Appendix I

Addendum
Noise and vibration impact assessment

Question today
Imagine tomorrow
Create for the future

EnergyConnect (NSW – Western Section)
Supplementary noise and vibration impact assessment

TransGrid

WSP
Level 27, 680 George Street
Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001

Tel: +61 2 9272 5100
Fax: +61 2 9272 5101
wsp.com

REV	DATE	DETAILS
Final	06/04/2021	Final

	NAME	DATE	SIGNATURE
Prepared by:	Rebecca Warren	19/03/2021	
Reviewed by:	Ben Ison	19/03/2021	
Approved by:	Caitlin Bennett	06/04/2021	

TABLE OF CONTENTS

CONTENTS (Continued)

LIST OF TABLES

LIST OF FIGURES

1 INTRODUCTION

This document presents the Addendum Noise and Vibration Report for EnergyConnect – Western Section ('the proposal') works. This report is an addition and makes reference to the Noise and Vibration Assessment ('Technical paper 8') completed by WSP for the proposal in September 2020 to support the Environmental Impact Statement (EIS) for the proposal.

TransGrid proposes to make a series of amendments to the proposal which have been developed since the public exhibition of the EIS, including a series of clarifications and refinements as a result of ongoing design of the proposal and comments received during exhibition of the EIS which have been described in the Amendment Report. This addendum noise and vibration report presents the findings of the impacts of these amendments compared to the findings of Technical paper 8.

Unless otherwise stated, all modelling assumptions and scenarios are consistent with Technical paper 8.

1.1 OVERVIEW OF AMENDMENTS

Details of the proposed amendments are included in the Amendment Report, however the amendments to the proposal requiring further consideration for the purpose of this report include the following:

- confirmation of the construction compound and accommodation camp site at Wentworth
- a change to the Buronga substation layout and inclusion of additional material earthworks at this site
- construction of a temporary bypass transmission line
- provision of onsite waste water treatment at the Buronga and Wentworth main construction compound and accommodation camp sites
- confirmation of a series of construction water supply points
- amendment to the indicative disturbance area
- changes to construction traffic volumes.

1.2 ASSESSED SCENARIOS

Based on the potential impacts associated with the amendments, this assessment has considered the construction and operational noise and vibration impacts, and road noise impacts from the proposed amendments outlined in Section 1.1 and detailed in Section 2 of the Amendment Report.

The assessment has not assessed cumulative noise or blasting impacts as they would be unchanged from Technical paper 8.

2 ASSESSMENT OF CONSTRUCTION NOISE IMPACTS

2.1 BURONGA SUBSTATION UPGRADE AND EXPANSION AMENDMENTS

2.1.1 OVERVIEW

As discussed in Section 2 of the Amendment Report, fill material for the substation upgrade and expansion site would be obtained closer to the substation site, from two areas adjacent to the substation upgrade and expansion site (referred to hereafter as the 'earthwork material sites').

The construction methodology for the earthwork material sites would generally be consistent with the earthwork methodology presented in Section 6.6 of the EIS.

2.1.2 EARTHWORKS

2.1.2.1 AMENDMENT

The earthwork material sites are located to the north–east and north–west of the Buronga substation upgrade and expansion site, and further from the nearest potentially affected sensitive receiver. Site works from the substation earthworks are likely to result in minimal impacts to this receiver, as any construction related activities at this location would be masked by other works associated with construction at the Buronga upgrade and expansion and the Buronga main construction compound. The western earthwork material site is located east of the Buronga main construction compound, therefore the additional impacts of additional plant and equipment would be offset by the buffer distance of two kilometres to the nearest receiver to the south-west. The eastern earthworks materials site is separated from this receiver by the Buronga substation upgrade and expansion site.

2.1.2.2 POTENTIAL IMPACTS

Section 5.2.2 of Technical paper 8 found that construction works at the Buronga substation upgrade and expansion site would comply with relevant noise levels at the nearest sensitive receivers for all construction work phases, with noise levels less than 30 dBA to the nearest sensitive receiver. The impacts of this amendment would see a negligible change in impacts to these predicted noise levels at the nearest sensitive receivers as a result of additional earthwork material sites and additional plant activity associated with removal of fill.

2.1.3 CRUSHING AND SCREENING ACTIVITIES

2.1.3.1 AMENDMENT

The proposed amendment would include the potential for some crushing and screening to occur within the site using a mobile crushing and screening plant. These activities present a significant acoustic contributor compared to other activities, and have potential to generate adverse impact sensitive receivers. Crushing and screening activities would be undertaken (as required) between 7:00am and 7:00pm seven days per week for the duration of the earthworks at this site.

The final specifications of the plant would be confirmed during detailed design.

The crushing and screening plant and material stockpiles would be contained within the areas as shown in Figure 2.1. Material that is not suitable for use in the substation pad would be used during the re–instatement of the earthwork material sites.

2.1.3.2 POTENTIAL IMPACTS

Based on the indicative locations of the potential crushing and screening equipment, it is anticipated that rock crushing, being the most acoustically significant activities, would not generate adverse impact at the nearest sensitive receivers due to the distance to the nearest sensitive receivers and masking from other earthworks equipment. Based on the available information, it is considered that rock crushing would not generate adverse impact where a buffer distance of 500 metres can be maintained between equipment and the nearest sensitive receiver (approximately 2 km south-west at 694 Arumpo Road). Overall impacts of the earthworks and crushing and screening activities would see a negligible change in impacts to predicted noise levels at the nearest sensitive receivers compared to the results presented in Section 5.2.2 of Technical paper 8.

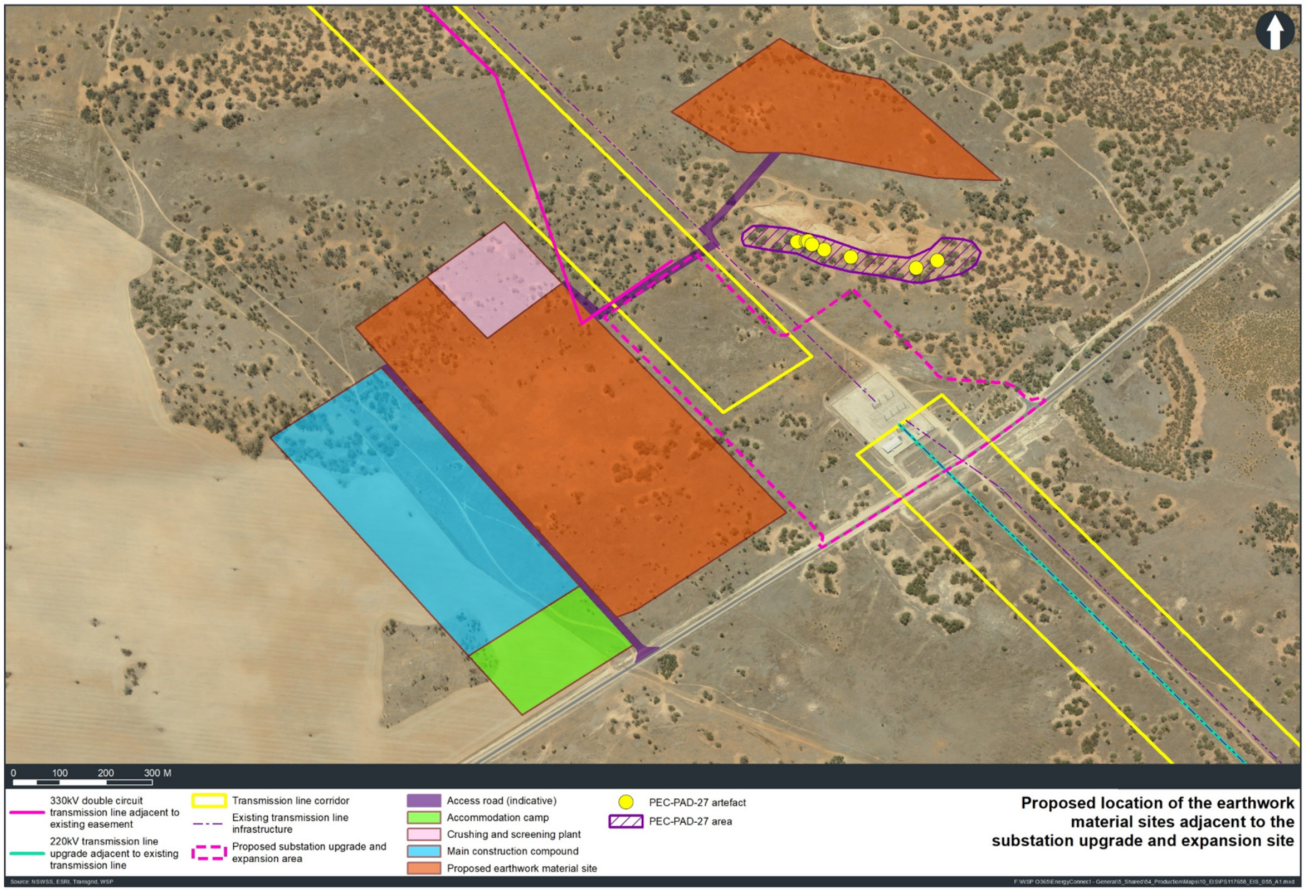

Figure 2.1 Proposed location of the earthwork material sites adjacent to the substation upgrade and expansion site Amended indicative disturbance area

2.1.4 OVERVIEW

Chapter 8 of the EIS outlined the approach to assessment of the potential environmental impacts associated with the proposal, including the indicative disturbance area required to construct and operate the proposal. To achieve a level of flexibility while undertaking a rigorous level of impact assessment, the approach adopted for the EIS was to assess a 'worst case' impact. It was conservatively assumed that any area could be impacted by the proposal within the transmission line corridor, and areas identified for Buronga substation upgrade and expansion, the main construction compounds and accommodation camps.

As discussed in Section 3.2.1.1 of Technical paper 8, the assessment assumed the transmission line and associated construction works could be located anywhere within the defined transmission line corridor. This corridor represented a worst–case impact.

2.1.5 AMENDMENT

As discussed in Section 5.2.2.1 of Technical paper 8, the noise levels along the transmission line corridor have been modelled assuming all construction activities occur simultaneously, and results presented as a range based on the proximity to sensitive receivers.

As a result of the proposed changes described in Section 2 of the Amendment Report, it is proposed to amend the indicative disturbance area. This updated disturbance area is referred to as the 'amended indicative disturbance area'. In parts, the amended indicative disturbance area extends marginally outside the transmission line corridor.

2.1.6 POTENTIAL IMPACTS

Based on the amendments outlined in Section 2 of the Amendment Report, the impacts of the amended indicative disturbance area are likely to be minor and largely confined to the original transmission line corridor outlined in Technical paper 8.

A summary of the potential noise impacts is presented in Table 2.1 where the amended indicative disturbance area extends beyond the transmission line corridor assessed in the EIS.

Table 2.1 Potential for construction noise impact – amended indicative disturbance area

AFFECTED AREA	DISTANCE TO NEAREST SENSITIVE RECEIVER	WORKS DESCRIPTION	POTENTIAL CONSTRUCTION IMPACT OF PROPOSED AMENDMENTS COMPARED TO PREVIOUS ASSESSMENT
Palinyewah Public School	>2000 m	Access road route passes outside the transmission line corridor	Negligible – no sensitive receivers located within 2km of this location
Receivers South east of Buronga substation	>2000 m	Brake and winch site extends 60 m outside the transmission line corridor; there are no receivers in the vicinity of this location	Negligible – no sensitive receivers located within 2km of this location
Receivers near Psyche Bend	>200 m	An access road passes from Psyche Bend to the Stuart Highway in the vicinity of receivers 959, 960 and 961	Negligible – sensitive receivers located over 200 m from access road

Table 2.1 shows that impacts predicted in Technical paper 8 are predicted to be largely unchanged as a result of the amended indicative disturbance area. Negligible changes may be expected at receivers in the vicinity of Psyche Bend. Impacts of changes in the vicinity of the Buronga substation are assessed in Section 2.1.

The impacts at these receivers would largely be associated with the construction of access tracks / ancillary works, and impacts are likely to be minimal and of short duration as a result of these works. Noise impacts from the ongoing use of these tracks are predicted to be negligible.

2.2 ONSITE WASTEWATER TREATMENT

2.2.1 OVERVIEW

An opportunity to reuse the effluent and greywater produced by the accommodation camps and construction sites has been identified. The wastewater treatment facilities would be designed to accommodate the proposed personnel numbers at Buronga and Wentworth construction compounds and accommodation camp sites (refer to Section 2.6 of the Amendment Report).

The proposed onsite wastewater treatment plants would be a generally contained system and would include biological and chemical treatment, filtration and disinfection. Subject to detailed design of the wastewater treatment facilities, it is proposed that a sequencing batch reactor type sewage treatment plant be constructed at each of the primary camp sites (within the Buronga and Wentworth accommodation camps).

2.2.2 POTENTIAL IMPACTS

The storage tanks would be located above ground next to the wastewater treatment system in a bunded area (up to approximately 110,000 litre total capacity to allow for potential storage during rain events).

Effluent from the wastewater treatment facilities would be discharged to constructed turkey's nests (or a similar small basin type structures), following this greywater would be collected and transported via water carts for reuse in construction activities such as dust suppression, compaction of materials or other construction activities which can utilise grey water. Subject to detailed design, that the following specifications are anticipated for the turkey nests:

- Buronga accommodation camp: approximately 20 metres by 20 metres by 2 metres deep, providing around 800,000 litres of storage
- Wentworth accommodation camp: approximately 13 metres by 13 metres by 2 metres deep, providing around 338,000 litres of storage.

The potential impacts of the amendments to Buronga construction compound have been assessed in Table 2.2.

The potential impacts for the Wentworth construction compound are presented in Section 2.4.1.

Table 2.2 Potential for construction noise impact – wastewater systems

WATER SUPPLY LOCATION	DISTANCE TO NEAREST SENSITIVE RECEIVER (M)	WORKS DESCRIPTION	POTENTIAL CONSTRUCTION IMPACT OF PROPOSED AMENDMENTS COMPARED TO PREVIOUS ASSESSMENT
Buronga accommodation camp	3.6 km from receiver on Silver City Highway (receiver 2037).	Proposed contained system which would include biological and chemical treatment, filtration and disinfection.	Minimal due to distance to receiver* Plant to be selected to achieve the relevant noise goals outlined in Technical paper 8.

* Impacts to workers in the accommodation camps have not been assessed as they are not considered noise sensitive receivers under the ICNG due to their association with the project

Based on the large distances to the nearest sensitive receivers, impacts from the wastewater systems at Buronga site could be managed by equipment selection to achieve the relevant noise goals outlined in Technical paper 8.

Construction works associated with the amendments are located at sufficient distance that construction noise levels will generate minimal impacts compared to construction works from other construction activities at Buronga construction compound, which were predicted to be less than 30 dBA for all activities during all assessment periods (refer to Table 5.9 of Technical paper 8). Cumulative impacts from construction works will comply with relevant noise goals at the nearest sensitive receivers. compared to the noise results presented in Table 5.9 of Technical paper 8.

2.3 CONSTRUCTION WATER SUPPLY

2.3.1 OVERVIEW

As part of the ongoing discussion with these water suppliers, a series of water supply points have been identified which would provide connection points to existing water supply pipelines (refer to Section 2.7 of the Amendment Report).

Seven locations have been identified throughout the project area to install water supply infrastructure.

Two new elements of infrastructure would be required to be constructed to provide water supply access points, including new standpipe infrastructure and a new pipeline to the Wentworth main construction compound and accommodation camp.

2.3.1.1 NEW STANDPIPE INFRASTRUCTURE

The construction methodology for the new standpipe infrastructure at the Alcheringa Road, Fletchers Lake Drive and Silver City Highway sites would involve topsoil removal, sub–base placement, construction of hydrants next to existing pipes and removal on completion of works. The plant and equipment required to construct the new hydrants would include excavators, rollers, water carts and graders. Preparation works would be limited to around one week for installation, and one week to remove infrastructure at the end of the proposal.

2.3.1.2 NEW PIPELINE

The construction methodology for the new standpipe infrastructure to connect an existing water supply point at the Fort Courage Caravan Park to the Wentworth main construction compound and accommodation camp would generally involve vegetation clearing, trenching and road reinstatement. The plant and equipment required to construct the new hydrants would include excavators, rollers, water carts and other trucks. Preparation works would be limited to around two weeks for installation, and around one to remove infrastructure at the end of the proposal (if required).

2.3.2 POTENTIAL IMPACTS

Based on the indicative location for proposed water supply points and distance to sensitive receivers, a qualitative assessment of potential impacts from construction activities has been completed, as presented in Table 2.3. This assessment considers the water supply points alone. The impacts of heavy vehicle movements associated with the water supply points is discussed in Section 4.3.

Table 2.3 Potential for construction noise impact – water supply points

WATER SUPPLY LOCATION	STATUS	DISTANCE TO NEAREST SENSITIVE RECEIVER (M)	CONSTRUCTION WORKS REQUIRED? DESCRIPTION	POTENTIAL CONSTRUCTION NOISE IMPACTS OF PROPOSED AMENDMENTS COMPARED TO PREVIOUS ASSESSMENT
Alcheringa Road, Buronga	New	2 m to utility station, 700 m to Alcheringa St (receiver 3430)	Yes – The proposed works would include installation of a new standpipe and connection to the existing Western Murray Irrigation pipeline. The area is currently cleared and adjacent to Alcheringa Road.	Minimal impact (<2 dBA) due to distance to receiver from construction activities and vehicle movements.

WATER SUPPLY LOCATION	STATUS	DISTANCE TO NEAREST SENSITIVE RECEIVER (M)	CONSTRUCTION WORKS REQUIRED? DESCRIPTION	POTENTIAL CONSTRUCTION NOISE IMPACTS OF PROPOSED AMENDMENTS COMPARED TO PREVIOUS ASSESSMENT
Fletchers Lake Drive, Dareton	New	255 m to 82 Channel Road	Yes – Proposed works would include installation of a new standpipe and connection to the existing Western Murray Irrigation pipeline. The area is currently not utilised (road reserve/verge) adjacent to Fletchers Lake Drive.	Minimal impact (<2 dBA) due to distance to receiver from construction activities and vehicle movements.
Silver City Highway intersection with Milpara Road, Anabranch South	New	3.6 km from Silver City Highway (receiver 2037)	Yes – Proposed works would include the installation of a new standpipe and connection to the existing Broken Hill pipeline.	Minimal impact (<2 dBA) due to distance to receiver from construction activities and vehicle movements.
River Drive, Buronga	Existing	50 m from 48 River Drive	No – No new infrastructure would be required to allow for access to this water supply point.	Negligible from construction activities.
Beverley Street, Wentworth	Existing	45 m to receiver 3566, 6 m to 42 Arthur St	No – No new infrastructure would be required to allow for access to this water supply point.	Negligible from construction activities.
Wentworth main construction compound and accommodation camp	New	320 m to receiver 3144 and 200 m to 1703 Old Renmark Road	Yes – The proposed works would include installation of a piped connection between the pump station and the proposed Wentworth construction compound and accommodation camp	Minimal due to distance to receiver.
690 Pomona Road, Pomona	Existing	10 m to 690 Pomona Road	No – No new infrastructure would be required to allow for access to this water supply point.	Negligible from construction activities.

2.4 MAIN CONSTRUCTION COMPOUND AND ACCOMMODATION CAMP SITES

Section 5.1.4 of Technical paper 8 discusses the impacts of the main construction compounds and accommodation camps and access.

2.4.1 WENTWORTH MAIN CONSTRUCTION COMPOUND AND ACCOMMODATION CAMP SITE

2.4.1.1 OVERVIEW

Section 5.1.4 of Technical paper 8 noted that an assessment for the Wentworth main construction compound and accommodation camp site would be conducted once the site has been confirmed, and necessary approvals obtained. The location for the construction compound and accommodation camp site has now been confirmed as being on the northern side of Renmark Road, around 17 kilometres west of the township of Wentworth.

Similar to the sites described in the EIS, the Wentworth construction compound and accommodation camp would provide a range of facilities including:

- staging and laydown facilities
- concrete batching plants
- workforce accommodation camp areas
- demountable offices for up to around 50 workers
- construction support facilities including vehicle and equipment storage, maintenance sheds, chemical/ fuel stores and potential stockpile areas.
- parking for up to around 190 light vehicles, 45 heavy vehicles and five 20–seat buses
- other worker facilities such as food and catering facilities, fitness and recreational facilities (such as indoor and outdoor recreational spaces, gymnasium areas), first aid facilities and telecommunication services for personal use.

The proposed location for the Wentworth construction compound and accommodation camp site is shown in Figure 2.2. This site is located approximately 680 metres from the nearest previously identified sensitive receiver (3144), 570 metres from the Fort Courage Caravan Park, and approximately 570 metres from short stay holiday accommodation and a residence west of the Caravan Park. The access road extends to 320 metres,220 metres and 260 metres respectively of these receivers.

The accommodation camp would house around 200 workers. As discussed in Section 2.2, it is also proposed to construct wastewater treatment facilities at Wentworth construction compound and accommodation camp site.

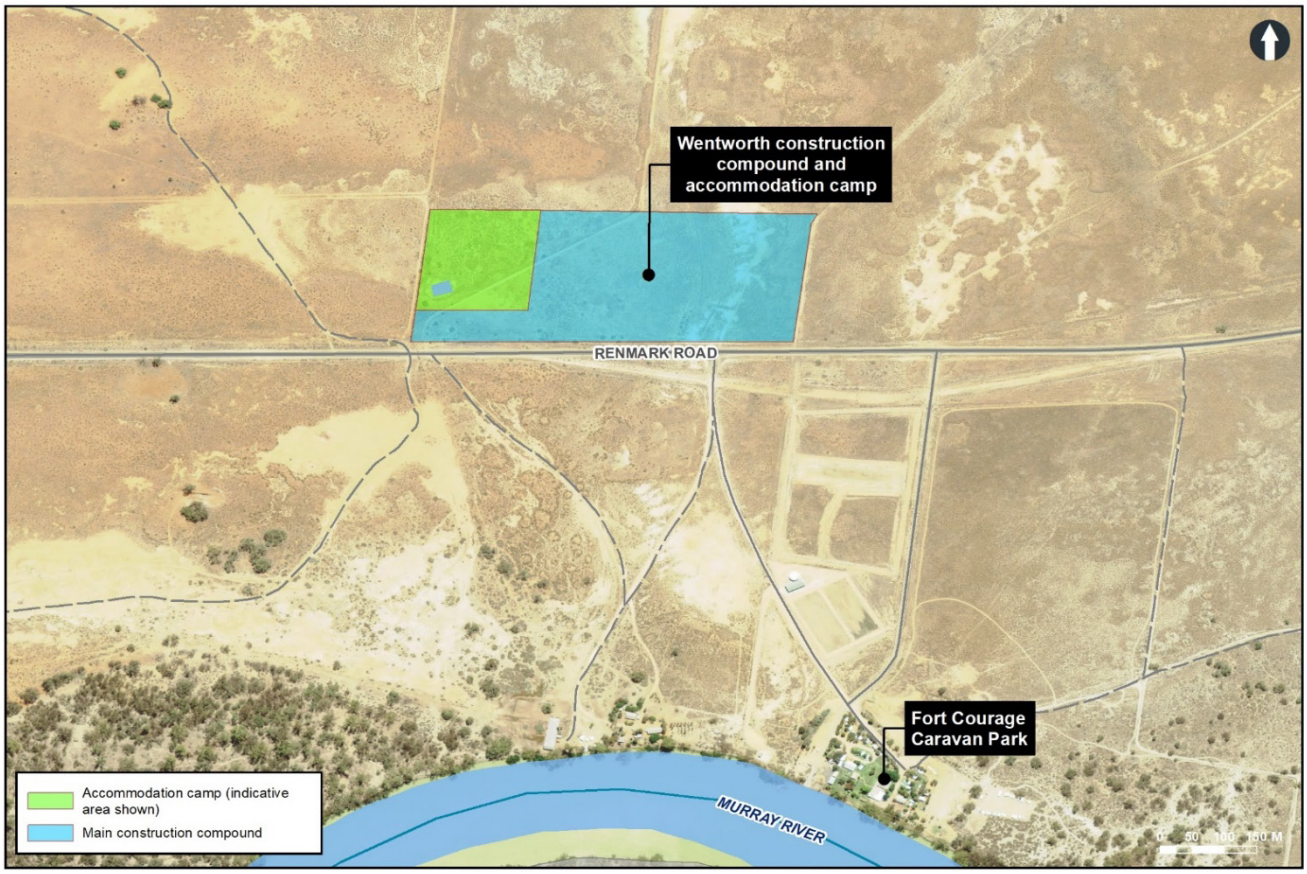

Figure 2.2 Proposed Wentworth construction compound and accommodation camp site location

2.4.1.2 POTENTIAL IMPACTS

Consistent with the methodology of Technical paper 8, noise levels the construction works at main construction compounds and accommodation camps have been predicted to the nearest receiver during standard hours of work and out-of-hours work (OOHW) periods.

The closest receivers to the Wentworth main construction compound and accommodation camp is approximately 570 metres from the site. The results of this assessment are presented in Table 2.4.

Table 2.4 Predicted noise level ranges per construction work phase – main construction compound and accommodation sites – Wentworth

CONSTRUCTION WORK PHASE	PERIOD[1]	ICNG NML, $L_{eq\ 15\ min}$ dBA[2]	PREDICTED NOISE LEVELS, $L_{eq\ 15\ min}$ dBA	EXCEEDANCE OF ICNG NMLS, $L_{eq\ 15\ min}$ dBA	HIGHLY NOISE AFFECTED NML 75dBA OR GREATER $L_{eq\ 15min}$
Enabling works	SH Day	45	Up to 39	–	–
	OOHW D	40		–	–
	OOHW E/N	35		Up to 4	–
Enabling works – site establishment of the compound and accommodation camp	SH Day	45	Up to 48	Up to 3	–
	OOHW D	40		Up to 8	–
	OOHW E/N	35		Up to 13	–

CONSTRUCTION WORK PHASE	PERIOD[1]	ICNG NML, $L_{eq\ 15\ min}$ dBA[2]	PREDICTED NOISE LEVELS, $L_{eq\ 15\ min}$ dBA	EXCEEDANCE OF ICNG NMLS, $L_{eq\ 15\ min}$ dBA	HIGHLY NOISE AFFECTED NML 75dBA OR GREATER $L_{eq\ 15min}$
Operation of the compound	SH Day	45	Up to 39[3]	–	–
	OOHW D	40[3]		–	–
	OOHW E/N	35[3]		–	–
Operation of the accommodation camp(4)	SH Day	45	Up to 35	–	–
	OOHW D	40		-	–
	OOHW E/N	35		-	–
Demobilisation / rehabilitation	SH Day	45	Up to 43	–	–
	OOHW D	40		Up to 3	–
	OOHW E/N	35		Up to 8	–

(1) SH Day = recommended standard working hours, OOHW E/N = outside of recommended standard hours work as defined in Section 5.2 of Technical paper 8.

(2) ICNG NMLs defined in Section 5.2 of Technical paper 8.

(3) Works outside standard hours to be conducted in accordance with the OOHW protocol for night works

(4) The accommodation camp would operate 24 hours, seven days a week and would not be subject to OOHW protocols.

Based on the distances to the nearest sensitive receiver, adverse impacts during construction are not anticipated during Standard Hours, nor the operation of the accommodation camps. However, out of hours works are likely to result in exceedances of NMLs for the majority of construction stages associated with compound.

Noise generating equipment associated with the operation of the accommodation camps is anticipated to include the use of generators and other mechanical plant, it is considered that any impacts associated with these activities could be managed by the appropriate siting of equipment, equipment selection and screening. Activities would occur 24 hours a day and would not be subject to OOHW protocols.

This is due to the use of acoustically signification plant such as:

- during enabling works and site establishment geotechnical boring rigs, dozers, and excavators.
- demobilisation: excavators, cranes and dumper trucks

Further assessment of the level of these exceedances, the affected receiver and recommended mitigation measures are presented in Section 4. It is noted the sensitive receivers identified are associated with the same caravan park which may contain permanent residents, as well as short stay holiday accommodation and a residence, and it is recommended that mitigation and management be implemented during out of hours works.

2.4.2 ANABRANCH SOUTH ACCOMMODATION CAMP SITE

2.4.2.1 OVERVIEW

The Anabranch South accommodation camp site would no longer be required as a result of the changes to the construction accommodation strategy for the proposal.

The Anabranch South construction compound site would however be retained as an ancillary construction site to allow for activities such as laydown areas, vehicle and equipment storage, maintenance sheds, potential stockpile areas, and demountable offices and parking (for up to around 10 staff).

2.4.2.2 POTENTIAL IMPACTS

As discussed in Section 5.2.2.2 of Technical paper 8, construction noise and vibration impacts for the Anabranch South compound areas are located within the proposal study area. The nearest receivers to the previously assessed Anabranch South and accommodation camp site are approximately 1.8 kilometres from the proposed site boundary. Noise levels were predicted to be less than 30 dBA as a result of activities, including accommodation camp activities. These levels would be reduced further as a result of removal of accommodation camp activities.

2.5 TEMPORARY BYPASS TRANSMISSION LINE

2.5.1 OVERVIEW

Section 6.6.4 of the EIS provided an overview of the general construction methodology for the transmission line towers. this methodology was considered appropriate for the upgrade of the existing TransGrid 220kV transmission line (known as line 0X1) between Buronga substation and the NSW/Victoria border to a new 220kV transmission line.

In order to minimise the disturbance footprint during the construction of 0X1 transmission line, an option to construct and operate a temporary bypass has been identified as part of the ongoing development of the construction methodology following appointment of the preferred construction contractor.

The proposed bypass line would consist of around 6.5 kilometres of temporary transmission line and around 60 supporting transmission line poles (around 18 metres in height).

The bypass line would commence from the existing Buronga substation and travel in a south east direction parallel to the eastern side of the existing 220kV single circuit transmission line (between the 220kV single circuit and the existing X3 220kV). The alignment for the proposed bypass line is shown in Figure 2.3.

The bypass line would have an offset of around 25 metres from both the existing 220kV transmission lines.

2.5.2 POTENTIAL IMPACTS

The proposed temporary bypass line is located within the impact affectation area assessed in Technical paper 8, and proposed amendments are generally within the worst-case noise affectation area modelled as part of that paper. As a result, impacts predicted in Technical paper 8 are predicted to be largely unchanged as a result of the temporary bypass transmission line.

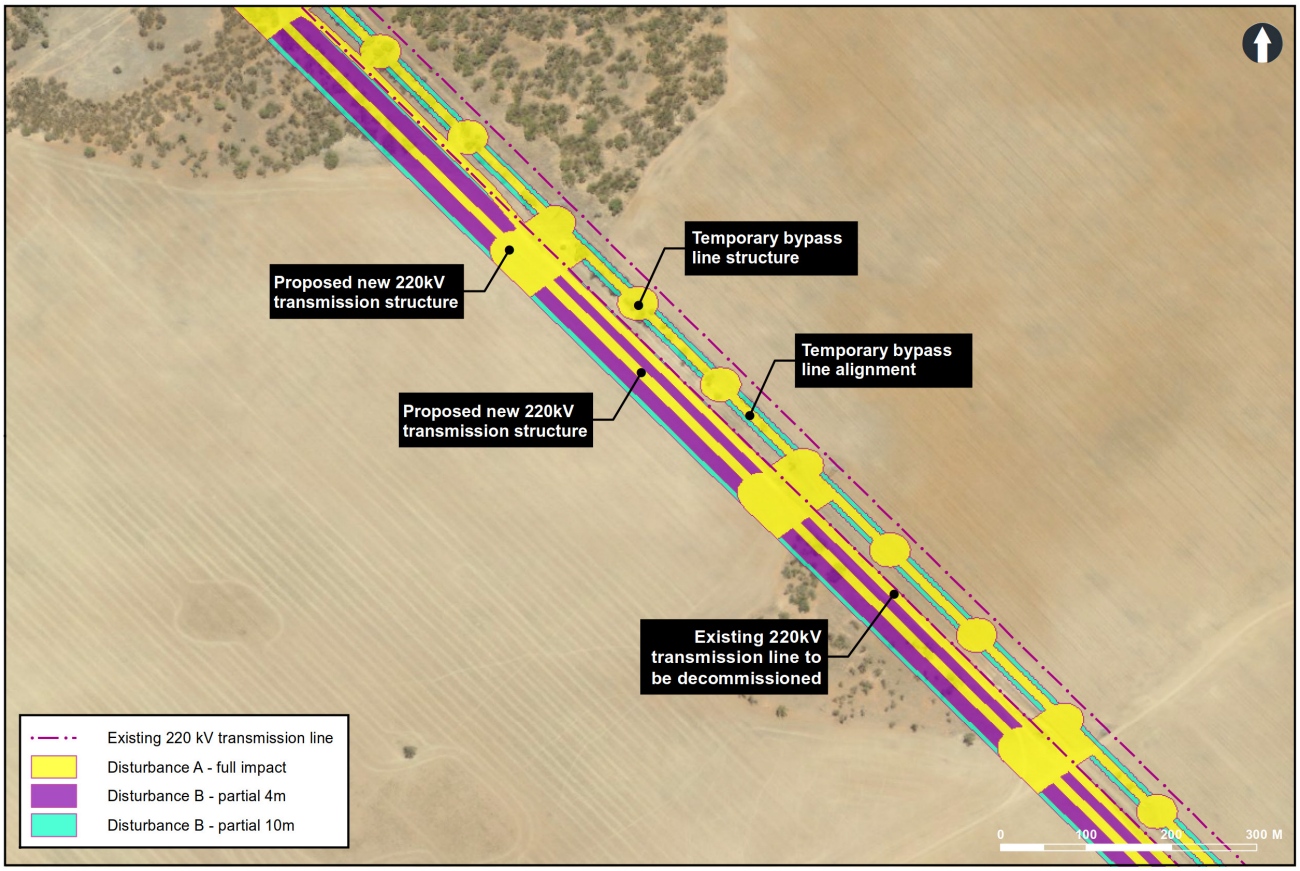

Figure 2.3 Overview of the proposed 220kV temporary bypass line

2.6 CONSTRUCTION TRAFFIC VOLUMES

2.6.1 OVERVIEW

As discussed in Section 5.4 of Technical paper 8, a peak of 250 light vehicle movements and 80 heavy vehicle movements per day was anticipated for construction of the proposal.

2.6.2 AMENDMENTS

Following development of the construction strategy, an increase in overall traffic volumes was identified due to:

- the overall increase in construction workforce for the proposal from 400 to 600 FTE
- increased clarity on the heavy vehicle volumes required to support transmission line works and the substation upgrade and expansion, including:
  - the amount of materials being delivered to site from the nominated port(s) as well as material being transported from the construction compound(s) to sites along the transmission line alignment
  - peak activities that would occur concurrently. This would include tower foundations and tower assembly, specifically concrete trucks to backfill tower leg foundations, and crane trucks to off load tower steel to site.

A comparison of indicative vehicle movements between those exhibited in the EIS and the proposed revised vehicle movements is presented in Table 2.5.

Table 2.5 Comparison of indicative vehicle movements – exhibited EIS and revised movement

VEHICLE TYPE	PHASE	INDICATIVE VEHICLE MOVEMENTS DURING CONSTRUCTION (EXHIBITED EIS) [1, 2]	INDICATIVE VEHICLE MOVEMENTS DURING CONSTRUCTION (REVISED) [1, 2]
Buronga substation upgrade and expansion site			
Light vehicles	Indicative daily movements (typical day)	50	80
Light vehicles	Maximum daily movements (critical/peak construction period)	100	200
Heavy vehicles	Indicative daily movements (typical day)	15	40
Heavy vehicles	Maximum daily movements (critical/peak construction period)	80	200[3]
Transmission line works			
Light vehicles	Indicative daily movements (typical day)	67	200
Light vehicles	Maximum daily movements (critical/peak construction period)	150	300
Heavy vehicles	Indicative daily movements (typical day)	15	100
Heavy vehicles[3]	Maximum daily movements (critical/peak construction period)	30	200

(1) Indicative daily movements based on current program of works (as at the time of the EIS and following identification of the nominated construction contractor respectively). These numbers are an average and there would be days of increased peak activities (or decreased activities) which may impact these average/indicative numbers.

(2) Vehicle movements are each way (i.e. a heavy/light vehicle arriving and leaving a site within a day counts as two movements).

(3) 300 movements would occur should the material earthworks described in section 2.2 of the Amendment Report not proceed.

Further to the above amendments, upon more detailed investigation into the traffic routes and more detailed investigation into affected receivers, the distances to nearest affected residences previously adopted have been refined to reflect the nearest identified receiver on each traffic route. These corrections have been incorporated into the revised assessment.

2.6.3 POTENTIAL IMPACTS

The methodology presented in Section 5.5 of the Technical paper 8 have been modified to reflect the modified construction traffic volumes outlined in this report. The assessment has been conducted assuming peak hour volumes to provide a conservative estimate of potential noise impact. The revised traffic volumes would generate a peak of 200 light vehicle movements per day and 200 heavy vehicle movements per day on the road network for vehicles affected by the Buronga substation works. Transmission line works would see peak vehicle movements of 300 light vehicles and 200 heavy vehicle movements per day. Table 2.6 presents the construction traffic noise assessment for the proposal on the key haulage routes adopting traffic volumes for the transmission line works, being the more conservative assumption for the purpose of this assessment. It presents the results of the assessment as exhibited and as amended.

As noted previously, since the exhibition of the EIS some refinements have been made to the distances to receivers provided in Table 2.6; these have been incorporated into this assessment to facilitate comparison with EIS findings. The corrections to the distances have not altered the relative increase in road traffic noise as presented in the EIS, but have increased the prediction of the traffic noise levels at the receiver, both with and without the proposal. These refinements do not change the conclusions in the exhibited EIS concerning the proposal-related construction road traffic noise levels against the applicable NSW Road Noise Policy (RNP) (NSW Department of Environment, Climate Change and Water, 2011) noise management level.

Table 2.6 Predicted road traffic noise levels and impacts – Addendum traffic volumes

ROAD NAME AND LOCATION	DISTANCE TO NEAREST RECEIVER (METRES)[2]	RNP CLASSIFICATION	RNP MANAGEMENT LEVELS[1]	PREDICTED NOISE LEVEL OF BASE TRAFFIC, dBA	EXHIBITED PROPOSAL		AMENDED PROPOSAL		
					PREDICTED NOISE LEVEL OF BASE TRAFFIC WITH CONSTRUCTION TRAFFIC, dBA	INCREASE IN NOISE LEVEL GENERATED BY CONSTRUCTION TRAFFIC, dB	PREDICTED NOISE LEVEL OF BASE TRAFFIC WITH CONSTRUCTION TRAFFIC, dBA	INCREASE IN NOISE LEVEL GENERATED BY CONSTRUCTION TRAFFIC, dB	COMPLIANT WITH RNP MANAGEMENT LEVEL?
Silver City Highway (B79). Ellerslie – between Broken Hill and Wentworth (from Broken Hill to Renmark Road, Wentworth)	60 (1000)	Sub–arterial	60	45 (29)	48 (32)	2.9	50	5.5	YES
Silver City Highway (B79). Wentworth Town Centre (from Renmark Road, Wentworth to Delta Road in Wentworth)	20 (100)	Sub–arterial	60	55 (47)	56 (48)	0.5	57	1.6	YES
Silver City Highway (B79).– between Dareton and Buronga (from Fletchers Lake Road to Corbett Avenue)	20 (100)	Sub–arterial	60	58 (50)	59 (50)	0.7	60	1.6	YES

ROAD NAME AND LOCATION	DISTANCE TO NEAREST RECEIVER (METRES)[2]	RNP CLASSIFICATION	RNP MANAGEMENT LEVELS[1]	PREDICTED NOISE LEVEL OF BASE TRAFFIC, dBA	EXHIBITED PROPOSAL		AMENDED PROPOSAL		
					PREDICTED NOISE LEVEL OF BASE TRAFFIC WITH CONSTRUCTION TRAFFIC, dBA	INCREASE IN NOISE LEVEL GENERATED BY CONSTRUCTION TRAFFIC, dB	PREDICTED NOISE LEVEL OF BASE TRAFFIC WITH CONSTRUCTION TRAFFIC, dBA	INCREASE IN NOISE LEVEL GENERATED BY CONSTRUCTION TRAFFIC, dB	COMPLIANT WITH RNP MANAGEMENT LEVEL?
Silver City Highway (B79). within Buronga Town Centre (from Corbett Avenue to Sturt Highway)	20	Sub–arterial	60	59	59	0.2	59	0.8	YES
Sturt Highway (A20) George Chaffey Bridge – between Mildura and Silver City Highway, Buronga	20	Sub–arterial	60	64	64	0.1	65	0.4	YES
Sturt Highway (A20) within Buronga (between Silver City Highway and Knights Road in Gol Gol)	20	Sub–arterial	60	56	56	0.5	57	1.5	YES

ROAD NAME AND LOCATION	DISTANCE TO NEAREST RECEIVER (METRES)[2]	RNP CLASSIFICATION	RNP MANAGEMENT LEVELS[1]	PREDICTED NOISE LEVEL OF BASE TRAFFIC, dBA	EXHIBITED PROPOSAL		AMENDED PROPOSAL		
					PREDICTED NOISE LEVEL OF BASE TRAFFIC WITH CONSTRUCTION TRAFFIC, dBA	INCREASE IN NOISE LEVEL GENERATED BY CONSTRUCTION TRAFFIC, dB	PREDICTED NOISE LEVEL OF BASE TRAFFIC WITH CONSTRUCTION TRAFFIC, dBA	INCREASE IN NOISE LEVEL GENERATED BY CONSTRUCTION TRAFFIC, dB	COMPLIANT WITH RNP MANAGEMENT LEVEL?
Arumpo Road (north of Mourquong Road, Mourquong)	30 (100)	Sub–arterial	60	47 (41)	50 (44)	2.6	53	5.5	YES
Renmark Road	70 (800)	Sub–arterial	60	38 (24)	45 (31)	7.1	49	11.0	YES

(1) Day 7 am – 10 pm, night 10 pm – 7am.

(2) Distances have been refined following exhibition of the proposal; distances to nearest affected residences previously adopted have been refined to reflect the nearest identified receiver on each traffic route. The distances and corresponding noise levels as identified in the exhibited EIS is provided in brackets.

The results in Table 2.6 indicate that construction road traffic noise levels as a result of the amended proposal are predicted to comply with relevant RNP noise criteria at all proposal affected roads. However, there would be a general increase in the noise contribution from construction vehicles along all assessed roads when compared to the exhibited proposal. As outlined in the table, noise level increases are predicted to be generally limited to below 2 dB on sub–arterial roads. The exception to this would be on the Silver City Highway, Arumpo Road and Renmark Road. As noted previously, the impacts of this assessment are considered to be conservative using peak hour volumes, whereas actual construction generation would fluctuate over the course of the day and according to the construction program.

The Silver City Highway (between Broken Hill to Perry Street) is expected to experience nearly a doubling in traffic volumes. However, noise impacts are still predicted to be below road noise criteria due to existing low levels of traffic.

Regional roads such as Arumpo Road and Renmark Road are predicted to experience notable increases in traffic noise levels as a result of the amended construction traffic volumes, with increases of 5.5 dB and 11.0 dB respectively. This would be a further increase of around 3 – 4 dB when compared to the exhibited proposal. While this would be an increase in potential impact, the noise levels would remain below the applicable RNP management level for these roads.

The amended proposal would also increase the contribution of road traffic noise on the Sturt Highway (between Mildura and Silver City Highway, Buronga), with a predicted increase in noise level by 0.4 dB. However, as highlighted in the EIS, the existing noise levels are in the order of 64 dBA at receivers in the vicinity of this road, which exceeds the applicable RNP management level. However, as the contribution from the amended proposal is less than 2 dB, no additional mitigation is required.

Mitigation measure NV5 identified the requirement to examine all feasible and reasonable noise measures to manage traffic noise impacts in public roads where exceedances above 2dB are identified. This measure would apply to address the impacts to receivers along the Silver City Highway (Broken Hill to Perry Street), Arumpo Road and Renmark Road (refer to Section 4).

With respect to vehicle movements associated with water supply points, the impacts of additional traffic on these roads is anticipated to be negligible due to the low number of vehicle movements associated with these works in the context of other vehicle movements on these roads.

Consistent with Technical paper 8, the impacts of construction traffic have not been assessed on local roads due to the lack of existing traffic volumes on these roads, however it is likely that local roads would not be used by construction traffic due to heavy vehicle route limitations.

2.7 CONSTRUCTION VIBRATION

Section 5.3.5 of Technical paper 8 summarises the relevant minimum working distances for certain vibration generating activities with regard to cosmetic damage and human comfort impacts outlined in relevant guidelines.

The nearest sensitive receiver to the Buronga substation upgrade and expansion works is approximately 2.3 kilometres from the site. As a result, no vibration related impacts are anticipated as a result of construction works at the substation.

With regard to the transmission line construction affectation area, the nearest sensitive receivers to the works are the Buronga and Ellerslie substation facilities, located within approximately 70 metres of the construction footprint. As a result, there may be exceedances of human comfort criteria within the facilities themselves, however vibration levels are expected to remain below the levels for building damage. Given the active roles of most staff at these sites, human comfort impacts are expected to be minor. All other sensitive receivers are located outside the minimum safe working distances for vibration generating plant.

As discussed in Section 5.3.5.1 of Technical paper 8, no works are proposed within the minimum working distances for cosmetic damage, human response and heritage sensitivity, based on the assessment of the safe working distances for vibration generating plant within the transmission line corridor to relevant vibration sensitive receivers. Based on the amended proposal, it is anticipated that impacts as a result of the revised indicative disturbance area are likely to be consistent with those identified previously in Technical paper 8.

3 ASSESSMENT OF OPERATIONAL IMPACTS

This section presents the assessment of operational noise and traffic noise associated with the proposal. Relevant noise goals are outlined in the NPfI.

3.1 BURONGA SUBSTATION LAYOUT

As discussed in Section 2.1, the overall footprint of the Buronga substation upgrade and expansion has been reduced from the area shown in the EIS. The amendment results in a decrease in the overall footprint of the proposed substation upgrade and expansion by around 11.9 hectares to 21.6 hectares (from 33.5 hectares in the EIS), with the revised affectation area limited to 470 metres by 630 metres at its the greatest extents.

The impacts of this amendment would see a reduction in the potential noise impact at the nearest sensitive receivers. With reference to Section 6.1.5 of Technical paper 8, operational noise levels were predicted to comply with relevant noise limits under calm and noise enhancing meteorological conditions.

Noise impacts will be further reduced as a result of the amendments due to the reduction in the footprint.

3.2 TRANSMISSION LINE

Operational transmission line impacts are not anticipated as a result of these amendments. Noise impacts would therefore be unchanged from Technical paper 8.

3.3 TRAFFIC NOISE

Operational road traffic noise impacts are not anticipated as a result of these amendments. Noise impacts would therefore be unchanged from Technical paper 8.

4 MANAGEMENT AND MITIGATION ASSESSMENT

4.1 CONSTRUCTION NOISE

Based on the assessment of amendments outlined in this report, it is anticipated that, in general, noise mitigation measures would remain consistent with Technical paper 8. The exception would be the requirement for mitigation during out of hours works at Wentworth construction compound and accommodation camp.

4.1.1 MANAGEMENT AND MITIGATION OF WENTWORTH CONSTRUCTION COMPOUND AND ACCOMMODATION CAMP

As discussed in Section 2.4.1.2, the acoustically significant plant causing exceedances of NMLs include:

- during enabling works and site establishment geotechnical boring rigs, dozers, and excavators
- demobilisation: excavators, cranes and dumper trucks.

Due to the localised nature of the construction activities associated with the Wentworth construction compound, and the low number of receivers potentially impacted by the works, it is considered that the implementation of a number of site-specific measures and scheduling controls should be sufficient to reduce noise levels to comply with relevant noise goals during out of hours periods.

Mitigation measure NV3 requires the investigation and implementation of feasible and reasonable measures or construction methodologies to minimise noise levels during construction. This measure will be amended to include accommodation camps with respect to the consideration of proposed layouts of the camp in addition to the construction compounds to minimise noise levels at sensitive receivers. Mitigation measure NV4 would also apply to the Wentworth main construction compound , which also requires further engagement with affected receivers to understand any preferences for mitigation and management measures where exceedances of noise management levels are predicted.

All out of hours works should be conducted in line with the Out of Hours Works protocol required by mitigation measure NV6.

4.2 CONSTRUCTION VIBRATION

Based on the assessment of amendments outlined in this report, it is anticipated that noise mitigation measures would remain consistent with Technical paper 8.

4.3 CONSTRUCTION TRAFFIC

Based on the assessment of amendments outlined in this report, it is anticipated that noise mitigation measures would remain consistent with Technical paper 8.

4.4 OPERATIONS

Based on the assessment of amendments outlined in this report, it is anticipated that noise mitigation measures would remain consistent with Technical paper 8.

5 CONCLUSION

5.1 CONSTRUCTION IMPACTS

Impacts as a result of the proposed amendments have been assessed compared to previous findings. Due to the conservative approach adopted as part of Technical paper 8, which considered a worst case noise affectation area to allow for flexibility in design, the majority of proposed amendments are contained to within the previously assessed noise affectation area. As a result the majority of the amendments are likely to result in minimal changes compared to the results of Technical paper 8.

The findings of this assessment can be summarised as follows:

- Buronga substation earthworks – impacts are negligible compared to previous findings; crushing and screening activities not expected to generate adverse impact at nearest receivers
- amended indicative disturbance areas – impacts largely unchanged compared to previous findings
- onsite wastewater treatment – impacts will be minimal due to distances to receivers and can be managed by appropriate equipment selection; construction impacts will be negligible compared to other construction activities
- construction water supply – impacts negligible where existing infrastructure is present, and impacts minimal due to significant offsets where new infrastructure is required
- construction compound and accommodation camp sites
  - Wentworth – construction activities during Standard Hours will comply with relevant criteria at nearest sensitive receivers, exceedances predicted at three receivers during out of hours works
  - Anabranch South – noise levels would reduce as a result of amendments
- temporary bypass – impacts contained within previously assessed transmission line corridor
- construction traffic impacts largely consistent with Technical paper 8, with noticeable changes on some roads consistent with previous findings. No significant changes are anticipated as a result of the amendments, therefore additional mitigation measures are not proposed
- vibration impacts are likely to be consistent with Technical paper 8.

5.2 OPERATIONAL IMPACTS

Operational impacts from the proposed amendments were found to be negligible or be reduced as a result of the proposal when compared to the findings of Technical paper 8.

5.3 MITIGATION MEASURES

Mitigation measures identified as a result of the amendments are largely consistent with Technical paper 8. Mitigation measures have been recommended for sensitive receivers near the Wentworth construction compound and accommodation camp as a result of the amendments, consistent with measures presented in Technical paper 8.

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 September 2019 and agreement with the Client dated 31 October 2020 (Agreement) and as agreed under variations up to March 2021.

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).

6.2 QUALIFICATIONS AND ASSUMPTIONS

The services undertaken by WSP in preparing this Report were limited to those specifically detailed in the Report and are subject to the scope, qualifications, assumptions and limitations set out in the Report or otherwise communicated to the Client.

Except as otherwise stated in the Report and to the extent that statements, opinions, facts, conclusion and/or recommendations in the Report (Conclusions) are based in whole or in part on information provided by the Client and other parties identified in the report (Information), those Conclusions are based on assumptions by WSP of the reliability, adequacy, accuracy and completeness of the Information and have not been verified. WSP accepts no responsibility for the Information.

WSP has prepared the Report without regard to any special interest of any person other than the Client when undertaking the services described in the Agreement or in preparing the Report.

6.3 USE AND RELIANCE

This Report should be read in its entirety and must not be copied, distributed or referred to in part only. The Report must not be reproduced without the written approval of WSP. WSP will not be responsible for interpretations or conclusions drawn by the reader. This Report (or sections of the Report) should not be used as part of a specification for a project or for incorporation into any other document without the prior agreement of WSP.

WSP is not (and will not be) obliged to provide an update of this Report to include any event, circumstance, revised Information or any matter coming to WSP's attention after the date of this Report. Data reported and Conclusions drawn are based solely on information made available to WSP at the time of preparing the Report. The passage of time; unexpected variations in ground conditions; manifestations of latent conditions; or the impact of future events (including (without limitation) changes in policy, legislation, guidelines, scientific knowledge; and changes in interpretation of policy by statutory authorities); may require further investigation or subsequent re-evaluation of the Conclusions.

This Report can only be relied upon for the Permitted Purpose and may not be relied upon for any other purpose. The Report does not purport to recommend or induce a decision to make (or not make) any purchase, disposal, investment, divestment, financial commitment or otherwise. It is the responsibility of the Client to accept (if the Client so chooses) any Conclusions contained within the Report and implement them in an appropriate, suitable and timely manner.

In the absence of express written consent of WSP, no responsibility is accepted by WSP for the use of the Report in whole or in part by any party other than the Client for any purpose whatsoever. Without the express written consent of WSP, any use which a third party makes of this Report or any reliance on (or decisions to be made) based on this Report is at the sole risk of those third parties without recourse to WSP. Third parties should make their own enquiries and obtain independent advice in relation to any matter dealt with or Conclusions expressed in the Report.

6.4 DISCLAIMER

No warranty, undertaking or guarantee whether expressed or implied, is made with respect to the data reported or the Conclusions drawn. To the fullest extent permitted at law, WSP, its related bodies corporate and its officers, employees and agents assumes no responsibility and will not be liable to any third party for, or in relation to any losses, damages or 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.

ABOUT US

WSP is one of the world's leading engineering professional services consulting firms. We are dedicated to our local communities and propelled by international brainpower. We are technical experts and strategic advisors including engineers, technicians, scientists, planners, surveyors, environmental specialists, as well as other design, program and construction management professionals. We design lasting Property & Buildings, Transportation & Infrastructure, Resources (including Mining and Industry), Water, Power and Environmental solutions, as well as provide project delivery and strategic consulting services. With approximately 50,000 talented people globally, we engineer projects that will help societies grow for lifetimes to come.

wsp