

Lismore to Mullumbimby Electricity Network Upgrade Environmental Assessment Report

Annexures A - P Volume 2

for Country Energy

January 2009

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Annex A

Lismore to Mullumbimby Electricity Network Upgrade - Line Route Options Report (ERM, 2007)



Proposed Lismore to Mullumbimby Electricity Network Upgrade

Line Route Options Report

for Country Energy

March 2008

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FINAL REPORT

Country Energy

Proposed Lismore to Mullumbimby Electricity Network Upgrade *Line Route Options Report*

March 2008

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FINAL REPORT

Country Energy

Proposed Lismore to Mullumbimby Electricity Network Upgrade *Line Route Options Report*

March 2008

Reference: 0051706

For and on behalf of Environmental Resources Management Australia Approved by: Murray Curtis Signed: Position: Managing Partner Date: 10 March 2008

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EXECUTIVE SUMMARY

Environmental Resources Management Australia (ERM) was commissioned by Country Energy to undertake a Line Route Option Study for the proposed upgrade of the existing 66 kilovolt (kV) electricity network between Lismore and Mullumbimby via Ballina, NSW to 132kV, and for new 66kV sub-transmission lines servicing the Lismore area (referred to as the Proposed Lismore to Mullumbimby Electricity Network Upgrade).

Country Energy has identified the need for major augmentation of its electricity supply network in the Lismore, Ballina, Ewingsdale, Byron Bay and Mullumbimby areas to cater for long term demands resulting from significant population expansion in northern NSW. Based on projected demand, Country Energy identified that this project needs to be progressively constructed and completed by 2013. The proposed project falls within three Local Government Areas (LGAs): Ballina Shire, Byron Shire and Lismore City.

In order to assess the feasibility of the proposed options ERM undertook a detailed desktop constraints study, which was followed up by an on-ground investigation within the defined study area. The purpose of the on-ground investigation was to confirm the environmental conditions identified in the desktop study, and to consider the expected environmental and social impacts of constructing new circuits or upgrading existing transmission lines.

As a result of preliminary desktop and on-ground investigations, consideration was generally been given to the upgrade of existing infrastructure where possible to reduce the need for new corridors. It is considered that this would likely be more easily achievable than acquiring new line routes with associated easements as required for the single circuit 66kV augmentation option. Therefore, some of the preliminary options considered included sections of dual circuit 66/66kV and 66/132kV while mainly focusing on upgrading existing 66kV network to 132kV. It is noted that the proposed upgraded network needs to link a number of existing zone substations further supporting the above rationale.

It was concluded that, based on the preliminary environmental and social constraints assessment, the proposal to largely upgrade to 132kV on the existing 66kV alignment would be the lowest risk option. This is primarily because there is expected that there will be virtually no significant change to the visual amenity along most of the existing corridor, and also as no significant additional vegetation clearing is likely to be required.

Some deviations from the existing alignment have been proposed, which may represent an improvement over the existing alignment particularly in built up areas. In those areas where dual circuit lines are proposed, they are considered likely to represent less overall impact than the construction new lines in new corridors.

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1 PROJECT OVERVIEW

1.1 INTRODUCTION

Environmental Resources Management Australia (ERM) was commissioned by Country Energy to undertake a Line Route Option Study for the proposed upgrade of the existing 66 kilovolt (kV) electricity network between Lismore and Mullumbimby via Ballina, NSW to 132kV, and for new 66kV subtransmission lines servicing the Lismore area (referred to as the Proposed Lismore to Mullumbimby Electricity Network Upgrade).

The location of the study area is shown on *Figure 1.1 below*.

1.2 BACKGROUND

Country Energy has identified the need for major augmentation of its electricity supply network in the Lismore, Ballina, Ewingsdale, Byron Bay and Mullumbimby areas to cater for long term demands resulting from significant population expansion in northern NSW. Based on projected demand, Country Energy identified that this project needs to be progressively constructed and completed by 2013. The proposed project falls within three Local Government Areas (LGAs): Ballina Shire, Byron Shire and Lismore City.

Country Energy has identified and investigated two alternatives for the proposed network upgrade including augmentation of the existing 66kV network (either by upgrading the existing 66kV circuit to dual circuit 66kV or by constructing new separate circuits), or alternatively, upgrading to 132kV the existing 66kV network, along with construction of some new 66kV circuits. An additional single 66kV circuit is required between Lismore South Zone Substation and a new switching station in Lismore.

The first option of augmenting the existing 66kV network by dual circuiting sections of the existing 66kV and/or by constructing additional 66kV circuits would required the construction of two new additional circuits, in addition to the existing 66kV circuit, between Mullumbimby and Suffolk Park. Country Energy have indicated that the 66kV augmentation option would not be capable of meeting long term needs unless the additional circuits between Mullumbimby and Suffolk Park are constructed.

In order to assess the feasibility of the proposed options ERM undertook a detailed desktop constraints study, which was followed up by an on-ground investigation within the defined study area (refer *Figure 1.1*). The purpose of the on-ground investigation was to confirm the environmental conditions identified in the desktop study, and to consider the expected environmental and social impacts of constructing new circuits or upgrading existing transmission lines.

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1.3 PURPOSE

The purpose of this Line Route Options Report is to provide the basis for Country Energy to select preferred options and to develop engineering solutions prior to proceeding to landowner negotiations and the preparation of detailed environmental assessments.

The following report summarises the environmental, social and engineering aspects of potential options for the proposed electricity network upgrade between Lismore to Mullumbimby via Ballina, and the proposed 66kV sub-transmissions lines at Lismore. Constraints associated with the siting of the lines with respect to community impact, land use, ecology, indigenous heritage, flooding and visual impact have been included to assist the assessment of the proposed options and minimise the overall impact.

1.4 PRELIMINARY OPTIONS ASSESSMENT

The preliminary options and constraints assessment undertaken by ERM considered both the 66kv augmentation and the 132kV upgrade options.

The 66kV augmentation option would require significant additional 66kV circuits (including either dual circuit 66kV on the existing alignment and/or new separate 66kV circuit). Dual circuit 66kV lines would be expected to significantly increase the visual impact along the existing 66kV transmission line alignment. ERM understands that the 66kV augmentation solution would also require major extensions to the space constrained Mullumbimby 132/66/11kV zone substation site resulting in significant technical issues and high costs. Country Energy has also indicated that the 66kV augmentation option would require the construction of two new additional 66kV circuits between Mullumbimby and Suffolk Park.

The 132kV network upgrade option could substantially utilise existing 66kV line routes, i.e. upgrading the existing 66kV lines to 132kV. This would minimise the need for new line route corridors.

As a result of preliminary desktop and on-ground investigations, consideration has generally been given to the upgrade of existing infrastructure where possible to reduce the need for new corridors. It is considered that this would likely be more easily achievable than acquiring new line routes with associated easements as required for the single circuit 66kV augmentation option. Therefore, some of the options considered within this report have included sections of dual circuit 66/66kV and 66/132kV while mainly focusing on upgrading existing 66kV network to 132kV. It is noted that the proposed upgraded network needs to link a number of existing zone substations further supporting the above rationale.

1.5.1 Proposed Transmission Lines

The proposed Lismore to Mullumbimby Electricity Network Upgrade project involves construction of new substations, expansion of existing substations, and installation of new sub-transmission lines and/or upgrades of existing sub-transmission lines.

The existing 66kV infrastructure and proposed preferred upgraded and/or new infrastructure locations are presented in detail on *Figure 1 to 6* of *Annex A*. Key points have been labelled alphabetically and numerically on *Figures 1 to 6* for the purpose of describing the separate areas discussed within this briefing paper.

The specific sub-transmission network upgrades and options for proposed new sub-transmission lines and sub-stations are summarised as follows:

- Upgrade to 132kV the existing network connection from Mullumbimby 132/66/11kV substation (*Point A*) to Ballina 66/11kV substation (*Point F*) via Ewingsdale 66/11kV substation (*Point C*), a proposed new 132/11kV zone substation at Suffolk Park (*Point D*) and Lennox Head zone substation (Point E).
- Construction of two 132kV transmission lines from the existing Mullumbimby to Ewingsdale 66kV transmission line to the proposed new 132/11kV zone substation at Brunswick Heads (*Point B*).
- Upgrade to 132kV the existing network connection between Ballina 66/11kV substation (*Point F*) to the 66/11kV substation located near Alstonville (*Point G*).
- Construction of a new 132kV network connection from Lismore 132/66kV substation (*Point J*) to join the upgraded 66kV alignment near Alstonville. This could include reconstructing the existing 66kV line (feeder 0897) from Lismore 132/66kV substation (*Point J*) to near Alstonville (*Point G*) to a dual circuit line with one circuit to operate at 132kV and the other at 66kV. A single circuit 132kV line on a new and separate route from Lismore 132/66kV substation (*Point J*) to near Alstonville (*Point G*) initially considered, but not considered further than the preliminary options assessment due the constraints identified and to reduce the need for new corridors.
- Construction of two new underground 66kV transmission lines (length about 1.2km) between the proposed new Lismore University 66kV switching station (*Point H2*) and the proposed new Lismore University zone substation (*Point H2*).

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- Construction of a single circuit 66kV line from Lismore South 66/11kV substation (*Point I*) to the proposed Lismore University 66kV switching station (*Point H2*) on a largely new and separate route.
- Construction of two separate underground 66kV lines from Lismore 132/66kV substation (*Point J*) to Lismore South 66/11kV substation (*Point I*) along Three Chain Road.

In summary, it is considered by ERM that the majority of the proposed 132kV upgrades could be achieved by the upgrading of existing transmission line from 66kV to 132kV. This may involve pole replacement along parts of the route. ERM understands that no additional land clearing would be required to upgrade the existing 66kV line to 132kV.

An overview of the identified preferred options for the proposed Network Upgrade is presented in *Figure 1.2* below.

1.6 REPORT STRUCTURE

The line route selection report is structured as follows:

Chapter 1: provides a general introduction and overview of the project;

Chapter 2: assesses options generated and considers the potential constraints to the selected sub-transmission line route options; and

Chapter 3: provides a conclusion of the study and preliminary recommendations.

