Appendix F2 – Construction Noise Assessment

Hanson Tweed Sand Plant (HTSP) Expansion

Altona Road, Cudgen

Construction Noise Assessment

Hanson Construction Materials Pty Ltd

Project No.: ATP190611

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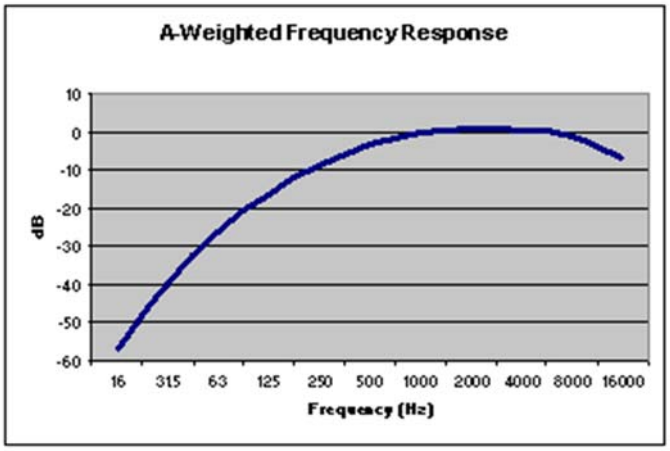
Acoustics Glossary

A-weighting

The A-weighting filter suppresses low frequency sounds and some of the higher frequency sounds to which the human ear is less sensitive. It is a correction to sound pressure levels to mimic the response of the human ear at low sound pressure levels. The A-weighted sound pressure level correlates well with the perceived loudness at low sound levels. The A-weighted sound pressure level is used extensively for general purpose noise measurements.



Broadband sound

Sound distributed across the whole audible frequency range.

dB(A)

The A-weighted sound pressure level.

Fast time-weighting

The Fast ("F") time-weighting is defined in AS 1259.1-1990. Instruments with F time weighting use a time constant of 125 milliseconds in their exponential averaging circuit.

Hz (Hertz)

Hertz is the standard measure of the frequency of oscillations in a wave motion. The frequency is most often measured in cycles per second (cps) or Hertz (Hz). Frequency of 1 Hz is one cycle per second.

Impulsive noise and impulsiveness adjustment

Noise having a high peak of short duration or a sequence of such peaks. Impulsive noise is present if the difference in A-weighted maximum noise levels between fast response and impulse response is greater than 2dB. Impulsiveness adjustment (penalty) of up to 5dB should be applied to the component noise level.

$L_{Aeq,T}$

"Average-energy" sound level used in situations where sound varies over time. $L_{Aeq,T}$ is the A-weighted sound pressure level that has the same energy as the fluctuating sound over the time period T sec.

$L_{A01,T}$

Measure of the maximum sound level. $L_{A01,T}$ is a statistical parameter that is the A-weighted sound pressure level that is exceeded for 1% of the measurement time T.

$L_{A10,T}$

$L_{A10,T}$ is a statistical parameter that is the A-weighted sound pressure level that is exceeded for 10% of the measurement time T.

$L_{A90,T}$

Background sound level. $L_{A90,T}$ is a statistical parameter that is the A-weighted sound pressure level that is exceeded for 90% of the measurement time T.

Noise

Unwanted sound.

Octave bands and 1/3 octave bands	A range of frequencies whose upper frequency limit is twice that of its lower frequency limit. In acoustics, the audible spectrum (20Hz to 20kHz) is divided into 10 parts (octaves) with centre frequencies of 31.5Hz, 63Hz, 125Hz, 250Hz, 500Hz, 1kHz, 2kHz, 4kHz, 8kHz and 16kHz. For more detailed frequency analysis, octave bands are further divided into more discrete bands. For examples, 1/3 octaves bands are is where each octave band is divided into three parts. IEC 61260:1995, *Electroacoustics — Octave-band and fractional-octave band filters*
Rating background level (RBL)	The overall single-figure background level representing each assessment period (e.g. standard hours, non-standard hours). The RBL is the background noise level for each work period using the tenth percentile method of measured $L_{A90,15\text{-minute}}$.
Sound power	The sound energy radiated per unit time by a sound source in all directions, measured in Watts (W).
Sound Power Level, L_w (SWL)	The sound power level in decibels (dB) is 10 times the base 10 logarithm of the ratio of the sound power in W to the reference sound power of 1×10^{-12} W (hearing threshold).
Sound pressure	The difference between the pressure caused by a sound wave and the ambient pressure of the medium the sound wave is passing through. Measured in Pascals (Pa).
Sound Pressure Level, L_p (SPL)	The sound power level in decibels (dB) is 20 times the base 10 logarithm of the ratio of the sound pressure in Pa to the reference sound pressure of 2×10^{-5} Pa (hearing threshold).
Tonal noise, tonality and tonality adjustment	Tonal noise is characterised by one or more distinct frequency components (“tones”) that emerge audibly from the total sound. For example, distinct tones may be emitted by fans, saws, grinders and other equipment. Tonal noise is generally far more annoying than non-tonal noise. Presence of tonal sound (“tonality”) can be identified by analysing the sound levels in adjacent 1/3 octave bands. AS1055.1-1997 and the DEHP Noise Measurement Manual 2013 provides guidance on how tonality should be assessed. If tonal components are clearly audible and they can be detected by 1/3 octave analysis (1/3 octave band exceeds neighbouring bands by at least 5dB), tonality adjustment (penalty) of up to 5dB should be applied to the component noise level.
Weighted Sound Reduction Index (R_w)	A single-number quantity which characterises the airborne sound insulation of a material or building element over a range of frequencies.

1. Introduction

ATP Consulting Engineers (ATP) was engaged to prepare a construction noise assessment in support of the proposed expansion of the existing Hanson Tweed Sand Plant (HTSP) in Cudgen, owned and operated by Hanson Construction Materials Pty Ltd (Hanson).

The HTSP currently operates under an existing Notice of Modification to DA 152-6-2005 issued by the New South Wales Department of Planning, Industry & Environment (DPIE) on 20 August 2018. The site also operates in accordance with Environment Protection Licence (No. 11453) issued by the New South Wales Environment Protection Authority (EPA).

Hanson is proposing to expand and redevelop the existing HTSP and is applying to the DPIE for approval to enable the following:

- Access to a sand resource of approximately 30-35 million tonnes with an annual maximum extraction of 950,000 tonnes of sand;
- The operations to be 24 hours seven days a week;
- Initially the existing wash plant and stockpile area will be used with an expectation that as the extraction phases progress, the area would be relocated as per the operational requirements; and
- Hanson will retain ownership of the site following completion of sand extraction and any proposed subsequent use of the site will be decided via the appropriate consultative, application and regulation processes in place at that time.

ATP Consulting has also prepared an Operational Noise Impact Assessment (ONIA) report (ref. ATP190611-R-NIA-05, dated 12 February 2021) for this project to address potential noise impacts associated with the expanded operations of the HTSP.

This acoustic report is prepared as per the requirements of the *Environmental Planning and Assessment Act 1979*, *Tweed Local Environment Plan 2014*, and *Interim Construction Noise Guideline,* and considers the impacts from the construction activities associated with the expansion of the HTSP (clearing of areas to be dredged, construction of new haulage road, as well as construction and installation of new processing facilities).

1.1 Study Objectives

Study objectives are as follows:

- Identify the nearest noise sensitive receptors to the proposed works;
- Determine the construction noise criteria applicable to the project, based on review of the *Interim Construction Noise Guideline*, and with consideration of the background noise levels measured as part of the ONIA report (ref. ATP190611-R-NIA-02, dated 11 January 2021);
- Consider proposed construction work practices and equipment to be used at the site and identify the dominant noise sources associated with the construction activities;

- Prediction of noise levels associated with the proposed works at each construction phase;
- Assess the noise levels at the nearest noise sensitive receptors against the applicable noise criteria;
- Recommendation of mitigation measures and work practices to be implemented throughout the construction period;
- Identify the procedures to be adopted for monitoring and reporting of construction noise emissions;
- Provide details of the complaint response procedures to be adopted; and
- Identify procedures to be adopted for revision and review of the noise management plan (NMP) in response to changes in the construction schedule and the nature of the construction activities undertaken.

1.2 Relevant Environmental Legislation and Documents

The list of NSW Acts and related documents that regulate matters of relevance to management of potential construction noise impacts is presented in Table 1.1.

Table 1.1 Relevant environmental legislation and related documents

Legislation	• *Environmental Planning and Assessment Act 1979* (EP&A Act) • *Protection of the Environment Operations Act 1997* (POEO Act)
Standards	• AS/NZS ISO 14001: Environmental Management • Australian Standard AS 2107-2016 *Acoustics - Recommended design sound levels and reverberation times for building interiors* • Australian Standard AS 2436-2010 *Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites* • British Standard BS 5228-1:2009, *Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise*
Policies / guidelines / specifications	• NSW EPA, *Noise Policy for Industry (2017)* • NSW EPA, *Interim Construction Noise Guideline (2009)* • NSW EPA, *Noise Guide for Local Government (2013)* • Roads and Maritime Services (RMS), *Construction Noise and Vibration Guideline (April 2016)* • NSW Government Transport for NSW, *Construction Noise and Vibration Strategy (2018)*

2. Project Description

2.1 Subject Site

The existing HTSP is located on the land described as Lot 22 on DP1082435, Lot 23 on DP1077509 and Lot 494 on DP720450.

Over the 30-year planning horizon it is proposed to expand the HTSP to also occupy adjacent allotments, specifically Lot 1 on DP1250570, Lot 2 on DP1192506, Lot 3 on DP1243752, Lot 50 on DP1056966 and Lot 51 on DP1166990.

The Phasing Plan for the proposed expansion is presented in Appendix A.

The location of the existing HTSP and the proposed 30-year planning horizon site extent is presented in Figure 1.1.

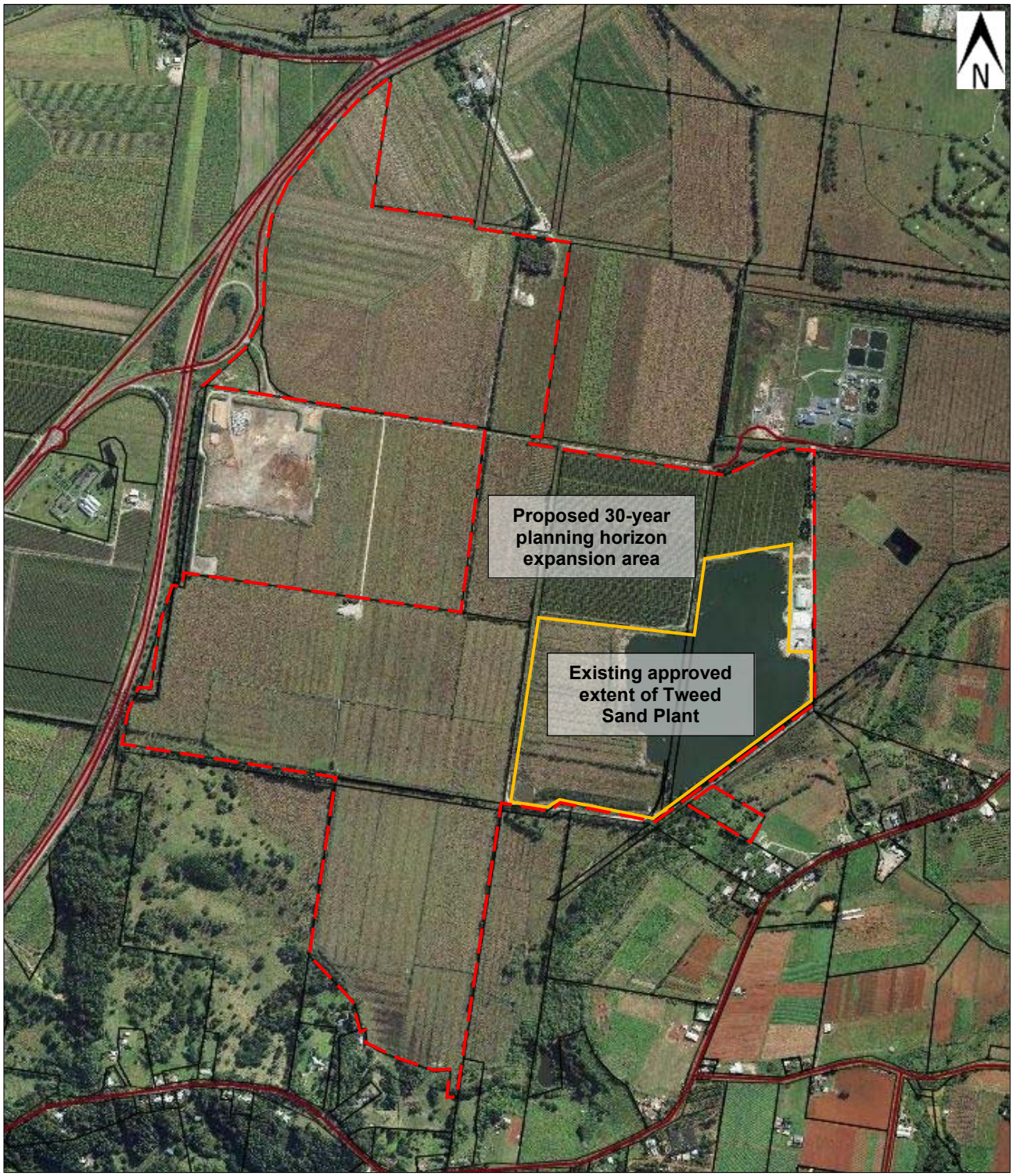


Figure 2.1 Site location

2.2 Proposed Works

As part of the expansion of the Tweed Sand Plant, the following construction activities are expected:

- Clearing of areas to be dredged (clearing of top soil to a depth of approximately 0.5m, and removal of cleared materials from site). Within each project phase, clearing will take place in stages, wherein over a 1–2 week period once a year, a 20–30m setback of land will be cleared to facilitate dredging operations;
- Construction of new haulage road (earthworks and road paving works); and
- Construction and installation of new processing facilities.

2.3 Zoning

Under the *Tweed Local Environment Plan 2014*, the subject site and most of the surrounding land is zoned RU1 Primary Production. There is a portion of land to the north which is zoned SP2 Infrastructure (Tweed Shire Sustainable Living Centre) and some land to the east, which is zoned R2 Low Density Residential, RE1 Recreation and R1 General Residential.

Zoning map from the *Tweed Local Environment Plan 2014* online mapping system is presented in Figure 1.2.

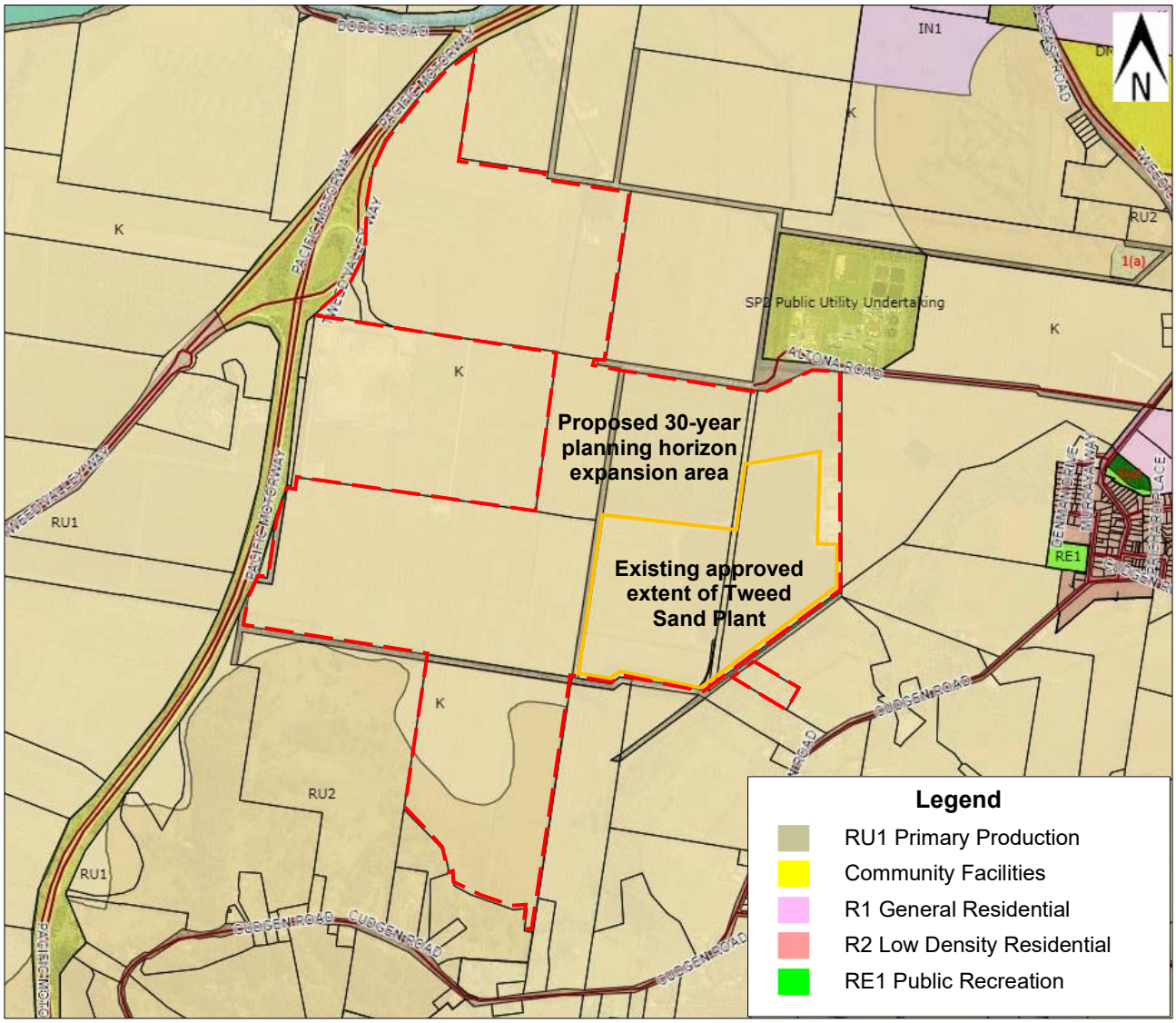


Figure 2.2 Zoning map – Tweed Shire Council

2.4 Nearest Noise Sensitive Places

In accordance with the *Interim Construction Noise Guideline*, a noise sensitive land use is defined as a land use that is sensitive to noise such as residences, classrooms, hospitals, places of worship, as well as passive and active recreation areas.

The nearest noise sensitive land uses to the HTSP are as follows:

- Residential dwellings to the south at Cudgen Road;
- Cudgen Public School to the east;
- Residential dwellings to the east; and
- Residential dwellings to the north.

All noise sensitive land uses are labelled in Appendix B.

3. Construction Noise Criteria

The construction noise criteria applicable to the proposed works are derived from the *NSW Interim Construction Noise Guideline*.

The background noise levels used in determination of the construction noise criteria are taken from the ONIA report for the development (ref. ATP190611-R-NIA-02, dated 11 January 2021).

3.1 Interim Construction Noise Guideline

The noise criteria stated in the *Interim Construction Noise Guideline* are presented in Table 3.1.

Table 3.1 Interim Construction Noise Guideline – Noise criteria at residences

Period	Management level $L_{Aeq,15min}$ dB(A)
Recommended standard hours: Monday to Friday 7:00am to 6:00pm Saturday 8:00am to 1:00pm No work on Sundays or public holidays	Noise affected RBL + 10dB
	Highly noise affected 75dB(A)
Outside recommended standard hours:	Noise affected RBL + 5dB

The resulting noise limits at the noise sensitive receptors are presented in Table 3.2.

Table 3.2 Interim Construction Noise Guideline – Noise limits at residences

Location	Period	RBL	Construction noise limit $L_{Aeq,adj,15min}$, dB(A)	
			Noise affected	Highly noise affected
Noise sensitive places to the east, and to the south-east (north of intersection between Cudgen Road and Plantation Road)	Standard hours *Mon-Fri: 7am-6pm* *Sat: 8am-1pm*	37	**47** (37 + 10)	75
	Non-standard hours (evening) *Mon-Fri: 6pm-10pm* *Sat: 1pm-10pm* *Sun: 7am-10pm*	38	**47** (37 + 10) *	n/a
	Non-standard hours (night) *Mon-Sun: 10pm-7am*	37	**47** (37 + 10)	n/a
Noise sensitive places to the south and south-west (south of intersection between Cudgen Road and Plantation Road)	Standard hours *Mon-Fri: 7am-6pm* *Sat: 8am-1pm*	36	**46** (36 + 10)	75
	Non-standard hours (evening) *Mon-Fri: 6pm-10pm* *Sat: 1pm-10pm* *Sun: 7am-10pm*	45	**46** (36 + 10) *	n/a
	Non-standard hours (night) *Mon-Sun: 10pm-7am*	38	**46** (36 + 10) *	n/a
Noise sensitive places to the north at significant setback from Pacific Motorway (primarily applicable to dwelling at 271 Pacific Motorway)	Standard hours *Mon-Fri: 7am-6pm* *Sat: 8am-1pm*	37	**47** (37 + 10)	75
	Non-standard hours (evening) *Mon-Fri: 6pm-10pm* *Sat: 1pm-10pm* *Sun: 7am-10pm*	45	**47** (37 + 10) *	n/a

Location	Period	RBL	Construction noise limit $L_{Aeq,adj,15min}$, dB(A)	
			Noise affected	Highly noise affected
	Non-standard hours (night) *Mon-Sun: 10pm-7am*	39	**47** (37 + 10) *	n/a
Noise sensitive places to the north and west within proximity to Pacific Motorway	Standard hours *Mon-Fri: 7am-6pm* *Sat: 8am-1pm*	41	**51** (41 + 10)	75
	Non-standard hours (evening) *Mon-Fri: 6pm-10pm* *Sat: 1pm-10pm* *Sun: 7am-10pm*	46	**51** (41 + 10) *	n/a
	Non-standard hours (night) *Mon-Sun: 10pm-7am*	39	**49** (39 + 10)	n/a

** The Interim Construction Noise Guideline does not make conditions for instances where the RBL during evening is higher than daytime, or for when the night-time RBL is higher than daytime and/or evening. This is likely due to seasonal insect noise and is typical of rural areas. However, conservative assessment has adopted the procedure from Section 2.3 of the NSW Noise Policy for Industry for determination of the construction noise limits. As per this procedure, noise limits for evening were set to be no greater than the limits for day time, and the noise limits for night time were set to be no greater than the limits for day time or evening.*

Table 3.3 presents the noise criteria which is applicable at uses other than residences.

Table 3.3 Interim Construction Noise Guideline – Noise criteria at uses other than residences

Land use	Management level $L_{Aeq,15min}$ dB(A) (applies when properties are being used)
Classrooms at schools and other educational institutions	45 (internally) 50 (externally)

4. Operational Noise Impact Assessment

4.1 Modelling Methodology

The potential noise impacts are dependent on the following factors:

- Sound power levels of the construction plant and equipment;
- The number of plant and equipment engaged;
- The time and day on which works are carried out (i.e. standard or non-standard works);
- Duration of the works;
- Distance between the noise source and nearest sensitive receptors;
- Existing background noise levels at the nearest sensitive receptors;
- Topography;
- Ground absorption;
- Screening by noise barriers;
- Atmospheric conditions (wind direction, humidity and temperature inversions); and
- The noise control measures implemented on the site (i.e. the implementation of noise management measures).

A 3D model of the site and surroundings was developed using SoundPLAN noise propagation software considering the construction activities associated with the planned expansion of the HSTP over a 30-year period relative to the nearest noise sensitive places.

The calculations were carried out as per the procedures specified in the International Standard ISO9613 (*Acoustics – Attenuation of sound during propagation outdoors*).

The calculation method for a single frequency is as follows:

$$L_S = [\ L_W + K_0\ ] - [\ A_{dI} + A_{div} + A_{gr} + A_{bar} + A_{atm} + d_{Lrefl} + d_{Lw}\ ]$$

Where:

L_S	Sound pressure for a single frequency
L_W	Sound power of source
K_0	Correction for propagation in limited spatial angle
A_{DI}	Mean directivity correction
A_{div}	Mean attenuation due to geometrical spreading
A_{gr}	Mean attenuation due to ground effect
A_{bar}	Mean attenuation due to screening
A_{atm}	Mean attenuation due to air absorption
d_{Lrefl}	Level increase due to reflections
d_{Lw}	Correction due to source operation time

The noise propagation losses are calculated as a combination of distance attenuation (geometrical spreading), screening, ground attenuation and other factors.

The assumptions and data used in development of the operational noise propagation model are presented in Table 4.1.

Table 4.1 Data and assumptions

Development layout and modelling of site expansion over 30-year planning horizon	Nine (9) different modelling scenarios were considering in the noise modelling, accounting for construction of the haulage road, construction of the new processing facilities, and construction activities associate with the clearing works over the 30-year planning horizon as the HTSP expands its operations onto the adjacent allotments. The modelling scenarios for the clearing works are based on the Concept Development / Phasing Plan for the HTSP Expansion, prepared by Zone Planning Group (job / drawing no: Z19163-104, preliminary issue), dated 25 January 2021, which is presented in Appendix A. Within each project phase, clearing will take place in stages, wherein over a 1–2 week period once a year, a 20–30m setback of land will be cleared to facilitate dredging operations. For brevity and simplicity, the construction noise levels associated with the clearing activities are assessed over the entire area for each phase. The modelling scenarios are as follows: • Scenario 1: Haulage road construction – Earthworks and road paving; • Scenario 2: Construction of new processing facilities; • Scenario 3: Phase 5 – Year 1-3 (expansion of dredge area to the north-west, onto northern section of Lot 22 on DP1082435 and onto the area of Lot 2 on DP1192506 not occupied by future wash plant facilities); • Scenario 4: Phase 6 – Year 4-8 (expansion of dredge area to the south-west, onto centre portion of Lot 1 on DP1250570, over Lot 3 on RP1243752 onto southern section of Lot 1 on DP1250570, and over location of existing wash plant facilities); • Scenario 5: Phase 7 – Year 9-13 (relocation of wash plant facilities to northern portion of Lot 2 on DP1192506. and expansion of dredge area to the west, towards western portion of Lot 1 on DP1250570); • Scenario 6: Phase 8 – Year 14-18 (expansion of dredge area to the west, to the far western portion of Lot 1 on DP1250570); • Scenario 7: Phase 9 – Year 19-22 (expansion of dredge area to the south, onto southern portion of Lot 1 on DP1250570); • Scenario 8: Phase 10 – Year 23-26 (relocation of dredge to eastern portion of Lot 51 on DP1166990); and • Scenario 9: Phase 11 – Year 27-30 (expansion of dredge area to the west, onto western portion of Lot 51 on DP1166990).
Proposed haulage route	• The proposed haulage road was modelled as per the layout plans featured in Appendix A of the Traffic Impact Assessment report prepared by Burchills Engineering Solutions (BE190043-RP-TIA-06), dated 9 February 2021.
Terrain	• Ground surface levels were obtained from ELVIS 5 metre grid elevation data. • Ground surface absorption factor of 0 was applied to all paved surfaces and water body surfaces, whilst a factor of 1 was applied for all grassed areas.
Calculation receivers	• Receivers were attached to the façades of the nearest noise sensitive buildings at a height of 1.5m above each floor level. • SoundPLAN adds +2.5dB(A) to the calculated noise levels when the receivers are attached to the buildings, thus the noise levels are facade adjusted. • 50m grid spacing was used for calculation of the noise contour maps.
Noise sources and operating times	• Refer to Table 4.2.

Noise control measures	• The recommended noise control measures are discussed in Section 5 of this report.
Noise enhancing meteorological effects	• All scenarios in the construction noise modelling were prepared to account for noise enhancing meteorological effects (equation 3 of ISO 9613), resulting in a worst-case assessment. • By utilising equation 3 in ISO 9613, the noise modelling automatically accounts for noise enhancing effects of downwind noise propagation and temperature inversion. • The calculations give the average downwind sound pressure levels $L_{AT(DW)}$. The downwind propagation conditions are: o Wind direction within an angle of ± 45° of the direction connecting the centre of the dominant sound source and the centre of the specified receptor region, with the wind blowing from the source to receptor; and o Wind speed between approximately 1 m/s and 5 m/s, measured at a height of 3 m to 11 m above the ground. • The calculations consider average propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs on clear, calm nights. • Extract from ISO 9613 is as follows: "*use of equation 3 leads directly to an equivalent continuous A-weighted sound pressure level L_{AT} at the receiver for meteorological conditions which are favourable for propagation from the sound source to that receiver. This may be the appropriate condition for meeting a specific community noise limit, i.e. a level which is seldom exceeded.*"
Distance attenuation	• 3D model of the subject site and surroundings was developed using cadastral data in SoundPLAN. • The source-receptor distances and geometrical spreading are automatically calculated in SoundPLAN to a high level of accuracy in accordance with the ISO 9613 procedure.
Barrier attenuation / screening	• Some of the neighbouring properties are shielded by intervening buildings and topographical features which act as noise barriers. • The barrier attenuation is calculated in SoundPLAN to a high level of accuracy in accordance with the ISO9613 procedure.
Ground attenuation	• Sound reflecting surfaces such as pavement or water are modelled with ground absorption coefficient of 0 (no absorption). • Grassed and vegetated areas are modelled with ground absorption coefficient of 1 (100% absorption) in accordance with ISO9613.

4.2 Noise Sources

The sound power levels, tonality/impulsiveness adjustment factors, and the construction scenarios for all noise sources considered in the SoundPLAN model are presented in Table 4.2.

Table 4.2 Noise sources

Activity	Equipment	Sound pressure level @ 10m L_{pA}, dB(A)	Sound power level L_{wA}, dB(A)	Tonality / impulsiveness adjustment
Scenario 1 – Haulage road construction				
Earthworks	Excavator (20 tonne)	71	99	+5 dB
	Excavator (14 tonne)	69	97	
	Excavator (5 tonne)	65	93	
	Padfoot roller (16 tonne)	74	102	
	Smooth drum roller (18 tonne)	74	102	
	Body truck	78	106	
	Water cart	76	104	
Road paving works	Asphalt paver	81	109	
	Grader	82	110	
	Tip trucks	79	107	
Overall sound power level, dB(A) including tonality / impulsiveness adjustment			120 dB(A)	
Scenario 2 – Construction of new processing facilities				
Earthworks	Excavator (5 tonne)	65	93	+5 dB
	Padfoot roller (16 tonne)	74	102	
	Smooth drum roller (18 tonne)	74	102	
Concrete works	Concrete mixer truck and concrete pump	75	103	
	Concrete vibrator	71	99	
General works	Mobile crane	75	103	
	Body truck	78	106	
	Generator	64	92	
Overall sound power level, dB(A) including tonality / impulsiveness adjustment			116 dB(A)	
Scenarios 3 to 9 – Phase 5 to Phase 11				
Clearing works	Excavator (14 tonne)	69	97	+5 dB
	Excavator (5 tonne)	65	93	
	Body truck	78	106	
	Bulldozer (20 tonne)	71	99	
Overall sound power level, dB(A) including tonality / impulsiveness adjustment			112 dB(A)	

Sources: *BS5228-1:2009 and AS2436:2010.*

Extract from the SoundPLAN operational noise model for Scenario 1 (haulage road construction) is presented in Figure 4.1.

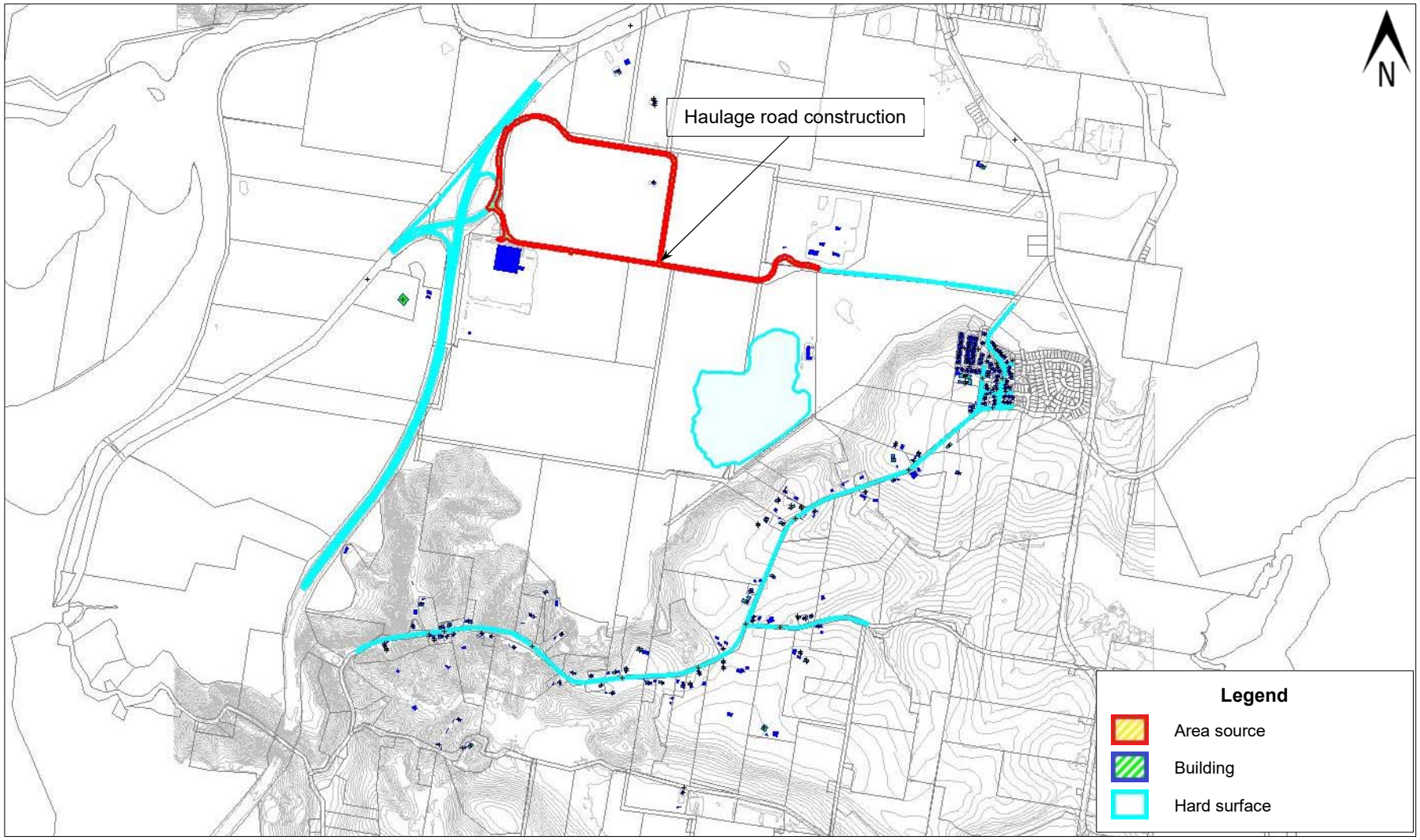


Figure 4.1 SoundPLAN noise model excerpt – Scenario 1 (haulage road construction)

Extract from the SoundPLAN operational noise model for Scenario 2 (construction of new processing facilities) is presented in Figure 4.2.

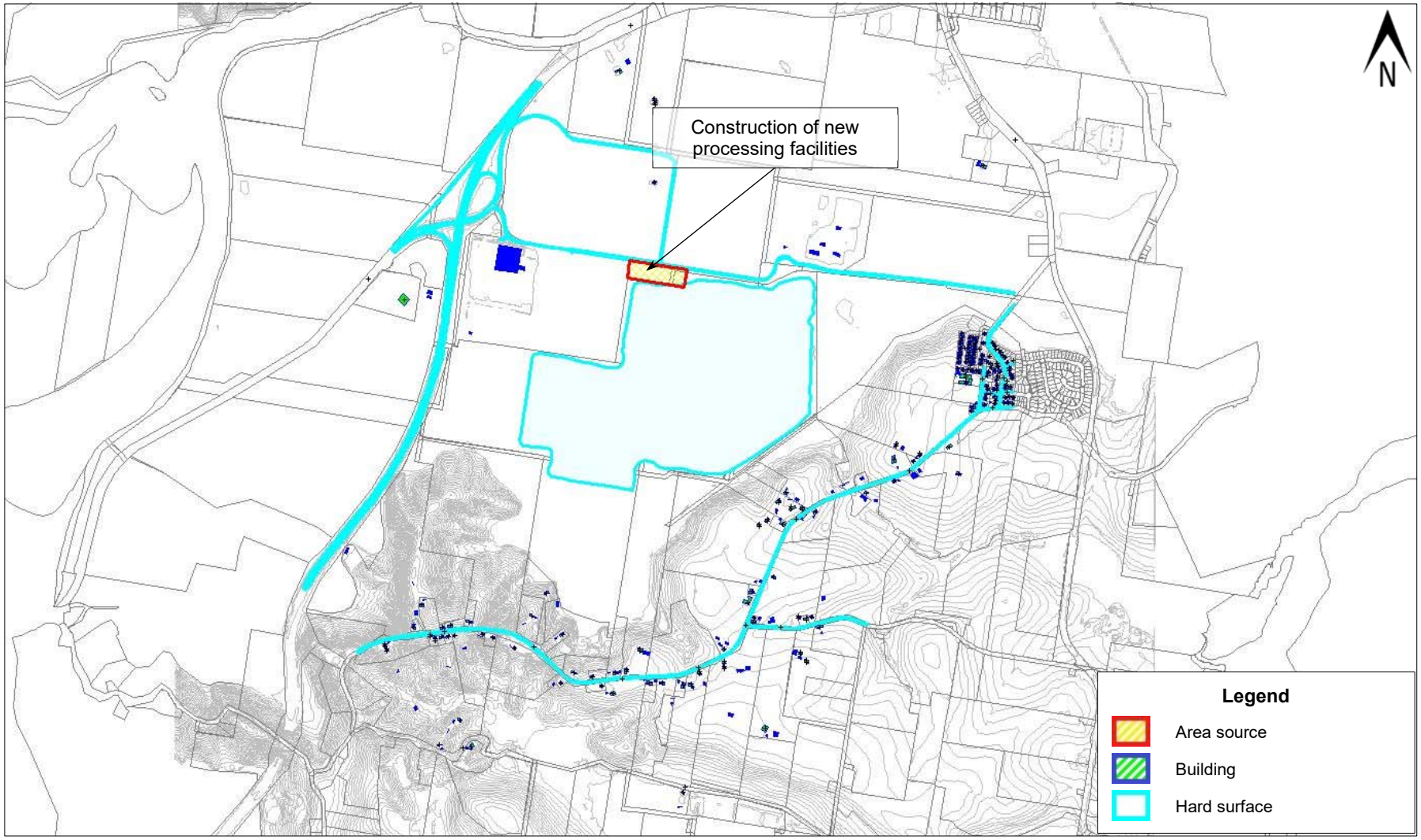


Figure 4.2 SoundPLAN noise model excerpt – Scenario 2 (construction of new processing facilities)

Extract from the SoundPLAN operational noise model for Scenario 3 (clearing for phase 5 operations) is presented in Figure 4.3.

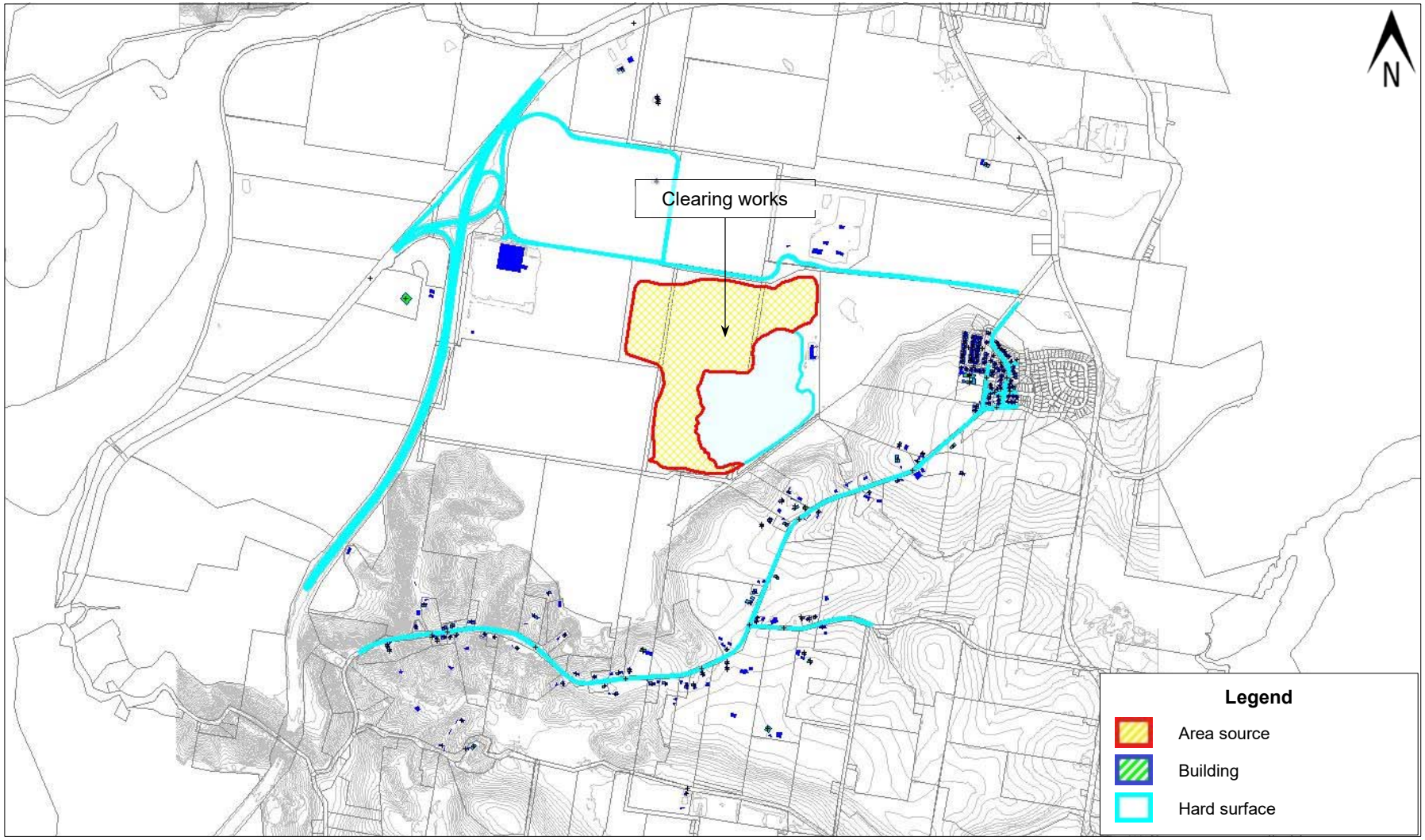


Figure 4.3 SoundPLAN noise model excerpt – Scenario 3 (clearing for phase 5 operations)

Extract from the SoundPLAN operational noise model for Scenario 4 (clearing for phase 6 operations) is presented in Figure 4.4.

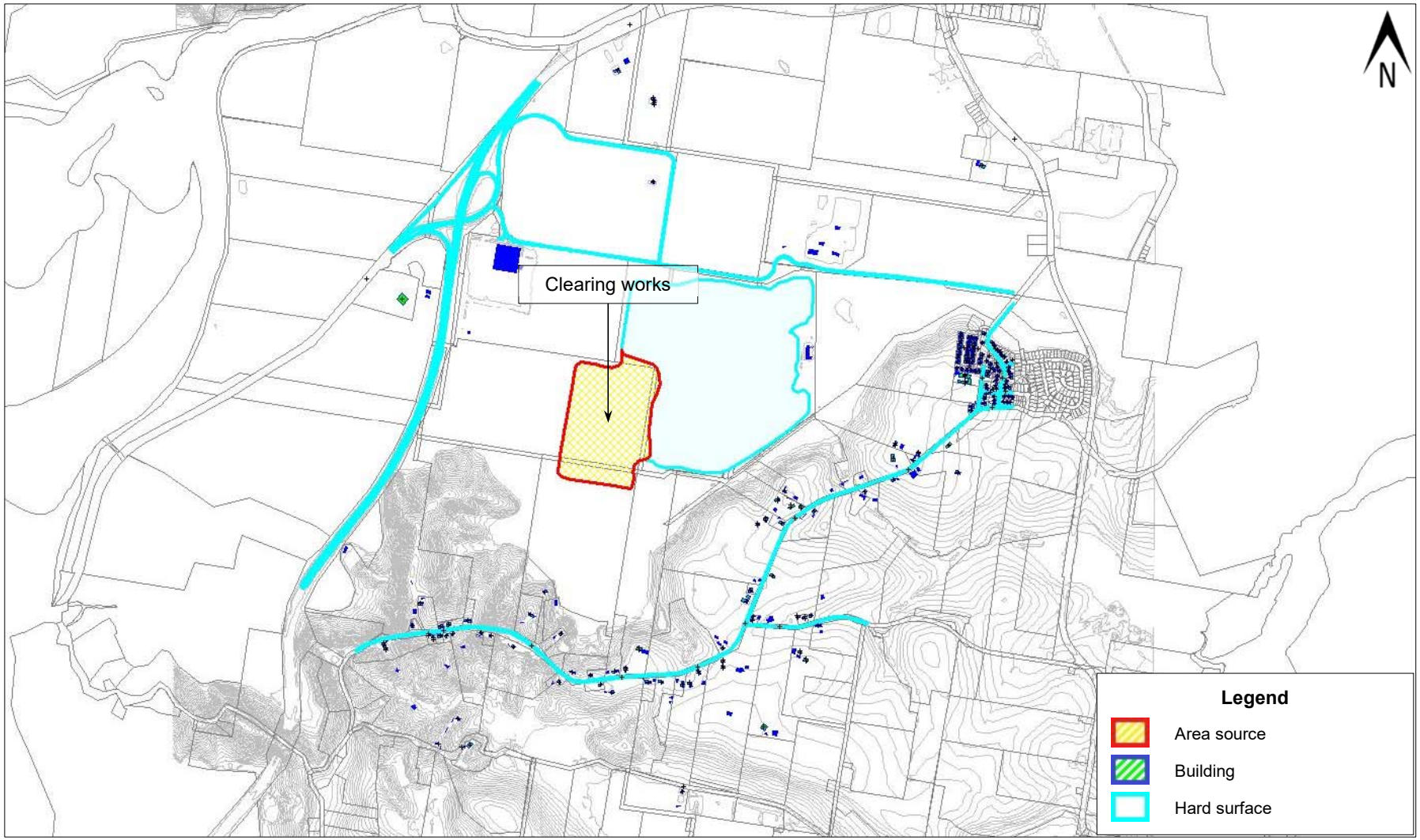


Figure 4.4 SoundPLAN noise model excerpt – Scenario 4 (clearing for phase 6 operations)

Extract from the SoundPLAN operational noise model for Scenario 5 (clearing for phase 7 operations) is presented in Figure 4.5.

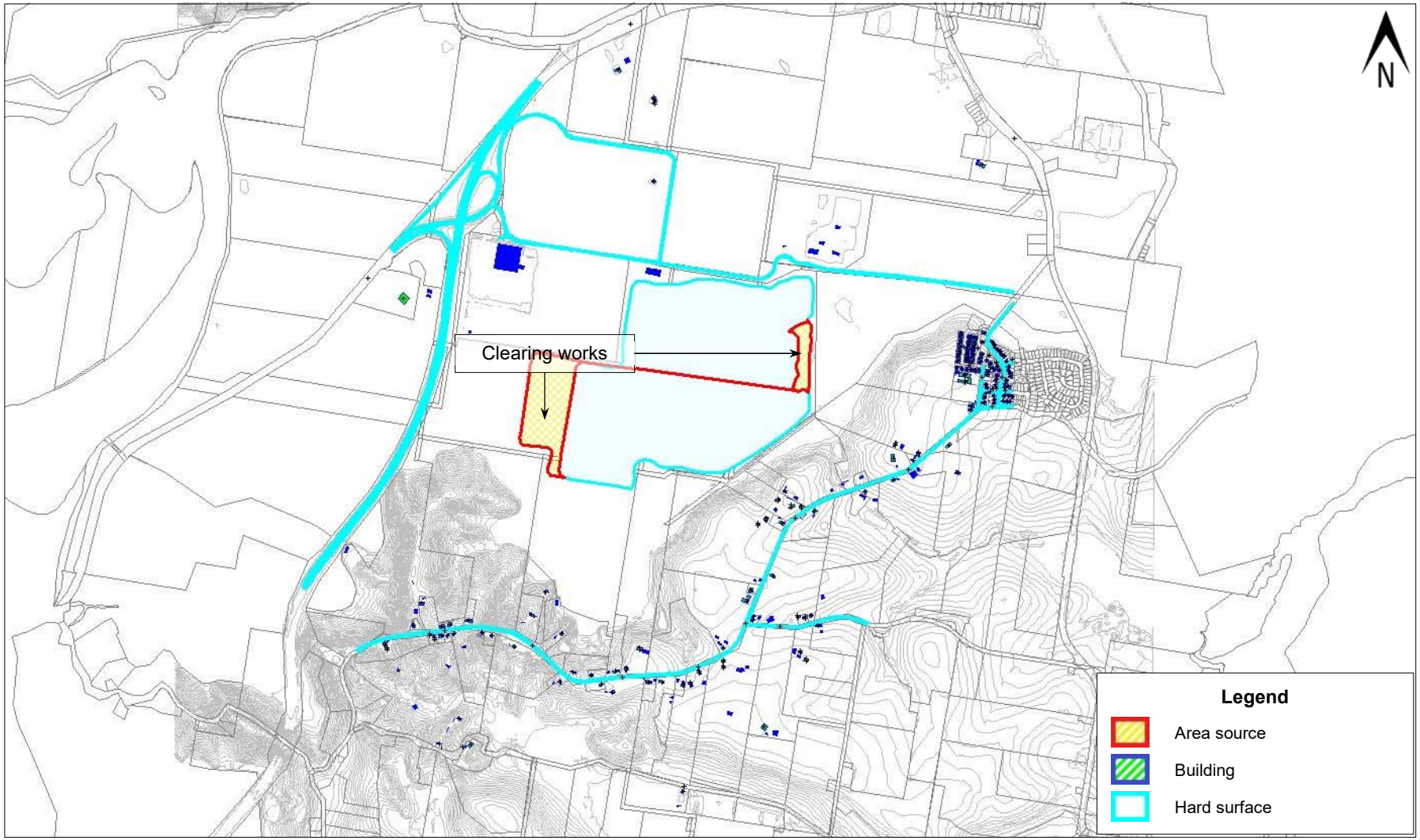


Figure 4.5 SoundPLAN noise model excerpt – Scenario 5 (clearing for phase 7 operations)

Extract from the SoundPLAN operational noise model for Scenario 6 (clearing for phase 8 operations) is presented in Figure 4.6.

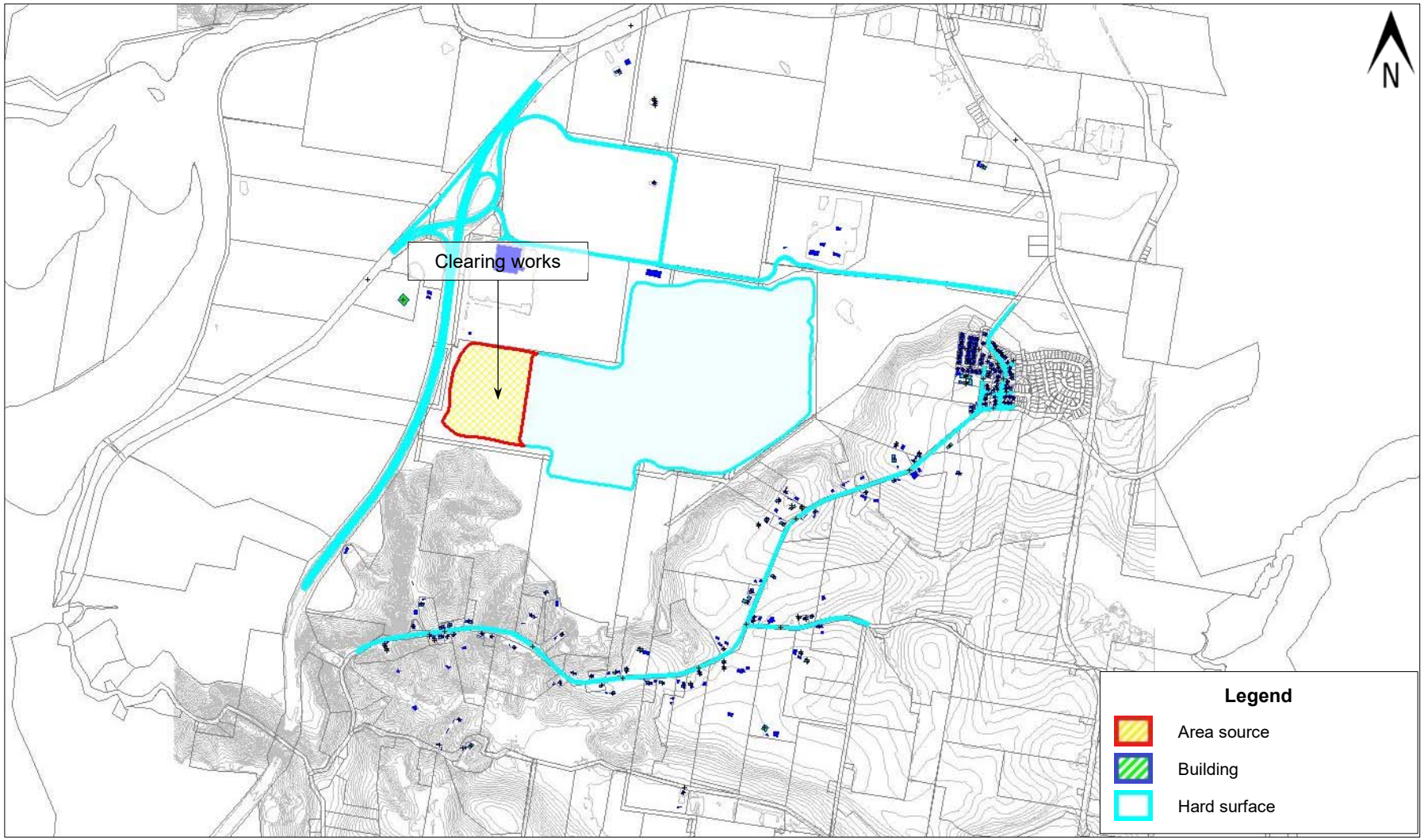


Figure 4.6 SoundPLAN noise model excerpt – Scenario 6 (clearing for phase 8 operations)

Extract from the SoundPLAN operational noise model for Scenario 7 (clearing for phase 9 operations) is presented in Figure 4.7.

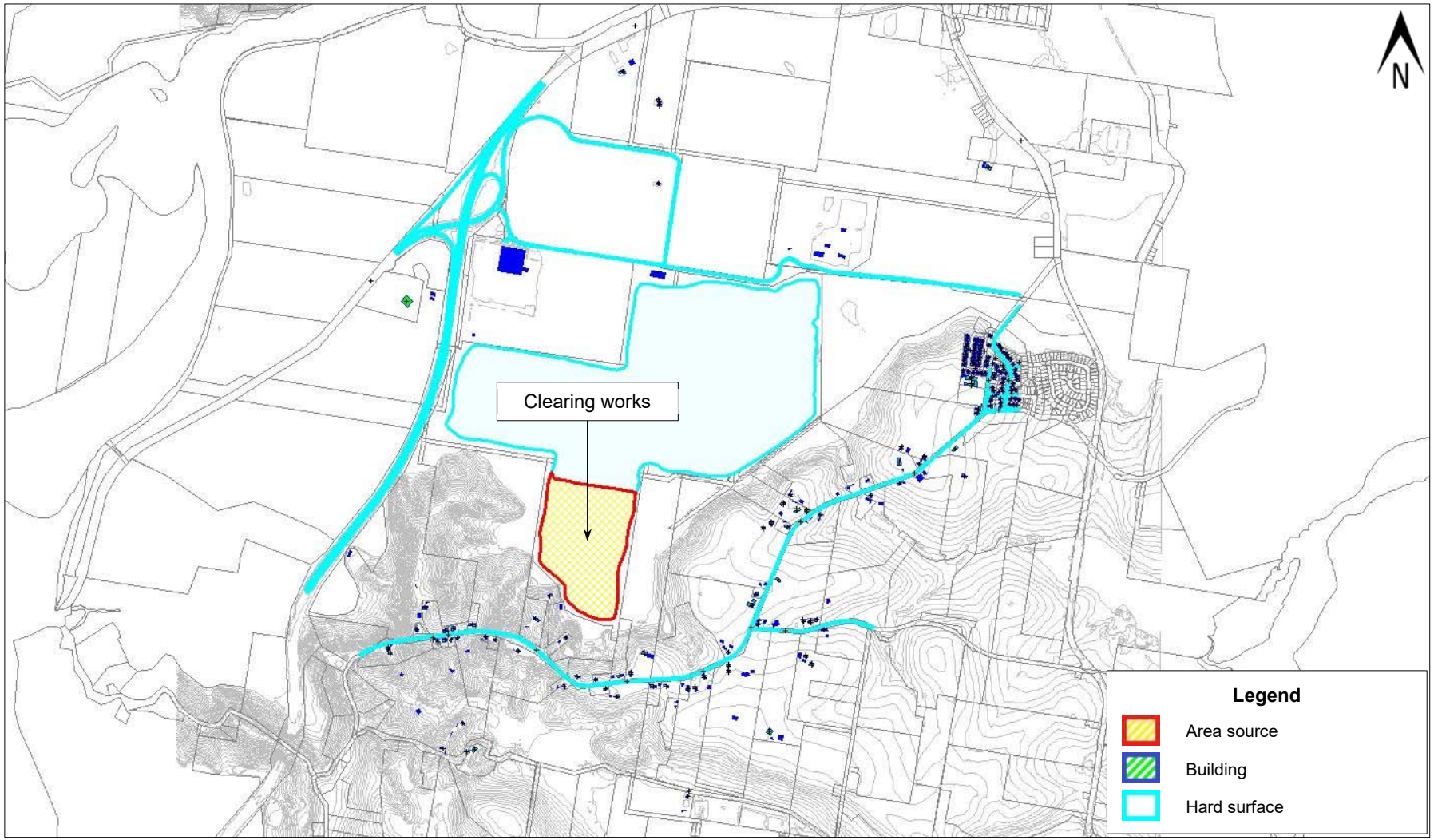


Figure 4.7 SoundPLAN noise model excerpt – Scenario 7 (clearing for phase 9 operations)

Extract from the SoundPLAN operational noise model for Scenario 8 (clearing for phase 10 operations) is presented in Figure 4.8.

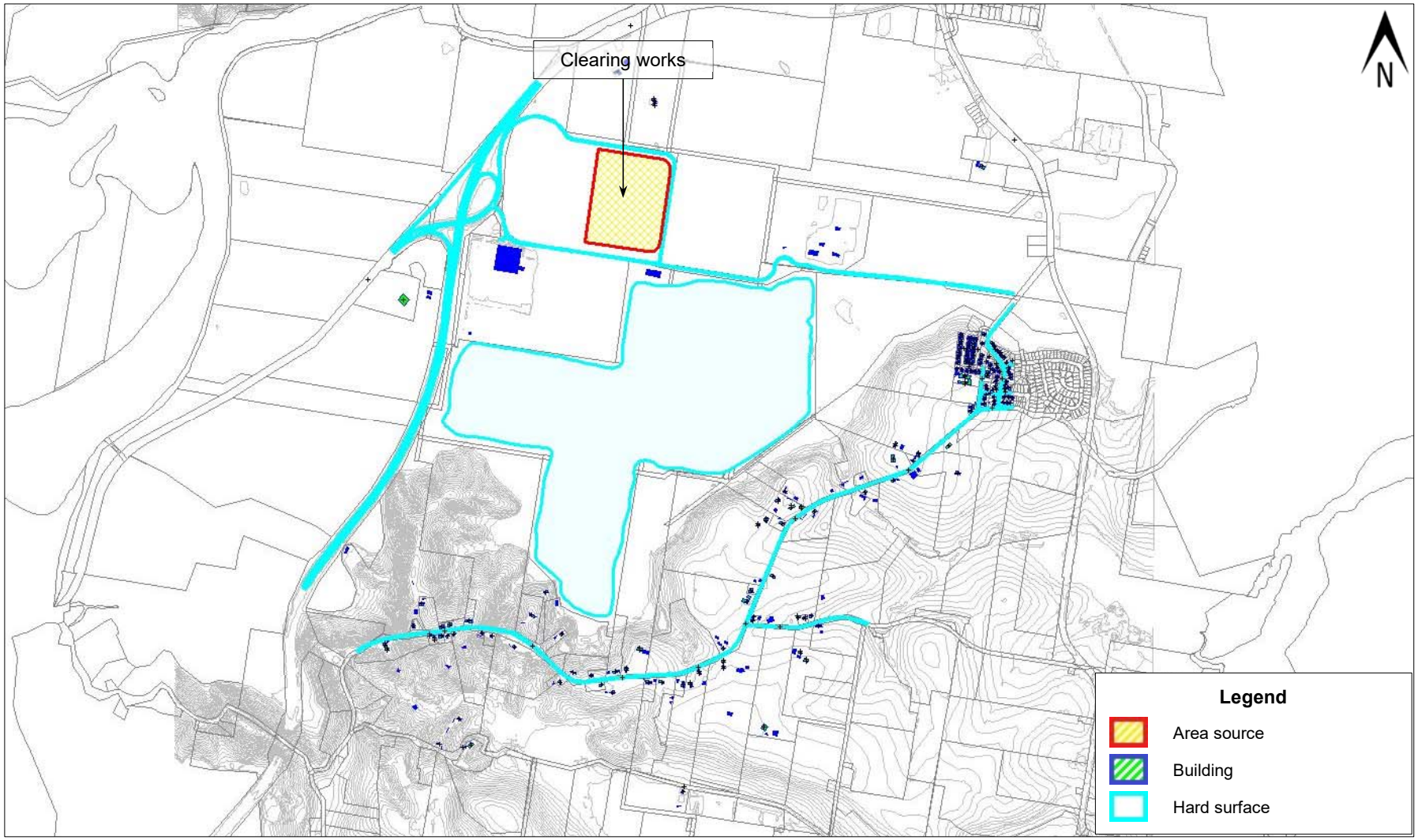


Figure 4.8 SoundPLAN noise model excerpt – Scenario 8 (clearing for phase 10 operations)

Extract from the SoundPLAN operational noise model for Scenario 9 (clearing for phase 11 operations) is presented in Figure 4.9.

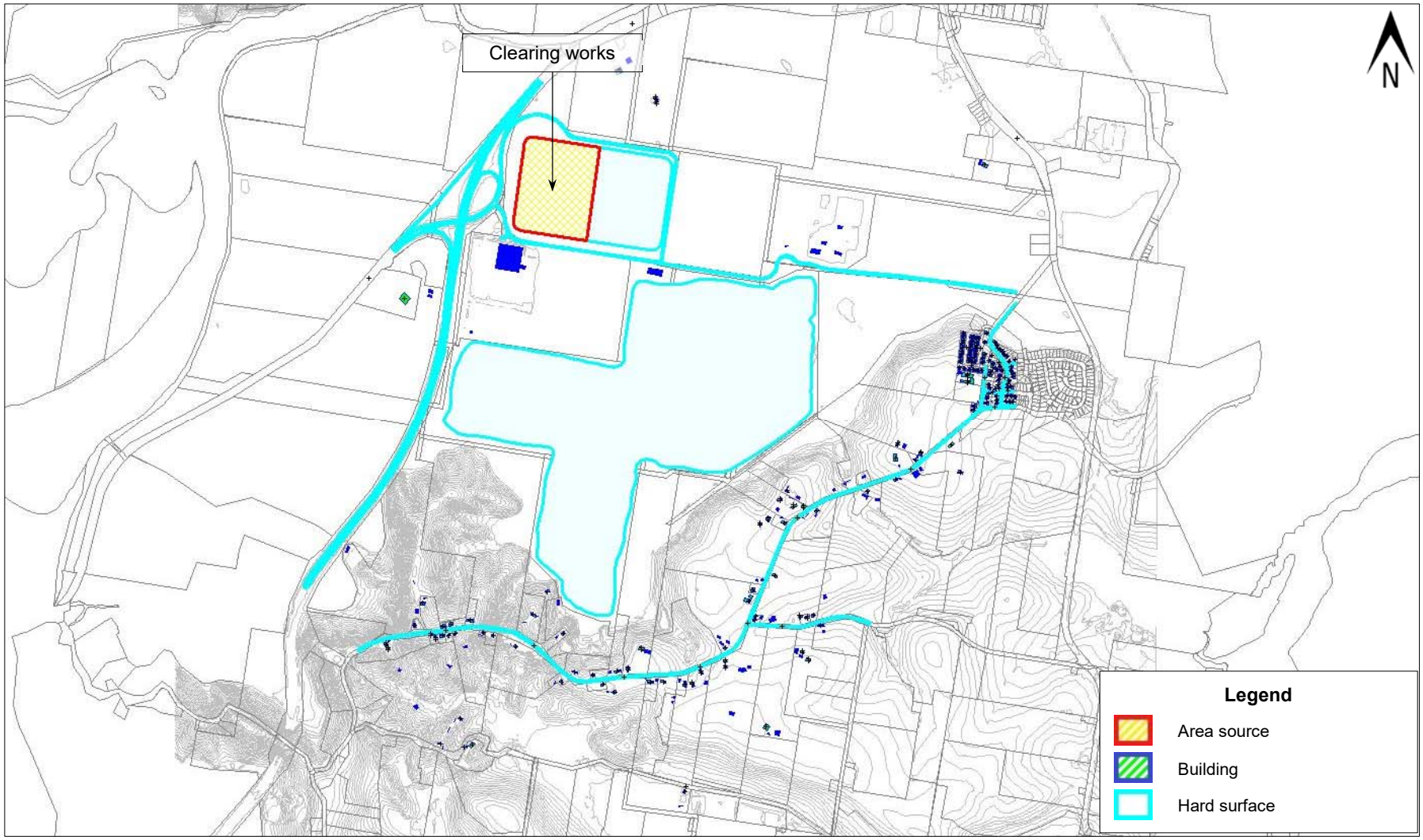


Figure 4.9 SoundPLAN noise model excerpt – Scenario 9 (clearing for phase 11 operations)

4.3 Operational Noise Modelling Results

4.3.1 Scenario 1 (Haulage Road Construction)

The noise levels from the construction activities associated with the haulage road construction, assessed against the *NSW Interim Construction Noise Guideline* criteria, are presented in Table 4.3.

Table 4.3 Construction noise levels – Scenario 1 (haulage road construction)

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
NSW Interim Construction Noise Guideline Noise sensitive places to the east, and to the south-east (north of intersection between Cudgen Road and Plantation Road)	47	47	47		
2 Clarke Street	29	0	0	Yes	Yes
3 Clarke Street	29	0	0	Yes	Yes
6 Clarke Street	28	0	0	Yes	Yes
1 Collier Street	32	0	0	Yes	Yes
2 Collier Street	29	0	0	Yes	Yes
4 Collier Street	29	0	0	Yes	Yes
6 Collier Street	29	0	0	Yes	Yes
8 Collier Street	28	0	0	Yes	Yes
10 Collier Street	29	0	0	Yes	Yes
16 Collier Street	30	0	0	Yes	Yes
17 Collier Street	31	0	0	Yes	Yes
18 Collier Street	30	0	0	Yes	Yes
20 Collier Street	29	0	0	Yes	Yes
22 Collier Street	30	0	0	Yes	Yes
24 Collier Street	29	0	0	Yes	Yes
1 Crescent Street	28	0	0	Yes	Yes
3 Crescent Street	28	0	0	Yes	Yes
4 Crescent Street	29	0	0	Yes	Yes
5 Crescent Street	28	0	0	Yes	Yes
7 Crescent Street	28	0	0	Yes	Yes
8 Crescent Street	31	0	0	Yes	Yes
9 Crescent Street	29	0	0	Yes	Yes
10 Crescent Street	29	0	0	Yes	Yes
11 Crescent Street	27	0	0	Yes	Yes
12 Crescent Street	27	0	0	Yes	Yes
13 Crescent Street	29	0	0	Yes	Yes
14 Crescent Street	29	0	0	Yes	Yes
16 Crescent Street	29	0	0	Yes	Yes
17 Crescent Street	27	0	0	Yes	Yes
18 Crescent Street	29	0	0	Yes	Yes
19 Crescent Street	30	0	0	Yes	Yes
20 Crescent Street	29	0	0	Yes	Yes
20A Crescent Street	29	0	0	Yes	Yes
21 Crescent Street	29	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
22-24 Crescent Street	31	0	0	Yes	Yes
23 Crescent Street	27	0	0	Yes	Yes
26 Crescent Street	29	0	0	Yes	Yes
28 Crescent Street	29	0	0	Yes	Yes
29 Crescent Street	27	0	0	Yes	Yes
30 Crescent Street	28	0	0	Yes	Yes
32 Crescent Street	28	0	0	Yes	Yes
34 Crescent Street	29	0	0	Yes	Yes
36 Crescent Street	30	0	0	Yes	Yes
38 Crescent Street	28	0	0	Yes	Yes
1-5 Cudgen Road	29	0	0	Yes	Yes
7 Cudgen Road	28	0	0	Yes	Yes
11 Cudgen Road	28	0	0	Yes	Yes
463 Cudgen Road	28	0	0	Yes	Yes
480 Cudgen Road	26	0	0	Yes	Yes
480A Cudgen Road	27	0	0	Yes	Yes
482 Cudgen Road	28	0	0	Yes	Yes
501 Cudgen Road	27	0	0	Yes	Yes
529A Cudgen Road	32	0	0	Yes	Yes
529B Cudgen Road	33	0	0	Yes	Yes
531 Cudgen Road	30	0	0	Yes	Yes
535A Cudgen Road	29	0	0	Yes	Yes
535B Cudgen Road	29	0	0	Yes	Yes
535C Cudgen Road	33	0	0	Yes	Yes
542 Cudgen Road	29	0	0	Yes	Yes
543 Cudgen Road	33	0	0	Yes	Yes
576 Cudgen Road	29	0	0	Yes	Yes
592 Cudgen Road	29	0	0	Yes	Yes
604 Cudgen Road	27	0	0	Yes	Yes
607 Cudgen Road	33	0	0	Yes	Yes
609 Cudgen Road	31	0	0	Yes	Yes
611A Cudgen Road	28	0	0	Yes	Yes
611B Cudgen Road	32	0	0	Yes	Yes
626 Cudgen Road	28	0	0	Yes	Yes
647 Cudgen Road	28	0	0	Yes	Yes
5 Denman Drive	31	0	0	Yes	Yes
7 Denman Drive	31	0	0	Yes	Yes
9 Denman Drive	32	0	0	Yes	Yes
11 Denman Drive	31	0	0	Yes	Yes
13 Denman Drive	30	0	0	Yes	Yes
14 Denman Drive	36	0	0	Yes	Yes
15 Denman Drive	30	0	0	Yes	Yes
16 Denman Drive	36	0	0	Yes	Yes
17 Denman Drive	31	0	0	Yes	Yes
18 Denman Drive	35	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
19 Denman Drive	32	0	0	Yes	Yes
20 Denman Drive	35	0	0	Yes	Yes
21 Denman Drive	32	0	0	Yes	Yes
22 Denman Drive	35	0	0	Yes	Yes
23 Denman Drive	32	0	0	Yes	Yes
24 Denman Drive	35	0	0	Yes	Yes
25 Denman Drive	31	0	0	Yes	Yes
26 Denman Drive	34	0	0	Yes	Yes
27 Denman Drive	30	0	0	Yes	Yes
28 Denman Drive	34	0	0	Yes	Yes
30 Denman Drive	34	0	0	Yes	Yes
32 Denman Drive	33	0	0	Yes	Yes
34 Denman Drive	32	0	0	Yes	Yes
36 Denman Drive	31	0	0	Yes	Yes
38 Denman Drive	31	0	0	Yes	Yes
40 Denman Drive	31	0	0	Yes	Yes
42 Denman Drive	30	0	0	Yes	Yes
3 Murraya Way	28	0	0	Yes	Yes
6 Murraya Way	29	0	0	Yes	Yes
8 Murraya Way	29	0	0	Yes	Yes
9 Murraya Way	29	0	0	Yes	Yes
10 Murraya Way	28	0	0	Yes	Yes
12 Murraya Way	29	0	0	Yes	Yes
14 Murraya Way	29	0	0	Yes	Yes
15 Murraya Way	29	0	0	Yes	Yes
16 Murraya Way	30	0	0	Yes	Yes
17 Murraya Way	29	0	0	Yes	Yes
142 Plantation Road	27	0	0	Yes	Yes
154A Plantation Road	25	0	0	Yes	Yes
154B Plantation Road	26	0	0	Yes	Yes
2 The Village Lane	28	0	0	Yes	Yes
146 Tweed Coast Road	30	0	0	Yes	Yes
Noise sensitive places to the south and south-west (south of intersection between Cudgen Road and Plantation Road)	46	46	46		
278A Cudgen Road	25	0	0	Yes	Yes
278B Cudgen Road	24	0	0	Yes	Yes
293 Cudgen Road	28	0	0	Yes	Yes
297 Cudgen Road	27	0	0	Yes	Yes
298A Cudgen Road	26	0	0	Yes	Yes
298B Cudgen Road	26	0	0	Yes	Yes
301 Cudgen Road	29	0	0	Yes	Yes
302 Cudgen Road	27	0	0	Yes	Yes
306 Cudgen Road	27	0	0	Yes	Yes
307 Cudgen Road	29	0	0	Yes	Yes
310 Cudgen Road	28	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
312 Cudgen Road	28	0	0	Yes	Yes
317 Cudgen Road	27	0	0	Yes	Yes
320 Cudgen Road	27	0	0	Yes	Yes
346 Cudgen Road	25	0	0	Yes	Yes
351 Cudgen Road	29	0	0	Yes	Yes
353 Cudgen Road	30	0	0	Yes	Yes
355 Cudgen Road	28	0	0	Yes	Yes
372 Cudgen Road	25	0	0	Yes	Yes
379 Cudgen Road	27	0	0	Yes	Yes
389 Cudgen Road	28	0	0	Yes	Yes
394 Cudgen Road	27	0	0	Yes	Yes
396 Cudgen Road	25	0	0	Yes	Yes
401 Cudgen Road	28	0	0	Yes	Yes
413A Cudgen Road	28	0	0	Yes	Yes
413B Cudgen Road	27	0	0	Yes	Yes
416 Cudgen Road	25	0	0	Yes	Yes
422 Cudgen Road	25	0	0	Yes	Yes
438 Cudgen Road	26	0	0	Yes	Yes
440A Cudgen Road	26	0	0	Yes	Yes
440B Cudgen Road	26	0	0	Yes	Yes
458A Cudgen Road	26	0	0	Yes	Yes
458B Cudgen Road	25	0	0	Yes	Yes
459 Cudgen Road	26	0	0	Yes	Yes
396 Melaleuca Road	21	0	0	Yes	Yes
37 Mccollums Road	23	0	0	Yes	Yes
41 Mccollums Road	22	0	0	Yes	Yes
54 Mccollums Road	24	0	0	Yes	Yes
52 Reardons Road	23	0	0	Yes	Yes
Noise sensitive places to the north at significant setback from Pacific Motorway	47	47	47		
271 Pacific Motorway	52	0	0	No	Yes
145 Plantation Road	26	0	0	Yes	Yes
155A Plantation Road	25	0	0	Yes	Yes
155B Plantation Road	26	0	0	Yes	Yes
Noise sensitive places to the north and west within proximity to Pacific Motorway	51	51	49		
139A Pacific Motorway	43	0	0	Yes	Yes
139B Pacific Motorway	45	0	0	Yes	Yes
141 Pacific Motorway	44	0	0	Yes	Yes
9394 Tweed Valley Way	37	0	0	Yes	Yes
School class room	50	50	50		
11A Collier Street	29	0	0	Yes	Yes
11B Collier Street	30	0	0	Yes	Yes

4.3.2 Scenario 2 (Construction of New Processing Facilities)

The noise levels from the construction activities associated with the construction of the new processing facilities, assessed against the *NSW Interim Construction Noise Guideline* criteria, are presented in Table 4.4.

Table 4.4 Construction noise levels – Scenario 2 (construction of new processing facilities)

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
NSW Interim Construction Noise Guideline Noise sensitive places to the east, and to the south-east (north of intersection between Cudgen Road and Plantation Road)	47	47	47		
2 Clarke Street	24	0	0	Yes	Yes
3 Clarke Street	24	0	0	Yes	Yes
6 Clarke Street	24	0	0	Yes	Yes
1 Collier Street	27	0	0	Yes	Yes
2 Collier Street	24	0	0	Yes	Yes
4 Collier Street	24	0	0	Yes	Yes
6 Collier Street	24	0	0	Yes	Yes
8 Collier Street	24	0	0	Yes	Yes
10 Collier Street	25	0	0	Yes	Yes
16 Collier Street	25	0	0	Yes	Yes
17 Collier Street	25	0	0	Yes	Yes
18 Collier Street	25	0	0	Yes	Yes
20 Collier Street	25	0	0	Yes	Yes
22 Collier Street	25	0	0	Yes	Yes
24 Collier Street	24	0	0	Yes	Yes
1 Crescent Street	24	0	0	Yes	Yes
3 Crescent Street	24	0	0	Yes	Yes
4 Crescent Street	25	0	0	Yes	Yes
5 Crescent Street	23	0	0	Yes	Yes
7 Crescent Street	24	0	0	Yes	Yes
8 Crescent Street	26	0	0	Yes	Yes
9 Crescent Street	24	0	0	Yes	Yes
10 Crescent Street	25	0	0	Yes	Yes
11 Crescent Street	23	0	0	Yes	Yes
12 Crescent Street	23	0	0	Yes	Yes
13 Crescent Street	25	0	0	Yes	Yes
14 Crescent Street	24	0	0	Yes	Yes
16 Crescent Street	24	0	0	Yes	Yes
17 Crescent Street	20	0	0	Yes	Yes
18 Crescent Street	23	0	0	Yes	Yes
19 Crescent Street	25	0	0	Yes	Yes
20 Crescent Street	24	0	0	Yes	Yes
20A Crescent Street	24	0	0	Yes	Yes
21 Crescent Street	24	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
22-24 Crescent Street	26	0	0	Yes	Yes
23 Crescent Street	22	0	0	Yes	Yes
26 Crescent Street	24	0	0	Yes	Yes
28 Crescent Street	24	0	0	Yes	Yes
29 Crescent Street	21	0	0	Yes	Yes
30 Crescent Street	24	0	0	Yes	Yes
32 Crescent Street	24	0	0	Yes	Yes
34 Crescent Street	24	0	0	Yes	Yes
36 Crescent Street	25	0	0	Yes	Yes
38 Crescent Street	21	0	0	Yes	Yes
1-5 Cudgen Road	25	0	0	Yes	Yes
7 Cudgen Road	24	0	0	Yes	Yes
11 Cudgen Road	22	0	0	Yes	Yes
463 Cudgen Road	25	0	0	Yes	Yes
480 Cudgen Road	24	0	0	Yes	Yes
480A Cudgen Road	25	0	0	Yes	Yes
482 Cudgen Road	25	0	0	Yes	Yes
501 Cudgen Road	25	0	0	Yes	Yes
529A Cudgen Road	30	0	0	Yes	Yes
529B Cudgen Road	30	0	0	Yes	Yes
531 Cudgen Road	27	0	0	Yes	Yes
535A Cudgen Road	27	0	0	Yes	Yes
535B Cudgen Road	27	0	0	Yes	Yes
535C Cudgen Road	31	0	0	Yes	Yes
542 Cudgen Road	26	0	0	Yes	Yes
543 Cudgen Road	31	0	0	Yes	Yes
576 Cudgen Road	26	0	0	Yes	Yes
592 Cudgen Road	26	0	0	Yes	Yes
604 Cudgen Road	23	0	0	Yes	Yes
607 Cudgen Road	28	0	0	Yes	Yes
609 Cudgen Road	27	0	0	Yes	Yes
611A Cudgen Road	25	0	0	Yes	Yes
611B Cudgen Road	29	0	0	Yes	Yes
626 Cudgen Road	24	0	0	Yes	Yes
647 Cudgen Road	25	0	0	Yes	Yes
5 Denman Drive	25	0	0	Yes	Yes
7 Denman Drive	25	0	0	Yes	Yes
9 Denman Drive	26	0	0	Yes	Yes
11 Denman Drive	26	0	0	Yes	Yes
13 Denman Drive	26	0	0	Yes	Yes
14 Denman Drive	28	0	0	Yes	Yes
15 Denman Drive	25	0	0	Yes	Yes
16 Denman Drive	28	0	0	Yes	Yes
17 Denman Drive	26	0	0	Yes	Yes
18 Denman Drive	28	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
19 Denman Drive	26	0	0	Yes	Yes
20 Denman Drive	28	0	0	Yes	Yes
21 Denman Drive	26	0	0	Yes	Yes
22 Denman Drive	27	0	0	Yes	Yes
23 Denman Drive	27	0	0	Yes	Yes
24 Denman Drive	27	0	0	Yes	Yes
25 Denman Drive	26	0	0	Yes	Yes
26 Denman Drive	27	0	0	Yes	Yes
27 Denman Drive	26	0	0	Yes	Yes
28 Denman Drive	27	0	0	Yes	Yes
30 Denman Drive	27	0	0	Yes	Yes
32 Denman Drive	27	0	0	Yes	Yes
34 Denman Drive	26	0	0	Yes	Yes
36 Denman Drive	26	0	0	Yes	Yes
38 Denman Drive	26	0	0	Yes	Yes
40 Denman Drive	25	0	0	Yes	Yes
42 Denman Drive	25	0	0	Yes	Yes
3 Murraya Way	24	0	0	Yes	Yes
6 Murraya Way	25	0	0	Yes	Yes
8 Murraya Way	25	0	0	Yes	Yes
9 Murraya Way	24	0	0	Yes	Yes
10 Murraya Way	25	0	0	Yes	Yes
12 Murraya Way	25	0	0	Yes	Yes
14 Murraya Way	25	0	0	Yes	Yes
15 Murraya Way	24	0	0	Yes	Yes
16 Murraya Way	25	0	0	Yes	Yes
17 Murraya Way	25	0	0	Yes	Yes
142 Plantation Road	24	0	0	Yes	Yes
154A Plantation Road	23	0	0	Yes	Yes
154B Plantation Road	24	0	0	Yes	Yes
2 The Village Lane	24	0	0	Yes	Yes
146 Tweed Coast Road	24	0	0	Yes	Yes
Noise sensitive places to the south and south-west (south of intersection between Cudgen Road and Plantation Road)	46	46	46		
278A Cudgen Road	20	0	0	Yes	Yes
278B Cudgen Road	20	0	0	Yes	Yes
293 Cudgen Road	25	0	0	Yes	Yes
297 Cudgen Road	24	0	0	Yes	Yes
298A Cudgen Road	22	0	0	Yes	Yes
298B Cudgen Road	22	0	0	Yes	Yes
301 Cudgen Road	25	0	0	Yes	Yes
302 Cudgen Road	24	0	0	Yes	Yes
306 Cudgen Road	24	0	0	Yes	Yes
307 Cudgen Road	25	0	0	Yes	Yes
310 Cudgen Road	24	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
312 Cudgen Road	25	0	0	Yes	Yes
317 Cudgen Road	25	0	0	Yes	Yes
320 Cudgen Road	25	0	0	Yes	Yes
346 Cudgen Road	22	0	0	Yes	Yes
351 Cudgen Road	26	0	0	Yes	Yes
353 Cudgen Road	27	0	0	Yes	Yes
355 Cudgen Road	25	0	0	Yes	Yes
372 Cudgen Road	22	0	0	Yes	Yes
379 Cudgen Road	25	0	0	Yes	Yes
389 Cudgen Road	25	0	0	Yes	Yes
394 Cudgen Road	24	0	0	Yes	Yes
396 Cudgen Road	22	0	0	Yes	Yes
401 Cudgen Road	25	0	0	Yes	Yes
413A Cudgen Road	25	0	0	Yes	Yes
413B Cudgen Road	25	0	0	Yes	Yes
416 Cudgen Road	22	0	0	Yes	Yes
422 Cudgen Road	22	0	0	Yes	Yes
438 Cudgen Road	23	0	0	Yes	Yes
440A Cudgen Road	22	0	0	Yes	Yes
440B Cudgen Road	22	0	0	Yes	Yes
458A Cudgen Road	22	0	0	Yes	Yes
458B Cudgen Road	22	0	0	Yes	Yes
459 Cudgen Road	23	0	0	Yes	Yes
396 Melaleuca Road	18	0	0	Yes	Yes
37 Mccollums Road	19	0	0	Yes	Yes
41 Mccollums Road	19	0	0	Yes	Yes
54 Mccollums Road	20	0	0	Yes	Yes
52 Reardons Road	20	0	0	Yes	Yes
Noise sensitive places to the north at significant setback from Pacific Motorway	47	47	47		
271 Pacific Motorway	41	0	0	Yes	Yes
145 Plantation Road	22	0	0	Yes	Yes
155A Plantation Road	22	0	0	Yes	Yes
155B Plantation Road	22	0	0	Yes	Yes
Noise sensitive places to the north and west within proximity to Pacific Motorway	51	51	49		
139A Pacific Motorway	31	0	0	Yes	Yes
139B Pacific Motorway	33	0	0	Yes	Yes
141 Pacific Motorway	32	0	0	Yes	Yes
9394 Tweed Valley Way	28	0	0	Yes	Yes
School class room	50	50	50		
11A Collier Street	24	0	0	Yes	Yes
11B Collier Street	26	0	0	Yes	Yes

4.3.3 Scenario 3 (Clearing for Phase 5 Operations)

The noise levels from the construction activities associated with the clearing in preparation for phase 5 operations, assessed against the *NSW Interim Construction Noise Guideline* criteria, are presented in Table 4.5.

Table 4.5 Construction noise levels – Scenario 3 (clearing for phase 5 operations)

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
NSW Interim Construction Noise Guideline Noise sensitive places to the east, and to the south-east (north of intersection between Cudgen Road and Plantation Road)	47	47	47		
2 Clarke Street	25	0	0	Yes	Yes
3 Clarke Street	26	0	0	Yes	Yes
6 Clarke Street	24	0	0	Yes	Yes
1 Collier Street	29	0	0	Yes	Yes
2 Collier Street	27	0	0	Yes	Yes
4 Collier Street	27	0	0	Yes	Yes
6 Collier Street	26	0	0	Yes	Yes
8 Collier Street	26	0	0	Yes	Yes
10 Collier Street	26	0	0	Yes	Yes
16 Collier Street	27	0	0	Yes	Yes
17 Collier Street	25	0	0	Yes	Yes
18 Collier Street	27	0	0	Yes	Yes
20 Collier Street	26	0	0	Yes	Yes
22 Collier Street	26	0	0	Yes	Yes
24 Collier Street	25	0	0	Yes	Yes
1 Crescent Street	26	0	0	Yes	Yes
3 Crescent Street	24	0	0	Yes	Yes
4 Crescent Street	26	0	0	Yes	Yes
5 Crescent Street	24	0	0	Yes	Yes
7 Crescent Street	25	0	0	Yes	Yes
8 Crescent Street	26	0	0	Yes	Yes
9 Crescent Street	27	0	0	Yes	Yes
10 Crescent Street	25	0	0	Yes	Yes
11 Crescent Street	26	0	0	Yes	Yes
12 Crescent Street	24	0	0	Yes	Yes
13 Crescent Street	26	0	0	Yes	Yes
14 Crescent Street	25	0	0	Yes	Yes
16 Crescent Street	25	0	0	Yes	Yes
17 Crescent Street	20	0	0	Yes	Yes
18 Crescent Street	24	0	0	Yes	Yes
19 Crescent Street	27	0	0	Yes	Yes
20 Crescent Street	25	0	0	Yes	Yes
20A Crescent Street	24	0	0	Yes	Yes
21 Crescent Street	26	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
22-24 Crescent Street	27	0	0	Yes	Yes
23 Crescent Street	22	0	0	Yes	Yes
26 Crescent Street	24	0	0	Yes	Yes
28 Crescent Street	25	0	0	Yes	Yes
29 Crescent Street	21	0	0	Yes	Yes
30 Crescent Street	24	0	0	Yes	Yes
32 Crescent Street	24	0	0	Yes	Yes
34 Crescent Street	25	0	0	Yes	Yes
36 Crescent Street	25	0	0	Yes	Yes
38 Crescent Street	21	0	0	Yes	Yes
1-5 Cudgen Road	26	0	0	Yes	Yes
7 Cudgen Road	24	0	0	Yes	Yes
11 Cudgen Road	22	0	0	Yes	Yes
463 Cudgen Road	29	0	0	Yes	Yes
480 Cudgen Road	26	0	0	Yes	Yes
480A Cudgen Road	27	0	0	Yes	Yes
482 Cudgen Road	29	0	0	Yes	Yes
501 Cudgen Road	28	0	0	Yes	Yes
529A Cudgen Road	35	0	0	Yes	Yes
529B Cudgen Road	35	0	0	Yes	Yes
531 Cudgen Road	31	0	0	Yes	Yes
535A Cudgen Road	30	0	0	Yes	Yes
535B Cudgen Road	31	0	0	Yes	Yes
535C Cudgen Road	36	0	0	Yes	Yes
542 Cudgen Road	29	0	0	Yes	Yes
543 Cudgen Road	36	0	0	Yes	Yes
576 Cudgen Road	29	0	0	Yes	Yes
592 Cudgen Road	29	0	0	Yes	Yes
604 Cudgen Road	26	0	0	Yes	Yes
607 Cudgen Road	32	0	0	Yes	Yes
609 Cudgen Road	30	0	0	Yes	Yes
611A Cudgen Road	28	0	0	Yes	Yes
611B Cudgen Road	32	0	0	Yes	Yes
626 Cudgen Road	27	0	0	Yes	Yes
647 Cudgen Road	28	0	0	Yes	Yes
5 Denman Drive	22	0	0	Yes	Yes
7 Denman Drive	24	0	0	Yes	Yes
9 Denman Drive	26	0	0	Yes	Yes
11 Denman Drive	25	0	0	Yes	Yes
13 Denman Drive	25	0	0	Yes	Yes
14 Denman Drive	30	0	0	Yes	Yes
15 Denman Drive	26	0	0	Yes	Yes
16 Denman Drive	30	0	0	Yes	Yes
17 Denman Drive	27	0	0	Yes	Yes
18 Denman Drive	30	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
19 Denman Drive	27	0	0	Yes	Yes
20 Denman Drive	30	0	0	Yes	Yes
21 Denman Drive	27	0	0	Yes	Yes
22 Denman Drive	30	0	0	Yes	Yes
23 Denman Drive	28	0	0	Yes	Yes
24 Denman Drive	30	0	0	Yes	Yes
25 Denman Drive	27	0	0	Yes	Yes
26 Denman Drive	30	0	0	Yes	Yes
27 Denman Drive	25	0	0	Yes	Yes
28 Denman Drive	29	0	0	Yes	Yes
30 Denman Drive	29	0	0	Yes	Yes
32 Denman Drive	29	0	0	Yes	Yes
34 Denman Drive	28	0	0	Yes	Yes
36 Denman Drive	27	0	0	Yes	Yes
38 Denman Drive	27	0	0	Yes	Yes
40 Denman Drive	26	0	0	Yes	Yes
42 Denman Drive	26	0	0	Yes	Yes
3 Murraya Way	21	0	0	Yes	Yes
6 Murraya Way	23	0	0	Yes	Yes
8 Murraya Way	23	0	0	Yes	Yes
9 Murraya Way	24	0	0	Yes	Yes
10 Murraya Way	23	0	0	Yes	Yes
12 Murraya Way	24	0	0	Yes	Yes
14 Murraya Way	24	0	0	Yes	Yes
15 Murraya Way	24	0	0	Yes	Yes
16 Murraya Way	25	0	0	Yes	Yes
17 Murraya Way	24	0	0	Yes	Yes
142 Plantation Road	26	0	0	Yes	Yes
154A Plantation Road	25	0	0	Yes	Yes
154B Plantation Road	26	0	0	Yes	Yes
2 The Village Lane	24	0	0	Yes	Yes
146 Tweed Coast Road	25	0	0	Yes	Yes
Noise sensitive places to the south and south-west (south of intersection between Cudgen Road and Plantation Road)	46	46	46		
278A Cudgen Road	21	0	0	Yes	Yes
278B Cudgen Road	21	0	0	Yes	Yes
293 Cudgen Road	25	0	0	Yes	Yes
297 Cudgen Road	25	0	0	Yes	Yes
298A Cudgen Road	24	0	0	Yes	Yes
298B Cudgen Road	24	0	0	Yes	Yes
301 Cudgen Road	26	0	0	Yes	Yes
302 Cudgen Road	25	0	0	Yes	Yes
306 Cudgen Road	25	0	0	Yes	Yes
307 Cudgen Road	26	0	0	Yes	Yes
310 Cudgen Road	24	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
312 Cudgen Road	25	0	0	Yes	Yes
317 Cudgen Road	26	0	0	Yes	Yes
320 Cudgen Road	26	0	0	Yes	Yes
346 Cudgen Road	24	0	0	Yes	Yes
351 Cudgen Road	28	0	0	Yes	Yes
353 Cudgen Road	29	0	0	Yes	Yes
355 Cudgen Road	27	0	0	Yes	Yes
372 Cudgen Road	24	0	0	Yes	Yes
379 Cudgen Road	26	0	0	Yes	Yes
389 Cudgen Road	27	0	0	Yes	Yes
394 Cudgen Road	26	0	0	Yes	Yes
396 Cudgen Road	24	0	0	Yes	Yes
401 Cudgen Road	27	0	0	Yes	Yes
413A Cudgen Road	28	0	0	Yes	Yes
413B Cudgen Road	27	0	0	Yes	Yes
416 Cudgen Road	25	0	0	Yes	Yes
422 Cudgen Road	25	0	0	Yes	Yes
438 Cudgen Road	25	0	0	Yes	Yes
440A Cudgen Road	25	0	0	Yes	Yes
440B Cudgen Road	25	0	0	Yes	Yes
458A Cudgen Road	25	0	0	Yes	Yes
458B Cudgen Road	23	0	0	Yes	Yes
459 Cudgen Road	26	0	0	Yes	Yes
396 Melaleuca Road	19	0	0	Yes	Yes
37 Mccollums Road	21	0	0	Yes	Yes
41 Mccollums Road	20	0	0	Yes	Yes
54 Mccollums Road	21	0	0	Yes	Yes
52 Reardons Road	23	0	0	Yes	Yes
Noise sensitive places to the north at significant setback from Pacific Motorway	47	47	47		
271 Pacific Motorway	34	0	0	Yes	Yes
145 Plantation Road	25	0	0	Yes	Yes
155A Plantation Road	25	0	0	Yes	Yes
155B Plantation Road	25	0	0	Yes	Yes
Noise sensitive places to the north and west within proximity to Pacific Motorway	51	51	49		
139A Pacific Motorway	26	0	0	Yes	Yes
139B Pacific Motorway	28	0	0	Yes	Yes
141 Pacific Motorway	28	0	0	Yes	Yes
9394 Tweed Valley Way	26	0	0	Yes	Yes
School class room	50	50	50		
11A Collier Street	26	0	0	Yes	Yes
11B Collier Street	27	0	0	Yes	Yes

4.3.4 Scenario 4 (Clearing for Phase 6 Operations)

The noise levels from the construction activities associated with the clearing in preparation for phase 6 operations, assessed against the *NSW Interim Construction Noise Guideline* criteria, are presented in Table 4.6.

Table 4.6 Construction noise levels – Scenario 4 (clearing for phase 6 operations)

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
NSW Interim Construction Noise Guideline Noise sensitive places to the east, and to the south-east (north of intersection between Cudgen Road and Plantation Road)	47	47	47		
2 Clarke Street	24	0	0	Yes	Yes
3 Clarke Street	23	0	0	Yes	Yes
6 Clarke Street	23	0	0	Yes	Yes
1 Collier Street	24	0	0	Yes	Yes
2 Collier Street	24	0	0	Yes	Yes
4 Collier Street	24	0	0	Yes	Yes
6 Collier Street	23	0	0	Yes	Yes
8 Collier Street	23	0	0	Yes	Yes
10 Collier Street	23	0	0	Yes	Yes
16 Collier Street	24	0	0	Yes	Yes
17 Collier Street	21	0	0	Yes	Yes
18 Collier Street	24	0	0	Yes	Yes
20 Collier Street	23	0	0	Yes	Yes
22 Collier Street	23	0	0	Yes	Yes
24 Collier Street	24	0	0	Yes	Yes
1 Crescent Street	23	0	0	Yes	Yes
3 Crescent Street	22	0	0	Yes	Yes
4 Crescent Street	23	0	0	Yes	Yes
5 Crescent Street	22	0	0	Yes	Yes
7 Crescent Street	23	0	0	Yes	Yes
8 Crescent Street	23	0	0	Yes	Yes
9 Crescent Street	24	0	0	Yes	Yes
10 Crescent Street	23	0	0	Yes	Yes
11 Crescent Street	23	0	0	Yes	Yes
12 Crescent Street	22	0	0	Yes	Yes
13 Crescent Street	23	0	0	Yes	Yes
14 Crescent Street	23	0	0	Yes	Yes
16 Crescent Street	22	0	0	Yes	Yes
17 Crescent Street	21	0	0	Yes	Yes
18 Crescent Street	22	0	0	Yes	Yes
19 Crescent Street	23	0	0	Yes	Yes
20 Crescent Street	21	0	0	Yes	Yes
20A Crescent Street	18	0	0	Yes	Yes
21 Crescent Street	22	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
22-24 Crescent Street	23	0	0	Yes	Yes
23 Crescent Street	18	0	0	Yes	Yes
26 Crescent Street	21	0	0	Yes	Yes
28 Crescent Street	22	0	0	Yes	Yes
29 Crescent Street	20	0	0	Yes	Yes
30 Crescent Street	21	0	0	Yes	Yes
32 Crescent Street	21	0	0	Yes	Yes
34 Crescent Street	22	0	0	Yes	Yes
36 Crescent Street	22	0	0	Yes	Yes
38 Crescent Street	19	0	0	Yes	Yes
1-5 Cudgen Road	23	0	0	Yes	Yes
7 Cudgen Road	23	0	0	Yes	Yes
11 Cudgen Road	22	0	0	Yes	Yes
463 Cudgen Road	31	0	0	Yes	Yes
480 Cudgen Road	28	0	0	Yes	Yes
480A Cudgen Road	29	0	0	Yes	Yes
482 Cudgen Road	29	0	0	Yes	Yes
501 Cudgen Road	30	0	0	Yes	Yes
529A Cudgen Road	33	0	0	Yes	Yes
529B Cudgen Road	33	0	0	Yes	Yes
531 Cudgen Road	30	0	0	Yes	Yes
535A Cudgen Road	29	0	0	Yes	Yes
535B Cudgen Road	31	0	0	Yes	Yes
535C Cudgen Road	35	0	0	Yes	Yes
542 Cudgen Road	27	0	0	Yes	Yes
543 Cudgen Road	34	0	0	Yes	Yes
576 Cudgen Road	27	0	0	Yes	Yes
592 Cudgen Road	28	0	0	Yes	Yes
604 Cudgen Road	24	0	0	Yes	Yes
607 Cudgen Road	29	0	0	Yes	Yes
609 Cudgen Road	27	0	0	Yes	Yes
611A Cudgen Road	25	0	0	Yes	Yes
611B Cudgen Road	29	0	0	Yes	Yes
626 Cudgen Road	24	0	0	Yes	Yes
647 Cudgen Road	24	0	0	Yes	Yes
5 Denman Drive	18	0	0	Yes	Yes
7 Denman Drive	20	0	0	Yes	Yes
9 Denman Drive	23	0	0	Yes	Yes
11 Denman Drive	23	0	0	Yes	Yes
13 Denman Drive	23	0	0	Yes	Yes
14 Denman Drive	26	0	0	Yes	Yes
15 Denman Drive	23	0	0	Yes	Yes
16 Denman Drive	25	0	0	Yes	Yes
17 Denman Drive	23	0	0	Yes	Yes
18 Denman Drive	25	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
19 Denman Drive	24	0	0	Yes	Yes
20 Denman Drive	25	0	0	Yes	Yes
21 Denman Drive	24	0	0	Yes	Yes
22 Denman Drive	25	0	0	Yes	Yes
23 Denman Drive	24	0	0	Yes	Yes
24 Denman Drive	25	0	0	Yes	Yes
25 Denman Drive	24	0	0	Yes	Yes
26 Denman Drive	25	0	0	Yes	Yes
27 Denman Drive	24	0	0	Yes	Yes
28 Denman Drive	25	0	0	Yes	Yes
30 Denman Drive	25	0	0	Yes	Yes
32 Denman Drive	25	0	0	Yes	Yes
34 Denman Drive	25	0	0	Yes	Yes
36 Denman Drive	24	0	0	Yes	Yes
38 Denman Drive	24	0	0	Yes	Yes
40 Denman Drive	24	0	0	Yes	Yes
42 Denman Drive	25	0	0	Yes	Yes
3 Murraya Way	20	0	0	Yes	Yes
6 Murraya Way	19	0	0	Yes	Yes
8 Murraya Way	20	0	0	Yes	Yes
9 Murraya Way	21	0	0	Yes	Yes
10 Murraya Way	20	0	0	Yes	Yes
12 Murraya Way	21	0	0	Yes	Yes
14 Murraya Way	21	0	0	Yes	Yes
15 Murraya Way	23	0	0	Yes	Yes
16 Murraya Way	23	0	0	Yes	Yes
17 Murraya Way	24	0	0	Yes	Yes
142 Plantation Road	27	0	0	Yes	Yes
154A Plantation Road	26	0	0	Yes	Yes
154B Plantation Road	28	0	0	Yes	Yes
2 The Village Lane	23	0	0	Yes	Yes
146 Tweed Coast Road	21	0	0	Yes	Yes
Noise sensitive places to the south and south-west (south of intersection between Cudgen Road and Plantation Road)	46	46	46		
278A Cudgen Road	25	0	0	Yes	Yes
278B Cudgen Road	24	0	0	Yes	Yes
293 Cudgen Road	30	0	0	Yes	Yes
297 Cudgen Road	30	0	0	Yes	Yes
298A Cudgen Road	27	0	0	Yes	Yes
298B Cudgen Road	27	0	0	Yes	Yes
301 Cudgen Road	31	0	0	Yes	Yes
302 Cudgen Road	30	0	0	Yes	Yes
306 Cudgen Road	29	0	0	Yes	Yes
307 Cudgen Road	30	0	0	Yes	Yes
310 Cudgen Road	29	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
312 Cudgen Road	30	0	0	Yes	Yes
317 Cudgen Road	31	0	0	Yes	Yes
320 Cudgen Road	31	0	0	Yes	Yes
346 Cudgen Road	28	0	0	Yes	Yes
351 Cudgen Road	34	0	0	Yes	Yes
353 Cudgen Road	35	0	0	Yes	Yes
355 Cudgen Road	32	0	0	Yes	Yes
372 Cudgen Road	28	0	0	Yes	Yes
379 Cudgen Road	30	0	0	Yes	Yes
389 Cudgen Road	30	0	0	Yes	Yes
394 Cudgen Road	30	0	0	Yes	Yes
396 Cudgen Road	27	0	0	Yes	Yes
401 Cudgen Road	30	0	0	Yes	Yes
413A Cudgen Road	31	0	0	Yes	Yes
413B Cudgen Road	30	0	0	Yes	Yes
416 Cudgen Road	28	0	0	Yes	Yes
422 Cudgen Road	28	0	0	Yes	Yes
438 Cudgen Road	29	0	0	Yes	Yes
440A Cudgen Road	29	0	0	Yes	Yes
440B Cudgen Road	29	0	0	Yes	Yes
458A Cudgen Road	27	0	0	Yes	Yes
458B Cudgen Road	27	0	0	Yes	Yes
459 Cudgen Road	25	0	0	Yes	Yes
396 Melaleuca Road	22	0	0	Yes	Yes
37 Mccollums Road	23	0	0	Yes	Yes
41 Mccollums Road	23	0	0	Yes	Yes
54 Mccollums Road	25	0	0	Yes	Yes
52 Reardons Road	24	0	0	Yes	Yes
Noise sensitive places to the north at significant setback from Pacific Motorway	47	47	47		
271 Pacific Motorway	31	0	0	Yes	Yes
145 Plantation Road	24	0	0	Yes	Yes
155A Plantation Road	26	0	0	Yes	Yes
155B Plantation Road	26	0	0	Yes	Yes
Noise sensitive places to the north and west within proximity to Pacific Motorway	51	51	49		
139A Pacific Motorway	25	0	0	Yes	Yes
139B Pacific Motorway	25	0	0	Yes	Yes
141 Pacific Motorway	25	0	0	Yes	Yes
9394 Tweed Valley Way	29	0	0	Yes	Yes
School class room	50	50	50		
11A Collier Street	25	0	0	Yes	Yes
11B Collier Street	23	0	0	Yes	Yes

4.3.5 Scenario 5 (Clearing for Phase 7 Operations)

The noise levels from the construction activities associated with the clearing in preparation for phase 7 operations, assessed against the *NSW Interim Construction Noise Guideline* criteria, are presented in Table 4.7.

Table 4.7 Construction noise levels – Scenario 5 (clearing for phase 7 operations)

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
NSW Interim Construction Noise Guideline Noise sensitive places to the east, and to the south-east (north of intersection between Cudgen Road and Plantation Road)	47	47	47		
2 Clarke Street	23	0	0	Yes	Yes
3 Clarke Street	23	0	0	Yes	Yes
6 Clarke Street	22	0	0	Yes	Yes
1 Collier Street	26	0	0	Yes	Yes
2 Collier Street	24	0	0	Yes	Yes
4 Collier Street	25	0	0	Yes	Yes
6 Collier Street	24	0	0	Yes	Yes
8 Collier Street	24	0	0	Yes	Yes
10 Collier Street	23	0	0	Yes	Yes
16 Collier Street	24	0	0	Yes	Yes
17 Collier Street	21	0	0	Yes	Yes
18 Collier Street	24	0	0	Yes	Yes
20 Collier Street	23	0	0	Yes	Yes
22 Collier Street	23	0	0	Yes	Yes
24 Collier Street	23	0	0	Yes	Yes
1 Crescent Street	23	0	0	Yes	Yes
3 Crescent Street	22	0	0	Yes	Yes
4 Crescent Street	24	0	0	Yes	Yes
5 Crescent Street	21	0	0	Yes	Yes
7 Crescent Street	22	0	0	Yes	Yes
8 Crescent Street	23	0	0	Yes	Yes
9 Crescent Street	24	0	0	Yes	Yes
10 Crescent Street	22	0	0	Yes	Yes
11 Crescent Street	23	0	0	Yes	Yes
12 Crescent Street	22	0	0	Yes	Yes
13 Crescent Street	23	0	0	Yes	Yes
14 Crescent Street	22	0	0	Yes	Yes
16 Crescent Street	22	0	0	Yes	Yes
17 Crescent Street	19	0	0	Yes	Yes
18 Crescent Street	21	0	0	Yes	Yes
19 Crescent Street	24	0	0	Yes	Yes
20 Crescent Street	21	0	0	Yes	Yes
20A Crescent Street	19	0	0	Yes	Yes
21 Crescent Street	23	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
22-24 Crescent Street	23	0	0	Yes	Yes
23 Crescent Street	18	0	0	Yes	Yes
26 Crescent Street	21	0	0	Yes	Yes
28 Crescent Street	22	0	0	Yes	Yes
29 Crescent Street	20	0	0	Yes	Yes
30 Crescent Street	21	0	0	Yes	Yes
32 Crescent Street	21	0	0	Yes	Yes
34 Crescent Street	22	0	0	Yes	Yes
36 Crescent Street	21	0	0	Yes	Yes
38 Crescent Street	19	0	0	Yes	Yes
1-5 Cudgen Road	23	0	0	Yes	Yes
7 Cudgen Road	22	0	0	Yes	Yes
11 Cudgen Road	20	0	0	Yes	Yes
463 Cudgen Road	28	0	0	Yes	Yes
480 Cudgen Road	25	0	0	Yes	Yes
480A Cudgen Road	27	0	0	Yes	Yes
482 Cudgen Road	27	0	0	Yes	Yes
501 Cudgen Road	27	0	0	Yes	Yes
529A Cudgen Road	30	0	0	Yes	Yes
529B Cudgen Road	31	0	0	Yes	Yes
531 Cudgen Road	29	0	0	Yes	Yes
535A Cudgen Road	29	0	0	Yes	Yes
535B Cudgen Road	30	0	0	Yes	Yes
535C Cudgen Road	32	0	0	Yes	Yes
542 Cudgen Road	28	0	0	Yes	Yes
543 Cudgen Road	33	0	0	Yes	Yes
576 Cudgen Road	29	0	0	Yes	Yes
592 Cudgen Road	28	0	0	Yes	Yes
604 Cudgen Road	24	0	0	Yes	Yes
607 Cudgen Road	31	0	0	Yes	Yes
609 Cudgen Road	28	0	0	Yes	Yes
611A Cudgen Road	27	0	0	Yes	Yes
611B Cudgen Road	31	0	0	Yes	Yes
626 Cudgen Road	25	0	0	Yes	Yes
647 Cudgen Road	26	0	0	Yes	Yes
5 Denman Drive	20	0	0	Yes	Yes
7 Denman Drive	21	0	0	Yes	Yes
9 Denman Drive	23	0	0	Yes	Yes
11 Denman Drive	24	0	0	Yes	Yes
13 Denman Drive	24	0	0	Yes	Yes
14 Denman Drive	28	0	0	Yes	Yes
15 Denman Drive	24	0	0	Yes	Yes
16 Denman Drive	28	0	0	Yes	Yes
17 Denman Drive	23	0	0	Yes	Yes
18 Denman Drive	28	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
19 Denman Drive	24	0	0	Yes	Yes
20 Denman Drive	28	0	0	Yes	Yes
21 Denman Drive	25	0	0	Yes	Yes
22 Denman Drive	28	0	0	Yes	Yes
23 Denman Drive	25	0	0	Yes	Yes
24 Denman Drive	28	0	0	Yes	Yes
25 Denman Drive	24	0	0	Yes	Yes
26 Denman Drive	27	0	0	Yes	Yes
27 Denman Drive	24	0	0	Yes	Yes
28 Denman Drive	27	0	0	Yes	Yes
30 Denman Drive	27	0	0	Yes	Yes
32 Denman Drive	27	0	0	Yes	Yes
34 Denman Drive	25	0	0	Yes	Yes
36 Denman Drive	25	0	0	Yes	Yes
38 Denman Drive	24	0	0	Yes	Yes
40 Denman Drive	24	0	0	Yes	Yes
42 Denman Drive	24	0	0	Yes	Yes
3 Murraya Way	20	0	0	Yes	Yes
6 Murraya Way	21	0	0	Yes	Yes
8 Murraya Way	21	0	0	Yes	Yes
9 Murraya Way	21	0	0	Yes	Yes
10 Murraya Way	22	0	0	Yes	Yes
12 Murraya Way	21	0	0	Yes	Yes
14 Murraya Way	21	0	0	Yes	Yes
15 Murraya Way	22	0	0	Yes	Yes
16 Murraya Way	23	0	0	Yes	Yes
17 Murraya Way	23	0	0	Yes	Yes
142 Plantation Road	25	0	0	Yes	Yes
154A Plantation Road	25	0	0	Yes	Yes
154B Plantation Road	26	0	0	Yes	Yes
2 The Village Lane	23	0	0	Yes	Yes
146 Tweed Coast Road	22	0	0	Yes	Yes
Noise sensitive places to the south and south-west (south of intersection between Cudgen Road and Plantation Road)	46	46	46		
278A Cudgen Road	25	0	0	Yes	Yes
278B Cudgen Road	25	0	0	Yes	Yes
293 Cudgen Road	30	0	0	Yes	Yes
297 Cudgen Road	30	0	0	Yes	Yes
298A Cudgen Road	27	0	0	Yes	Yes
298B Cudgen Road	27	0	0	Yes	Yes
301 Cudgen Road	31	0	0	Yes	Yes
302 Cudgen Road	30	0	0	Yes	Yes
306 Cudgen Road	29	0	0	Yes	Yes
307 Cudgen Road	30	0	0	Yes	Yes
310 Cudgen Road	29	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
312 Cudgen Road	30	0	0	Yes	Yes
317 Cudgen Road	30	0	0	Yes	Yes
320 Cudgen Road	30	0	0	Yes	Yes
346 Cudgen Road	28	0	0	Yes	Yes
351 Cudgen Road	32	0	0	Yes	Yes
353 Cudgen Road	33	0	0	Yes	Yes
355 Cudgen Road	31	0	0	Yes	Yes
372 Cudgen Road	26	0	0	Yes	Yes
379 Cudgen Road	29	0	0	Yes	Yes
389 Cudgen Road	29	0	0	Yes	Yes
394 Cudgen Road	28	0	0	Yes	Yes
396 Cudgen Road	26	0	0	Yes	Yes
401 Cudgen Road	29	0	0	Yes	Yes
413A Cudgen Road	29	0	0	Yes	Yes
413B Cudgen Road	29	0	0	Yes	Yes
416 Cudgen Road	26	0	0	Yes	Yes
422 Cudgen Road	26	0	0	Yes	Yes
438 Cudgen Road	27	0	0	Yes	Yes
440A Cudgen Road	28	0	0	Yes	Yes
440B Cudgen Road	27	0	0	Yes	Yes
458A Cudgen Road	26	0	0	Yes	Yes
458B Cudgen Road	25	0	0	Yes	Yes
459 Cudgen Road	23	0	0	Yes	Yes
396 Melaleuca Road	21	0	0	Yes	Yes
37 Mccollums Road	22	0	0	Yes	Yes
41 Mccollums Road	23	0	0	Yes	Yes
54 Mccollums Road	24	0	0	Yes	Yes
52 Reardons Road	22	0	0	Yes	Yes
Noise sensitive places to the north at significant setback from Pacific Motorway	47	47	47		
271 Pacific Motorway	30	0	0	Yes	Yes
145 Plantation Road	24	0	0	Yes	Yes
155A Plantation Road	24	0	0	Yes	Yes
155B Plantation Road	25	0	0	Yes	Yes
Noise sensitive places to the north and west within proximity to Pacific Motorway	51	51	49		
139A Pacific Motorway	25	0	0	Yes	Yes
139B Pacific Motorway	25	0	0	Yes	Yes
141 Pacific Motorway	25	0	0	Yes	Yes
9394 Tweed Valley Way	31	0	0	Yes	Yes
School class room	50	50	50		
11A Collier Street	25	0	0	Yes	Yes
11B Collier Street	25	0	0	Yes	Yes

4.3.6 Scenario 6 (Clearing for Phase 8 Operations)

The noise levels from the construction activities associated with the clearing in preparation for phase 8 operations, assessed against the *NSW Interim Construction Noise Guideline* criteria, are presented in Table 4.8.

Table 4.8 Construction noise levels – Scenario 6 (clearing for phase 8 operations)

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
NSW Interim Construction Noise Guideline Noise sensitive places to the east, and to the south-east (north of intersection between Cudgen Road and Plantation Road)	47	47	47		
2 Clarke Street	21	0	0	Yes	Yes
3 Clarke Street	20	0	0	Yes	Yes
6 Clarke Street	20	0	0	Yes	Yes
1 Collier Street	21	0	0	Yes	Yes
2 Collier Street	20	0	0	Yes	Yes
4 Collier Street	20	0	0	Yes	Yes
6 Collier Street	19	0	0	Yes	Yes
8 Collier Street	19	0	0	Yes	Yes
10 Collier Street	19	0	0	Yes	Yes
16 Collier Street	20	0	0	Yes	Yes
17 Collier Street	19	0	0	Yes	Yes
18 Collier Street	21	0	0	Yes	Yes
20 Collier Street	20	0	0	Yes	Yes
22 Collier Street	20	0	0	Yes	Yes
24 Collier Street	21	0	0	Yes	Yes
1 Crescent Street	20	0	0	Yes	Yes
3 Crescent Street	19	0	0	Yes	Yes
4 Crescent Street	20	0	0	Yes	Yes
5 Crescent Street	19	0	0	Yes	Yes
7 Crescent Street	19	0	0	Yes	Yes
8 Crescent Street	20	0	0	Yes	Yes
9 Crescent Street	21	0	0	Yes	Yes
10 Crescent Street	20	0	0	Yes	Yes
11 Crescent Street	19	0	0	Yes	Yes
12 Crescent Street	19	0	0	Yes	Yes
13 Crescent Street	20	0	0	Yes	Yes
14 Crescent Street	20	0	0	Yes	Yes
16 Crescent Street	19	0	0	Yes	Yes
17 Crescent Street	17	0	0	Yes	Yes
18 Crescent Street	20	0	0	Yes	Yes
19 Crescent Street	20	0	0	Yes	Yes
20 Crescent Street	19	0	0	Yes	Yes
20A Crescent Street	18	0	0	Yes	Yes
21 Crescent Street	20	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
22-24 Crescent Street	21	0	0	Yes	Yes
23 Crescent Street	16	0	0	Yes	Yes
26 Crescent Street	19	0	0	Yes	Yes
28 Crescent Street	20	0	0	Yes	Yes
29 Crescent Street	18	0	0	Yes	Yes
30 Crescent Street	19	0	0	Yes	Yes
32 Crescent Street	20	0	0	Yes	Yes
34 Crescent Street	20	0	0	Yes	Yes
36 Crescent Street	20	0	0	Yes	Yes
38 Crescent Street	18	0	0	Yes	Yes
1-5 Cudgen Road	20	0	0	Yes	Yes
7 Cudgen Road	20	0	0	Yes	Yes
11 Cudgen Road	19	0	0	Yes	Yes
463 Cudgen Road	26	0	0	Yes	Yes
480 Cudgen Road	24	0	0	Yes	Yes
480A Cudgen Road	25	0	0	Yes	Yes
482 Cudgen Road	24	0	0	Yes	Yes
501 Cudgen Road	25	0	0	Yes	Yes
529A Cudgen Road	26	0	0	Yes	Yes
529B Cudgen Road	27	0	0	Yes	Yes
531 Cudgen Road	25	0	0	Yes	Yes
535A Cudgen Road	24	0	0	Yes	Yes
535B Cudgen Road	25	0	0	Yes	Yes
535C Cudgen Road	29	0	0	Yes	Yes
542 Cudgen Road	24	0	0	Yes	Yes
543 Cudgen Road	28	0	0	Yes	Yes
576 Cudgen Road	23	0	0	Yes	Yes
592 Cudgen Road	24	0	0	Yes	Yes
604 Cudgen Road	20	0	0	Yes	Yes
607 Cudgen Road	25	0	0	Yes	Yes
609 Cudgen Road	23	0	0	Yes	Yes
611A Cudgen Road	21	0	0	Yes	Yes
611B Cudgen Road	25	0	0	Yes	Yes
626 Cudgen Road	20	0	0	Yes	Yes
647 Cudgen Road	21	0	0	Yes	Yes
5 Denman Drive	18	0	0	Yes	Yes
7 Denman Drive	19	0	0	Yes	Yes
9 Denman Drive	20	0	0	Yes	Yes
11 Denman Drive	20	0	0	Yes	Yes
13 Denman Drive	20	0	0	Yes	Yes
14 Denman Drive	23	0	0	Yes	Yes
15 Denman Drive	21	0	0	Yes	Yes
16 Denman Drive	23	0	0	Yes	Yes
17 Denman Drive	21	0	0	Yes	Yes
18 Denman Drive	22	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
19 Denman Drive	21	0	0	Yes	Yes
20 Denman Drive	22	0	0	Yes	Yes
21 Denman Drive	21	0	0	Yes	Yes
22 Denman Drive	22	0	0	Yes	Yes
23 Denman Drive	21	0	0	Yes	Yes
24 Denman Drive	22	0	0	Yes	Yes
25 Denman Drive	21	0	0	Yes	Yes
26 Denman Drive	22	0	0	Yes	Yes
27 Denman Drive	20	0	0	Yes	Yes
28 Denman Drive	21	0	0	Yes	Yes
30 Denman Drive	21	0	0	Yes	Yes
32 Denman Drive	21	0	0	Yes	Yes
34 Denman Drive	22	0	0	Yes	Yes
36 Denman Drive	22	0	0	Yes	Yes
38 Denman Drive	21	0	0	Yes	Yes
40 Denman Drive	21	0	0	Yes	Yes
42 Denman Drive	21	0	0	Yes	Yes
3 Murraya Way	19	0	0	Yes	Yes
6 Murraya Way	19	0	0	Yes	Yes
8 Murraya Way	19	0	0	Yes	Yes
9 Murraya Way	19	0	0	Yes	Yes
10 Murraya Way	19	0	0	Yes	Yes
12 Murraya Way	19	0	0	Yes	Yes
14 Murraya Way	20	0	0	Yes	Yes
15 Murraya Way	21	0	0	Yes	Yes
16 Murraya Way	21	0	0	Yes	Yes
17 Murraya Way	20	0	0	Yes	Yes
142 Plantation Road	23	0	0	Yes	Yes
154A Plantation Road	22	0	0	Yes	Yes
154B Plantation Road	24	0	0	Yes	Yes
2 The Village Lane	20	0	0	Yes	Yes
146 Tweed Coast Road	18	0	0	Yes	Yes
Noise sensitive places to the south and south-west (south of intersection between Cudgen Road and Plantation Road)	46	46	46		
278A Cudgen Road	26	0	0	Yes	Yes
278B Cudgen Road	23	0	0	Yes	Yes
293 Cudgen Road	30	0	0	Yes	Yes
297 Cudgen Road	28	0	0	Yes	Yes
298A Cudgen Road	27	0	0	Yes	Yes
298B Cudgen Road	26	0	0	Yes	Yes
301 Cudgen Road	31	0	0	Yes	Yes
302 Cudgen Road	28	0	0	Yes	Yes
306 Cudgen Road	27	0	0	Yes	Yes
307 Cudgen Road	30	0	0	Yes	Yes
310 Cudgen Road	29	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
312 Cudgen Road	30	0	0	Yes	Yes
317 Cudgen Road	30	0	0	Yes	Yes
320 Cudgen Road	29	0	0	Yes	Yes
346 Cudgen Road	26	0	0	Yes	Yes
351 Cudgen Road	31	0	0	Yes	Yes
353 Cudgen Road	31	0	0	Yes	Yes
355 Cudgen Road	29	0	0	Yes	Yes
372 Cudgen Road	26	0	0	Yes	Yes
379 Cudgen Road	27	0	0	Yes	Yes
389 Cudgen Road	28	0	0	Yes	Yes
394 Cudgen Road	27	0	0	Yes	Yes
396 Cudgen Road	25	0	0	Yes	Yes
401 Cudgen Road	28	0	0	Yes	Yes
413A Cudgen Road	28	0	0	Yes	Yes
413B Cudgen Road	27	0	0	Yes	Yes
416 Cudgen Road	24	0	0	Yes	Yes
422 Cudgen Road	24	0	0	Yes	Yes
438 Cudgen Road	25	0	0	Yes	Yes
440A Cudgen Road	26	0	0	Yes	Yes
440B Cudgen Road	26	0	0	Yes	Yes
458A Cudgen Road	26	0	0	Yes	Yes
458B Cudgen Road	25	0	0	Yes	Yes
459 Cudgen Road	23	0	0	Yes	Yes
396 Melaleuca Road	20	0	0	Yes	Yes
37 Mccollums Road	21	0	0	Yes	Yes
41 Mccollums Road	21	0	0	Yes	Yes
54 Mccollums Road	23	0	0	Yes	Yes
52 Reardons Road	21	0	0	Yes	Yes
Noise sensitive places to the north at significant setback from Pacific Motorway	47	47	47		
271 Pacific Motorway	28	0	0	Yes	Yes
145 Plantation Road	22	0	0	Yes	Yes
155A Plantation Road	22	0	0	Yes	Yes
155B Plantation Road	22	0	0	Yes	Yes
Noise sensitive places to the north and west within proximity to Pacific Motorway	51	51	49		
139A Pacific Motorway	24	0	0	Yes	Yes
139B Pacific Motorway	24	0	0	Yes	Yes
141 Pacific Motorway	25	0	0	Yes	Yes
9394 Tweed Valley Way	37	0	0	Yes	Yes
School class room	50	50	50		
11A Collier Street	21	0	0	Yes	Yes
11B Collier Street	20	0	0	Yes	Yes

4.3.7 Scenario 7 (Clearing for Phase 9 Operations)

The noise levels from the construction activities associated with the clearing in preparation for phase 9 operations, assessed against the *NSW Interim Construction Noise Guideline* criteria, are presented in Table 4.9.

Table 4.9 Construction noise levels – Scenario 7 (clearing for phase 9 operations)

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
NSW Interim Construction Noise Guideline Noise sensitive places to the east, and to the south-east (north of intersection between Cudgen Road and Plantation Road)	47	47	47		
2 Clarke Street	21	0	0	Yes	Yes
3 Clarke Street	21	0	0	Yes	Yes
6 Clarke Street	20	0	0	Yes	Yes
1 Collier Street	22	0	0	Yes	Yes
2 Collier Street	22	0	0	Yes	Yes
4 Collier Street	22	0	0	Yes	Yes
6 Collier Street	21	0	0	Yes	Yes
8 Collier Street	21	0	0	Yes	Yes
10 Collier Street	21	0	0	Yes	Yes
16 Collier Street	22	0	0	Yes	Yes
17 Collier Street	17	0	0	Yes	Yes
18 Collier Street	21	0	0	Yes	Yes
20 Collier Street	20	0	0	Yes	Yes
22 Collier Street	21	0	0	Yes	Yes
24 Collier Street	21	0	0	Yes	Yes
1 Crescent Street	22	0	0	Yes	Yes
3 Crescent Street	20	0	0	Yes	Yes
4 Crescent Street	21	0	0	Yes	Yes
5 Crescent Street	21	0	0	Yes	Yes
7 Crescent Street	21	0	0	Yes	Yes
8 Crescent Street	21	0	0	Yes	Yes
9 Crescent Street	21	0	0	Yes	Yes
10 Crescent Street	21	0	0	Yes	Yes
11 Crescent Street	20	0	0	Yes	Yes
12 Crescent Street	19	0	0	Yes	Yes
13 Crescent Street	21	0	0	Yes	Yes
14 Crescent Street	20	0	0	Yes	Yes
16 Crescent Street	20	0	0	Yes	Yes
17 Crescent Street	19	0	0	Yes	Yes
18 Crescent Street	20	0	0	Yes	Yes
19 Crescent Street	21	0	0	Yes	Yes
20 Crescent Street	18	0	0	Yes	Yes
20A Crescent Street	17	0	0	Yes	Yes
21 Crescent Street	20	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
22-24 Crescent Street	20	0	0	Yes	Yes
23 Crescent Street	18	0	0	Yes	Yes
26 Crescent Street	18	0	0	Yes	Yes
28 Crescent Street	19	0	0	Yes	Yes
29 Crescent Street	17	0	0	Yes	Yes
30 Crescent Street	19	0	0	Yes	Yes
32 Crescent Street	19	0	0	Yes	Yes
34 Crescent Street	19	0	0	Yes	Yes
36 Crescent Street	19	0	0	Yes	Yes
38 Crescent Street	17	0	0	Yes	Yes
1-5 Cudgen Road	22	0	0	Yes	Yes
7 Cudgen Road	21	0	0	Yes	Yes
11 Cudgen Road	21	0	0	Yes	Yes
463 Cudgen Road	31	0	0	Yes	Yes
480 Cudgen Road	29	0	0	Yes	Yes
480A Cudgen Road	31	0	0	Yes	Yes
482 Cudgen Road	30	0	0	Yes	Yes
501 Cudgen Road	31	0	0	Yes	Yes
529A Cudgen Road	31	0	0	Yes	Yes
529B Cudgen Road	33	0	0	Yes	Yes
531 Cudgen Road	30	0	0	Yes	Yes
535A Cudgen Road	28	0	0	Yes	Yes
535B Cudgen Road	29	0	0	Yes	Yes
535C Cudgen Road	31	0	0	Yes	Yes
542 Cudgen Road	26	0	0	Yes	Yes
543 Cudgen Road	31	0	0	Yes	Yes
576 Cudgen Road	25	0	0	Yes	Yes
592 Cudgen Road	25	0	0	Yes	Yes
604 Cudgen Road	22	0	0	Yes	Yes
607 Cudgen Road	25	0	0	Yes	Yes
609 Cudgen Road	25	0	0	Yes	Yes
611A Cudgen Road	23	0	0	Yes	Yes
611B Cudgen Road	25	0	0	Yes	Yes
626 Cudgen Road	22	0	0	Yes	Yes
647 Cudgen Road	22	0	0	Yes	Yes
5 Denman Drive	14	0	0	Yes	Yes
7 Denman Drive	16	0	0	Yes	Yes
9 Denman Drive	20	0	0	Yes	Yes
11 Denman Drive	19	0	0	Yes	Yes
13 Denman Drive	20	0	0	Yes	Yes
14 Denman Drive	22	0	0	Yes	Yes
15 Denman Drive	20	0	0	Yes	Yes
16 Denman Drive	22	0	0	Yes	Yes
17 Denman Drive	21	0	0	Yes	Yes
18 Denman Drive	22	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
19 Denman Drive	22	0	0	Yes	Yes
20 Denman Drive	22	0	0	Yes	Yes
21 Denman Drive	23	0	0	Yes	Yes
22 Denman Drive	22	0	0	Yes	Yes
23 Denman Drive	22	0	0	Yes	Yes
24 Denman Drive	22	0	0	Yes	Yes
25 Denman Drive	22	0	0	Yes	Yes
26 Denman Drive	22	0	0	Yes	Yes
27 Denman Drive	22	0	0	Yes	Yes
28 Denman Drive	22	0	0	Yes	Yes
30 Denman Drive	23	0	0	Yes	Yes
32 Denman Drive	22	0	0	Yes	Yes
34 Denman Drive	22	0	0	Yes	Yes
36 Denman Drive	22	0	0	Yes	Yes
38 Denman Drive	22	0	0	Yes	Yes
40 Denman Drive	22	0	0	Yes	Yes
42 Denman Drive	21	0	0	Yes	Yes
3 Murraya Way	18	0	0	Yes	Yes
6 Murraya Way	17	0	0	Yes	Yes
8 Murraya Way	17	0	0	Yes	Yes
9 Murraya Way	19	0	0	Yes	Yes
10 Murraya Way	18	0	0	Yes	Yes
12 Murraya Way	18	0	0	Yes	Yes
14 Murraya Way	19	0	0	Yes	Yes
15 Murraya Way	20	0	0	Yes	Yes
16 Murraya Way	19	0	0	Yes	Yes
17 Murraya Way	21	0	0	Yes	Yes
142 Plantation Road	28	0	0	Yes	Yes
154A Plantation Road	27	0	0	Yes	Yes
154B Plantation Road	27	0	0	Yes	Yes
2 The Village Lane	21	0	0	Yes	Yes
146 Tweed Coast Road	19	0	0	Yes	Yes
Noise sensitive places to the south and south-west (south of intersection between Cudgen Road and Plantation Road)	46	46	46		
278A Cudgen Road	24	0	0	Yes	Yes
278B Cudgen Road	25	0	0	Yes	Yes
293 Cudgen Road	34	0	0	Yes	Yes
297 Cudgen Road	33	0	0	Yes	Yes
298A Cudgen Road	32	0	0	Yes	Yes
298B Cudgen Road	31	0	0	Yes	Yes
301 Cudgen Road	34	0	0	Yes	Yes
302 Cudgen Road	33	0	0	Yes	Yes
306 Cudgen Road	32	0	0	Yes	Yes
307 Cudgen Road	35	0	0	Yes	Yes
310 Cudgen Road	34	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
312 Cudgen Road	36	0	0	Yes	Yes
317 Cudgen Road	36	0	0	Yes	Yes
320 Cudgen Road	38	0	0	Yes	Yes
346 Cudgen Road	33	0	0	Yes	Yes
351 Cudgen Road	43	0	0	Yes	Yes
353 Cudgen Road	49	0	0	No	Yes
355 Cudgen Road	43	0	0	Yes	Yes
372 Cudgen Road	34	0	0	Yes	Yes
379 Cudgen Road	39	0	0	Yes	Yes
389 Cudgen Road	39	0	0	Yes	Yes
394 Cudgen Road	37	0	0	Yes	Yes
396 Cudgen Road	34	0	0	Yes	Yes
401 Cudgen Road	39	0	0	Yes	Yes
413A Cudgen Road	39	0	0	Yes	Yes
413B Cudgen Road	39	0	0	Yes	Yes
416 Cudgen Road	33	0	0	Yes	Yes
422 Cudgen Road	32	0	0	Yes	Yes
438 Cudgen Road	32	0	0	Yes	Yes
440A Cudgen Road	34	0	0	Yes	Yes
440B Cudgen Road	33	0	0	Yes	Yes
458A Cudgen Road	34	0	0	Yes	Yes
458B Cudgen Road	33	0	0	Yes	Yes
459 Cudgen Road	32	0	0	Yes	Yes
396 Melaleuca Road	23	0	0	Yes	Yes
37 Mccollums Road	25	0	0	Yes	Yes
41 Mccollums Road	25	0	0	Yes	Yes
54 Mccollums Road	27	0	0	Yes	Yes
52 Reardons Road	27	0	0	Yes	Yes
Noise sensitive places to the north at significant setback from Pacific Motorway	47	47	47		
271 Pacific Motorway	27	0	0	Yes	Yes
145 Plantation Road	26	0	0	Yes	Yes
155A Plantation Road	26	0	0	Yes	Yes
155B Plantation Road	28	0	0	Yes	Yes
Noise sensitive places to the north and west within proximity to Pacific Motorway	51	51	49		
139A Pacific Motorway	22	0	0	Yes	Yes
139B Pacific Motorway	23	0	0	Yes	Yes
141 Pacific Motorway	23	0	0	Yes	Yes
9394 Tweed Valley Way	26	0	0	Yes	Yes
School class room	50	50	50		
11A Collier Street	22	0	0	Yes	Yes
11B Collier Street	22	0	0	Yes	Yes

4.3.8 Scenario 8 (Clearing for Phase 10 Operations)

The noise levels from the construction activities associated with the clearing in preparation for phase 10 operations, assessed against the *NSW Interim Construction Noise Guideline* criteria, are presented in Table 4.10.

Table 4.10 Construction noise levels – Scenario 8 (clearing for phase 10 operations)

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
NSW Interim Construction Noise Guideline Noise sensitive places to the east, and to the south-east (north of intersection between Cudgen Road and Plantation Road)	47	47	47		
2 Clarke Street	22	0	0	Yes	Yes
3 Clarke Street	22	0	0	Yes	Yes
6 Clarke Street	22	0	0	Yes	Yes
1 Collier Street	25	0	0	Yes	Yes
2 Collier Street	22	0	0	Yes	Yes
4 Collier Street	22	0	0	Yes	Yes
6 Collier Street	22	0	0	Yes	Yes
8 Collier Street	22	0	0	Yes	Yes
10 Collier Street	22	0	0	Yes	Yes
16 Collier Street	23	0	0	Yes	Yes
17 Collier Street	23	0	0	Yes	Yes
18 Collier Street	23	0	0	Yes	Yes
20 Collier Street	22	0	0	Yes	Yes
22 Collier Street	23	0	0	Yes	Yes
24 Collier Street	23	0	0	Yes	Yes
1 Crescent Street	22	0	0	Yes	Yes
3 Crescent Street	22	0	0	Yes	Yes
4 Crescent Street	22	0	0	Yes	Yes
5 Crescent Street	22	0	0	Yes	Yes
7 Crescent Street	22	0	0	Yes	Yes
8 Crescent Street	24	0	0	Yes	Yes
9 Crescent Street	22	0	0	Yes	Yes
10 Crescent Street	23	0	0	Yes	Yes
11 Crescent Street	21	0	0	Yes	Yes
12 Crescent Street	21	0	0	Yes	Yes
13 Crescent Street	23	0	0	Yes	Yes
14 Crescent Street	22	0	0	Yes	Yes
16 Crescent Street	22	0	0	Yes	Yes
17 Crescent Street	21	0	0	Yes	Yes
18 Crescent Street	22	0	0	Yes	Yes
19 Crescent Street	23	0	0	Yes	Yes
20 Crescent Street	22	0	0	Yes	Yes
20A Crescent Street	22	0	0	Yes	Yes
21 Crescent Street	22	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
22-24 Crescent Street	24	0	0	Yes	Yes
23 Crescent Street	22	0	0	Yes	Yes
26 Crescent Street	22	0	0	Yes	Yes
28 Crescent Street	23	0	0	Yes	Yes
29 Crescent Street	21	0	0	Yes	Yes
30 Crescent Street	22	0	0	Yes	Yes
32 Crescent Street	22	0	0	Yes	Yes
34 Crescent Street	23	0	0	Yes	Yes
36 Crescent Street	23	0	0	Yes	Yes
38 Crescent Street	22	0	0	Yes	Yes
1-5 Cudgen Road	22	0	0	Yes	Yes
7 Cudgen Road	22	0	0	Yes	Yes
11 Cudgen Road	22	0	0	Yes	Yes
463 Cudgen Road	22	0	0	Yes	Yes
480 Cudgen Road	21	0	0	Yes	Yes
480A Cudgen Road	22	0	0	Yes	Yes
482 Cudgen Road	22	0	0	Yes	Yes
501 Cudgen Road	22	0	0	Yes	Yes
529A Cudgen Road	26	0	0	Yes	Yes
529B Cudgen Road	27	0	0	Yes	Yes
531 Cudgen Road	25	0	0	Yes	Yes
535A Cudgen Road	24	0	0	Yes	Yes
535B Cudgen Road	24	0	0	Yes	Yes
535C Cudgen Road	27	0	0	Yes	Yes
542 Cudgen Road	23	0	0	Yes	Yes
543 Cudgen Road	27	0	0	Yes	Yes
576 Cudgen Road	23	0	0	Yes	Yes
592 Cudgen Road	23	0	0	Yes	Yes
604 Cudgen Road	21	0	0	Yes	Yes
607 Cudgen Road	25	0	0	Yes	Yes
609 Cudgen Road	24	0	0	Yes	Yes
611A Cudgen Road	22	0	0	Yes	Yes
611B Cudgen Road	26	0	0	Yes	Yes
626 Cudgen Road	22	0	0	Yes	Yes
647 Cudgen Road	22	0	0	Yes	Yes
5 Denman Drive	24	0	0	Yes	Yes
7 Denman Drive	24	0	0	Yes	Yes
9 Denman Drive	25	0	0	Yes	Yes
11 Denman Drive	24	0	0	Yes	Yes
13 Denman Drive	24	0	0	Yes	Yes
14 Denman Drive	26	0	0	Yes	Yes
15 Denman Drive	24	0	0	Yes	Yes
16 Denman Drive	26	0	0	Yes	Yes
17 Denman Drive	24	0	0	Yes	Yes
18 Denman Drive	26	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
19 Denman Drive	25	0	0	Yes	Yes
20 Denman Drive	26	0	0	Yes	Yes
21 Denman Drive	25	0	0	Yes	Yes
22 Denman Drive	25	0	0	Yes	Yes
23 Denman Drive	25	0	0	Yes	Yes
24 Denman Drive	25	0	0	Yes	Yes
25 Denman Drive	24	0	0	Yes	Yes
26 Denman Drive	25	0	0	Yes	Yes
27 Denman Drive	24	0	0	Yes	Yes
28 Denman Drive	25	0	0	Yes	Yes
30 Denman Drive	25	0	0	Yes	Yes
32 Denman Drive	24	0	0	Yes	Yes
34 Denman Drive	24	0	0	Yes	Yes
36 Denman Drive	24	0	0	Yes	Yes
38 Denman Drive	24	0	0	Yes	Yes
40 Denman Drive	24	0	0	Yes	Yes
42 Denman Drive	23	0	0	Yes	Yes
3 Murraya Way	23	0	0	Yes	Yes
6 Murraya Way	23	0	0	Yes	Yes
8 Murraya Way	22	0	0	Yes	Yes
9 Murraya Way	23	0	0	Yes	Yes
10 Murraya Way	22	0	0	Yes	Yes
12 Murraya Way	23	0	0	Yes	Yes
14 Murraya Way	23	0	0	Yes	Yes
15 Murraya Way	23	0	0	Yes	Yes
16 Murraya Way	24	0	0	Yes	Yes
17 Murraya Way	23	0	0	Yes	Yes
142 Plantation Road	21	0	0	Yes	Yes
154A Plantation Road	20	0	0	Yes	Yes
154B Plantation Road	22	0	0	Yes	Yes
2 The Village Lane	21	0	0	Yes	Yes
146 Tweed Coast Road	23	0	0	Yes	Yes
Noise sensitive places to the south and south-west (south of intersection between Cudgen Road and Plantation Road)	46	46	46		
278A Cudgen Road	19	0	0	Yes	Yes
278B Cudgen Road	19	0	0	Yes	Yes
293 Cudgen Road	23	0	0	Yes	Yes
297 Cudgen Road	23	0	0	Yes	Yes
298A Cudgen Road	20	0	0	Yes	Yes
298B Cudgen Road	21	0	0	Yes	Yes
301 Cudgen Road	24	0	0	Yes	Yes
302 Cudgen Road	22	0	0	Yes	Yes
306 Cudgen Road	23	0	0	Yes	Yes
307 Cudgen Road	23	0	0	Yes	Yes
310 Cudgen Road	22	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
312 Cudgen Road	23	0	0	Yes	Yes
317 Cudgen Road	23	0	0	Yes	Yes
320 Cudgen Road	23	0	0	Yes	Yes
346 Cudgen Road	20	0	0	Yes	Yes
351 Cudgen Road	24	0	0	Yes	Yes
353 Cudgen Road	25	0	0	Yes	Yes
355 Cudgen Road	23	0	0	Yes	Yes
372 Cudgen Road	20	0	0	Yes	Yes
379 Cudgen Road	23	0	0	Yes	Yes
389 Cudgen Road	23	0	0	Yes	Yes
394 Cudgen Road	22	0	0	Yes	Yes
396 Cudgen Road	21	0	0	Yes	Yes
401 Cudgen Road	23	0	0	Yes	Yes
413A Cudgen Road	23	0	0	Yes	Yes
413B Cudgen Road	22	0	0	Yes	Yes
416 Cudgen Road	20	0	0	Yes	Yes
422 Cudgen Road	20	0	0	Yes	Yes
438 Cudgen Road	21	0	0	Yes	Yes
440A Cudgen Road	20	0	0	Yes	Yes
440B Cudgen Road	21	0	0	Yes	Yes
458A Cudgen Road	20	0	0	Yes	Yes
458B Cudgen Road	20	0	0	Yes	Yes
459 Cudgen Road	20	0	0	Yes	Yes
396 Melaleuca Road	16	0	0	Yes	Yes
37 Mccollums Road	18	0	0	Yes	Yes
41 Mccollums Road	17	0	0	Yes	Yes
54 Mccollums Road	19	0	0	Yes	Yes
52 Reardons Road	18	0	0	Yes	Yes
Noise sensitive places to the north at significant setback from Pacific Motorway	47	47	47		
271 Pacific Motorway	0	0	0	Yes	Yes
145 Plantation Road	20	0	0	Yes	Yes
155A Plantation Road	20	0	0	Yes	Yes
155B Plantation Road	20	0	0	Yes	Yes
Noise sensitive places to the north and west within proximity to Pacific Motorway	51	51	49		
139A Pacific Motorway	38	0	0	Yes	Yes
139B Pacific Motorway	40	0	0	Yes	Yes
141 Pacific Motorway	39	0	0	Yes	Yes
9394 Tweed Valley Way	28	0	0	Yes	Yes
School class room	50	50	50		
11A Collier Street	23	0	0	Yes	Yes
11B Collier Street	23	0	0	Yes	Yes

4.3.9 Scenario 9 (Clearing for Phase 11 Operations)

The noise levels from the construction activities associated with the clearing in preparation for phase 11 operations, assessed against the *NSW Interim Construction Noise Guideline* criteria, are presented in Table 4.11.

Table 4.11 Construction noise levels – Scenario 9 (clearing for phase 11 operations)

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
NSW Interim Construction Noise Guideline Noise sensitive places to the east, and to the south-east (north of intersection between Cudgen Road and Plantation Road)	47	47	47		
2 Clarke Street	20	0	0	Yes	Yes
3 Clarke Street	20	0	0	Yes	Yes
6 Clarke Street	20	0	0	Yes	Yes
1 Collier Street	23	0	0	Yes	Yes
2 Collier Street	20	0	0	Yes	Yes
4 Collier Street	21	0	0	Yes	Yes
6 Collier Street	20	0	0	Yes	Yes
8 Collier Street	20	0	0	Yes	Yes
10 Collier Street	20	0	0	Yes	Yes
16 Collier Street	21	0	0	Yes	Yes
17 Collier Street	21	0	0	Yes	Yes
18 Collier Street	21	0	0	Yes	Yes
20 Collier Street	20	0	0	Yes	Yes
22 Collier Street	21	0	0	Yes	Yes
24 Collier Street	21	0	0	Yes	Yes
1 Crescent Street	20	0	0	Yes	Yes
3 Crescent Street	20	0	0	Yes	Yes
4 Crescent Street	20	0	0	Yes	Yes
5 Crescent Street	20	0	0	Yes	Yes
7 Crescent Street	20	0	0	Yes	Yes
8 Crescent Street	22	0	0	Yes	Yes
9 Crescent Street	20	0	0	Yes	Yes
10 Crescent Street	21	0	0	Yes	Yes
11 Crescent Street	20	0	0	Yes	Yes
12 Crescent Street	19	0	0	Yes	Yes
13 Crescent Street	21	0	0	Yes	Yes
14 Crescent Street	20	0	0	Yes	Yes
16 Crescent Street	20	0	0	Yes	Yes
17 Crescent Street	19	0	0	Yes	Yes
18 Crescent Street	20	0	0	Yes	Yes
19 Crescent Street	21	0	0	Yes	Yes
20 Crescent Street	20	0	0	Yes	Yes
20A Crescent Street	20	0	0	Yes	Yes
21 Crescent Street	21	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
22-24 Crescent Street	22	0	0	Yes	Yes
23 Crescent Street	20	0	0	Yes	Yes
26 Crescent Street	20	0	0	Yes	Yes
28 Crescent Street	21	0	0	Yes	Yes
29 Crescent Street	19	0	0	Yes	Yes
30 Crescent Street	20	0	0	Yes	Yes
32 Crescent Street	20	0	0	Yes	Yes
34 Crescent Street	21	0	0	Yes	Yes
36 Crescent Street	22	0	0	Yes	Yes
38 Crescent Street	20	0	0	Yes	Yes
1-5 Cudgen Road	20	0	0	Yes	Yes
7 Cudgen Road	20	0	0	Yes	Yes
11 Cudgen Road	20	0	0	Yes	Yes
463 Cudgen Road	22	0	0	Yes	Yes
480 Cudgen Road	20	0	0	Yes	Yes
480A Cudgen Road	21	0	0	Yes	Yes
482 Cudgen Road	21	0	0	Yes	Yes
501 Cudgen Road	21	0	0	Yes	Yes
529A Cudgen Road	25	0	0	Yes	Yes
529B Cudgen Road	26	0	0	Yes	Yes
531 Cudgen Road	23	0	0	Yes	Yes
535A Cudgen Road	22	0	0	Yes	Yes
535B Cudgen Road	22	0	0	Yes	Yes
535C Cudgen Road	26	0	0	Yes	Yes
542 Cudgen Road	22	0	0	Yes	Yes
543 Cudgen Road	26	0	0	Yes	Yes
576 Cudgen Road	21	0	0	Yes	Yes
592 Cudgen Road	21	0	0	Yes	Yes
604 Cudgen Road	19	0	0	Yes	Yes
607 Cudgen Road	24	0	0	Yes	Yes
609 Cudgen Road	23	0	0	Yes	Yes
611A Cudgen Road	20	0	0	Yes	Yes
611B Cudgen Road	24	0	0	Yes	Yes
626 Cudgen Road	20	0	0	Yes	Yes
647 Cudgen Road	20	0	0	Yes	Yes
5 Denman Drive	22	0	0	Yes	Yes
7 Denman Drive	22	0	0	Yes	Yes
9 Denman Drive	23	0	0	Yes	Yes
11 Denman Drive	22	0	0	Yes	Yes
13 Denman Drive	22	0	0	Yes	Yes
14 Denman Drive	24	0	0	Yes	Yes
15 Denman Drive	22	0	0	Yes	Yes
16 Denman Drive	24	0	0	Yes	Yes
17 Denman Drive	22	0	0	Yes	Yes
18 Denman Drive	24	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
19 Denman Drive	23	0	0	Yes	Yes
20 Denman Drive	24	0	0	Yes	Yes
21 Denman Drive	23	0	0	Yes	Yes
22 Denman Drive	23	0	0	Yes	Yes
23 Denman Drive	23	0	0	Yes	Yes
24 Denman Drive	23	0	0	Yes	Yes
25 Denman Drive	22	0	0	Yes	Yes
26 Denman Drive	23	0	0	Yes	Yes
27 Denman Drive	22	0	0	Yes	Yes
28 Denman Drive	23	0	0	Yes	Yes
30 Denman Drive	23	0	0	Yes	Yes
32 Denman Drive	22	0	0	Yes	Yes
34 Denman Drive	23	0	0	Yes	Yes
36 Denman Drive	22	0	0	Yes	Yes
38 Denman Drive	22	0	0	Yes	Yes
40 Denman Drive	22	0	0	Yes	Yes
42 Denman Drive	22	0	0	Yes	Yes
3 Murraya Way	21	0	0	Yes	Yes
6 Murraya Way	21	0	0	Yes	Yes
8 Murraya Way	21	0	0	Yes	Yes
9 Murraya Way	21	0	0	Yes	Yes
10 Murraya Way	21	0	0	Yes	Yes
12 Murraya Way	21	0	0	Yes	Yes
14 Murraya Way	21	0	0	Yes	Yes
15 Murraya Way	21	0	0	Yes	Yes
16 Murraya Way	22	0	0	Yes	Yes
17 Murraya Way	21	0	0	Yes	Yes
142 Plantation Road	20	0	0	Yes	Yes
154A Plantation Road	19	0	0	Yes	Yes
154B Plantation Road	20	0	0	Yes	Yes
2 The Village Lane	20	0	0	Yes	Yes
146 Tweed Coast Road	22	0	0	Yes	Yes
Noise sensitive places to the south and south-west (south of intersection between Cudgen Road and Plantation Road)	46	46	46		
278A Cudgen Road	20	0	0	Yes	Yes
278B Cudgen Road	19	0	0	Yes	Yes
293 Cudgen Road	22	0	0	Yes	Yes
297 Cudgen Road	23	0	0	Yes	Yes
298A Cudgen Road	20	0	0	Yes	Yes
298B Cudgen Road	20	0	0	Yes	Yes
301 Cudgen Road	24	0	0	Yes	Yes
302 Cudgen Road	22	0	0	Yes	Yes
306 Cudgen Road	22	0	0	Yes	Yes
307 Cudgen Road	23	0	0	Yes	Yes
310 Cudgen Road	22	0	0	Yes	Yes

Receiver name	Calculated noise levels $L_{eq,adj,15min}$, dB(A)			Compliance with noise criteria?	
	Day	Evening	Night	Lower limit	Upper limit
312 Cudgen Road	23	0	0	Yes	Yes
317 Cudgen Road	23	0	0	Yes	Yes
320 Cudgen Road	23	0	0	Yes	Yes
346 Cudgen Road	20	0	0	Yes	Yes
351 Cudgen Road	24	0	0	Yes	Yes
353 Cudgen Road	24	0	0	Yes	Yes
355 Cudgen Road	23	0	0	Yes	Yes
372 Cudgen Road	20	0	0	Yes	Yes
379 Cudgen Road	22	0	0	Yes	Yes
389 Cudgen Road	22	0	0	Yes	Yes
394 Cudgen Road	22	0	0	Yes	Yes
396 Cudgen Road	20	0	0	Yes	Yes
401 Cudgen Road	23	0	0	Yes	Yes
413A Cudgen Road	23	0	0	Yes	Yes
413B Cudgen Road	22	0	0	Yes	Yes
416 Cudgen Road	19	0	0	Yes	Yes
422 Cudgen Road	19	0	0	Yes	Yes
438 Cudgen Road	22	0	0	Yes	Yes
440A Cudgen Road	21	0	0	Yes	Yes
440B Cudgen Road	22	0	0	Yes	Yes
458A Cudgen Road	19	0	0	Yes	Yes
458B Cudgen Road	19	0	0	Yes	Yes
459 Cudgen Road	19	0	0	Yes	Yes
396 Melaleuca Road	16	0	0	Yes	Yes
37 Mccollums Road	18	0	0	Yes	Yes
41 Mccollums Road	17	0	0	Yes	Yes
54 Mccollums Road	19	0	0	Yes	Yes
52 Reardons Road	17	0	0	Yes	Yes
Noise sensitive places to the north at significant setback from Pacific Motorway	47	47	47		
271 Pacific Motorway	0	0	0	Yes	Yes
145 Plantation Road	19	0	0	Yes	Yes
155A Plantation Road	19	0	0	Yes	Yes
155B Plantation Road	19	0	0	Yes	Yes
Noise sensitive places to the north and west within proximity to Pacific Motorway	51	51	49		
139A Pacific Motorway	37	0	0	Yes	Yes
139B Pacific Motorway	38	0	0	Yes	Yes
141 Pacific Motorway	38	0	0	Yes	Yes
9394 Tweed Valley Way	32	0	0	Yes	Yes
School class room	50	50	50		
11A Collier Street	21	0	0	Yes	Yes
11B Collier Street	20	0	0	Yes	Yes

SoundPLAN noise contour maps are presented in Appendix C.

5. Discussion and Recommendations

Based on the results of the construction noise propagation modelling, considering nine (9) scenarios accounting for construction of the haulage road, construction of the new processing facilities, and clearing works over the 30-year planning horizon as the HTSP expands its operations onto the adjacent allotments, the following is concluded:

- In general, all proposed works will be carried out within standard construction hours.
- During construction of the haulage road, there is potential exceedance of the lower limit noise criteria at 271 Pacific Highway. The exceedance is associated with operation of the road grader, asphalt paver and tip truck along the haulage road alignment closest to the dwelling.
- During clearing works in preparation for Phase 9 there is potential exceedance of the lower limit noise criteria at 353 Cudgen Road. The exceedance is associated with operation of the body truck used to remove waste from site at the southernmost section of the expansion.
- The predicted noise levels have never exceeded the “highly affected” noise limit of 75dB(A) $L_{Aeq,15min}$ specified in the *Interim Construction Noise Guideline*.

Construction noise management and mitigation measures are recommended to minimise the noise impacts at the noise sensitive receptors which, because of their proximity to various construction sites, may be affected by noise during multiple stages of HTSP expansion.

6. Noise Management

6.1 Noise Mitigation Measures

The following noise mitigation and management measures are recommended:

- Works should be carried out during standard (day time) construction hours where possible.
- If works outside standard hours are necessary, all reasonable and practicable measures should be implemented to achieve compliance with the “noise affected” limit from the *Interim Construction Noise Guideline*.
- Prior to commencing “out of hours work”, detailed risk assessment should be carried out in accordance with Council’s Out of Hours Work procedure to determine whether the out of hours works should be permitted. The risk assessment is to document the reasoning behind the works being undertaken 'out of hours' and if permitted, the risk assessment will include reasonable and practicable control measures that the Contractor is proposing to implement during out of hours works.
- The Contractor must provide the following information for Council to complete the out of hours risk assessment:
    - type of work to be undertaken
    - where the works are to be undertaken
    - equipment to be used
    - reasoning behind the works being undertaken 'out of hours'
    - consideration of any alternatives to undertaking the works at night
    - duration of the work
    - sensitive receptors likely to be impacted
    - mitigation measures to be implemented to reduce impacts
- Ensure all site workers are aware of commitments and specific directives for noise control throughout the construction period through toolbox meetings and on-site training.
- Select plant and equipment with low sound power levels, where possible. (Hydraulic or electric-controlled units should be considered instead of noisier diesel units).
- Inspect and maintain plant and equipment to ensure it is in good working order.
- Plant and equipment which is not in use should be powered down.
- Schedule deliveries to minimise number of trucks queuing around the site.
- Truck drivers should be advised of designated vehicle routes.

- Position noisy plant and equipment as far away from noise sensitive receptors as possible.
- Plant and equipment which emits noise more strongly in a particular direction should be oriented away from noise sensitive receptors.
- Plant and equipment which is in clear breach of the noise limits at the nearest noise sensitive places and will be operating long term or is otherwise deemed to be causing an environmental nuisance should have sound attenuation devices fitted or be surrounded by an acoustic enclosure or temporary noise barrier where feasible and reasonable.
- Temporary noise barrier can be in the form of “noise curtains” (Flexshield Sonic Curtain, Echobarrier curtain or similar) attached to temporary fencing, or earth mounds. To be effective, the noise barrier has to obscure line of sight between the top of the machine and the noise receptor.
- Minimise drop height of materials when transferring (e.g. loading and unloading vehicles and storage areas).
- Enclose stand by generators or fit them with an effective muffler.
- Fit more efficient exhaust sound reduction equipment to engines of earthmoving equipment.
- Ensure manufacturer’s enclosure panels or engine bay doors are kept closed.
- Provide acoustical dampening to metal casings of compressors or generators.
- Line chutes and dump trucks with a resilient material to reduce impact noise of moving material.
- Site entrance should be located as far as possible from the noise sensitive receptors.
- On-site parking for staff and on-site truck waiting areas to be located away from residences and other sensitive land uses.
- Ensure the loading and unloading points are positioned away from sensitive and critical receptors.
- Consider use of “broadband” (non-tonal) reversing alarms instead of beeper alarms, taking into account Workplace Health and Safety requirements.
- Avoid the use of radios or stereos outdoors where neighbours may be affected.
- The over use of external public address systems to be avoided or link these systems to the telephone.
- Avoid shouting, and minimise talking loudly and slamming vehicle doors as well the use of horns within the construction area, except in the case of emergency or for safety.

6.2 Noise Monitoring

Noise monitoring should be undertaken on receipt of a noise complaint at an appropriate location near the origin of the complaint in accordance with the requirements of Australian Standard AS1055-2018 (*Description and measurement of environmental noise*) or any other noise monitoring methodology agreed with the regulatory authorities.

If the results of noise monitoring indicate exceedance of the noise limits, appropriate noise mitigation measures should be implemented to reduce the noise levels.

6.3 Community Relations

The Contractor carrying out the proposed works has to maintain positive community relations which will include the following:

- The public to be informed (letter box leaflet drop; organised community consultation; or other form of communication) about the construction plans and the measures implemented to minimise construction noise;
- Establishment of procedures for prompt response to any noise complaints and corrective measures;
- Maintain the line of communication by designating community liaison officer, with knowledge and experience in community consultation and management of environmental (or nuisance) impacts on construction projects;
- The contact details of the responsible person for management of noise compliant to be prominently displayed at the site office location; and
- Records of any noise complaint and the response measures implemented to be kept on site with the copy of the NMP.

6.4 Contingencies

During construction, the Contractor shall allocate sufficient resources (personnel and materials) to the site to immediately attend to any non-conformance and/or emergency event.

Corrective actions may be agreed upon, dependent upon the severity of non-conformance and/or emergency and parameter involved, between the Principal Contractor, any sub-contractors and the regulatory authorities, primarily Tweed Shire Council.

6.5 Responsibilities

It should be noted that the basic responsibility for the implementation of the noise control measures rest with the Project Manager and all employees, as well as any Sub-Contractor management and employees. The specific responsibilities that pertain to this NMP are presented in Table 6.1.

Table 6.1 Specific responsibilities

Party	Primary responsibility
Project Manager	• Overall implementation of the NMP and management of potential noise impacts and risks. • Responsible for reporting any incidents to relevant authorities if required. • Issue and distribution of NMP. • Revision of the NMP, as required, to reflect site conditions and instructions from the regulatory authorities. • Revisions are to be made by replacing the entire document by consecutively numbered amendments.
Construction Manager/Site Foreman	• Implementation of strategies, requirements, procedures and measures to ensure that appropriate noise control measures are in place. • To attend construction at all times during working hours. • Site inspections to ensure adherence to the commitments under the NMP. • Direct actions, as required, to protect the noise amenity of the local environment and to minimise and/or rectify any concerns.
All other site personnel	• Responsible for a General Environmental Duty under the *Environmental Planning and Assessment Act 1979*. • Responsible for environmentally sound management of operations and reporting any observed incidents to the Site Foreman. • Adherence to Site Safety Rules, the Emergency Plan and the NMP.
Environmental Consultant	• Assist with implementation, monitoring, reporting and corrective actions as required by the Project Manager.

6.6 Complaints and Incidents

The Construction Manager shall investigate all construction noise complaints. Where considered appropriate and/or required, the Construction Manager shall notify Tweed Shire Council and/or any other relevant statutory authority. Complaints received by external parties will also be subject to investigation by the Site Manager.

Should an incident of noise emissions impacting on the surrounding land uses occur during the course of construction the Principal Contractor and any sub-contractors shall take prompt action to minimise any impact and, where necessary, seek the advice of the relevant authorities.

All complaints will be treated with respect. The Construction Manager shall maintain a Complaints Register (refer Appendix E) and shall direct an appropriate course of action relating to the complaint. The Complaints Register will be included in any audit reports during construction and shall record the date, time and nature of any complaint, the name and contact details of the complainant, action taken, person responsible for action, and resolution of complaint. The Construction Manager shall certify each entry on the record.

6.7 Awareness and Training

A copy of this NMP will be available from the following officers at the site:

- Construction Manager; and
- Safety Officer.

Awareness and Training forms shall be part of Safety Inductions conducted prior to commencement of the construction work. As part of site induction and training all personnel engaged in construction shall be made aware of the provisions of the NMP in order to promote a general awareness of the potential for noise generation and to minimise any potential impacts. Evidence of environmental induction of personnel in this project shall be maintained on project records.

7. References

- Australian Standard AS 1055.1-2018 *(Acoustics – Description and measurement of environmental noise)*
- Australian Standard AS 2436-2010 (*Guide to noise and vibration control on construction, demolition and maintenance sites*)
- Australian Standard AS/NZS IEC61672.1-2019 (*Electroacoustics – Sound level meters – Specifications*)
- International Standard ISO 9613 (*Acoustics – Attenuation of sound during propagation outdoors*)
- NSW EPA, 2017 *Noise Policy for Industry* (2017)
- NSW EPA, 2009 *Interim Construction Noise Guideline* (2009)
- NSW EPA, 2013 *Noise Guide for Local Government* (2013)
- *NSW Government, 1979 Environmental Planning and Assessment Act 1979*
- *NSW Government, 1997 Protection of the Environment Operations Act 1997*
- NSW Government Transport for NSW, 2018 *Construction Noise and Vibration Strategy* (2018)

Appendix A – Phasing Plan

PROJECT TITLE

HANSON TWEED SAND PLANT

PHASE 5-11

DRAWING TITLE

CONCEPT DEVELOPMENT PHASING

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
A	PASHING ARRANGEMENT CHANGES - REQ. PLANNER	25.01.2021	ZP	LN	LN	LN

ISSUE: PRELIMINARY

CLIENT: HANSON CONSTRUCTION MATERIALS PTY LTD

BASE PROVIDED BY: SIXMAPS DCDB

MANAGER: LANCE NEWLEY

ZONE PLANNING GROUP

GOLD COAST
1638 Tweed Street, Burleigh Heads QLD 4220
PO Box 3805, Burleigh Town QLD 4220

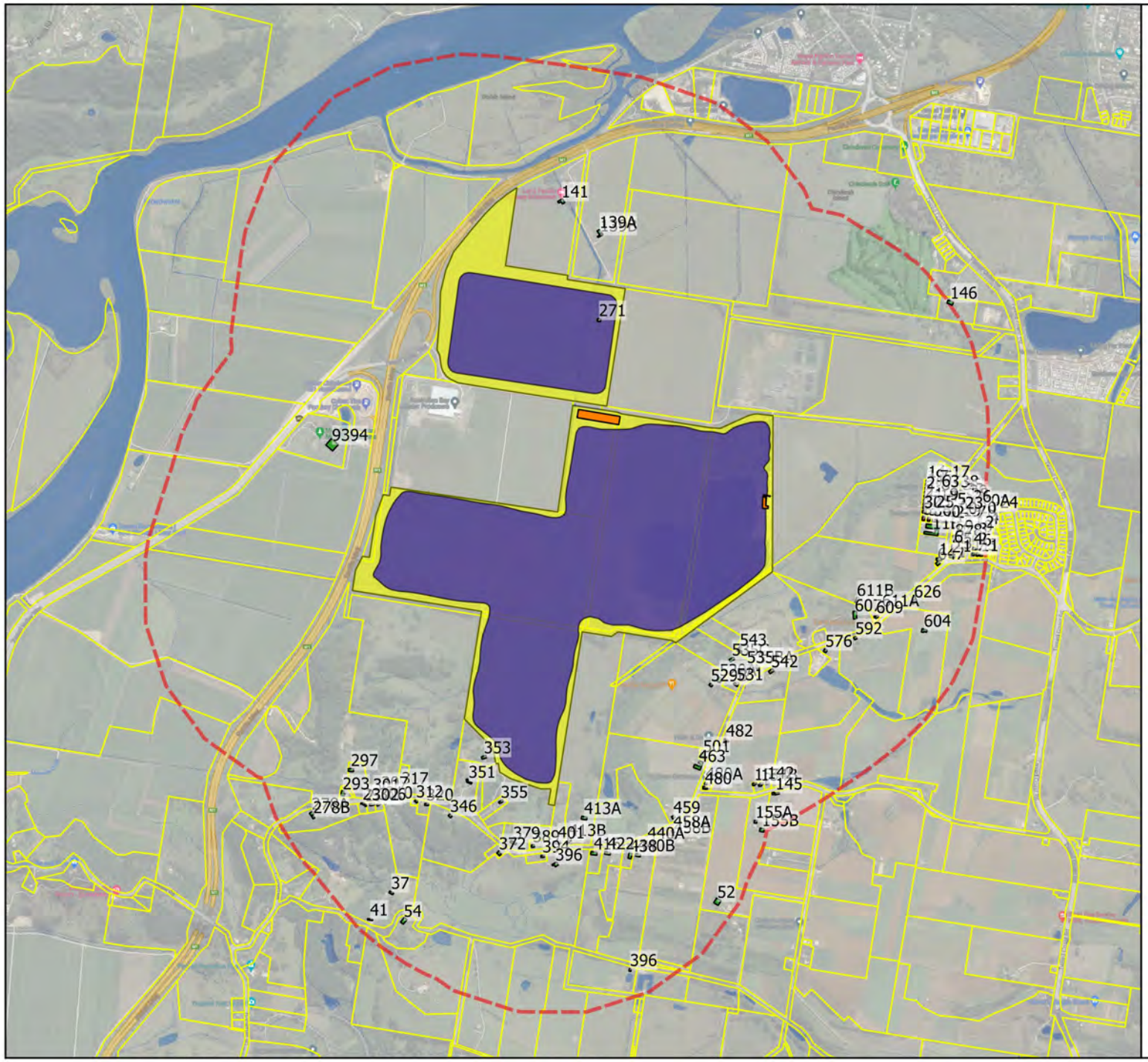
GLADSTONE
2/172 Goondoon St, Gladstone, QLD 4680
PO Box 5332, Gladstone QLD 4680

zonelandscape.com.au | 07 55622303

JOB / DRAWING NO: **Z19163- 104**

SHEET NO. **SHEET 01 OF 01**

Appendix B – Nearest Noise Sensitive Places



ATP CONSULTING ENGINEERS

ATP190611

Tweed Sand Plant
Cudgen

Noise Sensitive Land Uses

Overview

Legend

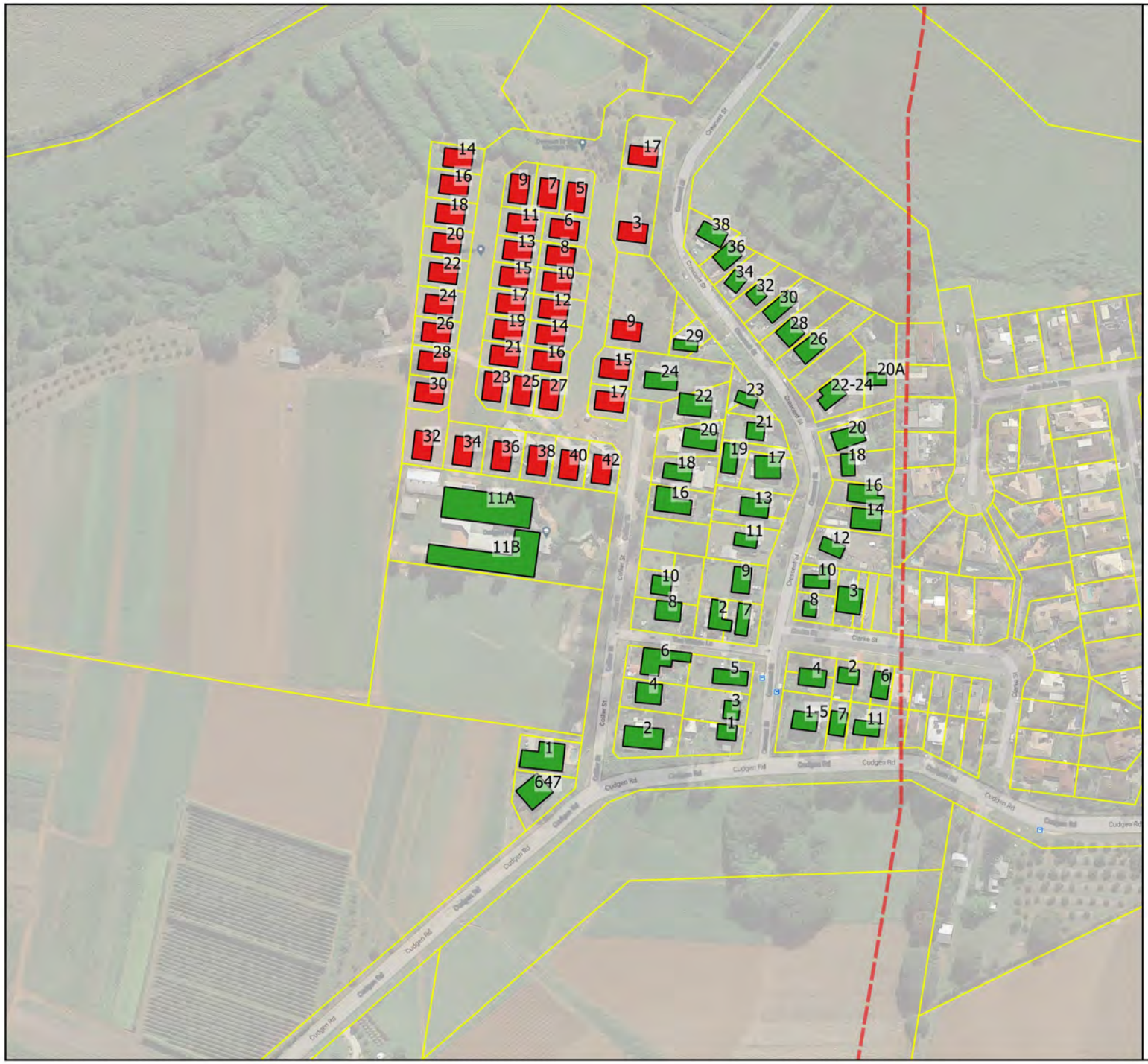
- Existing noise sensitive use
- Future noise sensitive use
- Other building
- Subject site
- Dredging area
- 1 km setback from subject site

N

Scale @ A4 1:27,000

0 250 500 750 1000 1250 1500 m

Created: 12/02/2021



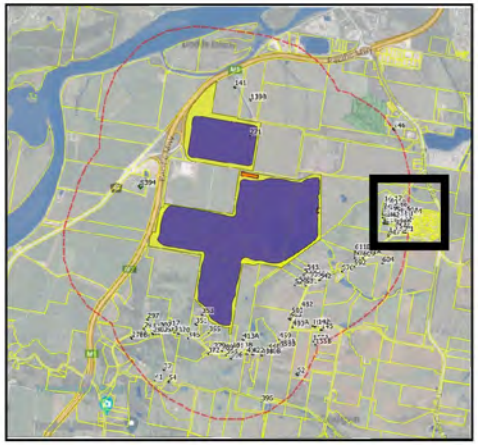
ATP
CONSULTING ENGINEERS

ATP190611

Tweed Sand Plant
Cudgen

Noise Sensitive Land Uses

Part 1



Legend

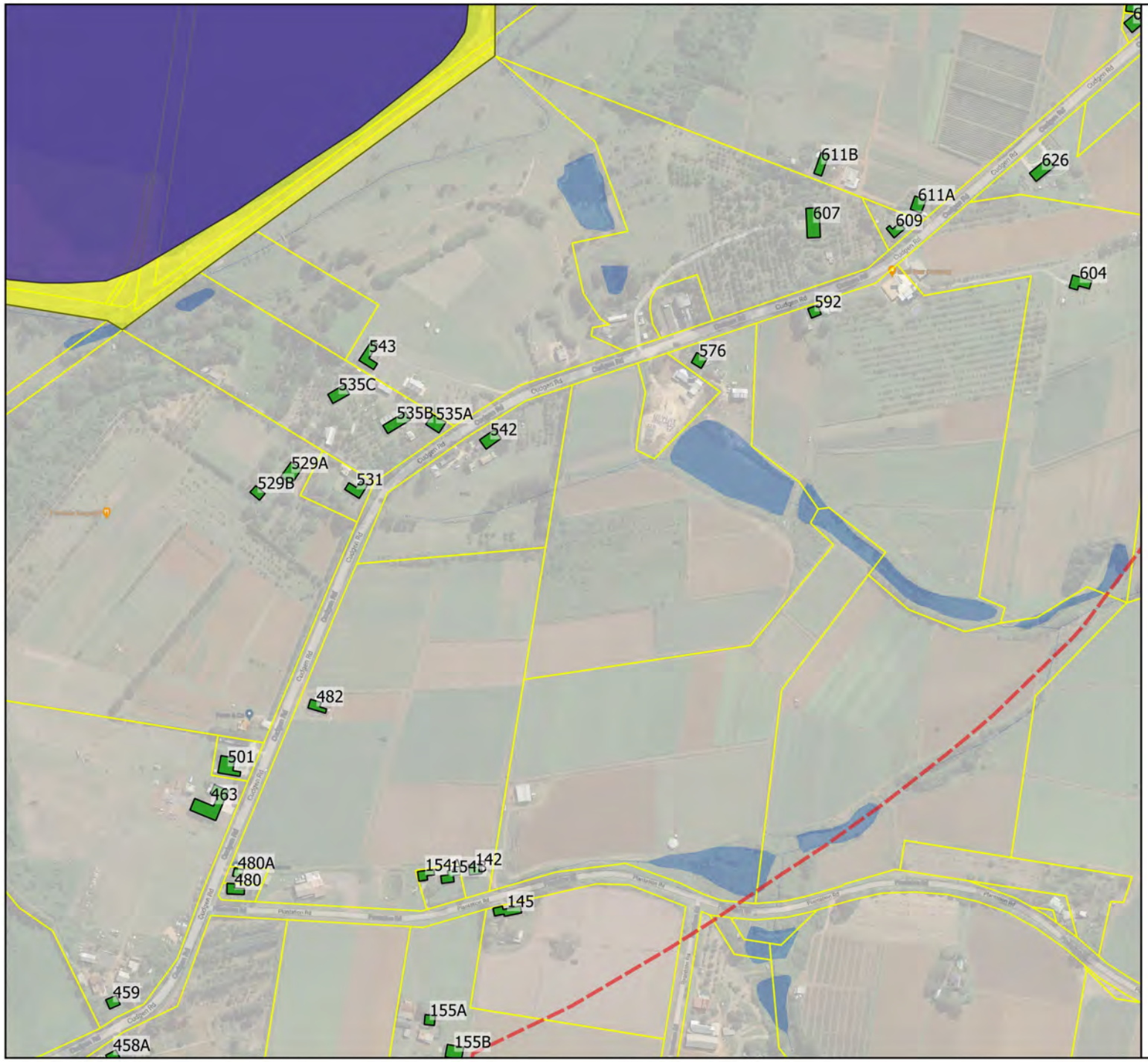
- Existing noise sensitive use
- Future noise sensitive use
- Other building
- Subject site
- Dredging area
- 1 km setback from subject site

N

Scale @ A4 1:3,500

0 50 100 150 200 m

Created: 12/02/2021



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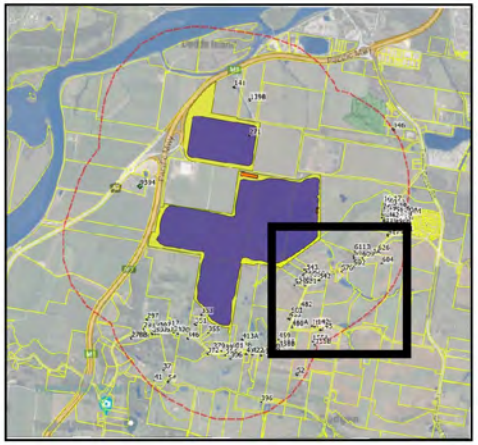
Tweed Sand Plant
Cudgen

Noise Sensitive Land Uses

Part 2



Legend

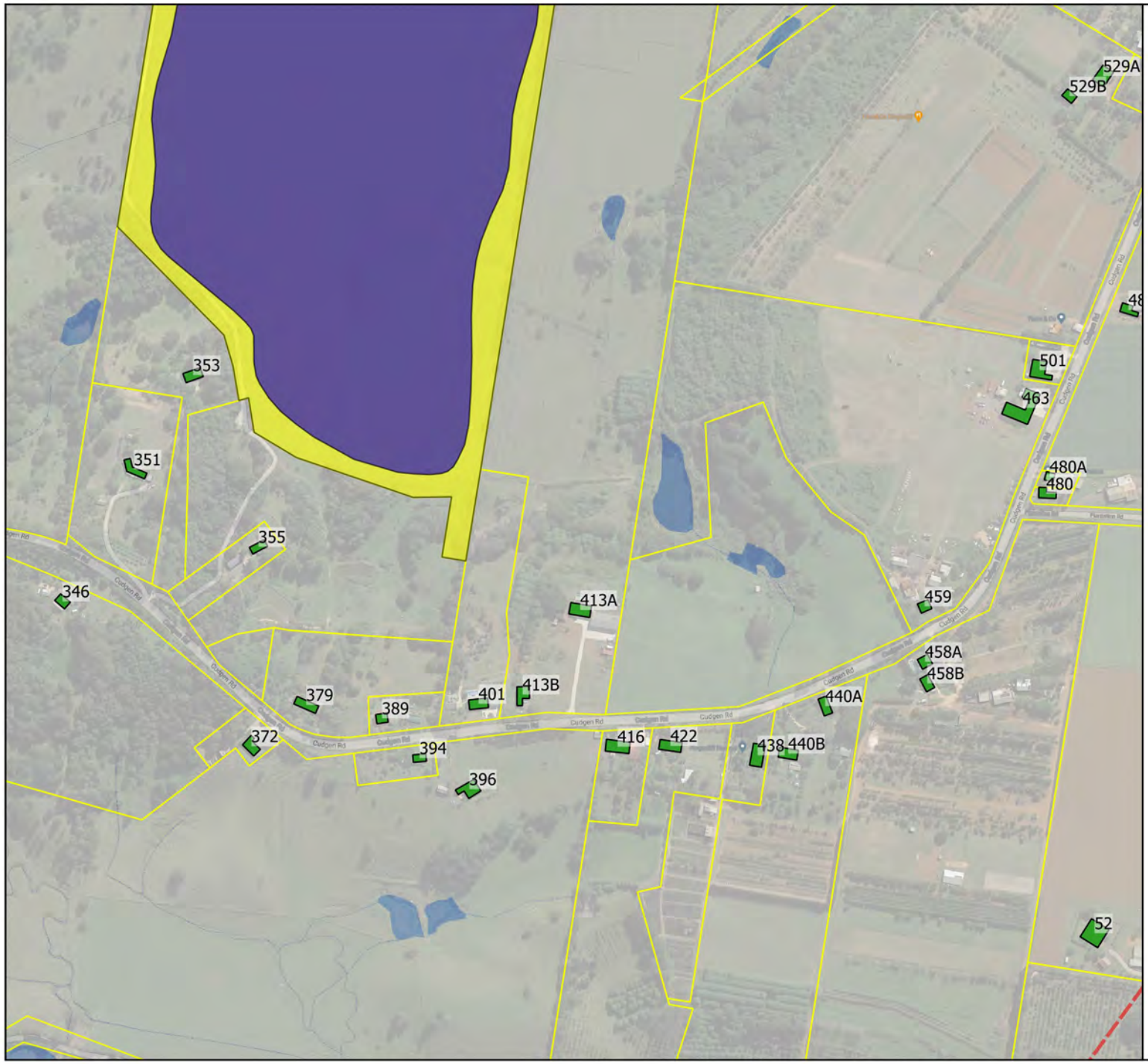
- Existing noise sensitive use
- Future noise sensitive use
- Other building
- Subject site
- Dredging area
- 1 km setback from subject site

N

Scale @ A4 1:7,000

0 100 200 300 400 m

Created: 12/02/2021



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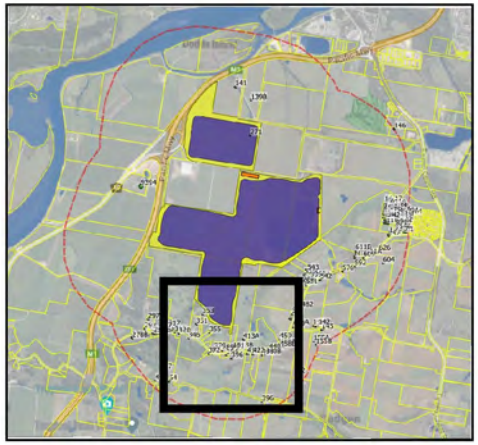
Noise Sensitive Land Uses

Part 3



Legend

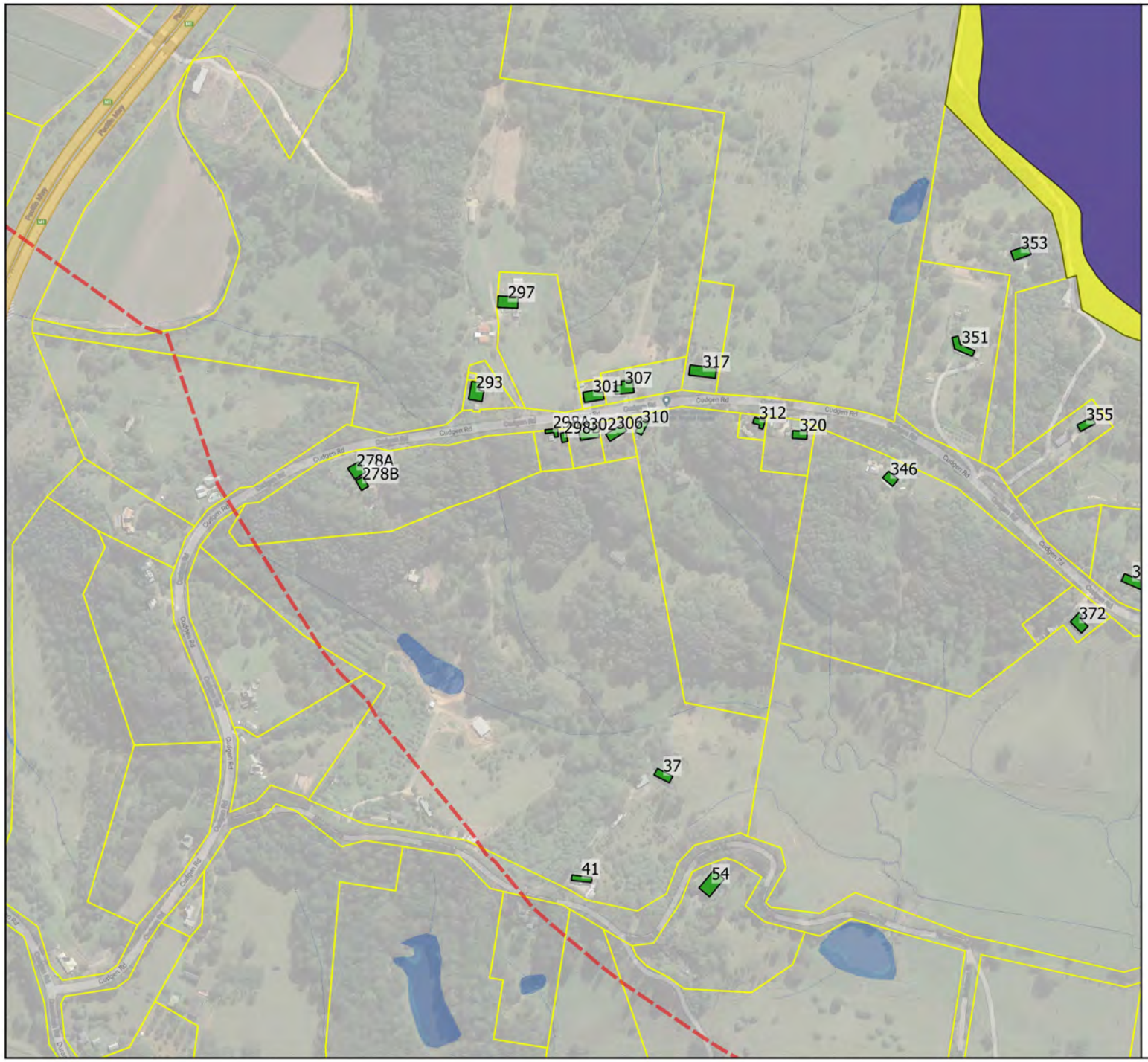
- Existing noise sensitive use
- Future noise sensitive use
- Other building
- Subject site
- Dredging area
- 1 km setback from subject site

N

Scale @ A4 1:7,000

0 100 200 300 400 m

Created: 12/02/2021



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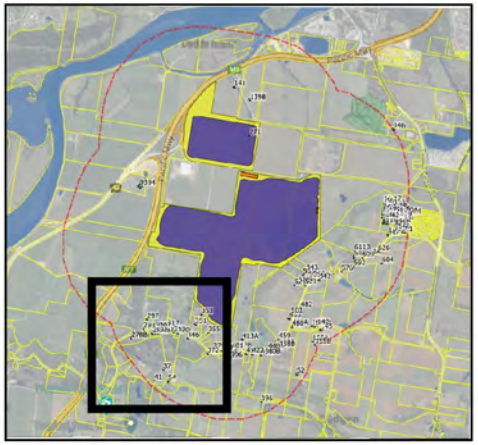
Noise Sensitive Land Uses

Part 4



Legend

- Existing noise sensitive use
- Future noise sensitive use
- Other building
- Subject site
- Dredging area
- 1 km setback from subject site

N

Scale @ A4 1:7,000

0 100 200 300 400 m

Created: 12/02/2021

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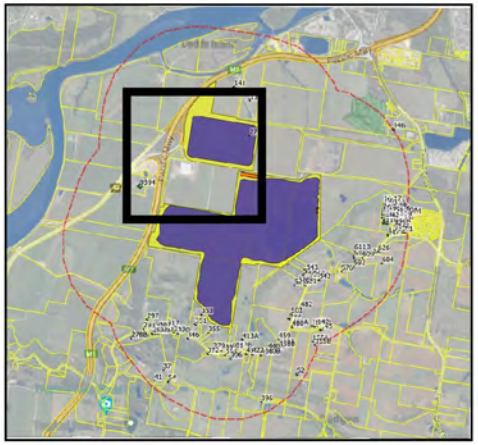
Tweed Sand Plant
Cudgen

Noise Sensitive Land Uses

Part 5



Legend

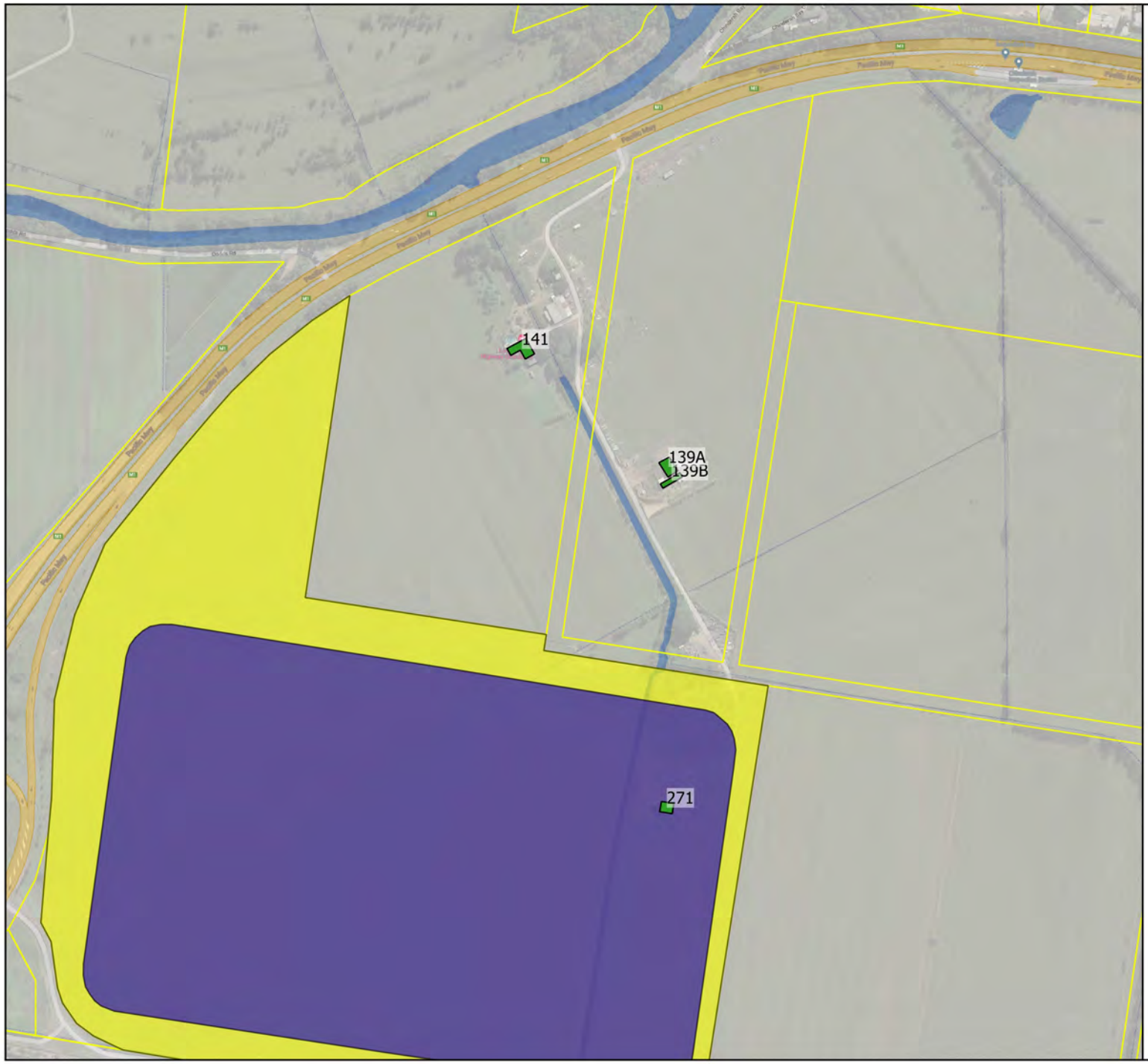
- Existing noise sensitive use
- Future noise sensitive use
- Other building
- Subject site
- Dredging area
- 1 km setback from subject site

N

Scale @ A4 1:7,000

0 100 200 300 400 m

Created: 12/02/2021



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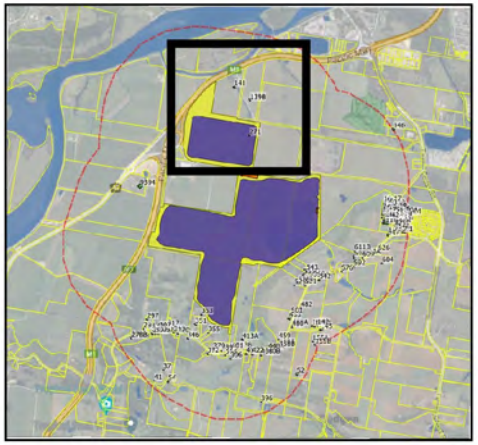
Tweed Sand Plant
Cudgen

Noise Sensitive Land Uses

Part 6



Legend

- Existing noise sensitive use
- Future noise sensitive use
- Other building
- Subject site
- Dredging area
- 1 km setback from subject site

N

Scale @ A4 1:7,000

0 100 200 300 400 m

Created: 12/02/2021

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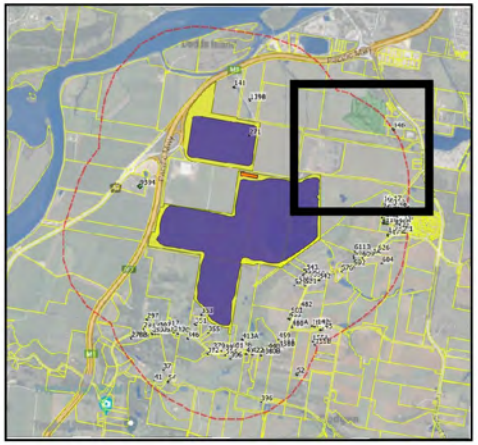
Noise Sensitive Land Uses

Part 7



Legend

- Existing noise sensitive use
- Future noise sensitive use
- Other building
- Subject site
- Dredging area
- 1 km setback from subject site

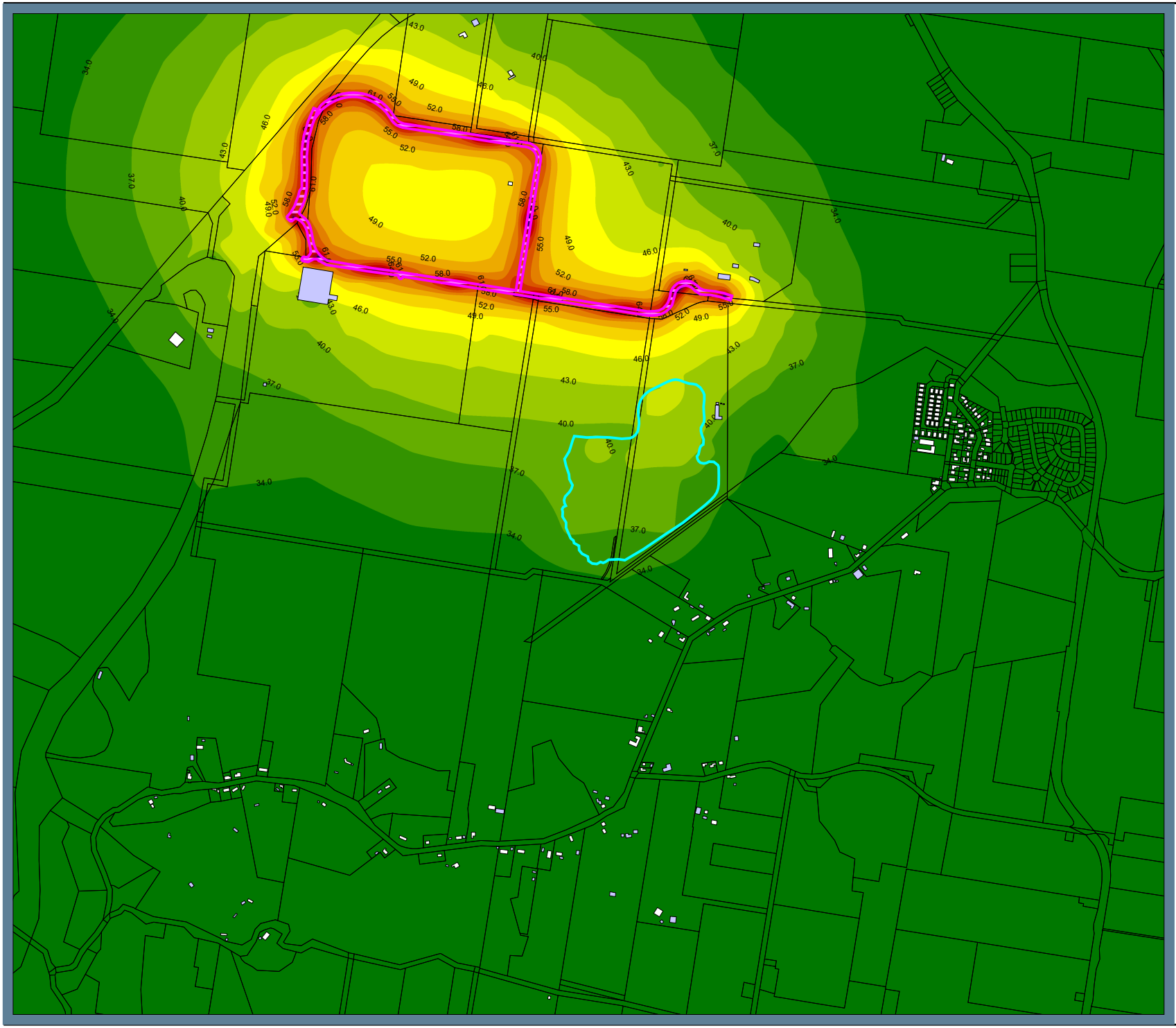
N

Scale @ A4 1:7,000

0 100 200 300 400 m

Created: 12/02/2021

Appendix C – SoundPLAN Results



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Hanson Tweed Sand Plant
Altona Road, Cudgen

Scenario 1

Haulage Road Construction

Construction noise level
$L_{eq,adj,15min}$ dB(A)

		<= 34
34	<	<= 37
37	<	<= 40
40	<	<= 43
43	<	<= 46
46	<	<= 49
49	<	<= 52
52	<	<= 55
55	<	<= 58
58	<	<= 61
61	<	<= 64
64	<	<= 67
67	<	<= 70
70	<	<= 73
73	<	

Legend

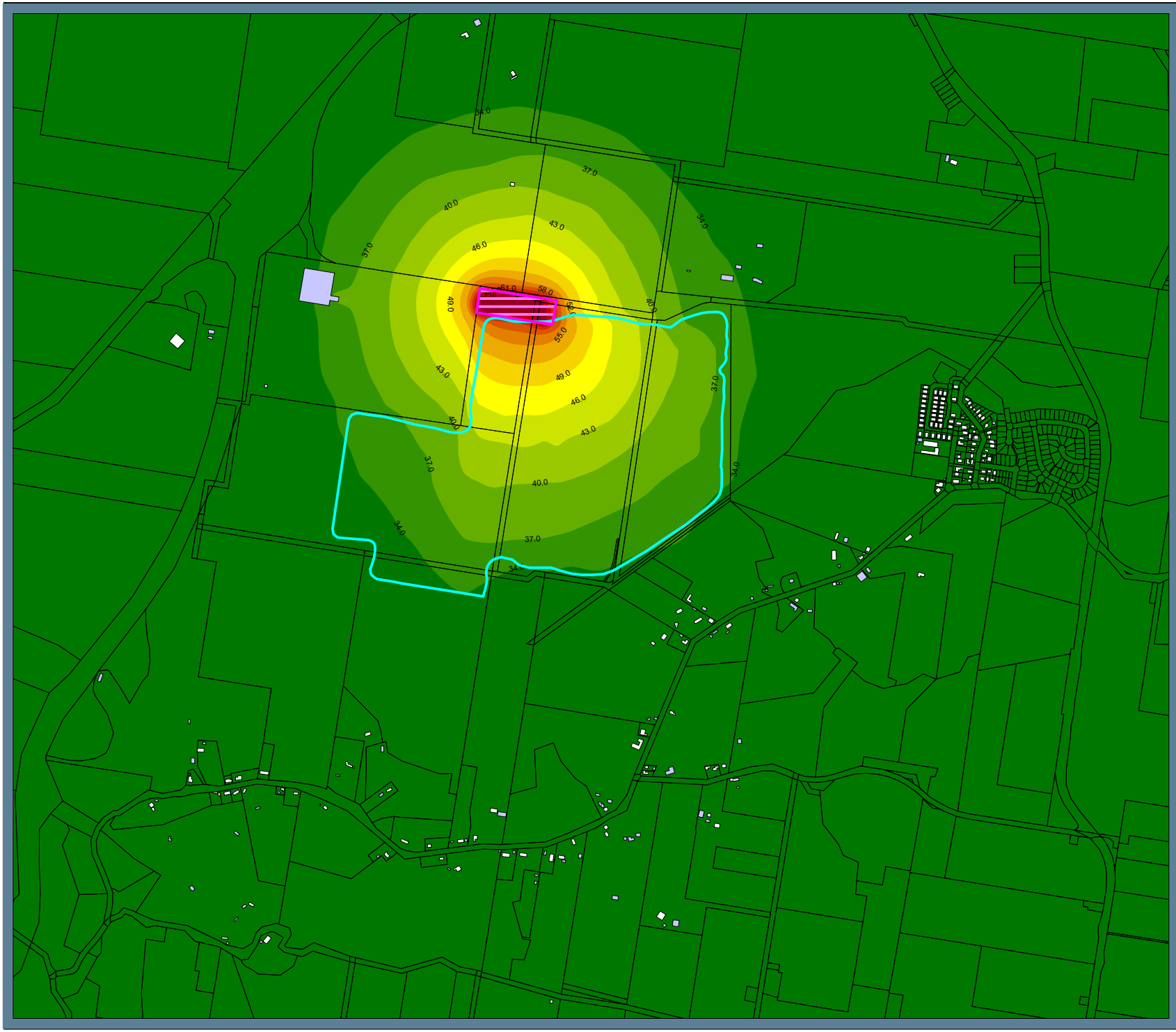
- Area source
- Dredge area
- Line
- Noise sensitive building
- Non noise sensitive building

SCALE @ A4 1:20000

0 125 250 500 750 1000 m

N

Grid Spacing: 50m
Project Engineer: Aidan Daniels
Created: 12/02/2021
Processed with SoundPLAN 8.2



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Hanson Tweed Sand Plant
Altona Road, Cudgen

Scenario 2

Construction of New Processing Facilities

Construction noise level
$L_{eq,adj,15min}$ dB(A)

		<= 34
34	<	<= 37
37	<	<= 40
40	<	<= 43
43	<	<= 46
46	<	<= 49
49	<	<= 52
52	<	<= 55
55	<	<= 58
58	<	<= 61
61	<	<= 64
64	<	<= 67
67	<	<= 70
70	<	<= 73
73	<	

Legend

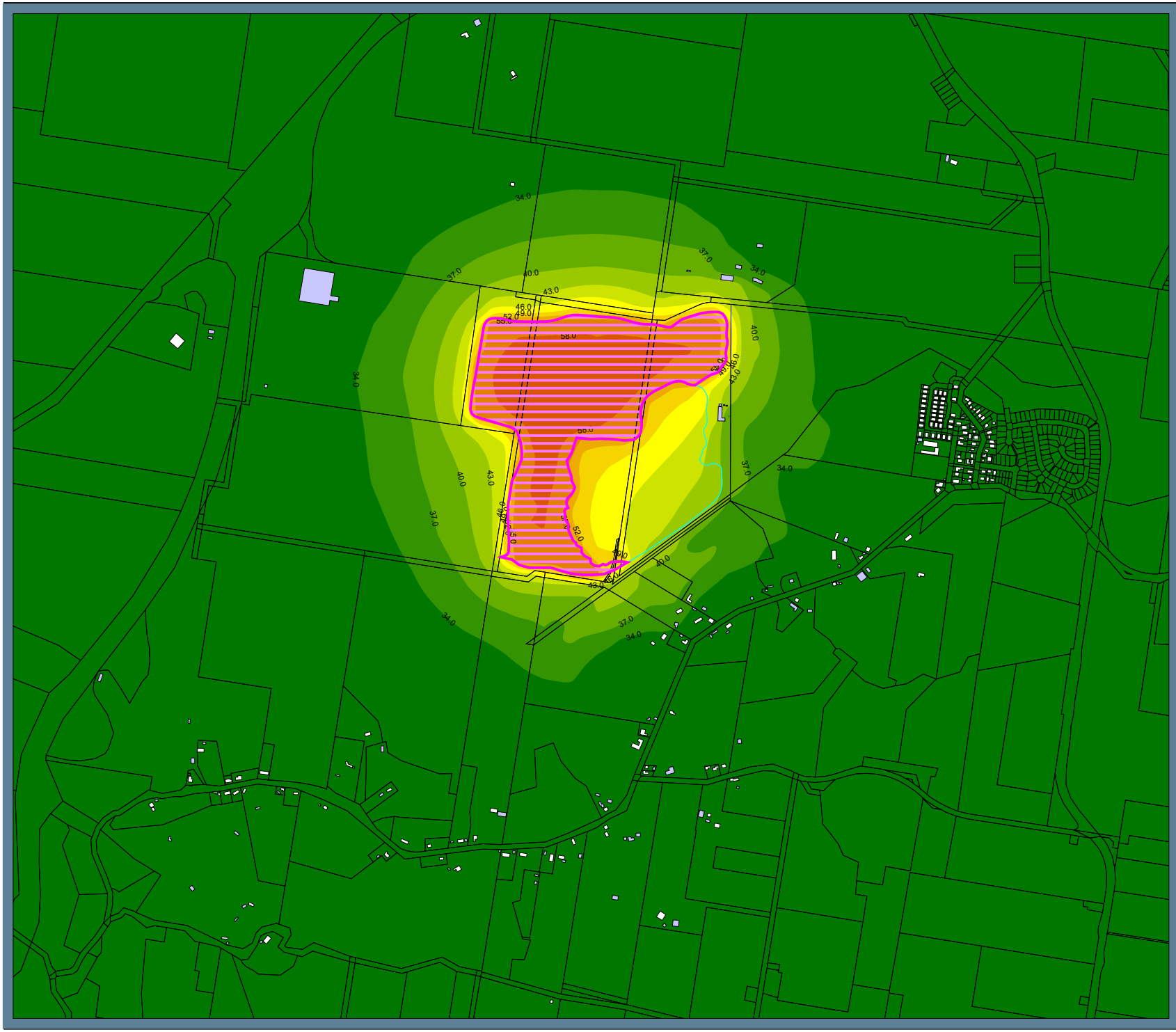
- Area source
- Dredge area
- Line
- Noise sensitive building
- Non noise sensitive building

SCALE @ A4 1:20000

0 125 250 500 750 1000 m

N

Grid Spacing: 50m
Project Engineer: Aidan Daniels
Created: 12/02/2021
Processed with SoundPLAN 8.2



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Hanson Tweed Sand Plant
Altona Road, Cudgen

Scenario 3

Clearing for Phase 5 Operations

Construction noise level
$L_{eq,adj,15min}$ dB(A)

		<= 34
34	<	<= 37
37	<	<= 40
40	<	<= 43
43	<	<= 46
46	<	<= 49
49	<	<= 52
52	<	<= 55
55	<	<= 58
58	<	<= 61
61	<	<= 64
64	<	<= 67
67	<	<= 70
70	<	<= 73
73	<	

Legend

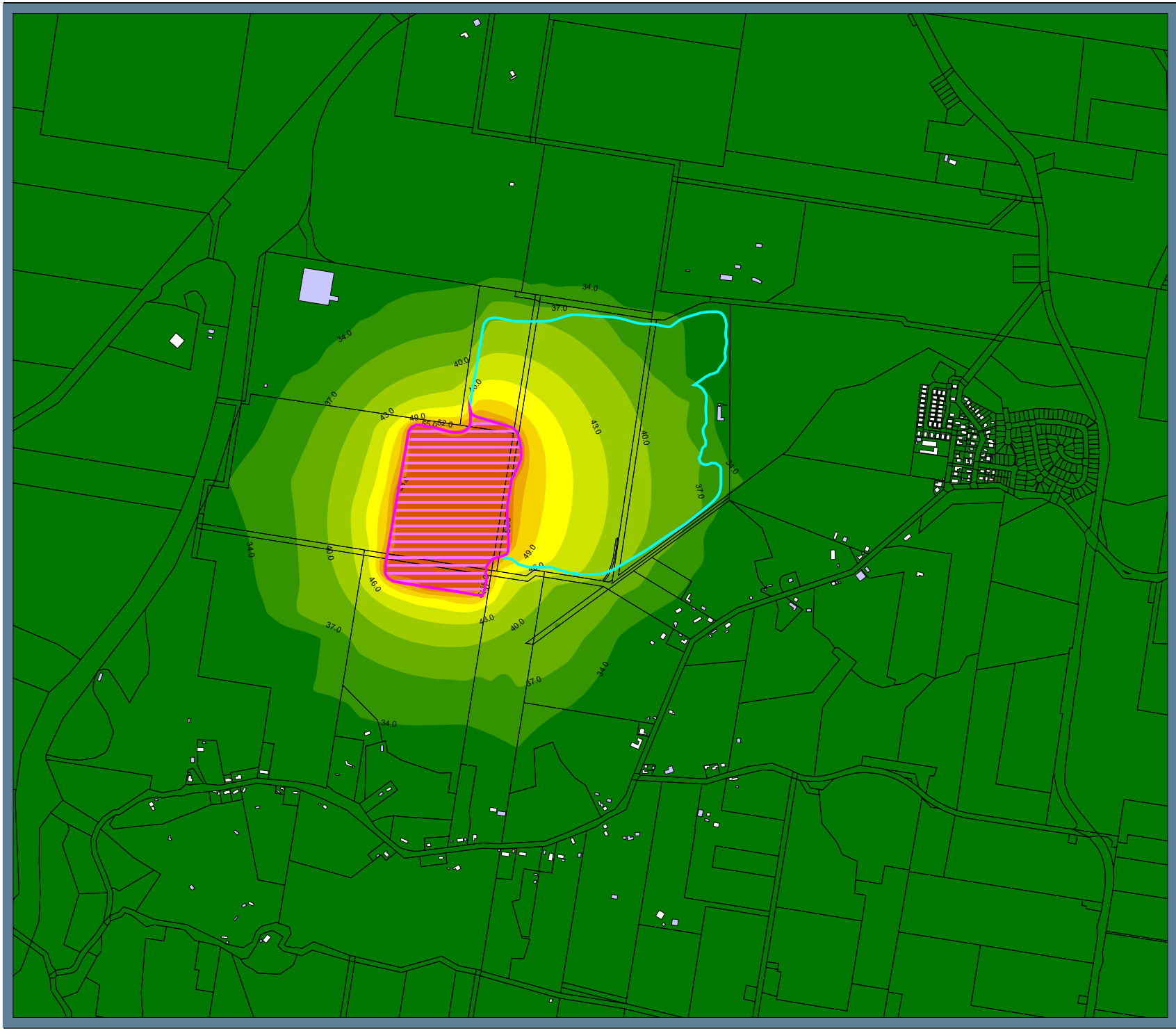
- Area source
- Dredge area
- Line
- Noise sensitive building
- Non noise sensitive building

SCALE @ A4 1:20000

0 125 250 500 750 1000 m

N

Grid Spacing: 50m
Project Engineer: Aidan Daniels
Created: 12/02/2021
Processed with SoundPLAN 8.2



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Hanson Tweed Sand Plant
Altona Road, Cudgen

Scenario 4

Clearing for Phase 6 Operations

Construction noise level
$L_{eq,adj,15min}$ dB(A)

		<= 34
34	<	<= 37
37	<	<= 40
40	<	<= 43
43	<	<= 46
46	<	<= 49
49	<	<= 52
52	<	<= 55
55	<	<= 58
58	<	<= 61
61	<	<= 64
64	<	<= 67
67	<	<= 70
70	<	<= 73
73	<	

Legend

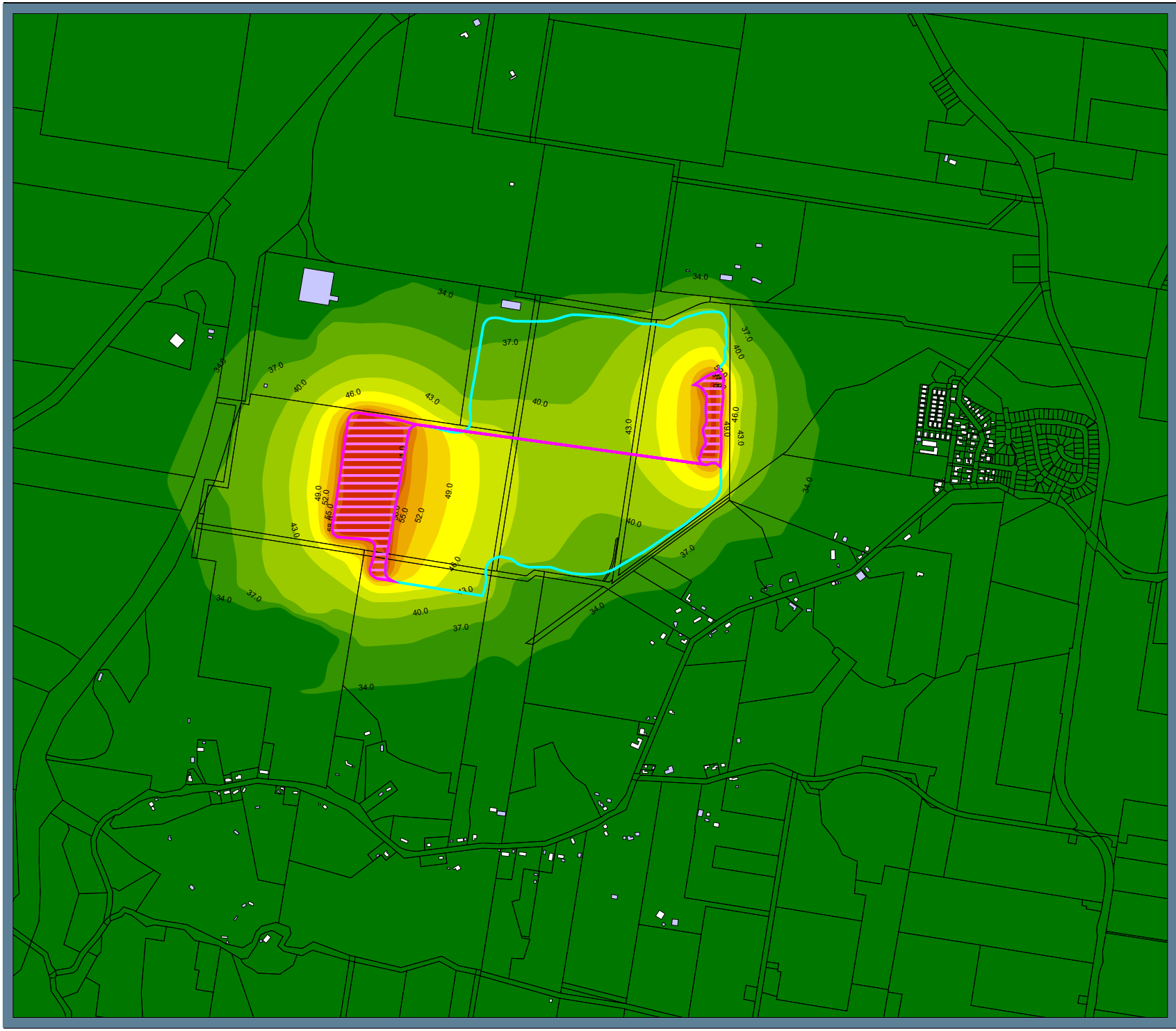
- Area source
- Dredge area
- Line
- Noise sensitive building
- Non noise sensitive building

SCALE @ A4 1:20000

0 125 250 500 750 1000 m

N

Grid Spacing: 50m
Project Engineer: Aidan Daniels
Created: 12/02/2021
Processed with SoundPLAN 8.2



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Hanson Tweed Sand Plant
Altona Road, Cudgen

Scenario 5

Clearing for Phase 7 Operations

Construction noise level
$L_{eq,adj,15min}$ dB(A)

		<= 34
34	<	<= 37
37	<	<= 40
40	<	<= 43
43	<	<= 46
46	<	<= 49
49	<	<= 52
52	<	<= 55
55	<	<= 58
58	<	<= 61
61	<	<= 64
64	<	<= 67
67	<	<= 70
70	<	<= 73
73	<	

Legend

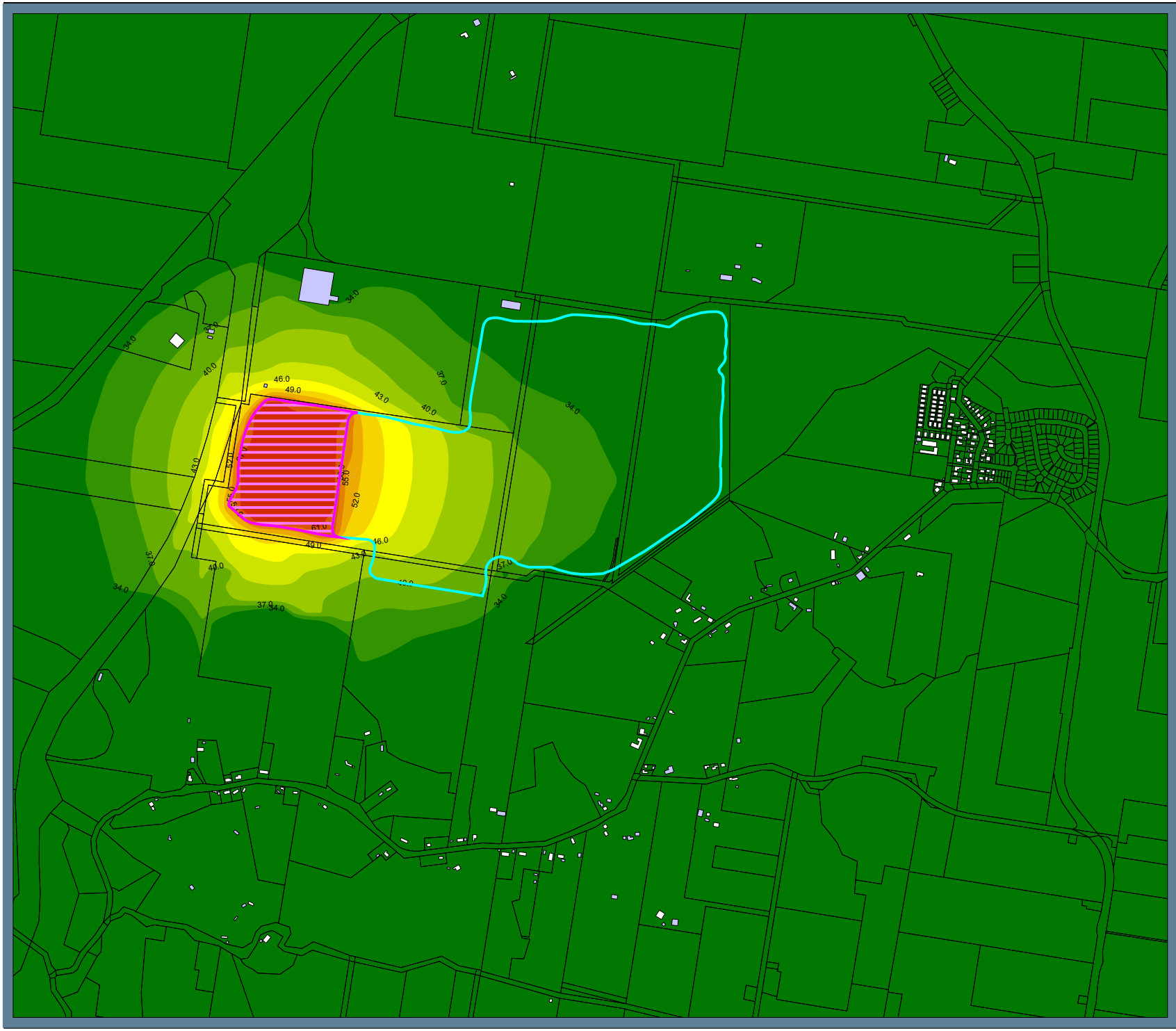
- Area source
- Dredge area
- Line
- Noise sensitive building
- Non noise sensitive building

SCALE @ A4 1:20000

0 125 250 500 750 1000 m

N

Grid Spacing: 50m
Project Engineer: Aidan Daniels
Created: 12/02/2021
Processed with SoundPLAN 8.2



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Hanson Tweed Sand Plant
Altona Road, Cudgen

Scenario 6

Clearing for Phase 8 Operations

Construction noise level
$L_{eq,adj,15min}$ dB(A)

		<= 34
34	<	<= 37
37	<	<= 40
40	<	<= 43
43	<	<= 46
46	<	<= 49
49	<	<= 52
52	<	<= 55
55	<	<= 58
58	<	<= 61
61	<	<= 64
64	<	<= 67
67	<	<= 70
70	<	<= 73
73	<	

Legend

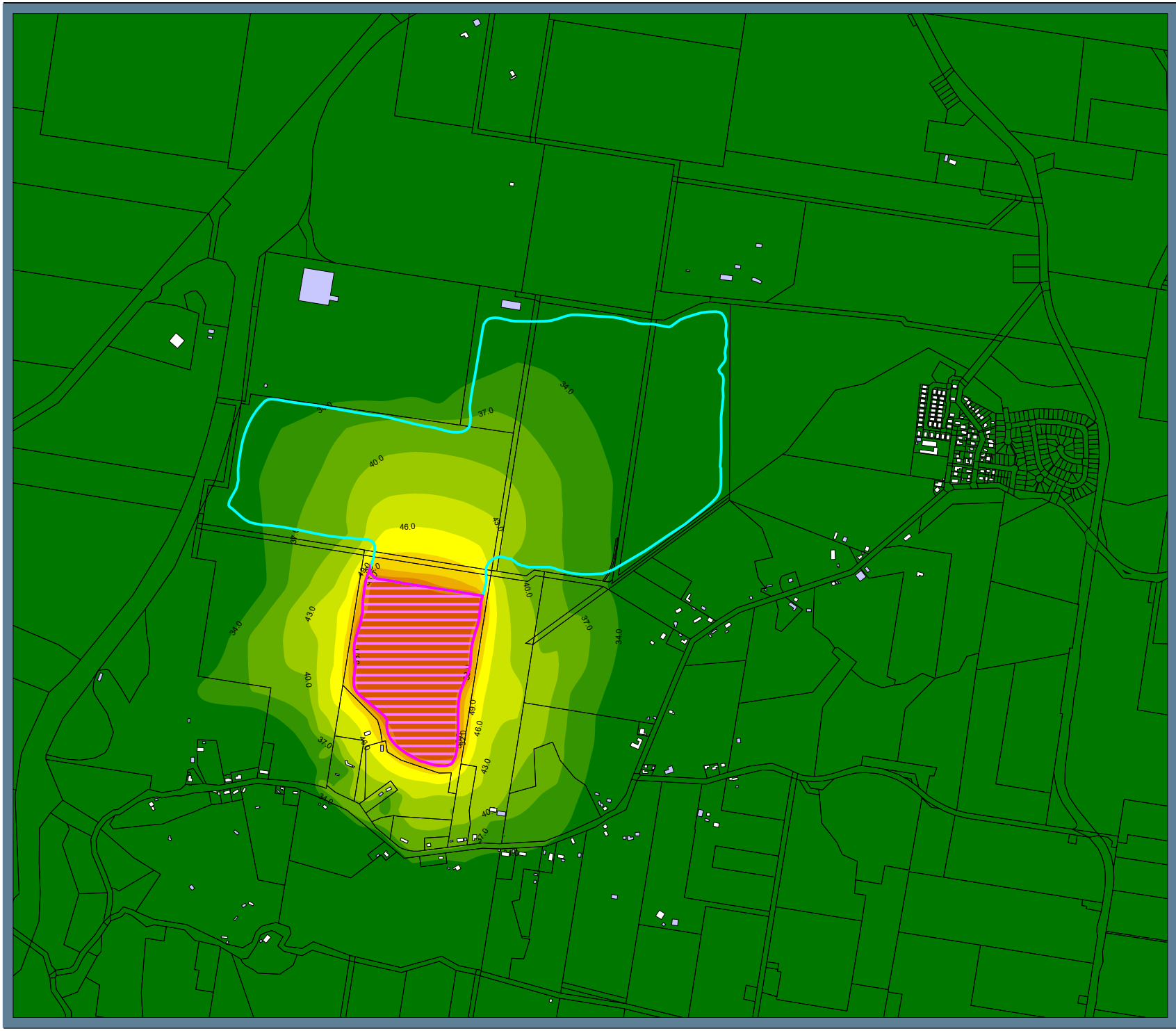
- Area source
- Dredge area
- Line
- Noise sensitive building
- Non noise sensitive building

SCALE @ A4 1:20000

0 125 250 500 750 1000 m

N

Grid Spacing: 50m
Project Engineer: Aidan Daniels
Created: 12/02/2021
Processed with SoundPLAN 8.2



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Hanson Tweed Sand Plant
Altona Road, Cudgen

Scenario 7

Clearing for Phase 9 Operations

Construction noise level
$L_{eq,adj,15min}$ dB(A)

		<= 34
34	<	<= 37
37	<	<= 40
40	<	<= 43
43	<	<= 46
46	<	<= 49
49	<	<= 52
52	<	<= 55
55	<	<= 58
58	<	<= 61
61	<	<= 64
64	<	<= 67
67	<	<= 70
70	<	<= 73
73	<	

Legend

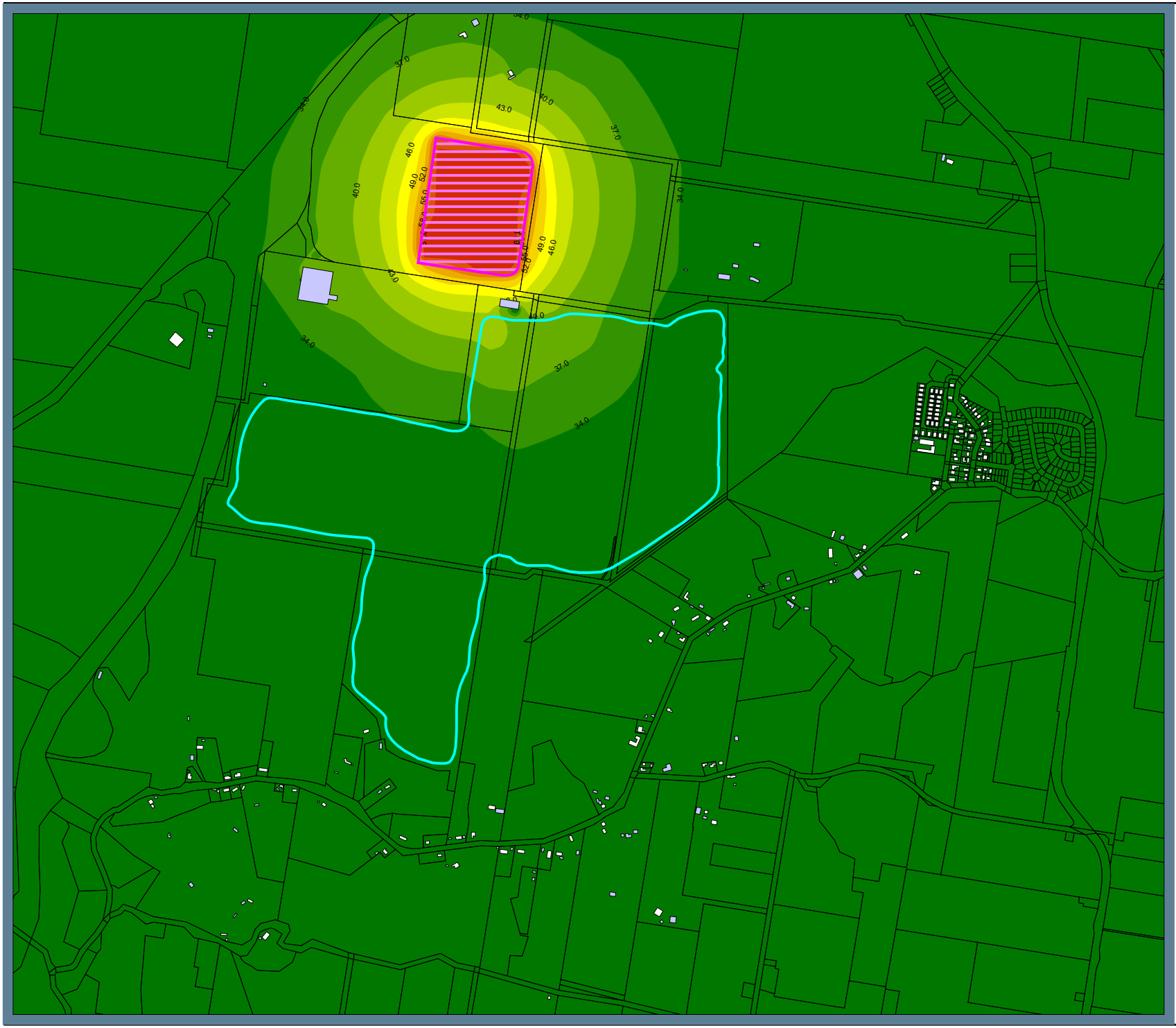
- Area source
- Dredge area
- Line
- Noise sensitive building
- Non noise sensitive building

SCALE @ A4 1:20000

0 125 250 500 750 1000 m

N

Grid Spacing: 50m
Project Engineer: Aidan Daniels
Created: 12/02/2021
Processed with SoundPLAN 8.2



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Hanson Tweed Sand Plant
Altona Road, Cudgen

Scenario 8

Clearing for Phase 10 Operations

Construction noise level
$L_{eq,adj,15min}$ dB(A)

		<= 34
34	<	<= 37
37	<	<= 40
40	<	<= 43
43	<	<= 46
46	<	<= 49
49	<	<= 52
52	<	<= 55
55	<	<= 58
58	<	<= 61
61	<	<= 64
64	<	<= 67
67	<	<= 70
70	<	<= 73
73	<	

Legend

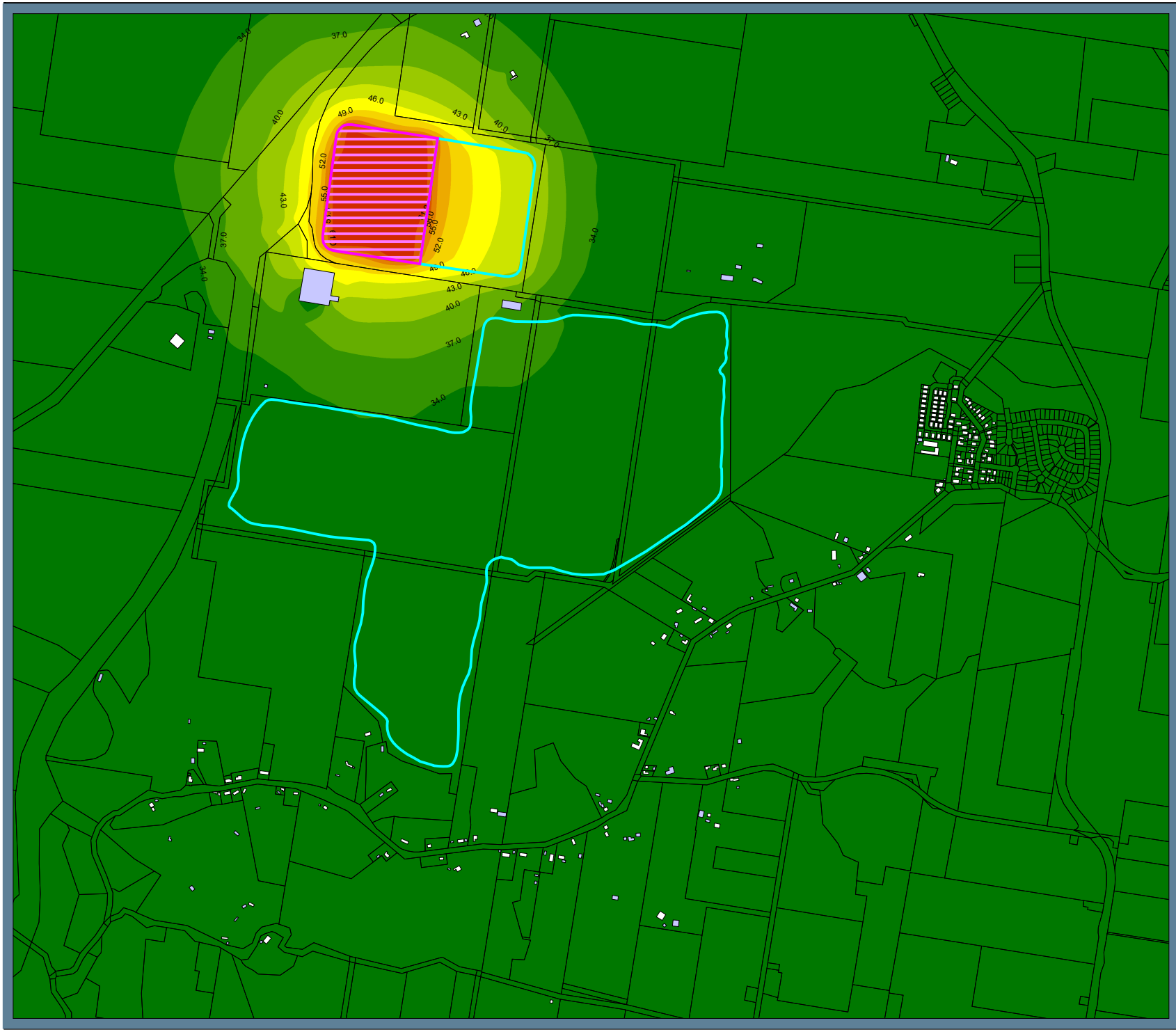
- Area source
- Dredge area
- Line
- Noise sensitive building
- Non noise sensitive building

SCALE @ A4 1:20000

0 125 250 500 750 1000 m

N

Grid Spacing: 50m
Project Engineer: Aidan Daniels
Created: 12/02/2021
Processed with SoundPLAN 8.2



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Hanson Tweed Sand Plant
Altona Road, Cudgen

Scenario 9

Clearing for Phase 11 Operations

Construction noise level
$L_{eq,adj,15min}$ dB(A)

		<= 34
34	<	<= 37
37	<	<= 40
40	<	<= 43
43	<	<= 46
46	<	<= 49
49	<	<= 52
52	<	<= 55
55	<	<= 58
58	<	<= 61
61	<	<= 64
64	<	<= 67
67	<	<= 70
70	<	<= 73
73	<	

Legend

- Area source
- Dredge area
- Line
- Noise sensitive building
- Non noise sensitive building

SCALE @ A4 1:20000

0 125 250 500 750 1000 m

N

Grid Spacing: 50m
Project Engineer: Aidan Daniels
Created: 12/02/2021
Processed with SoundPLAN 8.2

Appendix D – Noise Management Plan (NMP)

Issues	• Noise from site, equipment, construction work and deliveries impacting on site workers, adjacent land uses and environment in general.
Objectives	• With particular reference to the HTSP development, the Contractor is committed to implementing all reasonable and practicable mitigation measures to achieve the noise and vibration criteria. • In line with the above commitment, this Noise Management Plan (NMP) has been prepared to o To ensure all noise related impacts are prevented and/or minimised and managed appropriately. o Ensure that the noise emissions from the construction activities do not cause an 'environmental nuisance'. o To comply with relevant Tweed Shire Council directives. o Compliance with noise limits from the *Interim Construction Noise Guideline*. o Make the Principal Contractor, consultants and sub-contractors fully aware of the noise management commitments, obligations and objectives and to undertake all activities in accordance with the NMP; o Ensure that all personnel, consultants and sub-contractors comply with the relevant noise management requirements; o Continually improve work practices and procedures to minimise any adverse noise impacts throughout the construction period; and o Provide appropriate information and instruction to the construction sub-contractors to ensure full compliance with the requirements of the NMP and the relevant environmental legislation throughout the construction process.
Validity	• The currency of this document remains valid throughout the civil works for HSTP expansion project. • The NMP will be reviewed and additional reasonable and practicable measures will be implemented where: o Directed by Tweed Shire Council; o In response to a justifiable complaint caused by the project's activities; or o When changes in the equipment/work method, intensity, location, duration or timing of impacts that are expected to increase noise impacts are foreseen.
Performance criteria	• No noise complaints. • Overall A-weighted equivalent continuous adjusted sound pressure level ($L_{Aeq,adj,15\text{-}minute}$) from the combined operation of all construction noise sources does not exceed the limits presented in Section 5 of the Construction Noise Assessment.

Management procedures	• Ensure all site workers are aware of commitments and specific directives for noise control throughout the construction period through toolbox meetings and on-site training. • Carry out construction work during standard hours where possible. Any work performed outside standard hours is to be carried out in accordance with the Principal Contractor's Out of Hours Work (OOHW) Protocol. • Ensure all site workers are aware of commitments and specific directives for noise control throughout the construction period through toolbox meetings and on-site training. • Select plant and equipment with low sound power levels, where possible. (Hydraulic or electric-controlled units should be considered instead of noisier diesel units). • Inspect and maintain plant and equipment to ensure it is in good working order. • Plant and equipment which is not in use should be powered down. • Schedule deliveries to minimise number of trucks queuing around the site. • Truck drivers should be advised of designated vehicle routes. • Position noisy plant and equipment as far away from noise sensitive receptors as possible. • Plant and equipment which emits noise more strongly in a particular direction should be oriented away from noise sensitive receptors. • Plant and equipment which is in clear breach of the noise limits at the nearest noise sensitive places and will be operating long term or is otherwise deemed to be causing an environmental nuisance should have sound attenuation devices fitted or be surrounded by an acoustic enclosure or temporary noise barrier where feasible and reasonable. • Temporary noise barrier can be in the form of "noise curtains" (Flexshield Sonic Curtain, Echobarrier curtain or similar) attached to temporary fencing, or earth mounds. To be effective, the noise barrier has to obscure line of sight between the top of the machine and the noise receptor. • Minimise drop height of materials when transferring (e.g. loading and unloading vehicles and storage areas). • Enclose stand by generators or fit them with an effective muffler. • Fit more efficient exhaust sound reduction equipment to engines of earthmoving equipment. • Ensure manufacturer's enclosure panels or engine bay doors are kept closed. • Provide acoustical dampening to metal casings of compressors or generators. • Line chutes and dump trucks with a resilient material to reduce impact noise of moving material.

	• Site entrance should be located as far as possible from the noise sensitive receptors. • On-site parking for staff and on-site truck waiting areas to be located away from residences and other sensitive land uses. • Ensure the loading and unloading points are positioned away from sensitive and critical receptors. • Consider use of "broadband" (non-tonal) reversing alarms instead of beeper alarms, taking into account Workplace Health and Safety requirements. • Avoid the use of radios or stereos outdoors where neighbours may be affected. • The over use of external public address systems to be avoided or link these systems to the telephone. • Avoid shouting, and minimise talking loudly and slamming vehicle doors as well the use of horns within the construction area, except in the case of emergency or for safety.
Performance indicators	• Absence of complaints pertaining to noise.
Implementation strategy	• Ensure that all workers and contractors involved in the construction operations are aware of the potential for noise emissions, and operate as per the requirements of this NMP.
Critical dates	• Prior to commencement of work/construction safety induction to include training in regard to the implementation of the noise mitigation and management measures.
Monitoring	• The Project Manager/Site Foreman will ensure the following noise monitoring measures are implemented as necessary: o The Construction Manager or authorised staff member will record any complaints in the complaint register. As a minimum the details to be recorded are: ▪ Details of the complainant; ▪ The reason for the complaint; ▪ The time of the complaint and the duration of the offending event; ▪ Record of the activities undertaken at the site at the time the complaint was received; and ▪ The measures undertaken to address the issues in the complaint. o Monitoring to be undertaken on receipt of noise complaint at appropriate location near the origin of the complaint in accordance with the requirements of Australian Standard AS1055-1997 (*Description and measurement of environmental noise*) or any other noise monitoring methodology agreed with the regulatory authorities.
Reporting	• The Construction Manager/Site Foreman or authorised staff member should maintain the following records:

	o Daily record of the construction operations carried out (e.g. construction details, number of trucks arriving and leaving the site) for reference with any complaint investigation and noise monitoring. o Complaint log and complaint investigation records. o Noise monitoring records (if noise monitoring is required). • These records will be available for audit by the relevant Administrative Authority on request. • Should there be need for noise monitoring by a specialist consultant (i.e. due to noise complaint to an Administrative Authority) the Noise Monitoring Report will be made available to the relevant Administrative Authority that is managing the noise complaint issue. The Noise Monitoring Report should contain, as a minimum, the following information: o Noise monitoring methodology and instrumentation. o Noise levels measured at the most exposed part of the sensitive place where the complaint has originated. o Analysis of the data and discussion of the results relative to the relevant noise criteria. o Recommendations for modified operations to reduce noise emissions or for implementation of additional noise control measures.
Responsibility	• The Construction Manager/Site Foreman and any authorised staff members responsible for implementation of the whole or parts of the requirements specified under this NMP.
Corrective action	• The Construction Manager/Site Foreman will be responsible for immediate rectification of any identified non-conformance with the objectives of this NMP. • In the event that a non-conformance occurs as a result of poor practices, personnel on site will be made aware of the problem and informed of acceptable work practices. • Observations and complaints shall be used to guide implementation of additional measures, if and when required.
Auditing compliance	• The Project Manager/Construction Manager/Site Foreman will carry out regular reviews of the implementation of the noise management practices. The audit will especially consider the level of compliance with the following: o Implementation of the requirement for noise emissions to be kept as low as practicably possible; and o Auditing compliance by assessing the number of noise complaints.
Timing	• From commencement to completion of all construction operations as part of the proposed works.
Review	• Continual review of the NMP shall be practiced ensuring best management practices and continuous compliance with the objectives of this NMP.

Appendix E – Complaints Register

For the recording of any complaint pertaining to construction and the environment.

Date:	**Time:**
Name and Contact Details of Complainant: ……	
Details of Complaint: …… ……	
Action Taken: ……	
Responsible Person: ……	
Resolution/Notes: ……	
Construction Manager: ……	**Date:** ……
Date: ……	**Time:** ……
Name and Contact Details of Complainant: …… ……	
Details of Complaint: …… ……	
Action Taken: ……	
Responsible Person: ……	
Resolution/Notes: ……	
Construction Manager: ……	**Date:** ……
Date: ……	**Time:** ……
Name and Contact Details of Complainant: …… ……	
Details of Complaint: …… ……	
Action Taken: ……	
Responsible Person: ……	
Resolution/Notes: ……	
Construction Manager: ……	**Date:** ……