Appendix G Noise Assessment

ACOUSTICS AND AIR

BEERBURRUM TO NAMBOUR RAIL UPGRADE PROJECT

RAIL NOISE STUDY

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PREPARED FOR

SMEC – AUSTRALIA & NEW ZEALAND DIVISION
PO BOX 5333
SOUTH BRISBANE, QLD 4101

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Version	Status	Date	Prepared By	Reviewed By
A	Draft	26 August 2016	Adam Bioletti	Neil Gross

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GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

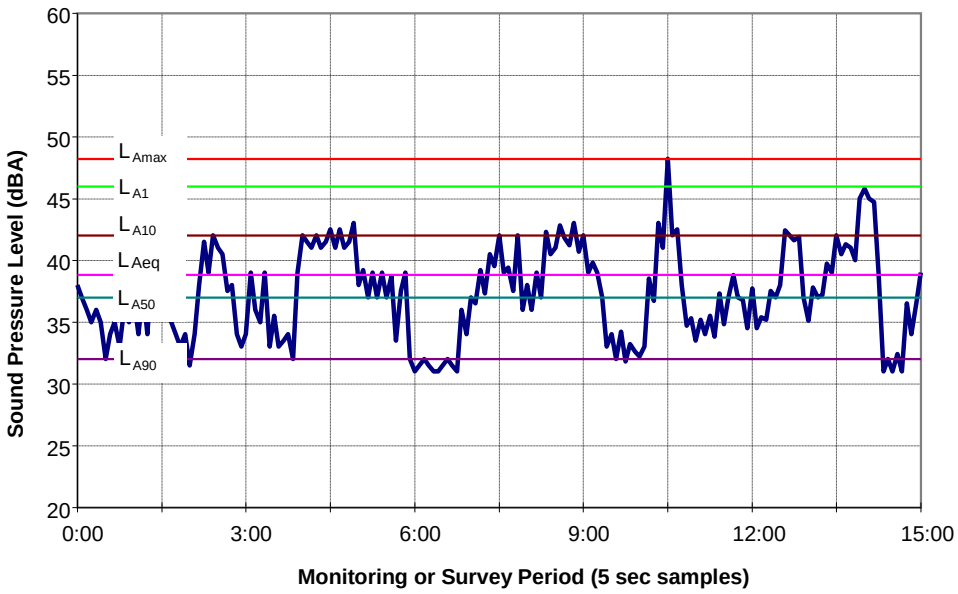
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



1 INTRODUCTION

The 39km long Beerburrum to Nambour (B2N) section of the North Coast Line consists of a single bi-directional line, with passing loops at stations.

Building Queensland is currently evaluating an option to upgrade the B2N section, including:

- duplication from Beerburrum to Glass House Mountains on a new alignment, and duplication from Glass House Mountains to Landsborough primarily on the existing alignment
- extension of the Landsborough passing loop
- Caloundra Street level crossing removal
- duplication of the platforms and upgrade of the stations between Landsborough and Nambour
- extension of the Mooloolah passing loop.

Wilkinson Murray has been commissioned by SMEC – Australia & New Zealand Division (SMEC) to undertake an assessment of rail noise associated with the proposal, as part of their larger engagement by Building Queensland.

The primary purpose of the current study is to identify locations requiring noise mitigation so that these may be included in the Business Case Reference Design. Mitigation to be considered includes all in-corridor measures such as noise barriers and earth mounds.

This report details the rail noise study which includes monitoring of existing rail noise levels, validation of a computer noise model, prediction of noise levels as a result of the proposed upgrade and assessment of potential impacts against relevant Queensland Government guidelines.

2 SITE DESCRIPTION

The proposal is located in the Sunshine Coast Hinterland, in or adjacent to the existing North Coast line.

The majority of residential receivers along the route are located in the following built up areas.

- Beerburrum
- Glass House Mountains
- Beerwah
- Landsborough
- Mooloolah Valley
- Eudlo
- Palmwoods
- Woombye
- Nambour

3 PROPOSAL DESCRIPTION

A detailed proposal description is included in the Review of Environmental Factors. This section highlights elements of the proposal that are significant to the assessment of rail noise.

Table 3-1 Proposal Elements

Location	Proposal Elements
Beerburrum to Glass House Mountains Station	• Duplication on improved alignment within the existing and protected corridor. • Bridges/ structures at Tibrogargan Creek • Replacement of Barrs Road Level Crossing, with a road bridge over Coonowrin Creek and new connection to Coonowrin Road on the west of existing railway. • Reconstruction of the Burgess Street road bridge south of its current location.
Glass House Mountains to Landsborough	• Duplication of the existing alignment within the existing rail corridor.
Landsborough Grade separation	• Replacement of Caloundra Street level crossing with grade separation (road over rail bridge) to the south of the existing level crossing, crossing old Landsborough road and connecting into Stephens Street/ Maleny Street.
Landsborough Passing Loop	• Extension of the duplicated track (passing loop) from Gympie Street North for approximately 1km, entirely within the existing rail corridor. A new/extended crossing of Addlington Creek will be required.
Eudlo bridge replacement and passing loop	• Extension of the passing loop south of Eudlo Station, and replacement/ duplication of the Highland Road/ Acrobat Creek rail bridge.
Woombye passing loop	• Extension of the passing loop south of the station, to integrate with the new Woombye stabling yard.

The improved alignment would decrease the distance to some noise-sensitive receivers in the Beerburrum to Glass House Mountains section. The other significant change that would result from the proposal is the train speed, which would increase in sections where the proposed alignment reduces existing curves.

4 RAIL NOISE CRITERIA

The *Environmental Protection Act 1994 (Qld) (EP Act)* aims to protect Queensland's environment while allowing for development that improves the total quality of life. Under the EP Act, Queensland Rail has a "General Environmental Duty" to take all reasonable and practicable measures to prevent or minimise "Environmental Harm", which includes "Environmental Nuisance".

However, under the EP Act notable exclusions from nuisance provisions include:

- Noise from the ordinary use of a busway, light rail or rail transport infrastructure
- Environment nuisance caused by maintaining a public road, State-controlled road, railway or other infrastructure for public transport.

Queensland Rail aims to meet its General Environmental Duty and to progressively minimise noise impacts associated with its activities through the implementation MD-15 Noise Management series of documents.

MD-15-316 Specification – Noise assessment (Environment) establishes Rail Noise Planning Levels (the Planning Levels) to assist in the assessment and management of rail noise.

Queensland Rail's Planning Levels are as follows:

- 65 dB(A) assessed as a 24-hour average equivalent continuous A-weighted sound pressure level (or $L_{Aeq,24\ hours}$)
- 87 dB(A) assessed as a Single Event Maximum Sound Level, defined as the arithmetic average of maximum levels from the highest 15 single events over a given 24-hour period.

Noise modelling or monitoring activities aimed at assessing performance against the Planning Levels, must be undertaken 1 metre from the most exposed façade of an affected building, 0.5 metres below the eave height.

MD-15-317 Procedure – Noise Management (Environment) states that all new infrastructure built by or on behalf of Queensland Rail must be designed to satisfy the Planning Levels. MD-15-317 also states changes to infrastructure will seek to minimise noise exposure at Noise-Sensitive Places. For the purpose of this assessment the Planning Levels have been applied for all Noise-Sensitive Places.

5 EXISTING RAIL NOISE LEVELS

5.1 Noise Monitoring Methodology

Existing rail noise levels were determined through a noise monitoring campaign between Monday 13 June and Tuesday 5 July, 2016.

Monitoring was undertaken at 27 locations, as shown in Figure 5-1 and detailed in Table 5-1.

The purpose of the noise monitoring was to determine rail noise descriptors for calibration of the computer noise model.

Figure 5-1 Noise monitoring locations

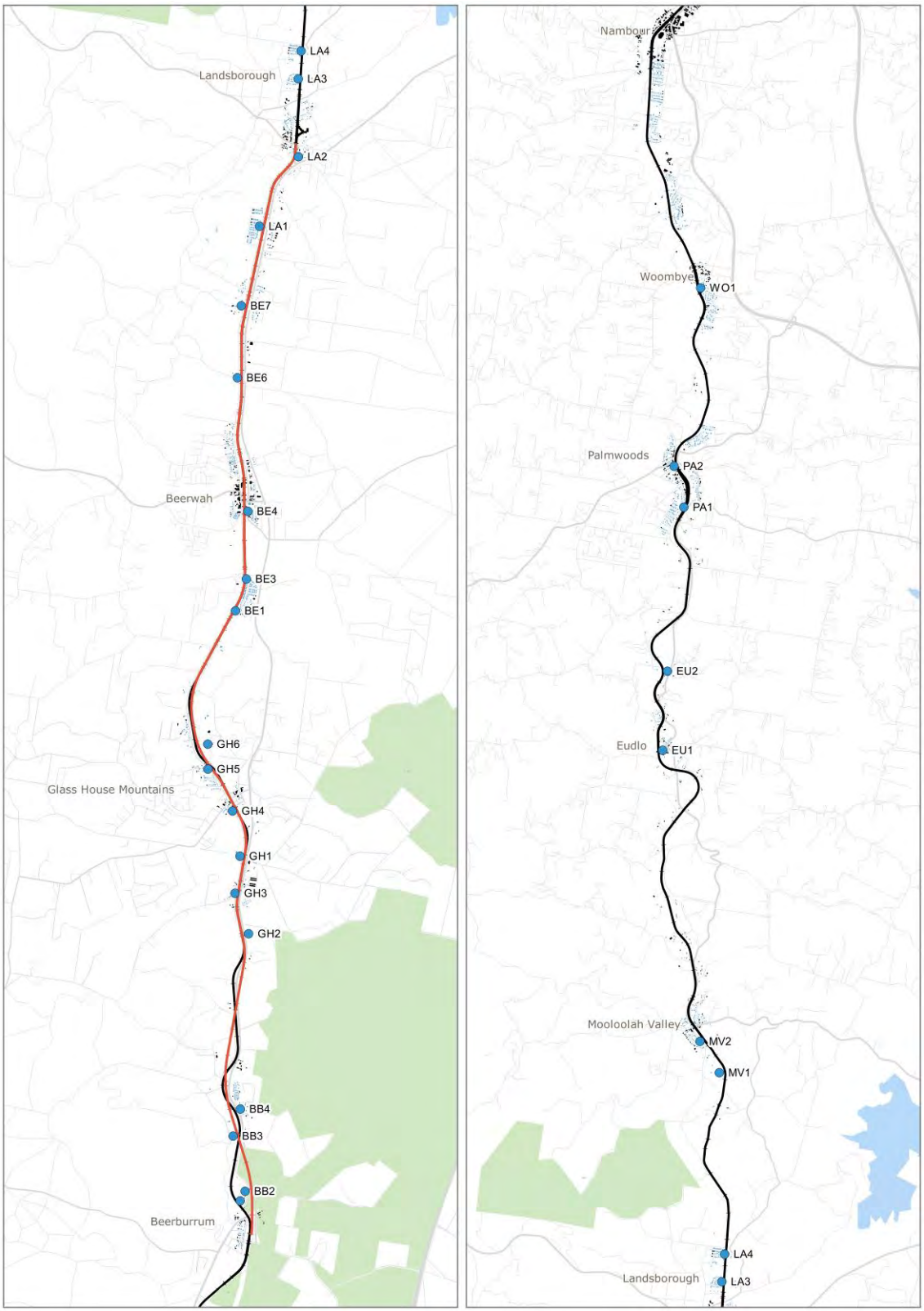


Table 5-1 Noise Monitoring Locations

ID	Suburb	Address	Façade/ Free-field Location	Comments
BB1	Beerburrum	17 Old Coach Road	Free-field	Rail noise prominent
BB2	Beerburrum	37 Old Coach Road	Facade	Distant from existing rail line
BB3	Beerburrum	401 Steve Irwin Way	Facade	Rail noise prominent
BB4	Beerburrum	466 Steve Irwin Way	Facade	Significant road traffic noise
GH1	Glass House Mountains	1A Barrs Road	Facade	Rail noise prominent
GH2	Glass House Mountains	730 Steve Irwin Way	Facade	Significant road traffic noise
GH3	Glass House Mountains	16 Barrs Road	Facade	Rail noise prominent
GH4	Glass House Mountains	6 Burgess Street	Facade	Rail noise prominent
GH5	Glass House Mountains	59 Railway Parade	Free-field	Rail noise prominent
GH6	Glass House Mountains	75 Youngs Road	Free-field	Rail noise prominent
BE1	Beerwah	6 Mahogany Court	Facade	Rail noise prominent
BE3	Beerwah	11 Santa Ana Court	Facade	Shielded by existing 3.5m noise barrier
BE4	Beerwah	Beerwah Parade (Telstra Exchange)	Facade	Rail noise prominent
BE6	Beerwah	2 Clarkes Road	Free-field	Significant road traffic noise
BE7	Beerwah	115 Old Landsborough Road	Facade	Significant road traffic noise
LA1	Landsborough	13 Edwin Drive	Facade	Significant road traffic noise
LA2	Landsborough	20 Beerwah Street	Facade	Rail noise prominent
LA3	Landsborough	26 Vidler Court	Facade	Rail noise prominent
LA4	Landsborough	31 Tiverton Street	Facade	Rail noise prominent
MV1	Mooloolah Valley	61 South Paget Road	Free-field	Rail noise prominent
MV2	Mooloolah Valley	46 Jones Street	Free-field	Rail noise prominent
EU1	Eudlo	Eudlo School	Facade	Rail noise prominent
EU2	Eudlo	585 Eudlo Road	Free-field	Rail noise prominent
PA1	Palmwoods	49 Main Street	Facade	Rail noise prominent
PA2	Palmwoods	Main Street	Facade	Rail noise prominent
WO1	Woombye	4 Keil Street	Free-field	Rail noise prominent

The unattended noise monitoring equipment used for these measurements consisted of ARL NGARA environmental noise loggers set to fast response. This equipment is capable of remotely monitoring and storing both A-weighted and C-weighted noise levels every one-tenth of a second. Additionally, the noise monitors are capable of storing wav files for aural analysis. The equipment calibration was checked before and after the survey and no significant drift was noted.

Post processing of the one-tenth second noise level data permits the derivation of noise descriptors.

Detailed analysis of the unattended monitoring data was undertaken following collection of the equipment. The analysis involved:

a) the automatic identification of possible train events based on the characteristic noise level history of rail events. Wav files corresponding to identified events were also extracted during this stage;

b) aural confirmation of rail events and classification into train types based on the extracted audio files. Those events that were identified as being non-rail were eliminated from further analysis;

c) exclusion of extraneous noise such as train whistles, traffic or birds;

d) calculation of noise parameters relevant to rail operations – being L_{Amax} and L_{AE} – from the one-tenth second sound pressure level history.

The passby Sound Exposure Levels (L_{AE}) describes the amount of sound energy in the event. L_{AE} is used in the calculation of the $L_{Aeq,24hour}$ Planning Level. The maximum passby level (L_{Amax}) describes the maximum noise level for the passby. The Single Event Maximum Sound Level Planning Level is determined from the L_{Amax} of individual passbys.

5.2 Noise Monitoring Results

Table 5-2 presents a summary of the rail noise monitoring results.

Table 5-2 Noise Monitoring Results

ID	Passenger Trains			Tilt & Travel Trains			Freight Trains		
	No.	L_{AE} dB(A)	L_{Amax} dB(A)	No.	L_{AE} dB(A)	L_{Amax} dB(A)	No.	L_{AE} dB(A)	L_{Amax} dB(A)
BB1	209	76.5	66.1	17	83.1	72.6	56	86.6	75.8
BB2	23	82.4	75.2	14	89.7	82	59	87.9	75.8
BB3	122	76.8	67	11	86.4	72.2	40	86.7	72.9
BB4	21	71.1	58.6	19	80.1	66.3	59	79.5	67.7
GH1	275	80.7	71.7	26	90.1	79.5	93	91.2	76.5
GH2	31	76.9	65.9	15	82.5	70.4	60	84.5	70.9
GH3	232	81.4	73.7	20	88.6	78.5	84	90.4	78.7
GH4	187	79.8	71.7	20	85.1	76.9	88	88.4	76.4
GH5	76	73.9	64.3	25	83.7	71.9	85	86.1	73.2
GH6	139	68.6	57.6	24	77.8	64.5	74	81.1	66.5
BE1	289	94.3	88.3	22	97	89.4	90	99.8	87.9
BE3	260	78.8	70.7	29	83.6	74.5	85	85.3	74.8
BE4	101	78.2	68.8	22	88.4	79.8	86	89.3	78.7
BE6	132	80.7	72.8	27	85.1	75.2	61	88.0	76.8
BE7	110	85.2	78.4	8	89.0	81.7	35	89.9	78.2
LA1	36	82.8	75.3	9	89.8	83.0	74	87.6	75.0
LA2	231	85.7	76.9	16	90.3	78.7	76	92.8	79.7
LA3	244	84.9	77.1	18	92.6	81.7	88	91.6	80.5
LA4	236	83.4	77.2	19	88.6	80.2	73	89.9	78.5
MV1	271	74.3	62.3	7	83.4	70.2	77	83.3	68.5
MV2	157	73.4	63.1	27	79.2	67.7	99	83.8	70.1
EU1	235	81.5	72.7	14	86.4	76.1	89	93.3	77.5
EU2	249	79.1	69.9	20	86.1	74.0	87	91.3	78.9
PA1	259	87.7	80.0	20	94.3	87.0	91	94.9	85.6
PA2	198	86.2	77.8	10	91.3	83.2	80	94.3	82.5
WO1	232	84.9	78.1	2	83.4	73.7	119	89.3	79.6

Notes: 1. The presented L_{AE} is the energy-average of all valid events of that train type.
2. The presented L_{Amax} is the median of all valid events of that train type.

6 RAIL NOISE PREDICTIONS

6.1 Duplicated Rail – Beerburrum to Landsborough

Future rail noise with the proposal was calculated for the Beerburrum to Landsborough section of the proposal using a computer noise model.

SoundPLAN Version 7.4 was utilised in the rail noise modelling. Noise levels were predicted using the Nordic Rail Prediction Method (Kilde Report 130), as implemented in SoundPLAN. Kilde has been used in this assessment as it is accepted by Queensland Rail and Queensland Rail standard emission tables correspond with the Kilde methodology.

6.2 Model Inputs and Assumptions

The noise propagation model takes account of attenuation due to geometrical spreading from the noise source, ground effect and shielding from obstructions such as terrain, noise barriers and buildings.

Modelling was done in accordance with Queensland Rail's MD-15 series documents and in particular MD-15-318 Noise Modelling Checklist (Environment).

Noise modelling was undertaken within 200m either side of the existing and proposed rail lines. Noise levels were predicted at 1m from the most exposed façade. Reflections (up to 3rd order reflections) were included in the model.

Terrain data was included in the form of equal height ground contour lines. Buildings were modelled with individual heights from GIS data and with no reflection loss.

Where the proposed alignment earth works were unknown and proposed track elevations differed from the existing ground height, typical conservative cutting and embankment angles were assumed.

Existing track features such as crossings and elevated structures were identified through aerial photography, online imagery and onsite observations. Where elevated structures are proposed to be constructed adjacent existing structures, the same structure type was assumed. Where elevated structures are proposed without a similarly positioned existing structure, a concrete bridge with ballast was assumed. Track corrections for crossings and elevated structures were applied according to MD-15-318.

Curve radii for the each of the existing and proposed rail lines were calculated using a geometric algorithm, stepping along the alignment in 10m segments. Track corrections for curves with radii less than 500m were applied according to MD-15-318.

Existing train speeds were derived from Brisbane Metropolitan System Information Pack Appendix D. Design speeds for the proposal were provided by SMEC.

Forecast train numbers, by type, were provided by SMEC.

Source railway noise levels were derived from Queensland Rail's standard emission table. This provides source values to account for the rail vehicle type, speed and length. Emission from passenger vehicles on the existing and proposed lines were modelled as six-car suburban multiple unit (SMU)/interurban multiple unit (IMU) vehicles on continuous welded rail. Passenger trains were modelled at a source height 0.5m above the rail head.

Freight and tilt/travel trains were separated into locomotive and wagon components and modelled at 3.5m and 0.5m above the rail head respectively.

The $L_{Aeq,24hr}$ is able to be computed by the noise model and is a function of the L_{AE} and number of trains, by type, at each receiver.

The Single Event Maximum Sound Level is defined as the arithmetic average of maximum levels from the highest 15 single events over a given 24-hour period. In practice this is difficult to model, because the computer model does not capture the inherent variation in noise emissions for each passby; instead predicting a single L_{Amax} at each receiver for each train type. Given the number of trains in the forecast, it is reasonable to approximate the Single Event Maximum Sound Level by the loudest calibrated median L_{Amax} across the various train types.

(i.e. The L_{Amax} predictions were calibrated against the median measured L_{Amax} for each train type at each calibration location. The predicted Single Event Maximum Sound Level at each receiver was then assumed to be equal to the loudest of the predicted L_{Amax} from the three train types at that receiver.)

A summary of the rail noise model inputs is presented in Table 6-1.

Table 6-1 Summary of Rail Noise Model Inputs

Input	Detail	Source
Prediction method	Nordic Rail Prediction Method (Kilde Report 130) in SoundPLAN Version 7.4	
Reflections	3rd order reflections considering all buildings and barriers	
Train emission levels	Type-specific emissions coefficients	Queensland Rail standard emission tables with adjustment based on calibration of each train type individually
Train speed	Various	Brisbane Metropolitan System Information Pack (Existing)
		SMEC (Proposed)
Train volumes	Proposed = 84 passenger, 8 tilt/travel trains, 34 freight	SMEC
Source heights	Wagons = 0.5m above rail head	MD-15-318
	Locomotives = 3.5m above rail head	
Receivers	Located 1m from the most exposed facade	MD-15-318
	2.5m above ground height	Approximates 0.5m below 3m eaves
Track corrections	Level crossings = + 5 dB(A)	MD-15-318
	Concrete bridge with parapets = + 1 dB(A)	
	Concrete bridge without parapets = + 3.5dB(A)	
	Steel bridges with concrete = + 4 dB(A)	
	Steel bridges with box or lattice girder = + 9 dB(A)	
	Curve with radii less than 300 metres = + 8 dB(A)	
	Curve with radii 300 to 500 metres = + 3 dB(A)	
Terrain	250mm interval within 15m of the rail line	SMEC
	500mm interval between 15m and 200m of the rail line	
Buildings	Façade reflections with no loss	Digitised from aerial photography and online imagery within 200m of the rail line
	4m high unless identified as multiple storey	
Predicted metrics	$L_{Aeq,24hr}$ = total of all forecast trains	Planning Levels
	Single Event Maximum Sound Level approximated by the median (calibrated) L_{Amax} of the loudest train type	

6.3 Model Calibration

A SoundPLAN model of the existing rail line between Beerburrum and Landsborough was used to calibrate each train type separately.

The Sound Exposure Level (L_{AE}) for each train type was calculated at each of the calibration locations. For tilt/travel trains and freight trains, the L_{AE} was computed by summing the wagon and locomotive components. The predicted L_{AE} was compared against the energy average measured L_{AE} for each train type at each calibration location.

The maximum noise level (L_{Amax}) for each train type was computed at each calibration location. The L_{Amax} for tilt/travel trains and freight trains was assumed to be the maximum of either the locomotive or wagon components, which were modelled as separate rail strings in the mode. Aural analysis and examination of noise level traces from the monitoring data confirmed the validity of this assumption for the majority of passbys (i.e. the maximum noise level for most passbys clearly resulted from either the locomotive or the wagon, as distinct from the sum of the two components). The predicted L_{Amax} was compared against the median measured L_{Amax} for each train type at each calibration location.

The calibration method, which compares rail noise descriptors for a single passby of each train type, is independent of the number of trains. Therefore, it is largely insensitive to variations in the number of rail events that were analysed at each location (as distinct, for example, from an overall L_{Aeq} based on an assumed number of trains).

Noise monitoring data was collected at 19 locations along the Beerburrum to Landsborough rail alignment. A full description of baseline monitoring is included in Table 5-1. Not all monitoring positions have been used to calibrate the model as some locations were affected by existing extraneous noise sources, such as road traffic noise, which made identification of sufficient rail events impossible. This was most common with passenger trains due to their relatively low noise emissions.

Summaries of the L_{AE} and L_{Amax} calibrations are presented in Table 6-2 and Table 6-3 respectively.

The majority of locations calibrated well for both L_{AE} and L_{Amax}.

The following are suggested as likely causes for significant discrepancies at particular locations.

- BE3 – The noise model grossly over-predicted both L_{Aeq} and L_{Amax} for each train type at this location. The monitoring location was behind a 3.5m barrier, between the barrier and the house. Calibration included this barrier. The predicted levels are extremely sensitive to the modelled height of the noise source for locomotives (also at 3.5m). Reflections between the house and the barrier in the model also inflate the predicted noise level.

- BE4 – The noise model marginally over-predicted both L_{Aeq} and L_{Amax} for passenger trains at this location. Modelled train speeds appear to be overestimated for passenger trains, likely due to the close proximity to Beerwah station.

- LA2 – The noise model marginally over-predicted both L_{Aeq} and L_{Amax} for passenger trains at this location. Modelled train speeds appear to be overestimated for all train types, likely due to the close proximity to Landsborough station.

Table 6-2 Noise Model Calibration - L_{AE} dB(A)

ID	Passenger Trains			Tilt & Travel Trains			Freight Trains		
	Measured	Modelled	Difference	Measured	Modelled	Difference	Measured	Modelled	Difference
BB1	76.5	77.6	1.1	83.1	83.1	0.0	86.6	85.5	-1.1
BB3	76.8	78.5	1.7	86.4	82.0	-4.4	86.7	86.5	-0.2
BB4				80.7	81.8	1.7	79.5	86.0	6.5
GH1	80.7	81.7	1.0	90.1	85.4	-4.7	91.2	89.7	-1.5
GH3	81.4	82.5	1.1	88.6	86.0	-2.6	90.4	90.4	0.0
GH4	79.8	80.0	0.2	85.1	84.5	-0.6	88.4	87.6	-0.8
GH5				83.7	84.4	0.7	86.1	88.6	2.5
GH6	68.6	73.0	4.4	77.8	78.1	0.3	81.1	81.0	-0.1
BE1	94.3	89.5	-4.8	97.0	95.2	-1.8	99.8	97.4	-2.4
BE3	78.8	81.6	2.8	83.6	89.8	6.2	85.3	90.7	5.4
BE4	78.2	81.9	3.7	88.4	88.7	0.3	89.3	90.3	1.0
BE6	80.7	82.5	1.8	85.1	88.4	3.3	88.0	90.5	2.5
BE7	85.2	83.8	-1.4	89.0	88.6	-0.4	89.9	91.0	1.1
LA1	82.8	85.1	2.3	89.8	90.8	1.0	87.6	93.1	5.5
LA2	85.7	81.1	-4.6	90.3	86.1	-4.2	92.8	88.8	-4.0
LA3	84.9	83.1	-1.8	92.6	86.6	-6.0	91.6	91.1	-0.5
LA4	83.4	83.9	0.5	88.6	90.2	1.6	89.9	93.1	3.2
		Mean	0.5		Mean	-0.6		Mean	1.0
		Median	1.1		Median	0.0		Median	0.0

Table 6-3 Noise Model Calibration - L_{Amax} dB(A)

ID	Passenger Trains			Tilt & Travel Trains			Freight Trains		
	Measured	Modelled	Difference	Measured	Modelled	Difference	Measured	Modelled	Difference
BB1	66.1	67.6	1.5	72.6	74.1	1.5	75.8	73.7	-2.1
BB3	67.0	68.8	1.8	72.2	72.1	-0.1	72.9	72.5	-0.4
BB4				66.3	69.1	2.8	67.7	70.6	2.9
GH1	71.7	73.1	1.4	79.5	76.5	-3.0	76.5	75.8	-0.7
GH3	73.7	74.6	0.9	78.5	78.1	-0.4	78.7	78.0	-0.7
GH4	71.7	71.8	0.1	76.9	78.4	1.5	76.4	73.5	-2.9
GH5				71.9	74.5	2.6	73.2	75.5	2.3
GH6	57.6	58.8	1.2	64.5	64.7	0.2	66.5	63.5	-3.0
BE1	88.3	83.5	-4.8	89.4	90.1	0.7	87.9	86.2	-1.7
BE3	70.7	73.2	2.5	74.5	79.6	5.1	74.8	83.0	8.2
BE4	68.8	73.2	4.4	79.8	79.5	-0.3	78.7	76.4	-2.3
BE6	72.8	74.4	1.6	75.2	80.8	5.6	76.8	77.4	0.6
BE7	78.4	75.6	-2.8	81.7	80.5	-1.2	78.2	78.3	0.1
LA1	75.3	77.3	2.0	83.0	83.6	0.6	75.0	80.2	5.2
LA2	76.9	71.1	-5.8	78.7	77.6	-1.1	79.7	73.8	-5.9
LA3	77.1	75.1	-2.0	81.7	78.8	-2.9	80.5	81.8	1.3
LA4	77.2	77.0	-0.2	80.2	80.5	0.3	78.5	80.7	2.2
		Mean	0.1		Mean	0.7		Mean	0.2
		Median	1.2		Median	0.3		Median	-0.4

6.4 Beerburrum to Landsborough Rail Noise Predictions

$L_{Aeq,24hr}$ and Single Event Maximum Sound Level rail noise levels were predicted at each of the identified noise-sensitive receiver locations, without any new noise mitigation measures.

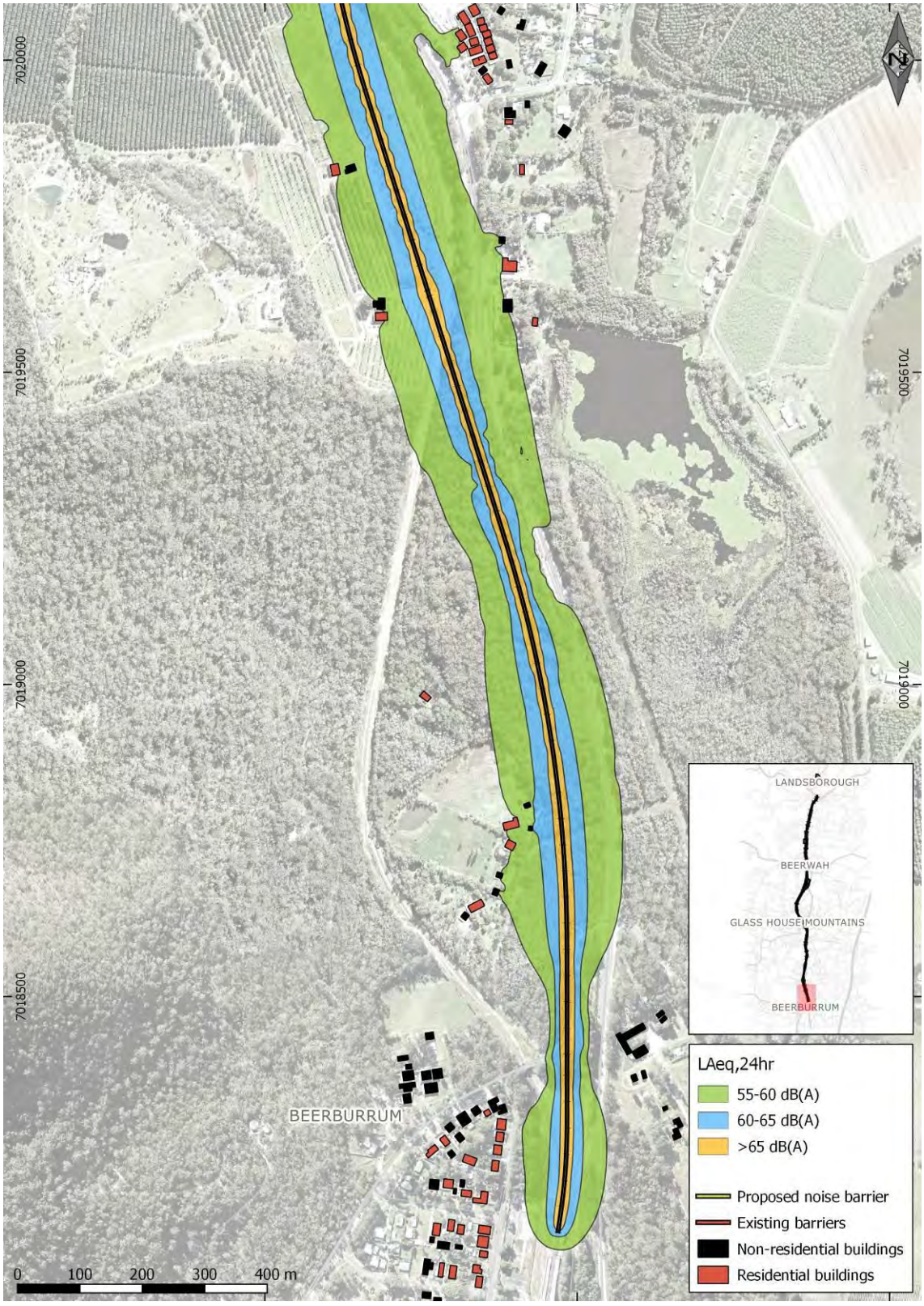
$L_{Aeq,24hr}$ noise levels are predicted to be within the Planning Level of 65 dB(A) at all noise-sensitive receivers.

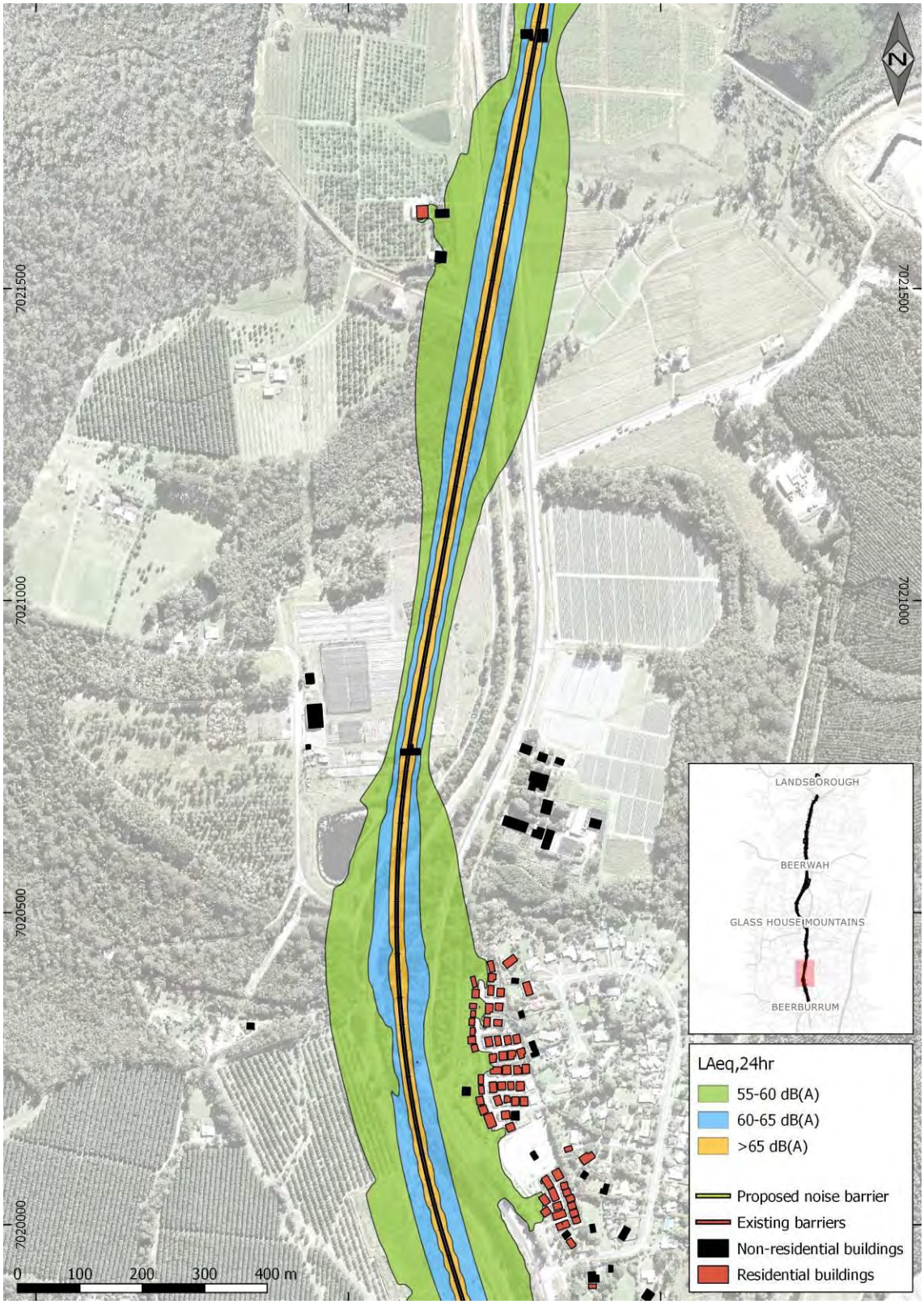
The Single Event Maximum Sound Level Planning Level of 87 dB(A) is predicted to be exceeded at four noise-sensitive receivers. These are all located in Coochin Hills Drive, Beerwah. The four residences are immediately south of a residential subdivision which has an existing 3.5m noise barrier. In order to mitigate maximum noise levels at these residences, a 120m noise barrier is proposed immediately south of the existing barrier. The noise barrier would be 3.5m, in order to attenuate locomotive noise. With the proposed noise barrier, Single Event Maximum Sound Level are predicted to comply with the Planning Level.

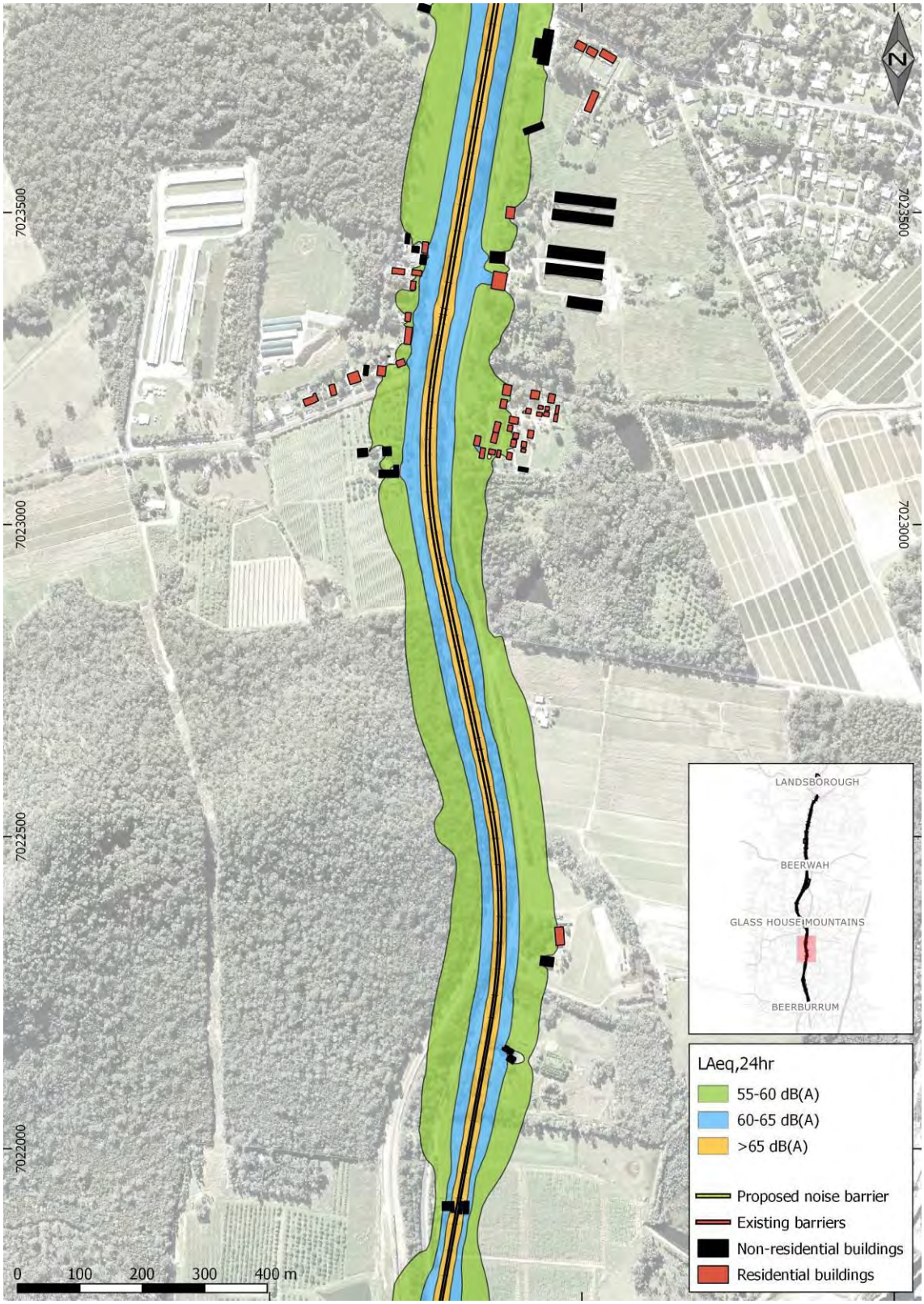
Predicted $L_{Aeq,24hr}$ rail noise levels, with the proposed noise barrier, are presented in Figure 6-1.

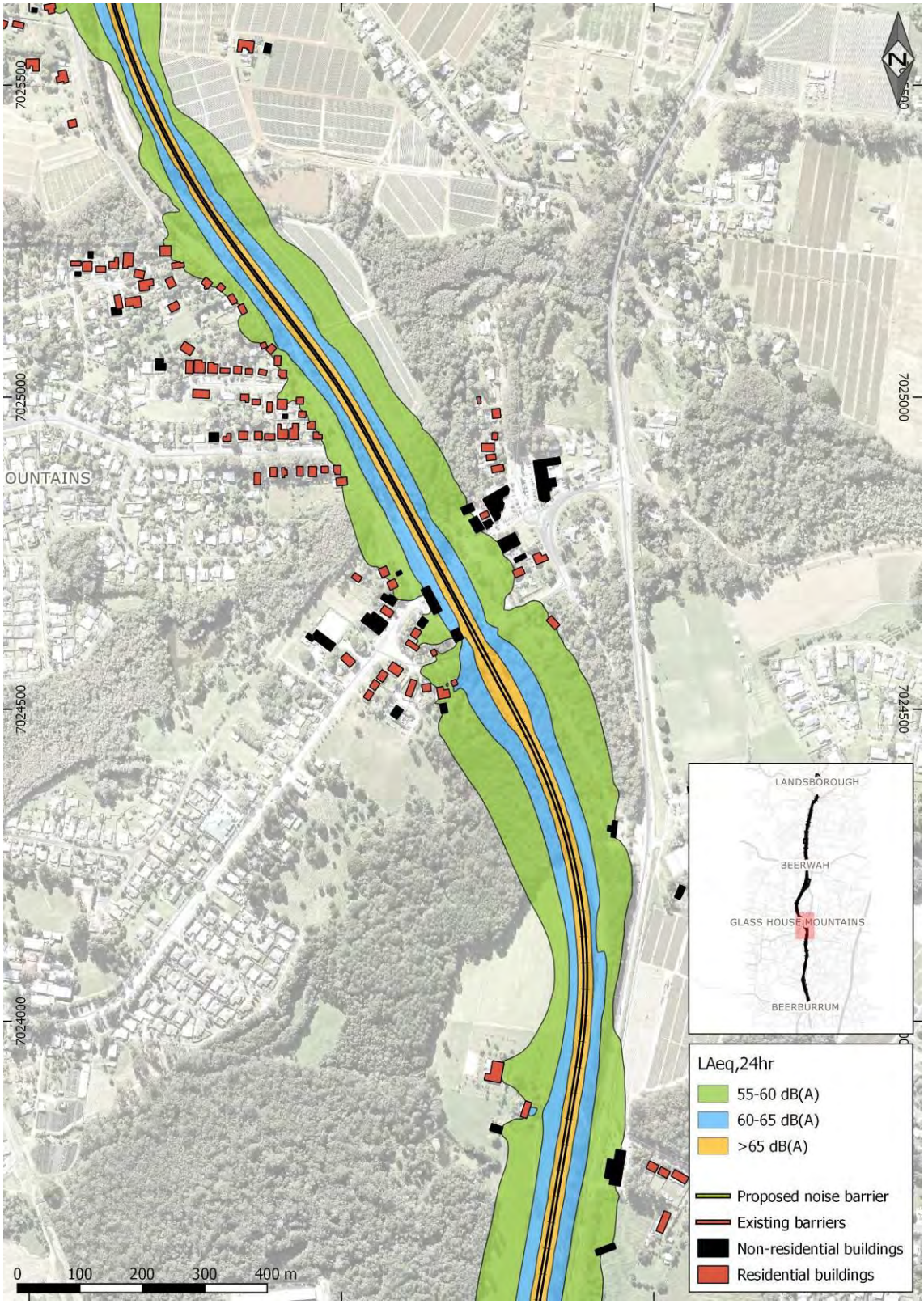
Predicted Single Event Maximum Sound Levels, with the proposed noise barrier, are presented in Figure 6-2.

Figure 6-1 Predicted $L_{Aeq,24hr}$ Rail Noise Levels




N
7021500
7021000
7020500
7020000
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAeq,24hr
55-60 dB(A)
60-65 dB(A)
>65 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings
0
100
200
300
400 m


N
7023500
7023000
7022500
7022000
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAeq,24hr
55-60 dB(A)
60-65 dB(A)
>65 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings
0 100 200 300 400 m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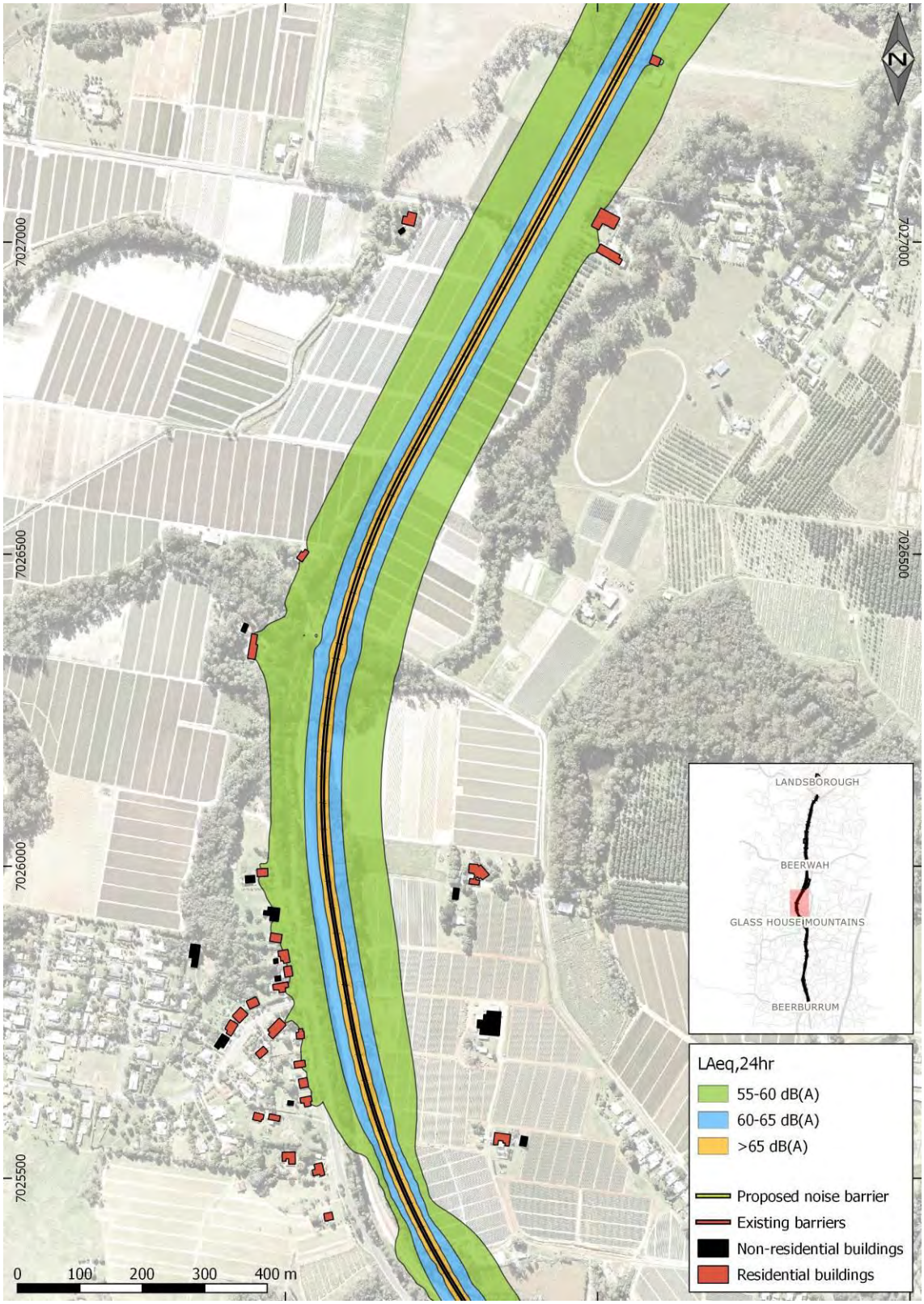
7025000
7024500
7024000
OUNTAINS
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAeq,24hr
55-60 dB(A)
60-65 dB(A)
>65 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings
0
100
200
300
400 m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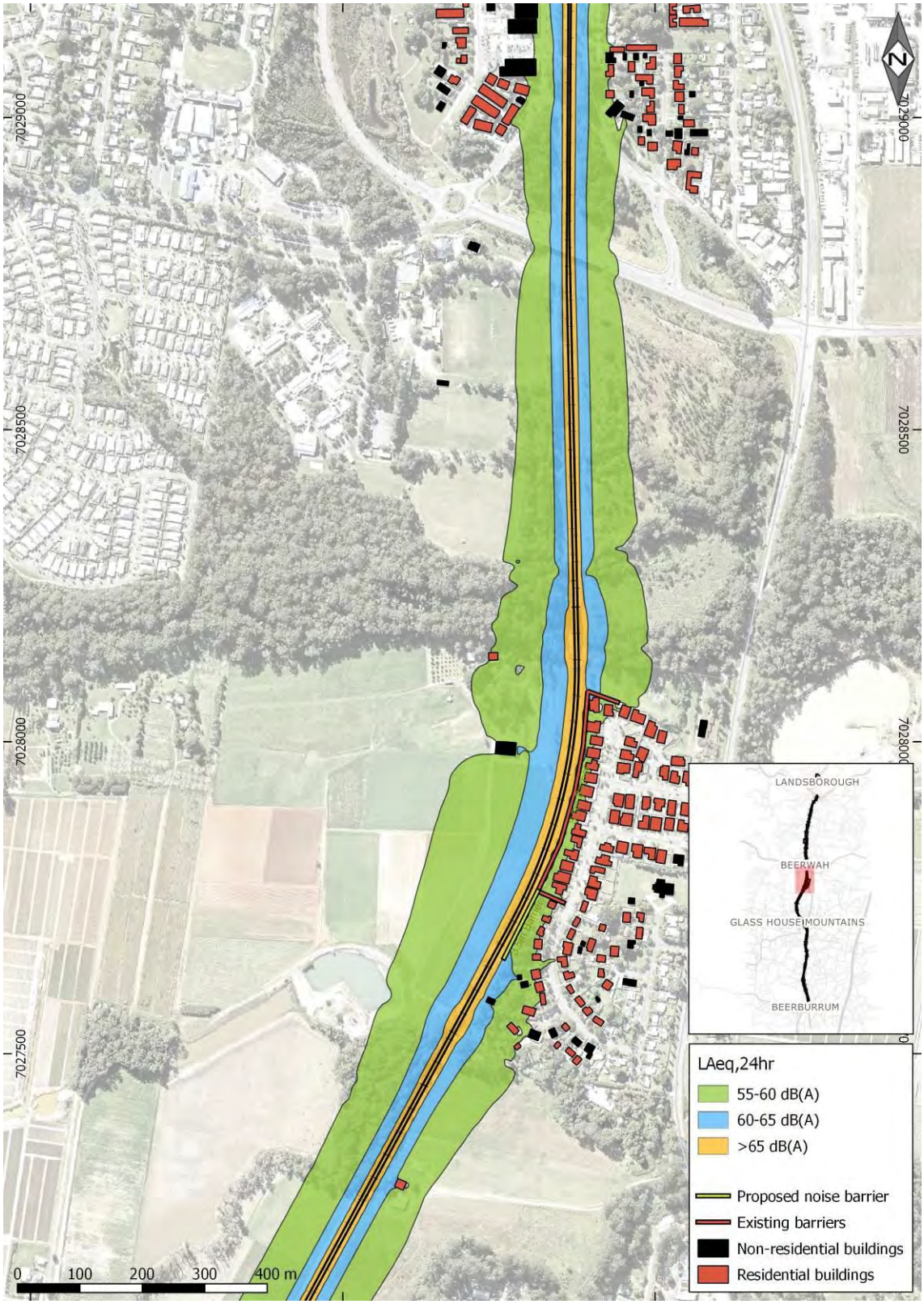
7026500
7026000
7025500
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAeq,24hr
55-60 dB(A)
60-65 dB(A)
>65 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings
0
100
200
300
400 m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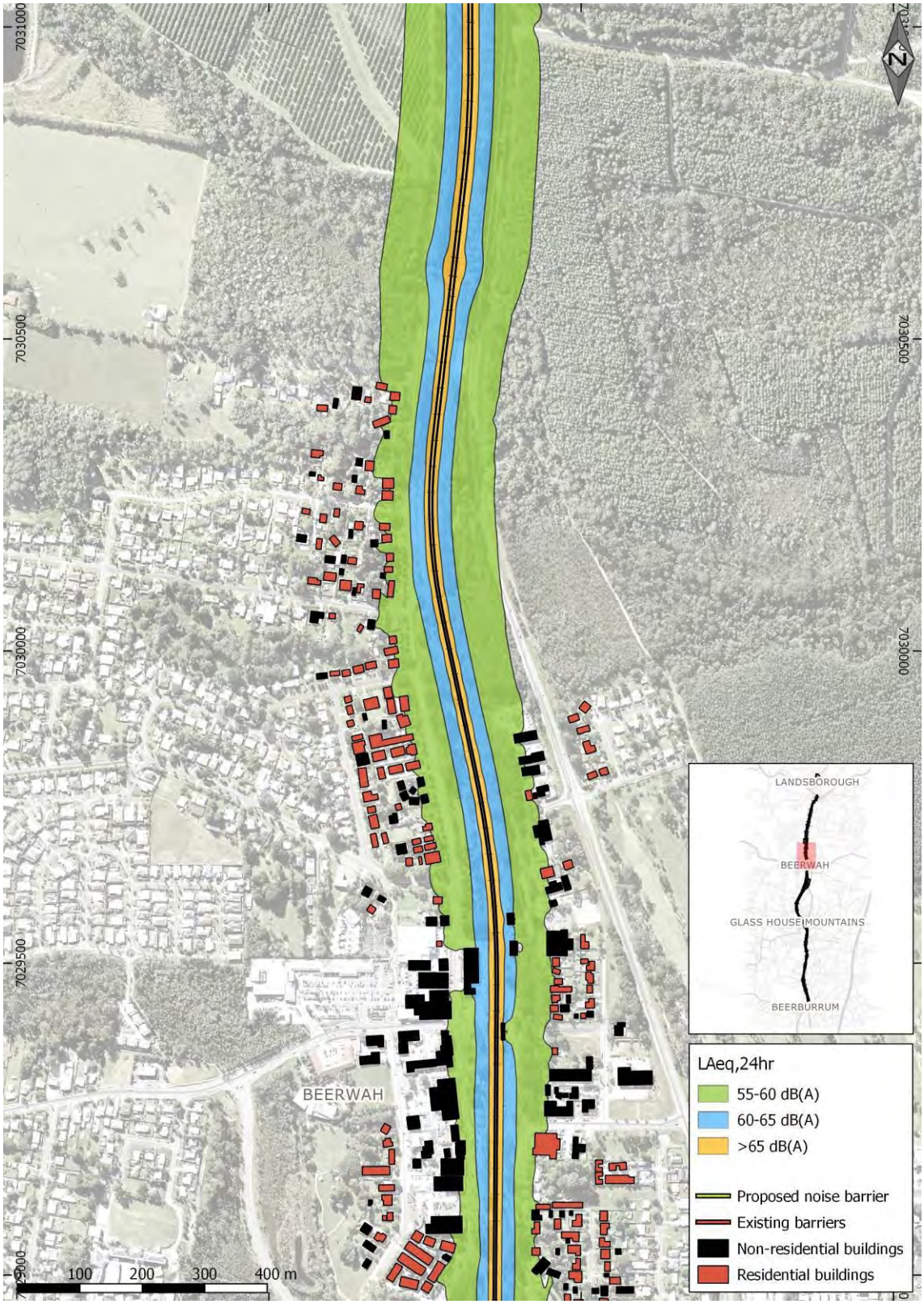
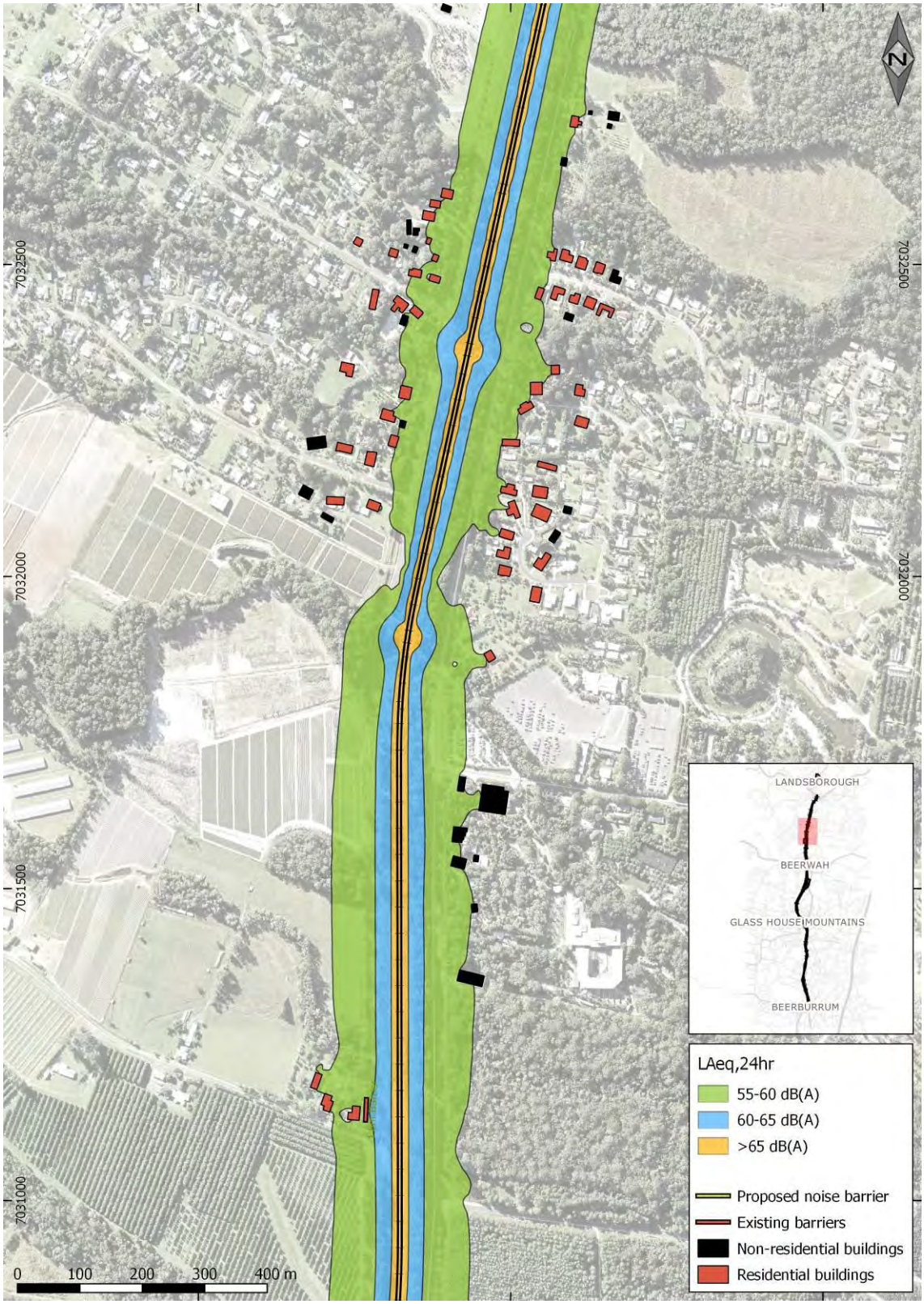
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAeq,24hr
55-60 dB(A)
60-65 dB(A)
>65 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings
0
100
200
300
400 m


7031000
7030500
7030000
7029500
7029000
N
BEERWAH
100
200
300
400 m
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAeq,24hr
55-60 dB(A)
60-65 dB(A)
>65 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings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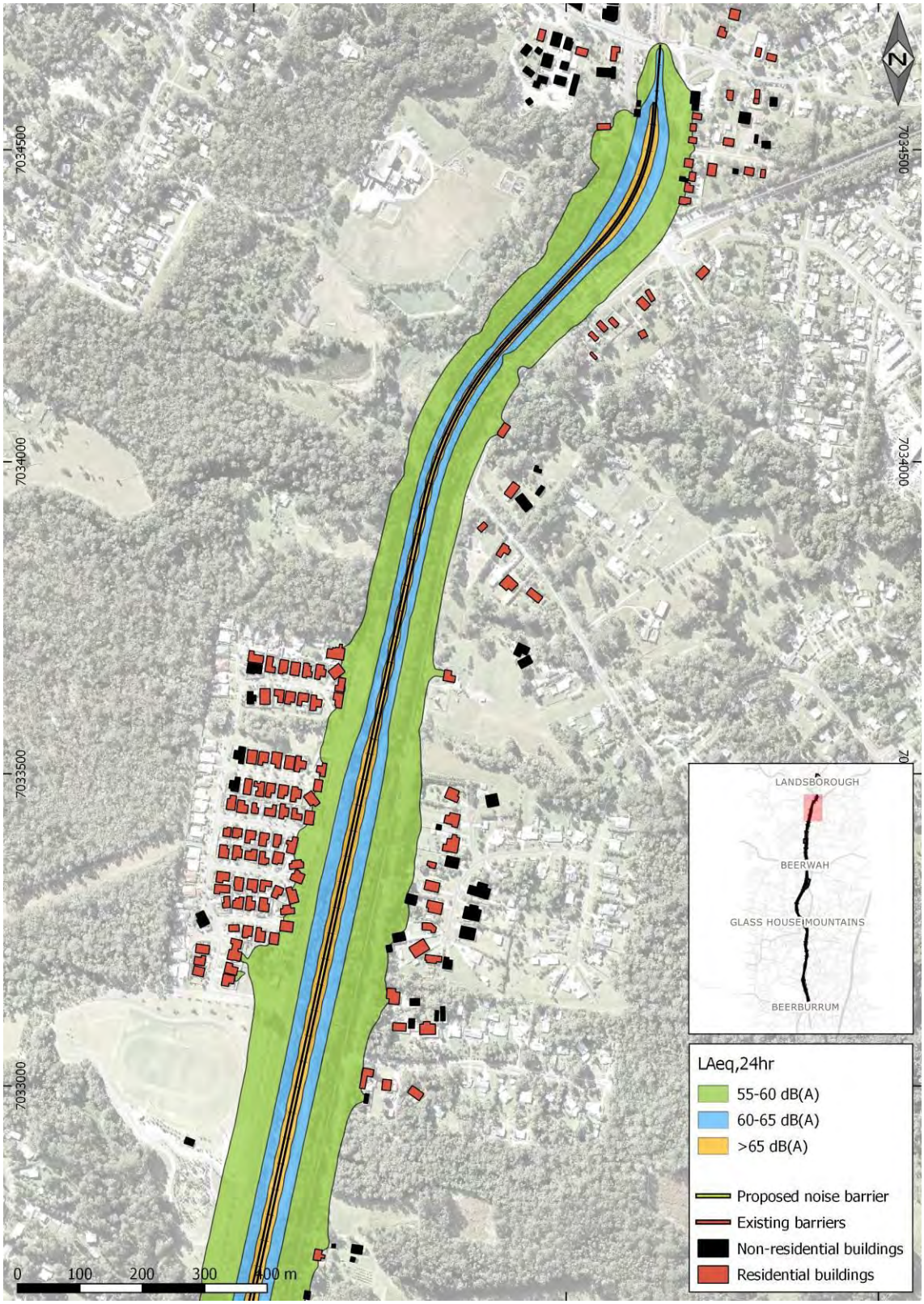
7032000
7031500
7031000
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAeq,24hr
55-60 dB(A)
60-65 dB(A)
>65 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings
0
100
200
300
400 m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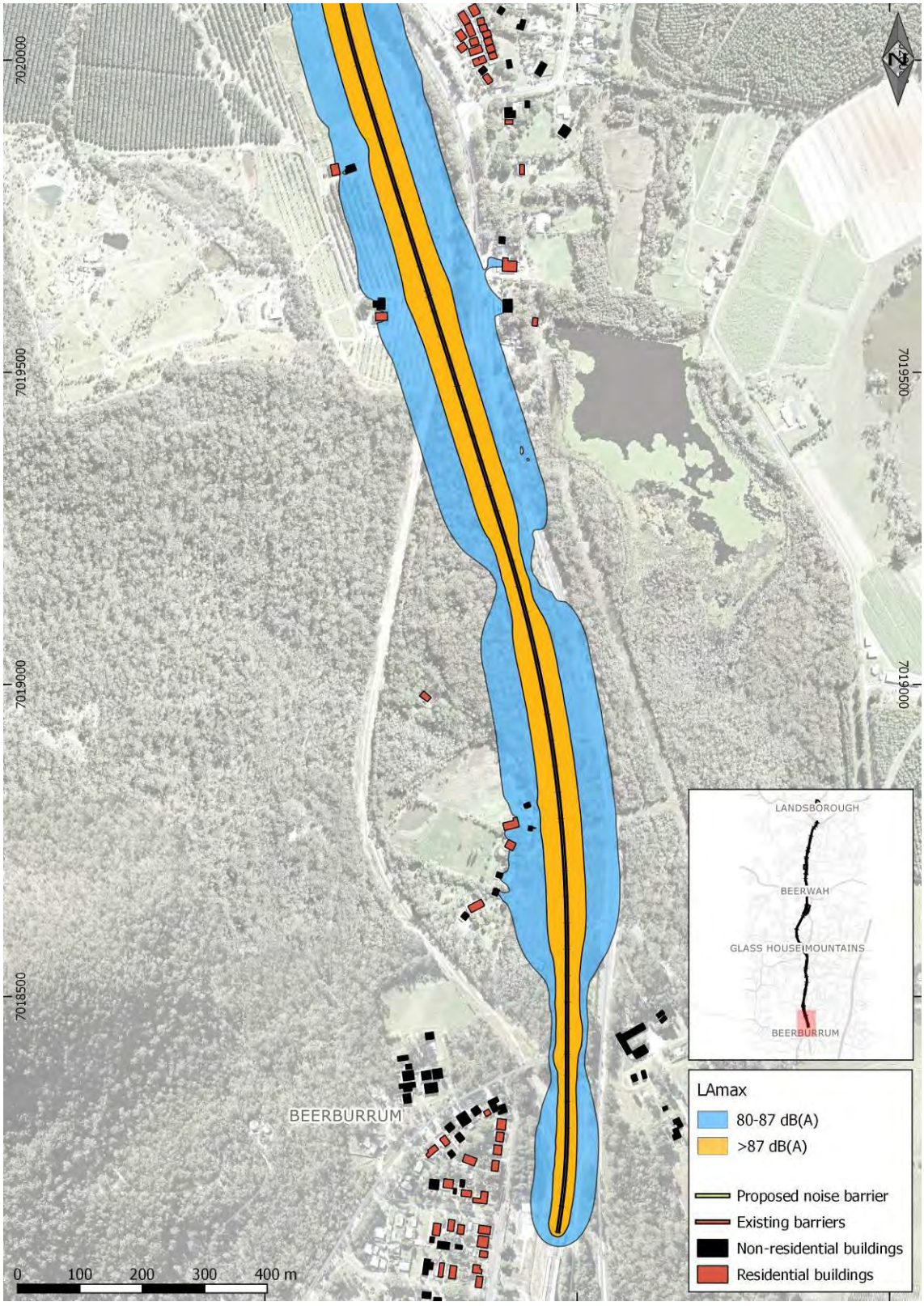
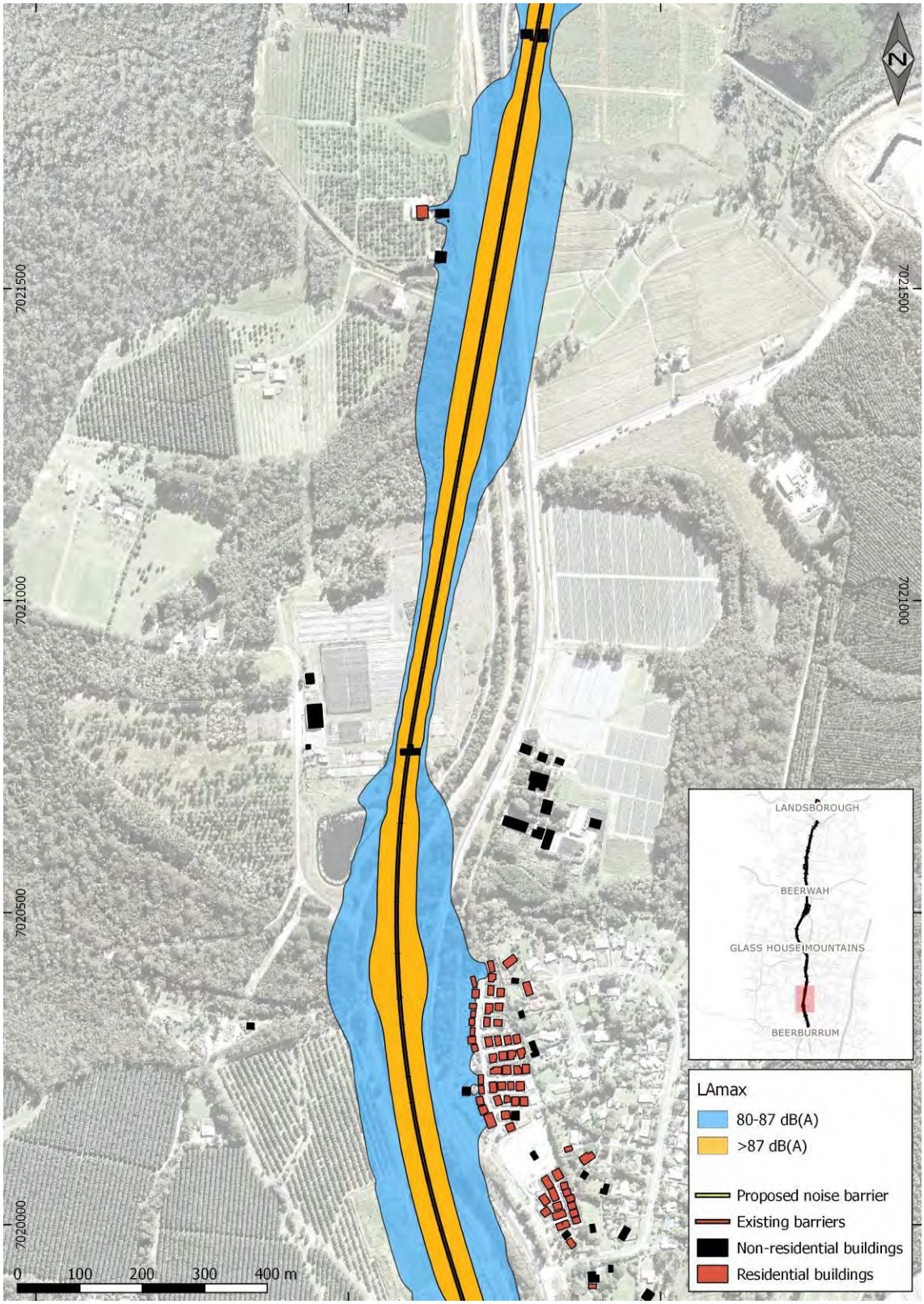
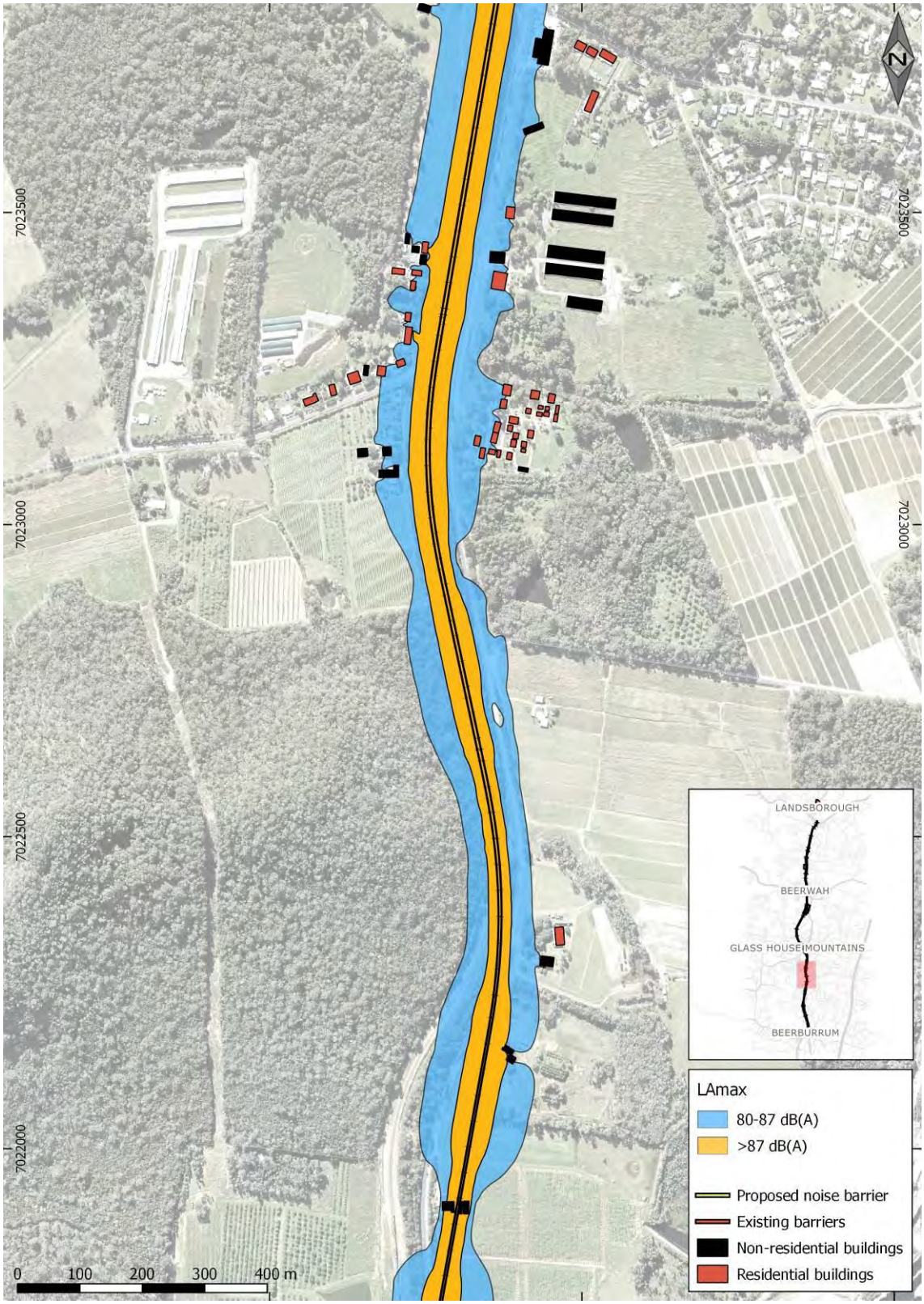
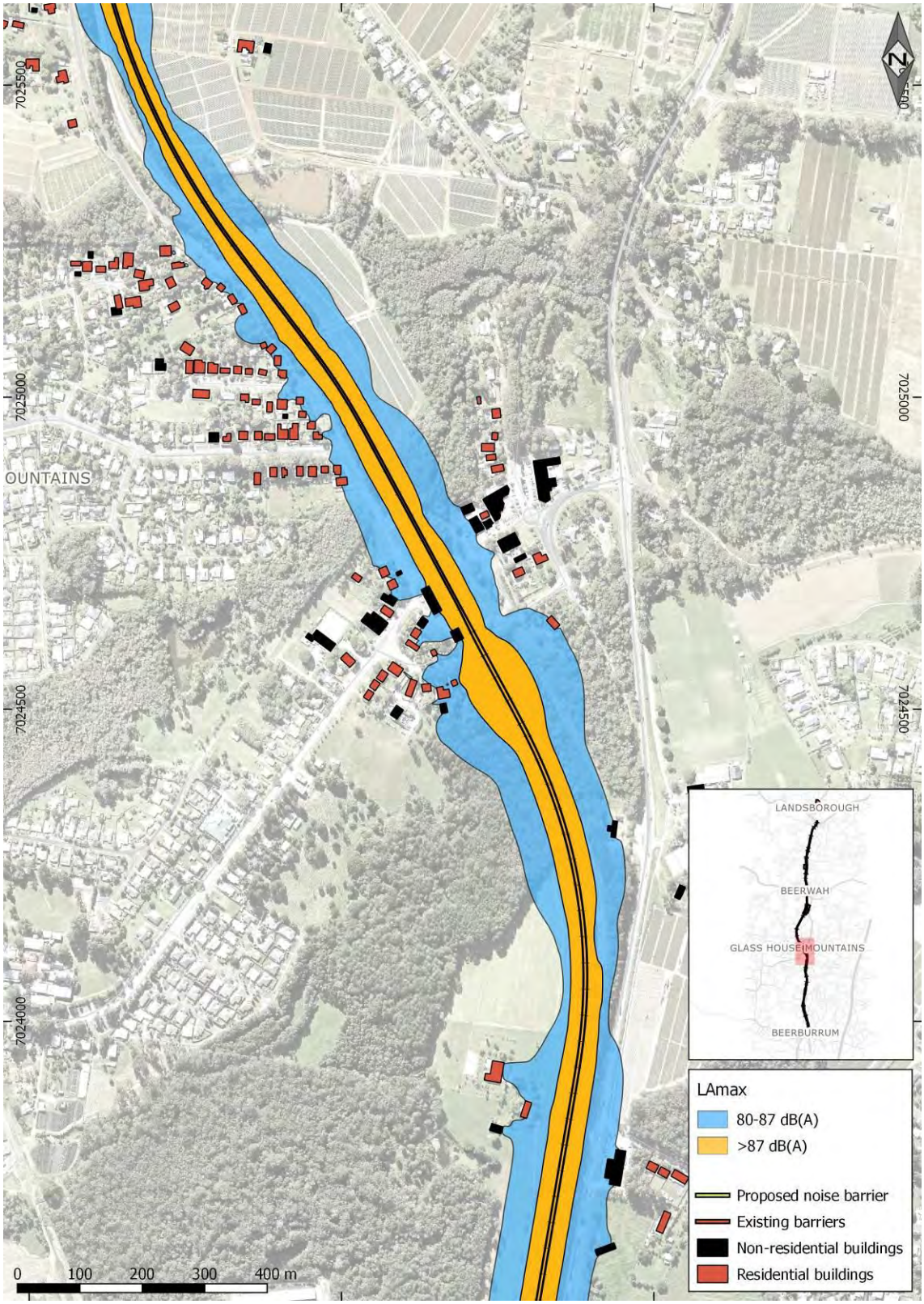
7033000
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAeq,24hr
55-60 dB(A)
60-65 dB(A)
>65 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings
0
100
200
300
400 m

Figure 6-2 Predicted Single Event Maximum Sound Levels




N
7021500
7021000
7020500
7020000
0
100
200
300
400 m
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAmax
80-87 dB(A)
>87 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings


N
7023500
7023000
7022500
7022000
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAmax
80-87 dB(A)
>87 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings
0
100
200
300
400 m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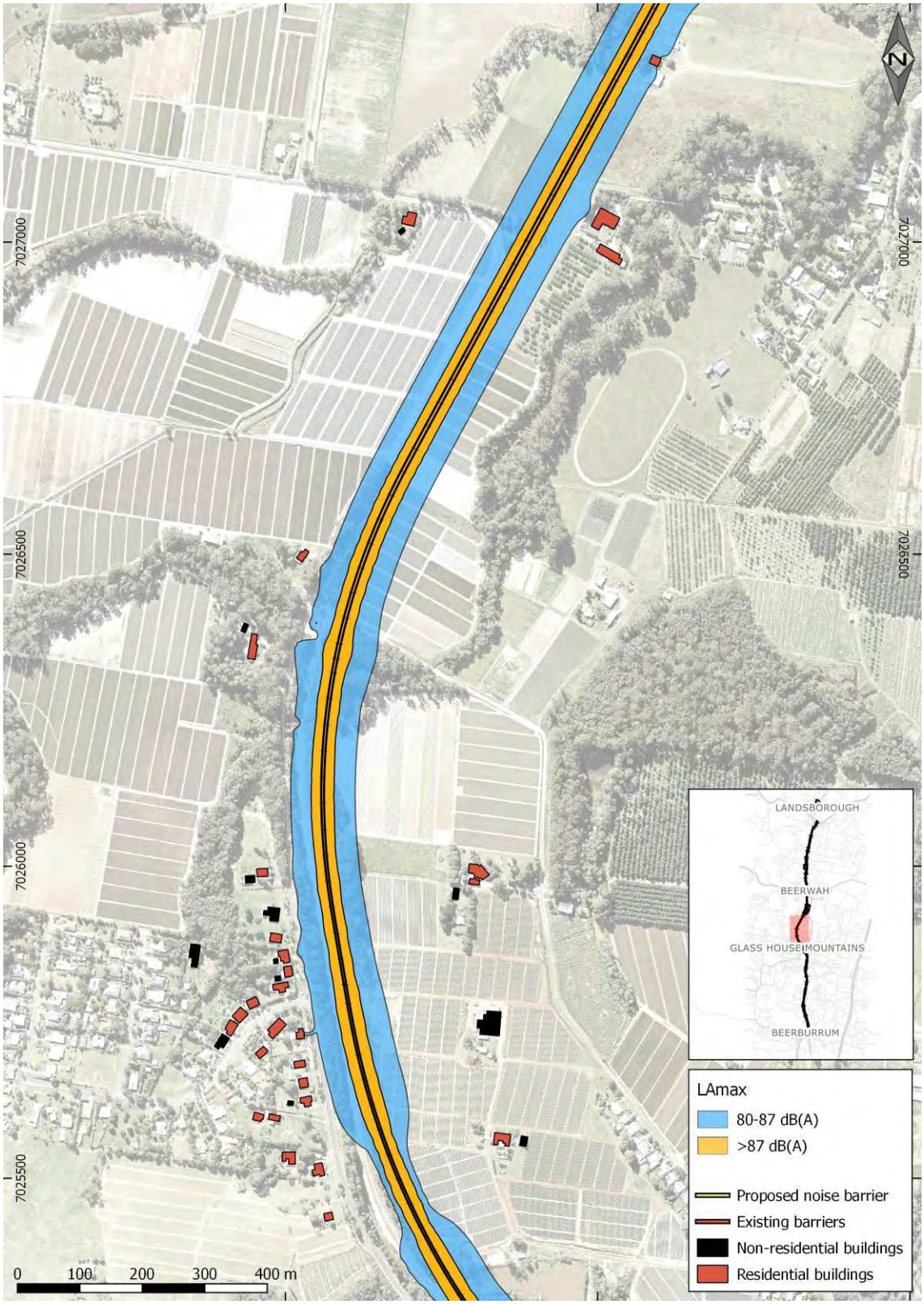
7024500
7024000
OUNTAINS
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAmax
80-87 dB(A)
>87 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings
0
100
200
300
400 m


N
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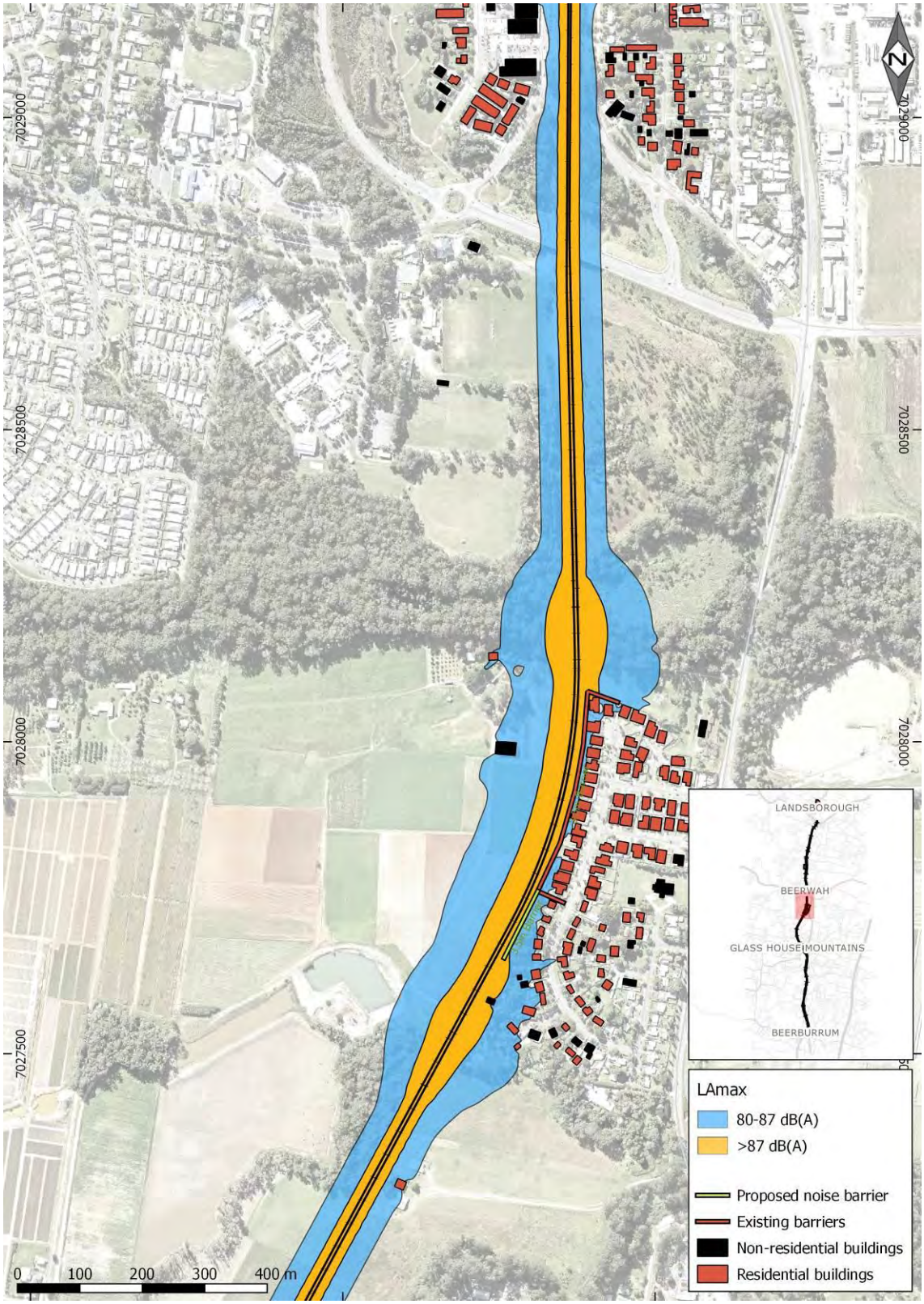
7026500
7026000
7025500
0
100
200
300
400 m
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAmax
80-87 dB(A)
>87 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings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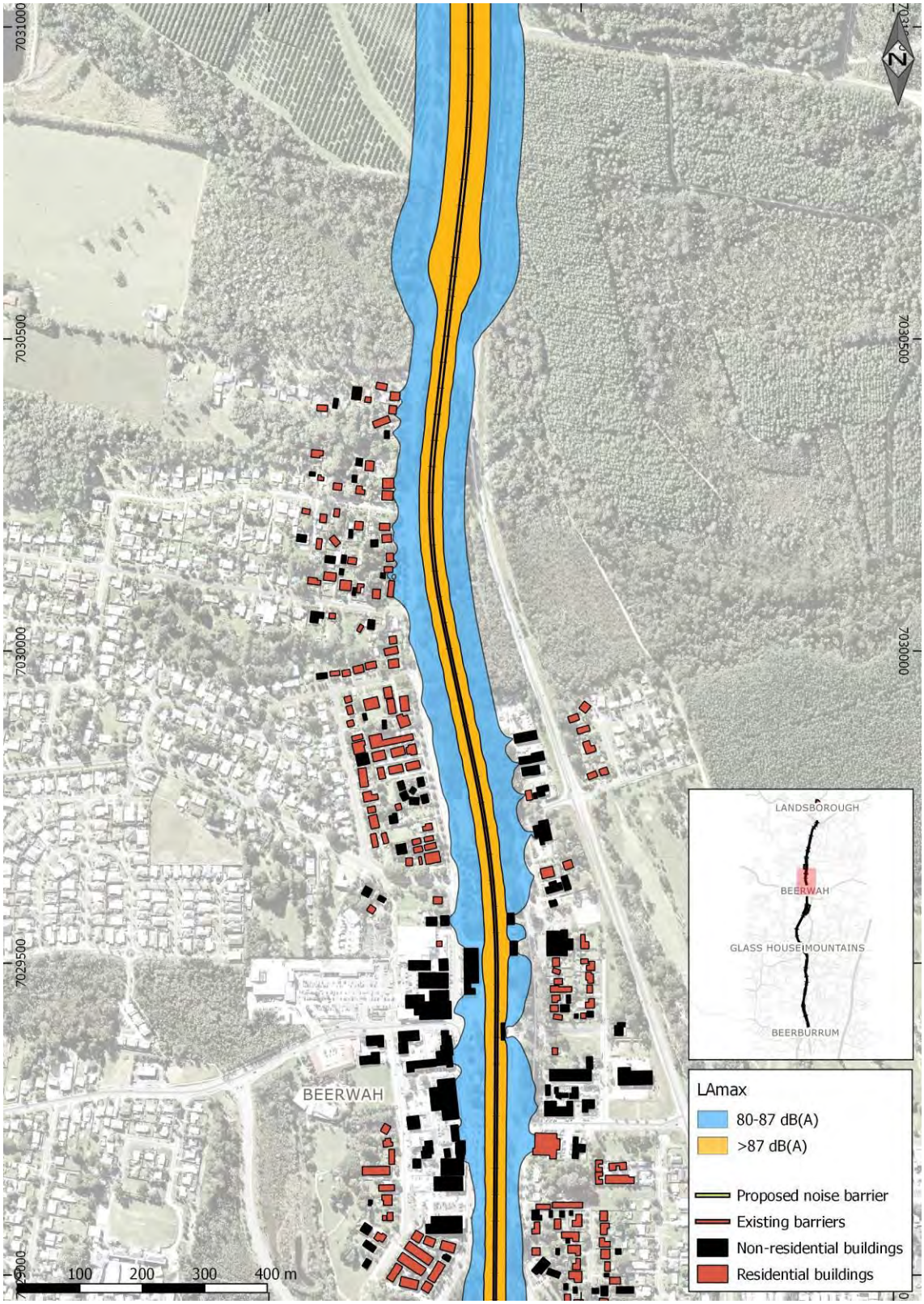
7028500
7028000
7027500
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAmax
80-87 dB(A)
>87 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings
0
100
200
300
400 m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7030000
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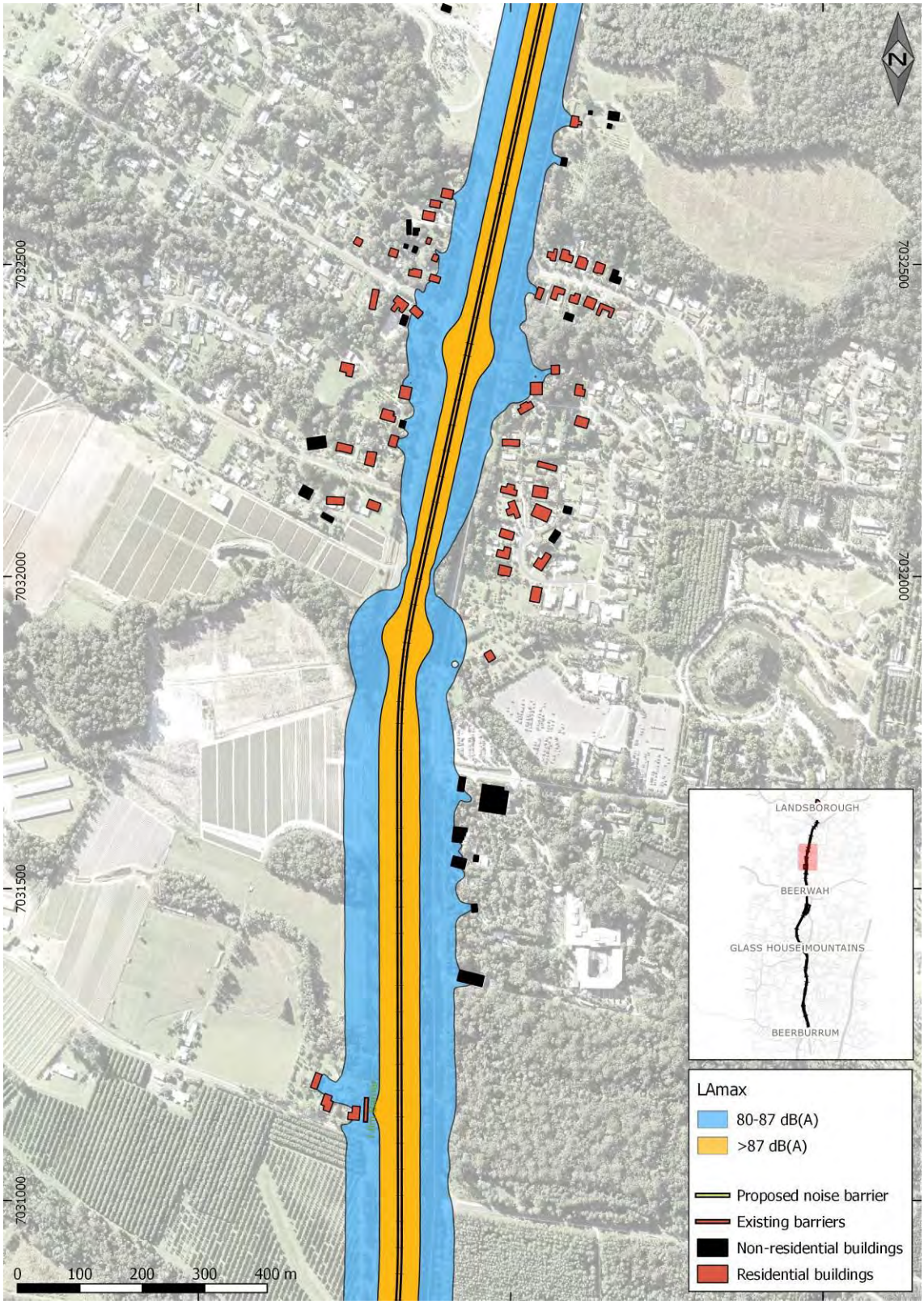
N
BEERWAH
100
200
300
400 m
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAmax
80-87 dB(A)
>87 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings


N
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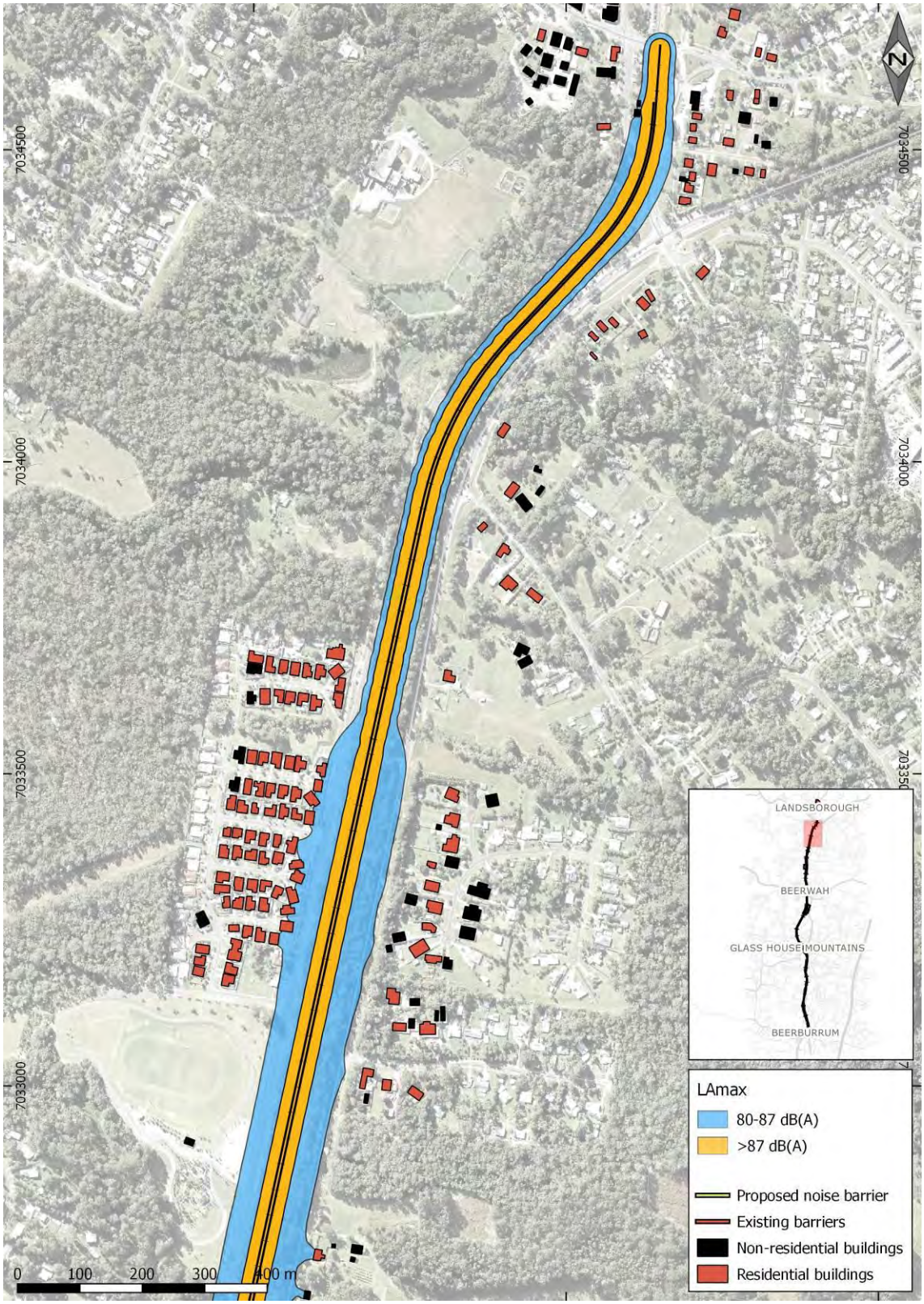
7032000
7031500
7031000
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAmax
80-87 dB(A)
>87 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings
0
100
200
300
400 m


N
7034500
7034000
7033500
7033000
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
LAmax
80-87 dB(A)
>87 dB(A)
Proposed noise barrier
Existing barriers
Non-residential buildings
Residential buildings
0
100
200
300
400 m

7.1 Landsborough to Nambour – Discrete Upgrade Sites

The proposed works in the Landsborough to Nambour section would be limited to:

- extension of the Landsborough passing loop;
- Caloundra Street level crossing removal;
- duplication of the platforms and upgrade of the stations between Landsborough and Nambour; and
- extension of the Mooloolah passing loop.

These proposed upgrades would have minimal impact on noise emissions. Rather than modelling each of the discrete work areas, conclusions can be drawn from the monitoring data.

The monitoring locations in this section of the proposal represent the potentially most impacted noise-sensitive receiver locations.

As there is no significant change to the alignment of the rail line proposed, the predicted $L_{Aeq,24hr}$ can be calculated by applying the traffic volumes to the measured noise levels at these locations (for individual train types). Single Event Maximum Noise Levels can be determined directly from the measurements.

A summary of the predicted rail noise levels at each of the measurement locations in the Landsborough to Nambour section is presented in Table 7-1.

Table 7-1 Summary of Predicted Rail Noise Levels – Landsborough to Nambour

ID	Predicted $L_{Aeq,24hr}$ dB(A)	Predicted $L_{Aeq,24hr}$ dB(A)
MV1	53.7	72.7
MV2	53.4	72.6
EU1	60.1	77.5
EU2	60.6	81.4
PA1	63.1	86.9
PA2	62.0	83.2
WO1	60.7	82.1

The predicted rail noise levels are within the Planning Levels at all locations. It is therefore reasonable to conclude that rail noise emissions at other noise-sensitive receivers in these areas would also be within the Planning Levels.

7.2 Landsborough to Nambour – Between Discrete Upgrade Sites

Based on the outcomes of the rail noise assessment in the preceding sections, it is considered unlikely that rail noise levels would be significantly increased in the remaining areas between Landsborough and Nambour.

There is a moderate risk that the Single Event Maximum Sound Level Planning Level could be currently exceeded at the closest receivers, however the proposal would not be expected to impact these levels.

It is unlikely that the $L_{Aeq,24hr}$ Planning Level would be exceeded at any noise-sensitive receivers.

Based on the above discussion, it is considered unnecessary to consider rail noise emissions in these areas further in the context of the current study, noting that the stated aim of the study is to determine the need for noise mitigation measures.

8 CONCLUSION

Wilkinson Murray has undertaken an assessment of rail noise associated with the proposed Beerburrum to Nambour Rail Upgrade Project. The purpose of the study was to identify locations along the 39km long (B2N) section of the North Coast Line requiring noise mitigation so that these may be included in the Business Case Reference Design.

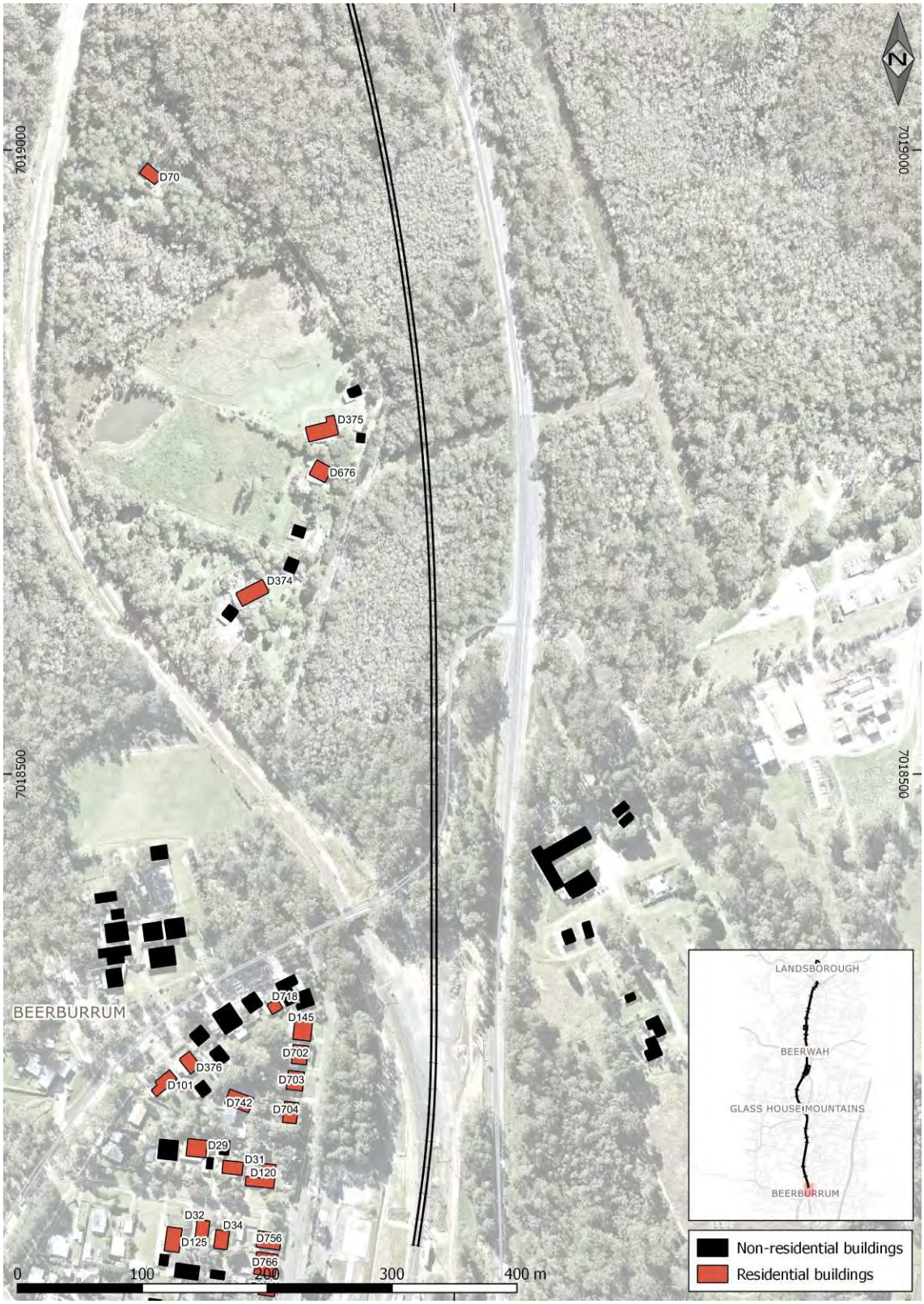
A comprehensive noise monitoring campaign was undertaken in order to quantify the existing rail noise emissions along the proposal. Data from the noise monitoring was used to calibrate a computer noise model for the prediction of rail noise levels resulting from the proposed upgrades.

Single Event Maximum Sound Levels were predicted to be exceeded at four residential receivers in Beerwah. A 120m long, 3.5m high noise barrier was developed in order to mitigate maximum noise levels at these receivers. With the inclusion of said noise barrier, maximum noise levels were predicted to be within the Planning Level of 87 dB(A).

$L_{Aeq,24hr}$ rail noise levels are predicted to be within the Planning Level of 65 dB(A) at all identified noise-sensitive receivers.

APPENDIX A

IDENTIFIED NOISE-SENSITIVE RECEIVERS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7019000
7018500
D70
D375
D676
D374
BEERBURRUM
D718
D145
D702
D376
D703
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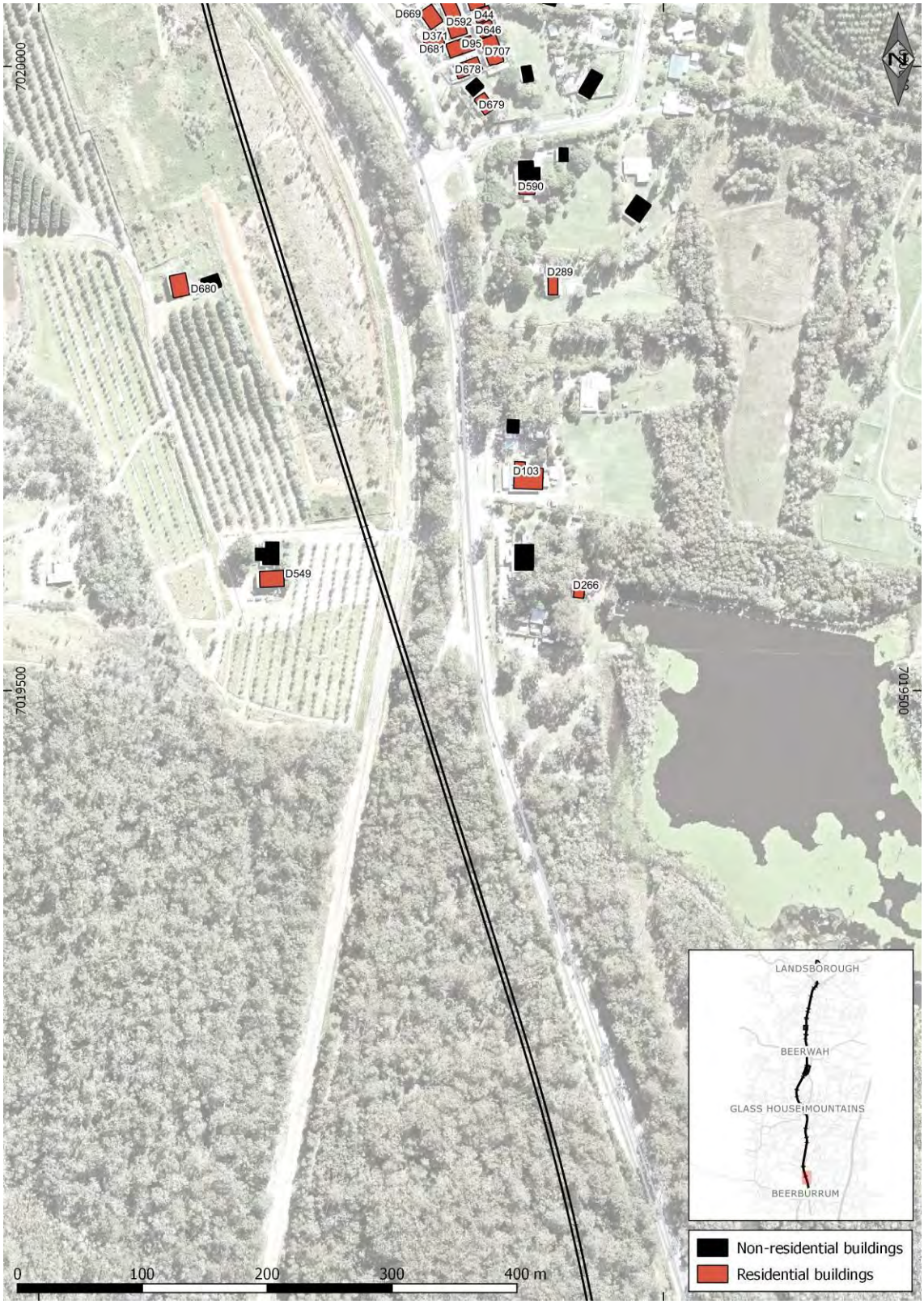
D742
D704
D29
D31
D120
D32
D34
D125
D756
D766
0
100
200
300
400 m
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings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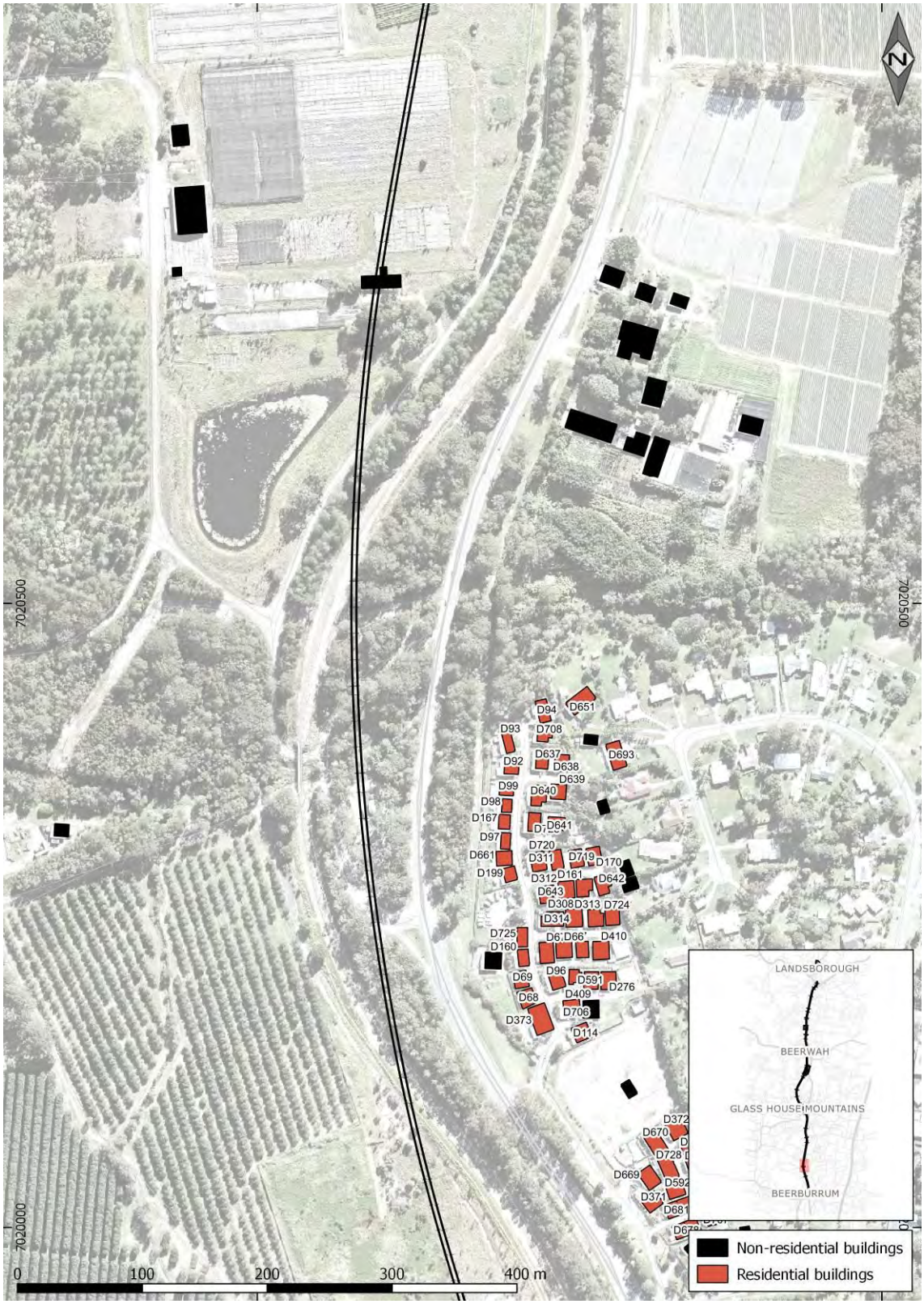
D44
D646
D371
D95
D681
D707
D678
D679
D590
D289
D680
D103
D549
D266
7020000
7019500
7019500
N
0
100
200
300
400 m
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings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100
200
300
400 m
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D93
D708
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D92
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D639
D99
D640
D98
D167
D641
D97
D720
D661
D311
D719
D170
D199
D312
D161
D642
D643
D308
D313
D724
D314
D725
D6;D66'
D410
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D96
D69
D591
D276
D68
D409
D706
D373
D114
D372
D670
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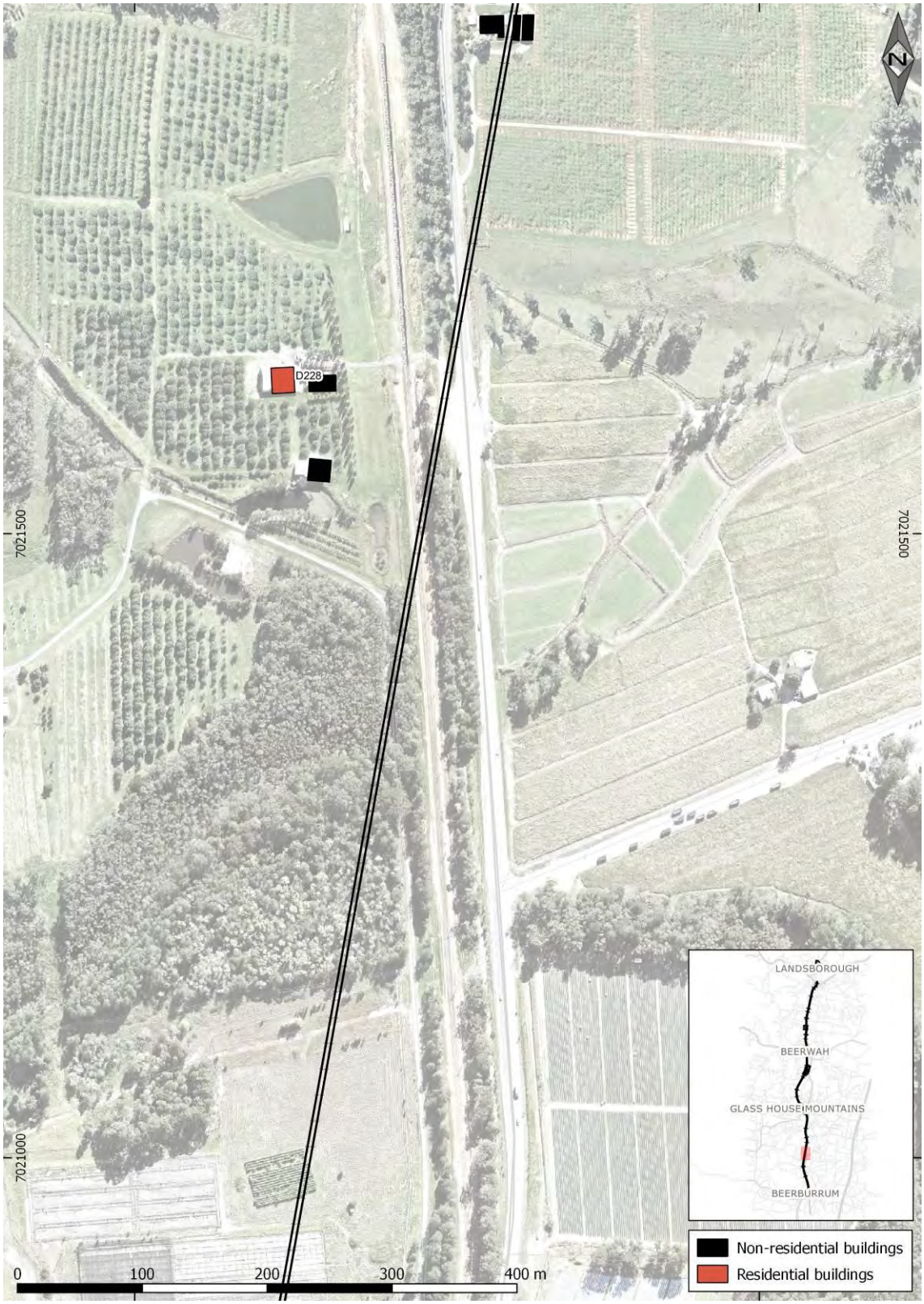
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings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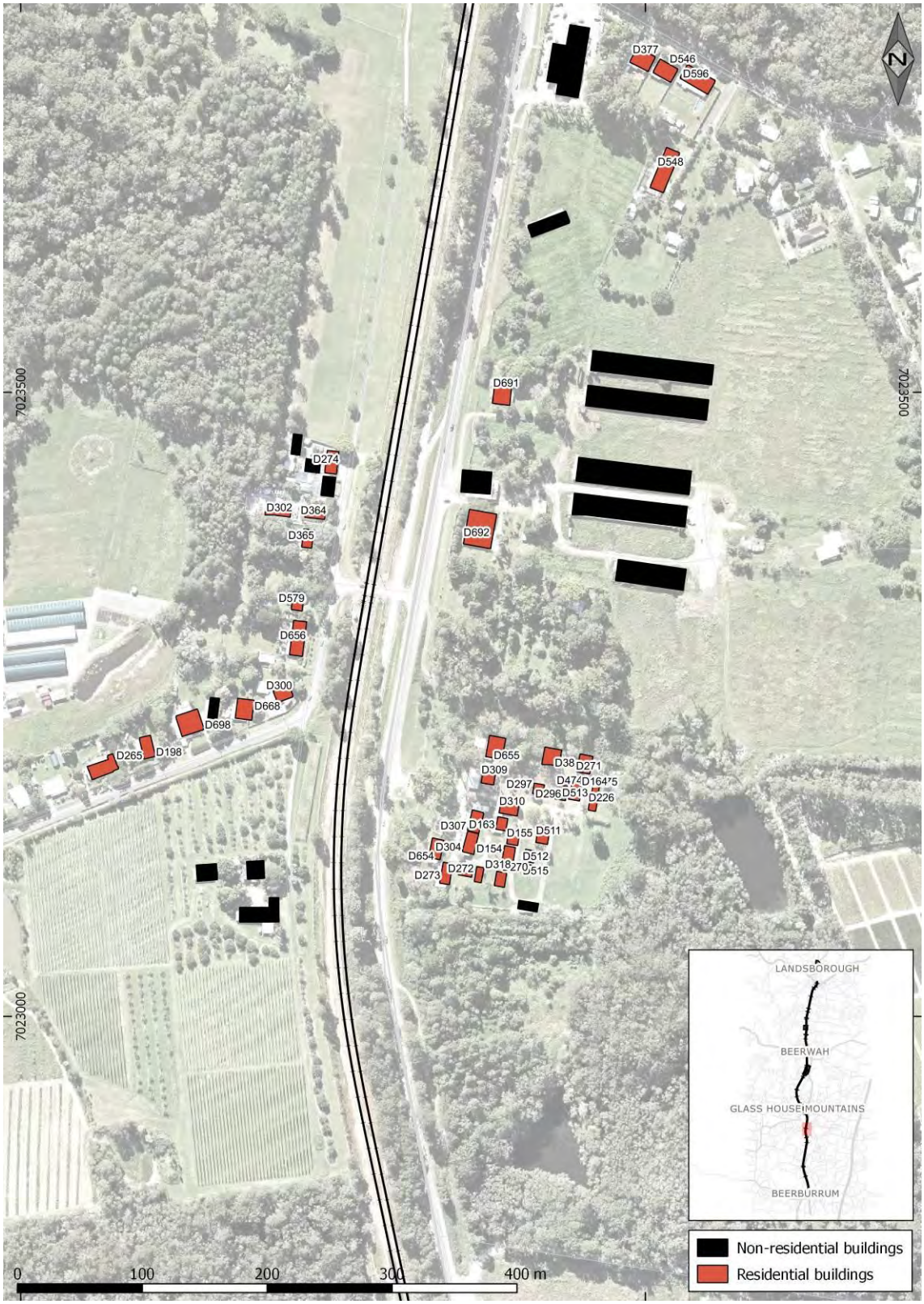
7021500
7021000
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings
0
100
200
300
400 m


N
7022500
7022500
7022000
D46
0
100
200
300
400 m
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings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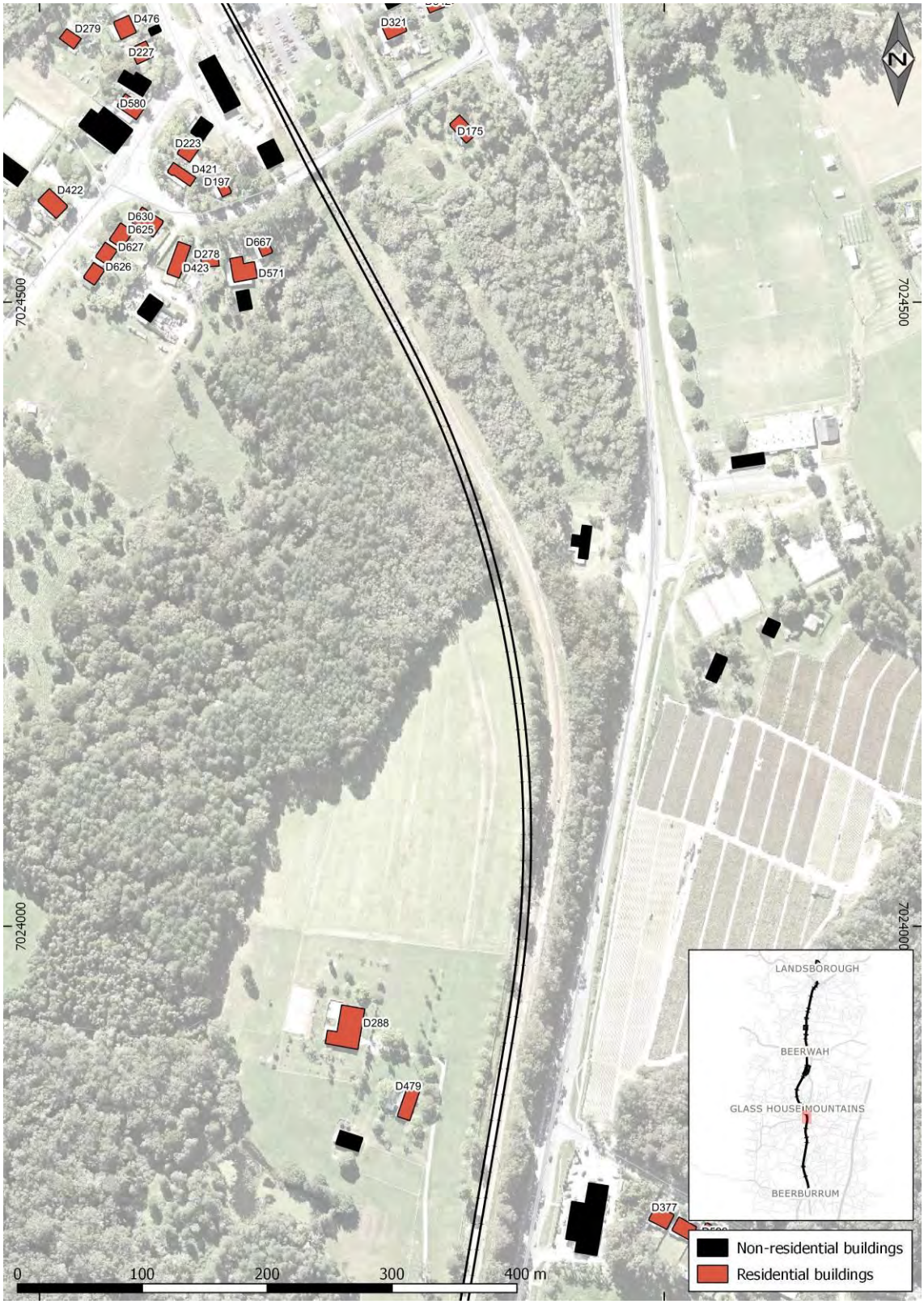
D38
D271
D309
D297
D474
D164
75
D296
D513
D226
D310
D307
D163
D155
D511
D304
D154
D512
D654
D318
270
D515
D272
D273
7023500
7023000
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings
0
100
200
300
400 m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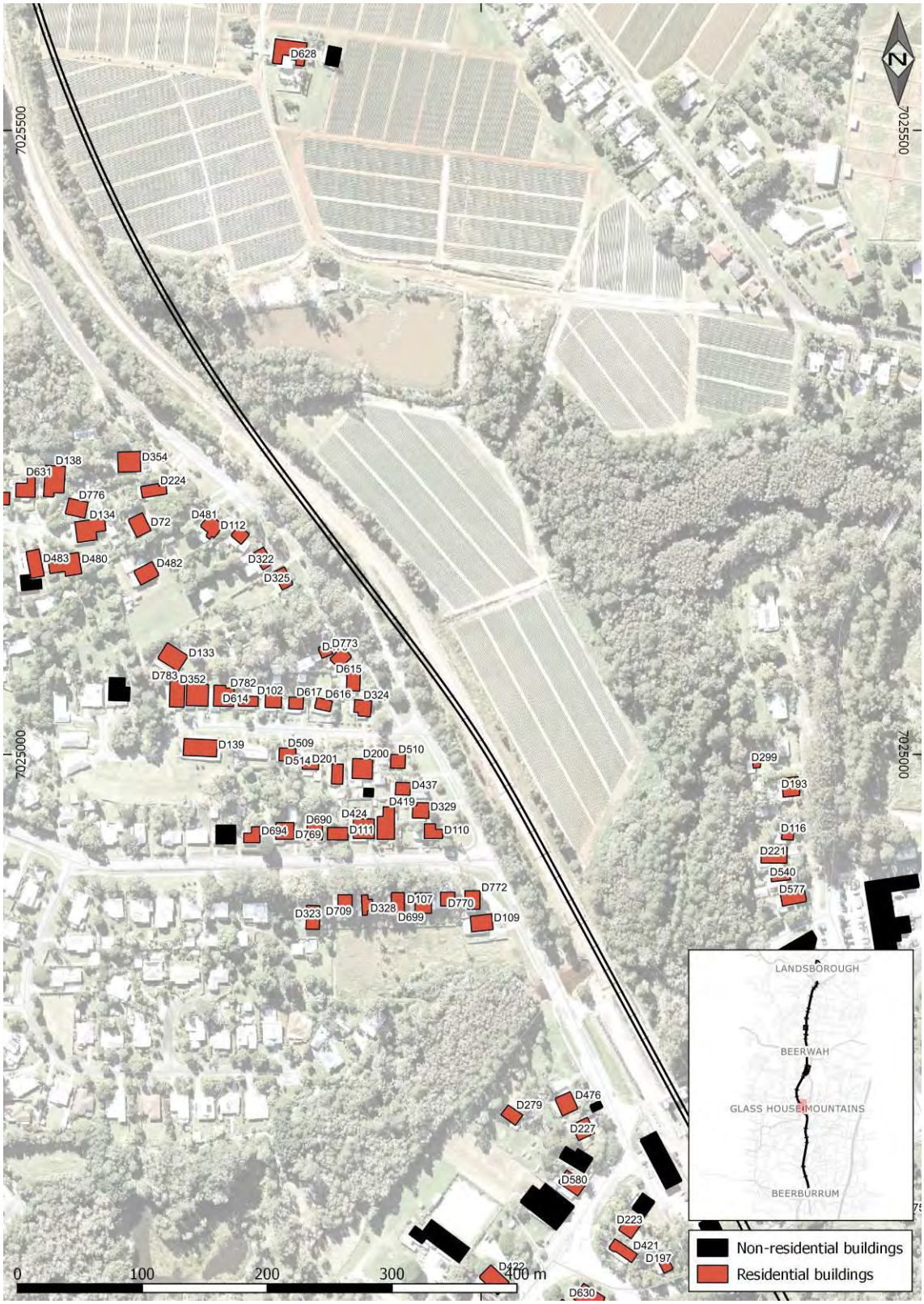
D278
D423
D667
D571
D288
D479
D377
7024500
7024000
N
0
100
200
300
400 m
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings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D322
D325
D133
D783
D352
D773
D615
D782
D614
D102
D617
D616
D324
D139
D509
D514
D201
D200
D510
D437
D419
D329
D424
D690
D694
D769
D111
D110
D772
D323
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D221
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D577
D279
D476
D227
D580
D223
D421
D197
D422
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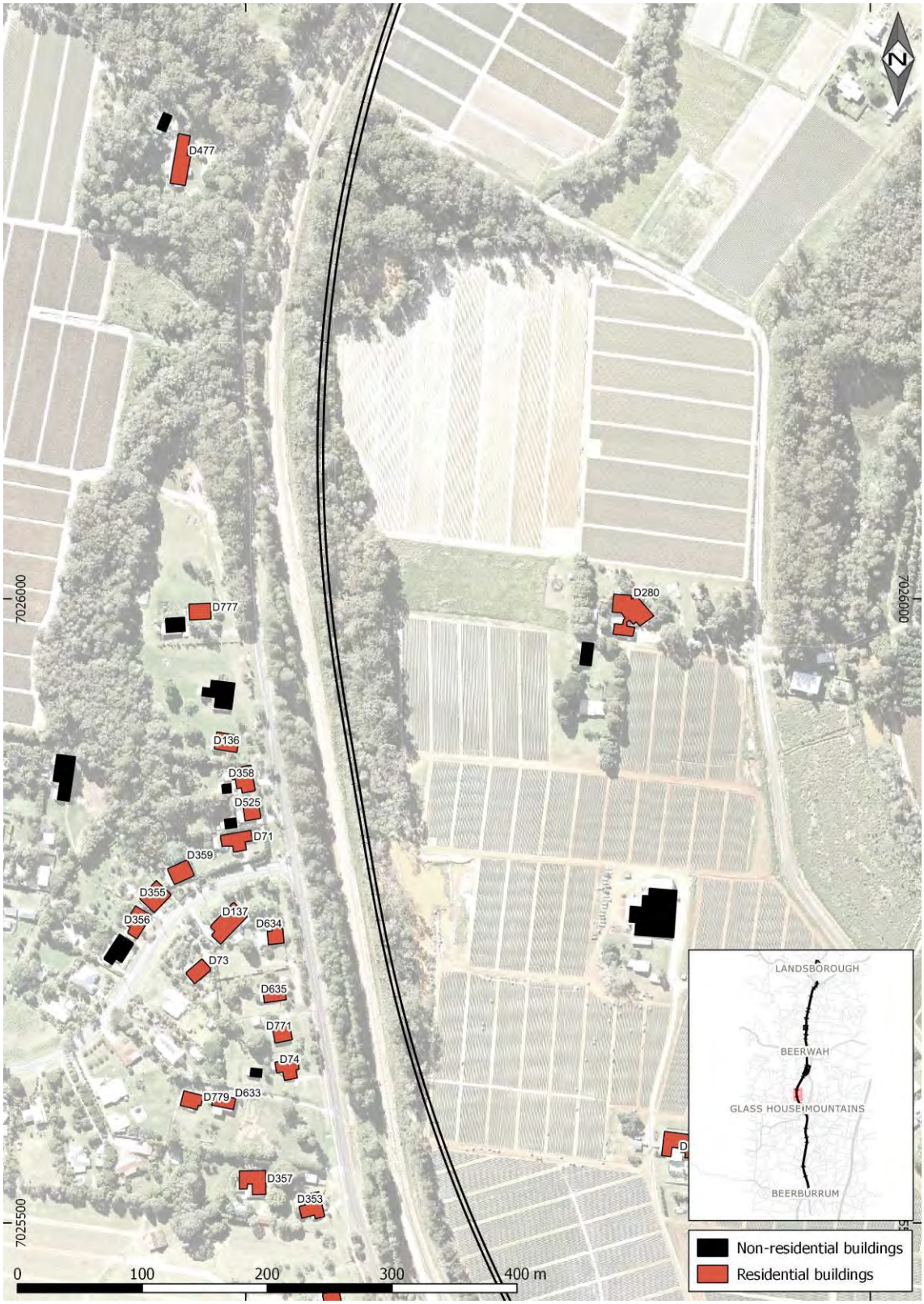
300
400 m
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings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D136
D358
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D71
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D74
D779
D633
D357
D353
7026000
7026000
7025500
0
100
200
300
400 m
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings


N
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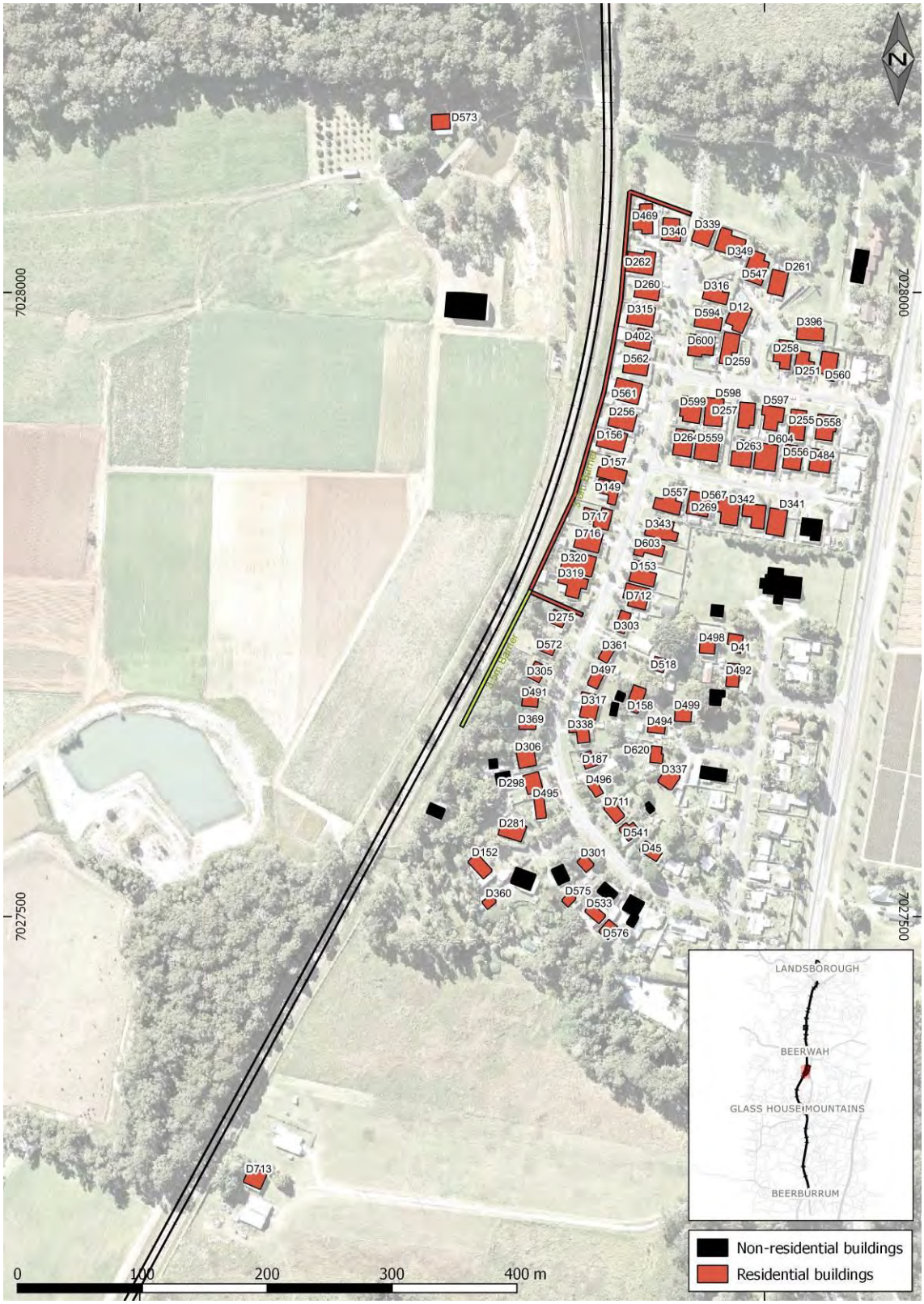
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings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LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings
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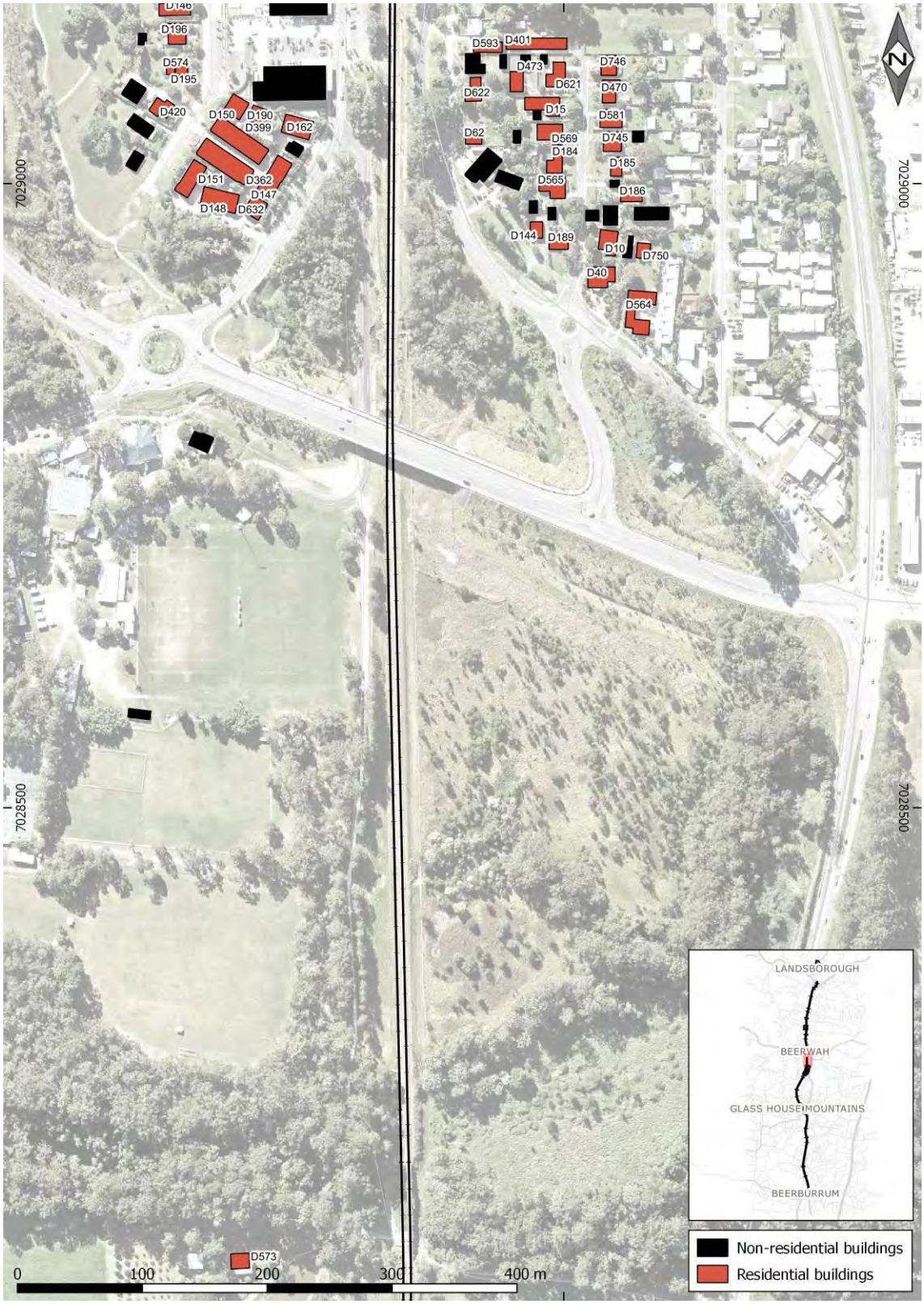
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LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings


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GLASS HOUSE MOUNTAINS
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Non-residential buildings
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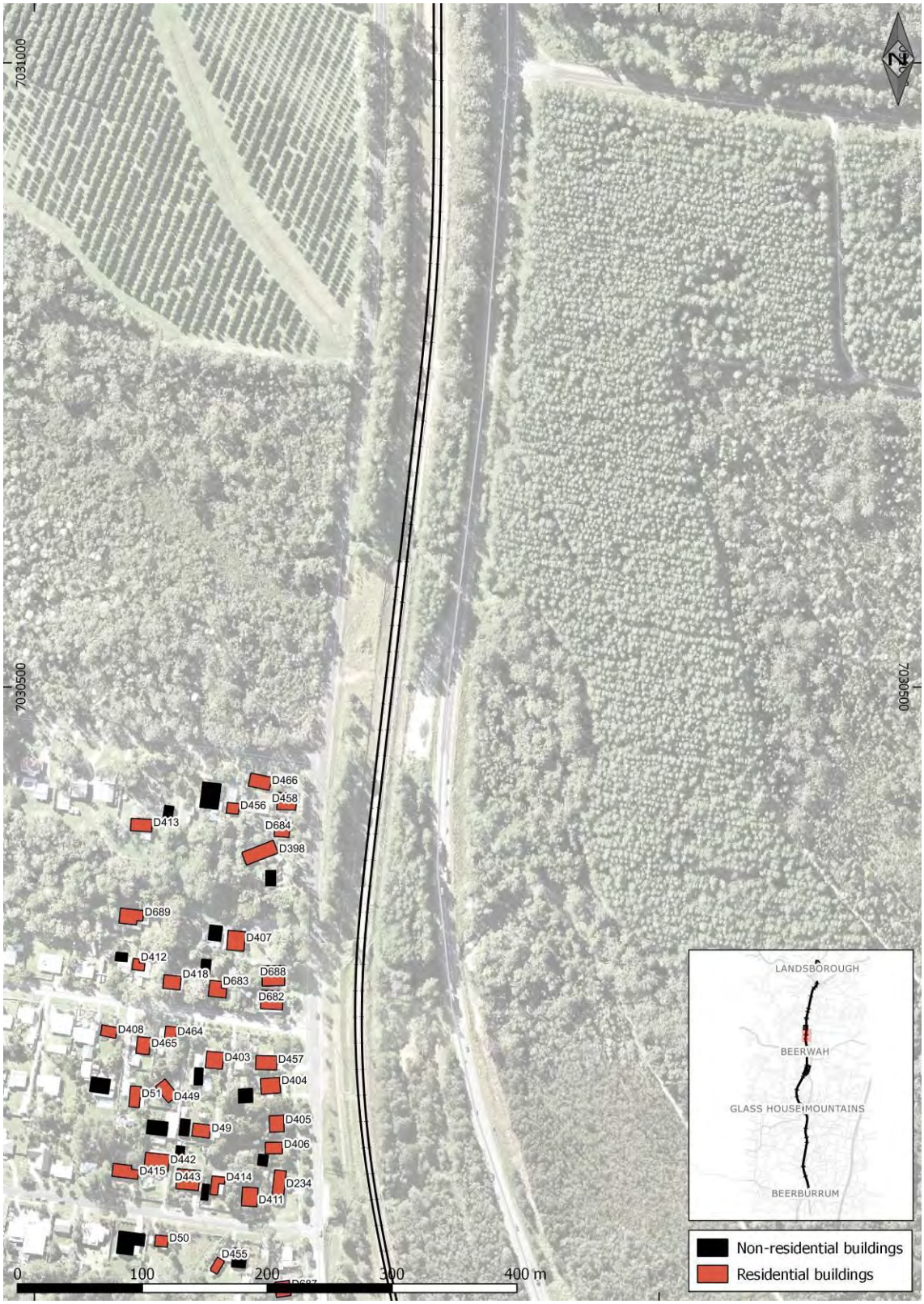
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LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings


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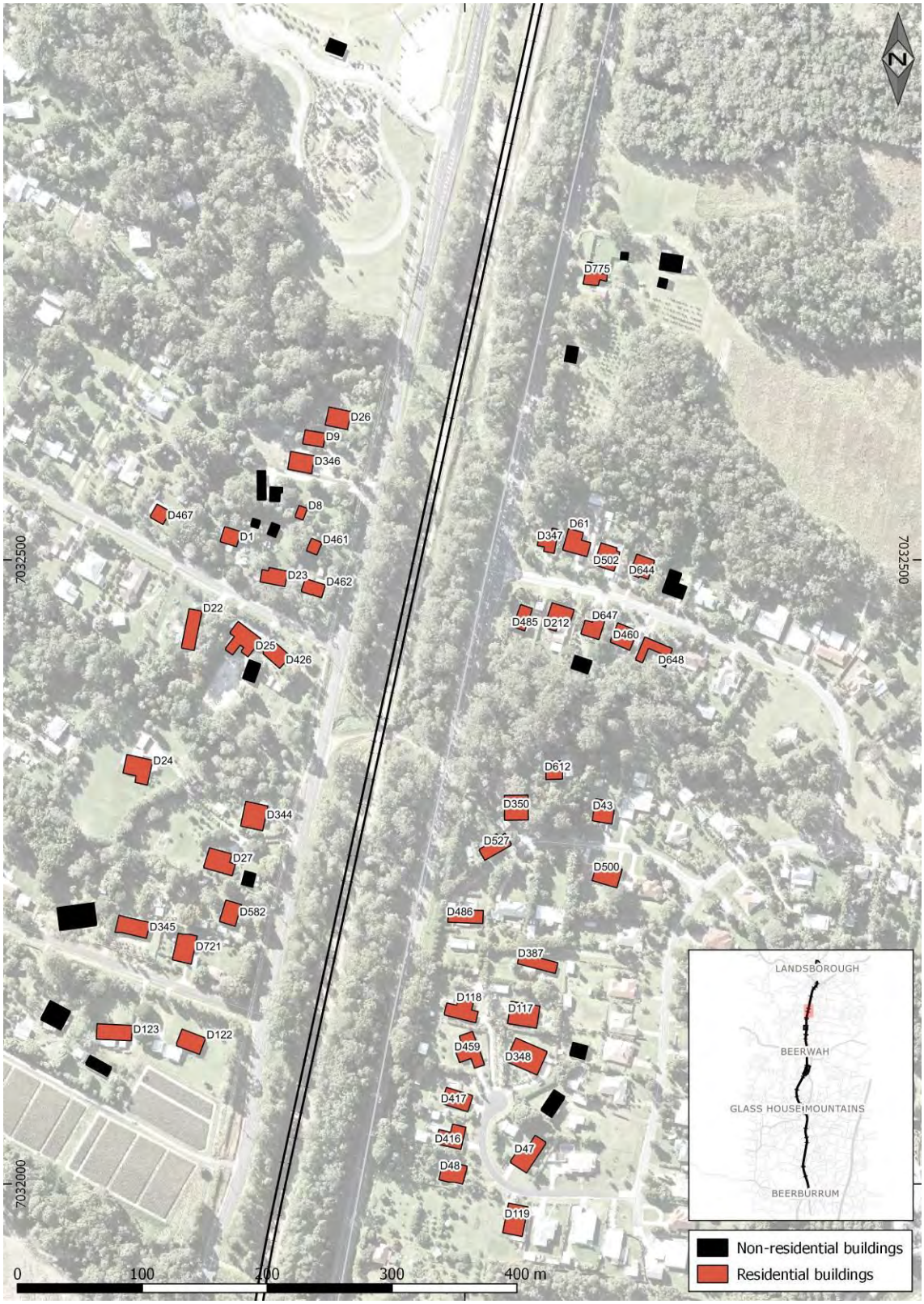
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings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D459
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LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings
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N
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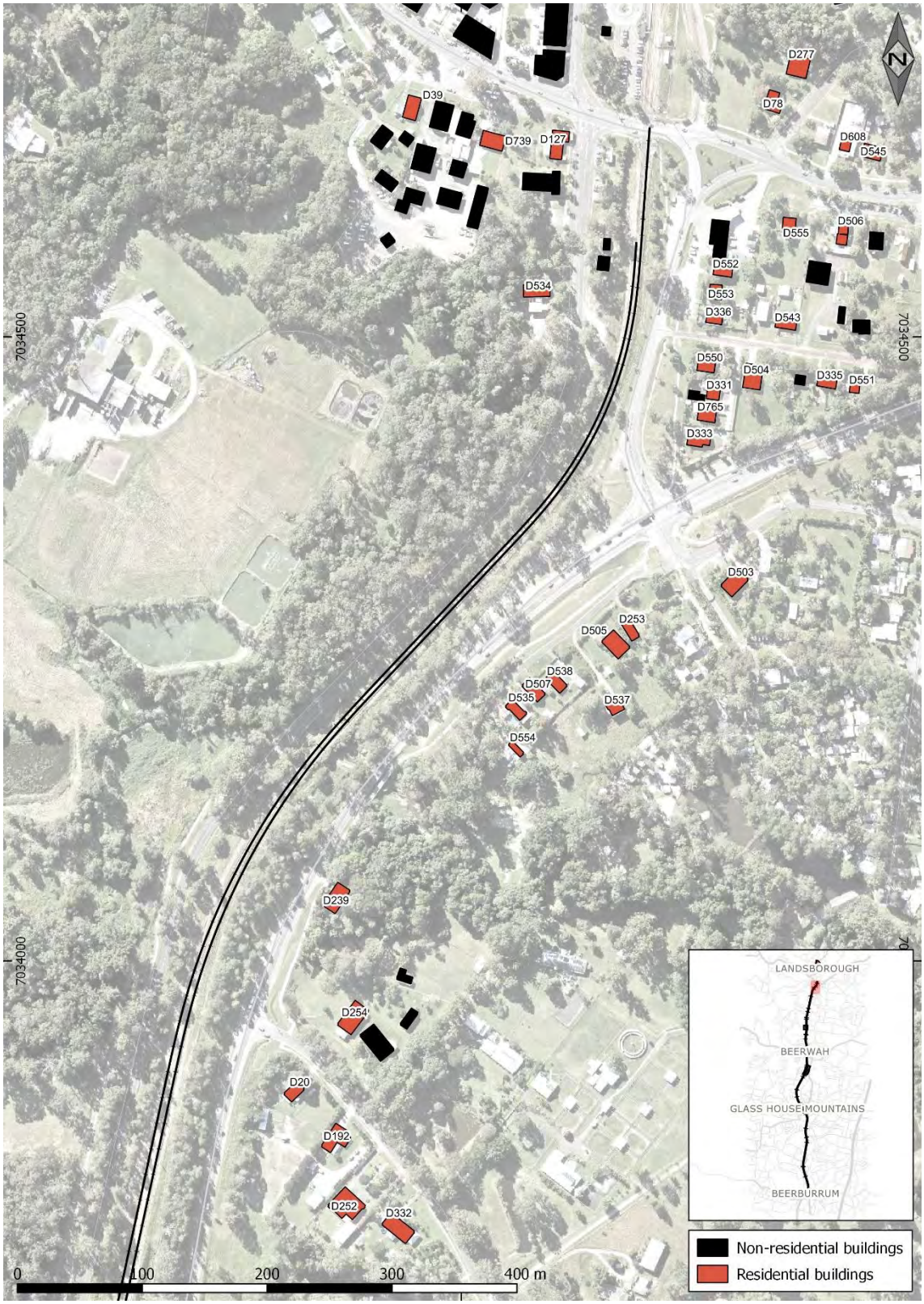
LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings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LANDSBOROUGH
BEERWAH
GLASS HOUSE MOUNTAINS
BEERBURRUM
Non-residential buildings
Residential buildings

APPENDIX B

TABULATED RAIL NOISE PREDICTIONS

ID	Predicted $L_{Aeq,24hr}$ dB(A) with Mitigation	Predicted L_{Amax} dB(A) with Mitigation
D1	53.3	75.9
D2	52.5	73.3
D3	53.9	76.2
D4	52.7	73.8
D5	50.3	70.2
D6	52	73.8
D7	52.9	73.7
D8	56.6	80.1
D9	57.4	80
D10	52.3	74.8
D11	57.3	78.9
D12	51.7	73.8
D13	55.4	78.1
D14	51.1	71
D15	49.2	67.6
D16	40.3	55.7
D17	53.2	76.6
D18	44.9	61.1
D19	57.8	79.1
D20	54.5	72.8
D21	54.3	76
D22	52	75.4
D23	56.8	78.7
D24	53.1	77.2
D25	54.4	77.9
D26	58.1	80.8
D27	56.9	80.9
D28	42.7	66.1
D29	47.5	69.6
D30	35.6	55.1
D31	49.3	72.2
D32	49.4	72
D33	36.3	50.1
D34	51	74.2
D35	57.5	79.7
D36	35.1	51.2
D37	41.9	57.6
D38	53.5	76.2
D39	43.9	60.8
D40	53.4	74.6
D41	49.6	69.6
D42	56.1	79.9
D43	53.3	77.2
D44	48.9	68.9
D45	51.3	74.9
D46	56.8	78.6
D47	50.9	73.3
D48	55.1	76.5
D49	55.3	75.2

ID	Predicted $L_{Aeq,24hr}$ dB(A) with Mitigation	Predicted L_{Amax} dB(A) with Mitigation
D50	52.5	73.6
D51	51.4	69.5
D52	51.8	73.2
D53	52.8	74.2
D54	54.1	73.8
D55	49.6	69.7
D56	56.4	77.9
D57	51.2	70.6
D58	56.5	78.2
D59	51	71.5
D60	56.2	78
D61	53.2	75.5
D62	57.7	78.5
D63	58.8	82.4
D64	50.5	69.8
D65	52.2	72.7
D66	54.1	77.5
D67	54.3	78.4
D68	57.7	81.1
D69	57.8	81.4
D70	51.7	76
D71	56.6	79.1
D72	54.7	77.2
D73	51	72.9
D74	56.9	79.3
D75	34.6	48.4
D76	40.8	57.4
D77	32.3	46.2
D78	48.5	67.4
D79	44.3	61.7
D80	57.4	76.9
D81	50	67.5
D82	52.7	76.4
D83	48.9	68.5
D84	42.8	59.3
D85	44.1	61.5
D86	36.3	56.4
D87	36.1	51.2
D88	37.1	51.5
D89	37.1	51.7
D90	34.9	50.6
D91	53.7	75.8
D92	57.8	82.3
D93	57.5	82.8
D94	56.7	81.4
D95	50.1	74
D96	55.3	79
D97	57.8	81.3
D98	57.9	81.9

ID	Predicted $L_{Aeq,24hr}$ dB(A) with Mitigation	Predicted L_{Amax} dB(A) with Mitigation
D99	58	82.3
D100	35.2	50.4
D101	46.9	69.5
D102	53.5	77.8
D103	56.8	80.1
D104	40.7	57.9
D105	42.7	60.7
D106	35.2	50.7
D107	52.8	75.5
D108	39.2	54.6
D109	58.6	83.8
D110	57.3	81.2
D111	50.7	70.5
D112	59.2	82.7
D113	52.4	75.1
D114	56.2	79.4
D115	46.1	68.9
D116	52.4	75.6
D117	53	74.6
D118	56.4	79.2
D119	52.4	76.1
D120	52.3	75.5
D121	53.2	74.4
D122	55.5	78.9
D123	53.7	74.4
D124	48	69.8
D125	46.3	67.4
D126	53.2	74.8
D127	54.5	74.3
D128	37.7	55.5
D129	47.7	70
D130	50.7	70.3
D131	49.8	69.3
D132	50.5	71
D133	52.5	77.7
D134	52.6	75.5
D135	58.2	81.3
D136	58.9	80.1
D137	54.7	77.7
D138	52.2	75.4
D139	50.7	74.4
D140	51.8	75.1
D141	50.9	74.1
D142	48.4	70.8
D143	46	68.1
D144	54.3	77
D145	54.7	77.3
D146	49.1	66.8
D147	55.2	77.6

ID	Predicted $L_{Aeq,24hr}$ dB(A) with Mitigation	Predicted L_{Amax} dB(A) with Mitigation
D148	50.7	74
D149	57.3	80.9
D150	49.9	71.8
D151	48.2	67.6
D152	59.3	84.9
D153	53.3	74.7
D154	56.7	78.9
D155	56.4	79.2
D156	58.8	86.9
D157	57.4	81.2
D158	51.8	74.1
D159	33.5	47.2
D160	56.8	79.8
D161	53.8	77.6
D162	56.7	78.1
D163	56.4	78
D164	53.9	76.6
D166	33.7	48.2
D167	57.9	81.8
D168	35.3	48.6
D169	35.4	48.5
D170	52.3	74.7
D171	34.7	48.7
D172	36.6	50.8
D173	37.1	50.7
D174	56.5	77.7
D175	57.7	83
D176	55.8	76.4
D177	53.8	78.2
D178	53.1	75.9
D179	58.7	82.3
D180	58.6	82.2
D181	56.7	79
D182	53.8	76.3
D183	50.8	71
D184	51	68.8
D185	48.6	64.8
D186	47.6	62.9
D187	53.1	77.5
D188	53.9	76.8
D189	53.8	76.1
D190	50.3	71.8
D191	54.6	77.2
D192	53.1	71
D193	53.7	76.2
D194	50.3	70.4
D195	48.3	67.8
D196	48.6	66.2
D197	55.8	80.2

ID	Predicted $L_{Aeq,24hr}$ dB(A) with Mitigation	Predicted L_{Amax} dB(A) with Mitigation
D198	53	78.3
D199	57.7	80.9
D200	56.3	81.2
D201	54.9	79.2
D202	33.9	47.8
D203	33.2	49.8
D204	34.1	47.8
D205	34.2	49.5
D206	34.4	48.9
D207	35.4	49.2
D208	35.9	52.5
D209	31.7	47.6
D210	34.7	50.2
D211	36.2	50.1
D212	54.3	77.4
D213	52.5	73.5
D214	48.1	67.3
D215	51.7	71.9
D216	50.7	69
D217	58.1	79.2
D218	49	68.8
D219	52.4	74.4
D220	53.7	75.9
D221	54.5	77.4
D222	49.7	68.5
D223	55.9	81.5
D224	57.6	81.8
D225	34.1	47.8
D226	52.8	74.3
D227	56.9	82.8
D228	56.9	79.7
D229	48.9	68.6
D230	35.5	49.7
D231	57.3	82
D232	56.5	78.3
D233	58	79.2
D234	60.1	81.9
D235	50.1	69.4
D236	39.9	54.9
D237	35.3	51.4
D238	43.3	63.1
D239	55.8	74.7
D240	54	76
D241	57.6	78.8
D242	55.2	77
D243	56.3	75.1
D244	52.9	75.2
D245	44	62.7
D246	49.8	70.8

ID	Predicted $L_{Aeq,24hr}$ dB(A) with Mitigation	Predicted L_{Amax} dB(A) with Mitigation
D247	58	81.6
D248	50.3	69.6
D249	42.5	57.9
D250	50	69.3
D251	50.1	69.7
D252	51	68.6
D253	52.8	71.6
D254	53.6	71.6
D255	51.7	71.9
D256	58.6	84
D257	53.8	74.6
D258	52.3	73.2
D259	52.9	73.3
D260	59	85.5
D261	52.4	77.9
D262	60.6	85.5
D263	53.3	74.7
D264	53.9	76
D265	51.7	74.8
D266	55.2	79.1
D267	37.2	51.7
D268	58.7	81.3
D269	51.5	70.8
D270	55.2	77.2
D271	53.9	76.1
D272	57.6	82.1
D273	60.2	85.6
D274	61.8	86.2
D275	57.8	82
D276	50.4	74.3
D277	46	66.8
D278	56.9	82.5
D279	54.5	79.5
D280	47.3	62.8
D281	58.2	83.5
D282	31.5	46.4
D283	36.1	50.8
D284	35.5	49.6
D285	36.9	51.5
D286	35.1	51.3
D287	36	50.2
D288	57.2	81.1
D289	53.6	75.7
D290	42.7	58.5
D291	42.5	58.5
D292	41.8	60.8
D293	41.9	57.5
D294	43.2	59.9
D295	42.7	58.5

ID	Predicted $L_{Aeq,24hr}$ dB(A) with Mitigation	Predicted L_{Amax} dB(A) with Mitigation
D296	54.7	77.2
D297	55.9	79.9
D298	56.6	81.3
D299	53.6	75.6
D300	60.6	85.9
D301	54.1	77.8
D302	55.2	80.2
D303	53.6	75.4
D304	58.2	80.3
D305	58.5	80.8
D306	57.2	82.9
D307	58.9	83
D308	54.2	77.9
D309	58.5	81.3
D310	58	81.3
D311	54.9	77.3
D312	55.4	78.7
D313	54.3	78.6
D314	56	80.2
D315	58.7	83.7
D316	55	76.4
D317	53.6	76.9
D318	55.4	78.3
D319	58.3	83.9
D320	58.6	83.9
D321	56.3	78.7
D322	58.5	82.7
D323	50.9	74.1
D324	59	84.9
D325	59.4	84.4
D326	42.7	59.9
D327	42.6	59.4
D328	52	75.9
D329	57.5	80.2
D330	41	57.6
D331	56.3	77.7
D332	50.1	67
D333	57.6	77.7
D334	49.1	72.5
D335	50.5	69.8
D336	57.8	78.4
D337	51.4	72.4
D338	55.1	80.1
D339	55.4	79.9
D340	56.6	79.9
D341	49.8	68.4
D342	49.9	69.3
D343	53.1	74.2
D344	58.5	82

ID	Predicted $L_{Aeq,24hr}$ dB(A) with Mitigation	Predicted L_{Amax} dB(A) with Mitigation
D345	51.1	72.1
D346	57.4	79.6
D347	57.3	79.6
D348	51.5	71.5
D349	52.6	74.3
D350	57	81.1
D351	55	76.7
D352	53.4	78.5
D353	54.1	76.2
D354	57.4	80.4
D355	47	66
D356	45.7	62.6
D357	51.9	75.4
D358	57.9	79.3
D359	48.9	68.6
D360	57.9	84.1
D361	54.5	76.2
D362	52	74.2
D363	47.3	63.2
D364	61.5	86.9
D365	61.2	86.4
D366	40.5	63.2
D367	42.5	62.2
D368	39.9	62.1
D369	58.1	83.4
D370	43.7	60.9
D371	55.3	78.4
D372	52.8	76.2
D373	57.2	80.6
D374	54.4	79.2
D375	58.7	83.9
D376	46.1	68.3
D377	52.8	76.3
D378	36.1	50.2
D379	36.9	51.4
D380	35.3	49.1
D381	37.5	52
D382	35.4	49.1
D383	36.9	50.4
D384	35.5	49.2
D385	41.3	60.1
D386	55.4	76.9
D387	54	75.9
D388	54.4	77.2
D389	57	78.5
D390	51.1	71.9
D391	58.4	82.3
D392	51.5	73.8
D393	52.9	75.6

ID	Predicted $L_{Aeq,24hr}$ dB(A) with Mitigation	Predicted L_{Amax} dB(A) with Mitigation
D394	50.8	73.9
D395	57.8	80
D396	51.3	72.9
D397	51.8	73.9
D398	57.7	80.2
D399	50.1	72.4
D400	57.3	79
D401	52.1	72.9
D402	58.1	81.8
D403	55.6	76.2
D404	59.1	80.9
D405	59.2	81
D406	59.4	80.6
D407	57.1	79.1
D408	51.1	69.5
D409	51	75.2
D410	52.4	76
D411	56	77.5
D412	52.3	71.6
D413	52.1	71.1
D414	53.3	73.8
D415	52.2	71.9
D416	55	75.2
D417	55.3	76.5
D418	52.5	71.2
D419	54	77
D420	48.4	67.1
D421	55.3	81
D422	49.9	72.4
D423	54.8	79.2
D424	52.3	75.5
D425	51.7	72.4
D426	58.2	82.9
D427	50	69.4
D428	50.7	71.1
D429	49.6	70.5
D430	58.7	82.4
D431	51.6	72.1
D432	54	78.2
D433	51.3	74.2
D434	48.8	68.2
D435	47.3	68.9
D436	49.9	71
D437	56.8	81.3
D438	58.7	82.3
D439	49.9	69.1
D440	50.3	69.1
D441	53.2	75.7
D442	51.6	72.3

ID	Predicted $L_{Aeq,24hr}$ dB(A) with Mitigation	Predicted L_{Amax} dB(A) with Mitigation
D443	51.6	72.1
D444	58.6	82
D445	54	76.7
D446	52.4	72.4
D447	50.9	69.5
D448	50.9	70.4
D449	52.1	73.5
D450	46.7	67.4
D451	56	78.1
D452	53.3	73
D453	57.8	78.8
D454	55.3	76.7
D455	51.7	71
D456	53.4	74
D457	58.9	80.7
D458	59.2	81.2
D459	55.1	78.1
D460	51.4	72.4
D461	58.7	82.1
D462	58.2	81.5
D463	54.4	76.8
D464	54.1	74.9
D465	52.1	71.2
D466	56.9	79.6
D467	52.2	75.1
D468	57.5	79.5
D469	64.6	85.5
D470	47.9	63.5
D471	56	78.1
D472	48.2	66
D473	49.6	67.9
D474	54.4	78.2
D475	54.1	77
D476	58.2	83.6
D477	58.5	79.4
D478	60.6	86.5
D479	59.9	84.8
D480	51	73.2
D481	57.7	81.4
D482	53.2	74.8
D483	48.5	67.1
D484	48.8	68.6
D485	57	80.2
D486	57.3	80.2
D487	41.8	57.4
D488	39.2	55.2
D489	36.9	50.8
D490	33.4	47
D491	58.4	81.8

ID	Predicted $L_{Aeq,24hr}$ dB(A) with Mitigation	Predicted L_{Amax} dB(A) with Mitigation
D492	51	71.2
D493	39.1	54
D494	51.4	73.1
D495	55.7	81.1
D496	52.9	76.5
D497	54.4	75.7
D498	52.1	72
D499	51.2	72.1
D500	50.7	71.6
D501	32.8	48.4
D502	53.2	76.5
D503	52.8	71.5
D504	53.9	73.5
D505	54.7	73.5
D506	47.7	66.4
D507	55.5	74.1
D508	40.7	56.4
D509	53.1	76.5
D510	58.3	83.5
D511	54.1	76.3
D512	53.9	76.7
D513	52.5	74.9
D514	54.3	78
D515	52.9	74.7
D516	38.2	53.4
D517	37.6	53
D518	52.3	72.4
D519	33	48
D520	35.5	49
D521	36.9	50.5
D522	36.6	51.9
D523	52.1	73.1
D524	51.5	72.8
D525	57.9	79.6
D526	51.4	72
D527	56.2	80.3
D528	51.5	71
D529	56.5	78.1
D530	55.4	77.2
D531	49.5	69.5
D532	50.6	71.3
D533	52.4	75.6
D534	57.3	78.1
D535	55.5	73.9
D536	53.9	74.6
D537	51.3	69.3
D538	55	73.9
D539	54.2	78.3
D540	55.3	78.1

ID	Predicted $L_{Aeq,24hr}$ dB(A) with Mitigation	Predicted L_{Amax} dB(A) with Mitigation
D541	52.4	75.5
D542	54	76.3
D543	52.9	73.3
D544	37.3	56.5
D545	43.7	64.6
D546	50.6	76.1
D547	52.4	74.2
D548	53.1	77
D549	59.5	84.5
D550	58.3	78.9
D551	47.6	64.9
D552	56.8	77.4
D553	56.9	78
D554	53.6	72.2
D555	48.9	67.3
D556	50.5	70.6
D557	54	76.1
D558	50.1	70.3
D559	50.7	73.7
D560	50.4	70.8
D561	58	81.7
D562	57.9	82.5
D563	57.4	79
D564	52.6	73.4
D565	52.3	73.7
D566	51	69.7
D567	52.2	73.4
D568	56.4	77.6
D569	51.5	72.2
D570	47.8	69.4
D571	59.8	86.2
D572	58.2	80.4
D573	59.9	83.7
D574	48.4	65.1
D575	53.5	77.8
D576	51.9	76.4
D577	54.7	78
D578	36.7	52.4
D579	61.3	86.6
D580	52.6	77.5
D581	48.3	63.9
D582	57.2	80.6
D583	50.3	69.6
D584	34.3	48.1
D585	57	81.4
D586	60.2	84.8
D587	50.4	70.9
D588	58	79.2
D589	49.5	67.5

ID	Predicted $L_{Aeq,24hr}$ dB(A) with Mitigation	Predicted L_{Amax} dB(A) with Mitigation
D590	54	75.7
D591	52.4	76.7
D592	51.1	73.7
D593	56.4	76.5
D594	55.7	76.4
D595	47.2	69.8
D596	50.9	76.1
D597	51.7	72.1
D598	52.9	73.8
D599	53.7	76.3
D600	54.4	76.2
D601	51.1	71.5
D602	53.7	75
D603	53.4	74.5
D604	52.1	73.7
D605	34.9	51.3
D606	40.2	57.5
D607	34.7	48.6
D608	46.2	66.1
D609	35	52.5
D610	47.5	67.4
D611	57.8	79
D612	56.4	80.9
D613	50	71.2
D614	53.1	78.3
D615	59.9	85.7
D616	55.2	79.6
D617	54.1	78
D618	52.3	73.3
D619	48.1	66.7
D620	52.1	74.9
D621	49.3	66
D622	57	76.6
D623	50.8	71.4
D624	51.4	70.6
D625	51.3	73.1
D626	50.9	74.9
D627	50.6	73.2
D628	53.9	75.9
D629	54.6	73.1
D630	53.8	77.6
D631	47.5	71.4
D632	54.6	77
D633	51.2	71.4
D634	58.3	80.6
D635	57.5	79.6
D636	37.8	52.1
D637	55.1	77.4
D638	53.7	78.4
D639	54.2	79.9
D640	55.8	79.3
D641	53.9	76.2
D642	53.9	77.8
D643	56.4	79.5
D644	52	73.1
D645	48.4	69.8
D646	48.6	67.4
D647	53.3	74.6
D648	50.7	74.8
D649	38.6	53.7
D650	37	52.2
D651	52.9	74.3
D652	50.2	72.9
D654	60.2	86.3
D655	56.7	80.3
D656	61.6	86.2
D657	48.6	67.7
D658	49.8	69.7
D659	52.2	75.5
D660	55.7	79.3
D661	58	81.2
D662	34.8	49.3
D663	32.8	46.4
D664	38.5	53.8
D665	43.8	64.3
D666	40.9	58.3
D667	61.1	82.4
D668	57.7	83.1
D669	55.9	77.3
D670	54.3	76.9
D671	50.7	70.2
D672	51.8	73.9
D673	50.3	71.9
D674	59	82.8
D675	55.1	77.7
D676	57.9	83.6
D677	33.5	49.1
D678	54.9	76.7
D679	54.6	76.2
D680	57.2	80.5
D681	53.9	77.5
D682	59.3	81.4
D683	54.8	76.2
D684	59	80.9
D685	49.9	68.3
D686	48.1	67.8
D687	58.1	79.4
D688	59.4	81.5

ID	Predicted $L_{Aeq,24hr}$ dB(A) with Mitigation	Predicted L_{Amax} dB(A) with Mitigation
D689	52.9	72.9
D690	49.1	70.5
D691	59.4	83.2
D692	61.1	85.5
D693	55.2	78.1
D694	50.8	70.9
D695	36	51.7
D696	41.9	56.7
D697	38.2	53.8
D698	53	78.4
D699	51.1	74.9
D700	38.1	52.6
D701	38.1	53.6
D702	54.3	77.1
D703	54.1	76.7
D704	53.7	76.3
D705	49.4	72.6
D706	53.9	75.7
D707	49.5	71.6
D708	56.1	80.2
D709	51.1	75.4
D710	37.4	52.9
D711	52.5	74.3
D712	53.1	75
D713	61.8	85.4
D714	55.8	77.2
D715	36.3	53.8
D716	58.6	83.6
D717	58	81.9
D718	50.1	73.1
D719	53.6	76.1
D720	54.6	79.1
D721	54.9	78.1
D722	57.2	78.6
D723	55.2	77
D724	53.7	78.6
D725	57.4	80.9
D726	47.9	69
D727	37.7	52.6
D728	54	77.4
D729	43.4	62.4
D730	37.2	50.7
D731	38.5	57
D732	40.2	54.5
D733	40.5	57.9
D734	40.8	57.6
D735	38	54.5
D736	43.1	59.7
D737	38.6	55.4
D738	43.8	61.6
D739	50.6	69.3
D740	47.3	66.1
D741	43.8	61.4
D742	49.1	72.2
D743	36.6	51.3
D744	32.2	45.6
D745	48.9	64.8
D746	48.4	66.2
D747	36.1	49.7
D748	36	52.7
D749	36.6	50
D750	47	67
D751	36.3	51
D752	35.8	49.8
D753	33.3	48.3
D754	54	77.4
D755	54.9	78.3
D756	51.9	75.4
D757	50	69.3
D758	49.8	68.2
D759	57.3	80.7
D760	47.9	65.1
D761	59.1	82.6
D762	51.6	70
D763	53	73.8
D764	58.3	79.8
D765	57.3	77.6
D766	51.4	74.7
D767	46	69.3
D768	32.3	45.8
D769	50.1	70.5
D770	53.2	77.6
D771	57.3	79.4
D772	58	83.2
D773	59.4	85.5
D774	36	49.5
D775	59.2	81.7
D776	53.3	75.7
D777	58.9	79.6
D778	55.3	75
D779	49.9	69.7
D780	55.8	73.7
D781	49.1	72.8
D782	53.6	78.6
D783	51.3	76.3
D784	37.5	51.1
D785	35.5	48.9

Appendix H Potentially Affected Properties Outside the Project Footprint

LOTPLAN	SUNSHINE COAST PLANNING SCHEME ZONING	TENURE
Beerburrum		
579CG3232	Community Facilities Zone (school)	Freehold
915CG2336	Community Facilities Zone	Freehold
589NPW725	Environmental Management and Conservation Zone	National Park
1RP159520	Local Centre Zone	Freehold
325CG3462	Local Centre Zone	Freehold
3RP159520	Local Centre Zone	Freehold
5RP165664	Local Centre Zone	Freehold
921CG2906	Local Centre Zone	Freehold
107B5404	Low Density Residential Zone	Freehold
108B5404	Low Density Residential Zone	Freehold
109B5404	Low Density Residential Zone	Freehold
11RP165664	Low Density Residential Zone	Freehold
11RP800457	Low Density Residential Zone	Freehold
12B5408	Low Density Residential Zone	Freehold
12RP165664	Low Density Residential Zone	Freehold
12RP800457	Low Density Residential Zone	Freehold
13B5408	Low Density Residential Zone	Freehold
13RP165664	Low Density Residential Zone	Freehold
13RP814567	Low Density Residential Zone	Freehold
14B5408	Low Density Residential Zone	Freehold
14RP814567	Low Density Residential Zone	Freehold
15CG6374	Low Density Residential Zone	Freehold
15RP814567	Low Density Residential Zone	Freehold
210B5404	Low Density Residential Zone	Freehold
211B5404	Low Density Residential Zone	Freehold
2RP159520	Low Density Residential Zone	Freehold
528CG6252	Low Density Residential Zone	Freehold
5SP269011	Low Density Residential Zone	Freehold
6SP269011	Low Density Residential Zone	Freehold
7SP269011	Low Density Residential Zone	Freehold
8SP272482	Low Density Residential Zone	Freehold
925CG3312	Open Space Zone	Reserve
2RP122417	Rural Zone	Freehold
2RP179742	Rural Zone	Freehold
3RP179742	Rural Zone	Freehold
3RP229380	Rural Zone	Freehold
5RP198768	Rural Zone	Freehold

LOTPLAN	SUNSHINE COAST PLANNING SCHEME ZONING	TENURE
Beerwah		
113CP909424	Community Facilities Zone	Freehold
1RP68755	Community Facilities Zone	Freehold
234CG838775	Community Facilities Zone (school)	Freehold
0SP202547	High Density Residential Zone	Freehold
1RP106753	High Density Residential Zone	Freehold
1RP82070	High Density Residential Zone	Freehold
1SP202547	High Density Residential Zone	Freehold
2RP179398	High Density Residential Zone	Freehold
2RP82070	High Density Residential Zone	Freehold
2RP89777	High Density Residential Zone	Freehold
6RP838784	High Density Residential Zone	Freehold
21SP115614	Local Centre Zone	Freehold
11RP835958	Low Density Residential Zone	Freehold
12RP835958	Low Density Residential Zone	Freehold
13RP835958	Low Density Residential Zone	Freehold
16SP183159	Low Density Residential Zone	Freehold
1RP138171	Low Density Residential Zone	Freehold
25RP183306	Low Density Residential Zone	Freehold
5RP160860	Low Density Residential Zone	Freehold
6RP160860	Low Density Residential Zone	Freehold
6SP183160	Low Density Residential Zone	Freehold
9SP183159	Low Density Residential Zone	Freehold
0BUP12317	Major Centre Zone	Freehold
0BUP13014	Major Centre Zone	Freehold
0BUP6648	Major Centre Zone	Freehold
0GTP2490	Major Centre Zone	Freehold
0SP270286	Major Centre Zone	Freehold
111B4412	Major Centre Zone	Freehold
1BUP13014	Major Centre Zone	Freehold
1BUP6648	Major Centre Zone	Freehold
1GTP2490	Major Centre Zone	Freehold
1SP199824	Major Centre Zone	Freehold
1SP270286	Major Centre Zone	Freehold
2BUP13014	Major Centre Zone	Freehold
2GTP2490	Major Centre Zone	Freehold
2RP858614	Major Centre Zone	Freehold
2SP155409	Major Centre Zone	Freehold
2SP270286	Major Centre Zone	Freehold
3BUP13014	Major Centre Zone	Freehold
3RP67322	Major Centre Zone	Freehold
3SP270286	Major Centre Zone	Freehold

LOTPLAN	SUNSHINE COAST PLANNING SCHEME ZONING	TENURE
4BUP12317	Major Centre Zone	Freehold
4BUP13014	Major Centre Zone	Freehold
4SP270286	Major Centre Zone	Freehold
5BUP13014	Major Centre Zone	Freehold
5BUP6648	Major Centre Zone	Freehold
8RP842822	Major Centre Zone	Freehold
9BUP13014	Major Centre Zone	Freehold
9BUP6648	Major Centre Zone	Freehold
0SP185840	Medium Density Residential Zone	Freehold
1RP155643	Medium Density Residential Zone	Freehold
2RP155643	Medium Density Residential Zone	Freehold
2RP170406	Medium Density Residential Zone	Freehold
3RP155643	Medium Density Residential Zone	Freehold
4RP155643	Medium Density Residential Zone	Freehold
6SP185840	Medium Density Residential Zone	Freehold
7RP170406	Medium Density Residential Zone	Freehold
8RP170406	Medium Density Residential Zone	Freehold
9RP170406	Medium Density Residential Zone	Freehold
13SP229833	n/a	Freehold
111CG7	Open Space Zone	Reserve
418B4414	Open Space Zone	Reserve
17RP180989	Rural Residential Zone	Freehold
1RP182882	Rural Residential Zone	Freehold
1RP193735	Rural Residential Zone	Freehold
1RP200778	Rural Residential Zone	Freehold
1SP172281	Rural Residential Zone	Freehold
2RP182882	Rural Residential Zone	Freehold
2RP200778	Rural Residential Zone	Freehold
2SP194868	Rural Residential Zone	Freehold
3RP182882	Rural Residential Zone	Freehold
3RP200778	Rural Residential Zone	Freehold
3SP194868	Rural Residential Zone	Freehold
4RP182882	Rural Residential Zone	Freehold
1RP881333	Rural Zone	Freehold
222SP197237	Rural Zone	Freehold
3RP133700	Rural Zone	Freehold
3RP881333	Rural Zone	Freehold
4RP133700	Rural Zone	Freehold
240SP224920	Sport and Recreation Zone	Reserve
Eudlo		
417CG4702	Community Facilities Zone (school)	Freehold
8RP811531	Community Facilities Zone	Freehold

LOTPLAN	SUNSHINE COAST PLANNING SCHEME ZONING	TENURE
50CP848476	Community Facilities Zone	Reserve
6RP906864	Local Centre Zone	Freehold
39RP28184	Low Density Residential Zone	Freehold
52RP867976	Open Space Zone	Freehold
7SP113225	Open Space Zone	Freehold
1CG3439	Rural Zone	Freehold
1RP199207	Rural Zone	Freehold
1RP208188	Rural Zone	Freehold
2RP208188	Rural Zone	Freehold
2RP80506	Rural Zone	Freehold
2RP911740	Rural Zone	Freehold
3RP40323	Rural Zone	Freehold
3RP838064	Rural Zone	Freehold
6RP885231	Rural Zone	Freehold
7RP43971	Rural Zone	Freehold
7RP885231	Rural Zone	Freehold
53RP867976	Sport and Recreation Zone	Freehold
Glass House Mountains		
1SP173407	Community Facilities Zone	Freehold
3RP174740	Community Facilities Zone	Freehold
4G5937	Community Facilities Zone	Reserve
931CP860399	Community Facilities Zone	Reserve
14CG4880	Environmental Management and Conservation Zone	Reserve
15CG4945	Environmental Management and Conservation Zone	Reserve
10RP903247	Local Centre Zone	Freehold
1G5936	Local Centre Zone	Freehold
1RP101009	Local Centre Zone	Freehold
1RP127108	Local Centre Zone	Freehold
1RP138970	Local Centre Zone	Freehold
1RP144156	Local Centre Zone	Freehold
1RP70596	Local Centre Zone	Freehold
2RP101009	Local Centre Zone	Freehold
2RP127108	Local Centre Zone	Freehold
2RP138970	Local Centre Zone	Freehold
3RP113657	Local Centre Zone	Freehold
3RP127108	Local Centre Zone	Freehold
4RP127108	Local Centre Zone	Freehold
5G59310	Local Centre Zone	Freehold
6RP127108	Local Centre Zone	Freehold
7RP183318	Local Centre Zone	Freehold
8RP168054	Local Centre Zone	Freehold
0SP293257	Low Density Residential Zone	Freehold

LOTPLAN	SUNSHINE COAST PLANNING SCHEME ZONING	TENURE
0SP295893	Low Density Residential Zone	Freehold
10RP208082	Low Density Residential Zone	Freehold
11RP208105	Low Density Residential Zone	Freehold
19RP180427	Low Density Residential Zone	Freehold
1RP131077	Low Density Residential Zone	Freehold
1RP186674	Low Density Residential Zone	Freehold
20RP180427	Low Density Residential Zone	Freehold
20SP120252	Low Density Residential Zone	Freehold
21SP120252	Low Density Residential Zone	Freehold
22SP120252	Low Density Residential Zone	Freehold
2RP186674	Low Density Residential Zone	Freehold
32G5932	Low Density Residential Zone	Freehold
33G5932	Low Density Residential Zone	Freehold
3RP186674	Low Density Residential Zone	Freehold
4RP195746	Low Density Residential Zone	Freehold
6RP180426	Low Density Residential Zone	Freehold
6SP187659	Low Density Residential Zone	Freehold
7RP180426	Low Density Residential Zone	Freehold
7RP195746	Low Density Residential Zone	Freehold
7SP187659	Low Density Residential Zone	Freehold
8RP180426	Low Density Residential Zone	Freehold
8RP208105	Low Density Residential Zone	Freehold
9G59312	Low Density Residential Zone	Freehold
9RP180426	Low Density Residential Zone	Freehold
9RP202627	Low Density Residential Zone	Freehold
9SP187659	Low Density Residential Zone	Reserve
10RP166150	Rural Zone	Freehold
113CG3131	Rural Zone	Freehold
118CG1838	Rural Zone	Freehold
11RP222413	Rural Zone	Freehold
15RP202234	Rural Zone	Freehold
18RP208093	Rural Zone	Freehold
1RP124412	Rural Zone	Freehold
1RP194232	Rural Zone	Freehold
1RP807399	Rural Zone	Freehold
20RP153799	Rural Zone	Freehold
2RP137978	Rural Zone	Freehold
2RP203126	Rural Zone	Freehold
2RP7660	Rural Zone	Freehold
2RP807399	Rural Zone	Freehold
3RP127524	Rural Zone	Freehold
3RP135561	Rural Zone	Freehold

LOTPLAN	SUNSHINE COAST PLANNING SCHEME ZONING	TENURE
41CG2457	Rural Zone	Freehold
4RP7660	Rural Zone	Freehold
5RP139456	Rural Zone	Freehold
5RP195751	Rural Zone	Freehold
60SP100795	Rural Zone	Freehold
6RP163935	Rural Zone	Freehold
7RP139456	Rural Zone	Freehold
8RP127524	Rural Zone	Freehold
8RP163935	Rural Zone	Freehold
8RP166150	Rural Zone	Freehold
916CG2457	Rural Zone	Freehold
97C311431	Rural Zone	Freehold
9RP166150	Rural Zone	Freehold
1CP887637	Sport and Recreation Zone	Freehold
Landsborough		
14L2588	Community Facilities Zone	Freehold
19CG815018	Community Facilities Zone (Landsborough state school)	Freehold
1RP3389	Community Facilities Zone	Freehold
201SP156678	Community Facilities Zone	Freehold
23RP45367	Community Facilities Zone	Freehold
24RP45367	Community Facilities Zone	Freehold
3RP145460	Community Facilities Zone	Freehold
5RP3388	Community Facilities Zone	Freehold
202SP156678	Community Facilities Zone	Reserve
2L2588	Community Facilities Zone	Reserve
513CG6425	Community Facilities Zone	Reserve
514CP835985	Community Facilities Zone	Reserve
2RP208083	Emerging Community Zone	Freehold
1CG4850	Environmental Management and Conservation Zone	State Land
3RP145504	Limited Development (Landscape Residential) Zone	Freehold
3RP208083	Limited Development (Landscape Residential) Zone	Freehold
6L25819	Limited Development (Landscape Residential) Zone	Freehold
0BUP104310	Local Centre Zone	Freehold
0BUP12273	Local Centre Zone	Freehold
0BUP6643	Local Centre Zone	Freehold
0BUP7500	Local Centre Zone	Freehold
0GTP998	Local Centre Zone	Freehold
0SP209849	Local Centre Zone	Freehold
12L2588	Local Centre Zone	Freehold
12RP8439	Local Centre Zone	Freehold
1BUP104310	Local Centre Zone	Freehold
1BUP12273	Local Centre Zone	Freehold

LOTPLAN	SUNSHINE COAST PLANNING SCHEME ZONING	TENURE
1BUP6643	Local Centre Zone	Freehold
1BUP7500	Local Centre Zone	Freehold
1GTP998	Local Centre Zone	Freehold
1RP195540	Local Centre Zone	Freehold
1RP47512	Local Centre Zone	Freehold
1RP55228	Local Centre Zone	Freehold
1RP62782	Local Centre Zone	Freehold
1RP78658	Local Centre Zone	Freehold
1SP209849	Local Centre Zone	Freehold
2BUP104310	Local Centre Zone	Freehold
2BUP12273	Local Centre Zone	Freehold
2BUP6643	Local Centre Zone	Freehold
2BUP7500	Local Centre Zone	Freehold
2GTP998	Local Centre Zone	Freehold
2RP195540	Local Centre Zone	Freehold
2RP55228	Local Centre Zone	Freehold
2RP62782	Local Centre Zone	Freehold
2SP209849	Local Centre Zone	Freehold
3BUP104310	Local Centre Zone	Freehold
3BUP12273	Local Centre Zone	Freehold
3BUP6643	Local Centre Zone	Freehold
3BUP7500	Local Centre Zone	Freehold
3GTP998	Local Centre Zone	Freehold
3RP217605	Local Centre Zone	Freehold
3RP62782	Local Centre Zone	Freehold
3SP209849	Local Centre Zone	Freehold
4BUP104310	Local Centre Zone	Freehold
4BUP12273	Local Centre Zone	Freehold
4BUP6643	Local Centre Zone	Freehold
4GTP998	Local Centre Zone	Freehold
4RP217605	Local Centre Zone	Freehold
4SP209849	Local Centre Zone	Freehold
5BUP104310	Local Centre Zone	Freehold
5BUP12273	Local Centre Zone	Freehold
5RP217605	Local Centre Zone	Freehold
66RP8439	Local Centre Zone	Freehold
68SP176891	Local Centre Zone	Freehold
6BUP104310	Local Centre Zone	Freehold
6BUP12273	Local Centre Zone	Freehold
6RP858465	Local Centre Zone	Freehold
70RP8439	Local Centre Zone	Freehold
7BUP104310	Local Centre Zone	Freehold

LOTPLAN	SUNSHINE COAST PLANNING SCHEME ZONING	TENURE
7BUP12273	Local Centre Zone	Freehold
7RP145460	Local Centre Zone	Freehold
8BUP104310	Local Centre Zone	Freehold
8BUP12273	Local Centre Zone	Freehold
8RP179372	Local Centre Zone	Freehold
9BUP12273	Local Centre Zone	Freehold
9RP183302	Local Centre Zone	Freehold
10RP801987	Low Density Residential Zone	Freehold
11RP801987	Low Density Residential Zone	Freehold
12SP290341	Low Density Residential Zone	Freehold
13SP290341	Low Density Residential Zone	Freehold
14SP290341	Low Density Residential Zone	Freehold
15SP290341	Low Density Residential Zone	Freehold
16SP290341	Low Density Residential Zone	Freehold
17SP290341	Low Density Residential Zone	Freehold
1RP111079	Low Density Residential Zone	Freehold
1RP145504	Low Density Residential Zone	Freehold
22RP213968	Low Density Residential Zone	Freehold
23SP129708	Low Density Residential Zone	Freehold
24L2589	Low Density Residential Zone	Freehold
25L2589	Low Density Residential Zone	Freehold
26RP213968	Low Density Residential Zone	Freehold
27RP213968	Low Density Residential Zone	Freehold
29RP213968	Low Density Residential Zone	Freehold
2RP145504	Low Density Residential Zone	Freehold
2RP3388	Low Density Residential Zone	Freehold
36L2589	Low Density Residential Zone	Freehold
3RP111079	Low Density Residential Zone	Freehold
3RP55228	Low Density Residential Zone	Freehold
3SP201520	Low Density Residential Zone	Freehold
4L2585	Low Density Residential Zone	Freehold
4RP3388	Low Density Residential Zone	Freehold
53RP45367	Low Density Residential Zone	Freehold
54RP45367	Low Density Residential Zone	Freehold
56RP45367	Low Density Residential Zone	Freehold
56SP159196	Low Density Residential Zone	Freehold
57RP45367	Low Density Residential Zone	Freehold
57SP159196	Low Density Residential Zone	Freehold
58SP159196	Low Density Residential Zone	Freehold
59SP159196	Low Density Residential Zone	Freehold
5RP55228	Low Density Residential Zone	Freehold
60SP159196	Low Density Residential Zone	Freehold

LOTPLAN	SUNSHINE COAST PLANNING SCHEME ZONING	TENURE
64SP159196	Low Density Residential Zone	Freehold
66RP45367	Low Density Residential Zone	Freehold
67RP45367	Low Density Residential Zone	Freehold
69SP159196	Low Density Residential Zone	Freehold
6L25816	Low Density Residential Zone	Freehold
6RP155823	Low Density Residential Zone	Freehold
70SP159196	Low Density Residential Zone	Freehold
7RP155823	Low Density Residential Zone	Freehold
9RP179372	Low Density Residential Zone	Freehold
14RP8439	Medium Density Residential Zone	Freehold
15RP8439	Medium Density Residential Zone	Freehold
1BUP5392	Medium Density Residential Zone	Freehold
2BUP5392	Medium Density Residential Zone	Freehold
63RP8439	Medium Density Residential Zone	Freehold
64RP8439	Medium Density Residential Zone	Freehold
75RP8439	Medium Density Residential Zone	Freehold
0BUP101147	Medium Impact Industry Zone	Freehold
1BUP101147	Medium Impact Industry Zone	Freehold
2BUP101147	Medium Impact Industry Zone	Freehold
36RP45367	Medium Impact Industry Zone	Freehold
37RP45367	Medium Impact Industry Zone	Freehold
38RP45367	Medium Impact Industry Zone	Freehold
39RP45367	Medium Impact Industry Zone	Freehold
40RP45367	Medium Impact Industry Zone	Freehold
41RP45367	Medium Impact Industry Zone	Freehold
8RP201396	Medium Impact Industry Zone	Freehold
46RP45367	Medium Impact Industry Zone/Open Space Zone	Freehold
100SP100138	Open Space Zone	Freehold
201SP156669	Open Space Zone	Freehold
202SP156669	Open Space Zone	Freehold
203SP156669	Open Space Zone	Freehold
204SP156669	Open Space Zone	Freehold
90RP817394	Open Space Zone	Freehold
1RP169699	Rural Residential Zone	Freehold
1RP177461	Rural Residential Zone	Freehold
26SP156669	Rural Residential Zone	Freehold
27SP156669	Rural Residential Zone	Freehold
2RP169699	Rural Residential Zone	Freehold
2RP177461	Rural Residential Zone	Freehold
39SP156669	Rural Residential Zone	Freehold
3RP177461	Rural Residential Zone	Freehold
40SP156669	Rural Residential Zone	Freehold

LOTPLAN	SUNSHINE COAST PLANNING SCHEME ZONING	TENURE
41SP156669	Rural Residential Zone	Freehold
50RP902961	Rural Residential Zone	Freehold
52SP156669	Rural Residential Zone	Freehold
53SP156669	Rural Residential Zone	Freehold
54SP156669	Rural Residential Zone	Freehold
82SP171473	Rural Residential Zone	Freehold
83SP171473	Rural Residential Zone	Freehold
84SP171473	Rural Residential Zone	Freehold
89RP817394	Rural Residential Zone	Freehold
97SP171473	Rural Residential Zone	Freehold
98SP171473	Rural Residential Zone	Freehold
99SP171473	Rural Residential Zone	Freehold
BSP280929	Rural Zone	Covenant
CSP280929	Rural Zone	Covenant
257SP280929	Rural Zone	Freehold
258SP280929	Rural Zone	Freehold
2RP77023	Rural Zone	Freehold
20RP45367	Specialised Centre Zone	Freehold
21RP45367	Specialised Centre Zone	Freehold
22RP45367	Specialised Centre Zone	Freehold
25RP45367	Specialised Centre Zone	Freehold
29RP45367	Specialised Centre Zone	Freehold
83RP183473	Specialised Centre Zone	Freehold
84RP183473	Specialised Centre Zone	Freehold
25RP214535	Sport and Recreation Zone	Freehold
Mooloolah Valley		
1RP8474	Local Centre Zone	Freehold
1SP119729	Local Centre Zone	Freehold
2RP8477	Local Centre Zone	Freehold
36SP159377	Local Centre Zone	Freehold
21RP8479	Low Density Residential Zone	Freehold
22RP8479	Low Density Residential Zone	Freehold
23RP8479	Low Density Residential Zone	Freehold
24RP8479	Low Density Residential Zone	Freehold
25RP8479	Low Density Residential Zone	Freehold
Nambour		
2RP224422	Community Facilities Zone	Freehold
3RP802185	Community Facilities Zone	Freehold
1RP92814	Major Centre Zone	Freehold
2RP104480	Major Centre Zone	Freehold
2RP81009	Major Centre Zone	Freehold
2SP173065	Major Centre Zone	Freehold

LOTPLAN	SUNSHINE COAST PLANNING SCHEME ZONING	TENURE
3RP182277	Major Centre Zone	Freehold
3RP62838	Major Centre Zone	Freehold
4CG2097	Major Centre Zone	Freehold
4SP115741	Major Centre Zone	Freehold
5RP62838	Major Centre Zone	Freehold
693CG2097	Major Centre Zone	Freehold
6RP62838	Major Centre Zone	Freehold
7RP62838	Major Centre Zone	Freehold
0BUP12479	Medium Density Residential Zone	Freehold
1BUP12479	Medium Density Residential Zone	Freehold
2BUP12479	Medium Density Residential Zone	Freehold
3BUP12479	Medium Density Residential Zone	Freehold
Palmwoods		
1RP107111	Community Facilities Zone	Freehold
2P44518	Community Facilities Zone	Reserve
00000SP125388	Local Centre Zone	Freehold
10RP40559	Local Centre Zone	Freehold
17RP161119	Local Centre Zone	Freehold
18SP110912	Local Centre Zone	Freehold
1SP170745	Local Centre Zone	Freehold
1SP170766	Local Centre Zone	Freehold
20RP178340	Local Centre Zone	Freehold
21RP178340	Local Centre Zone	Freehold
2RP111965	Local Centre Zone	Freehold
2RP132322	Local Centre Zone	Freehold
2RP141433	Local Centre Zone	Freehold
45RP903227	Local Centre Zone	Freehold
415CG1621	Local Centre Zone	Reserve
11P4456	Low Density Residential Zone	Freehold
12P4456	Low Density Residential Zone	Freehold
13P4456	Low Density Residential Zone	Freehold
1RP188612	Low Density Residential Zone	Freehold
1RP67507	Low Density Residential Zone	Freehold
2RP207507	Low Density Residential Zone	Freehold
2RP41517	Low Density Residential Zone	Freehold
2RP67507	Low Density Residential Zone	Freehold
3RP806877	Low Density Residential Zone	Freehold
3SP263638	Low Density Residential Zone	Freehold
409P4458	Low Density Residential Zone	Freehold
4RP226770	Low Density Residential Zone	Freehold
5SP110889	Low Density Residential Zone	Freehold
6P4456	Low Density Residential Zone	Freehold

LOTPLAN	SUNSHINE COAST PLANNING SCHEME ZONING	TENURE
7SP110889	Low Density Residential Zone	Freehold
2P44512	Low Impact Industry Zone	Freehold
3P44512	Low Impact Industry Zone	Freehold
4P44517	Low Impact Industry Zone	Freehold
5P44517	Low Impact Industry Zone	Freehold
6P44517	Low Impact Industry Zone	Freehold
7P44517	Low Impact Industry Zone	Freehold
0SP107547	Medium Density Residential Zone	Freehold
0SP125388	Medium Density Residential Zone	Freehold
100SP263638	Medium Density Residential Zone	Freehold
1SP107547	Medium Density Residential Zone	Freehold
2SP107547	Medium Density Residential Zone	Freehold
2SP125388	Medium Density Residential Zone	Freehold
3SP107547	Medium Density Residential Zone	Freehold
4SP107547	Medium Density Residential Zone	Freehold
1P44512	Open Space Zone	Reserve
368CP893394	Open Space Zone	State Land
1RP223607	Rural Zone	Freehold
2SP157051	Rural Zone	Freehold
Woombye		
2RP77601	Community Facilities Zone	Freehold
505CP895096	Community Facilities Zone	Reserve
900SP201808	Environmental Management and Conservation Zone	Freehold
4RP77601	Local Centre Zone	Freehold
14RP152215	Low Density Residential Zone	Freehold
15RP152215	Low Density Residential Zone	Freehold
16RP152215	Low Density Residential Zone	Freehold
17RP152215	Low Density Residential Zone	Freehold
18RP864884	Low Density Residential Zone	Freehold
19RP864884	Low Density Residential Zone	Freehold
1RP149481	Low Density Residential Zone	Freehold
20RP864884	Low Density Residential Zone	Freehold
2RP220194	Low Density Residential Zone	Freehold
2SP297260	Low Density Residential Zone	Freehold
375SP289035	Low Density Residential Zone	Freehold
4RP152215	Low Density Residential Zone	Freehold
5RP152215	Low Density Residential Zone	Freehold
5SP201808	Low Density Residential Zone	Freehold
6RP152215	Low Density Residential Zone	Freehold
6RP56696	Low Density Residential Zone	Freehold
6RP74709	Low Density Residential Zone	Freehold
6SP201808	Low Density Residential Zone	Freehold

LOTPLAN	SUNSHINE COAST PLANNING SCHEME ZONING	TENURE
7RP152215	Low Density Residential Zone	Freehold
7SP201808	Low Density Residential Zone	Freehold
8RP122093	Low Density Residential Zone	Freehold
503CP895096	Open Space Zone	Reserve
504CP895096	Open Space Zone	Reserve
100SP188247	Rural Zone	Freehold
1RP149059	Rural Zone	Freehold
794C311688	Rural Zone	Freehold
1SP208675	Sport and Recreation Zone	Reserve
2SP208675	Sport and Recreation Zone	Reserve