Whitehaven

2025

Maules Creek Continuation Project

Environmental Impact Statement

Appendix Q
Environmental Risk Assessment Report

For Whitehaven Coal Limited – Maules Creek Coal Pty Ltd

Maules Creek Continuation Project EIS – Environmental Risk Assessment Report

Report Title:	Maules Creek Continuation Project EIS Environmental Risk Assessment Report
Client:	Whitehaven Coal Limited
By:	Peter Standish, Director
Team Session:	15th August 2023
Job:	RM19179
Revision:	V3
Date:	19th May 2025

DOCUMENT DISTRIBUTION AND CONTROL

Ref No.	RM19179
Title	Maules Creek Continuation Project Environmental Risk Assessment Report
General Description	This report summarises the results and recommends follow up actions from the study conducted into the planned Maules Creek Continuation Project at the Maules Creek Coal Mine. It reviews the various aspects and impacts of the potential effects related to the works on the subject area.
Key Supporting Documentation	AS/NZS ISO 31000: 2018 Risk Management – Principles and Guidelines. MDG1010 – Minerals Industry Safety and Health Risk Management Guideline (Department of Trade and Investment, 2011).

Versions

Rev	Date	Description	Created By
1	28/08/2023	Draft report for Resource Strategies review	P Standish
2	27/09/2023	Revised draft released for team review	P Standish
3	27/03/2025	Finalised version issued for wider review	P Standish

Distribution List of Latest Version

No	User
1	Whitehaven Coal Limited
2	Resource Strategies
3	Risk Mentor

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EXECUTIVE SUMMARY

This document is an Environmental Risk Assessment (ERA) which identifies risks associated with key potential environmental issues for the Maules Creek Continuation Project (the Project).

The Maules Creek Coal Mine (MCCM) is located approximately 17 kilometres north-east of Boggabri in the Narrabri Shire Local Government Area (Narrabri LGA) in New South Wales. The Project proposes the continuation of open cut mining operations at the MCCM for an additional operational life of approximately 10 years (beyond the current 2034 consented mine life) within mining and exploration tenements held by Whitehaven Coal Limited (Whitehaven).

On 15 August 2023, a team consisting of representative from Whitehaven and specialist consultants participated in a facilitated ERA workshop. The scope of the ERA workshop was:

To identify key Project environmental risks to be addressed in the Environmental Impact Statement.

Key potential environmental issues were identified by the ERA team using a voting system, whereby team members were assigned a number of "votes" to put towards the issues they considered to be the key potential environmental issues for the Project. The key potential environmental issues identified by the ERA team were considered to warrant further assessment in the Project Environmental Impact Statement (EIS). The key potential environmental issues identified in the ERA workshop will be addressed in the EIS and in the specialist reports included as appendices to the EIS.

The planned controls were considered for all identified risks, including management measures currently implemented at the MCCM. With an application of the identified controls, the team consensus was that potential environmental risks associated with the Project could be managed to "As Low As Reasonably Practicable" level of risk.

1 INTRODUCTION

The Maules Creek Coal Mine (MCCM) is located approximately 17 kilometres north-east of Boggabri in the Narrabri Shire Local Government Area (Narrabri LGA) in New South Wales (NSW) (Figures 1 and 2).

The MCCM is a joint venture between Aston Coal 2 Pty Ltd (a wholly owned subsidiary of Whitehaven Coal Limited [Whitehaven]) (75 percent [%]), ICRA MC Pty Ltd (a wholly owned subsidiary of Itochu Corporation) (15%) and J-Power Australia Pty Ltd (a wholly owned subsidiary of Electric Power Development Company Ltd) (10%). The MCCM is operated by Maules Creek Coal Pty Ltd (MCC).

Mining operations at MCCM are approved until 31 December 2034 with a run-of-mine (ROM) coal extraction rate of up to 13 million tonnes per annum (Mtpa).

The Maules Creek Continuation Project (the Project) proposes the continuation of open cut mining operations at the MCCM within its mining and exploration tenements for a further approximately 10 years (from 2034 to 2044).

This document is an Environmental Risk Assessment (ERA) that identifies potential impacts associated with key potential environmental issues associated with the Project. This document draws on the outcomes of the ERA conducted for the approved MCCM (Hansen Bailey, 2011), where relevant.

1.1 *Overview of the Project*

The Project would allow for the extraction of additional coal adjacent to the approved MCCM open cut pit within existing mining and exploration tenements. The Project would include the following activities (Figures 3 and 4):

- extension of open cut mining operations within Coal Lease 375, Mining Lease 1719 and Authorisation 346 to allow mining and processing of additional coal reserves until approximately 31 December 2044;
- extraction of approximately 117 Mt of ROM coal (in addition to the approved MCCM coal resource of 240 Mt of ROM coal;
- extraction of up to 14 Mtpa of ROM coal (i.e. a 1 Mtpa increase from the currently approved maximum ROM coal mining rate of 13 Mtpa);
- a revegetation program to establish approximately 2,300 hectares of native woodland in the vicinity of the MCCM (i.e. in addition to any offset and rehabilitation obligations);
- an increase in the operational workforce to an average of approximately 940 people, with a peak operational workforce of approximately 1,030 people;
- continued operation of the existing Coal Handling and Preparation Plan and train load-out and rail spur infrastructure, with upgrades as required;
- continued transport of up to 12.4 Mtpa of product coal via rail (i.e. no change to the currently approved maximum product coal transport rate);
- development of an integrated waste rock emplacement landform that incorporates geomorphic design principles;
- construction and use of a remote go-line, access and infrastructure area;
- continued operation and extension of the MCCM water management system;
- upgrades to workshops, electricity distribution and other ancillary infrastructure;

- continued placement of coal rejects within the mined out voids and the out-of-pit overburden emplacement areas;
- construction and operation of a water transfer pipeline between the MCCM water pipeline network and the approved Vickery Coal Mine to Tarrawonga Coal Mine pipeline;
- ongoing exploration activities; and
- other associated infrastructure, equipment and activities.

1.2 *Objectives*

The aim of the ERA workshop was to:

- Identify key environmental risks to be addressed in the Project EIS.
- Confirm that adequate risk treatment measures are identified for implementation such that the expected residual risk is as low as reasonably practicable.
- Enable development of an ERA document prepared in accordance with Australian Standard/New Zealand Standard International Organisation for Standardisation (AS/NZS ISO) 31000:2018 Risk management – Guidelines (AS/NZS ISO 31000:2018), for inclusion in the EIS.

1.3 *Client*

The client for the ERA is Whitehaven and the proponent for the development is MCC.

1.4 *Scope*

The scope of the ERA was to conduct a risk assessment of the potential environmental impacts of the Project with a focus on risks relating to the environment and the public, and identify the key issues for further assessment.

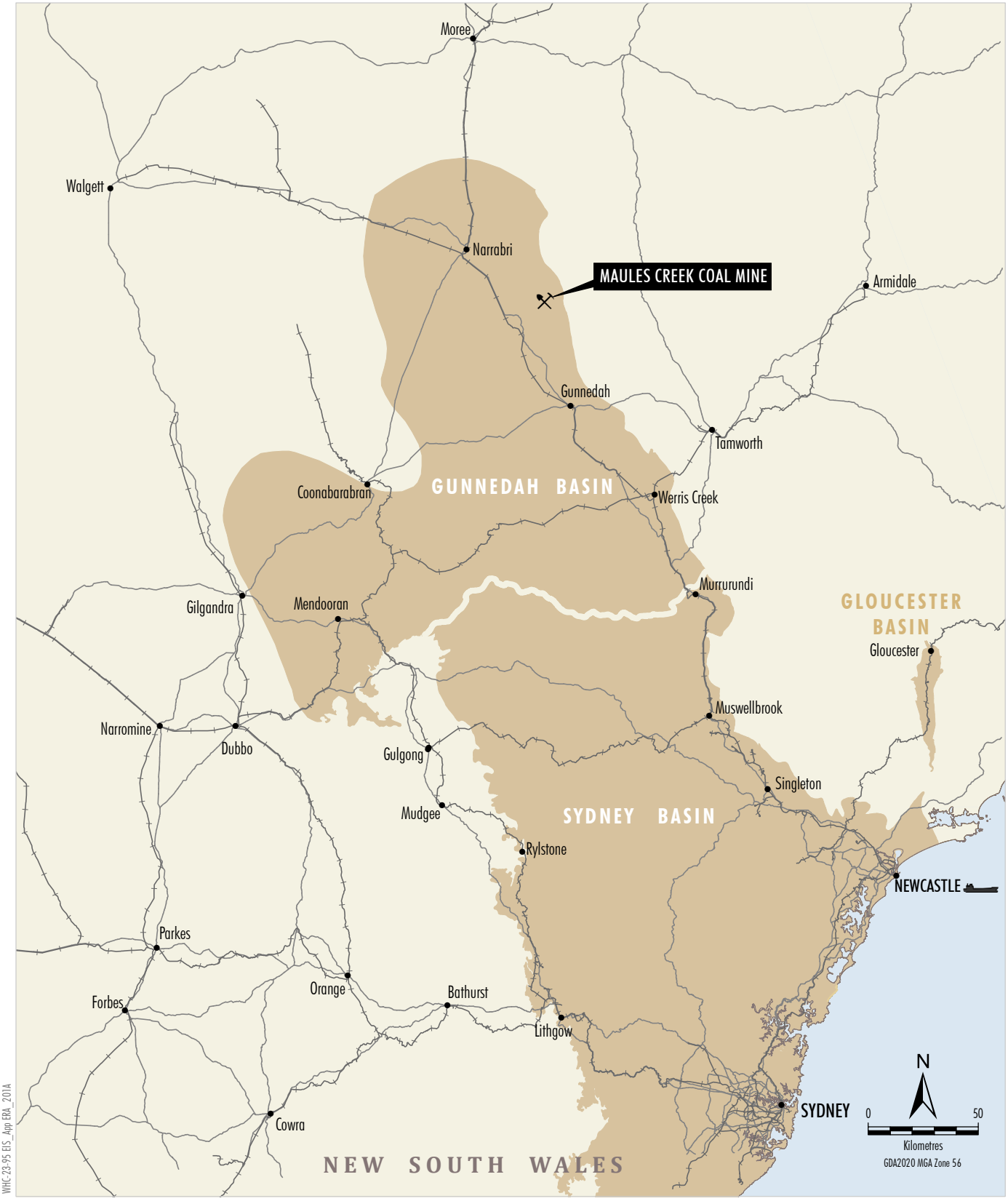
The existing ERA for MCCM, as well as risks identified prior to the workshop will be used to provide baseline information for this ERA.

The risks will be assessed against the below aspects:

- relevant criteria defined by statutory requirements;
- requirements by the local, State and Federal Government agencies with responsibilities in the area;
- relevant guidelines published by the State and Federal Government (including any recent updates or changes);
- previous observations/information collected from the area; and
- any other information.

Other considerations were also noted by the team but are not within the scope of this ERA. These were:

- regulatory requirements and/or approvals risks;
- technical assessment issues;
- health and safety risks to MCCM personnel; and
- business risks to Whitehaven.



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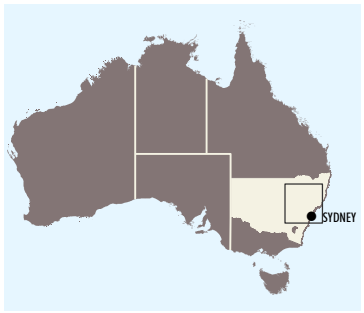
Source: NSW Spatial Services (2021)



LEGEND
- Highway
- Major Railway
- Mine Site
- Port
- Coal Basin

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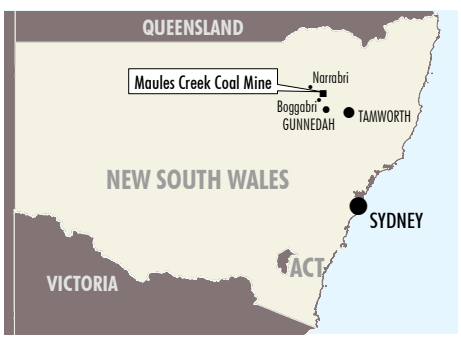
MAULES CREEK CONTINUATION PROJECT

Regional Location of the Project

Figure 1



LEGEND
- MCCM Mining Tenement Boundary (CL and ML)
- Mine Site
- Local Government Boundary
- State Forest
- State Conservation Area, Aboriginal Area
- Rail Line

Source: NSW Spatial Services (2023); Geoscience Australia (2011)

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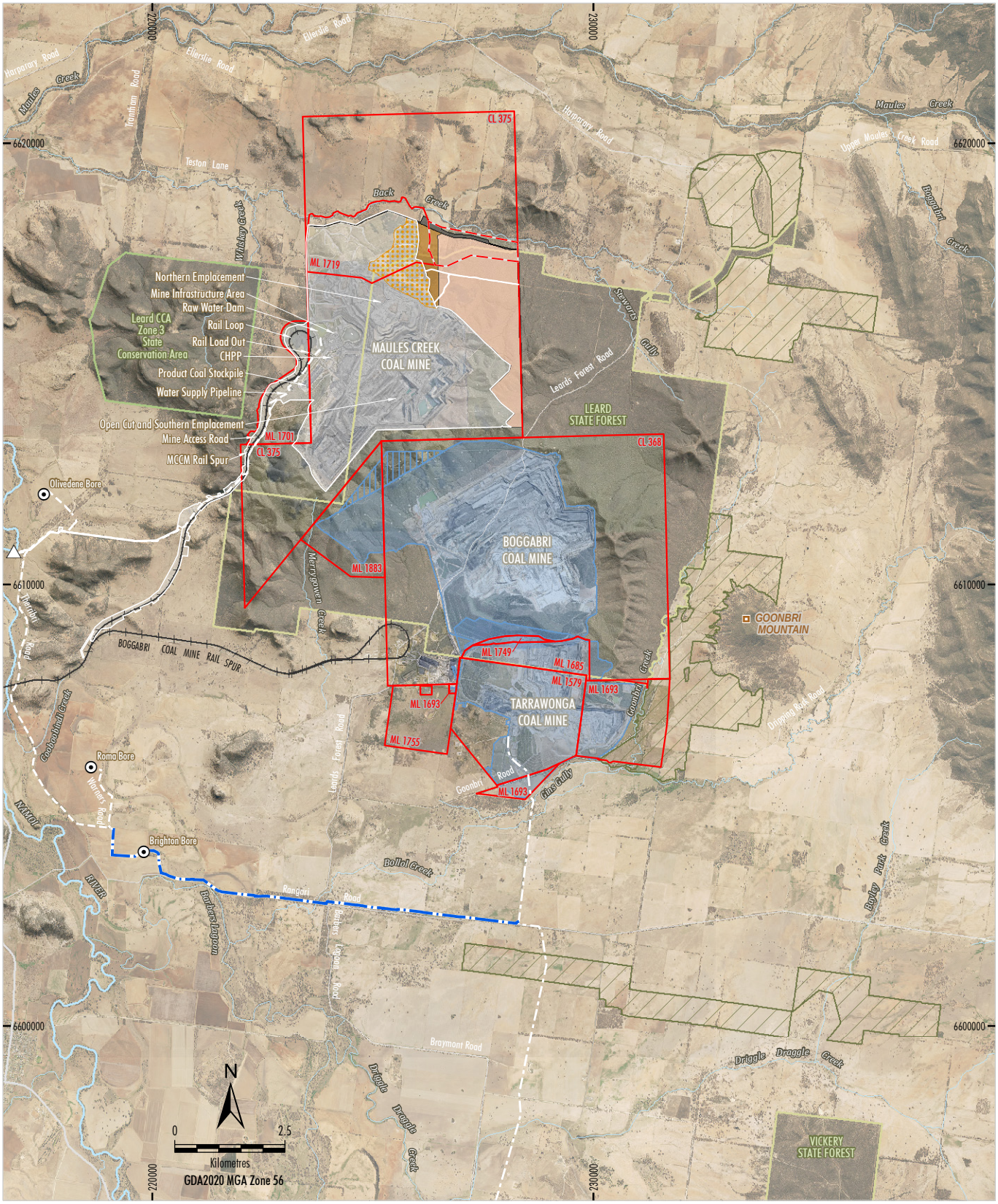
MAULES CREEK CONTINUATION PROJECT

Location of the Project in the Narrabri LGA

Figure 2



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LEGEND

- Rail Line
- State Conservation Area
- State Forest
- Mining Tenement Boundary (ML and CL)
- Provisional Mining Lease Application Area
- Other Mining Operation *
- Other Mining Operation - Proposed *
- VCM to TCM Water Transfer Pipeline

Existing/Approved MCCM Development

- Approximate Extent of Existing/Approved Surface Development
- MCCM Water Supply Pipeline
- MCCM Groundwater Supply Bore
- MCCM Namoi River Pump Station

Maules Creek Continuation Project

- Indicative Go-line, Access and Infrastructure Area
- Indicative Open Cut Extension Area
- Indicative Overburden Emplacement Extension
- Existing Overburden Rehabilitation to be Disturbed
- Indicative Landscape Revegetation Zones#
- Indicative Water Transfer Pipeline (Proposed)

Source: NSW Spatial Services (2024)
Orthophoto Mosaic: Whitehaven (2019-2024)

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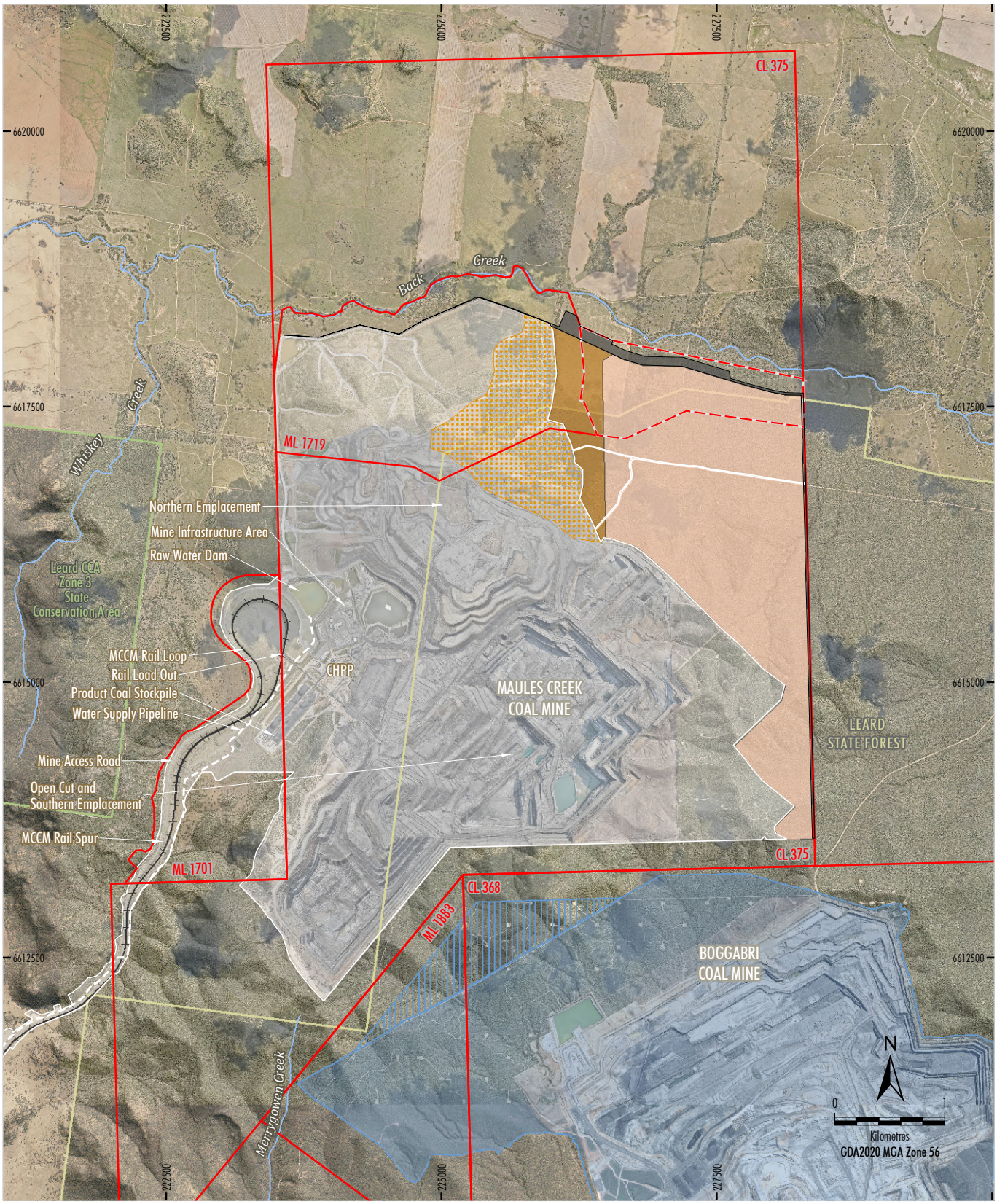
MAULES CREEK CONTINUATION PROJECT

Overview of the Project Site Activities

** BCM boundary digitised from Figure 1 of the BCM Modification 10 Scoping Letter.*

#Landscape Revegetation Zones shown on this figure are approximate extents only.

Figure 3



WHC-23-95 EIS_App ERA_204A

LEGEND

- Rail Line
- State Conservation Area
- State Forest
- Provisional Mining Lease Application Area
- Mining Tenement Boundary (ML and CL)
- Other Mining Operation *
- Other Mining Operation - Proposed *

Existing/Approved MCCM Development

- Approximate Extent of Existing/Approved Surface Development
- MCCM Water Supply Pipeline

Maules Creek Continuation Project

- Indicative Go-line, Access and Infrastructure Area
- Indicative Open Cut Extension Area
- Indicative Overburden Emplacement Extension
- Existing Overburden Rehabilitation to be Disturbed

Source: NSW Spatial Services (2024)
Orthophoto Mosaic: Whitehaven (2022-2024)

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MAULES CREEK CONTINUATION PROJECT

Detailed Site Overview

** BCM boundary digitised from Figure 1 of the BCM Modification 10 Scoping Letter*

Figure 4

1.5 *External Facilitation*

The ERA workshop was facilitated by Dr Peter Standish of Risk Mentor Pty Ltd (Risk Mentor) – a company specialising in risk assessment and risk management processes. The facilitator, Dr Peter Standish, is experienced with open cut mining and many aspects of environmental monitoring and rehabilitation.

The risk assessment workshop included:

- establishing the context including review of supporting information and objectives;
- identifying risks via a number of risk management techniques, including:
  - brain writing;
  - modified hazard and operability (HAZOP) analysis; and
  - gap analysis against the performance measures in the Development Consent.
- analysis of identified risks and nomination of key potential environmental issues; and
- ranking of the risks, including consideration of identified preventative and mitigation measures.

1.6 *The Team*

The team met on 15 of August, 2023 at Whitehaven's Gunnedah offices, Gunnedah, NSW. A team-based approach was utilised in order to incorporate an appropriate mix of skills and experience to identify the potential loss scenarios/issues relating to the Project. Details of the team members and their relevant qualifications and experience are shown in Table 1.

Table 1 – Team Members

Name	Position / Affiliation	Relevant Qualifications & Experience
Mark Stevens	Executive General Manager - Project Delivery, Whitehaven	Bachelors of Science (Honours, Mining Engineering), Masters in Science (Mining), Masters of Business Administration and over 25 years of industrial and operational experience, designing, delivering and managing projects.
Sarah Withell	Executive General Manager HSE, Whitehaven	Masters in Engineering Science. 25 years of experience in metalliferous and coal mining.
Shaun Leary	General Manager Technical Services, Whitehaven	Formal qualifications in Mining Engineering and Geology. Statutory qualifications as a Mining Engineering Manager with over 25 years of experience within the mining industry.
Michael Barker	Senior Project Manager - Project Development, Whitehaven	Bachelors of Science (Geology and Earth Sciences) and over 25 years design, construction, operational and leadership experience in the resources sector.
Tony Dwyer	Group Manager - Approvals and Biodiversity, Whitehaven	Bachelors of Science, Graduate Diploma (Natural Resources), Masters of Business and Environmental Management, and over 20 years operational and technical design and management experience.
Jorge Moraga	General Manager Maules Creek Operations, Whitehaven	Formal qualifications and over 28 years of experience in industrial and leadership roles.
David Gonzalez	Technical Service Manager, Whitehaven	Bachelors of Engineering (Mining and Metallurgy) and over 18 years industrial and technical design and management.
Roman Haverkamp	Senior Acoustic Engineer, RWDI	Formal qualifications and over 20 years of experience in acoustics and noise design, monitoring, modelling and management.

Name	Position / Affiliation	Relevant Qualifications & Experience
Philip Henschke	Senior Atmospheric Physicist, Todoroski Air Sciences Pty Ltd	Bachelors of Science (Physics and Ecology) and over 12 years analysis and management experience in atmospheric monitoring, modelling and design.
James Tomlin	Technical Director / Principle - Hydrogeologist, AGE	Bachelors of Science (Environmental Science) Certificate of Science (Geology), Masters of Science (Hydrology and Groundwater Management) and over 23 years investigation, analysis and water management experience.
Sally Kirby	Senior Ecologist, Premise	Bachelors of Science (Marine), Masters of Science (Environmental Studies) and over 20 years operational and consulting experience.
Rachel Lillis	Whincop Archaeology	Bachelors of Arts (History) and Diploma of Languages (University of Newcastle), Graduate Certificate of Archaeological Science and Masters of Archaeological Science (Australian National University). 8 years of consulting experience in archaeology heritage assessment and management.
David Newton	WRM Water and Environment (Surface Water)	PhD, Masters of Engineering (Civil), Bachelors of Engineering (Civil) and over 18 years operational and consulting experience in water management and system designs.
Peter Standish	Facilitator, Risk Mentor	Formal technical and statutory qualifications in mining and over 30 years industrial experience at similar operations.
Jamie Warwick	Senior Environmental Consultant, Resource Strategies	Bachelors of Engineering (Civil) and over 12 years of experience in environmental management and approvals.
Courtney Muller	Environmental Manager, Resource Strategies	Bachelors of Science (Zoology/Ecology) and approximately 2 years consulting experience.

2 ESTABLISH THE CONTEXT

2.1 *Project Context*

A summary of the main activities associated with the Project is provided in Section 1.1 earlier in this report.

2.2 *Risk Management and Organisational Context*

This ERA was conducted within the context of Whitehaven's guidelines. These guidelines require a rigorous analysis and suggest an approach to assessing the risks that involves qualitatively considering their likelihood and consequence.

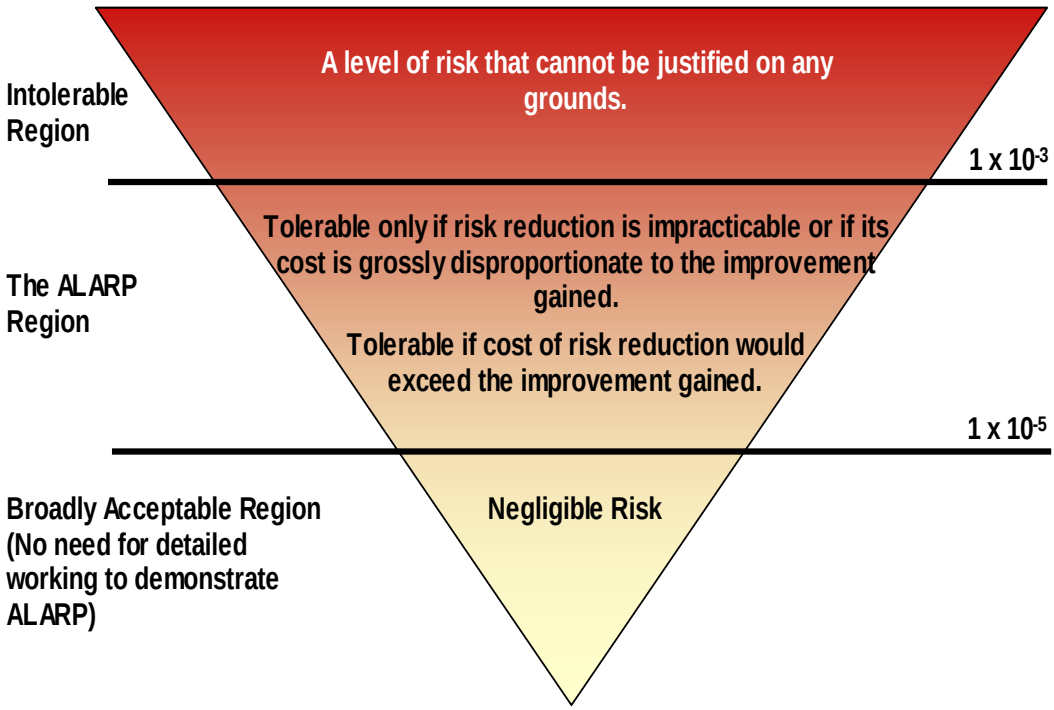
2.2.1 Risk Acceptability and Risk Criteria

The 'tolerability' of a risk is the willingness to live with a risk to secure benefits, on the understanding that the risk is being properly controlled (HB 203:2018 – *Environmental Risk Management – Principles and Process*). Legislation and good practice are targeted to reduce risk to *"As Low as Reasonably Practicable"* (ALARP). ALARP is often interchanged with *"As Low as Reasonably Achievable"* (ALARA).

The purpose of risk criteria is to allow the organisation to clearly define unacceptable levels of risk, or conversely the level of risk which is acceptable or ALARP. In essence the risk criterion enables the organisation to prioritise actions proposed to control the risk during the risk assessment – leading to the development of the Risk Treatment Plan (see later sections and the Appendices).

The ALARP principle, as represented in the diagram below, was developed to assist in the definition of the acceptability of risk and to demonstrate that an organisation has done all that is considered to be practical in reducing the level of exposure to a risk. More often this is done qualitatively rather than as a quantitative probability as shown on the right-hand side of the diagram presented in Figure 5**.** A risk may be tolerable in the ALARP zone as shown in Figure 5.

Figure 5 – Risk Criteria "ALARP"



2.3 *Key Assumptions*

The identification of key assumptions is a critical part of the risk assessment process – forming the basis for many engineering/project decisions. It is important that these assumptions are validated and reviewed as part of the risk management process. Key assumptions applied during the risk assessment process were:

- the risk assessment relates only to the changes related to the Project – all other issues being suitably addressed by existing environmental management controls;
- all commitments made in approval documentation or controls currently in place were taken to be valid for this Project; and
- risk ranking was undertaken on the basis of consequences being in excess of approved levels and in consideration of remediation and the application of stated controls (included in the ranking basis discussions).

3 METHODOLOGY

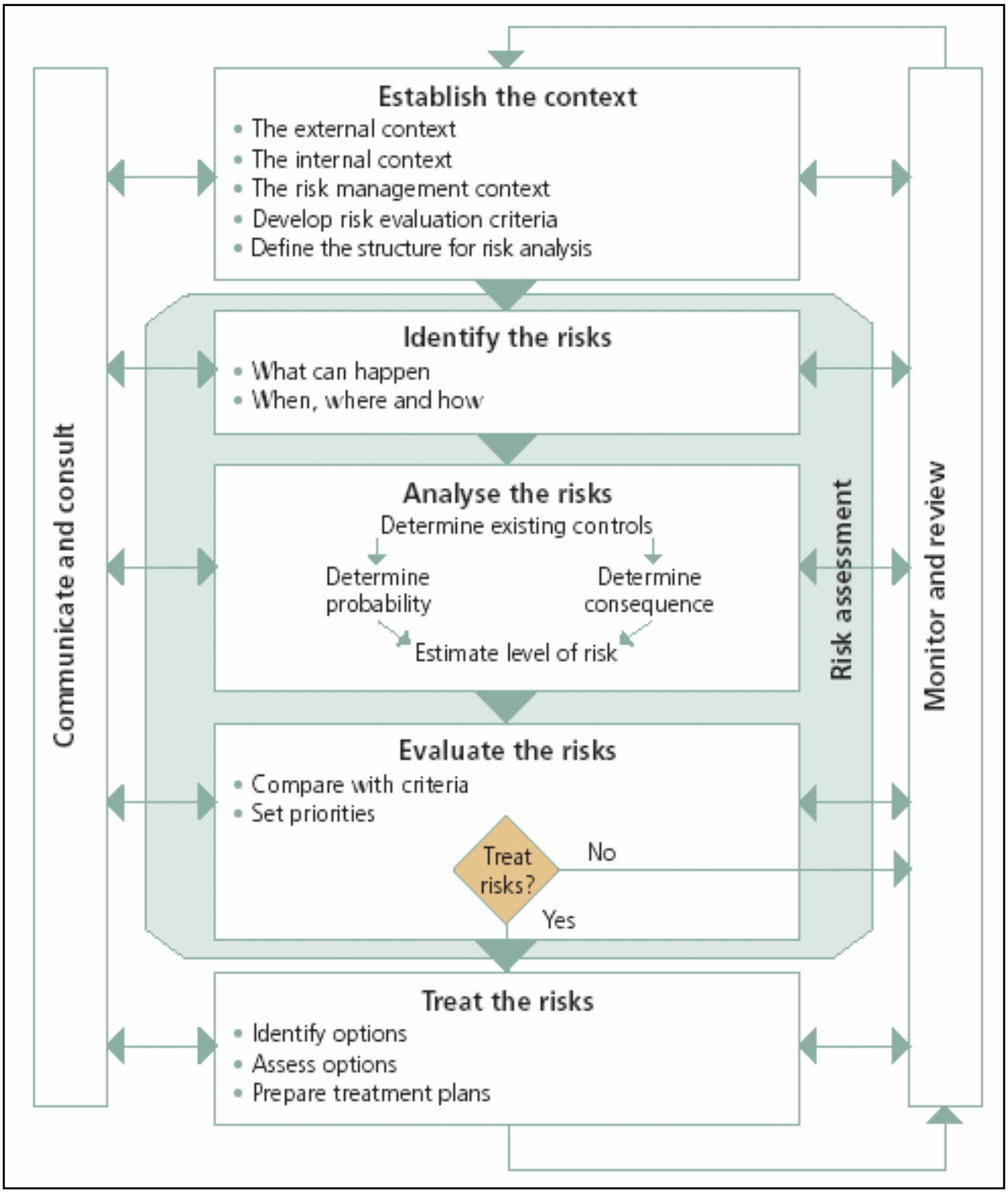
3.1 *Key Steps*

The key steps in the risk assessment process included:

1. Reviewing the available background data on MCCM's environmental issues (including incidents), and site controls (in procedures, management plans, and strategy documents).
2. Facilitation of a scoping session with decision making personnel to discuss scope material, and to confirm the risk analysis process and key outcomes sought.
3. Facilitation of a team-based analysis to evaluate and treat risks, comprising:
    a. an open discussion with the team on "what do we want to achieve" in relation to the analysis;
    b. presentation by subject matter experts on the project and the status of detailed studies;
    c. review of earlier relevant Risk Assessment documentation;
    d. brain writing process to identify general issues related to the application;
    e. modified HAZOP - reviewing an aerial photo view of the mine to identify potential surface features which could contribute to/be affected by activities related to the Project;
    f. identification of planned (existing) and additional controls to mitigate risk levels to a ALARP state; and
    g. risk ranking of the summary items.
4. Complete draft report to AS/NZS ISO 31000: 2018 standard for review by personnel.
5. Finalise the report and issue as a controlled copy for ongoing use.

This approach is informed by the process pictured in Figure 6.

Figure 6 – Risk Management Process



Source: **After HB 203:2012.**

4 IDENTIFYING HAZARDS AND ISSUES

4.1 *Background Analysis of Documents*

The various documents listed in Section 9 were reviewed to determine the nature of specific threats and controls identified for the operation. This desktop analysis, and the knowledge of the documents held by the Risk Assessment team members assisted in the population of the Control Measures and Ranking Basis columns in the Risk Treatment Plan provided in Appendix 2.

4.2 *Brain Writing*

Brain writing is a technique based on the work of Edward de Bono (who built on the work of Alex Faickney Osborne) and is intended to promote creative thought amongst a group of people. As applied by Risk Mentor, the process involves:

1. Quiet reflection – where individuals write their thoughts on the subject onto paper or card(s);
2. Group discussion – with each person in the team taking a turn to read out one of their issues – and then refinement of each issue based on input from other team members who had similar items on their list; and
3. Key word association (where relevant) to identify additional issues for the register based on connection with the subject.

Synopses of these issues are included in the Table 6 – Risk Treatment Plan, later in this report.

4.3 *Modified HAZOP*

The next "tool" applied with the team was that of modified HAZOP. In this process, aerial photographs in the presentation of the site (the Project area) were used to identify potential impacts that could arise.

The identified keywords used in the HAZOP process representing environmental issue subject areas for the Project were:

- Groundwater;
- Surface Water;
- Noise;
- Air Quality;
- Health Risk;
- Biodiversity;
- Aquatic Ecology;
- Aboriginal Cultural Heritage;
- Historic Heritage;
- Greenhouse Gas;
- Road Transport;
- Agricultural Enterprises;
- Land Contamination;
- Social;
- Economic;
- Visual Landscape;
- Soil Resources;
- Geotechnical and Geomorphic; and
- Blasting.

The output from this process was added to the over-arching risk register from the team session (shown in the Table 6).

5 ANALYSE RISK

Analysis of identified issues requires the stakeholders to determine the risk that the identified threat poses to the organisation or the importance of the potential control. Risk is the product of the consequence and the likelihood of the event occurring with and without controls in place.

Risk analysis involves determining the consequences or impact of a potential event occurring in combination with the likelihood of that event occurring. The result is a "level of risk" defined by the following.

Level of Risk = Consequence x Likelihood

The elements of risk level determination are as follows:

1. Consider the causal pathway – the balance between the intensity and frequency of the cause(s) and the preventative controls in place to prevent them from becoming incidents.
2. Identify existing mitigating control strategies and tactics that act to minimise negative outcomes from an incident.
3. Determine the consequences of the outcome reached by the causal pathway – with a negative impact or an opportunity. Where appropriate, the causal pathway considered should identify the dimension upon which is impacted (e.g. outcome is related to harming people, natural environment, property, process continuity, etc.).
4. Determine the likelihood of the outcome being reached – giving balance to the cause, preventative and mitigating controls for a negative consequence or positive opportunity occurring. Likelihood is defined as the product of the probability of the event occurring and the overall exposure to the event.
5. Estimate the level of risk of an outcome by combining the consequence and likelihood rankings using the risk matrix.
6. Identify and consider any uncertainties in the estimates, validate these where appropriate.

This technique was applied to reach the risk scores shown in Table 6 later in this report. Note that in some instances the risk levels were not scored – which flows from guidance including:

- Uncertainty – if the causal pathway cannot be clearly described, any estimation of risk levels would be misleading, and the matter should be referred as an action to the Client to determine the level of risk more clearly;
- Being Control Related – where an issue such as failing to follow a procedure or a detection system not functioning are identified. In this case it is impossible to generate a meaningful risk score, as it requires the combination of the probability of the control failing and the causal pathway being "traversed" at the same instant in time – which is not assessable; and
- Being Undefined – where a causal pathway has no clear outcome and so no meaningful risk score can be assigned.

6 ASSESS RISK

The risk ranking likelihood, severity and risk heat map (matrix) considered by the team during the ranking process are outlined in the Appendices. The Risk Treatment Plan given in the Appendices shows the risk ranking results. The team took into account cumulative impacts related to the Project throughout all loss scenarios.

6.1 *Probability and Maximum Reasonable Consequence*

Potential loss scenarios (primarily based on the identified key potential environmental issues) were described and then ranked for risk by the ERA team. A tabular analysis was used for this ranking process, based on the probability and consequence of a loss scenario occurring as decided by the ERA team.

The following definition of risk was used (Table 2 for consequence and Table 3 for likelihood):

- the combination of the probability of an unwanted event occurring; and
- the maximum reasonable consequences should the event occur.

6.2 *Risk Ranking*

Risk ranking was undertaken by the team on loss scenarios based on the identified key potential environmental issues (including off-site human health issues) (Appendix 2). The risk ranking is based on Table 4.

Table 2 – Qualitative Measures of Maximum Reasonable Consequences for Environmental Issues

Rank	Consequence	Example
1	Negligible	No lasting environmental impact (typically <24 hours).
2	Minor	Short-term environmental impact (typically <1 week), requires minor remediation.
3	Medium	Medium term environmental impact (typically <1 year), requires moderate remediation.
4	Major	Long-term environmental impact (2 to 10 years).
5	Catastrophic	Unconfined and widespread environmental damage or effect (permanent; >10 years) require major remediation.

Table 3 – Likelihood Measures

Rank	Name	Description
5	Almost Certain	The unwanted event has occurred frequently; occurs in order of one or more times per year and is likely to reoccur within one year.
4	Likely	The unwanted event has occurred infrequently; occurs in order of less than once per year and is likely to reoccur within five years.
3	Possible	The unwanted event has happened at some time; or could happen within 10 years.
2	Unlikely	The unwanted event has happened at some time; or could happen within 20 years.
1	Rare	The unwanted event has never been known to occur; or is highly unlikely to occur within 20 years.

Table 4 – Risk Ranking

		Consequence Rating				
		1. Negligible	2. Minor	3. Medium	4. Major	5. Catastrophic
Likelihood	5. Almost Certain	M5	H10	H15	C20	C25
	4. Likely	L4	M8	H12	H16	C20
	3. Possible	L3	M6	M9	H12	H15
	2. Unlikely	L2	L4	M6	M8	H10
	1. Rare	L1	L2	L3	L4	M5

* The yellow and orange cells correlate with the 'ALARP Region' in Figure 5.

7 RISK TREATMENT

A systems approach to the treatment of risks involves consideration of three aspects:

1. Areas of Intervention (Prevention, Monitoring, Mitigation, Response/Recovery);
2. Wheel of Safe Production (Nertney Wheel); and
3. Sequence of Barriers (Hierarchy of Controls).

Additional information is provided in the Appendices.

A selection of controls to reduce the likelihood of the risks associated with the topic under review were made with due regard to their prospective reliability. That is, installing engineering modifications is a superior control to relying on operator training efforts. As part of the process, existing controls are analysed and recommendations for amendments or additions made where these existing controls were deemed unacceptable or inadequate.

Further, the prospective reliability of the controls identified was also reviewed. These controls were qualitatively reviewed by considering their position on the hierarchy of controls, the ability to detect any deterioration in the control and the ability to mitigate this deterioration.

7.1 *Risk Treatment Plan*

The Risk Treatment Plan given in the Appendices (at Table 6) shows the risk evaluation results.

8 MONITOR AND REVIEW

8.1 *Nominated Coordinator*

The nominated coordinator is Michael Barker, Senior Project Manager – Project Development, Whitehaven.

It is understood the nominee will coordinate the inclusion of the key potential environmental issues into the various studies undertaken as part of the EIS and the overall Whitehaven management system.

The nominated coordinator should also:

1. review the report to confirm the accuracy of the material recorded from the team session;
2. provide feedback to the parties who attended the risk assessment on any decisions which may be different from team expectations/recommendations raised on the day; and
3. monitor the completion of the additional actions to confirm there is close out of each action.

8.2 *Implementation Review Plan*

It is important to confirm the controls and actions identified are appropriately managed. The expectation of the team was that:

1. appropriate personnel would be allocated for implementation of recommended actions in a timely manner for completion;
2. assumptions are validated; and
3. action items would be appropriately resourced and implemented.

Whitehaven and MCC can make modifications to the recommended actions, but these should be done in light of the risk management framework. If a change occurs, the basis for the change and a desktop review to assess whether the risk of the underlying hazard remains ALARP is required. If the change is significant then implementation of formal analysis and communication process should be triggered by the site's Change Management protocols.

8.3 *Communication and Consultation*

Consultation, involvement of personnel (including Whitehaven and their specialists) and communication of the process and outcomes of the ERA are intended to be achieved by the inclusion of this report and the relevant specialist assessments addressing the key potential environmental issues in the EIS, and consideration of the report's outcomes in the overall company management systems.

8.4 *Concluding Remarks*

The risk assessment process conducted by the team was aligned with AS/NZS ISO 31000:2018, HB 203:2012 and MDG1010 *Minerals Industry Safety and Health Risk Management Guideline* (Department of Trade and Investment, 2011), with the intention of identifying the key potential environmental issues for the Project.

A significant goal of the risk assessment process was to identify and analyse the potential hazards related to the Project with rigour. The desired outcome was to prevent losses to people, equipment, the environment, and the local community by evaluating the causal pathways and developing recommended controls for inclusion into an action plan (as required).

This outcome was achieved by following the risk assessment process described within this document.

Ongoing review will be needed to manage the controls identified, and to ensure that subsequent risk management activities are conducted as required.

Peter Standish
March 2025

9 REFERENCES

ANU Enterprise Pty Limited (2016) *Rehabilitation of Grassy Box Woodland - A structured Review.*

Australasian Groundwater & Environmental Consultants (2021) *Boggabri, Tarrawonga, Maules Creek Complex Groundwater Model Update.*

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10 APPENDICES

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APPENDIX 1

Table 5 provides guidance on terms used throughout this report.

Table 5– Definition of Terms

Term	Explanation
ALARP	"As Low As Reasonably Practicable". The level of risk between tolerable and intolerable levels that can be achieved without disproportionate expenditure in relation to the benefit gained.
Aspect	A classification of risk normally applied to environmental matters. "Aspects" are best thought of as mechanisms of harm – or causes of loss. Typical aspects are: surface water contamination or loss; land changes; or fauna/flora changes. Each of these aspects produces a subsequent environmental "impact".
Causal Pathway	A term used to describe the "flow" of events beginning from a root cause and leading to an unwanted outcome. The flow is typically causes prevented from becoming incidents by preventative controls and incidents reduced in severity by mitigating controls which lead to different severity outcomes. A causal pathway is a cause *to* failed preventative controls *to* incident *to* successful mitigating controls *to* outcome.
Hazard	A thing or a situation with potential to cause loss.
HAZOP	Method of analysing mining operations, plant or processes to identify potential causes of incidents and prompt for required controls. Guidance on the method is available in AS/IEC 61882-2003 Hazard and operability studies (HAZOP).
Impact	A result of risk normally used when considering environmental matters. Impacts are the end result of the realisation of an "aspect". For example – surface water changes have an impact that includes loss of habitat for water dwelling fauna and flora.
Incident	A step in the causal pathway which describes the point at which control of pathway is lost. System required preventative controls have failed or been circumvented when an incident occurs. An incident is NOT a risk as it should not be described as a consequence.
Inspection	A regular check of workplace equipment, working environment and practices, to identify hazards and deficiencies.
Instrument	Term used to describe either statute, standards, policies or other legal or corporate document which imposes obligations on the site and the personnel filling roles in the organisation.
Issue	Is used in the document to describe any point raised by the team or in the risk review process generally. An issue can be any of cause, hazard, incident, control, outcome (risk), requirement, background information or general point related to the subject area.
Personnel	Includes all people working in and around the site (e.g. all contractors, sub-contractors, visitors, consultants, project managers, etc.).
Practicable	The extent to which actions are technically feasible, in view of cost, current knowledge and best practices in existence and under operating circumstances of the time.
Residual Risk	The risk associated with an unwanted event *after* the existing control measures are considered.
Review	An examination of the effectiveness, suitability and efficiency of a system and its components.

Term	Explanation
Risk	The combination of the potential consequences arising from a specified hazard together with the likelihood of the hazard resulting in an unwanted event.
Risk Management	The systematic application of management policies, procedures and practices to the tasks of identifying, analysing, assessing, treating and monitoring risk.

APPENDIX 2

The following Risk Treatment Plan was developed by the team during the session on the 15th of August 2023.

Table 6 – Risk Treatment Plan

Subject Area	Consideration	Potential Impact	Existing and Proposed Controls	Ranking Basis	Likelihood	Consequence	Risk Score
Ecology	Vegetation clearing, drilling, blasting and topsoil stripping	Loss of biodiversity and disruption to threatened flora and fauna or likely habitat	Existing controls/management measures described in the MCCM Biodiversity Management Plan and Offset Management Plan (with purchases in the pipeline), include (but are not limited to): • land disturbance protocol; • marking the limits of clearing; • pre-clearance flora and fauna surveys; • clearance procedures including use of licensed wildlife carers and/or ecologists to attempt to capture and/or remove fauna that have the potential to be disturbed as a result of clearing activities; • weed management procedures; • maximising salvage of habitat resources; • fauna radio-tracking program; • seed collection and propagation; • weed management procedures; • feral animal management measures; • erosion control (in accordance with the Water Management Plan); • management of livestock and grazing; • controlling access; • vehicle driving and signage; • bushfire management; • ongoing monitoring and report; • induction and staff education; and • implementation of a Mine Site Rehabilitation Plan including undertaking progressive rehabilitation and rehabilitation monitoring. Proposed controls for the Project include: • implementation of a Biodiversity Offset Strategy for the Project that addresses the NSW Biodiversity Offset Scheme requirements; • mine plan design which is developed in consideration of the avoidance, minimisation and offset principles; and • implementation of the Landscape Revegetation Zones which would provide a larger benefit (net gain) in biodiversity values.	Ranked on the basis of the consideration of the disturbance of biodiversity, in particular the Serious and Irreversible Impact (SAII) communities (e.g. Box Gum), in the proposed development footprint and how this impact can be minimised through existing and future controls. This includes mine design aiming to avoid and minimise impacts to SAII communities, and the conservation of biodiversity as part of the Biodiversity Offset Scheme and rehabilitation of the site (with biodiversity as a final land use).	2	4	**Medium (08)**
		Disturbance to Federally listed species and consideration of cumulative biodiversity impacts					
	Identification of suitable biodiversity offsets for inclusion in the EIS application	Loss of biodiversity and disruption to threatened flora and fauna or likely habitat					

Table 6 – Risk Treatment Plan (continued)

Subject Area	Consideration	Potential Impact	Existing and Proposed Controls	Ranking Basis	Likelihood	Consequence	Risk Score
Archaeological and Cultural Heritage	Vegetation clearing, drilling and exploration activities, blasting and topsoil stripping	Disturbance of Aboriginal artefacts, sites or places of cultural heritage significance	Existing controls/management measures described in the MCCM Aboriginal Archaeology and Cultural Heritage Management Plan, include: • management of the Aboriginal Site Database; • fencing of Aboriginal sites; • Aboriginal Heritage Induction & Cultural Awareness Training; • monitoring of Aboriginal sites including annual inspections and reporting of a condition report; • inspection of cultural heritage sensitive areas will be undertaken prior to vegetation and/or topsoil clearance; • monitoring of potential blasting impacts; • briefing of ecologists to identify potential culturally modified trees during preclearance surveys; • inclusion of RAPs in salvage program and other relevant fieldwork; • artefact salvage methodology; • consultation with RAPs to identify a culturally appropriate keeping place for all salvaged material; • Aboriginal heritage induction and cultural awareness training; • outlining procedure on the discovery of Aboriginal archaeological objects; • ground impacts from weed and feral animal management; • reporting requirements; • facilitating reasonable access to sites; • ongoing consultation with the Aboriginal community including through the CCC; • cultural heritage training for community; and • complaints handling and incident reporting procedures. Proposed controls for the Project include: • extensive surveys have and will be conducted in the Project area and surrounds; • the Aboriginal cultural heritage survey used a conservative 500 m survey buffer from the open cut extension area to ensure no blasting impacts on grinding grooves; • Traditional Owners will be engaged as part of the Aboriginal Cultural Heritage Assessment process, which will be prepared in accordance with relevant guidelines; and • additional test excavation mitigation measures to be conducted.	Extensive surveys have, and will continue to be conducted in the Project area and surrounds. Aboriginal stakeholders will be engaged as part of the Aboriginal Cultural Heritage Assessment process, which will be prepared in accordance with relevant guidelines. The Aboriginal Cultural Heritage Assessment aims to assess the impacts on items of Aboriginal cultural heritage and Aboriginal cultural values, identify the measures to avoid, mitigate, monitor and manage the potential impacts of the Project and the implementation of management measures to mitigate potential impacts on Aboriginal heritage. Ranked on the basis that artefact management at MCCM has been well managed, and with the existing and proposed controls, it is unlikely to cause harm to any item with significant scientific values based on surveys completed to date.	2	2	**Low (04)**
		Missing artefacts during Aboriginal cultural heritage assessment surveys		Ranked on the basis that with the proposed survey methods and excavation mitigation measures, which are currently implemented for the existing operations, the likelihood of missing artefacts during the survey would be minimal.	2	2	**Low (04)**
		Disturbance of Non-Indigenous heritage sites		Ranked on the basis that there are no known sites in the proposed water transfer pipeline corridor and it is unlikely that a greater than minor impact could occur.	2	1	**Low (02)**

Table 6 – Risk Treatment Plan (continued)

Subject Area	Consideration	Potential Impact	Existing and Proposed Controls	Ranking Basis	Likelihood	Consequence	Risk Score
Surface Water Management	Topsoil stripping, haul roads, un-vegetated spoil	Dirty water runoff entering local waterways	Existing controls/management measures described in the MCCM Surface Water Management Plan, include: • clean water runoff from undisturbed catchment areas is diverted away from the mining area, where possible and practical to do so; • sediment laden runoff from disturbed areas is re-used in the water management system or released into the receiving environment if water quality meets Environmental Protection Licence (EPL) requirements; • water balance model calibrated to historical data and updates as required; • implementation of erosion and sediment control measures described in Surface Water Management Plan; • mine water (including water that accumulates within, or drains from, active mining areas, coal reject emplacement areas and CHPP infrastructure areas) and groundwater collected within open cut pits is contained and reused on-site; • no discharge of mine water off-site; • on-site water demands are satisfied whilst minimising offsite water requirements; and • ongoing implementation of the surface water monitoring network at the MCCM. Proposed mine design considerations: • offset of mine infrastructure from flood ways or creeks and consideration of bunding requirements; • adequate sizing of water storages and sediment dams; • design of water transfer pipeline in accordance with the *Managing Urban Stormwater: Soils and construction – Volume 1* (Landcom, 2004); • HDPE Polypipe to Design Standard to Water Supply Code of Australia; and • inclusion of a burst protection system. A Surface Water Assessment would be prepared for the EIS to assess the impacts of the Project on the quantity and quality of the region's water resources.	Ranked on the basis that no mine water has ever been discharged from MCCM. With the existing and proposed control measures, any consequences would be short-term and unlikely to lead to significant environmental harm.	2	1	**Low (02)**
	Coal processing and production	Water demand for dust suppression and coal washing					
	Water discharge into local waterways	Contaminated water from wash down bays, etc					
	Take of clean water without appropriate licences	Fines and impact on company reputation as a result of not holding licenses		Considered that adverse impact to the environment is unlikely to be significant given the potential catchment areas that require licensing and existing licences. Minor legal impact that will be less likely with the controls intended include construction of clean water drains and acquiring relevant water licensing for water take.	2	3	**Medium (06)**
	Water Transfer Pipeline failure	Loss of mine water to the environment		Ranked on the basis that no mine water has ever been discharged from MCCM, although the implementation of the Water Transfer Pipeline was noted as possibly increasing this potential. With the existing and proposed controls, any consequences would be short-term and unlikely to lead to significant environmental harm.	2	1	**Low (02)**

Table 6 – Risk Treatment Plan (continued)

Subject Area	Consideration	Potential Impact	Existing and Proposed Controls	Ranking Basis	Likelihood	Consequence	Risk Score
Groundwater Management	Coal extraction and overburden removal	Drawdown of aquifers on surrounding water users Cumulative impacts with surrounding users	Existing controls/management measures described in the MCCM Groundwater Management Plan, include: • monitoring of groundwater levels to verify predicted groundwater model drawdown; • monitoring of abstraction of groundwater volume and levels and quality of groundwater bores; • monitoring of groundwater quality; • validation of the groundwater model with newly collected groundwater monitoring data over the life of the Project; • implementation of a Trigger Action Response Plan (TARP) for groundwater levels, quality and pit inflows; and • three yearly updates to the BTM complex groundwater model and predictions. Proposed controls for the Project include: • future mine design considerations that include: ○ offset of open cut from creeks; ○ adequate sizing of water storages and sediment dams; and ○ final void management and design that aims to achieve the objectives of the existing MCCM. • 'make good' provisions at private bores ahead of time where there is a predicted loss of water availability as a result of drawdown. A Groundwater Assessment would be prepared for the EIS to assess the impacts of the Project on the quantity and quality of the region's groundwater resources, using a groundwater model developed in accordance with contemporary guidelines.	Ranked on the basis that the Groundwater Assessment model (the BTM model) is a mature model which accounts for contemporary groundwater assessment guidelines. The likelihood of a significant impact occurring is rare. If there is a new predicted loss of water availability due to Project drawdown, this impact can be addressed via 'make good' provisions at private bores ahead of time. The risk score would be low in both scenarios.	1	4	**Low (04)**
	Final void acts as a source of contamination to other aquifers	Contaminated water leaving the site from overtopping of voids		Ranked on the basis that the intent is for the final void to be located in the south-east of the Project area, similar to the existing void position (i.e. away from Back Creek). It is expected the final void will act as a long-term ground water sink and no expected impacts outwards from the final void. The Project EIS Groundwater Assessment modelling will validate this understanding, but as an interim position it would be rare that a release could occur, which would have major impacts. With the proposed controls, the likelihood of a significant impact is rare.	1	4	**Low (04)**

Table 6 – Risk Treatment Plan (continued)

Subject Area	Consideration	Potential Impact	Existing and Proposed Controls	Ranking Basis	Likelihood	Consequence	Risk Score
Air Quality	Vegetation clearing, drilling, blasting and topsoil stripping	Wind blown dust and machinery exhaust fumes contributing to elevated dust levels	Existing controls/management measures described in the MCCM Air Quality and Greenhouse Gas Management Plan, include (but not limited to): • dust controls (e.g. use of water carts and chemical suppressants); • dust monitoring (including real-time monitoring with fixed cameras deployed by MCC and external agencies [Environment Protection Authority]); • a TARP based on weather conditions and measured dust levels; • predictive modelling and day to day planning; and • training. An Air Quality Impact Assessment would be prepared for the EIS to assess the air quality impacts resulting from the Project.	Ranked on the basis that with the existing controls (e.g. cessation of operations or increased watering of haul roads under the existing TARP) and potential future amendment of control measures. Blasting is similarly managed with TARPs to avoid fume releases that could impact off-site receivers. The likelihood of having a minor level impact is unlikely.	3	2	**Medium (06)**
	Coal extraction and overburden removal						
	Coal, rejects and overburden loading, haulage and unloading						
	CHPP operations including coal processing and production						
	Dust, fumes, gases and odours	Air quality emissions impacting private landowners and private land					
Greenhouse Gas Emissions	Combustion of diesel fuel	Unacceptable greenhouse gas emissions	Existing controls/management measures described in the MCCM Air Quality and Greenhouse Gas Management Plan, include (but are not limited to): • carbon neutral energy supply to the site; • consideration of the energy efficiency of all new major electrical equipment during procurement; • use of variable speed drives on pumps and conveyors in the CHPP; • avoiding idle running of conveyors in the CHPP; • turning off unnecessary lighting around the mine site consistent with safety requirements; • consideration of the fuel efficiency of all mobile and fixed equipment during procurement; • ensuring dump trucks are fully loaded for each load prior to hauling to maximise productivity and efficiency with regard to the amount of fuel used per unit of material moved; • optimisation of fleet to reduce kilometres equipment travel where possible; • investigate biodiesel use and where possible source from local and sustainable agricultural resources; and • greenhouse gas emissions reporting in accordance with the Commonwealth Government's National Greenhouse and Energy Reporting Scheme. A Greenhouse Gas Assessment would be prepared for the EIS to assess the Scope 1, 2 and 3 greenhouse gas emissions in accordance with the Safeguard Mechanism. The Greenhouse Gas Assessment will consider recently introduced requirements under the Safeguard Mechanism, EPA's advice into the Secretary's Environmental Assessment Requirements and any other relevant changes to legislation or policies.	Ranked on the basis that there is an expected increase in greenhouse gas impact due to increased mining activities associated with the Project (i.e. higher strip ratio), however, the Project would address the Safeguard Mechanism and other contemporary greenhouse gas policies and guidelines. It is possible for a minor impact to occur but the impact would be low.	2	2	**Low (04)**
	Electricity use						
	Downstream impacts from burning of coal						
	Greenhouse gases	Effectiveness of greenhouse gas mitigation measures					

Table 6 – Risk Treatment Plan (continued)

Subject Area	Consideration	Potential Impact	Existing and Proposed Controls	Ranking Basis	Likelihood	Consequence	Risk Score
Noise	Coal, rejects and overburden loading, haulage and unloading, including acute noise events with dumping into truck bodies (and wider transmission of sound) Plant and equipment working in-pit and on overburden dumps Train movements CHPP operations including coal loading General road noise impacts from increased traffic movement and transport activities Product coal transport	Excessive noise generation impacting private landowners, particularly to the north and north-east of the Project site	Existing controls/management measures described in the MCCM Noise Management Plan, include: • attended noise monitoring on a monthly basis to assess compliance with the noise criteria; • use of a noise directional compass to understand additional noise sources within the area and specifically look at that noise which can be apportioned to MCCM; • implementation of continuous unattended real-time noise monitoring to enable proactive (model forecasting) and reactive noise management, and validation of the noise model; • implementation of one or more control options (including relocation or periodically shutdown of fleet) to reduce noise levels based on real-time noise monitoring; and • ongoing testing of fleet and plant sound power levels to identify need for maintenance to noise suppressive components. Proposed controls for the Project include: • implementation of additional noise mitigation measures (e.g. attenuation of fleet); and • implementation of additional noise management control measures guided by the noise modelling for the Project. A Noise and Blasting Assessment would be prepared for the EIS to assess the potential noise impacts as a result of the Project.	This risk is ranked (interim) on the basis that it is possible to have a medium impact to new noise receivers from the Project with the existing measures (e.g. pro-active management such as shutting down some fleet). New receivers could potentially notice an increase in noise levels in the absence of adequate controls and/or greater proactive management would be required to achieve compliance with noise criteria. However, with the proposed noise attenuation of the fleet and recommended control measures guided by the noise modelling, it is expected this risk would be lowered.	3	3	**Medium (09)**
Blasting	Impacts due to blasting	Greenhouse gas emissions, blast fume and dust generation Overpressure and ground vibration impacts	Existing controls/management measures described in the MCCM Blast Management Plan, include (but not limited to): • obtaining a Forestry Corporation NSW Permit (which includes exclusive use areas for the Forest surrounding MCCM to limit people being in proximity to blasting activities). A Noise and Blasting Assessment would be prepared for the EIS to assess the potential noise impacts as a result of the Project.	This risk is ranked (interim) on the basis that the receivers to the north-east could potentially notice the closer blasting operations with the existing control measures. It is expected that there is a possible medium impact, however with more considerations recommended in the Noise and Blasting Assessment, this risk ranking is likely to be lowered.	3	3	**Medium (09)**

Table 6 – Risk Treatment Plan (continued)

Subject Area	Consideration	Potential Impact	Existing and Proposed Controls	Ranking Basis	Likelihood	Consequence	Risk Score
Visual	Overburden stockpile dumps, exposed earthworks and lighting from mobile and fixed plant	Visual impact to surrounding receivers	Existing control/management measures include: • mine design and implementation of a Rehabilitation Management Plan and Forward Program in accordance with the requirements of the *Mining Act 1992*. Proposed controls for the Project include: • landforms will be progressively rehabilitated, minimising the area of impact to a temporary basis. A Visual Assessment would be prepared for the EIS to assess potential views of the Project operations and landforms, particularly from publicly accessible viewpoints, and lighting impacts of the Project on private receivers and the Siding Spring Observatory.	Ranked on the basis that the visual impact would likely be minor (based on 3D models from potential private/public vantage points) with the existing and proposed control measures, including progressive rehabilitation and implementation of biodiversity values as a final land use.	4	2	**Medium (08)**
Traffic and Transport	Increased vehicle movements from employees, deliveries and train loading	Increased traffic movements	Existing controls/management measures described in the MCCM Traffic Management Plan, include: • adherence to Code of Conduct for Drivers; • driver education; • vehicle load and dimensions limits; • driver fatigue management; • driver amenity requirements; • use of a shuttle bus system; • minimising interactions with school buses; and • monitoring and auditing. A Road Transport Assessment would be prepared for the EIS to assess changes to traffic volumes on the surrounding road network and assess potential cumulative impacts resulting from the Project.	Ranked on the basis that the future workforce would likely be similar to the existing MCCM workforce, therefore any potential change is unlikely to be beyond the current threshold for road safety and traffic blockages. Minor relative impact could possibly occur.	3	1	**Low (L03)**
	Road noise impacts	Additional noise impacts from traffic movement on public roads					
Waste Management	General waste	Land contamination	Existing controls/management measures described in the MCCM Waste Management Plan include addressing waste oils, solid and general wastes, and sewerage treatment and control. A Land Contamination Assessment would be developed for the EIS to assess the potential for contaminated land within the Project area including required remediation works to be undertaken prior to commencement of the Project.	Ranked on the basis that low volumes of waste and rubbish are expected for the Project, similar to the existing MCCM, and existing waste streams are being well managed. It is unlikely that a minor impact could occur.	2	2	**Low (04)**
	Rejects	Water contamination					
	Sewage						
	Waste tyres	Land contamination		Ranked on the basis that the current approved disposal method for used tyres (i.e. emplacement in in waste dump) as well as regulation of this activity via the conditions in the Environmental Protection Licence. It is likely that there will be a continuation of existing waste management operations resulting in a negligible impact.	4	1	**Low (04)**

Table 6 – Risk Treatment Plan (continued)

Subject Area	Consideration	Potential Impact	Existing and Proposed Controls	Ranking Basis	Likelihood	Consequence	Risk Score
Mine Rehabilitation and Closure	Topsoil stripping and land preparation	Failure to meet rehabilitation criteria	Existing controls/management measures described in the MCCM Rehabilitation Management Plan, MCCM Biodiversity Management Plan and Water Management Plan. A Land Use Assessment would be developed for the EIS to assess topsoil requirements for successful rehabilitation, including topsoil management practices.	Ranked on the basis that the current rehabilitation program is progressing well, with ecology values recorded in the rehabilitated area. It is likely that there will be ongoing negligible impacts.	4	1	**Low (04)**
		Loss of productive topsoil					
		Deterioration of land capability					
	Rehabilitation	Erosion and sedimentation					
		Invasion of weed species					
		Invasion of feral animals					
Land	Soil	Cross contamination of soils and associated runoff into streams	Existing controls/management measures described in the MCCM Rehabilitation Management Plan and Water Management Plan. A Land Contamination Assessment would be prepared for the EIS to assess the potential for contaminated land within the Project area including required remediation works to be undertaken prior to the commencement of the Project. Potential impacts on water resource (which may be used by agricultural enterprises) will be assessed in the Groundwater Assessment and Surface Water Assessment.	Ranked on the basis that the current soil management practices and rehabilitation program are working effectively. The proposed extension area is largely located within the Leard State Forest which is not used for agricultural activities. It is likely that there will be ongoing negligible impacts.	4	1	**Low (04)**
	Agriculture	Impact on agricultural resources as a result of mining activities					
	Topography and landforms	Long-term geotechnical stability of final landforms					
	Other land users	Changes to the potential land uses directly disturbed or otherwise impacted as a result of mining activities					

11 About Your Report

Your report has been developed on the basis of your unique and specific requirements as understood by Risk Mentor and only applies to the subject matter investigated.

We have endeavoured to accurately gather information from observations, document reviews and from site personnel. Analysis has been conducted using the best methods of risk engineering science known to the author(s) and should represent a useful suite of information on which the site can base subsequent actions.

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