

PART D

Risk assessment



22 Hazard and risk assessment

22.1 Assessment objectives

The DGRs require an assessment of hazards associated with the Project.

22.2 Project risk assessments

EMM prepared the risk assessments, summarised in this chapter:

- a preliminary hazard assessment (PHA), to determine if the Project is a hazardous or offensive development and to assess general risks from the Project (Appendix T 'Project update report'); and
- a preliminary environmental risk assessment for the Project (EMM 2011a).

Bushfire risks were assessed separately and are summarised in Chapter 11.

The risks identified and rated in the preliminary environmental risk assessment have been re-rated based on the findings of this EA to provide an environmental risk assessment (ie no longer 'preliminary') in this chapter (see Section 22.5).

22.2.1 Risk ratings

The risks identified for the Project were rated using the Australian/New Zealand Standard International Organisation for Standardisation 31000-2009 Risk Management – Principles and Guidelines (AS/NZS ISO 31000-2009). Two factors were considered for each scenario: the potential consequences (ie the severity of the impact) and the likelihood that the impact will occur.

The criteria used to rate the potential consequences of impacts to the environment, individuals and society are provided in Table 22.1. The criteria used to rate the likelihood that the impact will occur are provided in Table 22.2.

Table 22.1 Qualitative measures of consequence

Level	Potential consequences to individuals	Potential consequences to the environment and society
1	Minor injury or short-term health effect (eg requiring first aid)	Limited environmental impacts to a small area of low significance Low level repairable damage to commonplace structures Short-term local social issues or disruptions
2	Minor injury or short-term health effects requiring restricted work	Minor short-term environmental impacts not affecting environmental systems Moderate damage to items of local cultural significance or minor damage to items of regional significance Minor medium-term social impacts on local population

Table 22.1 **Qualitative measures of consequence (Cont'd)**

Level	Potential consequences to individuals	Potential consequences to the environment and society
3	Major injury or health effects (eg lost time injuries or permanent disabilities) Minor injury or health effects to multiple people	Medium-term environmental impacts affecting local environmental systems Moderate damage to items of regional cultural significance Ongoing local social issues
4	Permanent total disability Major injuries or health effects to multiple people	Long-term environmental impacts with significant effects locally and some effects regionally Irreparable damage to items of regional cultural significance Widespread local social issues and moderate regional social issues
5	Fatality or multiple fatalities	Regional long-term environmental impacts on critical species, habitat or environmental systems Irreparable damage to items of national cultural significance Ongoing major regional social impacts

Table 22.2 **Qualitative measures of likelihood**

Level	Likelihood	Approximate chance of occurring during the life of the Project
A	Practically impossible	0.1%
B	Not likely to happen	10.0%
C	Possible or could happen	50.0%
D	Likely to happen at some point	90.0%
E	Almost certain to happen	99.9%

The risk rating is determined by comparing the consequences and likelihood ratings using the matrix provided in Table 22.3. Where the potential consequences of a risk are minor and the likelihood that it will occur is low, it is rated as a level 3 (low) risk. Conversely, where the potential consequences of a risk are major and the likelihood that it will occur is high, it is rated as a level 1 (high) risk. Level 2 (medium) risks are those that fall between these extremes.

Table 22.3 Risk rating

Consequence	Likelihood				
	A	B	C	D	E
5	Level 2 (medium)		Level 1 (high)		
4					
3					
2					
1	Level 3 (low)				

Risk levels comprise:

- Level 1 (high), where risks are likely to be unacceptable and additional management measures, major redesign or relocation of Project components will be required;
- Level 2 (medium), where there will be some risk that can be managed with project-specific management measures, or cannot be further reduced but is in line with the societal risks associated with the incident type; and
- Level 3 (low), where risks are manageable and there is little risk.

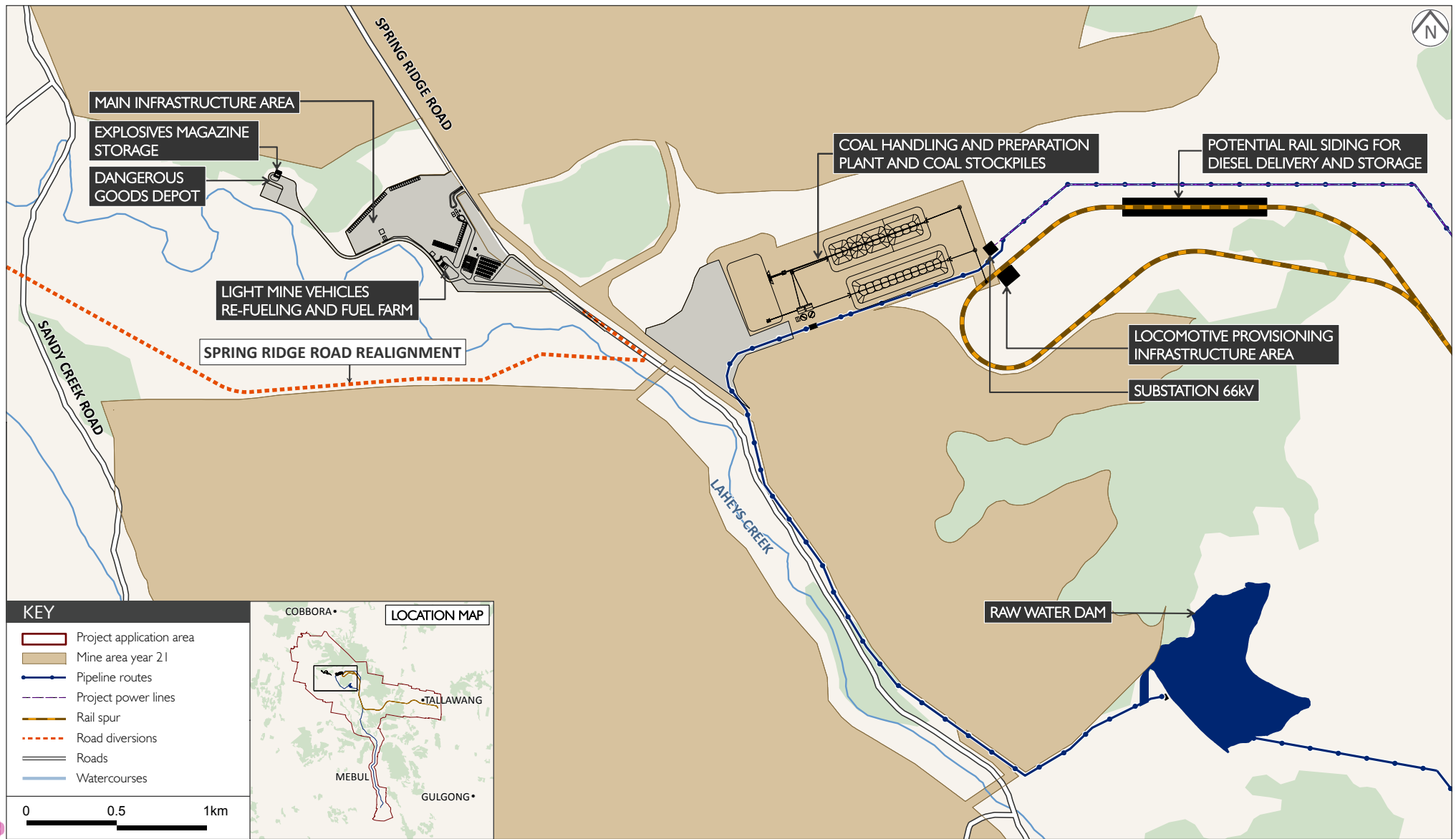
22.3 Hazardous and offensive development

The PHA considered if the Project is a hazardous or offensive development under State Environmental Planning Policy No 33 (Hazardous and Offensive Development) (SEPP 33). This was determined by comparing the quantities of hazardous materials to be stored and used on site to the threshold quantities of dangerous goods in *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (DP&I 2011a).

The bulk hazardous materials that the Project will use are diesel, petrol, other hydrocarbons (oils, greases, degreaser and kerosene), liquid petroleum gas and explosives. These materials will be stored at a number of locations (Figure 22.1).

22.3.1 Hydrocarbons

Diesel, petrol and other hydrocarbons will be stored in accordance with Australian Standard 1940-2004 The Storage and Handling of Flammable and Combustible Liquids and liquid petroleum gas will be stored in accordance with Australian Standard/New Zealand Standard 1596-2008 The Storage and Handling of LP Gas. These materials will be stored and used at the Project in smaller quantities than the SEPP 33 thresholds for them.



Indicative Cobbora Coal Project Infrastructure Area Layout

Cobbora Coal Project - Environmental Assessment

Figure 22.1

22.3.2 Explosives

Up to 5 tonnes of detonators, primers and charge cord (initiating explosives), and 1,000 tonnes of ammonium nitrate will be stored on site. Initiating explosives will be stored in a magazine at a distance from publicly accessible areas outside the SEPP 33 threshold distance. The ammonium nitrate store will be just over 1,000 m from the nearest publicly accessible area. Off-site risks will be further analysed as part of the store's detailed design to ensure it is stored outside the SEPP 33 threshold distance.

Explosives storage will be designed and constructed in accordance with Australian Standard 2187-1998 Explosives – Storage, Transport and Use-Storage.

22.3.3 Conclusion

Comparison of hazardous material quantities and storage locations to SEPP 33 criteria shows the Project will not be a hazardous or offensive development.

22.4 Risks from the Project

22.4.1 Preliminary hazard assessment method

The PHA (Appendix T 'Preliminary hazard assessment') assessed general risks from the Project to people, property and the environment in accordance with the method outlined in Section 22.2.

A risk workshop was held and attended by representatives from CHC and EMM. During the workshop:

- the project was divided into a series of components (public roads, mine area, including haul roads, mine infrastructure area, water infrastructure and rail spur and train provisioning area);
- hazards and incident types were identified (leaks/spills, fire/explosion, safety loss and security breach);
- scenarios presenting a risk to individuals, society and/or the environment were identified;
- potential controls were identified; and
- a consequence and likelihood rating was qualitatively determined for each scenario in the presence of engineering and administrative controls.

The resulting risk table, including the scenarios identified and the associated risk ratings, is provided in Appendix T ('Preliminary hazard assessment') and is summarised below.

22.4.2 Preliminary hazard assessment results

Forty two risk scenarios based on atypical events (eg accidents) were identified as part of the assessment of risks for the Project. Of these, there were:

- no level 1 (high) risks;
- 24 level 2 (medium) risks; and
- 18 level 3 (low) risks.

The level 2 (medium) risks and the project components with which they are associated are discussed below.

i Road transport

Nine level 2 (medium) risks were associated with road transport. This reflects the potential consequences of vehicle accidents to individuals and is in line with higher societal risks associated with road transport. All of these transport-related risks were associated with:

- traffic accidents involving vehicle roll-overs and collisions resulting in injuries, spills, fire or explosion;
- traffic accidents as a result of fatigue or intoxication; or
- traffic accidents as a result of changed road alignments and new intersections.

The following measures will be implemented to reduce these risks:

- engineering (including local road and intersection upgrades) and administrative controls (including transport management systems) will be implemented to minimise the risk of vehicle roll-overs and collisions;
- the temporary construction accommodation village will house the majority of the construction workforce close to the worksite, appropriate shift rosters will be designed, and drug and alcohol testing will be implemented, to minimise the risk of fatigue- or intoxication-related traffic accidents; and
- new roads will be designed in accordance with the *Guide to Road Design* (Austroads 2009) to minimise the risk of traffic accidents as a result of changed road alignments and new intersections.

ii Rail transport

Two level 2 (medium) risks were associated with rail transport:

- train derailment or collision at the rail spur or train provisioning area; and
- a member of the public being struck by a train along the rail spur.

The following measures will be implemented to reduce these risks:

- the rail spur will be designed and operated in accordance with ARTC guidelines to minimise the risk of a train derailment or collision; and
- penalties for trespassing will be clearly posted and the rail spur will be fenced from publicly accessible areas to minimise the risk of a member of the public accessing the rail spur.

iii Unauthorised entry to mine area and mine infrastructure area

Eight level 2 (medium) risks were associated with injury from entry to the Project area by people not associated with the Project. People gaining unauthorised access to the Project could be electrocuted, drowned in dams or crushed by mobile plant and moving parts of stationary infrastructure.

The following measures will be implemented to reduce these risks:

- control of access to the mining and infrastructure areas will be addressed during detailed design;
- penalties for trespassing will be clearly posted and publicly accessible areas will be fenced; and
- stationary infrastructure will be constructed with guarding to protect employees and others.

iv Blasting

One level 2 (medium) risk was associated with flyrock from blasting. The following measures will be implemented to reduce this risk:

- the mine and blasting regime will be designed to prevent off-site blasting impacts;
- where blasts are near public areas (eg roads) they will be cleared before blasting; and
- buffer zones will be provided on properties owned by CHC.

v Fire and explosions

Four level 2 (medium) risks were associated with fire or explosions in the mine infrastructure area and bushfires. These comprise fires and explosions in the mine area and mine infrastructure area.

The following measures will be implemented to reduce these risks:

- fuels and explosives will be transported, stored and used in compliance with relevant legislation, codes of practice and Australian Standards; and
- the management measures outline in Chapter 11 'Bushfire' will be implemented to reduce bushfire-related risks.

22.4.3 Preliminary hazard assessment conclusions

Risks from the Project are generally low because:

- no major hazards associated with the hazardous materials have been identified;
- the consequences of risks from the Project will generally be contained within the PAA. Exceptions are bushfires (Chapter 11) and risks associated with road and rail transport. These risks will be minimised to be as low as reasonably practical via a range of controls; and
- a potential incident at the Project will not impact other potentially hazardous or offensive industries as the Project will not be next to any such developments.

The elevated risks from the Project will be examined as part of detailed project design and reassessed in the ongoing hazard assessment process to ensure risks are as low as reasonably practical.

22.5 Environmental risk assessment

The *Preliminary Environmental Assessment* (ERM 2009) provided a preliminary environmental risk assessment that considered potential risks to the environment from the Project. This was updated in the *Project Update Report* (EMM 2011a).

An environmental risk assessment that re-rates the risks based on the proposed controls (avoidance, minimisation, mitigation and/or compensation) and the impact assessment conclusions is provided in Table 22.4. The environmental risk assessment was in accordance with the method outlined in Section 22.2.

The preliminary environmental risk assessment before the environmental assessment investigations found 26 environmental risks. Of these, there were:

- one level 1 (high) risk (clearing of areas of remnant vegetation, including EECs);
- 22 level 2 (medium) risks; and
- 3 level 3 (low) risks.

The environmental risk assessment after the environmental assessment investigations found improved understanding of the existing environment, the proposed controls and greater certainty about Project impacts reduced the risk rating for many issues. The environmental risk assessment found there are:

- no level 1 (high) risks;
- 9 level 2 (medium) risks; and
- 17 level 3 (low) risks.

Table 22.4 Preliminary risk assessment and environmental risk assessment

Risk description ¹	Preliminary environmental risk assessment (August 2011) ¹		Environmental risk assessment (June 2012)				
	Preliminary risk rating ²	Preliminary impact assessment	Controls	Consequences	Probability	Risk rating	Predicted impacts
Surface water							
Reduced surface water availability to other users.	Level 2 (medium)	Comprehensive modelling undertaken and assessed by State Water and NSW Office of Water (NOW) led NOW to grant water extraction licences under the <i>Water Management Act 2000</i> .	Surface water and groundwater collected within the mining area and surrounds will be supplemented by the high security Water Access Licences bought on the open market.	1	D	Level 3 (low)	Water from water access licences will only decrease water availability to the willing sellers of the licences. Water flows in the Talbragar downstream of the Project will not be significantly impacted and so downstream water users will not be impacted. The Extraction Strategy Agreement will complement the current operation of the river to help State Water minimise river transmission losses and, in turn, will leave more water in Windamere Dam for later use.
Project increases the risk of flooding.	Level 2 (medium)	Laheys and Sandy Creeks will not be diverted during operations. This will potentially reduce impacts to existing surface drainage compared to the original proposal.	Design waterway crossings, cross-drainage culverts and rail corridor longitudinal drainage so that local flooding can be managed and impacts to the local environment and rail infrastructure minimised. Implement progressive revegetation and sedimentation controls.	1	D	Level 3 (low)	No significant change is predicted in flood levels along Sandy and Laheys creeks upstream or downstream of the mine. Implementation of mitigation measures (eg a 70 ML dry detention basin) will avoid impacts to the Golden Highway associated with peak flows in Flyblowers Creek.
Changed surface water regime affects other water users.	Level 2 (medium)	Potential impacts to the surface water regime will be reduced with the removal of creek diversions.	Surface water management will be an integral part of the Project's design. Water will be re-used on site rather than be discharged.	2	B	Level 3 (low)	Water flows in the Talbragar downstream of the Project will not be significantly impacted and so downstream water users will not be impacted. The Project's water management system and associated mitigation measures will minimise surface water quality and flow impacts from the Project during construction and operations. These limited impacts will largely be confined to Sandy Creek. The Project will not affect town water supply and domestic and stock requirements because these will be met before any river water is allocated to the mine.

Table 22.4 Preliminary risk assessment and environmental risk assessment (Cont'd)

Risk description ¹	Preliminary environmental risk assessment (August 2011) ¹		Environmental risk assessment (June 2012)				
	Preliminary risk rating ²	Preliminary impact assessment	Controls	Consequences	Probability	Risk rating	Predicted impacts
Groundwater							
Reduced groundwater availability to other users.	Level 2 (medium)	Pit dewatering requirements and associated groundwater drawdown is expected to be less for the smaller pits than the single large pit originally proposed. The number of potentially impacted groundwater users and the degree of impact is likely to be reduced.	Provide alternative water supplies to affected groundwater users if required. Monitor groundwater level and water quality.	1	C	Level 3 (low)	Groundwater level drawdown will occur largely on CHC-owned properties and will only impact one privately-owned bore which CHC will rectify in agreement with the landholder.
Reduced water availability to groundwater dependent ecosystems (GDEs).	Level 2 (medium)	Potential impacts to GDEs are likely to be reduced due to reduced pit dewatering requirement and the preservation of the existing alignment of Sandy Creek and Laheys creek.	Detailed groundwater measurements and modelling have been undertaken. Monitor groundwater level and water quality.	2	C	Level 3 (low)	The persistent pools along Sandy and Laheys creeks appear to be GDEs. Where these pools occur within the potential groundwater drawdown zone, it is likely there will be impacts on groundwater baseflow into these pools with an increase in the number or length of drying events. As these pools naturally dry out during extended dry periods, the species that inhabit these areas are already tolerant of such impacts. Only 2 ha of woodland occur where it may opportunistically use groundwater within the potential groundwater drawdown zone. Impacts to terrestrial vegetation are not likely to be significant as the water is only used opportunistically.
Air quality							
Dust levels exceed criteria at non-mine owned properties.	Level 2 (medium)	The smaller footprint and mining rate will reduce dust emissions compared to the original proposal. The pit design has been amended to improve the recovery of coal extraction and reduce overburden stripping ratios. This will reduce blasting and subsequent potential air quality impacts.	Use proven mining dust control measures. Acquire properties. Implementing management measures, including a predicative and reactive air quality management system, will ensure the Project complies with air quality criteria.	2	C	Level 3 (low)	All air pollutant concentrations will remain below the applicable air quality criteria, with the exception that the EPA 24-hour average PM ₁₀ criterion will be exceeded at six privately owned residences and the NEPC 24-hour and annual average PM _{2.5} criteria will be exceeded at three privately owned residences during the life of the Project. Exceedences are predicted to occur at six of the nearest privately owned residences. Acquiring these properties and implementing management measures will ensure the Project complies with air quality criteria.

Table 22.4 Preliminary risk assessment and environmental risk assessment (Cont'd)

Risk description ¹	Preliminary environmental risk assessment (August 2011) ¹		Environmental risk assessment (June 2012)				
	Preliminary risk rating ²	Preliminary impact assessment	Controls	Consequences	Probability	Risk rating	Predicted impacts
Noise							
Noise levels from mine exceed noise criteria at non-mine owned properties.	Level 2 (medium)	The smaller footprint and mining rate will reduce noise emissions compared to the original proposal. The pit design has been amended to improve coal recovery of coal extraction and reduce overburden stripping ratios. This will reduce blasting and subsequent noise impacts.	Use of proven mining noise control measures. Acquire properties. Provide noise mitigation at properties.	2	C	Level 3 (low)	During maximum impact meteorological conditions for the day, evening and night assessment periods, for all stages of the mining life, nine residential receptors that are privately owned are predicted to experience noise levels above the strict operational criteria (ie 35 dB(A)). An additional four receptors are predicted to experience noise levels above the acquisition criteria (ie 40 dB(A)). Acquiring these properties or providing noise mitigation at them will ensure the Project complies with noise criteria.
Noise levels from infrastructure, including rail, exceed noise criteria at non-mine owned properties.	Level 2 (medium)	The reduced coal production and preparation rate will reduce noise from mine infrastructure compared to the original proposal. The number of train movements and associated noise will be reduced. There is no longer a requirement to transport coal along the Gwabegar line through Mudgee.	Use proven noise control measures. Provide noise mitigation at the affected residences along the rail line between Tallawang and Ulan.	2	C	Level 3 (low)	Infrastructure, including the rail spur, was assessed as part on the mine assessment. Off-site train movements on the main line are predicted to satisfy the relevant daytime noise criteria at all receptors. The night Leq criteria would be satisfied at all but six receptors that are situated within 30 m of the railway during the planned train movement scenario. The Lmax criteria would be satisfied at all but two receptors that are situated within 25 m of the railway. Noise mitigation will be provided at the affected residences.
Fly rock or vibration damage to non-mine owned properties.	Level 3 (low)	Mining areas are generally further removed from residences compared to the original proposal reducing potential vibration impacts.	Use proven blasting control measures. Design blasting to ensure adequate buffer distances.	2	B	Level 3 (low)	There will be sufficient distance between blasts and private residences or heritage items to provide protection from vibration or fly rock.

Table 22.4 Preliminary risk assessment and environmental risk assessment (Cont'd)

Risk description ¹	Preliminary environmental risk assessment (August 2011) ¹		Environmental risk assessment (June 2012)				
	Preliminary risk rating ²	Preliminary impact assessment	Controls	Consequences	Probability	Risk rating	Predicted impacts
Ecology							
Clearing of areas of remnant vegetation, including endangered ecological communities (EECs).	Level 1 (high)	While the total pit area has been reduced, the new pit areas to the north-east contain a larger portion of remnant vegetation. The total area of remnant vegetation to be cleared will be assessed as part of the environmental assessment.	Mine design (including the mining area extent) has avoided remnant vegetation as far as possible. Implement a biodiversity offset strategy.	2	E	Level 2 (medium)	The Project will result in some significant impacts to threatened species and communities within the disturbance footprint. However, the implementation of the biodiversity offset strategy will ensure the Project results in a net gain for biodiversity values within the region.
Heritage							
Potential to disturb areas of Aboriginal cultural significance.	Level 2 (medium)	There is a higher density of sites of Aboriginal cultural significance along creeks. The sites along Sandy and Lahey creeks are no longer proposed to be disturbed. There is the potential for additional sites to occur within the new pit areas.	The Project design has been modified to avoid known sites, where possible, particularly along Sandy Creek. Local Aboriginal groups have been consulted about the significance of sites. Prepare an Aboriginal heritage management plan in consultation with registered Aboriginal parties.	2	E	Level 2 (medium)	The Project will affect 78 Aboriginal sites out of the 229 recorded within the PAA (ie will avoid 66% of sites identified in the PAA). Of the sites impacted, four are of high significance, 34 are of moderate significance and 40 are of low significance. The Aboriginal heritage management program including site protection, excavation and collection will mitigate development impacts.
Potential to disturb areas of historic (non-Aboriginal) significance.	Level 2 (medium)	A number of sites of historic significance that were within the previous pit area are no longer proposed to be disturbed. It is not expected that there will be significant sites within the new pit areas.	Mine design has avoided areas of historic significance.	2	B	Level 3 (low)	The Project will have no impact on five of the identified heritage items in the PAA. While there will be no direct impacts on the remaining eight items, they will be protected by the implementation of management measures.

Table 22.4 Preliminary risk assessment and environmental risk assessment (Cont'd)

Risk description ¹	Preliminary environmental risk assessment (August 2011) ¹		Environmental risk assessment (June 2012)				
	Preliminary risk rating ²	Preliminary impact assessment	Controls	Consequences	Probability	Risk rating	Predicted impacts
Greenhouse gas							
Fugitive greenhouse gas (methane) released from exposed coal seams will contribute to global climate change.	Level 2 (medium)	Fugitive greenhouse gas emission rates have now been measured as being very low.	Fugitive emissions cannot be prevented.	1	E	Level 2 (medium)	Fugitive methane emissions are the greatest contributor to Scope 1 emissions for many coal mines. However, fugitive emissions will only be 15% of Scope 1 emissions from the Project.
Greenhouse gas emissions from mine operations.	Level 2 (medium)	The reduced mining rate over the same project life will reduce annual and total greenhouse gas emissions.	Use and regularly maintain efficient mining equipment. The low overburden:coal strip ratio minimises diesel requirements to extract the coal.	1	E	Level 2 (medium)	At full production, the direct annual Scope 1 greenhouse gas emissions from the Project will be 0.2 Mt CO ₂ -e/year and Scope 2 emissions from electricity use by the Project will be 0.16 Mt CO ₂ -e/year.
Burning mined coal at power stations will generate greenhouse gases.	Level 2 (medium)	The project will produce less coal over its lifetime compared to the previous proposal. Therefore, less scope 3 emissions will be produced.	Greenhouse gas emissions have been assessed.	1	E	Level 2 (medium)	The mine will produce 12 Mtpa of coal at full production. The Scope 3 emissions from transporting and burning this coal will be 23.5 Mt CO ₂ -e/year.
Traffic and transport							
Traffic volumes exceed the capacity of local roads and intersections.	Level 2 (medium)	The reduced mining rate and operational workforce will reduce traffic volumes.	Realign or upgrade sections of local roads or implement additional traffic management or maintenance implemented. Some local intersections will be upgraded.	3	B	Level 3 (low)	The Project will increase traffic levels during construction and operations. The road and intersection capacity improvements will maintain local road traffic conditions.

Table 22.4 Preliminary risk assessment and environmental risk assessment (Cont'd)

Risk description ¹	Preliminary environmental risk assessment (August 2011) ¹		Environmental risk assessment (June 2012)				
	Preliminary risk rating ²	Preliminary impact assessment	Controls	Consequences	Probability	Risk rating	Predicted impacts
Traffic volumes exceed the capacity of regional roads and intersections.	Level 3 (low)	The reduced mining rate and operational workforce will reduce traffic volumes.	Upgrade intersections of the local roads (used by Project traffic) with the Golden and Castlereagh highways where required to maintain current service levels. Seal shoulders and provide more signs on a short section of Cobbora Road.	2	B	Level 3 (low)	Regional road service levels will not be affected as a result of the Project.
Local road closures or realignments increase travel times.	Level 2 (medium)	The use of a series of smaller pits will require less changes to the local road network compared to those required for a larger single pit.	Road realignments have been designed to replicate existing routes to the greatest possible extent.	2	E	Level 2 (medium)	The road realignments on Brooklyn and Dapper roads will not influence travel times. Traffic using the northern end of Spring Ridge Road and travelling to/from the Dunedoo direction will need to travel a further 7 km (5 minutes) in each direction. Based on current traffic levels, this will affect about 23 vehicle movements in each direction each day. However, traffic using Spring Ridge Road to travel to/from the Dubbo direction will have shorter journeys.

Table 22.4 Preliminary risk assessment and environmental risk assessment (Cont'd)

Risk description ¹	Preliminary environmental risk assessment (August 2011) ¹		Environmental risk assessment (June 2012)				
	Preliminary risk rating ²	Preliminary impact assessment	Controls	Consequences	Probability	Risk rating	Predicted impacts
Visual amenity							
Regional visual amenity is significantly impacted.	Level 2 (medium)	The visual impacts of the mine at various viewpoints will change — being reduced at some and increased at others.	<p>The majority of properties with close to medium (<5 km) views of the mine or infrastructure have been acquired by CHC.</p> <p>Vegetation will be planted to screen infrastructure and operational elements of the mine.</p> <p>Make amenity agreements where this is the landholder's preference.</p> <p>Overburden emplacement areas will be rehabilitated as soon as possible.</p>	2	C	Level 3 (low)	<p>Initially, the mine and associated infrastructure will be visible from a small number of publically accessible areas (roads) and from 12 privately owned residences with 5 km. However, the visual impacts of these views will be temporary until vegetation screening and rehabilitation is established.</p> <p>The Project is not predicted to significantly impact the visual amenity of the area.</p>
Agriculture							
Reduced availability of land for agriculture productivity.	Level 2 (medium)	Less land suitable for agriculture will be impacted compared with the previous proposal because the mine footprint has reduced.	<p>The Rural Land Capability Class II land in the PAA will be avoided and disturbance to Class III land has been minimised.</p> <p>Rehabilitate land to provide a mixture of agricultural land and woodland.</p>	2	E	Level 2 (medium)	<p>Areas of Rural Land Capability Class III to VII land will be disturbed by the Project. No Rural Land Capability Class I or Class II land will be disturbed.</p> <p>Progressive and final rehabilitation will reinstate Class III to VII agricultural land. The area of the best agricultural land in the disturbance footprint (Class III) will increase by 323 ha (from 17% to 24% of the total post-mining disturbance footprint area).</p>

Table 22.4 Preliminary risk assessment and environmental risk assessment (Cont'd)

Risk description ¹	Preliminary environmental risk assessment (August 2011) ¹		Environmental risk assessment (June 2012)			
	Preliminary risk rating ²	Preliminary impact assessment	Controls	Consequences	Probability	Predicted impacts
Disruption to agricultural activities through changed access or mining activities.	Level 2 (medium)	There will be less disruption to agricultural activities compared to the previous proposal because the mine footprints have been reduced.	Leases will allow agricultural production to continue on much of land owned by CHC. Consult landholders about mining activities that may affect farming activities. Maintain access to farm properties.	2	B	Level 3 (low) Disruptions to agricultural activities will be minimal during the mine life. Agricultural activities in the Project footprint will decrease during the mine life. Rehabilitation will ensure long-term agricultural productivity in the PAA can return pre-mining levels.
Socio-economic						
Accommodation is insufficient to meet increased demand from mine workforce.	Level 2 (medium)	The workforce will be smaller because the mining rate will be lower compared to the previous proposal. Therefore, there will be less demand for accommodation compared to the previous proposal.	Implement measures to maximise employment of people already in the region. These will include partnerships with local training providers and providing apprenticeships to increase mining-related skills. The mine entrance road (the Spring Ridge Road realignment) has been located to encourage employment from areas where accommodation requirements are most easily met, including Dubbo and Wellington.	3	D	Level 2 (medium) Construction workforce accommodation requirements will be largely met by the construction accommodation village. Relocating workers will be some 50% of the peak operations workforce. There will be enough regional accommodation to meet this demand based on current regional building rates and the gradual ramp up of the operations workforce over 12 years.

Table 22.4 Preliminary risk assessment and environmental risk assessment (Cont'd)

Risk description ¹	Preliminary environmental risk assessment (August 2011) ¹		Environmental risk assessment (June 2012)				
	Preliminary risk rating ²	Preliminary impact assessment	Controls	Consequences	Probability	Risk rating	Predicted impacts
Insufficient local community services to support increased population.	Level 3 (low)	The workforce will be smaller because the mining rate will be lower compared to the previous proposal. Therefore, there will be less demand for local services compared to the previous proposal.	Regional and local service providers will continue to be consulted regarding workforce numbers. VPAs will be agreed with councils that will allow them to provide additional services.	2	B	Level 3 (low)	The projected regional population is predicted to decline with an attendant decline in the need for community services. The Project will help maintain the viability of community services.
Social disruptions from relocation of local residences.	Level 2 (medium)	Social disruptions are likely to be smaller for the revised proposal as the footprint and workforce is smaller.	CHC has offered to buy or provide other compensation to all landholders of properties within the project footprint or those for which noise or air quality criteria are predicted to be exceeded at residences. Where farms have been bought, formal agreements have been made to allow agricultural activities to continue up to a defined date.	2	C	Level 3 (low)	The acquisition and compensation program started in 2009 has offered landholders within the project footprint, or those for which noise or air quality criteria are predicted to be exceeded, increased certainty about their future. The Project will continue to contribute to community facilities, such as Jubilee Hall (Dunedoo) and Laheys Creek RFS.
Decreased availability of employees for non-mining sectors.	Level 2 (medium)	The workforce will be smaller because mine output will be lower compared to the previous proposal. Therefore, there will be less demand for employees compared to the previous proposal.	CHC will continue to work with agencies, councils, education providers and businesses to provide training and education places to create self-sustainable employment without compromising the labour pool available to existing local businesses.	3	C	Level 2 (medium)	There may be some competition for employees. However, the training programs and relocation of skilled workers will increase the skills base of the region. The increase in the operations workforce over 12 years will provide time for regional economies to adjust gradually.

Table 22.4 Preliminary risk assessment and environmental risk assessment (Cont'd)

Risk description ¹	Preliminary environmental risk assessment (August 2011) ¹		Environmental risk assessment (June 2012)				
	Preliminary risk rating ²	Preliminary impact assessment	Controls	Consequences	Probability	Risk rating	Predicted impacts
Hazards							
Risks to the public from mining, infrastructure and increased traffic.	Level 2 (medium)	Reduced mine production will decrease (the already small) risks to the public from the mine.	Ongoing risk assessments. Use risk reduction as part of ongoing design. Implement procedures during construction and operations.	3	B	Level 3 (low)	Risks have been reduced during project design to date. They will continue to be assessed and reduced during ongoing design and through implementing procedures during construction and operations.

1. Replicated from EMM (2011).

2. Since the preliminary environmental risk assessment (EMM 2011a) was completed, the risk assessment method has been refined so that the highest risk is 'level 1' in accordance with Australian/New Zealand Standard International Organisation for Standardisation 31000-2009 Risk Management – Principles and Guidelines (AS/NZS ISO 31000:2009). The preliminary environmental risk assessment ratings have been re-presented based on this definition.