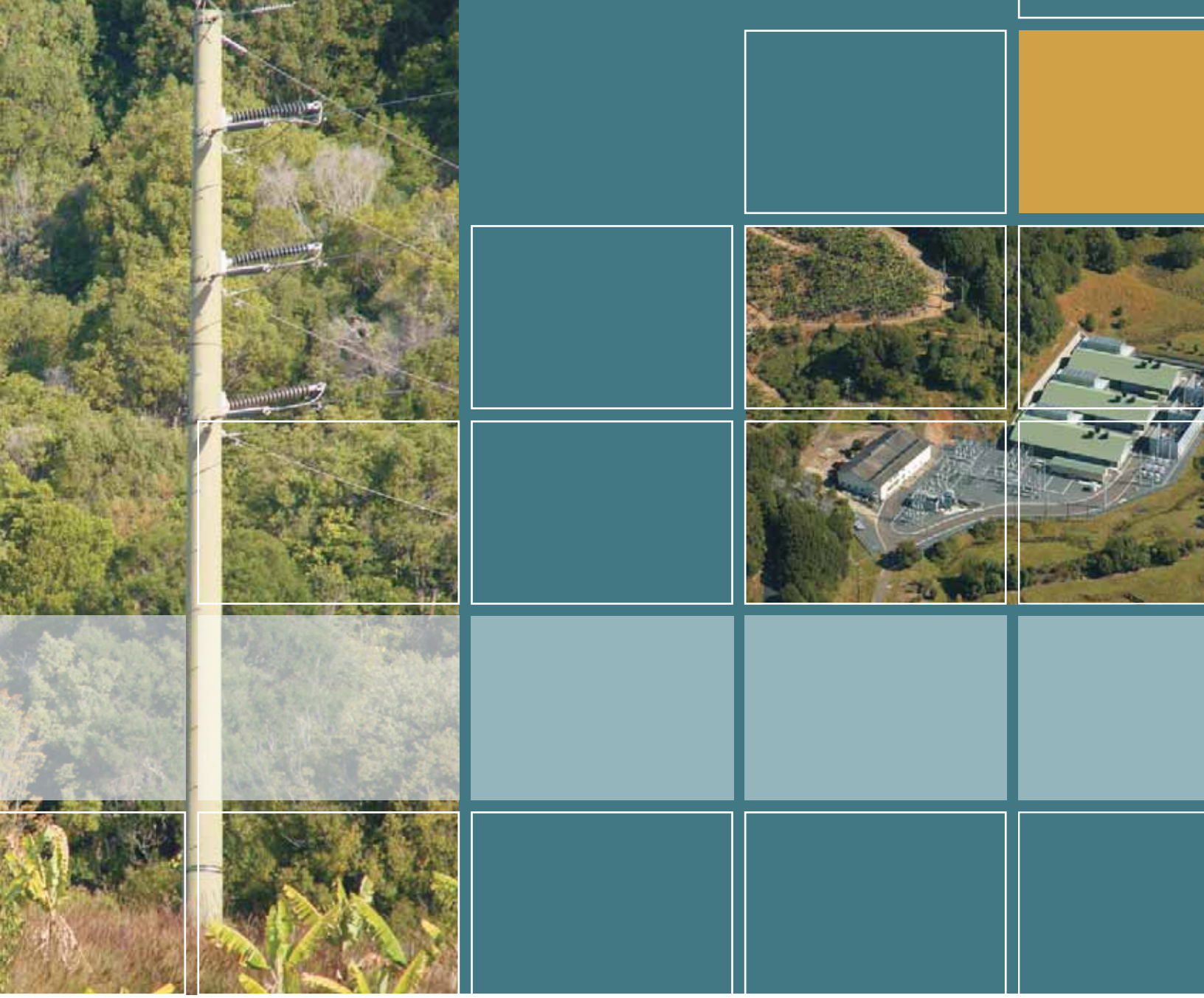

Lismore to Mullumbimby Electricity Network Upgrade

Preferred Project Report

Final Report

for Country Energy

May 2009

0051706

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FINAL REPORT

Country Energy

Lismore to Mullumbimby Electricity Network Upgrade
Preferred Project Report

May 2009

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FINAL REPORT

Country Energy

Lismore to Mullumbimby Electricity Network Upgrade
Preferred Project Report

May 2009

Reference: 0051706_PPR

For and on behalf of
Environmental Resources Management Australia

Approved by: Murray Curtis

Signed: 

Position: Managing Partner

Date: 27 May 2009

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1 INTRODUCTION

The major project application for the Lismore to Mullumbimby Electricity Network Upgrade (referred to as 'the EA') was exhibited from 4 February 2009 to 6 March 2009. Country Energy has considered the issues raised during the exhibition period and this report sets out:

- responses to submissions;
- a preferred project which includes amendments to the project plan and a revised statement of commitments.

The preferred project has been prepared in response to the submissions.

2 RESPONSE TO SUBMISSIONS

2.1 INTRODUCTION

Submissions were received from:

- Department of Environment and Climate Change (DECC);
- Heritage Council of NSW;
- Roads and Traffic Authority (RTA);
- Byron Shire Council;
- Friends of the Koala Inc; and
- numerous members of the general public.

The following sections are a response to the issues raised in the submissions.

2.2 RESPONSE TO STATE GOVERNMENT DEPARTMENT SUBMISSIONS

The DECC has provided comments relating to the Statement of Commitments as well as input into the assessment. Comments regarding the assessment issues raised by DECC are provided within *Table 2.1*.

Additional Statement of Commitments are required by DECC that relate to:

- Aboriginal cultural heritage;
- minor changes to the scope of the Construction Environmental Management Plan (CEMP) with regards noise, soil and water management;
- requirement to develop a Construction Noise Management Plan (CNMP);
- Brunswick Heads Substation; and
- requirement to develop a Soil and Water Management Plan (SWMP).

ERM and Country Energy have examined these requirements and have amended the Statement of Commitments accordingly to include all of the matters raised by DECC. An amended Statement of Commitments is provided at *Section 3.4*.

Table 2.1 Issues Raised by the Department of Environment and Climate Change

Issues raised by Department of Environment and Climate Change	Response
All disturbed areas should be revegetated using locally endemic flora species grown from local seed.	All disturbed areas will be revegetated in accordance with the Construction Environmental Management Plan (CEMP) prepared for the Project using locally endemic flora species grown from local seed.
31 Aboriginal heritage sites identified by the AHIMS search are within the project area. Given the uncertainty of the final route location, impacts and consequent management of these sites should be discussed.	A Line Route Selection (LRS) study was undertaken (provided as Annex A to the EA report) which investigated the potential for the electricity network upgrade to impact on Aboriginal heritage items or places. This report identified areas that would require further assessment as part of the EA. Detailed assessment was undertaken in areas of Aboriginal archaeological sensitivity and where ground disturbance and earthworks are proposed. Additional areas to be surveyed if ground disturbance is proposed once final line routes are identified are detailed in *Section 7.2.1* of the EA.
Detail the feasibility of relocating Suffolk Park and Brunswick Heads Substations to avoid Aboriginal Heritage impacts at both sites, and ecological impacts to the nature reserve adjacent to the proposed power line between Brunswick Heads substation and Brunswick Heads.	At this stage no Line Route Selection process has been completed for the proposed Brunswick Heads Feeder powerlines. This will be undertaken, along with a Site Selection process for the proposed new Brunswick Heads Zone Substation in due course and all potential environmental and social constraints will be considered. There are no specific known burial sites in the vicinity of the Suffolk Park Zone Substation, rather the potential for such in the general area. As a precaution a Burial Management Plan is to be prepared and if such sites are identified appropriate mitigation measures will be followed as required by the Plan.
No evidence of support by the Aboriginal community provided. This may reflect on the generalised nature of the proposal and the extended timeframes over which it is to be implemented.	All management and mitigation measures were discussed with the registered community representatives during fieldwork and the final meeting in accordance with DECC procedure. One written response was received to the report. The community's opinions and views were considered when management and mitigation measures were identified. For example Brunswick Heads grinding groove site, the community response was to excavate the site as a mechanism to teach the younger generation within the LALC. This is included in the Statement of Commitments provided in *Section 3.4*.
Consider the implications of State and Federal Native Title legislation on the project in terms of claims registered in the Byron, Ballina and Lismore City Local Government Areas by the Bundjalung and Widjabul Aboriginal Peoples.	Country Energy has complied with the EA requirements to assess impacts of the Project on Aboriginal heritage. If native title may be affected by the Project, Country Energy will comply with the applicable provisions of the *Native Title Act 1993 (Cth)*.
Provide details of Aboriginal community input	

Issues raised by Department of Environment and Climate Change	Response
into, and acceptance of, the following:	
• salvage and public interpretation of the grinding bowls and other items at the Brunswick Heads substation; and	The Aboriginal community asked for the excavation as they want to use this site to teach the young Aboriginal community members about cultural heritage. Country Energy has agreed to this request.
• the proposed reburial of any human burial sites found at the proposed Suffolk Park substation site.	Two options were presented to the Aboriginal community and the one with least potential to require reburial was preferred by the community and adopted by Country Energy.
Provide details of location, management and consultation strategy in relation to the sacred Women's site referred to in *Section 6.1* of the AHA.	No female members of the Aboriginal community were available to discuss the site. A male member stated that it was more than 2km from the impact area and that the location was to remain undisclosed. As there was no potential for impact it was considered prudent not to divulge sensitive information unnecessarily.
Provide details of potential impacts on, and management of, the known Aboriginal heritage sites along Three Chains Road.	Monitoring is included in the Statement of Commitments provided in *Section 3.4*.
The Statement of Commitments is considered inadequate to cater for the uncertainties manifest in the current EA and AHA.	An amended Statement of Commitments is provided in *Section 3.4*.
Various formatting comments made.	Noted.

Table 2.2 Issues raised by the Heritage Council of New South Wales

Issued raised by Heritage Council of New South Wales	Response
A Moveable Heritage Management plan be prepared which outlines the conservation and relocation of the buildings associated equipment, tools, control panels and signage of the Lismore Power Station, should the demolition option be chosen at this location.	Refer to the amended Statement of Commitments provided in *Section 3.4*.
Should Lismore Power Station be demolished, appropriate interpretation signage outlining the heritage significance of the site should be erected outside the station where it can be viewed by the public.	Refer to the amended Statement of Commitments provided in *Section 3.4*.
Requests that further mitigation measures for unexpected finds be considered as per the management framework in *Section 8.1* of the environment assessment report on a site by site basis once the detailed design and placement of infrastructure, such as transmission poles, has been established.	Refer to the amended Statement of Commitments provided in *Section 3.4*.

Table 2.3 Issues raised by the Roads and Traffic Authority

Issues raised by Roads and Traffic Authority	Response
Any works within a road reserve will require the approval of Council and the RTA. Detailed plans should be submitted to Council and the RTA for approval prior to work commencing.	Under Section 45 of the Electricity Supply Act 1995 Country Energy is not required to obtain Council approval for works within a road way. Council will be notified of the proposed works and given 40 days to provide a submission for consideration by Country Energy. All reasonable RTA requirements will be met.
Generally, the RTA does not allow the installation of new longitudinal services in a Freeway corridor or in sections of highway that will have potential future upgrade. The RTA would only consider such a proposal where it can be shown that there is no alternative location for an otherwise essential service.	Noted. This is currently not proposed to occur.
Where the RTA does agree to longitudinal services in its Freeway corridors a licence is entered into and the RTA charges significant annual fees. The RTA may also require an undertaking from Country Energy that it will pay any relocation expenses if such services are required to be relocated at a later date.	Noted.

2.3 RESPONSE TO THE BYRON SHIRE COUNCIL SUBMISSION

The submission from Byron Shire Council consists of three primary elements, those being:

- general assessment issues and matters to be included within any approval conditions;
- upgrade works to Skinners Shoot Road; and
- ecology.

2.3.1 General Issues

Table 2.4 General Issues Raised by Byron Shire Council.

Issues Raised by Byron Shire Council	Response
Heritage items listed in Councils *Community Based Heritage Study* within the project area should be considered in the assessment process.	The heritage assessment undertaken as part of the line route selection process (Annex A of the EA) concluded that heritage studies were only required for the Lismore and Mullumbimby Power Stations as these were the only items listed on National, State, Regional or Local heritage registers that are likely to be impacted by the proposed electricity network upgrade.
Concerns regarding the visual impacts of Suffolk Park and Brunswick Heads substations. Council requested that a condition be imposed on the applicant to submit a landscape plan for each proposed new substation to Council for approval.	The visual impacts associated within the proposed Suffolk Park substation were assessed during the site selection process undertaken by MWH, and the extensive visual impact assessment included within the EA report. Whilst Country Energy will undertake landscaping around its substation sites, it is considered that submission of the proposed landscaping plans to Council is not required and beyond Councils scope of involvement with Part 3A projects as outlined within Section 75 of the EP&A Act 1979.
Some of the proposed electricity poles are located within the 7(d) scenic escarpment zone, therefore an assessment of such structures against Clause 30 – Development within the 7(d) Scenic Escarpment Zone and Clause 31 – Development of ridge tops of the Byron Shire LEP 1988 should be undertaken.	An extensive visual impact assessment was undertaken encompassing the entire project area.
Council would support the under grounding of the power lines in the 7(d) zone and in other prominent visual locations.	As the powerlines are already an established element of the visual environment, it is considered unnecessary to undertake the costly exercise of undergrounding these lines.

Issues Raised by Byron Shire Council	Response
Recommended that more detailed information regarding the location of the substations in relation to acid sulphate soils risk areas.	Detailed investigations into the location of acid sulfate soils (ASS) within the Project area were undertaken as part of the *Lismore to Mullumbimby Electricity Network Upgrade – Line Route Options Report* (ERM, 2007). This allowed Country Energy to avoid areas with high ASS risk where possible. All work will be undertaken in accordance with the CEMP prepared for the project which will include management of ASS.
Recommended that the conditions of consent incorporate a requirement for Country Energy to submit a Section 68 application for the on site sewage management system's at each of the proposed substations.	Noted. Refer to the amended Statement of Commitments provided in *Section 3.4*.
Recommended that the applicant submit additional information relating to the construction and operational noise modelling and mitigation measures for the Suffolk Park and Brunswick Heads substations.	As outlined in *Chapter 9* of the EA the Suffolk Park and Brunswick Heads substations will meet the DECC's requirements in relation to construction and operational noise modelling.

2.3.2 Upgrade of Skinners Shoot Road

Country Energy intends to undertake some work on Skinners Shoot Road to improve access to the Suffolk Park substation site for construction traffic. Once construction of the substation is complete, Country Energy will repair any damage to the road surface caused by construction traffic. It is considered that the construction of a substation that will result in a minor increase in traffic does not warrant the full upgrade of Skinner's Shoot Road. The upgrade of this road to meet AUSROADS standards for the existing traffic is the responsibility of Byron Shire Council.

The following general statements are offered in relation to Skinners Shoot Road:

- Skinners Shoot Road is in substandard condition for the current volume of traffic. The maintenance of this road is the responsibility of Byron Shire Council. Country Energy intends to upgrade sections of Skinners Shoot Road that are inadequate to allow construction traffic access.

- Country Energy have committed to upgrading Skinners Shoot Road by regrading and resealing a section of the road between the intersection of Wentworth Street and Skinners Shoot Road and the Yagers Lane, Skinners Shoot Road intersection. Yagers Lane will be upgraded from the intersection with Skinners Shoot Road to the Suffolk Park substation access driveway. The sealed pavement will be widened from the current 3m width to 4m. Once construction of the substation is complete, Country Energy will repair any damage to the road surface caused by construction traffic.

- During operation, the substation is estimated to generate between two and six light vehicle movements per week, a negligible increase in average daily traffic movements on Skinners Shoot Road.

Table 2.5 Issues relating to the upgrade of Skinners Shoot Road raised by Byron Shire Council

Issue Raised	Response
Country Energy's consultants have provided reports as to the works required along Skinners Shoot Road and Yagers Lane to achieve their access requirements during construction. These reports do not provide specific details for Council to consider the extent of their work or the type of work to be undertaken.	The Tricend report (Volume 3, Annexure Q, Appendix C of the EA report) was commissioned to assess the quality, curvature, width and gradient of Skinners Shoot Road and Yagers Lane to provide access for a 50 tonne low loader truck. This report was prepared for submission with the EA report and is not intended to be final design plans. Upon approval of the Project, Country Energy will undertake further detailed road design investigations.
Council has been petitioned by residents in the Skinners Shoot area to ensure that the access roads to the proposed substation are upgraded to meet Austroads Standards. The proposed upgrade provided in the report falls well short of required standards, and the standard requested by the community, and Council would welcome, and support an increased standard for the road due to this development.	The upgrade of Skinner's Shoot Road to meet current standards is the responsibility of Byron Shire Council and does not form part of this EA. However, Country Energy intends to undertake some work on Skinners Shoot Road to allow access for construction traffic. Once construction is complete, the road pavement will be restored to at least pre-construction conditions. The construction of a substation that will result in a negligible increase in traffic once operational and does not warrant the full upgrade of Skinner's Shoot Road.
Traffic control plans should be assessed by Council prior to works taking place.	All traffic management/control plans will be in accordance with the CEMP prepared for the Project. Refer to the amended Statement of Commitments provided in *Section 3.4*.
The size of oversized loads/vehicles may impact on trees along these roads. The applicant will need to take into account any impact on such vegetation, particularly in light of the SEPP 14 Wetlands along Skinners Shoot Road.	No impacts from vegetation removal or disturbance will occur in the SEPP 14 wetland area on Skinners Shoot Road.
As well as the need to submit engineering plans with Council in regards to proposed works, a bond should be lodged with Council against the potential damage to roads and drainage infrastructure where such works may not be proposed.	Schedule 2, Clause 5 of the *Roads Act 1993* states the following: *"Section 138 does not require a public authority…..to obtain a roads authority's consent to the exercise of the public authority's ….functions in, on or over an unclassified road….."* The proposed works on Skinners Shoot Road and Yagers Lane are required for the sole purpose of allowing access to the Suffolk Park substation site for construction and delivery vehicles. This enables Country Energy (a public authority) to carry out their function, which is to provide a safe and reliable electricity supply to the region. Furthermore, both Skinners Shoot Road and Yagers Lane are unclassified roads. Therefore approval under Section 138 of the *Roads Act 1993* is not required for the proposed upgrade of these roads. In accordance with Section 45 of the *Electricity*

Issue Raised	Response
	Supply Act 1995 Country Energy will notify Council of the proposed works and allow 40 days for Council to make a submission in relation to the work (refer to *Section 3.4*). The requirement to repair any damage to roads and drainage infrastructure is covered within the scope of Statement of Commitments (refer to *Section 3.4*).
Traffic Control Plans should be prepared and implemented by suitably qualified persons for the duration of works.	Traffic Control Plans are to be developed and appropriately implemented as part of the CEMP.
During all works across the shire, access by local residents must be maintained at all times. Temporary road closures for the provision of works should be considered as a last resort.	Traffic Control Plans are to be developed and appropriately implemented as part of the CEMP.

2.3.3 Ecology

Council's submission included a comprehensive assessment of the ecological survey carried out within the scope of the Environmental Assessment report. The following conclusion was reached by Council:

"The ecological assessment cannot be considered adequate for the consent authority to determine the potential impacts of the electricity network upgrade as the:

- *Threatened Species Assessment is incomplete;*
- *Habitat Assessment and Mapping (including vegetation) lacks detail; and*
- *Absence of fauna survey and associated results limits impact assessment capabilities.*

The ecological assessment would be improved if NSW DEC & DPI (2005) guidelines were used as recommended by the DGR. Incorporating the methods and format of NSW DEC (2004) would also improve the ecological assessment."

The EA report was twice submitted to the Department of Planning for adequacy assessment in accordance with s75H(1) of the EP&A Act. Advice was received from the DoP that the EA report had been prepared in accordance with the EA requirements and thus was deemed to be adequate and able to be exhibited. ERM considers the view of Council conflicts with advice provided by the DoP and thus is not prepared to undertake additional surveys and impact assessments. Additional comments regarding Council's submission are provided below.

Table 2.6 Ecological issues raised by Byron Shire Council

Issue Raised	Response
The ecological assessment is deficient in the thoroughness of the field assessment, and the level of detail of the assessment results. Field surveys were conducted over only 4 days that included the entire proposed route of the transmission line (c110km) and the location of substations and the survey methods do not conform to those specified by NSW DEC (2004) or NSW DEC & DPI (2005).	The majority of the route is along the existing cleared transmission line easement and therefore vegetation disturbance will be minimal. ERM completed a LRS report which included desktop and preliminary ecological investigations prior to conducting field assessment and reporting for the final EA. The LRS report identified a number of 'hotspot' areas that required further detailed investigation where deviations from the existing electricity line route easement were proposed and areas where vegetation removal may be required. These areas were the subject of assessment during the final preparation of the EA. Additional assessment will be undertaken for the proposed Brunswick Heads Feeder Loop and Zone Substation.
Issues with the information provided in relation to ecology field work and sampling.	The LRS Report identified a number of 'hotspot' areas that required further detailed ecological investigation. These areas are indicated in the LRS report and were the focus of further field and desktop assessment and reporting for the final EA.
Lack of quantitative fauna survey and the fauna assessment is inadequate.	Surveys concentrated on areas that were identified in the LRS as 'hotspot' areas and were aimed at assessing potential impacts resulting from the proposed upgrade. A habitat assessment of threatened species previously recorded within a 10km radius of the proposed route was conducted. Assessments of Significance (7-part tests) were also conducted in accordance with the *Threatened Species Conservation Act 1995* for any species that was considered to have a moderate likelihood of utilising available habitat within the project area.
Vegetation descriptions inadequate.	Vegetation along the proposed route is described in general terms with greater description given to areas of vegetation identified as 'hotspots' in the LRS report. Description of these areas includes an assessment of the condition of the vegetation and dominant flora species present. A list of flora species recorded within the project area is provided as Annex A of the ecological assessment.
Simplistic habitat assessment, lack of fauna survey and lack of detail on spatial distribution of vegetation types.	Mapping of EECs identified within the project area are provided in the EA. Vegetation mapping of all communities was also provided in Annex A of the EA as part of the LRS Report. Surveys were undertaken in areas for new alignments and for the new substation at Suffolk Park.
A more complete assessment of impacts of the project is required prior to development	Further site selection and assessment of the proposed Brunswick Heads substation will

Issue Raised	Response
consent being granted, particularly at Brunswick Heads, Suffolk Park, Ewingsdale and Mullumbimby substation sites.	be undertaken. A detailed assessment was undertaken by MWH Australia Pty Ltd for the proposed Suffolk Park substation. The Ewingsdale substation has also undergone a separate assessment and approval under Part 4 of the EP&A Act was received from Byron Shire Council. Construction is near completion. No ecological issues were identified at the Mullumbimby and Lismore Zone Substation sites in the LRS Report.
Concerns regarding the number of 5A assessments for the threatened flora and fauna in the area (not as many as Council expected).	A habitat assessment of threatened species that had previously been recorded within a 10km radius of the project area was conducted to determine the likelihood of threatened species utilising or inhabiting the project area. This habitat assessment involved comparing known habitat requirements for each species with habitat features identified within in the project area. Assessments of significance (7-part tests) were then conducted for those species considered having a moderate-high likelihood of utilising or inhabiting the site to determine whether the proposal would be likely to significantly impact these species. Threatened species records were obtained from the Department of Environment and Climate Change (DECC) Atlas of NSW Wildlife database. Threatened species identified from the Department of Environment, Water, Heritage and the Arts (DEWHA) Online Search Tool for MNES as having the potential to occur within a 10km radius of the project area were also included in the habitat assessment.
Concerns over underestimating the role of Camphor Laurel in the conservation of threatened flora and fauna.	All areas of vegetation along the proposed route were considered during the habitat assessment to determine the likelihood of threatened species utilising or inhabiting the project area. This included consideration of remnant rainforest vegetation including those areas dominated by Camphor Laurel.
Concerns regarding the management of vegetation within and surrounding the power line corridor.	All vegetation within electricity easements will be maintained in accordance with Country Energy's *Vegetation Management Plan*.

2.4 RESPONSE TO SUBMISSIONS FROM INCORPORATED BODIES

2.4.1 Friends of the Koala Inc

A submission was received from the Friends of Koala Inc.

Table 2.7 Issues raised by Friends of the Koala Inc.

Issues raised by Friends of the Koala Inc.	Response
Questioned why detailed ecological investigations have not been undertaken for the proposed new work at Brunswick Heads and Lismore.	Project approval is not being sought for the Mullumbimby to Brunswick Heads element of the upgrade project. Concept approval only has been applied for, and further detailed assessment may be required. The final route of Line No. 85616 in the south Lismore area has been subject to ongoing landholder negotiation and impact assessment. This line has been included within the preferred project element of this report (refer to *Chapter 3*).
Confusion with the vegetation mapping being used as the basis for vegetation mapping in the EA.	ERM is not aware of the particular area being referred to and without this information cannot comment. Vegetation mapping used during the assessment was obtained directly from the Byron Shire, Ballina Shire and Lismore City Councils. Ground-truthing of vegetation communities was conducted in the field.
Disagree with Lismore City Council's analysis of vegetation types in some areas of the line.	Data from Lismore City Council was used for the purposes of undertaking preliminary desktop assessment prior to ecological field works being undertaken. Field investigations included ground truthing and describing the vegetation in accordance with the provisions of the *Threatened Species Conservation Act 1995* and other relevant legislation.
The approach that has been undertaken to assess the presence of Koala feed tree species listed under SEPP 44 across the entire Project Area may underestimate the likely impact of the proposal on Koala populations. In particular, relevant feed trees may well be sufficient in numbers, so that areas within the Project Area do constitute potential or core Koala habitat and would thus require a Koala Plan of Management.	Under SEPP 44, a Koala Plan of Management is required where a site is defined as "core" Koala habitat. Although feed tree species listed under SEPP 44 were recorded, the project area was not considered to be "core" or "potential" Koala habitat as these trees did not constitute greater than 15% of the total number of trees in the upper or lower strata of the tree component. The Project Area comprises the proposed electricity route which predominantly followed existing electricity easements currently maintained in accordance with the *Electricity Supply Act 1995*.
Points out that the adequacy of the SEPP's biological basis is questionable in the light of the somewhat arbitrary selection of feed tree species scheduled and it is an over simplified approach to what constitutes Koala habitat.	Assessment can only be undertaken in accordance with the provisions of SEPP 44 as requested by the DoP within the EA requirements of the Director General. The matter of the contents and legitimacy of SEPP 44 is a separate matter for the submitter to raise with the DoP.

Issues raised by Friends of the Koala Inc.	Response
Require further detailed assessment of the proposed 66kV electricity supply line 8516 including an assessment under SEPP 44. Formally request that the proposal be placed on further public exhibition once these assessments have been completed.	Further assessment of the proposed line has been undertaken and is included within the preferred project section of this report.

2.5 *RESPONSE TO PUBLIC SUBMISSIONS*

During the exhibition period, a number of submissions were received from residents. For the purposes of this submissions report, these have been separated into two groups, Skinners Shoot Road residents and the remainder of the community along the route.

2.5.1 *Skinners Shoot Road Community Issues*

Issues relating to Skinners Shoot Road

All of the submissions from residents within the Skinners Shoot Road area contained requests to undertake a full upgrade of the road in accordance with AUSTROADS standards. Whilst the issue of the road has been addressed previously within *Section 2.3*, a summary of the comments raised in the submissions have been addressed below.

Table 2.8 Issues raised by Residents of the Skinners Shoot Road community relating to the upgrade of the road

Issues Raised	Response
Only support the location of the chosen site for the Suffolk Park zone substation if there is a net benefit to the community, that being the upgrade of Skinners Shoot Road to AUSTROADS rural road design standard.	The upgrade of Skinners Shoot Road is the responsibility of Byron Shire Council not Country Energy. Certain sections of the road will be improved to allow access by construction vehicles. This will result in a net benefit to the community as the width of the sealed road will be increased from 3m to 4m.
The EA report states that no residents want an upgrade of Skinners Shoot Road. This is a glaring error and is a product of no community consultations.	The EA report <u>does not</u> state that "no residents want an upgrade of Skinners Shoot Road". Significant community consultation was undertaken by Country Energy prior to and during the preparation of the EA. This took the form of: • 3 community newsletters; • press releases; • a question and answer leaflet; • a technical leaflet; • free call 1800 number; • meetings with directly affected landholders; and • community drop-in days. As stated above, the upgrade of Skinners Shoot Road is the responsibility of Byron Shire

Issues Raised	Response
	Council.
The Tricend report is a total whitewash and substandard in its engineering requirements. This report needs to be readdressed with current and relevant information about Skinners Shoot Road.	The Tricend report is not intended to be a detailed engineering report. It was produced to guide DoP decision making during the assessment of the Project application. Detailed engineering designs will be prepared once Project approval has been granted.
The majority of the budget for road upgrades related to this project should not be spent on Yagers Lane which only services 4 properties.	Yagers Lane will be upgraded to allow low loaders to access the proposed substation site, as is the case with Skinners Shoot Road. The number of residences along these roads has no implication on the level of work to be undertaken by Country Energy.

Issues relating to the line route selection

Many of the submissions disagree with the line route selection proposed for the Skinners Shoot area. A number of additional options have been put forward including undergrounding of the line between Skinners Shoot and Ewingsdale substations, relocation and undergrounding of the line through certain properties, as well as a substantial realignment through road reserves. Country Energy is confident that the option chosen for the Skinners Shoot area is the route with least environmental impact and presents the most economically rational design as outlined within the Line Route Selection Report provided as *Annex A* to the EA report.

A summary of the comments regarding the line route selection process and preferred route are addressed below.

Table 2.9 Issues raised by the Skinners Shoot Road community relating to the line route selection

Issue Raised	Response
Disagrees with the preferred transmission line route identified within the ERM report. Reasons for disagreeing and rejecting the proposed overhead route in this hotspot area include:	
• inadequate and flawed community consultation process;	A two level community consultation program was undertaken. The first level provided details about the project to the community. Individual landholders were consulted regarding easement negotiations as a second level.
• lack of detailed ecological investigations; • lack of rigor in the ecological assessment;	The level of detail and "rigor" in the ecological investigations and impact assessment was twice confirmed as acceptable by the DoP through the adequacy review process.
• lack of detail in the economic and social impact assessment; • lack of any detailed economic costing on the provider;	The EA requirements issued by the Director General did not require a detailed economic and social impact assessment be undertaken, however these were considered during the line route selection process.
• lack of any detailed visual impact	The level of detail within the visual impact

Issue Raised	Response
assessment; and	assessment was twice confirmed as acceptable by the DoP through the adequacy review process; and
• lack of any bushfire management and evacuation plan.	Country Energy has responsibilities under the provisions of the *Rural Fires Act 1997* which will be implemented through the CEMP and the life of the power lines.
Recommends that the proposed underground section of the new transmission line be extended.	The underground section of the transmission line in question will not be extended due to the significant additional cost associated with this.
Recommends that the proposed underground section of the transmission line be extended through this identified 'hotspot' so as to:	
• reduce bush fire risk, including any flow on litigation risk resulting from a bushfire;	There are above ground power lines throughout the state that are managed to minimize the risk for bushfire. It is considered that this area does not require different management to any other area.
• maintain the ecology of the area;	The option preferred by Country Energy utilizes an existing easement and does not require any native vegetation to be removed therefore ecological impacts are minimised.
• improve the economic viability of the proposed Byron Shire Council approved shop;	The existing pole on the shop site will not impact on the viability of the approved shop.
• improve the visual amenity of the 'hotspot' area particularly as seen from nearby residences and the proposed shop; and	Electricity infrastructure is an established element of the landscape and although undergrounding the lines has the potential to reduce visual impacts; it is considered an unjustifiably expensive exercise. In addition, the presence of acid sulphate soils within the area also presents difficulties in the placement of this line underground.
• support the economic and social development, public health and wellbeing and identity of the community of Skinners Shoot.	The provision of costly underground electricity lines will not aid in the economic or social development of the Skinners Shoot area. The potential health and wellbeing impacts associated with the project have been considered within the EA. Country Energy will adopt a 'prudent avoidance' approach with regards to EMF, in accordance with ESAA.
Landholders along Raywards Lane are seeking an extension of the 11kV line to properties presently not connected to the electricity network.	This Project Approval relates only to the 132kV and 66kV elements of the network. Any connections and extensions of the 11kV network would be subject to separate negotiations between the landholders and Country Energy.

Issues relating to the amount of public consultation undertaken

A number of the submissions received have criticized the level of public consultation that was undertaken during the preparation of the EA report. This was a two stage process; one stage undertaken by ERM aimed at providing information to individual stakeholders and the wider public, and a the other undertaken by Right of Way Services liaising directly with affected property owners and where required easement negotiations. The following general comments are provided in relation to the level of community consultation undertaken:

- there are 82 property holders in the section of line 8508 C – D, including the Skinners Shoot community at one end of this section, all of whom have been consulted personally on multiple occasions;
- offers to meet with the Skinners Shoot Residents Group have been extended verbally and in writing (6 January 2009) to the representatives of this group but were not taken up;
- there has been ongoing liaison with those identifying themselves as representatives of the Skinners Shoot Residents Group, totalling more than 50 contact events;
- three Project newsletters and numerous Skinners Shoot area specific personal letters have been distributed to the community; and
- one public display and information session was undertaken. This was promoted by public advertisement, personal phone invitations and personal correspondence and was attended by many people from the Skinners Shoot area including the groups identified representative.

Table 2.10 Issues raised by the Skinners Shoot Road community relating to the level of community consultation undertaken

Issues Raised	Response
An inadequate and flawed community consultation process when assessed against "Ideas for Community Consultation – A Discussion on Principles and Procedures for Making Consultation Work".	The EA requirements issued by the Director General did not require that this document be followed however it is considered that the level of public consultation undertaken is appropriate.
The lack of community consultation has led to the opinion that residents do not want Skinners Shoot Road upgraded.	A substantial community consultation plan was put into practice as outlined in *Table 2.9*.
There has been no community consultation with the Skinners Shoot Resident Group (the community) on the upgrade proposal from either Country Energy or Right of Way.	Refer to comments above this Table with regard to consultation with the Skinners Shoot Residents Group.
Lack of information and presentation concerns regarding Volume 2 Section C. It does not make reference to any community or stakeholders in any discernable form or document any petitions or opposition or support.	The information in *Volume 2 - Annex C* was provided as an example of what was used throughout the consultation process for the wider Project as discussed in *Section 1.8.1* of the EA report. ERM and Country Energy have maintained detailed consultation records throughout all stages of the community consultation process for the Project. This

Issues Raised	Response
	information can be provided on request.
The Community Consultation section is flawed because it is impossible for the lay person to decipher. It is impossible to attribute any meaning from it as a Country Energy document imparting information from the affected communities. Sections C and D are therefore derelict in showing clear outcomes of the community consultation process and needs to be readdressed as a matter of urgency.	*Section 1.8.1* of the EA details the community consultation undertaken during the preparation of the EA. Detailed consultation records and materials can be provided on request.

2.5.2 Issues raised by the remainder of the community along the line

Submissions were also received from members of the public residing outside of the Skinners Shoot area. These generally related to site specific issues such as substation noise, protection of trees and impacts on amenity and property value.

Table 2.11 Issues Raised by the General Community

Issues Raised	Response
Undergrounding of line through Ewingsdale may kill some established trees and a new route at the back of the property is suggested.	Impacts of transmission line installation on tree roots will be considered and managed to minimise impacts to established vegetation.
Concerns over the impact of the easement on the property (459-515 Skyline Road, Goonellabah). Requests that the existing electricity power line running through the property be relocated along an unformed Crown Road.	Country Energy is satisfied that the route chosen in this area presents the most economically, socially and environmentally sound option as detailed within the line route selection report.
Concerned that the encumbrance of an easement will severely limit any future plans for subdivision – keeping in mind that the property (459–515 Skyline Road, Goonellabah) is only eight kilometres from the Lismore CBD post office and five kilometres from Goonellabah Schools.	The property described is not within any identified urban growth areas as assessed within Chapter 4 of the EA report, therefore it is unreasonable to realign the route based on highly speculative future land use patterns.
Concern that upgrade of the substation at Laverty's Gap will exacerbate an already undesirable acoustic impact and urges Country Energy to employ sufficient and genuine noise mitigation measures at the source.	As detailed within Chapter 9 of the EA report, it is considered that with the implementation of appropriate mitigation measures, all noise impacts associated with new and upgraded substations will be able to be effectively minimized.
Owners of properties adjacent to the Alstonville Zone Substation believe that the routing of the new 132kV line around the substation and across two properties is unreasonable and will cause: • loss of amenity; • loss of property values; and • restrictions on land use under and adjacent to the line, including impacting on the water source of one property.	Most of the proposed works near the Alstonville substation are within a Country Energy easement. Country Energy has considered realignment of the network in this area but it is not economically viable. Instead, Country Energy considers that removing poles near the road way and placing the 11kV infrastructure underground is a better outcome for the whole community in terms of road safety. The local council has also indicated that this will allow them to upgrade Wardell Road, further increasing the road safety in this locality. The realignment of the 132kV line will not significantly impact on the land use of affected

Issues Raised	Response
	properties. The main restriction is the type of vegetation permitted within the easement. Country Energy has had discussions with the landholder that was concerned about their single water source being affected and an agreement has been reached that will not impact on this water source.

3 PREFERRED PROJECT

3.1 INTRODUCTION

Country Energy has considered the submissions received during the exhibition period and has made modifications to the Project and the statement of commitments.

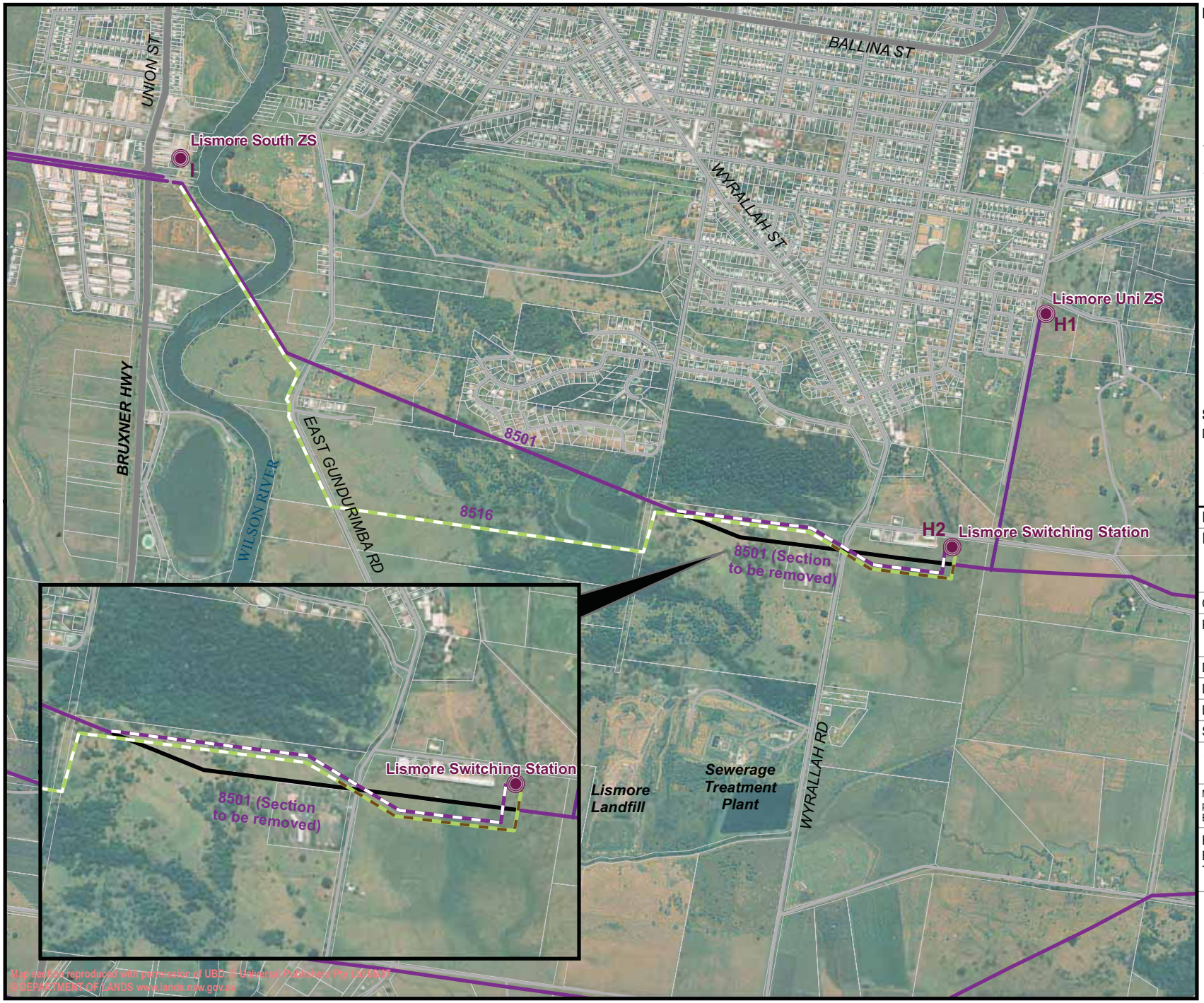
An approval is sought for the concept and project application as exhibited from 4 February 2009 to 6 March 2009 with the modifications set out in *Sections 3.2*.

3.2 PROJECT MODIFICATIONS

3.2.1 Modifications to 66kV Line Route

Following landowner negotiations it is proposed that the route of the 66kV line between Lismore South 66/11kV substation to the Lismore 66kV switching station be modified as illustrated on *Figure 3.1*.

The modification includes the relocation of 8501 and construction of the new line 8516 along the northern boundary of Lot 2 DP 587430. The modification will reduce the potential impacts of the proposal on a proposed new dwelling site on the property. The revision will have no adverse visual impact, and a supplementary ecology and heritage assessments indicate there will be no adverse impacts (refer to *Annex A* and *B*).



Legend

- Substation
- Confirmed 8501 Realignment
- Confirmed Underground
- Confirmed Overhead
- 8501 Section to be Removed
- Existing 66 kV
- Roadway
- Cadastral Boundaries

Source:
Department of Lands

Figure 3.1
Line 8501 and 8516 Routes

Client:	Country Energy	
Project:	Lismore to Mullumbimby Upgrade	
Drawing No:	0051706pm	
Date:	04/05/2009	Drawing size: A4
Drawn by:	TH	Reviewed by: MC
Scale:	Refer to Scale Bar	

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3.3 PROJECT SUMMARY

Country Energy is specifically seeking Concept Approval for:

1. Upgrade, including any necessary realignments or deviations of transmission lines:

    a. Mullumbimby to Ballina - 66kV power line from the Mullumbimby substation to the Ballina substation, to 132 kV; and

    b. Ballina to Alstonville - 66kV power line from the Ballina substation to join to the new 132kV Lismore/Alstonville transmission line, to 132kV.

2. Construction of new transmission lines:

    a. Brunswick Heads feeder loop - 132kV transmission line from the Mullumbimby to Ewingsdale transmission line to the Brunswick Heads substation;

    b. Lismore to Alstonville - 132kV transmission line from the Lismore 132kV bulk supply point (BSP) substation to join to the upgraded Alstonville to Ballina 132kV transmission line near Alstonville;

    c. 66kV power line from Lismore South 66/11kV substation to the Lismore 66kV switching station; and

    d. two underground 66kV power lines from Lismore bulk supply point substation to Lismore South substation.

3. Construction of new substations:

    a. 132/11kV substation at Brunswick Heads (the Brunswick Heads substation); and

    b. 132/11kV substation at Suffolk Park (the Suffolk Park substation).

4. Upgrade of substations:

    a. Mullumbimby 132/66/11kV substation (Mullumbimby substation) to 132/11kV;

    b. Ewingsdale 66/11kV substation (Ewingsdale substation) to 132/11kV;

    c. Lennox Head 66/11kV substation (Lennox Head substation) to 132/11kV;

    d. Ballina 66/11kV substation (Ballina substation) to 132/66/11kV;

    e. Lismore 132/66/11kV bulk supply point (Lismore substation); and

f. Lismore South 66/11kV substation (Lismore South substation).

Country Energy is seeking Concept Approval for the Project and concurrently seeking Project Approval for all project components other than 2a and 3a. It is acknowledged that the Brunswick Heads substation and feeder loop require additional site selection and environmental assessment. Country Energy seeks to complete these assessments and consider the environmental impacts through Country Energy's established environmental assessment process.

3.4 REVISED STATEMENT OF COMMITMENTS

Country Energy is committed to minimising the potential for environmental impacts from the proposed development. After consideration of the submissions received during the exhibition period, approval is sought for the revised statement of commitments.

Item Number	Item	Commitment	Responsibility	Timing
		Overall Project Commitments		
1	Scope of Development	The development will be carried out generally in accordance with Environmental Assessment Report (EAR), prepared by ERM, September 2008 and supporting reports, except where amended by other items of this Statement of Commitments.	Country Energy	For the duration of the Project.
2	Community Consultation	• Prior to the commencement of construction, Country Energy must institute, publicise and list with a telephone company a 24 hour toll free complaints contact telephone number, which would enable any member of the general public to reach a person who can arrange an appropriate response action to the complaint. • All directly affected landowners and occupiers must be consulted regarding the Project. Consultation must address, but not be limited to, final pole locations, construction activities and mitigation measures that may affect workings of properties and timing of such activities to minimise disruption; proposed site accesses; landscaping measures; and the nature and timing of maintenance activities. All reasonable and feasible requests from directly affected landowners must be taken into consideration and records of consultation must be maintained, and these records must be made available to the Director-General on request.	Country Energy	Prior to commencement of construction & ongoing during the construction phase of the Project.

3	Environmental Management Plan - Construction	• Prior to the commencement of construction a Construction Environmental Management Plan (CEMP) will be prepared.
		• The CEMP document must, but is not limited to:
		  • Address construction activities associated with all key construction sites, including staging and timing of the proposed works.
		  • Describe management measures to be implemented in respect of key environmental elements.
		  • Cover specific environmental management objectives and strategies for environmental system elements including, but not limited to: water quality; noise and vibration; air quality; erosion and sedimentation; access roads; construction access and traffic; heritage and archaeology; acid sulphate soils; contamination; waste management; flora and fauna; weed control; rehabilitation; refuelling and fuel storage areas; energy use, resource use and recycling; and utilities.
			Country Energy	Prior to commencement of construction.

Item Number	Item	Commitment	Responsibility	Timing
		• address, but not be limited to: ○ Identification of the statutory and other obligations which Country Energy is required to fulfil during project construction, including all approvals and consultations/agreements required from other authorities and stakeholders, and key legislation and policies which control Country Energy's construction of the project. ○ Definition of the role, responsibility, authority, accountability and reporting of personnel relevant to compliance with the EMP. ○ Measures to avoid and/or control the occurrence of environmental impacts. ○ Measures (where practicable and cost-effective) to provide positive environmental offsets to unavoidable environmental impacts. ○ Strategies (where reasonable and feasible) for reducing exposure of residences or sensitive receivers to electric and magnetic fields. ○ Environmental management procedures for all construction processes which are important for the quality of the environment in respect of permanent and/or temporary works. ○ Environmental management instructions for all complex environmental control processes which do not follow common practice or where the absence of such instructions could be potentially detrimental to the environment. ○ Monitoring, inspection and test plans for all activities and environmental qualities which are important to the environmental management of the project. ○ Consultation requirements with relevant government agencies. ○ Community consultation and notification strategy (including local community, Local Aboriginal Land Councils, relevant government agencies, and Council), and complaint handling procedures. The CEMP will incorporate the management measures identified elsewhere within this Statement of Commitments.		
4	Ecology	• No additional vegetation removal or land disturbance is to be undertaken within the SEPP 14 wetland areas, including the existing transmission line corridor and the road corridor at Skinner Shoot.	Country Energy	Prior to commencement of construction & ongoing during the

Item Number	Item	Commitment	Responsibility	Timing
		• Disturbance/removal of existing native vegetation and potential fauna habitat will be minimised where possible. • Pre-clearance fauna surveys will be undertaken in areas where potential fauna habitat is identified and where removal is required. • A detailed ecological assessment of the proposed new 66kV line 8516 between Lismore South and Lismore Switching Station will be undertaken including assessment under SEPP 44. Prior to construction commencing a Construction Environmental Management Plan (CEMP) will be prepared which will include the following: • Erosion and sediment control measures in accordance with Country Energy's *CEM 7022 Environmental Operations Manual* will be put in place whilst tree clearing is being undertaken. • The spread of weeds will be prevented in accordance with Country Energy's *CEM 7022 Environmental Operations Manual, CEM7022.07: Land Use and Animal Diseases* and the requirements of the *Noxious Weeds Act 1993.* • Protection barriers will be constructed around areas of vegetation near the existing route to prevent potential damage. • Professional advice from an Arborist will be sought in instances where there is potential for root damage to native trees. • Works will be staged to avoid disturbance to threatened fauna that may potentially inhabit the area during their breeding season (e.g. Koala).		construction phase of the Project.
5	Aboriginal Heritage	• If ground disturbance or vegetation removal is proposed outside existing power line corridors in any sensitive areas identified in *Section 6.1.2* and illustrated in on *Figures 6.1 to 6.3* of the Aboriginal Heritage Assessment (*Annex I*), archaeological surveys and further assessment should be completed. • Any works that result in the disturbance of the ground surface, such as excavation for new transmission line poles, removal of vegetation or trenching, should be monitored by LALC representatives and other interested parties between the Lismore BSP substation south to the existing Alstonville zone substation. • In the unlikely event of sub-surface construction disturbing archaeological relics	Country Energy	Prior to commencement of construction & ongoing during the construction phase of the Project.

Item Number	Item	Commitment	Responsibility	Timing
		(any deposit, object or material evidence which relates to the settlement of the area that comprises NSW, not being Aboriginal settlement which is 50 or more years old) all work likely to affect the site(s) will cease immediately and, in accordance with section 146(a) of the *Heritage Act (NSW) 1977,* the Applicant will ensure the Heritage Council of NSW is notified within a reasonable time of the discovery or location of any relics. Written notification should be forwarded unless the Applicant believes on reasonable grounds that the Heritage Council of NSW is aware of the location of the relic. Prior to construction commencing a Construction Environmental Management Plan (CEMP) will be prepared which will include the following: • Cultural Heritage Induction to be carried out for site supervisors prior to construction which explains procedures to be followed in the event that Aboriginal archaeological sites are uncovered. A Site Contractors Heritage Handbook summarising key heritage issues and recommendations and providing contact details for archaeologists and LALC's may be issued during the Cultural Heritage Induction.		

6	Noise	Prior to construction commencing a Construction Environmental Management Plan (CEMP) will be prepared which will include the following:
		• Residents in the vicinity of noisy construction works are to be informed that work is to take place and is likely to generate some noise.
		• All construction activities will be restricted to the hours of 7:00am and 6:00pm Monday to Friday, 8:00am to 1:00pm Saturdays and at no time on Sundays or Public Holidays except:
		  • any works which do not cause emissions to be audible at any nearby residential property;
		  • the delivery of materials which is required outside these hours as requested by police or other authorities for safety reasons;
		  • emergency work to avoid the loss of lives, property and/or to prevent environmental harm; and
		  • any other work as agreed through negotiations between Country Energy and
			Country Energy	Prior to commencement of construction & ongoing during the construction phase of the Project.

Item Number	Item	Commitment	Responsibility	Timing
		potentially affected noise receivers. • Construction in close proximity to residences be completed in as short a time frame as possible; • Where practical, pushing topsoil or fill to form earth mounds between the construction site and residences; • Where possible barriers should be placed nearest to plant equipment to maximise barrier attenuation; • Maximise the offset distance between noisy plant items and nearby noise sensitive receivers; • Avoiding any coincidence of noisy plant working together in close proximity simultaneously adjacent to sensitive receivers; • Minimising the occurrence of consecutive or ongoing out of hours works in the same locality; • Orienting noisy plant or equipment away from sensitive areas; • Carrying out loading and unloading away from noise sensitive areas, if loading near sensitive receiver's acoustic enclosures or barriers of a suitable height is constructed to minimise the noise impacts; • Should blasting be required, specific assessment should be undertaken regarding impacts to any nearby residences • Compliance attended noise monitoring of construction noise levels throughout specific relevant stages of the project (i.e. substation construction) to quantify potential impact at the most sensitive residences; and • The contractor must take reasonable steps to manage and control noise from all plant and equipment. Examples of appropriate noise management and control may include installation of acoustic silencers, low noise mufflers and alternatives to reversing alarms.		
7	Visual Amenity	• Green transmission poles and communication tower poles will be installed in visually sensitive areas where a vegetation backdrop is present. • The visual impacts of the new substation at Brunswick Heads will be fully assessed	Country Energy	Prior to commencement of construction.

Item Number	Item	Commitment	Responsibility	Timing
		and mitigation measures, as deemed necessary, will be included in the final designs. • A detailed Landscape Plan will be developed for the Ballina zone substation upon finalisation of the substation upgrade design.		
8	Electric and Magnetic Fields (EMF)	• The Project will be undertaken in accordance with the Energy Networks Association *Policy Statement on Electric and Magnetic Fields (EMFs)* (2006) which is adopted by Country Energy.	Country Energy	Prior to commencement of construction.
9	Waste	Prior to construction commencing a Construction Environmental Management Plan (CEMP) will be prepared which will include the following: • The management of all general and construction waste will be undertaken in accordance with Country Energy *CEM 7022 Environmental Operations Manual.* • All wastes will be classified, stored and disposed in accordance with the NSW DECC (2008) *Waste Classification Guidelines*. • Opportunities for waste reduction and the beneficial reuse of materials will be identified in accordance with Country Energy's obligations with regard to the *Waste Avoidance and Resource Recovery Act 2001*. This will also include the appropriate segregation of materials for recycling to divert such material from the general waste stream. • Where possible, grass and topsoil will be set aside and reused to establish groundcover to reduce the potential for erosion. • Vegetation removal will be undertaken in accordance with Country Energy's *CEM 7022 Environmental Operations Manual.* Where possible removed vegetation will be mulched and reuse for site stabilisation and/or landscaping purposes. • Materials deemed unsuitable for in-situ reuse will be appropriately stored, disposed or recycled off-site. • If contaminated materials are encountered during construction work will stop until such time as the material can be classified and/or appropriate waste management measures put in place. • No on-site maintenance of construction equipment will be done unless disposal of	Country Energy	Prior to commencement of construction & ongoing during the construction phase of the Project.

Item Number	Item	Commitment	Responsibility	Timing
		any wastes generated is undertaken. • Staff amenities will be serviced by a licensed liquid waste contractor as required. • At substations, skip bins or other containers will be used on-site for the collection of general waste. An appropriately licensed waste contractor will collect the waste. • In the event of any oil waste occurring on-site, this will be collected and transported to the nearest oil recycling facility. Prior to commencement of construction of the Suffolk Park zone substation an on-site waste water treatment system will be designed and implemented in accordance with AS 1547-2000 and any requirements of Byron Shire Council.		
10	Climate Change	Prior to construction commencing a Construction Environmental Management Plan (CEMP) will be prepared which will include the following: • Vehicles and machinery will be maintained in accordance with manufacturer's requirements and regularly serviced to ensure optimal performance. • All machinery noted to be producing excessive emissions will be stood down for maintenance. Where practical, vehicles and machinery not in use will be turned off.	Country Energy	Prior to commencement of construction and during the construction phase of the Project.
11	Traffic Management	• Prior to construction commencing a Construction Environmental Management Plan (CEMP) will be prepared which will identify all accesses required to undertake the Project and the key safety and traffic control and mitigation measures that will be applied to minimise disruption and ensure that public safety and adequate access are maintained. Country Energy will be responsible for minimising any disruption to services resulting from the Project and will be responsible for advising local residents and businesses on disruption to services.	Country Energy	Prior to commencement of construction & ongoing during the construction phase of the Project.

Item Number	Item	Commitment	Responsibility	Timing
		Site Specific Commitments		
12	Brunswick Heads Substation	Further archaeological investigation will be undertaken at the Brunswick Heads Substation site prior to construction commencing. While a Section 87 permit is not required for a Part 3A Project, the investigation will be undertaken to the usual standards required for a Section 87 permit. All clearing and earthworks will be monitored by LALC representatives at this site.	Country Energy	Prior to construction commencing.
13	Mullumbimby Power Station	• Upgrade works will not directly impact on the heritage listed power station. • Preparation of an archival recording in accordance with NSW Heritage Branch guidelines of the power station building and its associated machinery and equipment will be undertaken. Copies of the archival recording will be lodged with the Brunswick Valley Historical Society, State Library of NSW and the NSW Heritage Branch. A green coloured pole will be used for new transmission poles and the proposed communications tower to minimise the visual impact against the vegetated backdrop.	Country Energy	Ongoing during the construction phase of the Project.

Item Number	Item	Commitment	Responsibility	Timing
14	Suffolk Park Substation	• An Aboriginal heritage Burial Management Plan will be prepared and implemented prior to the commencement of works at the Suffolk Park Substation site and all clearing and earth works will be monitored by LALC representatives at this site; • Country Energy will undertake further road design investigations to produce plans for the upgrade of Skinners Shoot Road and Yagers Lane. The upgrade will be of the nature described in the following paragraph. Plans will be provided to Byron Shire Council for their review and, in accordance with Section 45 of the *Electricity Supply Act 1995*, Council will be given 40 days to provide a written submission to Country Energy regarding the proposed works. A section of Skinners Shoot Road, between the intersection of Wentworth Street and Skinners Shoot Road and the Yagers Lane/Skinners Shoot Road intersection will be regraded and resealed. Yagers Lane will be upgraded from the intersection with Skinners Shoot Road to the Suffolk Park substation access driveway. The sealed pavement on both roads will be widened from the current 3m width to 4m. Once construction of the substation is complete, Country Energy will repair any damage to the road surface caused by construction traffic.	Country Energy	Prior to commencement of construction.
15	Ballina Substation	• The final noise mitigation options included in the detailed design phase will be modelled by a suitably qualified acoustical consultant to confirm the substation once operational is predicted to meet relevant DECC noise criteria. • Post construction noise monitoring will be undertaken by a suitably qualified acoustic consultant confirming noise levels actually generated by the upgraded substation. The consultants report will recommend any necessary additional amelioration measures to be carried out. • Once commissioned a noise compliance monitoring report will be prepared by a suitably qualified acoustic consultant confirming noise levels generated by the upgraded substation comply with DECC's *Industrial Noise Policy* (2000).	Country Energy	Prior to commencement of construction.

Item Number	Item	Commitment	Responsibility	Timing
16	Lismore Substation	If the Lismore Power Station is to be demolished: • A Moveable Heritage Management Plan will be prepared outlining the conservation and relocation of the buildings associated equipment, tools, control panels and signage; and • Appropriate interpretation signage outlining the heritage significance of the site will be erected outside the station where it can be viewed by the public.	Country Energy	Prior to commencement of demolition and any construction works.

Annex A

Archaeology Assessment

FINAL REPORT

Country Energy

Lismore to Mullumbimby Electricity Network Upgrade *Aboriginal Heritage Survey for Line 8516*

May 2009

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FINAL REPORT

Country Energy

Lismore to Mullumbimby Electricity Network Upgrade *Aboriginal Heritage Survey for Line 8516*

May 2009

Reference: 0051706_PPR_8516 Archaeology

For and on behalf of
Environmental Resources Management Australia

Approved by: Murray Curtis

Signed: 

Position: Managing Partner

Date: 25 May 2009

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1 ADDITIONAL ABORIGINAL HERITAGE SURVEY FOR LINE 8516

1.1 BACKGROUND

An additional archaeological field survey was undertaken for a section of electricity transmission line (8516) to be built in the Lismore area. The transmission line is to run from the South Lismore zone substation to the Lismore switching station, east of Wyrallah Road and south of Skyline Road (see *Figure 1.1*).

The proposed line route runs by aerial crossing over the Wilson River duplicating the current line (8501) that runs between the Lismore South zone substation and the Lismore switching station. The new overhead line then deviates from the existing line west of Gundarimbah Road and follows the eastern easement of Gundarimbah Road. The line then turns east and follows the fence line between Lot 3 DP805680 to the north and on the property of Lot 29 DP755718 to the south. The line then runs into Lot 12 DP 1130877 in a north easterly direction until it intersects with line 8501 and runs parallel with this line until Wyrallah Road. From Wyrallah road line 8516 will run underground through the industrial area to the Lismore switching station, *Figure 1.1* shows the proposed line route.

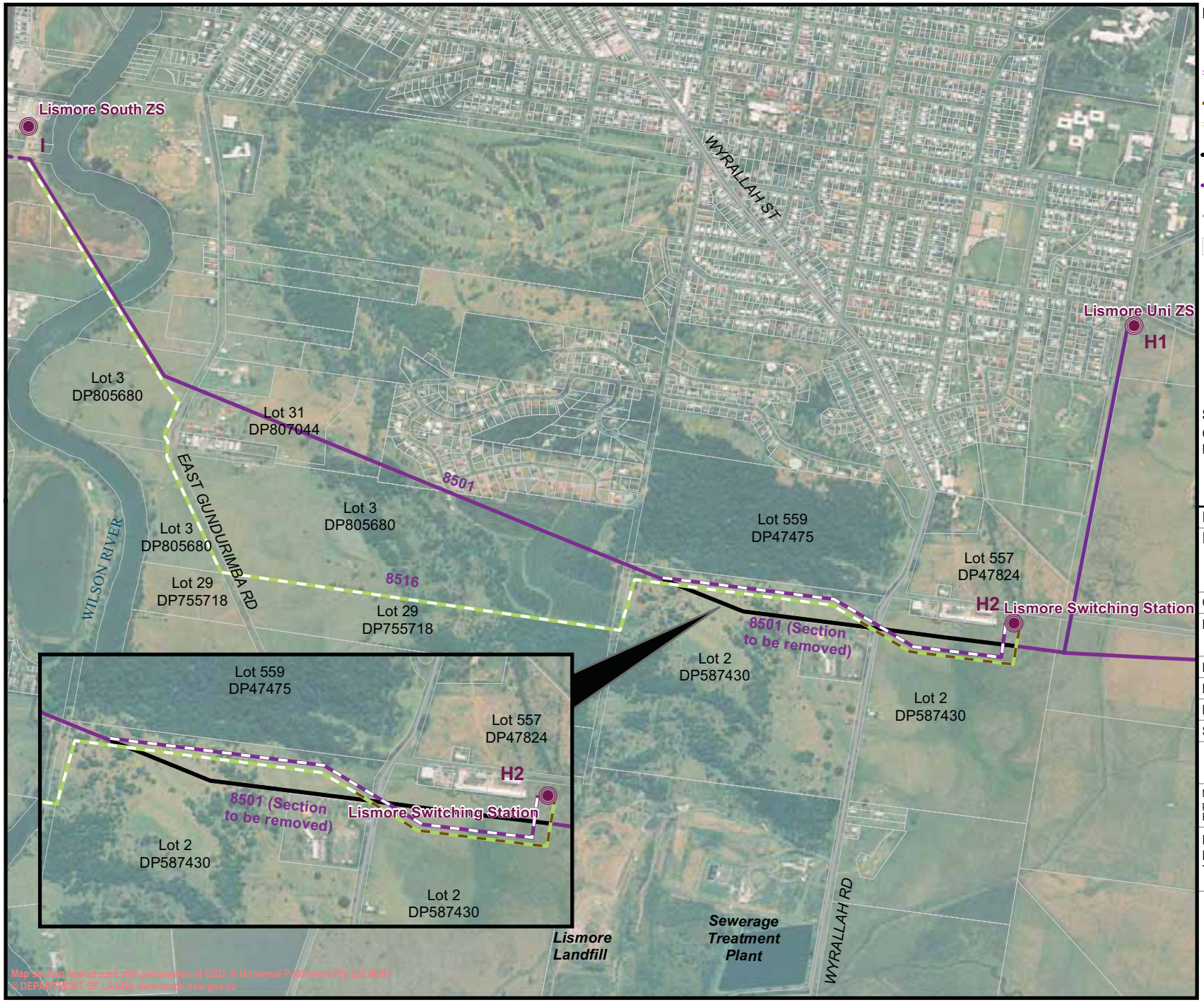
Line 8501 is proposed to be realigned as shown in *Figure 1.1* and will remain an overhead line from where it currently is located to where it crosses Wyrallah Road and connects into the Lismore switching station.

1.2 COMMUNITY CONSULTATION

All the groups registered for the Lismore area of this project were contacted and invited to participate in the fieldwork. Faxes and phone calls were made to the following groups:

- Ngulingah Local Aboriginal Land Council (LALC);
- John Cook Foundation (Numbahjing Clan Native Title Group);
- Wai:Bal Aboriginal Corporation; and
- Gilbert King.

The only response received was from Ngulingah (LALC), John Roberts represented the Land Council during the fieldwork.



Legend

- Substation
- Confirmed 8501 Realignment
- Confirmed Underground
- Confirmed Overhead
- 8501 Section to be Removed
- Existing 66 kV
- Roadway
- Cadastral Boundaries

Source:

Cadastre and aerial imagery:
NSW Department of Lands 2006

Figure 1.1

Proposed Line Route Options

Client:	Country Energy	
Project:	Lismore to Mullumbimby Electricity Network Upgrade	
Drawing No:	0051706pm_GIS11_R0	
Date:	06/05/2009	Drawing size: A4
Drawn by:	TH	Reviewed by: MC
Scale:	Refer to Scale Bar	

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1.3 *IMPACTS*

There are three main types of impacts from the proposed line duplication:

- the clearing of the easement for the 66kV powerline;
- the placing of new power poles; and
- the trenching for the underground section of line.

Clearing of the 30m wide easement (or 50m wide easement where lines run parallel) for the overhead section will be undertaken by cutting of trees and the majority of shrubs within the easement (note: a number of threatened shrub species will not be cleared). Soil profiles in the area will not be impacted by the clearing. The only archaeological site type that could potentially be impacted by this process is scarred trees. There is limited potential for scarred trees within the study area as over 90% of the study area has been cleared for agricultural (or industrial) purposes in the last 150 years.

Insertion of new power poles does have impact on soil horizons and can impact on sites such as artefact scatters, potential archaeological deposits (PADs) and middens. Holes are bored into the ground, to fit each power pole, and the poles inserted into the cavity. The overall disturbance resulting from this activity is 'localised' and given the length of the proposed transmission line, it may be described as having a minimal impact.

Trenching is required for the underground section of transmission line. Trenching has a direct impact to soil horizons and some types of archaeological sites which could be present. The trenching will be within the 6 metre area of clearing and will be in the order of 0.5 metres wide and 1.5 metres deep.

1.4 *ARCHAEOLOGICAL BACKGROUND AND FIELDWORK METHODOLOGY*

The current study area has been heavily modified for both agricultural and industrial purposes. Both the eastern and western sections (see *Figure 1.2*) are on a low lying flood plain at approximately 5m AHD. Industrial development areas are either within the study area or directly adjoining the study area. The central section of the study area crosses a ridge that rises to a maximum of 120 metres AHD. This central section is farmland, which has been predominantly cleared of old growth vegetation. The alternative line route option traverses an area that has some older eucalypts and has not been fully cleared in the past.

Legend

Flat Landform

Sloping Landform

Source:
Cadastre and aerial imagery: NSW Department of Lands 2006.

Figure 1.2

Landform Units and Sections within the Study Area

Client:	Country Energy	
Project:	Lismore to Mullumbimby Electricity Network Upgrade	
Drawing No:	0051706s_GIS12_R0	
Date:	06/05/2009	Drawing size: A4
Drawn by:	JF	Reviewed by: DN
Scale:	Refer to Scale Bar	

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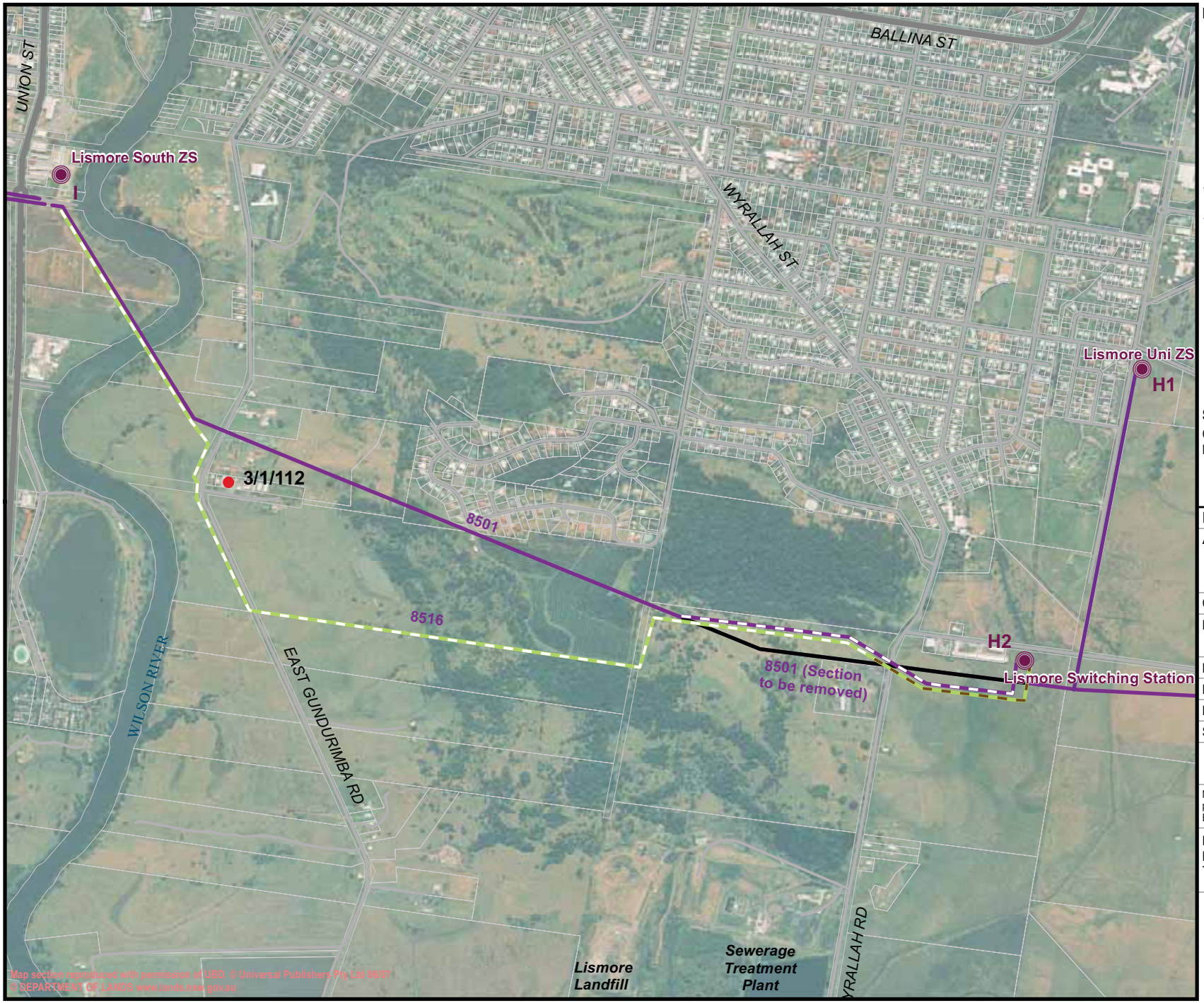

Legend

- Habitation
- Substation
- Confirmed 8501 Realignment
- Confirmed Underground
- Confirmed Overhead
- 8501 Section to be Removed
- Existing 66 kV
- Roadway
- Cadastral Boundaries

Source:

Cadastre and aerial imagery:
NSW Department of Lands 2006

Figure 1.3

AHIMS Search Results

Client:	Country Energy	
Project:	Lismore to Mullumbimby Electricity Network Upgrade	
Drawing No:	0051706pm_GIS13_R0	
Date:	06/05/2009	Drawing size: A4
Drawn by:	TH	Reviewed by: MC
Scale:	Refer to Scale Bar	

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The AHIMS search conducted for this project showed that there is only one site registered near the study area (see *Figure 1.3*). This was a "habitation site" and relates to the Aboriginal community housing that lies east of the study area along Gundurimbah Road.

As the eastern and western sections of the study area lie in the floodplain there is little potential in these areas for sites such as artefact scatters or PADs. It is suggested that there are no previously recorded sites along the Wilson River in this area due to the regular flooding of this zone. It would be suggested that this area was used by the Aboriginal communities for resources gathering and not for camping or artefact production. As the areas have been cleared and have some development it is unlikely that scarred trees would be present.

The effect of clearing of the native trees would have caused soil erosion over the elevated areas. It is unlikely that the slopes which have been cleared in the past contain intact soil profiles. Therefore the only soil horizons not potentially eroded are those in the area of the older eucalypts.

The central section of the proposed route holds higher potential for Aboriginal sites to be present. The ridge line would have offered good views of the surrounding landscape and has the potential for artefact scatters or isolated artefacts. The area in the south that has some old trees contains the potential for scarred trees and for undisturbed soil deposits around these trees.

A personal communication from John Roberts (21 April 2009) was that the area of older trees has oral tradition for at least one burial. The precise location of the burial is unknown and due to the history of land use in the area there is unlikely to be any markings on trees or stone cairns remaining to denote the burial. Again it is suggested that if the burial remains intact in this area it would be found around the older eucalypt trees where the soil has likely suffered less erosion.

The fieldwork methodology was discussed on the day of survey to determine if there were any areas of sensitivity to the Aboriginal community. The response was that the raised area in the central section held the most potential for archaeological sites and would have been a bigger focus of use by the local Aboriginal people prior to European occupation. The community feeling was that the areas of floodplain at either end of the study area did not contain Aboriginal sensitivity and were highly unlikely to contain sites.

Due to adverse weather conditions on the first day of survey the line was assessed (on this day) from the vehicle. The floodplain areas were excessively boggy from recent rain and showed 0% visibility as they were fully grassed. These areas were not walked but were assessed from the road and discussed with the community representative with reference to aerial photographs.

A pedestrian survey of the central section, that was deemed to hold higher potential for sites, was undertaken on the 22 April 2009. The pedestrian survey was recorded using a hand held GPS and digital camera. Each landform unit was recorded as a separate transect. The results of the survey are given below.

1.5 FIELDWORK RESULTS

The survey was undertaken on the 21 and 22 April 2009. Present on both days of the survey days were Mr John Roberts (Ngulingah LALC representative) and Dr Diana Neuweger (ERM heritage consultant), present on the 21st was Mr Ian Brooks (Country Energy) and present on the 22nd was Mr Greg McDonald (relative of the land owners).

The central portion of the study area was traversed by foot on the 22 April 2009. The various landform units were recorded as transects which are illustrated on *Figure 1.4*. The effective coverage of the survey averaged 2%, see *Table 1.1* for the full effective coverage details.

No Aboriginal sites were located during the survey. Some areas of sensitivity were identified and these are discussed below.

Legend

- Substation
- Drainage Line Location
- Confirmed 8501 Realignment
- Confirmed Underground
- Confirmed Overhead
- 8501 Section to be Removed
- Existing 66 kV
- Roadway
- Cadastral Boundaries

Source:
Cadastre and aerial imagery:
NSW Department of Lands 2006

Figure 1.4

Survey Transects and Drainage Line Location

Client:	Country Energy	
Project:	Lismore to Mullumbimby Electricity Network Upgrade	
Drawing No:	0051706pm_GIS14_R0	
Date:	06/05/2009	Drawing size: A4
Drawn by:	TH	Reviewed by: MC
Scale:	Refer to Scale Bar	

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Table 1.1 Effective Coverage Table

Transect	Landform	Length (m)	Width (m)	Area (m²)	Visibility	Exposure	Visible area (m²)	Area available for detection (m²)	% Effective coverage
1	Flat	180	10	1800	0%	0%	0	0.0	0%
2	Slope (westerly aspect)	149	10	1490	1%	90%	149	7.5	1%
3	Open Depression (man made)	10	4	40	15%	5%	6	0.3	1%
4	Slope (westerly aspect)	450	10	4500	10%	5%	450	22.5	1%
5	ridge	323	10	3230	20%	75%	646	484.5	15%
6	slope (easterly aspect)	300	10	3000	0%	0%	0	0.0	0%
7	Slope (easterly aspect)	200	10	2000	0%	0%	0	0.0	0%
8	slope (westerly aspect)	400	10	4000	20%	10%	800	80.0	2%
									2%

1.5.1 Transect 1

Transect 1 was in the flat on the western side of Gundurimba Road within Lot 26 DP755718. The area was completely covered in grass and shows 0% visibility. The ground was heavily waterlogged from the recent rain. This transect showed no archaeological sensitivity and further monitoring of this area is not warranted.

Photograph 1.1 Transect 1 showing grass cover, facing east.

1.5.2 Transect 2

Transect 2 was on a slope that has a westerly aspect, the slope was gentle in this transect. This slope was covered in grass, with small areas of exposure near the Camphor Loral vegetation. The ground visibility was approximately 1%. The ground was saturated in this area. This transect showed no Aboriginal archaeological sensitivity.

Photograph 1.2 Transect 2 showing grass cover, facing east.

1.5.3 Transect 3

Transect 3 was an open depression where a drainage channel has been dug out. The visibility was around 20% as the drainage channel was almost completely covered in grass, with some small patches of bare ground, there were also some volcanic stones in the channel. This transect showed no Aboriginal archaeological sensitivity.

Photograph 1.3 Transect 3 Artificial open depression (seen between the two hillocks in the photograph)

1.5.4 Transect 4

Transect 4 was a slope, with a westerly aspect. This transect was quite steep at roughly a 45 degree angle. The visibility was low at 1%. On this landform tree density increased, all the trees are young introduced species and are not old growth trees. Within Transect 4 there was a natural drainage line that contained may large bolder and pebbles of volcanic rock. The visible rocks were checked for grinding grooves but none were noted. There is the potential for grinding grooves to be present on rocks but due to the overgrowth may not have been able to be identified during the current survey. Where ground disturbance for the transmission line construction intersects with this natural drainage line, further monitoring for Aboriginal archaeological sites should occur.

Photograph 1.4 Transect 4 showing ground cover, facing west.

Photograph 1.5 Natural drainage line

1.5.5 Transect 5

Transect 5 is the ridge that is over 100m in height. This area has dense tree cover and ground visibility was about 20%. No sites were identified during survey in this landform. This landform is less likely to be eroded than the areas of slope and therefore this landform contains the highest potential for Aboriginal sites to be present. Thus as this landform contains archaeological sensitivity and the Aboriginal community are interested in monitoring this area, monitoring should occur here when the ground is disturbed (e.g. during pole installation).

Photograph 1.6 Transect 5

1.5.6 Transect 6

Transect 6 was the slope facing east. This area was currently a fallow field with grass over 1m in height, with some bushes and trees. The visibility was 0%. The transect represents an undifferentiated landform with new growth vegetation, which is unlikely to have any remnant evidence for Aboriginal activities.

Photograph 1.7 Transect 6, showing the height of grass cover and the 0% visibility

1.5.7 Transect 7

Transect 7 was on an east facing slope, this area was heavily vegetated with the grass over 2m in height. This landform is one of the rolling hills near the eastern end of the study area. The visibility across this landform was 0%. To the east of this landform were the older eucalypts with the potential to have preserved the soil horizons in the study area. The area around the older eucalypts is the area traditionally understood to contain a burial and as some of the soil may be intact it holds the potential to contain not only the burial but also Aboriginal sites. Therefore is suggested that avoidance of this area during line route selection be considered. Where avoidance is not possible further survey or monitoring may be required.

Photograph 1.8 Transect 7

1.5.8 Transect 8

Transect 8 was slope with a westerly aspect. This area was particularly rocky with patchy tree cover. The visibility was higher at around 20% in this landform. This landform has been heavily modified and is unlikely to contain Aboriginal archaeological sites.

Photograph 1.9 Transect 8 showing the rocky covering of the westerly aspect.

1.5.9 Summary of Fieldwork Results & Areas of Sensitivity Identified

No Aboriginal sites were identified during the fieldwork. There was three areas of archaeological sensitivity determined, as shown in *Figure 1.5*.

Area 1: contained a drainage line (Transect 4) has the potential to contain grinding grooves on the rocks. Currently the visibility is low and therefore there is the potential for sites to be present that could not be identified. This area is of moderate sensitivity and therefore where avoidance is not possible further survey or monitoring will be required.

Area 2: is the ridge line in the centre of the study area (Transect 5) which has the potential to contain sites and is of interest to the Aboriginal community. This area is considered to have moderate archaeological sensitivity as it may contain sites. Any ground disturbance in the higher areas along the ridge will require further survey and monitoring.

Area 3: is an area of high sensitivity, where the older eucalypt trees remain. There is the potential for soil profiles to have remained intact in this area. The line route option should avoid locating the easement in the area of the older eucalypts. Where avoidance is not possible further survey or monitoring is required.

Legend

- Substation
- Confirmed 8501 Realignment
- Confirmed Underground
- Confirmed Overhead
- 8501 Section to be Removed
- Existing 66 kV
- Roadway
- Area of High Sensitivity
- Monitoring Required
- Cadastral Boundaries

Source:
Cadastre and aerial imagery:
NSW Department of Lands 2006

Figure 1.5
Zoning Plan

Client:	Country Energy	
Project:	Lismore to Mullumbimby Electricity Network Upgrade	
Drawing No:	0051706pm_GIS15_R0	
Date:	06/05/2009	Drawing size: A4
Drawn by:	TH	Reviewed by: MC
Scale:	Refer to Scale Bar	

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1.6 CONCLUSIONS AND RECOMMENDATIONS

There are no direct heritage constraints to the proposed realignment of transmission line 8501 or the new transmission line 8516. Areas of sensitivity were identified and should be avoided during works.

The area along the drainage line should be checked after clearing to determine if there are any sites (grinding grooves) in the rocks. The high ridge area should be monitored during the installation of the poles. Monitoring should be undertaken by a representative of the Local Aboriginal Land Council.

A burial management plan should also be in place before works commences in the central area. A burial management plan should include the following basic stipulations:

- All workers are to be briefed during initial site induction about the Aboriginal heritage potential;
- If a burial or suspected burial is found then:
    - all works in the immediate vicinity of the burial should be halted;
    - the local police contacted;
    - a Local Aboriginal Representative contacted if not already present on site and if required a suitably qualified archaeologist or physical anthropologist contacted;
    - any excavated material from the area of the burial should be identified and placed within a restricted area for possible sieving; and
    - management of the burial should be made in consultation with the DECC and Ngulingah Local Aboriginal Land Council.

Annex B

Ecological Assessment

FINAL REPORT

Country Energy

Lismore to Mullumbimby Electricity Network Upgrade: Line 8516 *Ecological Assessment*

May 2009

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FINAL REPORT

Country Energy

Lismore to Mullumbimby Electricity Network Upgrade: Line 8516 *Ecological Assessment*

May 2009

Reference: 0051706_PPR_8516 Ecology

For and on behalf of:
Environmental Resources Management Australia

Approved by: Murray Curtis

Signed: 

Position: Managing Partner

Date: 28 May 2009

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1 INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) was commissioned by Country Energy to conduct an ecological assessment of a proposed 66 kilovolt (kV) electricity supply line within the Lismore area as part of the proposed Lismore to Mullumbimby Electricity Network Upgrade project.

As shown in *Figure 1.1*, a new 66kV electricity supply line (herein referred to as 'Line 8516') is proposed for the area between the Lismore South zone substation located on Three Chain Road and the Lismore switching station located on Skyline Road.

Vegetation within Lot 29 DP 755718 and Lot 7 DP 1115057 (refer *Figure 1.2*) (herein referred to as the 'study area') has been identified as a potential ecological constraint to Line 8516.

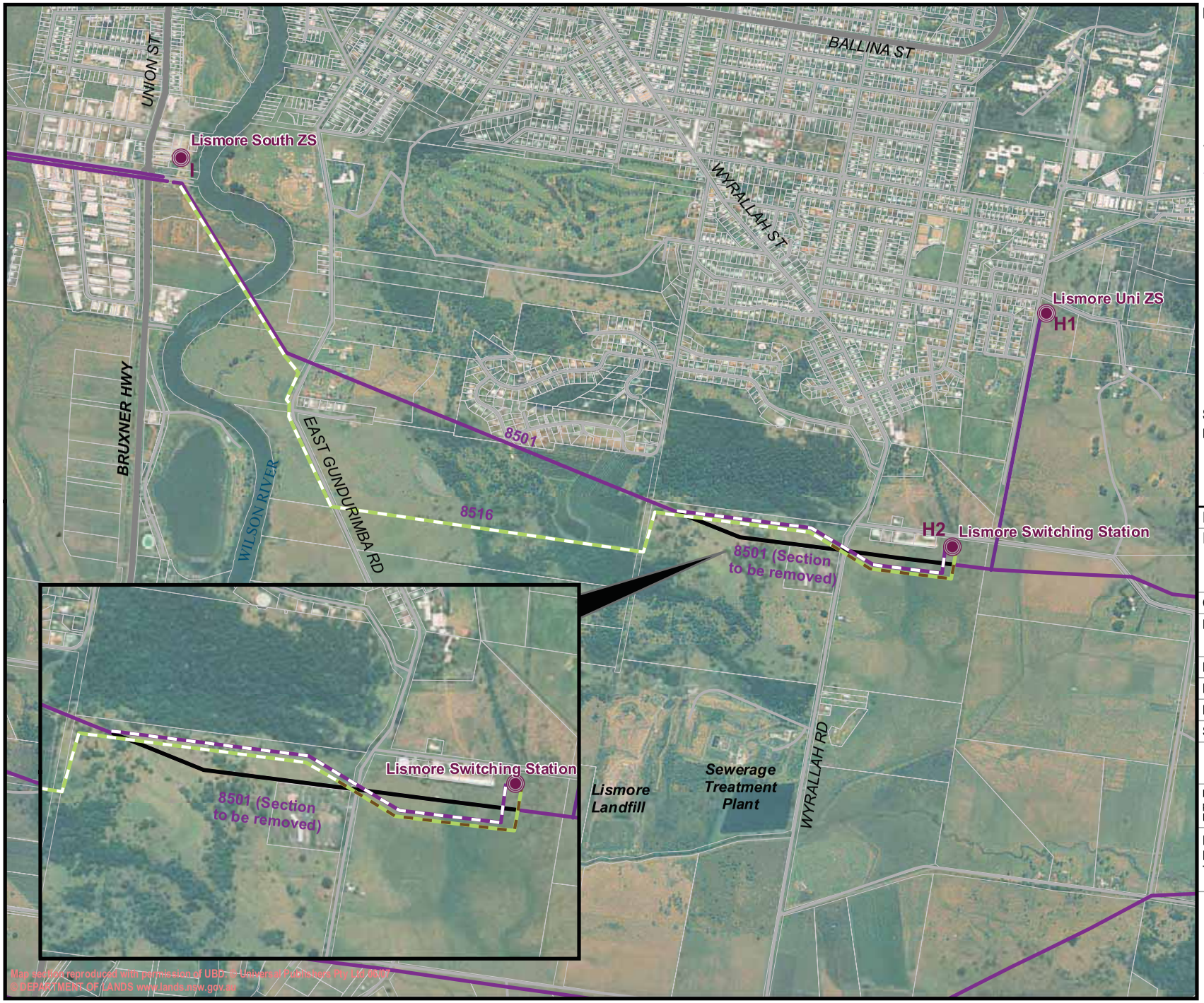
This report presents the results of an ecological investigation undertaken by ERM within the study area and assesses the potential impacts resulting from the proposal. This report is a supplementary report to ecological investigations detailed in the Environmental Assessment (EA) (ERM, 2008) that was prepared for the Lismore to Mullumbimby Electricity Network project in accordance with Part 3A of the *Environmental Planning and Assessment Act 1979* (*EP&A Act*). The EA was granted Adequacy by the Department of Planning on 14 November 2008. This report is designed to be read in conjunction with a Preferred Project Report (ERM, 2009) that has been prepared for the project.

1.1 AIMS AND OBJECTIVES

The aim of this report is to assess the ecology of the study area and identify potential environmental impacts resulting from the proposal in accordance with relevant local, State and Commonwealth legislation.

Specifically the report aims to:

- identify flora and fauna species, habitats and communities within the study area and describe them in a broader environmental context;
- assess the potential of the study area to significantly contribute to the conservation value of the surrounding area;
- assess the potential for rare or threatened species, populations or ecological communities as listed under relevant legislation to occur within the study area;
- identify and assess the potential impacts resulting from the proposal on threatened species, populations, ecological communities or their habitats; and
- provide mitigation measures to reduce any potential impacts identified.



Legend

- Substation
- Confirmed 8501 Realignment
- Confirmed Underground
- Confirmed Overhead
- 8501 Section to be Removed
- Existing 66 kV
- Roadway
- Cadastral Boundaries

Source:
Department of Lands

Figure 1.1
Line 8501 and 8516 Routes

Client:	Country Energy	
Project:	Lismore to Mullumbimby Upgrade	
Drawing No:	0051706pm	
Date:	04/05/2009	Drawing size: A4
Drawn by:	TH	Reviewed by: MC
Scale:	Refer to Scale Bar	

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Maps and figures contained within this document may be based on third party data, may not be to scale and is intended for use as a guide only. ERM does not warrant the accuracy of any such maps or figures.

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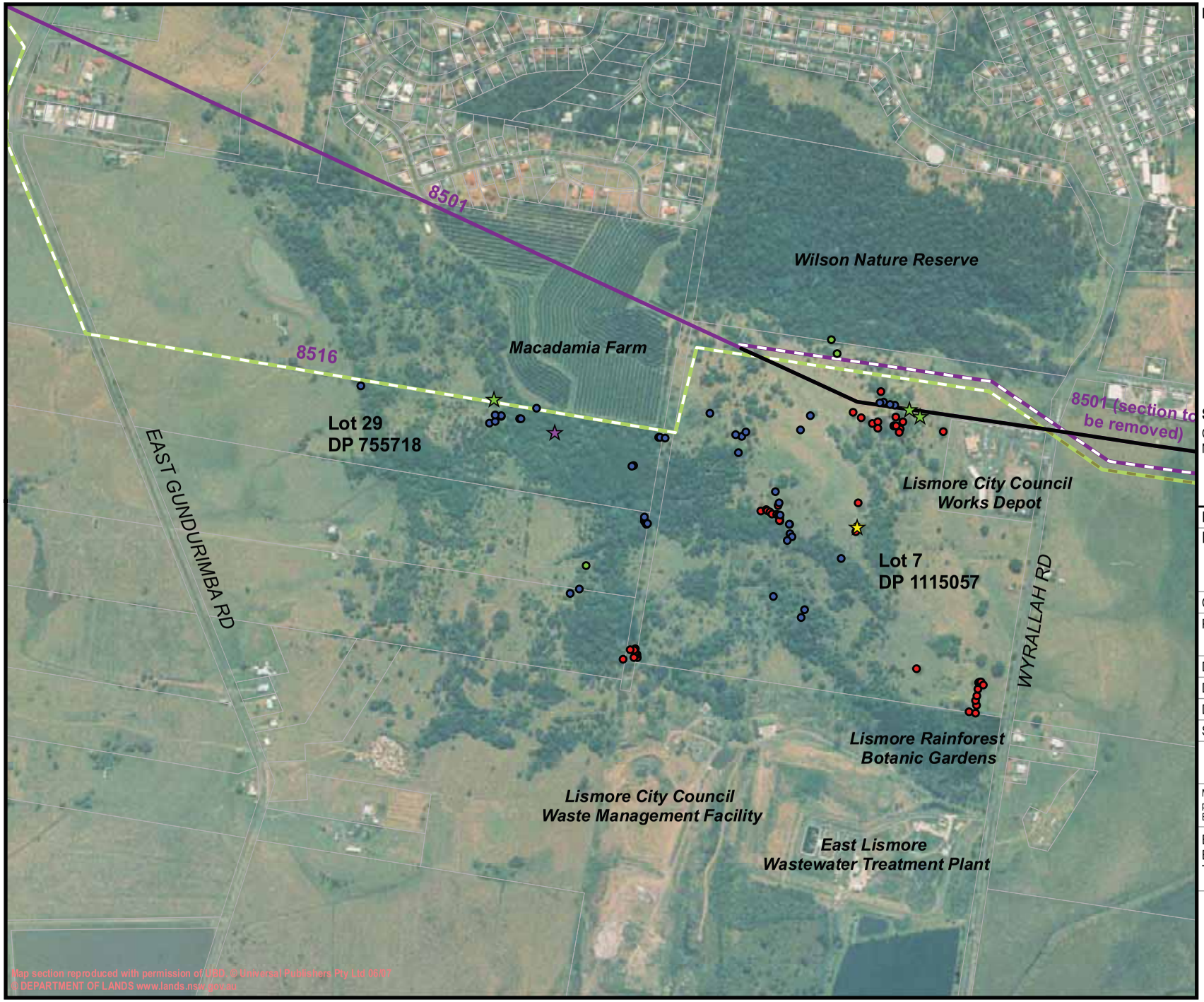

Legend

- Thorny Pea
- Koala
- Forest Red Gum
- Grey-headed Flying-fox
- Rose-crowned Fruit-dove
- Spiny Gardenia
- Existing 66kV
- 8501 Section to be Removed
- Confirmed 8501 Realignment
- Confirmed Upgrade
- Confirmed Underground

Source:
Cadastre and Aerial Imagery:
NSW Department of Lands 2006

Figure 1.2
Ecological Constraints

Client:	Country Energy	
Project:	Lismore to Mullumbimby Electricity Network Upgrade	
Drawing No:	0051706pm_ECO03	
Date:	07/05/2009	Drawing size: A4
Drawn by:	TH	Reviewed by: MC
Scale:	Refer to Scale Bar	

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1.2 PROJECT DESCRIPTION

The majority of Line 8516 will be constructed above ground with the exception of the section of line between the Lismore switching station and Lot 7 DP 1115057 which will be installed underground (refer *Figure 1.1*). As indicated in *Figure 1.1*, the proposal also includes the realignment of a section of Line 8501 in order to accommodate Line 8516.

1.2.1 Overhead Powerlines

The overhead section of Line 8516 will require the establishment and maintenance of an electricity easement. This easement will be 30 metres (m) wide for the majority of the overhead section, with the exception of the portion of the line within Lot 7 DP 1115057 which will require a 50m easement to accommodate the realignment of Line 8501.

Electricity easements for overhead powerlines consist of 'clearing' and 'inspection' zones. As a general requirement all vegetation (excluding groundcover such as herbs and grasses) is removed from the clearing zone except for:

- low growing species adjacent to river or creek crossings;
- vegetation within deep valleys where the conductors will be well above the maximum height of the prevailing vegetation;
- low growing species within the first 5m of a clearing corridor located adjacent to main roads; and
- stumps in areas where erosion is a potential risk.

Exceptions may also be made in areas of ecologically sensitivity to mitigate potential impacts on threatened species, populations or endangered ecological communities.

In addition to the 'clearing zone', an 'inspection zone' must also be established and maintained either side of the clearing zone. Vegetation liable to break, fall or be blown into the powerline is removed from this zone. This includes dead, diseased and dying trees or trees with limited root structure. Low growing species can be retained within this zone.

Many factors affect the extent of clearing and the width of the 'clearing' and 'inspection' zones including the length of the span, the amount of sag on hot days with heavily loaded lines, the amount of conductor swing, the degree of whip of adjacent trees on windy days, the type of vegetation, regrowth rates, terrain etc. The width of these zones will be determined during the detailed design and construction phases.

1.2.2 Underground Powerlines

The section of underground line will be installed via open trenching which generally requires the excavation of a trench 1.5m deep and approximately 0.5m wide, depending upon final conduit configuration. Trenches will be excavated using appropriate items of plant.

1.2.3 Access and Maintenance

Following installation of the proposed powerline, ongoing maintenance will be undertaken to ensure correct working order.

'Clearing' and 'inspection' zones will be maintained for the overhead section. The width of these zones and extent of clearing will be dependant upon a number of factors (including ecological constraints) and will be determined during the detailed design and construction phases. A 6m cleared easement will be maintained for the underground section.

Access during construction and maintenance will be via existing roads and access tracks and via negotiation with landowners. Details regarding access during construction and maintenance will be included in a Construction Environmental Management Plan (CEMP).

1.3 SITE DESCRIPTION

1.3.1 Land Use

The study area is zoned 1(a) – *General Rural* under the *Lismore City Council Local Environmental Plan 2000* (*Lismore LEP*). Lot 29 DP 755718 and Lot 7 DP 1115057 consist of partly cleared agricultural land currently used for grazing.

The study area is bounded by Gundurimba Road to the west and Wyrallah Road to the east (refer *Figure 1.2*).

The Wilson Nature Reserve is located to the north of Lot 7 DP 1115057 and Lismore Rainforest Botanic Gardens, the Lismore City Council Waste Management Facility and East Lismore Wastewater Treatment Plant are located to the south. Lismore City Council Works Depot is located on Lot 1 DP 587430 and is bounded to the north, west and south by Lot 7 DP 1115057. A macadamia farm is located to the north of Lot 29 DP 755718 (refer *Figure* 1.2).

The proposed electricity supply line will be constructed along the northern boundary of Lot 29 DP 755718 and close to the northern boundary of Lot 7 DP 1115057 (refer *Figure 1.2*). This proposed route has been negotiated with existing landowners.

1.3.2 Climate

The climate of the study area is generally subtropical with mild to warm temperatures year round and a high rainfall during summer with drier winter and spring seasons.

1.3.3 Topography and Drainage

The study area is steep with elevation ranging from 10m to130m Australian Height Datum (AHD). Within Lot 29 DP 755718, land slopes from the north-east to the west, towards Gundurimba Road. Within Lot 7 DP 1115057, land slopes from the north-west to the south, south-east and east, towards Wyrallah Road and land to the south.

Surface water within the study area flows towards a series of drainage lines that flow to Wilsons River which is located directly to the west of the study area.

1.3.4 Geology and Soils

The regional geology is characterised by tertiary Macpherson Volcanics consisting of Lismore Basalt, Nimbin Rhyolite and Blue Knob Basalt formed from lava flow from the Mt Warning area. The *Tweed Heads-Lismore Casino 1:50,000 Geological Sheet* (SH-56-3 9540, 1980) indicates that the site is underlain by Tertiary Lismore Basalt.

Soils within the study area belong to the Georgica soil landscape unit which are described as erodible soils with surface movement potential and localised low wet bearing strength and waterlogging (Morand, 1994).

2 METHODOLOGY

2.1 DESKTOP REVIEW

Background literature reviews and database searches were conducted prior to field investigations to obtain recent data on flora and fauna species, populations, communities and habitats known to occur within the study area and the surrounding local area.

Background information used in the assessment process was collected via:

- a literature review of site-specific and regional studies including:
    - Proposed Lismore to Mullumbimby Electricity Network Upgrade: Line Route Selection Report (ERM, 2007); and
    - Proposed Lismore to Mullumbimby Electricity Network Upgrade: Environmental Assessment Report (ERM, 2008).
- map, aerial photograph and Geographic Information System (GIS) interpretations including:
    - Lismore City Council Vegetation Mapping 2007; and
    - Lismore City Council Koala Habitat Mapping 2000.
- the NSW Department of Environment and Climate Change (DECC) Atlas of NSW Wildlife database (2009a); and
- the Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA) on-line search tool for Matters of National Environmental Significance (MNES) (2009).

Desktop habitat assessments were conducted for threatened species that were previously recorded within the locality being a 10 kilometre (km) radius of the study area and included an evaluation of the likelihood of those species to inhabit or utilise the study area.

2.2 FIELD SURVEYS

An ecological investigation of the study area was conducted by ERM personnel on 11, 12 and 13 February 2009 and 13 and 14 March 2009. Flora and fauna species identified during field investigations were recorded and any potential ecological constraints identified.

The weather conditions during the sampling period are summarised below:

Table 2.1 Weather Observations, Lismore NSW

Date	General Weather Description	Temperature (˚C)		Rainfall (mm)
		Maximum	Minimum	
11 February 2009	overcast and humid during the day; heavy rain at night	21.6	27.6	0
12 February 2009	cloudy and humid during the day; heavy rain at night	19.4	23.6	20.8
13 February 2009	rain	18.8	23.7	18
13 March 2009	fine with some clouds	25.5	17.8	0.6
14 March 2009	cloudy, with light patchy rain	28.2	16.6	3.2

Source: Site Observation and BOM, 2009

2.2.1 Flora

The random-meander technique was used to identify vegetation communities and flora species within the study area. This method involved traversing vegetation communities and topographical features, recording plant species as they were encountered.

Vegetation communities were determined based on structure, floristic composition, topography and soil type. The conservation status of these communities was assessed based on condition, occurrence of threatened flora and assessment of the distribution of the community.

The likelihood of Endangered Ecological Communities (EECs) occurring was determined by considering the dominant plant species that comprise the vegetation communities, topography and the dominant soils present.

2.2.2 Fauna

Fauna species were recorded opportunistically. Any evidence of traces such as tracks, scats and scratches on and around trees were also noted as were any potential habitat features.

Spotlighting for nocturnal animals was conducted on the nights of 11 and 12 February 2009 within Lot 29 DP 755718 and involved two ERM personnel using handheld spotlights to inspect areas of potentially suitable habitat. Spotlighting was also undertaken on the night of the 13 March within Lot 7 DP 1115057.

Owl call playback was also conducted on the nights of 11 and 12 February 2009 and an Anabat detector was carried during night time surveys. Owl calls were played for the Masked Owl (*Tyto novaehollandiae*), Sooty Owl (*Tyto tenebricosa*), Powerful Owl (*Ninox strenua*) and Grass Owl (*Tyto capensis*). Each call was played for a period of five minutes each followed by a listening period of ten minutes each. Spotlighting followed each playback session to detect any owls that may have flown into the area.

2.2.3 Threatened Species

Mapping, aerial photographs and field surveys were used to identify and assess the distribution of potential habitat types within the site. An assessment of the habitat potential for threatened species was undertaken using the following criteria:

- the presence of nesting/sheltering/basking sites such as tree hollows, litter, fallen timber and logs, caves and rocks;
- the cover/abundance of ground, shrub and canopy layers;
- drainage and the presence of freshwater or estuarine aquatic habitats such as streams, swamps and pools, noting their permanency (i.e. permanent, semi-permanent or ephemeral);
- connectivity to adjacent areas of habitat;
- the extent and nature of previous disturbances, including the presence of fire scars and dieback;
- vegetation assemblage and structure; and
- soil type and topography.

Targeted surveys for threatened flora and fauna species known to occur within the area were conducted on 13 and 14 March 2009. These surveys concentrated on a number of proposed line route options being investigated by Country Energy.

State Environmental Planning Policy No. 44 – Koala Habitat Assessment

Although State Environmental Planning Policy No. 44 – Koala Habitat Protection (SEPP 44) does not apply to Part 3A projects, consideration has been given to SEPP 44 to determine whether the study area constitutes *core* or *potential* Koala habitat as defined by the Policy in order to assist in determining the likely impacts of the proposal on this species. Assessment under SEPP 44 involved identifying Koala habitat trees as listed under Schedule 2 of the Policy and determining whether they constituted greater than 15% of the tree cover within the study area. Targeted searches for evidence of Koala habitation was also undertaken and involved searches for scats and scratch marks at identified feed trees.

2.3 LIMITATIONS

Field surveys concentrated on identifying potential ecological constraints that would restrict the installation of Line 8516. Such constraints included the presence of threatened flora and fauna species and particular habitat features. Although the proposed route has been determined with consideration of these ecological constraints, it is recognised that further detailed ecological assessment may need to be undertaken during the detailed design and construction phase in order to mitigate against potential impact to threatened species. Mitigation measures are outlined in *Chapter 5* of this report.

3 RESULTS

3.1 FLORA

A total of 83 flora species were identified during field investigations of these, 39 (47%) were exotic. A list of these species is provided in *Table A.1 Annex A*.

3.1.1 Vegetation Communities

The study area has been subjected to a number of disturbances as a result of past and present land use and consequently vegetation within the study area consists predominantly of cleared pasture with areas of Camphor Laurel (*Cinnamomum camphora*) Forest (refer *Photograph 3.1* and *Photograph 3.2)*.

Despite the highly disturbed nature of the study area and significant presence of exotic flora species, a number of native flora species (predominantly rainforest species) persisted within the mid and understorey. Remnant Forest Red Gum (*Eucalyptus tereticornis*) trees (refer *Figure 1.2*) and Hoop Pines (*Araucaria cunninghamii*) also occurred in scattered distribution across the study area, occasionally as emergents within the Camphor Laurel Forest.

The Wilson Nature Reserve, located directly to the north of the study area, contains remnant Dry Rainforest and Eucalypt Forest. Native species identified during field investigations suggests that these communities probably occurred within the study area prior to clearing for agricultural purposes and the invasion of exotic species.

A Hoop Pine plantation was planted in 1985 to the south of the study area and is now part of the Lismore Rainforest Botanic Gardens. Hoop Pines occur in scattered distribution across the study area though tend to be more concentrated within the southern portion of Lot 7 DP 1115057.

Camphor Laurel Forest

Camphor Laurel to approximately 20m in height was the dominant tree within this community with Large-leaved Privet (*Ligustrum lucidum*) dominating the mid-storey. A shrub layer was sometimes present in areas where Camphor Laurel was not as dense and often consisted of the introduced Mickey Mouse Plant (*Ochna serrulata*) with Lantana (*Lantana camara*) dominant at the fringes of the forest. The introduced Mistflower (*Ageratina riparia*) was often the dominant ground cover species.

Photograph 3.1

Lot 7 DP 1115057 - facing west from Wyrallah Road underneath Line 8501

Photograph 3.2

Camphor Laurel Forest along the Northern Boundary of Lot 29 DP 755718

Despite the dominance of exotic species within this community, a number of native species were also present. Commonly encountered native species included Cockspur Thorn (*Maclura cochinchinensis*), Red Kamala (*Mallotus philippensis*), Guioa (*Guioa semiglauca*), Blush Macaranga (*Macaranga tanarius*) and Rough-leaved Elm (*Aphananthe philippinensis*) in the midstorey and Native Wandering Jew (*Commelina cyanea*) and Basket Grass (*Oplismenus spp*.) in the lower stratum. Native vine species including Lawyer Vine (*Smilax australis*), Scrambling Lily (*Geitonoplesium cymosum*), Wonga Wonga Vine (*Pandorea pandorana*) and Snake Vine (*Stephania japonica*) were also identified within this community. Ephiphytic ferns including Staghorn (*Platycerium superbum*) and Horseshoe Felt Fern (*Pyrrosia confluens*) were also noted occasionally on rocky outcrops. Forest Red Gum trees occasionally occur within this community as emergents.

The density of Camphor Laurel was greatest on Lot 29 DP 755718 and the western portion of Lot 7 DP 1115057. Disturbances included clearing, weed invasion and cattle grazing.

Modified Grassland

Grassland on the site was dominated by a variety of pasture grasses, including Kikuyu (*Pennisetum clandestinum*), Pigeon Grass (*Setaria spp.*) and Rhodes Grass (*Chloris gayana*) and herbaceous weeds, including Flaxleaf Fleabane (*Conyza bonariensis*) and Purple Top (*Verbena bonariensis*). Lantana (*Lantana camara*) thickets and remnant Forest Red Gum trees also occurred throughout the study area in scattered distribution (refer *Figure 1.2*). Parts of the study area are currently maintained via cattle grazing.

3.1.2 Endangered Ecological Communities

A number of EECs have been identified as potentially occurring within the *Lismore 1:100,000 Map Sheet* (DECC, 2009a). These EECs are listed in *Table 3.1*.

Table 3.1 Endangered Ecological Communities Potentially Occurring within the Study Area

Endangered Ecological Communities	Bioregions
Swamp Oak Floodplain Forest	NSW North Coast, Sydney Basin and South East Corner
Littoral Rainforest	NSW North Coast, Sydney Basin and South East Corner
Montane Peatlands and Swamps	New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps
Subtropical Coastal Floodplain Forest	NSW North Coast
Lowland Rainforest	NSW North Coast and Sydney Basin
Freshwater Wetlands on Coastal Floodplains	NSW North Coast, Sydney Basin and South East Corner
Byron Bay Dwarf Graminoid Clay Heath Community	-
Themeda Grassland on Seacliffs and Coastal Headlands	NSW North Coast, Sydney Basin and South East Corner
Swamp Sclerophyll Forest on Coastal Floodplains	NSW North Coast, Sydney Basin and South East Corner
White Box Yellow Box Blakely's Red Gum Woodland	-
River-Flat Eucalypt Forest on Coastal Floodplains	NSW North Coast, Sydney Basin and South East Corner
Lowland Rainforest on Floodplain	NSW North Coast
Coastal Saltmarsh	NSW North Coast, Sydney Basin and South East Corner
Hunter Lowland Redgum Forest	Sydney Basin and NSW North Coast Bioregions

Source: DECC, 2009a

Native species identified within the Camphor Laurel Forest community are known to occur within the Lowland Rainforest EEC although the high level of fragmentation and weed invasion prevents vegetation within the study area from being of high conservation value as an EEC.

Structurally the Camphor Laurel Forest resembles a rainforest community, however the dominance of introduced species such as Camphor Laurel, Large-leaved Privet and Lantana at every level of the community has altered the floristics of this community to the detriment of native species such that it may only be considered to be at best a low condition example of the Lowland Rainforest EEC. Native species known from the EEC are present in low numbers within the emergent, mid and lower stratum of the community including some threatened species (see *Section 3.1.3*). It is also acknowledged that this community may represent regrowth forest dominated by exotic species supporting a diversity of rainforest plants and rainforest dependent fauna.

Given the lack of certainty an assessment of this community has been undertaken in accordance with the requirements of the *Threatened Species Conservation Act 1995* (TSC Act).

3.1.3 Threatened Flora

Twenty-four threatened flora species have previously been recorded within a 10km radius of the study area (DECC, 2009a) and an additional 10 threatened flora species were predicted to potentially occur within a 10km radius of the site based on known habitat requirements (DEWHA, 2009).

A habitat assessment was undertaken for these species and the results presented in *Annex B*. Habitat assessment showed that the flora species listed in *Table 3.2* had a moderate or moderate to high likelihood of occurring within the study area based on known habitat requirements.

Table 3.2 Threatened Flora Species with a Moderate to High Likelihood of Occurring within the Study Area

Scientific Name	Common Name	Legal Status	
		TSC Act	EPBC Act
Clematis fawcettii	Northern Clematis	V	V
Desmodium acanthocladum	Thorny Pea	V	V
Floydia praealta	Ball Nut	V	V
Gossia fragrantissima	Sweet Myrtle	E	E
Ochrosia moorei	Southern Ochrosia	E	E
Randia moorei	Spiny Gardenia	E	E
Rhynchosia acuminatissima	Pointed Trefoil	V	-
Tinospora smilacina	Tinospora Vine	E	-

V = Vulnerable; E = Endangered

Although vegetation on the site is dominated by exotic species, the Thorny Pea and Spiny Gardenia were identified within the study area. Within the study area, Thorny Pea shrubs were often found growing on the fringes of the Camphor Laurel Forest amongst patches of Lantana. The Spiny Gardenia was found growing within areas of Camphor Laurel Forest containing remnant rainforest species. Locations of these species within the study area are indicated on *Figure 1.2*.

Although not previously recorded within a 10km radius of the study area, Hairy Jointgrass (*Arthraxon hispidus*) was also recorded within the southern portion of Lot 7 DP 1115057 (Peter Parker, 2009). This species is listed as Vulnerable under the *Threatened Species Conservation Act* (TSC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

An assessment of the likely impacts of the proposal on these species was undertaken in accordance with the NSW TSC Act with consideration to the requirements of the Commonwealth EPBC Act (refer *Annex C*).

3.2 FAUNA

All fauna species identified within the study area are listed in *Table A.2 Annex A*. A total of three amphibians, two reptiles, 20 birds and seven mammals were recorded during field investigations. Of these species, three were exotic. The majority of species recorded are characteristically common and widespread species across similar environs. A number of threatened species were also recorded (refer *Section 3.2.2*).

3.2.1 Fauna Habitat

Field investigations revealed that potentially suitable fauna habitat exists within the study area in the form of:

- Camphor Laurel Forest; and
- Modified Grassland.

Despite the highly disturbed nature of vegetation within the study area, these communities provide a number of sheltering, breeding and foraging resources for native fauna. Within the study area, the following habitat features were identified:

- long grass, rocky outcrops, fallen timber and plant matter – provides suitable cover for reptiles and hollow-bearing logs provide habitat for small terrestrial mammals;
- Lantana thickets – provides suitable foraging/nesting habitat for small bird species and cover for macropods and small ground-dwelling mammals;
- grassland – provides seed and stem resources for granivorous and herbivorous species;
- hollows within large Forest Red Gum trees – provide shelter and breeding habitat for birds and arboreal mammals;
- Forest Red Gums – provide a suitable foraging resource for Koalas and nectivorous birds and arboreal mammals; and
- Camphor Laurel Forest – provides suitable shelter/nesting/roosting habitat and a foraging resource for frugivorous birds and mammals and insectivorous microchiropteran bat species.

A small dam in the north-eastern corner of Lot 7 DP 1115057 was also identified as providing a foraging resource for aquatic birds and habitat for frogs.

Key Habitats and Regional Corridors

No key habitats or regional corridors as mapped by the NSW DECC (Scotts, 2003) occur within the study area.

SEPP 44 – Koala Habitat Assessment

Field investigations have identified that the study area supports the Koala feed tree Forest Red Gum as listed under Schedule 2 of *SEPP 44*. However, the study area does not constitute *potential* Koala habitat as defined under SEPP 44, as Forest Red Gum comprises less than 15% of the total tree cover within the study area. The location of Forest Red Gum trees within the study area is indicated on *Figure 1.2*.

While the site does not qualify as potential Koala habitat as defined by SEPP 44, field investigations confirmed that the study area supports Koala habitat based on the identification of a Koala in Lot 7 DP 1115057 and identification of evidence of habitation (scats and scratches) at a number of feed trees. An assessment of the potential impact of the proposal on this species has been undertaken in *Annex C* and measures to mitigate potential impacts to this species as a result of the proposal are addressed in *Chapter 5*.

3.2.2 Threatened Fauna

Twenty-six threatened fauna species have previously been recorded within a 10km radius of the study area (DECC, 2009a) and an additional 11 threatened fauna species were predicted to potentially occur within a 10km radius of the study area based on known habitat requirements (DEWHA, 2009).

A habitat assessment was undertaken for these species and the results presented in *Annex B*. Habitat assessment showed that the fauna species listed in *Table 3.3* had a moderate or moderate to high likelihood of occurring within the study area based on known habitat requirements.

Table 3.3 Threatened Fauna Species with a Moderate to High Likelihood of Occurring within the Study Area

Common Name	Scientific Name	Legal Status	
		TSC Act	EPBC Act
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	V	-
Eastern Long-eared Bat	*Nyctophilus bifax*	V	-
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V
Koala	*Phascolarctos cinereus*	V	-
Little Bentwing-bat	*Miniopterus australis*	V	-
Marbled Frogmouth	*Podargus ocellatus*	V	-
Rose-crowned Fruit-dove	*Ptilinopus regina*	V	-
Wompoo Fruit-dove	*Ptilinopus magnificus*	V	-

V = Vulnerable

Despite the highly disturbed nature of the study area, field investigations show that a number of threatened fauna species utilise the site. Locations of these species within the study area are indicated on *Figure 1.2*.

The Koala was identified within the study area and a number of Forest Red Gum trees were also recorded (refer *Figure 1.2*). Evidence of Koala habitation including scratch marks on the trunk and Koala scats at the base suggest that Koalas utilise the study area on a regular basis as part of a larger home range.

The Rose-crowned Fruit-dove was recorded within the study area amongst an area of dense Camphor Laurel Forest dominated by exotic flora species. This species feeds entirely on the fruit from vines, shrubs, large trees (including Camphor Laurel) and palms and is thought to be locally nomadic (and in some instances migratory) in response to food availability and the ripening of fruits (DECC, 2009b).

Although Camphor Laurel is an exotic species and listed as a Class 4 Noxious Weed within the Lismore City Council control area, the removal of Camphor Laurel without appropriate mitigation measures (i.e. the replacement with suitable native species) is recognised as a threat to the survival of the Rose-crowned Fruit-dove (DECC, 2009b).

The Grey-headed Flying-fox was also recorded within the study area and was observed feeding on exotic Guava (*Psidium guajava*) trees found growing underneath the existing power easement located in the northern portion of the study area. The Grey-headed Flying-fox is a highly mobile species and is known to travel up to 50km to forage. They are found in a range of habitats where they feed on a variety of plants including the nectar and pollen of native trees and the fruits of rainforest trees, vines and exotic garden and fruit crop species (DECC, 2009b).

An assessment of the likely impacts of the proposal on these species was undertaken in accordance with the NSW TSC Act with consideration of the requirements of the Commonwealth EPBC Act (refer *Annex C*).

4 IMPACT ASSESSMENT

General requirements of the level of clearing needed to install the proposed 66kV electricity supply line and maintain an electricity easement are outlined in *Section 1.3* of this report. These requirements have been adopted in this report to determine the potential ecological impacts of the proposal. The actual extent of clearing will be determined during the detailed design and construction phases with consideration given to ecologically sensitive areas identified in this report.

4.1 NSW THREATENED SPECIES CONSERVATION ACT 1995 ASSESSMENT

Habitat assessment of the study area revealed that 26 species as listed under the *Threatened Species Conservation Act 1995* (TSC Act) had a low likelihood of utilising or inhabiting the study area and a further 28 threatened species were considered to have a low to moderate likelihood (refer *Annex B*). Given the low likelihood of these species utilising or inhabiting the study area, it was determined that further assessment under the provisions of the TSC Act was not required to assess potential impacts to these species as a result of the proposal.

The threatened species listed below within *Table 4.1* were either identified within the study area or considered to have moderate or moderate to high likelihood of utilising the study area based on known habitat requirements.

Table 4.1 Threatened Species Assessed under the TSC Act

Common Name	Scientific Name
Flora	
Ball Nut	*Floydia praealta*
Hairy Jointgrass	*Arthraxon hispidus*
Northern Clematis	*Clematis fawcettii*
Pointed Trefoil	*Rhynchosia acuminatissima*
Southern Ochrosia	*Ochrosia moorei*
Spiny Gardenia	*Randia moorei*
Sweet Myrtle	*Gossia fragrantissima*
Thorny Pea	*Desmodium acanthocladum*
Tinospora Vine	*Tinospora smilacina*
Birds	
Marbled Frogmouth	*Podargus ocellatus*
Rose-crowned Fruit-dove	*Ptilinopus regina*
Wompoo Fruit-dove	*Ptilinopus magnificus*
Mammals	
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*
Eastern Long-eared Bat	*Nyctophilus bifax*
Grey-headed Flying-fox	*Pteropus poliocephalus*
Koala	*Phascolarctos cinereus*
Little Bentwing-bat	*Miniopterus australis*

Assessment of the potential effects of the proposal on these species as listed under the schedules of the TSC Act was undertaken in accordance with the draft *Guidelines for Threatened Species Assessment under Part 3A of the*

Environmental Planning and Assessment Act 1995 (TSC Act) (DEC &DPI, 2005) (refer *Annex C*).

Threatened species were assessed in groups rather than as individuals based on the assumption that species having similar ecological requirements are at risk from the same threats and are likely to be impacted in similar ways by the proposal.

4.1.1 TSC Act Assessment Conclusion

Assessment under the TSC Act (refer *Annex C*) found that the proposal incorporating mitigation measures (refer *Chapter 5*) was unlikely to have a significant impact on those species under consideration owing largely to the absence of particular habitat features and the minimal level of disturbance.

4.2 COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY ACT 1999 ASSESSMENT

Under the EPBC Act, an assessment and approvals process has been developed for actions that significantly impact Matters of National Environmental Significance (MNES) as listed under the Act. MNES identified within a 10km radius of the study area are addressed in *Table 4.2*.

Table 4.2 Relationship between the Proposal and Matters of National Environmental Significance

Matters of National Environmental Significance	Application to the Project
World Heritage Properties	Not identified within the study area.
National Heritage Places	Not identified within the study area.
Wetlands of International Significance (Ramsar)	Not identified within the study area.
Commonwealth Marine Areas	Not identified within the study area.
Threatened Ecological Communities	Not identified within the study area.
Threatened Species	36 threatened species identified as potentially occurring within the study area.
Migratory Species	13 migratory species identified as potentially occurring within the study area.

Source: DEWHA, 2009

The Commonwealth EPBC Act requires approval for actions that may have a significant impact on MNES. Threatened and migratory species as listed under the EPBC Act have been identified as potentially occurring within the study area (DEWHA, 2009).

4.2.1 Threatened Species

Habitat assessment of the study area revealed that 14 species as listed under the EPBC Act had a low likelihood of utilising or inhabiting the study area and a further 19 threatened species were considered to have a low to moderate

likelihood (refer *Annex B*). Given the low likelihood of these species utilising or inhabiting the study area, it was determined that further assessment under the provisions of the EPBC Act was not required to assess potential impacts to these species as a result of the proposal.

The threatened species listed within *Table 4.3* were either identified within the study area or considered to have moderate or moderate to high likelihood of utilising the study area based on known habitat requirements.

Table 4.3 Threatened Species Assessed under the EPBC Act

Common Name	Scientific Name
Plants	
Ball Nut	*Floydia praealta*
Hairy Jointgrass	*Arthraxon hispidus*
Northern Clematis	*Clematis fawcettii*
Southern Ochrosia	*Ochrosia moorei*
Spiny Gardenia	*Randia moorei*
Sweet Myrtle	*Gossia fragrantissima*
Thorny Pea	*Desmodium acanthocladum*
Mammals	
Grey-headed Flying-fox	*Pteropus poliocephalus*

These species have been assessed under the TSC Act (refer *Annex C*) which showed that with the adoption of mitigation measures outlined in Chapter 5, the proposed activity is unlikely to have a significant impact on an important population of these species.

4.2.2 Migratory Species

A search of the DEWHA database for MNES (2009) showed that 13 migratory terrestrial and wetland bird species have been identified as occurring or having the potential to occur within the locality (refer *Table 4.4*).

Table 4.4 Migratory Species Considered to Potentially occur within a 10km Radius of the Study Area

Common Name	Scientific Name
Black-faced Monarch	Monarcha melanopsis
Cattle Egret	Ardea ibis
Coxen's Fig-Parrot	Cyclopsitta diophthalma coxeni
Great Egret	Ardea alba
Latham's Snipe	Gallinago hardwickii
Painted Snipe	Rostratula benghalensis
Rainbow Bee-eater	Merops ornatus
Regent Honeyeater	Xanthomyza phrygia
Rufous Fantail	Rhipidura rufifrons
Satin Flycatcher	Myiagra cyanoleuca
Spectacled Monarch	Monarcha trivirgatus
White-bellied Sea-Eagle	Haliaeetus leucogaster
White-throated Needletail	Hirundapus caudacutus

Note: Fish, marine birds and mammals were excluded from this assessment.

Of these species, the Rufous Fantail (*Rhipidura rufifrons*) was identified within the study area during field surveys. Given the nature of the proposal and the fact that this species is wide-ranging with generalist habitat requirements it was considered that the proposal is unlikely to have a significant impact on this species and is not considered to:

- substantially modify, destroy or isolate an area of important habitat of the species;
- result in harmful invasive species becoming established within the study area; or
- seriously disrupt the life cycle of an ecologically significant proportion of a population of the species.

4.2.3 EPBC Act Conclusion

The proposal is not expected to have a significant impact upon the health and viability of any threatened or migratory species listed under the provisions of the EPBC Act and further assessment under this Act is not required.

5 MITIGATION AND MANAGEMENT MEASURES

During the detailed design and construction phases, measures will be taken to avoid impacts to threatened species and certain habitat features as identified within this report. This would include an on-site investigation resulting in possible minor alteration to line and pole location to avoid impacts or the retention of low-growing species within the 'clearing' and 'investigation' zones. Prior to installation of the proposed electricity supply line it is recommended that a management program is prepared to address the possible risks to threatened species identified within the study area and to formalise measures to mitigate potential impacts to these species.

Measures to avoid impacts and mitigate impacts to be addressed in the program include:

Planning Phase

- identification and avoidance where possible of threatened flora species and Koala feed trees (Forest Red Gums) in determining preferred line route during the design phase. This would allow location of the route and/or infrastructure on the ground such that direct impacts on individual plants and or trees are avoided and where not possible appropriate mitigation measures are identified in consultation with the land holder.

Construction Phase

- preparation of a flora and fauna management sub-plan within the Project Construction Environmental Management Plan that specifically manages construction risks to the ecological values of the study area in particular the identified threatened flora and fauna species and Koala feed trees and to include:
    - identification, marking and protection of threatened flora species (and where possible, trees containing hollows) along the proposed electricity supply line corridor;
    - two-staged clearing process to allow sufficient warning of any fauna utilising identified habitat resources prior to final clearing; and
    - ensure all trees to be cleared are felled inwards within the electricity corridor and away from vegetation to be retained.

Operational Phase

- develop a site rehabilitation and weed management program for the corridor; and
- where land holder agreement, enhancement of adjoining Camphor Laurel Forest to compensate for any removal of this vegetation community and

loss of potential habitat for the Rose-crowned Fruit-dove and Grey-headed Flying-fox.

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Annex A

Species Lists

Table A.1 Flora Species Recorded within the Study Area

Family	Scientific Name	Common Name
ACANTHACEAE	*Pseuderanthemum variabile*	Pastel Flower
ADIANTACEAE	*Adiantum hispidulum*	Rough Maidenhair
ADIANTACEAE	*Cheilanthes distans*	Bristly Cloak Fern
APIACEAE	*Centella asiatica*	Indian Pennywort
APOCYNACEAE	*Asclepias curassavica**	Blood Flower
APOCYNACEAE	*Gomphocarpus fruticosus**	Narrow-leaved Cotton Bush
ARALIACEAE	*Schefflera actinophylla**	Umbrella Tree
ARAUCARIACEAE	*Araucaria cunninghamii*	Hoop Pine
ASPARAGACEAE	*Asparagus aethiopicus**	Asparagus Fern
ASPARAGACEAE	*Asparagus plumosus**	Climbing Asparagus
ASPLENIACEAE	*Asplenium australasicum*	Bird's Nest Fern
ASTERACEAE	*Ageratina adenophora**	Crofton Weed
ASTERACEAE	*Ageratina riparia**	Mistflower
ASTERACEAE	*Ageratum houstonianum**	-
ASTERACEAE	*Ambrosia artemisiifolia**	Annual Ragweed
ASTERACEAE	*Bidens pilosa**	Cobbler's Pegs
ASTERACEAE	*Cirsium vulgare**	Spear Thistle
ASTERACEAE	*Conyza bonariensis**	Flaxleaf Fleabane
ASTERACEAE	*Hypochaeris radicata**	Catsear
ASTERACEAE	*Senecio madagascariensis**	Fireweed
BIGNONIACEAE	*Pandorea pandorana*	Wonga Wonga Vine
BLECHNACEAE	*Blechnum spp.*	Water Fern
CHENOPODIACEAE	*Einadia hastata*	Berry Saltbush
COMMELINACEAE	*Commelina cyanea*	Native Wandering Jew
CYPERACEAE	*Cyperus brevifolius**	-
CYPERACEAE	*Cyperus eragrostis**	Umbrella Sedge
EUPHORBIACEAE	*Macaranga tanarius*	Blush Macaranga
EUPHORBIACEAE	*Mallotus philippensis*	Red Kamala
FABACEAE (CAESALPINIOIDEAE)	*Senna pendula var. glabrata**	Cassia
FABACEAE (FABOIDEAE)	***Desmodium acanthocladum***	**Thorny Pea**
FABACEAE (FABOIDEAE)	*Desmodium rhytidophyllum*	-
FABACEAE (FABOIDEAE)	*Glycine spp.*	Glycine
FABACEAE (FABOIDEAE)	*Trifolium repens**	White Clover
GERANIACEAE	*Geranium solanderi*	Native Geranium
LAMIACEAE	*Gmelina leichhardtii*	White Beech
LAURACEAE	*Cinnamomum camphora**	Camphor Laurel
LUZURIAGACEAE	*Eustrephus latifolius*	Wombat Berry
LUZURIAGACEAE	*Geitonoplesium cymosum*	Scrambling Lily
MALVACEAE	*Hibiscus heterophyllus*	Native Rosella
MENISPERMACEAE	*Stephania japonica*	Snake Vine
MORACEAE	*Ficus coronata*	Creek Sandpaper Fig
MORACEAE	*Maclura cochinchinensis*	Cockspur Thorn
MYRTACEAE	*Eucalyptus tereticornis*	Forest Red Gum
MYRTACEAE	*Lophostemon confertus*	Brush Box
MYRTACEAE	*Psidium guajava**	Guava
OCHNACEAE	*Ochna serrulata**	Mickey Mouse Plant
OLEACEAE	*Ligustrum lucidum**	Large-leaved Privet
OLEACEAE	*Ligustrum sinense**	Small-leaved Privet
PASSIFLORACEAE	*Passiflora suberosa**	Cork Passionfruit
PASSIFLORACEAE	*Passiflora subpeltata**	White Passionflower
PHYLLANTHACEAE	*Breynia oblongifolia*	Coffee Bush
PHYLLANTHACEAE	*Glochidion ferdinandi*	Cheese Tree
PITTOSPORACEAE	*Pittosporum undulatum*	Sweet Pittosporum
PLANTAGINACEAE	*Plantago lanceolata**	Lamb's Tongues
POACEAE	*Chloris gayana**	Rhodes Grass
POACEAE	*Echinopogon spp.*	Hedgehog Grass
POACEAE	*Imperata cylindrica*	Blady Grass

Family	Scientific Name	Common Name
POACEAE	*Melinis repens**	Red Natal Grass
POACEAE	*Oplismenus spp.*	Basket Grass
POACEAE	*Panicum spp.*	-
POACEAE	*Paspalum dilatatum**	Paspalum
POACEAE	*Pennisetum alopecuroides**	Swamp Foxtail
POACEAE	*Pennisetum clandestinum**	Kikuyu Grass
POACEAE	*Setaria spp.**	Pigeon Grass
POACEAE	*Sida rhombifolia**	Paddy's Lucerne
POACEAE	*Sporobolus africanus**	Parramatta Grass
POACEAE	*Themeda australis*	Kangaroo Grass
POLYGONACEAE	*Persicaria decipiens*	Slender Knotweed
POLYPODIACEAE	*Platycerium superbum*	Staghorn
POLYPODIACEAE	*Pyrrosia confluens*	Horseshoe Felt Fern
ROSACEAE	*Rubus parvifolius*	Rose-leaf Bramble
RUBIACEAE	***Randia moorei***	**Spiny Gardenia**
SAPINDACEAE	*Guioa semiglauca*	Guioa
SAPINDACEAE	*Jagera pseudorhus*	Foambark Tree
SMILACACEAE	*Smilax australis*	Lawyer Vine
SOLANACEAE	*Solanum mauritianum**	Wild Tobacco Bush
SOLANACEAE	*Solanum nigrum**	Blackberry Nightshade
THYMELAEACEAE	*Pimelea latifolia*	-
ULMACEAE	*Aphananthe philippinensis*	Rough-leaved Elm
VERBENACEAE	*Lantana camara**	Lantana
VERBENACEAE	*Verbena bonariensis**	Purpletop
VERBENACEAE	*Verbena rigida**	Veined Verbena
VITACEAE	*Cayratia clematidea*	Slender Grape

* denotes introduced species; bold text denotes threatened species.

Table A.2 Fauna Species Recorded within the Study Area

Family	Scientific Name	Common Name
AMPHIBIAN		
BUFONIDAE	*Bufo marinus**	Cane Toad
HYLIDAE	*Litoria fallax*	Eastern Dwarf Tree Frog
MYOBATRACHIDAE	*Limnodynastes peronii*	Brown-striped Frog
REPTILES		
ELAPIDAE	*Vermicella annulata*	Bandy-bandy
SCINCIDAE	*Lampropholis delicata*	Dark-flecked Garden Sunskink
BIRDS		
ACANTHIZIDAE	*Sericornis frontalis*	White-browed Scrubwren
ALCEDINIDAE	*Dacelo novaeguineae*	Laughing Kookaburra
ARDEIDAE	*Egretta novaehollandiae*	White-faced Heron
ARTAMIDAE	*Gymnorhina tibicen*	Australian Magpie
ARTAMIDAE	*Strepera graculina*	Pied Currawong
CACATUIDAE	*Eolophus roseicapillus*	Galah
CISTICOLIDAE	*Cisticola exilis*	Golden-headed Cisticola
COLUMBIDAE	***Ptilinopus regina***	**Rose-crowned Fruit-dove**
CORVIDAE	*Corvus orru*	Torresian Crow
DICRURIDAE	*Rhipidura rufifrons*	Rufous Fantail
ESTRILDIDAE	*Lonchura castaneothorax*	Chestnut-breasted Mannikin
ESTRILDIDAE	*Neochmia temporalis*	Red-browed Finch
EUPETIDAE	*Psophodes olivaceus*	Eastern Whipbird
MALURIDAE	*Malurus lamberti*	Variegated Fairy-wren
MELIPHAGIDAE	*Meliphaga lewinii*	Lewin's Honeyeater
PACHYCEPHALIDAE	*Pachycephala pectoralis*	Golden Whistler
PODARGIDAE	*Podargus strigoides*	Tawny Frogmouth
PSITTACIDAE	*Trichoglossus haematodus*	Rainbow Lorikeet
SYLVIIDAE	*Megalurus timoriensis*	Tawny Grassbird
THRESKIORNITHIDA	*Threskiornis molucca*	Australian White Ibis
MAMMALS		
BOVIDAE	*Bos taurus**	European Cattle
CANIDAE	*Vulpes vulpes**	Fox
MACROPODIDAE	*Wallabia bicolor*	Swamp Wallaby
PHALANGERIDAE	*Trichosurus caninus*	Short-eared Possum
PHASCOLARCTIDAE	***Phascolarctos cinereus***	**Koala**
PTEROPODIDAE	*Pteropus alecto*	Black Flying-fox
PTEROPODIDAE	***Pteropus poliocephalus***	**Grey-headed Flying-fox**

* denotes introduced species; bold text denotes threatened species.

Annex B

Threatened Species Habitat Assessment

Table B.1 Threatened Species Habitat Assessment

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
PLANTS					
Baloghia marmorata	Marbled Baloghia	V	V	In NSW, known only from the Lismore district. Found in subtropical rainforest on soils derived from basalt (DECC, 2009b).	Low to moderate - few flora species characteristic of lowland subtropical rainforest community present within the study area.
Bosistoa selwynii	Heart-leaved Bosistoa	V	V	Within NSW, known from the Tweed River district. Occurs in rainforest up to 300m altitude on deep basaltic soils. In NSW, it prefers alluvial flats, particularly creek banks (DECC, 2009b).	Low – no suitable habitat within the study area.
Bosistoa transversa	Three-leaved Bosistoa	V	V	Within NSW, occurs within the Nightcap Range north of Lismore in lowland subtropical rainforest up to 300m in altitude (DECC, 2009b).	Low to moderate - few flora species characteristic of lowland subtropical rainforest community present within the study area.
Clematis fawcettii	Northern Clematis	V	V	Within NSW, found in the north-east of the State, north from Lismore. Occurs in drier rainforest, usually near streams (DECC, 2009b).	**Moderate** – flora species characteristic of dry rainforest have been identified within the study area. This species has previously been recorded within close proximity to the proposed electricity supply line (DECC, 2009a).
Corchorus cunninghamii	Native Jute	E	E	In NSW, populations occur at Bungabbee and Toonumbar. Occurs in ecotones between wet eucalypt forest and dry to dry-subtropical rainforest on sheltered slopes and gullies, and grassy, open forest on exposed slopes and ridges (DECC, 2009b).	Low to moderate – flora species characteristic of eucalypt forest and rainforest present within the study area although the highly disturbed nature of the site reduces the likelihood of such a rare species occurring within the study area.

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
Cryptocarya foetida	Stinking Cryptocarya	V	V	Within NSW, occurs in the north-east of the state, south to Iluka. Found in littoral rainforest, usually on sandy soils, but mature trees are also known on basalt soils (DECC, 2009b).	Low – no littoral rainforest identified within the study area.
Cryptostylis hunteriana	Leafless Tongue-orchid	V	V	Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. The larger populations typically occur in woodland dominated by Scribbly Gum (*Eucalyptus sclerophylla*), Silvertop Ash (*E. sieberi*), Red Bloodwood (*Corymbia gummifera*) and Black Sheoak (*Allocasuarina littoralis*); appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (*C. subulata*) and the Tartan Tongue Orchid (*C. erecta*) (DECC, 2009b).	Low – no suitable habitat within the study area.
Desmodium acanthocladum	Thorny Pea	V	V	Occurs only in north-east NSW where it is found in the Lismore area. Also recorded from near Grafton, Coraki, Casino and the Mount Warning area. Found in dry rainforest and fringes of riverine subtropical rainforest on basalt-derived soils at low elevations. Much of its habitat has been cleared for agriculture (DECC, 2009b).	**High** – recorded within the study area.
Diploglottis campbellii	Small-leaved Tamarind	E	E	Recorded from the coastal lowlands between Richmond River on the Far North Coast of NSW and Mudgeeraba Creek on the Gold Coast hinterland, Queensland. Confined to the warm subtropical rainforests of the NSW-Queensland border lowlands and adjacent low ranges. The forest types in which the species occurs vary from lowland subtropical rainforest to drier subtropical rainforest with a Brush Box open overstorey. Occurs on basalt-derived soils and also on poorer soils such as those derived from quartz monzonite (DECC, 2009b).	Low – no suitable habitat within the study area.

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
Doryanthes palmeri	Giant Spear Lily	V	-	In NSW, occurs in the far north-east of the state on the coastal ranges that are part of the Mount Warning Caldera. Its southern distributional limit is Mount Billen. Found on exposed rocky outcrops on infertile soils or on bare rock where it grows in a narrow band of vegetation along the cliff-tops and on steep cliff-faces or rocky ledges in montane heath next to subtropical rainforest, warm temperate rainforest or wet eucalypt forest (DECC, 2009b).	Low – no heath identified within the study area.
Endiandra hayesii	Rusty Rose Walnut	V	V	A restricted distribution from Burleigh Heads in Queensland to the Richmond River in north-east NSW. Found in sheltered moist gullies in lowland subtropical and warm temperate rainforest on alluvium or basaltic soils (DECC, 2009b).	Low to moderate – few flora species characteristic of lowland subtropical rainforest community present within the study area.
Floydia praealta	Ball Nut	V	V	Small scattered populations distributed from Gympie in Queensland to the Clarence River in north-east NSW. Found in riverine and subtropical rainforest, usually on soils derived from basalt (DECC, 2009b).	**Moderate** – few flora species characteristic of subtropical rainforest present within the study area. This species has previously been recorded within close proximity to the proposed electricity supply line (DECC, 2009a).
Geijera paniculata	Axe-Breaker	E	-	Very rare in north-east NSW, where it is known from the Tweed, Lismore and Wardell areas. Found in dry subtropical rainforest and vine scrub, often along rivers (DECC, 2009b).	Low to moderate – flora species characteristic of dry rainforest present within the study area although the highly disturbed nature of the site reduces the likelihood of such a rare species occurring within the study area.

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
Gossia fragrantissima	Sweet Myrtle	E	E	Occurs in north-east NSW, south to the Richmond River where it is mostly found on basalt-derived soils in dry subtropical and riverine rainforest. Coppices from roots left in the ground and can also occur as isolated plants in paddocks or as regrowth in areas originally covered by rainforest (DECC, 2009b).	**Moderate to high** – flora species characteristic of dry rainforest have been identified within the study area. This species has previously been recorded within close proximity to the proposed electricity supply line (DECC, 2009a) and is known to persist in cleared areas originally covered by rainforest.
Hicksbeachia pinnatifolia	Monkey Nut	V	V	Within NSW, occurs in coastal areas of north-east NSW, north from the Nambucca Valley. Found in subtropical rainforest, moist eucalypt forest and Brush Box forest (DECC, 2009b).	Low to moderate - few flora species characteristic of lowland subtropical rainforest community present within the study area.
Isoglossa eranthemoides	Isoglossa	E	E	A very restricted distribution in north-east NSW from the Tweed to the Lismore area. Found in the understorey of lowland subtropical rainforest, in moist situations on floodplains and slopes. Underlying soils are derived from basalt, metasediments or gabbro (DECC, 2009b).	Low to moderate - few flora species characteristic of lowland subtropical rainforest community present within the study area.
Macadamia tetraphylla	Rough-shelled Bush Nut	V	V	Within NSW, this species is chiefly confined to the Richmond and Tweed Rivers in north-east NSW where it is found in subtropical rainforest, usually near the coast (DECC, 2009b).	Low to moderate - few flora species characteristic of the subtropical rainforest community present within the study area.
Marsdenia longiloba	Clear Milkvine	E	V	Occurs at scattered sites on the north coast of NSW north from Barrington Tops within subtropical and warm temperate rainforest, lowland moist eucalypt forest adjoining rainforest and, sometimes, in areas with rock outcrops (DECC, 2009b).	Low to moderate - few flora species characteristic of the subtropical rainforest community present within the study area.
Micromelum minutum	-	PE	-	Grows mainly in drier lowland rainforest, north from Lismore. Last collected in NSW in 1911 (RBG, 2009).	Low – rarity of the species reduces the likelihood of occurrence in such a highly disturbed area.

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
Oberonia complanata	Yellow-flowered King of the Fairies	E	-	Within NSW, there are several historical records of this species from Byron Bay, Lismore and Coffs Harbour. More recent observations have been made from Lismore and Wollumbin. This species grows on trees and rocks in littoral rainforest, subtropical rainforest, dry rainforest, wet or dry eucalypt forests, dunes (including stabilised sands), stream-side areas, swampy forests and mangroves (DECC, 2009b).	Low to moderate – few areas of potential habitat available within the study area. No records within close proximity to the proposed electricity supply line and only two historical records within a 10km radius of the study area (DECC, 2009a).
Ochrosia moorei	Southern Ochrosia	E	E	This species is found in north-east NSW, north from the Richmond River where it occurs in riverine and lowland subtropical rainforest (DECC, 2009b).	**Moderate** - few flora species characteristic of lowland subtropical rainforest present within the study area. This species has previously been recorded within close proximity to the proposed electricity supply line (DECC, 2009a).
Owenia cepiodora	Onion Cedar	V	V	This species occurs north from the Richmond River in north-east NSW in subtropical and dry rainforest on or near soils derived from basalt (DECC, 2009b).	Low to moderate – some areas of potential habitat available within the study area. No records within close proximity to the proposed electricity supply line and only one historical record within a 10km radius of the study area (DECC, 2009a).
Randia moorei	Spiny Gardenia	E	E	Within NSW, occurs in the north-east of the State, north from Lismore in subtropical, riverine, littoral and dry rainforest. Hoop Pine and Brush Box are common canopy species (DECC, 2009b).	**High** – recorded within the study area.
Rapanea sp. A Richmond River	Ripple-leaf Muttonwood	E	E	Known only from a few populations at Coraki, Boatharbour near Lismore and the Cherry Tree area west of Casino. Found in subtropical and dry rainforest and swamp forest on creek flats and slopes on basalt derived soil (DECC, 2009b).	Low to moderate – some areas of potential habitat available within the study area. No records within close proximity to the proposed electricity supply line and only two records within a 10km radius of the study area (DECC, 2009a).

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
Rhynchosia acuminatissima	Pointed Trefoil	V	-	Known from only nine locations north of Lismore, six of which occur within National Parks and Nature Reserves, and three in State Forests. Found in or near dry rainforest dominated by Hoop Pine. Also associated with Brush Box (*Lophostemon confertus*), Grey Ironbark (*Eucalyptus siderophloia*), Rough-leaved Elm (*Ahananthe philipinensis*) and Native Holly (*Alchornea ilicifolia*) (DECC, 2009b).	**Moderate** – some areas of potential habitat containing Hoop Pine available within the study area. No records within close proximity to the proposed electricity supply line (DECC, 2009a).
Sarcochilus dilatatus	Brown Butterfly Orchid	E	-	Very rare within NSW, with the only recent record being from a single location near Hortons Creek. Grows on trees in littoral rainforest, subtropical rainforest, dry rainforest and streamside forests, mainly at low to medium (up to 500m) altitudes. Favour Hoop Pine as a host (DECC, 2009b).	Low to moderate – flora species characteristic of dry subtropical rainforest (including Hoop Pine) present within the study area although the highly disturbed nature of the site reduces the likelihood of such a rare species occurring within the study area. No records within close proximity to the proposed electricity supply line (DECC, 2009a).
Sarcochilus hartmannii	Waxy Sarcochilus	V	V	Within NSW, occurs north from the Richmond River. Favours cliff faces on steep narrow ridges supporting eucalypt forest and clefts in volcanic rock from 500 to 1,000m in altitude. Also found occasionally at the bases of fibrous trunks of trees, including cycads and grass-trees (DECC, 2009b).	Low – no suitable habitat within the study area.
Senna acclinis	Rainforest Cassia	E	-	Found in coastal districts and adjacent tablelands of NSW, north from the Illawarra. Grows in or on the edges of subtropical and dry rainforest (DECC, 2009b).	Low to moderate – some areas of potential habitat available within the study area. No records within close proximity to the proposed electricity supply line and only one historical record within a 10km radius of the study area (DECC, 2009a).
Syzygium hodgkinsoniae	Red Lilly Pilly	V	V	Within NSW, has a restricted range in the north-east of the state, north from the Richmond River. Usually found in riverine and subtropical rainforest on rich alluvial or basaltic soils (DECC, 2009b).	Low to moderate - few flora species characteristic of the subtropical rainforest community present within the study area.

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
Taeniophyllum muelleri	Minute Orchid	-	V	Grows on outer branches and branchlets of rainforest trees. Occurs on the coast and coastal ranges, from sea level to 250m altitude, north from the Bellinger River (RBG, 2009).	Low to moderate – limited suitable habitat within the study area.
Tarenna cameronii	Cameron's Tarenna	E	-	In NSW, only one very small population is known in Lismore. Grows in the understorey of dry rainforest on rocky basalt-derived soils (DECC, 2009b).	Low to moderate – few flora species characteristic of dry rainforest persisting in the overstorey within the study area. No records within close proximity to the proposed electricity supply line (DECC, 2009a).
Thesium australe	Austral Toadflax	V	V	Found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. Occurs in grassland or grassy woodland where it is often found in damp sites in association with Kangaroo Grass (*Themeda australis*) (DECC, 2009b).	Low to moderate – only one small patch of Kangaroo Grass identified near the south-eastern corner of Lot 7 DP 1115057. No records within close proximity to the proposed electricity supply line (DECC, 2009a).
Tinospora smilacina	Tinospora Vine	E	-	Occurs north from the Coffs Harbour district in north-east NSW, where it is rare. Found in dry rainforest and along the boundaries of dry rainforest and dry eucalypt forest (DECC, 2009b).	**Moderate** – flora species characteristic of dry rainforest (including Hoop Pine) and eucalypt forest present within the study area. Previously recorded to the north of the proposed electricity supply line, within Wilson Nature Reserve (DECC, 2009a).
Tinospora tinosporoides	Arrow-head Vine	V	V	Occurs north from the Richmond River in north-east NSW, where it is locally common in some parts of its range. Found in wetter subtropical rainforest, including littoral rainforest, on fertile, basalt-derived soils (DECC, 2009b).	Low to moderate – limited potentially suitable habitat available within the study area.

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
INSECTS					
Nurus brevis	Shorter Rainforest Ground-beetle	E	-	Historically widespread in heavily timbered, high rainfall areas east of the Great Dividing Range on the north coast of NSW. Currently the only known populations occur in very isolated patches of forest near Mallanganee, west of Casino. Found in low elevation rainforest, predominantly in drier rainforests. Little is known of its detailed habitat requirements apart from the fact that adults live in burrows (DECC, 2009b).	Low to moderate – the highly modified nature of vegetation within the study area reduces the likelihood of this endangered species being present.
AMPHIBIANS					
Litoria olongburensis	Wallum Sedge Frog	V	V	Within NSW, occurs in coastal areas, north from the Yuraygir National Park near Grafton. Found in paperbark swamps and sedge swamps of the coastal "wallum" country. Wallum is a Banksia dominated lowland heath ecosystem characterised by acidic waterbodies. Usually found amongst sedges and rushes in coastal wetlands (DECC, 2009b).	Low – no suitable habitat within the study area.
Mixophyes iteratus	Southern Barred Frog	E	E	Within NSW, occur on the coast and ranges, north from the Hawkesbury River. North-eastern NSW, particularly the Coffs Harbour-Dorrigo area, is now a stronghold. Forage and live amongst deep, damp leaf litter in rainforests, moist eucalypt forest and nearby dry eucalypt forest, at elevations below 1000m. Breed around shallow, flowing, rocky streams (DECC, 2009b).	Low – no suitable habitat within the study area.
REPTILES					
Cacophis harriettae	White-crowned Snake	V	-	Within NSW, occurs in coastal and near-coastal areas, north from Coffs Harbour. Stronghold area appears to be the middle Clarence Valley. Favours low to mid-elevation dry eucalypt forest and woodland, particularly areas with a varied and well-developed litter layer, where small lizards (prey) may be more abundant. Also occasionally found in moist eucalypt forest and coastal heathland (DECC, 2009b).	Low – eucalypts occur in scattered distribution within the study area and do not form a suitable community that would provide habitat for this species.

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
Coeranoscincus reticulatus	Three-toed Snake-tooth Skink	V	V	Occurs on the coast and ranges from the Macleay valley in NSW, north to Queensland. Very uncommon south of Grafton. Found in rainforest and occasionally moist eucalypt forest, on loamy or sandy soils. Lives in loose soil, leaf litter and rotting logs, and feeds on earthworms and beetle grubs (DECC, 2009b).	Low to moderate – minimal suitable habitat available within the study area.
BIRDS					
Amaurornis olivaceus	Bush-hen	V	-	Occur in coastal northern Australia and through eastern Queensland to the NSW north coast. Uncommon from the Queensland border to the Clarence River and recorded as far south as the Nambucca River. Occur in a variety of coastal wetlands from mangroves, lagoons and swamps, to river margins and creeks running through rainforest. Also recorded away from water in dense low vegetation, including Blady Grass and the introduced Lantana (DECC, 2009b).	Low – no suitable wetland or waterway habitat within the study area.
Anthochaera phrygia	Regent Honeyeater	E	E	Mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Also found in drier coastal woodlands and forests in some years (DECC, 2009b).	Low – no suitable habitat within the study area.
Burhinus grallarius	Bush Stone-curlew	E	-	Found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber and feeds on insects and small vertebrates, such as frogs, lizards and snakes. Nests on the ground in a scrape or small bare patch (DECC, 2009b).	Low - eucalypts occur in scattered distribution within the study area and do not form a suitable forest or woodland community that would provide habitat for this species.
Cyclopsitta diophthalma coxeni	Coxen's Fig-Parrot	E	E	Limited to about 5 populations scattered between Bundaberg in Queensland and the Hastings River in NSW. Usually recorded from drier rainforests and adjacent wetter eucalypt forest but rarely seen due to its small size and cryptic habits. Also found in the wetter lowland rainforests that are now largely cleared in NSW. Shows a decided preference for fig trees, but also feeds on other fruiting rainforest species (DECC, 2009b).	Low to moderate – some potential habitat within the study area though the disturbed nature of the study area reduces the likelihood of this species occurring.
Ephippiorhynchus asiaticus	Black-necked Stork	E	-	Widespread across coastal northern and eastern Australia, becoming increasingly uncommon further	Low – no suitable wetland or waterway habitat within the study

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
				south into NSW, and rarely south of Sydney. Inhabits permanent freshwater wetlands including margins of billabongs, swamps, shallow floodwaters, and adjacent grasslands and savannah woodlands; can also be found occasionally on inter-tidal shorelines, mangrove margins and estuaries. Feeds in shallow, still water on a variety of prey including fish, frogs, eels, turtles, crabs and snakes. Builds a large nest, up to 2m diameter, made in a live or dead tree, in or near a freshwater swamp (DECC, 2009b).	area.
Erythrotriorchis radiatus	Red Goshawk	E	V	This species is very rare in NSW where most records are from the Clarence River Catchment, with a few records near the lower Richmond and Tweed Rivers. In NSW, this species is mainly found along or near watercourses, in swamp forest and woodlands on the coastal plain. It favours patches of dense forest interspersed with open woodland or cleared land and often frequents forest edges (DECC, 2009b).	Low – no suitable forest or woodland within the study area.
Irediparra gallinacea	Comb-crested Jacana	V	-	Occurs throughout coastal Australia and well inland in the north from the Kimberley to Sydney. Vagrants occasionally appear further south, possibly in response to unfavourable conditions in the north. Inhabits permanent wetlands with a good surface cover of floating vegetation, especially water-lilies. Forage across floating vegetation where they feed primarily on insects and other invertebrates, as well as some seeds and vegetation (DECC, 2009b).	Low – no suitable wetlands containing floating vegetation within the study area.
Ixobrychus flavicollis	Black Bittern	V	-	In NSW, records are scattered along the east coast, with individuals rarely being recorded south of Sydney or inland. Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves. Feeds on frogs, reptiles, fish and invertebrates, including snails, dragonflies, shrimps and crayfish, with most feeding done at dusk and at night. During the day, roosts in trees or on the ground amongst dense reeds. Nests, built in spring	Low – no suitable wetlands within the study area.

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
				are located on a branch overhanging water and consist of a bed of sticks and reeds on a base of larger sticks (DECC, 2009b).	
Lathamus discolor	Swift Parrot	E	E	Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia. In NSW, mostly occurs on the coast and south west slopes in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany (*Eucalyptus robusta*), Spotted Gum (*Corymbia maculata*), Red Bloodwood (*C. gummifera*), Mugga Ironbark (*E. sideroxylon*), and White Box (*E. albens*). Commonly used lerp infested trees include Grey Box (*E. macrocarpa*), Grey Box (*E. moluccana*) and Blackbutt (*E. pilularis*) (DECC, 2009b).	Low – no preferred feed trees identified within the study area.
Menura alberti	Albert's Lyrebird	V	-	In NSW, it occurs west to the Acacia Plateau in the Border Ranges and reaches its eastern and southern limits in the coastal range south west of Ballina. Inhabits mixed rainforest and wet open forest, frequently dominated by Brush Box. In winter birds commonly forage in moist forest on ridges between wetter forest (DECC, 2009b).	Low to moderate – the highly disturbed nature of vegetation within the study area reduces the likelihood of this species utilising areas containing remnant rainforest species.
Pandion haliaetus	Osprey	V	-	Ospreys are found right around the Australian coast line, except for Victoria and Tasmania. Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water. Nests are made high up in dead trees or in dead crowns of live trees, usually within 1km of the sea (DECC, 2009b).	Low – the study area is located further than 1km from the sea and does not provide suitable foraging or nesting habitat for this species.
Podargus ocellatus	Marbled Frogmouth	V	-	Its NSW distribution extends west to the upper Clarence River and is generally rare. Prefers subtropical rainforest spending most time in deep, wet, sheltered gullies frequently containing stands of Bangalow Palms. Less frequently it occurs in higher elevation temperate rainforests and wet eucalypt forest with a well-developed rainforest understorey (DECC, 2009b).	**Moderate to high** – the Wilson Nature Reserve (located to the north of the study area) provides habitat for this species and records have been identified within close proximity to the proposed electricity supply line (DECC, 2009a).
Poephila cincta cincta	Black-throated Finch	E	E	Once found from southern Cape York in Queensland to the Inverell district in northern NSW.	Low – no suitable habitat within the study area.

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
				It is now very rare in NSW. Inhabits eucalypt woodland and riverside vegetation, including paperbark and wattle shrubland. Favours areas close to water with a dense understorey of seeding grass and shrubs (DECC, 2009b).	
Ptilinopus magnificus	Wompoo Fruit-dove	V	-	Occurs along the coast and ranges from the Hunter River in NSW to Cape York Peninsula. Rare south of Coffs Harbour. Occurs in, or near rainforest, low elevation moist eucalypt forest and brush box forests. Most often seen in mature forests, though also found in remnant and regenerating rainforest. Feeds on a diverse range of tree and vine fruits and is locally nomadic; following ripening fruit. The nest is a typical pigeon nest; a flimsy platform of sticks on a thin branch or a palm frond, often over water, usually 3 - 10m above the ground (DECC, 2009b).	**Moderate to high** – fruits of rainforest species present within the study area provide a foraging resource for this species.
Ptilinopus regina	Rose-crowned Fruit-dove	V	-	Occurs on the Coast and ranges of eastern NSW and Queensland, from Newcastle to Cape York. Vagrants occasionally found further south to Victoria. Found mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful. Feed entirely on fruit from vines, shrubs, large trees and palms, and are thought to be locally nomadic as they follow the ripening of fruits (DECC, 2009b).	**High** – recorded within the study area.
Rostratula australis	Australian Painted Snipe	E	V	In NSW, this species has been recorded at the Paroo wetlands, Lake Cowell, Macquarie Marshes and Hexham Swamp. Most common in the Murray-Darling Basin. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. Forages nocturnally on mud-flats and in shallow water (DECC, 2009b).	Low – no suitable habitat within the study area.

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
Stictonetta naevosa	Freckled Duck	V	-	Breeds in large temporary swamps created by floods in the Bulloo and Lake Eyre basins and the Murray-Darling system, particularly along the Paroo and Lachlan Rivers, and other rivers within the Riverina. The duck is forced to disperse during extensive inland droughts when wetlands in the Murray River basin provide important habitat. May also occur as far as coastal NSW and Victoria during such times. Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds. Generally rest in dense cover during the day, usually in deep water. Feed at dawn and dusk and at night on algae, seeds and vegetative parts of aquatic grasses and sedges and small invertebrates. Nests are usually located in dense vegetation at or near water level (DECC, 2009b).	Low – no suitable waterways or wetlands within the study area.
Turnix melanogaster	Black-breasted Button-quail	E	V	In north-east NSW, there are few reliable records, all north of the Bruxner Highway and east of the Great Divide. Prefers drier rainforests and viney scrubs, often in association with Hoop Pine and a deep, moist leaf litter layer. During drought the bird may move into adjacent wetter rainforests (DECC, 2009b).	Low to moderate – limited potential habitat available within the study area. Lack of deep, moist leaf litter.
Tyto tenebricosa	Sooty Owl	V	-	Occupy the easternmost one-eighth of NSW, occurring on the coast, coastal escarpment and eastern tablelands. Found in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests. Roosts by day in the hollow of a tall forest tree or in heavy vegetation; hunts by night for small ground or tree-dwelling mammals such as the Common Ringtail Possum (*Pseudocheirus peregrinus*) or Sugar Glider (*Petaurus breviceps*). Nests in very large tree hollows (DECC, 2009b).	Low to moderate - flora species characteristic of dry rainforest present within the study area although few hollows identified within the study area. No records within close proximity to the proposed electricity supply line (DECC, 2009a).
MAMMALS					
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Found mainly in areas with extensive cliffs and	Low – no suitable habitat within the study area.

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
				caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. Generally rare with a very patchy distribution in NSW. Scattered records from the New England Tablelands and North West Slopes. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Hirundo ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features. Found in well-timbered areas containing gullies (DECC, 2009b).	
Dasyurus maculatus	Spotted-tailed Quoll	V	E	Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Queensland. Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites. Use 'latrine sites', often on flat rocks among boulder fields and rocky cliff-faces. Consume a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits and insects; also eats carrion and takes domestic fowl. Females occupy home ranges up to about 750ha and males up to 3500ha and usually traverse their ranges along densely vegetated creeklines (DECC, 2009b).	Low to moderate – limited potential habitat available within the study area although the highly disturbed nature of the study area reduces the likelihood of this species occurring.
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	Found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania. Prefers moist habitats, with trees taller than 20m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy (DECC, 2009b).	**Moderate** – potential moist habitat provided by dense Camphor Forest and small hollows in Forest Red Gums provide potential roosting habitat.

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
Miniopterus australis	Little Bentwing-bat	V	-	Found in coastal north-eastern NSW and eastern Queensland. Inhabit moist eucalypt forest, rainforest or dense coastal banksia scrub. Roost in caves, tunnels and sometimes tree hollows during the day, and forage at night for small insects beneath the canopy of densely vegetated habitats. They often share roosting sites with the Common Bentwing-bat and, in winter, the two species may form mixed clusters (DECC, 2009b).	**Moderate** - the Wilson Nature Reserve (located to the north of the study area) provides potential habitat for this species and records have been identified within close proximity to the proposed electricity supply line (DECC, 2009a).
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V	-	Occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. At other times of the year, populations disperse within about 300km range of maternity caves. Hunt in forested areas, catching moths and other flying insects above the tree tops (DECC, 2009b).	Low – no suitable roosting habitat within the study area.
Nyctophilus bifax	Eastern Long-eared Bat	V	-	In NSW, they appear to be confined to the coastal plain and nearby coastal ranges, extending south to the Clarence River area, with a few records further south around Coffs Harbour. Found in lowland subtropical rainforest and wet and swamp eucalypt forest, extending into adjacent moist eucalypt forest. Coastal rainforest and patches of coastal scrub are particularly favoured. Roosts in hollows in trees and also in the hanging foliage of palms, in dense clumps of foliage of rainforest trees and under bark (DECC, 2009b).	**Moderate** - the Wilson Nature Reserve (located to the north of the study area) provides potential habitat for this species and records have been identified within close proximity to the proposed electricity supply line (DECC, 2009a).

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
Petaurus norfolcensis	Squirrel Glider	V	-	Widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. Inhabit mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest, west of the Great Dividing Range; and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefer mixed species stands with a shrub or Acacia midstorey. Require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein (DECC, 2009b).	Low – no suitable habitat within the study area.
Phascolarctos cinereus	Koala	V	-	In NSW, mainly occurs on the central and north coasts with some populations in the western region. Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Home range size varies with quality of habitat, ranging from less than 2ha to several hundred hectares in size (DECC, 2009b).	**High** – recorded within the study area.
Planigale maculata	Common Planigale	V	-	Found in coastal north-eastern NSW, coastal eastern Queensland and Arnhem Land. The species reaches its southern distribution limit on the NSW lower north coast. Inhabits rainforest, eucalypt forest, heathland, marshland, grassland and rocky areas where there is surface cover; usually close to water. Active at night, they shelter during the day in saucer-shaped nests built in crevices, hollow logs, beneath bark or under rocks. Prey on insects and small vertebrates, some nearly their own size. The female builds a nest lined with grass, eucalypt leaves or shredded bark (DECC, 2009b).	Low to moderate – no suitable habitat near water available within the study area.

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
Potorous tridactylus tridactylus	Long-nosed Potoroo	V	V	In NSW, it is generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760mm. Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature (DECC, 2009b).	Low – no suitable habitat within the study area.
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Found within 200km of the eastern coast of Australia, from Bundaberg in Queensland to Melbourne in Victoria. Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Travel up to 50km to forage. Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines. Also forage in cultivated gardens and fruit crops (DECC, 2009b).	**High** – recorded within the study area.

Scientific Name	Common Name	Legal Status		Habitat Requirements	Likelihood of Occurrence
		TSC Act	EPBC Act		
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	Found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. It extends to the coast over much of its range. In NSW, it is widespread on the New England Tablelands, however does not occur at altitudes above 500m. Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Forages along creek and river corridors at an altitude of 3 - 6 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species (DECC, 2009b).	Low to moderate – limited suitable foraging habitat within the study area.
Thylogale stigmatica	Red-legged Pademelon	V	-	Patchily distributed along coastal and sub-coastal eastern Australia from Cape York to the Hunter Valley in NSW. Inhabits forest with a dense understorey and ground cover, including rainforest, moist eucalypt forest and vine scrub. Wet gullies with dense, shrubby groundcover provide shelter from predators. In NSW, rarely found outside forested habitat. Disperse from dense shelter areas to feed from late afternoon to early morning, favouring native grasses and herbs on the edge of the forest. Also known to feed on fruits, young seedling leaves and stems, fungi and ferns (DECC, 2009b).	Low to moderate – minimal foraging habitat and limited sheltering habitat available within the study area.

V = Vulnerable; E = Endangered; PE = Presumed Extinct.

Note: Fish and marine birds and mammals were excluded from assessment.

Annex C

Threatened Species Conservation Act 1995 Assessment

C.1 PART 3A THREATENED SPECIES ASSESSMENT

Under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) the impact of the proposal on threatened species, populations or ecological communities or their habitats is considered against the *Guidelines for Threatened Species Assessment* (DEC & DPI 2005) in particular Appendix 3.

This annex considers the impact of the proposal on threatened species identified in *Table 4.1* as occurring or having a high likelihood of occurrence in habitats in the study area that may be impacted by the proposal.

How is the proposal likely to affect the lifecycle of a threatened species and/or population?

In general it is noted that the clearing and ongoing maintenance of the proposed transmission line easement may impact directly on individual threatened plants or fauna through clearance. However, a 30 metre wide easement is unlikely to fragment and or separate individuals within a population such that there would be impact on pollination cycle. With implementation of the mitigation measures outlined in *Chapter 5*, including the avoidance and protection of threatened flora species during the detailed planning and construction phases, it is considered unlikely that the proposal would affect the lifecycle of these species.

Flora

- Ball Nut (V TSC Act; V EPBC Act)

The Ball Nut (*Floydia praealta*) is a rainforest tree which is closely related to the Macadamia Tree. It occurs in small scattered populations distributed from Gympie in Queensland to the Clarence River in north-east NSW. The species is found in riverine and subtropical rainforest, usually on basalt-derived soils or in coastal scrub (DECC 2009). It is considered to have a moderate likelihood of occurring in the area based on presence of 'rainforest' community on basalt-derived soils.

The Ball Nut is threatened by clearing, modification of and or loss of suitable habitat by weed invasion, grazing and risk of extinction due to low numbers and isolation. The proposal will clear an area approximately 30 metres wide by 300 metres long on the edge of an area of Camphor Laurel Forest that supports a number of rainforest species. This tree has not been identified in surveys to date, however if it is identified during design planning inspections, to confirm location of infrastructure measures will be implemented to avoid impacting on any individuals wherever possible.

- Hairy Jointgrass (V TSC Act; V EPBC Act)

Hairy Jointgrass (*Arthraxon hispidus*) occurs over a wide area in south-east Queensland, and on the northern tablelands and north coast of NSW, but is never common. Hairy Jointgrass is a creeping perennial grass that prefers moist and shady conditions, in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps, as well as woodland (DECC 2009). It is threatened by clearing of habitat mainly for agriculture, grazing, inappropriate fire regimes, competition from pasture grasses and slashing.

Hairy Jointgrass is not recorded on the DECC database in the locality, however it has been identified within the southern portion of Lot 7 DP 1115057 (Peter Parker, 2009). The proposal will clear an area approximately 30 metres wide by 300 metres long on the edge of an area of Camphor Laurel Forest that supports a number of rainforest species.

This grass has not been identified in surveys to date, however if it is identified during design planning inspections in particular to confirm location of infrastructure such as poles, measures will be implemented to avoid impacting on any individuals wherever possible. It should be noted that groundcover and low shrubs may be retained within the easement thereby providing for management of any individuals should they be identified during planning phase inspections.

- Northern Clematis (V TSC Act; V EPBC Act)

Northern Clematis (*Clematis fawcettii*) is a vine that grows high in canopy of rainforest from the Richmond River in north-east NSW to the Bunya Mountains in south-east Queensland. Northern Clematis prefers canopy gaps on loam soils derived from basalt and mixed volcanic rocks (Harden, 1990). The vine also grows high into the rainforest canopy and prefers streamside habitat within dry rainforest (DECC 2009).

Northern Clematis is threatened by clearing, frequent fire, modification of and or loss of suitable habitat by weed invasion, grazing and risk of extinction due to low numbers and isolation. It is considered to have a moderate likelihood of occurring in the area (see *Table B.1*) being known from the nearby Wilson Nature Reserve.

The proposal will clear an area approximately 30 metres wide by 300 metres long on the edge of an area of Camphor Laurel Forest that supports a number of rainforest species. This vine has not been identified in surveys to date, however if it is identified during design planning inspections to confirm location of infrastructure, measures will be implemented to avoid impacting on any individuals wherever possible.

- Pointed Trefoil (V TSC Act)

Pointed Trefoil (*Rhynchosia acuminatissima*) is known from only nine locations north of Lismore, six of which occur within National Parks and Nature Reserves, and three in State Forests. Pointed Trefoil is a climbing herb found in or near dry rainforest dominated by Hoop Pine, but is also associated with Brush Box (*Lophostemon confertus*), Grey Ironbark (*Eucalyptus siderophloia*), Rough-leaved Elm (*Ahananthe philipinensis*) and Native Holly (*Alchornea ilicifolia*) (DECC 2009). It is threatened by habitat modification from forestry, too frequent fire, modification of and or loss of suitable habitat by weed invasion in particular lantana and risk of extinction due to low numbers and isolation. It is considered to have a moderate likelihood of occurring in the area based on presence of Hoop Pine (see *Table B.1*).

This herb has not been identified in surveys to date, however if it is identified during design planning inspections, in particular to confirm location of infrastructure such as poles, measures will be implemented to avoid impacting on any individuals wherever possible.

It should be noted that groundcover and low shrubs may be retained within the easement thereby providing for management of works and maintenance activities to minimise impact on any individuals.

- Southern Ochrosia (E TSC Act; E EPBC Act)

Southern Ochrosia (*Ochrosia moorei*) is known from north-east NSW and south-east Queensland. The range of this species extends from Richmond River in NSW through to the McPherson Ranges, Queensland (Forster 1996). Southern Ochrosia has been recorded at 23 locations within NSW. Current distribution is very sparse due to land clearing (Barry and Thomas 1994).

Southern Ochrosia a small tree that grows in riverine and lowland warm subtropical rainforest (Floyd 1989) and complex notophyll vine forest in soils of volcanic origin (Forster 1993; 1996). The species is often found on hillsides near drainage lines, at elevations of 100 to1000 metres above sea level.

It is threatened by clearing and fragmentation of habitat, modification of and or loss of suitable habitat by weed invasion, seed collection for horitculture and risk of extinction due to low numbers and isolation. It is considered to have a moderate likelihood of occurring in the area based on nearby record (see *Table B.1*).

This tree has not been identified in surveys to date, however if it is identified during design planning inspections measures will be implemented to avoid impacting on any individuals wherever possible.

- Spiny Gardenia (E TSC Act; E EPBC Act)

Spiny Gardenia (*Randia moorei*) occurs from Lismore on the north coast of NSW to southern Queensland (Quinn *et al*. 1995). The species is sparsely distributed, with most records in the Tweed and Brunswick areas (DECC 2009).

Spiny Gardenia is a tall shrub/small tree found in subtropical, riverine, littoral and dry rainforest and sometimes along moist scrubby watercourses. In NSW the species is often found in Hoop Pine (*Araucaria cunninghamii*) - Brush Box (*Lophostemon confertus*) forest with other rainforest elements present in the understorey (DECC 2004). The Spiny Gardenia is generally found on basalt-derived soils and on alluvium (DECC 2004). The species has been recorded at altitudes up to 360 m, with most records made from below 100 m (McKinley & Stewart 1999). It is threatened by clearing and fragmentation of habitat, modification of and or loss of suitable habitat by weed invasion, fire frequency and trampling by visitors.

The Spiny Gardenia was recorded on site within areas of Camphor Laurel Forest containing remnant rainforest species and on the southern edge of the Wilson Nature Reserve (see *Figure 1.2*). The location of these plants will be identified in the field at the design stage inspection to ensure that individuals are avoided wherever possible. Any additional individuals identified during design planning inspections will be marked and measures implemented to avoid impacting on them. It should be noted that groundcover and low shrubs may be retained within the easement thereby providing for management of this shrub within the easement.

- Sweet Myrtle (E TSC Act; E EPBC Act)

Sweet Myrtle (*Gossia fragrantissima* syn *Austromyrtus fragrantissima*) is a shrub/small tree that occurs in north-east NSW, south to the Richmond River where it is mostly found on basalt-derived soils in dry subtropical and riverine rainforest (DECC 2009). Sweet Myrtle coppices from roots left in the ground and can also occur as isolated plants in paddocks or as regrowth in areas originally covered by rainforest (DECC, 2009).

It is threatened by clearing of habitat, modification of and or loss of suitable habitat by weed invasion, risk of extinction due to low number, and grazing. It is considered to have a moderate to high likelihood of occurring in the area based on nearby record and presence of preferred habitat and soils (see *Table B.1*).

This shrub has not been identified in surveys to date, however if it is identified during design planning inspections measures will be implemented to avoid impacting on any individuals wherever possible and manage individuals within the immediate area of the easement.

- Thorny Pea (V TSC Act; V EPBC Act)

The Thorny Pea (*Desmodium acanthocladum*) only occurs in north-east NSW, mainly in the Lismore area of north-eastern NSW, but there are also records of the species from near Grafton, Coraki, Casino and the Mount Warning area (DECC 2009).

The Thorny Pea is a sprawling low shrub that occurs on basalt-derived soils at low elevations, mainly along rivers (Harden 1991). It also occurs in dry rainforest and on the fringes of riverine subtropical rainforest (DECC 2009). Much of the habitat for this species has been cleared for agriculture (DECC 2009). It is also threatened by modification of and or loss of suitable habitat by weed invasion in particular Lantana and Asparagus, grazing and trampling by cattle.

The Thorny Pea shrubs were often found growing on the fringes of the Camphor Laurel Forest amongst patches of Lantana (see *Figure 1.2*). It is also known from the nearby Wilson Nature Reserve (Floyd 1990).

The location of these plants will be identified in the field at the design stage inspection to ensure that individuals are avoided wherever possible. Any additional individuals identified during design planning inspections will be marked and measures implemented to avoid impacting on them wherever possible. It should be noted that groundcover and low shrubs may be retained within the easement thereby providing for management of this shrub within the easement.

- Tinospora Vine (E TSC Act)

The Tinospora Vine (*Tinospora smilacina*) occurs near the coast at Richmond in northern NSW River (where it is locally common in some parts of its range) to Burleigh Heads National Park in Queensland (DEWHA 2008).

The Tinospora Vine is a slender climber found in rainforest on fertile basalt-derived soils, along the boundaries of dry rainforest and dry eucalypt forest and in complex notophyll vine forest (Forman, 2007).

It is threatened by clearing and fragmentation of habitat, timber harvesting, fire, modification of and or loss of suitable habitat by weed invasion, and accidental damage during bush regeneration when removing introduced vines. It is considered to have a moderate likelihood of occurring in the area based on nearby record in the nearby Wilson Nature Reserve and presence of preferred habitat on site (see *Table B.1*). This vine has not been identified in surveys to date, however if it is identified during design planning inspections to confirm location of infrastructure, measures will be implemented to avoid impacting on any individuals wherever possible.

Birds

- Marbled Frogmouth (V TSC Act)

The Marbled Frogmouth (*Podargus ocellatus*) prefers subtropical rainforest, spending most time in deep, wet, sheltered gullies frequently containing stands of Bangalow Palms. Less frequently it occurs in higher elevation temperate rainforests and wet eucalypt forest with a well-developed rainforest understorey (DECC 2009). The Marbled Frogmouth breeds between August and December nesting in a small, cuplike platform up to 40 metres above the ground (Pizzey & Knight 2003).

Wilson Nature Reserve provides habitat for the Marbled Frogmouth which has been recorded within close proximity to the proposed line. The frogmouth is threatened by fragmentation of habitat, weed invasion and increased density in the understorey.

Although, the Marbled Frogmouth has been recorded within close proximity to the proposed electricity line, it is unlikely that the vegetation within the study area provides significant habitat for this species and it is more likely to utilise remnant vegetation within the nearby Wilson Nature Reserve.

- Rose-crowned Fruit-dove (V TSC Act)

The Rose-crowned Fruit-dove (*Ptilinopus regina*) occurs along the coast and ranges of eastern NSW and Queensland, from Newcastle to Cape York. Vagrants are occasionally found further south in Victoria. The Rose-crowned Fruit-dove is fund mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful. Fruit-doves feed entirely on fruit from vines, shrubs, large trees and palms, and are thought to be locally nomadic as they follow the ripening of fruits (DECC 2009).

The Rose-crowned Fruit-dove breeds between November and April, and nests on a platform of twigs located low in vines or other understorey vegetation (Pizzey & Knight 2003).

- Wompoo Fruit-dove (V TSC Act)

The Wompoo Fruit-dove (*Ptilinopus magnificus*) occurs along the coast and ranges from the Hunter River in NSW to Cape York Peninsula. It is rare south of Coffs Harbour. The species occurs in, or near rainforest, low elevation moist eucalypt forest and brush box forests and is most often seen in mature forests, although it is also found in remnant and regenerating rainforest. The Wompoo Fruit-dove feeds on a diverse range of tree and vine fruits and is locally nomadic as it follows the ripening fruit.

The Wompoo Fruit-dove breeds between October and February (Pizzey & Knight 2003). Its' nest is a typical pigeon nest: a flimsy platform of sticks on a thin branch or a palm frond, often over water and usually three to 10 metres above the ground (DECC 2009).

The Rose-crowned Fruit-dove was recorded within this area and is known to forage on the fruit of Camphor Laurel and remnant rainforest plants. Records also indicate that the Wompoo Fruit-dove has previously been recorded within close proximity of the study area.

The maximum area of Camphor Laurel Forest to be removed from the northern boundary is a 30m wide easement along the northern boundary of Lot 29 DP 755718. This would be removed from the edge of a larger patch of Camphor Laurel Forest that continues to the south of the proposed easement. The removal of Camphor Laurel without appropriate mitigation measures is recognised as a threat to the survival of these species. Consequently, it has been recommended (refer *Chapter 5*) that enhancement of adjoining Camphor Laurel Forest is undertaken in order to compensate for loss of habitat for these species.

Microchiropteran Bats

- Eastern False Pipistrelle (V TSC Act)

The Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) prefers moist habitats with trees taller than 20 metres. It generally roosts communally in eucalypt hollows, but has also been found under loose bark on trees or in buildings and caves. The Eastern False Pipistrelle hunts beetles, moths, weevils and other flying insects above or just below the tree canopy (DECC 2009).

- Eastern Long-eared Bat (V TSC Act)

The Eastern Long-eared Bat (*Nyctophilus bifax*) appears to be confined to the coastal plain and nearby coastal ranges, extending south to the Clarence River area, with a few records further south around Coffs Harbour. The Eastern Long-eared Bat is found in lowland subtropical rainforest and wet and swamp eucalypt forest, extending into adjacent moist eucalypt forest. Coastal rainforest and patches of coastal scrub are particularly favoured. It roosts in tree hollows, the hanging foliage of palms, in dense clumps of foliage of rainforest trees and under bark (DECC, 2009).

- Little Bentwing-bat (V TSC Act)

The Little Bentwing Bat (*Miniopterus australis*) is found in coastal north-eastern NSW and eastern Queensland. It inhabits moist eucalypt forest, rainforest or dense coastal *Banksia* scrub. The Little Bentwing Bat forages for small insects at night beneath the canopy of densely vegetated habitats.

The Little Bentwing Bat roosts in caves, tunnels and sometimes tree hollows during the day. It gathers in large maternity colonies in summer and then disperses into smaller colonies after young become independent in March (Menkhorst & Knight 2004). The species often shares roosting sites with the Common Bentwing-bat and, in winter, the two species may form mixed clusters (DECC 2009). The easement route does not support cave roosting habitat for this species which may forage in the Camphor Laurel Forest.

Although potentially suitable habitat has been identified within the study area for these species, no records were obtained during Anabat surveys. It is possible that these species utilise the Camphor Laurel Forest as a foraging resource although it is unlikely that the clearing of a 30m easement on the edge of this community would significantly impact the life cycle of these species. The likelihood of hollows suitable for roosting habitat is low within this area, however, it is recommended that any hollows identified during the planning and construction phases are retained where possible and/or clearing modified to provide for individuals to abandon any roosts with felling of habitat trees supervised by an ecologist or wildlife handler.

Megachiropteran Bats

- Grey-headed Flying-Fox (V TSC Act; V EPBC Act)

The Grey-headed Flying-fox (*Pteropus poliocephalus*) occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps, as well as urban gardens and cultivated fruit crops. The Grey-headed Flying-fox can travel up to 50 kilometres to forage and feeds on the nectar and pollen of native trees (such as *Eucalyptus, Melaleuca* and *Banksia*) and fruits of rainforest trees and vines. The Grey-headed Flying-fox may also forage in cultivated gardens and fruit crops (DECC 2009).

Roosting camps are generally located within 20 kilometres of a regular food source and are commonly found in gullies, close to water and in vegetation with a dense canopy.

The Camphor Laurel Forest provides a foraging resource and does not support a roosting or camp site for this species. Although this species was identified within close proximity to Line 8516, it is unlikely that the removal of a narrow section of Camphor Laurel Forest would significantly impact the life cycle of this species. The proposed enhancement of adjoining Camphor Laurel Forest for rainforest birds would also compensate for any potential loss of foraging habitat for this species.

Other Mammals

- Koala (V TSC Act)

Koalas (*Phascolarctos cinereus*) inhabit eucalypt woodlands and forests and feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Home range size varies with quality of habitat, ranging from less than two hectares to several hundred hectares in size (DECC 2009).

No Koala feed trees will be removed as a result of the proposal and measures will be taken to ensure that all trees are inspected prior to felling and that any trees are felled inwards so as to prevent damage to nearby vegetation.

Koalas are known within the site and the Wilson Nature Reserve to the north and Botanic Gardens to the south. Koalas are expected to move between sites and if so would currently cross through cleared areas and over the existing Line 8501. Construction of the proposed Line 8516 directly to the north of the existing Line 8501 is unlikely to fragment existing populations such that there life cycle would be affected.

How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

The proposal will clear approximately 0.9ha of Camphor Laurel Forest along the northern edge of the habitat within a highly fragmented and weed affected environment.

While the proposed construction works may provide for dispersal of weed species this is unlikely to be a significant impact on this community given the high percent of weed species currently in this community and can be managed to minimise spread to or from the site.

DECC describe Lowland Rainforest EEC as subtropical rainforest and some related forms of dry rainforest, excluding Littoral Rainforest and Lowland Rainforest on the flooplains. In a relatively undisturbed state it has a closed canopy characterised by a high diversity of trees including emergents, canopy and sub-canopy. Scattered eucalypt emergents may include *Eucalyptus grandis* or *E. saligna*. There is a range of plant forms including palms, vines and epiphytes. It is associated with a range of high nutrient substrates including basalt and fine-grained sedimentary rocks. In the north of its range Lowland Rainforest is found up to 600 metres above sea level.

Lowland Rainforest encompass a number of Subtropical and Dry Rainforest Alliances as defined by Floyd (1990) including the following:

- *Argyrodendron trifoliolatum* alliance (Subtropical Rainforest):
    - 1. *Argyrodendron trifoliolatum* suballiance;
    - 5. *Castonospermum australe – Dysoxylum muelleri* suballiance;
    - 6. *Archonotophoenix – Livistona* suballiance (Palm Forest)

- *Dendrocnide excelsa* alliance (Subtropical Rainforest largely between Hastings and Clyde River):
    - 14. *Doryphora sassafras – Daphnandra micranthus - Dendrocnide excelsa Ficus* spp. – *Toona* suballiance;
    - 15. *Ficus* spp. - *Dysoxylum fraserianum- Toona - Dendrocnide* suballiance;
- *Drypetes australasica - Araucaria cunninghamii* alliance (Dry Rainforest):
    - 21. *Araucaria cunninghamii* suballiance;
    - 22. *Flindersia* spp. - *Araucaria* suballiance.

The Wilson Nature Reserve immediately to the north of the proposed easement (see *Figure 1.2*) is a significant dry rainforest remnant of the 'Big Scrub'. It is characteristic of the *Araucaria cunninghamii* suballiance dry rainforest as described by Floyd (1990) occurring on dry rocky steep slopes on the edge of the basalt (Floyd 1990). This suballiance is representative of the Lowland Rainforest ECC. Given the proximity of the Camphor Laurel Forest to Wilson Nature Reserve, presence of similar species including emergent Hoop Pines and the underlying basalt geology the Camphor Laurel Forest would most likely be aligned with the *Araucaria cunninghamii* suballiance dry rainforest.

Structurally the Camphor Laurel Forest resembles a rainforest community, however the dominance of introduced species such as Camphor Laurel, Large-leaved Privet and Lantana at every level of the community has altered the floristics of this community to the detriment of native species such that it may only be considered to be at best a low condition example of the Lowland Rainforest EEC. Native species known from the EEC are present in low numbers within the emergent, mid and lower stratum of the community including some threatened species (see *Section 3.1.3*). It is also acknowledge that this community may represent regrowth forest dominated by exotic species supporting a diversity of rainforest plants and rainforest dependent fauna. Given the lack of certainty an assessment of this community has been undertaken.

The proposal requires clearance of a 30 metre wide strip of Camphor Laurel Forest along the northern edge of the community. This section of the community is fragmented from other remnants, in particular more intact remnants and the whole stand is heavily weed infested. The works will not impact on the significant remnant of Lowland Rainforest EEC currently conserved in Wilson Nature Reserve which occurs to the north of Lot 7 DP 1115057. The proposal is therefore unlikely to affect the habitat of the EEC in the local area.

With the adoption of mitigation measures outlined in *Chapter 5*, it is unlikely that the proposal is likely to affect the habitat of threatened species. The recommendation to enhance adjoining Camphor Laurel Forest may be seen as a net improvement on existing threatened species habitat.

Does the proposal affect any threatened species or populations that are at the limit of its known distribution?

Thorny Pea is at its northern limit in the Lismore area and Spiny Gardenia is at its southern limit. Hairy Jointgrass has not previously been recorded within the Lismore area. Therefore records in this area would be a range extension of known distribution limit.

As stated above the implementation of mitigation measures in particular the inspections to be conducted at the design plan stage provide for the avoidance of any individuals of these species. Further measures can be included in management plans for construction and maintenance activities targeting any individuals in the immediate area of the easement.

How is the proposal likely to affect current disturbance regimes?

Current disturbance regimes affecting the study area are a result of historical land use and include clearing, weed invasion and grazing. The proposal is unlikely to alter any of these current disturbance regimes. The adoption of a weed management program as recommended in *Chapter 5* will help to reduce the spread of weeds.

How is the proposal likely to affect habitat connectivity?

The proposed electricity supply line will be constructed on the northern boundary of Lot 29 DP 755718, to the south of a macadamia farm and on the edge of a highly modified area of Camphor Laurel Forest. Line 8516 will also be constructed directly to the north of an existing overhead powerline (Line 8501) that occurs within the northern portion of Lot 7 DP 1115057. Given the existing land uses and highly modified nature of the vegetation within the study area, it is unlikely that the proposal will have a significant affect on existing habitat connectivity.

How is the proposal likely to affect critical habitat?

The proposal will not affect critical habitat as no areas of critical habitat as identified under the TSC Act occur within the locality.

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