4 Project Description

4.1 Introduction

This chapter of the Environmental Assessment provides an overview of the key components of the Project along with a description of each of the associated activities. This chapter also describes:

- the Project components;
- the Project schedule;
- the Project construction methodology including specific tasks, plant and staffing requirements;
- Project operation; and
- Project decommissioning.

4.2 Project Overview

As described in **Chapter 1 Introduction**, the Project comprises:

- a 205km, 330kV transmission line and associated easement corridors incorporating pole and tower structures and comprising:
  - construction of a new 96km 330kV transmission line with a 60m easement through greenfield areas from Dumaresq Switching Station to the proposed location of the new Tenterfield 330/132kV Substation (Tenterfield 330kV Substation);
  - construction of a new 109km 330kV transmission line between Tenterfield 330kV Substation and Lismore Substation. Between the Tenterfield 330kV Substation and Casino (95km), the 330kV transmission line would be located on the route of the existing 132kV transmission line and the existing 45m easement would be extended to 60m. Between Casino and Lismore Substation (14km), the new 330kV transmission line would run adjacent to the existing 132kV transmission line (which would remain operational on completion of construction). The existing 45m easement would be extended to 90m for this section;
  - removal of 95km of the existing 132kV transmission line between the proposed Tenterfield 330kV Substation and structure 395 to the south of Casino;
- upgrades to the Lismore Substation and Dumaresq Switching Station. Upgrades would be within the existing sub/switching station footprints;
- establishment of a new 330/132kV substation approximately 14km north east of Tenterfield to maintain the existing 132kV connection to the Tenterfield 132kV Substation;
- establishment and upgrade of access tracks both within the easement and outside the easement for the purposes of transmission line construction and operational maintenance;
- replacing and restringing the existing earthwire between the new Tenterfield 330kV Substation and existing Tenterfield 132kV Substation with optical ground wire (OPGW); and
- a site storage facility with sufficient room for storage of crossarms, insulators, fittings and an area for welding/fabricating and storage of waste materials.

The location of the Project is described in **Chapter 3 Location of Works** and shown on **Figures 3-2a - 3.2ae**. The Project has been developed following the consideration of options as discussed within **Chapter 2 Project Need and Alternatives**. The construction phase of the Project is likely to last 32 months and the operational lifespan of the Project is 30 years.

The current Project cost estimate is approximately $227 million inclusive of all planning, design, environmental assessment, approvals, contract establishment, and the elements of the Project outlined in this Chapter.

At the time of preparing this EA, discussions with landowners are ongoing and will continue as the Project progresses. Whilst structure locations have been identified for the purposes of environmental assessment, it should be noted that their final location is subject to continued liaison with landowners. The final structure locations would be within previously assessed areas and take into consideration the environmental constraints. The process for assessing any changes to structure locations or access tracks is presented in **Chapter 19 Draft Statement of Commitments**. Those commitments relevant to the construction phase would be included in a Construction Environmental Management Plan (CEMP) that would be prepared once the Project is approved and prior to commencement of construction activities.

4.3 Project Components

The Project would consist of the transmission line and associated supporting structures, conductors, and earthwires as well as the transmission line easements, access tracks and establishment of a new substation and upgrade works to the existing substation infrastructure at both ends of the transmission line.

4.3.1 Transmission Line Easement

Transmission line easements are required to construct, operate and maintain the transmission lines. Easements also ensure protection of the public by controlling activities under or near the line that might otherwise create an unsafe situation. For this Project an easement width of at least 60m is required to maintain the necessary safe clearances for a 330kV transmission line. This would allow safe clearances between conductors and vegetation and would minimise the risk of lines causing bushfires, thus helping to ensure public safety and to maintain high levels of system reliability. Further information is found within TransGrid's internal policies GD AS G3 015 *Principals for the Clearing of Transmission Line Easements* and GM AS L1 002 *Easements and Access Track Maintenance Policy* (refer to **Appendix C TransGrid Policies**).

Where there are no major terrain barriers or clearing constraints along the alignment, continuous access along the easement would generally provide the simplest method of access to individual structures and easement areas.

4.3.2 Supporting Structures

The high voltage transmission line would consist of a series of support structures between which conductors and earth wires would be suspended. A total of 534 supporting structures have been identified for the Project. However this may change depending on design requirements. Supporting structures would be required at regular intervals along the line to ensure that adequate and safe clearance is maintained. The transmission line would include two basic supporting structure types – suspension and tension.

Suspension Structures

Suspension structures are designed to 'suspend' the conductors. They are typically used in straight line positions or where small angles are encountered. Suspension structures for this Project would predominantly be H-Frame arrangements as shown in **Plate 4-1**. Where required, steel tower structures may be used in a limited number of locations depending on environmental conditions (e.g. wind) and design requirements (e.g. structural loads). **Table 4-1** provides further details.

Plate 4-1 330kV H-Frame Supporting Structure

Tension Structures

Tension structures would typically only be used at Angle Positions and where other engineering requirements dictate the use of a more robust support structure. A total of 70 Angle Positions (APs) have been identified along the 205km alignment (as shown in **Figures 3-2a – 3-2ae, Section 2, Volume 3**). APs are used for the purposes of this EA as location markers and reference points along the line. They indicate where there would be a change in the angle of the alignment and are numerically ordered from west to east. **Table 4-1** provides further details.

Tension structures would be rectangular or square based steel lattice towers with typical tower heights ranging from 25m to 37m[1]. An intermediate type would be designed for angles up to 40 degrees and a 'heavy duty' type provided for angles above 40 degrees and termination positions, (e.g. at each end of the line). Tension structures are of heavier construction than suspension structures as they are designed to withstand much larger horizontal loads (resulting from directional change in the transmission line),

[1] The last two tension structures coming into Lismore Substation would be double circuit structures, supporting both the 132kV and 330kV lines. The height of these structures would be between 46m – 54m.

longitudinal loads (from the termination of the conductors on the structure), as well as vertical loads and wind loads (**Plate 4-2**).

Plate 4-2 330kV Steel Tower Tension Structure

Earthing Requirements

Tension and suspension structures would require earthing fixtures (known variously as earthing strips and earthing stakes) to 'ground' the structure and the transmission line in the event of a lightning strike. The strips and stakes would be either galvanized steel, stainless steel or copper straps depending on soil conditions. The earthing strips would be buried horizontally just below the surface while the earthing stakes would extend down vertically into the soil – each structure would have one earthing fixture per leg (four in total). **Table 4-1** shows the approximate sizes and depths of earthing strips and stakes as applied to each structure type.

A summary of the key H-Frame and steel lattice tower dimensions is provided in **Table 4-1.**

Table 4-1 Design Configuration & Dimensions

	Concrete H-Frame	Steel Lattice Tower
Typical use	Along straight line sections	At major directional changes and across gullies
Max Height	37m	37m[1]
Average Height	30m	28m
Dimensions of base	2 x 0.95m diameter poles spaced 11m apart	9.5m x 4.75m to 12.3m x 12.3m depending on design configuration.
Max Height to cross-arm	33m	31m
Cross-arm width	22m	22m – 30m

	Concrete H-Frame	Steel Lattice Tower
Foundation Type	Typically bored footing	Typically bored footing or mass concrete footing
Typical foundation depth[2]	Bored foundations 3-5m depth depending on soil and underlying rock	2-2.5m depth when mass foundations are required (soil and rock)
Typical average span across level ground	400m	400m
Typical no. and dimensions of earthing strips	2 strips (one per pole) 32mm x 5mm. These typically extend 6m horizontally 0.25-0.5m below the surface.	4 strips (one per leg) 30mm x 3mm. These typically extend 15m 0.25-0.5m below the surface.
Typical dimensions and depth of earthing stakes	< 50mm diameter extending 2.7m vertically into the ground	< 50mm diameter extending 3.5m vertically into the ground

[1] The last two tension structures coming into Lismore Substation would be structures that supporting both the 132kV and 330kV lines. The height of these structures would be between 46m – 54m.

[2] These are typical values only as precise depths will depend on specific soil conditions.

4.3.3 Conductors and Insulators

Current Carrying Conductors

The single circuit 330kV transmission line construction would require three sets of twin conductors and two overhead ground wires.

The electrical current carrying conductors would be stranded high strength aluminium alloy approximately 27mm in diameter. Fibreglass would provide insulation between the current carrying conductors and the structures. Insulation between the conductors in the span would be provided by the spacing in air.

A minimum clearance of 9m (12m above roads) would be provided for extreme operating conditions (i.e. high temperature and/or high wind conditions). Typical minimum clearance would normally be 1-2m greater than this (i.e. 10-12m). Where additional clearance is required (e.g. to cross roads or other power lines) taller supporting structures would be provided. The line would be designed to meet these clearances when the conductors are operating at their highest temperature and hence have sagged the greatest amount.

Earthwires

Overhead earthwires would be required to provide protection to the conductors from direct strike by lightning and would also be used for communication purposes with optical fibres inside the wire. In the event of a power fault the earthwires would carry a high proportion of the fault current and contribute to the safety of the line and the local environment.

Two earthwires would be fitted to each structure. They would consist of one standard ground wire and one optical fibre ground wire (OPGW) for maintenance communication along the line. The earthwire would be made of an Aluminium Conductor Steel Reinforced (ACSR) line. Both the earthwire and OPGW would have overall diameters in the order of 16mm.

4.3.4 Substations and Switching Stations

The Project would involve upgrades to the Dumaresq Switching Station and the Lismore Substation, as well as construction of the new Tenterfield 330kV Substation.

Substations contain transformers to convert electricity between different voltage levels. They also control power flows between associated power systems within the electricity supply network. Lismore converts electricity from 330kV to 132kV. The Tenterfield 330kV Substation would also convert electricity from 330kV to 132kV. Switching Stations, such as Dumaresq, do not contain power transformers, and as such do not convert between different voltage levels. However Dumaresq Switching Station does control power flows between associated power systems.

The Project would involve modifications to the Dumaresq Switching Station and Lismore Substation that currently facilitate a 330kV supply. All work related to the Project would occur within the existing sub/switching station boundaries, and would involve the installation of an additional shunt reactor and other associated electrical equipment within the switching station.

All major oil filled pieces of equipment at the substations and switching station would be located in an area serviced by a primary oil containment system and would consist of a bunded area around the equipment that would drain to a primary oil containment tank. Bunding design would comply with Australian Standard 1940 (2004) and the design, installation and operation of all substation components would follow TransGrid's *Oil Containment in Substations* policy (GD AS G2 101). Substation upgrade works involving the transport and handling of insulating oil are further considered in the **Hazard and Risk Screening Report** (refer to **Appendix I-1**).

Proposed upgrade works at the Dumaresq Switching Station and Lismore Substation are described in **Sections 4.5.12** and **4.5.13**.

The Tenterfield 330kV Substation would be approximately 14km north east of TransGrid's existing Tenterfield 132kV Substation. Construction would involve civil and electrical works for the excavation and preparation of the substation site, formation of the switchyard, and the supply and installation of electrical equipment. The construction of a services building, internal access roads, drainage, fencing and security lighting would all be components of the proposed construction work. The footprint of the new substation would be approximately 150m x 130m. The Tenterfield 330kV Substation is discussed further in **Section 4.5.14**.

4.4 Project Schedule

It is anticipated that construction of the transmission line would commence by mid 2012, subject to Project Approval being granted. For the purposes of this EA total construction time for the proposed works would be 32 months. Work would be completed in four stages. However a number of factors, e.g. weather, approvals etc, may result in revisions to timing and the order of the four stages. Indicative staging is provided below:

Stage 1- 12 months:

- Transmission line rearrangements outside Dumaresq Switching Station;
- Augmentation work at Dumaresq Switching Station;
- Construction of 330kV Transmission Line between Dumaresq Switching Station and Tenterfield 330kV Substation; and
- Construction of Tenterfield 330kV Substation.

Stage 2- 4 months:

- Dumaresq Switching Station to Tenterfield 330kV Substation transmission line connected to Tenterfield 330kV Substation;
- Tenterfield 330kV Substation connected to Tenterfield 132/22kV Substation via existing 96L 132kV transmission line; and
- Dismantling and removal of the 96L 132kV transmission line from Tenterfield 330kV Substation to Casino (Structure 396).

Stage 3- 16 months:

- Line bay augmentation at Lismore Substation;
- Construction of the 330kV Transmission Line between Tenterfield 330kV Substation and Lismore Substation; and
- Replacement and restringing of existing earthwire between Tenterfield 330kV Substation and Tenterfield 132kV Substation with OPGW on remaining section of 96L.

Stage 4- Commissioning and Operation:

- New Dumaresq to Lismore 330kV Transmission Line and Tenterfield 330kV Substation operational.

These stages are illustrated in **Figures 4-1 to 4-4** below.

Figure 4-1 Construction Stage 1

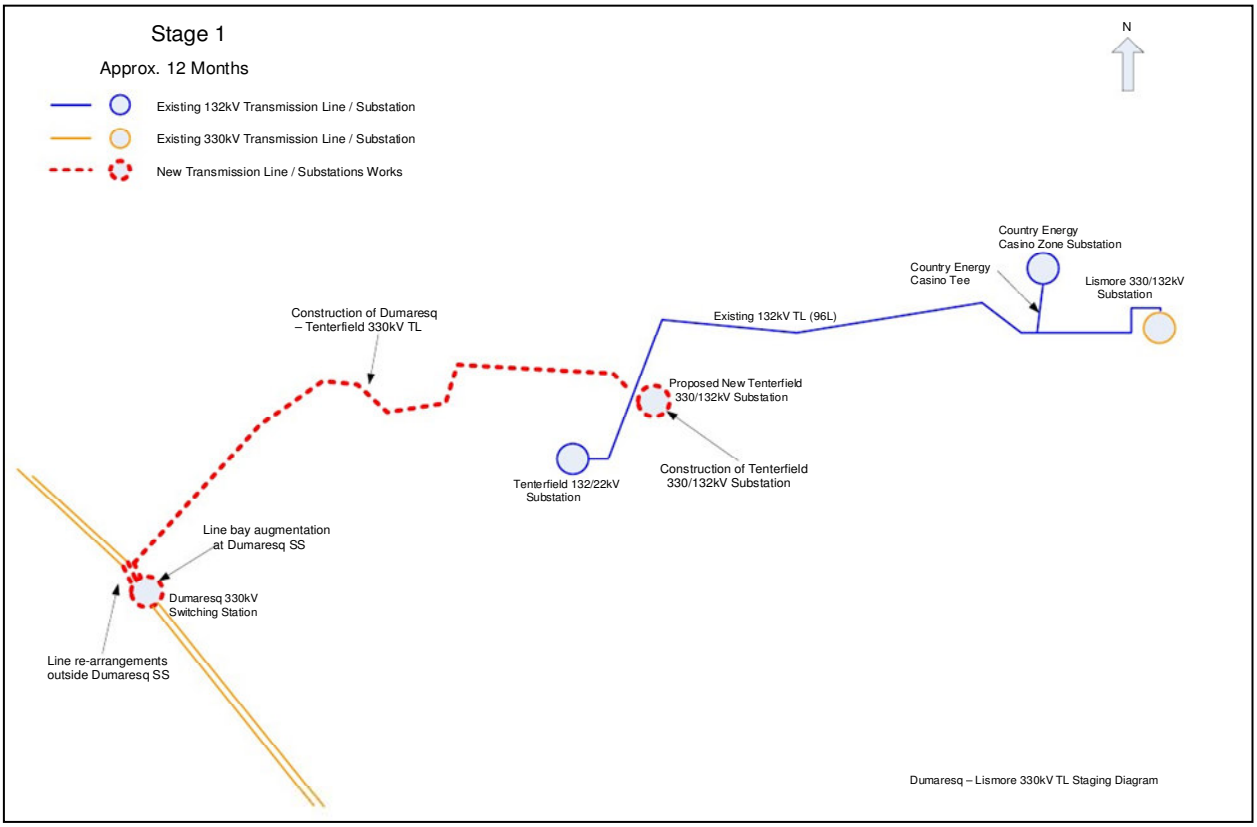


Figure 4-2 Construction Stage 2

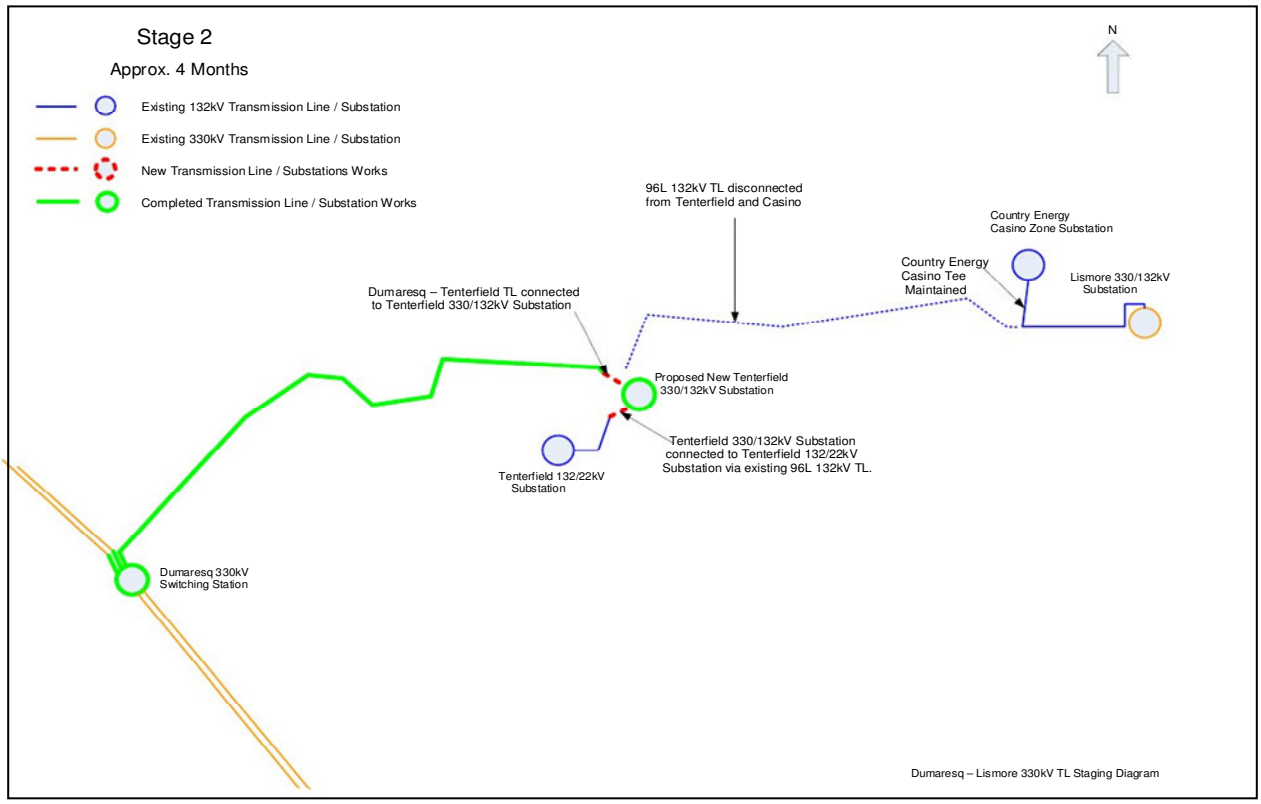


Figure 4-3 Construction Stage 3

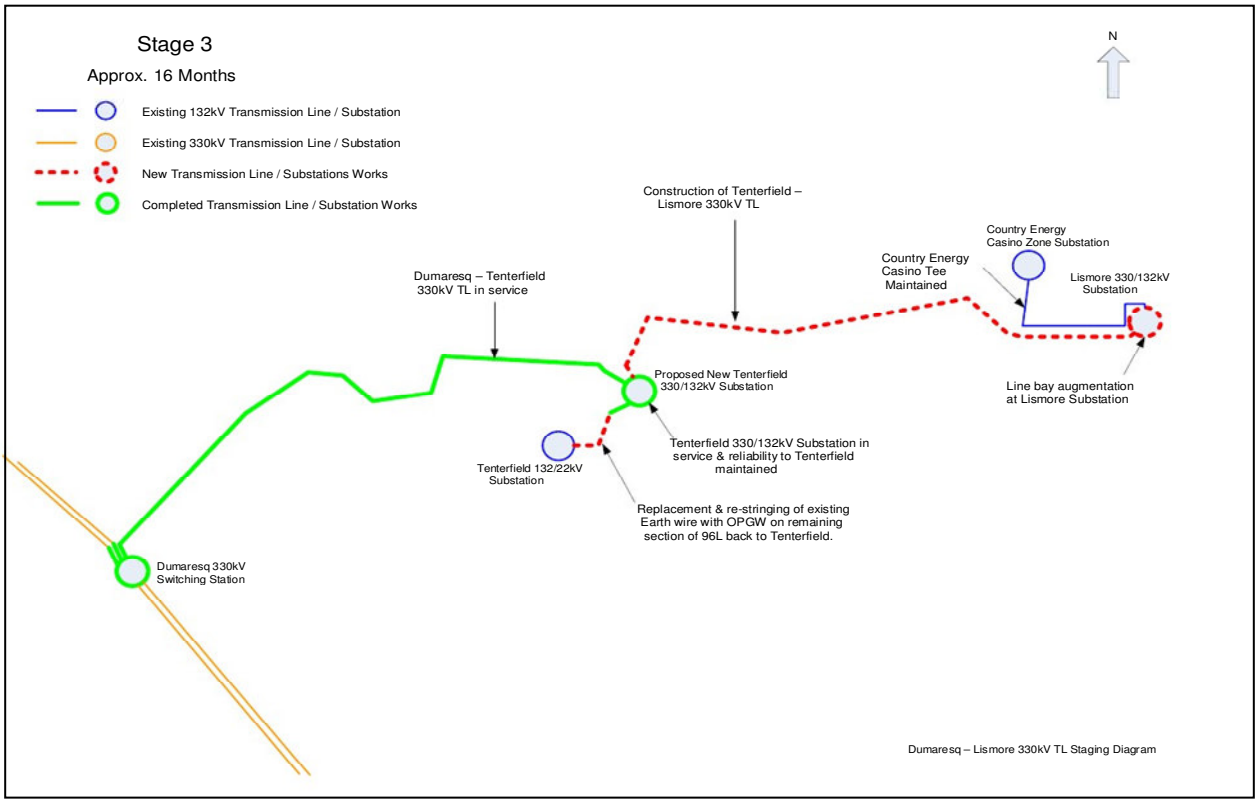
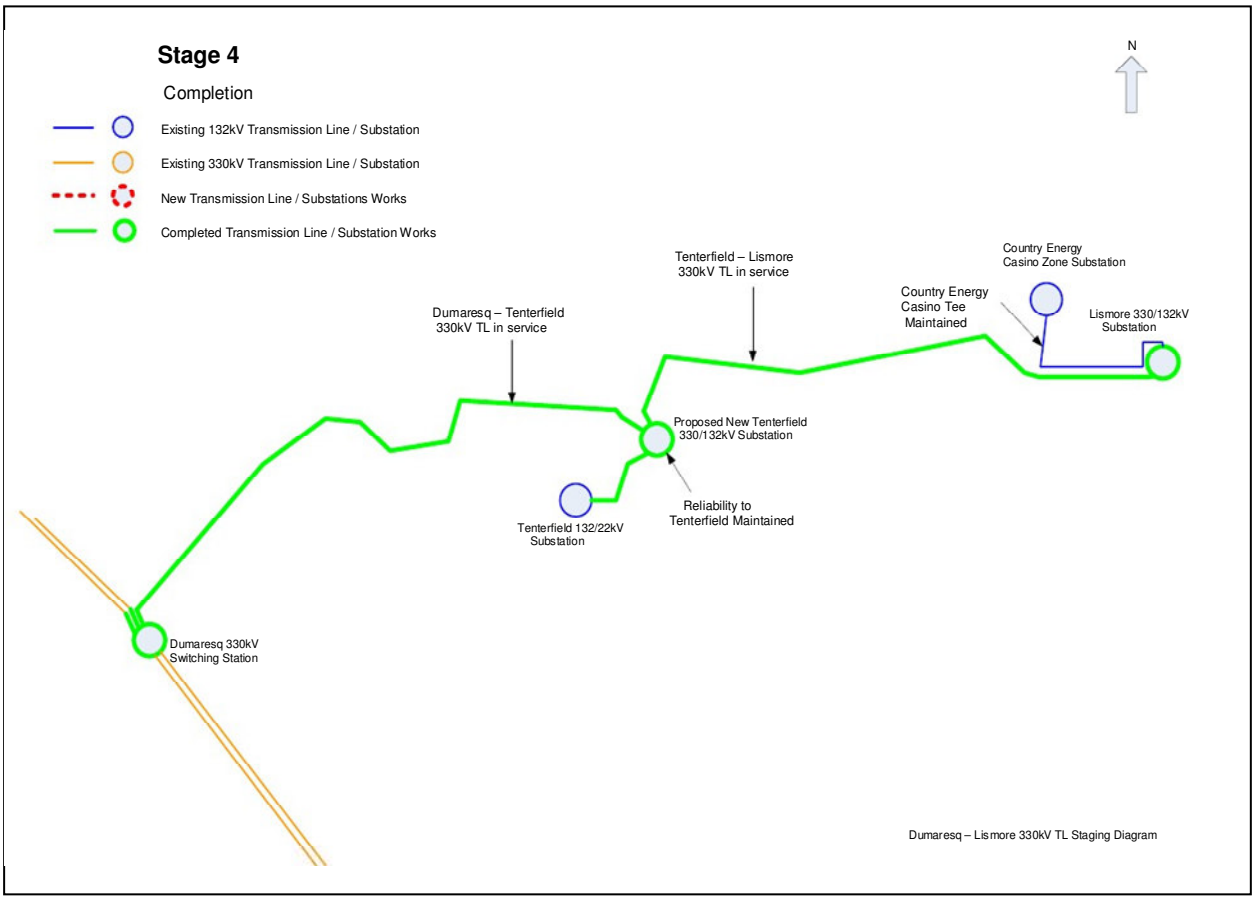


Figure 4-4 Construction Stage 4



4.5 Construction Methodology

4.5.1 Overview of Construction Sequence

Project construction for the transmission line, easement and structures would comprise the following steps. It should be noted that a number of these steps are likely to overlap:

- pre-construction activities including site inspections, centreline and easement surveys, structure pegging, and identification and marking out of existing underground services;
- installation of environmental mitigation measures such as fencing, erosion and sediment controls, basins etc;
- access track upgrading and / or construction of new access tracks as required;
- establishment of a temporary site office with amenities and sufficient room for storage of plant, equipment and waste materials;
- installation of temporary and permanent fences and gates as required and agreed upon between the proponent and affected landholders;
- dismantling of the existing 132kV transmission line from Tenterfield 330kV Substation to Structure 396 south of Casino;

- vegetation clearing along the new 60m wide easements as required for access and safety purposes. TransGrid must maintain adequate clearance between transmission line conductors and vegetation;
- site preparation for steel tower and concrete H-frame foundation work including any necessary benching, excavation and controlled blasting as required for establishing work pad sites;
- installation of steel tower and concrete H-frame structures;
- conductor and earthwire stringing between each of the supporting structures; and
- rehabilitation, including slope stabilisation works and revegetation at work site areas as required.

Construction phases for the upgrade works to Dumaresq Switching Station and Lismore Substation as well as construction of the Tenterfield 330kV Substation are described in **Section 4.5.12, Section 4.5.13 and Section 4.5.14** respectively.

The construction methodology for installing the OPGW between Tenterfield 330kV Substation and Tenterfield 132kV Substation is described in **Section 4.5.15**.

4.5.2 Plant and Equipment

Plant and equipment to be used for construction of the 330kV transmission line, associated easement and access track works would comprise:

- 12-14 x multi wheel drive trucks;
- 2-4 x long articulated and oversize truck for steel tower and H-frame delivery;
- 10 x concrete trucks;
- 2 x multi wheel drive truck mounted drilling rig;
- 2 x boring machine;
- 2 x winches/brakes;
- 2 x cranes (1 x 50 tonne, 1 x 35 tonne);
- 2 x franna cranes;
- 2 x roller compactor;
- 2 x bulldozer;
- 5 x excavators;
- 2 x bobcat/backhoe;
- 4 x EWPs;
- 1 x telehandler;
- 2 x timber mulchers (wheel or track mounted); and
- 25-30 x 4WD.

Exact requirements for the number of each item would depend upon the finalised work program. Construction activities would proceed concurrently at a number of locations along the alignment. Materials for the transmission line construction would include steel and concrete for the supporting structures and foundation works, as well as steel and copper for the earthing strips.

4.5.3 Construction Workforce

The workforce engaged on the Project would vary during the construction program and would depend on the specific activities underway. It is estimated that construction would require approximately 20 workers during the early establishment stage increasing to more than 200 during the peak stages. This workforce would be distributed in teams at various locations along the line.

4.5.4 Working Hours

Working hours across all proposed works would be 7.00am to 6.00pm Monday to Friday and 8.00am to 1.00pm on Saturday. Previous transmission line construction activities have required work to be undertaken outside of normal working hours at the request of the RTA or police for activities such as the delivery of oversized loads (poles, steel towers or other materials). Any work to be carried out outside the hours stated, on a Sunday or public holiday would be subject to discussion with affected landholders and any relevant authorities in accordance with DECCW guidelines.

4.5.5 Vegetation Clearing Protocol

Clearing of vegetation likely to infringe upon the necessary safety clearances for the proposed transmission line would be required in order for the Project to proceed. Equally construction of the new and upgraded access tracks would also require vegetation clearance. All vegetation clearance would take place in line with any issued conditions of consent and be carried out in accordance with TransGrid's *Easements and Access Track Maintenance Policy* (GM AS L1 002) provided within **Appendix C TransGrid Policies.**

Along the easement, clearing would generally be undertaken to a level where the remaining vegetation could be maintained by periodic slashing and chemical control. Beyond the easement boundaries, any trees that could infringe electrical clearance requirements under high wind conditions or fall on the line would be selectively removed in accordance with Clause 48 of the Electricity Supply Act 1995.

In areas where extensive vegetation removal is required, larger equipment such as a "tree pusher" would be used for the safe removal of larger trees, without leaving a stump. Where tree and stump cover is removed from the transmission line easement, the extent of bare earth would be minimised and vegetation that does not need to be removed for ongoing maintenance would remain.

Clearing requirements across the easement (outside the footprint for the supporting structures, worksites and access tracks) would be assessed on a case by case basis and would depend on the type of topography, vegetation and height of conductors. In general:

- where possible ground layer vegetation would be retained;
- some shrubs and trees would be maintained where they to do not exceed clearance requirements to overhead conductors;
- at spans where topography allows (i.e. gullies and escarpments) vegetation would be retained where conductor height is sufficient to make clearing unnecessary;
- in environmentally sensitive areas such as where Threatened Ecological Communities (TECs), significant threatened species habitat, water courses or steeply sloping lands have been identified, restrictive clearing practices would be applied in conformance with relevant approvals, typically enabling vegetation with a mature height of 4m or less to be left in situ;
- habitat features such as felled hollow bearing trees and woody debris (Gibbons et al., 2005) to be relocated to adjoining vegetation areas to enhance local fauna habitat; and
- where possible, key vegetation within the alignment, to be retained between continuous vegetated patches to maintain and enhance key fauna movement corridors throughout the region.

Such locations would be identified in the Fauna Management Plan as part of the Project CEMP following preclearance surveys (refer to **Chapter 9 Biodiversity**). Connectivity is discussed in the Biodiversity Report (**Appendix F Biodiversity**) and is also included in the Biodiversity mitigation measures. Detailed vegetation mapping of the proposed transmission line route has been undertaken as part of the

biodiversity assessment and estimates regarding the level of vegetation clearing have been made. The impact assessment of the anticipated vegetation clearance requirements for the Project is presented in **Chapter 9 Biodiversity.**

4.5.6 Establishment of Access Tracks

Access to sites proposed for structures along the alignment would be required to facilitate their construction. Access tracks would be established to ensure plant, machinery, equipment and materials could be transported from the existing road network to each proposed work site for the duration of the construction phase. The majority of the tracks would be retained during the operational life of the transmission line for maintenance purposes.

For the purposes of construction, access to each structure site would be required for a truck-mounted auger and excavator, one or two steel tower erection cranes, trucks transporting the supporting structure components and concrete trucks. Tracks would generally be between 4m – 6m wide (depending on topography, environmental conditions and route).

Access tracks would be required both within the transmission line easement (on-easement) and outside the easement to link to the existing road network (off-easement).

The identification of locations has taken into consideration land owner requirements and has aimed to minimise disturbance to the overall environment in accordance with the recommendations contained in the "*Guidelines for the Planning, Construction and Maintenance of Access Tracks*" (Department of Land, Water and Conservation (DLWC), 1994). The principles for selecting the location of access tracks included:

- site assessment involving TransGrid and landowners wherever possible;
- minimising disturbance to soils, vegetation, protected ecological features and sensitive heritage features;
- minimising the number of watercourse and drainage line crossings;
- avoiding steep cross slopes and waterlogged land; and
- taking advantage of topographic opportunities, such as locating the track on high ground to minimise drainage requirements, and following the contour of the land to reduce requirements for cut and fill work.

Existing access tracks would be used wherever possible, particularly in alignment east, where a number of existing tracks currently facilitate maintenance of the existing 132kV transmission line.

Construction of some of the access tracks would require vegetation clearance. All vegetation clearance would take place in line with any issued conditions of consent and be carried out in accordance with TransGrid's *Easements and Access Track Maintenance Policy* (GM AS L1 002) provided within **Appendix C TransGrid Policies.**

Figures 3-2a – 3-2ae show the location of the proposed access tracks. The tracks have been split into three categories depending on the level and type of work required. The three categories are:

- **Category 1**: minimal work required. This would include removal of surface obstacles and/ or minor upgrades to existing tracks (i.e. resurfacing, widening etc.). Some imported sand and gravel may be required.

- **Category 2**: earth works required. Construction of tracks through flat or undulating timbered / rocky areas where existing tracks do not exist. These can range from tracks required over flat plains country, or involve the formation of tracks after cut and fill, rock removal and / or levelling. Newly constructed Category 2 access tracks would typically be topped with approved gravel. Access tracks would be appropriately compacted and graded and include drainage in the direction of the cross fall to ensure tracks could be maintained and erosion impacts from run off minimised over their operational life.
- **Category 3**: earth works required in wet or swampy areas. Typically construction would require excavation of unstable material, drainage works and the import of rock material. This rock would be placed upon a geotextile material to provide a stable surface to facilitate the movement of required construction plant and equipment.

A width of 6m has been assessed for all access tracks required for the Project. Indicative access track lengths are presented in **Table 4-2**.

Table 4-2 Summary Table of Access Track Information

	On-easement access tracks (km)	Off-easement access tracks (km)	Total (km)
Length of Category 1 Access Tracks	42	62	104
Length of Category 2 Access Tracks	58	95	153
Length of Category 3 Access Tracks	7	2	9
Total length of new access tracks	107	159	266

*Note: All of these numbers are approximate. They would be confirmed during the pre-construction design phase. Refer to **Section 19.3 Chapter 19 Draft Statement of Commitments**.

No defined access tracks exist within the Casino to Lismore section. However, a number of roads run close to the existing 132kV alignment. Access to this part of the alignment would be from these existing roads. The precise route from the road to the proposed structure would depend on specific weather and soil conditions and the use of the land for that particular growing season. Access to the proposed structures would take place in consultation with landholders.

Principles that would be followed as part of the design and construction of the access tracks include:

- access across paddocks not requiring constructed tracks would occur under conditions that would limit any damage to soils and vegetation within the paddocks. In the event that mesh and or gravel is needed to obtain access, the work would be undertaken in consultation with the landholder;
- any new access tracks would follow the contour of the land as far as possible, minimising earthworks and drainage requirements;
- stormwater would be controlled by construction of table drains with mitre drains as required, and cross drains to control concentration of runoff;
- temporary erosion control measures would be installed during the construction work. Measures would include the installation of silt fences, hay bales and drains as required;
- erosion control measures would be monitored and maintained during the construction works to ensure that their effectiveness is maintained; and
- where additional material is required for the construction of tracks, local material would be used where suitable material is available. The construction of access tracks and associated environmental management would be included in the CEMP.

Establishment of access tracks and the movement of vehicles, plant and equipment to and along the easement would require the construction of a number of creek crossings. Field teams have identified areas requiring the installation of new creek crossings, as well as existing creek crossings where upgrades would be required. The location of identified creek crossings is illustrated in **Figures 3-2a-3-2ae**. In accordance with the published guidelines available from the NSW Department of Primary Industries and NSW Fisheries, the design of creek crossings would be site specific and potential crossing types may range from the installation of culverts and bridges, to fords, wet crossings or causeway types. **Chapter 8 Groundwater and Surface Water** and **Appendix E** provide further detail of identified watercourse crossings along with assessment of potential impacts.

4.5.7 Establishment of Transmission Line Work Sites

Work site areas comprise the location of each supporting structure and the immediate surrounding area within the easement which would be used as a temporary lay-down area for plant and equipment used to erect each structure and for future maintenance work. The actual size of the footprint required for each structure and its associated worksite would be determined on a site by site basis and is influenced by topography and other environmental factors. However it has been assumed for the purposes of this assessment that each structure would require 21m radius area to be cleared. This area would fall within the proposed easement.

Additional benching of the underlying ground surface may be required adjacent to each work site location where sloped terrain is encountered. The equipment used during the construction phase would require a level area, which would be created by cut and fill methods in areas which have undulating topography. The bench area required for the use of cranes and the elevated work platform (EWP) would be approximately 8m by 4m. Soil disturbance works with the appropriate soil erosion controls would only be carried out at locations where this would be required for the safe operation of equipment during construction. Where required, gravelling would be used at work sites, dependent upon terrain. It is anticipated that the majority of the worksites would be allowed to revegetate naturally at the conclusion of works. However, where benching has taken place this work would be retained for maintenance purposes. All benching works would fall within the proposed easement.

4.5.8 Foundation Construction

The construction of self supporting structure foundations for H-frame structures would involve boring or excavating a hole for each pole, installing a steel reinforcement cage followed by a concrete pour. Where the underlying geology allows, poles would be lowered into the holes and the concrete would be backfilled to the appropriate level. The following foundations would be required:

- 2.3 - 2.5m deep when mass foundations are required (soil and rock);
- 2.2 - 2.4m deep when pad footings are required (soil); and
- 3 - 5m deep when bored footings are required - depth would depend on soil structure, underlying rock conditions and the required footing type.

Foundations for steel tower structures can be bored, mass or pad type constructions. Excavation of bored foundations would be by truck-mounted auger. Backhoes or track-mounted excavators would be used to excavate mass concrete foundations. In extreme situations, rock drilling using a truck mounted air compressor, or controlled blasting, may be required. Alternative foundation types would be used where the ground conditions are not suitable for bored piles.

More substantial foundations would be required for the heavier tension steel towers, depending on ground conditions and topography. Construction would involve open excavation, the installation of the framework, pouring of concrete and subsequent backfilling of the excavation. These foundations would take longer to install and would cause more disturbance than the construction of bored tower foundations. In steeper terrain it may also be necessary to create a level bench at a number of structure sites to provide a level working area for construction crew and equipment.

4.5.9 Structure Erection

The term 'structure erection' refers to a sequence of activities from delivery to site, pre-assembly, erection, revision (tightening of bolts) and inspection of each supporting structure. For this Project it is expected that the majority of structures would be assembled at the worksite. However, steep terrain or other site features may require the structure to be assembled in advance and delivered to site. Mobile cranes would be used to move members and sections about the worksite and a work crew would bolt steel members together (**Plate 4-3**).

The work at each pole and steel tower site is expected to take approximately four days over a six week period to complete (weather permitting and accounting for concrete set period of approximately 28 days). This would involve:

- a day to establish the work pad (if required) and undertake site preparation;
- a day to auger the holes;
- a day to prepare the required foundations; and
- a day to erect each structure.

A tower erection team would consist of approximately 12 people. It is likely that there would be a number of structure erection teams allowing structure work to be carried out across both the eastern and western portions of the line simultaneously.

Plate 4-3 Steel Tower Assembly

4.5.10 Conductor and Earthwire Stringing

A process called 'Tension Stringing' would be used to string the conductors between the various structures. This process would ensure that the conductors remain above the ground at all locations in each stringing section. The work would be completed along the line as construction progresses.

Appropriate drum and winch sites providing stable platform areas would be set up as this process continues along the line. The extent of earthworks carried out at these sites would be determined by the underlying topography. Minimal site preparation would be required across relatively flat pasture areas. However, more significant bulk earthworks including benching may be required across the range areas.

The stringing process would be completed by helicopter along the majority of the alignment. The helicopter would string out a light weight winch rope, which would then be manually raised with a crane and the rope threaded through the sheaves (insulators) of each tower. The rope would be tensioned with a winch and braking machine on the ground. Where it is not possible to use a helicopter to string out the line, this would be done from a vehicle travelling along the easement.

When the section of conductor or earthwire is in place, the tension of the line is adjusted and the line is then terminated (refer to **Plate 4-4**).

A stringing/tensioning team consisting of approximately 18 people would work from one end of the works to the other, sequentially. More than one site would therefore be under construction at any one time. It is expected that each 5km section of line would take two weeks to string with the actual pulling out of the conductors taking two days. The remainder of the time would be required for preparation and final tensioning.

Plate 4-4 Termination Work Following Stringing

4.5.11 Existing 132kV Line Dismantling

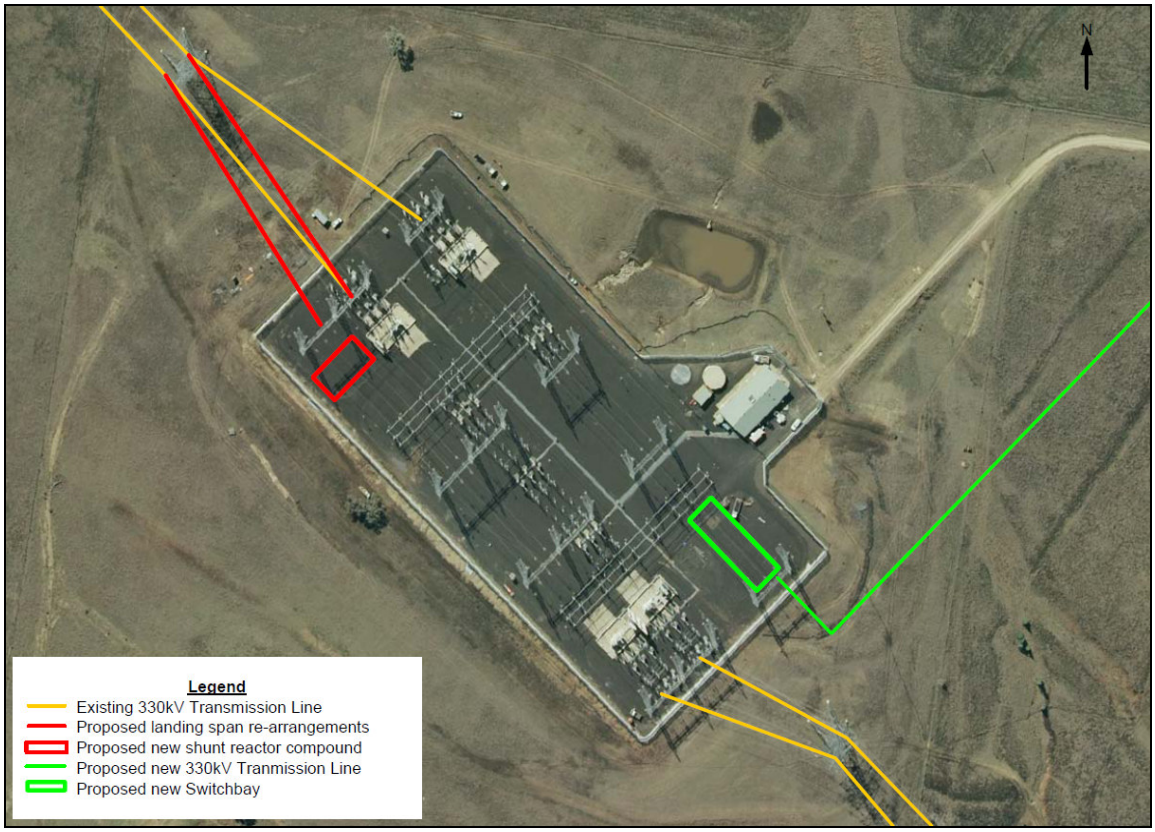
Dismantling of the existing 132kV transmission line from the Tenterfield 330kV Substation to the Casino Tee (Structure 396) would involve the removal of conductors and earthwires under partial tension to be wound onto cable drums. Pole structures would be dismantled and the poles removed from the ground. Wherever possible, timber poles would be lifted out of the ground with the pole butt intact. In the event that a pole cannot be removed in this manner owing to ground swell resistance, the pole would be cut near ground level and the butt removed from the ground by excavation. Guy anchor rods would be cut 0.5m below ground where the land is capable of cultivation and at least 0.3m below ground elsewhere. The remainder of the anchor would remain buried on the easement. Spoil would be appropriately managed and stockpiled prior to offsite disposal (where required) in accordance with the CEMP. Should the pre-construction soil sampling procedure (refer to **Chapter 7 Soils, Geology and Topography**) not indicate pesticide presence, soil from the surface around existing poles would be disposed of in the bottom of pole holes, with clean soil used for the final backfill obtained from excavations for the new line.

4.5.12 Dumaresq 330kV Switching Station Upgrade

An additional switchbay would be constructed within the Dumaresq Switching Station to accommodate the new 330kV transmission line. The upgrade works would require a reconfiguration of the internal layout of the switchyard, with a number of rearrangements to electrical components being undertaken. **Plate 4-5** shows the proposed upgrade works to be carried out.

The proposed works would be contained within the current Dumaresq Switching Station and would not require any expansion beyond the current footprint.

Plate 4-5 Proposed Dumaresq Switching Station Works



The upgrade work would be completed over a six month period. The upgrade would involve the following phases:

- site preparation and minor earthworks;
- civil, steel, building and electrical works;
- erection of switchgear and other plant;
- transmission line connections; and
- commissioning.

The amount of earthworks at the site is likely to be minimal as the bench on this site already exists.

Approximately 25 staff would be on site for the construction phase at any one time. The following plant would be used to complete the upgrade works:

- 1 x bulldozers;
- 2 x excavators;
- 2 x roller compactor;
- 4 x trucks (articulated and non-articulated) ;
- 4 x whacker rammers ;
- 2 x concrete trucks and pumps ;
- 2 x cable trucks ;
- 2 x EWPs ;
- 1 x cable winch/brake ;
- 2 x mobile crane ;
- high voltage testing equipment; and
- telehandler.

4.5.13 Lismore 330kV Substation Upgrade

As part of the proposed upgrade works, a new 330kV shunt reactor would be installed at the existing Lismore Substation. The existing bus sections (electrical connection between multiple electrical devices) would be modified to allow the new Dumaresq connection to be separate from the existing transmission line to Armidale.

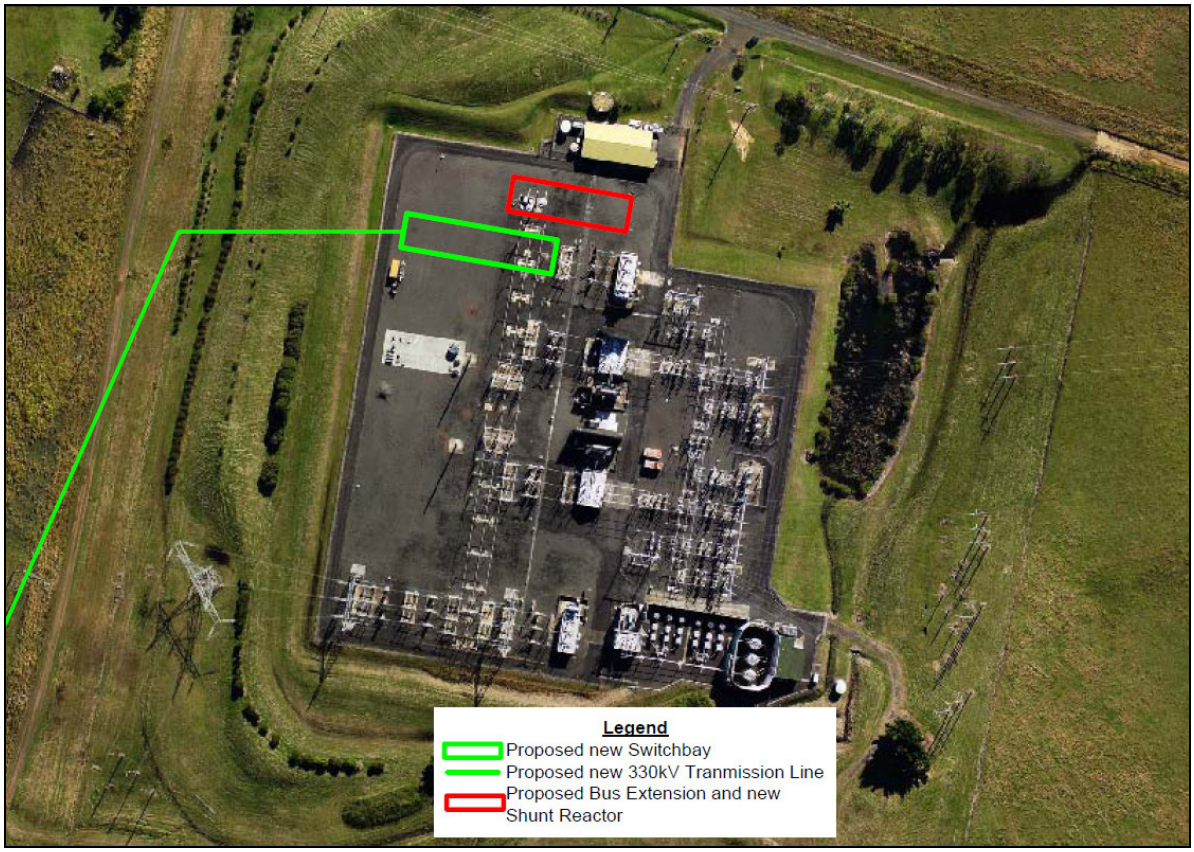
The proposed works would be contained within the current Lismore Substation and would not require any expansion beyond the current footprint. **Plate 4-6** outlines the proposed upgrade works.

The upgrade work would be completed over approximately an eight month period. The upgrade would involve the following phases:

- site preparation and minor earthworks;
- civil, steel, building and electrical works;
- erection of switchgear and other plant;
- transmission line connections;
- commissioning; and
- site shed – fence off area.

The amount of earthworks at the site is likely to be minimal as the bench on this site already exists.

Plate 4-6 Lismore Substation Works



A maximum of 25 staff would be on site for the construction phase at any one time. The following plant would be used to complete the upgrade works:

- 2 x excavators;
- 4 x trucks (articulated and non-articulated) ;
- 2 x concrete trucks and pumps ;
- 2 x cable trucks ;
- 2 x EWPs;
- 1 x cable winch/brake ;
- 2 x mobile crane ;
- high voltage testing equipment; and
- telehandler

4.5.14 Tenterfield 330kV Substation

A new 330/132kV substation would be established approximately 14km north-east of the existing Tenterfield 132/22kV substation. **Figures 3-2p** and **3-3p** within **Section 2** of **Volume 3** show the proposed Tenterfield 330kV Substation site. The preferred location is close to AP40, within DP 751541, Lot 86.

Substation construction would involve the excavation and preparation of a substation site with approximate dimensions of 150m x 130m. Construction works for the proposed Tenterfield 330kV Substation are expected to occur over a 12 month period starting in late 2011. Construction would follow the phases listed below:

- site preparation of the substation compound and set-up including vegetation clearing;
- bulk earthworks;
- steel works, building works, erection of switchgear and other plant, and electrical works;
- overhead transmission line connections;
- commissioning of the proposed substation; and
- site landscaping and securing.

Table 4-3 below outlines the key construction phases, the length of time for each phase, the approximate number of personnel each phase would require and plant required for each phase. Approximately five permanent contractor staff would be deployed throughout the construction period supervising additional teams of up to 20 staff when required. In addition, TransGrid staff would be present for the purposes of supervision and inspection.

Table 4-3 Staff and Plant Requirements for Construction of the Tenterfield 330kV Substation

Construction phase	Programme	Construction Staff (approximate)	Construction Plant	
			Item	Number
Site preparation	1 month	10	Mulcher/ chipper	1
			Bulldozers	1
			Trucks	1
			Elevated work platforms	1
Bulk earthworks	2 months	10	Bulldozers	1
			Excavators	1
			Scrapers	1
			Roller compactor	2
			Trucks	4
			Grader	1
			Water truck	1
Steel works, building works, erection of switchgear and other plant, and electrical works	6 months	30	Trucks	4
			Mobile crane	2
			Whacker rammers	4
			Concrete trucks and pumps	2
			Roller compactor	2
			Excavators	2
			Bobcat	1
			Telehandler	1

Construction phase	Programme	Construction Staff (approximate)	Construction Plant	
			Item	Number
Transmission line connections	1 month	30	Cable trucks	2
			Elevated work platforms	2
			Cable winch/brake	1
			Mobile crane	1
Commissioning	1 month	10	High voltage testing equipment.	
Site landscaping and securing	2 weeks	5	Trucks	1
			Excavator	1
			Bobcat	1

To be fully functional the new substation would require:

- installation of one 330kV and one 132kV busbar;
- construction of one transformer compound for the installation of one 330/132kV 200 Mega Volt Ampere (MVA) transformer;
- construction of one reactor compound for the installation of one 330kV 150 Mega Volt Ampere reactive (MVAr) reactor;
- installation of one 330kV and one 132kV line and transformer bay;
- installation of one 330kV line reactor bay;
- connection to the existing Tenterfield – Lismore 132kV transmission line;
- connection to the proposed Dumaresq – Lismore 330kV transmission line; and
- installation and provision of electrical protection, control, metering, cabling and communication equipment.

Temporary facilities established for the construction period would consist of demountable buildings for use as an office, staff amenities, and storage areas for materials and equipment with temporary power obtained using portable generators. Temporary drainage and sediment controls (refer to **Chapter 8 Surface Water and Hydrology**) would be installed to collect surface water flows from areas likely to be disturbed during construction. All temporary facilities would be located within the same lot as the proposed substation and would be removed at the end of the works.

The earthworks involved are likely to require sediment control pond(s), sediment fencing and temporary drainage structures. Any disturbed areas as a result of construction activities that fall outside the substation would be stabilised with vegetation as soon as possible following the completion of earthworks (refer to **Chapter 7 Soils, Geology and Topography**). Area disturbed areas inside the substation compound would be levelled and finished with aggregate.

Works at the substation would also include the construction of internal access roads, primary and secondary oil containment systems, an auxiliary services building, a secondary systems building, the construction and installation of appropriate switchyard drainage, and the installation of appropriate switchyard fencing, security and lighting.

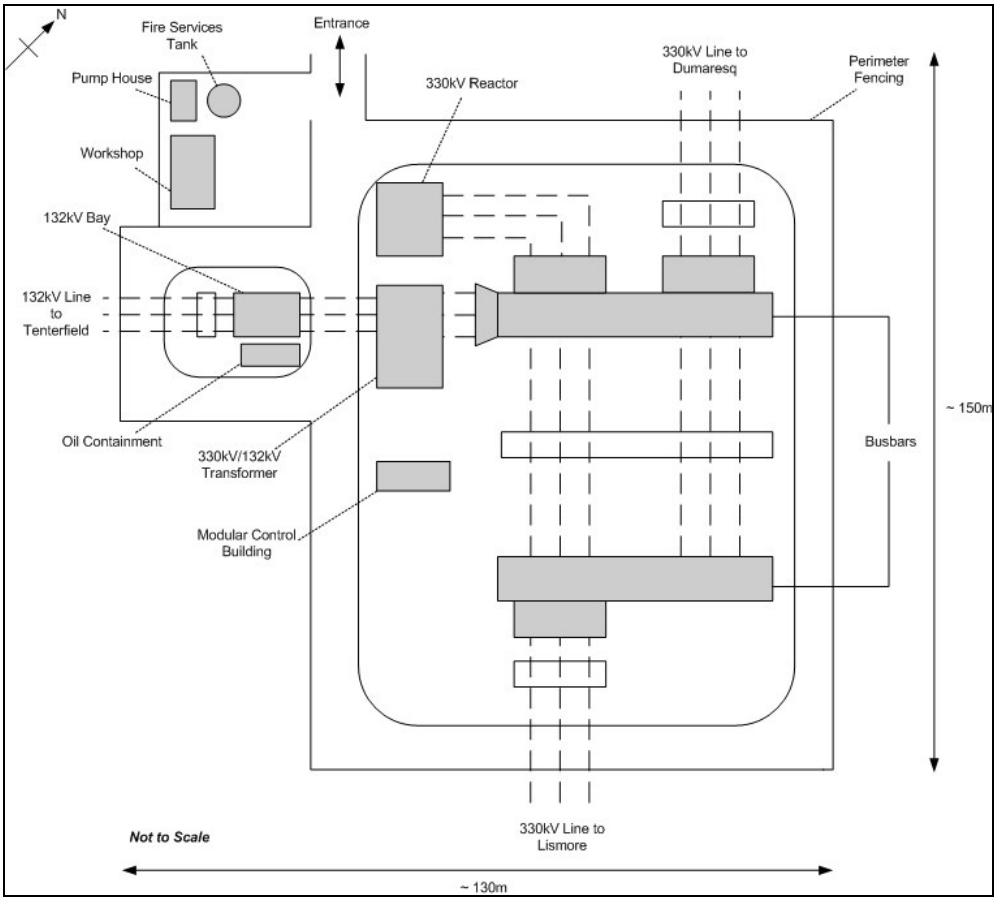
Landscaping options (refer to **Chapter 12 Landscape and Visual**) would be considered at the detailed design stage and would consider species selection and maintenance requirements. Revegetation of disturbed areas would take place at the earliest opportunity following bulk earthworks.

The new substation would require a three-phase 330/132kV 200MVA power transformer and a 330kV 150MVAr shunt reactor. These units would be approximately 4.5m high (with electrical bushings extending up to 9m in height), 4.7m wide and 5.4m deep. They would contain approximately 76,000L of oil each.

The transformer and reactor tank and cooler would be located within a concrete compound that would serve as the primary oil containment bund and connect to the oil containment system for the site (refer to **Chapter 16 Bushfire, Hazard and Risk**).

Figure 4-5 provides an indicative layout of the new substation. A visual representation is provided in **Appendix H Landscape and Visual.**

Figure 4-5 Indicative Layout of Tenterfield 330kV Substation



4.5.15 OPGW Upgrade between Tenterfield 330kV and Tenterfield 132kV Substations

Stage 3 of the construction works would involve the replacement and re-stringing of existing earth wire with OPGW on the remaining section of the 132kV line back to Tenterfield. This work is expected to take approximately two months.

Existing access tracks would be used to move the necessary equipment from the road network to the retained section of the 132kV transmission line. An assessment of the transmission line and the existing structures would take place to understand how many 'pulls'[2] would be required and which poles would be safest to use to pull the new OPGW up into place. It is estimated that three pulls of around 4-5km would be required.

Prior to the new line being installed, the existing transmission line may be taken out of service. To facilitate the replacement works, the existing conductors would be lowered during the stringing period. Alternatively temporary hurdles may be installed to allow the transmission line to remain in service during the stringing of the new OPGW.

The replacement work would be completed by:

- Identifying an existing earthwire as a draw wire (i.e. the wire used to pull the OPGW along the transmission line);
- Back anchoring the indentified structures to ensure stability during the pull;
- Setting up brake and winch positions to pull the draw wire and OPGW along the transmission line;
- Pulling the draw wire and OPGW along the transmission line under tension;
- Pulling the OPGW up to its final tension and fixing to the structures by placing in suspension clamps; and
- Removing any back-anchors and completing any remediation work.

The following plant would be required:

- 1 x excavator (if benching required) ;
- 1 x mobile crane (if hurdles required) ;
- 2 x EWPs;
- 5 x 4WD vehicles ; and
- 3 x multi wheel drive trucks – to transport conductor, winch & brake.

The number of staff needed to complete this work may vary slightly depending on weather conditions, and the final construction methodology. However it is estimated that approximately eight personnel would be required.

4.5.16 Rehabilitation

Erosion control measures would be implemented at each work site in accordance with "*Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom, 2004) *and Volume 2* (DECC, 2008)" (The Blue Book Volumes 1 & 2) during the work period and at the completion of work. Rehabilitation of work sites would be carried out as work proceeds and as soon as possible after the completion of work at each structure site.

[2] The term 'pulls' refers to the process of putting tension into the OPGW once it has been strung along the existing structures.

Erosion control measures would be implemented at each work site during the work period and at the completion of work. Measures to restore the pre-existing ground condition would be implemented (refer to **Chapter 7 Soils, Geology and Topography**). Revegetation techniques such as loosening of compacted ground, application of fertiliser and grass seeding would be implemented as required.

All materials and debris resulting from the activity would be removed from each work site. Access to each structure site would be left in a suitable condition for future maintenance of the transmission line.

Planting of shrubs across areas cleared and vegetation screening would be considered after consultation between TransGrid and the affected property holders.

4.6 Operation Phase

4.6.1 Operation Phase Activities

On completion of construction and commissioning of the transmission line, ongoing maintenance of the Project components would be required. The performance of routine maintenance activities would be necessary to ensure the safe operation and reliability of transmission lines. Maintenance would include:

- inspection and assessment of infrastructure (steel tower and H-frame structures, conductors and ancillary components) and vegetation;
- managing vegetation to maintain safety clearances from transmission lines in line with GM AS L1 002 - Maintenance of Easements and Access Tracks (refer to **Appendix C**). The maintenance of safe clearances from conductors to vegetation is essential to eliminate the risk of lines causing bushfires, to ensure the safety of the public and to maintain high levels of system reliability;
- repairing or replacing elements of transmission lines; and
- maintaining access tracks. Passage must be maintained for all weather access to transmission lines and structures for emergency repairs, routine maintenance, inspection and/or construction.

Annual inspections of the line would be undertaken by maintenance staff in 4WD vehicles or by aerial inspection.

The Tenterfield 330kV Substation would be designed to operate without continuous on-site supervision. An alarm and supervisory control system would be installed for remote control by the onsite staff at the Newcastle Regional Centre.

During normal operation, a mobile operator and various design and maintenance staff would visit the substation to perform routine tasks and inspections as part of a regular maintenance program. Routine inspection of the site would take place once every two months. Regular maintenance activities would involve periodic inspection, testing and overhaul of the substation equipment. These activities would range from minor adjustments of electronic equipment (daily attendance for one or two weeks) to major scheduled overhauling of equipment such as circuit breakers and transformers (up to ten personnel with trucks, small mobile crane and elevated work platforms). Minor maintenance would be carried out on a two year cycle and major maintenance on a four year cycle.

At present, Dumaresq Switching Station remains unsupervised and Lismore Substation has two permanent staff onsite. The number of staff and the maintenance schedules on these sites would not be required to change as a result of the Project.

4.6.2 Vegetation Control

Three basic types of vegetation control would be used during the operation of the project: chemical control, hand clearing, and/or mechanical vegetation control. Chemical control would be the preferred option. However all three would be used on particular parts of the alignment. The three types of control are summarised below:

- ***Chemical control*** is used selectively to remove fast growing species within the easement, generally in places where mechanical control is not appropriate because of terrain, i.e. parts of alignment west. Chemical control has proved effective in reducing regrowth rates often allowing for longer maintenance cycles across the easement where this control method is applied. Only approved herbicides would be used, and strictly in accordance with the existing TransGrid Environmental Policy '*Use of Herbicide for Vegetation Control*' (GM AS L3 008).
- ***Hand clearing*** can be used in sensitive areas or in areas too steep for mechanical control. Vegetation is typically lopped rather than removed to keep disturbance to a minimum.
- ***Mechanical vegetation control*** would involve a tractor driven brush cutting equipment capable of clearing small trees. Slashing vegetation is also considered mechanical vegetation control. This technique is commonly used to maintain access tracks and where heavy regrowth is occurring within the easement.

4.7 Project Decommissioning

The expected service life for the Project would be approximately 50 years. Both Dumaresq Switching Station and Lismore Substation are existing assets, so different project components may require upgrade, replacement or decommissioning at different times. Regardless of whether decommissioning is likely to occur concurrently across the whole project, TransGrid's Environment Policy covers all activities and services undertaken by TransGrid including the planning, building and operation of infrastructure, ongoing management of these assets and their decommissioning.

As described in **Section 4.5.11** regarding the dismantling of the existing 132kV line, the line (and associated substation infrastructure) would require decommissioning and deconstruction in a considered and strategic manner when no longer adequate (or appropriate) to meet the energy demands of consumers.

In line with TransGrid's current approach, Project decommissioning would involve the removal of all physical components inclusive of the steel towers and concrete H-Frame poles, conductors, earthing strips and stakes and conductors as well as substation decommissioning as required. It would also involve the restoration of the Project footprint at the end of the Project's operational life.

All decommissioning and restoration activities would be in accordance with applicable federal, state, and local permits and requirements and would include the following specific activities:

- the transmission line would be completely dismantled and removed from the land. Conductors and earthwires would be removed under partial tension and wound onto cable drums. Pole and tower structures would be dismantled and removed from their foundations in the ground;
- extracted tower components and poles would be transported to temporary storage areas along the line easement, selected to be accessible by road for subsequent removal and transport. The process of removing structures would involve evaluating and categorising all components and materials into categories of recondition and reuse, salvage, recycling and disposal. The stockpiled

components and material would be transported to the appropriate facilities for reconditioning, salvage, recycling, or disposal;

- substation equipment and plant requiring divestment and removal would be carried out in accordance with TransGrid's Environment Policy. Assets would be recycled/reused where this is deemed appropriate;
- areas where subsurface components are removed would be graded to match adjacent contours, stabilised with an appropriate seed mix, and allowed to re-vegetate naturally; and
- in all areas, restoration would include, as reasonably required, levelling, terracing, mulching, and other necessary steps to prevent soil erosion, to ensure establishment of suitable grasses and forbs, and to control noxious weeds and pests.

4.8 Waste Management

Waste materials would be generated during construction and accordingly specific handling and disposal procedures would be required.

The operation of the proposed Project would not routinely produce significant amounts of waste and where replacement or repair of physical components is required, any wastes generated would be removed from site at the time of repair or replacement.

Waste Generation

Wastes generated during construction would potentially include:

- 132kV poles and conductors from the existing transmission line;
- empty conductor and earthwire drums;
- short lengths of conductors, earthwires and staywires;
- vegetation debris;
- excavated soil and rock;
- concrete, bricks;
- packaging materials;
- drums and lubricants from machinery services;
- items replaced such as fences and gates; and
- putrescibles wastes from construction personnel.

Waste Management

The NSW Waste Management Hierarchy would be incorporated into the waste recovery and resource strategies for the project. The hierarchy is formed on the principles of:

- avoidance of unnecessary resource consumption;
- resource recovery (including reuse, reprocessing, recycling and energy recovery); and
- minimising waste disposal.

All waste would be classified, stored and disposed in accordance with the NSW DECC (2008) *Waste Classification Guidelines* and TransGrid's *Waste Management Policy* (GD EN G3 023). This policy provides processes for the storage, transport and disposal of wastes in a manner compliant with legislation. A Waste Management Plan would be developed and implemented as part of the CEMP. The following specific management techniques would apply:

- waste that requires disposal would be minimised by accurately calculating materials brought to the site and limiting packaging.
- removed 132kV poles would be recycled where possible. Where it is not possible to recycle the poles they would be classified, transported off site and disposed of at a registered waste facility.
- empty drums, conductors, insulators and fittings along with other packaging products would be removed from site as they are generated and recycled where possible, or otherwise disposed; and
- in the event that servicing of vehicles occurs on site, no fuel or lubricants would be deposited on the site.

All of the measures taken to minimise waste and waste related impacts from the Project are detailed in **Chapter 19 Draft Statement of Commitments**.

5 Statutory Planning

5.1 Introduction

On 21 April 2009, the Department of Planning advised TransGrid that the construction of the Project would be permissible without Development Consent and would therefore be subject to assessment under Part 5 of the NSW *Environmental Planning & Assessment Act* 1979 (NSW) (EP&A Act). TransGrid has formed the view that an Environmental Impact Statement (EIS) within the meaning of Part 5 of the EP&A Act is required. Accordingly, pursuant to the Minister's 'General' Order of 29 July 2005 made under section 75B(1), the Project is to be assessed under Part 3A of the EP&A Act.

To initiate the Part 3A process, TransGrid submitted a preliminary environmental assessment (PEA) to the Department of Planning on 10 July 2009. Following the submission of the PEA, a Planning Focus Meeting was held on 24 August 2009. On 11 September 2009, the Executive Director of the Department of Planning, as delegate for the Director-General, issued the Director-General's (environmental assessment) Requirements (DGRs). The Project was referred to the Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) and has been determined a 'controlled action' because it is likely to have a significant impact on threatened species and communities listed under the Commonwealth *Environment Protection and Biodiversity Act* 1999 (Cth) (EPBC Act) (section 18 & 18A). Supplementary DGRs reflecting the Commonwealth's requirements for this EA were issued for the Project on 16 March 2010.

A number of statutory planning controls need to be addressed for the purposes of the proposed Project. This chapter reviews Commonwealth and State legislation as well as State, regional and local planning policies that may apply to determine the approvals required to allow the Project to proceed.

5.2 Commonwealth Legislation

5.2.1 Environment Protection and Biodiversity Conservation Act 1999

Part 3 of the EPBC Act (Cth) requires that an action which has, will have or is likely to have a significant impact on a matter of national environmental significance may not be undertaken without prior approval of the Commonwealth Minister administering that Act. The Act identifies the following matters of national environmental significance for which Ministerial approval is required:

- World Heritage properties;
- National Heritage places;
- Wetlands of international importance (including Ramsar Wetlands);
- Listed threatened species and ecological communities;
- Listed migratory species protected under international agreements;
- Nuclear actions; and
- Commonwealth marine areas.

The EPBC Act also protects the environment where actions proposed are on, or will affect, Commonwealth land and its environment.

Relevantly, the matter of national significance that could be impacted by the Project is "listed threatened species and ecological communities". The other matters of national significance will not be affected by the Project. That is, no World Heritage sites, National Heritage Places, Ramsar Wetlands or Commonwealth Marine Areas will be impacted by the proposed transmission line. The Project also would not involve a nuclear action, is not expected to have a significant effect upon the health and viability of any migratory species listed under provisions of the Act and would not affect any Commonwealth land and its environment.

No threatened species listed under the EPBC Act were recorded during the surveys of the study area (refer **Chapter 9 Biodiversity**). A search based on a 10km radius around the alignment, identified 99 species having potential to occur within the alignment based on the habitats present. In addition to this, approximately 22ha of Threatened Ecological Communities (TEC) listed under the EPBC Act would be directly impacted by the proposal (**Appendix F Biodiversity**).The Project was referred to the SEWPAC and was determined a 'controlled action' in February 2010 because it is likely to have a significant impact on threatened species and communities listed under the EPBC Act (section 18 & 18A). Based on the clearing of TECs listed under the provisions of the Act and potential impacts on threatened species, approval from the Commonwealth SEWPAC under the EPBC Act is required. However, due to the Bilateral Agreement between the Commonwealth and New South Wales under the EPBC Act, the Project will be assessed by the Commonwealth through a 'one off accredited process' as part of the Part 3A assessment process by the NSW Department of Planning. Requirements of the referral have been detailed in the DGRs provided by the Commonwealth and addressed within the Biodiversity Report (**Appendix F Biodiversity**).

5.2.2 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The purpose of the *Aboriginal and Torres Strait Islander Heritage Protection Act* 1984 (Cth) (ATSIHPA Act) is to preserve and protect areas and objects that are of particular significance to Aboriginals in accordance with Aboriginal tradition.

The ATSIHPA Act empowers the Minister administering that Act to make declarations regarding certain areas or objects which are of particular significance to Aboriginals. Any declaration made under the ATSIHPA Act is to include provisions protecting and/or preserving the area or object the subject of the declaration. Failing to comply with the provisions of a declaration is a criminal offence.

In circumstances where an area or object of Aboriginal significance is under immediate threat, the relevant Minister/officers has the power to make an emergency declarations, without the usual process being complied. Emergency declarations may apply for a maximum period of 30 days and in some cases a maximum period of 48 hours.

No heritage places or sites within the study area are listed under the EPBC Act. All sites identified are protected under NSW State legislation and should not require implementation of the ATSIHPA Act.

5.2.3 Native Title Act 1993

The *Native Title Act 1993 (Cth)* seeks to regulate and protect native title rights and interests by providing a process for claiming native title and regulating activities that may impact on native title rights.

"Native title" is defined in the *Native Title Act* as the rights and interests that are possessed under the traditional laws and customs of the Aboriginal people and Torres Strait Islanders in land and waters, and that are recognised by common law. The key decision which outlines what rights and interests are

recognised by the common law is *Mabo v Queensland* (No.2)(1992) 175 CLR 1, in which the High Court of Australia held that native title exists, in accordance with the laws and customs of the Aboriginal people, where:

- those people have maintained their connection with the land and/or waters; and
- those peoples' title to that land and/or waters has not been extinguished by acts of Imperial, Colonial, State Territory or Commonwealth government.

Native title rights will have been extinguished by the grant of private interests in land, in particular grants of freehold or leasehold, at least to the extent that the leasehold interest provides a right of exclusive occupancy or possession.

Table 3.1 in **Appendix G Heritage** details what native claims exist in the Local Government Areas which the Project traverses.

5.3 NSW Legislation

5.3.1 Environmental Planning and Assessment Act 1979

The EP&A Act and the *Environmental Planning and Assessment Regulation 2000* (the Regulation) provide the framework for the assessment and approval of proposed developments in NSW. Part 3A of the EP&A Act provides a streamlined and integrated development assessment and approvals regime for major infrastructure and other projects of significance to the State. The Minister for Planning determines whether or not to approve such projects. These projects are considered to be 'Major Projects' as declared by State Environmental Planning Policy (Major Development) 2005 (Major Development SEPP) or by order of the Minister in the Government Gazette.

Planning Approvals

If an activity that is being assessed under Part 5 of the EP&A Act is likely to require an Environmental Impact Statement, then by Ministerial Order No. 96, the proposal must be assessed under Part 3A of the EP&A Act.

On the basis of initial studies completed to date, TransGrid has formed the view that the proposal is likely to have a significant effect on the environment. As such the Project is considered a major infrastructure development under Ministerial Order No.96 and Part 3A of the EP&A Act applies.

5.3.2 Environmental Legislation

While the EP&A Act provides the framework for the planning and development approvals system in NSW, there are a number of other Acts and Regulations that may apply to the Project. These Acts and Regulations have been identified and considered during the environmental assessment of the Project. Key Acts of relevance are discussed below.

It is noted that Section 75U of the EP&A Act outlines approvals and legislation that do not apply when a Project is assessed under Part 3A. Section 75V of the EP&A Act outlines approvals and legislation that must be consistently applied when a Project is approved under Part 3A.

The following section provides an assessment of the Project against the relevant NSW legislation that is applicable.

Protection of the Environment Administration Act 1991

The encouragement of ecologically sustainable development is an object of the EP&A Act. Ecologically sustainable development, as defined in the EP&A Act, has the same meaning as section 6(2) of the *Protection of the Environment Administration Act* 1991 (NSW). Principles of Ecologically Sustainable Development have been addressed in **Section 20.3** of **Chapter 20 Project Evaluation and Justification**.

Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act* 1997 (NSW) (PoEO Act) requires that a person who undertakes a scheduled activity must hold an Environment Protection Licence (EPL). Activities requiring an EPL are listed in Schedule 1 of the Act. The PoEO Act also provides for the management of water, air and noise pollution and the control of wastes.

The Department of Environment, Climate Change and Water (DECCW) (11 September 2009) noted within their DGR responses that based on the information provided to them within the PEA, an Environment Protection Licence would not be required because the activity is not scheduled under the PoEO Act.

The mitigation measures outlined in the draft Statement of Commitments (**Chapter 19 Draft Statement of Commitments**) would be implemented to minimise the potential of the Project to result in pollution of the environment.

Roads Act 1993

The *Roads Act* 1993 (NSW) (Roads Act) regulates a range of activities undertaken on public roads. Section 138 of the Roads Act requires that a person obtain the consent of the appropriate roads authority for the erection of a structure, or the carrying out of work in, on or over a public road, or the digging up or disturbance of the surface of a public road, or connecting to a classified road. A public authority is not required to obtain a roads authority's consent to the exercise of the public authority's functions in, on or over an unclassified road other than a Crown road. Further, if the applicant is a public authority, the roads authority must consult with the applicant before deciding whether or not to grant consent or concurrence.

Establishment of access tracks would not require modification to classified roads. However, the Project crosses the Bruxner Highway and the New England Highway, and the construction of a new access track would be connected to a classified road. Accordingly, an approval under section 138 of the Roads Act would be required for this part of the Project. Under section 75V of the EP&A Act, a section 138 consent for the Project cannot be refused and must be substantially consistent with any approval given under Part 3A of the EP&A Act.

Water Management Act 2000

The *Water Management Act* 2000 (NSW) establishes a framework for managing water in NSW. The Act creates:

- mechanisms for protecting and restoring water sources and their dependent ecosystems;
- improved access rights to water; and
- partnership arrangements between the community and the Government for water management.

One such mechanism is a Water Sharing Plan (WSP). A WSP is a legal document prepared under the *Water Management Act*. These plans establish rules for sharing water between the environmental needs of the river or aquifer and water users, and also between different types of water uses such as town supply, rural domestic supply, stock watering, industry and irrigation.

A WSP (Tenterfield Creek Water Source, 2003) applies to the land around the Tenterfield area between AP 18 and 34. Therefore, in relation to water use, sharing and extraction, the *Water Management Act* applies to this part of the Project. In relation to all other areas of the Project (the approximate areas between AP 1 – 17 alignment west, and AP 35 – 71 alignment east), surface water allocation is administered under Part 2 of the *Water Act 1912* (NSW) and groundwater is administered under Part 5 of the *Water Act 1912*.

The use of water would be required during the construction of the Project for concrete batching, access track construction, dust suppression activities, drilling work for footings and for earth staking. Exact water requirements would be determined at the detailed design stage. However, it is estimated from previous projects that approximately 4 to 4.5 megalitres of water would be required for the entire Project. It is envisaged that sufficient water would be available from town water supplies and artificially constructed dams to service all construction water requirements. During the detailed design stage, consultation with NSW Office of Water (NOW) will be ongoing to ensure that permitting requirements are met. No bore water would be required during construction. No groundwater would be extracted for use during construction. In terms of ongoing water supply requirements, TransGrid envisages that only minimal supplies would be needed for the Project at Tenterfield 330kV Substation and this supply could be supplied by rainwater tanks.

Water Act 1912

The *Water Management Act* will eventually replace the water management framework in the *Water Act*. In relation to all other areas of the Project footprint not included within a WSP, surface water allocation is administered under Part 2 of the *Water Act* and groundwater is administered under Part 5 of the *Water Act.* There are no exemptions under the *Water Act* (either under Part 2 or Part 5) for Part 3A approvals.

Across the Project area, it is noted that the Coastal Alluvials Embargo presently applies to the making of applications for new sub-surface water licences under Part 5. Where an embargo order applies, an application for a new water licence under the *Water Act* cannot be lodged unless it fits within one of the exemptions specified in the order or in the *Water Act*.

Where the Project is likely to intercept groundwater, a licence under Part 5 of the *Water Act* is required. Dewatering of any structure footings may become an issue in low lying areas particularly towards Lismore Substation where the water table is generally shallower. If this work is required, the proponent would apply for a water licence for temporary construction dewatering and construction would proceed only when approval is obtained from the NOW.

Crown Lands Act 1989

The *Crown Lands Act* 1989 (NSW) broadly applies to all land which is the property of the State of NSW, such as national parks, State forests and State parks. One-off activities, such as construction activities on Crown land may require a licence under the *Crown Lands Act.* The permanent placement of infrastructure, such as electricity poles on Crown land may require a lease under the *Crown Lands Act*.

The Project passes through Crown land, including State Forests. Where this occurs, TransGrid would follow the provisions detailed in *Land Acquisition (Just Terms Compensation) Act* 1991 (Cth).

Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act* 1995 (NSW) (TSC Act) provides legal status for biota of conservation significance in NSW. The TSC Act aims to '*conserve biological diversity and promote ecologically sustainable development*'. The environmental assessment has identified the presence of threatened species and the strategies for management and mitigation of any impacts. This is addressed in **Appendix F Biodiversity** and summarised in **Chapter 9 Biodiversity.**

Fisheries Management Act 1994

Permits under section 201 (dredging and reclamation) and 219 (fish passage) of the *Fisheries Management Act* are not required for projects that have been approved under Part 3A. Despite the Part 3A exemption from this formal requirement, all works proposed within riparian areas would be consistent with the Department of Water and Energy's Controlled Activity Guidelines (2008) and all watercourse crossings would be constructed in accordance with TransGrid specifications and undertaken in accordance with the NSW Department of Industry and Investment's policies and guidelines.

Native Vegetation Act 2003

The *Native Vegetation Act* 2003 (NSW) (NV Act) aims to provide for, encourage and promote the management of native vegetation on a regional basis in the social, economic and environmental interests of the State. An authorisation referred to in section 12 of the NV Act to clear native vegetation or State protected land is not required for projects to which Part 3A applies. Therefore, no authorisation would be required for the project on land to which the NV Act applies.

Noxious Weeds Act 1993

The *Noxious Weeds Act* 1993 (NSW) provides for the identification and control of noxious weeds and specifies the duties of public and private landholders to control noxious weeds. The Act stipulates that an occupier of land must take steps to control noxious weeds on their land. The Act also provides for the monitoring of and reporting on the effectiveness of the management of weeds in NSW. Appropriate methods for controlling noxious weed species are defined under the control category or categories for particular species of weeds.

Personnel working along the line would implement noxious weed control measures to prevent the spread and occurrence of noxious weeds along the easement and access tracks (refer to **Appendix F Biodiversity**). Additionally, mitigation measures have been contained within the draft Statement of Commitments for the Project to manage the risk of noxious weeds on site. Details of these measures are contained in **Chapter 19 Draft Statement of Commitments**.

Heritage Act 1977

The *Heritage Act* 1977 (NSW) encourages the conservation of the State's heritage defined as places, buildings, works, relics, moveable objects, and precincts, of State or local heritage significance which are at least 50 years old. The Act provides for the listing of heritage structures on the State Heritage Register and Orders can be made under the Act to protect relics from removal or alteration. This Act applies to non-Aboriginal relics only. Aboriginal relics are protected under the *National Parks and Wildlife Act 1974*.

Heritage structures listed on the State Heritage Register have been reviewed as part of the desk-based and field survey works undertaken as part of this EA. As discussed within the Heritage Assessment (**Appendix G Heritage**), none of the identified State Heritage Register items were identified within the proposed alignment or associated working areas.

Pursuant to section 75U of the EP&A Act, an approval under Part 4 or an excavation permit under section 139 of the Heritage Act is not required, nor does Division 8 of Part 6 of the Heritage Act apply to prevent or interfere with the carrying out of an approved project to which Part 3A of the EP&A Act applies. Therefore, no approvals would be required for the Project for excavation of heritage items.

National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act* 1974 (NSW) (NPW Act) provides for the preservation of land and the protection of that land, as well as the protection of flora and fauna and aboriginal heritage. For approved projects under Part 3A of the EP&A Act, a permit under section 90 allowing Aboriginal heritage to be impacted is not required Therefore, no permits would be required for the project to excavate or destroy an aboriginal site under the NPW Act. There are also no designated National Parks or Nature Reserves located within the proposed alignment or access tracks. The NPW Act also provides that if the harming, damaging and/or picking threatened species, endangered species, ecological communities and/or habitats is essential to the carrying out of a project approved under Part 3A of the EP&A Act, then no licences are required under the *National Parks and Wildlife Act*.

Rural Fires Act 1997

The *Rural Fires Act* 1997 (NSW) (RF Act) manages bushfire within the State and regulates development in bushfire prone areas. The Project is not for subdivision and is not a special fire protection purpose. Therefore, approval for a bushfire safety authority is not required under the RF Act.

Contaminated Lands Management Act 1997

The *Contaminated Lands Management Act* 1997 (NSW) (CLM Act) details the requirements for investigation and remediation of contaminated land. The CLM Act identifies the role of the NSW DECCW and local Councils in the management of contaminated land and details responsibilities for managing contaminated land.

Existing activities within the study area that have the potential to result in contaminated land are considered to be limited. A search was made of the contaminated lands notices (DECCW) and the *Protection of the Environment Operations Act* (PoEO) public register within the Tenterfield, Richmond Valley, Kyogle, Inverell and Lismore Local Government Areas (LGAs). There are no contaminated land notices registered within the Tenterfield, Richmond Valley, Kyogle and Inverell LGAs. Within the Lismore LGA there are 10 notices relating to six sites. The closest of these sites to the transmission line alignment is an asbestos waste burial site at Tuncester, approximately 5km north of Lismore Substation.

5.4 Environmental Planning Instruments

Environmental planning instruments include State Environmental Planning Policies and Local Environmental Plans. Section 75R(3) of the EP&A Act provides that State Environmental Planning Policies apply to an approved project, but that other environmental planning instruments do not apply to or in respect of an approved project.

However, section 75J (3) of the EP&A Act provides that in deciding whether or not to approve the carrying out of a project, the Minister may (but is not required to) take into account the provisions of any environmental planning instrument that would not (because of section 75R) apply to the project if approved. Clause 8O of the Regulations addresses projects that are prohibited by environmental planning instruments for which project approval may not be given. It is in this context that relevant environmental planning instruments are addressed.

5.4.1 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) provides a consistent planning regime for infrastructure and the provision of services across NSW, along with providing for consultation with relevant public authorities during the assessment process. The SEPP supports greater flexibility in the location of infrastructure and service facilities along with improved regulatory certainty and efficiency.

Clause 41 of the Infrastructure SEPP states that development for the purposes of an electricity transmission or distribution network may be carried out by, or on behalf of, an electricity supply authority or public authority without consent on any land. Land reserved under the *National Parks and Wildlife Act* 1974 may also be carried out without development consent so long as where specific provisions are met. No part of the Project traverses any areas of National Park. As such, the Project would be permissible without consent. Accordingly, the activity is to be assessed under Part 5 of the EP&A Act unless an Environmental Impact Statement is required. In that circumstance, the activity is to be assessed as a project under Part 3A of the EP&A Act.

Clause 85 of SEPP Infrastructure applies to development that involves the use of a crane in air space above any rail corridor. Clause 86 of SEPP Infrastructure applies to development that involves the penetration of ground to a depth of at least 2m below ground level (existing) on land either within or adjacent to a rail corridor. Construction of AP63 close to the northern rail line means that these clauses are relevant to this EA.

As the Project is being assessed under Part 3A of the EP&A Act and thus does not require development approval, no concurrence exists with the Australian Rail Track Corporation (ARTC). However, consultation with ARTC will be required as part of the EA process. Any comments received by ARTC during the exhibition of the EA would be taken into account by the DoP.

State Environmental Planning Policy (Major Development) 2005

As discussed in **Section 5.3.1** and above, if it is likely that after assessing an activity under Part 5 of the EP&A Act an Environmental Impact Statement is required, then by Ministerial Order, the proposal must be assessed under Part 3A of the EP&A Act. As TransGrid has formed the view that an Environmental Impact Statement would be required for the Project, Part 3A applies and accordingly the Major Development SEPP also applies.

According to *State Environmental Planning Policy (Major Development) 2005* (SEPP Major Development), developments referred to as a 'Major Project' require assessment and approval by the Minister for Planning in accordance with Part 3A of the EP&A Act. SEPP Major Development defines certain types of developments as major projects. As discussed above in **Section 5.3.1**, notes under Clause 6 of SEPP Major Development state that under section 75B of the EP&A Act, development may be declared by a State Environmental Planning Policy or Ministerial Order to be a project to which Part 3A applies.

Ministerial Order No.96, published in July 2005, states that State Government infrastructure projects which were likely to significantly affect the environment, must be determined by the Minister under Part 3A rather than the State Governments proponent agency. TransGrid has formed the view that the proposal is likely to have a significant effect on the environment. As such the Project is defined as a major infrastructure development under Ministerial Order No.96 and hence, the Project is considered to be a 'Major Project' pursuant to the Ministerial Order.

State Environmental Planning Policy 33 - Hazardous and Offensive Development

State Environmental Planning Policy 33 - Hazardous and Offensive Development (SEPP 33) represents the approach used in NSW for planning and assessing proposals for industrial development. Through the policy, the permissibility of an industrial proposal is linked to its safety and pollution control performance.

SEPP 33 applies to any proposal which falls under the policy's definition of 'potentially hazardous industry' or 'potentially offensive industry'. For development proposals classified as 'potentially hazardous industry' the policy establishes a comprehensive test by way of a preliminary hazard analysis (PHA) to determine the risk to people, property and the environment at the proposed location and in the presence of controls.

The aim of the hazard and risk screening is to:

Determine whether the on-site hazards and risks from the use and processing of potentially hazardous material may have the potential to cause off-site risks to the landuses around the Project; and

Determine whether a Preliminary Hazard Analysis (PHA) is required for the Project.

The hazard and risk screening for the Project (**Chapter 16 Hazard, Risk and Bushfire** and **Appendix I-1 Hazard and Risk**) has determined that the proposed development is not *Potentially Hazardous* (as defined in SEPP 33). Hence a Preliminary Hazard Analysis (PHA) is not required as per the standard requirements for so called *Potentially Hazardous Development*, as part of NSW Department of Planning requirements.

State Environmental Planning Policy 44 - Koala Habitat Protection

State Environmental Planning Policy 44 - Koala Habitat Protection (SEPP 44) aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline. SEPP 44 will be implemented:

by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and

by encouraging the identification of areas of core koala habitat, and

by encouraging the inclusion of areas of core koala habitat in environment protection zones.

Inverell, Tenterfield, Kyogle, Richmond River and Lismore local government areas are listed under Schedule 1 of this Policy. A formal assessment under SEPP 44 is not required for the Project as it is a Project to which Part 3A of the EP&A Act applies. Notwithstanding, the principles of SEPP 44 have been addressed in the current study by conducting searches for koala habitat trees and signs of koala activity during field surveys. An assessment for the presence of feed trees listed under Schedule 2 is provided within the Biodiversity Report (**Appendix F Biodiversity**).

State Environmental Planning Policy (Rural Lands) 2009

The aim of SEPP (Rural Lands) is to facilitate the orderly and economic use and development of rural lands for rural and related purposes. Part 2 of SEPP (Rural Lands) identifies rural planning principles to be considered. The Project is located on rural zoned land, pursuant to a number of Local Environmental Plans. The rural planning principles contained within SEPP (Rural Lands) encourage the protection and promotion of opportunities for productive and sustainable economic activities in rural areas. The SEPP (Rural Lands) also identifies that in planning for rural lands, the social, economic and environmental interests of the community are to be balanced.

The Project would not significantly result in the loss of land that is zoned for rural purposes. Although the proposed easement and the access tracks predominantly cross privately owned property used for grazing and cropping, in the majority of cases, the impact to existing land use in terms of agricultural capability would be relatively minor as cropping and agricultural activities are able to continue within transmission line easements (refer to **Chapter 18 Socio Economic**).

Overall, it is considered that the Project would result in an outcome whereby the social, economic and environmental interests are balanced. As such, the Project is appropriate for the site in which it is located, and does not raise any issues that conflict with SEPP (Rural Lands).

North Coast Regional Environmental Plan 1988 (Deemed SEPP)

The *North Coast Regional Environmental Plan 1988* (Deemed SEPP) (North Coast REP) aims to develop regional policies that protect the natural environment, encourage an efficient and attractive built environment and guide development into a productive yet environmentally sound future. It also aims to, to provide a basis for the co-ordination of activities related to growth in the region and encourage optimum economic and social benefit to the local community and visitors to the region. The North Coast REP applies to local government areas of the North Coast including Lismore, Kyogle and Richmond River.

Part 2 Division 5 of the North Coast REP regulates utility services within the region. It sets an objective in relation to utility services, to provide the economic and timely provision of utility services to new urban and residential areas. Part 2 Division 5 is limited to the provision of utility services for new urban and residential areas only and does not regulate upgrades to existing utility service infrastructure.

There are no specific provisions in the North Coast REP which apply to the Project. Notwithstanding, the Project is consistent with the aims of the Plan in that it will provide a regional solution to maintain the reliable provision of electricity. The Project does not raise any issues which conflict with the provisions of the North Coast REP.

5.4.2 Local Environmental Plans

Local environmental plans (LEPs) guide planning decisions for local government areas (LGAs). Through zoning and development controls, they allow councils and other consent authorities to manage the ways in which land is used. In accordance with section 75R(3) of the EP&A Act, LEPs do not apply to, or in respect of, an approved project. Notwithstanding, in deciding whether or not to approve the carrying out of a project, the Minister may, but is not required to, take into account the provisions of any Environmental Planning Instrument (EPI), including an LEP, that would not apply to the Project if approved. However, the regulations may preclude approval for the carrying out of a class of project that such an instrument would otherwise prohibit. In this instance, the Project is permissible without development consent.

The proposed alignment traverses five LGAs:

- Inverell LGA;
- Tenterfield LGA;
- Kyogle LGA;
- Richmond Valley LGA; and
- Lismore LGA.

As detailed below, all LEPs associated with the local government areas in which the Project is located, would allow transmission lines, either with or without development consent.

Even if a relevant LEP did not have the effect of allowing transmission lines with or without development consent, the effect of clause 41 of the Infrastructure SEPP is to make development for the purpose of an electricity transmission or distribution network permissible without consent in this case (see discussion above at **Section 5.4.1**) as the Infrastructure SEPP prevails to the extent of any inconsistency with any relevant LEPs.

Inverell Local Environmental Plan 1988

The proposed alignment crosses land zoned 1(a) Rural (Agricultural) under the *Inverell 1988* (Inverell LEP). The plan identifies that transmission lines on land zoned 1(a) Rural (Agricultural) would be permissible under Item 4 with development consent.

Tenterfield Local Environmental Plan 1996

The proposed alignment crosses land zoned 1(a) (General Rural) and land identified under Clause 20 – Special Emphasis Area under the *Tenterfield Local Environmental Plan 1996* (Tenterfield LEP). The plan identifies that transmission lines on land zoned 1(a) (General Rural) and under Clause 20 – Special Emphasis Area would be permissible with development consent.

Kyogle Interim Development Order (IDO)

The *Kyogle Interim Development Order* (Kyogle IDO) applies to all the existing urban areas in the Kyogle Council area. The proposed alignment crosses land zoned 1(A) (Non Urban) and 1(B) (Non Urban – 400 metres either side of a Main Road) under the Kyogle IDO. The plan identifies that transmission lines on land zoned 1(A) (Non Urban) and 1(B) (Non Urban – 400 metres either side of a Main Road) would be permissible with development consent.

Richmond River Local Environmental Plan 1992

The proposed alignment crosses land zoned 1(a) Rural (Prime Agricultural Land), 1(b1) Rural (Secondary Agricultural Land) and 7(b) Environmental Protection (Scenic Escarpment) under the *Richmond River Local Environmental Plan 1992* (Richmond River LEP).

The plan specifies that transmission lines on land zoned 1(a) Rural (Prime Agricultural Land), 1(b1) Rural (Secondary Agricultural Land) and 7(b) Environmental Protection (Scenic Escarpment) would be permissible under Item 3 with development consent.

Lismore Local Environmental Plan 2000

The proposed alignment and land zoned 1(a) (General Rural), 1(b) (Agricultural Rural) and 1(r) (Riverlands) pursuant to the *Lismore Local Environmental Plan 2000* (Lismore LEP). Transmission lines on land zoned 1(a) (General Rural), 1(b) (Agricultural Rural) and 1(r) (Riverlands) would be permissible with development consent as advertised development pursuant to clauses 30.4, 31.4 and 35.4, respectively, of the Lismore LEP.

5.5 Strategic Planning Framework

Far North Coast Regional Strategy (2006)

The purpose of the *Far North Coast Regional Strategy* (2006) (Regional Strategy) is to manage the Region's expected high growth rate in a sustainable manner over the next 25 years. The Regional Strategy, which incorporates the specific regional infrastructure requirements identified in the State Infrastructure Strategy 2006–07 to 2015–16, will continue to inform future infrastructure investment priorities for the Far North Coast. The Regional Strategy recognises that infrastructure planning will take into account the broad planning framework identified in the Regional Strategy, to ensure that future population growth is supported by required services and associated infrastructure.

The Project is not specifically identified within the Regional Strategy. However, it is consistent with the overall aim and purpose of the Regional Strategy in terms of the provision of reliable electricity infrastructure to service growing demand, and as such, does not raise any issues that conflict with the Regional Strategy.

6 Consultation

6.1 Introduction

A program of community, landowner and government agency consultation has been undertaken and has assisted in the identification of relevant issues and potential impacts in accordance with the Director General's requirements (DGRs) for this Project. This chapter provides a summary of the consultation program undertaken. The Consultation Report is provided in full in **Appendix D Consultation Report**.

The key objectives of the consultation program were to ensure that key stakeholders were:

- appropriately informed of the Project parameters;
- aware of the approval process;
- provided with an opportunity to ask questions and to identify areas of concern with respect to the Project; and
- provided with an opportunity to provide feedback to assist in the identification of key environmental and community issues.

Submissions made during the exhibition of the EA would be addressed with the Submissions report to be prepared as part of the assessment process for the Project.

6.2 Objectives of Stakeholder Consultation

The specific objectives of the consultation program included:

- identifying key issues for selection of the transmission line route;
- providing input to the design in relation to what is acceptable to the local community, government agencies, authorities and other stakeholders; and
- promoting awareness of the Project and gathering local knowledge about the area and what is important to the local community.

The DGRs issued for the Project specified a requirement to undertake consultation with the following parties during preparation of the EA.

Commonwealth Government Agencies

- Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPAC); and
- Australian Rail Track Corporation

State Government Agencies

- NSW Department of Environment, Climate Change and Water (DECCW) (including NSW Office of Water) (Armidale & Grafton);
- NSW Department of Industry and Investment (including the Department of Primary Industries and Forests NSW);
- NSW Roads and Traffic Authority;

- NSW Health;
- Land and Property Management Authority;
- NSW Rural Fire Service;
- Livestock, Health and Pest Authorities (Rural Lands Protection Board) for North West, New England and New Coast Regions; and
- Catchment Management Authorities (CMAs) (Northern Rivers CMA and Border Rivers/Gwydir CMA).

Local Government

- Tenterfield Council;
- Inverell Council;
- Kyogle Council;
- Richmond Valley Council; and
- Lismore Council.

Other Government Agencies

- Civil Aviation Safety Authority; and
- AirServices Australia.

Aboriginal Stakeholders

- NSW Aboriginal Land Councils/NSW Native Title Service; and
- Local Aboriginal Land Council.

Community Stakeholders

- landowners and residents in the vicinity of the area of study; and
- general public and local community.

The Department of Planning (Sydney & Northern NSW) was also consulted as part of the Part 3A planning process. Each of the government agencies listed above were consulted via the Department of Planning (DoP) for their requirements and inputs into the Director-General's Requirements (DGRs) (refer to **Appendix A Director-General's Requirements**). These requirements are addressed in detail in **Appendix D Consultation Report**. The community stakeholder consultation program is addressed in **Section 6.3**, while a description of the feedback mechanisms available to the local community is provided in **Section 6.4**. The Aboriginal stakeholder consultation program is summarised in **Section 6.5**.

6.3 Government Agency Consultation

Government agency consultation is addressed in detail in **Section 2.4** of **Appendix D Consultation Report**. The following provides an overview of government agency consultation activities undertaken for the Project.

6.3.1 Initial Consultation

Meetings were held with each of the five local councils between 6 and 8 April 2009, except Richmond Valley Council who were not available at that time. Richmond Valley Council stated they would make a submission if there were any issues to raise.

The meetings allowed the councils to be briefed on the Project and for them to ask questions or raise issues to be addressed as part of the Project and the associated EA.

A letter was received from the DoP on 21 April 2009 confirming that the Project would be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

A list of State and local government agencies was developed by the DoP in consultation with TransGrid. The DoP issued the Preliminary Environmental Assessment (PEA) and the Planning Focus Meeting (PFM) invitation on 7 August 2009. The PFM was held at URS North Sydney on 24 August 2009. **Section 2.4** of **Appendix D Consultation Report** summarises the various issued raised by the government agencies as a result of this process.

Agencies attending the PFM comprised:

- Department of Planning;
- Industry and Investment NSW (via conference call);
- Department of Environment, Climate Change and Water, Office of Water (via conference call);
- Land and Property Management Authority (via conference call); and
- Department of Environment, Climate Change and Water (via conference call).

DGRs for the Project were received on 14 September 2009. A copy of the DGRs is provided in **Appendix A Director General's Requirements**. This appendix also provides a table (Table A1) that summarises the key issues raised in the DGRs and where they have been addressed in the EA. Inputs to the DGRs were received from:

- Department of Planning;
- Department of Environment, Climate Change and Water;
- NSW Office of Water;
- NSW Roads and Traffic Authority;
- Land and Property Management Authority;
- Inverell Shire Council;
- Kyogle Shire Council;
- NSW Industry and Investment; and
- Border Rivers-Gwydir Catchment Management Authority.

The Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) was also consulted during the initial stages of the Project. The Project was referred to the SEWPAC and has been determined a 'controlled action' because it is likely to have a significant impact on threatened species and communities listed under the *Environmental Protection and Biodiversity Act 1999* (EPBC Act) (section 18 & 18A). Supplementary DGRs were issued for the Project on 16 March 2010 that reflected the Commonwealth's requirements for this EA. A copy of the Supplementary DGRs is provided in **Appendix A Director General's Requirements**.

SEWPAC was also consulted during the preparation of the Biodiversity Report (**Appendix F Biodiversity**) regarding the development of an offset package to compensate for the unavoidable loss of biodiversity for the Project.

Further consultation was undertaken with SEWPAC (per comms) on 7 September 2010 in regards to the impact that the proposed access tracks would have on the existing referral under the EPBC Act. In response to these discussions, SEWPAC advised that no EPBC referral variation was required as the referral mentions that the EA will consider all integral elements required to develop, construct and maintain the transmission line.

6.3.2 Ongoing Consultation

Inputs to the DGRs from various government agencies required follow up as part of the EA process. Advice and clarifications were sought from relevant government departments as each of the technical studies progressed, as detailed in **Appendix D Consultation Report**. The DGRs along with identification of where in the EA each requirement is addressed is provided in **Appendix A Director-General's Requirements.**

The Environmental Assessment has also been updated to respond to comments from DoP, DECCW and SEWPAC during the adequacy review period (April 2011).

Ongoing consultation with councils did not identify any critical constraints, although future development proposals and proximity to concentrations of residential dwellings were discussed. Specific items raised for consideration by the local councils included proposed developments, soil and weed management, management of impact on the road network during construction, and close liaison with affected landowners. These issues are addressed in each of the technical studies (refer to **Chapters 7 – 18**).

6.3.3 Government Agency Consultation: Key Issues

Table 6-1 below provides a brief summery of the key issues raised by each government agency. Only agencies that responded are included.

Table 6-1 Government Agency Key Issues

Government Agency	Key Issues	Relevant EA Chapter or Appendix
Department of Planning	The DoP had a number of general requirements and a number of key assessment requirements comprising: strategic planning and project justification, land use planning impacts, ecological impacts, heritage impacts, human amenity impacts –(noise and vibration, air quality (dust and odour) and traffic impacts), hazards and risk Impacts, visual amenity impacts, construction-related impacts and traffic and transport impacts. Consultation with various organisations and stakeholders was also requested.	These issues are addressed throughout the EA.
Department of Environment, Climate Change and Water	Numerous issues relating to water quality, contaminated land, noise, biodiversity and heritage	EA Chapters 7, 8, 9, 10, 11 and 14. Appendices E, F and G.
NSW Office of Water	A number of water based issues related to riparian management, water issues, acid sulphate soils, farm dams, flooding issues, groundwater and surface water	EA Chapters 7 and 8. Appendix E.

Government Agency	Key Issues	Relevant EA Chapter or Appendix
Land and Property Management Authority	Issues comprised general requirements including the level of information which is required to be shown on the plans, descriptions of the staging of the development, details of any land acquisitions and consultation with Aboriginal Land Council and NSW Native Title Services Limited	Chapters 4 and 6. Appendix D.
NSW Industry & Investment	Issues comprised forestry, fisheries, agricultural, weed and pest management, biosecurity and emergency impacts, and mineral resources	Chapters 4, 8 & 9. Appendix E and F.
Department of Sustainability, Environment, Water, Population and Communities	The key issues for this agency were the proper consideration of biodiversity and the fact that the project is a controlled action. It was also consulted regarding the biodiversity offset package.	Chapter 9. Appendix F.
Border Rivers-Gwydir Catchment Management Authority	Issues relating to the mitigation of vegetation loss and other rehabilitation management issues	Chapter 9. Appendix F.
Australian Rail Track Corporation (ARTC)	The ARTC's key issue was to ensure that they were properly consulted during the EA process.	Chapter 5. Appendix D.
NSW Roads and Traffic Authority (RTA)	The key issue for the RTA was compliance with the provisions of the *Roads Act 1993* (NSW)	Chapter 5.

6.4 Aboriginal Stakeholders Consultation

The Project falls within the boundaries of the Casino, Jubullum and Moombahlene Local Aboriginal Land Councils (LALCs). Preliminary consultation has been undertaken with Aboriginal stakeholders for the Project according to the *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DECCW, 2005 (Draft)) with reference to the *Interim Community Consultation Guidelines* (ICCGs) (refer to **Appendix G Heritage**). As a result of the notification phase, 11 Aboriginal groups and two individuals (total 13) were identified, consulted and given an introduction to the Project. These are:

- Moombahlene LALC;
- Aboriginal Elder Lilly Bartholomew;
- Aboriginal Elder Bertha Daley;
- Kwiembal Elders Indigenous Group;
- Edgerton-Kwiembal People (Edgerton-Kwiembal Environmental, Heritage & Cultural Aboriginal Corporation);
- Kambuwal Aboriginal Corporation for Culture, Heritage & Land;
- Maree Aboriginal Corporation;
- Widajabul Aboriginal People;
- Ashford LALC;
- Ngulingah LALC;
- Jubullum LALC;

- Bandjalang People; and
- Casino LALC.

Following the initial consultation, letters describing the methods to be employed for the archaeological assessment and asking for any Project specific cultural information were also issued to all registered stakeholders. Responses to these letters have raised issues regarding service provision for the archaeological assessment. Additional consultation was undertaken in relation to the proposed access tracks following field identification work. On Thursday 7 October 2009, letters were despatched to the registered stakeholders advising of the upcoming fieldwork and inviting one representative from each of the groups. Follow up phone calls were also made.

Subsequent to field assessments, a copy of the draft report was provided to Jubullum LALC, Casino LALC, Moombahlene LALC, Edgerton Kwiembal Environmental & Heritage Aboriginal Corporation, Kwiembal Elders Indigenous Group, Kambuwal Aboriginal Corporation for Culture Heritage & Land, and the Maree Aboriginal Corporation. All other registered stakeholders were advised the report was available and were given the option to request a hard copy. A three week time period was given for response. No feedback was received within the allocated time period. Ozark subsequently contacted all Registered Stakeholders who had a copy of the report by phone or email to follow up on the report's distribution and seek comment, A summary of concerns raised is provided in **Appendix G Heritage**, **Volume 2** of the EA.

6.5 Community Consultation

A range of consultation activities have been implemented in order to present information to the community on the need for the transmission line, the history of the Project and the process to be undertaken in order to identify an alignment. This section provides an outline of the key activities undertaken.

6.5.1 Letters to Potentially Affected Lot Holders

The following letters were sent to affected lot holders where full or partial acquisition for the Project would be required:

- initial letters issued to lot holders in the study area (8 April 2009);
- follow-up letters issued to lot holders requesting one-on-one meetings (19 May 2009);
- expanded study area letters (Mole River & Northern Tenterfield) (22 July 2009); and
- preferred corridor mail out to 'affected' and 'no longer affected' lot holders (October 2009).

A description of the content and number of the letters issued is contained in **Section 2.2** of **Appendix D Consultation Report.**

6.5.2 Project Update Newsletter

The first Project update in the form of a newsletter was mailed out to lot holders within the study area in May 2009. Further updates were sent in July and December in 2009 and again in June and September 2010. In addition, a separate update was sent to lot holders between Lismore and Casino in July 2010. Newsletters were also sent upon request to other community members and published on TransGrid's website. A copy of the Project update newsletters is provided in Appendix A of **Appendix D Consultation Report**.

6.5.3 Media

Media to date regarding the Project are listed below:

- 'TransGrid Announces Plans for Essential Power Upgrade in Far North NSW': announcement of plans to invest $227 million into the electricity network in Far North NSW, to meet reliability needs and address increasing electricity demand (20 March 2009).
- 'TransGrid Listens To Community Concerns': article reporting on community meeting held in Tenterfield on 13 June 2009 (15 June 2009).
- 'Far North NSW Project Will Reduce NSW Energy Loss' – article reporting TransGrid's Far North NSW Project will save over 33,000 tonnes of CO_2 every year due to increased efficiency of the network (6 July 2009).
- 'TransGrid asks the community for input on two additional study areas' – media release also announcing the upcoming community information sessions to be held in August 2009 (21 July 2009).
- 'TransGrid receives valuable community feedback' – media release recounting the information sessions held in Mingoola Hall and Tenterfield RSL pavilion (30 July 2009).
- 'TransGrid to hold additional information sessions following community interest' – media release informing the Tenterfield community of further opportunities to comment on the Project between the 4-6 August 2009 (31 July 2009).
- 'Preferred Corridor Selected for Far North NSW Project': announcement of selection of preferred corridor for the proposed power line to connect Dumaresq Switching Station (Bonshaw) and Lismore Substation (30 September 2009).
- 'TransGrid welcomes major gas deposit discovery': an announcement advising that TransGrid, the NSW transmission network operator, welcomed the discovery of a major gas deposit in Casino by Metgasco. Despite the discovery of the major gas deposit, TransGrid will be continuing to progress its Far North NSW Transmission Line Project in order to meet rising energy demand on the Far North Coast forecast by 2012 (3 December 2009).
- 'TransGrid seeks network support for NSW Far North Coast Region': announcement of the release of a Request for Proposals (RFP) seeking non-network solutions to meet peak demand in the Far North Coast region of NSW in the short term (21 May 2010).

An example of these media releases is provided in **Appendix D Consultation Report.**

Examples of media statements issued to date include:

- 'Update: TransGrid's Far North NSW Project': provided an outline of the plan to upgrade the existing transmission line between Tenterfield and Lismore, and to build a new line between Bonshaw and Tenterfield. This update outlined that environmental studies are being conducted, a route for the line has not yet been selected and that affected landholders would be compensated. It also encouraged members of the public to visit the TransGrid website and displays (27 April 2009).
- 'Update: TransGrid's Far North NSW Project': reinforced that the Project is in its preliminary stage and no alignment has been decided. This media update also directed people to recently uploaded satellite images showing a more detailed view of the study area on the TransGrid Website (11 May 2009).

- 'Far North NSW Project Update': stated that TransGrid is in the process of considering route options, and asked for feedback from community members. The update included the TransGrid hotline number where enquiries and feedback could be directed (21 May 2009).

6.5.4 TransGrid Website

A Project website was established in 2009 and included background information and an explanation of the need for, and benefits of, the Project. The website contains public documents relating to the proposal, aerial imagery and contact information such as the 1800 number and designated email address (with an option to subscribe to regular feeds). The website will remain accessible until construction of the Project is complete and can be accessed at the following address: http://www.transgrid.com.au/projects/projects/dumaresq_lismore/Pages/default.aspx

6.5.5 Newspaper Advertisements

Advertisements regarding consultation venues, Project information and the request for proposals were advertised in local papers, including:

- Tenterfield Star (April, May, June, July 2009 and March 2010);
- Southern Free Times (April, May, June, July 2009 and March 2010);
- Northern Star (April, May, June, July 2009);
- Northern Rivers Echo (March 2010);
- Daily Examiner (May 2010);
- Coffs Coast Advocate (May 2010);
- Don Dorrigo Gazette (May 2010); and
- The Sydney Morning Herald (May 2010).

Examples of the advertisements are provided in **Appendix D Consultation Report.**

6.5.6 Public displays

Fixed display sites were established at Lismore, Kyogle, Richmond Valley, Tenterfield and Inverell Councils. The display sites included material such as the Project update newsletters, feedback forms, mapping sheets and CDs containing high resolution maps for community members requiring more detailed images.

As discussed in **Appendix D Consultation Report**, public displays at each of the display sites occurred on 18 May 2009 and 23 July 2009, coinciding with the announcement of the expanded study areas. A third public display was held in October 2009 coinciding with announcement of the preferred corridor.

TransGrid has undertaken consultation activities to inform and receive feedback from the public, affected landowners and government agencies as the Project has progressed. In addition, the EA would be placed on public exhibition by the NSW DoP for a minimum of 30 days. In accordance with the requirements of the EP&A Act, stakeholders and the public are invited to make submissions. This process provides further opportunity for public involvement and participation in the environmental planning and assessment process for this Project.

6.5.7 Public Information Sessions

There have been eight public information sessions held to date to provide an opportunity for the community to discuss the Project and provide local information and feedback. The information sessions were held at readily accessible locations in proximity to the study area. Information session venues included community halls at:

- Tenterfield Memorial Hall (13 June 2009);
- Mingoola Hall (28 July 2009);
- Tenterfield RSL Pavilion (29 July 2009);
- Drake Community Hall (30 July 2009);
- Casino Civic Hall (30 July 2009); and
- Tenterfield RSL Pavilion (4, 5, 6 August 2009).

Further information about the public information sessions is contained in **Section 2.2** of **Appendix D Consultation Report.** The information collected at these sessions is presented in **Section 6.6** below.

6.5.8 Feedback Tools

The following section outlines feedback tools which were utilised by TransGrid to obtain feedback from local community members.

1800 contact number

A 1800 number was established for the Project in February 2009 and advertised in local papers so members of the community could contact the Project team with any queries on the Project. The 1800 number was also included in the letters to lot holders, Project update newsletters and feedback forms. The recordings were checked regularly (morning, midday and evening) and calls were responded to within one working day. As of 19 October 2010, a total of 214 calls had been received on the 1800 number.

All of the calls to the 1800 number were logged and distributed to the Project team. **Section 3.2** of **Appendix D Consultation Report** identifies the issues raised from the 1800 number. A summary of these issues is presented below in **Section 6.5.9.**

Feedback Form

Feedback forms were prepared to allow the community to readily provide the team with their comments and issues of concern. These forms were made available at both the fixed display sites and the public information sessions and were also sent out on request to members of the community that rang the 1800 number. The forms included a reply paid address where responses could be sent. As of 31 January 2010, there have been 53 feedback forms submitted. A summary of issues raised as part of this process is presented in **Section 6.5.9.** An example of the feedback form is provided in **Appendix D Consultation Report.** A total of 53 feedback forms were received.

Focus Group Registration Form

Focus Group Registration Forms were prepared to allow the community to provide their interest in participating in a focus group meeting as well allowing the community to readily provide the team with their comments and issues of concern.

There were 28 focus group registration forms submitted. A number of these marked their interest in participating in a focus group. Consequently, four focus groups were held at three locations. TransGrid engaged an independent firm to undertake these sessions aimed in gaining specific data from the community in relation to the Project. The locations of these meetings were:

- Drake Village Resource Centre (Group 1) (1 September 2009);
- Tenterfield Best Western Henry Parkes (Group 2 and 3) (2 September 2009); and
- Mole River Area (Group 4) (3 September 2009).

A summary of issues raised from the questionnaire is presented in **Section 6.6.**

6.5.9 Community Consultation: Key Issues

During the Constraints Identification and Preferred Corridor Stage (February – September 2009), following preliminary environmental studies, aerial surveys and feedback from the community, two additional areas were identified for consideration. The additional areas identified were to the north of Tenterfield and the around Mole River district. The expanded Study Areas were placed on public exhibition and community members provided comment on the areas. Key issues raised during this process included land severance, proximity to residences, proximity to clusters of small lots, and the need for the transmission line. Other issues of concern to some members of the community included preservation of heritage listed sites in the locality, water quality issues and weed management.

The issues identified from the Constraints Identification and Preferred Corridor Stage, including the public exhibition of the expanded study areas fed into the design process and were considered as part of the identification of the preferred corridor and progression of the preferred alignment and associated easement. Following the identification and announcement of the Preferred Corridor in September 2009, key issues raised were largely in relation to the position of the alignment on property, consideration of land and field boundaries, consideration of interference with use of agricultural machinery, and requests for information including the position and type of structures within the easement.

This section provides an overview of issues raised through the consultation process, including the feedback mechanisms identified above. It is noted that additional feedback was also received from landholders and members of parliament through letters to TransGrid.

Table 6-2 provides an overview of the key issues raised via the feedback tools.

Table 6-2 Key Issues Identified Via 1800 Number, Feedback Forms and Questionnaire Forms

Key Issue Identified	Number of Times Raised
Proximity of Transmission Line to Residences	68
Other Data Request (e.g. dates of information sessions)	67
Location of Property in Relation to the Study Area	62
Compensation and Easement Acquisition	61
Request Project Information	60
Visibility of Infrastructure	55
Environmental Issues (incl. heritage, biodiversity)	53
Land Use Impacts	50
Impact on Property Value	38
Use of Publicly Owned Land Where Possible	31

Key Issue Identified	Number of Times Raised
Safety During Operation and / or Construction	31
Requests for One on One Meeting	30
Fire Management	29
Security of Electricity Supply	28
Health (incl. EMF)	22

Table 6-3 outlines the key community consultation issues raised and how the Project planning process has responded to these issues. It is noted that the issues raised by Government Agencies are recorded in **Section 2.5** of **Appendix D Consultation Report** and responses to issues are provided within each of the technical studies (refer to **Chapters 7 – 18**). A summary of where in the EA responses are made to the DGRs is provided in **Appendix A Director-General's Requirements.**

Table 6-3 Community Consultation Issues Summary

Aspect	Issue Raised	Response/Section of the EA in which Issue is Addressed
Proximity to Residences	• Concern over proximity to residences and associated effects including health, visual and property value. Request to avoid dense clusters of residential land use.	Through the constraints identification process, the alignment has been designed to be located as far as practicable from residential receptors. Refer to **Appendix B3 Constraints Identification Report, Chapter 12 Visual** and **Appendix H Visual Assessment.**
Land Value	• Concern over impact of the transmission line on property value. • Request information on the easement acquisition and compensation process. • Concern raised over interference with property development plans including sub-division and future property construction. • Expressed support for the Project. Enquires regarding Project timelines and organisation of on-site meeting with TransGrid.	**Chapter 18 Socio-Economic** provides an overview of the easement acquisition process. When TransGrid acquires an easement on private property the landowner is entitled to compensation under the *Land Acquisition (Just Terms Compensation) Act 1991*. Easement compensation would be assessed by an independent registered property valuer. TransGrid encourages affected landowners to seek independent valuation and legal advice. The location of submitted and approved development applications was confirmed with Council and mapped as part of the constraints identification Project stage (refer to **Appendix B Constraints Identification and Preferred Corridor Report**). Future property development plans and the easement acquisition and compensation process were and continue to be discussed as part of meetings between lot holders and TransGrid staff.
Strategic Justification	• Questions raised regarding the need for the line and the proposed location.	**Chapter 2 Project Need and Alternatives** of this EA provides detail on the Project Need and Alternatives.

Aspect	Issue Raised	Response/Section of the EA in which Issue is Addressed
Property/ Agriculture	• Negative impact on intensive agricultural/tourist/environmentally friendly focused business. • Dissection of agricultural land will result in it being impossible to use GPS guidance systems and large efficient farming machinery. • Reduction in the capital value of land as a result of both impacts to agricultural production and aesthetic value. • Impact and restriction on the use of centre-pivot irrigation systems located in particular at the Dumaresq end of the alignment. • Lack of consideration to the future impacts for farmers and livelihood. • Impact on the use of some farming equipment or construction of silos/sheds etc. • The proposed route would prevent the use of take/off landing area for aircraft used in agricultural operations. • Changes to cropping practices. Concerns that structures will add more work to farming program.	These issues were discussed during meetings between lot holders and TransGrid staff. Where possible issues were addressed and the proposed alignment considering these factors. Issues regarding land use impacts, easement restrictions and compensation are addressed in **Chapter 18 Socio-Economic** of this EA. Issues regarding concerns over airport safety are addressed in **Appendix B3 Constraints Identification Report.**
Visual	• Concerns over visibility of infrastructure in a scenic area with a strong tourist economy.	Concerns regarding particular localities were issued to the design team and the visual consultant. Refer **Chapter 12 Visual** and **Appendix H Visual Assessment**.
Health	• Questions raised regarding the effect of long term exposure to electro magnetic field and radiation.	An assessment of potential health effects as a result of electromagnetic fields associated with the power line has been undertaken and is provided in **Chapter 17 Electric and Magnetic Fields.**
Heritage	• Identification of known heritage sensitivities in the Study Area	Information on known heritage constraints was issued to the Heritage Consultants (refer to **Chapters 10 Indigenous Heritage, 11 Non-Indigenous Heritage** and **Appendix G Heritage**).
Community Consultation	• Concerns over lack of community consultation and approach to community consultation.	An extensive community consultation program has been implemented as summarised in this Chapter of the EA and in **Appendix D Consultation Report** . TransGrid will continue to keep the public informed and will continue this consultation program as the Project progresses.
Biodiversity	• Identification of the location of known threatened species in the locality. • Recognition by the community that impact to flora and fauna is a lower priority to impact on agricultural activities.	Information provided has been taken into consideration as part of the Biodiversity report provided in **Appendix F Biodiversity** and summarised in **Chapter 9 Biodiversity**.

6.6 Conclusion

Consultation undertaken during the development of the Constraints Identification and Preferred Corridor Selection Report in **Appendix B-3** of this EA (between February and September 2009) identified a number of issues raised by stakeholders in relation to the Project. Proximity of the Project to residences

and traversing of small lots particularly near Tenterfield, were raised as key issues for consideration as the design stage of the Project progressed. These issues fed into the identification of the preferred corridor. The preferred corridor was selected on the basis that where possible it:

- avoided dense clusters of landholdings;
- minimised the number of affected properties;
- minimised visual impacts;
- has reasonable access from existing sealed roads; and
- avoided endangered ecological communities, threatened species and habitats;

The preferred corridor is shown on **Figures 6.2a** and **6.2b** in **Appendix B-3 Constraints Identification Report.**

In identifying a preferred corridor for the Project and consequently the alignment as shown in **Figures 3-2a - 3-2ae** (**Section 2, Volume 3** of this EA), TransGrid faced the challenge of balancing the different needs and expectations of many stakeholders. The consultation undertaken has identified key issues of concern to stakeholders associated with the line and those who have a general interest in the Project.

During consultation activities, no critical constraints were raised by the local councils, though future development proposals and proximity to concentrations of residential dwellings were discussed. Specific items raised for consideration by the local councils included proposed developments, soil and weed management, management of impact on the road network during construction, and close liaison with affected landowners.

The local community that provided feedback to the Project is predominantly a rural community involved in agricultural and associated land-based enterprises. Accordingly, the issues raised included land use impacts associated with the Project, including impacts on cropping regimes, airstrips and operation of farming enterprises. Questions were also raised in relation to the proposed design, specifically, where structures would be located and how arrangements would be made for dismantling the existing 132kV transmission line and constructing the 330kV line.

Other issues raised included flora and fauna protection, soil erosion control, dust and noise management and access issues. Of concern to some members of the community was preservation of heritage listed sites in the locality, water quality issues and weed management.

Consultation with government agencies has been ongoing and has assisted in developing an EA that addresses each of the identified environmental issues, allowing any potential impacts to be mitigated.

The EA would be placed on public exhibition by the NSW DoP for a minimum of 30 days. Submissions made during the exhibition of the EA would be addressed with the Submissions report to be prepared as part of the assessment process for the Project. This process provides further opportunity for public involvement and participation in the environmental planning and assessment process for this Project.

7 Soils, Geology and Topography

7.1 Introduction

This chapter presents an assessment of the soil, geology and topography within, and in proximity to, the Project. The assessment is based on a desktop review of available data, along with analysis of soil samples collected within the study area.

The assessment has been undertaken in accordance with the DGRs including identification, assessment and management of any land contamination, areas of acid sulfate soils and water quality issues.

7.1.1 Assessment Methodology

Desktop Studies

Individual 1:100,000 and 1:250,000 map sheets across the proposed alignment have not yet been produced and were therefore not available from the Department of Natural Resources at the time of this assessment. Information for the desktop soil review was collated from the NSW 1:2,000,000 map sheets, the Australian Soil Resource Information System (ASRIS) and the NSW Natural Resource Atlas (NRAtlas). Soil information and discussion is based on the use of Isbell, R. (1996) The Australian Soil Classification (ASC).

Field Investigations

Visual inspection of portions of the proposed alignment and access track locations was undertaken for the purposes of ground truthing soil types and profiles, and identifying areas of potential high sensitivity. Soil samples were collected from a number of locations for analysis using the Aggregate Stability in Water (ASWAT) test for slaking and dispersion.

7.2 Existing Environment

The study area is located within the NSW North Coast, South Eastern Queensland, Nandewar and New England Tablelands bioregions (**Figure 2a** and **2b** of **Section 3 Biodiversity Figures, Volume 3**) as defined in the *Interim Biogeographic Regionalisation for Australia* (Thackway & Creswell 1995).

7.2.1 Geology

Dumaresq Switching Station to Tenterfield (Study Area West)

The area from Dumaresq Switching Station to the Tenterfield township lies within the Nandewar and New England Tableland bioregions, and is part of the New England Fold Belt. The geology of this region consists of several intrusions of granites, each of slightly different composition. The soil type largely consists of siliceous sands amongst granite rock outcrops.

Soil in basalt areas consists of shallow stony loams on the steep areas, and red brown to black, fertile, well-structured loams located on flatter slopes. Siliceous sands and red earths occur on tertiary sands and gravels. Alluvial loams and clays with moderate to high fertility are found in the valleys (DECC, 2008).

Tenterfield to Lismore (Study Area East)

Between Tenterfield and Lismore the alignment and access tracks lie within the New England Tableland bioregion, North Coast bioregion and the South East Queensland bioregion (DECC, 2008).

Soils within the North Coast Bioregion are typically red, friable loams or clay loams with good structure and excellent water-holding capacity in the basalt derived soil. Shallow yellow earths are found on hillcrests, yellow and brown texture contrast profiles are found on the slopes, and organic loams or sandy loams are found on the alluvial plains, on granites and most of the quartz rich sedimentary rocks (DECC, 2008).

The geology of the alignment from Casino to Lismore consists of deep alluvial sediments – alluvium, clay and sand. Fine-grained basaltic sediments predominate in these soil types (Soil Landscapes of the Lismore to Ballina 1:100 000 Sheet).

7.2.2 Topography

Dumaresq Switching Station to Tenterfield – Study Area West (within the Nandewar and New England Tablelands Bioregion)

Study area west traverses the Nandewar and New England Tablelands Bioregions (**Figure 2a** of **Section 3 Biodiversity Figures, Volume 3**), Topography within the New England Tablelands Bioregion is generally described as a "*stepped plateau of hills and plains*" with elevations ranging from 600 to 1500m above sea level (DECC, 2008). The Nandewar Bioregion consists of *"hilly landscapes"* that are warmer and drier than the tablelands.

Tenterfield to Lismore – Study Area East (within the NSW North Coast and South Eastern Queensland Bioregion)

Study area east falls within the IBRA South Eastern Queensland and North Coast Bioregions. The portions of these two IBRA Bioregions that fall within NSW are classified as the North Coast Bioregion by DECCW (NPWS, 2003) Landforms in this area range from floodplains through to low foothills and ranges, within the coastal lowlands of the east, to the steep slopes and gorges of the Great Escarpment in the west (DECC, 2008).).

7.2.3 Soils

Table 7-1 provides a summary of soil type and landscape limitations in the area.

Table 7-1 Soil Type and Landscape Limitations

Location	Bioregion	Angle Positions	Soil Type (Australian Soil Classification)	Soil Limitations	Landscape Limitations
Dumaresq Switching Station – Tenterfield	Nandewar & New England Tablelands	1-40	Sodosols and Tenosols	Sodicity/ dispersibility; Hardsetting surface; Weak soil structure/ structural decline hazard; Rock layer/carbonate pan; and High erodibility.	Rock outcrops; Steep slopes (localised); High run-on; and Gully erosion.
Tenterfield – Drake	New England Tablelands & NSW North Coast	41-45	Kurosols	Sodicity/ dispersibility; Hardsetting surface; Weak soil structure/structural decline hazard; Stoniness (localised); and Rock layer/carbonate pan.	Run-on (potentially affecting areas between AP 41 – 42); Gully erosion; and Rock outcrop (localised).

Location	Bioregion	Angle Positions	Soil Type (Australian Soil Classification)	Soil Limitations	Landscape Limitations
Drake – Tabulam	NSW North Coast & South Eastern Queensland	46 - 50	Kurosols	Sodicity/ dispersibility; Hardsetting surface; Low fertility; Acidity localised; and High erodibility.	Potential acidity when disturbed which can be highly toxic to plants.
Tabulam - Mummulgum	South Eastern Queensland	51 - 56	Kurosols and Chromosols	Magnesium, sodium or aluminium toxicity potential; and Low fertility.	Stream-bank erosion and Run-on.
Piora	South Eastern Queensland	57 – 59	Chromosols	Sodicity/ dispersibility (localised); Stoniness (localised); Low fertility; High erodibility (topsoils); and Chromosol.	Water erosion hazard.
Piora – Casino	South Eastern Queensland	60 - 63	Chromosols and Rudosols	Weak soil structure/structural decline hazard; Hardsetting surface (seasonally); and Subsoil acidity (localised).	Potential acidity when disturbed which can be highly toxic to plants.
Casino - Lismore	South Eastern Queensland	64 - 70	Vertosols, Kurosols and Dermosols	Sodicity/ dispersibility (localised); Hard setting surfaces; Shrink-swell clay; Magnesium, sodium or aluminium toxicity potential; and Subsoil acidity (localised).	Foundation hazard; Stream-bank erosion; and Potential acidity when disturbed which can be highly toxic to plants.

7.2.4 Erosion Potential

Soil (both topsoil and subsoil) erodibility was identified as an issue (**Table 7-1**) in a number of the soil units identified. Within the Australian Soil Classification System, sodosols present the greatest dispersal and erosion potential. This soil type was identified predominately between Dumaresq Switching Station and Tenterfield. Tenosols, also common between Dumaresq Switching Station and Tenterfield, have weak pedological organisation (i.e. a weak structure) and thus, tenosols have an inability to maintain structure under stressful activities such as construction.

As shown in **Plate 7-1**, soil erosion is already occurring at a number of locations in proximity to the proposed alignment. Photograph locations are shown in **Figure 7-1**.

Plate 7-1 Examples of Soil Erosion in Proximity to the Proposed Alignment

The field investigations noted that there are variable levels of previous disturbance across the landscape. However, a number of locations also appear to be relatively undisturbed. Suitable controls would be implemented during construction activities to minimise soil erosion impacts caused by activities such as vegetation clearance and benching, where required (refer to **Section 7.3 Assessment of Impacts**).

Due to the limited desktop soil information available within the study area west, and the knowledge that there are potentially highly erodible and dispersive soils between Dumaresq Switching Station and Tenterfield, representative soil samples were collected from four locations within this region for analysis using the Aggregate Stability in Water (ASWAT) test for slaking and dispersion.

Sampling locations are shown in **Figure 7-2** and comprised:

- T1 – in the vicinity of AP6 East of the Bruxner Highway;
- T2 – between AP10 – AP11 East of the Bruxner Highway;
- T3 – to the northeast of the study area adjacent to the Bruxner Highway south of Reedy Creek; and
- T4 – in the vicinity of AP26 west of Woodside Road.

Samples were randomly selected for analysis to gain an understanding of soil characteristics along this section of the alignment (study area west). Results from these soil characteristics tests can be considered during design and construction (**Section 7.3 Assessment of Impacts**). Salinity was not identified as an issue within the study area west.

Sample T4 exhibited the highest levels of dispersibility. However the T4 air dry aggregates only exhibited a minor amount of dispersion. No slaking or dispersion was evident in the T1 or T3 samples. This indicates that soils within the vicinity of T4 have a higher potential to disperse and erode during proposed construction activities than soils from T1 and T3.

The ASWAT test could not be conducted on the T2 soil sample due to a lack of peds (aggregates of soil) of sufficient size.

All samples were also tested after remoulding. The purpose of remoulding is to ascertain how the soil would react once disturbed by activities such as cultivation, or in this example, clearing and construction. Although minimal dispersion was noted around the natural soil aggregates, all samples except T2 both slaked and dispersed after remoulding. This indicates a higher chance of dispersion and consequently erosion during construction works**.**

QUEENSLAND

NEW SOUTH WALES

TENTERFIELD SHIRE COUNCIL

KYOGLE COUNCIL

LISMORE CITY COUNCIL

RICHMOND VALLEY COUNCIL

INVERELL SHIRE COUNCIL

Plate 7-1b

Plate 7-1a

DRAKE

TABULAM

CASINO

LISMORE

RUTHVEN

CASINO 132kV SUBSTATION (COUNTRY ENERGY)

LISMORE SUBSTATION

PROPOSED TENTERFIELD 330kV SUBSTATION

TENTERFIELD

TENTERFIELD 132kV SUBSTATION

WOODSIDE

BONSHAW

DUMARESQ SWITCHING STATION

0 5 10 20

Kilometers

Datum: GDA94, Projection: UTM, Grid: MGA Zone 56

LEGEND:

- Photo Locations
- Proposed 330kV Alignment^
- Substation/Switching Station
- State Border
- Local Government Area
- Slope Greater than 18°
- National Park/State Forest

Symbols and lines used in this figure are indicative and are not intended to reflect actual size of represented features.
Symbols and lines have been enhanced to aid visibility.

Source: Photos from URS, 2009
^ Transgrid 2010

Map compiled using MapInfo StreetPro and NPWS Data.

Drawn: AO/SB	Approved: WM/TH	Date: 17/11/2010
Job No.: 43177662	File No.: 43177662.109.mxd	

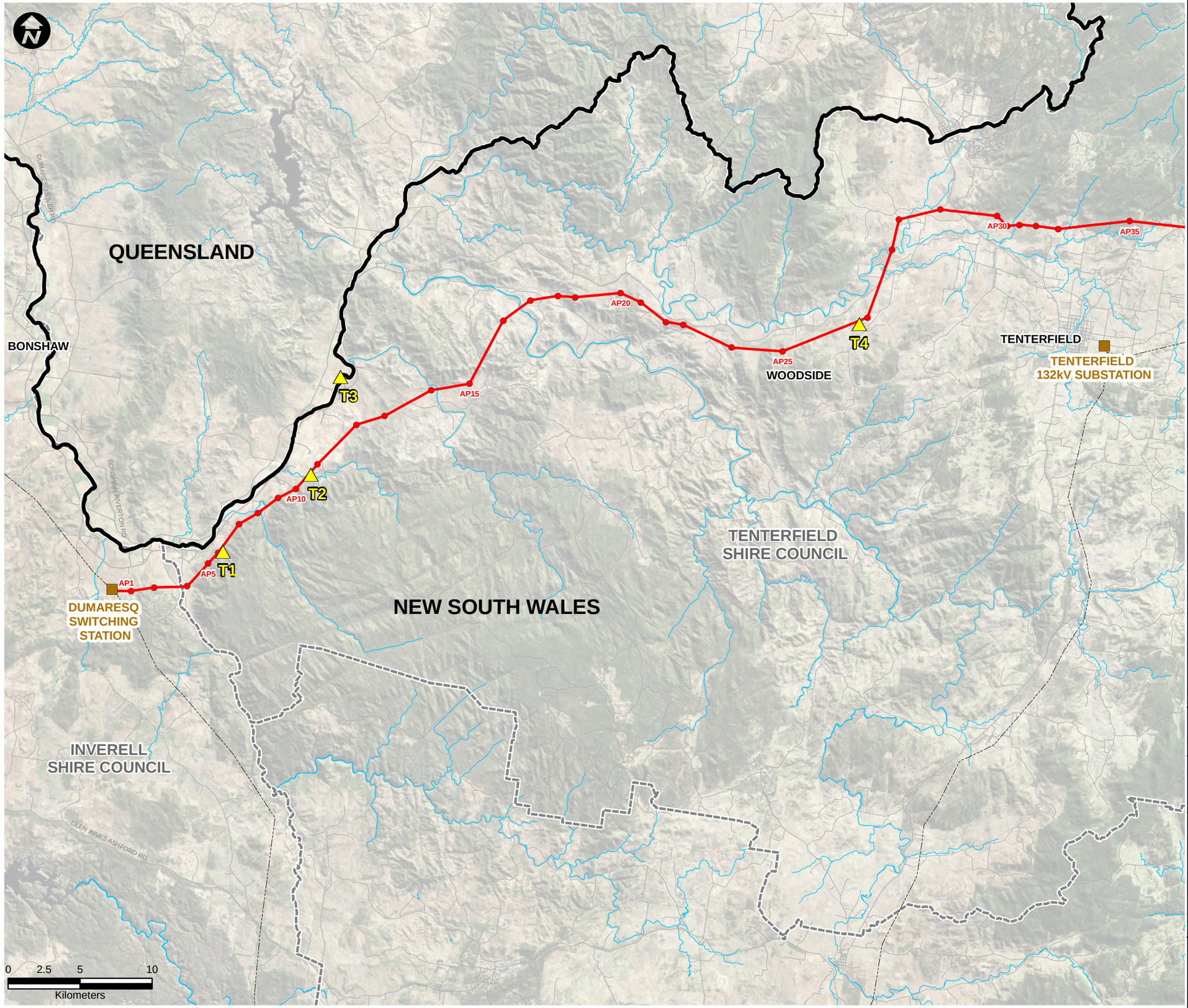
Client: TransGrid

Project: FAR NORTH NSW (DUMARESQ - LISMORE 330kV TRANSMISSION LINE) PROJECT

Title: TOPOGRAPHY OF PROPOSED ALIGNMENT AND PHOTOGRAPH LOCATIONS

Figure: 7-1

URS



Datum: GDA94, Projection: UTM, Grid: MGA Zone 56

LEGEND:

- Soil Sample Location
- Existing Transmission Lines^
- Proposed 330kV Angle Positions (Indicative)^
- Proposed 330kV Alignment^
- Substation/Switching Station
- Roads
- Waterways
- Local Government Area
- State Border

Symbols and lines used in this figure are indicative and are not intended to reflect actual size of represented features.
Symbols and lines have been enhanced to aid visibility.

Source: Aerial Imagery from Microsoft © Bing Maps
^ Transgrid 2010

Map compiled using MapInfo StreetPro and NPWS Data.

Drawn: AO/SB	Approved: WM/TH	Date: 13/01/2011
Job No.: 43177662	File No.: 43177662.093.mxd	

Client: TransGrid

Project: FAR NORTH NSW (DUMARESQ - LISMORE 330kV TRANSMISSION LINE) PROJECT

Title: DISTRIBUTION OF SOIL SAMPLE LOCATIONS ALONG ALIGNMENT

Figure: 7-2

URS

T2 is the only sample which did not disperse. Although the ASWAT test could not be conducted on peds from this sample, the lack of slaking and dispersion in the remoulding test indicates the peds would not have slaked or dispersed.

The ASWAT test illustrates that with the exception of the T2 sample, all soil types have the potential to slake and disperse once the soil has been disturbed. Disturbance occurring within the vicinity of drainage lines has the potential to impact on downstream water quality through increasing the sediment load transported as run-off. These soils would be managed to ensure that the subsoils are not exposed without suitable controls being implemented (refer to **Section 7.3 Assessment of Impacts**).

7.2.5 Acid Sulfate Soils

Acid Sulfate Soils, which are the main cause of acid generation within soils, are commonly found less than 5m above sea level, particularly in low-lying coastal areas such as mangroves, salt marshes, floodplains, swamps, wetlands, estuaries, and brackish or tidal lakes. When exposed to air, these soils produce sulfuric acid which can be a health risk during construction and often result in the release of toxic quantities of iron, aluminium and heavy metals. The potential for Acid Sulfate Soils to occur within the vicinity of the Project is considered to be low as the most eastern point of the alignment is approximately 40km from the coast and is 20m above sea level.

Use of the ASRIS derived soil maps of acid sulfate potential revealed that the potential between Dumaresq Switching Station and Lismore is low, with patches of extremely low probability around Tabulum, Casino and Sandy Hills. Despite this low probability, the CEMP would include measures for managing Acid Sulfate Soils should they be identified during construction.

7.2.6 Acidic Soils

Between Tenterfield and Casino, the dominant soil type is kurosols which have strongly acid B horizons. If the topsoil of this soil unit is disturbed or removed and the subsoil is exposed, the potential for acidity is likely to be increased. If disturbed, the acids in the soils may become soluble and available for plant uptake. Such acidic solutions can be highly toxic to plants. Measures for addressing acidic soils would be included in the CEMP.

7.2.7 Contaminated land

With the exception of the sub/switching stations and the existing 132kV transmission line from Tenterfield 132kV Substation to Lismore Substation, land across the Project footprint is largely undeveloped. Existing activities within the study area that have the potential to result in contaminated land are considered to be limited.

Searches were undertaken of the contaminated lands notices issued under the *Contaminated Land Management Act 1997* and the *Protection of the Environment Operations Act* (PoEO) public register within the Tenterfield, Richmond Valley, Kyogle, Inverell and Lismore Local Government Areas (LGAs). There are no contaminated land notices registered within the Tenterfield, Richmond Valley, Kyogle and Inverell LGAs. Within the Lismore LGA there are 10 notices relating to six sites. The closest of these sites to the Transmission line alignment is an asbestos waste burial site at Tuncester, approximately 5km north of Lismore Substation.

There is potential for pesticide contamination of the soils along the existing line between Tenterfield and Lismore. Pesticides are routinely used to protect transmission lines, applied directly to timber poles (to protect the poles) or applied by spraying after supporting structures are erected. The application of such chemicals may have residual impacts on chemical concentrations in the soils around the 132kV poles. A regime of soil sampling is proposed to be undertaken in conjunction with required geotechnical testing to

determine whether, and to what extent, contamination exists. This will be carried out prior to dismantling works. The procedure for the identification and management of contaminated soil is outlined in **Section 7.3 Assessment of Impacts**.

7.3 Assessment of Impacts

7.3.1 Construction Phase Impacts

Erosion of Disturbed Areas During Construction

There is potential for erosion and sedimentation to occur in association with all works requiring disturbance to the ground surface. These impacts would be associated with the removal of redundant 132kV poles, all necessary vegetation clearance, the establishment of access tracks and work sites, erection of new structures and the construction of the proposed Tenterfield 330kV Substation.

The primary risk associated with soils in the Project area is the presence of soil types (sodic soils) that can become highly erodible when disturbed.

As outlined in **Table 7-1**, the soil limitations of sodicity and dispersibility were identified across various parts of the proposed alignment. Between Dumaresq Switching Station and Tenterfield, the soils are likely to be sodosols and would therefore have a sodic B horizon. These soils are likely to have a high percentage of fines and be dispersible. They are readily erodible once the topsoil is disturbed. The combination of dispersive soils and high water run-on has the potential to cause gully erosion.

A constraints analysis was undertaken to assist in the determination of the alignment route and the route of the off-easement access tracks. Steeply sloped areas were avoided where possible to minimise potential erosion impacts. A number of locations with steep terrain do exist across parts of the proposed route, including ranges running adjacent to the alignment with gullies crossing the alignment between AP3-AP25 and within and in proximity to Girard State Forest (AP41-45) where the topography is more variable. Areas of steep topography (i.e. slopes > 18°) are identified in **Figure 7-1**, and have been mostly avoided by the chosen alignment.

Dismantling of the Existing 132kV Transmission Line

Dismantling the existing 132kV line would involve ground disturbance to remove redundant timber poles. Areas of disturbed ground would be kept to a minimum and all work would be completed in line with the Soil and Water Management Plan as part of the CEMP (based on the Blue Book) to limit erosion. A summary of these measures is outlined in **Section 7.4 Draft Statement of Commitments**.

As pesticides are routinely used to protect TransGrid assets, (often applied directly to timber poles or applied by spraying poles after they are erected), there is potential for soil contamination at the existing 132kV pole locations. If the geotechnical investigations detect pesticide contamination in the soil, remedial action will be required. This would involve the excavation and disposal of soil material from impacted pole locations. Soil material would be excavated to the extent of the pesticide contamination. This excavated spoil would be appropriately classified in accordance with DECCW Waste Classification Guidelines before being transported off site and disposed of at a registered waste facility.

Where possible, the new supporting structure locations for the 330kV line would utilise the footprint areas of the dismantled pole structures. Opportunities to minimise the Project area footprint associated with the construction of the new transmission line would be taken wherever practicable.

Easement and Access Tracks

Access tracks would be established within the proposed alignment and in proximity to the alignment between the wider road network and the centreline (**Chapter 4 Project Description**). This component of the Project would involve vegetation clearing and other earth disturbance work such as the forming and grading of access roads and work site benching where this is required in areas of steeper terrain. Existing access tracks, in particular those currently used for maintenance of the 132kV line, would be utilised wherever possible.

The alignment design, proposed supporting structure placement and access track locations have been designed to avoid vegetated areas, wherever possible, so as to reduce the overall clearing required. Disturbance from vegetation clearing would be limited as far as possible, e.g. through restricted clearing and through locating supporting structures to allow spanning of gullies wherever possible (refer **Chapter 9 Biodiversity**). Where vegetation clearing cannot be avoided, mitigation measures (as discussed in **Section 7.4**) would be applied to limit the impact of the disturbance to surface soils. Where possible, vegetation would be pushed over rather than uprooted and removed. This would limit direct soil exposure and hence reduce potential erosion. All access tracks would be appropriately graded and stabilised to minimise erosion impacts. Temporary features such as benched work site areas or temporary access roads would be reformed to the natural slope of the terrain and revegetated at the conclusion of construction.

330kV Line Construction

As described in **Chapter 4 Project Description**, the construction of the proposed 330kV transmission line would require foundation preparation and establishment of a worksite area at each structure location.

Where terrain necessitates, excavation and benching of the underlying ground would be carried out to provide elevated work platforms (EWP) and other equipment with stable deployment areas. Construction would also involve the drilling or excavation of tower foundations to an estimated depth of 5m. Some additional ground disturbance would be required for earthing the tower structures using earthing straps and stakes. Mitigation measures outlined in the Soil and Water Management Plan would be undertaken to limit erosion and sedimentation. A summary of these measures is provided in **Section 7.4 Draft Statement of Commitments**.

The transport of materials and equipment to each worksite has the potential to cause contamination to the underlying soils through the leaking of fuels, oils and lubricants from vehicles and plant. The potential for these impacts to arise would be managed through the implementation of a CEMP and associated mitigation measures. These mitigation measures are detailed in **7.4 Draft Statement of Commitments** and include measures to ensure appropriate refuelling practices are observed by contractors on site, as well as by limiting vehicular access to established access tracks wherever feasible.

Substation Upgrades

All upgrade work at the Lismore Substation and Dumaresq Switching Station would occur within the existing compound boundaries and would involve the reconfiguration and/or installation of electrical equipment. No ground disturbance external to the existing footprint is anticipated. Therefore no significant erosion impacts are expected in relation to this work.

Tenterfield 330kV Substation Construction

The Tenterfield 330kV Substation construction would involve the excavation and preparation of a substation compound with approximate dimensions 150m x 130m. Construction works would include civil and electrical works, the preparation of the switchyard, and the supply and installation of required busbar

and transformer bays. Overhead transmission line connections would be established prior to substation commissioning. Work would include the construction of internal access roads, primary and secondary oil containment systems, a services building, the construction and installation of appropriate switchyard drainage, and the installation of appropriate compound fencing, security and lighting.

Where required, pollution control pond(s), sediment fencing and temporary drainage structures within and around the compound would be installed prior to commencement of construction. Any disturbed areas outside the compound would be stabilised with vegetation as soon as possible following the completion of earthworks. Temporary drainage and sediment controls would be installed to collect surface water flows from areas likely to be disturbed during construction. All temporary facilities would be removed at the end of the works. All work would be completed in line with the requirements of the CEMP to limit erosion. A summary of these measures are outlined in **Section 7.4 Draft Statement of Commitments**.

To avoid soil contamination within the substation compound, all major oil filled pieces of equipment would be installed within an area serviced by primary containment. The primary containment system would consist of a bunded area around the equipment draining to a primary oil containment tank. The secondary oil containment dam would be designed to capture discharge from the primary oil containment tank.

Providing the construction phase recommendations are implemented, impacts from construction would be minimal.

7.3.2 Operational Phase Impacts

Operational activities along the alignment would be limited to 4WD inspections of the line condition and easement and access track maintenance. Therefore there is limited potential for significant erosion or soil contamination impacts to occur during the operation. Access tracks would be maintained as required (refer to **Appendix C-1 Easements and Access Track Maintenance Policy**).

There is a low potential for contamination across the site to be caused during the operation phase as the frequency of easement maintenance work and low numbers of required vehicle movements along the line would limit the potential for fuel leaks and soil disruption. Therefore any impact would be negligible.

The Tenterfield 330kV Substation would be designed to operate without continuous on-site manning. An alarm and supervisory control system would be installed and run via remote control by the permanently manned Newcastle Regional Centre. During normal operation, a mobile operator and various design and maintenance staff may visit the substation to perform routine tasks and inspections as part of a regular maintenance program. Regular maintenance activities would involve periodic inspection, testing and overhaul of the substation equipment. These activities would range from minor adjustments of electronic equipment (daily attendance for one or two weeks) to major scheduled overhauling of equipment such as circuit breakers and transformers. There is a low potential for contamination across the site to be caused during the operation phase given the intended design features of the compound.

7.4 Draft Statement of Commitments

In order to reduce the potential impact of the Project on soils within the alignment and adjoining lands, the following management and mitigation strategies will be implemented.

Table 7-2 Draft Statement of Commitments – Soils, Geology and Topography

Mitigation Measure and Commitment		Implementation of mitigation measures		
		Design	Construction	Operation
B1	Locate the alignment and access tracks to avoid areas of steep terrain wherever possible (partially completed).	✓		
B2	Access across paddocks not requiring constructed tracks would occur under conditions that would not result in damage to soils within the paddocks.		✓	
B3	Where additional material is required for the construction of tracks, local certified material would be used where available.		✓	
B4	A Soil and Water Management Plan shall be prepared, including an Erosion and Sediment Control Plan, which shall be implemented as part of the CEMP. Soil conservation and erosion prevention measures shall be in accordance with "*Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) and Volume 2 (DECC, 2008)" (The Blue Book Volumes 1 & 2)*. 8.	✓	✓	
B5	Avoid or minimise wherever possible soil exposure generated as a result of construction-related activities, especially on dispersive soil areas.		✓	
B6	Surface water flow would be diverted around disturbed construction areas such as stockpiles. This may involve constructing an earth bank or mitre drains around construction zones.		✓	
B7	All access tracks would be appropriately profiled and stabilised to avoid erosion impacts in accordance with "*Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) and Volume 2 (DECC, 2008)" (The Blue Book Volumes 1 & 2)*..	✓	✓	
B8	The number of vehicle access routes into working areas would be minimised. Where there is risk of mud or soil being transferred to any sealed roads, gravel, crushed rock or other approved devices would be installed to the driveway area linking the worksite to paved roadways	✓	✓	
B9	Sediment fences (straw bales or silt fences) would be placed downslope from soil stockpile areas and all stormwater entry points surrounding disturbed areas, to protect other lands and waterways. These measures would be detailed in the Soil and Water Management Plan and the Erosion and Sediment Control Plan.		✓	
B10	Where a bulldozer is used to push over trees or consolidate felled timber, the blade would be set above the level of ground to minimise disturbance to the soil. Where soil disturbance occurs the land profile would be restored.		✓	

Mitigation Measure and Commitment		Implementation of mitigation measures		
		Design	Construction	Operation
B11	Sediment and erosion pollution control structures would be inspected regularly following significant rainfall events, and repaired or replaced as required in accordance with the CEMP.		✓	
B12	Wherever possible, refuelling or servicing of plant and machinery shall take place off-site, or as a minimum be positioned as far away as possible from drains or locations with direct drainage to a waterway or an environmentally sensitive area.		✓	✓
B13	Soils found to be contaminated in the vicinity of the poles removed from the 132kV Transmission Line would be excavated, appropriately classified in accordance with DECCW Waste Classification Guidelines and then transported off site and disposed of at a registered waste facility.		✓	
B14	Disturbed areas would be revegetated as soon as reasonably practicable at the completion of construction activities, in accordance with the Soil and Water Management Plan and the Erosion and Sediment Control Plan.		✓	