



**Roads &
Maritime**

Realignment of the Newell Highway at Grong Grong

Addendum review of environmental
factors - April 2017

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Roads and Maritime Services

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Addendum review of environmental factors


April 2017

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Executive summary

Background

Roads and Maritime Services (Roads and Maritime) proposes to modify the work of the Newell Highway realignment at Grong Grong project. The original project was assessed and reviewed with a Review of Environmental Factors (REF) (RMS, 2015).

The proposed modification

The proposed modification includes the following works:

- clearing vegetation within the Newell Highway road reserve west of Grong Grong
- installing a powerline within the Newell Highway road reserve west of Grong Grong
- upgrading Bogolong Road intersection and adjacent farm access
- upgrading culverts along the Newell Highway at the Bogolong Road intersection
- constructing a temporary side track at the northern and southern ends of the work and along the southern side of Canola Way
- installing lighting at the intersection of Canola Way and the Newell Highway, and at the intersection of Berembed Street and the Newell Highway
- constructing a borrow pit (one hectare, 20,000m³ extraction) within the approved construction footprint
- stockpiling topsoil and surplus material.

Need for the proposed modification

Chapter 2 of the project REF addresses the strategic need for the project and the project objectives. The proposed modifications assessed in this addendum REF are consistent with the strategic need of the project.

The proposed modifications are required to further improve the road safety of the realigned Newell Highway at Grong Grong during construction and operation.

Proposal objectives and development criteria

Section 2.3 of the project REF identifies the proposal objectives and development criteria that apply to the proposed modification.

The objectives of the proposed modification include:

- improving road user safety at northern and western intersections
- providing power for road lighting and other facilities
- improving road safety at Bogolong Road intersection
- improving site drainage of the Bogolong Road intersection
- consolidating temporary traffic arrangements and reducing traffic impacts
- reducing costs of pavement rehabilitation at temporary traffic arrangements.

Options considered

Two options were considered as part of the development of the proposal.

- Option one: do nothing – continue with project as approved
- Option two: modify the project as proposed.

Option one involves no additional work or environmental impacts and no changes to the project. This option does not address the proposal objectives and would not result in further road safety improvements.

Option two would lead to some extra environmental impacts, particularly on biodiversity, and includes a number of different power supply alternatives. This option meets the proposal objectives and would lead to improved road safety outcomes, and is therefore the preferred option. The biodiversity impacts would be minor and short term.

Statutory and planning framework

The proposed modification can be assessed under Part 5 of the New South Wales (NSW) *Environmental Planning and Assessment Act 1979*, with Roads and Maritime as the proponent and determining authority. As the proposed modification is a development for the purpose of road infrastructure facilities and is being carried out by or on behalf of a public authority, under clause 94 of the State Environmental Planning Policy (Infrastructure), the proposed modification is permissible without consent.

Community and stakeholder consultation

Roads and Maritime met with the affected landowner on-site to discuss the proposed drainage and safety work at Bogolong Road intersection. The landowner was in favour of the work. Narrandera Shire Council was presented with the design for comment.

Environmental impacts

Potential environmental impacts of the proposed modification are the same as those identified in the project REF. Impacts would be minor given the limited scope of the proposed modification. The proposed modification would involve removing an additional 0.329 hectares of native vegetation, which includes Inland Grey Box Woodland Endangered Ecological Community (EEC), and 0.247 hectares of modified cropping land. The cumulative footprint of the project would be 5.169 hectares total. Some minor extra soil, dust, odour, noise and traffic impacts to the project are expected. These would be effectively managed with standard control measures. Overall these impacts were assessed as unlikely to be significant.

Justification and conclusion

The proposed modification for the inclusion of the powerline supply, intersection lighting, a borrow pit and side tracks would impact a further 0.369 hectares of Inland Grey Box Woodland and 0.247 hectares of modified cropping land with a cumulative total footprint on the Inland Grey Box Woodland EEC of 5.169 hectares.

Revised assessments of significance, in line with the TSC Act and EPBC Act, were completed for Inland Grey Box Woodland EEC, Sand-hill Spider Orchid, Pine Donkey Orchid, Superb Parrot, Brown Treecreeper, and Grey-crowned Babbler. The revised assessments concluded a non-significant impact of the proposed modification on each of these species. The proposed modification is not likely to further impact threatened species, populations or ecological communities or their habitats, within the meaning of the TSC Act or FM Act and therefore a Species Impact Statement is not required. The proposed modification is not likely to significantly impact threatened species, populations, ecological communities or migratory species within the meaning of the EPBC Act. Given the minor changes in the impacts to flora and fauna habitats, including EECs and hollow-bearing trees, the conclusions reached in the project REF's biodiversity assessment are still considered to apply. Significant impacts to threatened flora, fauna and EECs are considered unlikely.

The proposed modification would further improve the road safety of the realigned Newell Highway at Grong Grong. Due to the minor nature of extra work it is unlikely to pose any significant

environmental impacts. The benefits of the proposal are considered to outweigh the expected impacts.

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1 Introduction

1.1 Proposed modification overview

Roads and Maritime Services (Roads and Maritime) proposes to modify the Newell Highway realignment at Grong Grong by changing the design, construction methodology and project boundary to improve safety (proposed modification). Key features of the proposed modification would include:

- adding lighting at the northern and western intersections to improve traffic safety
- adding 11,000 volt overhead powerlines to power the lighting at both intersections
- upgrading the Bogolong Road and Newell Highway intersection around 2.5 kilometres north of Grong Grong
- constructing three temporary side tracks outside the approved project boundary at the northern and western ends of the work and along Canola Way
- sourcing extra fill materials for the project from the borrow pit located within the approved construction footprint.

The location of the proposed modification is shown in Figure 1-1. Chapter 3 describes the proposed modification in more detail.

A Review of Environmental Factors (REF) was prepared for the Newell Highway realignment at Grong Grong in April 2015 (the project REF). The project REF was placed on public display between 27 April and 15 May 2015 for community and stakeholder comment. A submissions report dated September 2015 responded to issues raised.

Extra biodiversity assessments for two previous revisions of the design and construction footprint for the Grong Grong curve realignment have been prepared:

- 10 September 2015 – updates to Biodiversity Assessment for the Newell Highway Realignment at Grong Grong for the revised proposal
- 29 November 2016 – updates to Biodiversity Assessment for the Newell Highway Realignment at Grong Grong for the revised proposal including powerline

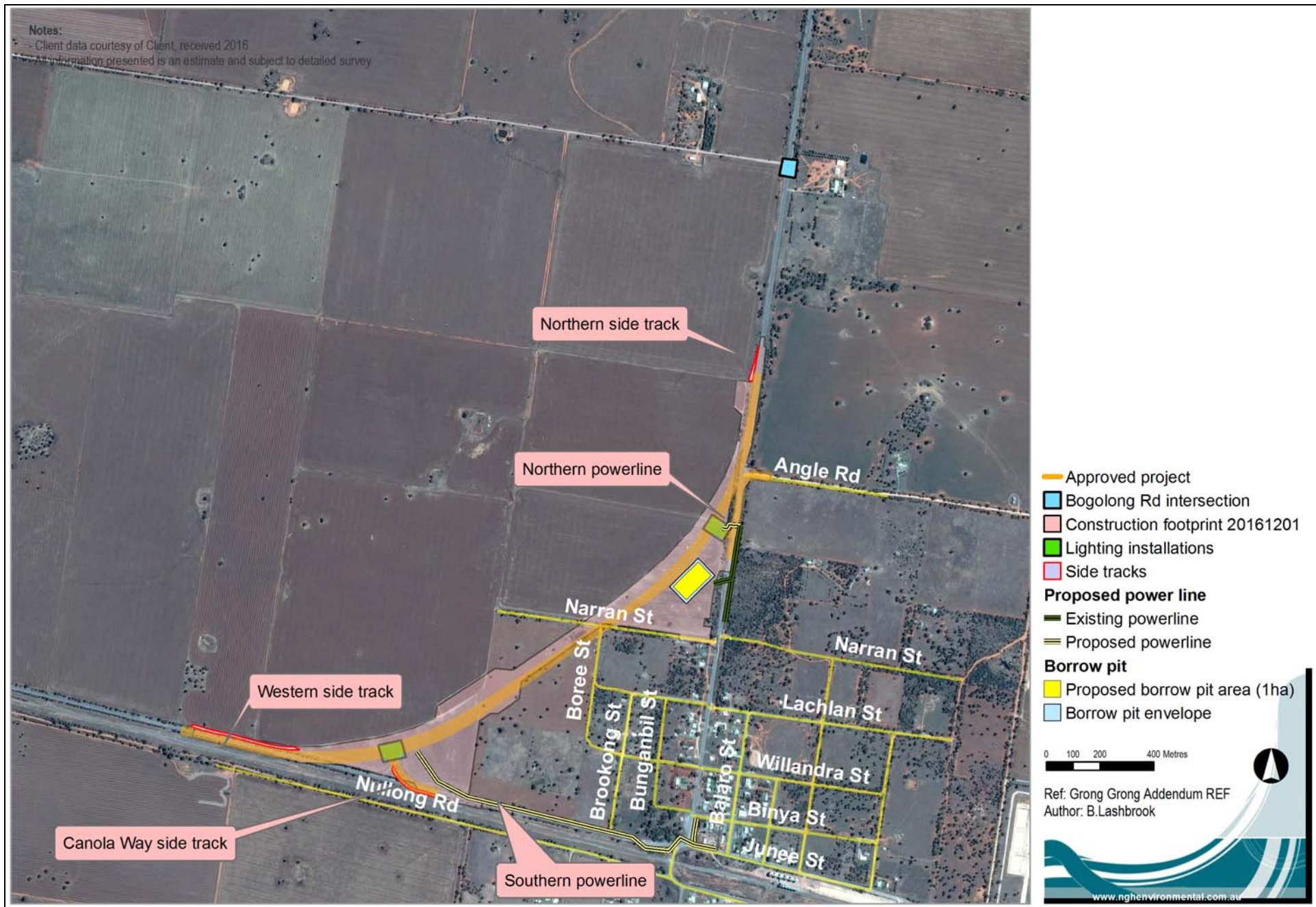


Figure 1-1: Locations of the proposed modification.

1.2 Purpose of the report

This addendum REF has been prepared by NGH Environmental on behalf of Roads and Maritime. For the purposes of these works, Roads and Maritime is the proponent and the determining authority under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of this addendum REF is to describe the proposed modification, to document and assess the likely impacts of the proposed modification on the environment and to detail protective measures to be implemented. This addendum REF is to be read in conjunction with the project REF and submissions reports for the project.

The description of the proposed work and associated environmental impacts have been carried out in context of clause 228 of the Environmental Planning and Assessment Regulation 2000, the *Threatened Species Conservation Act 1995* (TSC Act), the *Fisheries Management Act 1994* (FM Act) and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so, the addendum REF helps to fulfil the requirements of Section 111 of the EP&A Act that Roads and Maritime examines, and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The findings of the addendum REF would be considered when assessing:

- whether the proposed modification is likely to result in a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Part 5.1 of the EP&A Act
- the significance of any impact on threatened species as defined by the TSC Act and/or FM Act, in section 5A of the EP&A Act and therefore the requirement for a Species Impact Statement
- the significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and whether offsets are required and able to be secured
- the potential for the proposed modification to significantly impact any other matters of national environmental significance or Commonwealth land and therefore the need to make a referral to the Australian Government Department of the Environment for a decision by the Commonwealth Minister for the Environment on whether assessment and approval is required under the EPBC Act.

2 Need and options considered

2.1 Strategic need for the proposed modification

Chapter 2 of the project REF addresses the strategic need for the project, the project objectives and the options that were considered. The proposed modification described and assessed in this addendum REF is consistent with the strategic need for the project.

The proposed modification is needed to assess the impact of items that have been added to the project since the project REF was completed and to assess the impacts of changes in design and construction that were not considered in the project REF. These include:

- adding street lights at the northern and western intersections to improve safety in these areas. The powerlines are required to supply electricity to the lights
- adding the Bogolong Road and Newell Highway intersection upgrade to improve safety. Large agricultural machinery regularly crosses the highway at Bogolong Road. An improved intersection layout and improved drainage would allow plant and highway traffic to move safely
- proposing temporary side tracks outside the project REF site boundary, which would limit traffic impacts, reduce traffic safety risks and decrease costs. Adding temporary side tracks is a change in proposed construction method that would change the impacts but would not result in increased environmental impacts
- a borrow pit that would provide materials for the project.

2.2 Proposal objectives and development criteria

Chapter 2 of the project REF addresses the strategic need for the project, the project objectives and the options that were considered. The proposed modification described and assessed in this addendum REF is consistent with the strategic need for the project. The proposed modification is needed to:

- meet the project objective to improve road safety and reduce conflicts between local and through traffic, and between vehicles and vulnerable road users
- ensure all additions to the project scope and construction activities have been described, assessed and mitigated.

2.3 Alternatives and options considered

2.3.1 Identified options

Option one: do nothing – continue with the project as approved

This option involves no additional work or environmental impacts, and no design changes to the project. However, this proposal does not address the proposal objectives.

Option two: modify project

This option involves boosting the power supply to the southern intersection with an above ground powerline along the alignment of Canola Way. The powerline is to be located within previously disturbed areas and within areas of Box Gum Woodland.

This option involves extra tree clearing so powerlines can be installed along Canola Way.

There would be some extra environmental impacts as described in the project REF, but to a lesser degree given the limited scope of the proposed modification. These are considered unlikely to be significant.

These impacts can also be mitigated with appropriate measures. This option meets the objectives of the proposed modification.

Alternative alignments for the powerline

- a) Power supply to the southern intersection with an above ground powerline along the new alignment of the Newell Highway

This option involves additional tree clearing so the powerline can be installed. This option meets the objectives of the proposed modification.

- b) Underground power supply along the new bypass (from north) or along the existing road reserve (from east)

This option was not preferred due to the extra cost associated with installing an under-bored cable. An open trench cable installation would not provide adequate benefit.

- c) Partial underground power supply in tree congested areas

This option was not preferred due to the extra cost associated with installing an under-bored cable. An open trench cable installation would not provide adequate benefit. Further, the extra underground supply would reduce the proposed line's reliability.

- d) Supply via Crown Reserve (Lot 76 DP1212250) along the boundary with Lot 143 DP750851

This lot is subject to an Aboriginal land claim. This option has not progressed because a lease arrangement with the land claimants cannot be negotiated.

- e) Supply along proposed route with either NMSHVABC or CCT (Insulated HV Conductors for Roads and Maritime's reference)

This option was not preferred due to the extra cost of both the cable and pole earths. Also, while the insulated conductors would reduce the extent of tree trimming needed, significant tree trimming would still be required to obtain the required separation between the power line and adjacent trees.


In addition, including a full width side track at three of the tie-ins is considered. The alternative to full width side tracks is half width side tracks on both sides of the road. The use of half width side tracks on both sides of the road would take longer to construct, require more extensive traffic disruption and cost more to build and remove. As such, full width side tracks on one side of the approved new road alignment at the tie-ins is the preferred option.


The use of an extra borrow pit for the project was also considered. Sourcing material from external providers would add more costs due to hauling and purchase. Off-site sources require the existing road network to support the delivery of the materials adding to congestion and extra traffic issues. Sourcing the material on-site is cost effective and reduces traffic issues and pressures on the immediate road network. Sourcing materials on-site is the preferred option.

2.3.2 Analysis of options

Objective	Option 1	Option 2
Improving safety for road users at northern and western intersections	Red	Green
Providing power for road lighting and other facilities	Red	Green
Improving road safety at Bogolong Road intersection	Red	Green
Improving drainage at Bogolong Road intersection	Red	Green
Providing temporary traffic arrangements (side tracks)	Red	Green
Sourcing materials on site for the project	Red	Green

Legend colour

Red  **Rating meaning**
Does not meet proposal objective

Green  Meets proposal objective

2.4 Preferred option

Alternative line arrangements or routes for the powerline were considered. The under-boring design option impacted vegetation and was discounted at the concept phase as the estimated cost was deemed too excessive for the project.

Option two meets the proposal objectives, and has limited or reduced environmental impacts which can be readily managed with mitigation measures listed in the project REF. It is therefore the preferred option.

3 Description of the proposed modification

3.1 The proposed modification

Roads and Maritime proposes to modify the Newell Highway realignment at Grong Grong project to:

- add lighting at the northern and western intersections to improve traffic safety
- add overhead 11,000 volt powerlines to power the lighting at both intersections
- upgrade the Bogolong Road and Newell Highway intersection around 2.5 kilometres north of Grong Grong
- build three temporary side tracks at the northern and western end of the work and along Canola Way
- source materials for the project from a borrow pit located within the approved construction footprint.

The proposed modifications are shown in Figure 3-1 to Figure 3-6.



Bogolong Road

Newell Highway

Legend

— Design of Bogolong Road intersection upgrade



Subject to detailed design.

Grong Grong
Addendum REF
J Murphy
January 2017

Figure 3-1 The proposed modification: Bogolong Road intersection upgrade.

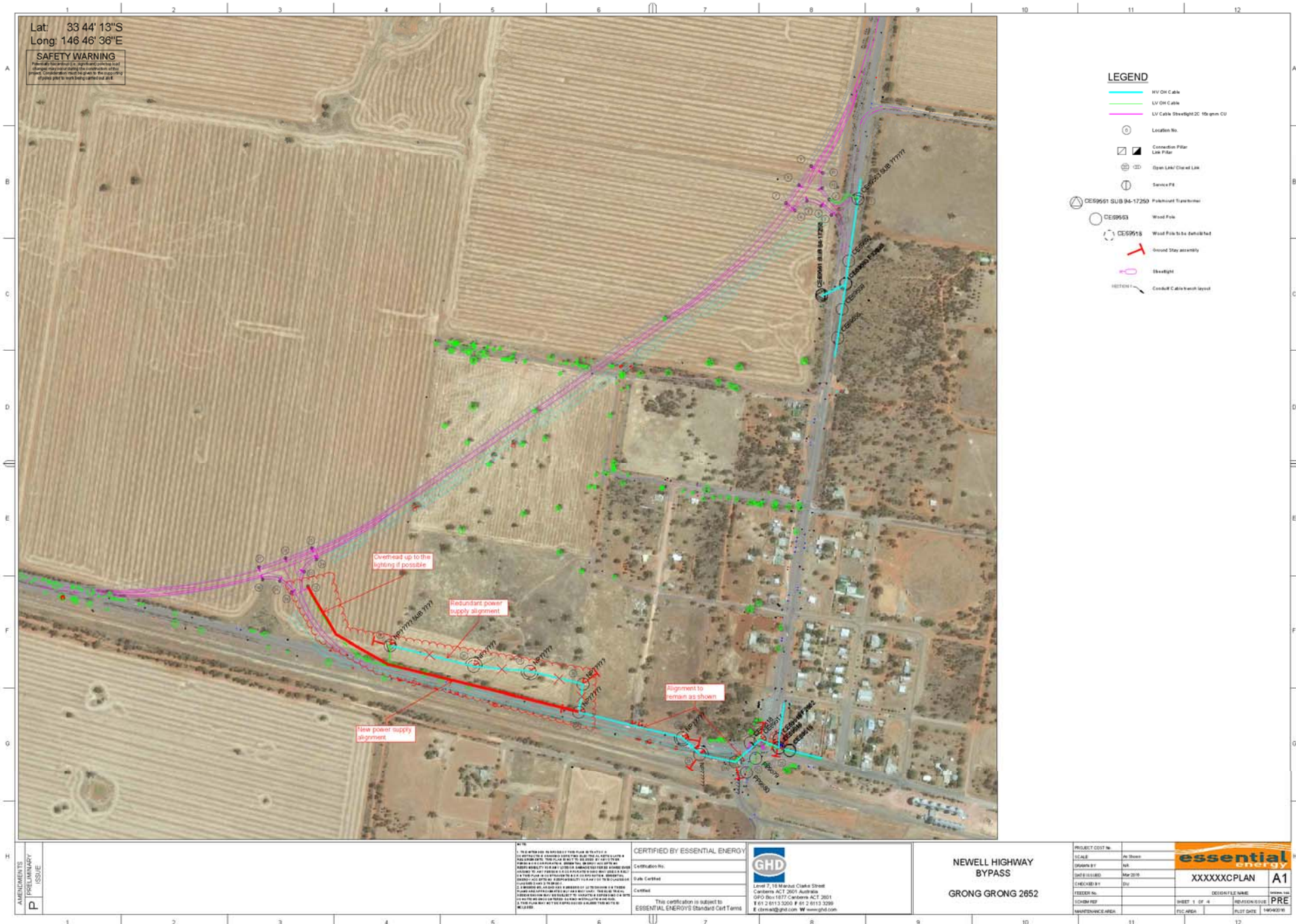


Figure 3-3 Diagram of lighting and powerlines.

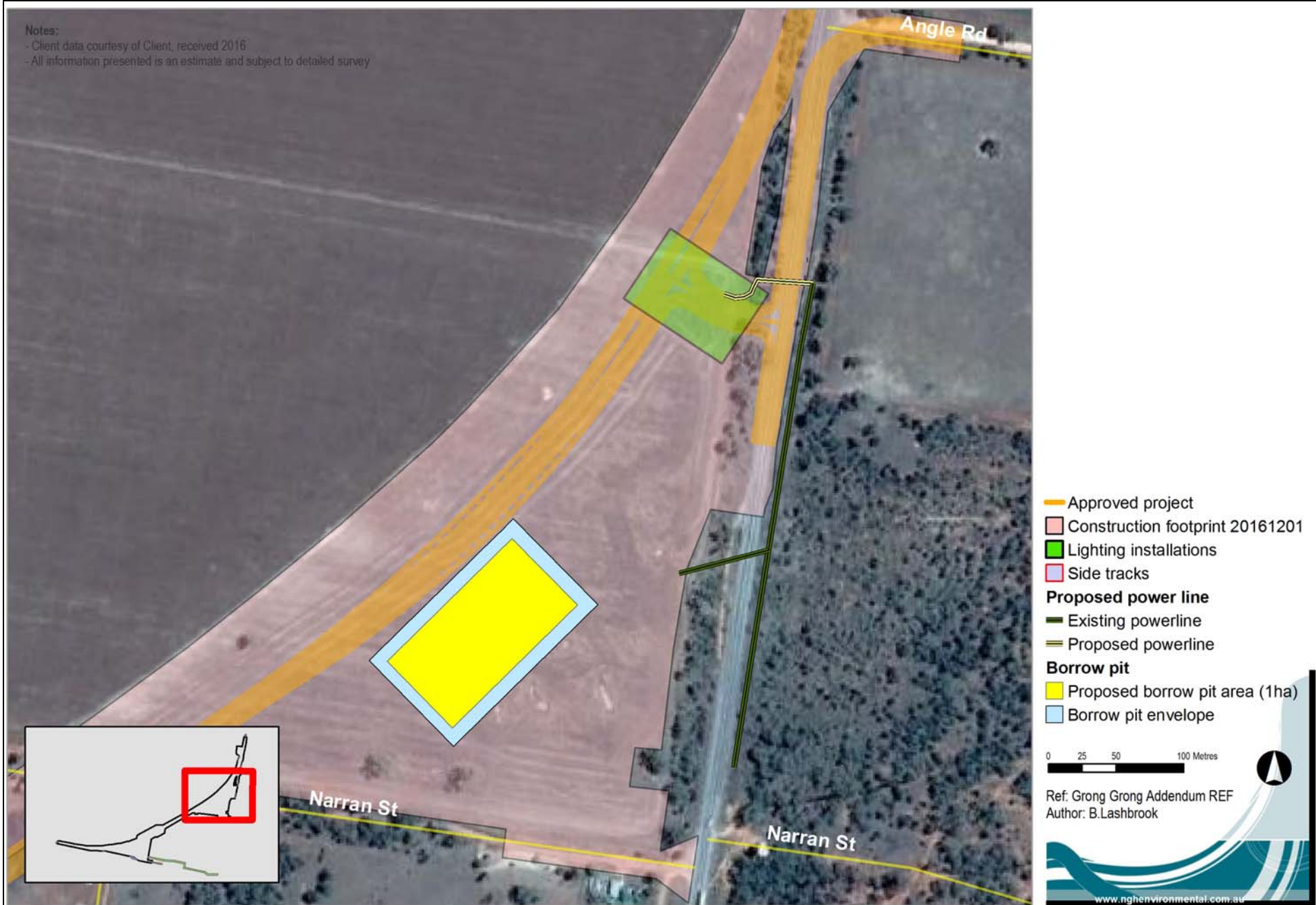
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Notes:
- Client data courtesy of Client, received 2016
- All information presented is an estimate and subject to detailed survey



Figure 3-4 The proposed modification: northern side track.

Notes:
 - Client data courtesy of Client, received 2016
 - All information presented is an estimate and subject to detailed survey



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Figure 3-5 The proposed modification: borrow pit, intersection lighting and northern powerline.

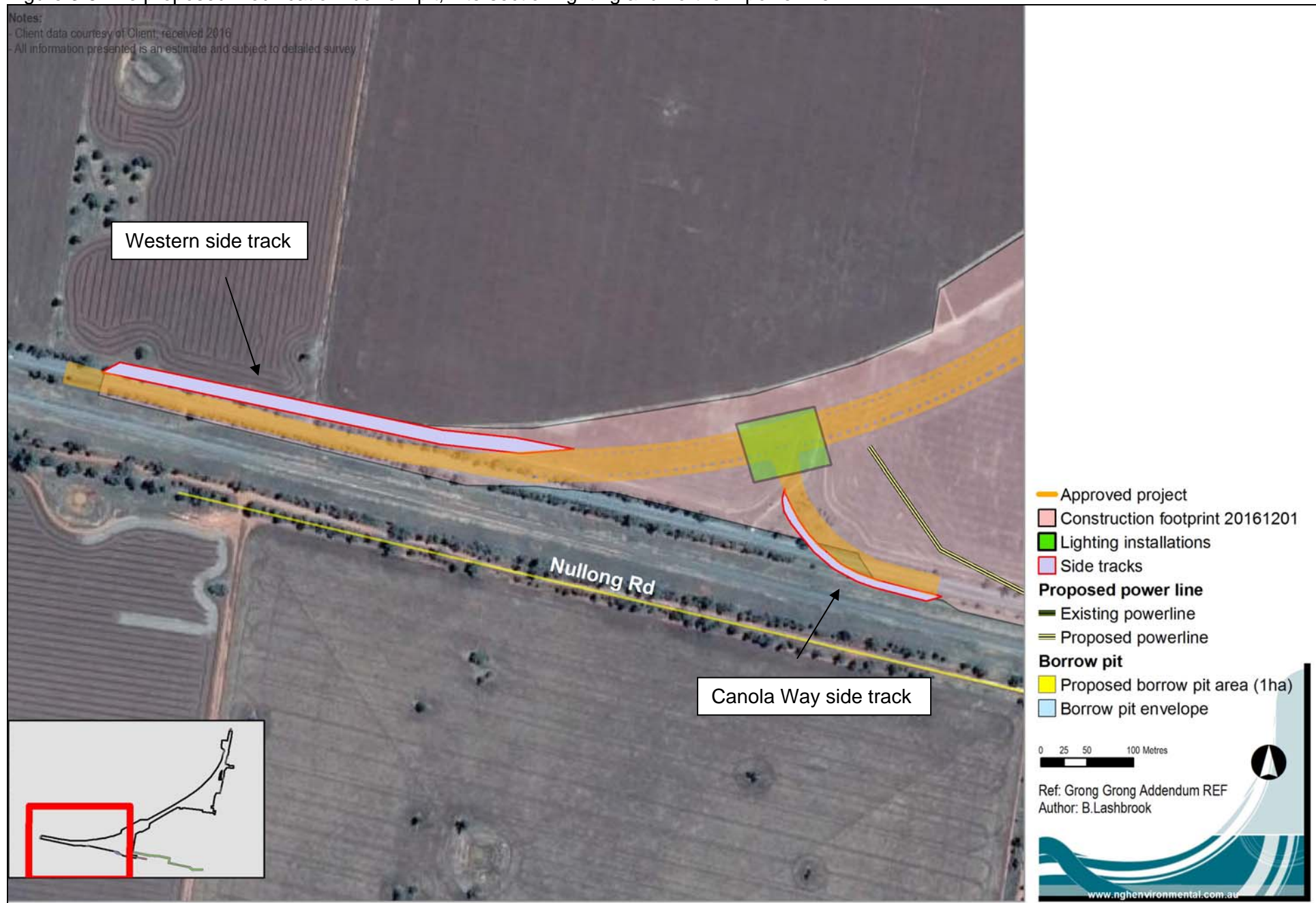


Figure 3-6 The proposed modification: western and Canola Way side tracks and intersection lighting.

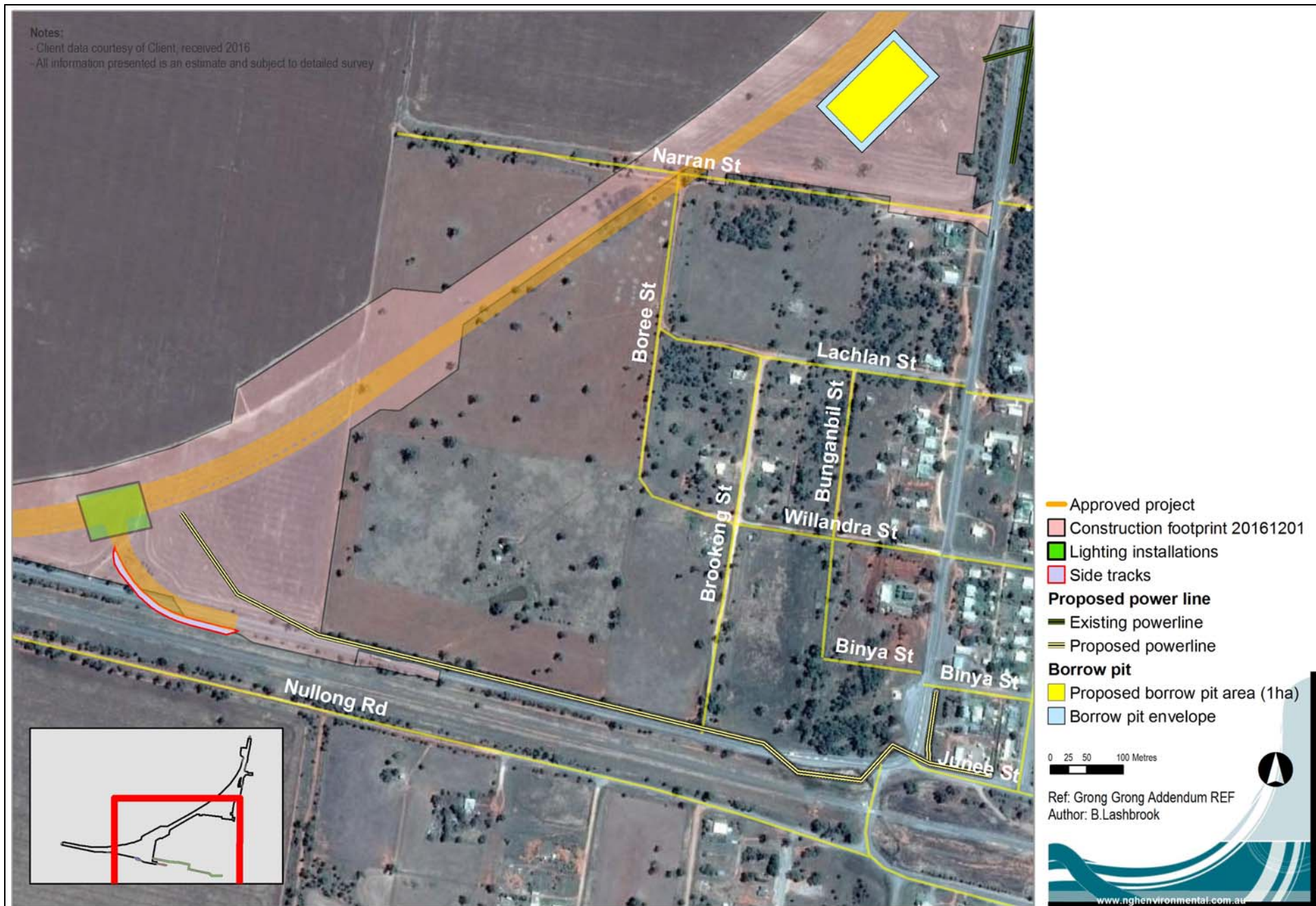


Figure 3-7 The proposed modification: proposed powerline for the southern intersection lighting.

3.2 Design

3.2.1 Design criteria

Staging plans for the project are being developed to meet Austroads and Roads and Maritime standards as specified in Roads and Maritime's Specification G10. The staging plans describe how temporary side-tracks will be built to allow completion of the final project works.

Intersection lighting has been designed to meet Australian Standard (AS) 1158 SAA Public Lighting Code. The overhead 11,000 volt powerline has been designed to comply with Essential Energy's Sub Transmission Line Design Manual CEOM 7081 and Overhead Design Manual CEOM 7097 requirements. The powerline requires design certification before construction and authorisation before being connected to Essential Energy's network. Design plans are included as Appendix A.

The Bogolong Road and Newell Highway intersection upgrade has been designed to meet the requirements of the Austroads Guide to Road Design. The design is included in Appendix A.

The proposal description in this Addendum REF represents the proposal concept design. The concept design is provided in Appendix A. The concept design would be further refined during the detailed design phase of the proposal.

3.2.2 Engineering constraints

Engineering constraints identified for the proposal include:

- minimising traffic disruption with appropriate timing for any staging works and lane closures
- staging work appropriately with standard traffic control measures
- relocating public utilities in conjunction with the affected service provider.

3.2.3 Main features of the modification

Bogolong Road intersection upgrade

Property access areas and Bogolong Road intersection would be cleared of vegetation and topsoil stockpiled. The same area would be excavated and reconstructed to provide a pavement suitable for B-double movements. Realigned drainage is dealt with below. Line marking and road side furniture would be installed. This would improve the safety of the intersection, particularly for large agricultural machinery crossing the highway and through traffic.

On the western side of the highway, the existing culvert would be removed. The pipe foundation and bedding would be regraded and replaced. New culverts with sloping traversable head walls would be installed. The culverts would be backfilled and the areas sealed.

On the eastern side of the highway opposite Bogolong Road, the table drain would be excavated and reshaped. Culvert drainage pipe and sloping traversable culvert headwalls would be installed. Road pavement would be placed over and about the culvert to create the new access, improving access and drainage of the area. Figure 3-1 and Figure 3-2 provide an overview of these works.

Newell Highway intersections lighting and power supply

Lighting would be installed at the northern and western intersections of the realigned Newell Highway. This would include 10 street lights (Sylvania Roadster style) at the northern intersection and nine at the western intersection. A powerline would also be constructed to supply power to these lights.

Construction of the powerline would include creating an appropriate vegetation clear zone. Vegetation would be cleared to meet Essential Energy's guidelines. A 20 metre wide clear zone is specified for an 11,000 volt powerline. A powerline would be installed along the northern edge of the Newell Highway road reserve east of Grong Grong up to the lighting. Another powerline on the eastern side of Berembled Street north of Grong Grong would also be installed.

Powerline construction would include drilling holes for the power poles and erecting the power poles. The stringing of powerlines and installation of transformers and switching equipment would also occur. Low voltage underground powerlines would be installed near the new intersections to connect the lighting to the electricity network. Figure 3-3, Figure 3-5 and Figure 3-6 provide an overview of these works.

Borrow pit

A borrow pit would be built near the northern intersection of the realigned Newell Highway within the approved project area. The borrow pit is proposed to be around one hectare in size and located within an envelope (Figure 3-5). Vegetation (grassy and exotic groundcover) would be removed, and topsoil would be stripped and stockpiled to the east of the borrow pit. Subsoil to a depth of around 400 - 500 mm would be stripped and stockpiled to the northeast of the borrow pit. Around 20,000m³ of material would then be excavated for the project.

At the completion of construction, the borrow pit would be backfilled with surplus material from other areas of the project, including boulders found during excavation. Subsoil and topsoil would be replaced, reshaped and levelled, and the area would be revegetated. Figure 3-5 provides an overview of these works.

Temporary side tracks at northern and western ends of work and on Canola Way

It is proposed to construct three side tracks. The first (northern side track) would be 9.5 metres wide, on the western side of the highway at the northern end of the project, and would involve removing an extra 0.04 hectares of existing vegetation, topsoil and surplus material on the western side of the highway. The second (western side track) would be on the northern side of the highway at the western end of the approved work, between around chainages 20.225 and 20.780, and would involve removing property boundary fencing as needed. The third (Canola Way side track) would be on the southern side of Canola Way, near the western intersection of the Newell Highway realignment.

Construction of these side tracks would involve vegetation stripping, followed by placing and compacting road gravels to form the side track pavement, sealing and line marking, and installing road furniture including guideposts and signs. The side tracks would be parallel to the existing alignment, finishing in a taper at each end.

Each side track would be removed, and the footprint topsoiled and revegetated before the project is completed. The staging plan to have each side track entirely on one side of the highway may result in less environmental impact on the opposite side. Figure 3-4 and Figure 3-6 provide an overview of these works.

3.3 Construction activities

3.3.1 Work methodology

The work methodology for the powerline would likely include:

- removing about 0.33 hectares of native vegetation, including one extra hollow-bearing tree
- installing power poles by direct burying pre-dressed power poles using excavator and crane
- stringing with the use of elevated work platforms and rollers
- trenching for underground connections

The work methodology for the intersection upgrade would include:

- establishing site and traffic controls
- installing temporary erosion and sediment controls
- removing vegetation, topsoil and unsuitable material
- placing and compacting pavement widening materials
- removing existing drainage and regrading and shaping culvert excavations
- reshaping inlets to directly flow into pipe culverts
- placing new culverts and headwalls and backfilling with pavement materials
- sealing and line marking intersection
- placing rock for scour protection if necessary
- restoring existing access
- repairing disturbed areas.

The work methodology for the borrow pit would include:

- removing vegetation
- stripping and stockpiling topsoil subsoil
- excavating around 20,000m³ of material for the project
- backfilling with surplus material from elsewhere in the project
- replacing subsoil and topsoil
- shaping, levelling, stabilising and revegetating.

The work methodology for the side tracks would include:

- excavating table drain to foundation material
- removing vegetation and topsoil, and stockpiling for later re-use
- placing and compacting road gravels
- sealing and marking lines
- removing the side track seal and gravels after the tie-in work
- reshaping the new table drains
- repairing and stabilising to meet final design.

3.3.2 Construction hours and duration

Construction at the Bogolong Road intersection is proposed to be completed within one to two weeks. Powerline construction is proposed to be completed within three to four weeks, with vegetation removal taking place before powerline construction. The side track construction would take about four to eight days.

Residents and local businesses would be notified of the proposed work hours before work starts.

Standard working hours are provided for in the EPA’s Interim Construction Noise Guidelines (2009). Work hours during construction would be limited to those specified in the Environmental Protection Licence held by Georgiou (No. 20719).

Standard Working Hours	
Monday – Friday	7am to 6pm
Saturday	8am to 1pm
Sundays or public holidays	No work

3.3.3 Plant and equipment

Plant and equipment needed for the proposal would be determined during construction planning phase. Indicative plant and equipment that may be used include:

- excavators
- bulldozers

- hand tools
- chainsaws
- delivery trucks
- generators
- dump trucks
- small cranes
- graders
- concrete delivery truck
- power tools
- backhoe
- rollers
- light vehicles.

3.3.4 Earthworks

There will be earthworks associated with regrading the culvert on the western side of the highway, reshaping the inlet and outlet channels on the eastern side of the highway, and reshaping and regrading the property access. The side track will also involve some earthworks, including excavating the table drain.

3.3.5 Source and quantity of materials

Road pavement and side track materials would be sourced from appropriately licensed facilities (quarries). Imported materials would be sourced from commercial suppliers in nearby areas wherever possible. The work will require:

- about 1000 metres of 11,000 volt powerline and about seven to eight power poles (10.5 metres mounting height x 4.5 metres single outreach arm style one column with screw anchor or ragbolt cage/concrete base)
- two or three 375mm diameter culverts and two matching headwalls
- about 9.6 metres of 450mm diameter concrete pipe culvert and matching headwalls
- about 250 to 300m³ of road pavement gravels for the intersections and side tracks
- 400m² of organic fibre matting
- reusing topsoil and seeds.

Surplus material that cannot be used on-site would be classified in line with the *Waste Classification Guidelines* (DECCW, 2009) and disposed of at an approved materials recycling or waste disposal facility.

3.3.6 Traffic management and access

Traffic management and access during construction would be managed in line with the *Traffic Control at Work Sites Manual* (RTA, 2010a). The project modification would also be incorporated into the traffic management plan and traffic control plan developed for the project.

Traffic management controls, including reduced speed limits and partial road closures, would be put in place during the proposed work.

Construction traffic would generally use the new Newell Highway realignment and existing Newell Highway to get to and from the proposal site. Construction access locations are to be finalised in consultation with the construction contractor. Access would be provided in a suitable location to ensure safe entry and exit from site including sufficient sight distance and signage, a low-speed environment and minimising local traffic impact.

3.4 Ancillary facilities

Stockpiles, material and machinery storage will be located away from the highway in previously cleared areas. Roads and Maritime's site compound would act as the worksite compound, avoiding unnecessary disturbance and cost.

3.5 Public utility adjustment

Public utilities identified in the project REF near the project site include:

- electricity transmission lines

- telephone line
- water hydrants
- Nextgen fibre-optic cable.

These existing utilities will not be impacted by the proposed modification. An overhead powerline at the Bogolong Road intersection would be avoided by maintaining clearances in line with utility providers' specifications. If necessary, relocation as part of the proposed works is possible, and consultation with the relevant utility authorities would be carried out. Any extra utilities that are located during the detailed design phase would also be relocated following consultation with relevant utility operators.

4 Statutory and Planning Framework

4.1 Environmental Planning and Assessment Act 1979

4.1.1 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State.

Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposed modification is for a road and road infrastructure facilities and is to be carried out by Roads and Maritime, it can be assessed under Part 5 of the *Environmental Planning and Assessment Act 1979*. Development consent from council is not required.

The proposed modification is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not affect land or development regulated by *State Environmental Planning Policy No. 14 - Coastal Wetlands*, *State Environmental Planning Policy No. 26 - Littoral Rainforests*, *State Environmental Planning Policy (State and Regional Development) 2011* or *State Environmental Planning Policy (Major Development) 2005*.

Part 2 of the ISEPP contains provisions for public authorities to consult with local councils and other public authorities before the start of certain types of development. Consultation, including consultation as required by ISEPP (where applicable), is discussed in chapter 5 of this addendum REF.

State Environmental Planning Policy (Rural Lands) 2008

State Environmental Planning Policy (Rural Lands) 2008 aims to facilitate the orderly and economic use of rural lands, including the subdivision, development, and protection of rural lands. It applies to land within the Narrandera LGA.

Clause 7 of the SEPP (Rural Lands) identifies rural planning principles. Table 4-1 in the project REF summarises how the proposal addresses or responds to each of these principles. The proposed modification does not change the response to the rural planning principals provided in the project REF.

State Environmental Planning Policy No. 44 (Koala Habitat Protection)

State Environmental Planning Policy No. 44 (Koala Habitat Protection) aims to encourage the proper conservation and management of natural vegetation areas that provide habitat for koalas, to ensure that permanent free-living populations are protected in their present range and to reverse the current trend of population decline. The policy applies to the Narrandera LGA.

SEPP 14 does not apply to the proposed modification as the proposed modification does not require development consent. Further, as described in the original proposal, the area of the proposed modification is not considered to be potential or core koala habitat, due to the small area of suitable feeding habitat, the lack of connectivity to core habitat areas and the location near a busy road and urban area.

4.2 Local Environmental Plans

4.2.1 Narrandera Local Environmental Plan 2013 (LEP)

The proposed modification is located within the Narrandera LGA. The *Narrandera Local Environmental Plan 2013* (LEP) is the local planning instrument for the Narrandera LGA. The proposed modification would be located on land zoned by the LEP as:

- RU1 Primary Production Zone
- RU5 Village.

Roads are permitted without consent within both of these zones. The proposed modification is also permissible without consent under clause 94 of the ISEPP, which is the governing instrument in this case.

4.3 Other relevant NSW legislation

4.3.1 Threatened Species Conservation Act 1995 (TSC Act)

The *Threatened Species Conservation Act 1995* aims to conserve and protect certain classes of threatened, endangered and vulnerable species, populations and ecological communities.

Section 5A of the EP&A Act lists a number of factors to be taken into account when deciding if there is a likelihood of a significant impact on threatened species, populations and their habitat, or on ecological communities. If there is a chance of an impact, an Assessment of Significance would be required to determine impact significance. If there is likelihood for a significant impact on threatened species, populations and their habitat, or on ecological communities, then a Species Impact Assessment is required. Further details about threatened species is located in section 6.2 and the associated Biodiversity Assessment.

4.3.2 National Parks and Wildlife Act 1974 (NPW Act)

The *National Parks and Wildlife Act 1974* (NP&W Act) is administered by the Office of Environment and Heritage (OEH). It aims to conserve nature, habitat, ecosystems, ecosystem processes and biological diversity at the community, species and genetic levels. Under this Act, all native fauna is protected, threatened or otherwise. Schedule 13 of the Act lists protected plants which shall not be harmed on any land on or off National Park estate. Biodiversity impacts are assessed in section 6.1 of this addendum REF.

Additionally, the NP&W Act provides legislative protection for Aboriginal heritage in NSW. Part 6 of the Act refers to Aboriginal objects and places and prevents persons from impacting on an Aboriginal place or relic without consent or a permit. Heritage impacts are assessed in section 6.3 of this addendum REF.

4.3.3 Water Management Act 2000 (WM Act)

The *Water Management Act 2000* provides for the sustainable and integrated management of water resources for the benefit of both present and future generations. It provides for the implementation of plans that establish rules for sharing a water resource while taking into account the environmental need of the resource. The proposal's construction footprint is covered by the Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2003.

Section 56 of the WM Act establishes access licences for taking water within a particular water management area. Under section 18(1) of the Water Management (General) Regulation 2011 (Water Management Regulation), Roads and Maritime, as a roads authority, is exempt from obtaining an access licence for water needed for road construction and maintenance. Sections 89 to 91 of the WM Act establish three types of approvals that a proponent may require. These are water use, water management (including water supply, drainage and flood work approvals) and activity approvals (including controlled activity and aquifer interference approvals).

A water use approval under Section 91A(1) of the WM Act would be required for the use of water covered by the water sharing plans. However, under clause 31(1) of the Water Management Regulation, Roads and Maritime, as a roads authority, is exempt from requiring a water use approval for road construction and maintenance.

Clause 38 of the Water Management (General) Regulation 2011 exempts Roads and Maritime, as a public authority, from obtaining approval under Section 91E(1) of the WM Act for controlled activities on waterfront land. Despite not requiring controlled activity approvals, NSW Office of Water (NoW) guidelines for controlled activities have been considered in this assessment and would be considered during the detailed design and construction phases of the proposal.

4.3.4 Noxious Weeds Act 1993 (NW Act)

The *Noxious Weeds Act 1993* (NW Act) establishes control mechanisms to reduce the negative impacts of weeds on the economy, community and environment. Under Section 13 of the NW Act, Roads and Maritime, as a public authority, is required to control noxious weeds on land that it owns and prevent noxious weeds from spreading to adjoining properties.

One noxious weed species (African Boxthorn *Lycium ferocissimum*) (Class 4) was found within the project's construction footprint. Class 4 weeds are locally controlled weeds that pose a threat to primary production, the environment or human health.

4.3.5 Protection of the Environment Operations Act 1993 (POEO Act)

The *Protection of the Environment Operations Act 1997* (POEO Act) establishes a regulatory framework for the protection and restoration of the environment. It provides a mechanism for licensing certain activities (scheduled activities), listed in Schedule 1 of the POEO Act.

The project has an Environment Protection Licence (EPL) because it meets the definition of 'extractive activities' under clause 19 of Schedule 1. The proposed modification would be covered by this EPL. The proposed borrow pit is located within the scheduled premises map identified in the EPL. The EPL limit for extractive activities is 100,000 – 500,000 tonnes per annum. Current cut quantities for the project are 194,000 tonnes. The borrow pit will add 25,000 tonnes to the project. This is still under the 500,000 tonne limit.

4.4 Commonwealth legislation

4.4.1 Environment Protection and Biodiversity Conservation Act 1999

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) a referral is required to the Australian Government for proposed 'actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land'. These are considered in Appendix B and chapter 6 of the addendum REF. Potential impacts to these biodiversity matters are also considered as part of chapter 6 of the addendum REF and Appendix B.

Findings – matters of national environmental significance (other than biodiversity matters)

The assessment of the proposed modification's impact on matters of national environmental significance found there would be no change to the findings of the determined activity. The activity is unlikely to cause a significant impact on matters of national environmental significance or the Commonwealth land, and a referral to the Australian Department of the Environment and Energy is not required.

The proposed modification is not likely to result in a significant impact on threatened species, populations or ecological communities or migratory species, within the meaning of the EPBC Act. This addendum REF has been prepared to meet the requirements of the EPBC Act strategic assessment approval for Roads and Maritime Part 5 road activities. A referral to the Australian Department of the Environment and Energy is not required.

4.5 Confirmation of statutory position

The proposed modification is categorised as development for the purpose of road infrastructure facilities and is being carried out by or on behalf of a public authority. Under clause 94 of the ISEPP the proposed modification is permissible without consent. The proposed modification is not State significant infrastructure or State significant development. The proposed modification can be assessed under Part 5 of the EP&A Act. Consent from Council is not required.

Roads and Maritime is the determining authority for the proposed modification. This addendum REF fulfils Roads and Maritime's obligation under clause 111 of the EP&A Act to examine and take into account, to the fullest extent possible, all matters affecting or likely to affect the environment.

5 Consultation

Roads and Maritime met with the affected landowner of the Bogolong Road intersection works on-site on 24 June 2016 to discuss the work. The landowner was in favour of the proposed intersection upgrade.

Narrandera Shire Council was presented with the lighting design and the Bogolong Road intersection design on 15 July 2016. The Bogolong Road intersection design was altered in line with comments received from Narrandera Shire Council.

Roads and Maritime has carried out Aboriginal community consultation and investigation since the project proposal started in 2009. Consistent with the Roads and Maritime *Procedure for Aboriginal cultural heritage consultation and investigation*, no further consultation with the Aboriginal community was necessary.

6 Environmental assessment

This section of the addendum REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposed modification of the Newell Highway realignment at Grong Grong. All aspects of the environment potentially impacted by the proposed modification are considered. This includes the factors specified in the guidelines *Roads and Related Facilities* (DUAP 1996) and *Is an EIS required?* (DUAP 1999) as required under clause 228(1) of the Environmental Planning and Assessment Regulation 2000. The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 are also considered in Appendix B.

Site-specific safeguards and management measures are provided to improve the identified potential impacts.

6.1 Biodiversity

6.1.1 Methodology

NGH Environmental Pty Ltd was engaged by Roads and Maritime to carry out the REF's biodiversity assessment. This included:

- consulting relevant literature and previous studies conducted within the region
- desktop review of flora and fauna likely to occur in the study area
- targeted flora and fauna surveys
- a general flora and vegetation survey
- assessing impacts on species, populations and ecological communities.

NGH Environmental also provided an addendum biodiversity assessment to inform the addendum REF. This includes the calculated cumulative area of impact and a revised impact assessment. A copy of the full report is provided in Appendix E.

6.1.2 Existing environment

The proposed modification's work areas are within the project area locality.

The threatened species, populations and ecological communities likely to occur in the proposed modification area are therefore likely to be the same as those identified in the project REF. The biodiversity assessment found that the proposed modification footprint includes Inland Grey Box Woodland EEC and modified cropping land.

6.1.3 Potential impacts

Vegetation types and Endangered Ecological Communities (EEC)

Changes to the proposal and resulting construction footprint are considered to be relatively minor. Table 5-1 in the project REF's biodiversity assessment detailed the approximate area of each vegetation type and EEC affected. This table has been revised with the new construction footprint including the powerline (**Table 1**).

Table 1 Approximate area of each vegetation type and EEC within the revised construction footprint

Vegetation community	Biometric vegetation type	Biometric vegetation condition	Total area of vegetation communities impacted (hectares). Previously approved area in brackets	Impacts to Inland Grey Box Woodland EEC (hectares). REF figures are included in brackets	
				TSC Act (NSW)	EPBC Act (Cwth)
Inland Grey Box Woodland	MR565	Moderate to good	(2.9)	(2.9)	(2.9)
Inland Grey Boy Woodland (highly modified)	MR565	Low	0.869 (0.5)	0.869 (0.5)	Does not qualify
Bimble Box and Inland Grey Box Woodland	MR564	Moderate to good	(0.3)	(0.3)	Does not qualify
Bimble Box and Dwyer's Red Gum (<i>Eucalyptus dwyeri</i>) with Grey Box	MR568/ MR564	Moderate to good	(1.1)	(1.1)	(1.1)
Additional area of vegetation communities impacted			0.369	0.369	0.0
Total area of vegetation communities impacted (assessed in previous reports)			4.8	4.8	4.0
Total area of vegetation communities impacted			5.169	5.169	4.0

The proposed modification for the inclusion of the powerline supply, intersection lighting, a borrow pit and side tracks would impact a further 0.369 hectares of Inland Grey Box Woodland and 0.247 hectares of modified cropping land with a cumulative total footprint on the Inland Grey Box Woodland EEC of 5.169 hectares.

As stated in the project REF's biodiversity assessment (Appendix F of the displayed REF), a total of 26 habitat trees (ie hollow-bearing trees) were recorded within the study area, with an additional three potential habitat trees and this remains the case. In the project REF's biodiversity assessment, 13 habitat trees were located within the original construction footprint displayed in the REF. One extra habitat tree is located in the revised construction footprint for the powerline.

As stated in the project REF's Biodiversity Assessment, Addendum Biodiversity Assessment (NGH Environmental, September 2015 and Additional Assessment (NGH Environmental, March 2016) and Additional Assessment (NGH Environmental, December 2016) there are about nine habitat trees that would be directly impacted by the proposal. The project REF's biodiversity assessment for the powerline found that one extra hollow-bearing tree is likely to be removed for the construction of the powerline. This tree, located at the intersection of the existing highway and Brookong Street, would be removed.

Revised assessments of significance, in line with the TSC Act and EPBC Act, were completed for Inland Grey Box Woodland EEC, Sand-hill Spider Orchid, Pine Donkey Orchid, Superb Parrot, Brown Treecreeper, and Grey-crowned Babbler. The revised assessments concluded a non-significant impact of the proposed modification on each.

Conclusion on significance of impacts

The proposed modification is not likely to further impact threatened species, populations or ecological communities or their habitats, within the meaning of the TSC Act or FM Act and therefore a Species Impact Statement is not required.

The proposed modification is not likely to significantly impact threatened species, populations, ecological communities or migratory species within the meaning of the EPBC Act.

Given the minor changes in the impacts to flora and fauna habitats, including EECs and hollow-bearing trees, the conclusions reached in the project REF's biodiversity assessment are still considered to apply. Significant impacts to threatened flora, fauna and EECs are considered unlikely.

6.1.4 Safeguards and management measures

Regrowth trees shown in Figure 6-1 will be avoided during drainage improvements. The project CEMP - biodiversity management sub-plan would be updated to include the proposed modification.

No extra safeguards or mitigation measures additional to those described in the project REF are required.

The Biodiversity Offset Strategy would be prepared to identify the suitable land and mechanism for offsetting as soon as practicable.



Figure 6-1 Regrowth trees to be avoided during Bogolong intersection upgrade.

6.1.5 Biodiversity offsets

The Roads and Maritime *Guideline for Biodiversity Offsets* sets out criteria to determine if the proposal's residual impacts are sufficient to warrant offsets consideration. It states that offsets should be considered for works involving vegetation clearing in areas of high conservation value, including EECs in moderate to good condition, where clearing exceeds one hectare.

The revised project would impact on around 5.17 hectares of Inland Grey Box Woodland EEC, of which 4.3 hectares is in moderate to good condition. Offsets would therefore be considered, and as identified in the project REF, a Biodiversity Offset Strategy would be prepared to identify the suitable land and mechanism for offsetting as soon as practicable.

6.2 Soil and water

6.2.1 Existing environment

The soil and hydrology at the proposed modification site are consistent with the description within the project REF.

6.2.2 Potential impacts

Construction

Construction of the proposed modification would disturb the soil surface and drainage lines.

The stripping and stockpiling of extra spoil and topsoil would pose further erosion and sedimentation risk during construction. Soil loss could occur due wind or water.

Construction activities have the potential to contaminate soil from accidental spills of fuels, oils and other hazardous materials such as bitumen. Although the proposed modification results in an increase in the project footprint, additional risk from the proposed modification is minimal.

Standard soils and chemicals storage and handling practices and the extra mitigation measures outlined in the project REF are considered sufficient to manage the additional risk.

Operation

The proposed modification would result in some extra pavement surface area, which would slightly increase runoff from hard surfaces. This may result in soil erosion and movement of sediment-laden water in the adjacent table drains. This could reduce water quality in drainage structures but, given the limited pavement works scope, any extra impacts are likely to be negligible.

6.2.3 Safeguards and management measures

Stockpiles, material and machinery storage will be located away from the highway in previously cleared areas. If a site compound is required for the work, the nearby Roads and Maritime site compound could be used to avoid unnecessary disturbance and cost. The project CEMP - soil and water management sub-plan, including the erosion sediment control plans, would be updated to include the proposed modification.

6.3 Aboriginal heritage

6.3.1 Method

Aboriginal Cultural Heritage Office (South West) with Roads and Maritime confirmed with a Roads and Maritime 'Procedure for Cultural Heritage Consultation and Investigation' (PACHCI resource 4)

that the proposed modification was unlikely to have an impact on Aboriginal cultural heritage. The assessment was based on the following due diligence considerations:

- the project is unlikely to harm known Aboriginal objects or places
- the Aboriginal Heritage Information Systems (AHIMS) search did not indicate any concentrations of Aboriginal objects or places in the study area
- the study area does not contain landscape features that indicate the presence of Aboriginal objects, based on the OEH's Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW and Roads and Maritime's procedure
- the cultural heritage potential of the study area appears to be reduced due to past disturbance
- there is an absence of sandstone rock outcrops likely to contain Aboriginal art.

6.3.2 Potential impacts

The PACHCI (Step 2 Memo) only included Bogolong Road intersection upgrade, although the Aboriginal Cultural Heritage Office (South West) conducted further AHIMS searches to determine the presence of any items of Aboriginal cultural heritage significance. Searches did not identify any items of Aboriginal cultural heritage significance within the modification areas.

The proposed modification is located within the Wiradjuri Aboriginal Land Council Region and the Narrandera Local Aboriginal Land Council (LALC) area.

The proposal is located in a highly disturbed area as a result of agricultural practices, residential development and road construction. Areas of least disturbance are located within the road reserve of the Newell Highway.

The AHIMS searches did not identify any recorded Aboriginal heritage, and the site survey conducted for the project found no items of cultural significance.

Roads and Maritime's Aboriginal Cultural Heritage Advisor (South West) assessed the proposed modification as being unlikely to have an impact on Aboriginal cultural heritage.

6.3.3 Safeguards and management measures

If any potential Aboriginal objects (including skeletal remains) are discovered during the course of the project, all works in the vicinity of the find must stop. Follow the steps outlined in the Roads and Maritime Services Procedure: Unexpected 'Heritage Items' (*PN 285 P02*).

6.4 Other impacts

Environmental factor	Existing environment	Potential impacts	Environmental safeguards
Property and land use	See project REF	<ul style="list-style-type: none"> Minimal additional property acquisition for side tracks 	No additional safeguards to those listed in the project REF required
Traffic and transport	See project REF	<ul style="list-style-type: none"> Extra work in the Newell Highway road reserve Minimal increase in construction vehicles travelling to, from and within construction area on the Newell Highway and local roads Short traffic delays during construction and lane closures Reduced potential for impacts to motorists due to decreased traffic impacts at the tie-ins Reduced project time and costs. 	The project traffic management plan would be updated to incorporate the proposed modification
Socio-economic	See project REF	<ul style="list-style-type: none"> Minimal extra socio-economic impacts (positive and negative), including employment, construction disruption, improved local access and road safety 	No additional safeguards to those listed in the project REF required
Landscape character and visual amenity	See project REF.	<ul style="list-style-type: none"> Minimal extra visual impacts Impacts to nearby residences from the introduction of intersection street lighting. Impacts are considered minor and inconsequential as Grong Grong already has street lights and the proximity of existing residences to the proposed lighting is about 500 metres. 	No additional safeguards to those listed in the project REF required

Environmental factor	Existing environment	Potential impacts	Environmental safeguards
Noise and vibration	See project REF	<ul style="list-style-type: none"> Minimal extra construction noise Negligible extra construction vibration eg from excavators, bulldozers. 	The project noise and vibration management plan would be updated to incorporate the proposed modification
Non-Aboriginal heritage	See project REF	<ul style="list-style-type: none"> None 	No additional safeguards to those listed in the project REF required
Air quality	See project REF	<ul style="list-style-type: none"> Minimal extra localised dust, fuel, and exhaust emissions from vehicles and construction equipment Minimal extra dust generated from earthworks, stockpiles, transport of materials and vegetation removal. 	No additional safeguards to those listed in the project REF required
Waste minimisation and management	See project REF	<ul style="list-style-type: none"> Minimal extra waste materials generated 	No additional safeguards to those listed in the project REF required

6.5 Cumulative impacts

At the time of writing the addendum REF, there were no known plans for other developments in Grong Grong. As a result, cumulative impacts from multiple project sources are not expected to arise. The cumulative impact of the approved project with the proposed modifications has been identified as not significant.

6.6 Environmental management plans

Safeguards and management measures have been identified to minimise adverse environmental impacts that could potentially arise as a result of the proposed modification. Should the proposed modification proceed, these management measures would be addressed if required during detailed design and incorporated into the Construction Environmental Management Plan (CEMP) and applied during the construction of the proposed modification.

6.7 Summary of safeguards and management measures

Environmental safeguards and management measures for the Newell Highway realignment at Grong Grong are summarised in Table 7-1. Additional safeguards and management measures identified in this addendum REF are included in bold and italicised font. The safeguards and management measures will be incorporated into the detailed design phase of the proposed modification and the CEMP, and implemented during construction and operation of the proposed modification, should it proceed. These safeguards and management measures will minimise any potential adverse impacts arising from the proposed works on the surrounding environment.

Table 6-2: Summary of safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing
General	<ul style="list-style-type: none"> • All environmental safeguards must be incorporated within the following: <ul style="list-style-type: none"> ○ detailed design stage ○ contract specifications for the proposal ○ Contractor's Environmental Management Plan • <i>The project CEMP and sub-plans would be updated to include the proposed modification.</i> 	Roads and Maritime Project Manager Contractor	Pre-construction
General	<ul style="list-style-type: none"> • A risk assessment must be carried out on the proposal in line with Roads and Maritime's Project Pack and PMS risk assessment procedures to determine an audit and inspection program for the works. The risk assessment recommendations are to be implemented • A review of the risk assessment must be carried out after the initial audit or inspection to evaluate if the level of risk chosen for the project is appropriate. • Any work resulting from the proposal and as covered by the REF may be subject to environmental audit(s) and/or inspection(s) at any time during their duration. 	Roads and Maritime Project Manager	Pre-construction After first audit

Impact	Environmental safeguards	Responsibility	Timing
General	<ul style="list-style-type: none"> The CEMP shall be reviewed by the Roads and Maritime Environment Officer South West Region 	Roads and Maritime Project Manager	Pre-construction
General	<ul style="list-style-type: none"> The Roads and Maritime Project Manager must notify the Roads and Maritime Environment Officer South West Region at least five working days before work starts 	Roads and Maritime Project Manager	Pre-construction
General	<ul style="list-style-type: none"> All businesses and residents likely to be affected by the proposal must be notified at least five working days before the start of the proposed activities 	Contractor	Pre-construction
General	<ul style="list-style-type: none"> The contractor must provide environmental awareness to all field personnel and subcontractors 	Contractor	Pre-construction and during construction as required
Pre-clearing	<ul style="list-style-type: none"> If unexpected threatened fauna or flora species are discovered, works will stop immediately and the <i>Roads and Maritime Unexpected Threatened Species Find Procedure</i> in the <i>Biodiversity Guidelines – Guide 1 (Pre-clearing process)</i> will be followed The extent of the construction footprint would be clearly marked and vehicle and plant movement outside of these areas would be avoided. Any trees and native vegetation to be retained on-site will be protected and managed through the use of clearly marked exclusion zones. Exclusion zones will be implemented in line with the <i>Biodiversity Guidelines – Guide 2 (Exclusion zones)</i> (RTA, 2011) Prior to any vegetation clearing the pre-clearance process outlined in <i>Biodiversity Guidelines – Guide 1 (Pre-clearing process)</i> (RTA, 2011) will be implemented. 	Contractor	Pre-construction

Impact	Environmental safeguards	Responsibility	Timing
Clearing of native vegetation	<ul style="list-style-type: none"> • Carry out vegetation clearance in line with <i>Biodiversity Guidelines – Guide 4 (Clearing of vegetation and removal of bushrock)</i> (RTA, 2011) • Restrict vegetation clearing to those areas where it is necessary • Trees will be removed so as not to cause damage to surrounding vegetation. This will ensure minimum groundcover disturbance • Use areas already impacted by previous clearing or disturbance, and minimise clearing where feasible. Trimming will be preferred over removal where feasible • Hollow-bearing tree removal is to be carried out in a two stage clearing process as stated in the <i>Biodiversity Guidelines – Guide 4 (Clearing of vegetation and removal of bush rock)</i> (RTA, 2011). Large trunks and logs would be placed into adjacent habitat • <i>Selected regrowth trees will be avoided at Bogolong Road intersection upgrade.</i> 	Contractor	Construction
Fauna and habitat impacts	<ul style="list-style-type: none"> • Fauna handling must be carried out in line with the <i>Biodiversity Guidelines - Guide 9 (Fauna Handling)</i> (RTA, 2011) • Details of the local veterinary and/or wildlife carer (WIRES) would be available on-site. 	Contractor	Construction

Impact	Environmental safeguards	Responsibility	Timing
Weed spread and establishment	<ul style="list-style-type: none"> Weeds will be managed in line with the <i>Biodiversity Guidelines – Guide 6 (Weed Management)</i> (RTA, 2011). Priority will be given to the control of noxious weeds such as African Boxthorn (<i>Lycium ferocissimum</i>) Machinery will be cleaned before coming to site to ensure that weed seeds and propagules are not imported. 	Contractor	Construction
Disturbance to fallen timber, dead wood, and bush rock	<ul style="list-style-type: none"> Re-use coarse woody debris on-site in line with the <i>Biodiversity Guidelines - Guide 5 (Re-use of woody debris and bushrock)</i> (RTA, 2011) Avoid bushrock disturbance where practical. Where disturbance cannot be avoided, remove the bushrock in line with the management requirements of <i>Biodiversity Guidelines - Guide 4 (Clearing of vegetation and removal of bushrock)</i> (RTA, 2011) Bushrock will be re-used on-site where possible. Re-use bushrock in line with the <i>Biodiversity Guidelines - Guide 5 (Re-use of woody debris and bushrock)</i> (RTA 2011). 	Contractor	Construction
Loss of mature trees including hollow-bearing trees	<ul style="list-style-type: none"> Clearly mark hollow-bearing trees to be removed Hollow-bearing tree removal is to be carried out in a two stage clearing process as stated in the <i>Biodiversity Guidelines – Guide 4 (Clearing of vegetation and removal of bush rock)</i> (RTA, 2011). 	Contractor	Construction
Removal of redundant highway areas	<ul style="list-style-type: none"> Revegetation of the two areas of redundant highway to be removed and revegetated will be carried out in line with <i>Biodiversity Guidelines – Guide 3 (Re-establishment of native vegetation)</i> (RTA, 2011) 	Contractor	Construction Post-construction

Impact	Environmental safeguards	Responsibility	Timing
Revegetation of disturbed or cleared areas of EEC	<ul style="list-style-type: none"> • Areas of Inland Grey Box Woodland EEC that are cleared for temporary ancillary facilities (eg for compound access) and are not required for the proposal's operation will be revegetated in line with <i>Biodiversity Guidelines – Guide 3 (Re-establishment of native vegetation)</i> (RTA, 2011) 	Contractor	Post-construction
Loss of quality soil from construction (ancillary sites)	<ul style="list-style-type: none"> • Strip and stockpile topsoil during the preparation of any ancillary sites • Reinststate topsoil as part of the rehabilitation of these areas for ongoing agricultural use • <i>Stockpiles, material, and machinery storage will be located away from the highway in previously cleared areas. If a site compound is required for the work, the nearby Roads and Maritime site compound would be used to avoid unnecessary disturbance and cost.</i> 	Contractor	Construction

Impact	Environmental safeguards	Responsibility	Timing
Changes to property areas/accesses	<ul style="list-style-type: none"> Roads and Maritime will continue negotiating with landowners about property access and acquisition to establish works zones and location for ancillary facilities Roads and Maritime will continue to consult with affected landowners and residents where temporary and permanent property access changes would be required Roads and Maritime will provide landowners and residents with advanced notification of construction schedules and any changes to local roads and property access Roads and Maritime will provide community updates on changes to the local road network during construction, in line with a Traffic Management Plan Roads and Maritime will work with the owner of the 'Woodlands' property to plan for and allow safe stock movements near the highway. This may include installing large, lockable fold out signage which can be opened when moving stock. Details will continue to be developed in consultation with the landowner during detailed design. 	<p>Roads and Maritime Project Manager</p> <p>Permanent: Roads and Maritime Project Manager Temporary: Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Roads and Maritime Project Manager</p>	Pre-construction Construction
Permanent loss of farm land	<ul style="list-style-type: none"> Carry out property acquisition in line with Roads and Maritime's <i>Land Acquisition Information Guide</i> (Roads and Maritime, 2014) and the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> Continue consulting with all affected property owners about property acquisition during the detailed design of the proposal. 	Roads and Maritime Project Manager	Pre-construction Detailed design phase

Impact	Environmental safeguards	Responsibility	Timing
Traffic and access	<ul style="list-style-type: none"> • Prepare and implement a traffic management plan (TMP) in line with Roads and Maritime QA Specification G10 Traffic Management. The TMP would be implemented in consultation with key stakeholders • The local community would be notified about any work that may affect access to local roads and property accesses in a timely manner • Private property access would be maintained at all times during the construction works. 	Contractor	Construction

Impact	Environmental safeguards	Responsibility	Timing
Economic impacts to businesses and agriculture – town access	<ul style="list-style-type: none"> In consultation with the Grong Grong community, Roads and Maritime will provide signposting to encourage highway traffic to visit Grong Grong. Signage would be consistent with Roads and Maritime signposting guidelines In addition, Roads and Maritime will provide advertising signage, visible from the Newell Highway, to mitigate against loss of trade (for the general store and the motel) and to contribute towards the town's ongoing viability (for the hotel). 	Roads and Maritime Project Manager	Pre-construction Operation
Reduced visual amenity	<ul style="list-style-type: none"> Prepare and implement a detailed urban design plan based on the urban design concept outlined in section 5.3 of the Urban Design Strategy (PAA, 2014) and in consultation with the Grong Grong community and Narrandera Shire Council The urban design plan shall include a landscape plan to revegetate road reserve areas and reduce visual impacts to residences located to the east. 	Prepare: Roads and Maritime Project Manager Implement: Contractor	Pre-construction Operation
Signage	<ul style="list-style-type: none"> Roads and Maritime will install town entrance signage at both the west and north accesses in consultation with Narrandera Shire Council and the local community 	Consult: Roads and Maritime Project Manager Install: Contractor	Construction
Construction noise impacts on sensitive receivers	<ul style="list-style-type: none"> Revise the noise and vibration assessment based on the final detailed design 	Roads and Maritime Project Manager	Detailed design

Impact	Environmental safeguards	Responsibility	Timing
Construction noise impacts on sensitive receivers	<ul style="list-style-type: none"> • Prepare and implement a Construction Noise and Vibration Management Plan (CNVMP) in line with Practice Note VI of the ENMM (RTA, 2001) and include as a minimum: <ul style="list-style-type: none"> ○ identification of nearby residences and sensitive land uses ○ description of approved hours of work and what work will be carried out ○ description of what work practices will be applied to minimise noise ○ description of the complaints handling process ○ description of monitoring that is required • Update the CNVMP to include the proposed modification. 	Contractor	Construction

Impact	Environmental safeguards	Responsibility	Timing
Construction noise impacts on sensitive receivers	<ul style="list-style-type: none"> • Consult with residential noise sensitive receivers within 1.2 kilometres of the proposal before and during construction. This includes the majority of residential receivers within the town of Grong Grong and those south of the rail line • Implement a 24-hour hotline and complaints management procedure for noise and other construction-related complaints • Turn down radios when not in use and no yelling on site • No slamming doors • Prohibit air brakes use and enforce speed limit • Drive all plant in a conservative manner (no over-revving) • Obtain site access via entry points most remote to noise sensitive receivers where possible • Do not permit plant to 'warm-up' before the nominated working hours • Where possible, machinery will direct noise away from the closest noise sensitive receivers • Carry out regular machinery maintenance to minimise noise emissions. Maintenance would be completed away from noise sensitive receivers where possible • Select the quietest suitable machinery reasonably available for each work activity • Maximise the offset distance between noisy items of plant/machinery and nearby noise sensitive receivers where possible • Where practicable, ensure the coincidence of noisy plant/machinery working simultaneously near noise sensitive receivers is avoided. 	Contractor	Construction

Impact	Environmental safeguards	Responsibility	Timing
Construction vibration impacts on sensitive receivers	<ul style="list-style-type: none"> Where construction activities involving impulsive vibration from excavator buckets or intermittent vibration from tracked equipment (eg excavators, dozers) are carried out close to sensitive receivers, there will be an offset distance of at least five metres from buildings to comply with structural vibration criteria 	Contractor	Construction
Soil and water quality – erosion and sedimentation	<ul style="list-style-type: none"> Prepare and implement a Soil and Water Management Plan (SWMP) and site specific erosion and sediment control plans (ESCPs) as part of the CEMP Prepare and implement SWMP and ESCPs in line with Managing Urban Stormwater - Soils and Construction, Volume 2D (Landcom 2004) Update the project SWMP to include the proposed modification Implement temporary erosion and sediment controls until drainage treatments are complete Design adopted erosion and sediment control measures to achieve short and long term stability of embankments and cuttings and other disturbed areas Maintain erosion and sediment controls regularly during construction and until the works are complete and disturbed areas are revegetated Progressively stabilise disturbed areas during the works Maintain established stockpile sites during construction in line with the <i>Stockpile Site Management Procedures</i> (RTA, 2011a). 	Contractor	Pre-construction Construction

Impact	Environmental safeguards	Responsibility	Timing
Soil and water quality	<ul style="list-style-type: none"> • Refuel plant and equipment in impervious bunded areas away from waterway and drainage lines • Emergency spill kits to manage accidental dry and wet chemical spills will be available at the compound area. All personnel shall be made aware of their availability and trained in their use • Vehicle wash down is to occur in a designated bunded area • Appropriately train all staff in minimising and managing accidental spills • Roads and Maritime's Environmental Incident Classification and Management Procedure will be followed if an accidental spill occurs • Notify the Roads and Maritime Project Manager immediately after learning about a spill. 	Contractor	<p>Pre-construction</p> <p>Construction</p>
Potential contamination of any lands, including adjoining lands	<ul style="list-style-type: none"> • Carry out a Phase 2 detailed site investigation if construction of the proposal contaminates any land or it is uncertain whether construction of the proposal has contaminated any land. The Phase 2 detailed site inspection is to confirm the status of the affected land and to inform any subsequent action required. In the case of adjoining lands, it is to be carried out in consultation with the land owner. 	Contractor	Construction

Impact	Environmental safeguards	Responsibility	Timing
Water extraction	<ul style="list-style-type: none"> Roads and Maritime would carry out further consultation about potential water extraction at Bundidgerry Creek with NOW prior to the start of construction. A Works Approval licence would be obtained where necessary If water is extracted from Bundidgerry Creek, minimise scour and creek instability at the creek's extraction point by minimising clearing and amount of bank disturbance in line with the <i>Biodiversity Guidelines - Guides 4 and 10</i> (RTA, 2011). Water extraction methods used will aim to minimise aquatic ecology impacts, surrounding land uses and the area's visual amenity. 	Contractor	Pre-construction
Discovery of unexpected items of Aboriginal cultural significance	<ul style="list-style-type: none"> Follow the <i>Standard Management Procedure: Unexpected Archaeological Finds</i> (RMS, 2012) if construction-related disturbance results in the discovery of Aboriginal objects or suspected human remains The site induction for the proposal must include an overview of the procedure for unexpected archaeological finds. 	Roads and Maritime Project Manager Contractor Contractor	Construction
Accidental discovery of items of non-Aboriginal cultural significance	<ul style="list-style-type: none"> Follow the <i>Standard Management Procedure – Unexpected Archaeological Finds</i> (RMS, 2012) if unexpected heritage/archaeological finds are encountered during construction of the proposal The site induction for the proposal must include an overview of the procedure for unexpected archaeological finds. 	Roads and Maritime Project Manager Contractor Contractor	Construction
General air quality impacts	<ul style="list-style-type: none"> Manage construction activities to minimise dust and fuel emissions 	Contractor	Construction

Impact	Environmental safeguards	Responsibility	Timing
Vehicle and other equipment emissions	<ul style="list-style-type: none"> • Plant and machinery will be maintained in line with manufacturer's specification • Vehicles will not be left running when idle • Vehicles transporting waste or other materials that may produce dust are to be covered during transportation. 	Contractor	Construction
Dust	<ul style="list-style-type: none"> • Measures including watering or covering exposed areas will be used to minimise or prevent air pollution with dust from disturbed areas, if required, and especially during hot and windy conditions • Visual surveillance for visible dust generation will occur at all times. Works must stop when high levels of air-borne dust cannot be controlled • Clearing of natural vegetation will be minimised where practicable • Vegetation or other materials are not to be burnt on site • Disturbed areas will be stabilised progressively during the works • Stockpiles or areas that may generate dust are to be managed to suppress dust emissions in line with the <i>Stockpile Site Management Guideline</i> (Roads and Maritime, 2011b). 	Contractor	Construction

Impact	Environmental safeguards	Responsibility	Timing
Management of waste	<ul style="list-style-type: none"> • Manage and dispose of waste in line with applicable legislation and government policies, including: <ul style="list-style-type: none"> ○ <i>Waste Avoidance and Resource Recovery Act 2001</i> (WARR Act) ○ <i>Waste Avoidance and Resource Recovery Strategy 2007</i> (DECC, 2007) ○ <i>Waste Reduction and Purchasing Policy</i> (WRAPP) (RTA, 2010b) ○ complying with relevant EPA resource recovery exemptions. • Use recycled products in construction where the use of such material is cost and performance competitive, (eg where quality control specifications allow), to reduce the demand on resources. 	Contractor	Pre-construction Construction
Reduction of carbon emissions	<ul style="list-style-type: none"> • Assess plant and equipment for energy efficiency. Where reasonable and feasible, plant and equipment with higher energy efficiency rating will be selected • To reduce transport fuel emissions, locally produced and sourced goods and services will be used where feasible and reasonable • Seek opportunities to reduce the quantity of construction materials used through innovative design and construction methodologies • Plan earthworks to minimise long haulage distances and reduce excess spoil • Maximise re-use of excavated road materials as far as possible where they are cost, quality and performance competitive. 	Contractor Contractor Design: Roads and Maritime Construction: Contractor Contractor Contractor	Construction

6.8 Licensing and approvals

The proposed modification would be covered by the project Environmental Protection Licence (No. 20719) and Water extraction – works approval permit held by Georgiou. Consultation with the EPA is advised to determine if the proposed borrow pit location needs to be added to the scheduled premises map.

7 Conclusion

7.1 Justification

There is a need to carry out the proposed modification in order to improve safety and freight efficiency. While there are some associated environmental impacts, these are not likely to be significant and can be readily managed with standard mitigation measures.

7.2 Objects of the EP&A Act

Object	Comment
5(a)(i) To encourage the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages, for the purpose of promoting the social and economic welfare of the community and a better environment	The proposed modification would improve road safety and reduce conflicts between road traffic and large agricultural machinery, which would have a positive social impact. The proposed modification is consistent with this objective
5(a)(ii) To encourage the promotion and co-ordination of the orderly economic use and development of land	Not relevant to the proposed modification
5(a)(iii) To encourage the protection, provision and co-ordination of communication and utility services	Design of the proposed modification involved minimising impact on utilities. The powerline would be constructed to meet industry standards, including column bases with engineering certification. The proposed modification is consistent with this objective
5(a)(iv) To encourage the provision of land for public purposes	Not relevant to the proposed modification
5(a)(v) To encourage the provision and co-ordination of community services and facilities	Not relevant to the proposed modification
5(a)(vi) To encourage the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats	The proposed modification would require some additional vegetation clearing, including 0.329 hectares of Inland Grey Box Woodland EEC. Impacts would be minor and were assessed as unlikely to significantly impact threatened species and communities. The proposed modification is consistent with this objective
5(a)(vii) To encourage ecologically sustainable development	Ecologically sustainable development is considered in sections 7.2.1 to 7.2.4 below. The proposed modification is consistent with this objective
5(a)(viii) To encourage the provision and maintenance of affordable housing	Not relevant to the proposed modification

Object	Comment
5(b) To promote the sharing of the responsibility for environmental planning between different levels of government in the State	Not relevant to the proposed modification
5(c) To provide increased opportunity for public involvement and participation in environmental planning and assessment	This addendum REF would be publicly available on the Roads and Maritime website. There have been several opportunities for community involvement throughout the project, and the affected landholder was consulted for the proposed modification. The proposed modification is consistent with this objective.

7.2.1 The precautionary principle

The proposed modification has been assessed with the purpose of reducing risk of serious and permanent impacts on the environment. Assessments included field surveys by experts, desktop assessments and specialist reports.

7.2.2 Intergenerational equity

The proposed modification would have a positive impact on road safety and would not adversely impact the environment (compromise the health, diversity or productivity of the environment) to unsustainable levels on present and future generations.

7.2.3 Conservation of biological diversity and ecological integrity

The proposed modification would require an extra 0.329 hectares of native vegetation, which includes Inland Grey Box Woodland EEC, to be cleared for powerline construction. The proposed modification would not significantly fragment or isolate any existing large patches and would not compromise biological diversity or ecological integrity. No significant impacts to flora and fauna species were identified. Safeguards were developed for the project REF that would help protect fauna and flora at the site that could potentially be impacted by the proposal.

7.2.4 Improved valuation, pricing and incentive mechanisms

Improved valuation, pricing and incentive mechanisms provide that costs to the environment should be factored into the economic costs of a proposal. The addendum REF has examined the environmental consequences of the proposed modification and identified mitigation measures for areas which have the potential to be adversely impacted. These mitigation measures have been incorporated into the proposal's capital and operating costs budget. During the addendum REF preparation, improvements have occurred, minimising impacts and therefore costs to the environment, community and project.

The proposed modification's overall safety improvements outweigh any adverse impacts that cannot be satisfactorily mitigated. The proposal provides value in that it would improve road safety.

7.3 Conclusion

This addendum REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration, where relevant, of conservation agreements and plans of management under the NPW Act, joint management and biobanking agreements under the TSC Act, wilderness areas, critical habitat, impacts on threatened species, populations and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the Federal EPBC Act.

A number of potential environmental impacts from the proposed modification have been avoided or reduced during the design development and options assessment. The proposed modification as described in the addendum REF best meets the project objectives, but would still result in some impacts on native vegetation, including an Endangered Ecological Community. The safeguards and management measures detailed in the project REF would improve or minimise these expected impacts. The proposed modification would also improve road safety and freight efficiency. On balance, the proposed modification is considered justified and the following conclusions are made.

Significance of impact under NSW legislation

The proposed modification would not result in a change to the findings of the project REF and would be unlikely to cause a significant impact on the environment. It is therefore not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Part 5.1 of the EP&A Act. A Species Impact Statement is not required. The proposed modification is subject to assessment under Part 5 of the EP&A Act. Consent from Council is not required.

Significance of impact under Australian legislation

The proposed modification would not likely cause a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999*. A referral to the Australian Department of the Environment is not required.


8 Certification

This addendum review of environmental factors provides a true and fair review of the proposed modification in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed modification.



Bryson Lashbrook
Environmental Consultant
NGH Environmental
04/04/2017

I have examined this addendum review of environmental factors and accept it on behalf of Roads and Maritime Services.



Rick Koschel
Project/Contract Manager
Regional Project Office
Roads and Maritime Services
05/04/2017

9 References

NGH Environmental (2015). *Realignment of the Newell Highway at Grong Grong. Review of Environmental Factors*. For Roads and Maritime Services.

NGH Environmental (2016). *Updated Biodiversity Assessment for the Newell Highway Realignment at Grong Grong*. For Roads and Maritime Services.

Roads and Maritime Services (2015). *Realignment of the Newell Highway at Grong Grong. Submissions Report*.

10 Terms and acronyms used in this addendum REF

Term / Acronym	Description
CEMP	Construction / Contractor's environmental management plan
Clearing	The removal of vegetation or other obstacles at or above ground level
Culvert	A stream or drain
Earthworks	All operations involved in loosening, excavating, placing, shaping, and compacting soil or rock
EEC	Endangered Ecological Community
EIA	Environmental impact assessment
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EPA	NSW Environment Protection Authority (formerly part of DECCW, now part of OEH)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process
EPL	Environment Protection Licence
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased
FM Act	<i>Fisheries Management Act 1994</i> (NSW)
Habitat	The place where a species, population, or ecological community lives (whether permanently, periodically, or occasionally). Habitats are measurable and can be described by their flora and physical components.
Heritage Act	<i>Heritage Act 1977</i> (NSW)
Impact	Influence or effect exerted by a project or other activity on the natural, built, and community environment
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
LGA	Local Government Area
NES	Matters of National Environmental Significance under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>

Term / Acronym	Description
NOW	New South Wales Office of Water
Noxious Weeds Act	<i>Noxious Weeds Act 1993 (NSW)</i>
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>
NSW	New South Wales
Proponent	The person or organisation that proposes carrying out the project or activity
POEO Act	<i>NSW Protection of the Environment Operations Act 1997</i>
REF	Review of Environmental Factors
Roads and Maritime / RMS	Roads and Maritime Services
RTA	NSW Roads and Traffic Authority, known as Roads and Maritime Services since November 2013
Sediment	Material, both mineral and organic, that is being or has been moved from its site of origin by the action of wind, water, or gravity and comes to rest either above or below water level
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act
Stockpile	Temporarily stored materials such as soil, sand, gravel, and spoil/waste
TSC Act	<i>Threatened Species Conservation Act 1995 (NSW)</i>
WM Act	<i>NSW Water Management Act 2000</i>

Appendix A

Drawings

Lat: 33 44' 13"S
Long: 146 46' 36"E

SAFETY WARNING
Potentially hazardous (i.e. significant) pole top load changes may occur during the construction of this project. Consideration must be given to the supporting of poles prior to work being carried out aloft.

LEGEND

- HV OH Cable
- LV UG Cable
- LV Cable Streetlight 2C 25sqmm CU
- Location No.
- NP 399675 Connection Pillar
- NP 400084 Service Pit
- CE 69563 SUB 82418 Polemount Transformer
- NP 380518 Wood Pole
- PP9580 Private Pole
- Ground Stay assembly
- NP 400267 Streetlight
- SECTION 1 Conduit/ Cable trench layout
- F10695 HV Fuse

NOTES

1. The electrical works shall be carried out by a contractor with Level 1 Service Provider Accreditation from the NSW Department of Trade and Investment - Resources and Energy.
2. The electrical works shall comply with Essential Energy Construction Standards & AS/NZS 3000:2007 Amdt 1.
3. Before commencing any construction work, the contractor shall obtain all necessary clearances and locations of existing services from relevant authorities. The Contractor must verify the location of all underground assets on site with "Dial Before You Dig" and must have a copy of "Dial Before You Dig" plans, no more than 30 days old, on site for reference. The Contractor shall obtain details and locations of Council's underground assets such as but not limited to:-
 - Below Ground water mains;
 - Sewer mains;
 - Storm water pipes.
- Information regarding Narrandera Shire Council underground assets shall be obtained from Narrandera Shire Council prior to the commencement of work on site. GHD takes no responsibility for any damage to assets caused by the Contractor during the course of the works.
4. The Developer shall provide all HV and LV fuses as required.
5. When placing network assets minimum clear spaces shall be provided around network assets including pole substations in accordance with the clearances required. Road crossings shall be as near as possible at right angles to the centreline of the road and have a minimum depth of 1.0m below the invert of table drains, 1.2m below the road surface and 750mm elsewhere in the road reserve.
6. Ensure the new installation operates in the manner intended to the complete satisfaction of the Superintendent.
7. The Contractor is to check all dimensions on site to ensure accuracy and notify the Designer of any discrepancies before commencing work.
8. All existing Supply Authorities assets are deemed to be in good condition. If found otherwise contact the Supply Authority Inspector.
9. Certified Designs shall remain valid for a period of 6 months from the date of certification.
10. No outage is permitted, all construction works are to be completed in readiness for the connection. Connection to the existing main line will be via PG Clamps or Ampact connections. The cost of any Live Line work shall be borne by the customer.
11. The existing conductors are described as:-
 - 7/4.50 AAAC 11kV
 - 19/3.75 AAAC 11kV
- Existing HV and LV conductors to be confirmed by the Level 1 ASP.
12. When installing spare conduits to be used in subsequent stages, to enable the buried ends of the conduits to be located electric marker tape will be extended from the end of the conduit to 300mm above ground level prior to backfilling.
13. All conduits shall be capped and sealed to prevent debris ingress.
14. Underground electrical work is to be inspected by Essential Energy Quality Compliance CoOrdinators when trenches are open with conduits installed prior to backfilling and on completion of works. The Developer is responsible to ensure that trench depths comply with mandatory separations between electricity, gas, Telstra and other underground services as per Essential Energy Underground Construction Standards and or Essential Energy Shared Trench Agreement.

PROJECT NOTES

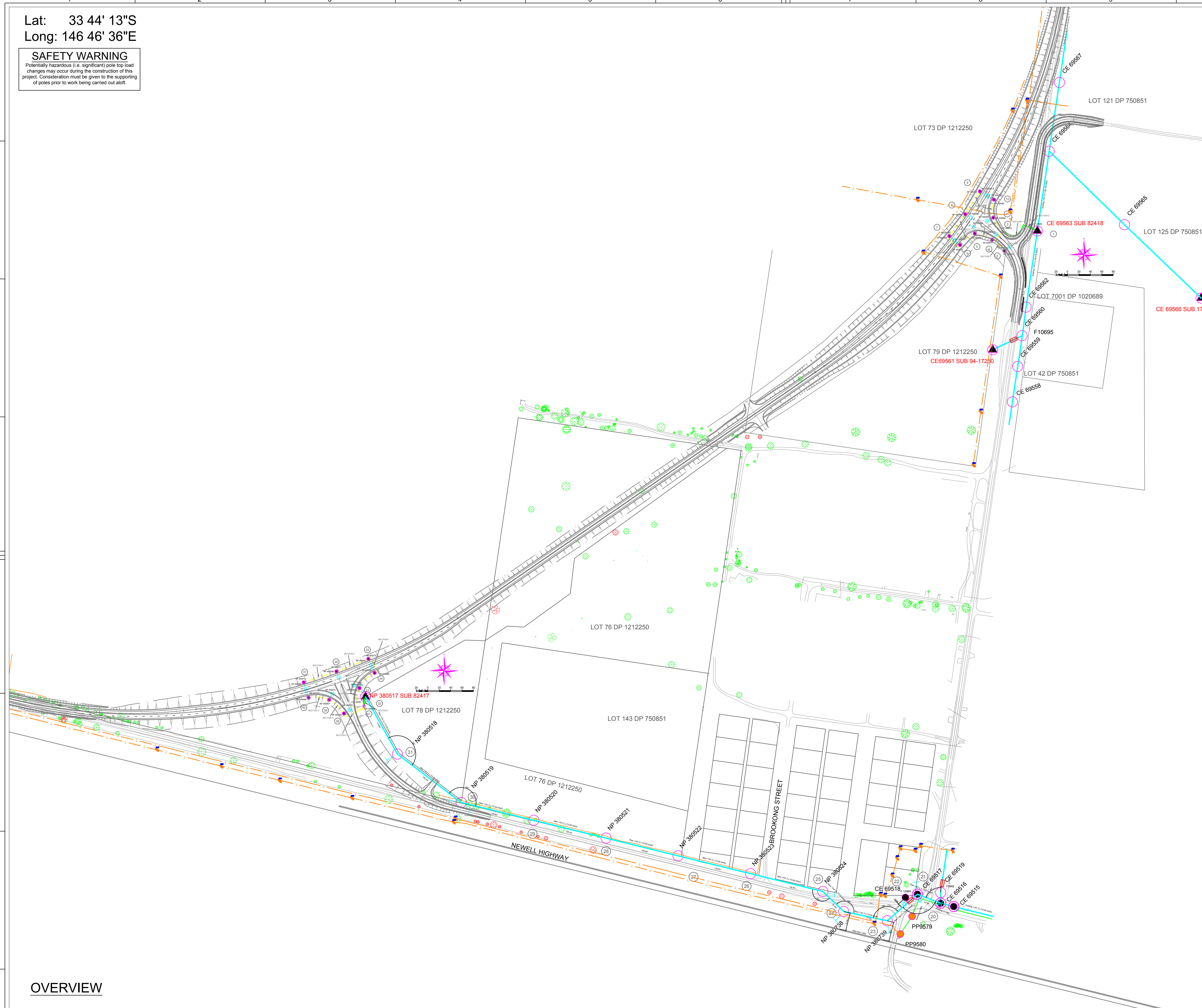
1. Design alterations must first be approved in writing by Essential Energy's delegated person.
2. Upon completion of the construction an "As Constructed" plan should be returned to Essential Energy in an acceptable electronic format and clearly marked "As Constructed".
3. Developer to carry out all Civil works - including Traffic Control, underboring, excavation, reinstatement & sediment control work & the supply & installation of bedding sand. All works are to be to the satisfaction of the Local Council.
4. New Polemount Substation 16kVA SUB 82417 and 82418 requires:-
 - HV Fuses - 5 Amp K Type
 - LV Fuse - 80 Amp
- The primary tap setting for this transformer is 11000 Volts
5. New HV OH fuse elements will be rated at 20 Amps
6. All pole and stay footings have been calculated on medium soil bearing capacity (300kPa/m) unless otherwise stated. The contractor is to notify the designer immediately if it is found the soil bearing capacity is less than 300 kPa/m or otherwise stated.
7. An Environmental Impact Assessment (EIA) document set has been completed for this project. Summary control measures have been placed on this design, however the Level 1 ASP should make themselves familiar with the EIA Part 1 and 2 prior to commencing work.

CONSTRUCTION NOTES

1. All construction work shall comply with Essential Energy design and construction manuals. All individual component assemblies quoted relate to Essential Energy drawings.
2. The contractor is to check all dimensions and quantities before commencing work and notify the designer of any discrepancies before starting work.
3. The contractor shall locate all underground services prior to commencement of work. Contact Dial Before You Dig.
4. All existing Essential Energy assets are deemed to be in good working order and condition. If existing Essential Energy assets are found not in good working order or condition contact the Essential Energy inspector.
5. The Developer shall obtain easements in favour of Essential Energy over underground cables, conduits, pillars, pits, substations etc as per Essential Energy document CE 8046.

WORKING WITHIN COUNCIL ROAD RESERVES

1. All works are to be to the satisfaction of the Local Council. If the proposed works are to incur any disruptions to traffic movements, the Level 1 ASP shall provide Council with a Traffic Control Plan for approval, prior to the commencement of the works.
2. Narrandera Shire Council is to be advised upon completion of the works. All reinstatement works are to be completed within 28 days of completion of the work. If reinstatement is not carried out within this time period, Council will perform the reinstatement and invoice the Level 1 contractor for the cost of the works. The Level 1 contractor shall reinstate, or arrange for the reinstatement of all surfaces disturbed by its operations to a condition equal to that existing before the works. If Council requests, or is requested to carry out the surface reinstatement, this should be arranged and completed as soon as practicable.
3. Excavations in areas of the road reserve, outside the carriageways, are to be reinstated with materials or vegetation consistent with the existing surface.
4. The Level 1 ASP shall take out or extend a Public Risk Insurance Policy, with a cross clause to cover RMS and Narrandera Shire Council, for public liability in an amount of not less \$20,000,000 or such other amount as RMS shall nominate to the applicant from time to time.
- The Level 1 ASP shall provide copies of all relevant insurances to Council prior to the commencement of works.



OVERVIEW

AMENDMENTS	PRELIMINARY ISSUE	ORIGINAL ISSUE	<p>NOTE</p> <p>1. THE INTENDED PURPOSE OF THIS PLAN IS THAT OF A CONSTRUCTION DRAWING DEPICTING ELECTRICAL RETICULATION REQUIREMENTS. THIS PLAN IS NOT TO BE USED BY ANY OTHER PERSON OR CORPORATION. ESSENTIAL ENERGY ACCEPTS NO RESPONSIBILITY FOR ANY LOSS OR DAMAGE SUFFERED HOWSOEVER ARISING TO ANY PERSON OR CORPORATION WHO MAY USE OR RELY ON THIS PLAN IN CONTRAVENTION OF CORPORATION ESSENTIAL ENERGY ACCEPTS NO RESPONSIBILITY FOR ANY OF THIS CLAUSE OR CLAUSES 2 AND 3 THEREOF.</p> <p>2. DIMENSIONS, AREAS AND NUMBERS OF LOTS SHOWN ON THESE PLANS ARE APPROXIMATE ONLY AND MAY VARY. THE ELECTRICAL DESIGN SHOWN MAY BE SUBJECT TO VARIATION DEPENDING ON SITE CONDITIONS ENCOUNTERED DURING INSTALLATION WORKS.</p> <p>3. THIS PLAN MAY NOT BE REPRODUCED UNLESS THIS NOTE IS INCLUDED.</p>	<p>CERTIFIED BY ESSENTIAL ENERGY</p> <p>Certification No. _____</p> <p>Date Certified _____</p> <p>Certified _____</p> <p>This certification is subject to ESSENTIAL ENERGY'S Standard Cert Terms</p>	<p>Level 7, 16 Marcus Clarke Street Canberra ACT 2601 Australia GPO Box 1877 Canberra ACT 2601 T 61 2 6113 3200 F 61 2 6113 3299 E cbmail@ghd.com W www.ghd.com Accreditation No. 2085</p>	<p>NEWELL HIGHWAY BYPASS</p> <p>GRONG GRONG 2652</p>	<table border="1"> <tr> <td>PROJECT COST No.</td> <td></td> <td rowspan="2"> </td> <td rowspan="2"> <p>111303CPAN</p> </td> <td rowspan="2"> <p>A1</p> </td> </tr> <tr> <td>SCALE</td> <td>As Shown</td> </tr> <tr> <td>DRAWN BY</td> <td>NR</td> <td colspan="2">DESIGN FILE NAME</td> <td>ORIGINAL SIZE</td> </tr> <tr> <td>DATE ISSUED</td> <td>Mar 2016</td> <td colspan="2">SHEET 1 OF 7</td> <td>REVISION ISSUE</td> </tr> <tr> <td>CHECKED BY</td> <td>DU</td> <td colspan="2">PLOT DATE</td> <td>03/02/2017</td> </tr> <tr> <td>FEEDER No.</td> <td>NDA 382 Mt St 11kV</td> <td>FSC AREA</td> <td>Cooluman</td> <td></td> </tr> <tr> <td>SCHEM REF</td> <td>Narrandera</td> <td></td> <td></td> <td></td> </tr> <tr> <td>MAINTENANCE AREA</td> <td>Cooluman</td> <td></td> <td></td> <td></td> </tr> </table>	PROJECT COST No.			<p>111303CPAN</p>	<p>A1</p>	SCALE	As Shown	DRAWN BY	NR	DESIGN FILE NAME		ORIGINAL SIZE	DATE ISSUED	Mar 2016	SHEET 1 OF 7		REVISION ISSUE	CHECKED BY	DU	PLOT DATE		03/02/2017	FEEDER No.	NDA 382 Mt St 11kV	FSC AREA	Cooluman		SCHEM REF	Narrandera				MAINTENANCE AREA	Cooluman			
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Lat: 33 44' 13"S
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SAFETY WARNING
Potentially hazardous (i.e. significant) pole top load changes may occur during the construction of this project. Consideration must be given to the supporting of poles prior to work being carried out.

WORKING WITH TRANSFORMERS
When transporting Transformers, care shall be taken to ensure transformers are kept in an upright position. When unpacking and installing Transformers, care shall be taken to ensure transformers are kept in an upright position. Spill Kits shall be located adjacent to any equipment containing oil when the equipment is being moved or installed. The Team Leader shall be notified of any transformer oil spills. Oil spills shall be controlled and managed as per CECM1000.90.

DBYD LEGEND
DBYD Job 57950468,
57950504, 57950506



EROSION AND SEDIMENTATION
Erosion and sedimentation control measures are required to be installed and operational. It is the responsibility of the Level 1 contractor to ensure that any excavation has adequate steps taken to ensure that erosion is minimised and sediment run off is controlled as per CEPC 2022. Adequate numbers of spill kits shall be conveniently located on site and workers shall be trained in the use of spill kits.

EXCAVATION
When backfilling trenches, the L1 ASP or their nominated contractor may only use non contaminated Virgin Excavated Natural Material (VENM) as backfill. Notwithstanding conduits and cables shall be bedded on a layer of clean, washed river sand, free of any sharp objects, slag, organic or other harmful substances as per CEOM7098 Clause 4.26.

SOIL WASTE
Prior to any soil waste being transported or removed from site, the treated soil shall be tested and validated by an environmental consultant to confirm adequacy of soil treatment. Test reports and waste dockets are to be provided to Essential Energy for any soil waste transported or removed from site.

Shorting and Capping of Underground Cables
Following issues when handling and installing underground cables, a review of current instructions and practices is required.

ISSUES
Underground cables have been transported, stored and left in trenches when they were not adequately sealed.
Underground cables have been energised while one end of the cable remained un-terminated.

IMPLICATIONS & RISK
Issue 1: - Ingress of moisture and contaminants into underground cables reducing the reliability and lifespan of the cable and /or accessories it is connected to.
Issue 2: - Exposure to live un-terminated cable ends. Affected persons could be the general public, internal and external Accredited Service Providers (ASPs), and operating staff. In addition to the risk of shock, energising an un-terminated ends will also cause a flashover/arc that will damage the end of the cable and could initiate a fire.

SOLUTION
Please refer to pages one and two of CEOM7204.16 for the approved procedure for shorting and capping.

ACTION
Shorting and Capping shall occur on any underground cable end that has been installed and not immediately terminated.
Manufacturers capped end shall not be considered as shorted unless identification tail can be seen exiting from the cap.
Viable lengths of left over cable on a drum shall also be short circuited and capped immediately after being cut and before being stored.
All cables that have been disconnected and made redundant shall be short circuited and capped if left in the ground.

NOTE: Essential Energy may deem a cable to be "damaged" and refuse the commissioning of the circuit if there is clear evidence of failure to complete the above noted actions.

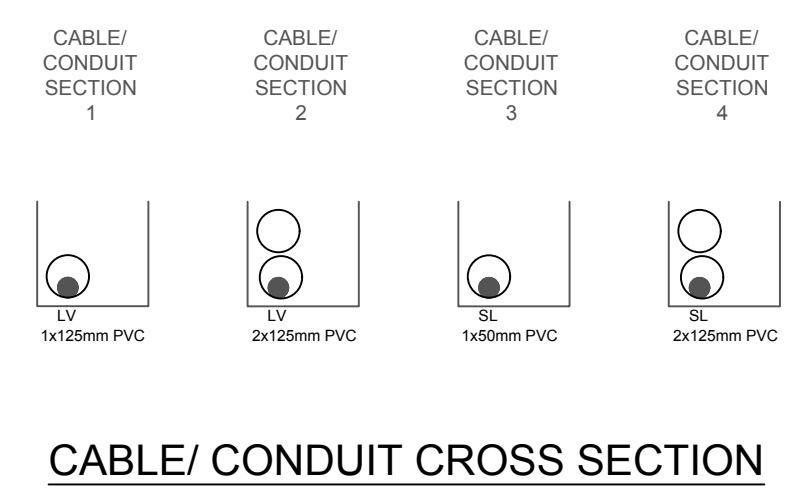


CABLE DESTINATION LABELS
Underground cable destination labels are to be made up & installed by Construction Staff in accordance with Essential Energy Operational Procedure - Networks: Asset Identification and Operational Labels CEOP 8042.

TRAFFIC MANAGEMENT
Temporary Traffic Management Plans and certified Traffic Controllers will be supplied by the Level 1 contractor as required. Narrandera Shire Council will require a copy of the Traffic Control Plan for approval prior to the commencement of the works.
Traffic Control must be in accordance with "RMS Traffic Control at Worksites Manual" available via the RMS web page
www.rms.nsw.gov.au/business-industry/partners-suppliers/documents/technical-manuals/tcwev412.pdf and the Traffic Control organisation must be registered under RMS Registration Scheme Category G for "Traffic Control".
Traffic and pedestrian movement control plans shall consider that emergency vehicles may approach and through pass the project area.

LEGEND

- HV OH Cable
- LV UG Cable
- LV Cable Streetlight 2C 25sqmm CU
- Location No.
- NP 399675 Connection Pillar
- NP 400084 Service Pit
- CE 69563 SUB 82418 Polemount Transformer
- NP 380518 Wood Pole
- PP9580 Private Pole
- Ground Stay assembly
- NP 400267 Streetlight
- Conduit/ Cable trench layout
- F10695 HV Fuse



BUSHFIRE SEASON 2016-2017
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To comply with legislation and to minimise the risk of a bushfire, Contractors must ensure they know and understand their responsibilities including restrictions on types of equipment that may be used on days of Total Fire Ban (TFB).
Carry the prescribed fire safety equipment when in the field and ensure everyone knows how to use the equipment:
• A knapsack spray pump of 16 litres minimum capacity filled with water, or
• A fire extinguisher (liquid type) of nine (9) litre minimum capacity, or
• A dry powder type extinguisher of 0.9kg minimum capacity.
When working in the field on TFB days, check regularly for Bushfire Alert messages and if required, act promptly to leave the area safely.
Report visibly high fuel loads and other potential ignition sources located around network assets and infrastructure.
Take extreme caution when managing burnt timber power poles - especially treated poles;
Take appropriate precautions when driving in highly vegetated areas and avoid driving through long grass during total fire ban restrictions.
• Conduct regular visual inspections of the undercarriage of your vehicle and ensure it is regularly cleaned out
• Monitor the temperature gauge in your vehicle -an increase could provide early indication of a problem.

RULES WE LIVE BY
If our work cannot be performed safely, we will always STOP until it can be done without harm.
Prior to undertaking any work relating to a Network Fatal Risk, the worker must apply these fundamental requirements which underpin and form part of the Rules We Live By:
• Work will not be conducted without a HIRAC and a safety discussion to plan to the risks
• Use PPE to meet site requirements and as instructed in the HIRAC
• Be fit for work
• Carry out your pre-start checks. Damaged or defective equipment and tools must be removed from service
• Hold the appropriate licence, authorisation or training for the work
• Speak up - take responsibility for your own safety and the safety of others
• Report all hazards, incidents, injuries and near misses
• Put rescue and recovery plans in place before work starts

NO UNSAFE ACTS

VEGETATION CLEARING
All tree clearing along the route of the new powerline, within the Council controlled Road Reserve, shall comply with 'CEPG2010 Vegetation Clearing for New Powerlines'.
It is the responsibility of the Developer to obtain the necessary approvals required for vegetation clearing and to perform the vegetation clearing.
It is the responsibility of the level 1 ASP to ensure that vegetation clearing is carried out to standard.
Clearing should not commence until the consent of all affected landholders and Government bodies has been obtained by the Developer.

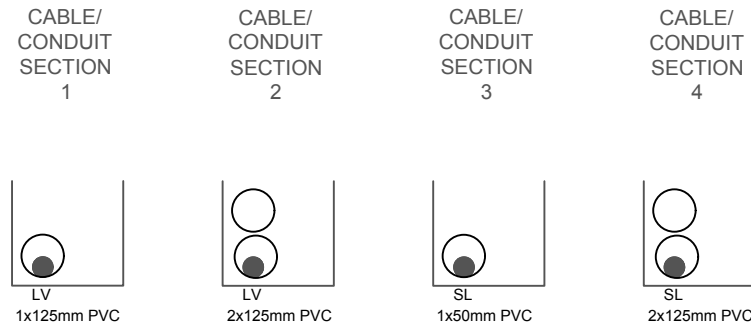
SOUTH CONSTRUCTION PAGE 1

AMENDMENTS	PRELIMINARY	ORIGINAL	ISSUE	1	2	3	4	5	6	7	8	9	10	11	12						
	P															A					
<p>NOTE 1. THE INTENDED PURPOSE OF THIS PLAN IS THAT OF A CONSTRUCTION DRAWING DEFINING ELECTRICAL RETICULATION REQUIREMENTS. THIS PLAN IS NOT TO BE USED BY ANY OTHER PERSON OR CORPORATION. ESSENTIAL ENERGY ACCEPTS NO RESPONSIBILITY FOR ANY LOSS OR DAMAGE SUFFERED HOWSOEVER ARISING TO ANY PERSON OR CORPORATION WHO MAY USE OR RELY ON THIS PLAN IN CONTRAVENTION OR CORPORATION. ESSENTIAL ENERGY ACCEPTS NO RESPONSIBILITY FOR ANY OF THIS CLAUSE OR CLAUSES 2 AND 3 THEREOF. 2. DIMENSIONS, AREAS AND NUMBERS OF LOTS SHOWN ON THESE PLANS ARE APPROXIMATE ONLY AND MAY VARY. THE ELECTRICAL DESIGN SHOWN MAY BE SUBJECT TO VARIATION DEPENDING ON SITE CONDITIONS ENCOUNTERED DURING INSTALLATION WORKS. 3. THIS PLAN MAY NOT BE REPRODUCED UNLESS THIS NOTE IS INCLUDED.</p>																					
<p>CERTIFIED BY ESSENTIAL ENERGY</p> <p>Certification No. _____ Date Certified _____ Certified _____</p> <p>This certification is subject to ESSENTIAL ENERGY'S Standard Cert Terms</p>										<p>Level 7, 16 Marcus Clarke Street Canberra ACT 2601 Australia GPO Box 1877 Canberra ACT 2601 T 61 2 6113 3200 F 61 2 6113 3299 E cbmail@ghd.com W www.ghd.com Accreditation No. 2085</p>			<p>NEWELL HIGHWAY BYPASS</p> <p>GRONG GRONG 2652</p>			<p>PROJECT COST No. _____ SCALE As Shown DRAWN BY NR DATE ISSUED Mar 2016 CHECKED BY DU FEEDER No. NDA 3B2 May St 11kv SCHEM REF Narrandera MAINTENANCE AREA Coolamon</p>			<p>111303CPLAN A1</p> <p>DESIGN FILE NAME ORIGINAL SIZE SHEET 2 OF 7 REVISION ISSUE A PLOT DATE 03/02/2017</p>		

Lat: 33 44' 13"S
Long: 146 46' 36"E

SAFETY WARNING
Potentially hazardous (i.e. significant) pole top load changes may occur during the construction of this project. Consideration must be given to the supporting of poles prior to work being carried out.

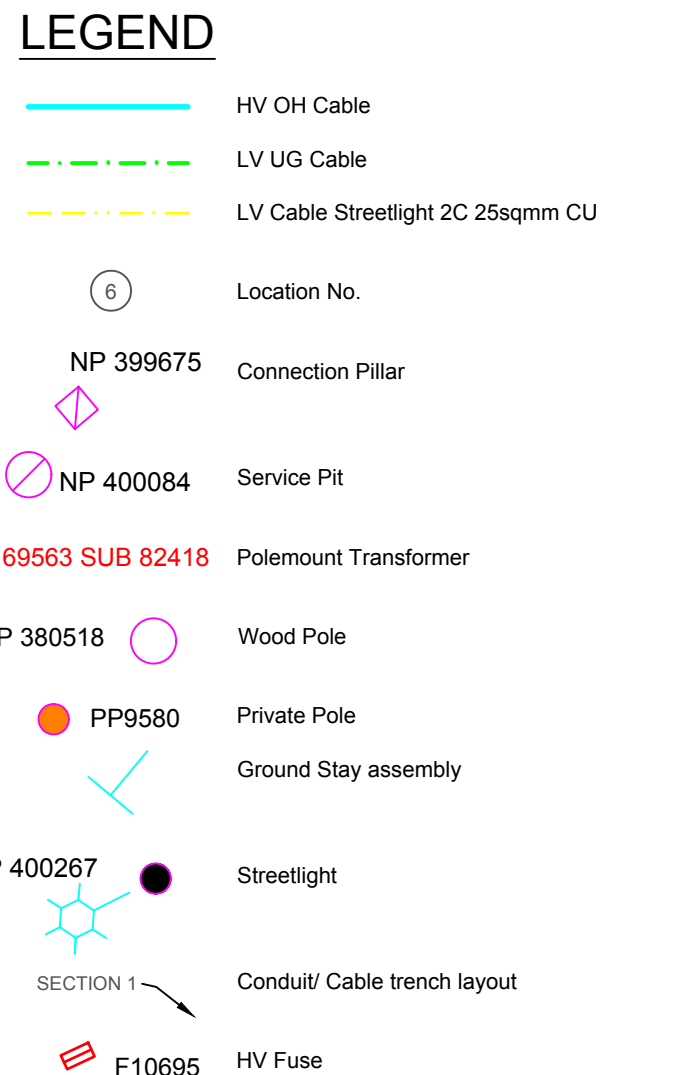
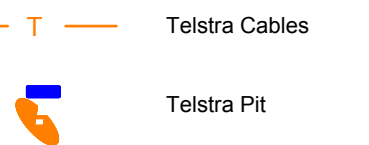
LOT 143 DP 750851



7201.14 Note 3-
Minimum conduit separation both vertically and horizontally shall be 50mm

CABLE/ CONDUIT CROSS SECTION

DBYD LEGEND
DBYD Job 57950468,
57950504, 57950506



SITE REMEDIATION
When redundant equipment has been removed from site, the Level 1 contractor shall reinstate, or arrange for the reinstatement of all surfaces disturbed by the original equipment installation to a condition equal to that existing before the equipment installation. All site remediation shall be to the absolute satisfaction of the Superintendent.

DANGER POINT
High Voltage overhead cables exist in the area of this project. All high voltage electrical apparatus and circuits shall be regarded as LIVE until isolated, proved de-energised, earthed and short circuited either side of the work site and an Essential Energy 'Access Permit' issued. Voltages can be induced on overhead lines due to the close proximity of other high voltage lines, therefore during the stringing, tensioning process and line maintenance the conductors shall be shorted and earthed to protect workers.

TRAFFIC MANAGEMENT
Temporary Traffic Management Plans and certified Traffic Controllers will be supplied by the Level 1 contractor as required. Narrandera Shire Council will require a copy of the Traffic Control Plan for approval prior to the commencement of the works.
Traffic Control must be in accordance with 'RMS Traffic Control at Worksites Manual' available via the RMS web page
www.rms.nsw.gov.au/business-industry/partners-suppliers/documents/technical-manuals/tcws42.pdf and the Traffic Control organisation must be registered under RMS Registration Scheme Category G for 'Traffic Control'.
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- A fire extinguisher (liquid type) of nine (9) litre minimum capacity, or
- A dry powder type extinguisher of 0.9kg minimum capacity.

When working in the field on TFB days, check regularly for Bushfire Alert messages and if required, act promptly to leave the area safely.
Report visibly high fuel loads and other potential ignition sources located around network assets and infrastructure.

- Take extreme caution when managing burnt timber power poles – especially treated poles.
- Take appropriate precautions when driving in highly vegetated areas and avoid driving through long grass during total fire ban restrictions.
- Conduct regular visual inspections of the undercarriage of your vehicle and ensure it is regularly cleaned out.
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- Speak up - take responsibility for your own safety and the safety of others
- Report all hazards, incidents, injuries and near misses
- Put rescue and recovery plans in place before work starts

NO UNSAFE ACTS

EROSION AND SEDIMENTATION
Erosion and sedimentation control measures are required to be installed and operational. It is the responsibility of the Level 1 contractor to ensure that any excavation has adequate steps taken to ensure that erosion is minimised and sediment run off is controlled as per CE/PG 2027. Adequate numbers of spill kits shall be conveniently located on site and workers shall be trained in the use of spill kits.

EXCAVATION
When backfilling trenches, the L1 ASP or their nominated contractor may only use non contaminated Virgin Excavated Natural Material (VENM) as backfill. Notwithstanding conduits and cables shall be bedded on a layer of clean, washed river sand, free of any sharp objects, slag, organic or other harmful substances as per CE/NT/058 Clause 4.26.

SOIL WASTE
Prior to any soil waste being transported or removed from site, the treated soil shall be tested and validated by an environmental consultant to confirm adequacy of soil treatment. Test reports and waste dockets are to be provided to Essential Energy for any soil waste transported or removed from site.

VEGETATION CLEARING

All tree clearing along the route of the new powerline, within the Council controlled Road Reserve, shall comply with 'CE/PG2010 Vegetation Clearing for New Powerlines'.
It is the responsibility of the Developer to obtain the necessary approvals required for vegetation clearing and to perform the vegetation clearing.
It is the responsibility of the level 1 ASP to ensure that vegetation clearing is carried out to standard.
Clearing should not commence until the consent of all affected landholders and Government bodies has been obtained by the Developer.

SOUTH CONSTRUCTION PAGE 2

AMENDMENTS	ISSUE	ORIGINAL
P	PRELIMINARY	A

NOTE
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2. DIMENSIONS, AREAS AND NUMBERS OF LOTS SHOWN ON THESE PLANS ARE APPROXIMATE ONLY AND MAY VARY. THE ELECTRICAL DESIGN SHOWN MAY BE SUBJECT TO VARIATION DEPENDING ON SITE CONDITIONS ENCOUNTERED DURING INSTALLATION WORKS.
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CERTIFIED BY ESSENTIAL ENERGY

Certification No.
Date Certified
Certified
This certification is subject to ESSENTIAL ENERGY'S Standard Cert Terms



Level 7, 16 Marcus Clarke Street
Canberra ACT 2601 Australia
GPO Box 1877 Canberra ACT 2601
T 61 2 6113 3200 F 61 2 6113 3299
E cbrmail@ghd.com W www.ghd.com Accreditation No. 2085

NEWELL HIGHWAY BYPASS
GRONG GRONG 2652

PROJECT COST No.	As Shown
SCALE	NR
DRAWN BY	NR
DATE ISSUED	Mar 2016
CHECKED BY	DU
FEEDER No.	NDA 3B2 May St 11kV
SCHEM REF	Narrandera
MAINTENANCE AREA	Coolamon

essential energy	
111303CPLAN	A1
DESIGN FILE NAME	ORIGINAL SIZE
SHEET 3 OF 7	REVISION ISSUE A
FSC AREA	COOLAMON
PLOT DATE	03/02/2017

Lat: 33 44' 13"S
Long: 146 46' 36"E

SAFETY WARNING
Potentially hazardous (i.e. significant) pole top load changes may occur during the construction of this project. Consideration must be given to the supporting of poles prior to work being carried out.

LOT 73 DP 1212250

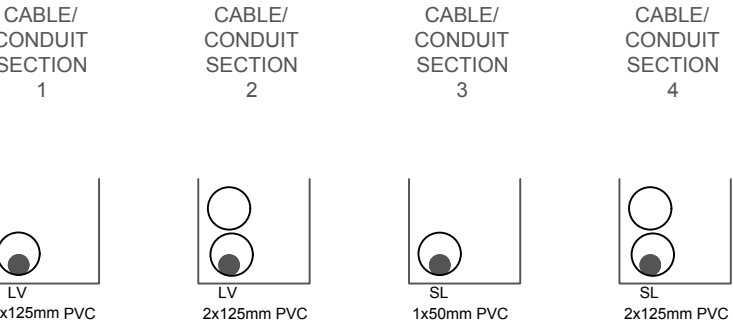
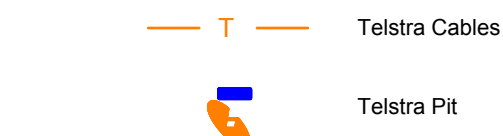
LOT 121 DP 750851

EROSION AND SEDIMENTATION
Erosion and sedimentation control measures are required to be installed and operational. It is the responsibility of the Level 1 contractor to ensure that any excavation has adequate steps taken to ensure that erosion is minimised and sediment run off is controlled as per CE/PG 2027. Adequate numbers of spill kits shall be conveniently located on site and workers shall be trained in the use of spill kits.

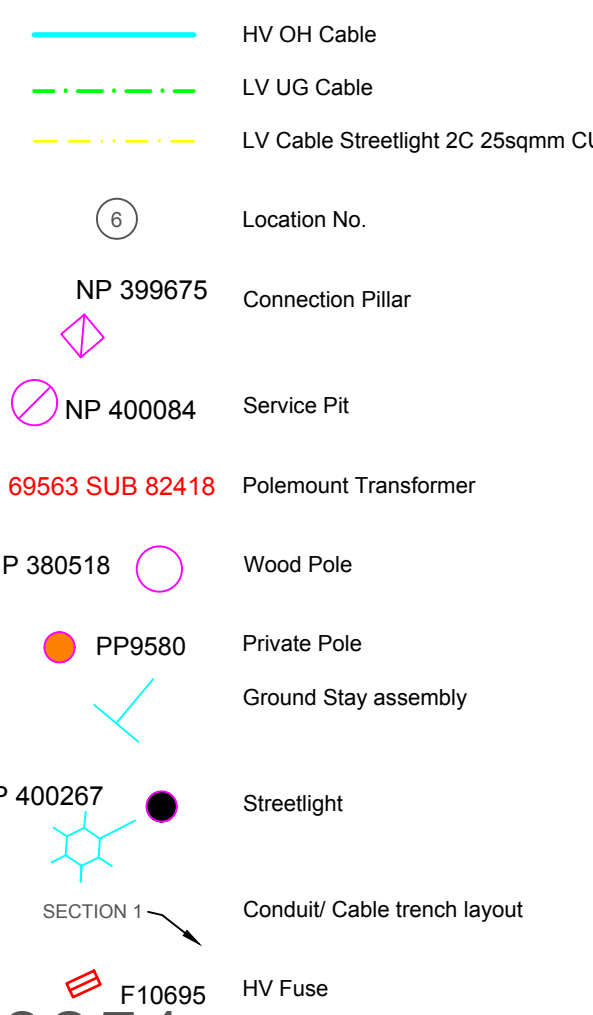
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When backfilling trenches, the L1 ASP or their nominated contractor may only use non contaminated Virgin Excavated Natural Material (VENM) as backfill. Notwithstanding conduits and cables shall be bedded on a layer of clean, washed river sand, free of any sharp objects, slag, organic or other harmful substances as per CEOM7068 Clause 4.26.
SOIL WASTE
Prior to any soil waste being transported or removed from site, the treated soil shall be tested and validated by an environmental consultant to confirm adequacy of soil treatment. Test reports and waste dockets are to be provided to Essential Energy for any soil waste transported or removed from site.

DBYD LEGEND

DBYD Job 57950468,
57950504, 57950506



LEGEND



CABLE/ CONDUIT CROSS SECTION

WORKING WITH TRANSFORMERS
When transporting Transformers, care shall be taken to ensure transformers are kept in an upright position. When unpacking and installing Transformers, care shall be taken to ensure transformers are kept in an upright position. Spill Kits shall be located adjacent to any equipment containing oil when the equipment is being moved or installed. The Team Leader shall be notified of any transformer oil spills. Oil spills shall be controlled and managed as per CECM1000.90.

VEGETATION CLEARING
All tree clearing along the route of the new powerline, within the Council controlled Road Reserve, shall comply with 'CEPG2010 Vegetation Clearing for New Powerlines'. It is the responsibility of the Developer to obtain the necessary approvals for vegetation clearing and to perform the vegetation clearing. It is the responsibility of the level 1 ASP to ensure that vegetation clearing is carried out to standard. Clearing should not commence until the consent of all affected landholders and Government bodies has been obtained by the Developer.

Construction Schedule North			
Location No.	Asset Label	Standard Drawing No.	Assembly No.
1	CE69563		
	SUB 82418	7104.01 7104.20 7104.22 7109.11 7104.24	1 1 7 1
	LVF 34095	7204.13	1
		7204.11	
2	NP 399675	7202.05	6
3	NP 400093	7206.01 7206.02	1
	NP 400076	7201.25 7204.10	
4	NP 400094	7206.01 7206.02	1
	NP 400077	7201.25 7204.10	
5	NP 400095	7206.01 7206.02	1
	NP 400078	7201.25 7204.10	
6	NP 400096	7206.01 7206.02	1
	NP 400079	7201.25 7204.10	
7	NP 400097	7206.01 7206.02	1
	NP 400080	7201.25 7204.10	
8	NP 400098	7206.01 7206.02	1
	NP 400081	7201.25 7204.10	
9	NP 400099	7206.01 7206.02	1
	NP 400082	7201.25 7204.10	
10	NP 400266	7206.01 7206.02	1
	NP 400083	7201.25 7204.10	
11	NP 400267	7206.01 7206.02	1
	NP 400084	7201.25 7204.10	

Shorting and Capping of Underground Cables
Following issues when handling and installing underground cables, a review of current instructions and practices is required.

ISSUES
Underground cables have been transported, stored and left in trenches when they were not adequately sealed. Underground cables have been energised while one end of the cable remained un-terminated.

IMPLICATIONS & RISK
Issue 1: - Ingress of moisture and contaminants into underground cables reducing the reliability and lifespan of the cable and /or accessories it is connected to.
Issue 2: - Exposure to live un-terminated cable ends. Affected persons could be the general public, internal and external Accredited Service Providers (ASPs), and operating staff. In addition to the risk of shock, energising an un-terminated end will also cause a flashover that will damage the end of the cable and could initiate a fire.

SOLUTION
Please refer to pages one and two of CEOM7204.16 for the approved procedure for shorting and capping.
ACTION
Shorting and Capping shall occur on any underground cable end that has been installed and not immediately terminated. Manufacturers capped end shall not be considered as shorted unless identification tail can be seen exiting from the cap. Viable lengths of live over cable on a drum shall also be short circuited and capped immediately after being cut and before being stored. All cables that have been disconnected and made redundant shall be short circuited and capped if left in the ground.
NOTE: Essential Energy may deem a cable to be 'damaged' and refuse the commissioning of the circuit if there is clear evidence of failure to complete the above noted actions

LOT 79 DP 1212250

CE69561 SUB 94-17250

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NORTH CONSTRUCTION

LOT 7001 DP 1020689

CE 69562
CE 69560
CE 69559

LOT 42 DP 750851

CE 69558

LOT 125 DP 750851

CE 69566 SUB 17201

DANGER POINT
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Underground Cable & Conduit Schedule North			
From Location No.	To Location No.	Cable & Conduit Details	Route Length (m)
1	2	Provide LV 4C 240sqmm AL XLPE/PVC Cable in 125mm Conduit	86
2	4	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	30
NP 399675	NP 400077	Provide 125mm Conduit plus spare 125mm Conduit in road crossing	34
4	3	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	0.3
NP 400077	NP 400076	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	37
4	5	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	0.4
NP 400077	NP 400078	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	37
5	6	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	0.4
NP 400078	NP 400079	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	38
NP 400079	NP 400080	Provide 125mm Conduit plus spare 125mm Conduit in road crossing	52
7	8	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	0.5
NP 400080	NP 400081	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	52
8	9	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	0.5
NP 400081	NP 400082	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	34
2	11	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	0.3
NP 399675	NP 400084	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	36
11	10	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	0.4
NP 400084	NP 400083	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	0.4

CERTIFIED BY ESSENTIAL ENERGY

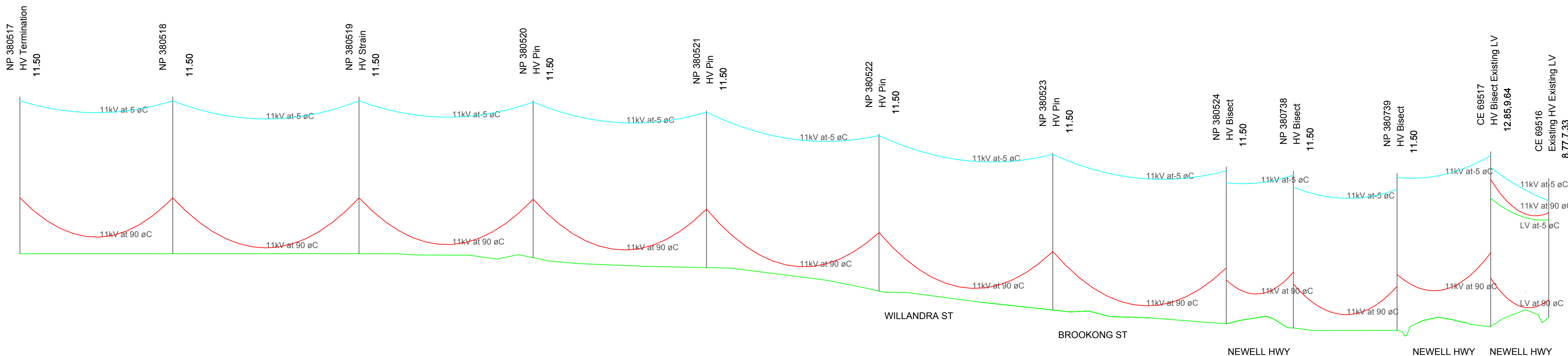
Certification No. _____
Date Certified _____
Certified _____
This certification is subject to ESSENTIAL ENERGY Standard Cert Terms

GHD
Level 7, 16 Marcus Clarke Street
Canberra ACT 2601 Australia
GPO Box 1877 Canberra ACT 2601
T 61 2 6113 3200 F 61 2 6113 3299
E cbmail@ghd.com W www.ghd.com Accreditation No. 2085

NEWELL HIGHWAY BYPASS
GRONG GRONG 2652

PROJECT COST No.	As Shown
SCALE	As Shown
DRAWN BY	NR
DATE ISSUED	Mar 2016
CHECKED BY	DU
FEEDER No.	NDA 3B2 May St 11kV
SCHEM REF	Narrandera
MAINTENANCE AREA	Coolamon
DESIGN FILE NAME	111303CPLAN
REVISION ISSUE	A
PLOT DATE	03/02/2017

AMENDMENTS	ISSUE	ORIGINAL
P	PRELIMINARY	
A	ORIGINAL	



OH PROFILE

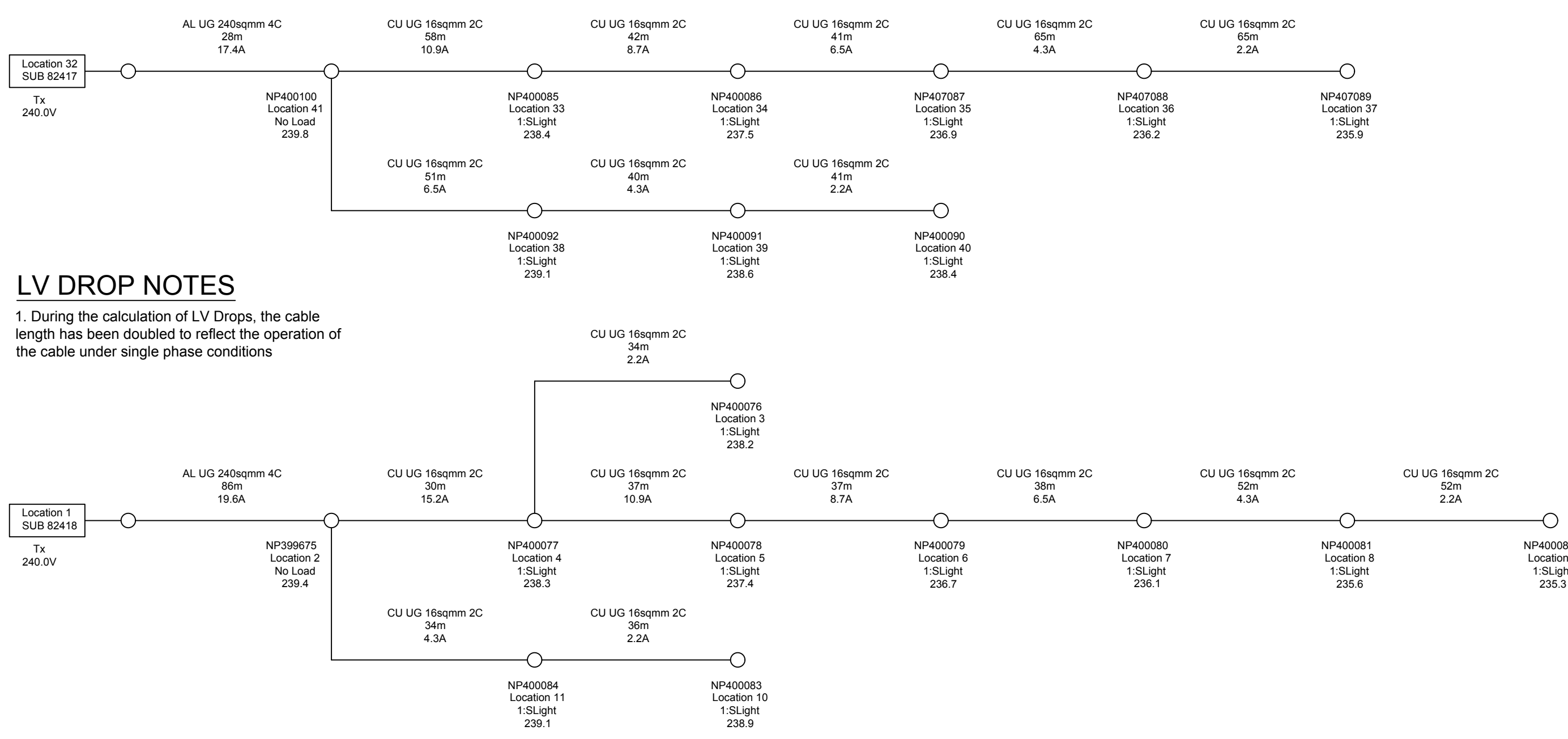
DEVIATION ANGLE (D.MM)	23.37L		23.22L				30.07R		31.52L		53.22L		62.29R	
CHAINAGE (m)	0.0	114.8	140.0	254.8	385.6	515.8	645.4	776.0	906.4	956.8	1034.7	1105.1	1148.6	
SPAN (m)		114.8	140.0	130.8	130.2	129.6	130.6	130.4	50.4	77.9	70.4	43.6		
GROUND CLEARANCE (m)		8.55	7.74	8.09	8.46	8.03	8.22	8.19	9.06	8.49	9.31	8.20 HV 6.17 LV	7.30 HV 6.00 LV	
DESIGN CLEARANCE (m)		7.30	7.30	7.30	7.30	7.30	7.30	7.30	7.30	7.30	7.30			

VERTICAL SCALE 1:200
HORIZONTAL SCALE 1:2000

FUNDING ARRANGEMENTS FOR SCOPE OF WORKS	
ESSENTIAL ENERGY SUPPLIED MATERIALS TO BE COLLECTED FROM COOLAMON DEPOT	Nil
ASSETS TO BE RETURNED TO NEAREST ESSENTIAL ENERGY DEPOT BY L1 ASP	Redundant materials recovered from demolition tasks including but not limited to:- Demolished wood pole

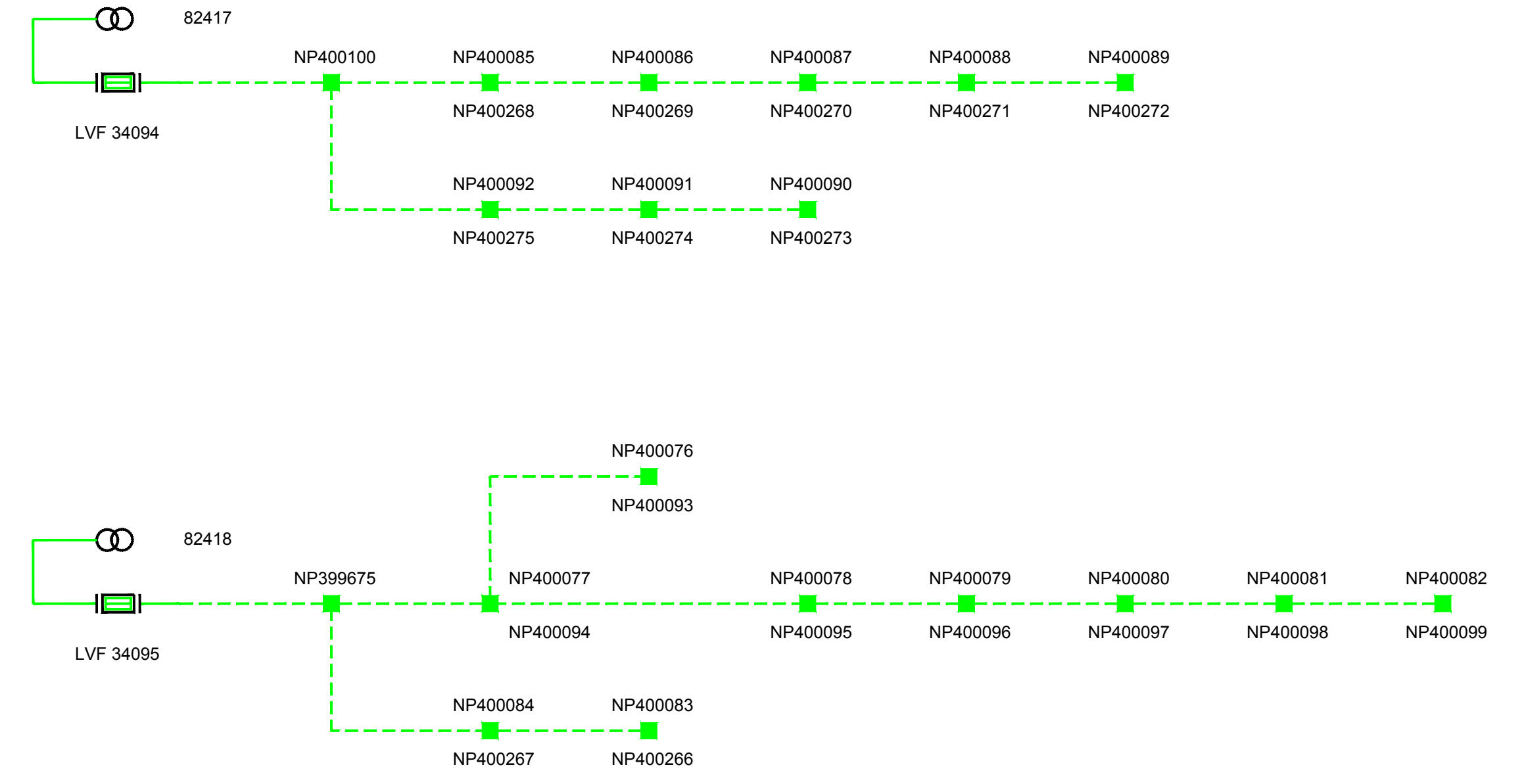
OVERHEAD CONDUCTOR SCHEDULE							
From Location	To Location	Conductor Details Voltage/ Wires/ Conductor	Route Length	Design Tension	Ruling Span	Max Operating Temp	Min Design GC @ Design Operating Temp
20	21	Construct 11kV 7/3.00 AAAC 1PH conductor	43.6	9% UTS @ 6° C	44	65° C	7.3m @ 90° C
CE 69516	CE 69517	Retain existing LV Twisted aerial	43.6	11% UTS @ 6° C	44	65° C	6.0m @ 90° C
21	23	Construct 11kV 7/3.00 AAAC 1PH conductor	70.4	9% UTS @ 6° C	70	65° C	7.3m @ 90° C
CE 69517	NP 380739						
23	24	Construct 11kV 7/3.00 AAAC 1PH conductor	77.9	9% UTS @ 6° C	78	65° C	7.3m @ 90° C
NP 380739	NP 380740						
24	25	Construct 11kV 7/3.00 AAAC 1PH conductor	50.4	9% UTS @ 6° C	50	65° C	7.3m @ 90° C
NP 380740	NP 380524						
25	26	Construct 11kV 7/3.00 AAAC 1PH conductor	130.4	17% UTS @ 6° C	130	65° C	7.3m @ 90° C
NP 380524	NP 380523						
26	27	Construct 11kV 7/3.00 AAAC 1PH conductor	130.6	17% UTS @ 6° C	130	65° C	7.3m @ 90° C
NP 380523	NP 380522						
27	28	Construct 11kV 7/3.00 AAAC 1PH conductor	129.6	17% UTS @ 6° C	130	65° C	7.3m @ 90° C
NP 380522	NP 380521						
28	29	Construct 11kV 7/3.00 AAAC 1PH conductor	130.2	17% UTS @ 6° C	130	65° C	7.3m @ 90° C
NP 380521	NP 380520						
29	30	Construct 11kV 7/3.00 AAAC 1PH conductor	130.8	17% UTS @ 6° C	130	65° C	7.3m @ 90° C
NP 380520	NP 380519						
30	31	Construct 11kV 7/3.00 AAAC 1PH conductor	140.0	17% UTS @ 6° C	140	65° C	7.3m @ 90° C
NP 380519	NP 380518						
31	32	Construct 11kV 7/3.00 AAAC 1PH conductor	114.8	17% UTS @ 6° C	115	65° C	7.3m @ 90° C
NP 380518	NP 380517						

VOLTAGE DROPS



LV DROP NOTES
1. During the calculation of LV Drops, the cable length has been doubled to reflect the operation of the cable under single phase conditions

LV SCHEMATIC



AMENDMENTS	PRELIMINARY ISSUE	ORIGINAL ISSUE
P		A

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NEWELL HIGHWAY BYPASS
GRONG GRONG 2652

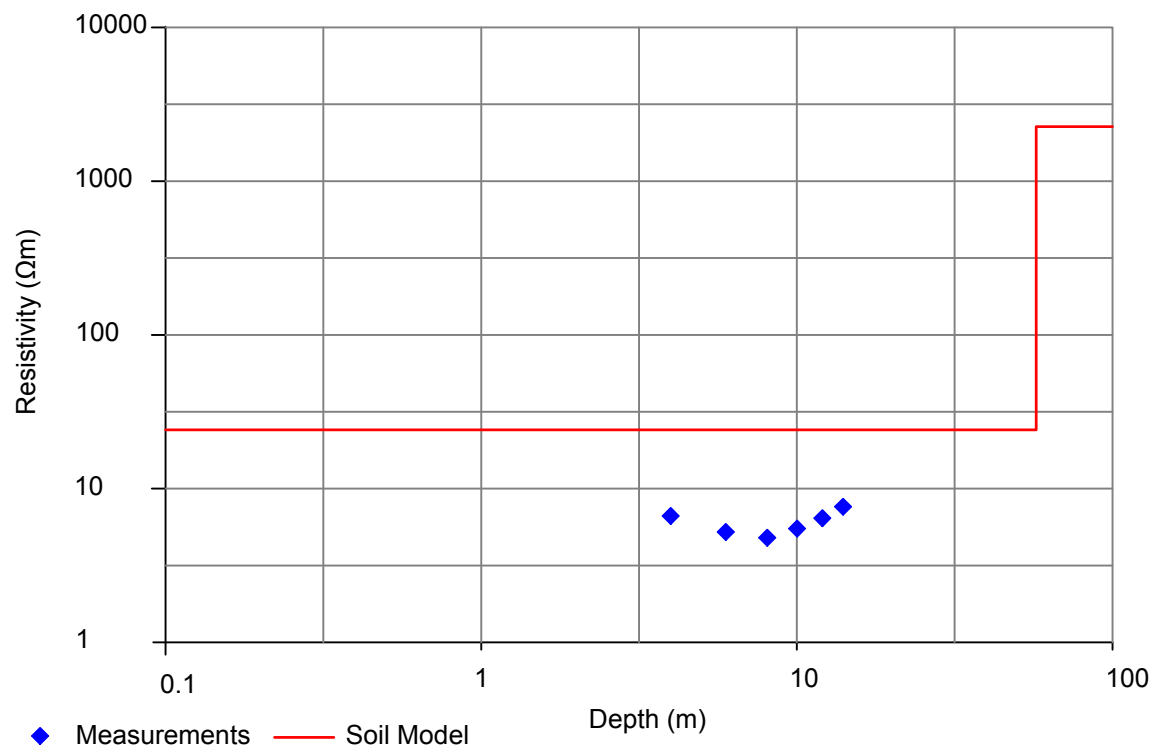
PROJECT COST No.			
SCALE	As Shown	111303CPLAN	A1
DRAWN BY	NR	DESIGN FILE NAME	ORIGINAL SIZE
DATE ISSUED	Mar 2016		A
CHECKED BY	DU	SHEET 5 OF 7	REVISION ISSUE
FEEDER No.	NDA 3B2 May St 11kV		
SCHEM REF	Narrandera		
MAINTENANCE AREA	Coolamon	FSC AREA	Coolamon
		PLOT DATE	03/02/2017

Test	Probe Spacing	Resistance Reading Ω	Apparent Resistivity Ω
1	4	0.25	6.25
2	6	0.13	4.74
3	8	0.09	4.72
4	10	0.08	4.83
5	12	0.08	5.69
6	14	0.08	6.62
7	16	0.14	13.6
8	18	0.12	13.8
9	20	0.06	7.06

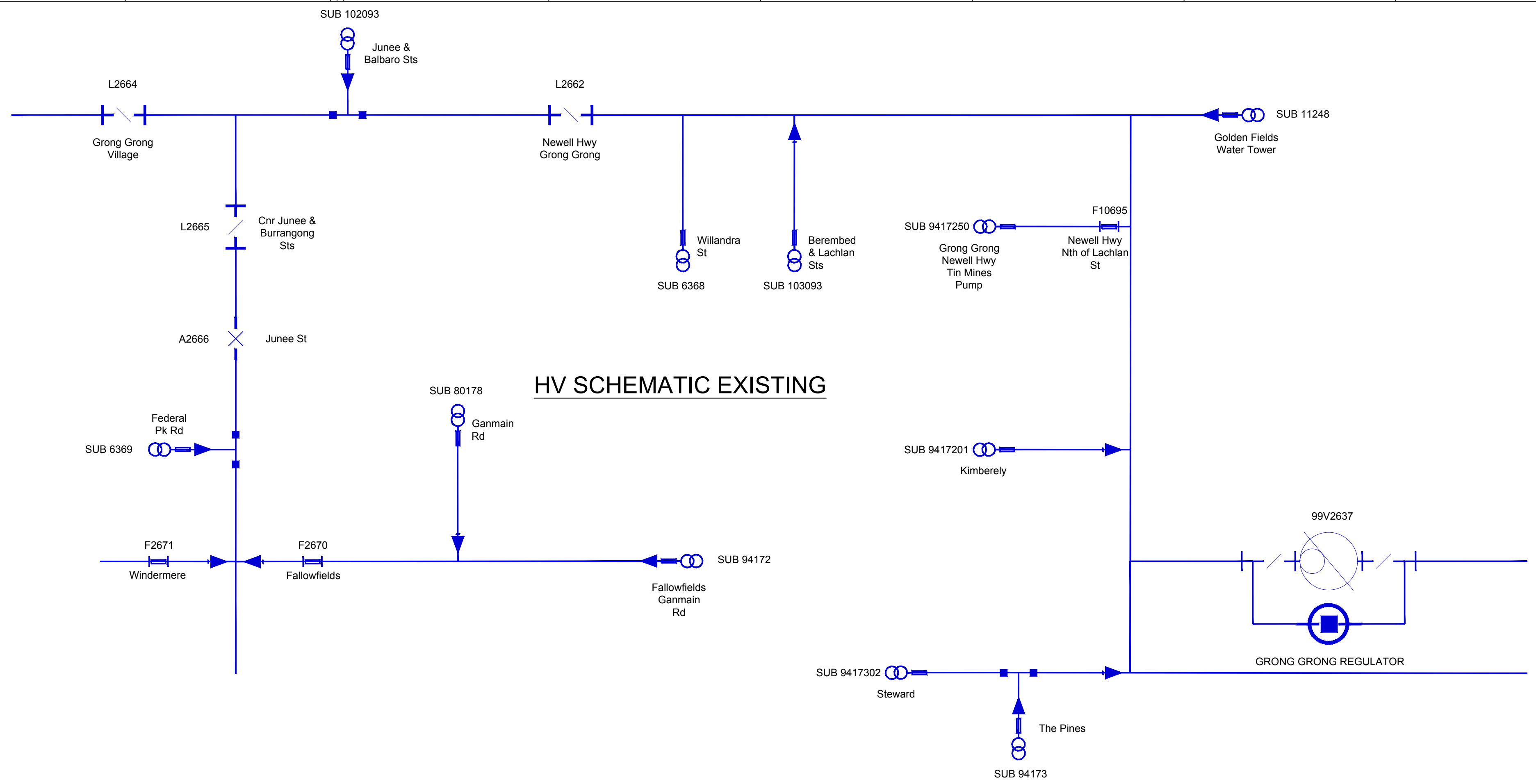
Length of Strip electrode	20m
Number of Electrodes	2
Electrode Length	2.4m
Expected HV Earth Resistance	2.8 Ω

Length of Strip electrode	20m
Number of Electrodes	2
Electrode Length	2.4m
Expected LV Earth Resistance	2.8 Ω
Minimum separation distance between HV and LV Earthing Systems	4.1m

EARTHING REQUIREMENTS SUB 82417



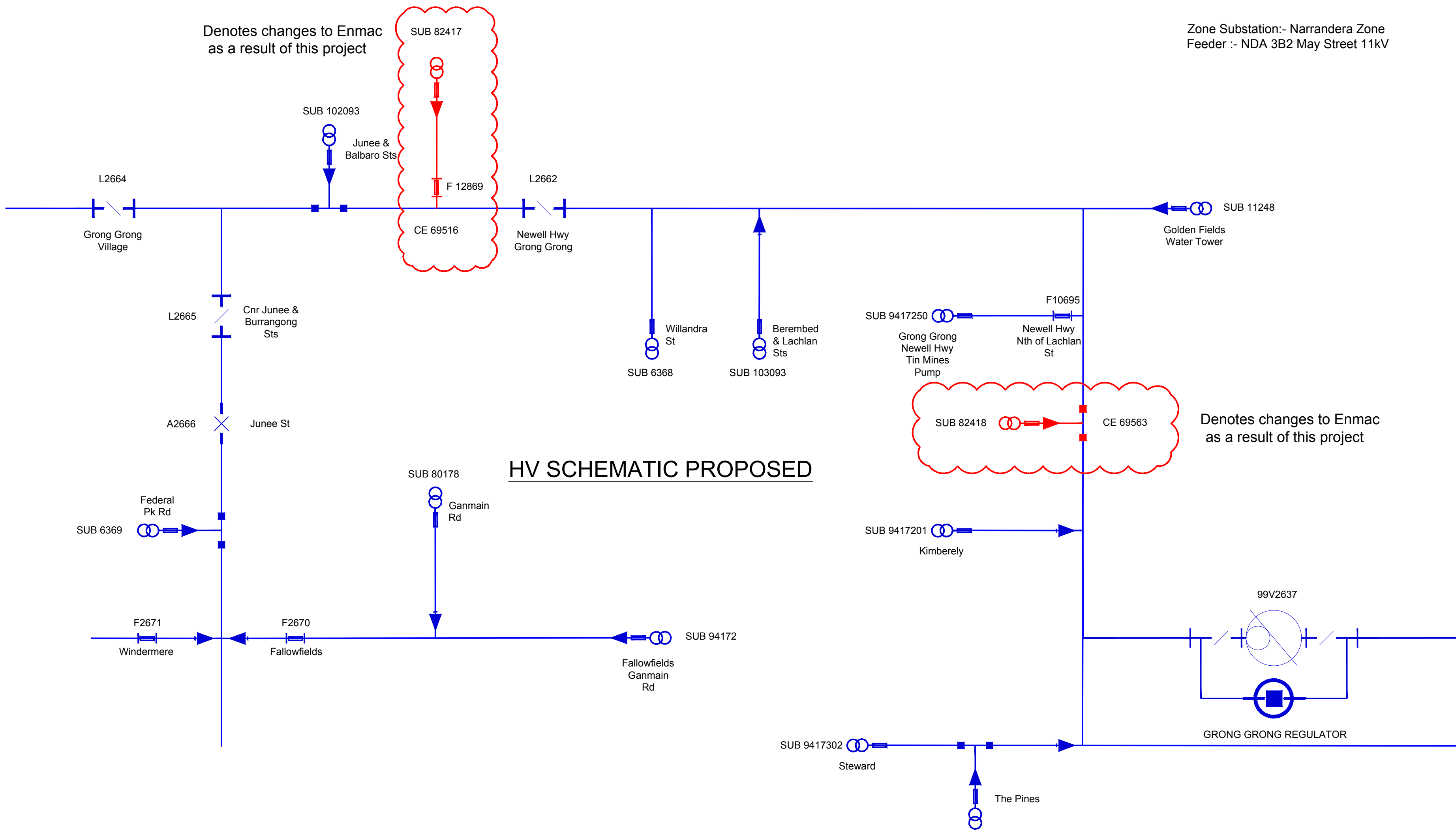
SOIL MODEL



HV SCHEMATIC EXISTING

Denotes changes to Enmac as a result of this project

Zone Substation:- Narrandera Zone Feeder :- NDA 3B2 May Street 11kV



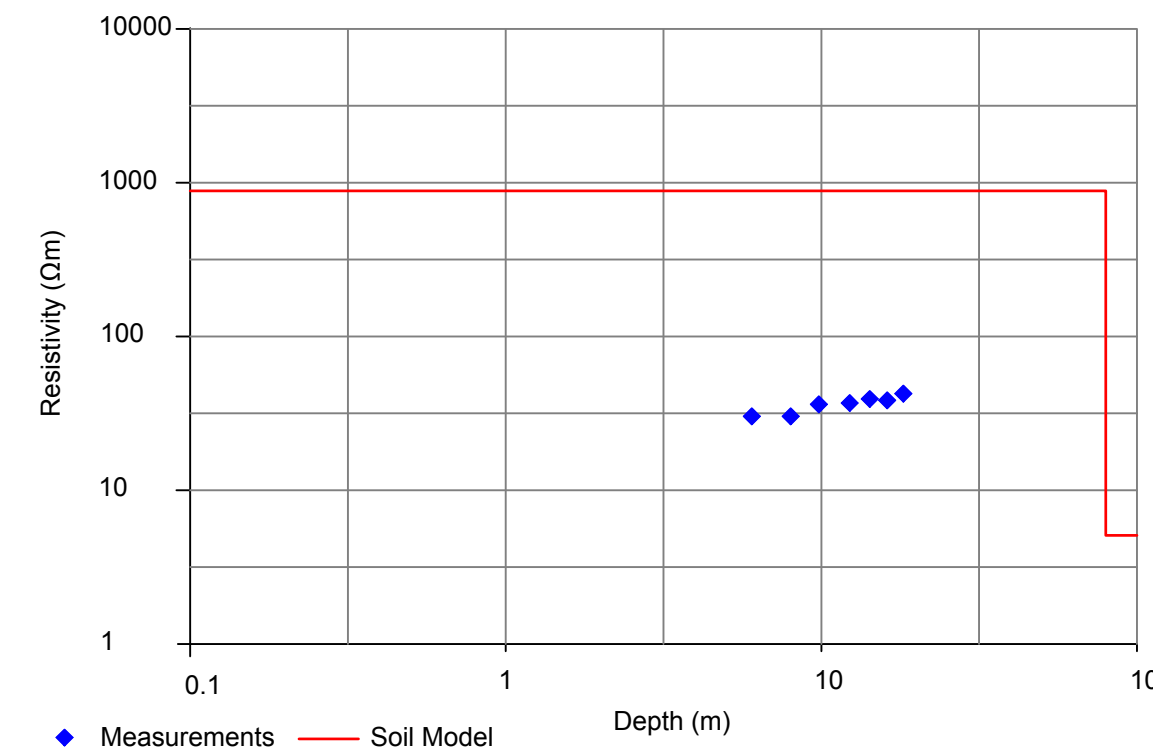
HV SCHEMATIC PROPOSED

Test	Probe Spacing	Resistance Reading Ω	Apparent Resistivity Ω
1	4	0.87	22.0
2	6	0.77	28.9
3	8	0.58	29.1
4	10	0.55	34.6
5	12	0.46	34.8
6	14	0.42	37.4
7	16	0.36	36.3
8	18	0.36	40.5
9	20	0.37	46.1

Length of Strip electrode	20m
Number of Electrodes	2
Electrode Length	5.0m
Expected HV Earth Resistance	72.8 Ω

Length of Strip electrode	20m
Number of Electrodes	2
Electrode Length	5.0m
Expected LV Earth Resistance	72.8 Ω
Minimum separation distance between HV and LV Earthing Systems	4.1m

EARTHING REQUIREMENTS SUB 82418



SOIL MODEL

AMENDMENTS	PRELIMINARY ISSUE	ORIGINAL ISSUE
P	A	

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NEWELL HIGHWAY BYPASS
GRONG GRONG 2652

PROJECT COST No.		essential energy	
SCALE	As Shown	111303CPAN	A1
DRAWN BY	NR	DESIGN FILE NAME	ORIGINAL SIZE
DATE ISSUED	Mar 2016	SHEET 6 OF 7	REVISION ISSUE A
CHECKED BY	DU	MAINTENANCE AREA	PLOT DATE
FEEDER No.	NDA 3B2 May St 11kV	FSC AREA	Coolamon
SCHEM REF	Narrandera		03/02/2017

Construction Schedule South				
Location No.	Asset Label	Standard Drawing No.	Assembly No.	Construction Notes
33	NP 400268	7206.01	1	Style 1 Streetlight column URD Lighting column connection - Impact absorbing frangible columns Locate frangible column minimum 5m from road carriageway edge line Provide Ragbolt Cage/ Concrete base with engineering certification. Provide Sylvania Roadster 150w HPS Style 1 luminaire complete with PE Cell Provide 10.5m mounting height x 4.5m Single Outreach arm Style 1 column Impact Absorbing Provide 16sqmm 2C CU cable in 50mm conduit to column as required
		7206.02		
	NP 400085	7201.25	13	URD Service Pit Provide Service Terminations as required
		7204.10		
34	NP 400269	7206.01	1	Style 1 Streetlight column URD Lighting column connection - Impact absorbing frangible columns Locate frangible column minimum 5m from road carriageway edge line Provide Ragbolt Cage/ Concrete base with engineering certification. Provide Sylvania Roadster 150w HPS Style 1 luminaire complete with PE Cell Provide 10.5m mounting height x 4.5m Single Outreach arm Style 1 column Impact Absorbing Provide 16sqmm 2C CU cable in 50mm conduit to column as required
		7206.02		
	NP 400086	7201.25	13	URD Service Pit Provide Service Terminations as required
		7204.10		
35	NP 400270	7206.01	1	Style 1 Streetlight column URD Lighting column connection - Impact absorbing frangible columns Locate frangible column minimum 5m from road carriageway edge line Provide Ragbolt Cage/ Concrete base with engineering certification. Provide Sylvania Roadster 150w HPS Style 1 luminaire complete with PE Cell Provide 10.5m mounting height x 4.5m Single Outreach arm Style 1 column Impact Absorbing Provide 16sqmm 2C CU cable in 50mm conduit to column as required
		7206.02		
	NP 400087	7201.25	13	URD Service Pit Provide Service Terminations as required
		7204.10		
36	NP 400271	7206.01	1	Style 1 Streetlight column URD Lighting column connection - Impact absorbing frangible columns Locate frangible column minimum 5m from road carriageway edge line Provide Ragbolt Cage/ Concrete base with engineering certification. Provide Sylvania Roadster 150w HPS Style 1 luminaire complete with PE Cell Provide 10.5m mounting height x 4.5m Single Outreach arm Style 1 column Impact Absorbing Frangible Lighting column installation (Cat V Lighting)
		7206.02		
	NP 400088	7201.25	13	URD Service Pit Provide Service Terminations as required
		7204.10		
37	NP 400272	7206.01	1	Style 1 Streetlight column URD Lighting column connection - Impact absorbing frangible columns Locate frangible column minimum 5m from road carriageway edge line Provide Ragbolt Cage/ Concrete base with engineering certification. Provide Sylvania Roadster 150w HPS Style 1 luminaire complete with PE Cell Provide 10.5m mounting height x 4.5m Single Outreach arm Style 1 column Impact Absorbing Provide 16sqmm 2C CU cable in 50mm conduit to column as required
		7206.02		
	NP 400089	7201.25	13	URD Service Pit Provide Service Terminations as required
		7204.10		
38	NP 400275	7206.01	1	Style 1 Streetlight column URD Lighting column connection - Impact absorbing frangible columns Locate frangible column minimum 5m from road carriageway edge line Provide Ragbolt Cage/ Concrete base with engineering certification. Provide Sylvania Roadster 150w HPS Style 1 luminaire complete with PE Cell Provide 10.5m mounting height x 4.5m Single Outreach arm Style 1 column Impact Absorbing Provide 16sqmm 2C CU cable in 50mm conduit to column as required
		7206.02		
	NP 400092	7201.25	13	URD Service Pit Provide Service Terminations as required
		7204.10		
39	NP 400274	7206.01	1	Style 1 Streetlight column URD Lighting column connection - Impact absorbing frangible columns Locate frangible column minimum 5m from road carriageway edge line Provide Ragbolt Cage/ Concrete base with engineering certification. Provide Sylvania Roadster 150w HPS Style 1 luminaire complete with PE Cell Provide 10.5m mounting height x 4.5m Single Outreach arm Style 1 column Impact Absorbing Provide 16sqmm 2C CU cable in 50mm conduit to column as required
		7206.02		
	NP 400091	7201.25	13	URD Service Pit Provide Service Terminations as required
		7204.10		
40	NP 400273	7206.01	1	Style 1 Streetlight column URD Lighting column connection - Impact absorbing frangible columns Locate frangible column minimum 5m from road carriageway edge line Provide Ragbolt Cage/ Concrete base with engineering certification. Provide Sylvania Roadster 150w HPS Style 1 luminaire complete with PE Cell Provide 10.5m mounting height x 4.5m Single Outreach arm Style 1 column Impact Absorbing Provide 16sqmm 2C CU cable in 50mm conduit to column as required
		7206.02		
	NP 400090	7201.25	13	URD Service Pit Provide Service Terminations as required
		7204.10		
41	NP 400100	7202.05	6	URD Connection Pillar Type 6

Construction Schedule South				
Location No.	Asset Label	Standard Drawing No.	Assembly No.	Construction Notes
20	CE69516	7101.67	1	Existing 12.5m 6kN wood pole to remain Existing 3Ø HV Termination assembly wood crossarm at 8.75m above ground level Provide additional materials to convert existing Termination assembly to Strain assembly Provide Bridging Insulators as required Existing OH conductors are 7/4.50 AAAC (to be confirmed on site)
		7101.04		
21	CE69517	7101.03	13	Existing 12.5m 6kN wood pole to be removed Construct 15.5m/6kN wood pole set 2.35m Construct Pole Footing Stabilised Construct 45 Degree Ground Stay ASSM 1 Bearing 350 degrees Construct Ground Anchor ASSM 1
		7103.10		
	F 12869	7101.68	1	Construct 1Ø Bisect assembly Composite crossarm Composite Crossarm FG71 125 x 125 x 2000mm
		7111.71		
		7105.54	1	Provide additional materials on lower Bisect Composite crossarm to construct 1 Ø HV Fuses. Load with 20A elements Provide Bridging Insulators as required
		7101.04		
22	CE69518	7107.07	1	Retain existing LV Level 2 ABC service cable connected to CE 69516 Retain existing LV Level 2 Open Wire assemblies and service cable supplies PP9579 - Railway Crossing signals Provide spacing between HV and LV constructions
		7107.06		
23	NP 380739	7101.03	10	Retain existing streetlight outreach arm and 250w Luminaire Minimum clearances between OH conductor and streetlight outreach arm Reconnect existing streetlight
		7103.10		
		7106.25	1	Existing 12.5m 6kN wood pole to remain Retain existing streetlight outreach arm and 250w Luminaire Adjust streetlight outreach to maintain minimum Clearances to new HV OH
		7103.11		
24	NP 380738	7101.03	10	Construct 14m/6kN wood pole set 2.2m Construct Pole Footing Stabilised Construct 60 Degree Ground Stay ASSM 1 Bearing 170 degrees Construct Ground Anchor ASSM 1
		7103.01		
		7103.11	1	Construct 1Ø Bisect Assembly Composite Crossarm Composite Crossarm FG71 125 x 125 x 2000mm Provide bridging insulators as required
		7111.71		
		7101.68	1	Construct 14m/6kN wood pole set 2.2m Construct Pole Footing Stabilised Construct 60 Degree Ground Stay ASSM 1 Bearing 220 degrees Construct Ground Anchor ASSM 1
		7111.71		

Construction Schedule South				
Location No.	Asset Label	Standard Drawing No.	Assembly No.	Construction Notes
25	NP 380524	7101.03	10	Construct 14m/6kN wood pole set 2.2m Construct Pole Footing Stabilised Construct 45 Degree Ground Stay ASSM 1 Bearing 104 degrees Construct Ground Anchor ASSM 1
		7103.10		
	NP 380523	7101.03	10	Construct 14m/6kN wood pole set 2.2m Construct 1Ø Pin Assembly Composite Crossarm Composite Crossarm FG62 100 x 100 x 2000mm
		7111.62		
26	NP 380522	7101.03	10	Construct 14m/6kN wood pole set 2.2m Construct 1Ø Pin Assembly Composite Crossarm Composite Crossarm FG62 100 x 100 x 2000mm
		7101.56		
	NP 380521	7101.03	10	Construct 14m/6kN wood pole set 2.2m Construct 1Ø Pin Assembly Composite Crossarm Composite Crossarm FG62 100 x 100 x 2000mm
		7111.62		
27	NP 380520	7101.03	10	Construct 14m/6kN wood pole set 2.2m Construct 1Ø Pin Assembly Composite Crossarm Composite Crossarm FG62 100 x 100 x 2000mm
		7101.56		
	NP 380519	7101.03	10	Construct 14m/6kN wood pole set 2.2m Construct Pole Footing Stabilised Construct 45 Degree Ground Stay ASSM 1 Bearing 130 degrees Construct Ground Anchor ASSM 1
		7103.01		
28	NP 380518	7101.03	10	Construct 45 Degree Ground Stay ASSM 1 Bearing 280 degrees Construct Ground Anchor ASSM 1
		7103.11		
	NP 380517	7101.67	1	Construct 1Ø Strain Assembly Composite Crossarm Composite Crossarm FG71 125 x 125 x 2000mm Provide bridging insulators as required
		7111.71		
29	NP 380516	7101.03	10	Construct 14m/6kN wood pole set 2.2m Construct Pole Footing Stabilised Construct 60 Degree Ground Stay ASSM 1 Bearing 240 degrees Construct Ground Anchor ASSM 1
		7103.01		
	NP 380515	7101.03	10	Construct 14m/6kN wood pole set 2.2m Construct Pole Footing Stabilised Construct 45 Degree Ground Stay ASSM 1 Construct Ground Anchor ASSM 1
		7103.11		
30	NP 380514	7101.03	10	Construct 14m/6kN wood pole set 2.2m Construct Pole Footing Stabilised Construct 45 Degree Ground Stay ASSM 1 Construct Ground Anchor ASSM 1
		7103.01		
	SUB 82417	7104.01	1	Construct 16kVA Polemount Tx. Arrange Equipment Construct EDO's Construct 16kVA 11,000V 1PH Polemount Substation Construct Separate Earthing system Wood Pole Substation Construct pole substation LV fuse switch 160A 1PH
		7104.22		
31	LVF 34094	7104.24	1	LV OH to Overhead Links to LV UG Cable arrangement, utilise construction to connect LV 4C 240sqmm AL cable to LV fuse switch Provide additional lugs etc as required AL Cable to be utilised as single phase only. Only one core is to be energised. Spare cable cores shall be suitably capped and secured Fix LV cable to wood pole
		7204.13		
		7204.11	1	
		7204.11		

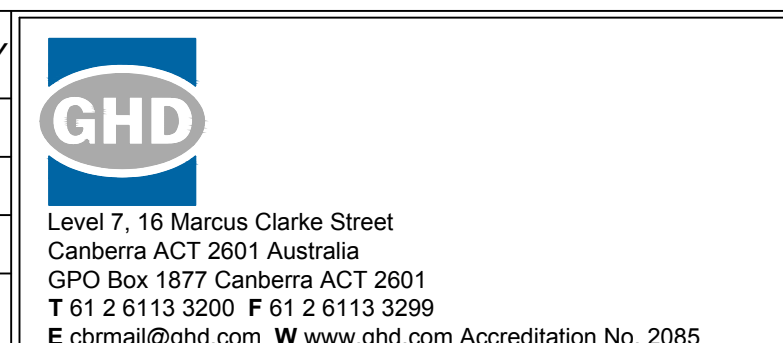
Underground Cable & Conduit Schedule South				Calculated Max pulling tension (kN) during installation
From Location No.	To Location No.	Cable & Conduit Details	Route Length (m)	
32	41	Provide LV 4C 240sqmm AL XLPE/PVC Cable in 125mm Conduit	28	0.5
NP 380517	NP 400100			
41	33	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	58	0.7
NP 400100	NP 400085			
33	34	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	42	0.4
NP 400085	NP 400086			
34	35	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	41	0.4
NP 400086	NP 400087	Provide 125mm Conduit plus spare 125mm Conduit in road crossing		
35	36	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	65	0.7
NP 400087	NP 400088			
36	37	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	65	0.7
NP 400088	NP 400089			
37	38	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	51	0.5
NP 400089	NP 400092	Provide 125mm Conduit plus spare 125mm Conduit in road crossing		
38	39	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	40	0.4
NP 400092	NP 400091			
39	40	Provide LV 2C 16sqmm CU XLPE/PVC Cable in 50mm Conduit	41	0.4
NP 400091	NP 400090			

AMENDMENTS
PRELIMINARY ISSUE
ORIGINAL ISSUE

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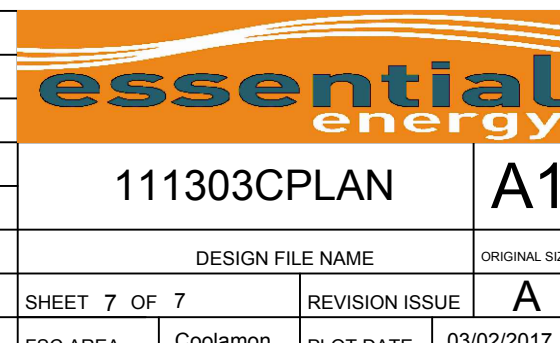
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SCHEM REF Narrandera
MAINTENANCE AREA Coolamon



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Appendix B

Consideration of clause 228(2) factors and matters of national environmental significance

Clause 228(2) Checklist

In addition to the requirements of the *Is an EIS required?* (1995/1996) guideline and the *Roads and Related Facilities EIS Guideline* (DUAP 1996) as detailed in the addendum REF, the following factors, listed in clause 228(2) of the *Environmental Planning and Assessment Regulation 2000*, have also been considered to assess the likely impacts of the proposed modification on the natural and built environment.

Factor	Impact
<p>a. Any environmental impact on a community? Minimal air quality impacts during construction, however this will be temporary and localised. Noise and vibration impacts during construction, however residents and local businesses would be notified of the proposed work hours before works start, and work hours during construction would generally be limited to the standard working hours provided in the EPA's Interim Construction Noise Guidelines (2009). Minimal increase in traffic due to construction vehicles, and traffic delays during construction and lane closures, however this will be temporary and is not likely to be significantly more than in the original project.</p>	<p>Negative Minor Short term</p>
<p>b. Any transformation of a locality?</p>	<p>No</p>
<p>c. Any environmental impact on the ecosystems of the locality? The proposed modification involves clearing an extra 0.329 hectares of native vegetation and potential for minor erosion, sedimentation and pollution. However, these impacts are not likely to significantly impact the ecosystems of the locality and can be mitigated by retaining regrowth trees around Bogolong Road intersection, locating ancillary facilities away from the highway in previously cleared areas, implementing temporary erosion and sediment control during construction, and with the safeguards listed in the project REF.</p>	<p>Negative Minor Clearing – long term Other – short term</p>
<p>d. Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? Removing native vegetation and installing a powerline would impact on the aesthetic value of the proposal area, but the impact is very localised and would not have a significant impact on the locality.</p>	<p>Negative Minor Long term</p>
<p>e. Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?</p>	<p>No</p>
<p>f. Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)? Removing native vegetation would have a minor and localised impact on the habitat of protected fauna. The impact would be mitigated by retaining regrowth trees around Bogolong Road intersection and with the safeguards listed in the project REF.</p>	<p>Negative Minor Long term</p>
<p>g. Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</p>	<p>No</p>

Factor	Impact
<p>h. Any long-term effects on the environment? Removing native vegetation would have a long term, but minor and localised impact on the environment. The impact would be mitigated by retaining regrowth trees around Bogolong Road intersection and with the safeguards listed in the project REF.</p>	Negative Minor Long-term
<p>i. Any degradation of the quality of the environment? The proposed modification would involve removing native vegetation and the potential for erosion, sedimentation and minor pollution. These are unlikely to be significant and can be mitigated by retaining regrowth trees around Bogolong Road intersection, locating ancillary facilities away from the highway in previously cleared areas, implementing temporary erosion and sediment control during construction, and with the safeguards listed in the project REF.</p>	Negative Minor Short term
<p>j. Any risk to the safety of the environment? The proposed modification would improve the safety of the environment for road users, with lighting helping motorists to see intersection configurations in low light, and improved property access improving safety where large agricultural machinery regularly cross the highway.</p>	Positive Minor Long term
<p>k. Any reduction in the range of beneficial uses of the environment?</p>	No
<p>l. Any pollution of the environment? There is some potential for construction pollution, including sediment release and dust, fuel, and exhaust emissions. However, these can be mitigated by locating ancillary facilities away from the highway in previously cleared areas, implementing temporary erosion and sediment controls during construction, and the safeguards listed in the project REF.</p>	Negative Minor Short term
<p>m. Any environmental problems associated with the disposal of waste?</p>	No
<p>n. Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?</p>	No
<p>o. Any cumulative environmental effect with other existing or likely future activities?</p>	No
<p>p. Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?</p>	No

Matters of National Environmental Significance

Under the environmental assessment provisions of the *Environment Protection and Biodiversity Conservation Act 1999*, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposed modification should be referred to the Australian Government Department of the Environment.

Under the EPBC Act strategic assessment approval a referral is not required for proposed road actions that may affect nationally listed threatened species, populations, endangered ecological communities and migratory species. Impacts on these matters are assessed in detail as part of this addendum REF in line with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
a. Any impact on a World Heritage property? There are no World Heritage listed properties located near the study area that would be impacted by the proposed modification.	No
b. Any impact on a National Heritage place? There are no National Heritage listed places located near the study area that would be impacted by the proposed modification.	No
c. Any impact on a wetland of international importance? No wetlands of international importance would be affected directly or indirectly by the proposed modification.	No
d. Any impact on a listed threatened species or communities? Although a number of threatened species and communities have been recorded within a 10 kilometre radius of the study area, the works have been assessed as unlikely to have a significant impact.	No
e. Any impacts on listed migratory species?	No
f. Any impact on a Commonwealth marine area?	No
g. Does the proposed modification involve a nuclear action (including uranium mining)?	No
Additionally, any impact (direct or indirect) on Commonwealth land?	No

Appendix C

Statutory consultation checklists

Infrastructure SEPP

Council related infrastructure or services

Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	ISEPP clause
Stormwater	Are the works likely to have a <i>substantial</i> impact on the stormwater management services which are provided by council?	No		ISEPP cl.13(1)(a)
Traffic	Are the works likely to generate traffic to an extent that will <i>strain</i> the existing road system in a local government area?	No		ISEPP cl.13(1)(b)
Sewerage system	Will the works involve connection to a council owned sewerage system? If so, will this connection have a <i>substantial</i> impact on the capacity of any part of the system?	No		ISEPP cl.13(1)(c)
Water usage	Will the works involve connection to a council owned water supply system? If so, will this require the use of a <i>substantial</i> volume of water?	No		ISEPP cl.13(1)(d)
Temporary structures	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a <i>minor</i> or <i>inconsequential</i> disruption to pedestrian or vehicular flow?	No		ISEPP cl.13(1)(e)
Road & footpath excavation	Will the works involve more than <i>minor</i> or <i>inconsequential</i> excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	No		ISEPP cl.13(1)(f)

Local heritage items

Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s)	ISEPP clause
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Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s)	ISEPP clause
Local heritage	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the item/area are more than <i>minor</i> or <i>inconsequential</i> ?	No		ISEPP cl.14

Flood liable land

Issue	Potential impact	Yes / No	If 'yes' consult with local Council(s)	ISEPP clause
Flood liable land	Are the works located on flood liable land? If so, will the works change flood patterns to more than a <i>minor</i> extent?	No		ISEPP cl.15

Public authorities other than councils

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
National parks and reserves	Are the works adjacent to a national park or nature reserve, or other area reserved under the <i>National Parks and Wildlife Act 1974</i> ?	No	Office of Environment and Heritage	ISEPP cl.16(2)(a)
Marine parks	Are the works adjacent to a declared marine park under the <i>Marine Parks Act 1997</i> ?	No	Department of Primary Industries	ISEPP cl.16(2)(b)
Aquatic reserves	Are the works adjacent to a declared aquatic reserve under the <i>Fisheries Management Act 1994</i> ?	No	Department of Primary Industries	ISEPP cl.16(2)(c)
Sydney Harbour foreshore	Are the works in the Sydney Harbour Foreshore Area as defined by the <i>Sydney Harbour Foreshore Authority Act 1998</i> ?	No	Sydney Harbour Foreshore Authority	ISEPP cl.16(2)(d)
Bush fire prone land	Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?	No	Rural Fire Service	ISEPP cl.16(2)(f)

Appendix D

Addendum Biodiversity Assessment

1 December 2016



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Dear Roshan,

RE – Updates to Biodiversity Assessment for the Newell Highway Realignment at Grong Grong for the revised proposal including powerline easement.

A Biodiversity Assessment (BA) was prepared for the Newell Highway Realignment at Grong Grong (the proposal) by NGH Environmental in March 2015, which formed part of the Review of Environmental Factors for the project. Subsequently a further revision to the design and construction footprint was made and assessed in a BA update letter (10 September 2015). Following was an additional update to the assessment that included a number of design refinements and the inclusion of a powerline easement. Subsequently the location of the powerline has changed. As such a review of the impact assessment and conclusions reached in the BA is required. Specifically, this letter:

- Outlines the key changes in the proposal design.
- Provides a revised assessment of the impacts to biodiversity.
- Includes an updated map set reflecting the revised design and construction footprint.
- Outlines any changes to the conclusions reached or mitigation measures recommended in the BA.

The components described above are detailed overleaf. If you have any questions regarding the information provided herein, please do not hesitate to contact me.

Yours sincerely,

Bryson Lashbrook
Environmental Consultant
Ph 02 6923 1503
NGH Environmental

REVISED IMPACT ASSESSMENT

Changes in the proposal design

The original location for the powerline was along the road reserve and through cleared paddocks, as a result of the changes in design there is now an additional 420m of powerline easement proposed to be located in the road reserve. The location of the proposed powerline is shown in **Error! Reference source not found.**

Vegetation types and Endangered Ecological Communities

The changes to the proposal and resulting construction footprint are considered to be relatively minor. Table 5-1 in the previous BA detailed the approximate area of each vegetation type and Endangered Ecological Community (EEC) affected. This table has been revised with the new construction footprint including the powerline (Table 1).

Total clearing of native vegetation and habitat was increased from approximately 4.3 hectares (Initial BA, NGH Environmental, 2015), to 4.7 hectares (revised BA, NGH Environmental, September 2015) to 4.8 hectares (revised BA, NGH Environmental, 2016) and again 4.8 hectares (revised BA, NGH Environmental, 2016). This assessment has found that the proposed changes would impact a further 0.329 hectares of Inland Grey Box Woodland with a further 0.247 hectares of modified cropping land potentially impacted. This would result in a cumulative total of 5.129 hectares for the project. This would translate to an additional 0.329 hectares (0.829 hectares total) of direct impact to the Inland Grey Box Woodland EEC listed within the NSW *Threatened Species Conservation Act 1995* (TSC Act).

Revised assessments of significance pursuant to the TSC Act and EPBC Act have been completed for the Inland Grey Box Woodland EEC (refer to Attachment B). These assessments concluded a non-significant impact to the Inland Grey Box Woodland EEC would result from the modified proposal.

Table 1 Approximate area of each vegetation type and EEC within the revised construction footprint

Vegetation Community	Biometric vegetation type	Biometric vegetation condition	Total area of vegetation communities impacted (hectares). REF figures () Additional assessment figures [] Original powerline assessment figures { }	Impacts to Inland Grey Box Woodland EEC (hectares). REF figures are included in brackets	
				TSC Act (NSW)	EPBC Act (Cwth)
Inland Grey Box Woodland	MR565	Moderate to good	2.9 {2.9} [2.8] (2.5)	2.9 {2.9} [2.8] (2.5)	2.9 {2.9} [2.8] (2.5)
Inland Grey Boy Woodland (highly modified)	MR565	Low	0.829 {0.5} [0.5] (0.8)	0.829 [0.5] (0.8)	Does not qualify
Bimble Box and Inland Grey Box Woodland	MR564	Moderate to good	{0.3} [0.3] (0.3)	[0.3] (0.3)	Does not qualify

Bimble Box and Dwyer's Red Gum (<i>Eucalyptus dwyeri</i>) with Grey Box	MR568/ MR564	Moderate to good	{1.1} [1.1] (0.7)	{1.1} [1.1] (0.7)	{1.1} [1.1] (0.7)
Total Area of vegetation communities impacted			5.129	5.129	4.0
Total Area of vegetation communities impacted (assessed in previous reports)			4.8	4.8	4.0
Difference			+ 0.329	+ 0.329	+ 0.0

Habitat trees

As stated in the BA (Appendix F of the displayed REF), a total of 26 habitat trees (ie. hollow-bearing trees) were recorded within the study area, with an additional three potential habitat trees and this remains the case. In the BA 13 habitat trees were located within the original construction footprint displayed in the REF; one additional habitat tree is located in the revised construction footprint for the power line.

As stated in the BA and Additional Assessment (NGH Environmental, September 2015) there are approximately nine habitat trees that would be directly impacted by the proposal. The original assessment for the powerline found that one additional hollow bearing tree (Figure 2) is likely to be removed for the construction of the powerline. This tree, located at the intersection of the existing highway and Brookong Street, would be still be removed with the updated design.

There were no additional important habitat features impacted by the revised design.

Threatened flora and fauna species

Revised assessments of significance pursuant to the TSC Act and EPBC Act for threatened flora and fauna species identified as having the potential to be impacted in the BA were completed (refer to Attachment B). The assessments concluded a non-significant impact for:

- Sand-hill Spider Orchid (*Caladenia arenaria*) - Endangered TSC Act and EPBC Act
- Pine Donkey Orchid (*Diuris tricolor*) - Vulnerable TSC Act
- Superb Parrot (*Polytelis swainsonii*) - Vulnerable TSC act and EPBC Act
- Brown Treecreeper (*Climacteris picumnus victoriae*) - Vulnerable TSC Act
- Grey-crowned Babbler (*Pomatostomus temporalis temporalis*) - Vulnerable TSC Act

The potential for all other threatened species considered in Appendix B of the BA to occur at the site remains unlikely and no further assessment for these species is required.

Offset Strategies

As discussed in the BA (NGH Environmental 2015), the Roads and Maritime *Guideline for Biodiversity Offsets* sets out a set of criteria to determine if the residual impacts of the proposal are sufficient to warrant the consideration of offsets. The Guideline states offsets should be considered for works involving the clearing of vegetation of high conservation value, including Threatened Ecological Communities in moderate to good condition, where clearing exceeds 1 hectare. The revised proposal would involve impacting on 5.129 hectares of Inland Grey Box Woodland EEC, 4.3 hectares of which is in moderate to good condition.

As recommended in the BA and committed to in the REF, offsets shall be considered for the Inland Grey Box woodland EEC and a Biodiversity Offset Strategy would be prepared to identify the suitable land and mechanism for offsetting as soon as practicable.

CHANGES TO CONCLUSIONS AND MITIGATION MEASURES

Given the minor changes in the impacts to flora and fauna habitats, including EECs and hollow-bearing trees, the conclusions reached in the BA are still considered to apply. Significant impacts to threatened flora, fauna and EECs are considered unlikely. No safeguards or mitigation measures additional to those described in the BA are considered to be required.

ATTACHMENT A – UPDATED MAP SET

The following attachment provides a set of figures that outline the proposed design and construction footprint and includes:

- Figure 1 Location of the powerline easement
- Figure 2 Vegetation located within the powerline easement

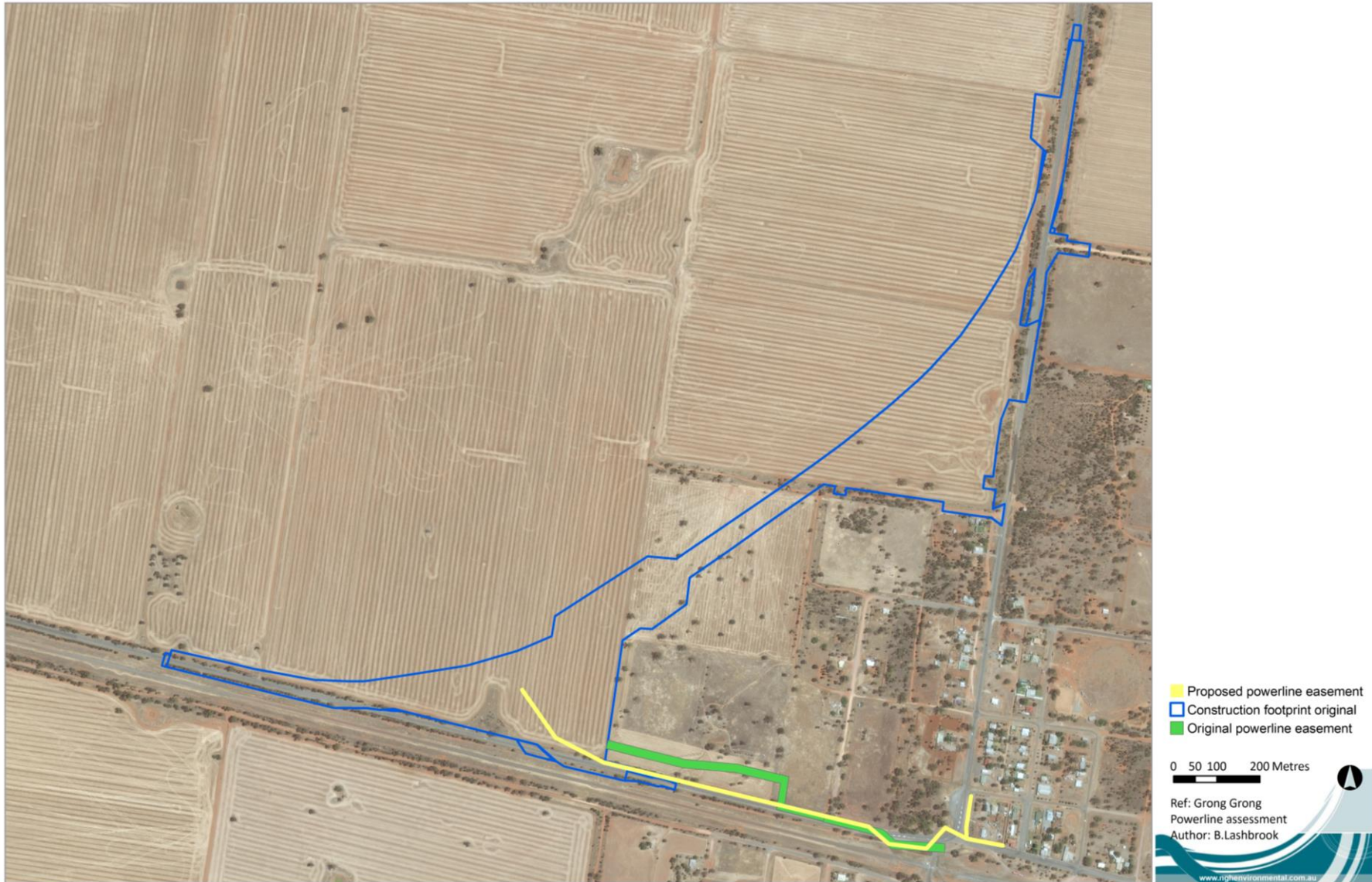


Figure 1 Location of the powerline easement



Figure 2 Vegetation located within the powerline easement

ATTACHMENT B – UPDATED ASSESSMENTS OF SIGNIFICANCE

THREATENED SPECIES CONSERVATION ACT

The *Threatened Species Conservation Act 1995* (TSC Act) specifies a set of seven factors which must be considered by decision makers in assessing the effect of a proposed development or activity on threatened species, populations or ecological communities, or their habitats. These factors are collectively referred to as the ‘seven part test’ or assessments of significance.

The following seven factors have been used to determine whether there would be a significant impact as a result of the revised proposal (as described in the document this assessment is appended to) on any of the TSC-listed threatened species and vegetation communities found at or likely to occur at the proposal site including:

Endangered Ecological Communities (EEC)

- *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penneplain, Nandewar and Brigalow Belt South Bioregions - Endangered*

Flora Species

- Sand Hill Spider Orchid (*Caladenia arenaria*) TSC – Endangered
- Pine Donkey Orchid (*Diuris tricolor*) TSC - Vulnerable

Birds

- Superb Parrot (*Polytelis swainsonii*) TSC - Vulnerable
- Brown Treecreeper (*Climacteris picumnus*) TSC - Vulnerable
- Grey Crowned Babbler (*Pomatostomus temporalis temporalis*) TSC - Vulnerable

Endangered Ecological Communities

Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions

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

Not Applicable

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

Not Applicable

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

- I. Grey Box Woodlands are scattered along the 2.4 kilometre section of works within the road reserve. The proposal would require the removal of woodland vegetation, isolated trees and groundcover vegetation from along the construction footprint and proposed tie in areas.

Areas of moderate to good quality Inland Grey Box EEC as defined under the TSC Act are present within the study area. Grazed paddock areas with scattered remnant Grey Box trees are likely to also fall within the definition of this EEC although this area is of very poor quality. The proposal would require the removal of approximately 4.3 hectares of Inland Grey Box Woodland EEC in moderate to good condition with a further 0.829 hectares of scattered Inland Grey Box Woodland within cropping paddocks considered to be in low condition.

Not taking into account modified cropping land, Inland Grey Box EEC is the dominant vegetation community present within the study locality. A large area of similar vegetation is also present east of the highway to the north of the Grong Grong Township. The proposed area of impact is considered minor in terms of the extent of this vegetation community in similar condition throughout the surrounding road reserve areas.

The removal of 5.129 hectares of Inland Grey Box Woodland would not place the local occurrence of this community at risk of extinction.

- II. The proposal would not remove this community in entirety from the study area, nor change the composition of the community in the locality. Areas of Grey Box Woodland still occur in the road reserve and adjacent lands and would not be impacted. The community within the study area has already been subject to varying levels of disturbance from agricultural practices and edge effects. It is

not likely that the removal of Grey Box woodland vegetation within the already disturbed road reserve would substantially and adversely modify the composition of the ecological community as such that its local occurrence is likely to be placed at risk of extinction. While the proposal is likely to result in some soil disturbance which could lead to the spread or introduction of additional exotic species, it is considered unlikely that this would change the composition of the community to the point where its local occurrence would be placed at risk of extinction. Soil disturbance to areas outside of the construction footprint would be avoided in order to reduce any associated impacts to these areas.

(d) in relation to the habitat of a threatened species, population or ecological community:

- i. the extent to which habitat is likely to be removed or modified as a result of the action proposed, and**
 - ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**
 - iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality**
- i. The proposal would require the removal of approximately 5.129 hectares of EEC. This includes 4.3 hectares of moderate to good quality EEC located within the road reserve and along Narran Street. These areas contain a diversity of native species and good structural integrity. In addition, approximately 0.829 hectares of low quality EEC would also require removal. This area consists of exotic pasture with scattered remnant trees including Grey Box, White Cypress Pine and Yellow Box. This is not considered significant in relation to the distribution of this community in the locality.
 - ii. The vegetation to be removed is currently considered to be highly fragmented as a result of road construction and rural development. From a landscape context the vegetation provides low to moderate connectivity from woodland to the west of the study site, Bundidgerry Creek and the Murrumbidgee River to the south, road reserves adjacent to the Newell Highway, and vegetation north of Grong Grong. The works would have a minor impact upon connectivity where the proposed deviation would tie in with the existing road. Vegetation on the southern and eastern sides of the existing highway would be maintained which are likely to reduce the potential impacts of fragmentation. The proposal would not create a barrier to seed dispersal such that the community would be isolated from surrounding areas.
 - iii. Inland Grey Box is common throughout the study area locality in similar condition to that within the study area. Vegetation mapping from the NSW VIS (OEH 2014) indicates that within a three kilometre radius, about 125 hectares of this EEC is present. Larger areas of this EEC have also been mapped in the wider locality. It should be noted however, that this mapping is approximate only. The proposal would mostly remove narrow linear strips of the community that is in moderate to good condition and adjacent vegetation would remain intact. The proposed vegetation removal is not considered important in relation to the distribution of this community or its survival in the locality.

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

No areas of critical habitat have been declared for these species.

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

There are no recovery plans or threat abatement plans relevant to the proposal.

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

Key threatening processes relevant to the proposal include:

Clearing of native vegetation

The clearing of native vegetation is considered a major contributor to the loss of biodiversity. In its determination, the NSW Scientific Committee found that 'clearing of any area of native vegetation, including areas less than two hectares in extent, may have significant impacts on biological diversity'. Clearing can lead to direct habitat loss, habitat fragmentation and associated genetic impacts, habitat degradation and off-site impacts such as downstream sedimentation.

Inland Grey Box Woodland is present along the Newell Highway and Narran Street. The proposal would require the removal of 5.129 hectares of low to moderate quality native vegetation from these areas. Due to this vegetation removal the proposal can be considered to result in the operation of this key threatening process at a minor scale.

Conclusion

The proposal would remove 4.8 hectares Inland Grey Box Woodland, 4.3 ha of which is in moderate to good condition and 0.829 hectares in low condition. Most of the community to be impacted occurs within an existing road reserve and modified cropping land that is surrounded by a largely cleared agricultural landscape. An estimated 125 hectares of the community occurs within 3 kilometres of the study area. The proposal is considered unlikely to reduce the extent, modify the community or remove habitat such that the local occurrence would be placed at risk of extinction. The habitat to be removed is not considered important to the long-term survival of the community in the locality nor is it considered likely to result in increased fragmentation.

The proposal is considered unlikely to have a significant effect on the Inland Grey Box Woodland EEC. Therefore, further assessment is not required, however, safeguards and mitigation measures have been recommended. This includes an offset strategy with the objective of enhancing remnant patches, and their connectivity within the road corridor and the locality through revegetation, regeneration and management.

Flora Species

Sand-hill Spider Orchid (*Caladenia arenaria*)

Pine-Donkey Orchid (*Diuris tricolor*)

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

Caladenia arenaria

Only a total of approximately 25 plants of *Caladenia arenaria* are known to occur in NSW. The species is only known from two populations, north of Narrandera and near Lake Urana. A single record of the species is listed on the OEH Wildlife Atlas as occurring in a paddock (i.e. unsuitable habitat) south of the railway line near Grong Grong. The species prefers dense stands of *Callitris* woodland and is associated with a male thynnid wasp for pollination. Little is known of the habitat requirements for the wasp.

The habitats in the study area are heavily disturbed, particularly the understorey vegetation, and dense stands of *Callitris* do not occur extensively in the area. It is therefore considered unlikely that any individuals or a viable population of this species would be present in this study area.

The proposal would require the clearing of an area approximately 0.5 hectares of potential marginal habitat along Narran Street. Potentially suitable marginal habitat for these species is present in adjacent areas along Narran Street and would not be affected by the proposal (approx. 0.5ha). The habitat that would be affected is located along a road and evidence of grazing along the road was noted. The site also contains a number of weed species and no orchid species (common or threatened) were noted in the area at the time of the targeted survey. The proposal would also not affect the movement of the associated pollinating wasp.

Given these factors, it is considered unlikely that the proposal would place a viable local population at risk of extinction.

Diuris tricolor

Diuris tricolor has a sporadic distribution and is known from an area extending south of Narrandera to the far north of NSW. Localities include the Condobolin-Nymagee road, Wattamondara towards Cowra, Cooyal, Adelong, Red Hill north of Narrandera, Coolamon, near Darlington Point, Eugowra, Girilambone, Dubbo, Muswellbrook, and several sites west of Wagga Wagga. Typically this species is recorded as common or locally frequent in populations. The Pine Donkey Orchid (formerly known as *Diuris sheaffiana*) is a terrestrial species (it grows from the ground rather than from rocks or vegetation). The Pine Donkey Orchid grows in sclerophyll forest among grass, often with native Cypress Pine (*Callitris spp.*). It is found in sandy soils, either on flats or small rises. It is also recorded from a red earth soil in a Bimble Box community in western NSW. Disturbance regimes are not known, although the species is usually recorded from disturbed habitats. Associated species include *Callitris glaucophylla*, *Eucalyptus populnea*, *Eucalyptus intertexta*, and Ironbark and Acacia shrubland. The understorey is often grassy with herbaceous plants such as *Bulbine* species.

The closest record of the species is around the Narrandera area approximately 17 kilometres from the proposal site. Potentially suitable habitat is located in the study area both within and outside the proposal

footprint. Targeted searches for this species in spring failed to find any evidence of its presence. Given the past and ongoing disturbances in the area, and given the lack of any evidence of its presence, it is considered that the species is not likely to occur in the study area.

The proposal would affect approximately 0.5 hectares of suitable habitat for this species, with a further 0.5 hectares of suitable habitat in the immediate locality not being affected. Furthermore, more extensive tracks of similar vegetation occur immediately to the east of the study area, although these areas too are subject to ongoing disturbances such as grazing and clearing.

Given these factors, it is unlikely that a viable local population of this species occurs in the study area and would be placed at risk of extinction by the proposal.

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

Not Applicable

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

Not Applicable

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

- I. The proposal would require the removal of approximately 0.5 hectares of suitable habitat from along Narran Street. This habitat is at best marginal for these species given the presence of exotic species, past soil disturbance and evidence of grazing. No orchids were found in the area although a number of Bulbine Lily individuals were present. Approximately 0.5 hectares of suitable habitat would not be affected by the works in this area.
- II. The vegetation to be removed is already in a fragmented state as a result of road construction and urban development. From a landscape context the vegetation provides little connectivity and is isolated by agricultural activities, mostly broad-acre cropping. Vegetation along Narran Street would be fragmented however given the low likelihood of occurrence of these species, it is not expected that this would affect the life cycle of these orchids.

III. Habitat to be removed as part of the works is of poor quality and suffering weed invasion and previous soil disturbance in areas. Given that these species have not been recorded in the study area previously and are considered unlikely to occur the habitats are not considered to be important to the long-term survival of either species.

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

No areas of critical habitat have been declared for these species.

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

No current Recovery Plans or Threat Abatement Plans have been prepared for *Diuris tricolor*. A recovery plan for *Caladenia arenaria* was approved in February 2004 and this assessment has been undertaken in accordance with this plan. The overall objective of the plan is to ensure all populations of *Caladenia arenaria* persist and that declines in population numbers attributable to threatening processes are reversed. Specific objectives include:

- Population demographic factors influencing recoverability are understood.
- The impact of threatening processes affecting populations is minimised.
- Long-term management strategies are developed for each *C. arenaria* population.
- The possibility of stochastic events eliminating a population are reduced

The proposal is unlikely to impact upon a population of this species and so would not contradict the objectives of the plan.

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

Key threatening processes relevant to the proposal include:

- Clearing of native vegetation.

The clearing of native vegetation is considered a major contributor to the loss of biodiversity. In its determination, the NSW Scientific Committee found that 'clearing of any area of native vegetation, including areas less than two hectares in extent, may have significant impacts on biological diversity'. Clearing can lead to direct habitat loss, habitat fragmentation and associated genetic impacts, habitat degradation and off-site impacts such as downstream sedimentation.

The proposal would require the removal of 0.5 hectares of native vegetation from along Narran Street which is considered to be marginal habitat for the Sand-hill Spider Orchid and Pine Donkey Orchid. Due to this vegetation removal the proposal can be considered to result in the operation of this key threatening process. However, the vegetation to be removed as part of this proposal is considered minor in terms of the local

extent of native vegetation in surrounding areas as well as the fragmented nature of the vegetation. As such the proposal is not likely to contribute significantly to the operation of clearing as a threatening process.

Conclusion

It is considered unlikely that viable populations of the Spider Sand-hill Orchid or the Pine Donkey orchid occur within the study area given the levels of disturbance and absence of orchid species during the targeted surveys. As such, the proposal is considered unlikely to result in the extinction of any viable populations. The removal of a very small area of habitat (0.5ha) would not be removing habitat important to the survival of these species in the context of similar habitat within the study area and locality. The proposal would not result in any substantial increases to the fragmentation of habitat for these species. Significant impacts to the Sand-hill Spider Orchid or the Pine Donkey Orchid are considered unlikely as a result of the proposal.

Bird Species

Superb Parrot (*Polytelis swainsonii*)

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

The woodland within the study locality is known to provide foraging habitat for the Superb Parrot. Hollow-bearing trees are present within the study area that could be utilised for breeding however, this is considered unlikely as Superb Parrots are known to favour River Red Gum trees for breeding and this resource is abundant along Bundidgerry Creek and the Murrumbidgee River to the south of the study area.

As such, the woodland to be removed predominantly provides movement and foraging habitat for the Superb Parrot. The proposed removal of 5.129 hectares of habitat would reduce the amount of foraging habitat available within the study area however the Superb Parrot is a highly mobile species and suitable foraging habitat is abundant in the locality. Considering this, the proposal is unlikely to place a viable local population at risk of extinction.

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

Not Applicable

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

- ii. **is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction**

Not Applicable

(d) in relation to the habitat of a threatened species, population or ecological community:

- i. **the extent to which habitat is likely to be removed or modified as a result of the action proposed, and**
- ii. **whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**
- iii. **the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality**
 - i. Approximately 5.129 hectares of Superb Parrot foraging habitat, would be removed as a result of the proposal. Ten hollow-bearing trees may be removed that provide potential breeding habitat.
 - ii. Habitat is unlikely to be fragmented as a result of the proposal. The removal of vegetation from a linear corridor of vegetation would likely increase the fragmented nature of the road reserve, as well as further increase the distance between existing patches in the landscape. However, habitat connectivity is unlikely to change substantially as the remaining vegetation would still be traversable for the Superb Parrot which is a highly mobile species.
 - iii. The proposal site and surrounding areas may provide breeding habitat, and definitely provide foraging habitat, for the Superb Parrot. In the context of extensive similar and more highly preferred habitat in the locality, it is considered unlikely that the habitat to be removed is of considerable importance to this species. The removal of 4.8 hectares of native vegetation, including up to Ten hollow-bearing trees that are unlikely to be preferred for breeding, is not considered to be important habitat for the long-term survival of the Superb Parrot in the locality.

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

No areas of critical habitat have been declared for these species.

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

There is a National Recovery Plan for the Superb Parrot (DECC 2008b). Two of the four objectives of the recovery plan are relevant to this proposal which include:

- *Increase the level of knowledge of the Superb Parrot's ecological requirements.* This includes identifying and mapping areas used for foraging during the non-breeding season, and identifying flight corridors used in the non-breeding season.

The proposal would not interfere with this objective, as information on the sighting of this species during surveys will be submitted to OEH as part of our licence agreement.

- *Develop and implement threat abatement strategies.* This includes developing and implementing a Superb Parrot 'Habitat Retention and Enhancement' policy which uses all administrative avenues (e.g. native vegetation retention Acts), to protect box-gum woodland from clearing and degradation within the range of the Superb Parrot. Also, identify and revegetate critical breaks in flight corridors.

The proposal is not consistent with this objective, as 5.129 hectares of Inland Grey Box woodland would be removed as a result of the proposal. In addition, the removal of this native vegetation may also contribute somewhat to the fragmentation of flight corridors albeit at a very minor scale.

The importance of the proposal site to this species is considered negligible, however it does provide potential breeding and foraging habitat, therefore the proposal has the potential to be inconsistent with this objective.

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

A number of key threatening processes are relevant to the Superb Parrot including:

- Clearing of native vegetation;
- Removal of dead wood and dead trees; and
- Loss of hollow-bearing trees.

The clearing of native vegetation is considered a major contributor to the loss of biodiversity. In the determination, the NSW Scientific Committee found that 'clearing of any area of native vegetation, including areas less than two hectares in extent, may have significant impacts on biological diversity'. Clearing can lead to direct habitat loss, habitat fragmentation and associated genetic impacts, habitat degradation and off-site impacts such as downstream sedimentation. The removal of 4.8 hectares of moderate to good condition native vegetation in a largely cleared landscape has the potential to increase the operation of this key threatening process.

Dead trees and dead wood that occur within the proposal site are also likely to be removed or at least relocated as part of the proposal. This may remove potential breeding habitat for the Superb Parrot however as discussed above this is unlikely to be preferred habitat. As part of the mitigation measures, it has been recommended that fallen timber is retained and placed in adjacent areas.

The proposal would remove up to ten hollow-bearing trees along the 2.4 kilometre length of the Newell Highway. This has some potential to remove breeding resources, for the Superb Parrot but again these resources are unlikely to be preferred given the close proximity of mature River Red Gum trees along Bundidgerry Creek and the Murrumbidgee River to the south of the study area. The proposal is considered to have a low potential to increase the impact of this key threatening process with regard to the Superb Parrot.

Conclusion

The Assessment of Significance has concluded that the proposal is unlikely to significantly impact the Superb Parrot. The proposal site provides foraging habitat and potentially breeding habitat for the Superb Parrot in a region which has been impacted by historical clearing. However, there are numerous patches of vegetation in the locality (10 kilometre radius) that provide similar or higher quality habitat, which is likely to be preferentially utilised by the Superb Parrot. The proposal site is also used, to an unknown degree, as a

movement corridor for the species. The proposal site is likely to remain traversable by the species. Therefore the proposal is unlikely to impact the movement patterns of the species.

Brown Treecreeper (Climacteris picumnus victoriae)

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

The Brown Treecreeper is found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range. Fallen timber is an important habitat component for foraging. Hollows in standing dead or live trees and tree stumps are essential for nesting, with breeding extending from June to January.

No Brown Treecreepers were recorded within the study area during the site visit, however there is on record of this species located in Grong Grong town centre from 1978. The majority of the study area comprises of isolated paddock trees with minimal fallen timber or foraging habitat for this species. A number of hollow bearing trees would be removed as part of the proposal, however there is an abundance of hollows present within the study locality at Bogolong Hills, along the Murrumbidgee River, and within the existing road reserve areas. This species is highly flight mobile and can traverse to other adjacent habitats within the study locality.

Given the relatively small area (5.129ha) of habitat to be removed the proposed activity is considered unlikely to have an adverse effect on the life cycle of the Brown Treecreeper such that a viable local population of the species would be placed at risk of extinction by the proposed activity.

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

Not applicable

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

Not applicable

- (d) in relation to the habitat of a threatened species, population or ecological community:**
- i. the extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

- ii. **whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**
- iii. **the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality**
 - i. Approximately 5.129 hectares of Brown Treecreeper foraging habitat, would be removed as a result of the proposal. Ten hollow-bearing trees may be removed that provide potential breeding habitat.
 - ii. Habitat is unlikely to be fragmented as a result of the proposal. The removal of vegetation from a linear corridor of vegetation would likely increase the fragmented nature of the road reserve, as well as further increase the distance between existing patches in the landscape. However, habitat connectivity is unlikely to change substantially as the remaining vegetation would still be traversable for the Brown Treecreeper which is a highly mobile species.
 - iii. The Brown Treecreeper was not recorded in the study area and there are no recent records in adjacent habitats. It is considered unlikely that this species relies on the habitats present within the study area. The small area of foraging habitat and number of hollow-bearing trees to be removed as a result of the proposal is considered minor in the context of extensive similar habitat in the locality. Habitats to be removed are highly fragmented and disturbed. The habitat to be removed is not considered important to the long-term survival of the Brown Treecreeper.

(e) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan

No areas of critical habitat have been declared for the Brown Treecreeper.

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

No Recovery plans or Threat abatements plans have been prepared for the Brown Treecreeper.

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

A number of key threatening processes are relevant to the Brown Treecreeper including:

- Clearing of native vegetation;
- Removal of dead wood and dead trees; and
- Loss of hollow-bearing trees.

The clearing of native vegetation is considered a major contributor to the loss of biodiversity. In the determination, the NSW Scientific Committee found that 'clearing of any area of native vegetation, including areas less than two hectares in extent, may have significant impacts on biological diversity'. Clearing can lead to direct habitat loss, habitat fragmentation and associated genetic impacts, habitat degradation and off-site impacts such as downstream sedimentation. The removal of 5.129 hectares of moderate to good condition

native vegetation in a largely cleared landscape has the potential to increase the operation of this key threatening process.

Dead trees and dead wood that occur within the proposal site are also likely to be removed or at least relocated as part of the proposal. This may remove potential foraging and breeding habitat for the Brown Treecreeper. As part of the mitigation measures, it has been recommended that fallen timber is retained and placed in adjacent areas.

The proposal would remove up to Ten hollow-bearing trees along the 2.4 kilometre length of the Newell Highway. This has some potential to remove breeding resources, for the Brown Treecreeper however, this species has not been recorded within the study area or adjacent habitats and is unlikely to rely on these habitat resources. The proposal is considered to have a low potential to increase the impact of this key threatening process with regard to the Brown Treecreeper.

Conclusion

The Assessment of Significance has concluded that the proposal is unlikely to significantly affect the Brown Treecreeper should they occur in the study area. This species has not been recorded within the study area or recently in adjacent habitats. The habitat to be removed is minor in the context of extensive similar habitat in the locality and given the likely low utilisation of the habitat by this species, is unlikely to be important. The proposal is considered unlikely to fragment habitat for this species or place a viable population at risk of extinction.

Grey-crowned Babbler (*Pomatostomus temporalis temporalis*)

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

Grey-crowned Babblers live and breed in co-operative territorial groups of two to fifteen individuals. They are sedentary and territorial. The breeding season extends from June to February. Nests are located in shrubs or the lower canopy of trees, usually less than six metres above the ground (Parsons Brinckerhoff 2005). Often old nest sites are renovated and re-used from year to year (Parsons Brinckerhoff 2005). A viable population is likely to contain more than 10 family groups, while populations with less than 10 groups are likely to have a high rate of extinction (Parsons Brinckerhoff, 2005). The Grey-crowned Babbler appears to be relatively disturbance tolerant as this species has been observed foraging in gardens, parks and small remnants, along fence boundaries and man-made structures near major roads (Parsons Brinckerhoff 2005). The species is a laborious flyer and is known to feed on the ground, placing it at risk of being killed by oncoming traffic.

Grey-crowned Babblers were observed in the north of the study area with four individuals observed. These individuals are likely to be part of a greater family group occurring within the broader area. No nests were observed within the study area. The ability of this species to utilise degraded roadside vegetation suggests that the proposal would not inhibit the movement of Grey-crowned Babblers through the landscape. As no nests were observed within the study area the impacts of the proposal are likely to be restricted to the removal of foraging habitat and connecting habitat. The local population would extend well beyond the small area to be impacted by the proposal.

The proposal is not considered likely to increase the risk of extinction of a local population of the species.

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

Not applicable

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

Not applicable

- (d) in relation to the habitat of a threatened species, population or ecological community:**
- i. the extent to which habitat is likely to be removed or modified as a result of the action proposed, and**
 - ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**
 - iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality**
- i. Approximately 5.129 hectares of poor to moderate condition native vegetation, providing suitable foraging and breeding habitat, would be removed as a result of the proposal.
 - ii. The removal of vegetation from a linear corridor of vegetation would likely increase the fragmented nature of the road reserve, as well as further increase the distance between existing patches in the landscape. The species is reluctant to traverse large areas of cleared land in the landscape (Parsons Brinckerhoff 2005), however the minor fragmentation as a result of the proposal would be unlikely to present a barrier to the species.
 - iii. The lack of active or past nests suggests the proposal site has not been used very recently for breeding. The study area is likely to be mostly used by this species for foraging and movement only. The minor additional fragmentation as a result of the proposal is considered unlikely to restrict movement of the species. Considering these factors and the occurrence of extensive similar habitats in the locality the habitat to be removed is not considered important to the long-term survival of the Grey-crowned Babbler in the locality.

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

No areas of critical habitat have been declared for this species.

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

The Action Plan for Australian Birds 2000 lists the Grey-crowned Babbler as near threatened. The recommendations that are relevant to the proposal include:

- Protect all woodland in which Grey-crowned Babblers are known to be resident from clearing, monitoring compliance biennially.
- Secure all Grey-crowned Babbler subpopulations found on public land through conservation management, particularly those in timber reserves or transport corridors or on local government land
- Within the Babbler's range, manage at least 15% of the pre-European area of all woodland communities on public or private land for nature conservation, using incentives where necessary
- Using appropriate incentives, undertake extension with land-holders that have suitable woodland habitat to promote sound management of remnants and encourage greater connectivity between sub-populations.
- Undertake long-term monitoring of remnant sub-populations

Offsets of suitable habitat for the Grey-crowned Babbler have been recommended as part of this Biodiversity Assessment.

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

The Proposal would result in the operation of the following key threatening processes relevant to the Grey-crowned Babbler:

- Clearing of native vegetation.
- Removal of dead wood and dead trees.
- Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners.

The clearing of native vegetation is considered a major contributor to the loss of biodiversity. In the determination, the NSW Scientific Committee found that 'clearing of any area of native vegetation, including areas less than two hectares in extent, may have significant impacts on biological diversity'. Clearing can lead to direct habitat loss, habitat fragmentation and associated genetic impacts, and habitat degradation. Given that 5.129 hectares of endangered ecological communities would be cleared as a result of the proposal, where the majority of the surrounding landscape has been historically cleared, the proposal is likely to increase the impact of this key threatening process.

Dead trees and dead wood that occur within the proposal site are also likely to be removed or relocated as part of the proposal. As part of the mitigation measures, it has been recommended that fallen timber is retained and placed in adjacent areas. The presence of scattered dead standing trees and fallen dead wood in surrounding farmland means that the removal of dead wood within the proposal site is unlikely to have a significant impact on the Grey-crowned Babbler.

The Grey-crowned Babbler has been identified as a threatened species that is adversely affected by aggressive exclusion by Noisy Miners. The Noisy Miner favours open, lightly timbered areas and habitat edges. The habitat within the study area is already highly modified and suitable for this species. The proposal is unlikely to increase the suitability of habitat. Therefore the impact of this key threatening process is unlikely to be exacerbated.

Conclusion

The Assessment of Significance has concluded that the proposal is unlikely to have a significant impact on the Grey-crowned Babbler. The habitat in the study area is unlikely to be currently utilised for breeding by this species with the habitat being used mostly for foraging and movement. Extensive foraging habitat occurs in the locality and the minor degree of additional fragmentation as a result of the proposal would not inhibit the movement of this species to these areas. The local population would extend across the broader area of habitat outside of the study area which would not be impacted by the proposal. As such, the proposal would be unlikely to reduce the long-term viability of the species or place it at risk of extinction in the locality.

ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT

The *Environment Protection and Biodiversity Conservation Act 1999* specifies factors to be taken into account in deciding whether a development is likely to significantly affect Endangered Ecological Communities, threatened species and migratory species, listed at the Commonwealth level. The following assessment assesses the significance of the likely impacts associated with the proposal on:

Endangered Ecological Communities (EECs)

- *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia – EPBC – Endangered Ecological Community*

Flora Species

- *Sand Hill Spider Orchid (Caladenia arenaria) EPBC – Endangered*

Birds

- *Superb Parrot (Polytelis swainsonii) EPBC - Vulnerable*

Assessments of Significance under the TSC Act for these communities and species have already been undertaken. Detailed information has been provided in these assessments and will be summarised here. The assessments below should be read in conjunction with the TSC Act assessments of significance.

Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

Reduce the extent of an ecological community

The proposal would remove approximately 4.0 hectares of the community. Approximately 125 hectares has been mapped in the NSW VIS as occurring within three kilometres of the study area. The small extent (3%) of the community to be removed in the local area is not considered substantial.

Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines

The 4.0 hectares of the community in the proposal site is separated from other patches of the same community by exotic-dominated vegetation, other native vegetation communities, and manmade features. The proposal is likely to increase the fragmentation of this community by widening the road impact zone and removing vegetation from this community. This will further minimise the width of these patches and cause additional fragmentation between the road-side vegetation and surrounding remnant patches of this community. This fragmentation is however, considered minor in the context of existing fragmentation across the landscape.

Adversely affect habitat critical to the survival of an ecological community.

Approximately 4.0 hectares of the community would be cleared or highly modified as a result of the proposal. Most of this vegetation consists of mature trees with an understorey of shrubs and groundcover species. Although some vegetation would be lost, this loss of habitat will not be critical to the survival of this community within the locality. With an offset strategy in place that has an objective of enhancing remnant patches, and their connectivity within the road corridor and locality through revegetation, regeneration and management, losses of this EEC due to the proposal would largely be compensated.

Modify or destroy abiotic (non-living) factors (such as water, nutrients or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns.

The proposal would modify the abiotic factors necessary for the survival of the patches of this community where direct habitat removal occurs, and where direct modification to drainage features occurs within the proposal site. However, these impacts are unlikely to affect the survival of the ecological community in the local area.

Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting.

The proposal would cause a substantial change in the species composition of this community occurring within the proposal footprint through the clearing of the vegetation within it. The composition of the community in the impact zone would be substantially and adversely modified, however, this composition would be preserved north and south of the proposal site where the community extends.

Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:

- **Assisting invasive species, that are harmful to the listed ecological community, to become established, or**
- **Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which will kill or inhibit the growth of species in the ecological community**

Interfere with the recovery of an ecological community

The removal of approximately 4.0 hectares of this ecological community from the study area would modify the patch in which it occurs. Given the current fragmentation, disturbance and edge effects, it is unlikely that the proposal will assist invasive species to become established further in the community as a result of the construction and operation of the road.

With the implementation of safeguards and management protocols, the proposal is unlikely to cause the regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community.

Although the patch of the community is already disturbed due to historical factors, any recovery of the ecological community in the patch proposed for removal will be prevented in perpetuity. With an offset strategy in place that has an objective of enhancing remnant patches, and their connectivity within the road corridor and locality through revegetation, regeneration and management, losses of this EEC due to the proposal will largely be compensated for.

Conclusion

It is likely that the proposal will have an effect on the extent, composition, and level of fragmentation of this community within the study area. However, considering the existing levels of disturbance and proportionally small area to be impacted by the proposal compared to the remaining extent of this community within the study area, the proposal works is not considered likely to have a significant impact on this community, such that it needs to be referred further.

Sand Hill Spider Orchid

An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:

Lead to a long-term decrease in the size of a population of a species?

Based on the results of the survey and assessment of habitat within the study area, it is considered unlikely that a population of the species occurs within the study area. The proposal is unlikely to result in a decrease to the size of a population

Reduce the area of occupancy of the species?

The proposal would remove approximately 0.5 hectares of habitat for this species which is considered to be marginal and unoccupied. The proposal is unlikely to reduce the area of occupancy of this species.

Fragment and existing population into two or more populations?

No existing populations are considered likely to occur within the study area. As such no populations would become fragmented as a result of the proposal.

Adversely affect habitat critical to the survival of a species?

No areas of critical habitat have been declared for this species. The habitats within the study area are modified and fragmented and not considered critical to the survival of the species.

Disrupt the breeding cycle of a population?

As discussed above, it is unlikely that a population occurs within the study area. The proposal is unlikely to disrupt the breeding cycle of a population.

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

The proposal would remove approximately 0.5 hectares of habitat for this species but as the species is unlikely to be occupying the habitat, there would be no decline in the species.

Result in invasive species that are harmful to an endangered species becoming established in the endangered species habitat or;

Introduce disease that may cause the species to decline?

The proposal has the potential to introduce weeds and pathogens that may be harmful to the species however, as the species is considered unlikely to occur, they are unlikely to harm the species. Measures have been specified within the biodiversity assessment to reduce the potential for the introduction of harmful species and pathogens.

Interfere substantially with the recovery of the species?

The proposal would remove 0.5 hectares of marginal habitat for the species. This habitat is not likely to contribute to the recovery of the species.

Conclusion

It is considered unlikely the Sand-hill Spider orchid occurs within the study area and direct impacts to the species are unlikely. The habitat to be removed is marginal and not likely to interfere with the recovery of the species. The proposal not considered likely to have a significant impact on this species, such that it needs to be referred further.

Superb Parrot

An action is likely to have a significant impact on a vulnerable if there is a real chance or possibility that it will:

Lead to a long-term decrease in the size of an important population of a species?

A population of the Superb Parrot is known to occur in the area. As this species is listed as endangered under the EPBC Act, all populations could be considered to be important. The population in the study area locality is likely to occupy a large area. Breeding is likely to be focused on riparian areas along nearby waterways including Bundidgerry Creek and the Murrumbidgee River to the south of the study area.

A small area (5.129ha) of foraging habitat and approximately ten hollow-bearing trees that could potentially be utilised by the Superb Parrot (but not preferred) would be removed. This is considered minor relative to the extensive similar or more preferred habitats in the locality and unlikely to result in a decrease to the size of the population.

Reduce the area of occupancy of an important population of a species?

The proposal would remove 5.129 hectares of potential foraging habitat in an area where similar habitat is common. The minor fragmentation that may result from the proposal would not prevent the movement of the species to other areas of habitat and as such the area of occupancy is unlikely to be reduced.

Fragment and existing important population into two or more populations?

Additional fragmentation as a result of the proposal would be minor with regard to the Superb Parrot which is a highly mobile species.

Adversely affect habitat critical to the survival of a species?

No areas of declared critical habitat occur within the study area. The habitat to be removed by the proposal is not preferred breeding habitat and not considered critical to the survival of the Superb Parrot.

Disrupt the breeding cycle of an important population?

As discussed above, the hollow-bearing trees to be impacted by the proposal are not generally preferred by the Superb Parrot in the context of the surrounding landscape where mature River Red Gums are available along waterways such as Bundidgerry Creek and the Murrumbidgee River. The proposal is unlikely to disrupt the breeding cycle of the species.

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

A relatively small area of previously modified foraging habitat would be removed by the proposal. This is considered minor in the context of similar and better habitat in the locality and unlikely to result in the decline of a highly mobile species such as the Superb Parrot.

Result in invasive species that are harmful to an endangered species becoming established in the vulnerable species habitat or;

Introduce disease that may cause the species to decline?

The proposal is unlikely to result in the introduction of any species or diseases that could cause harm to the Superb Parrot.

Interfere substantially with the recovery of the species?

The proposal is inconsistent with the objectives of the National Recovery Plan for this species however, as discussed above the impacts are relatively minor. The impacts are unlikely to interfere with the recovery of the species within the broader locality. An offset strategy will be prepared to compensate for the loss of endangered ecological communities within the study area that will also lead to positive outcomes for the Superb Parrot.

Conclusion

The habitats within the study area are not considered important for the breeding of the Superb Parrot but do provide foraging habitat and facilitate movement of the species. The area of habitat to be removed however, is relatively small compared to extensive similar habitats in the local area and the impacts associated with the removal of habitat are considered unlikely to place the local population of Superb Parrots at risk of decline. The habitat to be removed is not considered critical to the survival of the Superb Parrot nor is it likely to reduce the area of occupancy of the species. The proposal is unlikely to interfere with the recovery of the species and may contribute through the protection of habitat in the establishment of an offset area for the proposal. The proposal not considered likely to have a significant impact on this species, such that it needs to be referred further.



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