Appendix E

CMPL Risk Assessment

Centennial Coal
Myuna

Risk Assessment Document

Myuna

Myuna Colliery Extension of Mining Project

Risk Assessment No.: 52

1. Background:

Myuna Colliery is a small underground coal mine operated by Centennial Myuna Pty Ltd, a wholly owned subsidiary of Centennial Coal Company Ltd (Centennial). The Myuna Colliery mine entry and primary surface facilities are located approximately 500-600m west of the closest residences of Wangi Wangi township on the western side of Lake Macquarie, near Newcastle NSW. Myuna Colliery has been producing coal by bord and pillar method since 1982.

Centennial Myuna Pty Limited (Myuna) operates the Myuna Colliery, an existing underground coal mine located in the Lake Macquarie region of NSW. Myuna Colliery currently operates under an extension of S74 of the Mining Act which deems mining under this section not illegal until 16 December 2010. As such Myuna is required to obtain approval under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to enable the continuation of underground mining and associated surface operations at the site.

No significant changes to existing coal handling and annual throughput are proposed. Minimal changes are proposed to existing surface operations.

This Risk Assessment (RA) has been prepared to assess the key environmental issues relating to a proposal by Centennial for an extension to mining operations at Myuna Colliery beyond the existing 1977 Development Consent boundary. An application for a Part 3A Project Approval will be lodged by Centennial for the Myuna Colliery Extension of Mining Project (the "Project), which will seek approval from the Minister for Planning to allow ongoing underground mining and associated surface operations.

Context of the Risk Assessment:
This Risk Assessment should consider the environmental risks posed by the entire Project as required for a Part 3A Environmental Assessment. The Scope of this RA is outlined in Section 4 (Risk Assessment Boundary Definition).

Presentation to the Risk Team During the Risk Assessment Workshop:
A project background presentation (powerpoint) for the Part 3A Environmental Assessment - Myuna Colliery was presented to the risk team by AECOM at the risk assessment workshop (see Appendix A . This provided an overview of the Part 3A process, as well as providing background to the mining areas including previous history, natural and man-made features and expected subsidence behavior.

2. Objective:

The following Hierarchy of Controls offers a framework for considering the effectiveness of controls. Note that the effectiveness of a control that is intended to reduce a risk decreases from top to bottom of the list. In other words, the closer the control type is to the top of the hierarchy, the more potentially effective the control.

·Eliminate the hazard or energy source (do not use the energy)
·Minimise or replace the hazard or energy source (reduce the amount of energy to a less damaging level or replace the energy with another hat has less potential negative consequences)
·Control the hazard or energy using engineered devices (ex. Lock outs, chemical containers, mechanical roof support, gas monitors, etc.)
·Control the hazard or energy by using physical barriers (ex. machine guarding, warning signs, etc.)
·Control the hazard or energy with procedures (ex. Isolation procedures, standard operating procedures, etc.)
·Control the hazard or energy with personal protective equipment (ex. hard hats, boots with toe caps, gloves, safety glasses, welding gear, etc.)
·Control the hazard or energy with warnings and awareness (ex. posters, labels, stickers, verbal warnings, etc.)

The following key objective of this preliminary RA for the Part 3A Environmental Assessment - Myuna Colliery include:
1. To establish an appropriate risk assessment team of suitable qualified and experienced Centennial staff, specialist consultants;
2. Discuss and review existing information known for the Study Area;
3. Identify and rank the environment and community constraints to future mining at Myuna;
4. Identify existing controls in place at Myuna to manage identified constraints; and
5. Identify where further works will be required to accurately assess the impacts of future proposed mining on the environment and community.
6. To produce a Project Risk Assessment Report (including Risk Register/WRAC Worksheet) for the Environmental Assessment to the DoP.

The aim is to provide the basis for identifying issues prior to the commencement of the environmental impact assessment phase of the project. It is intended that this RA would be used in the preparation of an Environmental Assessment (EA) to be submitted to the Department of Planning (DoP) under Part 3A of the Environmental Planning and Assessment Act and form part of the "risk based" justification for the level of assessment for the various aspects of the project.

3. Potential Hazards:

The identified potential hazards include

Impacts to Private Land
Ecology (terrestrial and aquatic)
Surface Water
Groundwater
Heritage (Aboriginal and European)
Noise
Dust
GHG
Community
Visual
Infrastructure
Waste
Social & economic
Traffic
Rehabilitation
Soils and Land use

4a. Risk Assessment Boundary Definition:

This risk assessment will cover the risks to the environment and community as detailed in Section 3 of this risk assessment as a result of underground mining within the Project Area. This risk assessment provides an overview of all potential environmental and community impacts on the Project. It is not specific to any mine layout.

Further, the scope of the risk assessment for the Myuna Colliery Continuation of Mining Project includes:
The Myuna pit top facilities (Surface Operations) associated with the coal handling plant;
All potential environmental impacts associated with mine access, ventilation and other services provided through the existing working areas to the active and proposed mining areas.

5. Risk Assessment Methods:

Yes/No	Method
	PROACTIVE TOOLS
Yes	Workplace Risk Assessment and Control (WRAC)
No	Fault Tree Analysis (FTA)
No	SIL Analysis to Australian Standard 61508 - Under Development
No	Bow Tie Analysis (BTA)
No	Failure Modes and Effects Analysis (FMEA)
	REACTIVE TOOLS:
No	Root Cause Analysis (RCA) - Under Development

6. Previous Risk Assessment and other documents to be used and/or referenced:

Document Name	Title	Version	Referenced Document Date
FINAL 2010 Review of Environmental Risks	Environmental Risk Assessment 2010	1	23-Jan-2010

7. Information Required for Risk Assessment:

Presentations were made by the Centennial Environment and Community Coordinator, Subsidence Engineers, Technical Services superintendent and AECOM to the risk assessment team at the start of the risk assessment workshop (refer to Appendix A) which provided an overview of the key characteristics of the Project study area and aspects required for discussion and assessment during the risk assessment. The presentations illustrated the study areas, outlined the mining method, predicted subsidence behaviour and history and subsidence in the area. The risk assessment team was given the opportunity to comment on the material in each presentation.

Preliminary mapping/figures were presented for natural and constructed surface features and land ownership within the Study Area. Comment was provided on each relevant aspect by the specialists present at the risk assessment meeting for ecology, archaeology/Aboriginal heritage, noise, air quality, surface water and mine subsidence.

More specifically the following documents will be called upon during the risk assessment:
Myuna Environmental Management System
Myuna Environmental Management Plans
Myuna Environmental Work Procedures
Applicable Legislation
MY10416
Heggies Air and Noise Gas Analysis Part 1
GHD Stormwater Investigation
Existing Flora and Fauna Surveys
LMCC State Conservation Area Plan of Management
All Myuna Lease's, Licences, Consents and Approvals
Myuna and Cooranbong EIS
Myuna historic Subsidence information

8. Venue and Time:

Date	Description	Location	Start Time	End Time	Comment
1. 08-Apr-2010	Scoping	Myuna Colliery	1:00 PM	2:30 PM	
2. 23-Apr-2010	Assessment	Myuna Colliery	1:00 PM	2:30 AM	
3.	Review				

9. Risk Assessment Team Selection

Name	Title	Company	Yrs. of Exp.	Mobile Phone #	E-Mail Address	Role
Catherine Whatson	Environment & Community Co-Coordinator	Myuna Colliery	2		catherine.whatson@centennialcoal.com.au	
Dianne Munro	Project Environmental Scientist	AECOM				
James Wearne	Environment and Community Coordinator Projects	Centennial Coal Company Limited	5			

Centennial Coal
Myuna

Attendance:

Name	1. 08-Apr-2010	2. 23-Apr-2010	3.
	Attendance Code	Attendance Code	Attendance Code
Catherine Whatson	P	P	
Dianne Munro		A	
James Wearne	P	P	

10. Scoping Document Authorisation Details:

Approval Status: Not Approved

Date:

Approver Name:

Comments:

WRAC Analysis Worksheet

L= Likelihood; MRC= Maximum Reasonable Consequence; RR= Risk Rank

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
1. Land	There is a risk to Myuna from ::: Damage to privately owned lands ::: Caused by: Geological failure or Subsidence or Surface disturbance Resulting in: Adverse public perception or Community complaints or Damage to privately owned infrastructure or Environmental Damage or Inrush or Loss of Aboriginal Heritage or Loss of European Heritage or Perceived damage to environment or Subsidence.	1.1.a. Mine design causes negligible surface disturbance >20mm over land 1.1.b. Stakeholder Engagement Plan 1.1.c. Hazardous Management Plan Inrush Management HSMS-HMP-D-03 1.1.d. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01 1.1.e. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03	**E** (D)	4 (F)	23 (L)	11. Subsidence Assessment being undertaken for inclusion in EA
2. Aquatic Ecology	There is a risk to Myuna from ::: Impacts to sea grass beds ::: Caused by: Subsidence or Underground mining Resulting in: Community complaints or Environmental Damage or Fines or Poor public perception.	2.1.a. Mine design causes negligible surface disturbance >20mm in areas of sea grass beds 2.1.b. Sea grass beds being mapped and assessed	**C** (D)	4 (L)	18 (M)	11. Subsidence Assessment being undertaken for inclusion in EA 2. Sea grass beds being mapped 3. Aquatic ecology impact assessment being done for EA
3. Terrestrial Ecology	There is a risk to Myuna from ::: Impact to threatened species ::: Caused by: Subsidence or Surface disturbance or Underground mining Resulting in: Adverse public perception or Environmental Damage or Fines or Loss of threatened species.	3.1.a. Mine design causes negligible surface disturbance >20mm over land 3.1.b. No additional surface disturbance for infrastructure required 3.1.c. Surface Disturbance Procedure MY-EWP-028 3.1.d. Land Management Plan MM-EMS-3-004 3.1.e. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03 3.1.f. Hazardous Management Plan Inrush	**E** (D)	4 (E)	23 (L)	19. Due Diligence desk top Terrestrial Ecology assessment to be undertaken for EA

WRAC Analysis Worksheet

L= Likelihood; MRC= Maximum Reasonable Consequence; RR= Risk Rank

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		Management HSMS-HMP-D-03				
		3.1.g. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
	There is a risk to Myuna from ::: Impact to Endangered Ecological Communities ::: Caused by: Subsidence or Surface disturbance or Underground mining Resulting in: Adverse public perception or Community complaints or Environmental Damage or Fines.	3.2.a. Mine design causes negligible surface disturbance >20mm over land	**E** (D)	4 (E)	23 (L)	19. Due Diligence desk top Terrestrial Ecology assessment to be undertaken for EA
		3.2.b. No additional surface disturbance for infrastructure required				
		3.2.c. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
		3.2.d. Land Management Plan MM-EMS-3-004				
		3.2.e. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				
		3.2.f. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03				
		3.2.g. Surface Disturbance Procedure MY-EWP-028				
	There is a risk to Myuna from ::: Impact to Ground water dependant ecosystems ::: Caused by: Changes in stream flows/flooding regimes or Subsidence or Underground mining Resulting in: Community complaints or Environmental Damage or Fines or Poor public perception.	3.3.a. Mine design causes negligible surface disturbance >20mm over land				19. Due Diligence desk top Terrestrial Ecology assessment to be undertaken for EA
		3.3.b. No additional surface disturbance for infrastructure required				
		3.3.c. Mining condition limits mining to maximum depth of rock head cover 40m				
		3.3.d. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01	**E** (D)	4 (E)	23 (L)	
		3.3.e. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				
		3.3.f. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03				

WRAC Analysis Worksheet

L= Likelihood; MRC= Maximum Reasonable Consequence; RR= Risk Rank

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	There is a risk to Myuna from ::: Impacts to fauna ::: Caused by: Loss of habitat Resulting in: Community complaints or Environmental Damage or Fines or Poor public perception.	3.4.a. Mine design causes negligible surface disturbance >20mm over land	**E** (D)	4 (E)	23 (L)	19. Due Diligence desk top Terrestrial Ecology assessment to be undertaken for EA
		3.4.b. Land Management Plan MM-EMS-3-004				
		3.4.c. No additional surface disturbance for infrastructure required				
		3.4.d. Surface Disturbance Procedure MY-EWP-028				
		3.4.e. Mining condition limits mining to maximum depth of rock head cover 40m				
		3.4.f. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
		3.4.g. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				
		3.4.h. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03				
4. Surface Water	There is a risk to Myuna from ::: Impact to local streams/watercourses ::: Caused by: Changes in stream flows/flooding regimes or Subsidence Resulting in: Adverse public perception or Environmental Damage or Fines.	4.1.a. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03	**D** (D)	4 (E)	21 (L)	11. Subsidence Assessment being undertaken for inclusion in EA
		4.1.b. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				4. Water Assessment to be done for EA
		4.1.c. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
		4.1.d. Mining condition limits mining to maximum depth of rock head cover 40m				
		4.1.e. No additional surface disturbance for infrastructure required				
		4.1.f. Land Management Plan MM-EMS-3-004				
		4.1.g. Mine design causes negligible surface disturbance >20mm over				

WRAC Analysis Worksheet

L= Likelihood; MRC= Maximum Reasonable Consequence; RR= Risk Rank

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		land				
	There is a risk to Myuna from ::: Impact to local streams/watercourses ::: Caused by: Licenced discharges Resulting in: Adverse public perception or Community complaints or Environmental Damage.	4.2.a. Myuna EPL details discharge criteria and limits	**D** (D)	4 (R)	21 (L)	5. Water Assessment to consider this for EA
		4.2.b. Monthly environmental monitoring				
		4.2.c. Continuous water quality monitor at LDP001				
		4.2.d. Thorough underground water settlement process prior to pumping to surface				
		4.2.e. Site surface area is split into three areas for management				
		4.2.f. Administration, wash down bay and amenities are discharged to HWC sewer under existing Trade Waste Agreement.				
	There is a risk to Myuna from ::: Impact to local streams/watercourses ::: Caused by: Exceedance of EPL criteria or Surface runoff or Unlicenced discharges Resulting in: Adverse public perception or Community complaints or Environmental Damage.	4.3.a. Monitor in accordance with EPL	**D** (D)	4 (R)	21 (L)	5. Water Assessment to consider this for EA
		4.3.b. Monthly environmental monitoring				
		4.3.c. Continuous water quality monitor at LDP001				
		4.3.d. GHD study into water quality				
		4.3.e. Thorough underground water settlement process prior to pumping to surface				
		4.3.f. Water Management Plan MM-EMS-3-001				
		4.3.g. Site surface area is split into three areas for management				
		4.3.h. Administration, wash down bay and amenities are discharged to HWC sewer under existing Trade Waste Agreement.				
		4.3.i. Hydrocarbon Management Plan MM-EMS-3-006				
		4.3.j. Daily and weekly surface inspection				
		4.3.k. Hydrocarbon Management Plan MM-EMS-3-006				
5. Groundwater	There is a risk to Myuna from	5.1.a. In seam groundwater volumes monitored.	**C** (D)	4 (E)	18 (M)	6. 4.1.a. Groundwater impact assessment and modelling being undertaken for Project

WRAC Analysis Worksheet

L= Likelihood; MRC= Maximum Reasonable Consequence; RR= Risk Rank

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	::: Adverse Impacts to groundwater aquifers ::: Caused by: Subsidence or Underground mining Resulting in: Adverse public perception or Community complaints or Environmental Damage.	5.1.b. Geotechnical engineered mine designs developed				
		5.1.c. Water Management Plan MM-EMS-3-001				
		5.1.d. Existing dewatering bores				
		5.1.e. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03				
		5.1.f. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				
		5.1.g. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
		5.1.h. Mining condition limits mining to maximum depth of rock head cover 40m				
6. Heritage (Aboriginal and European)	There is a risk to Myuna from ::: Impacts to Aboriginal Archaeological sites ::: Caused by: Subsidence or Surface disturbance Resulting in: Adverse public perception or Community complaints or Loss of Aboriginal Heritage.	6.1.a. Mine design causes negligible surface disturbance >20mm over land	**E** (D)	4 (E)	23 (L)	11. Subsidence Assessment being undertaken for inclusion in EA
		6.1.b. Surface Disturbance Procedure MY-EWP-028				7. Archaeological Impact Assessment to be done for EA
		6.1.c. Section 151 REF Consent for subsidence monitoring at Point Wolstoncroft				
	There is a risk to Myuna from ::: Impacts to European Heritage Sites ::: Caused by: Subsidence or Surface disturbance Resulting in: Adverse public perception or Community complaints.	6.2.a. Mine design causes negligible surface disturbance >20mm over land	**E** (D)	5 (E)	25 (L)	11. Subsidence Assessment being undertaken for inclusion in EA
		6.2.b. Surface Disturbance Procedure MY-EWP-028				12. European heritage Assessment to be done for EA
7. Noise	There is a risk to Myuna from	7.1.a. Vegetated ridgelines	**C**	4	18	8. 6.1.a. Noise assessment being undertaken for Project

WRAC Analysis Worksheet

L= Likelihood; MRC= Maximum Reasonable Consequence; RR= Risk Rank

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	::: Elevated noise levels above consent criteria/INP criteria ::: Caused by: Change in assessment criteria or Changes in surface infrastructure or Coal handling at pit top Resulting in: Adverse public perception or Community complaints or Delays in approval process or Land acquisition.	7.1.b. Noise Management Plan MM-EMS3-003 7.1.c. No complaints in last 5 years received	(D)	(R)	(M)	
8. Dust	There is a risk to Myuna from ::: Elevated dust levels ::: Caused by: Change in assessment criteria or Coal handling at pit top or Remote Infrastructure (e.g. Ventilation fans) Resulting in: Community complaints or Delays in approval process or Fines or Land acquisition or Poor public perception or Potential health problems in community.	8.1.a. Dust Management Plan MM-EMS-3-002 8.1.b. Fortnightly vacuum sweeper reduces elevated dust on surface 8.1.c. Daily wash down of CHP 8.1.d. Enclosed gantry, CHP and conveyor 8.1.e. No transport of coal by road/rail 8.1.f. Roads are bitumen 8.1.g. Monthly dust monitoring and annual reporting	**C** (D)	4 (R)	18 (M)	9. 7.1.a. Air quality assessment being done on Project for the EA
9. Subsidence	There is a risk to Myuna from ::: Subsidence ::: Caused by: Subsidence greater than predicted Resulting in: Adverse public perception or Community complaints or Damage to land or Damage to privately owned infrastructure or Fines.	9.1.a. Previous mining experience 9.1.b. Subsidence monitoring on Wangi Peninsula, Pulbah Island and Point Wolstoncroft 9.1.c. Geotechnical engineered mine designs developed 9.1.d. appropriate Factor of Safety calculation used 9.1.e. independent specialist peer review of the mine design 9.1.f. Mining operations is then managed	**C** (D)	3 (E)	13 (S)	1. Peer review of subsidence assessment

WRAC Analysis Worksheet

L= Likelihood; MRC= Maximum Reasonable Consequence; RR= Risk Rank

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		in accordance with design dimensions				
		9.1.g. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03				
		9.1.h. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				
		9.1.i. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
		9.1.j. Mining condition limits mining to maximum depth of rock head cover 40m				
10. Community	There is a risk to Myuna from ::: Community complaints ::: Caused by: Lack of consultation or Perceived unacceptable environmental impacts or Unacceptable environmental impacts Resulting in: Community complaints or Poor public perception.	10.1.a. Stakeholder Engagement Plan in place	**C** (D)	4 (R)	18 (M)	16. Information flyer to be developed and made available
		10.1.b. Dedicated community Information Line for Myuna				17. Article to be published in Centennial Coal section within the Lakes Mail
		10.1.c. Community Information Flyer				20. Centennial Key Messages to be developed
	There is a risk to Myuna from ::: Community action group protest ::: Caused by: History of Centennial/Newstan activities or Inadequate consultation or Perceived unacceptable Impacts to the environment or Unacceptable impacts to the environment Resulting in: Community complaints or Poor public perception or Submission taking longer than predicted for approval due to community concerns.	10.2.a. Stakeholder Engagement Plan	**D** (D)	4 (R)	21 (L)	

WRAC Analysis Worksheet

L= Likelihood; MRC= Maximum Reasonable Consequence; RR= Risk Rank

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	There is a risk to Myuna from ::: Concerned Aboriginal groups ::: Caused by: Inadequate consultation or Unacceptable impacts to Aboriginal sites Resulting in: Community complaints or Poor public perception or Submission taking longer than predicted for approval due to community concerns.	10.3.a. Mine design causes negligible surface disturbance >20mm over land and therefore unlikely to be impacts to Aboriginal sites	**D** (D)	5 (R)	24 (L)	15. Consultation guideline to be followed for Aboriginal Impact Assessment
		10.3.b. Advertisement calling for interested Aboriginal groups to register interest in project				18. Aboriginal Impact Assessment to be done for EA
	There is a risk to Myuna from ::: Adverse Media attention ::: Caused by: Community outrage or History of Centennial/Newstan activities or Inadequate consultation or Unacceptable impacts to the environment Resulting in: Community complaints or Poor public perception or Submission taking longer than predicted for approval due to community concerns.	10.4.a. Stakeholder Engagement Plan 10.4.b. Centennial has an External Relations Manager	**D** (D)	4 (R)	21 (L)	20. Centennial Key Messages to be developed
11. Visual	There is a risk to Myuna from ::: Visual amenity ::: Caused by: Lighting or Surface infrastructure Resulting in: Community complaints or Poor public perception or Submission taking longer than predicted for approval due to community concerns.	11.1.a. Colliery surrounded by vegetated buffer zone	**E** (D)	5 (E)	25 (L)	10. Visual amenity assessment being undertaken for Project and inclusion in EA
		11.1.b. Colliery nearest neighbour 5-600m from pit top				
		11.1.c. No additional surface disturbance for infrastructure required				
12. Infrastructure	There is a risk to Myuna from	12.1.a. Mine design causes negligible	**E**	4	23	11. Subsidence Assessment being undertaken for inclusion in EA

WRAC Analysis Worksheet

L= Likelihood; MRC= Maximum Reasonable Consequence; RR= Risk Rank

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	::: Adverse impacts to Infrastructure ::: Caused by: Subsidence or Underground mining Resulting in: Community complaints or Damage to mine infrastructure or Damage to privately owned infrastructure or Fines or Poor public perception or Possible safety hazard to people or Submission taking longer than predicted for approval due to community concerns.	surface disturbance >20mm over land 12.1.b. Location of key services identified	(D)	(R)	(L)	
13. Waste	There is a risk to Myuna from ::: Waste Management ::: Caused by: Poor waste management practices and procedures Resulting in: Fines or Inappropriate disposal of waste or Large deposits of waste to landfill.	13.1.a. Waste Minimisation and Management Plan MM-EMS-3-007 13.1.b. Ongoing Refresher Training 13.1.c. Environmental Induction 13.1.d. Contractors sort waste daily 13.1.e. Recycling Bins 13.1.f. Designated Scrap Metal Bins	**E** (D)	5 (E)	25 (L)	14. Waste Management being considered in Environmental Assessment
14. Social	There is a risk to Myuna from ::: Adverse social impacts ::: Caused by: Adverse environmental impacts or Delays in approval or Loss of jobs or Mine closure Resulting in: Community complaints or Decline in local economy or Loss of jobs or No further community contributions or Poor public perception.	14.1.a. Employ people from local area 14.1.b. Community sponsorship and programmes 14.1.c. Environmental Management System MM-EMS-2-001	**E** (D)	4 (R)	23 (L)	13. Social and Economic Impact Assessment being done for Project
15. Traffic and Transport	There is a risk to Myuna from ::: Traffic Impacts :::	15.1.a. Employ people from local area 15.1.b. Similar employee numbers for future operation as existing.	**D** (D)	4 (E)	21 (L)	21. Traffic Impact Assessment being done for EA

WRAC Analysis Worksheet

L= Likelihood; MRC= Maximum Reasonable Consequence; RR= Risk Rank

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: Staff and delivery vehicle movements to the surface facilities via public roads. Resulting in: Reduced traffic flow and safety.					
16. Green House Gas (GHG)	There is a risk to Myuna from ::: GHG emissions ::: Caused by: operation of surface infrastructure and facilities along with underground mining Resulting in: Increases to greenhouse gas emissions.	16.1.a. Reporting in accordance with the requirements of the National Greenhouse and Energy Reporting Act 2007	**D** (D)	5 (E)	24 (L)	24. GHG Assessment being done for EA
17. Rehabilitation	There is a risk to Myuna from ::: Rehabilitation conflicts ::: Caused by: Incompatible with surrounding land uses e.g. residential areas, industry. Resulting in: Adverse public perception or reduced economic benefit.	17.1.a. Since 2004, two areas have been rehabilitated back to native vegetation 17.1.b. Rehabilitation of the riparian zone downstream of the surface facilities area in 2007.	**D** (D)	4 (R)	21 (L)	23. Consideration of life of mine and rehabilitation in EA
18. Soils and Land Capability	There is a risk to Myuna from ::: Impacts to soils and land ::: Caused by: Impacts to soil from continued surface facilities operation Resulting in: Contamination of soils and reduced land capability.	18.1.a. Surface facilities cited on old power station ash dam. 18.1.b. No change in operation or land use proposed.	**E** (D)	5 (E)	25 (L)	22. Consideration of soils and land capability in EA

WRAC Analysis Sorted by RR

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
9. Subsidence	There is a risk to Myuna from ::: Subsidence ::: Caused by: Subsidence greater than predicted Resulting in: Adverse public perception or Community complaints or Damage to land or Damage to privately owned infrastructure or Fines.	9.1.a. Previous mining experience 9.1.b. Subsidence monitoring on Wangi Peninsula, Pulbah Island and Point Wolstoncroft 9.1.c. Geotechnical engineered mine designs developed 9.1.d. appropriate Factor of Safety calculation used 9.1.e. independent specialist peer review of the mine design 9.1.f. Mining operations is then managed in accordance with design dimensions 9.1.g. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03 9.1.h. Hazardous Management Plan Inrush Management HSMS-HMP-D-03 9.1.i. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01 9.1.j. Mining condition limits mining to maximum depth of rock head cover 40m	C (D)	3 (E)	13 (S)	1. Peer review of subsidence assessment
2. Aquatic Ecology	There is a risk to Myuna from ::: Impacts to sea grass beds ::: Caused by: Subsidence or Underground mining Resulting in: Community complaints or Environmental Damage or Fines or Poor public perception.	2.1.a. Mine design causes negligible surface disturbance >20mm in areas of sea grass beds 2.1.b. Sea grass beds being mapped and assessed	C (D)	4 (L)	18 (M)	11. Subsidence Assessment being undertaken for inclusion in EA 2. Sea grass beds being mapped 3. Aquatic ecology impact assessment being done for EA
5. Groundwater	There is a risk to Myuna from	5.1.a. In seam groundwater volumes monitored.	C (D)	4 (E)	18 (M)	6. 4.1.a. Groundwater impact assessment and modeling being undertaken for Project

WRAC Analysis Sorted by RR

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	::: Adverse Impacts to groundwater aquifers ::: Caused by: Subsidence or Underground mining Resulting in: Adverse public perception or Community complaints or Environmental Damage.	5.1.b. Geotechnical engineered mine designs developed 5.1.c. Water Management Plan MM-EMS-3-001 5.1.d. Existing dewatering bores 5.1.e. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03 5.1.f. Hazardous Management Plan Inrush Management HSMS-HMP-D-03 5.1.g. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01 5.1.h. Mining condition limits mining to maximum depth of rock head cover 40m				
7. Noise	There is a risk to Myuna from ::: Elevated noise levels above consent criteria/INP criteria ::: Caused by: Change in assessment criteria or Changes in surface infrastructure or Coal handling at pit top Resulting in: Adverse public perception or Community complaints or Delays in approval process or Land acquisition.	7.1.a. Vegetated ridgelines 7.1.b. Noise Management Plan MM-EMS3-003 7.1.c. No complaints in last 5 years received	**C** (D)	4 (R)	18 (M)	8. 6.1.a. Noise assessment being undertaken for Project
8. Dust	There is a risk to Myuna from ::: Elevated dust levels ::: Caused by: Change in assessment criteria or Coal handling at pit top or Remote Infrastructure (e.g. Ventilation fans) Resulting in:	8.1.a. Dust Management Plan MM-EMS-3-002 8.1.b. Fortnightly vacuum sweeper reduces elevated dust on surface 8.1.c. Daily wash down of CHP 8.1.d. Enclosed gantry, CHP and	**C** (D)	4 (R)	18 (M)	9. 7.1.a. Air quality assessment being done on Project for the EA

WRAC Analysis Sorted by RR

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Community complaints or Delays in approval process or Fines or Land acquisition or Poor public perception or Potential health problems in community.	conveyor				
		8.1.e. No transport of coal by road/rail				
		8.1.f. Roads are bitumen				
		8.1.g. Monthly dust monitoring and annual reporting				
10. Community	There is a risk to Myuna from ::: Community complaints ::: Caused by: Lack of consultation or Perceived unacceptable environmental impacts or Unacceptable environmental impacts Resulting in: Community complaints or Poor public perception.	10.1.a. Stakeholder Engagement Plan in place				16. Information flyer to be developed and made available
		10.1.b. Dedicated community Information Line for Myuna				17. Article to be published in Centennial Coal section within the Lakes Mail
		10.1.c. Community Information Flyer	**C** (D)	4 (R)	18 (M)	20. Centennial Key Messages to be developed
4. Surface Water	There is a risk to Myuna from ::: Impact to local streams/watercourses ::: Caused by: Changes in stream flows/flooding regimes or Subsidence Resulting in: Adverse public perception or Environmental Damage or Fines.	4.1.a. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03				11. Subsidence Assessment being undertaken for inclusion in EA
		4.1.b. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				4. Water Assessment to be done for EA
		4.1.c. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01	**D** (D)	4 (E)	21 (L)	
		4.1.d. Mining condition limits mining to maximum depth of rock head cover 40m				
		4.1.e. No additional surface disturbance for infrastructure required				
		4.1.f. Land Management Plan MM-EMS-3-004				
		4.1.g. Mine design causes negligible				

WRAC Analysis Sorted by RR

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		surface disturbance >20mm over land				
4. Surface Water	There is a risk to Myuna from ::: Impact to local streams/watercourses ::: Caused by: Licenced discharges Resulting in: Adverse public perception or Community complaints or Environmental Damage.	4.2.a. Myuna EPL details discharge criteria and limits	**D** (D)	4 (R)	21 (L)	5. Water Assessment to consider this for EA
		4.2.b. Monthly environmental monitoring				
		4.2.c. Continuous water quality monitor at LDP001				
		4.2.d. Thorough underground water settlement process prior to pumping to surface				
		4.2.e. Site surface area is split into three areas for management				
		4.2.f. Administration, wash down bay and amenities are discharged to HWC sewer under existing Trade Waste Agreement.				
4. Surface Water	There is a risk to Myuna from ::: Impact to local streams/watercourses ::: Caused by: Exceedance of EPL criteria or Surface runoff or Unlicenced discharges Resulting in: Adverse public perception or Community complaints or Environmental Damage.	4.3.a. Monitor in accordance with EPL	**D** (D)	4 (R)	21 (L)	5. Water Assessment to consider this for EA
		4.3.b. Monthly environmental monitoring				
		4.3.c. Continuous water quality monitor at LDP001				
		4.3.d. GHD study into water quality				
		4.3.e. Thorough underground water settlement process prior to pumping to surface				
		4.3.f. Water Management Plan MM-EMS-3-001				
		4.3.g. Site surface area is split into three areas for management				
		4.3.h. Administration, wash down bay and amenities are discharged to HWC sewer under existing Trade Waste Agreement.				
		4.3.i. Hydrocarbon Management Plan MM-EMS-3-006				
		4.3.j. Daily and weekly surface inspection				
		4.3.k. Hydrocarbon Management				

WRAC Analysis Sorted by RR

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		Plan MM-EMS-3-006				
10. Community	There is a risk to Myuna from ::: Community action group protest ::: Caused by: History of Centennial/Newstan activities or Inadequate consultation or Perceived unacceptable Impacts to the environment or Unacceptable impacts to the environment Resulting in: Community complaints or Poor public perception or Submission taking longer than predicted for approval due to community concerns.	10.2.a. Stakeholder Engagement Plan	**D** (D)	4 (R)	21 (L)	
10. Community	There is a risk to Myuna from ::: Adverse Media attention ::: Caused by: Community outrage or History of Centennial/Newstan activities or Inadequate consultation or Unacceptable impacts to the environment Resulting in: Community complaints or Poor public perception or Submission taking longer than predicted for approval due to community concerns.	10.4.a. Stakeholder Engagement Plan 10.4.b. Centennial has an External Relations Manager	**D** (D)	4 (R)	21 (L)	20. Centennial Key Messages to be developed
15. Traffic and Transport	There is a risk to Myuna from ::: Traffic Impacts ::: Caused by: Staff and delivery vehicle movements to the surface facilities via public roads. Resulting in: Reduced traffic flow and safety.	15.1.a. Employ people from local area 15.1.b. Similar employee numbers for future operation as existing.	**D** (D)	4 (E)	21 (L)	21. Traffic Impact Assessment being done for EA
17. Rehabilitation	There is a risk to Myuna from	17.1.a. Since 2004, two areas have	**D**	4	21	23. Consideration of life of mine and rehabilitation in EA

WRAC Analysis Sorted by RR

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	::: Rehabilitation conflicts ::: Caused by: Incompatible with surrounding land uses e.g. residential areas, industry. Resulting in: Adverse public perception or reduced economic benefit.	been rehabilitated back to native vegetation 17.1.b. Rehabilitation of the riparian zone downstream of the surface facilities area in 2007.	(D)	(R)	(L)	
1. Land	There is a risk to Myuna from ::: Damage to privately owned lands ::: Caused by: Geological failure or Subsidence or Surface disturbance Resulting in: Adverse public perception or Community complaints or Damage to privately owned infrastructure or Environmental Damage or Inrush or Loss of Aboriginal Heritage or Loss of European Heritage or Perceived damage to environment or Subsidence.	1.1.a. Mine design causes negligible surface disturbance >20mm over land 1.1.b. Stakeholder Engagement Plan 1.1.c. Hazardous Management Plan Inrush Management HSMS-HMP-D-03 1.1.d. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01 1.1.e. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03	**E** (D)	4 (F)	23 (L)	11. Subsidence Assessment being undertaken for inclusion in EA
3. Terrestrial Ecology	There is a risk to Myuna from ::: Impact to threatened species ::: Caused by: Subsidence or Surface disturbance or Underground mining Resulting in: Adverse public perception or Environmental Damage or Fines or Loss of threatened species.	3.1.a. Mine design causes negligible surface disturbance >20mm over land 3.1.b. No additional surface disturbance for infrastructure required 3.1.c. Surface Disturbance Procedure MY-EWP-028 3.1.d. Land Management Plan MM-EMS-3-004 3.1.e. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03 3.1.f. Hazardous Management Plan Inrush Management HSMS-	**E** (D)	4 (E)	23 (L)	19. Due Diligence desk top Terrestrial Ecology assessment to be undertaken for EA

WRAC Analysis Sorted by RR

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		HMP-D-03				
		3.1.g. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
3. Terrestrial Ecology	There is a risk to Myuna from ::: Impact to Endangered Ecological Communities ::: Caused by: Subsidence or Surface disturbance or Underground mining Resulting in: Adverse public perception or Community complaints or Environmental Damage or Fines.	3.2.a. Mine design causes negligible surface disturbance >20mm over land	E (D)	4 (E)	23 (L)	19. Due Diligence desk top Terrestrial Ecology assessment to be undertaken for EA
		3.2.b. No additional surface disturbance for infrastructure required				
		3.2.c. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
		3.2.d. Land Management Plan MM-EMS-3-004				
		3.2.e. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				
		3.2.f. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03				
		3.2.g. Surface Disturbance Procedure MY-EWP-028				
3. Terrestrial Ecology	There is a risk to Myuna from ::: Impact to Ground water dependant ecosystems ::: Caused by: Changes in stream flows/flooding regimes or Subsidence or Underground mining Resulting in: Community complaints or Environmental Damage or Fines or Poor public perception.	3.3.a. Mine design causes negligible surface disturbance >20mm over land	E (D)	4 (E)	23 (L)	19. Due Diligence desk top Terrestrial Ecology assessment to be undertaken for EA
		3.3.b. No additional surface disturbance for infrastructure required				
		3.3.c. Mining condition limits mining to maximum depth of rock head cover 40m				
		3.3.d. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
		3.3.e. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				

WRAC Analysis Sorted by RR

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		3.3.f. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03				
3. Terrestrial Ecology	There is a risk to Myuna from ::: Impacts to fauna ::: Caused by: Loss of habitat Resulting in: Community complaints or Environmental Damage or Fines or Poor public perception.	3.4.a. Mine design causes negligible surface disturbance >20mm over land	**E** (D)	4 (E)	23 (L)	19. Due Diligence desk top Terrestrial Ecology assessment to be undertaken for EA
		3.4.b. Land Management Plan MM-EMS-3-004				
		3.4.c. No additional surface disturbance for infrastructure required				
		3.4.d. Surface Disturbance Procedure MY-EWP-028				
		3.4.e. Mining condition limits mining to maximum depth of rock head cover 40m				
		3.4.f. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
		3.4.g. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				
		3.4.h. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03				
6. Heritage (Aboriginal and European)	There is a risk to Myuna from ::: Impacts to Aboriginal Archaeological sites ::: Caused by: Subsidence or Surface disturbance Resulting in: Adverse public perception or Community complaints or Loss of Aboriginal Heritage.	6.1.a. Mine design causes negligible surface disturbance >20mm over land	**E** (D)	4 (E)	23 (L)	11. Subsidence Assessment being undertaken for inclusion in EA
		6.1.b. Surface Disturbance Procedure MY-EWP-028				7. Archaeological Impact Assessment to be done for EA
		6.1.c. Section 151 REF Consent for subsidence monitoring at Point Wolstoncroft				
12. Infrastructure	There is a risk to Myuna from ::: Adverse impacts to Infrastructure :::	12.1.a. Mine design causes negligible surface disturbance >20mm over land	**E** (D)	4 (R)	23 (L)	11. Subsidence Assessment being undertaken for inclusion in EA

WRAC Analysis Sorted by RR

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: Subsidence or Underground mining Resulting in: Community complaints or Damage to mine infrastructure or Damage to privately owned infrastructure or Fines or Poor public perception or Possible safety hazard to people or Submission taking longer than predicted for approval due to community concerns.	12.1.b. Location of key services identified				
14. Social	There is a risk to Myuna from ::: Adverse social impacts ::: Caused by: Adverse environmental impacts or Delays in approval or Loss of jobs or Mine closure Resulting in: Community complaints or Decline in local economy or Loss of jobs or No further community contributions or Poor public perception.	14.1.a. Employ people from local area 14.1.b. Community sponsorship and programmes 14.1.c. Environmental Management System MM-EMS-2-001	**E** (D)	4 (R)	23 (L)	13. Social and Economic Impact Assessment being done for Project
10. Community	There is a risk to Myuna from ::: Concerned Aboriginal groups ::: Caused by: Inadequate consultation or Unacceptable impacts to Aboriginal sites Resulting in: Community complaints or Poor public perception or Submission taking longer than predicted for approval due to community concerns.	10.3.a. Mine design causes negligible surface disturbance >20mm over land and therefore unlikely to be impacts to Aboriginal sites	**D** (D)	5 (R)	24 (L)	15. Consultation guideline to be followed for Aboriginal Impact Assessment
		10.3.b. Advertisement calling for interested Aboriginal groups to register interest in project				18. Aboriginal Impact Assessment to be done for EA
16. Green House Gas (GHG)	There is a risk to Myuna from ::: GHG emissions ::: Caused by:	16.1.a. Reporting in accordance with the requirements of the National Greenhouse and Energy Reporting Act 2007	**D** (D)	5 (E)	24 (L)	24. GHG Assessment being done for EA

WRAC Analysis Sorted by RR

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	operation of surface infrastructure and facilities along with underground mining Resulting in: Increases to greenhouse gas emissions.					
6. Heritage (Aboriginal and European)	There is a risk to Myuna from ::: Impacts to European Heritage Sites ::: Caused by: Subsidence or Surface disturbance Resulting in: Adverse public perception or Community complaints.	6.2.a. Mine design causes negligible surface disturbance >20mm over land	**E** (D)	5 (E)	25 (L)	11. Subsidence Assessment being undertaken for inclusion in EA
		6.2.b. Surface Disturbance Procedure MY-EWP-028				12. European heritage Assessment to be done for EA
11. Visual	There is a risk to Myuna from ::: Visual amenity ::: Caused by: Lighting or Surface infrastructure Resulting in: Community complaints or Poor public perception or Submission taking longer than predicted for approval due to community concerns.	11.1.a. Colliery surrounded by vegetated buffer zone	**E** (D)	5 (E)	25 (L)	10. Visual amenity assessment being undertaken for Project and inclusion in EA
		11.1.b. Colliery nearest neighbour 5-600m from pit top				
		11.1.c. No additional surface disturbance for infrastructure required				
13. Waste	There is a risk to Myuna from ::: Waste Management ::: Caused by: Poor waste management practices and procedures Resulting in: Fines or Inappropriate disposal of waste or Large deposits of waste to landfill.	13.1.a. Waste Minimisation and Management Plan MM-EMS-3-007	**E** (D)	5 (E)	25 (L)	14. Waste Management being considered in Environmental Assessment
		13.1.b. Ongoing Refresher Training				
		13.1.c. Environmental Induction				
		13.1.d. Contractors sort waste daily				
		13.1.e. Recycling Bins				
		13.1.f. Designated Scrap Metal Bins				
18. Soils and Land Capability	There is a risk to Myuna from ::: Impacts to soils and land ::: Caused by: Impacts to soil from continued surface	18.1.a. Surface facilities cited on old power station ash dam.	**E** (D)	5 (E)	25 (L)	22. Consideration of soils and land capability in EA
		18.1.b. No change in operation or land use proposed.				

WRAC Analysis Sorted by RR

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	facilities operation Resulting in: Contamination of soils and reduced land capability.					

WRAC Analysis Sorted by Consequence

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
9. Subsidence	There is a risk to Myuna from ::: Subsidence ::: Caused by: Subsidence greater than predicted Resulting in: Adverse public perception or Community complaints or Damage to land or Damage to privately owned infrastructure or Fines.	9.1.a. Previous mining experience 9.1.b. Subsidence monitoring on Wangi Peninsula, Pulbah Island and Point Wolstoncroft 9.1.c. Geotechnical engineered mine designs developed 9.1.d. appropriate Factor of Safety calculation used 9.1.e. independent specialist peer review of the mine design 9.1.f. Mining operations is then managed in accordance with design dimensions 9.1.g. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03 9.1.h. Hazardous Management Plan Inrush Management HSMS-HMP-D-03 9.1.i. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01 9.1.j. Mining condition limits mining to maximum depth of rock head cover 40m	**C** (D)	3 (E)	13 (S)	1. Peer review of subsidence assessment
3. Terrestrial Ecology	There is a risk to Myuna from ::: Impact to threatened species ::: Caused by: Subsidence or Surface disturbance or Underground mining Resulting in: Adverse public perception or Environmental Damage or Fines or Loss of threatened species.	3.1.a. Mine design causes negligible surface disturbance >20mm over land 3.1.b. No additional surface disturbance for infrastructure required 3.1.c. Surface Disturbance Procedure MY-EWP-028 3.1.d. Land Management Plan MM-EMS-3-004 3.1.e. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03	**E** (D)	4 (E)	23 (L)	19. Due Diligence desk top Terrestrial Ecology assessment to be undertaken for EA

WRAC Analysis Sorted by Consequence

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		3.1.f. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				
		3.1.g. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
3. Terrestrial Ecology	There is a risk to Myuna from ::: Impact to Endangered Ecological Communities ::: Caused by: Subsidence or Surface disturbance or Underground mining Resulting in: Adverse public perception or Community complaints or Environmental Damage or Fines.	3.2.a. Mine design causes negligible surface disturbance >20mm over land	**E** (D)	4 (E)	23 (L)	19. Due Diligence desk top Terrestrial Ecology assessment to be undertaken for EA
		3.2.b. No additional surface disturbance for infrastructure required				
		3.2.c. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
		3.2.d. Land Management Plan MM-EMS-3-004				
		3.2.e. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				
		3.2.f. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03				
		3.2.g. Surface Disturbance Procedure MY-EWP-028				
3. Terrestrial Ecology	There is a risk to Myuna from ::: Impact to Ground water dependant ecosystems ::: Caused by: Changes in stream flows/flooding regimes or Subsidence or Underground mining Resulting in: Community complaints or Environmental Damage or Fines or Poor public perception.	3.3.a. Mine design causes negligible surface disturbance >20mm over land				19. Due Diligence desk top Terrestrial Ecology assessment to be undertaken for EA
		3.3.b. No additional surface disturbance for infrastructure required				
		3.3.c. Mining condition limits mining to maximum depth of rock head cover 40m	**E** (D)	4 (E)	23 (L)	
		3.3.d. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
		3.3.e. Hazardous Management Plan				

WRAC Analysis Sorted by Consequence

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		Inrush Management HSMS-HMP-D-03				
		3.3.f. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03				
3. Terrestrial Ecology	There is a risk to Myuna from ::: Impacts to fauna ::: Caused by: Loss of habitat Resulting in: Community complaints or Environmental Damage or Fines or Poor public perception.	3.4.a. Mine design causes negligible surface disturbance >20mm over land	**E** (D)	4 (E)	23 (L)	19. Due Diligence desk top Terrestrial Ecology assessment to be undertaken for EA
		3.4.b. Land Management Plan MM-EMS-3-004				
		3.4.c. No additional surface disturbance for infrastructure required				
		3.4.d. Surface Disturbance Procedure MY-EWP-028				
		3.4.e. Mining condition limits mining to maximum depth of rock head cover 40m				
		3.4.f. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
		3.4.g. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				
		3.4.h. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03				
4. Surface Water	There is a risk to Myuna from ::: Impact to local streams/watercourses ::: Caused by: Changes in stream flows/flooding regimes or Subsidence Resulting in: Adverse public perception or Environmental Damage or Fines.	4.1.a. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03	**D** (D)	4 (E)	21 (L)	11. Subsidence Assessment being undertaken for inclusion in EA
		4.1.b. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				4. Water Assessment to be done for EA
		4.1.c. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
		4.1.d. Mining condition limits mining to maximum depth of rock head cover 40m				

WRAC Analysis Sorted by Consequence

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		4.1.e. No additional surface disturbance for infrastructure required				
		4.1.f. Land Management Plan MM-EMS-3-004				
		4.1.g. Mine design causes negligible surface disturbance >20mm over land				
5. Groundwater	There is a risk to Myuna from ::: Adverse Impacts to groundwater aquifers ::: Caused by: Subsidence or Underground mining Resulting in: Adverse public perception or Community complaints or Environmental Damage.	5.1.a. In seam groundwater volumes monitored.	C (D)	4 (E)	18 (M)	6. 4.1.a. Groundwater impact assessment and modeling being undertaken for Project
		5.1.b. Geotechnical engineered mine designs developed				
		5.1.c. Water Management Plan MM-EMS-3-001				
		5.1.d. Existing dewatering bores				
		5.1.e. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03				
		5.1.f. Hazardous Management Plan Inrush Management HSMS-HMP-D-03				
		5.1.g. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01				
		5.1.h. Mining condition limits mining to maximum depth of rock head cover 40m				
6. Heritage (Aboriginal and European)	There is a risk to Myuna from ::: Impacts to Aboriginal Archaeological sites ::: Caused by: Subsidence or Surface disturbance Resulting in: Adverse public perception or Community complaints or Loss of Aboriginal Heritage.	6.1.a. Mine design causes negligible surface disturbance >20mm over land				11. Subsidence Assessment being undertaken for inclusion in EA
		6.1.b. Surface Disturbance Procedure MY-EWP-028				7. Archaeological Impact Assessment to be done for EA
		6.1.c. Section 151 REF Consent for subsidence monitoring at Point Wolstoncroft	E (D)	4 (E)	23 (L)	
15. Traffic and Transport	There is a risk to Myuna from	15.1.a. Employ people from local area	D	4	21	21. Traffic Impact Assessment being done for EA

WRAC Analysis Sorted by Consequence

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	::: Traffic Impacts ::: Caused by: Staff and delivery vehicle movements to the surface facilities via public roads. Resulting in: Reduced traffic flow and safety.	15.1.b. Similar employee numbers for future operation as existing.	(D)	(E)	(L)	
1. Land	There is a risk to Myuna from ::: Damage to privately owned lands ::: Caused by: Geological failure or Subsidence or Surface disturbance Resulting in: Adverse public perception or Community complaints or Damage to privately owned infrastructure or Environmental Damage or Inrush or Loss of Aboriginal Heritage or Loss of European Heritage or Perceived damage to environment or Subsidence.	1.1.a. Mine design causes negligible surface disturbance >20mm over land 1.1.b. Stakeholder Engagement Plan 1.1.c. Hazardous Management Plan Inrush Management HSMS-HMP-D-03 1.1.d. Health and Safety Management System component Mine Inspection Program HSMS-SC-D-01 1.1.e. Health and Safety Management System component Supervision Arrangements HSMS-SC-D-03	**E** (D)	4 (F)	23 (L)	11. Subsidence Assessment being undertaken for inclusion in EA
2. Aquatic Ecology	There is a risk to Myuna from ::: Impacts to sea grass beds ::: Caused by: Subsidence or Underground mining Resulting in: Community complaints or Environmental Damage or Fines or Poor public perception.	2.1.a. Mine design causes negligible surface disturbance >20mm in areas of sea grass beds 2.1.b. Sea grass beds being mapped and assessed	**C** (D)	4 (L)	18 (M)	11. Subsidence Assessment being undertaken for inclusion in EA 2. Sea grass beds being mapped 3. Aquatic ecology impact assessment being done for EA
4. Surface Water	There is a risk to Myuna from ::: Impact to local streams/watercourses ::: Caused by: Licenced discharges Resulting in:	4.2.a. Myuna EPL details discharge criteria and limits 4.2.b. Monthly environmental monitoring 4.2.c. Continuous water quality monitor at LDP001 4.2.d. Thorough underground water settlement process prior to	**D** (D)	4 (R)	21 (L)	5. Water Assessment to consider this for EA

WRAC Analysis Sorted by Consequence

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Adverse public perception or Community complaints or Environmental Damage.	pumping to surface 4.2.e. Site surface area is split into three areas for management 4.2.f. Administration, wash down bay and amenities are discharged to HWC sewer under existing Trade Waste Agreement.				
4. Surface Water	There is a risk to Myuna from ::: Impact to local streams/watercourses ::: Caused by: Exceedance of EPL criteria or Surface runoff or Unlicenced discharges Resulting in: Adverse public perception or Community complaints or Environmental Damage.	4.3.a. Monitor in accordance with EPL 4.3.b. Monthly environmental monitoring 4.3.c. Continuous water quality monitor at LDP001 4.3.d. GHD study into water quality 4.3.e. Thorough underground water settlement process prior to pumping to surface 4.3.f. Water Management Plan MM-EMS-3-001 4.3.g. Site surface area is split into three areas for management 4.3.h. Administration, wash down bay and amenities are discharged to HWC sewer under existing Trade Waste Agreement. 4.3.i. Hydrocarbon Management Plan MM-EMS-3-006 4.3.j. Daily and weekly surface inspection 4.3.k. Hydrocarbon Management Plan MM-EMS-3-006	**D** (D)	4 (R)	21 (L)	5. Water Assessment to consider this for EA
7. Noise	There is a risk to Myuna from ::: Elevated noise levels above consent criteria/INP criteria ::: Caused by: Change in assessment criteria or Changes in surface infrastructure or Coal handling at pit top Resulting in:	7.1.a. Vegetated ridgelines 7.1.b. Noise Management Plan MM-EMS3-003 7.1.c. No complaints in last 5 years received	**C** (D)	4 (R)	18 (M)	8. 6.1.a. Noise assessment being undertaken for Project

WRAC Analysis Sorted by Consequence

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Adverse public perception or Community complaints or Delays in approval process or Land acquisition.					
8. Dust	There is a risk to Myuna from ::: Elevated dust levels ::: Caused by: Change in assessment criteria or Coal handling at pit top or Remote Infrastructure (e.g. Ventilation fans) Resulting in: Community complaints or Delays in approval process or Fines or Land acquisition or Poor public perception or Potential health problems in community.	8.1.a. Dust Management Plan MM-EMS-3-002	**C** (D)	4 (R)	18 (M)	9. 7.1.a. Air quality assessment being done on Project for the EA
		8.1.b. Fortnightly vacuum sweeper reduces elevated dust on surface				
		8.1.c. Daily wash down of CHP				
		8.1.d. Enclosed gantry, CHP and conveyor				
		8.1.e. No transport of coal by road/rail				
		8.1.f. Roads are bitumen				
		8.1.g. Monthly dust monitoring and annual reporting				
10. Community	There is a risk to Myuna from ::: Community complaints ::: Caused by: Lack of consultation or Perceived unacceptable environmental impacts or Unacceptable environmental impacts Resulting in: Community complaints or Poor public perception.	10.1.a. Stakeholder Engagement Plan in place	**C** (D)	4 (R)	18 (M)	16. Information flyer to be developed and made available
		10.1.b. Dedicated community Information Line for Myuna				17. Article to be published in Centennial Coal section within the Lakes Mail
		10.1.c. Community Information Flyer				20. Centennial Key Messages to be developed
10. Community	There is a risk to Myuna from ::: Community action group protest ::: Caused by: History of Centennial/Newstan activities or Inadequate consultation or Perceived unacceptable Impacts to the environment or Unacceptable impacts to the environment	10.2.a. Stakeholder Engagement Plan	**D** (D)	4 (R)	21 (L)	

WRAC Analysis Sorted by Consequence

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Resulting in: Community complaints or Poor public perception or Submission taking longer than predicted for approval due to community concerns.					
10. Community	There is a risk to Myuna from ::: Adverse Media attention ::: Caused by: Community outrage or History of Centennial/Newstan activities or Inadequate consultation or Unacceptable impacts to the environment Resulting in: Community complaints or Poor public perception or Submission taking longer than predicted for approval due to community concerns.	10.4.a. Stakeholder Engagement Plan 10.4.b. Centennial has an External Relations Manager	**D** (D)	4 (R)	21 (L)	20. Centennial Key Messages to be developed
12. Infrastructure	There is a risk to Myuna from ::: Adverse impacts to Infrastructure ::: Caused by: Subsidence or Underground mining Resulting in: Community complaints or Damage to mine infrastructure or Damage to privately owned infrastructure or Fines or Poor public perception or Possible safety hazard to people or Submission taking longer than predicted for approval due to community concerns.	12.1.a. Mine design causes negligible surface disturbance >20mm over land 12.1.b. Location of key services identified	**E** (D)	4 (R)	23 (L)	11. Subsidence Assessment being undertaken for inclusion in EA
14. Social	There is a risk to Myuna from ::: Adverse social impacts ::: Caused by: Adverse environmental impacts or Delays in approval or Loss of jobs or Mine closure	14.1.a. Employ people from local area 14.1.b. Community sponsorship and programmes 14.1.c. Environmental Management System MM-EMS-2-001	**E** (D)	4 (R)	23 (L)	13. Social and Economic Impact Assessment being done for Project

WRAC Analysis Sorted by Consequence

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Resulting in: Community complaints or Decline in local economy or Loss of jobs or No further community contributions or Poor public perception.					
17. Rehabilitation	There is a risk to Myuna from ::: Rehabilitation conflicts ::: Caused by: Incompatible with surrounding land uses e.g. residential areas, industry. Resulting in: Adverse public perception or reduced economic benefit.	17.1.a. Since 2004, two areas have been rehabilitated back to native vegetation 17.1.b. Rehabilitation of the riparian zone downstream of the surface facilities area in 2007.	**D** (D)	4 (R)	21 (L)	23. Consideration of life of mine and rehabilitation in EA
6. Heritage (Aboriginal and European)	There is a risk to Myuna from ::: Impacts to European Heritage Sites ::: Caused by: Subsidence or Surface disturbance Resulting in: Adverse public perception or Community complaints.	6.2.a. Mine design causes negligible surface disturbance >20mm over land 6.2.b. Surface Disturbance Procedure MY-EWP-028	**E** (D)	5 (E)	25 (L)	11. Subsidence Assessment being undertaken for inclusion in EA 12. European heritage Assessment to be done for EA
11. Visual	There is a risk to Myuna from ::: Visual amenity ::: Caused by: Lighting or Surface infrastructure Resulting in: Community complaints or Poor public perception or Submission taking longer than predicted for approval due to community concerns.	11.1.a. Colliery surrounded by vegetated buffer zone 11.1.b. Colliery nearest neighbour 5-600m from pit top 11.1.c. No additional surface disturbance for infrastructure required	**E** (D)	5 (E)	25 (L)	10. Visual amenity assessment being undertaken for Project and inclusion in EA
13. Waste	There is a risk to Myuna from ::: Waste Management :::	13.1.a. Waste Minimisation and Management Plan MM-EMS-3-007 13.1.b. Ongoing Refresher Training	**E** (D)	5 (E)	25 (L)	14. Waste Management being considered in Environmental Assessment

WRAC Analysis Sorted by Consequence

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: Poor waste management practices and procedures Resulting in: Fines or Inappropriate disposal of waste or Large deposits of waste to landfill.	13.1.c. Environmental Induction 13.1.d. Contractors sort waste daily 13.1.e. Recycling Bins 13.1.f. Designated Scrap Metal Bins				
16. Green House Gas (GHG)	There is a risk to Myuna from ::: GHG emissions ::: Caused by: operation of surface infrastructure and facilities along with underground mining Resulting in: Increases to greenhouse gas emissions.	16.1.a. Reporting in accordance with the requirements of the National Greenhouse and Energy Reporting Act 2007	**D** (D)	5 (E)	24 (L)	24. GHG Assessment being done for EA
18. Soils and Land Capability	There is a risk to Myuna from ::: Impacts to soils and land ::: Caused by: Impacts to soil from continued surface facilities operation Resulting in: Contamination of soils and reduced land capability.	18.1.a. Surface facilities cited on old power station ash dam. 18.1.b. No change in operation or land use proposed.	**E** (D)	5 (E)	25 (L)	22. Consideration of soils and land capability in EA
10. Community	There is a risk to Myuna from ::: Concerned Aboriginal groups ::: Caused by: Inadequate consultation or Unacceptable impacts to Aboriginal sites Resulting in: Community complaints or Poor public perception or Submission taking longer than predicted for approval due to community concerns.	10.3.a. Mine design causes negligible surface disturbance >20mm over land and therefore unlikely to be impacts to Aboriginal sites				15. Consultation guideline to be followed for Aboriginal Impact Assessment
		10.3.b. Advertisement calling for interested Aboriginal groups to register interest in project	**D** (D)	5 (R)	24 (L)	18. Aboriginal Impact Assessment to be done for EA

Recommended Controls

Recommended Controls Do NOT enter additional Recommended Controls on this sheet.	Place(s) Used	Allocated To (Only one SITE person for each Recommended Control)	Required By Date	Pulse User No.
1. Peer review of subsidence assessment	Events: 9.1	Aecom	31-Jul-2010	
2. Sea grass beds being mapped	Events: 2.1			
3. Aquatic ecology impact assessment being done for EA	Events: 2.1			
4. Water Assessment to be done for EA	Events: 4.1			
5. Water Assessment to consider this for EA	Events: 4.2, 4.3			
6. 4.1.a. Groundwater impact assessment and modeling being undertaken for Project	Events: 5.1			
7. Archaeological Impact Assessment to be done for EA	Events: 6.1			
8. 6.1.a. Noise assessment being undertaken for Project	Events: 7.1			
9. 7.1.a. Air quality assessment being done on Project for the EA	Events: 8.1			
10. Visual amenity assessment being undertaken for Project and inclusion in EA	Events: 11.1			
11. Subsidence Assessment being undertaken for inclusion in EA	Events: 1.1, 2.1, 4.1, 6.1, 6.2, 12.1			
12. European heritage Assessment to be done for EA	Events: 6.2			
13. Social and Economic Impact Assessment being done for Project	Events: 14.1			
14. Waste Management being considered in Environmental Assessment	Events: 13.1			
15. Consultation guideline to be followed for Aboriginal Impact Assessment	Events: 10.3			
16. Information flyer to be developed and made available	Events: 10.1			
17. Article to be published in Centennial Coal section within the Lakes Mail	Events: 10.1			
18. Aboriginal Impact Assessment to be done for EA	Events: 10.3			
19. Due Diligence desk top Terrestrial Ecology assessment to be undertaken for EA	Events: 3.1, 3.2, 3.3, 3.4			
20. Centennial Key Messages to be developed	Events: 10.1, 10.4			
21. Traffic Impact Assessment being done for EA	Events: 15.1			
22. Consideration of soils and land capability in EA	Events: 18.1			
23. Consideration of life of mine and rehabilitation in EA	Events: 17.1			
24. GHG Assessment being done for EA	Events: 16.1			

RISK MANAGEMENT STANDARD — Management Standard-004

CENTENNIAL RISK MATRIX

Rating	Consequence Note: Consequence may result from a single event or may represent a cumulative impact over a period of 12 months. Use the worst case reasonable consequence if there is more than one.						Likelihood A Certain	B Probable	C Possible	D Remote	E Improbable	Description (D)
							Common"	Has Happened within Centennial"	"Could Happen & has happened in non-CEY operations	Not Likely	"Practically impossible	Probability (Pb)
							Frequent incidents	Regular incidents	Infrequent incidents	Unlikely to occur. Very few recorded or known incidents	May occur in exceptional circumstances. Almost no recorded incidents.	Incident Frequency (IF)
							Operations – within 3 months	Operations – within 2 years	Operations – within 5 years	Operations – within 10 years	Operations – within 30 years	Operations (Op)
							Project – Every project	Project – Every 2 projects	Project – Every 5 projects	Project – Every 10 projects	Project – Every 30 projects	Project (Pr)
1. Catastrophic	>$50m	Multiple Fatalities	> 1month	Prolonged litigation, heavy fines, potential jail term	Prolonged International media attention	Long term impairment habitats/ ecosystem	1 (E)	2 (E)	5 (H)	7 (H)	11 (S)	
2. Major	$10m - $50m	Single Fatality	1 week to 1 month	Major breach/ major litigation	International media attention	Long term effects of ecosystem	3 (E)	4 (E)	8 (H)	12 (S)	16 (M)	
3. Moderate	$1m - $10m	Serious/ Disabling Injury	1 day to 1 week	Serious breach of regulation. prosecution/ fine	National media attention	Serious medium term environmental effects	6 (H)	9 (H)	13 (S)	17 (M)	20 (L)	
4. Minor	$100k - $1m	Lost Time Injury	12 hrs to 1 day	Non-compliance, breaches in regulation	Adverse local public attention	Minor effects to physical environment	10 (S)	14 (S)	18 (M)	21 (L)	23 (L)	
5. Insignificant	<$100k	First Aid Treatment Only	< 12 hrs	Low level compliance issue	Local complaints	Limited physical damage	15 (S)	19 (M)	22 (L)	24 (L)	25 (L)	

Risk Rating	Risk Category		Generic Management Actions
1 to 4	E	Extreme	Immediate intervention required from senior management to eliminate or reduce this risk
5 to 9	H	High	Imperative to eliminate or reduce risk to a lower level by the introduction of control measures. Management planning required at senior levels
10 to 15	S	Significant	Corrective action required, senior management attention needed to eliminate or reduce risk
16 to 19	M	Moderate	Corrective action to be determined, management responsibility must be specified
20 to 25	L	Low	Monitor and manage by corrective action where practicable

BOW TIE ANALYSIS Control Effectiveness Matrix			CONTROL – Impact / Status / Quality				
			A >= 80%	B 50 – 80%	C 50 / 50%	D 50 – 20%	E <= 20%
TYPE OF CONTROL	1.	Elimination of hazard					
	2.	Substitution					
	3.	Engineered without people					
	4.	Engineered with people					
	5.	Procedural					
	6.	Awareness					