TransGrid

Review of Environmental Factors

Coppabella Wind Farm – Rebuild of Transmission Line 99M

Part 5 EP&A Act Environmental Impact Assessment

May 2019

Document Preparation History

Revision	Reviewed By	Date
RevA	Denise Lo	09/05/2019
RevB (FINAL)	Heather Wagland	27/05/2019

Certification

I certify that I have prepared the contents of this REF and, to the best of my knowledge, it is in accordance with the *NSW Code of Practice for Authorised Network Operators* approved under clause 244K of the *Environmental Planning and Assessment Regulation 2000*, and the information it contains is neither false nor misleading. It addresses, to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the proposed activity. It has been prepared by persons appropriately trained and qualified in accordance with TransGrid Procedure *Authorisation to Work*.

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Signed	
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Organisation	TransGrid

Executive Summary

TransGrid is the proponent and determining authority for the Coppabella Wind Farm - Rebuild of Transmission Line 99M project. In accordance with Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), this Review of Environmental Factors (REF) has been prepared to consider the potential environmental impacts of this proposed activity.

Goldwind Pty Ltd has received approval to construct the Coppabella Wind Farm (CWF) with a capacity of approximately 290 megawatts, located approximately 39 km west of Yass, NSW in the Yass Local Government Area.

The CWF would connect to the National Electricity Market via TransGrid's Transmission Line 99M (Line 99M), which currently provides a single circuit 132 kV electrical transmission connection between TransGrid's Yass and Murrumburrah substations. The current capacity of Line 99M is not sufficient to support the grid connection of the CWF. Consequently, TransGrid is proposing to rebuild Line 99M from the CWF site to Yass substation (approximately 39 km) as a double circuit transmission line (the proposed activity).

The proposed activity (as detailed in Section 3.2) would involve the following:

- Replacement of all existing wooden pole transmission structures between Yass 330 kV substation and Structure 143 (inclusive) with new steel or concrete pole transmission structures up to 40 meters in height (up to 20 meters higher than the existing wooden pole structures). The additional height of the line is required due to outage constraints as the existing line would remain in service throughout construction.
- Installation of optical ground wire on the rebuilt section of Line 99M, between Yass 330 kV substation and Structure 143 to facilitate the remote monitoring and protection of the new transmission connection.
- Rearrangement of other transmission lines (Line 973, Line 970 and Line 990) outside of Yass 330 kV substation to facilitate the entry of the rebuilt Line 99M into the substation.
- Construction of a new switchbay at Yass 330 kV substation to support the grid connection of CWF. This would also involve secondary systems equipment to be installed within the control room and/or auxiliary services building for the necessary control and protection requirements.

To facilitate the construction, the following ancillary works would be required:

- Establishment of construction work sites at each structure. This would require surface disturbance of an area of approximately 40 m x 40 m surrounding the transmission structure for the laydown of equipment and materials and to support plant and machinery such as EWPs and cranes.
- Establishment of level construction benches in areas of uneven topography to support the safe operation of plant and machinery.
- Repair, upgrade and maintenance of existing access tracks where required and construction of new access tracks.
- Construction of new watercourse crossings and upgrade to existing watercourse crossings.

This REF has identified the following key impacts associated with the proposed activity:

- An Aboriginal Heritage Impact Permit pursuant to Section 90 of the *National Parks and Wildlife Act 1974* is required prior to works being carried at Structures 11 and 12 due to unavoidable impacts on the previously recorded artefact scatter (Yass River Open Site 1).
- Direct vegetation removal and trimming to facilitate access to the work sites. The ecological assessment determined that no threatened flora, fauna or vegetation communities listed under either the Biodiversity Conservation Act 2016 (NSW) or the *Environment Protection and Biodiversity Conservation Act 1999* (Clth) would be affected.
- Minor visual impacts associated with the taller rebuilt steel or concrete transmission line structures experienced at some surrounding residential dwellings and along public roads.
- Potential minor temporary impacts to agricultural activities due to the physical presence of construction works on agricultural land.

- Minor erosion and sedimentation from soil disturbance activities including structure replacement, access track upgrade and construction works, watercourse crossings works and construction bench excavations.
- Minor and temporary elevated noise from construction activities.
- Minor and temporary increase in traffic movements on the surrounding road network, however the level of the increase is not expected to impact the safety and function of the road network.
- Minor amounts of dust and emissions from vehicles, equipment or earthworks during construction.

Other potential impacts are identified in Section 6 of this REF and management and mitigation measures to alleviate these impacts are summarised in Appendix A.

Additional approvals under the *Fisheries Management Act 1994* and *Water Management Act 2000* would be required prior to commencing work at watercourse crossing locations described in Section 4.4. Additionally, consent under the *Roads Act 1993* would also be required prior to overhead stringing above classified roads.

A Construction Environmental Management Plan would be prepared prior to the commencement of construction works.

Considering the assessment of the impacts detailed in this REF, it is concluded that the proposed activity is not likely to significantly affect the environment, and is not likely to significantly affect threatened species, ecological communities or other habitats.

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1. Introduction

Goldwind Pty Ltd (Goldwind) has received planning approval to construct the Coppabella Wind Farm (CWF) with a capacity of approximately 290 megawatts (MW), located approximately 39 km west of Yass, NSW in the Yass Local Government Area (LGA).

The CWF would connect to the National Electricity Market (NEM) via TransGrid's Transmission Line 99M (Line 99M), which currently provides a single circuit 132 kV electrical transmission connection between TransGrid's Yass and Murrumburrah substations. The current capacity of Line 99M is not sufficient to support the grid connection of the CWF. Consequently, TransGrid is proposing to rebuild Line 99M from the CWF site to Yass substation as a double circuit transmission line (the proposed activity). The approval for all other associated grid connection works including the construction of a new substation on the wind farm site and new transmission cut-in connection to Line 99M has been granted under Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* (State Significant Development – 6698).

NSW Electricity Networks Operations Pty Ltd as a trustee for NSW Electricity Operations Trust (known as TransGrid) is an authorised network operator and must complete an environmental assessment under Part 5 of the EP&A Act in accordance with the *New South Wales Code of Practice for Authorised Network Operators* (the Code). The appropriate assessment and approvals process in accordance with the Code for the proposed activity is **Class 4 – REF – Review of Environmental Factors (REF)**.

The purpose of this REF is to determine if the proposed activity would significantly affect the environment or significantly affect threatened species, ecological communities or their habitats. This REF documents the proposed activity, assesses the potential environmental impacts and provides environmental management measures to be implemented to minimise the risk of adverse environmental impacts during construction and operation.

2. Proposed Activity Justification

2.1 Need of the Proposed Activity

The current capacity of Line 99M does not meet the required rating to transmit the generation capacity of the CWF in the NEM. Consequently, rebuilding the approximate 39 km section of Line 99M from the CWF site to Yass substation as a double circuit line would meet the generation capacity of the CWF and reduce the predicted marginal loss factors associated with electrical generation of the CWF.

2.2 Alternative Options Considered and Preferred Option

A number of options were considered for Line 99M from the CWF site to Yass Substation to meet the generation capacity of the CWF as identified in Table 2-1. The preferred option is to rebuild above the existing Line 99M.

Table 2-1: Alternative options considered and preferred option

Option	Overview and Justification	Preferred Option
'Do Nothing'	This option would involve leaving Line 99M in its current state as a single circuit 132 kV transmission line. This would not address the project need as the rating of the current line is not sufficient in meeting the generation capacity of the CWF.	No
Uprating of Line 99M	This option was previously assessed in the *Review of Environmental Factors – Transmission Line 99M Yass to Murrumburrah 132kV Uprating* prepared by WolfPeak (2018) and involved the replacement of the existing conductors on Line 99M. Further analysis of this option determined that uprating Line 99M would result in an unacceptable marginal loss factor.	No
Rebuild In-situ	This option would require that structures along Line 99M be progressively replaced with double circuit structures. Conductor and earthwires would then be transferred onto the new structure and the existing structure dismantled. Due to undulating terrain, it was determined that existing structures would unlikely tolerate the interim arrangement between the existing wood pole structures and new double circuit structures. Additionally, the process of lifting up the conductor was determined to have significant issues on existing conductors in terms of the safe working limits and earthwire tensions.	No
Rebuild Alongside	This option would involve the rebuild of Line 99M alongside the existing transmission line as a double circuit line. Once the new line is complete, the existing wood poles would be dismantled. As the new line would be built off centre within the existing easement, this option would involve widening the easement by approximately 10 m resulting in potential property acquisition requirements. Whilst feasible, this option was not progressed due to the additional property acquisition requirements.	No
Rebuild Above	This option would involve rebuilding Line 99M as a double circuit line above the existing line. Once the new line is complete, the existing wood poles would be dismantled. This approach would allow the existing line to remain in operation during construction and would not require additional property acquisition.	Yes

3. Proposed Activity Description

3.1 Proposed Activity Location

Line 99M forms an approximate 73 km 132 kV connection between the Yass 330 kV substation and the Murrumburrah 132 kV substation, located in the Southern Tablelands region. The proposed activity would occur along an approximate 39 km section of Line 99M, from the Yass 330 kV substation to Structure 143, which is located at the eastern boundary of the CWF site. The proposed activity traverses both the Yass Valley and Hilltops LGAs. The general locality of the proposed activity is shown in Figure 3-1 and in more detail in Figure 3-2.

Line 99M traverses a low gradient, mildly undulating landscape consisting of predominantly rural and agricultural land uses. The proposed activity is located primarily within a 45 m existing easement which has been previously cleared where vegetation is regularly maintained. Access tracks provide access to the easement from the formed roads and extend beyond the easement into the surrounding agricultural land.

The majority of the proposed activity would occur on freehold land within TransGrid's existing transmission line easement. The easement, and TransGrid's rights under the *Electricity Supply Act 1995*, allows TransGrid to operate and maintain the transmission line. In total, the proposed activity traverses 34 privately owned land holdings and six State government owned properties.

For the purpose of this REF, collectively the 'study area' is defined as the:

- Existing 45 m wide easement between Yass 330 kV substation and Structure 143;
- Yass 330 kV substation inclusive of a 500 m buffer around the substation site; and
- The network of existing roads and access tracks used to access the transmission line easement.

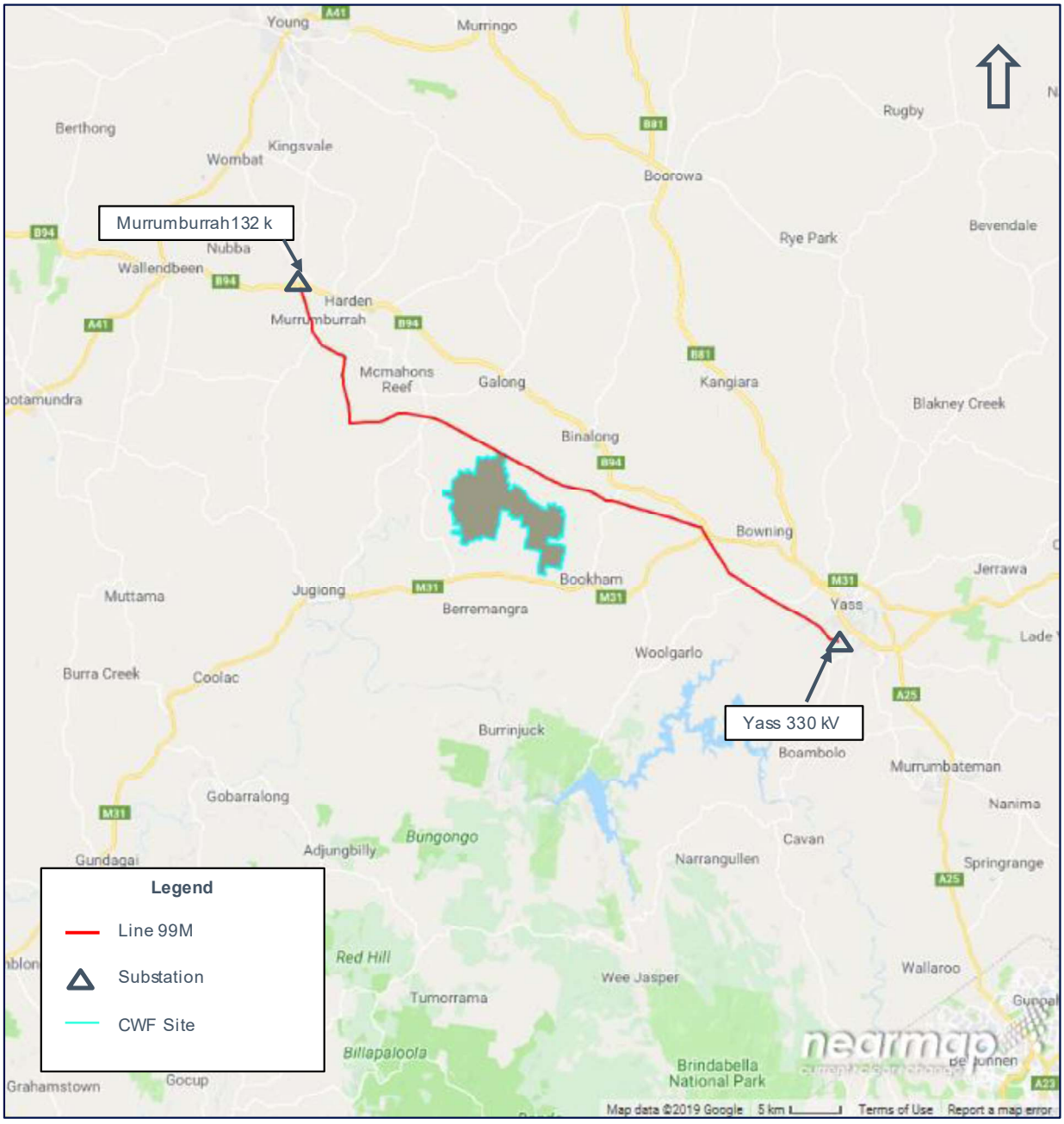

Figure 3-1: Line 99M Locality Map

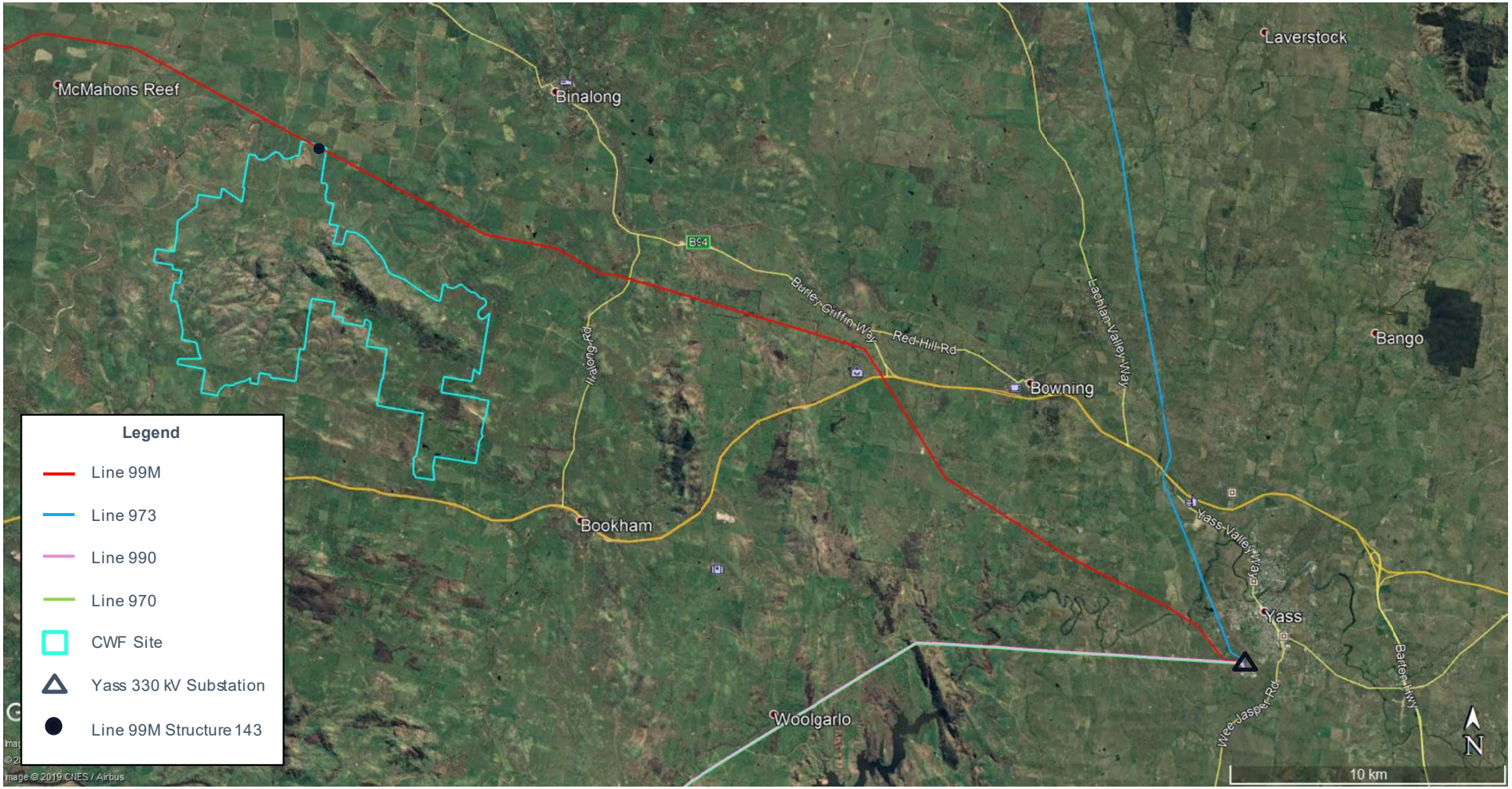

Figure 3-2: Proposed Activity Location

3.2 Detailed Proposed Activity Scope

The proposed activity would involve the following scope of works:

- Replacement of all existing wooden pole transmission structures between Yass 330 kV substation and Structure 143 (inclusive) with new steel or concrete pole transmission structures up to 40 m in height. At some locations, the new structure would be approximately 20 m higher than the existing wooden pole structures and would be installed within approximately 5 m of the existing structure, just off the centreline of the easement. The majority of the line rebuild would involve the existing wooden pole structures being replaced with single pole structures aside from the tension structures which would be replaced with two-pole structures.
- Installation of optical ground wire (OPGW) on the rebuilt section of Line 99M, between Yass 330 kV substation and Structure 143 to facilitate the remote monitoring and protection of the new transmission connection.
- Rearrangement of transmission lines outside of Yass 330 kV substation to facilitate the entry of the rebuilt Line 99M into the substation. This would include:
  - Replacement or strengthening works on Structures 1 (steel lattice tower) and 1A (concrete pole) on Line 970;
  - Replacement of Structure 522 (concrete pole) on Line 990;
  - Replacement of Structure 523 (steel lattice tower) on Line 973;
  - Installation of a new structure on Line 973 (near Structure 2 on Line 99M); and
  - Restringing the conductors and earth wires from the structure replacement and installation locations into Yass substation.
- Construction of a new switchbay at Yass 330 kV substation to support the grid connection of CWF. This would also involve secondary systems equipment to be installed within the control room and/or auxiliary services building for the necessary control and protection requirements.

To facilitate the works, the following ancillary works would be required:

- Establishment of construction work sites at each structure. This would require surface disturbance of an area of approximately 40 m x 40 m surrounding the transmission structure for the laydown of equipment and materials and to support plant and machinery such as EWPs and cranes.
- Establishment of a level construction benches at 34 structure locations to allow for the safe operation of plant and equipment including cranes and elevated work platforms. These would be located within the 40 m x 40 m construction work site.
- Establishment of hurdles at ten undercrossing locations to provide the protection whilst stringing of conductor and earthwire above existing distributor electricity lines in the event that tension is lost. Two benches would be required at each undercrossing location to construct the hurdle.
- Establishment of brake and winch sites at approximately 17 structure locations to pull through the OPGW, conductor and overhead earthwire.
- Access track works to allow construction vehicles to gain safe access to the work locations including:
  - Repair, upgrade and maintenance of existing access tracks where required.
  - Construction of approximately 2.5 km of new access track to nine locations.
  - Widening of approximately 100 m of existing track to one structure location.
  - Upgrade of nine existing waterway crossings.
  - Construction of up to two new watercourse crossings.

A summary of the proposed activity scope of works is provided in Appendix A and shown in Appendix B.

This REF has assessed the scope of works identified in this section. If there are changes to the scope of works following determination, further assessment and approval may be required.

3.3 Construction and Commissioning Activities

3.3.1 Methodology

An overview of the key activities associated with proposed activity is outlined in Table 3-1.

Table 3-1: Construction Methodology and Key Activities

Activity	Overview
Site Establishment	
Access Track and Watercourse Crossing Works	*Repair and upgrade of access tracks* The repair and upgrade to existing access track would involve: > Grading and/or reshaping of existing tracks, within existing access track width; > Excavations up to approximately 150 mm followed by laying and compaction of crushed rock or gravel, to improve the track surface and drainage; and > Vegetation slashing and removal where required. *New access track* Typically standard tracks through non swampy areas are excavated to a depth of about 150 mm while heavy grade tracks through boggy or swampy area are excavated to approximately 600 mm. Given the terrain, it is anticipated that the new tracks would generally be excavated to a depth of between 150 mm to 300 mm followed by the infill of crushed rock and/or gravel then compacted. Upgrade to the watercourse crossings may involve bank regrading, bed widening and addition of clean rock fill to allow the access by construction vehicles hauling plant and equipment. Construction of new watercourse crossing would typically involve some excavation of the banks and grading works to smooth out the approach followed by the infill of rock armour.
Construction Benches	Up to two construction benches would be established at structure locations which are located on uneven topography. Bench construction would generally involve a cut and fill approach to establish a level bench. Construction benches would typically occupy an area of approximately 12 m x 12 m and would be located within the 40 m x 40 m works area surrounding the structure. Some would require one bench, which would occupy an area of approximately 20 m x 15 m.
Brake and Winch Sites	Brake and winch sites would be required to facilitate the stringing of OPGW and conductor. The purpose of these sites is to pull through the OPGW and conductor and would typically comprise an area of approximately 20 metres x 10 metres. Ground disturbance works at these sites is expected to be limited to minor surface disturbance and would typically involve the placement of matting beneath the relevant equipment (hydraulic brake, winch and OPGW and conductor cable drums).
Hurdles at Undercrossing Locations	Establishment of hurdles would require up to two 12 m x 12 m construction benches followed by the boring of up to six wooden pole structures to support a netting system, which would restrict conductor, OPGW or overhead earthwire making contact with the distributor line in the event of breakage or loss of tension during the stringing process.
Construction	
New Switchbay at Yass 330 kV Substation	Civil works would be carried out to establish new concrete footings for new high voltage equipment including new switchgear equipment. New secondary systems equipment would also be installed within the control room and/or the auxiliary services building at the substation, which may require the establishment of new cable trenches (approximately 0.4 m wide x 0.6 m deep) for the necessary cable connections.

Activity	Overview
Transmission Line Rebuild	The new section of Line 99M would be rebuilt whilst the existing single circuit line remains in operation. As such, the existing structures may need to be modified to provide the require clearance between existing conductors and the new transmission structures. This would be achieved through the modification of the insulators or the rearrangement of insulators on the existing structures. Some existing structures may need to be replaced with a three-pole interim structure to create the required clearance between phase conductors. Construction of foundations for the new structures would generally involve boring or excavating a hole for each pole. It is expected that each borehole would be approximately 1 m wide and up to 10 m deep. Each pole would be craned into position and stabilised with concrete. Alternatively, steel reinforcements would be placed into to the hole and backfilled with concrete. The new pole would then be craned onto the footing and secured with holding down bolts. Some structures may require additional strengthening through the use of guy wires. The guy wire would be connected to a metal rod which would be embedded in a concrete foundation block (approximately 1 m^3) installed below ground.
Line Rearrangement Works Outside of Yass 330 kV substation	As part of the rearrangement works on other transmission lines entering Yass 330 kV substation, the following construction works would be carried out: > Structure 1 on Line 970 and Structure 523 on Line 973 are steel lattice structures. If strengthening works are carried out, this would involve the replacement or installation of additional steel members to achieve the required load capacity. If the structures require replacement, they would be replaced with a new steel lattice structures. New footings may be established at each of the four tower legs with the new structure then secured using hold down bolts. > Structure 1A on Line 970 and Structure 522 on Line 990 are three-pole concrete structures. If strengthening works are carried out, this would involve the installation of guy wires. If the structures require replacement, they would be replaced with a new three-pole concrete structure with guy wires or a three-pole steel structure without guy wires. The works required to carry out the structure replacement would follow a similar process as outlined above for the Line 99M rebuild. > A new concrete or steel pole structure would be installed on Line 973 to support the rearrangement works. The works required to carry out the structure installation would follow a similar process as outlined above for the Line 99M rebuild. The process of restringing conductor, OPGW and earthwire into Yass substation as part of these line rearrangement works would follow the process as outlined below.
Conductor, Earthwire and OPGW Stringing	Tension stringing would be used to carry out the stringing of conductor, OPGW and earthwires to ensure that they remain above ground at all locations. Sheaves (or pulleys) would be attached to the top of the poles in readiness for stringing work. EWPs would be used to access the poles to install the sheaves. The stringing process starts with a draw wire being fed through the sheaves. A draw wire would be attached to the end of cable and wire and would be pulled through the sheaves using brake and winch equipment. Sufficient tension is applied to keep the wire and cables clear of the ground and obstructions. The tension would then be adjusted to achieve the correct sag in each span. The OPGW, conductor and earthwire would then be clipped into each pole peak, and the sheaves removed.
Communications Works	New terminal equipment would be installed at Yass 330 kV substation for the connection of the OPGW which may require minor excavation (trenching) works from the gantry to the relevant equipment cabinets and the control room.
Cut-over and Energisation	Following the completion of the Line 99M rebuild works and line-rearrangement works outlined above, the existing Line 99M would be cut-over at Structure 143 and at Yass 330 kV substation. The new Line 99M would then be energised and placed into service.
Line 99M Wooden Pole Dismantling	Prior to removing the structures, all the conductor and earthwires would be removed followed by the removal of all the conductor fittings.

Activity	Overview
	The removal of the former wooden pole structures would be typically undertaken using a crane. Once the pole has been removed, the soil around the perimeter would be collapsed to the bottom of the hole. The hole would be backfilled with clean soil to the ground level, and rehabilitated.
Rehabilitation	
Rehabilitation of Disturbed Areas	Following the completion of construction, disturbed areas would be restored to as close as practicable to the condition they were in prior to works commencing. Rehabilitation works may include seeding. Disturbed areas that are required for future operation and maintenance of the transmission line, such as access tracks and construction work benches, would likely be left in a stable and suitable condition for long-term use.

3.3.2 Construction Plant, Material and Equipment

Typical construction materials that would be used during the proposed activity include:

- Steel or concrete pole transmission structures
- Guy wires
- Steel cross bracing and counterweights
- Conductor
- Earthwire
- OPGW drum rolls
- Clean rock for watercourse crossing upgrades
- Gravel, road base etc. for access tracks
- Erosion and sediment controls
- Fencing and gate materials.

Construction vehicles and equipment may include, but are not limited to the following:

- 4WD vehicles
- Articulated trucks for delivery/removal of structures, materials and machinery
- Excavator/bulldozer/grader for earthworks for access tracks and construction benches
- Rock breaker / hydraulic jackhammer for rockbreaking during access track or bench construction
- Roller to compact and stabilise earthworks areas, for access tracks and construction benches
- Drill rig / boring machine for the excavation of the hole for the poles and for the guy anchors
- EWPs to access structure components
- Crane and hydraulic jack for the replacement of structures
- Winch machine for pulling cables
- Brake machine to control the OPGW, conductor and eathwire spool
- OPGW, earthwire and OPGW drum rolls and drum carrier.

Specific construction materials, vehicles and equipment would be determined during detailed design.

3.3.3 Construction Schedule

Construction of the proposed activity is expected to commence in quarter 3 to quarter 4 2019 and is expected to take approximately 18 months to complete. The proposed activity start date may alter with revision of TransGrid's project program, although the duration of the construction activities would remain the same.

3.3.4 Construction Hours

Noise generating works would be limited to the recommended standard hours for construction work outlined in the *Interim Construction Noise Guideline* (DECC, 2009) which are:

- Monday to Friday 7:00am to 6:00pm
- Saturday 8:00am to 1:00pm
- No works on Sundays or Public Holidays.

Work outside standard hours would only comprise:

- The delivery of materials outside standard hours requested by police or other authorities for safety reasons.
- Emergency work to avoid the loss of lives and/or property.
- Work timed to correlate with system planning outages.

If the need for additional noise generating works outside standard construction hours is identified following the determination of this REF then they would require justification in accordance with the *Interim Construction Noise Guideline* (DECC, 2009) and the prior formal written consent of Environment - HSE/TransGrid.

3.4 Operation and Maintenance

Following completion, there would be no changes to the existing maintenance requirements as a result of the proposed activity. Such maintenance activities would include:

- Regular inspections and maintenance of electrical equipment
- Vegetation maintenance
- Access track maintenance.

It is expected that only light vehicles and small to medium plant would need to access the transmission line for these activities.

4. Planning Context

4.1 Approvals Pathway

4.1.1 Environmental Planning and Assessment Act 1979

The EP&A Act and the *Environmental Planning and Assessment Regulation 2000* (the Regulation) provide the framework for development assessment in NSW. The EP&A Act and the Regulation include provisions to ensure that the potential environmental impacts of a development are considered in the decision making process prior to works proceeding.

The EP&A Act contains a number of different planning approval pathways for the assessment of development proposals in NSW, including Part 4 (development with consent), Division 4.1 of Part 4 (State Significant Developments), Part 5 (development without consent, typically public infrastructure developments), and Division 5.2 (State Significant Infrastructure). The approval pathway that applies to a proposed activity is determined by relevant environmental planning instruments such as Local Environmental Plans and State Environmental Planning Policies (SEPPs).

As described below, the proposed activity would be permitted without development consent from Council in accordance with *State Environmental Planning Policy (Infrastructure) 2007* (the Infrastructure SEPP), and the proposed activity is therefore subject to the assessment requirements of Part 5 of the EP&A Act.

TransGrid, is an Authorised Network Operator (ANO) under the *Electricity Network Assets (Authorised Transactions) Act 2015*, and as such, is a determining authority for the purposes of Section 5.6 of the EP&A Act. Accordingly, TransGrid is the proponent and determining authority for this proposed activity.

This environmental impact assessment has also been prepared in accordance with the *NSW Code of Practice for Authorised Network Operators* (the Code, September 2015), which sets out the environmental assessment requirements for ANOs. Accordingly this environmental impact assessment is deemed as a Review of Environmental Factors (REF).

State Environmental Planning Policy (Infrastructure) 2007

The State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) aims to facilitate the delivery of infrastructure across NSW. Clause 41 of the Infrastructure SEPP provides that development for the purpose of an electricity transmission or distribution network may be carried out by or on behalf of an electricity supply authority or public authority without development consent on any land.

The carrying out of development by or on behalf of an ANO (i.e. TransGrid) for the purpose of an electricity transmission or distribution network, constitutes the carrying out of that development as an electricity supply authority and public authority (Clause 41 (2) of the *Electricity Network Assets (Authorised Transactions) Act 2015)*.

As this proposed activity meets the definition of development for the purposes of an electricity transmission or distribution network, and would be carried out by TransGrid (an ANO), it is permissible without consent from the Council.

Duty to Consider Environmental Impacts

For activities subject to assessment under Part 5, Section 5.5 of the EP&A Act imposes a duty on a determining authority to 'examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment' by reason of the proposed activity (refer Section 7.1). In addition, Clause 228 of the EP&A Regulation identifies factors which must be taken into account when considering the likely impact of an activity on the environment. These factors have been considered in Section 7.2.

Under Section 5.7 of the EP&A Act, an environmental impact statement (EIS) is required for 'an activity that is likely to significantly affect the environment' including significant affects to threatened species or ecological

communities or their habitats. This activity is not likely to have a significant impact and therefore an EIS is not required.

4.2 Requirements under Other NSW Environmental Planning Instruments and Legislation

Other environmental planning instruments and legislation that are directly relevant to the determination and/or assessment of the proposed activity are considered in Table 4-1.

Table 4-1: Relevant NSW Legislation

Legislation	Potential approval requirements	Relevance to the proposed activity
Biodiversity Conservation Act 2016 (BC Act)	The BC Act lists a number of threatened species, populations and ecological communities to be considered in deciding whether there is likely to be a significant impact on threatened biota, or their habitats. If any of these could be impacted by the proposed activity, an assessment of significance that addresses the requirements of Section 7.3 of the BC Act must be completed to determine the significance of the impact.	The proposed activity not significantly affect any threatened species, populations and ecological communities listed under the BC Act. Section 6.4 provides further details of the impacts to ecology.
Fisheries Management Act 1994 (FM Act)	A permit is required: > for dredging or reclamation work on key fish habitat waterways as per Section 201. > for any works that would block or obstruct fish passage on key fish habitat waterways as per Section 219.	The proposed activity would require the upgrade of four watercourse crossings and construction of one new creek crossing within areas mapped as key fish habitat. While the works are not expected to obstruct fish passage, they would constitute reclamation works and therefore would require a permit (refer to Table 4-2).
Heritage Act 1977	Approval under Section 57(1) is required for works to a place, building, work, relic, moveable object, precinct, or land listed on the State Heritage Register. Section 57(2) provides that an exemption from the approval requirements of Section 57(1) can be sought in certain circumstances. An excavation permit is required under Sections 139(1) and (2) to disturb or excavate any land containing or likely to contain a relic. Section 139(4) provides that exceptions from the approval requirements of Sections 139(1) and (2) can be sought in certain circumstances.	There are no heritage listed items near the proposed activity and the activity would not involve disturbing or excavating land on which a relic is located or where there is reasonable expectation that the excavation or disturbance is likely to result in a relic being discovered, exposed, moved, damaged or destroyed (see Section 6.6). Therefore no permits or approvals are required under the Heritage Act.
National Parks and Wildlife Act 1974 (NPW Act)	An Aboriginal heritage impact permit (AHIP) under Section 90 of the NPW Act is required to harm or desecrate an Aboriginal heritage object. If works are located in land reserved under the NPW Act, approval from OEH is required.	An Aboriginal Cultural Heritage Assessment was carried out to support the REF and is outlined in Section 6.5. The assessment determined that an Aboriginal Heritage Impact Permit (AHIP) would be required at two structure locations (Structure 11 and Structure 12) as impacts to the Aboriginal heritage site cannot be avoided.

Legislation	Potential approval requirements	Relevance to the proposed activity
Roads Act 1993	Under Section 138 of the *Roads Act 1993*, consent is required to impact or carry out work on or over a classified road.	The proposed activity would require the stringing of conductor, OPGW and earthwire across Hume Highway, which is a classified road.
Water Management Act 2000	*Controlled Activity Approval* Under Chapter 3 Part 3 91E (1) of the Act, an approval is required to carry out a controlled activity in, on or under waterfront land e.g. to construct or upgrade a watercourse crossing, except where exemptions apply. The definitions of the Act define a controlled activity. Examples are specified in Part 2 of Schedule 5 of the *Water Management (General) Regulation 2011.* Section 21 of Schedule 5 includes vehicular crossing or an access track being an activity carried out in, on or under waterfront land which is a minor stream (first or second order stream) and is located within the rural zone (other than a rural village) under an environmental planning instrument.	Controlled activity approval under the WM Act would be required to undertake watercourse crossing upgrade works at four watercourse crossing locations and one location where a new watercourse crossing would be established.

4.3 Approvals under Commonwealth Legislation

The proposed activity would not affect Commonwealth land or have an impact on any matters of national environmental significance (MNES) under the *Environmental Protection and Biodiversity and Conservation Act 1999*. As such, a referral has not been lodged with the Commonwealth Department of Environment and Energy.

4.4 Summary of Environmental Approvals, Permits and Notifications

Table 4-2: Environmental Approval, Permits and Notifications Required

Name	Requirement	Timing
National Parks and Wildlife Act 1974	Aboriginal Heritage Impact Permit.	Prior to works occurring at Structure 11 and Structure 12 on Line 99M.
Roads Act 1993	Consent from Roads and Maritime Services (RMS) for works in, on or over classified roads.	Prior to the commencement of stringing conductor, OPGW and overhead earthwire over the Hume Highway.
Fisheries Management Act 1994	A permit is required to be obtained from NSW Department of Primary Industries-Fisheries (DPI-Fisheries) for the proposed watercourse crossing works at: > Booroo Creek (4th order watercourse) between Structures 8-9. > Booroo Creek (4th order watercourse) between Structures 9-10. > Illalong River (4th order watercourse) to access Structure 99 and 100. > Balgalal Creek (3rd order watercourse) between Structures 122 and 123. > Bobbara Creek (5th order) to access Structure 143 from Coppabella Road.	Prior to carrying out any works within the mentioned watercourses.

Name	Requirement	Timing
Water Management Act 2000	Controlled Activity Approval required under Part 3 of the Act to carry out works at the same locations listed above.	Prior to carrying out any works within the mentioned watercourses.

5. Consultation

5.1 Consultation Undertaken

TransGrid has consulted with landowners and Government Agencies in accordance with *TransGrid's Consultation Protocol* (2016) as summarised in this section. All consultations described the proposed activity, the environmental assessment pathway and the way in which to make a submission on the proposed activity.

Section 45 (4) of the *Electricity Supply Act 1995* requires that the local council be given a reasonable opportunity (no less than 40 days notification from the date on which the notice was given) to make submissions on the proposed activity. Clause 42 of the Infrastructure SEPP provides that written notification must be given to the local council and occupiers of adjoining land for the development for the purpose of a new or existing electricity substation of any voltage.

Notification was provided to Yass Valley Council and Hilltops Council on 23 January 2019 in accordance with the *Electricity Supply Act 1995* and the Infrastructure SEPP. Councils were provided with 40 days to provide a submission in accordance with Section 45 of the *Electricity Supply Act 1995.*

Notification was provided to occupiers of land adjoining the Yass 330 kV Substation on 22 March 2019. Occupiers were provided with 21 days to provide a submission in accordance with Infrastructure SEPP.

Clause 16 of the Infrastructure SEPP requires that consultation is undertaken with public authorities other than Council, in certain circumstances (e.g. adjacent to National Parks estate). The proposed activity would occur approximately 100 m north east of Hattons Corner Nature Reserve between Structures 10 and 13. Notification was provided to the National Parks and Wildlife Service / Office of Environment and Heritage on 22 March 2019.

In addition to the notifications above, and in accordance with Sections 5 and 6 of the *TransGrid Consultation Protocol for Review of Environmental Factors for Class 4 and 5 Activities* (2016), written notification was provided on 22 March 2019 to other Government Agencies and stakeholders, which were considered likely to have a potential interest in the proposed activity. This included:

- Department of Primary Industries (DPI) – Local Lands Services
- Department of Industry – Lands and Water
- DPI Fisheries
- Environment Protection Authority
- Fire and Rescue NSW
- Rural Fire Service
- Roads and Maritime Services
- Civil Aviation Safety Authority.

All landholders along Line 99M, from Yass 330 kV substation to Structure 143 were also notified in writing of the proposed activity on 22 March 2019.

Table 5-1 summarises the consultation where issues have been raised and where the issues have been addressed in this assessment.

Table 5-1: Consultation

Stakeholder	Issues Raised	Comment
Department of Industry – Lands and Water	It was recommended that the REF include: - Assessment of impacts on surface and groundwater sources (both quality and quantity), watercourses, riparian land, and groundwater	With consideration to the works carried out on waterfront land, only those locations outlined in Table 4-2 would be subject to controlled activity with consideration to

Stakeholder	Issues Raised	Comment
	dependent ecosystems, and measures proposed to reduce and mitigate these impacts. > Assessment of potential impacts to flow behaviour under normal and flood conditions both during and following construction activities, and measures proposed to reduce and mitigate these impacts. > Details of water proposed to be taken via groundwater interception or from other water supply sources; > Assessment of approval and licensing requirements under the *Water Management Act 2000*. > Consideration and incorporation of relevant policies and guidelines such as the "Guidelines for *Controlled Activities on Waterfront Land (2012)*" and the *"NSW Aquifer Interference Policy (2012)"*.	TransGrid's exemptions as outlined in Table 4-1. Groundwater, flooding and consideration of relevant policies and guidelines have been addressed in Section 6.3.
DPI Fisheries	No specific issues were raised, however advice was provided as to which watercourse crossing locations would be subject to approval under the FM Act.	Locations where works would be carried out within watercourses in areas mapped as KFH and subject to approval under the FM Act are outlined in Table 4-2.
Civil Aviation Safety Authority (CASA)	It was noted that the transmission line does not pass near any certified or registered aerodromes and therefore CASA does not have any objection to the proposed activity. CASA did note that the proposed activity may occur in proximity to some privately run airstrips and advised that consultation with those landholders should be carried out if private airstrips occur in proximity.	One private airstrip was identified at the property located at 1079 Black Range Road, Bowning (Lot 4 DP1124263). The airstrip is located approximately 2.5 km south west of Line 99M. The Line 99M rebuild would be clearly visible and would follow the same alignment as the existing transmission line. Given the distance of the airstrip to Line 99M and the rebuild being clearly visible to pilots, the proposed activity would unlikely affect aircraft operations.
NPWS	NPWS advised in writing on 3 April 2019 that they had no comments or questions in relation to the proposed activity.	Noted.
Rural Fire Service	Rural Fire Service advised on 1 May 2019 that they had no objections to the proposed activity providing it complies with Section 4.1.3 of *Planning for Bush Fire Protection 2006*.	The proposed activity would not involve any expansion to the existing transmission line easement or the extension of the Yass substation switchyard. Consequently, any asset protection zones, particularly at Yass would remain unchanged. Furthermore, the proposed activity would not affect any current roads or access tracks which may be utilised by firefighters in the event of a fire.

5.2 Future Consultation

As per the requirements of the Consultation Protocol the REF would be placed on TransGrid's website for a period of 20 business days to allow stakeholders to provide a submission. Stakeholders, as identified above, would be notified in writing of the website and would be invited to view the REF and provide feedback.

Following exhibition of the REF, a Submissions Report would be prepared and published on TransGrid's website.

Should TransGrid proceed with the activity, following determination of the REF, TransGrid would write to any stakeholders that had made submissions on the proposed activity to advise:

- How they can obtain a copy of the REF documentation and Decision Statement for the activity from TransGrid's website; and
- The expected commencement date of the construction works.

6. Environmental Impact Assessment

6.1 Land Use

6.1.1 Existing Environment

The proposed activity would generally occur within the existing Line 99M easement and along the existing network of access roads and tracks, which provide access to the work locations. The existing 45m easement and provisions under the *Electricity Supply Act 1995* provides TransGrid with a right of way to construct, operate and maintain the transmission line. The study area has been highly modified from the initial construction and ongoing maintenance of the transmission line. Land along the transmission line easement has been modified as a result of clearing for agricultural purposes, and for the construction and maintenance of the transmission line itself.

Agriculture, including cattle grazing, sheep grazing and cropping is the dominant land use within the study area, which is characterised by the majority of the proposed activity occurring on land zoned *RU1-Primary Production* and *RU2-Rural Landscape*. Line 99M also traverses a pocket of land adjoining Yass River between Structures 10-11 zoned *E2 – Environmental Conservation* under the *Yass Valley Local Environment Plan 2013*. Additionally, Hattons Corner Nature Reserve, which is part of the National Parks estate is located approximately 100 m to the south east of Structure 13 (refer to Figure 6-1).

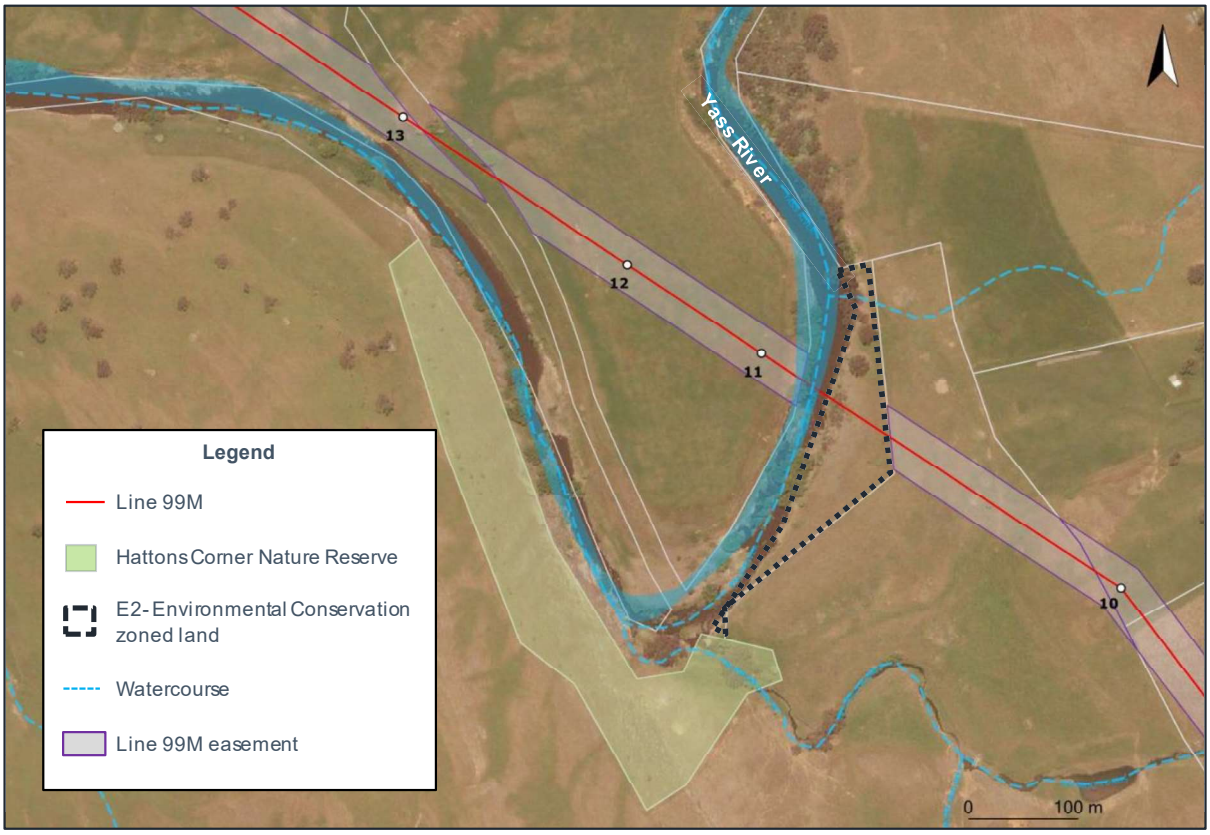

Figure 6-1: Sensitive Land

6.1.2 Impact Assessment

Construction

During the construction works, there may be minor and temporary land use constraints due to the physical presence of construction plant and equipment at each of the work locations. As the proposed activity is generally

located on agricultural land, there is a potential for disruption to these operations or other activities within the study area if they occur concurrently during construction works. As such, all landholders would be notified regarding the construction schedule of works prior to the commencement of works on their property to allow them to plan activities on their land which may conflict with the construction works.

The proposed activity is not expected to affect any recreational use of Hattons Corner Nature Reserve or the pocket of *E2- Environmental Conservation* zoned land as no ground disturbance works are located within their boundaries.

A more permanent impact on land use may occur at work locations where construction benches would be established, if they are to remain in place following completion of construction. The retention of construction benches for potential future use during maintenance activities may have a minor effect on the landholder's use of the land at the base of the structure, however the existing land use restrictions imposed by the registered easement would remain unchanged.

Operation

The proposed activity is not expected to cause any significant changes or impact to agricultural activities or other land uses within the study area during the ongoing operation of Line 99M.

6.1.3 Mitigation Measures

The following mitigation measures would be implemented to minimise land use impacts:

- All landholders within the study area shall be notified regarding the schedule of works at least 7 days prior to the commencement of works at their property. This would allow landholders to plan activities on their land which may conflict with the construction works.
- On completion of the work disturbed areas shall be stabilised, and returned to as close to original condition or as otherwise agreed with the landowner.

6.2 Geology and Soils

6.2.1 Existing Environment

Geology and Soils

The study area generally extends in a north westerly direction from Yass substation across undulating terrain at elevations ranging between approximately 350 – 500 m above sea level.

The study area is located within the South Western Slopes Bioregion and the South Eastern Highlands Bioregion. Across the study area, soil landscapes vary with landform and topography. Shallow stony soils are typically found on the tops of ridges and hills. Underlying soils downslope generally consist of texture contrast soils. Areas in the valley floors and alluvial plains, typically comprise alluvial sands and loams (NPWS, 2002).

Contamination

Whilst unlikely, current and former land uses within and adjacent to the study area may have resulted in the contamination of soils. Potential on-site sources of contamination include the use of pesticides, herbicides and fertilisers across the study area, whilst additional potential off-site sources of contamination may include the following:

- Former livestock dip sites.
- Improper disposal of waste from rural properties.
- Buried or illegal dumping of waste.

A search of the Environment Protection Authority's (EPA) Contaminated Land Record and the List of NSW Contaminated Sites Notified to the EPA was undertaken on 6 March 2019. A former gas works and former fuel depot approximately 2 km to the north-east of the study area, within the township of Yass were the only sites on the Contaminated Land Record (EPA 2017a). These sites were also listed under NSW Contaminated Sites

Notified to the EPA and were currently being regulated under the *Contaminated Land Management Act 1997* (EPA 2017b).

The TransGrid depot, at the Yass 330 kV Substation, is also listed under the NSW Contaminated Sites Notified to the EPA and is currently under assessment by the EPA (EPA 2017b).

Naturally Occurring Asbestos

A review of mapping held by the NSW Department of Trade and Investment determined that there is no known potential for encountering naturally occurring asbestos in the underlying soils across the study area.

Acid Sulphate Soils

According to the CSIRO's Australian Soil Resource Information System (ASRIS), there is either no known occurrence of acid sulphate soils (ASS) or a low probability of encountering ASS within the study area.

6.2.2 Impact Assessment

Construction

During construction, the main risks to geology and soils would be erosion and sedimentation from soil disturbance activities including:

- Construction bench establishment;
- Structure replacement;
- New access track construction and track upgrades;
- Civil works at Yass Substation as part of the new switchbay construction; and
- Movement of construction vehicles over exposed surfaces.

The risk of soil erosion and sedimentation impacts is expected to increase during high wind, rainfall events and areas on steeper slopes.

Work locations requiring construction benches or new access tracks are expected to generate the most amount of spoil, however the volume of spoil is not expected to exceed 300 m^3 at any one work location. Work locations along Line 99M requiring structure replacement works only are expected to only generate approximately 25 m^3 of spoil. Potential steel lattice structure replacement works as part of the line rearrangement works outside Yass substation may generate more spoil, with approximately 50 m^3 of spoil potentially being generated at these locations.

Excess spoil would be disposed of at a suitable location within the easement by spreading it out flush with the ground surface or at an alternative location as agreed to with the landowner. Excess spoil may also be used as backfill in the voids left from the removal of the wooden pole structures. Furthermore, erosion generated from the movement of vehicles along existing access tracks and exposed surfaces is not expected to be significant given the low volume of vehicles required to service the proposed activity. Providing the mitigation measures in Section 5.2.3 are implemented, the risk of erosion and sedimentation can be effectively managed.

Creosote may be present in the soil surrounding the wooden pole structures and may be encountered during their removal. Any such contamination is expected to be minor. Any contaminated spoil excavated from around the pole would be placed back in to the excavated hole and would be buried below clean fill. The removal of all poles (whether contaminated or not) would be undertaken in accordance with the mitigation measures in Section 5.11.3.

There is some risk that contaminated soil may be encountered during civil works associated with the construction of the new switchbay at Yass 330 kV substation as the site adjoins TransGrid's Yass Depot. Providing the mitigation measures in Section 6.2.3 are implemented in the event that contaminated soil is encountered at the substation site, the risk of additional impacts can be adequately managed.

Furthermore, the risk of any contamination being encountered from potential off-site sources along Line 99M associated with historical agricultural activities or improper disposal of waste is expected to be low.

Soil contamination has the potential to occur during construction works as a result of any accidental spills or leaks of fuels, oils and other chemicals from plant, equipment and vehicles used during construction works. Any unplanned release is expected to be minor and can be effectively managed through the implementation of the mitigation measures in Section 6.2.3.

Operation

The ongoing operation of Line 99M is not expected to contribute to any additional impacts on geology and soils.

6.2.3 Mitigation Measures

The following mitigation measures would be implemented to minimise geology and soil impacts:

- An Erosion and Sediment Control Plan (ESCP) shall be prepared as part of the CEMP. All erosion and sediment control measures shall be designed, implemented and maintained in accordance with relevant sections of "*Managing Urban Stormwater: Soil and Construction Volume 1*" (Landcom, 2004) ('the Blue Book) (particularly Section 2.2). The ESCP shall include stockpiles, stormwater run-off, trees, site boundaries, site access and storage areas. Exposed surfaces shall be kept to a minimum to limit the potential for erosion.
- Any imported fill shall be certified at source location (e.g. Quarrymaster or property owner) as pathogen and weed free Excavated Natural Material (ENM) or Virgin Excavated Natural Material (VENM) in accordance with the *Protection of the Environment Operations Act 1997* (POEO Act) and the *Protection of the Environment (Waste) Regulation 2014* (POEO Waste Regulation).
- Any material or soil suspected of showing evidence of contamination shall be sampled and analysed by a NATA Registered laboratory and managed in accordance with the *Waste Classification Guidelines* (EPA, 2014), *the Guidelines on the Duty to Report Contamination* (EPA, 2015) and the *Contaminated Land Management Act 1997*.
- Environmental spill kits containing spill response materials suitable for the works being undertaken shall be kept on site at all times and be used in the event of a spill. Any spills shall be contained, cleaned up promptly and immediately reported to the TransGrid site representative.
- All chemicals or other hazardous substances shall be stored in bunded and weatherproof facilities away from drainage lines. The capacity of the bunded area shall be at least 130% of the largest chemical volume contained within the bunded area. The location of the bunded enclosure/s shall be shown on the Site Plans.
- Access tracks off public roads shall not be used in wet weather conditions where there is a risk of damage to the tracks which could cause soil erosion and sediment control issues.

6.3 Hydrology and Water Quality

6.3.1 Existing Environment

The study area traverses the Murrumbidgee catchment in southern NSW. It is bordered by the Great Dividing Range to the east, the Lachlan catchment to the north, and the Murray catchment to the south.

The Murrumbidgee catchment is 84,000 square kilometres, with elevations ranging from over 2,200 metres to the east, to less than 50 metres on the western plains. The Murrumbidgee River, a major tributary of the Murray-Darling River system, drains much of southern NSW and most of the ACT. It spans almost 1,600 kilometres, rising in the Monaro Plains near Cooma and flowing westward towards its junction with the Murray River near Balranald.

Land use in the Murrumbidgee catchment is dominated by extensive agriculture, with the largest industry, grazing, occupying 64 per cent of the catchment. Major water users include local councils and water utilities, forestry, tourism, and agriculture, including rice, dairy, wool, wheat, beef, lamb, grapes and citrus. The alteration of natural river flows through the construction of dams and weirs, and erosion from land clearing affect riverine health and contribute to water quality problems, such as salinity (WaterNSW 2018).

The study area traverses numerous minor gullies, unnamed first and second order creeks, tributaries and the Yass River (between Structures 10 and 11).

A review of the Yass Valley and Hilltops Council's flood prone land mapping determined that the study area is not located on any flood prone land.

Groundwater is expected to occur at varying levels throughout the study area and subject to seasonal fluctuations. Groundwater levels within the flood plains of Yass River, Derringullen Creek, Bowning Creek, Illalong Creek and Jugiong Creek and other perennial watercourses within the study area are expected to have groundwater occurring at lower levels compared to the more elevated areas of the study area.

6.3.2 Impact Assessment

Construction

Potential causes for water quality impacts associated with the proposed activity include:

- Potential erosion and sedimentation associated with construction bench establishment, structure replacement and access track construction and upgrades.
- Upgrade of existing watercourse crossings and construction of new crossings.

The watercourse crossing upgrade works would generally involve the placement of rock on the bed of the watercourse to enable access of heavy vehicles hauling plant and equipment to the work locations. Some grading of the bank may also be required to allow for a smooth access and egress. The placement of rock is not anticipated to alter stream flows and would be undertaken in accordance with the relevant policies and guidelines outlined in Section 6.3.3.

Erosion and sedimentation, if uncontrolled, would have the potential to increase the amount of sediment and organic matter entering nearby waterways, including, minor ephemeral drainage lines as a result of construction site runoff. This has the potential to increase turbidity and result in a decline in the water quality of these watercourses. This risk of impacts on the water quality of surrounding watercourses is increased where ground disturbance work is carried out in close proximity (particularly within 40 m) of watercourses and during periods of high rainfall where exposed areas are more susceptible to sediment runoff.

Water quality impacts also have the potential to occur during construction if fuel or chemical spills from construction vehicles enter waterways. If not managed appropriately, the introduction of pollutants could result in the following potential impacts to the quality of the watercourses:

- Changes to pH, electrical conductivity, dissolved oxygen and temperature.
- Reduced light penetration due to increased turbidity.
- Increased sediment load, organic matter and turbidity of water.
- Increase in gross pollutants.
- Introduction of toxic pollutants such as construction fuels, oils and grease and chemicals.

Potential chemical or oil leaks and accidental spills associated with construction machinery could also result in localised contamination of soils. However, with the implementation of the mitigation measures in Section 6.3.3, the risk of contaminating nearby watercourses would be adequately managed.

There is potential that groundwater may be encountered during boring for the new structures, particularly in the low lying flood plain areas and near perennial watercourses. The NSW Office of Water state in their *Dewatering Applications - Mandatory Information requirements to support licence applications for construction dewatering projects* that any take of water as a result of minor temporary dewatering activities that is estimated to be less than three megalitres per year (ML/yr) would not require a licence. It is extremely unlikely that this volume would be exceeded should groundwater be encountered during the structure replacement works.

The proposed activity would not significantly alter the shape and contour of the land within the study area. As such, flood regime of the study area is not expected to be affected.

Operation

No ongoing adverse impacts to water quality and hydrology are anticipated once proposed activity works have has been completed.

6.3.3 Mitigation Measures

The following mitigation measures would be implemented to minimise hydrology and water quality impacts:

- Spoil shall be stockpiled in a manner so as to avoid the possibility of sediments entering watercourses (including stormwater drains) or migrating off-site.
- Any bulk fuel or hazardous material transport vehicles shall be parked on level ground a minimum of 40 m away from watercourses (including drainage lines). No refuelling or bulk herbicide preparation shall occur within 40 metres of a watercourse.
- Watercourse crossings shall be constructed in accordance with the *Fisheries Management Act 1994, Policy and guidelines for fish habitat conservation and management 2013, Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003), *Controlled Activity Guidelines* under the *Water Management Act 2000* (WM Act) and the DPI - Water's *Guidelines for watercourse crossings on waterfront land*.
- If minor dewatering is required, the management of discharge water shall be documented in the CEMP. Discharge water should be limited to vegetated, grassed areas, away from waterways, and within the transmission line easement. If the discharge water is highly turbid, dewatering through a filter sock (or similar) shall be considered, where appropriate, to minimise sedimentation.

6.4 Ecology

This section draws on the findings of the previous ecological assessment *Line 99M Yass to Murrumburrah 132kV Uprating Ecological Assessment* carried out by OzArk (2018). This report is provided in Appendix D.

6.4.1 Existing Environment

The study area has been highly modified, having been cleared for agricultural grazing and cropping activities and the initial construction of Line 99M. Consequently, the majority of the study area is dominated by a mixture of non-native and derived native grassland and generally does not contain key habitat features such as shrubs, tree layer or tree hollows.

A summary of key ecological constraints identified within the study area is outlined in the subsequent sections.

Endangered Ecological Communities

Two endangered ecological communities (EEC) were identified in the study area:

- *Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory*; Critically Endangered under the Commonwealth EPBC Act.
- *White Box Yellow Box Blakely's Red Gum Woodland*; Critically Endangered under the Commonwealth EPBC Act and Endangered under the NSW BC Act.

Given the high weed burden, vegetation within the Line 99M easement did not meet the quality criteria thresholds to be protected under the EPBC Act for the ecological communities mentioned above.

The locations of the EECs is shown on Figure 6-2 and Figure 6-3.

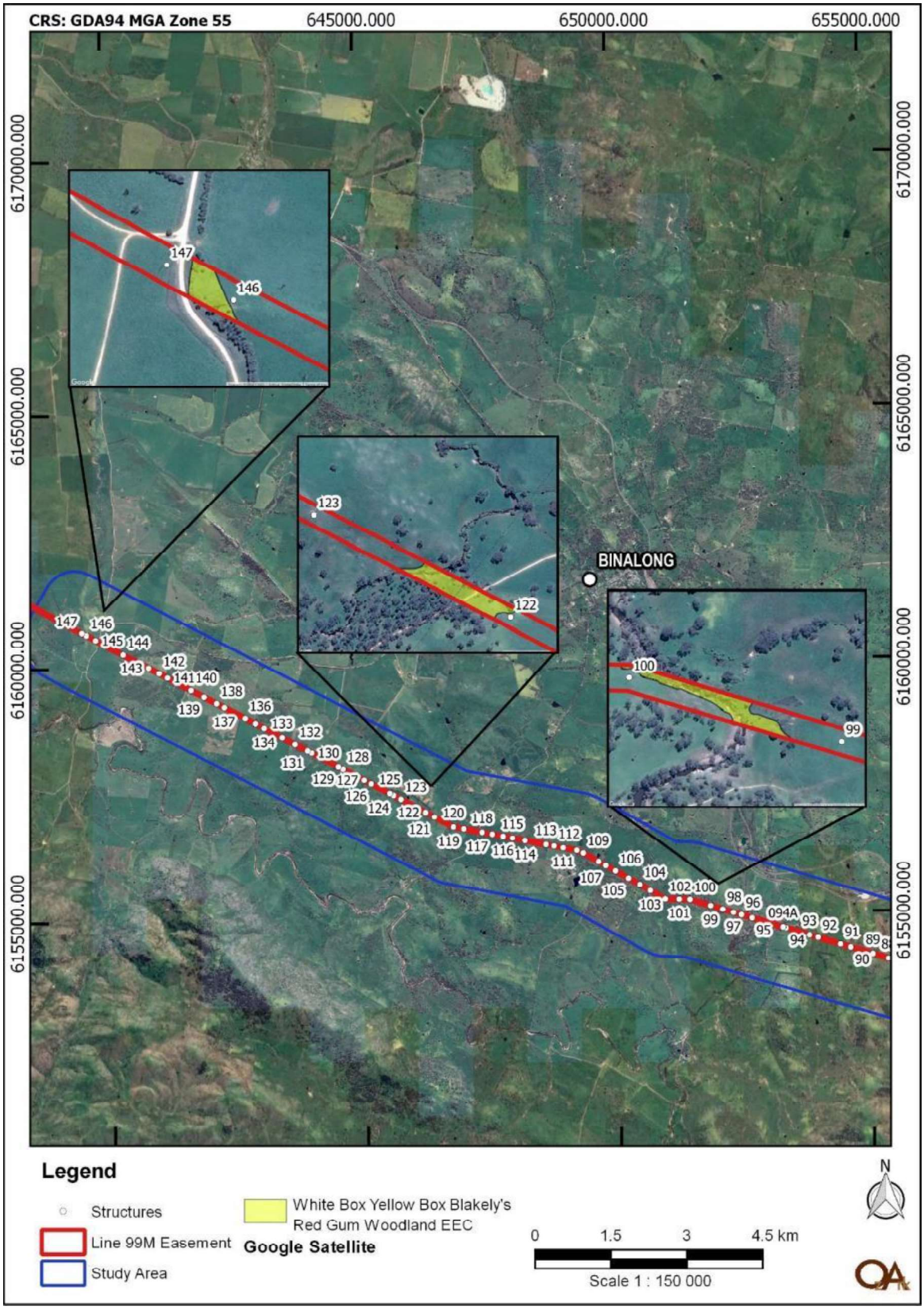

Figure 6-2: ***White Box Yellow Box Blakely's Red Gum Woodland*** **EEC Recorded within the Study Area**

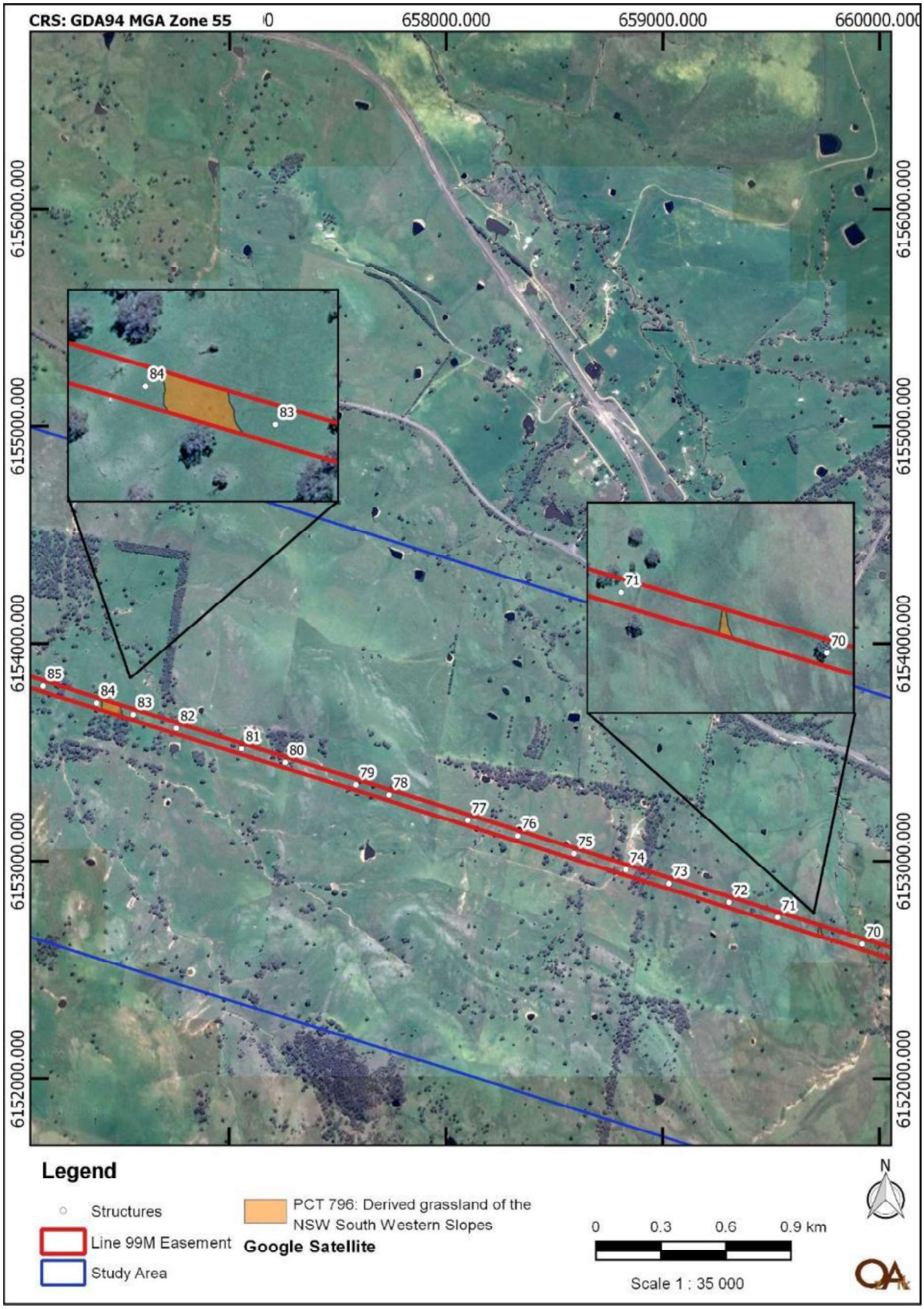

Figure 6-3: ***Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory EEC Recorded within the Study Area***

Threatened Flora

A review of habitat requirements and database search records for threatened flora identified six threatened plant species with the potential to occur in the study area. This included:

- Yass Daisy (*Ammobium craspedioides*), listed as Vulnerable under both the BC Act and EPBC Act.
- Hoary Sunray (*Leucochrysum albicans var. tricolor*), listed as Endangered under the EPBC Act.
- Small Purple-pea (*Swainsona recta*), listed as Endangered under both the BC Act and EPBC Act.
- Austral Toadflax (Thesium austral), listed as Vulnerable under both the BC Act and EPBC Act.
- Crimson Spider Orchid (*Caladenia concolor*), listed as Endangered under the BC Act and Vulnerable under the EPBC Act.
- Dwarf Bush-pea (*Pultenaea humilis*), listed as Vulnerable under the BC Act.

None of the above threatened flora species or any other species listed under the EPBC or BC Act were found across the study area during field surveys carried out in December 2017.

Threatened Fauna

A review of habitat requirements and database search records for the study area identified a total of 28 threatened fauna species with potential to occur within the study area. This included: four frog species, four bat species, 16 bird species, one insect species, one marsupial species, one reptile species and one fish species (refer to Table 7, Appendix D).

During the field survey, 32 fauna species were recorded, of which 26 were native. The Dusky Woodswallow (*Artamus cyanopterus*) (listed as Vulnerable under the BC Act) was the only threatened fauna species observed within the study area. It was recorded outside of the Line 99M easement on a dead tree near Structure 23.

Habitat types for threatened fauna are limited due to existing and previous land use as agricultural land and a transmission line easement. Clearing and degradation of vegetation has resulted in a predominately exotic ground stratum, no mid-stratum vegetation and a lack of diversity of tree ages. This limits the use of the study area for many small birds that inhabit a dense mid-stratum.

Fallen logs, which can provide habitat for threatened reptile species were absent from most of the study area, except for isolated areas where either single or stockpiled logs remained. Where rock outcropping were identified, the rocks were considered to be too small and in areas of too high a weed burden to be used by the threatened reptile species including the Pink-tailed Legless Lizard (*Aprasia parapulchella*) or Striped Legless Lizard (*Delma impar*). Potential habitat rocks were investigated during the field survey and found no evidence of any reptile inhabitation.

Review of the DPI Fisheries distribution of threatened fish shows there are no threatened fish predicted to occur in watercourses within the study area.

Aquatic Habitats

The study area contains watercourses which are part of the Lowland Murray River aquatic endangered ecological community (Murray River EEC). The Murray River EEC includes all native fish and aquatic invertebrates within all natural creeks, rivers, and associated lagoons, billabongs and lakes of the regulated portions of the Murray River (DPI Fisheries 2007).

Many of the major watercourses (Strahler third order and above), of which the minor gullies and creeks feed, are mapped as Key Fish Habitat and are protected under the FM Act.

Other Habitats

A number of patches of planted vegetation occur throughout the study area. These areas appeared to vary in intent, from wind-breaks to habitat rehabilitation. Habitat restoration areas have a higher potential to provide habitat for threatened species than the remainder of the cleared easement, whereas wind-breaks are strategically placed for livestock management purposes.

Whilst not threatened under Commonwealth and NSW legislation, the study area contains suitable habitat for Wombat (*Vombatus ursinus*) and potentially other native mammal species. During the field study, Wombat burrows were observed near Structures 10, 11 and 13 (refer to Figure 6-4).

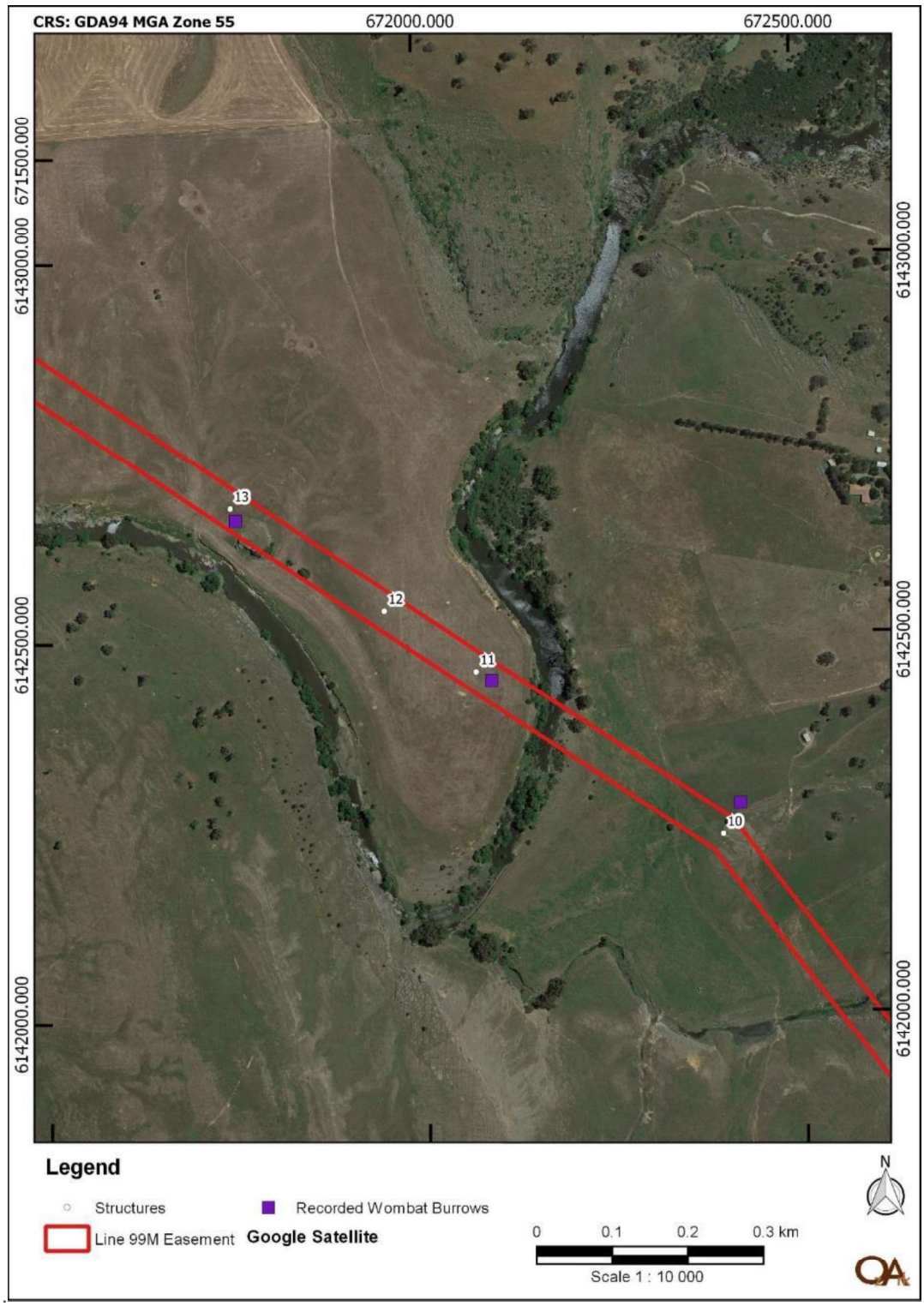

Figure 6-4: Location of wombat burrows

Weeds

Much of the study area contains invasive weed species with the majority of the work locations containing at least one species of a listed priority weed. The most common priority weed species identified were the African Boxthorn (*Lycium ferocissimum*) and Blackberry (*Rubus fruticosus*) which are also Weeds of National Significance.

6.4.2 Impact Assessment

Construction

Endangered Ecological Communities

No ground disturbance or vegetation clearing would occur within any of the areas within the study area which contain either the *Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory* or the *White Box Yellow Box Blakely's Red Gum Woodland* EEC. As such, the proposed activity would unlikely affect these EECs

Threatened Flora

The proposed impact locations are generally within the highly disturbed area of the transmission line easement and on cleared agricultural land. Whilst no threatened flora was identified during the field survey, there is some potential that the species listed in Section 6.4.1 may still occur within the study area. Assessments of significance carried out under the BC Act and EPBC Act determined that the proposed activity would not significantly affect any of the six listed threatened flora species which may occur within the study area.

Threatened Fauna

Fauna has the potential to be affected either indirectly or through habitat destruction by ground disturbance works (construction benches, access track construction, structure replacement and vegetation clearing).

Assessments of Significance under the BC Act and EPBC Act were carried out for all threatened fauna species identified as potentially being affected by the proposed activity. As habitat disturbance is generally limited to areas of non-native grassland, which is abundant across the study area, no fauna species were identified as being significantly affected by the proposed activity.

Aquatic Habitats

All watercourses within the study area are part of the Murray River EEC The proposed activity would involve the direct disturbance to these watercourses at 11 locations as part of the construction of new watercourse crossings and the upgrade of existing watercourse crossings. Watercourse crossing upgrade works would generally involve the placement of rock armour on the bed and bank of the watercourse and grading works to smooth out the crossing approaches. Establishment of new watercourse crossings would require more extensive excavations to establish the approaches on either side of the crossings. Like the upgrade works, clean rock would be placed on the bed and banks to allow the movement of heavy vehicles and stabilise the newly formed crossings. Both the watercourse crossing upgrades and new crossing works would be undertaken in a manner that would not impede or alter stream flows

An Assessment of Significance carried out under the BC Act determined that watercourse crossing upgrades and new crossing works would not significantly affect the Murray River EEC.

A total of five locations where watercourse crossing upgrade and construction works are located in areas of Key Fish Habitat and would require approval under the FM Act (refer to Table 4-2).

Other Habitats

The proposed activity would involve the direct clearing and disturbance to underlying native and non-native grasslands and agricultural cropping land as part of construction works described in Section 3. It has been assessed that all clearing and ground disturbance works are located within vegetation communities which are not of any conservation significance under the BC Act or EPBC Act.

Some clearing of planted vegetation would be required as part of the proposed activity, however it was assessed as unlikely to affect any threatened species. Notwithstanding this, consultation with the landholder should be undertaken particularly where the function of the planted vegetation is for a wind break.

Wombat burrows identified near Structures 10, 11 and 13 are not located within the footprint of any construction works and therefore would not be affected. Should any additional Wombat burrows be identified during construction works, ground disturbance works would be positioned as to avoid disturbance to the burrows.

Weeds

The proposed activity has the potential to cause the spread of weeds as construction vehicles move between work areas (e.g. via soil on wheels) and new weed incursions in areas where soil has been disturbed as part of the proposed activity. Providing weed control mitigation measures are incorporated in the CEMP and implemented during construction, the impacts associated with the spread and incursion of noxious weeds can be effectively managed.

Operation

The proposed activity would not result in any additional impacts on biodiversity as part of the ongoing operation of Line 99M.

6.4.3 Mitigation Measures

The following mitigation measures would be implemented to minimise ecological impacts:

- Ground disturbance and vegetation clearing shall not occur within any of the mapped areas containing Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory and White Box Yellow Box Blakely's Red Gum Woodland EECs (refer to Figure 6-2 and Figure 6-3).
- Weed control mitigation and management strategies shall be documented and implemented in accordance with the CEMP. All herbicide selection and use shall be in accordance with TransGrid requirements.
- Ground disturbance works and plant traversing the site shall avoid Wombat (*Vombatus ursinus*) burrows identified near Structures 10, 11 and 13 and any other burrows which may occur within the study area.
- Any fallen timber, dead wood and bush rock (if present) encountered on site shall be left in situ or relocated to a suitable place nearby.
- Consultation with DPI Fisheries shall be carried out as part of the design of all watercourse crossings upgrade and construction works to ensure the designs meet relevant requirements and to confirm if a Part 7 Permit is required.
- Consultation with the landholder shall be carried out prior to undertaking any clearing of planted vegetation along Spans 19-20, 21-23, 27-28, 30-31, 62A-63, 88-89, 96-98 and 114-115.

6.5 Aboriginal Heritage

An Aboriginal Due Diligence and Historic Heritage Assessment Report was undertaken by OzArk (2019) with the full report contained in Appendix E. The assessment was undertaken in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010). The subsequent section outlines the findings in the report.

6.5.1 Existing Environment

A desktop search was undertaken of the Office of Environment and Heritage (OEH) administered Aboriginal Heritage Information Management System (AHIMS) to identify any previously recorded Aboriginal heritage within a 1 km buffer of Line 99M. The search returned a total of 20 previously recorded Aboriginal sites within the search area.

Of the 20 sites recorded, three sites were identified as being potentially affected by the proposed activity given their proximity to proposed work locations:

- **AHIMS 51-4-0392 (Yass River-OS1) –** The site consists of an artefact scatter to the west of Yass River on an elevated, flat elongated spur landform located on agricultural land. The site comprises a total of 16 surface artefacts and associated potential archaeological deposit (PAD) with an area of approximately 165 m x 130 m extending between Structures 11 and 12 on Line 99M.
- **AHIMS 50-5-0027 (Booroo Ponds 1**) - Low-density artefact scatter with the potential for subsurface deposits, as the site is located on a broad gently sloping elevated terrace. The surface artefacts were recorded on an exposed area of access track used to access to Structure 10 and comprised an area of approximately 45 m x 4 m. A survey of the site did not locate any artefacts associated with the site.
- **AHIMS 51-4-0052 (YSS1**) - low-density artefact scatter with few artefacts exposed on the surface of a dirt track, trending east–west from the Yass substation. The site extends along the track for approximately 105 m and an area of archaeological potential was identified further to the south and southeast of the track, which gradually falls into a shallow gully associated with Booroo Ponds. A survey of the site did not locate any artefacts associated with the site. Furthermore it was assessed that there is little potential for subsurface archaeological deposits as the soils appeared to be very thin and the landforms to the immediate west of the site appear to be a more suitable landform for occupation.

The location of each of the three AHIMS sites described above is shown in Figure 6-5 and Figure 6-6

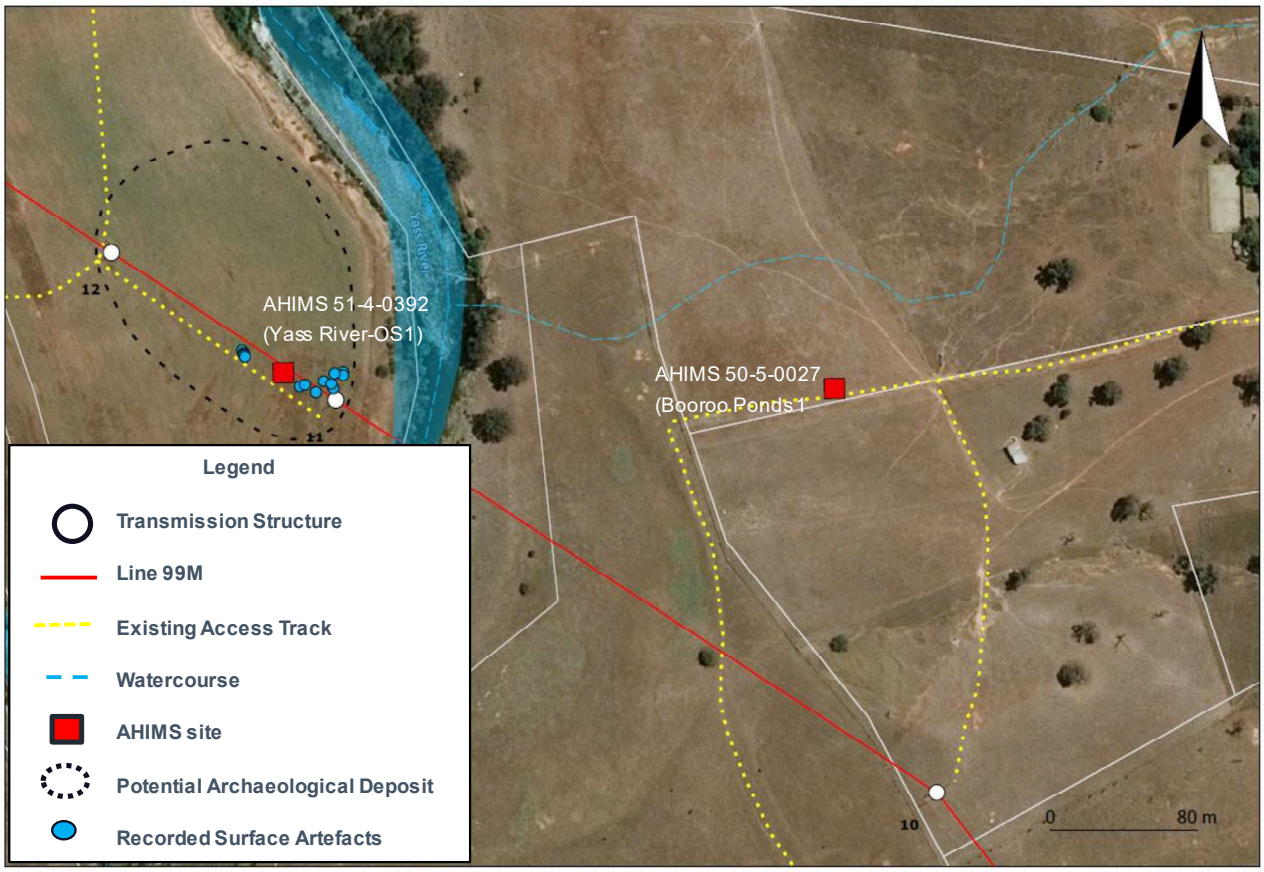

Figure 6-5: Location of AHIMS 51-4-0392 (Yass River-OS1) and AHIMS 50-5-0027 (Booroo Ponds 1)

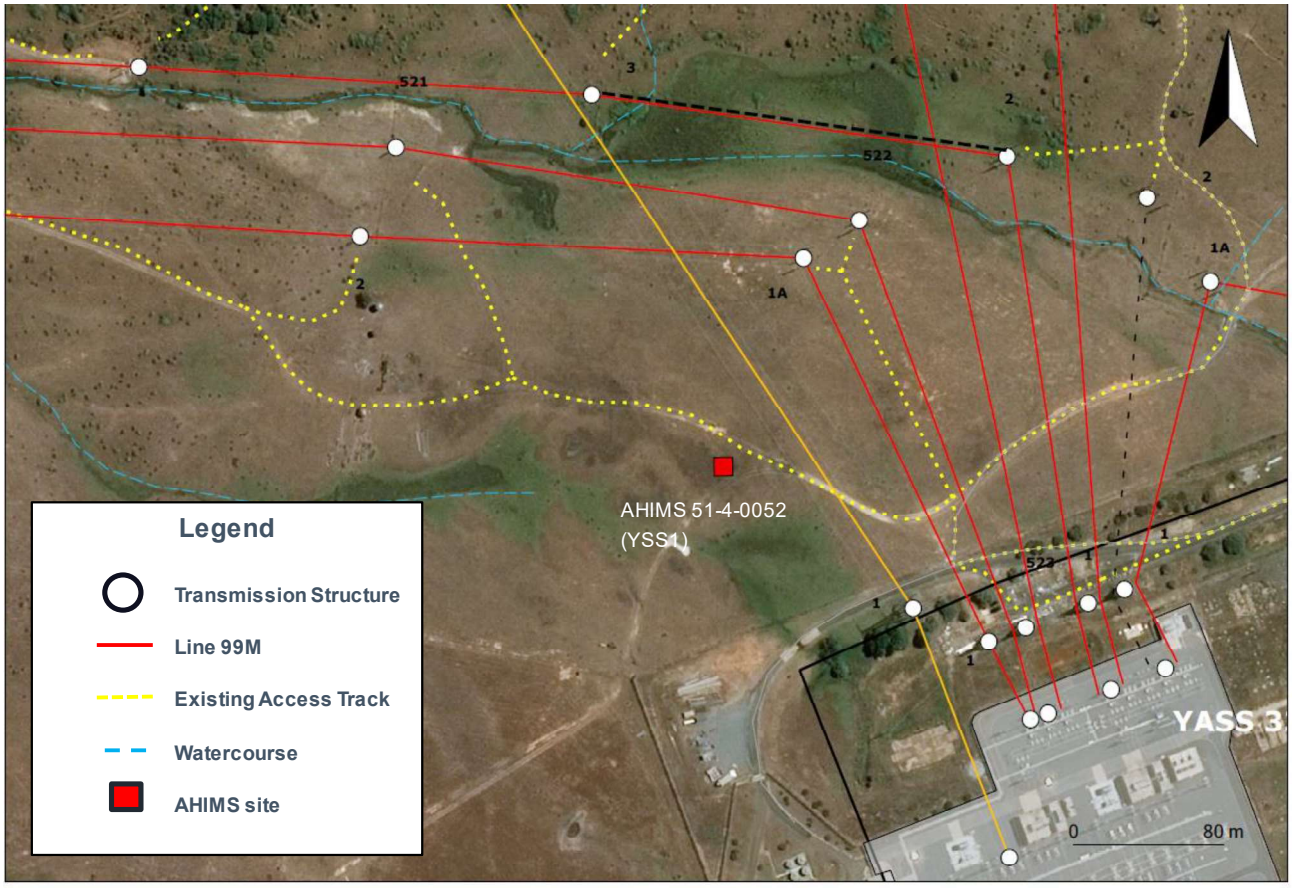

Figure 6-6: Location of AHIMS 51-4-0052 (YSS1)

All other work locations within the study area were identified to be located within areas and on landforms of low archaeological sensitivity.

6.5.2 Impact Assessment

An assessment of the potential impact on the three previously recorded Aboriginal heritage sites is discussed below. The due diligence did not identify any other areas of potential Aboriginal heritage sensitivity likely to be affected by the proposed activity.

AHIMS 51-4-0392 (Yass River-OS1)

The proposed activity would require the replacement of Structure 11 and Structure 12 within the mapped extent of the site. Consequently, direct impact to the site is unavoidable and an Aboriginal Heritage Impact Permit (AHIP) would be required prior to carrying out any works at Structure 11 and Structure 12 (refer to Section 6.5.3).

AHIMS 50-5-0027 (Booroo Ponds 1)

No surface artefacts were identified on the existing track to Structure 10 on Line 99M during the field survey however the site is located on a terraced landform adjacent to the Yass River, which is considered archaeologically sensitive. It was assessed that the use of the existing track to Structure 10 can occur without impacting the site. However, earthworks are required to flatten out the existing drop off through the access gate to the west of the recorded site in order for construction vehicles to safely access Structure 10.

Provided the area to the north of the access gate is avoided and the other mitigation measures in Section 6.5.3 are implemented, further assessment of the sensitive terrace landform is not required (refer to Figure 6-7).

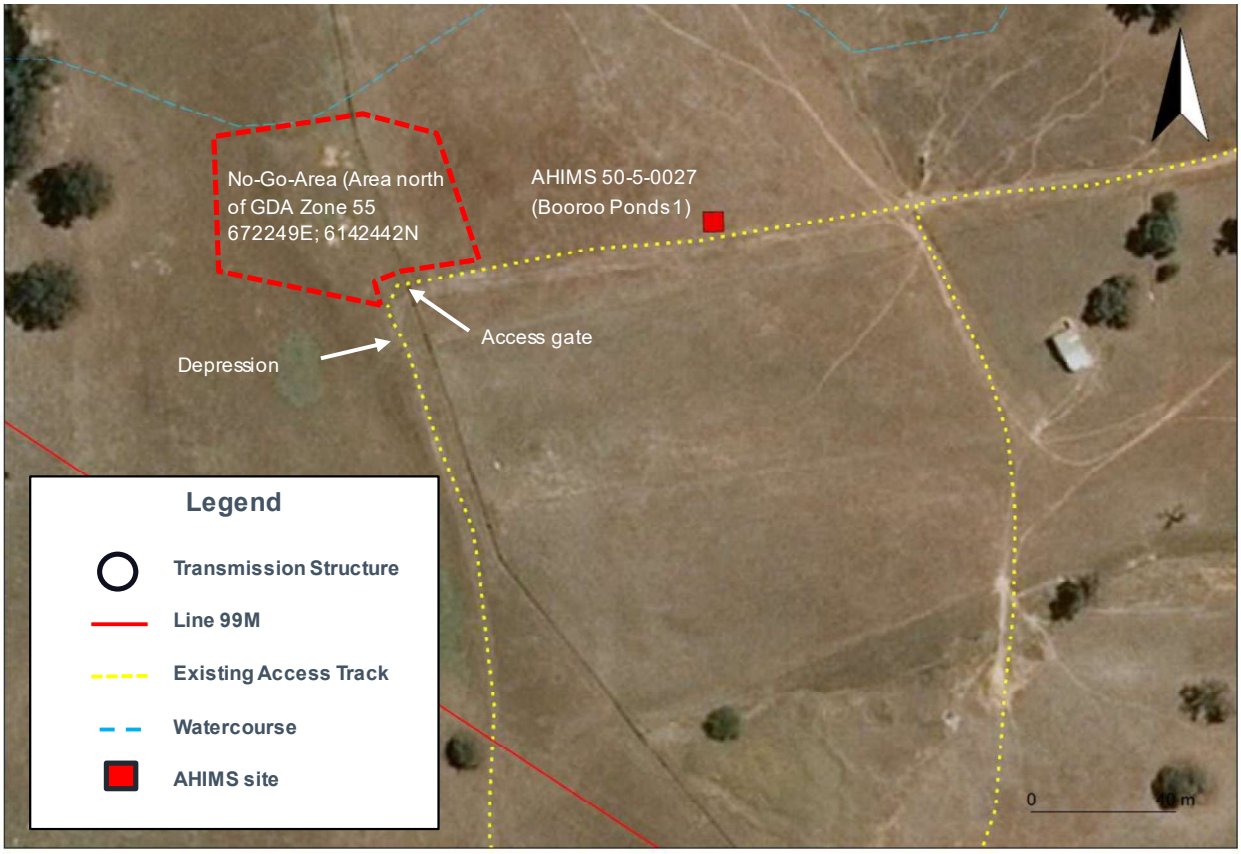

Figure 6-7: AHIMS 50-5-0027 (Booroo Ponds 1) No-Go-Area

AHIMS 51-4-0052 (YSS1)

Given that no artefacts were visible on the access track or surrounding landforms, vehicle movement across the surface of the existing access track can continue without further archaeological investigation.

6.5.3 Mitigation Measures

The following mitigation measures would be implemented to minimise Aboriginal heritage impacts:

- AHIMS 51-4-0392 (Yass River-OS1) - To manage the unavoidable impact to the site, an Aboriginal Heritage Impact Permit (AHIP) pursuant to Section 90 of the *National Parks and Wildlife Act 1997* shall be sought from the NSW Office of Environment and Heritage prior to any works occurring at Structure 11 and 12. Once obtained, all works at these locations must comply with the conditions outlined in the AHIP.
- To protect AHIMS 50-5-0027 (Booroo Ponds 1) and the associated sensitive terrace landform the following measures shall be implemented:
  - No ground disturbance associated with improving access through the gate on the existing access track to structure 10 shall occur north of GDA Zone 55 672249E; 6142442N as shown in Figure 6-7.
  - Works in the area should take place in dry weather to minimise ground churning.
  - All ground disturbance works within the terrace landform (area west of the fence line) must be kept to a strict minimum
  - As much as possible, the depression (as shown in Figure 6-7) in the terrace (former erosion) should be utilised as the location of the access track/earth works as shown in Figure 6-5.
- In the event that a site or artefact (as defined by the *National Parks and Wildlife Act 1974* or *Heritage Act 1977*) is identified during construction works, works shall cease at the location and no further harm to the object shall occur. The find shall be immediately reported to TransGrid, and the regulator in accordance

with legislation. No work shall commence in the vicinity of the find until any required approvals have been given by the regulator. In the event that skeletal remains are encountered during the activity, works must stop immediately, the area secured to prevent unauthorised access and NSW Police, OEH and TransGrid contacted.

6.6 Non-Aboriginal Heritage

6.6.1 Existing Environment

A search of the following databases was undertaken on 6 March 2019 to identify items and places of non-Aboriginal heritage recorded within the study area:

- World Heritage Register;
- National Heritage List;
- Commonwealth Heritage Register;
- NSW State Heritage Register and State Heritage Inventory; and
- Section 170 register (NSW government agencies) on the State Heritage Inventory.

The search identified one non-Aboriginal heritage listed item within the study area. The item is Hattons Corner, located approximately 580 m north east of Structure 13. This item is listed under the *Yass Valley Local Environmental 2013* as Item A301. It is registered as a classic palaeontological and stratigraphical locality providing an outstanding section of richly fossiliferous Silverdale formation and Booroo Ponds Group; and is of international palaeontological importance.

An old wooden bridge was identified at the watercourse crossing between Structures 89- 90, however is no longer used and is not considered to have historic heritage significance.

6.6.2 Impact Assessment

No impact to any previously recorded non-Aboriginal heritage items would occur as part of the proposed activity. The wooden bridge identified would not be used as part of the proposed activity, therefore would not be affected.

6.6.3 Mitigation Measures

The following mitigation measures would be implemented to minimise historic heritage impacts:

- In the event that a site or artefact (as defined by the *National Parks and Wildlife Act 1974* or *Heritage Act 1977*) is identified during construction works, works shall cease at the location and no further harm to the object shall occur. The find shall be immediately reported to TransGrid, and the regulator in accordance with legislation. No work shall commence in the vicinity of the find until any required approvals have been given by the regulator. In the event that skeletal remains are encountered during the activity, works must stop immediately, the area secured to prevent unauthorised access and NSW Police, OEH and TransGrid contacted.

6.7 Noise and Vibration

6.7.1 Existing Environment

Existing noise conditions within the study area are expected to be influenced by environmental noise (e.g. wildlife calls, wind-blown vegetation). Vehicles travelling on the surrounding road network, namely the Hume Highway, and the Yass substation are other key source of noise within the study area. Overall, existing background levels across the majority of the study area are expected to be low, which is attributed to its rural setting.

Being located primarily on agricultural land, the study area is characterised by low population density with the closest dwelling (R9 – refer to Appendix A) located approximately 218 m from Line 99M easement. No other

sensitive receivers, such as schools, hospitals, childcare facilities, aged care facilities or places of worship were identified within 250 m of the study area.

6.7.2 Impact Assessment

Construction

Noise would be generated from a variety of sources during construction including drill rig (for pole replacement/installation), excavator for construction bench establishment and access track works, conductor, OPGW and earth wire stringing, and trucks and utility vehicles used to access each structure and for the delivery of equipment.

Whilst elevated noise levels may be experienced at nearby residential dwellings, particularly those within 250 m of any work locations, they would be:

- Short term (up to approximately 10 days) at any one location and intermittent in nature; and
- Limited to the standard hours of construction as per the Interim Construction Noise Guideline (DECC, 2009) (refer to Section 6.7.3).

Construction noise is unlikely to have a significant impact on the amenity in the local and regional area. As such, a quantitative noise assessment is not considered necessary for the works.

Operation

Noise from the ongoing operation of Line 99M (including corona noise and noise generated from routine maintenance activities) is expected to remain unchanged from current operations.

In summary, noise and vibration impacts are considered minor and would be adequately managed in accordance with the mitigation measures in Section 6.7.3.

6.7.3 Mitigation Measures

The following mitigation measures would be implemented to minimise noise and vibration impacts:

- Noise generating works shall be in accordance with the Interim Construction Noise Guideline (DECC, 2009):
  - 7:00am – 6:00pm Monday to Friday.
  - 8:00am – 1:00pm Saturdays.
  - No work on Sundays or Public Holidays.

  Work outside normal hours, on Sundays and public holidays shall only comprise:
  - The delivery of materials outside normal hours requested by police or other authorities for safety reasons.
  - Emergency work to avoid the loss of lives and/or property.
  - Work timed to correlate with system planning outages.

  Other noise generating works outside of the standard construction hours shall require the prior formal written consent of Environment - HSE/TransGrid and require justification in accordance with the Guideline.
- Noise affected neighbouring properties shall be notified as to the timing and duration of the construction works at least 7 days prior to commencing work.

6.8 Traffic and Access

6.8.1 Existing Environment

The study area consists of local roads providing access from rural residences to the main road network. The Hume Highway is the main feeder for the region and is an RMS classified road.

The Yass 330 kV substation is accessed via Perry Street, connecting to the Yass township, Yass Valley Way and the Hume Highway.

Access to the Line 99M structures is provided from the main road network, primarily the Hume Highway, Yass Valley Way and Burley Griffin Way via a series of existing local roads and access tracks. The main road network carries high volumes of passenger vehicle and truck movements. The tracks carry low levels of local traffic flows comprising passenger vehicles and also plant and machinery for farming purposes.

Line 99M intersects numerous private access tracks and the following named local and main roads:

- Black Range Road (non-classified road) at Structures 36 – 37.
- Bowning Road (non-classified road) at Structures 37 – 38.
- Hume Highway (RMS classified highway) at Structures 62 – 63.
- Illalong Road (non-classified road) at Structures 98-99.
- Skyes Road (non-classified road) at Structures 122-123.

6.8.2 Impact Assessment

Construction

During construction, various vehicles would be used to transport personnel, materials, waste and equipment to and from the work locations within the study area via the existing roads and access tracks. It is expected that at any one time, vehicle movements to the specific structure locations would be fewer than 30 vehicle movements per day. Aside from Hume Highway, Yass Valley Way and Burley Griffin Way, the other roads and access tracks utilised by the proposed activity are expected to carry low traffic volumes. As such, there may be a noticeable temporary increase in construction traffic utilising the local road network, particularly along access tracks. Notwithstanding this, it is not anticipated that the increase in traffic volume during construction works would affect the safety and function of the surrounding road network. Potential impacts arising from the increase in traffic movements would be managed in accordance with the mitigation measures in Section 6.8.3.

There may be some temporary disruptions to traffic movements along Hume Highway and other public roads during the stringing of conductor, OPGW and overhead earth wire above the road corridor. Whilst road access may be required, impacts on traffic would be temporary in nature and would unlikely cause considerable disruptions to other road users. Consent under Section 138 of the *Roads Act 1993* would be sought for the overhead stringing works above Hume Highway, which is a classified State road.

The proposed access track repair works and new access track construction may result in some minor disruption to landholder's use of the access tracks and general movements around their property, however may have a positive impact in the long term through the improvement in track conditions and accessibility.

Operation

After the completion of the proposed activity, vehicle movements would return to current operational levels. This generally involves the intermittent access by TransGrid and its contractors to the transmission line easement for maintenance purposes.

6.8.3 Mitigation Measures

The following mitigation measures would be implemented to minimise traffic and access impacts:

- Transportation and equipment delivery shall be in accordance with RMS and Council requirements.
- Access track works shall be constructed in accordance with the *Soils and Construction Volume 2C Unsealed Roads (DECC, 2008).*
- Traffic, transportation and access mitigation and management strategies shall be documented and implemented in accordance with the CEMP and updated as required. This shall include:
  - The management of the delivery of equipment and materials.
  - Access to and from the site including nominated roads and site access tracks.
  - Traffic management to be implemented for conductor, OPGW and earth wire road crossings
  - Parking.
  - Speed limits.

- Road occupancy licence conditions.

6.9 Air Quality and Climate Change

6.9.1 Existing Environment

Air quality across the majority of the study area is expected to be typical of a rural landscape with few industrial pollution sources. Likely sources of air quality pollution would include hazard reduction burning, dust, car emissions and bushfires. Other sources of poor local air quality are likely to include backyard burning, wood fires and emissions from industrial processes in the Yass township.

6.9.2 Impact Assessment

Construction

The primary air quality impacts associated with the proposed activity would be dust generated from excavations (namely, access track establishment and upgrade works, structure installation and replacement, construction bench establishment and civil works associated with the new switchbay at Yass substation) and dust generated from vehicular movements on disturbed or unsealed surfaces during the construction period. There would also be exhaust emissions generated from construction plant and vehicles. Dust and exhaust emissions (such as carbon monoxide, nitrogen dioxide, hydrocarbons and nitrogen oxides) would be temporary (up to ten days at any location). The impact of the proposed activity on the air quality in the surrounding environment would be minor. As such, the proposed activity would have limited potential to contribute to the cause or the effects of climate change.

Operation

During operation, the transmission line would have no significant impact on the air quality of the surrounding environment. The level of dust generated by maintenance vehicles would be comparable to that of other vehicles on the roads and access tracks in the area.

6.9.3 Mitigation Measures

The following mitigation measures would be implemented to minimise air quality impacts:

> If necessary, dust suppression techniques shall be implemented, and incorporated into the Environmental Management Plan, as per the techniques outlined in the "Blue Book", such as water spraying of surfaces, covering stockpiles and covering surplus soils and materials during transportation.

> Air quality mitigation and management strategies shall be documented and implemented in accordance with the CEMP. This shall include:
  - Reducing vehicle speeds when in the vicinity of residences to minimise the generation of nuisance dust.
  - Progressively revegetating or otherwise rehabilitating disturbed areas as works are completed.

6.10 Visual Amenity

A Landscape Character and Visual Impact Assessment for the proposed activity was carried out by Green Bean Design Landscape Architects with the full report provided in Appendix F. This section describes the existing visual environment in the context of the existing Line 99M and discusses the potential impacts associated with its rebuild.

6.10.1 Existing Environment

Land cover and land use patterns are generally consistent across the majority of the study area with predominantly pasture (and more limited extents of agricultural cultivation) forming the main visual context and

backdrop to views within the study area. Figure 6-8 shows the typical agricultural landscape which is representative of the majority of the study area.

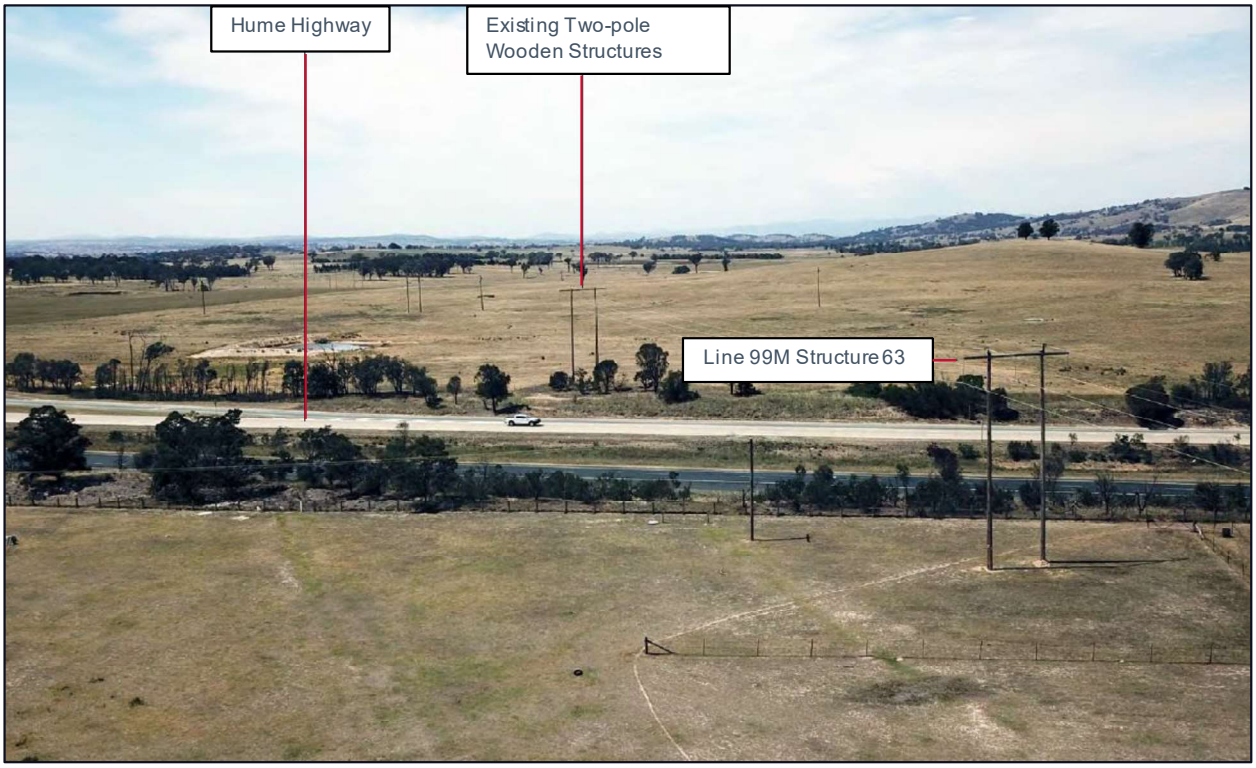

Figure 6-8: Typical Agricultural Landscape across the Study Area.

The landform combines a gently undulating landscape, with moderate to steeper slopes through the western portion of the study area. The landform is influenced by drainage to the south east of the easement beyond the Yass substation, with flatter to gently sloping landforms extending south of the Hume Highway.

Human settlement within and in proximity to the study area is sparse with only 19 individual or groups of residential dwellings located within 1 km of Line 99M. The nearest residential dwelling (R9) is located approximately 218 m from the transmission line near Structure 40. Residential dwellings within 1 km of Line 99M are shown in Appendix B and in more detail in Appendix A of the *Landscape Character and Visual Impact Assessment* (refer to Appendix G).

6.10.2 Impact Assessment

Construction

During construction, there would be minor visual impacts associated with the construction activities and the presence of construction work sites, vehicles, equipment and plant. Construction works may be visible from some residential dwellings, and from nearby roads and access tracks.

Construction works would move progressively along the transmission line and as such, visual impacts associated with the construction activities would be temporary (up to 10 days at any one location) and considered minor in nature. With the implementation of the mitigation measures in Section 6.10.3, visual impacts during construction are unlikely to be significant.

Operation

Following construction, Line 99M between Yass substation and Structure 143 would be visually different from the existing wooden pole line with the rebuilt section comprising steel or concrete transmission structures up to 40 m in height. Consequently, at some locations, the new structure would be up to 20 m higher than the existing wooden pole structures. The level of impact resulting from the proposed change was assessed with consideration to all existing residential dwellings within 1 km of Line 99M and from surrounding roads as outlined

in Table 6-1 and Table 6-2. Furthermore, photomontages were also generated from three publicly accessible roads (Black Range Road, Graces Flat Road and Burley Griffin Way) to assess the level of visual impact associated with the proposed transmission line rebuild.

Table 6-1: Visual Impact Assessment - Residential Dwellings

Viewpoint	Approximate Distance to Line 99M	View Context	Overall Visibility and Assessed Level of Impact
Residential Dwellings			
R1 - Eight dwellings west of Shearsby Crescent	278 m	Views from residential dwellings extend west to north west generally above and beyond the existing transmission line, which is located on land sloping gently down to the Yass River corridor. A number of the dwellings have scattered or denser tree planting surrounding the dwelling which will screen or filter views toward the transmission line. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the transmission line relative to residential dwelling position.	**Low (and Nil where screened by vegetation).**
R2 - Around 7 dwellings east and north of Shearsby Crescent and Rossi Street.	575 m	Views from residential dwellings toward the transmission line are largely screened by a combination of landform and tree cover surrounding and beyond residential dwellings. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low (and mostly nil) where largely mitigated by the location of the line relative to landform and tree cover.	**Low (and Nil where screened by vegetation).**
R3 – Residential Dwelling	688 m	Views from the residential dwelling toward the transmission line are partially screened and filtered by tree cover surrounding and beyond residential dwelling. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low where largely mitigated by the location of the line relative to tree cover.	**Low**
R4 – Residential Dwelling	729 m	Views from the residential dwelling toward the transmission line are largely screened and filtered by tree cover surrounding the residential dwelling. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low as views are largely mitigated by the location of the line relative to tree cover surrounding the dwelling.	**Low**
R5 – Residential Dwellings	373 m	Views from residential dwellings extend south to south west generally above and beyond the existing transmission line, which is located on gently sloping and undulating land. A number of the dwellings have scattered or denser tree planting surrounding the dwelling which would screen or filter views towards the transmission line. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the line relative to residential dwelling position.	**Low (and Nil where screened by vegetation).**

Viewpoint	Approximate Distance to Line 99M	View Context	Overall Visibility and Assessed Level of Impact
R6 – Residential Dwelling	829 m	Views from the residential dwelling/s are largely screened by scattered or denser tree planting surrounding the dwelling/s which will screen or filter views toward the majority of the transmission line. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the line relative to residential dwelling and surrounding tree cover.	**Low**
R7 – Residential Dwelling	264 m	Views from the residential dwelling extend south to south east toward the existing transmission line including Structures 31 and 32 along an approximate 500 m length of the easement. Whilst visible, the existing (and proposed) structures are not considered to be visually dominant within the overall available view from the dwelling. The potential increase in visual magnitude associated with the transmission line rebuild is generally considered to be low.	**Low**
R7A– Residential Dwelling	580 m	Views from the residential dwelling are largely screened by scattered or denser tree planting surrounding the dwelling which will screen or filter views toward the majority of the transmission line. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the line relative to the residential dwelling and surrounding tree cover.	**Low (Nil)**
R8– Residential Dwelling	459 m	Views from the residential dwelling are largely screened by scattered or denser tree planting surrounding the dwelling which will screen or filter views toward the majority of the transmission line. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the line relative to the residential dwelling and surrounding tree cover.	**Low (Nil)**
R9– Residential Dwelling	218 m	Views from the residential dwelling extend toward the existing transmission line including Structures 37 to 41 along an approximate 1.2 km length of the easement. The more visually direct and proximate Structures 38 and 39 extend in a south easterly direction from the dwelling which is located mid slope above the Black Range Road. Whilst visible, the existing (and proposed) structures are not considered to be visually dominant within the overall available view from the dwelling. The potential increase in visual magnitude associated with the transmission line rebuild is generally considered to be low to moderate	**Low to Moderate**
R10	563 m	Views from the residential dwelling are largely screened by scattered or denser tree plantings surrounding the dwelling which are expected to screen or filter views toward the transmission line. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely	**Low**

Viewpoint	Approximate Distance to Line 99M	View Context	Overall Visibility and Assessed Level of Impact
		mitigated by the location of the line relative to the residential dwelling and surrounding tree cover.	
R11	409 m	Views from the residential dwelling are largely screened by scattered or denser tree plantings surrounding the dwelling which are expected to screen or filter views toward the transmission line. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the line relative to the residential dwelling and surrounding tree cover.	**Low**
R12	848 m	Views from the residential dwelling are largely screened by scattered or denser tree plantings surrounding the dwelling which are expected to screen or filter views toward the transmission line. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the line relative to the residential dwelling and surrounding tree cover.	**Low**
R13	631 m	Views from the residential dwelling and gallery are largely screened by scattered or denser tree plantings surrounding the dwelling which are expected to screen or filter views toward the transmission line. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the line relative to the residential dwelling and surrounding tree cover.	**Low**
R14	764 m	Views south to west from the residential dwelling are largely screened by landform rising gently to the west of the dwelling which will largely screen views toward the majority of the transmission line rebuild. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the line relative to the residential dwelling.	**Low**
R14A	844 m	Views south from the residential dwelling toward the transmission line rebuild will be partially screened by undulating landform and disrupted by scattered tree cover beyond the dwelling curtilage. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the line relative to the residential dwelling and surrounding tree cover.	**Low**
R15	413 m	Views south from the residential dwelling toward the transmission line rebuild will be partially screened and disrupted by tree cover and scattered tree planting beyond the dwelling curtilage. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely	**Low**

Viewpoint	Approximate Distance to Line 99M	View Context	Overall Visibility and Assessed Level of Impact
		mitigated by the location of the line relative to the residential dwelling and surrounding tree cover.	
R16	750 m	Views north from the residential dwelling toward the transmission line rebuild will be largely screened and disrupted by tree cover and scattered tree planting beyond the dwelling curtilage. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the line relative to the residential dwelling and surrounding tree cover.	**Low**
R17	536 m	Views south from the residential dwelling toward the transmission line rebuild will be partially screened and disrupted by tree cover and scattered tree planting beyond the dwelling curtilage. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the line relative to the residential dwelling and surrounding tree cover.	**Low**
R18	436 m	Views south from the residential dwelling toward the transmission line rebuild will be partially screened and disrupted by tree cover and scattered tree planting beyond the dwelling curtilage. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the line relative to the residential dwelling and surrounding tree cover.	**Low**
R19	572 m	Views north from the residential dwelling toward transmission line rebuild will be largely screened by tree cover surrounding and beyond the dwelling. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the line relative to the residential dwelling and surrounding tree cover.	**Low**

Table 6-2: Visual Impact Assessment – Road Corridors

Road Corridor	Structure Adjoining Road	View Context	Overall Visibility and Level of Impact
Black Range Road and Bowning Road.	36, 37 and 39	The proposed new structures would be visible from short sections of the Black Range and Black Range Bowning Road corridors, with indirect views extending across surrounding pasture land. Views would be short duration and at oblique angles where spanning the road corridor. **Refer to photomontage in Figure 6-9.**	**Low**
Graces Flat Road	51 and 52	The proposed new structures would be visible from short sections of the Graces Flat Road corridor, with indirect views extending across surrounding pasture land. Views would be	**Low**

Road Corridor	Structure Adjoining Road	View Context	Overall Visibility and Level of Impact
		short duration and at oblique angles where spanning the road corridor. **Refer to photomontage in Figure 6-10.**	
Hume Highway	62A and 63	Views from vehicles travelling both west and eastbound would be partially filtered by occasional low tree and shrub planting alongside the Highway corridor; however, views toward structures would extend from sections for the Highway approaching the transmission line as it spans the Highway. For the most part views would be indirect and very short duration from vehicles travelling at the posted speed limit.	**Low**
Burley Griffin Way	N/A	The existing transmission structures are visible at around 700 m from the Burley Griffin Way road corridor extending to around 1.5 – 2km. Views are generally indirect and restricted to around 500 m of the road corridor. The potential increase in visual magnitude associated with the transmission line rebuild is considered to be low and largely mitigated by the location of the line relative to the road corridor and minimal number of structures that would be visible above the immediate skyline. **Refer to photomontage in Figure 6-11.**	**Very Low**
Illalong Road	98 and 99	The proposed new transmission structures would be visible from a short section of the Illalong Road corridor, with indirect views extending across surrounding pasture land. Views would be short duration and filtered by tree cover extending along either side of the road corridor.	**Low**
Glengarry Road	112 and 113	The proposed new transmission structures would be visible from a short section of the Garrys Road corridor. The majority of views from the road corridor are indirect and filtered by tree cover extending along either side of the road corridor and by scattered tree cover across the surrounding pasture landscape.	**Low**
Sykes Road	122 and 123	Views toward the transmission line from the road corridor would be largely indirect and short term, with views from travel south west to north east partially screened by tree cover alongside and beyond the road corridor.	**Low**
Coppabella Road	146 and 147	Views toward the transmission line rebuild, commencing around 1.5km east of the Coppabella Road corridor, are screened by a combination of landform and tree planting alongside the eastern side of the road corridor.	**Very Low**

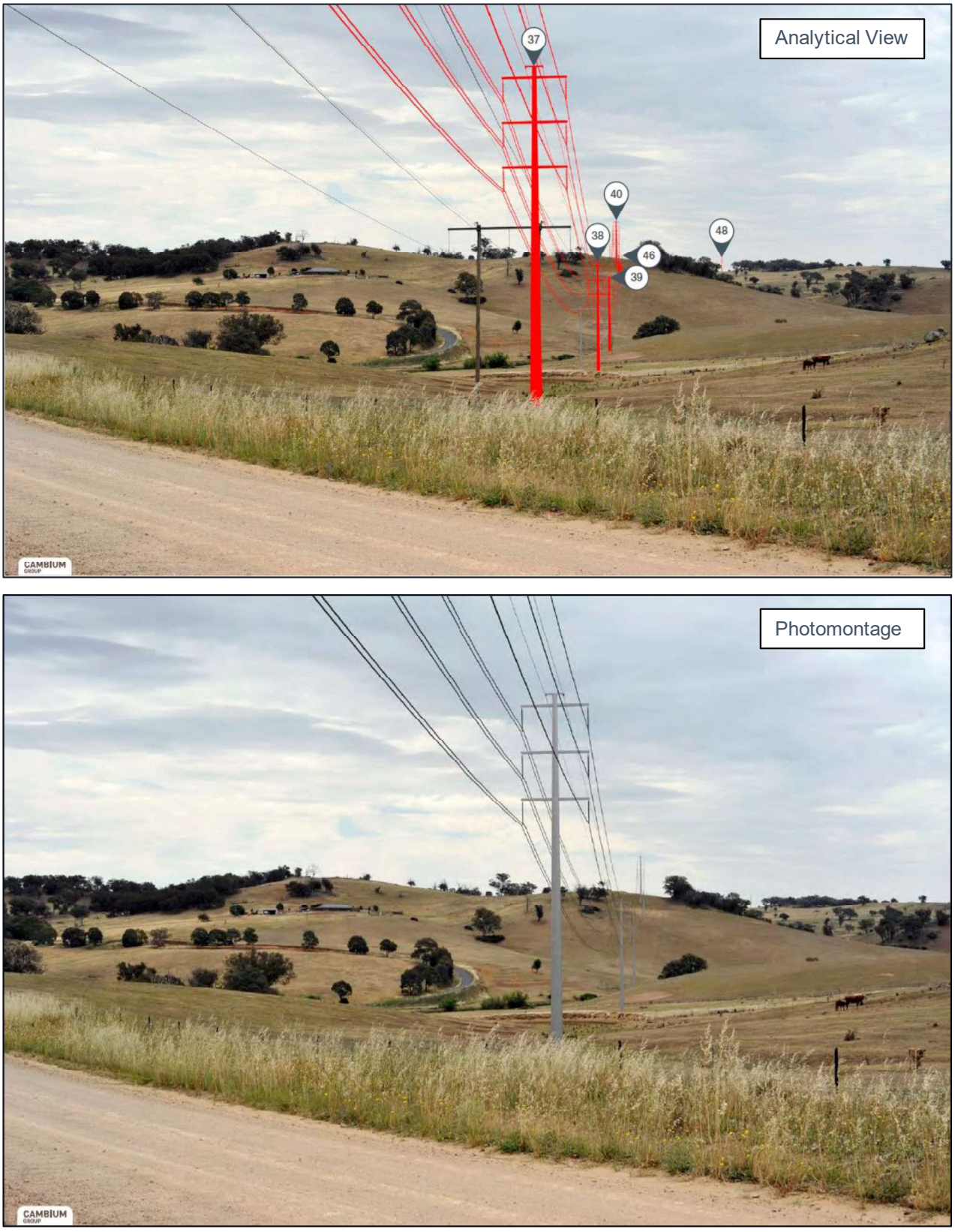

Figure 6-9: Photomontage 1 – View Looking North West From Black Range Road

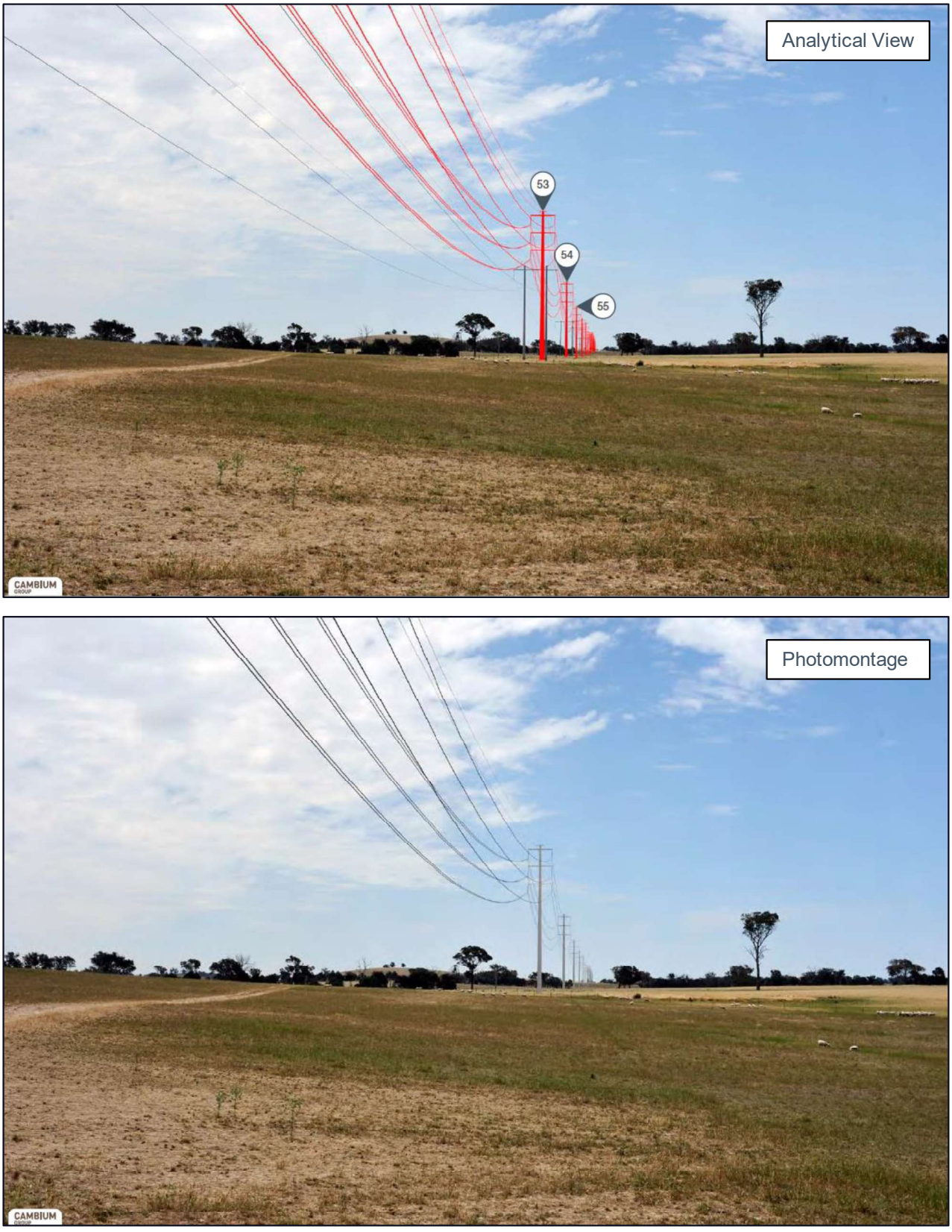

Figure 6-10: Photomontage 2 – View Looking North West From Graces Flat Road

Figure 6-11: Photomontage 3 – View Looking South West From Burley Griffin Way

With consideration to the visual impact assessment from residential and publicly accessible viewpoints, the overall impact on visual amenity associated with the proposed rebuild of the transmission line is generally considered low having regard to distance, existing landform and the presence of existing vegetation screens. Whilst the transmission line would look visually different at close range as demonstrated in Photomontage 1 and Photomontage 2 (Refer to Figure 6-9 and Figure 6-10), the impact experienced by motorists would be short in duration as they pass by the transmission line, resulting in an overall low assessed level of visual impact.

6.10.3 Mitigation Measures

The following mitigation measures would be implemented to minimise visual amenity impacts:

> All construction plant, equipment, waste and excess materials shall be contained within the designated boundaries of the work site and shall be removed from the site following the completion of construction.

6.11 Waste

6.11.1 Existing Environment

Minimal waste is generated from the normal operation of Line 99M. Maintenance activities may generate waste associated with any damaged components of the line that require replacement (e.g. earth wire, insulators and fittings). Vegetation maintenance also results in the generation of green waste, in addition to domestic waste generated during line inspections.

6.11.2 Impact Assessment

Anticipated waste streams generated during construction works would include:

> General construction waste such as off-cuts, packaging and excess construction material (such as concrete, plastic and metal);
> Excess spoil;
> Redundant wooden pole structures, steel members, steel structures, conductors, earth wires and fittings;
> Waste oils, greases and lubricants from maintenance of construction plant and equipment; and
> Domestic and putrescible waste (including food scraps, bottles, cans and paper).

All waste generated during construction would be reused if appropriate, or removed, transported and disposed from the site in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014), *Protection of the Environment Operations Act 1997* (POEO Act) and POEO (Waste) Regulation 2005.

With the implementation of the mitigation measures described in Section 6.11.3, waste related impacts are considered to be minor.

6.11.3 Mitigation Measures

The following mitigation measures would be implemented to minimise waste impacts:

> Waste mitigation and management strategies shall be documented in the Construction Environmental Management Plan, and be in accordance with TransGrid Waste Procedures and associated Work Instructions.
> All waste, including surplus soils, which cannot be reused shall be classified in accordance with the *Waste Classification Guidelines* (EPA, 2014), removed from the site and disposed of at a facility that can lawfully accept the waste in accordance with the POEO Act and POEO Waste Regulation.
> Concrete trucks shall be permitted to flick wet wipe their discharge chutes with the effluent discharged into prepared bored holes, prepared excavations/formwork or a watertight receptacle for recycling or disposal. No concrete washout or agitators is permitted.
> Wooden poles, including pole butts, shall be disposed of in accordance with the TransGrid document – Waste Management of Timber Poles or gifted to landowners in accordance with the OEH's '*Protocols for recycling redundant utility poles and bridge timbers in New South Wales'* (2011) and TransGrid requirements.

6.12 Electric and Magnetic Fields (EMF)

6.12.1 Existing Environment

EMF is part of the natural environment and electric fields are present in the atmosphere and static magnetic fields are created by the earth's core. EMF is also produced wherever electricity or electrical equipment is in use. The primary sources of EMF within the study area includes Line 99M, Yass 330 kV substation and other overhead electrical transmission and distribution lines.

6.12.2 Impact Assessment

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines published in 2010 advocate the Reference Levels in Table 6-3, which have been adopted by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

Table 6-3: EMF reference Levels

	Electric Field (volt per meter (V/m))	Magnetic Field (milligauss (mG))
General Public Reference Levels	5kV/m	2,000mG
Occupational Reference Levels	10kV/m	10,000mG

The predicted EMF levels for the proposed activity are as follows:

> The maximum magnetic field strength on the easement will be 215.4 mG which is under the general public reference level of 2000 mG.

> The maximum electric field strength on the easement will be 1.88 kV/m which is under the general public reference level of 5 kV/m.

Based on the outcomes of the assessment, the proposed activity is not expected to contribute to any risk to public safety.

6.12.3 Mitigation Measures

The following mitigation measures would be implemented to minimise EMF impacts:

> All designs shall be in accordance with the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to EMF (ARPANSA 2010).

6.13 Social and Economic Considerations

6.13.1 Existing Environment

Line 99M is an integral component of the electricity supply network within the Southern Tablelands region of NSW, especially within the Yass township.

A key component of the economy of the study area and surrounding region is driven by the agriculture. Residential and commercial development along the transmission line is generally sparse which is reflective of the broad-scale agricultural landscape. There is a higher density of commercial and industrial operations near at the eastern extent of the study area near Yass.

The general sparse commercial and residential development is expected to be a key contributor to the rural lifestyle enjoyed by the residents proximate to the study area.

6.13.2 Impact Assessment

Construction

The proposed activity would have negligible impact on social infrastructure or services in the region, as the proposed activity would only include a small workforce. Negligible positive economic benefits from the proposed activity would be derived from the workforce sourcing daily needs and accommodation from the area.

The proposed activity would result in no distinct change to the disturbance footprint of Line 99M. As such, no long term impacts on the agricultural value of the land or the rural setting and lifestyle of the surrounding residents is expected. Notwithstanding this, some temporary disruptions to landholders may occur in the short term due to the physical presence of proposed works; however this would be managed through direct consultation with landholders at each work location.

When Line 99M is out of service, the supply to Murrumburrah 132 kV substation at the line's western extent can be affected. As such, TransGrid's approach to rebuild Line 99M above the existing line would allow the line to return to service during night time hours and during emergency conditions. Consequently, construction works is not expected to significantly affect electricity supply to the region.

In the short term, construction works would have a minor negative impact on the surrounding community with regards to noise, air pollution and traffic. However, these impacts would be minor and limited in duration with mitigation measures being implemented to reduce impacts.

Operation

The proposed activity is required for the Coppabella Wind Farm (CWF) development. As such, not undertaking the project would mean that power generated by the CWF would not be supplied to the NEM. Consequently, the proposed activity would result in the positive impact of connecting 290 MW of renewable energy into the NEM, which would further help to secure the long term supply of electricity throughout the NEM.

6.13.3 Mitigation Measures

Social and economic impacts would be appropriately managed with the mitigation measures outlined in Sections 6.1.3, Section 6.7.3, Section 6.8.3 and Section 6.9.3. No additional mitigation measures are proposed.

6.14 Cumulative Impacts

6.14.1 Existing Environment

Cumulative impacts are incremental environmental impacts caused by the combination of past, present and reasonably foreseeable future actions. Cumulative impacts accumulate over time, from one or more sources. Whilst impacts may be insignificant in isolation, significant impacts may occur when individual effects are considered in combination.

The assessment of cumulative impacts also focused on the proposed activity's interaction with other projects in the vicinity of the proposed activity, and where construction and/or operational timeframes are likely to be concurrent.

A search of the Department of Planning and Environment's Major Projects website was conducted on 7 March 2019. Four active major projects were identified in the Yass Valley and Hilltops LGAs, being the CWF, Bango Wind Farm, Rye Park Wind Farm and the Springdale Solar Farm. All of these developments are located beyond 30 km from the study area aside from CWF for which its boundary traverses the study area at Structure 143.

The CWF is the only development that is located in close proximity to the study area. The nearest turbine lies approximately 3km south of Line 99M between Structures 114 and 143. A 132kV feeder connection would be constructed as part of the CWF project to connect the CWF to Structure 143 and the new circuit.

6.14.2 Impact Assessment

Construction of CWF may result in potential impacts such as dust generation, traffic and noise. However these would largely occur at a distance no closer than 2 km from the proposed activity, such that cumulative impacts (in combination with the proposed activity) would be negligible. Works that would occur in close proximity to the proposed activity, being the 132 kV feeder connecting the CWF to Line 99M, would be minor and predominantly

short term in nature and may occur in parallel. However, the scope of works of the feeder connection would be similar to that of the Line 99M rebuild. As such, when considering both projects occurring at the same time, any cumulative impacts are expected to be minor.

Whilst the proposed activity would involve the rebuild of the existing transmission line, it would be visually different to the existing line. When considering this change from surrounding viewpoints (such as the surrounding roads and residential dwellings) in combination with the new CWF infrastructure (including the new 132 kV feeder connection and wind turbine generators), there is expected to be a minor to moderate cumulative visual impact.

As such it is considered that the potential cumulative impacts would be minor.

6.14.3 Mitigation Measures

Cumulative impacts would be appropriately managed with the mitigation measures outlined in the Sections 6.3.3, 6.7.3 and 6.9.3.

6.15 Summary of Impacts

In Section 6 the following key impacts associated with the proposed activity:

- An Aboriginal Heritage Impact Permit pursuant to Section 90 of the *National Parks and Wildlife Act 1974* is required prior to works being carried at Structures 11 and 12) due to unavoidable impacts on the previously recorded artefact scatter (Yass River Open Site 1).
- Direct vegetation removal and trimming to facilitate access to the work sites. The ecological assessment determined that no threatened flora, fauna or vegetation communities listed under either the Biodiversity Conservation Act 2016 (NSW) or the *Environment Protection and Biodiversity Conservation Act 1999* (Clth) would be affected.
- Minor visual impacts associated with the taller rebuilt steel or concrete transmission line structures experienced at some surrounding residential dwellings and along public roads
- Potential minor temporary impacts to agricultural activities due to the physical presence of construction works on agricultural land.
- Minor erosion and sedimentation from soil disturbance activities including structure replacement, access track upgrade and construction works, watercourse crossings works and construction bench excavations.
- Minor and temporary elevated noise from construction activities.
- Minor temporary increase in traffic movements on the surrounding road network, however the level of the increase is not expected to impact the safety and function of the road network.
- Minor amounts of dust and emissions from vehicles, equipment or earthworks during construction.

Other potential impacts are identified in Section 6 and management and mitigation measures to alleviate these impacts are summarised in Appendix A.

7. Consideration of Statutory Factors

7.1 Section 5.5 of the EP&A Act and 7.3 of the Biodiversity Conservation Act 2016

Under Section 5.5 of the EP&A Act, the determining authority (being TransGrid) has a duty to consider the effect of the proposed activity on the environment and the effects on any wilderness areas. Table 7-1 provides a summary of how each of the factors has been considered.

Table 7-1: Consideration of Section 5.5 of the EP&A Act - Duty to Consider Environmental Impact

Factor	Comment
5.5 (1). Examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity.	This REF and supporting specialist assessments have been prepared to assess to the fullest extent possible all matters likely to affect the environment.
5.5 (3). Consider the effect of an activity on any wilderness area (within the meaning of the *Wilderness Act 1987*) in the locality in which the activity is intended to be carried on.	The proposed activity would not affect any wilderness area.

Under Section 7.3 of the *Biodiversity Conservation Act 2016*, the determining authority (being TransGrid) has a duty to take into account whether there is likely to be a significant effect on threatened species, ecological communities, or their habitats.

As detailed in Section 6.4.2, the proposed activity would unlikely affect threatened species, ecological communities, or their habitats. Assessments of Significance were carried out under the BC Act and EPBC Act for a number of species potentially affected by the proposed activity, which determined the proposed activity would unlikely contribute to any significant impact (refer to Appendix D).

7.2 Clause 228 of the EP&A Regulation

Clause 228(2) of the EP&A Regulation details those factors that must be taken into account when consideration is given to the likely impact of any activity on the environment, for the purposes of Part 5 of the EP&A Act. Table 7-2 provides a summary on how each of the Clause 228 factors has been considered.

Table 7-2: Consideration of Clause 228 factors

Factor	Potential Impact
a. any impact on a community	During construction, there would be potential traffic, noise and dust and visual impacts on the community. These potential impacts would be minor and temporary and managed through the mitigation measures in Appendix C. Whilst the rebuilt Line 99M would look considerably different in form and height compared to the existing wooden pole line, the overall visual impact on surrounding sensitive receivers and from surrounding roads was assessed as low. In the long term, the proposed activity would provide a positive benefit through the supply of renewable energy to the network.
b. any transformation of a locality	The proposed activity would generally occur within the existing easement and would not involve any additional land acquisition. Furthermore, the proposed activity is not expected to affect any agricultural operations occurring throughout the study area in the long term.

Factor	Potential Impact
c. any environmental impact on the ecosystems of the locality	The proposed activity would not significantly impact on any ecosystem of the locality (refer to Section 6.4)
d. any reduction of the aesthetic, recreational, scientific or other environmental quality	Whilst the rebuilt Line 99M would look considerably different in form and height compared to the existing wooden pole line, the overall visual impact on surrounding sensitive receivers and from surrounding roads was assessed as low.
e. any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations	The proposed activity would not affect any non-Aboriginal heritage items or places (refer to Section 6.6) The proposed activity would directly impact one Aboriginal heritage site (AHIMS 51-4-0392 – Yass River-OS1). As such, an AHIP would be required prior to works occurring within the mapped boundary of the site.
f. any impact on the habitat of protected animals (within the meaning of the *Biodiversity Conservation Act 2016*)	The proposed activity would not impact on the habitat of any protected animals (refer to Section 6.4).
g. any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air	The proposed activity would not increase the risk of endangering any listed species or ecological community listed under either the BC Act or EPBC Act.
h. any long-term effects on the environment	The proposed activity would result in a minor permanent change to the existing landscape where construction benches and new access tracks are required for the work. However, given the context of the existing transmission line easement and surrounding agricultural land use this minor impact is not considered significant. The proposed activity would not result in any long term impacts such as air and water quality degradation, waste generation, noise, traffic impacts that would significantly affect the environment.
i. any degradation of the quality of the environment	There may be short-term air quality, waste generation, noise and visual impacts during the construction period. Implementation of the recommended mitigation measures would ensure that any potential environmental impacts are managed appropriately and are minor. No long term degradation of the quality of the environment is anticipated.
j. any risk to the safety of the environment	The proposed activity would require hot works during construction, imposing potential fire safety risks. Furthermore, the handling of chemicals such as fuel and oil would be required for the operation and maintenance of plant and equipment. Providing hot works is carried out in accordance with relevant TransGrid procedures, impacts associated with bushfire can be effectively managed. Furthermore, any chemicals required for the proposed activity would be stored and handled in accordance with the mitigation measures in Appendix C to reduce any risk of contamination to the environment.
k. any reduction in the range of beneficial uses of the environment	The proposed activity would generally be confined to within TransGrid's existing easement and surrounding access tracks. Whilst the physical presence of the proposed activity and the establishment of construction benches may affect the use of the affected land for agricultural use, the level of impact is considered to be minor and would be addressed through consultation with the landholder.
l. any pollution of the environment	There is the potential for some short-term air, noise, water and soil pollution during the construction, however, these impacts would be managed and mitigated through the implementation of the measures in Appendix C.
m. any environmental problems associated with the disposal of waste	Providing waste is managed in accordance with the mitigation measures in Appendix C, no environmental problems from the disposal of waste are anticipated.

Factor	Potential Impact
n. any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	There would be no increase in demand on resources that are likely to become in short supply. The proposed activity would facilitate the provision of renewable energy to the NEM, reducing demand on non-renewable and greenhouse gas emitting energy sources.
o. any cumulative environmental effect with other existing or likely future activities	The proposed activity would not contribute to any significant potential cumulative impacts when considered in conjunction with other existing or likely future activities (refer to Section 6.14.2).
p. any impact on coastal processes and coastal hazards, including those under projected climate change conditions	The proposed activity is not located within a coastal zone and therefore would not affect any coastal processes or coastal hazards.

7.3 Matters of National Environmental Significance (MNES) under the EPBC Act

Under the EPBC Act, TransGrid is required to consider matters of national environmental significance (MNES), to assist in determining whether the proposed activity should be referred to the Commonwealth Department of the Environment and Energy. Table 7-3 provides a summary of how MNES have been considered.

Table 7-3: MNES under EPBC Act

MNES / Commonwealth Land	Potential Impact
Any impact on a World heritage property?	No World heritage places are located within 1 km of the study area.
Any impact on a National heritage place?	No National heritage places are located within 1 km of the study area.
Any impact on any wetlands of international importance?	No wetlands of international importance are located within 1 km of the study area.
Any impact on a Commonwealth listed threatened species or ecological communities?	The proposed activity would not significantly affect any EPBC Act listed threatened species or ecological communities (refer to Section 6.4.2).
Any impacts on a Commonwealth listed migratory species?	No impact on Commonwealth listed migratory species is expected.
Any impact on a Commonwealth marine area?	The proposed activity would not affect any Commonwealth marine areas.
Any impact on the Great Barrier Reef Marine Park?	The proposed activity would not affect the Great Barrier Reef Marine Park.
Does the proposed activity involve a nuclear action (including uranium mines)?	The proposed activity does not involve a nuclear action.
Does the proposed activity involve a water resource, in relation to coal seam gas development and large coal mining development?	The proposed activity is not associated with a coal seam gas or mining development.
Is the proposed activity likely to have a significant impact on the environment on Commonwealth land?	The proposed activity is not located on or within close proximity to any Commonwealth lands.

7.4 Consideration of Ecologically Sustainable Development under the EP&A Act

Obligations under the *Environmental Planning and Assessment Act 1979* and the *Energy Services Corporations Act 1995* require that TransGrid protects the environment by conducting its operations in compliance with the principles of ecologically sustainable development (ESD), namely:

- The precautionary principle;
- Intergenerational equity;
- Conservation of biological diversity and ecological integrity; and
- Improved valuation, pricing and incentive mechanisms.

The principles of ESD have been applied during the proposed activity design and assessment. Mitigation measures (Appendix C) would be applied to avoid or minimise impacts.

7.4.1 Precautionary Principle

The precautionary principle provides that "if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation".

The assessment of potential environmental impacts has indicated that there would be no threats of serious or irreversible environmental damage as a result of the construction and operation of the proposed activity. Where potential environmental impacts have been considered to occur, mitigation measures have been proposed to minimise and manage any environmental impacts during construction and operation of the proposed activity.

7.4.2 Intergenerational Equity

The principle of intergenerational equity provides that "the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations".

The proposed activity would connect renewable energy generation from CWF to the NEM, contributing to the reduction in the reliance of non-renewable generation sources. Consequently, the proposed activity would contribute to the overall positive benefit for future generations in assisting in reducing the effects of climate change whilst also providing for both current and projected electricity supply requirements. In addition, any potential short-term and long-term adverse environmental impacts would be minimised with the implementation of appropriate mitigation measures.

Further, the proposed activity would not result in environmental or social impacts that would detrimentally limit the potential for future generations to enjoy and utilise the natural environment.

7.4.3 Conservation of Biological Diversity and Ecological Integrity

This principle provides that "conservation of biological diversity and ecological integrity should be a fundamental consideration" in all of TransGrid's activities.

An assessment of ecological impacts was undertaken as part of this REF (refer to Section 6.4). It is unlikely that the biological diversity and ecological integrity of the proposed activity's area would be compromised as no significant impacts on any threatened flora or fauna species or ecological communities have been identified. Minor clearing would be generally limited to common native and non-native grasses. The mitigation measures proposed in Appendix C would further minimise impacts on ecology.

7.4.4 Improved Valuation and Pricing of Environmental Resources

The principle of improve valuation, pricing and incentive mechanisms provides that *"environmental factors should be included in the valuation of assets and services".*

The principle requires that costs to the environment should be factored into the economic costs of an activity. Environmental issues were considered as key matters in the scoping of the proposed activity and in the economic and financially feasibility assessments for the proposed activity.

The proposed activity has taken into account these potential impacts and has identified mitigation measures to be implemented to minimise the loss of environmental values. The implementation of these environmental measures would increase both the capital construction and operating costs of the proposed activity. This signifies that the environmental costs have been included in the costs of the proposed activity.

8. Environmental Management

TransGrid is committed to conducting its activities and services, including the current proposed activity, in a manner that minimises pollution, environmental impacts, and complies with relevant legislation, industry standards and codes of practice. To achieve this, TransGrid maintains an Environmental Management System (EMS) that is certified under the international standard ISO 14001. All activities undertaken for the activity would be consistent with the EMS and the TransGrid Environmental Handbook.

As a result of the detailed environmental assessment undertaken in this REF, environmental management mitigation measures have been included in Appendix C.

The mitigation measures in Appendix C form an integral part of the activity and have been taken into account in considering the likely significance of the activity's impacts. Where the mitigation measures in specialist reports differ from those listed in Appendix C, the mitigation measures contained in Appendix C take precedence.

A Construction Environmental Management Plan (CEMP) shall be prepared and submitted to TransGrid for review and endorsement four weeks prior to the commencement of works, including site establishment. The CEMP shall be prepared in accordance with TransGrid's procedure *Preparation of a Construction Environmental Management Plan.*

In addition to the Contractor's Environmental Supervisor, TransGrid shall appoint an Environmental Inspector to regularly check that the proposed activity is being carried out in compliance with all environmental approval and legislative conditions.

The operation of the activity would be managed in accordance with TransGrid's certified Environmental Management System, which includes detailed maintenance procedures to minimise potential environmental impacts. Due diligence environmental checks, including environmental information generated from GIS where relevant, are undertaken before any maintenance works are carried out.

9. Conclusion

The proposed activity has been assessed under Part 5 of the EP&A Act and this Review of Environmental Factors has been prepared in accordance with relevant legislation, including but not limited to Section 5.5 of the EP&A Act, Clause 228 of the EP&A Regulation and the Commonwealth EPBC Act. An assessment of potential impacts and the data sets and sources consulted are identified in Section 6.

Actions to mitigate (prevent, minimise, or offset) potential and likely impacts have been prescribed in Appendix C. These measures shall be implemented in undertaking the activity.

This REF provides a true and fair review of the activity in relation to its potential effects on the environment. It addresses, to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the activity.

Considering the assessment of the impacts detailed in this REF, it is concluded that the activity **is not likely to significantly affect the environment** and therefore an Environmental Impact Statement is not required.

In addition, it is concluded that the activity is not likely to significantly affect threatened species, ecological communities or their habitats and therefore a Species Impact Statement is not required.

This conclusion has been based on the assessment undertaken within this REF.

This REF is limited to the assessment of the activity described in Section 3. Supplementary assessment and determination in accordance with the *Environmental Planning and Assessment Act 1979* would be required for:

- Works outside of the scope of work assessed in this environmental impact assessment, for which the environmental impact has not been considered; or
- Modifications to the activity scope, methodology or recommended mitigation measures, that alter the environmental impact assessed in this environmental impact assessment.

10. References

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