

# Section 3

## Consultation and Issue Identification

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*This section describes how the environmental issues assessed in the Environmental Assessment were identified and prioritised. In summary:*

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(i) *a comprehensive list of all relevant environmental issues was assembled through consultation with the local community and local and State government agencies and a review of relevant legislation, planning documents and environmental guidelines;*

(ii) *a review of the Project design and local environment was undertaken to identify risk sources and potential environmental impacts for each environmental issue;*

(iii) *an analysis of risk for each potential unmitigated environmental impact was then completed with a risk rating assigned to each impact based on likelihood and consequence of occurrence; and*

(iv) *through a review of the allocated risk ratings and the frequency with which each issue was identified, the relative priority of each issue was determined, with this priority used to provide an order of assessment and breadth of coverage within Section 4.*



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## **3.1 INTRODUCTION**

In order to undertake a comprehensive *Environmental Assessment* of the proposed Cudgen Lakes Sand Extraction Project, appropriate emphasis needs to be placed on those issues likely to be of greatest significance to the local environment, neighbouring landowners and the wider community. In order to ensure this has occurred, a program of community and government consultation was undertaken to identify relevant environmental issues and potential impacts. This was followed by an analysis of the risk posed by each potential impact in order to prioritise the assessment of the identified environmental issues within the *Environmental Assessment*.

## **3.2 ISSUE IDENTIFICATION**

### **3.2.1 Introduction**

Identification of environmental issues relevant to the development and operation of the Cudgen Lakes Sand Extraction Project involved a combination of consultation and background investigations and research. This included:

- consultation with surrounding landowners (Section 3.2.2.1);
- consultation with the wider local community (Section 3.2.2.2);
- consultation with State and local government agencies (Section 3.2.2.3); and
- reference to relevant NSW government policies and guidelines (Section 3.2.3).

### **3.2.2 Consultation**

#### **3.2.2.1 Consultation with Surrounding Landowners**

Targeted interviews with local landholders were undertaken during August 2005. A total of 19 local residents/landholders surrounding the Project Site were interviewed and provided with a community information sheet which was also distributed to the wider community (and to parents of the Cudgen Primary School – see Section 3.2.2.2). The interviews sought to inform the residents / landholders about the Project and to identify relevant issues associated with historical, existing and proposed developments within and surrounding the Project Site.

The majority of residents and landholders were aware of the Proponent and to a degree, the Proponent's wider activities in the local area. Most residents approached responded positively to the consultation program and consented to various monitoring activities being undertaken on their land to establish background levels for various environmental factors including noise, air quality and/or groundwater.



Feedback received from local residents and landholders in relation to the proposed Project indicated three main issues of concern, namely:

- groundwater - impacts on crops or livestock, either through increased salinity, loss of water supply or change in water quality (5 residents);
- acid sulfate soils - odour, red staining and fish kills (4 residents); and
- flooding and drainage - loss of crops due to flooding and impacts on local waterways (4 residents).

These issues were commonly related to historic and current developments including the Noble Lake retirement development and the Tweed Turf and Sand Operation (now Hanson Tweed Sand Quarry).

Concerns were also raised in relation to changes to the local amenity, increased traffic levels, impact on tourist opportunities, odour, loss of agricultural land, visual impact, land subsidence, noise and property values.

Five residents didn't raise any concerns in relation to the proposed Project but acknowledged the Project's potential benefits including:

- greater development in the area;
- access to the final lake and surrounding areas;
- increases in property values; and
- more jobs for the local construction industry.

When questioned about specific development activities required in the local area, the two most commonly raised activities were shopping facilities/centre and sporting fields.

#### **3.2.2.2 Consultation with the Local Community**

In late August and early September 2005, a number of interviews and discussions were held with a number of community groups/organisations including the:

- Cudgen Progress Association;
- Chinderah Progress Association;
- Kingscliff Rotary Club;
- Chinderah Drainage Union; and
- Tweed Growers' Union.

Discussions were also held with Mr Steve Armes, Principal of Cudgen Public School and a community information sheet circulated to parents of the school through the school newsletter.



The three key issues raised by the stakeholder groups consulted included flooding/drainage, groundwater and acid sulfate soils. The Chinderah Drainage Union, Tweed Growers' Union, Cudgen and Chinderah Progress Associations all raised the issue of flooding and drainage with concerns over increased flooding risks due to filling of low lying areas and alteration of the existing drainage network. Concerns were also raised regarding the cumulative flooding impacts arising from the Hanson Tweed Sand Quarry, new Waste Water Treatment Plant and the approved Australian Bay Lobster Farm. These four groups also raised concerns relating to the effect of the Project on surface and groundwater quality and levels.

Other issues raised were of a similar nature to those raised by surrounding residents and landholders with the addition of the following.

- The need to maintain separation between the final lake and surroundings drains (used for agriculture purposes).
- The need to address alternative sources of sand for raising the height of fill sites (eg. from the Tweed River).
- The need for public road access from east to west past the Project Site.

In relation to local / regional opportunities and developments, there was division amongst members of the above community groups as to the need for a range of civic, commercial, residential and environmental projects. A community meeting was also held on 17 December 2006 with residents of the Noble Park Estate and interested parties. The predominant feedback was very strong support for the District Town Centre, proposed as part of the Proponent's wider development strategy, with no issues raised relating to the Project.

A Shirewide survey was also conducted to every residence within the Tweed Shire. This survey also indicated very strong support for the District Town Centre with 85% of responses in favour of a new District Town Centre at Chinderah.

In the past, the Proponent has maintained contact with the wider community with respect to its broader development plans through circulars, information sheets released in local newspapers, newsletters and questionnaires. Further detail relating to community consultation is provided in DGP (2008) (Part 11 of the *Specialist Consultant Studies Compendium*).

### **3.2.2.3 Consultation with Government Authorities**

R.W. Corkery & Co. Pty Limited and the Proponent have held various discussions with Tweed Shire Council and State government agencies in relation to the broader development plans and specific projects within the Kingscliff / Chinderah / Cudgen area. A planning focus meeting was convened on 17 October 2004 during which a number of government agencies were presented with introductory information about the Project and the opportunity to inspect the Project Site prior to submitting their specific requirements for the, then, EIS to address.



The following government agencies were represented at this meeting.

- Department of Infrastructure, Planning and Natural Resources (Major Assessments Branch) (DIPNR) (now Department of Planning (DoP)).
- Department of Environment and Conservation (Environment Protection Authority) (now Department of Conservation and Climate Change (DECC) (EPA)).
- Department of Infrastructure, Planning and Natural Resources (Natural Resources Branch) (DIPNR) (now Department of Water and Energy (DWE)).
- Department of Mineral Resources (now DPI (MR)).
- NSW Fisheries (now Department of Primary Industries (DPI (Fisheries))).
- NSW Agriculture (now Department of Primary Industries (Agriculture) (DPI(Ag))).
- Roads and Traffic Authority (RTA).
- Tweed Shire Council.

Following the Planning Focus Meeting, each agency responded with written requirements for the, then, EIS. These written requirements are presented in **Appendix 2** and summary listing the section(s) of the *Environmental Assessment* where each issue is addressed is presented in **Appendix 3**.

Following the 2005 amendment of the *Environmental Planning and Assessment Act 1979* to incorporate the Part 3A Major Projects approval process, the Proponent submitted an application for project approval (No. 05\_0103) and a request that the Project be assessed under the provisions of Part 3A of the Act.

Following this application, Director-General's requirements (DGRs) for an *Environmental Assessment* were subsequently issued by the DoP on 6 January 2006, although these DGRs also referred to the previously issued requirements for the, then, EIS provided by other government agencies. The DGRs issued on 6 January 2006 are duplicated in **Appendix 2**.

The issues raised in the 2006 DGRs and those previously provided by other government agencies in 2004 have been incorporated into the risk analysis presented in Section 3.3.

### **3.2.3 Review of Planning Issues and Environmental Guidelines**

#### **3.2.3.1 Introduction**

A number of State, regional and local planning instruments apply to the Project. These planning instruments were reviewed to identify any environmental aspects requiring consideration in the *Environmental Assessment*. In addition, the DGRs identified a number of guideline documents to be referenced / reviewed during the preparation of the *Environmental Assessment* (see **Appendix 2**).



A brief summary of each relevant planning instrument is provided in Sections 3.2.3.2 and 3.2.3.3. The application and relevance of planning instruments related to specific environmental issues have been assessed in the relevant specialist consultant assessments. Section 3.2.3.4 briefly outlines the approach taken to referencing and reviewing environmental guideline documents.

### **3.2.3.2 State Planning Issues**

The six State Environmental Planning Policies (SEPPs) considered during the assessment of the Cudgen Lakes Sand Extraction Project are as follows.

#### **State Environmental Planning Policy (Major Projects) 2005**

This SEPP was gazetted on 25 May 2005 and applies to all Projects satisfying nominated criteria made following this date. The aims of this Policy are:

- “(a) to identify development of economic, social or environmental significance to the State or regions of the State so as to provide a consistent and comprehensive assessment and decision making process for that development;*
- (b) to facilitate the development, redevelopment or protection of important urban, coastal and regional sites of economic, environmental or social significance to the State so as to facilitate the orderly use, development or conservation of those State significant sites for the benefit of the State;*
- (c) to facilitate service delivery outcomes for a range of public services and to provide for the development of major sites for a public purpose or redevelopment of major sites no longer appropriate or suitable for public purposes; and*
- (d) to rationalise and clarify the provisions making the Minister the consent authority for State significant development and State significant sites and to keep those provisions under review so that the consent powers are devolved to councils when the State planning objectives have been achieved.”*

As identified in Schedule 1 for Part 3A Projects, the proposed Project would be classified as a Group 2 development, ie. mining, petroleum production, extractive industries and related industries – hence, this SEPP is relevant to the proposed Project.

#### **State Environmental Planning Policy No. 14 (SEPP 14) – Coastal Wetlands**

SEPP 14 was gazetted with the aim of preserving and protecting coastal wetlands and applies to any development that has the potential to damage or destroy wetlands.



There are no defined SEPP 14 wetlands within or immediately surrounding the Project Site. The closest SEPP 14 wetlands to the Project Site lie within the vicinity of the Tweed River and Cudgen Creek – hence, this SEPP is not relevant to the proposed Project.

### **State Environmental Planning Policy No. 33 (SEPP 33) – Hazardous and Offensive Development**

Hazardous and offensive industries, and potentially hazardous and offensive industries, relate to industries that, without the implementation of appropriate impact minimisation measures would, or potentially would, pose a significant risk in relation to the locality, to human health, life or property, or to the biophysical environment.

The hazardous substances and dangerous goods to be held or used on the Project Site are required to be identified and classified in accordance with the risk screening method contained within the document entitled *Applying SEPP 33 2nd edition*, (DUAP, 1997). Hazardous materials are defined within DUAP (1997) as substances falling within the classification of the *Australian Code for Transportation of Dangerous Goods by Road and Rail* (Dangerous Goods Code).

The Project would involve the storage and use of approximately 10 000L of diesel fuel, Class 3 C1 combustible liquid, and small amounts of other hydrocarbons including lubricating oils and grease, Class 3 C2 combustible liquids. As the diesel fuel and lubricating oils and greases would not be stored adjacent to any other hazardous materials of the same class, DUAP (1997) does not require these to be considered further.

Furthermore less than five loads of diesel, each 10 000L in volume, would be required per week. No assessment or screening thresholds are provided in relation to the transport of Class 3 C1 or C2 combustible liquids. However, experience with determinations for Projects transporting similar quantities of Class 3 hazardous materials, via comparable transportation routes suggests transport of diesel to the site would not be considered potentially hazardous.

Based on the risk screening method of DUAP (1997), neither the storage nor transport of the hazardous materials to be stored on the Project Site would result in the Project being considered potentially hazardous under SEPP 33. As such, there is no requirement to undertake a Preliminary Hazard Analysis for the Project.

### **State Environmental Planning Policy No. 44 (SEPP 44) – Koala Habitat Protection**

The Tweed Local Government Area is identified in Schedule 1 of this policy as an area that could provide habitat for Koalas. The policy requires an investigation to be carried out to determine if any Koala feed trees are present on the Project Site. Schedule 2 of this policy also provides a list of tree species that are favoured food tree species of Koalas.





Potential Koala habitat is defined as areas of vegetation where the trees listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component. SEPP 44 has been addressed by the fauna specialist (Kendall & Kendall 2008 – *Specialist Consultant Studies Compendium* – Part 5) who established that no Schedule 2 trees (Koala food trees) occur within the Project Site or Pipeline Corridors - hence, this SEPP is not relevant to the proposed Project.

### **State Environmental Planning Policy No. 71 (SEPP 71) – Coastal Protection**

SEPP 71 aims to further the implementation of the NSW Coastal Policy 1997. This policy does not apply to the Project Site given that no ground disturbance would occur within the Coastal Zone defined under the *Coastal Protection Act 1979*, ie. the area within 1km of coastal waters of the State, bay, estuary, coastal lake or lagoon, mangroves or tidal limit of coastal rivers. It is noted that the Turnock Street and Elrond Drive road crossings within the eastern pipeline corridor would be undertaken within 1km of coastal waters, however, it is considered that the road crossings would meet the objectives of the policy, ie. the crossings would not:

- diminish public access to the coastal foreshore;
- diminish the visual or natural scenic amenity of the coast or surrounding area; or
- impact upon native vegetation or items of Aboriginal significance.

### **State Environmental Planning Policy (SEPP) (Mining, Petroleum Production and Extractive Industries) 2007**

The SEPP specifies matters requiring consideration in the assessment of any mining, petroleum production and extractive industry development, as defined in NSW legislation. **Table 3.1** presents a summary of each element requiring consideration and a reference to the section in this *Environmental Assessment* where each element is addressed.

#### **3.2.3.3 Regional Planning Issues**

##### **North Coast Regional Environmental Plan 1988**

The Project Site lies within an area covered by the North Coast Regional Environmental Plan (NCREP). NCREP was gazetted in January 1988 to provide local Councils with broad guidelines for the preparation of Local Environmental Plans and specify regional policies and objectives for future planning and development within the region.



**Table 3.1**  
**Application of SEPP (Mining, Petroleum Production and Extractive Industries) 2007**

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Relevant SEPP Clause	Description	EA Section
12: Compatibility with other land uses	<p>Consideration is given to:</p> <ul style="list-style-type: none"> <li>- the existing uses and approved uses of land in the vicinity of the development;</li> <li>- the potential impact on the preferred land uses (as considered by the consent authority) in the vicinity of the development; and</li> <li>- any ways in which the development may be incompatible with any of those existing, approved or preferred land uses.</li> </ul> <p>The respective public benefits of the development and the existing, approved or preferred land uses are evaluated and compared.</p> <p>Measures proposed to avoid or minimise any incompatibility are considered.</p>	<p>S1.4.4, S1.4.5 and S4.1.4</p> <p>S4.2.8, S4.3.6, S4.4.6, S4.5.7, S4.6.6, S4.7.6, S4.8.5, S4.9.6, S4.10.5, S4.11.3, S4.11.4 and S4.12.4</p> <p>S6.2.1</p> <p>S4.11.3, S4.11.4 and S6.2</p> <p>S2.15, S4.2.6, S4.3.5, S4.4.5, S4.5.6, S4.6.5, S4.7.5, S4.8.4, S4.9.4, S4.10.4 and S4.12.3.</p>
13: Compatibility with mining, petroleum production or extractive industry	<p>Consideration is given to whether the development is likely to have a significant impact on current or future mining, petroleum production or extractive industry and ways in which the development may be incompatible.</p> <p>Measures taken by the applicant to avoid or minimise any incompatibility are considered.</p> <p>The public benefits of the development and any existing or approved mining, petroleum production or extractive industry must be evaluated and compared.</p>	<p>S6.2, Part 12 of Specialist Consultants Studies Compendium</p> <p>S2.15, S4.2.6, S4.3.5, S4.4.5, S4.5.6, S4.6.5, S4.7.5, S4.8.4, S4.9.4, S4.10.4 and S4.12.3.</p> <p>S4.11.3, S4.11.4 and S6.2</p>
14: Natural resource and environmental management	<p>Consideration is given to ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure:</p>	-
	- impacts on significant water resources, including surface and groundwater resources, are avoided or minimised;	S4.2.6, S4.3.5
	- impacts on threatened species and biodiversity are avoided or minimised; and	S4.4.5, S4.5.6, S4.6
	- greenhouse gas emissions are minimised and an assessment of the greenhouse gas emissions (including downstream emissions) of the development is provided.	S4.9. and S6.3
15: Resource recovery	The efficiency of resource recovery, including the reuse or recycling of material and minimisation of the creation of waste, is considered.	S2.6 and 2.7.

**Table 3.1 (Cont'd)**  
**Application of SEPP (Mining, Petroleum Production and Extractive Industries) 2007**

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Relevant SEPP Clause	Description	EA Section
16: Transportation	<p>The following transport related issued are considered.</p> <ul style="list-style-type: none"> <li>- The transport of some or all of the materials from the site by means other than public road.</li> <li>- Limitation of the number of truck movements that occur on roads within residential areas or roads near to schools.</li> <li>- The preparation of a code of conduct for the transport of materials on public roads.</li> </ul>	<p>S2.8</p> <p>S2.9.4</p> <p>S4.7.4</p>
17: Rehabilitation	<p>The rehabilitation of the land affected by the development is considered including:</p> <ul style="list-style-type: none"> <li>- the preparation of a plan that identifies the proposed end use and landform of the land once rehabilitated;</li> <li>- the appropriate management of development generated waste;</li> <li>- remediation of any soil contaminated by the development; and</li> <li>- the steps to be taken to ensure that the state of the land does not jeopardize public safety, while being rehabilitated or at the completion of rehabilitation.</li> </ul>	<p>S2.14.4 and S2.14.5</p> <p>S2.6.4, S2.7</p> <p>S2.14.4</p> <p>S2.14.3.1</p>

The objectives of the plan include the following.

- To develop regional policies that guide development in a productive, yet environmentally sound manner.
- To consider and amend existing policies for the region to be more appropriate for regional needs and within the context of regional policy.
- To provide a basis for the co-ordination of growth-related activities and encourage optimum social and economic benefits.
- To initiate a regional planning process which serves as a framework for identifying priorities for further investigation to be carried out by the Department and other agencies.

Part 2 Division 1 of the NCREP directs Local Environmental Plans to protect prime crop or pasture land. It is noted that the Project Site comprises Class 4 agricultural land suitable for grazing as defined by the DPI Rural Land Evaluation Manual. The agricultural suitability of the site is assessed by HMC (2008) (Part 3 of the *Specialist Consultant Studies Compendium*).

Under Part 2 Division 3, the NCREP also provides for the prevention of sterilisation of known extractive resources by inappropriate development on or near to extraction sites. The resource within the Project Site has been identified by the Far North Coast Regional Strategy as a regionally significant resource.



### **Far North Coast Regional Strategy**

The Far North Coast Regional Strategy 2006 aims to “develop policies and actions to address the region’s future growth” and “to manage the expected high growth rate in a sustainable manner”.

The strategy builds upon previous planning work including the Northern Rivers Regional Strategy and Urban Release Strategies.

The strategy identifies the Project Site as containing a regionally significant extractive resource which should be protected by Local Environmental Plans such as through appropriate buffers.

The strategy also identifies the nominated fill sites to the north as employment land required to meet the requirements of the regional economy.

As such, it is considered that the Project meets the objectives of the strategy through the development of a regionally significant extractive resource which would also provide the required fill material to develop land parcels identified as important to the regional economy.

#### **3.2.3.4 Local Planning Issues**

The relevant local planning instrument covering the Project Site is the *Tweed Local Environmental Plan 2000*, which identified the Project Site as being located within land zoned 1(b2) Agricultural Protection. The proposed extraction is a permissible use in this zone with development consent. A range of other local planning issues have also been considered throughout the preparation of the *Environmental Assessment* and are referred to within the relevant sections and specialist reports.

#### **3.2.3.5 Environmental Guidelines**

The DGRs require that in assessing the identified key assessment requirements, reference be made to one or more guideline documents. In addition, a number of the government agencies consulted in relation to the Project required reference to other environmental guideline documents.

Each of these guidelines was obtained, reviewed and, where appropriate, forwarded to the relevant specialist consultant for incorporation into the specialist environmental studies. Where appropriate, the relevant guideline documents are also referred to throughout the *Environmental Assessment*.



### 3.2.4 Summary of the Identified Environmental Issues

**Table 3.2** presents a summary of the environmental issues identified, and the frequency with which each was identified, as part of the identification process. The frequency of identification provides an initial indication of those environmental aspects perceived to be at greatest risk and hence of greatest priority. **Table 3.2** has been ordered accordingly (from most to least frequently identified).

**Table 3.2**  
**Summary of Identified Environmental Issue**

Environmental Issue	Source and Frequency of Identification				Summary
	Government Consultation <sup>1</sup>	Community Consultation <sup>2</sup>	Specialist Consultant <sup>3</sup>	Legislation, Policies & Guidelines <sup>4</sup>	
Groundwater	6	8	1	3	17
Traffic and transport	6	3	1	5	15
Flooding	5	7	1	1	14
Acid sulfate soils	6	6	1	1	14
Threatened fauna protection	4	1	1	6	12
Threatened flora protection	4	1	1	5	11
Operational noise	6	1	1	3	11
Air pollution - dust/odour/other	5	1	1	2	9
Aquatic ecology	1	-	1	7	9
Agricultural lands	3	2	1	1	7
Monitoring	1	-	5	-	6
Rehabilitation and final land use	5	-	-	1	6
Aboriginal heritage	3	-	1	1	5
Resource type / assessment	4	-	1	-	5
Visual amenity	2	2	-	-	4
Socio-economic impacts	2	-	1	1	4
Market assessment	2	-	1	-	3
Contaminated or polluted land	2	-	1	-	3
Waste management	3	-	-	-	3
Hazards / safety issues	1	-	-	1	2
Erosion/sediment minimisation	1	-	-	-	1
Property values	-	1	-	-	1
<p>Note 1: Summarised from the Director-General's Requirements, correspondence to DoP from consulted government agencies and issues raised during the planning focus meeting.</p> <p>Note 2: Summarised from one-on-one discussions held with surrounding landowners and consultation undertaken with the wider community (see Part 11 of the <i>Specialist Consultant Studies Compendium</i>).</p> <p>Note 3: Based on the identified constraints of environmental studies conducted by the specialist consultants for the Project.</p> <p>Note 4: A record of the environmental legislation, planning documents and guidelines required to be referenced in the preparation of the <i>Environmental Assessment</i>.</p>					



### 3.3 ANALYSIS OF RISK AND ISSUE PRIORITISATION

#### 3.3.1 Analysis of Risk

Risk is the chance of something happening that will have an impact upon the objectives or the task, which in this case is development and operation of the Project with minimal affect on the local environment. Risk is measured in terms of consequence (severity) and likelihood (probability) of the event happening. For each environmental issue identified in **Table 3.2**, the potential environmental impacts (see **Table 3.6**) have been allocated a risk rating based on the potential consequences and likelihood of occurrence.

The allocation of a consequence rating was based on the definitions contained in **Table 3.3**. It is noted that the assigned consequence rating represents the highest level applicable, ie. if a potential impact is assigned a level of 4 - Major based on impact to the environment and 2 - Minor based on area of impact, the consequence level assigned would be 4 - Major.

**Table 3.3**  
**Qualitative Consequence Rating**

Level	Descriptor	Description
5	Catastrophic	<ul style="list-style-type: none"> <li>Massive and permanent detrimental impacts on the environment.</li> <li>Very large area of impact.</li> <li>Massive remediation costs.</li> <li>Reportable to government agencies.</li> <li>Large fines and prosecution resulting in potential closure of operation.</li> <li>Severe injuries or death.</li> </ul>
4	Major	<ul style="list-style-type: none"> <li>Extensive and/or permanent detrimental impacts on the environment.</li> <li>Large area of impact.</li> <li>Very large remediation costs.</li> <li>Reportable to government agencies.</li> <li>Possible prosecution and fine.</li> <li>Serious injuries requiring medical treatment.</li> </ul>
3	Moderate	<ul style="list-style-type: none"> <li>Substantial temporary or minor long term detrimental impact to the environment.</li> <li>Moderately large area of impact.</li> <li>Moderate remediation costs.</li> <li>Reportable to government agencies.</li> <li>Further action may be requested by government agency.</li> <li>Injuries requiring medical treatment.</li> </ul>
2	Minor	<ul style="list-style-type: none"> <li>Minor detrimental impact on the environment.</li> <li>Affects a small area.</li> <li>Minimal remediation costs.</li> <li>Reportable to internal management only.</li> <li>No operational constraints posed.</li> <li>Minor injuries which would require basic first aid treatment.</li> </ul>
1	Insignificant	<ul style="list-style-type: none"> <li>Negligible and temporary detrimental impact on the environment.</li> <li>Affects an isolated area.</li> <li>No remediation costs.</li> <li>Reportable to internal management only.</li> <li>No operational constraints posed.</li> <li>No injuries or health impacts.</li> </ul>

Source: modified after HB 203:2006 - Table 4(B)



The likelihood or probability of each impact occurring was then rated according to the definitions contained in **Table 3.4**.

**Table 3.4**  
**Qualitative Likelihood Rating**

Level	Descriptor	Description
A	Almost Certain	Is expected to occur in most circumstances.
B	Likely	Will probably occur in most circumstances.
C	Possible	Could occur.
D	Unlikely	Could occur but not expected.
E	Rare	Occurs only in exceptional circumstances.

Source: HB 203:2006 - Table 4(A)

The risk associated with each environmental impact was assessed without the inclusion of any operational controls or safeguards in place and based on the qualitative assessment of consequence and likelihood. A risk ranking of either; low, medium, high or extreme has been assigned to each potential impact based on the matrix of **Table 3.5**.

**Table 3.5**  
**Risk Rating**

Likelihood	Consequences				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
A (Almost Certain)	H	H	E	E	E
B (Likely)	M	H	H	E	E
C (Possible)	L	M	H	E	E
D (Unlikely)	L	L	M	H	E
E (Rare)	L	L	M	H	H

Note: Rating modified after HB 203:2006 - Table 4(C)

The four risk rankings are defined as follows.

- Low (L): requiring a basic assessment of proposed controls and residual impacts. Any residual impacts are unlikely to have any major impact on the local environment or stakeholders.
- Moderate (M): requiring a medium level assessment of proposed controls and residual impacts. It is unlikely to preclude the development of the Project but may result in impacts deemed unacceptable to some local or government stakeholders.
- High (H): requiring in-depth assessment and high level documentation of the proposed controls and mitigation measures. Ultimately, this level of risk may preclude the development of the Project.
- Extreme (E): requiring in-depth assessment and high level documentation of the proposed controls and mitigation measures and possible preparation of a specialised management plan. Unless considered to be adequately managed by the controls and/or management plan, this level of risk is likely to preclude the development of the Project.



**Table 3.6** presents the identified potential impacts that may be associated with each environmental issue presented in **Table 3.2** based on the source or risk or potential incident, potential consequences and local receptor/surrounding environment.

**Table 3.7** provides an assessment of the unmitigated risk for each potential environmental impact based on the classifications and definitions outlined in **Table 3.3** to **Table 3.5**. The risk associated with identified environmental impacts of **Table 3.6** has been determined in accordance with Australian Standards HB 203:2006 and AS/NZS 4360:2004 and through consideration of the potential consequence(s) of the environmental impacts. Where appropriate, and to provide a more realistic assessment of the risks posed by the various environmental issues, the environmental impacts have been further defined using either a level, range or scale of impact providing for the various circumstances which may apply. **Table 6.1** in Section 6 provides an analysis of risk following the implementation of operational and safeguards measures.

### 3.3.2 Environmental Issue Prioritisation

The issues identified as requiring assessment within the *Environmental Assessment* have been prioritised based, in decreasing order, of emphasis upon the following.

- The key assessment requirements of the DGRs (see Section 3.2.2.3 and **Appendix 2**).
- Issues identified with a greater frequency of impacts with high or extreme risk ratings (see **Table 3.7**).
- Issues with a high frequency of identification (see **Table 3.2**).

The Proponent recognises that due to the breadth of the consultation for the Project, some community representatives are likely to have been consulted on more than one occasion or as part of more than one stakeholder group. Similarly, the various government agencies consulted invariably duplicated many issues requiring assessment. As a consequence, the frequency of identification for some issues may be slightly elevated. Notwithstanding this duplication, and considering the comprehensive nature of the consultation program, the potentially elevated frequency of identification for some issues, is not assessed as unduly influencing the prioritisation of issues given those issues likely to be repeated would generally be noted by many stakeholders and are therefore likely to be highly identified in any event.





**Table 3.6**  
**Risk Sources and Potential Environmental Impacts**

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Environmental Issue (see Table 3.2)	Risk Source/potential incident(s)	Potential Consequences	Receptor/ Surrounding Environment	Potential Environmental Impacts
Groundwater	<ul style="list-style-type: none"> <li>Pollution of groundwater due to hydrocarbon spills, internment of contaminated VENM, mixing of saline groundwater.</li> </ul>	<ul style="list-style-type: none"> <li>Decreased groundwater quality.</li> </ul>	<ul style="list-style-type: none"> <li>Surrounding landholders utilising bores or spear pumps.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced groundwater quality causing reduced availability for existing uses.</li> </ul>
	<ul style="list-style-type: none"> <li>Reduction of groundwater levels due to Project-related extraction.</li> </ul>	<ul style="list-style-type: none"> <li>Decrease in availability of groundwater to local landholders and groundwater dependent ecosystems.</li> <li>Exposure of potentially acid sulfate soils.</li> </ul>	<ul style="list-style-type: none"> <li>Surrounding landholders utilising bores or spear pumps.</li> <li>Surrounding groundwater dependent ecosystems.</li> </ul>	<ul style="list-style-type: none"> <li>Reduction in groundwater levels.</li> <li>Reduced yields of local groundwater bores.</li> <li>Degradation of groundwater dependent ecosystems.</li> <li>Acidification of surrounding potentially acid sulfate soils and sediments.</li> </ul>
Air Pollution – Dust, Odour, other	<ul style="list-style-type: none"> <li>Dust generation resulting from vehicle movements on unsealed roads.</li> <li>Wind action on disturbed areas and stockpiles.</li> </ul>	<ul style="list-style-type: none"> <li>Increased deposited and suspended particulates.</li> </ul>	<ul style="list-style-type: none"> <li>Surrounding residences and buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Nuisance impacts from dust deposited on window sills, cars, surfaces etc.</li> <li>Adverse health impacts (if PM<sub>10</sub> levels are excessive).</li> </ul>
	<ul style="list-style-type: none"> <li>Vehicle emissions.</li> </ul>	<ul style="list-style-type: none"> <li>Increased greenhouse and other gas emissions.</li> </ul>	<ul style="list-style-type: none"> <li>Local air shed.</li> </ul>	<ul style="list-style-type: none"> <li>Increased contribution to greenhouse effect.</li> </ul>
Erosion / Sediment Minimisation	<ul style="list-style-type: none"> <li>Suspension of sediments within runoff resulting from erosion of disturbed areas.</li> </ul>	<ul style="list-style-type: none"> <li>Increased turbidity and sedimentation within surrounding drains/ waterways.</li> </ul>	<ul style="list-style-type: none"> <li>Adjacent drains and/or waterways.</li> </ul>	<ul style="list-style-type: none"> <li>Increased sediment load and turbidity in drains and/or waterways resulting in degradation of water quality.</li> </ul>
	<ul style="list-style-type: none"> <li>Erosive actions of wind and water.</li> </ul>	<ul style="list-style-type: none"> <li>Lost of topsoil.</li> </ul>	<ul style="list-style-type: none"> <li>Project Site soils.</li> </ul>	<ul style="list-style-type: none"> <li>Soil erosion and degradation.</li> </ul>
Flooding/Drainage	<ul style="list-style-type: none"> <li>Reduction of flood retention capacity due to altered drainage patterns and increased elevation of surrounding land parcels.</li> </ul>	<ul style="list-style-type: none"> <li>Altered flood regime.</li> <li>Increased property damage from floodwaters .</li> </ul>	<ul style="list-style-type: none"> <li>Surrounding landholdings and/or residences and buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Increased flood levels and inundation of land, residences and/or buildings.</li> </ul>
Contaminated or Polluted Land	<ul style="list-style-type: none"> <li>Excavations and dredging exposing materials previously contaminated by historical activities.</li> </ul>	<ul style="list-style-type: none"> <li>Transfer of contaminated materials to non-contaminated areas.</li> </ul>	<ul style="list-style-type: none"> <li>Areas receiving contaminated material.</li> </ul>	<ul style="list-style-type: none"> <li>Land contamination.</li> <li>Reduction in land values.</li> </ul>
Threatened Flora and Fauna Protection	<ul style="list-style-type: none"> <li>Removal of native vegetation due to land clearing activities.</li> </ul>	<ul style="list-style-type: none"> <li>Removal of habitat and disturbance of threatened species.</li> </ul>	<ul style="list-style-type: none"> <li>Vegetation within Project Site and area of influence.</li> </ul>	<ul style="list-style-type: none"> <li>Loss of existing habitats and impacts upon threatened species.</li> <li>Reduced biodiversity.</li> </ul>
	<ul style="list-style-type: none"> <li>Disturbance of fauna and fauna habitat as a result of Project operations, eg. noise, dust etc.</li> </ul>	<ul style="list-style-type: none"> <li>Reduction in biodiversity in surrounding habitat.</li> </ul>		
Operational Noise	<ul style="list-style-type: none"> <li>Increased noise levels resulting from operation of mobile equipment, processing plants and product transportation.</li> </ul>	<ul style="list-style-type: none"> <li>Decreased amenity.</li> <li>Disruption to learning/education.</li> <li>Health related issues.</li> <li>Decreased land values.</li> </ul>	<ul style="list-style-type: none"> <li>Surrounding residents and landowners.</li> <li>Cudgen Public School.</li> </ul>	<ul style="list-style-type: none"> <li>Increased noise levels associated with construction and operational activities causing annoyance, distractions.</li> <li>Increased noise levels associated with construction and operational activities causing sleep disturbance.</li> <li>Reduction in land values.</li> </ul>
Visual Amenity	<ul style="list-style-type: none"> <li>Changes in visual characteristics due to construction and extraction activities/change in land use.</li> </ul>	<ul style="list-style-type: none"> <li>Changed visual outlook during operation.</li> </ul>	<ul style="list-style-type: none"> <li>Surrounding residents and local motorists.</li> </ul>	<ul style="list-style-type: none"> <li>Decreased visual amenity (during operation).</li> <li>Improved visual amenity (post operation).</li> </ul>
Aboriginal Heritage	<ul style="list-style-type: none"> <li>Removal or destruction of Aboriginal artefacts due to soil stripping and extraction activities.</li> </ul>	<ul style="list-style-type: none"> <li>Loss or damage of Aboriginal artefacts.</li> </ul>	<ul style="list-style-type: none"> <li>Local Aboriginal community.</li> </ul>	<ul style="list-style-type: none"> <li>Impact on unidentified Aboriginal sites and/or artefacts of Aboriginal cultural heritage.</li> </ul>
Socio-Economic Impacts	<ul style="list-style-type: none"> <li>Alteration of social activities or employment due to employment generation and capital expenditure.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced unemployment and increased local spending.</li> </ul>	<ul style="list-style-type: none"> <li>Local community and businesses.</li> </ul>	<ul style="list-style-type: none"> <li>Improved economic activity and related social impacts attributable to reduced unemployment.</li> </ul>
	<ul style="list-style-type: none"> <li>Perceived or real impacts on local amenity.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced property values.</li> </ul>	<ul style="list-style-type: none"> <li>Surrounding residents/landholders.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced quality of life (actual or perceived).</li> <li>Reduced property values.</li> </ul>
Acid Sulfate Soils	<ul style="list-style-type: none"> <li>Exposure of PASS during soil stripping or dry excavation.</li> </ul>	<ul style="list-style-type: none"> <li>Acidification of PASS.</li> </ul>	<ul style="list-style-type: none"> <li>Soil within Project Site.</li> <li>Underlying groundwater aquifer.</li> <li>Surface waters within and surrounding the Project Site.</li> </ul>	<ul style="list-style-type: none"> <li>Acidification of soil, surface waters and groundwater.</li> <li>Mobilisation of existing soil contaminants.</li> </ul>
	<ul style="list-style-type: none"> <li>Inadequate treatment of PASS prior to processing.</li> </ul>		<ul style="list-style-type: none"> <li>Soil, groundwater and/or surface water external to the Project Site.</li> </ul>	

Source: Modified after HB203:2006 - Table 3



Table 3.6 (Cont'd)  
Risk Sources and Potential Environmental Impacts

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Environmental Issue (see Table 3.2)	Risk Source/potential incident(s)	Potential Consequences	Receptor/ Surrounding Environment	Potential Environmental Impacts
Agricultural Activity	<ul style="list-style-type: none"><li>Reduction in agricultural productivity due to creation of lake.</li></ul>	<ul style="list-style-type: none"><li>Reduced availability of land suitable for agriculture.</li></ul>	<ul style="list-style-type: none"><li>Land within Project Site.</li></ul>	<ul style="list-style-type: none"><li>Loss of agricultural land and agricultural productivity.</li></ul>
Traffic and Transport	<ul style="list-style-type: none"><li>Increased traffic levels due to transport of VENM and sand products.</li></ul>	<ul style="list-style-type: none"><li>Reduced road pavement quality.</li><li>Increased traffic delays.</li><li>Reduced road safety.</li></ul>	<ul style="list-style-type: none"><li>Surrounding road network and users.</li></ul>	<ul style="list-style-type: none"><li>Deterioration of road pavement.</li><li>Traffic delays.</li><li>Increased chance of road accidents.</li></ul>
Property Values	<ul style="list-style-type: none"><li>Reduction in property values due to presence of sand extraction operation.</li></ul>	<ul style="list-style-type: none"><li>Changed property values.</li></ul>	<ul style="list-style-type: none"><li>Surrounding landholders.</li></ul>	<ul style="list-style-type: none"><li>Possible short-term reduction in land values versus increases from increased economic growth.</li></ul>

Source: Modified after HB203:2006 - Table 3



**Table 3.7**  
**Analysis of Risk**

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Potential Environmental Impacts (see Table 3.6)	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
<b>Groundwater</b>				
Groundwater Pollution by leaking/spilt hydrocarbon	Contamination requiring minor recovery works.	2	D	L
	Contamination requiring major recovery works.	3	E	M
Drawdown of groundwater levels	Drawdown resulting in reduction of bore yields of <15%.	2	A	H
	Drawdown resulting in reduction of bore yields of >15%.	3	B	H
	Drawdown resulting in acidification of limited amounts of PASS.	2	B	H
	Drawdown resulting in acidification of significant amounts of PASS.	4	D	H
Impacts on Groundwater Dependent Ecosystems	Drawdown external to Project Site within natural fluctuation levels.	2	B	H
	Drawdown external to Project Site beyond natural fluctuation levels.	4	D	H
<b>Air Quality</b>				
Nuisance - deposited dust	Deposited dust levels attributable to the Project occasionally (for one or two months every year) above DEC guideline, affects only adjacent landholders.	2	B	H
	Deposited dust levels attributable to the Project regularly (exceedances greater than DEC guideline for >5 months per year) affects landholders some distance from the Project Site.	3	C	H
Health - PM <sub>10</sub>	PM <sub>10</sub> levels attributable to the Project occasionally (once every 1 to 2 years) above the Project goal, affects only adjacent landholders.	2	C	M
	PM <sub>10</sub> levels attributable to the Project occasionally (>5 times per year) above the Project goal, affects landholders some distance from Project Site.	3	D	M
Greenhouse Gas Emissions.		1	B	M
<b>Erosion and Sedimentation</b>				
Soil erosion	Minor erosion within Project Site.	2	C	M
	Minor erosion external to the Project Site.	2	D	L
	Major erosion external to the Project Site.	3	E	M
Sediment Load and Turbidity	One-off discharge of dirty water from the Project Site.	2	C	M
	Regular discharge of dirty water from the Project Site.	3	D	M
<b>Flooding and Drainage</b>				
Flood levels and land inundation	Increased flood levels at surrounding residences (above background levels).	4	D	H
Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare Risk Rating: E = Extreme; H = High; M = Moderate; L = Low				



**Table 3.7 (Cont'd)**  
**Analysis of Risk**

Page 2 of 3

Potential Environmental Impacts (see Table 3.6)	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
<b>Threatened Flora and Fauna (terrestrial and aquatic))</b>				
Loss of, or alteration to, existing habitats.	Disturbance to native vegetation / habitat within nominated areas.	2	A	H
	Disturbance to native vegetation / habitat outside nominated areas.	3	D	M
Direct adverse impact on threatened species.	Disturbance to Threatened flora / fauna and endangered communities.	3	C	H
	Disturbance leading to local population reduction.	4	D	H
	Disturbance leading to local extinction(s).	5	E	E
Reduced biodiversity	Local biodiversity.	3	D	M
	Regional biodiversity.	4	E	H
<b>Noise</b>				
Increased noise levels associated with Project Site activities causing annoyance, distractions, ie. amenity impacts.	Occasional minor exceedance of noise criteria (1-2dB(A)).	2	C	M
	Regular minor exceedance of noise criteria (1-2dB(A)).	3	D	M
	Occasional marginal exceedance of noise criteria (3-5dB(A)).	2	C	M
	Regular marginal exceedance of noise criteria (3-5dB(A)).	3	D	M
	Occasional major exceedance of noise criteria (>5dB(A)).	2	C	M
	Regular major exceedance of noise criteria (>5dB(A)).	3	D	M
Increased noise levels associated with Project related road traffic activities causing annoyance, distractions, ie. amenity impacts.	Occasional minor exceedance of noise criteria (1-2dB(A)).	2	C	M
	Regular minor exceedance of noise criteria (1-2dB(A)).	3	D	M
	Occasional marginal exceedance of noise criteria (3-5dB(A)).	2	C	M
	Regular marginal exceedance of noise criteria (3-5dB(A)).	3	D	M
	Occasional major exceedance of noise criteria (>5dB(A)).	2	C	M
	Regular major exceedance of noise criteria (>5dB(A)).	3	D	M
Maximum noise levels resulting in sleep disturbance.		2	C	M
<b>Acid Sulfate Soil</b>				
Soil stripping and extraction leading to exposure of PASS.	Temporary exposure of small areas (<4ha) of PASS.	2	A	H
	Extended exposure of small areas (<4ha) of PASS.	3	D	M
	Temporary exposure of small areas (>4ha) of PASS.	2	D	L
	Extended exposure of small areas (>4ha) of PASS.	4	E	H
<b>Agricultural Land</b>				
Loss of agricultural land.	Temporary loss of agricultural land.	1	A	H
	Permanent loss of agricultural land.	2	A	H
<b>Consequence of Occurrence:</b> 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic <b>Likelihood of Occurrence:</b> A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare <b>Risk Rating:</b> E = Extreme; H = High; M = Moderate; L = Low				



**Table 3.7 (Cont'd)**  
**Analysis of Risk**

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Potential Environmental Impacts (see Table 3.6)	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
<b>Traffic and Transport</b>				
Increased traffic congestion.		2	C	M
Road pavement deterioration.		3	C	H
Elevated risk of accident/incident on local roads	Minor accident - no injury.	2	C	M
	Minor accident - minor injury.	3	D	M
	Major accident - moderate injuries requiring hospitalisation.	4	E	H
	Severe accident - severe injuries or death injury.	5	E	H
<b>Aboriginal Heritage</b>				
Impact on unidentified sites and/or artefacts of Aboriginal cultural heritage as a result of soil stripping and extraction activities.		3	D	M
<b>Visual Amenity</b>				
Reduced Visual Amenity	Temporary (<2 years) views of disturbed areas.	2	A	H
	Medium-term (>2, <15 years) views of disturbed areas.	2	B	H
	Long-term (>15 years) views of disturbed areas.	2	D	L
<b>Land Contamination</b>				
Transfer of contaminated material	Small area affected (<0.1ha).	2	D	L
	Large area affected (>0.1ha).	3	D	M
<b>Socio-Economic Impacts and Property Values</b>				
Improved economic activity and related social impacts attributable to reduced unemployment .		n/a	n/a	n/a
Reduced quality of life (actual or perceived).		3	D	M
Reduced property values	Temporary (<2 years) decrease in property values.	2	C	M
	Moderate term (>2, <15 years) decrease in property values.	3	C	H
	Long term (>15 years) decrease in property values.	3	D	H
<b>Consequence of Occurrence:</b> 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic <b>Likelihood of Occurrence:</b> A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare <b>Risk Rating:</b> E = Extreme; H = High; M = Moderate; L = Low				

Based on the issues identified and the risk ratings allocated to the potential environmental impacts of these, the following order of priority has been determined. This order of priority provides for the order of assessment in Section 4, namely:

1. groundwater;
2. flooding;
3. acid sulfate soil;
4. flora;
5. fauna;
6. aquatic ecology;



7. transportation;
8. noise;
9. air quality;
10. Aboriginal heritage;
11. socio-economic; and
12. visibility.

It is noted that the inclusion of “Socio-economic Setting” at N<sup>o</sup> 11 is not a direct consequence of the risk analysis. Rather, it is included at N<sup>o</sup> 11 to enable all other issues to be considered prior to the consideration of the socio-economic setting as this issue invariably is inter-related with many of the preceding issues.

The sources of risk and potential environmental impacts associated with each issue are discussed within relevant subsections within Section 4. All other issues generally allocated a “moderate” or “low” level of priority, have been addressed to the level considered appropriate throughout the *Environmental Assessment*.

