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# Addendum Review of Environmental Factors

Coppabella Wind Farm – Rebuild of Line 99M

Part 5 EP&A Act Environmental Impact Assessment

Addendum REF 2 - Installation of a Static Synchronous Compensator

November 2023

## Document preparation history

| Revision | Reviewed by | Date |
|---|---|---|
| 01 | Denise Lo | 24 October 2023 |
| 01 | Suzane Westgate | 7 November 2023 |
| 02 | | |

## Certification

I certify that I have prepared this Part 5 environmental impact assessment and, to the best of my knowledge, it is in accordance with the NSW Code of Practice for Authorised Network Operators approved under clause 198 of the *Environmental Planning and Assessment Regulation 2021*, and the information 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 modified activity.

| | |
|---|---|
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| **Signed** |  |
| **Date** | 7 November 2023 |
| **Designation** | Environmental Planner |
| **Qualification** | BSc. Environmental and Natural Resource Economics |
| **Organisation** | Transgrid |

# Executive summary

Transgrid proposes to amend the *Coppabella Wind Farm – Rebuild of Transmission Line 99M* activity which was assessed in the:

- Review of Environmental Factors (REF) and determined by Transgrid on 31 March 2020
- Addendum Review of Environmental Factors and determined by Transgrid on 6 November 2020 (herein referred to as Addendum REF 1).

The proposed activity described in the REF included the rebuild of Transgrid's 132 kV Transmission Line 99M (Yass to Murrumburrah) (Line 99M) from the Coppabella Wind Farm site to Yass 330 kV substation as a double circuit transmission line to support the connection of the Coppabella Wind Farm (CWF) to the National Electricity Market.

The Addendum REF 1 included the following scope:

- Construction of a new switchbay and installation of a 132/330 kV transformer on the former switchyard bench, located to the immediate east of the existing switchyard at Yass substation
- Minor realignment of Line 99M external to Yass substation to facilitate the entry of the rebuilt Line 99M into the new switchbay.

Following determination of the original REF and the Addendum REF 1, it has been identified that a second modification to the proposed activity is required. The changes include the installation of a static synchronous compensator (STATCOM) at Yass substation to meet the connection requirements of the Australian Energy Regulator and address network planning constraints due to the CWF grid connection. The STATCOM would be installed on the former switchyard bench, adjacent to the new 132/330 kV transformer compound.

It has been identified that further assessment is required for the proposed modified activity as potential environmental impacts associated with the changes were not considered in the original REF and the Addendum REF 1. This Addendum REF 2 describes and assesses the proposed modifications since the original REF and Addendum REF 1 and should be read in conjunction with those assessments.

All relevant statutory planning instruments have been examined for the proposed modified activity. The proposed modified activity is permissible under Part 5 of the *Environmental Planning and Assessment Act 1979*.

An assessment of the substation operational noise with the additional STATCOM equipment modelled the potential for elevated noise levels (up to 4 dBA above criteria) to be experienced at four residential receiver locations under adverse weather conditions. With the introduction of noise mitigation (noise barrier around three sides 132 kV STATCOM transformer), the noise impacts are reduced with elevated noise (1 dBA above criteria) predicted at one only one residential receiver under adverse weather conditions. The predicted exceedance of 1 dBA during adverse weather conditions is considered to be minor and is likely to be imperceptible by the receiver. An additional mitigation measure has been included to address operational noise.

Additional impacts to those identified and assessed in the original REF and Addendum REF 1 include:

- Minor and temporary elevated noise from construction activities
- Potential minor temporary disruptions on the road network during the delivery of the additional transformer and STATCOM equipment

- Potential to encounter groundwater contaminated with Per- and Polyfluorinated Substances (PFAS) during excavation works
- Potential to encounter heavy metal, hydrocarbon and polychlorinated biphenyls (PCBs) affected soil during ground disturbance works
- Disturbance of asbestos containing material as part of excavation works and demolition of buildings
- Minor erosion and sedimentation from soil disturbance activities
- Minor amounts of dust and emissions from vehicles, equipment and earthworks during construction.

Changes to the mitigation measures are required to minimise the impacts of the proposed modified activity with the revised consolidated suite of mitigation measures provided in Appendix A.

It is concluded that with consideration to the amended mitigation measures outlined in Appendix A, the proposed modified activity is not likely to have a significant impact on the environment, and is not likely to significantly affect threatened species, populations, ecological communities, or their habitats and is not to be carried out on a declared area of outstanding biodiversity value.

# Contents

# 1. Introduction

## 1.1. Background

A Review of Environmental Factors (REF) was prepared by Transgrid for the *Coppabella Wind Farm - Rebuild of Transmission Line 99M* project and was determined in March 2020.

An Addendum REF was prepared by Transgrid and determined in November 2020 for the installation of an additional 132/330 kilovolt (kV) transformer at Transgrid's Yass 330 kV substation to support the connection of the Coppabella Wind Farm (CWF) into the Transgrid's 330 kV network.

The determined activity described in the REF included the rebuild of Transgrid's 132 kV Transmission Line 99M (Yass to Murrumburrah) (Line 99M) from the CWF site to Yass 330 kV substation as a double circuit line to support the connection of the wind farm to the National Electricity Market (NEM). The Addendum REF, which was determined in November 2020 (herein referred to as Addendum REF 1) included the:

- Construction of a new switchbay and installation of a 132/330 kV transformer on the former switchyard bench, located to the immediate east of the existing switchyard
- Minor realignment of Line 99M external to Yass substation to facilitate the entry of the rebuilt Line 99M into the new switchbay.

It has now been identified that a second modification to the proposed activity is required, which is the focus of this Addendum REF 2. The changes include the installation of a static synchronous compensator (STATCOM) at Yass substation to meet the connection requirements of the Australian Energy Regulator (AER) and address network planning constraints due to the CWF grid connection. STATCOMs are devices which are capable of providing or absorbing reactive current and therefore regulate the voltage at the point of connection to the grid. The STATCOM would be installed on the former switchyard bench, adjacent to the new 132/330 kV transformer compound.

Not carrying out the proposed modified activity would not address the connection requirements of the AER and network planning constraints. As such, not proceeding with the proposed activity would inhibit the connection of CWF to the NEM.

## 1.2. Purpose of the Addendum REF

The purpose of this Addendum REF 2 is to describe the proposed modified activity, assess the potential impacts on the environment, identify any additional mitigation measures that should be implemented and determine whether the proposed modified activity can proceed.

This Addendum REF 2 only addresses changes to the *Coppabella Wind Farm - Rebuild of Transmission Line 99M* project since Addendum REF 1 was determined. For an understanding of the entire activity, this Addendum REF should be read in conjunction with the:

- Original REF (May, 2019) and Submissions Report (March, 2020)
- Addendum REF 1 (July, 2020) and Addendum Submissions Report (October, 2020).

This Addendum REF has been prepared to address the requirements of the *Environmental Planning and Assessment Act 1979* (EP&A Act), Clause 171 of the *Environmental Planning and Assessment Regulation*

2021 (EP&A Regulation) and the *NSW Code of Practice for Authorised Network Operators* (IPART, 2015). For the purpose of the works described in this Addendum REF, Transgrid is the proponent and the determining authority under Part 5 of the EP&A Act.

# 2. Proposed activity

## 2.1. Description of the determined activity

The key features of the determined activity as described in the original REF and Addendum REF 1 include:

- 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 metres (m) in height (up to 20 m higher than the existing wooden pole structures)
- Installation of optical ground wire (OPGW) on the rebuilt section of Line 99M 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 and transformer compound on the former switchyard bench at Yass substation
- Installation of a new 132/330 kV transformer and auxiliary transformer within the new compound.
- Installation of new secondary systems for the control and protection of the new equipment including new outdoor panels in existing equipment kiosk and associated footings and supports as required within the switchyard. Secondary systems equipment installation and upgrade works would also be carried out within the auxiliary services building
- Installation of cables within new cable conduits / trenches within the switchyard as required to complete the necessary connections
- Overhead line crossing of the CWF transmission connection into the new switchbay through the construction of three additional concrete three-pole transmission structures.

## 2.2. Description of the proposed modified activity

The proposed modified activity would involve the following:

- Removal of redundant footings, transformer bunds, conduits and tanks and demolition of three onsite buildings (largest being approximately 20 metres x 10 metres) to make way for new grid connection infrastructure
- 132 kV switchbay and a new 132 kV transformer (oil filled) and auxiliary transformer with associated compounds
- Installation of the new STATCOM equipment which includes the control, water cooling and reactor components, control / ancillary services building and all necessary ancillary equipment
- Connection of the transformer compound and switchbay to the existing spill oil and stormwater drainage network. New spill oil tank(s) (approximately 20 metres long x 6 metres wide x 3.5 metres deep), pipework and pits will be installed as required on the former switchyard bench
- Reinstatement of the earthgrid within the former switchyard
- Underground and overhead electrical connections as required to connect the new STATCOM and transformer equipment. These connections would be confined to the former switchyard bench
- Upgrades and installation of secondary systems equipment within the auxiliary services building and the existing switchyard as required

- Installation of palisade security fencing (approximately 6 metres high) around the perimeter of the STATCOM equipment, transformer compound and switchbays.

Ground disturbance associated with the construction of the new STATCOM, switchbays and transformer compound is estimated to be approximately 1 hectare and would require the removal of one Acacia shrub. However, additional ground disturbance across the existing and former switchyards would be required as part of trenching for cable connections and installation/upgrade of secondary systems equipment, such as new equipment kiosks and other minor ancillary equipment.

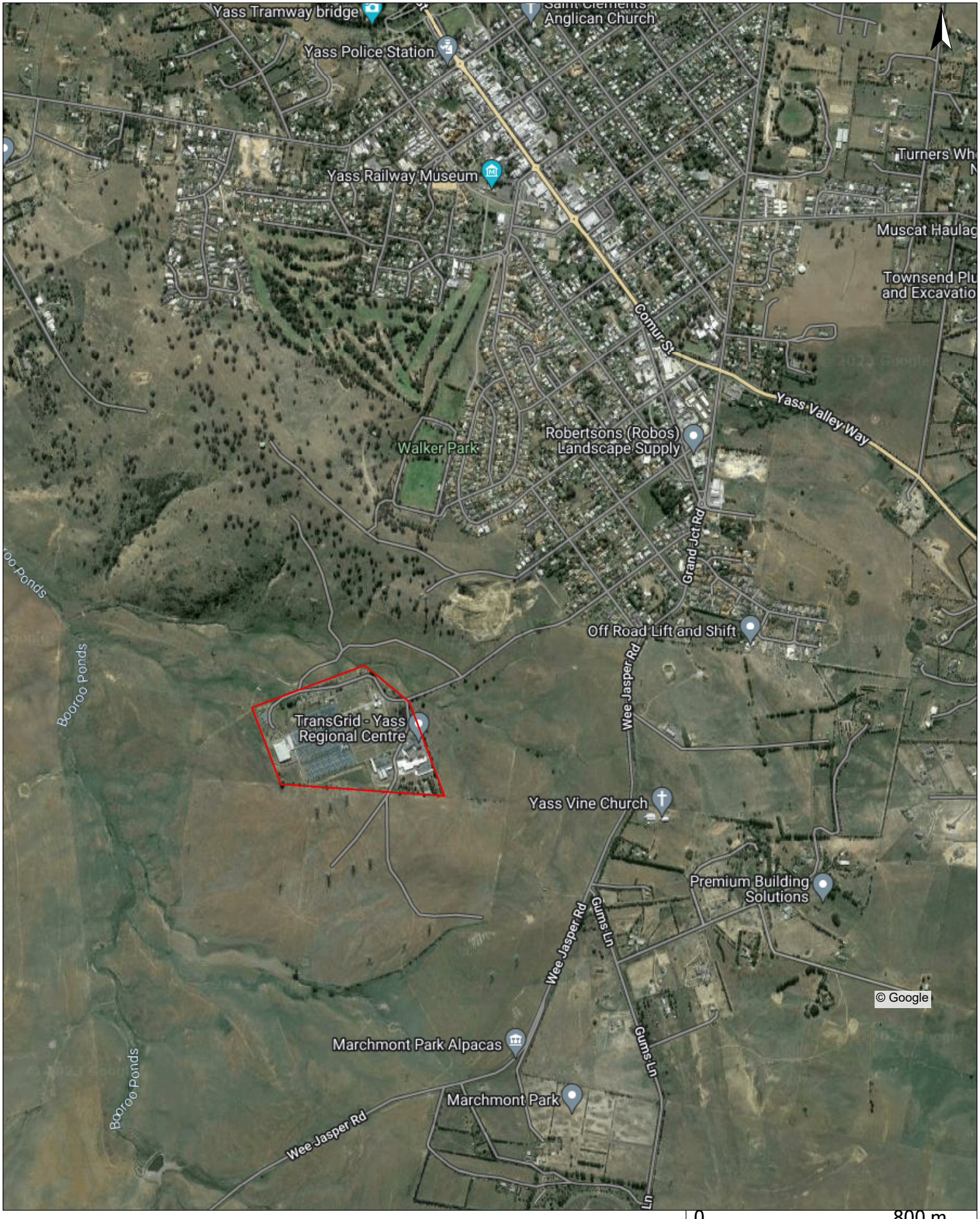
The proposed modified activity would occur wholly within the existing and former switchyards within Transgrid's Yass 330 kV substation site. As such, no additional landholders would be affected as part of the proposed modified activity.

For the purpose of this Addendum REF the:

- **'Study area'** has been defined as Transgrid's property boundary being Lot 1 DP999493
- The existing and former switchyards inclusive of the ancillary services building collectively comprise the '**impact area'**.

The proposed modified activity location and study area is shown in Figure 1 with the proposed modified activity scope shown in Figure 2. An indicative STATCOM and associated equipment is shown in Photograph 1.

Photograph 1 Indicative STATCOM equipment




Study area (proposed modified activity)

**Figure 1 - Locality map**

Scale: 1: 17627.2023484909


Study area
Impact area
Former switchyard

STATCOM equipment area (indicative)
Acacia shrub to be removed

0 100 m

**Figure 2 Scope of works**

Scale: 1: 3463.72283415836

## 2.3. Description of the construction for the proposed modified activity

### 2.3.1. Construction methodology

*Site establishment*

Prior to construction works commencing, construction office/ amenities, equipment storage and laydown areas would be designated at a suitable location within the substation. This is not expected to require any ground disturbance. No alterations to the existing vehicle access route (being the existing sealed road off Perry Street) would be required to facilitate the construction works.

*Demolition of onsite buildings and redundant infrastructure*

Prior to the construction and installation of the new grid connection infrastructure, redundant footings, conduits, bunds and tanks would be removed. This is expected to involved excavating around the infrastructure and then removal using a crane and other appropriate machinery.

The onsite buildings would also be demolished. This would typically involve an inspection of each structure to confirm the presence of any hazardous material. Should any hazardous material (e.g. fuel, oils, asbestos) be identified, it would be safely removed prior to demolition. It is expected that a bulldozer would be used to carry out the demolition works. All waste would be disposed of in accordance with its waste classification in accordance with mitigation measure WA2, Appendix A.

*Earthgrid establishment*

A series of trenches (approximately 0.4 metres wide x 0.6 metres deep) would be established in a grid-form arrangement across the former switchyard bench using a small excavator. Copper cabling would then be installed within the trenches to form the earthgrid. The trenches would be progressively backfilled as the copper cabling is installed.

*Switchbay construction*

New concrete footings would be established to support new high voltage switchgear equipment. Excavations would typically be limited to approximately 2 metres in depth. The new switchgear equipment would then be placed into position using cranes and appropriately fastened. In addition, new supports and footings would be established to support the extension of the busbar.

Cable trenches (approximately 0.6 metres deep and 0.4 metres wide) would be excavated using a small excavator or vacuum truck (for non-destructive digging) between the switchgear equipment and the nearest existing available cable trenches in the Yass substation switchyard connecting to the auxiliary services building. Once excavated, cables would be installed and the equipment connected.

*Transformer and STATCOM installation*

Excavation and civil works would be carried out to construct a new transformer and auxiliary transformer bunded compound and the footings for the STATCOM equipment. Excavations for the compound are expected to be approximately 24 metres long x 15 metres wide x 2 metres deep.

The new power transformer and STATCOM equipment would be transported to the substation by a flat-bed over–mass truck. The transformer and STATCOM would be placed into position using a crane or transported

to its position using a skate then lifted into position using a hydraulic jack. Once the transformer has been placed into position, it would be oil filled over an approximate 24 hour period.

The installation of the new auxiliary transformer would follow the same general process as the power transformer, however it is not expected that an over-mass truck would be required for transport due to its size.

Cable trenches (approximately 0.6 metres deep and 0.4 metres wide) would be excavated using a small excavator or vacuum truck between the new transformer compound and STATCOM and the nearest existing available cable trenches connecting to the auxiliary services building. Once excavated, cables would be installed connecting the transformer and STATCOM to the auxiliary services building.

Upon completion, the palisade security fencing be installed around the new equipment. This would involve minor civil works to establish new footings for the fence posts followed by attaching the palisade fencing to the posts.

*Secondary systems*

Where required, a small excavator would be used to establish new concrete footings for the installation of new equipment kiosks throughout the switchyard. Generally, the footings are expected to up to approximately 2 metres long x 2 metres wide and approximately 0.5 metres deep. New cable trenches would be established from the auxiliary services building to necessary connection points within the switchyard where required, using a small excavator or vacuum truck.

Installation and modification of secondary systems equipment, such as panels within the existing auxiliary services building may also be required.

### 2.3.2. Plant and equipment

The construction plant and equipment to be used for the proposed modified activity is expected to include:

- Steel structural supports and high voltage equipment
- Conductor and overhead earthwire
- Concrete
- Electrical conduit and cables
- Cable trench and covers
- Imported fill material
- Erosion and sediment controls.

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

- Trucks and utility vehicles for the transport of equipment and building materials
- Excavator, vacuum truck and hole borer for the establishment of footings
- Bulldozer
- General hand tools (powered and unpowered)
- Backhoes and bobcats
- EWPs to work at heights
- Crane for the new transformer and new structure installation
- Air compressors and generator
- Various power tools (angle grinder, drills, rattle gun)

- Concrete pumps, concrete vibrators and finishers.

Exact requirements for construction materials and equipment would be determined during detailed design.

### 2.3.3. Construction schedule and hours

Construction works are scheduled to commence in July 2024 and would be carried out in conjunction with the rebuild of Line 99M, which is scheduled to take approximately 20 months to complete. There would be no change to the construction hours as described in the original REF 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
- Vacuum and oil filling of equipment.

### 2.3.4. Operation and maintenance

The proposed modified activity would not result in any significant changes to existing operational or maintenance activities carried out at the substation.

# 3. Planning context

## 3.1. Relevant legislation

Chapter 4 of the REF considered the Commonwealth and NSW legislation applicable to the proposed activity, and additional permits/ approvals required to be obtained. The proposed modified activity continues to be consistent with the legislation considered in the original REF and no additional permits or approvals are required.

The modified activity would not result in any changes to the approval pathway, being Part 5 of the EP&A Act and also would not change the classification of the proposed activity as Class 4 – REF in accordance with the NSW Code of Practice for Authorised Network Operators (the Code).

# 4. Consultation

Section 5 of the original REF and Section 4 of the Addendum REF 1 outlines consultation that was undertaken for the determined activity and considers applicable consultation and notification requirements.

Transgrid carried out the consultation for the proposed modified activity in accordance with Transgrid's *Consultation Protocol for Review of Environmental Factors for Class 4 and 5 Activities* (2016) (the Protocol). This included the consultation requirements under the *State Environmental Planning Policy (Transport and*

*Infrastructure) 2021* and *Electricity Supply Act 1995* and consultation with landowner and Government agencies in accordance with general law requirements.

Details of the consultation carried out in accordance with the Protocol during the preparation of this Addendum REF is provided in Table 1 and proposed future consultation is outlined in Table 2.

Table 1 Statutory consultation

| Stakeholder | Reason for Consultation | Timing | Issues raised |
|---|---|---|---|
| Yass Valley Council | Required under section 45 of the *Electricity Supply Act 1995* and clause 2.45 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021*.<br>Council was given 40 days to provide a response. | Letter sent via email on 27 September 2023 | A response was received on 23 October 2023 advising that Council do not intend to make a formal submission. |
| Occupiers of land adjoining Yass substation | Required under clause 2.45 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* | Letters sent on 29 September 2023 | No response was received. |

Table 2 Future consultation

| Stakeholder | Reason for consultation | Details |
|---|---|---|
| Chair of the Coppabella Windfarm Community Consultative Committee (CCC) | The Coppabella Windfarm CCC includes a number of local community members who have an active interest in the CWF project and the Line 99M Rebuild project. | These stakeholders would be notified of the proposed modified activity prior to the public exhibition of this Addendum REF on Transgrid's website. The written notification would include the dates of the exhibition period and details on how to lodge a submission. All submissions received would be considered and addressed by Transgrid following the public exhibition period in the Submissions Report.<br>All stakeholders previously consulted in Table 1 would also be notified of the exhibition period and would be invited to lodge a submission. |
| Environmental Protection Authority (EPA) | The Yass substation is listed on the *'List of Contaminated Sites Notified to EPA'* due to groundwater beneath the site being contaminated with per- and polyfluoroalkyl substances (PFAS). | |
| Rural Fire Service of NSW (RFS) | Additional building works at Yass substation and RFS were previously interested as part of the original REF. | |
| Transport for NSW | Heavy vehicle movements associated with the transformer and STATCOM delivery. Potential disruptions on the surrounding road network during haulage of equipment. | |
| NSW Department of Planning and Environment - Water | Potential to encounter PFAS contaminated groundwater during excavation works within the substation. | |

| Stakeholder | Reason for consultation | Details |
|---|---|---|
| Potentially noise affected landholders | This includes select properties along Yeo Crescent, Meriman Drive, Victoria Street, Cobham Street, Perry Street and Grand Junction Road in Yass, who may experience elevated noise levels during construction. | |
| NSW Local Land Services | Whilst not considered key stakeholders for the proposed modified activity, they were previously consulted as part of the original REF and Addendum REF 1. | |
| Department of Industry- Fisheries | | |
| Fire and Rescue NSW | | |
| Hilltops Council | | |
| National Parks and Wildlife Service | | |
| Affected landholders along the Line 99M rebuild | | |

# 5. Environmental impact assessment

This section of the Addendum REF provides a detailed description of the potential environmental impacts associated with the proposed changes to the activity. Key environmental aspects associated with the proposed modified activity are outlined in Section 5.1 to Section 5.3 and other non-key environmental aspects are assessed in Section 5.4.

## 5.1. Geology, soils and contamination

### 5.1.1. Existing environment

*Geology and Soils*

Soils within the proposed modified activity area generally comprise imported fill material used as part of the initial construction of the existing and former substation bench. Imported fill ranges from sandy clays to gravelly clay and underlain with shale rock at depths ranging from approximately 0.2 metres to 3 metres below the ground surface.

*Contamination*

A Contaminated Site Investigation (CSI) carried out by Jacobs (2017) identified previous soil contamination in the area of the proposed modified activity. The CSI identified the concentration of contaminants in soil including heavy metals, hydrocarbons and polychlorinated biphenyls (PCBs), as being within the Site Assessment Criteria (SAC). Per- and polyfluoroalkyl substances (PFAS) were also identified in soil samples collected, however were also below the adopted SAC.

An asbestos survey of Yass 330 kV substation carried out by Healthy Buildings International (2020) identified asbestos containing material (ACM) in the following locations which are relevant to the proposed modified activity:

- Subsurface conduit within the former switchyard
- Windows, eaves, flooring and roof of existing buildings
- Subsurface conduits in existing buildings
- Telecommunication pits
- Distribution boards, control panels, electrical backing boards and electrical components in the control room building.

### 5.1.2. Impact assessment

*Erosion and Sedimentation*

The proposed modified activity would not result in any changes to the assessed impacts in relation to erosion and sedimentation risks as detailed in Section 6.2.2 of the original REF and Section 5.2.2 of Addendum REF 1.

Excavations as part of the proposed modified activity has the potential to cause erosion and sedimentation. With the implementation of the erosion and sedimentation controls (mitigation measure GS1), no additional impacts are expected. As such, no additional mitigation measures to those outlined in the original REF are required.

*Contamination*

The proposed modified activity has the potential to disturb heavy metal, hydrocarbon and PCB contaminated soil across the existing and former switchyards. Whilst the concentration of contaminants are below the adopted SAC, there is some risk that areas within the impact area (i.e. particularly the former switchyard bench) not subject to previous testing may contain elevated concentrations of contaminants. As such, any unexpected soil contamination encountered during ground disturbance works would be managed in accordance with a contamination management plan (refer to mitigation measure GS3, Appendix A). Providing the works are carried out in accordance with the contamination management plan, contamination related impacts can be adequately managed.

The establishment of new footings, reinstatement of the earthgrid and cable connections across the former switchyard would require the removal of redundant subsurface conduit, which is known to contain asbestos. Furthermore, the existing buildings to be demolished contain asbestos in the eaves, flooring windows and roof. Prior to the demolition of onsite buildings, a suitably qualified asbestos removal contractor would inspect the buildings and remove all asbestos containing material. Providing ACM is identified and removed in accordance with an Asbestos Management Plan as per mitigation measure GS5, Appendix A, potential risks to human health and the environment is considered low.

## 5.2. Hydrology and water quality

### 5.2.1. Existing environment

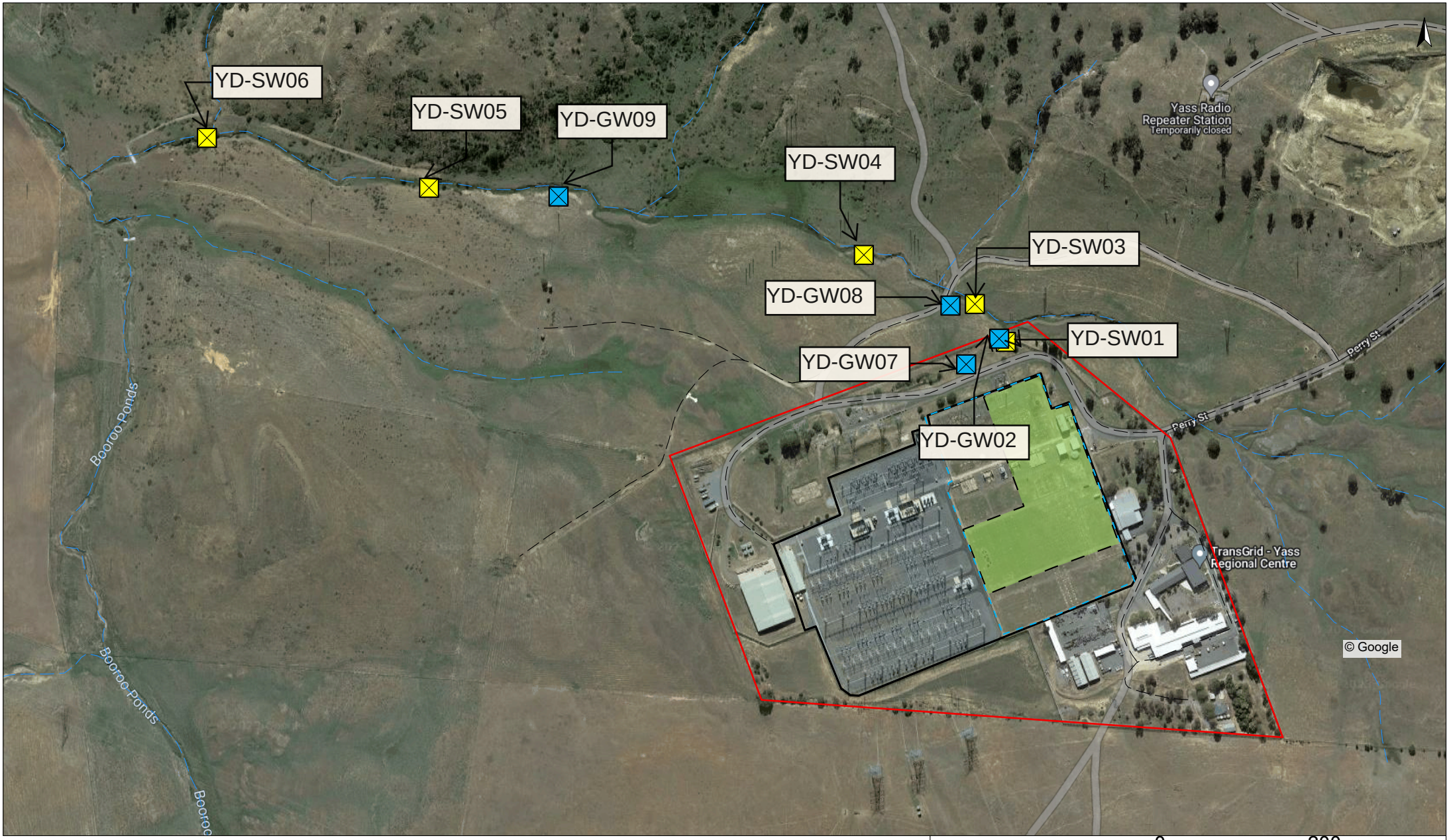
The nearest surface water feature consists of an unnamed creek line located approximately 60 metres north of the proposed modified activity area, external to the Yass 330 kV substation site. The minor watercourse drains into the Yass River (refer to Figure 3).

Groundwater is generally shallow (within approximately 5 metres below ground level) within the proposed modified activity area and generally flows in a north westerly direction towards Booroo Ponds.

Elevated concentrations of per- and polyfluoroalkyl substances (PFAS) were reported by Jacobs (2017) in groundwater near the northern boundary of the former switchyard, which triggered the Yass 330 kV substation site being placed on the 'List of Contaminated Sites Notified to EPA'.

Further investigation on the nature and extent of the PFAS contamination was carried out by Jacobs (2020) which concluded that:

- Concentrations of PFAS were reported above the SAC in samples collected from three comprising two groundwater monitoring wells (YD-GW02, YD-GW07) located along the northern boundary of the substation and a third groundwater monitoring well (YD-GW08) located approximately 90 metres to the north of Yass 330 kV substation
- Concentrations of PFAS in the groundwater monitoring well YD-GW09 located approximately 550 metres north west of the proposed modified activity and external to the substations site were either below the SAC or below the limits of reporting
- Concentrations of PFAS were reported above the SAC in five surface water samples (YD-SW01, YD-SW03, YD-SW04, YD-SW05, YD-SW06) collected from the unnamed creek, located to the immediate north of Yass substation, which flows into Yass River.




Study area
Impact area
Former switchyard
STATCOM equipment area (indicative)
Surface water testing location
Groundwater testing location
Watercourse

0 200 m

**Figure 3 Hydrology and surface water features**

Scale: 1: 5709.15112231539

### 5.2.2. Impact assessment

The proposed modified activity has the potential to encounter PFAS contaminated groundwater during excavation works described in Section 2.2. Groundwater containing PFAS, if not appropriately handled and managed, has the potential to:

- Contaminate the surrounding agricultural grazing land, terrestrial ecology and affect livestock
- Further impact the aquatic ecology in surrounding watercourses including riparian vegetation and fish stocks within the broader catchment.

To manage impacts associated with PFAS contaminated groundwater, mitigation measure HW5 would be implemented, consistent with the Addendum REF 1. Mitigation measure HW5 includes the requirement to store and test any groundwater encountered during excavation works within the existing substation and former switchyard. Providing mitigation measures HW5 is implemented, potential contamination on surface water and groundwater can be effectively managed.

The proposed modified activity would not result in any other changes or additional impacts on hydrology and water quality to that outlined in the original REF.

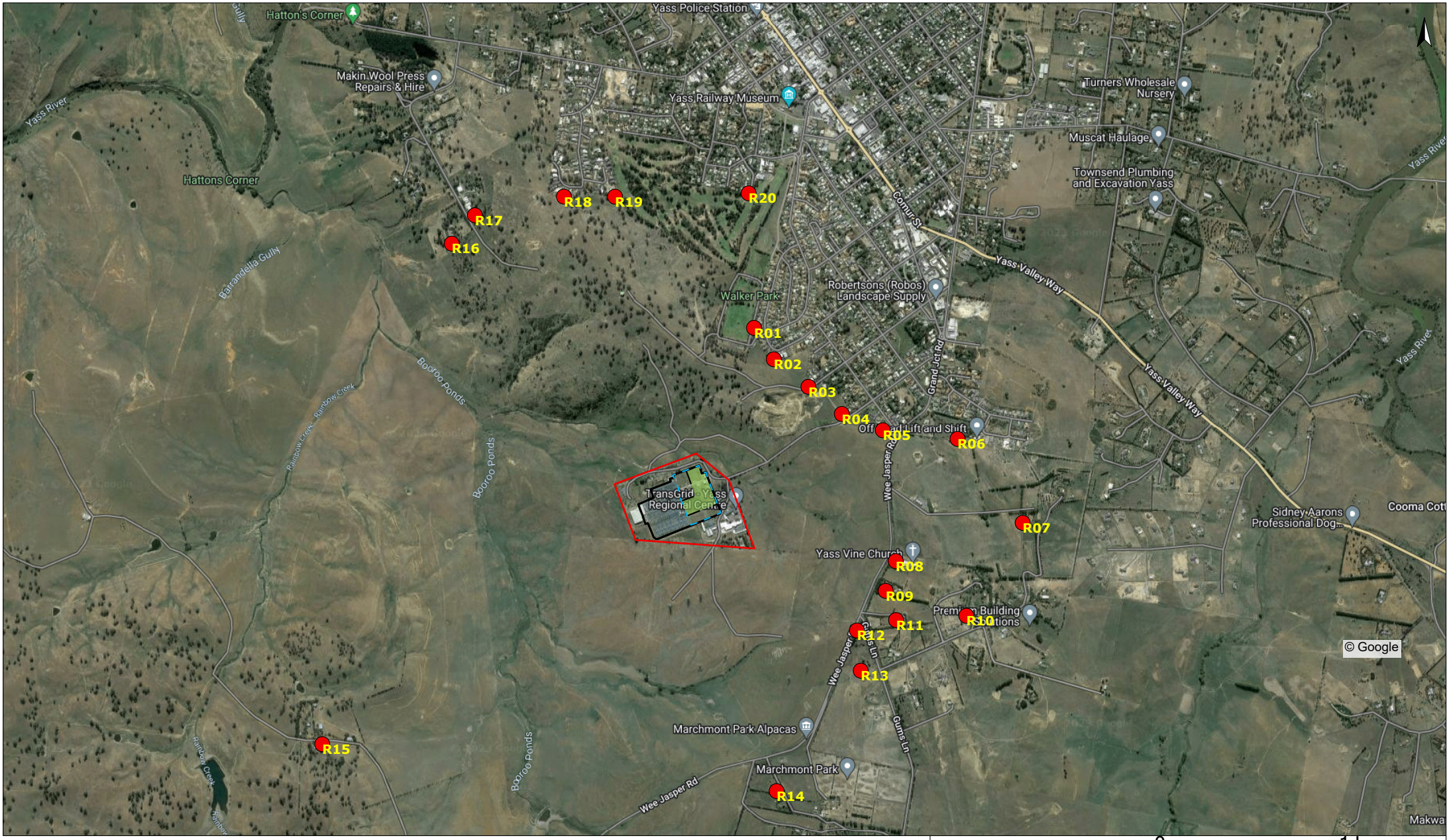
## 5.3. Noise and vibration

A Noise Impact Assessment (NIA) was carried out by WSP (2023) for the operation of the proposed modified activity with the outcomes summarised below. The complete report is provided in Appendix B. This section also summarises the outcomes of the construction noise assessment carried out by ERM (2020) for the previous Addendum REF 1 which are applicable to the proposed modified activity.

### 5.3.1. Existing environment

The noise environment surrounding the proposed modified activity is best described as 'rural' in accordance with the Environment Protection Authority's *Noise Policy for Industry* (NPI) (EPA, 2017). As such, the noise environment is dominated by natural sounds, having little or no road traffic noise and generally characterised by low background noise levels.

The NIA considered 20 representative noise sensitive receiver locations comprising 19 residential receivers and one place of worship as shown in Figure 4. The closest residential receiver (R3) is located approximately 610 metres to the north east of the proposed modified activity area. The place of worship (R08) is located approximately 900 metres to the south east of the proposed modified activity area.




Study area

Impact area

Former switchyard

STATCOM equipment area (indicative)

Noise sensitive receiver

**Figure 4 Noise sensitive receiver locations**

Scale: 1: 25000

### 5.3.2. Impact assessment

*Construction noise*

The noise generating construction activities for the proposed modified activity are consistent with those described and assessed by ERM (2020) for the previous Addendum REF 1, which includes scenarios for:

- Site preparation and establishment
- General construction of Infrastructure
- Delivery of equipment
- Oil filling of new equipment.

As such, the outcomes of the construction noise assessment are considered to be applicable to this Addendum REF.

In accordance with the NSW *Interim Construction Noise Guideline* (ICNG) (DECC, 2009), the Noise Management Levels (NML) adopted for construction noise were as follows:

- 45 dBA during standard hours and 40 dBA during non-standard daytime hours and 35 dBA during evening and night time hours at residential receiver locations.
- 55 dBA at all times at the place of worship (R08).

The construction noise impact assessment determined the following:

- During daytime standard hours, elevated noise levels of up to 5 dBA were predicted at six residential receiver locations (R02, R03, R04, R05, R09 and R10) during the construction noise scenario of site preparation and establishment.
- During daytime standard hours, no exceedances were predicted for the other construction noise scenarios noise that were modelled.
- Predicted noise levels at the place of worship were compliant with the NMLs for all construction noise scenarios.
- Should any construction noise occur outside of standard daytime hours, noise exceedances above the adopted NMLs are predicted for at least one construction noise scenario across all residential receiver locations. Notwithstanding this, any works occurring outside of daytime standard hours are expected to be limited in extent and duration and are expected to include activities such as:
    - The delivery of materials and equipment (such as the new transformer) as requested by police or other authorities for safety reasons.
    - Emergency work to avoid the loss of lives and/or property.
    - Oil filling of equipment.
    - Work timed to correlate with system planning outages.

The magnitude and extent of potential impacts associated with these elevated noise levels is best described as low during daytime standard hours with the predicted noise emissions considered consistent with noise emissions generated by other construction works conducted regularly in NSW. Although exceeding criteria, the predicted construction noise levels do not represent a constant emission that would be experienced by the community on a daily basis throughout the project's schedule of works.

Providing the mitigation measures NV1 and NV2 in Appendix A are implemented, construction noise impacts can be mitigated and managed.

*Operational noise*

In accordance with the NPI, the Project-specific Noise Trigger Levels (PNTL) adopted for operational noise of the Yass substation were as follows:

- 40 dBA during standard daytime hours and 35 dBA during evening and night time hours at residential receiver locations
- 48 dBA at all times at the Place of Worship (R08).

With the introduction of the additional noise generating equipment (STATCOM, 132 kV power transformer and auxiliary transformer), noise exceedances are predicted to occur at levels of up to 4 dBA at residential receiver locations R02, R03, R04 and R05 during evening and nighttime hours under adverse meteorological conditions. An exceedance of 1 dBA was also predicted to occur at R03 under neutral meteorological conditions. All other noise sensitive receiver locations reported predicted noise levels below the PNTL.

Further assessment was carried out with the inclusion of noise mitigation. With the installation of noise walls around the northern, southern and eastern sides at a height of 4 metres above the top of the 132 kV STATCOM transformer (i.e. approximately 7 metre height in total), noise impacts at R02, R03, R04 and R05 were predicted to decrease. With the introduction of the noise mitigation, noise levels at:

- R02, R04 and R05 were predicted to comply with the PNTL during daytime, evening and nighttime hours for all meteorological conditions
- R03 were predicted to comply with the PNTL during daytime, evening and nighttime hours under neutral meteorological conditions. However, an exceedance of 1 dBA was predicted to occur under adverse meteorological conditions during evening and nighttime hours.

The exceedance at R03 during adverse meteorological conditions is considered to be minor, and a 1 dBA exceedance is likely to be imperceptible.

To reduce operational noise to acceptable levels and the additional mitigation measure NV3 has been included (refer to Table 4 and Appendix A).

## 5.4. Other non-key environmental aspects

Table 3 assesses the change in, or additional impacts associated with other non-key environmental aspects that require consideration for the modified proposed activity.

Table 3 Change to environmental impacts from the proposed modified activity

| Environmental aspect | Changes to impacts |
|---|---|
| Land use | During both construction and ongoing operation, the proposed modified activity would not alter the existing land use being an electrical substation. As such, there is no change in land use impacts to those identified an assessed in the original REF and Addendum REF 1. |
| Ecology | The modified proposed activity would occur within the highly disturbed area of the existing Yass 330 kV substation, and the adjoining former switchyard. Vegetation disturbance would be limited to the removal of a single Acacia shrub located within the former switchyard. The single shrub is not of conservation significance.<br>In accordance with Transgrid's *Ecological Due Diligence Procedure,* a search of Transgrid's Spatial System (TSS) was carried out on 6 October 2023. The search |

| Environmental aspect | Changes to impacts |
|---|---|
| | did not report any Moderate or High risk threatened species/communities or ecological constraints previously identified by Transgrid within the study area.<br>Ecological impacts as part of the proposed modified activity are assessed as negligible. |
| Aboriginal heritage | An Aboriginal heritage due diligence assessment carried out in accordance with Transgrid's *Aboriginal Heritage Due Diligence Assessment Procedure* (February 2022) determined the proposed modified activity would unlikely affect Aboriginal heritage (refer to Appendix C). No additional mitigation measures are required. |
| Historic heritage | The proposed modified activity would not result in any changes or additional impacts on historic heritage to those outlined in the original REF and Addendum REF 1. |
| Traffic and access | The proposed modified activity would not result in any significant changes or additional impacts in relation to traffic and transport to that outlined in the original REF.<br>The proposed modified activity would require the transport of an additional power transformer and the STATCOM to Yass 300 kV substation using an over-mass transporter vehicle which would be subject to relevant permit requirements from Council and Transport for NSW. The existing site access road to the Yass substation is suitable to accommodate the over-mass transporter vehicle and no closures to public roads are anticipated. Subject to permit requirements, the delivery of the new equipment may occur during night time hours to minimise potential impacts on the surrounding road network. |
| Air quality | The proposed modified activity would not result in any changes or additional air quality related impacts to those outlined in the original REF and Addendum REF 1. Air quality related impacts would typically include minor dust emissions generated during excavation works and vehicle movements over exposed surfaces. There would also be minor exhaust emissions generated from construction plant and vehicles. |
| Hazards and risks | The addition of the high voltage equipment associated with the proposed modified activity may result in a localised alteration to electromagnetic fields (EMF) contours in the immediate vicinity of the equipment, but no increase at Transgrid's property boundary is expected. The level of EMF in the vicinity of the new equipment is expected to be consistent with the rest of the existing substation. As the equipment is within a restricted access area, there would be no impact of raised EMF levels on the local community. The security system for the site, including existing substation palisade fencing and additional fencing around the new equipment, would be maintained (as appropriate) throughout construction and the ongoing operation, to provide safety to the public. |
| Visual amenity | The proposed modified activity would not result in any significant changes or additional visual amenity related impacts to those identified and assessed in the original SER. The additional equipment to be installed would be visually consistent with the surrounding high voltage infrastructure at Yass 330 kV substation and the surrounding transmission lines. |
| Waste | Aside from the contaminated waste spoil, waste from the demolished buildings, asbestos containing material and potential PFAS impacted groundwater addressed in Section 5.1 and 5.2, potential waste streams generated by the proposed modified activity would be similar to those described in the original REF and Addendum REF 1. Providing waste streams are managed in accordance with |

| Environmental aspect | Changes to impacts |
|---|---|
| | mitigation measures GS3, GS5, HW4, HW5, WA1 and WA2, impacts associated with the improper management of waste streams can be adequately managed. |
| Social and economic considerations | The proposed modified activity would not contribute to additional socio-economic related impacts (both positive and negative) to those outlined in the original REF and the Addendum REF 1. |
| Cumulative impacts | A review of the NSW Department of Planning and Environment's major projects assessment website on 25 October 2023 did not report any approved major projects within 1 kilometre of the proposed modified activity.<br>When considering potential minor construction projects in conjunction with the proposed modified activity, there is some potential for cumulative impacts from noise, traffic and dust to occur if the projects are located in close proximity (within approximately 1 kilometre of the study area).<br>In the event that any minor construction projects occur in proximity during construction works, cumulative impacts are expected to be minor, temporary and localised in nature. In addition, no permanent cumulative visual impacts are expected to occur as additional equipment introduced to the Yass substation as part of the proposed modified activity would be visually consistent with the existing equipment at the substation.<br>The proposed activity would not generate any ongoing cumulative impacts during operation. |

### 5.5. Summary of impacts

The assessment of the proposed modified activity identified the following key environmental impacts:

- Without noise mitigation for the concept design, elevated noise of up 4 dBA above criteria were predicted to occur at four residential receiver locations under adverse weather conditions. With the introduction of noise mitigation (acoustic barriers around the 132 kV STATCONM transformer), predicted operational noise impacts are reduced to an acceptable level
- Minor and temporary elevated noise from construction activities
- Potential minor temporary disruptions on the road network during the delivery of the additional transformer and STATCOM equipment
- Potential to encounter PFAS contaminated groundwater during excavation works
- Potential to encounter heavy metal, hydrocarbon and PCB affected soil during ground disturbance works
- Disturbance of asbestos containing material as part of excavation works and demolition of buildings
- Minor erosion and sedimentation from soil disturbance activities
- Minor amounts of dust and emissions from vehicles, equipment and earthworks during construction.

Based on the impact assessment of the proposed modified activity, the nature and magnitude of the impacts are considered minor and can be appropriately managed with the implementation of the revised mitigation measures in Appendix A.

## 6. Mitigation measures

A review of the consolidated mitigation measures for the determined activity as detailed in the Addendum REF 1 was undertaken and changes to these measures are required as a result of the proposed modified activity. Table 4 provides an overview of the changes to the mitigation measures. Text underlined in Table 4

shows amended mitigation measures or a new measure. Text with a strike-through indicates whole or part of a mitigation measure as being removed.

An updated consolidated list of mitigation measures is included in Appendix A.

Table 4 Revised and additional to mitigation measures

| Mitigation measures | |
|---|---|
| Environmental Management and Incident Response | |
| EM1 | A Construction Environmental Management Plan (CEMP) shall be prepared and submitted ~~by the Contractor to Environment – HSE/ Transgrid~~ to the Environmental Business Partner/Delivery 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 Procedure. |
| Geology ,Soils and Contamination | |
| GS3 | As part of the preparation of the CEMP, a contamination management plan would be prepared. The plan (as a minimum shall include):<br>• The requirement for 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.*<br>• Details on how contaminated soil, if encountered, would be stored and managed to prevent impacts to the environment and human health. |
| GS5 | An Asbestos Management Plan (AMP) would be prepared, in accordance with relevant WorkCover guidelines, prior to any demolition, earthworks or ground disturbance being performed on the site where asbestos has been identified or is predicted to occur. This includes onsite buildings to be demolished and the subsurface of the former switchyard.<br><br>The AMP would include the following requirements:<br>• Any asbestos containing material encountered during the proposed works, which requires removal shall be undertaken by a suitably qualified licenced asbestos removal contractor and disposed of at a suitably licenced waste facility capable of accepting asbestos waste.<br>• Prior to the demolition of existing buildings, they are to be inspected by a suitably qualified asbestos removal contractor, with all asbestos containing material removed. |
| Hydrology and Water Quality | |
| HW4 | If minor dewatering is required outside the modified ~~proposed~~ activity areas as detailed in Addendum REF 1 (Figure 2-2) and Addendum REF 2 (Figure 2), 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. |
| HW5 | Any groundwater encountered as part of excavation and boring works within the modified activity areas as detailed in Addendum REF 1 (Figure 2-2) and Addendum REF 2 (Figure 2) must be pumped from the excavation and appropriately stored prior to being classified in accordance with the *Waste Classification Guidelines* (EPA, 2014). The collected |

| Mitigation measures | |
|---|---|
| | groundwater would then need to be managed and disposed of in accordance with its waste classification. |
| Heritage | |
| HE1 | 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~~ Heritage NSW 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. |
| HE3 | 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~~ Department of Planning and Environment and Transgrid contacted. |
| NV1 | Noise generating works shall be in accordance with the Interim Construction Noise Guideline (DECC, 2009):<br>• 7:00am – 6:00pm Monday to Friday.<br>• 8:00am – 1:00pm Saturdays.<br>• No work on Sundays or Public Holidays.<br>Work outside normal hours, on Sundays and public holidays shall only comprise:<br>• The delivery of materials outside normal hours requested by police or other authorities for safety reasons.<br>• Emergency work to avoid the loss of lives and/or property.<br>• Work timed to correlate with system planning outages.<br>• Vacuum and oil filling of equipment<br>Other noise generating works outside of the standard construction hours shall require the prior formal written consent of ~~Environment - HSE/Transgrid~~ Environmental Business Partner/Delivery and require justification in accordance with the Guideline. Impacted residents would be notified of out of hours works including out of hours deliveries in accordance with the CEMP. |
| NV3 | An operational noise assessment would be carried out following detailed design to determine whether there would be potential for exceedance of the noise criteria. If so, noise mitigation measures such as noise walls would be installed to ensure operational noise levels are below the noise criteria. |
| TA1 | Transportation and equipment delivery movements on public roads shall be in accordance with ~~RMS~~ Transport for NSW and Council requirements. |

# 7. Consideration of statutory factors

## 7.1. Section 5.5 and 5A of the EP&A Act

Under section 5.5 of the EP&A Act, the determining authority (being Transgrid), has a duty to consider all matters affecting or likely to affect the environment by reason of the proposed modified activity and the effects on any wilderness area. Table 5 provides a summary of how each of the factors has been considered for the proposed modified activity.

Table 5 Consideration of section 5.5 of EP&A Act – Duty to Consider Environmental Impact

| Factor | Comment |
|---|---|
| 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 Addendum SER has addressed the environmental impacts of the proposed modified activity. |
| 3 Without limiting subsection 1, consider the effect 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. | No change from the determined SER |

## *7.2.* Section 7.3 of the *Biodiversity Conservation Act 2016*

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, or ecological communities, or their habitats.

The proposed modified activity is not likely to significantly affect threatened species, or ecological communities, or their habitats; nor would the proposed modified activity be carried out on a declared area of outstanding biodiversity value.

## 7.3. Clause 171 of the EP&A Regulation

Clause 171(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 6 provides a summary on how each of the Clause 171 factors has been considered for the proposed modified activity.

Table 6 Consideration of Clause 171 factors

| Factor | Potential impact |
|---|---|
| a. any environmental impact on a community. | Aside from potential minor construction noise and traffic related impacts, the proposed modified activity would not result in any significant changes or additional socio-economic related impacts.<br>With the implementation of mitigation measure NV3, Appendix A, potential operational noise |

| Factor | Potential impact |
|---|---|
| | impacts at surrounding residential receivers would be addressed. |
| b. any transformation of a locality. | The proposed modified activity is located wholly within Transgrid's Yass 330 kV substation site. As such, it would not contribute to any transformation of the locality. |
| c. any environmental impact on the ecosystems of the locality. | The proposed modified activity is not expected to impact any ecosystems of the locality. |
| d. any reduction of the aesthetic, recreational, scientific or other environmental quality. | The proposed modified activity is not expected to result in any reduction of the aesthetic, recreational, scientific or other environmental quality. . |
| 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 modified activity is not expected to affect known Aboriginal or non-Aboriginal heritage. |
| f. any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*). | The proposed modified activity would not impact on the habitat of any protected fauna. |
| 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 modified 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 modified activity is not expected to cause any long-term effects on the environment. |
| i. any degradation of the quality of the environment. | The proposed modified activity is not expected to cause any degradation to the quality of the environment. |
| j. any risk to the safety of the environment. | The proposed modified activity would not result in any risk to the safety of the environment |
| k. any reduction in the range of beneficial uses of the environment. | As works would be confined to the existing Yass 330 kV substation site, the proposed modified activity would not result in a reduction in the range of beneficial uses of the environment. |
| l. any pollution of the environment. | The proposed activity has the potential to encounter underlying PFAS contaminated groundwater, asbestos and contaminated soil. Providing the mitigation measures in Appendix A are implemented, the risk of pollution to the surrounding environment can be effectively managed. |
| m. any environmental problems associated with the disposal of waste. | Providing waste streams (including potentially PFAS affected groundwater, asbestos and contaminated soil) is managed in accordance with the mitigation measures in Appendix A, 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. |
| 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. |
| 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. |
| q. applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1. | The proposed modified activity would not affect any local strategic planning statements, regional strategic plans or district strategic plans. |
| r. other relevant environmental factors. | All relevant environmental factors have been identified and assessed in Section 5. |

## 7.4. Matters of National Environmental Significance (MNES) under EPBC Act

Under the EPBC Act, Transgrid is required to consider matters of national environmental significance (MNES) and impacts to Commonwealth land, to assist in determining whether the proposed activity should be referred to the Commonwealth Department of Climate Change, Energy, the Environment and Water.

Table 7 provides a summary of how impacts on MNES and Commonwealth land have been considered for the proposed modified activity.

Table 7 Consideration of Matters of National Environmental Significance

| MNES/Commonwealth land | Potential impact |
|---|---|
| Any impact on a World heritage property? | The proposed modified activity would not affect any World heritage properties. |
| Any impact on a National heritage place? | The proposed modified activity would not impact on a National heritage place. |
| Any impact on any wetlands of international importance? | The proposed modified activity would not impact any wetlands of international importance. |
| Any impact on a Commonwealth listed threatened species or ecological communities? | The proposed modified activity would not impact on a Commonwealth listed threatened species or ecological communities. |
| Any impacts on a Commonwealth listed migratory species? | The proposed modified activity would not impact any Commonwealth listed migratory species. |
| Any impact on a Commonwealth marine area? | The proposed modified activity would not impact a Commonwealth marine area. |
| Any impact on the Great Barrier Reef Marine Park? | The proposed modified activity would not impact the Great Barrier Reef Marine Park. |
| Does the proposed activity involve a nuclear action (including uranium mines)? | No |

| MNES/Commonwealth land | Potential impact |
|---|---|
| Does the proposed activity involve a water resource, in relation to coal seam gas development and large coal mining development? | No |
| Is the proposed activity likely to have a significant impact on the environment on Commonwealth land? | The proposed modified activity is not likely to have a significant impact on the environment on Commonwealth land. |

# 8. Conclusion

The proposed modified activity has been assessed under Part 5 of the EP&A Act and this Addendum REF has been prepared in accordance with relevant legislation, including but not limited to section 5.5 of the EP&A Act, Clause 171 of the EP&A Regulation and the Commonwealth EPBC Act. Actions to mitigate (prevent, minimise, or offset) potential and likely impacts have been prescribed in Appendix A. These measures shall be implemented in undertaking the activity.

This Addendum REF 2 provides a true and fair review of the proposed modified 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 modified activity above and beyond the existing impacts assessed as part of the determined REF

Considering the assessment of the impacts detailed in this Addendum REF, it is concluded that the activity **is not likely to have a significant impact on the environment**. Therefore, an Environmental Impact Statement under s. 5.7 (1) of the EP&A Act is not required.

In addition, it is concluded that the activity is not likely to significantly affect threatened species, populations, ecological communities or their habitats; nor would the proposed modified activity be carried out on a declared area of outstanding biodiversity value and therefore a Species Impact Statement is not required.

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

Transgrid is therefore able to make a determination of the activity's impacts based on this Addendum REF.

Supplementary assessment and determination in accordance with the EP&A Act would be required for:

(a) works outside of the scope of work assessed in the original REF and this Addendum REF, for which the environmental impact has not been considered; or

(b) modifications to the activity scope, methodology or recommended mitigation measures, that alter the environmental impact assessed in the determined REF and this Addendum REF.

# 9. References

Environment Protection Authority (2014). *Waste Classification Guidelines*.

Environment Protection Authority (2017) *Noise Policy for Industry.* October 2017.

ERM (2020). *Yass 330kV Substation Noise Impact Assessment*. Report prepared for Transgrid, June, 2020.

Healthy Buildings International (2020). *Yass Regional Depot – Hazardous Material Inspection Report* (Asbestos and Lead)

IPART (2015). *NSW Code of Practice for Authorised Network Operators*, September 2015

Jacobs (2017). *Contaminated Site Investigation - Yass Depot*. Report prepared for Transgrid, November 2017.

Jacobs (2020). *PFAS Investigation - Yass Substation.* Report prepared for Transgrid, April 2020.

NSW Department of Environment and Climate Change (DECC) (2009). *NSW Interim Construction Noise Guideline* (ICNG, 2009), July 2009

Transgrid (2022). *Aboriginal Heritage Due Diligence Assessment.* Transgrid, February 2022

WSP (2023). *Yass 330 kV Substation Update Operational Noise Assessment*. Report prepared for Transgrid, October 2023.

# Appendix A Revised mitigation measures

| Mitigation Measures | |
|---|---|
| Environmental Management and Incident Response | |
| EM1 | A Construction Environmental Management Plan (CEMP) shall be prepared and submitted to the Environmental Business Partner/Delivery 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 Procedure |
| EM2 | All works shall be undertaken in accordance with the *Transgrid Environmental Handbook*. |
| EM3 | All workers shall be inducted onto the CEMP, site environmental conditions and sensitivities identified in this REF and receive training as appropriate. All workers shall receive Aboriginal heritage awareness training. Records shall be kept of this induction and training. |
| EM4 | An Environmental Supervisor shall be included as part of the construction staff to oversee implementation of the Environmental Management Plan and to ensure that all mitigation measures are being effectively applied.<br>In addition to the Contractor's Environmental Supervisor, Transgrid shall appoint an Environmental Inspector to regularly check that the work is being carried out in compliance with all environmental approval and legislative conditions. |
| EM5 | The following additional environmental approvals/licences/permits are required for the activity:<br>• A Section 138 permit and Road Occupancy Licence shall be obtained from Roads and Maritime Services (RMS) prior to carrying out works in, on or over Hume Highway which is a classified road.<br>- A permit is required to be obtained from NSW Department of Primary Industries-Fisheries (DPI-Fisheries) for the proposed watercourse crossing works at:<br>- Booroo Creek (1st order watercourse) between Structures 8-9.<br>- Booroo Creek (4th order watercourse) between Structures 9-10.<br>- Illalong River (4th order watercourse) to access Structure 99 and 100.<br>- Balgala Creek (3rd order watercourse) between Structures 122 and 123.<br>- Bobbara Creek (5th order) to access Structure 143 from Coppabella Road.<br>• Controlled Activity Approval to be sought from NSW Department of Primary Industries-Water prior to carrying out works at same locations listed above.<br>• Aboriginal Heritage Impact Permit for works at Structures 11 and 12 on Line 99M. |
| EM6 | All environmental incidents and near misses shall be reported to Transgrid. All pollution incidents that threatens or harms the environment shall be reported immediately to relevant authorities, in accordance with the *Protection of the Environment Operations Act 1997* (POEO Act). |
| EM7 | 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. |
| EM8 | All chemicals or other hazardous substances shall be stored in a bunded area and away from any drainage lines/pits. 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. |
| EM9 | Any environmentally sensitive areas shall be clearly delineated and shown on Site Plans and identified on site. |

| | |
|---|---|
| EM10 | A REF Close Out Report shall be prepared at the conclusion of the construction of the proposed activity to document how and whether the conditions and measures were observed, and the nature of and reasons for any non-compliance. |
| Land Use | |
| LU1 | Ongoing consultation shall occur with all affected landholders prior to and during construction to allow the planning of activities on their land which may conflict with the construction works. Landholder requirements shall be discussed on an individual basis. |
| LU2 | On completion of the work disturbed areas shall be stabilised and returned to as close to original condition or as otherwise agreed with the landholder. Transgrid is to undertake any repair works of access tracks and watercourses which have been damaged during construction in consultation with the landholder. |
| Geology, Soils and contamination | |
| GS1 | 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) and "*Managing Urban Stormwater: Soil and Construction Volume 2A – Installation of Services*" (DECC, 2008a)". 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. Erosion and sediment controls shall remain in place and be monitored and maintained until such time the site has been stabilised. |
| GS2 | 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). |
| GS3 | As part of the preparation of the CEMP, a contamination management plan would be prepared. The plan (as a minimum shall include):<br>• The requirement for 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*.<br>• Details on how contaminated soil, if encountered, would be stored and managed as to prevent impacts to the environment and human health. |
| GS4 | 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. |
| GS5 | An Asbestos Management Plan (AMP) would be prepared, in accordance with relevant WorkCover guidelines, prior to any demolition, earthworks or ground disturbance being performed on the site where asbestos has been identified or is predicted to occur. This includes onsite buildings to be demolished and the subsurface of the former switchyard.<br>The AMP would include the following requirements:<br>• Any asbestos containing material encountered during the proposed works, which requires removal shall be undertaken by a suitably qualified licenced asbestos removal contractor and disposed of at a suitably licenced waste facility capable of accepting asbestos waste.<br>• Prior to the demolition of existing buildings, they are to be inspected by a suitably qualified asbestos removal contractor, with all asbestos containing material removed. |
| Hydrology and Water Quality | |

| | |
|---|---|
| HW1 | Spoil shall be stockpiled in a manner so as to avoid the possibility of sediments entering watercourses (including stormwater drains) or migrating off-site. |
| HW2 | Any bulk fuel or hazardous material transport vehicles shall be parked on level ground a minimum of 40 m away from watercourses (including drainage line). No refuelling or bulk herbicide preparation shall occur within 40 metres of a watercourse. |
| HW3 | 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*. |
| HW4 | If minor dewatering is required outside the modified activity areas as detailed in Addendum REF 1 (Figure 2-2) and Addendum REF 2 (Figure 2), 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. |
| HW5 | Any groundwater encountered as part of excavation and boring works within the modified activity area as detailed in Addendum REF 1 (Figure 2-2) and Addendum REF 2 (Figure 2) must be pumped from the excavation and appropriately stored prior to being classified in accordance with the *Waste Classification Guidelines* (EPA, 2014). The collected groundwater would then need to be managed and disposed of in accordance with its waste classification. |
| Ecology | |
| EC1 | Ground disturbance (including vehicle movements) and vegetation clearing shall not occur within any of the mapped areas containing White Box Yellow Box Blakely's Red Gum Woodland EECs and Derived grassland of the NSW South Western Slopes (refer to Figure 6-2 and Figure 6-3 of the REF). |
| EC2 | 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. |
| EC3 | 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. |
| EC4 | 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. |
| EC5 | Consultation with DPI Fisheries would 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. |
| EC6 | Consultation with the landholder would be carried out prior to any undertaking any clearing of planted vegetation along the following Spans 19-20, 21-23, 27-28, 30-31, 62A-63, 88-89, 96-98 and 114-115. |
| EC7 | Any disturbed riparian areas would be remediated with native endemic vegetation as appropriate. |
| EC8 | Consultation with each landholder shall occur prior to the commencement of construction to understand any biosecurity risks specific to their land. Any properties with an on-farm biosecurity plan shall be complied with and specific measures incorporated in the CEMP. |
| Heritage | |

| | |
|---|---|
| HE1 | 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 Heritage NSW 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. |
| HE2 | To protect AHIMS 50-5-0027 (Booroo Ponds 1) and the associated sensitive terrace landform the following measures shall be implemented:<br>• 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.<br>• Works in the area should take place in dry weather to minimise ground churning.<br>• All ground disturbance works within the terrace landform (area west of the fence line) must be kept to a strict minimum<br>• As much as possible, the depression in the terrace (former erosion) should be utilised as the location of the access track/earth works as shown in Figure 6-7. |
| HE3 | 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, Department of Planning and Environment and Transgrid contacted. |
| Noise and Vibration | |
| NV1 | Noise generating works shall be in accordance with the Interim Construction Noise Guideline (DECC, 2009):<br>• 7:00am – 6:00pm Monday to Friday.<br>• 8:00am – 1:00pm Saturdays.<br>• No work on Sundays or Public Holidays.<br>Work outside normal hours, on Sundays and public holidays shall only comprise:<br>• The delivery of materials outside normal hours requested by police or other authorities for safety reasons.<br>• Emergency work to avoid the loss of lives and/or property.<br>• Work timed to correlate with system planning outages.<br>• Vacuum and oil filling of equipment<br>Other noise generating works outside of the standard construction hours shall require the prior formal written consent of Environmental Business Partner/Delivery and require justification in accordance with the Guideline. Impacted residents would be notified of out of hours works including out or hour deliveries in accordance with the CEMP. |
| NV2 | 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. The notification shall provide details on who to contact should they have any issues or require further information. Noise affected properties in Yass include:<br>• Yeo Crescent – Numbers 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63<br>• Merriman Drive – Numbers 67, 69, 70 |

| | |
|---|---|
| | • Victoria Street – Numbers 3, 11/9, 10/9, 9/9, 8/9, 7/9, 6/9, 5/9, 4/9, 3/9, 2/9,1/9, 11, 13, 15, 19, 21, 25, 27, 31, 33, 35, 37, 45, 47, 49,51, 53<br>• Cobham Street – Numbers 49. 51, 53, 55, 57, 59, 61, 54, 58, 74, 62,60<br>• Perry Street- Numbers 1A, 1B, 1C, 1, 3, 5, 7, 9, 11, 13, 15, 19, 21, 23, 25, 27, 29, 31, 33, 30, 26, 24, 18, 16, 14, 12, 10<br>• Grand Junction Road. Number 114 |
| NV3 | An operational noise assessment would be carried out following detailed design to determine whether there would be potential for exceedance of the noise criteria. If so, noise mitigation measures such as noise walls would be installed to ensure operational noise levels are below the noise criteria. |
| Traffic and Access | |
| TA1 | Transportation and equipment delivery movements on public roads shall be in accordance with Transport for NSW and Council requirements. |
| TA2 | Access track works shall be constructed in accordance with the *Soils and Construction Volume 2C Unsealed Roads* (DECC, 2008). |
| TA3 | 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:<br>• The management of the delivery of equipment and materials.<br>• Access to and from the site including nominated roads and site access tracks should be undertaken in consultation with the landholder.<br>• Traffic management to be implemented for conductor, OPGW and earth wire road crossings<br>• Parking.<br>• Speed limits.<br>• Road occupancy licence conditions. |
| Air Quality and Climate Change | |
| AQ1 | 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. |
| AQ2 | Air quality mitigation and management strategies shall be documented and implemented in accordance with the CEMP. This shall include:<br>• Reducing vehicle speeds when in the vicinity of residences to minimise the generation of nuisance dust.<br>• Progressively revegetating or otherwise rehabilitating disturbed areas as works are completed. |
| Visual Amenity | |
| VA1 | 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. |
| VA2 | Transgrid shall undertake further direct consultation with each landholder to identify opportunities to further minimise impacts on visual amenity. |
| Waste | |
| WA1 | 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. |

| | |
|---|---|
| WA2 | 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. |
| WA3 | 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. |
| WA4 | Wooden poles, including pole butts, shall be disposed of in accordance with the Transgrid document – *Waste Management of Timber Poles* or gifted to landholders in accordance with the OEH's '*Protocols for recycling redundant utility poles and bridge timbers in New South Wales'* (2011) and Transgrid requirements. If gifted, Transgrid shall provide the landholder information on what the pole is treated with, how to appropriately handle treated timber, and what it can and cannot be used for. |
| Electric and Magnetic Fields | |
| EF1 | All designs shall be in accordance with the *International Commission on Non-Ionizing Radiation Protection* (ICNIRP) *Guidelines for limiting exposure to EMF* (ARPANSA 2010). |
| Social and Economic Considerations | |
| | No Additional Mitigation Measures |
| Bushfire | |
| BF1 | All works shall be undertaken in accordance with Transgrid's *Hot Works and Fire Risk Work Procedure*. |
| BF2 | Fuels and other hazardous materials shall be stored to minimise potential impacts on bushfires. |
| Cumulative Impacts | |
| | No Additional Mitigation Measures |

# Appendix B Operational Noise Assessment

Transgrid

October 2023

Confidential

# Yass 330kV Substation

## Updated Operational Noise Assessment

Question today
*Imagine tomorrow*
Create for the future

# Yass 330kV Substation
# Updated Operational Noise Assessment

Transgrid

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| Rev | Date | Details |
|---|---|---|
| 0 | 3 October 2023 | Draft for client review |
| 1 | 18 October 2023 | Final issue to client |

| | Name | Date | Signature |
|---|---|---|---|
| Prepared by: | Nic Roberts | 3/10/2023 |  |
| Reviewed by: | Ash Stevens | 3/10/2023 |  |
| Approved by: | Ben Ison | 18/10/2023 |  |

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

# Table of contents

# Glossary

| | |
|---|---|
| Acoustic barrier | Solid walls or partitions, solid fences, earth mounds, earth berms, buildings, etc used to reduce noise, without eliminating it. |
| Ambient noise | The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far. |
| Assessment period | The period in a day over which assessments are made. |
| Audible range | The limits of frequency which are audible or heard as sound. The normal ear in young adults detects sound having frequencies in the region 20 hz to 20 khz, although it is possible for some people to detect frequencies outside these limits. |
| Background noise | Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the a-weighted noise level exceeded for ninety percent of a sample period. This is represented as the $L_{90}$ noise level (see below). |
| Decibels (dB) | The level of noise is measured objectively using a sound level meter.<br>The range of pressure variations associated with everyday living may span over a range of a million to one. Instead of expressing pressure in this enormous range of unit, it is convenient to condense this range to a logarithmic scale and give it the units of decibels.<br>The following are examples of the decibel readings of every day steady or quasi-steady sounds:<br>*20db quiet bedroom at night or recording studio*<br>*30db quiet library or quiet location in the country*<br>*40db living room*<br>*50db typical office or ambience in the city at night*<br>*60db normal conversational speech*<br>*70db a car passing by*<br>*80db kerbside of a busy road*<br>*90db truck passing by*<br>*100db nightclub*<br>*110db rock band or 2m from a jackhammer*<br>*120db 70m from a jet aircraft*<br>*140db 25m from a jet aircraft* |
| dBA: A-weighted decibels | The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the 'A' filter. A sound level measured with this filter switched in is denoted as dB(A). Most environmental noise is measured using the 'A' filter. |
| dBC: C-weighted decibels | 'C' weighted adjustments are relatively flat across lower frequencies, and as such are better suited for the assessment of low frequency noise. |

| | |
|---|---|
| Frequency | The time rate for each wave peak (of a sound wave) to pass a given point. Frequency is measured in hertz (Hz). |
| Loudness | A 3db increase represents a doubling of the sound pressure, however an increase of about 10db is required before the sound will subjectively appear to be twice as loud. That is, a sound of 85db is twice as loud as a sound of 75db which is twice as loud as a sound of 65db and so on. That is, the sound of 85db is four times as loud as a sound of 65db. The smallest change which can be readily heard is approximately 2db. An increase beyond 5db is considered to represent the level at which a change in loudness begins to be clearly perceived. |
| $L_{90}$ | The level of noise exceeded for 90% of the time for which a given sound is measured. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A). |
| $L_{eq}$ | Equivalent sound pressure level – the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring. The sound weighting of the noise measurement is commonly added, for example $L_{Aeq}$ or $L_{Ceq}$. |
| Rating Background Level (RBL) | Defined by the NSW EPA as the median value of the (lower) tenth percentile of $L_{90}$ ambient background noise levels for day, evening or night periods, measured over a number of days during the monitoring period |
| Reflection | Sound wave changed in direction of propagation due to a solid object obscuring its path. |
| Sound Exposure Level (SEL) | Sound exposure level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations. |
| Sound level meter | An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels. |
| Sound pressure level ($L_p$) | The level of sound pressure at a specific location, expressed in decibels. |
| Sound Power Level ($L_w$) | A measure of the acoustic energy emitted from a source of noise, expressed in decibels. |

# 1 Introduction

## 1.1 Proposal description

Yass 330 kV substation is location in Yass, NSW, approximately 50 km north-west of Canberra. A planned Transgrid project requires the installation of a new static synchronous compensator (STATCOM), and an associated transformer at the substation.

WSP has been engaged to prepare an operational noise assessment to determine the potential noise impacts on nearby residential receivers once the additional plant has been installed. This will support an addendum REF for the *Coppabella Wind Farm – Line 99M Rebuild* project.

An operational noise assessment was conducted in June 2020 by ERM (the ERM Report), which will form the basis for the current noise impacts produced by the Yass 330 kV substation (the Project).

## 1.2 Report purpose

This operational noise assessment has been prepared by WSP and has the following objectives:

- Consideration of the existing noise environment (Section 2)
- Recreate and validate the findings of the ERM Report to establish the current operational noise impacts (Section 4.2)
- Assessment of potential additional operational noise impacts of the new STATCOM and transformer (Section 4)

## 1.3 Referenced documents

The following documents have been used to inform this assessment:

- *Yass 330kV Substation Noise Impact Assessment Report*, ERM, revision 01 dated 12 June 2020.
- *Coppabella STATCOM Noise Analysis*, RXHK.
- *Coppabella Wind Farm – Rebuild of Transmission Line 99M Addendum Review of Environmental Factors*, Transgrid, revision B dated 24 July 2020.
- Yass 330kV substation diagram with location of proposed STATCOM highlighted, *YSN-HVD-SKT-100101* revision 02.
- NSW EPA *Noise Policy for Industry*, NPfI.

# 2 Existing environment

## 2.1 Study area

The noise study area is provided in Figure 2-1, which includes the location of representative receivers as assessed in the ERM Report, and the general location of the Project. The Project is located on the south-western edge of the township of Yass, NSW, approximately 2 km from the centre of the township.

## 2.2 Noise sensitive receivers

Noise sensitive receivers surround the Project consist of suburban properties to the north-east, and rural properties to the east and south, with the closest receivers being approximately 760m away.

A total of 20 representative noise sensitive receivers were assessed within the study area in the ERM Report and have been replicated geographically as accurately as reasonably practicable. These representative receivers are detailed in Table 2-1 and Figure 2-1.

Table 2-1 Representative noise sensitive receivers

| Receiver ID | Address | Receiver type | Distance from Project (m) |
|---|---|---|---|
| R01 | 39 Yeo Crescent | Residential | 700 |
| R02 | 49 Yeo Crescent | Residential | 620 |
| R03 | 61 Cobham Street | Residential | 610 |
| R04 | 1 Perry Street | Residential | 700 |
| R05 | 53 Victoria Street | Residential | 810 |
| R06 | 114 Green Street | Residential | 1,160 |
| R07 | 18 Cusack Place | Residential | 1,500 |
| R08 | Yass Vine Church | Place of worship | 900 |
| R09 | 11460 Wee Jasper Road | Residential | 910 |
| R10 | 10 Cusack Place | Residential | 1,350 |
| R11 | 11440 Wee Jasper Road | Residential | 1,020 |
| R12 | 12 Gums Lane | Residential | 890 |
| R13 | 28 Gums Lane | Residential | 1,050 |
| R14 | 11348 Wee Jasper Road | Residential | 1,400 |
| R15 | 30 Wades Road | Residential | 1,890 |
| R16 | 19 Shearsby Crescent | Residential | 1,500 |
| R17 | 24 Shearsby Crescent | Residential | 1,550 |
| R18 | 6 Burgess Place | Residential | 1,430 |
| R19 | 11 Martin Place | Residential | 1,350 |
| R20 | 9 Worth Street | Residential | 1,350 |

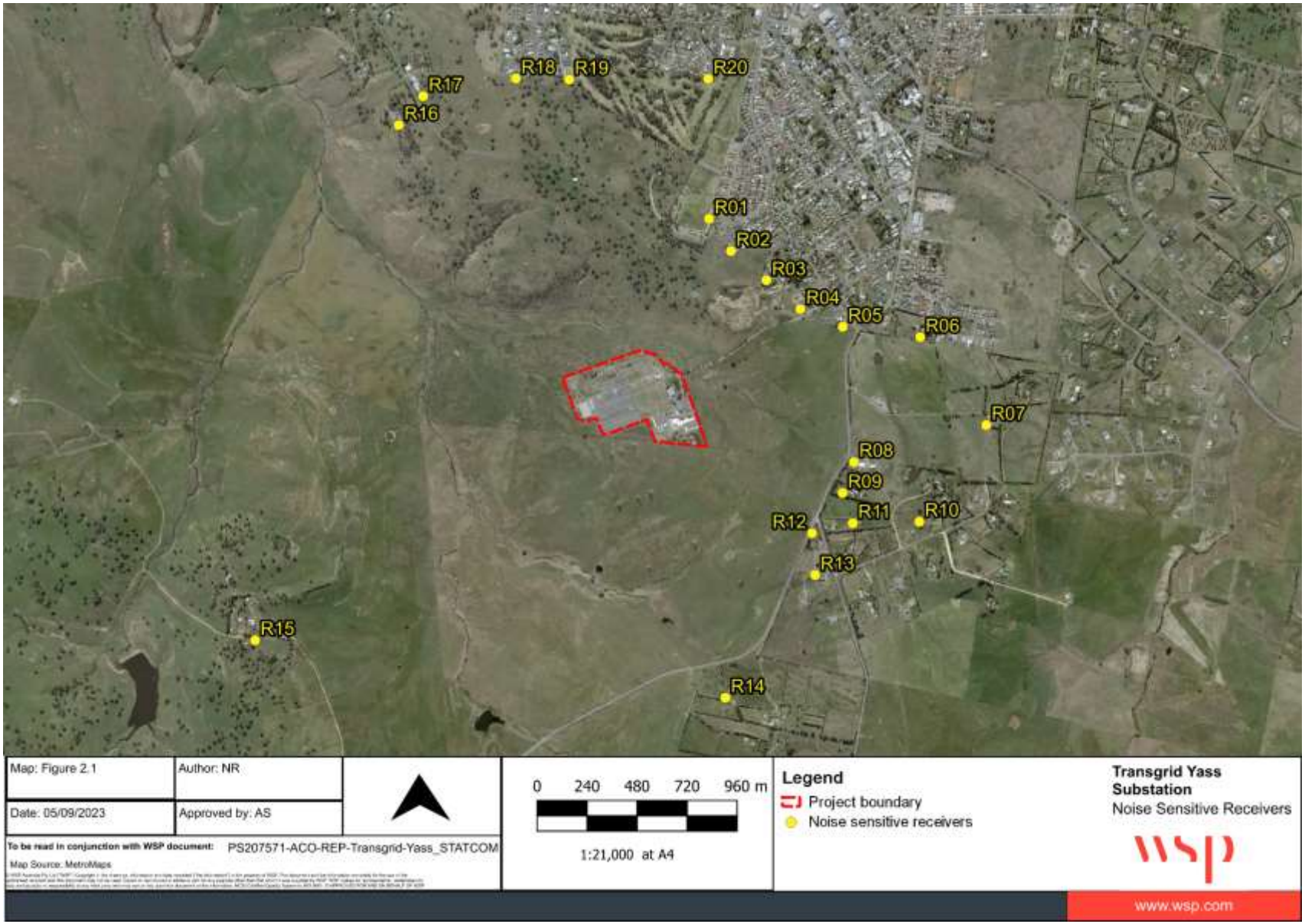


Figure 2-1 Noise sensitive receivers

## 2.3 Existing background noise levels

The ERM Report establishes the rating background noise levels (RBL) for each representative sensitive receiver outlined in 2.2 for each time period outlined in the NPfI. Each of the RBLs represent the minimum background noise level requirements in the NPfI and are summarised in Table 2-2.

Table 2-2 Rating Background Levels

| **Receiver ID** | **Rating Background Noise Levels dBA $L_{90}$ [1]** | | |
|---|---|---|---|
| | **Day** | **Evening** | **Night** |
| All representative receivers | 35 | 30 | 30 |

(1) Day: the period from 7 am to 6 pm Monday to Saturday; or 8 am to 6 pm on Sundays and public holidays; evening: the period from 6 pm to 10pm; night: the remaining periods.

# 3 Noise guidelines

## 3.1 Noise Policy for Industry (NPfI)

Assessment of on-site noise sources is guided by NPfI, which is applicable to industrial noise sources from activities such as the proposal, under Schedule 1 of the *Protection of the Environment Operations Act 1997* (POEO Act).

The NPfI is used to calculate Project Noise Trigger Levels (PNTLs). These are planning levels and in the absence of an Environmental Protection Licence (EPL) for the site, do not form mandatory limits. They do however provide guidance on the likely acceptability of predicted noise levels and will assist the determining authority to assess operational noise impacts. Where noise criteria are predicted to be exceeded, feasible and reasonable noise mitigation strategies should be considered. Feasible and reasonable noise mitigation measures should consider the economic, social and environmental costs and benefits of the development against the noise impacts.

The assessment procedure for industrial noise sources outlines two components:

- controlling intrusive noise impacts in the short-term for residences
- maintaining noise level amenity for particular land uses for residences and other land uses.

In assessing the noise impact of industrial sources, both components must be taken into account for residential receivers. The minimum values of each of these components will form the project trigger levels for the industrial source under assessment. As the upgraded substation facility would operate 24 hours a day, the night-time criteria are likely to be the controlling time criteria.

The relevant operational noise criteria (in accordance with the NPfI) from the ERM Report is reproduced in Table 3-1.

Table 3-1 Summary of Project Noise Trigger Levels (PNTLs)

| **Receiver type** | **Project Noise Trigger Levels dBA $L_{eq\ 15min}$** | | |
|---|---|---|---|
| | **Day[1]** | **Evening[1]** | **Night[1]** |
| Residential | 40 | 35 | 35 |
| Place of worship | 48 | 48 | 48 |

(1) Day: the period from 7 am to 6 pm Monday to Saturday; or 8 am to 6 pm on Sundays and public holidays; evening: the period from 6 pm to 10pm; night: the remaining periods.

# 4 Operational noise assessment

## 4.1 Modelling methodology

Noise modelling was conducted to validate the original model from the ERM Report and determine the predicted additional level of operational noise generated by the STATCOM at the representative noise sensitive receivers surrounding the Project.

The noise modelling methodology was replicated as reasonably practicable to the methodology used in the ERM Report, with the exception of the modelling software. While ERM applied the ISO9613:2 prediction algorithm within Predictor noise modelling software, this report has adopted the same prediction algorithm within SoundPLAN 8.2. This does not typically result in any significant difference in predicted noise levels. The modelling inputs adopted in this assessment are outlined in Table 4-1.

The ERM Report outlines that noise-enhancing meteorological conditions increased the predicted operational noise by generally 3 dBA. For consistency, and to account for potential differences in modelling software, this increase will be applied to the updated operational noise predictions in this report and is presented in Table 4-3.

Table 4-1 Noise modelling assumptions

| Modelling element | Input/assumption/source reference |
|---|---|
| Noise modelling software | SoundPLAN (Version 8.2) |
| Ground elevation geometry | NSW Six Maps |
| Ground absorption | 75% soft ground |
| Assessment standard | ISO 9613:2 |
| Plant sound power levels | — Existing substation plant: the ERM Report<br>— STATCOM: *Coppabella STATCOM Noise Analysis*, RXHK. |
| Plant location | Yass 330kV substation diagram with location of proposed STATCOM highlighted, *YSN-HVD-SKT-100101* revision 02. |
| Receiver locations | As outlined in Table 2-1. |
| Receiver height | 1.5 m |

The modelled sound power levels for the existing substation plant and STATCOM components has been reproduced in Table 4-2 from the ERM Report and *Coppabella STATCOM Noise Analysis*, RXHK, respectively.

Table 4-2 Substation plant sound power level

| Substation component | Modelled sound power level, dBA |
|---|---|
| **Existing** | |
| #1 Reactor | 90 |
| #2 Reactor | 90 |
| #3 Reactor | 90 |
| #1 Capacitor Bank | 85 |
| #1 Auxiliary Transformer | 74 |
| #2 Auxiliary Transformer | 74 |
| #4 Auxiliary Transformer | 74 |
| #1 Transformer | 94 |
| #2 Transformer | 102 |
| #3 Transformer | 85 |
| #4 Transformer | 101 |
| **STATCOM** | |
| Water heat exchanger radiator (Full-load) | 80 |
| Reactor (Full-load) | 75 |
| Transformer main tank (No load) | 94 |
| Transformer main tank (Full-load) | 105 |
| Separate coolers | 60 |
| Auxiliary transformer | 75 |

The Project layout is provided in Figure 4-1, which includes the location of the existing substation plant, and the location of the proposed STATCOM components.

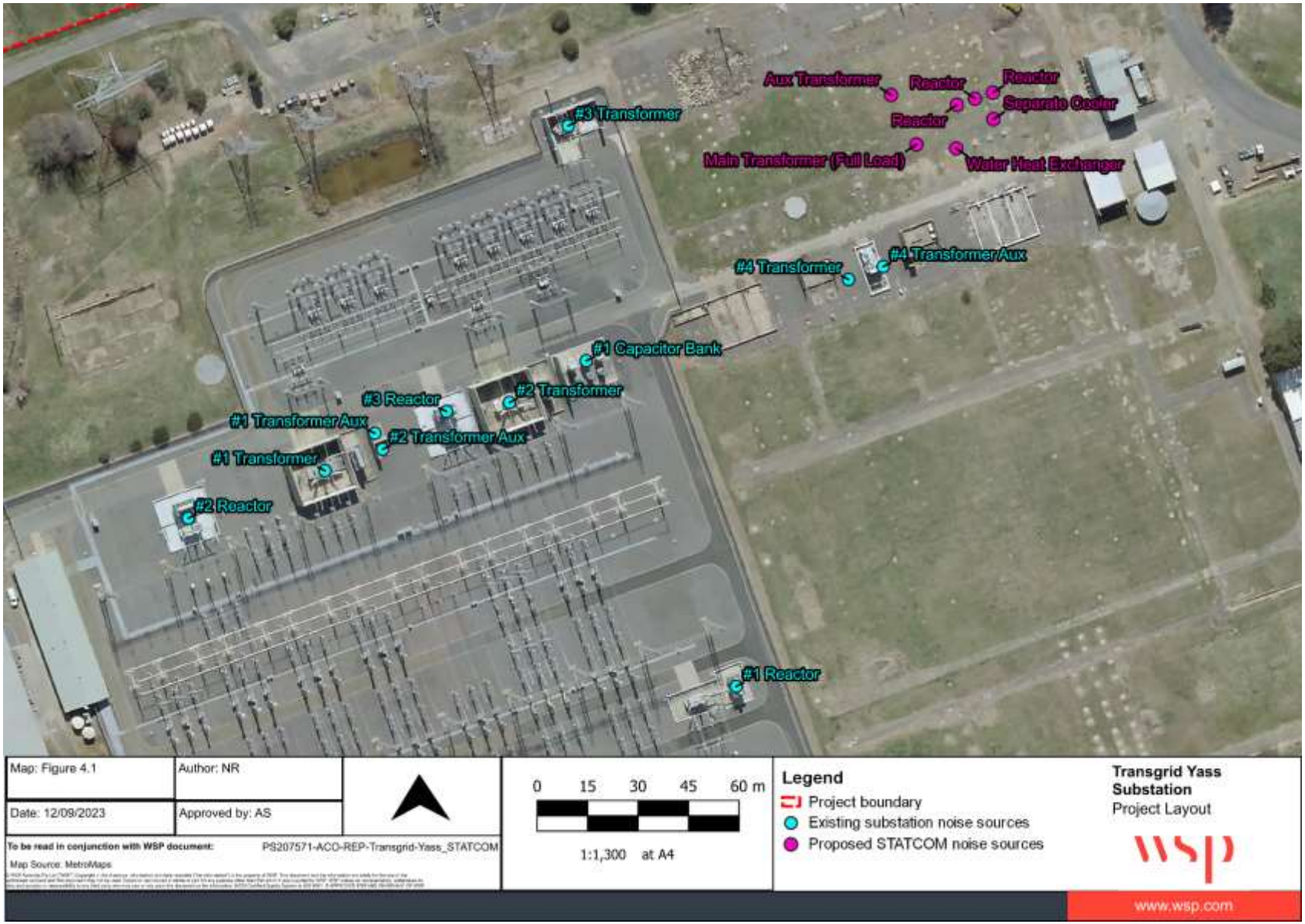


Figure 4-1 Project layout with proposed STATCOM

## 4.2 Model validation

– To validate the model presented in the ERM Report, a base scenario was created to represent the current operational equipment at the Project and compared to the *Existing + Proposed Substation Operations (Standard MET)* results found in the ERM report. Generally, predictions within +/- 2dB are considered to be an acceptable validation and the updated model has found that for most receivers there was no difference in the modelled noise levels at the representative receivers. Minor differences of up to 2dB were noted at four receivers, likely as a result of minor differences between the models and modelling software, however this validation is considered an overall acceptable duplication of the original model. The detailed comparison between the two result sets can be found in Table 4-3.

## 4.3 Predicted operational noise levels

A summary of the predicted operational noise levels at each representative receiver are presented in Table 4-3.

– The formatting within

Table 4-3 indicates the following:

– The cells with **red text** show exceedances for evening / night criteria.

Table 4-3 Predicted operational noise impacts

| Receiver ID | Project noise trigger levels $L_{eq,15\ min}$ dBA | | | Predicted operational noise levels $L_{eq,15\ min}$ dBA | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Current substation layout - ERM | | Current substation layout – validated model | | Proposed substation layout with STATCOM | |
| | Day | Evening | Night | Neutral meteorological conditions | Adverse meteorological conditions | Neutral meteorological conditions | Adverse meteorological conditions | Neutral meteorological conditions | Adverse meteorological conditions |
| R01 | 40 | 35 | 35 | 28 | 31 | 28 | 31 | 32 | 35 |
| R02 | | | | 31 | 34 | 31 | 34 | 35 | **38** |
| R03 | | | | 32 | 35 | 32 | 35 | **36** | **39** |
| R04 | | | | 31 | 34 | 31 | 34 | 35 | **38** |

| Receiver ID | Project noise trigger levels $L_{eq,15\ min}$ dBA | | | Predicted operational noise levels $L_{eq,15\ min}$ dBA | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Current substation layout - ERM | | Current substation layout – validated model | | Proposed substation layout with STATCOM | |
| | Day | Evening | Night | Neutral meteorological conditions | Adverse meteorological conditions | Neutral meteorological conditions | Adverse meteorological conditions | Neutral meteorological conditions | Adverse meteorological conditions |
| R05 | | | | 29 | 32 | 29 | 32 | 33 | 36 |
| R06 | | | | 27 | 30 | 28 | 31 | 30 | 33 |
| R07 | | | | 26 | 28 | 28 | 30 | 31 | 33 |
| R08 | 48 | 48 | 48 | 29 | 32 | 29 | 32 | 32 | 35 |
| R09 | | | | 29 | 32 | 29 | 32 | 32 | 35 |
| R10 | | | | 26 | 29 | 26 | 29 | 29 | 32 |
| R11 | | | | 28 | 31 | 28 | 31 | 31 | 34 |
| R12 | | | | 28 | 31 | 29 | 32 | 32 | 35 |
| R13 | | | | 27 | 30 | 27 | 30 | 31 | 34 |
| R14 | | | | 26 | 29 | 26 | 29 | 29 | 32 |
| R15 | 40 | 35 | 35 | 24 | 27 | 24 | 27 | 26 | 29 |
| R16 | | | | 24 | 27 | 24 | 27 | 28 | 31 |
| R17 | | | | 24 | 27 | 24 | 27 | 28 | 31 |
| R18 | | | | 24 | 27 | 24 | 27 | 28 | 31 |
| R19 | | | | 24 | 27 | 25 | 28 | 29 | 32 |
| R20 | | | | 24 | 27 | 24 | 27 | 29 | 32 |

## 4.4 Discussion

The results of modelling indicates that the addition of a STATCOM to Yass 330 kV substation may result in non-compliance with the project noise trigger levels for some receivers. This exceedance is minor for standard meteorological conditions (+1 dBA in exceedance for representative receiver R03 only), however noise-enhancing meteorological conditions causes more representative receivers to exceed NPfI criteria by up to 4dB.

The STATCOM transformer sound power level outlined in *Coppabella STATCOM Noise Analysis* (RXHK) is ~5 dBA louder than the existing transformers on the project site, and the STATCOM proposed location is closer to the exceeding representative receivers. As the predicted noise levels in the ERM Report were close to the PNTL at some locations for the current configuration of the substation, this result is expected. Suggested mitigation measures are found in Section 4.5.

## 4.5 Noise mitigation and management

Operational noise levels are not predicted to comply with the NPfI trigger levels and as such, noise mitigation is required to reduce the predicted noise impacts from the installation of the STATCOM.

### *4.5.1 Noise barrier*

To mitigate the noise impacts of the STATCOM transformer, a three-sided wall could be constructed around the northern, eastern, and southern sides of the transformer, at a distance of approximately 5m from the STATCOM system. This layout is depicted in Figure 4-2.

Figure 4-2 Proposed STATCOM wall location

Modelling suggests that given the topography of the area surrounding the site, the optimal height for this wall would be **4m** above the top of the STATCOM transformer. The predicted noise levels incorporating this barrier are detailed in Table 4-4. The formatting within the results table indicates the following:

- The cells with **red text** show exceedances for evening and night criteria.

Table 4-4 Predicted operational noise impacts with noise wall

| Receiver ID | Project noise trigger levels $L_{eq,15\ min}$ dBA | | | Predicted operational noise levels $L_{eq,15\ min}$ dBA | | | |
|---|---|---|---|---|---|---|---|
| | | | | Proposed substation layout with STATCOM wall | | Noise reductions | |
| | Day | Evening | Night | Neutral meteorological conditions | Adverse meteorological conditions | Neutral meteorological conditions | Adverse meteorological conditions |
| R01 | 40 | 35 | 35 | 29 | 32 | -3 | -3 |
| R02 | | | | 32 | 35 | -3 | -3 |
| R03 | | | | 33 | **36** | -3 | -3 |
| R04 | | | | 32 | 35 | -3 | -3 |
| R05 | | | | 30 | 33 | -3 | -3 |
| R06 | | | | 28 | 31 | -2 | -2 |
| R07 | | | | 29 | 31 | -2 | -2 |
| R08 | 48 | 48 | 48 | 32 | 35 | 0 | 0 |
| R09 | 40 | 35 | 35 | 30 | 33 | -2 | -2 |
| R10 | | | | 27 | 30 | -2 | -2 |
| R11 | | | | 29 | 32 | -2 | -2 |
| R12 | | | | 29 | 32 | -3 | -3 |
| R13 | | | | 28 | 31 | -3 | -3 |
| R14 | | | | 27 | 30 | -2 | -2 |
| R15 | | | | 27 | 30 | -1 | -1 |
| R16 | | | | 27 | 30 | -1 | -1 |
| R17 | | | | 26 | 29 | -2 | -2 |
| R18 | | | | 26 | 29 | -2 | -2 |
| R19 | | | | 26 | 29 | -3 | -3 |
| R20 | | | | 25 | 28 | -4 | -4 |

With the addition of a wall that is 4 m higher from the top of the STATCOM as depicted in Figure 4-2, noise impacts from the proposed substation layout are predicted to be similar to those with the current substation layout, in neutral meteorological conditions. However, during adverse meteorological conditions, an exceedance of 1 dBA is expected at receiver R03. Increasing the wall height above the modelled height provided minimal benefit.

This exceedance during adverse meteorological conditions is considered to be minor, and a 1 dBA increase or decrease is likely to be imperceptible. Furthermore, the STATCOM components were modelled using the “full-load” sound power levels as outlined in Table 4-2, however there was a 11 dBA decrease in sound power level between the transformer at full load and no load. The predicted exceedances for the Project are during evening and night-time periods, when it is unlikely that the transformer will be at full load, and therefore quieter.

# 5 Conclusions

WSP Australia Pty Ltd (WSP) has been engaged by Transgrid to examine operational noise generated by the Yass 330 kV substation in its current state and with the addition of a STATCOM. Results from the noise modelling are summarised in Section 4.

The addition of a STATCOM to the Yass 330 kV substation was found to exceed the relevant criteria outlined in the NPfI, and therefore mitigation would be required for consideration to meet project noise trigger levels. A wall constructed to the approximate specifications as detailed in Section 4.5 would be adequate in reducing most noise impacts of the STATCOM to acceptable levels, however some exceedances may be experienced under certain conditions.

# 6 Limitations

This Report is provided by WSP Australia Pty Limited (WSP) for Transgrid (Client) in response to specific instructions from the Client and in accordance with WSP's proposal dated 25 August.

## 6.1 Permitted purpose

This Report is provided by WSP for the purpose described in the Agreement and no responsibility is accepted by WSP for the use of the Report in whole or in part, for any other purpose (Permitted Purpose).

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expenses (including any indirect, consequential or punitive losses or damages or any amounts for loss of profit, loss of revenue, loss of opportunity to earn profit, loss of production, loss of contract, increased operational costs, loss of business opportunity, site depredation costs, business interruption or economic loss) of any kind whatsoever, suffered on incurred by a third party.

# Appendix C Aboriginal heritage due diligence assessment

| **Aboriginal heritage due diligence assessment** | | |
|---|---|---|
| An Aboriginal heritage due diligence assessment has been completed to demonstrate that appropriate due diligence has been carried out in accordance with Transgrid's *Aboriginal Heritage Due Diligence Assessment Procedure* (February 2022) (the Procedure). | | |
| Step 1: Existing Aboriginal heritage sites<br>Are there any registered Aboriginal sites within 100 m of the proposed modified activity which would need to be avoided and/or managed?<br><br>A search of the Aboriginal Heritage Information Management System carried out on 25 October 2023 did not report any Aboriginal heritage items or places within 100 m of the proposed modified activity.<br><br>Proceed to Step 2. | ☐ Yes | ☒ No |
| Step 2: Level of ground disturbance<br>What is the level of current ground disturbance across the proposed modified activity area?<br><br>The level of current ground disturbance within the proposed activity area is shown in Figure 2. | | |

With reference to Figure 2, the following type(s) of land are traversed by the proposed activity. Select one or more:

| | | | | |
|---|---|---|---|---|
| Completely ☒ modified | Highly disturbed ☐ | Moderately ☐ disturbed | Minimally ☐ disturbed | Undisturbed ☐ |

| | | |
|---|---|---|
| In accordance with the Procedure, land that is moderately disturbed, highly disturbed or completely modified is considered disturbed land.<br><br>Proceed to Step 3. | | |
| Step 3. Checking for landscape features<br>For the portion of the proposed activity area occurring on land that is either disturbed (moderately disturbed, highly disturbed or completely modified), are any of the following landscape feature present?<br>• Within a mapped sand dune systems including lunettes.<br>• On ridgelines in areas with sandstone geology or areas where rock platforms exist in proximity to water sources (unless a site inspection is undertaken to demonstrate no rock shelters, engravings, grinding grooves or stone arrangements are likely to be present).<br>• Within 200m of lower slopes/flats/terraces associated with major watercourses (unless a site inspection is undertaken to demonstrate activity is not located within and not associated with areas of deep soil profile). | ☐ Yes | ☒ No<br>☐ N/A |
| For the portion of the proposed activity area occurring on land that is undisturbed (either minimally disturbed or undisturbed), are any of the following landscape feature present? | ☐ Yes | ☐ No<br>☒ N/A |

| | | |
|---|---|---|
| • Within 200 m of waters (river, stream, lake, lagoon, swamps, wetland, natural watercourse)<br>• Within a sand dune system<br>• On a ridge top, ridge line, or headland<br>• Within 200 m below or above a cliff face<br>• Within 20 m of a cave, rock shelter, or a cave mouth | | |
| If you answered:<br>**'No' or N/A** in Step 3, no further assessment is required.<br>**'Yes'** in Step 3, *proceed to Step 4*. | | |
| **Based on the due diligence assessment impacts on Aboriginal heritage are assessed as unlikely and no further assessment is required.** | | |