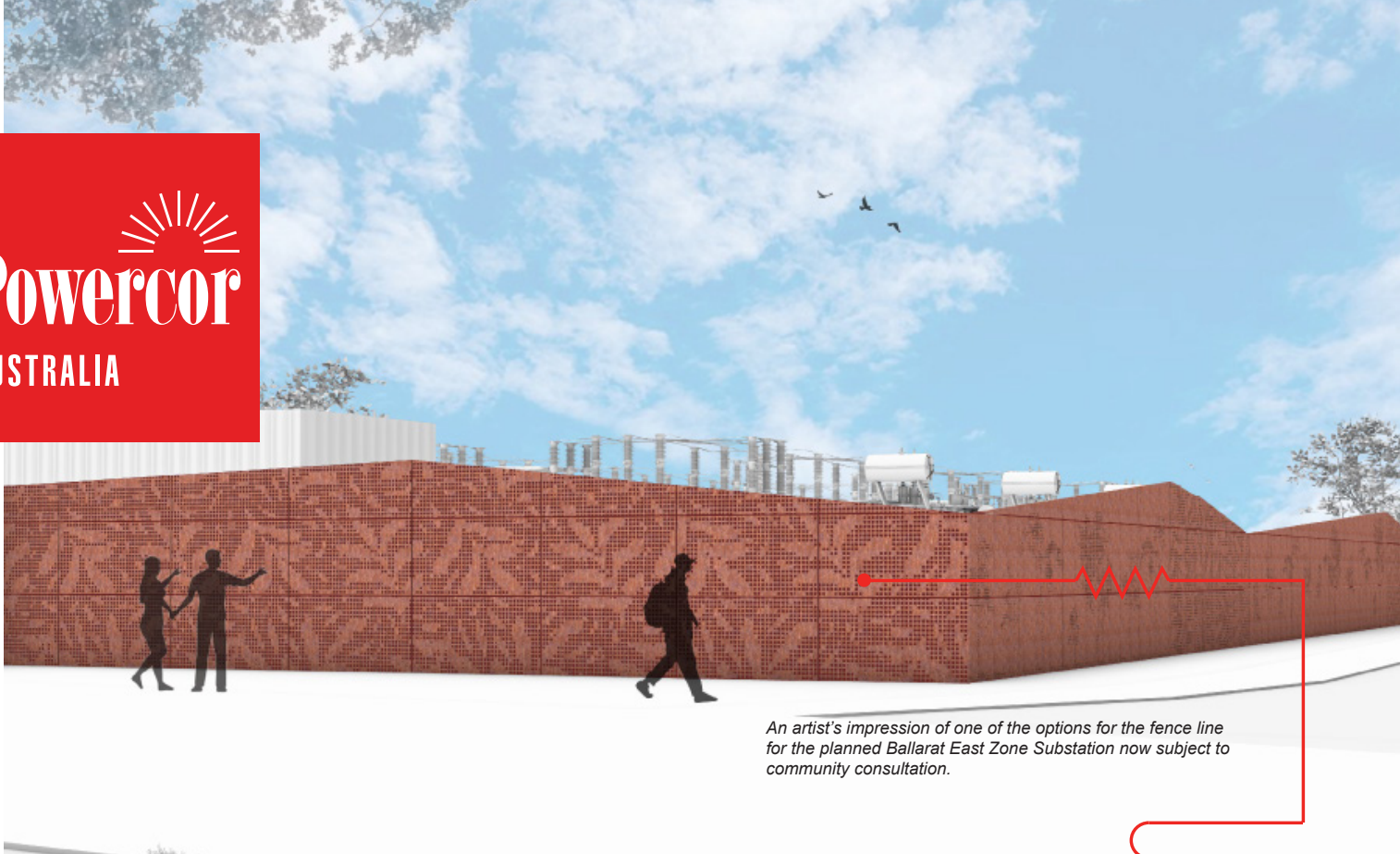




An artist's impression of one of the options for the fence line for the planned Ballarat East Zone Substation now subject to community consultation.

Ballarat East Zone Substation Noise Report

Actions taken to ensure unreasonable noise is not generated by the Ballarat East Zone Substation have been informed by studies by leading independent noise and vibration consulting firm, Watson Moss Growcott Acoustics (WMG).

The zone substation is planned to be developed at 203 York Street Ballarat East. The most likely sources of noise from this facility are the transformer and ventilation fans. It is through the transformer that electricity flows and the voltage is reduced which is the main role of the zone substation.

To examine the potential impact of this noise, WMG:

- undertook a baseline study to measure the current noise experienced around the development site
- proposed noise limits based on day, evening and night time periods
- conducted noise monitoring at the fully operational Torquay Zone Substation which is of a similar size and design to the planned Ballarat East facility
- developed a detailed model to predict the level of noise to be emitted by the new zone substation in Ballarat East.

The WMG report predicts that noise from the new zone substation will be below current baseline levels of ambient noise and will be within targeted noise limits under Environment Protection Authority (EPA) guidelines.

Legislative objectives

In the interests of both human health and the environment, the *Environment Protection Act 2017* focuses on the prevention of pollution impacts including noise. Under this Act, we must not emit an unreasonable noise from the zone substation and must minimise the risk of noise pollution as far as reasonably practicable.

Residential community needs respected

Because the York Street site is within an established residential community, the WMG study was designed to assess noise at different times of the day as shown in table 1.

Within these periods, the modelling considered the extent to which noise might impact on:

- sleep during the night
- domestic and recreational activities
- normal conversation
- child learning and development
- human tranquility and enjoyment outdoors in natural areas (for example, in Warranheip Gully Reserve to the east of the development site)
- musical entertainment.

Table 1. Environment Protection Authority Assessment Periods

EPA Assessment Period	Relevant days	Relevant time periods
Day	Monday to Saturday	7:00am to 6:00pm
Evening	All days Sunday, public holidays	6:00pm to 10:00pm 7:00am to 6:00pm
Night	All days	10:00pm to 7:00am

Table 2. Noise Protocol Noise Limits

EPA Assessment Period	Noise Protocol Noise Limits
Day	51 dB (A)
Evening	45 dB (A)
Night	40 dB (A)

What is a decibel measuring?

We measure sound intensity (also referred to as sound power or sound pressure) in units called decibels. Decibels (dB) are named in honour of Alexander Graham Bell, the inventor of both the telephone and the audiometer. An audiometer is a device that measures how well a person can hear certain sounds.

Background noise established

WMG installed a fixed monitoring device that tracked noise continuously for a week, and used other monitors to measure current noise levels at various locations within and near the site boundaries.

The main noise currently in the area is from vehicles travelling along nearby and distant roads, and birds and insects during the evening and night time periods.

Based on this ambient background noise, WMG calculated noise limits that must be met at the boundary to abutting and adjacent homes around the zone substation site shown in the map below.

Torquay comparison measured

The Torquay Zone Substation was selected for comparison because the two new transformers there are similar in specifications to those planned for Ballarat East. Noise monitoring undertaken in Torquay by WMG in 2021 and 2022, both before and after this site was commissioned, provides valuable insights into actual noise levels from the transformers.

Map showing the location of properties where the Noise Protocol Noise Limits must be met.



Ballarat East site designed for safety

Planning for the zone substation includes three key actions to minimise the risk of noise pollution:

1. the type of transformers selected have low sound power levels
2. the position of the transformers is as far as possible from the nearest homes
3. the transformers will be enclosed on three sides by solid masonry barriers with 100mm thick sound absorbing materials.

Initially, only one transformer will be constructed in this zone substation. A second may be added in the future as demand for electricity in Ballarat and surrounding areas continues to rise.

Ballarat East model complies with noise limits

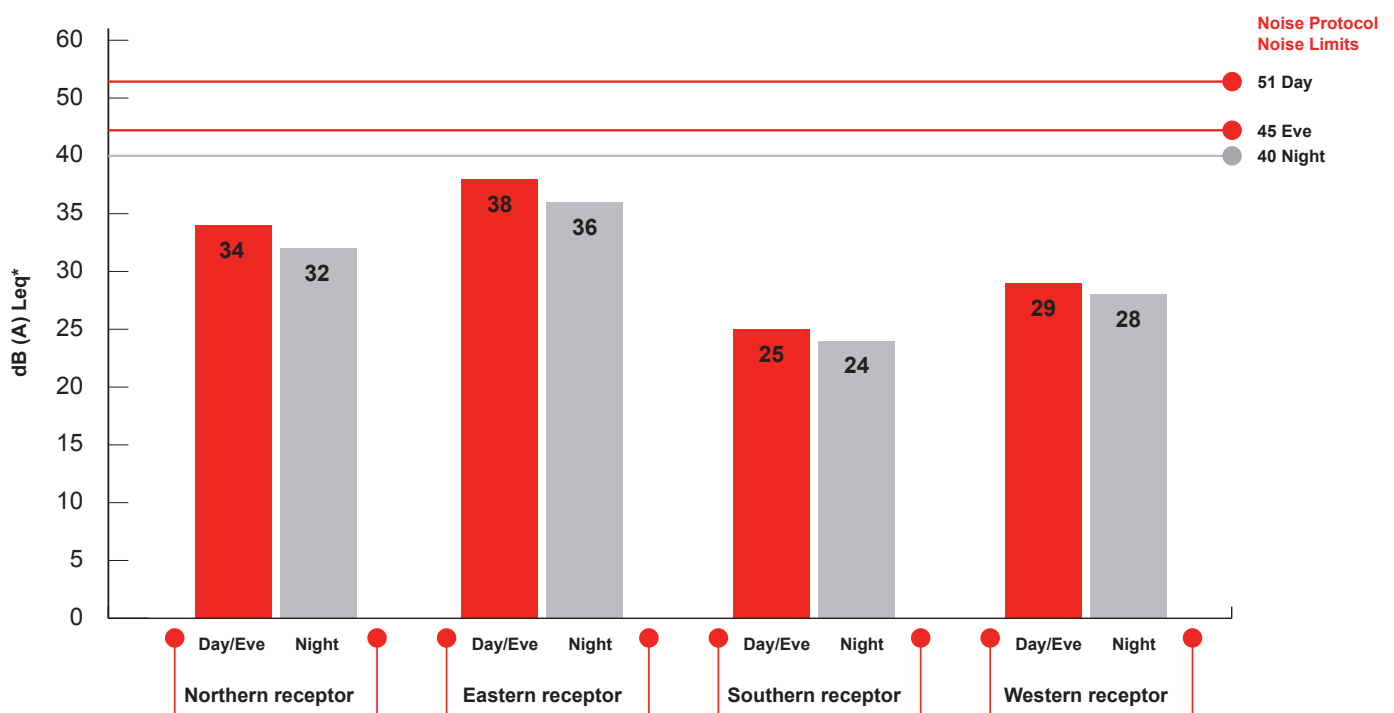
The noise model developed by WMG considers a wide range of factors including the results of these studies, the natural land heights on the site, and the location of surrounding homes. The modelling has also included a contingency of 5 decibels in case of any variation in site or weather conditions.

The WMG model shows that even without barriers around the transformers, noise from the Ballarat East Zone Substation will be well within the targeted limits. The acoustic barriers make a difference to the direction of noise away from homes on the western boundary and so help minimise the risk of noise pollution.

For full transparency, the results are shown in the graph below.

The WMG study predicts noise emissions will be well within the standard limits for residential areas. More monitoring will be conducted once the new zone substation is commissioned to compare the actual results with this forecast.

Graph. Noise assessment for Ballarat East Zone Substation assuming two transformers and including planned acoustic barriers. (dB (A) Leq)*



*dB (A) Leq - Decibels recorded on a sound level meter set to international standards and quantifying the average human loudness response to sounds of different character when heard continuously for 30 minutes.

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Powercor is your electricity network. We move energy from where it's generated to your property. Every day, our team works hard to make sure you always have the power you need. We're keeping power reliable while supporting the shift to more renewable energy like solar and wind, and people choosing to electrify their homes and vehicles.

For more information visit www.powercor.com.au/BallaratEastZSS, email majorprojects@powercor.com.au or call 13 22 06