Publication of Information for Assessment on Preliminary Documentation under Section 95 of the *Environment Protection and Biodiversity Conservation Act 1999*

Name of the Action: Narrabri Coal Mine Stage 2 Longwall Project (EPBC 2009/5003).

Location of the Action: 30km south of Narrabri, NSW.

Description of the Action: Narrabri Coal Operations Pty Ltd (NCOPL) is proposing to convert the Narrabri Coal Mine from a continuous miner operation (Stage 1) with an approved annual production rate of 2.5 Mtpa to a longwall (underground) mining operation with a maximum annual production rate of 8 Mtpa.

The relevant matter protected by Part 3 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is listed threatened species and communities, including the listed Superb Parrot (*Polytelis swainsonii*) and the listed *Bertya opponens*. In accordance with section 95 of the EPBC Act, NCOPL invites public comment on the Narrabri Coal Mine Stage 2 Longwall Project as described in the below listed published material:

- Narrabri Coal Mine Stage 2 Longwall Project EPBC Act Referral (dated 16 July 2009);
- Narrabri Coal Mine Stage 2 Longwall Project EPBC Act Reconsideration Request (dated 13 October 2009);
- Variation Request - Narrabri Coal Project 2009/5003 (dated 10 February 2010); and
- Variation decision (dated 15 March 2010).

The above published material will be available for public inspection from Thursday 25 March 2010 to Friday 9 April 2010 at the following locations:

Narrabri Shire Library
8 Doyle Street
Narrabri NSW 2390

State Library of New South Wales
Macquarie Street
Sydney NSW 2000

Commonwealth Department of the Environment, Heritage, Water and the Arts
John Gorton Building
Environment entrance
King Edward Terrace
Parkes ACT 2600

Interested parties are invited to provide written comments in relation to the published material or the Action by 9 April 2010. Please provide comments to:

Mr Brian Cullen
Narrabri Coal Operations Pty Ltd
PO Box 600, Gunnedah, NSW, 2380

Narrabri Coal Mine Stage 2 Longwall Project EPBC Act Referral (dated 16 July 2009)

Narrabri Coal Operations Pty Ltd

ABN: 76 107 813 963

Narrabri Coal Mine

Environment Protection and Biodiversity Conservation Act Referral

Compiled by:

R.W. CORKERY & CO. PTY. LIMITED

July 2009

Australian Government

Department of the Environment, Water, Heritage and the Arts

Referral of proposed action

What is a referral?

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister. To obtain approval from the Environment Minister, a proposed action should be referred. The purpose of a referral is to obtain a decision on whether your proposed action will need formal assessment and approval under the EPBC Act.

Your referral will be the principal basis for the Minister's decision as to whether approval is necessary and, if so, the type of assessment that will be taken. These decisions are made within 20 business days, provided that sufficient information is provided in the referral.

Who can make a referral?

Referrals may be made by a person proposing to take an action, the Commonwealth or a Commonwealth agency, a state or territory government, or agency, provided that the relevant government or agency has administrative responsibilities relating to the action.

When do I need to make a referral?

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15B and 15C)
- Wetlands of international importance (sections 16 and 17B)
- Listed threatened species and communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- Protection of the environment from nuclear actions (sections 21 and 22A)
- Commonwealth marine environment (sections 23 and 24A)
- The environment, if the action involves Commonwealth land (sections 26 and 27A), including:
    - actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land);
    - actions taken on Commonwealth land that may have a significant impact on the environment generally;
- The environment, if the action is taken by the Commonwealth (section 28)
- Commonwealth Heritage places outside the Australian jurisdiction (sections 27B and 27C)

You may still make a referral if you believe your action is not going to have a significant impact, or if you are unsure. This will provide a greater level of certainty that Commonwealth assessment requirements have been met.

To help you decide whether or not your proposed action requires approval (and therefore, if you should make a referral), the following guidance is available from the Department's web site:

- the Policy Statement titled Significant Impact Guidelines 1.1 – Matters of National Environmental Significance. Additional sectoral guidelines are also available.
- the Policy Statement titled Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies.
- the interactive map tool (enter a location to obtain a report on what matters of NES may occur in that location).

Can I refer part of a larger action?

In certain circumstances, the Minister may not accept a referral for an action that is a component of a larger action and may request the person proposing to take the action to refer the larger action for consideration under the EPBC Act (Section 74A, EPBC Act). If you wish to make a referral for a staged or component referral, read 'Fact Sheet 6 Staged Developments/Split Referrals' and contact the Referral Business Entry Point (1800 803 772).

Do I need a permit?

Some activities may also require a permit under other sections of the EPBC Act. Information is available on the Department's web site.

What information do I need to provide?

Schedule 2 of the EPBC Regulations sets out the information that must be included in a referral. Completing all parts of this form will ensure that you submit the required information and will also assist the Department to process your referral efficiently.

You can complete your referral by entering your information into this Word file.

Instructions

Instructions are provided in green text throughout the form.

Attachments/supporting information

The referral form should contain sufficient information to provide an adequate basis for a decision on the likely impacts of the proposed action. You should also provide supporting documentation, such as environmental reports or surveys, as attachments.

Coloured maps, figures or photographs to help explain the project and its location should also be submitted with your referral. Aerial photographs, in particular, can provide a useful perspective and context. Figures should be good quality as they may be scanned and viewed electronically as black and white documents. Maps should be of a scale that clearly shows the location of the proposed action and any environmental aspects of interest.

Please ensure any attachments are below two megabytes (2mb) as they will be published on the Department's website for public comment (Note: the Minister may decide not to publish information that is commercial-in-confidence). To minimise file size, enclose maps and figures as separate files if necessary. If unsure, contact the Referral Business Entry Point for advice. Attachments larger than two megabytes (2mb) may delay processing of your referral.

How do I submit a referral?

Referrals may be submitted by mail, fax or email.

Mail to:

Referral Business Entry Point
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

- If submitting via mail, electronic copies of documentation (on CD/DVD or by email) are appreciated.

Fax to: 02 6274 1789

- Faxed documents must be of sufficiently clear quality to be scanned into electronic format.
- Address the fax to the mailing address, and clearly mark it as a 'Referral under the EPBC Act'.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

Email to: epbc.referrals@environment.gov.au

- Clearly mark the email as a 'Referral under the EPBC Act'.
- Attach the referral as a Microsoft Word file and, if possible, a PDF file.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

What happens next?

Following receipt of a valid referral (containing all required information) you will be advised of the next steps in the process, and the referral and attachments will be published on the Department's web site for public comment (**Note: the Minister may decide not to publish information that is commercial-in-confidence**).

The Department will write to you at the end of 20 business days to advise you of the outcome of your referral and whether or not formal assessment and approval under the EPBC Act is required. There are a number of possible decisions regarding your referral, including:

The proposed action is NOT LIKELY to have a significant impact and does NOT NEED approval

No further consideration is required under the environmental assessment provisions of the EPBC Act and the action can proceed (subject to any state or local government requirements).

The proposed action is NOT LIKELY to have a significant impact IF undertaken in a particular manner

The particular manner in which you must carry out the action will be identified as part of the final decision. You must report your compliance with the particular manner to the Department.

The proposed action is LIKELY to have a significant impact and does NEED approval

If the action has, will have or is likely to have a significant impact it is called a *controlled action* and the particular matters upon which the action may have a significant impact (such as World Heritage or threatened species) are known as the *controlling provisions*.

The proposed action is subject to a public assessment process before it can be considered for approval. The assessment approach will usually be decided at the same time as the controlled action decision. (Further information about the levels of assessment and basis for deciding the approach are available on the Department's web site.)

Compliance audits

The Department may audit your project at any time to ensure that it was completed in accordance with the information provided in the referral or the particular manner specified in the decision. If the project changes, such that the likelihood of significant impacts could vary, you should write to the Department to advise of the changes.

For more information

- call the Department of the Environment, Water, Heritage and the Arts Community Information Unit on 1800 803 772 or
- visit the web site www.environment.gov.au/epbc

All the information you need to make a referral, including documents referenced in this form, can be accessed from the above web site.

Referral of Proposed Action

Project Title: Narrabri Coal Mine Stage 2 Longwall Project

1 Summary of Proposed Action

NOTE: You must also attach a map/plan(s) showing the location and approximate boundaries of the area in which the project is to occur. Maps in A4 size are preferred. You must also attach a map(s)/plan(s) showing the location and boundaries of the project area in respect to any features identified in 3.1 & 3.2, as well as the extent of any freehold, leasehold or other tenure identified in 3.3(j).

1.1 **Short Description**

The project involves the conversion of the approved Narrabri Coal Mine from a continuous miner operation with an approved annual production rate of 2.5Mtpa to a longwall mining operation with a maximum annual production rate of 8Mtpa.

1.2 **Latitude and Longitude**

Latitude and longitude details are used to accurately map the boundary of the proposed action. If these coordinates are inaccurate or insufficient it may delay the processing of your referral.

	Latitude			Longitude		
location point[1]	degrees	minutes	seconds	degrees	minutes	seconds
A	30	28	41	149	49	59
B	30	28	44	149	53	34
C	30	31	41	149	54	58
D	30	31	30	149	53	36
E	30	31	57	149	53	05
F	30	33	20	149	52	49
G	30	33	24	149	49	51

Note 1: see **Figure A**

1.3 **Locality**

Narrabri Coal Mine is approximately 30km south-southeast of Narrabri and 10km north-northwest of Baan Baa west of the Kamilaroi Highway (see **Figure 1** – as presented in Ecotone, 2009). The project area overlaps the 8837 Narrabri 1:100 000 & 8836 Baan Baa 1:100 000 map sheets.

1.4 **Size of the Development Footprint or Work Area (Hectares)**

Mining is proposed within a large lease area of approximately 5 210 hectares in area and stretching approximately 8.6 km from north to south and 4.8 km to 7.9 km from east to west. The underground mining area covers 3 630ha and the area of surface disturbance up to 566ha (30ha for additional surface facilities and up to 536ha for longwall mining-related activities)

1.5 **Street Address of the Site**

Kamilaroi Highway NSW

1.6 **Lot Description**

Describe the lot numbers and title description, if known.

All or part of:

- Lots 381 & 382 DP 1028753,
- Lot 1 DP 798487,
- Lots 57, 58, 60, 63 to 65, 81 to 84 & 115 DP 757114,
- Lot 61 & Part Lots 60 & 115 DP 757124.
- Lots 1 & 2 DP 811171,
- Lots 3, 7, 8, 10, 25, 67 & 68 DP 757104,
- Lot 3 DP 1005608,
- Lots 151 & 152 DP 816020,
- Lot 1 DP 659899,

Includes part of Pilliga East State Forest and Jacks Creek State Forest, and various Crown roads.

1.7 **Local Government Area and Council contact (if known)**

If the project is subject to local government planning approval, provide the name of the relevant council contact officer.

Project assessed under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and not subject to local government planning approval.

1.8 **Timeframe**

Activity	Indicative Timing
Narrabri Coal Project Stage 1 surface facilities completed	November 2009
Narrabri Coal Mine Pit Bottom established	November 2009
Narrabri Coal Mine Stage 1 production commences	December 2009
Longwall Project Approval Determination	January to March 2010
Longwall unit brought onto Mine Site and assembled	October 2010
Roadways for Panel 1 completed	December 2010
Longwall mining commences	January 2011

Based upon an annual production rate of up to 8.0Mt the mine is estimated to operate for a period of approximately 30 years.

1.9	**Alternatives** Does the proposed action include alternative timeframes, locations or activities?	✓	No
1.10	**State Assessment** Is the action subject to a state or territory environmental impact assessment?	✓	Yes, please refer to Section 2.4
1.11	**Component of Larger Action** Is the proposed action a component of a larger action?	✓	Yes, please refer to Section 2.6
1.12	**Related Actions/Proposals** Is the proposed action related to other actions or proposals in the region (if known)?	✓	Yes, this project is the second stage of the Narrabri Coal Mine Project.
1.13	**Australian Government Funding** Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	✓	No

2 Detailed Description of Proposed Action

NOTE: It is important that the description is complete and includes all components and activities associated with the action. If certain related components are not intended to be included within the scope of the referral, this should be clearly explained in section 2.6.

2.1 Description of Proposed Action

Narrabri Coal Operations Pty Ltd (NCOPL) proposes to convert the approved Narrabri Coal Mine (Stage 1) from a continuous miner operation with an approved annual production rate of 2.5Mtpa to a longwall mining operation (Stage 2) with a maximum annual production rate of 8Mtpa ("the Longwall Project"). **Figure A** identifies the critical surface and underground components of the proposed Longwall Project. **Figure B** differentiates between those activities or infrastructure already approved for the Stage 1 operations (within the Pit Top Area of the Narrabri Coal Mine) and those proposed for the Stage 2 Longwall Project. The following provides a summary of the activities associated with the development of the Longwall Project.

Longwall Mining

Longwall mining would involve the sequential development of heading gate roads approximately 305m apart oriented north-south from the main headings ("West Mains") and developed for the full distance to the northern and southern boundaries of ML 1609 (up to 4.2km). Once each set of roadways are fully developed, the longwall equipment would be installed and the coal recovered as the longwall unit retreats back towards the West Mains between the two roadways. All coal would be conveyed back to the Pit Bottom Area for transfer to the surface via the approved conveyor drift. **Figure A** provides the proposed layout of the underground mining operations.

The longwall unit would recover 4.2m of coal from the bottom of the Hoskissons Coal Seam (leaving up to 5.2m of coal in-situ) retreating at a rate of approximately 15m per day. At this rate, each longwall panel would take approximately 1 year to complete. Based on the proposed mining schedule, there could be up to three longwall panels being prepared (gate road development) or mined (longwall unit retreat).

Gas Drainage and Mine Ventilation

The gas composition of the Hoskissons Coal Seam (which has a measured gas content range from 3.5m^3/t to 7.5m^3/t) is predicted to vary considerably, however, for planning purposes and subject to further data becoming available, it is assumed to be an average of 90% CO_2 and 10% CH_4. The porous coarse grained sandstone floor of the Hoskissons Coal Seam would also be a source of gas within the underground workings. Pre drainage of the coal seam would be undertaken to reduce gas content to less than 5.0m^3/t for the management of outbursts and rib emission prior to the development of each longwall panel. Pre-drainage would be undertaken using surface to in-seam (SIS) medium radius drilling (MRD) and or conventional underground boreholes.

Surface to In-seam (SIS) pre-drainage using Medium Radius Drilling (MRD) involves drilling from surface (Pre-drainage Borehole Site) into and along the coal seam (up to 2.5km). The gas (as well as water) is then drawn from the seam using a vacuum pump (Gas Production Site) and dispersed to the atmosphere. The water pumped to the surface would be piped to the Pit Top Area for storage in one of the Water Storage / Evaporation Ponds. Along each longwall panel, two to three Pre-drainage Borehole and Gas Production Sites would be required. The combined disturbance associated with each Pre-drainage Borehole and Gas Production Site is estimated to be a maximum of 3.5ha. **Figure A** presents the proposed locations of the Pre-drainage Borehole and Gas Production Sites, which combined would disturb up to 259ha.

As the underground workings are developed, a ventilation system would be progressively upgraded to prevent gas build-up within the underground workings, thereby providing for safe working conditions and minimising the risk of outburst or spontaneous combustion. This would involve the establishment of ventilation shafts from the West Mains, as well as at the rear of every third or fourth longwall panel, which could operate as ventilation intakes or exhausts. The disturbance associated with each ventilation shaft would be approximately 6.25ha for the three located above the West

Mains and 2.25ha for the rear of panel ventilation shaft areas. **Figure A** presents the proposed locations of ventilation shafts, which combined would disturb up to 40ha.

As the longwall unit retreats, and the top coal of the seam collapses, the gas accumulating in the goaf would also be drained. Goaf gas drainage would be completed either by re-using the MRD system used for pre-draining the gas from the panel to be developed, or by the development of additional bores from surface into the collapsed panel, with the gas drawn out the goaf by the installation and operation of vacuum plant at the top of each bore. Each goaf gas drainage site (which would disturb up to 0.25ha) would be located towards the tailgate edge of the completed longwall panel and at approximately 200m intervals. **Figure A** presents the estimated locations of the Goaf Gas Drainage Sites, which combined would disturb up to 100ha.

Coal Transfer to Surface

Transportation of the mined coal to the Run-of Mine (ROM) coal stockpile within the Pit Top Area would be via the conveyor drift from the Pit Bottom Area to the box cut of the Pit Top Area. From the box cut excavation, the ROM coal would be transported to the ROM coal stockpile area by conveyor from where it would be sent to the Coal Handling and Preparation Plant (CHPP).

Coal Processing

The ROM coal would be drawn from the ROM coal stockpiles via one of two reclaim valve and tunnels from where it would be fed to a rotary breaker for size reduction. The broken coal would then be transferred to a dry screen with the <16mm coal transferred directly to the product coal stockpile area and the remainder transferred to a jig washery for removal of fine material and screening of the coarse reject. The <50mm coal would be transferred to the product coal stockpile area with the coarse reject and dewatered and thickened fine reject sent to a reject emplacement area for storage.

As illustrated on **Figure B**, the ROM coal pad would be extended to the north to provide for the increased stockpile requirements and additional infrastructure required to accommodate the increase in coal production from 2.5Mtpa to a maximum of 8.0Mtpa. The ROM coal pad extension would increase the size of the pad from approximately 2ha to approximately 4.2ha and would, in combination with the elevation of the ROM coal drift conveyor and stacking system, increase the ROM coal storage capacity to 400 000t.

Reject Management

Coal processing is expected to remove up to 5% of the total ROM feed as reject, which will be predominantly rock from the floor of the workings. About 90% of this will be coarse reject (16mm to 125mm) and the remainder a filter cake produced by the dewatering and thickening of the ultra-fine reject. The two reject streams would be mixed and conveyed to a reject pile for stockpiling.

From the reject pile, the material would be loaded to trucks and transported to an area to the southwest of the box cut for placement and stockpiling. This Reject Emplacement Area, which is identified on **Figure B**, is on the north-facing side of a low ridge and is bounded on the north by Kurrajong Creek, and on the south by the crest of the ridge. The proposed location of the reject emplacement area falls gently at about 1.5° from the ridge to the bank of Kurrajong Creek over a distance of about 600m. The area allocated to the reject emplacement area is approximately 25ha, although it would be developed progressively over the life of the mine and the entire area may not be required for the management of reject material. The emplacement would be constructed against the slope of the ridge, rising to a maximum of 15m above the natural surface level.

Transportation

The product coal would be drawn from stockpiles via three reclaim valves and tunnels and conveyed to the train load-out bin. The loading of product coal via the drawdown valves and trains load-out bin would be fully automated with batches drawn from the stockpiles and loaded to trains on the Narrabri Coal Rail Siding.

Rehabilitation

Rehabilitation of the mine site would involve three distinct areas.

1. Pit Top Area infrastructure.

   All surface infrastructure, within the exception of the mine access road and rail infrastructure would be decommissioned, dismantled and removed from the mine site. The disturbed areas of the Pit Top Area would be backfilled where appropriate, eg. box cut and underground water storage dams (after dam lining and saline material is removed), profiled, covered with available topsoil and revegetated with either pasture grass species or native tree, shrub and grass species (depending on final landform and land use requirements).

2. Ventilation and gas drainage infrastructure.

   The ventilation and gas drainage infrastructure would be rehabilitated in much the same fashion as the Pit Top Area, albeit on a smaller and more widespread scale. Much of the rehabilitation would be completed progressively as the area required for the construction and installation of the bores required for ventilation and gas drainage greatly exceeds the area required to manage and maintain these operations.

3. Surface cracking caused by subsidence.

   The disturbance resultant from any surface cracking caused by subsidence would be progressively rehabilitated. For smaller width cracking, the surface would simply be ripped to allow the cracks to be filled in. In some instances, the surface cracking may be too wide to be effectively in-filled by surface ripping and in these instances, material excavated from the borrow pit area would be used to in-fill the cracks prior to ripping and revegetation.

In addition to these principal activities, the mine would continue to be operated with comprehensive systems to manage groundwater, surface water, noise, air quality, and visibility.

2.2 Alternative Locations, Time Frames or Activities That Form Part of the Referred Action

There are no alternative locations, time frames or activities that form part of the Longwall Project.

2.3 Context, Planning Framework and State/Local Government Requirements

The Longwall Project will be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979*. As such, the Minister for Planning is the approval authority.

Under Part 3A, the application for project approval must be made prior to the receipt of Director-General's Requirements for the Longwall Project. The application was made on October 9 2008 (application number MP 08_0144).

The following licences and leases, additional to those encompassed by the planning approval process, would be required to allow commencement of the Longwall Project.

- Environment Protection Licence 12789 – Department of Environment and Climate Change. The Proponent (Narrabri Coal Operations Pty Ltd) holds Environment Protection Licence No. 12789 for the Narrabri Coal Mine and this would require variation under Section 58 of the *Protection of the Environment Operations Act 1997* should the Longwall Project be approved.
- Mining Lease – Department of Primary Industries (Mineral Resources). The Proponent holds Mining Lease (ML) No. 1609 which entitles the Proponent to recover of coal from the Hoskissons Coal Seam. A small variation to ML 1609 may be required to extend the area without surface restriction to enable the construction of the Reject Emplacement Area.

- Water Licence – Department of Water and Energy. A licence is required under Section 116 of the *Water Act 1912* to permit the extraction of groundwater during mining activities.

A licence is also required under the *Water Management Act 2000* should the Longwall Project result in any loss in water within aquifers for which a Water Sharing Plan is current. The Proponent currently holds WAL AL811436 for 248MLpa within the Intake Beds of the Great Artesian Basin Groundwater Source. The Proponent is currently investigating the acquisition of additional WAL's within either or the Namoi Alluvium Groundwater Source or from the Namoi River.

Further approvals and notifications would be required in accordance with the *Coal Mines Health and Safety Act 2002*, relating to the commencement of operations.

The Proponent would ensure all buildings constructed on the Mine Site are approved and/or certified by Narrabri Shire Council.

2.4 Environmental Impact Assessments Under Commonwealth, State or Territory Legislation

If you have identified that the proposed action will be or has been subject to a state or territory environmental impact statement (in Section 1.10) you must complete this section. Describe any environmental assessment of the relevant impacts of the project that has been, is being, or will be carried out under state or territory legislation. Specify the type and nature of the assessment, the relevant legislation and the current status of any assessments or approvals. Where possible, provide contact details for the state/territory assessment contact officer.

The following assessments are being, or have been, undertaken to accompany an Environmental Assessment currently in preparation in accordance with the requirements of Part 3A of the *Environmental Planning and Assessment Act 1979:* for the Longwall Project.

- Flora and fauna impact assessment (finalised awaiting assessment of adequacy from NSW Department of Planning). This assessment includes an assessment of impact on threatened species in accordance with Part 5A of the EP&A Act, the EPBC Act Protected Matters and State Environmental Planning Policy No. 44 – Koala Habitat Protection.
- Soil and land capability assessment (currently being finalised prior to submission to the NSW Department of Planning for assessment of adequacy).
- Subsidence assessment (currently being finalised prior to submission to the NSW Department of Planning for assessment of adequacy).
- Aboriginal heritage assessment (currently being finalised prior to submission to the NSW Department of Planning for assessment of adequacy).
- Non-indigenous heritage assessment (currently being finalised prior to submission to the NSW Department of Planning for assessment of adequacy).
- Groundwater impact assessment (currently being finalised prior to submission to the NSW Department of Planning for assessment of adequacy).
- Surface water impact assessment (currently being finalised prior to submission to the NSW Department of Planning for assessment of adequacy).
- Noise and vibration assessment (currently being finalised prior to submission to the NSW Department of Planning for assessment of adequacy).
- Air quality impact assessment (currently being finalised prior to submission to the NSW Department of Planning for assessment of adequacy).
- Greenhouse gas assessment (currently being finalised prior to submission to the NSW Department of Planning for assessment of adequacy).

Describe or summarise any public consultation undertaken, or to be undertaken, during the assessment. Attach copies of relevant assessment documentation and outcomes of public consultations (if available).

A community consultation day was held at Baan Baa local hall on the 15th of May 2009. The community consultation day was open to the general public and advertised in the *Namoi Valley Independent* and *Narrabri Courier* on 7, 12 and 14 May 2009. Approximately 150 people attended the day where they were able to individually question each of the consultants preparing the above environmental assessments. Each consultant was positioned at a desk around the sides of the hall. All feedback from the day was positive. Most people who attended were unfamiliar with the project and attended to find out what was planned.

None of those attending identified threatened species, or ecological issues more generally, as an issue of concern.

2.5 Consultation with Indigenous Stakeholders

Where Indigenous stakeholders are likely to be affected by your proposed action, your referral should describe any consultations undertaken with Indigenous stakeholders. Identify the relevant stakeholders and the status of consultations at the time of the referral.

In accordance with the "*Guidelines For Aboriginal Cultural Heritage Impact Assessment and Community Consultation*" (DECC, 2005), an advertisement was placed in the *Narrabri Courier* on 26 August 2008 inviting all Aboriginal stakeholders with an interest in the longwall project to register their interest. Responses were received from Narrabri Local Aboriginal Land Council (LALC) and Narrabri Gomeroi Traditional Owner Group (Gomeroi).

Both groups were contacted and provided with a description of proposed investigative strategy for the archaeological investigation of the Mine Site. After a protracted period of consultation involving the Proponent, Gomeroi, Narrabri LALC and the consultant archaeologist it was agreed that the field investigation could commence in accordance with the proposed survey strategy. Subsequently, a field investigation of the initial seven longwall panels was conducted over 5 days by the consultant archaeologist and representatives of both Narrabri LALC and Gomeroi. Both prior to and during the survey, the representatives of Narrabri LALC and Gomeroi and the archaeologist discussed the potential for particular site types to be present, and the particular environments in which they might occur. The survey strategy and results were considered and discussed throughout the survey and at the completion of each survey unit. At the conclusion of the survey the results were discussed as were the possible outcomes in view of the potential impacts. A listing of the 43 sites recorded during the investigation were forwarded to both Narrabri LALC and Gomeroi, to provide them with the information on which they could base any recommendations they might have as to the future management of the identified cultural record. Both groups have subsequently responded and provided recommendations for the management of the identified sites. Notably, the alignment of proposed surface disturbing activities has been modified, where possible, to avoid a number of the sites identified by the Aboriginal community as being of greatest significance.

Narrabri LALC and Gomeroi have subsequently agreed to undertake a field survey over the remaining longwall panels (LW8 to LW26) of the Mine Site. This survey is scheduled for 6 July to 18 July 2009, after which a listing of all identified sites will be provided and both groups invited to provide recommendations for the management of these sites (and Aboriginal heritage generally).

The Proponent would also abide by the provisions of the National Parks and Wildlife Act 1974 in relation to the identification of additional Indigenous archaeological sites following the approval and commencement of the Longwall Project.

2.6 A Staged Development or Component of a Larger Project

If you have identified that the proposed action is a component of a larger action (in section 1.11) you must complete this section. Provide information about the larger action and details of any interdependency between the stages/components and the larger action. You may also provide justification as to why you believe it is reasonable for the referred action to be considered separately from the larger proposal (eg. the referred action is 'stand-alone' and viable in its own right, there are separate responsibilities for component actions or approvals have been split in a similar way at the state or local government levels).

From the outset of mine planning for the Stage 1 operation, it was recognised the coal resource may be suitable for extraction by longwall mining methods, however, given the absence of any experience with longwall mining in this area, the Proponent favoured a staged approach to enable further assessment of ground, mining and groundwater conditions. Mine planning for Stage 2 commenced almost immediately following the granting of PA 05_0102, considering economic, geological, geotechnical and environmental issues.

The area of Stage 1 is much smaller than Stage 2. The minimal disturbance associated with Stage 1 led Ecotone (2007) to conclude that referral of Stage 1 of the project pursuant to the EPBC Act was not necessary. In the same report, Ecotone indicated that the potential wider impacts of Stage 2 would likely require referral for assessment. While Ecotone (2009) found that no significant impact are likely to occur from Stage 2 of the project – referral for assessment was recommended due to the large size of the project area and the number of threatened fauna species recorded.

3 Description of Environment & Likely Impacts

3.1 Matters of National Environmental Significance

3.1 (a) World Heritage Properties

No world heritage properties occur within the Mine Site and none are known in the local area (20km radius from the centre of the Mine Site). The Longwall Project will not affect any world heritage areas.

3.1 (b) National Heritage Places

No world heritage places occur within the Mine Site and none are known in the local area (20km radius from the centre of the Mine Site). The Longwall Project will not affect any national heritage places.

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

No wetlands of international importance occur within the Mine Site and none are known in the local area (20km radius from the centre of the Mine Site). The Longwall Project will not affect any wetlands of international importance.

3.1 (d) Listed Threatened Species and Ecological Communities

A flora and fauna impact assessment of the Longwall Project was prepared by Ecotone Ecological Consultants Pty Ltd (2009) and the relevant sections are summarised below.

The EPBC Act Protected Matters Search Tool was accessed on 11th May 2009 to identify the Protected Matters under the Commonwealth EPBC Act that occur or may occur within the study locality. The Protected Matters Report listed three endangered ecological communities (two critically endangered), nine threatened flora species (one endangered) and 12 threatened fauna species (three endangered). The results of the Protected Matters Report are shown in **Table 1**.

Table 1
Protected Matters Report Summary Table

Protected Matter	Details
Threatened Ecological Communities	Three ecological communities: • Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland (**CE**), • Weeping Myall Woodlands (**E**), and • White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (**CE**)

Table 1
Protected Matters Report Summary Table (cont'd)

Protected Matter	Details
Threatened Species - Flora	Nine species: **Species or species habitat may occur within area according to EPBC modelling.** • *Diuris sheaffiana* (=*Diuris tricolor*) Tricolour diuris (**V**) **Species or species habitat likely to occur within area according to EPBC modelling.** • *Bertya opponens* (**V**) • *Cadellia pentastylis* Ooline (**V**) • *Digitaria porrecta* Finger panic grass (**E**) • *Philotheca ericifolia* (**V**) • *Pterostylis cobarensis* Cobar greenhood orchid (**V**) • *Rulingia procumens* (**V**) • *Swainsona murrayana* Slender darling-pea (**V**) • *Thesium australe* Austral toadflax (**V**)
Threatened Species – Fauna (Terrestrial Species only)	Twelve species: **Species or species habitat may occur within area according to EPBC modelling.** • Australian painted snipe *Rostratula australis* (**V**) • Booroolong frog *Litoria booroolongensis* (**E**) • Brush-tailed rock-wallaby *Petrogale penicillata* (**V**) • Eastern long-eared bat *Nyctophilus timoriensis* (south-eastern form) (**V**) • Five-clawed worm-skink *Anomalopus mackayi* (**V**) • Large-eared pied bat *Chalinolobus dwyeri* (**V**) • Regent honeyeater *Xanthomyza phrygia* (**E**) • Superb parrot *Polytelis swainsonii* (**V**) **Species or species habitat likely to occur within area according to EPBC modelling.** • Border thick-tailed gecko *Underwoodisaurus sphyrurus* (**V**) • Malleefowl *Leipoa ocellata* (**V**) • Swift parrot *Lathamus discolor* (**E**) • Pilliga mouse *Pseudomys pilligaensis* (**V**) (*now known as the Delicate mouse Pseudomys delicatatus*).

Notes:
V Species listed as **Vulnerable** under the Commonwealth *EPBC Act*.
E Species listed as **Endangered** under the Commonwealth *EPBC Act*.
CE Species listed as **Critically Endangered** under the Commonwealth *EPBC Act*.

Threatened Flora Species

No threatened flora species listed under either the NSW *Threatened Species Conservation Act 1979* (TSC Act), Commonwealth EPBC Act or rare species on the ROTAP database were detected in the study area during the flora survey. One NSW Wildlife Atlas record of *Bertya opponens* (Vulnerable TSC Act) from 1999 was found to fall towards the western edge of the study area, but its position was only given to an accuracy of 1000m. The existence of this record was used as the basis for the location of Flora Site 1 (see **Figure 3** – as presented in Ecotone, 2009), and this species was

particularly targeted during the survey at this site. However, its presence was not detected at this or any other flora site, but due to the record (which could actually occur just off-site) the likelihood of the species being present within the study area was regarded as remaining high. Two other threatened flora species considered to have potential to occur in the study area include *Cadellia pentastylis* (ooline) and *Lepidium aschersonii* (spiny peppercress).

Threatened Ecological Communities

Two Endangered Ecological Communities (EEC) are considered to occur within the study area, based on the results of the field investigations (see **Figure 3**).

- Brigalow (*Acacia harpophylla* dominant and co-dominant) – marginal occurrence only. Intergrades in and out of Brown Bloodwood / Pilliga Grey Box / Red Ironbark woodland community dominating the western half of the project area. Note that the Brigalow community was not mapped within the much larger Brown Bloodwood / Pilliga Grey Box / Red Ironbark woodland community. Due to the large size and dense vegetation of the Brown Bloodwood / Pilliga Grey Box / Red Ironbark woodland community much of the community was not surveyed and only some areas of Brigalow were identified (not shown).
- Weeping Myall Woodlands – trace occurrence only. A highly fragmented, isolated and disturbed 0.3 hectare stand of weeping myalls occurs on both sides of a farm track.

Threatened Fauna Species

Three threatened fauna species listed on the EPBC Act were recorded in the project area during ecological field surveys by Ecotone (2009). The three species are:

Superb Parrot (*Polytelis swainsonii*)

A group of four superb parrots were recorded on a single occasion. The group of four birds were recorded flying along a narrow strip of woodland drainage line vegetation (see **Figure 9** – as presented in Ecotone, 2009).

Delicate Mouse (*Pseudomys delicatulus*)

A single delicate mouse was captured in a pitfall trap (see **Figure 9**). The individual, a male, weighed eight grams, had a tail length of 61mm and a head and body length of 55mm. The record of the delicate mouse is a significant range extension for the species which is typically found in central and southern Queensland. The delicate mouse is listed as Endangered on the TSC Act. The southern-most recorded location of the delicate mouse is Bebo State Forest near Warialda (approximately 210km northeast), near the Queensland and New South Wales border (DECC threatened species web site). The delicate mouse is closely related to the Pilliga mouse and the New Holland mouse and there is currently some debate as to the taxonomic identity of the species (DECC threatened species web site). On the EPBC Act Protected Matters Database the Pilliga mouse is noted as "now known as the delicate mouse *Pseudomys delicatulus*" but the delicate mouse is not listed on the EPBC Act. As a precautionary approach the Pilliga mouse and Delicate mouse are considered to be the same species for the purposes of this assessment and as such are listed as vulnerable on the EPBC Act under the title 'Pilliga Mouse'.

Greater Long-eared Bat (*Nyctophilus timoriensis*)

A single greater long-eared bat was captured in a harp trap (see **Figure 9**).

Nature and extent of likely impact

Surface disturbance associated with the Longwall Project would require the removal of 178.9 hectares of brown bloodwood/Pilliga box woodland (containing unmapped areas of the Brigalow EEC) and 22.9 hectares of inland grey box woodland EEC. The small area of Weeping Myall EEC would not be affected. Additionally subsidence will occur in the remaining areas of all woodland communities. The potential impacts of subsidence include the following.

- Reduction in surface height of up to a maximum of 2.17m in the east and up to a maximum of 2.44m in the west of the Mine Site.
- Surface cracks ranging in width from 20mm (in the west) to 190mm (in the east) will occur. Strain concentrations in near surface rock, could double the above crack widths to 40mm and 380mm respectively. Cracks will probably extend to depths ranging from 5m to 15m, and possibly deeper in near surface rock exposures and ridges (may double to between 20 and 380mm).
- Surface cracks repair works may be required, in particular along access tracks and roads and along watercourses where cracks do not infill naturally with sediment.
- At cover depths less than 215m, creek flows (surface waters) could be re-routed to below-surface pathways and re-surface down-stream of the mining extraction limits. Groundwater dependent vegetation is likely to be affected by increases in vertical permeability and may result in the death of such vegetation.
- At cover depths greater than 215m surface water impacts are likely to be minimal.
- Sub-surface aquifers could be affected by subsidence and cause long-term increases to vertical permeability.
- It is very unlikely that a large-scale instability or landslip would occur in the long-term due to mining effects.
- Changes in surface tilts are very unlikely to cause localized surface slope instability unless mining-induced cracking and increased erosion rates also affect them. This particularly applies to the steeply eroded banks present within the creeks, which are likely to slump or topple if cracks develop through them.
- In areas with exposed dispersive/reactive soils and slopes greater than 10º, increases in tilt by 1º or 2º are expected to significantly increase the rate of soil erosion.
- In areas with slopes less than 10º, increases in tilt by 1º or 2º are expected to cause low erosion rate increases, except for creek channels, which would be expected to re-adjust to any changes in gradient.
- Head cuts are expected to develop above chain pillars between the panels and on the side where gradients increase. Sediments would be expected to accumulate where gradients decrease.
- Upsidence is unlikely to occur due to the broad nature of the valleys across the mining lease and the lack of thick, massive beds of conglomerate and/or sandstone units along the creeks/valleys. However if upsidence does occur, it may cause some minor, localized deviation of surface flows along ephemeral creek beds into sub-surface routes above the longwall panels. Re-routed surface flows would be expected to re-surface downstream of the damaged area.
- Surface slopes in the elevated areas of the mining area range between 10º and 20º and are unlikely to be affected by ponding. The net fall across the area will therefore be sufficient to allow surface drainage to continue un-impeded after mining is completed. However some of the longwall panels and watercourses present within the mining area could be susceptible to potential ponding depths of between 0.5m and 1.5m. Ponding may extend beyond the banks of drainage lines and result in the drowning of riparian and surrounding vegetation. The actual ponding depths will depend upon several

factors, such as rain duration, surface cracking and effective percolation rates of the surface soils and fractured rock bars/outcrops along the creeks.

- Subsidence may result in the breaching of farm dam walls or water losses through the floor of the dam storage area. Loss or increases in storage area may also occur due to the predicted tilting.
- Surface cracking will be rehabilitated by filling the cracks with material excavated during the construction of mine infrastructure.

In order to minimise the potential impacts of longwall mining, the Proponent would undertake the following mitigation measures:

- Surface cracks will be filled as they are identified.
- Small cracks will be filled in by the action of wind, water and natural soil movement,
- Large cracks will be filled in by a bulldozer or grader,
- Wider than expected cracks or those through drainage lines will be filled with subsoil material.
- Changes to surface drainage will be monitored and any stream re-direction or modification works will be undertaken after consultation with an appropriately qualified hydrological professional and/or the DWE.
- To minimise the potential impacts of erosion and steeply eroded creek banks toppling the Proponent would:
- Monitor surface slope displacement along subsidence cross lines
- Infill cracks as they appear,
- Regrade or revegetate areas significantly affected by erosion, and
- Regularly review and appraise any significant changes to surface slopes after each longwall is extracted.
- Treed areas to be cleared will be inspected by an ecologist for roosting or nesting fauna prior to clearing, and will relocate any identified fauna.
- The location of access tracks will be influenced by an ecologist after inspecting each proposed route and determining the path with least impact on environmental values.

An assessment of the following known to occur (recorded during field surveys) and predicted to occur (Protected Matters Database Search) EPBC Act listed species or ecological communities was carried out be Ecotone (2009) and is detailed in **Table 2**.

<u>Endangered Ecological Communities</u>

- Brigalow (*Acacia harpophylla* dominant and co-dominant) – marginal occurrence only.
- Weeping Myall Woodlands – trace occurrence only.

<u>Endangered Species</u>

- Swift parrot.
- Regent honeyeater.
- Spotted-tailed quoll.

Vulnerable Species

- *Cadellia pentastylis* (ooline).
- *Lepidium ascheronii* (spiny peppercress).
- Superb parrot.
- Eastern long-eared bat.
- Large-eared pied bat.
- Delicate mouse.
- Border thick-tailed gecko.
- Five-clawed worm skink.

Table 2
Assessment of Potential Impact on Matters of NES Listed Under the EPBC Act 1999

Significant Impact Criteria and Assessment	
Critically Endangered and Endangered Ecological Communities Brigalow (*Acacia harpophylla* dominant and co-dominant) and Weeping Myall Woodlands	
An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	*a) reduce the extent of an ecological community;* Brigalow: Given the limited and patchy distribution of the community in the western portion of the Mine Site, the limited surface works proposed are unlikely to significantly reduce the extent of the community, if at all. Weeping Myall: Unless there is a particular requirement to widen the dirt road along which the weeping myalls were found to occur, the current extent of the ecological community (which is very small already) would not be reduced.
	b) fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines; Brigalow: It is possible that the proposed 30m wide transmission line easement could fragment an intact patch of the community along the alignment, but other patches would remain unaffected, or suffer minor temporary disturbance due to the provision of tracks and goaf boreholes. Weeping Myall: Already highly fragmented and isolated from other patches by past clearing. The proposal is unlikely to significantly increase fragmentation of the community.
	c) adversely affect habitat critical to the survival of an ecological community; No habitat critical to the survival of either community occurs in the study area.
	d) modify or destroy abiotic (non-living) factors (such as water, nutrients or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns; Brigalow: Although some hydrological changes and alteration of surface water drainage patterns could occur within some patches of the community's habitat due to subsidence in the underground mining area, the community is not critically dependent on strict maintenance of the current hydrological regime for its survival. Weeping Myall: No major modifications of the abiotic environment are anticipated in the vicinity of the habitat for the community, unless substantial roadworks occur in that area.
	e) cause a substantial change in the species composition of an occurrence of an ecological community, causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting ;

Table 2
Assessment of Potential Impact on Matters of NES Listed Under the EPBC Act 1999

Significant Impact Criteria and Assessment	
Critically Endangered and Endangered Ecological Communities (cont'd) Brigalow (*Acacia harpophylla* dominant and co-dominant) and Weeping Myall Woodlands	
An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	No substantial changes in the species composition of either ecological community are expected as a direct or indirect result of the proposal.
	f) cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: – *Assisting invasive species , that are harmful to the listed ecological community, to become established; or* – *Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community;* The proposal has the potential to increase the risk of invasive weeds and diseases becoming established in or beyond new edge areas created by the power transmission easement and tracks to goaf boreholes throughout currently undisturbed vegetation in the western part of the Mine Site. These risks can be substantially reduced by implementation of a weed management plan and protocols to prevent the introduction and spread of pathogens, as outlined in the Recommendations.
	g) interfere with the recovery of an ecological community. While the proposal could potentially result in the incremental loss or modification of either community, this would not interfere significantly with the recovery of the ecological communities.
Critically Endangered and Endangered Species Flora: None Fauna: Swift parrot, regent honeyeater and spotted-tailed quoll	
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	*a) lead to a long-term decrease in the size of a population;* The swift parrot and regent honeyeater are only likely to visit the study area on an opportunistic, occasional basis. The spotted-tailed quoll may be a resident species. Due to the small area of vegetation to be removed the proposed longwall mine is unlikely to lead to a long-term decrease in the size of any populations of the swift parrot, regent honeyeater or spotted-tailed quoll.
	b) reduce the area of occupancy of the species; While 208.6 ha of potential habitat for the swift parrot, regent honeyeater and spotted-tailed quoll would be lost as a result of the proposal, this is unlikely to have a significant impact on any of these species.
	c) fragment an existing population into two or more populations; The proposal would not fragment an existing population of the swift parrot, regent honeyeater or spotted-tailed quoll into two or more populations.
	d) adversely affect habitat critical to the survival of a species; The proposal would not adversely affect habitat critical to the survival of the swift parrot, the regent honeyeater or spotted-tailed quoll.
	e) disrupt the breeding cycle of a population; No breeding habitat for the swift parrot or regent honeyeater has been recorded within the study area and none is likely to be affected. The proposal would not disrupt the breeding cycle of a population of any of these species. Breeding habitat may be present for the spotted-tailed quoll, however the breeding cycle of the spotted-tailed quoll is unlikely to be disrupted.
	f) modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline; The proposal would not affect the habitat of the swift parrot, the regent honeyeater or spotted-tailed quoll to such an extent that one or more of these species would be likely to decline.
	g) result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat;* The proposal is highly unlikely to result in an invasive species harmful to the swift parrot, regent honeyeater or spotted-tailed quoll from becoming established within the study area.

Table 2
Assessment of Potential Impact on Matters of NES Listed Under the EPBC Act 1999

Significant Impact Criteria and Assessment	
Critically Endangered and Endangered Species (cont'd) Flora: None Fauna: Swift parrot, regent honeyeater and spotted-tailed quoll	
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	*h) introduce disease that may cause the species to decline; o* The proposal is highly unlikely to result in the introduction of a disease that would cause the swift parrot, regent honeyeater or spotted-tailed quoll to decline.
	i) interfere with the recovery of the species. While the proposal would result in the loss of some potential habitat for the swift parrot, regent honeyeater and spotted-tailed quoll, this would not interfere significantly with the recovery of these species.
Vulnerable species Flora – *Bertya opponens* (Coolabah bertya), *Cadellia pentastylis* (ooline) and *Lepidium ascheronii* (spiny peppercress) Fauna – Superb parrot, eastern long-eared bat, large-eared pied bat, delicate mouse, border thick-tailed gecko and five-clawed worm skink.	
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	*a) lead to a long-term decrease in the size of an important population[**] of a species;* Flora: Due to the extent of the known distributions and abundances of all three species, which may not include the Mine Site, the disturbances to potential habitat due to the proposal are unlikely to lead to a long-term decrease in the size of important populations of any of the species. Superb parrot, eastern long-eared bat and large-eared pied bat – Due to the relatively small area (208.6 ha) and linear nature of potential habitat to be removed, the proposed longwall mine is unlikely to lead to a long-term decrease in the size of an important population of these species. Delicate mouse, border thick-tailed gecko and five-clawed worm skink – Surface cracking associated with the proposed longwall mine may lead to a loss of some individuals. However the staged occurrence of possible surface cracks and the surrounding areas of similar habitat suggest that there is unlikely to be a long-term decrease in the size of an important population of these species. The population of the delicate mouse on the Mine Site is likely an important population as it occurs at the southern limit of its known distribution.
	b) reduce the area of occupancy of an important population; Coolabah bertya: The species occupies a large area within Jack's Creek State Forest to the west of the Mine Site, comprising an estimated population in excess of 5 million individuals (NPWS 2002). Impacts within the Mine Site (subsidence; easement, track and goaf hole creation) could potentially reduce the area of occupation of this important population incrementally. Ooline and spiny peppercress: Potential habitat for both species occurs on the flat plains area, of which only a minor proportion would be directly disturbed due to the proposal. The area of occupancy of both species is likely to remain unchanged, or at least not significantly altered. Superb parrot, eastern long-eared bat and large-eared pied bat – Due to the relatively small area and linear nature of potential habitat to be removed, the proposed longwall mine is unlikely to lead to a reduction of the area of occupancy of an important population of these species. Delicate mouse, border thick-tailed gecko and five-clawed worm skink – Due to the relatively small area and linear nature of potential habitat to be removed, the proposed longwall mine is unlikely to lead to a reduction of the area of occupancy of an important population of these species.
	c) fragment an existing important population into two or more populations; Flora: There is a small potential for an important population of any of the three species in the Mine Site to be fragmented into two or more populations by the power line easement, particularly Coolabah bertya. Superb parrot, eastern long-eared bat and large-eared pied bat – Due to the relatively small area and linear nature of potential habitat to be removed and each of these species' high level of mobility, the proposed longwall mine is unlikely to fragment an important population of these species. Delicate mouse, border thick-tailed gecko and five-clawed worm skink – There is potential for the east-west powerline easement to fragment part an important population of each of these species. However if each of these species is widespread throughout the Mine Site and the surrounding State Forests, the level of fragmentation would be significantly reduced.

Table 2
Assessment of Potential Impact on Matters of NES Listed Under the EPBC Act 1999

Significant Impact Criteria and Assessment	
Vulnerable species (cont'd) Flora – *Bertya opponens* (Coolabah bertya), *Cadellia pentastylis* (ooline) and *Lepidium ascheronii* (spiny peppercress) Fauna – Superb parrot, eastern long-eared bat, large-eared pied bat, delicate mouse, border thick-tailed gecko and five-clawed worm skink.	
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	*d) adversely affect habitat critical to the survival of a species;* Flora: The proposal would not adversely affect habitat critical to the survival of ooline or spiny peppercress. Superb parrot, eastern long-eared bat and large-eared pied bat – The proposal would not adversely affect habitat critical to the survival of the superb parrot, eastern long-eared bat or large-eared pied bat. Delicate mouse, border thick-tailed gecko and five-clawed worm skink – The proposal would not adversely affect habitat critical to the survival of the delicate mouse, border thick-tailed gecko or five-clawed worm skink
	e) disrupt the breeding cycle of an important population; Flora: Since substantial potential habitat for all three species would be retained within the proposal area, the breeding cycles for these species are unlikely to be disrupted. Superb parrot, eastern long-eared bat and large-eared pied bat – Due to the relatively small area and linear nature of potential habitat to be removed and each of these species high level of mobility, the proposed longwall mine is unlikely to disrupt the breeding cycle an important population of these species. Delicate mouse, border thick-tailed gecko and five-clawed worm skink – Due to the relatively small area (208.6ha) and linear nature of potential habitat to be removed, the proposed longwall mine is unlikely to disrupt the breeding cycle of an important population of these species.
	f) modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline; Flora: The proposal would not affect the habitat of Coolabah bertya, ooline or spiny peppercress to such an extent that one or more of these species would be likely to decline. Superb parrot, eastern long-eared bat and large-eared pied bat, delicate mouse, border thick-tailed gecko and five-clawed worm skink - The proposal would not affect the habitat of any of these species to such an extent that one or more of these species would be likely to decline.
	*g) result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat***;* Flora: Invasive species (including noxious weeds) are currently present at low abundance in the Mine Site. With simple preventive and management measures (see Recommendations) these species or others are unlikely to significantly increase in abundance in any areas of potential habitat for threatened flora. Superb parrot, eastern long-eared bat and large-eared pied bat, delicate mouse, border thick-tailed gecko and five-clawed worm skink – the proposal is unlikely to result in invasive species that are harmful to any of these species becoming established in the their habitat.
	h) introduce disease that may cause the species to decline; or Flora: There is a risk that the action could introduce plant diseases or pathogens such as *Phytophthora cinnamomi* into the species' potential habitat, but this risk could be substantially reduced by implementation of protocols to prevent the introduction and spread of pathogens, as outlined in the Recommendations. Superb parrot, eastern long-eared bat and large-eared pied bat, delicate mouse, border thick-tailed gecko and five-clawed worm skink – the proposal is unlikely to introduce disease that may cause the species to decline.
	i) interfere substantially with the recovery of the species. Flora: The proposal is unlikely to interfere significantly with the recovery of any species. Superb parrot, eastern long-eared bat and large-eared pied bat, delicate mouse, border thick-tailed gecko and five-clawed worm skink – the proposal is unlikely to interfere substantially with the recovery of any of these species.

Following the above assessment using the administrative guidelines for the EPBC Act, Ecotone (2009) found that the proposed Longwall Project is unlikely to have a significant impact on any nationally listed threatened flora or fauna species, or ecological communities.

3.1 (e) Listed Migratory Species

A flora and fauna impact assessment of the Longwall Project was prepared by Ecotone Ecological Consultants Pty Ltd (2009) and the relevant sections are summarised below.

The EPBC Act Protected Matters Search Tool was accessed on 11th May 2009 to identify the Protected Matters under the Commonwealth EPBC Act that occur or may occur within the study locality. The Protected Matters Report listed nine migratory species (including one endangered and one vulnerable species) (**Table 3**).

Table 3
Protected Matters Report Summary Table

Protected Matter	Details
Migratory Species (Terrestrial Species Only)	Nine species : <u>Species or species habitat likely to occur within area according to EPBC modelling.</u> • Malleefowl *Leipoa ocellata* (**Mi, V**) • White-bellied sea eagle *Haliaeetus leucogaster* (**Mi**) <u>Species or species habitat may occur within area according to EPBC modelling.</u> • White-throated needletail *Hirundapus caudacutus* (**Mi**) • Rainbow bee-eater *Merops ornatus* (**Mi**) • Regent honeyeater *Xanthomyza phrygia* (**Mi, E**) Wetland Species <u>Species or species habitat may occur within area according to EPBC modelling.</u> • Cattle egret *Ardea ibis* (**Mi**) • Great egret *Ardea alba* (**Mi**) • Latham's snipe *Gallinago hardwickii* (**Mi**) • Painted snipe *Rostratula benghalensis s. lat.* (**Mi**)
Notes: **V** Species listed as **Vulnerable** under the Commonwealth *EPBC Act*. **E** Species listed as **Endangered** under the Commonwealth *EPBC Act*. **Mi** Species listed as **Migratory** under the Commonwealth *EPBC Act*.	

Two migratory species were recorded during the field surveys by Ecotone (2009).

- Rainbow Bee-eater (Merops ornatus)
- White-throated Needletail (Hirundapus caudacutus)

The Rainbow bee-eater was recorded on five occasions (see **Figure 9**). The Rainbow bee-eater was recorded high above the canopy on four occasions and amongst the canopy on a single occasion.

The White-throated needletail was recorded on four occasions (see **Figure 9**). Large groups of White-throated needletails were recorded above or high above both woodland and grassland areas.

Nature and Extent of Likely Impact

See **Section 3.1 (d)** above for the nature and extent of the likely impacts associated with the predicted subsidence levels.

An assessment of the following known to occur (recorded during field surveys) and predicted to occur (Protected Matters Database Search) EPBC Act migratory species was carried out be Ecotone (2009) and is detailed in **Table 4**.

Following assessment using the administrative guidelines for the EPBC Act, Ecotone (2009) found that the proposal is unlikely to have a significant impact on any nationally listed migratory species.

Table 4
Assessment of Potential Impact on Migratory Species Listed Under the EPBC Act 1999

Significant Impact Criteria and Assessment	
Migratory Species Cattle egret, great egret, Latham's snipe, white-throated needletail, rainbow bee-eater and regent honeyeater.	
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:	*a) substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat[#] for a migratory species;* Due to the relatively small area and linear nature of potential habitat to be removed, the proposed longwall mine is unlikely to substantially modify, destroy or isolate an area of important habitat for any of the above migratory species.
	b) result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or It is highly unlikely that an invasive species that is harmful to any of the above listed migratory species would become established within the study area as a result of the proposal.
	c) seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion[##] of the population[###] of a migratory species. The proposal would not seriously disrupt the lifecycle of any of the above listed migratory species.

3.1 (f) Commonwealth Marine Area

No commonwealth marine areas occur within the Mine Site and none are known in the local area (20km radius from the centre of the Mine Site). The Longwall Project will not affect any commonwealth marine areas.

3.1 (g) Commonwealth Land

No commonwealth land occurs within the Mine Site and none is known in the local area (20km radius from the centre of the Mine Site). The Longwall Project will not affect any commonwealth land.

3.2 Nuclear actions, Actions Taken by the Commonwealth (or Commonwealth agency), Actions Taken in a Commonwealth Marine Area, or Actions Taken on Commonwealth Land

3.2 (a) Is the proposed action a nuclear action?

No.

3.2 (b) Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?

No.

3.2 (c) Is the proposed action to be taken in a Commonwealth marine area?

No.

3.2 (d) Is the proposed action to be taken on Commonwealth land?

No.

3.3 Other Important Features of the Environment

3.3 (a) Soil and Vegetation Characteristics

The soil types evident across the Mine Site are largely dependent on two features of the local environment, namely:

- the underlying geological formation; and
- the landform unit within which the soil is located.

The majority of the Mine Site soils are derived from either the Purlawaugh Formation (over the eastern half of the Mine Site) comprising conglomerate, quartz sandstone, shale largely obscured by Quaternary talus material or the Pilliga Sandstone (over the western half of the Mine Site) comprising quartz sandstone, conglomerate and claystone, largely obscured by Quaternary sands and talus material. The soil types are further categorised by their location in relation to local landforms, with soils within the drainage lines of the Mine Site differing from those located on the lower, mid and upper slopes of the undulating topography.

Four natural or predominantly natural vegetation community types and one artificial vegetation community type have been identified within the Mine Site as follows:

<u>Natural Communities</u>

1. Brown Bloodwood / Pilliga Grey Box / Red Ironbark Sandstone Slopes and Ridgetop Woodland.
2. Inland Grey Box / Bimble Box / Blakely's Red Gum Lower Flats and Floodplain Woodland.
3. River She Oak / Belah Riparian Forest.
4. Callitris Forest.

<u>Artificial Community</u>

5. Cleared open pasture with or without scattered native trees or cultivated cropland or gardens.

Community 1 generally occupies the forested western half of the Mine Site, whilst Communities 2, 3 and 4 occur in the eastern part of the Mine Site. Community 5 is the largest single community in area, and makes up the balance of the eastern part of the Mine Site. Distributions of the natural vegetation communities are shown on **Figure 3**.

The condition of the vegetation varied significantly within the Mine Site. The natural vegetation at the western end of the Mine Site was often close to pristine, with few or no exotic species (although past logging and/or clearing was evident). Overall, the condition of the vegetation was surprisingly good even in the grazed pasture areas with patches of remnant tree cover, where there was moderate to high native species diversity and a low diversity and cover of weeds. Weeds occurred almost exclusively in the cleared farmland on the plains in the eastern half of the Mine Site (Vegetation Communities 2 – 5). Native vegetation in this area was highly modified with the tree layer absent over much of the area, with the exception of remnant patches of trees, riparian and fence line strips, and scattered paddock trees.

3.3 (b) Water Flows, Including Rivers, Creeks and Impoundments

Two creek-lines and their tributary's drain the Mine Site to the east (Kurrajong Creek) and north east (Pine Creek) into the Namoi River (see **Figure A**). Within the of the Namoi River both creek-lines comprise little more than dry drainage lines lacking pools of semi-permanent or permanent water (no pools of water were encountered in the portions of drainage line sampled). No fish habitat was identified or is likely to occur. Drainage line structure varied between sandy creek beds with eroded and incised steep banks between 1m and 3m in depth and broad grassy creek beds between 2m and 15m in width. No aquatic vegetation was recorded. In most parts drainage lines were bordered by thin strips of woodland vegetation, typically lacking a shrubby understorey.

Approximately 30 farm dams occur across the Mine Site. Most farm dams were less than 50m in diameter, contained gently sloping grassy banks and were likely between one and three metres deep. Most farm dams contained areas of emergent and aquatic vegetation while others were bordered by a narrow strip of soil between the water and surrounding grass cover. Most farm dams visited contained relatively clear water and all contained some aquatic macro-invertebrates.

3.3 (c) Outstanding Natural Features, Including Caves

No outstanding natural features are contained within the Mine Site. However the western half of the Mine Site comprises part of the regionally significant Pilliga woodland/forest area (Community 1, see **Figure 3**).

3.3 (d) Gradient (or Depth Range if Action to be Taken in a Marine Area)

Topographic relief above the proposed longwalls ranges from 270m AHD to 370m AHD.

3.3 (e) Buildings or Other Infrastructure

Mining infrastructure of the approved Stage 1 Narrabri Coal Mine is concentrated within the Pit Top Area and includes the following buildings and other structures.

- Sealed access road.
- Rail loop and train loading facilities.
- Car parks.
- Main office and bathouse.
- Industrial hard stand area.
- Power lines and transformer.
- Coal crushing and screening equipment.

- Evaporation ponds and water storages.
- Mine ventilation fan and associated infrastructure.

Additional infrastructure to be constructed for the Longwall Project includes the following.

- Coal Preparation Plant.
- Reject Emplacement Area.
- Additional water storages.
- Additional ventilation fans.

The remainder of the Mine Site contains agricultural properties and their associated fence lines and dams, homesteads (most of which are dilapidated and uninhabitable, access roads, farm tracks, farm sheds, silo's, stock yards and stock watering points.

3.3 (f) Marine Areas

No marine areas occur within the Mine Site and none are known in the local area (20 km radius from the centre of the Mine Site). The Longwall Project will not affect any marine areas.

3.3 (g) Kinds of Fauna & Flora

Flora species diversity was found to be relatively high within the Mine Site, with 209 flora species from 60 families being identified. This total included two ferns, one cycad, two conifers, 153 dicotyledons and 51 monocotyledons.

A total of 156 fauna species were recorded within the study area during the field surveys, comprising 93 birds, 37 mammals, 16 reptiles and ten frogs. Fourteen threatened fauna species (14 on the NSW TSC Act and four on the EPBC Act) were recorded comprising five birds (superb parrot, turquoise parrot, glossy-black cockatoo, grey-crowned babbler, diamond firetail and speckled warbler), seven mammals (koala, eastern pygmy possum, black striped wallaby, yellow-bellied sheath-tail bat, little pied bat, greater long-eared bat and delicate mouse) and one reptile (pale-headed snake).

3.3 (h) Current State of the Environment in the Area

Include information about the extent of erosion, whether the area is infested with weeds or feral animals and whether the area is covered by native vegetation or crops.

The current state of the environment is typical of rural areas in the region. The eastern two thirds of the Mine Site is dominated by rural properties of predominately grazing and cropping enterprises. Stock rates within grazing areas appeared to be maintaining adequate ground cover for the prevention of erosion. While stocking rates appeared to prevent regeneration of isolated farm trees they also appeared to promote a low level of regeneration within the small woodland remnants within grazing areas.

Creek lines varied between sandy creek beds with eroded and incised steep banks between one and three metres in depth and broad grassy creek beds between two and 15m in width.

22 species of introduced flora were identified, representing approximately 11% of all species identified. Six of the species recorded in the Mine Site are declared Noxious Weeds in the Narrabri Shire Council control area, pursuant to the Noxious Weeds Act 1993. The six species are:

- Bathurst burr (*Xanthium spinosum*).

- Creeping oxalis (*Oxalis corniculata*).
- Mother of millions (*Bryophyllum delagoense*).
- Noogoora burr (*Xanthium occidentale*).
- Prickly pear (*Opuntia stricta*).
- Spiny burrgrass (*Cenchrus longispinus*).

Apart from declared noxious species, common or established environmental weed species within the study area include gomphrene weed, cobblers pegs, greater beggar's ticks, spear thistle, flatweed, fleabane, curly dock, moss verbena (Mayne's pest) and stinkgrass. Some of these weed species occurred at locally high densities, but most were generally restricted in their distribution throughout the site or occurred at low density.

Nine introduced fauna species (two birds and seven mammals) were recorded at low to very low densities. The nine species were the common starling, house mouse, black rat, dog, fox, rabbit, brown hare, pig and goat.

3.3 (i) Other Important or Unique Values of the Environment

Describe any other key features of the environment affected by, or in proximity to the proposed action (for example, any national parks, conservation reserves, wetlands of national significance etc).

The woodland area in the western third of the project area is part of the regionally significant Pilliga woodland/forest area. The project area joins Jacks Creek State Forest to the west and Pilliga East State Forest to the south-west. The Pilliga woodland/forest area is the largest remnant of woodland/forest west of the Great Dividing Range in NSW.

3.3 (j) Tenure of the Action Area (eg Freehold, Leasehold)

The majority of the Mine Site is held under freehold title, with limited areas of Crown land (Pilliga East and Jack's Creek State Forests). **Figure C** identifies the land ownership of the land on the Mine Site.

3.3 (k) Existing Land/Marine Uses of Area

The predominant land use of the Mine Site is low intensity grazing and cropping.

3.3 (l) Any Proposed Land/Marine Uses of Area

With the possible exception of the perimeter amenity bund wall, which would only be disturbed to provide material for backfilling areas of the Pit Top Area, all land disturbed during the life of the mine would be returned to a land capability / agricultural land suitability similar to the existing levels. This would be achieved principally through the re-instatement of a comparable soil profile across those areas disturbed throughout the life of the Longwall Project. Given this commitment, NCOPL intends that the bulk of the areas disturbed would be returned to land of comparable agricultural potential as its original state.

The likely retention of the rail loop may influence the succeeding land use depending upon land use around the Pit Top Area at that time.

4 Measures to Avoid or Reduce Impacts

The Minister for the Environment, Heritage and the Arts may decide that a proposed action is not a controlled action if the action will be undertaken in a particular manner that will ensure that any potential significant impacts are avoided or reduced by mitigation measures to the extent that they will not be significant (Subsection 77A(1) of the EPBC Act).

To be considered, any such measures must:
- clearly form part of the referral (eg be identified in the referral form and fall within the responsibility of the person proposing to take the action),
- be concrete and prescriptive, and
- be clearly effective in avoiding or mitigating significant impacts.

Examples of relevant measures to avoid or reduce impacts may include the timing of works to avoid critical periods for listed species, avoidance of habitat important for listed species from direct and indirect impacts, application of specific design measures to avoid or reduce impacts, or adoption of specific work practices to reduce or avoid impacts.

More general commitments (eg preparation of management plans or monitoring) and measures aimed at providing environmental offsets, compensation or off-site benefits CANNOT be taken into account in making a decision on significance (but are relevant at the assessment and approval stages if your project proceeds to these stages).

Refer to the Guideline on Particular Manner Decisions under the EPBC Act available at the Department's web site.

For any measures intended to avoid or mitigate significant impacts on matters protected under the EPBC Act, specify:
- what the measure is
- how the measure is expected to be effective
- the timeframe or workplan for the measure.

In order to minimise the potential impacts of longwall mining, NCOPL would undertake the following mitigation measures:

- Surface cracks will be filled as they are identified. The following provides an overview of how this will be achieved.
  - Small cracks will be filled in by the action of wind, water and natural soil movement.
  - Large cracks will be filled in by a bulldozer or grader.
  - Wider than expected cracks or those through drainage lines will be filled with subsoil material.
- Changes to surface drainage will be monitored and any stream re-direction or modification works will be undertaken after consultation with an appropriately qualified hydrological professional and/or the DWE, and an appropriately qualified ecologist.
- To minimise the potential impacts of erosion and steeply eroded creek banks toppling the Proponent would:
  - monitor surface slope displacement along subsidence cross lines;
  - infill cracks as they appear;
  - regrade or revegetate areas significantly affected by erosion; and
  - regularly review and appraise any significant changes to surface slopes after each longwall is extracted.
- Treed areas to be cleared will be inspected by an ecologist for roosting or nesting fauna prior to clearing, with any identified fauna relocated.
- The location of access tracks will be influenced by an ecologist after inspecting each proposed route and determining the path with least impact on environmental values.
- Groundwater levels would be monitored continuously to ascertain what, if any, impact subsidence is having on local and regional groundwater levels with appropriate licence

allocation obtained and contingency measures developed to ensure that no groundwater user is disadvantaged by these impacts.

- Unless recommendations for salvage are provided by local Aboriginal stakeholders and the DECC, any archaeological artefacts would be retained in-situ on the Mine Site. The affect of subsidence is likely to be restricted to minor movement of the artefact as the ground level subsides.
- Residences located within the area identified as subject to subsidence may be affected structurally and the Proponent would provide alternative housing arrangements for the residents of these houses when active subsidence is taking place. Notably, all residences that may be impacted upon by the predicted subsidence are owned by the Proponent and leased by the current resident.

Rehabilitation of the mine site would involve three distinct areas.

1. Pit Top Area infrastructure.

   All surface infrastructure, within the exception of the mine access road and rail infrastructure would be decommissioned, dismantled and removed from the Mine Site. The disturbed areas of the Pit Top Area would be backfilled where appropriate, eg. box cut and underground water storage dams (after dam lining and saline material is removed), profiled, covered with available topsoil and revegetated with either pasture grass species or native tree, shrub and grass species (depending on final landform and land use requirements).

2. Ventilation and gas drainage infrastructure.

   The ventilation and gas drainage infrastructure would be rehabilitated in much the same fashion as the Pit Top Area, albeit on a smaller and more widespread scale. Much of the rehabilitation would be completed progressively as the area required for the construction and installation of the bores required for ventilation and gas drainage greatly exceeds the area required to manage and maintain these operations.

3. Surface cracking caused by subsidence.

   The disturbance resultant from any surface cracking caused by subsidence would be progressively rehabilitated. For smaller width cracking, the surface would simply be ripped to allow the cracks to be filled in. In some instances, the surface cracking may be too wide to be effectively in-filled by surface ripping and in these instances, material excavated from a borrow pit area would be used to in-fill the cracks prior to ripping and revegetation.

Proposed Biodiversity Offset Strategy

NCOPL would implement an offset strategy to compensate for the loss of woodland communities across the Mine Site. This would be implemented through the protection in perpetuity of a Biodiversity Offset Area comprising two parcels of land, namely Lots 64 and 65, DP757114, in the northwestern section of the Mine Site (see attached **Figure D**). These parcels would be protected under a covenant under Section 88B of the *Conveyancing Act 1919* or similar. **Table 5** identifies the area of each vegetation community that would be removed for mining activities (across the entire Mine Site), the area of each community in the proposed Biodiversity Offset Area, and the resulting offset ratio.

Table 5
Areas of Disturbance, Areas to be Offset and Offset Ratios

Community	Area to be Disturbed (ha)	Area to be Offset (ha)	Offset Ratio
1 – Brown bloodwood / Pilliga box woodland	178.9	465.7	2.6 : 1
2 – Inland grey box woodland	22.9	78.7	3.4 : 1
3 – Riparian forest	4.1	2.9	0.7 : 1
4 – Callitris forest	2.7	0	--
Weeping Myall	0	0	--

The proposed offset strategy would see both Community 1 and Community 2 conserved at an offset ratio greater than 2.5:1. Community 3 (riparian forest) would be conserved at an offset ratio of 0.7:1 However the area of riparian forest within the proposed Biodiversity Offset Area is likely to increase due to the encouragement of natural regeneration within the area. Additionally areas of riparian forest have been fenced and are managed for conservation as part of the Narrabri Coal Mine Stage 1. None of the identified Weeping Myall EEC is included in the proposed offset area as the extremely small area of this community within the Mine Site (0.3ha) will not be impacted by mining activities.

5 Conclusion on the Likelihood of Significant Impacts

Identify whether or not you believe the action is a controlled action (ie. significant impacts on the matters protected under the Act are likely) and the reasons why. If you think that the action is a controlled action, you must also identify the relevant protected matters in section 5.3. (An action is a controlled action if it has, will have, or is likely to have a significant impact on a matter protected by a provision of Part 3 of the EPBC Act).

5.1 Do You THINK Your Proposed Action is a Controlled Action?

✓	No, complete section 5.2
	Yes, complete section 5.3

5.2 Proposed Action IS NOT a Controlled Action.

Following an assessment using the criteria given in the administrative guidelines for the EPBC Act, Ecotone (2009) concluded that the proposed Longwall Mine was unlikely to significantly impact on any nationally listed threatened or migratory flora or fauna species, ecological communities or any other matters of NES.

5.3 Proposed action IS a controlled action

Type 'x' in the box for the matter(s) of the EPBC Act that you think are likely to be impacted (controlling provisions).

	Matters likely to be impacted
	sections 12 and 15A (World Heritage)
	sections 15B and 15C (National Heritage places)
	sections 16 and 17B (Wetlands of international importance)
	sections 18 and 18A (Listed threatened species and communities)
	sections 20 and 20A (Listed migratory species)
	sections 21 and 22A (Protection of the environment from nuclear actions)
	sections 23 and 24A (Commonwealth marine environment)
	sections 26 and 27A (Protection of the environment from actions involving Commonwealth land)
	section 28 (Protection of the environment from Commonwealth actions)
	Sections 27B and 27C (Commonwealth Heritage places outside the Australian Jurisdiction)

Specify the key reasons why you think the proposed action is a controlled action (ie. LIKELY to have significant impacts).

6 Environmental History of the Responsible Party

NOTE: If a decision is made that a proposal needs approval under the Act, the Minister will also decide the assessment approach. The EPBC Regulations provide for the environmental history of the party proposing to take the action to be taken into account when deciding the assessment approach for actions that need approval under the Act.

		Yes	No
6.1	**Does the party taking the action have a satisfactory record of responsible environmental management?** Narrabri Coal Operations Pty Ltd is a joint venture between Narrabri Coal Pty Ltd (77.5%), Upper Horn Investments (Australia) Pty Ltd (7.5%), J-Power (7.5%) and EDF Trading (7.5%). Narrabri Coal Pty Ltd is a 100% subsidiary Company of Whitehaven Coal Limited (WCL), a publicly listed Company which is currently involved in a number of mining projects in the Gunnedah region of NSW, namely: • Canyon Mine; • Tarrawonga Coal Mine; • Rocglen Coal Mine; • Sunnyside Coal Project; and • Narrabri Coal Mine (Stage 1). These mines have been operating in the region for between 1 (Narrabri Coal Mine) and 10 (Canyon Mine) years without significant incident and to the satisfaction of the NSW and local regulatory authorities. Notably, periodic audits of compliance against the environmental criteria are conducted for each mine by an independent environmental auditor. In each case, the results of the audits have determined general compliance with the conditions of approval for each operation.	✓	
6.2	**Has the party taking the action ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?**		✓
6.3	**If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?** All activities associated with the Longwall Project would be undertaken in accordance with a project approval granted by the NSW Minister for Planning.	✓	
6.4	**Has the person proposing to take the action previously referred an action under the EPBC Act?**		✓

7 Information sources and attachments

(For the information provided above)

7.1 References

- List the references used in preparing the referral.
- Highlight documents that are available to the public, including web references if relevant.

Ecotone Ecological Consultants Pty Ltd (2007). Narrabri Coal Project Ecology Impact Assessment. Ecotone Ecological Consultants, Waratah, NSW. Specialist Consultant Studies Compendium - Volume 1, Part 3 - prepared for Narrabri Coal Pty Ltd.

Ecotone Ecological Consultants Pty Ltd (2009). Narrabri Coal Mine Stage 2 Longwall Project Flora and Fauna Impact Assessment. Ecotone Ecological Consultants, Waratah, NSW. Specialist Consultant Studies Compendium - Volume 2, Part 4 - prepared for Narrabri Coal Pty Ltd.

7.2 Reliability and Date of Information

For information in section 3 specify:

- source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

The reports referenced in this application were prepared by professional environmental consultants – Ecotone Ecological Consultants Pty Ltd. All Ecotone staff involved in the preparation of the above reports are members of the Ecological Consultants Association of NSW.

Field surveys for Ecotone (2007) were conducted in October 2005.

Field surveys for Ecotone (2009) were conducted in January 2009.

Project information was based the Project Description prepared by R. W. Corkery and Co. Pty Limited on the behalf of the proponent. The Project Description was dated May 2009.

7.3 Attachments

Indicate the documents you have attached. All attachments must be less than two megabytes so they can be published on the Department's website. Attachments larger than two megabytes (2mb) may delay the processing of your referral.

		Attached	Title of attachment(s)
You must attach	Figures, maps or aerial photographs showing the project locality (section 1)	✓	**Figure 1**: Study Locality (Ecotone)
	Figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	**Figure A**: Indicative Surface Disturbance for the Longwall Project (RWC) **Figure B**: Pit Top Area and Reject Emplacement Area Surface Disturbance (RWC) **Figure C**: Land Ownership of the Mine Site (RWC) **Figure D**: Proposed Biodiversity Offset Area (RWC) **Figure 1**: Study Locality (Ecotone) **Figure 3**: Veg Communities and Flora Survey Area (Ecotone) **Figure 9**: Threatened and Migratory Species Records (Ecotone)

If relevant, attach	Copies of any state or local government approvals and consent conditions (section 2.3)	N/A	
	Copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.4)	N/A	
	Copies of any flora and fauna investigations and surveys (section 3)	X	
	Technical reports relevant to the assessment of impacts on protected matters and that support the arguments and conclusions in the referral (section 3 and 4)	N/A	
	Report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)	N/A	

8 Contacts, Signatures and Declarations

NOTE: Providing false or misleading information is an offence punishable on conviction by imprisonment and fine (s 489, EPBC Act).

Under the EPBC Act a referral can only be made by:

- the person proposing to take the action; or
- a Commonwealth, state or territory government, or agency that is aware of a proposal by a person to take an action, and that has administrative responsibilities relating to the action[1].

Project Title: **Narrabri Coal Mine Stage 2 Longwall Project**

8.1 Person Proposing to Take Action

This is the individual, government agency or company that will be principally responsible for, or who will carry out, the proposed action.

If the proposed action will be taken under a contract or other arrangement, this is:

- the person for whose benefit the action will be taken; or
- the person who procured the contract or other arrangement and who will have principal control and responsibility for the taking of the proposed action.

The Minister may also request additional information from this person, for the purposes of deciding whether the action is a controlled action, the controlling provisions that apply, and for the making of an approval decision (if applicable).

If approval for the action is required and is granted, it will be issued to the person proposing to take the action. This person will be responsible for complying with any conditions of approval.

If the Minister decides that the action is a controlled action, the Minister must also designate a person as a proponent of the action. The proponent is responsible for meeting the requirements of the EPBC Act during the assessment process. The proponent will generally be the person proposing to take the action[2].

Name	Greig Duncan
Title	General Manager Narrabri Coal
Organisation	Narrabri Coal Operations Pty Ltd
ACN / ABN (if applicable)	76 107 813 963
Postal address	Level 9, 1 York Street SYDNEY NSW 2000 PO Box R1113 Royal Exchange NSW 1225
Telephone	(02) 8507 9700
Email	gduncan@whitehaven.net.au
Declaration	I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be nominated as the proponent for this action.
Signature	
Date	16/07/09

[1] *If the proposed action is to be taken by a Commonwealth, state or territory government or agency, section 8.1 of this form should be completed. However, if the government or agency is aware of, and has administrative responsibilities relating to, a proposed action that is to be taken by another person which has not otherwise been referred, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

[2] *If a person other than the person proposing to take action is to be nominated as the proponent, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

8.2 Person Preparing the Referral Information (if Different from 8.1)

Individual or organisation who has prepared the information contained in this referral form.

Name	Alex Irwin
Title	Senior Environmental Consultant
Organisation	R.W. Corkery & Co. Pty Limited
Postal address	Suite 15/256 Anson Street ORANGE NSW 2800
Telephone	(02) 6362 5411
Email	alex@rwcorkery.com

Declaration: I declare that the information contained in this form is, to my knowledge, true and not misleading.

Signature  Date 16/7/09

If the referring party is a small business (fewer than 20 employees), estimate the time taken, in hours and minutes, to complete this form (include your time reading the instructions, working on the questions and obtaining the information and time spent by all employees in collecting and providing this information). 17 Hours

REFERRAL CHECKLIST

NOTE: This checklist is to help ensure that all the relevant referral information has been provided. It is not a part of the referral form and does not need to be sent to the Department.

HAVE YOU:

- ❑ Completed all required sections of the referral form?
- ❑ Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- ❑ Provided a map showing the location and approximate boundaries of the project area?
- ❑ Provided a map/plan showing the location of the action in relation to any matters of NES?
- ❑ Provided complete contact details and signed the form?
- ❑ Provided copies of any documents referenced in the referral form?
- ❑ Ensured that all attachments are less than two megabytes (2mb)?
- ❑ Sent the referral to the Department (electronic and hard copy preferred)?

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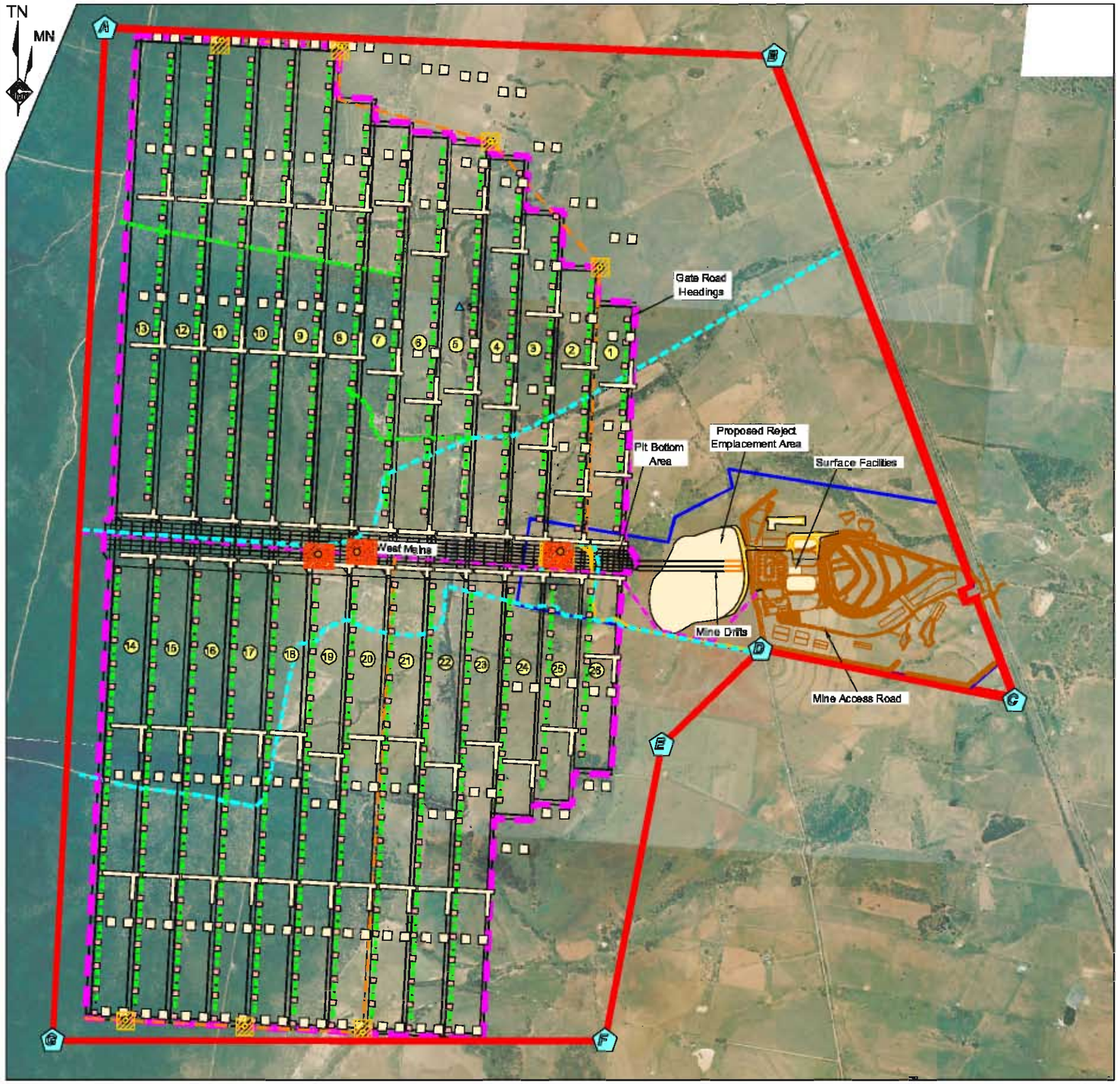

REFERENCE

- Mine Site Boundary
- Pit Top Area Boundary
- Approved Disturbance within the Pit Top Area
- Area of Proposed Stage 2 Surface Disturbance
- Proposed Stage 2 All Weather Unsealed Access Road
- Proposed Stage 2 Power Line
- Proposed Stage 2 Power Line Advancing with Mine
- Proposed Stage 2 Access for Goaf Drainage
- Ventilation Shaft Area
- Proposed Stage 2 Rear of Panel Ventilation Shaft
- Proposed Ventilation Shaft Location
- Proposed Goaf Drainage Borehole Site
- Proposed Gas Production Site
- Proposed Pre-drainage Borehole Site
- Longwall Panel No.
- Latitude / Longitude Point (See Section 1.2)

SCALE 1:40 000

0.5 0 0.5 1.0 1.5 2.0 km

Base Photo Source: Geo-spectrum (Australia) Pty Ltd - Date of Photo: 5 December 2005

Figure A
INDICATIVE SURFACE DISTURBANCE FOR THE LONGWALL PROJECT

R.W. CORKERY & CO. PTY. LIMITED

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TN
MN

Magazine
Amenity Bund
Longwall Unit Assembly Area
Clean Water Diversion Drain
Concrete Lined Dirty Water Drain
Road (20m Wide)
Coal ROM Pad Extension
(Height up to 20m)
Evaporation Pond A1
Evaporation Pond A2
Evaporation Pond A3
Evaporation Pond B
Boxcut
Mine Portals
& Drifts
Coal
Preparation
Plant
Reject Emplacement Area
Product Coal Stockpile
Transformer
Yard
Industrial
Hardstand
Admin & Bath-house
Proposed Access Road
Car Park
Mine
Access
Road
Rail Loop

REFERENCE

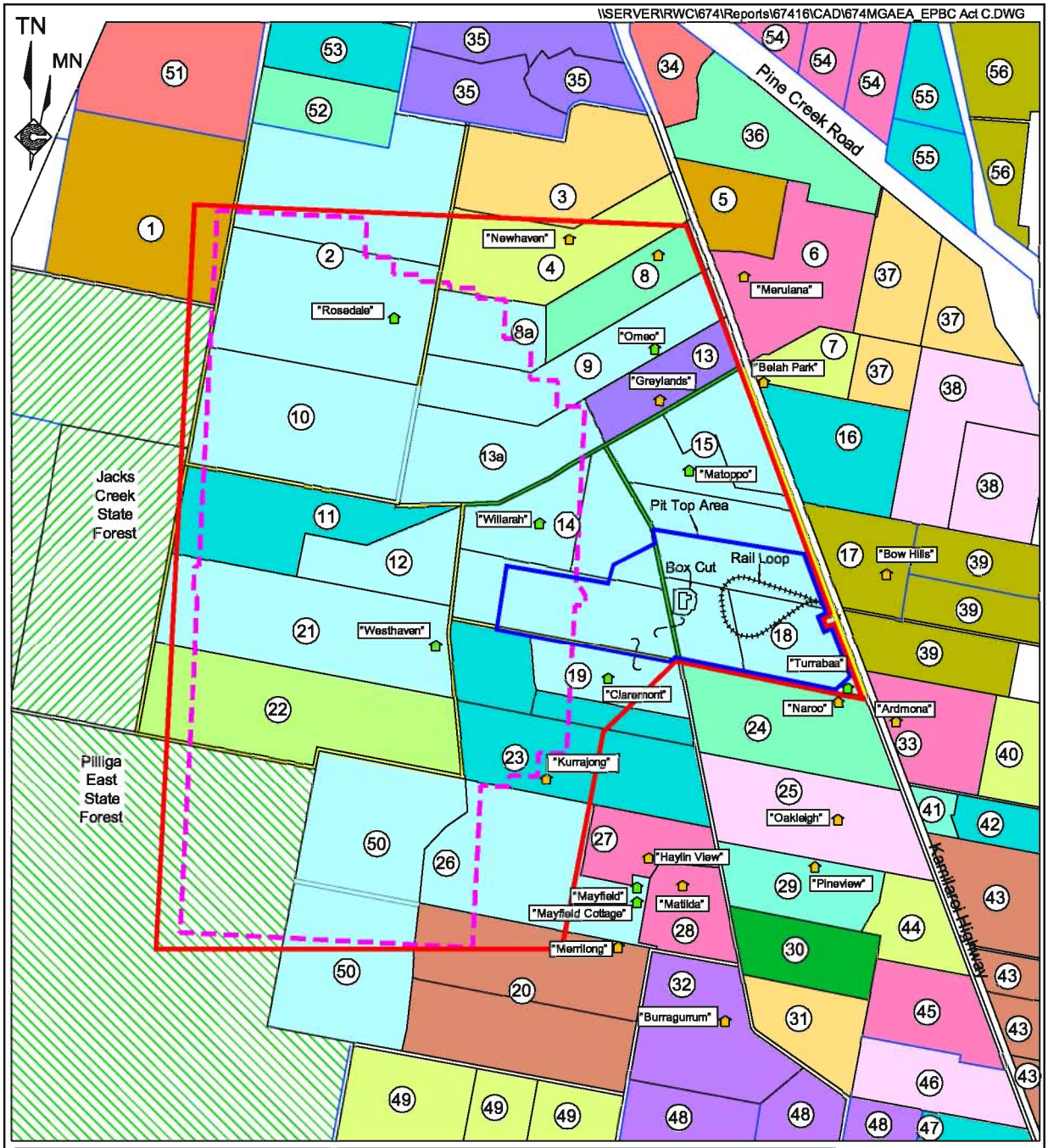
- Mine Site Boundary
- Pit Top Area Boundary
- Contour (m AHD)(Interval = 2m)
- Creek / Drainage Line
- Sealed Road
- Unsealed Road / Track
- Approved Disturbance within the Pit Top Area
- Area of Proposed Stage 2 Surface Disturbance

SCALE 1:5 000

50 0 50 100 150 200 250 m

Figure B
PIT TOP AREA AND REJECT EMPLACEMENT AREA SURFACE DISTURBANCE

R.W. CORKERY & CO. PTY. LIMITED



LAND OWNERSHIP							
1	N. & F. King	17	J. & R. Stieger	35	J. & A. Collins	53	J. Westwood
2	Narrabri Coal Pty Ltd	18	Narrabri Coal Pty Ltd	36	S. & J. Holman	54	S. & J. McGowan
3	A. & L. Grumley	19	Narrabri Coal Pty Ltd	37	Boonery Pty Ltd	55	J. & D. Zimmerman
4	K. & J. Scott	20	R. & S. Chappel	38	C. & R. Melbourne	56	J. & W. Baylis
5	W. & A. Tick	21	Narrabri Coal Pty Ltd	39	J. & R. Stieger		
6	P. Smart	22	D.,P.,B. & N. Gmcarski	40	J. Richards		
7	G. & C. Sevil	23	J. & G. Lennox	41	G. Smith		
8	J. & M. Bish	24	M. W. Foster	42	S. Murton		
8a	Narrabri Coal Operations Pty Ltd	25	C. Towns	43	P. Webb		
9	Narrabri Coal Operations Pty Ltd	26	Narrabri Coal Pty Ltd	44	T., W. & S. Tapscott		
10	Narrabri Coal Pty Ltd	27	W. Chapman	45	M. Thomas		
11	P. Bradbury	28	W. Chapman	46	B. Scott		
12	Narrabri Coal Pty Ltd	29	C. & D. Kirkby	47	B. & A. Mainey		
13	M. & D. White	30	M. Thomas	48	G. & L. Stuart		
13a	Narrabri Coal Operations Pty Ltd	31	B. Scott	49	G. & L. Clarke		
14	Narrabri Coal Pty Ltd	32	G. & L. Stuart	50	Narrabri Coal Pty Ltd		
15	Narrabri Coal Pty Ltd	33	P.C. Webb	51	J. Irvine		
16	C. Healion	34	J. Pattison	52	S. Smith		

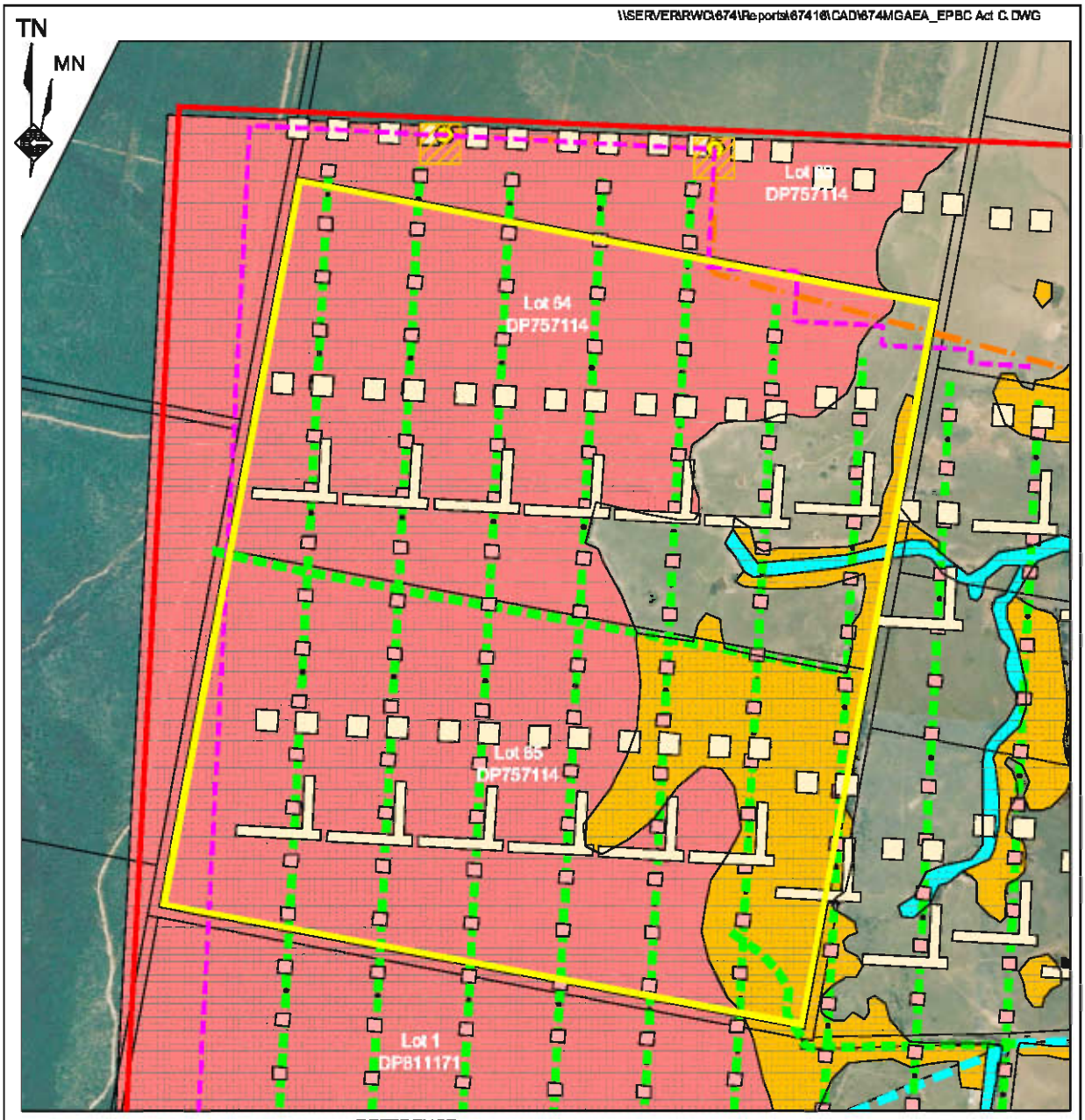
REFERENCE
- Mine Site Boundary
- Pit Top Area Boundary
- Underground Mining Area
- Residence (Project Related)
- Residence (Non-project Related)
- Property Owned by Narrabri Coal Operations Pty Ltd
- Crown Land
- Crown Road
- Council Road

SCALE 1:75 000

1 0 1 2 3 4km

Land Ownership Source: Dept. of Lands / Narrabri Coal Operations Pty Ltd

Figure C
LAND OWNERSHIP



REFERENCE

- Mine Site Boundary
- Cadastral Boundary
- Contour (m AHD)(Interval = 10m)
- Creek / Drainage Line
- Boundary of Biodiversity Offset Area (offset for clarity)
- Indicative Limit of Underground Workings
- Proposed Stage 2 All Weather Unsealed Access Road
- Proposed Stage 2 Power Line
- Proposed Stage 2 Power Line Advancing with Mine
- Proposed Stage 2 Access for Goaf Drainage
- Proposed Stage 2 Rear of Panel Ventilation Shaft
- Proposed Goaf Drainage Borehole Site
- Proposed Gas Production Site
- Community 1 - Brown Bloodwood / Pilliga Box Woodland
- Community 2 - Inland Grey Box Woodland
- Community 3 - Riparian Forest
- Community 4 - Callitris Forest
- Community 5 - Weeping Myall
- Cleared Land (Remainder)

Note: See Figure A for entire mine site

Vegetation Community	Biodiversity Offset Area	
	Total Area (ha)	Area to be Disturbed (ha)
1	520	54.3
2	88.1	9.4
3	3.2	0.3
4	0	0
5	0	0
Cleared	76.1	11.0
Total	**687.4**	**75.0**

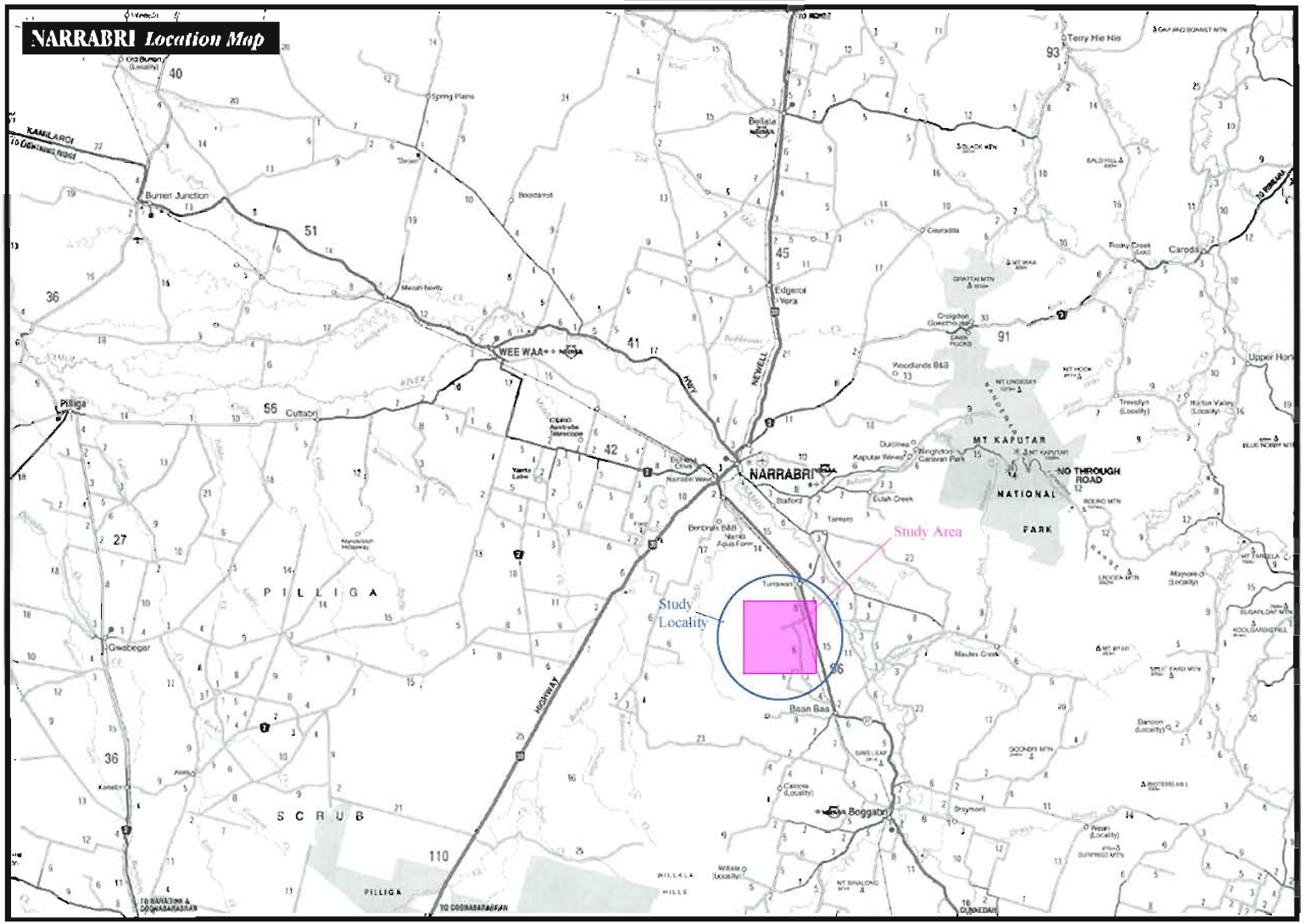
SCALE 1:25 000

250 0 250 500 750 1000 1250 m

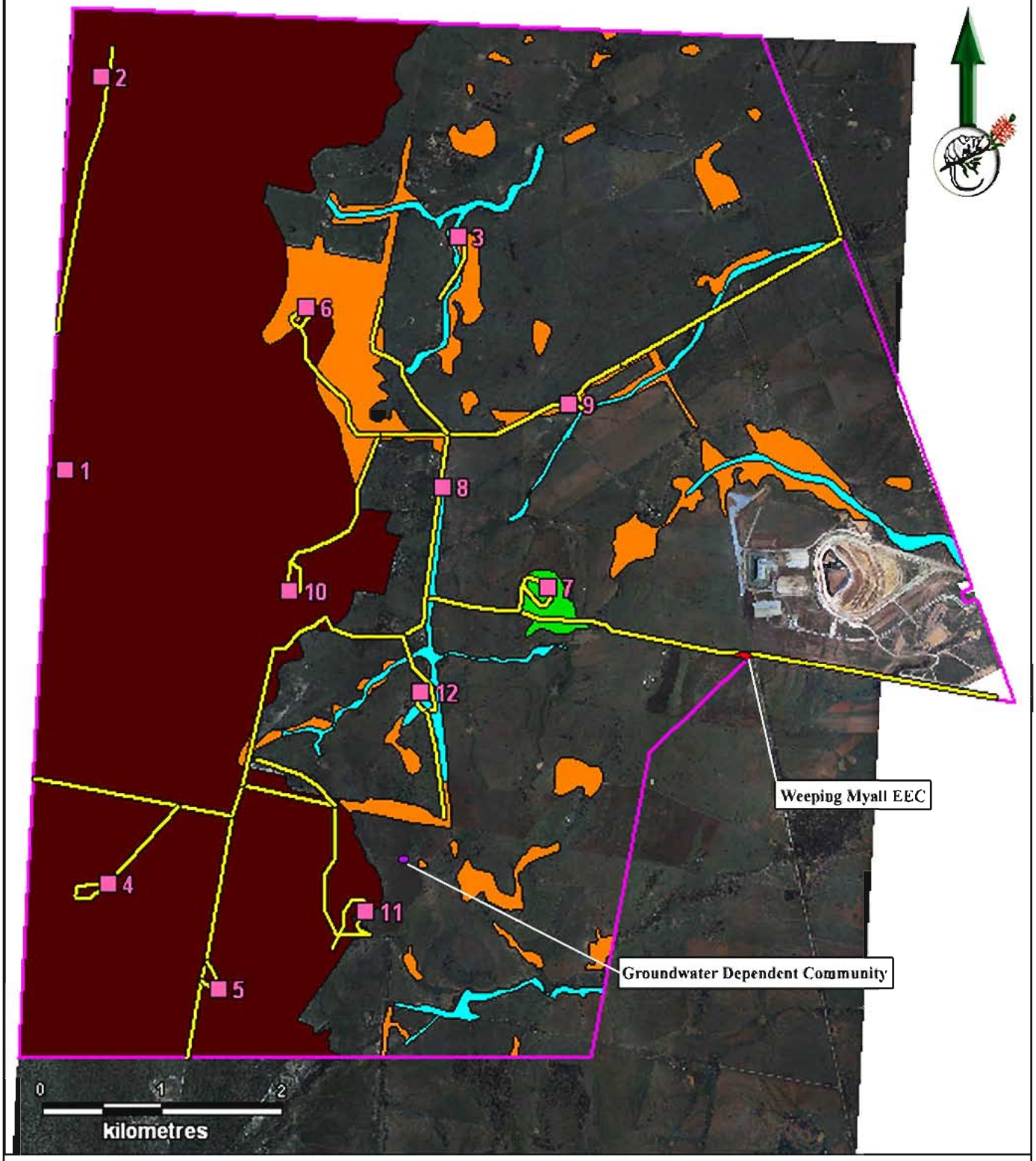
Base Photo Source: Geo-spectrum (Australia) Pty Ltd - Date of Photo: 5 December 2005

Figure D

BIODIVERSITY OFFSET AREA



Ecotone Ecological Consultants Pty Ltd	**Figure 1. Location of the Study Locality and Study Area**	
	Flora and Fauna Impact Assessment: Proposed Narrabri Longwall Coal Mine Stage Two	May 2009



Key

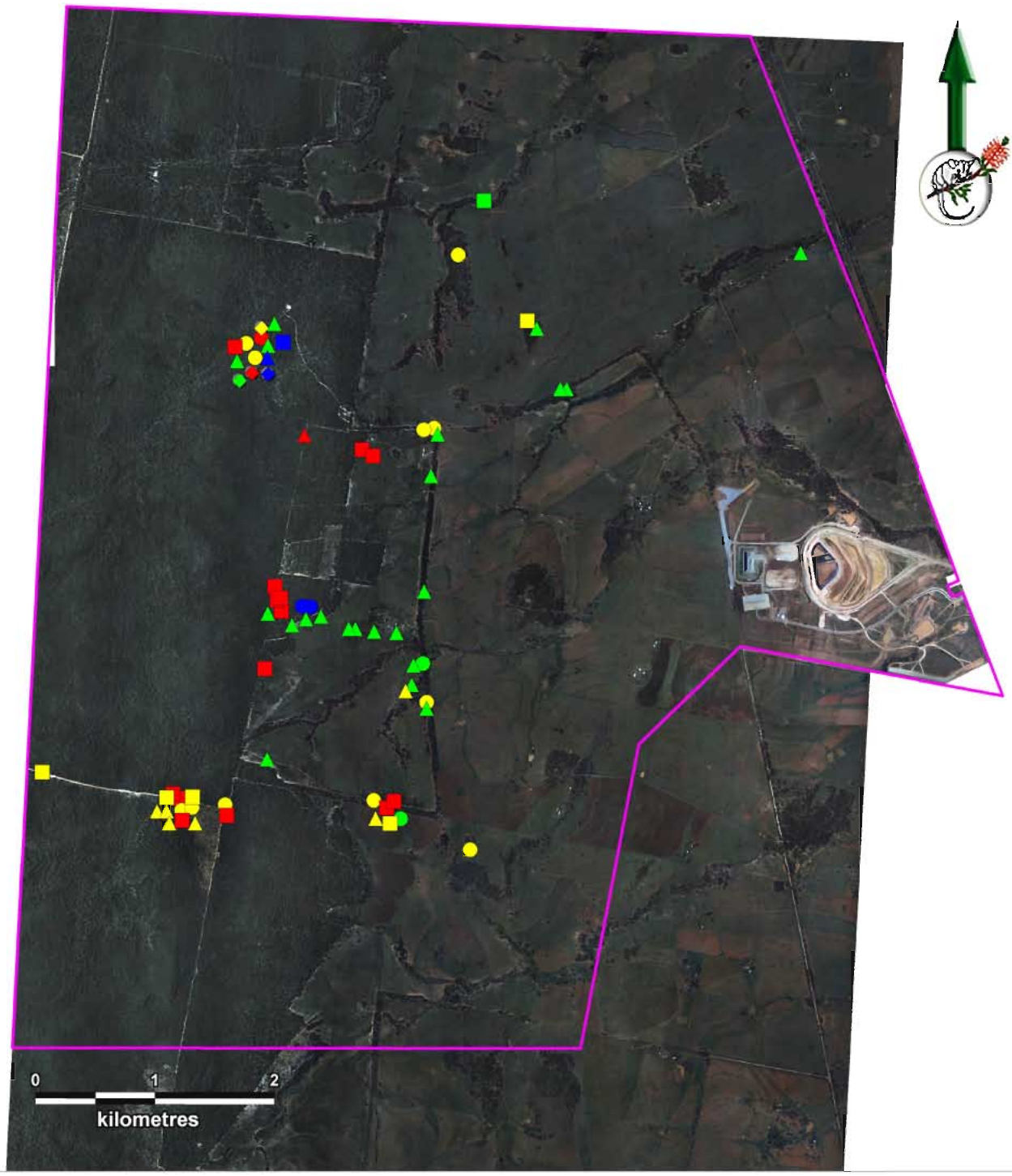
- Subject Site
- Community 1 - Brown Bloodwood/Pilliga Box Woodland
- Community 2 - Inland Grey Box Woodland
- Community 3 - Riparian Forest
- Community 4 - Callitris Forest
- Weeping Myall EEC
- Groundwater Dependent Community
- Flora Quadrat
- Walking/Vehicle Transect

Ecoplans Ecological Consultants Pty Ltd

Figure 3. Vegetation Communities and Flora Survey Locations

Flora and Fauna Impact Assessment
Proposed Narrabri Longwall Coal Mine
Stage Two

May 2009



Key

Subject Site

- Delicate mouse
- Diamond firetail
- Eastern pygmy-possum
- Glossy-black cockatoo
- Greater long-eared bat
- Grey-crowned babbler
- Pale-headed snake
- Rainbow bee-eater
- Speckled warbler
- Superb parrot
- Turquoise parrot
- White-throated needletail
- Black-striped wallaby
- Koala
- Little pied bat
- Yellow-bellied sheathtail-bat

Ecotone Ecological Consultants Pty Ltd

Figure 9. Threatened and Migratory Species Records

Flora and Fauna Impact Assessment:
Proposed Narrabri Longwall Coal Mine
Stage Two

May 2009

Narrabri Coal Mine Stage 2 Longwall Project EPBC Act Reconsideration Request (dated 13 October 2009)

13 October 2009

Mr Tim Kahn
Director, Mining Section
Environment Assessment and Approvals Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

Dear Mr Kahn

On the 17 August 2009, a delegate for the Minister of the Department of the Environment, Water, Heritage and the Arts (DEWHA) determined the proposed Narrabri Coal Mine (the Project) (EPBC 2009/5003) a controlled action under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) after review of the Narrabri Coal Mine EPBC Act Referral.

It is Narrabri Coal Operations Pty Ltd's (NCOPL) understanding that the basis for the controlled action decision was the potential impact of the Project on the Malleefowl (*Leipoa ocellata*), the Superb Parrot (*Polytelis swainsonii*) and the Brigalow (*Acacia harpophylla* dominant and co-dominant) Endangered Ecological Community (Brigalow EEC).

The purpose of this letter is to request a reconsideration of the controlled action decision for the Project (EPBC 2009/5003) under Section 78 of the EPBC Act.

To support this request, the attachments to this letter provide substantial new information that was not contained in the Narrabri Coal Mine EPBC Act Referral. This new information has been compiled following: the undertaking of additional field surveys targeting the above listed species and ecological community; and following additional research and compilation of known distribution, habitat requirements and species and community ecologies. The substantial new information includes:

- **A description of the historic and current distribution of the Malleefowl and Superb Parrot relative to the Project.**
- **A description of the habitat requirements of the Malleefowl and Superb Parrot and the relative availability and quality of these habitats at the Project.**
- **Further detail in regard to commitments to avoid, minimise and manage disturbance to the available habitat of the Malleefowl and Superb Parrot at the Project.**
- **Further detail in regard to the presence of the Brigalow EEC at the Project.**

While not specifically included on the *Decision on Referral* notice (dated 17 August 2009) as a species which DEWHA considered the Project would have a significant impact on, Coolabah Bertya (*Bertya opponens*) was recorded within the Project area during the field surveys undertaken by FloraSearch in September 2009. This letter subsequently provides further information in regard to the distribution of Coolabah Bertya at the Project, potential impacts of the Project on Coolabah Bertya and measures to avoid, minimise and manage those potential impacts.

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NCOPL wishes to use this opportunity to present to the DEWHA additional consideration of the Project by: terrestrial fauna expert (Prof David Goldney) (Attachment A) and flora expert (Dr Colin Bower) (Attachment B) in the impact assessment and proposed management of impacts on the Malleefowl, Superb Parrot, Coolabah Bertya and the Brigalow EEC. A full account of their consideration of the Project is provided in Attachments A and B and a summary is provided below.

It is NCOPL's view that this substantial new information warrants a reconsideration of the controlled action decision, and a finding that the Project is not likely to have a significant impact on the Malleefowl, Superb Parrot, Coolabah Bertya or the Brigalow EEC, and is therefore not a controlled action.

1. Malleefowl (Leipoa ocellata)

Distribution of the Malleefowl

Based on the available data, the National Recovery Plan for the Malleefowl (Benshemesh, 2000) and the NSW DECCW Threatened Species Profile for the Malleefowl (NPWS, 1999) map the distribution of the Malleefowl. Copies of these maps are provided in Attachment A and they indicate that the Project is located near to the historic northern extremity of the range of the Malleefowl.

This northern range extremity to the south-west of the Project is supported in 'The New Atlas of Australian Birds' (Barrett *et al*, 2002, p31) as well as current distribution records of this species sourced from the DECCW Atlas of NSW Wildlife, Birds Australia and Bionet databases (data received September 2009). Database records provide that the nearest known recent records are approximately 40 km south-west of the Project.

Available Habitat at the Project

The current available Malleefowl habitats within the Project Area are (after Attachment A):

- Western portion of the Project area – Dense to very dense (observed to range from 5,000 to 40,000 stems per hectare, usually toward the higher end of stem density) regrowth habitats following fire and/or cessations of grazing and farming. This habitat, represents about 2,058 ha, or 40% of the Project area. Such habitat is considered very unsuited to Malleefowl and very likely too dense (i.e. impenetrable) for dispersing young in the very unlikely event of the northern range extremity being breached.

- Eastern portion of the Project area (remnant woodland vegetation) – Modified by clearing and/or fire, the dominants in these woodlands range from Ironbark, Grey Box, Belah and Bimble Box. This habitat represents about 436 ha, or 8% of the Project Area. Such woodlands are potential marginal Malleefowl habitat although outside the historically acknowledged range of the Malleefowl.

- Eastern portion of the Project area (cleared agricultural lands with scattered paddock trees) – This habitat is not considered suitable for any stage of the Malleefowl's lifecycle. This habitat represents about 2,716 ha or 52% of the Project Area.

It is likely that some potential marginal woodland habitat suitable for Malleefowl existed within the Project area at the time of settlement albeit possibly never utilised by the species. This is what would be predicted near a species' range extremity. Within the western portion of the Project area, landuse and/or fire have resulted in the extant formation of a near impenetrable dense woodland barrier completely unsuited to Malleefowl dispersal or carrying out the species' lifecycle components.

Some limited potential Malleefowl regrowth habitat exists in the remnant woodland east of this dense regrowth area, but for all intents and purposes, would remain inaccessible to Malleefowl in the very unlikely event of a Malleefowl dispersal event penetrating further to the north-west of its current range extremity.

Project and Supplementary Survey Results and Assessment

As provided in Attachment A, neither the Malleefowl nor its distinctive mounds were located at the Project during either of the surveys undertaken in 2009 despite rigorous searches. The north-western range extremity of the Malleefowl in northern NSW lies south-west of the Project. Since 1980 this range extremity has further contracted to the south-west. Recent fauna surveys in the Brigalow Belt South (Resources and Conservation Assessment Council, 2000) and the Pilliga State Forest (Carlton and Paul, 2002) affirm that the Malleefowl, as would be expected, is rare to absent within the northern extremity of its range in NSW. This is further confirmed by the database records accessed in September this year.

Management Measures

Of note to the potential impacts of the Project on the Malleefowl is NCOPL's commitment to undertake a tree clearing protocol to avoid direct disturbance to nesting birds. This commitment has been made in NCOPL's recently lodged Environmental Assessment (prepared under Part 3A of the *Environmental Planning and Assessment Act 1979*). Attachment A indicates that this measure, if extended to include searches for distinctive Malleefowl nest mounds could further reduce the potential for the Project to adversely impact this species in the unlikely event that Mallefowl occur within the Project Area. Notwithstanding the assessment summarised above and detailed in Attachment A, if the Project is approved NCOPL would extend the tree clearing protocol to include this Mallefowl specific avoidance measure.

2. Superb Parrot (Polytelis swainsonii)

Distribution of the Superb Parrot

Four Superb Parrots were observed at the Project on one occasion in January 2009, flying overhead along a wooded drainage line (Ecotone Ecological Consultants, 2009). Review of the DECCW Atlas of NSW Wildlife, Birds Australia and Bionet databases (data received September 2009) indicate that a further single sighting of the species was recorded in 2001 within 10 km of the Project and an additional sighting, also in 2001 of a single bird was recorded within 20 km of the Project.

As reported in Attachment A, the Project is at or nearing the north-eastern extremity of the Superb Parrot's range but external to and significantly north of the core breeding range. Based on the available data, Attachment A describes the species as very likely being a rare occurrence at the Project in the non-breeding season, with such occurrences possibly ceasing altogether during the breeding season.

Available Habitat at the Project

In the southern portion of its range, the species forages in Box Woodland during both its breeding and migratory-dispersal phase. Further north in the non-breeding period (including at the Project and its surrounds), Superb Parrots are known to forage in Boree and Box-pine woodlands (DEWHA 2009).

Available habitat for the Superb Parrot at the Project consists of woodland, riparian areas and semi-cleared agricultural areas with scattered paddock trees. The semi-cleared agricultural areas and some of the woodland areas offer little in the way of sustainable resources for the Superb Parrot and are not considered further. Vegetation communities at the Project (as mapped by Ecotone Ecological Consultants, 2009) that provide suitable habitat resources for the Superb Parrot include:

- Sandstone Slopes Woodland: Brown Bloodwood/Pilliga Grey Box/Red Ironbark.
- Lower Flats and Floodplain Woodland: Inland Grey Box/Bimble Box/Blakely's Red Gum.
- Riparian Forest: River Oak/Belah/Inland Grey Box.

Attachment A provides an assessment of the ability of these communities to provide habitat resources to support the Superb Parrot (e.g. for feeding, breeding, roosting and movement). The main findings of the assessment are provided below.

Sandstone Slopes Woodland: Brown Bloodwood/Pilliga Grey Box/Red Ironbark

This vegetation community represents an area approximately 2,058 ha (40% of the Project area) in the western portion of the Project area. Available foraging resources are low as very few suitable trees are present and the understorey and ground layer plants in many locations are frequently near impenetrable.

Roosting resources are present (albeit sparsely distributed) although the existing empirical data indicates that these resources are not utilised by the species, likely due to the preferential roosting habitat elsewhere (e.g. along the Namoi River), and the very low density of this species at its northern extremity.

This community is considered to be a successional landscape dominated by large areas of dense regrowth up to 40,000 stems/ha, due to likely combinations of fire, logging and regrowth following clearing. Some patches of high quality habitat are present but the bulk of the area is assessed as being low quality habitat for the Superb Parrot.

Lower Flats and Floodplain Woodland: Inland Grey Box/Bimble Box/Blakely's Red Gum

This community represents an area of approximately 318 ha (6% of the Project area) in patches scattered across the Project area. Similar to the above community, while roosting resources are present (albeit sparsely distributed), the existing empirical data is that these resources are not utilised by the species.

This community is considered to represent a post logging/fire successional landscape that is (in some instances) partially enclosed by the Sandstone Slopes Woodland community with its dense regrowth. Some small areas of this community are assessed as higher quality habitat but generally this community is considered to represent low to medium quality Superb Parrot habitat.

Riparian Forest: River Oak/Belah/Inland Grey Box

This vegetation community is made up of narrow linear formations and represents an area of approximately 98 ha (2% of the Project area) in the eastern portion of the Project area along ephemeral drainage lines. While this community can provide seasonal feeding resources for the Superb Parrot (albeit scattered across the Project), the existing empirical data is that these resources are not utilised by the species. Again this is considered likely due to preferential roosting habitat elsewhere and the very low density of this species at its northern extremity.

This community is assessed as containing some small patches of quality habitat components suited to the needs of some parts of the lifecycle of the Superb Parrot.

Under-Utilisation of Potential Habitat and Species Rarity at the Northern Range Extremity

During the migratory/dispersal phase of the Superb Parrot, the species is non-breeding but still requires roosting and foraging resources as the majority of the population spreads out across its full range. Despite reductions in availability of habitat due to land clearing there still remain substantial areas of potential foraging, roosting and overflying habitats (such as those at the Project) that are either underutilised or never utilised due to the very low density of the species at it north-eastern range extremity.

Furthermore there is anecdotal evidence that the Superb Parrot may preferentially utilise River Red Gum dominated major river corridors (such as the Namoi River) as non-breeding roosting areas and from there, make daily foraging flights to potential feeding areas, including the Project area and its immediate surrounds.

Management Measures

Notwithstanding the above assessment, NCOPL has made several commitments in its' recently lodged Environmental Assessment that would reduce the potential impacts of the Project on the Superb Parrot. These commitments include:

- Clearly identify the boundaries of disturbance within the Pit Top Area and progressive disturbance associated with ventilation and gas drainage infrastructure. Ensure no clearing occurs outside these boundaries.

- Avoid disturbance to the vegetation of Community 3 along Kurrajong Creek Tributary 1.

- Clearly identify the boundaries of proposed disturbance. As far as practicable avoid disturbance to the vegetation of Community 3 along watercourses of the Mine Site.

- Commission a qualified ecologist to complete a pre-clearance survey of nominated areas of disturbance (to identify whether any threatened species, population or community or their habitat is present).

- The location of access tracks will be determined in conjunction with an ecologist after inspecting each proposed route and determining the path with least impact on environmental values.

- Retain all substantial habitat trees, wherever possible.

- Undertake any tree-felling in accordance with a Tree Felling Protocol. The Tree Felling Protocol will be developed in conjunction with a qualified ecologist and will include, but not necessarily be limited to a description of:
  - the best time of the year for felling;
  - pre-felling mapping of habitat trees;
  - inspections of trees on the day of felling;
  - procedures for the safe removal of fauna species;
  - a relocation/release protocol; and
  - a protocol for the assessment and salvaging of tree hollows.

- Re-site all hollows from hollow-bearing trees removed where practicable.

3. Coolabah Bertya (Bertya opponens)

While not specifically included on the Decision on Referral notice (dated 17 August 2009) as a species which DEWHA considered the Project would have a significant impact on, Coolabah Bertya was recorded within the Project area during the field surveys undertaken by FloraSearch on the 8 to 10 September 2009.

In regard to Coolabah Bertya, FloraSearch provides in Attachment B a description of its distribution within the western portion of the Project area and surrounds and an assessment of the potential impacts of the Project on it. Extracts from Attachment B regarding Coolabah Bertya at the Project are provided below.

"Bertya opponens was found to be abundant in Jacks Creek and Pilliga East State Forests and to extend into the northern and western sides of the pilliga community in the west of the study area. The records of its distribution in the study area are shown on Figure 1 (see Attachment B). Observations of this species indicated that it is most abundant on east facing hill slopes on shallow gravelly to stony soils over sandstone. It was common in such situations in Pilliga East and Jacks Creek State Forests on the western side of the study area. It also extended approximately 2 km to the north of the study area along Scratch Road and at least 3 km west of the study area along Chromite Road. The populations are large, numbering many tens of thousands of individuals. NPWS (2002) estimated that over 5 million plants occur in Jacks Creek State Forest. The occurrences of the Coolabah Bertya in Jacks Creek State Forest represent the largest known extant populations of this species, which is otherwise only known from the Coolabah-Cobar area (NPWS 2002, DECC 2008a).

The occurrences of Coolabah Bertya on the study area are continuous with, and represent the eastern limits of, the distribution of the Jacks Creek and Pilliga East State Forest populations. Suitable habitat for this species, gravelly soils on east facing slopes, is likely to be relatively common in the western parts of the study area. It is also clear that the number of individuals on the study area may number many thousands of plants.

The relatively large populations of the Coolabah Bertya on the study area were missed by Ecotone Ecological Consultants (2009). However, they did consider it had a high potential to occur on the study area and assessed the potential impact of the development on it accordingly. This survey found occurrences of the species in the north of the study area above longwall panels 10 to 13 and within the zone of influence from subsidence. It is likely to also occur in areas designated for surface clearance activities including powerlines, gas drainage sites and associated access tracks. The full extent of the distribution of the Coolabah Bertya in the north of the study area is unclear. Similarly, the extent to which populations of the Coolabah Bertya impinge on the southern parts of the western edge of the study area is also unclear. Even so, there is no doubt the development activities are likely to impact on populations of the species".

The likely impact of the action on the Coolabah Bertya is re-assessed in Attachment B using the EPBC Act Significant Impact Guidelines (DEH 2006).

In Attachment B, Dr Bower after applying the EPBC Act Significant Impact Guidelines, has concluded that "it is clear that the Project would not have a significant impact on the Coolabah Bertya".

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4. Brigalow (Acacia harpophylla Dominant and Co-Dominant) Endangered Ecological Community

The following section provides extracts from Attachment B regarding the presence of the Brigalow EEC at the Project.

In New South Wales, the listed Brigalow EEC includes the following three vegetation communities of Benson et al. (2006) (DEWHA, 2009b):

- Community 29-Brigalow open woodland on red earth and clay plains mainly in the Mulga Lands Bioregion.
- Community 31-Brigalow-Gidgee open woodland on clay plains west of the Culgoa River, Mulga Lands Bioregion.
- Community 35-Brigalow-Belah woodland on alluvial often gilgaied clay soil mainly in the Brigalow Belt South Bioregion.

The first two communities are confined to the Mulga Lands Bioregion (Benson et al. 2006) and are not considered further. The Project is located in the Brigalow Belt South Bioregion and therefore the third community is of relevance. Community 35-Brigalow-Belah woodland on alluvial often gilgaied clay soil mainly in the Brigalow Belt South Bioregion is described in DEWHA (2009b), after Benson et al. (2006), as follows:

'*This vegetation type is woodland and open forest up to 25 m high dominated by Acacia harpophylla (Brigalow), with a range of shrub species in the understorey. Pockets of Casuarina cristata (Belah), Eucalyptus populnea (Bimble Box, Poplar Box) and E. pillagaensis (Narrow-leaved Box) may also be present. Characteristic shrub species include Geijera parviflora (Wilga), Capparis mitchellii (Wild Orange, Native Orange), Eremophila mitchellii (Budda, False Sandalwood), E. deserti (Turkeybush), Apophyllum anomalum (Warrior Bush), Currant Bush), Pittosporum angustifolium (Weeping Pittosporum, Butterbush, Berrigan), Citrus glauca (Desert Lime, Limebush), Acacia pendula (Boree, Weeping Myall), Carissa ovata) (Currant Bush) and Alectryon oleifolius subsp. canescens (Western Rosewood, Bonaree). The ground cover is frequently sparse or bare (New South Wales National Parks and Wildlife Service 2002).*

The community occurs on flat or gentle rises on alluvial plains or undulating peneplains on quarternary heavy, gilgaied cracking clay or clayey loam soils over sedimentary strata.'

"Ecotone (2009) reported that Brigalow '*occurred as scattered plants or small clumps of plants within the flat plains area covered by Community 2*' on the study area. Community 2 is dominated by Inland Grey Box (Eucalyptus microcarpa) / Bimble Box (E. populnea) and Blakely's Red Gum (E. blakelyi) and occurs on lower flats and floodplains. This vegetation type includes many of the species listed above that are typically found in the Brigalow ecological community. However, since Brigalow '*did not form the dominant or co-dominant species in this area*' Ecotone (2009) concluded these occurrences do not constitute the EEC.

By contrast, Ecotone (2009) found that '*Brigalow did form stands where it was the dominant canopy species in scattered parts of the pilliga community (Community 1)*'. The pilliga community is dominated by Brown Bloodwood (Corymbia trachyphloia), Pilliga Grey Box (Eucalyptus pilligaensis) and Red Ironbark (E. fibrosa). Ecotone (2009) noted that the pilliga community is on '*sandy soil over sandstone*' and that '*the associated shrub and ground layer species (such as Phebalium squamulosum and Calytrix tetragona) are atypical of the EEC*'. Ecotone Ecological Consultants (2009) concluded that '*the EEC occurs in marginal form only in scattered parts of the western slopes portion of the study area*'.

The supplementary flora survey was carried out on 8 to 10 September 2009. Surveyors familiarised themselves with Brigalow (*Acacia harpophylla*) and the Brigalow EEC by examining natural occurrences beside the Newell Highway approximately 1 km south of Narrabri.

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The natural vegetation at the Project was inspected by vehicle and foot traverses across the whole area. All remnant vegetation patches on the cleared agricultural areas were examined throughout their areas and lengths. The large bushland block in the western part of the area was examined along all old firetrails, and mining exploration tracks that have been established since the original flora survey was conducted. The latter tracks provided access to areas that had not previously been surveyed. In addition this block was examined by transects on foot extending up to 500 m from the western boundary to the east.

Despite three days of searching, no Brigalow (*Acacia harpophylla*) was found anywhere on the Project area, including a search in an approximately 100 m radius around the GPS coordinates of the Brigalow recorded reported in the original EPBC referral.

Of relevance is that no areas of floodplain exist on the study area, the eastern parts of which are entirely gently sloping foothill country with ephemeral watercourses, although small alluvial terraces occur on some ephemeral creek lines. The absence of floodplains is important for assessing the potential availability of habitat for the Brigalow EEC.

Due to the impenetrability of much of the dense heath understorey of this community, Ecotone was unable to survey much of the western area of the site. Consequently, to be conservative, they assumed that more than the single recorded patch of Brigalow were likely to be present. This assumption was not confirmed in the current survey in which it was possible to traverse much of the western area on newly constructed tracks, and on foot transects into the area from Scratch Road in Jacks Creek State Forest.

The Brigalow species was not found on the lower gently sloping areas on the eastern parts of the site where it would be most likely to occur. Nor was it recorded in the immediate surrounds of the study area. While many of the species known to associate with Brigalow occur on the lower areas of the mine site, the substrate is not suitable for Brigalow itself. Brigalow – Belah woodland occurs on heavy alluvial, often gilgaied, clay soils on floodplains in the Brigalow Belt South Bioregion (Benson *et al.* 2006). Such habitats do not occur on the study area.

The isolated small occurrence of the Brigalow species within the Brown Bloodwood (*Corymbia trachyphloia*), Pilliga Grey Box (*Eucalyptus pilligaensis*) and Red Ironbark (E. *fibrosa*) community is not considered to represent an example of the EEC. Very few of the associated species are found in the listed EEC and the substrate is a light sandy loam, rather than the heavy clay soils favoured by the Brigalow – Belah woodland community".

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5. Summary of Specialist Ecologist Findings

Prof David Goldney (Cenwest Environmental Services)

Prof David Goldney (Bsc Dip Ed PhD DSc (honoris causa) MEIA) has extensive experience in conducting fauna surveys and impact assessments being the principal consulting ecologist at Cenwest Environmental Services for the past 25 years. A letter from Prof Goldney is provided in Attachment A. In this letter, Prof Goldney concludes:

"*Given the reasons advanced above, the Project is considered very unlikely to have a significant impact on either the Malleefowl or the Superb Parrot*".

Dr Colin Bower (FloraSearch)

Dr Bower has extensive experience in conducting flora surveys, vegetation community mapping and threatened species searches and assessments over the last 16 years. A letter from Dr Bower is provided in Attachment B. In this letter Dr Bower concludes:

"*From the above consideration of the EPBC significant impact criteria, it is clear that the project would not have a significant impact on the Coolabah Bertya*".

And

"*It is concluded from the above considerations that the Brigalow (Acacia harpophylla dominant and sub-dominant) EEC does not occur on the study area. Consequently, the proposed action is unlikely to have a significant impact on this ecological community*".

6. Conclusion

It is NCOPL's view that this substantially new information warrants a reconsideration of the controlled action decision, and a finding that the Project is not likely to have a significant impact on the Malleefowl, Superb Parrot or the Brigalow EEC, and is therefore not a controlled action.

NCOPL is committed to the extraction, processing and supply of coal in an environmentally responsible manner. If you would like to discuss any aspect raised in this letter or the attached supporting information, please do not hesitate to contact Mr Brian Cullen, General Manager Technical Services for Whitehaven Coal or alternatively me.

Yours sincerely

Greig Duncan
General Manager
Narrabri Coal Operations Pty Ltd

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7. References

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Attachment A

Letter from Cenwest Environmental Services

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Brian Cullen
General Manager - Technical Services
Whitehaven Coal

6 October 2009

Dear Brian,

Re: Narrabri Coal Mine EPBC Referral – Fauna Survey and Assessment

The below provides supporting information to a request for reconsideration of the controlled action decision for the Narrabri Coal Mine. The below is based on additional field surveys undertaken across the Narrabri Coal Mine site on 25 October 2009 targeting the Malleefowl (*Leipoa ocellata*) and the Superb Parrot (*Polytelis swainsonii*) and their habitats. Both of these species are listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and are the subject of a decision by the Commonwealth Department of the Environment Water Heritage and the Arts (DEWHA) to determine the Narrabri Coal Mine as a controlled action.

Based on the new information provided below I consider that the Narrabri Coal Mine is unlikely to have a significant impact on either the Malleefowl or the Superb Parrot.

1. Malleefowl

Malleefowl Distribution

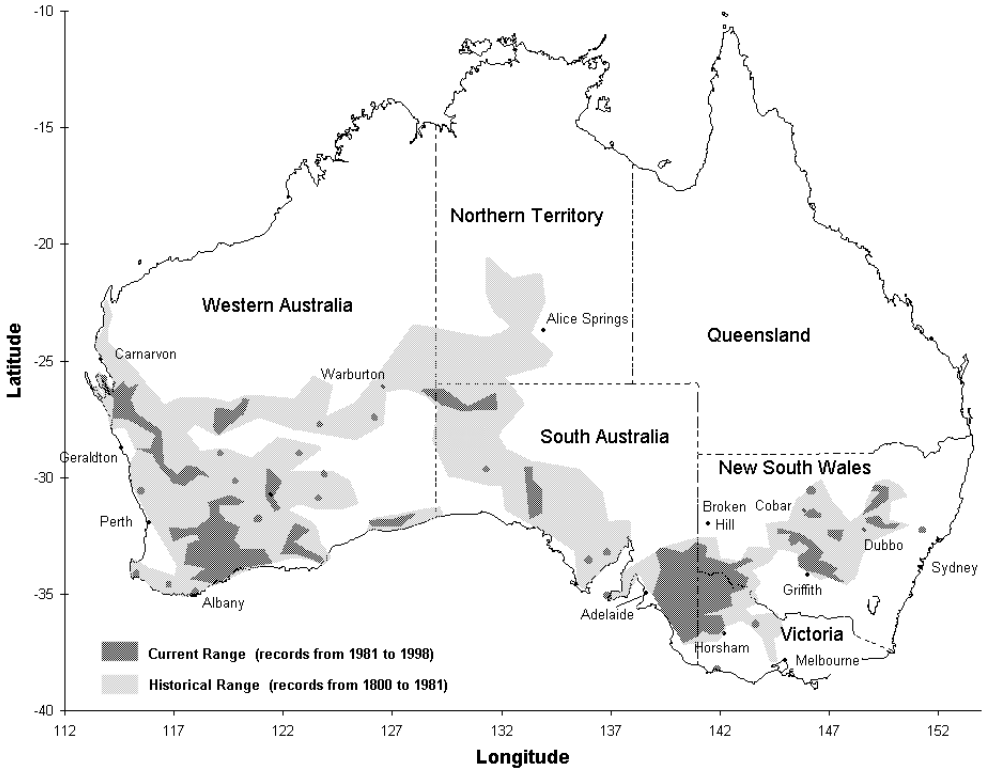
The current (c 1998) and historic distribution of the Malleefowl is compiled and presented in Figure 1, Appendix 2 of The National Recovery Plan for the Malleefowl (2000) and in the NSW DECCW threatened species profile for the Malleefowl (NPWS, 1999).

These data are presented as the historic distribution to 1981 and 'current' 1981-1998. Based on limited historic data, the known north-western range extremity of the Malleefowl is to the immediate southwest of the Project Area. The 'current' distribution (1980-1988) demonstrates there has been a westerly range contraction at the species' north west range extremity.

This northern range extremity south west of Narrabri and the Project Area is confirmed in 'The New Atlas of Australian Birds' Barrett et al 2002, p31, as well as current distribution records of this species located in DECCW's Atlas of NSW Wildlife[1] and Birds Australia databases[1] as assessed in September 2009.

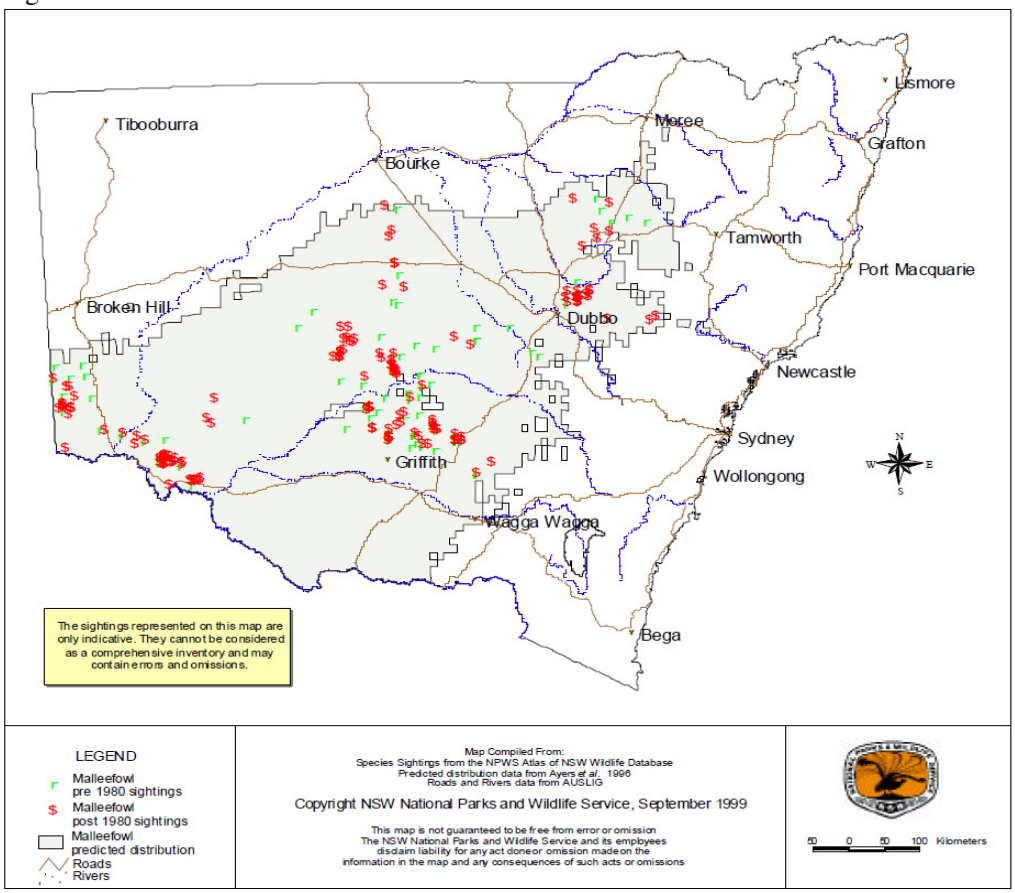
[1] Co-ordinates used to generate database results were: -30.0786, 149.3459; -30.0560, 150.3822; -30.9568, 150.4135; -30.9802, 149.3677 based on a 10,000 km^2 square centered on the Narrabri Coal Mine

Figure 1. Current and historical range of Malleefowl across Australia



Source: Figure 1 Appendix 2 of The National Recovery Plan for the Malleefowl (2000)

Figure 2: Malleefowl Distribution across NSW



Source: NPWS (1999) *Threatened Species Information – Malleefowl, Leipoa ocellata.*

The predicted absence of the Malleefowl within the Project Area has been confirmed by lack of sightings of adults or breeding mounds:

- During a fauna field survey program conducted in January 2009 over three days across the Project Area (Ecotone Ecological Consultants 2009)[2].

- During a one day targeted survey carried out by Cenwest Environmental Services 25 October 2009. This survey focused on identifying the presence or absence of breeding mounds (very obvious structures – refer to Attachment 1) by slow driving through a range of bush tracks with an estimated mound viewing potential of approximately 25m on either side of each track. This was supplemented by a number of transect meanders up to 500m from a given track to ensure that habitat adjacent to tracks was similar to habitats further away from tracks. This proved to be the case. The extent of this survey within the regrowth arid woodland (mapped as Community 1 – Brown Bloodwood/Pilliga Box Woodlands by EEC [2009]) and semi-cleared agricultural landscape was equivalent to a continuous transect approximately 55 km in length and 50m wide. This represents a sample area of approximately 278 ha, which is approximately 11% of the regrowth arid woodland and semi-cleared agricultural land within the Project Area.

Habitat Quality and Impact of Fire on Habitat in the Project Area

The Project Area is near to the historic northern extremity of the range of the Malleefowl, with the nearest known recent records being approximately 40 km south-west of the Project Area. Furthermore, two recent surveys in the Pilliga Nature Reserve (Resources and Conservation Assessment Council, 2000) and the Pilliga State Forest (Carlton and Paul, 2002) returned a total count of six and zero individuals respectively. These very low numbers are reflected in the DECCW's Atlas of NSW Wildlife and the Birds Australia database records of the Malleefowl accessed in September 2009. Whilst we cannot be certain of the distribution and abundance of this species south of the Project Area at the time of European settlement, it is likely that we can make a number of inferences;

- Malleefowl near or at a range extremity (in this case southwest of the Project Area) are likely to have been in very low density and would usually be described as rare occurrences on the ground;

- Habitat conditions at a range extremity are likely to be sub-optimal for reasons not necessarily well understood since a complex interplay of biophysical variables are involved;
- An historically determined range extremity should not necessarily be viewed as an impenetrable barrier for this or any other species but could contract and expand under a range of bio-physical conditions leading to differential breeding success rates of the species.

- Under some sets of biophysical conditions that might facilitate a relatively rapid population build up in Malleefowl numbers at a range extremity, a temporary breaching of the range extremity could occur as young disperse in all directions. However, whilst the Malleefowl lays more eggs than most avian species (around 30 per mound), it is not regarded as an irruptive species; and

[2] Ecotone Ecological Consultants are hereafter abbreviated EEC (2009)

- It is conceivable that under some conditions in the past dispersing young could have found their way through to the current Project Area. However dispersing young moving out of an established adult breeding area are likely more prone to reproductive failure, assuming that they survive to breeding age and in the unlikely event they meet up with a potential breeding partner.

Such a scenario (dispersing young moving into the Project Area) is very unlikely today given the species range contraction since settlement, distance of the most recent known records from the Project Area, predator pressure from cats and foxes in addition to predatory native species, and the quality and extent of available habitat on site.

The general habitat requirements of the Malleefowl are well understood. Its core habitat is located in Mallee formations (Frith 1962) but it also occurs in semi-arid shrublands and low woodlands. Suitable but possibly sub-optimal habitat is also located in native pine and ironbark formations such as occurs in the Pilliga area. However the precise habitat needs of the Malleefowl are not well understood (Benshemesh 2000). The species is known to require a sandy substrate and an abundance of leaf litter to facilitate the construction of a mound with an estimated 2-3m^3 of litter required in its initial construction. In mallee formations, Frith (1962) identified the following requirements needed to optimize Malleefowl density:

- Numerous food plants
- A dense canopy
- Open ground layer (for feeding, moving and breeding), and
- Absence of grazing.

The fire history requirements of this species are now better, but by no means fully understood, compared to the period when Frith was undertaking his pioneering research in the 1960s. Malleefowl are known to prefer old growth mallee formation. Following extensive fire, Malleefowl breeding can be suppressed for up to 20 years (Cowley et al 1969). Long unburnt habitats (60-80) years also appear to optimize species density, with adverse fire impacts modified in patchily burnt landscapes (Woinarski 1989a and 1989b).

The Project Area is now heavily modified due to past clearing for logging and agriculture, and in the western section, exemplifies the very dense early succession regrowth that occurs following a hot fire estimated to have occurred about 20 years ago, or possibly a similar outcome following the cessation of farming and grazing across the Project Area.

The likely pre-European condition of the Project Area would be, in the absence of fire for a period of say 40 years, a semi-arid open woodland, with a well established understorey mosaic of shrubland and grassland, with sandy soil and ample ground litter, and potential habitat connectivity continuous with the historic known location of the Malleefowl southwest of the Project Area.

The current available habitats within the Project Area are:

- Extensive and understorey dense regrowth habitats following fire and/or cessations of grazing and farming. During the current field assessments stem density per hectare in this regrowth habitat varied from around 5,000 – 40,000 stems per hectare (refer to representative photos in Attachment 2), usually towards the higher end of stem density. Such habitat is very unsuited to Malleefowl life history strategies and very likely too dense (i.e. impenetrable) for would-be dispersing young in the very unlikely event of a range extremity boundary being breached, moving northwest from the low density populations further to the south. It is very unlikely that dispersing Malleefowl chicks would make use of existing tracks within the Project Area other

than perhaps in dashing across a track, were such an unlikely event to occur. This habitat, represents about 2,058 ha, or 39.5% of the project area. This habitat is very unsuitable for Malleefowl and is very likely an impenetrable barrier, in the unlikely event that dispersing chicks from known stocks to the southwest could even reach the western boundary of the Project Area.

- Moving further east within the Project Area and immediately adjacent to the dense regrowth areas are the extant open woodlands, albeit modified by clearing and/or fire. The dominants in these woodlands range from Ironbark, Grey Box , Belah and Bimble Box. Such woodlands are potential marginal Malleefowl habitat but as has been demonstrated, outside of the historically acknowledged range of the Malleefowl. This habitat represents about 436.3 ha, or 8.5% of the Project Area.

- The third remaining major habitat within the Project Area is the cleared agricultural lands with or without scattered trees. This habitat does not constitute Malleefowl habitat during any stage of its lifecycle. This represents about 2715.7 ha or 52% of the Project Area.

Management Measures

Of note to the potential impacts of the Project on Malleefowl is Narrabri Coal Operations Pty Ltd's commitment to undertake a tree clearing protocol to avoid direct disturbance to nesting birds. This measure, if extended to include searches for distinctive Malleefowl nest mounds, could further reduce the potential for the Project to adversely impact this species in the unlikely event that Malleefowl occurs within the Project Area.

Malleefowl Conclusions

Neither the Malleefowl nor its distinctive mounds were located within the Project Area during either of the surveys undertaken in 2009 despite rigorous searches. The northwestern range extremity of the Malleefowl (1788 -1980) in northern NSW lies southwest of the Project Area. Since1980 this range extremity has further contracted to the southwest. Recent fauna surveys in the Brigalow Belt South and the Pilliga State Forest affirm that the Malleefowl, as would be expected, is rare to absent within the northern extremity of its range in NSW. This is confirmed by DECCW's Atlas of NSW Wildlife and Birds Australia database records accessed in September this year.

It is likely that some potential marginal woodland habitat suitable for Malleefowl existed within the Project Area at the time of settlement albeit possibly never utilised by the species. This is what would be predicted near a species' range extremity. Within the western section of the Project Area, landuse and/or fire have resulted in the extant formation of a near impenetrable dense woodland barrier completely unsuited to Malleefowl dispersal or carrying out the species' life history strategies. Some limited potential Malleefowl regrowth habitat exists immediately east of this dense regrowth area, but for all intents and purposes, would remain inaccessible to Malleefowl in the very unlikely event of a Malleefowl dispersal event penetrating further to the northwest of its current range extremity.

2. Superb Parrot

Status, Range and Population Dynamics

Status within the Project Area and the Immediate Surrounds

Four Superb Parrots were observed in the Project Area on one occasion only, in January 2009, flying overhead along a wooded drainage line, during the course of a flora and fauna survey (EEC 2009)[3]. An interrogation of DECCW database indicated that a further single sighting of the species was recorded in 2001 within 10 km of the Project Area and an additional sighting, also in 2001 of a single bird within a 20 km radius of the Project Area. The Project Area is within the northern extremity of the Superb Parrot's range but external to and significantly north of the core breeding range (Figures 3-5). Based on the available data, the species would be described as being a rare occurrence[4] in the Project Area in the non-breeding season, with such occurrences possibly ceasing altogether during the breeding season.

Superb Parrot Distribution and Movement Patterns

The Superb Parrot is now believed to be a single population (Forshaw and Cooper 2002) albeit at different times of the year either substantially contracted to its core breeding areas in the Riverina and Southwest slopes of NSW, or spread out in small groups throughout its range (DEWHA 2009) during the non-breeding period. Its core range, including the migratory and occasional vagrancy phase, is mainly located west of the Great Dividing Range, from northern Victoria to around Narrabri and Wee Waa in the North-west Plains of NSW (See Figures 3-5).

The contracted breeding range of the Superb Parrot is well understood (Barrett et al 2003) although from time to time extensions in the breeding range are recorded (e.g. Christie 2004). However some non-breeding birds remain throughout the core range during the breeding season (Barrett et al 2003, Higgins 1999). However breeding in the northern part of its range, for example around the Namoi River, Wee Waa, Narrabri and the Project Area, has never been observed and such a breeding range extension is extremely unlikely to occur. For some members of the population, the core breeding areas in the southern part of their range coincides with their foraging area.

The DEWHA (2009) species' profile appropriately describes the range of movement patterns of the species as resident, dispersive, migratory or partly migratory, nomadic or partly nomadic. During the breeding season foraging males are capable of moving at least 10 km to their preferred feeding locations (Webster 1997), and may range even further than this. In non-breeding components of the species' range the extent of daily foraging routines is unknown but there is little reason to believe that it would not be similar to Webster's observation during breeding.

Little is known about the dispersal routes of the Superb Parrot from their core breeding range to their northern winter foraging areas but it is thought that the species moves via major rivers and streams such as the Namoi River dominated by River Red Gum. These major River Red Gum dominated rivers and streams and their tributaries have also the potential to become resident roosting areas (Higgins 1999; unpublished observations).

[3] Ecotone Ecological Consultants are hereafter abbreviated EEC (2009)

[4] Judged against a continuum scale: absent, rare occurrence, uncommon, common, abundant and vagrant/nomad.

Figure 3: Current distribution of the Superb Parrot – source EPBC web pages 02/10/2009

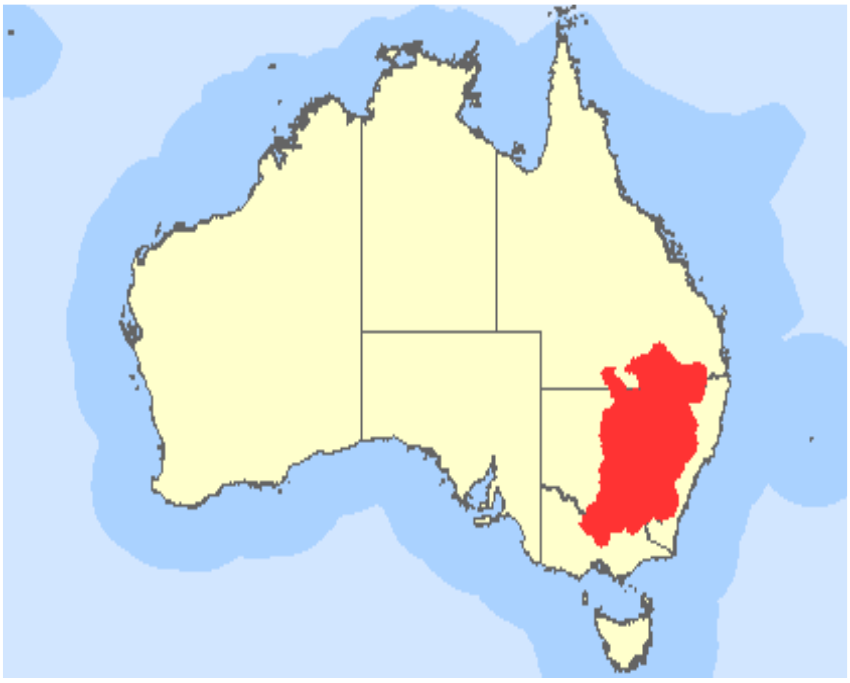


Figure 4: Current distribution of the Superb Parrot – source Bionet 02/10/2009

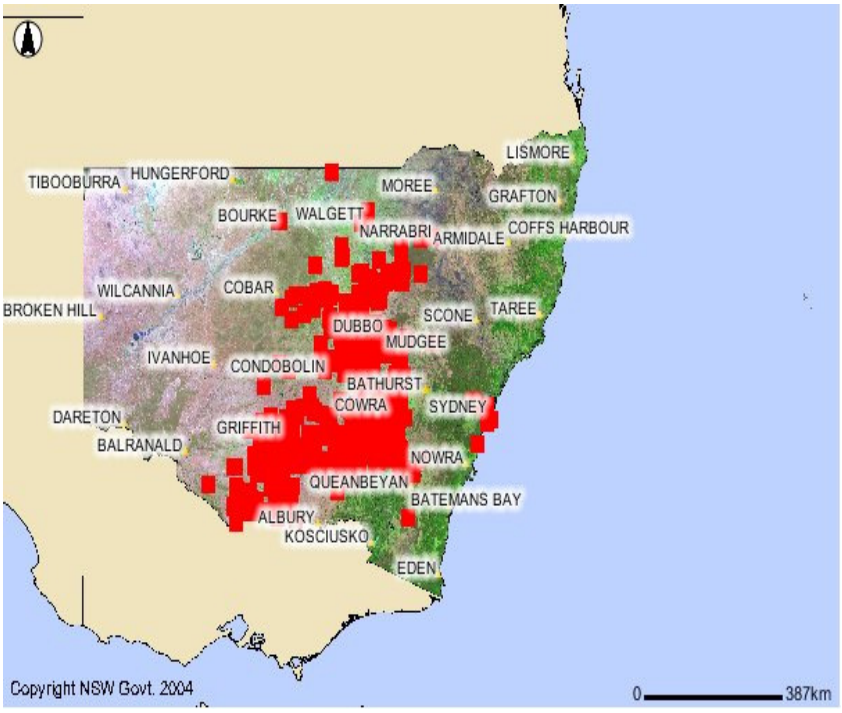
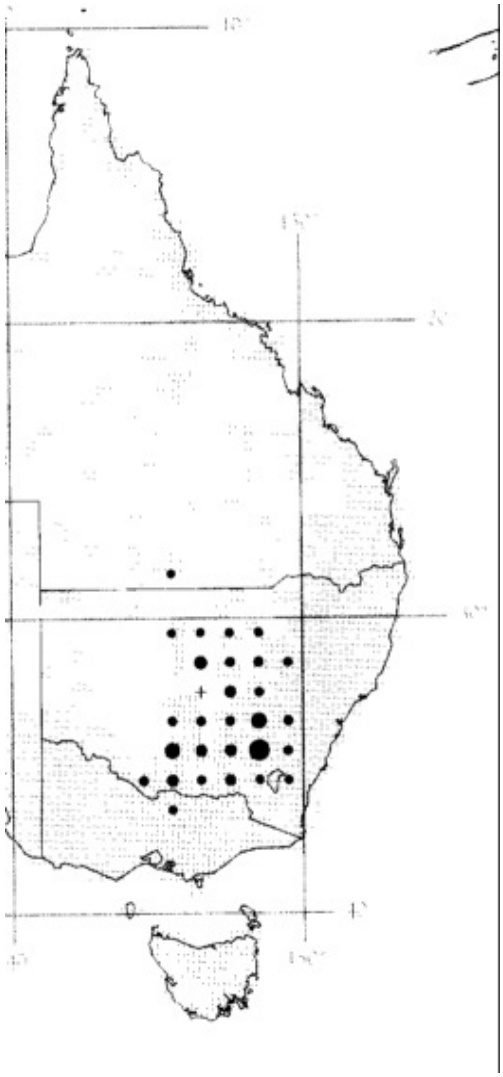


Figure 5: Current distribution of the Superb Parrot. Source - New Atlas of Australian Birds p 295 (2003)



Movement Behaviours Observed in the Superb Parrot in the Project Area and the Immediate surrounds

The range of movement behaviours observed in this species can be categorised as:

- Resident: This can refer to roosting or breeding in the same location for a period of time. Residency status does not preclude foraging movements that can be up to 10 km or more per day, although foraging very close to roost or nest sites is also a well understood behaviour. Resident males in the breeding season are known to move in small, all-male groups when foraging up to 10km from active nest sites. Hence a resident bird has the potential to range over an area of approximately 300 km^2. Residency can be seasonal or extend over a number of season or more depending to some extent on the sexual maturity of the individual.

- Dispersive: This term is usually associated with the behaviour of fledged young after leaving the breeding nest and becoming independent sub-adults or juveniles. The manner in which dispersing birds interact with each other or with adults is not known. Hence it is conceivable that small flocks of birds seen moving through the landscape could be combinations of dispersing juveniles or migrating adult birds, or demonstrating nomadic behaviour, or made up of birds that are demonstrating only one of the three movement behaviours.

- Migratory or partly migratory: This term usually refers to the movement of adult birds after the cessation of the breeding season moving (i.e. migrating) to their winter feeding grounds, and likewise migrating back to the core breeding southern areas prior to the commencement of the breeding season. 'Partly migratory' refers to the possibility of an individual bird or a group of birds changing from migratory to another type of movement behaviour (e.g. nomadicity).

- Nomadic: This term is used to describe random movements of usually individual birds either within their known range or more usually as unexpected appearances beyond their normally accepted range. Nomadic and vagrant behaviours are virtually impossible to differentiate although vagrancy tends to express itself in the appearance of a species in completely unexpected locations. Nomadic and vagrant behaviours are very likely the explanation of the different range presentations demonstrated in Figures 3-5, particularly the differences in the range map illustrated in Figure 3 from the DEWHA (2009) and the other two (Figures 4 and 5). The DEWHA range map appears to be defined by the inclusion of nomadic records of individual birds. While this is a legitimate interpretation of the species' range it needs careful interpretation and explanation. In the author's view Figures 4 and 5 provide a more realistic interpretation of the species range than does Figure 3.

How then can we best interpret the very sparse data of Superb Parrot records within the Project Area and the immediate surrounds? We know that the Superb Parrot is very unlikely to be a current resident species within the Project Area since EEC (2009) recorded only one group of four Superb Parrots flying overhead and saw no other Superb Parrots during the remaining survey period. The author also visited the site on a sunny day on September the 24th specifically targeting this species along with the Malleefowl. In spite of a very extensive coverage of the Project Area and the potential for opportunistic sightings in the immediate surrounds, no Superb Parrots were seen or observed. It hardly needs adding that the Superb Parrot is a very readily observable species when present. The most probable explanation of the EEC (2009) observation is that this sighting was likely a group of resident Superb Parrots roosting within the immediate surrounds, possibly along the Namoi River or a tributary, undertaking foraging activities in the general area, probably on a 'search and see' basis, before returning to their roost area each night. However the possibility of the Superb Parrot assuming residential status within the Project Area in some years cannot be completely excluded.

The two records of single birds within a 20km radius of the Project Area could conceivably have been residents (unlikely), dispersive depending on the time of the year (unlikely) , lone migrants (unlikely) or nomadics (most likely). Small group flocking is usually associated with the first three movement behaviours but not necessarily on all occasions. While nomadic behaviour in the Superb Parrot is not well understood, it is very likely that such behaviour does occur even though the behaviour drivers are virtually unknown.

Notes on this Species at their Northern Range Extremity

The Project Area is near the northern extremity of the Superb Parrot's range. All birds observed are in their non-breeding phase and can only be one of the following: first year juveniles, sub adults not yet capable of breeding, or birds of breeding age. As previously argued, they likely belong to one of the following groups:

- nearby short term residents that forage in the Project Area in the non breeding season;
- residents that stay put during the breeding season due to reasons such as sexual immaturity, and forage in the Project Area; and
- lone nomadics.

The density of this species in the northern extremity of its range will likely be very much lower than in the southern extremity of its range. In the non-breeding season numbers are likely to increase marginally as continuing residents are supplemented by newly arrived migrants or juvenile dispersers. It is likely that the bulk of adults and newly recruited juveniles will migrate northwards from the southern breeding areas following the cessation of breeding. While the migratory routes and the eventual destinations (residency) of individual birds cannot be predicted, it is very likely that migration outcomes will be a combination of random movements constrained by the locations of suitable major river and tributary corridors and innate movement behaviours. Hence the eventual distribution pattern of this species across its range is more likely to be clumped rather than random or equally spaced, and will also partly be determined by available resources and the capacity of individuals to range over long distances. The mortality rate associated with migration-dispersal for this species is not known but would be expected to be very high in the juvenile cohort in particular. It is a well understood phenomenon that at a range extremity the density of a species will be at its lowest, particularly in a population that undergoes two migrations per year, due to the gradual loss of population members to residential status or through mortality *en route* and additional mortality on the return journey. Hence we would predict the population of the Superb Parrot to be sparse and widely separated in small clumps at the northern range extremity. This would very likely translate to a species status described as being 'a rare occurrence'. The available data supports such a model within the Project Area and the immediate surrounds.

Conclusions

The Project Area is near the northern range extremity of the Superb Parrot. It does not breed within the Project Area nor does it appear to be a resident species. From time to time small groups or single birds may forage in the Project Area although be residents elsewhere, possibly along the River Red Gum lined Namoi River or its tributaries. Based on the available data the species would be described as a rare occurrence in the Project Area in the non-breeding season and likely absent during the breeding season.

In the following section the habitat needs and feeding behaviour of the Superb Parrot are analysed with specific reference to the Project Area. This analysis provides additional understanding as to the status of the species within the Project Area, and the potential of the proposed Project to adversely impact this species.

Figure 6: Vegetation Communities in the Project area- Source Ecotone Ecological (2009)

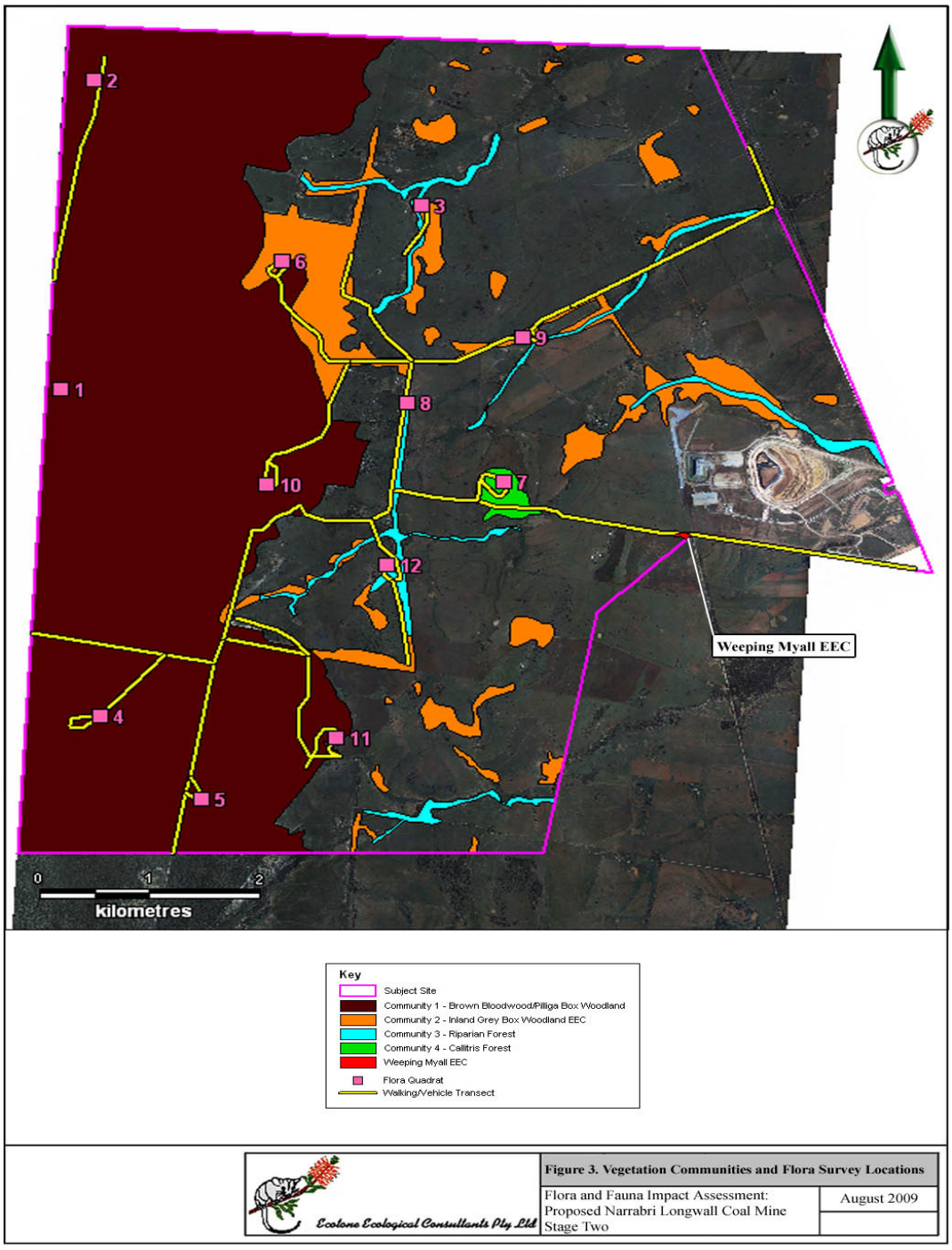
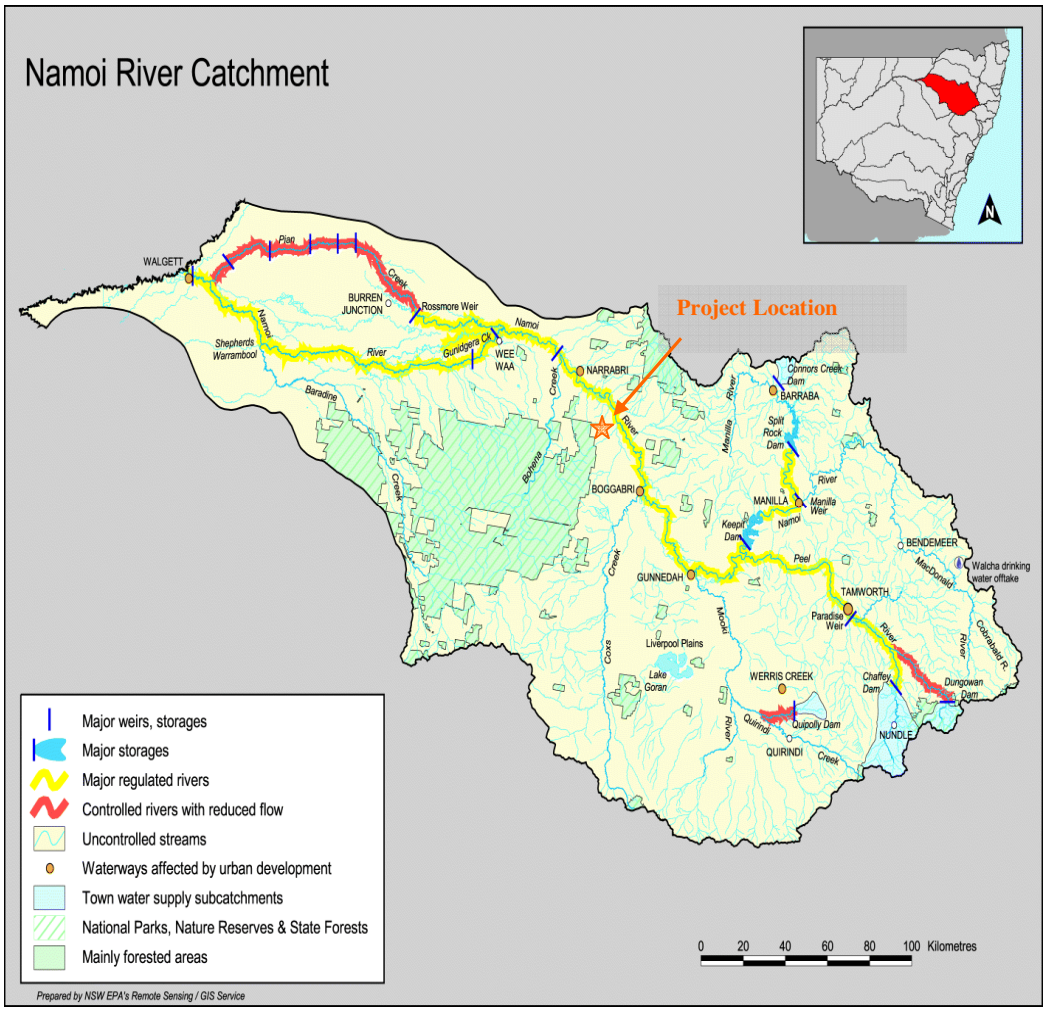


Figure 7: Namoi River Catchment Illustrating the Location of the River Red Gum Dominated Namoi River and its Tributaries, likely preferred Roosting, Migratory and Dispersal Pathways for the Superb Parrot at its Northern Range Extremity.



Habitat Suitability, Feeding and Nesting Resources

Known Feeding Resources of the Superb Parrot

Superb Parrots feed in canopy trees and on the ground, with at least some studies indicating that marginally more time is spent at ground level (DEWHA 2009), although in the author's experience this can be very variable. They eat seeds of plants including grain crop seeds and native and introduced grass seeds, seed pods of wattles and other understorey species, flowers and fruits of various eucalypt species, mistletoe berries, and lerps associated with eucalypts and likely insects associated with other tree species (DEWHA 2009). Most feeding occurs in woodlands dominated by gum and box eucalypts, but also in other woodland types (native pine and box-pine communities) (Higgins, 1999) as well as in grassland patches within woodlands or in adjacent cropping lands when seed formation and ripening is occurring.

Habitat Resources of the Superb Parrot

Some of the woodlands and forests utilised by the Superb Parrot provide hollows for breeding within the core breeding range, typically in River Red Gum, Grey Box, Red Box, Blakely's Red Gum, Inland Red Box, Apple Box and possible other eucalypt species (Higgins, DEWHA 2009). Nest sites are almost always adjacent to extensive areas of foraging land (Webster 1988, 1998).

In the southern portion of its range, the species forages in Box Woodland during both its breeding and migratory-dispersal phase. Further north in the non-breeding period, parrots are known to forage in Boree and Box-pine woodlands (DEWHA 2009).

When foraging, dispersing or migrating, woodland and woodland-forest riparian corridors are preferred flyover areas (Webster 1988). They tend not to fly over cleared areas but will feed in cropping paddocks.

An Assessment of Superb Parrot Habitat Quality and Feeding, Roosting and Nesting Resources within the Project Area

EEC (2009) identified four main vertebrate fauna habitats within the Project Area: woodland areas, cleared areas with or without scattered trees, drainage lines with and without riparian woodland/forest and farm dams. The woodlands, and riparian areas and semi-cleared farmlands within the Project Area were determined by EEC (2009) to consist of five natural vegetation communities and one artificial community. These are:

1. Sandstone Slopes Woodland: Brown Bloodwood/Pilliga Grey Box/Red Ironbark
2. Lower Flats and Floodplain Woodland: Inland Grey Box/Bimble Box/Blakely's Red Gum
3. Riparian Forest: River Oak/Belah/Inland Grey Box
4. White Cypress Forest
5. Weeping Myall Woodland
6. Cleared Open Grassland/Cropland/Weedy Areas/Cultivated Gardens

Each of the above communities is briefly described below and their ability to provide habitat resources to support the Superb Parrot (e.g. for feeding, breeding, roosting and movement) are assessed. The habitat assessments provided below are based on descriptions and analysis provided by EEC (2009) as well as the observations of the author during the one-day field assessment on 24th September 2009.

Community 1: Sandstone Slopes Woodland: Brown Bloodwood/Pilliga Grey Box/Red Ironbark

This vegetation community represents an area approximately 2,058 ha along the western boundary of the Project Area. The dominant trees (up to 18m high) in this community are Brown Bloodwood, Pilliga Grey Box and Ironbark, but they are very sparsely spread with few old growth specimens present (EEC, 2009). The mid-storey small tree layer is mainly *Acacia* spp and native Pine. The shrub layers and ground layers are dominated by shrubs, grasses and herb, many producing seed potentially suitable for the Superb Parrot. The community ranges from low mallee woodland with a dense shrub layer to open forest with a sparse shrub layer. Dense stands of Yarran and other understorey species are widespread.

Foraging resources are assessed as being low as very few Pilliga Grey Box trees are present and the understorey and ground layer plants in many locations are frequently near impenetrable.

Whilst roosting resources are present albeit sparsely distributed, the existing empirical data is that these resources are not utilised by the species. This is very likely due to preferential roosting habitat elsewhere, and the very low density of this species at its northern extremity.

This community is considered to be a successional landscape dominated by large areas of dense regrowth up to 40,000 stems/ha, due to likely combinations of fire, logging and regrowth following clearing. Some patches of high quality habitat are present but the bulk of the area is assessed as being low quality habitat for the Superb Parrot.

Community 2: Lower Flats and Floodplain Woodland: Inland Grey Box/Bimble Box/Blakely's Red Gum

This community is located in one larger patch in the western portion of the Project Area and in numerous smaller patches scattered throughout the Project Area. The total area of Community 2 within the Project Area is 318 ha. The dominant trees (to 22m) are Inland Grey Box, Bimble Box and Blakely's Red Gum. This community is partially cleared and disturbed woodland, due mainly to logging. Old growth trees with hollows are very sparse. Weed invasion is relatively low. The under-storey small tree layer, the shrub and ground layers contain species that potentially provide food resources for the Superb Parrot. The density of the under storey layers is very variable.

Similar to Community 1, while roosting resources are present, albeit sparsely distributed, the existing empirical data is that these resources are not utilised by the species. Again, this is very likely due to preferential roosting habitat elsewhere, and the very low density of this species at its northern extremity.

This community is considered to represent a post logging/fire successional landscape that is (in some instances) partially enclosed by Community 1 with its dense regrowth. Some small areas within the Project Area are assessed as higher quality habitat but generally this community is considered to represent low to medium quality Superb Parrot habitat.

Community 3: Riparian Forest: River Oak/Belah/Inland Grey Box

This vegetation community is made up of narrow linear formations representing an area approximately 98 ha in the eastern half of the Project Area along ephemeral drainage lines. The regrowth tree dominants (to 35m) are River Sheoak, Belah, Grey Box and Bimble Box. This is a partially modified open woodland/forest. The shrub and ground layer is variable in density. This community intergrades with Community 2. The small tree layer, shrub and ground layer provide seed resources that can potentially be eaten by the Superb Parrot.

This community can provide seasonal feeding resources for the Superb Parrot, albeit scattered across the Project Area. Similarly, roosting resources are present albeit sparsely distributed. In addition, the existing empirical data is that these resources are not utilised by the species. This is very likely due to preferential roosting habitat elsewhere, and the very low density of this species at its northern extremity.

This community is assessed as containing some small patches of quality habitat components suited to the needs of some parts of the lifecycle of the Superb Parrot.

Community 4: White Cypress Forest

This is a small (approximately 20 ha) monoculture isolated forest patch with no shrub layer and a sparse impacted ground layer offering little in the way of sustainable resources for the Superb Parrot and is considered no further.

Community 5: Weeping Myall Woodland

This community consists of a very small (approximately 0.3 ha) isolated occurrence at the southern extremity of the Project Area. This community would not be impacted by the Project (Corkery & Co Pty Ltd, 2009) and is not considered further.

Community 6: Cleared Open Grassland/Cropland/Weedy Areas

This community occupies the balance of the eastern two-thirds of the study area, and is almost entirely restricted to the plains section of the study area. It is composed predominantly of cleared open pasture without trees or isolated paddock trees and with ground cover generally to a height of less than 50cm. Some food resources are seasonally and/or periodically available for the Superb Parrot. Overall it offers little in the way of sustainable resources and is considered no further.

Under Utilised Potential Habitat and Species Rarity at the Northern Range Extremity

During the migratory, dispersal phase of the Superb Parrot, the species is non-breeding but still requires roosting and foraging resources, as the majority of the population spreads out across its full range. Although clearing and logging have greatly reduced the availability of various habitats required by the parrot, particularly within the core breeding range, there still remain significant areas of potential foraging, roosting and overflying habitats that are either never utilised or underutilised or in case of potential breeding habitats, never utilised. As argued previously the reasons for this are unknown, including why breeding site selection occurs only in the core southern component of the range. Whatever the reason, it remains a fact that particularly at the northern extremity of its range, potential habitat resources are either underutilised or not utilised. This is partly explained, at least in the case of selection of roosting, foraging and overflying habitats by the likely very low density of the species at the northern range extremity. The species' density almost certainly decreases in proportion to the distance the species is from the core breeding area, as individual migrating or dispersal groups become 'resident' during the fanning out migratory/dispersal phase. Such population behaviour ensures that the species is randomly clumped across its range, thereby minimising competition for resources. This is likely a very important outcome in drought years and self evidently would help to minimise inter-specific competition induced mortality. Furthermore there is anecdotal evidence that the Superb Parrot may preferentially utilise River Red Gum dominated major river corridors (such as the Namoi River, Figure 6) as non-breeding roosting areas and from there, make daily foraging flights to potential feeding areas including the Project Area and the immediate surrounds.

These data, inferences and explanations help to account for the seemingly rare occurrence status of the species in the northern range extremity including within the Project Area and the immediate surrounds.

Management Measures

Of note to the potential impacts of the Project on the Superb Parrot are Narrabri Coal Operations Pty Ltd's following commitments (Corkery & Co Pty Ltd, 2009):

- "*Clearly identify the boundaries of disturbance within the Pit Top Area and progressive disturbance associated with ventilation and gas drainage infrastructure. Ensure no clearing occurs outside these boundaries*".

- *"8.2 Avoid disturbance to the vegetation of Community 3 along Kurrajong Creek Tributary 1".*

- *"Clearly identify the boundaries of proposed disturbance. As far as practicable avoid disturbance to the vegetation of Community 3 along watercourses of the Mine Site".*

- *"Commission a qualified ecologist to complete a pre-clearance survey of nominated areas of disturbance (to identify whether any threatened species, population or community or their habitat is present)".*

- *"The location of access tracks will be determined in conjunction with an ecologist after inspecting each proposed route and determining the path with least impact on environmental values".*

- *"Retain all substantial habitat trees, wherever possible".*

- *"Undertake any tree-felling in accordance with a Tree Felling Protocol. The Tree Felling Protocol will be developed by a qualified ecologist and will include, but not necessarily be limited to a description of:*
  - *the best time of the year for felling;*
  - *pre-felling mapping of habitat trees;*
  - *inspections of trees on the day of felling;*
  - *procedures for the safe removal of fauna species;*
  - *a relocation/release protocol; and*
  - *a protocol for the assessment and*
  - *salvaging of tree hollows".*

- *"Re-site all hollows from hollow-bearing trees removed where practicable".*

Superb Parrot Conclusions

Within the Project Area and the immediate surrounds, there are potential breeding, foraging, roosting and overflying resources that are either under utilised or not utilised. The reasons why this should be so are not well understood, however the Superb Parrot breeds only in a core southern breeding range. The empirical data suggests that at the northern range extremity (including within the Project Area and the immediate surrounds), species density is very low. Furthermore there is anecdotal evidence that the species may preferentially roost in nearby River Red Gum dominated habitat (e.g. along the Namoi River), and from there fan out during the day to various foraging sites.

3. Assessment of Impact of the Project on the Malleefowl and Superb Parrot Using the EPBC Significant Impact Criteria

The following sections draws on the information provided above and assesses the potential impact of the Project on the Malleefowl and the Superb Parrot under the nine EPBC significant impact criteria specified in DEH (2006).

Is the Project likely to lead to a long-term decrease in the size of an important population of a species?

Malleefowl

The Malleefowl has not been located within the Project Area or in the immediate surrounds, nor was this species likely to have been present in the Project Area prior to European settlement. Hence the Project cannot lead to a long term decrease in the size of an important population of this species.

Superb Parrot

The Project Area is near the northern extremity of the Superb Parrots' range where the population density of the species is likely very low and where significant areas of potential habitats are either never utilised or underutilised. Furthermore this species does not breed in the Project Area. Only a small group of four overflying Superb Parrots have been observed once in the Project Area during targeted surveys. Hence it is very unlikely that the Project will lead to a long-term decrease in the size of an important population.

Reduce the area of occupancy of an important population?

Malleefowl

The Malleefowl has not been located within the Project Area or in the immediate surrounds, nor was this species likely to have been present in the Project area prior to European settlement. Hence the Project cannot reduce the area of occupancy of an important population.

Superb Parrot

The Project Area is near the northern extremity of the Superb Parrots' range where the population density of the species is likely very low and where significant areas of potential habitats are either never utilised or underutilised. The Superb Parrot habitat within the Project Area has been demonstrated to be limited and marginal due to the successional phase of the vegetation and past logging and farming land use. Hence it is very unlikely that the Project will reduce the area of occupancy of an important population.

Fragment an existing important population into two or more populations?

Malleefowl

The known historic northwest range extremity in NSW is southwest of the Project Area. Furthermore the current range extremity has contracted further southwest. Hence the Project cannot fragment an existing important population into two or more populations.

Superb Parrot

The Project Area is near the northern extremity of the Superb Parrots' range where the population density of the species is likely very low and where significant areas of potential habitats are either never utilised or underutilised. Furthermore this species does not breed in the Project Area. Only a small group of four overflying Superb Parrots have been observed once in the Project Area during targeted surveys. Hence it is very unlikely that the Project will fragment an existing important population into two or more populations.

Adversely affect habitat critical to the survival of a species?

Malleefowl

The Malleefowl has not been located within the Project Area or in the immediate surrounds, nor was this species likely to have been present in the Project Area prior to European settlement. There is some potential marginal habitat for this species present within the Project Area that was never included within the species' known range. This does not constitute critical habitat. Hence the Project cannot adversely affect habitat critical to the survival of this species.

Superb Parrot

The Project Area is near the northern extremity of the Superb Parrots' range where the population density of the species is likely very low and where significant areas of potential habitats are either never utilised or underutilised. The Superb Parrot habitat within the Project Area has been demonstrated to be limited and marginal due to the successional phase of the vegetation and past logging and farming land use. Hence it is very unlikely that the Project will adversely affect habitat critical to the survival of the species.

Disrupt the breeding cycle of an important population?

Malleefowl

The Malleefowl has not been located within the Project Area or in the immediate surrounds, nor was this species likely to have been present prior to European settlement within what is now the Project Area. Hence the Project cannot disrupt the breeding cycle of an important population of this species.

Superb Parrot

The Project Area is near the northern extremity of the Superb Parrots' range where the population density of the species is likely very low and where significant areas of potential habitats are either never utilised or underutilised. Furthermore this species does not breed in the Project Area but only in a core breeding area in the southern area of its range. Hence the Project is very unlikely to disrupt the breeding cycle of an important population.

Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

Malleefowl

The Malleefowl has not been located within the Project Area or in the immediate surrounds, nor was this species likely to have been present within the Project Area prior to European settlement. Hence the Project cannot modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

Superb Parrot

The Project Area is near the northern extremity of the Superb Parrots' range where the population density of the species is likely very low and where significant areas of potential habitats are either never utilised or underutilised. Furthermore this species does not breed in the Project Area. Only a small group of four overflying Superb Parrots have been observed once in the Project Area during targeted surveys. Hence the Project is very unlikely to modify, destroy, remove or isolate or decrease the availability of quality of habitat to the extent that the Superb Parrot is likely to decline.

Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

Malleefowl

The Malleefowl has not been located within the Project Area or in the immediate surrounds, nor was this species likely to have been present in the Project Area prior to European settlement. A weed management strategy would be implemented and would be developed in consultation with the Livestock Health and Pest Authority and the Narrabri Shire Council weeds officer, for the retained or rehabilitated natural vegetation on-site. Noxious weeds would be treated in accordance with the *Noxious Weeds Act 1993*. Weed management strategies for the Project would make it unlikely that invasive species could adversely impact on the marginal Malleefowl habitat within the Project Area.

Superb Parrot

The Project Area is near the northern extremity of the Superb Parrots' range where the population density of the species is likely very low and where significant areas of potential habitats are either never utilised or underutilised. A weed management strategy would be implemented and would be developed in consultation with the Livestock Health and Pest Authority and the Narrabri Shire Council weeds officer, for the retained or rehabilitated natural vegetation on-site. Noxious weeds would be treated in accordance with the *Noxious Weeds Act 1993*. Weed management strategies for the Project would make it unlikely that invasive species could adversely impact on the potential Superb Parrot habitat within the Project Area

Introduce disease that may cause the species to decline?

Malleefowl

The Malleefowl has not been located within the Project Area or in the immediate surrounds, nor was this species likely to have been present in the Project Area prior to European settlement. The Project is very unlikely to result in the introduction of a disease that may cause the species to decline, since the northern extremity of the known range of the Malleefowl in NSW is approximately 40 - 50 km southwest of the Project Area.

Superb Parrot

There are existing known diseases of the Superb Parrot that may from time to time adversely impact the population throughout its range. There is no known disease of the species that could be unilaterally introduced into the Project Area that could adversely impact on the Superb Parrot. Hence it is very unlikely that the Project would introduce disease that may cause the species to decline.

Interfere substantially with the recovery of the species?

Malleefowl

The Malleefowl has not been located within the Project Area or in the immediate surrounds, nor was this species likely to have been present in the Project Area prior to European settlement. It is very unlikely that any recovery of the Malleefowl within its known range outside of the Project Area could be adversely impacted by the Project.

Superb Parrot

The Project Area is near the northern extremity of the Superb Parrots' range where the population density of the species is likely very low and where significant areas of potential habitats are either never utilised or underutilised. Furthermore this species does not breed in the Project Area. Only a small group of four overflying Superb Parrots have been observed once in the Project Area during targeted surveys. Recovery of the species is more likely to be centred on the core breeding range that is much further south that the Project Area. Hence it is very unlikely that the Project would interfere substantially with the recovery of the species.

4. Overall Conclusion

Given the reasons advanced above, the Project is considered very unlikely to have a significant impact on either the Malleefowl or the Superb Parrot.

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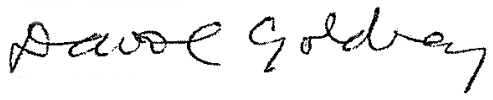
Yours faithfully,



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Attachment 1 – Example Malleefowl Mounds – Not at the Project

Attachment 2 –Representative Photos of Available Habitat in Community 1 – Brown Bloodwood/Pilliga Box Woodland

Attachment B

Letter from FloraSearch

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Brian Cullen
General Manager - Technical Services
Whitehaven Coal

2 October 2009

Dear Brian,

Re: Narrabri Coal Mine EPBC Referral – Supplementary Flora Survey and Assessment

This letter reports the findings of a supplementary flora survey of the proposed longwall mining area at the Narrabri Coal Mine, conducted on 8 to 10 September 2009. The survey aimed to determine the extent and status of Brigalow, *Acacia harpophylla*, within the mine development area. The need for additional survey work has arisen from the decision by the Commonwealth Department of the Environment Water Heritage and the Arts (DEWHA) to make the development a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act*. The decision was based partly on the conclusion by DEWHA that the development '*involves the clearing of vegetation including an unquantified amount of endangered Brigalow (Acacia harpophylla dominant and co-dominant) ecological community*'. In this letter it is shown that the occurrence of Brigalow on the development area:

- is limited to a single known patch of 30 m in diameter.
- is an atypical occurrence of the Brigalow species constituting a minor component of the Brown Bloodwood – Pilliga Box – Ironbark heathy woodland community.
- is not the Brigalow (*Acacia harpophylla* dominant and co-dominant) ecological community as defined in the listing under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Unfortunately, the above points were not made clearly in the original EPBC referral owing to some uncertainty regarding the amount of Brigalow in the tall dense heathland on the western parts of the development area. The additional survey work reported here was undertaken as a targeted search of the whole development area in order to determine more accurately the locations, amount and nature of the Brigalow occurrences on the site.

Brigalow communities in NSW

The Brigalow (*Acacia harpophylla* dominant and co-dominant) endangered ecological community listed under the EPBC Act is described in the Recommendation to the Minister for the Environment and Water Resources from the Threatened Species Scientific Committee (DEWHA 2007) and the DEWHA community profile (DEWHA 2009) (both accessed on the DEWHA website on 7 September 2009). From these documents the listed community in the NSW part of its distribution is circumscribed as below.

The recommendation to the Minister (DEWHA 2007) included two units in NSW:

- Brigalow outlier in the Mulga Lands Bioregion
- Brigalow community of the northern floodplains

However, three NSW units were cited in DEWHA (2009) following Benson *et al*. (2006) who split the Brigalow outlier in the Mulga Lands Bioregion unit into the first two units below:

- *Acacia harpophylla* open woodland [Vegetation type ID number: 29 (Benson *et al*. 2006)]
- *Acacia harpophylla – Acacia cambagei* open woodland [Vegetation type ID number: 31 (Benson *et al*. 2006)]
- *Acacia harpophylla – Casuarina cristata* woodland and open forest [Vegetation type ID number: 35 (Benson *et al*. 2006)]

The first two units are confined to the Mulga Lands Bioregion (Benson *et al*. 2006) and are not considered further here. The Narrabri Coal Mine is located in the Brigalow Belt South Bioregion and the relevant Brigalow unit is the NSW NPWS *Brigalow community on the northern floodplains* which is equivalent to the *Acacia harpophylla – Casuarina cristata woodland and open forest* of Benson *et al*. (2006).

Acacia harpophylla – Casuarina cristata woodland and open forest is described in DEWHA (2009), after Benson *et al.* (2006), as follows:

> '*This vegetation type is woodland and open forest up to 25 m high dominated by Acacia harpophylla (Brigalow), with a range of shrub species in the understorey. Pockets of Casuarina cristata (Belah), Eucalyptus populnea (Bimble Box, Poplar Box) and E. pillagaensis (Narrow-leaved Box) may also be present. Characteristic shrub species include Geijera parviflora (Wilga), Capparis mitchellii (Wild Orange, Native Orange), Eremophila mitchellii (Budda, False Sandalwood), E. deserti (Turkeybush), Apophyllum anomalum (Warrior Bush), Currant Bush), Pittosporum angustifolium (Weeping Pittosporum, Butterbush, Berrigan), Citrus glauca (Desert Lime, Limebush), Acacia pendula (Boree, Weeping Myall), Carissa ovata) (Currant Bush) and Alectryon oleifolius subsp. canescens (Western Rosewood, Bonaree). The ground cover is frequently sparse or bare (New South Wales National Parks and Wildlife Service 2002).*
>
> *The community occurs on flat or gentle rises on alluvial plains or undulating peneplains on quarternary heavy, gilgaied cracking clay or clayey loam soils over sedimentary strata.*'

Ecotone Ecological Consultants survey results

Ecotone (2009) reported that Brigalow '*occurred as scattered plants or small clumps of plants within the flat plains area covered by Community 2*' on the study area. Community 2 is dominated by Inland Grey Box (*Eucalyptus microcarpa*) / Bimble Box (*E. populnea*) and Blakely's Red Gum (*E. blakelyi*) and occurs on lower flats and floodplains. This vegetation type includes many of the species listed above that are typically found in the Brigalow ecological community. However, since Brigalow '*did not form the dominant or co-dominant species in this area*' Ecotone (2009) concluded these occurrences do not constitute the EEC.

By contrast, Ecotone (2009) found that '*Brigalow did form stands where it was the dominant canopy species in scattered parts of the pilliga community (Community 1)*'. The pilliga community is dominated by Brown Bloodwood (*Corymbia trachyphloia*), Pilliga Grey Box (*Eucalyptus pilligaensis*) and Red Ironbark (*E. fibrosa*). Ecotone (2009) noted that the pilliga community is on '*sandy soil over sandstone*' and that '*the associated shrub and ground layer species (such as Phebalium squamulosum and Calytrix tetragona) are atypical of the EEC*'. Ecotone (2009) concluded that '*the EEC occurs in marginal form only in scattered parts of the western slopes portion of the study area'*.

Methods

The supplementary flora survey was carried out by two people (Dr. Colin Bower and Mr Josh Peters) working together (8 to 10 September 2009). The surveyors familiarised themselves with Brigalow (*Acacia harpophylla*) and the Brigalow ecological community by examining natural occurrences beside the Newell Highway approximately 1 km south of Narrabri.

The natural vegetation on the proposed Narrabri Coal Mine longwall mining area was inspected by vehicle and foot traverses across the whole area. All remnant vegetation patches on the cleared agricultural areas were examined throughout their areas and lengths. The large bushland block in the western part of the

area was examined along all old firetrails, and mining exploration tracks that have been established since the original flora survey was conducted. The latter tracks provided access to areas that had not previously been surveyed. In addition this block was examined by transects on foot extending up to 500 m from the western boundary to the east.

By contrast with the impression given by the Ecotone Flora and Fauna Impact Assessment (2009) that Brigalow occurs relatively frequently in the study area, a telephone discussion with an Ecotone botanist indicated that only one patch of Brigalow, of about 30 m in diameter, was sighted during their survey. A concerted effort was made to relocate this patch near Ecotone's flora quadrat Site 1, using GPS coordinates provided by the Ecotone botanist.

During the searches for Brigalow, the presence of *Bertya opponens* (Coolabah Bertya), which is listed as Vulnerable under the EPBC Act, was noted in several locations within the study area and the adjoining Pilliga East and Jacks Creek State Forests and these occurrences were recorded.

Results

Brigalow

Despite three days of searching, no Brigalow (*Acacia harpophylla*) was found anywhere on the development area, including a search in an approximately 100 m radius around the GPS coordinates of the Ecotone Brigalow sighting. It is not known why the species was not relocated, except that the habitat in the vicinity of the coordinates is tall, dense heathland with poor visibility. Nevertheless, it is surprising that the original sighting could not be confirmed. However, there is some discrepancy between the dense heath searched and the photograph of the Brigalow patch in Ecotone (2009) which shows relatively open habitat with scattered low shrubs. It is possible there was an error in recording the GPS coordinates of the locality.

Bertya opponens

Bertya opponens was found to be abundant in Jacks Creek and Pilliga East State Forests and to extend into the northern and western sides of the pilliga community in the west of the study area. The records of its distribution in the study area are shown on Figure 1. Observations of this species indicated that it is most abundant on east facing hill slopes on shallow gravelly to stony soils over sandstone. It was common in such situations in Pilliga East and Jacks Creek State Forests on the western side of the study area. It also extended approximately 2 km to the north of the study area along Scratch Road and at least 3 km west of the study area along Chromite Road. The populations are large, numbering many tens of thousands of individuals. NPWS (2002) estimated that over 5 million plants occur in Jacks Creek State Forest. The occurrences of the Coolabah Bertya in Jacks Creek State Forest represent the largest known extant populations of this species, which is otherwise only known from the Coolabah-Cobar area (NPWS 2002, DECC 2008a).

The occurrences of Coolabah Bertya on the study area are continuous with, and represent the eastern limits of, the distribution of the Jacks Creek and Pilliga East State Forest populations. Suitable habitat for this species, gravelly soils on east facing slopes, is likely to be relatively common in the western parts of the study area. It is also clear that the number of individuals on the study area may number many thousands of plants.

Discussion

The findings of this study with respect to the occurrence of Brigalow (*Acacia harpophylla*) on the Narrabri Coal Mine site are significantly at variance with those reported in Ecotone (2009). In particular, no plants of Brigalow were found in this survey on the lower parts of the study area where Ecotone (2009) reported the occurrence of '*scattered plants or small clumps of plants*'. In addition, Ecotone (2009) refers to the low areas as '*flat floodplain or slightly elevated gently sloping land between watercourses*'. No areas of floodplain exist on the study area, the eastern parts of which are entirely gently sloping foothill country with ephemeral watercourses, although small alluvial terraces occur on some ephemeral creek lines. The absence of floodplains is important for assessing the potential availability of habitat for the Brigalow EEC.

Despite the statement that '*Brigalow did form stands where it was the dominant canopy species in scattered parts of the pilliga community*,' Ecotone (2009) only sighted a single patch of the species during their survey. Due to the impenetrability of much of the dense heath understorey of this community, Ecotone was unable to survey much of the western area of the site. Consequently, to be conservative, they assumed that more patches of Brigalow were likely to be present. This assumption was not confirmed in the current survey in which it was possible to traverse much of the western area on newly constructed tracks, and on foot transects into the area from Scratch Road in Jacks Creek State Forest.

Is the Brigalow EEC present?

Brigalow was not found on the lower gently sloping areas on the eastern parts of the site where it would be most likely to occur. Nor does it occur in the immediate surrounds of the study area. While many of the species known to associate with Brigalow occur on the lower areas of the mine site, the substrate is not suitable for Brigalow itself. Brigalow – Belah woodland occurs on heavy alluvial, often gilgaied, clay soils on floodplains in the Brigalow Belt South Bioregion (Benson *et al*. 2006). Such habitats do not occur on the study area.

The isolated small occurrence of Brigalow within the Brown Bloodwood (*Corymbia trachyphloia*), Pilliga Grey Box (*Eucalyptus pilligaensis*) and Red Ironbark (*E. fibrosa*) community is not considered to represent an example of the EEC. Very few of the associated species are found in the listed EEC and the substrate is a light sandy loam, rather than the heavy clay soils favoured by the Brigalow – Belah woodland community.

It is concluded from the above considerations that the Brigalow (*Acacia harpophylla* dominant and sub-dominant) EEC does not occur on the study area. Consequently, the proposed action is unlikely to have a significant impact on this ecological community.

Bertya opponens

The relatively large populations of the Coolabah Bertya on the study area were missed by Ecotone Ecological Consultants (2009). However, they did consider it had a high potential to occur on the study area and assessed the potential impact of the development on it accordingly. This survey found occurrences of the species in the north of the study area above longwall panels 10 to 13 and within the zone of influence from subsidence. It is likely to also occur in areas designated for surface clearance activities including powerlines, gas drainage sites and associated access tracks. The full extent of the distribution of the Coolabah Bertya in the north of the study area is unclear. Similarly, the extent to which populations of the Coolabah Bertya impinge on the southern parts of the western edge of the study area is also unclear. Even so, there is no doubt the development activities are likely to impact on populations of the species. Accordingly, the likely impact of the action on the Coolabah Bertya is re-assessed below using the EPBC Act Significant Impact Guidelines (DEH 2006).

Plate 1. *Bertya opponens*, Scratch Road, Jacks Creek State Forest.

The Coolabah Bertya is a tall, slender, often multi-branched shrub to 4 m high, which grows among other tall shrubs to form a dense tall heath understorey in woodlands on sandstone slopes and rises in Jacks Creek State Forest, the north eastern parts of Pilliga East State Forest and the western and northern margins of the study area. It has densely hairy stems and glossy, dark green, blunt-tipped, mostly

opposite, lanceolate leaves with recurved margins and dense velvety hairs on the underside (Plate 1). Yellowish brown flowers borne in the leaf axils appear in July and August. The densely hairy, pale, round seed capsules (Plate 1) carry two to three seeds (NPWS 2002, DECC 2005).

The Jacks Creek State Forest population of *Bertya opponens* is estimated to be in excess of 5 million individuals comprising an even mixture of male and female plants. Reproduction is active with up to 150 flowers/m^2 of foliage and juvenile plants are abundant indicating viable reproduction and a healthy population (NPWS 2002). Plant densities up to 24/100m^2 have been recorded. Seed germination appears to be triggered by fire and soil disturbance. There are currently considered to be no known threats to the viability of the Jacks Creek State Forest population of the Coolabah Bertya (NPWS 2002).

Assessment of impact of the action on the Coolabah Bertya

The following sections assess the potential impact of the development on the Coolabah Bertya under the nine significant impact criteria in DEH (2006).

1. *Will the action lead to a long-term decrease in the size of an important population of the species?*

   The project involves clearance activities in areas known and/or likely to be occupied by the Coolabah Bertya in the western parts of the study area. The clearance would be for powerline construction, gas drainage sites and associated access tracks. Some individual plants may be directly affected by these activities. However, the impact would be minimised by targeting the Coolabah Bertya in pre-clearance surveys. Where Coolabah Bertya is identified, alternate locations or orientations of the disturbance area would be considered and confirmed, if practicable. The long term impact is likely to be minimal owing to the capacity of the species to germinate and grow in disturbed areas (NPWS 2002) such that it can be expected to recolonise cleared sites undergoing rehabilitation. Narrabri Coal Operations Pty Ltd could enhance this process by collecting and spreading Coolabah Bertya seed during rehabilitation in appropriate sites for the species. Occasionally, other plants may be deleteriously affected by surface cracking due to subsidence. However, this is likely to be a temporary, one-off effect with lost individuals being replaced by new seedlings in the openings created. Overall, it is considered unlikely that the project would result in a long term decrease in the size of the Coolabah Bertya population on the study area.

2. *Will the action reduce the area of occupancy of an important population?*

   The Coolabah Bertya is restricted to the western parts of the study area where clearance activities for powerline construction, gas drainage sites and access tracks may potentially reduce the area occupied by the species. However, these impacts would be temporary and the cleared areas would be rehabilitated to a condition suitable for the species, which could include spreading of Coolabah Bertya seed at suitable sites, such that the area of occupancy would be restored. Consequently, it is considered unlikely that the area occupied by the Coolabah Bertya would be permanently reduced.

3. *Will the action fragment an existing important population into two or more populations?*

   The Coolabah Bertya population(s) on the study area represent the eastern extremities of two large continuous populations in the adjoining parts of Jacks Creek State Forest, Pilliga East State Forest and private land. One of these populations impinges on the north western corner of the study area and extends two km further north into private land and about one km west into Jacks Creek State Forest (Figure 1). The second population impinges on the south west corner of the study area and extends south into Pilliga East State Forest and west into Jacks Creek State Forest (Figure 1). These populations are already split by roads and forest management tracks. However, these roads and tracks are considered unlikely to prevent the movement of pollen, which is thought to be wind-blown (NPWS 2002) in the Coolabah Bertya, although seed dispersal may not occur across tracks.

   Clearance for powerlines, gas drainage sites and access tracks within the study area would only affect the margins of the two populations and would not result in fragmentation of habitat into permanently discrete units, even if the area was not rehabilitated. However, given that cleared areas would be rehabilitated, population fragmentation would not occur in the long term.

4. *Will the action adversely affect habitat critical to the survival of the species?*

   The habitat of the Coolabah Bertya on the study area is on the margins of the distribution of the species within Jacks Creek State Forest and represents both a very small proportion of the local distribution and the total population of the species in the area. As such, the representation of the Coolabah Bertya on the study area is not considered to be critical to the survival of the species.

5. *Will the action disrupt the breeding cycle of an important population?*

   The action will not have any predictable effects beyond the study area and is therefore highly unlikely to affect the breeding cycle of the core parts of the populations that occur outside the study area. Similarly, there are no conceivable impacts of the project that would disrupt normal breeding generally across the entire population within the study area. Consequently, it is considered highly unlikely that the action would disrupt the breeding cycle of an important population.

6. *Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?*

   The action may have localised adverse effects on individual plants of the Coolabah Bertya owing to clearance activities for powerlines, gas drainage facilities and access tracks. However, these activities would not affect the bulk of the local populations that occur outside the study area, which are expected to continue to grow and reproduce normally. Cleared areas are likely to recover to close to their original condition following rehabilitation and re-establishment of *Bertya opponens* on affected areas. It is considered highly unlikely that the action would lead to a decline of the species in the local area.

7. *Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?*

   Consistent with the habitat requirements described in the Recovery Plan (NPWS 2002), Coolabah Bertya was observed to occur on shallow sands to loamy sands, often with high stone and gravel contents, over a sandstone substrate. Such soils have low fertility and generally do not support invasive species when cleared or disturbed. There is no indication of an invasive weed problem in disturbed areas of the Pilliga Sandstone community on the study area or in the adjoining State Forests. It is considered highly unlikely that the action would encourage the establishment of any invasive species that might threaten the Coolabah Bertya.

8. *Will the action introduce disease that may cause the species to decline?*

   There are no known diseases of native plants that have potential to establish and threaten the Coolabah Bertya in the habitats on the study area. The potentially most damaging disease of native plants is the fungus *Phytophora cinnamomi*. However, this species is primarily a threat in coastal and tableland areas where the climate is relatively moist (DECC 2008b). It is not expected to be a problem in dry inland environments such as the Pilliga region. It is considered to be highly unlikely that the action would introduce a disease that may cause the Coolabah Bertya to decline.

9. *Will the action interfere substantially with the recovery of the species?*

   The Coolabah Bertya is the subject of a Recovery Plan (NPWS 2002). However, all the proposed actions in this plan refer to the declining and unhealthy Coolabah-Cobar population of the species. There are no actions in the Recovery Plan for the Jacks Creek State Forest population apart from a recommendation to conduct further targeted surveys to determine more accurately the size and extent of the population. However, this action was given a low priority owing to the large known size of the population and the lack of threats to its viability. In effect, recovery actions are not required for the Coolabah Bertya population in the surrounds of the development area because the population is very large, in excess of 5 million plants, and is healthy and viable. Consequently, there are no recovery actions with which the project could potentially interfere.

From the above consideration of the EPBC significant impact criteria, it is clear that the project would not have a significant impact on the Coolabah Bertya.

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Colin C Bower PhD
Principal Consultant Botanist

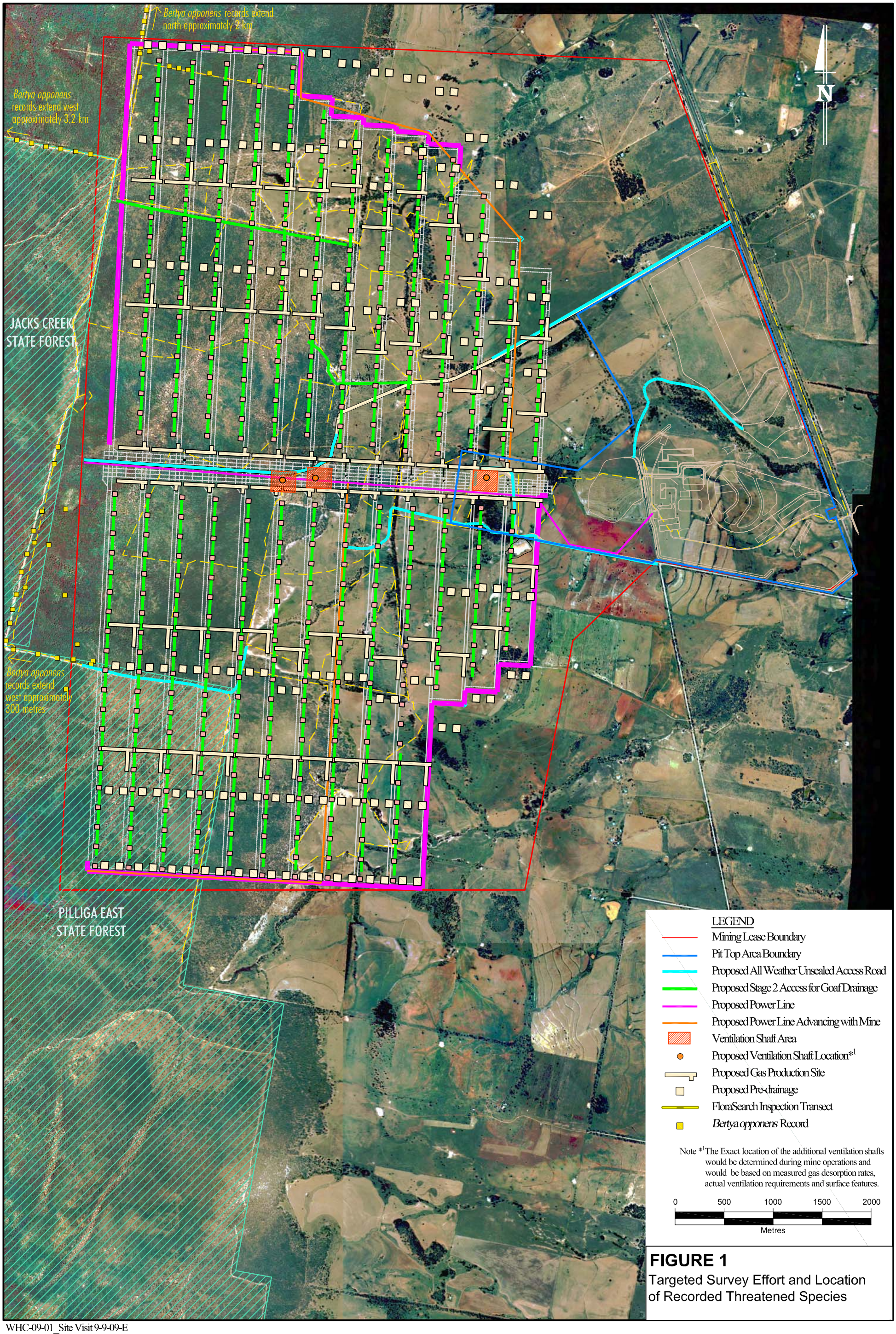

FIGURE 1
Targeted Survey Effort and Location of Recorded Threatened Species

Variation Request - Narrabri Coal Project 2009/5003
(dated 10 February 2010)

WHITEHAVEN COAL

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10 February 2010

Mr James Barker
Director, Mining Section
Environment Assessment and Approvals Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

Dear Mr Barker,

Re: Narrabri Coal Operations Pty Ltd – EPBC Reference Number: 2009/5003.

On the 17 August 2009, a delegate for the Minister of the Department of the Environment, Water, Heritage and the Arts (DEWHA) determined the proposed Narrabri Coal Mine (the Project) (EPBC 2009/5003) a controlled action under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) after review of the Narrabri Coal Mine EPBC Act Referral.

Subsequent to the above a request for reconsideration of the controlled action decision was made in accordance with Section 78 of the EPBC Act on 13 October 2009. DEWHA indicated in a letter dated 5 February 2010 that the reconsideration request had been rejected (i.e. the original controlled action decision is upheld) and that the assessment would be on Preliminary Documentation under Section 87(5) of the EPBC Act. The letter dated 5 February 2010 also indicated that following the 10 business day public exhibition period and provision to DEWHA of a copy of any comments received and associated response, the assessment process could generally be expected to take no longer than 40 business days.

Subject to it obtaining State (NSW) approval under Section 75W of the *Environmental Planning and Assessment Act, 1979*, Narrabri Coal Operations Pty Ltd (NCOPL) wishes to undertake some preliminary activities in the short term to ensure continuity of operations. These activities are relatively minor in nature and do not require any vegetation clearance.

In order to undertake these activities without committing an offence under Section 74AA of the EPBC Act, NCOPL requests, under Section 156A of the EPBC Act, to vary the action described in the Narrabri Coal Mine EPBC Act Referral (2009/5003) by removing minor components of the action that are required to commence in the short term to ensure continuity of operations.

NCOPL considers the variation request justified as the removal of these components does not change the character of the original proposal, and because none of the components requested to be removed require vegetation clearance. The carrying out of these components does not pose any risk of material impact to any matter of national environmental significance.

A summary of the variation request is provided below with further detail provided in Attachment 1 of this letter.

Components of the proposal requested to be removed from the referred action include:

- Construction of two ventilation shafts in cleared agricultural paddocks.
- Construction and use of gas and water pre-drainage infrastructure in cleared agricultural paddocks located above proposed Longwalls 1 to 3.
- Construction (but not operation) of a Coal Handling and Preparation Plant (CHPP) within the existing cleared surface facilities area.
- Construction and use of supporting infrastructure associated with the above components (e.g. access tracks, power lines and water/gas pipelines) within cleared agricultural paddocks or existing cleared disturbance areas.

In consideration of the above and attached information, NCOPL considers the character of the varied proposal to be substantially the same as the character of the original proposal and also that the carrying out of these components poses no risk of material impact to any matter of national environmental significance.

It would be appreciated if you could consider this variation request at your earliest convenience.

In the meantime please do not hesitate to contact Brian Cullen on (02) 6741 9304 or Richard Kirwood on (07) 3871 3144.

Yours Sincerely

Greig Duncan
General Manager
Narrabri Coal Operations Pty Limited

Attachment 1

Description of the Original Referral and the Requested Variation

Table 1
Description of the Original Referral and the Requested Variation

Project Component	Existing Action as Described in Original Referral	Components Requested to be Removed
Project Summary	"*Narrabri Coal Operations Pty Ltd (NCOPL) proposes to convert the approved Narrabri Coal Mine (Stage 1) from a continuous miner operation with an approved annual production rate of 2.5Mtpa to a longwall mining operation (Stage 2) with a maximum annual production rate of 8Mtpa ("the Longwall Project"). Figure A identifies the critical surface and underground components of the proposed Longwall Project. Figure B differentiates between those activities or infrastructure already approved for the Stage 1 operations (within the Pit Top Area of the Narrabri Coal Mine) and those proposed for the Stage 2 Longwall Project. The following provides a summary of the activities associated with the development of the Longwall Project*".	No Change.
Longwall Mining	"*Longwall mining would involve the sequential development of heading gate roads approximately 305m apart oriented north-south from the main headings ("West Mains") and developed for the full distance to the northern and southern boundaries of ML 1609 (up to 4.2km). Once each set of roadways are fully developed, the longwall equipment would be installed and the coal recovered as the longwall unit retreats back towards the West Mains between the two roadways. All coal would be conveyed back to the Pit Bottom Area for transfer to the surface via the approved conveyor drift.* *Figure A provides the proposed layout of the underground mining operations. The longwall unit would recover 4.2m of coal from the bottom of the Hoskissons Coal Seam (leaving up to 5.2m of coal in-situ) retreating at a rate of approximately 15m per day. At this rate, each longwall panel would take approximately 1 year to complete. Based on the proposed mining schedule, there could be up to three longwall panels being prepared (gate road development) or mined (longwall unit retreat)*".	No Change.
Coal Transfer to Surface	"*Transportation of the mined coal to the Run-of Mine (ROM) coal stockpile within the Pit Top Area would be via the conveyor drift from the Pit Bottom Area to the box cut of the Pit Top Area. From the box cut excavation, the ROM coal would be transported to the ROM coal stockpile area by conveyor from where it would be sent to the Coal Handling and Preparation Plant (CHPP)*".	No Change.
Coal Processing	"*The ROM coal would be drawn from the ROM coal stockpiles via one of two reclaim valve and tunnels from where it would be fed to a rotary breaker for size reduction. The broken coal would then be transferred to a dry screen with the <16mm coal transferred directly to the product coal stockpile area and the remainder transferred to a jig washery for removal of fine material and screening of the coarse reject. The <50mm coal would be transferred to the product coal stockpile area with the coarse reject and dewatered and thickened fine reject sent to a reject emplacement area for storage.* *As illustrated on Figure B, the ROM coal pad would be extended to the north to provide for the increased stockpile requirements and additional infrastructure required to accommodate the increase in coal production from 2.5Mtpa to a maximum of 8.0Mtpa. The ROM coal pad extension would increase the size of the pad from approximately 2ha to approximately 4.2ha and would, in combination with the elevation of the ROM coal drift conveyor and stacking system, increase the ROM coal storage capacity to 400 000t*".	No Change.

Table 1 (Continued)
Description of the Original Referral and the Requested Variation

Project Component	Existing Action as Described in Original Referral	Components Requested to be Removed
Gas Drainage and Mine Ventilation	"*The gas composition of the Hoskissons Coal Seam (which has a measured gas content range from 3.5m3/t to 7.5m3/t) is predicted to vary considerably, however, for planning purposes and subject to further data becoming available, it is assumed to be an average of 90% CO2 and 10% CH4. The porous coarse grained sandstone floor of the Hoskissons Coal Seam would also be a source of gas within the underground workings. Pre drainage of the coal seam would be undertaken to reduce gas content to less than 5.0m3/t for the management of outbursts and rib emission prior to the development of each longwall panel. Pre-drainage would be undertaken using surface to in-seam (SIS) medium radius drilling (MRD) and or conventional underground boreholes.* *Surface to In-seam (SIS) pre-drainage using Medium Radius Drilling (MRD) involves drilling from surface (Pre-drainage Borehole Site) into and along the coal seam (up to 2.5km). The gas (as well as water) is then drawn from the seam using a vacuum pump (Gas Production Site) and dispersed to the atmosphere. The water pumped to the surface would be piped to the Pit Top Area for storage in one of the Water Storage / Evaporation Ponds. Along each longwall panel, two to three Pre-drainage Borehole and Gas Production Sites would be required. The combined disturbance associated with each Pre-drainage Borehole and Gas Production Site is estimated to be a maximum of 3.5ha.* *Figure A presents the proposed locations of the Pre-drainage Borehole and Gas Production Sites, which combined would disturb up to 259ha.* *As the underground workings are developed, a ventilation system would be progressively upgraded to prevent gas build-up within the underground workings, thereby providing for safe working conditions and minimising the risk of outburst or spontaneous combustion. This would involve the establishment of ventilation shafts from the West Mains, as well as at the rear of every third or fourth longwall panel, which could operate as ventilation intakes or exhausts. The disturbance associated with each ventilation shaft would be approximately 6.25ha for the three located above the West Mains and 2.25ha for the rear of panel ventilation shaft areas. Figure A presents the proposed locations of ventilation shafts, which combined would disturb up to 40ha. As the longwall unit retreats, and the top coal of the seam collapses, the gas accumulating in the goaf would also be drained. Goaf gas drainage would be completed either by re-using the MRD system used for pre-draining the gas from the panel to be developed, or by the development of additional bores from surface into the collapsed panel, with the gas drawn out the goaf by the installation and operation of vacuum plant at the top of each bore. Each goaf gas drainage site (which would disturb up to 0.25ha) would be located towards the tailgate edge of the completed longwall panel and at approximately 200m intervals. Figure A presents the estimated locations of the Goaf Gas Drainage Sites, which combined would disturb up to 100ha*".	• No Change for Longwalls 4 to 25. • Construction of two ventilation shafts in cleared agricultural paddocks. One located above the West Mains between Longwalls 2 and 25 and the other located above the north-eastern extent of Longwall 2 – refer to Figure A of the Narrabri Coal Mine EPBC Act Referral (2009/5003) (Attachment 2). • Construction and use of gas and water pre-drainage infrastructure in cleared agricultural paddocks located above Longwalls 1 to 3 – refer to Figure A of the Narrabri Coal Mine EPBC Act Referral (2009/5003) (Attachment 2). • Construction and use of supporting infrastructure associated with the above components (e.g. access tracks, power lines and water/gas pipelines) and restricted to the cleared agricultural paddocks above Longwalls 1 to 3 and between the component locations and the surface facilities area – refer to Figure B of the Narrabri Coal Mine EPBC Act Referral (2009/5003) (Attachment 2).
Transportation	"*The product coal would be drawn from stockpiles via three reclaim valves and tunnels and conveyed to the train load-out bin. The loading of product coal via the drawdown valves and trains load-out bin would be fully automated with batches drawn from the stockpiles and loaded to trains on the Narrabri Coal Rail Siding*".	No Change.

Table 1 (Continued)
Description of the Original Referral and the Requested Variation

Project Component	Existing Action as Described in Original Referral	Components Requested to be Removed
Reject Management	"*Coal processing is expected to remove up to 5% of the total ROM feed as reject, which will be predominantly rock from the floor of the workings. About 90% of this will be coarse reject (16mm to 125mm) and the remainder a filter cake produced by the dewatering and thickening of the ultra-fine reject. The two reject streams would be mixed and conveyed to a reject pile for stockpiling. From the reject pile, the material would be loaded to trucks and transported to an area to the southwest of the box cut for placement and stockpiling. This Reject Emplacement Area, which is identified on Figure B, is on the north-facing side of a low ridge and is bounded on the north by Kurrajong Creek, and on the south by the crest of the ridge. The proposed location of the reject emplacement area falls gently at about 1.5° from the ridge to the bank of Kurrajong Creek over a distance of about 600m. The area allocated to the reject emplacement area is approximately 25ha, although it would be developed progressively over the life of the mine and the entire area may not be required for the management of reject material. The emplacement would be constructed against the slope of the ridge, rising to a maximum of 15m above the natural surface level*".	No Change.
Rehabilitation	"*Rehabilitation of the mine site would involve three distinct areas.* *1. Pit Top Area infrastructure.* *All surface infrastructure, within the exception of the mine access road and rail infrastructure would be decommissioned, dismantled and removed from the mine site. The disturbed areas of the Pit Top Area would be backfilled where appropriate, e.g. Box cut and underground water storage dams (after dam lining and saline material is removed), profiled, covered with available topsoil and revegetated with either pasture grass species or native tree, shrub and grass species (depending on final landform and land use requirements).* *2. Ventilation and gas drainage infrastructure.* *The ventilation and gas drainage infrastructure would be rehabilitated in much the same fashion as the Pit Top Area, albeit on a smaller and more widespread scale. Much of the rehabilitation would be completed progressively as the area required for the construction and installation of the bores required for ventilation and gas drainage greatly exceeds the area required to manage and maintain these operations.* *3. Surface cracking caused by subsidence.* *The disturbance resultant from any surface cracking caused by subsidence would be progressively rehabilitated. For smaller width cracking, the surface would simply be ripped to allow the cracks to be filled in. In some instances, the surface cracking may be too wide to be effectively in-filled by surface ripping and in these instances, material excavated from the borrow pit area would be used to in-fill the cracks prior to ripping and revegetation.* *In addition to these principal activities, the mine would continue to be operated with comprehensive systems to manage groundwater, surface water, noise, air quality, and visibility*".	No Change.

Table 1 (Continued)
Description of the Original Referral and the Requested Variation

Project Component	Existing Action as Described in Original Referral	Components Requested to be Removed
Surface Facilities Area	As per Figure B – Attachment 2.	• Construction (but not operation) of a Coal Handling and Preparation Plant (CHPP) within the existing cleared surface facilities area – refer to Figure B of the Narrabri Coal Mine EPBC Act Referral (2009/5003) (Attachment 2).
Vegetation Clearance	– Community 1 (Brown Bloodwood/Pilliga Box Woodland): 178.9 ha. – Community 2 (Inland Grey Box Woodland): 22.9 ha. – Community 3 (Riparian Forest): 4.1 ha. – Community 4 (Callitris Forest): 2.7 ha. – Community 5 (Weeping Myall): 0 ha	No Change.

Attachment 2

Figure A of the Narrabri Coal Mine EPBC Act Referral (2009/5003) – Indicative Surface Disturbance for the Longwall Project

Figure B of the Narrabri Coal Mine EPBC Act Referral (2009/5003) – Pit Top and Reject Emplacement Area Surface Disturbance

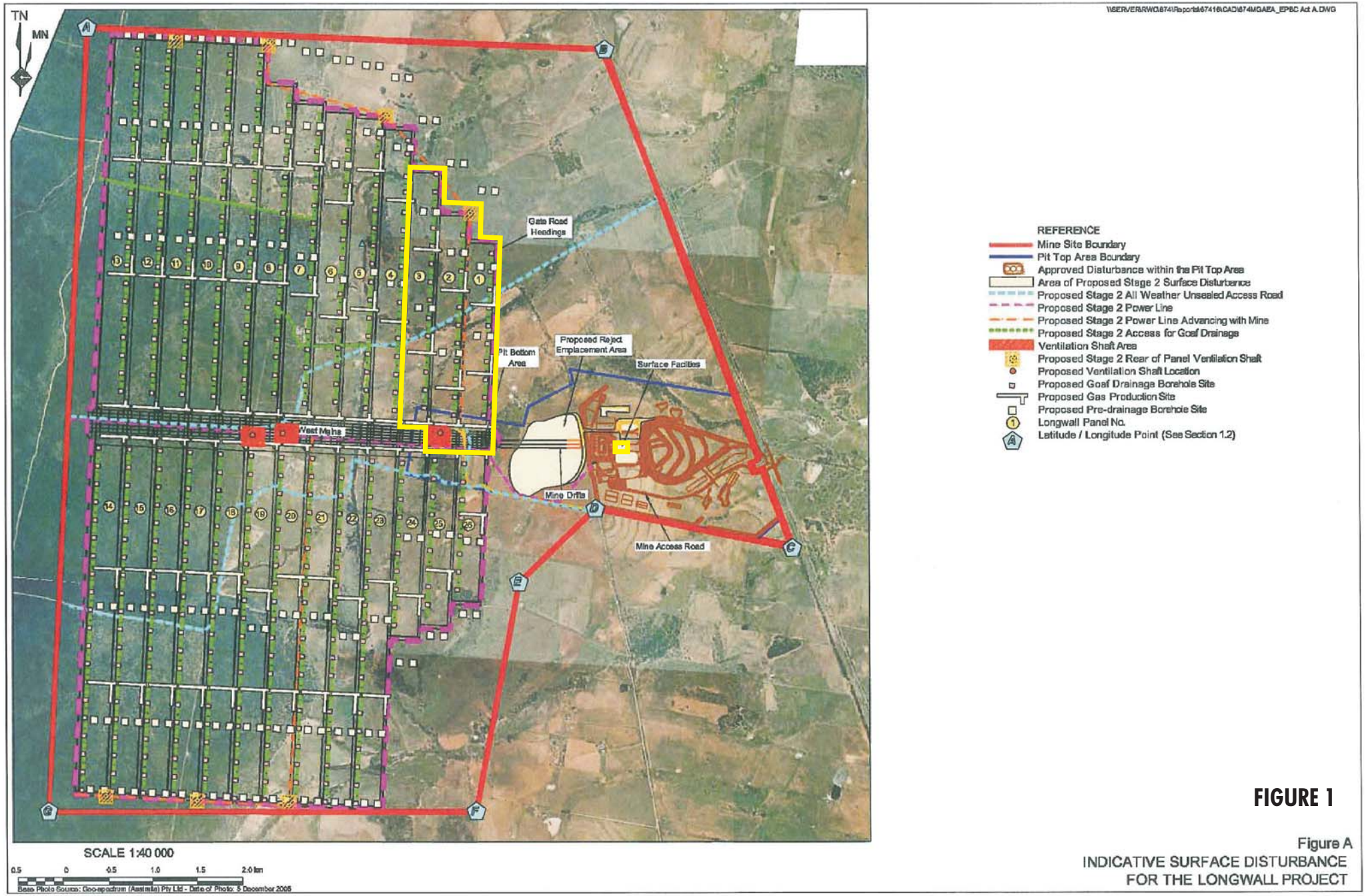


FIGURE 1

Figure A
INDICATIVE SURFACE DISTURBANCE
FOR THE LONGWALL PROJECT

R.W. CORKERY & CO. PTY. LIMITED

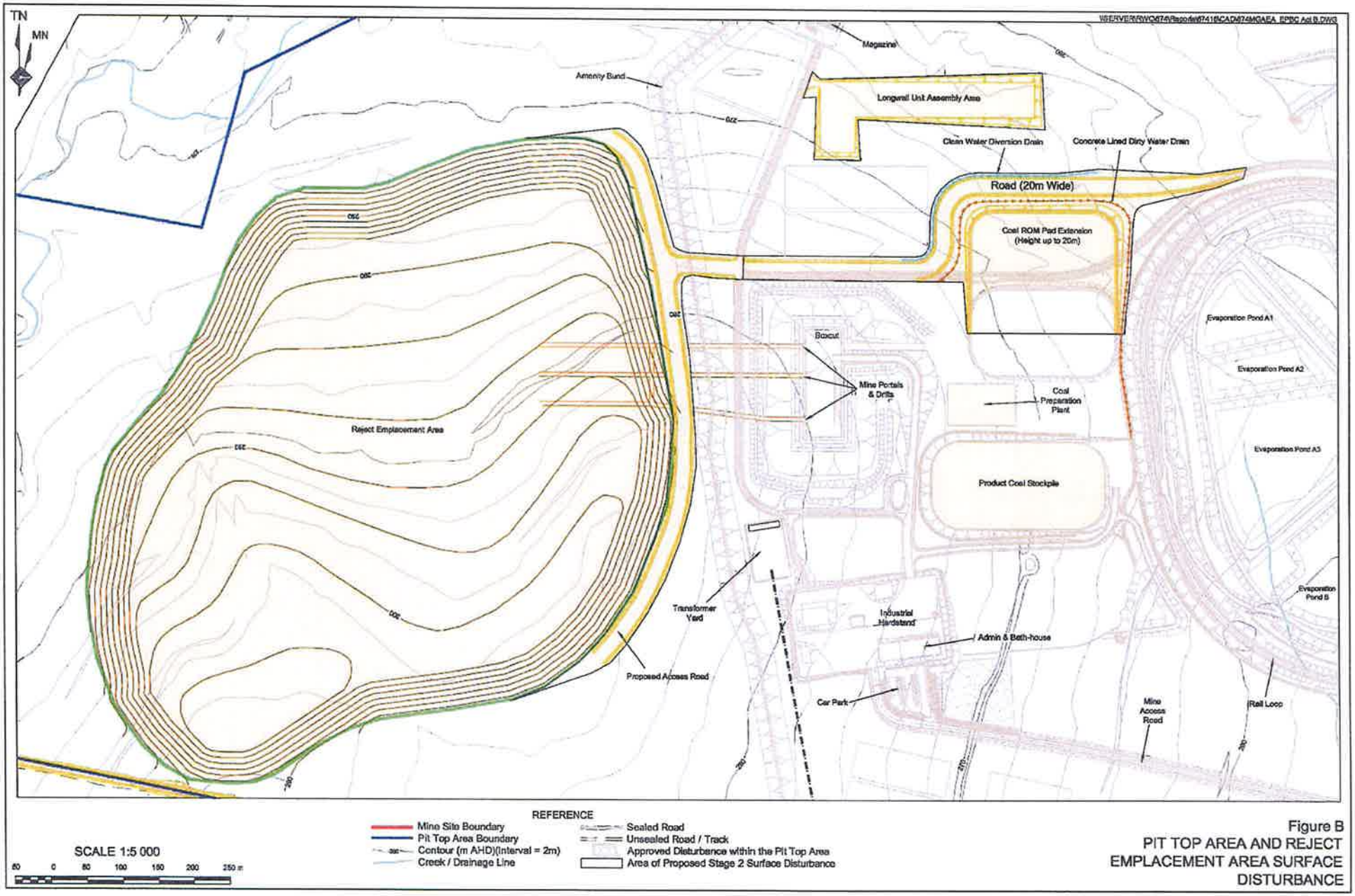


Figure B
PIT TOP AREA AND REJECT EMPLACEMENT AREA SURFACE DISTURBANCE

R.W. CORKERY & CO. PTY. LIMITED

Variation decision (dated 15 March 2010)

Australian Government

Department of the Environment, Water, Heritage and the Arts

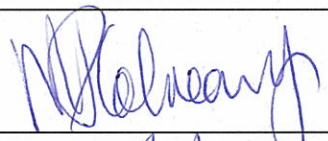
Notification of
VARIATION OF PROPOSAL TO TAKE ACTION

Narrabri Coal Project, Kamilaroi Highway, NSW (EPBC 2009/5003)

The Minister's delegate has accepted the variation to the proposal in accordance with section 156B of the *Environment Protection and Biodiversity Conservation Act 1999*.

Proposed action	Conversion of the Narrabri coal mine from a continuous mining operation with an annual production rate of 2.5Mtpa to a longwall mining operation with a maximum production rate 8Mtpa.
Designated Proponent	Narrabri Coal Operations Pty Ltd, ABN 76 107 813 963
Variation	As outlined in the request from the General Manager of Narrabri Coal Operations Pty Ltd dated 10 February 2010 (attached).

Decision-maker

Name and position	Mary Colreavy Assistant Secretary Environment Assessment Branch
signature	
date of decision	15/3/2010

WHITEHAVEN COAL

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10 February 2010

Mr James Barker
Director, Mining Section
Environment Assessment and Approvals Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

Dear Mr Barker,

Re: Narrabri Coal Operations Pty Ltd – EPBC Reference Number: 2009/5003.

On the 17 August 2009, a delegate for the Minister of the Department of the Environment, Water, Heritage and the Arts (DEWHA) determined the proposed Narrabri Coal Mine (the Project) (EPBC 2009/5003) a controlled action under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) after review of the Narrabri Coal Mine EPBC Act Referral.

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Subject to it obtaining State (NSW) approval under Section 75W of the *Environmental Planning and Assessment Act, 1979*, Narrabri Coal Operations Pty Ltd (NCOPL) wishes to undertake some preliminary activities in the short term to ensure continuity of operations. These activities are relatively minor in nature and do not require any vegetation clearance.

In order to undertake these activities without committing an offence under Section 74AA of the EPBC Act, NCOPL requests, under Section 156A of the EPBC Act, to vary the action described in the Narrabri Coal Mine EPBC Act Referral (2009/5003) by removing minor components of the action that are required to commence in the short term to ensure continuity of operations.

NCOPL considers the variation request justified as the removal of these components does not change the character of the original proposal, and because none of the components requested to be removed require vegetation clearance. The carrying out of these components does not pose any risk of material impact to any matter of national environmental significance.

A summary of the variation request is provided below with further detail provided in Attachment 1 of this letter.

Components of the proposal requested to be removed from the referred action include:

- Construction of two ventilation shafts in cleared agricultural paddocks.
- Construction and use of gas and water pre-drainage infrastructure in cleared agricultural paddocks located above proposed Longwalls 1 to 3.
- Construction (but not operation) of a Coal Handling and Preparation Plant (CHPP) within the existing cleared surface facilities area.
- Construction and use of supporting infrastructure associated with the above components (e.g. access tracks, power lines and water/gas pipelines) within cleared agricultural paddocks or existing cleared disturbance areas.

In consideration of the above and attached information, NCOPL considers the character of the varied proposal to be substantially the same as the character of the original proposal and also that the carrying out of these components poses no risk of material impact to any matter of national environmental significance.

It would be appreciated if you could consider this variation request at your earliest convenience.

In the meantime please do not hesitate to contact Brian Cullen on (02) 6741 9304 or Richard Kirwood on (07) 3871 3144.

Yours Sincerely

per

Greig Duncan
General Manager
Narrabri Coal Operations Pty Limited

Attachment 1

Description of the Original Referral and the Requested Variation

Table 1
Description of the Original Referral and the Requested Variation

Project Component	Existing Action as Described in Original Referral	Components Requested to be Removed
Project Summary	"*Narrabri Coal Operations Pty Ltd (NCOPL) proposes to convert the approved Narrabri Coal Mine (Stage 1) from a continuous miner operation with an approved annual production rate of 2.5Mtpa to a longwall mining operation (Stage 2) with a maximum annual production rate of 8Mtpa ("the Longwall Project"). Figure A identifies the critical surface and underground components of the proposed Longwall Project. Figure B differentiates between those activities or infrastructure already approved for the Stage 1 operations (within the Pit Top Area of the Narrabri Coal Mine) and those proposed for the Stage 2 Longwall Project. The following provides a summary of the activities associated with the development of the Longwall Project*".	No Change.
Longwall Mining	"*Longwall mining would involve the sequential development of heading gate roads approximately 305m apart oriented north-south from the main headings ("West Mains") and developed for the full distance to the northern and southern boundaries of ML 1609 (up to 4.2km). Once each set of roadways are fully developed, the longwall equipment would be installed and the coal recovered as the longwall unit retreats back towards the West Mains between the two roadways. All coal would be conveyed back to the Pit Bottom Area for transfer to the surface via the approved conveyor drift.* *Figure A provides the proposed layout of the underground mining operations. The longwall unit would recover 4.2m of coal from the bottom of the Hoskissons Coal Seam (leaving up to 5.2m of coal in-situ) retreating at a rate of approximately 15m per day. At this rate, each longwall panel would take approximately 1 year to complete. Based on the proposed mining schedule, there could be up to three longwall panels being prepared (gate road development) or mined (longwall unit retreat)*".	No Change.
Coal Transfer to Surface	"*Transportation of the mined coal to the Run-of Mine (ROM) coal stockpile within the Pit Top Area would be via the conveyor drift from the Pit Bottom Area to the box cut of the Pit Top Area. From the box cut excavation, the ROM coal would be transported to the ROM coal stockpile area by conveyor from where it would be sent to the Coal Handling and Preparation Plant (CHPP)*".	No Change.
Coal Processing	"*The ROM coal would be drawn from the ROM coal stockpiles via one of two reclaim valve and tunnels from where it would be fed to a rotary breaker for size reduction. The broken coal would then be transferred to a dry screen with the <16mm coal transferred directly to the product coal stockpile area and the remainder transferred to a jig washery for removal of fine material and screening of the coarse reject. The <50mm coal would be transferred to the product coal stockpile area with the coarse reject and dewatered and thickened fine reject sent to a reject emplacement area for storage.* *As illustrated on Figure B, the ROM coal pad would be extended to the north to provide for the increased stockpile requirements and additional infrastructure required to accommodate the increase in coal production from 2.5Mtpa to a maximum of 8.0Mtpa. The ROM coal pad extension would increase the size of the pad from approximately 2ha to approximately 4.2ha and would, in combination with the elevation of the ROM coal drift conveyor and stacking system, increase the ROM coal storage capacity to 400 000t*".	No Change.

Table 1 (Continued)
Description of the Original Referral and the Requested Variation

Project Component	Existing Action as Described in Original Referral	Components Requested to be Removed
Gas Drainage and Mine Ventilation	"*The gas composition of the Hoskissons Coal Seam (which has a measured gas content range from 3.5m3/t to 7.5m3/t) is predicted to vary considerably, however, for planning purposes and subject to further data becoming available, it is assumed to be an average of 90% CO2 and 10% CH4. The porous coarse grained sandstone floor of the Hoskissons Coal Seam would also be a source of gas within the underground workings. Pre drainage of the coal seam would be undertaken to reduce gas content to less than 5.0m3/t for the management of outbursts and rib emission prior to the development of each longwall panel. Pre-drainage would be undertaken using surface to in-seam (SIS) medium radius drilling (MRD) and or conventional underground boreholes.* *Surface to In-seam (SIS) pre-drainage using Medium Radius Drilling (MRD) involves drilling from surface (Pre-drainage Borehole Site) into and along the coal seam (up to 2.5km). The gas (as well as water) is then drawn from the seam using a vacuum pump (Gas Production Site) and dispersed to the atmosphere. The water pumped to the surface would be piped to the Pit Top Area for storage in one of the Water Storage / Evaporation Ponds. Along each longwall panel, two to three Pre-drainage Borehole and Gas Production Sites would be required. The combined disturbance associated with each Pre-drainage Borehole and Gas Production Site is estimated to be a maximum of 3.5ha.* *Figure A presents the proposed locations of the Pre-drainage Borehole and Gas Production Sites, which combined would disturb up to 259ha.* *As the underground workings are developed, a ventilation system would be progressively upgraded to prevent gas build-up within the underground workings, thereby providing for safe working conditions and minimising the risk of outburst or spontaneous combustion. This would involve the establishment of ventilation shafts from the West Mains, as well as at the rear of every third or fourth longwall panel, which could operate as ventilation intakes or exhausts. The disturbance associated with each ventilation shaft would be approximately 6.25ha for the three located above the West Mains and 2.25ha for the rear of panel ventilation shaft areas. Figure A presents the proposed locations of ventilation shafts, which combined would disturb up to 40ha. As the longwall unit retreats, and the top coal of the seam collapses, the gas accumulating in the goaf would also be drained. Goaf gas drainage would be completed either by re-using the MRD system used for pre-draining the gas from the panel to be developed, or by the development of additional bores from surface into the collapsed panel, with the gas drawn out the goaf by the installation and operation of vacuum plant at the top of each bore. Each goaf gas drainage site (which would disturb up to 0.25ha) would be located towards the tailgate edge of the completed longwall panel and at approximately 200m intervals. Figure A presents the estimated locations of the Goaf Gas Drainage Sites, which combined would disturb up to 100ha*".	• No Change for Longwalls 4 to 25. • Construction of two ventilation shafts in cleared agricultural paddocks. One located above the West Mains between Longwalls 2 and 25 and the other located above the north-eastern extent of Longwall 2 – refer to Figure A of the Narrabri Coal Mine EPBC Act Referral (2009/5003) (Attachment 2). • Construction and use of gas and water pre-drainage infrastructure in cleared agricultural paddocks located above Longwalls 1 to 3 – refer to Figure A of the Narrabri Coal Mine EPBC Act Referral (2009/5003) (Attachment 2). • Construction and use of supporting infrastructure associated with the above components (e.g. access tracks, power lines and water/gas pipelines) and restricted to the cleared agricultural paddocks above Longwalls 1 to 3 and between the component locations and the surface facilities area – refer to Figure B of the Narrabri Coal Mine EPBC Act Referral (2009/5003) (Attachment 2).
Transportation	"*The product coal would be drawn from stockpiles via three reclaim valves and tunnels and conveyed to the train load-out bin. The loading of product coal via the drawdown valves and trains load-out bin would be fully automated with batches drawn from the stockpiles and loaded to trains on the Narrabri Coal Rail Siding*".	No Change.

Table 1 (Continued)
Description of the Original Referral and the Requested Variation

Project Component	Existing Action as Described in Original Referral	Components Requested to be Removed
Reject Management	"*Coal processing is expected to remove up to 5% of the total ROM feed as reject, which will be predominantly rock from the floor of the workings. About 90% of this will be coarse reject (16mm to 125mm) and the remainder a filter cake produced by the dewatering and thickening of the ultra-fine reject. The two reject streams would be mixed and conveyed to a reject pile for stockpiling. From the reject pile, the material would be loaded to trucks and transported to an area to the southwest of the box cut for placement and stockpiling. This Reject Emplacement Area, which is identified on Figure B, is on the north-facing side of a low ridge and is bounded on the north by Kurrajong Creek, and on the south by the crest of the ridge. The proposed location of the reject emplacement area falls gently at about 1.5° from the ridge to the bank of Kurrajong Creek over a distance of about 600m. The area allocated to the reject emplacement area is approximately 25ha, although it would be developed progressively over the life of the mine and the entire area may not be required for the management of reject material. The emplacement would be constructed against the slope of the ridge, rising to a maximum of 15m above the natural surface level*".	No Change.
Rehabilitation	"*Rehabilitation of the mine site would involve three distinct areas.* *1. Pit Top Area infrastructure.* *All surface infrastructure, within the exception of the mine access road and rail infrastructure would be decommissioned, dismantled and removed from the mine site. The disturbed areas of the Pit Top Area would be backfilled where appropriate, e.g. Box cut and underground water storage dams (after dam lining and saline material is removed), profiled, covered with available topsoil and revegetated with either pasture grass species or native tree, shrub and grass species (depending on final landform and land use requirements).* *2. Ventilation and gas drainage infrastructure.* *The ventilation and gas drainage infrastructure would be rehabilitated in much the same fashion as the Pit Top Area, albeit on a smaller and more widespread scale. Much of the rehabilitation would be completed progressively as the area required for the construction and installation of the bores required for ventilation and gas drainage greatly exceeds the area required to manage and maintain these operations.* *3. Surface cracking caused by subsidence.* *The disturbance resultant from any surface cracking caused by subsidence would be progressively rehabilitated. For smaller width cracking, the surface would simply be ripped to allow the cracks to be filled in. In some instances, the surface cracking may be too wide to be effectively in-filled by surface ripping and in these instances, material excavated from the borrow pit area would be used to in-fill the cracks prior to ripping and revegetation.* *In addition to these principal activities, the mine would continue to be operated with comprehensive systems to manage groundwater, surface water, noise, air quality, and visibility*".	No Change.

Table 1 (Continued)
Description of the Original Referral and the Requested Variation

Project Component	Existing Action as Described in Original Referral	Components Requested to be Removed
Surface Facilities Area	As per Figure B – Attachment 2.	• Construction (but not operation) of a Coal Handling and Preparation Plant (CHPP) within the existing cleared surface facilities area – refer to Figure B of the Narrabri Coal Mine EPBC Act Referral (2009/5003) (Attachment 2).
Vegetation Clearance	- Community 1 (Brown Bloodwood/Pilliga Box Woodland): 178.9 ha. - Community 2 (Inland Grey Box Woodland): 22.9 ha. - Community 3 (Riparian Forest): 4.1 ha. - Community 4 (Callitris Forest): 2.7 ha. - Community 5 (Weeping Myall): 0 ha	No Change.

Attachment 2

Figure A of the Narrabri Coal Mine EPBC Act Referral (2009/5003) – Indicative Surface Disturbance for the Longwall Project

Figure B of the Narrabri Coal Mine EPBC Act Referral (2009/5003) – Pit Top and Reject Emplacement Area Surface Disturbance

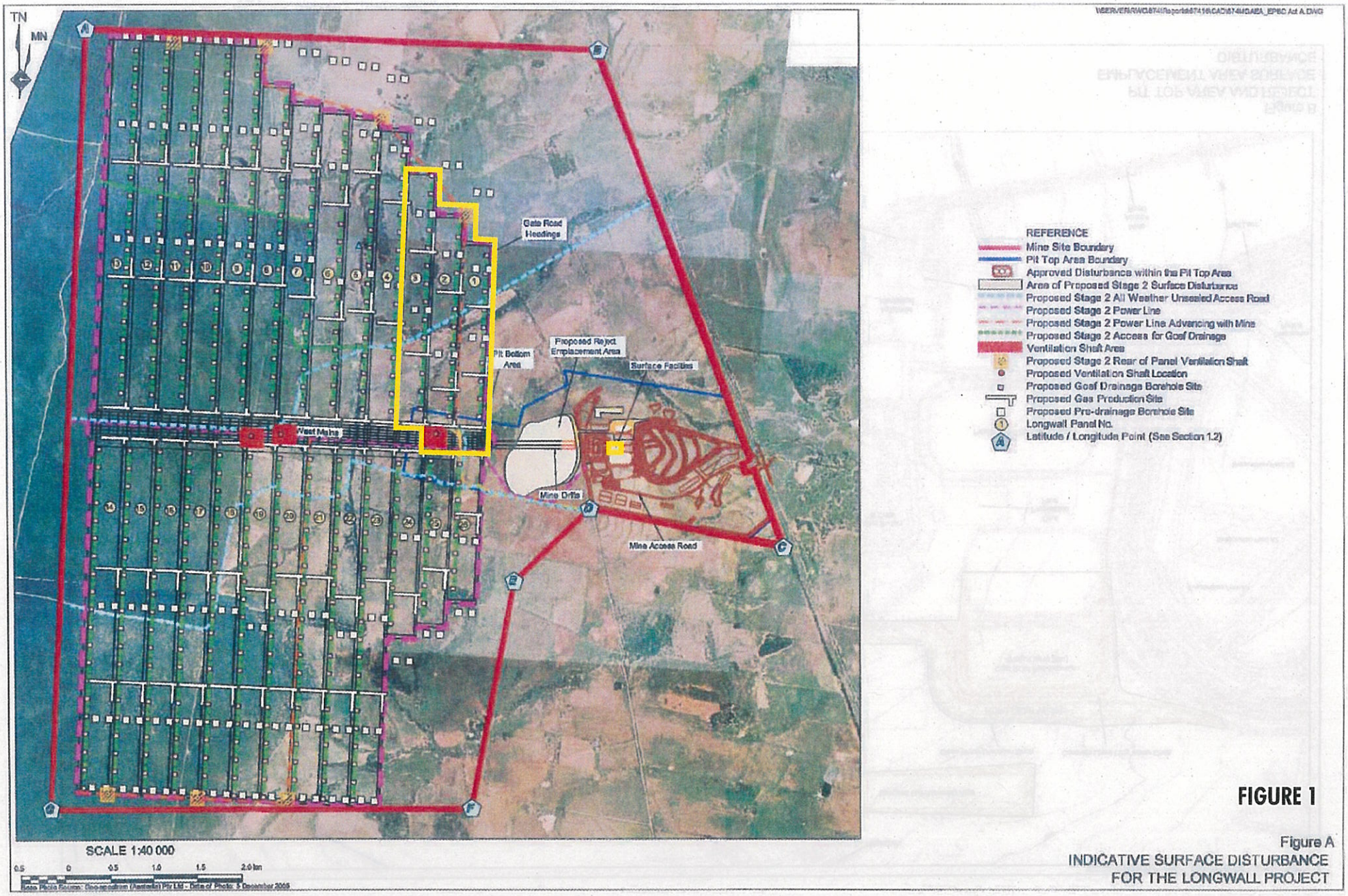

FIGURE 1

Figure A
INDICATIVE SURFACE DISTURBANCE
FOR THE LONGWALL PROJECT

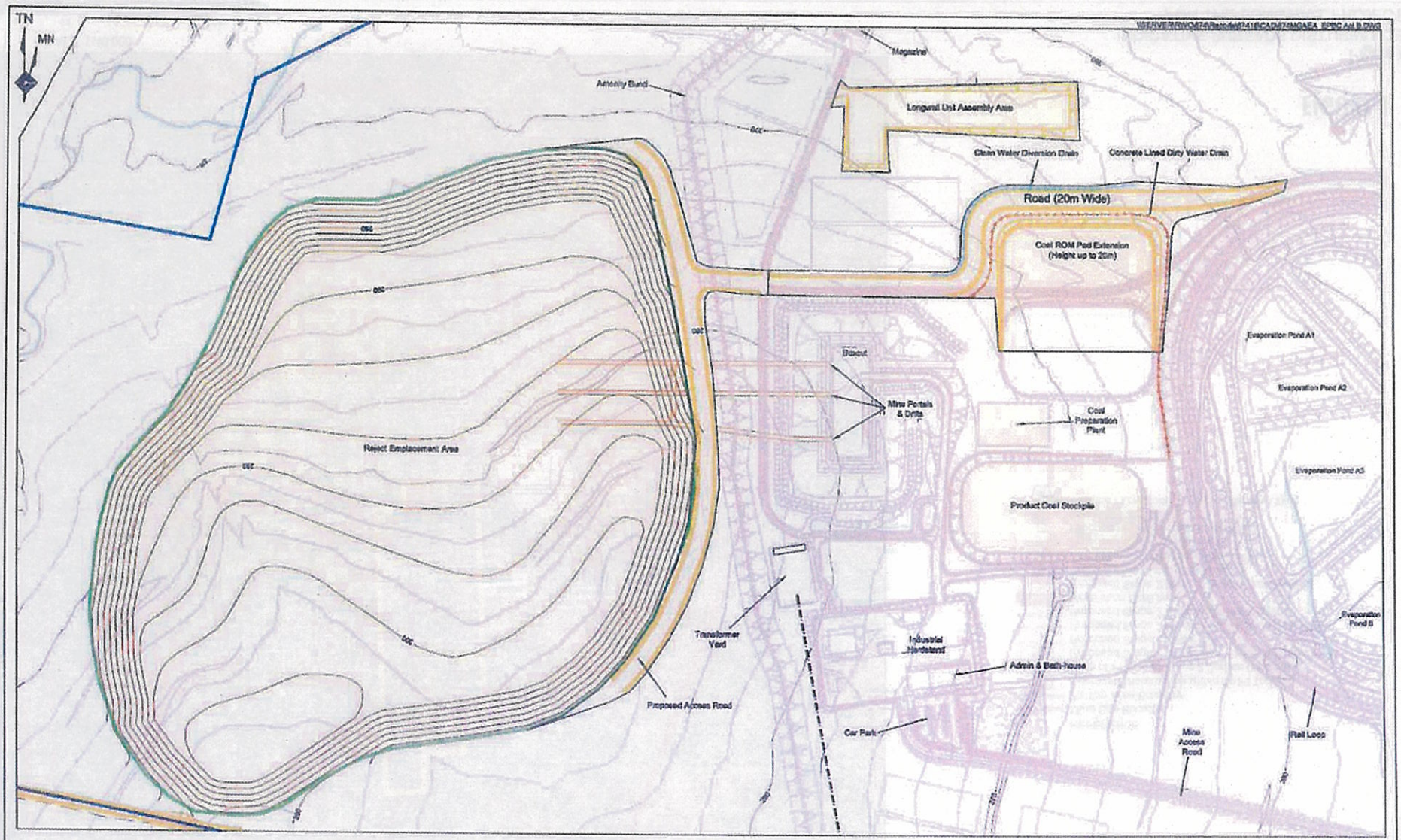

Figure B
PIT TOP AREA AND REJECT EMPLACEMENT AREA SURFACE DISTURBANCE

R.W. CORKERY & CO. PTY. LIMITED