

APPENDIX A

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

INTEGRATED STATE SIGNIFICANT DEVELOPMENT

**DETERMINATION OF DEVELOPMENT APPLICATION
PURSUANT TO SECTIONS 76(A)9 & 80**

I, the Minister for Urban Affairs and Planning, pursuant to Sections 76(A)9 & 80 of the Environmental Planning and Assessment Act, 1979 (“the Act”) determine the development application (“the application”) referred to in Schedule 1 by granting consent to the application subject to the conditions set out in Schedule 2.

The reasons for the imposition of the conditions are to:

- (i) minimise the adverse impact the development may cause through water and air pollution, noise and visual disturbance;
- (ii) provide for environmental monitoring and reporting; and
- (iii) set requirements for infrastructure provision.

Andrew Refshauge

Minister for Urban Affairs and Planning

ORIGINAL CONSENT SIGNED BY MINISTER REFSHAUGE 14 MAY 1999.

Sydney,

1999

File No. N91/00544

Schedule 1

Application made by:	Powercoal Pty Ltd (ACN 052 533 070) (“the Applicant”).
To:	The Minister for Urban Affairs and Planning (DA 73-11-98)
In respect of:	The area of land as shown in red edge and orange hatch in Figure 1 of Appendix 1.
For the following:	Extension of an underground coal mine, and upgrade of associated surface facilities (“the Development”).
BCA Classification:	Class 10(a) (conveyor coal reclaim system, train loading bin (Newstan Colliery); ventilation shaft, men and materials access shaft and winder housing (Awaba Colliery)).
NOTE:	1) To ascertain the date upon which the consent becomes effective, refer to section 83 of the Act. 2) To ascertain the date upon which the consent is liable to lapse, refer to section 95 of the Act.

- 3) Section 97 of the Act confers on an Applicant who is dissatisfied with the determination of a consent authority a right of appeal to the Land and Environment Court exercisable within 12 months after receipt of notice.

23 September 2007 modification (DA73-11-98 MOD 1) shown in red type.

27 November 2009 modification (DA73-11-98 MOD 2) shown in blue type.

26 November 2010 modification (DA73-11-98 MOD 3) shown in green type.

16 March 2012 modification (DA 73-11-98 MOD 4) shown in pink type (Newstan Main West)

19 November 2012 modification (DA 73-11-98 MOD 5) shown in mauve type (Transport Modification)

SCHEDULE 2

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DEFINITIONS:

AEMR - *Annual Environmental Management Report*

CCC - *Community Consultative Committee*

DA - *Development Application*

DA Area – *the area of land to which this consent applies, as shown in red edge and orange hatch in Figure 1 of Appendix 1*

Department – *Department of Planning and Infrastructure*

Director-General - *Director-General of the Department of Planning and Infrastructure or delegate*

Development Consent Area – *the area of the development as shown in the figure in Appendix 1*

EIS - *Environmental Impact Statement*

Executive Director, Mineral Resources – *the Executive Director of the Mineral Resources within DRE*

LEA – *Lease Extension Area as shown in blue broken line in Figure 1 of Appendix 1*

Main West Mining Area – *the area shown in orange hatch in Figure1 of Appendix1*

Minister – *Minister for Planning and Infrastructure, or delegate*

SEE – *Statement of Environmental Effects*

SMP – *Subsidence Management Plan*

Surface facilities – *Northern Reject Emplacement Area, Southern Reject Emplacement Area, new coal stockpile areas and Rail Loading Facilities (Newstan Colliery), and Ventilation and Men and Materials Access Shafts (Awaba Colliery).*

Section 138 – *section 138 of the Coal Mine Regulation Act, 1982*

Relevant Area – *relevant area of surface facilities*

Safe, serviceable and repairable criteria – *Category 3 to 5 for strain and/or category C or D for tilt, in accordance with Australian Standard AS2870-1996*

Government Authorities

EPA – Environment Protection Authority

DRE – Division of Resources and Energy, within the Department of Trade and Investment, Regional Infrastructure and Services

LMCC - *Lake Macquarie City Council*

MSB - *Mine Subsidence Board*

NOW – NSW Office of Water

OEH – Office of Environment and Heritage

RMS – Roads and Maritime Services

1. General

There is an obligation on the Applicant to prevent and minimise harm to the environment throughout the life of the project. This requires that all practicable measures are to be taken to prevent and minimise harm that may result from the construction, operation and, where relevant, decommissioning of the development.

1.1 Terms of Approval

The Applicant shall carry out the development generally in accordance with the:

- (a) DA 73-11-98;
- (b) EIS titled "*Newstan Colliery Life Extension Project*", dated November 1998;
- (c) SEE titled "*Newstan Colliery Modifications to Development Consent*", dated April 2007;
- (d) the modification application DA 73-11-98 – MOD 2 and accompanying Environmental Assessment entitled *Washing of Mandalong Coal at Newstan Section 96(1A) Application Statement of Environmental Effects*, dated October 2009;
- (e) the modification application DA 73-11-98 – MOD 3 and accompanying Environmental Assessment entitled *Washing of Awaba Coal at Newstan Section 75W Application Statement of Environmental Effects*, dated September 2010;
- (f) the modification application DA 73-11-98 – MOD 4 and accompanying Environmental Assessment entitled *Centennial Coal Newstan Colliery Main West Mining Project Section 75W Modification Environmental Assessment*, dated June 2011; and the Response to Submissions document entitled *Centennial Coal Newstan Colliery Main West Mining Project Response to Submissions*, dated December 2011;
- (g) the modification application DA 73-11-98 MOD 5 and accompanying Environmental Assessment entitled *Newstan Colliery Modification 5 Environmental Assessment*, dated September 2012; and
- (h) the conditions of this consent.

If there is any inconsistency between the above documents, the latter document shall prevail to the extent of the inconsistency. However, the conditions of this consent shall prevail to the extent of any inconsistency.

1.2 Period of Approval/Project Commencement

- (i) The approval for mining is for a period of 21 years from the date of granting of a mining lease pursuant to this consent. If, at any time, the Director-General is aware of environmental impacts from the proposal that pose serious environmental concerns due to the failure of existing environmental management measures to ameliorate the impacts, the Director-General may order the Applicant to cease the activities causing those impacts until those concerns have been addressed to the satisfaction of the Director-General.
- (ii) At least one month prior to the commencement of: construction of each of the surface facilities; and secondary workings within the LEA, or within such

period as agreed by the Director-General, the Applicant shall submit for the approval of the Director-General a compliance report detailing compliance with all the relevant conditions that apply prior to the commencement: of construction of each of the surface facilities; and secondary workings within the LEA.

- (iii) Date of commencement of construction of each of the surface facilities and date of commencement of first and secondary workings in the LEA is to be notified in writing to the Director-General and LMCC, at least two weeks prior to commencement of the surface construction works, and underground mining in the LEA respectively.

1.3 Dispute Resolution

In the event that the Applicant and the LMCC or a Government agency, other than **the Department**, cannot agree on the specification or requirements applicable under this consent, the matter shall be referred by either party to the Director-General or if not resolved, to the Minister, whose determination of the disagreement shall be final and binding on the parties.

1.4 Security Deposits and Bonds

Security deposits and bonds will be paid as required by **DRE** under mining lease approval conditions.

2. Mine Management

2.1 *Deleted*

2.2 *Limits on Production or Hours of Operation*

The operation of bulldozers on the northern and southern reject emplacement areas shall occur only during daylight hours.

3. Land and Site Environmental Management

3.1 Appointment of Environmental Officer

- (i) The Applicant shall employ a suitably qualified Environmental Officer throughout the life of the mine, whose qualifications are acceptable to the Director-General and who shall report to the Mine Manager. The Officer will:
 - (a) be responsible for the preparation of the environmental management plans (refer condition 3.2);
 - (b) be responsible for considering and advising on matters specified in the conditions of this consent and compliance with such matters;
 - (c) be responsible responding to complaints in accordance with condition 10.2(a);
 - (d) facilitate an induction and training program for all persons involved with construction activities, mining and remedial activities; and
 - (e) have the authority and independence to require reasonable steps to be taken to avoid or minimise unintended or adverse environmental impacts and failing the effectiveness of such steps, to stop work immediately if an adverse impact on the environment is likely to occur.
- (ii) The Applicant shall notify the Director-General, DRE, EPA, NOW, LMCC and the CCC (refer condition 8.8) of the name and contact details of the Environmental Officer upon appointment and any changes to that appointment.

3.2 Environmental Management Strategies and Plans

- (a) The Applicant shall prepare an Environmental Management Strategy as a continuation of the existing Newstan Colliery Environmental Management System for the DA area including within the LEA and all proposed surface facilities. The Environmental Management Strategy shall be prepared in consultation with the relevant authorities and the Community Consultative Committee and to the satisfaction of the Director-General, prior to commencement of construction of surface facilities or secondary workings, whichever is the sooner.
- (b) The Environmental Management Strategy shall include:
 - (i) statutory and other obligations which the Applicant is required to fulfill during construction and mining, including all approvals and consultations and agreements required from authorities and other stakeholders, and key legislation and policies;
 - (ii) definition of the role, responsibility, authority, accountability and reporting of personnel relevant to environmental management, including the Environmental Officer;
 - (iii) overall environmental management objectives and performance outcomes, during construction, mining and decommissioning of the mine, for each of the key environmental elements for which management plans are required under this consent;
 - (iv) overall ecological and community objectives for the water catchment, and a strategy for the restoration and management of the areas of the catchment affected by mining operations, including elements such as

- wetlands and other habitat areas, creek lines and drainage channels, within the context of those objectives;
- (v) identification of cumulative environmental impacts and procedures for dealing with these at each stage of the development;
 - (vi) overall objectives and strategies to protect existing economic productivity within the area affected by mining, including agricultural productivity and other businesses;
 - (vii) steps to be taken to ensure that all approvals, plans, and procedures are being complied with;
 - (viii) processes for conflict resolution in relation to the environmental management of the project; and
 - (ix) documentation of the results of consultations undertaken in the development of the Environmental Management Strategy.
- (c) The Applicant shall make copies of the Environmental Management Strategy available to LMCC, EPA, NOW, DRE, MSB and the Community Consultative Committee within fourteen days of approval by the Director-General.
- (d) The Applicant shall also prepare the following environmental management plans:
- Archaeology and cultural management plan (refer condition 3.3)
 - Flora and fauna management plan (refer condition 3.4)
 - Erosion and sediment control plan (refer condition 3.5(a))
 - Soil stripping management plan (refer condition 3.5(c))
 - Landscape management plan (refer condition 3.7)
 - Bushfire management plan (refer condition 3.8)
 - Land management plan (refer condition 3.9(a))
 - Wetland management plan (refer condition 3.9(c))
 - Site water management plan (refer condition 4.1)
 - Dust management plan (refer condition 6.1)
 - Noise management plan (refer condition 6.4(d))
- (e) The management plans are to be revised/updated at least every 5 years or as otherwise directed by the Director-General in consultation with the relevant government agencies. They will reflect changing environmental requirements or changes in technology/operational practices. Changes shall be made and approved in the same manner as the initial environmental management plan. The plans shall also be made publicly available at LMCC within two weeks of approval of the relevant government authority.
- (f) If the applicant is unable to prepare the relevant environmental strategies and plans within the period required by these conditions of consent, prior to commencing relevant works within the area of LW15A, the applicant shall prepare specific management strategies and plans for the area of LW 15A prior to commencement of those works. The preparation, content and approval of the plans for the area of LW15A shall not otherwise be inconsistent with the requirements for the management strategies and plans set out in this consent.

3.3 Heritage Assessment and Management

- (A) The Applicant shall prior to construction of surface facilities or secondary workings within identified areas of archaeological sensitivity within the LEA:
- (i) Prepare an archaeology and cultural management plan which shall include, but not be limited to:
 - (a) identification of any future salvage, excavation, monitoring, and protection of any heritage and archaeological items, within the area of the surface facilities, particularly the waste emplacement and coal stockpile areas, Awaba Colliery, and the area within the LEA prior to and during development;
 - (b) measures to undertake test excavations along Lords Creek to verify the archaeological potential of those areas identified as having low archaeological sensitivity at least one year prior to finalisation of the route of channelisation or other proposed works along Lords Creek;
 - (c) details of proposed investigations of rockshelters and grinding groove sites identified as having potential to contain archaeological deposit to be undertaken prior to mining being undertaken in the vicinity of the identified sites. The investigation will include test excavations undertaken in accordance with a permit issued under section 87 of the National Parks and Wildlife Act 1974, under a research design which is acceptable to the Aboriginal community and OEH;
 - (d) measures to protect Aboriginal sites from subsidence and mine working impacts, in consultation with OEH, the Aboriginal community and local residents to ensure integration of measures to protect Aboriginal sites.
 - (e) identification and documentation of Aboriginal cultural heritage issues;
 - (f) details of a monitoring program to document the effects of subsidence and mining works on Aboriginal sites and areas of archaeological sensitivity.

The plan shall be prepared in consultation with OEH, the Local Aboriginal Land Council, LMCC, and to the satisfaction of the Director-General, and shall be considered by the Applicant when completing the final underground mine layout;

- (B) The Applicant shall:
- (i) submit to and have approved by the Director-General of OEH, a Consent to Destroy application under section 90 of the National Parks and Wildlife Act 1974 for Aboriginal archaeological sites that have been identified to be damaged or destroyed as a result of the development prior to this consent and/or by the archaeology and cultural management plan, prior to any disturbance of the identified sites by mining activity; and
 - (ii) not undertake surface development works within the area of high archaeological sensitivity identified as the alluvial terrace along Lords Creek (within proposed Long Wall 42).

- (C) If, during the course of construction of any surface facilities, or mining in the LEA, the Applicant becomes aware of any heritage or archaeological material not previously identified, all work likely to affect the material shall cease immediately and the relevant authorities consulted about an appropriate course of action prior to recommencement of work. The relevant authorities may include [OEHS](#), the NSW Heritage Office, and the Local Aboriginal Land Council. Any necessary permits or consents shall be obtained and complied with prior to recommencement of work.

(D) General Terms of Approval - [OEHS](#)

The Applicant shall invite the Koompahtoo Local Aboriginal Land Council to collect the identified isolated artefacts within the area of the proposed surface facilities prior to construction within the relevant area.

3.4 Flora and Fauna Assessment and Management

- (a) The Applicant shall prior to commencement of any construction works for surface facilities in the relevant area or secondary workings within the LEA, prepare and implement a Flora and Fauna Management Plan for the management of flora and fauna issues for the areas of the proposed surface facilities and LEA. The Plan shall be prepared in consultation with [OEHS](#) and LMCC, and to the satisfaction of the Director-General, and shall include but not be limited to:
- (i) a detailed assessment of the current characteristics and ecological values of existing ecosystems likely to be affected by the development;
 - (ii) strategies to minimise the net loss of ecologically significant vegetation communities within DA area as a result of the development, including the provision of compensatory areas of equivalent ecological and habitat value where necessary;
 - (iii) strategies to provide increased security for existing habitats and communities (including the strengthening of riparian communities, the management of *Tetratheca juncea* plants in the vicinity of the proposed surface facilities, particularly in and around the northern and southern reject emplacement areas), and LEA, and habitats of other threatened species such as the Squirrel Glider and Threatened Bat Species identified in the species impact statement;
 - (iv) strategies to manage the impact of surface water management, erosion and sediment control measures, and flooding mitigation measures on flora and fauna, including the impact of heavy machinery;
 - (v) details of monitoring the mine's impacts on native vegetation and threatened fauna and flora, and outline contingency measures should impacts be identified as occurring (refer also condition 8.5);
 - (vi) measures to monitor the impacts on threatened species populations shall address:
 - 1. methods of clearing near existing vegetation and measures to protect existing vegetation from the edge effects. Consideration of buffers is essential, especially near drainage lines.
 - 2. measures to reduce sediment into drainage lines.

3. subsidence impacts on *Tetratheca juncea* through a monitoring program. This program will be co-ordinated with a surveyed and levelled line to determine drops in the terrain, following mine subsidence;
 4. development of a program to specifically monitor the success or otherwise of proposed ameliorative measures in relation to the threatened flora and fauna species over five years from the commencement of construction in the relevant area. The monitoring is to be undertaken by experienced Botanist(s)/ Zoologist(s). Annual progress reports and a final report outlining the implementation and success or otherwise of the ameliorative measures shall be included in the AEMR during the monitoring period.
- (vii) measures to maintain trees with denning hollows for the protection of threatened arboreal fauna species such as the Squirrel Glider and small Bats. In the event that trees and/or nesting value relevant to these species are felled and tree hollows relocated to augment habitat, and/or in the event that individual animals are captured and relocated during construction, this work shall be undertaken by a Zoologist with knowledge and experience in the implementation of such ameliorative techniques for these species;
 - (viii) a large scale plan showing quadrat number locations for *Tetratheca juncea* together with a table showing sub-population sizes and their relevant co-ordinates. In particular, this information is required where populations will be lost by the Northern and Southern Reject Emplacement Areas;
 - (ix) strategies to maintain and enhance wildlife corridors around and through the site for the movement of fauna particularly for arboreal mammals, small birds, and squirrel gliders.
 - (x) development of a protocol for identifying and managing significant impacts on any threatened flora and fauna species not identified in the EIS, during development through construction or **operation** of the coal mine.
- (b) **Deleted.**
 - (c) The Applicant shall not disturb the *Tetratheca juncea* population within the area identified as “common” in figure 7 of the species impact statement, which is close to the northern reject emplacement area boundary.
 - (d) The Applicant shall implement the ameliorative measures for *Tetratheca juncea*, Squirrel Glider, and Threatened Bat Species identified in sections 11.1 and 11.2 of the species impact statement.
 - (e) Any fencing of native vegetation which is to be retained shall not consist of barbed wire fencing.

3.5 Prevention of Soil Erosion

- (a) The Applicant shall prepare Erosion and Sediment Control Plans for the surface facilities, particularly the waste reject emplacement areas, and the LEA in consultation with LMCC and to the satisfaction of **NOW** and Director-

General, and submit these Plans to the [EPA](#) as part of applications for a licence under the Protection of the Environment Act. The Plans shall be prepared and implemented prior to the commencement of work in the relevant areas.

- (b) The Erosion and Sediment Control Plans shall include:
 - (i) consideration and management of erosion and sedimentation of surface watercourses/waterbodies, including LT Creek and all creeks within the LEA; and
 - (ii) consideration of LMCC's Erosion and Sediment Control Policy and Code of Practice.
 - (iii) a program for reporting on the effectiveness of the sediment and erosion control systems and performance against objectives contained in the approved erosion and sediment control management plans, and EIS. (refer also condition (d) (i) below)
- (c) The Applicant shall also prepare a soil stripping management plan for the northern waste emplacement extension area and southern waste emplacement area to the requirements of [DRE](#) which shall include, but not be limited to:
 - (i) details of the management of soil stockpiles, soil stripping techniques and scheduling; and
 - (ii) a program for reporting on the effectiveness of the soil stripping methods and performance against objectives contained in the soil stripping management plan, and EIS.
- (d) General Terms of Approval - [EPA](#)

(i) *Stormwater/sediment Control - Construction Phase*

The Erosion and Sediment Control Plan (ESCP) in sub clause (a) above must also be prepared to describe the measures that will be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during construction activities. The ESCP should be consistent with the requirements for such plans outlined in *Managing Urban Stormwater: Soils and Construction*, ([Landcom](#)), or most recent version of these guidelines.

(ii) *Stormwater/sediment Control- Operation Phase*

A Stormwater Management Scheme must be developed and implemented to mitigate the impacts of stormwater runoff from the site following the completion of construction activities. The Scheme should be consistent with the Stormwater Management Plan for the catchment and the Water Management Plans in condition 4.1. Where a Stormwater Management Plan has not yet been prepared, the Scheme should be consistent with the guidance contained in *Managing Urban Stormwater: Council Handbook* (available from the [EPA](#)). The Scheme shall be prepared at the same time as the Water

Management Plans in condition 4.1.

3.6 Site Rehabilitation Management

The Applicant shall carry out rehabilitation of all mine areas in accordance with the requirements of any Mining Lease.

3.7 Visual Amenity and Landscaping

- a) The Applicant shall, prior to the commencement of construction works in the relevant area, submit for the approval of LMCC a detailed landscape and revegetation management plan for the surface facility sites prepared by a suitably qualified person. The plan shall include, but not be limited to:
- (i) details of the establishment of vegetation and the construction of mounding or bunding, for the purposes of maintaining satisfactory visual amenity, ecological functioning and habitat provision;
 - (ii) consideration of revegetation works along creeklines;
 - (iii) use of indigenous species;
 - (iv) details of the visual appearance of all buildings, structures, facilities or works (including paint colours and specifications). Buildings and structures shall be designed and constructed so as to blend as far as possible with the surrounding landscape;
 - (v) details, specifications and staged work programs to be undertaken, including a maintenance program of all landscape works, building materials and cladding.

The landscaping and revegetation plan must be consistent with the Environmental Management Strategy (condition 3.2).

- b) The Applicant shall ensure that an undisturbed barrier of 50 metres be maintained between the eastern boundary of the property at 1 Fassifern Road, Wakefield, and the toe of the proposed Northern Reject Emplacement Area.

3.8 Bushfire and other Fire Controls

The Applicant shall:

- (a) provide adequate fire protection works on the sites of surface works in accordance with the Coal Mine Regulation Act, 1982; and
- (b) prior to commencement of construction of surface facilities/works prepare a bushfire management plan for all its holdings contained in the DA, particularly the southern waste emplacement area to the satisfaction of the LMCC.

3.9 Land Management

The Applicant shall:

- (a) prior to commencement of construction works in the relevant area prepare a Land Management Plan for the areas of the proposed surface facilities, and its holdings in the LEA, to provide for proper land management in consultation

with **OEH**, **DRE**, and LMCC, and to the satisfaction of the Director-General . The plan shall include, but not be limited to:

- (i) pastures and remnant vegetation management;
 - (ii) prevention and rehabilitation of land degradation;
 - (iii) eradication of vermin and noxious weeds as required by the Rural Lands Protection Authority, the Prickly Pear Authority and other relevant authorities;
 - (iv) feral animal control.
- (b) minimise the removal of trees and other vegetation from the proposed surface facilities, particularly the waste emplacement areas and proposed new coal stockpile areas, and restrict any clearance to the areas occupied by mine activity, buildings and paved surfaces, and those areas necessary for fire control in accordance with LMCC's requirements.
- (c) prepare and implement a Wetland Management Plan for all wetland areas affected by the surface facilities, particularly within the proposed southern reject emplacement area. The Plans shall be prepared in consultation with **OEH**, **DRE** and affected landowners, and to the satisfaction of LMCC, prior to surface construction works in the relevant area. The plan shall include, but not limited to, replacement of habitat and in creek storages for water flows as part of the restoration of the emplacement areas.

3.10 Subsidence Management Plan

Prior to carrying out any underground mining operations that could cause subsidence, the Applicant shall prepare a Subsidence Management Plan (SMP) to the satisfaction of the **Executive Director, Mineral Resources**. This plan must be prepared in accordance with the:

- (a) *New Approval Process for Management of Coal Mining Subsidence - Policy*; and
- (b) *Guideline for Applications for Subsidence Management Approvals* (or the latest versions or replacements of these documents).

3.11 Subsidence Protection

In preparing the SMP, the Applicant shall pay particular attention to assessing and managing the potential surface impacts on all areas of the proposed underground mining area where:

- (a) cover depths are less than 100 metres (not including any depth of alluvium);
- (b) overlying mine workings occur; or
- (c) surface infrastructure such as power line towers and Hawkmount Road occurs.

3.12 Subsidence Management in the Main West Mining Area

The Applicant shall:

- (a) not conduct mining operations within 100 metres of points in the seam directly below Tension Tower # 18;
- (b) ensure that underground mining in the Main West Mining Area does not cause more than 20 mm of vertical subsidence at the surface in any location; and
- (c) remediate any unpredicted subsidence impacts on the 330 kV power transmission lines and towers in the Main West Mining Area, to the satisfaction of TransGrid.

4. Water Management

4.1 Surface & Ground Water Management

The Applicant shall:

- (a) prior to the commencement of construction of each of the new surface facilities at Newstan Colliery, and prior to first workings within the LEA, prepare water management plans for the relevant developments, in consultation with **NOW**, **EPA**, LMCC, and **DRE** and to the satisfaction of the Director-General, which shall include, but not be limited to, the following matters:
 - (i) management of the quality and quantity of surface and ground water within the areas covered by the water management plans, which shall include preparation of monitoring programs as provided by condition 8.2.;
 - (ii) management of stormwater and general surface runoff diversion to ensure separate effective management of clean and dirty water; (refer also condition 3.5 (d) (ii)).
 - (iii) measures to prevent the quality of any surface waters being degraded below the relevant water quality prior to construction, particularly in LT Creek and all creeks within the LEA due to the operation of the mine workings;
 - (iv) investigation into opportunities to reduce the minewater discharge into LT Creek in consultation with the **EPA** and include the results of such investigations in the Annual Environmental Management Report;
 - (v) identification of any possible adverse effects on water supply sources of surrounding land holders, as a result of the underground mining operations in the LEA and surface mine works, and implementation of mitigation measures as necessary;
 - (vi) identification of changes in flow of surface waters including all creeks within the LEA, particularly in Lord's Creek, due to subsidence, and LT Creek particularly due to the southern and northern waste emplacement areas and coal stockpiling areas;
 - (vii) identification of any stream rehabilitation works required to ameliorate subsidence effects on stream flows within Lords Creek;
 - (viii) contingency plans for managing adverse impacts of the development on surface and groundwater quality, including the matter in condition 4.1(d)(iv);
 - (ix) identification of the fresh quality groundwater resources within the project area, including the development of appropriate protection strategies;
 - (x) projection of potential groundwater changes during mining (short term) and post-mining (long term) with particular attention given to the affect of changes to groundwater quality and mobilisation of salts;

- (xi) a monitoring and remediation strategy for all streams which may be adversely affected by subsidence including bed fracturing and/or degradation of the stream channel. Where the monitoring indicates any adverse impacts due to mining, the company shall implement the remediation strategy to the satisfaction of [NOW](#).
- (xii) consideration of the State Wetlands Management Policy for all significant downstream wetlands that may be effected by mining activity within the LEA or the relevant area.
- (xiii) a program for reporting on the effectiveness of the water management systems and performance against objectives contained in the approved site water management plans, and EIS;
- (b) implement remediation measures, to the satisfaction of [NOW](#), where the development is responsible for the loss of groundwater quality or quantity below its current beneficial use;
- (c) obtain a license with [NOW](#) under part 5 of the Water Act (1912) prior to construction of all new excavations, test bores and production bores (including dewatering bores) that intersect the groundwater.
- (d) General Terms of Approval - [NOW](#)

Pursuant to Part 2 of the Water Act, 1912:

- (i) the licensed works shall:
 - (a) be constructed in accordance with plans and specifications approved by [NOW](#);
 - (b) be constructed and maintained in a safe and proper manner;
 - (c) not impede or capture floodwater;
 - (d) not cause erosion or sedimentation of adjacent and downstream watercourses shall;
- (ii) ~~Deleted~~;
- (iii) an appropriate vegetative buffer zone shall be installed between the licensed works and any adjacent mining activities;
- (iv) groundwater and surface water quality monitoring shall be conducted, to the satisfaction of [NOW](#), in the vicinity of the licensed works. The monitoring program is to identify any degradation in water quality as a result of the works (also refer to condition 8.2(ii)). A contingency plan shall be developed, to the satisfaction of [NOW](#), to remediate any such degradation (also refer to condition 4.1(a)(ix)). A copy of the finding shall be submitted to LMCC.
- (e) General Terms of Approval - [EPA](#)

(i) Pollution of Waters

The licensee must design construct and operate all plant and equipment and any other facilities on the premises so as to minimise the pollution of waters.

(ii) Discharge Concentration Limits

The Applicant shall only discharge water from the development in accordance with the provisions of a current Environmental Protection Licence.

(iii) Wastewater Utilisation Areas

Spray from the application of wastewater must not drift beyond the boundary of the waste water utilisation area to which it is applied.

(iv) Maintaining Waste Water Utilisation Areas

Waste water utilisation areas must effectively utilise the waste water applied to those areas. This includes the use for pasture or crop production, as well as ensuring the soil is able to absorb the nutrients, salts, hydraulic load and organic materials in the solids or liquids. Monitoring of land and receiving waters to determine the impact of waste water application may be required by the EPA.

4.2 Assessment of LT Creek and Water Re-use Options

The Applicant shall undertake an assessment of water quality and stream health in LT Creek and minewater re-use options to the satisfaction of the Director-General. This assessment must:

- (a) be prepared in consultation with the CCC, EPA, NOW and LMCC and be submitted to the Director-General by the end of March 2013 for approval;
- (b) review the history of operations at Newstan Colliery and describe any historical impacts from discharges from the Colliery on water quality and stream health in LT Creek;
- (c) identify the source(s) of exceedances of ANZECC water quality criteria for waters discharged from the site;
- (d) establish appropriate water quality criteria for water discharged from the site;
- (e) identify any reasonable and feasible options for the improvement of water management at Newstan Colliery including water treatment, re-use or transfer; and
- (f) provide a proposed timetable for the implementation of reasonable and feasible measures identified in (d) above.

4.3 Groundwater Monitoring Program – Main West Mining Area

The Applicant shall prepare a Groundwater Monitoring Program for the Main West Mining Area. This program must:

- (a) be prepared in consultation with NOW, and be submitted to the Director-General by the end of August 2012 for approval;
- (b) include:

- baseline data of groundwater levels (including alluvial and weathered rock aquifers), yield and quality in the region, and any privately owned groundwater bores that may be affected by mining operations;
- groundwater assessment criteria based upon analysis of baseline data for groundwater, surface water, including trigger levels for investigating any potentially adverse groundwater impacts; and
- a program to monitor and/or validate the impacts of mining in Main West on alluvial and coal seam aquifers, and any groundwater bores.

5. Hazardous Materials and Tailings Management

5.1 Waste Rock Emplacement and Management

The Applicant shall construct and manage the waste emplacements as set out in the EIS, and to the approval of the **DRE**.

5.2 Fine Rejects/Tailings Emplacement and Management

The Applicant shall prepare a Fine Rejects Management Plan for the placement of fine rejects in the Southern Waste Emplacement area to the satisfaction of the **DRE** prior to **any** placement of fine rejects in the emplacement areas.

5.3 Waste

General Terms of Approvals - **EPA**

(a) Receiving or Disposing of Waste

Except as expressly permitted in a licence, waste must not be:

- received at the premises for storage, treatment, processing, reprocessing or disposal; or
- disposed of at the premises.

(b) Hazardous and industrial waste

Hazardous or industrial waste must be stored and disposed of in a manner that will minimise the wastes impact on the environment including appropriate segregation for storage or disposal and transportation by a waste transporter licensed by the **EPA**.

6. Air Quality, Blast, Noise and Light Management

6.1 Air Quality and Greenhouse Gas

Odour

6.1A The Applicant shall ensure that no offensive odours, as defined under the POEO Act, are emitted from the site.

Greenhouse Gas Emissions

6.1B The Applicant shall implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site to the satisfaction of the Director-General.

Air Quality Criteria

6.1C The Applicant shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not exceed the criteria listed in Tables 1, 2 and 3 at any residence on privately owned land, or on more than 25 percent of any privately owned land.

Table 1: Long term impact assessment criteria for particulate matter

Pollutant	Averaging period	^d Criterion
Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³

Table 2: Short term impact assessment criterion for particulate matter

Pollutant	Averaging period	^d Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 50 µg/m ³

Table 3: Long term impact assessment criteria for deposited dust

Pollutant	Averaging period	Maximum increase² in deposited dust level	Maximum total¹ deposited dust level
^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month

Notes to Tables 1-3

^a Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources);

^b Incremental impact (i.e. incremental increase in concentrations due to the development on its own);

^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: *Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method*; and

^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Director-General.

Operating Conditions

6.1D The Applicant shall:

- (a) implement best management practice to minimise the off-site odour and dust emissions of the development;
 - (b) operate a comprehensive air quality management system on site that uses a combination of predictive meteorological forecasting and real-time air quality monitoring data to guide the day to day planning of surface activities and the implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of this consent;
 - (c) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see Note d to Tables 1-3);
 - (d) minimise any visible off-site air pollution; and
 - (e) minimise the surface disturbance of the site generated by the development,
- to the satisfaction of the Director-General.

Air Quality and Greenhouse Gas Management Plan

6.1E The Applicant shall prepare and implement an Air Quality and Greenhouse Gas Management Plan for the development to the satisfaction of the Director-General. This plan must:

- (a) be prepared in consultation with the EPA, and be submitted to the Director-General for approval by the end of September 2012;
- (b) describe the measures that would be implemented to ensure:
 - best management practice is being employed;
 - the air quality impacts of the development are minimised during adverse meteorological conditions and extraordinary events; and
 - compliance with the relevant conditions of this consent;
- (c) describe the proposed air quality management system;
- (d) include an air quality monitoring program that:
 - uses a combination of real-time monitors and supplementary monitors to evaluate the performance of the development;
 - adequately supports the proactive and reactive air quality management system;
 - includes PM_{2.5} monitoring;
 - evaluates and reports on the effectiveness of the air quality management system;
 - includes a protocol for determining any exceedances of the relevant conditions of this consent.

6.3 Blast Management

- (a) The Applicant shall only blast for the purposes of **underground mining or** constructing the vent shaft at the Awaba Colliery. (refer to condition 8.4 (b) for blast monitoring)

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(b) Overpressure

The overpressure level from blasting operations on the premises must not:

- (i) exceed 115dB (Lin Peak) for more than 5% of the total number of blasts over a period of 12 months; and
- (ii) exceed 120dB (Lin Peak) at any time,

when measured or computed at a free field location within 30 metres of any potentially affected residential building or other noise sensitive location such as a school or hospital unless otherwise approved in writing by the **OEH**.

(c) Ground Vibration (ppv)

Ground vibration peak particle velocity from the blasting operations on the premises must not:

- (i) exceed 5mm/s for more than 5% of the total number of blasts over a period of 12 months; and
- (ii) exceed 10mm/s at any time,

when measured or computed at a free field location within 30 metres of any potentially affected residential boundary or other noise sensitive location such as a school or hospital.

(d) Time of Blasting

- (i) Blasting operations associated with **surface** construction works may only take place between the hours of *9am and 5pm Monday to Saturday inclusive*.
- (ii) **Deleted.**

(e) Blast Management Protocol

A Blasting/Vibration Management Protocol must be prepared and implemented which will include details on:

- Compliance standards;
- Mitigation measures;
- Remedial action;
- Monitoring methods and program;
- Monitoring program for flyrock distribution;

- Measures to protect underground utilities (eg: rising mains, subsurface telecommunication and electric cables), and livestock nearby;
- Notification of procedures for neighbours prior to detonation of each blast;
- Measures to ensure no damage by flyrock to people, property, livestock and powerlines.

6.4 Noise Control **Newstan Surface Facilities**

Operational Noise Criteria

6.4A The Applicant shall ensure that noise from the development (excepting the Newstan ventilation shaft site at Awaba) does not exceed the noise criteria in Table 4.

Table 4: Noise criteria

Location	Shoulder dB(A) <i>L_{Aeq}(15 min)</i>	Day dB(A) <i>L_{Aeq}(15 min)</i>	Evening dB(A) <i>L_{Aeq}(15 min)</i>	Night dB(A) <i>L_{Aeq}(15 min)</i>	Night dB(A) <i>L_{A1} (1 min)</i>
NC1 -Davis	35	35	35	35	45
NC2 – Culgan	38	38	35	35	45
NC3 – Orrock	39	39	37	37	45
NC4 – Phelps	35	35	35	35	45
NC5 - Parnell	35	35	35	35	45
NC6 – Fassifern Primary School	N/A	35	N/A	N/A	N/A
All other privately- owned land	N/A	35	N/A	N/A	n/A

Notes:

- To interpret the locations referred to in Table 4, see Figure1 in Appendix2;
- Noise generated by the development is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.
- Day is defined as the period from 7am to 6pm;
- Evening is defined as the period from 6pm to 10pm;
- Night is defined as the period from 10pm to 6am; and
- Shoulder is defined as the period from 6 am to 7am.

However, these criteria do not apply if the Applicant has an agreement with the relevant owner/s of these residences/land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Conditions

6.4B The Applicant shall:

- (i) implement best practice noise management to minimise the operational, low frequency, rail and road traffic noise of the development
- (ii) regularly assess the real-time noise monitoring and meteorological forecasting data and relocate, modify, and/or stop operations on site to ensure compliance with the relevant conditions of this consent;
- (iii) minimise the noise impacts of the development during temperature inversions;
- (iv) use its best endeavours to achieve the long-term noise goals in Table 5, where this is reasonable and feasible, and report on the progress towards achieving these goals in the Annual Environmental Management Report; and
- (v) carry out a comprehensive noise audit of the development in conjunction with each independent environmental audit, to the satisfaction of the Director-General.

Table 5: Long-term noise goal

<i>Location</i>	<i>Day/Evening/Night/Shoulder dB(A) L_{Aeq} (15min)</i>
All privately-owned land	35

Note: Noise generated by the development is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.

Noise Management Plan

6.4C The Applicant shall revise the Noise Management Plan for the development to the satisfaction of the Director-General. This revised plan must:

- (i) be prepared by a suitably qualified expert whose appointment has been approved by the Director-General;
- (ii) be submitted to the Director-General by the end of September 2012 for approval;
- (iii) describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent, including a real-time noise management system that employs both reactive and proactive mitigation measures; and
- (iv) include a Noise Monitoring Program that:
 - uses a combination of real-time and supplementary attended noise monitoring measures to evaluate the performance of the development;
 - is capable of monitoring temperature inversion strengths at an appropriate sampling rate;

- evaluates and reports on the effectiveness of the real-time noise management system; and
- includes a protocol for determining exceedances of the relevant conditions of this consent.

6.4D Noise Control – Newstan Ventilation Shaft Site at Awaba

Operational Noise Criteria

The Applicant shall ensure that the noise generated at the Newstan ventilation shaft site at Awaba does not exceed the noise impact assessment criteria in Table 3A for any privately owned residence.

Table 3A: Noise impact assessment criteria dB(A)

Location	Day L _{Aeq} (15 minute)	Evening L _{Aeq} (15 minute)	Night L _{Aeq} (15 minute)
All privately owned residences	38	40	36

Notes:

- Noise from the development is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary, to determine compliance with the L_{Aeq}(15 minute) noise limits in the above table. The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- Where it can be demonstrated that direct measurement of noise from the development is impractical, the **OEHS** may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
 - wind speeds of up to 3 m/s at 10 metres above ground level; or
 - temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.
- In this condition:
 - Day is defined as the period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays;
 - Evening is defined as the period from 6pm to 10pm; and
 - Night is defined as the period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays.

Construction Activities

The Applicant shall ensure that noise caused by construction activities at the Newstan ventilation shaft site at Awaba outside of the hours 7am to 6pm Monday to Friday and 8am to 1pm Saturdays does not exceed the operational noise criteria in Table 3A.

Noise Monitoring

Prior to the commencement of construction activities at the Newstan ventilation shaft site at Awaba the Applicant shall prepare and implement a Noise Monitoring Program for the Awaba surface facilities and ventilation shaft site to the satisfaction of the Director-General. This program must:

- be submitted to the Director-General for approval; and
- provide for the monitoring of both construction and operational activities.

6.5 *Light Emissions*

The Applicant shall screen or direct all onsite lighting away from residences and roadways to the satisfaction of LMCC.

7. Transport and Utilities

7.1 Road Transport

- (a) No approval is granted for the haulage of coal on public roads.
- (b) Deleted.
- (c) The Applicant, in consultation with MSB, shall ensure that access within the DA area, to properties and within properties, is maintained at no less than the existing standard during the period in which mining occurs under the land and for a period of at least five years thereafter, in relation to condition, flood liability, public safety and flood hazard. The Applicant shall carry out any roadworks considered necessary by LMCC or the RMS to ensure compliance with this condition insofar as any works to maintain the existing standard at the time of mining are directly attributable to the operation of the mine, particularly on the F3 Sydney-Newcastle Freeway, Main Road 220 – Toronto to Freemans Waterholes and Main Road 217 – Toronto to Morisset.
- (d) The Applicant shall ensure that the efficiency and effectiveness of all drainage, culverts and watercourses affecting roadways within the DA area must be maintained in so far as any works to maintain the existing standard at the time of mining are directly attributable to the operation of the mine.
- (e) Pre-surveys of existing public road formations, roadways structures and drainage structures must be conducted prior to the commencement of mining activity and every year subsequent year until the possibility of potential subsidence has ceded. All datum collected must be submitted to the RMS Hunter Region and LMCC for review.
- (f) All mining activities and works related to mining in the LEA must be conducted in such a fashion as to ensure that there will be no subsidence within the F3 Sydney-Newcastle Freeway corridor.
- (g) The Applicant shall notify the RMS and LMCC of imminent mining operations at least 12 months prior to mining under any section of Main Road 217 and/or Main Road 220.

7.2 Deleted.

8. Monitoring/Auditing

- (a) In addition to the requirements contained elsewhere in this consent, the Director-General may, at any time in consultation with the relevant government authorities and Applicant, require the monitoring programs in conditions 8.1 - 8.7 below to be revised/updated to reflect changing environmental requirements or changes in technology/operational practices. Changes shall be made and approved in the same manner as the initial monitoring programs. All monitoring programs shall also be made publicly available at LMCC within two weeks of approval of the relevant government authority.
- (b) All sampling strategies and protocols undertaken as part of any monitoring program shall include a quality assurance/quality control plan and shall require approval from the relevant regulatory agencies to ensure the effectiveness and quality of the monitoring program. Only accredited laboratories shall be used for laboratory analysis.

8.1 Meteorological

For the life of the development, the Applicant shall ensure that there is a meteorological station in the vicinity of the site that:

- (i) complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* guideline; and
- (ii) is capable of continuous real-time measurement of temperature lapse rate in accordance with the *NSW Industrial Noise Policy*, unless a suitable alternative is approved by the Director-General following consultation with the EPA

8.2 Surface and Ground Water

- (a)
 - (i) The Applicant shall construct and locate surface and ground water monitoring positions, as identified in the site water management plan (condition 4.1 (a)), in consultation with **NOW**, LMCC and **EPA**, and to the satisfaction of the Director-General , at least three months prior to the commencement of construction works in the relevant area and first workings in the LEA;
 - (ii) The Applicant shall prepare a detailed monitoring program in respect of ground and surface water quality and quantity, including water in and around the Newstan mine site, Northern and Southern Emplacements, and LEA, and also consistent with condition 4.1(b)(iv), during construction works, mine operations and post mine operations in consultation with **NOW**, **EPA**, and to the satisfaction of the Director-General. The monitoring program shall also include surveys of drainage channels within the LEA to update information obtained in the preparation of Property Subsidence Management Plans. The monitoring program shall be prepared prior to commencement of construction in the relevant area.

- (iii) The results and interpretation of surface and ground water monitoring are to be provided by the Applicant in an approved form to the **NOW**, LMCC and **EPA** on a six monthly basis, unless otherwise directed by the Director-General. The results are also to be contained and analysed in the Annual Environmental Management Report (**Condition 9.1**).
- (b) *The Applicant must conduct water quality monitoring for pollutants in accordance with any current Environment Protection Licence under the Protection of the Environment Operations Act 1997 for the site.*

8.3 Deleted

8.4 Noise and Blast

- (a) Noise Investigations and Management-Newstan Surface Facilities

The Applicant shall:

- (i) prior to commencement of construction in the relevant area, develop a plan to conduct noise investigations at three monthly intervals to evaluate, assess and report the LA₁₀ (15 minute) noise emission levels due to normal operations of the mine under prevailing weather conditions, or as otherwise determined by the **EPA**. The methodologies, including establishing the mine's operating configuration, determining survey intervals, weather conditions, seasonal variations, selecting variations, selecting locations, periods and times of measurements, the design of any noise modelling or other studies, including the means for determining the noise levels emitted by the mining operations, shall be in accordance with the requirements of the **EPA**;
- (ii) survey and investigate noise reduction measures from plant and equipment at the conclusion of the first 12 months.
- (iii) arrange independent noise emission investigations as provided in Condition 11.2.

A summary of noise monitoring results shall be included in the AEMR.

- (b) Blasting-Newstan Surface Facilities and Newstan Ventilation Shaft Site at Awaba

The Applicant shall:

- (i) monitor any blasts and record the overpressure and peak particle velocity as agreed by the **EPA**, including details of monitoring locations; and
- (ii) include the results of the monitoring information as required by the **EPA** and in the Annual Environmental Management Report (Condition 9.2).

8.5 Fauna and Flora Monitoring

The Applicant shall prepare a detailed monitoring program of habitat areas, including any wetlands and aquatic habitats, during the development and for a period after the completion of the development to be determined by the Director-General in consultation with LMCC, OEH and DRE. The program shall monitor impacts attributable to the development and include monitoring of the success of any restoration or reconstruction works. The Applicant shall include the monitoring program in the Flora and Fauna Management Plan (condition 3.4). The Applicant shall carry out any further works required by the Director-General as a result of the monitoring. A summary of monitoring results shall be included in the AEMR.

8.6 Cultural Heritage Monitoring

The Applicant shall monitor the effectiveness of measures outlined in the archaeology and heritage management plan (condition 3.3). A summary of monitoring results shall be included in the AEMR.

8.7 Subsidence Monitoring

The Applicant shall undertake a detailed and ongoing monitoring program of subsidence resulting from mining to the satisfaction of the Director-General and in consultation with NOW, DRE and MSB throughout the life of the mine and for a period of at least five years after the completion of mining, or other such period as determined by the Director-General in consultation with NOW and DRE.

Monitoring shall include the following:

- (i) a survey of watercourses within areas mined within the DA Area;
- (ii) monitoring of groundwater levels and quality;
- (iii) monitoring of impacts on any buildings, structures and roads within areas mined within the DA Area;
- (iv) a monitoring program to identify any subsidence impacts on the 330kV power transmission lines and towers in the Main West Mining Area, developed in consultation with DRE and TransGrid;
- (v) monitoring of remedial measures; and
- (vi) a comparison of predicted impacts with actual impacts, including mapping of subsidence profiles within areas mined within the DA Area.

The Applicant shall include information on monitoring conducted and the interpreted results in the Annual Environmental Management Report (condition 9.2).

8.8 Community Consultative Committee

- (i) The Applicant shall maintain a Community Consultative Committee (CCC) for the development. This committee shall:
 - (a) comprise:
 - 2 representatives from the Applicant, including the person responsible for environmental management at the mine;
 - at least 1 representative from Council (if available); and
 - at least 3 representatives (or as otherwise agreed by the Director-General) from the local community whose appointment has been approved by the Director-General;

- (b) be chaired by an independent chairperson, whose appointment has been approved by the Director-General;
- (c) meet at least twice per year;
- (d) review the Applicant's performance with respect to environmental management and community relations;
- (e) undertake regular inspections of the mining operations;
- (f) review community concerns or complaints about the mine operations, and the Applicant's complaints handling procedures;
- (g) provide advice to:
 - the Applicant on improved environmental management and community relations, including the provision of information to the community and the identification of community initiatives to which the Applicant could contribute;
 - the Department regarding the conditions of this consent; and
 - the general community on the performance of the mine with respect to environmental management and community relations; and
- (h) be operated generally in accordance with any guidelines the Department may publish in regard to the operation of Community Consultative Committees for mining projects.

Notes:

- 1) *Guidelines were published by the Department in June 2007.*
- 2) *The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Applicant complies with this consent.*

- (ii) The Applicant shall, at its own expense:
 - (a) ensure that 2 of its representatives attend CCC meetings;
 - (b) provide the CCC with regular information on the environmental performance of the development;
 - (c) provide meeting facilities for the CCC;
 - (d) arrange site inspections for the CCC, if necessary;
 - (e) respond to any advice or recommendations the CCC may have in relation to environmental management or community relations;
 - (f) take minutes of the CCC meetings;
 - (g) forward a copy of these minutes to the Director-General; and
 - (h) put a copy these minutes on its website.

8.9 Independent Environmental Audit

- (i) Prior to 14 May 2009, and every 3 years thereafter, unless the Director-General directs otherwise, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:
 - (a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;
 - (b) include consultation with the relevant agencies
 - (c) assess the environmental performance of the project and assess whether it is complying with the relevant requirements of this approval and any relevant mining lease or EPL (including any strategy, plan or program required under these approvals);

- (d) review the adequacy of strategies, plans or programs required under these approvals; and, if appropriate,
- (e) recommend measures or actions to improve the environmental performance of the project, and/or any strategy, plan or program required under these approvals.

Note: This audit team must be led by a suitably qualified auditor.

- (ii) Within 6 weeks of the completion of this audit, or as otherwise agreed by the Director-General, the Applicant shall submit a copy of the audit report to the Director-General, together with its response to any recommendations contained in the audit report.
- (iii) Within 3 months of submitting the audit report to the Director-General, the Applicant shall review, and if necessary revise the strategies/plans/programs required under this consent to the satisfaction of the Director-General.

9. Reporting

9.1 Annual Environmental Management Report

Each year the Applicant shall submit an AEMR to the Director-General and to all relevant agencies. This report must:

- (a) identify the standards and performance measures that apply to the development;
- (b) describe the works carried out in the last 12 months;
- (c) describe the works that will be carried out in the next 12 months;
- (d) include a summary of the complaints received during the past year, and compare this to the complaints received in the previous 5 years;
- (e) include a summary of the monitoring results on the development during the past year;
- (f) include an analysis of these monitoring results against the relevant:
 - impact assessment criteria/limits;
 - monitoring results from previous years; and
 - predictions in the EIS and SEE noted in condition 1.1;
- (g) identify any trends in the monitoring results over the life of the development;
- (h) identify any non-compliance during the previous year; and
- (i) describe what actions were, or are being, taken to ensure compliance.

9.2 Access to Information

- (a) Within 3 months of the approval of any plan/strategy/program required under this consent (or any subsequent revision of these plans/strategies/programs), or the completion of the audits or AEMRs required under this consent, the Applicant shall:
 - provide a copy of the relevant document/s to the relevant agencies;
 - ensure that a copy of the relevant document/s is made publicly available at the mine; and
 - put a copy of the relevant document/s on its website.
- (b) During the development, the Applicant shall:
 - make a summary of monitoring results required under this consent publicly available at the mine and on its website; and
 - update these results on a regular basis (at least every three months).

9.3 Recording and Reporting Requirements

General Terms of Approval – [EPA](#)

(i) Recording of Monitoring

The results of any monitoring required must be recorded and retained as set out in the licence.

(ii) Reporting Requirements

The EPA will require reporting on the environmental performance of the proposal as set out in the licence. The timing of reporting shall be consistent with the environmental reporting required by this consent, as far as practical.

10. Community Consultation/Obligations

10.1 Deleted

10.2 Community Consultation

(a) Complaints

The Environmental Officer (refer condition 3.1) shall be responsible:

- (i) for **responding to** complaints with respect to construction works and mine operations on a dedicated and publicly advertised telephone line, 24 hours per day 7 days per week, entering complaints or comments in an up to date **system**, and ensuring that a response is provided to the complainant within 24 hours; and
- (ii) providing a report of complaints **in the AEMR** throughout the life of the project to the Director-General, LMCC, **EPA**, **DRE**, and CCC.

(b) Other community consultation required by this consent

Refer condition 8.8 - Community Consultative Committee

Refer condition 3.3 - Heritage Assessment and Management

11. Land Acquisition and Compensation

11.1 Land Acquisition as a Result of Subsidence

Initial Valuation and Options Agreement

- (a) The Applicant shall compensate landowners for compensable loss in accordance with the provisions of the Mining Act, 1992. Compensable loss is defined in that Act.
- (b) Within six months of the date of this consent, any landowner within the **Development Consent Area** may request in writing a valuation of their property from the Applicant. Upon receipt of the request, the Applicant shall:
 - (i) obtain a valuation within one month of receipt of the request, which includes proper consideration of a sum not less than the current market value of the owner's interest in the land as if the land was unaffected by the development proposal, whosoever is the occupier, having regard to:
 - the existing use and permissible use of the land in accordance with the applicable planning instruments at the date of the written request; and
 - the presence of improvements on the land and/or any Council approved building or structure which although substantially commenced at the date of the request is completed subsequent to that date ; and
 - (ii) within 14 days of receipt of the valuation, offer in writing to enter into an options agreement with the landowner to acquire the land when notification is received if the mine plan submitted with an application for approval under s138 of the Coal Mine Regulation Act, 1982 indicates that the landowner is entitled to acquisition under Conditions 11.1(B) and (C).
- (c) The valuation and options agreement shall also be available to any landowner who may be affected by noise and/or dust impacts from the surface facilities as proposed in the EIS. The options agreement shall be based on an option to sell if and when the landowner is entitled to acquisition under Condition 11.2.

(B) Acquisition and Compensation – Significant Structural Damage to Dwellings

- (a) Where a dwelling within the DA area is, or is likely to be, subject to damage beyond the safe, serviceable and repairable criteria as a result of the development, the landowner, after receiving notification from the Applicant, may request the Applicant in writing to:
 - (i) carry out such works as agreed by the landowner to remedy or mitigate any damage; or
 - (ii) compensate the landowner for such effects; or
 - (iii) acquire the whole of the property, or such part of the property requested by the landowner where subdivision is approved.
- (b) The Applicant shall comply with any such request for acquisition or compensation in accordance with Conditions 11.1(D) and (E). If necessary to

confirm the impact, the Applicant shall, at the request of the landowner in writing, conduct a structural inspection.

(C) Acquisition and Compensation – Land Use Impacts

- (a) Where a landowner suffers a loss of agricultural productivity or other adverse impact on the use of land as a result of the development, the landowner, may request the Applicant in writing to:
 - (i) carry out such works as agreed by the landowner to rectify the problem; or
 - (ii) compensate the landowner for such effects; or
 - (iii) acquire the whole of the property, or such part of the property requested by the landowner where subdivision is approved.
- (b) The Applicant shall comply with any such request for acquisition or compensation in accordance with Conditions 11.1(D)-(E). If necessary to confirm the impact, the Applicant shall, at the request of the landowner in writing, conduct a structural inspection.
- (c) Where the landowner requests acquisition, significant adverse impact to agricultural productivity or the use of the land or an enterprise must be demonstrated.

Note: The Independent Panel may be requested to advise on whether significant adverse impact has been demonstrated.

(D) Acquisition and Compensation – Procedure

- (a) Any disputes relating to land acquisition or compensation (except those relating to valuation matters) may be referred by either party to the Independent Panel for consideration and advice if no agreement is reached within three months of receipt by the Applicant of the written request, or to the Mining Warden at any time in accordance with the provisions of the Mining Act.
- (b) Upon receipt of a written request to purchase property in accordance with any conditions of this consent, the Applicant shall negotiate and purchase the whole of the property (unless the request specifically requests acquisition of only part of the property and subdivision has already been approved) within six months of receipt of the request. The Applicant shall pay the landowners an acquisition price resulting from proper consideration of:
 - (i) a sum not less than the current market value of the owner's interest in the land as if the land was unaffected by the development proposal, whosoever is the occupier, having regard to:
 - the existing use and permissible use of the land in accordance with the applicable planning instruments at the date of the written request; and
 - the presence of improvements on the land and/or any Council approved building or structure which although substantially commenced at the date of the request is completed subsequent

to that date. In determining the effect of the development, consideration shall be given to any valuation conducted under Condition 11.1(A)(b);

- (ii) the owner's reasonable compensation for disturbance allowance and relocation within the Lake Macquarie or Wyong local government areas, or within such other location as may be determined by the Director-General in exceptional circumstances; (iii) the owner's reasonable costs for obtaining legal advice and expert witnesses for the purposes of determining the acquisition price for the land and the terms upon which it is to be acquired; and (iv) the purchase price determined by reference to points (i), (ii) and (iii) shall be reduced by the amount of any compensation awarded to a landowner pursuant to the Mining Act, 1992 or other legislation providing for compensation in relation to coal mining but limited to compensation for dwellings, structures and other fixed improvements on the land, unless otherwise determined by the Director-General in consultation with the DRE or MSB.
- (c) An offer by the Applicant to purchase a property under the conditions of this consent shall remain open to the landowner for the following periods from the date of the offer:
 - (i) for damage to a dwelling beyond the safe, serviceable and repairable criteria (Condition 11.1(B)), three years after completion of mining of longwall panels that affect the property;
 - (ii) for land use impacts (Condition 11.1(C)), five years after completion of mining of longwall panels that affect the property; and
 - (iii) for noise or dust impacts (Condition 11.2), for the life of the mine.
- (d) Notwithstanding any other Condition of this consent, the landowner and the Applicant may enter into any other agreed arrangement regarding compensation; or the Applicant may, upon request of the landowner, acquire any property affected by the project during the course of this consent on terms agreed to between the Applicant and the landowner.

(E) Independent Valuation

- (a) In the event that the Applicant and the landowner cannot agree within three months upon the acquisition price of the land and/or the terms upon which it is to be acquired under the terms of this consent, then either party may refer the matter to the Director-General who shall request an independent valuation to determine the acquisition price. The independent valuer shall consider any submissions from the landowner and the Applicant in determining the acquisition price.
- (b) If the independent valuer requires guidance on any contentious legal, planning or other issues, the independent valuer shall refer the matter to the Director-General, who, if satisfied that there is a need for a qualified panel, shall arrange for the constitution of the panel. The panel shall consist of:
 - (i) the appointed independent valuer;

- (ii) the Director-General; and/or
 - (iii) the President of the Law Society of NSW or nominee.
- The qualified panel shall, on the advice of the valuer, determine the issue referred to it and advise the valuer.

- (c) The Applicant shall bear the costs of any independent valuation or survey assessment requested by the Director-General.
- (d) The Applicant shall, within fourteen days of receipt of a valuation by the independent valuer, offer in writing to acquire the relevant land at a price not less than the said valuation.

(F) Independent Panel

- (a) The Director-General shall establish an Independent Panel to assist in the implementation of conditions of this consent relating to subsidence impacts, including remedial work, compensation, acquisition and decisions about impacts on agriculture and other land uses. The Panel shall be chaired by an independent mediator appointed by the Director-General, and comprise representatives, as required, from Lake Macquarie City Council and government agencies and/or technical experts. The Applicant shall contribute reasonable funds to facilitate functioning of the Panel, at amounts determined by the Director-General, for payment of the mediator and technical experts.
- (b) The purpose of the Panel will be to assist in the resolution of disputes and provide technical advice on matters relating to subsidence impacts, but not those relating to valuation of property. If matters cannot be resolved by the Panel, they shall then be referred to the appropriate statutory body (such as the MSB or the Mining Warden). The Panel shall report annually to the Director-General on its considerations. If at any time the Chairperson of the Panel considers it necessary, the Panel may refer a matter to the Director-General for advice or determination.
- (c) In considering matters referred to it, the Panel shall seek and consider submissions from all relevant parties.
- (d) Before considering any matters relating to the impact of the development on agricultural productivity or other land uses, the Panel shall prepare guidelines setting out the criteria on which it will base such advice. The Guidelines shall be prepared within two months of receipt of the first request for advice and be made available to any enquirer upon request.

11.2 Land Acquisition as a Result of Excessive Noise and/or Dust

Note: In Condition 11.2 (a)-(e) "land" means the whole of a lot in a current plan registered at the Land Titles Office as at the date of this consent.

- (a) (i) In the event that landowners consider that noise and/or dust from the Newstan mining operations, including surface facilities at their dwelling(s) is in excess of the noise levels set out in this consent or the relevant EPA amenity criteria for dust levels, and the Director-General, in consultation with the EPA, is satisfied that an investigation is required, the Applicant shall upon receipt of a written request:
- appoint a qualified independent person to undertake direct discussions with the landowners affected to ascertain their concerns and to plan and implement an investigation to quantify the impact and determine the sources of the effect, and
 - bear the cost of the independent investigation and make available plans, programmes and other information necessary for the independent person to form an appreciation of the past, present and future mining operations and their effects on noise and/or dust emissions.
- (ii) The investigation is to be carried out by a qualified independent person in accordance with a documented Plan. The Plan shall be designed and implemented to measure and/or compute (with appropriate calibration by measurement) the relevant noise and/or dust levels at the complainant's residence emitted by the current normal mining operations.
- (iii) The independent person, the Plan and the timing of its implementation shall be approved by the Director-General, in consultation with LMCC, the EPA, the affected landowner and the Applicant. A report of the investigation shall be provided to the Director-General, the EPA the Applicant and the affected landowner.
- (iv) The results of the investigation shall be assessed and reported by the independent person in the light of the mine's current operations and proposed short, medium and long term development plans.
- (v) If the independent noise and/or dust investigation finds that the relevant criteria are being exceeded by noise and/or dust emission from normal mining operations, the Applicant shall:
- modify those areas of the mining operation which are causing the exceedances; or
 - undertake other measures, as agreed with the affected landowner, to ameliorate the effects of the impact, within three (3) months or as otherwise directed by the Director General in consultation with the EPA.
- (vi) Within two (2) months after the expiry of the three (3) month period in sub-clause (v) above, and upon written request from the landowner, the Applicant shall arrange for a further independent noise and/or dust investigation to be completed.
- (vii) If the investigation in sub-clause (vi) above finds that the relevant noise and/or dust emission levels from normal mine operations exceed relevant amenity

criteria or consent conditions, the Applicant shall purchase the property within six months of receipt of a written request from the owner of the affected property.

- (viii) Further independent investigations shall cease if the Director-General, in consultation with the EPA is satisfied that the relevant consent limits or EPA amenity criteria are not being exceeded and are unlikely to be exceeded in the future.
- (b) In respect of a request to purchase land arising under Condition 11.2(a), the Applicant shall pay the owner the acquisition price which shall take into account and provide payment for:
 - (i) a sum not less than the current market value of the owner's interest in the land used for its existing use at the date of this consent who is the occupier and all improvements thereon at this date as if the land was unaffected by the development proposal.
 - (ii) the owner's reasonable compensation for disturbance allowance and relocation costs within the Lake Macquarie City or Wyong Local Government Areas.
 - (iii) the owner's reasonable costs for obtaining legal advice and expert witnesses for the purposes of determining the acquisition price of the land and the terms upon which it is to be acquired.
- (c) In the event that the Applicant and any owner referred to in Condition 11.2(a) cannot agree within the time limit upon the acquisition price of the land and/or the terms upon which it is to be acquired, then:
 - (i) either party may refer the matter to the Director-General, who shall request the President of the Australian Institute of Valuers and Land Economists to appoint a qualified independent valuer, suitably qualified in compensation issues, who shall determine, after consideration of any submissions from the land owner and the Applicant, the acquisition price.
 - (ii) in the event that the independent valuer requires guidance on any contentious legal, planning or other issues, the independent valuer shall refer the matter to the Director-General, who if satisfied that there is need for a qualified panel, shall arrange for the constitution of the panel. The panel shall consist of:
 - 1) the appointed independent valuer,
 - 2) the Director-General,
and/or
 - 3) the President of the Law Society of NSW or his/her nominee.

The qualified panel shall, on the advice of the valuer, determine the issue referred to it and advise the valuer.

- (d) The Applicant shall bear the costs of any valuation or survey assessment requested by the Director-General in accordance with Conditions 11.2(a) - 11.2(c).
- (e) Upon receipt of a valuation, the Applicant shall offer to acquire the relevant land at a price not less than the said valuation. Should the Applicant's offer to acquire not be accepted by the owner within six (6) months of the date of such offer, the Applicant's obligations to such owner and in respect of that property under Conditions 11.2(a) - 11.2(e) above shall cease.

12. Structural Adequacy

12.1 Structural Adequacy

The Applicant shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the Building Code of Australia.

Notes:

- *Under Part 4A of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for the proposed building works.*
- *Part 8 of the EP&A Regulation sets out the requirements for the certification of the development.*

12.2 Demolition

The Applicant shall ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures*, or its latest version.

APPENDIX 1 DA AREA

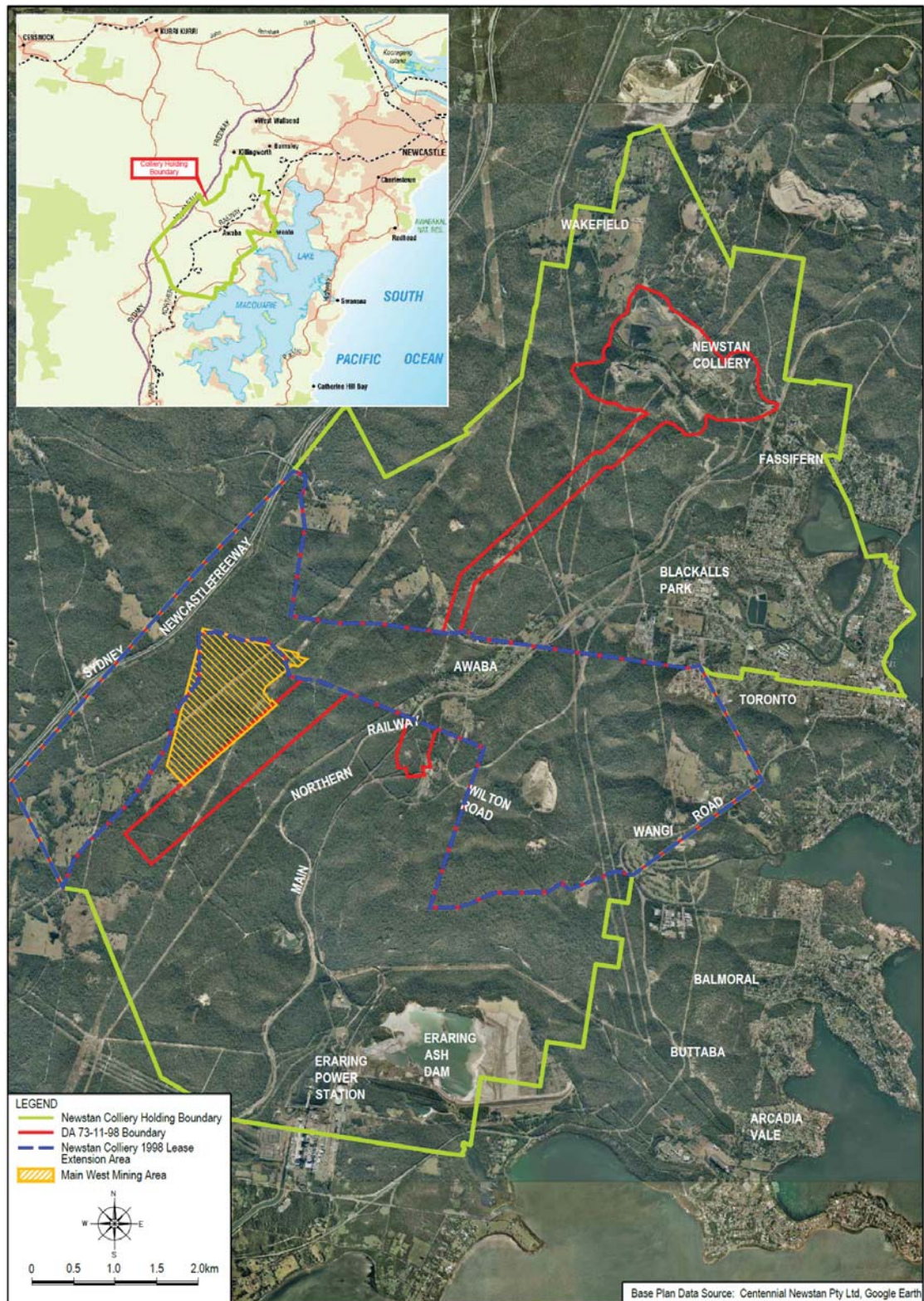


Figure 1: DA Area (combination of all areas within the red boundary of DA 73-11-98 and the orange hatched area of Main West Mining Area)

APPENDIX 2 NOISE ASSESSMENT LOCATIONS

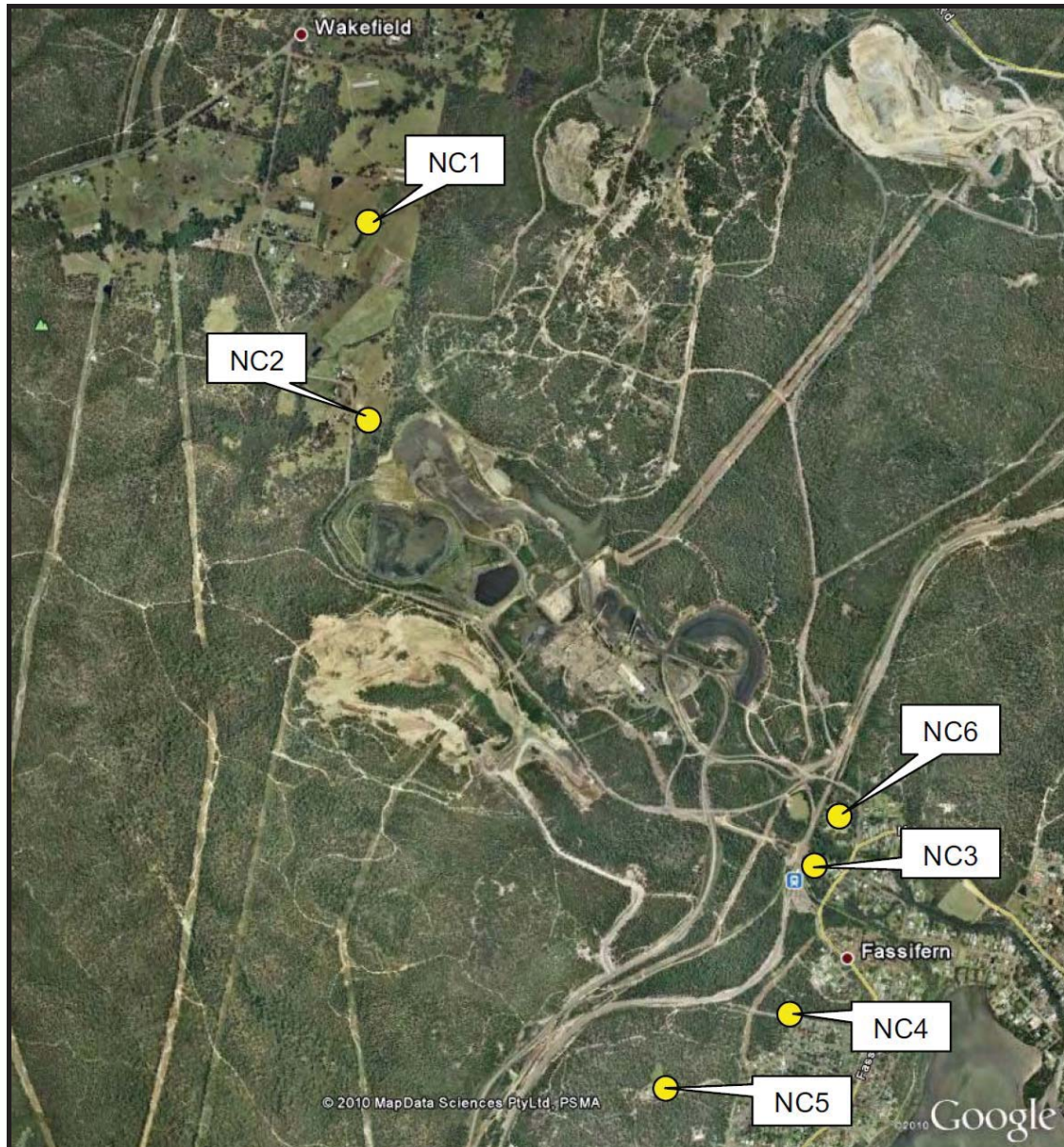


Figure 1: Noise assessment locations

APPENDIX B



26 June, 2013

Mr David Kitto
Director, Mining and Industry Projects
Department of Planning and Infrastructure
GPO Box 39
Sydney NSW 2001

Dear Mr Kitto,

Re: Newstan Colliery – Modification (DA 73-11-98)

Centennial Newstan Pty Ltd is seeking to modify the development consent DA 73-11-98 to allow for a minor adjustment of the development consent boundary in an area referred to as Main West. A portion of the Main West Mining Area was approved as a modification (MOD 4), to development consent DA 73-11-98, in March 2012. An oversight in the application has resulted in the approved boundary for the Main West Mining Area not aligning properly with the previously approved development consent boundary. Consequently, there are some small areas which are not technically within the current development consent boundary (refer drawings NS3105A and NS3105B). Some of these misaligned areas provide a substantial impediment to the efficient extraction of the Main West Mining Area due to the discontinuity created in the available mine resource. Centennial Newstan Pty Ltd is seeking to properly align the approved boundary within the Main West Mining Area.

The progressive history of mining approvals for Newstan Colliery has resulted in a patchwork of approved areas. The previously approved mining areas (under the existing use rights) and the current approved mining areas (under the development consent DA 73-11-98) are shown in drawings NS3109A, NS3109B and NS3109C. The proposed areas for consolidation and the proposed development consent boundary are shown in drawings NS3109D, NS3105A, NS3105B and NS3109E.

The proposed modification is predominantly an administrative change to the development consent DA 73-11-98 and does not require any other changes to the existing mine operation. Centennial Newstan Pty Ltd considers that the boundary alignment is not a radical transformation of the original development consent and as such is proposed under Section 75W of the Environmental Planning and Assessment Act 1979.

Centennial Newstan Pty Ltd has considered the environmental risks of the project and believes that ecology and Aboriginal heritage are the only potential impacts requiring further consideration in an Environmental Assessment. I have attached the proposed content of the Environmental Assessment for your consideration (see Attachment 1 to this letter). Could you please advise if you agree with the proposed scope of the Environmental Assessment or provide any additional elements you believe require further consideration.

If you have any questions or require further information in regards to the proposed modification please contact me on (02) 4358 0520 or Mary-Anne Crawford on (02) 4935 8918.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Terry O'Brien', with a stylized, cursive script.

Terry O'Brien

Project Manager – Northern Projects

Attachment 1

Proposed Content of Environmental Assessment

General Requirements

The Environmental Assessment (EA) for the modification will meet the form and content requirements in Clauses 6 and 7 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000.

In addition, the EA will include a:

- detailed description of the proposed modification, including the:
 - need for the proposal;
 - justification for the proposal, including alternatives considered, efficiency of resource recovery, mine safety, and environmental protection;
 - likely staging of the proposal - including construction, operational stage/s and rehabilitation;
 - likely interactions between the proposal and existing, approved and proposed mining operations in the vicinity of the site; and
 - plans of any proposed building works;
- consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies with these instruments;
- risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment;
- detailed assessment of the key issues specified below, and any other significant issues identified in the risk assessment (above), including:
 - a description of the existing environment, using sufficient baseline data;
 - an assessment of the potential impacts of all stages of the proposal, including any cumulative impacts, taking into consideration relevant guidelines, policies, plans and statutes; and
 - a description of the measures that would be implemented to avoid, minimise and if necessary, offset the potential impacts of the proposal, including proposals for adaptive management and/or contingency plans to manage any significant risks to the environment; and
- consolidated summary of all the proposed environmental management and monitoring measures, highlighting commitments included in the EA.

Key Issues

The key issues to be considered in the EA include:

- **Ecology** - including a desktop ecological impact assessment relying on baseline data previously collected over the area
- **Aboriginal Heritage** - including a desktop heritage impact assessment relying on baseline data previously collected over the area

David Humphris

Subject: FW: Newstan Colliery – Modification (DA 73-11-98)
Attachments: Colin Phillips.vcf

From: "Colin Phillips" <Colin.Phillips@planning.nsw.gov.au>
To: "Chad Stockham" <Chad.Stockham@centennialcoal.com.au>
Cc: "Howard Reed" <Howard.Reed@planning.nsw.gov.au>, "Mary-Anne Crawford" <maryanne.crawford@centennialcoal.com.au>
Date: 04/07/13 12:05 PM
Subject: Re: Newstan Colliery – Modification (DA 73-11-98)

Mary-Anne and Chad,

Thank you for your recent letter consulting with the Department about the requirements for a an Environmental Assessment to accompany a proposed modification application for Newstan Colliery.

The proposed effect of the modification would be to consolidate 4 small/minor areas adjacent to the Main West area into the Newstan Colliery consent DA 73-11-98. It is understood that active mining would only be undertaken in the 2 areas on the western margin of the approved Main West area; the other two areas are to be consolidated for essentially administrative reasons so that all workings around the Main West area would be regulated under a single consent.

As long as the proposed method of future mining within any of these 4 additional areas is first-workings only with resultant vertical subsidence of 20 mm or less, the Department is in agreement with proposed content of the EA as set out in Attachment 1 of your letter of 26 June 2013 with the following qualifications:

1. Any impacts to surface infrastructure must be considered. In particular, it is noted that one of the additional areas is traversed by a high voltage power line and any impacts to transmission towers will need to be considered.
2. A risk assessment is not required to identify key issues.
3. The description of the proposed modification must identify the areal extent of the proposed additional areas, the likely coal production from any areas proposed to be mined and consideration that additional coal production and rejects disposal would be consistent with any relevant limitations of consent DA 73-11-98.

Please be mindful that the EA will be a stand alone document that must contain all the necessary information to enable the assessment of the proposed modification application. Although the modification application could be considered in large part an extension of the Main West modification, the EA should not be based on assumed knowledge of materials that supported this prior application.

Should you have any questions about these requirement please contact me.

Regards

Colin Phillips
Environmental Planning Officer
Mining & Extractive Industries Team
Phone: 92286483 Fax:92286466

>>> Chad Stockham <Chad.Stockham@centennialcoal.com.au> 2/07/2013 4:23 pm >>>
Colin

last week Centennial sent a letter to DP&I seeking confirmation of the requirements to modify the development consent DA 73-11-98. The modification is to allow for a minor adjustment of the development consent boundary in an area referred to as Main West.

A copy of the mailed documents are attached to enable DP&I to view the supporting drawings at a larger scale if necessary.

I have attached one of the drawings (NS3109A) in a seperate email as it's 8 Mb in size.

Regards,

Chad Stockham

Environmental Approvals Coordinator



(02) 4358 0550



(02) 4358 1892



0407 138 157



Chad.Stockham@centennialcoal.com.au



www.centennialcoal.com.au



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APPENDIX C

**Newcastle Office**

Ground Floor, 241 Denison Street, Broadmeadow, NSW Australia 2292
PO Box 428, Hamilton, NSW Australia 2303

Our Ref: PR118633 / AB
Date: 13 August 2013

Attn: Chad Stockham
Centennial Newstan Pty Limited
PO Box 1000
Toronto NSW

Via: Email

Dear Mr Stockham,

RE: NEWSTAN COLLIERY – MODIFICATION (DA 73-11-98) DESKTOP HERITAGE IMPACT ASSESSMENT FOR ENVIRONMENTAL ASSESSMENT

Centennial Newstan Pty Ltd (Centennial Newstan) is seeking to modify Development Consent DA 73-11-98 to allow for a minor adjustment of the approved development consent boundary. The Project Application Area comprises four small areas (totalling approximately 14.7 hectares) located outside, but adjoining, the approved Development Consent DA 73-11-98 boundary (Consolidation Consent Boundary). The Project Application Area is located in an area referred to as the Main West Mining Area, which was approved pursuant to a modification (MOD 4) to DA 73-11-98. Due to an oversight, the boundary of the Main West Mining Area resulted in the four areas that make up the Project Application Area being left out of the approved Consolidated Consent Boundary (**Figure 1**). As such, RPS has been engaged by Centennial Newstan to undertake an additional desktop Heritage Impact Assessment (HIA) to be incorporated into the Environmental Assessment.

RPS conducted the original HIA for Main West Mining Area modification no. 4 to the Newstan DA 73-11-98 subject to 75W of the *Environmental Planning & Assessment Act 1979* (EP&A Act). The report compiled results from a number of previous studies undertaken within and around the Project Application Area and a search of the AHIMS database identified no registered Aboriginal objects or places inside it, although one site was identified within 100 metres of the Project Application Area boundary. An archaeological survey was also undertaken and no new Aboriginal heritage sites were identified.

Historic Records of Aboriginal Occupation

The Aboriginal heritage assessment process requires that the significance of Aboriginal sites within a Project Application Area be assessed. It is important that Aboriginal sites are contextualised within the local and regional landscape, in order to inform the assessment of significance. The Aboriginal heritage context is also needed in order to develop a predictive model of Aboriginal sites in the Project Application Area. Historical information also provides additional information for the interpretation of archaeological sites.

Historic records of Aboriginal occupation in the Lake Macquarie area indicate that the Awabakal were people of the coast, estuaries, lakes and wetlands, but also had attachment to the rugged sandstone country through the Sugarloaf and Watagan Ranges. Various Aboriginal groups in the region displayed some level of interaction as reported by Threlkeld (Turner 1997) who noted that the *“the natives here are connected in kind of a circle extending to the Hawkesbury and Port Stephens”*.

Regional Archaeological Heritage Context

The Project Application Area is located in the Lower Hunter Valley/Lake Macquarie region. Archaeological evidence suggests that Aboriginal occupation of the Hunter Valley region began at least 35,000 years BP (Koettig 1987). Evidence from the valley's north east mountains provided dates between 13,000 and 35,000 years BP, indicating that the region was occupied during the Pleistocene (>10,000 years BP). However, the majority of sites in the region have been dated to the more recent Holocene (<10,000 years BP). This may reflect Aboriginal occupation patterns but may also be influenced by the inaccessibility of potential coastal Pleistocene sites which were inundated when sea levels rose and reached present levels approximately 6,000 years BP (Mulvaney and Kamminga 1999:223).

Previous Archaeological Studies Undertaken in the Project Application Area

A new search of the AHIMS database was undertaken on 16 July 2013 for the Project Application Area, which identified a total of 168 Aboriginal sites in the general region as set out below.

Site Type	Frequency	Percentage
Isolated find	63	37.50%
Artefact(s) unspecified	26	15.48%
Artefact scatter	17	10.12%
Grinding groove	15	8.93%
Scarred tree	12	7.14%
Midden with artefact site	10	5.95%
Shell	5	2.98%
Grinding groove with PAD	3	1.79%
Rockshelter	2	1.19%
Artefact with PAD	2	1.19%
PAD	2	1.19%
Restricted	2	1.19%
Grinding groove with waterhole	1	0.59%
Stone arrangement	1	0.59%
Grinding groove with stone quarry	1	0.59%
Grinding groove and shelter with deposit	1	0.59%

Site Type	Frequency	Percentage
Rock engraving	1	0.59%
Natural mythological (Ritual)	1	0.59%
Scarred tree and artefact with PAD	1	0.59%
Aboriginal Ceremony & Dreaming	1	0.59%
Waterhole	1	0.59%
Total	168	100%

During the desktop study of the AHIMS results it was found that one site, #45-7-0070, was no longer extant. Furthermore, #45-7-0310 (Rockshelter) was found to be a duplication of #45-7-0005 (Grinding groove and shelter with deposit). As such it is considered that there are only 166 extant sites in the vicinity of the Project Application Area and surrounds.

Of the above sites, three were identified within 250 metres of the Project Application Area but none were identified inside it. The three sites, #45-7-0078 (Isolated find), #45-7-0314 (Rockshelter) and #45-7-0315 (Isolated find) were situated to the east, south and west of the Project Application Area.

Previous archaeological assessments in and around the Project Application Area include Indigenous Outcomes (2007), Umwelt (1998), Pam Dean-Jones (1989) and RPS HSO (2009). These assessments identified a number of sites in the region, including scarred trees, rockshelters, artefact sites, middens and grinding grooves. Site patterning in the region was as predicted, with middens occurring close to the shores of the lake, grinding grooves and rockshelters occurring where sandstone outcropped either near watercourses or along ridgelines and artefact sites being widely distributed across all landforms.

The Centennial Northern Holdings Cultural Heritage Management Plan, which includes Newstan, was prepared in 2012 for the purpose of identifying minimum standards and processes for Aboriginal cultural heritage monitoring and management across Centennial's northern operations (RPS 2012).

Overview of Environmental and Archaeological Context

The Project Application Area is thickly forested in parts and located approximately seven kilometres from Lake Macquarie. The AHIMS data suggests that Aboriginal occupation was focussed on the shores of Lake Macquarie and particularly in the Fennel Bay area; sites are more sparsely distributed inland. That no Aboriginal sites have been identified in the Project Application Area supports the patterning that more frequent, or more intensive, Aboriginal occupation occurred closer to Lake Macquarie. Inland areas such as the Project Application Area appear to have been frequented less often and may have been primarily exploited for foraging activities including hunting and trapping animals and harvesting plant resources. Ground-edge hatchets were used areas evidenced by the presence of grinding grooves to the north of the Project Application Area. Such implements would have been used for activities such as possum hunting indicating that this area may have been an inland food resource zone. The large shell middens on the edge of the lake indicate an abundance of food resources associated

with this large water body; the exploitation of resources further inland may have been relied upon when lacustrine resources were not available in abundance. However, the exploitation of inland areas is difficult to discern as material evidence (such as butchered animal bone) is unlikely to be preserved outside a rockshelter context in the inland area, and only one rockshelter with PAD has been identified (which has not been excavated).

Impact Assessment and Mitigation

The Project comprises a minor adjustment of the Newstan Colliery Consolidated Consent Boundary to include four small separate areas that adjoin the Main West Mining Area. It is proposed that active mining will only take place within the two areas on the western margin of the approved Main West Mining Area. The remaining two areas (which already accommodate mine workings undertaken under existing use rights) are proposed to be consolidated for administrative reasons to ensure all workings around the Main West Mining Area are regulated under Development Consent DA 73-11-98 **(Figures 2 & 3)**.

The additional two mining areas will continue to mine coal from the West Borehole Seam; this seam is a combination of the Young Wallsend, Yard and Borehole Seams. The depth of cover for the Project Application Area in the West Borehole Seam is approximately 150 metres below the surface. Subsidence in the Project Application Area is predicted to be less than 20 millimetres and surface impacts are predicted to be negligible (Seedsman Geotechnics Pty Ltd 2010).

A desktop study has determined that no Aboriginal sites are located within the boundaries of the adjusted Project Application Area, but three registered sites are situated within 250 metres of it, (#45-7-0078, #45-7-0314 and #45-7-0315). As such, while no known Aboriginal heritage sites are situated within the Project Application Area, the potential exists for such sites to occur. However, as surface impacts are predicted to be negligible, no impacts to Aboriginal heritage sites are anticipated.

The Australian Heritage Database, the NSW Heritage Inventory and the Lake Macquarie Local Environmental Plan were searched for non-Indigenous heritage items. None were identified in the Project Application Area.

Conclusions and Recommendations

No Aboriginal or non-Indigenous heritage items have been identified during the desktop study of the adjusted Project Application Area. The subsidence resulting from the proposed Project is predicted to be less than 20 millimetres and will therefore have negligible surface impacts (Seedsman Geotechnics Pty Ltd 2010). No impacts to either known or unknown Aboriginal heritage sites, or non-Indigenous heritage sites, are anticipated.

Ongoing management will conform with existing protocols and management plans. Specifically, Aboriginal heritage at the Newstan Colliery will continue to be managed in accordance with Centennial's Northern Holdings Cultural Heritage Management Plan. The Centennial Northern Holdings Cultural Heritage Management Plan will be reviewed and updated, as required, to incorporate the Project and any additional consent conditions.

We trust this information is sufficient for your purposes however should you require any further details or clarification, please do not hesitate to contact the writer by telephone.

Yours sincerely

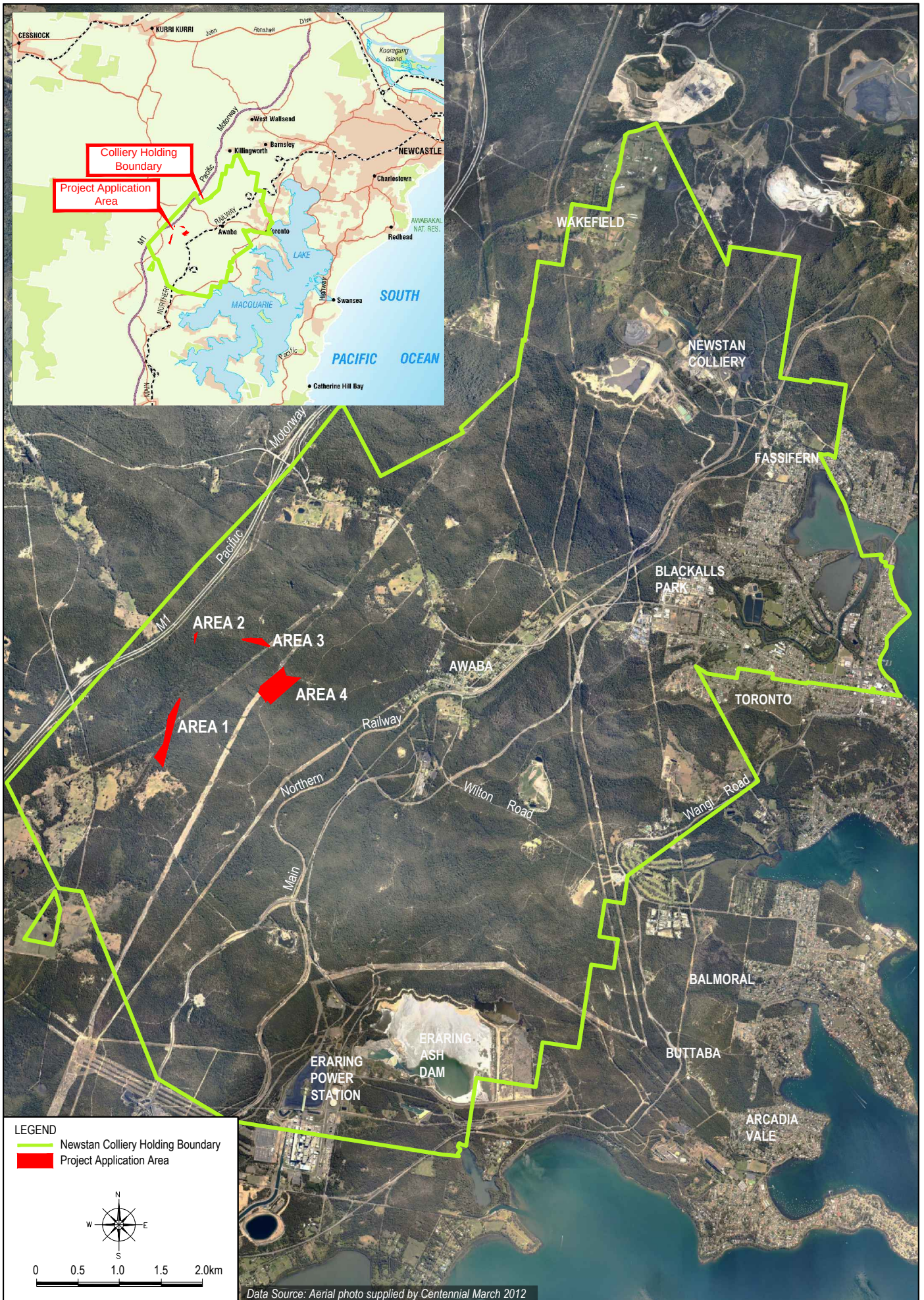
RPS

A handwritten signature in black ink, appearing to read 'Darrell Rigby'.

Darrell Rigby
Regional Technical Director, Cultural Heritage

References;

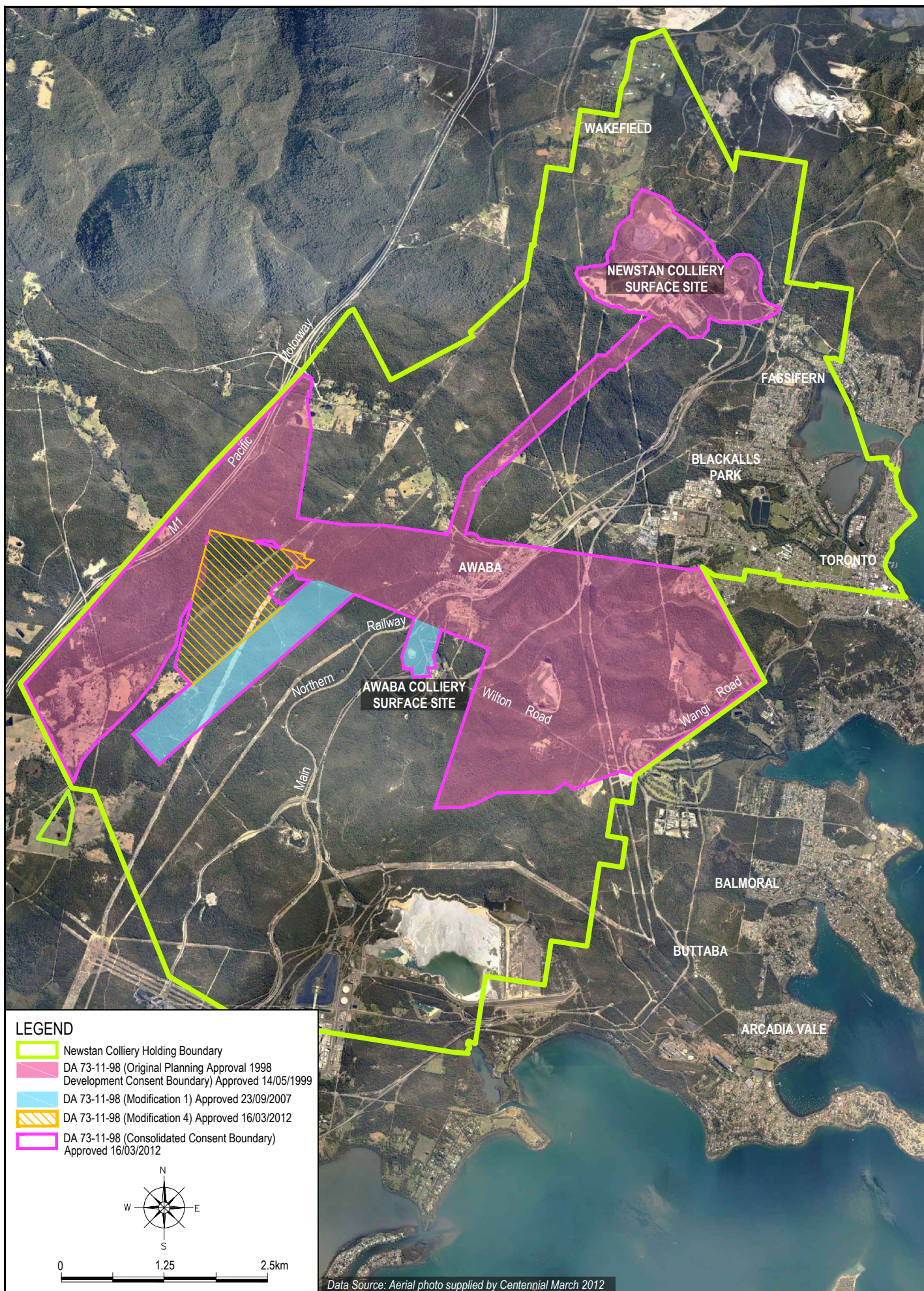
- Koettig, M. 1987. "Monitoring Excavations at Three Locations along the Singleton to Glennies Creek Pipeline Route, Hunter Valley: third report on archaeological investigations along this route." NSW Department of Public Works.
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- RPS. 2010. "Heritage Assessment Impact Newstan Colliery modification." Centennial Newstan Pty Ltd.
- RPS. 2012. "Centennial's Northern Holdings Cultural Heritage Management Plan." Centennial Coal.
- Seedsman Geotechnics Pty Ltd. 2010. "Draft Subsidence Assessment Newstan AEast-06 July 2010." Centennial Newstan.
- Turner, J. 1997. *A Pictorial History of Newcastle*. Crows Nest: Kingsclere Books.



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Newstan Colliery - Modification of Development Consent Boundary
Location Plan

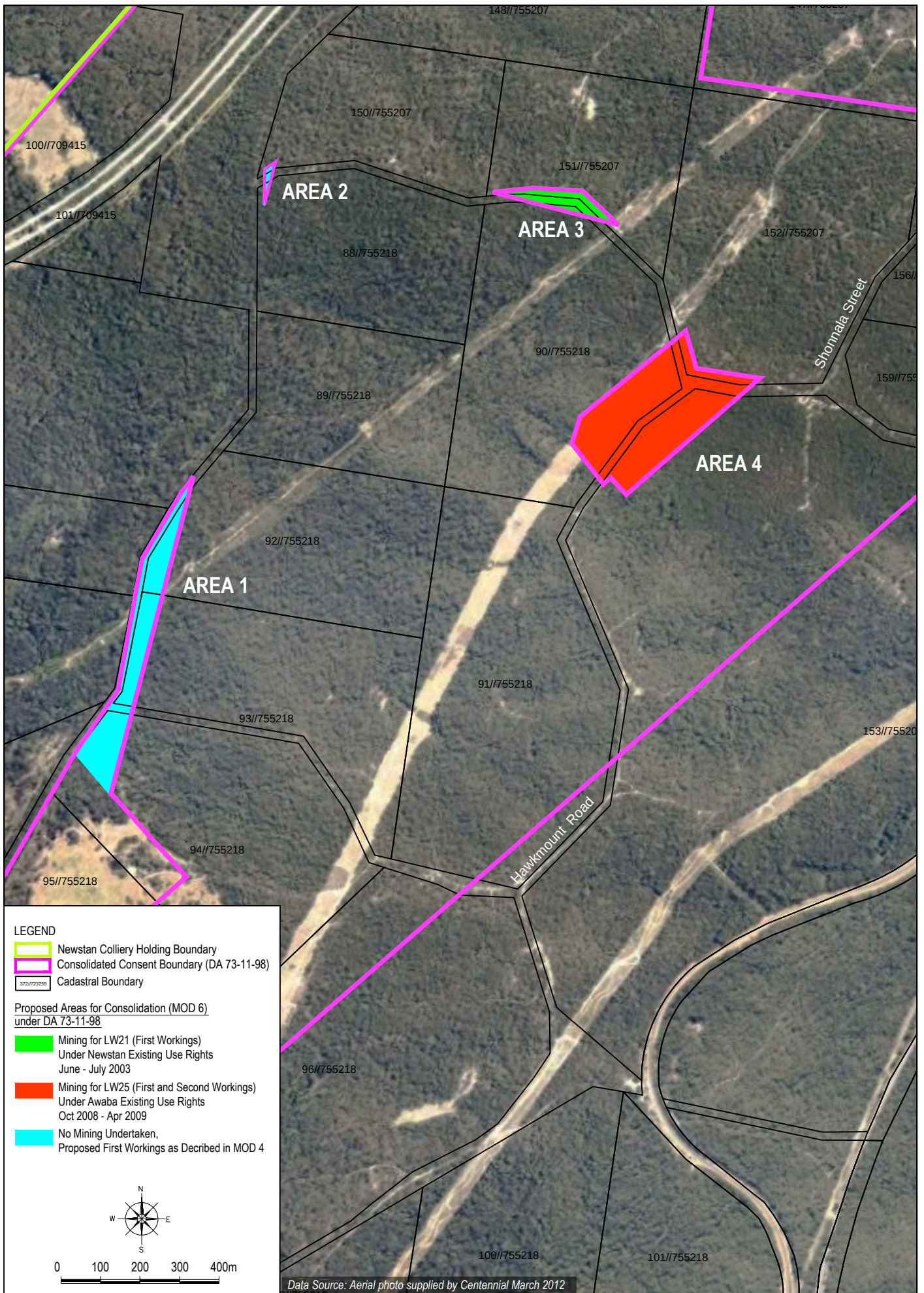
FIGURE 1



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Newstan Colliery - Modification of Development Consent Boundary
Current Approved Mining Areas under Development Consent DA 73-11-98

FIGURE 3



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**Newstan Colliery - Modification of Development Consent Boundary
Proposed Areas for Consolidation**

FIGURE 6

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : PR118633 search1

Client Service ID : 106216

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
38-4-0461	Heaton State Forest;	AGD	56	361350	6352170	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	1333
	<u>Contact</u>									
38-4-0462	Heaton State Forest	AGD	56	361100	6352130	Open site	Valid	Grinding Groove : 12, Artefact : 1, Habitation Structure : -	Axe Grinding Groove	1333
	<u>Contact</u>									
45-7-0070	Eraring;Crooked Creek;	AGD	56	363454	6341759	Open site	Valid	Shell : -, Artefact : -	Midden	
	<u>Contact</u>									
45-7-0077	Sandy Creek;	AGD	56	359925	6344618	Open site	Valid	Artefact : -	Open Camp Site	
	<u>Contact</u>									
45-7-0078	Sandy Creek;	AGD	56	359900	6345898	Open site	Valid	Artefact : -	Open Camp Site	
	<u>Contact</u>									
45-3-0905	Sandy Creek;Sunday Creek;	AGD	56	358413	6342395	Open site	Valid	Artefact : -	Open Camp Site	
	<u>Contact</u>									
45-3-0908	Old Maitland Road;Jigadee Creek;	AGD	56	358919	6344599	Open site	Valid	Artefact : -	Open Camp Site	
	<u>Contact</u>									
45-3-0909	Jigadee Ck;Becks Road;Old Maitland Road;	AGD	56	358246	6346324	Open site	Valid	Artefact : -	Open Camp Site	
	<u>Contact</u>									
45-3-0914	Old Maitland Road;Jigadee Creek;Becks Road;	AGD	56	358246	6346324	Open site	Valid	Artefact : -	Open Camp Site	
	<u>Contact</u>									
38-4-0097	Diega Creek;M-W-14;	AGD	56	363150	6351550	Open site	Valid	Artefact : -	Open Camp Site	
	<u>Contact</u>									
38-4-0102	Palmers Creek PC1	AGD	56	362500	6347750	Open site	Valid	Grinding Groove : -, Water Hole : -	Axe Grinding Groove,Water Hole/Well	
	<u>Contact</u>									
45-7-0241	Awaba 1	AGD	56	363091	6345787	Open site	Valid	Artefact : 3		
	<u>Contact</u> S Scanlon									
38-4-0995	Great North Walk (GNW 1)	AGD	56	361702	6351816	Open site	Valid	Artefact : 2		
	<u>Contact</u> S Scanlon									
38-4-0996	Western Domain 1 (WD 1)	AGD	56	362761	6352545	Open site	Valid	Artefact : 6		
	<u>Contact</u> Searle									
38-4-0997	Western Domain 2 (WD 2)	AGD	56	362738	6352559	Open site	Valid	Artefact : 6		
	<u>Contact</u> Searle									

Report generated by AHIMS Web Service on 16/07/2013 for Ali Byrne for the following area at Datum :GDA, Zone : 56, Eastings : 358267 - 363773, Northings : 6340712 - 6353044 with a Buffer of 0 meters. Additional Info : EA. Number of Aboriginal sites and Aboriginal objects found is 115

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : PR118633 search 2

Client Service ID : 106218

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-7-0145	Fishing Point 1;Fishing Point, Lake Macquarie; Contact	AGD	56	368670	6341400	Open site	Valid	Shell : -, Artefact : -	Midden	
45-7-0146	Fishing Point 2;Fishing Point, Lake Macquarie; Contact	AGD	56	368450	6341710	Open site	Valid	Shell : -, Artefact : -	Midden	
45-7-0211	Styles Point 2; Contact	AGD	56	368450	6343990	Open site	Valid	Shell : -, Artefact : -	Midden	
45-7-0212	Styles Point 1; Contact	AGD	56	368450	6343900	Open site	Valid	Shell : -, Artefact : -	Midden	
45-7-0005	Awaba Railway Stn;Toronto; same as 45-7-0310 Contact	GDA	56	364953	6345699	Closed site	Valid	Artefact : -, Grinding Groove : -	Axe Grinding Groove,Shelter with Deposit	
38-4-0187	Fennell Bay; Contact	AGD	56	368310	6349290	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1333,98458,98459
38-4-0188	Fennell Bay; Contact	AGD	56	368340	6349300	Open site	Valid	Artefact : -	Isolated Find	1333,98458,98459
38-4-0189	Fennell Bay; Contact	AGD	56	367800	6349720	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	1333
38-4-0190	Fennell Bay; Contact	AGD	56	368150	6349020	Open site	Valid	Shell : -, Artefact : -	Midden	1333,98458,98459
38-4-0191	Fennell Bay; Contact	AGD	56	367750	6348230	Open site	Valid	Aboriginal Ceremony and Dreaming : -	Natural Mythological (Ritual)	1333
38-4-0212	Kooroor Bay; Contact	AGD	56	369150	6348250	Open site	Valid	Shell : -, Artefact : -	Midden	1333,98458,98459
45-7-0246	Stockyard Creek - Locus B Contact	AGD	56	367010	6344060	Open site	Valid	Shell : -		
38-4-1021	TFB 3 Contact Searle	AGD	56	368922	6347934	Open site	Valid	Shell : -		
45-7-0247	Stockyard Creek - Locus A Contact T Russell	AGD	56	366990	6343980	Open site	Valid	Shell : -, Artefact : -		
38-4-0991	Fennell Bay 2	AGD	56	368890	6347830	Open site	Valid	Shell : -, Artefact : -		

Report generated by AHIMS Web Service on 16/07/2013 for Ali Byrne for the following area at Datum :GDA, Zone : 56, Eastings : 363773 - 369279, Northings : 6340712 - 6353044 with a Buffer of 0 meters. Additional Info : EA. Number of Aboriginal sites and Aboriginal objects found is 53

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : PR118633 search 2

Client Service ID : 106218

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact T Russell	Recorders Mr.Edward Clarke						Permits	2768	
38-4-0992	Fennell Bay 1	GDA	56	369060	6348230	Open site	Valid	Shell : -, Artefact : -		
	Contact Searle	Recorders Mr.Edward Clarke						Permits	2768,3588	
45-7-0252	TFB1mainRdSpeersPt	AGD	56	368200	6346740	Open site	Valid	Shell : -		
	Contact T Russell	Recorders Mr.Alan Williams						Permits	2759	
45-7-0259	LEA 9 (Swansea)	GDA	56	366685	6346040	Closed site	Valid	Artefact : -		
	Contact	Recorders RPS Australia East Pty Ltd -Hamilton						Permits		
45-7-0260	LEA 10 (Swansea)	GDA	56	365425	6345450	Open site	Valid	Grinding Groove : 5		
	Contact	Recorders RPS Australia East Pty Ltd -Hamilton						Permits		
45-7-0261	Stockyard Creek AS with PAD (Swansea)	GDA	56	365653	6343871	Open site	Valid	Potential Archaeological Deposit (PAD) : 0, Artefact : 41		
	Contact	Recorders Mr.Alan Williams						Permits	3095,3199	
45-7-0288	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			
	Contact Awabakal LALC	Recorders RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson						Permits		
45-7-0286	RPS MB 1	GDA	56	365025	6341071	Open site	Valid	Shell : -		
	Contact Awabakal LALC	Recorders RPS Australia East Pty Ltd -Hamilton						Permits		
45-7-0313	RPS NEWST 20	GDA	56	363978	6346050	Open site	Valid	Artefact : -		
	Contact	Recorders RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson						Permits		
45-7-0304	RPS NEWST 11	GDA	56	365537	6343813	Open site	Valid	Artefact : -		
	Contact	Recorders RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson						Permits		
45-7-0305	RPS NEWST 12	GDA	56	365658	6343764	Open site	Valid	Artefact : -		
	Contact	Recorders RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson						Permits		
45-7-0306	RPS NEWST 13	GDA	56	364478	6343664	Open site	Valid	Artefact : -		
	Contact	Recorders Mr.Roger Mehr,RPS Australia East Pty Ltd -Hamilton						Permits		
45-7-0307	RPS NEWST 14	GDA	56	365155	6343126	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson						Permits		
45-7-0309	RPS NEWST 16	GDA	56	364857	6345409	Open site	Valid	Artefact : -		
	Contact	Recorders RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson						Permits		
45-7-0310	RPS NEWST 17, same as 45-7-0005	GDA	56	364953	6345699	Open site	Valid	Habitation Structure :-		
	Contact	Recorders RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson						Permits		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : PR118633 search 2

Client Service ID : 106218

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-7-0294	RPS NEWST 1	GDA	56	366193	6342431	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	<u>Contact</u>	<u>Recorders</u>	RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson					<u>Permits</u>		
45-7-0295	RPS NEWST 2	GDA	56	365245	6345771	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>	RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson					<u>Permits</u>		
45-7-0296	RPS NEWST 3	GDA	56	365499	6344513	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>	RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson					<u>Permits</u>		
45-7-0297	RPS NEWST 4	GDA	56	365501	6344486	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>	Mr.Roger Mehr,RPS Australia East Pty Ltd -Hamilton					<u>Permits</u>		
45-7-0298	RPS NEWST 5	GDA	56	365524	6344433	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>	Mr.Roger Mehr,RPS Australia East Pty Ltd -Hamilton					<u>Permits</u>		
45-7-0299	RPS NEWST 6	GDA	56	365445	6344870	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>	RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson					<u>Permits</u>		
45-7-0303	RPS NEWST 10	GDA	56	365471	6344111	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>	RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson					<u>Permits</u>		
38-4-1574	Diega Creek IF8	GDA	56	364576	6352849	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	Umwelt (Australia) Pty Limited					<u>Permits</u>		
38-4-1575	Diega Creek IF9	GDA	56	364394	6352717	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	Umwelt (Australia) Pty Limited					<u>Permits</u>		
45-7-0335	AWMF PIPELINE PAD2	GDA	56	365839	6344029	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<u>Contact</u>	<u>Recorders</u>	Niche Environment and Heritage					<u>Permits</u>		
45-7-0336	AWMF PIPELINE PAD 1	GDA	56	365304	6344358	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<u>Contact</u>	<u>Recorders</u>	Niche Environment and Heritage					<u>Permits</u>		
45-7-0327	AWTF_ST1, TP7	GDA	56	364468	6345051	Open site	Deleted	Modified Tree (Carved or Scarred) : -, Potential Archaeological Deposit (PAD) : -, Artefact : -		
	<u>Contact</u> Mr.Shane Frost	<u>Recorders</u>	Ms.Elizabeth Wyatt					<u>Permits</u>		
45-7-0330	AWABA AWT IF1	GDA	56	364997	6344822	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	Niche Environment and Heritage					<u>Permits</u>		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : PR118633 search 2

Client Service ID : 106218

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-7-0331	AWTF ST1 TP7	GDA	56	364468	6345051	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1, Modified Tree (Carved or Scarred) : 1		
	<u>Contact</u>									<u>Recorders</u>
										Insite Heritage Pty Ltd
										<u>Permits</u>
45-7-0332	AWTF ST2	GDA	56	364449	6345264	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	<u>Contact</u>									<u>Recorders</u>
										Insite Heritage Pty Ltd
										<u>Permits</u>
45-7-0333	AWTF ST3	GDA	56	364546	6345488	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	<u>Contact</u>									<u>Recorders</u>
										Insite Heritage Pty Ltd
										<u>Permits</u>
45-7-0328	RPS NEWST 24	GDA	56	365657	6343846	Open site	Valid	Water Hole : 1		
	<u>Contact</u>									<u>Recorders</u>
										RPS
										<u>Permits</u>
45-7-0329	RPS NEWST 24A	GDA	56	365657	6343846	Open site	Valid	Water Hole : 1		
	<u>Contact</u>									<u>Recorders</u>
										RPS
										<u>Permits</u>
38-4-1532	Diega Creek IF7	GDA	56	364723	6352948	Open site	Valid	Artefact : 1		
	<u>Contact</u>									<u>Recorders</u>
										Umwelt (Australia) Pty Limited
										<u>Permits</u>
45-7-0322	AWMF Pipeline Isolated Find1	GDA	56	366291	6343775	Open site	Valid	Artefact : 1		
	<u>Contact</u>									<u>Recorders</u>
										Niche Environment and Heritage,Ms.Clare Anderson
										<u>Permits</u>
45-7-0323	AWMF Pipeline Midden 1	GDA	56	364901	6344577	Open site	Valid	Shell : 50		
	<u>Contact</u>									<u>Recorders</u>
										Niche Environment and Heritage,Ms.Clare Anderson
										<u>Permits</u>
38-4-1511	Kurran Kurran - Blackalls Park Lake Macquarie	AGD	56	367700	6348350	Open site	Valid	Aboriginal Ceremony and Dreaming : -		
	<u>Contact</u>									<u>Recorders</u>
										Brad Welsh
										<u>Permits</u>
45-7-0325	AWTF_ST2	GDA	56	364449	6345264	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	<u>Contact</u>									<u>Recorders</u>
										Ms.Elizabeth Wyatt
										<u>Permits</u>
45-7-0326	AWTF_ST3	GDA	56	364546	6345488	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	<u>Contact</u>									<u>Recorders</u>
										Ms.Elizabeth Wyatt
										<u>Permits</u>

Report generated by AHIMS Web Service on 16/07/2013 for Ali Byrne for the following area at Datum :GDA, Zone : 56, Eastings : 363773 - 369279, Northings : 6340712 - 6353044 with a Buffer of 0 meters. Additional Info : EA. Number of Aboriginal sites and Aboriginal objects found is 53

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : PR118633 search1

Client Service ID : 106216

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
38-4-0998	Western Domain 3 (WD 3)	AGD	56	362684	6352566	Open site	Valid	Artefact : 6		
	Contact Searle	Recorders			Umwelt (Australia) Pty Limited			Permits	3092,3094	
38-4-0999	Western Domain 4 (WD 4)	AGD	56	362937	6352491	Open site	Valid	Artefact : 6		
	Contact Searle	Recorders			Umwelt (Australia) Pty Limited			Permits	3092,3094	
38-4-1000	Western Domain 6 (WD 6)	AGD	56	362490	6352631	Open site	Valid	Artefact : 6		
	Contact Searle	Recorders			Umwelt (Australia) Pty Limited			Permits		
38-4-1001	Western Domain 7 (WD 7)	AGD	56	362420	6352644	Open site	Valid	Artefact : 6		
	Contact Searle	Recorders			Umwelt (Australia) Pty Limited			Permits		
38-4-1002	Western Domain 8 (WD 8)	AGD	56	362215	6352700	Open site	Valid	Artefact : 6		
	Contact Searle	Recorders			Umwelt (Australia) Pty Limited			Permits		
38-4-1003	Western Domain 9 (WD 9)	AGD	56	362704	6352554	Open site	Valid	Artefact : 6		
	Contact Searle	Recorders			Umwelt (Australia) Pty Limited			Permits	3092,3094	
38-4-0098	Diega Creek;M-W-15;	AGD	56	362600	6350780	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders			J.C Lough			Permits		
38-4-1007	Palmers Creek 1	GDA	56	362804	6349157	Open site	Valid	Grinding Groove : -		
	Contact Searle	Recorders			Umwelt (Australia) Pty Limited			Permits		
45-3-3373	AA2	AGD	56	359722	6342564	Open site	Valid	Artefact : 2		
	Contact	Recorders			Indigenous Outcomes - Cheryl Kitchener			Permits		
45-3-3374	AA3	AGD	56	359463	6344845	Open site	Valid	Artefact : 2		
	Contact	Recorders			Indigenous Outcomes - Cheryl Kitchener			Permits		
38-4-1255	Cockle Creek IF1	GDA	56	363226	6352212	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley			Permits		
38-4-1256	Cockle Creek IF2	GDA	56	361849	6352560	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley			Permits		
38-4-1257	Cockle Creek IF3	GDA	56	363217	6352210	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited,Ms.Amanda Reynolds			Permits		
38-4-1260	Cockle Creek Shelter	GDA	56	361956	6352179	Open site	Valid	Artefact : 2		
	Contact	Recorders			Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley			Permits		
45-7-0289	Diega Creek AS1	GDA	56	362248	6351710	Open site	Valid	Artefact : 15		
	Contact	Recorders			Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley			Permits		
38-4-1262	Diega Creek AS2	GDA	56	361640	6351078	Open site	Valid	Artefact : 2		
	Contact	Recorders			Umwelt (Australia) Pty Limited,Ms.Amanda Reynolds			Permits		
38-4-1263	Diega Creek AS3	GDA	56	361689	6351152	Open site	Valid	Artefact : 4		
	Contact	Recorders			Umwelt (Australia) Pty Limited,Ms.Amanda Reynolds			Permits		

Report generated by AHIMS Web Service on 16/07/2013 for Ali Byrne for the following area at Datum :GDA, Zone : 56, Eastings : 358267 - 363773, Northings : 6340712 - 6353044 with a Buffer of 0 meters. Additional Info : EA. Number of Aboriginal sites and Aboriginal objects found is 115

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : PR118633 search1

Client Service ID : 106216

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
38-4-1224	AS1 (Wallsend)	GDA	56	361262	6352814	Open site	Valid	Artefact : 1		
	Contact	Recorders	Ms.Mary-Jean Sutton					Permits		
38-4-1225	AS2 (Wallsend)	GDA	56	362287	6352674	Open site	Valid	Artefact : 1		
	Contact	Recorders	Ms.Mary-Jean Sutton					Permits		
38-4-1226	AS3 (Wallsend)	GDA	56	361841	6351003	Open site	Valid	Artefact : 1		
	Contact	Recorders	Ms.Mary-Jean Sutton					Permits		
38-4-1227	AS4 (Wallsend)	GDA	56	362110	6350939	Open site	Valid	Artefact : 1		
	Contact	Recorders	Ms.Mary-Jean Sutton					Permits		
38-4-1228	IF1 (Wallsend)	GDA	56	361286	6352876	Open site	Valid	Artefact : 1		
	Contact	Recorders	Ms.Mary-Jean Sutton					Permits		
38-4-1229	IF2 (Wallsend)	GDA	56	362537	6351484	Open site	Valid	Artefact : 1		
	Contact	Recorders	Ms.Mary-Jean Sutton					Permits		
38-4-1230	IF3 (Wallsend)	GDA	56	362066	6350938	Open site	Valid	Artefact : 1		
	Contact	Recorders	Ms.Mary-Jean Sutton					Permits		
38-4-1231	IF4 (Wallsend)	GDA	56	362881	6349862	Open site	Valid	Artefact : 1		
	Contact	Recorders	Ms.Mary-Jean Sutton					Permits		
38-4-1235	Bangalow Creek GG2	GDA	56	361557	6352650	Open site	Valid	Grinding Groove : 10, Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Ms.Amanda Reynolds					Permits		
38-4-1236	Bangalow Creek GG3	GDA	56	361505	6352672	Open site	Valid	Grinding Groove : 5, Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Ms.Amanda Reynolds					Permits		
38-4-1237	Bangalow Creek GG4	GDA	56	361602	6352681	Open site	Valid	Grinding Groove : 1		
	Contact	Recorders	Ms.Amanda Reynolds					Permits		
38-4-1238	Bangalow Creek GG5	GDA	56	361593	6352524	Closed site	Valid	Grinding Groove : 40		
	Contact	Recorders	Ms.Amanda Reynolds					Permits		
38-4-1239	Bangalow Creek GG6	GDA	56	361390	6352084	Open site	Valid	Grinding Groove : 1		
	Contact	Recorders	Ms.Amanda Reynolds					Permits		
38-4-1240	Bangalow Creek GG7	GDA	56	361077	6352304	Open site	Valid	Grinding Groove : 40		
	Contact	Recorders	Ms.Amanda Reynolds					Permits		
38-4-1241	Boggy Hole Creek AS1	GDA	56	360999	6350504	Open site	Valid	Artefact : 12		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Ms.Amanda Reynolds					Permits		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : PR118633 search1

Client Service ID : 106216

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
38-4-1242	Boggy Hole Creek IF1	GDA	56	361010	6350446	Open site	Valid	Artefact : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Ms.Amanda Reynolds					Permits		
38-4-1243	Brunkerville Trail AS1	GDA	56	361019	6351212	Open site	Valid	Artefact : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley					Permits		
38-4-1249	Cockle Creek AS4	GDA	56	363428	6352202	Open site	Valid	Artefact : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Ms.Amanda Reynolds					Permits		
38-4-1251	Cockle Creek AS6	GDA	56	361775	6352940	Open site	Valid	Artefact : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley					Permits		
38-4-1252	Cockle Creek GG1	GDA	56	362055	6352271	Open site	Valid	Grinding Groove : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley					Permits		
45-7-0312	RPS NEWST 19	GDA	56	361062	6341692	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Roger Mehr,RPS Australia East Pty Ltd -Hamilton					Permits		
45-7-0314	RPS NEWST 21	GDA	56	361985	6346530	Open site	Valid	Habitation Structure : -		
	Contact	Recorders	RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson					Permits		
45-7-0315	RPS NEWST 22	GDA	56	361364	6346170	Open site	Valid	Artefact : -		
	Contact	Recorders	RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson					Permits		
45-3-3443	RPS NEWST23	GDA	56	359392	6344043	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Ms.Tessa Boer-Mah,RPS Australia East Pty Ltd -Hamilton					Permits		
45-7-0311	RPS NEWST 18	GDA	56	360611	6341266	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Roger Mehr,RPS Australia East Pty Ltd -Hamilton					Permits		
38-4-1232	Bangalow Creek AS1	GDA	56	361531	6352044	Open site	Valid	Artefact : -		
	Contact	Recorders	Umwelt (Australia) Pty Limited					Permits		
38-4-1233	Bangalow Creek AS2	GDA	56	361698	6352637	Open site	Valid	Artefact : -		
	Contact	Recorders	Umwelt (Australia) Pty Limited					Permits		
38-4-1234	Bangalow Creek GG1	GDA	56	361578	6352591	Open site	Valid	Grinding Groove : 4, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Ms.Amanda Reynolds					Permits		
45-7-0318	RPS ST01	GDA	56	362999	6344235	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Ms.Tessa Boer-Mah,RPS Australia East Pty Ltd -Hamilton					Permits		

Report generated by AHIMS Web Service on 16/07/2013 for Ali Byrne for the following area at Datum :GDA, Zone : 56, Eastings : 358267 - 363773, Northings : 6340712 - 6353044 with a Buffer of 0 meters. Additional Info : EA. Number of Aboriginal sites and Aboriginal objects found is 115

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : PR118633 search1

Client Service ID : 106216

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-7-0319	RPS ST02	GDA	56	363423	6343924	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Ms.Tessa Boer-Mah,RPS Australia East Pty Ltd -Hamilton					Permits		
38-4-1264	Diega Creek GG1	GDA	56	361579	6350994	Open site	Valid	Grinding Groove : 2		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley					Permits		
38-4-1265	Diega Creek GG2	GDA	56	361996	6351675	Open site	Valid	Grinding Groove : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley					Permits		
38-4-1266	Diega Creek GG3	GDA	56	361875	6351630	Open site	Valid	Grinding Groove : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley					Permits		
38-4-1267	Diega Creek GG4	GDA	56	361685	6351253	Open site	Valid	Grinding Groove : 3		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley					Permits		
38-4-1268	Diega Creek GG5	GDA	56	361892	6351138	Open site	Valid	Grinding Groove : 2		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley					Permits		
38-4-1269	Diega Creek GG6	GDA	56	362444	6351755	Open site	Valid	Grinding Groove : 2		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley					Permits		
38-4-1270	Diega Creek IF1	GDA	56	361698	6351135	Open site	Valid	Artefact : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Ms.Amanda Reynolds					Permits		
38-4-1271	Diega Creek IF2	GDA	56	361830	6351338	Open site	Valid	Artefact : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Ms.Amanda Reynolds					Permits		
38-4-1272	Diega Creek IF3	GDA	56	361846	6351338	Open site	Valid	Artefact : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Ms.Amanda Reynolds					Permits		
38-4-1273	Diega Creek IF4	GDA	56	361881	6351309	Open site	Valid	Artefact : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Ms.Amanda Reynolds					Permits		
38-4-1274	Diega Creek IF5	GDA	56	361910	6351311	Open site	Valid	Artefact : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Ms.Amanda Reynolds					Permits		
38-4-1275	Diega Creek IF6	GDA	56	361428	6351539	Open site	Valid	Artefact : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley					Permits		
38-4-1276	Diega Creek SA1	GDA	56	361446	6351548	Open site	Valid	Stone Arrangement : 3		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley					Permits		
38-4-1277	Diega Creek ST1	GDA	56	362167	6351667	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Mrs.Jillian Huntley					Permits		

Report generated by AHIMS Web Service on 16/07/2013 for Ali Byrne for the following area at Datum :GDA, Zone : 56, Eastings : 358267 - 363773, Northings : 6340712 - 6353044 with a Buffer of 0 meters. Additional Info : EA. Number of Aboriginal sites and Aboriginal objects found is 115

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : PR118633 search1

Client Service ID : 106216

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
38-4-1278	Diega Creek ST4	GDA	56	361856	6350920	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	<u>Contact</u>									
38-4-1279	Palmers Creek GG2	GDA	56	362778	6349783	Open site	Valid	Grinding Groove : 10, Stone Quarry : 8		
	<u>Contact</u>									
38-4-1280	Palmers Creek GG3	GDA	56	363099	6349675	Open site	Valid	Grinding Groove : 19		
	<u>Contact</u>									
45-7-0300	RPS NEWST 7	GDA	56	362080	6343607	Open site	Valid	Artefact : -		
	<u>Contact</u>									
45-7-0301	RPS NEWST 8	GDA	56	362700	6344225	Open site	Valid	Artefact : -		
	<u>Contact</u>									
45-7-0302	RPS NEWST 9	GDA	56	362839	6343963	Open site	Valid	Artefact : -		
	<u>Contact</u>									
38-4-1565	Cockle Creek IF8	GDA	56	361829	6352523	Open site	Valid	Artefact : 1		
	<u>Contact</u>									
38-4-1566	Cockle Creek IF9	GDA	56	361766	6352280	Open site	Valid	Artefact : 1		
	<u>Contact</u>									
38-4-1568	Diega Creek AS4	GDA	56	362687	6351304	Open site	Valid	Artefact : 1		
	<u>Contact</u>									
38-4-1569	Diega Creek AS5	GDA	56	362298	6350956	Open site	Valid	Artefact : 1		
	<u>Contact</u>									
38-4-1570	Diega Creek AS6	GDA	56	361754	6351054	Open site	Valid	Artefact : 1		
	<u>Contact</u>									
38-4-1571	Diega Creek AS7	GDA	56	361720	6351074	Open site	Valid	Artefact : 1		
	<u>Contact</u>									
38-4-1572	Diega Creek AS8	GDA	56	362622	6350935	Open site	Valid	Artefact : 1		
	<u>Contact</u>									
38-4-1573	Diega Creek AS9	GDA	56	362724	6350902	Open site	Valid	Artefact : 1		
	<u>Contact</u>									
38-4-1576	Diega Creek IF10	GDA	56	361774	6351028	Open site	Valid	Artefact : 1		
	<u>Contact</u>									
38-4-1577	Diega Creek IF11	GDA	56	362691	6350928	Open site	Valid	Artefact : 1		
	<u>Contact</u>									

Report generated by AHIMS Web Service on 16/07/2013 for Ali Byrne for the following area at Datum :GDA, Zone : 56, Eastings : 358267 - 363773, Northings : 6340712 - 6353044 with a Buffer of 0 meters. Additional Info : EA. Number of Aboriginal sites and Aboriginal objects found is 115

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : PR118633 search1

Client Service ID : 106216

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
38-4-1578	Diega Creek IF12	GDA	56	362704	6350905	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited					Permits
38-4-1579	Palmers Creek IF3	GDA	56	362971	6349820	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited					Permits
38-4-1580	Palmers Creek IF4	GDA	56	362773	6349886	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited					Permits
38-4-1591	Cockle Creek AS15	GDA	56	362590	6352416	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited,Ms.Amanda Reynolds					Permits
38-4-1592	Cockle Creek AS16	GDA	56	362689	6352427	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited,Ms.Amanda Reynolds					Permits
38-4-1593	Cockle Creek AS17	GDA	56	362768	6352463	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited					Permits
38-4-1594	Cockle Creek AS18	GDA	56	362491	6352404	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited,Ms.Amanda Reynolds					Permits
38-4-1484	Palmers Creek IF2	GDA	56	363411	6350219	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited					Permits
38-4-1485	Palmers Creek IF1	GDA	56	363343	6350197	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited					Permits
38-4-1486	Palmers Creek AS1	GDA	56	363594	6349584	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited					Permits
38-4-1487	Palmers Creek AS2	GDA	56	363449	6350234	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited					Permits
45-7-0324	RPS COALLOG1	GDA	56	361815	6343309	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders			RPS					Permits
38-4-1533	Cockle Creek IF7	GDA	56	361836	6352586	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited					Permits
38-4-1554	Bangalow Creek AS7	GDA	56	361674	6352708	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited					Permits
38-4-1555	Bangalow Creek IF1	GDA	56	361549	6352128	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited					Permits
38-4-1556	Bangalow Creek IF2	GDA	56	361634	6352319	Open site	Valid	Artefact : 1		
	Contact	Recorders			Umwelt (Australia) Pty Limited					Permits
38-4-1557	Bangalow Creek IF3	GDA	56	361790	6352551	Open site	Valid	Artefact : 1		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : PR118633 search1

Client Service ID : 106216

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	<u>Contact</u>	<u>Recorders</u>	Umwelt (Australia) Pty Limited					<u>Permits</u>		
38-4-1562	Cockle Creek AS12	GDA	56	361789	6352831	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	Umwelt (Australia) Pty Limited					<u>Permits</u>		
38-4-1563	Cockle Creek AS13	GDA	56	362603	6352824	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	Umwelt (Australia) Pty Limited					<u>Permits</u>		
38-4-1564	Cockle Creek AS14	GDA	56	362367	6352992	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	Umwelt (Australia) Pty Limited					<u>Permits</u>		
38-4-1550	Bangalow Creek AS3	GDA	56	361657	6352353	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	Umwelt (Australia) Pty Limited					<u>Permits</u>		
38-4-1551	Bangalow Creek AS4	GDA	56	361679	6352382	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	Umwelt (Australia) Pty Limited					<u>Permits</u>		
38-4-1552	Bangalow Creek AS5	GDA	56	361704	6352471	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	Umwelt (Australia) Pty Limited					<u>Permits</u>		

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APPENDIX D

**Newcastle Office**

Ground Floor, 241 Denison Street, Broadmeadow, NSW Australia 2292
PO Box 428, Hamilton, NSW Australia 2303

Our Ref: PR118633
Date: 19 August 2013

Attn: Chad Stockham
Centennial Newstan Pty Ltd
PO Box 100
Toronto NSW 2283

Via:

Dear Chad

**RE: NEWSTAN COLLIERY – MODIFICATION (DA 73-11-98) DESKTOP ECOLOGICAL
IMPACT ASSESSMENT FOR ENVIRONMENTAL ASSESSMENT**

Background

RPS Australia East Pty Ltd (RPS) was engaged by Centennial Newstan Pty Ltd (Centennial Newstan) to undertake an ecological desktop assessment of the modification to the Development Consent boundary (Development Consent DA 73-11-98). The Project Application Area comprises four small areas (totalling approximately 14.7 ha) located outside, but adjoining, the approved Development Consent DA 73-11-98 boundary (Consolidation Consent Boundary). The Project Application Area is located in an area referred to as the Main West Mining Area, which was approved pursuant to a modification (MOD 4) to DA 73-11-98 (see **Figure 1**). Due to an oversight, the boundary of the Main West Mining Area resulted in the four areas that make up the Project Application Area being left out of the approved Consolidated Consent Boundary.

Centennial Newstan owns and operates the Newstan Colliery. The Newstan Colliery is located approximately 25 kilometres southwest of Newcastle and 140 kilometres north of Sydney within the Lake Macquarie Local Government Area. The Newstan Colliery pit top and surface facilities is located four kilometres north of the township of Toronto.

This assessment aims to examine the likelihood of the proposal having a significant effect on any threatened species, populations or ecological communities listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act). This report recognises the relevant requirements of the EP&A Act 1979 as amended by the NSW *Environmental Planning and Assessment Amendment Act 1997*. Assessment is also made with regard to those threatened entities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).



TITLE: FIGURE 1: SITE LOCALITY	LOCATION: NEWSTAN	DATUM: GDA94 PROJECTION: MGA ZONE 56	DATE: 15/08/2013 PURPOSE: ECOLOGY	LAYOUT REF: J:\JOBS\Centennial\All Jobs\118633 Newstan boundary Mod 10 - Drafting\MapInfo Workspaces\Eco VERSION (PLAN BY): JS (A A4)
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Methods

For the purposes of this assessment, desktop investigations were required in which previous reports and studies were evaluated. No field surveys were undertaken for this assessment as sufficient information was currently available to describe the ecological attributes within the Project Application Area, and predicted impacts was considered not significant enough to warrant further field surveys. This existing information includes ecological assessments that have previously been undertaken over the approved Consolidated Consent. RPS has also undertaken several ecological surveys across the Newstan Colliery Holdings.

Online database searches involving a 10 km buffer surrounding the Project Application Area were used in the NSW Wildlife Atlas and Commonwealth Matters of National Significance search on the 8 July 2013. RPS threatened species records and vegetation mapping has formed the basis of this report (RPS unpublished data). The original ecological impact assessment was also reviewed (Hunter Eco 2010) as well as a number of other ecological studies previously conducted in and near the Project Application Area. These studies include:

- Cumberland Ecology (2007). Ecological Impact Assessment. Newstan Colliery. Modification to Development Consent. Statement of Environmental Effects. February 2007.
- Cumberland Ecology (2008). Newstan Colliery, Longwall Panel 25, REF, Ecological Impact Assessment;
- Eco Biological (2005). Awaba Outbye SMP;
- GHD (2010). Centennial Coal – Newstan S75W Modification: Groundwater Impact Assessment;
- HLA (2006). Flora and Fauna Impact Assessment Upgrade to Existing Ash Dam Eraring Power Station. Flora and Fauna Report. Appendix E. February 2006;
- Hunter Eco (2008a). Awaba East Exploratory Drilling Program REF Stage 1 – Ecology. A Report for Centennial Coal;
- Hunter Eco (2008b). Centennial Coal, Proposed Cooranbong Colliery to Awaba Haul Road, Threatened flora investigation;
- Hunter Eco (2009a). The Vegetation Communities along the Proposed Cooranbong Colliery to Awaba Haul Road. A Report for Centennial Coal;
- Hunter Eco (2009b). Awaba East Exploratory Drilling Program REF Stage 2 – Ecology. A Report for Centennial Coal;
- Hunter Eco (2010). Ecological Impact Assessment. Newstan Colliery s75W Modification. Report to Centennial Coal. September 2010;
- HWR (2008). Stony Creek Baseline Study;
- Seedsman (2010). Centennial Newstan Pty Limited Subsidence Assessment Main West Area. Report prepared for Centennial Coal by Seedsman Geotechnics. October 2010;
- Umwelt / Gunninah (1998). Life Extension Project 1998 Flora and Fauna Assessment and SIS;
- Umwelt (2004). Centennial Newstan Longwall 22-23 Flora and Fauna Assessment; and
- Umwelt (2005). Targeted threatened plant survey.

Results

Database Searches

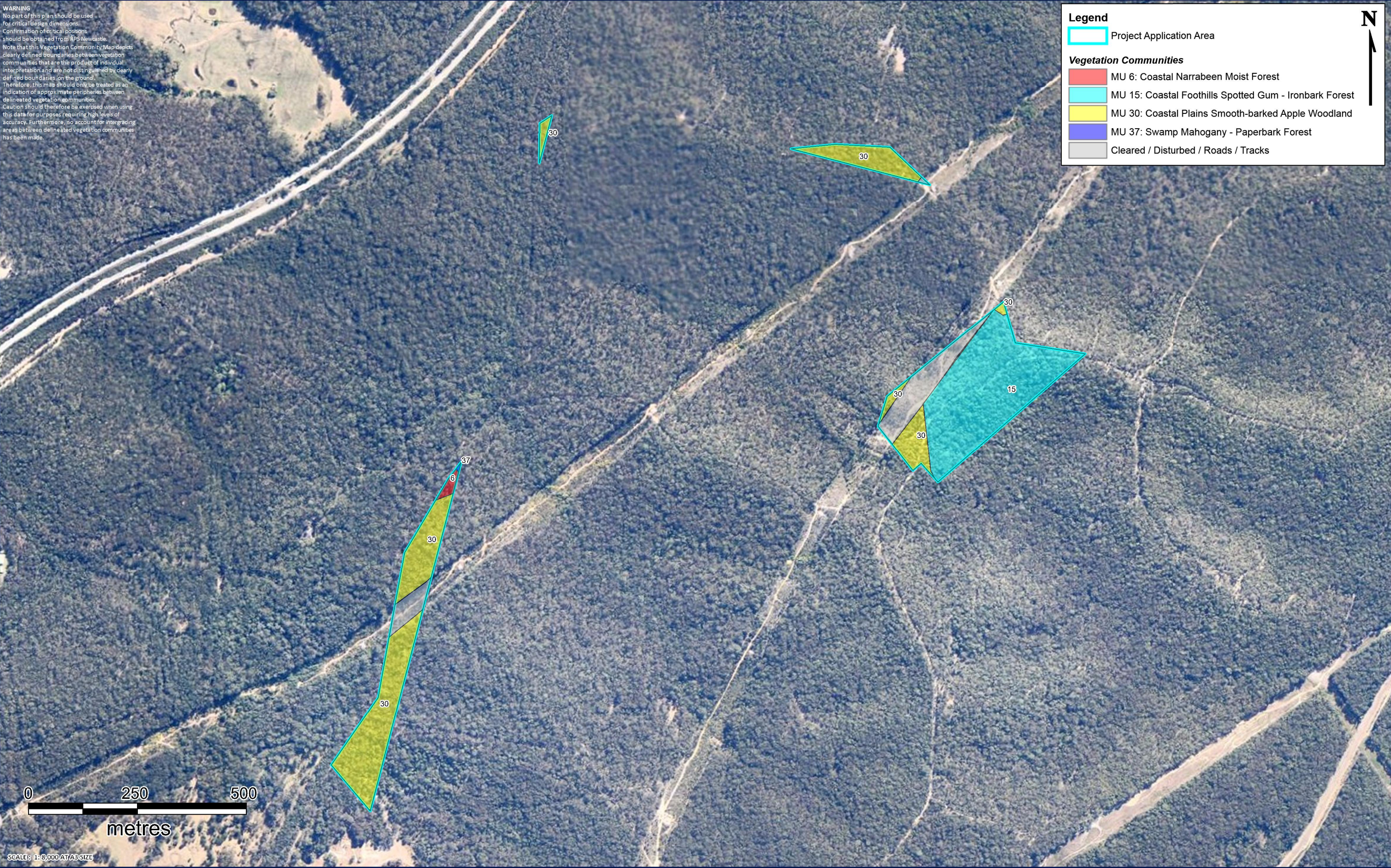
The results from the Protected Matters and Wildlife Atlas 10km searches identified 44 threatened flora species, 88 threatened fauna species and 15 ecological communities as having been recorded or having the potential to occur (see **Appendix 1**).

Vegetation Communities

In total, four vegetation communities were found to occur within the Project Application Area (see **Table 1**). One vegetation community was found to be commensurate with an Endangered Ecological Community listed under the TSC Act (see **Table 1**). **Figure 2** displays the vegetation communities that occur on the Project Application Area.

Table 1. Vegetation communities found within the Project Application Area (RPS unpublished data).

MU	Vegetation community name	Commensurate with a threatened ecological community (TSC Act)	Area (ha)
6	Coastal Narrabeen Moist Forest	-	0.14
15	Coastal Foothills Spotted Gum – Ironbark Forest	-	6.28
30	Coastal Plains Smooth-barked Apple Forest	-	6.34
37	Swamp Mahogany – Paperbark Forest	<i>Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i>	0.01
NA	Cleared/disturbed land	-	1.97
Total			14.74



Threatened Flora

Whilst there are no known records of threatened flora species occurring within the Project Application Area, there are several records of threatened flora species in close proximity (Cumberland Ecology 2007; Hunter Eco 2010; RPS unpublished data), namely:

- *Acacia bynoeana* (Bynoe's Wattle): Endangered under the TSC Act and Vulnerable under the EPBC Act;
- *Angophora inopina* (Charmhaven Apple): Vulnerable under the TSC Act and EPBC Act;
- *Tetratheca juncea* (Black-eyed Susan): Vulnerable under the TSC Act and EPBC Act; and
- *Grevillea parviflora* subsp. *parviflora* (Small-flower Grevillea): Vulnerable under the TSC Act and EPBC Act.

Threatened Fauna

Whilst there are no known records of threatened fauna species occurring within the Project Application Area, there are several records of threatened fauna species in close proximity (Cumberland Ecology 2007; Hunter Eco 2010; RPS unpublished data), namely:

- Sooty Owl (*Tyto tenebricosa*): Vulnerable under the TSC Act;
- Masked Owl (*Tyto novaehollandiae*): Vulnerable under the TSC Act;
- Powerful Owl (*Ninox strenua*): Vulnerable under the TSC Act;
- Yellow-bellied Sheath-tail-bat (*Saccolaimus flaviventris*): Vulnerable under the TSC Act;
- East-coast Freetail-bat (*Mormopterus norfolkensis*): Vulnerable under the TSC Act; and
- Little Bentwing-bat (*Miniopterus australis*): Vulnerable under the TSC Act.

Predicted Impacts

This Project proposes to use the bord and pillar mining method under 14.2 ha of remnant vegetation. A subsidence assessment has been undertaken for the Project by Seedsman (2010). Seedsman (2010) predicts that a maximum of 20 millimetres of subsidence may result from the bord and pillar mining under the 14.2 ha of remnant vegetation. There is no other potential habitat modification/clearing proposed as part of this Project.

As there is no vegetation clearing as part of the proposal, all potential impacts are expected to be limited to impacts associated with subsidence e.g. ponding and cracking. This level of subsidence (maximum of 20 millimetres) is considered to be negligible as far as the threatened species habitat is concerned. In general, vegetation can be impacted from the loss of water in the upper alluvium as a result of cracking from subsidence. However, the bord and pillar mining method (as opposed to longwalls) would be very unlikely to result in such cracking (GHD 2010; Seedsman 2010). Furthermore, the overall slopes on the Project Application Area are such that subsidence of the range predicted would not result in any diversion of water from the existing drainage lines. This would mean that the Project is unlikely to impact on any downstream Groundwater Dependent Ecosystems (GDEs).

Assessment of Significant Species/Communities

The following species/community were considered likely to occur within the Project Application Area and had some potential to be impacted (see **Appendix 2** for Assessment of Significant Species/Communities table):

- *Acacia bynoeana* (Bynoe's Wattle): Endangered under the TSC Act and Vulnerable under the EPBC Act;
- *Angophora inopina* (Charmhaven Apple): Vulnerable under the TSC Act and EPBC Act;
- *Tetratheca juncea* (Black-eyed Susan): Vulnerable under the TSC Act and EPBC Act;
- *Grevillea parviflora* subsp. *parviflora* (Small-flower Grevillea): Vulnerable under the TSC Act and EPBC Act;
- Sooty Owl (*Tyto tenebricosa*): Vulnerable under the TSC Act;
- Masked Owl (*Tyto novaehollandiae*): Vulnerable under the TSC Act;
- Powerful Owl (*Ninox strenua*): Vulnerable under the TSC Act;
- Yellow-bellied Sheath-tail-bat (*Saccolaimus flaviventris*): Vulnerable under the TSC Act;
- East-coast Freetail-bat (*Mormopterus norfolkensis*): Vulnerable under the TSC Act;
- Little Bentwing-bat (*Miniopterus australis*): Vulnerable under the TSC Act; and
- *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*: Endangered under the TSC Act.

The above species and ecological community were further assessed in using a 7 - part test of Significance (TSC Act) (see **Appendix 3**). *Acacia bynoeana*, *Angophora inopina*, *Tetratheca juncea* and *Grevillea parviflora* subsp. *parviflora* also had an Assessment of Significance (AoS) (EPBC Act) (see **Appendix 4**). The assessments found that the above listed threatened species and ecological community are unlikely to be significantly impacted by the proposal.

Other Legislative Considerations

State Environmental Planning Policies (SEPPs): SEPP 44 - Koala Habitat Protection

First Consideration – Is the Land 'Potential Koala Habitat'?

Schedule 2 of State Environmental Planning Policy (SEPP) No. 44 – 'Koala Habitat Protection' lists 10 tree species that are considered indicators of 'Potential Koala Habitat'. The presence of any of the species listed on a site proposed for development triggers the requirement for an assessment for 'Potential Koala Habitat'. SEPP 44 defines potential Koala Habitat as:

“areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component”.

Whilst no flora surveys have been performed within the Project Application Area, due the likely vegetation community on the Project Application Area, the following koala feed tree species area likely to occur at a density of greater than 15%:

- *Eucalyptus punctata* (Grey Gum) within MU 15: Coastal Foothills Spotted Gum – Ironbark Forest; and
- *Eucalyptus robusta* (Swamp Mahogany) within MU 37: Swamp Mahogany – Paperbark Forest.

Therefore, 6.29 ha of the Project Application Area was considered to constitute 'Potential Koala Habitat' as defined by the SEPP.

Second Consideration – Is the Land 'Core Koala Habitat'

SEPP 44 defines core Koala habitat as:

“an area of land with a resident population of Koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population.”

No targeted surveys were performed within the Project Application Area. However, previous surveys within the Consolidated Consent Boundary have failed to detect any evidence of koalas. However, the possibility of a low density koala population occurring along the western side of Lake Macquarie and including within the Project Application Area cannot be entirely discounted.

As a result, the proposal is not considered to constitute core Koala habitat under SEPP 44 and no further provisions of the SEPP 44 apply to the proposal.

Considerations under the Environment Protection and Biodiversity Conservation Act 1999

Considerations have been made under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). An EPBC Act Protected Matters Search was undertaken within the SEWPaC online database (accessed July 2013) to generate a list of those matters of National Environmental Significance (NES) from within 10 km of the Project Application Area, which may have the potential to occur within the Project Application Area. This data, combined with other local knowledge and records, was utilised to assess whether the type of activity proposed on the Project Application Area will have, or is likely to have a significant impact upon a matter of NES, or on the environment of Commonwealth land.

The matters of NES and site-specific responses are listed below:

World Heritage Properties

The Project Application Area is not a World Heritage Property, and is not in close proximity to any such area. Therefore, the proposal is unlikely to impact upon any World Heritage Property.

National Heritage Places

The Project Application Area is not a National Heritage Place, and is not in close proximity to any such area. Therefore, the proposal is unlikely to impact upon any National Heritage Place.

Wetlands of International Importance (declared Ramsar wetlands)

The Ramsar listed Hunter Estuary Wetland, which comprises Kooragang Nature Reserve and Shortland Wetlands, is located north of the Project Application Area. The proposal is located

wholly within the catchment of Lake Macquarie which drains directly to the ocean and is not part of the Hunter River Catchment. The proposed activity of bord and pillar mining is not expected to have an impact on any connected body of water, therefore, the proposal is unlikely to impact upon the Hunter Estuary Wetland.

The Great Barrier Reef Marine Park

The Great Barrier Reef Marine Park does not occur within or adjacent to the Project Application Area, therefore, the proposal is unlikely to impact upon any areas of the Great Barrier Reef Marine Park.

Commonwealth Marine Area

The Project Application Area is not a Commonwealth Marine Area, and is not in close proximity to any such area. Therefore, the proposal is unlikely to impact upon any Commonwealth Marine Area.

Nationally listed threatened species and ecological communities

A total of 44 threatened species (11 of which are marine species) listed under the EPBC Act have been recorded or have suitable habitat within a 10 km radius of the Project Application Area (see **Appendix 1** for the likelihood of occurrence of threatened species listed under EPBC Act 1999). The potential for the proposal to significantly impact on individuals or local populations has been assessed in **Appendix 2** and likely impacts assessed in **Appendix 4**. Due to the nature of the proposal (being entirely underground), no significant impacts are expected to occur on nationally threatened species.

Nationally listed migratory species

A total of 19 migratory species listed under the EPBC Act 1999, excluding marine species, have been recorded or have suitable habitat within a 10 km radius of the Project Application Area. The following seven species are terrestrial migratory species and have potential to occur within the Project Application Area. Of these species, only the Regent Honeyeater is as listed as threatened under the EPBC Act 1999.

- Regent Honeyeater (*Anthochaera phrygia*);
- White-bellied Sea-Eagle (*Haliaeetus leucogaster*);
- White-throated Needletail (*Hirundapus caudacutus*);
- Rainbow Bee-eater (*Merops ornatus*);
- Black-faced Monarch (*Monarcha melanopsis*);
- Satin Flycatcher (*Myiagra cyanoleuca*); and
- Rufous Fantail (*Rhipidura rufifrons*).

As no habitat is proposed to be removed, the proposal is unlikely to; substantially modify, destroy or isolate an area of important habitat, result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat or seriously disrupt the lifecycle of an ecological significant proportion of the population of a migratory species.

Summary Statement:

Based on the above and with reference to the assessment within **Appendix 4**, it is considered the current proposal is unlikely to significantly impact on any Matter of NES listed under the EPBC Act 1999. Therefore, it is recommended that a Referral to SEWPaC is not required for this action.

Conclusions

A subsidence assessment predicts 20 millimetres would be the upper limit of subsidence resulting from the mining (Seedsman 2010) with no other potential habitat modification/clearing proposed. This level of subsidence is negligible as far as the threatened species habitat is concerned. A formal desktop assessment found that there would not likely be significant impacts on state or nationally threatened species or communities resulting from the proposed mining and associated activity.

We trust this information is sufficient for your purposes, however should you require any further details or clarification, please do not hesitate to contact the writer by telephone.

Yours sincerely
RPS



Dr Andrew Smith
Ecologist

Reference

- Cumberland Ecology (2007). Ecological Impact Assessment. Newstan Colliery. Modification to Development Consent. Statement of Environmental Effects. February 2007.
- Cumberland Ecology (2008). Newstan Colliery, Longwall Panel 25, REF, Ecological Impact Assessment;
- Eco Biological (2005). Awaba Outbye SMP;
- GHD (2010). Centennial Coal – Newstan S75W Modification: Groundwater Impact Assessment.
- HLA (2006). Flora and Fauna Impact Assessment Upgrade to Existing Ash Dam Eraring Power Station. Flora and Fauna Report. Appendix E. February 2006;
- Hunter Eco (2008a). Awaba East Exploratory Drilling Program REF Stage 1 – Ecology. A Report for Centennial Coal;
- Hunter Eco (2008b). Centennial Coal, Proposed Cooranbong Colliery to Awaba Haul Road, Threatened flora investigation;
- Hunter Eco (2009a). The Vegetation Communities along the Proposed Cooranbong Colliery to

Awaba Haul Road. A Report for Centennial Coal;

Hunter Eco (2009b). Awaba East Exploratory Drilling Program REF Stage 2 – Ecology. A Report for Centennial Coal;

Hunter Eco (2010). Ecological Impact Assessment. Newstan Colliery s75W Modification. Report to Centennial Coal. September 2010;

HWR (2008). Stony Creek Baseline Study;

Seedsman (2010). Centennial Newstan Pty Limited Subsidence Assessment Main West Area. Report prepared for Centennial Coal by Seedsman Geotechnics. October 2010;

Umwelt / Gunninah (1998). Life Extension Project 1998 Flora and Fauna Assessment and SIS;

Umwelt (2004). Centennial Newstan Longwall 22-23 Flora and Fauna Assessment; and

Umwelt (2005). Targeted threatened plant survey.

Appendix 1: Database results

Threatened flora species that been recorded or have the potential to occur within 10km of the Project Application Area.

Family	Scientific name	Common name	TSC Act	EPBC Act	Records within 10 km
Apocynaceae	<i>Cynanchum elegans</i>	White-flowered Wax Plant	E	E	K
Araliaceae	<i>Astrotricha crassifolia</i>	Thick-leaf Star-hair	V	V	P
Asteraceae	<i>Rutidosia heterogama</i>	Heath Wrinklewort	V	V	K
	<i>Senecio spathulatus</i>	Coast Groundsel	E	-	K
Convolvulaceae	<i>Wilsonia backhousei</i>	Narrow-leafed Wilsonia	V	-	K
Dilleniaceae	<i>Hibbertia procumbens</i>	Spreading Guinea Flower	E	-	K
Elaeocarpaceae	<i>Tetradlea glandulosa</i>	-	V	V	K
	<i>Tetradlea juncea</i>	Black-eyed Susan	V	V	266
Ericaceae	<i>Epacris purpurascens</i> var. <i>purpurascens</i>	-	V	-	K
Euphorbiaceae	<i>Chamaesyce psammogeton</i>	Sand Spurge	E	-	K
Fabaceae	<i>Senna acclinis</i>	Rainforest Cassia	E	-	K
	<i>Pultenaea maritima</i>	Coast Headland Pea	V	-	K
	<i>Acacia bynoeana</i>	Bynoe's Wattle	E	V	35
Juncaginaceae	<i>Maundia triglochinosoides</i>	-	V	-	K
Lamiaceae	<i>Prostanthera askania</i>	Tranquility Mintbush	E	E	K
	<i>Prostanthera junonis</i>	Somersby Mintbush	E	E	K
Moraceae	<i>Streblus pendulinus</i>	Siah's Backbone	-	E	P
Myrtaceae	<i>Callistemon linearifolius</i>	Netted Bottle Brush	V	-	K
	<i>Angophora inopina</i>	Charmhaven Apple	V	V	18
	<i>Darwinia glaucophylla</i>	-	V	-	K
	<i>Eucalyptus camfieldii</i>	Camfield's Stringybark	V	V	K
	<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	-	V	V	K
	<i>Eucalyptus parramattensis</i> subsp. <i>parramattensis</i>	Eucalyptus parramattensis C. Hall. subsp. parramattensis in Wyong and Lake Macquarie local government areas	E pop	-	K
	<i>Melaleuca biconvexa</i>	Biconvex Paperbark	V	V	4
	<i>Melaleuca groveana</i>	Grove's Paperbark	V	-	P
	<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	E	V	K
	<i>Caladenia porphyrea</i>	-	E	-	K
Orchidaceae	<i>Caladenia tessellata</i>	Thick Lip Spider Orchid	E	V	K
	<i>Corunastylis</i> sp. Charmhaven (NSW896673)	-	CE	-	K
	<i>Corybas doweringii</i>	Red Helmet Orchid	E	-	K
	<i>Cryptostylis hunteriana</i>	Leafless Tongue Orchid	V	V	3
	<i>Dendrobium melaleucaphilum</i>	Spider orchid	E	-	K
	<i>Diuris bracteata</i>	-	E	X	K
	<i>Diuris praecox</i>	Rough Doubletail	V	V	K
	<i>Genoplesium insignis</i>	Variable Midge Orchid	E	-	K
	<i>Pelargonium</i> sp. Striatellum (G.W.Carr 10345)	Omeo Stork's-bill	-	E	P
	<i>Prasophyllum</i> sp. Wyong (C.Phelps ORG 5269)	a leek-orchid	-	CE	P
	<i>Pterostylis gibbosa</i>	Illawarra Greenhood	E	E	P
	<i>Thelymitra</i> sp. <i>adorata</i>	Wyong Sun Orchid	CE	-	K
	<i>Rhizanthella slateri</i>	Eastern Underground Orchid	V	E	P

Family	Scientific name	Common name	TSC Act	EPBC Act	Records within 10 km
Polygonaceae	<i>Persicaria elatior</i>	Tall Knotweed	V	V	P
Proteaceae	<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Small-flower Grevillea	V	V	22
Rutaceae	<i>Asterolasia elegans</i>	-	E	E	P
Zannichelliaceae	<i>Zannichellia palustris</i>	-	E	-	K

Notes:

V = Vulnerable
X = Extinct

E = Endangered
P = Predicted to occur

CE = Critically Endangered
K = Known to occur

Threatened fauna species that been recorded or have the potential to occur within 10km of the Project Application Area.

Family	Scientific name	Common name	TSC Act	EPBC Act	Records within 10 km
Birds					
Acanthizidae	<i>Chthonicola sagittata</i>	Speckled Warbler	V	-	K
Accipitridae	<i>Lophoictinia isura</i>	Square-tailed Kite	V	-	P
	<i>Pandion cristatus</i>	Eastern Osprey	V	-	1
	<i>Erythrotriorchis radiatus</i>	Red Goshawk	CE	V	1
	<i>Circus assimilis</i>	Spotted Harrier	V	-	K
	<i>Hieraaetus morphnoides</i>	Little Eagle	V	-	1
Anatidae	<i>Nettapus coromandelianus</i>	Cotton Pygmy-Goose	E	-	K
	<i>Oxyura australis</i>	Blue-billed Duck	V	-	K
	<i>Stictonetta naevosa</i>	Freckled Duck	V	-	K
Anseranatidae	<i>Anseranas semipalmata</i>	Magpie Goose	V	-	K
Ardeidae	<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	E	K
	<i>Ixobrychus flavicollis</i>	Black Bittern	V	-	K
Burhinidae	<i>Burhinus grallarius</i>	Bush Stone-curlew	E	-	K
Cacatuidae	<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V	-	2
	<i>Calyptorhynchus lathamii</i>	Glossy Black-Cockatoo	V	-	14
Charadriidae	<i>Charadrius leschenaultii</i>	Greater Sand-plover	V	M	K
	<i>Charadrius mongolus</i>	Lesser Sand-plover	V	M	K
Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E	-	K
Climacteridae	<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	V	-	4
Columbidae	<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	V	-	K
	<i>Ptilinopus regina</i>	Rose-crowned Fruit-Dove	V	-	K
	<i>Ptilinopus superbus</i>	Superb Fruit-Dove	V	-	K
Estrildidae	<i>Stagonopleura guttata</i>	Diamond Firetail	V	-	K
Haematopodidae	<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	V	-	K
	<i>Haematopus longirostris</i>	Pied Oystercatcher	E	-	K
Jacanidae	<i>Irediparra gallinacea</i>	Comb-crested Jacana	V	-	K
Laridae	<i>Sternula albifrons</i>	Little Tern	E	M	K
	<i>Sternula nereis nereis</i>	Australian Fairy Tern	-	V	P
Meliphagidae	<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	E	K
	<i>Ephianura albifrons</i>	White-fronted Chat	V	-	K
	<i>Grantiella picta</i>	Painted Honeyeater	V	-	K
	<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)	V	-	K
Neosittidae	<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	-	7
Pardalotidae	<i>Dasyornis brachypterus</i>	Eastern Bristlebird	E	E	P
Petroicidae	<i>Petroica boodang</i>	Scarlet Robin	V	-	K
	<i>Petroica phoenicea</i>	Flame Robin	V	-	K
Pomatostomidae	<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	V	-	K

Family	Scientific name	Common name	TSC Act	EPBC Act	Records within 10 km
Psittacidae	<i>Lathamus discolor</i>	Swift Parrot	E	E	K
	<i>Neophema pulchella</i>	Turquoise Parrot	V	-	K
	<i>Glossopsitta pusilla</i>	Little Lorikeet	V	-	15
Rostratulidae	<i>Rostratula australis</i>	Australian Painted Snipe	E	E	P
Scolopacidae	<i>Calidris alba</i>	Sanderling	V	M	K
	<i>Calidris ferruginea</i>	Curlew Sandpiper	E	M	K
	<i>Calidris tenuirostris</i>	Great Knot	V	M	K
	<i>Limicola falcinellus</i>	Broad-billed Sandpiper	V	M	K
	<i>Limosa limosa</i>	Black-tailed Godwit	V	M	K
	<i>Xenus cinereus</i>	Terek Sandpiper	V	M	K
Strigidae	<i>Ninox connivens</i>	Barking Owl	V	-	K
	<i>Ninox strenua</i>	Powerful Owl	V	-	12
Turnicidae	<i>Turnix maculosus</i>	Red-backed Button-quail	V	-	K
Tytonidae	<i>Tyto novaehollandiae</i>	Masked Owl	V	-	24
	<i>Tyto tenebricosa</i>	Sooty Owl	V	-	9
Frogs					
Hylidae	<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V	1
	<i>Litoria brevipalmata</i>	Green-thighed Frog	V	-	K
	<i>Litoria littlejohni</i>	Littlejohn's Tree Frog	V	V	K
Myobatrachidae	<i>Mixophyes balbus</i>	Stuttering Frog	E	V	25
	<i>Mixophyes iteratus</i>	Giant Barred Frog	E	E	K
	<i>Crinia tinnula</i>	Wallum Froglet	V	-	1
	<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V	V	K
	<i>Pseudophryne australis</i>	Red-crowned Toadlet	V	-	K
Reptiles					
Elapidae	<i>Hoplocephalus bungaroides</i>	Broad-headed Snake	E	V	K
	<i>Hoplocephalus bitorquatus</i>	Pale-headed Snake	V	-	K
	<i>Hoplocephalus stephensii</i>	Stephens' Banded Snake	V	-	1
Varanidae	<i>Varanus rosenbergi</i>	Rosenberg's Goanna	V	-	K
Mammals					
Burramyidae	<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V	-	K
Dasyuridae	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V	E	3
	<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V	-	K
	<i>Planigale maculata</i>	Common Planigale	V	-	K
Emballonuridae	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V	-	K
Macropodidae	<i>Macropus parma</i>	Parma Wallaby	V	-	K
	<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E	V	K
	<i>Thylogale stigmatica</i>	Red-legged Pademelon	V	-	K
Molossidae	<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	V	-	3
Muridae	<i>Pseudomys gracilicaudatus</i>	Eastern Chestnut Mouse	V	-	K
	<i>Pseudomys novaehollandiae</i>	New Holland Mouse	-	V	K
Petauridae	<i>Petaurus australis</i>	Yellow-bellied Glider	V	-	12
	<i>Petaurus norfolcensis</i>	Squirrel Glider	V	-	4
Phascolarctidae	<i>Phascolarctos cinereus</i>	Koala	V	V	6
Potoroidae	<i>Potorous tridactylus</i>	Long-nosed Potoroo	V	V	K
Pteropodidae	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	8
Vespertilionidae	<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	2
	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	-	1
	<i>Kerivoula papuensis</i>	Golden-tipped Bat	V	-	7
	<i>Miniopterus australis</i>	Little Bentwing-bat	V	-	7
	<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	V	-	8
	<i>Myotis macropus</i>	Southern Myotis	V	-	1
	<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	-	2
	<i>Vespadelus troughtoni</i>	Eastern Cave Bat	V	-	K

Notes:

V = Vulnerable
M = Migratory

E = Endangered
P = Predicted to occur

CE = Critically Endangered
K = Known to Occur

Threatened ecological communities that been recorded or have the potential to occur within 10km of the Project Application Area.

Vegetation community	TSC Act	EPBC Act
<i>Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i>	E	-
<i>Coastal Upland Swamp in the Sydney Basin Bioregion</i>	E	-
<i>Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i>	E	-
<i>Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions</i>	E	-
<i>Kincumber Scribbly Gum Forest in the Sydney Basin Bioregion</i>	CE	-
<i>Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i>	E	CE
<i>Lower Hunter Spotted Gum-Ironbark Forest in the Sydney Basin Bioregion</i>	E	-
<i>Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions</i>	E	CE
<i>Quorrobolong Scribbly Gum Woodland in the Sydney Basin Bioregion</i>	E	-
<i>River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i>	E	-
<i>Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i>	E	-
<i>Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i>	E	-
<i>Sydney Freshwater Wetlands in the Sydney Basin Bioregion</i>	E	-
<i>Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions</i>	E	-
<i>Umina Coastal Sandplain Woodland in the Sydney Basin Bioregion</i>	E	-

Notes:

E = Endangered

CE = Critically Endangered

Appendix – 2: Assessment of Significant Species/Communities Table

Threatened flora and fauna species (listed under the TSC Act and/or EPBC Act) that have been gazetted and recorded within a 10 km radius of the Project Application Area have been considered within this assessment. Endangered Ecological Communities (EEC's) known from the broader area have also been addressed. Each species / community is considered for its potential to occur within the Project Application Area.

This assessment deals with the following heads of consideration in tabulated form (following table):

'Species / Community'– Lists each threatened species / EEC known from the vicinity. The status of each threatened species under the TSC Act and EPBC Act are also provided.

'Species Distribution and Preferred Habitat' – Provides a brief account of the species / community / population and the distribution and preferred habitat attributes required for the existence / survival of each species / community.

'Likelihood of Occurrence' – Assesses the likelihood of each species / community to occur along or within the immediate vicinity of the Project Application Area in terms of the aforementioned habitat description and taking into account local habitat preferences, previous field investigations, data gained from various sources (such as OEH Atlas of NSW Wildlife, HBOC records etc) and previously gained knowledge via fieldwork undertaken within other RPS ecological assessments of the area.

'Potential for Impact' – Assesses the potential of each species/community/population to be impacted within the Project Application Area.

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Table 1. Assessment of Likelihood of Occurrence of Threatened Species and Communities and Assessment of Potential Impacts

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
Flora			
<i>Cynanchum elegans</i> White-flowered Wax Plant E, E*	Restricted to eastern NSW where it is distributed from Brunswick Heads on the north coast to Gerroa in the Illawarra region. The species has been recorded as far west as Merriwa in the upper Hunter River valley. The White-flowered Wax Plant usually occurs on the edge of dry rainforest vegetation. Other associated vegetation types include littoral rainforest; Coastal Tea-tree <i>Leptospermum laevigatum</i> – Coastal Banksia <i>Banksia integrifolia</i> subsp. <i>integrifolia</i> coastal scrub; Forest Red Gum <i>Eucalyptus tereticornis</i> aligned open forest and woodland; Spotted Gum <i>Corymbia maculata</i> aligned open forest and woodland; and Bracelet Honey myrtle <i>Melaleuca armillaris</i> scrub to open scrub. Flowering occurs between August and May, with a peak in November. Flower abundance on individual plants varies from sparse to prolific.	No suitable dry rainforest habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Astrotricha crassifolia</i> Thick-leaf Star-hair V, V*	Occurs near Patonga (Gosford LGA), and in Royal NP and on the Woronora Plateau (Sutherland and Campbelltown LGAs). There is also a record from near Glen Davis (Lithgow LGA). Occurs in dry sclerophyll woodland on sandstone. Flowers in spring.	Suitable woodland habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Rutidosia heterogama</i> Heath Wrinklewort V, V*	Recorded from near Cessnock to Kurri Kurri with an outlying occurrence at Howes Valley. On the Central Coast it is located north from Wyong to Newcastle. There are north coast populations between Woolli and Evans Head in Yuraygir and Bundjalung National Parks. It also occurs on the New England Tablelands from Torrington and Ashford south to Wandsworth south-west of Glen Innes. Grows in heath on sandy soils and moist areas in open forest, and has been recorded along disturbed roadsides.	Suitable moist areas in open forest habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Senecio spathulatus</i> Coast Groundsel E	Coast Groundsel occurs in Nadgee Nature Reserve (Cape Howe) and between Kurnell in Sydney and Myall Lakes National Park (with a possible occurrence at Cudmirrah). In Victoria there are scattered populations from Wilsons Promontory to the NSW border. Coast Groundsel grows on frontal dunes.	No suitable frontal dunes habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Wilsonia backhousei</i> Narrow-leafed Wilsonia V	In NSW Narrow-leaf Wilsonia is found on the coast between Mimosa Rocks National Park and Wamberal north of Sydney (Nelson's Lake, Potato Point, Sussex Inlet, Wowly Gully, Parramatta River at Ermington, Clovelly, Voyager Point, Wollongong and Royal National Park). It grows in all southern states. This is a species of the margins of salt marshes and lakes. Flowering occurs in spring and summer.	No suitable salt marshes and lake habitats occur within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Hibbertia procumbens</i> Spreading Guinea Flower E	Within NSW, known from several locations only on the Central Coast in the Gosford and Wyong local government areas. These populations are at Bumble Hill near Yarramalong in Wyong LGA; Kulnura, Strickland State Forest, Mangrove Mountain, Somersby, Calga/Mt White and Peats Ridge in the Gosford LGA; and near Mogo Creek to the west of Mangrove Creek Dam. It has been recorded in four conservation reserves: Yengo, Popran and Brisbane Water National Parks and the non-production Strickland State Forest. Also occurs in Victoria and Tasmania, although investigation is required to verify that the disjunct NSW populations are the same species. Majority of known populations occur within <i>Banksia ericifolia</i>–<i>Angophora hispida</i>–<i>Allocasuarina distyla</i> scrub/heath on skeletal sandy soils. May also be found associated with 'hanging swamp' vegetation communities on sandy deposits. Flowers in summer.	No suitable scrub/heath or hanging swamp habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Tetratheca glandulosa</i> V, V*	restricted to the following Local Government Areas: Baulkham Hills, Gosford, Hawkesbury, Hornsby, Ku-ring-gai, Pittwater, Ryde, Warringah, and Wyong. There are approximately 150 populations of this plant ranging from Sampons Pass (Yengo NP) in the north to West Pymble (Lane Cove NP) in the south. The eastern limit is at Ingleside (Pittwater LGA) and the western limit is at East Kurrajong (Wollemi NP). There are historical collections of this species south to Manly, Willoughby and Mosman, however these populations are now extinct. The current north-south range is approximately 65km. Associated with shale-sandstone transition habitat where shale-cappings occur over sandstone, with associated soil landscapes such as Lucas Heights, GyMEA, Lambert and Faulconbridge. Topographically, the plant occupies ridgetops, upper-slopes and to a lesser extent mid-slope sandstone benches. Soils are generally shallow, consisting of a yellow, clayey/sandy loam. Stony lateritic fragments are also common in the soil profile on many of these ridgetops. Vegetation structure varies from heaths and scrub to woodlands/open woodlands, and open forest. Vegetation communities correspond broadly to Benson & Howell's Sydney Sandstone Ridgetop Woodland (Map Unit 10ar). Common woodland tree species include: <i>Corymbia gummifera</i>, <i>C. eximia</i>, <i>Eucalyptus haemastoma</i>, <i>E. punctata</i>, <i>E. racemosa</i>, and/or <i>E. sparsifolia</i>, with an understorey dominated by species from the families Proteaceae, Fabaceae, and Epacridaceae. Flowers July-November however residual flowers may persist until late December. Flowering influenced by seasonal weather conditions and/or the microclimate effects (eg. exposure) of each particular site.	It is likely that <i>Corymbia gummifera</i> and <i>E. punctata</i> habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Tetratheca juncea</i> Black-eyed Susan V, V*	Confined to the northern portion of the Sydney Basin bioregion and the southern portion of the North Coast bioregion in the local government areas of Wyong, Lake Macquarie, Newcastle, Port Stephens, Great Lakes and Cessnock. It is usually found in low open forest/woodland with a mixed shrub understorey and grassy groundcover. However, it has also been recorded in heathland and moist forest. The majority of populations occur on low nutrient soils associated with the Awaba Soil Landscape. While some studies show the species has a preference for cooler southerly aspects, it has been found on slopes with a variety of aspects. It generally prefers well-drained sites below 200m elevation and annual rainfall between 1000 - 1200mm. The preferred substrates are sandy skeletal soil on sandstone, sandy-loam soils, low nutrients; and clayey soil from conglomerates, pH neutral.	This species has been recorded adjacent to the Project Application Area (Cumberland Ecology 2007; RPS unpublished data) and patches of suitable habitat occur on the Project Application Area. Therefore, this species is considered likely to occur within the Project Application Area.	It is considered unlikely that this species habitat will be impacted by the <20 mm of subsidence. However, as this species is likely to occur on the Project Application Area, a 7-part test of significance (TSC Act) has been applied to this species in Appendix 2 as well as an AoS (EPBC Act) in Appendix 3 .
<i>Epacris purpurascens</i> var. <i>purpurascens</i> V	Recorded from Gosford in the north, to Narrabeen in the east, Silverdale in the west and Avon Dam vicinity in the South. Found in a range of habitat types, most of which have a strong shale soil influence.	No suitable strong shale soil habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Chamaesyce psammogeton</i> Sand Spurge E	Sand Spurge is found sparsely along the coast from south of Jervis Bay (at Currarong, Culburra and Seven Mile Beach National Park) to Queensland (and Lord Howe Island). Populations have been recorded in Wamberal Lagoon Nature Reserve, Myall Lakes National Park, Moonee Beach Nature Reserve and Bundjalung National Park. Grows on fore-dunes, pebbly strandlines and exposed headlands, often with Spinifex (<i>Spinifex sericeus</i>) and Prickly Couch (<i>Zoysia macrantha</i>). Flowering recorded in spring and summer.	No suitable fore-dunes habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Senna acclinis</i> Rainforest Cassia E	Coastal districts and adjacent tablelands of NSW from the Illawarra in NSW to Queensland. Grows in or on the edges of subtropical and dry rainforest.	No suitable subtropical or dry rainforest habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Pultenaea maritima</i> Coast Headland Pea V	Occurs in New South Wales and Queensland. Within NSW, the species has been recorded from Newcastle north to Byron Bay on 16 headlands. Populations vary from a few plants to larger populations of many hundreds of individuals where the species is a major component of the Kangaroo Grass Headland community. Five sites occur within conservation reserves. The species occurs in grasslands, shrublands and heath on exposed coastal headlands.	No suitable grasslands, shrublands and heath on exposed coastal headlands habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Acacia bynoeana</i> Bynoe's Wattle E, V*	Bynoe's wattle is found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains. The species is currently known from about 30 locations, with the size of the populations at each location being very small (1-5 plants). It has recently been found in the Colymea and Parma Creek areas west of Nowra. Occurs in heath or dry sclerophyll forest on sandy soils. Seems to prefer open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple.	Suitable dry sclerophyll forest on sandy soils habitat occurs within the Project Application Area. This species has also been recorded in close proximity to the Project Application Area (Cumberland Ecology 2007). Therefore, this species is considered likely to occur within the Project Application Area.	It is considered unlikely that this species habitat will be impacted by the <20 mm of subsidence. However, as this species is likely to occur on the Project Application Area, a 7-part test of significance (TSC Act) has been applied to this species in Appendix 2 as well as an AoS (EPBC Act) in Appendix 3 .
<i>Maundia triglochinos</i> V	Restricted to coastal NSW and extending into southern Queensland. The current southern limit is Wyong; former sites around Sydney are now extinct. Grows in swamps, lagoons, dams, channels, creeks or shallow freshwater 30 - 60 cm deep on heavy clay, low nutrients. Flowering occurs during warmer months. Associated with wetland species e.g. <i>Triglochin procerum</i>.	No suitable swamps, lagoons, dams, channels, creeks or shallow freshwater habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Prostanthera askania</i> Tranquility Mintbush E, E*	Occurs over a very restricted geographic range (of less than 12 km) in the upper reaches of creeks that flow into Tuggerah Lake or Brisbane Water within the Wyong and Gosford local government areas. Eight populations are known from the catchments of Ourimbah Creek, Narara Creek, Dog Trap Gully, Chittaway Creek and Berkeley Creek. A further two populations are known from the Erina Creek–Fires Creek catchment. The species may also have occurred in West Gosford. Occurs adjacent to, but not immediately in, drainage lines on flat to moderately steep slopes formed on Narrabeen sandstone and alluvial soils derived from it. Occurs in moist sclerophyll forest and warm temperate rainforest communities, and the ecotone between them. These communities are generally tall forests with a mesic understorey; Sydney Blue Gum <i>Eucalyptus saligna</i> and Turpentine <i>Syncarpia glomulifera</i> are usually present, though canopy species present can be highly variable.	No suitable moist sclerophyll forest and warm temperate rainforest ecotone habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Prostanthera junonis</i> Somersby Mintbush E, E*	Has a north-south range of approximately 19 km on the Somersby Plateau in the Gosford and Wyong local government areas. The species is restricted to the Somersby Plateau. It occurs on both the Somersby and Sydney Town soil landscapes on gently undulating country over weathered Hawkesbury sandstone within open forest/low woodland/open scrub. It occurs in both disturbed and undisturbed sites. The dominant flowering period for this species is October to mid-December depending on weather/site conditions. The plant is very difficult to identify outside of this time.	No suitable Somersby Plateau habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Angophora inopina</i> Charmhaven Apple V, V*	Endemic to the Central Coast region of NSW. The known northern limit is near Karuah where a disjunct population occurs; to the south populations extend from Toronto to Charmhaven with the main population occurring between Charmhaven and Morisset. There is an unconfirmed record of the species near Bulahdelah. Approximately 1250 ha of occupied habitat has been mapped in the Wyong–southern Lake Macquarie area. Occurs most frequently in four main vegetation communities: (i) <i>Eucalyptus haemastoma</i>–<i>Corymbia gummifera</i>–<i>Angophora inopina</i> woodland/forest; (ii) <i>Hakea teretifolia</i>–<i>Banksia oblongifolia</i> wet heath; (iii) <i>Eucalyptus resinifera</i>–<i>Melaleuca sieberi</i>–<i>Angophora inopina</i> sedge woodland; (iv) <i>Eucalyptus capitellata</i>–<i>Corymbia gummifera</i>–<i>Angophora inopina</i> woodland/forest.	No suitable habitat (of the four habitat types known) occurs within the Project Application Area. However, this species has been recorded in close proximity to the Project Application Area (Cumberland Ecology 2007). Therefore, this species is considered to have potential to occur within the Project Application Area.	It is considered unlikely that this species habitat will be impacted by the <20 mm of subsidence. However, as this species has potential as there are records in close proximity to the Project Application Area. Therefore, a 7-part test of significance (TSC Act) has been applied to this species in Appendix 2 as well as an AoS (EPBC Act) in Appendix 3 .

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Callistemon linearifolius</i> Netted Bottle Brush V	Recorded from the Georges River to Hawkesbury River in the Sydney area, and north to the Nelson Bay area of NSW. Recorded in 2000 at Coalcliff in the northern Illawarra. For the Sydney area, recent records are limited to the Hornsby Plateau area near the Hawkesbury River. The species was more widespread in the past, and there are currently only 5-6 populations remaining from the 22 populations historically recorded in the Sydney area. Three of the remaining populations are reserved in Ku-ring-gai Chase National Park, Lion Island Nature Reserve and Spectacle Island Nature Reserve. The species has also been recorded from Yengo National Park. Grows in dry sclerophyll forest on the coast and adjacent ranges. Flowers spring – summer.	Suitable dry sclerophyll forest on the coast and adjacent ranges habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Darwinia glaucophylla</i> V	Occurs between Gosford and the Hawkesbury River around Calga, Karing and Mt Karing. Known from approximately 15 sites, several within or near to Brisbane Waters NP and one within Popran NP. Occurs entirely within the Gosford Local Government Area of the Sydney Basin Bioregion. Occurs in sandy heath, scrub and woodlands often associated with sandstone rock platforms or near hanging swamps and friable sandstone shallow soils. Associated species in scrub include: <i>Banksia ericifolia</i>, <i>Acacia terminalis</i>, <i>A. oxycedrus</i>, <i>Angophora hispida</i>, <i>Hakea teretifolia</i>, <i>Bauera rubioides</i>, and in woodland: <i>Corymbia gummifera</i>, <i>C. eximia</i>, <i>Eucalyptus haemastoma</i> and <i>E. punctata</i>. Flowers winter and spring.	This species is not known from the northern area of the Central Coast. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Eucalyptus camfieldii</i> Camfield's Stringybark V, V*	Restricted distribution in a narrow band with the most northerly records in the the Raymond Terrace area south to Waterfall. Localised and scattered distribution includes sites at Norah Head (Tuggerah Lakes), Peats Ridge, Mt Colah, Elvina Bay Trail (West Head), Terrey Hills, Killara, North Head, Menai, Wattamolla and a few other sites in Royal National Park. Poor coastal country in shallow sandy soils overlying Hawkesbury sandstone. Coastal heath mostly on exposed sandy ridges. Occurs mostly in small scattered stands near the boundary of tall coastal heaths and low open woodland of the slightly more fertile inland areas. Associated species frequently include stunted species of <i>E. oblonga</i> Narrow-leaved Stringybark, <i>E. capitellata</i> Brown Stringybark and <i>E. haemastoma</i> Scribbly Gum.	No suitable heath habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i> V, V*	There are two separate meta-populations of <i>E. parramattensis</i> subsp. <i>decadens</i>. The Kurri Kurri meta-population is bordered by Cessnock—Kurri Kurri in the north and Mulbring—Abedare in the south. Large aggregations of the subspecies are located in the Tomalpin area. The Tomago Sandbeds meta-population is bounded by Salt Ash and Tanilba Bay in the north and Williamtown and Tomago in the south. Generally occupies deep, low-nutrient sands, often those subject to periodic inundation or where water tables are relatively high. It occurs in dry sclerophyll woodland with dry heath understorey. It also occurs as an emergent in dry or wet heathland. Often where this species occurs, it is a community dominant. In the Kurri Kurri area, <i>E. parramattensis</i> subsp. <i>decadens</i> is a characteristic species of 'Kurri Sand Swamp Woodland in the Sydney Basin Bioregion', an endangered ecological community under the TSC Act. In the Tomago Sandbeds area, the species is usually associated with the 'Tomago Swamp Woodland' as defined by NSW NPWS (2000).	No suitable dry or wet heathland habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Eucalyptus parramattensis</i> subsp. <i>parramattensis</i> E -pop	The species usually occurs from the Goulburn Valley on the Central West slopes to Hill Top on the Central Coast. The endangered population in the Lake Macquarie and Wyong local government areas is at the north-eastern limit of the species range and is quite separate from other known populations. The majority of the population occurs within Wyong in the Porter's Creek and the Wallarah Creek catchments. This species is associated with low moist areas alongside drainage lines and adjacent to wetlands. It is often found in woodland on sandy soils. The endangered population occurs on sandy alluvium within a floodplain community which also supports <i>Eucalyptus robusta</i> (Swamp mahogany), <i>E. tereticornis</i> (Forest Red Gum), <i>E. gummiifera</i> (Sydney Bloodwood) as well as Melaleuca (Paperbark) species.	Suitable swamp habitat likely occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impact by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Melaleuca biconvexa</i> Biconvex Paperbark V, V*	Biconvex Paperbark is only found in NSW, with scattered and dispersed populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north. Biconvex Paperbark generally grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects.	Suitable swamp habitat likely occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impact by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Melaleuca groveana</i> Grove's Paperbark V	Widespread, scattered populations in coastal districts north of Port Stephens to southeast Queensland. Grove's Paperbark grows in heath and shrubland, often in exposed sites, at high elevations, on rocky outcrops and cliffs. It also occurs in dry woodlands.	This species is not known from the Central Coast area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Syzygium paniculatum</i> Magenta Lilly Pilly E, V*	The Magenta Lilly Pilly is found only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest. On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.	No riverside gallery rainforests and remnant littoral rainforest habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Caladenia porphyrea</i> E	In NSW, <i>Caladenia porphyrea</i> has a highly restricted geographic distribution. It has been recorded from 2 localities in the Wyong Local Government Area north of Gosford approximately 2 km apart. At these locations it covers areas of about 2 ha and 0.2 ha respectively. <i>Caladenia porphyrea</i> grows in coastal sclerophyll forest on sandy soils.	This species is not known from the northern area of the Central Coast. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Caladenia tessellata</i> Thick Lip Spider Orchid E, V*	The Thick Lip Spider Orchid is known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW. Populations in Kiama and Queanbeyan are presumed extinct. It was also recorded in the Huskisson area in the 1930s. The species occurs on the coast in Victoria from east of Melbourne to almost the NSW border. Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. Flowers appear between September and November (but apparently generally late September or early October in extant southern populations).	Suitable grassy sclerophyll woodland habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impact by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Corunastylis</i> sp. Charmhaven (NSW896673) CE	<i>Corunastylis</i> sp. Charmhaven (NSW896673) is currently only known from the Wyong Shire of NSW where it is restricted to a single location in the Gorokan/Charmhaven area. It occurs within low woodland to heathland with a shrubby understorey and ground layer. Dominants include <i>Allocasuarina littoralis</i> , <i>Leptospermum juniperinum</i> , <i>Melaleuca nodosa</i> , <i>Callistemon linearis</i> and <i>Schoenus brevifolius</i> .	Suitable woodland habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Corybas dowlingii</i> Red Helmet Orchid E	<i>Corybas dowlingii</i> is restricted to the central coast and Hunter regions of New South Wales where it is currently known from the Port Stephens, Bulahdelah, Lake Macquarie and Freemans Waterhole areas. It is known from the local government areas of Cessnock, Great Lakes, Lake Macquarie and Port Stephens. Sheltered areas such as gullies and southerly slopes in tall open forest on well-drained gravelly soil at elevations of 10-200 m. Flowering occurs from June to August.	Suitable forest habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Cryptostylis hunteriana</i> Leafless Tongue Orchid V, V*	The Leafless Tongue Orchid has been recorded from as far north as Gibraltar Range National Park south into Victoria around the coast as far as Orbost. It is known historically from a number of localities on the NSW south coast and has been observed in recent years at many sites between Batemans Bay and Nowra (although it is uncommon at all sites). Also recorded at Nelson Bay, Wyee, Washpool National Park, Nowendoc State Forest, Ku-Ring-Gai Chase National Park and Ben Boyd National Park. Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. The larger populations typically occur in woodland dominated by Scribbly Gum (<i>Eucalyptus sclerophylla</i>), Silvertop Ash (<i>E. sieberi</i>), Red Bloodwood (<i>Corymbia gummiifera</i>) and Black Sheoak (<i>Allocasuarina littoralis</i>); appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (<i>C. subulata</i>) and the Tartan Tongue Orchid (<i>C. erecta</i>).	Suitable woodland habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Dendrobium melaleucaphilum</i> Spider orchid E	In NSW, it is currently known from seven recent collections. There has been no subsequent confirmation from the locations of three earlier (pre-1922) collections and it is possible that these are now extinct. Grows frequently on <i>Melaleuca styphelioides</i> , less commonly on rainforest trees or on rocks in coastal districts. Flowers July–October.	It is unlikely that habitat accommodating <i>Melaleuca styphelioides</i> on which this species grows, occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Diuris bracteata</i> E, X*	For over 100 years <i>Diuris bracteata</i> was known only from the original collection made near Gladesville in northern Sydney. The complete absence of records for most of the 20th Century resulted in this species being listed as 'presumed extinct' on Part 4 of Schedule 1 of the Threatened Species Conservation Act. In recent years, however, extant populations from north-west of Gosford have been recorded and this area is now the only known area of occurrence of the species. All known plants fall within the Gosford and Wyong Local Government Areas. Dry sclerophyll woodland and forest with a predominantly grassy understorey.	This species is not known from the northern area of the Central Coast. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Diuris praecox</i> Rough Doubletail V, V*	Known from between Bateau Bay and Smiths Lake. Grows on hills and slopes of near-coastal districts in open forests which have a grassy to fairly dense understorey. Exists as subterranean tubers most of the year. It produces leaves and flowering stems in winter.	No hills and slopes of near-coastal districts in open forests habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Genoplesium insignis</i> Variable Midge Orchid E	Recorded from four localities between Chain Valley Bay and Wyong in Wyong local government area. Grows in patches of <i>Themeda australis</i> (Kangaroo Grass) amongst shrubs and sedges in heathland and forest. Associated vegetation at Chain Valley Bay is described as dry sclerophyll woodland dominated by <i>Eucalyptus haemastoma</i> (Scribbly Gum), <i>Corymbia gummifera</i> (Red Bloodwood), <i>Angophora costata</i> (Smooth-barked Apple) and <i>Allocasuarina littoralis</i> (Black She-oak). Flowering period is September to October.	Suitable forest habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impact by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Prasophyllum</i> sp. Wybong (C.Phelps ORG 5269) a leek-orchid -, CE*	The species is known from seven populations, with an estimated total population size based on surveys in 2006 of 460 mature individuals. The total population size could be larger as suitable habitat surrounding the population near Wybong has not been surveyed. Leek orchids are generally found in shrubby and grassy habitats in dry to wet soil. <i>Prasophyllum</i> sp. Wybong is known to occur in open eucalypt woodland and grassland	This species is not known from the northern area of the Central Coast. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Pterostylis gibbosa</i> Illawarra Greenhood E, E*	Known from a small number of populations in the Hunter region (Milbrodale), the Illawarra region (Albion Park and Yallah) and the Shoalhaven region (near Nowra). It is apparently extinct in western Sydney which is the area where it was first collected (1803). All known populations grow in open forest or woodland, on flat or gently sloping land with poor drainage. In the Illawarra region, the species grows in woodland dominated by Forest Red Gum <i>Eucalyptus tereticornis</i>, Woollybutt <i>E. longifolia</i> and White Feather Honey-myrtle <i>Melaleuca decora</i>. Near Nowra, the species grows in an open forest of Spotted Gum <i>Corymbia maculata</i>, Forest Red Gum and Grey Ironbark <i>E. paniculata</i>. In the Hunter region, the species grows in open woodland dominated by Narrow-leaved Ironbark <i>E. crebra</i>, Forest Red Gum and Black Cypress Pine <i>Callitris endlicheri</i>.	This species is not known from the northern area of the Central Coast. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Rhizanthella slateri</i> Eastern Underground Orchid V, E*	Occurs from south-east Queensland to south-east NSW. In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest. Highly cryptic given that it grows almost completely below the soil surface, with flowers being the only part of the plant that can occur above ground. Therefore usually located only when the soil is disturbed. Flowers September to November.	Suitable sclerophyll forest habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impact by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Thelymitra</i> sp. <i>adorata</i> Wyong Sun Orchid CE	Currently known from a few localised occurrences in the area bounded by the towns of Wyong, Warnervale and Wyongah on the New South Wales Central Coast, within the Wyong Local Government Area. Occurs from 10-40 m a.s.l. in grassy woodland or occasionally derived grassland in well-drained clay loam or shale derived soils. The vegetation type in which the majority of populations occur (including the largest colony) is a Spotted Gum - Ironbark Forest with a diverse grassy understorey and occasional scattered shrubs	Suitable Spotted Gum - Ironbark Forest habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Persicaria elatior</i> Tall Knotweed V, V*	Tall Knotweed has been recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). The species also occurs in Queensland. This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	No streams and lake habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Grevillea parviflora</i> subsp. <i>parviflora</i> Small-flower Grevillea V, V*	Sporadically distributed throughout the Sydney Basin with the main occurrence centred around Picton, Appin and Bargo (and possibly further south to the Moss Vale area). Separate populations are also known further north from Putty to Wyong and Lake Macquarie on the Central Coast and Cessnock and Kurri Kurri in the Lower Hunter. Grows in sandy or light clay soils usually over thin shales. Occurs in a range of vegetation types from heath and shrubby woodland to open forest. Found over a range of altitudes from flat, low-lying areas to upper slopes and ridge crests.	This species has been recorded adjacent to the Project Application Area (Cumberland Ecology 2007; RPS unpublished data) and patches of suitable habitat occur on Project Application Area. Therefore, this species is considered likely to occur within the Project Application Area.	It is considered unlikely that this species habitat will be impacted by the <20 mm of subsidence. However, as this species is likely to occur on the Project Application Area, A 7-part test of significance (TSC Act) has been applied to this species in Appendix 2 as well an AoS (EPBC Act) in Appendix 3.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Asterolasia elegans</i> E, E*	Occurs north of Sydney, in the Baulkham Hills, Hawkesbury and Hornsby local government areas. Also likely to occur in the western part of Gosford local government area. Known from only seven populations, only one of which is wholly within a conservation reserve. Occurs on Hawkesbury sandstone. Found in sheltered forests on mid- to lower slopes and valleys, e.g. in or adjacent to gullies which support sheltered forest. The canopy at known sites includes Turpentine (<i>Syncarpia glomulifera</i> subsp. <i>glomulifera</i>), Smooth-barked Apple (<i>Angophora costata</i>), Sydney Peppermint (<i>Eucalyptus piperita</i>), Forest Oak (<i>Allocasuarina torulosa</i>) and Christmas Bush (<i>Ceratopetalum gummiiferum</i>).	This species is not known from the northern area of the Central Coast. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Zannichellia palustris</i> E	In NSW, known from the lower Hunter and in Sydney Olympic Park. Grows in fresh or slightly saline stationary or slowly flowing water.	No in fresh or slightly saline stationary or slowly flowing water habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Pelargonium</i> sp. Striatellum (G.W.Carr 10345) Omeo Stork's-bill -, E*	<i>Pelargonium</i> sp. Striatellum (G.W.Carr 10345) occurs at Lake Omeo, Victoria and Lake Bathurst, NSW with populations situated within a linear strip, approximately 20 km wide, between these two locations. <i>Pelargonium</i> sp. Striatellum (G.W.Carr 10345) is known to occur in habitat usually located just above the high water level of irregularly inundated or ephemeral lakes. During dry periods, the species is known to colonise exposed lake beds. It is not known if the species' rhizomes and soil seedbank persist the rough prolonged inundation or drought.	No irregularly inundated or ephemeral lake habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Streblus pendulinus</i> Siah's Backbone -, E*	On the Australian mainland, Siah's Backbone is found in warmer rainforests, chiefly along watercourses. The altitudinal range is from near sea level to 800 m above sea level. The species grows in well developed rainforest, gallery forest and drier, more seasonal rainforest.	No suitable rainforest habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
Avifauna			

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Anseranas semipalmata</i> Magpie Goose V	Since the 1980s there have been an increasing number of records in central and northern NSW. Vagrants can follow food sources to south-eastern NSW. Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. Equally at home in aquatic or terrestrial habitats; often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes.	No suitable shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges habitat occur within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Nettapus coromandelianus</i> Cotton Pygmy-Goose E	Although once found from north Queensland to the Hunter River in NSW, the Cotton Pygmy-Goose is now only a rare visitor to NSW. Freshwater lakes, lagoons, swamps and dams, particularly those vegetated with waterlilies and other floating and submerged aquatic vegetation. The Cotton Pygmy-goose uses standing dead trees with hollows close to water for roosting and breeding.	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Oxyura australis</i> Blue-billed Duck V	It is widespread in NSW, but most common in the southern Murray-Darling Basin area. Birds disperse during the breeding season to deep swamps up to 300 km away. It is generally only during summer or in drier years that they are seen in coastal areas. The Blue-billed Duck prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover. It will fly if disturbed, but prefers to dive if approached.	No suitable large permanent water body habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Stictonetta naevosa</i> Freckled Duck V	The Freckled Duck is found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. It breeds in large temporary swamps created by floods in the Bulloo and Lake Eyre basins and the Murray-Darling system, particularly along the Paroo and Lachlan Rivers, and other rivers within the Riverina. The duck is forced to disperse during extensive inland droughts when wetlands in the Murray River basin provide important habitat. The species may also occur as far as coastal NSW and Victoria during such times. Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds.	No suitable permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Ptilinopus magnificus</i> Wompoo Fruit-Dove V	Occurs along the coast and coastal ranges from the Hunter River in NSW to Cape York Peninsula. It is rare south of Coffs Harbour. Three subspecies are recognised, with the most southerly in NSW and south-eastern Queensland. It used to occur in the Illawarra, though there are no recent records. Occurs in, or near rainforest, low elevation moist eucalypt forest and brush box forests.	Suitable low elevation moist eucalypt forest habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Ptilinopus regina</i> Rose-crowned Fruit-Dove V	Coast and ranges of eastern NSW and Queensland, from Newcastle to Cape York. Rose-crowned Fruit-doves occur mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful.	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Ptilinopus superbus</i> Superb Fruit-Dove V	The Superb Fruit-dove occurs principally from north-eastern in Queensland to north-eastern NSW. It is much less common further south, where it is largely confined to pockets of suitable habitat as far south as Moruya. Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees.	No suitable rainforest habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Ephippiorhynchus asiaticus</i> Black-necked Stork E	In NSW, the species becomes increasingly uncommon south of the Northern Rivers region, and rarely occurs south of Sydney. Since 1995, breeding has been recorded as far south as Buladelah. Black-necked Storks are mainly found on shallow, permanent, freshwater terrestrial wetlands, and surrounding marginal vegetation, including swamps, floodplains, watercourses and billabongs, freshwater meadows, wet heathland, farm dams and shallow floodwaters, as well as extending into adjacent grasslands, paddocks and open savannah woodlands. They also forage within or around estuaries and along intertidal shorelines, such as saltmarshes, mudflats and sandflats, and mangrove vegetation.	No suitable shallow, permanent, freshwater terrestrial wetlands and surrounding marginal vegetation habitat occur within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Botaurus poiciloptilus</i> Australasian Bittern E, E*	In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (<i>Typha</i> spp.) and spikerushes (<i>Eleocharis</i> spp.).	No suitable permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (<i>Typha</i> spp.) and spikerushes (<i>Eleocharis</i> spp.) occur within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Ixobrychus flavicollis</i> Black Bittern V	In NSW, records of the species are scattered along the east coast, with individuals rarely being recorded south of Sydney or inland. Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves.	No suitable wetland habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Circus assimilis</i> Spotted Harrier V	Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including <i>Acacia</i> and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.	Due to the presence of habitat, or be it sub-optimal, there is potential for this species to occur on the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Erythrotriorchis radiates</i> Red Goshawk CE, V*	he species is very rare in NSW, extending south to about 30°S, with most records north of this, in the Clarence River Catchment, and a few around the lower Richmond and Tweed Rivers. Formerly, it was at least occasionally reported as far south as Port Stephens. Red Goshawks inhabit open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water, and are often found in riparian habitats along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, <i>Melaleuca</i> swamp forest and riparian <i>Eucalyptus</i> forest of coastal rivers.	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Hieraaetus morphnoides</i> Little Eagle V	It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Sheoak or <i>Acacia</i> woodlands and riparian woodlands of interior NSW are also used.	Due to the presence of habitat, or be it sub-optimal, there is potential for this species to occur on the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Lophoictinia isura</i> Square-tailed Kite V	In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast, arriving in September and leaving by March. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses.	Due to the presence of habitat, or be it sub-optimal, there is potential for this species to occur on Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Burhinus grallarius</i> Bush Stone-curlew E	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range. Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber.	Suitable open forests and woodlands with a sparse grassy groundlayer and fallen timber habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required. .
<i>Haematopus fuliginosus</i> Sooty Oystercatcher V	Sooty Oystercatchers are found around the entire Australian coast, including offshore islands, being most common in Bass Strait. Small numbers of the species are evenly distributed along the NSW coast. Favours rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries.	No suitable rocky headlands, rocky shelves, exposed reefs with rock a pool, beaches or muddy estuary habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Haematopus longirostris</i> Pied Oystercatcher E	In NSW the species is thinly scattered along the entire coast, with fewer than 200 breeding pairs estimated to occur in the State. Favours intertidal flats of inlets and bays, open beaches and sandbanks.	No suitable intertidal flats, open beaches or sandbank habitat occur within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Charadrius leschenaultii</i> Greater Sand-plover V, M*	In NSW, the species has been recorded between the northern rivers and the Illawarra, with most records coming from the Clarence and Richmond estuaries. Almost entirely restricted to coastal areas in NSW, occurring mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks. Roosts during high tide on sandy beaches and rocky shores; begin foraging activity on wet ground at low tide, usually away from the edge of the water; individuals may forage and roost with other waders.	No suitable beaches or estuaries habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Charadrius mongolus</i> Lesser Sand-plover V, M*	In Australia the species is found around the entire coast but is most common in the Gulf of Carpentaria, and along the east coast of Queensland and northern NSW. Individuals are rarely recorded south of the Shoalhaven estuary, and there are few inland records. Almost entirely coastal in NSW, favouring the beaches of sheltered bays, harbours and estuaries with large intertidal sandflats or mudflats; occasionally occurs on sandy beaches, coral reefs and rock platforms. Roosts during high tide on sandy beaches, spits and rocky shores; forage individually or in scattered flocks on wet ground at low tide, usually away from the water's edge.	No suitable beaches or estuaries habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Irediparra gallinacea</i> Comb-crested Jacana V	The Comb-crested Jacana occurs on freshwater wetlands in northern and eastern Australia, mainly in coastal and subcoastal regions, from the north-eastern Kimberley Division of Western Australia to Cape York Peninsula then south along the east coast to the Hunter region of NSW, with stragglers recorded in south-eastern NSW (possibly in response to unfavourable conditions further north). Inhabit permanent freshwater wetlands, either still or slow-flowing, with a good surface cover of floating vegetation, especially water-lilies, or fringing and aquatic vegetation.	No suitable permanent freshwater wetland habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Rostratula australis</i> Australian Painted Snipe E, E*	In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds.	No suitable wetland habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Calidris alba</i> Sanderling V, M*	It is uncommon to locally common, arriving from September and leaving by May (some may overwinter in Australia). Sanderlings occur along the NSW coast, with occasional inland sightings. Often found in coastal areas on low beaches of firm sand, near reefs and inlets, along tidal mudflats and bare open coastal lagoons; individuals are rarely recorded in near-coastal wetlands.	No suitable beaches habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Calidris ferruginea</i> Curlew Sandpiper E, M*	It occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of birds pausing for a few days during migration. It arrives in Australia between August and November, and departing between March and mid-April. It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes the inland.	No suitable littoral and estuarine habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within subject the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Calidris tenuirostris</i> Great Knot V, M*	In NSW, the species has been recorded at scattered sites along the coast to about Narooma. It has also been observed inland at Tullakool, Armidale, Gilgandra and Griffith. Migrates to Australia from late August to early September, although juveniles may not arrive until October-November. Occurs within sheltered, coastal habitats containing large, intertidal mudflats or sandflats, including inlets, bays, harbours, estuaries and lagoons. Often recorded on sandy beaches with mudflats nearby, sandy spits and islets and sometimes on exposed reefs or rock platforms.	No suitable intertidal mudflats or sandflats habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Limicola falcinellus</i> Broad-billed Sandpiper V, M*	In NSW, the main site for the species is the Hunter River estuary, with birds occasionally reaching the Shoalhaven estuary. There are few records for inland NSW. Broad-billed Sandpipers favour sheltered parts of the coast such as estuarine sandflats and mudflats, harbours, embayments, lagoons, saltmarshes and reefs as feeding and roosting habitat. Occasionally, individuals may be recorded in sewage farms or within shallow freshwater lagoons. Broad-billed Sandpipers roost on banks on sheltered sand, shell or shingle beaches.	No suitable estuarine sandflats and mudflats, harbours, embayments, lagoons, saltmarshes or reef habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Limosa limosa</i> Black-tailed Godwit V, M*	In NSW, the it is most frequently recorded at Kooragang Island (Hunter River estuary), with occasional records elsewhere along the north and south coast, and inland. Records in western NSW indicate that a regular inland passage is used by the species, as it may occur around any of the large lakes in the western areas during summer, when the muddy shores are exposed. The species has been recorded within the Murray-Darling Basin, on the western slopes of the Northern Tablelands and in the far north-western corner of the state. Primarily a coastal species. Usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats.	No suitable intertidal mudflats or sandflats habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Xenus cinereus</i> Terek Sandpiper V, M*	A rare migrant to the eastern and southern Australian coasts, being most common in northern Australia, and extending its distribution south to the NSW coast in the east. The two main sites for the species in NSW are the Richmond River estuary and the Hunter River estuary. The latter has been identified as nationally and internationally important for the species. In Australia, has been recorded on coastal mudflats, lagoons, creeks and estuaries. Favours mudbanks and sandbanks located near mangroves, but may also be observed on rocky pools and reefs, and occasionally up to 10 km inland around brackish pools.	No suitable mudflat, lagoons, creeks or estuary habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Turnix maculosus</i> Red-backed Button-quail V	The Red-backed Button-quail is recorded only infrequently in NSW, with most records from the North Coast Bioregion; there are historical records south as far as Sydney and three outlying records from western NSW (a breeding record from Finley in 1954; the Macquarie Marshes in 1955; and Coolabah in 2000). The population around Sydney was last recorded in 1912. Between 1980 and 1995 the average reporting rate for this species in NSW was 2 birds per year; from 1996 to 2005, there were only six additional observations in NSW (0.75 records per year). There have been few recent records of this species within reserves: between 1977 and 1994, there were 17 records of the species from four north coast reserves in NSW: Bundjalung, Crowdy Bay, Nymboida and Yuraygir National Parks. There have been no further records within reserves in NSW since August 1994. In NSW, said to occur in grasslands, heath and crops. Said to prefer sites close to water, especially when breeding. The species has been observed associated with the following grasses (in various vegetation formations): speargrass <i>Heteropogon</i>, Blady Grass <i>Imperata cylindrica</i>, <i>Triodia</i>, <i>Sorghum</i>, and Buffel Grass <i>Cenchrus ciliaris</i>.	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Sternula albifrons</i> Little Tern E, M*	In NSW, it arrives from September to November, occurring mainly north of Sydney, with smaller numbers found south to Victoria. Almost exclusively coastal, preferring sheltered environments; however may occur several kilometres from the sea in harbours, inlets and rivers (with occasional offshore islands or coral cay records).	No suitable coastal habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Sternula nereis nereis</i> Australian Fairy Tern -, V*	The subspecies has been known from New South Wales (NSW) in the past, but it is unknown if it persists there. The Australian Fairy Tern nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. The subspecies has been found in embayments of a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands and mainland coastline. The bird roosts on beaches at night.	No suitable coastal habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo V	In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory. It is rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour and as far west as Mudgee. In summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas.	Suitable woodlands habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impact by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Calyptorhynchus lathami</i> Glossy Black-Cockatoo V	The species is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (<i>Allocasuarina littoralis</i>) and Forest Sheoak (<i>A. torulosa</i>) are important foods.	Open forest and woodlands habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impact by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Glossopsitta pusilla</i> Little Lorikeet V	NSW provides a large portion of the species' core habitat, with lorikeets found westward as far as Dubbo and Albury. Nomadic movements are common, influenced by season and food availability, although some areas retain residents for much of the year and 'locally nomadic' movements are suspected of breeding pairs. Forages primarily in the canopy of open <i>Eucalyptus</i> forest and woodland, yet also finds food in <i>Angophora</i>, <i>Melaleuca</i> and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species.	Suitable woodlands habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Lathamus discolor</i> Swift Parrot E, E*	In NSW mostly occurs on the coast and south west slopes. Migrates to the Australian south-east mainland between March and October. Favoured feed trees include winter flowering species such as Swamp Mahogany <i>Eucalyptus robusta</i>, Spotted Gum <i>Corymbia maculata</i>, Red Bloodwood <i>C. gummifera</i>, Mugga Ironbark <i>E. sideroxylon</i>, and White Box <i>E. albens</i>. Commonly used lerp infested trees include Inland Grey Box <i>E. microcarpa</i>, Grey Box <i>E. moluccana</i> and Blackbutt <i>E. pilularis</i>.	It is likely that Swamp Mahogany and Spotted Gum occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Neophema pulchella</i> Turquoise Parrot V	The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Ninox connivens</i> Barking Owl V	Although common in parts of northern Australia, the species has declined greatly in southern Australia and now occurs in a wide but sparse distribution in NSW. Core populations exist on the western slopes and plains (especially the Pilliga) and in some northeast coastal and escarpment forests. Many populations have crashed as woodland on fertile soils was cleared, leaving linear riparian strips of remnant trees as the last inhabitable areas. Sometimes extend their home range into urban areas, hunting birds in garden trees and insects attracted to streetlights. Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey on these fertile soils.	Suitable woodlands habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Ninox strenua</i> Powerful Owl V	In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered, mostly historical records on the western slopes and plains. Now uncommon throughout its range where it occurs at low densities. The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine <i>Syncarpia glomulifera</i>, Black She-oak <i>Allocasuarina littoralis</i>, Blackwood <i>Acacia melanoxylon</i>, Rough-barked Apple <i>Angophora floribunda</i>, Cherry Ballart <i>Exocarpus cupressiformis</i> and a number of eucalypt species.	Suitable woodlands habitat occurs within the Project Application Area. Also, it has been previously recorded in close proximity to the Project Application Area (Cumberland Ecology 2007). Therefore, it is considered that this species is likely to occur within the Project Application Area or be it intermittently.	It is considered unlikely that this species habitat will be impacted by the <20 mm of subsidence. However, as this species is likely to occur on the Project Application Area, a 7-part test of significance (TSC Act) has been applied to this species in Appendix 2 .

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Tyto novaehollandiae</i> Masked Owl V	Extends from the coast where it is most abundant to the western plains. Lives in dry eucalypt forests and woodlands from sea level to 1100 m.	Suitable woodlands habitat occurs within the Project Application Area. Also it previously been recorded in close proximity to the Project Application Area (Cumberland Ecology 2007) Therefore, it is considered that this species is likely to occur within the Project Application Area or be it intermittently.	It is considered unlikely that this species habitat will be impacted by the <20 mm of subsidence. However, as this species is likely to occur on the Project Application Area, a 7-part test of significance (TSC Act) has been applied to this species in Appendix 2.
<i>Tyto tenebricosa</i> Sooty Owl V	Occupies the easternmost one-eighth of NSW, occurring on the coast, coastal escarpment and eastern tablelands. Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests.	Suitable moist eucalypt forest habitat occurs within the Project Application Area. Also, it has been previously recorded in close proximity to the Project Application Area (Cumberland Ecology 2007). Therefore, it is considered that this species is likely to occur within the Project Application Area or be it intermittently.	It is considered unlikely that this species habitat will be impacted by the <20 mm of subsidence. However, as this species is likely to occur on the Project Application Area, a 7-part test of significance (TSC Act) has been applied to this species in Appendix 2.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Climacteris picumnus victoriae</i> Brown Treecreeper (eastern subspecies) V	The western boundary of the range of <i>Climacteris picumnus victoriae</i> runs approximately through Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell and along this line the subspecies intergrades with the arid zone subspecies of Brown Treecreeper <i>Climacteris picumnus picumnus</i> which then occupies the remaining parts of the state. The eastern subspecies lives in eastern NSW in eucalypt woodlands through central NSW and in coastal areas with drier open woodlands such as the Snowy River Valley, Cumberland Plains, Hunter Valley and parts of the Richmond and Clarence Valleys. Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (<i>Eucalyptus camaldulensis</i>) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Dasyornis brachypterus</i> Eastern Bristlebird E, E*	The distribution of the Eastern Bristlebird has contracted to three disjunct areas of south-eastern Australia: southern Queensland/northern NSW, the Illawarra Region and in the vicinity of the NSW/Victorian border. The estimated population size is less than 2000 individuals occupying a total area of about 120 sq km. There are now only four populations in the southern Queensland/northern NSW area with a total of 35 birds, compared to 15 years ago when 14 populations and 154 birds were recorded. This population once extended as far south as at least Dorrigo and has recently been identified as a separate ultrataxon (<i>monoides</i>) but further research is being undertaken to determine the validity of this. The remaining populations are the nominate ultrataxon (<i>brachypterus</i>) and once extended at least to what is now the Sydney urban area. The Illawarra population comprises an estimated 1600 birds, mainly from Barren Grounds Nature Reserve, Budderoo National Park and the Jervis Bay area. The southern population in Nadgee Nature Reserve and Howe's Flat is around 200 birds. Further surveys are required in parts of Ben Boyd National Park and Sydney Catchment Authority lands to determine whether further populations of the Eastern Bristlebird occur in these areas. Habitat is characterised by dense, low vegetation including heath and open woodland with a heathy understorey; in northern NSW occurs in open forest with tussocky grass understorey; all of these vegetation types are fire prone. Age of habitat since fires (fire-age) is of paramount importance to this species; Illawarra and southern populations reach maximum densities in habitat that has not been burnt for at least 15 years; however, in the northern NSW population a lack of fire in grassy forest may be detrimental as grassy tussock nesting habitat becomes unsuitable after long periods without fire; northern NSW birds are usually found in habitats burnt 5 to 10 years previously.	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Chthonicola sagittata</i> Speckled Warbler V	The Speckled Warbler has a patchy distribution throughout south-eastern Queensland, the eastern half of NSW and into Victoria, as far west as the Grampians. The species is most frequently reported from the hills and tablelands of the Great Dividing Range, and rarely from the coast. There has been a decline in population density throughout its range, with the decline exceeding 40% where no vegetation remnants larger than 100ha survive. The Speckled Warbler lives in a wide range of <i>Eucalyptus</i> dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area.	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area it is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Anthochaera phrygia</i> Regent Honeyeater CE, E*	In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks converge on flowering coastal woodlands and forests. The Regent Honeyeater is a flagship threatened woodland bird whose conservation will benefit a large suite of other threatened and declining woodland fauna. The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes.	Suitable woodlands habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Epthianura albifrons</i> White-fronted Chat V	In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas. Gregarious species, usually found foraging on bare or grassy ground in wetland areas, singly or in pairs.	No suitable wetland habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Grantiella picta</i> Painted Honeyeater V	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Melithreptus gularis gularis</i> Black-chinned Honeyeater (eastern subspecies) V	In NSW it is widespread, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It is rarely recorded east of the Great Dividing Range, although regularly observed from the Richmond and Clarence River areas. It has also been recorded at a few scattered sites in the Hunter, Central Coast and Illawarra regions, though it is very rare in the latter. Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (<i>Eucalyptus sideroxylon</i>), White Box (<i>E. albens</i>), Inland Grey Box (<i>E. microcarpa</i>), Yellow Box (<i>E. melliodora</i>), Blakely's Red Gum (<i>E. blakelyi</i>) and Forest Red Gum (<i>E. tereticornis</i>).	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Pomatostomus temporalis temporalis</i> Grey-crowned Babbler (eastern subspecies) V	In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains.	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Daphoenositta chrysoptera</i> Varied Sittella V	Distribution in NSW is nearly continuous from the coast to the far west. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and <i>Acacia</i> woodland.	Suitable woodlands habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Petroica boodang</i> Scarlet Robin V	In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter. The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs.	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Petroica phoenicea</i> Flame Robin V	In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains. It is likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understorey	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Stagonopleura guttata</i> Diamond Firetail V	It is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina. Not commonly found in coastal districts, though there are records from near Sydney, the Hunter Valley and the Bega Valley. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum <i>Eucalyptus pauciflora</i> Woodlands.	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
Amphibians			
<i>Crinia tinnula</i> Wallum Froglet V	Wallum Froglets are found along the coastal margin from Litabella National Park in south-east Queensland to Kurnell in Sydney. Wallum Froglets are found in a wide range of habitats, usually associated with acidic swamps on coastal sand plains. They occur in sedgeland, wet heathlands, paperbark swamps and drainage lines within other vegetation communities. They will also persist in disturbed areas.	No suitable with acidic swamps on coastal sand plains habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Heleioporus australiacus</i> Giant Burrowing Frog E, E*	The Giant Burrowing Frog is distributed in south eastern NSW and Victoria, and appears to exist as two distinct populations: a northern population largely confined to the sandstone geology of the Sydney Basin and extending as far south as Ulladulla, and a southern population occurring from north of Narooma through to Walhalla, Victoria. Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. Spends more than 95% of its time in non-breeding habitat in areas up to 300 m from breeding sites. Whilst in non-breeding habitat it burrows below the soil surface or in the leaf litter. Individual frogs occupy a series of burrow sites, some of which are used repeatedly. The home ranges of both sexes appear to be non-overlapping suggesting exclusivity of non-breeding habitat. Home ranges are approximately 0.04 ha in size.	Suitable woodlands habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Mixophyes balbus</i> Stuttering Frog E, V*	Stuttering Frogs occur along the east coast of Australia from southern Queensland to north-eastern Victoria. Considered to have disappeared from Victoria and to have undergone considerable range contraction in NSW, particularly in south-east NSW. It is the only <i>Mixophyes</i> species that occurs in south-east NSW and in recent surveys it has only been recorded at three locations south of Sydney. The Dorrigo region, in north-east NSW, appears to be a stronghold for this species Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range.	Suitable moist eucalypt forests habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Mixophyes iteratus</i> Giant Barred Frog E, E*	Coast and ranges from south-eastern Queensland to the Hawkesbury River in NSW. North-eastern NSW, particularly the Coffs Harbour-Dorrigo area, is now a stronghold. Considered to have disappeared south of the Hawkesbury and there are no recent records from the Blue Mountains. Giant Barred Frogs forage and live amongst deep, damp leaf litter in rainforests, moist eucalypt forest and nearby dry eucalypt forest, at elevations below 1000 m.	Suitable moist eucalypt forests habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Pseudophryne australis</i> Red-crowned Toadlet V	The Red-crowned Toadlet has a restricted distribution. It is confined to the Sydney Basin, from Pokolbin in the north, the Nowra area to the south, and west to Mt Victoria in the Blue Mountains. Occurs in open forests, mostly on Hawkesbury and Narrabeen Sandstones. Inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses or cappings. Shelters under rocks and amongst masses of dense vegetation or thick piles of leaf litter.	No suitable Hawkesbury or Narrabeen Sandstone habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Litoria aurea</i> Green and Golden Bell Frog E, V*	Formerly distributed from the NSW north coast near Brunswick Heads, southwards along the NSW coast to Victoria where it extends into east Gippsland. Records from west to Bathurst, Tumut and the ACT region. Since 1990 there have been approximately 50 recorded locations in NSW, most of which are small, coastal, or near coastal populations. These locations occur over the species' former range, however they are widely separated and isolated. Large populations in NSW are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast (one an island population). Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (<i>Typha</i> spp.) or spikerushes (<i>Eleocharis</i> spp.).	This species is not typically known from the Central Coast region. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Litoria brevipalmata</i> Green-thighed Frog V	Isolated localities along the coast and ranges from just north of Wollongong to south-east Queensland. Green-thighed Frogs occur in a range of habitats from rainforest and moist eucalypt forest to dry eucalypt forest and heath, typically in areas where surface water gathers after rain. It prefers wetter forests in the south of its range, but extends into drier forests in northern NSW and southern Queensland.	Suitable moist eucalypt forests habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Litoria littlejohni</i> Littlejohn's Tree Frog V, V*	Littlejohn's Tree Frog has a distribution that includes the plateaus and eastern slopes of the Great Dividing Range from Watagan State Forest (90 km north of Sydney) south to Buchan in Victoria. The majority of records are from within the Sydney Basin Bioregion with only scattered records south to the Victorian border and this species has not been recorded in southern NSW within the last decade. Records are isolated and tend to be at high altitude. This species breeds in the upper reaches of permanent streams and in perched swamps.	No suitable upper reaches of permanent streams and in perched swamp habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
Reptiles			

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Varanus rosenbergi</i> Rosenberg's Goanna V	Rosenberg's Goanna occurs on the Sydney Sandstone in Wollemi National Park to the north-west of Sydney, in the Goulburn and ACT regions and near Cooma in the south. There are records from the South West Slopes near Khancoban and Tooma River. Also occurs in South Australia and Western Australia. Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component.	Suitable woodlands habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Hoplocephalus bitorquatus</i> Pale-headed Snake V	A patchy distribution from north-east Queensland to north-east NSW. In NSW it occurs from the coast to the western side of the Great Divide as far south as Tuggerah. Found mainly in dry eucalypt forests and woodlands, cypress woodland and occasionally in rainforest or moist eucalypt forest. Favours streamside areas, particularly in drier habitats.	Suitable woodlands habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Hoplocephalus bungaroides</i> Broad-headed Snake E, V*	The Broad-headed Snake is largely confined to Triassic and Permian sandstones, including the Hawkesbury, Narrabeen and Shoalhaven groups, within the coast and ranges in an area within approximately 250 km of Sydney. Shelters in rock crevices and under flat sandstone rocks on exposed cliff edges during autumn, winter and spring.	No suitable shelters in rock crevices and under flat sandstone rocks on exposed cliff edges habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Hoplocephalus stephensii</i> Stephens' Banded Snake V	Coast and ranges from Southern Queensland to Gosford in NSW. Rainforest and eucalypt forests and rocky areas up to 950 m in altitude. Stephens' Banded Snake is nocturnal, and shelters between loose bark and tree trunks, amongst vines, or in hollow trunks limbs, rock crevices or under slabs during the day.	Suitable eucalypt forest habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
Mammals			

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Dasyurus maculatus</i> Spotted-tailed Quoll V, E*	The range of the Spotted-tailed Quoll has contracted considerably since European settlement. It is now found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Queensland. Only in Tasmania is it still considered common. Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites.	Suitable woodlands habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Phascogale tapoatafa</i> Brush-tailed Phascogale V	In NSW it is mainly found east of the Great Dividing Range although there are occasional records west of the divide. Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest. Agile climber foraging preferentially in rough barked trees of 25 cm DBH or greater.	Suitable dry sclerophyll open forest habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Planigale maculata</i> Common Planigale V	Coastal north-eastern NSW, coastal east Queensland and Arnhem Land. The species reaches its confirmed southern distribution limit on the NSW lower north coast however there are reports of its occurrence as far south as the central NSW coast west of Sydney. Common Planigales inhabit rainforest, eucalypt forest, heathland, marshland, grassland and rocky areas where there is surface cover, and usually close to water.	Suitable eucalypt forest habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Phascolarctos cinereus</i> Koala V, V*	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. It was briefly historically abundant in the 1890s in the Bega District on the south coast of NSW, although not elsewhere, but it now occurs in sparse and possibly disjunct populations. Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.	Swamp Mahogany and Grey Gum trees likely occur within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Cercartetus nanus</i> Eastern Pygmy-possum V	In NSW it extends from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes. Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes; an important pollinator of heathland plants such as banksias; soft fruits are eaten when flowers are unavailable.	Suitable woodlands habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Petaurus australis</i> Yellow-bellied Glider V	The Yellow-bellied Glider is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria. Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south.	No suitable tall mature eucalypt forest habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area. It is considered unlikely to be impacted by the proposal.
<i>Petaurus norfolcensis</i> Squirrel Glider V	The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey.	Bloodwood tree likely occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Potorous tridactylus</i> Long-nosed Potoroo V, V*	In NSW it is generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760 mm. Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature	No suitable tall mature eucalypt forest habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Macropus parma</i> Parma Wallaby V	Once occurred from north-eastern NSW to the Bega area in the southeast. Their range is now confined to the coast and ranges of central and northern NSW from the Gosford district to the Queensland border. Preferred habitat is moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest.	Suitable moist eucalypt forests habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Petrogale penicillata</i> Brush-tailed Rock-wallaby E, V*	In NSW they occur from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north.	No suitable rocky escarpments, outcrops and cliffs habitat occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Thylogale stigmatica</i> Red-legged Pademelon V	Patchily distributed along coastal and subcoastal eastern Australia from Cape York to the Hunter Valley in NSW. Southern range records are from the Watagan Mountains and the Wyong district. There are unconfirmed records from the western New England Tablelands (e.g. west of Emmaville). This species is also found in New Guinea. Inhabits forest with a dense understorey and ground cover, including rainforest, moist eucalypt forest and vine scrub. Wet gullies with dense, shrubby ground cover provide shelter from predators. In NSW, rarely found outside forested habitat.	Suitable moist eucalypt forests habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox V, V*	Grey-headed Flying-foxes are generally found within 200 km of the eastern coast of Australia, from Bundaberg in Queensland to Melbourne in Victoria. In times of natural resource shortages, they may be found in unusual locations. Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Suitable foraging habitat (woodland) occurs within the Project Application Area. However, the Project Application Area is not known to be a roosting site. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Saccolaimus flaviventris</i> Yellow-bellied Sheathtail-bat V	The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows.	It is likely that suitable roosting habitat (hollow-bearing trees) occurs within the Project Application Area. Also it previously been recorded in close proximity to the Project Application Area (Cumberland Ecology 2007). Therefore, it is considered that this species is likely to occur within the Project Application Area or be it intermittently.	It is considered unlikely that this species habitat will be impacted by the <20 mm of subsidence. However, as this species is likely to occur on the Project Application Area, a 7-part test of significance (TSC Act) has been applied to this species in Appendix 2.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Mormopterus norfolkensis</i> Eastern Freetail-bat V	The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW. Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures.	Suitable foraging habitat (woodland) and likely roosting habitat (hollow-bearing trees) occurs within the Project Application Area. Also it previously been recorded in close proximity to the Project Application Area (Cumberland Ecology 2007). Therefore, it is considered that this species is likely to occur within the Project Application Area or be it intermittently.	It is considered unlikely that this species habitat will be impacted by the <20 mm of subsidence. However, as this species is likely to occur on the Project Application Area, a 7-part test of significance (TSC Act) has been applied to this species in Appendix 2.
<i>Chalinolobus dwyeri</i> Large-eared Pied Bat V, V*	It is generally rare with a very patchy distribution in NSW. There are scattered records from the New England Tablelands and North West Slopes. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (<i>Petrochelidon ariel</i>), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs. They remain loyal to the same cave over many years. Found in well-timbered areas containing gullies.	Whilst suitable foraging habitat (woodland) occurs on the Project Application Area, no suitable roosting habitat (caves) occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Falsistrellus tasmaniensis</i> Eastern False Pipistrelle V	The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania. Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	Suitable foraging habitat and likely roosting habitat (hollow-bearing trees) occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Kerivoula papuensis</i> Golden-tipped Bat V	The Golden-tipped Bat is distributed along the east coast of Australia in scattered locations from Cape York Peninsula in Queensland to south of Eden in southern NSW. Found in rainforest and adjacent wet and dry sclerophyll forest up to 1000m. Also recorded in tall open forest, <i>Casuarina</i>-dominated riparian forest and coastal <i>Melaleuca</i> forests. Roost mainly in abandoned hanging Yellow-throated Scrubwren and Brown Gerygone nests, also in tree hollows, dense foliage and epiphytes; located in rainforest gullies on small first- and second-order streams.	Suitable foraging (wet and dry sclerophyll forest) habitat and likely roosting habitat (Brown Gerygone nests) occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Miniopterus australis</i> Little Bentwing-bat V	East coast and ranges of Australia from Cape York in Queensland to Wollongong in NSW. Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, <i>Melaleuca</i> swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.	Suitable foraging (wet and dry sclerophyll forest) habitat and likely roosting habitat (hollow-bearing trees) occurs within the Project Application Area. Also it previously been recorded in close proximity to the Project Application Area (Cumberland Ecology 2007). Therefore, it is considered that this species is likely to occur within the Project Application Area or be it intermittently.	It is considered unlikely that this species habitat will be impacted by the <20 mm of subsidence. However, as this species is likely to occur on the Project Application Area, a 7-part test of significance (TSC Act) has been applied to this species in Appendix 2.
<i>Miniopterus schreibersii oceanensis</i> Eastern Bentwing-bat V	Eastern Bentwing-bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	Whilst suitable foraging habitat (woodland) occurs on Project Application Area, no suitable roosting habitat (caves) occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Myotis macropus</i> Southern Myotis V	The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.	No suitable foraging (streams and pools) or roosting (caves) occurs within the Project Application Area. Therefore, it is considered unlikely for this species to occur within the Project Application Area.	As this species was considered unlikely to occur within the Project Application Area, it is considered unlikely to be impacted by the proposal.
<i>Scoteanax rueppellii</i> Greater Broad-nosed Bat V	In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m. Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings.	Suitable foraging (woodland) habitat and likely roosting habitat (hollow-bearing trees) occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Vespadelus troughtoni</i> Eastern Cave Bat V	The Eastern Cave Bat is found in a broad band on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range, and there is a single record from southern NSW, east of the ACT. Very little is known about the biology of this uncommon species. A cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings, occasionally in colonies of up to 500 individuals.	Whilst suitable foraging habitat (woodland) occurs on Project Application Area, no suitable roosting habitat (caves) occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Pseudomys gracilicaudatus</i> Eastern Chestnut Mouse V	In NSW the Eastern Chestnut Mouse mainly occurs north from the Hawkesbury River area as scattered records along to coast and eastern fall of the Great Dividing Range extending north into Queensland. There are however isolated records in the Jervis bay area. In NSW the Eastern Chestnut Mouse is mostly found, in low numbers, in heathland and is most common in dense, wet heath and swamps. In the tropics it is more an animal of grassy woodlands. Optimal habitat appears to be in vigorously regenerating heathland burnt from 18 months to four years previously. By the time the heath is mature, the larger Swamp Rat becomes dominant, and Eastern Chestnut Mouse numbers drop again.	Suitable swamp habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
<i>Pseudomys novaehollandiae</i> New Holland Mouse -, V*	The New Holland Mouse has a fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Genetic evidence indicates that the New Holland Mouse once formed a single continuous population on mainland Australia and the distribution of recent subfossils further suggest that the species has undergone a large range contraction since European settlement. Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes	Suitable woodland habitat occurs within the Project Application Area. Therefore, it is considered that there is potential for this species to occur within the Project Application Area.	As no habitat for this species is expected to be impacted by the <20 mm of subsidence, it is considered unlikely to be impacted by the proposal and therefore an AoS for this species is not required.
Vegetation communities			
<i>Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i> E	Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions is the name given to the ecological community occurring in the intertidal zone on the shores of estuaries and lagoons including when they are intermittently closed along the NSW coast. Coastal saltmarsh has been recorded from sites along the NSW coast. (NSW North Coast, Sydney Basin and South East Corner Bioregions). It is frequently found as a zone landward of mangrove stands. Occasional scattered mature <i>Avicennia marina</i> trees occur through saltmarsh at some sites, and <i>Avicennia</i> (and less frequently <i>Aegiceras corniculatum</i>) seedlings may occur throughout saltmarsh. In brackish areas dense stands of tall reeds (<i>Phragmites australis</i>, <i>Bulboschoenus</i> spp., <i>Schoenoplectus</i> spp., <i>Typha</i> spp.) may occur as part of the community.	The vegetation communities mapped within the Project Application Area are not considered to be commensurate with this EEC. Therefore, it is considered unlikely to occur within the Project Application Area.	This community was not mapped within the Project Application Area, thus this community is unlikely to be affected by the proposal. Therefore, an AoS for this community is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Coastal Upland Swamp in the Sydney Basin Bioregion</i> E	Coastal Upland Swamp in the Sydney Basin Bioregion is characterised by highly diverse and variable mosaics of vegetation related to variability in soil conditions and fire regimes. A number of studies (Buchanan 1980; Keith & Myerscough 1993; NPWS 2003) have recognised several sub-communities within the Coastal Upland Swamp community. Larger swamps of the community are characterised by distinctive mosaics of multiple sub-communities that may include a range of structural forms including tall open scrubs, tall closed scrubs, closed heaths, open graminoid heaths, sedgeland and fernlands. Smaller swamps are more typically characterised by open graminoid heaths and/or sedgelands, but may include tall scrubs. Trees are typically absent from the community, but may be present as scattered individuals or clumps of mallee or arborescent eucalypts.	The vegetation communities mapped within the Project Application Area are not considered to be commensurate with this EEC. Therefore, it is considered unlikely to occur within the Project Application Area.	This community was not mapped within the Project Application Area, thus this community is unlikely to be affected by the proposal. Therefore, an AoS for this community is not required.
<i>Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i> E	It is dominated by herbaceous plants and have very few woody species. The structure and composition of the community varies both spatially and temporally depending on the water regime (Yen and Myerscough 1989, Boulton and Brock 1999). Wetlands or parts of wetlands that lack standing water most of the time are usually dominated by dense grassland or sedgeland vegetation, often forming a turf less than 0.5 metre tall and dominated by amphibious plants including <i>Paspalum distichum</i> (water couch), <i>Leersia hexandra</i> (swamp rice-grass), <i>Pseudoraphis spinescens</i> (mud grass) and <i>Carex appressa</i> (tussock sedge). Wetlands or parts of wetlands subject to regular inundation and drying may include large emergent sedges over 1 metre tall, such as <i>Baumea articulata</i> , <i>Eleocharis equisetina</i> and <i>Lepironia articulata</i> , as well as emergent or floating herbs such as <i>Hydrocharis dubia</i> (frogbit), <i>Philydrum lanuginosum</i> (frogsmouth), <i>Ludwigia peploides</i> subsp. <i>montevidensis</i> (water primrose), <i>Marsilea mutica</i> (nardoo) and <i>Myriophyllum</i> spp. (milfoils).	The vegetation communities mapped within the Project Application Area are not considered to be commensurate with this EEC. Therefore, it is considered unlikely to occur within the Project Application Area.	This community was not mapped within the Project Application Area, thus this community is unlikely to be affected by the proposal. Therefore, an AoS for this community is not required. .
<i>Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions</i> E	It is generally an open forest with most common canopy trees species being <i>Eucalyptus tereticornis</i> and <i>Eucalyptus punctata</i> although other frequently occurring canopy species are <i>Angophora costata</i> , <i>Corymbia maculata</i> , <i>Eucalyptus crebra</i> and <i>Eucalyptus moluccana</i> , with a number of other eucalypts being less frequently recorded. The mid stratum is characterised as open with sparse shrubs of <i>Breynia oblongifolia</i> , <i>Leucopogon juniperinus</i> , <i>Daviesia ulicifolia</i> and <i>Jacksonia scoparia</i> . There is consistently a ground layer of grasses and herbs, characterised by <i>Microlaena stipoides</i> var. <i>stipoides</i> , <i>Cymbopogon refractus</i> , <i>Echinopogon caespitosus</i> var. <i>caespitosus</i> , <i>Cheilanthes sieberi</i> subsp. <i>sieberi</i> and <i>Pratia purpurascens</i> .	The vegetation communities mapped within the Project Application Area are not considered to be commensurate with this EEC. Therefore, it is considered unlikely to occur within the Project Application Area.	This community was not mapped within the Project Application Area, thus this community is unlikely to be affected by the proposal. Therefore, an AoS for this community is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Kincumber Scribbly Gum Forest in the Sydney Basin Bioregion</i> CE	It is an open forest with a tree canopy dominated by some combination of <i>Eucalyptus racemosa</i> (Scribbly Gum), <i>Angophora costata</i> (Smooth-barked Apple), <i>Corymbia gummifera</i> (Red Bloodwood), <i>Syncarpia glomulifera</i> (Turpentine) and <i>Eucalyptus piperita</i> (Sydney Peppermint). <i>Allocasuarina littoralis</i> (Black Sheoak) and <i>Glochidion ferdinandi</i> (Cheese Tree) may be present in the subcanopy. There is a prominent shrub layer which typically includes <i>Dodonaea triquetra</i> (Hopbush), <i>Platylobium formosum</i>, <i>Persoonia levis</i> (Broad-leaved Geebung), <i>Polyscias sambucifolia</i> (Elderberry Panax), <i>Breynia oblongifolia</i> (Coffee Bush), <i>Leptospermum polygalifolium</i> (Lemon-scented Tea-tree), <i>Banksia spinulosa</i> var. <i>collina</i> (Hill Banksia), <i>Epacris pulchella</i>, <i>Grevillea linearifolia</i> and <i>Lomatia silaifolia</i> (Crinkle Bush). The groundcover comprises herbs, scramblers, grasses, sedges and ferns, including <i>Billardiera scandens</i> (Appleberry), <i>Cassytha glabella</i>, <i>Dianella caerulea</i> (Blue Flax Lily), <i>Entolasia stricta</i> (Wiry Panic), <i>Lepidosperma laterale</i>, <i>Pratia purpurascens</i> (Whiteroot), <i>Pteridium esculentum</i> (Bracken), <i>Smilax glycyphylla</i> (Sweet Sarsaparilla) and <i>Tetrarrhena juncea</i> (Wire Grass). Kincumber Scribbly Gum Forest is restricted to a small area on the Bouddi Peninsula on the NSW Central Coast south of Kincumber. It occurs in the Gosford LGA. The total remaining area of Kincumber Scribbly Gum Forest is thought to be less than 100 ha. within an area of about 4 km².	The vegetation communities mapped within the Project Application Area are not considered to be commensurate with this EEC. Therefore, it is considered unlikely to occur within the Project Application Area.	This community was not mapped within the Project Application Area, thus this community is unlikely to be affected by the proposal. Therefore, an AoS for this community is not required.
<i>Littoral Rainforest in the NSW North coast, Sydney Basin and South East corner Bioregions</i> (E) <i>Littoral Rainforest and Coastal Vine tickets of Eastern Australia</i> (CE*)	The ecological community represents a complex of rainforest and coastal vine thickets, including some that are deciduous, on the east coast of Australia. Typically, the ecological community occurs within two kilometres of the coast or adjacent to a large salt water body, such as an estuary and, thus, is influenced by the sea. It is naturally distributed as a series of disjunct and localised stands occurring on a range of landforms derived from coastal processes that can include dunes and flats, cheniers, berms, cobbles, headlands, scree, seacliffs, marginal bluffs, spits, deltaic deposits, coral rubble and islands. As a result, the ecological community is not associated with a particular soil type and can occur on a variety of geological substrata.	The vegetation communities mapped within the Project Application Area are not considered to be commensurate with this EEC. Therefore, it is considered unlikely to occur within the Project Application Area.	This community was not mapped within the Project Application Area, thus this community is unlikely to be affected by the proposal. Therefore, an AoS for this community is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Lower Hunter Spotted Gum-Ironbark Forest in the Sydney Basin Bioregion</i> E	This community is widespread throughout the central to lower Hunter Valley, with forests between Cessnock and Beresfield forming the core of its distribution. This community is dominated by <i>Corymbia maculata</i> (Spotted Gum) and <i>Eucalyptus fibrosa</i> (Broad-leaved Ironbark) with occasional occurrences of <i>E. punctata</i> (Grey Gum) and <i>E. crebra</i> (Grey Ironbark). Classified by the Lower Hunter Central Coast Regional Biodiversity Conservation Strategy (LHCCREMS) as Map Unit (MU) 17.	The vegetation communities mapped within the Project Application Area are not considered to be commensurate with this EEC. Therefore, it is considered unlikely to occur within the Project Application Area.	This community was not mapped within the Project Application Area, thus this community is unlikely to be affected by the proposal. Therefore, an AoS for this community is not required.
<i>Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions</i> E, CE*	Lowland Rainforest, in a relatively undisturbed state, has a closed canopy, characterised by a high diversity of trees whose leaves may be mesophyllous and encompass a wide variety of shapes and sizes. Typically, the trees form three major strata: emergents, canopy and sub-canopy which, combined with variations in crown shapes and sizes results in an irregular canopy appearance. The trees are taxonomically diverse at the genus and family levels, and some may have buttressed roots. A range of plant growth forms are present in Lowland Rainforest, including palms, vines and vascular epiphytes. In disturbed stands of this community the canopy cover may be broken, or the canopy may be smothered by exotic vines. The Hawkesbury River notionally marks the southern limit of <i>Lowland Rainforest in the NSW North Coast and Sydney Basin bioregions</i>.	The vegetation communities mapped within the Project Application Area are not considered to be commensurate with this EEC. Therefore, it is considered unlikely to occur within the Project Application Area.	This community was not mapped within the Project Application Area, thus this community is unlikely to be affected by the proposal. Therefore, an AoS for this community is not required.
<i>Quorrobolong Scribbly Gum Woodland in the Sydney Basin Bioregion</i> E	It is a low shrubby woodland with the overstorey dominated by <i>Eucalyptus racemosa</i> (Scribbly Gum). Other tree species present include <i>E. piperita</i> (Sydney Peppermint), <i>E. resinifera</i> (Red Mahogany), <i>Angophora costata</i> (Smooth-barked Apple) and <i>E. punctata</i> (Grey Gum). There is usually a well developed shrub layer with common species being <i>Leptospermum trinervium</i> (Slender Tea-tree), <i>Acacia parvipinnula</i> (Silver-stemmed Wattle), <i>Persoonia linearis</i> (Narrow-leaved Geebung) and <i>Leptospermum polygalifolium</i> (Tantoon). The ground layer is often sparse and frequently occurring species are <i>Imperata cylindrica</i> var. <i>major</i> (Blady Grass), <i>Panicum simile</i> (Two-colour Panic), <i>Pratia purpuracens</i> (Whiteroot), <i>Lomandra cylindrica</i> (Needle Mat-rush) and <i>Dianella revoluta</i>. Currently known from only a small area between Quorrobolong and Mulbring in the Cessnock local government area, but may also occur elsewhere within the Hunter Valley. The current known extent is about 70 hectares; the pre-European extent is estimated to have been only 160 hectares, reflecting the limited area of the sand deposit on which it occurs. Not known to occur within any conservation reserves.	The vegetation communities mapped within the Project Application Area are not considered to be commensurate with this EEC. Therefore, it is considered unlikely to occur within the Project Application Area.	This community was not mapped within the Project Application Area, thus this community is unlikely to be affected by the proposal. Therefore, an AoS for this community is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i> E	Associated with silts, clay-loams and sandy loams, on periodically inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains. Composition of the tree stratum varies considerably, the most widespread and abundant dominant trees include <i>Eucalyptus tereticornis</i> (Forest Red Gum), <i>E. amplifolia</i> (Cabbage Gum), <i>Angophora floribunda</i> (Rough-barked Apple) and <i>A. subvelutina</i> (Broad-leaved Apple). Correlates with LHCCREMS communities - 'Central Hunter Riparian Forest' Map Unit (MU) 13, 'Wollombi Redgum-River Oak Woodland' MU14 and 'Redgum Roughbarked Apple Swamp Forest' MU38.	The vegetation communities mapped within the Project Application Area are not considered to be commensurate with this EEC. Therefore, it is considered unlikely to occur within the Project Application Area.	This community was not mapped within the Project Application Area, thus this community is unlikely to be affected by the proposal. Therefore, an AoS for this community is not required.
<i>Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i> E	This community is found on the coastal floodplains of NSW. It has a dense to sparse tree layer in which <i>Casuarina glauca</i> (Swamp Oak) is the dominant species northwards from Bermagui. Other trees including <i>Acmena smithii</i> (Lilly Pilly), <i>Glochidion</i> spp. (cheese trees) and <i>Melaleuca</i> spp. (paperbarks) may be present as subordinate species, and are found most frequently in stands of the community northwards from Gosford. Tree diversity decreases with latitude, and <i>Melaleuca ericifolia</i> is the only abundant tree in this community south of Bermagui. The understorey is characterised by frequent occurrences of vines, <i>Parsonsia straminea</i>, <i>Geitonoplesium cymosum</i> and <i>Stephania japonica</i> var. <i>discolor</i>, a sparse cover of shrubs, and a continuous groundcover of forbs, sedges, grasses and leaf litter. The composition of the ground stratum varies depending on levels of salinity in the groundwater. Under less saline conditions prominent ground layer plants include forbs such <i>Centella asiatica</i>, <i>Commelina cyanea</i>, <i>Persicaria decipiens</i> and <i>Viola banksii</i>; graminoids such as <i>Carex appressa</i>, <i>Gahnia clarkei</i>, <i>Lomandra longifolia</i>, <i>Oplismenus imbecillis</i>; and the fern <i>Hypolepis muelleri</i>. On the fringes of coastal estuaries, where soils are more saline, the ground layer may include the threatened grass species, <i>Alexfloydia repens</i>, as well as <i>Baumea juncea</i>, <i>Juncus kraussii</i>, <i>Phragmites australis</i>, <i>Selliera radicans</i> and other saltmarsh species.	The vegetation communities mapped within the Project Application Area are not considered to be commensurate with this EEC. Therefore, it is considered unlikely to occur within the Project Application Area.	This community was not mapped within the Project Application Area, thus this community is unlikely to be affected by the proposal. Therefore, an AoS for this community is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i> E	The most widespread and abundant dominant trees include <i>Eucalyptus robusta</i> (Swamp Mahogany), <i>Melaleuca quinquenervia</i> (Broad-leaved Paperbark) and, south from Sydney, <i>Eucalyptus botryoides</i> (Bangalay) and <i>Eucalyptus longifolia</i> (Woollybutt). Other trees may be scattered throughout at low abundance or may be locally common at few sites, including <i>Callistemon salignus</i> (Sweet Willow Bottlebrush), <i>Casuarina glauca</i> (Swamp Oak) and <i>Eucalyptus resinifera</i> subsp. <i>hemilampra</i> (Red Mahogany), <i>Livistona australis</i> (Cabbage Palm) and <i>Lophostemon suaveolens</i> (Swamp Turpentine). A layer of small trees may be present, including <i>Acacia irrorata</i> (Green Wattle), <i>Acmena smithii</i> (Lilly Pilly), <i>Elaeocarpus reticulatus</i> (Blueberry Ash), <i>Glochidion ferdinandi</i> (Cheese Tree), <i>Melaleuca linariifolia</i> and <i>M. styphelioides</i> (paperbarks). Shrubs include <i>Acacia longifolia</i>, <i>Dodonaea triquetra</i>, <i>Ficus coronata</i>, <i>Leptospermum polygalifolium</i> subsp. <i>polygalifolium</i> and <i>Melaleuca</i> spp. Occasional vines include <i>Parsonsia straminea</i>, <i>Morinda jasminoides</i> and <i>Stephania japonica</i> var. <i>discolor</i>. The groundcover is composed of abundant sedges, ferns, forbs, and grasses including <i>Gahnia clarkei</i>, <i>Pteridium esculentum</i>, <i>Hypolepis muelleri</i>, <i>Calochlaena dubia</i>, <i>Dianella caerulea</i>, <i>Viola hederacea</i>, <i>Lomandra longifolia</i>, <i>Entolasia marginata</i> and <i>Imperata cylindrica</i>. On sites downslope of lithic substrates or with soils of clay-loam texture, species such as <i>Allocasuarina littoralis</i>, <i>Banksia oblongifolia</i>, <i>B. spinulosa</i>, <i>Ptilothrix deusta</i> and <i>Themeda australis</i> may also be present in the understorey.	Sections of the vegetation communities mapped within the Project Application Area are considered to be commensurate with this EEC. Therefore, it is likely that this EEC occurs within the Project Application Area.	The proposal may impact on this mapped community. A 7-part test of significance (TSC Act) has been applied to this community in Appendix 2.
<i>Sydney Freshwater Wetlands in the Sydney Basin Bioregion</i> E	A complex of vegetation types largely restricted to freshwater swamps in coastal areas. These also vary considerably due to fluctuating water levels and seasonal conditions. Characteristic species include sedges and aquatic plants such as <i>Baumea</i> species, <i>Eleocharis sphacelata</i>, <i>Gahnia</i> species, <i>Ludwigia peploides</i> subsp. <i>montevidensis</i> and <i>Persicaria</i> species. Areas of open water may occur where drainage conditions have been altered and there may also be patches of emergent trees and shrubs. Largely restricted to freshwater swamps in swales and depressions on sand dunes and low nutrient sandplains such as those of the Warriewood and Tuggerah soil landscapes. Swampy areas on alluvium with a saline influence do not fall within this community.	The vegetation communities mapped within the Project Application Area are not considered to be commensurate with this EEC. Therefore, it is considered unlikely to occur within the Project Application Area.	This community was not mapped within the Project Application Area, thus this community is unlikely to be affected by the proposal. Therefore, an AoS for this community is not required.

Species/Community	Species Distribution and Preferred Habitat	Likelihood of Occurrence	Potential for Impact
<i>Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions</i> E	<i>Themeda australis</i> is the dominant species in the <i>Themeda</i> Grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner bioregion ecological community. <i>Themeda australis</i> is an extremely widespread species, but in this community it may have a distinctive appearance, being prostrate and having glaucous leaves. These features are retained in cultivation and the form is believed to be genetically distinct. <i>Banksia integrifolia</i> subsp. <i>integrifolia</i> , <i>Westringia fruticosa</i> and <i>Acacia sophorae</i> occurs as an emergent shrub or as a dense cover where they have recruited over grasslands.	The vegetation communities mapped within the Project Application Area are not considered to be commensurate with this EEC. Therefore, it is considered unlikely to occur within the Project Application Area.	This community was not mapped within the Project Application Area, thus this community is unlikely to be affected by the proposal. Therefore, an AoS for this community is not required.
<i>Umina Coastal Sandplain Woodland in the Sydney Basin Bioregion</i> E	A low woodland dominated by trees of <i>Eucalyptus botryoides</i> and <i>Angophora floribunda</i> with a diverse understorey of sclerophyllous shrubs species including <i>Banksia integrifolia</i> , <i>Banksia serrata</i> , <i>Monotoca elliptica</i> , <i>Macrozamia communis</i> , <i>Acacia ulicifolia</i> , <i>Platysace lanceolata</i> , <i>Acacia suaveolens</i> and <i>Allocasuarina littoralis</i> . <i>Eucalyptus botryoides</i> is the dominant tree in the zone immediately behind the beach, while <i>Angophora floribunda</i> is dominant in the zone beyond up to 2 km from the beach. Largely restricted to coastal sands on the Umina, Woy Woy and Ettalong Sandplain, a beach ridge system within the Gosford local government area.	The vegetation communities mapped within the Project Application Area are not considered to be commensurate with this EEC. Therefore, it is considered unlikely to occur within the Project Application Area.	This community was not mapped within the Project Application Area, thus this community is unlikely to be affected by the proposal. Therefore, an AoS for this community is not required.

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Appendix 3: 7 - Part Test of Significance (TSC Act)

The following species and ecological community were assessed:

Flora - Endangered

- *Acacia bynoeana* (Bynoe's Wattle).

Flora - Vulnerable

- *Angophora inopina* (Charmhaven Apple);
- *Tetradlea juncea* (Black-eyed Susan); and
- *Grevillea parviflora* subsp. *parviflora* (Small-flower Grevillea).

Fauna - Vulnerable

- Sooty Owl (*Tyto tenebricosa*);
- Masked Owl (*Tyto novaehollandiae*);
- Powerful Owl (*Ninox strenua*);
- Yellow-bellied Sheath-tail-bat (*Saccolaimus flaviventris*);
- East-coast Freetail-bat (*Mormopterus norfolkensis*); and
- Little Bentwing-bat (*Miniopterus australis*).

Ecological Communities - Endangered

- *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*: Endangered under the TSC Act.

- (a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.**

Flora

- *Acacia bynoeana* (Bynoe's Wattle);
- *Angophora inopina* (Charmhaven Apple);
- *Tetradlea juncea* (Black-eyed Susan); and
- *Grevillea parviflora* subsp. *parviflora* (Small-flower Grevillea).

Acacia bynoeana, *Angophora inopina*, *Tetradlea juncea* and *Grevillea parviflora* subsp. *parviflora* are known to occur adjacent to the Project Application Area and are considered likely or have potential to occur within the Project Application Area. These species are relatively common in the wider locality (RPS data). In particular, the surrounding individuals are within large areas of intact vegetated habitat. Therefore, it is considered that the populations are large enough to support itself into the long-term.

A subsidence assessment predicts 20 millimetres would be the upper limit of subsidence resulting from the mining (Seedsman 2010) with no other potential habitat modification/clearing proposed. As a result, it was considered that no additional surveys be undertaken for these species within the Project Application Area.

The bord and pillar mining method (as opposed to longwalls) would be very unlikely to result in surface cracking (GHD 2010; Seedsman 2010). Therefore, the proposal is considered unlikely to have an adverse effect on the life cycle of these species such that a viable local population of these species is likely to be placed at risk of extinction.

Forest Owls

- Sooty Owl (*Tyto tenebricosa*);
- Masked Owl (*Tyto novaehollandiae*); and
- Powerful Owl (*Ninox strenua*).

The Sooty Owl, Masked Owl and Powerful Owl have previous been detected in close proximity to the Project Application Area. A subsidence assessment predicts 20 millimetres would be the upper limit of subsidence resulting from the mining (Seedsman 2010) with no other potential habitat modification/clearing is proposed. The bord and pillar mining method (as opposed to longwalls) would be very unlikely to result in surface cracking (GHD 2010; Seedsman 2010). Therefore, the proposal is considered unlikely to have an adverse effect on the life cycle of these species such that a viable local population of these species is likely to be placed at risk of extinction.

Micro bats

- Yellow-bellied Sheath-tail-bat (*Saccolaimus flaviventris*);
- East-coast Freetail-bat (*Mormopterus norfolkensis*); and
- Little Bentwing-bat (*Miniopterus australis*).

The Yellow-bellied Sheath-tail-bat, East-coast Freetail-bat and Little Bentwing-bat have previous been detected in close proximity to the Project Application Area. The Yellow-bellied Sheath-tail-bat and East-coast Freetail-bat are likely to utilise the Project Application Area for foraging and roosting/breeding (tree hollows) purposes. Whilst the Little Bentwing-bat is only likely to utilise the Project Application Area for foraging purposes due to the likely lack of caves and suitable rock crevices that would be suitable for roosting/breeding purposes.

A subsidence assessment predicts 20 millimetres would be the upper limit of subsidence resulting from the mining (Seedsman 2010) with no other potential habitat modification/clearing is proposed. The bord and pillar mining method (as opposed to longwalls) would be very unlikely to result in surface cracking (GHD 2010; Seedsman 2010). Therefore, the proposal is considered unlikely to have an adverse effect on the life cycle of these species such that a viable local population of these species is likely to be placed at risk of extinction.

- (b) ***In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,***

No endangered populations have the potential of occurring within the Project Application Area.

Therefore, the action proposed is not likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

- (c) **In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:**
- (i) ***is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or***
 - (ii) ***is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction***

- *Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions*

The Swamp Sclerophyll Forest occurs on 0.01 ha within the Project Application Area. A subsidence assessment predicts 20 millimetres would be the upper limit of subsidence resulting from the mining (Seedsman 2010) with no other potential habitat modification/clearing proposed. The bord and pillar mining method (as opposed to longwalls) would be very unlikely to result in surface cracking (GHD 2010; Seedsman 2010). Therefore, it is unlikely that the proposal will have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction. Furthermore, it is considered unlikely that the proposal will substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

- (d) **In relation to the habitat of a threatened species, population or ecological community:**
- (i) ***the extent to which habitat is likely to be removed or modified as a result of the action proposed,***
 - (ii) ***whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and***
 - (iii) ***the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality***

- *Acacia bynoeana* (Bynoe's Wattle) is predicted to be restricted to MU 30: 6.34 ha;
- *Angophora inopina* (Charmhaven Apple) is predicted to be restricted to MU 30: 6.34 ha;
- *Tetratheca juncea* (Black-eyed Susan) is predicted to be restricted to MU 30: 6.34 ha and MU 15: 6.28 ha, total area of 12.62 ha;
- *Grevillea parviflora* subsp. *parviflora* (Small-flower Grevillea) is predicted to be restricted to MU 30: 6.34 ha and MU 15: 6.28 ha, total area of 12.62 ha;
- Sooty Owl (*Tyto tenebricosa*) is predicted to be mainly restricted the remnant vegetation within the Project Application Area for foraging and breeding/roosting, total area of 12.77 ha;

- Masked Owl (*Tyto novaehollandiae*) is predicted to be mainly restricted the remnant vegetation within the Project Application Area for foraging and breeding/roosting, total area of 12.77 ha;
- Powerful Owl (*Ninox strenua*) is predicted to be mainly restricted the remnant vegetation within the Project Application Area for foraging and breeding/roosting, total area of 12.77 ha;
- Yellow-bellied Sheath-tail-bat (*Saccolaimus flaviventris*) is predicted to be mainly restricted the remnant vegetation within the Project Application Area for roosting breeding, total of 12.77 ha. However, they are likely to forage across the whole Project Application Area, total area of 14.74 ha;
- East-coast Freetail-bat (*Mormopterus norfolkensis*) is predicted to be mainly restricted the remnant vegetation within the Project Application Area for roosting breeding, total of 12.77 ha. However, they are likely to forage across the whole Project Application Area, total area of 14.74 ha;
- Little Bentwing-bat (*Miniopterus australis*) is predicted forage across the whole Project Application Area, total area of 14.74 ha, No areas of roosting habitat is predicted to occur on the Project Application Area e.g. caves; and
- *Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions* occur across 0.01 ha within the Project Application Area.

No vegetation removal is associated with the proposal. However, 14.74 ha of land will be impacted with 20 mm upper limit of subsidence resulting from the mining, 12.76 ha having remnant vegetation. Therefore, a maximum of habitat for the above mentioned threatened species and ecological community is likely modified (<20 mm subsidence) as a result of the action proposed. This level of subsidence is unlikely to significantly impact any above mentioned threatened species or ecological community. Furthermore, no area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action. Thus, no habitat will be removed, modified, fragmented or isolated that could lead to impacts on the long-term survival of any species, population or ecological community in the locality.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)

No critical habitat for any threatened species occurs within the Project Application Area. Therefore, the action proposed is unlikely to have an adverse effect on critical habitat (either directly or indirectly).

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

Of the threatened species under consideration for this proposal, none have a recovery or threat abatement plan.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Key Threatening Processes (KTPs) are listed under Schedule 3 of the TSC Act. There are three KTPs that have the potential to affect the Project Application Area as a consequence of the proposal, being:

- Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands;

The proposal is likely to incrementally contribute to this KTP due to the expected subsidence of (< 20 mm) along the streams within the Project Application Area. This subsidence is not expected to alter stream flow and morphology by an insignificant amount.

- Degradation of native riparian vegetation along NSW watercourses; and

The proposal is likely to incrementally contribute to this KTP as the proposal involves the possible minor subsidence of vegetation along streams. It is considered that the proposal is unlikely to result in a decline of groundwater dependent species and ecosystems.

- Alteration of habitat following subsidence due to longwall mining.

The proposal is unlikely to contribute to this KTP as Bore and Pillar mining are proposed. The subsidence from this different technique of mining will lead less than 20 mm of subsidence. The bord and pillar mining method (as opposed to longwalls) would be very unlikely to result in surface cracking (GHD 2010; Seedsman 2010). However, if cracking did occur, it may have minor effect on a number of species and habitats, in particular groundwater dependent ecosystems. Aquatic invertebrates have been shown to decline in streams within the vicinity of longwall mining (Stout 2003) due to loss of water, flow alteration and/or bank erosion. The Giant Burrowing Frog (*Heleioporus australacius*), Long-nosed Potoroo (*Potorous tridactylus*) and Broad-headed Snake (*Hoplocephalus bungaroides*), among others, are believed to be affected by the associated activities of longwall mining such as bushrock removal and native vegetation clearing (OEH 2013).

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Appendix 4: Assessments of Significance (EPBC Act)

The following EPBC Act threatened species were considered likely or have potential to occur within the Project Application Area (see **Appendix 1**):

- *Acacia bynoeana* (Bynoe's Wattle): Endangered under the TSC Act and Vulnerable under the EPBC Act;
- *Angophora inopina* (Charmhaven Apple): Vulnerable under the TSC Act and EPBC Act;
- *Tetradlea juncea* (Black-eyed Susan): Vulnerable under the TSC Act and EPBC Act; and
- *Grevillea parviflora* subsp. *parviflora* (Small-flower Grevillea): Vulnerable under the TSC Act and EPBC Act.

Under the EPBC Act significant impact guidelines, a population of a Vulnerable species must be considered to be an 'important population' to require further assessment of impact. An important population is defined as a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal;
- populations that are necessary for maintaining genetic diversity; and/or
- populations that are near the limit of the species range.

***Acacia bynoeana* (Bynoe's Wattle):**

The occurrence of *Acacia bynoeana* within the Project Application Area would appear to form part of the northern limits of the Central Coast population. Therefore, the *A. bynoeana* within the Project Application Area would be considered a 'population that are near the limit of the species range'. This population would be at the species eastern most limit. As such, if *A. bynoeana* occurred within the Project Application Area, the population should be regarded as an important population.

***Angophora inopina* (Charmhaven Apple):**

The occurrence of *Angophora inopina* within the Project Application Area would form central part of Central Coast population. Therefore, the *A. inopina* within the Project Application Area would not be considered a 'population that are near the limit of the species range'. However, this population would form an important link between the northern and southern sub-populations. Therefore, it could be considered an important 'maintaining genetic diversity' in the region. As such, if *A. inopina* occurred within the Project Application Area, the population should be regarded as an important population.

Tetradthea juncea (Black-eyed Susan):

The EPBC Act referral guidelines for *Tetradthea juncea* (SEWPaC 2011) regards important populations of this species if it meets any of the following:

1. has greater than 1000 plant clumps;
2. an area of habitat has an average estimated plant clump density of 20 clumps/hectare or greater;
3. occurs in rare habitat;
4. occurs in an area of "important habitat" as defined in Maps provided in SEWPaC (2011) and has greater than 500 plant clumps;
5. occurs at or near the distributional limits of Black-eyed Susan; and
6. occurs in close proximity to a protected area (e.g. National Park) where Black-eyed Susan is known to occur.

Close proximity refers to:

- (a) within 500 m if connected by a suitable habitat corridor such as native vegetation; or
- (b) within 100 m over disturbed habitat or non-native vegetation.

The population of *T. juncea* within the Project Application Area would constitute an important population, based on the above definitions as it has greater than 1000 clumps, the Project Application Area forms part of a wider population (RPS unpublished data).

Grevillea parviflora subsp. *parviflora* (Small-flower Grevillea):

The Lake Macquarie *Grevillea parviflora* subsp. *parviflora* population is considered a disjunct population for the Lower Hunter Valley and more southern populations. This indicates a potential restricted distribution of a genetically isolated population (albeit large) population that may therefore be considered an important population.

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Assessment of Significance for Vulnerable Species

Significant Impacts	<i>Acacia bynoeana</i>	<i>Angophora inopina</i>	<i>Tetratheca juncea</i>	<i>Grevillea parviflora</i> subsp <i>parviflora</i>
Lead to a long-term decrease in the size of an important population.	This species was detected adjacent to the Project Application Area and plants and habitat is expected to occur on the Project Application Area. However, no vegetation clear will occur as part of the proposal. Therefore, no individual plants or habitat will be removed as part of the proposal. Therefore, the proposal is unlikely to lead to a long-term decrease in the size of an important population.	This species was detected adjacent to the Project Application Area and plants and habitat is expected to occur on the Project Application Area. However, no vegetation clear will occur as part of the proposal. Therefore, no individual plants or habitat will be removed as part of the proposal. Therefore, the proposal is unlikely to lead to a long-term decrease in the size of an important population.	This species was detected adjacent to the Project Application Area and plants and habitat is expected to occur on the Project Application Area. However, no vegetation clear will occur as part of the proposal. Therefore, no individual plants or habitat will be removed as part of the proposal. Therefore, the proposal is unlikely to lead to a long-term decrease in the size of an important population.	This species was detected adjacent to the Project Application Area and plants and habitat is expected to occur on the Project Application Area. However, no vegetation clear will occur as part of the proposal. Therefore, no individual plants or habitat will be removed as part of the proposal. Therefore, the proposal is unlikely to lead to a long-term decrease in the size of an important population.
Reduce the area of occupancy of the species.	No vegetation removal will occur as part of the proposal. Therefore, the proposal is unlikely to reduce the area of occupancy of the species.	No vegetation removal will occur as part of the proposal. Therefore, the proposal is unlikely to reduce the area of occupancy of the species.	No vegetation removal will occur as part of the proposal. Therefore, the proposal is unlikely to reduce the area of occupancy of the species.	No vegetation removal will occur as part of the proposal. Therefore, the proposal is unlikely to reduce the area of occupancy of the species.
Fragment an existing important population into two or more populations.	No vegetation removal will occur as part of the proposal. Therefore, the proposal is unlikely to fragment an existing important population into two or more populations	No vegetation removal will occur as part of the proposal. Therefore, the proposal is unlikely to fragment an existing important population into two or more populations	No vegetation removal will occur as part of the proposal. Therefore, the proposal is unlikely to fragment an existing important population into two or more populations	No vegetation removal will occur as part of the proposal. Therefore, the proposal is unlikely to fragment an existing important population into two or more populations.

Significant Impacts	<i>Acacia bynoeana</i>	<i>Angophora inopina</i>	<i>Tetratheca juncea</i>	<i>Grevillea parviflora</i> subsp <i>parviflora</i>
Adversely affect habitat critical to the survival of a species.	No vegetation removal will occur as part of the proposal. Therefore, the proposal is unlikely to adversely affect habitat critical to the survival of a species.	No vegetation removal will occur as part of the proposal. Therefore, the proposal is unlikely to adversely affect habitat critical to the survival of a species.	No vegetation removal will occur as part of the proposal. Therefore, the proposal is unlikely to adversely affect habitat critical to the survival of a species.	No vegetation removal will occur as part of the proposal. Therefore, the proposal is unlikely to adversely affect habitat critical to the survival of a species.
Disrupt the breeding cycle of a population.	No individual plants or habitat removal will occur as part of the proposal. Therefore, the proposal is unlikely to disrupt the breeding cycle of a population.	No individual plants or habitat removal will occur as part of the proposal. Therefore, the proposal is unlikely to disrupt the breeding cycle of a population.	No individual plants or habitat removal will occur as part of the proposal. Therefore, the proposal is unlikely to disrupt the breeding cycle of a population.	No individual plants or habitat removal will occur as part of the proposal. Therefore, the proposal is unlikely to disrupt the breeding cycle of a population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No individual plants or habitat removal will occur as part of the proposal. Therefore, the proposal is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No individual plants or habitat removal will occur as part of the proposal. Therefore, the proposal is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No individual plants or habitat removal will occur as part of the proposal. Therefore, the proposal is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No individual plants or habitat removal will occur as part of the proposal. Therefore, the proposal is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	There will be no disturbance to the species habitat as part of the proposal. Therefore, it is unlikely that the proposal will result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	There will be no disturbance to the species habitat as part of the proposal. Therefore, it is unlikely that the proposal will result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	There will be no disturbance to the species habitat as part of the proposal. Therefore, it is unlikely that the proposal will result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	There will be no disturbance to the species habitat as part of the proposal. Therefore, it is unlikely that the proposal will result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

Significant Impacts	<i>Acacia bynoeana</i>	<i>Angophora inopina</i>	<i>Tetratheca juncea</i>	<i>Grevillea parviflora</i> subsp <i>parviflora</i>
Introduce disease that may cause the species to decline.	There will be no disturbance to the species habitat as part of the proposal. Therefore, it is unlikely that the proposal will introduce disease (e.g. <i>P. cinnamomi</i>) that may cause the species to decline.	There will be no disturbance to the species habitat as part of the proposal. Therefore, it is unlikely that the proposal will introduce disease (e.g. <i>P. cinnamomi</i>) that may cause the species to decline.	There will be no disturbance to the species habitat as part of the proposal. Therefore, it is unlikely that the proposal will introduce disease (e.g. <i>P. cinnamomi</i>) that may cause the species to decline.	There will be no disturbance to the species habitat as part of the proposal. Therefore, it is unlikely that the proposal will introduce disease (e.g. <i>P. cinnamomi</i>) that may cause the species to decline.
Interfere substantially with the recovery of the species.	No individual plants or habitat removal will occur as part of the proposal. Therefore, the proposal is unlikely to interfere substantially with the recovery of the species.	No individual plants or habitat removal will occur as part of the proposal. Therefore, the proposal is unlikely to interfere substantially with the recovery of the species.	No individual plants or habitat removal will occur as part of the proposal. Therefore, the proposal is unlikely to interfere substantially with the recovery of the species.	No individual plants or habitat removal will occur as part of the proposal. Therefore, the proposal is unlikely to interfere substantially with the recovery of the species.