13.0 NOISE AND VIBRATION

This chapter provides details of existing ambient noise levels within the vicinity of the Project site. Noise sensitive receivers or locations have been identified along with details regarding their respective distances from the Project site.

Based on the vicinity of residences/human habitation to the Project site, an assessment of potential background and incidental noise levels at noise-sensitive locations, particularly during construction and operational phases has been undertaken. Mitigation measures to reduce the potential impacts have also been identified within this section.

13.1 EXISTING ENVIRONMENT

The acoustic environment in which the substation is proposed to be situated is currently dominated by the noise of the existing Kogan Creek Power Station (approximately 1.5km to the north-east). During field investigations, the power station was clearly audible at the proposed substation site. Due to the magnitude of the power station, its associated noise is expected to be significant in comparison to the expected noise emanating from the proposed substation.

Noise sensitive places as defined by the *Environmental Protection (Noise) Policy 1997* (EPP (Noise)) include:

- Dwellings;
- Library, childcare centre, kindergarten, school, college, university or other educational institution;
- Hospital, surgery or other medical institution;
- Protected areas, or an area identified under a conservation plan as a critical habitat or an area of major interest, under the *Nature Conservation Act 1992*; and
- Parks or gardens open to the public for use other than for sport or organized entertainment.

One noise sensitive receptor (dwelling) has been identified from aerial photography and regional investigations. The residential dwelling exists approximately 400m to the immediate west of the proposed substation on the adjacent property.

13.2 POTENTIAL IMPACTS

Background and incidental noise and vibration levels are expected to be elevated during the construction phase within and surrounding the Project site. Sources of noise and vibration will include earthworks, machinery traffic (both heavy and light vehicle movements), cranes, foundation excavation and boring, structure installations, vegetation clearing, mulching and chipping, access and building construction. The expected noise and vibration levels and exposure periods will be comparable to that of an ordinary construction site.

Due to the large separation distance, and proposed construction works being carried out during less noise sensitive hours, there is a low potential for noise impacts to occur during the construction phase. Furthermore, considering the Project site is located in a rural setting, adjacent to a pre-existing power station, construction noise is not anticipated to be unreasonable or cause nuisance within the immediate area.

During the operational phase, the transformer units of the substation can produce a low-level noise or hum at a frequency of around 100Hz. Transmission lines connecting to the substation can also produce corona noise, which is a crackling sound that is caused by the ionisation of air near the conductors. Corona noise is likely to be greatest immediately following rainfall or fog. Energized transmission lines connecting to the substation can also generate noise, as a result of wind passing across conductors and poles. Wind noise is generally masked by other wind-generated noise such as rustling vegetation.

Noise created during the operation phase, as described above, will not result in an increase the current ambient levels, as these sources of noise already exist within the vicinity from the Kogan Creek Power Station. Noise levels during the operational phase will therefore remain consistent with the levels currently present within the Project area. No increase in ambient noise levels is expected. Furthermore, vibration is not expected to cause an impact during the operational phase.

During maintenance, potential noise and vibration sources include those related to vehicle operation, and noise associated with repairs. However, there is expected to be lower noise and vibration levels associated with these activities, and a shorter period of noise exposure, as compared to the impact during the construction period.

13.3 MITIGATION MEASURES

The proposed substation site has been chosen to ensure the distance between the substation and the adjacent dwelling is maximised whilst minimising clearing of remnant vegetation. Due to the presence of the adjacent Kogan Creek Power Station, the noise impact from the proposed development is expected to be minimal.

A number of mitigation measures have been recommended to minimise the potential noise impact of the proposed development during the construction phase, including:

- Trucks and machinery to be fitted with effective mufflers and regularly maintained to prevent noise sources (i.e. loose bearings, vibrating panels etc);
- Machinery and vehicles are to be maintained in accordance with the manufacturer's recommendations;
- Equipment not being utilised as part of the work should not be left standing with engines idling for an extended period;
- Ensure construction time is kept to a minimum;
- Restricting construction works to those hours permitted by the DERM (normally 6:30am to 6:30pm Monday to Saturday); and
- Publicly communicate construction schedules.

Should works be required outside of those hours stipulated above, potentially affected landholders will be notified.

During maintenance, the potential for noise nuisance would also be minimised by keeping the public informed of maintenance schedules and restricting maintenance works, where possible, to the hours outlined above. There may be infrequent instances where emergency works may be required outside these hours.

The additional proposed mitigation measures for Noise Management are outlined further in the EMP (see Appendix E).