

# 15 NOISE AND VIBRATION

## 15.1 OLYMPIC DAM REGION

### Issue:

Clarification was sought regarding the noise sources and noise levels predicted to occur in Roxby Downs and Hiltaba Village, and the assessment used to determine these, specifically:

- what sources were included in the modelling, and whether they were modelled together
- noise levels during inversions
- whether the noise produced by air horns and reversing alarms has a greater impact because of modulation (variation in volume and/or frequency)
- whether the assessment accounted for shift workers sleeping during the day
- what the noise level would be inside the buildings and how this would compare to relevant standards
- vibration levels from blasting
- increases in traffic noise on Olympic Way.

**Submissions:** 2, 12, 71 and 72

### Response:

#### Noise sources

Several independent noise models were developed for the purpose of the Draft EIS to determine compliance with the requirements of the Environment Protection (Noise) Policy 2007. Where no criteria were established in this policy, other relevant standards and guidelines were used as assessment criteria. The noise models were:

- an industrial model, to determine the noise impacts associated with the operation of the expanded mining and processing infrastructure
- a rail model, to predict noise levels as a result of the operation of the proposed rail spur between Pimba and Olympic Dam
- an airport model, to determine the noise contours associated with aircraft using the relocated Olympic Dam airport.

The assessment criteria specified with the various policies and guidelines relate specifically to noise from a particular source and the impact of that source, considered independently, on nearby receivers. As a result, no single model was developed that included all noise sources. The sources included in each of these models were detailed in Section 5 of Appendix M of the Draft EIS, and encompassed all the significant sources identified for each criteria.

#### Noise levels during inversions

Table 14.10 of the Draft EIS indicated that during inversions the potential exists for noise levels to reach 43 dB(A), and therefore to exceed the night-time noise criteria of 40 dB(A) by up to 3 dB(A). Subsequent to the publication of the Draft EIS, a number of minor modifications to the expanded operation layout have been made, resulting in noise levels of up to 48 dB(A) at Hiltaba Village now being predicted during inversion conditions. The revised noise assessment is presented in Section 1.4 and further detailed in Appendix A7 of the Supplementary EIS.

Section 19 of the Environment Protection (Noise) Policy 2007 outlines factors that should be considered when a criterion is predicted to be exceeded, including:

- the existing background noise levels
- the timing, frequency and duration of the criteria exceedance
- the nature of the receiving environment.

As indicated in the Draft EIS, conditions conducive to the formation of inversions are expected to occur on about 95 nights per year for a few hours per night. Background noise levels measured in Roxby Downs indicated that the night-time noise levels were around 35 dB(A). An external noise level of 48 dB(A) would correspond to an internal noise level of around 33 dB(A) (using the World Health Organisation (WHO 1995) guidelines for noise attenuation for a standard building with the window open). The level of 33 dB(A) is slightly above the threshold of 30 dB(A) considered by the WHO to represent best practice. However, investigations of the attenuation characteristics of the proposed Hiltaba Village accommodation indicates that noise levels would be attenuated significantly more than the 15 dB(A) that is assumed in the above example (see Section 15.1.5 of the Supplementary EIS for further details regarding internal noise), resulting in internal noise levels being well within the WHO guidelines. The Draft EIS concluded that this represented a low residual impact and this remains valid for the Supplementary EIS.

#### Noise modulation

It is recognised that Section 14, Part (3) of the SA Environment Protection (Noise) Policy 2007 contains a provision that reduces the acceptable noise criteria, should the noise have a modulating characteristic. This exists on the basis that modulating noises have a greater impact on amenity than other, relatively constant, noises.

However, it is suggested that the proposed use of air horns and reversing beepers at the expanded Olympic Dam operation would not result in a significant modulating noise at either Roxby Downs or Hiltaba Village. Air horns and reversing beepers are, in isolation, modulating noise sources. However, the distance between the sources and the receivers (Roxby Downs and Hiltaba Village) would significantly reduce the intensity of the high-frequency aspects of the noise, resulting in little or no modulation at the receivers and an overall frequency approximately equivalent to that of the existing ambient frequency spectrum at the townships. Moreover, given the number of haul trucks when the mine is at full capacity (i.e. up to 160), the noise produced by the air horns and reversing beepers is expected to be relatively constant at the receivers.

#### Shift workers

In order to ensure adequate amenity for shift workers, the Draft EIS assessed the level of noise from operations against the more stringent night-time criteria, as was shown in Figure 14.1 of the Draft EIS. Table 14.2 of the Draft EIS showed the noise criteria established for Roxby Downs and Hiltaba Village, based on the provisions of the Environmental Protection (Noise) Policy 2007; these were 47 and 50  $\text{dBL}_{\text{Aeq}}$  during the day and 40 and 45  $\text{dBL}_{\text{Aeq}}$  at night respectively.

#### Internal noise criteria

It was suggested that the accommodation at Hiltaba Village should be designed to comply with the WHO guideline for internal (bedroom) noise of 30  $\text{dBL}_{\text{Aeq}}$ , measured with a window open. The WHO guidelines also state that a reduction of 15  $\text{dBL}_{\text{Aeq}}$  is typically achieved when moving from the outside to the inside of a dwelling.

Irrespective of external noise levels the proposed dwellings at Hiltaba Village would not meet the WHO 30  $\text{dBL}_{\text{Aeq}}$  guideline, as the noise level from internal fittings, specifically air-conditioner and refrigeration units, would exceed the guideline. The typical operating noise level of refrigerators from major manufacturers is between 35 and 45 dB. Similarly, split-system air-conditioning units produce internal noise levels (measured at 1 m from the duct opening) of around 38 dB, while the quietest ducted unit produces 31 dB. BHP Billiton considers air-conditioners and refrigerators to be essential appliances for employees and contractors living at the accommodation village in the arid environment of northern South Australia, and would not exclude them in order to meet the WHO guideline.

The South Australian Environment Protection (Noise) Policy 2007 contains no specific criteria for avoiding sleep disturbance. However it does require, in Section 5, Part (8), that noise levels in closed rooms should meet either the criteria outlined in Australian/New Zealand Standard AS/NZS 2107:2000 – Acoustic Recommended Design Sound Levels and Reverberation Times for Building Interiors or the external noise criteria minus 20 dB, whichever is greater. Noise attenuation studies undertaken by both the proposed accommodation unit manufacturers and ARUP Acoustics have demonstrated that, with the window closed, the proposed accommodation units would reduce external noise by between 24 and 30 dB, ensuring that operation noise levels within the accommodation units would not exceed 30  $\text{dBL}_{\text{Aeq}}$  with the windows closed. This was deemed appropriate as it is considered unlikely that an employee or contractor suffering sleep disturbance from external noise would choose to leave their window open.

BHP Billiton understands that recent mining approvals granted in Australia have not raised the issue of internal noise. For example, the South Australian Government recently approved the Prominent Hill Mining and Rehabilitation Program (MARP) with a predicted external noise limit at its accommodation camp of between 54 and 63 dB. Using the 15 dB noise reduction specified by the WHO, this could equate to internal noise of between 39 and 48 dB. Similarly, the Gorgon Gas project in Western Australia sets an external noise limit at its accommodation camp of 65 dB, meaning potential internal noise levels of up to 50 dB. In this context, it would seem reasonable that BHP Billiton's commitment to maintain external noise levels below 45 dB from the mining and processing operations, and the decision to locate the accommodation village at a site which is a significant distance from these operations to manage noise and dust impacts, represents industry best practice.

#### Vibration from blasting

Existing vibration levels associated with blasting were detailed in Section 14.5.2 of the Draft EIS, with predicted levels illustrated in Table 14.11, indicating that no vibration-related impacts associated with blasting would be expected outside the mining lease. Further investigations undertaken since the publication of the Draft EIS into the potential for mining-induced regional seismicity have been undertaken and are presented in Chapter 8 of this Supplementary EIS.

#### Traffic on Olympic Way

Section 14.5.2 of the Draft EIS discussed the likely noise impacts associated with an increase in traffic on Olympic Way. Traffic volumes on Olympic Way were predicted to be up to four times the existing volume during the construction phase, and would decrease for the operational phase. A significant proportion of this traffic was originating from Hiltaba Village. As this traffic would bypass the residential areas of Roxby Downs, the likely traffic increase in residential areas of Olympic Way was predicted to be around twice the existing volume. As detailed in Table 14.15 of the Draft EIS, a doubling of traffic would result in a 3 dB increase in noise levels.

Subsequent to the publication of the Draft EIS, a second access road and entry gate to the expanded Olympic Dam operation has been added. This second road (termed the eastern access road), would transport mine workers from Hiltaba Village directly to Olympic Dam (see Section 1.4 of the Supplementary EIS for details). Therefore, while some workers based at Hiltaba Village (e.g. those associated with the construction of the expanded metallurgical plant) would continue to travel along Olympic Way, the traffic numbers and therefore the traffic-generated noise would be significantly less than predicted in the Draft EIS. It is noted however, that the introduction of the eastern access road would increase traffic, and therefore traffic-related noise, on Axehead Road (see Section 1.4 and Appendix A6 for details).

## 15.2 DESALINATION PLANT

### Issue:

Concerns were raised regarding the potential noise and vibration impacts on the residences surrounding the proposed coastal desalination plant, and the adequacy of the noise impact assessment presented in the Draft EIS. Specific issues related to:

- the quality of the baseline noise assessment
- clarification of the criteria used for the assessment, with specific reference sought on 'coastal settlements'
- the potential for vibration impacts from blasting on local structures, and the potential for tunnelling of intake and outfall pipelines to reduce noise and vibration levels
- the construction of the desalination building.

**Submissions:** 2, 27, 90, 302 and 348

### Response:

#### Baseline assessment

A baseline assessment of noise levels in the area of the proposed desalination plant was undertaken in July 2007, and the results were summarised in Table 14.7 of the Draft EIS and detailed in Sections D3 and D4 of Appendix M of the Draft EIS. It was acknowledged in the Draft EIS that winds were high at the time that background noise levels were measured and, potentially as a result of the high wind velocities, noise from the existing industrial facilities was audible only occasionally at the measurement locations (with these locations being the nearest residences to the proposed desalination plant infrastructure). On this basis, the validity of the baseline noise monitoring has been questioned.

However, as also noted in the above-mentioned sections of the Draft EIS, in addition to the attended noise measurements, a noise data logger was used together with an ultrasonic wind meter, also connected to the data logger. This equipment was run continuously for two days, and allowed the noise levels to be correlated with the wind speed measurements to ensure that an accurate baseline representing the noise level with no wind was established. The average zero-wind-speed noise levels at the Point Lowly monitoring location measured on the data loggers was 33 to 35  $\text{dBL}_{\text{Aeq}}$ , significantly lower than the 41 to 42  $\text{dBL}_{\text{Aeq}}$  during attended measurements. Moreover, the zero-wind-speed levels were used to calibrate the model that was developed to predict noise levels from the proposed desalination plant.

The lack of audible noise from the existing industrial facilities does not influence the outcomes of the impact assessment as compliance with the Environment Protection (Noise) Policy 2007 is required for each individual operation. The results of the modelling for the proposed desalination plant (as presented in Figure 14.3 of the Draft EIS in the Supplementary EIS as Figure 15.1) indicate that noise levels would be low, and the plant's operations would typically be inaudible at the closest residences.

### Criteria

The Environment Protection (Noise) Policy 2007 does not discuss 'coastal settlement' or its implications when assessing noise. The noise criteria used for the assessments conducted for the Draft EIS were determined by conservatively classing the Coastal Settlement zone as Rural Living, as detailed in Appendix B, Section B.1 of Appendix M of the Draft EIS. The criteria presented were developed as the average of the General Industry and Rural Living zone noise criteria, less 5 dB for new developments under the Development Act (resulting in criteria of 51  $\text{dBL}_{\text{Aeq}}$  during the day and 43  $\text{dBL}_{\text{Aeq}}$  at night, with a maximum level of 60  $\text{dBL}_{\text{Amax}}$ ). Discussions with the SA EPA since the publication of the Draft EIS have confirmed these criteria were appropriate.

### Vibration

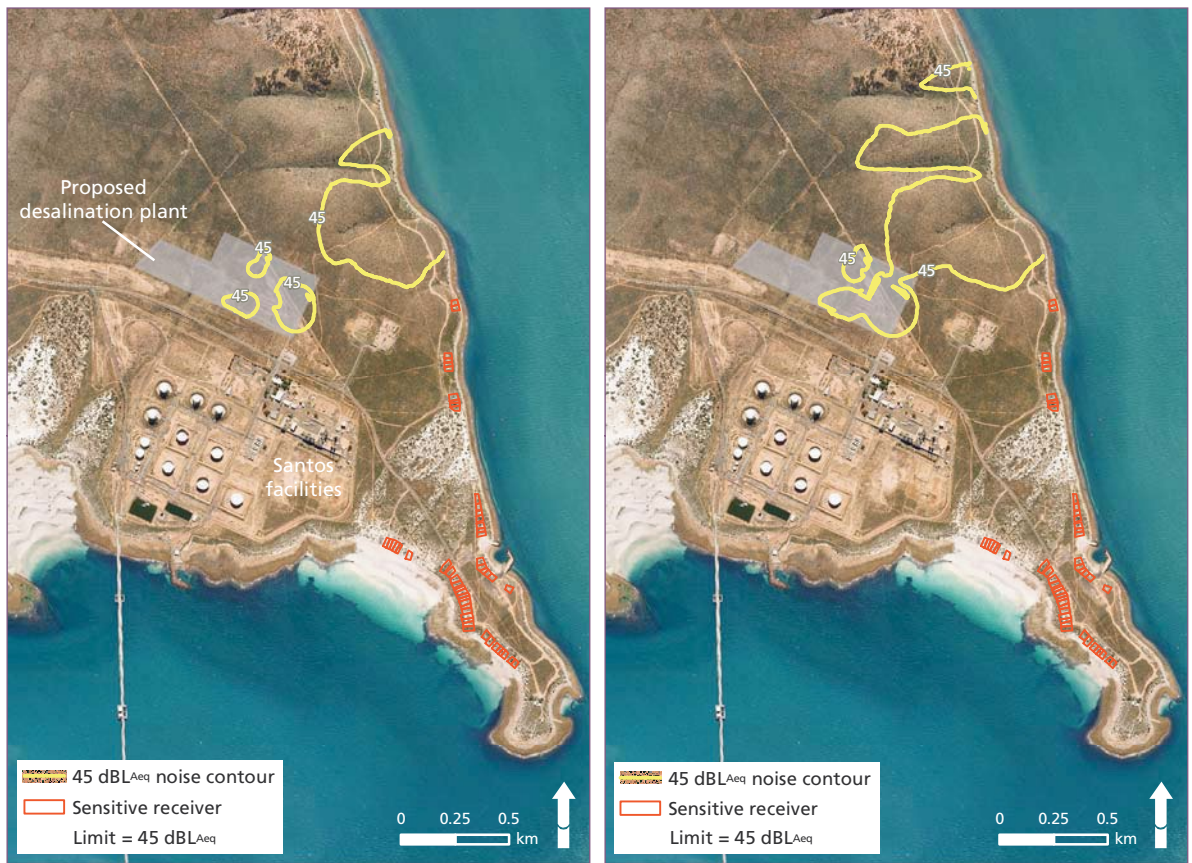
The potential impacts from vibration as a result of blasting were assessed by a blasting expert and discussed in Section 19.5.6 and further detailed in Appendix O12.2 of the Draft EIS. The assessment concluded that adverse effects on human comfort and building damage as a result of blasting were unlikely, based on Australian and international standards and criteria, and could be readily managed through:

- confining blasting to the period from 1 November to 1 May (i.e. outside the cuttlefish breeding season)
- undertaking pre- and post-blast dilapidation surveys on the Point Lowly lighthouse and amending the blasting regime as necessary to ensure its structural integrity was not compromised
- providing advance notice of the blasting schedule to people in the Point Lowly area
- placing prominent signs on blasting days at the boat ramps at Point Lowly and Whyalla, and at the two dive shops in Whyalla
- undertaking surveillance of the blast area two hours before a blast, intensifying water surveillance during blasting, and patrolling upstream of the blast area to safeguard drift divers
- monitoring blast patterns to ensure compliance with the appropriate air blast and vibration criteria, and using sequential detonations and a maximum charge size of 10 kg to minimise airblast, overpressure and vibrations
- keeping accurate records describing the location of each blast and blasthole, the design of the blast in terms of explosives and initiating system usage, and ground vibration and airblast measurement data.

As noted in Section 1.4 of the Supplementary EIS, and since the publication of the Draft EIS, BHP Billiton has committed to installing the outfall pipeline for the proposed desalination plant by a tunnelling method rather than using the 'cut and cover' method proposed in the Draft EIS. This commitment would avoid the need for blasting for the outfall pipe and would reduce marine and land-based vibrations accordingly (see Section 1.4 and Appendix A6 of the Supplementary EIS for details).

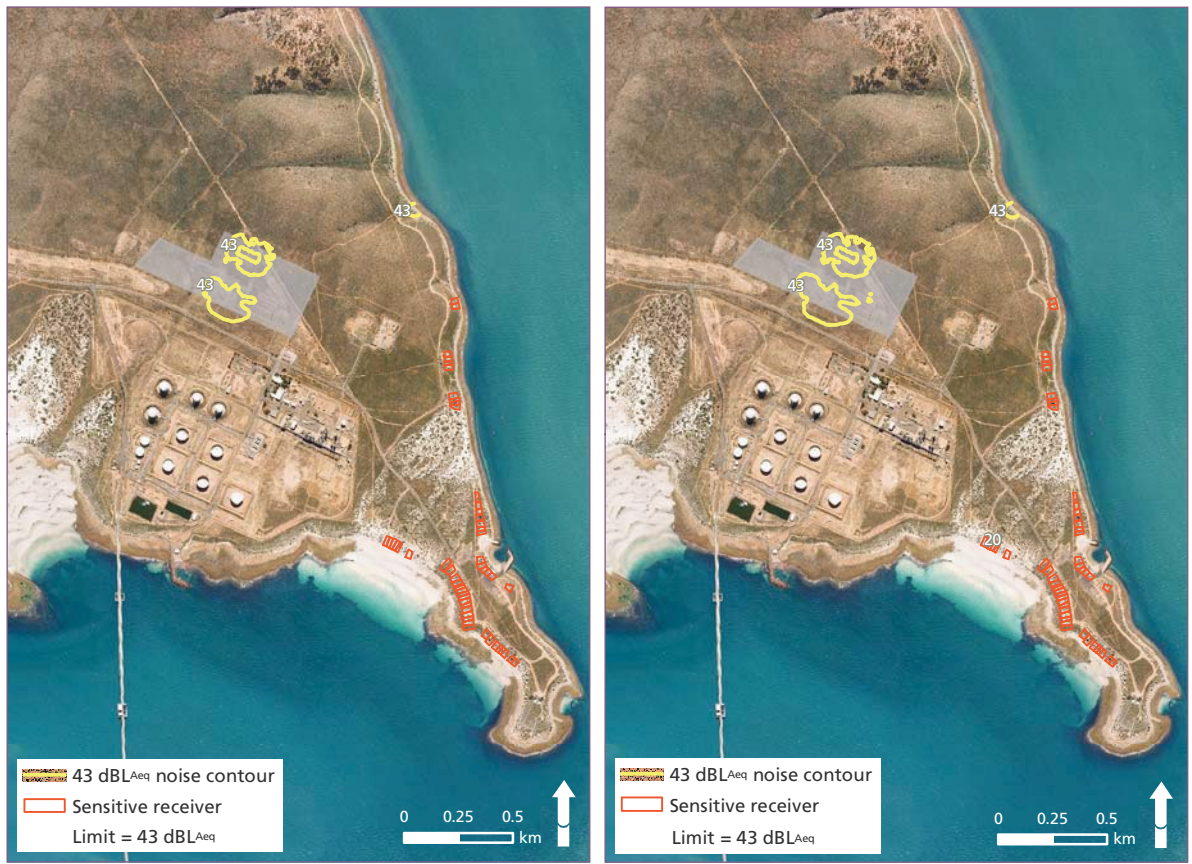
### Construction of the desalination buildings

It was suggested that the desalination buildings should be fabricated from concrete in a manner similar to that of the Perth desalination plants. The noise model developed for the proposed desalination plant (refer Section 14.4.1 of the Draft EIS) included the base case assumption that the desalination buildings would be enclosed in a corrugated iron clad building. The resultant predictions of noise levels at nearby receivers (refer Section 14.5.2 of the Draft EIS) indicate that the applicable noise criteria would be easily met using this building construction methodology. The actual design of the desalination buildings, including the choice of construction material, would be finalised at a later stage.



Construction phase – neutral conditions

Construction phase – adverse conditions



Operational phase – neutral conditions

Operational phase – adverse conditions

Figure 15.1 Predicted noise contours at the desalination plant

### 15.3 LANDING FACILITY

**Issue:**

Concerns were raised regarding the potential noise and vibration impacts on the residences surrounding the proposed landing facility, and the adequacy of the noise impact assessment presented in the Draft EIS. Specific issues related to:

- the nature and level of the predicted noise
- the assumptions and criteria used for the assessment
- the options for noise mitigation.

**Submissions:** 2, 68, 135, 211, 212, 213, 263, 273, 274, 310 and 386

**Response:**

**The assumptions and criteria used for the assessment**

The assumptions and criteria used for the noise impact assessment of the proposed landing facility were provided in Chapter 14 of the Draft EIS and further detailed in Appendix M to the Draft EIS.

The acoustic model used to predict noise levels for the proposed landing facility in the Draft EIS used two typical scenarios:

- A daytime scenario, where the barge vessel engines were operating while the vessel was being unloaded by a 'Franna'-style crane onto a flatbed truck, using sound power levels as described in Section F2.11 of Appendix M of the Draft EIS. This was considered a conservative estimate, as it is likely that the barge engines would not be operating once the barge was berthed, and the engines are sufficiently loud (13 dB louder than the operating crane) that the inclusion of extra cranes in the model would not have altered the overall noise levels at the nearest residences. In addition, the noise sources were modelled on the jetty structure, providing line-of-sight to all of the nearby residences, rather than some attenuation provided by the adjacent dwellings and vegetation. This further demonstrates the conservative nature of the modelling.
- A night-time scenario, when unloading activities cease, but the barge remains berthed at the facility with on-board generators operating to provide sufficient power to maintain the barge's systems.

For the purpose of the Draft EIS, the outputs of the acoustic model were assessed against the Environment Protection (Noise) Policy 2007 criteria, using the assumption that the site of the proposed landing facility would be rezoned as general industry. Using this assumption, the derivation of the daytime criteria is the average of the General Industry and Rural Living criteria (65 dB and 47 dB respectively), minus 5 dB for a new development, resulting in a daytime criteria of 51 dBL<sub>Aeq</sub> and a night-time criteria of 43 dBL<sub>Aeq</sub>. For the Supplementary EIS, the SA EPA has proposed alternative criteria using the existing rural residential zoning. This is provided in Table 15.1.

**Table 15.1 Noise criteria for the Supplementary EIS landing facility noise assessment**

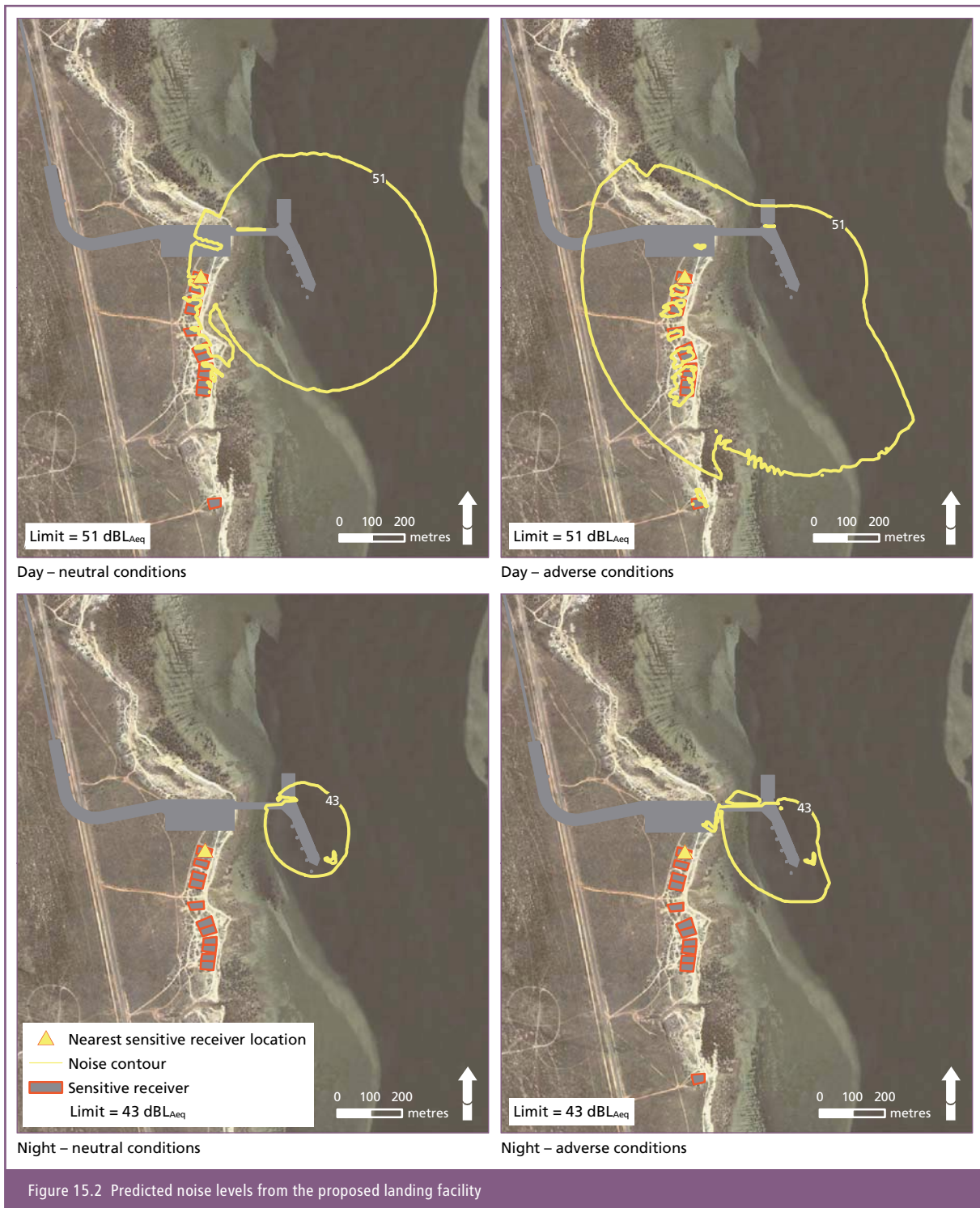
Operation	Noise Criteria	
	SA EPA	Draft EIS
Day (7am to 10pm)	47 dBL <sub>Aeq</sub>	51 dBL <sub>Aeq</sub>
Night (10pm to 7am)	40 dBL <sub>Aeq</sub>	43 dBL <sub>Aeq</sub>
	60 dBL <sub>Amax</sub>	60 dBL <sub>Amax</sub>

Assessment of noise against these criteria is provided in the following Section.

**The nature and level of the predicted noise**

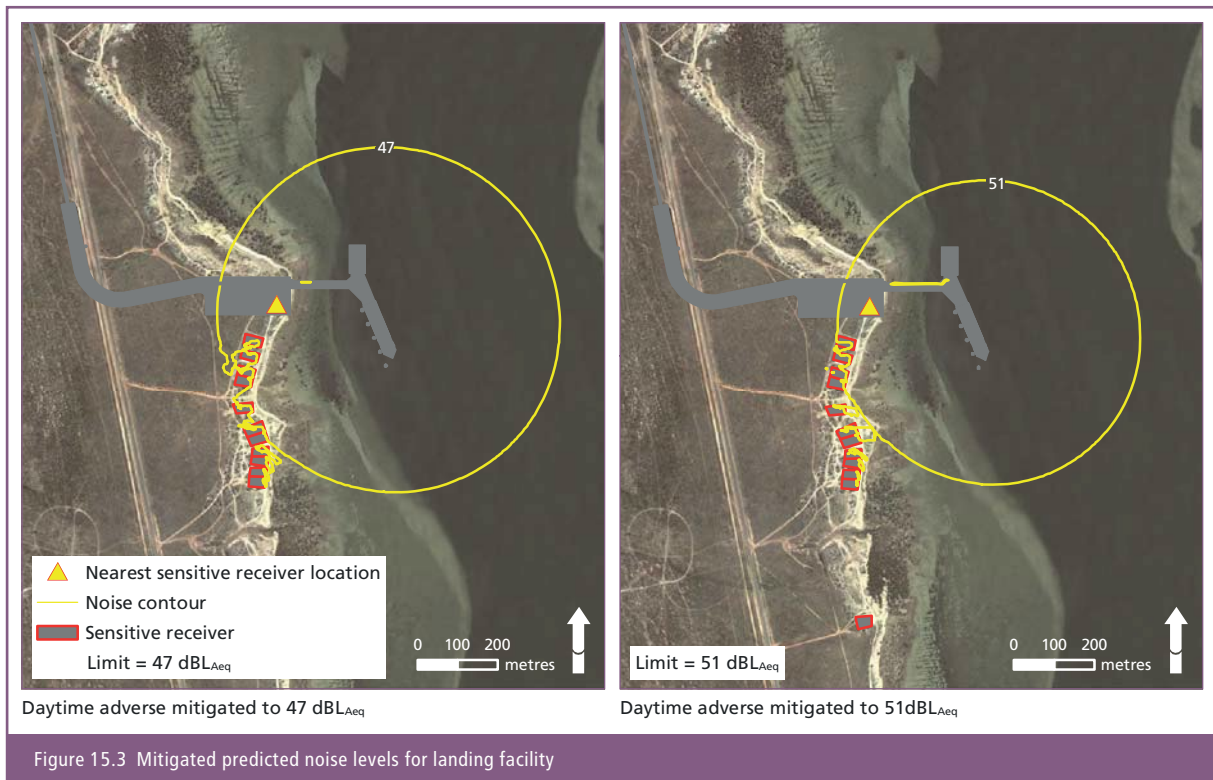
The results of acoustic modelling of the likely noise sources at the proposed landing facility were discussed in Section 14.5.2 of the Draft EIS, and indicated that the noise criteria would likely be exceeded at residences up to 450 m away during neutral meteorological conditions, and 750 m away when the wind was blowing from the landing facility to the residences (see Table 15.2 and Figure 15.2 of the Supplementary EIS).





**Table 15.2 Noise levels predicted in the Draft EIS at the nearest residence to the proposed landing facility**

Operation	Meteorological conditions		Criteria
	Neutral	Adverse	
Day (7am to 10pm)	54	58	51 dBL <sub>Aeq</sub>
Night (10pm to 7am)	37	42	43 dBL <sub>Aeq</sub>
	n.a.	n.a.	60 dBL <sub>Amax</sub>



As a result of the operation of the proposed landing facility, the results from the acoustic modelling presented in the Draft EIS indicated that up to 13 residences would be subject to noise levels that would, during barge and ship unloading operations (for approximately three days, every 11 days), exceed the noise criteria during daytime only (no unloading of vessels would occur during night hours).

A review of the noise source terms for the Supplementary EIS was undertaken for the purpose of understanding what mitigation may be required in order to comply with both the proposed Draft EIS noise criteria and that proposed by the SA EPA at the nearest sensitive receiver during daytime operations. This assessment is detailed in Appendix A7 to the Supplementary EIS.

The results of the revised modelling indicate that reducing the barge noise level by between 6-13 dB would be sufficient to meet the more stringent SA EPA noise criteria at all of the potentially affected residents for all meteorological conditions (see Table 15.3 and Figure 15.3).

**Table 15.3 Noise source reduction required to meet criteria at the landing facility during daytime operations**

Operation	Daytime Criteria (dBL <sub>Aeq</sub> )	Meteorological conditions	Reduction in noise level required (dB)
SA EPA criteria	47	Neutral	6
		Adverse	13
Draft EIS criteria	51	Neutral	1
		Adverse	7

BHP Billiton would install noise attenuation and mitigation to landing facility equipment and infrastructure as necessary to comply with the SA EPA criteria. Options for the reduction of noise levels from the barge and other landing facility sources are discussed in the following Section.

Beyond the nearest 13 residences mentioned above, the noise from the landing facility site is likely to be audible, though not above the noise criteria regardless of which criteria is used and in the absence of additional mitigation to the landing facility infrastructure, at distances of up to about 2 km from the site during adverse meteorological conditions and barge unloading operations. Beyond this, the background noise levels (presented in Table 14.7 of the Draft EIS) would dominate. Mitigation options are discussed later in this section.



### The options for noise mitigation

As mentioned in the Draft EIS, further management options will continue to be discussed with potentially affected landholders, and other engineering options for mitigation would be investigated during detailed design.

The revised acoustic modelling undertaken for the proposed landing facility indicated that the noise criteria could be met at the 13 nearest residences if the noise sources could be attenuated sufficiently (refer Table 15.3).

The nature of the landing facility structure and the location of the nearest residences presents a challenge in terms of the options available for noise mitigation, particularly because typical mitigation measures such as noise shields, bunds or barriers, are not suitable for mitigating noises travelling over water because they hinder the view that is a significant component of seaside living. Noise bunds and/or barriers could be used to mitigate noise generated from the onshore laydown areas of the landing facility, and such structures have been shown to reduce noise levels by between 5 dB and 20 dB. The addition of quieter underwater exhausts and additional engine room acoustic insulation would help reduce noise from the barge engines and generators, and similar quiet muffler systems for the land-based vehicles may also be effective. These would be investigated further during detailed design. The installation of double glazing on nearby residences would likely produce little benefit, as internal noise levels within residences are not expected to significantly change over existing levels, and in any case would not assist in compliance with the criteria, which is measured outside the residences.

Monitoring of noise levels at and around the proposed landing facility would be undertaken when the facility was operating to confirm the accuracy of the modelling predictions and the effectiveness of any installed noise mitigation.

## 15.4 ACCESS CORRIDOR AND PRE-ASSEMBLY YARD

### Issue:

Further information was sought regarding expected noise and vibration levels at residences adjacent to the access corridor and pre-assembly yard.

**Submissions:** 2, 68 and 386

### Response:

Activities associated with the access corridor and pre-assembly yard are expected to cause little, if any, increase in noise and vibration levels at the nearby residences. However, the specific activities that may be undertaken at the pre-assembly yard are yet to be fully defined and, as such, some mitigation measures may be required, depending on the results of noise monitoring to be undertaken during operations. This is explained further in the following sections.

### Access corridor

The existing traffic profile for Shack Road was obtained from the Port Augusta City Council and extrapolated using growth rates obtained from the Draft Port Augusta West Structure Plan – Road Network Assessment (2009) to represent the year of the

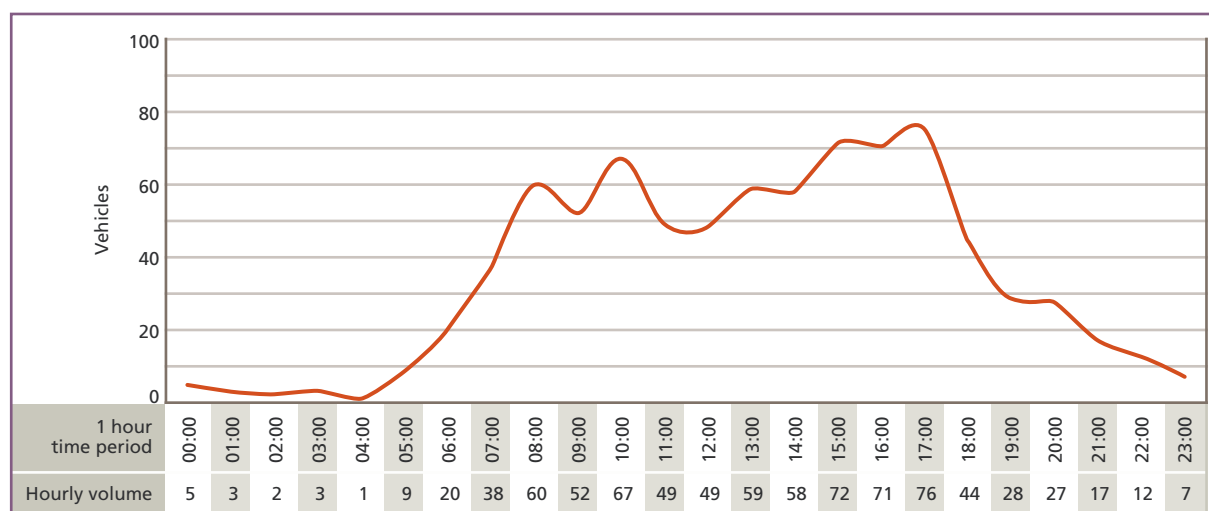


Figure 15.4 Shack Road daily traffic profile (2019)

expansion during which landing facility-related peak traffic movements would occur (see Figure 15.4 of the Supplementary EIS). This indicated approximately 760 vehicle movements per day, concentrated largely between 8am and 5pm. The proposed access corridor would result in an additional five to 10 movements per week, and approximately 10 light vehicles per day (or a total traffic increase of approximately 0.5%) when a vessel was at the landing facility (one vessel would arrive about every 11 days and remain for about three days).

As a result of the distance between the nearest residence and the access corridor (about 100 m) and the relatively minor increase in traffic, it is expected that the increase in noise and vibration levels would be insignificant. For context, a doubling (or 200% increase) of traffic volumes typically results in an increase in noise of around 3 dBL<sub>Aeq</sub>, generally considered to be the level below which changes in noise levels are imperceptible.

As shown in Figure 5.17 of the Supplementary EIS, the alignment of the northern section of the access corridor has been relocated closer to the boundary of the Port Augusta airport before heading east to the pre-assembly facility. This further reduces the potential for noise and vibration impacts on residences along Slade Road and Kittel Street.

#### Pre-assembly yard

A detailed discussion of activities proposed for the pre-assembly yard is presented in Section 5.7.4 of the Supplementary EIS. The major noise-generating activities at the yard would be:

- staging of over-dimensional modules
- prefabrication of site plant and infrastructure, including the use of cranes and forklifts
- abrasive blasting and high-pressure washing.

These activities would be intermittent, and no night-time construction-related activities would be undertaken on the site, although some over-dimensional vehicle movement may be required at night to minimise traffic disruption. It is anticipated that around four to eight commercial vehicles would enter and leave the site (using existing roadways) each day, and there would also be employee light vehicle movements.

The noise criterion at the nearest residences specified by the Environment Protection (Noise) Policy 2007 was calculated to be 51 dBL<sub>Aeq</sub>. Although unlikely, it is possible that the criterion may be exceeded in localised and short-term instances at the nearest residences due to the uncertain nature of the specific activities to be undertaken at the pre-assembly yard. A monitoring program would be established to monitor noise levels and, if necessary, reduction measures would be implemented. These may include:

- installing noise barriers (typically bunding or fencing) around noise-generating activities and/or along the relevant boundary of the pre-assembly yard. These have been demonstrated to achieve in the order of 5 dB reduction for barriers blocking line-of-sight, and up to 20 dB for larger, engineered barriers
- relocating noise-generating activities to an area of the pre-assembly yard further from residences.

No significant increase in vibration levels is expected.

## 15.5 OUTER HARBOR

### Issue:

Clarification and justification of the noise criteria used at Outer Harbor was requested, together with more details relating to the noise sources modelled.

**Submissions:** 2 and 22

### Response:

#### Noise sources

The acoustic model used to undertake predictions of noise levels used the following sources, as described in Appendix M to the Draft EIS:

- an 800 m materials handling conveyor (not enclosed) from the berthing facility to the storage shed, including rollers and idlers
- a conveyor drive motor located at the storage shed end of the conveyor
- two heavy materials handling vehicles.

It was considered that any noises originating from within the storage shed would be negligible with respect to the noise from the materials handling equipment. No mitigation was fitted to any of the equipment for the purpose of providing a conservative estimate, however cladding and enclosing the conveyor and drive motor, and installing noise mitigation kits on the heavy vehicles,

could be undertaken if required.

### Assessment criteria

The assessment criteria used for the purpose of noise impact assessment, which were 54 dBL<sub>Aeq</sub> (daytime) and 45 dBL<sub>Aeq</sub> (night-time), were presented in Table 14.2 of the Draft EIS. These criteria were developed on the basis that the proposed Northern Lefevre Peninsula Industry and Open Space Development Plan Amendment (DPA) (dated October 2008) (DPLG 2009) would be approved. This DPA was approved in June 2009, after publication of the Draft EIS.

The most significant feature of the DPA was the conversion of some Metropolitan Open Space System (MOSS) buffer-zoned land into industrial-zoned land. Using a direct line-of-sight between the proposed sulphur handling conveyor infrastructure (identified in the Draft EIS as the most significant noise source associated with the facility) and the nearest residence shows there is no longer a 100 m buffer area. As a consequence, in accordance with the Environment Protection (Noise) Policy 2007, the noise limit at the receiver becomes the average of General Industry (65 dBL<sub>Aeq</sub> day and 55 dBL<sub>Aeq</sub> night) and Residential (52 and 45 dBL<sub>Aeq</sub> day and night respectively) criteria, which is equivalent to the 54 dBL<sub>Aeq</sub> (daytime) and 45 dBL<sub>Aeq</sub> (night-time) criteria previously mentioned.

As it is proposed that the sulphur handling facility would operate 24 hours a day, assessment was undertaken against the 45 dBL<sub>Aeq</sub> criterion, which is equal to the non-industrial residential night-time noise criterion in any event. As discussed in the Draft EIS, the design of the conveyor system would include sufficient noise reduction to meet the policy's night-time criterion at the nearest residence. The DPA discussed existing noise levels in the Northern Lefevre Peninsula and concluded:

- Emissions from some existing industry sources are approaching the highest noise assessment standards of acceptance, and the cumulative effect of existing industry actually exceeds the standards in some locations (e.g. along Mersey Road).
- A high proportion of heavy vehicles use Victoria Road, particularly at night, and night-time and daytime traffic noise criteria limits along Victoria Road are already being exceeded. Rail noise along Mersey Road is also at the criteria limit.
- Future industry and the growth of existing industry will add to the cumulative noise impact.

The main recommendations from the acoustic report that informed the DPA were that:

- Subject to future development of land situated west of Mersey Road, a 6–8 m-high noise reduction barrier/mound west of the Techport Australia Precinct should be built to help reduce future industrial noise during the day and night.
- Buildings containing low-impact and/or noise-emitting activities should be used to form a minimum 6 m-high continuous barrier along the industrial/residential/open space land interface north of Biodiversity Park.
- Where feasible and practicable, building openings should face north and east, away from residential areas.

No timing associated with the implementation of these recommendations has been publicised.

Given the existing ambient noise levels in the Northern Lefevre Peninsula, it is considered unlikely that noise from the proposed sulphur handling facility would be audible at the nearest residences. In any case, the operation of the proposed facility would comply with the applicable criteria.

## 15.6 PIMBA

### Issue:

Clarification of the likely noise levels due to operation of the intermodal facility was requested in the context of all potential noise sources associated with the facility, with further information to be presented about potential mitigation options.

### Submission: 2

### Response:

The noise sources modelled during the assessment of potential noise impacts as a result of the Pimba Intermodal Facility were summarised in Section 14.5.2 of the Draft EIS and further detailed in Section 6.4 of Appendix M. The noise source modelled consisted of a constantly idling freight train plus additional impact (shunting and freight loading) noises, and assuming that the Pimba intermodal facility would nominally operate 24 hours a day.

Compliance with the requirements of the Environment Protection (Noise) Policy 2007 was assessed at a distance of 1.1 km from the nearest Pimba residence, at which point the noise criteria were met. While a submission has indicated that the actual distance between the edge of the proposed facility and the nearest residence is approximately 580 m, 1.1 km was chosen for the assessment as it represents the middle of the hardstand area to be established at the facility. If all activities occurred at 580 m (i.e. at the closest boundary of the facility to the nearest residence), it is likely that the night-time noise criteria would be exceeded on some

occasions, however it would not be possible in practice for all activities to occur on the boundary. In any case, the overriding commitment provided in the Draft EIS remains, which is to undertake noise monitoring when the facility was operational and implement mitigation measures as necessary to meet the noise criteria at existing Pimba residences. Noise mitigation measures may include:

- disconnecting and shutting down the locomotive during loading and unloading (the modelling assumes that the locomotive remains attached and idling)
- installing a noise barrier (bund or fence) at the southern boundary of the facility to shield Pimba residents from noise. These have been demonstrated to achieve in the order of 5 dB reduction for blocking line-of-sight, and up to 20 dB for larger, engineered noise barriers
- installing double-glazing.