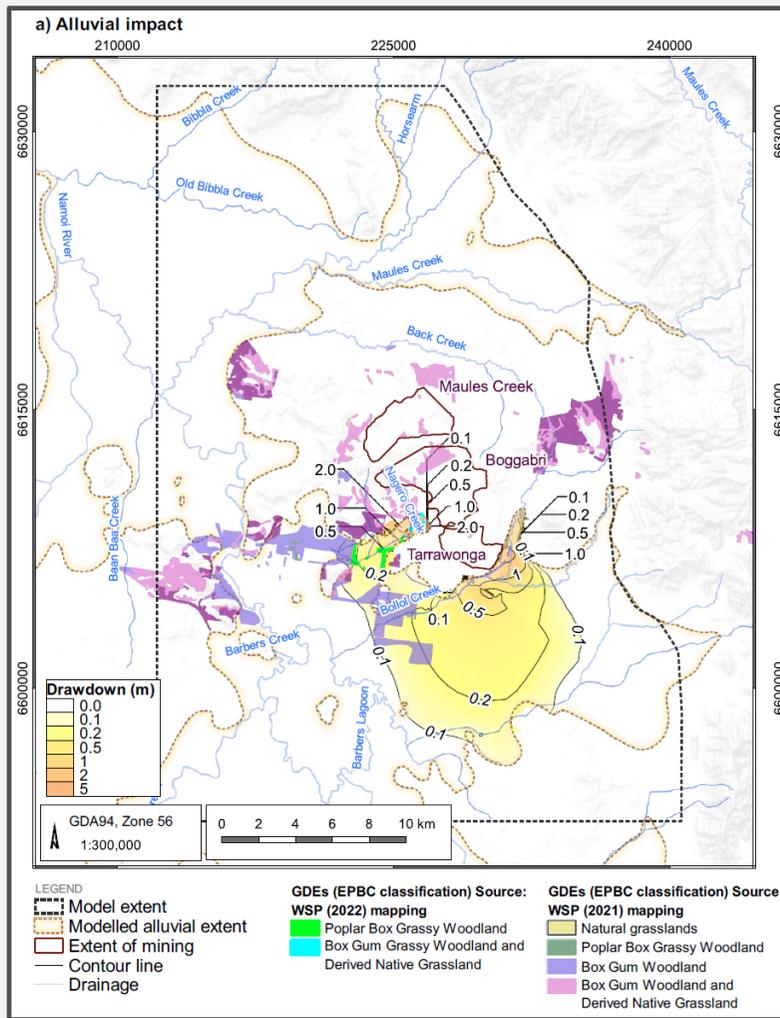


Figure 4 | Cumulative drawdown – Alluvium and GDE (Source: AGE, 2022)

Impacts on bores as a result of drawdown

Apart from mine associated bores, the predicted cumulative drawdown in the deeper aquifers from all mining in the BTM complex exceeds the 2 m minimal impact threshold of the AIP at one bore on privately owned land (GW002523) that is used for stock watering and located approximately 8 km south east of Boggabri Coal mine's infrastructure area. Cumulative drawdown in the area of this bore was already predicted to be 59.7 m. The modification would increase the cumulative drawdown by 0.4 m to 60.1 m..

In response to DPE Water's recommendation to undertake a census of GW002523, a site visit undertaken by confirmed that the bore is currently operational with a depth of around 36 m below ground level and water levels at the time of the inspection around 7 m below ground level, indicating that there was substantial standing water available in the bore and therefore water supply availability may not be impacted. Further, as the bore is located within the interburden of the Maules Creek formation the predicted impact is considered conservative as it is based on drawdown within underlying coal seams.

The submissions report notes that the existing make good provisions in the project approval (Condition 34 of Schedule 2) would continue to apply if there were to be a significant reduction in available water supply at this bore. Boggabri Coal proposes to monitor groundwater levels at this bore location to ensure that make good provisions be applied if there is more than a negligible impact on this bore's water supply.

There are no privately owned water supply bores located in the alluvium that are predicted to exceed the minimal impact consideration of the AIP.

Groundwater dependent ecosystems

High priority GDEs are identified in the relevant water sharing plans including the *Water Sharing Plan for the Namoi Alluvial Groundwater Sources 2020* and *Water Sharing Plan for the Murray Darling Basin Porous Rock Groundwater Sources 2020*. **Figure 4** above identifies GDEs, including potential terrestrial GDEs, which may rely on alluvial groundwater to some extent during drier climatic conditions, depending on depth to groundwater including:

- *Natural grasslands on basalt and fine-textured alluvial plains of northern NSW and southern Queensland;*
- *Poplar Box Grassy Woodland on Alluvial Plains (Poplar Box Woodland);* and
- *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box Gum Woodland).*

The IESC recommended that additional field data be collected to increase the confidence in predicted impacts on GDEs along Nagero, Bollol and Goonbri creeks, including on stygofauna. To address IESC concerns, Boggabri Coal included additional studies in its submissions report (prepared by WSP and Austral Research and Consulting) incorporating updated native vegetation mapping and field verification of potential GDE terrestrial vegetation, remote sensing analysis of green leaf index (across dry and wet periods), targeted threatened aquatic fauna and stygofauna surveys.

This further investigation concluded that Box Gum Woodland associated with Nagero Creek was unlikely to be groundwater dependent. The Poplar Box Woodland is considered the only community with potential reliance on groundwater associated with the Nagero Creek alluvium, which is the only alluvial aquifer potentially affected by incremental impacts from the modification (see **Figure 5**).

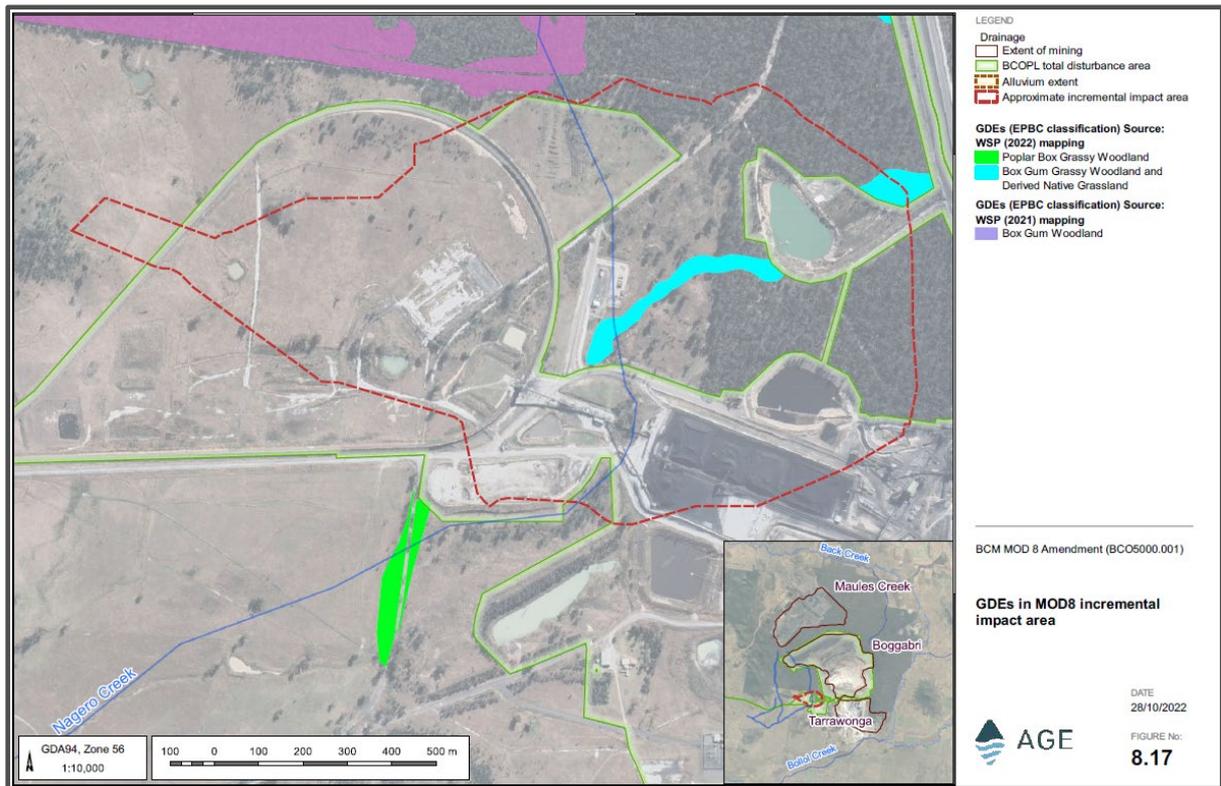


Figure 5 | Nagero Creek – Terrestrial GDE (Source: AGE, 2022)

WSP prepared a significance assessment applying the EPBC assessment of significance guidelines and concluded that there was unlikely to be a significant impact on the Poplar Box Woodland community along Nagero Creek as a result of the modification or from cumulative impacts associated with the BTM complex.

Regardless, Boggabri Coal has committed to installing additional groundwater monitoring bores in the Nagero Creek alluvium to monitor potential changes during mining operations, along with additional terrestrial GDE monitoring sites along Nagero Creek to monitor change in vegetation condition, including specifically targeting tree canopy health. Boggabri Coal would be required to update its water management plan to reflect these commitments.

To address IESC concerns, Austral also undertook additional monitoring of aquatic fauna (22 sites) and stygofauna (18 sites) in the creek system around the mine and also within the Namoi River and Barbers Lagoon, a significant anabranch of the Namoi. The stygofauna monitoring identified 2 sites with confirmed stygofauna species, and a number of sites with potential species.

In regard to GDEs along Bollol and Goonbri creeks, AGE advised that the depth to groundwater beneath these creeks and the nature of these creeks acting as losing streams indicate that the groundwater drawdown due to the modified project would not affect the flow regimes of these creeks and the associated GDEs and stygofauna.

Post mining groundwater recovery and seepage

As the modification does not increase the approved disturbance area, it does not reduce the catchment reporting to Nagero Creek, which primarily feeds the alluvial aquifer. Therefore, the groundwater assessment concluded that groundwater recharge of the alluvium associated with Nagero Creek from surface flows would not be affected by the modification.

The Department notes that the existing project approval (condition 38(c) of Schedule 2) includes the requirement to monitor the interconnectivity between the alluvial and bedrock aquifers, with the requirement in Condition 5 of Schedule 5 to review the strategies and plans following a modification of the project approval. Therefore, no additional conditions or changes to existing conditions are required to address this monitoring.

Over the long term, the groundwater levels are predicted to equilibrate at a similar level to the lowest point of the partially backfilled void, at 285 m Australian Height Datum (AHD). The groundwater assessment predicts this would be reached approximately 300 years after mining operations.

The groundwater assessment predicts the groundwater in the backfilled mining void would mostly flow to the Tarrawonga and Maules Creek mines pit lakes, with some seepage to the alluvium associated with Nagero Creek. The long-term flows to the alluvium are considered insignificant compared with other inputs, such as rainfall, and unlikely to increase salinity levels in downstream waterways including the Namoi River. Therefore, the groundwater assessment predicts that downstream water users would not be impacted by the groundwater discharges from the project over the long term.

Groundwater inflow and water licensing

The groundwater assessment included modelling of the changes in groundwater inflow into the open cut pit due to mining of the deeper coal seams.

The modelled pit inflows due to the approved project range from 59 ML/y to 324 ML/y between 2024 and 2035. Over the same period, the modified open cut operations are predicted to result in groundwater inflows ranging from 127 ML/y up to 583 ML/y. Over the operating life of the mine, the groundwater assessment predicts the modification would result in an additional 838 ML of groundwater inflow, at an average of 64.5 ML each year.

The deeper mining associated with the proposed modification results in a change in how the drawdown of the groundwater system is distributed across the BTM Complex. A deeper void at Boggabri would increase the maximum annual cumulative inflows across the system and some of the flows that would have entered Maules Creek or Tarrawonga would divert to the Boggabri void.

The groundwater assessment estimated the water take from all groundwater sources potentially affected by the proposed modification. This is shown in **Table 4**. All groundwater take of the modified project is expected to remain within the entitlements held by Boggabri Coal.

Table 4 | Groundwater take for the modification

Water Sharing Plan	Water Source	Year of max take	Max predicted annual take (ML)	Existing entitlements (ML)
NSW Murray Darling Basin Porous Rock Groundwater Sources	Gunnedah-Oxley Basin porous rock	2024	502	842
Upper and Lower Namoi Groundwater Sources	Zone 4 alluvium	2026	95	1,028
Upper and Lower Namoi Groundwater Sources	Zone 11 alluvium	2033	6	20
Upper and Lower Namoi Groundwater Sources	Zone 5 alluvium	N/A	0	0

Surface Water

A surface water impact assessment of the proposed modification was undertaken by Engeny Water Management (Engeny), which considered the existing water management system at the mine and changes to accommodate the modified mining operations. The assessment also reviewed the site water balance and updated the water balance model to predict water use of the modified project.

Surface Water Management System

Surface water impacts would continue to be managed by the existing water management system, which separates clean and contaminated water. Clean water flows from upslope of the active mining areas would continue to be captured and would need to be accounted for under licensed entitlement, given these exceed the harvestable rights allocations for the site.

The EPA recommended that Boggabri Coal considers measures to avoid the capture of clean water flows that would otherwise enter the site from upstream. Boggabri Coal noted that the approved operations currently capture clean water inflows in pit and the water management system includes the provision to construct highwall storages in 2033, designed to capture some of these flows. It also noted that diversion drains would be established where possible, to maximise the amount of clean water diverted around the site.

The Department accepts that topographic constraints restrict Boggabri Coal's ability to divert all clean water flows around the site, particularly in the area of the deepest extraction associated with the modification.

The EPA also sought clarification on how discharges from sediment basins and mine water storages would change with the proposed modification. The surface water assessment considers that the water management system would have sufficient capacity to accommodate the proposed mine plan changes associated with the modification. The EPA recommended a condition requiring ongoing review of the water management system, particularly for managing discharges during wet weather periods. This information would inform the EPA of any requirements for the environment protection licence. The Department notes that a further review and revision of the Water Management Plan would be required following a modification to the approval. The Department has included the EPA as a consultee on the Water Management Plan review.

The IESC recommended more detail on how climate change variability may influence rainfall events and evaporation, and consequent discharge and overflow volumes from the site. Boggabri Coal noted that the 126-year modelling range captured the climate variability sequencing that would likely be experienced over the extended three year period.

Sediment dams and other mine water storages would be reviewed during detailed design to ensure the storages adequately cater for the modified mine plan, with discharges to occur in rainfall greater than the 5-day 90th percentile event, in accordance with the mine's existing environment protection license (EPL 12407).

The IESC review also recommended that the water balance model include salt balance and water quality analysis, along with water treatment strategies and water quality objectives. These recommendations relate to surface water quality impacts that are relevant to the existing operations and Boggabri Coal has committed to implementing additional monitoring points, expanded water quality analysis to cover metals and metalloids, also noting that water quality discharge criteria are already established through the mine's EPL.

Namoi River and local creeks unlikely to be significantly impacted

As the second amended application removed the fauna crossing, the modification does not involve the disturbance of areas outside the approved footprint and would therefore not change the overall catchment area. Consequently, the modification does not include changes to the downstream surface flow and flooding regimes, except due to extending mining out to 2036.

Baseflow to the Namoi River is predicted to reduce by 2 ML/year on average and up to 7.5 ML/year. The IESC recommended further information should be provided about the potential impacts on ecologically relevant components of the flow regime due to increases in low and no-flow days in the river. Boggabri Coal's response additional interrogation of the data, which found that the estimated impact on low and no-flow days in the Namoi River due to the mining operations would be negligible, with an increase of 0.1 days per year on average (from 29.7 to 29.8 days) – that is there would be no perceptible change to the range of flows within the river.

Regarding Nagero Creek, Boggabri Coal noted that the ephemeral nature of the watercourse required the use of the Australian Water Balance Model to estimate flows, which indicated very minor changes in low- and no-flow days with an increase of 2 days from 300 to 302 days per year, or a 0.67% increase.

The IESC also recommended streamflow monitoring in Nagero and Bollol Creeks. Boggabri Coal has committed to establishing an additional monitoring point in Nagero Creek and including this in the updated surface water management plan, along with the additional analytes for metals and metalloids.

Given the minimal impacts expected from the project on the Bollol Creek catchment, Boggabri Coal has not proposed an additional flow monitoring location in Bollol Creek. The Department agrees that this is not necessary as the mine does not discharge directly into this creek system – noting that Tarrawonga mine has a discharge to Bollol Creek.

The existing project approval includes the requirement to review the management plans following the approval of a modification and this would capture the requirement to review the water management system based on the modified mine plan.

Water balance and licensing

The surface water assessment includes an updated water balance model for the site including modelling of climate sequences based on 126 years of climate data to simulate potential wet and dry climate scenarios.

The modelling indicates that water would continue to be supplied through groundwater inflows and rainfall, supplemented by up to 1,450 ML of water from Boggabri Coal's licensed borefield and river supply. With the increase in inflows associated with the deeper mining, the water balance model predicts the demand for this supplementary water would reduce, particularly in the later years of the modified mine plan.

DPE Water raised concerns around the potential risks to the mining operations should it require additional allocations during low rainfall conditions from the Upper Namoi Zone 4 Water Source and Bluevale Water Source.

Boggabri Coal has previously relied on the availability of temporary trading allocations to account for its water use during below average rainfall conditions. DPE Water notes that this is based on the carryover of unused entitlements and future reliance is not certain and may pose a risk of insufficient allocations to account for water take and potential compliance issues.

Boggabri Coal has noted that the general security licence pool in the Upper Namoi water source was 11,454 units during the dry 2018/2019 period and it was able to rely on water supplied from alluvial groundwater licenses and temporary transfers from the Upper Namoi Zone 4 Groundwater Source to continue its operations.

Boggabri Coal estimates that the supplementary supply demands during 95th percentile dry conditions would peak at 92 ML, which is lower than the peak demand of 156 ML during the 95th percentile dry conditions estimated in the water balance modelling of the approved operations. This is due to increased groundwater inflows.

Boggabri Coal also noted that its water balance adopts an operating rule which retains at least 500 ML of available water at the site and pumps water to the site when on site storage drops below 600 ML. It suggests that this would provide further water supply security during drier periods.

A key concern of DPE Water is accounting for water take by the clean water capture upstream of the open pit. This issue was also raised by in submissions from Lock the Gate Alliance, the Leard Forest Research Node, Wando Conservation and Cultural Centre Inc and others in their submissions, which also noted the lack of upstream diversion works, contrary to the original 2010 environmental assessment. The Department notes that the proposed modification does not result in an increase in clean water capture and this issue currently exists for the approved operations.

Nevertheless, the Department notes that Boggabri Coal has recently purchased an additional 93 ML of entitlement from the Bluevale water source to reduce its reliance on temporary trades. While there may still be a risk of more than 93 ML of clean licensable water reporting to the pit during wetter years, this is also when other WAL holders are likely to have sufficient water and are willing to offer temporary trades. Furthermore, under the approved mine plan the catchment size will be gradually reduced and less water would be diverted to the pit.

The Natural Resource Access Regulator has separately investigated Boggabri Mine's previous take of water from this water source and issued an enforceable undertaking to Boggabri Coal in relation to the take of surface water. To address this for future operations, DPE Water recommended that Boggabri Coal include reporting of its annual direct and indirect water take in the Annual Review and for the results of this review to confirm impact predictions and assist with its compliance with the *Water Management Act 2000*.

As a result of DPE Water's concerns, the Department has recommended an updated Site Water Balance condition to include the requirement for Boggabri Coal to monitor and report on its annual direct and indirect water take.

Monitoring and mitigation

To incorporate the modification into its existing water management system for the project, Boggabri Coal proposes the following additional mitigation measures:

- monitoring of groundwater levels in private bore GW002523 and provision of make good if required in accordance with existing conditions;
- the installation and operation of additional monitoring bores in the Nagero Creek alluvium, including adjacent to the Poplar Box Woodland to monitor potential impacts;
- additional GDE monitoring, including stygofauna and canopy condition of the Poplar Box Woodland;
- additional monitoring bores to replace bores impacted by mining operations along the northern boundary of the mine disturbance area;

- an additional multi-level vibrating wire piezometer to the northeast of the mine to monitor depressurisation in the coal seams as mining progresses;
- additional flow and water quality monitoring, including metals and metalloids; and
- updating the approved Water Management Plan to incorporate the modification and additional commitments.

Conclusion

The modification would not increase the disturbance area of the mine compared to approved operations, and the final landform would still be designed to be free draining to downstream receiving waters. Discharges from the site would continue to be regulated by the EPA through the environment protection licence already in place for the mine.

The Department considers that the existing and proposed mitigation measures reflect a best practice approach to minimise, monitor and manage the potential impacts of the modification on surface and groundwater resources, including the highly important alluvial groundwater source.

The Department considers that the project can be managed such that it would not result in a significant impact to water resources, subject to implementation of these mitigation measures.

5.2 Greenhouse Gas Emissions

The modified project would produce around 0.86 Mt of additional CO₂-e from Scope 1 and 2 emissions.

Lock the Gate raised concerns that historical emissions are higher than what was originally predicted, noting that the average emissions cited in the modification report (0.69 Mt CO₂-e emissions per year on average) are significantly higher than the emissions reported in recent annual reports. The amendment report includes an estimate of the additional greenhouse gas (GHG) emissions that would be produced by the modified project.

The submissions report clarified that this was the result of different calculation methodologies, with reporting of actual emissions undertaken in accordance with the *National Greenhouse and Energy Reporting (Measurement) Determination 2008* and *National Greenhouse and Energy Reporting Act 2007* (NGER), and the *National Greenhouse Accounts Factors* (NGA) used for the purposes of the original project assessment³.

For consistency, and to facilitate a comparison of the incremental impacts of the modification, the GHG emissions for the approved and the modified project were recalculated in the amendment report using the NGER method.

The Department's Net Zero Emissions Modelling team (NZEM) provided advice about the greenhouse gas assessment for the amended modification. NZEM did not identify any significant concerns about the methodology used to estimate emissions, although it requested clarification on underlying assumptions.

The Department also sought advice on the GHG emissions from the Independent Expert Advisory Panel for Mining, which noted that opportunities to mitigate GHG emissions in open cut mining by utilising a

³ A key difference between the methodologies is how fugitive emissions are calculated. Under the NGA, generic emissions factors were used to estimate CO₂-e emissions per tonne of ROM coal, whereas reporting under the NGER also allows site-specific estimates of emissions. Based on samples of gas drawn from the coal bearing strata at the site, the emissions per tonne of ROM coal are actually around two orders of magnitude lower than the generic emissions factors.

purely electrically powered mining equipment are limited, but recommended conditions requiring further investigations, research and development to more accurately determine GHG emissions and for better mitigation.

Following revisions to incorporate NZEM advice, the total Scope 1 and 2 emissions from the project between 2023 and 2036 is estimated to be around 2.96 Mt of carbon dioxide equivalent (CO₂-e), which is 0.86 Mt CO₂-e more than what the approved mine would produce over this period. This is an average of around 0.23 Mt CO₂-e per year. The emissions are mainly associated with the use of diesel at the mine with fugitive emissions from the mine of minor contribution due to low gas and methane content, estimated to be around 0.00077 t CO₂-e / t ROM coal. The overall average Scope 1 emissions intensity is around 0.027 t CO₂-e / t ROM coal. This emission factor is below average for open cut coal mines in NSW based on GHG emissions and ROM production levels reported in recent Annual Reviews and well below underground coal mine emissions. This also compares to the default fugitive emission factor for open cut coal mines in NSW of 0.061 t CO₂-e / t ROM coal used in the NGER Measurement Determination.

This is generally consistent with what has been reported in the annual reports in recent years which represents about 0.06% of Australia's emissions and 0.21% of NSW's annual emissions, based on 2020 reported total GHG emissions.

Incremental increase in Scope 3 emissions associated with the modification would be around 61.73 Mt CO₂-e. These emissions would not be generated directly by the project but would include emissions generated during transport of the product coal to customers and through the combustion of the coal for energy production or steel making. These emissions would be accounted for as Scope 1 emissions from those projects. It is worth noting that the coal produced from the Boggabri mine is mainly high quality bituminous coking and thermal coal. The higher energy content of thermal coal means less coal must be burnt to produce the same amount of energy than alternative lower quality thermal coals, resulting in comparatively lower emissions.

Many submissions commented that approving more coal mines is not consistent with the NSW Government goal of reducing emissions, and that the additional emissions from recently approved coal and gas projects would cancel the savings of the Electricity Infrastructure Roadmap.

The NSW Government has set a goal of achieving net zero emission by 2050, and to deliver a 70% emissions reduction over 2005 levels by 2035. *The Net Zero Stage 1: 2020-2030 Implementation Update* describes the policies and programs that will help achieve the Government's target.

Importantly, NZEM advised that GHG emissions from the project were accounted for in the emissions projections used for the *Net Zero Stage 1: 2020-2030 Implementation Update*, which was underpinned by modelling that had conservatively assumed mining at Boggabri mine would occur until 2042.

The EPA has released its *Climate Change Policy* and *Climate Change Action Plan 2023-26* that would apply to the Boggabri Coal Mine as it is regulated under an EPL. The EPA has provided advice to the Department that Boggabri Coal should prepare a greenhouse gas mitigation plan and climate change adaptation plan in accordance with requirements to be provided by the EPA. The Department has made a notation to this effect in the recommended conditions, noting that the EPA would lead the regulation of GHG emissions through requirements under the EPL.

The Department also notes that the project would be covered by the Commonwealth Safeguard Mechanism, which sets an emissions intensity "baseline" for Scope 1 emissions for facilities that emit more than 100,000 tonnes of CO₂-e per year. Boggabri Coal would be required to comply with the

requirements of this mechanism including any changes to baseline emissions intensity over time to ensure that the Commonwealth committed total emission “hard cap” from safeguard facilities is met.

The *Climate Change (Net Zero Future) Act 2023* (Net Zero Future Act) commenced on 11 December 2023 formalising the 2030, 2035 and 2050 net emission goals outlined in the Implementation Update. The incremental Scope 1 and 2 emissions as a result of the modification would contribute up to 0.38% of these targets without further mitigation or offsetting. These incremental increases would be able to be effectively managed under current NSW and Commonwealth GHG policy initiatives to ensure that Commonwealth and NSW targets would not be compromised, including the overall purpose and guiding principles of the Net Zero Future Act.

Monitoring and Mitigation

Boggabri Coal has proposed measures to reduce Scope 1 and 2 emissions, including by reducing diesel usage, regular maintenance of fleet and equipment, maximising energy efficiency, and using alternative fuels such as biofuels, hydrogen and solar.

NZEM also advised that significant advancements in battery-electric and other low emissions technologies are expected in the next 5-10 years and has recommended that Boggabri Coal should consider the adoption of these technologies when replacing/retiring fleet.

Boggabri Coal has proposed to conduct regular reviews into the availability and feasibility of low emissions alternatives to diesel equipment, which NZEM and EPA has agreed with and supported.

The existing conditions require Boggabri Coal to implement an Air Quality and Greenhouse Gas Management Plan, including requirements to minimise GHG emissions. This plan would need to be updated to incorporate the commitments made in relation to GHG emissions for the modification application, noting that the EPA’s required plans would duplicate this once prepared. The Department notes that to avoid regulatory duplication, once the EPA required plans are prepared, the Air Quality and Greenhouse Gas Management Plan could reference these documents.

Conclusion

The Department has considered the increase in GHG emissions in the context of NSW and Commonwealth policies and guidelines, including the Implementation Plan targets. The Department notes the advice from NZEM that the predicted GHG emissions from the modification are already included in the forecast modelling against these targets. The Department considers that the modification is consistent with current NSW and Commonwealth policy settings in regard to GHG emissions.

The existing conditions require that Boggabri Coal minimise GHG emissions and implement an Air Quality and Greenhouse Gas Management Plan. The management and minimisation of GHG emissions would be further strengthened through the regulatory changes being implemented by the EPA through its Climate Change Action Plan and the Commonwealth Government through the Safeguard Mechanism reforms.

The Department has also considered the NSW Government’s *Strategic Statement on Coal Exploration and Mining in NSW* (Statement on Coal), which recognised the value of continued coal production to the State including the potential for coal production to deliver significant economic benefits to regional communities, to contribute to export earnings, and to fund public services and infrastructure through mining royalties.

The Statement on Coal also sets out that, despite the global transition away from fossil fuels, coal production for export markets will continue to have an important role to play in the short to medium term as coal remains a critical global energy source around the world. The Statement on Coal also recognises that the use of coal for the manufacturing of steel is likely to be sustained for a longer period as there are currently limited practical substitutes available.

5.3 Noise

Some submissions on the modification raised concerns about the potential impacts of the modification on amenity as a result of noise.

A noise and blasting impact assessment was undertaken by Global Acoustics in accordance with the contemporary guidelines, including the EPA's *Noise Policy for Industry* (NPfI) and the Department's *Voluntary Land Acquisition and Mitigation Policy* (VLAMP). The noise modelling was updated by EMM Pty Ltd (EMM) for the amended modification (first amendment).

Operational noise

The updated modelling predicts four privately owned properties (receivers 44, 48, 90 and 158 shown in **Figure 6**), would experience noise levels exceeding 35 dB(A), the project noise trigger level (PNTL) identified under the NPfI.

Receivers 44, 48 and 90 currently have acquisition and mitigation rights on request as in the original decision the Planning Assessment Commission imposed acquisition rights for any receivers where noise levels were predicted to exceed 35 dB(A). The BTM complex mines are the only mines in NSW where acquisition rights have been applied at such a low level. When this determination was made in 2012 there was no formal NSW government policy on applying acquisition and mitigation rights for mining projects. The VLAMP was first introduced in 2014 to provide a policy framework to assist the decision maker. The VLAMP was updated in 2018 to reflect the introduction of the NPfI, which replaced the *Industrial Noise Policy*, that also applied to the original determination of the project.

Under this contemporary policy setting, mitigation rights would only apply to receiver 48 with a prediction of up to 39 dB(A) during the night time period under adverse meteorological conditions, with receivers 44 and 90 predicted to receive a negligible impact of no more than 1 dB(A) above the PNTL. However, in acknowledgement of the reasons of original decision maker, the Department recommends that the existing mitigation and acquisition conditions continue to apply for these three receivers.

Receiver 158 was constructed after the original determination of the project and the consent makes it clear that the noise acquisition and mitigation conditions would only apply to existing dwellings or where a development application for a dwelling had been submitted prior to the determination of the project. The noise modelling predicts that the PNTL of 35 dB(A) would be met at this receiver during the day and night time periods, and a 1 dB(A) exceedance during the night time period, with predicted 36 dB(A). The Department has recommended that this predicted night time noise level be applied at this receiver. All other receivers are predicted to meet the PNTL of 35 dB(A).

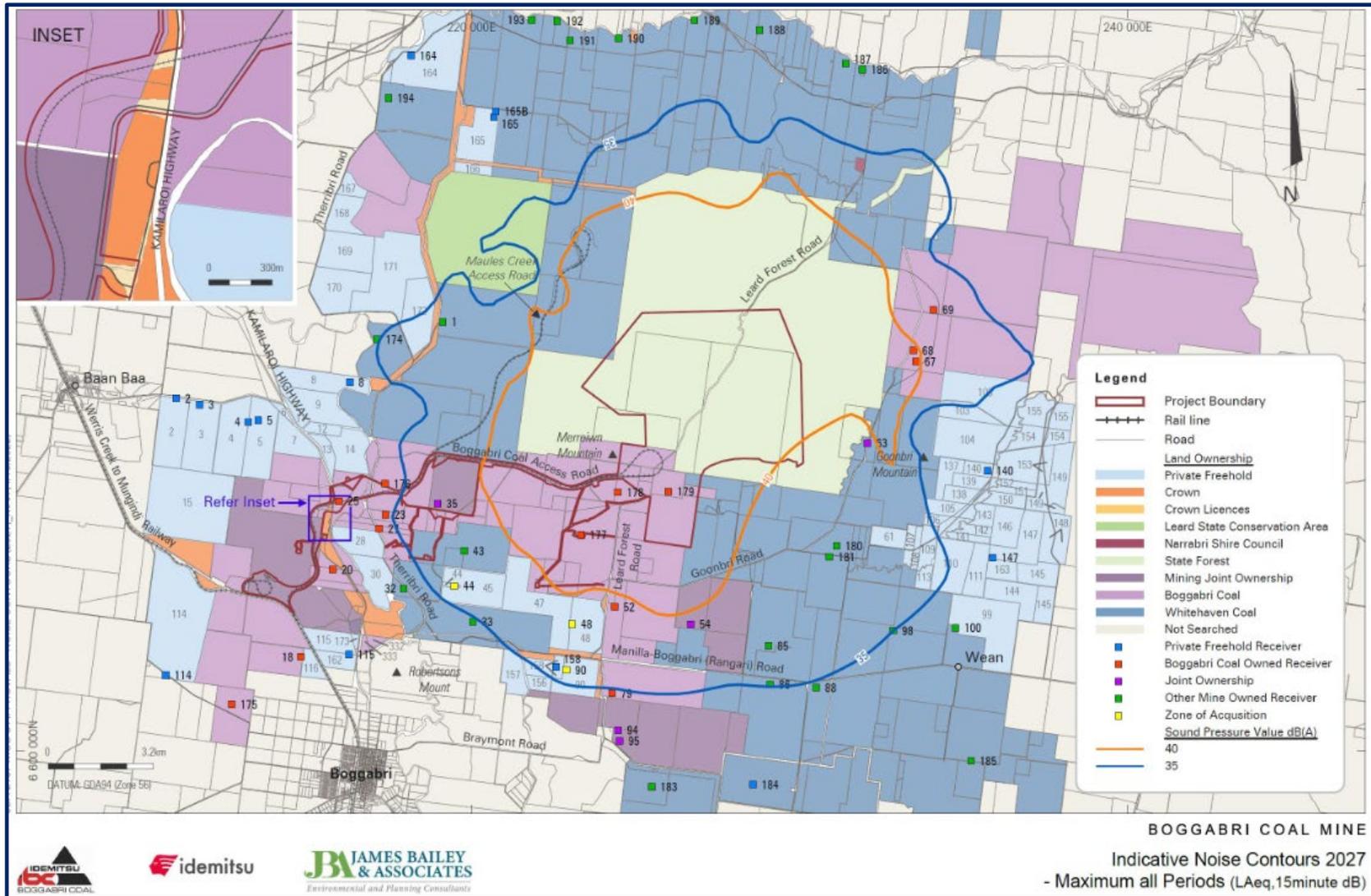


Figure 5 | Indicative noise contours – Year 2027

Class G inversions

The existing conditions of consent (Schedule 3 Condition 14) require that stronger G class inversions incorporating drainage flow apply to the noise limits, subject to undertaking further review of meteorological conditions that Class G inversions are not a feature of the area. The noise assessment included further review of meteorological conditions concluding that G class inversions with drainage flow are not a feature of the area. The EPA also advised in its advice on the Modification Report that it is considered that it was reasonable to not include G class inversions under contemporary policy settings, however further analysis should be undertaken. The EPA in its response to the submissions and amendment reports and the further review of adverse meteorological conditions noted that its comments on its advice on the Modification Report had been addressed in relation to noise.

Accordingly, the Department has recommended removal of Schedule 3 Condition 14, and that the meteorological conditions that apply to the site, should be based on the assumptions used in the noise modelling for the Amendment Report. The conditions have been changed to reference the meteorological conditions as determined in the NPfl. However, the Department also notes that the operating conditions require Boggabri Coal to minimise noise impacts during meteorological conditions when the noise limits do not apply, that is under very noise enhancing conditions, Boggabri Coal would still need to demonstrate management measures to minimise noise levels.

Sound power levels

The noise modelling undertaken for the original project assumed sound power levels for plant and equipment based on theoretical sound power levels before the mine was operational whereas the updated noise modelling was undertaken in accordance with the contemporary NPfl and uses sound power levels representative of the existing fleet.

Schedule 3 Condition 9 requires that new trucks are attenuated and sound power levels on all equipment are equal to or lower than the sound power levels identified in the original environmental assessment for the project. Condition 10 requires annual testing of the attenuated plant to ensure the attenuation remains effective.

Boggabri Coal is requesting that these requirements be removed on the basis that there are other reasonable and feasible noise mitigation and management measures that can be applied to ensure compliance with the noise limits. This includes ensuring trucks operate in more shielded areas during noise enhancing weather conditions, scheduling noisier activities to the day time periods, constructing noise bunds on the edges of exposed ramps, and operating equipment at lower speeds.

The company has been operating in accordance with an approved noise management plan that details these measures, and to date the company has complied with the noise limits set at residences.

The EPA in its advice also recommended the removal of conditions 9 and 10, as they would be regulating the site based on compliance against receiver noise limits, not the regulation of on-site sound power levels.

The Department agrees that limiting sound power levels is not the only way to achieve compliance with noise limits and may not be the most reasonable or cost effective measure. The Department also notes that contemporary mining consents do not stipulate the methods to be employed to achieve compliance with the conditions, but rather set the performance standards and rely on the mining company to ensure it complies with those standards.

Nonetheless, Boggabri Coal has advised that all new fleet has been fitted with noise attenuation/suppression and that trials on additional noise attenuation on its Komatsu trucks is ongoing. On this

basis, the Department recommends the removal of strict sound power levels for plant and equipment, but that Boggabri should continue to apply reasonable and feasible noise attenuation for its fleet to minimise noise, and ensure that annual testing of plant and equipment, continues to be applied.

Rail noise

Tables 3 and 4 in the conditions of consent included a note clarifying that “operational noise generated by the project includes noise generated from use of the private haul road and proposed rail spur”. However, under the *Rail Infrastructure Noise Guideline* (2013) (RING), which was published after the original approval of the project, noise from rail related activities within the mine site such as loading of trains, should be treated as an industrial source and assessed against the NPfl, while noise along the railway line should be assessed against the criteria in the RING.

The updated noise modelling calculated rail noise consistent with the RING. The modelling demonstrated that rail noise assessment undertaken against the guideline for the modified project indicated that noise from the railway line outside the mine (between the rail spur and the Werris Creek to Mungindi Railway Line) would comply with the amenity criteria in the guideline and that no exceedances were predicted.

The Department also notes that there is no longer any private haul road associated with the project following the construction of the rail spur line.

On this basis, the Department has removed the second note from tables 3 and 4 of the conditions.

Monitoring and mitigation

The existing conditions require a comprehensive noise monitoring program through the implementation of the approved Noise Management Plan, along with adherence to strict operating conditions. Some revisions to the noise conditions as outlined are recommended including:

- removing reference to private properties that are now mine-owned properties in the tables requiring noise limits;
- contemporising conditions in relation to applying meteorological conditions;
- removing the rail spur line (apart from rail unloading and rail loop area) as an operational noise source; and
- removing strict sound power level limits for fleet and equipment, rather relying on application of best practice measures being applied to minimise noise impacts (noting that noise limits would need to continue to be met regardless).

Conclusion

The proposed modification would not significantly change the predicted noise impacts of the project, noting that the production rate would remain the same, with the proposal to mine deeper coal seams rather than expand into new surface mining areas. The Department considers the existing conditions largely remain fit for purpose and can ensure ongoing compliance with noise limits at private receivers around the mine site.

5.4 Economic evaluation

Mining is an important industry in the region. The mining sector is a significant contributor to the local economy, accounting for around 12% of gross regional product⁴. Mining creates direct and indirect jobs, provides training opportunities, helps to diversify the regional economy, and delivers resources and important services for the community.

The modification would provide continued direct employment for around 740 full time equivalent (FTE) workers for a further three years, noting also that there would be an increase in the peak workforce of around 169 personnel compared to the existing operational workforce.

The modification report included an economic assessment undertaken by Gillespie Economics that included a cost benefit analysis (CBA) and local effects analysis, which was then later updated and included in the first amendment.

The CBA indicated that the modification would generate royalty payments to NSW from the recovery of the additional coal of around \$111 M⁵. MEG in its advice estimated the total royalties for the additional coal as around \$181 M, based on more recent consensus forecasts (December 2022 Consensus Economics) on coal price.

The modification would also generate additional company tax of around \$66 million (M), of which around \$21 M would accrue to NSW.

Gillespie estimated that, after accounting for the direct environmental and social costs, the total net social benefits of the modification to Australia would be \$177 M and to NSW would be \$131 M.

Several submissions contend that the GHG costs would outweigh the economic benefits of the modification. The Australia Institute raised concerns that the social costs of the modification have been significantly underestimated because the full costs of GHG emissions were not attributed to the project and the carbon price used in the assessment was too low.

Gillespie valued the damage costs to NSW from Scope 1 and Scope 2 at \$0.02 M, which he derived by estimating the total global damage costs from the incremental increase in GHG emissions and then calculating the NSW share of that cost (by using Australia's share of the global population (0.3%) and NSW's share of the Australian population (32%).

Gillespie contends that this method is consistent with the approach adopted for calculating benefits, which is also limited to those that accrue to NSW.

In relation to the carbon price, the Department notes there is a wide range of estimates in the literature for the global damage costs per tonne of CO₂^e released into the atmosphere. The value adopted in the economics assessment was based on guidance from the technical notes accompanying the *Guidelines for the Economics Assessment of Mining and Coal Seam Gas Proposals*.

Nevertheless, the Department requested Boggabri Coal to provide further analysis of the costs and benefits assuming a higher carbon price (based on the reformed Safeguard Mechanism price) and full apportionment of all GHG damage costs to NSW. This analysis indicates that even if a higher carbon price is assumed and the incremental costs of Scope 1 and Scope 2 GHG emissions are fully attributed to the project, the modification would still have a significant net social benefit to NSW.

⁴ New England North West Regional Plan 2041

⁵ Unless otherwise stated, all values quoted in this report are the net present values based on a 7% discount rate.

The local effects analysis, which focuses on the net economic impacts to the local community in the Narrabri and Gunnedah local government areas, notes that the modification would increase direct and indirect economic activity via both wage and non-wage expenditure. Non-wage operating expenditure in the local area associated with the Mod 8 is predicted to amount to \$228 M between 2023 and 2035, and Gillespie points out that expenditure by employees who reside in the region and non-labour expenditure in the local area also provide substantial flow-on economic activity to the local economy.

In summary, the modification would provide both direct economic activity via jobs to the local community and indirect economic activity via wage and non-wage expenditure.

5.5 Other issues

The Department is satisfied that other issues associated with the modification, such as air quality, traffic, biodiversity, Aboriginal and historic heritage and social impacts would not significantly increase from the approved project. The department has summarised its assessment of these matters in **Table 5**.

Table 5 | Other Issues

Issue	Findings	Recommendations
Air Quality	<ul style="list-style-type: none"> An air quality impact assessment was undertaken by Airen Consulting, in accordance with applicable guidelines including the EPA's <i>Approved Methods for the Modelling and Assessment of Air Pollutants in NSW</i>. The assessment was updated for the amended modification application using the years 2023 and 2027 to represent future operational scenarios, which is when maximum air quality impacts are expected at the mine. Dust emissions from the project only were modelled (incremental impacts), as well as the cumulative impacts from other sources including from Maules Creek, and Tarrawonga coal mines. The incremental air quality modelling predicted that there would be no exceedance of particulate matter (PM) criteria at any surrounding privately owned receivers, including in relation to short term (24-hour average) and long term (annual average) PM₁₀, PM_{2.5}, total suspended particulates and dust deposition criteria. This is largely due to the fact that the modification would not change the ROM production rate or the mining extent and disturbance area. The cumulative assessment found that the proposed modification could potentially contribute to an increase in the number of days that the BTM complex exceeds the 24-hour PM₁₀ criteria of 50 µg/m³. This assessment found that the mine could contribute up to a 3 µg/m³ increase at property 140, a nearby private receptor, but this would only occur when background levels were already approaching 50µg/m³. Nonetheless, the existing consent requires Boggabri Coal to implement all reasonable and feasible measures to ensure that it does not cause exceedances of the 50 µg/m³ criterion and Boggabri Coal has confirmed that this risk can be suitably managed with its existing air-quality management 	<p>The Department has updated the limits for the annual emissions in the conditions to align with contemporary air quality standards and included contemporary air quality criteria and operating conditions. The Department has removed the TSP and deposited dust limits from the consent on the basis that the dust deposition monitors (with data collected monthly) provide a limited opportunity for proactive or reactive management compared to real time monitoring of PM₁₀ and PM_{2.5}.</p>

Issue	Findings	Recommendations
	<p>system.</p> <ul style="list-style-type: none"> • Boggabri Coal would continue to implement ongoing controls and mitigation measures to minimise air quality impacts including the watering of haul roads, stockpiles and conveyors, optimising coal and overburden haulage, enclosing conveyor systems and progressively rehabilitating mine disturbance. The Department considers that these measures, along with the continued operation of the BTM Complex Air Quality Management Strategy and real-time air-quality monitoring system, would ensure that particulate emission from the mine is minimised as far as reasonable and feasible. • A review of air quality monitoring data and complaints data indicates that dust and air quality impacts have not been a significant issue for the existing mine. Few dust complaints have been received at the mine in previous years (ie. four between the 2015 and 2019 annual reporting periods and none since 2019) and monitoring data indicates that cumulative dust emissions are generally complying with the applicable criteria, apart from isolated exceedances of the 24-hour PM₁₀ criterion, mainly due to historical drought conditions and regional smoke experienced between 2017 and 2020. • The Department considers that the air quality impacts of the modification can be managed under existing and updated conditions of consent. 	
<p>Rehabilitation and final landform</p>	<ul style="list-style-type: none"> • An evaluation of the final landform was prepared by Landloch Pty Ltd (Appendix M of the Modification Report), which reviewed the proposed updated conceptual final landform. • The modification proposes to increase the approved maximum height of the overburden emplacement area (OEA) by 5 m (up to 400 m AHD) and incorporate macro-relief elements in the proposed final landform design (see Figure 2). • Public submissions raised concerns in relation to the proposed drainage and runoff in the final landform design and the adequacy of resources to ensure rehabilitation outcomes. However, Boggabri Coal confirmed that the proposed landform's undulating surfaces would ensure most run-off is managed in the highest areas of the landform, reducing potential for uncontrolled discharges and erosion of outer slopes while vegetation cover is being established. • NSC indicated its support for integrating the final landform with the adjoining Tarrawonga Coal Mine. 	<p>The consent has been updated to include the revised final landform figure and the target vegetation types for the final landform.</p>
<p>Traffic</p>	<ul style="list-style-type: none"> • The modification report includes a traffic and transport assessment undertaken by Stantec. • The approved access route to the mine is via the Kamilaroi Highway and Boggabri Coal Access Road. The mine 	<p>The existing conditions already require Boggabri Coal to review and update the Traffic Management Plan to reflect any</p>

Issue	Findings	Recommendations
	<p>currently generates a total of about 563 daily vehicle trips during peak operations, including 527 light vehicle trips, and 36 heavy vehicle trips.</p> <ul style="list-style-type: none"> • The modification would require an average of 740 personnel with a peak of about 875. This represents an increase of about 375 personnel when compared to the original Boggabri EA (2010), which was based on 500 personnel. Boggabri Coal has incrementally increased its workforce since 2010 and currently operates with an average of about 762 personnel. • This translates to a peak of around 1,088 daily vehicle trips, an increase of around 170 daily vehicle trips when compared to current operations. • The assessment concludes that the proposed increase in traffic would not result in any significant impacts on road capacity, serviceability or safety, with a Level of Service A predicted at peak traffic rates, including consideration of cumulative impacts from other projects. • Both NSC and TfNSW raised concerns about the potential for vehicles travelling via Rangari Road (also known as Manilla Road) and Leard Forest Road to access the site. • In its response, Boggabri Coal confirmed that the approved primary access to the mine is via the Kamilaroi Highway and BCM Access Road (including for heavy vehicles), with access permitted via Rangari Road and Leard Forest Road only for employees travelling from the east, from the direction of Manilla. • Boggabri Coal further noted that the approved Traffic Management Plan (revision 5, 2022) requires the use of the Kamilaroi Highway and BCM Access Road as the primary access route. • The Department notes that TfNSW requested that a limit be imposed on the number of personnel working at the mine site. • The Department does not support worker employee restrictions and recognises that there are social and economic benefits associated with additional employment opportunities at the mine. The Department considers that the increase in workforce would not adversely increase traffic impacts. 	<p>approved modification, in consultation with applicable authorities.</p>

Issue	Findings	Recommendations
Biodiversity and heritage	<ul style="list-style-type: none"> The modification initially included the construction of a fauna bridge which would have required about 1.21 ha of vegetation clearing and ground disturbance in areas not already approved to be disturbed. However, with the removal of the fauna bridge from the proposal, no additional clearing or ground disturbance would be required, beyond that already approved. Accordingly, there would be no additional direct impacts on biodiversity, Aboriginal or historic heritage. The Department's consideration of potential impacts on terrestrial GDE, including the EPBC listed Poplar Box Woodland is outlined in section 5.1 above. The Department has considered the provisions of section 7.17 of the <i>Biodiversity Conservation Act 2016</i> and considers that the modification would not increase the impacts on biodiversity values on the site. 	<p>No changes to biodiversity conditions, however the Water Management Plan has been updated to include Boggabri Coal's commitment to extend GDE monitoring to include canopy health of the Poplar Box Woodland.</p>
Social	<ul style="list-style-type: none"> A social impact assessment (SIA) was undertaken by Hansen Bailey. The key areas of concern from the community identified in the SIA are in relation to water impacts from deeper mining (and in particular water security), amenity impacts, and cumulative impacts from other mining in the area, including impacts on infrastructure and housing availability and affordability Perceptions of positive social impacts were linked to the continuation of the economic benefits of mining. As discussed in section 5.1 above, changes to water impacts would be relatively minor and access to water would be regulated through the relevant water sharing plans. Changes to amenity impacts would also be relatively minor, although the impacts would last for an additional three years. The SIA analysis of accommodation options indicates there is sufficient short-term accommodation available, including two accommodation villages in Narrabri and Boggabri that are largely used by contractors. Other cumulative impacts on infrastructure in Narrabri would be offset through ongoing payments to NSC through the existing voluntary planning agreement, which would continue to operate over the extended mine life. GSC requested that Boggabri Coal consider a planning agreement with that council given that a large part of the workforce resides in the Gunnedah local government area . Boggabri Coal notes that the project is located entirely within the Narrabri Shire LGA and consequently considers a planning agreement with GSC is not warranted. However, the company notes it has already contributed more than \$12.4 M for road, infrastructure and social projects in the area and has made voluntary contributions including over \$23,000 in funding to community groups and projects within 	<p>The existing conditions already require Boggabri Coal to review and update the Social Impact Management Plan to reflect any approved modification, in consultation with applicable authorities.</p>

Issue	Findings	Recommendations
	<p>the Gunnedah Shire Council LGA, with a further \$30,000 provided to groups that provide services to the Gunnedah Shire Council LGA such as the Westpac Helicopter.</p> <ul style="list-style-type: none"> • The Department agrees that contributions under a planning agreement are not warranted as the modification would not significantly increase pressure on council infrastructure, and any increase would only occur for an additional three years. • The Department also notes that the project is located entirely within the Narrabri local government area. • The project must operate in accordance with a Social Impact Management Plan (SIMP), which includes measures to mitigate the social impacts of the project. The SIMP would be reviewed and, if necessary, updated to reflect the outcomes of the SIA for the modification. • The Department considers that the modification would not lead to any significant change in social impacts, acknowledging, however, that there would be a 3-year extension to the mine life. This would facilitate ongoing positive social impacts for the mine workforce over this period. 	
<p>Visual and lighting</p>	<ul style="list-style-type: none"> • Hansen Bailey prepared a visual impact assessment for the modification. • Lighting at night would remain consistent with the approved project with impacts continuing for an additional three years. Boggabri Coal notes that direct light would continue to be screened by topography and eventually the overburden emplacement area. • Noting that the project is located within 200 km of the Siding Springs Observatory, the modification would not significantly increase lighting impacts on the observatory, with the operating conditions requiring external lighting to comply with relevant Australian Standards for the control of outdoor lighting, and operation of mobile equipment to prevent light being directed above horizontal where possible. • The modification seeks to increase the OEA height from 395m to 400m in places to incorporate macro relief features. • Given the size and scale of the OEA, an increase of this magnitude is unlikely to be visually significant and the incorporation of macro relief elements would provide a landform that is better integrated with the surrounding environment. • The Department considers that there would be no significant increase in visual or lighting impacts as a result of the modification, and that the existing conditions would continue to provide appropriate management and mitigation of impacts. 	<p>No changes to conditions recommended</p>

6 Evaluation

The Department has carried out a detailed assessment of the modification in accordance with the relevant requirements of the EP&A Act, with a particular focus on issues raised in public submissions, government agency advice and advice provided by the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development, the Department's Science, Economics and Insights Net Zero Emissions Modelling team, the Independent Expert Panel for Mining and the Department's independent groundwater expert.

The Department acknowledges the public interest received on the modification and the community concerns raised, including impacts to water resources and additional greenhouse gas emissions.

The modification application was amended to remove the proposed fauna bridge. As such, no additional clearing or ground disturbance would be required, resulting in no additional impacts on biodiversity or Aboriginal and historic heritage.

The Department's assessment has concluded that the impacts associated with the modification can be appropriately managed under existing and new conditions of consent. In particular, the Department considers that the project (incorporating the modification) would not result in significant impacts to groundwater resources, subject to implementation of the mitigation measures proposed by Boggabri Coal.

DPE Water also recommended that Boggabri Coal include reporting of its annual direct and indirect water take in the Annual Review. The Department agrees with this and has subsequently recommended a condition requiring an updated Site Water Balance to be included within the Annual Review.

Boggabri Coal has also proposed a series of measures, such as reducing diesel usage and regularly maintaining fleet and equipment, in order to reduce the additional 1.11 Mt CO₂-e of Scope 1 and 2 emissions estimated to be produced from activities associated with the modification (namely the use of diesel). NZEM agreed with Boggabri Coal's proposed measures and supports Boggabri Coal's commitment to conduct regular reviews into the availability and feasibility of low emissions alternatives to diesel equipment.

The Department considers that the incremental increase in greenhouse gas emissions associated with the modification are acceptable when weighed against the relevant climate change policy framework, including the recent Net Zero Future Act, objects of the EP&A Act (including the principles of ESD) and socio-economic benefits of the project.

The Department has considered the *Strategic Statement on Coal Exploration and Mining in NSW* in its assessment. The brownfield coal extension within the BTM coal mining precinct is consistent with the intent of the statement, and would support the continued benefits that coal production delivers for the State, including economic benefits to regional communities, ongoing employment and workforce benefits, contribution to export earnings and the funding of public service and infrastructure through mining royalties.

The modification would provide access to deeper coal seams within the already approved mine disturbance footprint. The Department considers that the modification has been designed in a manner that achieves a reasonable balance between recovery of high quality coal resource of State significance and minimising its potential environmental and social impacts.

The Department recognises that the modification would result in additional environmental impacts, particularly in relation to Scope 1 and 2 emissions. However, when considered against the significance

of the project's identified coal resources and the socio-economic benefits associated with continued operation of the Boggabri Coal Mine for a further 3 years, the Department considers the modification's benefits outweigh its residual costs and that it is in the public interest should be approved, subject to the recommended conditions.

7 Recommendation

It is recommended that the Deputy Secretary Development Assessment, as delegate of the Minister for Planning and Public Spaces:

- **considers** the findings and recommendations of this report;
- **determines** that the application MP09_0182 MOD 8 falls within the scope of section 4.55(2) of the EP&A Act;
- **forms the opinion** under section 7.17(2)(c) of the *Biodiversity Conservation Act 2016* that the application would not increase the impacts on biodiversity values on the site;
- **accepts and adopts** all of the findings and recommendations in this report as the reasons for making the decision to approve the modification;
- **modify** the consent MP09_0182; and
- **signs** the attached approval of the modification (**Appendix E**).

Prepared by:

Rose-Anne Hawkeswood

Phil Nevill

Team Leader Resources Assessments

Senior Planner

Recommended by:



22/12/2023



22/12/2023

Steve O'Donoghue

Clay Preshaw

Director

Executive Director

Resource Assessments

Energy, Resources and Industry

8 Determination

The recommendation is **Adopted / Not adopted** by:

David Gainsford

Deputy Secretary

Development Assessment and Systems

as delegate of the Minister for Planning and Public Spaces

Appendices

Appendix A – List of referenced documents

A1 – Modification Report: Refer to the ‘Modification Application’ folder under the ‘Assessment’ tab on the Department’s website at: <https://www.planningportal.nsw.gov.au/major-projects/projects/mod-8-increase-depth-mining>

A2 – Submissions: Refer to the ‘Submissions’ tab on the Department’s website at: <https://www.planningportal.nsw.gov.au/major-projects/projects/mod-8-increase-depth-mining>

A3 – Submissions Reports: Refer to the ‘Response to Submissions’ folder under the ‘Assessment’ tab on the Department’s website at: <https://www.planningportal.nsw.gov.au/major-projects/projects/mod-8-increase-depth-mining>

A4 – Agency Advice: Summarised in **Table A4.1**. Refer to the ‘Agency Advice’ folder under the ‘Assessment’ tab on the Department’s website at: <https://www.planningportal.nsw.gov.au/major-projects/projects/mod-8-increase-depth-mining>

Table A4.1 | Agency advice

Agency	Advice
Department of Planning and Environment	
Biodiversity, Conservation and Science Directorate (BCS)	<ul style="list-style-type: none"> • Advice on Modification Report • Advice on RTS • Advice on RTS (Att D)
Crown Lands	<ul style="list-style-type: none"> • Advice on Modification Report • Advice on RTS & Amendment Report
DPE Water	<ul style="list-style-type: none"> • Advice on Modification Report • Advice on RTS & Amendment Report • Advice on First Amendment RTS
Environment Protection Authority (EPA)	<ul style="list-style-type: none"> • Advice on Modification Report • Advice on RTS & Amendment Report • Advice on GHG Emissions
Science, Economics and Insights Net Zero Emissions Modelling (NZEM)	<ul style="list-style-type: none"> • Advice on Amendment Report – GHG Assessment • Advice on Additional Information – GHG Assessment
Department of Regional NSW	
Mining, Exploration and Geoscience (MEG)	<ul style="list-style-type: none"> • Advice on Modification Report (MEG) • Advice on Modification Report (Resources Regulator) • Advice on RTS
Resources Regulator	<ul style="list-style-type: none"> • Advice on Amendment Report
Transport for NSW (TfNSW)	<ul style="list-style-type: none"> • Advice on Modification Report
Forestry Corporation of NSW	<ul style="list-style-type: none"> • Advice on RTS

Agency	Advice
	<ul style="list-style-type: none"> Advice on Amendment Report
Councils	
Narrabri Shire Council	<ul style="list-style-type: none"> Comments on Modification Report Comments on RTS & Amendment Report
Gunnedah Shire Council	<ul style="list-style-type: none"> Comments on Modification Report

A5 – Additional Information: Summarised in **Table A5.1**. Refer to “Additional Information” folder under the ‘Assessment’ tab on the department’s website at:

<https://www.planningportal.nsw.gov.au/major-projects/projects/mod-8-increase-depth-mining>

Table A5.1 | Expert advice

Subject Area	Date
Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC)	<ul style="list-style-type: none"> 5 September 2021
Groundwater Review of Modification- Middlemiss	<ul style="list-style-type: none"> 23 September 2021
Groundwater Review of Amendment - Middlemiss	<ul style="list-style-type: none"> 15 March 2023
Greenhouse Gas Emissions Review – Independent Expert Advisory Panel for Mining	<ul style="list-style-type: none"> 24 October 2023

Appendix B – Modification amendments

B1 – First Amendment Report: Summarised in **Table B.1**. Refer to the ‘Amendments’ folder under the ‘Assessment’ tab on the Department’s website at: <https://www.planningportal.nsw.gov.au/major-projects/projects/mod-8-increase-depth-mining>

B2 – Second Amendment Report: Summarised in **Table B.1**. Refer to the ‘Amendments’ folder under the ‘Assessment’ tab on the Department’s website at: <https://www.planningportal.nsw.gov.au/major-projects/projects/mod-8-increase-depth-mining>

Table B.1 | Key amendments

Aspect	Modification 8	First Amendment	Second Amendment
Mining life	2039	2036	-
Maximum mining depth (Templemore Coal Seam)	380 m	380 m (mined between 2022 – 2025)	-
Rate	9.1 Mtpa	8.6 Mtpa (as currently approved)	-
Run of mine (ROM)	206.6 Mt	173.1 Mt	-
Coal production	191.3 Mt	159 Mt	-
Employment	620 FTE (average) between 2022 – 2039, with a peak of 770 FTE	740 FTE (average) between 2023 – 2035, with a peak of 875 FTE	-
Overburden	78.4MBcm at peak (2032)	73.3Mbcm at peak (2027)	-
Reject / tailings	14 Mt in pit (between 2022 – 2039) 22.4 Mt over life of mine	8.7 Mt in pit (between 2025 – 2036) 17 Mt total over life of mine	
Disturbance	Additional 1.21 ha for fauna crossing	-	No additional disturbance

Appendix C – Statutory considerations

Table C.1 summarises how the Department considers that the project can be undertaken in a manner that is consistent with these objectives, including Ecologically Sustainable Development.

Table C.1 | Consideration of the modification against relevant objects of the EP&A Act

Objects of the EP&A Act	Consideration
(a) <i>to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources;</i>	The modification meets this object because it would facilitate the continued operation of the mine and provide operational efficiencies to maximise the recovery of coal resources within an existing mining lease area. BCM's existing infrastructure and workforce would continue to be utilised.
(b) <i>to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment;</i>	The Department's assessment has sought to integrate all significant environmental, social and economic considerations. The Department considers that the modification could be carried out in a manner that is consistent with the principles of ecologically sustainable development.
(c) <i>to promote the orderly and economic use and development of land;</i>	The modification involves a permissible land use and would be carried out within existing project boundaries and approved disturbance areas. The modification would result in the continuation of employment of the workforce and a continuation of the economic benefits generated by the mine for an additional three years. The Department considers this represents an orderly and economic use of the land.
(e) <i>to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats;</i>	The modification would occur entirely within the BCM project approval boundary and would not require additional clearance of native vegetation or increase the impact on biodiversity values.
(f) <i>to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage);</i>	The modification would occur entirely within the BCM project approval boundary and would not require additional disturbance of native vegetation or increase the impacts on Aboriginal or historic heritage sites.
(i) <i>to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State; and</i>	The Department has assessed the modification application in consultation with Narrabri Shire Council and other relevant NSW government authorities and has given consideration to the issues raised by these agencies in its assessment.
(j) <i>to provide increased opportunity for community participation in environmental planning and assessment.</i>	The Department publicly exhibited the modification application and the first amendment and considered all submissions in its assessment.

Table C.2 | Matters for consideration under 4.15 of the EP&A Act

Environmental Planning Instruments	
<i>State Environmental Planning Policy (Planning Systems) 2021</i>	<p>In accordance with section 2.7(2) of this State Environmental Planning Policy (SEPP), the Independent Planning Commission of NSW is the consent authority for a modification application where an applicant has disclosed a reportable political donation. Boggabri Coal did not disclose a reportable political donation and consequently the Minister for Planning and Public Spaces is the consent authority for the modification. Under the Minister's delegation dated 26 April 2021, the Deputy Secretary, Development Assessment, may determine the application because there were more than 50 submissions objecting to the proposal.</p>
<i>State Environmental Planning Policy (Resources and Energy) 2021</i>	<p>Part 2.3 of the Resources and Energy SEPP lists a number of matters that a consent authority must consider before determining an application for consent for development for the purposes of mining. The Department has considered these matters in its assessment of the modification (throughout Section 5, as applicable) and has included a brief outline of key considerations below.</p> <p>Non-Discretionary Development Standards (section 2.16)</p> <p>Section 2.16 identifies non-discretionary development standards for the purposes of section 4.15(2) of the EP&A Act in relation to the carrying out of development for the purposes of mining. The modification report sets out Boggabri Coal's consideration of the applicable standards and whether or not the modified project meets them. The Department agrees with this assessment.</p> <p>Compatibility with Other Land Uses (sections 2.17 and 2.19)</p> <p>The Department's assessment has considered the potential impacts of the modification on other land uses in the area, including land used for forestry purposes, agricultural purposes, rural dwellings, conservation purposes and other approved mines.</p> <p>The Department considers that the modification would not materially change the compatibility of the project with these land uses, beyond what was considered in the original assessment. That is, the modified project would not be incompatible with the residential use of nearby dwellings and would have limited residual impacts on the capacity of other land users in the locality to undertake their activities.</p> <p>The modified project would also maximise the extraction of coal and would not prevent current or future extraction or recovery of resources.</p> <p>Voluntary Land Acquisition and Mitigation Policy (section 2.18)</p> <p>The Department's assessment has considered the NSW Government's <i>Voluntary Land Acquisition and Mitigation Policy</i> (VLAMP) in relation to noise impacts in Section 5.3. Under the VLAMP, a single receiver would qualify for mitigation rights due to predictions of elevated noise from the modified project. However, the existing conditions of consent already grant that receiver and two other receivers acquisition and mitigation rights on request as development consent was granted before the VLAMP was introduced. The Department has recommended that the existing mitigation and acquisition conditions continue to apply for these three receivers.</p>

The modification would not change the ROM production rate or disturbance area, and particulate matter (PM) concentrations would not exceed the criteria at any surrounding privately owned receivers. Accordingly, the VLAMP provisions in relation to air impacts are not relevant.

Natural Resource Management and Environmental Management (section 2.20)

Section 2.20 requires that, before granting consent for development for the purposes of mining, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure that impacts on significant surface water and groundwater resources, threatened species and biodiversity are avoided or minimised to the greatest extent practicable and that GHG emissions are minimised to the greatest extent practicable.

There would be no additional impacts to threatened species or biodiversity due to the modification. Impacts to surface and groundwater and greenhouse gas emissions are comprehensively addressed in **Sections 5.1 and 5.2**.

The Department considers the existing conditions of consent, including conditions in relation to water resources, threatened species and biodiversity and GHG emissions, are adequate to ensure that the modified project is undertaken in an environmentally responsible.

Resource Recovery (section 2.21)

The Department has considered the recovery of coal resources in its assessment of the modification. It considers that the modified project can be carried out in an efficient manner that optimises coal resource recovery while giving appropriate recognition to and protection for the significant environmental and other values that may be affected.

Transport (section 2.22)

The key purpose of this section relevant to the project is to limit the transport of coal on public roads. Although there would be an increase in employee numbers on the roads, the modification does not involve the transport of coal on public roads. Product coal would continue to be transported from the site by rail.

Rehabilitation (section 2.23)

Clause 17 outlines requirements relating to consideration of whether any consent granted should be subject to conditions aimed at ensuring rehabilitation of land disturbed by mining and, in particular, whether conditions should require preparation of a rehabilitation management plan, appropriate treatment of waste, remediation of soil contamination and the avoidance of public safety risks.

The Department considers the existing conditions are adequate to manage rehabilitation, waste and soil contaminations. The proposed modified conditions include a revised final landform.

State Environmental Planning Policy (Biodiversity and Conservation) 2021

There would be no changes to the lateral extent of the project and no additional land disturbance from the modification. Accordingly, the Department does not consider there would be any significant changes to the biodiversity impacts of the project and the existing conditions are adequate to manage biodiversity impacts.

State Environmental Planning Policy (Resilience and Hazards) 2021

Before granting consent for a development application that involves a “change of use”, the consent authority must consider a “preliminary investigation” of whether the land involved includes “contaminated land”. The modification would not involve a change of use and consequently no preliminary investigation is required.

The Department is satisfied that the project area does not have a significant risk of existing contamination given its historical and current land uses, and that the development is generally consistent with the aims, objectives and provisions of the SEPP.

Narrabri Local Environment Plan 2012 (Narrabri LEP)

The modification would not change the project boundary, which is located wholly within the area to which the Narrabri LEP applies. All activities are located within lands zoned for agricultural land use in the Narrabri LEP, and there would be no changes to the permissibility of the project.

Clause 5.10 of the Narrabri LEP outlines the provisions that relate to Aboriginal and European heritage in the Narrabri LGA. No heritage items listed in Schedule 5 of the Narrabri LEP are located within the project boundary, and there would be no impacts to European or Aboriginal heritage items as a result of the modification.

Clause 6.1 of the Narrabri LEP outlines considerations for the consent authority relating to earthworks.

Earthworks would be below land previously disturbed or approved to be disturbed. There would be no significant changes to the nature of the activities as a result of the modification.

At the end of mining, the infrastructure will be decommissioned and disturbed areas progressively rehabilitated.

The Department considers the existing conditions are adequate to avoid, manage or mitigate the impacts from earthworks

The public interest

C2 Ecologically Sustainable Development (ESD)

The EP&A Act adopts the definition of ESD found in the *Protection of the Environment Administration Act 1991*, as follows:

“ecological sustainable development requires the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:

a) *the precautionary principle;*

-
- b) *inter-generational equity;*
 - c) *conservation of biological diversity and ecological integrity; and*
 - d) *improved valuation, pricing and incentive mechanisms.”*

The Department has considered ESD and its related principles and programs. The Department has also had regard to the manner in which ESD and its principles and programs are addressed in the EIS, particularly in its Section 7.4.3. A summary of the Department's consideration follows.

Precautionary Principle

The ESD precautionary principle requires that: *“if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation”*.

The Department has assessed whether the modification threatens serious or irreversible environmental damage. The Department has carefully considered the material provided by Boggabri Coal in its modification report, Submissions Report, Amendment Report and other documents and has consulted closely with key Government agencies to obtain their input and advice on various aspects of the Project.

The modification report contains a number of specialist environmental impact assessments. These outline the environmental impacts of the modification, which would primarily be associated with additional greenhouse gas emissions and changes to impacts on water resources due to mining deeper.

The development consent already incorporates a number of requirements to ensure the impacts of the approved project are avoided or minimised. The Department has considered whether these requirements are adequate to manage any additional risks from the modification and/or whether additional conditions could be imposed to manage the risks.

The Department's assessment has been guided by:

- a. careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
- b. an assessment of the risk-weighted consequences of various options.

It considers that there is sufficient scientific certainty regarding environmental impacts and residual risks to enable determination of the application.

The Department considers that the existing performance measures and other conditions of consent would provide appropriate protection for water resource and environmental values, and would minimise the potential for any serious or irreversible environmental damage.

Intergenerational Equity

The ESD principle of intergenerational equity requires that: *“the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations”*.

The Department considers that the modification does not conflict with the principle of intergenerational equity. That is, the health, diversity and productivity of the environment would be maintained or enhanced.

The recommended performance measures and other conditions of consent would provide an appropriate degree of protection for the health, diversity and productivity of the environment and not constrain the ability of future generations to use or enjoy the project area in a similar way to the present and recent past.

The incremental increase in direct GHG emissions from the modification would constitute a very small contribution towards climate change at both the national and global scale. Nevertheless, the Department acknowledges that the mining of coal and its combustion is a major contributor to anthropogenic climate change, which has the potential to impact future generations. In recognition of that risk, NSW has set a goal of achieving net zero emission by 2050, and to deliver a 70% emissions reduction over 2005 levels by 2035. The Department considers that the modification would not prevent NSW from achieving those goals.

The existing conditions require Boggabri Coal to implement an Air Quality and Greenhouse Gas Management Plan, including requirements to minimise Scope 1 and 2 GHG emissions.

Scope 3 GHG emissions accounting would be undertaken by the entities and nations where the product coal is combusted. The Department considers that the Project's Scope 3 GHG emissions do not contravene the principle of intergenerational equity insofar as it is established and applied by NSW legislation and the applicable policy framework.

Conservation of Biological Diversity and Ecological Integrity

The ESD principle of conservation of biological diversity and ecological integrity requires that: *"conservation of biological diversity and ecological integrity should be a fundamental consideration"* in decision making processes, such as the development consent process and the environmental impact assessment process which supports it.

The modification would not require any further vegetation clearing or surface disturbance. The Poplar Box Woodland is the only plant community with potential reliance on groundwater that could potentially be affected by incremental impacts from the modification. However an assessment of significant concluded that there was unlikely to be a significant impact on this community.

Improved Valuation, Pricing and Incentive Mechanisms

The ESD principle of improved valuation, pricing and incentive mechanisms requires that: *"environmental factors should be included in the valuation of assets and services"* in decision making processes, including by such means as the 'polluter pays' principle, full life cycle costing and cost-effective pursuit of environmental goals.

The environmental costs of the modification have been addressed in detail and quantified to the degree possible in the cost benefit analysis prepared as part of the modification report. The direct environmental effects of the modification would largely be internalised through the adoption and funding of the mitigation measures proposed by Boggabri Coal or otherwise required by conditions to mitigate, remediate or offset them. The primary externality would be the damage costs of GHG emissions. However, after even after accounting for those costs, the modification would still have a significant net social benefit to NSW.

Planning Agreements

Boggabri Coal makes ongoing contributions to NSC through an existing voluntary planning agreement. This would continue to operate over the extended mine life.

Likely impacts of development, including environmental impacts on the natural and built environment and social and economic impacts on the locality

The Department has undertaken a comprehensive assessment of the likely impacts of the modification on the natural and built environment and the social and economic impacts on the locality. These matters are addressed in **Section 5**.

Suitability of the site

The modification would not change the project boundary or change anything that would alter the conclusions of the original assessment of the project.

Appendix D – Commonwealth assessment

D1 Introduction

On 28 May 2021, a delegate of the then Minister for Environment determined that Boggabri Coal Mine – Modification 8 (the modification) is a ‘controlled action’ under section 75(1) of the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The modification was determined as being likely to have a significant impact on the controlling provision of water resources, in relation to coal seam gas development and large coal mining development (section 24D & 24E).

In accordance with the Bilateral Agreement between the Commonwealth and NSW Governments, the Department provides the following additional information for the Commonwealth Minister to take into account when deciding whether or not to approve the modification under the EPBC Act.

The Department’s assessment has been prepared based on the information contained in:

- Boggabri Coal’s modification report;
- Boggabri Coal’s amendment reports;
- advice received from State agencies and local councils;
- submissions received from special interest groups and the public;
- Boggabri Coal’s submissions reports; and
- additional information provided in response to the Department’s requests.

This Appendix is supplementary to, and should be read in conjunction with, the main body of the Department’s Assessment Report, particularly **section 5.1**, which includes the consideration of impacts on groundwater and surface water.

D2 Impacts to water resources

The Department’s assessment has considered the predicted impacts on surface water and groundwater resources, including potential impacts on water resources, groundwater dependent ecosystems and other water users.

The modification was also jointly referred by the Department and the then Commonwealth Department of the Environment (the Commonwealth) to the IESC, requesting advice on potential surface water and groundwater impacts. The IESC’s advice is included in **Appendix A4**. The Department has considered the IESC’s advice and Boggabri Coal’s response in its assessment of the modification and in its updates to the conditions for the project (see **Appendix D and E**).

The Department considers that the modification would not result in a significant impact to surface water and groundwater resources, subject to implementation of the avoidance and mitigation measures described in Boggabri Coal’s modification report (see **Appendix A1**), submissions reports (see **Appendix A3**), amendment reports (see **Appendix B**) and additional information (see **Appendix A5**), and the Department’s updates to the conditions.

However, to ensure these measures are implemented appropriately and water impacts are minimised, the Department has recommended additional conditions requiring Boggabri Coal to:

- further report on direct and indirect water take;
- manage water during high rainfall and flooding periods;
- characterise surface water to confirm the appropriate discharge criteria; and
- monitor and assess the alluvial groundwater and groundwater dependent ecosystems identified during the modification.

D3 Conclusions on Controlling Provisions

A water resource, in relation to coal seam gas development and large coal mining development (Sections 24D and 24E of the Act)

For the reasons set out in **Sections 5.3, 6.4** and relevant sub-sections of **Section 6.5** and this Appendix, the Department recommends that the impacts of the action on a water resource, in relation large coal mining development would be acceptable, subject to the impact avoidance and mitigation measures described in NCOPL's EIS, Submissions Report, Amendment Report and the recommended conditions of consent in **Appendix H**.

D4 Additional EPBC Act Considerations

Table D1 contains the additional mandatory considerations, factors to be taken into account and factors to have regard to under the EPBC Act which are additional to those already addressed.

Table D1 – Additional considerations for the Commonwealth Minister under the EPBC Act

EPBC Act section	Consideration	Conclusion
Mandatory considerations:		
136(1)(b)	<p>Social and economic matters are considered in detail in Sections 5.3, 5.4 and 5.5 of this assessment report.</p> <p>Negative social impacts, including noise impacts on local residents living close to the project area and the costs of GHG emissions, have been considered in the assessment.</p> <p>The conditions already required a range of mitigation and offsetting measures for social impacts, including contributions to NSC and significant contributions for community projects in Gunnedah Shire.</p>	<p>The Department concludes that the proposed modification would result in a range of economic and social benefits for the local and regional communities and economies and is of public benefit to the community of NSW.</p> <p>Overall, social impacts would be very minor compared with the social and economic benefits.</p>
Factors to be taken into account:		
3A, 391(2)	<p>The principles of ESD, including the precautionary principle, have been taken into account throughout this assessment report (see in particular Section C2 in Appendix C).</p> <p>In particular, this has involved:</p> <ul style="list-style-type: none">careful consideration of the long term and short term economic, environmental, social and equitable considerations relevant to this decision;the assessment being based on the importance of conserving biological diversity and ecological and cultural integrity;proposed mitigation measures which reflect improved valuation, pricing and incentive mechanisms and place a financial cost on the Applicant to mitigate the environmental impacts of the proposed action;	<p>The Department considers that the proposed action, if undertaken in accordance with the recommended conditions of consent, would be consistent with the principles of ESD.</p>

EPBC Act section	Consideration	Conclusion
	<ul style="list-style-type: none"> proposed conditions that restrict environmental impacts and impose monitoring and adaptive management requirements and reduce uncertainty related to the potential impacts of the proposed action; and proposed conditions requiring the proposed action to be delivered and operated in a sustainable way, so as to protect water resources and other environmental values for future generations 	
136(2)(e)	<p>Other information on the relevant impacts of the proposed action to MNES. The Department is not aware of any information on relevant impacts which was not provided by Boggabri Coal; and not considered by relevant agencies and the IESC, and not considered by the Department in completing its assessment report.</p>	<p>The Department considers that all required information that is relevant to the impacts of the proposed action has been provided by Boggabri Coal and taken into account in its assessment, proposed conditions of consent and its advice to the Minister under the EPBC Act.</p>
136(2)(f)	<p>Advice from the IESC: The Department and DCCEEW collaborated in preparing a request for advice from the IESC. The advice received was duly considered by Boggabri Coal and the Department (see Section 5.1).</p>	<p>The Department's assessment took into account all advice received from the IESC.</p>
<p>Factors to have regard to:</p>		
176(5)	<p>Bioregional plans</p>	<p>There is no approved bioregional plan relevant to the proposed action.</p>
<p>Considerations on deciding on conditions:</p>		
134(4)	<p>The drafting of conditions must consider:</p> <p>Article I. information provided by the person proposing to take the action or by the designated proponent of the action; and</p> <p>Article II. the desirability of ensuring as far as practicable that the condition is a cost-effective means for the Commonwealth and the person taking the action to achieve the object of the condition.</p> <p>Article III. All Project-related documentation, including the material provided by Boggabri Coal, is available from the Department's website: www.majorprojects.planning.nsw.gov.au.</p>	<p>The recommended amendments to conditions are based on the material provided by Boggabri Coal (including its modification report, submissions report, amendment report and responses to requests for information) and consultation with the IESC, the Mining Panel, DPI – Water, EPA, BCS, the Resources Regulator and other agencies.</p> <p>The Department considers that the conditions of consent as modified by the instrument of modification (see Appendix E) are comprehensive, efficient and a cost-effective means of achieving their various purposes.</p>

Appendix E – Notice of modification

Refer to the 'Determination' folder under the 'Assessment' tab on the Department's website at:
<https://www.planningportal.nsw.gov.au/major-projects/projects/mod-8-increase-depth-mining>

Appendix F – Consolidated consent

Refer to the 'Determination' folder under the 'Assessment' tab on the Department's website at:
<https://www.planningportal.nsw.gov.au/major-projects/projects/mod-8-increase-depth-mining>