AQUIS RESORT AT THE GREAT BARRIER REEF PTY LTD

ENVIRONMENTAL IMPACT STATEMENT

VOLUME 2

CHAPTER 17

NOISE AND VIBRATION

17. NOISE AND VIBRATION

17.1 EXISTING ENVIRONMENT

Noise measurements were undertaken to determine the existing noise environment at and around the site. The measurements consisted of long-term noise logging at three sites over a period of approximately 1 week during August 2013, and short-term attended noise measurements during the same period. Attended noise measurements were conducted at the three logging sites plus an additional four sites.

The long-term noise logging measurement results assist in understanding the variation in noise level by time of day and day of week, while the attended measurements provide additional information on the sources contributing to the noise levels.

Meteorology data from the Bureau of Meteorology in the form of daily weather observations at Cairns Airport was collected for the noise logging period. This revealed:

- no recorded rainfall
- minimum temperatures from 11°C to 17°C
- maximum temperatures from 26°C to 28°C
- maximum daily recorded wind gusts of between 8 and 13 metres per second (m / s) were from north-east to the south-east between 11:30 am and 2:30 pm
- the daily wind speeds at 9:00 am were between 0 and 4 m / s and were from the south-south-west to the south-east
- the daily wind speeds at 3:00 pm were between 4 and 8 m / s and were from the north-north-east to the south.

Based on wind roses produced for Cairns Airport, the wind speeds recorded during the monitoring period appear typical of the wind speeds experienced at Cairns Airport (Cairns Aero). Overall, it is considered that the meteorological conditions during monitoring are typical of Cairns during the cooler dry season.

Finally, aircraft arrival and departure times were obtained from Cairns Airport records.

Figure 17-1 Noise logging locations.

Source: **Appendix S** (Figure 5.1).

17.1.1 Unattended Noise Levels

The background noise levels (minL_{90}) at each unattended logging location shown on **Figure 17-1** are shown in **Table 17-1**. These levels are calculated as per the EcoAccess Planning for Noise Control guideline.

TABLE 17-1 BACKGROUND NOISE LEVELS (UNATTENDED SITES)

LOCATION	BACKGROUND NOISE LEVEL minL90, dBA		
	Day	Evening	Night
L1 (South)	42	36	32
L2 (East)	32	33	30
L3 (North)	41	35	29

Source: Appendix S (Table 5.1).

The following conclusions can be drawn from the background data (see **Appendix S** for further details of temporal variation of noise measurements).

- The ambient noise environment at Location L1 (South) is relatively consistent across days. There is a peak in noise levels at 7:30 am, most likely due to road traffic, followed by a lull around 10:00 am, and then a gradually ramping up in noise levels until approximately 5:30 pm, after which the noise level decrease over the night to the quietest period around 2:30 am. There was one notable anomaly around 3:30 pm on Saturday afternoon, and audio files suggest it was a tractor or mower (or similar machinery) operating for a short period of time. Cane harvesting was underway for some of the time during which measurements were recorded.
- The noise environment at Location L2 (East) is significantly different from Location L1 although the background noise levels (L_{90}) are relatively consistent. There is a peak in background noise levels at 9:00 am due to bird noise, followed by a lull around 11:00 am, and then a gradually ramping up in noise levels until 2:00 pm due to increasing wind, after which the noise level is relatively constant until 5:30 pm and then decreases over the night to the quietest period around 2:00 am. There was one notable anomaly in the background noise levels on the afternoon of Saturday 3 August and this appears to be due to different weather conditions including lower wind speeds.
- The ambient noise environment at Location L2 (East) is significantly affected by aircraft passing overhead. The time series plots (see **Appendix S**) shows that the L_{eq} noise level rises up and down significantly, and this is considered to be due to aircraft, i.e. in the 15 minute period that an aircraft passes the L_{eq} noise level is significantly higher than periods without an aircraft passing. The L_{10} and L_{eq} noise levels varied significantly for the majority of the day and this is likely to be due in part to aircraft.
- The ambient noise environment at Location L3 (North) is relatively consistent across days. There is a peak in noise levels at 7:30 am, most likely due to road traffic, followed by a reduction in background noise levels which is consistent through to 6:30 pm, after which the noise level decrease over the evening and night to midnight where background noise levels remain consistent until around 5:30 am where they begin to rise. There were a couple of notable high noise level events, with one brief period of high level insect noise, and a second event being due to an unknown brief high noise level event.

The local noise environment will vary by time of day, and by day of the week (as shown in the noise logging results included in **Appendix S**). It would also be expected that the noise environment will change due to seasonal variations, particularly due to different levels of noise from insects. Given that the measurements were conducted in the cooler month of August (winter) it would be expected that background noise levels will be higher in the warmer months of summer. An assessment based on the

background noise levels measured in winter, as has occurred here, will thus likely underestimate the maximum noise levels at the site.

17.1.2 Attended Noise Levels

Attended noise measurements were undertaken at the noise logging locations L1 to L3 and at several other locations (A1 to A4) shown on **Figure 17-1**. Results are shown in **Table 17-2**.

TABLE 17-2 BACKGROUND NOISE LEVELS (ATTENDED SITES)

LOCATION	DATE & TIME	LOCATION, RESULTS & NOTES
A1	11:07 pm 31 / 07 / 13	Beside Yorkeys Knob Road at 10m from nearest trafficable lane Statistical noise levels: L_{10} 58 dBA, L_{eq} 59 dBA, L_{90} 36 dBA Weather: Fine, cool, clear sky, calm Car passbys 76, 74, 74, 75, 73, 75, 75, 75, 73 dBA 11 vehicles in 10 minutes Insects at 3 & 4 kHz quite loud but not dominant Distant aircraft visible but only audible as low frequency roar Distant dog < 40 dBA Occasional birds to east.
A2	11:28 pm 31 / 07 / 13	Beside canefield of recently planted cane at 8m from Dunne Road Statistical noise levels: L_{10} 46 dBA, L_{eq} 51 dBA, L_{90} 36 dBA Weather: Fine, cool, clear sky, calm Car passbys 68, 73, 65, 75 dBA 4 vehicles in 10 minutes Insects at 3 to 5 kHz quite loud and dominate L_{90} (Approximately 30 dBA in absence of insect noise) Occasional bird (curlew) 43 dBA.
L1	9:47 am 01 / 08 / 13	Behind houses on Yorkeys Knob Road at south end of site Statistical noise levels: L_{10} 55 dBA, L_{eq} 51 dBA, L_{90} 44 dBA Weather: Fine, warm, light SE breeze Car passbys 52 to 59 dBA and trucks 59 to 62 dBA 48 vehicles in 10 minutes Variable wind in cane and trees 40 to 51 dBA Distant motorbike on road to south was audible Plane 53 dBA Occasional birds (2 to 5 kHz) 40 to 48 dBA Creaking roof of plant nursery.
L2	10:30 am 01 / 08 / 13	In bush at east end of site Statistical noise levels: L_{10} 53 dBA, L_{eq} 55 dBA, L_{90} 36 dBA Weather: Fine, warm, 10% cloud cover, variable light breeze Background noise is wind in trees but when that is quiet it sounds like noise from distant surf (30 to 35 dBA) Variable wind in trees 35 to 45 dBA Planes 73 and 71 dBA, both heading south to land Bird 39 dBA.
L3	11:12am 01 / 08 / 13	Near Yorkeys Knob Road at north end of site Statistical noise levels: L_{10} 55 dBA, L_{eq} 53 dBA, L_{90} 43 dBA Weather: Fine, warm, light breeze Car passbys 49, 46, 51, 53, 52, 54 dBA 6 vehicles in 10 minutes Variable wind in trees 40 to 52 dBA Planes 61 (dash8), 60 (light) and 70 dBA (light, single prop), all heading

LOCATION	DATE & TIME	LOCATION, RESULTS & NOTES
		south to land. The loudest plane was almost overhead while others were to the east.
A3	11:53 am 01 / 08 / 13	Near Yorkeys Knob Primary School Statistical noise levels: L_{10} 51 dBA, L_{eq} 49 dBA, L_{90} 39 dBA Weather: Fine, warm, light breeze Postie bike 50 to 60 dBA Variable wind in trees 35 to 40 dBA Distant traffic 35 to 45 dBA Birds 35 to 40 dBA School door closed 42 dBA Plane 64 (jet) heading south to land.
A4	12:17 pm 01 / 08 / 13	Holloways Beach at northern end of loop in Baronia Crescent Statistical noise levels: L_{10} 60 dBA, L_{eq} 61 dBA, L_{90} 42 dBA Weather: Fine, warm, 10% cloud cover, light SE breeze Variable wind in many palm trees 40 to 54 dBA Planes 75 (Virgin jet), 78 (Qantas jet) and 79 dBA (Virgin jet), all heading south to land.

Source: Appendix S (Table 5.4).

17.1.3 Overall Noise Environment

The following conclusions regarding the noise environment can be drawn from the results of the unattended and attended readings:

- The ambient noise level environment is similar at logging locations L1 (South) and L3 (North) as they are both located near to Yorkeys Knob Road and thus affected by similar noises, particularly road traffic. Logging location L2 (East) is subject to a significantly different noise environment to locations L1 and L3 with little nearby road traffic, but increased influence by birds and wind rustling the trees.
- The background noise environment is dominated by wind blowing in trees and cane, distant traffic noise, birds and insects. At logging location L2 it appears that background noise levels (L_{90}) reduced by approximately 10 dBA one afternoon where wind speeds were reduced.
- Noise from vehicles on Yorkeys Knob Road and aircraft overhead are the dominant short-term noise events across the site with increased traffic noise nearer Yorkeys Knob Road and increased aircraft noise towards the eastern portion of the site.
- Logging location L2 (east) was affected by relatively high levels of aircraft noise, as was location A4 at the northern end of Holloways Beach, and to a lesser degree, location A3 near Yorkeys Knob Primary School. These locations of increased aircraft noise levels are not surprising given the flight path and resulting aircraft noise levels.

17.1.4 Sensitive Receptors

Sensitive receptors are discussed in the SPP 2013 under *Planning for hazards and safety (Emissions and hazardous activities)* and defined in Appendix 5 of the SPP 2013. The nearest affected sensitive receptors are shown on **Figure 17-2** and described in **Table 17-3**. These receptors are similar to but not identical with external receptors discussed for air.

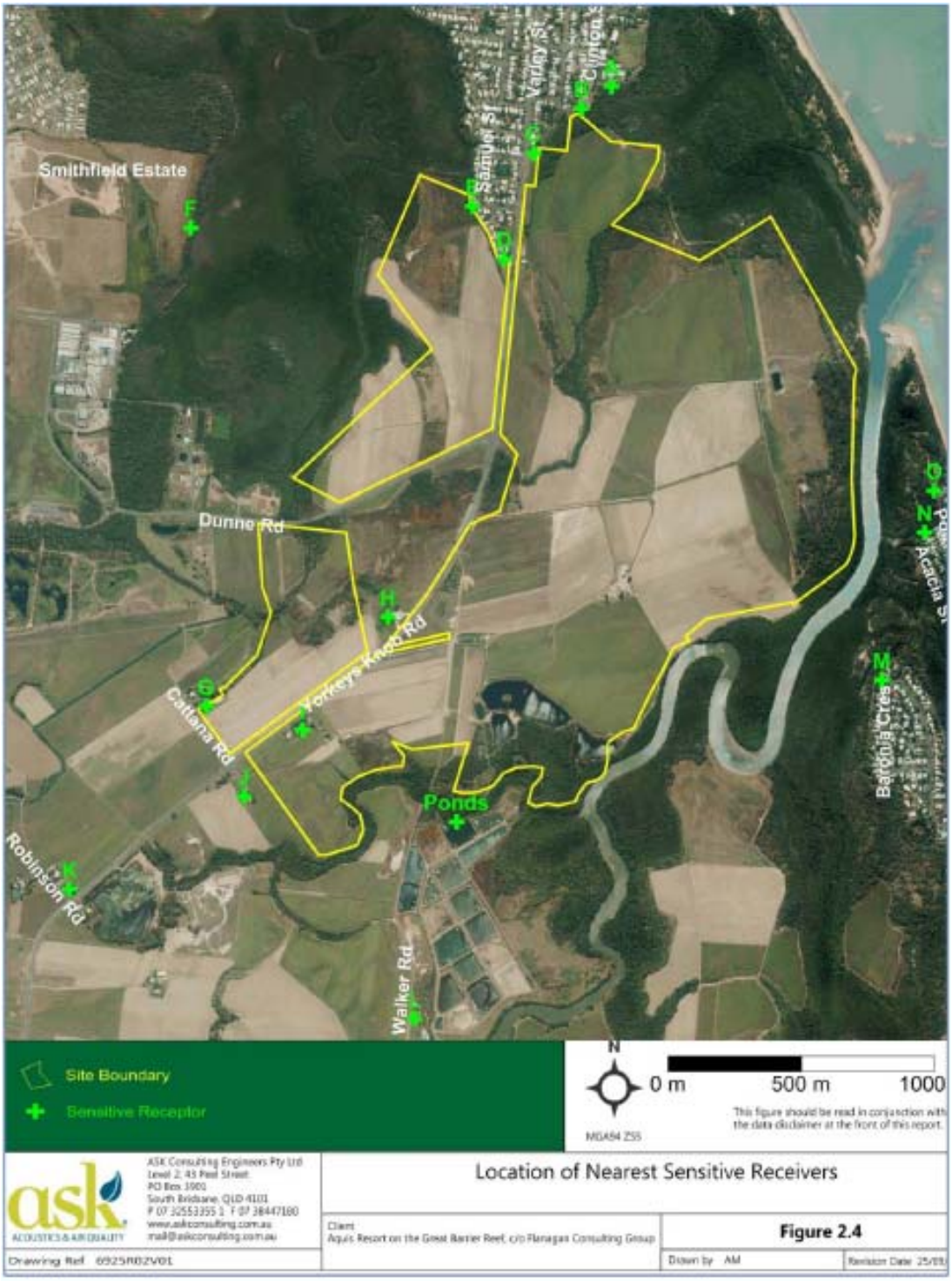

Figure 17-2 Location of sensitive receptors.

Source: Appendix S (Figure 2.4).

TABLE 17-3 LOCATION OF NEAREST SENSITIVE RECEPTORS

ID	NAME	TYPE	COORDINATES (GDA 55)	
			Easting (m)	Northing (m)
A	Yorkeys Knob State School	School	363850	8140388
B	21 Clinton Street	Residence	363672	8140222
C	410 Varley Street	Residence	363563	8139827
D	1 / 369 Varley Street	Residence	363444	8140024
E	1 Samuel Street	Residence	362396	8139946
F	Smithfield Estate	Residence	362453	8138169
G	22 Cattana Road	Residence	363128	8138499
H	233 Yorkeys Knob Road	Residence	362813	8138080
I *	[Deleted]			
J	154 Yorkeys Knob Road	Residence	361945	8137490
K	4 Robinson Road	Residence	363228	8137016
L	47 Walker Road	Residence	364966	8138265
M	72 Boronia Crescent	Residence	365126	8138813
N	30 Acacia Street	Residence	365162	8138969
O	Poinsettia Street Environmental Centre	Business & residential	363850	8140388

Source: Appendix S (Table 2.1).

* Site I is no longer a sensitive receptor as the residence now forms part of the Aquis Resort parcel and will be removed as part of development.

The main sensitive receptors are in the adjacent urban areas of Yorkeys Knob and across Richters Creek to Holloways Beach. Some rural receptors are located to the south and west. If predicted noise and vibration emission levels are compliant at the receptors listed above, then it is considered that all noise emission levels are compliant.

17.1.5 Environmental Values

Environmental Values for the noise environment as defined under the EPP (Noise) are:

a) the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems; and
b) the qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to do any of the following—
    i) sleep;
    ii) study or learn;
    iii) be involved in recreation, including relaxation and conversation; and
c) the qualities of the acoustic environment that are conducive to protecting the amenity of the community.

These values are protected by standards as described below.

There are many noise standards / criteria which can be applied in Queensland as described in detail in **Appendix S**. These are:

- CairnsPlan 2009 (including aircraft noise issues).
- Department of Transport and Main Roads – Road Traffic Noise Management: Code of Practice.
- Department of Environment and Heritage Protection – Environmental Protection Policy (Noise) and *Environmental Protection Act* (EP Act).
- Office of Liquor and Gaming Regulation – Guideline for Acoustic Consultants.
- Relevant acoustic and noise standards and guidelines.

Specific noise limits can depend on existing ambient or background noise levels and these are detailed in **Appendix S**, along with the selection of appropriate noise criteria considered on a source-by-source basis. The noise limits are summarised in **Table 17-4**. The appropriate noise criteria are selected for each noise source in each situation, i.e. not all noise criteria are applicable in each instance.

TABLE 17-4 SUMMARY OF AIRBORNE NOISE LIMITS AT RESIDENTIAL RECEPTORS

#	CRITERIA AND MEASUREMENT LOCATION	PARAMETER	LOCATION (Table 17-2)	NOISE LIMITS dBA*		
				Day	Evening	Night
C1	Act Noise Limits for Air-Conditioning and Refrigeration Plant, Outdoors	LAeq,adj,T	L1	47	41	35
			L2	37	38	33
			L3	46	40	32
C2	Act Noise Limits for Indoor Venues, Outdoors	LAeq,adj,T	L1	47	41	35#
			L2	37	38	33#
			L3	46	40	32#
C3	Act Noise Limits for Open-Air Events, Outdoors	LAeq,adj,T	L1	70	70	42#
			L2	70	70	40#
			L3	70	70	39#
C4	DERM EPP(Noise), Background Creep, Continuous Noise, Outdoors	LA90,T	L1	42	36	32
			L2	32	33	30
			L3	41	35	29
C5	DERM EPP(Noise), Background Creep, Variable Noise, Outdoors	LAeq,adj,T	L1	47	41	37
			L2	37	38	35
			L3	46	40	34
C6	DERM EPP(Noise) Acoustic Quality Objectives, Indoors	LAeq,adj,T	All	35	35	30
		LA10,adj,T	All	40	40	35
		LA1,adj,T	All	45	45	40
C7	DERM EPP(Noise) Acoustic Quality Objectives, Outdoors	LAeq,adj,T	All	50	50	N / A
		LA10,adj,T	All	55	55	N / A
		LA1,adj,T	All	65	65	N / A
C8	DERM EPP(Noise) Acoustic Quality Objectives, Outdoors (At façade, assuming open windows)	LAeq,adj,T	All	40-45	40-45	35-40
		LA10,adj,T	All	45-50	45-50	40-45
		LA1,adj,T	All	50-55	50-55	45-50

#	CRITERIA AND MEASUREMENT LOCATION	PARAMETER	LOCATION (Table 17-2)	NOISE LIMITS dBA*		
				Day	Evening	Night
C9	DERM EcoAccess Background Creep	LAeq,adj,T	L1	45	41	35
			L2	40	33	28
			L3	46	41	37
C10	DERM EcoAccess Sleep Disturbance, Indoors	LAmax,T	All	N / A	N / A	45
		LAeq,T	All	N / A	N / A	30
C11	DERM EcoAccess Sleep Annoyance, Indoors	LAeq,T	All	N / A	N / A	35
C12	DERM EcoAccess Sleep Disturbance, Outdoors	LAmax,T	All	N / A	N / A	50-55
		LAeq,T	All	N / A	N / A	35-40
C13	DERM EcoAccess Sleep Annoyance, Outdoors	LAeq,T	All	N / A	N / A	40-45
C14	DERM EcoAccess Low Frequency Noise, Indoors	LAmax,T	All	50 dBZ		
C15	'Comparison of Like Parameters' Noise, Outdoors	LA1	L1	62	61	-
			L2	52	42	-
			L3	59	62	-
		LA10	L1	58	54	-
			L2	45	39	-
			L3	53	57	-

Source: Appendix S (Table 5.10).

Note: * Limits are applied as A-weighted levels, i.e. dBA, unless mentioned otherwise. # Limits apply until midnight, after which the noise emissions are to be inaudible.

17.2 IMPACTS

17.2.1 Mitigation by Design

The dominant short-term noise events across the site are traffic on Yorkeys Knob Road and aircraft overhead. Increased traffic noise occurs closer to Yorkeys Knob Road and increased aircraft noise towards the eastern portion of the site.

Sensitive receptors exist in the adjacent urban areas of Yorkeys Knob and across Richters Creek to Holloways Beach (see **Figure 17-2**). Some rural receptors are located to the south and west.

High level design solutions to limit noise impact have included removing the Water Park and Stadium from the proposal.

17.2.2 Characteristics of Emissions

The project covers a large site and so while there will be noise and vibration emissions from its construction and operation, it is expected that these will be controllable due to the opportunity for reasonable buffers distances through appropriate design layout and construction management.

The major issues for the development relating to noise and vibration include:

- construction impacts such as noise and vibration emissions from construction activities, particularly involving heavy equipment, pile-driving and vehicle movements, have the potential to impact on nearby residents

- operational impacts of the development on the existing acoustic environment, i.e.:
  - noise emissions from the golf course, particularly lawn maintenance equipment, impacting on nearby residents
  - noise emissions from increased traffic flow on Yorkeys Knob Road and proposed new project roads, impacting on nearby residents
  - noise emissions from the helipad impacting on nearby residents and on Aquis Resort guests
- noise emissions from external sources affecting the project, with resulting requirements on building construction and impacts on people in outdoor areas:
  - traffic noise, especially from Yorkeys Knob Road
  - aircraft noise.

These issues are addressed in detail in **Appendix S**.

17.2.3 Impacts of Emissions on Environmental Values

The potential impacts of the development on sensitive receptors shown on **Figure 17-2** are summarised in **Table 17-5**.

TABLE 17-5 SUMMARY OF POTENTIAL NOISE AND VIBRATION IMPACTS CONSIDERED

SOURCE	RELEVANT SENSITIVE RECEPTORS	LIKELIHOOD OF CRITERIA EXCEEDANCES
Noise from maintenance equipment at golf course	A, B, C, D and E	Low to moderate
Noise from entertainment and retail buildings	All residences	Very low to low
Noise from increased road traffic	Residences on Yorkeys Knob Road	Moderate
Noise from helipad	All residences	Low
Noise from construction activities	All residences	Moderate
Vibration from construction activities	All residences	Low
Noise from aircraft movements	All residences	See Section.

Source: Appendix S (Table 10.1).

Overall, the major impacts are likely to be from:

- noise and vibration from construction activities, when occurring near to residents
- noise from increased vehicle movements on Yorkeys Knob Road, although it is expected that only two residents may be subject to noise levels in excess of criteria and this can be addressed with mitigation measures.

17.2.4 Air Traffic Noise

Section 24.4.2d) notes that, overall, there will be a 22% increase in flights arriving and departing from Cairns International Airport and that North Queensland Airports (NQA) as the owner and operator of the Cairns Airport have provided written confirmation that there is sufficient capacity at the airport to cater for the increase in demand arising from Aquis. The additional flights will not add to the level of noise associated with the operation of airport, just the frequency of noise episodes. All airport operations are under the control of NQA and this control includes the management of noise for all aircraft with permission to use the airport. Like many other aspects of infrastructure, this is a

consequential impact that is beyond the ability of Aquis to predict or manage. The Aquis Resort is simply using some of the latent capacity of already approved infrastructure.

17.3 MITIGATION AND MANAGEMENT IMPACTS

a) Overview of Impacts and Mitigation

The following is a summary of impacts on the acoustic environment and recommended mitigation.

Construction Impacts:

- Earthworks (including dredging): Bulk earthworks will involve extensive use of scrapers, bulldozers, graders, excavators, backhoes, loaders, trucks, and compaction equipment, as well as general equipment such as compressors, pumps, and generators. It is most likely that bulk excavation for the lake will utilise dredging plant. Given the scale of the development, the approach should be to limit noise impacts by selection of appropriate buffer distances. Nonetheless, where there are multiple plant items in close proximity it is likely that target construction noise criteria will be exceeded. In these instances noise and vibration emissions should be minimised in accordance with Australian Standard AS2436-2010 'Guide to noise and vibration control on construction, demolition and maintenance sites'. Further evaluation can be conducted in a detailed noise management plan to be developed for the site as part of the EMP (Planning).
- Concrete Batching: Mobile batching plant could be a significant noise source during operational periods and hence should not be located near to residences. It is expected a batching plant would be located near to each stage of the construction process. With a buffer distance of approximately 200 m, noise emissions should be compliant with the EPP (Noise) Acoustic Quality Objectives (Outdoors) during the daytime (7 am to 6 pm).
- Pile Driving: An initial review of pile driving noise and vibration has been conducted. It is expected that an impact pile driver may be noticeable within 200 m to 400 m of residences, though vibration is only likely to be above human comfort levels within 150 m. Pile driving is unlikely to cause damage within 50 m of a building.

Operation Impacts:

- Golf Course: The golf course maintenance operations have the potential to cause some noise impacts, although the residences may already be accustomed to farming machinery on nearby fields. Recommendations are for a 150 m buffer distance for high maintenance areas (i.e. fairway, greens and rough) at the north-west section of the golf course (13.70 ha site) near to Receptor E, and a 300 m buffer near all sensitive receptors at night. These recommendations provide design guidance, which can be evaluated in further detail during later design stages with additional equipment data and noise monitoring data.
- Entertainment and Retail Buildings: Buildings of these types will include a number of noise sources such as mechanical plant (e.g. air-conditioning and refrigeration), patrons (e.g. outside dining), amplified music (e.g. casino, bars, theatre, and convention and exhibition centre). However, these building types and uses are regularly constructed in areas adjoining or in close proximity to sensitive receptors, with the knowledge that these noise sources can be readily controlled through appropriate building location, design, and construction. Noise from external activities (e.g. outside dining and vehicle movements) is not always easily controlled and therefore potentially noisy external activities should be located away from sensitive receptors (e.g. existing residents) where possible to minimise the requirement for noise mitigation measures and noise management plans.
- Road traffic: Noise mitigation measures will need to be considered for two 2-storey residences at the intersection of Yorkeys Knob Road and Robinson Road, and this may consist of noise barriers or upgrades on the dwelling (e.g. mechanical ventilation, insulation, upgraded windows etc.).

- Helipad: Given the size of the resort site, it is considered that a suitable location can be found that allows a reasonable buffer distance to existing and proposed future sensitive receptors. A buffer distance of 0.5 km to 1 km should be achievable. **Appendix O** includes details of neighbour-friendly helicopter operating procedures.

In terms of impacts of external emissions on the development (operation phase only):

- Road traffic: The predicted road traffic noise levels are not expected to be excessive and standard building construction should be sufficient to achieve acceptable internal noise level for road traffic noise.
- Air traffic: The calculated aircraft noise reduction is considered readily achievable with relatively standard construction and upgrading glazing (Rw 31 glazing: 6mm laminated glass with acoustic seals) based on the current aircraft noise information.

b) Further Mitigation

Construction

The development will require significant earthworks as part of the construction process and a detailed noise and vibration management plan will be required to be developed as part of the EMP (Construction), once more information is available on the construction process, activities, and equipment.

- Generally noise and vibration from construction will be managed through hours of operation and, where practical, use of appropriate buffer distances.
- The noise and vibration element of the EMP (Construction) should make reference to Australian Standard AS 2436-2010 'Guide to noise and vibration control on construction, demolition and maintenance sites'. This standard provides details on strategies to minimise construction noise, such as the following:
  - maximising the distance between noise activities and noise sensitive land uses
  - undertaking noise fabrication work off site where possible
  - adopting alternatives to reversing alarms
  - maintaining any pre-existing barriers or walls on a demolition or excavation site as long as possible to provide optimum sound propagation control
  - constructing barriers that are part of the project design early in the project to afford mitigation against site noise
  - using temporary site building and material stockpiles as noise barriers. These can often be created using site earthworks and may be included as a part of final landscape design
  - installing purpose-built noise barriers, acoustic sheds and enclosures.

Operation

Operational phase noise impacts have already been mitigated by removing the water park and stadium from the project and hence away from sensitive receptors. Further opportunities for mitigation should be explored during detailed design.

c) Monitoring and Auditing

The EMP (Planning) (see **Section 23.4)** includes an outline of the required monitoring and auditing, as well as actions required to be undertaken during design, construction, and operation.

The design of a monitoring and auditing system will be addressed in detail in the EMP (Construction). This will involve ensuring that all activities will be consistent with best practice environmental management and comply with any government plan in place at the time.

17.4 RESIDUAL IMPACTS

Overall, it is considered that noise and vibration associated with the operation of the development can be maintained at a compliant level. Activities will need to be appropriately managed during the construction phase to minimise impacts on nearby sensitive receptors.

Additional aircraft movements will add to the frequency of noise episodes but not their magnitude. All airport operations (and this includes noise emissions) are under the control of NQA. The Aquis Resort will absorb some of the latent capacity of already approved infrastructure.