
CONTENTS

22. Noise and Vibration	22-1
22.1 Acoustic Goals and Noise Assessment Guidelines	22-1
22.1.1 Revised Construction Noise Goals	22-2
22.1.2 Noise Management – Consultative Approach	22-3
22.1.3 Complaints Management	22-3
22.2 Modelling Results	22-4
22.3 Road Traffic Noise	22-6
22.3.1 Gympie – Brooloo Road	22-6
22.3.2 Bruce Highway	22-7
22.4 Blast Impacts	22-10

FIGURES

Figure 22-1 Noise Exceedance Extent	22-5
Figure 22-2 Typical Sound Pressure Levels for Everyday Noise Sources	22-7
Figure 22-3 Bruce Highway Realignment	22-9
Figure 22-4 Potential Zones of Impact from Airblast Overpressure - Location 1	22-11
Figure 22-5 Potential Zones of Impact from Airblast Overpressure - Location 2	22-12
Figure 22-6 Potential Zones of Impact from Airblast Overpressure - Location 3	22-13
Figure 22-7 Potential Zones of Impact from Airblast Overpressure - Location 4	22-14

TABLES

Table 22-1 Project Construction Noise Goals	22-1
Table 22-2 LAmax Sleep Disturbance Goals	22-2
Table 22-3 - Proposed Construction Noise Goals	22-3

22. NOISE AND VIBRATION

This Chapter responds to issues raised in relation to the Noise and Vibration impact assessment undertaken for the Traveston Crossing Dam EIS.

Three submissions were received which raised issues related to noise and vibration. The main issues raised were related to impacts associated with infrastructure relocation and acoustic goals and objectives. Discussion of these issues is presented in this chapter.

22.1 Acoustic Goals and Noise Assessment Guidelines

A submission indicated that the Supplementary Report should identify acoustic goals and objectives that reflect the values of the receiving environment and establish benchmarks of compliance to be achieved throughout the project in the EMP. As the project will take several years to complete, noise goals need to ensure impacts to the receiving environment are sustainable for the life of the project. Further the submission raised the issue that considering much of the receiving environment is rural, an acoustic goal of 55dB(A) is not appropriate for the project.

As described in Section 11.1.3 of the EIS, the following legislative and guideline documents were considered in establishing construction and operational noise level goals for the Project:

- *Environmental Protection Act 1994*;
- Environmental Protection (Noise) Policy 1997;
- Environmental Protection Regulation 1998 and associated Nuisance Laws;
- Planning for Noise Control Guideline (EPA 2004);
- Maroochy, Noosa and Cooloola Local Government Planning Scheme provisions;
- Queensland Department of Main Roads, Road Traffic Noise Management: Code of Practice (Jan 2000); and
- EPA Ecoaccess Guideline: Noise and Vibration from Blasting (March 2006).

The Project construction noise criteria at the noise sensitive receivers were presented in Table 11.3 of the EIS, and have been summarised in the table below for reference purposes only. It is important to reiterate that the following time periods were (and will continue to be) adopted for the project for reference purposes:

- Daytime: 7am to 6pm;
- Evening: 6pm to 10pm; and
- Night: 10pm to 7am.

Table 22-1 Project Construction Noise Goals

Project goals	Day	Evening	Night time
Construction Noise	55 dB(A) L_{Aeq} 1 Hr	55 dB(A) L_{Aeq} 4 Hr	L_{Amax} 52 dB(A)

For an activity such as construction, even for works over extended periods, the Queensland EPA does not provide specific guidelines for the assessment of noise impacts. The only guideline is the generalised noise emission level taken from Section 11 Part 1 of the EPP (Noise) for an acoustic quality objective of L_{Aeq} 24Hr 55 dB(A) ambient level in residential areas. While it is acknowledged that the receiving environment in the project area is largely rural rather than residential there are no Queensland criteria which are considered to be more relevant than the general acoustic quality

objective stated above. Considering the predicted noise impacts for each phase of the construction are generally below 45 dB(A) for the majority of sensitive receivers surrounding the dam site it is considered feasible that construction noise impacts could be managed in accordance with criteria such as that adopted in NSW. Therefore in determining the revised Project noise goals, NSW Department of Environment and Climate Change (DECC) *Noise Control Guideline – Construction Site Noise* have been considered.

Out of Hours Works

It is important to reiterate that construction works are proposed to occur during the evening (6pm – 10pm), night (10pm – 7am) and on Sundays and public holidays. However, these construction activities will occur intermittently throughout the Project, and are not proposed 24 hours, 7 days per week for the entire construction life of the Project. As described in Section 11.2 of the EIS, These works will predominantly involve concrete batching, and works associated with construction of the RCC dam wall (such as truck and crane movements and a workshop). Given the proposed dam embankment is an RCC, the concrete laying method is likely to require two shifts per day, therefore requiring night works. It is proposed that the wall be constructed in four sections, approximately three months per section and would allow for a respite period from night-time activities of approximately one month between each section.

22.1.1 Revised Construction Noise Goals

The purpose for setting the construction noise goals is to ensure that an acceptable acoustic environment for sensitive receivers is achieved, in particular to avoid annoyance, speech interference and sleep disturbance (World Health Organisation, 1999)

As described in Section 11.1.3.2 of the EIS, the proponent has committed to more stringent noise levels at night, adopting noise criteria outlined within the Queensland EPA's Guideline, *Planning for Noise Control* (EPA, 2004). Specifically the proponent has proposed a nominal night time construction noise level assessment criterion for instantaneous noise sources of L_{Amax} 52 dB(A), for partially closed windows, in order to assist with the assessment and management of night time construction noise impacts. This noise limit has been calculated using the Queensland EPA's Guideline which recommends maximum instantaneous internal noise levels in sleeping areas should not exceed approximately 45 dB(A) more than 10–15 times per night. The corresponding external maximum noise levels (L_{Amax}), which should protect at least 90% of the population (i.e. a probability of only 10% awakenings) are presented in **Table 22-2**. These levels differ according to window types and whether windows are open or closed.

Table 22-2 LAmax Sleep Disturbance Goals

Window type and setting	External L_{Amax} Noise Level (dB(A)) [#]
Wide open	47
Partially closed	52
Single glazed, closed	62
Thermal double glazed, closed	67

[#] Assumes typical noise reduction of 5 dB(A) across a wide open window, 7 dB(A) across partially closed, 20 dB(A) single glazed, closed and 25 dB(A) thermal double glazed and closed

The proposed construction noise goals have been revised to account for the rural nature of the project area (refer **Table 22-3**), and to ensure that adequate respite periods are allowed for, given that works are proposed during the evening, night and on Sundays and public holidays. The following time periods will continue to be adopted for the project:

- Daytime: 7am to 6pm;
- Evening: 6pm to 10pm; and
- Night: 10pm to 7am.

Table 22-3 - Proposed Construction Noise Goals

Project Goals	Day	Evening	Night time
Monday to Saturday	L_{A10} background + 10 dB(A) ¹	L_{A10} background + 5 dB(A) ¹	L_{A10} background + 3 dB(A) ¹ L_{Amax} 52 dB(A)
Sundays (12am to 12pm)	L_{A10} background + 5 dB(A) ¹	L_{A10} background + 5 dB(A) ¹	L_{A10} background + 0 dB(A) ¹ L_{Amax} 52 dB(A)

¹ L_{A10} level measured over a period of not less than 15 minutes

22.1.2 Noise Management – Consultative Approach

Given that nuisance caused by noise is a subjective matter, some sensitive receivers may be more receptive to changes in noise levels than others. Therefore, the proponent proposes a consultative management approach, to ensure an acceptable acoustic environment is provided, by achieving the noise goals as detailed in **Table 22-3** above.

The proponent proposes to develop robust noise management strategy to ensure that the affected community is adequately consulted regarding developments within the Project and to gauge and address concerns and feedback associated with all aspects of construction activity. This will form part of the overall consultation strategy proposed to be implemented (as described in the Environmental Management Plan). The purpose of the strategy will be to advise residents/other receptors on the proposed project works and obtain feedback on their specific concerns. Engagement at this stage will also provide the opportunity to discuss more broadly the types of ‘out of hours’ work that may affect them in the future, for example, batch plant and associated activities, and identify concerns residents/receptors may have in advance of this work. Overall, the purpose of the consultation will be to understand what concerns and issues the community have, to identify mitigation and management responses and alternatives and to ensure that the concerns and issues are effectively and addressed by the proponent. Such engagement activities may involve personal interaction including one on one meetings, engagement through the Community Advisory Committee (CAC) process and supported by other communication processes nominated by the community to suit their particular circumstances including telephone, mail drop, text, email etc.

22.1.3 Complaints Management

The EIS and EMP also presented a complaints management approach that will be employed throughout the project, if in the event a complaint regarding noise is received. If a noise complaint was received, the following steps would occur:

- the Proponent would collect the complainants contact details and information on the time of alleged noisy or nuisance generating activities, the type of noise event and duration;
- within one hour of receiving the complaint the Site Superintendent and a member of the Community Engagement Team would be notified;
- an investigation response would then follow involving:
 - the proponent representative visiting the location (or general vicinity) of the complainant location to identify noise generating activities audible at the location of the complainant and confirm whether the source of noise complaint could be due to construction activities;

- proponent reviewing the site activity log, noise and meteorological monitoring data recorded at the time of the complaint;
- if the probable cause of the complaint is likely to be project construction works the project Alliance would immediately commence investigations into further noise mitigation options for the activity (activities) identified as the probable cause of complaint;
- mitigation measures (either site controls or measures which could be implemented at the complainant’s dwelling) would be identified and implemented as soon as practical after receipt of the complaint; and
- the Alliance Community Engagement Team would follow up the noise contact/complaint within 72 hours to inform the complainant of the actions being taken by the Alliance and assist in managing resolution of the complaint;

This complaints management procedure will enable proactive noise management measures to be taken almost immediately following receipt of a complaint and due to the process, minimise the likelihood of repeat.

22.2 Modelling Results

A submission raised the issue that the EIS indicates that up to four properties owned by QWI are within close proximity to the dam wall, and will be exposed to noise emissions that exceed the proposed noise limit.

The four properties that the submission refers to are all owned by QWI. QWI will ensure that there are no tenants or lessees residing in these properties during construction.

Figure 22-1 illustrates the worst case scenario for noise impacts on potential sensitive receivers and is based on site establishment works in 3M/S SW wind, Stability Class D. The site establishment works are proposed to occur during a day shift. The amended noise limits provided in **Table 22-1** indicate that daytime noise goals Monday to Saturday are L_{A10} background + 10 dB(A). Based on background monitoring undertaken for the EIS, the noise goals would be between approximately 44 L_{A10} dB(A) and 55 L_{A10} dB(A) depending on the location within the landscape.

Figure 22-1 indicates that the properties most likely to be affected by noise associated with the construction of the dam are owned by QWI and that for the majority of residences, the construction noise goals are not likely to be exceeded. However, the assessment scenarios investigated are static representations of construction activities which could occur at some time during the works. It is recognised that the construction methods used by the Construction Contractor(s) may differ to the activities assessed here and construction noise levels may therefore also vary. Given this, the rural nature of the Project area and the subjective nature of noise nuisance, some receivers may experience nuisance even if compliance with the Project goal is achieved. Noise management is therefore an important component of the project.

Where potential exceedences may occur, QWI will actively engage with the sensitive receiver in order to understand what their concerns and issues are and to identify mitigation and management responses and alternatives and to ensure that their concerns and issues are effectively and addressed.

As outlined by the EPA, QWI will consider all noise sensitive receptors and appropriate abatement measures will be investigated. QWI is committed to working with local residents to proactively minimise the potential for nuisance emissions and complaints as outlined in section 11.2.10.1 of the EIS, and in **Sections 22.1.2** and **22.1.3** above.

22.3 Road Traffic Noise

A submission raised the issue that the Project will result in a permanent change to the landscape due to creation of a large lake and that the EIS does not assess the likely changes to the receiving noise environment as a result noise carried across the lake particularly from the Bruce Highway which will be near the FSL in several locations.

The noise impact from the realigned Bruce Highway and the realigned local roads is discussed in detail in section 1.2.7 and 11.2.8 of the EIS. Given the location of the Bruce Highway and the large lake on completion, the predictions show traffic noise levels at the receivers across the lake will be significantly less than the criteria. The reduction in attenuation of sound across the lake has been taken into account.

22.3.1 Gympie – Brooloo Road

One submission raised the issue that the relocation of the Gympie – Brooloo Road (Mary Valley Road) would negatively impact their property as a result of increased noise during construction and operation particularly due to the geography of the valley.

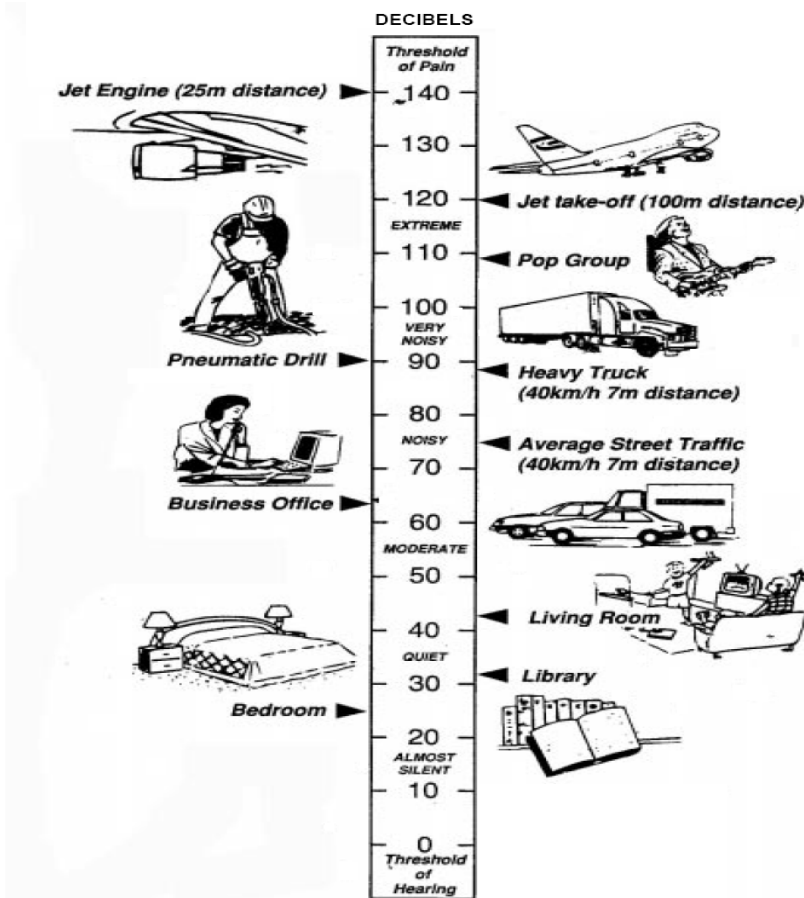
Section 11.2.8 of the EIS discusses the predicted noise impacts associated with the relocation of the Gympie – Brooloo Road (Mary Valley Road). The distance between the Gympie – Brooloo Road (Mary Valley Road) and 92 Frayne Road (as indicated as a sensitive receiver in the submission) is over 300 m. The projected traffic volume on Gympie – Brooloo Road (Mary Valley Road) is 2,840 vehicles per day in 2021. This is equivalent to approximately 2 vehicles per minute.

Given the large separation distance and low traffic volume, the traffic noise impact from the Gympie – Brooloo Road (Mary Valley Road) would be relatively minor. The predicted traffic noise level, LA10(18h hour), from the Gympie – Brooloo Road (Mary Valley Road) at the residence is approximately LA10(18h hour) 45dB(A). This is similar to the noise level of a typical living room (see **Figure 22-2**).

The EIS concludes that the realignment of the Gympie – Brooloo Road (Mary Valley Road) is likely to have a relatively minor impact, due to low traffic volume along these two roads.

To ensure that the design of these road works adequately considers the potential for noise impacts, the EIS states that further investigation into the potential for noise impacts associated with all road realignments associated with the Project would be undertaken as part of the detailed design for these works.

Figure 22-2 Typical Sound Pressure Levels for Everyday Noise Sources



Source: Environmental Criteria for Road Traffic Noise – EPA NSW

22.3.2 Bruce Highway

One submission is seeking a guarantee for more comprehensive noise abatement measures post construction, for the Bruce Highway flyover. The submission specifically referred to the heightened noise levels particularly related to truck movements and a need for more appropriate and comprehensive mitigation of noise levels.

The submission felt that it was critical that the Department of Main Roads (DMR) liaise with the Federal State School on the implementation of mitigation measures for the school due to the close proximity of the Bruce Highway realignment to Federal State School.

Sections 11.2.2 and 11.2.7 of the EIS addressed the potential impacts related to the realigned Bruce Highway. The realigned Bruce Highway will be located further away from the Federal State School than the existing Bruce alignment (see **Figure 22-3**). The distance between the realigned Bruce Highway and nearest Federal school building is approximately 60 m (the current distance is 55 metres).

As stated in the section 11.2.7 of the EIS, during the design stage, further acoustic investigation will be conducted with respect to the potentially affected buildings to evaluate the extent of noise attenuation that will be required at the classrooms and to determine the noise mitigation that will be

required to comply with Main Road's noise criteria. These measures will be implemented as part of the DMR Bruce Highway upgrade, by DMR.

22.4 Blast Impacts

A submission identifies that blasting associated with quarrying will have an impact on the receiving environment. It is suggested that the Supplementary Report should contain an assessment of potential quarry sites and the likely impacts of these sites assessed against current criteria and best practice requirements as the quarrying activities are integral to the conduct of the project and clearly within the scope of the EIS.

Section 11.2.1.4 of the EIS describes the impacts associated with blasting.

The Project is currently at concept design stage and details such as the suitability of potential quarry sites and construction material have not been finalised at this stage. Blasting is considered as an ERA and noise assessments would be undertaken as part of the subsequent development approval process for blasting.

Furthermore, the affects of blasting associated with the construction of the spillway, and potential quarry site on the right abutment are presented in **Figure 22-4**, to **Figure 22-7**.

