



## Tasman Extension Project Environmental Impact Statement

### SECTION 7

# SUMMARY OF MANAGEMENT, MITIGATION, MONITORING AND REPORTING

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## **7 SUMMARY OF MANAGEMENT, MITIGATION, MONITORING AND REPORTING**

In accordance with the Director-General's Requirements, this section provides a consolidated summary of all proposed environmental management and monitoring measures for the Tasman Extension Project (the Project).

### **7.1 SUBSIDENCE PERFORMANCE MEASURES**

Donaldson Coal Pty Limited (Donaldson Coal) will adopt subsidence performance measures for significant surface features as outlined in Table 7-1, subject to further consultation with surface feature owners and relevant government agencies.

These performance measures will be achieved by implementing subsidence control zones to manage subsidence effects on the surface feature and achieve the subsidence performance measure. The design parameters for the subsidence control zones will be finalised and adapted through the Extraction Plan process.

An adaptive management approach will be implemented to achieve the subsidence performance measures for the Project. Adaptive management will involve the monitoring and periodic evaluation of environmental consequences against the performance measures, and adjustment (if necessary) of the subsidence control zones (i.e. mine design and extent) to achieve the adopted performance measures.

### **7.2 PROPOSED PROJECT ENVIRONMENTAL MANAGEMENT, MONITORING AND REPORTING**

Section 4 of this Environmental Impact Statement (EIS) outlines proposed environmental mitigation, management, monitoring, offset and compensatory measures.

These include measures relating to subsidence impacts on built features, land use, groundwater, geomorphology, surface water, aquatic ecology, flora, terrestrial fauna, Aboriginal heritage, road transport, noise, vibration, air quality, greenhouse gas emissions, social impacts, hazards and visual character. Where relevant, Project specific environmental monitoring programs are also proposed in Section 4.

Section 5 of this EIS describes how surface disturbance areas will be rehabilitated and Project subsidence effects will be remediated.

Donaldson Coal will review and revise the existing management and monitoring plans listed in Table 7-2. Table 7-2 also lists new management and monitoring plans that are proposed to be prepared for the Project, including the plans as part of the Extraction Plan process.

The existing monitoring program at the Tasman Underground Mine will be augmented to address the new pit top facility and West Borehole Seam mining area. Figure 7-1 shows the location of environmental monitoring locations proposed to be maintained or added for the Project. Detailed monitoring programs, including final monitoring locations, will be developed as a component of the Extraction Plan process, including locations for ecological and Aboriginal heritage monitoring.

It is recognised that changes to the Project environmental management, monitoring and reporting proposal contained in this EIS may be considered necessary during further consultation with government agencies in the assessment and approval process of the Project. Environmental management, monitoring and reporting will be conducted in accordance with finalised Development Consent conditions, with the final monitoring details (locations, parameters and frequencies) to be provided in the relevant management plans/monitoring programs.

### **7.3 SPECIFIC ENVIRONMENTAL MANAGEMENT COMMITMENTS**

Environmental mitigation, management, monitoring, offset and compensatory measures to be implemented for the Project are described in Section 4. Key commitments include:

- restricting mining under principal residences to non-subsiding first workings only (unless otherwise agreed by the landholder);
- design and construction of the new pit top facility to avoid or minimise impacts on key ecological features;
- continued implementation of the principles of the Road Transport Protocol, including a Drivers Code of Conduct;
- implementation of private driveway/George Booth Drive safety improvement works;

**Table 7-1**  
**Subsidence Performance Measures<sup>1</sup>**

Surface Feature	Subsidence Performance Measure	Subsidence Control Zone <sup>2</sup>
Communication Towers on Mount Sugarloaf	Maintain safety and serviceability. No damage to structures or loss of service.	First workings only within 45 degree (°) angle of draw resulting in less than 2 millimetres (mm) subsidence and 10 mm horizontal displacement.
Fibre Optic Cables	Maintain safety and serviceability. Damage must be fully repaired or compensated.	Partial extraction with stable remnant pillars resulting in less than 300 mm of subsidence (unless fibre optic cables can be relocated by agreement with the infrastructure owner or is suspended on electricity transmission towers).
TransGrid Towers	Maintain safety and serviceability. Damage must be fully repaired or compensated.	First workings only within 26.5° angle of draw resulting in less than 20 mm subsidence, 5 millimetres per metre (mm/m) tilt and 2 mm/m strain (may be relaxed if cruciform footings can be installed and agreement reached with the infrastructure owner).
Ausgrid Towers	Maintain safety and serviceability. Damage must be fully repaired or compensated.	Maximum extraction (except where within another subsidence control zone).
Principal Residences	Maintain safety. Serviceability to be maintained and/or fully compensated. Damage must be fully repaired or compensated.	First workings only within 26.5° angle of draw resulting in less than 20 mm subsidence, 5 mm/m tilt and 2 mm/m strain (may be relaxed if agreement reached with the owner).
Cliff Lines	Minor impact resulting in negligible environmental consequence. No additional risk to public safety.	First workings only within 30 metre (m) of a cliff line greater than 20 m in length resulting in less than 150 mm subsidence. Partial extraction with stable remnant pillars resulting in less than 300 mm of subsidence for all other cliff lines.
Steep Slopes	Minor impact resulting in negligible environmental consequence. No additional risk to public safety.	Partial extraction with stable remnant pillars resulting in less than 300 mm of subsidence beneath slopes greater than 1 in 2. Maximum extraction beneath slopes between 1 in 3 and 1 in 2 (except where within another subsidence control zone).
3 <sup>rd</sup> Order Streams <sup>3</sup> or above	Negligible environmental consequences (that is, negligible diversion of flows and negligible change in the natural drainage behaviour of pools). Negligible connective cracking to underground workings.	First workings only within 26.5° angle of draw resulting in less than 20 mm subsidence at the edge of the bank.
1 <sup>st</sup> and 2 <sup>nd</sup> Order Streams <sup>3</sup>	Not more than minor environmental consequences. Negligible connective cracking to underground workings.	Partial extraction with stable remnant pillars resulting in less than 300 mm of subsidence where the depth of cover to the stream is less than 80 m.
Coastal Warm Temperate – Sub Tropical Rainforest and Alluvial Tall Moist Forest (Groundwater Dependent Ecosystems) and Hunter Lowlands Redgum Forest on 3 <sup>rd</sup> Order Streams <sup>3</sup>	Negligible environmental consequence.	Partial extraction with stable remnant pillars resulting in less than 300 mm of subsidence.

<sup>1</sup> Proposed subsidence performance measures and subsidence control zones are subject to further consultation with surface feature owners and relevant government agencies.

<sup>2</sup> Proposed subsidence control zones may be modified through the adaptive management process (Figure 2-10).

<sup>3</sup> In accordance with the Strahler stream order system.

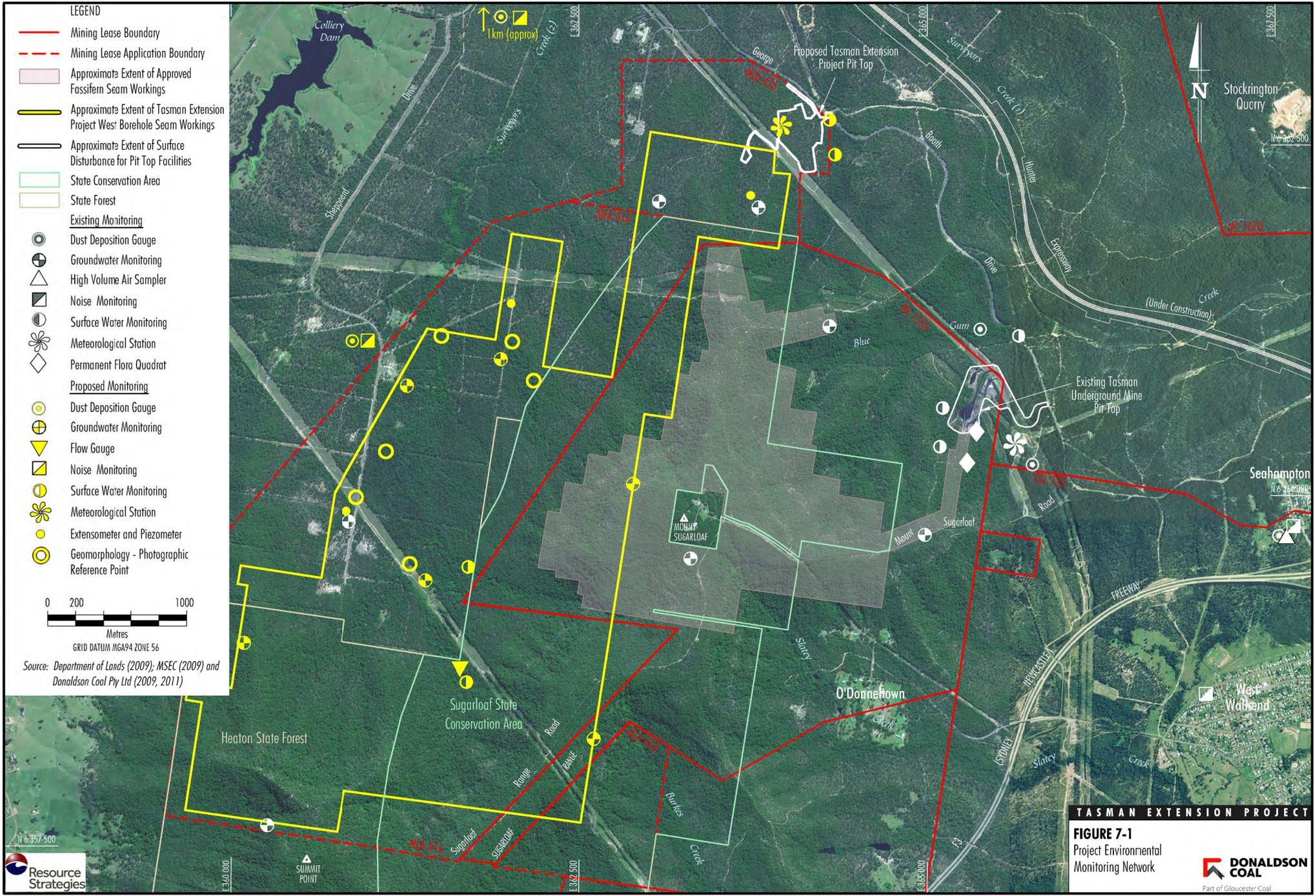
Note: Cliff Lines - a continuous rock face with minimum height of 10 m and minimum slope of 2 to 1.  
Minor - Relatively small in quantity, size and degree given the relative context.

Steep Slopes - an area of land having gradient between 1 in 3 and 2 in 1.  
Negligible - Small and unimportant.

**Table 7-2  
Summary of Project Management, Monitoring and Reporting**

<b>Proposed Management, Monitoring and Reporting</b>	<b>Key EIS Sections and Appendices</b>
<b>Management and Monitoring</b>	
Environmental Management Strategy	Section 2.1.7
Environmental Monitoring Program	Sections 2.1.7, 4.13.3 and 4.14.3
Health and Safety Management System	Section 4.18.2 and Appendix N
Abel Underground Coal (Integrated with Donaldson Open Cut, Tasman Underground and Bloomfield Open Cut Coal Mines) Integrated Environmental Monitoring Program	Sections 2.1.7, 4.13.3 and 4.14.3
Extraction Plan <sup>#</sup>	Sections 2.6.3 and 4.2
• Subsidence Monitoring Program <sup>#</sup>	Section 4.2.6 and Appendix A
• Built Features Management Plan <sup>#</sup>	Section 4.2.6 and Appendix A
• Water Management Plan <sup>#</sup>	Sections 4.4.3, 4.5.3, 4.6.3 and 4.7.3 and Appendices B and C
• Biodiversity Management Plan <sup>#</sup>	Sections 4.8.3 and 4.9.3
• Land Management Plan <sup>#</sup>	Section 4.3.3
• Heritage Management Plan <sup>#</sup>	Section 4.10.3 and Appendix K
• Public Safety Management Plan <sup>#</sup>	Section 4.3.3 and Appendix A
Road Transport Protocol	Section 4.12.3 and Appendix H
Site Water Management Plan	Sections 4.3.3 and 4.6.3 and Appendix C
Bushfire Management Plan	Section 4.3.3
Construction Flora and Fauna Management Plan (including Vegetation Clearance Protocol)	Sections 4.8.3 and 4.9.3 and Appendices F and G
Biodiversity Offset Strategy <sup>#</sup>	Section 4.8.4
Rehabilitation Management Plan <sup>#</sup>	Section 5.5
Mining Operations Plan or Rehabilitation and Environmental Management Plan	Section 6.3.1
Mine Closure Plan	Sections 4.16.3 and 5.6
<b>Reporting</b>	
Annual Environmental Management Report or Annual Review	Section 6.3.1
Licences and Approvals	Section 6.3.1
Greenhouse Gas Reporting	Sections 4.15.3 and 6.3.2

<sup>#</sup> New management/monitoring plan to be prepared.



**TASMAN EXTENSION PROJECT**  
**FIGURE 7-1**  
 Project Environmental Monitoring Network



- performance monitoring of the Donaldson access road intersection with John Renshaw Drive;
- undertaking an Aboriginal cultural heritage educational documentation program in consultation with Aboriginal stakeholders specific to the Mount Sugarloaf area;
- design of the mine plan to achieve acceptable levels of risk for key Aboriginal heritage sites of cultural and archaeological significance; and
- research, offset and compensatory measures for Project impacts on ecological aspects, including the establishment of biodiversity offset land.

These are described further below.

### **Principal Residences**

There are currently three privately-owned principal residences within the West Borehole Seam mining area.

#### *Donaldson Coal Commitment*

Donaldson Coal commits to restricting extraction to non-subsiding first workings only under principal residences (unless agreed otherwise with the landholder). Donaldson Coal will only consider one residence per private lot as a 'principal residence'.

This will involve no secondary extraction of coal within a 26.5° angle of draw resulting in less than 20 mm of subsidence. As a result, subsidence impacts to principal residences will be minimal.

Built Features Management Plans will be provided to the landholder/occupier of each private lot that will be undermined prior to mining in the area. The Built Features Management Plan will include information, predictions and a subsidence monitoring program tailored for that private lot.

In circumstances where the owner of the principal residence and Donaldson Coal can agree to terms which permit secondary workings under the principal residence, Donaldson Coal will negotiate a detailed plan of management and compensation accordingly.

### **Design and Construction of New Pit Top Facility**

An iterative design process was adopted for the new pit top facility to avoid or minimise impacts on key ecological features.

#### *Donaldson Coal Commitment*

The pit top facility will be designed and constructed to:

- limit vegetation clearance as far as practicable;
- avoid clearance of the threatened flora species Black-eyed Susan (*Tetratheca juncea*), including a 20 m buffer (as mapped on Figure 4-15);
- avoid clearance of the *Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions* endangered ecological community (as mapped on Figure 4-14);
- avoid a known roost tree for the threatened fauna species Yellow-bellied Glider (*Petaurus australis*) (as mapped on Figure 4-17b);
- limit clearance of the *Lower Hunter Spotted Gum – Ironbark Forest in the Sydney Basin Bioregion* endangered ecological community as far as practicable (as mapped on Figure 4-14); and
- limit clearance of the threatened flora species Heath Wrinklewort (*Rutidosis heterogama*) as far as practicable (as mapped on Figure 4-15).

### **Road Transport Protocol**

Donaldson Coal implements a Road Transport Protocol for the existing Tasman Underground Mine, which sets out details of the coal haulage between the Tasman Underground Mine and the Bloomfield coal handling and preparation plant and includes a Drivers Code of Conduct.

#### *Donaldson Coal Commitment*

The Project will include the continued implementation of the principles of the Road Transport Protocol, including a Drivers Code of Conduct.

The existing Road Transport Protocol will be reviewed and updated as required to address the Project, including:

- restriction on the total road haulage for the Project at up to 4,000 tonnes per day prior to commissioning of the Hunter Expressway;
- restriction on the total road haulage for the Project at up to approximately 6,200 tonnes per day following commissioning of the Hunter Expressway;
- continuation of the restriction of run-of-mine (ROM) coal haulage on weekdays (Monday to Friday) to 7.00 am to 10.00 pm, except in the case of exceptional circumstances<sup>1</sup>;
- extension of ROM coal haulage into the Saturday period (7.00 am to 6.00 pm), with ROM coal transport limited to no more than 26 Saturdays in a financial year; and
- continuation of the policy that ROM coal transport will not occur on Sundays or public holidays.

Donaldson Coal will continue to commission independent traffic audits at intervals in accordance with the requirements of the New South Wales (NSW) Department of Planning and Infrastructure and in consultation with the NSW Roads and Maritime Services and Cessnock City Council.

#### **Private Driveway/George Booth Drive Safety Improvement Works**

Donaldson Coal undertook upgrade works at a number of private driveways located on George Booth Drive between Richmond Vale Road and John Renshaw Drive including road shoulder widening and sealing as a component of road upgrades for the approved Tasman Underground Mine.

The Road Transport Assessment concluded that the Project's contribution to overall traffic conditions on George Booth Drive and John Renshaw Drive will be such that no significant impacts on the performance, capacity, efficiency and safety of the road network are expected to arise as a direct result of the Project.

Notwithstanding, as an outcome of community consultation, Donaldson Coal commissioned an inspection and safety review of private driveways on George Booth Drive between John Renshaw Drive and Richmond Vale Road. This review indicated that there were some safety improvements that could be made, including localised shoulder widening at some driveways.

#### **Donaldson Coal Commitment**

Donaldson Coal will implement the identified private driveway/George Booth Drive safety improvement works within one year of obtaining Development Consent for the Project, should it be approved (subject to any required landholder consent and necessary environmental approvals being obtained).

Donaldson Coal will also continue to consult with private landholders located on the ROM coal haulage route on George Booth Drive, and will consider on merit any further safety improvements at these driveways that may be requested by these landholders (e.g. funding the pruning of roadside vegetation on private land).

In addition, in the event that additional private residential access driveways are established on the ROM coal haulage section of George Booth Drive in accordance with Council approvals in the future, Donaldson Coal will commission a review of the driveway safety and implement any relevant road widening or upgrade works that may be determined to be required at the new driveway.

#### **Performance Monitoring of Donaldson Access Road Intersection**

The Road Transport Assessment has identified that in the long-term, the performance of the Donaldson access road intersection with John Renshaw Drive may deteriorate if the predicted levels of baseline traffic growth eventuate, and this baseline growth coincides with peak Project turning movements at this intersection.

#### **Donaldson Coal Commitment**

Donaldson Coal proposes to implement performance monitoring of the intersection, initially at 5 yearly intervals, with the monitoring interval to be reviewed based on measured intersection performance and in consultation with Roads and Maritime Services.

<sup>1</sup> Exceptional circumstances include unexpected events such as a significant disruption to the haulage route. Hours would be extended in accordance with a contingency plan in the Road Transport Protocol with the agreement of the Department of Planning and Infrastructure.

### **Aboriginal Cultural Heritage Educational Documentation Program**

Significant traditional, historical and contemporary cultural values and associations have been identified within the Project surrounds by the registered Aboriginal stakeholders and are also known through ethnohistorical evidence. Mount Sugarloaf within the Project area is documented for its association with male initiation ceremonies and the presence of the supernatural spirit being 'Puttikan' and the supreme being 'Koe-in'.

#### *Donaldson Coal Commitment*

A Heritage Management Plan will be developed for the Project in consultation with the registered Aboriginal stakeholders and the NSW Office of Environment and Heritage to detail management and mitigation measures relevant to the Project area.

The Heritage Management Plan will include a program (funded up to a maximum of \$20,000) for undertaking an Aboriginal cultural heritage educational documentation program specific to the Mount Sugarloaf area and for use as an education tool/resource by the Aboriginal community.

As part of this process, Donaldson Coal commits to funding (up to a maximum of \$10,000) a program for the further investigation of select grinding groove sites, including a residue and use-wear analysis.

### **Mine Plan Design for Key Aboriginal Heritage Sites**

A number of Aboriginal heritage sites were identified within the future mining areas and surrounds, including open artefact sites, grinding groove sites and rock shelters with potential archaeological deposits.

In addition, several of the registered Aboriginal groups identified three stone features within the Men's Area as being the most culturally significant individual features within the Project area. Specific details regarding these features have been deemed culturally sensitive and are not released in this EIS. The Subsidence Assessment concluded that with the implementation of the subsidence control zones, the risk of physical damage to these features is assessed as "very unlikely". This is the lowest risk category.

#### *Donaldson Coal Commitment*

The following measures would be detailed in the Heritage Management Plan and undertaken to manage potential impacts to Aboriginal heritage from subsidence throughout the life of the Project.

- Undertaking a detailed geotechnical assessment of the three culturally significant stone features within the Men's Area to further inform the mine layout design to avoid impacting these formations.
- Modification of the mine plan to ensure that the risk of perceptible subsidence impacts is lowered from "unlikely" to "very unlikely" for grinding groove site 38-4-0447 (i.e. such that the risk to any site with a high archaeological significance is "very unlikely").

### **Research, Offset and Compensatory Measures**

Condition 25 of the Tasman Underground Mine Development Consent (DA 274-9-2002) (16 March 2004) stated:

#### **FLORA & FAUNA**

##### **Compensatory Habitat**

*25. The Applicant shall establish at least 10 hectares of compensatory habitat on the surface colliery holding to the satisfaction of the Director-General, to offset the vegetation removed by the development.*

This condition was developed to offset the clearance of approximately 8 hectares of native vegetation required for development of the Tasman Underground Mine pit top facility.

The Project will include the clearance of approximately 11.2 hectares of native vegetation for the new pit top facility and upcast ventilation shaft, including approximately 8.9 hectares of the *Lower Hunter Spotted Gum – Ironbark Forest in the Sydney Basin Bioregion* endangered ecological community and approximately 2.3 hectares of Coastal Plains Smooth-barked Apple Woodland.

In addition, the Project will involve the continuation and extension of mining in the Sugarloaf State Conservation Area.

### Donaldson Coal Commitment

Consistent with the approved compensatory land package for the existing Tasman Underground Mine pit top facility, the Project biodiversity offset land may include the following:

- establishment of at least 22.5 hectares of native bushland (ratio of 2:1) as compensatory habitat (including at least 18 hectares of the *Lower Hunter Spotted Gum - Ironbark Forest in the Sydney Basin Bioregion* endangered ecological community);
- selection of suitable bushland for the compensatory habitat to the satisfaction of the Department of Planning and Infrastructure, in consideration of:
  - Office of Environment and Heritage's *Principles for the use of Biodiversity Offsets in NSW*; and
  - the Offsetting Principles outlined in the *Lower Hunter Regional Conservation Plan*;
- funding for costs associated with establishment of the compensatory habitat;
- suitable long-term protection of the compensatory habitat to the satisfaction of the Department of Planning and Infrastructure; and
- funding for minor site improvement works if required.

Alternatively, at the time the land was purchased by Newcastle Coal Company Pty Ltd, DEC (now OEH) indicated in a letter (dated 1 March 2007) that impacts associated with the new pit top would be offset in an appropriate manner should a set of actions relevant to the land and the new pit top be undertaken. These actions include:

- Designing the new pit top to avoid impact on the threatened flora species Black-eyed Susan (*Tetratheca juncea*), including a 20 m buffer.
- Designing the new pit top to avoiding clearance of the *Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions* EEC.
- Designing the new pit top to limit clearance of the *Lower Hunter Spotted Gum – Ironbark Forest in the Sydney Basin Bioregion* EEC.

- Transferring the land associated with the new pit top to OEH once mining and rehabilitation have been completed.
- Managing the existing Tasman Underground Mine compensatory habitat area to protect the area's biodiversity values in accordance with the existing Flora and Fauna Management Plan.
- Conserving a population of the threatened flora species Black-eyed Susan (*Tetratheca juncea*) located within the existing Tasman Underground Mine compensatory habitat area.
- Consideration of transferring the existing Tasman Underground Mine compensatory habitat area to OEH once mining and rehabilitation are complete.

Donaldson Coal will develop a Biodiversity Offset Strategy to finalise the selection of the biodiversity offset land and facilitate management of the land, in consultation with Office of Environment and Heritage and to the satisfaction of Department of Planning and Infrastructure. The Biodiversity Offset Strategy will be developed within 12 months of the Development Consent, if granted.

In addition to either option, Donaldson Coal commits to implementing the research offset and compensatory measures outlined in Table 7-3.

**Table 7-3  
Summary of Project Research, Offset and Compensatory Measures**

Activity	Financial Contribution
<b>Research Programs</b>	
<b>Heath Wrinklewort (<i>Rutidosia heterogama</i>):</b> <ul style="list-style-type: none"> <li>• A research program to determine the level of genetic exchange between patches of <i>Rutidosia heterogama</i> across George Booth Drive.</li> <li>• A research program into translocation of the individuals located within the proposed disturbance area, involving: <ul style="list-style-type: none"> <li>– translocation of as many of the plants as can readily be retrieved, and collection and planting of available seed in a target area (i.e. closest existing patch on Donaldson Coal owned land, located approximately 70 m to the south);</li> <li>– conservation of the translocation area in perpetuity; and</li> <li>– approval of the program by the Office of Environment and Heritage prior to any work commencing.</li> </ul> </li> </ul>	As required
<b>Sugarloaf State Conservation Area Works</b>	
<ul style="list-style-type: none"> <li>• Financial contribution towards rehabilitation and revegetation works within the Sugarloaf State Conservation Area.</li> </ul>	\$10,000/year during the period when mining takes place in the Sugarloaf State Conservation Area
<ul style="list-style-type: none"> <li>• Financial contribution to management within the Sugarloaf State Conservation Area: <ul style="list-style-type: none"> <li>– Pest Control - pest control programs for pests such as the Fox, Feral Goat and Feral Pig.</li> <li>– Weed Control - weed control programs for Lantana.</li> <li>– Myrtle Rust Control – control programs to minimise the spread of Myrtle Rust in the area.</li> <li>– Fire Management - fire management programs.</li> </ul> </li> </ul>	\$15,000/year during the period when mining takes place in the Sugarloaf State Conservation Area