

## APPENDIX 3

### Environmental Risk Assessment



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## Environmental Risk Analysis

An environmental risk assessment has been undertaken for the Project to identify the key issues which warrant further detailed assessment and discussion. The methodology used for this process follows the general principles outlined in Australian Standard AS/NZS 4360:1999 Risk Management and Environmental Risk Management – Principles and Process (Standards Australia, 2000). The results of the risk assessment are included in **Attachment A**.

The method used for the environmental risk assessment encompasses the following key steps:

1. Establish the context for the risk assessment process
2. Identify environmental risks
3. Analyse risks
4. Evaluate risks to determine significant issues

Each of these steps is discussed further below.

### Establish the Context

The risk assessment undertaken for the Project considers risks to the natural environment and members of the public. The 'Project' was considered to be the processes and activities described in Section 2.3 of the Preliminary Environmental Assessment, categorised as shown in **Table 1**.

**Table 1 - Process Areas and Activities Considered**

Process Area	Process Boundary	Activities
Construction	Construction of infrastructure associated with Project	Installation of proposed receipt, stacking, reclamation and loading systems
Operation	Continued operations including the operation of the Project	The receipt, stacking, reclaiming and loading of product coal through KCT
Ancillary Areas	Other activities undertaken to support installation and operation	Storage and handling of goods, maintenance

### Risk Identification

Risk identification involves identifying the environmental risks to be managed, and in its simplest form involves the analysis of the severity and frequency of potential impacts and the operational processes underlying any impact.

In order to provide a systematic framework to identify environmental risks, the following basic process was used:

1. Select a component of the surrounding environment that may be impacted by the Project.
2. Identify the activities from **Table 1** that may affect the value.
3. Identify the potential environmental impacts (positive or negative, acute or chronic) for each value, as a result of these activities.

## Risk Analysis

Risks are typically analysed by combining possible consequences and their likelihood, in the context of existing measures to control the risk. The consequence and likelihood of each risk determines the level of risk.

Each risk was assessed using a five level qualitative ranking of consequence and likelihood as listed in **Table 2** and **Table 3** respectively. This yields a five by five risk analysis matrix and results in four levels of risk: 'catastrophic', 'major', 'moderate' and 'minor', as shown in **Table 4**.

**Table 2 - Qualitative Measures of Environmental Consequence**

<b>Severity Level</b>	<b>Natural Environment</b>	<b>Legal / Government</b>	<b>Heritage</b>	<b>Community/Reputation/ Media</b>
(1) Insignificant	Limited damage to minimal area of low significance	Low-level legal issue. On the spot fine. Technical non-compliance prosecution unlikely. Ongoing scrutiny / attention from regulator	Low-level repairable damage to commonplace structures	Low level social impacts. Public concern restricted to local complaints. Could not cause injury or disease to people
(2) Minor	Minor effects on biological or physical environment. Minor short-medium term damage to small area of limited significance	Minor legal issues, non-compliances and breaches of regulation. Minor prosecution or litigation possible. Significant hardship from regulator	Minor damage to items of low cultural or heritage significance. Mostly repairable. Minor infringement of cultural heritage values	Minor medium-term social impacts on local population. Could cause first aid injury to people. Minor, adverse local public or media attention and complaints
(3) Moderate	Moderate effects on biological or physical environment (air, water) but not affecting ecosystem function. Moderate short-medium term widespread impacts (e.g. significant spills)	Serious breach of regulation with investigation or report to authority with prosecution or moderate fine possible. Significant difficulties in gaining approvals	Substantial damage to items of moderate cultural or heritage significance. Infringement of cultural heritage / sacred locations	Ongoing social issues. Could cause injury to people which requires medical treatment. Attention from regional media and/or heightened concern by local community. Criticism by NGOs. Environmental credentials moderately affected
(4) Major	Serious environmental effects with some impairment of ecosystem function. Relatively widespread medium-long term impacts	Major breach of regulation with potential major fine and/or investigation and prosecution by authority. Major litigation. Project approval seriously affected	Major permanent damage to items of high cultural or heritage significance. Significant infringement and disregard of cultural heritage values	On-going serious social issues. Could cause serious injury or disease to people. Significant adverse national media/public or NGO attention. Environment/management credentials significantly tarnished
(5) Catastrophic	Very serious environmental effects with impairment of ecosystem function. Long term, widespread effects on significant environment (e.g. national park)	Investigation by authority with significant prosecution and fines. Very serious litigation, including class actions. License to operate threatened	Total destruction of items of high cultural or heritage significance. Highly offensive infringements of cultural heritage	Very serious widespread social impacts with potential to significantly affect the well being of the local community. Could kill or permanently disable people. Serious public or media outcry (international coverage). Damaging NGO campaign. Reputation severely tarnished. Share price may be affected

**Table 3 - Qualitative Measure of Likelihood**

Level	Descriptor	Description	Guideline
A	Almost Certain	Consequence is expected to occur in most circumstances	Occurs more than once per month
B	Likely	Consequence will probably occur in most circumstances	Occurs once every 1 month – 1 year
C	Occasionally	Consequence should occur at some time	Occurs once every 1 year - 10 years
D	Unlikely	Consequence could occur at some time	Occurs once every 10 years – 100 years
E	Rare	Consequence may only occur in exceptional circumstances	Occurs less than once every 100 years

Source: AS/NZS 4360:1999 Risk Management

**Table 4 - Qualitative Risk Matrix**

	Maximum Reasonable Consequence				
Likelihood of the Consequence	(1) Insignificant	(2) Minor	(3) Moderate	(4) Major	(5) Catastrophic
(A) Almost certain	High	High	Extreme	Extreme	Extreme
(B) Likely	Moderate	High	High	Extreme	Extreme
(C) Occasionally	Low	Moderate	High	Extreme	Extreme
(D) Unlikely	Low	Low	Moderate	High	Extreme
(E) Rare	Low	Low	Moderate	High	High

Source: AS/NZS 4360:1999 Risk Management

The level of risk assessed was based on a risk level with the existing environmental management controls at KCT operations in place. An assessment of risk was also undertaken with the proposed mitigation controls in place. This allows for the determination of the effectiveness of the proposed controls in mitigating potential impacts associated with the project.

Although the risk rating gives no quantification of the actual value of the risk for a particular aspect, it does allow a relative comparison between issues to enable risks to be prioritised, facilitate informed decisions about treating risks and help identify whether a risk is acceptable.

**Table 5** shows the format used for the Project environmental risk assessment contained in **Attachment A**.

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**Table 5 – Format for Preliminary Project Environmental Risk Assessment**

<b>Project Activities</b>	<b>Environmental Value</b>	<b>Potential Impacts/ Consequences</b>	<b>Existing Control</b>	<b>Preliminary Risk Assessment</b>	<b>Proposed Controls</b>	<b>Revised Risk</b>
Identifies the Project's activities that may affect the environmental value	Components of the surrounding environment that can be affected by the Project	This describes any change to the environment, whether adverse or beneficial, wholly or partly resulting from the Project's activities	Details current understanding of the existing environment and existing controls	Risk Assessment provided in preliminary Environmental Assessment	Details additional controls to be incorporated into the Project	Details consequence, likelihood and risk rating for each aspect with proposed controls in place

### **Risk Evaluation**

Risk evaluation concerns setting priorities for decisions about risk. The purpose of risk evaluation is to compare risks against significance criteria to determine the degree of assessment required. The application of significance criteria will reduce the number of activities that require specific management attention and provides an opportunity to prioritise environmental issues based on predetermined criteria.

Although guidelines and regulations provide great detail on risk identification and characterisation, there is less guidance on what constitutes an acceptable level of risk. This is because the development of risk acceptance criteria is quite subjective and is not an exact science or based on a complex formula. For each risk assessment process there is a degree of flexibility in defining its own criteria to determine which impacts are potentially 'significant' and which are not. For the purposes of this Preliminary Environmental Assessment, significant risks have been defined as those with a risk rating of high or extreme, as defined by **Table 4**.

It is important to note that certain impacts associated with the Project's activities may be predetermined as significant by State or Federal legislation. These 'regulated' impacts, whilst not always rated as significant based on risk score alone, will also require further assessment to be undertaken.

## Attachment A

### Port Waratah Coal Services – Kooragang Coal Terminal Fourth Dump Station and Ship Loader Project

#### Preliminary Environmental Risk Analysis

Activity	Environmental Value	Potential Impact	Status and Proposed Control	Risk Assessment			Further Assessment Requirements	Key Issue?
				C	L	R		
CONSTRUCTION PHASE								
Construction of infrastructure associated with Project	European Heritage	Disturbance of sites of European heritage significance	The project will marginally increase the footprint of existing and approved operations.	1	D	L	No further assessment required	No
	Wetland Ecology	Loss of native flora and fauna	The project will marginally increase the footprint of existing and approved operations.	3	D	M	No further assessment required	No
	Aquatic Ecology	Loss of native flora and fauna	The project will marginally increase the footprint of existing and approved operations.	3	D	M	No further assessment required	No
	Cultural Heritage	Disturbance of Aboriginal places or objects	The project will marginally increase the footprint of existing and approved operations.	2	D	L	No further assessment required	No
	Erosion and sediment runoff	Sedimentation of local waterways	Existing controls sufficient to mitigate potential impact from project. Controls include an integrated water management system designed to collect and treat site 'dirty water' for up to a 1 in 100 year storm event.	2	E	L	No further assessment required	No

Activity	Environmental Value	Potential Impact	Status and Proposed Control	Risk Assessment			Further Assessment Requirements	Key Issue?
				C	L	R		
	Dust Generation	Degradation of air quality	No potential for significant dust emissions during construction phase. Existing controls are sufficient to minimise potential dust impacts from construction activities. Controls include dust suppression sprays, equipment modifications and dust control safeguards.	2	E	L	No further assessment required	No
	Noise Generation	Degradation of noise amenity (cumulative)	Construction phase does not involve significant noise generation. Existing controls are sufficient to minimise potential noise impacts from construction activities. Controls include noise attenuation measures fitted to equipment, noise monitoring.	2	E	L	No further assessment required	No
	Visual Amenity	Change to the aesthetics of operations in landscape	The proposed construction of a conveyor bridge over Teal Street on the approach to Stockton Bridge will have potential visual impacts. All other infrastructure constructed will be consistent with the existing and approved KCT.	3	C	H	A visual impact assessment will be undertaken	Yes
	Hydrogeological impacts	Disturbance to existing hydrogeological regime	The project will marginally increase the footprint of existing and approved operations.	3	E	M	No further assessment required	No
	Traffic	Supply of materials for installation phase resulting in increased traffic	Infrastructure associated with the Project will be constructed during defined periods, or campaigns. Heavy vehicle movements during these periods have potential to impact on normal traffic flow external and internal to the KCT site. Any potential impacts on traffic flow can be managed by the existing processes and procedures at KCT.	3	D	L	No further assessment required	No

Activity	Environmental Value	Potential Impact	Status and Proposed Control	Risk Assessment			Further Assessment Requirements	Key Issue?
				C	L	R		
OPERATION PHASE								
Operation of equipment with Project	Erosion and sediment runoff	Sedimentation of local waterways	Existing controls sufficient to mitigate potential impact from project. Controls include an integrated water management system designed to collect and treat site 'dirty water' for up to a 1 in 100 year storm event.	2	E	L	No further assessment required	No
	Water Demand	Increased water demand for dust suppression, washdown etc	Operation of project will not substantially increase water demand for dust suppression purposes as there is no increase in throughput. Controls in place to maximise re-use of water.	2	D	L	No further assessment required	N
	Dust Generation	Degradation of air quality	Operation of project has potential to increase dust generation from additional plant and equipment.	3	C	H	Further assessment required as part of Environmental Assessment	Y
	Noise Generation	Degradation of noise amenity (cumulative)	Operation of project has potential to increase noise generation from additional plant and equipment.	3	C	H	Further assessment required as part of Environmental Assessment	Y
	Visual Amenity	Aesthetics of modified operation	The proposed conveyor bridge over Teal Street on the approach to Stockton Bridge will have potential visual impacts. All infrastructure will be consistent with the approved KCT facility.	3	C	H	A visual impact assessment will be undertaken	Y
	Energy Use	Increase in greenhouse gas emissions	The additional infrastructure associated with the Project will have increase the Scope 1 and 2 greenhouse emissions for the Project. As this project does not include any increase in throughput capacity, Scope 3 emissions will not increase from those assessed as part of 2007 Project Approval.	3	C	H	An assessment of Scope 1 and Scope 2 greenhouse gas emissions will be undertaken	Y



Activity	Environmental Value	Potential Impact	Status and Proposed Control	Risk Assessment			Further Assessment Requirements	Key Issue?
				C	L	R		
	Hydrogeological impacts	Impacts on existing hydrogeological regime	The project will marginally increase the footprint of existing and approved operations.	3	E	M	No further assessment required	N
	Traffic	Increased traffic as a result of the Project	There will be no increased road traffic as a result of the Project – all coal is delivered by rail.  Rail traffic is managed by others and this proposal does not seek approval to increase rail traffic on the Main Northern Rail Line– KCT receives the coal delivered by others.	2	E	L	No further assessment required	N
<b>ANCILLARY ACTIVITIES AND ISSUES</b>								
Waste Management	Waste disposal	Pollution/contamination due to incorrect disposal. Inefficient use of resources.	All wastes generated by the project will be incorporated into existing waste streams. Existing controls are sufficient to mitigate potential impacts from waste disposal	2	E	L	No further assessment required	No
	Waste oil and grease storage	Soil and/or water contamination from spills or leaks.	Existing controls sufficient to mitigate potential impact from project. Controls include storage in sealed bunded area, disposal by licensed waste contractor	2	D	L	No further assessment required	No
Materials supply and storage	Oil, fuel and grease supply and storage	Soil and/or water contamination from spills or leaks.	No change to existing supply and storage arrangements. Existing controls sufficient to mitigate potential impact from project.	2	D	L	No further assessment required	No
	Materials delivery	Increase in traffic.	Any potential increases in traffic associated with materials delivery will be minor, short term in duration, and consistent with current traffic during ongoing maintenance activities	2	D	L	No further assessment required	No
Workforce and Amenities	Transport and access of employees to site	Increase in traffic.	The proposed project will not increase the workforce of KCT.	2	E	L	No further assessment required	No