

APPENDIX

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INLAND
RAIL 

Operational Railway Noise and Vibration Technical Report

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

INLAND RAIL—BORDER TO GOWRIE

Operational Railway Noise and Vibration Technical Report 0-0021-340-EMN-00-RP-0001

Prepared for:

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SLR Ref: 620.12209-R01
Version No: -v1.0
March 2020



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BASIS OF REPORT

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EXECUTIVE SUMMARY

The Melbourne to Brisbane Inland Rail Program is the construction of a 1,700 km rail freight transport network including; 1,200 km of enhanced and upgraded tracks and 500 km of new railways in regional Victoria, New South Wales (NSW) and Queensland (QLD). As part of the Inland Rail program, the Border to Gowrie (B2G) project section (the Project) in QLD is a new single track railway, approximately 216.2 kilometres (km) in length connecting the North Star to Border and Gowrie to Helidon project sections on the Inland Rail Program.

The Project is a 216.2 km section of new single track railway between the NSW/QLD border and Gowrie, in Queensland. The Project is comprised of 7.0 km of standard gauge rail (1,435 mm) and 209.2 km of dual standard/narrow gauge rail (1,435 mm standard and 1,067 mm narrow). The new railway will be positioned within approximately 145.0 km of new rail corridor (greenfield) and approximately 71.2 km of existing rail corridor (brownfield), currently utilised by Queensland Rail's South Western Line and Millmerran Branch Line.

Proposed railway operations include daytime and night-time train movements on the Project alignment and the management of trains at five new crossing loops. The movement of rail freight on the Project is a source of noise and vibration that could impact sensitive receptors and the surrounding environment. This report provides an assessment of potential noise and vibration levels from forecast daily rail freight operations for the Project.

This report has been prepared as part of the Environmental Impact Statement (EIS) for the Project and it addresses the applicable requirements of the final Terms of Reference for the EIS for the Project as issued by The Department of State Development, Manufacturing, Infrastructure and Planning in December 2017.

The report has referenced guidelines from the Department of Transport and Main Roads (DTMR) and Australian and international standards to assess the likely railway noise and vibration levels and inform the appropriate management of railway noise and vibration impacts.

The assessment of noise and vibration from the construction of the Project, fixed infrastructure and associated road traffic is detailed in Appendix N: Non-operational Noise and Vibration Technical Report of the EIS.

Railway noise

A detailed noise prediction model for the Project designs and the surrounding environment was developed to assess airborne noise from railway operations on the main line tracks, at level crossings and on crossing loops. The noise model covered an area 2 km either side of the alignment, which comprised a total area approximately 120 km² in size and approximately 1,600 individual sensitive receptors.

The model adopted a database of noise emission levels for the specific locomotives and wagons proposed on the Project. Noise modelling approaches were applied to account for the varying rail noise emissions along the alignment, including; the track gradients, train speeds and features such as road crossings and turnouts.

Noise levels for the proposed daytime and night-time railway operations at project opening (2026) and the design year (2040) were predicted to achieve the airborne railway noise assessment criteria from the DTMR and ARTC at the majority of the sensitive receptors.

The predicted noise levels were above the noise assessment criteria at 130 sensitive residential receptors for railway operations at the project opening (2026) and at 131 sensitive residential receptors (an additional one sensitive residential receptor) at the design year (2040). The predicted noise levels trigger the assessment criteria by less than 5 dBA (decibels) at approximately half of these sensitive receptors. The highest forecast railway noise level was 17 dBA above the relevant ARTC noise assessment criteria.

There are also up to five non-residential sensitive receptors where noise levels are forecast to trigger relevant assessment criteria.

Applying the predicted noise levels and the location of the sensitive receptors outside of the main townships; the reasonable and practicable measures adopted by ARTC to reduce railway noise impacts, beyond controlling railway noise at its source, are expected to be at-property controls such as architectural property treatments and upgrades to property fencing.

For the townships of Yelarbon, Brookstead and Pittsworth the predicted noise levels and location of sensitive receptors were conducive for the consideration of railway noise barrier mitigations. Conceptual railway noise barriers have been reviewed in the assessment to assist ARTC in determining the reasonable and practicable measures to reduce and control railway noise within the more populated townships.

The analysis determined that noise barriers would need to be at least 4 m in height to achieve a reasonable reduction in both L_{Aeq} and L_{Amax} noise levels and achieve the noise criteria at many of the nearest sensitive receptors. The noise barrier options identified potential constraints to reducing noise levels and the noise barrier concepts will require detailed investigation, including further noise prediction modelling, during the detail design and construction of the Project.

Whether at-property controls or other alternative noise mitigation measures are required will ultimately be determined through the detail design of the Project. This will include further railway noise modelling, analysis of engineering and environmental constraints, consultation with directly affected landowners and the verification of railway noise levels once Inland Rail operations commence on the Project.

Vibration from train movements

The daily train passbys on the Project can be a potential source of vibration and associated ground-borne noise. An assessment of ground-borne vibration was undertaken to identify where railway induced vibration and its effects may be a potential source of impact. The ground-borne vibration levels associated with train movements were assessed to achieve the relevant vibration criteria at all sensitive receptors.

There were three sensitive receptors within 50 m of the main line where the ground-borne noise criteria were forecast to be triggered. At these receptors the predicted levels are relatively low, and the noise environment is expected to be dominated by the airborne railway noise. If required, the detail design may need to investigate specific localised options to modify the trackform design to include measures to dampen vibration energy at source.

Summary

Assuming the detail design remains consistent with this assessment, the Project is expected to achieve the objectives of the DTMR policy and guidelines for the management of noise and vibration from railway operations at the majority of sensitive receptors. The best practice mitigation measures available to the Project are also expected to assist in reducing noise and vibration levels at receptors and provide the reasonable and practical control of potential impacts.

Nonetheless, achieving the criteria does not preclude the potential for noise and vibration during train passbys to be perceptible at sensitive receptors in the context of the quiet rural areas along the Project alignment.

Recommendations

Based on the assessment outcomes, key recommendations for the management of railway noise and vibration are:

- Review the reasonable and practicable noise and vibration mitigation options discussed in this report during the detail design and construction stages of the Project. Mitigation options include modifications to trackform and noise screening elements, in addition to at-property treatments for identified sensitive receptors.
- Allow for the vibration mitigation measures modelled in this report including the ballasted track over bridge and viaducts to consider suitable resilient matting for ballast retention and vibration isolation.
- Further validate the noise and vibration prediction models and update forecasts during the detail design of the Project.

The operational railway noise and vibration levels will be verified through noise and vibration monitoring once the Project is operational. ARTC will investigate reasonable and practicable mitigation measures where monitored operational noise and/or vibration levels at sensitive receptors are confirmed to be above adopted railway noise and vibration criteria.

ACRONYMS

Term	Definition
ARTC	Australian Rail Track Corporation
AS	Australian Standard
B2G	NSW/ QLD Border to Gowrie project
BS	British Standard
dBA	A-weighted decibel (referenced 20 μ Pa)
dBm	Decibel per metre.
dBV	Vibration expressed as decibels (referenced level 1 nanometre/second)
DIN	Deutsches Institut für Normung (German Institute for Standardisation)
DTMR	Department of Transport and Main Roads
EIS	Environmental Impact Statement
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EA	Environmental Authority
G2H	Gowrie to Helidon project
HDPE	High Density Polyethylene
Hz	Hertz
ISO	International Standards Organisation
Km	Kilometres
Km/h	Kilometres per hour
Km ²	Square kilometres
LAeq	Equivalent continuous sound level
LAeq(15hour)	The equivalent continuous sound level for the 15-hour daytime period of 7.00 am to 10.00 pm
LAeq(9hour)	The equivalent continuous sound level for the 9-hour daytime period of 10.00 pm to 7.00 am
LAeq(24hour)	The equivalent continuous sound level for the 24-hour period.
LAeq(12hour)	The equivalent continuous sound level for the 12-hour daytime period of 6.00 am to 6.00 pm
LAeq(1hour)	The equivalent continuous sound level for the busiest 1-hour period.
LAeq(T)	The equivalent continuous sound level for a defined time period 'T'.
LAmx	The maximum sound level during the measurement or assessment period. The LAFmax or Fast is averaged over 0.125 of a second and the LASmax or Slow is averaged over 1-second.
m	Metres
mm	Millimetres
mm/s	Millimetres per second
m/s	Metres per second
NS2B	North Start to Border project
NSW	New South Wales
PPV	Peak Particle Velocity
QLD	Queensland

Term	Definition
SDPWO	<i>State Development and Public Works Organisation Act 1971</i>
SEL	Sound Exposure Level
SEM	Single Event Maximum
TfNSW	Transport for New South Wales
ToR	Terms of Reference
VDV	Vibration Dose Value
Vppv	Vector peak particle velocity, which is the peak particle velocity calculated from the sum of the vibration in three directions; longitudinal, transverse and diagonal.

GLOSSARY OF PROJECT TERMINOLOGY

Term	Definition
Active level crossing	Where the movement of vehicular or pedestrian traffic across a railway crossing is controlled using signs or devices such as flashing signals, gates or barriers (or combination of these). The device(s) are active prior to, and during, the passage of the train through the crossing.
Airborne noise	Sound (noise) which travels through the air and commonly describes noise experienced within the outdoor environment.
Ballast	Crushed rock and stone used to provide a foundation for railway track. It usually forms the bed on which railway sleepers are laid, transmits the load from the train movements to the formation and restrains the track from movement.
Bunching and stretching	Wagons can touch from coming together or make a noise when they stretch and pull apart.
Consist	The set of wagons or carriages that form the train.
Continuously welded rail	Continuously welded rail shall be constructed on Inland Rail, and due to there being fewer joints, trains can travel faster on continuously welded steel rails than on jointed rails. The continuously welded rail can reduce noise and vibration emissions from passing trains.
Crossing loop	A place on a single line railway where trains travelling in the opposite direction can pass each other.
Culvert	A structure that allows water to flow under a road, railway, track or similar obstruction.
Existing rail corridor	The corridor within existing rail infrastructure are located. The existing rail corridor is defined by ARTC to mean everywhere within 15 metres of the outermost rails; or within the boundary fence (where fences are provided) and are closer than 15 metres. If the property boundary is less than 15 metres, the corridor is defined as the property boundary or a permanent structure such as a fence, wall or level crossing separating the operating rail corridor from other land.
Formation	The earthworks/ material on which the ballast, sleepers and tracks are laid.
Ground-borne noise	Railway vibration in buildings at frequencies typically from about 30 Hz to about 200 Hz, can excite the floors and walls which then radiate a rumbling noise directly into the rooms. This ground-borne (or structure-borne) noise is managed where it occurs without the masking from the airborne rail noise.
Level crossing	A place where rail lines and a road cross at the same elevation.
Passive level crossing	Where the movement of vehicular or pedestrian traffic across a railway crossing is controlled using signs or devices that are not activated by the approach or passage of a train, relying on the road user or pedestrian to detect the approach or presence of a train by direct observation.
Practicable	Relates to engineering considerations, what can practically be built (e.g. safety, access, site constraints).
Rail corridor	The corridor within which the rail tracks and associated infrastructure are located.
Rail dampers	Elements that are attached to the sides of the rails to improve the rail's ability to absorb and dissipate vibration energy that results from the rolling contact between the wheel and rail.
Rail pads	Rail pads are plastic or rubber mats that are inserted between the rails and the sleepers. Their purpose is to evenly distribute the load from passing trains onto the sleepers. They can also act to reduce noise and vibration emissions from passing trains.
Rating background level	The underlying level of noise present in an area once transient and short-term noise events are filtered out.

Term	Definition
Reasonable	Selecting reasonable measures from those that are feasible involves judging whether the overall noise benefits outweigh adverse social, economic and environmental effects, including the cost of the measure.
Rollingstock	All rail vehicles operating on the rail lines.
Rolling noise	Noise emissions from the rolling of the wheels on the rail.
Sensitive receptors	Land uses detailed in railway noise and vibration guidelines which are sensitive to potential noise and vibration impacts, such as residential dwellings, schools and hospitals.
Track	The structure consisting of rails, fasteners, sleepers and ballast, which sits on the formation.
Turnout	A junction point where a rail vehicle can leave a given track for a branching or parallel track.

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1 Introduction

1.1 Project overview

The New South Wales (NSW)/ Queensland (QLD) Border to Gowrie project (the Project) is a new railway infrastructure project providing a connection between the North Start to Border (NS2B) Inland Rail project and the Gowrie to Helidon (G2H) Inland Rail project.

The Project starts at the connection with the NS2B Inland Rail project at the NSW/QLD border, approximately 30 km south of Yelarbon. The alignment runs northeast via Yelarbon, Inglewood, Millmerran, Pampas, Brookstead, Pittsworth, Southbrook and the Toowoomba Wellcamp Airport to Gowrie Junction, north west of Toowoomba. At Gowrie Junction the alignment connects with the G2H Inland Rail project

The Project is a 216.2 km section of new single track railway comprising 7.0 km of standard gauge rail (1,435 mm) and 209.2 km of dual standard/narrow gauge rail (1,435 mm standard and 1,067 mm narrow). The new railway will be positioned within approximately 145.0 km of new rail corridor (greenfield) and approximately 71.2 km of existing rail corridor (brownfield), currently utilised by Queensland Rail's (QR's) South Western Line and Millmerran Branch Line.

The Project design has been developed in response to environmental, engineering and social constraints. The design objectives were to minimise environmental impacts, minimise disturbance to existing infrastructure and utilities and meet the engineering design criteria. The key components of the Project include:

- Approximately 216.2 km of standard and dual gauge rail line with five crossing loops to accommodate the potential for trains up 3,600 m long, but initially constructed for 1,800 m long trains.
- A series of bridges and viaducts are required so the route can traverse the local topography and cross waterways and other infrastructure.
- The construction of associated rail infrastructure including maintenance sidings and signalling infrastructure to support the advanced train management system.
- Rail crossings including level crossings, grade separations/road overbridges, occupational/private crossings, fauna crossing structures.
- Significant embankments and cuttings will be required along the length of the alignment.
- Ancillary works including road and public utility crossings and realignments, signage and fencing and provision of services within the corridor.
- Construction worksites, laydown areas and access roads.

Construction of the project is planned to start in 2020 and is expected to be completed in 2026.

1.2 Relationship to the Inland Rail Program

The Project is one of 13 projects that make up the Inland Rail Program for the delivery of 1,700 km of rail line by 2026. It is one of five Inland Rail projects in QLD and is one of the “missing links” within the Inland Rail Program. As part of the broader Inland Rail Program, this Project provides a more direct route between Melbourne and metropolitan Brisbane in comparison with the existing inland and coastal road and rail networks and meets the Australian Government's objective of providing a long-term rail solution for competitive freight movement.

At commencement of operations, the Project will connect to the adjoining NS2B and G2H projects on the Inland Rail Program, and accommodate the use of double-stacked, 1,800 m long freight trains.

1.3 Operational rail noise and vibration assessment report

The Project has been declared as a coordinated project for which an Environmental Impact Statement (EIS) is required under section 26 (1) (a) of the *State Development Public Works Organisation Act 1971*. This assessment report forms part of the Border to Gowrie Project EIS to be provided to the Coordinator-General.

The Project is also a controlled action under the *Environment Protection and Biodiversity Conservation Act (1999)* and requires approval from the Commonwealth Minister for the Department of Agriculture Water and the Environment (previously the Department of Environment and Energy).

This report, prepared by SLR Consulting Australia Pty Ltd (SLR), details the assessment of potential noise and vibration emissions from the railway operations on the Project. The report addresses the environmental assessment requirements, as they relate to noise and vibration from railway operations, of the Terms of Reference¹ (ToR) for an environmental impact statement: Inland Rail – Border to Gowrie project November 2018.

The baseline noise and vibration surveys and assessment of noise and vibration from non-operational railway aspects of the project, including construction, road traffic and fixed infrastructure, have been addressed in a separate technical report².

1.4 Report limitations

The findings of this report are based on the current design and may change as the Project design progresses. Should the final design or conditions vary from the basis of this assessment, the noise and vibration levels and associated impacts may differ from the findings presented in this report.

Preliminary mitigation measures for railway noise and vibration have been presented in this assessment based on the adopted assessment criteria, identified sensitive receptors and the forecast noise and vibration emissions associated with the proposed future railway operations of the Project.

As the Project progresses through its detail design and construction phases a final set of mitigation measures will be developed by ARTC. This is expected to require further assessment of railway noise and vibration and the monitoring of railway noise and vibration at the opening of the Project.

¹ The Department of State Development, Manufacturing, Infrastructure and Planning, 2018, Terms of reference for an environmental impacts statement: Inland Rail – Border to Gowrie project, dated December 2018.

² Future Freight Joint Venture, 2020. Inland Rail: Phase 2 – Border to Gowrie, Appendix N – Non-operational Noise and Vibration Technical Report.

2 Border to Gowrie project description

2.1 Overview

The Project includes the establishment of approximately 216.2 km of new single track, dual gauge railway connecting the NS2B Inland Rail project with the G2H Inland Rail project. The alignment commences at the NSW/QLD border, approximately 30 km south of Yelarbon, and is within a new rail corridor for approximately 7 km where it ties into the South Western Line approximately 6 km west of Kurumbul.

The Project alignment follows the South Western Line for approximately 46 km to Whetstone where it deviates from the existing rail corridor into approximately 93 km of new rail corridor until it ties into the Millmerran Line near Yandilla.

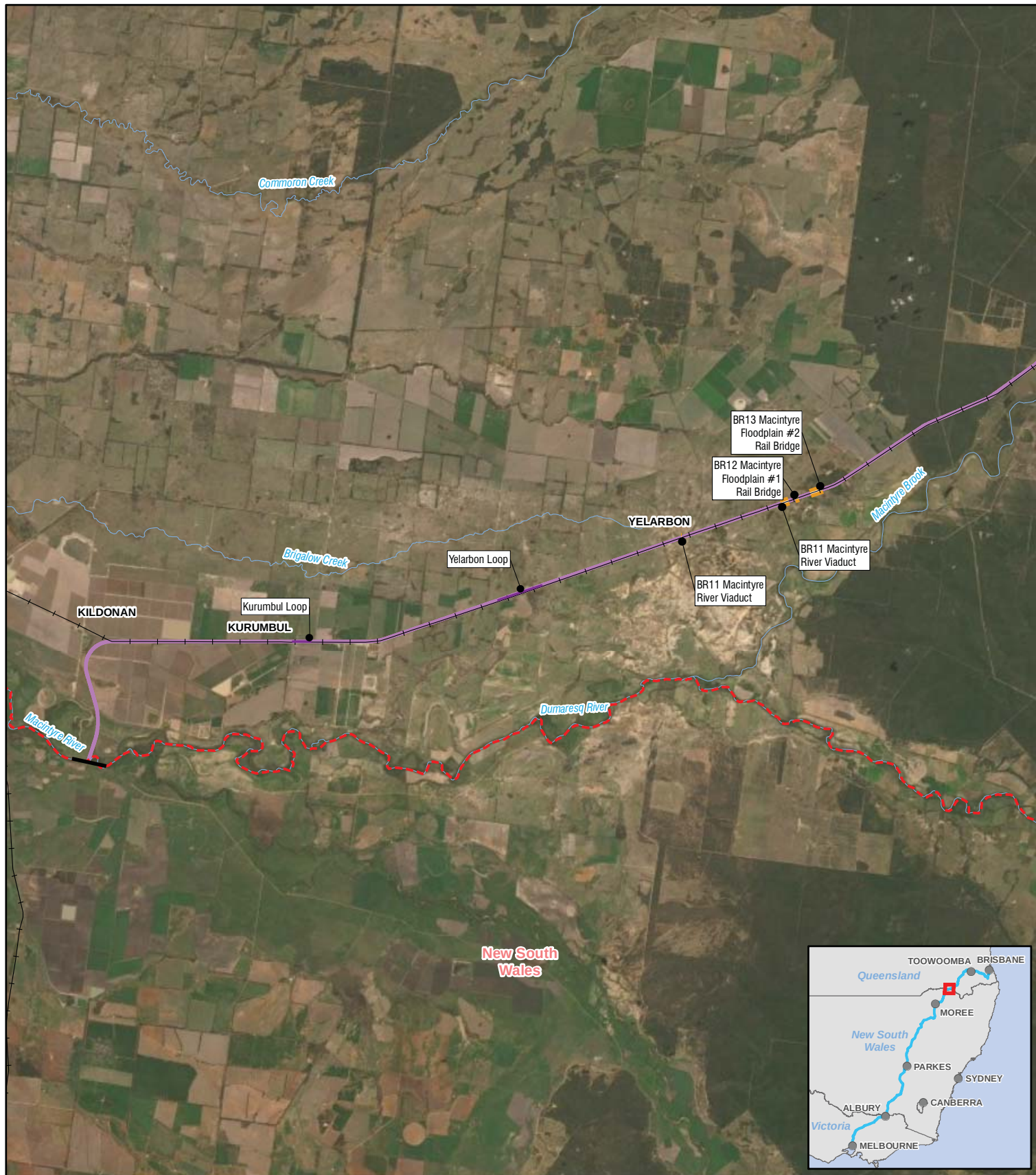
From Yandilla the alignment is within the existing rail corridor, through Pampas, until Brookstead where it deviates to a new rail corridor parallel to the existing rail corridor. To the east of Brookstead the alignment re-joins the existing rail corridor for a further 24 kms to Yarranlea where the project diverts to a new rail corridor for approximately 45 km to the Project extent at Gowrie Junction.

The design has been developed in response to environmental, engineering and social constraints. The design objective is to minimise environmental and social impacts, minimise disturbance to existing infrastructure and utilities, meet the engineering design criteria and realise Project benefits.

The key components of the Project are summarised in **Table 1**. The maps of the Project alignment along with the bridges and viaducts are presented in **Figure 1**.

Table 1 Key infrastructure for the B2G project

Key component	
Start and finish point	Border to Gowrie Junction in Queensland
Local government areas	Goondiwindi Regional Council and Toowoomba Regional Council
Length of alignment	216.2 km (145.0 km of new track and 71.2 km of upgraded track)
Track dimensions	Rail corridor is a minimum of 40 m wide, consisting of a single-track dual gauge railway line to facilitate rail traffic in both directions.
New level crossings	42 of which 18 are existing level crossings with 24 new level crossings.
New rail bridges and viaducts	34 of which 21 are rail bridges for crossing roads and waterways
Crossing loops	5 new loops initially up to 1,800 m in length at Ebenezer, Purga Creek, Washpool & Undullah.



BORDER TO GOWRIE

Overview of the Project

FIGURE 1 - Map 1 of 4

10 km

Coordinate System: GDA 1994 MGA Zone 56

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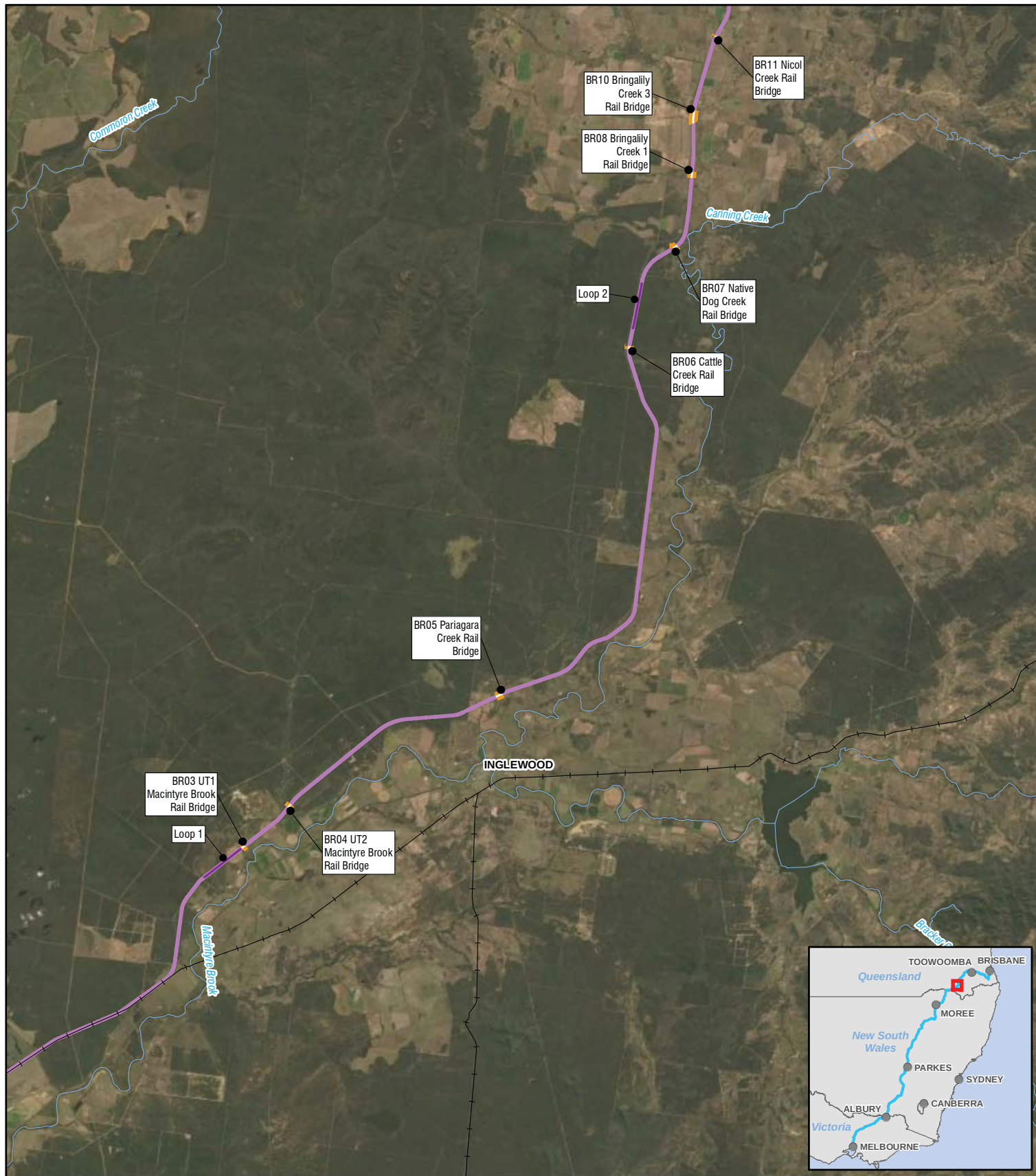
- Project Extent
- Watercourses
- +— Existing Railway
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:250,000

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BORDER TO GOWRIE

Overview of the Project

FIGURE 1 - Map 2 of 4

10 km

Coordinate System: GDA 1994 MGA Zone 56

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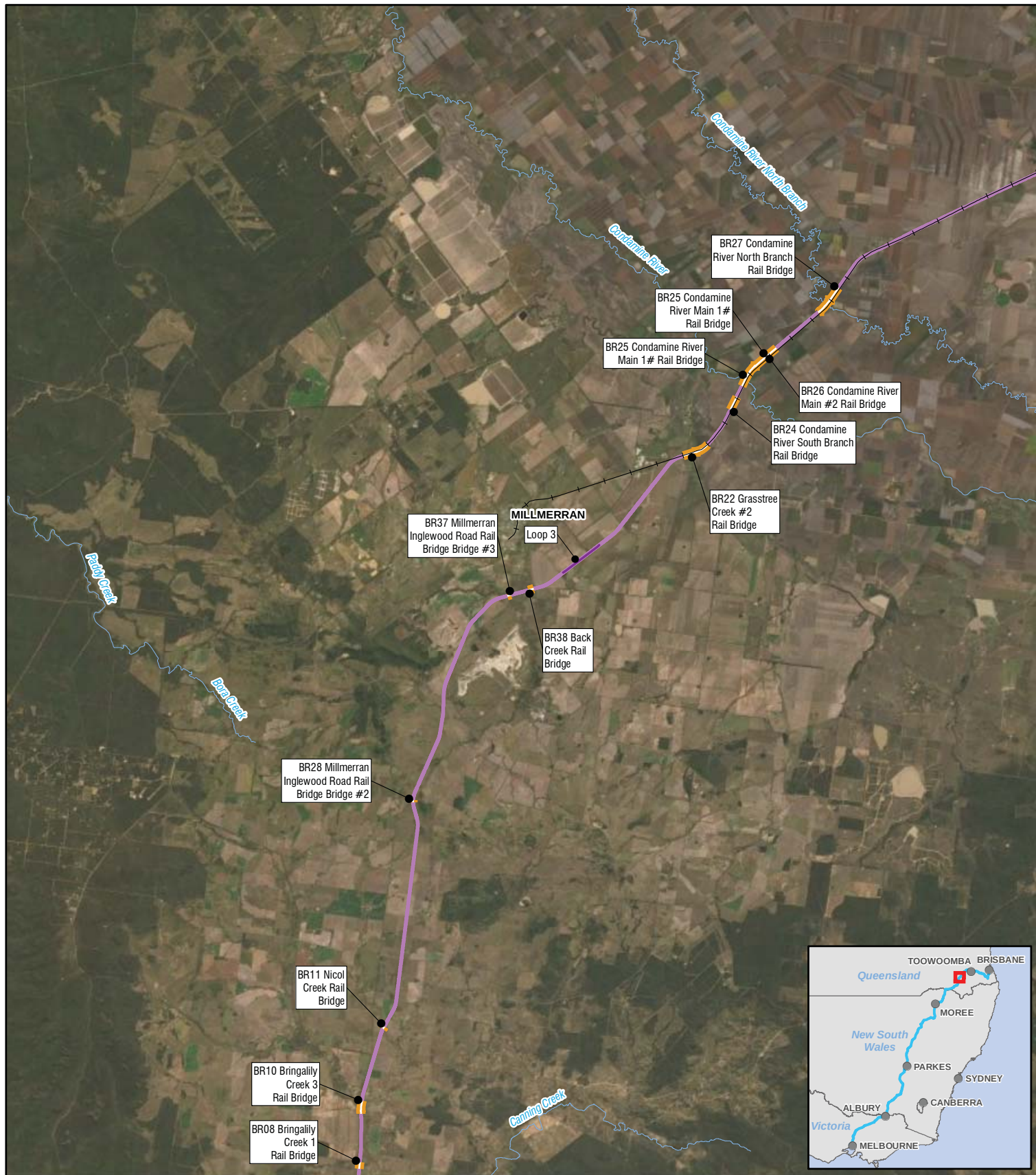
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:250,000

- Project Extent
- Watercourses
- +— Existing Railway
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

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BORDER TO GOWRIE

Overview of the Project

FIGURE 1 - Map 3 of 4

10 km

Coordinate System: GDA 1994 MGA Zone 56

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Scale: 1:250,000

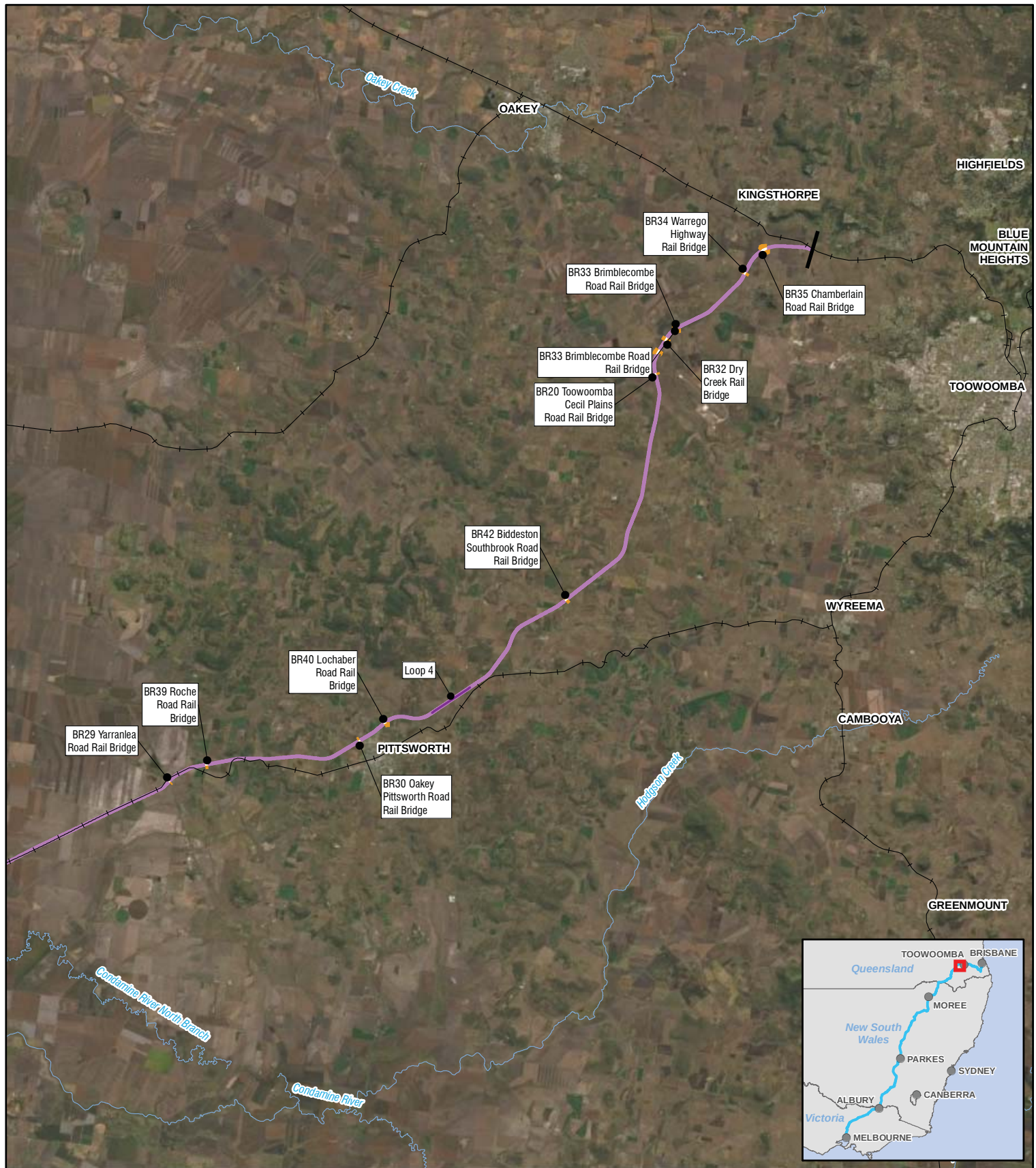
Date: 08-May-2020

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- Project Extent
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BORDER TO GOWRIE

Overview of the Project

FIGURE 1 - Map 4 of 4

10 km

Coordinate System: GDA 1994 MGA Zone 56

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ARTC **InlandRail**

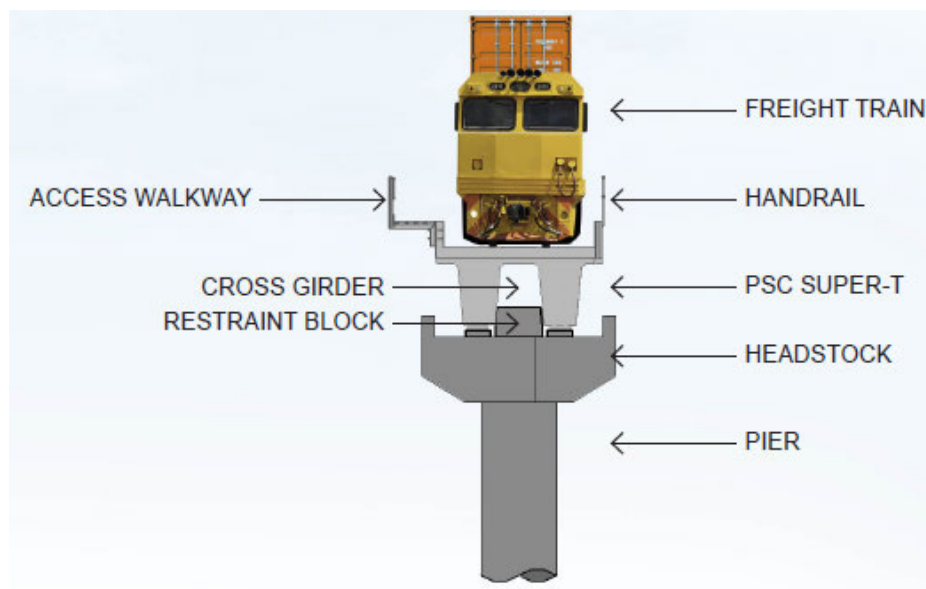
The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.

2.2 Rail bridges and viaducts

The Project requires 31 new bridge and viaduct structures of which 21 are for rail to cross over roads and waterways and 13 are to enable roads to cross over the rail corridor. The bridge and viaduct superstructures include the track system, walkways, guard rails and barriers as appropriate, and are typically founded on piles supporting in-situ reinforced concrete substructures.

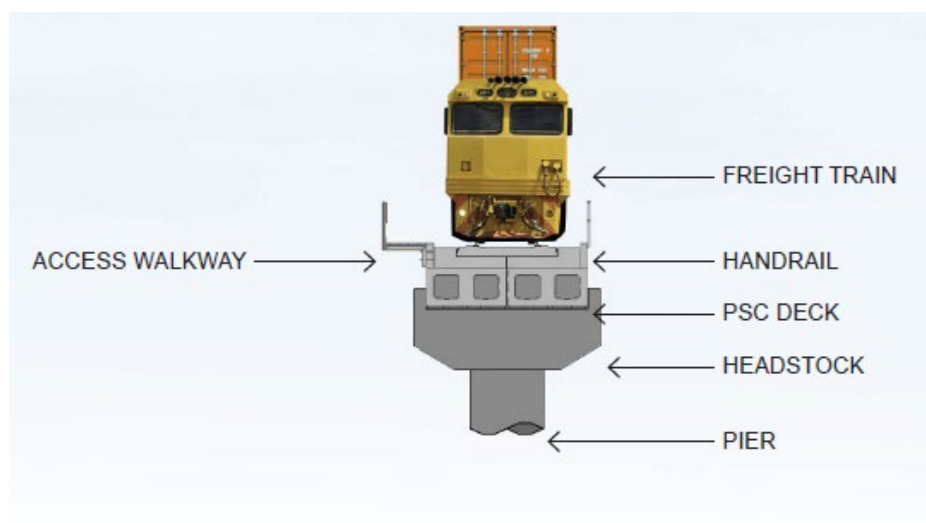
Currently the designs indicate that the deck spans will typically be between 14 m and 46 m in length, noting that most bridges are made up of multiple spans. The sub-formation and ballast height will be approximately the same as the deck edge resulting in minimal screening of noise by the bridge structures. The bridges can be Super-T girders or pre-stressed concrete slab spans as illustrated in **Figure 2** and **Figure 3**.

Figure 2 Typical pier with pre-stressed concrete Super-T girder



Note Not shown to scale.

Figure 3 Typical pier with pre-stressed concrete slab span



Note Not shown to scale.

The details of the 31 bridges and viaducts is provided in **Table 2** and the location of the bridges and viaducts is presented in **Figure 1**.

Table 2 Rail bridges and viaducts on the Project

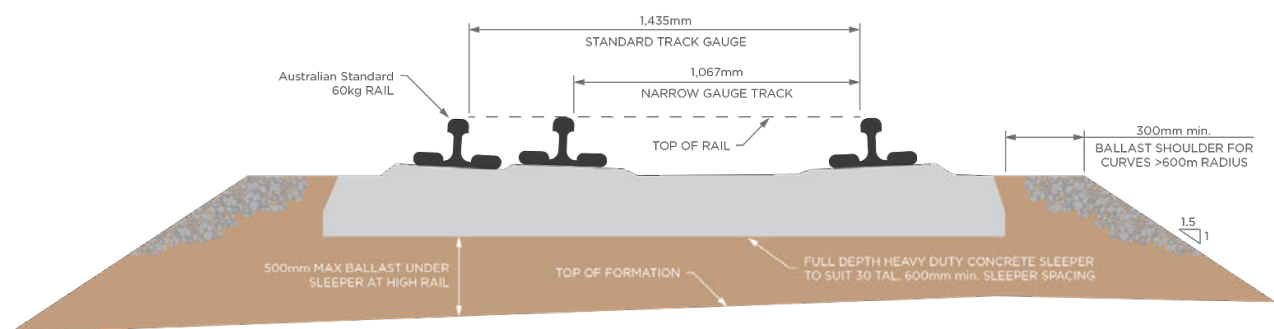
Bridge name	Crossing type	Bridge length, m
Macintyre River Viaduct	Waterway	435 m
Macintyre Floodplain #1 Rail Bridge	Waterway	140 m
Macintyre Floodplain #2 Rail Bridge	Waterway	546 m
UT1 Macintyre Brook Rail Bridge	Waterway	207 m
UT2 Macintyre Brook Rail Bridge	Waterway	207 m
Pariagara Creek Rail Bridge	Waterway	345 m
Cattle Creek Rail Bridge	Waterway	138 m
Native Dog Creek Rail Bridge	Waterway	184
Bringalily Creek 1 Rail Bridge	Waterway	299 m
Bringalily Creek 3 Rail Bridge	Waterway	621 m
Nicol Creek Rail Bridge	Waterway & road	92 m
Millmerran Inglewood Road Rail Bridge #2	Road	75 m
Millmerran Inglewood Road Rail Bridge #3	Road	167 m
Back Creek Rail Bridge (new location)	Waterway	230 m
Grasstree Creek #1 Rail Bridge	Waterway	336 m
Grasstree Creek #2 Rail Bridge	Waterway	952 m
Condamine River South Branch Rail Bridge	Waterway	658 m
Condamine River Main Branch #1 Rail Bridge	Condamine River	1,918 m
Condamine River Main Branch #2 Rail Bridge	Condamine River	602 m
Condamine River North Branch Rail Bridge	Condamine River North Branch	1,568 m
Yarranlea Road Rail Bridge	Road	69 m
Roche Road Rail Bridge	Road	121 m
Oakey Pittsworth Road Rail Bridge	Road	69 m
Lochaber Road Rail Bridge	Road	75 m
Biddeston Southbrook Road Rail Bridge	Road	144 m
Toowoomba Cecil Plains Road Rail Bridge	Road	92 m
Westbrook Creek Rail Bridge	Waterway	230 m
Dry Creek Rail Bridge	Waterway	184 m
Brimblecombe Road Rail Bridge	Road	75 m
Warrego Highway Rail Bridge	Road	132 m
Chamberlain Road Rail Bridge	Road	115 m

2.3 Rail design

A single-track, dual gauge railway line (standard (1,435 mm) and narrow (1,067 mm) gauge) is proposed to facilitate the travel of trains in both directions within this section. The mainline track structure is typically a ballasted track system consisting of continuously welded rail, resilient track fasteners, rail pads and concrete dual gauge full-depth sleepers at 600 mm centres and ballast between 250 mm and 500 mm in depth with 300 mm shoulder width for lateral restraint.

A typical section for a dual gauge ballasted track is shown in **Figure 4**.

Figure 4 Indicative design for new track



2.4 Level crossings

Level crossings are typically applied to facilitate vehicle and pedestrian access where public and private roads interface with rail corridors. For safety purposes, the level crossings can require alarm bells at each crossing and a requirement for each train to sound its horns as it approaches the crossing. The Project is proposing to include nine level crossings, which can be either passive or active, as defined below.

- Passive – have static warning signs (e.g. stop and give way signs) that are visible on approach. There are no mechanical aspects or light devices.
- Active – flashing lights and audible alarm bells with or without boom barriers for motorists, and automated gates for pedestrians. These devices are activated prior to and during the passage of a train through the levels crossing.

The location of the level crossings on the Project are summarised in **Table 3**.

Table 3 Level crossings on the Project

Road name	Treatment
Existing road-rail interfaces with level crossings	
Unnamed road	Active level crossing
South Kurumbul Road	Active level crossing
Unnamed Road	Active level crossing
Unnamed road	Active level crossing
Unnamed road	Active level crossing
Unnamed road	Passive level crossing

Road name	Treatment
Unnamed road	Active level crossing
Unnamed road	Active level crossing
Private crossing	Passive level crossing
Suttons Road	Passive level crossing
Springborg Road	Passive level crossing
Private crossing	Passive level crossing
Whestone Access Road	Active level crossing
Hall Road	Passive level crossing
Millmerran – Leyburn Road	Active level crossing
Gilgai Lane	Passive level crossing
Harris Road	Active level crossing
Elsden Road	Active level crossing
Mann Silo Access Road	Passive level crossing
Longhurst Road	Active level crossing
New road-rail interface with level crossings	
Wondalli Kurumbul Road	Passive level crossing
Unnamed Road	Passive level crossing
McDougalls Crossing Road	Active level crossing
Cremascos Road	Active level crossing
Bybera Road	Passive level crossing
Lovells Crossing Road	Active level crossing
Thornton Road	Active level crossing
Private crossing	Passive level crossing
Millmerran - Inglewood Road	Active level crossing
Grays Road	Passive level crossing
Wongavale – Yugalbar Road	Passive level crossing
Private crossing	Passive level crossing
Unnamed Road	Active level crossing
Kooroongarra Road	Passive level crossing
Private crossing	Passive level crossing
Kooroongarra Road	Passive level crossing
Private crossing	Passive level crossing
Paton Road	Passive level crossing
Nicol Creek Road	Passive level crossing
Private crossing	Passive level crossing
Millwood Road	Passive level crossing
Private crossing	Passive level crossing
Private crossing	Passive level crossing

Road name	Treatment
Private crossing	Passive level crossing
Private crossing	Passive level crossing
Blackwell Road	Active level crossing
Commodore Peak Road	Passive level crossing
Private crossing	Passive level crossing
Owens Scrub Road	Passive level crossing
Lindemayer Road	Passive level crossing
Private crossing	Passive level crossing
Private crossing	Passive level crossing
Private crossing	Passive level crossing
Tip Road	Passive level crossing
Private crossing	Passive level crossing
Linthorpe Valley Road	Passive level crossing
Purcell Road	Passive level crossing
Private crossing	Passive level crossing
Private crossing	Passive level crossing
Private crossing	Passive level crossing
Private crossing	Passive level crossing
Leesons Road	Active level crossing

2.5 Crossing loops

Crossing loops enable a train to move from the main line track and allow another train to pass through on the main line. The crossing loops are used to manage train movements on the network, such as trains travelling in the opposite direction or trains travelling at different speeds.

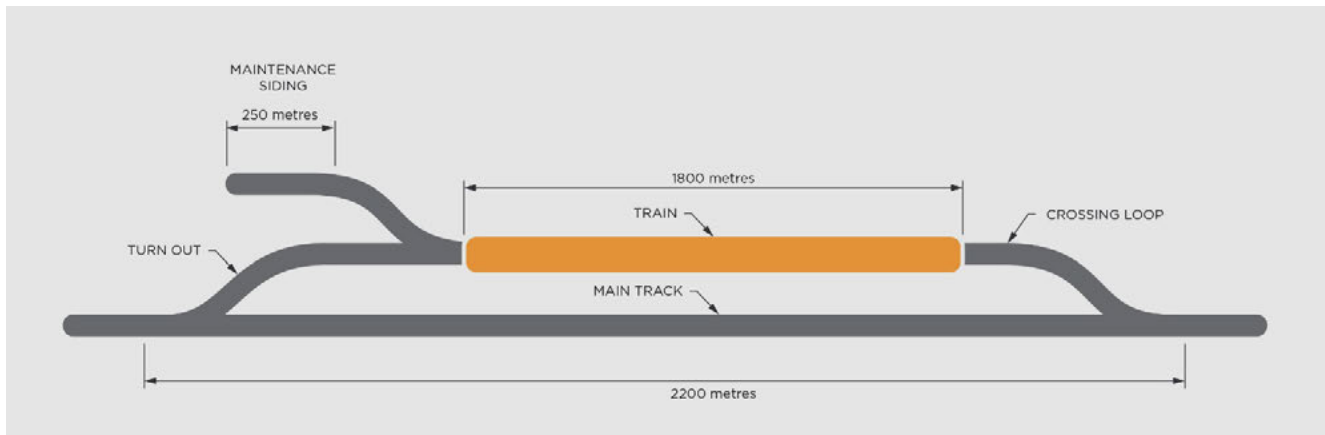
The Project incorporates five new crossing loops, designed to accommodate an 1,800 m train length, with consideration of future provision for a 3,600 m train length. Each crossing loop will be connected to the main line track at both ends so the crossing loops can be accessed by trains travelling in either direction.

The loops would be new sections of track parallel to the existing track at a distance of approximately 4.5 m spacing from the mainline track and incorporate a maintenance siding to enable maintenance of rollingstock without obstructing the track. The proposed location of the crossing loops are summarised in **Table 4** and the indicative design of the crossing loop and maintenance siding is shown in **Figure 5**.

Table 4 Crossing loop locations

Crossing loop	General location
Yelarbon	Adjacent to Gibinbell station and Yelarbon Kurumbul Road.
Inglewood	Greenfield alignment adjacent to local unnamed roads, north of the Cunningham Highway
Kooroongarra	Adjacent to Millmerran – Inglewood Road south of Kooroongarra
Yandilla	Adjacent to Lovells Road
Broxburn	North of the Gore Highway and Linthorpe Road

Figure 5 Indicative design for crossing loop and maintenance siding



2.6 Turnouts

A turnout is a point where a train can leave a given track for a branching or parallel track. The turnouts on the Project are expected at the locations below and each turnout on the Project alignment is detailed in **Table 5**.

- Connections between the Project and the South Western Line and Millmerran Branch Line;
- Cross overs to connect two parallel rail tracks; and
- Turnouts to each of the four crossing loops and the maintenance siding at each loop.

Table 5 Location of turnouts on the Project

Turnout details	Project reference
Location of new turnouts	
Number One Loop	1 in 16, dual to narrow gauge
Number One Siding	1 in 10 gauge
Number One Loop	1 in 16, dual to narrow gauge
Kildonan NSW/QLD border	1 in 16, dual to narrow gauge connect to South Western Line.
Whetstone	1 in 16, dual to narrow gauge connect to South Western Line.
Number Two loop	1 in 16
Number Two Siding	1 in 10
Number Two Loop	1 in 16
Number Three Loop	1 in 16
Number Three Siding	1 in 10
Number Three Loop	1 in 16
Number Four Loop	1 in 16
Number Four Siding	1 in 10
Number Four Loop	1 in 16
Number Five Loop	1 in 16
Number Five Siding	1 in 10

Turnout details	Project reference
Number Five Loop	1 in 16
Millmerran	1 in 16, dual to narrow gauge connect to Millmerran Branch Line.
Yarranlea	1 in 16, narrow to dual gauge connect to Millmerran Branch Line.
Location of new turnouts	
Kurumbul Loop	1 in 10 left hand, dual to narrow gauge
Kurumbul Siding	1 in 10 left hand, dual to narrow gauge
Kurumbul Loop	1 in 10 right hand, dual to narrow gauge
Yelarbon Loop	1 in 10 left hand, dual to narrow gauge
Yelarbon Siding	1 in 10 left hand, dual to narrow gauge
Yelarbon Loop	1 in 10 right hand, dual to narrow gauge
Brookstead Siding West	1 in 10 right hand, dual to narrow gauge
Brookstead Siding East	This siding is not currently used for rail operations and may cause conflict with the proposed GrainCorp access road.

3 Environmental impact assessment requirements

3.1 Terms of Reference

The ToR requirements for the noise and vibration assessment are detailed in **Table 6**.

Table 6 Terms of Reference – Noise and vibration

ToR reference	Specific assessment requirement	Addressed in this report
Existing environment		
11.117	Describe the existing noise and vibration environment that may be affected by the project in the context of the environmental values.	Section 6 details the existing noise environment.
11.118	Describe and illustrate on maps at a suitable scale, the locations of all sensitive noise and vibration sensitive receptors adjacent to all project components and estimate typical background noise and vibration levels based on surveys at representative sites.	Section 6.1 and Appendix A detail the assessed sensitive receptors.
11.119	If the proposed project could adversely impact on the noise and vibration impact, undertake baseline monitoring at a selection of sensitive receptors potentially affected by the project. Describe the results of any baseline monitoring.	Background noise surveys are summarised in Section 6.4 and detailed in Appendix N of the EIS.
Impact assessment		
11.120	Describe the characteristics of the noise and vibration sources that would be emitted when carrying out the activity (point source general emissions). Describe noise and vibration emissions (including fugitive sources) that may occur during construction, commissioning and operation.	Section 7 discusses sources of rail noise and vibration. Section 11.6 discusses specific characteristics from operational rail noise. Also detailed in Appendix N of the EIS.

ToR reference	Specific assessment requirement	Addressed in this report
11.121	Predict and map the impacts of the noise and vibration emissions from the construction and operation of the project on the environmental values of the receiving environment, including sensitive receptors.	Section 7 discusses sources of rail noise and vibration. The assessment of noise and vibration is provided in: Section 8 , Section 9 , Section 10 and Section 11 airborne noise, Section 12 ground-borne vibration and Section 13 ground-borne noise. Maps of predicted airborne noise levels are in Appendix D and Appendix E . Also detailed in Appendix N of the EIS.
	The assessment of impacts on noise and vibration should be in accordance with the following:	
	(a) Environmental Protection (Noise) Policy 2008, using recognised quality assured methods.	The Policy does not apply to transport infrastructure. Relevant assessment of noise against the Policy is detailed in Appendix N of the EIS.
	(b) Environmentally Relevant Activities – DES Application Requirements for ERAs with noise impacts (Guideline ESR/2015/1838).	The assessment methodology has been undertaken in general accordance with the guideline.
	(c) Construction – The Department of Transport and Main Roads Transport Noise Management Code of Practice: Volume 2 – Construction Noise and Vibration dated March 2016 and gazetted on 29 July 2016.	The assessment of construction noise and vibration is detailed in Appendix N of the EIS.
	(d) Operational noise – The Department of Transport and Main Roads <i>Policy for Development on Land Affected by Environmental Emissions from Transport and Transport Infrastructure Version 4, (October 2017)</i> (Rail noise external criteria contained in Table 3 of the document) (refer to Appendix 1).	Section 4 details the assessment criteria adopted in the assessment.
	(e) Operational vibration – British Standard BS 6472-1:2008 <i>Guide to evaluation of human exposure to vibration in buildings – Vibration sources other than blasting</i> . British Standards Institution, London.	Section 4 details the assessment criteria adopted in the assessment.
	(f) any additional railway noise and vibration guidance documents released by the State of Queensland.	Section 4 details the assessment criteria adopted in the assessment.
	Discuss separately the key project components likely to present an impact on noise and vibration for the construction and operation phases of the project.	The assessment of noise and vibration is provided in: Section 8 , Section 9 , Section 10 and Section 11 airborne noise, Section 12 ground-borne vibration and Section 13 ground-borne noise. Maps of predicted airborne noise levels are in Appendix D and Appendix E .
11.123	Taking into account the practices and procedures that would be used to avoid or minimise impacts, the impact prediction must address the:	
	(a) activity's consistency with the objectives of documentation referenced in 11.122.	The assessment of noise and vibration is provided in: Section 8 , Section 9 , Section 10 and Section 11 airborne noise, Section 12 ground-borne vibration and Section 13 ground-borne noise. Maps of predicted airborne noise levels are in Appendix D and Appendix E .

ToR reference	Specific assessment requirement	Addressed in this report
11.123	(b) cumulative impact of the noise and vibration with other known emissions of noise associated with existing major projects and/or developments and those which are progressing through planning and approval process that are publicly available.	Cumulative impacts are discussed in Section 14
	(c) Potential impacts of any low frequency (<200 Hz) noise emissions.	Section 11.6 provides an assessment of low frequency noise characteristics.
Mitigation measures		
11.124	Describe how the proposed project would be managed to be consistent with the best practice environmental management for the activity. Where a government plan is relevant to the activity, or the site where the activity is proposed, describe the activity's consistency with that plan.	Section 12 provides recommendations to manage and mitigation potential noise and vibration emissions, and associated impacts, from the project.
11.125	Describe any expected exceedances of noise and vibration goals or criteria following the provision or application of mitigation measures and how any residual impacts would be addressed.	Section 15 discusses residual impacts.
11.126	Describe how the achievement of the objectives would be monitored and audited and how corrective actions would be managed.	Section 15.7 provides recommendations on the monitoring and auditing of noise and vibration from railway operations.
Climate		
11.155	Describe relevant climate patterns that may influence the water, air and noise environment in the vicinity of the project.	Refer to Section 11.5 .

Source The Coordinator General, Terms of reference for an environmental impacts statement: Inland Rail – Border to Gowrie project, dated November 2018.

3.2 Referenced documentation

Based on the requirements of the ToR, the assessment of noise and vibration from railway operations was undertaken with consideration to the guidelines listed in **Table 7**.

Table 7 Referenced noise and vibration guidelines

Document	Publisher	Application in the assessment
Policy for Development on Land Affected by Environmental Emissions from Transport and Transport Infrastructure (2013)	Department of Transport and Main Roads	- Noise assessment criteria for land developed adjacent to transport corridors. - Ground vibration assessment criteria for land developed adjacent to transport corridors.
Interim Guideline, Operational Railway Noise and Vibration, Government Support Transport Infrastructure (2019).	Department of Transport and Main Roads	- Noise assessment criteria for railway infrastructure projects. - Ground vibration assessment criteria for railway infrastructure projects. - Guidelines for the measurement, prediction and mitigation of railway noise.
British Standard BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings – Vibration sources other than blasting (2008)	British Standards	- Establishment of assessment criteria for ground vibration. - Assessment methodologies for ground vibration.

4 Environmental values and assessment criteria

4.1 Airborne noise

The most common form of noise experienced by people is termed ‘airborne noise’, indicating the noise travels through the air between the source, such as a railway, and the receptor. This is the primary form of noise that occurs adjacent to above ground level railway tracks.

Guidelines for the identification and assessment of airborne noise from railway operations are discussed below, including the airborne noise criteria applied by ARTC for the assessment and management of railway noise from the Project.

4.1.1 DTMR assessment criteria

The ToR requires the assessment of railway noise from the Project to consider the objectives and assessment criteria from the Department of Transport and Main Roads (DTMR) *Policy for Development on Land Affected by Environmental Emissions from Transport and Transport Infrastructure Version 2* (DTMR Policy); specifically, the external rail noise criteria contained in Table 3 of the DTMR Policy.

The external rail noise criteria from the DTMR Policy are reproduced below in **Table 8**.

Table 8 DTMR Policy railway noise criteria

Development type	Location with development	Environmental criteria
Accommodation activities	All facades	≤65 dBA LAeq(24hour) façade corrected
		≤87 dBA (single event maximum sound pressure level) façade corrected
	Outdoor spaces for passive recreation	≤62 dBA LAeq(24hour) free field
		≤84 dBA (single event maximum sound pressure level) free field
Educational establishments, childcare centres	All facades	≤65 dBA LAeq(1hour) façade corrected ¹
		≤87 dBA (single event maximum sound pressure level) façade corrected
	Outdoor education areas, outdoor play areas	≤62 dBA LAeq(12hour) free field between 6.00 am and 6.00 pm
		≤84 dBA (single event maximum sound pressure level) free field
Health care services, hospitals, community uses, places of worship	All facades	≤65 dBA LAeq(1hour) façade corrected ¹
		≤87 dBA (single event maximum sound pressure level) façade corrected
	Outdoor spaces for passive recreation	≤62 dBA LAeq(12hour) free field between 6.00 am and 6.00 pm
		≤84 dBA (single event maximum sound pressure level) free field

Note 1 Maximum hour during normal opening hours

In 2019, the DTMR issued the Interim Guideline Operational Rail Noise and Vibration – Government Supported Transport Infrastructure³ (Interim Guideline). The Interim Guideline is a published standard under the *Transport Infrastructure Act 1994*.

³ Department of Transport and Main Roads, 2019. Interim Guideline, Operational Railway Noise and Vibration, Government Support Transport Infrastructure, dated March 2019.

The guideline is specific to the assessment and management of railway noise and vibration from new rail infrastructure and upgrades to existing railway infrastructure. In this regard, the Interim Guideline is considered to be more suitable for the assessment of noise from railway infrastructure than the noise criteria from Table 3 of the DTMR Policy.

The Interim Guideline is not directly referenced in the ToR, because the ToR predated the release of the guidelines. Notwithstanding, the assessment of railway noise from the Project has considered the railway noise criteria and noise assessment guidelines from the Interim guideline.

The railway noise assessment criteria within the Interim Guideline are reproduced below in **Table 9** and are generally more stringent than the railway noise assessment criteria in the DTMR Policy (refer **Table 8**).

Table 9 DTMR Interim Guideline railway noise criteria

Type	Location at sensitive land use	External operational railway noise criteria ¹		
		Single Event Maximum ³	LAeq(24hour)	LAeq(12hour)
New railway	All facades	≤ 82 dBA façade corrected	≤ 60 dBA façade corrected	-
	Outdoor spaces for passive recreation Outdoor education area Outdoor play area ²	≤ 79 dBA free field	-	≤ 57 dBA free field
Upgrading existing railway or existing railway	All facades	Development increases existing LAeq(24hour) or LAeq(12hour) rail noise levels by 2 dB or more, or existing SEM rail noise levels by 3 dB or more and predicted rail noise levels exceed:		
		≤ 87 dBA façade corrected	≤ 65 dBA façade corrected	-
Upgrading existing railway or existing railway	Outdoor spaces for passive recreation Outdoor education area Outdoor play area ²	≤ 84 dBA free field	-	≤ 62 dBA free field

Note 1 The façade corrected prediction height for the Inland Rail Program has been adopted at 1.8 m and 4.6 m above the building platform level for the ground floor and first floors respectively. For free-field land uses the criteria applies at 1.5 m above the ground level.

Note 2 For outdoor educational, outdoor play and passive recreational areas greater than 2,000 m², the criterion level is to be achieved for a minimum 2,000 m². For areas less than 2,000 m², the criterion shall be achieved for the whole area.

Note 3 Single Event Maximum (SEM) is the arithmetic average of the LAFmax from the highest 15 single events (i.e. rolling stock passby) during a Use Period within a 24-hour period.

4.1.2 ARTC's approach to management operational railway noise

ARTC is implementing a uniform approach for the assessment and management of operational railway noise across the Inland Rail Program to ensure the potential noise related impacts to public health, amenity and disturbance are managed consistently.

The rail noise criteria from the DTMR Policy, Interim Guideline and other Australian railway noise guidelines were considered in the development of the airborne railway noise criteria for the Project. As discussed further below, ARTC is applying criteria on the Project that are more stringent than the criteria from the DTMR Policy and the Interim Guideline.

Where the rail noise levels are above the assessment criteria, ARTC will investigate reasonable and practicable mitigation measures with the aim of reducing noise levels to meet the criteria and minimising potential noise impacts at sensitive receptors.

The railway noise criteria are specific to the daytime period of 7.00 am to 10.00 pm and the night-time period of 10.00 pm to 7.00 am. The noise assessment criteria are lower for the night-time period due to the greater sensitivity of communities to noise during the night-time.

There are different assessment criteria for new railways and for upgrading existing railway infrastructure. The criteria for new railways are 5 dBA lower, more stringent, based on the assumption that noise mitigation can be more readily implemented on newly constructed sections of railway infrastructure.

The airborne noise criteria adopted by ARTC for residential receptors are detailed in **Table 10**. Residential land use, as defined by the DTMR Policy, has been adopted for the assessment.

Table 10 Airborne railway noise criteria for residential receptors

Type of development	Noise assessment criteria at residential receptors (External)	
	Day (7.00 am to 10.00 pm)	Night-time (10.00 pm to 7.00 am)
New rail line development ¹	Predicted rail noise levels exceed:	
	LAeq(15hour) 60 dBA	LAeq(9 hour) 55 dBA
	LAFmax 80 dBA	LAFmax 80 dBA
Upgrade of existing rail line ²	Development increases existing LAeq(period) rail noise levels by 2 dB or more, or existing LAmx rail noise levels by 3 dB or more and predicted rail noise levels exceed:	
	LAeq(15hour) 65 dBA	LAeq(9 hour) 60 dBA
	LAFmax 85 dBA	LAFmax 85 dBA

Note 1 A new rail line development is a rail infrastructure project on land that is not currently an operational rail corridor.

Note 2 An upgraded line is a development on land that is within an existing operational rail corridor, where a line is or has been operational or is immediately adjacent to an existing operational rail line which may result in the widening of an existing rail corridor.

The ARTC approach includes rail noise criteria for sensitive receptors other than residential land uses. The noise criteria for these receptors types is detailed in **Table 11**.

Table 11 Airborne noise assessment criteria for other sensitive receptors

Other sensitive receptors	Noise assessment criteria (when receptor premises are in use)	
	New rail line development ¹	Upgrade of existing rail line ²
	Resulting rail noise levels exceed:	Development increases existing rail noise levels by 2 dBA or more in LAeq for that period, and resulting rail noise levels exceed:
Schools, educational institutions and childcare centres	LAeq(1 hour) 40 dBA (internal)	LAeq(1 hour) 45 dBA (internal)
Places of worship	LAeq(1 hour) 40 dBA (internal)	LAeq(1 hour) 45 dBA (internal)
Hospital wards	LAeq(1 hour) 35 dBA (internal)	LAeq(1 hour) 40 dBA (internal)
Hospital other uses	LAeq(1 hour) 60 dBA (external)	LAeq(1 hour) 65 dBA (external)
Open space – passive use (e.g. parkland, bush reserves)	LAeq(15hour) 60 dBA (external)	LAeq(15hour) 65 dBA (external)
Open space – active use (e.g. sports field, golf course)	LAeq(15hour) 60 dBA (external)	LAeq(15hour) 65 dBA (external)

Note 1 A new rail line development is a rail infrastructure project on land that is not currently an operational rail corridor.

Note 2 An upgraded line is a development on land that is within an existing operational rail corridor, where a line is or has been operational or is immediately adjacent to an existing operational rail line which may result in the widening of an existing rail corridor.

4.1.3 Summary of airborne noise management criteria

The assessment of noise must consider the DTMR Policy, as required by the ToR, and also the Interim Guideline. As discussed above, further to these guidelines, ARTC is implementing railway noise criteria specifically for the management of railway noise on Inland Rail.

It is preferential to have one set of noise criteria to provide consistency in the assessment of railway noise levels and the management of any railway noise impacts. A comparative review of the rail noise criteria from the Interim Guideline and the rail noise criteria implemented by ARTC was undertaken to establish the most stringent approach for the assessment and management of noise on the Project.

Detailed below in **Table 12**, the railway noise criteria adopted by ARTC are generally more stringent than the Interim Guideline. Accordingly, where the Project achieves the ARTC railway noise criteria at sensitive receptors the railway noise criteria from the DTMR Policy and Interim Guideline would also be achieved.

The assessment has therefore adopted ARTC's proposed noise assessment criteria in **Table 10** and **Table 11** as the primary railway noise assessment criteria.

Table 12 Review of assessment criteria for airborne noise

Aspect	Interim Guideline criteria	ARTC noise criteria	Commentary
Assessment periods	Noise levels assessed for the total rail operations in each 24-hour period.	Noise levels assessed separately for the daytime and night-time rail operations in each 24-hour period.	The ARTC criteria account for the variation in rail operations during the 24-hour period. Assessing the night-time acknowledges the need to protect the community from sleep disturbance at night. On this basis the ARTC is applying the more stringent criteria.
Noise criteria (all facades)	The LAeq and SEM ¹ noise criteria are 5 dBA more stringent for new railways than for upgrading existing railway infrastructure.	The LAeq and L _{Amax} noise criteria are 5 dBA more stringent for new railways than for upgrading existing railway infrastructure. The daytime LAeq noise criteria are 5 dBA more stringent than the night-time LAeq noise criteria.	The LAeq noise criteria are the same for the 24-hour period in the Interim Guideline and the 15-hour daytime period with the ARTC criteria. The night-time LAeq noise criteria applied by ARTC are 5 dBA more stringent than the 24-hour noise criteria in the Interim Guideline. The ARTC maximum noise criteria are 2 dBA more stringent than the Interim Guideline ² .
Application to sensitive receptors	The guideline adopts external rail noise criteria at sensitive receptors. The guideline applies both LAeq and SEM noise criteria.	The ARTC adopts external noise criteria for residential receptors. Internal LAeq criteria are provided to maintain the use of some building types.	The Interim Guideline defines sensitive receptors for a wider range of building uses. The ARTC approach for non-residential receptors is more rigorous by assessing internal noise levels. For non-residential sensitive receptors, the Interim Guideline provides assessment criteria for both LAeq and L _{Amax} noise metrics, whereas the ARTC approach only considers LAeq criteria.

Note 1 Single Event Maximum (SEM)

Note 2 The Interim Guideline and ARTC management levels have different approaches to deriving the maximum rail noise level. This may influence the significance of the 2 dBA to 5 dBA variations in the criteria levels.

4.2 Noise criteria for new and upgraded railway infrastructure

The Project will involve railway operations on new railway infrastructure and on sections of upgraded existing railway infrastructure for the Inland Rail tracks to be collated within existing rail corridors. The railway noise management requirements from DTMR and ARTC include specific noise criteria for new railways and the upgrade of existing railways.

ARTC has elected to assess and manage railway noise on the entire Project applying the noise criteria for new railways. The Project, for the purpose of operational railway noise, is being considered a greenfield railway infrastructure project. On this basis, an assessment or quantification of noise levels from existing railway operations on the Project alignment has not been undertaken.

The key aspects of the decision to assess the Project as new railway infrastructure are outlined below, including the benefits to the community of applying the noise criteria for new railways.

- The railway noise criteria for new railways are the most stringent criteria applicable under both the DTMR guidelines and ARTC's approach to managing railway noise on Inland Rail.
- All sensitive receptors will be assessed against the same noise criteria, irrespective of whether an individual receptor would currently experience noise from existing railway operations.
- The existing railway operations on the South Western Line and Millmerran Branch Line have a relatively small number of weekly train movements associated with seasonal agriculture. The operations equate to approximately one train per day and there would be periods throughout the year with no train movements over consecutive days.
- A result of the 2009-2011 floods in QLD, the Millmerran Line remains closed (red boarded) between Brookstead and Millmerran. There are currently no railway operations on this section.
- The potential existing railway noise levels at the substantial majority of sensitive receptors are expected to be well within applicable railway noise criteria. Consequently, the railway noise levels with the Project will likely be dominated by the future new and additional rail freight operations.
- Any requirement for noise management and mitigation will be determined by the future railway operations rather than the existing railway operations.

4.3 Ground-borne vibration guidelines

Railway vibration is generated by dynamic forces at the interface of the rail and train wheels. The resultant vibration from ground-level track can be transmitted into adjacent buildings via the intervening ground. If the levels of vibration are sufficiently high, then this vibration can be felt as tactile vibration by the occupants of nearby buildings.

People can perceive floor vibration at levels well below those likely to cause damage to buildings or their contents. Accordingly, the vibration criteria applied to manage potential impacts to human comfort at residences are usually the most stringent and it is generally not necessary to set separate criteria for vibration effects on typical building contents and structures.

4.3.1 Ground-borne vibration criteria for sensitive receptors

For intermittent events such as train passby events, the vibration dose value (VDV) is applied to assess potential impacts to human comfort. The VDV provides a cumulative measure of the vibration levels associated with all railway operations in a daytime or night-time assessment period. The VDV considers the combined effects of the level of the ground-borne vibration and the duration of vibration generating events and, as such, is suited for the assessment of transient sources such as train passbys.

The ToR requires potential ground-borne vibration impacts to be assessed with reference to British Standard BS 6472 Part 1⁴ and the DTMR Policy. The Interim Guideline also includes ground-borne vibration criteria for the management of vibration from railway operations. The criteria to manage vibration disturbance impacts are generally consistent between the documents, the vibration management levels in **Table 13** were referenced from the Interim Guideline as they are specific for the assessment of ground vibration associated with railways.

The British Standard advises the vibration levels in **Table 13** are expected to be just perceptible in typical residential environments, and likely to result in a low probability of adverse comment.

Table 13 Ground-borne vibration criteria for sensitive receptors

Type of development	Sensitive receptors	Internal ground-borne vibration criteria	
		Use period ¹	Vibration dose value
New railway or upgrading existing railway	Accommodation activities	Daytime	$\leq 0.20 \text{ m/s}^{1.75}$
		Evening	
		Night-time	$\leq 0.13 \text{ m/s}^{1.75}$
	Educational establishments, childcare centres, health care services, hospitals, community uses, places of worship and offices	While in use	$\leq 0.40 \text{ m/s}^{1.75}$ (all areas) $\leq 0.10 \text{ m/s}^{1.75}$ (critical areas)

Note 1 Daytime 7.00 am to 6.00 pm, evening 6.00 pm to 10.00 pm and night-time 10.00 pm to 7.00 am.

The vibration criteria in **Table 13** are for sensitive receptors buildings, some scientific equipment (for example, electron microscopes and microelectronics manufacturing equipment) can require more stringent design goals than those applicable to human comfort. A review of the current buildings in the noise assessment study area did not identify that vibration sensitive scientific equipment would likely be in use at the sensitive receptors.

4.3.2 Ground-borne vibration criteria for heritage sites

Buildings which possess architectural, aesthetic, historic or cultural values may have certain sensitivities to vibration with respect to their long term preservation. In lieu of specific ground-borne vibration criteria for heritage sites in the DTMR Policy and Interim Guideline, a discussion of various standards relevant to vibration and its effects on buildings is provided in **Table 14**.

⁴ British Standards, 2008. BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting, 2008.

Table 14 Referenced standards associated with cosmetic building damage risk

Reference	Notes
British Standard BS 5228.2 ⁵ British Standard BS 7385.2 ⁶	This standard notes that BS 7385-2 and BS ISO 4866:2010 provide guidance on vibration measurement, data analysis and reporting as well as building classification and guide values for building damage. BS 7385.2:1993 provides frequency dependent threshold levels which are judged to give a minimal risk of vibration-induced damage.
German Standard DIN 4150.3 ⁷	DIN 4150.3 prescribes levels as “safe limits”, up to which no damage due to vibration effects has been observed for the class of building. “Damage” is defined by DIN 4150.3 to include even minor non-structural effects such as superficial cracking in cement render, the enlargement of cracks already present, and the separation of partitions or intermediate walls from load bearing walls DIN 4150.3 also states that when vibration levels higher than the “safe limits” are present, it does not necessarily follow that damage will occur. Site specific criteria may be determined in conjunction with professional civil and/or structural engineering input based on the existing level of building condition and serviceability.

The Peak Particle Velocity (PPV) metric is applied as a measure of the maximum movement of the particles in the ground as a result of vibrations created from sources such as train passbys. It is commonly applied to evaluate the potential response of buildings and structures when exposed to vibration energy.

At the EIS stage, it is not possible to forecast with reasonable certainty the dominant (or resonant) frequencies of vibration at each building during train passby events. Accordingly, selecting the vibration criteria, irrespective of frequency, as essentially the lowest applicable value is an appropriately conservative assessment objective.

Based on **Table 14**, the relevant PPV guidance values for assessment of ground-borne vibration at heritage sites are presented in **Figure 6**. From this figure it can be seen that Line 3 of German Standard DIN 4150.3 is the lowest, most conservative vibration level, including where the vibration levels for Line 2 of British Standard BS 7385.2 are reduced by 50% where there is concern over continuous vibration generating ‘dynamic magnification’ resonance effects.

The German Standard DIN 4150.3 recommends a V_{PPV} objective of 3 mm/s at low frequencies increasing to around V_{PPV} 8 mm to 10 mm/s at frequencies above 50 Hz for sensitive structure with great intrinsic value (refer Line 3 DIN 4150.3).

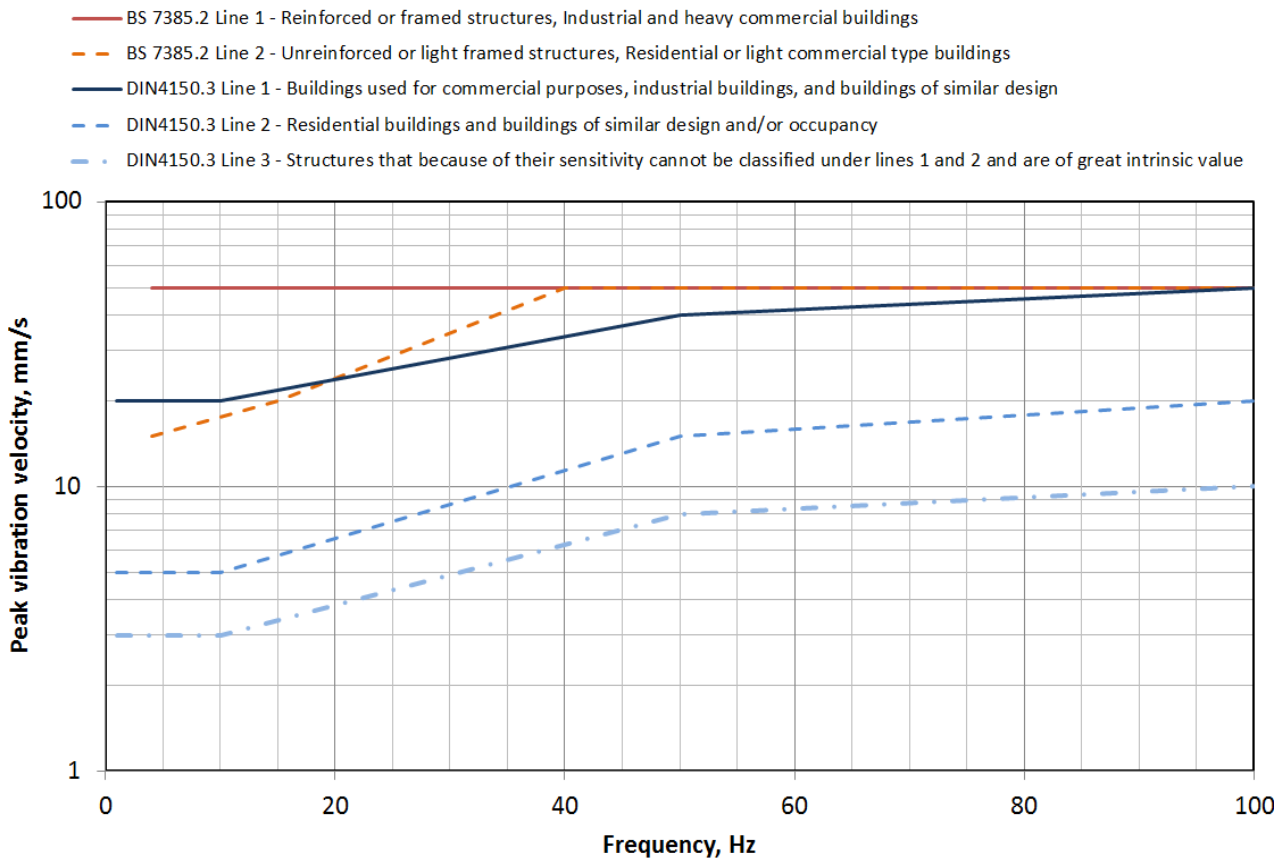
The 3 mm/s vibration level has been adopted as the vibration objective to provide conservative assessment of potential impacts to heritage sites.

⁵ British Standard BS 5228.2-2009/2014-Code of practice for noise and vibration control on construction and open sites—Part 2: Vibration

⁶ British Standard, BS7385-2:1993 Evaluation and measurement for vibration in buildings

⁷ DIN 4150-3 2016 Structural Vibration Part 3 – Effects of vibration on structures

Figure 6 Guidance values for short term vibration



4.4 Ground-borne noise guidelines

The ground-borne vibration from train passbys can be sufficient to cause floors or walls of the structure to vibrate and this can result in an audible low frequency rumble inside buildings. This is termed as ground-borne noise or regenerated noise.

ARTC is applying the ground-borne noise criteria in **Table 15** on the Project, which have been developed with reference to ground-borne noise assessment criteria from the Interim Guideline and other railway noise and vibration guidelines.

The ground-borne noise criteria are generally implemented where the rail induced ground-borne noise levels are higher than the airborne noise from the railway operations, and where the ground-borne noise levels are expected to be audible within habitable rooms.

Table 15 Ground-borne noise trigger levels

Type of development	Sensitive receptors	Internal ground-borne noise trigger levels	
		Use period ¹	L _{AS} max
New railway or upgrading existing railway	Accommodation activities	Daytime	≤ 40 dBA
		Evening/ night-time	≤ 35 dBA
	Educational establishments, Childcare centres Health care services and Hospitals	While in use	≤ 35 dBA ²
	Community uses (excluding a court of law) Places of worship and Offices		≤ 40 dBA
	Court of law (court rooms)		≤ 30 dBA
	Court of law (court reporting and transcript areas, Judges' chambers)		≤ 35 dBA

Note 1 Daytime 7.00 am to 6.00 pm, evening 6.00 pm to 10.00 pm and night-time 10.00 pm to 7.00 am.

Note 2 Maximum noise level not exceeded for 95% percent of rail passby events.

5 Assessment methodology

The assessment of noise and vibration from the railway operations applied the following methodology.

- A desktop survey was undertaken to identify sensitive receptors within a 2 km radius of the Project alignment. An area greater than 840 km² (>84,000 hectares) was applied as the initial assessment area for railway noise and vibration.
- The 2 km study area was constrained to the limits of the Project extents. Railway noise and vibration levels at sensitive receptors near to the Project extents are being assessed on the corresponding NS2B and G2H projects on Inland Rail.
- The applicable assessment criteria for airborne noise, ground-borne noise and ground-borne vibration were determined with reference to the relevant regulatory guidelines defined in the ToR and ARTC's proposed approach for managing noise and vibration on the Inland Rail Program.
- Noise and vibration assessment scenarios were determined for the proposed rail operations based on the project description and the requirements of the ToR. The year 2026 was applied for assessment of noise and vibration at the commencement of operations and the year 2040 was adopted as the year where rail operations would be at the designed freight capacity.
- The principle sources of airborne noise, ground-borne noise and ground-borne vibration from the operation of rollingstock were identified and each source was assigned an appropriate emission level.
- A detailed noise prediction model was developed for the calculation of airborne railway noise levels from rollingstock operations and associated sources of noise, including; level crossings and idling trains at crossing loops.
- The potential ground-borne vibration and ground-borne noise levels from rollingstock operations were calculated based on ground-borne vibration levels from comparable rail freight movements.
- The predicted airborne noise, ground-borne vibration and ground-borne noise levels were evaluated against the assessment criteria and the requirements of the ToR.
- The investigation of reasonable and practicable mitigation measures was triggered where the predicted levels were above the assessment criteria.

- The consideration of mitigation measures was not constrained by compliance to the assessment criteria, options for mitigation have been recommended as part of the overall strategy to minimise the potential noise and vibration impacts of the Project through the implementation of best practice environmental management.
- The potential for residual impacts at sensitive land uses, after mitigation is implemented, was evaluated and recommendations were prepared for future noise and vibration assessment and monitoring works through the detailed design.

6 Existing environment

6.1 Sensitive receptors

The DTMR Policy and Interim Guideline identify the typical receptors that can be potentially sensitive to noise and vibration from railway operations. The description of the various sensitive receptors is detailed in **Table 16**.

When applying the noise and vibration criteria in **Section 4**, the criteria for residential receptors are commonly applied to the range of receptors described under accommodation activities.

Table 16 Sensitive receptors

Sensitive receptors	Inclusions
Accommodation activities	Caretaker's accommodation, community residence, dual occupancy, dwelling house, dwelling unit, home-based business, multiple dwelling, nature-based tourism, non-resident workforce accommodation, relocatable home park, residential care facility, resort complex, retirement facility, rooming accommodation, rural workers' accommodation, short term accommodation and tourist park.
Education establishments	Primary and secondary schools, colleges, technical institutes, universities or other educational institutions.
Childcare centres	Crèches, early childhood centres, kindergartens and preschools.
Health care services	Medical centres, health clinics, surgeries and other medical institutions.
Hospitals	-
Community uses	Courts of law, art galleries, community halls, libraries and museums.
Places of worship	-
Offices	-
Mixed use	A mix of the uses listed above.

Source Section 2.1 of the DTMR Interim Guideline, operational Railway Noise and Vibration, Government Supported Transport Infrastructure, March 2019.

To determine the sensitive receptors included in the assessment of railway noise and vibration, all buildings over 9 m² within the 2 km radius of the Project alignment were identified from a national geospatial dataset of buildings.

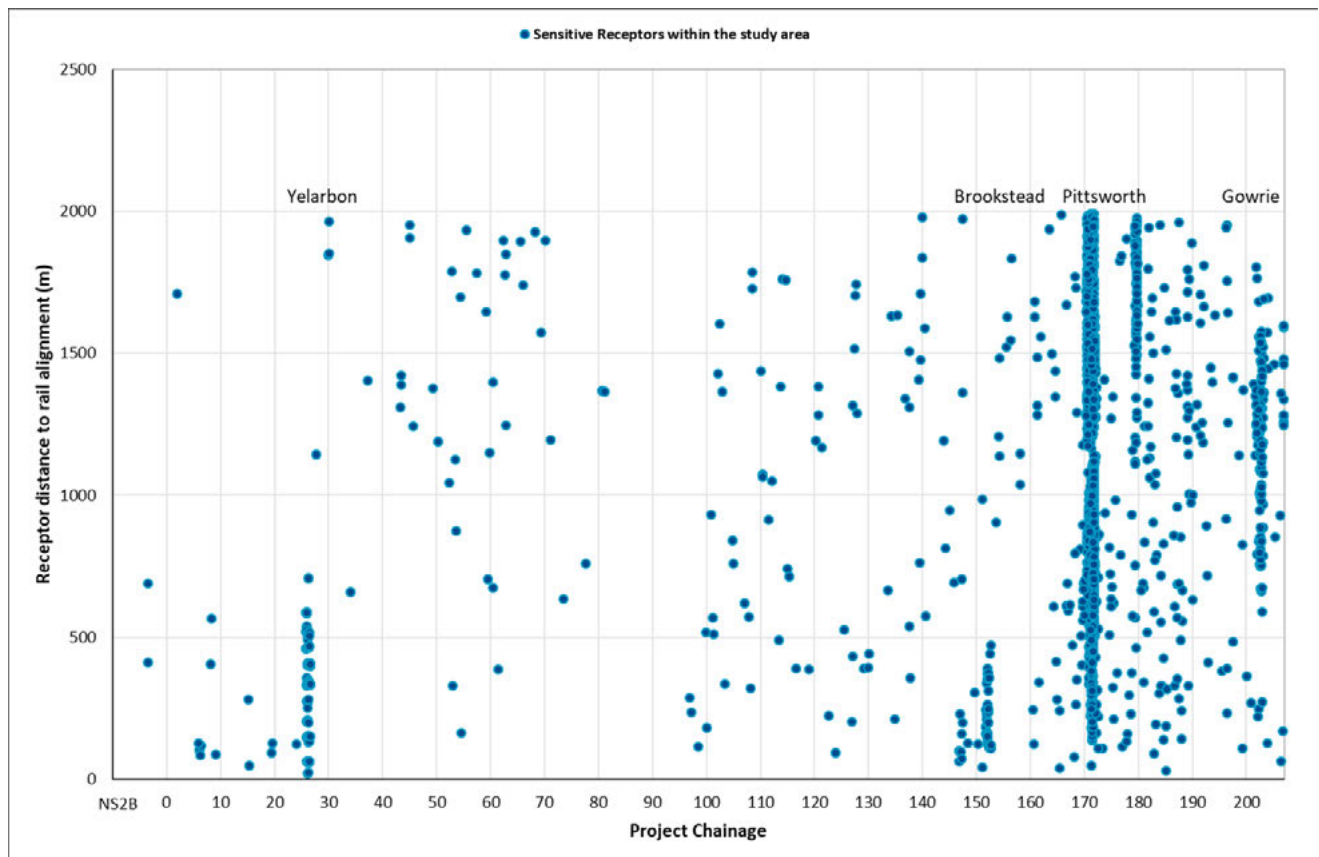
Over 8,000 buildings were identified within the 2 km study area and each building was assigned a unique identification number for the purpose of the assessment.

The buildings that were clearly identified from aerial imagery as non-sensitive, such as hoppers, sheds and warehouses were retained in the assessment as they could provide screening of rail noise levels at nearby sensitive receptors. Railway noise and vibration levels were not assessed at the non-sensitive buildings.

Of the buildings identified, approximately 1,600 receptors were identified as being potential noise and vibration sensitive receptors within the 2 km study area. The location of these sensitive receptors along the Project railway alignment is presented in **Figure 7**. The individual sensitive receptors are detailed in the route maps provided in **Appendix A**.

The majority of the sensitive receptors are within 50 m to 1,500 m of the Project alignment.

Figure 7 Distribution of sensitive receptors along the Project alignment



Note Some receptors are in the same location and the markers in the above figure may represent more than one receptor.

6.2 Sensitive receptors other than residences

Land use information from the EIS and the geospatial surveys was referenced to identify buildings that could be sensitive receptors other than individual residential properties.

The buildings and property in **Table 17** were included in the assessment of noise and vibration as sensitive receptors. Consistent with the noise criteria applied by ARTC on the Project, industrial sites and commercial premises were not included in the assessment.

Table 17 Non-residential sensitive receptors

Receptor name	Town	Classification
Yelarbon State School	Yelarbon	Education institution
Brookstead State School	Brookstead	Education institution
All Saints Anglican Church	Yandilla	Place of worship
Pampas Memorial Hall	Pampas	Community centre
Saint Stephens Catholic Primary School	Pittsworth	Education institution
Anglican Church of Australia, Pittsworth	Pittsworth	Place of worship
Saint Peter's Catholic Church	Pittsworth	Place of worship
Pittsworth & District Assembly of God/ Harvest New Life Church	Pittsworth	Place of worship
Pittsworth State School	Pittsworth	Education institution
Pittsworth State High School	Pittsworth	Education institution
Pittsworth Kindergarten	Pittsworth	Education institution
Pittsworth Uniting Church	Pittsworth	Place of worship
Pittsworth Library and Senior Citizens Club	Pittsworth	Education institution
Lutheran Church of Australia	Pittsworth	Place of worship
Kate's Place Early Education and Child Care Centre	Pittsworth	Child Care Centre
Southbrook Central State School	Southbrook	Education institution

6.3 Heritage sites

Referencing the cultural heritage assessment for the Project, the 13 non-indigenous sites in **Table 18** were identified as sites of potential heritage significance. Details of each site are provided in *Appendix R: Non-Indigenous Cultural Heritage Survey Report*⁸ prepared for the EIS.

A total of seven sites were identified as being within the disturbance footprint of the Project and expected to be removed or mitigated as part of the Project. It has been assumed that the sites within the existing rail corridors have not been impacted by ground-borne vibration from rail freight passby events.

Table 18 Non-Indigenous heritage sites

Site ID ¹	Site name	Site description	Proximity to the Project
B2G-19-H01	Kurumbul Station	Timber stump remains of previous buildings	30 m
B2G-19-H02	Gibinbell Shearing Complex	Iron clad sheds, potentially constructed from repurposed material	25 m
B2G-19-H03	Gibinbell Siding	Only an earth bank remains of the station.	10 m
B2G-19-H04	Yelarbon & District Soldiers Memorial Hall	Chamferboard clad building with corrugated iron roof.	60 m
B2G-19-H05	Anzac Memorial Garden	Small park with two stone/ granite block statues	60 m
B2G-19-H06	Cancer Charity Tree	Commemorative tree on sandstone block	17 m

⁸ Inland Rail: Border to Gowrie, Appendix R – Non-Indigenous Cultural Heritage Survey Report.

Site ID ¹	Site name	Site description	Proximity to the Project
B2G-19-H07	Church (former)	Chamferboard clad building with corrugated iron roof.	67 m
B2G-19-H08	Yelarbon Mill 1	Timber framed buildings in disrepair.	90 m
B2G-19-H09	Yelarbon Mill 2	Open sided iron roofed shed structure.	90 m
B2G-19-H10	Petrol Station	Disused chamferboard clad building	58 m
B2G-19-H11	Yelarbon Railway Complex	No original station buildings remain, large corrugated iron shed and series of grain silos	12 m
B2G-19-H12	Tree Trunk	Large felled tree, possibly used as a sign	100 m
B2G-19-H13	Whetstone Siding	All station buildings removed, and earthen loading bank remains.	450 m
B2G-19-H14	Homestead Complex	Weatherboard clad residence	SLR ID 254828, 110 m
B2G-19-H15	Homestead Complex	Weatherboard clad property from the later colonial period, not obviously occupied.	108 m
B2G-19-H16	Structure	Small weatherboard building, not occupied.	45 m
B2G-19-H17	Sheds	Two weatherboard & corrugated iron sheds	93 m
B2G-19-H18	Lookout	Lookout and rest area	370 m
B2G-19-H19	Outbuildings	Weatherboard clad outbuildings, associated homestead was removed	78 m
B2G-19-H20	Grass Tree Creek Bridge	Low timber girder rail bridge	Within the rail corridor
B2G-19-H21	Yandilla Station	Large corrugated iron shed and series of grain silos with a weighbridge	15 m
B2G-19-H22	Protest Public Art	Shipping container with public art	60 m
B2G-19-H23	Condamine River Bridge	Timber girder rail bridge with precast concrete abutments	Within rail corridor
B2G-19-H24	Pampas Station	Large metal grain handling shed with weighbridge	6 m
B2G-19-H25	Pampas Memorial Hall	Chamferboard clad hall on low timber stumps, still in use	75 m
B2G-19-H26	Sheds adjacent to Millmerran Branch Line	Dilapidated timber frame sheds	Within B2G rail corridor
B2G-19-H27	Condamine River Bridge 2	Timber girder rail bridge with precast concrete abutments	Within the rail corridor
B2G-19-H28	Brookstead Station	Complex of grain silos	53 m
B2G-19-H29	Brookstead Station Building (relocated)	Small weatherboard clad timber building on low stumps.	120 m
B2G-19-H30	Cecilvale Station	All station elements removed	Within the rail corridor
B2G-19-H31	Yarranlea Station	Existing grain silos and shed	45 m
B2G-19-H32	Murlaggan Station	All station elements removed	Within the rail corridor
B2G-19-H33	Homestead Complex	Occupied weatherboard colonial dwelling & ruins of timber structures	78 m
B2G-19-H34	Archaeological Site	Site of former buildings, assumed outbuildings, site is extensively ploughed	Within B2G rail corridor

Source Appendix R: Non-Indigenous Cultural Heritage Survey Report.

6.4 Existing noise environment

A baseline environmental noise survey was undertaken in 2018 to quantify and characterise the noise environment surrounding the Project alignment. The noise survey was conducted by AECOM Australia Pty Limited to support the assessment of noise from the construction of the Project. A summary of the survey is provided below with the noise monitoring survey detailed in the Non-operational Noise and Vibration technical report (Appendix N of the EIS).

Existing noise levels were monitored at 11 locations selected to be representative of the nearest communities to the Project. The monitoring surveys were principally to define the daily environmental noise levels rather than specifically quantify existing railway noise levels.

The Rating Background Levels (RBL) determined from the monitoring survey are summarised in **Table 19** and confirm that the existing noise levels are generally low, typically below 40 dBA during the daytime and evening and below 35 dBA during the night-time.

The RBLs are characteristic of the steady-state rural noise environments where the main sources of noise are local road traffic, residential activities and natural sources, such as windblown vegetation and bird song. The noise levels highlight the potential sensitivity of the environment to the introduction of additional sources of noise and this was considered by ARTC when proposing the noise management criteria for the Project.

Table 19 Existing environmental noise levels

Monitoring location	Rating background levels, dBA		
	Daytime	Evening	Night-time
B2G_01, Kurumbul	30	34	28
B2G_02, Yelarbon	36	35	25
B2G_03, Yelarbon	41	40	24
B2G_04, Yelarbon	32	34	23
B2G_05, Inglewood	31	33	23
B2G_06, Brookstead	39	38	29
B2G_07, Pittsworth	35	40	27
B2G_08, Pittsworth	37	37	25
B2G_09, Southbrook	40	37	30
B2G_010, Athol	35	36	29
B2G_011, Gowrie	35	31	26

Note Daytime is 7.00 am to 6.00 pm, evening is 6.00 pm to 10.00 pm and night-time is 10.00 pm to 7.00 am.

Source Inland Rail: Border to Gowrie, Appendix N – Non-Operational Noise and Vibration Assessment Technical report.

7 Railway noise modelling

7.1 Prediction of railway noise

The noise emissions from the railway operations on the Project were calculated through detailed noise prediction modelling using the SoundPLAN (version 7.4) noise prediction modelling software.

The noise prediction model included a detailed terrain model to develop a 3-dimensional (3D) representation of the Project and the 2 km study area. The terrain datasets comprised elevation contours of the existing ground and the Project designs at 0.5 m to 2 m intervals to recreate in detail the rail and road civil earthworks and infrastructure and the surrounding environment. The resultant terrain model represented the future environment with the Project.

The vertical and horizontal designs for the Project were digitised in the model, including; cuttings, embankments, and the track formation (earthworks and track ballast). The elevated structures for the bridges and viaducts were modelled at the height above ground level consistent with the Project designs. The base of the elevated structures was digitised to represent the concrete spans that form each bridge and viaduct with the rail track (inclusive of ballast) modelled on top of the spans.

The buildings for the sensitive receptors and non-sensitive structures were set to the mean ground height. Building heights were determined from the referenced geospatial database, where the building height was not reported a 5 m building height was adopted as being representative of the single storey residences that are common in rural areas.

The adopted building height would be conservative for non-sensitive buildings and structures, such as grain hoppers, sheds and warehouses which could shield railway noise. The Interim Guideline recommends noise levels are calculated at a height of 1.5 m or 1.8 m above the finished floor level of the ground floor. In lieu of the known building construction for the 1,600 sensitive receptors a conservative approach was adopted to assess noise levels at 2.4 m above ground level at the centre of each façade on the sensitive receptor buildings.

The adopted receptor calculation height considered that many properties in the rural environment are elevated on stumps or a traditional Queenslander property construction. As such, the ground floor of the properties is likely to be above the conventional 1.5 m or 1.8 m receptor heights.

Furthermore, the majority of the rail tracks on the Project are elevated above the surrounding ground level, either on constructed earthworks or the bridges and viaducts. The 2.4 m receptor calculation height also facilitated calculation of railway noise with a more direct line of sight between the rails and the receptor facades.

All external railway noise predictions were adjusted by +2.5 dBA to determine the façade corrected noise level, as required by the DTMR Policy and Interim Guideline.

The immediate area 600 m either side of the rail corridor was modelled with a ground absorption coefficient of zero (0) to be representative of a hard, reflective ground surface. Further than 600 m from the rail corridor a ground absorption coefficient of 0.6 was adopted to be representative of the mixed soft and hard ground areas within the rural environment beyond the rail corridor.

To calculate noise emissions from the operation of rollingstock, the model applied the Nordic Rail Traffic Noise Prediction Method (Kilde 130) methodology⁹. Both the SoundPLAN modelling software and the Nordic prediction methodology are widely applied in Australia for the prediction of railway noise levels.

⁹ KILDE, "Kilde Report 130 – Background Material for the Nordic Rail Traffic Noise Prediction Method, 1984.

To confirm the suitability of the noise modelling on the QLD sections of the Inland Rail program, a survey of existing railway noise levels was undertaken in 2019 at discrete locations on the West Moreton System. Details of the monitored railway noise levels and the noise model verification are provided in **Appendix B**.

7.2 Daily railway operations

The daytime and night-time train movements on the Project were provided by ARTC for the assessment of operational railway noise for the year the Project commences (2026) and the design year (2040). The daily train movements associated with the Project are detailed below and applied the following principles.

- The daily train numbers include the existing freight services that will be accommodated on the Project.
- The train movements in each time period are the combined northbound and southbound movements. For the purpose of the assessment the northbound and southbound rail movements were evenly distributed in the northbound and southbound directions.
- The noise assessment only considers whole trains so the train movements in each daytime and night-time period were rounded up to integers. The approach resulted in the daily train numbers being marginally higher than the actual daily train movements forecast for the Project.

The daily train movements detailed in **Table 20** for project opening in year 2026.

Table 20 Daily train movements on the Project (year 2026)

Train services	Train movements ¹		
	Daytime	Night-time	Total 24-hour
Year 2026 project commencement			
Inland Rail Express	2	2	4
Inland Rail Superfreighter	5	3	8
Narrabri Export Containers	1	1	2
Queensland grain, Narrabri to Fisherman Island	1	1	2
Queensland grain, Yelarbon to Fisherman Island	2	-	2
Queensland cotton	0	1	1
Daily totals year 2026	11	8	19

Note 1 Daytime is 7.00 am to 10.00 pm and night-time is 10.00 pm to 7.00 am.

Table 21 Daily train movements on the Project (year 2040)

Train services	Train movements ¹		
	Daytime	Night-time	Total 24-hour
Year 2040 design year			
Inland Rail Express	2	2	4
Inland Rail Superfreighter	8	3	11
Narrabri Export Containers	1	1	2
Queensland grain, Narrabri to Fisherman Island	1	2	3
Queensland grain, Yelarbon to Fisherman Island	3	-	3
Queensland cotton	0	1	1
Daily totals year 2040	15	9	24

Note 1 Daytime is 7.00 am to 10.00 pm and night-time is 10.00 pm to 7.00 am.

7.3 Operational railway noise model inputs

7.3.1 Track gradient and locomotive notch settings

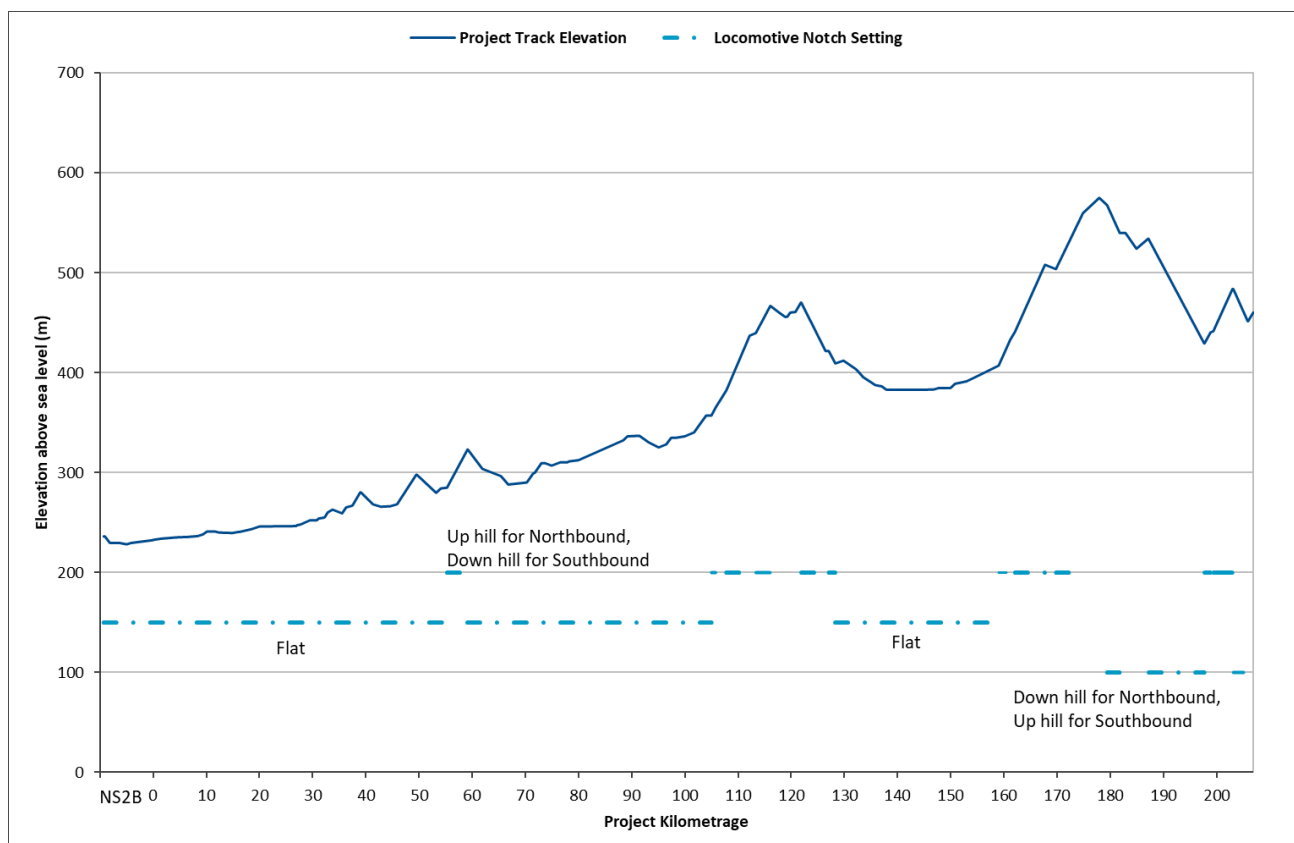
To control the speed of the trains, the locomotives have a series of throttle controls, known as notches. Most locomotives have up to eight notches and follow the operational principles below. The notch setting of a locomotive is related to the noise emission, with higher notch settings generally causing higher noise levels.

- When operating on relatively flat or moderate gradients the locomotive would generally be operated at a medium notch setting (notch settings 3, 4 or 5).
- On downhill gradient track trains are often in low notch setting or can use dynamic braking where the traction motors that drive each locomotive axle are used to slow the train. Dynamic braking can be a source of additional noise as the radiator cooling fans are used to dissipate heat energy.
- For uphill gradients the load is increased which requires high notch settings (notch setting 6, 7 or 8). Often on uphill sections the train can be operating at lower speeds but at a higher notch setting.

At this stage of the design, the specific notch operations of the locomotives as they traverse the alignment was not confirmed. For the purpose of assessment, a gradient of 1 in 100 or less was applied to identify areas where uphill and downhill sections may require a high notch setting or dynamic braking.

In practice, the selection of notch settings and dynamic braking will be determined by the driver and the 1 in 100 gradient was adopted to provide a conservative allowance for such events. The track elevation for the Project and the notch settings and dynamic braking applied in the assessment of airborne noise area shown in **Figure 8**.

Figure 8 Track elevation of locomotive notch setting



7.3.2 Train speeds

The trains on the Project are required to operate at their designated line speed of up to 105 km/h for the Inland Rail Express and Inland Rail Superfreighter services. The other rail services will operate at up to 80 km/h.

The train speeds supplied by ARTC, and presented below, included a modelled 8% reduction in the designated line speed to account for driver behaviour. The train speed will not be constant throughout the alignment, and the noise modelling applied speed profiles for each train type with the train speed detailed at 10 m intervals along the Project alignment.

To manage the railway operations, some trains will be required to slow down to access the crossing loop and then, on departure from the crossing loop, accelerate back up to the line speed.

Examples of the train speed profiles adopted in the noise modelling are presented in **Figure 9** (northbound) and **Figure 10** (southbound). The acute changes in train speed are associated with entry to and exit from the crossing loop.

Figure 9 Example track speed profiles, Border to Gowrie direction

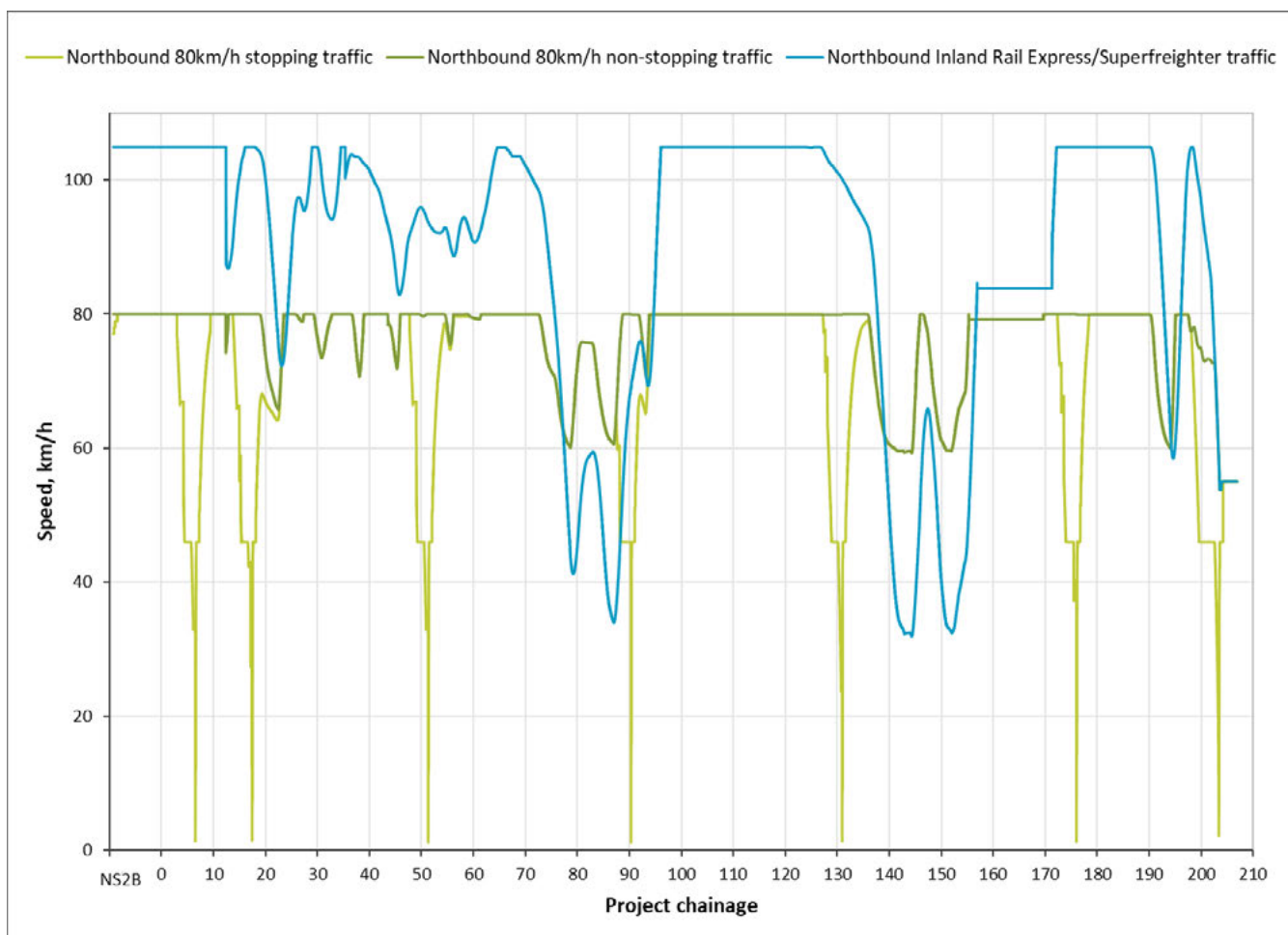
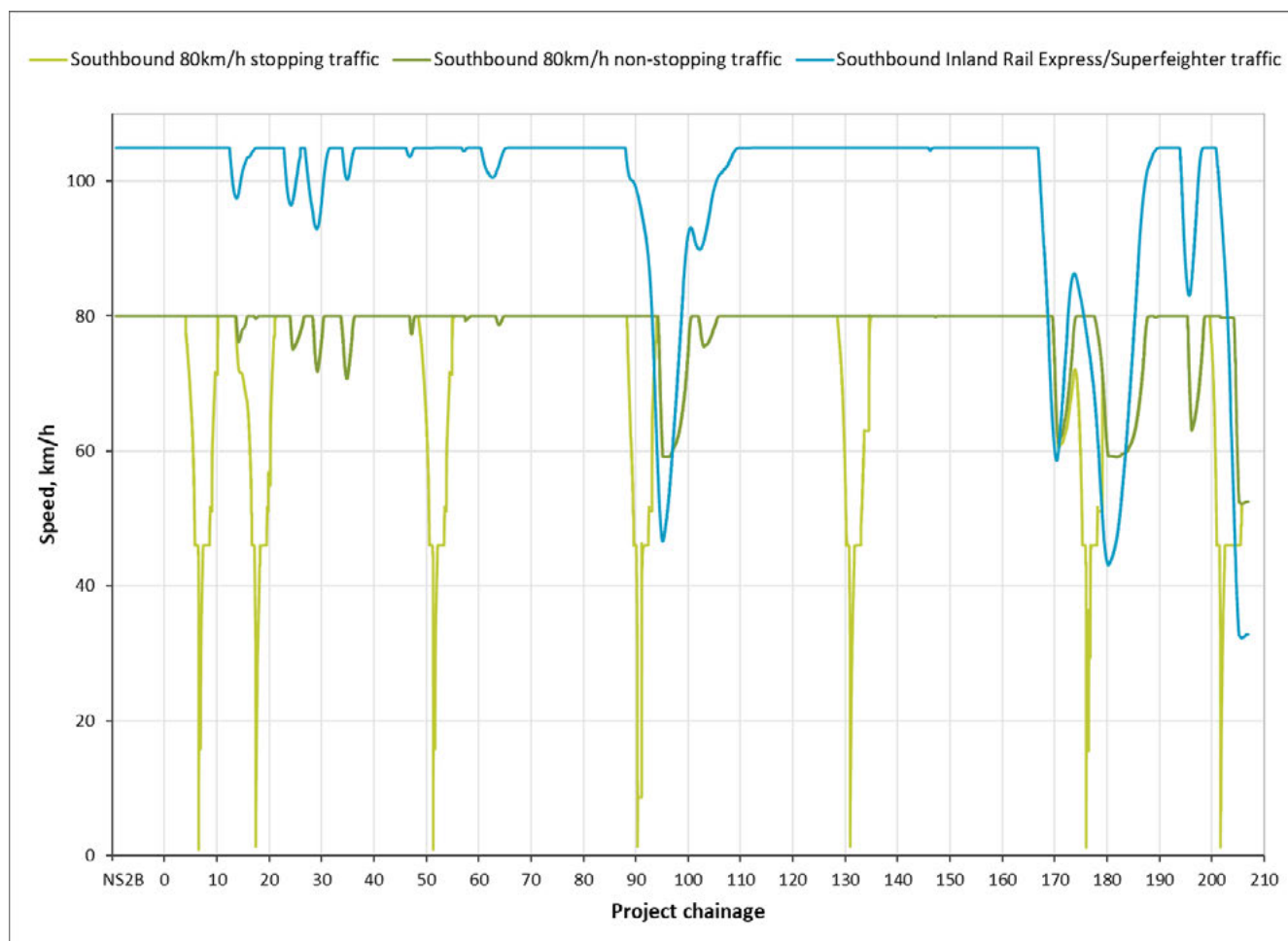


Figure 10 Example track speed profiles, Gowrie to Border direction



7.3.3 Train lengths and locomotive classes

The length of each train type and the number of locomotives for the future railway operations with the Project is shown in **Table 22**. The train data was derived from ARTC's forecast daily train movements for the Inland Rail Program.

Table 22 Train lengths and locomotive class

Train service	No. locomotives	Total locomotive length	Length of wagons	Total train length
Inland Rail Express (NR class)	3	66 m	1,680 m	1,746 m
Inland Rail Superfreighter (SCT class)	2	44 m	1,700 m	1,744 m
Toowoomba Export Container freight (82 class)	2	44 m	600 m	644 m
Narrabri Export Containers (82 class)	2	44 m	580 m	624 m
Queensland grain, Narrabri to Fisherman Island (PR22L class)	3	54 m	800 m	854 m
Queensland grain, Yelarbon to Fisherman Island (PR22L class)	3	54 m	560 m	614 m
Queensland cotton (PR22L class)	3	54 m	800 m	854 m

7.3.4 Source noise levels

Modelling of noise from railway operations requires defined source noise emission levels for the various classes of locomotives and rail wagons proposed to operate on the Project. For railway infrastructure projects in Queensland, the rollingstock noise emissions are often referenced from a noise emission database maintained by QR. The database is specific to rollingstock operating on existing rail networks in Queensland and does not provide the noise emission data for all the rollingstock proposed for the Project and the Inland Rail program.

The Transport for NSW (TfNSW) Asset Standards Authority (ASA) Stage III Rail Noise Database was referenced by this assessment to provide a source noise emission inventory for the locomotive classes proposed for Inland Rail. The TfNSW database defines reference noise levels for Australian rollingstock for use in commercial noise modelling software packages to conduct airborne noise predictions under a range of operating scenarios.

The database contains over 840 measurements of freight and passenger rail sources, including rail freight proposed on the Project. The noise levels were measured and analysed in line with procedures outlined in specific railway noise standards; International Standard ISO 3095¹⁰ and Australian Standard AS 2377¹¹.

As part of the assessment, the rail source noise emission levels derived from the TfNSW ASA database were validated against the ARTC Pollution Reduction Programme Rail Noise Study, which was prepared by ARTC to evaluate locomotive noise as part of ARTC's pollution reduction program.

The Inland Rail Program is introducing the PR22L class locomotives on to the rail network. The referenced sound exposure levels (SEL) and L_{Amax} noise emission levels for the PR22L class locomotive were determined from additional measurement of train passby noise where the locomotive class currently operates in Australia.

The following principles were applied when determining the source noise emission levels for rollingstock:

- The SEL and maximum (L_{Amax}) noise emission levels are derived for each locomotive and set of wagons i.e. per unit.
- Noise emission levels are presented for a standardised train speed of 80 km/h at a distance of 15 m from the track centreline.
- The noise levels for freight wagons account for a variety of wagon classes. The freight wagon reference noise levels are representative of typical wagon operations, and do not include a correction for increased noise levels that can result from unique operational influences (such as heavy braking) or significant defects (such as major wheel flats or bearing failures).
- Locomotive noise is determined from the required power output (notch setting) and only the rolling (wheel-rail) noise emissions for the wagons have been normalised to a speed of 80 km/h.
- The SEL noise level for an individual locomotive or consist of wagons is the logarithmic average of the referenced noise emissions levels and the L_{Amax} emission level is the overall 95th percentile L_{Amax} value derived from the database of noise measurements for each locomotive class or wagons.
- The source noise levels assume the track is in good condition and that the running surface of the rail head is free of defects. Wheel tread condition is also assumed to be in good to fair condition.

¹⁰ International Standards, 2013. ISO 3095 Railway applications – Acoustics – Measurement of noise emitted by railbound vehicles.

¹¹ Australian Standards, 2002. AS 2377 Acoustics – Methods for the measurement of railbound vehicle noise.

Conservatively, locomotive noise emissions are considered to be dominated by engine, cooling fans and exhaust systems, and for this reason the locomotive noise source is set to 4.0 m above the top of rail height to broadly represent the actual emissions of those items.

Noise emissions from wagons are considered to be dominated by ‘rolling noise’ generated equally by wheels and rail, so wagon noise emissions are set to the top of the rail height. On the basis that trains with defective wagons would not regularly be traversing the Project, the noise emission database does not account for local track defects, wheel flats or similar defects.

The referenced noise emission levels assume each train emits the same noise level and is therefore a typical worst-case noise generating event. Similarly, the method does not allow for deriving an arithmetic average of a range of maximum (L_{Amax}) noise levels for each train type as this could potentially result in lower daytime and night-time maximum noise level predictions.

The source noise emission levels for each rollingstock category are detailed in **Table 23**. Inspection of the source noise emission levels in **Table 23** indicates that the adopted noise emission levels for the noise modelling are generally higher (more conservative) than the QR database.

Discussed in **Section 7.3.1**, the locomotive settings (notches) were assigned based on the gradient of track, which provided specific noise emissions based on the features of the railway infrastructure and its influence on the operation of the trains.

Table 23 Source rail noise emission levels

Rollingstock category	Rail source elevation	Train class	Reference length	Gradient	Reference noise level, dBA ¹	
					SEL	L_{Amax}
Diesel electric locomotives	4.0 m above the top of rail	NR	22 m	Flat	85	90
				Downhill	84	90
				Uphill	90	94
		GT46C ²	21 m	Flat	84	88
				Downhill	84	91
				Uphill	89	92
		82	22 m	Flat	83	89
				Downhill	84	94
				Uphill	88	94
		PR22L	18 m	Flat	84	91
				Downhill	84	94
				Uphill	89	94
Wagons (all consist)	Top of rail	All	1,000 m	n/a	100	90

Note 1: Reference noise levels at 80 km/h, 15 m distance from track centreline, 1.5 m above top of rail, and ISO 3095 compliant track roughness.

Note 2: GT46C ACe model locomotive encompasses SCT, LDP, TT, WH, GWA, and SSR class designations.

7.3.5 Consideration of double-stack container freight

The Project will operate some trains with containers on wagons in a double-stacked configuration. Concerns were raised by stakeholders and the community that double stacking the containers could lead to significantly different wagon noise emissions. The potential noise emission levels from double-stacked containers were investigated as part of this assessment and the key outcomes are outlined below.

International Standard ISO 3095 provides general guidance on the difference in noise level resulting from changes in axle loads and notes that an approximate doubling of axle loads (increased weight) may result in a reduction in noise levels of around 1 dB in L_{Aeq} terms. A variance in noise emission of 1 dB is negligible in the context of other factors which can affect rolling noise and vibration emission levels, such as wheel and track condition, speed and unsprung mass.

To support the assessment of noise on the Project, a noise and vibration monitoring survey was undertaken to investigate the potential influence of single and double stacked containers on noise and vibration emissions from freight trains. The details of the survey is provided in **Appendix C** and the survey determined the following:

- Consistent with ISO 3095, individual wagons with double-stacked containers have L_{Aeq} noise levels approximately 1 to 2 dB less than the individual wagons with single-stacked containers.
- Overall train passby noise levels are not significantly reduced by wagons with double-stacked containers given the minimal change in rolling noise emissions from the wagons.
- The loading of individual trains can substantially vary both in terms of the number of wagons with single-stacked and double-stacked containers but also the weight of each container on the train will vary from empty to fully loaded (a typical range of 3 to 30 tonnes).
- The overall passby noise levels, particularly L_{Amax} noise levels, are more influenced by factors other than the configurations of the containers on individual wagons.

On the basis of the above, correction factors to account for the potential configuration of containers on the wagons were not applied to the source noise emission levels in **Table 23**.

7.3.6 Track feature corrections

Impact noise from rail discontinuities such as turnouts, expansion joints or rail defects can increase noise levels from trains and are heard as impulsive noise as each train wheel passes over the discontinuity. Noise modelling correction factors were applied at each turnout to account for potential impact noise during the train passbys.

The elevated structures on the Project are proposed to be ballasted concrete bridges and viaducts. Consistent with guidelines for noise prediction modelling, the rail noise emissions for the ballast track on the concrete bridges and viaducts were assumed to have noise emission levels and characteristics as the ballasted track at ground level.

The Project does not include tight radius curved track, accordingly the noise modelling did not apply noise emission correction factors for potentially curving noise emissions.

The railway noise level corrections in **Table 24** were included in the railway noise prediction modelling to account for the potential influence of the rail infrastructure on the wheel-rail noise emissions.

Table 24 Noise model rail infrastructure corrections

Track feature and infrastructure	Modelling correction for wheel-rail contribution, dBA	
	SEL	L _{Amax} ¹
Ballasted concrete rail bridges	0	0
Turnouts	+6	+6
At-grade active level crossings with the road network	+3	+3

7.3.7 Level crossings

The noise assessment assumed all active level crossings included noise sources during each train passby for the crossing alarm bells and approaching train horns. The passive level crossings only included the train horns as noise sources.

At each active level crossing the noise sources included; a single alarm bell and two train horn source emissions, one located 100 m either side of the crossing to account for trains approaching from either direction. A source height of 2.0 m above ground level for the crossing alarm bells and 4.0 m above ground level was applied for the train horns.

The Nordic railway noise prediction methodology is specific to the rolling noise emissions. To calculate noise levels from the level crossing alarm bells and train horns at sensitive land uses, the International Standard ISO 9613-2¹² method for calculating the outdoor noise propagation was applied.

The ISO method calculates noise levels with default meteorological conditions favourable for downwind propagation of noise (wind speeds between approximately 1 m/s and 5 m/s) or under a moderate ground-based temperature inversion.

The noise modelling applied the source noise levels for alarm bells and train horn detailed in **Table 25**. The noise levels were referenced from SLR's measurement of train horn and alarm bell events on existing freight corridors.

Table 25 Level crossing and train horn source emission levels

Source	Noise emission level (L _{Aeq}) at 15 m, dBA										
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz	Overall
Alarm bell	26	29	43	34	42	65	70	57	35	21	71
Train horn	38	52	68	81	93	98	95	92	82	62	101
Source	Noise emission level (L _{Amax}) at 15 m, dBA										
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz	Overall
Alarm bell ¹	31	35	48	46	57	68	73	60	45	33	74
Train horn ²	43	57	73	86	98	103	100	97	87	67	106

Note 1 L_{Aeq} noise level is for an alarm bell event 20-seconds in duration prior to the noise of the train becoming the dominant noise contribution and masking the alarm bell noise contribution.

Note 2 L_{Aeq} noise level for a train horn event 2-seconds in duration.

¹² International Standards, 1996. ISO 9613-2:1996, Acoustics – attenuation of sound during propagation outdoors – Part 2: General method of calculation.

7.3.8 Train movements within the crossing loops

For the purpose of assessment, it has been assumed that approximately one in four trains per daytime or night-time period would access the crossing loops and each train could be held at the crossing loop for up to 1-hour. The details of the loop operations used in the noise prediction modelling are shown in **Table 26**.

Table 26 Proposed crossing loop occupancy

Assessment scenario	Number of trains accessing the loop per period		Total hours occupancy time per period	
	Daytime	Night-time	Daytime	Night-time
Year 2026	3	2	3	2
Year 2040	4	3	4	3

At a crossing loop the train will come to a complete stop from the main line track and idle until the train is signalled to return to the main line track. The assessment of airborne noise considered the noise emissions from the train locomotive engines idling whilst the train has stopped as well as short-lived noise events such as wagon bunching and stretching, which results in contact noise as the wagons come together.

For the purpose of assessing typical worst-case noise levels, the noise modelling included the faster and longer Inland Rail Express and Inland Rail Superfreighter on the main line track with the other general freight types held on the crossing loops.

The noise emission for an individual locomotive at idle was modelled as 70 dBA at a distance of 15 m. Because the idling of locomotive engines is a steady-state continuous noise emission, the emission level was referenced for the L_{Aeq} and L_{Amax} noise metrics. Acknowledging that trains can access each crossing loop from either direction, the noise modelling considered idling locomotives at both extents of each crossing loop.

The source noise emission levels for rolling noise, including potential wagon bunching, were referenced from noise measurements of the existing coal and freight train movements in QLD. The noise emission level was applied as a contribution to the L_{Amax} level as the short-lived nature of bunching noise (1 to 2 seconds per event) would not be sufficient to influence the overall daily L_{Aeq} noise levels.

The noise prediction modelling for the crossing loops applied the ISO prediction methodology and each idling locomotive and bunching noise event was modelled as individual point noise sources. The bunching sources were modelled at approximately 300 m intervals to anticipate the potential for such events along the length of the train.

The noise sources for the idling trains and wagons bunching referenced the source noise emission levels detailed in **Table 27**. The bunching sources were modelled at approximately 300 m intervals to anticipate the potential for such events along the length of the train.

Table 27 Crossing loop source emission levels

Source	Noise emission level (L_{Aeq}/L_{Amax}) at 15 m, dBA										
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz	Overall
Idling train	47	52	47	47	57	58	69	46	39	21	70
Source	Noise emission level (L_{Amax}) at 15 m, dBA										
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz	Overall
Bunching	51	63	71	62	53	56	53	52	48	40	72

8 Airborne railway noise levels – Project opening 2026

8.1 Overview

The predicted daytime and night-time railway noise levels for the commencement of railway operations in Year 2026 are detailed in **Appendix D**. The railway noise levels are provided as tabulated noise level predictions at individual sensitive receptors and maps of railway noise contours for the Project alignment. The assessment of daytime, night-time and maximum railway noise levels is discussed in the following sections.

The railway noise levels are the combined noise levels from train passbys on the main tracks, train operations on the crossing loops and the alarm bells and train horn events at the level crossings. The predicted noise levels have been assessed against the adopted railway noise criteria to evaluate the potential noise impact of the Project and identify where noise mitigation options would need to be investigated.

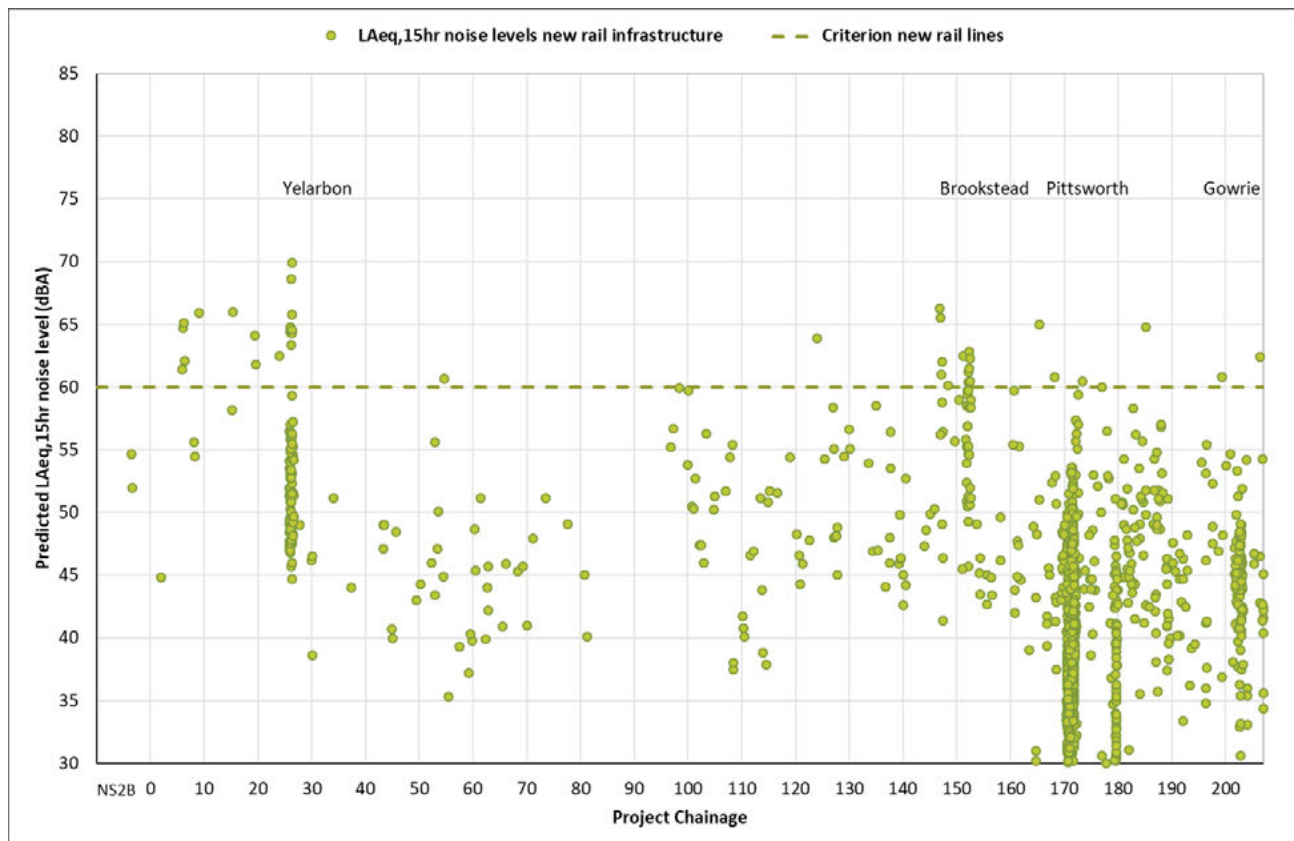
The noise criteria implemented by ARTC on the Project are more stringent than the noise criteria from the DTMR Policy and the Interim Guideline. On this basis, where the predicted railway noise levels at the sensitive receptors achieve the ARTC noise criteria, the noise levels would also be expected to achieve the noise criteria from the DTMR Policy and the Interim Guideline.

8.2 Railway noise levels at sensitive receptors

8.2.1 Daytime railway noise levels

The predicted daytime $L_{Aeq}(15hr)$ railway noise levels at the residential receptors are presented in **Figure 11**.

Figure 11 Predicted daytime $L_{Aeq}(15hr)$ railway noise levels (Year 2026)



Note Some receptors are in the same location and the markers in the above scatter plot represent more than one receptor.

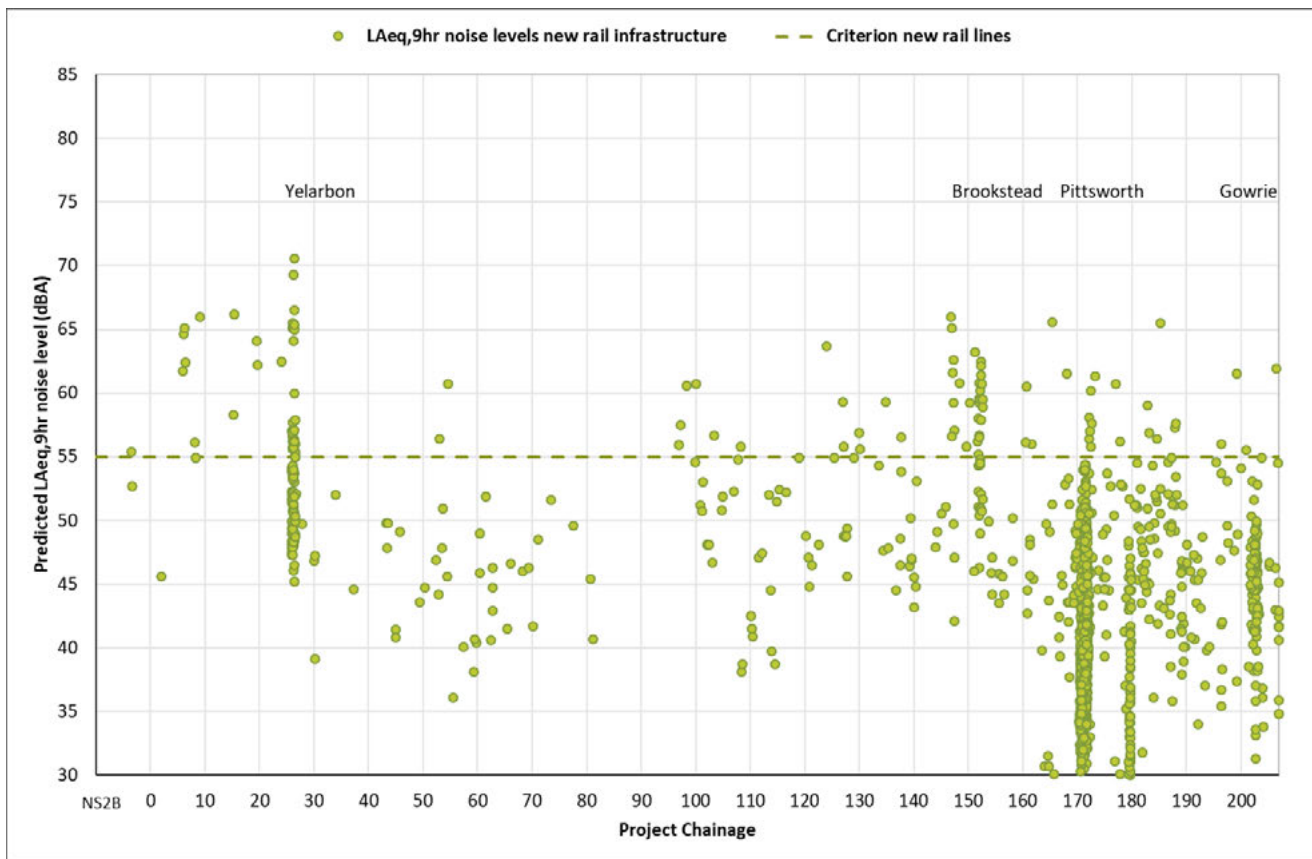
The predicted daytime railway noise levels achieve the $L_{Aeq(15\text{hour})}$ 60 dBA noise criterion at the majority of sensitive receptors adjacent to the section of new rail corridor. The predicted daytime $L_{Aeq(15\text{hour})}$ railway noise levels at 1 to 10 dBA above the noise criterion at 37 sensitive residential receptors.

8.2.2 Night-time railway noise levels

The predicted night-time $L_{Aeq(9\text{hour})}$ railway noise levels at the identified noise sensitive residential receptors are presented in **Figure 12**.

The predicted night-time railway noise levels achieve the $L_{Aeq(9\text{hour})}$ 55 dBA noise criterion at the majority of sensitive receptors adjacent to the sections of new rail corridor. The predicted night-time $L_{Aeq(9\text{hour})}$ railway noise levels are 1 to 16 dBA above the noise criterion at 103 sensitive receptors.

Figure 12 Predicted night-time $L_{Aeq(9\text{hour})}$ railway noise levels (Year 2026)



Note Some receptors are in the same location and the markers in the above scatter plot represent more than one receptor.

8.2.3 Daytime and night-time maximum railway noise levels

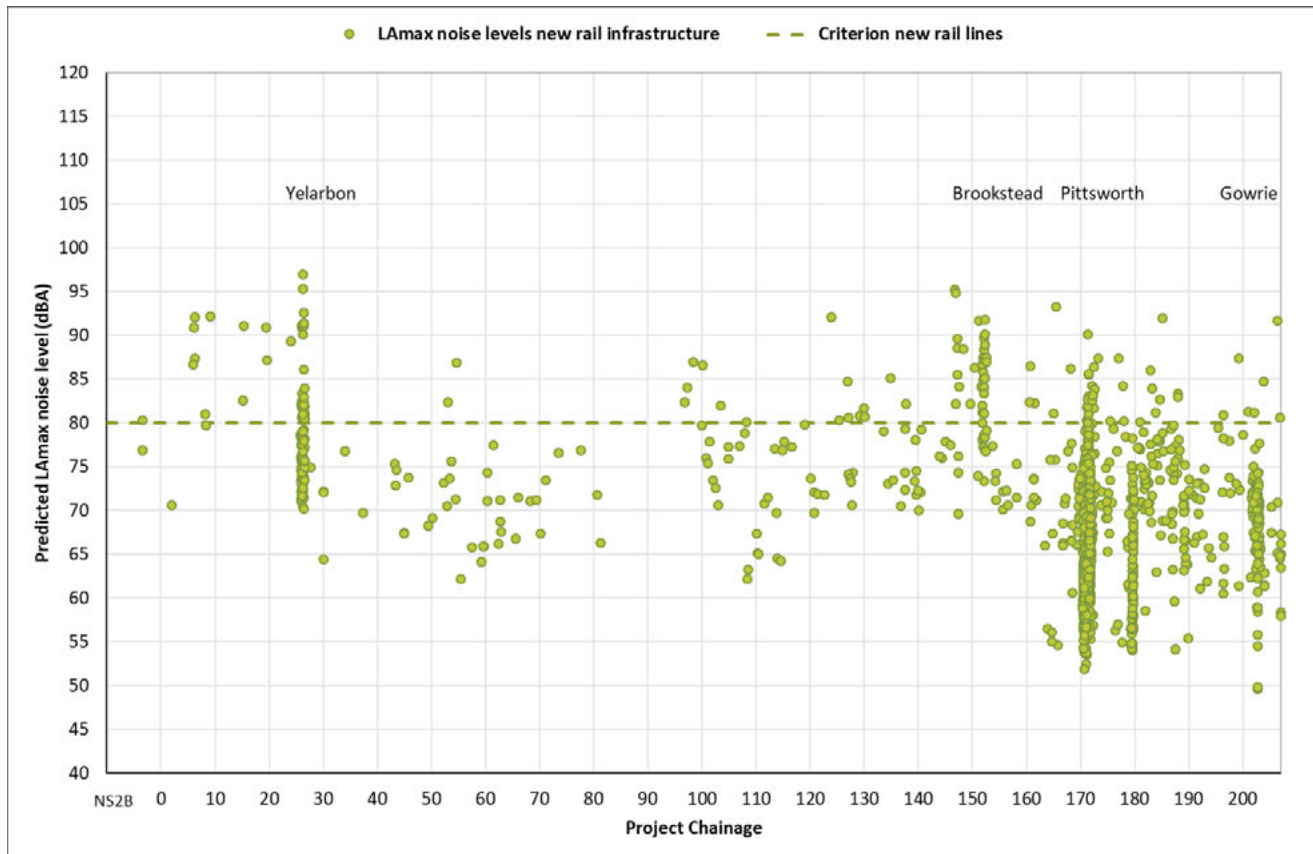
The maximum noise levels result from the highest discrete noise events from individual train passbys or the train operations on the level crossings or crossing loops. The predicted daytime and night-time L_{Amax} noise levels were generally consistent at the sensitive receptors, with a variation of less than 1 dBA.

Consequently, the higher predicted L_{Amax} noise level was adopted to assess the maximum noise levels in both the daytime and night-time periods.

The predicted daytime and night-time maximum (L_{Amax}) railway noise levels at the residential receptors are presented in **Figure 13**.

The predicted railway noise levels achieve the L_{Amax} 80 dBA noise criterion at the majority of the residential receptors adjacent to the sections of new rail corridor. At 129 residential receptors the predicted noise levels are 1 to 17 dBA above the L_{Amax} noise criterion.

Figure 13 Predicted daytime and night-time maximum railway noise levels (Year 2026)



Note Some receptors are in the same location and the markers in the above scatter plot represent more than one receptor.

9 Airborne railway noise levels – Design year 2040

9.1 Overview

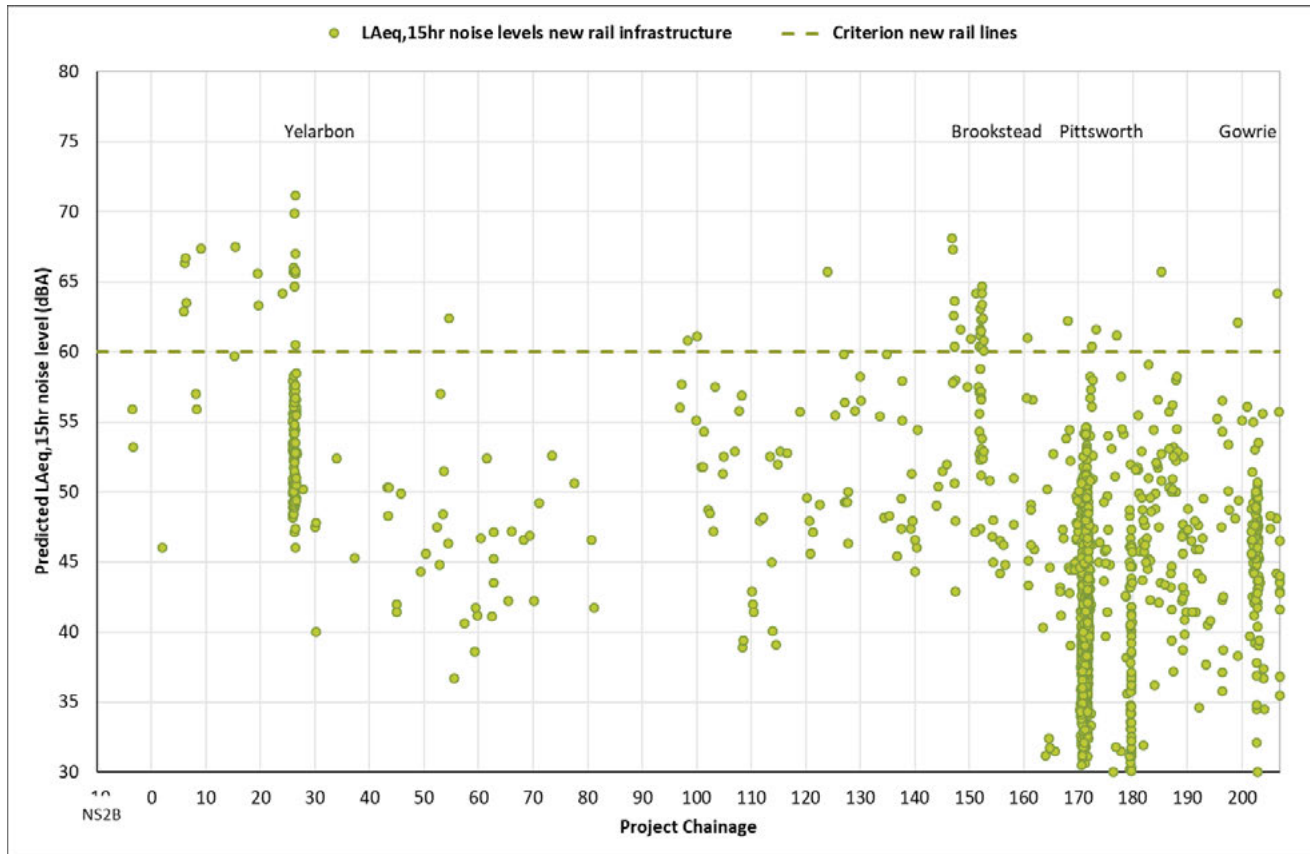
The predicted daytime and night-time railway noise levels for the railway operations in Year 2040 are detailed in **Appendix E**. The railway noise levels are provided as tabulated noise level predictions at individual sensitive receptors and maps of railway noise contours for the Project alignment. The assessment of daytime, night-time and maximum railway noise levels is discussed in the following sections.

9.1.1 Daytime railway noise levels

The predicted daytime $L_{Aeq(15hour)}$ railway noise levels at the identified noise sensitive residential receptors are presented in **Figure 14**.

The predicted daytime railway noise levels achieve the $L_{Aeq}(15\text{hour})$ 60 dBA noise criterion at the majority of sensitive receptors adjacent to the sections of new rail corridor. The predicted daytime $L_{Aeq}(15\text{hour})$ railway noise levels are 1 to 11 dBA above the noise criterion at 49 sensitive receptors.

Figure 14 Predicted daytime $L_{Aeq}(15\text{hour})$ railway noise levels (Year 2040)



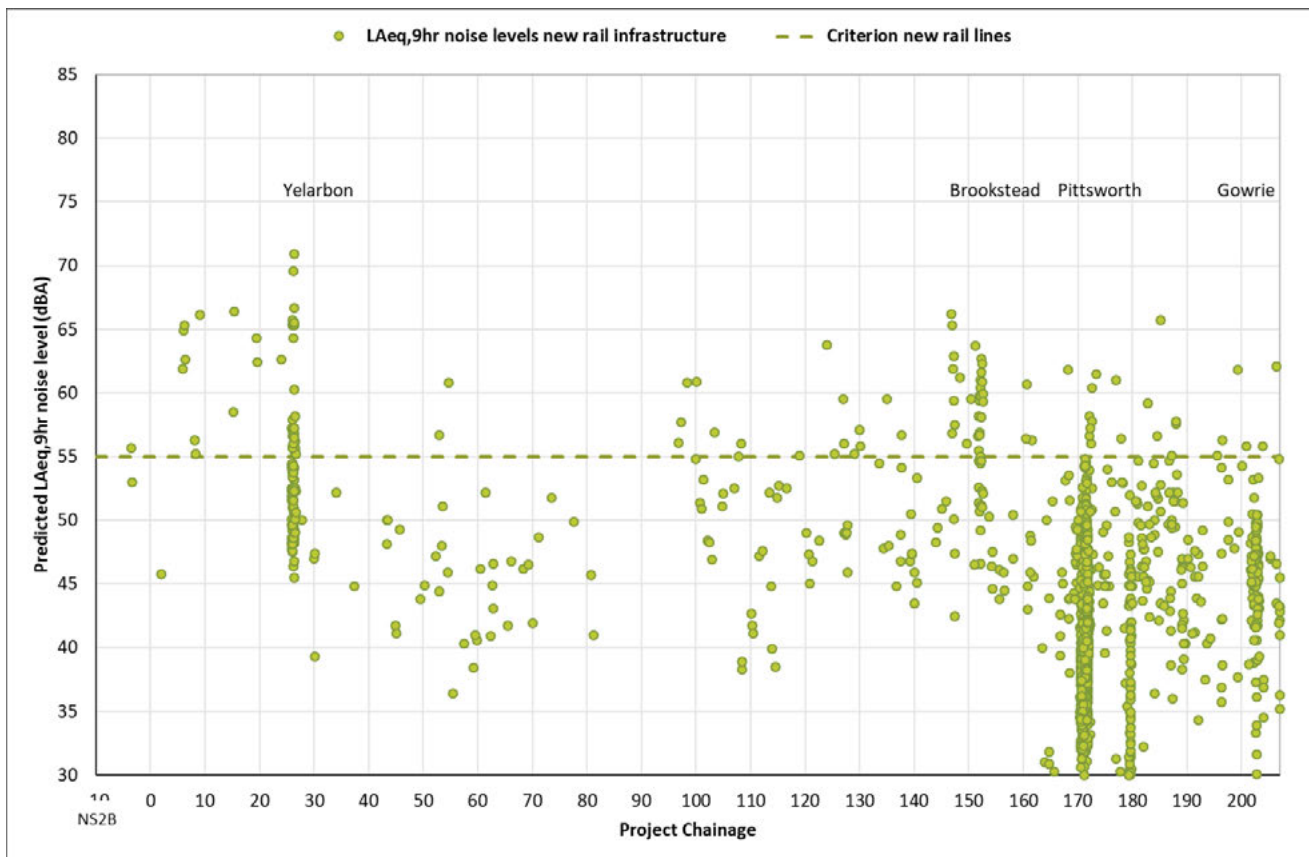
Note Some receptors are in the same location and the markers in the above scatter plot represent more than one receptor.

9.1.2 Night-time railway noise levels

The predicted night-time $L_{Aeq}(9\text{hour})$ railway noise levels at the identified noise sensitive residential receptors are presented in **Figure 15**.

The predicted night-time railway noise levels achieve the $L_{Aeq}(9\text{hour})$ 55 dBA noise criterion at the majority of sensitive receptors adjacent to the sections of new rail corridor. The predicted daytime $L_{Aeq}(15\text{hour})$ railway noise levels are 1 to 16 dBA above the noise criterion at 109 sensitive receptors.

Figure 15 Predicted night-time $L_{Aeq}(9\text{hour})$ railway noise levels (Year 2040)



Note Some receptors are in the same location and the markers in the above scatter plot represent more than one receptor.

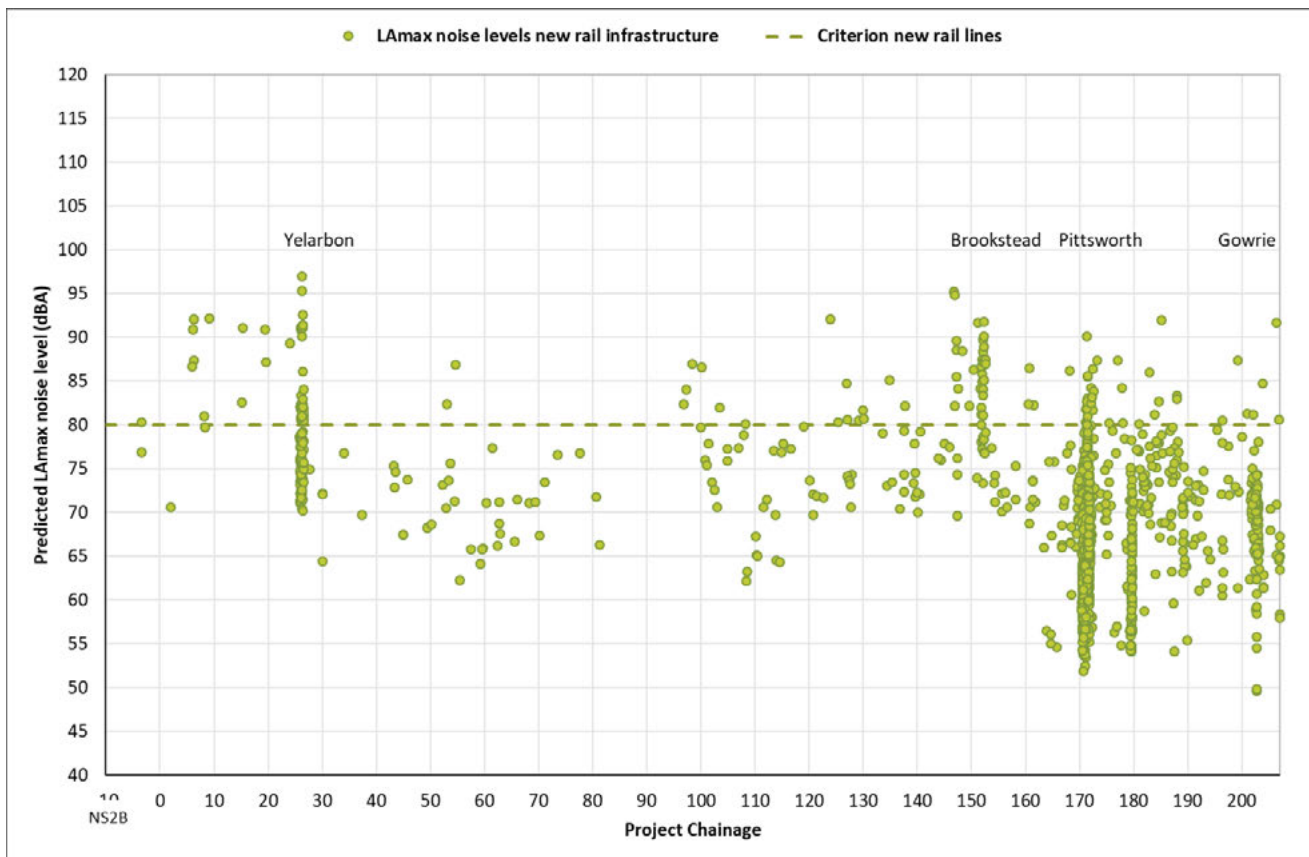
9.1.3 Daytime and night-time maximum railway noise levels

The predicted daytime and night-time L_{Amax} noise levels were generally consistent at the sensitive receptors, with a variation of less than 1 dBA. The higher predicted L_{Amax} noise level was adopted to assess the maximum noise levels in both the daytime and night-time periods.

The predicted daytime and night-time maximum (L_{Amax}) railway noise levels at the residential receptors are detailed in **Figure 16**.

The predicted railway noise levels achieve the L_{Amax} 80 dBA noise criterion at the majority of the residential receptors adjacent to the sections of new rail corridor. At 129 residential receptors the predicted noise levels are 1 to 17 dBA above the L_{Amax} noise criterion.

Figure 16 Predicted daytime and night-time L_{Amax} railway noise levels (Year 2040)



Note Some receptors are in the same location and the markers in the above scatter plot represent more than one receptor.

10 Airborne railway noise levels at non-residential receptors

The railway noise levels were predicted at the buildings and property identified as being non-residential noise sensitive receptors; for example, places of worship, schools and recreation facilities. Other than hospitals and outdoor recreation areas, which have external railway noise criteria, the noise assessment criteria for these sensitive receptors is an internal (indoor) noise level.

To assess potential internal railway noise levels, a conservative 7 dBA reduction was applied to the predicted external railway noise levels at the building façade to estimate the internal noise levels where windows are open for ventilation.

The predicted external and internal railway noise levels at the non-residential sensitive receptors is detailed in **Table 28**. The predicted railway noise levels are provided for the commencement of railway operations on the Project in 2026 and the future railway operations in 2040.

Table 28 Predicted railway noise levels at non-residential sensitive receptors

Sensitive receptor	LAeq(1hr) noise levels Year 2026, dBA				LAeq(1hr) noise levels Year 2040, dBA			
	Daytime		Night-time		Daytime		Night-time	
	Outside	Inside	Outside	Inside	Outside	Inside	Outside	Inside
Yelarbon State School	51	44	52	45	53	46	52	45
Yelarbon Scouts Hall	64	57	64	57	65	58	65	58
Pampas Memorial Hall	60	53	61	54	62	55	61	54
Brookstead State School	60	53	60	53	62	55	60	53
Pittsworth Masonic Centre	37	30	38	31	38	31	38	31
St Stephens Catholic Primary School	38	31	39	32	39	32	39	32
Pittsworth State School	35	28	36	29	36	29	36	29
Southbrook Central State School	40	33	40	33	40	33	40	33
Pittsworth Library	34	27	35	28	35	28	35	28
Pittsworth Uniting Church	34	27	35	28	35	28	35	28
Pittsworth and District Assembly of God	56	49	57	50	57	50	57	50
Pittsworth Kindergarten	37	30	38	31	38	31	38	31
Kate's Place Early Education	38	31	39	32	39	32	39	32
Anglican Church of Australia	39	32	40	33	40	33	40	33
Saint Peter's Catholic Church	38	31	39	32	39	32	39	32
Lutheran Church of Australia	38	31	38	31	39	32	39	32
Pittsworth State High School	46	39	46	39	47	40	47	40

The predicted railway noise levels are above the relevant assessment criteria, and trigger a review of noise mitigation, at the following sensitive receptors. The noise levels triggering the assessment criteria are highlighted in bold in **Table 28**.

- Yelarbon State School
- Yelarbon Scouts Hall
- Pampas Memorial Hall
- Brookstead State School
- Pittsworth and District Assembly of God

The predicted internal noise levels, and potential trigger of the noise criteria, is sensitive to the 7 dBA correction applied to external noise levels. The 7 dBA correction is commonly applied in Queensland with consideration to the age and style of property and buildings in the suburban and rural regions of the State.

In practice, many of the sensitive receptor properties will be a modern building construction and likely to have air-conditioning so the windows would not need to be opened. During the detail design of the Project, the construction of property and buildings identified as non-residential noise sensitive receptors should be reviewed. A revised assessment of internal noise levels would need to be undertaken where the adopted 7 dBA correction is deemed an overly conservative assessment assumption.

11 Summary of the railway noise assessment

11.1 Receptors triggering the investigation of noise mitigation

Where predicted railway noise levels at sensitive receptors are above the noise criteria, ARTC will investigate reasonable and practicable measures to reduce noise levels, and mitigate potential impacts, with the objective of achieving the noise criteria.

The review of noise mitigation is triggered at up to 130 individual sensitive residential receptors for the commencement of railway operations 2026 and up to 131 individual residential sensitive receptors (one additional receptor) for the design year operations in year 2040. Up to 103 sensitive residential receptors trigger the L_{Aeq} criteria and 129 sensitive residential receptors triggering the L_{Amax} criteria. Because not all receptors trigger both the L_{Aeq} and L_{Amax} criteria there are up to 131 individual criteria triggers in total. Additionally, there are up to five non-residential receptors where forecast noise levels are above the assessment criteria.

The noise criteria were most frequently triggered by the night-time L_{Aeq} rail noise levels and the L_{Amax} noise levels. The night-time period is more sensitive as the noise criteria are 5 dBA more stringent than the daytime.

The sensitive residential receptors where noise levels were predicted above the night-time noise criteria are detailed in **Table 29** for rail operations in 2040, with the individual criteria triggers highlighted in bold in the table. The predicted noise levels are provided for trains operating on the tracks of the main line and crossing loops and the separate contribution from the level crossings.

Where the level crossings were outside of the 2 km calculation area for an individual receptor, the predicted noise from the level crossing has been reported as <40 dBA L_{Aeq} and <60 dBA L_{Amax} and do not provide a cumulative increase to the railway noise levels from the main line and crossing loops.

The location of the sensitive receptors, including the non-residential sensitive receptors, where noise levels trigger the assessment criteria are presented in **Figure 17**.

Table 29 Sensitive receptors triggering the investigation of noise mitigation

SLR ID	Rail noise levels – rail tracks, dBA		Rail noise – level crossings, dBA		Overall night-time noise levels, dBA	
	$L_{Aeq}(9\text{hour})$	L_{Amax}	$L_{Aeq}(9\text{hour})$	L_{Amax}	$L_{Aeq}(9\text{hour})$	L_{Amax}
254161	65	90	61	92	66	92
254164	63	89	60	91	65	91
254170	64	89	60	92	65	92
254179	62	87	55	85	63	87
254181	61	86	55	87	62	87
254188	56	80	<40	<60	56	80
254193	56	81	46	76	56	81
254250	65	91	60	91	66	91
254255	57	82	53	83	59	83
254276	62	87	55	86	62	87
254347	60	86	59	89	63	89
254476	57	82	47	78	57	82

SLR ID	Rail noise levels – rail tracks, dBA		Rail noise – level crossings, dBA		Overall night-time noise levels, dBA	
	LAeq(9hour)	LAmix	LAeq(9hour)	LAmix	LAeq(9hour)	LAmix
254502	55	81	46	76	56	81
254516	56	81	<40	67	56	81
254521	55	81	<40	65	55	81
254526	56	82	<40	65	56	82
254529	55	81	<40	64	55	81
254531	56	81	<40	64	56	81
254534	58	83	45	74	58	83
254536	55	81	43	73	56	81
254537	55	81	<40	64	55	81
254539	57	82	42	72	57	82
254540	57	82	<40	70	57	82
254542	56	81	<40	69	56	81
254546	57	82	<40	67	57	82
254549	57	82	<40	72	57	82
254550	56	81	<40	70	56	81
254558	65	91	45	76	65	91
254559	65	91	45	76	65	91
254562	66	91	<40	72	66	91
254568	57	82	<40	68	57	82
254569	56	82	<40	63	56	82
254571	60	86	<40	66	60	86
254573	57	83	<40	67	57	83
254576	64	90	44	75	64	90
254587	58	84	<40	65	58	84
254589	65	91	43	75	65	91
254595	67	93	41	72	67	93
254598	65	91	40	71	65	91
254603	66	91	40	71	66	91
254609	70	95	46	77	70	95
254614	71	97	40	71	71	97
254787	57	82	<40	67	57	82
254828	59	85	57	87	61	87
255318	56	82	<40	<60	56	82
255333	58	84	<40	<60	58	84
255346	61	87	<40	<60	61	87
255350	61	87	42	72	61	87
255433	56	82	48	78	57	82

SLR ID	Rail noise levels – rail tracks, dBA		Rail noise – level crossings, dBA		Overall night-time noise levels, dBA	
	LAeq(9hour)	LAmaz	LAeq(9hour)	LAmaz	LAeq(9hour)	LAmaz
255514	55	80	49	80	56	80
256019	61	88	61	92	64	92
256166	60	85	<40	67	60	85
256191	55	81	43	71	55	81
256213	56	81	<40	68	56	81
256248	56	82	50	80	57	82
256289	55	81	45	75	56	81
256574	60	85	<40	65	60	85
256719	56	82	51	82	57	82
260058	63	90	63	95	66	95
260067	62	89	63	95	65	95
260119	59	86	52	83	59	86
260150	57	84	44	74	57	84
260165	56	82	50	80	57	82
260189	62	89	51	83	62	89
260213	63	90	52	83	63	90
260528	61	88	37	65	61	88
260930	55	82	51	81	56	82
261084	58	86	54	84	60	86
261227	64	92	42	71	64	92
261368	57	85	56	87	60	87
261386	57	85	57	88	60	88
261452	56	84	47	77	57	84
261535	54	82	46	78	55	82
261572	54	83	56	87	58	87
261608	53	81	51	81	55	81
261638	57	85	56	88	59	88
261639	57	85	59	90	61	90
261649	54	82	53	85	57	85
261661	53	81	54	86	57	86
261665	57	85	56	87	60	87
261720	60	88	60	92	63	92
261729	59	87	58	89	62	89
261739	60	88	59	90	62	90
261749	59	87	56	87	61	87
261781	51	79	53	84	55	84
261786	51	78	52	83	55	83

SLR ID	Rail noise levels – rail tracks, dBA		Rail noise – level crossings, dBA		Overall night-time noise levels, dBA	
	LAeq(9hour)	LAm _{ax}	LAeq(9hour)	LAm _{ax}	LAeq(9hour)	LAm _{ax}
261802	54	81	56	85	58	85
261829	52	80	52	81	55	81
261908	60	88	50	81	60	88
261969	59	87	48	79	59	87
315138	56	85	<40	64	56	85
315262	53	80	49	81	55	81
315421	58	87	60	92	62	92
319019	56	81	40	72	56	81
319044	50	81	50	81	53	81
319101	57	83	44	72	58	83
319103	58	83	45	75	58	83
319121	62	87	<40	68	62	87
319150	61	87	43	73	61	87
319154	56	82	<40	<60	56	82
319191	61	87	<40	<60	61	87
319200	56	82	<40	<60	56	82
319226	53	79	54	84	56	84
319278	66	92	<40	58	66	92
319294	57	83	<40	<60	57	83
319297	55	81	<40	<60	55	81
319605	56	81	<40	<60	56	81
319848	59	86	<40	62	59	86
320889	54	82	<40	60	54	82
321184	58	84	<40	<60	58	84
321457	55	86	<40	<60	55	86
321458	54	86	<40	<60	54	86
321975	54	82	<40	<60	54	82
322134	52	81	<40	<60	52	81
322135	53	82	<40	<60	53	82
322429	58	84	<40	<60	58	84
322453	54	82	<40	<60	54	82
322538	62	86	50	81	62	86
322552	62	87	<40	<60	62	87
322665	56	82	<40	<60	56	82
323678	54	82	<40	<60	54	82
323679	55	90	<40	<60	55	90
323680	53	83	<40	<60	53	83

SLR ID	Rail noise levels – rail tracks, dBA		Rail noise – level crossings, dBA		Overall night-time noise levels, dBA	
	LAeq(9hour)	LAmaz	LAeq(9hour)	LAmaz	LAeq(9hour)	LAmaz
323720	54	83	<40	<60	54	83
323796	57	83	<40	<60	57	83
323804	57	83	<40	<60	57	83
323854	60	86	<40	<60	60	86
324270	63	88	60	91	64	91
324333	57	84	<40	<60	57	84
324348	49	81	36	66	49	81
324674	66	93	49	79	66	93



BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 1 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:3,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 2 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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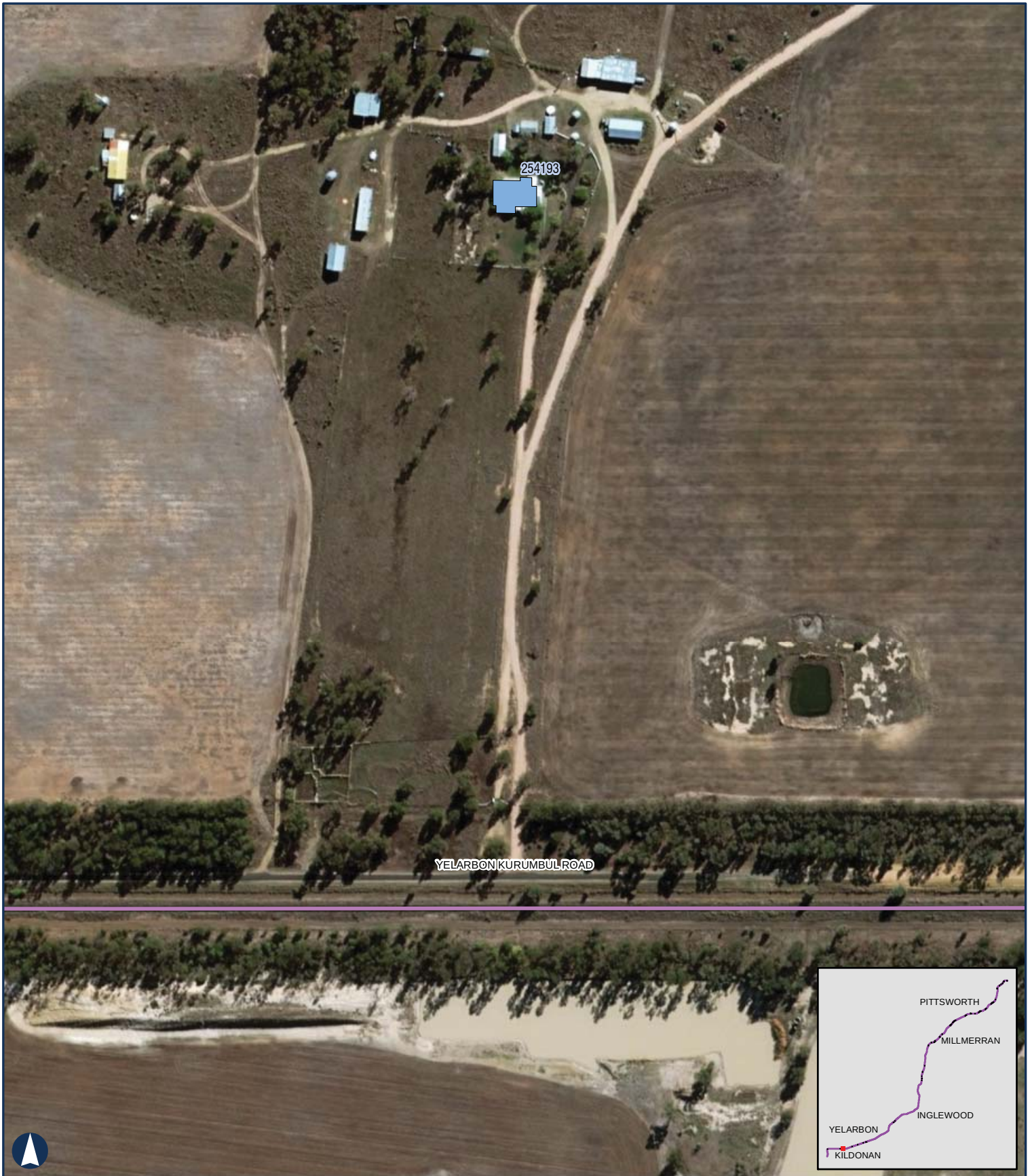
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:3,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 3 of 53

100Metres

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Author: JG

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 4 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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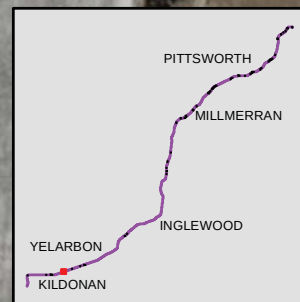
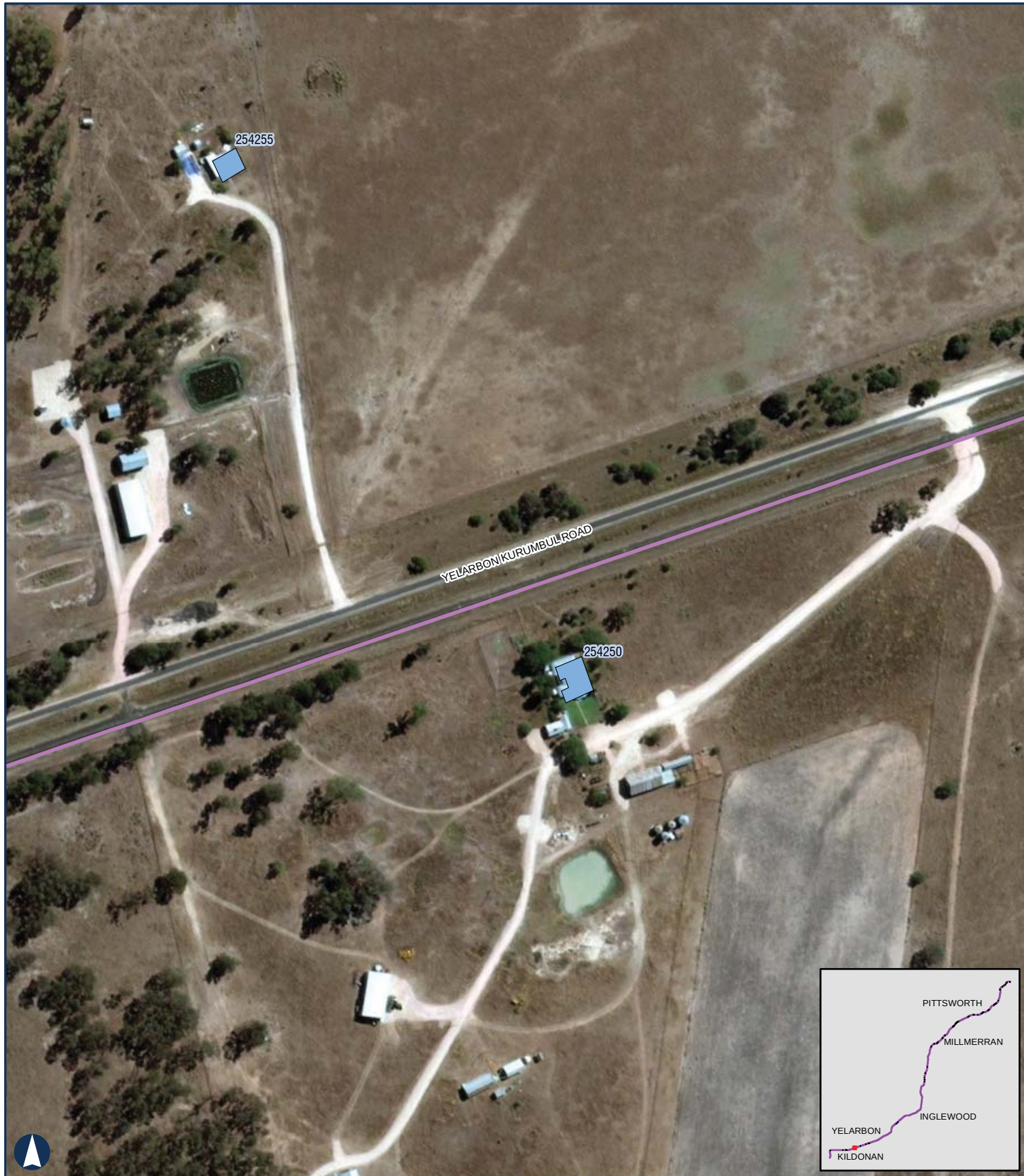
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:3,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 5 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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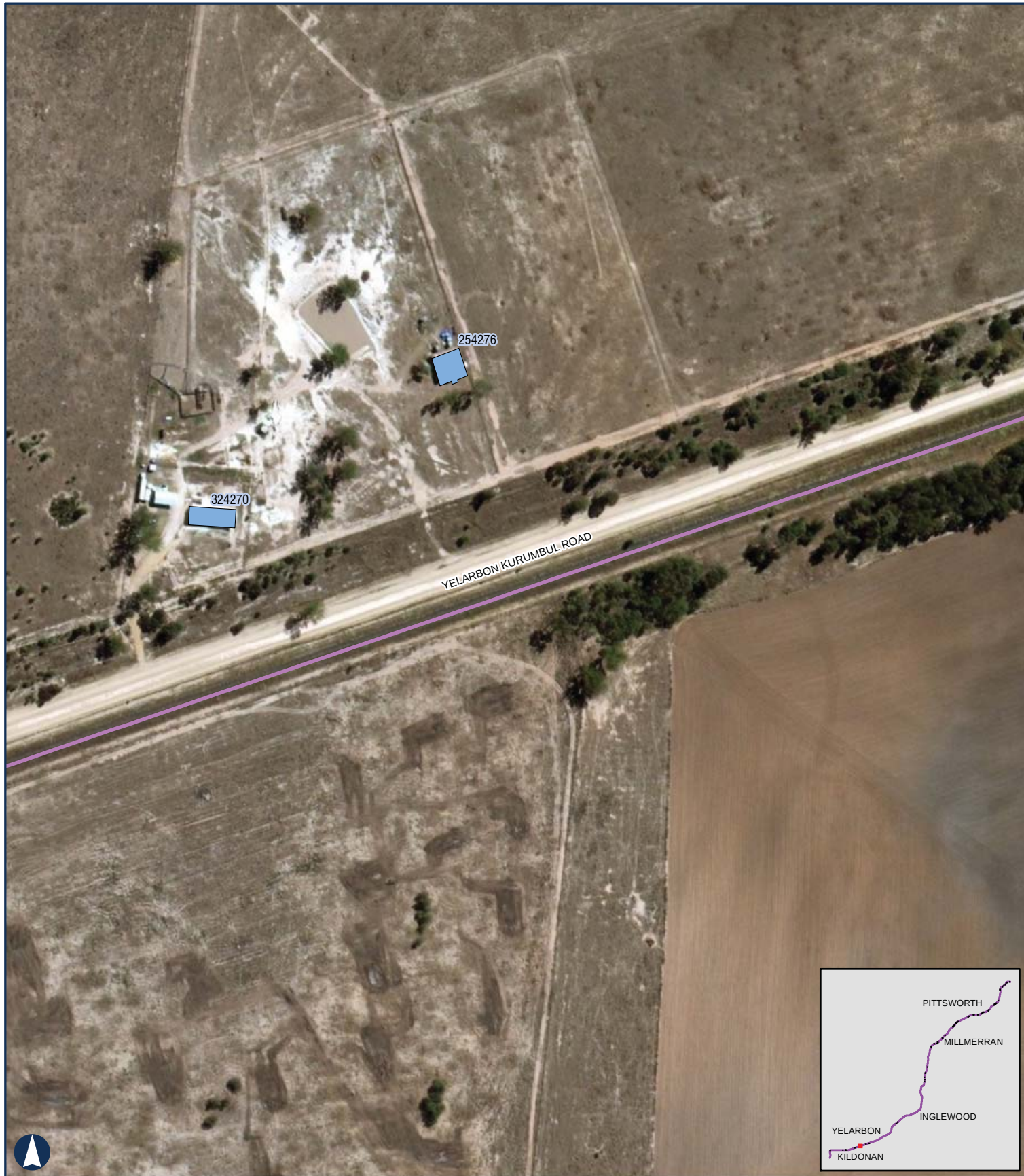
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:3,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 6 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:3,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 7 of 53

100Metres

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Author: JG

Scale: 1:3,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 8 of 53

100Metres

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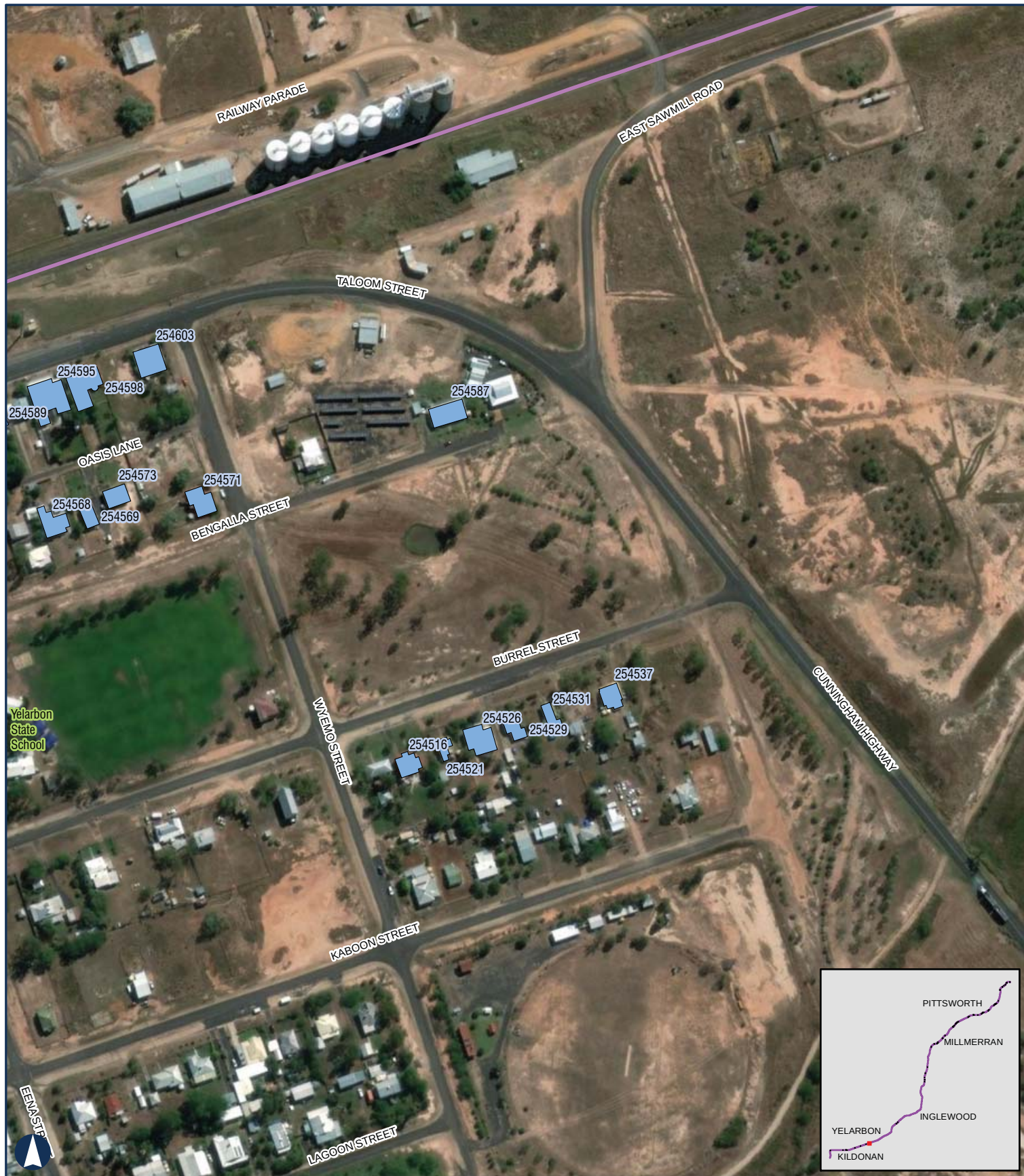
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:3,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 9 of 53

100Metres

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Author: JG

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 10 of 53

100Metres

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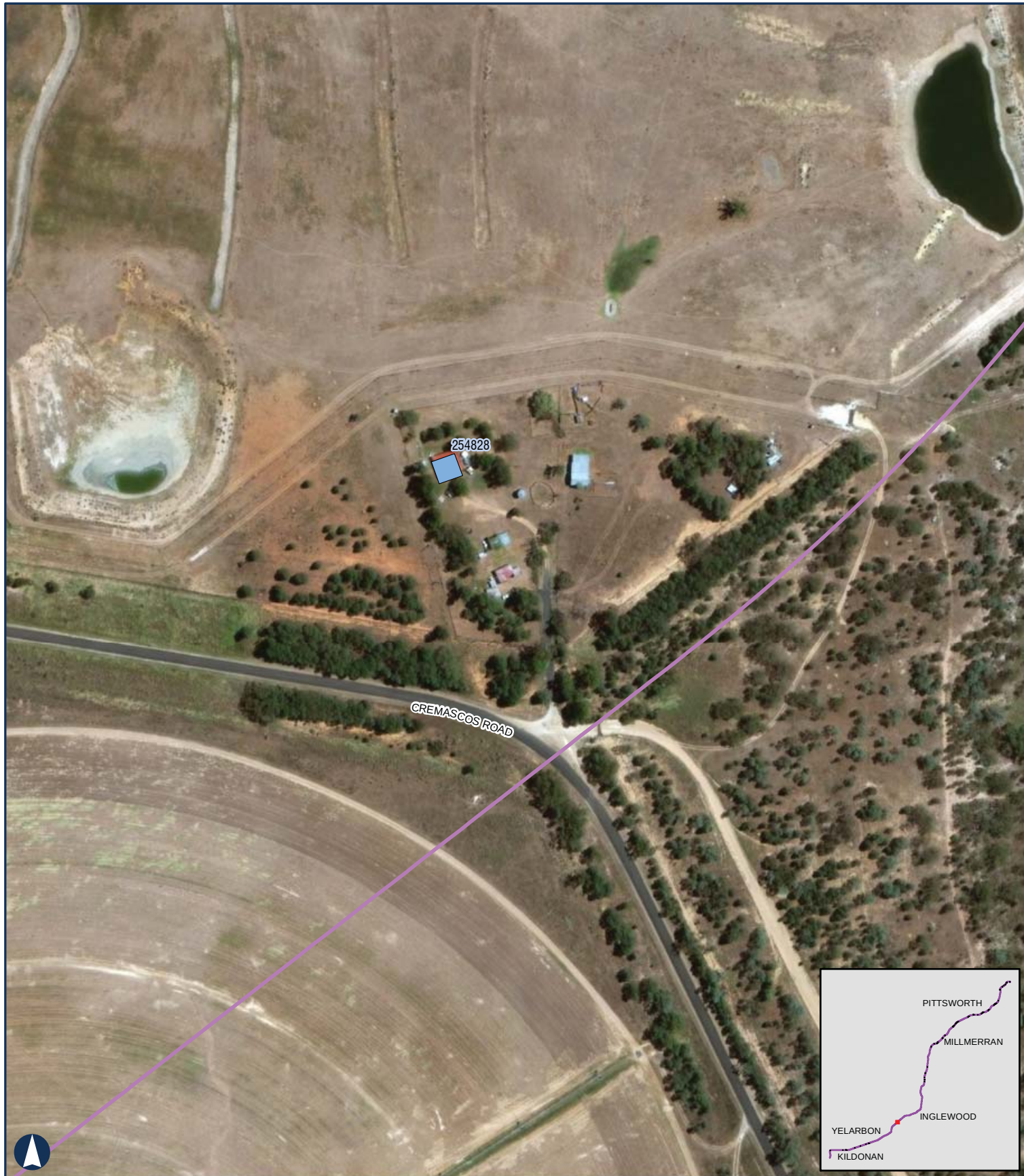
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Author: JG

Scale: 1:3,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 11 of 53

100Metres

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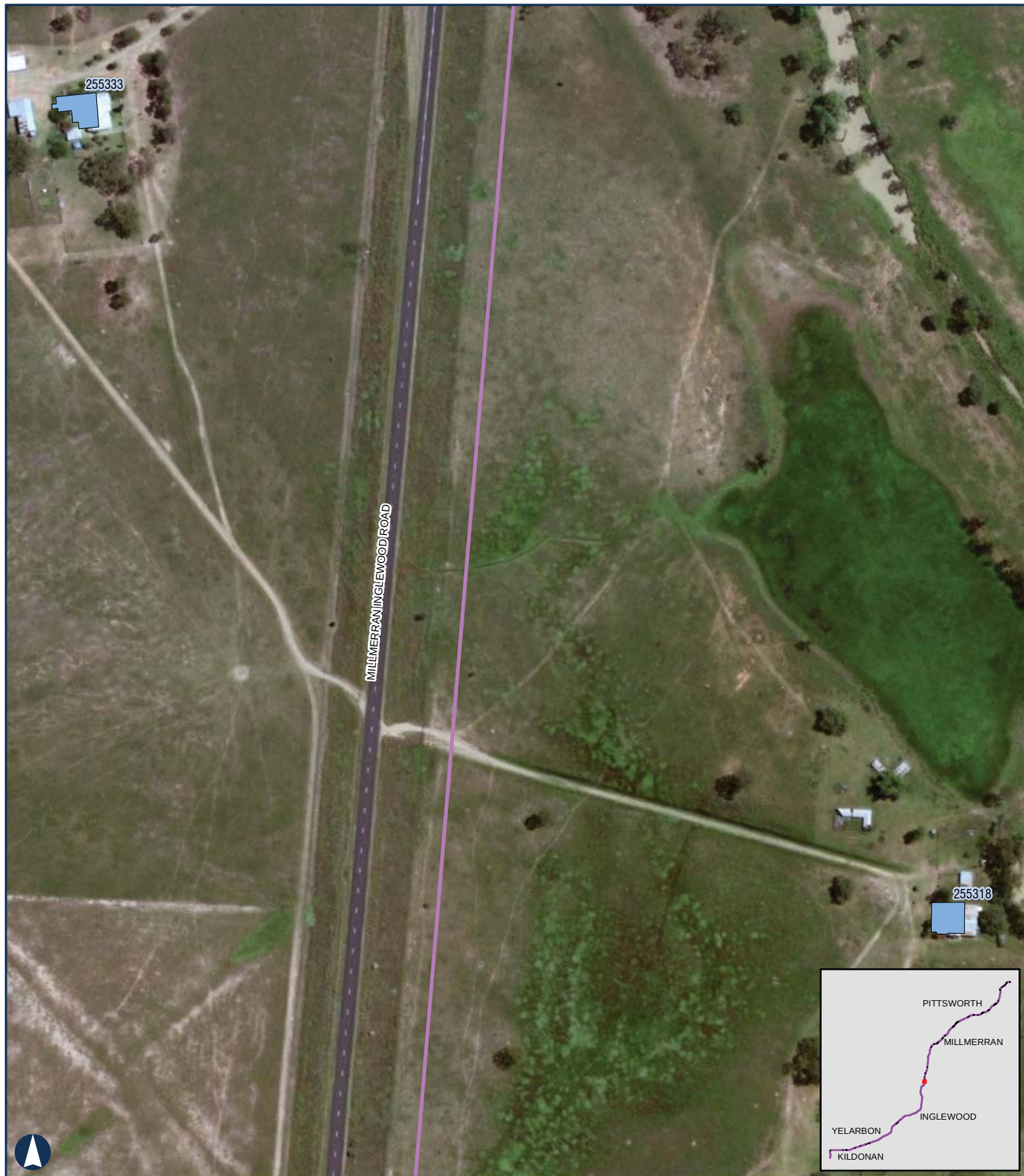
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Author: JG

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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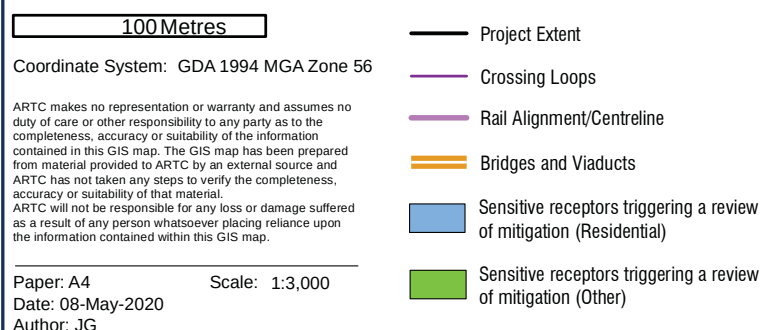
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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 12 of 53



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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 13 of 53

100Metres

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Author: JG

Scale: 1:3,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 14 of 53

100Metres

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

ARTC **InlandRail**

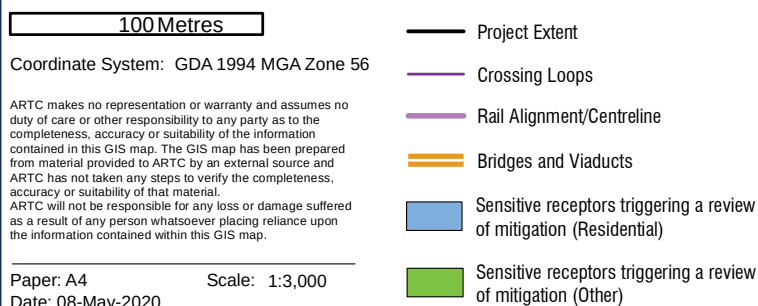
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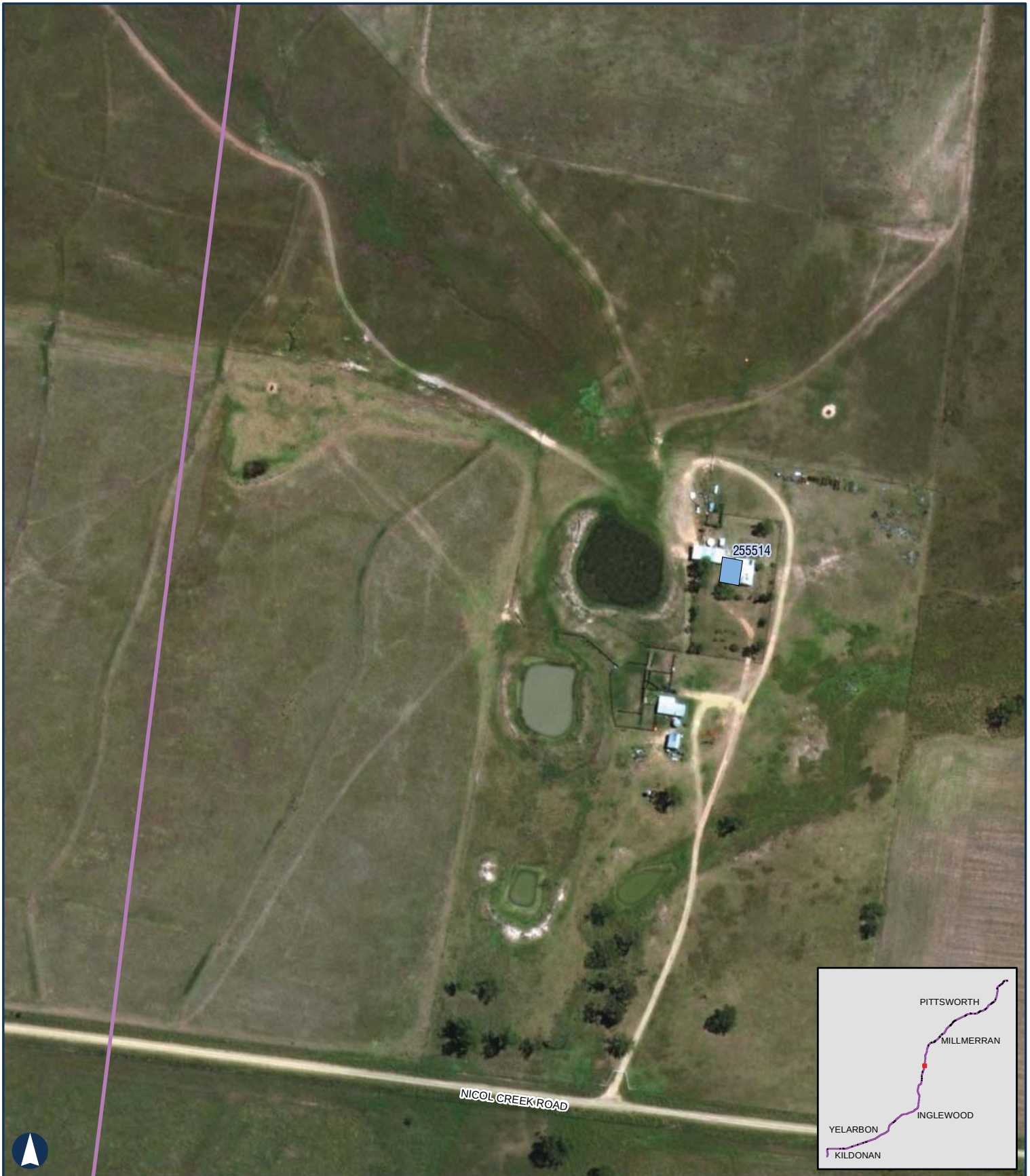
Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 15 of 53



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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 16 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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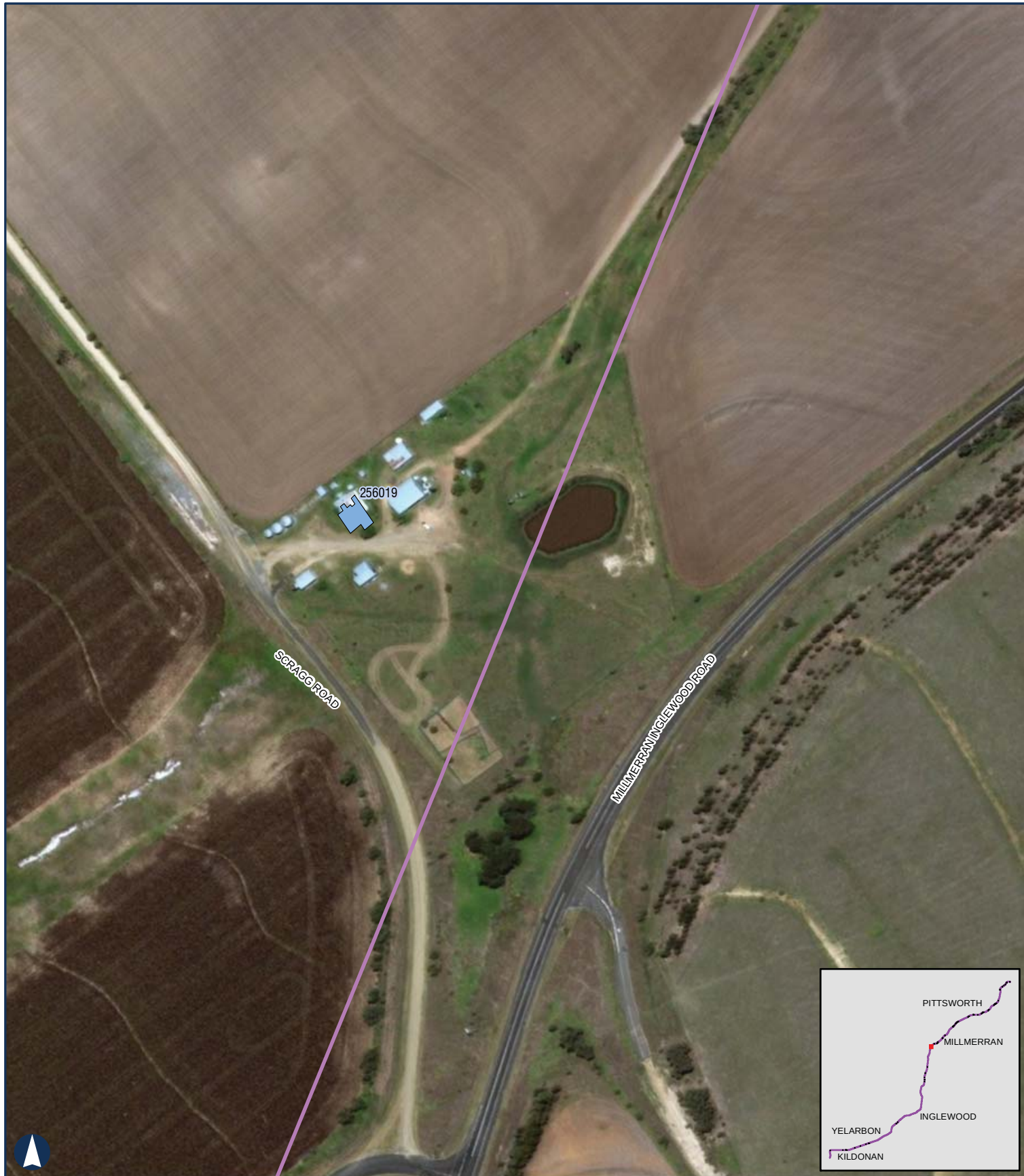
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:3,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 17 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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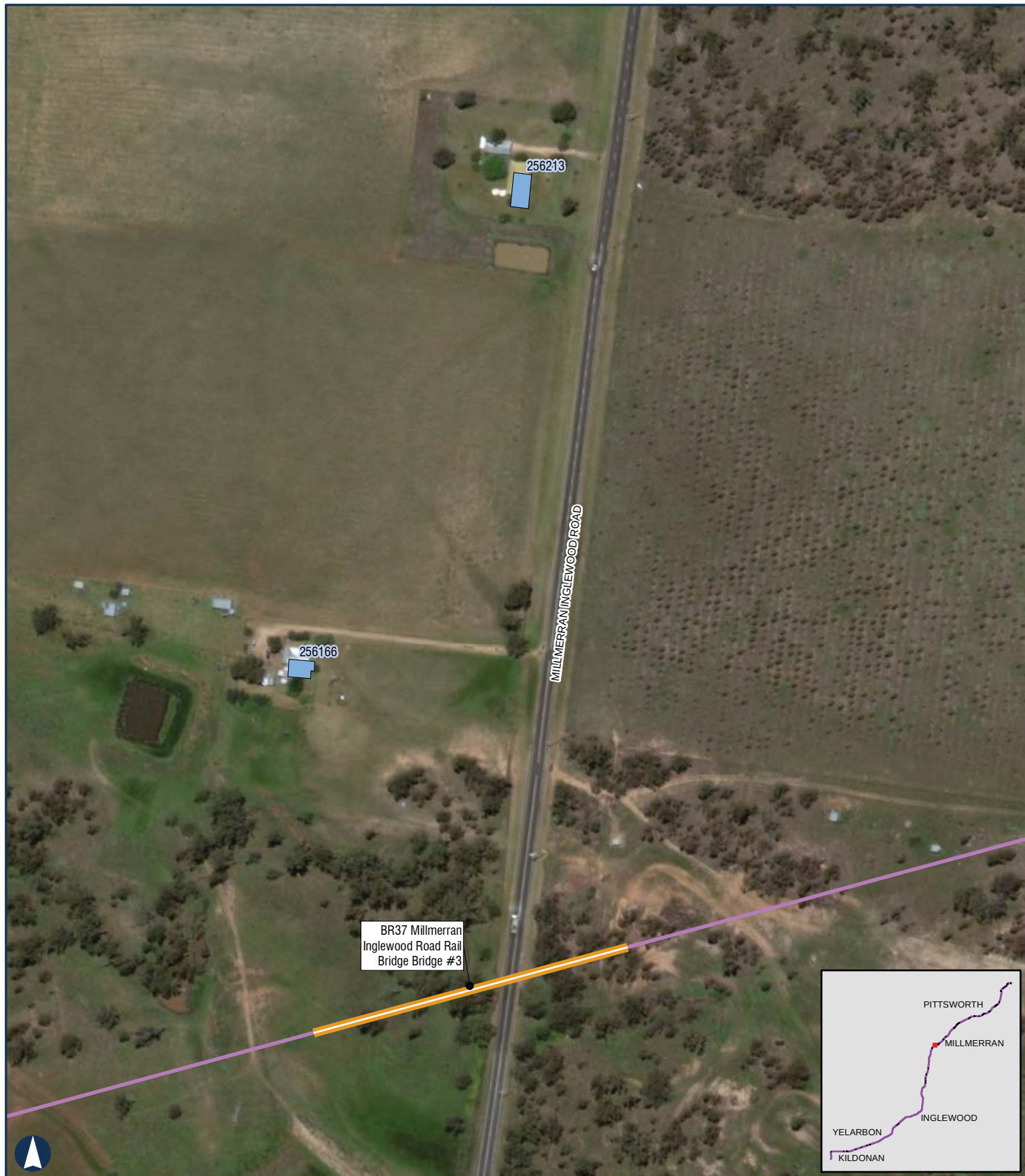
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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 18 of 53

100Metres

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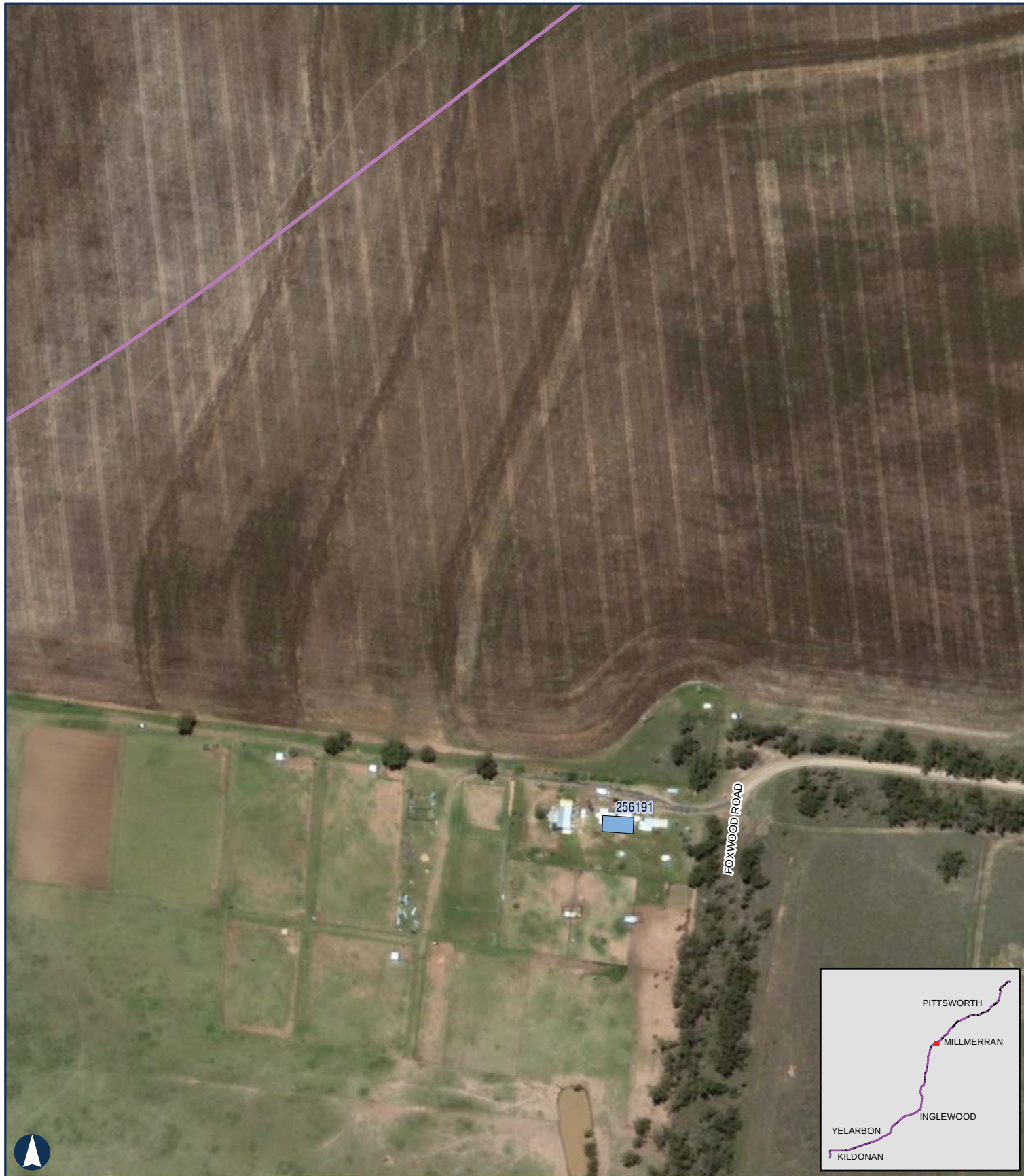
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Scale: 1:3,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 19 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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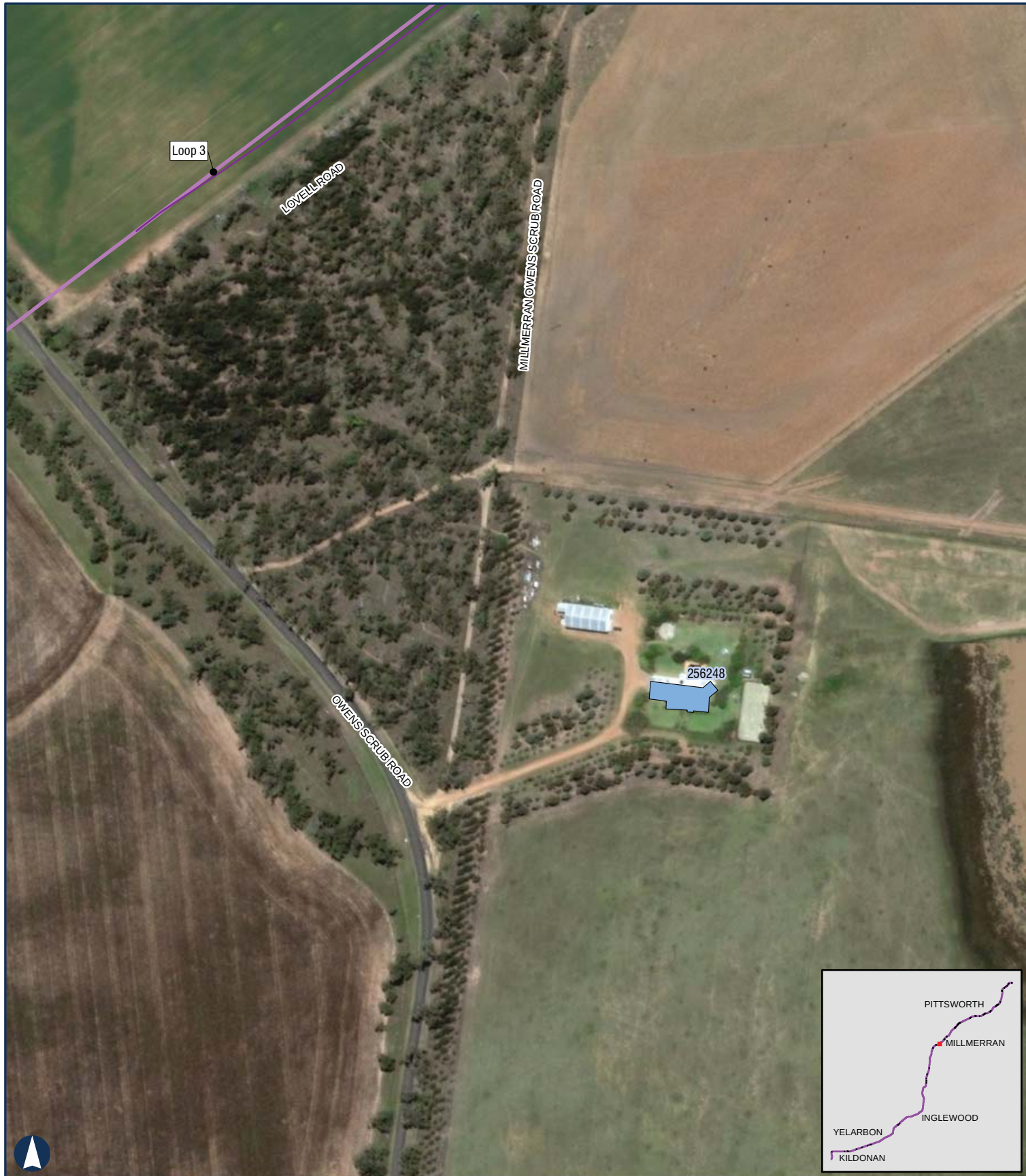
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:3,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 20 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:3,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 21 of 53

100Metres

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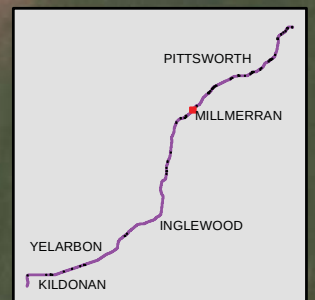
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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 22 of 53

100Metres

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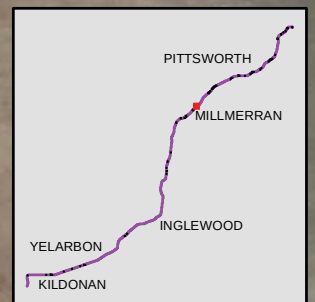
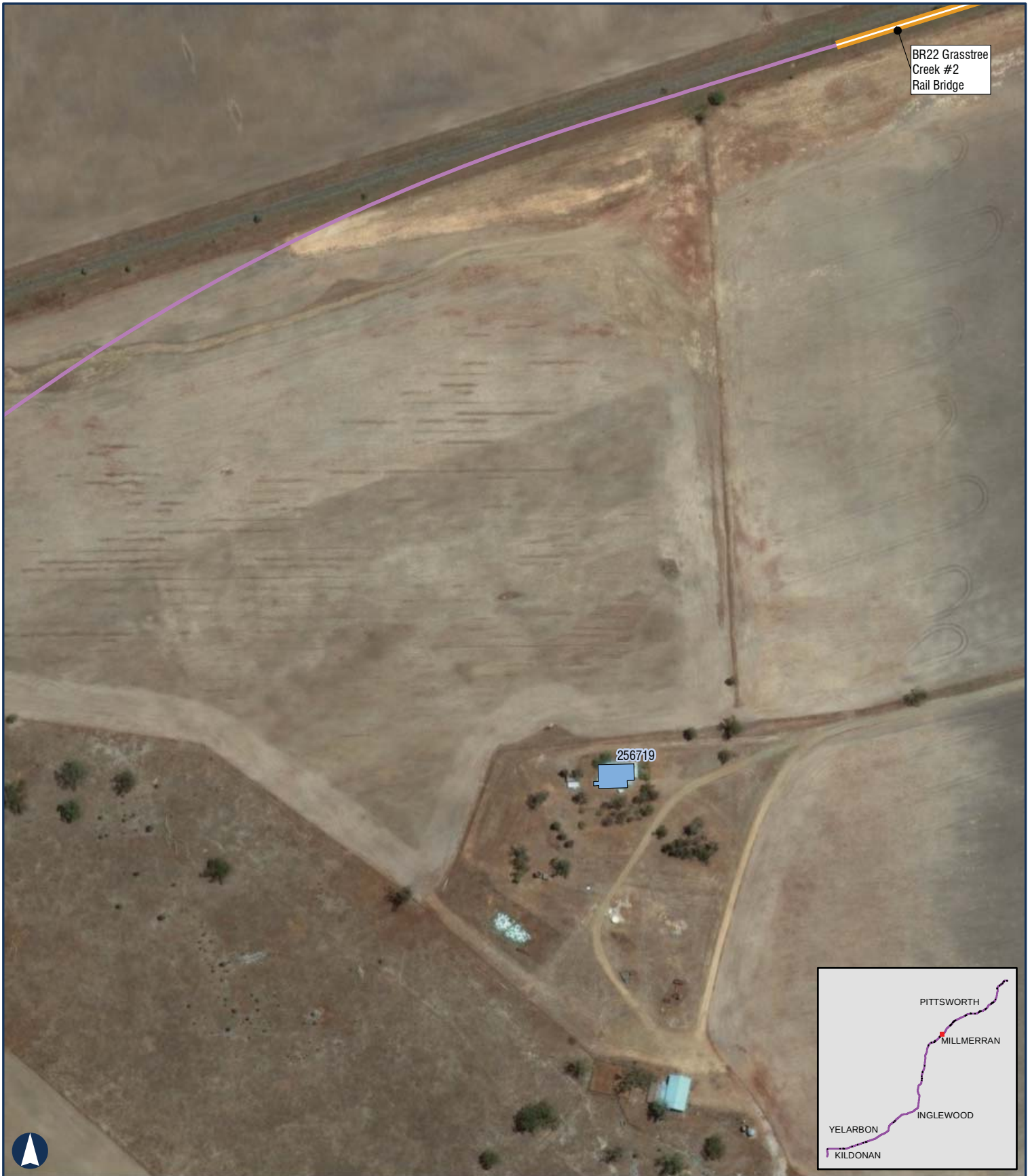
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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 23 of 53

100Metres

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 24 of 53

100Metres

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 25 of 53

100Metres

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 26 of 53

100Metres

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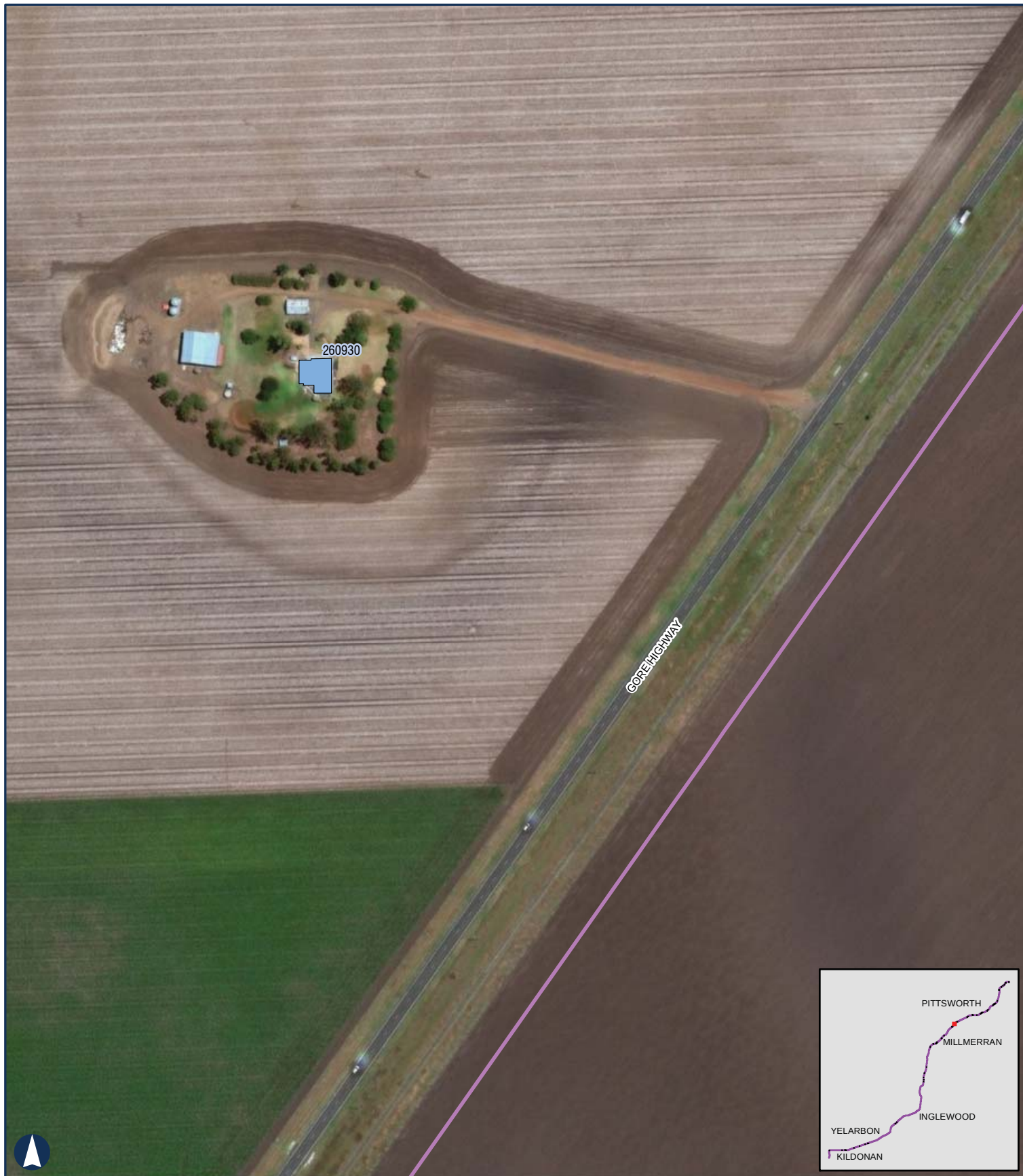
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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 27 of 53

100Metres

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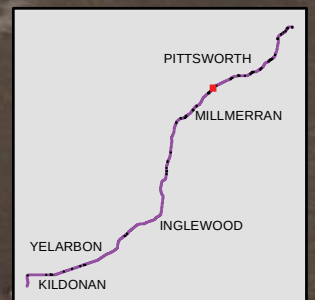
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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 28 of 53

100Metres

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 29 of 53

100Metres

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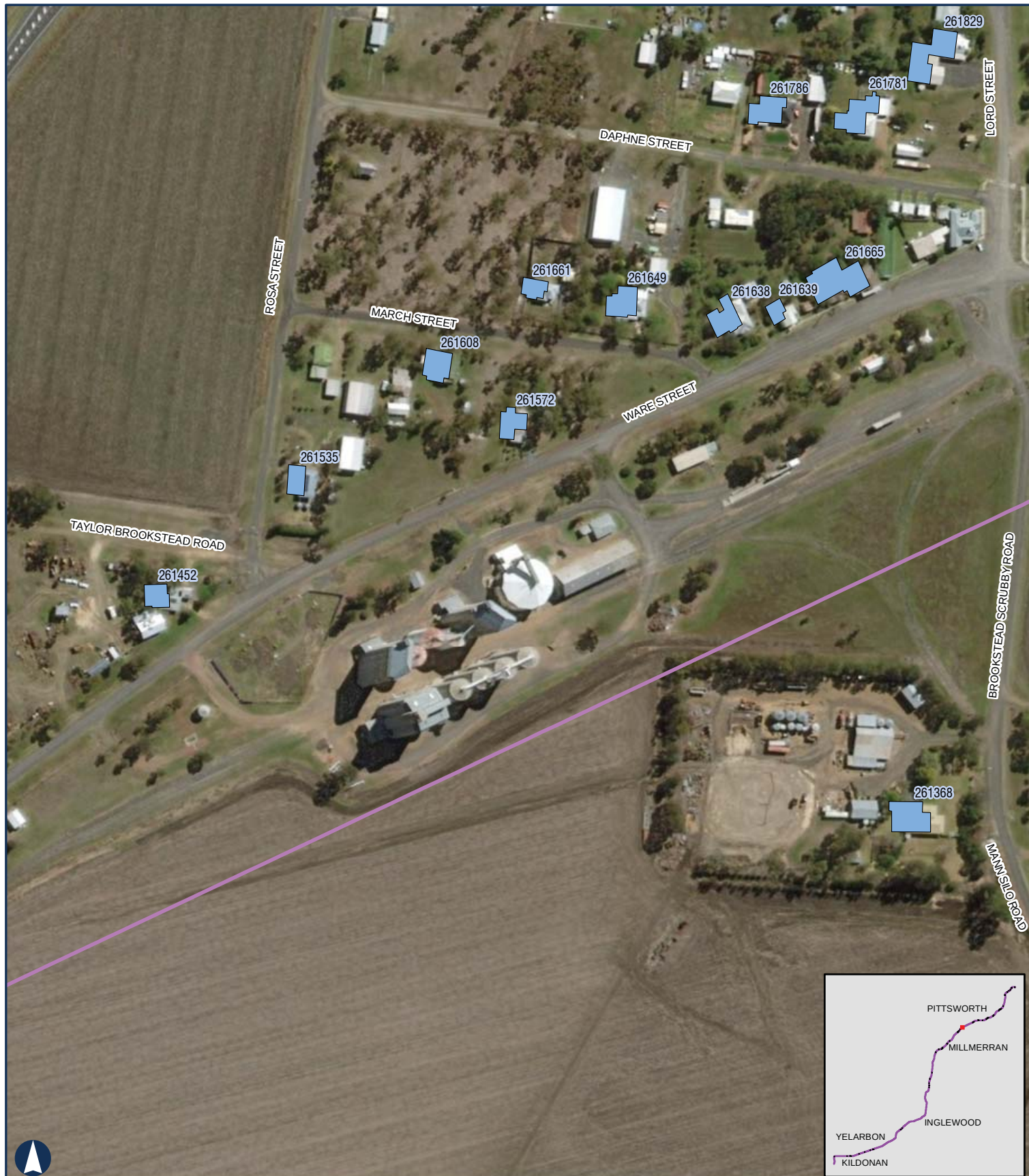
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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 30 of 53

100Metres

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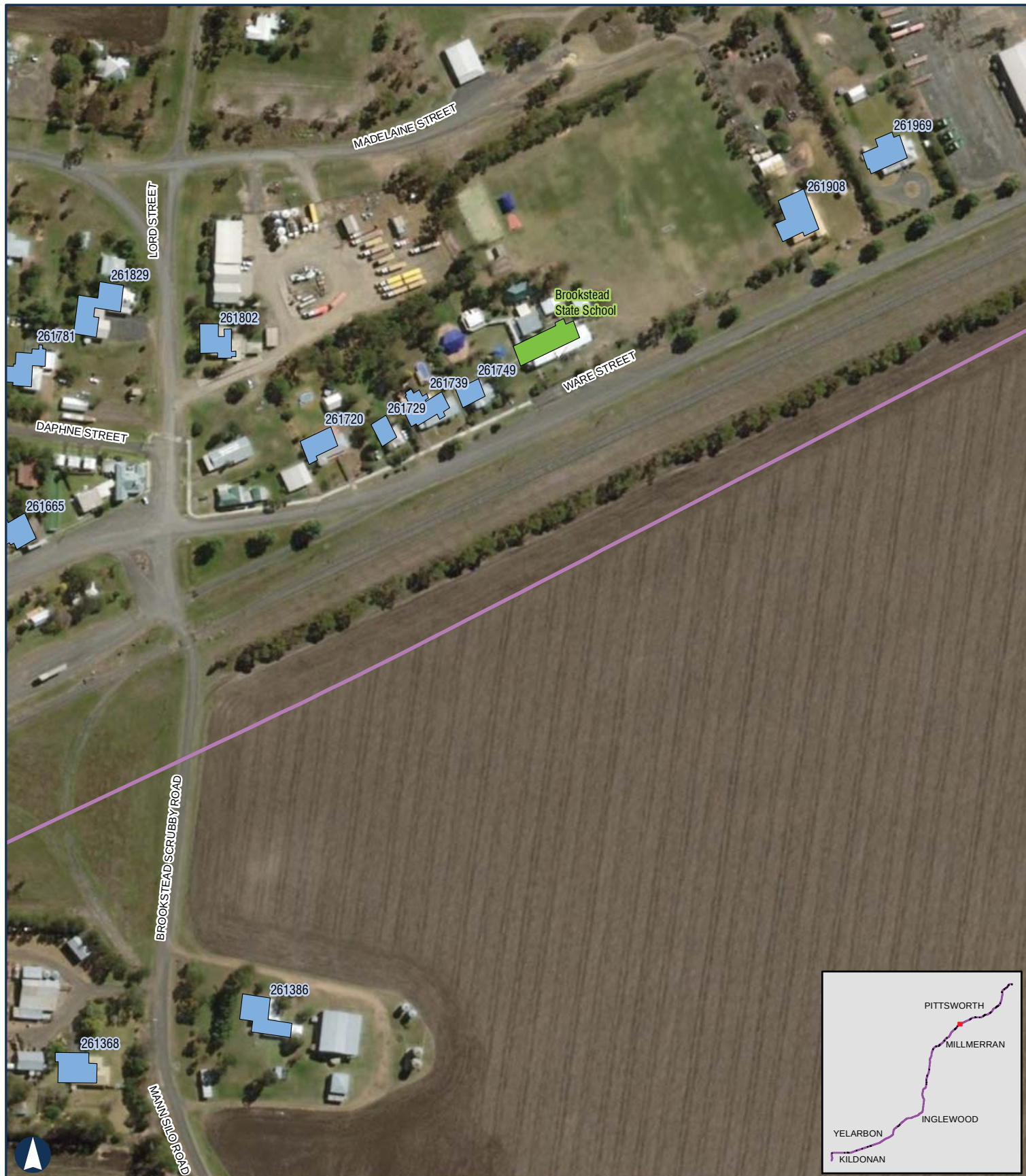
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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 31 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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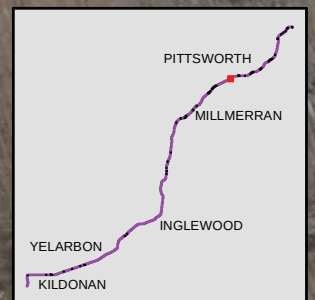
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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 32 of 53

100Metres

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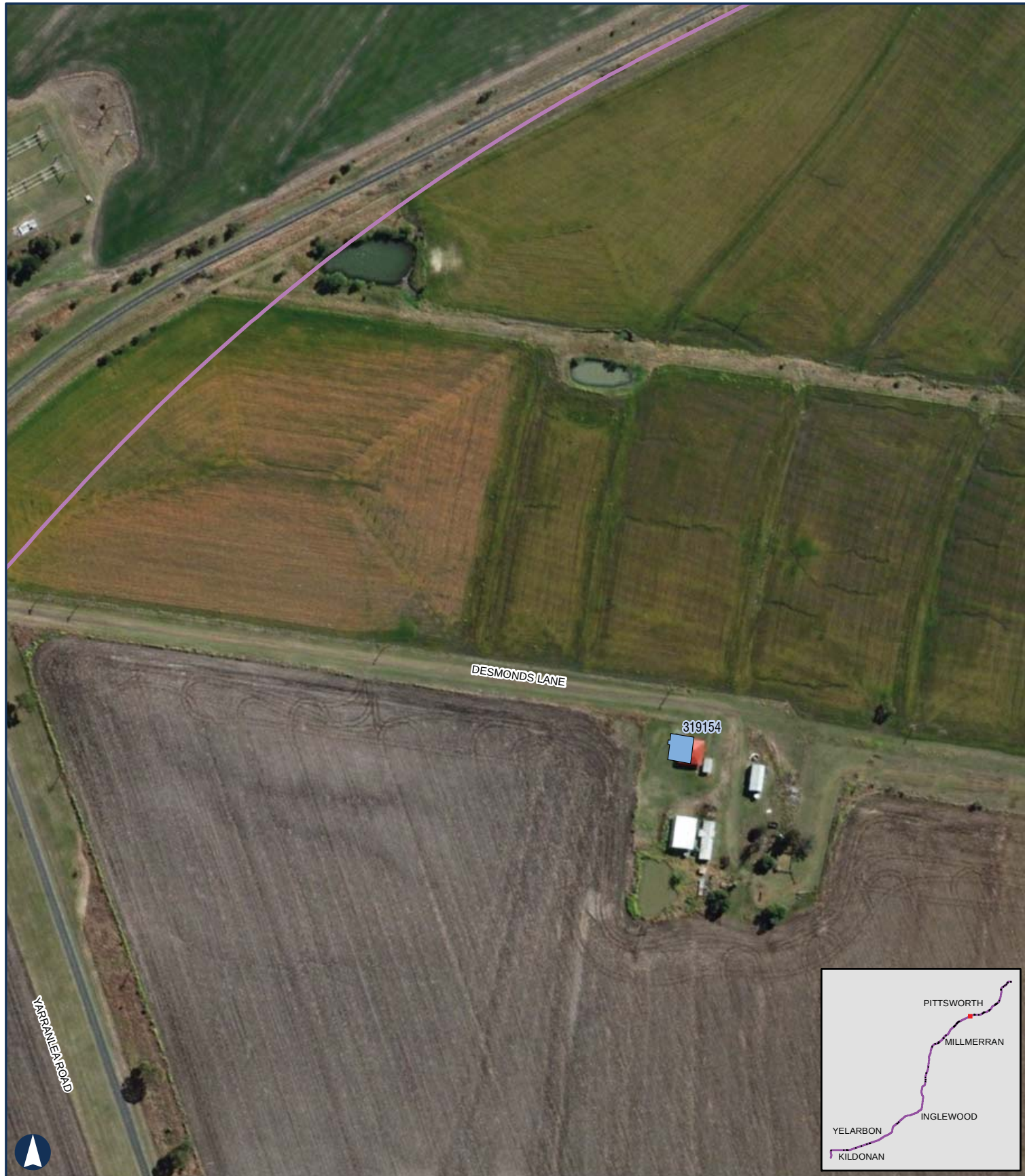
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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 33 of 53

100Metres

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 34 of 53

100Metres

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 35 of 53

100Metres

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 36 of 53

100Metres

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 37 of 53

100Metres

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 38 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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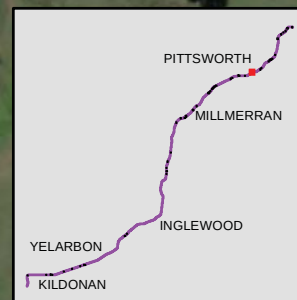
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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 39 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 40 of 53

100Metres

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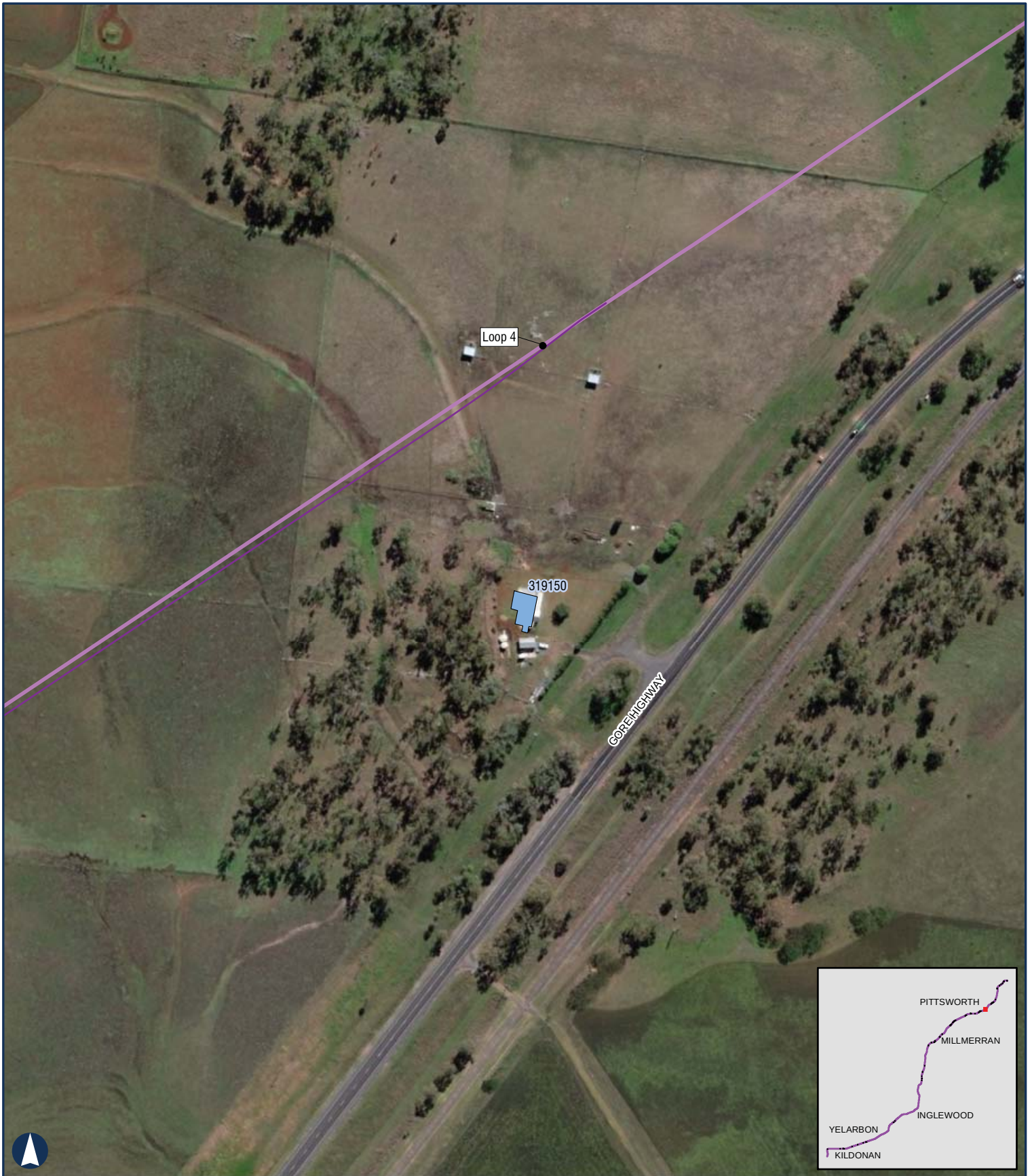
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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 41 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 42 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 43 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 44 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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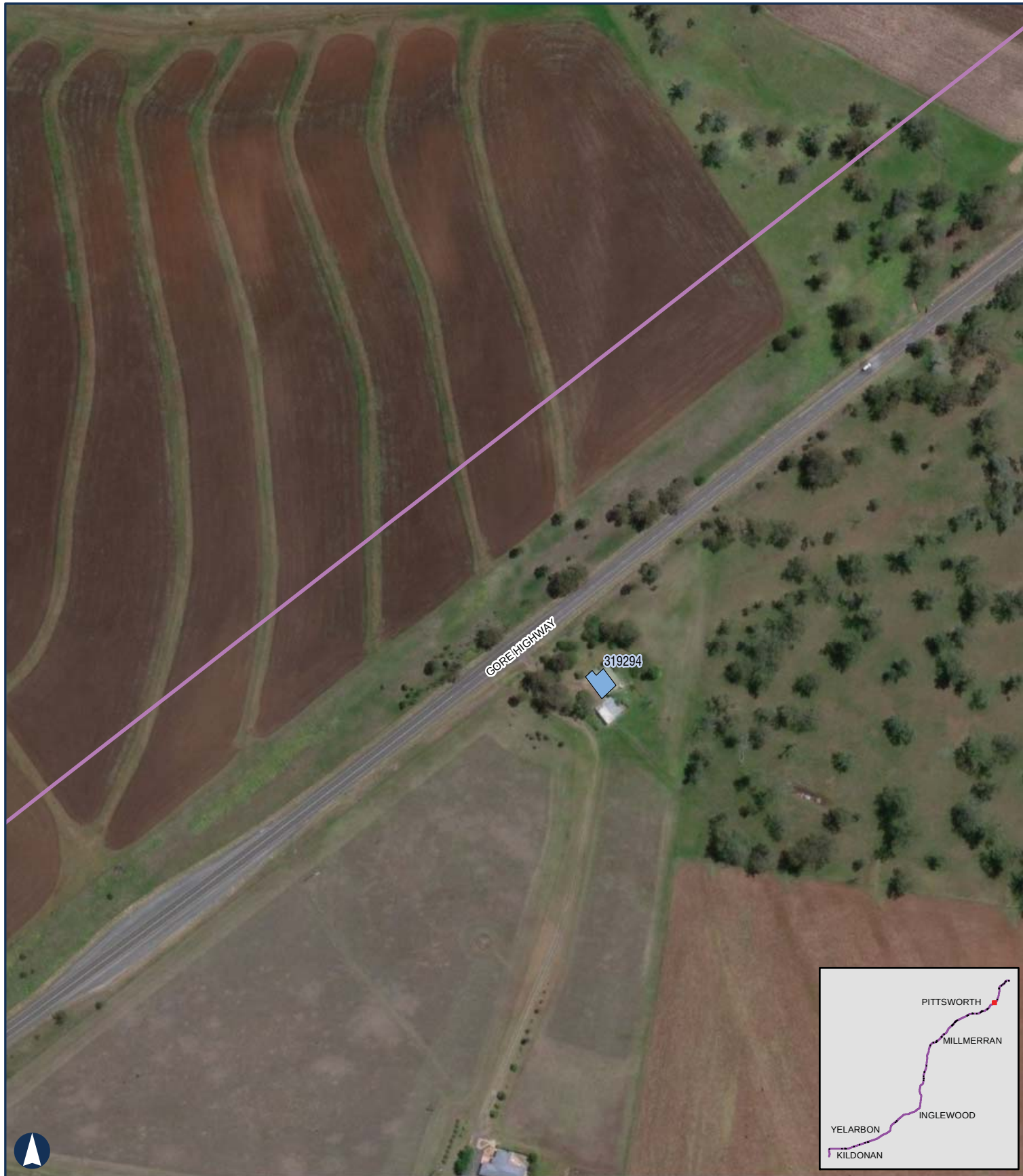
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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 45 of 53

100Metres

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:3,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive receptors triggering a review of mitigation (Residential)
- Sensitive receptors triggering a review of mitigation (Other)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 46 of 53

100Metres

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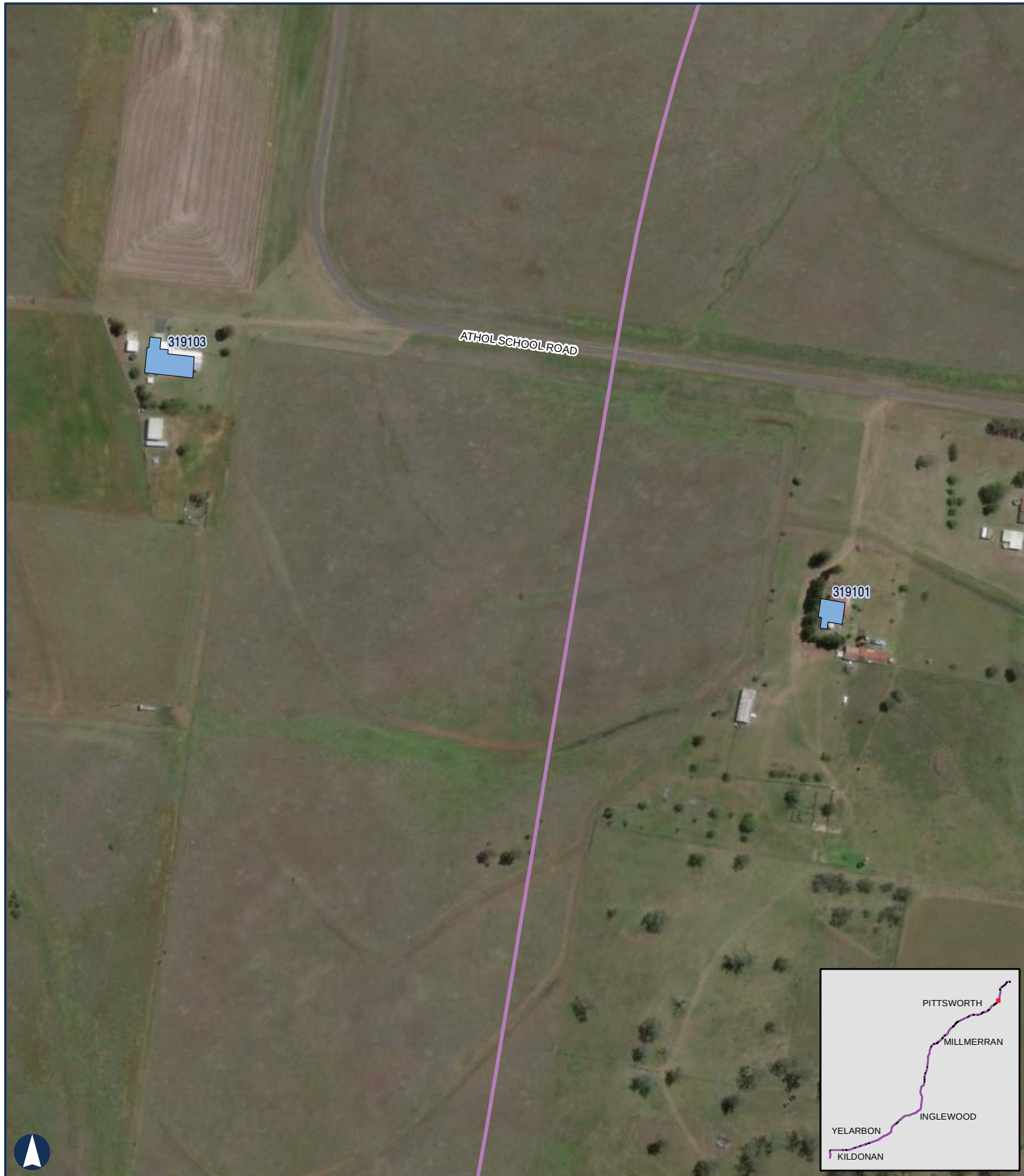
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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 47 of 53

100Metres

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 48 of 53

100Metres

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 49 of 53

100Metres

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 50 of 53

100Metres

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 51 of 53

100Metres

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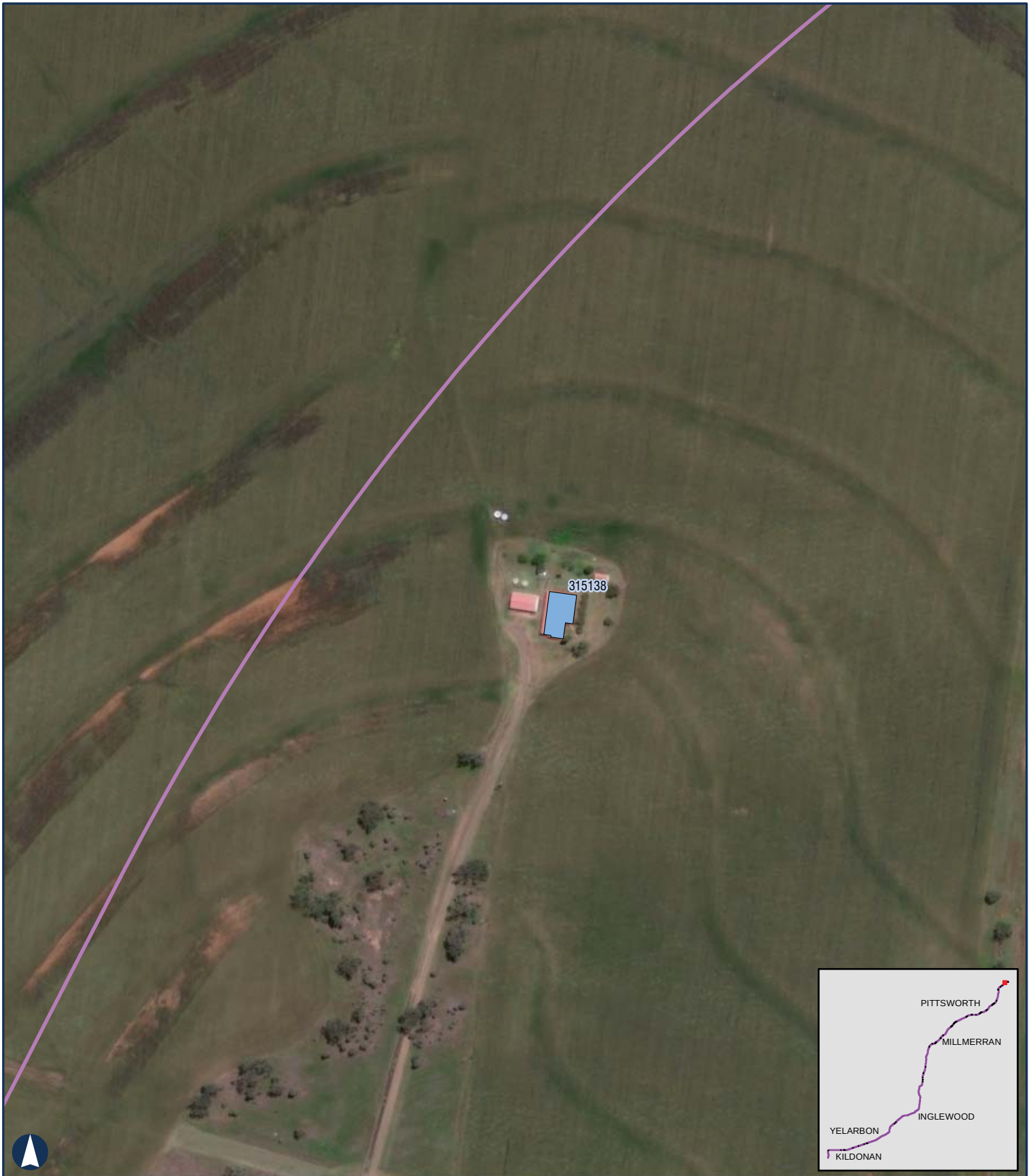
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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 52 of 53

100Metres

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BORDER TO GOWRIE

Sensitive Receptors Triggering the Investigation of Noise Mitigation

FIGURE 17 - Map 53 of 53

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11.2 Trains accessing the crossing loops

The assessment of L_{Aeq} and L_{Amax} railway noise levels in the previous sections included the contribution of railway operations at the crossing loops. A review of the predicted noise levels at the sensitive receptors determined the noise level contribution from the crossing loops were up to $L_{Aeq}(15\text{hour})$ 55 dBA daytime, $L_{Aeq}(9\text{hour})$ 52 dBA night-time and L_{Amax} 64 dBA for both the daytime and night-time periods.

The predicted noise levels from the crossing loops were within the ARTC noise management criteria and are lower than the railway noise levels from the daily train passby events on the main line. Because the crossing loops are within 4.5 m of the mainline tracks, they are not expected to be the primary influence on the overall daytime and night-time predicted noise levels at the sensitive receptors.

11.3 Operation of the level crossings

The predicted railway noise levels were reviewed to determine if the alarm bells and train horns at the level crossings were triggering the railway noise assessment criteria. In most cases, whilst the level crossings are a potential source of noise in the local environment, the predicted noise levels at the sensitive receptors was primarily influenced by the train passbys on the main line track.

The number of sensitive receptors where the level crossing events are triggering the noise criteria are summarised in **Table 30**. Based on this analysis, the Project is to review reasonable and practicable noise mitigation options for the level crossings and train horns at the level crossings at the roads detailed in **Table 30**.

Table 30 Summary of level crossing noise

Level crossing	Number of receptors triggering noise criteria
Commodore Peak Road 1	1
Cremascos Road	1
Elsden Road	2
Harris Road	5
Mann Silo Road	18
Private Crossing 1	1
Private Road 2	2
Private Road 3	2
Private Road 4	1
Private Road 5	1
Private Road 6	1
Private Road 7	1
Private Road 8	2
South Kurumbul Road	4
Tip Road	1

11.4 Potential for sleep disturbance

The night-time L_{Amax} (maximum) rail noise management criteria have been adopted by ARTC across the Inland Rail program to assess potential sleep disturbance impacts, such as; awakening, disrupted sleep or a general reduction to the quality of sleep over time. The L_{Amax} noise management criteria account for the highest level of noise during train passbys and the number of passby events in the night-time.

The assessment of rolling stock noise for the 2026 opening year and the 2040 design year determined the L_{Amax} noise management levels were achieved at the majority of sensitive receptors. There were up to 129 sensitive residential receptors where the predicted noise levels were above the L_{Amax} noise assessment criteria by up to 17 dBA within the night-time period. The noise predictions identified the L_{Amax} noise management criteria was generally achieved where receptors were further than 400 m from the rail corridor.

Railway noise has the potential to be audible at sensitive land uses, both externally and internally, even where the noise management criteria are achieved. To further the evaluation of potential for noise related impacts, the assessment has referenced guidance on sleep disturbance from the World Health Organisation (WHO).

The WHO guideline Night Noise Guidelines for Europe¹³ recommends that internal (indoor) noise levels are not above L_{Amax} 42 dBA to preserve sleep quality. The WHO guideline level corresponds to a conservative external (outdoor) level of L_{Amax} 49 dBA, allowing for a conservative 7 dBA difference between indoor and outdoor noise levels where windows at rural residential properties are open for ventilation.

Based on the noise modelling, the noise levels from rolling stock could be above L_{Amax} 49 dBA within approximately 1 km from the rail corridor. The 1 km distance is a guide to where night-time noise levels may have the potential to result in sleep disturbance impacts. Individuals will respond to noise differently, and just because railway noise can be audible does not mean it will cause disturbance or annoyance impacts.

Where sensitive residential land uses are proposed to be developed within 1 km of rail freight corridors, it would be expected that residential property, complying to Australian building codes and standards, would achieve façade noise reductions greater than the conservative 7 dBA assumption applied in this assessment.

11.5 Consideration of local weather on railway noise

The regional weather conditions have the potential to influence the propagation of noise within the local environment. Downwind from a noise source the wind conditions can enhance the propagation of noise and equally being upwind of a noise source, the wind conditions act to suppress noise propagation.

Temperature inversion conditions occur where the temperature of a layer of air in the atmosphere increases with height, rather than the typical conditions where air temperature decreases with height. This causes a layer of cool, still air being trapped below the warmer air. Temperature inversion conditions generally occur during the early morning and night-time periods during the winter months where little or no vertical air movement of the cool air layer can result in a refraction of sound waves and potentially enhance the propagation of noise.

The potential for railway noise at individual sensitive receptors to be influenced by the local weather conditions will be based on the complex interaction between the moving noise source (train passby), the varying frequency content of the received noise, the weather conditions in the region and the local environment.

Whilst there may be periods when the weather conditions influence the propagation of noise from train passby events, the railway operation are forecast to be 1 to 2 train movements per hour with audible passby events likely to be 2 to 5 minutes in duration.

¹³ World Health Organisation, 2009. Night Noise Guidelines for Europe.

The combination of the duration and intermittency of the train passbys would diminish the influence of weather conditions on the railway noise levels assessed over the 15-hour daytime and 9-hour night-time periods.

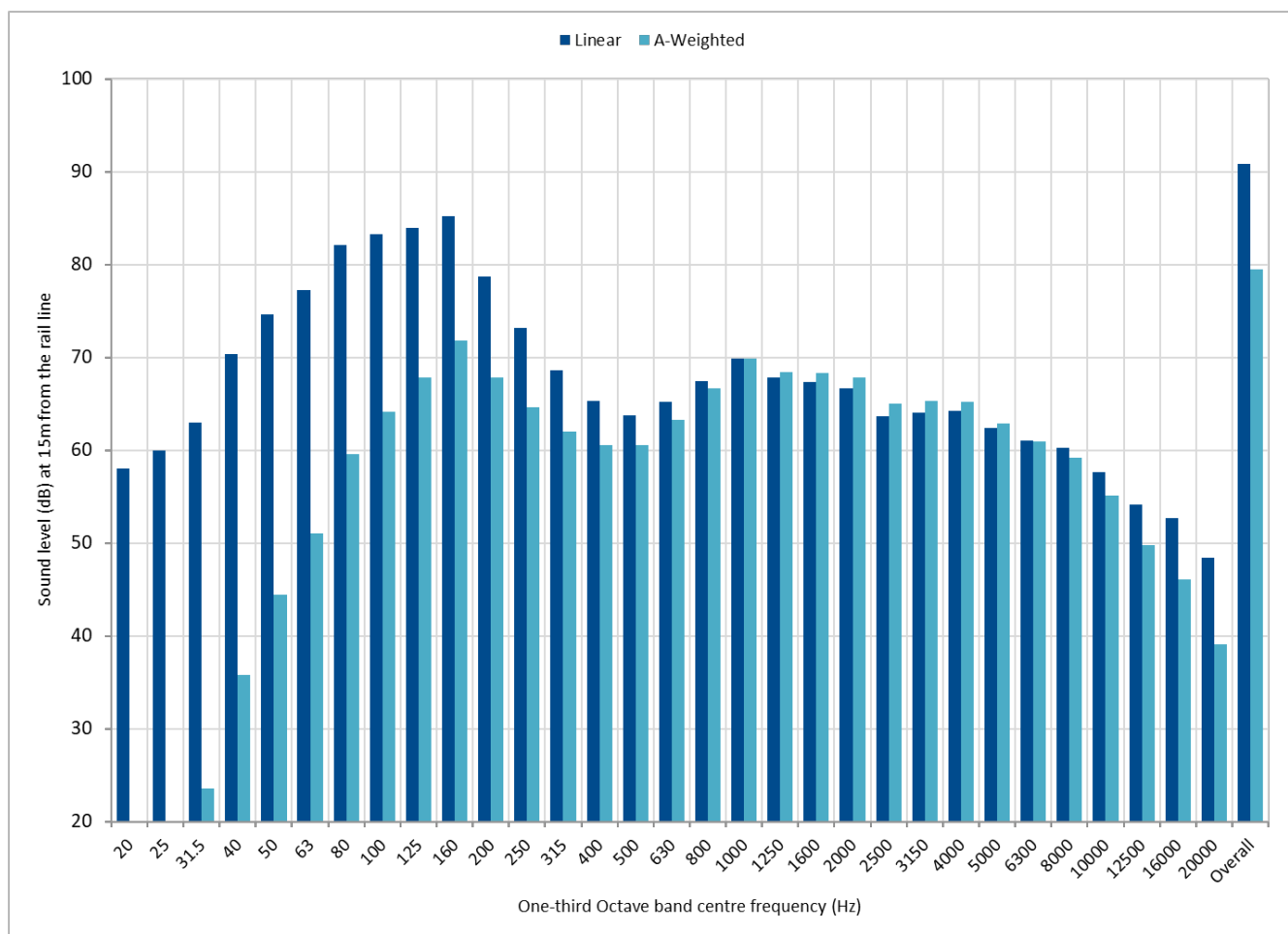
The daily noise levels from the steady state noise emissions from idling trains at the crossing loops can be more readily influenced by local weather conditions than noise from the transient train passbys. In this regard, the ISO methodology applied for the calculation of noise levels from the crossing loops and level crossings included an allowance for downwind noise enhancing weather conditions and/or moderate temperature inversions.

11.6 Characteristics of railway noise

The potential impacts of noise from railway operations can be influenced by the characteristics of the noise from the train passbys and rail operation at the crossing loops. A noise spectrum for a typical freight train passby events is detailed in **Figure 18**. The noise spectrum was derived from measurement of noise levels from 149 rail freight movements on the Main Line railway at Forest Hill in Queensland in March 2019. The noise levels were measured at 15 m from the single rail line where trains were operating at approximately 60 km/h.

The typical train passby spectra identifies there is a prominent contribution of noise in the low frequency range between 80 Hz and 250 Hz at 15 m from the rail line. The diesel-electric locomotive engines and exhaust systems are the primary source of the low frequency noise content during the train passby events.

Figure 18 Example noise emission spectra for rail freight



Note Noise spectra determined as the logarithmic average of daily coal and freight train passbys as measured at 15 m from the rail centreline.

It is important to note that where the noise emission of the locomotives have a low frequency noise content in close proximity to the rail line it does not mean that low frequency noise characteristics will necessarily be experienced at sensitive land uses.

The ability to detect features, such as low frequency noise, will also depend on the contribution of the other sources of noise in the local environment, which may influence an individual's perception of the loudness and character of the rollingstock noise.

The Nordic noise modelling methodology provides the overall A-weighted level of railway noise, it does not provide the frequency spectra for rollingstock noise at individual sensitive receptors. Notwithstanding, based on the typical frequency content of diesel electric locomotives, it would be reasonable to assume that where railway noise would be clearly audible above the ambient noise environment, such as within 300 m of the rail corridor, there could be low frequency noise content in the passby noise emission.

Analysis of the noise spectrum did not identify prominent tones at specific frequencies, and the noise emission from the rollingstock operations is not expected to include tonal noise characteristics.

Other general characteristics of railway noise are summarised below and are usually specific to individual items of rollingstock and track features:

- Bunching or stretching can occur when the couplings on a train are subject to sudden changes in force during acceleration and deceleration, this can cause short-lived 'squeaks' and 'bangs'. Events of this nature may have subjective impulsive noise emission characteristics, although not necessarily quantified as impulsive noise at nearest sensitive receptors. Noise events from bunching or stretching have been assessed at the crossing loops proposed on the Project.
- Short-lived 'booming' noise with potential low frequency characteristics can be caused by empty containers and wagons resonating.
- When the trains depart from the crossing loops the locomotives are required to initially operate under a high notch setting to accelerate from a standing position. This can cause higher noise emissions from the locomotives which may result in a perceptible increase in railway noise but would not be expected to influence the noise levels over the 15-hour daytime and 9-hour night-time assessment periods.
- Curving noise, such as wheel-squeal, can result in prominent tonal noise emissions. The Project designs do not include tight-radius curves (radius ≤ 500 m) and the noise modelling did not apply noise emission correction factors for potentially curving noise emissions.
- The condition of the track can be a primary influence on the rolling noise from the locomotives and the wagons. Features such as corrugation (deformation of the track) increase the roughness of the rails which can cause increased noise levels on both straight track and curves. The Project will be newly constructed rail that shall be specifically designed for freight rail operations and subject to periodic maintenance.
- Features such as jointed track can increase rolling noise. The track for Inland Rail will be continuously welded rail which reduces the likelihood of 'clickety-clack' sounds from the wheel-rail interface.

12 Assessment of ground-borne vibration

12.1 Approach

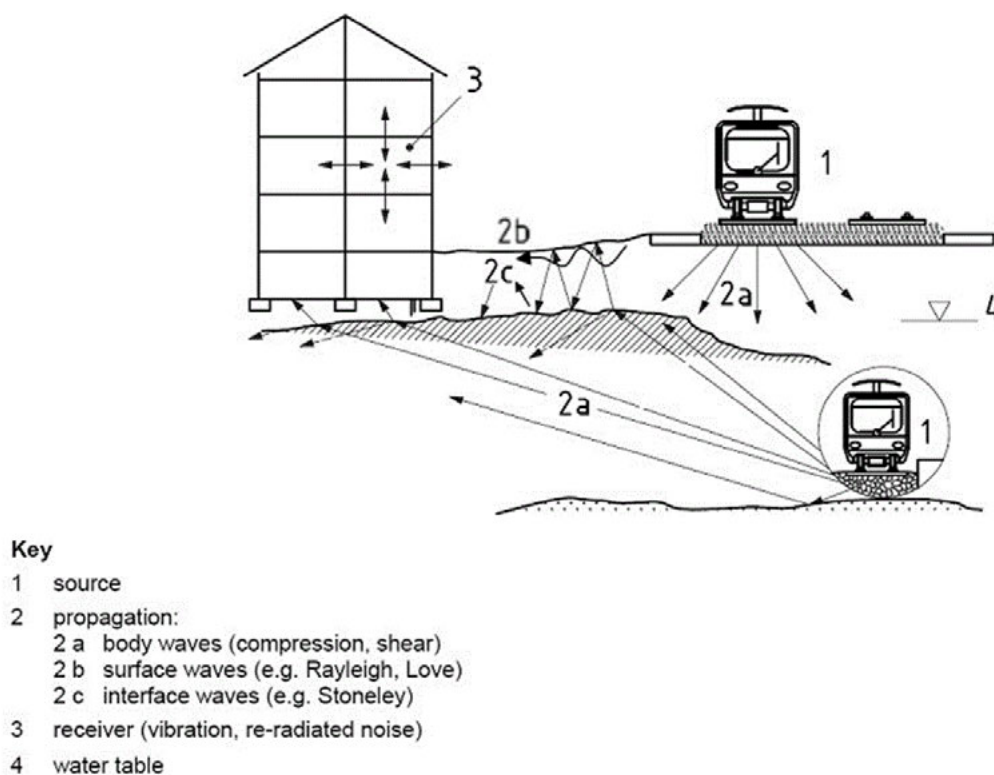
To inform the assessment of potential ground-borne vibration from the railway operations, guidance was referenced from International Standard ISO 14837¹⁴ on the typical assessment requirements for new rail systems, including definitions of:

- **Scoping Model** at the very earliest stages.
- **Environmental Assessment Model** during planning process and preliminary design.
- **Detailed Design Model** to finalise extent and form of mitigation for construction.

For this assessment, a combined Scoping Model with elements of an Environmental Assessment Model was adopted. In accordance with the ISO standard, modelling for ground-borne noise and ground-borne vibration considers key parameters that are critical in determining the likely range levels of ground-borne noise and vibration and the benefits (or otherwise) of different design and mitigation options.

An overview of the modelling approach is illustrated in **Figure 19**. The approach considers the source vibration levels, the vibration propagation between the surrounding environment and nearby building foundations, and the propagation of vibration within the building elements.

Figure 19 Example of rail vibration source, propagation and receptor system



NOTE The components of the system comprising source, propagation and receiver are interdependent.

¹⁴ ISO 14837-1 2005 "Mechanical vibration - Ground-borne noise and vibration arising from rail systems - Part 1: General guidance"

The modelling has been carried out using a combination of theoretical and empirical relationships to determine the attenuation and/or amplification of ground-borne vibration levels with assumptions that include:

- Single frequency overall values vs distance;
- No adjustment for buildings of substantially greater mass or size than those used to inform published data (conservative); and
- a crest factor¹⁵ of 4.

Previous measurement and assessment of ground-borne vibration from existing rail freight corridors indicates that potential for ground-borne vibration impacts would be limited to sensitive receptors located within 100 m of the proposed rails. Forecast levels at properties beyond this distance are routinely expected to be within assessment criteria and the integrity of building structures is unlikely to be compromised by passing trains.

The calculation of ground-borne vibration from above ground rail operations refrained from applying estimated adjustments, such as loss of vibration energy as it is transferred to buildings (coupling loss), where adjustments could infer there would be no risk of impacts from ground-borne vibration outside of the rail corridor.

12.2 Source vibration levels

The Project alignment is primarily a greenfield rail corridor with no existing comparable rail freight operations or speeds as that proposed. Consequently, it is not possible to measure local vibration levels directly and a model is used to estimate results at each location.

To determine a reference ground vibration level, detailed measurement surveys were completed on existing rail corridors between Wagga Wagga and Albury in NSW and Euroa and Wallan in Victoria. The locations are associated with the Inland Rail Program in NSW and Victoria where there are comparable existing rail freight operations, with single-stacked freight wagons, on ballasted track form. The rail corridor in these regions is mainly used for rail freight and had an average of 20 or more freight train movements per day operating at 60 km/h to 80 km/h. Ground-borne vibration levels were measured at three locations in each region, with measurements made at-grade (ground level) at distances of 15 m to 45 m from the outer rail line.

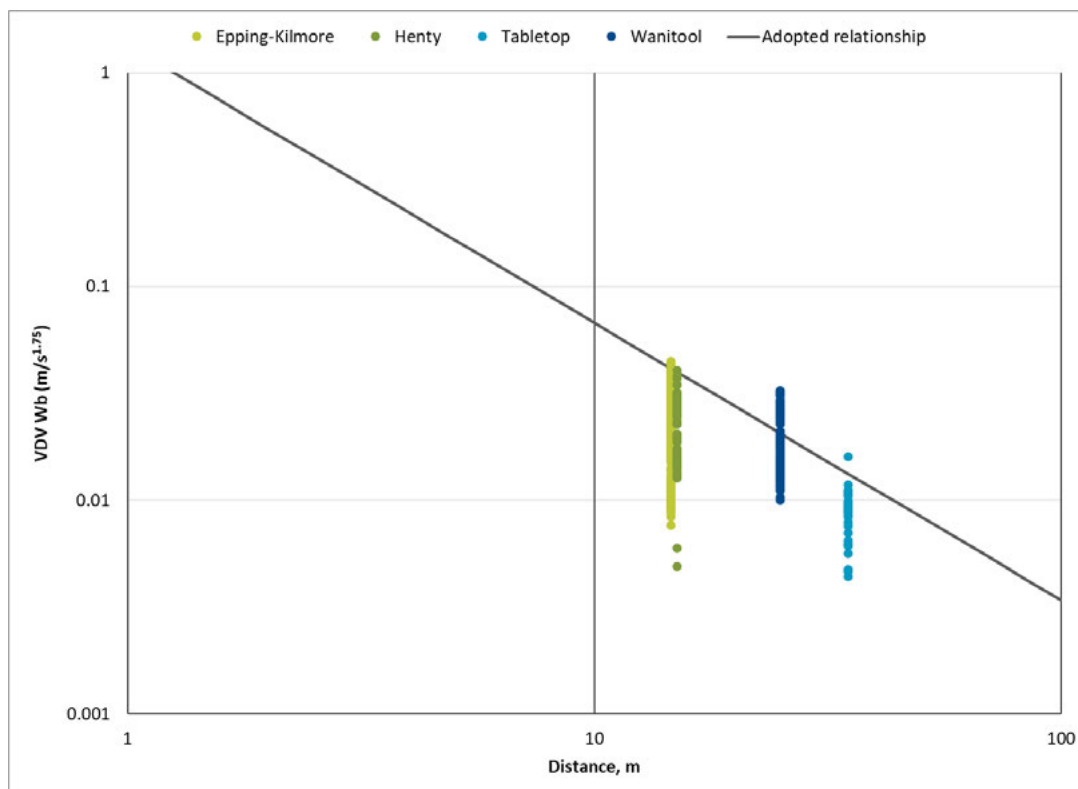
The train vibration measurements were referenced to calculate the W_b -weighted VDV_s at 15 m from the outer rail varied at all sites from 0.01 m/s^{1.75} to 0.04 m/s^{1.75} for a single train passby event. The variation is representative of differences in rollingstock, wheel conditions and consists. The adopted VDV (W_b weighted) of 0.04 m/s^{1.75} at a setback of 15 m for a single train passby was based on the maximum derived VDV_s. Accordingly, the assessment inherently assumes that each train is a worst-case vibration generating event and is therefore conservative.

The change in VDV for a single train passby event with distance from the track is shown in **Figure 20**. The figure presents the monitored vibration levels at the four sites and the adopted relationship between rail vibration and distance from the outer rail. The figure shows the reduction of VDV with increasing distance from the track based on geometric spreading of the vibration energy only (ignoring site specific dampening).

The results obtained using this process had similar vibration spectra and relationships between overall levels and distance from the rail track. The modelled vibration spectrum in **Figure 21** is provided as one-third octave bands based on the logarithmic averages of the measurement in order to bias sites with the highest ground-borne vibration levels during train passby events. As ground-borne vibration propagates away from the track, the amplitude of the vibration wave attenuates with increasing distance. The reference vibration spectrum was adjusted to account for this reduction in amplitude.

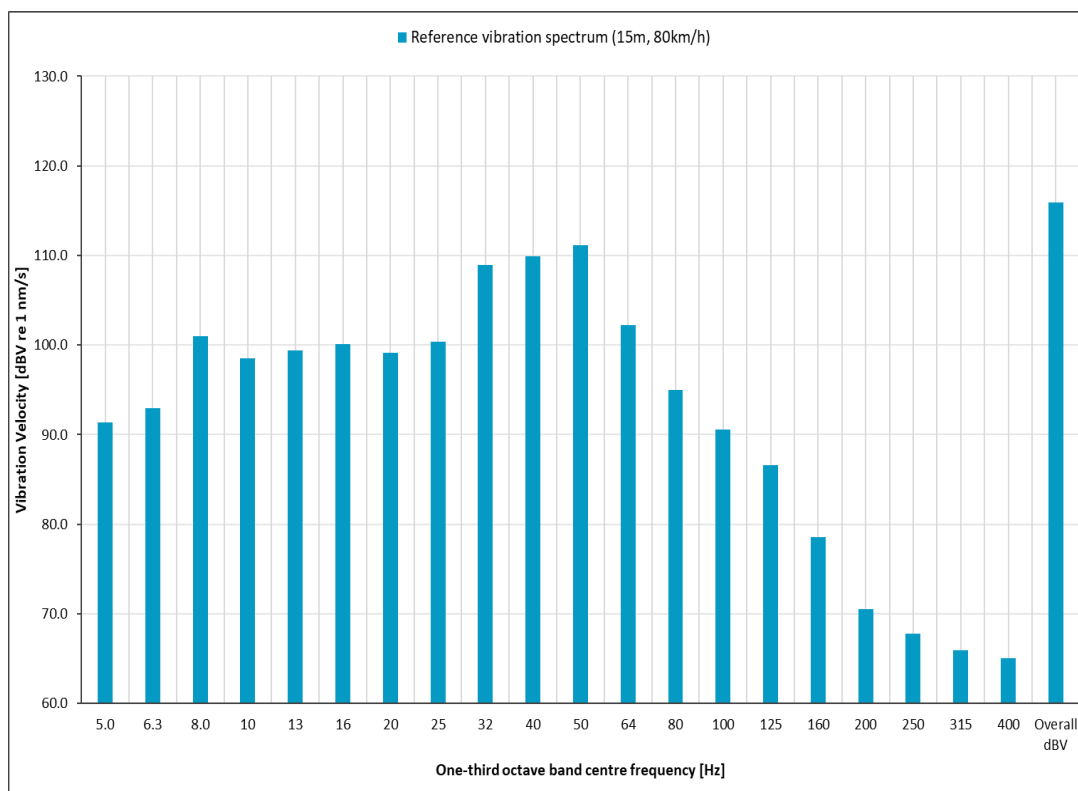
¹⁵ Ratio of peak to root mean square (RMS) velocity level.

Figure 20 Logarithmic relationship between VDV and distance



Note Reference VDV for a single freight train passby.

Figure 21 Vibration velocity spectrum at 15 m from the outer rail



Note Reference vibration velocity spectrum for a single freight train passby.

12.3 Ground-borne vibration from ground-level train passbys

The effects of vibration in buildings can be divided into two broad categories which are considered further in the following sections.

- Where the occupants or users of the building are inconvenienced or possibly disturbed either from tactile vibration or audible noise generated from the building vibration ('comfort risk'); and
- Where the building contents or internal linings may be noticeably affected or where the integrity of the building or the structure itself may be prejudiced ('cosmetic damage risk').

12.3.1 Residential and other occupied buildings

The VDV results were estimated based on daily train movements at the project opening in 2026 and the 2040 design year and the forecast train speeds. Estimated VDV levels for trains at 105 km/h were applied to determine the minimum off-set distance from the outer rail of the Project where the ground-borne vibration criteria would be expected to be achieved.

Suggested off-set distances to achieve the daytime and night-time rail vibration criteria are shown in **Table 31**.

Table 31 Screening assessment of ground-borne vibration levels

Year of operation	Estimated off-set to meet vibration criteria, subject to detailed review		Receptors within the off-set distance
	Daytime (0.2 m/s ^{1.75})	Night-time (0.13 m/s ^{1.75})	
2026 opening year	10 m (11 trains)	13 m (8 trains)	None
2040 design year	11 m (15 trains)	13 m (9 trains)	None

Note The estimated off-set distances are based on the VDV reference, actual vibration levels at individual receptors can vary from the calculated levels due to the rail infrastructure and geological conditions.

VDV levels calculated applying the W_b -weighted vibration levels as per the 2008 version of BS 6472.

Based on the highest estimated off-set distance for the night-time railway operations for the design year 2040, an estimated off-set distance of 13 m from the outer rail would be required to achieve ground-borne vibration criteria.

A review of the Project alignment identified that all sensitive receptors not resumed by the Project would be outside of the 13 m off-set distance from the outer rail of the Inland Rail track. On this basis, the railway operations on the Project rail tracks would achieve the ground-borne vibration assessment criteria at all sensitive receptors.

Where ground-borne vibration from railway operations are within the assessment criteria, there can still be potential for rail operations to generate perceptible levels of ground-borne vibration at sensitive receptors. The ground-borne vibration levels would achieve the criteria for managing vibration disturbance, consequently the less stringent vibration criteria for managing risk of cosmetic damage to buildings would also be achieved

12.3.2 Heritage sites

The assessment has considered the potential for ground-borne vibration from railway operations to impact sites along the Project alignment that were identified as possessing historical or cultural values in the Non-Indigenous Cultural Heritage Survey report undertaken for the EIS.

As this study is not informed as to the structural condition of each heritage site, SLR has considered that heritage structures are not structurally unsound, on the understanding that the Project will require:

- Condition surveys of buildings and structures in the vicinity of the alignment and any excavations would be carried out prior to final design.
- Where ground-borne vibration levels are predicted to exceed the screening criteria, a more detailed assessment of the structure and vibration monitoring would be carried out to confirm vibration levels remain below appropriate limits for that structure.
- For heritage items, any detailed assessment would determine any specific sensitivities in consultation with relevant specialists to ensure risks are adequately managed.
- If a heritage building or structure is found to be structurally unsound (following inspection), a more conservative cosmetic damage objective (for example 2.5 mm/s peak component particle velocity for long term vibration from DIN 4150.3) would be considered.

Based on the reference ground-borne vibration velocity for a freight train passby (**Figure 21**), the PPV levels would be within the vibration targets for minimising potential impacts at 15 m or more from the nearest rail, allowing for local factors such as turnouts. Within this distance it is to be acknowledged that:

- Depending on location, some assets may already be exposed to similar vibration levels, as the Project shall be collocating within an existing corridor that is used by freight trains; and,
- Ground-borne vibration levels may still be within the guidelines given the conservative assumptions and the dominant frequencies of rail vibration.

The screening assessment of vibration impacts at the sites of potential heritage significance is provided in **Table 32**. The assessment determined the heritage sites with identified structures are considered to not be at potential risk from railway induced ground-borne vibration.

Table 32 Screening assessment of ground-borne vibration at heritage sites

Site ID ¹	Site name	Site description	Proximity to the Project	Assessment
B2G-19-H01	Kurumbul Station	Timber stump remains of previous buildings	30 m	No impacts
B2G-19-H02	Gibinbell Shearing Complex	Iron clad sheds	25 m	No impacts
B2G-19-H03	Gibinbell Siding	All station buildings removed, and earth bank remains.	10 m	No impacts, note ²
B2G-19-H04	Yelarbon & District Soldiers Memorial Hall	Chamferboard clad building with corrugated iron roof.	60 m	No impacts
B2G-19-H05	Anzac Memorial Garden	Small park with two stone and granite block status	60 m	No impacts
B2G-19-H06	Cancer Charity Tree	Commemorative tree on sandstone block	17 m	No impacts
B2G-19-H07	Church (former)	Chamferboard clad building with corrugated iron roof.	67 m	No impacts
B2G-19-H08	Yelarbon Mill 1	Timber framed buildings in disrepair.	90 m	No impacts
B2G-19-H09	Yelarbon Mill 2	Open sided iron roofed shed.	90 m	No impacts
B2G-19-H10	Petrol Station	Disused chamferboard clad building	58 m	No impacts

Site ID ¹	Site name	Site description	Proximity to the Project	Assessment
B2G-19-H11	Yelarbon Railway Complex	Large corrugated iron shed and series of grain silos	12 m	No impacts, note ¹
B2G-19-H12	Tree Trunk	Large felled tree, possibly a sign	100 m	No impacts
B2G-19-H13	Whetstone Siding	All station buildings removed, and earthen loading bank remains.	450 m	No impacts
B2G-19-H14	Homestead Complex	Weatherboard clad residence	SLR ID 254828, 110 m	No impacts
B2G-19-H15	Homestead Complex	Weatherboard clad property, not obviously occupied.	108 m	No impacts
B2G-19-H16	Structure	Small weatherboard building, not obviously occupied.	45 m	No impacts
B2G-19-H17	Sheds	Two weatherboard & corrugated iron sheds	93 m	No impacts
B2G-19-H18	Lookout	Lookout and rest area	370 m	No impacts
B2G-19-H19	Outbuildings	Weatherboard clad outbuildings, associated homestead was removed	78 m	No impacts
B2G-19-H20	Grass Tree Creek Bridge	Low timber girder rail bridge	Within the rail corridor	No impacts, note ¹
B2G-19-H21	Yandilla Station	Large corrugated iron shed and grain silos with a weighbridge	15 m	No impacts, note ¹
B2G-19-H22	Protest Public Art	Shipping container with public art	60 m	No impacts
B2G-19-H23	Condamine River Bridge	Timber girder rail bridge with precast concrete abutments	Within rail corridor	No impacts, note ¹
B2G-19-H24	Pampas Station	Large metal grain handling shed with weighbridge	6 m	No impacts, note ¹
B2G-19-H25	Pampas Memorial Hall	Chamferboard clad hall on low timber stumps, still in use	75 m	No impacts
B2G-19-H26	Sheds adjacent to Millmerran Branch Line	Dilapidated timber frame sheds	Within B2G rail corridor	No impacts, note ¹
B2G-19-H27	Condamine River Bridge 2	Timber girder rail bridge with precast concrete abutments	Within the rail corridor	No impacts, note ¹
B2G-19-H28	Brookstead Station	Complex of grain silos	53 m	No impacts
B2G-19-H29	Brookstead Station Building (relocated)	Small weatherboard clad timber building on low stumps.	120 m	No impacts
B2G-19-H30	Cecilvale Station	All station elements removed	Within the rail corridor	No impacts, note ²
B2G-19-H31	Yarranlea Station	Existing grain silos and shed	45 m	No impacts
B2G-19-H32	Murlaggan Station	All station elements removed	Within the rail corridor	No impacts, note ²
B2G-19-H33	Homestead Complex	Occupied weatherboard colonial dwelling & ruins of timber structures	78 m	No impacts
B2G-19-H34	Archaeological Site	Site of former buildings, site is extensively ploughed	Within B2G rail corridor	No impacts, note ²

Note 1 Review in detail if the structures are to be retained with the Project 'as is' i.e. not modified.

Note 2 No impacts anticipated on the understanding there were no observed structures or artefacts.

13 Assessment of ground-borne noise

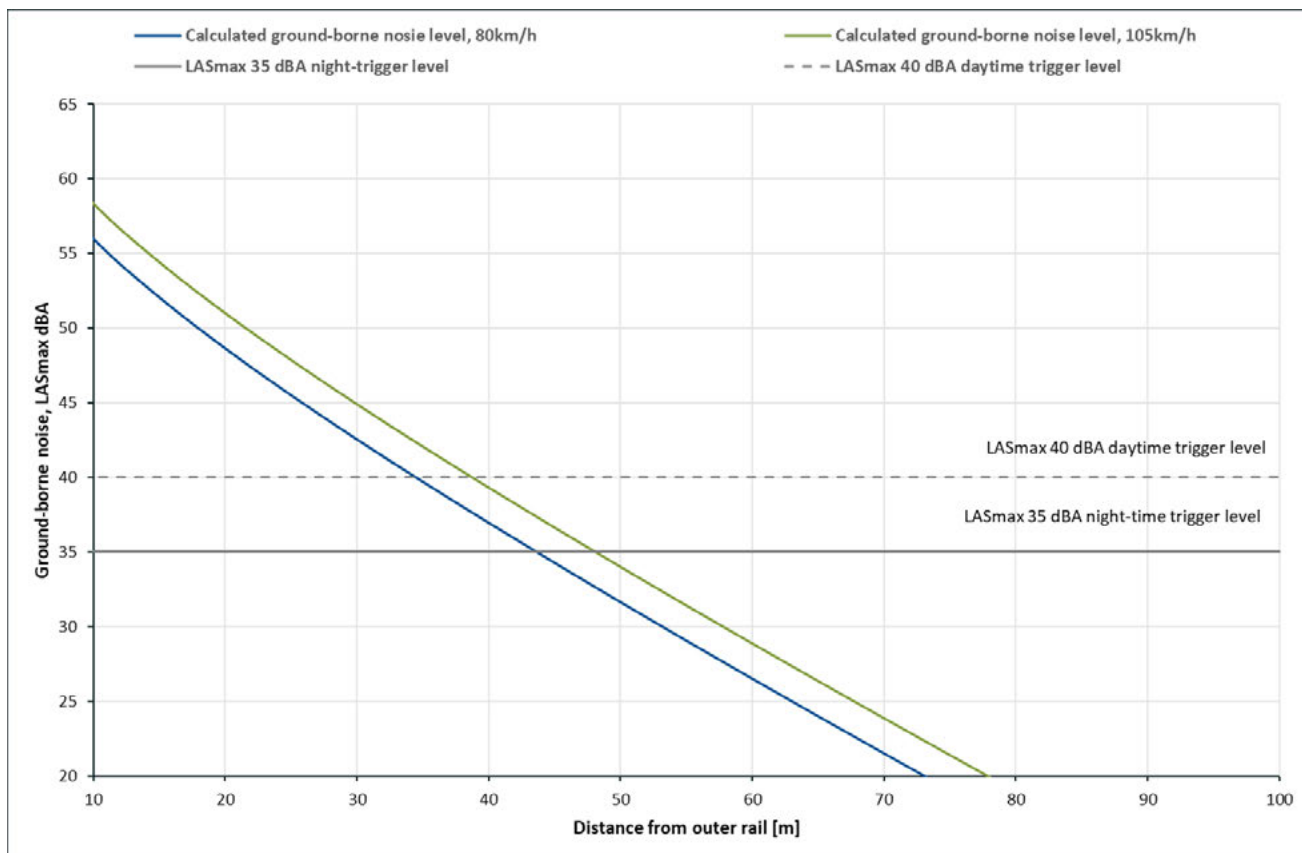
The ground-borne vibration scoping model and the referenced source rail vibration levels were applied to assess the potential ground-borne noise from railway operations at the ground-level track.

The building types and construction details of the sensitive receptors are not known and could have substantial variations in rural areas. To conservatively estimate the ground-borne noise levels at sensitive receptors, the calculations applied the following key assumptions:

- No coupling loss between the ground and the receptor building structures to account for loss of energy as vibration enters the building footings.
- No floor amplification effects or floor-to-floor losses within the receptor structures.
- Use of a vibration to sound pressure (noise) conversion factor of -32 dB¹⁶.
- Application of a 0.05 per metre damping loss estimated from the rail vibration measures described in **Section 12**.

The calculated ground-borne noise levels in decibels, at increasing distance from the outer rail, of the Project is detailed in **Figure 22**. The ground-borne noise levels are presented for a train speed of up to 105 km/h.

Figure 22 Calculated ground-borne noise levels from train passbys



¹⁶ Acoustics and Noise Consultants, Guideline "Measurement & Assessment of Groundborne Noise & Vibration", 2nd Edition 2012.

The calculated ground-borne noise levels identified that, at a distance of greater than 50 m from the outer rail, the $L_{A\text{Smax}}$ 40 dBA daytime and $L_{A\text{Smax}}$ 35 dBA night-time ground-borne noise assessment criteria would be achieved.

There were three sensitive receptors identified to be approximately within 50 m of the outer rail of the Project alignment:

- SLR ID 254250 off Yelarbon Kurumbul Road, west of Kurumbul Station;
- SLR ID 261227 off Ware Street in Brookstead;
- SLR ID 323679 off Quibet Road to the north of Pittsworth, the disturbance footprint of the Project suggests this property may be resumed.

At the 50 m off-set distance, the outdoor noise environment would be dominated by the airborne noise which would likely mask the potential ground-borne noise content at the nearest habitable rooms facing the rail corridor.

Within other habitable rooms, where the airborne noise component can be lower, there is potential for the airborne noise to not fully mask potential ground-borne noise and perceptible ground-borne noise impacts may be experienced.

Whilst ground-borne at all other sensitive receptors were calculated to be within the assessment criteria there can still be a risk of minor perceptible ground-borne noise at sensitive receptors. Consequently, the assessment outcomes are proposed to be reviewed during the detailed design phase to verify any future requirements to mitigate ground-borne noise.

14 Cumulative impacts

The Project directly links to the south with the adjoining NS2B project section and links directly to the G2H project section to the north. At the sensitive receptors within the B2G project area, the primary source of rail noise will be the Inland Rail trains as they travel on the B2G alignment.

Rail noise from the arrival and departure of the trains from the adjacent NS2B and G2H project sections will occur further from the B2G project infrastructure. Consequently, adjacent rail operations are not expected to result in a cumulative increase in daily railway noise levels at the sensitive receptors within the Project study area.

Whilst the Inland Rail program is being delivered as separate project sections, once in operation the source of railway noise and vibration would unlikely be defined by sensitive receptors as being within the extent of a specific project section. In this regard, subjective cumulative noise or vibration impacts from trains operating within individual project sections on Inland Rail is not anticipated to occur.

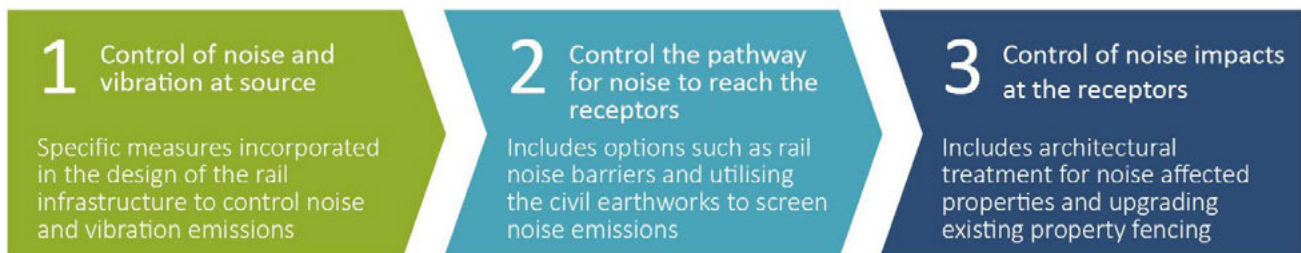
The Project proposes upgrading of existing rail corridors to accommodate all rail traffic and the overall railway noise levels from all train operations within the corridor have been assessed in this report. Where required by the noise criteria and assessment methodologies, the potential cumulative noise from the existing rail traffic and the future additional rail traffic introduced with the Project was included in the noise and vibration modelling predictions and the assessment of noise and vibration levels and associated impacts.

15 Recommendations

15.1 Reasonable and practicable mitigation measures

Mitigation measures shall be investigated where the predicted or monitored railway noise, ground-borne noise or ground-borne vibration levels are determined to be above the criteria. The investigation of noise and vibration mitigation for the Project follows a hierarchy of control options, as summarised in **Figure 23**.

Figure 23 Hierarchy of noise and vibration mitigation measures



On the Inland Rail Program, ARTC is applying the following strategy as the basis for selecting reasonable and practicable noise mitigation:

- Noise barriers are generally only considered where groups of triggered sensitive receptors are apparent. For isolated sensitive receptors, such as single dwellings, noise barriers would generally not be considered.
- The noise mitigation for isolated sensitive receptors is expected to include:
 - At-property architectural treatments to the building (such as increased glazing or facade constructions) to control rail noise inside building; and/or,
 - Upgrades to the receptor property boundary fencing to improve screening of rail noise.
- For two sensitive receptors on the same side of the track, the potential for a noise barrier or architectural treatment of the building will be considered on a case by case basis.
- For three or more sensitive receptors in close proximity on the same side of the track noise barriers will be considered as a primary noise mitigation option.

Further to the above strategy, the selection and specification of as-required noise mitigation also requires the consideration of a range of safety, community, visual amenity, engineering, environmental and cost factors. These factors are considered in determining whether a mitigation option is reasonable to implement.

The terms 'reasonable' and 'practicable', with respect to noise mitigation, are outlined below in **Table 33**.

Table 33 Evaluation of reasonable and practicable for noise mitigation

Term	Description											
Practicable	The noise mitigation should be a conventional and available noise mitigation approach. Ideally the option is consistent with industry best practice and does not introduce novel or untried technology. The mitigation should be practical to build with consideration to the constructability, engineering, maintenance and reliability of the option.											
Reasonable	When determining if mitigation is reasonable, the following factors should be considered:											
	<table> <tr> <td>Safety</td><td> The mitigation should not adversely impact the safety of the public or the safety of implications of rail operations within the rail corridor. For example, pedestrians should be able to audibly and visually detect trains at pedestrian crossings. </td></tr> <tr> <td>Noise impacts</td><td> The effect of the noise mitigation to change aspects such as the overall noise levels, the amenity of the ambient noise environment and how frequently the rail noise levels could trigger mitigation are all considered. </td></tr> <tr> <td>Noise mitigation benefits</td><td> The noise reduction performance achieved by the mitigation is reviewed, along with the perceptible change in noise level that could be experienced. </td></tr> <tr> <td>Community views</td><td> The views of landowners and the community should be consulted and options that have the majority support from the affected community should be considered. </td></tr> <tr> <td>State government requirements</td><td> Consider any State specific requirements for what constitutes reasonable or practicable. </td></tr> <tr> <td>Cost</td><td> The costs should be reasonable in context of the overall project cost and spending on other similarly affected residents. The cost should consider the overall project costs including maintenance costs. Any residual costs to the community, such as running air-conditioning, should also be reviewed. </td></tr> </table>	Safety	The mitigation should not adversely impact the safety of the public or the safety of implications of rail operations within the rail corridor. For example, pedestrians should be able to audibly and visually detect trains at pedestrian crossings.	Noise impacts	The effect of the noise mitigation to change aspects such as the overall noise levels, the amenity of the ambient noise environment and how frequently the rail noise levels could trigger mitigation are all considered.	Noise mitigation benefits	The noise reduction performance achieved by the mitigation is reviewed, along with the perceptible change in noise level that could be experienced.	Community views	The views of landowners and the community should be consulted and options that have the majority support from the affected community should be considered.	State government requirements	Consider any State specific requirements for what constitutes reasonable or practicable.	Cost
Safety	The mitigation should not adversely impact the safety of the public or the safety of implications of rail operations within the rail corridor. For example, pedestrians should be able to audibly and visually detect trains at pedestrian crossings.											
Noise impacts	The effect of the noise mitigation to change aspects such as the overall noise levels, the amenity of the ambient noise environment and how frequently the rail noise levels could trigger mitigation are all considered.											
Noise mitigation benefits	The noise reduction performance achieved by the mitigation is reviewed, along with the perceptible change in noise level that could be experienced.											
Community views	The views of landowners and the community should be consulted and options that have the majority support from the affected community should be considered.											
State government requirements	Consider any State specific requirements for what constitutes reasonable or practicable.											
Cost	The costs should be reasonable in context of the overall project cost and spending on other similarly affected residents. The cost should consider the overall project costs including maintenance costs. Any residual costs to the community, such as running air-conditioning, should also be reviewed.											

15.2 Noise and vibration mitigation options

A review of potential reasonable and practicable mitigation options to reduce and control noise and/ or vibration levels, and related impacts at sensitive receptors, is discussed below in **Table 34**.

The options demonstrate the range of mitigation measures that can be implemented on the Project. The final decision on mitigation measures will be determined during the detail design and construction of the Project. This is expected to include further noise and vibration prediction modelling to verify the outcomes of this assessment.

The mitigation measures are specific to the sources of noise and vibration, for example wheel-rail (rolling) noise, locomotive noise emissions or potential ground-borne noise from train passbys. The detail design may determine a combination of options would be implemented to provide the reasonable and practicable control of the noise and vibration, targeted to achieving the assessment criteria and minimising potential impacts.

Table 34 Review of potential noise mitigation measures

Noise source	Aspect	Commentary
Rolling noise	Noise walls or barriers at the rail corridor boundary	Rail noise barriers can be an effective noise mitigation option to control the noise emissions from both the wheel-rail interface and from the locomotives. Appropriately designed noise walls and barriers can typically reduce the overall noise levels between 5 dBA to 15 dBA, where the line of sight between the sensitive receptor and the source(s) is fully impeded by the barrier structure. The Project would only consider noise walls or barriers where the mitigation can effectively control noise at groups of sensitive land uses and receptor buildings and where noise level reductions of generally 5 dBA or more are required at sensitive receptors. The key considerations with rail noise walls or barriers, include: • The proximity of key infrastructure such as local roads, waterways and drainage culverts can constrain the location and extent of noise walls or barriers. These factors can prevent noise walls and barriers from being a reasonable or practicable noise mitigation option. • There would be little or no reduction in the noise emissions from the locomotive exhaust and train horns unless the wall or barrier structures are constructed to a height of at least 4 m and located within the rail corridor. • Availability of land between the rail line and sensitive receptors may constrain the construction of the base/ foundations of the noise wall or barrier. • The location, extent and height of noise walls or barriers would need to be designed to achieve a minimum noise reduction performance, control reflected sound and meet specifications for earthworks, flooding, surface water run-off, stabilisation, wind loading and erosion. • Social and environmental factors considered include; loss of open aspect and breezes, potential for vandalism and a need for graffiti removal, reduction in visual amenity of the landscape, loss of views and vistas and the removal of vegetation.
	Low height noise barriers	In situations where the primary noise source is from the wheel-rail interface, low height barriers (for example ≤ 2 m in height) can be constructed close to the outer rail track. Such barriers can achieve similar noise reductions to noise walls or barriers at the rail corridor boundary. Typically, this mitigation option only suits single tracks and where only the rolling noise needs to be controlled. Given the overall noise levels from rail freight are a combination of rolling noise and locomotive noise emissions the low height noise barriers could have a negligible influence on the compliance to the noise criteria. In some cases, the use of low height barriers could be considered to achieve a perceptible change in railway noise. Reductions in noise levels by at least 3 dBA could result in a perceptible improvement to the loudness of train passby events.
	Earth mounds at the rail corridor boundary	Earth mounds at the rail corridor boundary can be an alternative to or complement noise walls and barriers. The earth mounds can mitigate noise by impeding the direct line of sight between the noise source and receptor. To reduce noise levels between 5 dBA to 10 dBA, earth mounds would need to be a comparable height and length to potential rail noise walls or barriers.

Noise source	Aspect	Commentary
Rolling noise	Earth mounds at the rail corridor boundary	The required height of noise walls or barriers can be achieved where the structure is constructed on an earth mound base. This approach provides the required screening of noise and can reduce the associated costs of the noise wall or barrier. When reviewing the practical application of earth mounds, the following should be considered: • The construction of earth bunds can be constrained by the available space between the rail corridor and neighbouring infrastructure. • Earth mounds require considerably more space than the footprint of a rail noise barrier. A 2 m height earth mound could require an 8 m wide base. • Earth mounds could provide a benefit to control perceptible rail noise impacts. Reductions in noise levels by at least 3 dBA could result in a perceptible improvement to the loudness of train passby events. • Whilst earth mounds may not achieve specific noise reduction performance as can be achieved with noise walls or barriers, they can assist in reducing the overall noise levels to be closer to the assessment criteria. • In addition to the potential constraints associated with noise walls and barriers, the earth mound would also need to be designed to meet contamination, dust, health and ecological requirements. • The implications to water through flow and flooding will need careful consideration to ensure the earth mounding does not adversely impede the movement of surface water. • The required extent and height of the earth mounds to achieve reduction in noise levels may exceed the availability of re-usable spoil material.
	Rail dampers	Rail dampers may provide localised benefit for the control of rolling noise where the contribution from the rail is a primary factor. International experience suggests a reduction in rolling noise of 3 dBA could be achieved and there is limited evidence that suggests rail dampers can provide some benefit in controlling curving noise. The effectiveness of rail dampers may be limited by the stiffness of the ballasted track and concrete sleepers, the forces exerted by the heavy rail freight and the long-term durability and maintenance of such measures. Sections of generally straight track would not be highly susceptible to prominent or regular wear and would be most suited for the consideration of rail dampers.
	Maintaining defective rollingstock	Defects with the wagons, such as wheel flats or misaligned axles/ bogies, can cause discrete and potentially annoying high noise events. ARTC currently implements Wayside Monitoring Systems across the rail network to identify individual rollingstock and the specific sources of noise for the targeted mitigation of railway noise. The Wayside Monitoring Systems include: • Wheel impact and load detector, bearing acoustic monitoring (RailBAM) and Squeal acoustic detector (RailSQAD), • Angle of attack, hunting detector and wheel profile monitoring. A similar monitoring program could be implemented to identify sources of high noise events. Once identified, defective rollingstock can be temporarily removed from service and defects repaired to address factors contributing to higher noise levels or discrete annoying noise characteristics. It is likely the overall reduction to LAeq and average LMax noise levels would be minor (probably less than 1 dBA) but would assist in managing noise events that could cause disturbance.

Noise source	Aspect	Commentary
Locomotives	Exhaust mufflers	The exhaust outlets of the locomotives can be a primary source of low frequency and overall noise emissions from the train passbys. The exhaust systems of new and existing locomotives can be modified with exhaust mufflers to improve attenuation of noise emissions, including low frequency noise. Because such measures require specifications for the rollingstock they will not be readily implementable by ARTC without appropriate commitments from rail operators.
Safety warning devices	Safety requirements	The operation of devices such as train horns and level crossing alarms are exempt from compliance to airborne noise criteria due to public safety obligations. The following mitigation options are proposed as part of ARTC's commitment to managing noise impacts.
	Wayside horns	A wayside horn is an automated audible warning located at the level crossing. Instead of the train sounding its horn on approach to a level crossing the wayside horn automatically sounds to provide a targeted audible noise event for vehicles and pedestrians at the level crossing. The objectives are to remove the need for the train to sound its horn adjacent to sensitive receptors and to implement a horn event that has a noise emission level and sound directivity focused to the users of the level crossing. It is expected that respite from train horns could reduce L_{Amax} noise levels by more than 10 dBA at sensitive receptors and provide a notable improvement in loudness and potential risk for annoyance, particularly where there can be more two train horn events every hour with the Inland Rail project.
	Soft tone alarm bells	The design of level crossing alarm (warning) bells will be required to confirm to specific design standards. Typically, loud tone alarm bells are to operate at L_{Amax} noise levels between 85 dBA to 105 dBA at 3 m. A soft tone bell design, which has a lower L_{Amax} noise emission level between 75 dBA to 85 dBA at 3 m can be applied, where practicable, to reduce maximum noise levels from the alarm bells by approximately 10 dBA. The L_{Aeq} noise level would have a more marginal improvement (probably less than 1 dBA per daytime or night-time period) as the noise environment surrounding level crossings is primarily influenced by the train passby events.
Property controls	Architectural treatment of property	Where external rail noise levels are validated, through measurement, to exceed the assessment criteria a potential option is to mitigate the intrusion of rail noise within the affected property. The provision of architectural treatment would depend on a number of factors and is expected to only apply to habitable rooms or acoustically significant rooms/uses of sensitive buildings. Typically, measures such as upgraded acoustic glazing, acoustic window and door seals, acoustic insulation for the roof are considered to mitigate noise intrusion. The provision of upgrades to ventilation, such as fresh air ventilation (acoustic ducting) or air-conditioning will allow windows to be kept closed as a mitigation option whilst maintaining air flow. Appropriately designed measures, where windows are closed, can mitigate the intrusion of noise by more than 10 dBA. However, these measures can be more effective to control the intrusion of rolling noise as it is more broadband in nature and often does not have prominent tonal or low frequency components. All consideration of architectural property treatment would be subject to an inspection of each individual property to confirm its suitability for the implementation of noise control treatments.

Noise source	Aspect	Commentary
Property controls	Property construction	In rural locations, the age and construction of residential properties can influence the practical implementation of modern architectural treatments. The review of architectural treatments will require a detailed survey of the eligible properties and advice from engineers, architects and acousticians.
	Consideration of low frequency noise content	Noise which is considered to have low frequency and/or tonal content can be increasingly annoying. Where the control of low frequency noise is required at properties, the architectural acoustic treatments would need to consider the control of low frequency noise intrusion to achieve an overall improvement to the internal rail noise levels and potential characteristics that could cause annoyance. The control of low frequency noise within a property is challenging and care needs to be taken to manage residual impacts such as the architectural treatments controlling the mid and high frequencies which may cause the low frequency noise to become more perceptible. The United Kingdom Department of Environment, Food and Rural Affairs has published a reference curve for assessing low frequency noise indoors ¹⁷ . This curve should be adopted as a design target for architectural treatments where measured external rail noise levels at sensitive receptors are above the assessment criteria and identify prominent low frequency noise content.
	Upgrades to existing property fencing	Existing fencing at the boundary of individual receptors can be upgraded by replacing part or all of the existing fencing with an 'acoustic' fence design. Compared to standard residential property fencing, an acoustic fence, such as aerated concrete (solid masonry), has an improved acoustic transmission loss performance. Whilst the noise reduction performance will be specific to individual properties, upgrades to existing property fencing are likely to be suitable only where noise reductions of less than 10 dBA are required. The potential for upgrading existing property fencing can be limited by the line of sight between the railway and the receptor, the available land and the requirements of local Councils and regulatory authorities with respect to the height and materials permitted for property boundary fencing. Agreement between the landowner and ARTC would be required for ARTC to undertake works on private property.
	Property relocation	In rural locations, individual residential property can be located on large land holdings. It may be possible to relocate the residential property within the same land so that it is further from the rail corridor and noise levels would be lower. The relocation of property would be assessed on a case by case basis and ensure there would be a notable improvement to the noise environment at the relocation site. As a general rule, where the distance between the dwelling and the rail line is doubled the rail noise levels can 3 dBA less.
	Negotiated agreements	The implementation of architectural treatments and other measures to private property would likely be subject to the agreement of commercial and legal terms between ARTC and the property owner.

15.3 Summary of noise mitigation

The airborne noise assessment identified railway noise levels triggered the review of noise mitigation at 130 sensitive residential receptors for rail operations at project opening (2026), with an additional one sensitive residential receptor triggering the criteria, for a total of 131 sensitive residential receptors triggering investigation of noise mitigation at the design year 2040).

¹⁷ UK Department of Environment, Food and Rural Affairs, 2005. Proposed Criteria for the Assessment of Low Frequency Noise Disturbance, University of Salford, February 2005.

A review of the noise mitigation triggers, based on the margin the rail noise levels are above the criteria, is provided in **Table 35**. The noise levels at approximately half of sensitive receptors are within 5 dBA of the criteria.

Table 35 Summary of noise mitigation triggers

Assessment criteria margin	Sensitive receptors triggering the assessment criteria
Year 2026 – project opening	
1 dBA to 3 dBA	58
>3 dBA to 5 dBA	14
>5 dBA to 10 dBA	36
>10 dBA	22
Total receptors triggering noise mitigation - project opening	130
Year 2040 – design year	
1 dBA to 3 dBA	58
>3 dBA to 5 dBA	15
>5 dBA to 10 dBA	36
>10 dBA	22
Total receptors triggering noise mitigation - design year	131 (including the 130 receptors triggering in 2026)

A review of the location of these sensitive receptors determined in the order of half of properties were isolated properties dispersed along both sides of the Project alignment. Elsewhere, the residential receptors were located at the townships of Yelarbon, Brookstead and Pittsworth.

At these townships the sensitive receptors are grouped together, located adjacent to the railway corridor and are predicted to experience noise levels at least 5 dBA above the assessment criteria. On this basis, a review of conceptual noise barriers has been undertaken at Yelarbon, Brookstead and Pittsworth, as detailed in **Section 15.4**.

For the other sensitive receptors where the assessment criteria are predicted to be triggered the reasonable and practicable noise mitigation options are expected to be:

- at-source noise control measures to reduce the emission of railway noise; and,
- architectural acoustic treatments to the buildings triggering the assessment criteria to control rail noise within the internal environment of the building; and/or,
- upgrades to any existing property boundary fencing to improve screening of rail noise levels.

During the detail design phase, the sensitive receptors shall be surveyed to exclude rooms and buildings that are not noise sensitive from the consideration of at-property treatments, such as; storage areas, bathrooms, hallways and corridors. The surveys would need to investigate the noise attenuation performance of the existing property facades and, as-required, revise the assessment of potential internal rail noise levels.

In addition there are five non-residential receptors where forecast internal noise levels were above the noise assessment. The surveys of sensitive receptors will need to include the non-residential receptors to confirm the building use and occupancy and the noise attenuation performance of the existing facades.

15.4 Review of noise barrier options

15.4.1 Overview

At the towns of Yelarbon, Brookstead and Pittsworth the railway noise levels at nearby sensitive receptors are typically more than 5 dBA above the noise trigger levels, the receptors are within 200 m of the rail corridor and in groups of three or more receptors on the same side of the track. The assessment has reviewed potential noise barrier designs at these towns to demonstrate the potential reasonable and practicable noise mitigation options that could be available to the Project.

Whether rail noise barriers would be a reasonable and practicable noise mitigation will be determined by ARTC during the detail design and construction of the Project. This analysis will consider all design, engineering, environmental and social factors that determine the location, extent and height of the noise barriers (or similar structures). In particular, the investigations will need to carefully consider aspects such as flooding and management surface water, wind loading, visual amenity and safety within and outside the railway corridor.

The key assumptions referenced as part of the review of the noise barrier options in this report are:

- Daytime $L_{Aeq}(15\text{hour})$ railway noise levels are in the order of 1-2 dBA higher than the $L_{Aeq}(9\text{hour})$ railway noise levels due to the distribution of rail traffic in the daytime and night-time periods. The maximum (L_{Amax}) railway noise levels are essentially the same for the daytime and night-time periods.
- The number of receptors triggering the noise criteria is greater for the night-time as the night-time criteria are up to 5 dBA more stringent for the night-time period.
- The predicted noise levels for the worst-case night-time period in the year 2040 were applied as the basis for the mitigation assessment. The minor difference in noise levels between 2026 and 2040 operations would be unlikely to substantially revise the conceptual noise barrier designs.
- The predicted L_{Aeq} and L_{Amax} railway noise levels at sensitive receptors are a combination of the noise from both the wheel-rail interface (rolling noise), the locomotive exhausts and in some cases the train horns and level crossing alarms.
- Noise barrier heights below 2 m were not considered as the top of rail height is typically 1 m or more above the ground height within the rail corridor, which limits noise reduction performance of noise barriers under 2 m in height.
- All noise barriers would need to be solid structures constructed from material such as autoclaved aerated concrete or pre-cast concrete. A combination a rail noise barrier, retaining wall and/or earth mound structure may be feasible to ensure the barrier structure effectively impedes the direct line of sight (noise pathway) between the rail corridor and the sensitive receptors.
- An acoustically absorptive design for the noise barrier surface may be required to ensure reflected sound does not limit the noise reduction performance of the barrier and where the mitigation may need to carefully consider the frequency content, particularly where there is a requirement to control low frequency noise. The noise modelling has assumed sound reflected from the internal façade of the barriers will be controlled.

15.4.2 Conceptual noise barrier mitigation at Yelarbon

At Yelarbon, the Cunningham Highway will be realigned which would assist with a rail noise barrier to be investigated parallel to the nearest sensitive receptors. The predicted noise levels for 2040 identified 29 sensitive residential receptors within the main area of the town, including Yelarbon State School and the Yelarbon Scouts Hall, where noise levels were above the assessment criteria.

A 730 m section of noise barrier was considered at the rail corridor boundary between the western extent of the town to the existing silos to the east. To investigate the noise reduction potential of the conceptual mitigation, the noise modelling applied noise barrier heights up to 4 m above the residual ground level.

The noise barrier is shown in **Figure 24** along with the receptors where noise levels are above the assessment criteria. For the predicted night-time year 2040 railway noise levels, the additional receptors achieving the noise criteria and the residual receptors where noise levels remained above the criteria are summarised in **Table 36**.

Table 36 Sensitive residential receptors triggering noise criteria

No barrier scenario	Receptors achieving the LAeq noise criteria	Receptors achieving the LAmax noise criteria
No barriers (current design)	3 (24 residual triggers)	0 (27 residual triggers)
Barrier height 2 m	5 (22 residual triggers)	3 (24 residual triggers)
Barrier height 3 m	11 (16 residual triggers)	7 (20 residual triggers)
Barrier height 4 m	15 (12 residual triggers)	10 (17 residual triggers)

The predicted noise reductions for each considered barrier height are detailed in **Table 37**. The table presents the number of receptors within each noise reduction category.

Table 37 Noise reductions at the sensitive residential receptors

Noise reduction, dBA	Number of sensitive receptors					
	2 m Barrier		3 m Barrier		4 m Barrier	
	LAeq	LAmax	LAeq	LAmax	LAeq	LAmax
0-<2	21	21	14	12	9	14
≥2 – <4	6	6	8	12	9	8
≥4 – <6	0	0	3	3	4	3
≥6 – <8	0	0	2	0	5	2
≥8 – <10	0	0	0	0	0	0
>10	0	0	0	0	0	0

The review of the noise barrier performance identified:

- The noise barrier height of 2 m is predicted to achieve reductions to the LAeq and LAmax noise levels of up to 4 dBA and achieve the noise criteria at an additional five sensitive residential receptors.
- A barrier 3 m in height reduced noise levels up to LAeq 6 dBA and 5 dBA LAmax, achieving the LAeq criterion at 11 additional receptors and the LAmax criterion at 7 additional receptors. A barrier 4 m in height reduced noise levels up to LAeq 8 dBA and 5 dBA LAmax, achieving the LAeq criterion at 15 additional receptors and the LAmax criterion at 10 additional receptors.
- The noise barriers reduce predicted LAeq noise levels at Yelarbon State School by up to 2 dBA which may only be a marginally perceptible improvement to railway noise levels without a noise barrier. The predicted external noise levels of LAeq(1hour) 52 dBA are above the LAeq(1hour) 40 dBA internal noise criterion, allowing for a 7 dBA noise level reduction achieved by the building façade.
- Noise levels at the Yelarbon Scout Hall are reduced by up to 6 dBA but remain above the criterion.
- The rail line is parallel to the nearest receptors at Yelarbon which is conducive to effective noise control at receptors immediately adjacent to the rail corridor. At receptors located further from the noise barrier, the line of sight to the rail line is not fully impeded which limits potential noise reductions.



BORDER TO GOWRIE

Concept Noise Barrier at Yelarbon

FIGURE 24

150Metres

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4

Date: 02-Jun-2020

Author: JG

Scale: 1:4,500



Level Crossings



Bridges and Viaducts



Rail Alignment/Centreline



Sensitive Receptors Triggering Review of Mitigation



Other Sensitive Receptors

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.

15.4.3 Conceptual noise barrier mitigation at Brookstead

The sensitive receptors at Brookstead are to the north-west of the alignment with the nearest receptors approximately 110 m from the main line track. The predicted noise levels for 2040 identified 23 sensitive receptors (22 residential and Brookstead State School) where noise levels were above the assessment criteria.

The noise levels are influenced by the train passbys on the main line and the train horn and crossing alarm associated with the active level crossing proposed for Mann Silo Road. A potential noise barrier would need to stop with appropriate clearance either side of Mann Silo Road to maintain road access and meet relevant railway safety and access requirements.

Any openings or gaps within the noise barrier structure would not fully obstruct the line of sight between the nearby receptors and the railway line, which can result in little or no screening of noise emissions at nearby sensitive receptors.

A conceptual noise barrier was included in the noise modelling at a 10 m offset to the north of the track centreline. The noise barrier alignment was considered in two sections due to the location of Mann Silo Road. In total, the conceptual noise barrier is approximately 720 m in length and the noise modelling applied noise barrier heights up to 4 m above the residual ground level.

The noise barrier is shown in **Figure 25** along with the individual sensitive receptors where noise levels are above the assessment criteria. For the predicted night-time railway noise levels in the year 2040, the number of additional receptors achieving the noise criteria with the noise barrier mitigation and residual receptors where noise levels remained above the criteria are summarised in **Table 38**.

Table 38 Sensitive residential receptors triggering noise criteria

No barrier scenario	Receptors achieving the LAeq noise criteria	Receptors achieving the LAmax noise criteria
No barriers (current design)	3 (19 residual triggers)	0 (22 residual triggers)
Barrier height 2 m	3 (19 residual triggers)	0 (22 residual triggers)
Barrier height 3 m	5 (17 residual triggers)	0 (22 residual triggers)
Barrier height 4 m	8 (14 residual triggers)	0 (22 residual triggers)

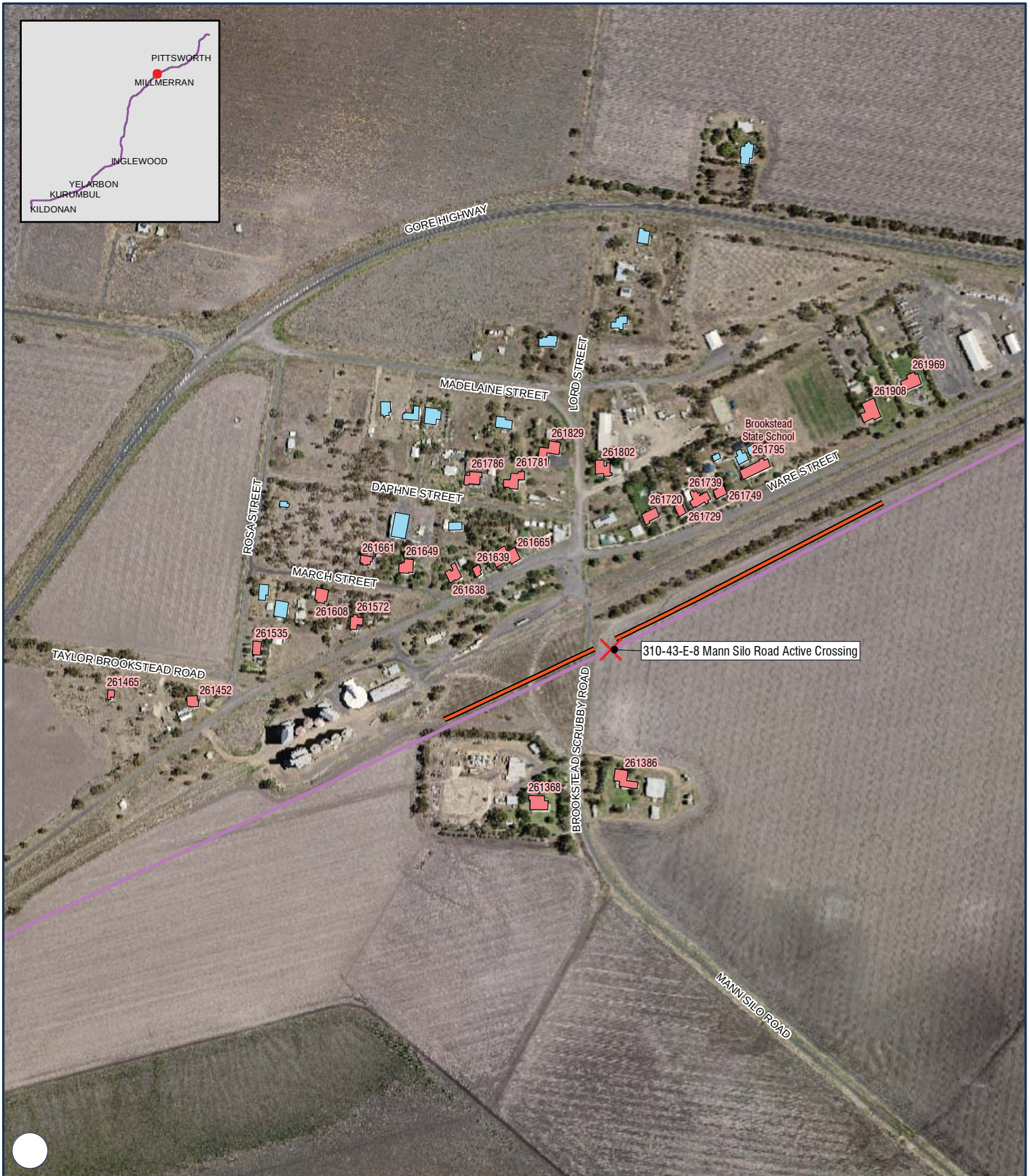
The predicted noise reductions for each considered barrier height are detailed in **Table 39**. The table presents the number of receptors within each noise reduction category.

Table 39 Noise reductions at the sensitive residential receptors

Noise reduction, dBA	Number of sensitive receptors					
	2 m Barrier		3 m Barrier		4 m Barrier	
	LAeq	LAmax	LAeq	LAmax	LAeq	LAmax
0-<2	22	22	16	20	13	16
≥2 – <4	0	0	6	1	5	6
≥4 – <6	0	0	0	1	4	0
≥6 – <8	0	0	0	0	0	0
≥8 – <10	0	0	0	0	0	0
>10	0	0	0	0	0	0

The review of the noise barrier performance identified:

- The conceptual noise barrier is having a limited ability to control railway noise levels, particularly the L_{Amax} noise levels. This is a result of the combined influence of the train horn noise passing over the top of the noise barrier, railway noise passing unimpeded through the gap in the barrier for Mann Silo Road and the separation distance between the sensitive receptors and the noise barrier.
- A noise barrier height of 2 m is reducing noise levels by less than 2 dBA and the predictions identified noise levels would not be sufficiently reduced to result in additional receptors achieving the assessment criteria.
- A noise barrier 3 m in height could reduce L_{Aeq} and L_{Amax} noise levels by up to 4 dBA and the predicted noise levels achieve the L_{Aeq} criterion at an additional five sensitive residential receptors. The L_{Amax} noise levels are not reduced sufficient for the L_{Amax} criterion to be achieved at additional residential receptors.
- Further increasing the noise barrier height to 4 m would reduce noise levels by up 5 dBA and achieve the noise criteria at eight additional residential receptors. The L_{Amax} noise levels are not reduced sufficient for the L_{Amax} criterion to be achieved at additional residential receptors.
- To control the L_{Amax} noise levels the design of the Project would likely need to consider additional mitigation options to reduce noise emissions from the train horns as they approach the Mann Silo Road crossing.
- Noise levels at Brookstead State School are predicted to be reduced by up to 5 dBA (L_{Aeq} and L_{Amax}) which may be a perceptible improvement to railway noise levels without a noise barrier. The predicted external noise levels of $L_{Aeq(1hour)}$ 55 dBA are above the $L_{Aeq(1hour)}$ 40 dBA internal noise criterion, allowing for a 7 dBA noise level reduction achieved by the building façade.



BORDER TO GOWRIE

Concept Noise Barrier at Brookstead

FIGURE 25

200Metres

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4

Date: 08-May-2020

Author: JG

Scale: 1:6,500



Level Crossings



Noise Protection Wall



Bridges and Viaducts



Rail Alignment/Centreline



Sensitive Receptors Triggering Review of Mitigation



Other Sensitive Receptors

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15.4.4 Conceptual noise barrier mitigation at Pittsworth

At Pittsworth the alignment, in a west to east direction, comes from elevated track on a bridge crossing the new road alignment, onto a newly constructed embankment and down into a cutting that is adjacent to the nearest sensitive receptors. Most of these sensitive receptors are clustered in a residential development at the north of Pittsworth, which is adjacent to the section where the track is in a cutting.

The predicted noise levels for 2040 identified a total of 12 sensitive residential receptors (including 2 receptors for motel buildings) where the L_{Amax} noise levels were above the assessment criteria. The predicted noise levels achieved the L_{Aeq} assessment criteria at the nearby sensitive receptors.

In consultation with ARTC, two noise barrier concepts were considered, where the noise barriers were either within the rail corridor or located at the assumed property boundary of the nearby sensitive receptors.

Noise barrier option 1

The conceptual noise barrier was considered at 10 m to the south of the track centreline and adjusted to be at the perimeter of the cutting. The barrier was not extending into the cutting or onto the adjacent rail bridge to the west. The conceptual noise barrier is 570 m in length and three noise barrier heights were reviewed.

The noise barrier is shown in **Figure 26** along with the individual sensitive receptors where noise levels are above the assessment criteria. For the predicted night-time year 2040 railway noise levels, the number of additional receptors achieving the noise criteria with the noise barrier mitigation and residual receptors where noise levels remained above the criteria are summarised in **Table 40**.

Table 40 Sensitive receptors triggering noise criteria

No barrier scenario	Receptors achieving the L_{Aeq} noise criteria	Receptors achieving the L_{Amax} noise criteria
No barriers (current design)	12 (0 residual triggers)	0 (12 residual triggers)
Barrier height 2 m	12 (0 residual triggers)	7 (5 residual triggers)
Barrier height 3 m	12 (0 residual triggers)	9 (3 residual triggers)
Barrier height 4 m	12 (0 residual triggers)	9 (3 residual triggers)

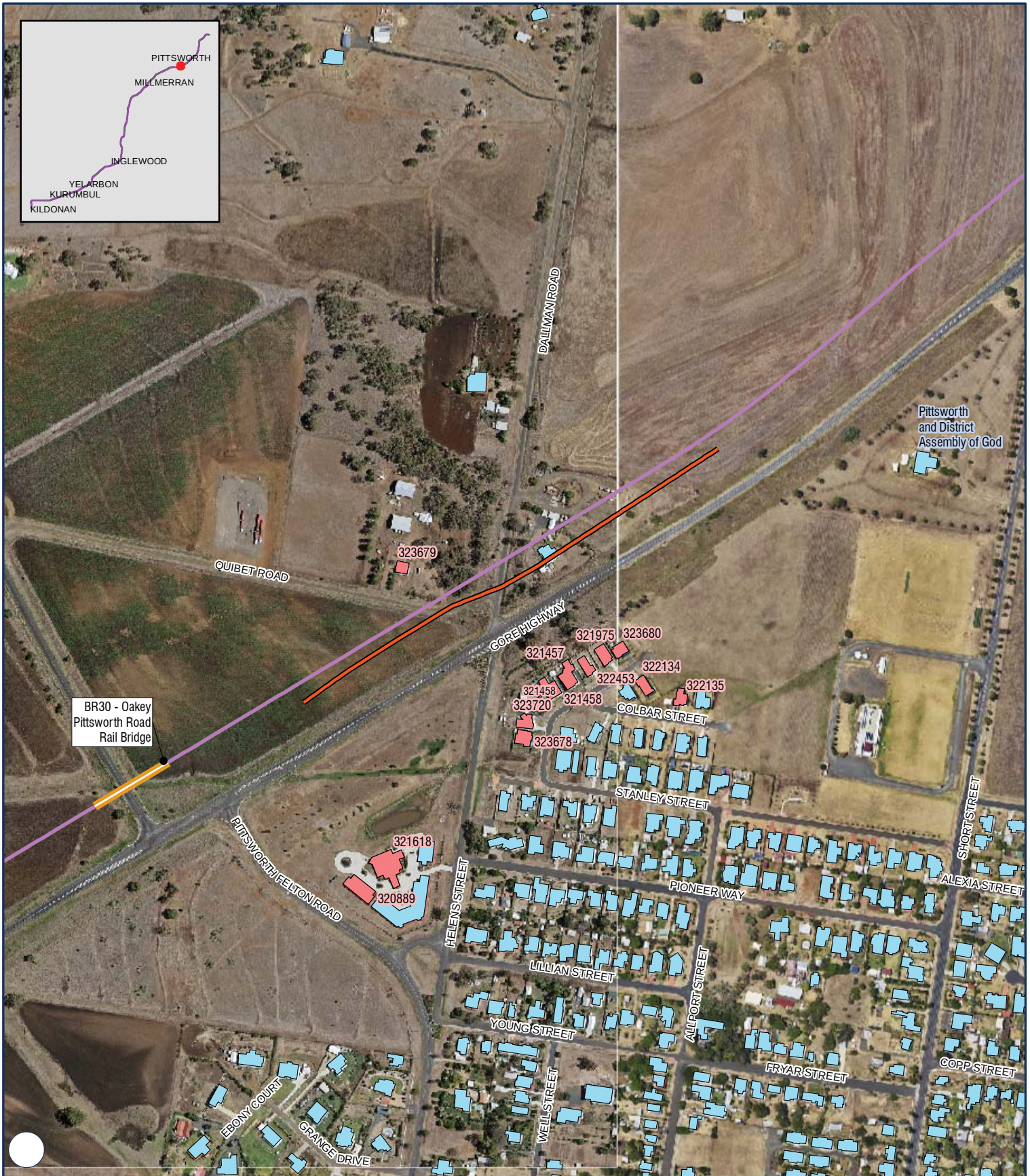
The predicted noise reductions for each considered barrier height are detailed in **Table 41**. The table presents the number of receptors within each noise reduction category.

Table 41 Noise reductions at the sensitive receptors

Noise reduction, dBA	Number of sensitive receptors					
	2 m Barrier		3 m Barrier		4 m Barrier	
	L_{Aeq}	L_{Amax}	L_{Aeq}	L_{Amax}	L_{Aeq}	L_{Amax}
0-<2	12	4	11	3	11	3
≥2 – <4	0	7	1	4	1	4
≥4 – <6	0	1	0	3	0	3
≥6 – <8	0	0	0	2	0	2
≥8 – <10	0	0	0	0	0	0
>10	0	0	0	0	0	0

The review of the noise barrier performance identified:

- A noise barrier of 2 m in height is predicted to achieve the L_{Amax} 80 dBA criterion at an additional seven residential receptors. As the barrier height increases to 3 m and 4 m in height, the L_{Amax} noise criterion is predicted to be achieved at an additional 9 of the 12 sensitive receptors triggering the L_{Amax} criteria.
- The L_{Amax} noise levels would require a noise reduction of approximately 5 dBA to achieve the L_{Amax} 80 dBA noise criterion. The noise barrier is sufficiently reducing the L_{Amax} noise emissions from the locomotives and the wheel-rail noise on the track adjacent to the noise barrier to achieve the targeted noise reduction at most of the receptors.
- The noise barrier is reducing predicted L_{Aeq} noise levels by up to 2 dBA. The L_{Aeq} noise reduction is relatively low compared to the predicted reduction in the L_{Amax} noise levels as the L_{Aeq} noise is influenced by the train passbys on the track outside of the immediate area of the noise barrier. This includes the elevated track section to the west as the alignment crosses over the local road network. The conceptual noise barrier was not extended onto the rail bridge crossing the road networks.
- The conceptual barrier has been located at the upper level of the embankment and cutting structures, resulting in the base of the noise barrier being located above the rail height. Further to the screening achieved by the cutting structure, the noise barrier is impeding the line of sight between the receptors and the rail track.
- Noise level reductions of L_{Amax} 5 dBA maybe achievable where, as an alternative to the noise barrier, the spoil material generated by the construction of the Project is reused to increase the height of the embankment and cutting structures. The resultant height would need to impede the line of sight to nearby receptors similar to the screening achieved by the conceptual noise barrier.



BORDER TO GOWRIE

Concept Noise Barrier at Pittsworth – Option 1

FIGURE 26

200Metres

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:6,000

- Level Crossings
- Noise Protection Wall
- Bridges and Viaducts
- Rail Alignment/Centreline
- Sensitive Receptors Triggering Review of Mitigation
- Other Sensitive Receptors

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Noise barrier option 2

An alternative noise barrier option was considered for the control of railway noise at the nearby residential receptors and the motel. Conceptual noise barriers were investigated at an assumed property boundary to the north of the residences on Stanley Street and to the north of the motel buildings.

The construction of noise barriers, or similar mitigation, on land outside of the railway corridor would potentially require ARTC to obtain land access consent from the relevant landowners and may be subject to relevant planning and environmental regulations and requirements. It is reasonable to assume that noise barriers or similar structures outside of the rail corridor may be limited to up to 2 m or 3 m in height depending on local planning requirements and the consideration of engineering and environmental factors, including the amenity at nearby sensitive receptors.

The noise barriers are shown in **Figure 27** along with the individual sensitive receptors where noise levels are above the assessment criteria. For the predicted night-time year 2040 railway noise levels, the number of additional receptors achieving the noise criteria with the noise barrier mitigation and residual receptors where noise levels remained above the criteria are summarised in **Table 42**.

Table 42 Sensitive receptors triggering noise criteria

No barrier scenario	Receptors achieving the LAeq noise criteria	Receptors achieving the LAmax noise criteria
No barriers (current design)	12 (0 residual triggers)	0 (12 residual triggers)
Barrier height 2 m	12 (0 residual triggers)	2 (10 residual triggers)
Barrier height 3 m	12 (0 residual triggers)	6 (6 residual triggers)

The predicted noise reductions for each considered barrier height are detailed in **Table 43**. The table presents the number of receptors within each noise reduction category.

Table 43 Noise reductions at the sensitive receptors

Noise reduction, dBA	Number of sensitive receptors			
	2 m Barrier		3 m Barrier	
	LAeq	LAmax	LAeq	LAmax
0-<2	12	10	9	5
≥2 – <4	0	2	3	3
≥4 – <6	0	0	0	4
≥6 – <8	0	0	0	0

Note Noise reductions greater than 6 dBA were not predicted with the conceptual noise barriers at the property boundary.

The review of the noise barrier performance identified:

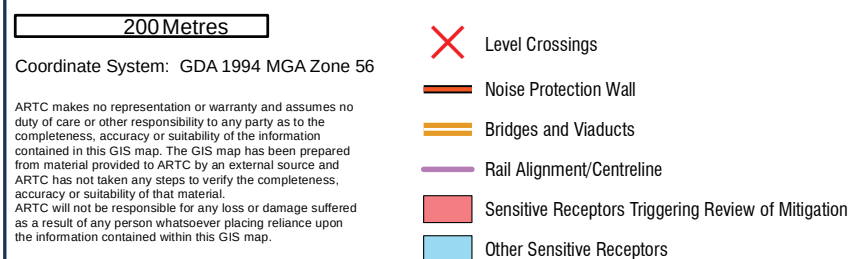
- Noise barriers 2 m in height reduce noise levels by LAeq 1 dBA and LAmax 3 dBA and achieve the LAmax criterion at an additional two residential receptors. The other sensitive receptors achieved negligible reduction (less than 1 dBA) in railway noise levels.
- Noise barriers 3 m in height reduce noise levels by LAeq 3 dBA and LAmax 6 dBA and achieve the LAmax criterion at an additional six residential receptors.
- Based on the concepts designs, noise barriers at the property boundaries would need to be at least 3 m in height to effectively control railway noise at more than just a few sensitive receptors.



BORDER TO GOWRIE

Concept Noise Barrier at Pittsworth – Option 2

FIGURE 27



Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:6,000

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15.4.5 Summary of the conceptual noise barrier mitigations

In summary, the review of conceptual noise barrier mitigation options concluded:

- The noise barriers can reduce L_{Aeq} and L_{Amax} railway noise levels at nearby sensitive receptors at Yelarbon, Brookstead and Pittsworth. Generally, noise barrier heights of at least 4 m in height are reducing both the L_{Aeq} and L_{Amax} noise levels by 5 dBA or more, which would be a perceptible improvement to railway noise levels.
- The noise reductions potentially achievable at individual receptors are dependent upon the ability of the noise barrier to screen the line of sight to the railway corridor. The line of sight to the railway corridor can vary depending on the orientation of the individual buildings and their facades.
- At Yelarbon, Brookstead and Pittsworth there are receptors, typically more than 100 m from the railway corridor, that continue to have a direct line of sight to sections of the railway track with the inclusion of the conceptual noise barriers.
- The conceptual railway noise barriers do not achieve the assessment criteria at all of the assessed sensitive receptors. The receptors where noise levels remain above the assessment criteria would be reviewed by ARTC to determine if they are eligible for at-property treatments for the control of potential noise impacts.
- The review of the noise barriers included all sources of railway noise in the modelling. In practice, the noise emissions from level crossing alarms and train horns may be reduced with at-source controls and the noise barriers may be designed for the control of train passby noise only.
- The calculated noise levels at the receptors are sensitive to the noise modelling parameters, including; the façade level correction, calculated reflections and the acoustic properties of the barrier materials. The number of properties achieving the criteria varied by more than 10% with a 1 dBA variation in the predicted railway noise levels.
- Typically, noise barrier panels will need to overlap by three times the width of any openings to ensure the sound transmission pathway is appropriately impeded.
- The location of noise barriers will need to minimise the potential for noise impacts associated with sudden increases in rail noise levels as the train emerges from behind the rail noise barrier structure.

15.5 Mitigation for ground-borne vibration and ground-borne noise

Based on the proximity of the sensitive receptors to the rail corridor, the assessment has identified that the potential ground-borne vibration and ground-borne noise levels would achieve the assessment criteria at the majority of the sensitive receptors.

The screening assessment identified there to be potentially three sensitive receptors where ground-borne noise levels could be above the assessment criteria. Notwithstanding, at these receptors the airborne noise is expected to be the dominant contribution and may mask the perceptible ground-borne noise within habitable rooms. If there are potential ground-borne noise impacts confirmed during detail design, a range of vibration control measures, such as rail pads or rail dampers, could be investigated to dampen the vibration energy at source and reduce the potential for vibration induced impacts at nearby sensitive receptors.

The assessment of potential vibration induced impacts to non-Indigenous cultural heritage items identified the following should be subject to a structural survey where the property and structures are determined to be within 15 m of the outer rail. The majority of these sites are within the existing railway corridor and in some cases may be resumed during the construction of the Project.

- Yelarbon Railway Complex
- Grass Tree Creek Bridge
- Yandilla Station
- Condamine River Bridge
- Pampas Station
- Sheds opposite the Millmerran Branch Line
- Condamine Rail Bridge 2

It is recommended that further assessment is undertaken during detail design phase to verify the screening assessment outcomes. This can be supplemented by additional ground-borne vibration and ground-borne noise assessment and analysis for existing railway operations on other sections of the Inland Rail program.

In the event the detailed assessment or verified (measured) ground-borne noise levels triggers an investigation of mitigation measures for ground-borne noise, options for mitigation include the use of more resilient track support pads, under-sleeper pads and under ballast matting. The effectiveness of measures such as rail pads and rail dampers may be significantly limited by the stiffness of the track and concrete sleepers, the forces exerted by the passage of heavy rail freight and the long-term durability and maintenance of such measures. Final noise mitigation options will need to be evaluated and confirmed having regard to cost, performance and effectiveness.

15.6 Further noise prediction modelling

The noise prediction modelling for this assessment adopted the Nordic method (Kilde 130) for calculating rail noise emissions and the propagation of rail noise within the environment. Whilst the Nordic methodology is accepted to provide reliable predictions, it can be inherently conservative and does not allow for more advanced prediction and analysis of railway noise.

It is recommended that during the detail design of the Project, when aspects such as noise mitigation will be confirmed, the rail noise prediction modelling is updated for the detail designs. The modelling should include the potential for assessing the frequency content of the railway noise emissions and the influence of regional meteorological conditions. The consideration of the frequency content from the rollingstock is important where predicted external rail noise levels are applied to determine the appropriate architectural property treatments or the design of mitigation such as rail noise barriers.

15.7 Validation of noise and vibration levels during operation

A programme of noise and vibration monitoring is recommended to be undertaken within six months of the commencement of railway operations on the Project. The purpose of the monitoring surveys shall be to:

- Quantify the rail noise and vibration levels from the daytime and night-time rail operations and determine the $L_{Aeq}(15\text{hour})$ daytime, $L_{Aeq}(9\text{hour})$ night-time and L_{Amax} rail noise levels at the most affected sensitive receptors.
- Assess the Project's compliance with any relevant conditions of approval relating to noise and vibration emissions from the operation of the Project.
- Provide an assessment of the effectiveness of any noise and vibration management and mitigation measures implemented on the Project.
- Identify, if required, further noise and vibration mitigation measures to meet the ARTC's noise and vibration management criteria and relevant conditions of approval.

The recommendations below have been developed to assist the preparation of a noise and vibration monitoring plan:

- Provide a monitoring strategy consistent with the requirements of relevant acoustic standards and guidelines for monitoring environmental and transport noise and vibration.
- Plan and schedule the monitoring surveys with consideration to:
 - The rail movements during each daytime and night-time period. The survey period shall include the days during which the highest number of train movements would be expected.
 - At locations free from localised buildings and structures (other than noise barriers) that may screen or reflect noise.
 - The condition of the rails and other rail infrastructure.
 - Weather conditions during the monitoring periods.
- Monitoring should be conducted at the sensitive receptors with the potential for the highest received noise and vibration levels from rail operations.
- Where feasible, noise levels should be assessed 1 m in front of the most affected building façade. Where noise levels are monitored in the free-field a +2.5 dBA correction should be considered to adjust the free-field level for a noise level at the building façade.
- Should monitoring be required within a property, the noise monitoring would be conducted at the centre of the habitable room that is most exposed to noise from rail operations.
- Vibration shall be monitored in the three axes representing horizontal, vertical and axial direction of displacement (movement). Vibration shall be monitored as the Peak Particle Velocity (mm/s) and vibration acceleration (m/s^2).
- If required, reference the monitored noise levels to update the predicted rail noise levels and re-assess rail noise and vibration levels at the sensitive receptors aligning the Project.
- If the noise and/or vibration levels are above the applicable criteria at any sensitive receptors, allowing for any monitoring and compliance tolerances, the key sources of rail noise and contributing factors (e.g. rail defects, excessive rail roughness levels, turnouts, locomotive engine exhausts) shall be identified to inform the investigation of reasonable and practicable mitigation measures.

The results of the monitoring surveys are to be applied, as-required, to revise and update the rail noise and vibration predictions for the rail operations. In this regard, the validated noise and vibration levels can be applied to continually refine the conservatism and uncertainty in the predictions and support the selection of reasonable and practicable mitigation measures.

16 Residual impacts

The rail noise and vibration assessment criteria implemented by both DTMR and ARTC are designed to manage aspects such as environmental harm and nuisance. The intent of the criteria is to identify where reasonable and practicable noise mitigations should be implemented to manage the potential for impacts consistent with best practice for environmental management.

The criteria do not require noise from railway operations, including where noise mitigation is implemented, to be inaudible at sensitive receptors. The potential for annoyance or disturbance from rail noise is subjective and can remain a potential impact even where noise mitigation is implemented, and noise levels are well within the noise criteria.

The reasonable and practicable noise mitigation for the Project is expected to primarily be at-property treatments for sensitive receptors. The at-property treatment could include upgrading existing glazing or the provision of air-conditioning to manage the intrusion of rail noise and maintain internal (indoor) noise amenity within habitable rooms. These treatments do not address the source emission of rollingstock noise or the external (outdoor) rail noise levels within the environment surrounding the rail corridor.

On this basis, the rail noise levels can remain above the external rail noise assessment criteria, and be perceptible, at the sensitive receptors with the implementation of at-property noise mitigation measures. Notwithstanding, the at-property treatments would be implemented to reduce to internal railway noise levels to achieve targeted improvements to the indoor acoustic environment of habitable rooms.

In lieu of the known building construction of the sensitive receptors and the acoustic performance specification of individual at-property treatments, the noise reduction performance is not able to be quantified at this stage. Referencing conventional building construction treatments and acoustic glazing specifications, it is reasonable to assume the internal railway noise could be reduced by at least 5 dBA. Reducing noise levels by this margin would be a perceptible improvement to building occupants, where noise characteristics such as low frequency are also suitably controlled.

Rail noise barriers, or similar mitigation, may be reasonable and practicable to control rail noise at sensitive receptors within Yelarbon, Brookstead and Pittsworth. The assessment of noise levels with conceptual noise barriers has identified that, depending on the final extent and height of the noise barriers, the noise criteria may not be fully achieved at all receptors. The at-property treatments could be applied to sensitive receptors that do not achieve the noise criteria where in the Project has implemented rail noise barriers, this would be determined by ARTC on a case-by-case basis.

The assessment has identified the ground-borne noise and vibration assessment criteria would be achieved at the majority of sensitive receptors. There is potential for ground-borne noise and vibration to be perceptible even where the assessment criteria are achieved at sensitive receptors. However, disturbance or annoyance impacts would not necessarily be experienced based on the relatively low levels of ground-borne noise and vibration predicted at the sensitive receptors.

17 Conclusion

The railway operations on the Project have the potential to be a source of airborne noise, ground-borne noise and ground-borne vibration within the environment surrounding the Project. This report has identified where the predicted levels of noise and vibration from the railway operations would achieve assessment criteria and where the levels trigger an investigation of reasonable and practicable mitigation options.

Based on the assessment of potential rail noise levels at 1,600 sensitive receptors, the noise criteria for the daytime and night-time periods are achieved at the majority of the sensitive receptors. There are up to 136 sensitive receptors; 131 residential receptors and five non-residential receptors, where noise levels trigger a review of mitigation.

The location of the sensitive receptors, the predicted noise levels at each receptor and the principles of ARTC's management of noise on the Inland Rail program were reviewed to identify the appropriate noise mitigation options. In addition to source noise controls implemented in the design and construction of the Project, the reasonable and practicable noise mitigation is expected to include at-property treatment for sensitive receptors.

At-property mitigations can include architectural treatments to control railway noise within the building and upgrades to property fencing. Whether at-property controls or other alternative mitigation options are required will ultimately be determined through the detail design of the Project. This will include consultation with the property owners, further railway noise modelling, analysis of engineering and environmental constraints and the verification of noise levels once railway operations commence on the Project.

The assessment investigated conceptual noise barrier mitigation options at Yelarbon, Brookstead and Pittsworth. The prediction of railway noise levels with noise barriers identified that reductions to the daytime and night-time railway noise levels could be achieved at many of the sensitive receptors near to the railway corridor. There are expected constraints with the location, extent and noise reduction performance of the conceptual noise barriers that could require the consideration of additional at-property treatments to manage residual noise impacts. The potential for noise barriers will be investigated further during the detail design and construction of the Project.

The assessment of ground-borne noise and vibration from railway operations determined that predicted levels would achieve the criteria for ground-borne noise and ground-borne vibration at the majority of sensitive receptors. The assessment recommends the resilient matting for retention of ballast on bridge and viaduct structures are retained. Further detailed investigation should be undertaken at detail design to verify the outcomes of this assessment and, if required, the application of additional measures to mitigate ground-borne vibration.

Where the Project achieves the noise and vibration criteria there can still be potential for noise and vibration from railway operations to be audible/ perceptible within the environment. It is not unreasonable for outdoor noise from railway operations to be audible and perceptible at least 1 km from the Project alignment.

The airborne noise, ground-borne noise and ground-borne vibration levels will continue to be assessed during the detail design and construction of the Project. It is recommended that the predicted noise and vibration levels and assessment outcomes presented in this report are verified as part of the on-going assessments.

Where the detail design remains consistent with this assessment and allowing for the implementation of noise and vibration mitigation measures such as those presented in this report, the Project is expected to achieve the objectives of the DTMR Policy and Interim Guideline for the management of railway noise and vibration.

APPENDIX

T

Operational Railway Noise and Vibration Technical Report

Appendix A Adopted Sensitive Receptors

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT



BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 1 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 2 of 61

500 m

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- Project Extent
- Crossing Loops
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Paper: A4
Date: 08-May-2020
Author: JG

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 3 of 61

500 m

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 4 of 61

500 m

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Date: 08-May-2020
Author: JG

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)



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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 5 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 6 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 7 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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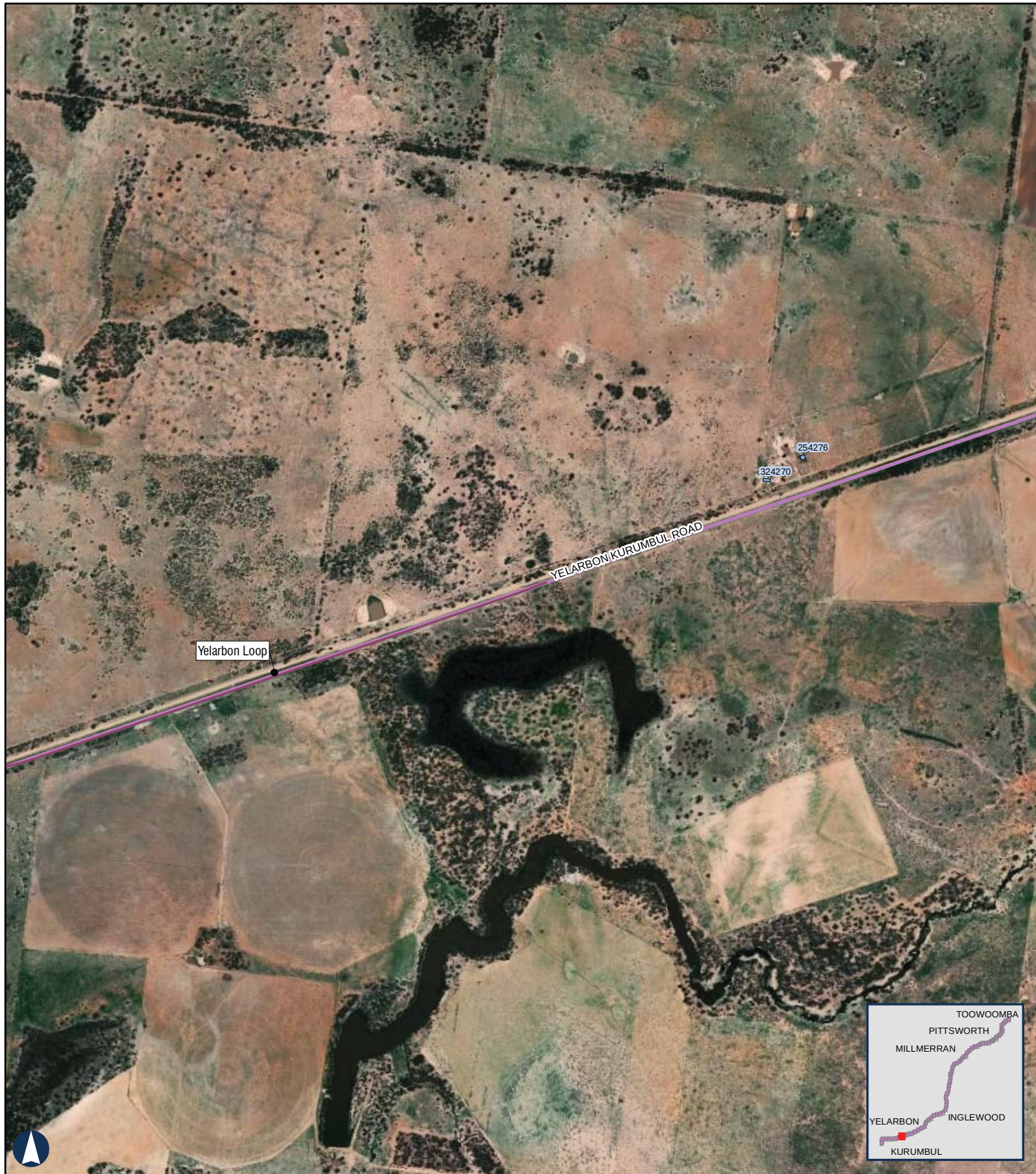
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 8 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 9 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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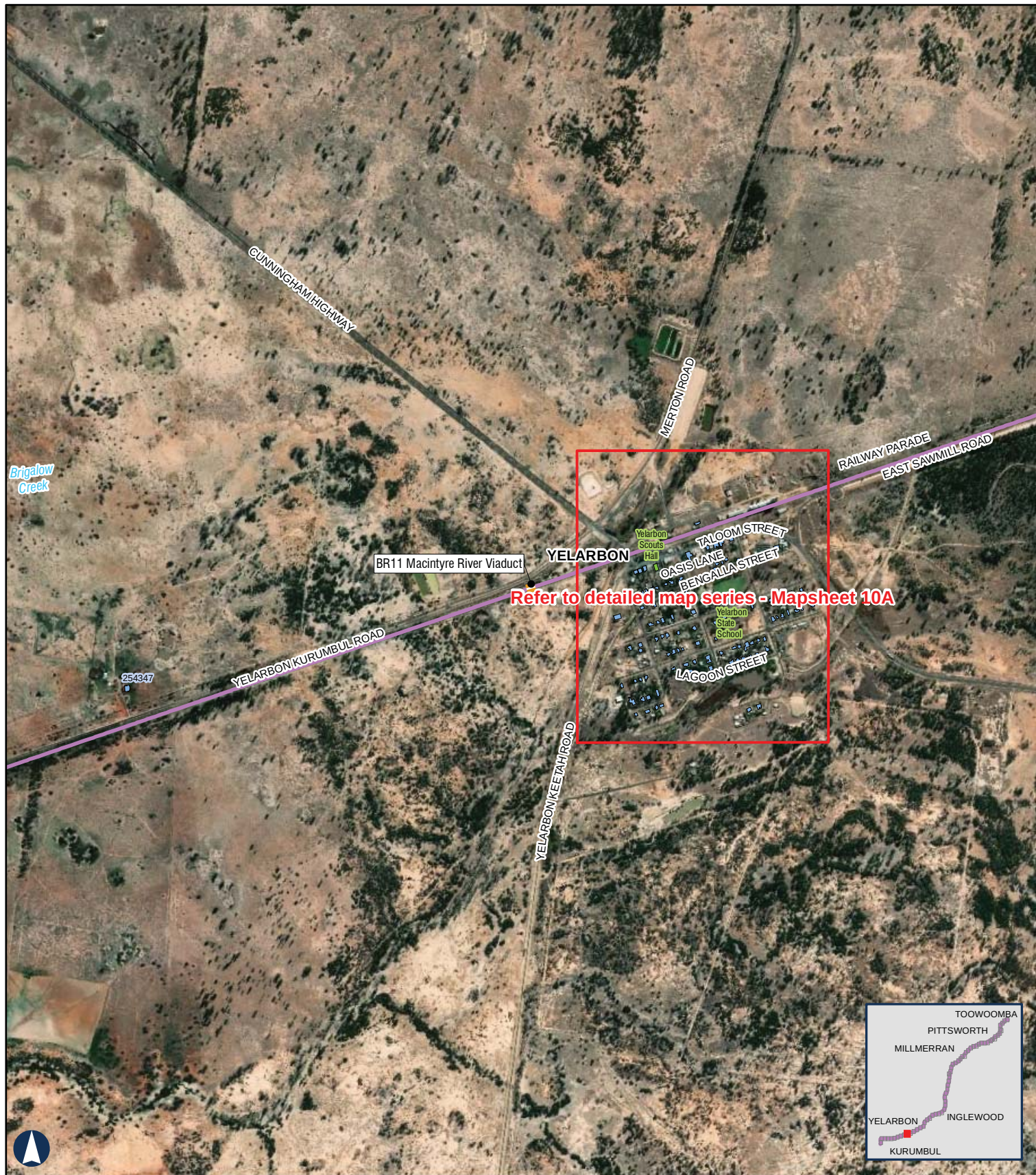
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 10 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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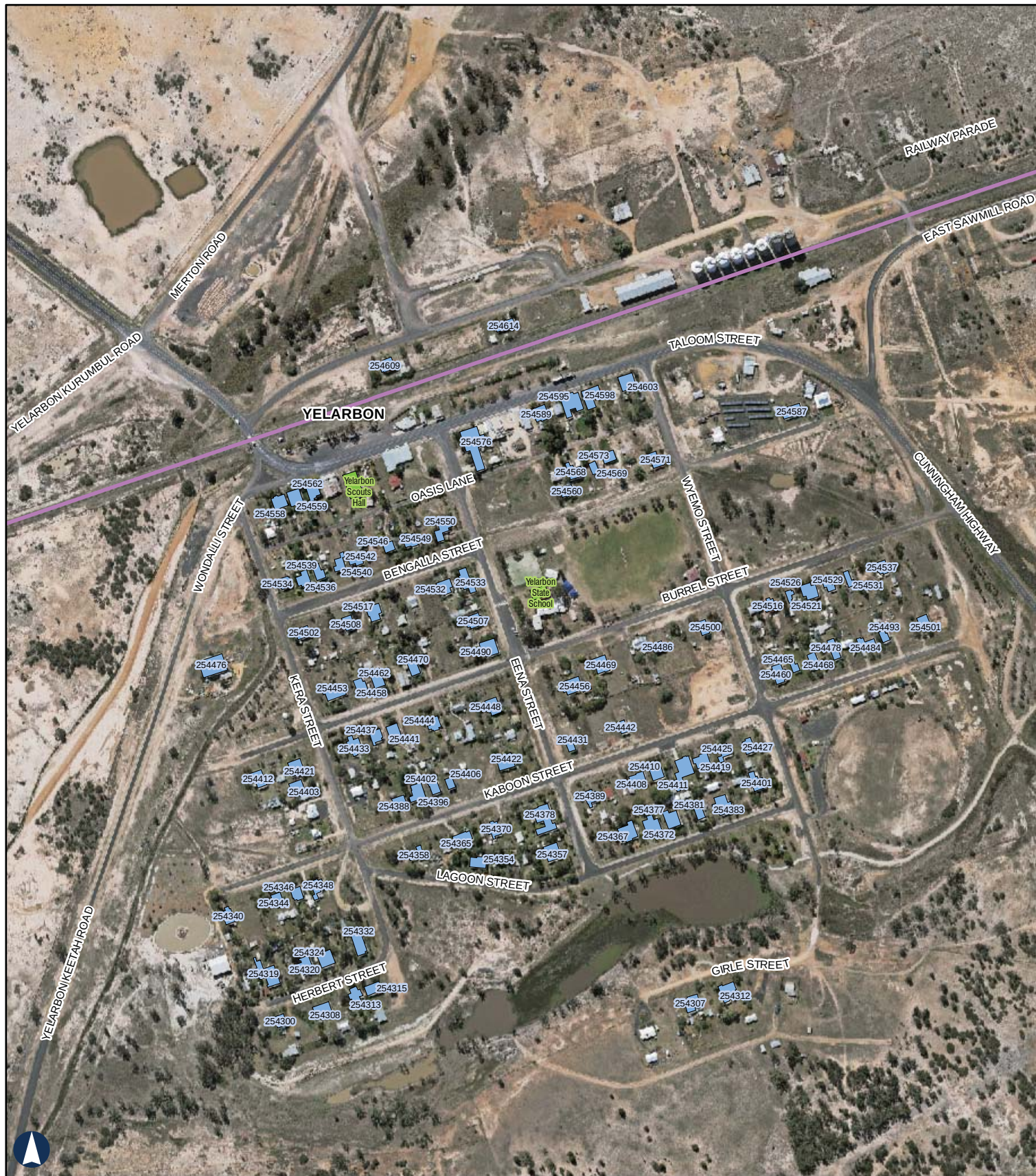
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

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BORDER TO GOWRIE

Sensitive Receptors - Detailed

APPENDIX A - Mapsheet 10A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)



ARTC **InlandRail**

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Paper: A4 Scale: 1:5,500

Date: 08-May-2020

Author: JG



BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 11 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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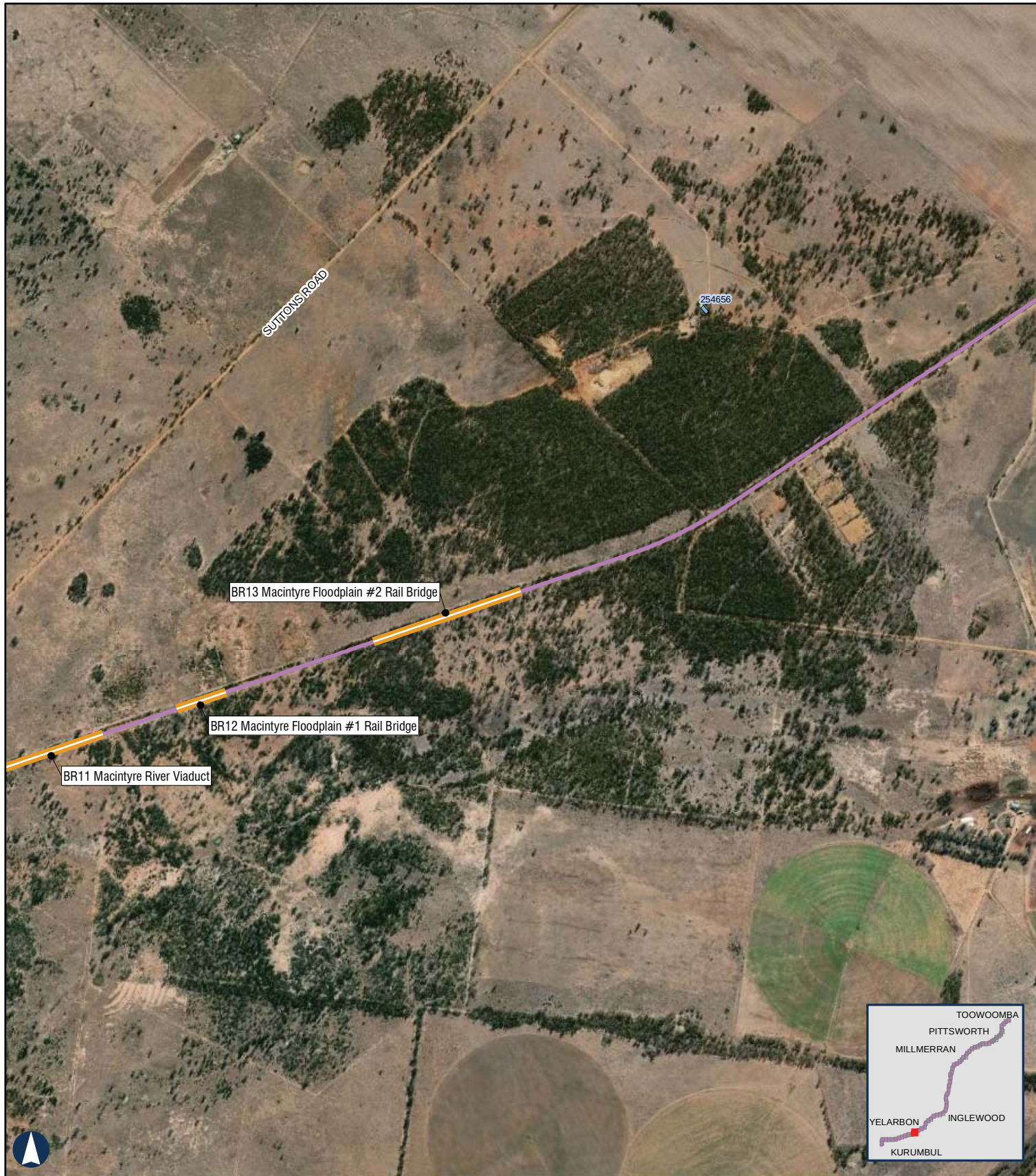
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 12 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

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- Project Extent
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- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 13 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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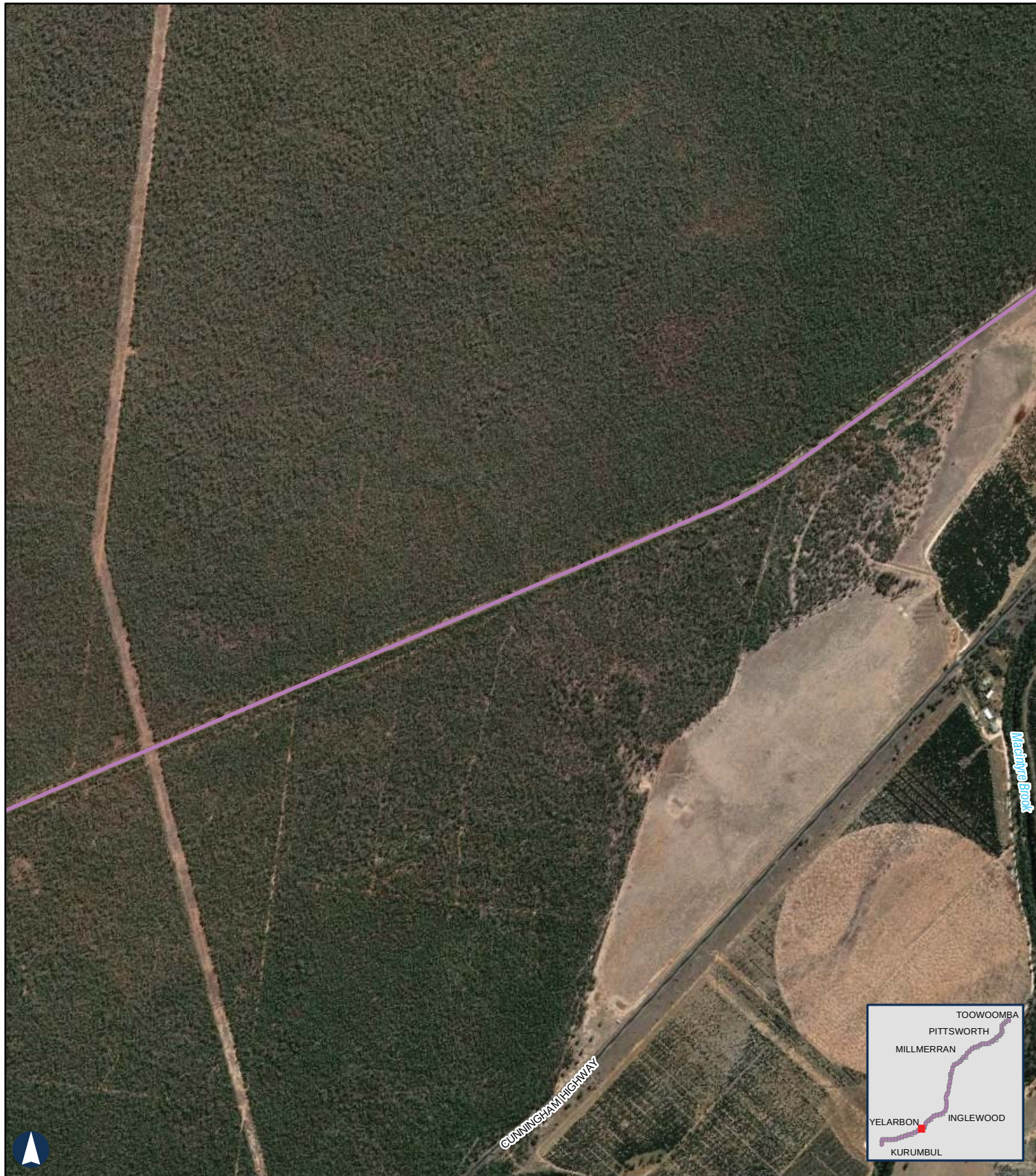
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Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 14 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

Paper: A4
Date: 08-May-2020
Author: JG

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 15 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- Project Extent
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- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 16 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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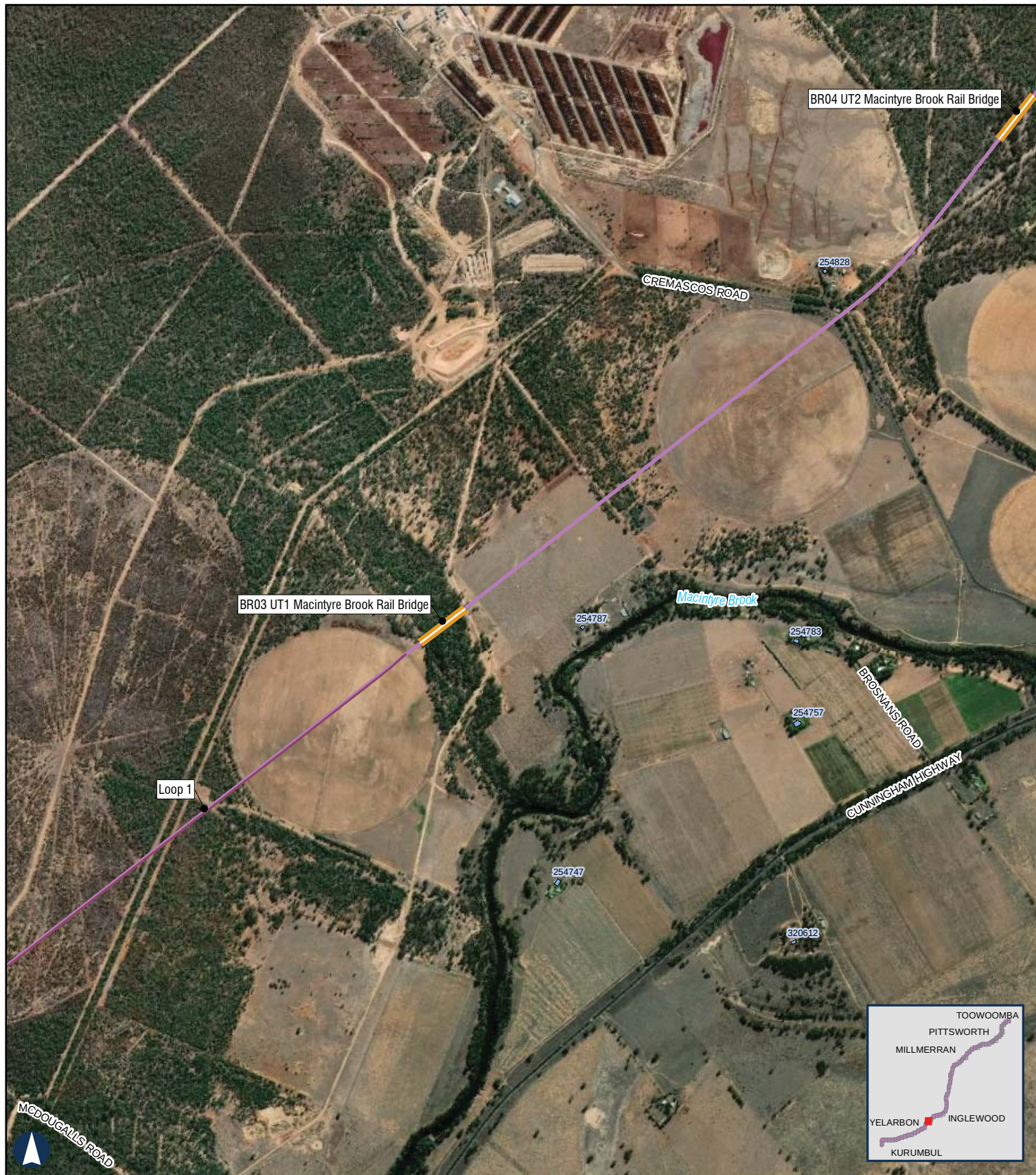
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 17 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 18 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

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- Project Extent
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- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 19 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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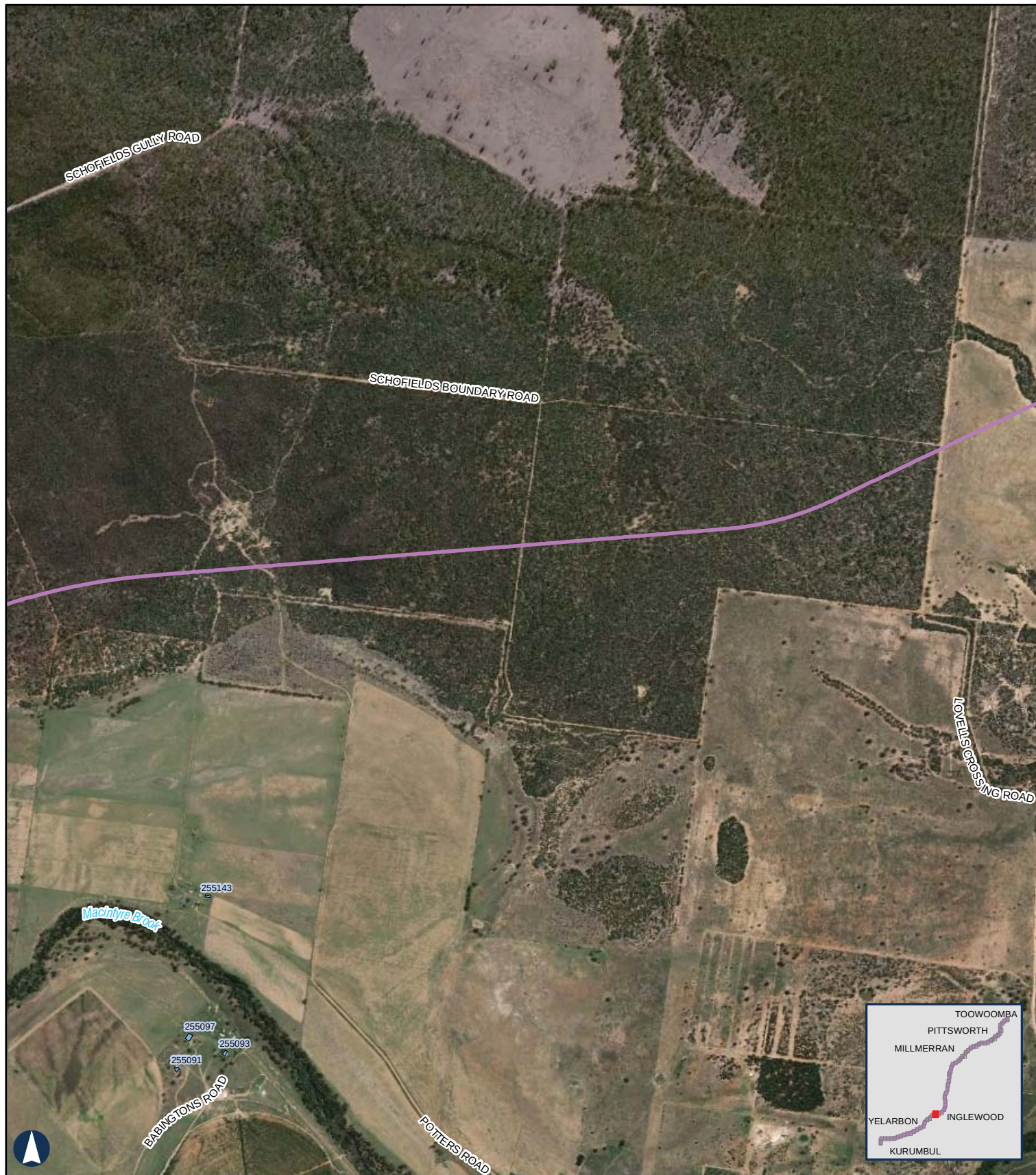
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 20 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 21 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 22 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 23 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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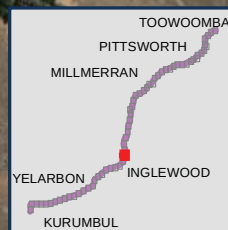
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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 24 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 25 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000



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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 26 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- Project Extent
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- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 27 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- Project Extent
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- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 28 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 29 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- Sensitive Receptors (Residential)
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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 30 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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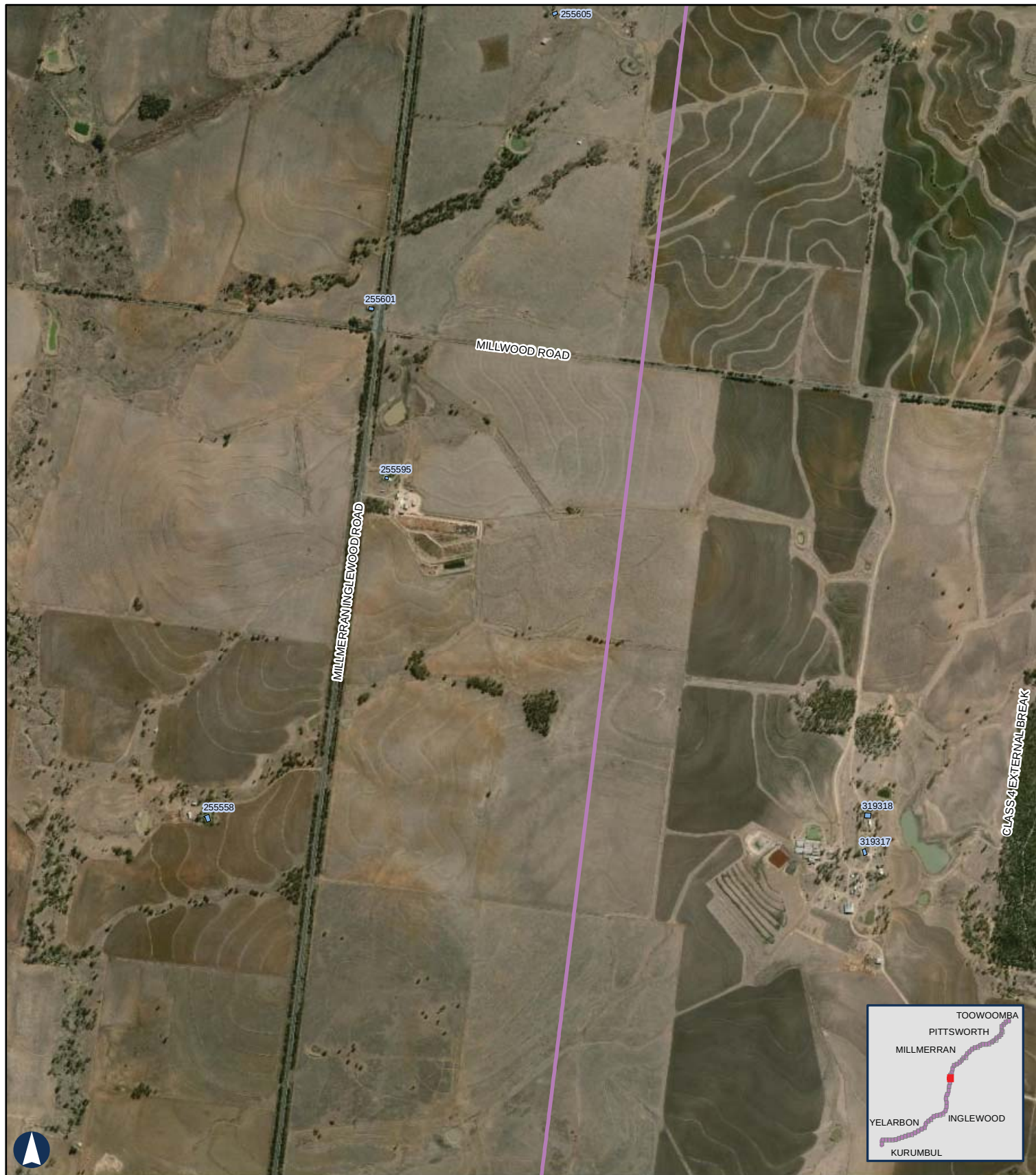
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 31 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 32 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 33 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
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- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
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ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 34 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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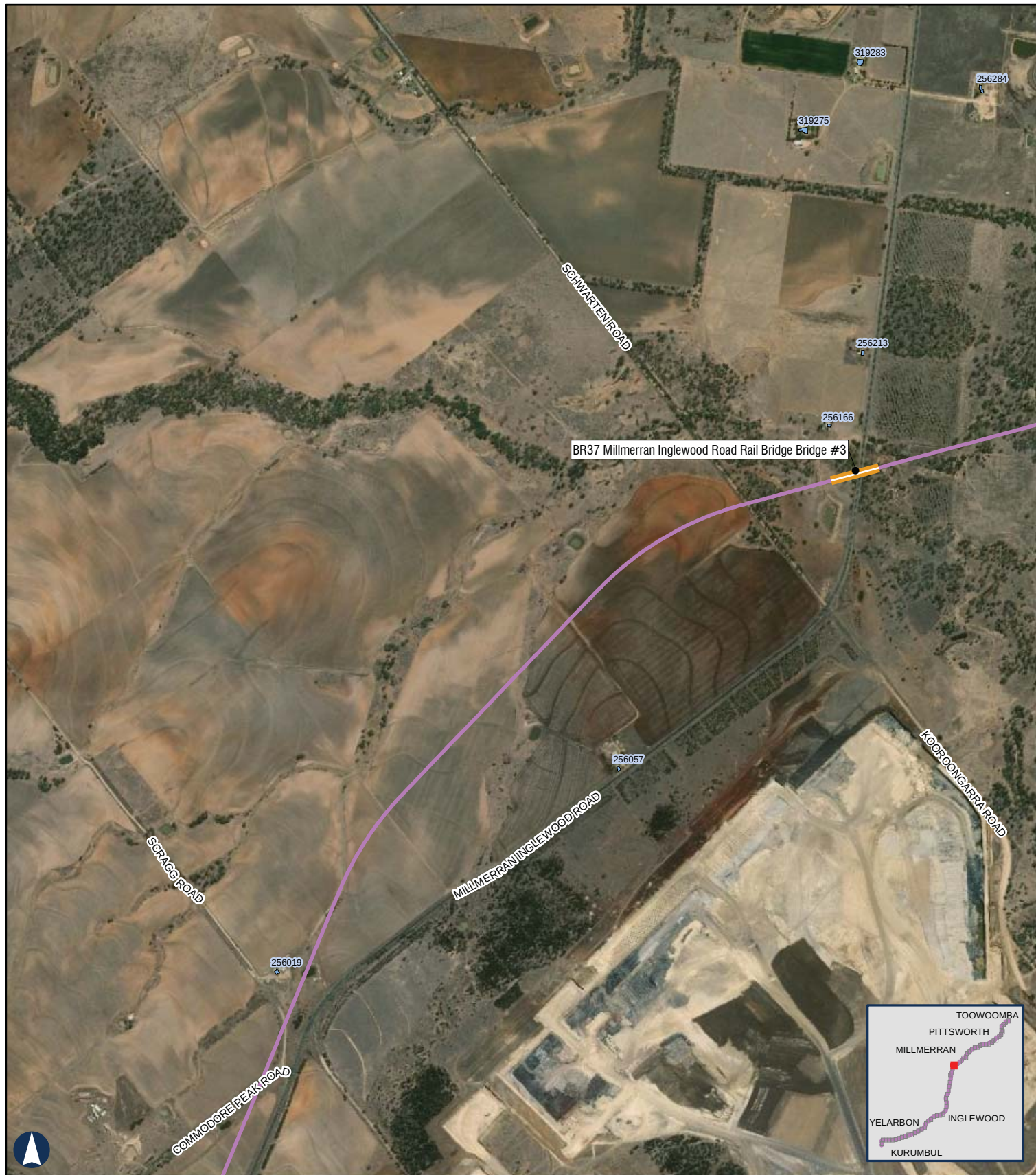
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 35 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 36 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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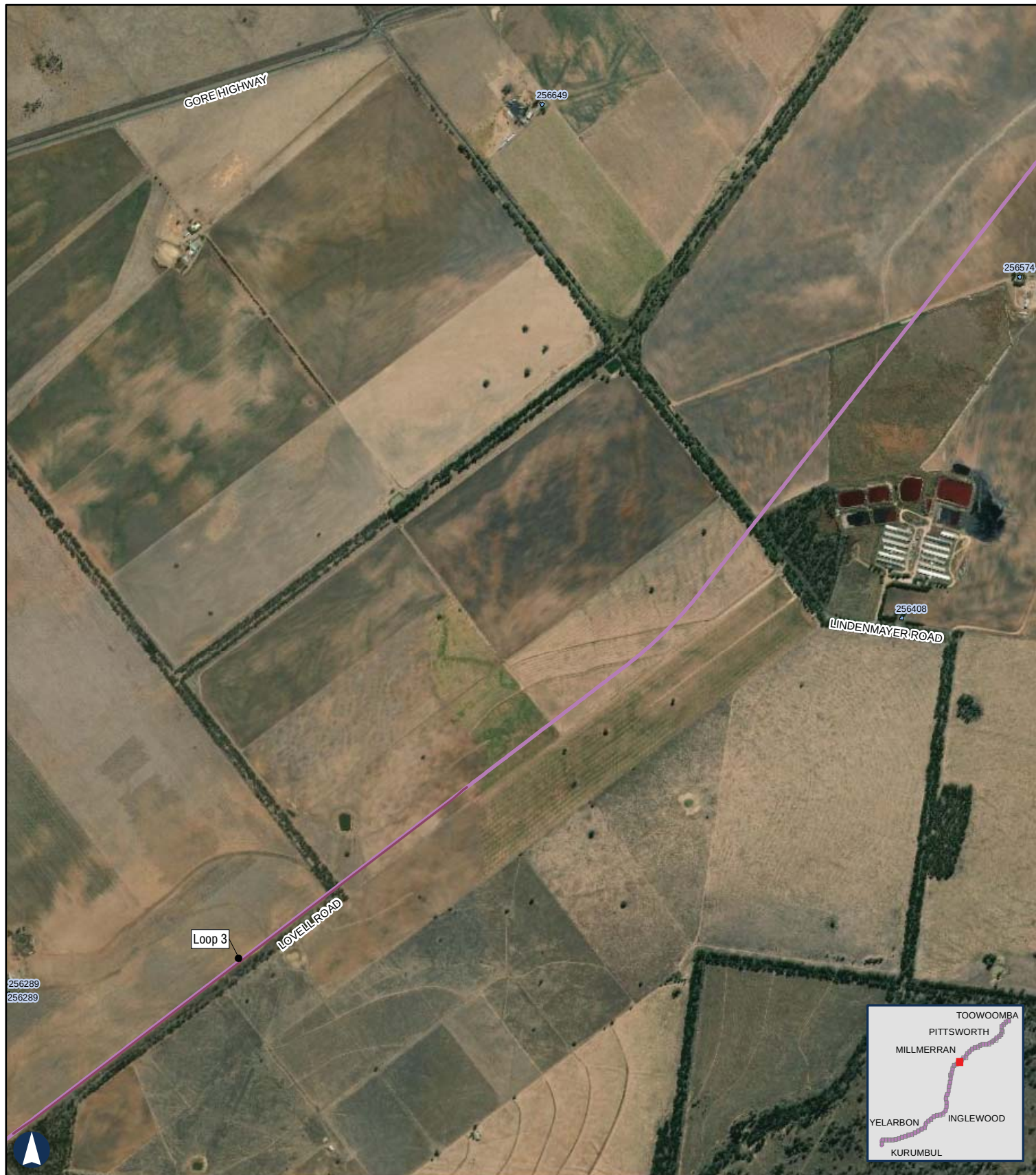
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 37 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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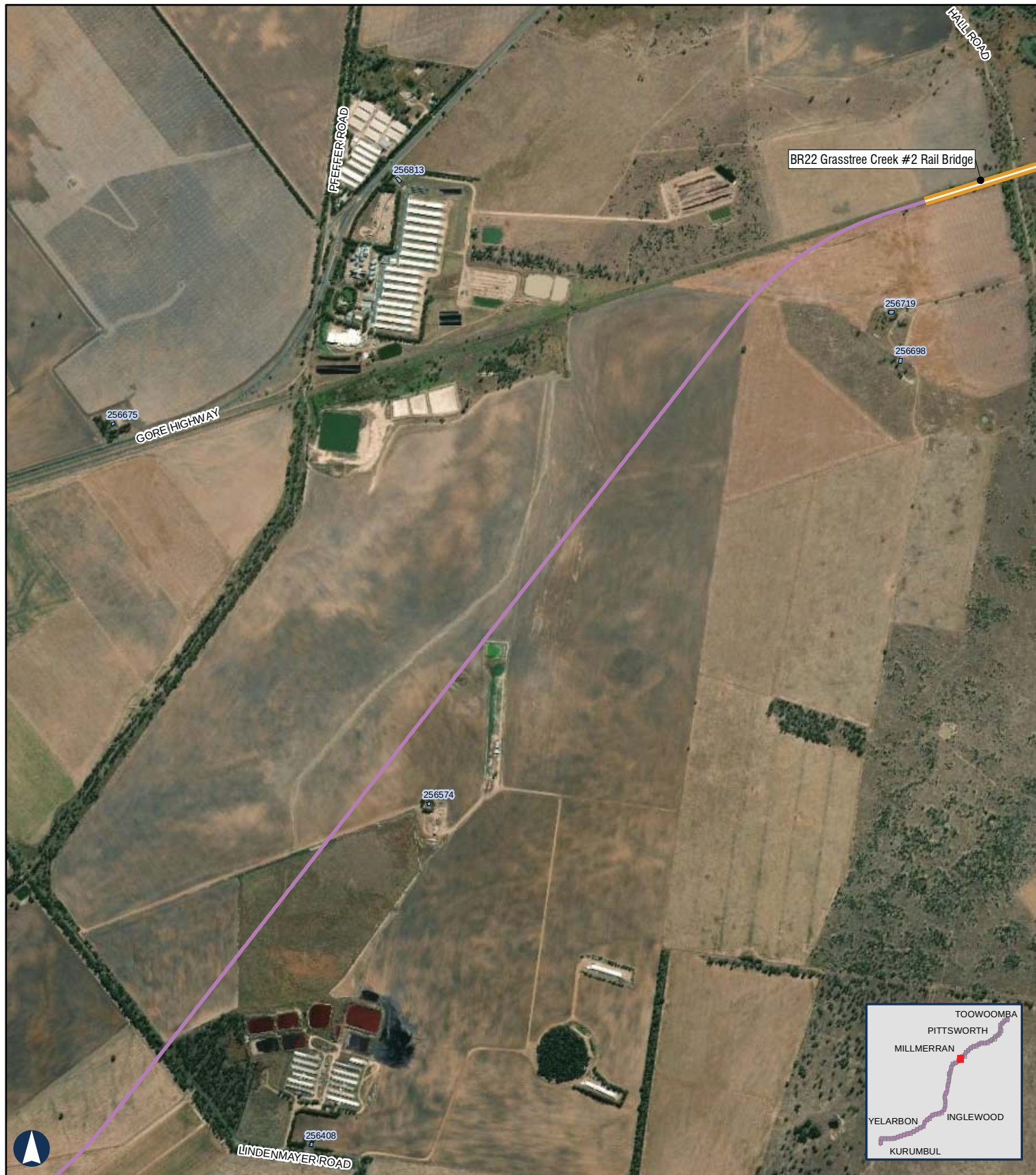
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)



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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 38 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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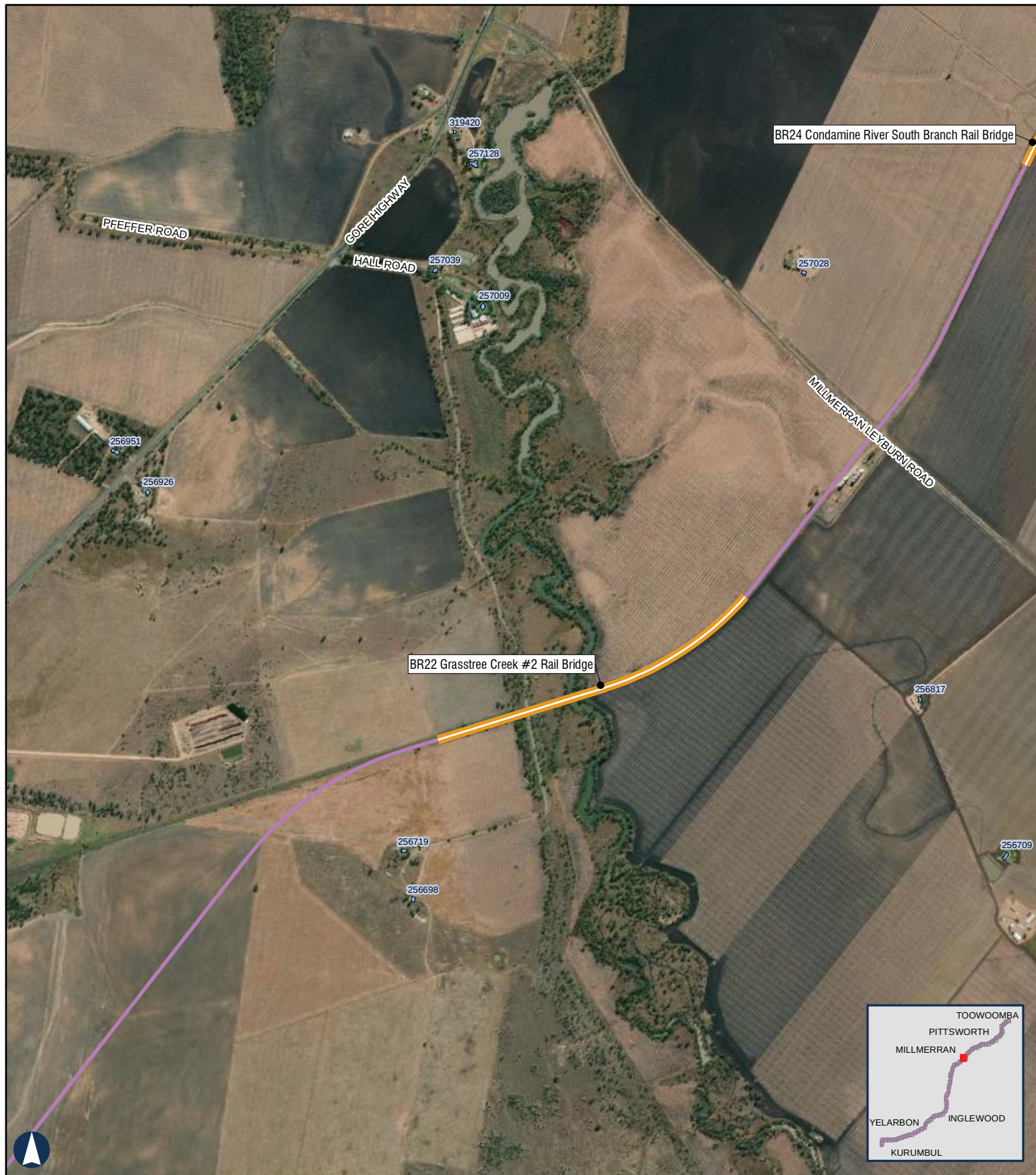
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 39 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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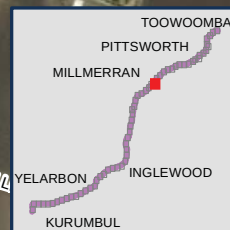
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 40 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 41 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 42 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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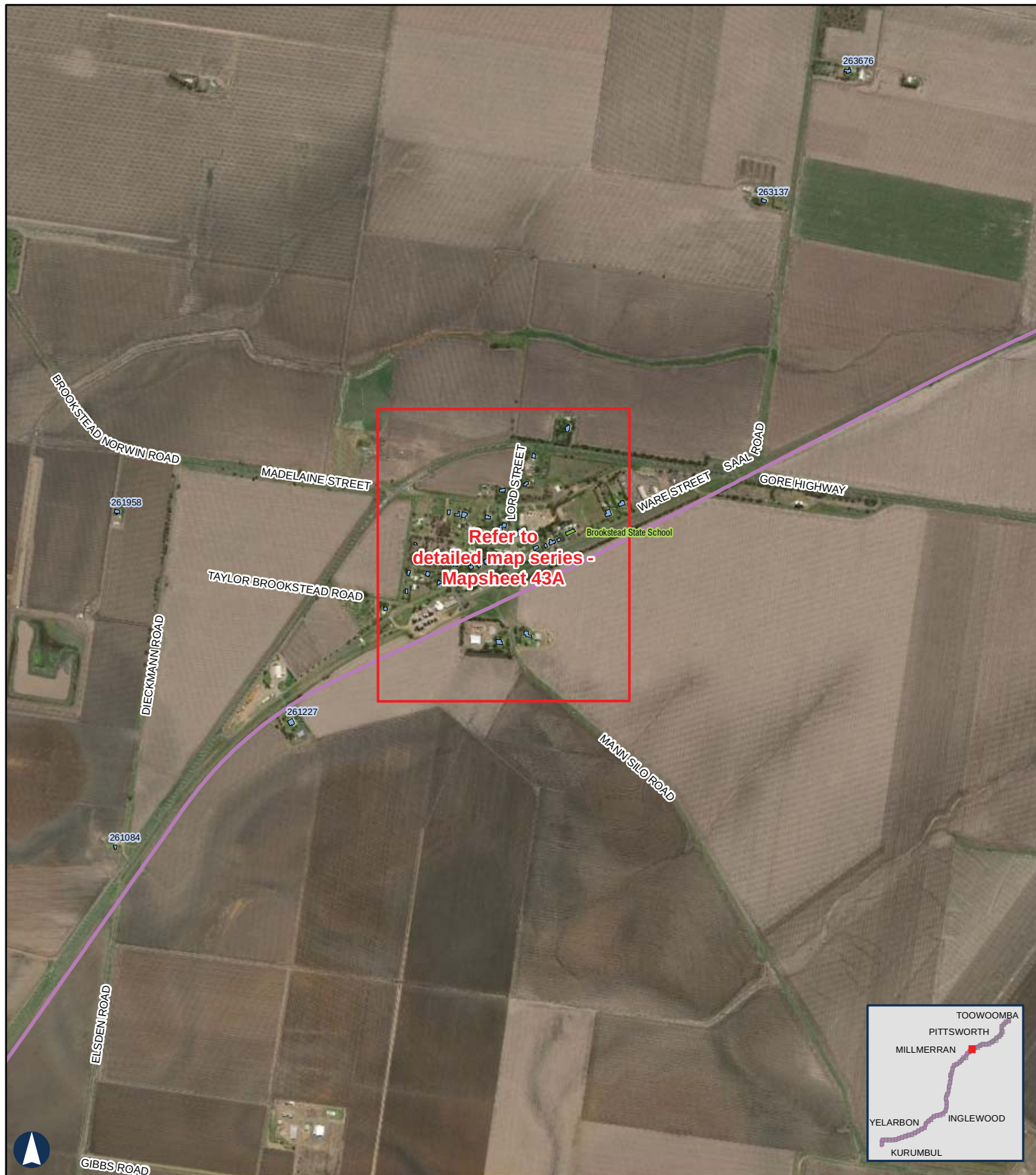
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 43 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors - Detailed

APPENDIX A - Mapsheet 43A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4

Scale: 1:5,500

Date: 08-May-2020

Author: JG

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)



ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 44 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 45 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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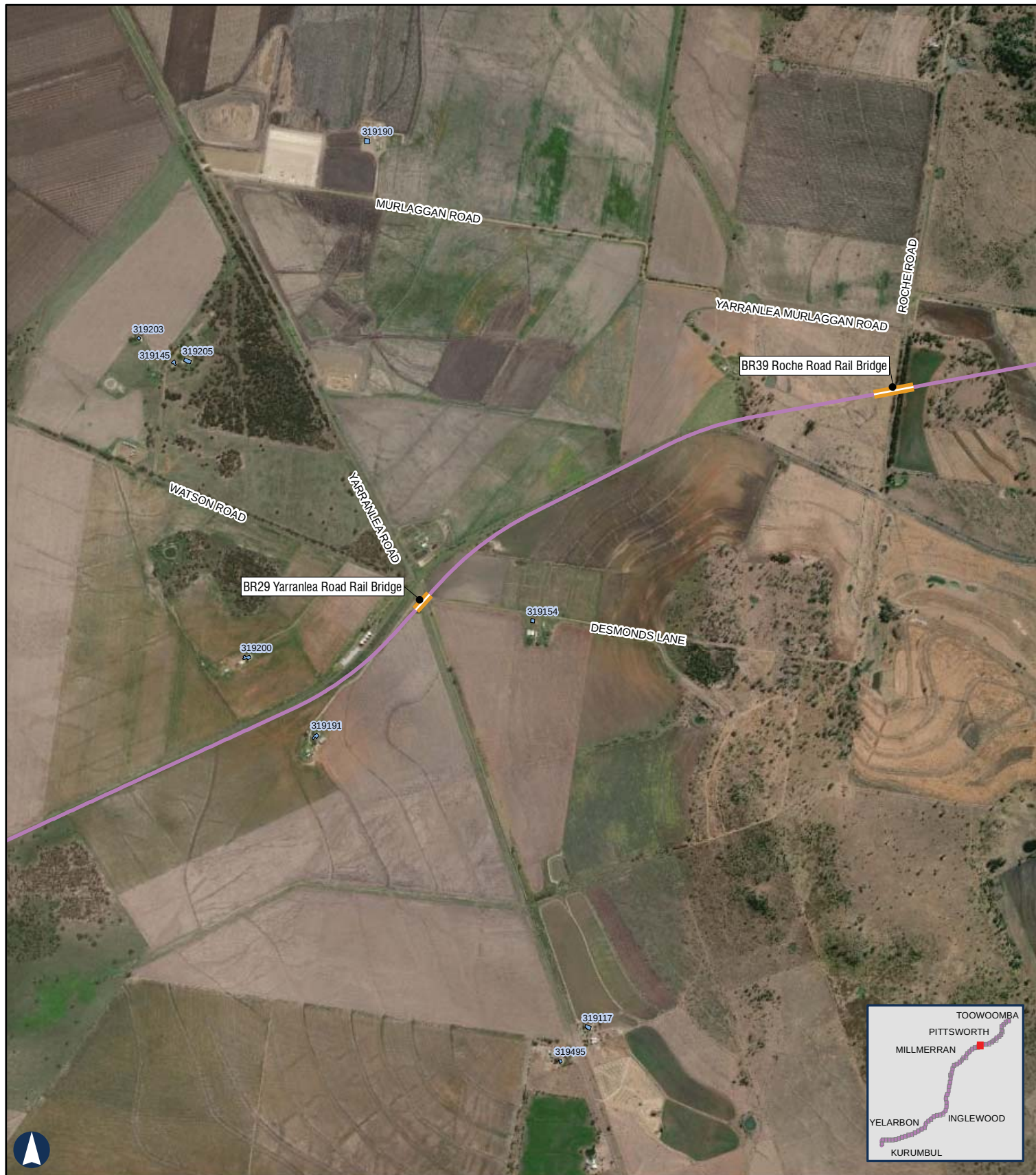
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 46 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 47 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 48 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- Project Extent
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- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 49 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Scale: 1:20,000

- Project Extent
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- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors - Detailed

APPENDIX A - Mapsheet 49A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4

Scale: 1:5,000

Date: 08-May-2020

Author: JG

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)



ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors - Detailed

APPENDIX A - Mapsheet 49B

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:5,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)



ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors - Detailed

APPENDIX A - Mapsheet 49C

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:5,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)



ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors - Detailed

APPENDIX A - Mapsheet 49D

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

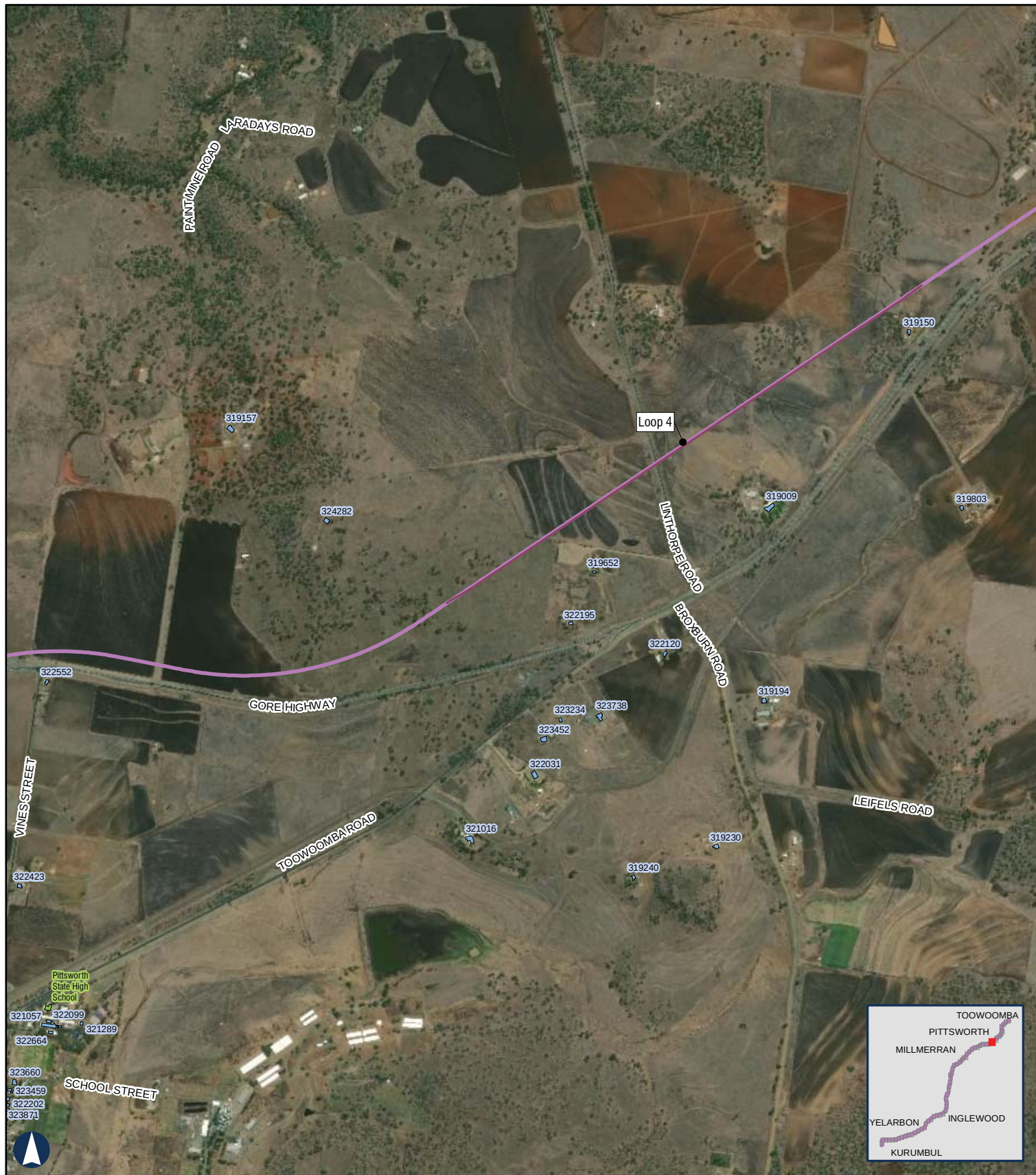
Scale: 1:5,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)



ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 50 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

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- Project Extent
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- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 51 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC **InlandRail**

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 52 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors - Detailed

APPENDIX A - Mapsheet 52A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4

Scale: 1:5,500

Date: 08-May-2020

Author: JG

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)



ARTC *InlandRail*

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 53 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 54 of 61

500 m

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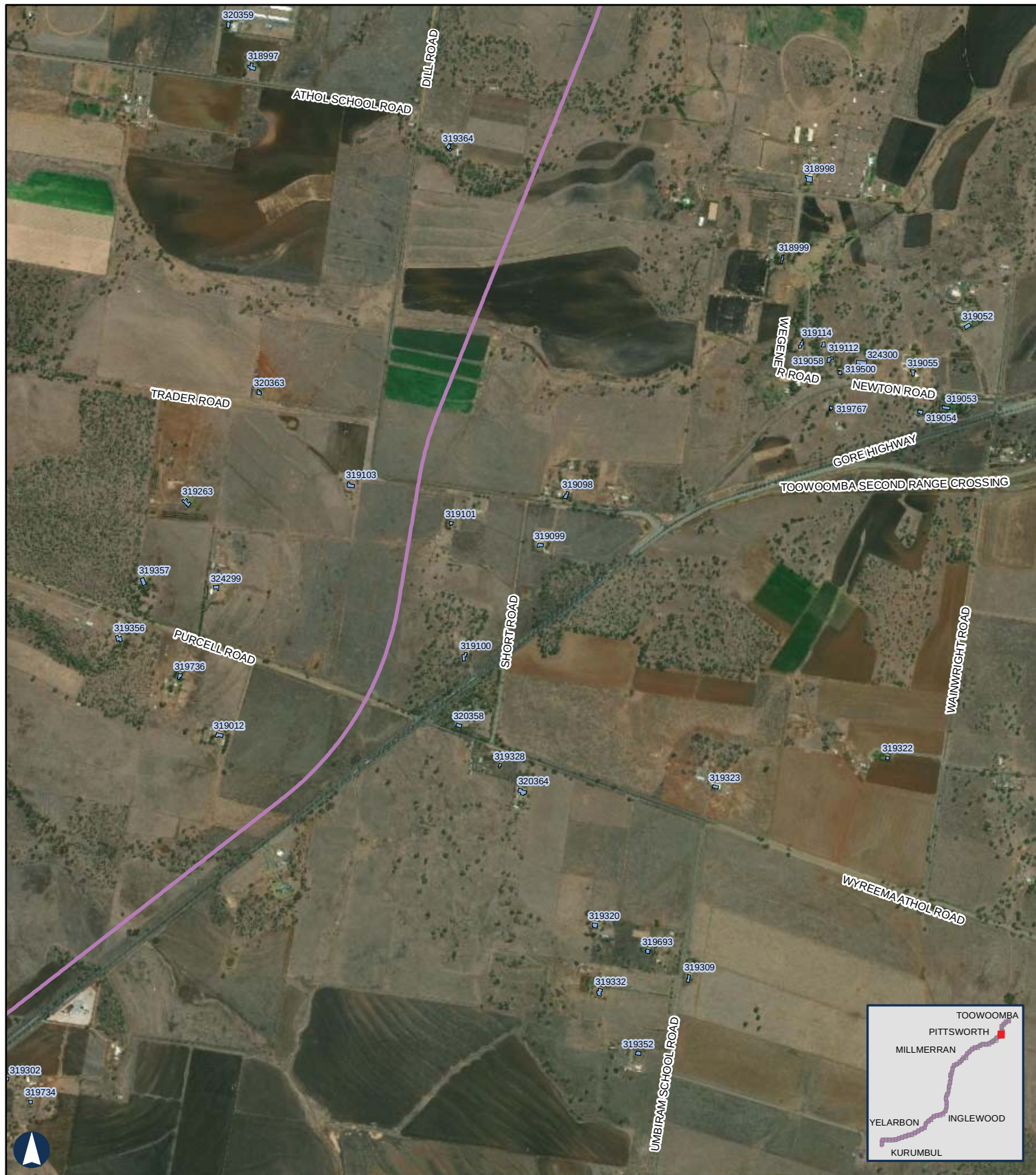
Paper: A4
Date: 08-May-2020
Author: JG

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 55 of 61

500 m

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Date: 08-May-2020

Author: JG

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 56 of 61

500 m

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- Project Extent
- Crossing Loops
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- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 57 of 61

500 m

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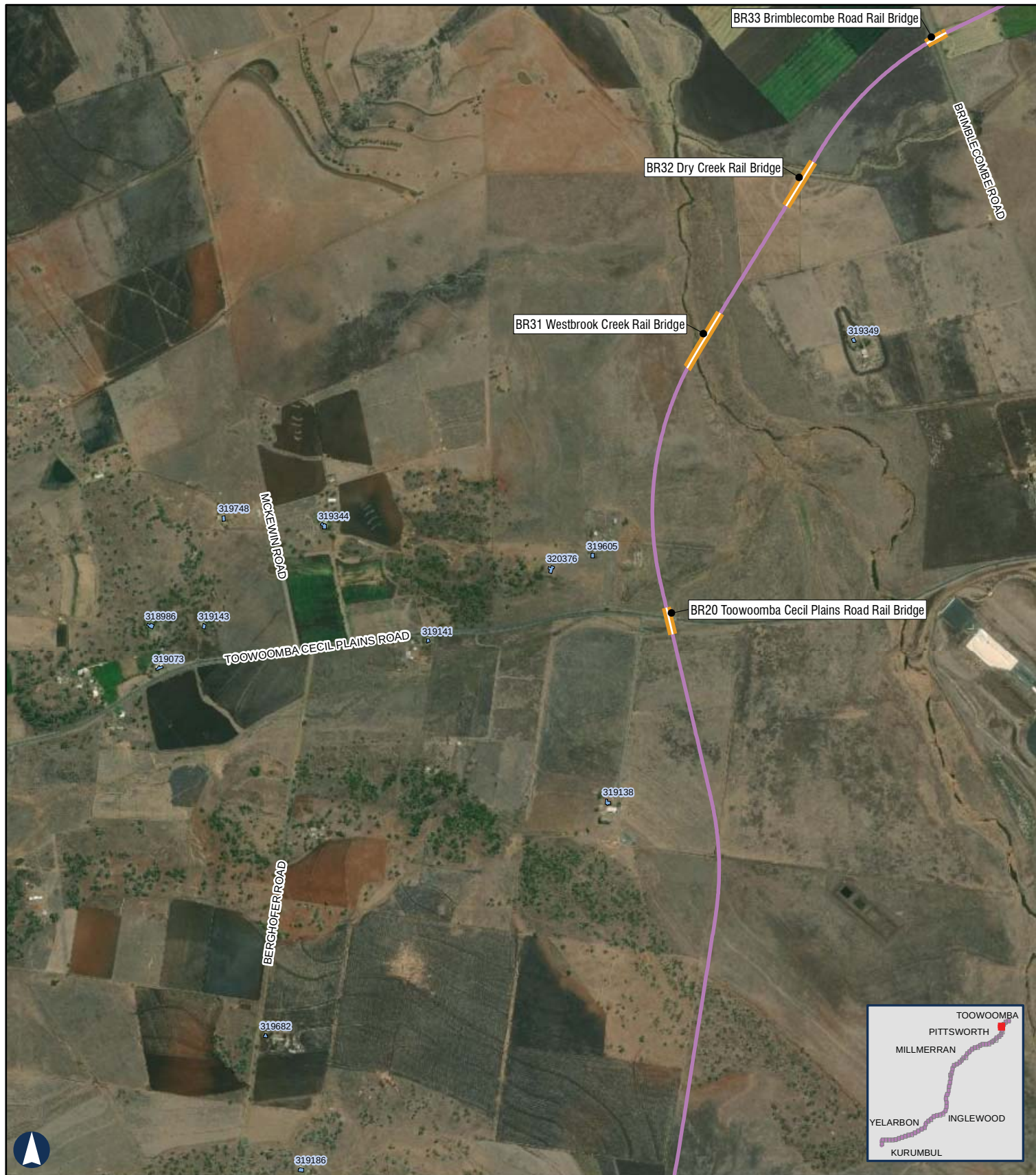
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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)



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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 58 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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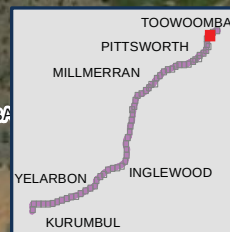
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Date: 08-May-2020
Author: JG

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 59 of 61

500 m

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Author: JG

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 60 of 61

500 m

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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Date: 08-May-2020
Author: JG

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BORDER TO GOWRIE

Sensitive Receptors - Detailed

APPENDIX A - Mapsheet 60A

100 m

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)



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BORDER TO GOWRIE

Sensitive Receptors

APPENDIX A - Map 61 of 61

500 m

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Author: JG

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- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Sensitive Receptors (Residential)
- Sensitive Receptors (Non-residential)

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APPENDIX

T

Operational Railway Noise and Vibration Technical Report

Appendix B Noise Prediction Model Verification (QLD)

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

Overview

The level and character of railway noise within the local environment is specific to the rollingstock operations, condition of the rails and the daily rail traffic. Because of the wide range in variability of these factors, noise prediction models for railway infrastructure are commonly developed from a database of verified source noise emission levels for the rollingstock.

Organisations such as TfNSW and QR provide train noise emission databases for the use in noise modelling and railway noise impact assessments. A similar verified noise emission database has been adopted for the Inland Rail project (refer **Table 23** of this report).

The methodology to predict railway noise within the environment adjacent to the Inland Rail project has also been verified with reference to existing railway noise levels monitored by SLR at sections of existing West Moreton Line.

The details of the railway noise monitoring and noise model verification in three townships in QLD are provided in the following sections. Whilst the specific verification sites are outside the Project study area, the outcomes of the verification are reliable for the verification of the noise model and modelling methodology.

Noise monitoring locations and methodology

The noise monitoring locations were selected based on the following criteria, designed to provide a consistent approach across the noise monitoring locations:

- At monitoring sites adjacent to the rail line(s) that could be safely and regularly accessed without requiring entry to the rail corridor.
- Generally, locations were within 50 m of the rail corridor to be representative of the nearest sensitive receptors that align the rail corridor and to be close enough to limit the potential influence of local weather conditions.
- Where the track was generally straight and observed to be in relatively good condition. This requirement limited the potential influence of unique factors such as curving noise or prominent track wear which can substantially increase localised rail noise levels.
- Where daily rail traffic was comparable to the proposed rail movements with the Inland Rail project.
- Railway operations were predominately heavy rail traffic (coal and freight trains) and the locomotives were expected to generally be at a constant speed to minimise potential for discrete events such as braking or acceleration (high notch).

Railway noise levels for the daily existing trains movements were monitored at five individual locations at the townships of Gatton, Forest Hill and Calvert, as summarised in **Table B1** and presented in **Figure B1**.

Table B1 Noise monitoring locations in QLD

SLR ID	Location	Monitoring dates	Equipment ^{1,2}
1	Smithfield Road, Gatton 40 m from the outer rail	20 to 27 March 2019	SVAN 957 noise logger (27580)
2	Chadwick Road, Gatton 17 m from the outer rail	20 to 27 March 2019	SVAN 957 noise logger (23241)
3	Railway Street, Forest Hill 15 m from the outer rail	20 to 27 March 2019	NGARA noise logger (8781A5)
4	Gordon Street, Forest Hill 18 m from the outer rail	20 to 27 March 2019	NGARA noise logger (8780FF)
5	Newcastle Street, Calvert 78 m from the outer rail	21 to 27 March 2019	NGARA noise logger (8780AF)

Note 1 All monitoring equipment complies with the requirements of Australian Standard AS1259-1990 (part 1 and 2) and IEC 61672.

Note 2 All equipment was calibrated before and after the monitoring period with any drift in signal less than 1 dB.



QLD NOISE MODEL VERIFICATION

FIGURE B1 - Map 1 of 4

300 metres

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- Noise monitoring location
- H2C Design Centreline
- Bridges
- Watercourse

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QLD NOISE MODEL VERIFICATION

FIGURE B1 - Map 2 of 4

300 metres

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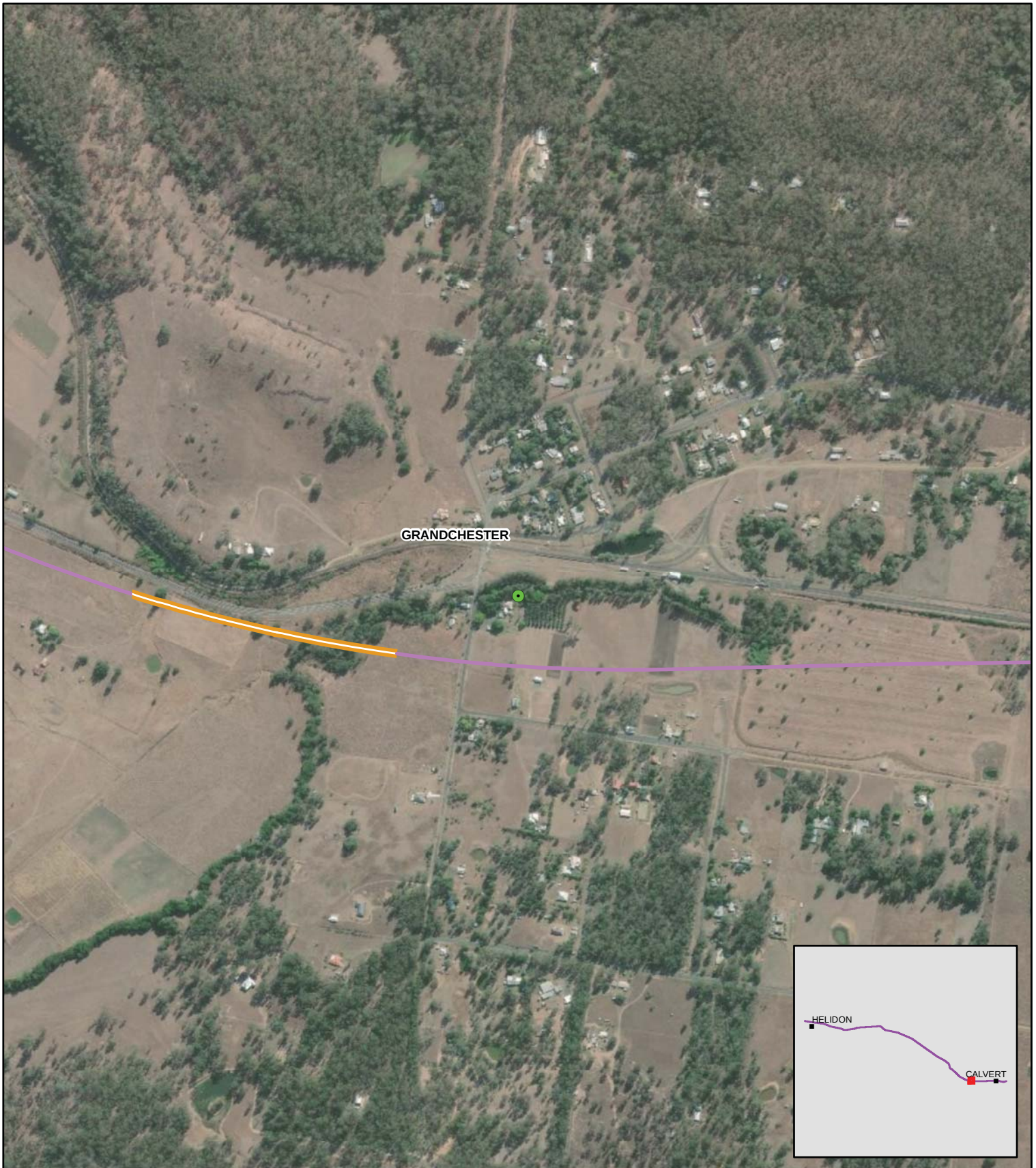
- Noise monitoring location
- H2C Design Centreline
- Bridges
- Watercourse

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QLD NOISE MODEL VERIFICATION

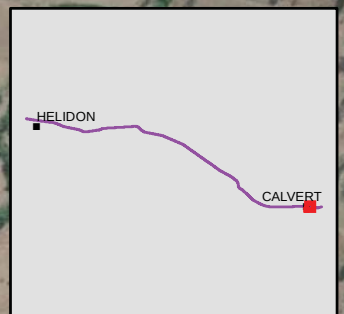
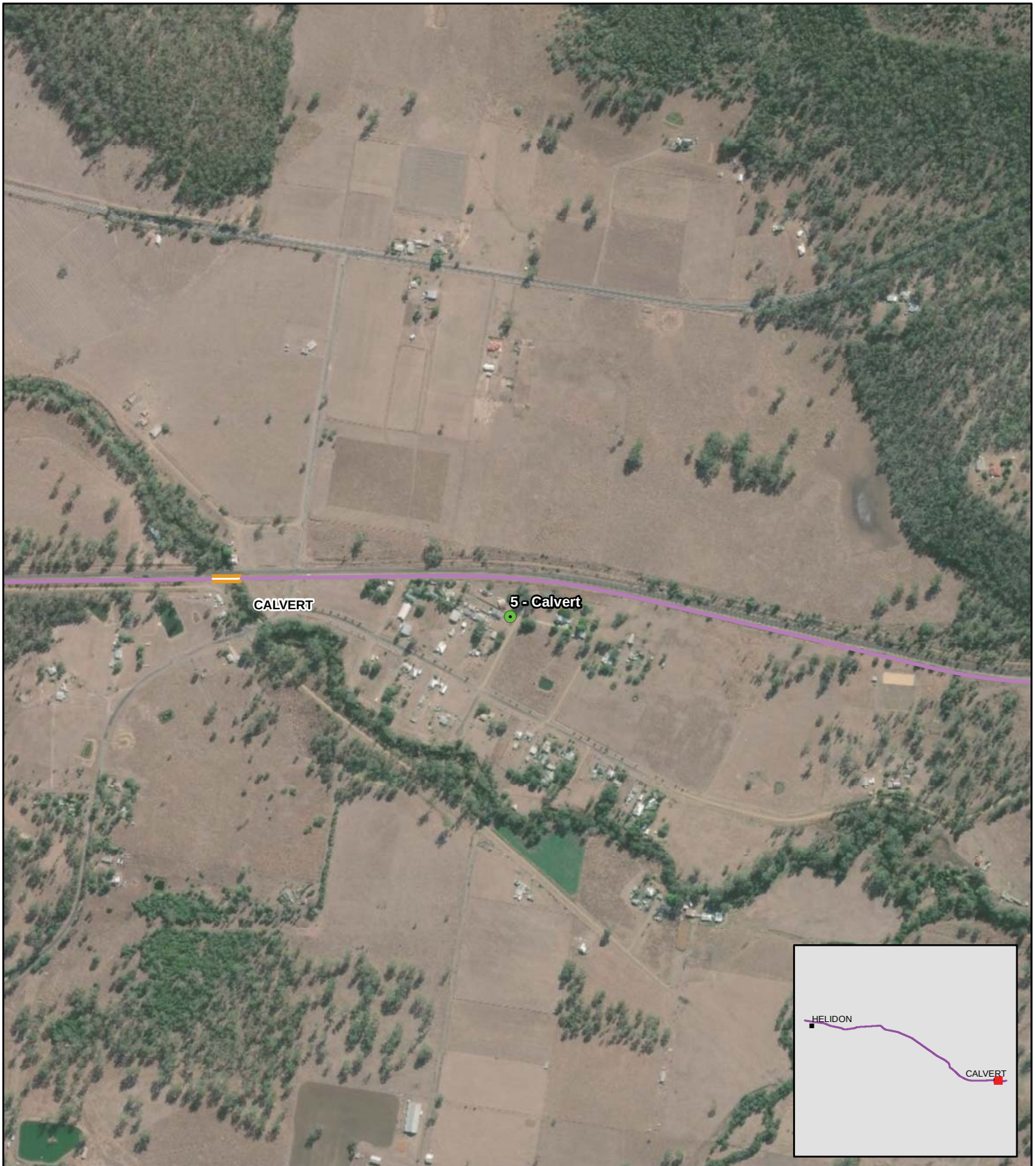
FIGURE B1 - Map 3 of 4

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QLD NOISE MODEL VERIFICATION

FIGURE B1 - Map 4 of 4

300 metres

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● Noise monitoring location

— H2C Design Centreline

— Bridges

— Watercourse

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Author: JG

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To avoid the influence of surrounding buildings and structures on the railway noise levels, the railway noise levels were monitored in the free-field environment at 1.5 m above ground level for a period of seven consecutive days at each location. The noise levels were measured at intervals of 1/10th of a second in order to isolate the discrete noise contribution from the train passby events.

The noise monitoring data was analysed to determine the noise emission level and duration of each clearly discernible train passby event. Applying principles from ISO 3095, the noise levels were analysed to define each train passby event. The analytical process for each location adopted the following approach:

- Identifying all noise level events above an initial threshold and sustained for a defined period of time; this was site specific and provided a first pass filter to identify likely train passby events.
- The length of each event was identified from the start and end points where the noise levels were within 10 dBA of the ambient noise level.
- Each event was visually inspected to identify statistically valid train profiles i.e. a train passby signature that can be used to refine the processing of identifying each passby event.
- The audio data for each identified noise event was reviewed to confirm it was a train passby and no other, erroneous, activity nearby to the monitoring location.

Monitored daily rail noise levels

The highest daily LAeq and LAmax railway noise levels at each monitoring location are detailed in the following table. The LAeq and LAmax noise levels are the highest noise levels reported over a 24-hour period for each period of noise monitoring period.

The LAmax railway noise levels have been determined as the 95th percentile in line with ARTC's noise assessment criteria for Inland Rail. The 24-hour LAmax noise level has been reported as the Single Event Maximum, which is the arithmetic average of the 15 highest LAmax passby noise levels in a 24-hour period or the arithmetic average of all LAmax noise levels where there were fewer than 15 train passbys in a 24-hour period. The LAmax noise levels exclude the influence from train horns and level crossing alarm bells.

Weather data was referenced from the nearest Bureau of Meteorology weather station at Gatton, station number 94562. The local weather conditions, principally wind speed and precipitation, were found to not have influenced the monitoring noise levels for the train passby events. This was also, in part, due to the proximity of the monitoring locations to the rail lines.

The monitored railway noise levels at the locations in Gatton, Forest Hill and Calvert are detailed in **Table B2**.

Table B2 Monitored daily railway noise levels

Monitoring location	Monitored railway noise levels, dBA				
	Daytime	Night-time	Daytime	Night-time	24-hour
	LAeq,15hr	LAeq,9hr	LAmax ¹	LAmax ¹	SEM ²
ID 1 Gatton	56.0	56.7	88.6	85.7	83.6
ID 2 Gatton	55.4	56.0	85.9	87.6	83.7
ID 3 Forest Hill	61.2	59.2	88.1	88.1	86.4
ID 4 Forest Hill	59.7	61.1	88.9	89.7	86.3
ID 5 Calvert	47.0	47.8	77.4	78.3	71.6

Note 1 Maximum railway noise levels determined as the 95th percentile LAmax noise level per period.

Note 2 Single Event Maximum as defined by Section 3.1.3 of the DTMR Interim Guideline, Operational Railway Noise and Vibration, March 2019.

The analysis of the monitored noise levels and audio recordings for the train passbys, along with on-site observations, identified the following:

- At ID 1 in Gatton, the nearby steel framed railway bridge did not substantially influence the rolling noise, when compared to the adjacent surface track sections. The trains speed of approximately 50 km/h in Gatton may not have been sufficient for the bridge structure to be a source of elevated rolling noise.
- The L_{Amax} noise levels in Gatton were, at times, influenced by trains accelerating using short-lived higher notch settings as the train departed the centre of Gatton. The specific notch settings and acceleration was dependent on the driver and varied for each train.
- The monitored noise levels vary by 1 to 2 dBA between the two monitoring locations at Forest Hill and demonstrate rail noise levels are generally consistent either side of the immediate rail corridor.
- At Calvert, whilst the train passbys were clearly audible, the ambient noise levels and local environment (buildings and vegetation) had an influence on the ability to isolate the complete duration, and L_{Aeq} noise level, of some train passbys events. The L_{Amax} noise levels were clearly defined.
- At all monitoring locations the SEM was in the order of 1 to 6 dBA lower than the daytime or night-time 95th percentile L_{Amax} noise levels.

Noise modelling

To enable verification of the monitored noise levels, the SoundPLAN noise modelling developed for the Inland Rail project, as discussed in **Section 7** of this report, was applied to calculate railway noise levels at each noise monitoring location.

A summary of the key noise modelling data and methodologies for the existing railway noise levels is provided in **Table B3**.

Table B3 Noise modelling inputs

Noise model attribute	Source data/ modelling approach
Daily train movements	Refer to Table C1 for the West Moreton Line
Rail line speeds	Referencing the monitored data the train speeds were estimated as 50 km/h in Gatton, 60 km/h in Forest Hill and Calvert.
Railway acoustic corrections	Nil, all track was straight with no tight-radius curves, turnouts etc. within 100 m of each monitoring location.
Track strings	The alignment of the existing rail tracks was referenced from publicly available datasets and rail corridor designs supplied by ARTC.
Consist information	All trains modelled with consist 850 m in length
Passenger rail traffic	There were no passenger rail movements on the West Moreton Line
Local environment	3-dimensional digital terrain models were developed for the existing environment at each monitoring location. Ground conditions were modelled as hard ground (ground absorption coefficient of 0.0).

Noise model attribute	Source data/ modelling approach			
Locomotive source noise emission levels	The rollingstock classes were determined from on-site observations and datasets of the rollingstock in use on each rail line. The following noise emission levels were assigned based on the Inland Rail noise emission database, with reference to comparable datasets developed by TfNSW and QR.			
	Rollingstock category	Reference length	Reference noise level, dBA	
			SEL	L _{Amax}
	West Moreton Line, Queensland			
	82 Class locomotive (two per train) (representative of typical coal train locomotives)	22 m	83	89
	NR Class locomotive (two per train) (representative of typical freight locomotives)	22 m	85	90
Note All noise levels are referenced at a distance of 15 m for a speed of 80 km/h.				

Noise model verification

The predicted and monitored L_{Aeq} and L_{Amax} railway noise levels at each location were compared as part of the noise model verification, as detailed in **Table B4**. The model was determined to be verified to a suitable accuracy where the predicted noise levels were within ± 2 dBA of the measured railway noise levels.

The modelled locomotive noise emissions at location ID 1 in Gatton included a +4 dBA adjustment to the modelled source levels to account for the intermittent localised increases in notch setting which were observed and monitored as trains had passed through the centre of Gatton.

Table B4 Modelled railway noise levels

Monitoring location	Railway noise levels, dBA			
	Daytime	Night-time	Daytime	Night-time
	L _{Aeq} ,15hr	L _{Aeq} ,9hr	L _{Amax} ¹	L _{Amax} ¹
West Moreton Line, QLD				
ID 1 Gatton	57.4	57.5	88.5	88.6
ID 2 Gatton	59.5	59.8	91.6	91.6
ID 3 Forest Hill	60.9	61.2	91.2	91.2
ID 4 Forest Hill	60.8	61.1	91.1	91.1
ID 5 Calvert	52.8	53.2	79.3	79.3

Note 1 Daytime and Night-time L_{Amax} is the 95th percentile L_{Amax} rail noise level

Note 2 Single Event Maximum level for the L_{Amax} railway noise levels.

The monitored and modelled L_{Aeq} and L_{Amax} noise levels at each location were compared, as detailed in **Table B5**. The noise model validation was determined for all five noise monitoring locations. Because the monitored L_{Aeq} noise levels at Calvert were at times influenced by the local environment the validation was also undertaken for the locations at Gatton and Forest Hill (total four monitoring locations).

Overall, the L_{Aeq} noise levels verify within 2 dBA of the monitored L_{Aeq} noise levels during the daytime and night-time periods and achieves DTMR guidelines on transport noise model validation. The L_{Amax} noise levels are a relatively minor 0.5 to 1 dBA more than the desired 2 dBA verification and this is discussed further after **Table B5**. At the EIS stage it is satisfactory to over-predict the railway noise levels to provide conservatism in both the assessment of potential noise impacts and the recommendations for potential noise mitigations.

Table B5 Noise model verification

Monitoring location	Noise model verification, dBA				
	Daytime	Night-time	Daytime	Night-time	24-hour
	LAeq,15hr	LAeq,9hr	L _{Amax} ¹	L _{Amax} ¹	SEM ²
West Moreton Line, QLD					
ID 1 Gatton	1.4	0.8	-0.1	2.9	5.0
ID 2 Gatton	4.1	3.8	5.7	4.0	7.9
ID 3 Forest Hill	-0.3	2.0	3.1	3.1	4.8
ID 4 Forest Hill	1.1	0.0	2.2	1.4	4.8
ID 5 Calvert	5.8	5.4	1.9	1.0	7.7
Model validation all locations	2.4	2.4	2.6	2.5	6.0
Model validation locations ID 1,2,3 & 4	1.6	1.7	2.7	2.9	5.6

Note 1 Daytime and Night-time L_{Amax} is the 95th percentile L_{Amax} rail noise level

Note 2 Single Event Maximum level for the L_{Amax} railway noise levels.

The following features of the existing railway operations and the noise modelling methodology are considered to have influenced the noise model validation.

- In Gatton the noise monitoring data and on-site observations identify potential for the speed of individual trains to vary depending on the time of day and driver behaviour. The monitored L_{Aeq} noise levels are sensitive to variations to factors such as train speed. The noise model assumes a consistent train speed of 50 km/h in Gatton and does not account for individual trains travelling at varying speeds.
- In Forest Hill the train speed was observed to be generally consistent and is suitably replicated by the consistent train speed applied in the noise model.
- The modelling of L_{Aeq} noise levels at Calvert does not account for the localised ambient noise which at times influenced the monitored L_{Aeq} railway noise levels.

The monitored 95th percentile L_{Amax} noise levels are less sensitive to outliers than the arithmetically averaged SEM noise levels. Consequently, the noise model, which adopted a consistent L_{Amax} noise emission, validates better to the 95th percentile L_{Amax} than the SEM.

APPENDIX

T

Operational Railway Noise and Vibration Technical Report

Appendix C Noise and Vibration from Double Stacked Freight Wagons

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

The load on the axles from freight wagons has the potential to influence the noise and vibration emission levels during the train passby event. The load will vary depending on the configuration of single stacked and double stacked containers and the contents of the containers which can vary from empty to the capacity weight.

To investigate the noise and vibration emission levels, SLR conducted a noise and vibration monitoring survey in January 2019 at a section of straight track near to Merriton, approximately 170 km north of Adelaide. The freight trains in the area were known to have both single stacked and double stacked containers on the wagons.

Based on site observations from outside the rail corridor area, the following features of the track were identified:

- The track was single line, on a ballasted track with concrete sleepers with train movements in both directions.
- The depth of the ballast was estimated at 700 mm on clay and sandy top soil.
- Based on site observations the train speeds ranged from 80 km/h to 100 km/h.

During train passby events, noise and vibration levels were monitored simultaneously at six locations along the track section. A comparison of the noise and vibration level across the whole train passby was made for the trains that had only single stacked containers on the wagons and those trains with a combination of double stacked and single stacked containers. It was noted that no trains had all wagons loaded with double stacked containers and the analysis did not isolate those wagons that were empty or stacked with empty containers.

The noise level over the duration of the train passby events are presented for the three noise monitoring locations (Channel 4, Channel 5 and Channel 6) in **Figure C1**. Spot 2D acoustic intensity measurements confirmed the rail and wheel are key noise sources (and not say radiated vibration of containers).

The locomotives at the front of the train are the initial elevated noise levels with the sections of known single stacked and double stacked containers identified thereafter. It can be seen that the noise levels at the three monitoring locations were approximately 2 dBA or less during the passby of the double stacked wagons.

As shown in **Figure C2**, consistent with the measured noise levels, albeit a more marginal difference, the vibration velocity levels (in dBV) are higher with the single stacked container wagons.

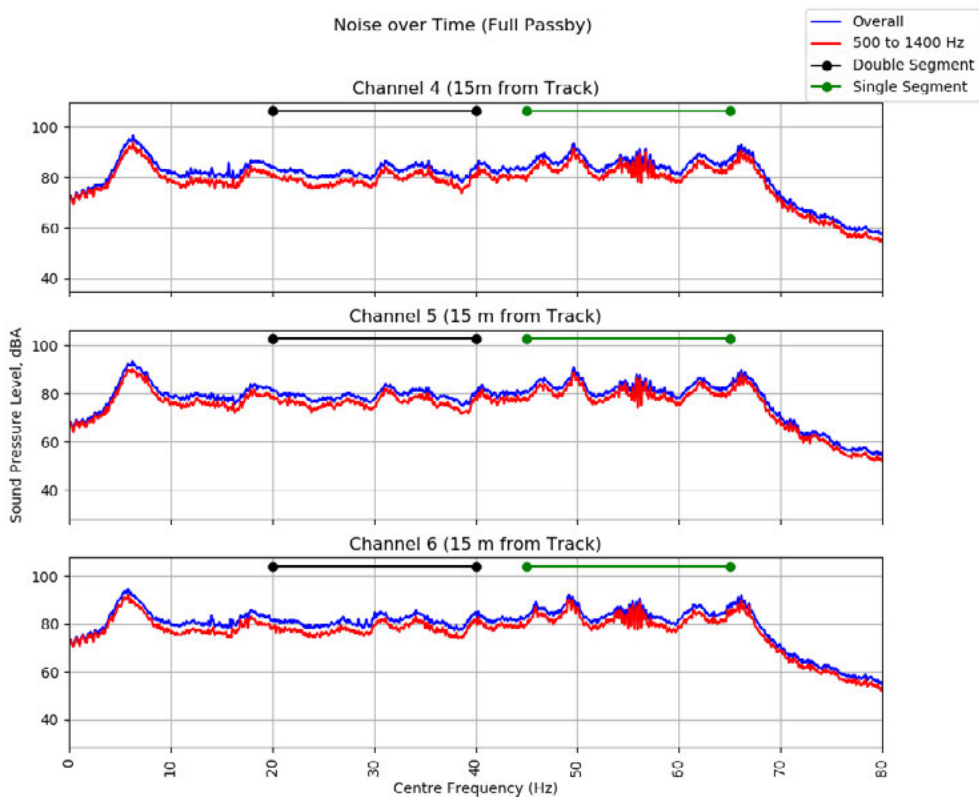
It is considered that if a noise emission correction factor were to be applied to the stacking configuration, this would be complicated by many factors in practice, particularly:

- the proportion of wagons with single and double stacked containers and where they are located,
- the number and position of empty wagons (no containers), and;
- the load of the individual wagons, which can vary from empty to the maximum load capacity.

Consequently, whilst the loading of the freight consist can vary considerably depending on the mix of empty or fully loaded containers, the measurements to date find it insignificant with respect to rolling noise and vibration emissions compared to other factors such as individual wheel and track condition.

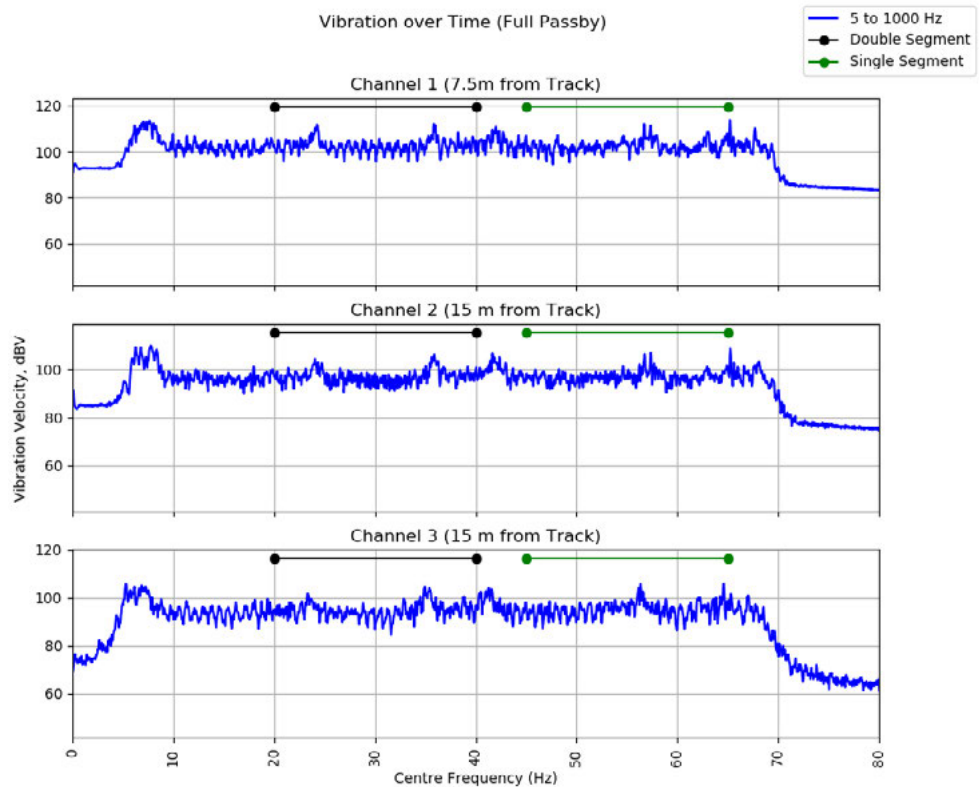
On the basis of the above analysis, correction factors to the noise and/or vibration emissions from double stacked wagons should not be considered in the Inland Rail operational rail noise and vibration assessments.

Figure C1 A-weighted noise levels for the entire train passby



The ground vibration levels at three locations (Channel 1, Channel 2 and Channel 3) for the same train passby event is presented in **Figure C2**.

Figure C2 Vibration velocity levels for the entire train passby



APPENDIX

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Operational Railway Noise and Vibration Technical Report

Appendix D Predicted Airborne Railway Noise Levels—Year 2026 Project Opening

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

The predicted railway noise levels at the commencement of railway operations in year 2026 are detailed in the following table and noise contour maps.

The predicted noise levels are provided for the identified sensitive receptors within the 2 km study area. This includes all sensitive receptors where the predicted noise levels triggered an investigation of noise mitigation.

The symbol (-) in the table denotes there was not a prediction of future rail noise as the sensitive receptor was located more than 2 km from the source of noise.

Following the tabulated results are the predicted noise contour maps for the daytime and night-time railway operations at the project opening in year 2026. The noise contours have been presented as the daytime and night-time assessment criteria applied by ARTC on the Project. All noise contours are predicted at 2.4 m above ground level including where there are bridges and viaducts.

The noise contours are calculated from the interpolation of thousands of calculation points and provide an overview of the railway noise levels to assist the interpretation of the assessment and its outcomes. The tabulated noise levels at the individual sensitive receptors should be referenced when assessing railway noise levels against the criteria.

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
254161	New	60	55	80	66	66	92
254164	New	60	55	80	65	65	91
254170	New	60	55	80	65	65	92
254179	New	60	55	80	62	62	87
254181	New	60	55	80	61	62	87
254188	New	60	55	80	55	55	80
254193	New	60	55	80	56	56	81
254219	New	60	55	80	55	55	80
254221	New	60	55	80	52	53	77
254250	New	60	55	80	66	66	91
254255	New	60	55	80	58	58	83
254261	New	60	55	80	45	46	71
254276	New	60	55	80	62	62	87
254295	New	60	55	80	39	39	64
254300	New	60	55	80	49	49	74
254307	New	60	55	80	48	48	73
254308	New	60	55	80	47	48	71
254312	New	60	55	80	48	49	74
254313	New	60	55	80	48	48	72
254315	New	60	55	80	47	47	71
254318	New	60	55	80	49	50	75
254319	New	60	55	80	51	51	78
254320	New	60	55	80	48	48	75
254324	New	60	55	80	47	48	71
254325	New	60	55	80	46	47	72
254332	New	60	55	80	49	49	73
254336	New	60	55	80	47	47	72
254340	New	60	55	80	54	54	79
254344	New	60	55	80	52	52	76
254346	New	60	55	80	52	52	76
254347	New	60	55	80	63	63	89
254348	New	60	55	80	51	52	76
254354	New	60	55	80	47	47	71
254357	New	60	55	80	46	46	70
254358	New	60	55	80	50	51	75
254365	New	60	55	80	49	49	73
254367	New	60	55	80	48	48	72
254370	New	60	55	80	49	49	74
254372	New	60	55	80	48	48	72
254377	New	60	55	80	48	49	74
254378	New	60	55	80	49	49	73
254381	New	60	55	80	45	45	70
254383	New	60	55	80	46	47	72
254388	New	60	55	80	50	50	74
254389	New	60	55	80	49	50	75
254396	New	60	55	80	49	50	74
254401	New	60	55	80	48	48	74
254402	New	60	55	80	49	49	74
254403	New	60	55	80	49	50	75
254406	New	60	55	80	48	48	72
254408	New	60	55	80	49	50	75
254410	New	60	55	80	50	50	76
254411	New	60	55	80	50	51	75
254412	New	60	55	80	54	54	78
254419	New	60	55	80	50	50	75
254421	New	60	55	80	54	54	78

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
254422	New	60	55	80	48	48	73
254425	New	60	55	80	50	51	76
254427	New	60	55	80	50	51	76
254431	New	60	55	80	49	49	74
254433	New	60	55	80	54	54	79
254437	New	60	55	80	52	52	76
254441	New	60	55	80	52	52	76
254442	New	60	55	80	49	50	74
254444	New	60	55	80	52	52	76
254448	New	60	55	80	50	51	74
254453	New	60	55	80	53	53	78
254456	New	60	55	80	50	51	76
254458	New	60	55	80	51	52	76
254460	New	60	55	80	48	49	74
254462	New	60	55	80	49	49	74
254465	New	60	55	80	49	50	76
254468	New	60	55	80	49	50	75
254469	New	60	55	80	52	52	77
254470	New	60	55	80	51	51	76
254476	New	60	55	80	57	57	82
254478	New	60	55	80	48	49	73
254484	New	60	55	80	52	52	78
254486	New	60	55	80	53	54	79
254490	New	60	55	80	51	51	76
254493	New	60	55	80	50	50	76
254500	New	60	55	80	52	53	78
254501	New	60	55	80	51	52	77
254502	New	60	55	80	55	56	81
254507	New	60	55	80	51	51	77
254508	New	60	55	80	53	54	78
254516	New	60	55	80	54	55	81
254517	New	60	55	80	53	53	78
254521	New	60	55	80	54	55	81
254526	New	60	55	80	55	56	82
254529	New	60	55	80	55	55	81
254531	New	60	55	80	55	55	81
254532	New	60	55	80	53	53	78
254533	New	60	55	80	53	54	79
254534	New	60	55	80	57	58	83
254536	New	60	55	80	55	56	81
254537	New	60	55	80	54	55	81
254539	New	60	55	80	56	57	82
254540	New	60	55	80	56	56	82
254542	New	60	55	80	56	57	83
254546	New	60	55	80	56	57	82
254549	New	60	55	80	56	57	82
254550	New	60	55	80	55	56	81
254558	New	60	55	80	64	65	91
254559	New	60	55	80	65	65	91
254560	New	60	55	80	52	52	78
254562	New	60	55	80	65	66	91
254568	New	60	55	80	56	56	82
254569	New	60	55	80	56	56	82
254571	New	60	55	80	59	60	86
254573	New	60	55	80	56	57	83
254576	New	60	55	80	63	64	90

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
254587	New	60	55	80	57	58	84
254589	New	60	55	80	65	65	91
254595	New	60	55	80	66	67	93
254598	New	60	55	80	64	65	91
254603	New	60	55	80	65	65	91
254609	New	60	55	80	69	69	95
254614	New	60	55	80	70	71	97
254656	New	60	55	80	51	52	77
254657	New	60	55	80	44	45	70
254681	New	60	55	80	49	50	75
254682	New	60	55	80	47	48	73
254691	New	60	55	80	49	50	75
254705	New	60	55	80	49	49	74
254720	New	60	55	80	43	44	68
254736	New	60	55	80	44	45	69
254747	New	60	55	80	46	47	73
254757	New	60	55	80	47	48	74
254762	New	60	55	80	45	46	71
254783	New	60	55	80	50	51	76
254787	New	60	55	80	56	56	82
254810	New	60	55	80	35	36	62
254828	New	60	55	80	61	61	87
254837	New	60	55	80	39	40	66
254892	New	60	55	80	37	38	64
255054	New	60	55	80	40	40	66
255080	New	60	55	80	45	46	71
255091	New	60	55	80	40	41	66
255093	New	60	55	80	42	43	68
255097	New	60	55	80	44	45	69
255114	New	60	55	80	41	42	67
255143	New	60	55	80	46	46	71
255158	New	60	55	80	46	47	72
255159	New	60	55	80	40	41	66
255169	New	60	55	80	51	52	77
255192	New	60	55	80	45	46	71
255220	New	60	55	80	41	42	67
255223	New	60	55	80	46	46	71
255240	New	60	55	80	48	49	73
255277	New	60	55	80	51	52	77
255282	New	60	55	80	49	50	77
255295	New	60	55	80	45	45	72
255309	New	60	55	80	40	41	66
255318	New	60	55	80	55	56	82
255333	New	60	55	80	57	58	84
255346	New	60	55	80	60	61	87
255349	New	60	55	80	54	55	80
255350	New	60	55	80	60	61	87
255377	New	60	55	80	51	51	76
255387	New	60	55	80	50	51	75
255394	New	60	55	80	53	53	78
255395	New	60	55	80	47	48	73
255402	New	60	55	80	47	48	73
255412	New	60	55	80	46	47	71
255433	New	60	55	80	56	57	82
255453	New	60	55	80	50	51	76
255455	New	60	55	80	51	52	77

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
255487	New	60	55	80	52	52	77
255511	New	60	55	80	54	55	79
255514	New	60	55	80	55	56	80
255518	New	60	55	80	38	38	62
255520	New	60	55	80	38	39	63
255558	New	60	55	80	42	43	67
255595	New	60	55	80	47	47	71
255601	New	60	55	80	47	47	72
255605	New	60	55	80	51	52	77
255617	New	60	55	80	44	45	70
255621	New	60	55	80	39	40	65
255630	New	60	55	80	51	52	77
255640	New	60	55	80	38	39	64
255641	New	60	55	80	52	52	78
255691	New	60	55	80	52	52	77
255777	New	60	55	80	54	55	80
255835	New	60	55	80	48	49	74
255861	New	60	55	80	47	47	72
255865	New	60	55	80	44	45	70
255892	New	60	55	80	46	47	72
255934	New	60	55	80	48	48	72
256019	New	60	55	80	64	64	92
256057	New	60	55	80	54	55	80
256166	New	60	55	80	58	59	85
256191	New	60	55	80	55	55	81
256213	New	60	55	80	55	56	81
256248	New	60	55	80	57	57	82
256284	New	60	55	80	49	49	74
256289	New	60	55	80	55	56	81
256408	New	60	55	80	54	54	79
256574	New	60	55	80	59	59	85
256649	New	60	55	80	47	48	73
256675	New	60	55	80	47	48	73
256698	New	60	55	80	54	54	79
256709	New	60	55	80	46	46	73
256719	New	60	55	80	56	57	82
256813	New	60	55	80	44	45	70
256817	New	60	55	80	50	50	78
256882	New	60	55	80	44	45	72
256926	New	60	55	80	48	49	74
256951	New	60	55	80	46	47	72
257009	New	60	55	80	46	47	75
257028	New	60	55	80	53	53	79
257039	New	60	55	80	46	47	72
257128	New	60	55	80	45	46	72
259291	New	60	55	80	49	49	76
259381	New	60	55	80	47	48	76
259957	New	60	55	80	50	51	78
260058	New	60	55	80	66	66	95
260067	New	60	55	80	66	65	95
260069	New	60	55	80	50	51	78
260119	New	60	55	80	59	59	86
260150	New	60	55	80	56	57	84
260165	New	60	55	80	56	57	82
260189	New	60	55	80	61	62	89
260213	New	60	55	80	62	63	90

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
260446	New	60	55	80	49	50	76
260528	New	60	55	80	60	61	88
260630	New	60	55	80	46	47	74
260789	New	60	55	80	41	42	70
260930	New	60	55	80	56	56	82
261084	New	60	55	80	59	59	86
261227	New	60	55	80	63	63	92
261368	New	60	55	80	60	60	87
261386	New	60	55	80	60	60	88
261419	New	60	55	80	46	47	74
261452	New	60	55	80	56	56	84
261535	New	60	55	80	54	54	82
261542	New	60	55	80	43	44	70
261572	New	60	55	80	59	58	87
261608	New	60	55	80	55	55	81
261613	New	60	55	80	51	51	78
261633	New	60	55	80	45	46	72
261638	New	60	55	80	59	59	88
261639	New	60	55	80	61	61	90
261649	New	60	55	80	57	57	85
261661	New	60	55	80	57	57	86
261665	New	60	55	80	60	60	87
261720	New	60	55	80	63	63	92
261729	New	60	55	80	62	61	89
261738	New	60	55	80	52	52	80
261739	New	60	55	80	62	62	90
261749	New	60	55	80	61	61	87
261781	New	60	55	80	55	55	84
261786	New	60	55	80	55	54	83
261802	New	60	55	80	58	58	85
261829	New	60	55	80	55	55	81
261888	New	60	55	80	49	49	78
261908	New	60	55	80	59	60	88
261910	New	60	55	80	51	51	79
261913	New	60	55	80	46	46	73
261927	New	60	55	80	51	50	77
261958	New	60	55	80	46	46	74
261969	New	60	55	80	58	59	87
261999	New	60	55	80	45	46	72
262034	New	60	55	80	51	51	77
262063	New	60	55	80	52	52	78
262181	New	60	55	80	51	51	77
262286	New	60	55	80	51	52	79
263137	New	60	55	80	49	50	77
263676	New	60	55	80	45	46	73
263929	New	60	55	80	44	44	71
314339	New	60	55	80	36	36	58
314342	New	60	55	80	34	35	58
314427	New	60	55	80	40	41	63
314460	New	60	55	80	42	42	65
314565	New	60	55	80	46	46	68
314569	New	60	55	80	42	43	65
314586	New	60	55	80	42	42	66
314594	New	60	55	80	41	42	65
314600	New	60	55	80	43	43	65
314619	New	60	55	80	45	45	67

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
314629	New	60	55	80	43	43	65
314940	New	60	55	80	47	46	71
315029	New	60	55	80	47	47	70
315138	New	60	55	80	54	55	85
315262	New	60	55	80	54	55	81
315421	New	60	55	80	62	62	92
316281	New	60	55	80	36	37	62
316291	New	60	55	80	33	34	61
316410	New	60	55	80	35	36	63
318986	New	60	55	80	35	35	61
318992	New	60	55	80	46	47	73
318994	New	60	55	80	47	47	73
318997	New	60	55	80	46	46	70
318998	New	60	55	80	40	40	64
318999	New	60	55	80	42	42	67
319003	New	60	55	80	53	53	78
319005	New	60	55	80	41	41	66
319009	New	60	55	80	52	53	79
319012	New	60	55	80	54	55	79
319013	New	60	55	80	43	44	70
319014	New	60	55	80	54	55	80
319017	New	60	55	80	48	49	72
319019	New	60	55	80	55	56	81
319022	New	60	55	80	50	50	75
319031	New	60	55	80	43	43	68
319032	New	60	55	80	45	46	70
319034	New	60	55	80	38	38	63
319035	New	60	55	80	38	38	64
319037	New	60	55	80	48	48	73
319039	New	60	55	80	49	50	74
319040	New	60	55	80	47	48	73
319042	New	60	55	80	51	52	77
319044	New	60	55	80	53	53	81
319048	New	60	55	80	54	54	79
319052	New	60	55	80	38	39	64
319053	New	60	55	80	37	38	63
319054	New	60	55	80	41	42	67
319055	New	60	55	80	42	42	68
319058	New	60	55	80	46	46	71
319061	New	60	55	80	33	34	61
319064	New	60	55	80	40	41	67
319073	New	60	55	80	36	37	61
319077	New	60	55	80	45	46	73
319082	New	60	55	80	40	41	66
319090	New	60	55	80	45	46	72
319094	New	60	55	80	45	45	71
319098	New	60	55	80	53	53	78
319099	New	60	55	80	51	51	76
319100	New	60	55	80	52	52	77
319101	New	60	55	80	57	57	83
319103	New	60	55	80	57	58	83
319111	New	60	55	80	44	45	71
319112	New	60	55	80	46	47	71
319114	New	60	55	80	46	47	72
319117	New	60	55	80	44	45	71
319121	New	60	55	80	61	62	87

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
319122	New	60	55	80	37	37	61
319126	New	60	55	80	47	48	73
319129	New	60	55	80	38	39	64
319133	New	60	55	80	45	45	71
319135	New	60	55	80	45	45	71
319138	New	60	55	80	54	55	79
319141	New	60	55	80	46	47	72
319143	New	60	55	80	41	42	67
319145	New	60	55	80	48	49	74
319150	New	60	55	80	60	61	87
319152	New	60	55	80	30	31	57
319154	New	60	55	80	55	56	82
319157	New	60	55	80	45	46	72
319163	New	60	55	80	51	51	76
319167	New	60	55	80	43	44	67
319168	New	60	55	80	49	50	76
319174	New	60	55	80	46	47	72
319175	New	60	55	80	50	50	75
319178	New	60	55	80	30	30	55
319180	New	60	55	80	31	32	59
319183	New	60	55	80	43	44	71
319186	New	60	55	80	39	40	66
319190	New	60	55	80	45	45	71
319191	New	60	55	80	60	61	87
319194	New	60	55	80	44	45	71
319199	New	60	55	80	53	53	80
319200	New	60	55	80	55	56	82
319203	New	60	55	80	45	46	72
319205	New	60	55	80	47	48	74
319210	New	60	55	80	41	41	68
319212	New	60	55	80	40	41	67
319215	New	60	55	80	48	48	74
319219	New	60	55	80	51	51	77
319220	New	60	55	80	51	51	77
319224	New	60	55	80	44	45	71
319225	New	60	55	80	47	48	75
319226	New	60	55	80	57	56	84
319228	New	60	55	80	41	41	67
319230	New	60	55	80	40	41	67
319235	New	60	55	80	48	48	75
319239	New	60	55	80	30	30	55
319240	New	60	55	80	39	39	65
319247	New	60	55	80	51	52	78
319249	New	60	55	80	29	30	56
319254	New	60	55	80	41	42	67
319261	New	60	55	80	45	45	71
319263	New	60	55	80	49	49	74
319267	New	60	55	80	47	48	74
319269	New	60	55	80	46	46	73
319275	New	60	55	80	48	49	74
319278	New	60	55	80	65	66	92
319279	New	60	55	80	51	52	78
319280	New	60	55	80	43	43	69
319283	New	60	55	80	48	49	74
319287	New	60	55	80	49	50	75
319292	New	60	55	80	48	49	75

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
319293	New	60	55	80	51	52	78
319294	New	60	55	80	56	56	83
319297	New	60	55	80	54	54	81
319299	New	60	55	80	51	52	78
319300	New	60	55	80	49	50	77
319302	New	60	55	80	52	53	79
319303	New	60	55	80	49	50	74
319309	New	60	55	80	38	39	63
319315	New	60	55	80	52	53	79
319317	New	60	55	80	41	42	65
319318	New	60	55	80	40	41	65
319320	New	60	55	80	44	44	70
319322	New	60	55	80	28	28	54
319323	New	60	55	80	36	36	60
319328	New	60	55	80	50	50	74
319331	New	60	55	80	50	51	78
319332	New	60	55	80	43	44	70
319336	New	60	55	80	42	42	69
319341	New	60	55	80	48	49	75
319344	New	60	55	80	41	42	66
319349	New	60	55	80	52	53	78
319352	New	60	55	80	42	43	68
319356	New	60	55	80	49	50	75
319357	New	60	55	80	49	49	73
319364	New	60	55	80	51	51	75
319374	New	60	55	80	47	47	73
319396	New	60	55	80	38	39	62
319420	New	60	55	80	43	43	70
319464	New	60	55	80	44	44	70
319491	New	60	55	80	30	31	55
319495	New	60	55	80	42	43	69
319500	New	60	55	80	44	45	70
319570	New	60	55	80	39	40	66
319605	New	60	55	80	55	56	81
319652	New	60	55	80	53	54	80
319659	New	60	55	80	31	31	57
319682	New	60	55	80	40	40	65
319693	New	60	55	80	40	41	67
319707	New	60	55	80	43	44	70
319718	New	60	55	80	48	49	75
319732	New	60	55	80	48	48	72
319734	New	60	55	80	50	51	77
319736	New	60	55	80	52	52	77
319737	New	60	55	80	43	43	69
319748	New	60	55	80	38	38	63
319752	New	60	55	80	25	25	55
319762	New	60	55	80	43	43	67
319767	New	60	55	80	46	46	71
319803	New	60	55	80	50	50	77
319816	New	60	55	80	36	36	63
319848	New	60	55	80	58	59	86
319858	New	60	55	80	51	51	77
320346	New	60	55	80	36	37	62
320350	New	60	55	80	44	45	72
320355	New	60	55	80	31	32	56
320357	New	60	55	80	42	42	66

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
320358	New	60	55	80	55	55	80
320359	New	60	55	80	40	40	65
320360	New	60	55	80	46	47	72
320363	New	60	55	80	52	52	77
320364	New	60	55	80	49	50	75
320365	New	60	55	80	49	50	76
320376	New	60	55	80	53	54	78
320432	New	60	55	80	44	45	70
320433	New	60	55	80	46	47	72
320434	New	60	55	80	43	44	69
320435	New	60	55	80	46	46	70
320436	New	60	55	80	39	40	64
320437	New	60	55	80	46	47	71
320439	New	60	55	80	46	46	69
320440	New	60	55	80	28	28	55
320441	New	60	55	80	42	43	66
320442	New	60	55	80	46	47	71
320444	New	60	55	80	47	48	71
320448	New	60	55	80	44	45	67
320450	New	60	55	80	29	29	56
320453	New	60	55	80	41	41	67
320454	New	60	55	80	45	46	71
320457	New	60	55	80	45	45	69
320458	New	60	55	80	41	42	68
320459	New	60	55	80	47	48	71
320460	New	60	55	80	45	46	69
320461	New	60	55	80	47	47	71
320462	New	60	55	80	46	47	72
320463	New	60	55	80	44	45	70
320465	New	60	55	80	44	45	69
320467	New	60	55	80	26	26	50
320468	New	60	55	80	43	44	69
320469	New	60	55	80	47	47	71
320471	New	60	55	80	45	46	70
320472	New	60	55	80	48	49	73
320473	New	60	55	80	42	43	66
320474	New	60	55	80	48	49	73
320475	New	60	55	80	46	47	71
320476	New	60	55	80	43	43	66
320477	New	60	55	80	48	49	73
320478	New	60	55	80	46	47	70
320479	New	60	55	80	44	45	68
320484	New	60	55	80	47	48	71
320492	New	60	55	80	40	40	65
320496	New	60	55	80	48	49	73
320501	New	60	55	80	44	45	70
320503	New	60	55	80	33	33	59
320524	New	60	55	80	45	46	69
320550	New	60	55	80	49	49	73
320551	New	60	55	80	43	44	69
320555	New	60	55	80	44	45	70
320562	New	60	55	80	41	41	66
320567	New	60	55	80	33	34	58
320568	New	60	55	80	42	43	66
320569	New	60	55	80	31	31	59
320570	New	60	55	80	40	41	65

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
320572	New	60	55	80	46	47	71
320573	New	60	55	80	46	47	70
320574	New	60	55	80	46	47	72
320575	New	60	55	80	43	44	69
320576	New	60	55	80	45	46	71
320577	New	60	55	80	48	48	74
320579	New	60	55	80	45	46	70
320580	New	60	55	80	44	45	69
320581	New	60	55	80	52	53	78
320582	New	60	55	80	41	42	65
320583	New	60	55	80	44	45	70
320584	New	60	55	80	49	49	73
320585	New	60	55	80	44	45	70
320586	New	60	55	80	35	36	61
320587	New	60	55	80	42	42	67
320588	New	60	55	80	45	45	69
320589	New	60	55	80	46	47	71
320590	New	60	55	80	46	47	70
320591	New	60	55	80	43	43	67
320592	New	60	55	80	46	47	70
320593	New	60	55	80	48	49	72
320594	New	60	55	80	42	43	66
320596	New	60	55	80	24	24	50
320597	New	60	55	80	48	48	72
320598	New	60	55	80	49	50	74
320599	New	60	55	80	48	49	73
320600	New	60	55	80	46	47	72
320601	New	60	55	80	47	48	70
320602	New	60	55	80	49	49	72
320603	New	60	55	80	46	47	71
320604	New	60	55	80	42	43	66
320606	New	60	55	80	47	48	71
320612	New	60	55	80	43	44	71
320645	New	60	55	80	47	48	71
320646	New	60	55	80	45	46	71
320647	New	60	55	80	41	41	66
320658	New	60	55	80	36	37	62
320661	New	60	55	80	46	47	72
320665	New	60	55	80	41	42	65
320678	New	60	55	80	44	45	71
320685	New	60	55	80	31	31	58
320686	New	60	55	80	48	48	73
320687	New	60	55	80	46	46	73
320688	New	60	55	80	29	30	57
320689	New	60	55	80	34	35	61
320691	New	60	55	80	43	43	70
320692	New	60	55	80	40	40	67
320695	New	60	55	80	31	32	58
320698	New	60	55	80	29	30	57
320704	New	60	55	80	27	28	55
320707	New	60	55	80	40	41	67
320708	New	60	55	80	42	43	70
320709	New	60	55	80	35	36	63
320713	New	60	55	80	29	30	57
320716	New	60	55	80	45	46	71
320718	New	60	55	80	43	44	70

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
320720	New	60	55	80	29	29	56
320721	New	60	55	80	27	27	54
320722	New	60	55	80	27	28	55
320724	New	60	55	80	35	35	61
320728	New	60	55	80	29	30	56
320734	New	60	55	80	31	31	58
320739	New	60	55	80	29	30	57
320740	New	60	55	80	37	37	62
320742	New	60	55	80	38	38	65
320743	New	60	55	80	41	42	69
320744	New	60	55	80	32	33	60
320753	New	60	55	80	33	34	62
320769	New	60	55	80	36	37	64
320844	New	60	55	80	39	40	64
320845	New	60	55	80	32	33	57
320846	New	60	55	80	39	40	64
320847	New	60	55	80	36	37	63
320850	New	60	55	80	41	41	66
320851	New	60	55	80	40	40	64
320859	New	60	55	80	48	48	76
320860	New	60	55	80	47	48	77
320863	New	60	55	80	38	38	63
320864	New	60	55	80	40	41	66
320867	New	60	55	80	39	39	64
320870	New	60	55	80	39	39	63
320871	New	60	55	80	38	39	62
320872	New	60	55	80	38	38	62
320873	New	60	55	80	39	40	64
320874	New	60	55	80	40	40	65
320877	New	60	55	80	32	32	57
320878	New	60	55	80	34	35	59
320885	New	60	55	80	35	36	60
320886	New	60	55	80	40	41	66
320889	New	60	55	80	53	54	82
320890	New	60	55	80	48	49	79
320892	New	60	55	80	34	34	59
320896	New	60	55	80	41	41	66
320897	New	60	55	80	40	41	65
320899	New	60	55	80	37	38	63
320900	New	60	55	80	33	34	58
320934	New	60	55	80	40	41	66
320937	New	60	55	80	48	49	74
320939	New	60	55	80	45	46	72
320940	New	60	55	80	37	38	62
320941	New	60	55	80	32	33	57
320942	New	60	55	80	37	38	63
320943	New	60	55	80	37	38	61
320946	New	60	55	80	49	49	74
320947	New	60	55	80	41	42	67
320951	New	60	55	80	49	50	75
320954	New	60	55	80	40	40	66
320955	New	60	55	80	41	42	67
320957	New	60	55	80	42	43	68
320958	New	60	55	80	29	30	55
320967	New	60	55	80	36	37	61
320977	New	60	55	80	49	50	80

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
320985	New	60	55	80	41	41	65
320987	New	60	55	80	38	39	64
320988	New	60	55	80	35	36	61
320990	New	60	55	80	52	53	77
320991	New	60	55	80	34	35	60
320992	New	60	55	80	33	34	59
320994	New	60	55	80	34	35	60
320996	New	60	55	80	37	38	62
320997	New	60	55	80	39	40	64
321001	New	60	55	80	40	41	66
321016	New	60	55	80	43	43	69
321017	New	60	55	80	39	40	64
321019	New	60	55	80	45	45	70
321020	New	60	55	80	50	51	76
321021	New	60	55	80	39	40	65
321024	New	60	55	80	38	39	63
321025	New	60	55	80	37	38	62
321031	New	60	55	80	39	40	64
321032	New	60	55	80	47	48	75
321033	New	60	55	80	46	47	76
321034	New	60	55	80	47	48	73
321057	New	60	55	80	41	42	68
321061	New	60	55	80	38	39	64
321062	New	60	55	80	34	35	60
321064	New	60	55	80	39	40	65
321065	New	60	55	80	38	38	64
321066	New	60	55	80	34	35	60
321067	New	60	55	80	36	37	62
321068	New	60	55	80	36	37	61
321069	New	60	55	80	35	36	60
321073	New	60	55	80	41	41	66
321075	New	60	55	80	43	44	69
321100	New	60	55	80	41	42	68
321104	New	60	55	80	42	43	68
321111	New	60	55	80	38	38	63
321118	New	60	55	80	41	42	67
321123	New	60	55	80	34	35	59
321124	New	60	55	80	44	45	70
321135	New	60	55	80	39	39	64
321141	New	60	55	80	46	47	72
321142	New	60	55	80	33	33	58
321144	New	60	55	80	37	38	61
321147	New	60	55	80	43	44	72
321155	New	60	55	80	35	36	61
321182	New	60	55	80	36	37	61
321184	New	60	55	80	57	58	84
321185	New	60	55	80	35	36	60
321186	New	60	55	80	31	31	56
321192	New	60	55	80	42	43	68
321199	New	60	55	80	35	36	60
321200	New	60	55	80	36	36	61
321205	New	60	55	80	31	32	58
321206	New	60	55	80	36	36	62
321207	New	60	55	80	36	37	63
321208	New	60	55	80	36	36	62
321209	New	60	55	80	39	40	65

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
321210	New	60	55	80	40	41	65
321214	New	60	55	80	35	36	60
321231	New	60	55	80	37	38	63
321237	New	60	55	80	39	40	65
321246	New	60	55	80	44	45	70
321247	New	60	55	80	38	38	64
321248	New	60	55	80	33	33	58
321249	New	60	55	80	44	45	73
321250	New	60	55	80	40	40	65
321252	New	60	55	80	37	38	63
321254	New	60	55	80	45	46	70
321256	New	60	55	80	42	43	68
321258	New	60	55	80	43	44	68
321277	New	60	55	80	35	36	60
321281	New	60	55	80	38	39	66
321282	New	60	55	80	37	38	63
321283	New	60	55	80	38	39	63
321284	New	60	55	80	46	46	71
321286	New	60	55	80	41	42	68
321289	New	60	55	80	44	45	71
321292	New	60	55	80	42	42	66
321294	New	60	55	80	41	41	67
321296	New	60	55	80	47	48	75
321297	New	60	55	80	45	46	71
321300	New	60	55	80	40	41	66
321301	New	60	55	80	39	39	64
321303	New	60	55	80	38	39	64
321305	New	60	55	80	38	39	63
321332	New	60	55	80	48	49	77
321339	New	60	55	80	38	38	64
321343	New	60	55	80	39	39	65
321344	New	60	55	80	37	38	62
321346	New	60	55	80	29	30	54
321352	New	60	55	80	40	41	66
321353	New	60	55	80	38	39	63
321354	New	60	55	80	40	41	65
321356	New	60	55	80	39	40	65
321357	New	60	55	80	39	40	65
321358	New	60	55	80	41	41	68
321370	New	60	55	80	43	43	71
321371	New	60	55	80	40	41	65
321372	New	60	55	80	41	42	66
321373	New	60	55	80	41	42	67
321375	New	60	55	80	37	37	63
321376	New	60	55	80	37	37	63
321379	New	60	55	80	40	41	67
321383	New	60	55	80	38	38	62
321391	New	60	55	80	36	37	63
321394	New	60	55	80	39	40	65
321417	New	60	55	80	34	34	59
321422	New	60	55	80	35	35	61
321429	New	60	55	80	46	46	74
321431	New	60	55	80	34	35	59
321433	New	60	55	80	33	34	58
321434	New	60	55	80	35	36	60
321435	New	60	55	80	36	37	61

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
321436	New	60	55	80	38	39	64
321437	New	60	55	80	34	35	60
321438	New	60	55	80	40	40	65
321439	New	60	55	80	41	41	66
321440	New	60	55	80	40	41	66
321448	New	60	55	80	39	40	64
321452	New	60	55	80	38	39	65
321457	New	60	55	80	54	54	86
321458	New	60	55	80	53	54	86
321485	New	60	55	80	41	42	67
321486	New	60	55	80	37	37	62
321489	New	60	55	80	43	44	68
321490	New	60	55	80	39	40	64
321491	New	60	55	80	38	39	63
321492	New	60	55	80	40	41	67
321494	New	60	55	80	27	28	53
321502	New	60	55	80	34	35	60
321533	New	60	55	80	39	40	64
321535	New	60	55	80	34	35	60
321539	New	60	55	80	49	50	75
321540	New	60	55	80	41	41	65
321541	New	60	55	80	39	40	65
321543	New	60	55	80	35	36	62
321544	New	60	55	80	39	40	66
321548	New	60	55	80	48	48	73
321549	New	60	55	80	48	49	74
321551	New	60	55	80	40	41	66
321555	New	60	55	80	47	48	72
321561	New	60	55	80	36	37	62
321562	New	60	55	80	37	38	63
321563	New	60	55	80	40	41	65
321564	New	60	55	80	39	40	65
321566	New	60	55	80	33	34	59
321567	New	60	55	80	36	37	61
321568	New	60	55	80	42	42	67
321569	New	60	55	80	41	42	68
321581	New	60	55	80	38	39	65
321582	New	60	55	80	35	36	61
321583	New	60	55	80	36	37	62
321585	New	60	55	80	47	47	73
321586	New	60	55	80	38	39	64
321589	New	60	55	80	34	35	59
321590	New	60	55	80	34	34	59
321612	New	60	55	80	34	35	60
321613	New	60	55	80	37	38	62
321631	New	60	55	80	30	31	58
321632	New	60	55	80	33	34	60
321633	New	60	55	80	36	37	63
321634	New	60	55	80	38	39	65
321646	New	60	55	80	30	30	58
321648	New	60	55	80	31	31	58
321650	New	60	55	80	30	31	58
321655	New	60	55	80	28	28	55
321656	New	60	55	80	30	31	58
321657	New	60	55	80	39	40	67
321660	New	60	55	80	46	47	73

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
321666	New	60	55	80	32	33	60
321676	New	60	55	80	41	42	69
321677	New	60	55	80	39	40	66
321678	New	60	55	80	36	37	63
321679	New	60	55	80	35	36	63
321682	New	60	55	80	30	31	58
321687	New	60	55	80	45	46	71
321689	New	60	55	80	47	48	73
321690	New	60	55	80	32	32	59
321691	New	60	55	80	45	46	73
321694	New	60	55	80	35	36	62
321695	New	60	55	80	34	34	61
321697	New	60	55	80	29	29	56
321699	New	60	55	80	31	32	58
321701	New	60	55	80	44	45	71
321702	New	60	55	80	29	30	56
321706	New	60	55	80	41	41	68
321708	New	60	55	80	48	49	73
321709	New	60	55	80	34	34	61
321715	New	60	55	80	31	32	58
321716	New	60	55	80	31	32	59
321717	New	60	55	80	35	36	62
321723	New	60	55	80	33	33	60
321724	New	60	55	80	34	35	61
321726	New	60	55	80	40	40	67
321727	New	60	55	80	40	40	67
321733	New	60	55	80	42	43	70
321737	New	60	55	80	29	30	56
321739	New	60	55	80	38	39	66
321740	New	60	55	80	47	47	74
321742	New	60	55	80	27	28	55
321743	New	60	55	80	47	48	73
321747	New	60	55	80	43	43	70
321748	New	60	55	80	45	46	72
321751	New	60	55	80	27	27	54
321752	New	60	55	80	36	37	64
321753	New	60	55	80	29	30	57
321755	New	60	55	80	44	45	71
321756	New	60	55	80	37	38	64
321758	New	60	55	80	40	41	68
321759	New	60	55	80	45	46	72
321760	New	60	55	80	45	46	72
321762	New	60	55	80	29	30	57
321813	New	60	55	80	40	40	66
321819	New	60	55	80	39	39	65
321821	New	60	55	80	47	47	72
321822	New	60	55	80	42	43	68
321890	New	60	55	80	39	40	65
321903	New	60	55	80	41	41	67
321904	New	60	55	80	38	39	65
321907	New	60	55	80	46	47	72
321908	New	60	55	80	38	38	62
321909	New	60	55	80	44	45	72
321910	New	60	55	80	45	46	70
321911	New	60	55	80	35	36	60
321913	New	60	55	80	32	33	58

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
321915	New	60	55	80	35	36	61
321920	New	60	55	80	47	48	77
321935	New	60	55	80	33	34	59
321944	New	60	55	80	39	40	65
321947	New	60	55	80	38	39	64
321957	New	60	55	80	42	43	67
321961	New	60	55	80	38	38	63
321963	New	60	55	80	37	38	63
321964	New	60	55	80	35	35	59
321965	New	60	55	80	39	40	63
321968	New	60	55	80	41	41	67
321970	New	60	55	80	39	39	65
321971	New	60	55	80	42	43	68
321973	New	60	55	80	38	38	61
321974	New	60	55	80	49	50	78
321975	New	60	55	80	53	54	82
321977	New	60	55	80	43	44	69
321978	New	60	55	80	39	40	65
321979	New	60	55	80	35	35	60
321980	New	60	55	80	36	37	62
321982	New	60	55	80	52	52	78
321987	New	60	55	80	40	40	66
321996	New	60	55	80	40	40	66
321999	New	60	55	80	40	40	65
322005	New	60	55	80	39	40	64
322011	New	60	55	80	40	41	65
322013	New	60	55	80	41	42	66
322021	New	60	55	80	37	38	63
322031	New	60	55	80	45	46	71
322032	New	60	55	80	38	39	63
322033	New	60	55	80	39	40	64
322034	New	60	55	80	45	45	70
322036	New	60	55	80	48	48	74
322037	New	60	55	80	45	46	75
322038	New	60	55	80	39	39	65
322039	New	60	55	80	36	37	63
322040	New	60	55	80	36	37	61
322041	New	60	55	80	45	46	71
322042	New	60	55	80	47	47	72
322043	New	60	55	80	45	46	71
322044	New	60	55	80	50	51	76
322046	New	60	55	80	48	49	73
322047	New	60	55	80	50	51	80
322048	New	60	55	80	48	48	77
322049	New	60	55	80	36	37	62
322050	New	60	55	80	44	45	70
322051	New	60	55	80	35	36	62
322052	New	60	55	80	40	41	65
322053	New	60	55	80	42	43	68
322072	New	60	55	80	39	40	65
322073	New	60	55	80	39	40	64
322074	New	60	55	80	31	32	56
322076	New	60	55	80	40	41	65
322077	New	60	55	80	45	45	71
322078	New	60	55	80	38	39	63
322083	New	60	55	80	35	36	60

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
322089	New	60	55	80	31	32	58
322096	New	60	55	80	46	47	72
322099	New	60	55	80	33	34	58
322103	New	60	55	80	39	39	63
322104	New	60	55	80	42	43	68
322111	New	60	55	80	40	41	66
322112	New	60	55	80	34	35	60
322115	New	60	55	80	50	51	76
322116	New	60	55	80	41	41	65
322117	New	60	55	80	46	47	79
322118	New	60	55	80	35	36	60
322119	New	60	55	80	37	38	61
322120	New	60	55	80	46	47	73
322122	New	60	55	80	40	40	66
322123	New	60	55	80	42	43	68
322124	New	60	55	80	34	35	59
322125	New	60	55	80	49	50	76
322127	New	60	55	80	32	33	58
322128	New	60	55	80	46	47	72
322129	New	60	55	80	34	35	59
322130	New	60	55	80	37	38	63
322131	New	60	55	80	48	49	73
322134	New	60	55	80	51	52	81
322135	New	60	55	80	52	53	82
322136	New	60	55	80	49	49	78
322139	New	60	55	80	48	49	77
322142	New	60	55	80	43	44	69
322156	New	60	55	80	38	39	64
322166	New	60	55	80	42	43	68
322169	New	60	55	80	37	38	63
322170	New	60	55	80	35	36	61
322173	New	60	55	80	34	34	59
322180	New	60	55	80	39	40	66
322190	New	60	55	80	38	39	63
322194	New	60	55	80	46	47	72
322195	New	60	55	80	49	49	76
322197	New	60	55	80	36	36	62
322198	New	60	55	80	38	39	62
322199	New	60	55	80	38	38	64
322202	New	60	55	80	41	42	68
322204	New	60	55	80	26	27	52
322205	New	60	55	80	35	36	61
322207	New	60	55	80	43	43	69
322208	New	60	55	80	41	41	66
322214	New	60	55	80	47	48	73
322215	New	60	55	80	41	42	67
322218	New	60	55	80	47	48	72
322233	New	60	55	80	27	28	55
322235	New	60	55	80	49	50	75
322236	New	60	55	80	34	35	59
322237	New	60	55	80	37	38	63
322238	New	60	55	80	41	42	66
322239	New	60	55	80	37	37	62
322241	New	60	55	80	43	43	68
322242	New	60	55	80	45	46	70
322243	New	60	55	80	38	38	63

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
322245	New	60	55	80	39	40	64
322246	New	60	55	80	48	48	79
322249	New	60	55	80	40	41	65
322252	New	60	55	80	45	46	72
322255	New	60	55	80	36	37	61
322258	New	60	55	80	38	39	64
322259	New	60	55	80	40	41	65
322262	New	60	55	80	32	32	58
322267	New	60	55	80	38	39	64
322269	New	60	55	80	40	41	66
322278	New	60	55	80	39	40	65
322281	New	60	55	80	40	41	66
322292	New	60	55	80	40	41	66
322293	New	60	55	80	31	32	57
322294	New	60	55	80	31	32	57
322295	New	60	55	80	42	42	67
322296	New	60	55	80	42	43	67
322297	New	60	55	80	44	45	70
322298	New	60	55	80	38	39	63
322302	New	60	55	80	45	46	73
322303	New	60	55	80	42	43	68
322304	New	60	55	80	39	40	65
322305	New	60	55	80	36	37	62
322306	New	60	55	80	35	35	60
322307	New	60	55	80	40	41	65
322308	New	60	55	80	33	34	59
322309	New	60	55	80	46	46	71
322318	New	60	55	80	39	40	65
322320	New	60	55	80	37	38	63
322323	New	60	55	80	33	34	59
322328	New	60	55	80	38	39	63
322350	New	60	55	80	48	49	74
322353	New	60	55	80	35	36	61
322354	New	60	55	80	39	40	66
322355	New	60	55	80	26	27	55
322356	New	60	55	80	41	42	68
322358	New	60	55	80	41	42	67
322359	New	60	55	80	37	37	63
322365	New	60	55	80	40	40	65
322367	New	60	55	80	29	30	54
322368	New	60	55	80	35	36	61
322371	New	60	55	80	35	35	60
322375	New	60	55	80	38	38	64
322378	New	60	55	80	36	37	62
322379	New	60	55	80	36	37	62
322384	New	60	55	80	40	40	65
322386	New	60	55	80	41	42	67
322389	New	60	55	80	40	40	66
322391	New	60	55	80	46	47	71
322420	New	60	55	80	37	38	63
322421	New	60	55	80	38	39	63
322423	New	60	55	80	46	47	73
322426	New	60	55	80	41	42	67
322428	New	60	55	80	35	35	61
322429	New	60	55	80	57	58	84
322430	New	60	55	80	38	39	63

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
322432	New	60	55	80	44	45	69
322435	New	60	55	80	47	48	74
322436	New	60	55	80	38	38	62
322439	New	60	55	80	43	44	70
322443	New	60	55	80	39	40	65
322444	New	60	55	80	47	47	72
322445	New	60	55	80	39	40	65
322446	New	60	55	80	29	29	54
322448	New	60	55	80	43	43	68
322449	New	60	55	80	40	40	64
322450	New	60	55	80	42	43	67
322453	New	60	55	80	53	54	82
322456	New	60	55	80	34	34	59
322458	New	60	55	80	37	38	62
322460	New	60	55	80	42	42	67
322462	New	60	55	80	46	47	72
322470	New	60	55	80	30	31	56
322473	New	60	55	80	44	44	66
322478	New	60	55	80	35	36	61
322486	New	60	55	80	37	37	63
322489	New	60	55	80	47	47	72
322490	New	60	55	80	50	51	77
322491	New	60	55	80	37	38	62
322492	New	60	55	80	51	51	76
322493	New	60	55	80	45	45	71
322494	New	60	55	80	50	51	80
322495	New	60	55	80	35	36	60
322496	New	60	55	80	45	46	71
322498	New	60	55	80	45	46	69
322500	New	60	55	80	38	39	64
322501	New	60	55	80	38	39	64
322511	New	60	55	80	37	38	63
322515	New	60	55	80	36	37	61
322518	New	60	55	80	37	38	62
322522	New	60	55	80	31	32	57
322523	New	60	55	80	34	35	59
322525	New	60	55	80	37	37	62
322526	New	60	55	80	36	37	61
322528	New	60	55	80	47	48	73
322529	New	60	55	80	51	51	75
322530	New	60	55	80	39	40	65
322531	New	60	55	80	37	38	62
322532	New	60	55	80	37	38	62
322533	New	60	55	80	35	36	61
322534	New	60	55	80	37	38	64
322538	New	60	55	80	61	62	86
322542	New	60	55	80	38	39	65
322543	New	60	55	80	48	49	74
322546	New	60	55	80	31	32	57
322547	New	60	55	80	28	29	54
322549	New	60	55	80	29	30	57
322550	New	60	55	80	40	41	64
322551	New	60	55	80	32	33	58
322552	New	60	55	80	61	61	87
322553	New	60	55	80	39	40	65
322554	New	60	55	80	33	34	58

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
322557	New	60	55	80	36	37	61
322558	New	60	55	80	40	41	66
322559	New	60	55	80	39	40	64
322561	New	60	55	80	39	40	66
322562	New	60	55	80	45	46	70
322566	New	60	55	80	38	39	63
322567	New	60	55	80	47	48	73
322568	New	60	55	80	40	41	66
322574	New	60	55	80	39	40	65
322575	New	60	55	80	41	41	67
322577	New	60	55	80	40	40	64
322578	New	60	55	80	41	42	67
322580	New	60	55	80	36	37	62
322581	New	60	55	80	38	39	62
322582	New	60	55	80	39	39	64
322583	New	60	55	80	40	41	65
322584	New	60	55	80	45	46	70
322589	New	60	55	80	40	40	64
322590	New	60	55	80	40	41	66
322592	New	60	55	80	37	38	64
322593	New	60	55	80	39	40	64
322598	New	60	55	80	38	39	64
322599	New	60	55	80	39	39	64
322602	New	60	55	80	39	40	66
322603	New	60	55	80	45	46	71
322605	New	60	55	80	46	46	71
322606	New	60	55	80	44	45	70
322607	New	60	55	80	34	35	59
322608	New	60	55	80	36	37	61
322609	New	60	55	80	39	40	65
322610	New	60	55	80	38	39	64
322615	New	60	55	80	44	44	70
322617	New	60	55	80	41	41	65
322624	New	60	55	80	46	46	73
322625	New	60	55	80	51	52	79
322627	New	60	55	80	36	36	61
322629	New	60	55	80	39	40	63
322630	New	60	55	80	43	44	70
322631	New	60	55	80	39	40	65
322635	New	60	55	80	34	35	59
322636	New	60	55	80	38	39	64
322637	New	60	55	80	38	38	63
322639	New	60	55	80	38	39	64
322643	New	60	55	80	36	37	61
322644	New	60	55	80	38	39	64
322646	New	60	55	80	48	48	75
322648	New	60	55	80	41	42	65
322649	New	60	55	80	44	45	70
322650	New	60	55	80	39	40	64
322651	New	60	55	80	43	44	69
322652	New	60	55	80	39	39	64
322654	New	60	55	80	40	41	66
322656	New	60	55	80	38	39	63
322660	New	60	55	80	48	49	74
322662	New	60	55	80	32	32	56
322663	New	60	55	80	33	34	58

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
322664	New	60	55	80	32	33	57
322665	New	60	55	80	55	56	82
322666	New	60	55	80	39	40	64
322668	New	60	55	80	43	44	69
322672	New	60	55	80	39	40	63
322673	New	60	55	80	38	39	63
322679	New	60	55	80	40	41	65
322681	New	60	55	80	39	40	66
322687	New	60	55	80	43	44	69
322714	New	60	55	80	39	40	64
322716	New	60	55	80	39	39	63
322719	New	60	55	80	43	44	68
322723	New	60	55	80	31	32	57
322724	New	60	55	80	35	36	60
322725	New	60	55	80	36	37	61
322726	New	60	55	80	38	39	64
322729	New	60	55	80	45	46	71
322730	New	60	55	80	45	45	70
322732	New	60	55	80	50	51	75
322733	New	60	55	80	43	44	70
322735	New	60	55	80	37	38	63
322781	New	60	55	80	40	41	66
322784	New	60	55	80	28	29	54
322785	New	60	55	80	31	31	56
322786	New	60	55	80	43	44	69
322787	New	60	55	80	37	38	62
322788	New	60	55	80	37	37	61
322789	New	60	55	80	35	36	60
322792	New	60	55	80	47	48	75
322794	New	60	55	80	46	47	72
322798	New	60	55	80	49	49	73
322808	New	60	55	80	49	49	74
322810	New	60	55	80	45	45	71
322850	New	60	55	80	41	42	67
322851	New	60	55	80	41	41	66
322852	New	60	55	80	31	32	57
322889	New	60	55	80	40	41	67
322890	New	60	55	80	35	36	61
322894	New	60	55	80	36	37	61
322950	New	60	55	80	36	37	63
322996	New	60	55	80	36	36	62
322997	New	60	55	80	32	33	58
323037	New	60	55	80	41	41	69
323066	New	60	55	80	40	41	64
323100	New	60	55	80	33	34	58
323105	New	60	55	80	47	48	73
323149	New	60	55	80	40	41	66
323153	New	60	55	80	39	40	65
323154	New	60	55	80	37	38	63
323156	New	60	55	80	40	41	66
323159	New	60	55	80	43	44	69
323221	New	60	55	80	36	37	62
323222	New	60	55	80	40	41	66
323225	New	60	55	80	38	38	64
323226	New	60	55	80	41	42	67
323227	New	60	55	80	39	40	63

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323231	New	60	55	80	37	38	63
323234	New	60	55	80	44	45	69
323279	New	60	55	80	35	36	59
323281	New	60	55	80	41	42	66
323282	New	60	55	80	46	46	71
323286	New	60	55	80	43	43	69
323288	New	60	55	80	38	39	64
323290	New	60	55	80	38	39	65
323304	New	60	55	80	38	39	64
323307	New	60	55	80	36	37	62
323308	New	60	55	80	38	38	64
323309	New	60	55	80	39	39	64
323311	New	60	55	80	34	35	59
323312	New	60	55	80	36	37	61
323313	New	60	55	80	37	38	63
323325	New	60	55	80	30	31	56
323351	New	60	55	80	41	42	66
323355	New	60	55	80	38	38	63
323356	New	60	55	80	38	38	63
323384	New	60	55	80	37	38	62
323397	New	60	55	80	44	45	72
323399	New	60	55	80	37	38	61
323401	New	60	55	80	35	36	60
323402	New	60	55	80	35	36	60
323403	New	60	55	80	42	43	68
323404	New	60	55	80	37	38	62
323407	New	60	55	80	38	39	64
323408	New	60	55	80	48	48	73
323409	New	60	55	80	38	39	64
323414	New	60	55	80	49	50	75
323415	New	60	55	80	48	48	74
323416	New	60	55	80	47	48	76
323417	New	60	55	80	47	48	75
323419	New	60	55	80	46	46	72
323420	New	60	55	80	38	38	64
323421	New	60	55	80	45	46	73
323423	New	60	55	80	38	39	64
323424	New	60	55	80	37	38	63
323425	New	60	55	80	38	38	63
323428	New	60	55	80	36	37	61
323429	New	60	55	80	36	37	61
323432	New	60	55	80	37	38	63
323434	New	60	55	80	48	49	75
323435	New	60	55	80	42	43	68
323437	New	60	55	80	32	33	57
323438	New	60	55	80	28	29	54
323439	New	60	55	80	33	34	58
323440	New	60	55	80	36	37	61
323441	New	60	55	80	33	34	59
323442	New	60	55	80	31	32	57
323443	New	60	55	80	39	40	65
323444	New	60	55	80	35	36	60
323445	New	60	55	80	35	36	60
323446	New	60	55	80	42	43	69
323447	New	60	55	80	32	32	57
323452	New	60	55	80	44	45	70

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323453	New	60	55	80	47	48	74
323456	New	60	55	80	35	36	61
323457	New	60	55	80	35	36	60
323458	New	60	55	80	51	52	77
323459	New	60	55	80	41	42	68
323461	New	60	55	80	47	48	77
323462	New	60	55	80	39	40	65
323463	New	60	55	80	41	42	67
323464	New	60	55	80	41	42	69
323465	New	60	55	80	45	46	71
323466	New	60	55	80	48	48	73
323467	New	60	55	80	40	41	66
323468	New	60	55	80	33	34	58
323470	New	60	55	80	37	38	63
323472	New	60	55	80	31	32	57
323473	New	60	55	80	27	27	54
323474	New	60	55	80	34	35	61
323475	New	60	55	80	39	40	65
323476	New	60	55	80	48	48	73
323478	New	60	55	80	40	41	66
323480	New	60	55	80	41	42	65
323485	New	60	55	80	43	44	67
323487	New	60	55	80	38	39	63
323488	New	60	55	80	40	41	67
323489	New	60	55	80	35	35	61
323490	New	60	55	80	34	35	61
323491	New	60	55	80	41	42	67
323492	New	60	55	80	41	41	67
323493	New	60	55	80	33	33	58
323494	New	60	55	80	33	34	59
323495	New	60	55	80	33	34	59
323496	New	60	55	80	35	36	62
323497	New	60	55	80	36	36	62
323500	New	60	55	80	28	29	56
323501	New	60	55	80	39	40	64
323502	New	60	55	80	46	46	71
323503	New	60	55	80	50	51	76
323504	New	60	55	80	48	49	74
323505	New	60	55	80	41	42	67
323507	New	60	55	80	38	39	64
323508	New	60	55	80	44	44	69
323510	New	60	55	80	44	45	69
323511	New	60	55	80	43	44	71
323512	New	60	55	80	41	42	66
323513	New	60	55	80	41	41	65
323515	New	60	55	80	36	37	62
323517	New	60	55	80	35	36	62
323518	New	60	55	80	36	37	62
323519	New	60	55	80	31	32	57
323520	New	60	55	80	31	32	57
323522	New	60	55	80	48	49	73
323524	New	60	55	80	38	39	63
323525	New	60	55	80	52	52	79
323527	New	60	55	80	36	37	60
323528	New	60	55	80	40	41	65
323529	New	60	55	80	39	39	64

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323530	New	60	55	80	45	45	71
323531	New	60	55	80	39	40	65
323533	New	60	55	80	39	39	64
323535	New	60	55	80	38	38	63
323536	New	60	55	80	41	41	66
323539	New	60	55	80	36	36	61
323541	New	60	55	80	36	37	61
323543	New	60	55	80	47	48	72
323544	New	60	55	80	36	36	61
323545	New	60	55	80	37	37	62
323546	New	60	55	80	36	36	62
323547	New	60	55	80	36	37	63
323549	New	60	55	80	49	49	77
323550	New	60	55	80	33	34	60
323551	New	60	55	80	34	35	60
323552	New	60	55	80	32	33	58
323553	New	60	55	80	38	38	63
323554	New	60	55	80	39	40	66
323555	New	60	55	80	38	39	64
323556	New	60	55	80	46	47	73
323557	New	60	55	80	46	47	71
323558	New	60	55	80	39	40	65
323561	New	60	55	80	40	41	65
323562	New	60	55	80	40	41	65
323563	New	60	55	80	53	53	78
323564	New	60	55	80	49	49	78
323566	New	60	55	80	33	33	58
323567	New	60	55	80	31	32	58
323568	New	60	55	80	40	41	65
323569	New	60	55	80	51	52	77
323570	New	60	55	80	48	49	76
323572	New	60	55	80	40	41	65
323573	New	60	55	80	36	37	62
323574	New	60	55	80	30	31	57
323575	New	60	55	80	47	48	73
323576	New	60	55	80	48	49	76
323577	New	60	55	80	49	49	74
323578	New	60	55	80	40	40	64
323579	New	60	55	80	45	45	71
323580	New	60	55	80	38	39	63
323581	New	60	55	80	39	40	64
323582	New	60	55	80	32	33	58
323583	New	60	55	80	37	38	62
323584	New	60	55	80	37	38	62
323585	New	60	55	80	38	38	62
323586	New	60	55	80	37	38	61
323587	New	60	55	80	36	36	61
323588	New	60	55	80	34	35	61
323589	New	60	55	80	35	36	60
323590	New	60	55	80	35	36	60
323591	New	60	55	80	43	44	68
323592	New	60	55	80	43	44	68
323593	New	60	55	80	44	45	69
323594	New	60	55	80	46	47	73
323595	New	60	55	80	45	46	71
323596	New	60	55	80	38	39	63

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323597	New	60	55	80	41	42	69
323598	New	60	55	80	51	51	77
323599	New	60	55	80	39	40	64
323600	New	60	55	80	41	42	66
323601	New	60	55	80	43	44	70
323602	New	60	55	80	41	42	66
323603	New	60	55	80	41	41	66
323605	New	60	55	80	53	54	80
323606	New	60	55	80	42	43	67
323607	New	60	55	80	39	40	63
323609	New	60	55	80	37	38	63
323610	New	60	55	80	37	38	62
323611	New	60	55	80	35	35	59
323612	New	60	55	80	35	35	61
323613	New	60	55	80	37	38	63
323614	New	60	55	80	36	37	61
323615	New	60	55	80	37	38	63
323618	New	60	55	80	40	41	65
323619	New	60	55	80	40	41	67
323620	New	60	55	80	46	46	71
323621	New	60	55	80	38	39	63
323622	New	60	55	80	47	48	75
323623	New	60	55	80	44	45	69
323625	New	60	55	80	40	41	68
323626	New	60	55	80	39	40	65
323627	New	60	55	80	48	49	74
323628	New	60	55	80	49	50	75
323630	New	60	55	80	37	37	63
323631	New	60	55	80	34	34	60
323635	New	60	55	80	50	50	75
323636	New	60	55	80	48	49	77
323638	New	60	55	80	41	42	67
323639	New	60	55	80	42	43	67
323640	New	60	55	80	41	42	66
323641	New	60	55	80	38	39	63
323642	New	60	55	80	38	39	63
323643	New	60	55	80	30	31	57
323644	New	60	55	80	28	29	54
323645	New	60	55	80	35	35	60
323646	New	60	55	80	38	38	63
323647	New	60	55	80	37	37	62
323648	New	60	55	80	39	40	66
323650	New	60	55	80	40	41	69
323651	New	60	55	80	52	53	79
323652	New	60	55	80	41	42	66
323653	New	60	55	80	36	37	61
323654	New	60	55	80	49	49	74
323655	New	60	55	80	47	48	73
323656	New	60	55	80	48	49	74
323657	New	60	55	80	50	51	76
323658	New	60	55	80	47	48	76
323659	New	60	55	80	36	36	62
323660	New	60	55	80	42	43	68
323662	New	60	55	80	35	36	60
323663	New	60	55	80	37	38	62
323665	New	60	55	80	29	30	54

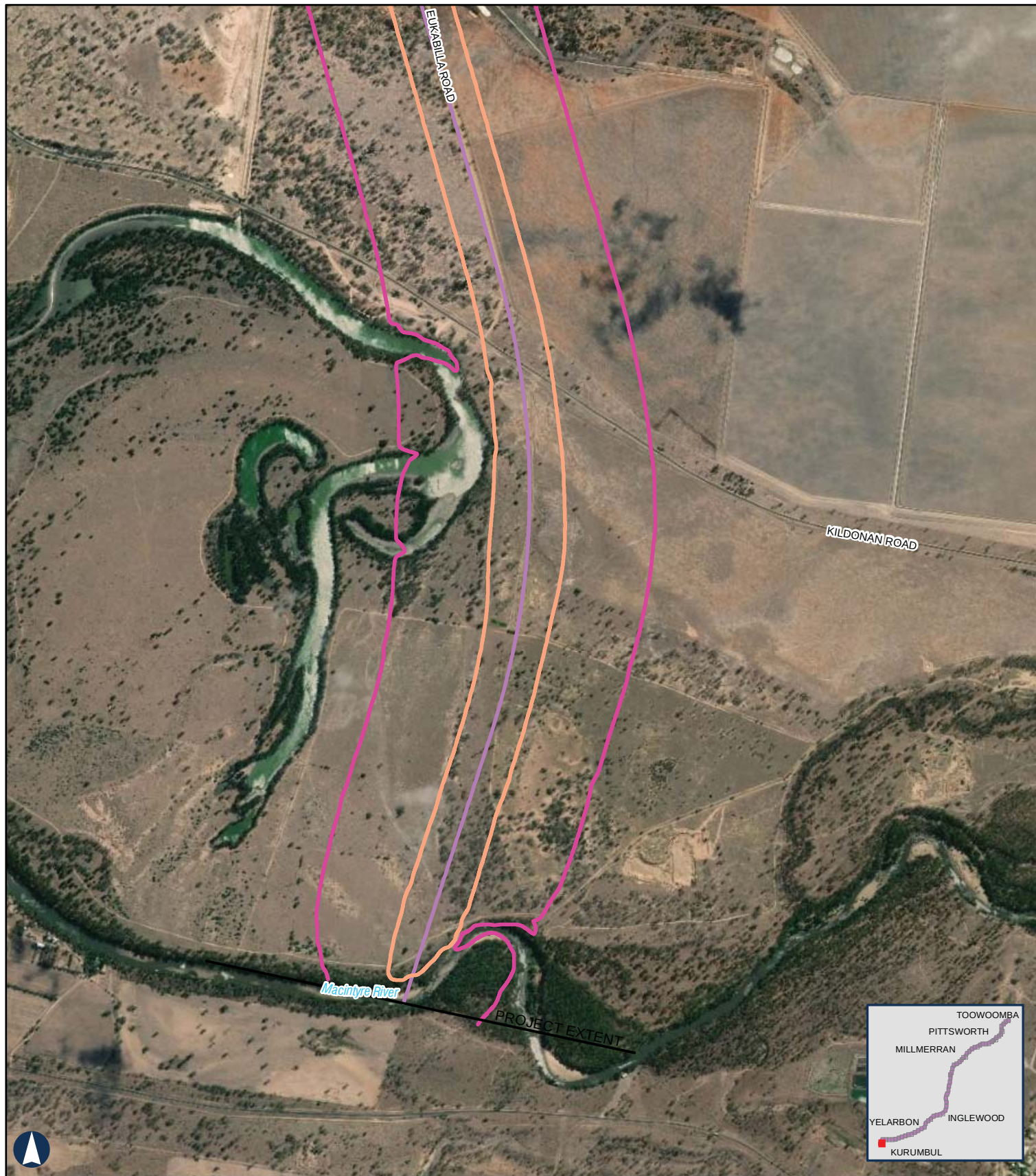
Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323666	New	60	55	80	37	38	64
323667	New	60	55	80	42	43	68
323668	New	60	55	80	39	40	65
323669	New	60	55	80	40	40	65
323670	New	60	55	80	50	51	76
323671	New	60	55	80	46	47	73
323672	New	60	55	80	41	42	68
323673	New	60	55	80	41	41	67
323674	New	60	55	80	40	41	66
323675	New	60	55	80	43	43	68
323676	New	60	55	80	41	42	66
323678	New	60	55	80	53	54	82
323679	New	60	55	80	54	54	90
323680	New	60	55	80	52	53	83
323681	New	60	55	80	41	42	65
323682	New	60	55	80	34	34	60
323683	New	60	55	80	50	50	75
323685	New	60	55	80	31	32	57
323686	New	60	55	80	34	35	59
323687	New	60	55	80	34	35	59
323688	New	60	55	80	33	34	59
323689	New	60	55	80	30	31	55
323690	New	60	55	80	31	32	57
323691	New	60	55	80	33	34	58
323693	New	60	55	80	35	36	60
323695	New	60	55	80	39	40	65
323696	New	60	55	80	41	42	68
323697	New	60	55	80	35	36	61
323698	New	60	55	80	39	39	64
323699	New	60	55	80	43	44	68
323700	New	60	55	80	38	39	63
323701	New	60	55	80	38	38	62
323702	New	60	55	80	45	46	71
323703	New	60	55	80	44	45	70
323704	New	60	55	80	37	38	62
323705	New	60	55	80	36	37	61
323706	New	60	55	80	32	32	57
323708	New	60	55	80	37	38	63
323709	New	60	55	80	35	36	62
323710	New	60	55	80	52	53	80
323711	New	60	55	80	48	49	75
323712	New	60	55	80	40	41	65
323714	New	60	55	80	46	47	78
323716	New	60	55	80	38	39	64
323718	New	60	55	80	40	40	66
323720	New	60	55	80	53	54	83
323722	New	60	55	80	50	51	79
323723	New	60	55	80	32	32	58
323724	New	60	55	80	32	33	59
323726	New	60	55	80	38	39	64
323729	New	60	55	80	37	38	63
323730	New	60	55	80	36	37	61
323731	New	60	55	80	36	37	62
323732	New	60	55	80	34	35	60
323733	New	60	55	80	35	36	60
323734	New	60	55	80	36	37	61

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323735	New	60	55	80	38	38	64
323736	New	60	55	80	38	39	63
323737	New	60	55	80	42	43	69
323738	New	60	55	80	45	46	72
323739	New	60	55	80	35	35	61
323740	New	60	55	80	37	38	64
323741	New	60	55	80	36	37	63
323742	New	60	55	80	44	45	70
323743	New	60	55	80	40	41	66
323744	New	60	55	80	42	42	66
323745	New	60	55	80	50	50	76
323746	New	60	55	80	48	48	77
323747	New	60	55	80	34	35	59
323748	New	60	55	80	45	45	71
323749	New	60	55	80	39	39	65
323750	New	60	55	80	34	35	60
323751	New	60	55	80	33	34	59
323752	New	60	55	80	33	34	60
323756	New	60	55	80	47	48	72
323757	New	60	55	80	41	41	66
323758	New	60	55	80	39	40	64
323759	New	60	55	80	46	47	71
323760	New	60	55	80	43	43	68
323761	New	60	55	80	44	45	70
323762	New	60	55	80	42	43	68
323763	New	60	55	80	37	38	61
323767	New	60	55	80	41	42	67
323768	New	60	55	80	41	42	66
323769	New	60	55	80	40	41	66
323770	New	60	55	80	46	47	72
323771	New	60	55	80	41	42	69
323772	New	60	55	80	33	34	58
323773	New	60	55	80	39	40	65
323774	New	60	55	80	34	35	59
323775	New	60	55	80	32	33	58
323777	New	60	55	80	37	38	63
323780	New	60	55	80	50	51	79
323783	New	60	55	80	43	44	70
323784	New	60	55	80	35	36	61
323785	New	60	55	80	37	38	61
323786	New	60	55	80	50	51	77
323788	New	60	55	80	43	44	69
323789	New	60	55	80	49	49	74
323790	New	60	55	80	37	38	62
323791	New	60	55	80	44	45	70
323792	New	60	55	80	41	42	67
323793	New	60	55	80	38	39	64
323794	New	60	55	80	41	42	67
323795	New	60	55	80	45	46	71
323796	New	60	55	80	56	56	83
323797	New	60	55	80	47	47	71
323798	New	60	55	80	50	51	76
323799	New	60	55	80	35	36	59
323800	New	60	55	80	36	37	61
323801	New	60	55	80	45	46	71
323803	New	60	55	80	50	51	76

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323804	New	60	55	80	56	57	83
323805	New	60	55	80	48	49	74
323806	New	60	55	80	49	50	74
323808	New	60	55	80	45	46	70
323809	New	60	55	80	49	49	75
323811	New	60	55	80	35	36	59
323812	New	60	55	80	31	32	57
323813	New	60	55	80	35	35	60
323815	New	60	55	80	39	40	65
323816	New	60	55	80	39	39	64
323817	New	60	55	80	41	42	67
323818	New	60	55	80	40	40	65
323819	New	60	55	80	47	48	78
323823	New	60	55	80	49	50	74
323824	New	60	55	80	30	30	55
323825	New	60	55	80	45	46	72
323828	New	60	55	80	30	31	56
323829	New	60	55	80	41	41	67
323830	New	60	55	80	41	42	69
323831	New	60	55	80	45	45	70
323832	New	60	55	80	47	48	76
323833	New	60	55	80	45	46	70
323835	New	60	55	80	40	41	67
323837	New	60	55	80	33	34	59
323838	New	60	55	80	33	34	58
323839	New	60	55	80	38	39	63
323840	New	60	55	80	37	38	62
323841	New	60	55	80	40	41	65
323843	New	60	55	80	40	41	66
323844	New	60	55	80	47	48	78
323845	New	60	55	80	47	48	72
323846	New	60	55	80	47	48	78
323847	New	60	55	80	46	47	74
323848	New	60	55	80	48	48	76
323849	New	60	55	80	39	39	64
323850	New	60	55	80	40	41	66
323851	New	60	55	80	37	37	62
323852	New	60	55	80	39	40	64
323853	New	60	55	80	38	38	62
323854	New	60	55	80	59	60	86
323856	New	60	55	80	44	44	69
323857	New	60	55	80	47	47	73
323862	New	60	55	80	39	39	64
323863	New	60	55	80	38	39	64
323866	New	60	55	80	44	45	70
323867	New	60	55	80	47	48	75
323868	New	60	55	80	49	49	80
323871	New	60	55	80	39	39	65
323877	New	60	55	80	37	38	64
323878	New	60	55	80	35	36	60
323879	New	60	55	80	34	35	59
323880	New	60	55	80	32	33	58
323882	New	60	55	80	38	39	64
323883	New	60	55	80	37	38	62
323885	New	60	55	80	42	43	69
323891	New	60	55	80	40	41	66

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323893	New	60	55	80	47	48	76
323894	New	60	55	80	44	45	70
323895	New	60	55	80	42	43	68
323896	New	60	55	80	43	43	69
323897	New	60	55	80	42	43	68
323898	New	60	55	80	41	42	67
323899	New	60	55	80	42	43	68
323901	New	60	55	80	33	34	58
323902	New	60	55	80	35	36	60
323903	New	60	55	80	33	34	60
323904	New	60	55	80	40	41	66
323905	New	60	55	80	40	41	65
323906	New	60	55	80	39	40	66
323907	New	60	55	80	40	40	65
323908	New	60	55	80	44	45	69
323910	New	60	55	80	41	42	66
323911	New	60	55	80	39	40	64
323912	New	60	55	80	48	49	75
323913	New	60	55	80	48	49	74
323914	New	60	55	80	48	48	73
323915	New	60	55	80	43	43	68
323916	New	60	55	80	40	40	65
323917	New	60	55	80	40	41	66
323918	New	60	55	80	41	41	66
323919	New	60	55	80	41	41	66
323920	New	60	55	80	43	44	69
323921	New	60	55	80	42	43	68
323922	New	60	55	80	42	43	67
323923	New	60	55	80	42	43	68
323925	New	60	55	80	50	50	75
323926	New	60	55	80	33	34	59
323927	New	60	55	80	45	46	72
323928	New	60	55	80	37	38	63
323929	New	60	55	80	37	38	62
323930	New	60	55	80	49	49	75
323931	New	60	55	80	33	34	59
323932	New	60	55	80	33	34	59
323933	New	60	55	80	36	37	61
323934	New	60	55	80	40	40	65
323935	New	60	55	80	41	42	66
323936	New	60	55	80	41	42	66
323937	New	60	55	80	37	38	63
323938	New	60	55	80	41	42	67
323939	New	60	55	80	37	38	62
323940	New	60	55	80	39	39	66
323941	New	60	55	80	48	49	74
323942	New	60	55	80	32	33	58
323943	New	60	55	80	45	46	71
323944	New	60	55	80	43	44	69
323945	New	60	55	80	44	45	70
323946	New	60	55	80	46	47	72
323947	New	60	55	80	33	34	60
324270	New	60	55	80	64	64	91
324277	New	60	55	80	49	49	74
324282	New	60	55	80	48	49	75
324299	New	60	55	80	51	51	76

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
324300	New	60	55	80	41	41	66
324333	New	60	55	80	56	57	84
324344	New	60	55	80	43	44	70
324347	New	60	55	80	48	48	79



BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 1 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr 60dBA New rail corridor

— Daytime noise criteria LA max 80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 2 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 3 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.



The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 4 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 5 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

Daytime noise criteria LAeq15hr
60dBA New rail corridor

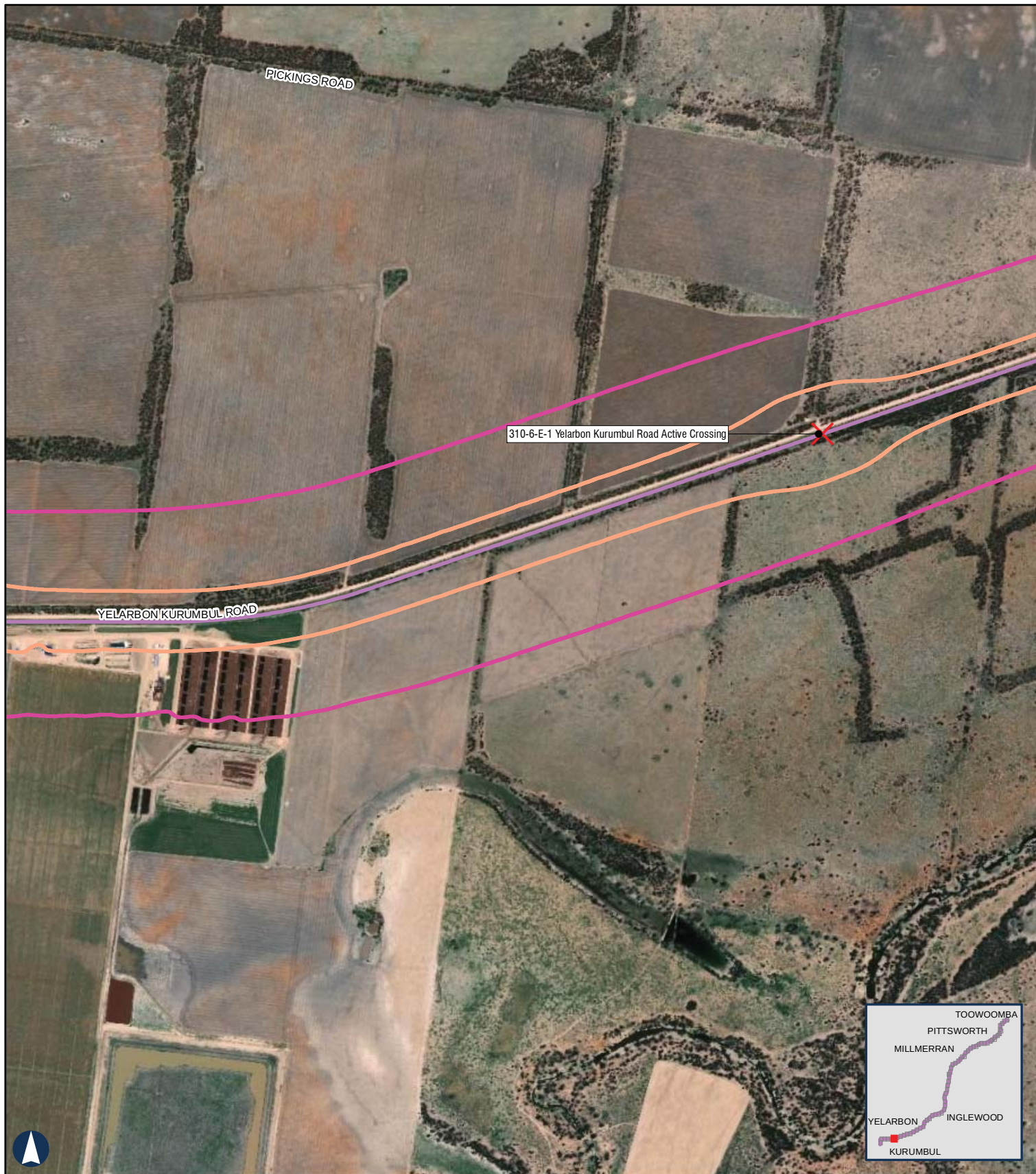
Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 6 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr 60dBA New rail corridor

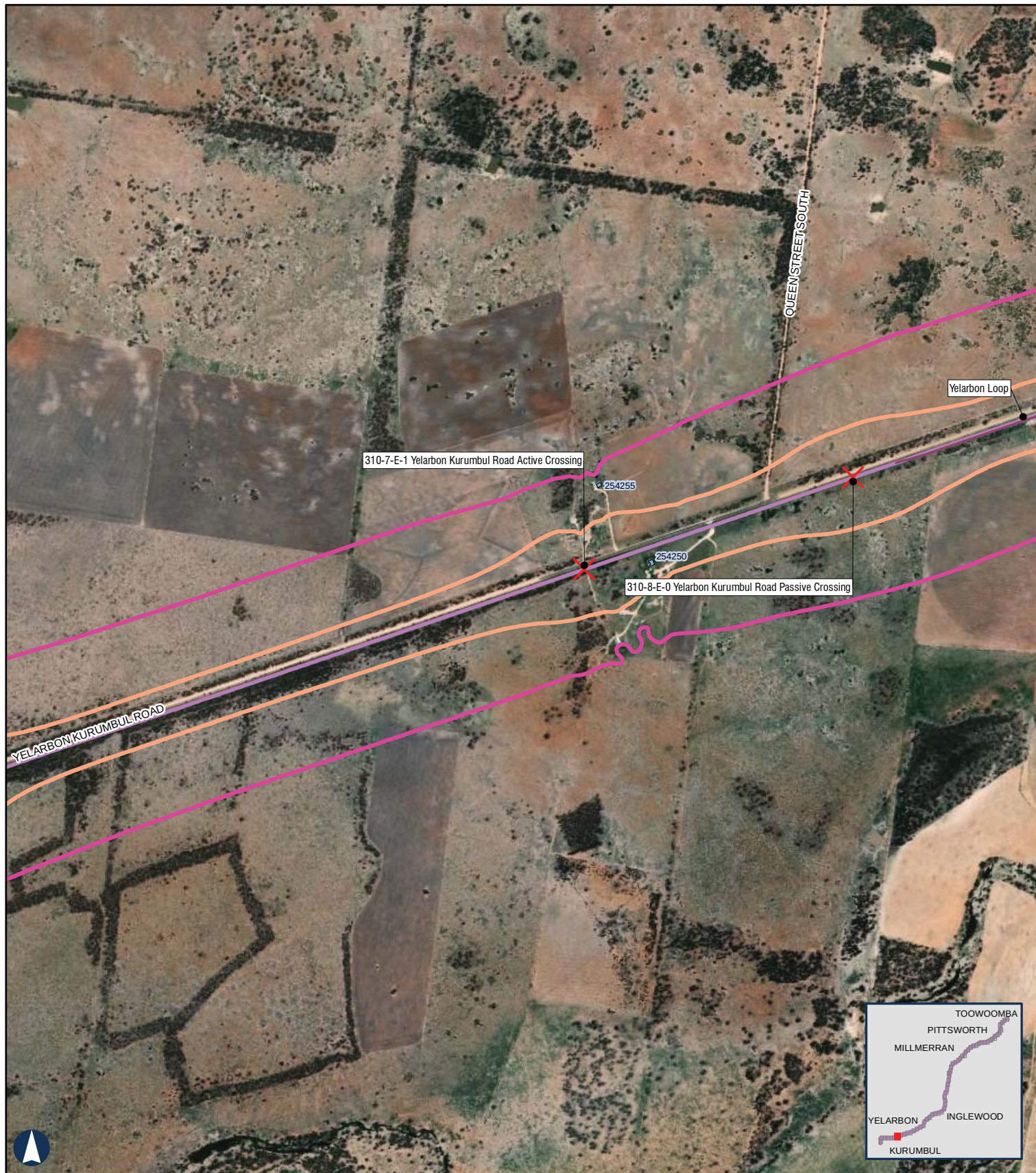
— Daytime noise criteria LA max 80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 7 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 8 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

Daytime noise criteria LAeq15hr
60dBA New rail corridor

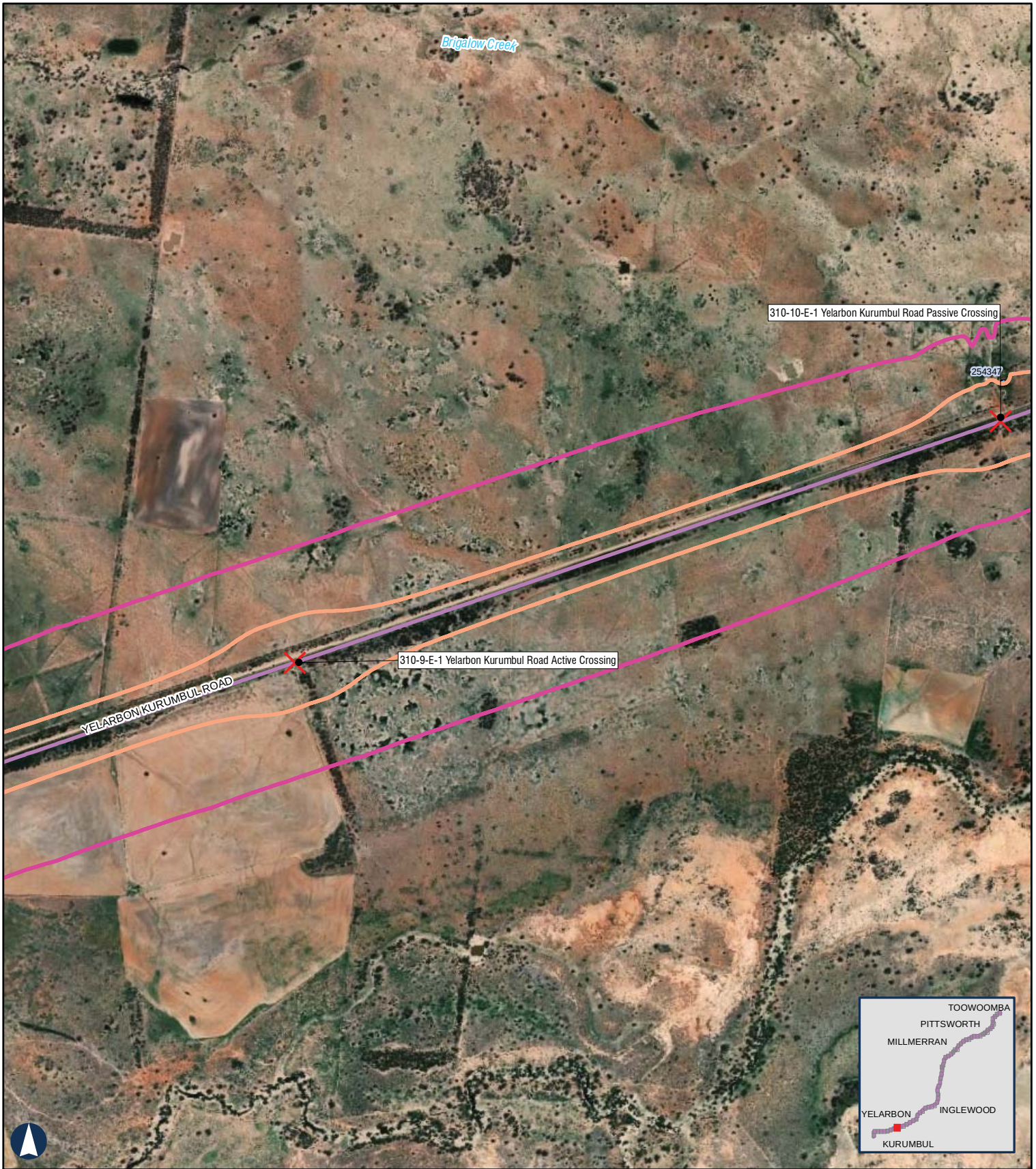
Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 9 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

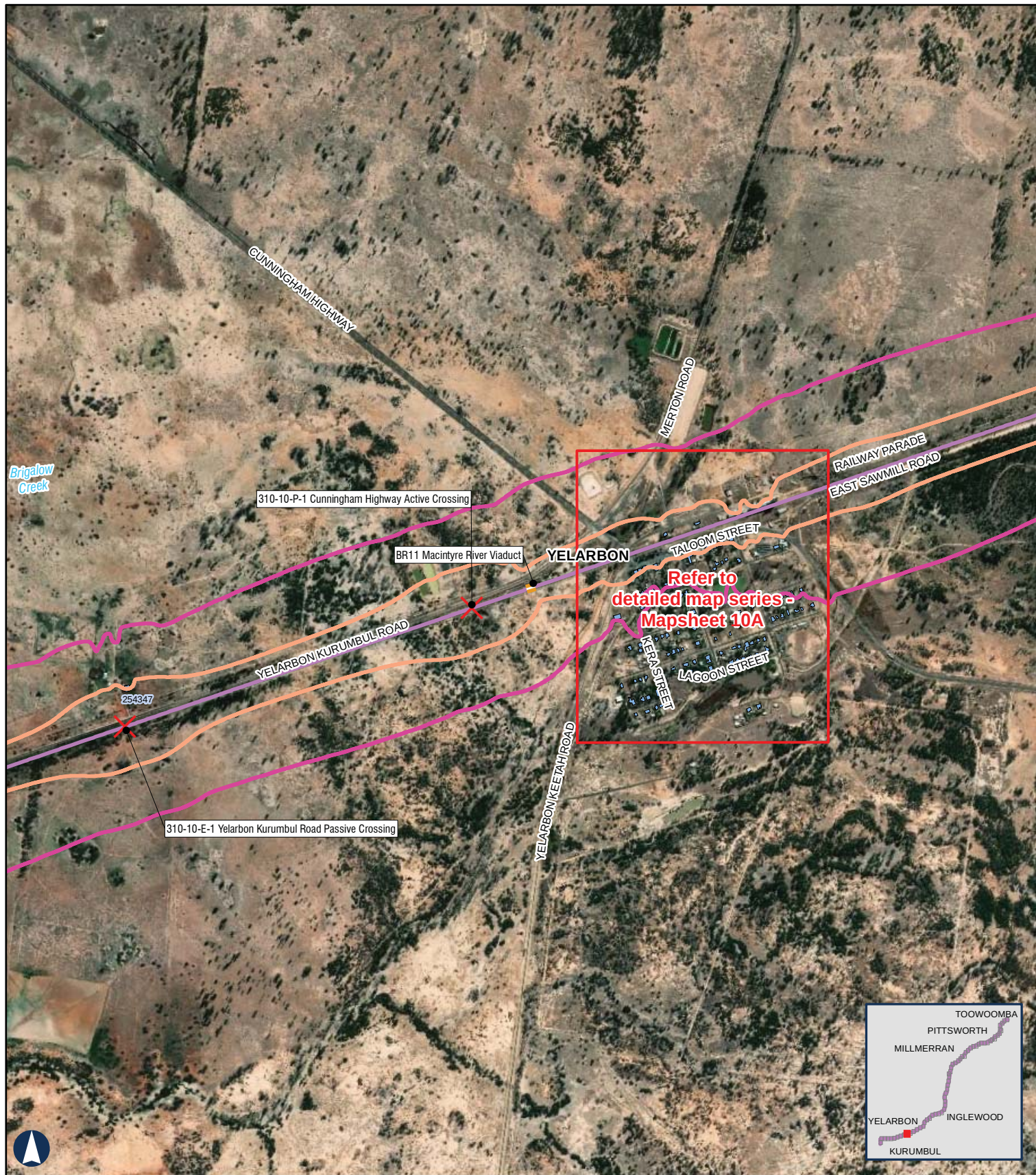
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 10 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels - Detailed

APPENDIX D - Mapsheet 10A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:5,500

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

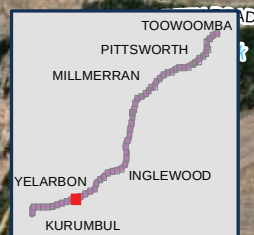
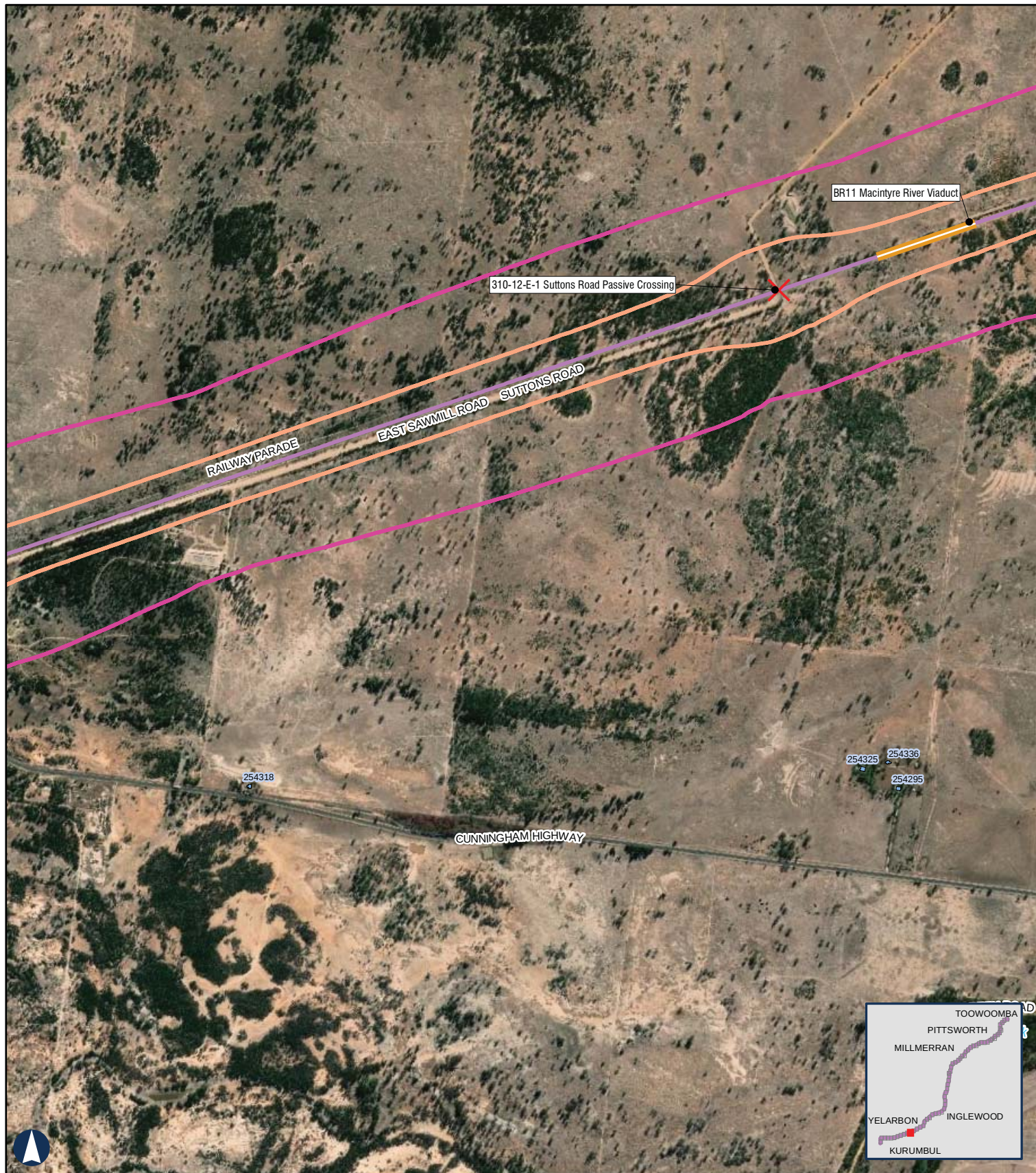
Noise contours are based on a set distance above the local terrain level of 2.4m.

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor



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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 11 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

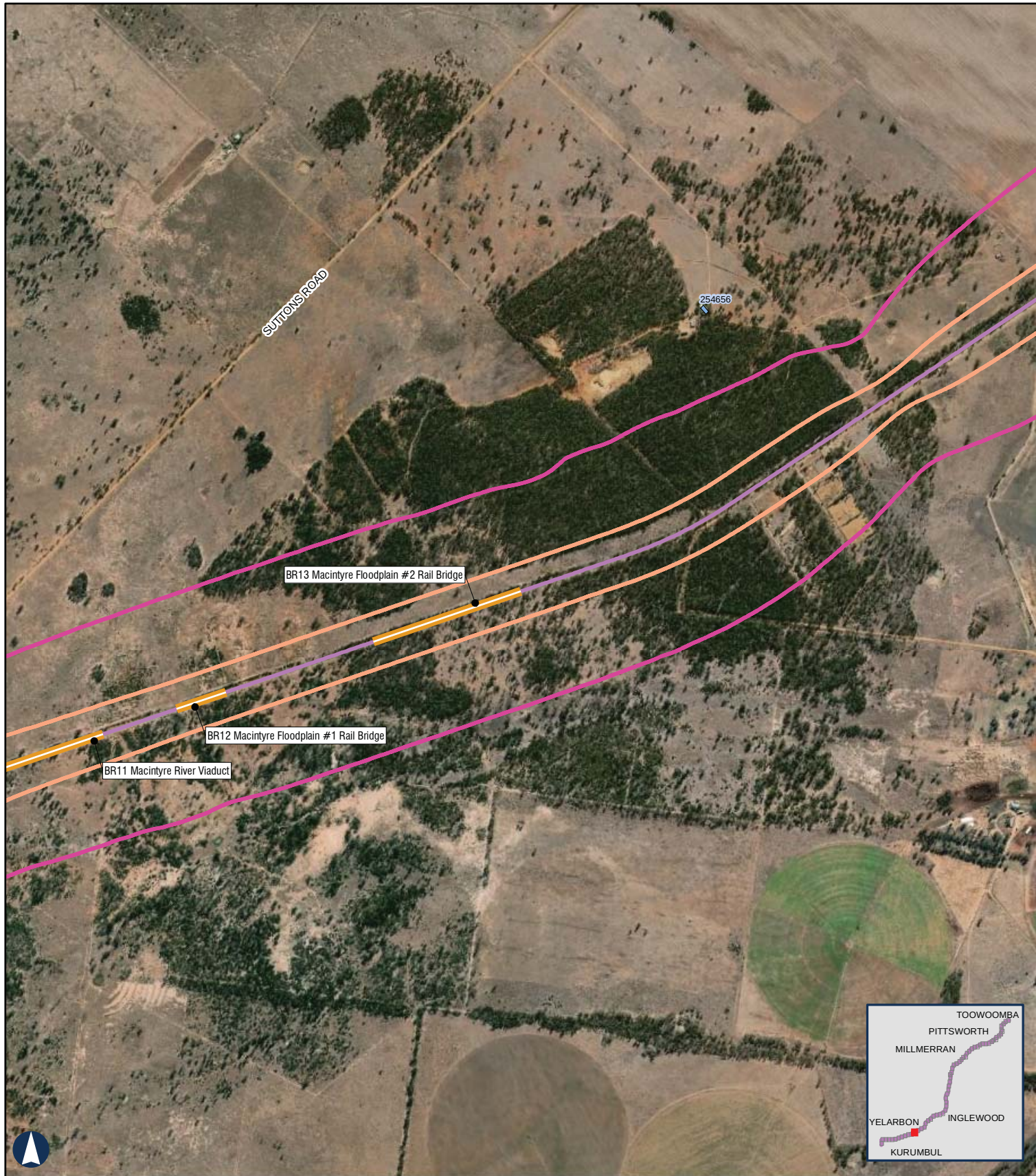
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 12 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

— Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 13 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

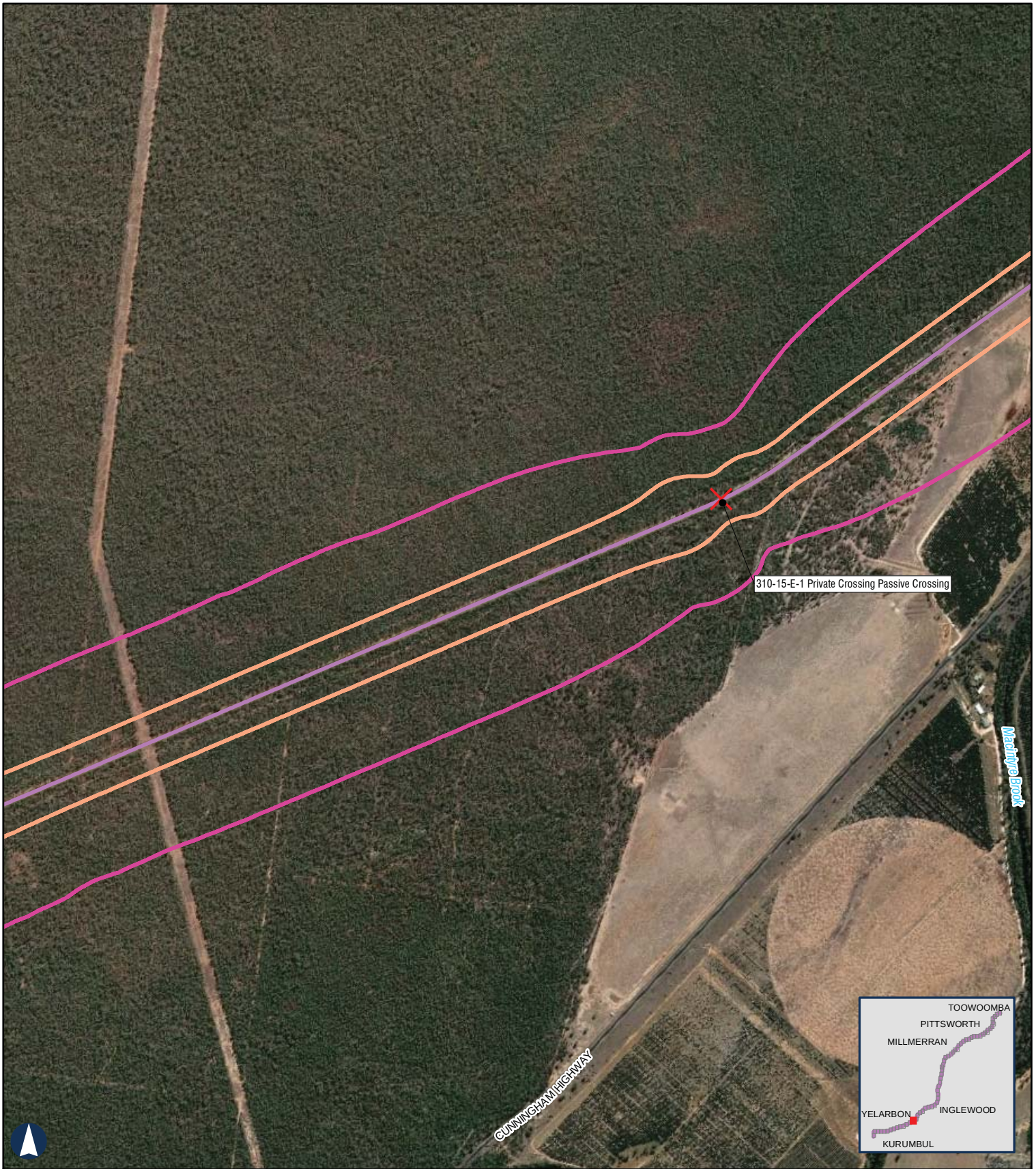
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 14 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

Daytime noise criteria LAeq15hr
60dBA New rail corridor

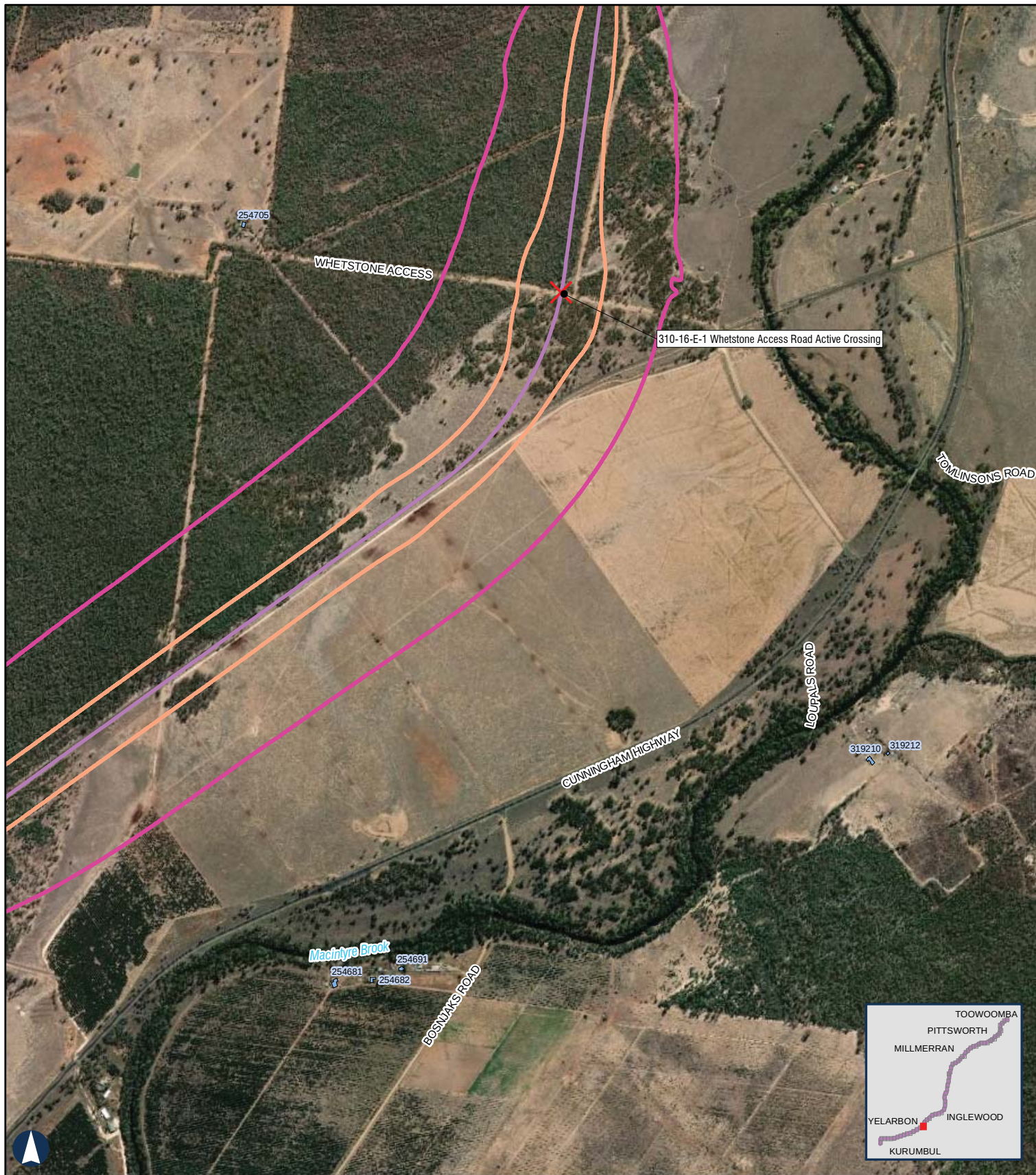
Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 15 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4

Scale: 1:20,000

Date: 02-Jun-2020

Author: JG

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

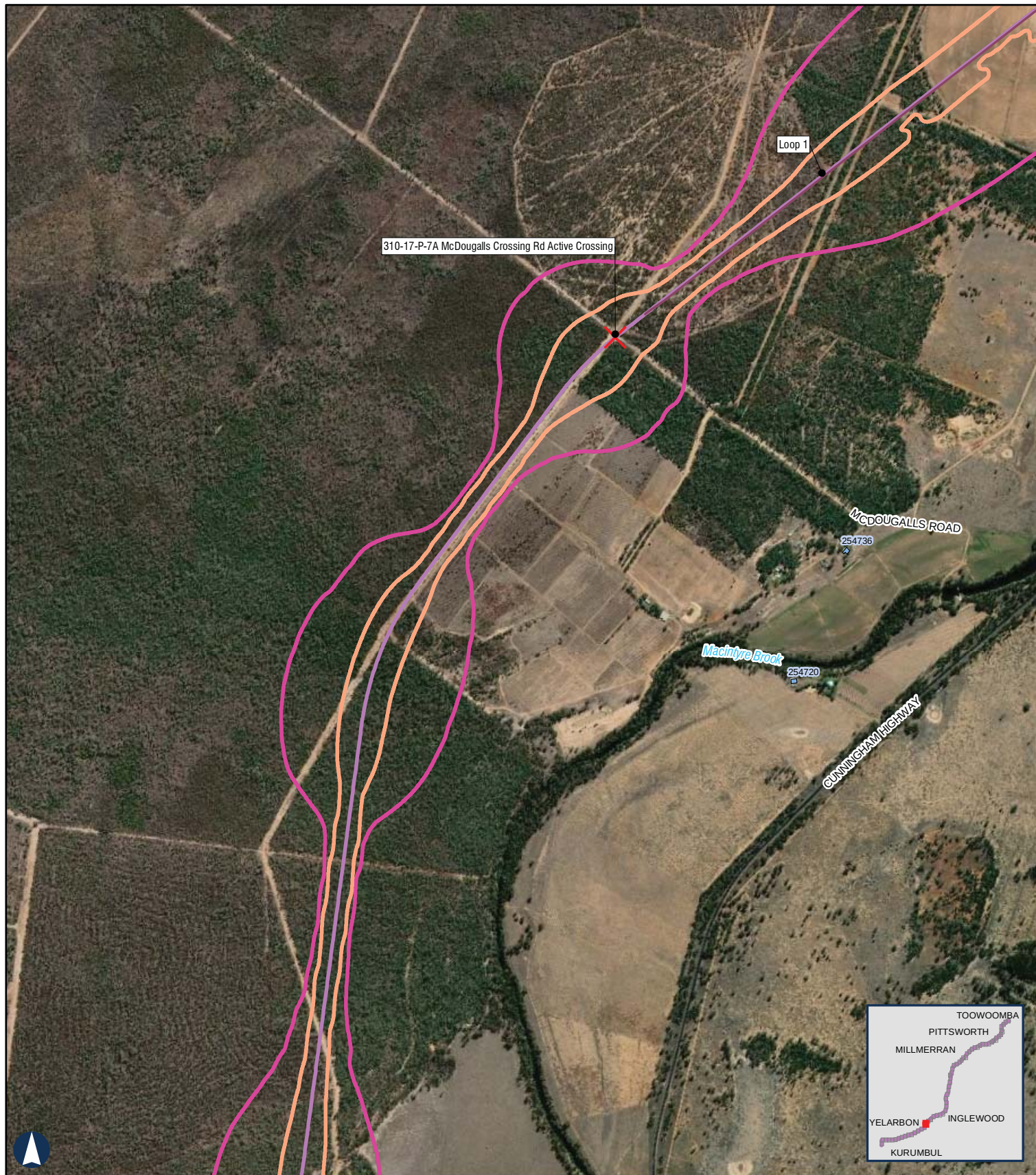
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 16 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

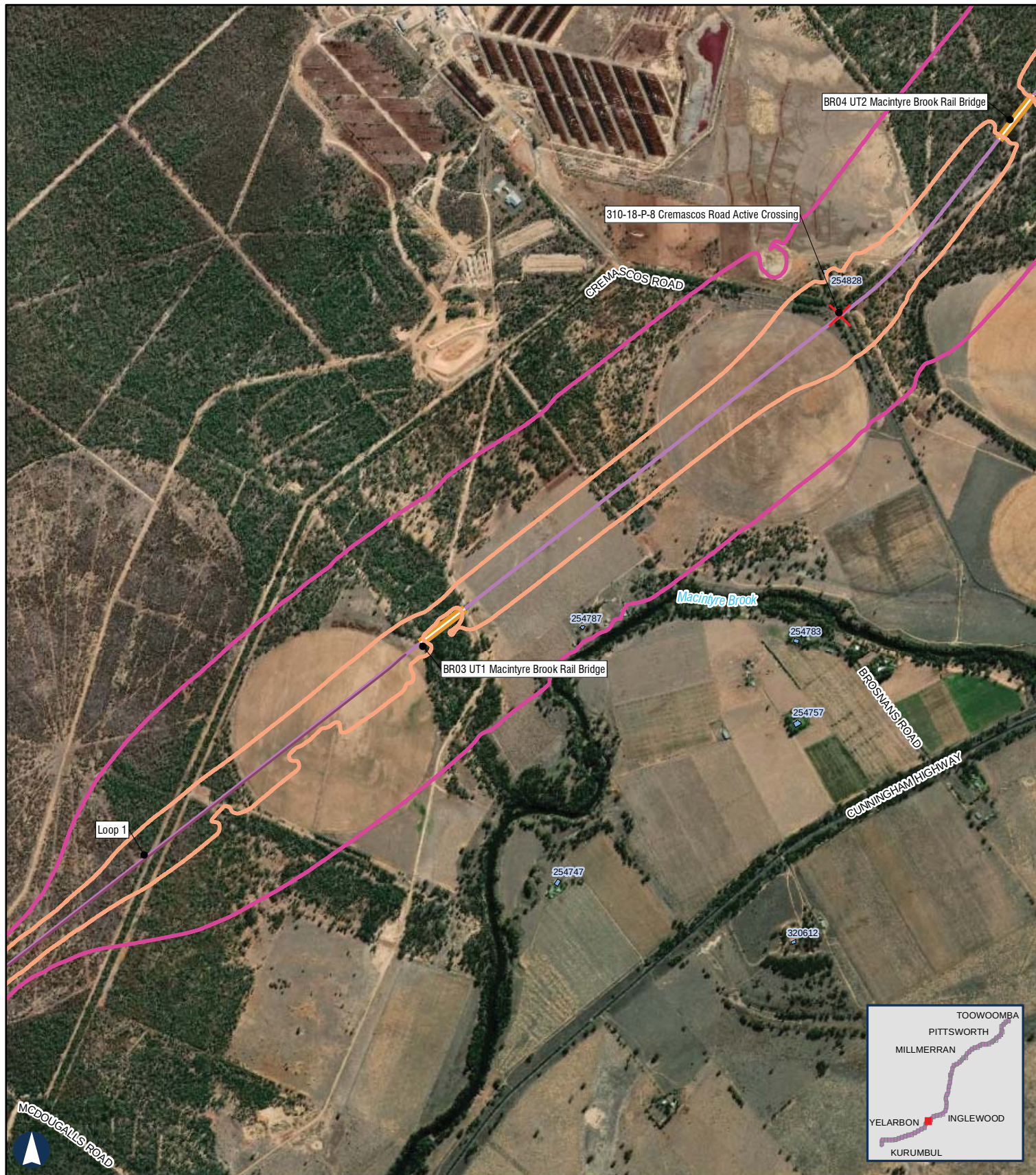
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 17 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

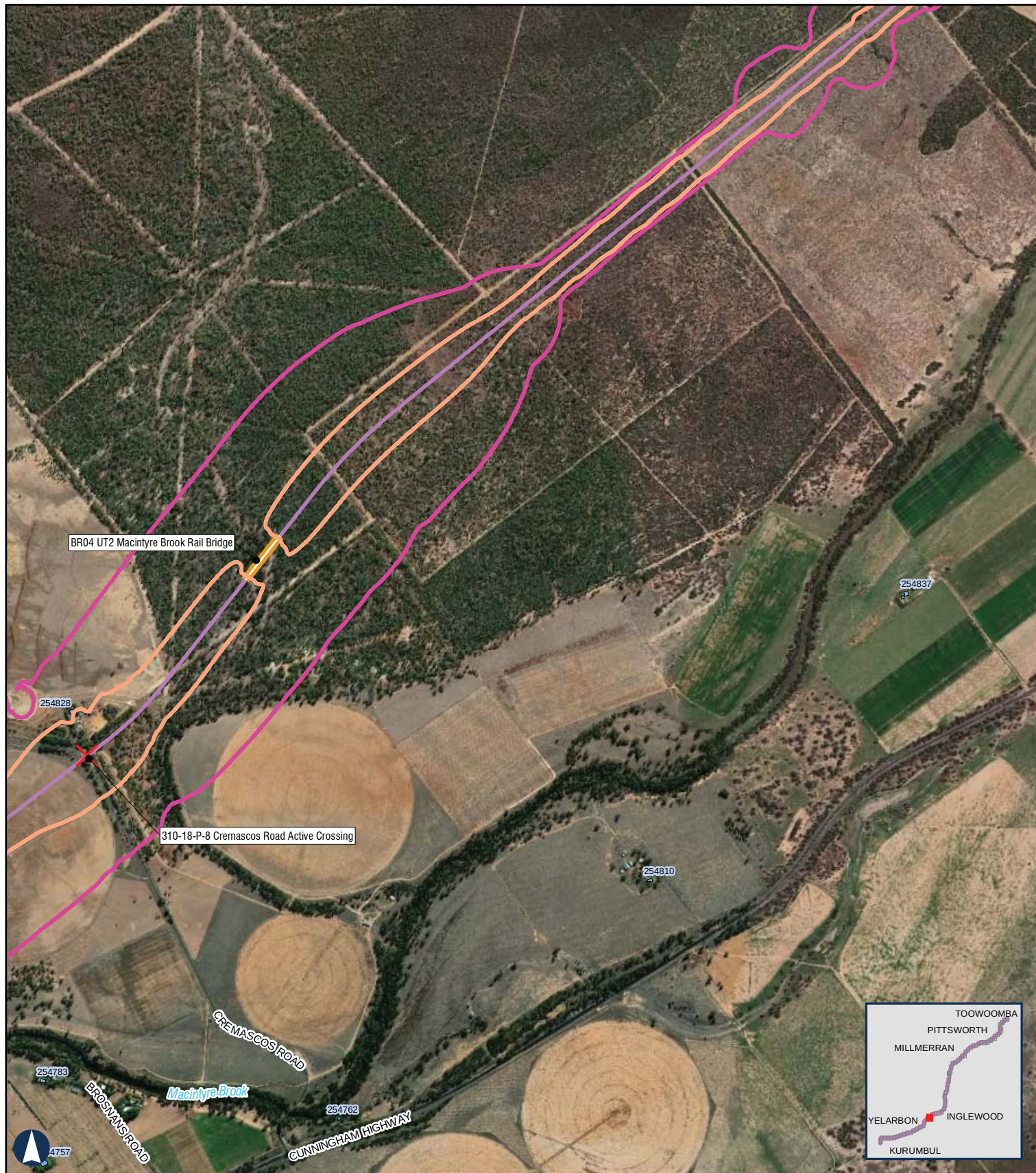
— Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 18 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

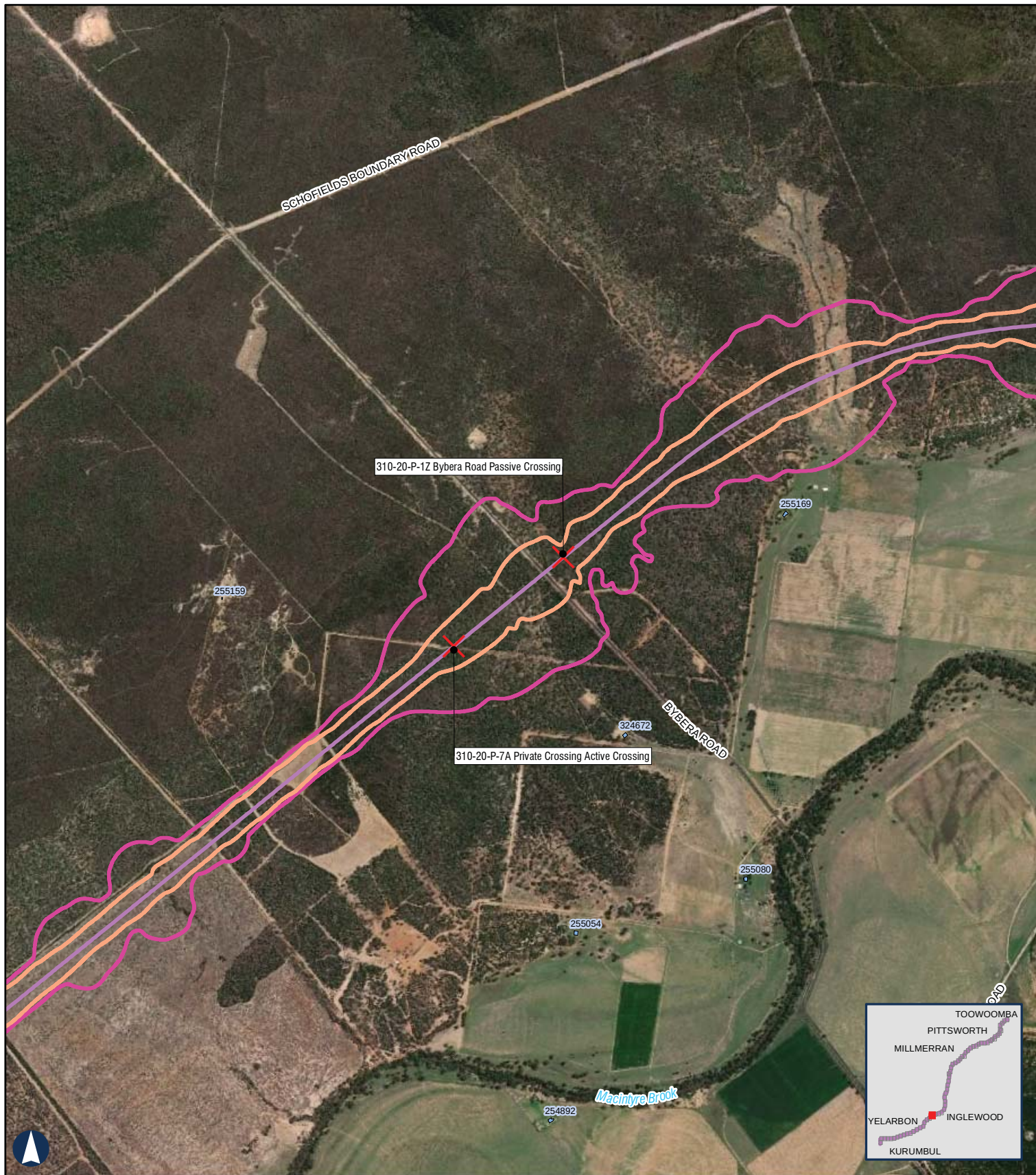
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 19 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

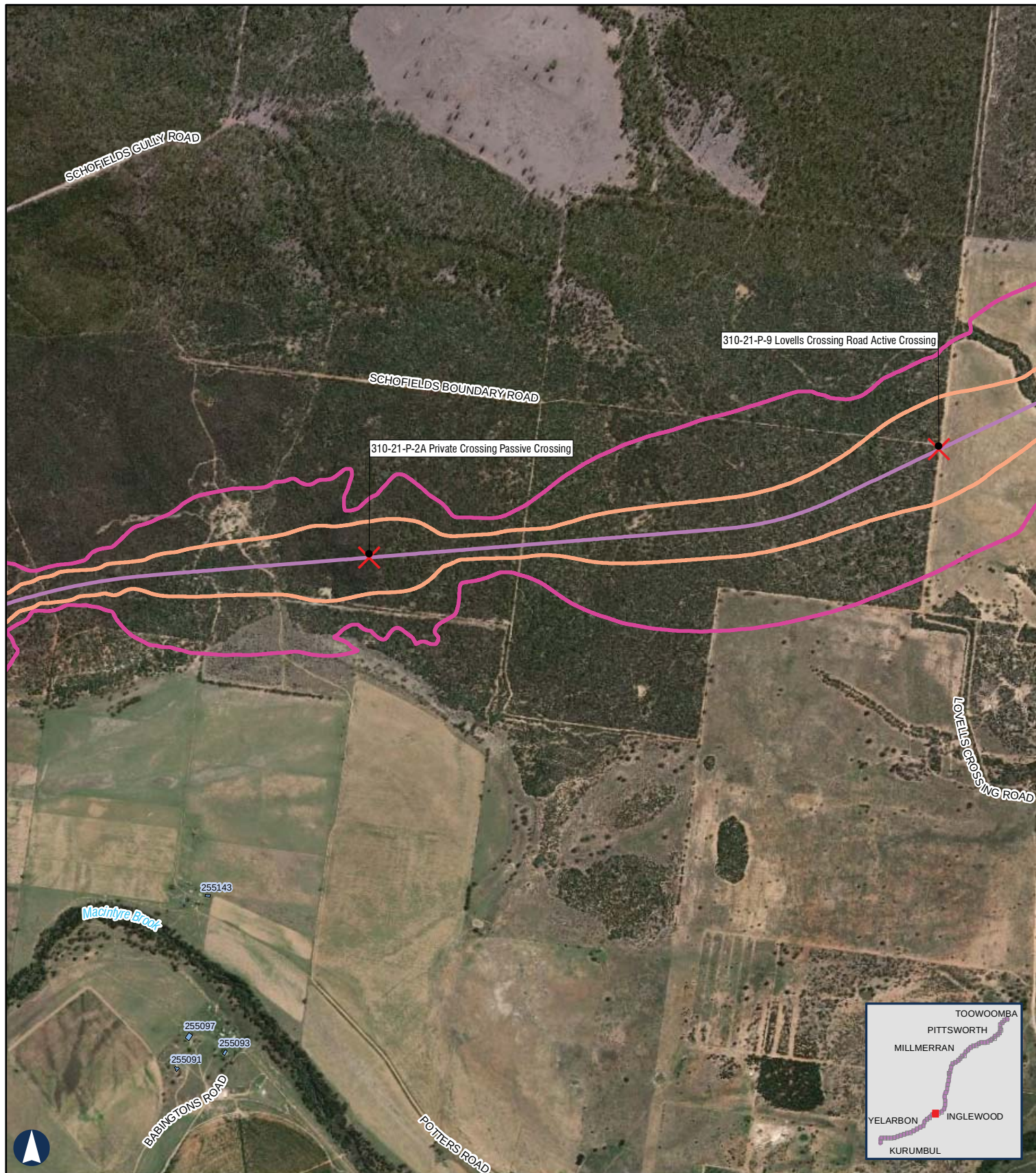
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 20 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

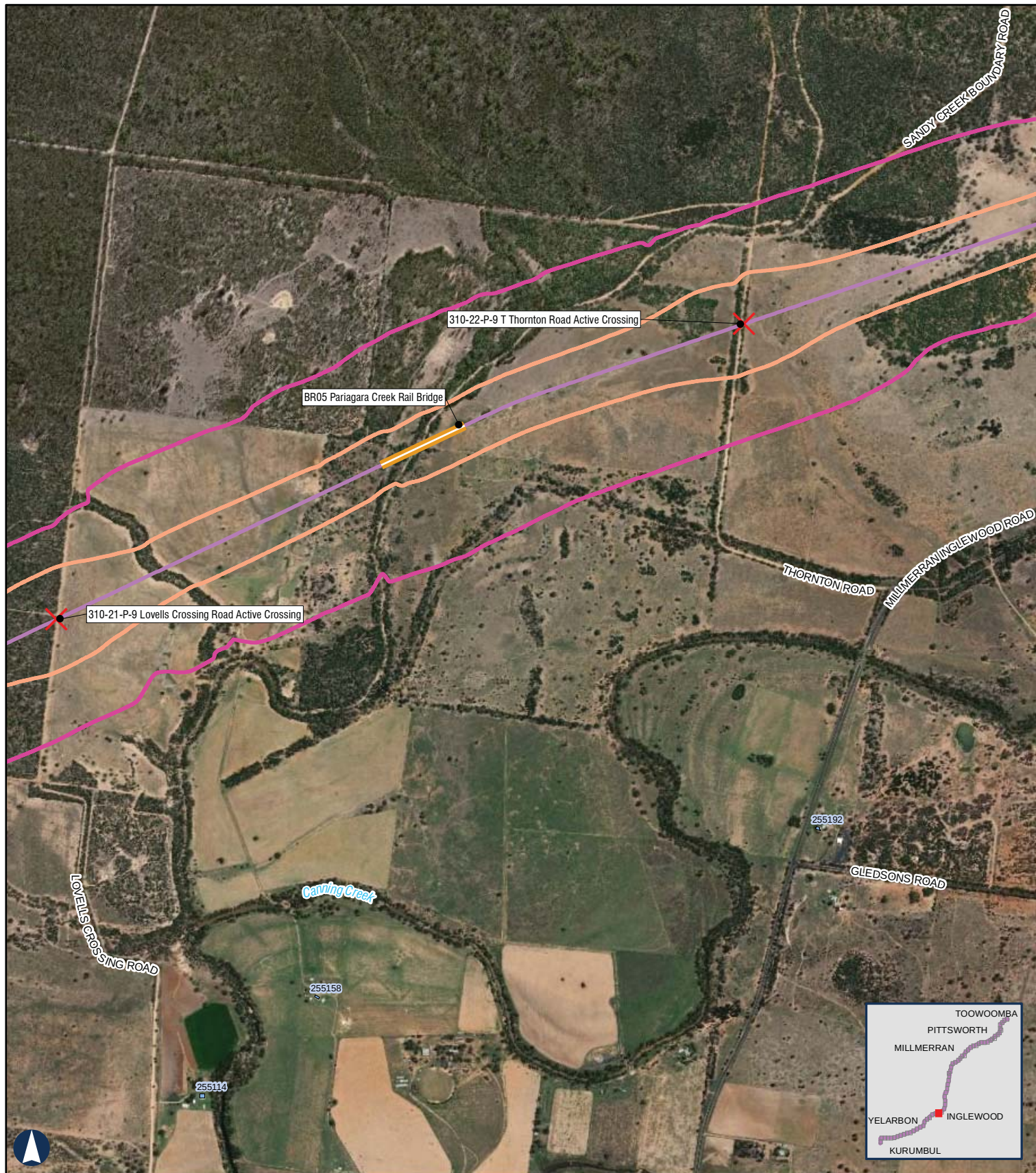
Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

Noise contours are based on a set distance
above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 21 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

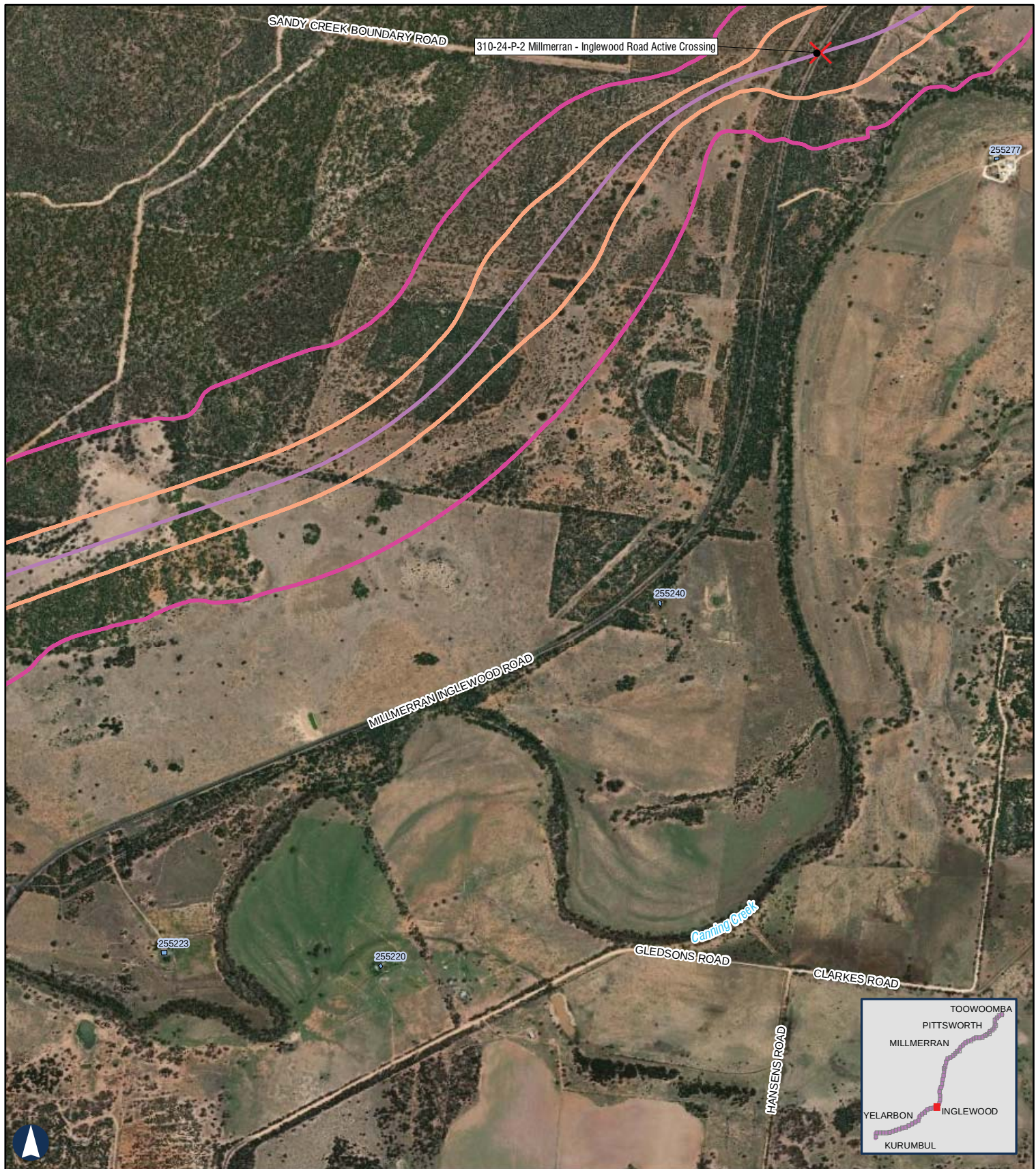
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 22 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

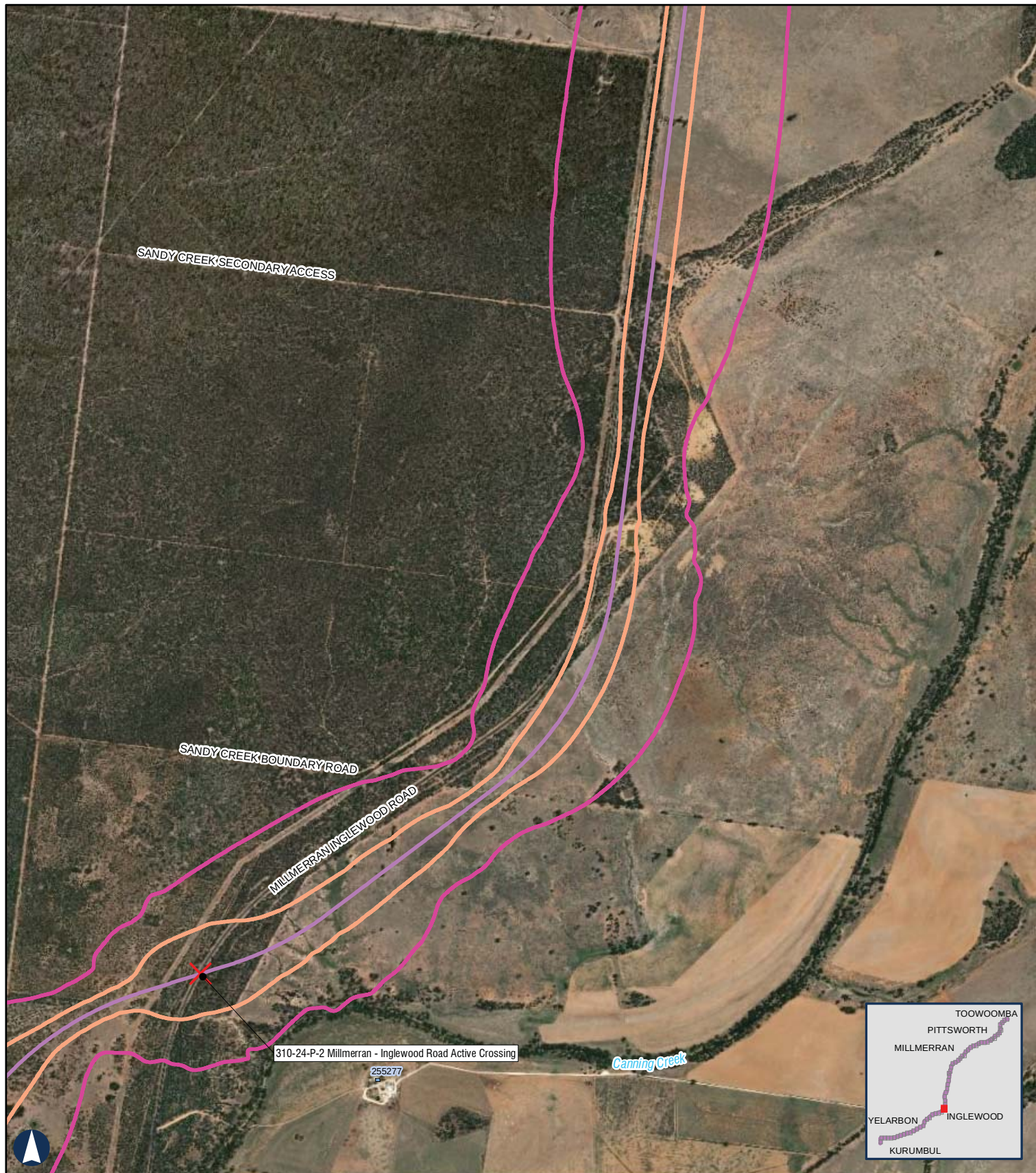
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 23 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

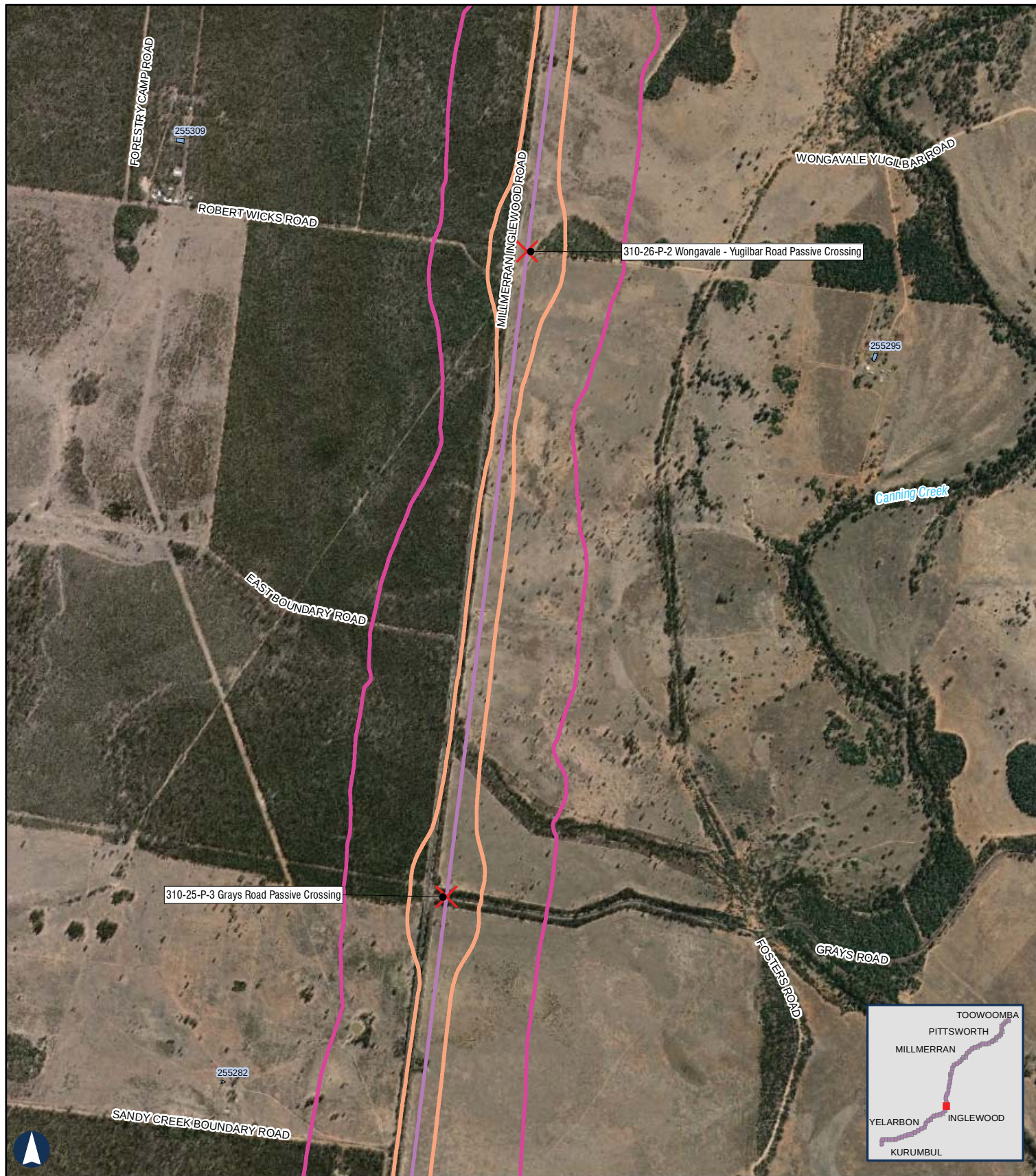
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 24 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

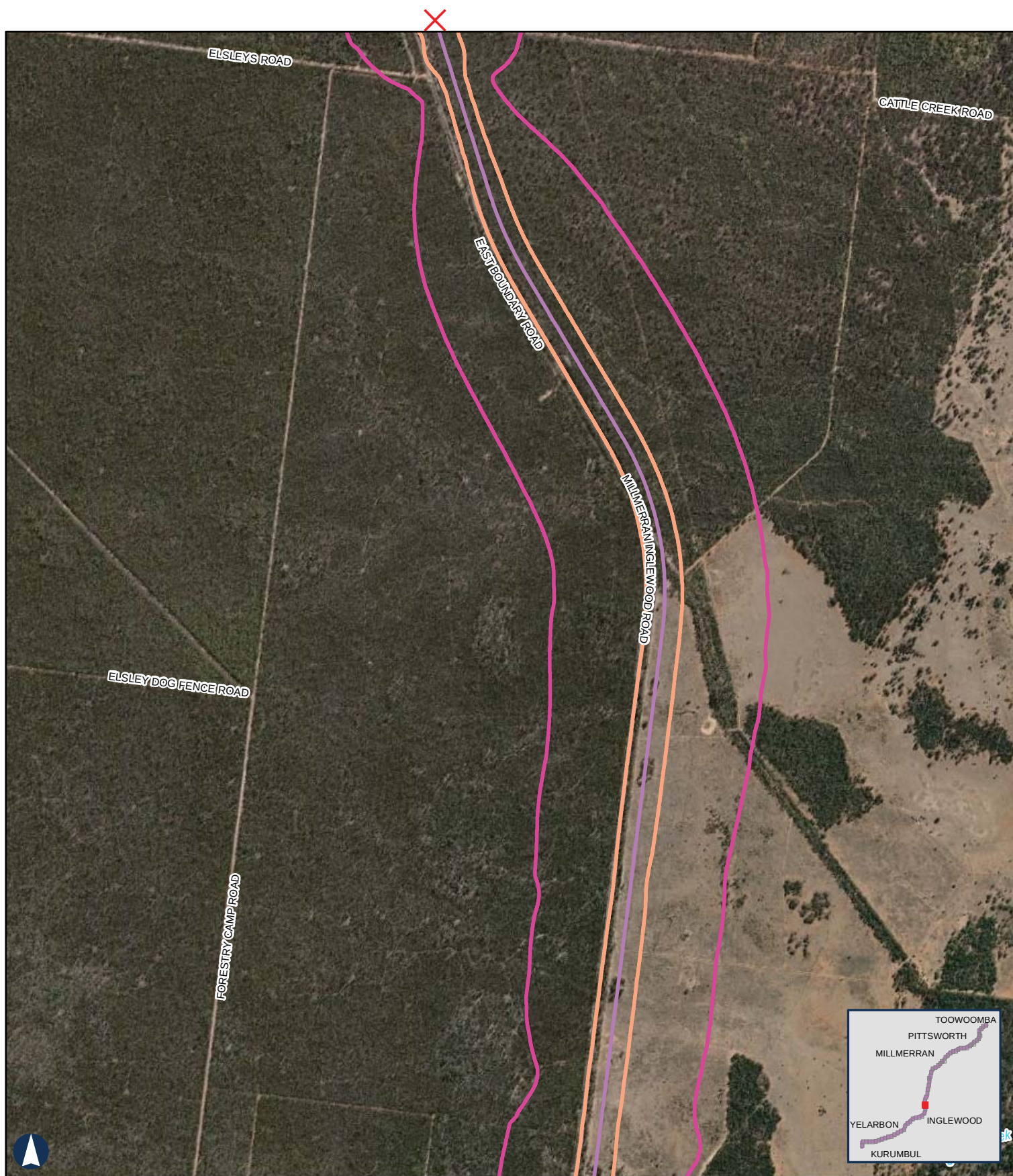
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 25 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

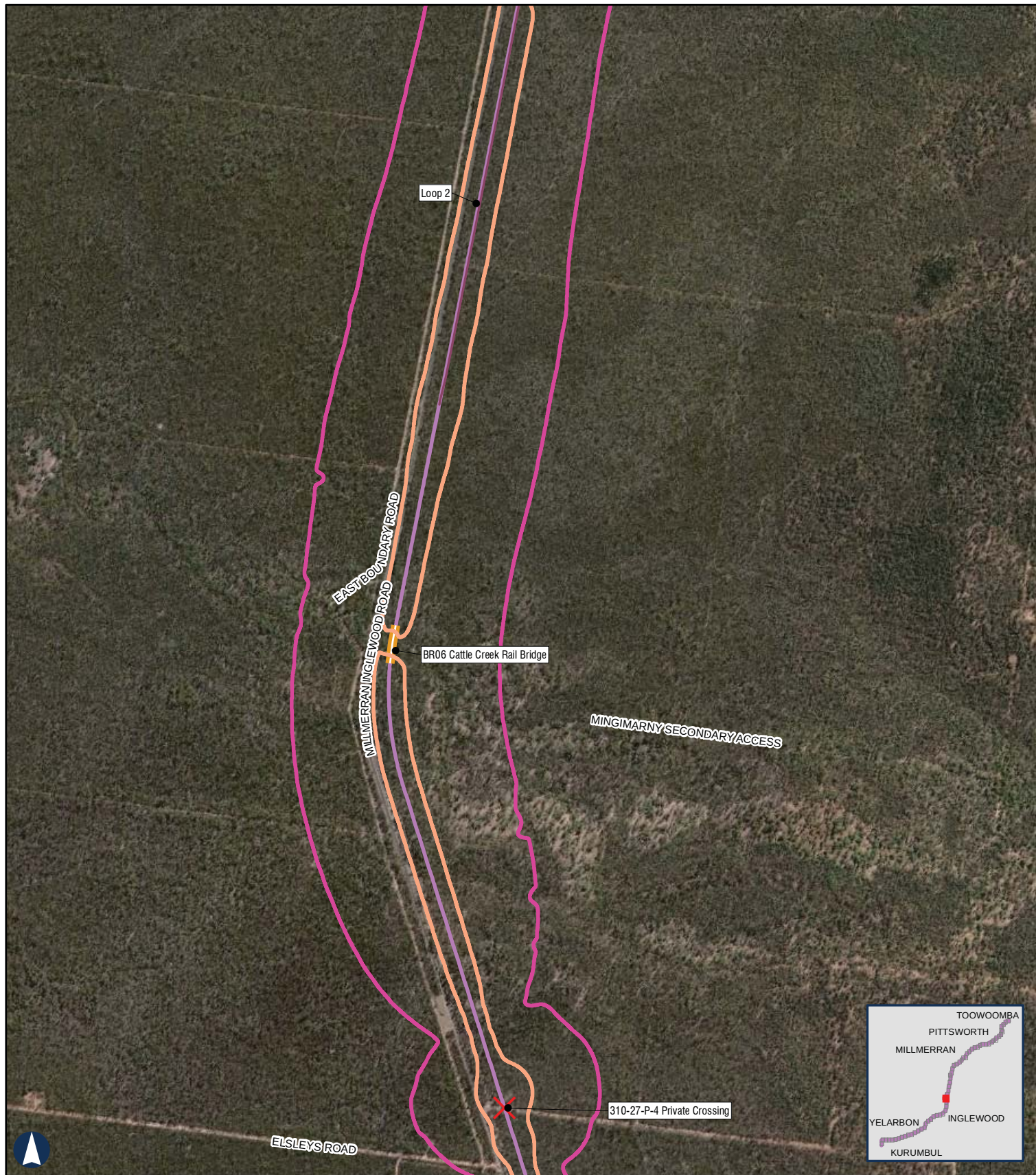
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 26 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

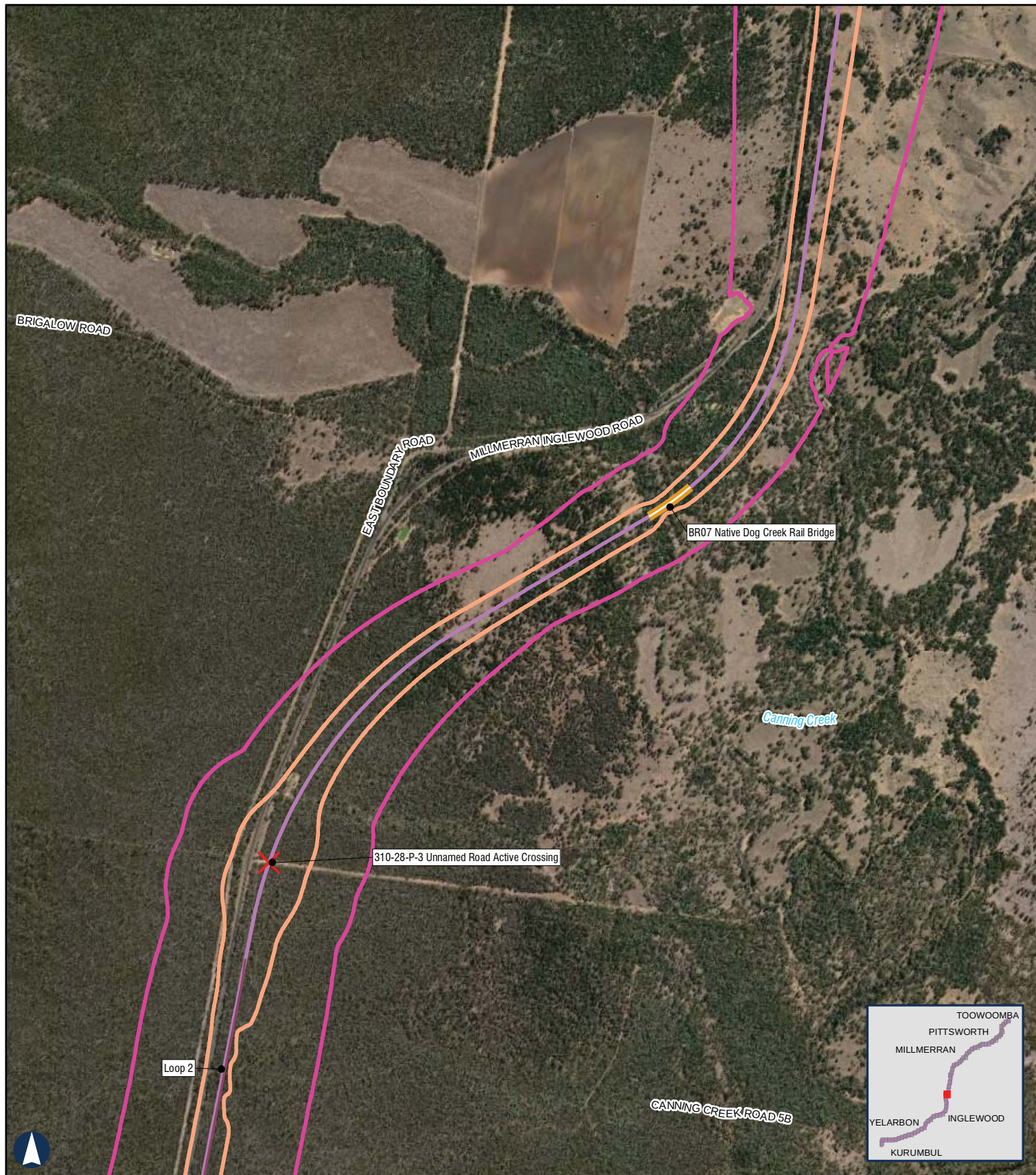
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 27 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

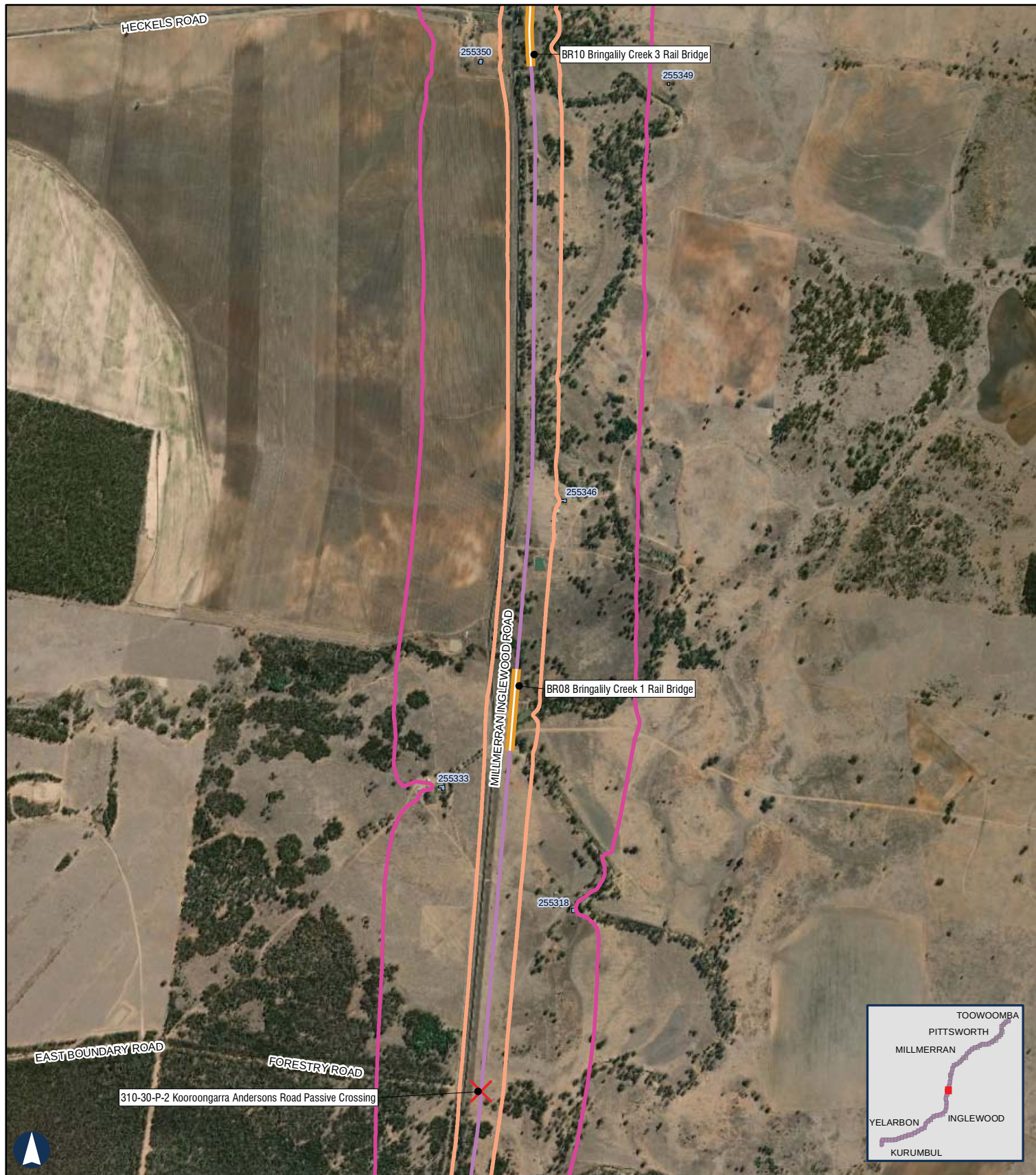
— Daytime noise criteria LA max
80dBA New rail corridor

— Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 28 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

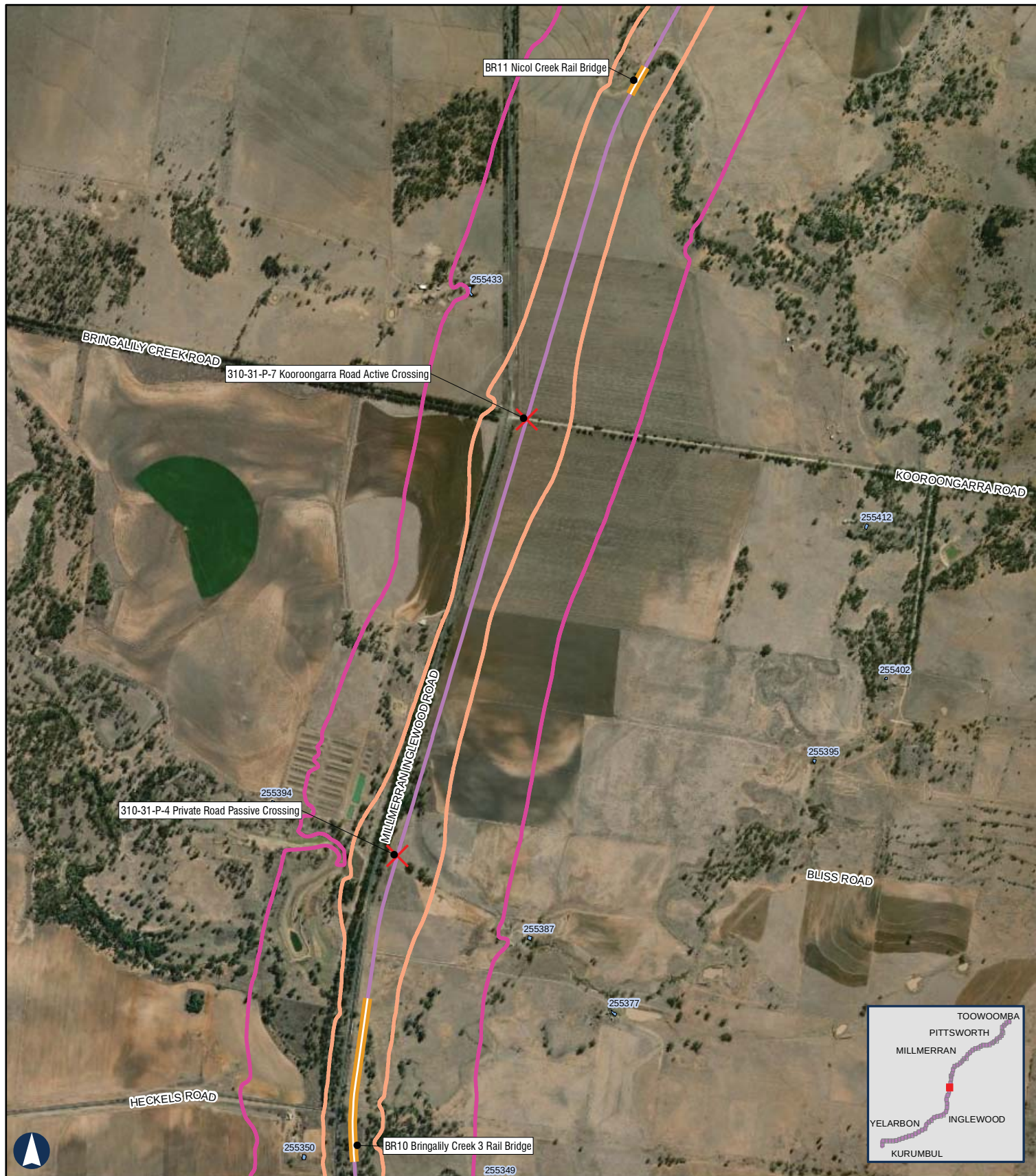
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 29 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

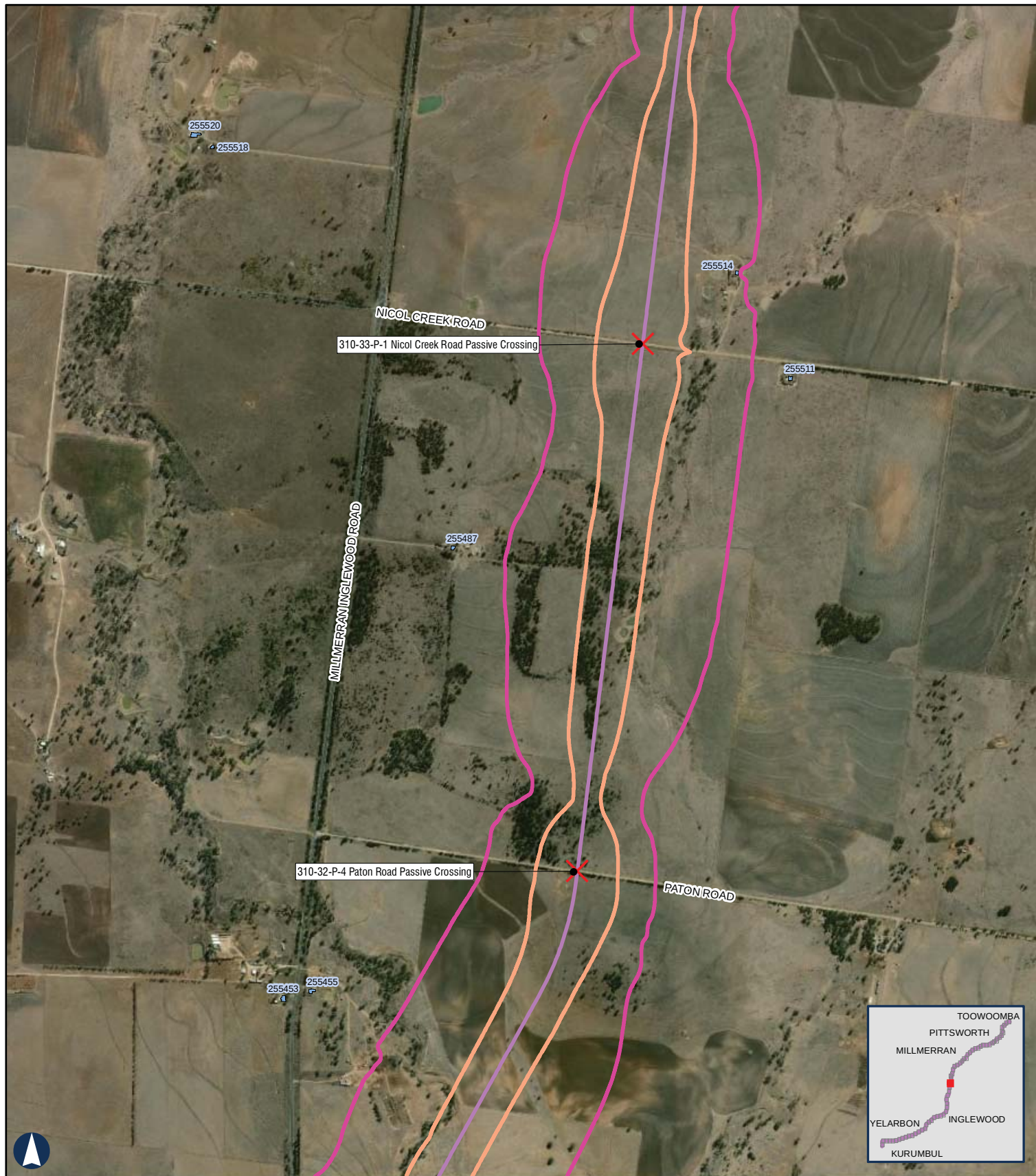
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 30 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

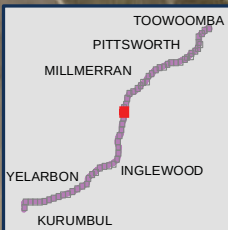
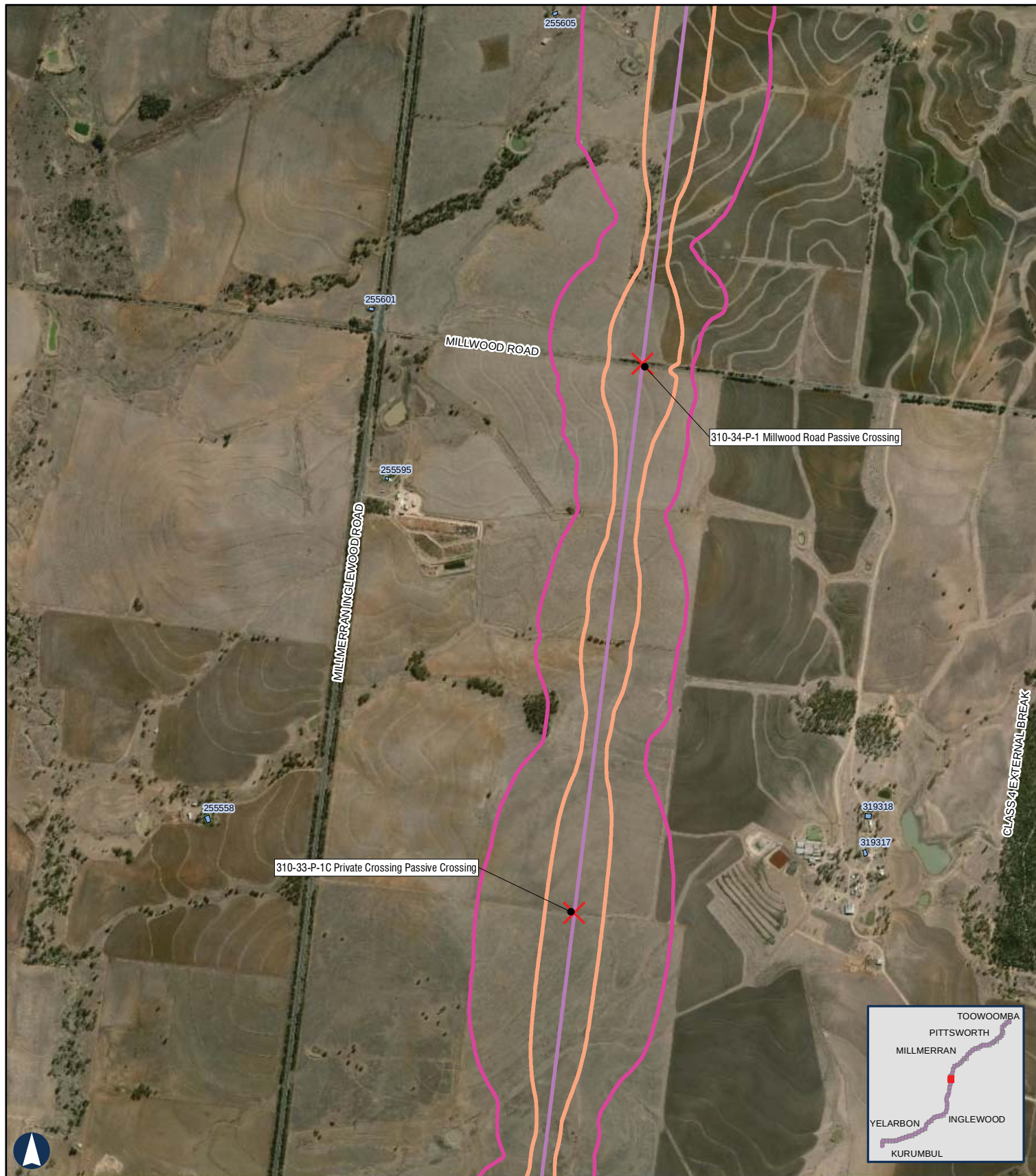
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 31 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria L_{Aeq}15hr 60dBA New rail corridor

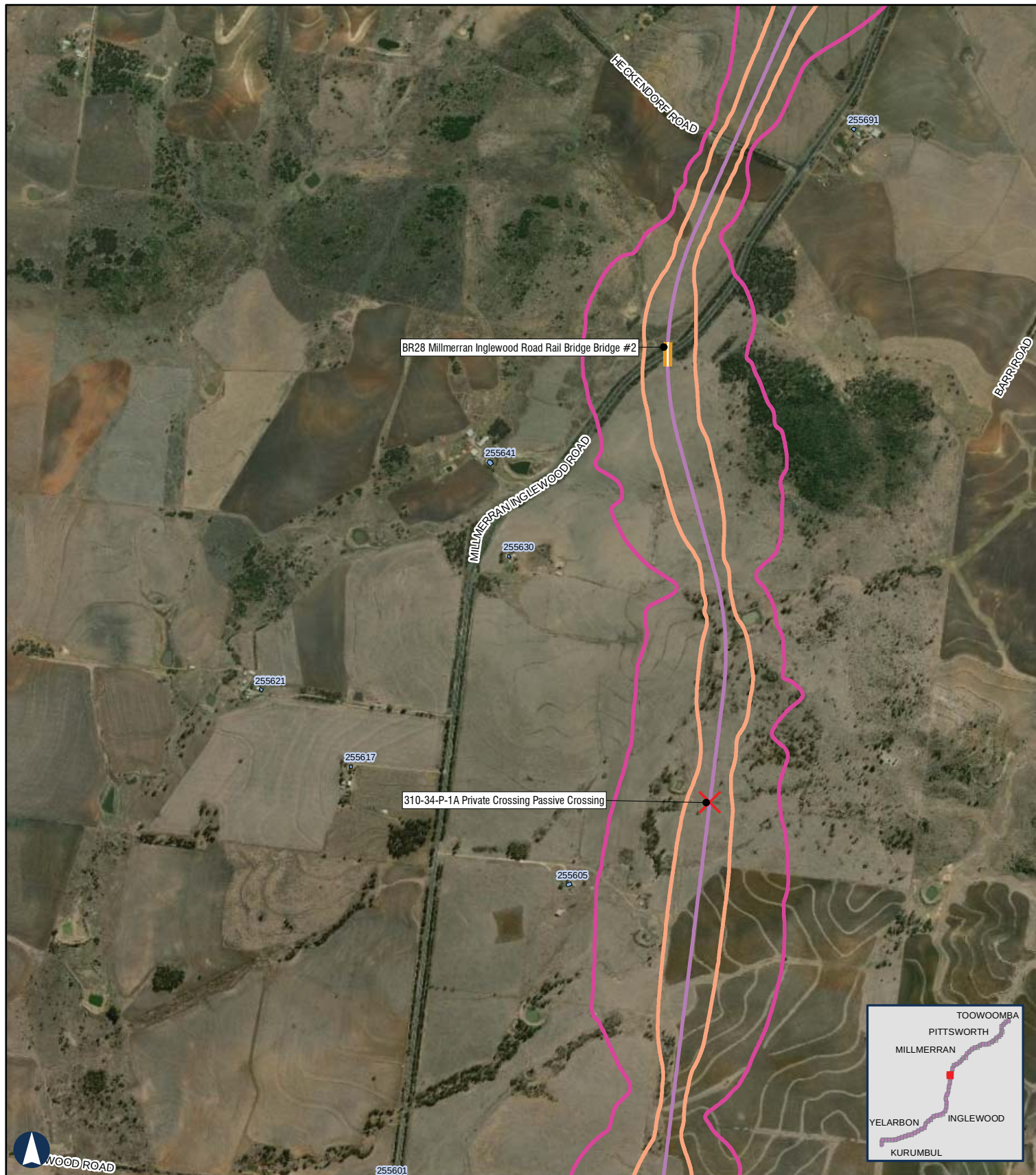
— Daytime noise criteria L_A max 80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 32 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

Daytime noise criteria LAeq15hr
60dBA New rail corridor

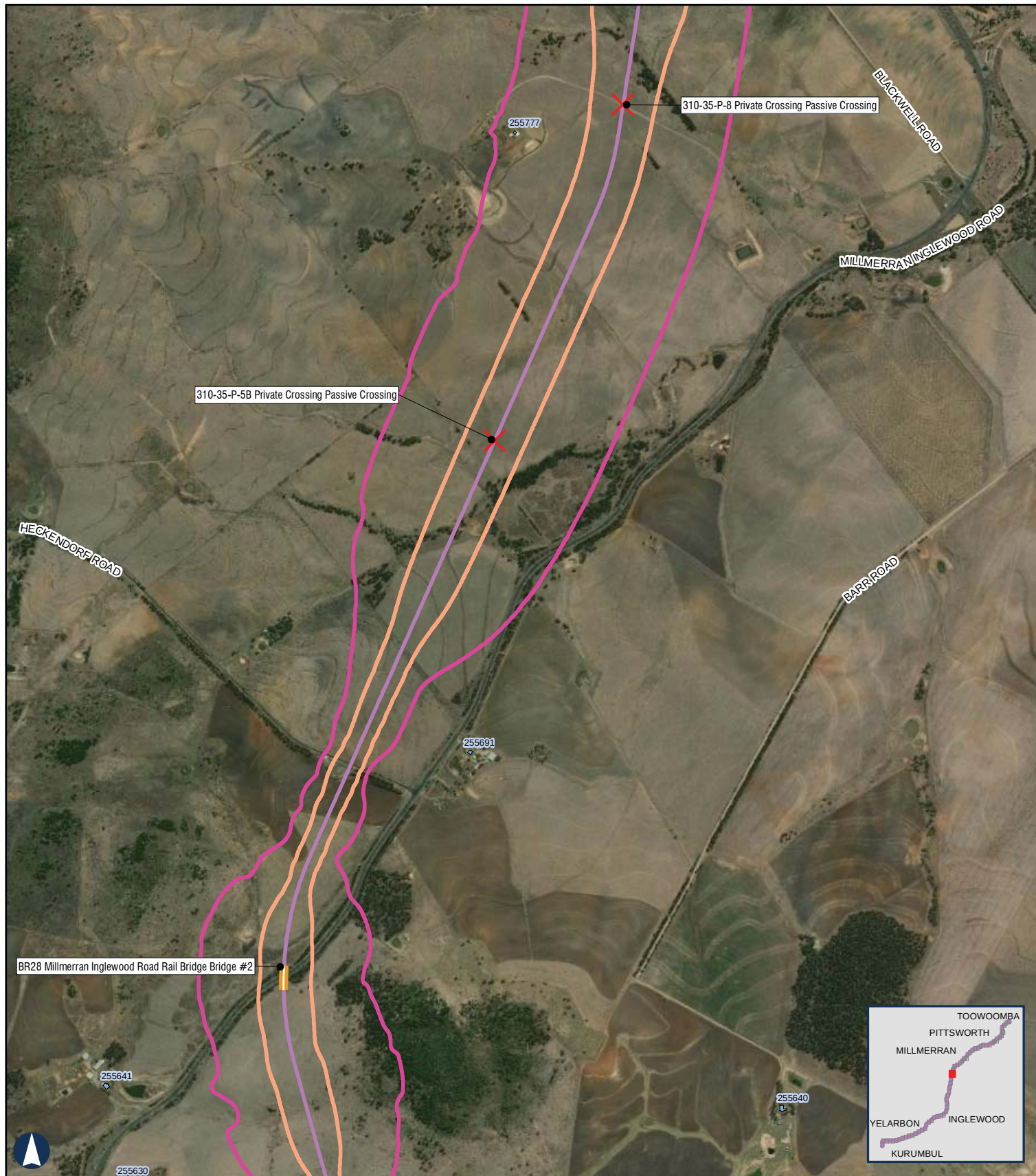
Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 33 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

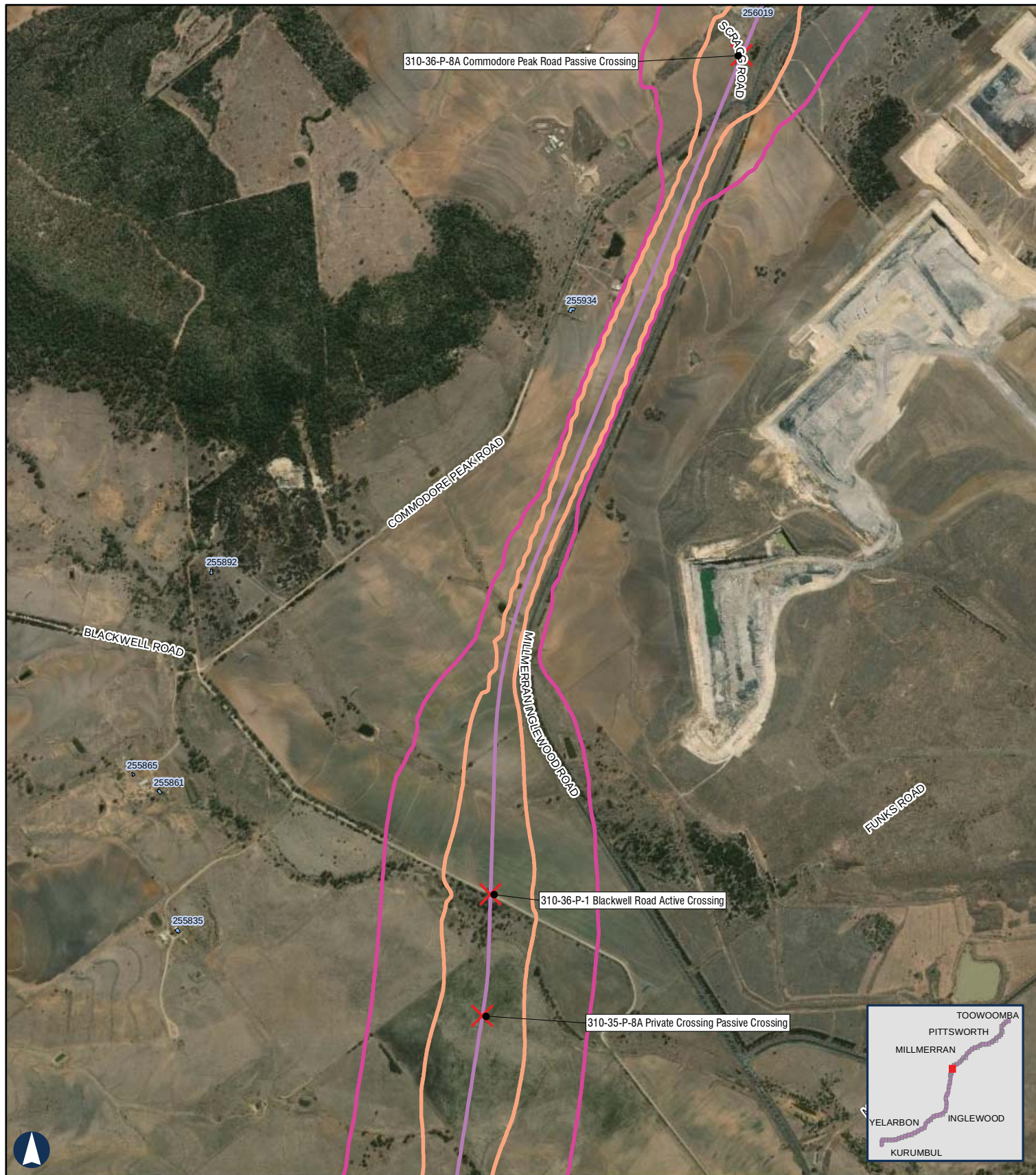
— Daytime noise criteria LA max
80dBA New rail corridor

— Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 34 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

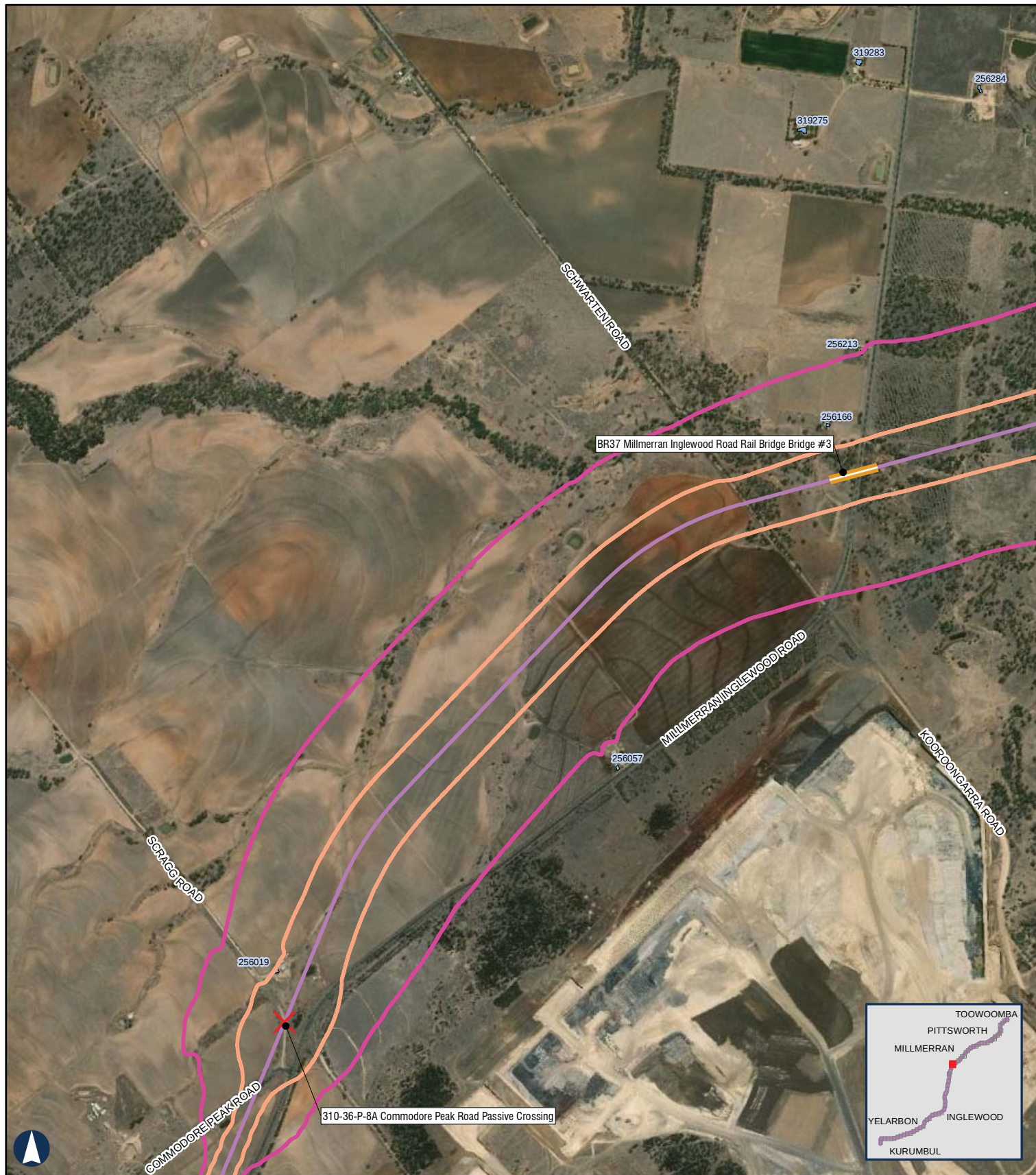
— Daytime noise criteria LA max
80dBA New rail corridor

— Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 35 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

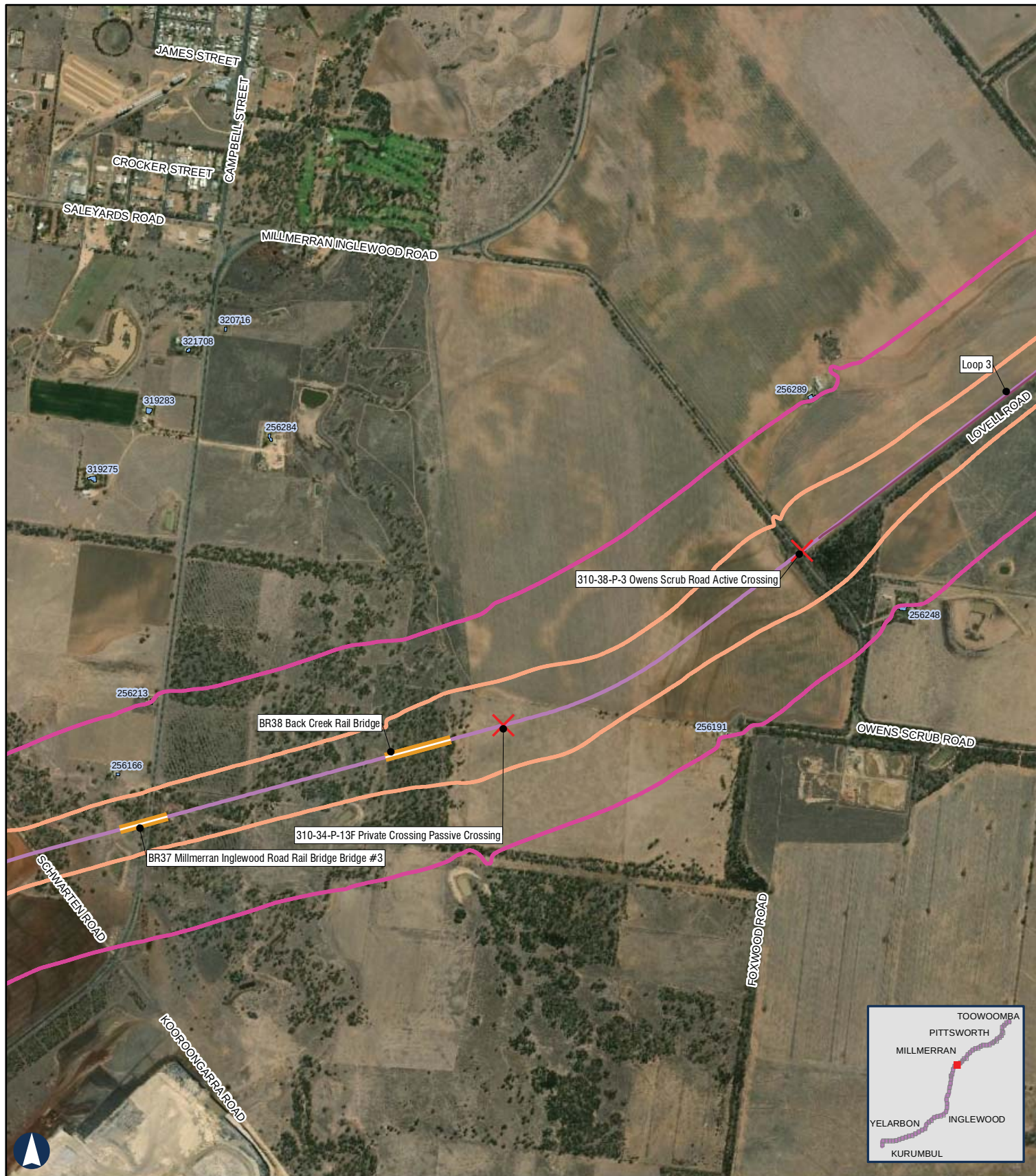
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 36 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4

Scale: 1:20,000

Date: 02-Jun-2020

Author: JG

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

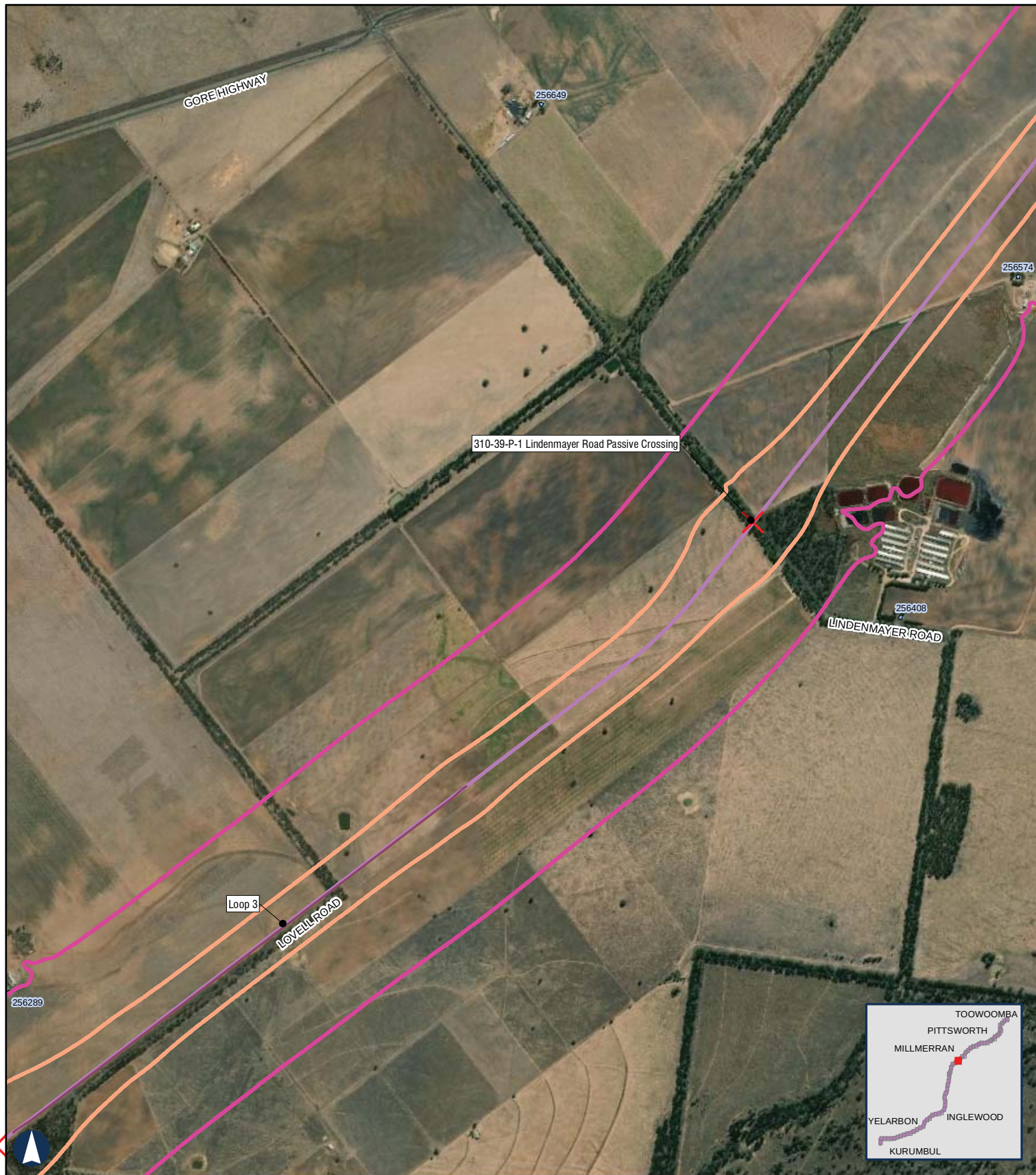
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 37 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

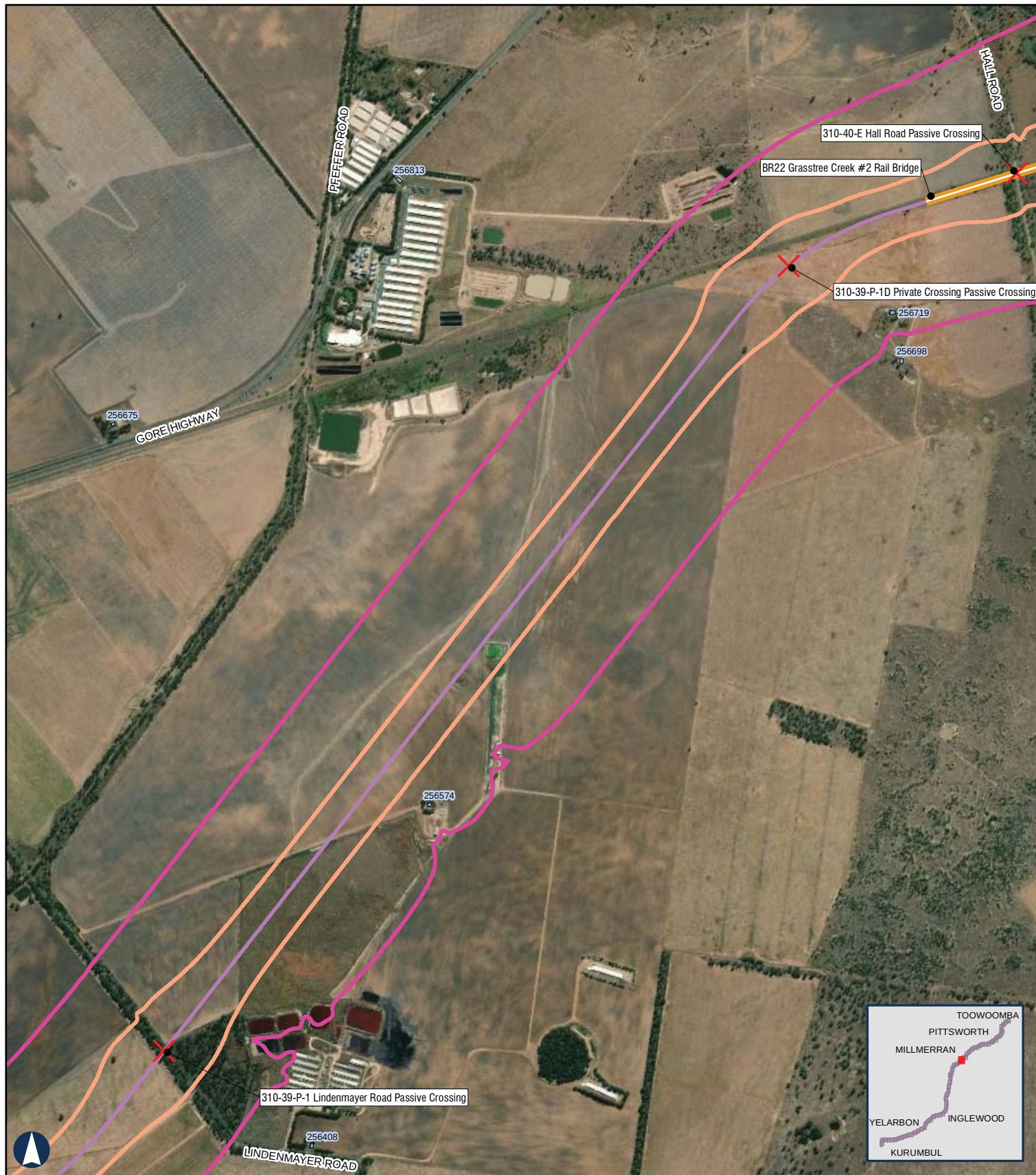
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 38 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

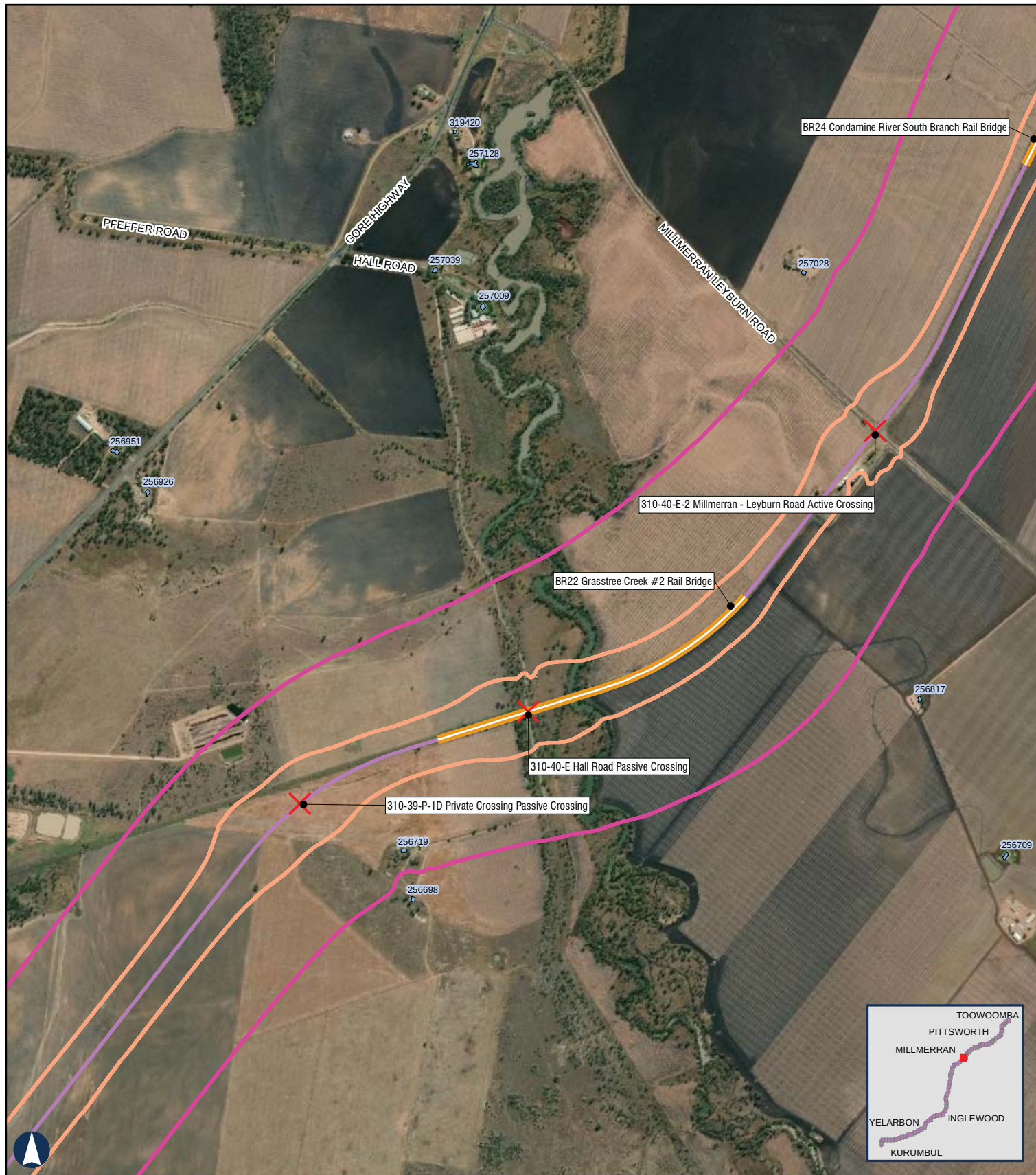
Paper: A4
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Author: JG

Scale: 1:20,000

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 39 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

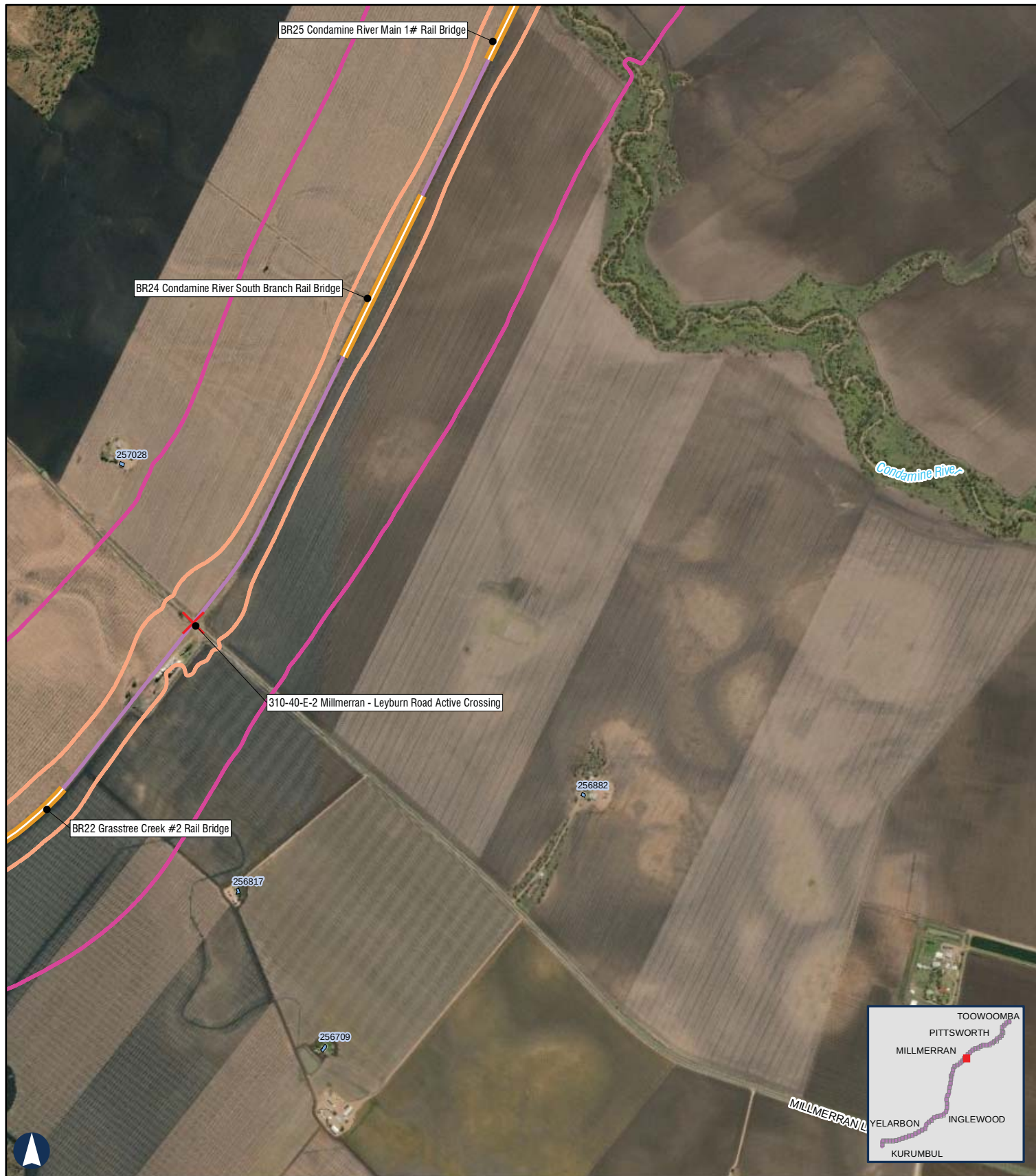
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 40 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

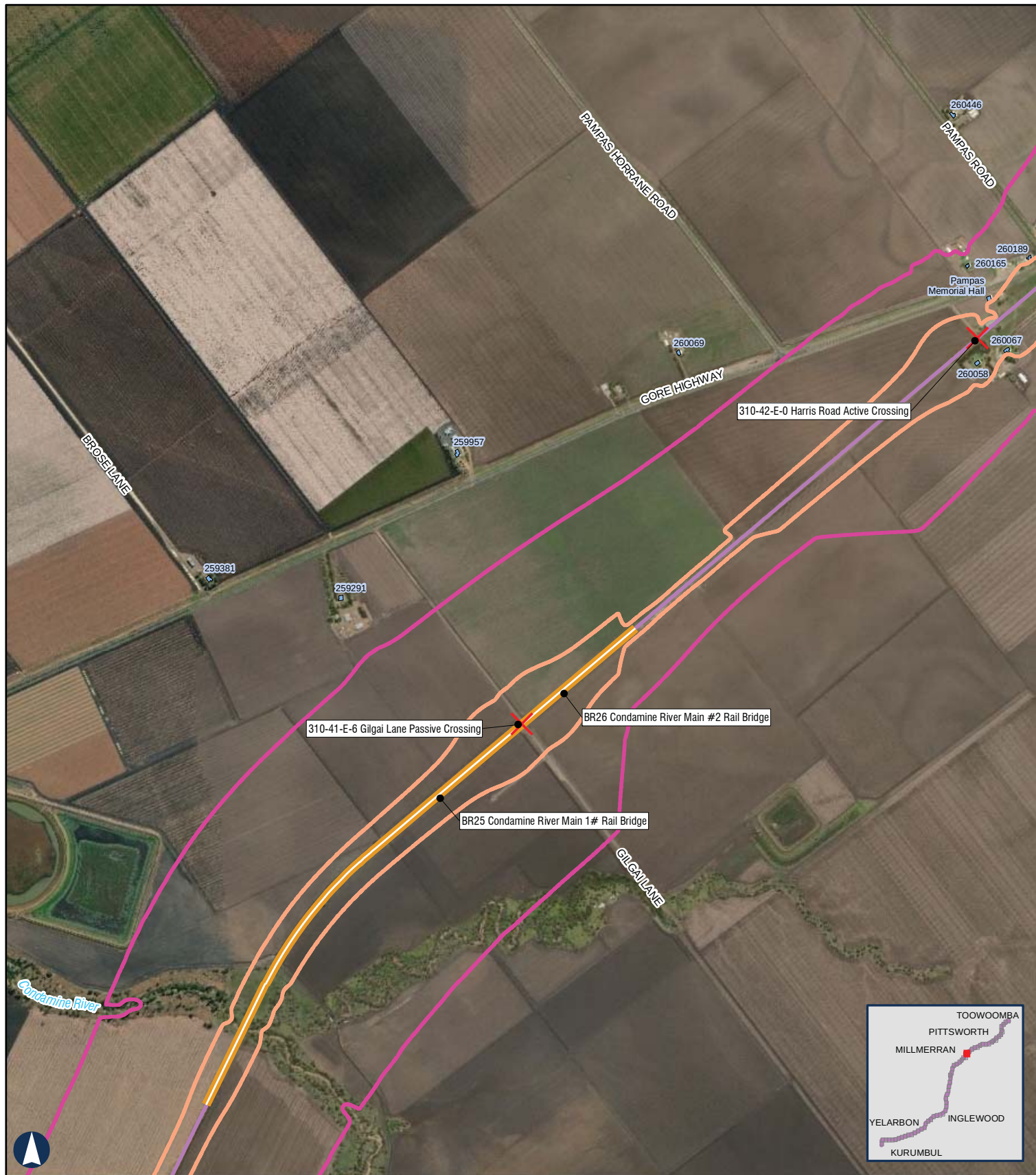
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 41 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 42 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

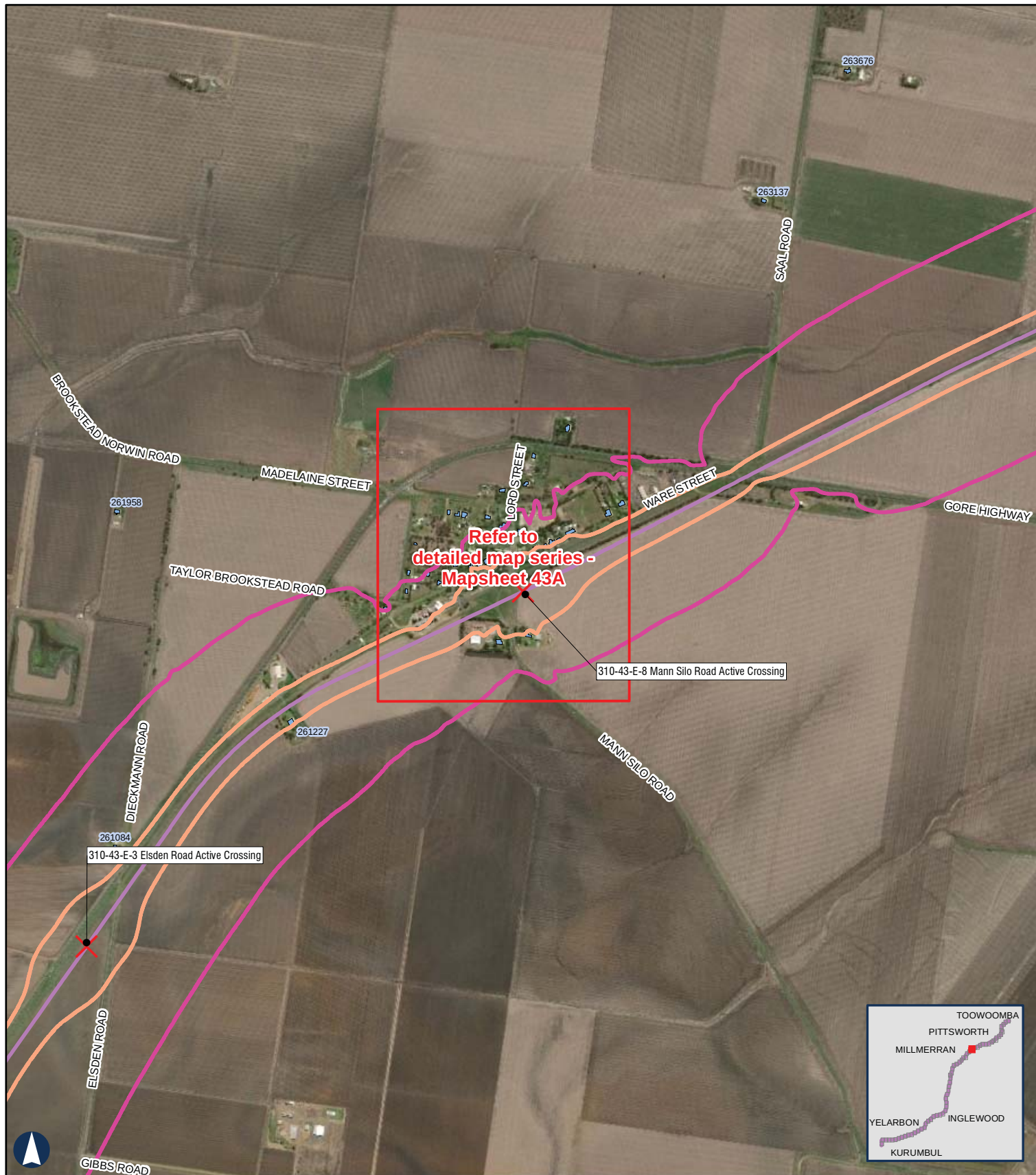
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 43 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Year 2026 Daytime rail noise levels - Detailed

APPENDIX D - Mapsheet 43A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:5,500

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

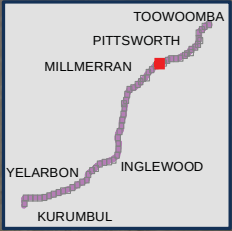
Noise contours are based on a set distance above the local terrain level of 2.4m.

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor



ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 44 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

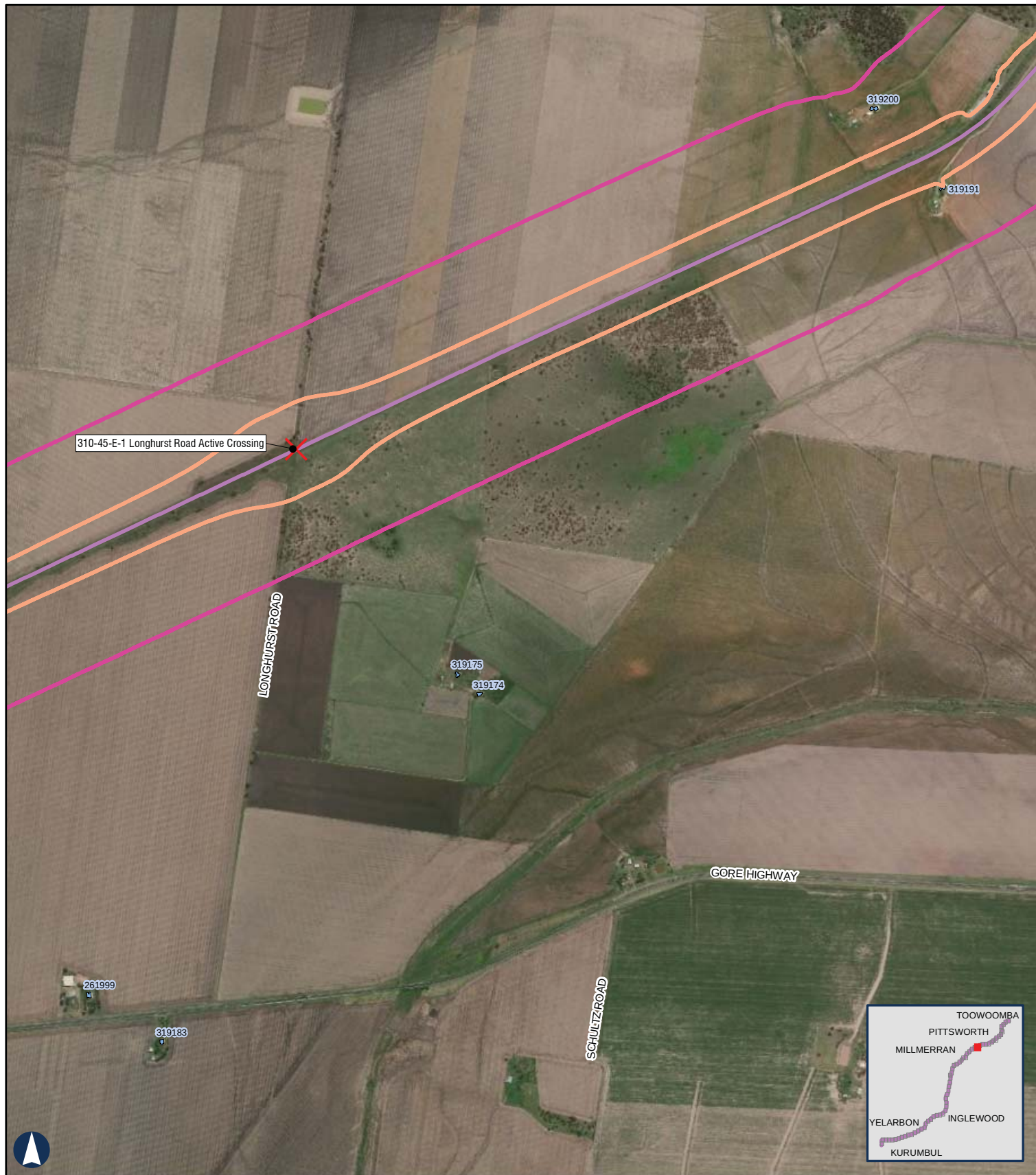
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 45 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

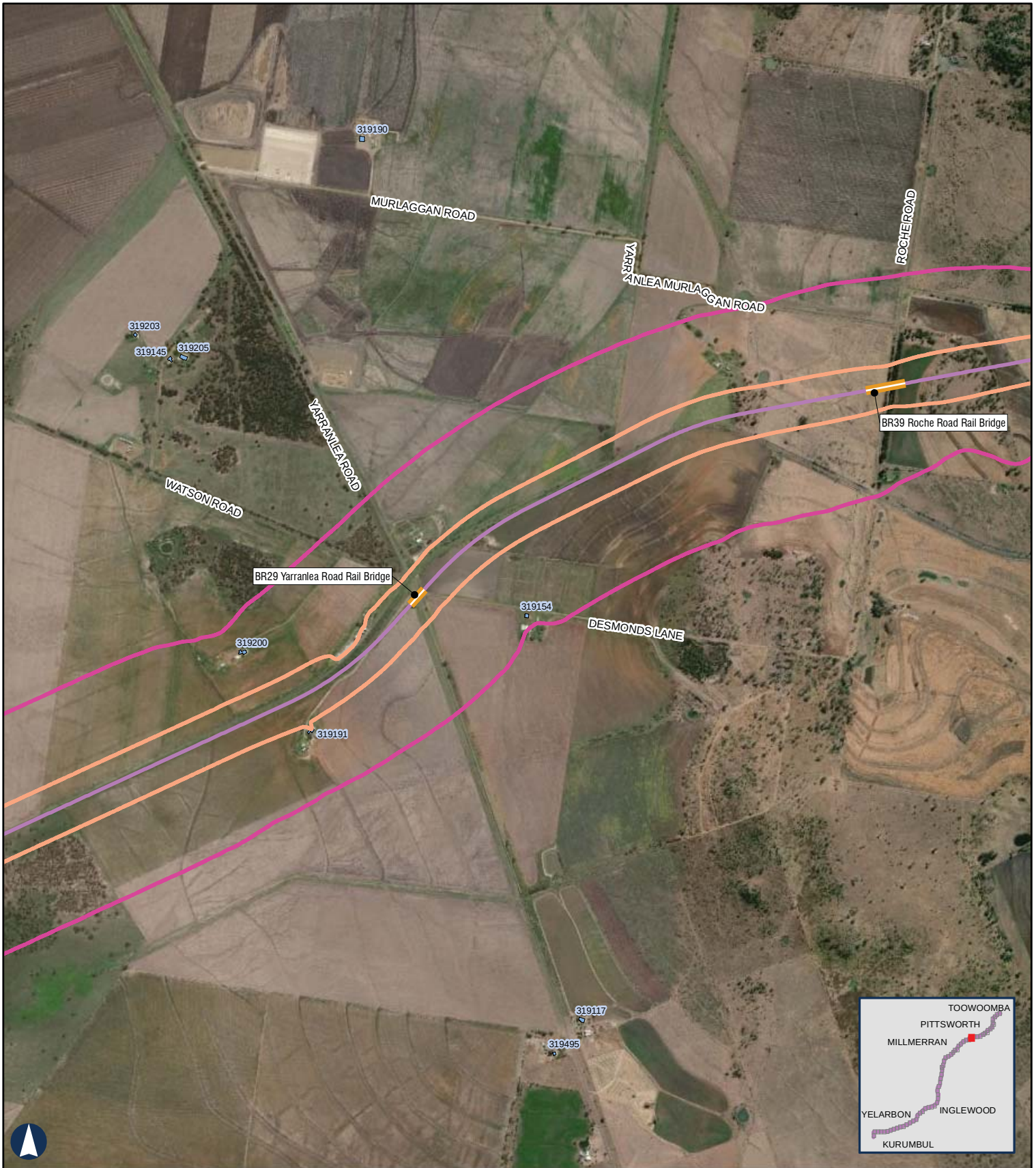
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 46 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

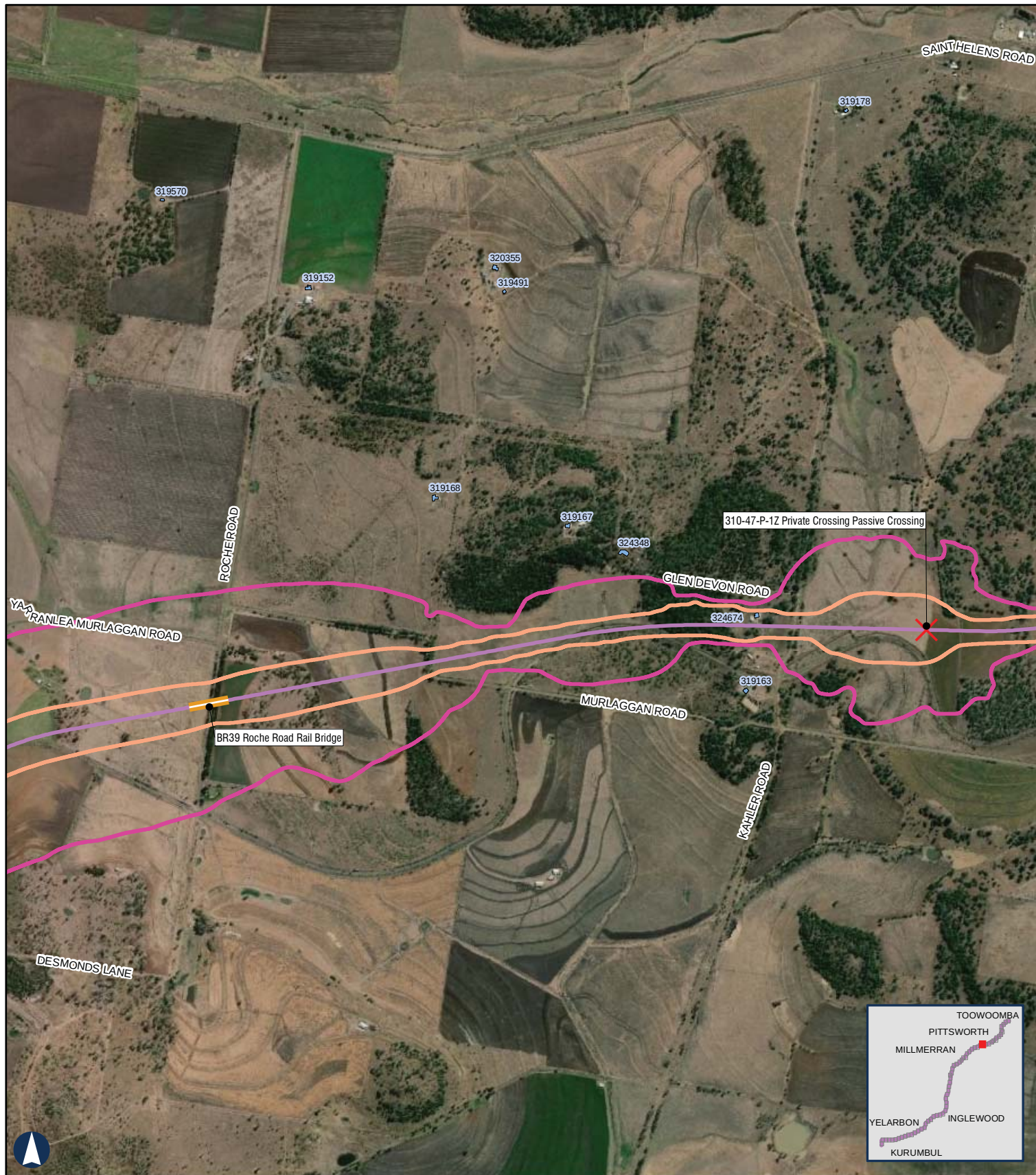
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 47 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

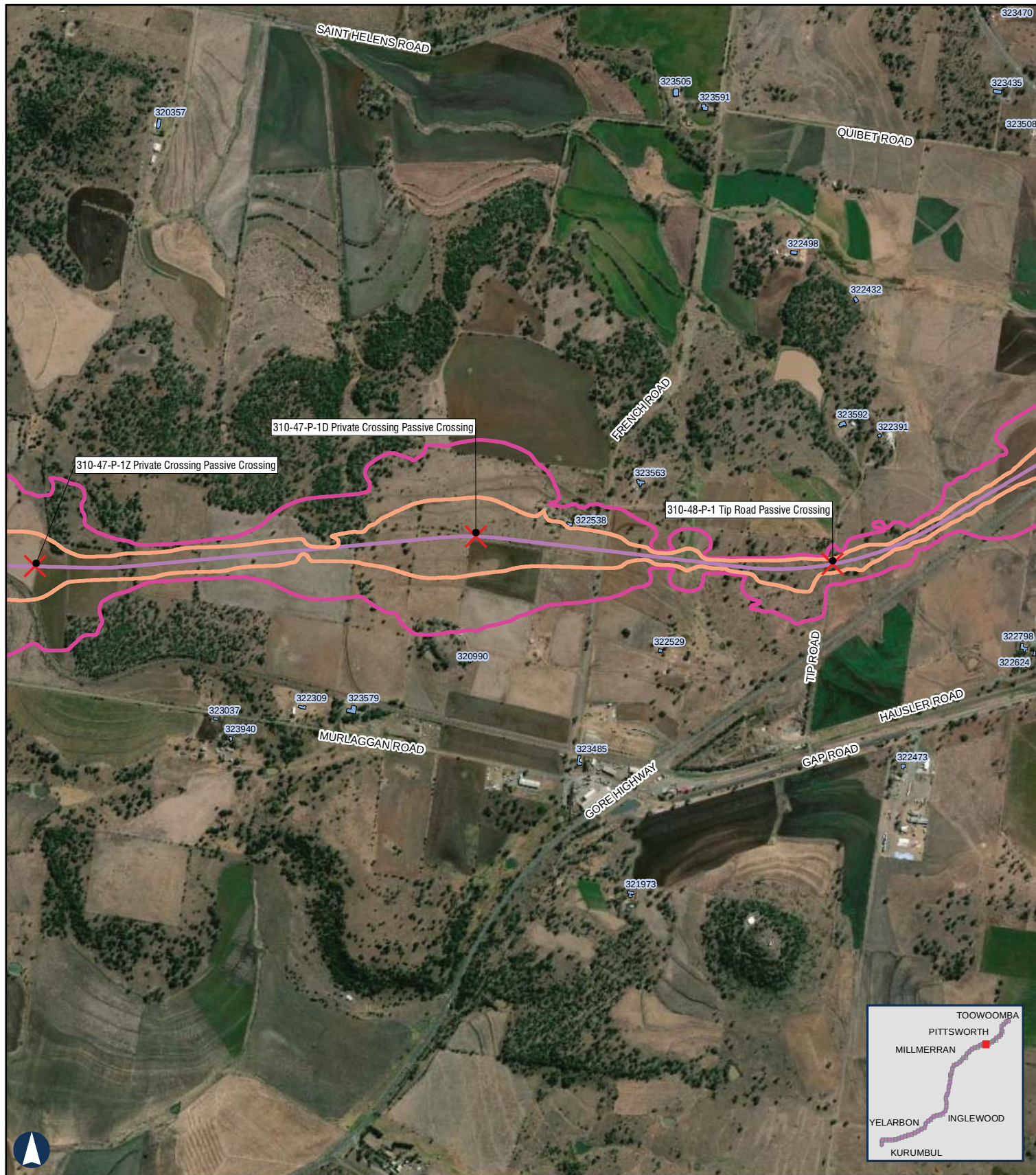
— Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 48 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

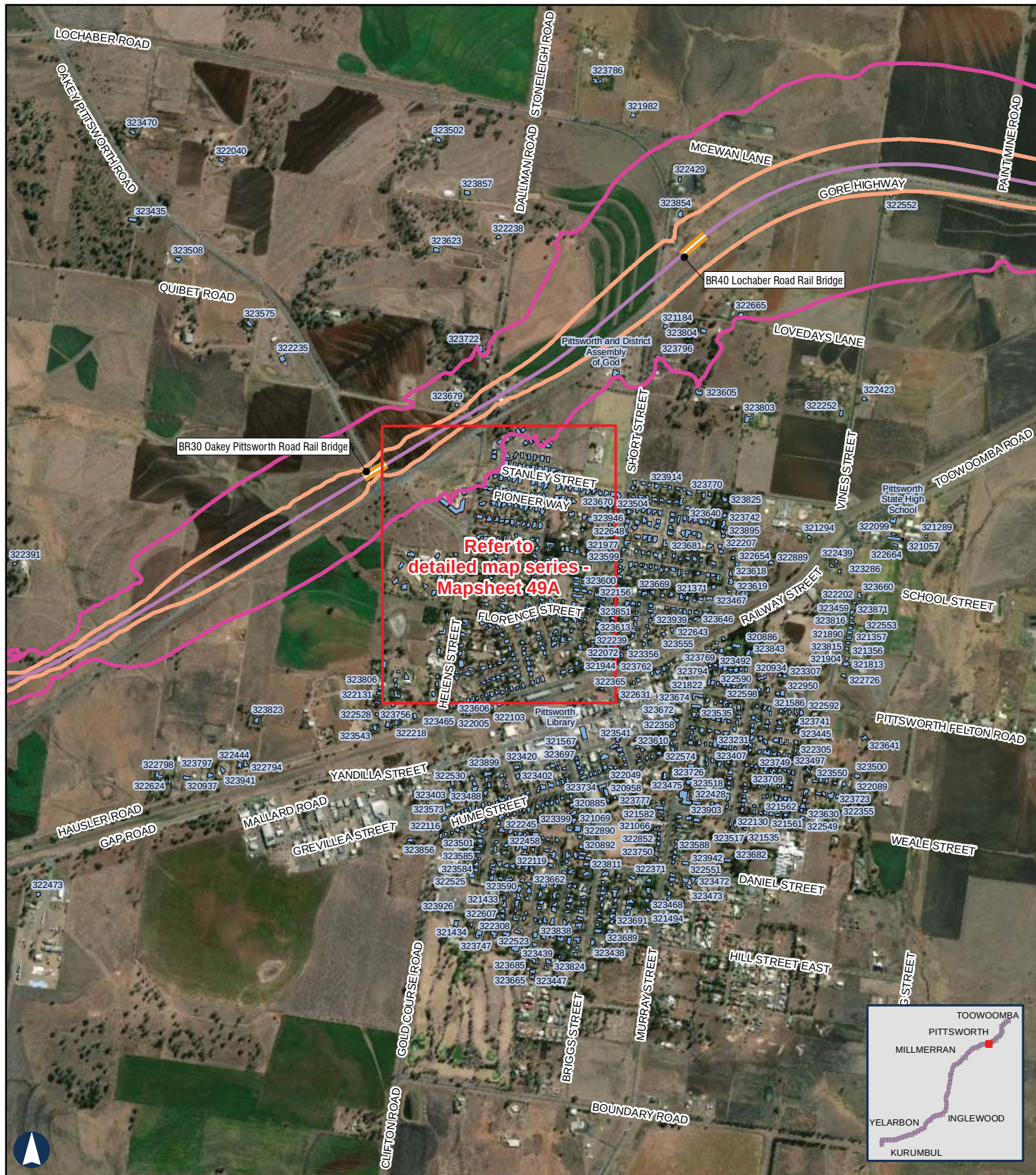
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 49 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels - Detailed

APPENDIX D - Mapsheet 49A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:5,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

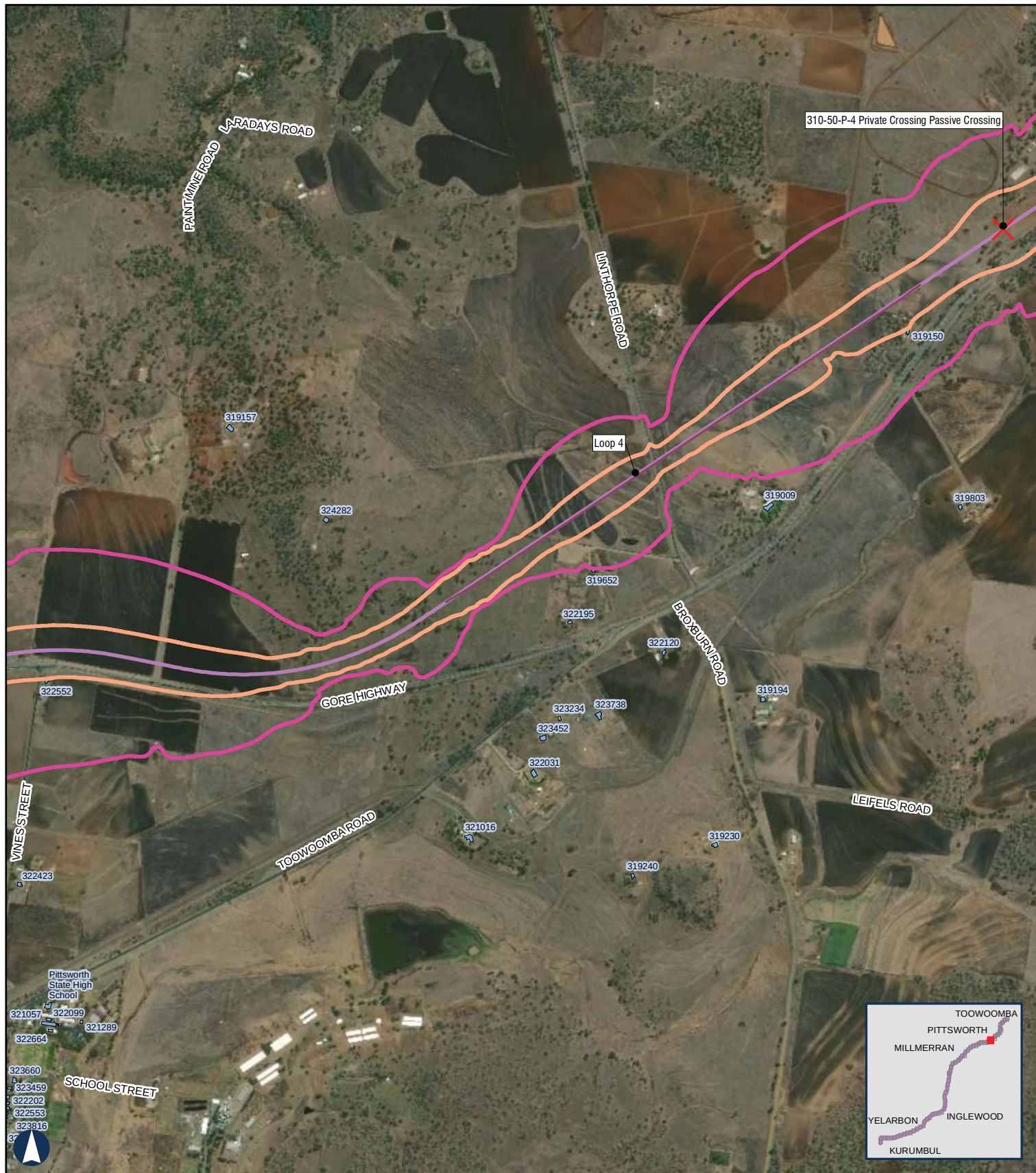
Noise contours are based on a set distance above the local terrain level of 2.4m.

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor



ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 50 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4

Scale: 1:20,000

Date: 02-Jun-2020

Author: JG

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

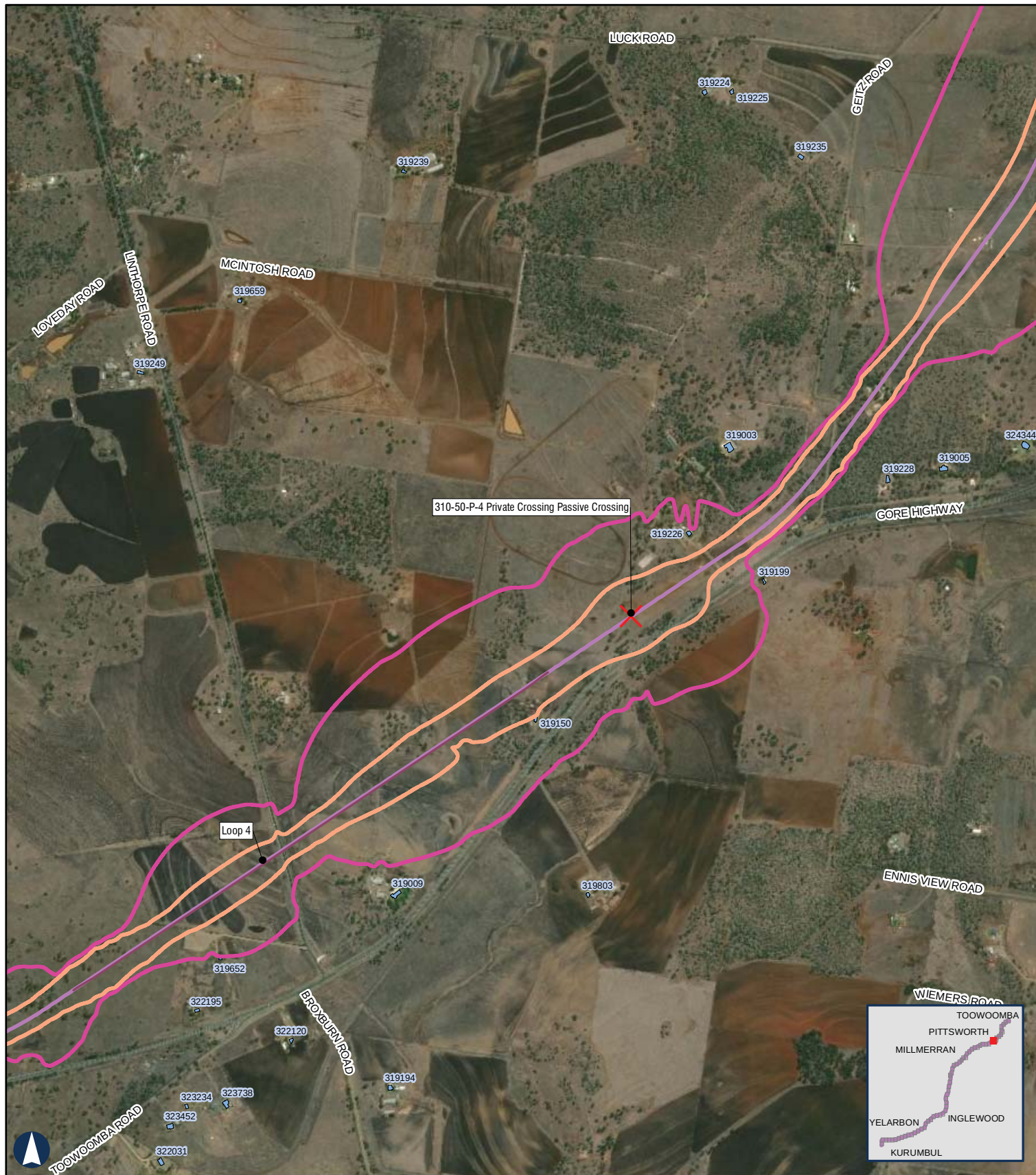
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 51 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

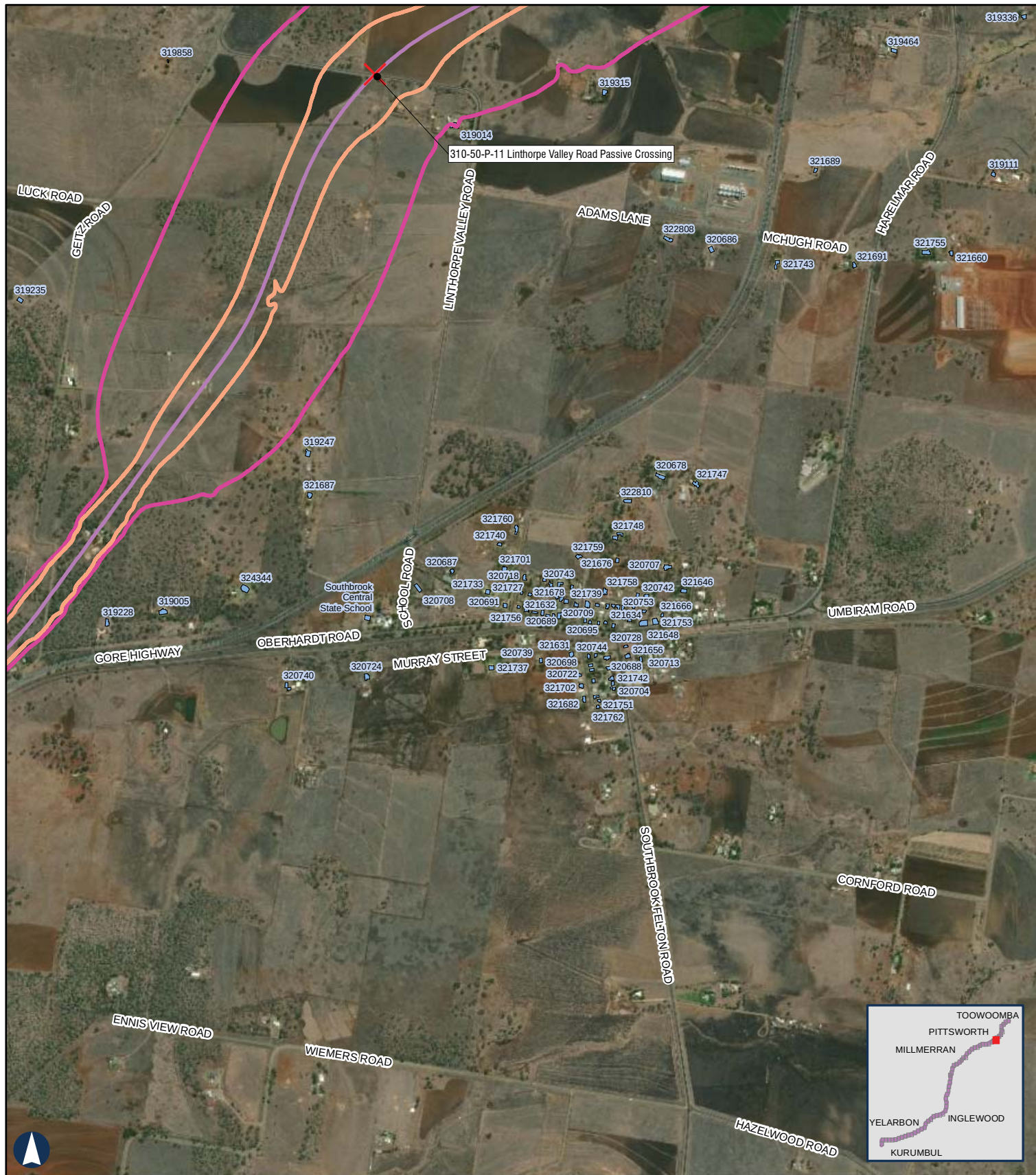
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 52 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

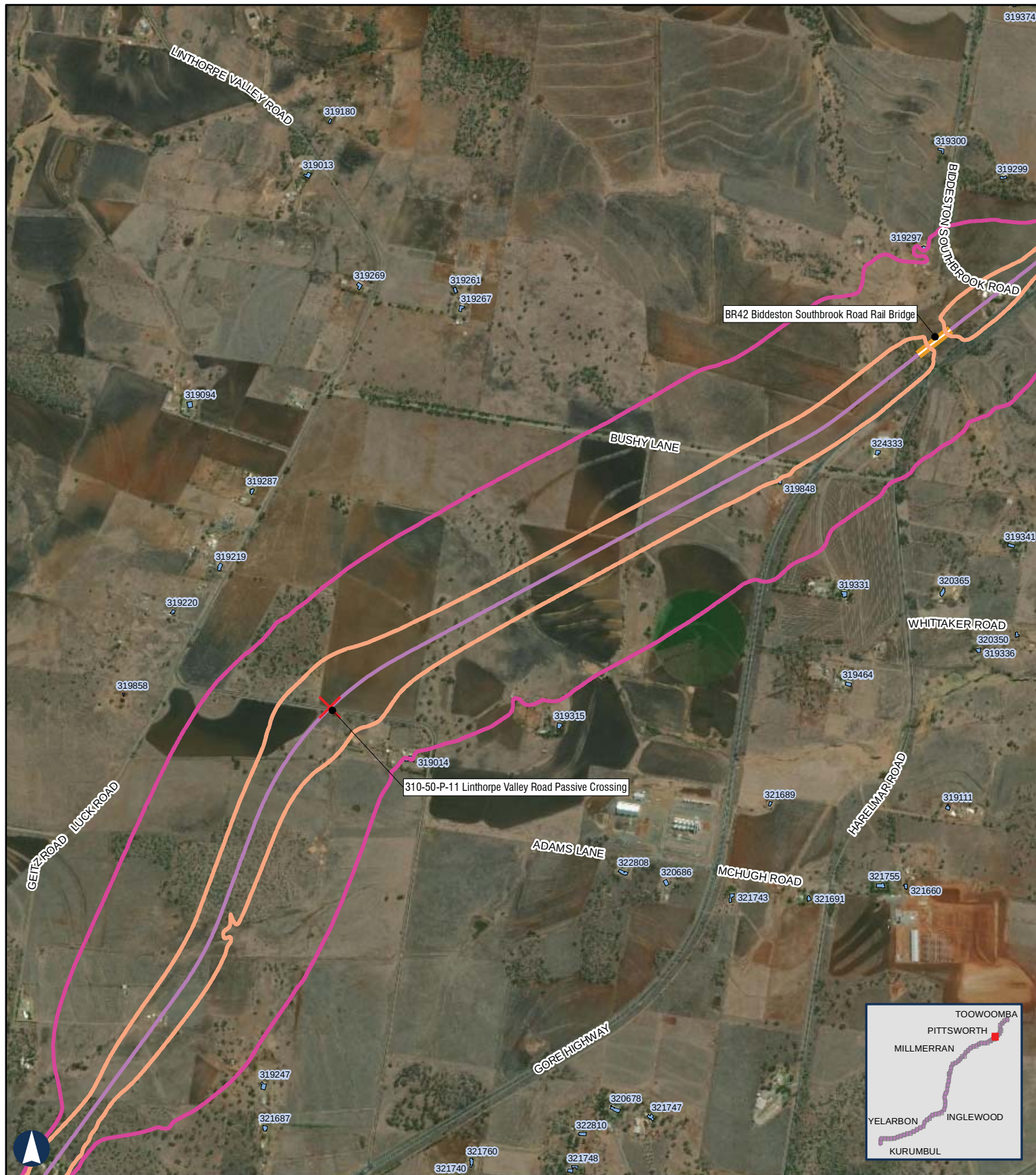
— Daytime noise criteria LA max
80dBA New rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 53 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

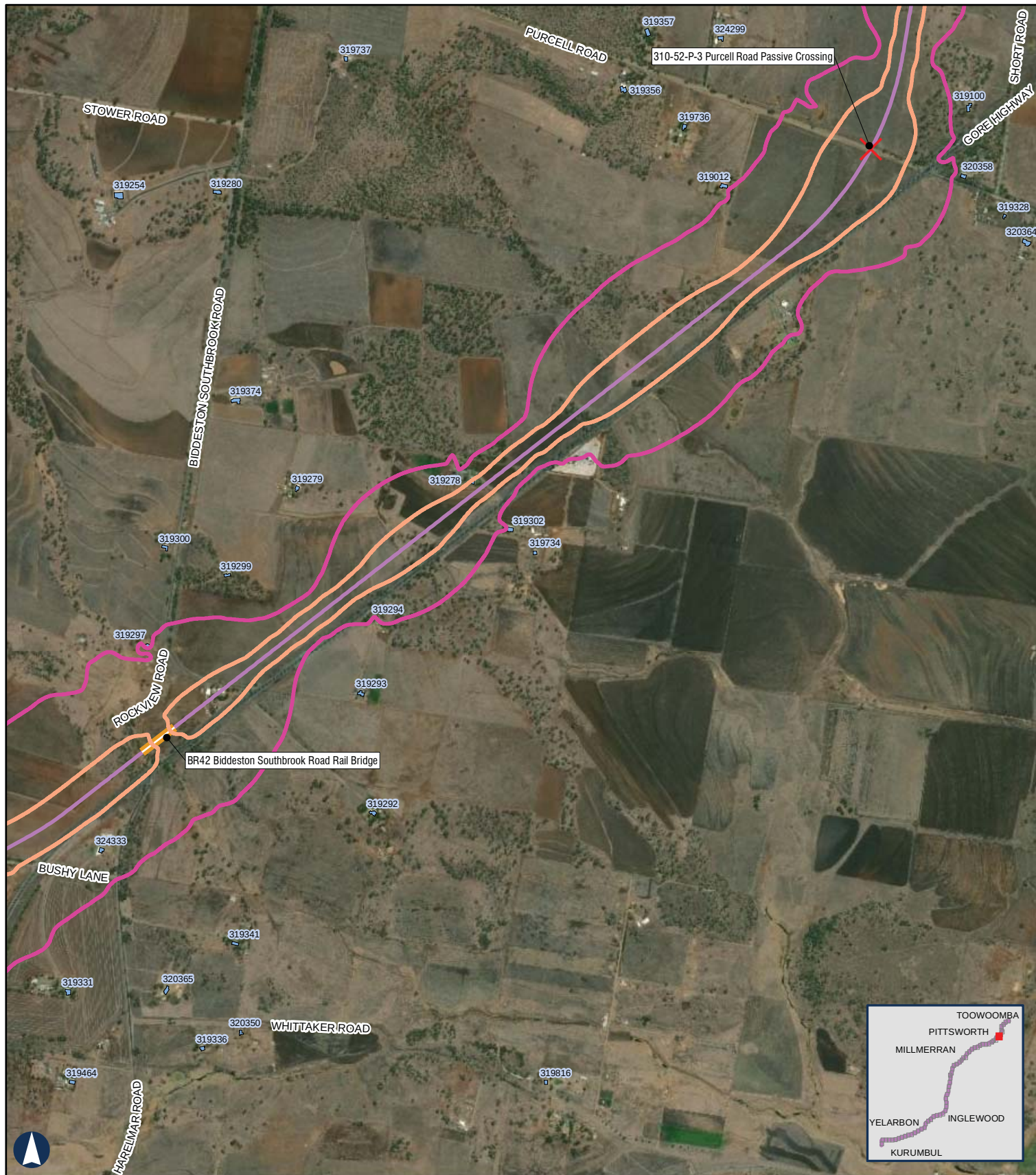
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 54 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

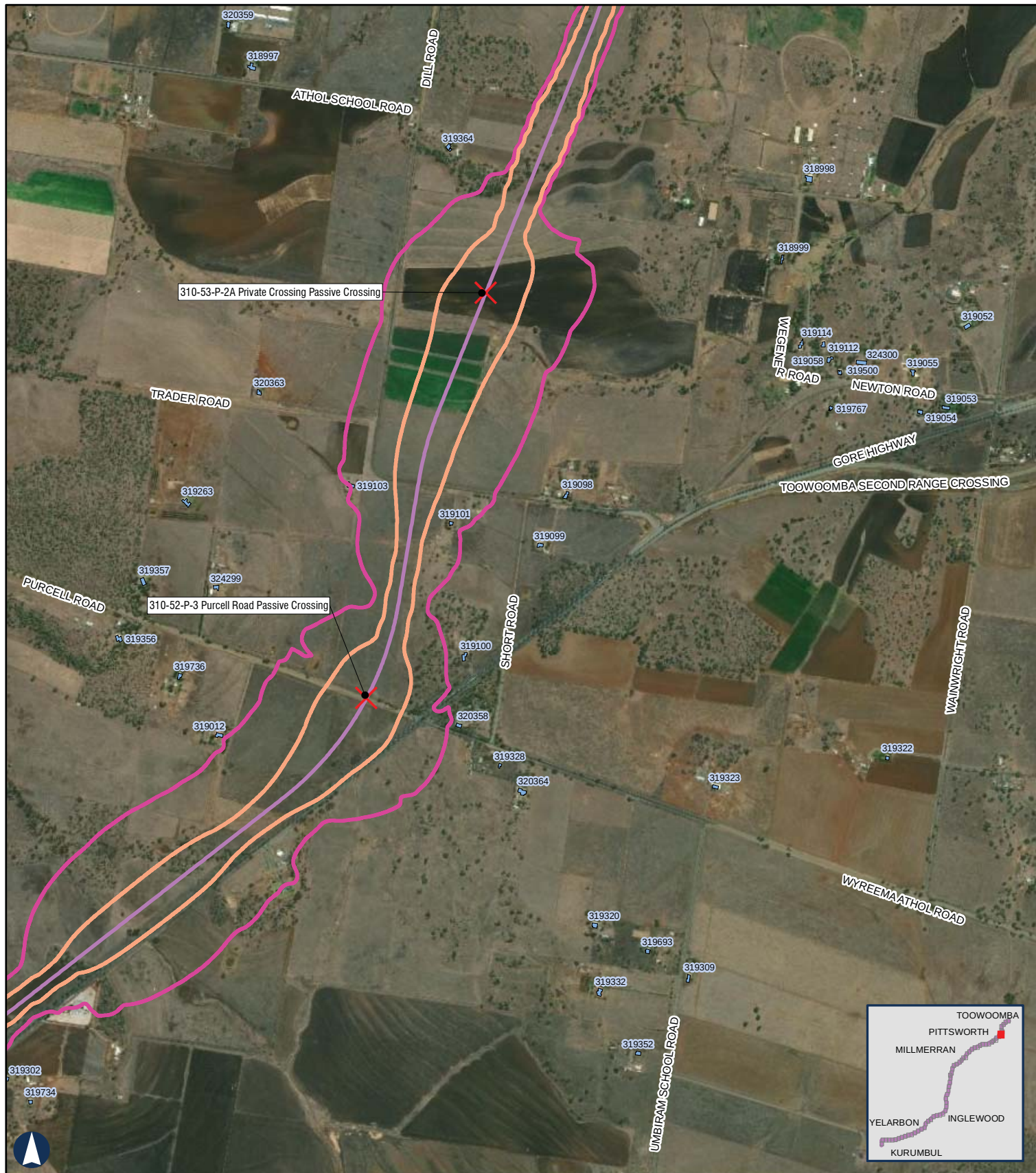
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 55 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

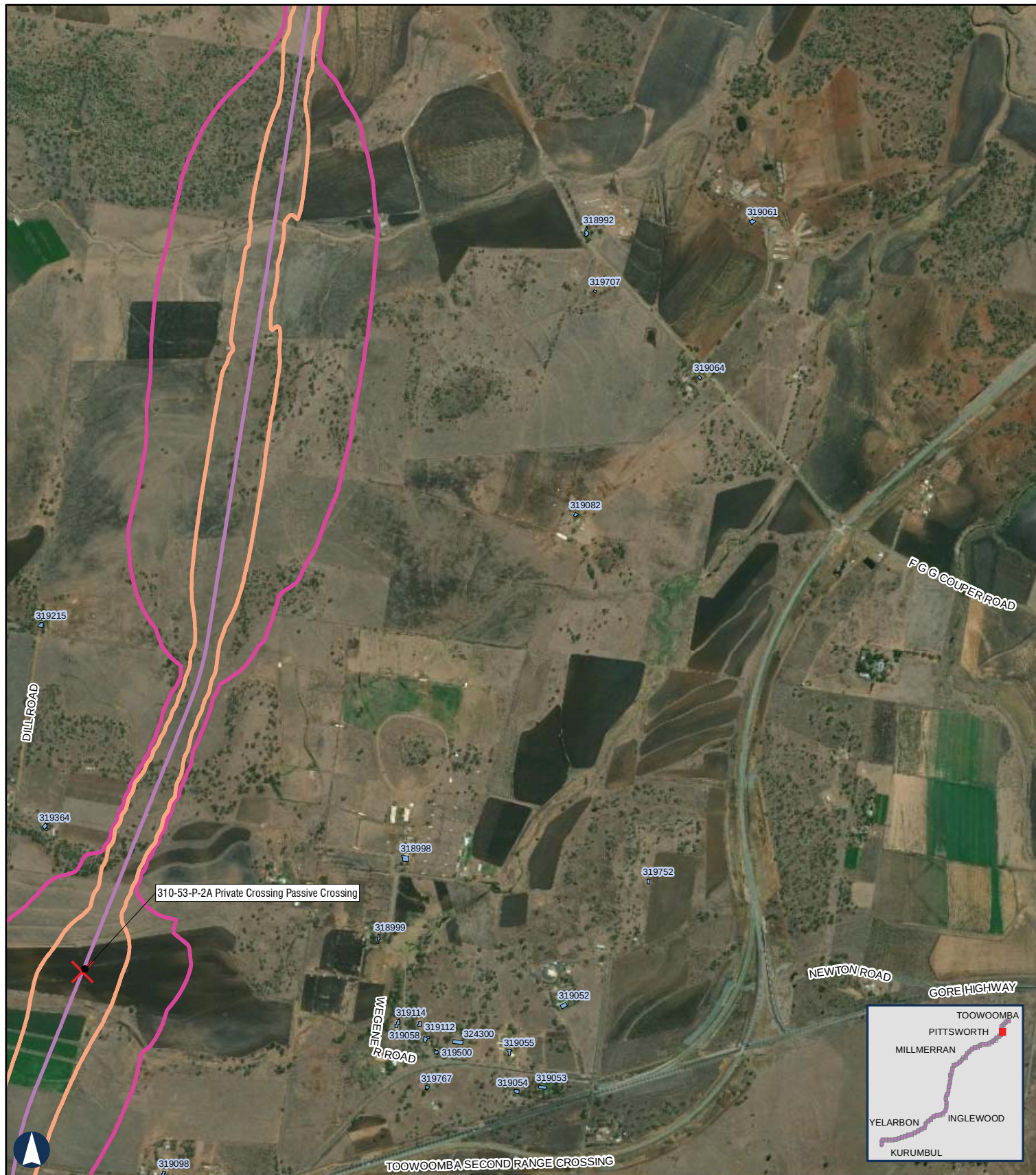
— Daytime noise criteria LA max
80dBA New rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 56 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

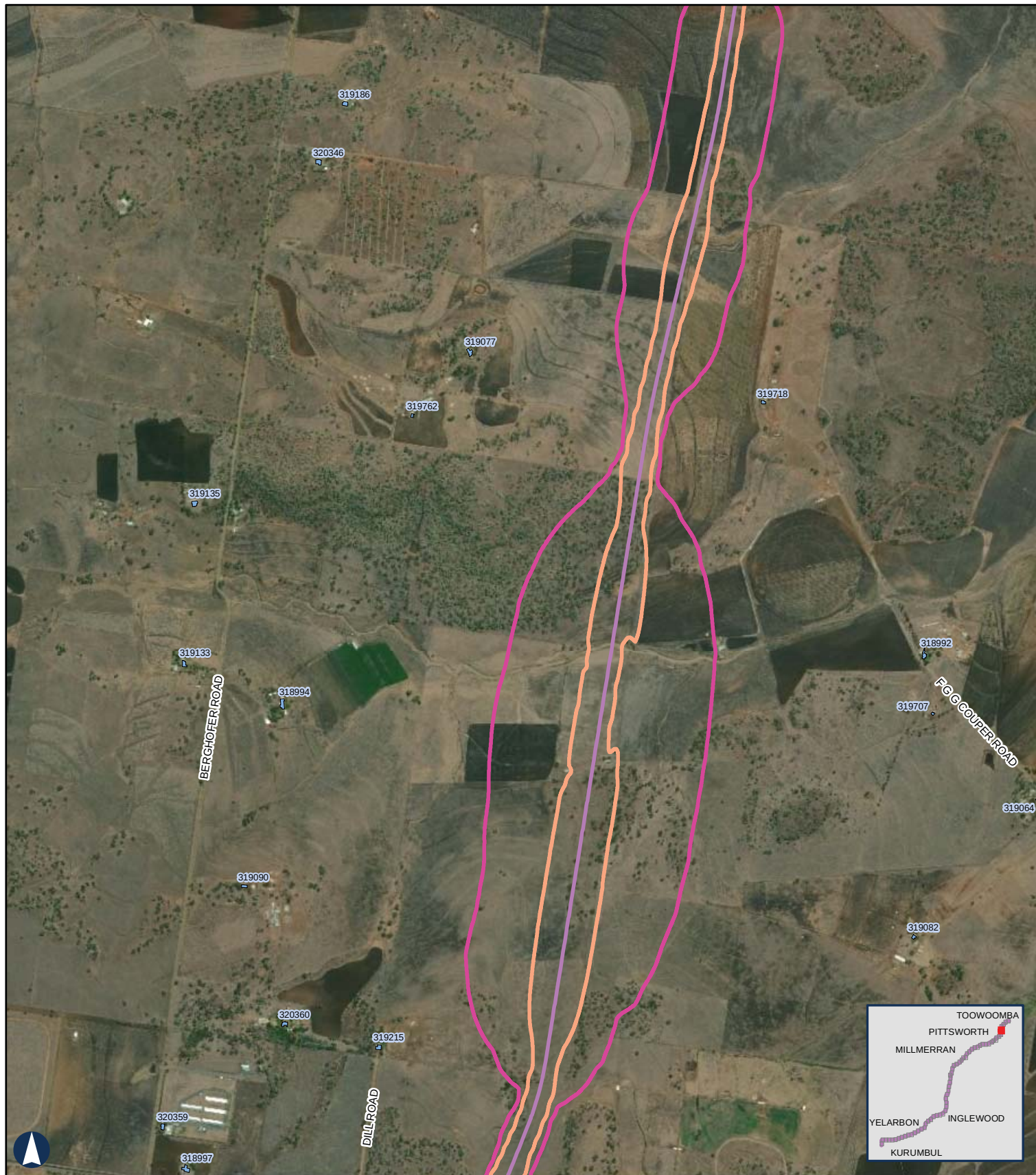
— Daytime noise criteria LA max
80dBA New rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 57 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4

Scale: 1:20,000

Date: 02-Jun-2020

Author: JG

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

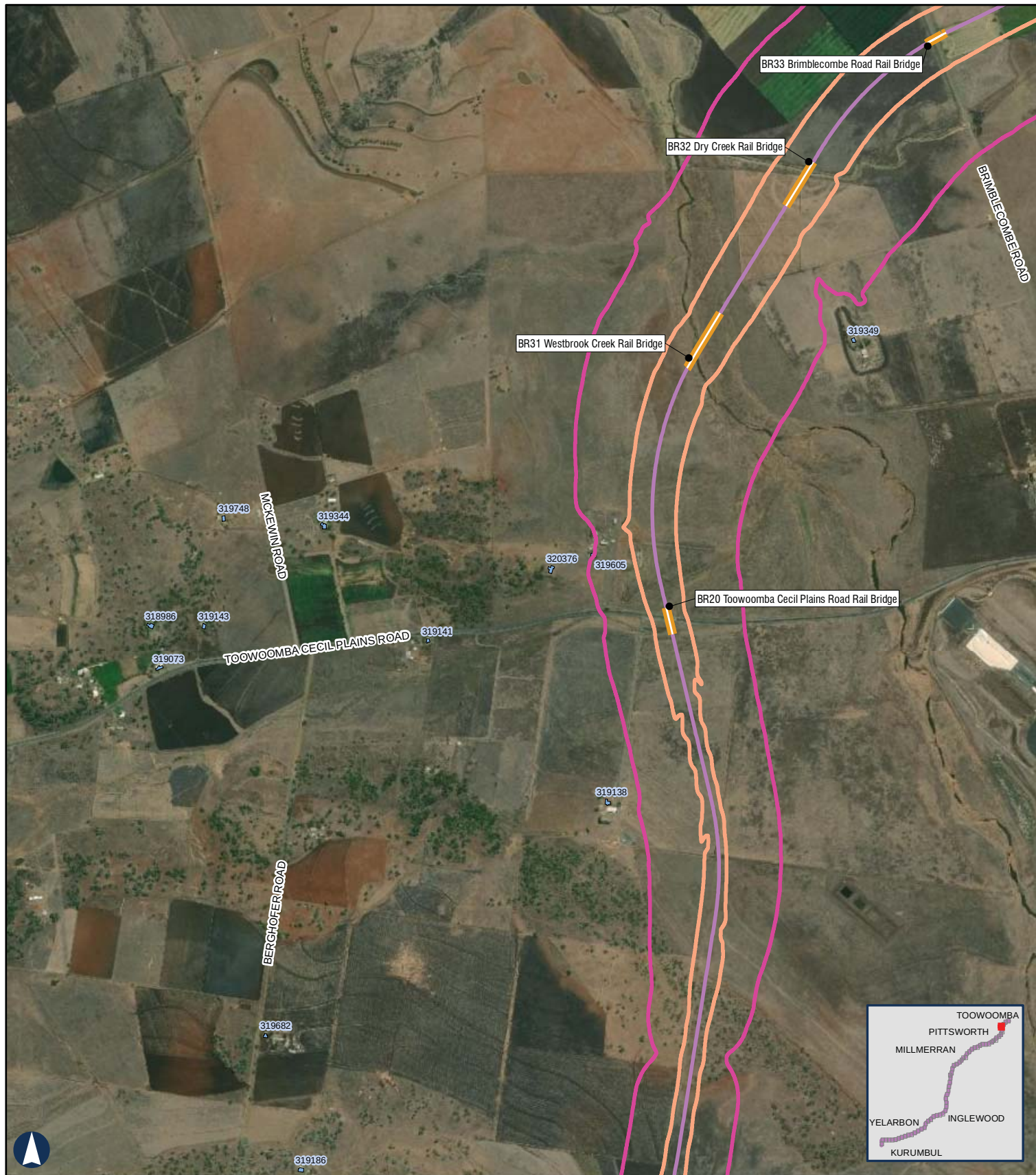
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 58 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4

Scale: 1:20,000

Date: 02-Jun-2020

Author: JG

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

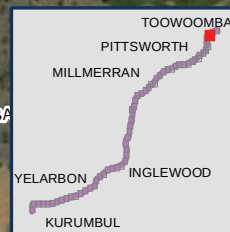
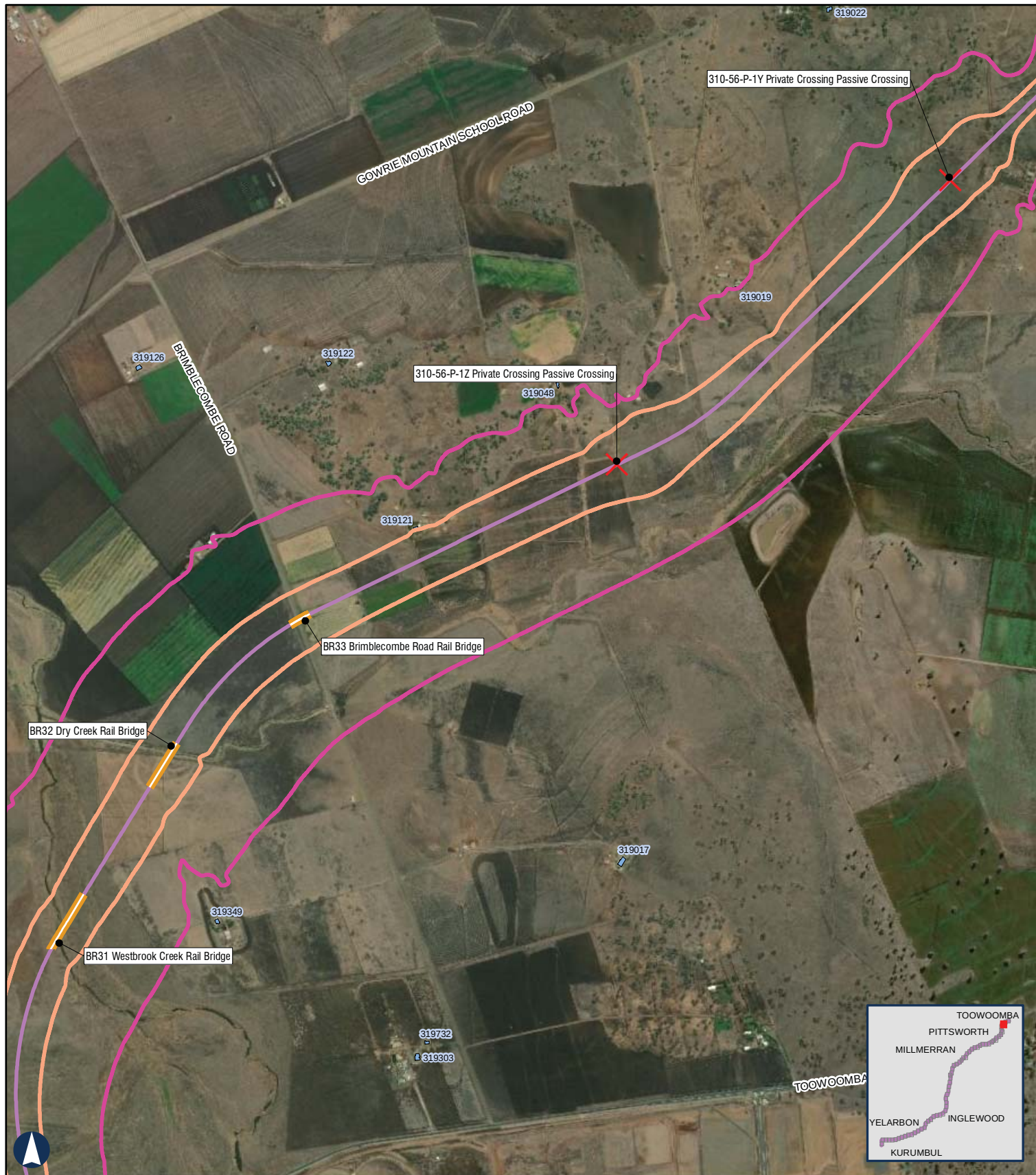
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 59 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

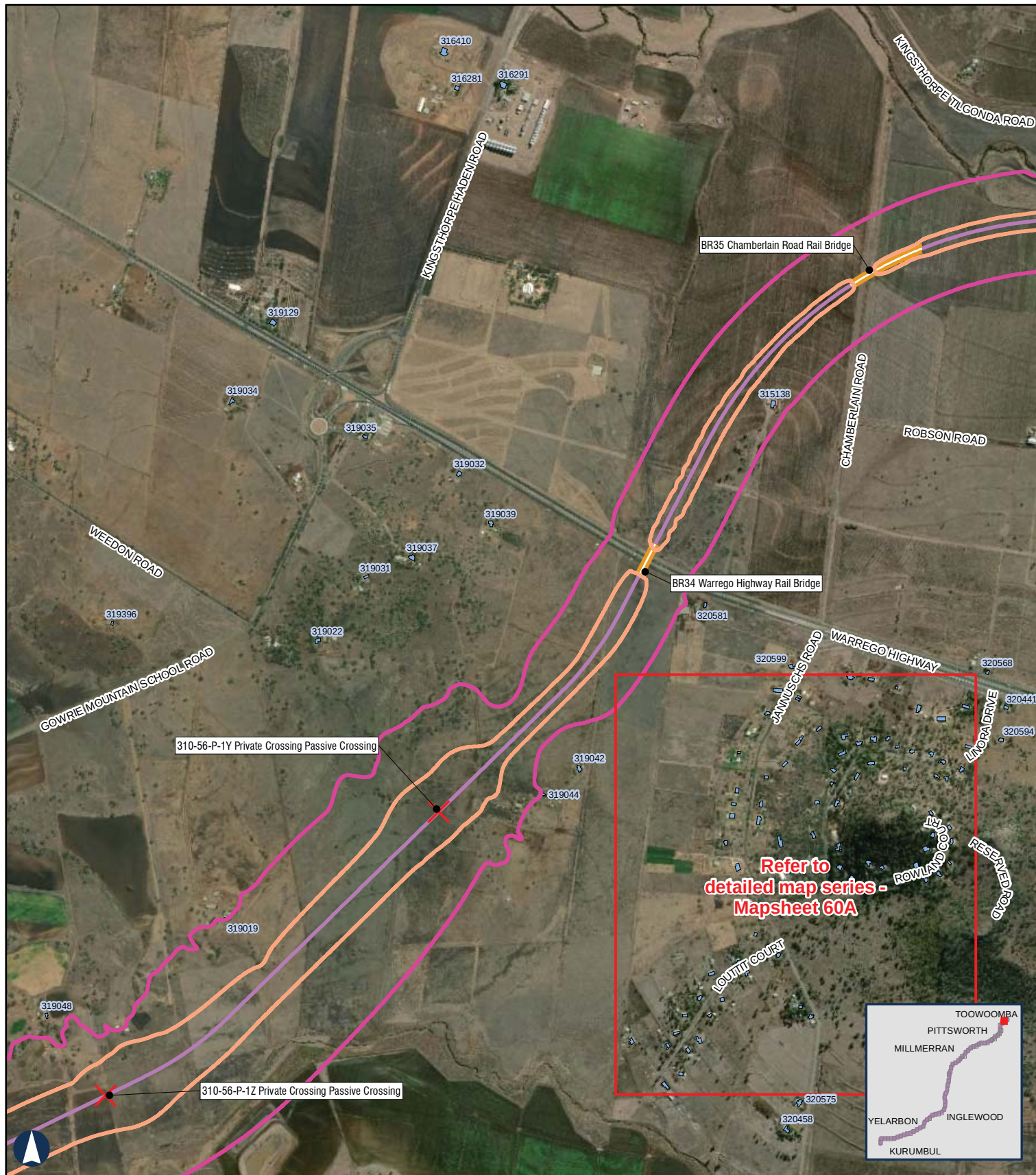
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 60 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

Daytime noise criteria LAeq15hr
60dBA New rail corridor

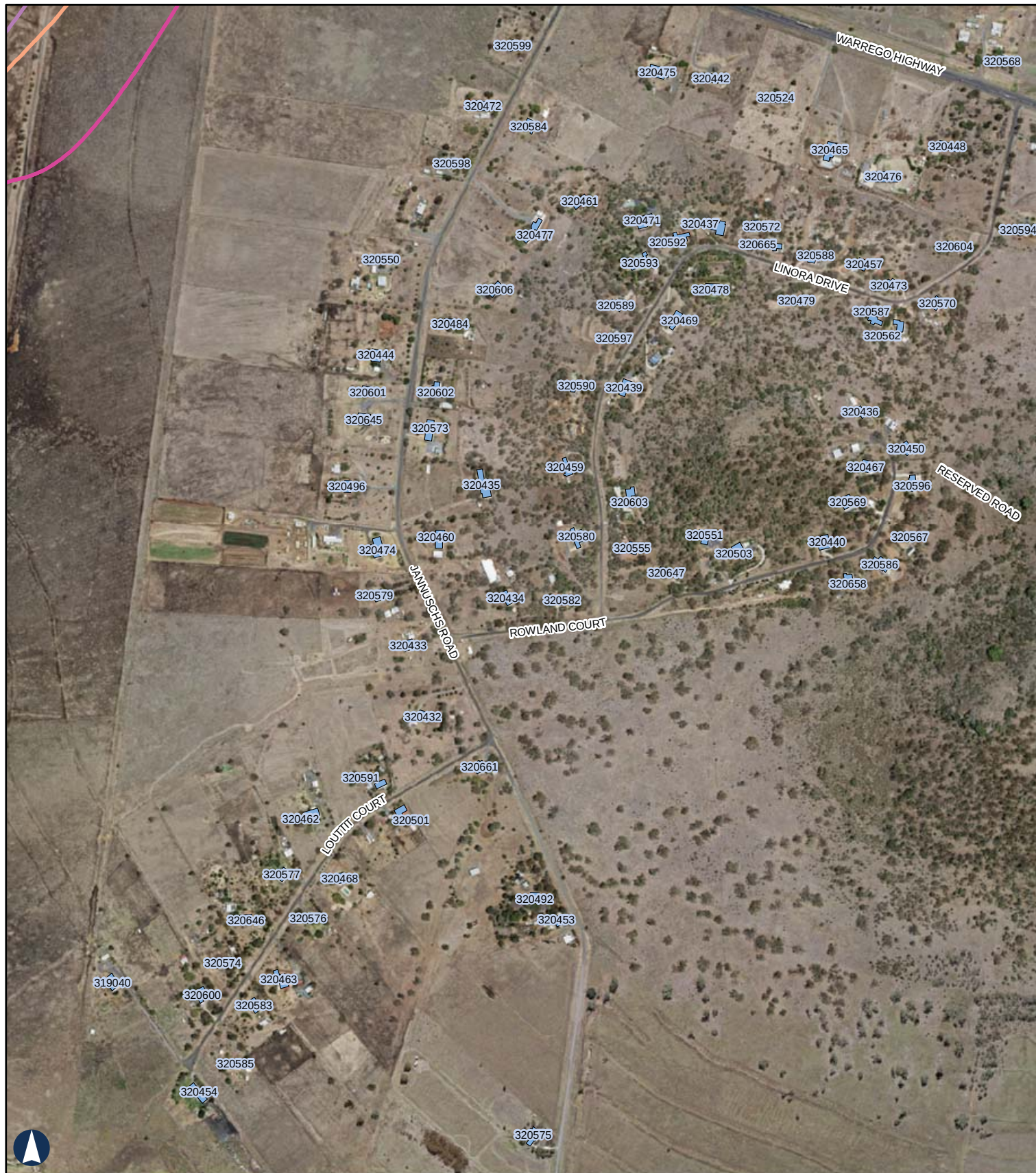
Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels - Detailed

APPENDIX D - Mapsheet 60A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:8,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

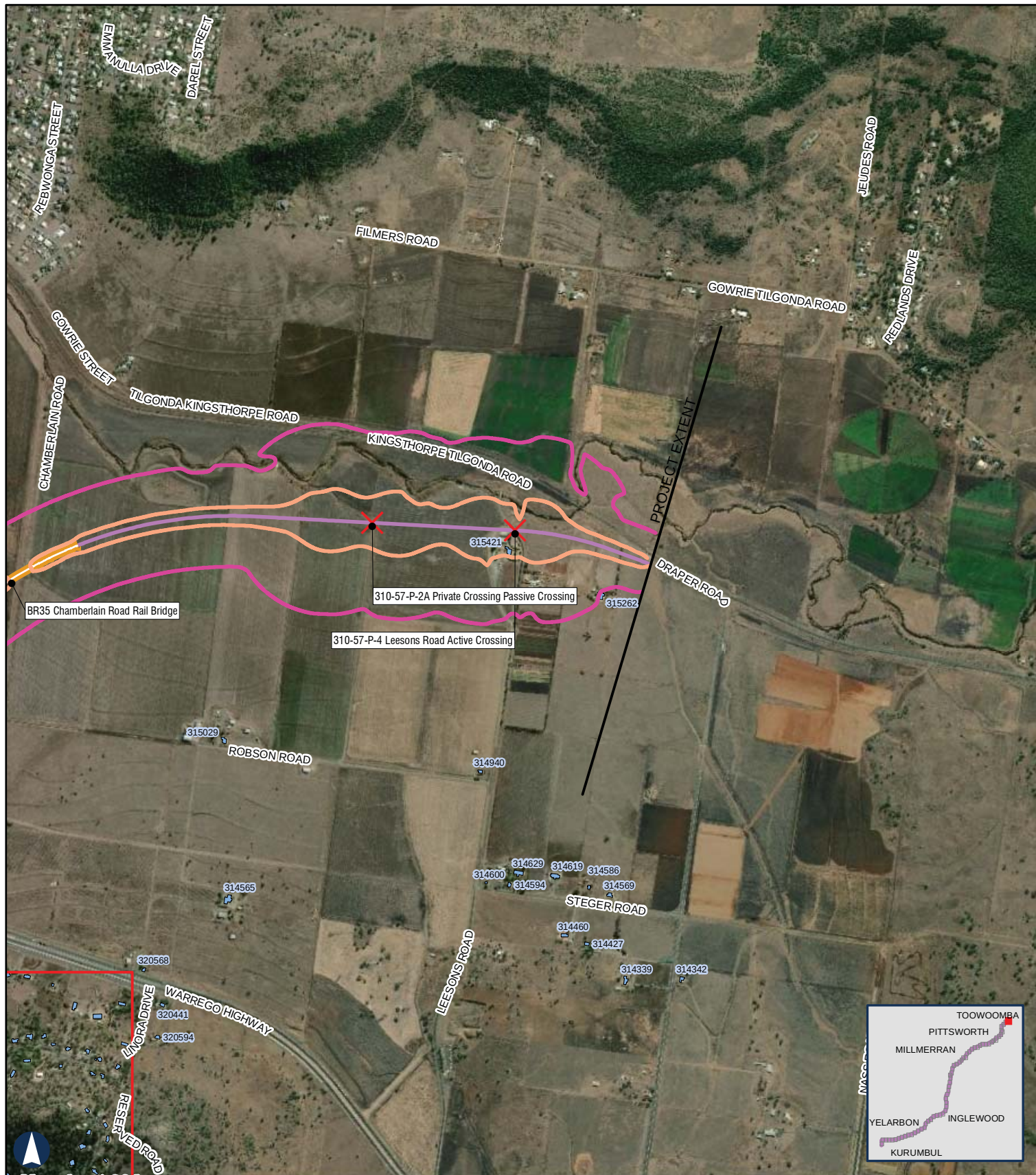
Noise contours are based on a set distance above the local terrain level of 2.4m.

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor



ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2026 Daytime rail noise levels

APPENDIX D - Map 61 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

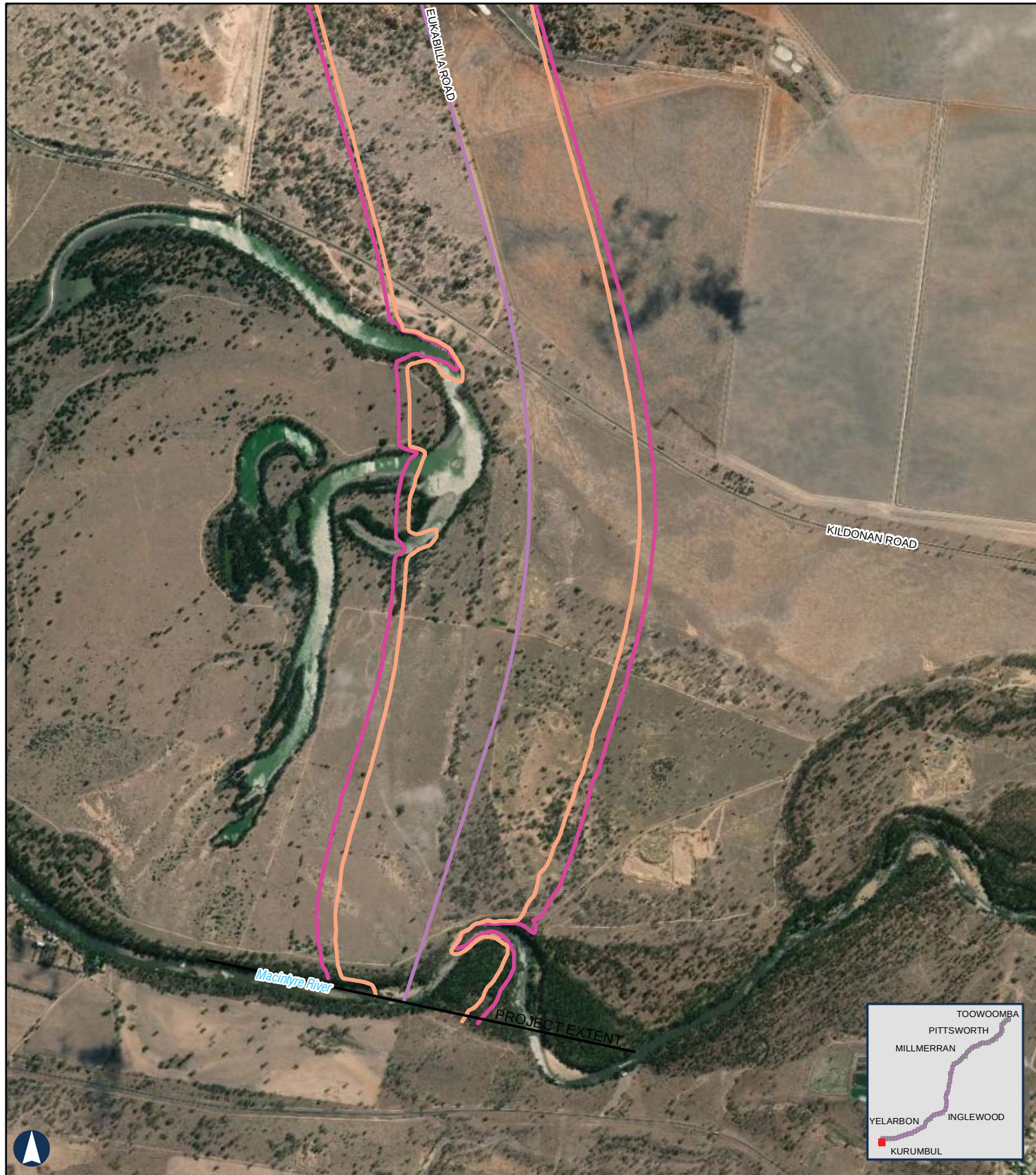
— Daytime noise criteria LA max
80dBA New rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 1 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

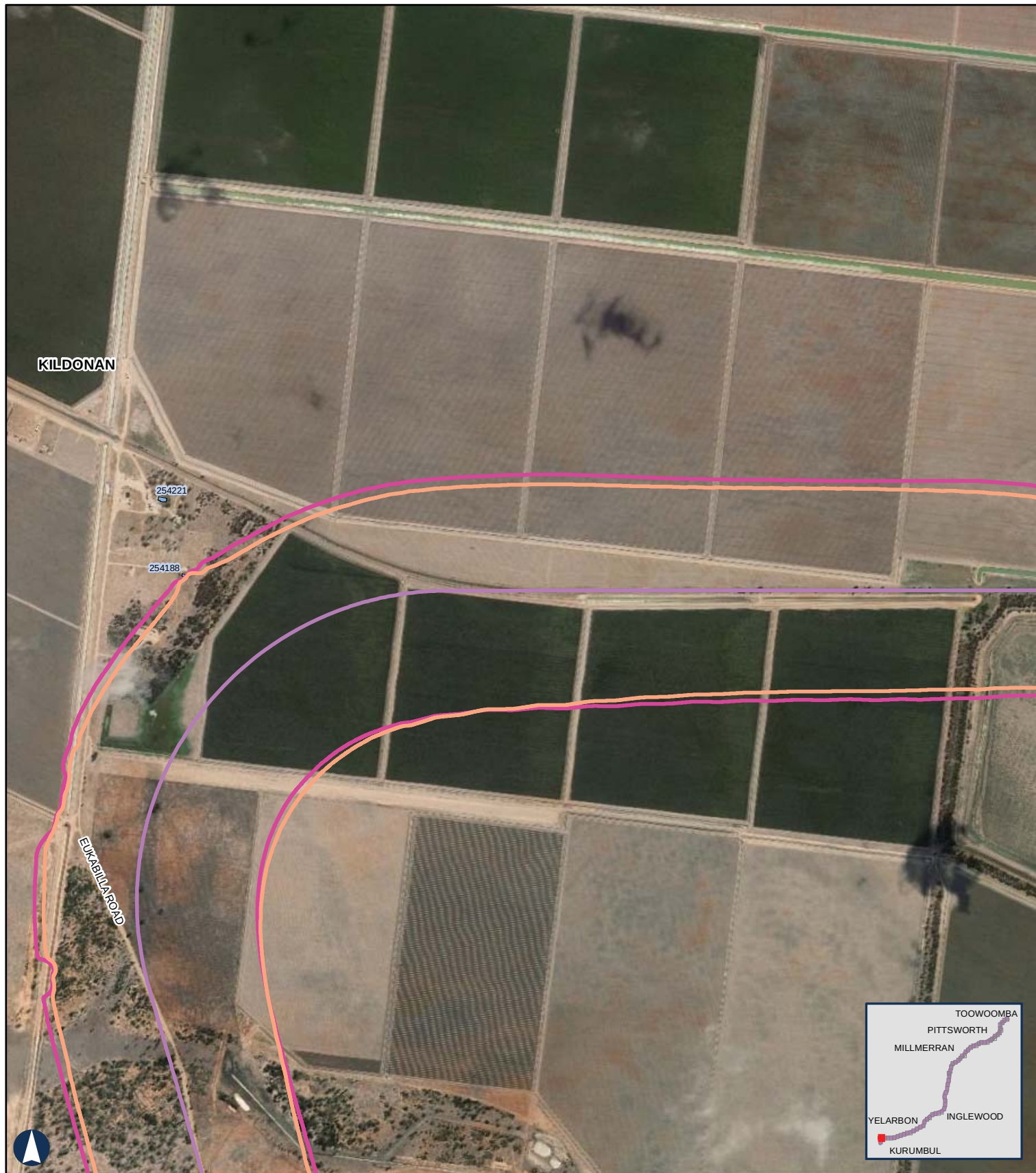
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 2 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

— Night-time noise criteria LA max 80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC *InlandRail*

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 3 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 4 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

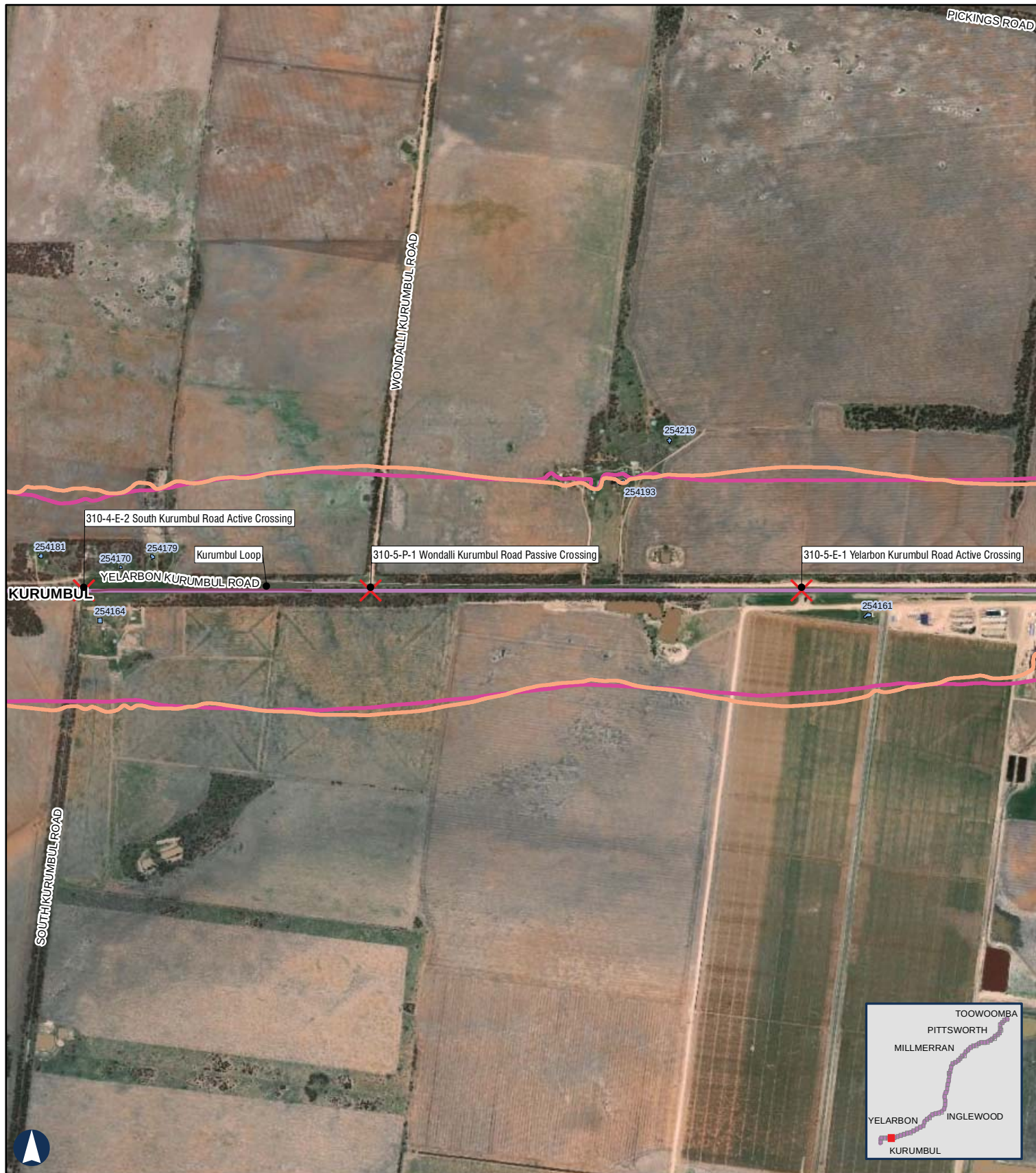
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 5 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

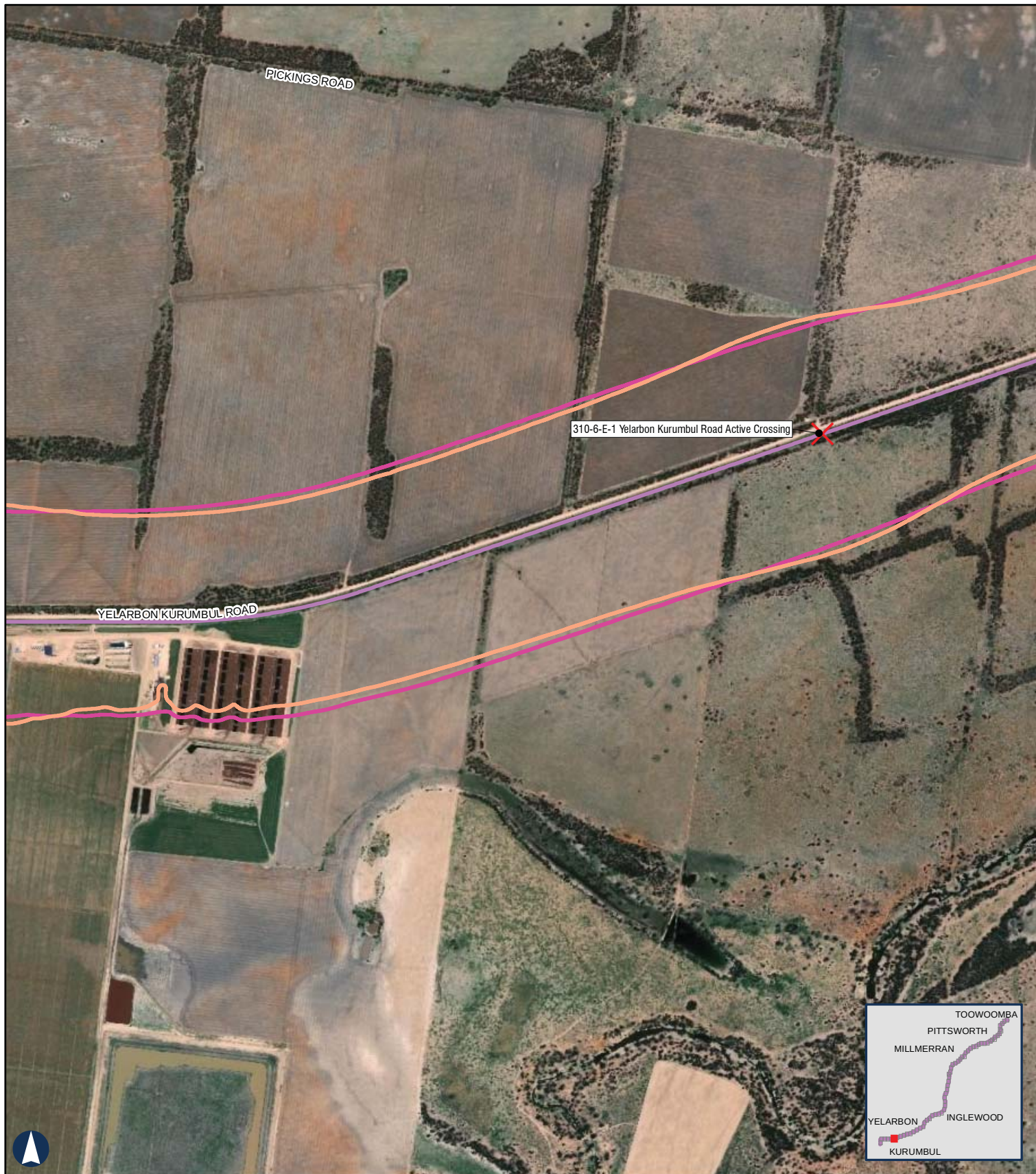
- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 6 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

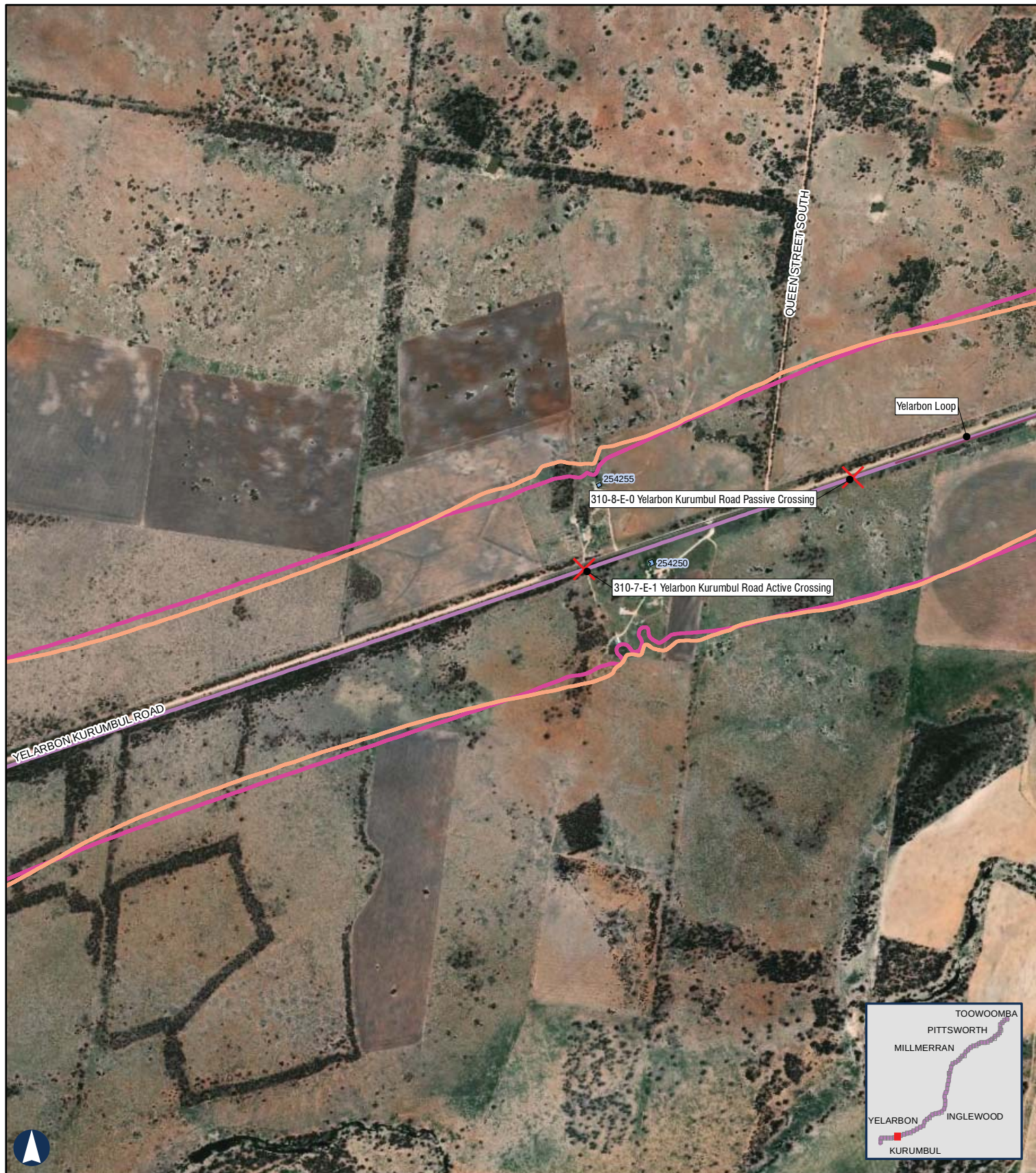
— Night-time noise criteria LA max
80dBA new rail corridor

Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 7 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

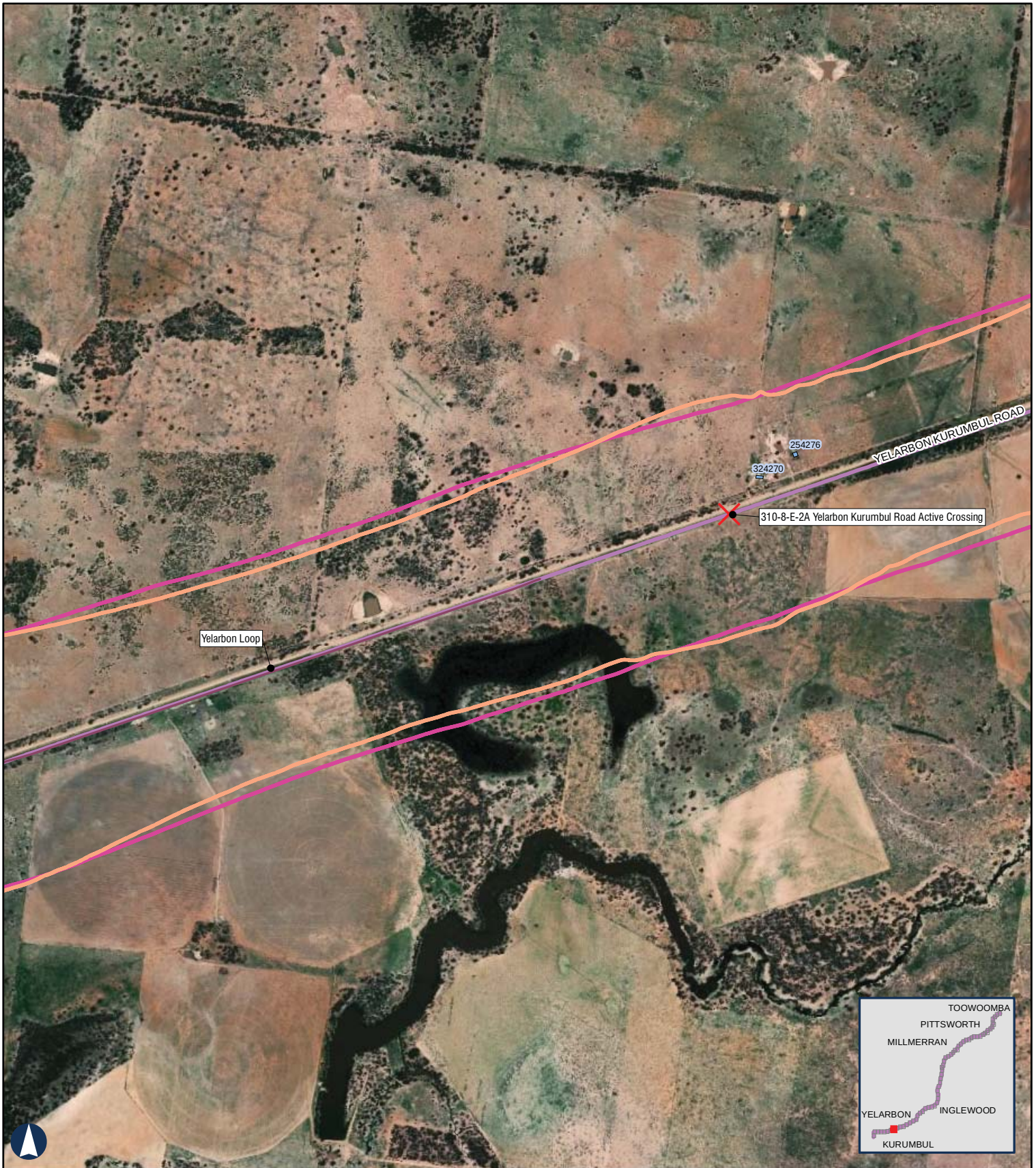
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 8 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

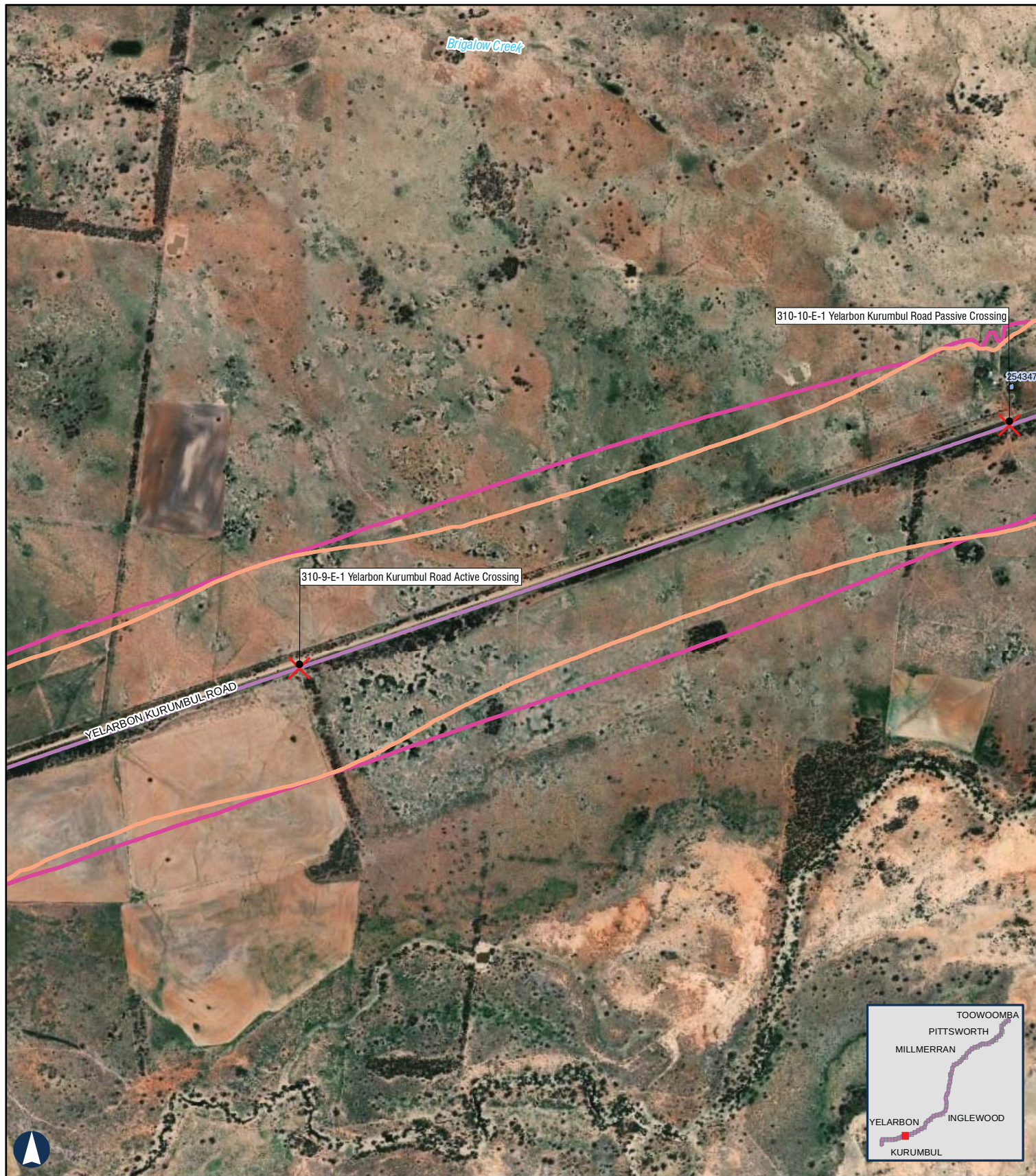
- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 9 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

— Night-time noise criteria LA max 80dBA new rail corridor

■ Receptors

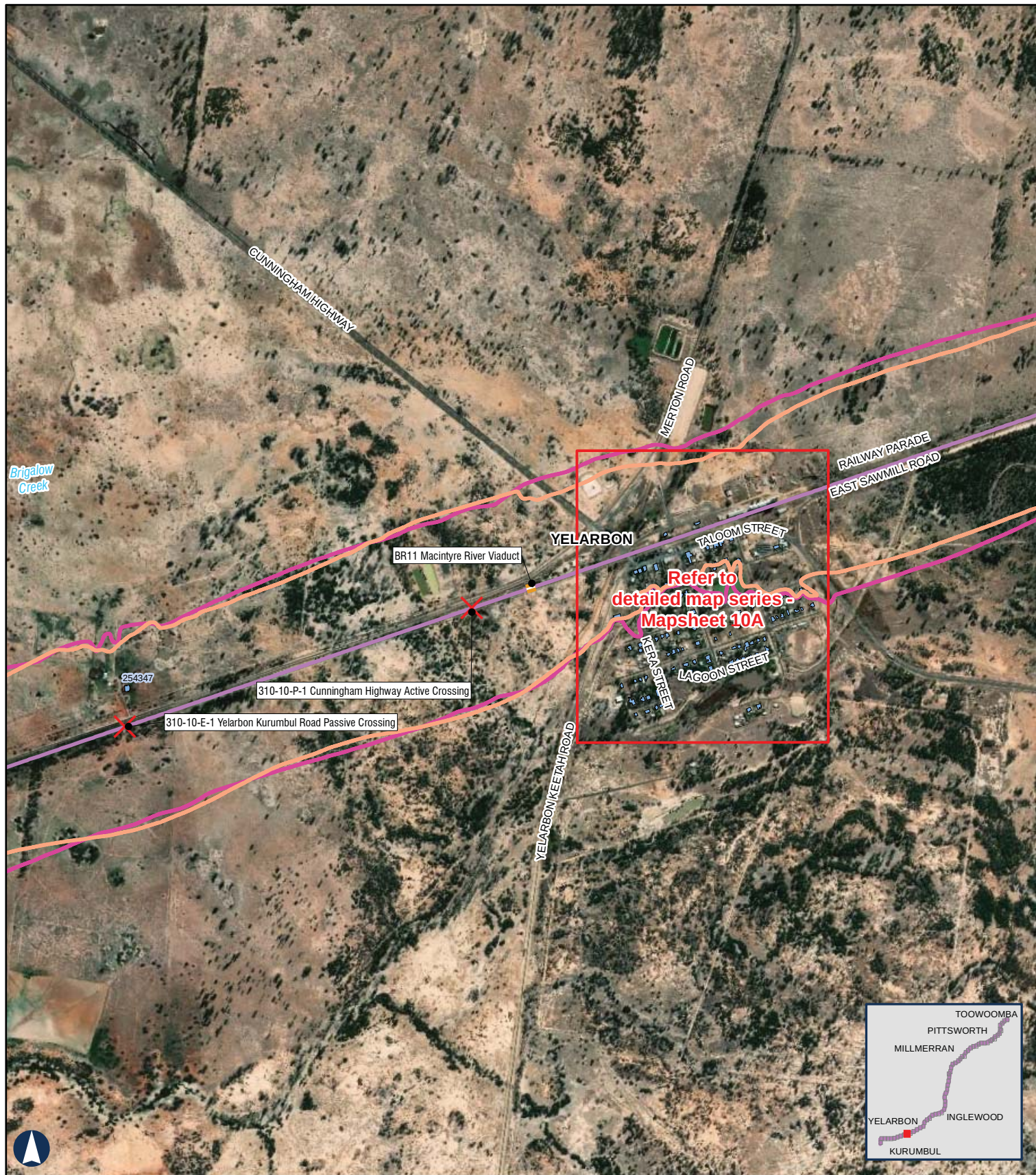
Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 10 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels - Detailed

APPENDIX D - Mapsheet 10A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:5,500

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

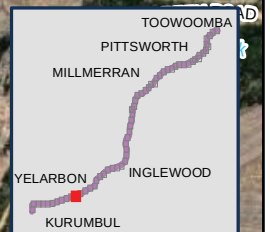
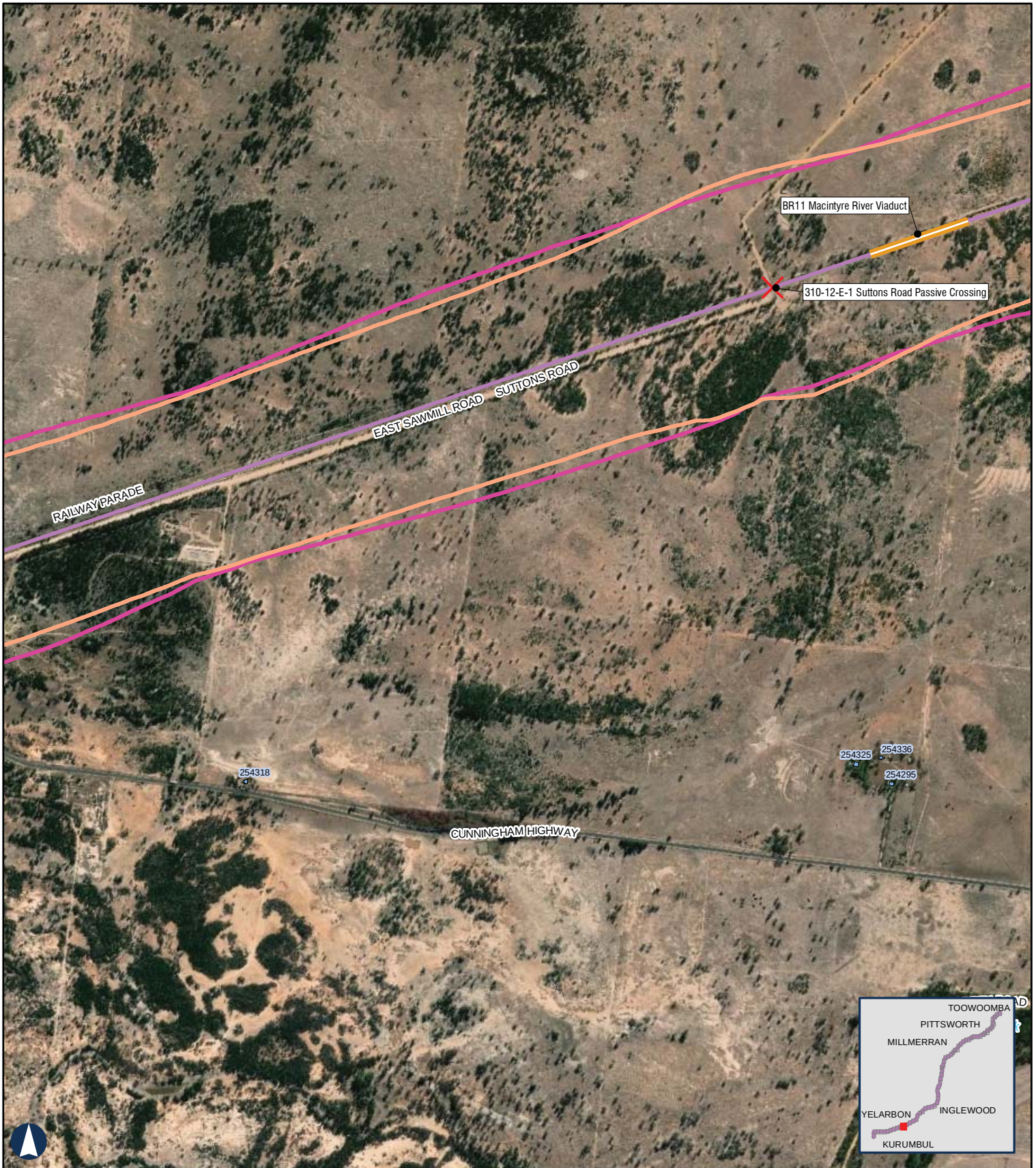
Noise contours are based on a set distance above the local terrain level of 2.4m.

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LAeq9hr 60dBA upgrading existing rail



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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 11 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

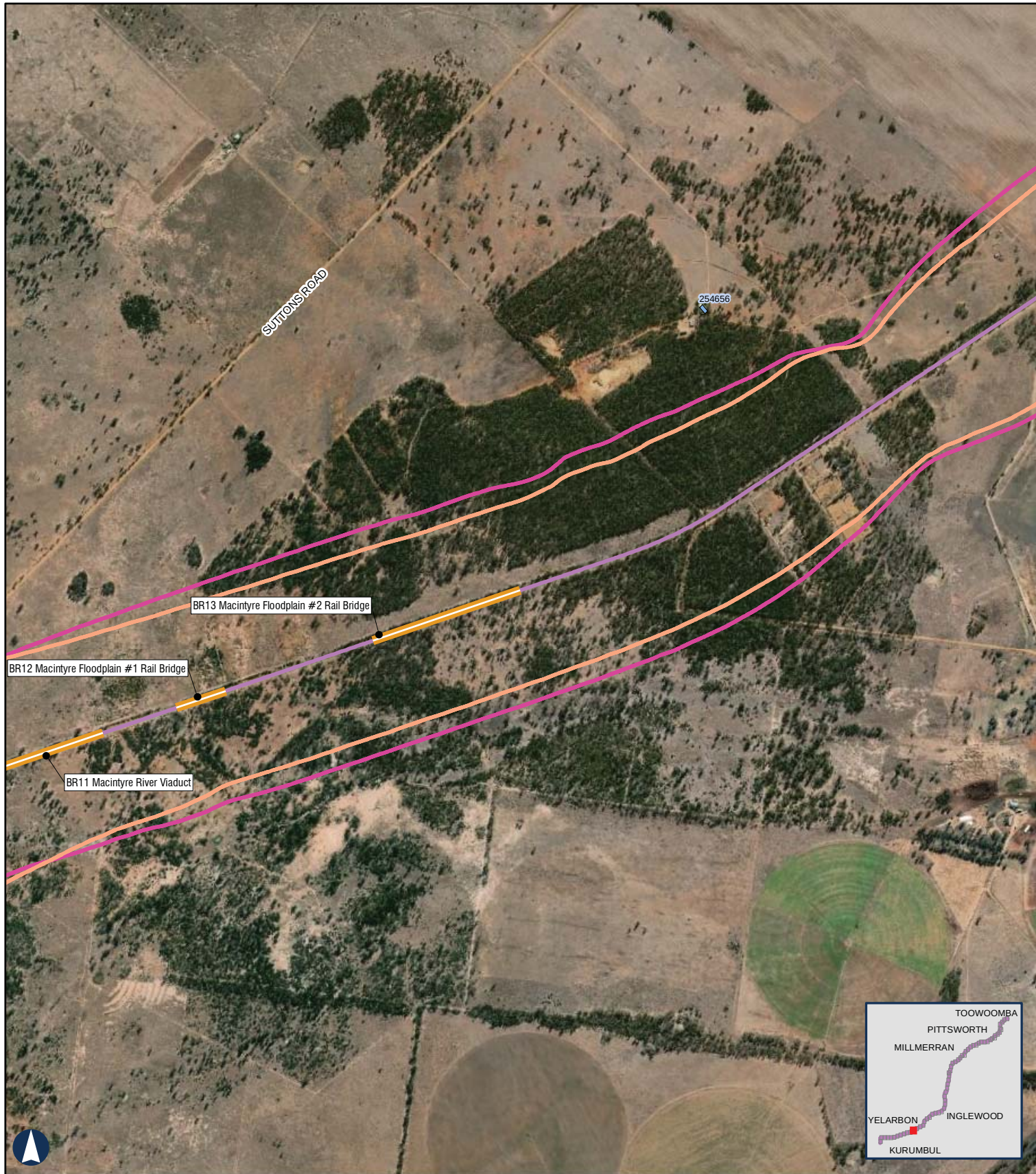
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 12 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 13 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

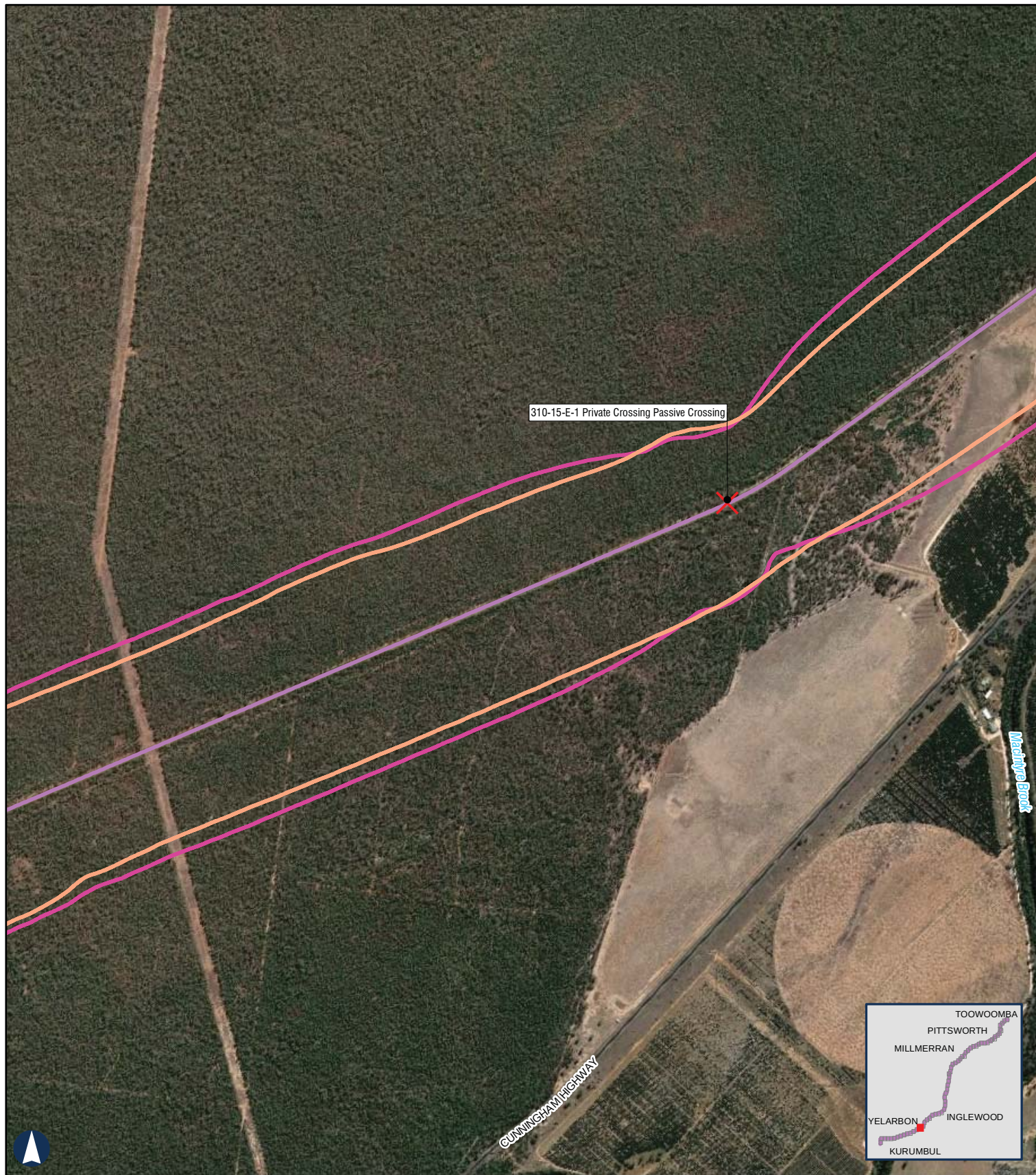
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.



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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 14 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

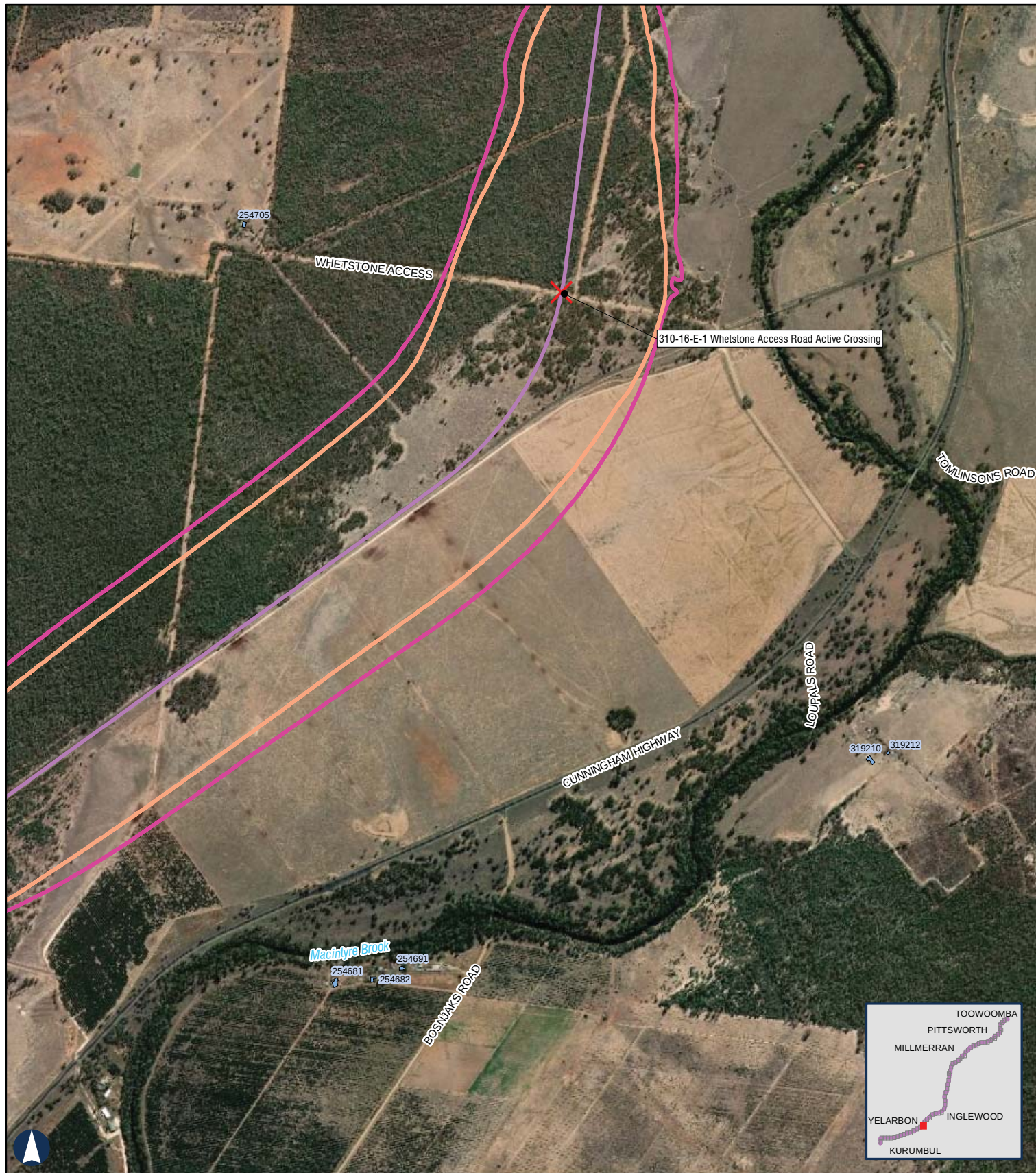
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 15 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

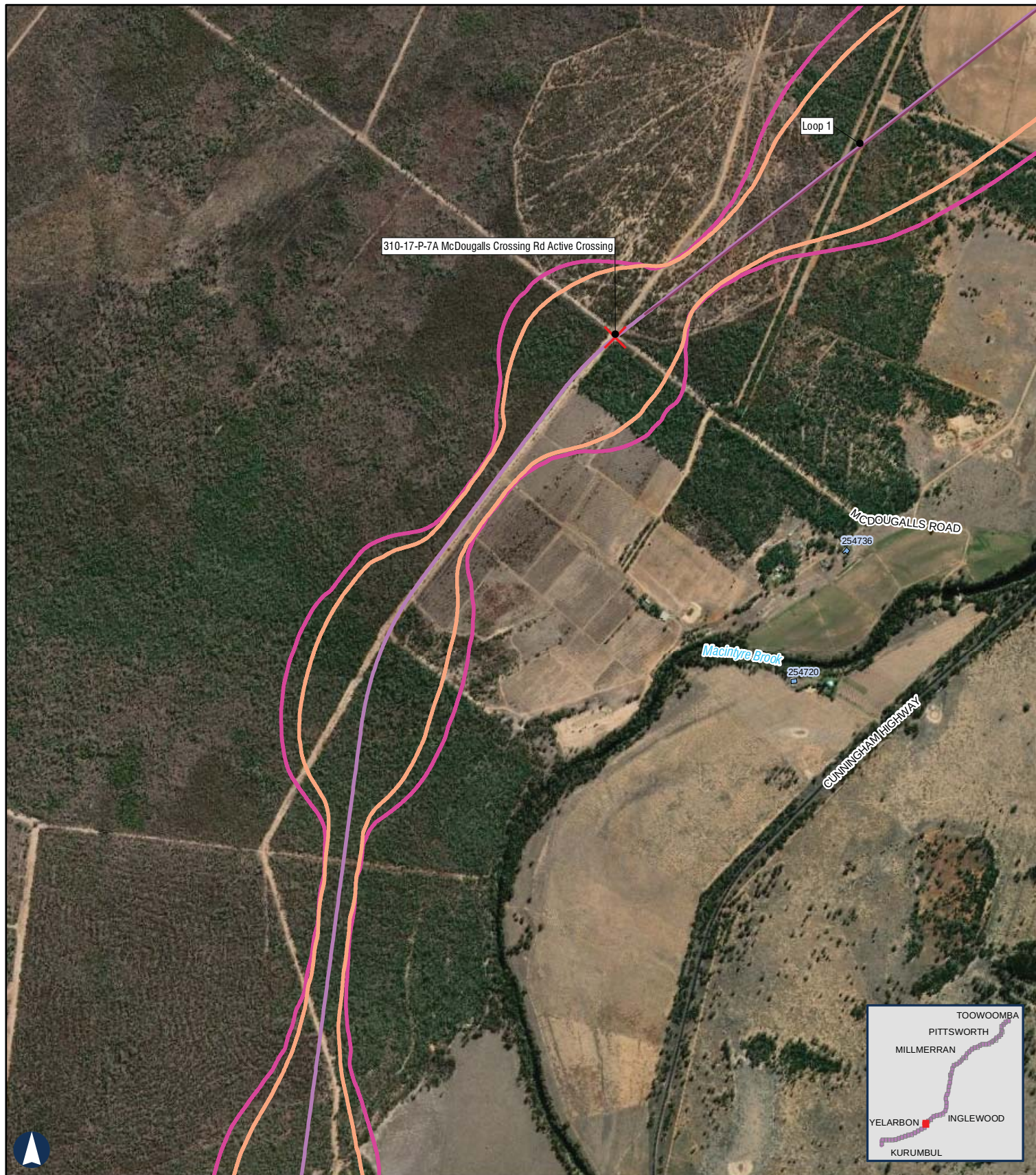
— Night-time noise criteria LA max
80dBA new rail corridor

● Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 16 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

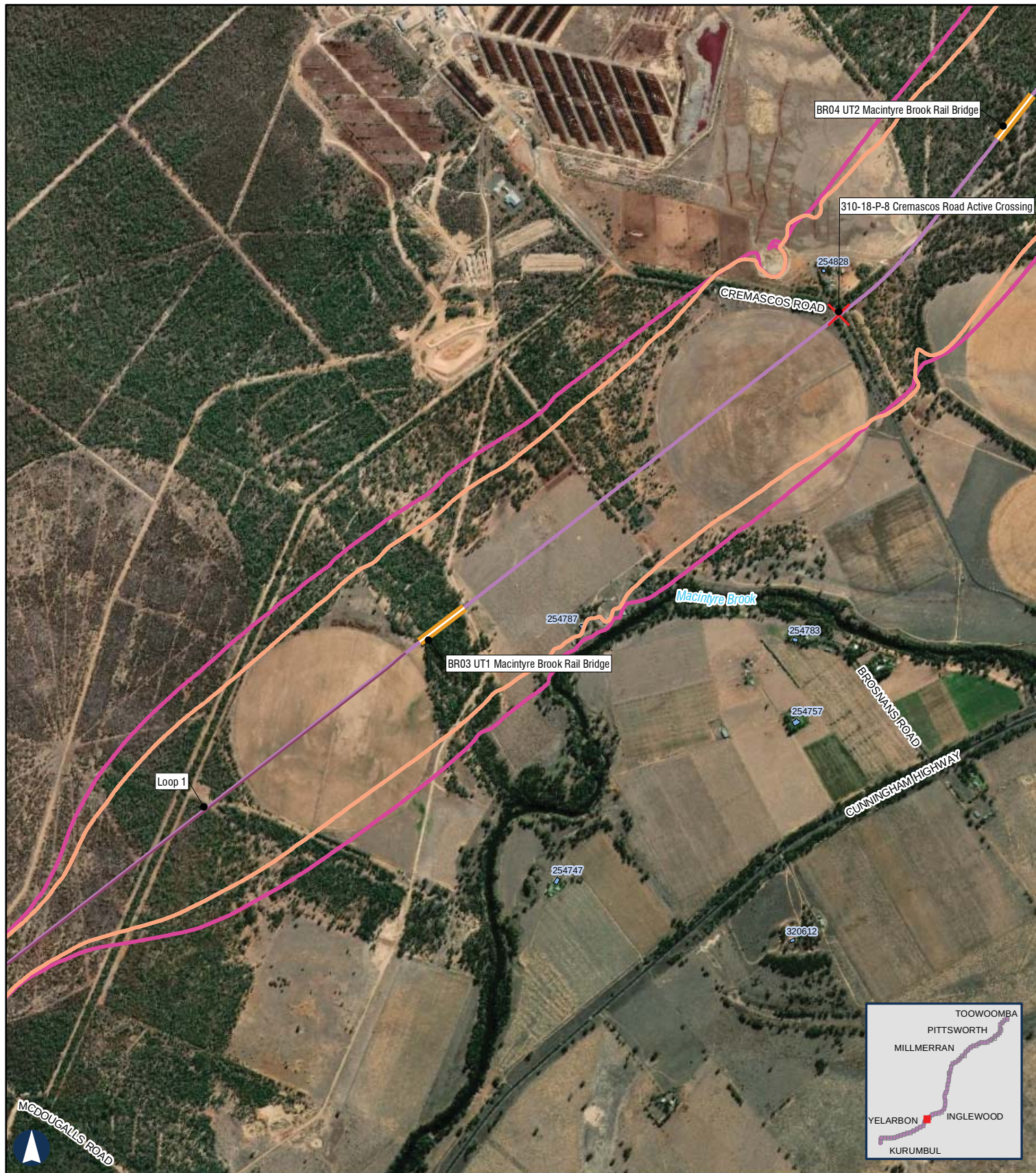
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 17 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

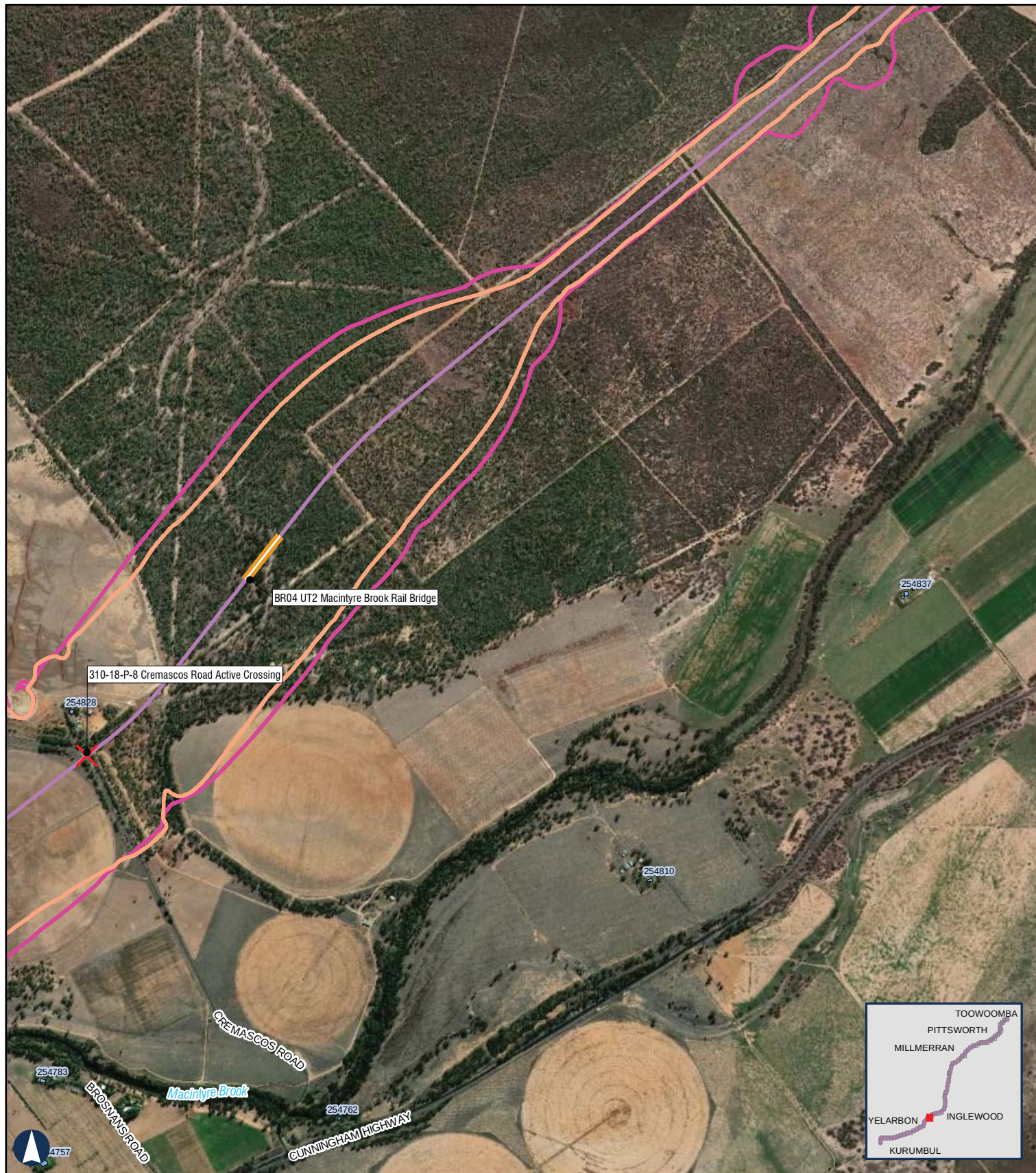
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 18 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

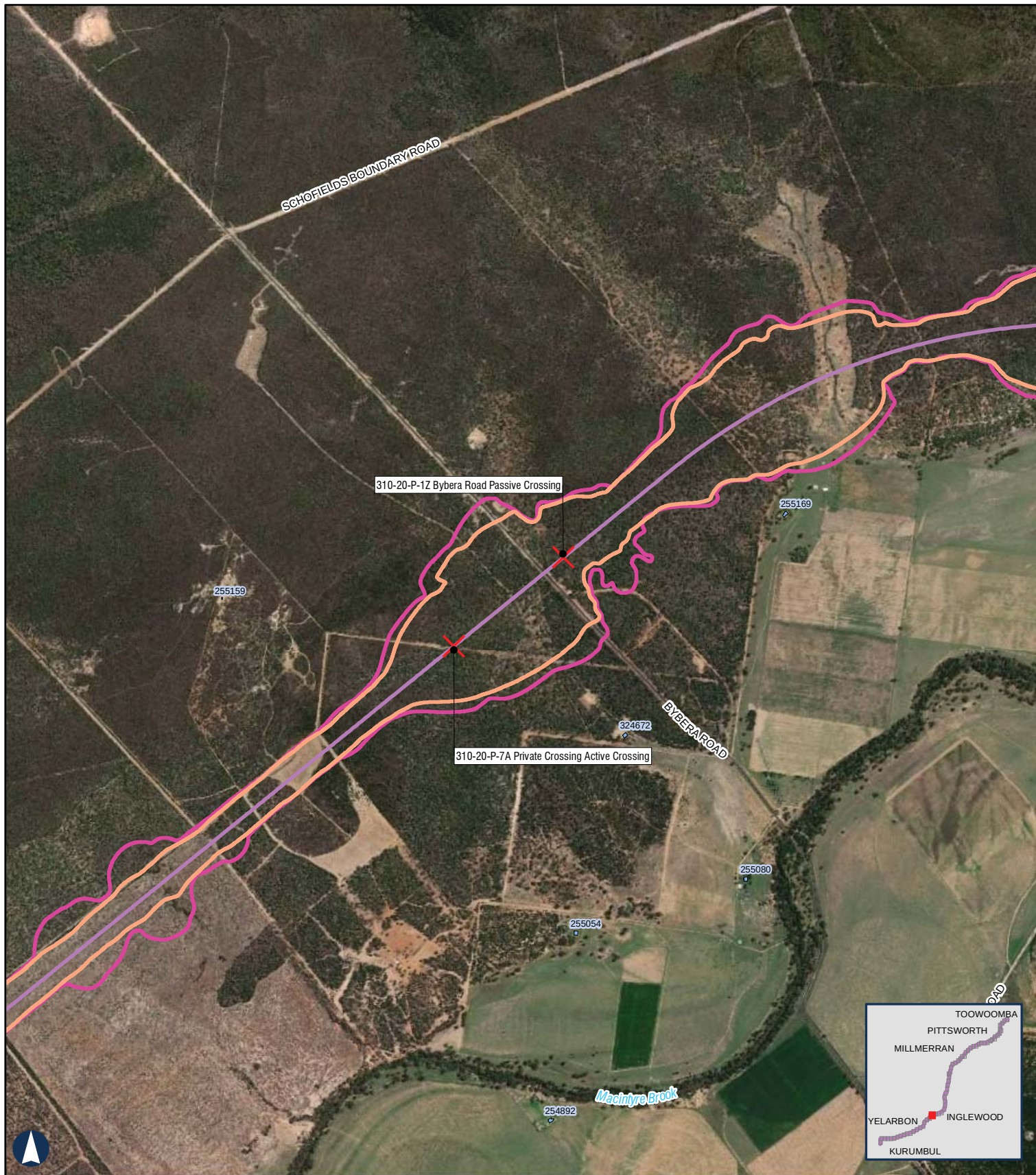
— Night-time noise criteria LA max
80dBA new rail corridor

● Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 19 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 20 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

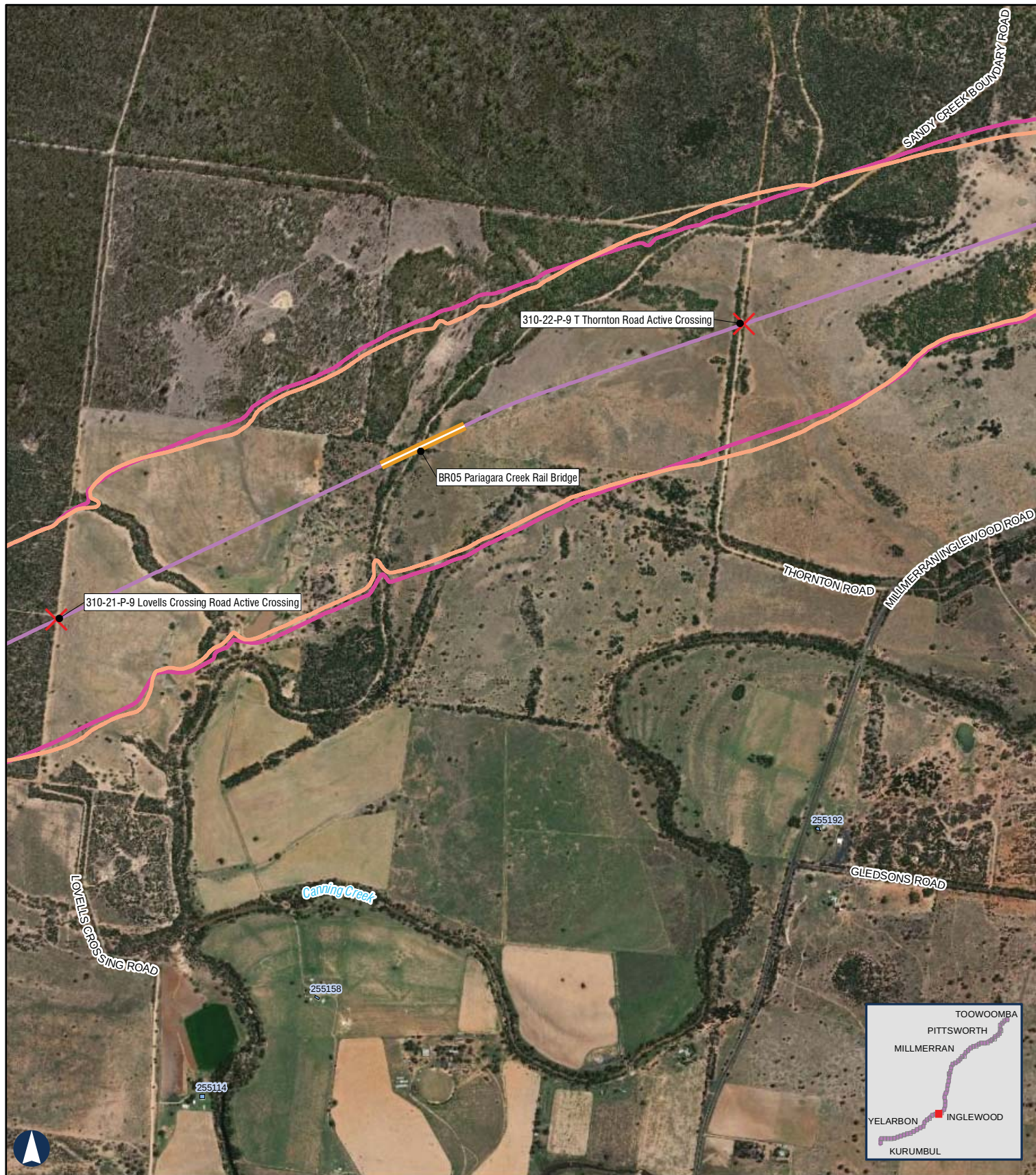
— Night-time noise criteria LA max 80dBA new rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 21 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

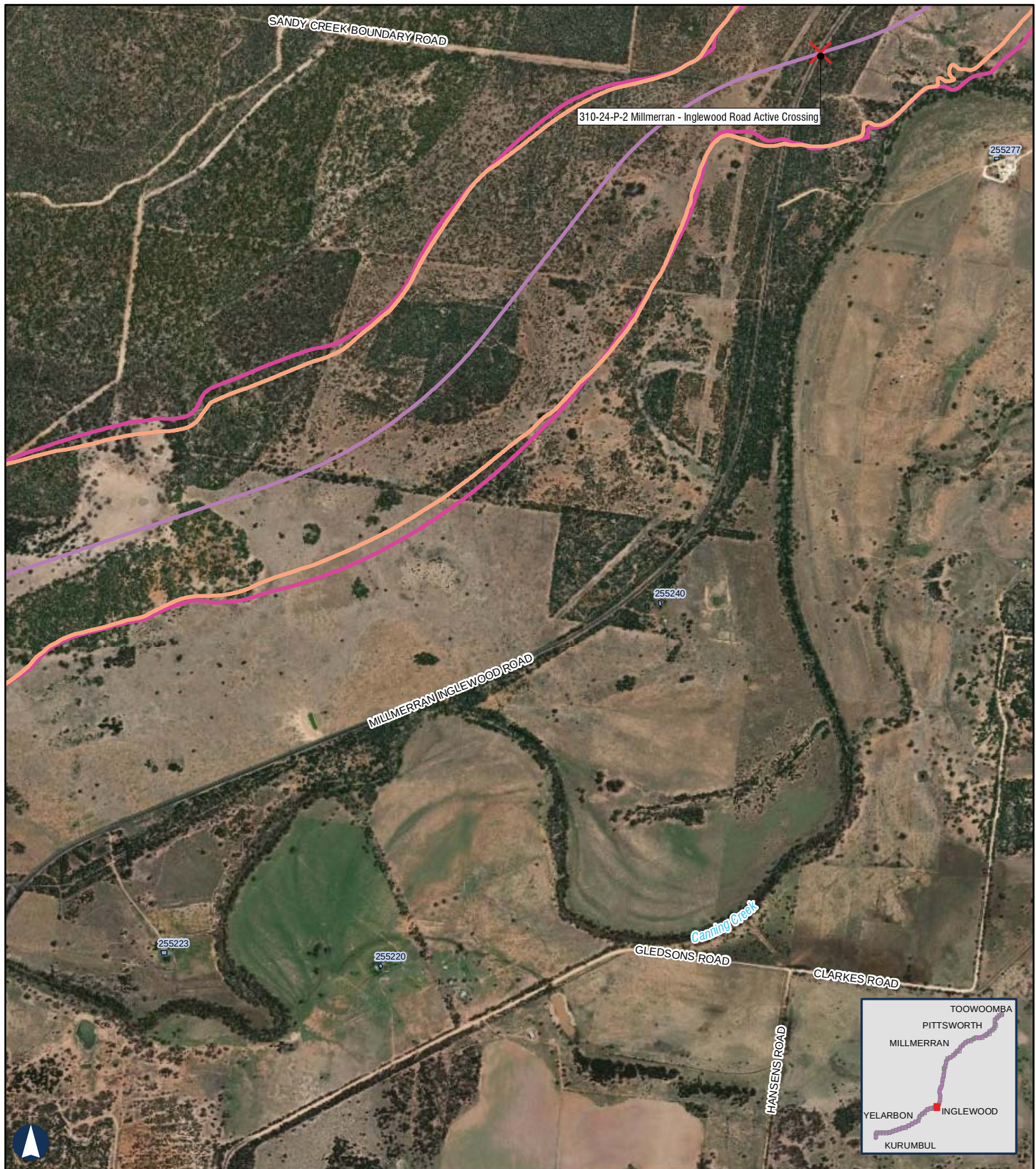
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 22 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

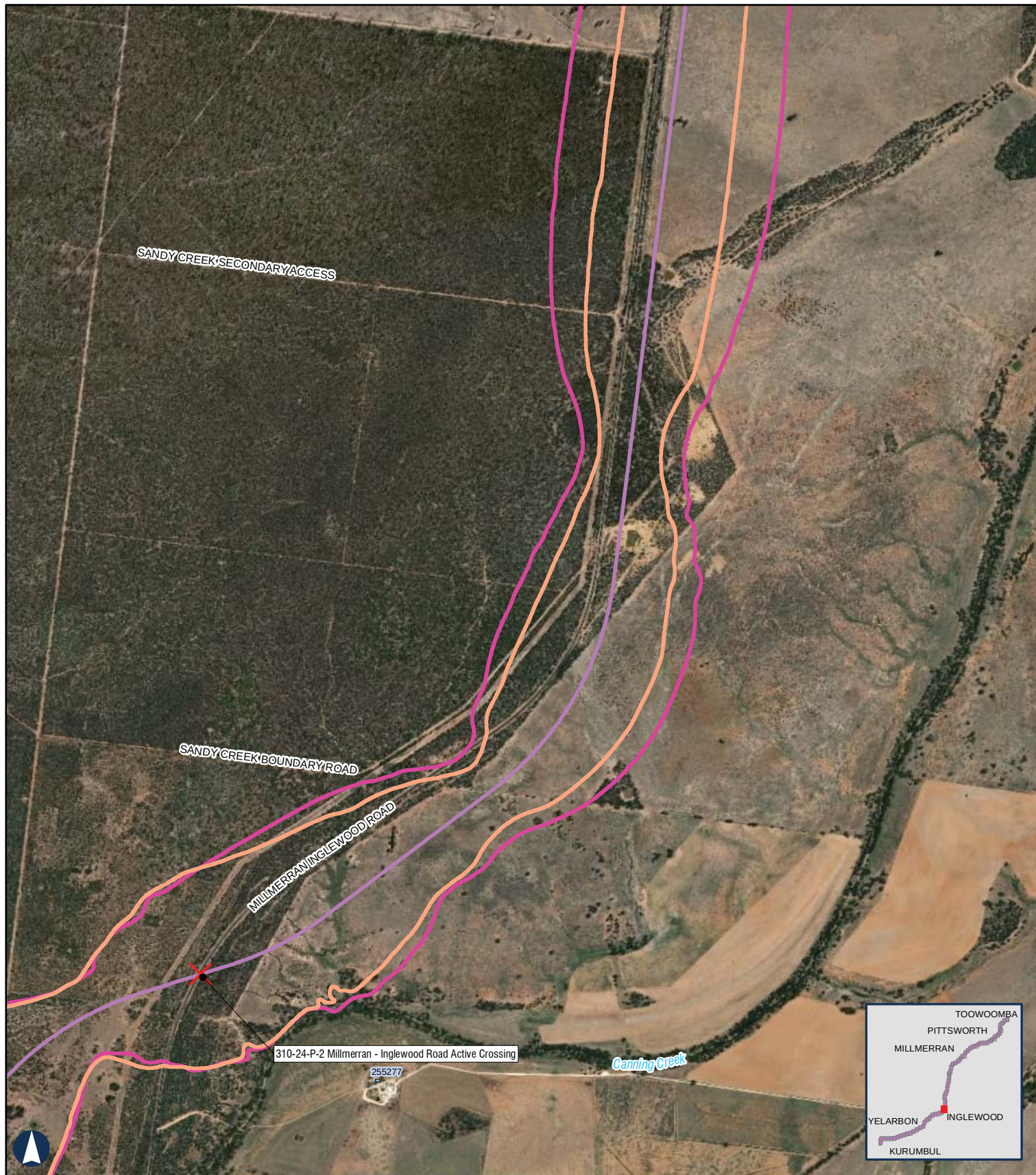
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 23 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

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- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

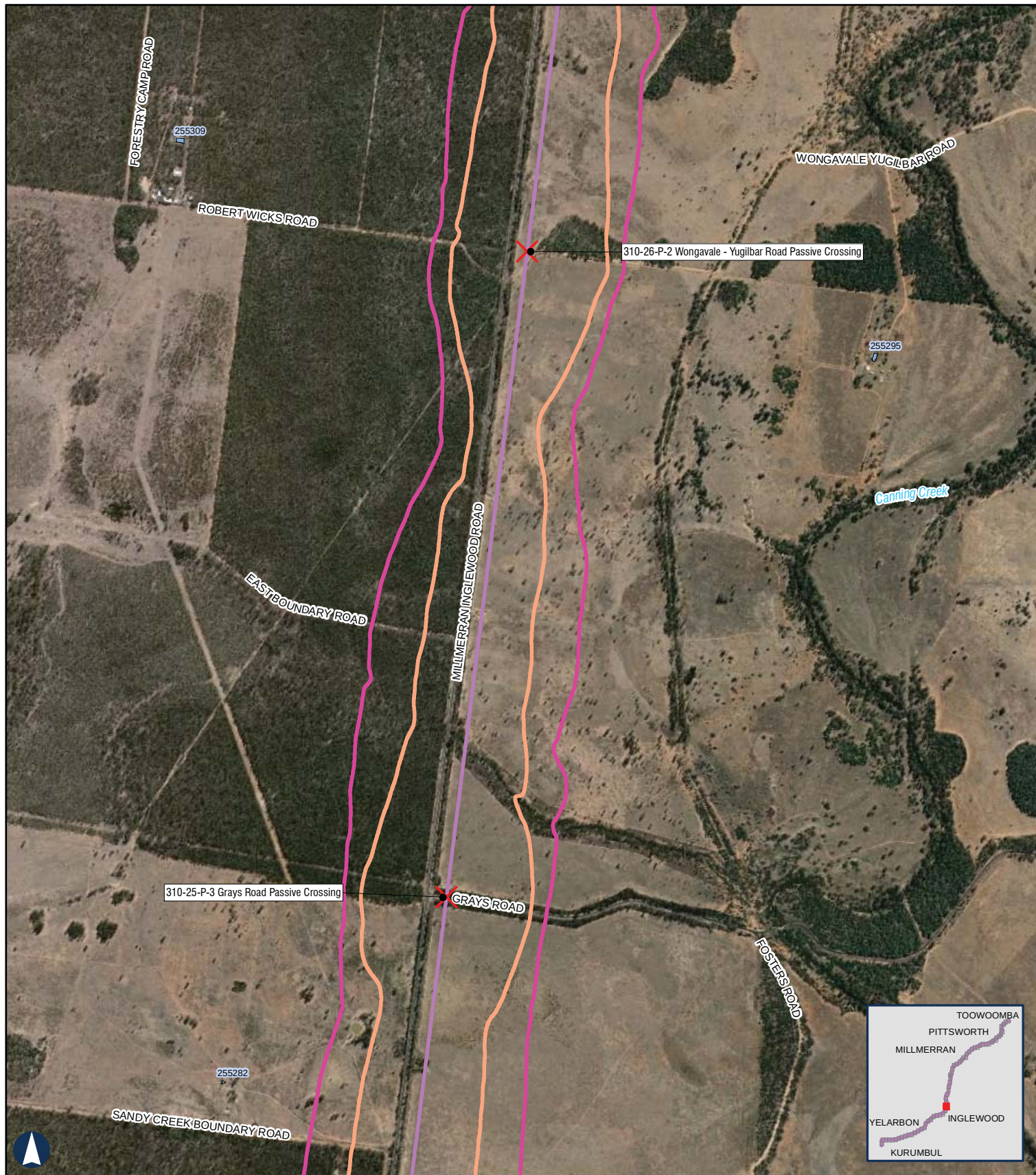
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 24 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

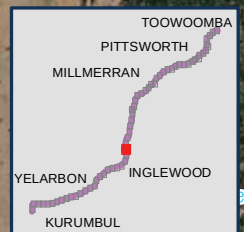
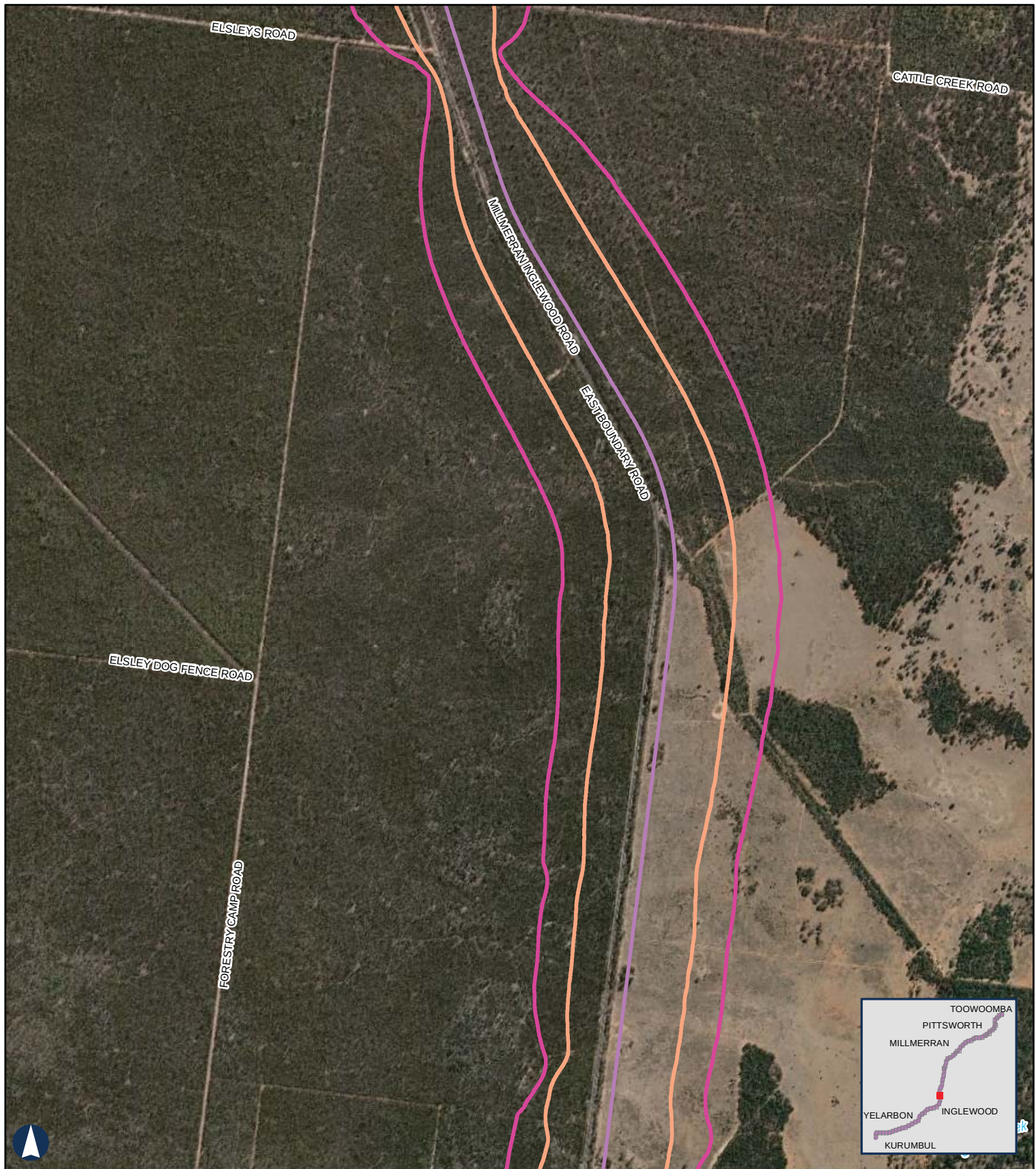
- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 25 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

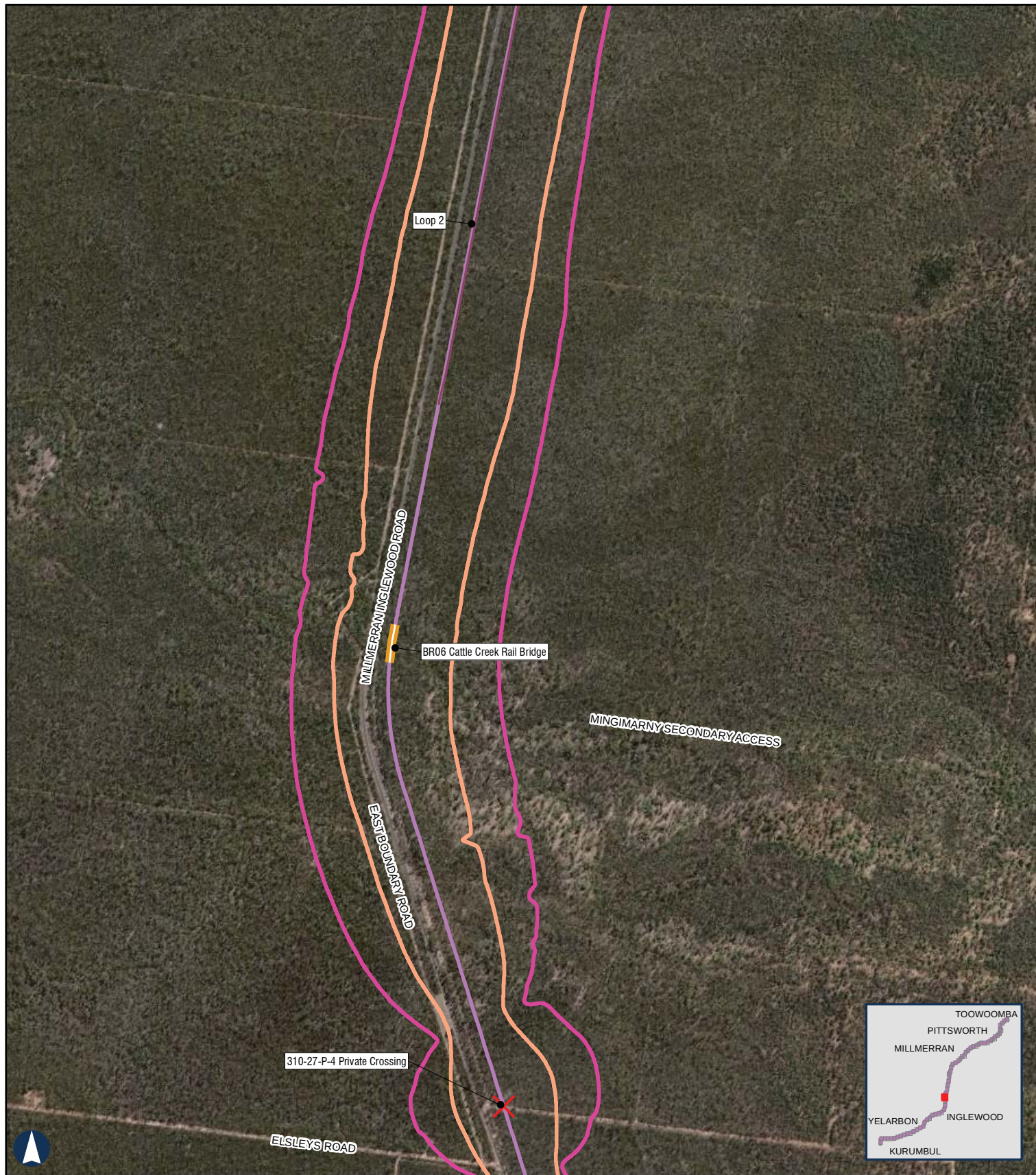
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 26 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

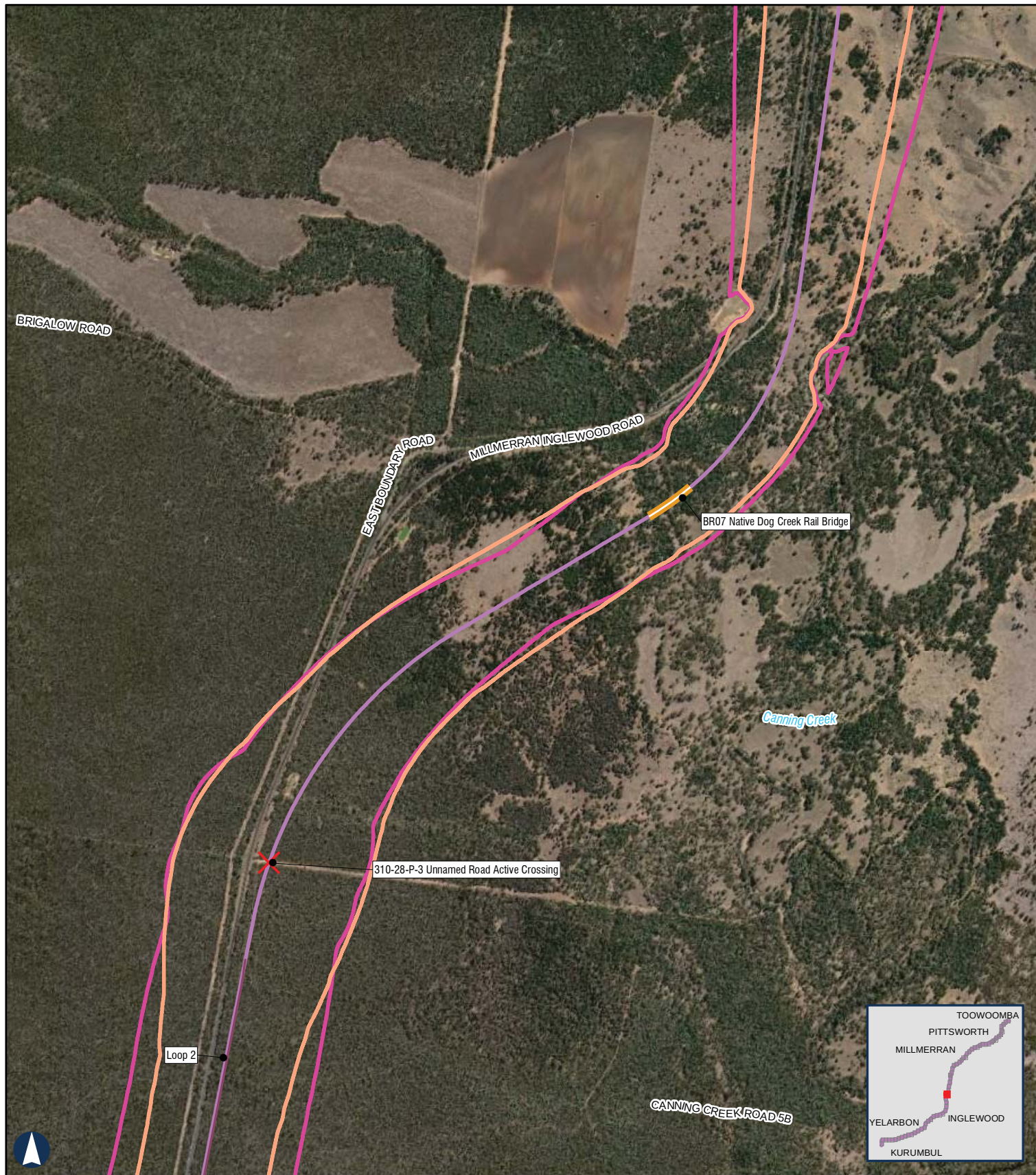
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 27 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

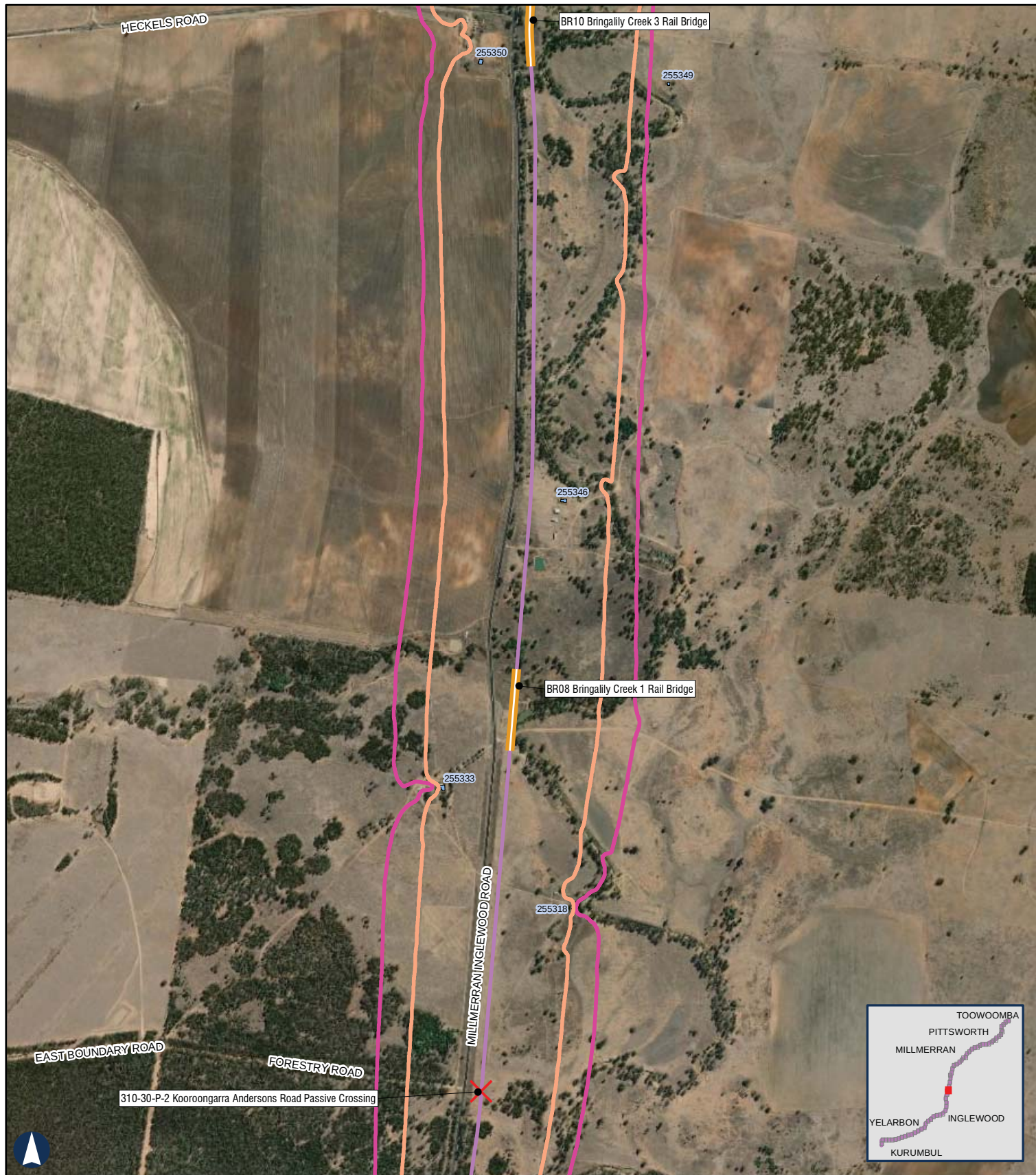
— Night-time noise criteria LA max
80dBA new rail corridor

— Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 28 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
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Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

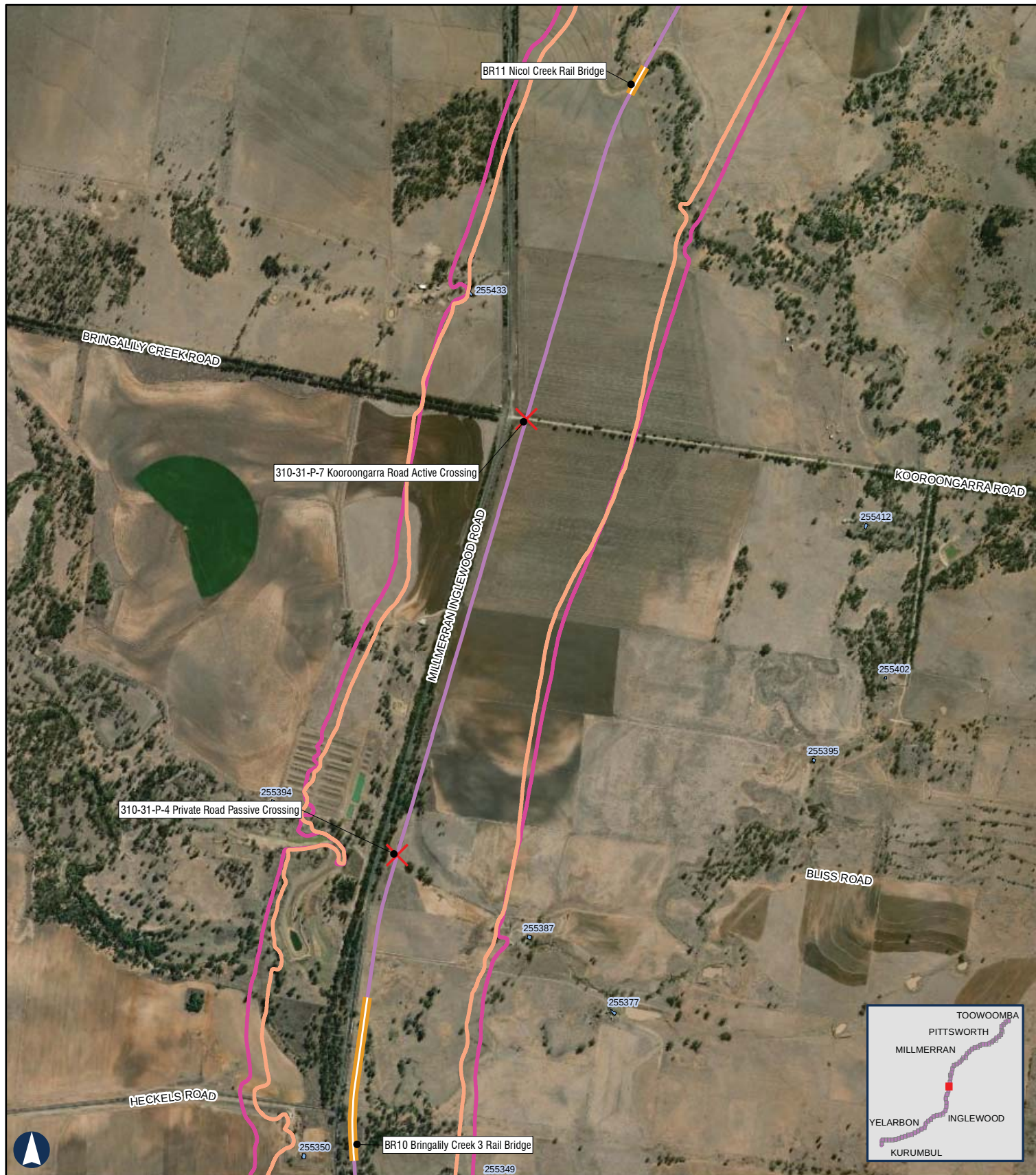
— Night-time noise criteria LA max 80dBA new rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 29 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

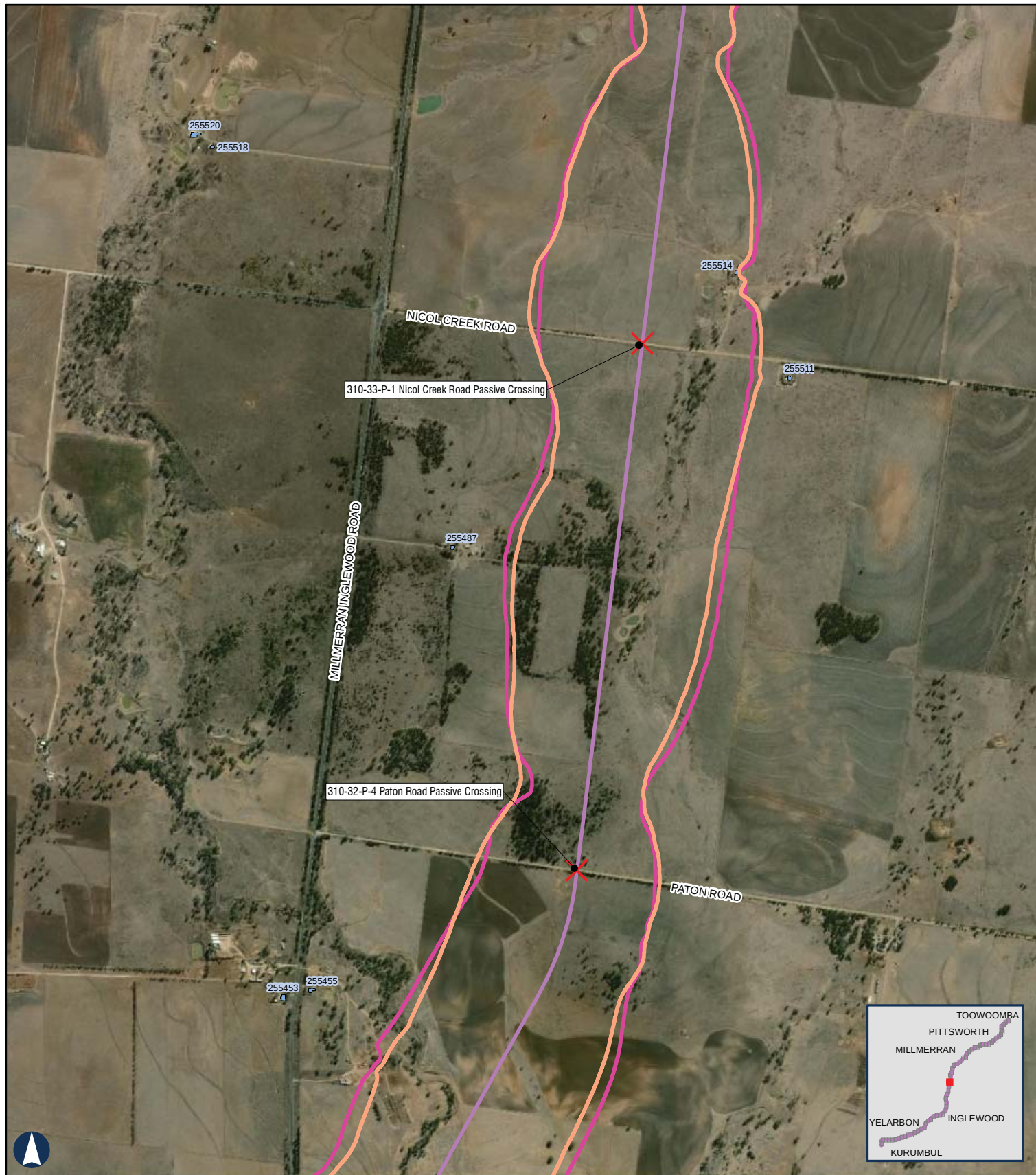
— Night-time noise criteria LA max 80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 30 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

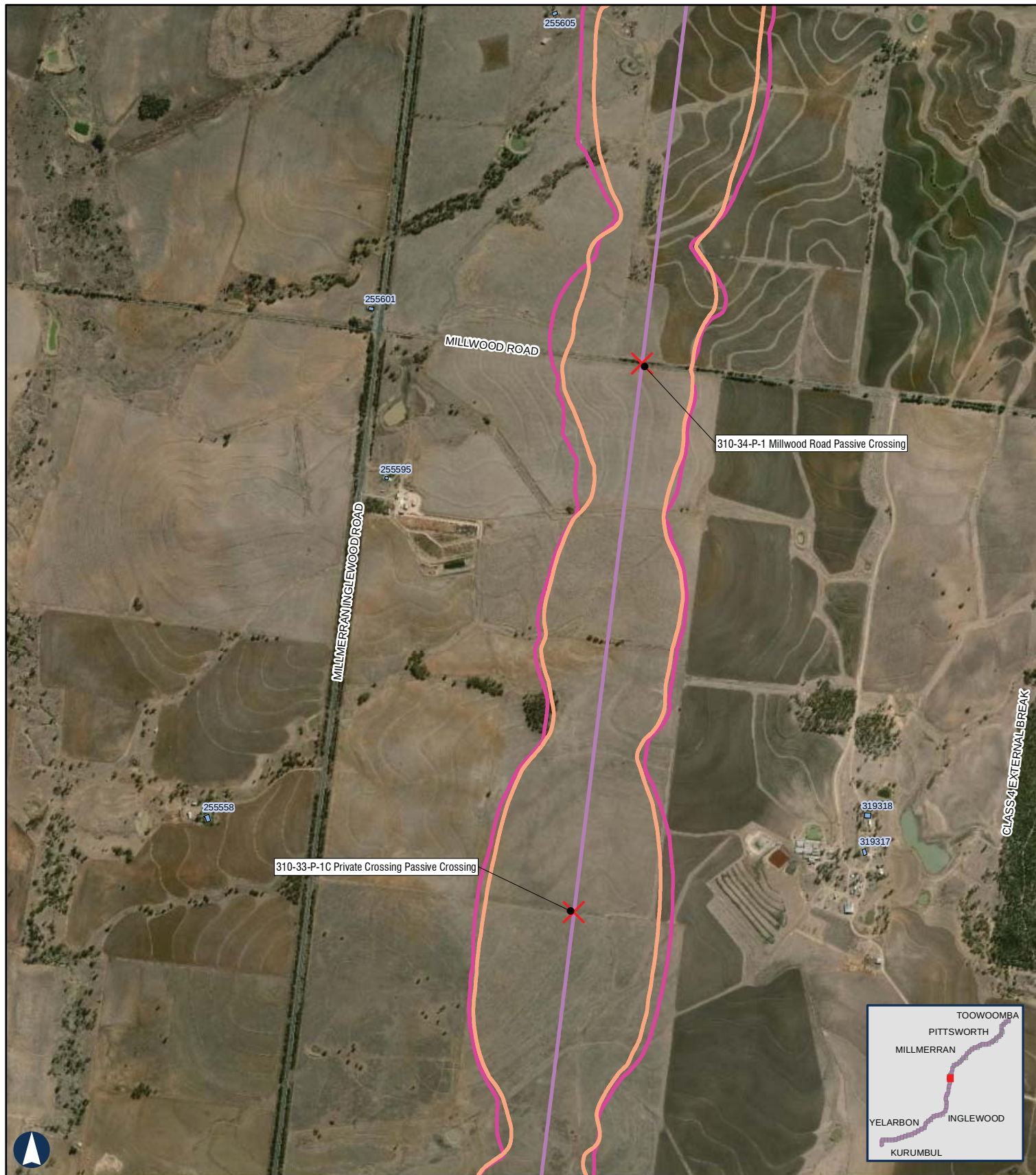
- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 31 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

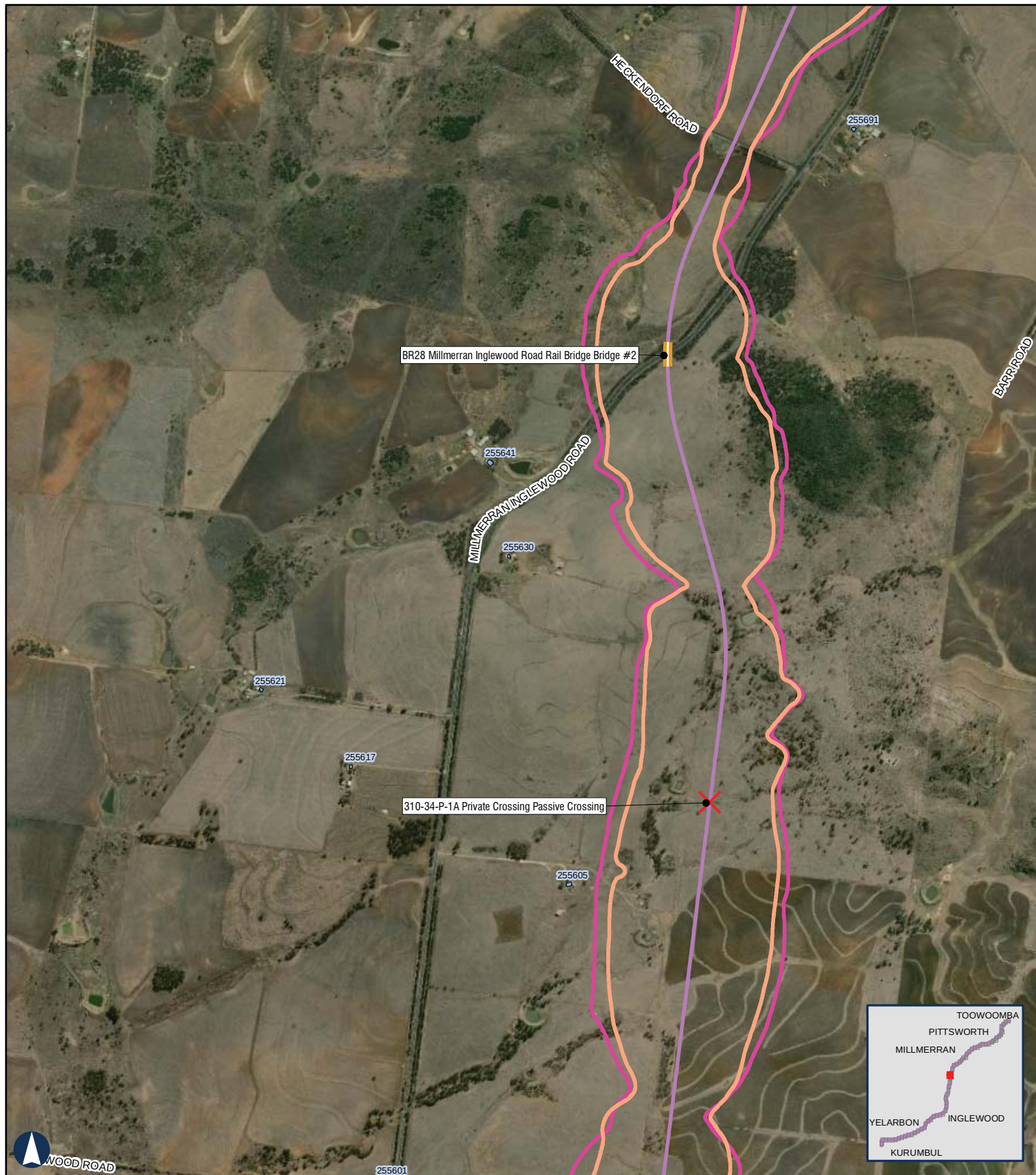
- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 32 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

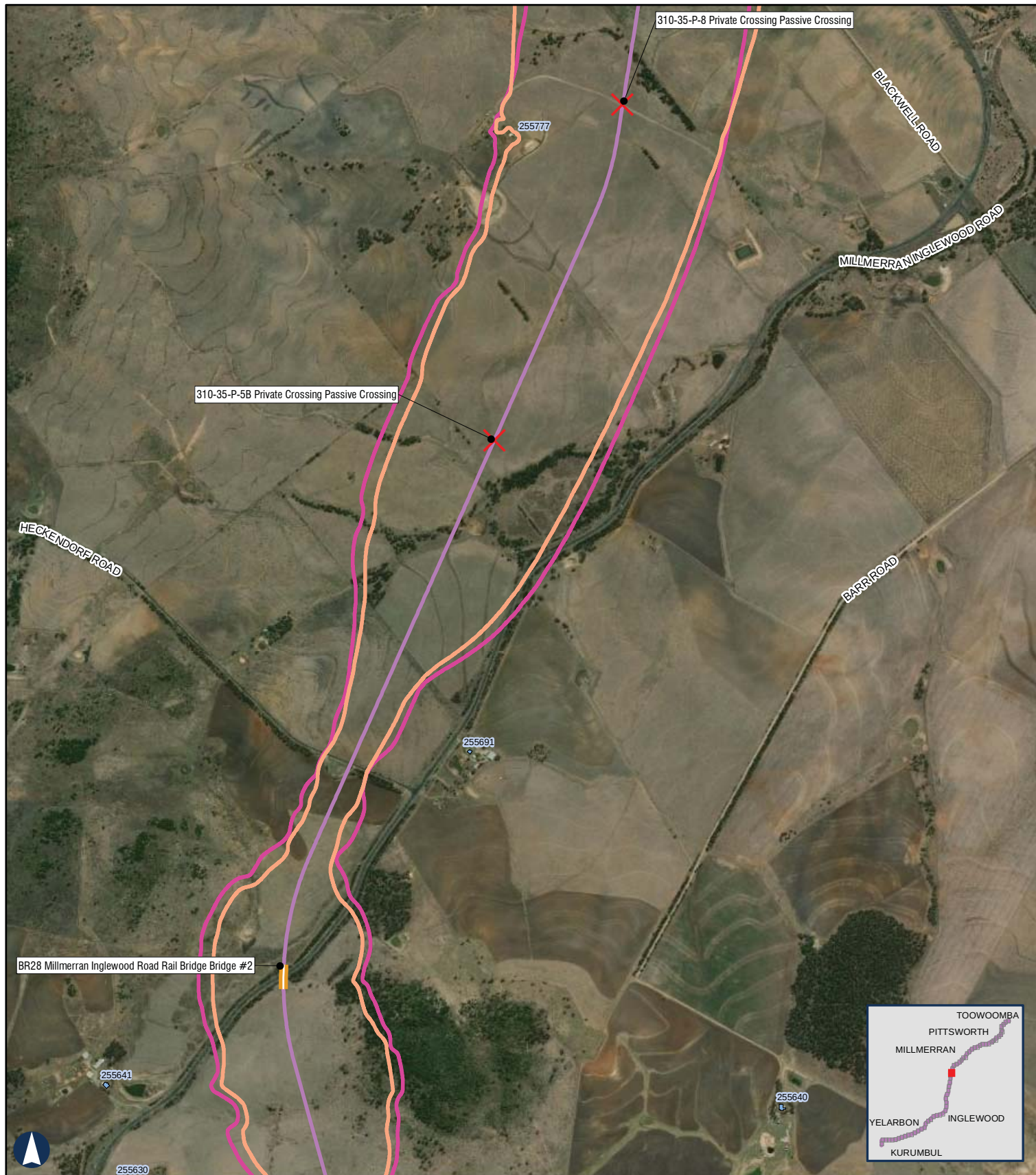
— Night-time noise criteria LA max 80dBA new rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 33 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

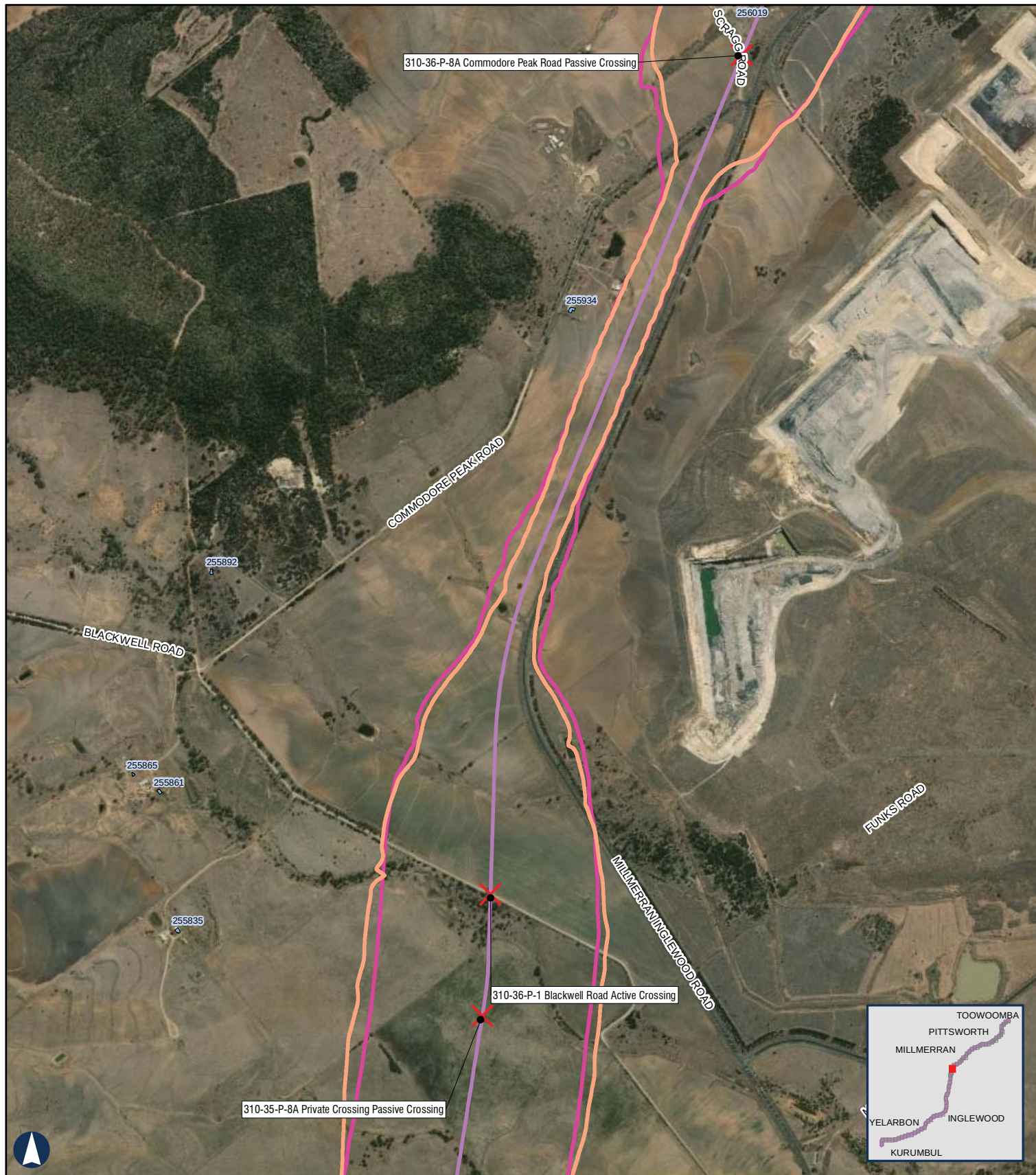
- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.



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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 34 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

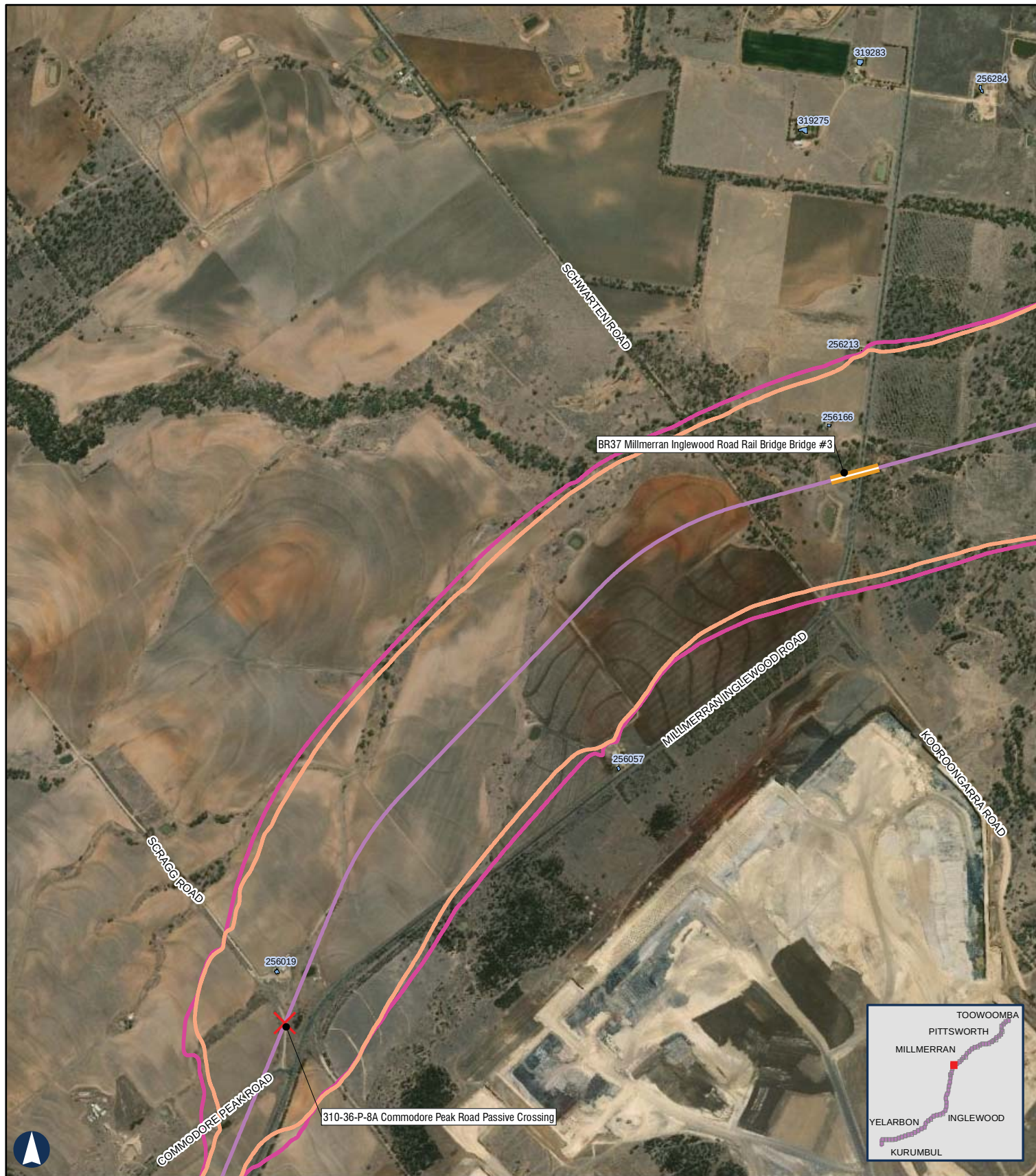
— Night-time noise criteria LA max 80dBA new rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 35 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

— Night-time noise criteria LA max 80dBA new rail corridor

● Receptors

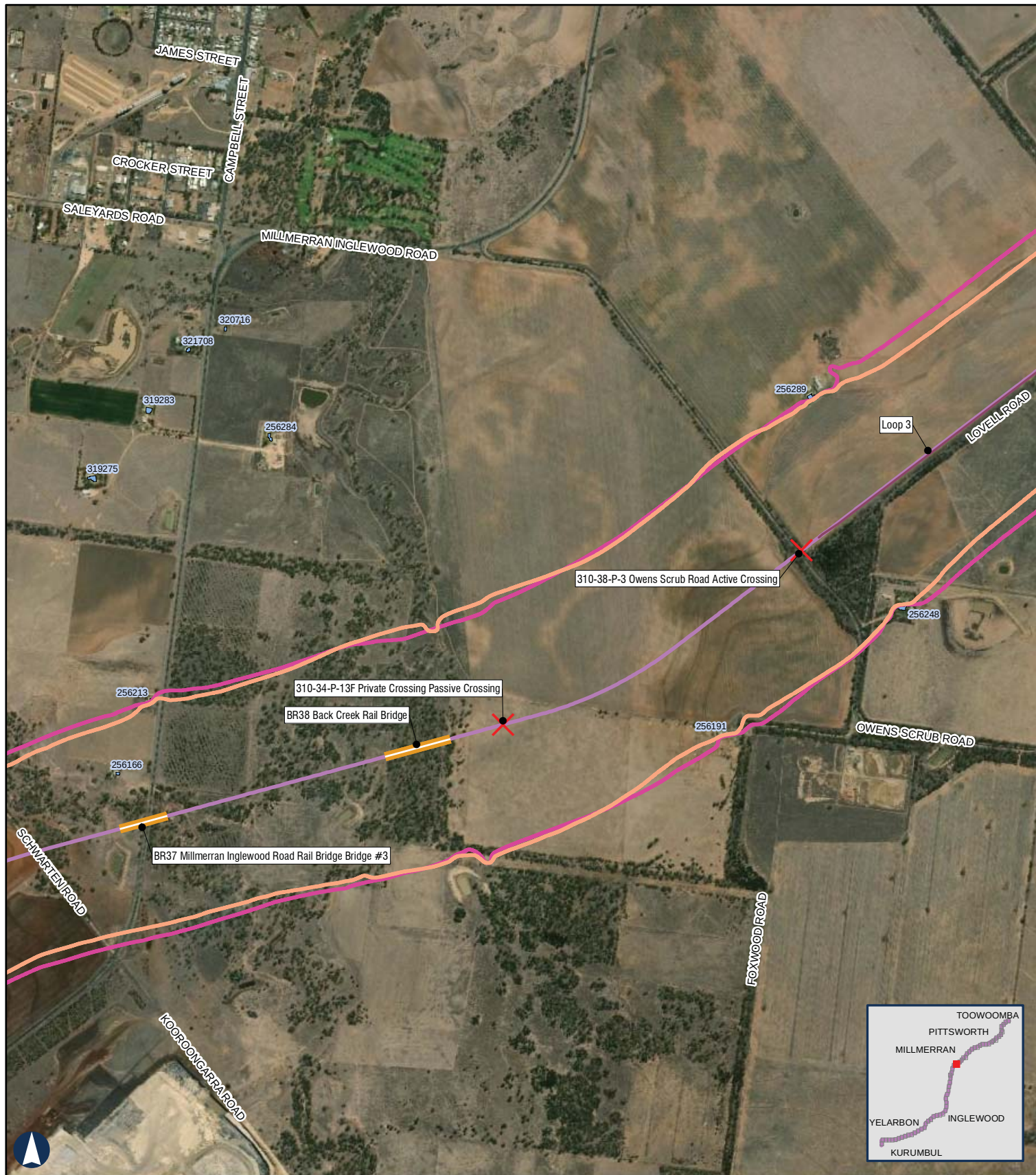
Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 36 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 37 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

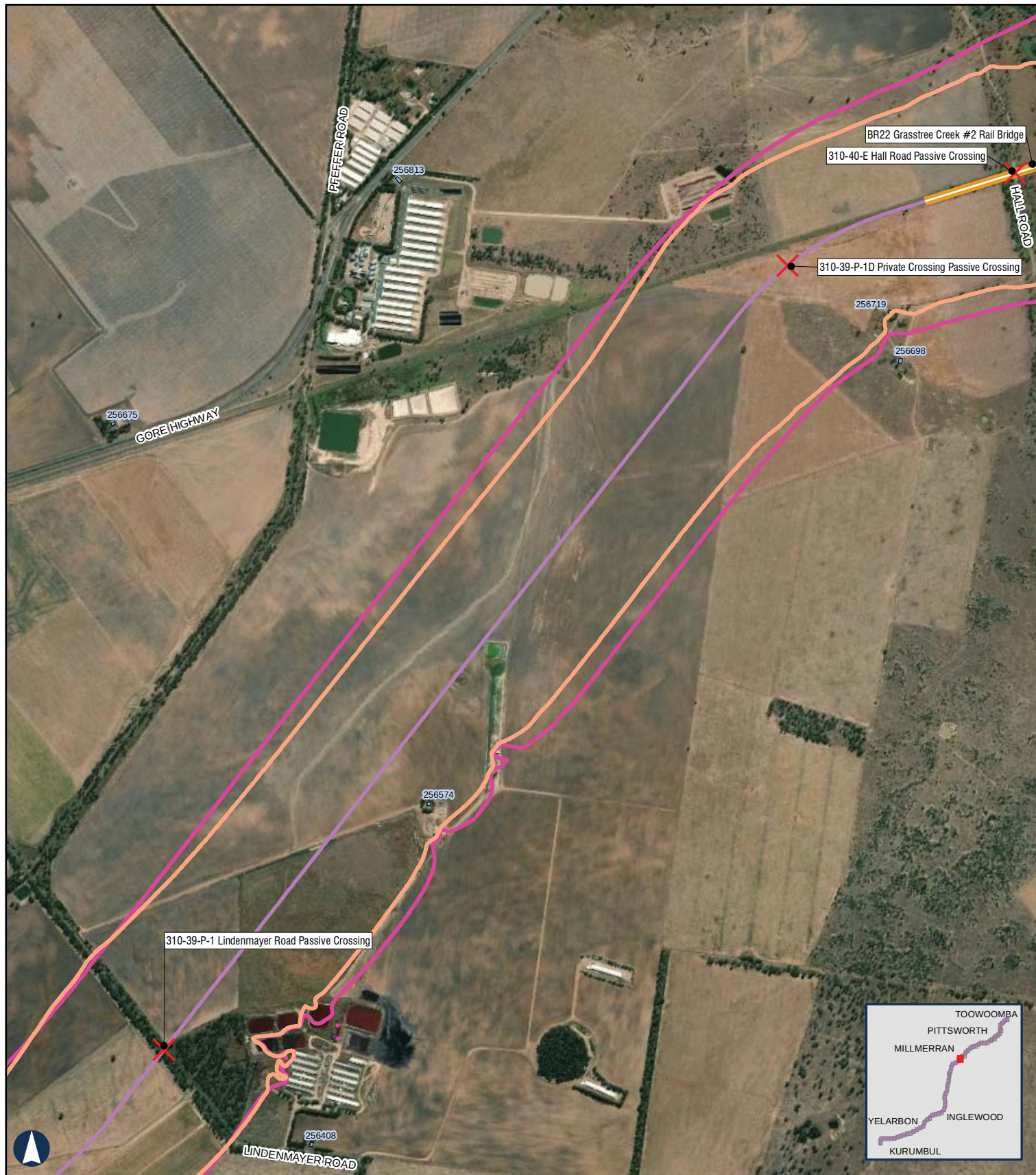
- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 38 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

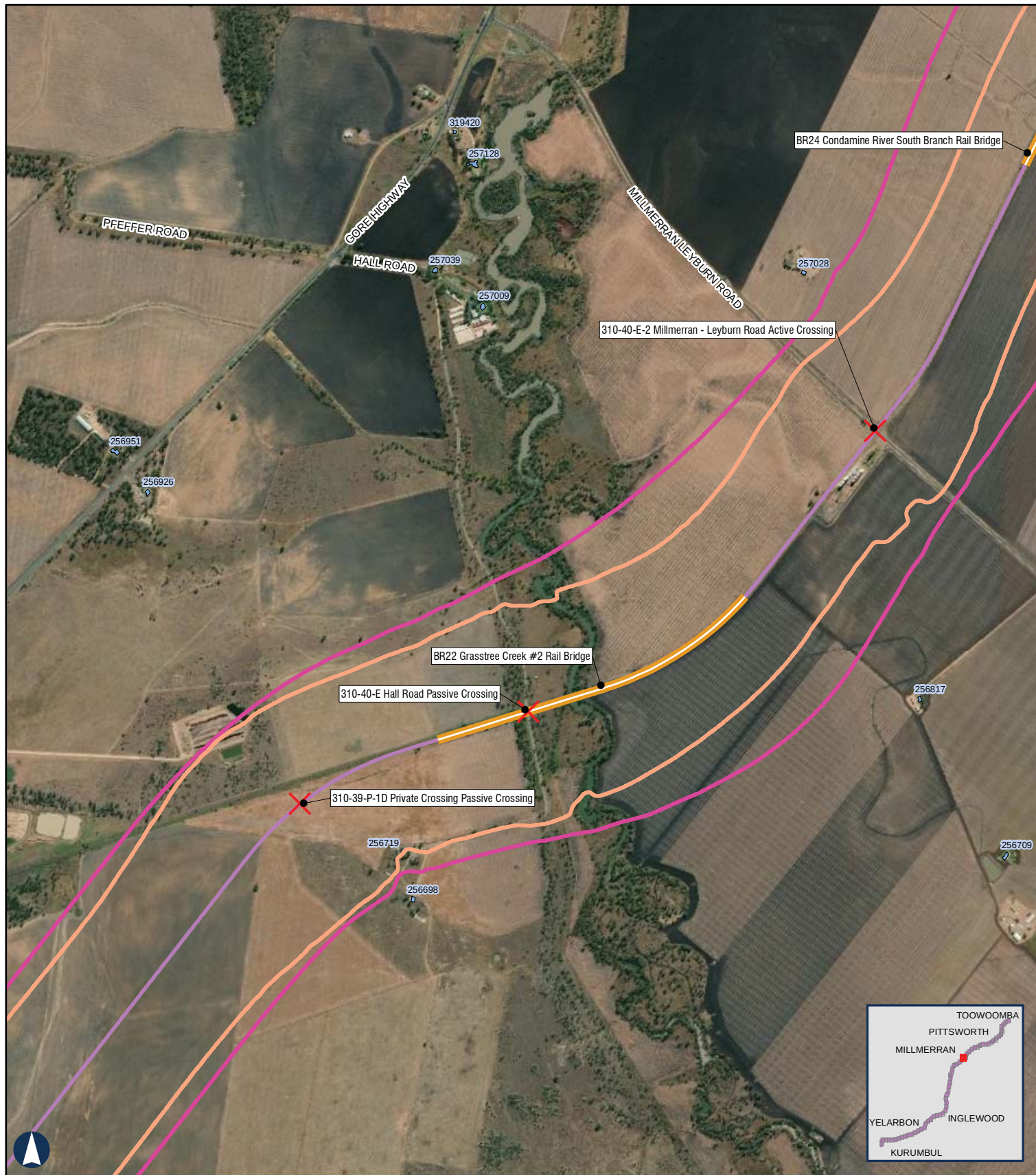
Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 39 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

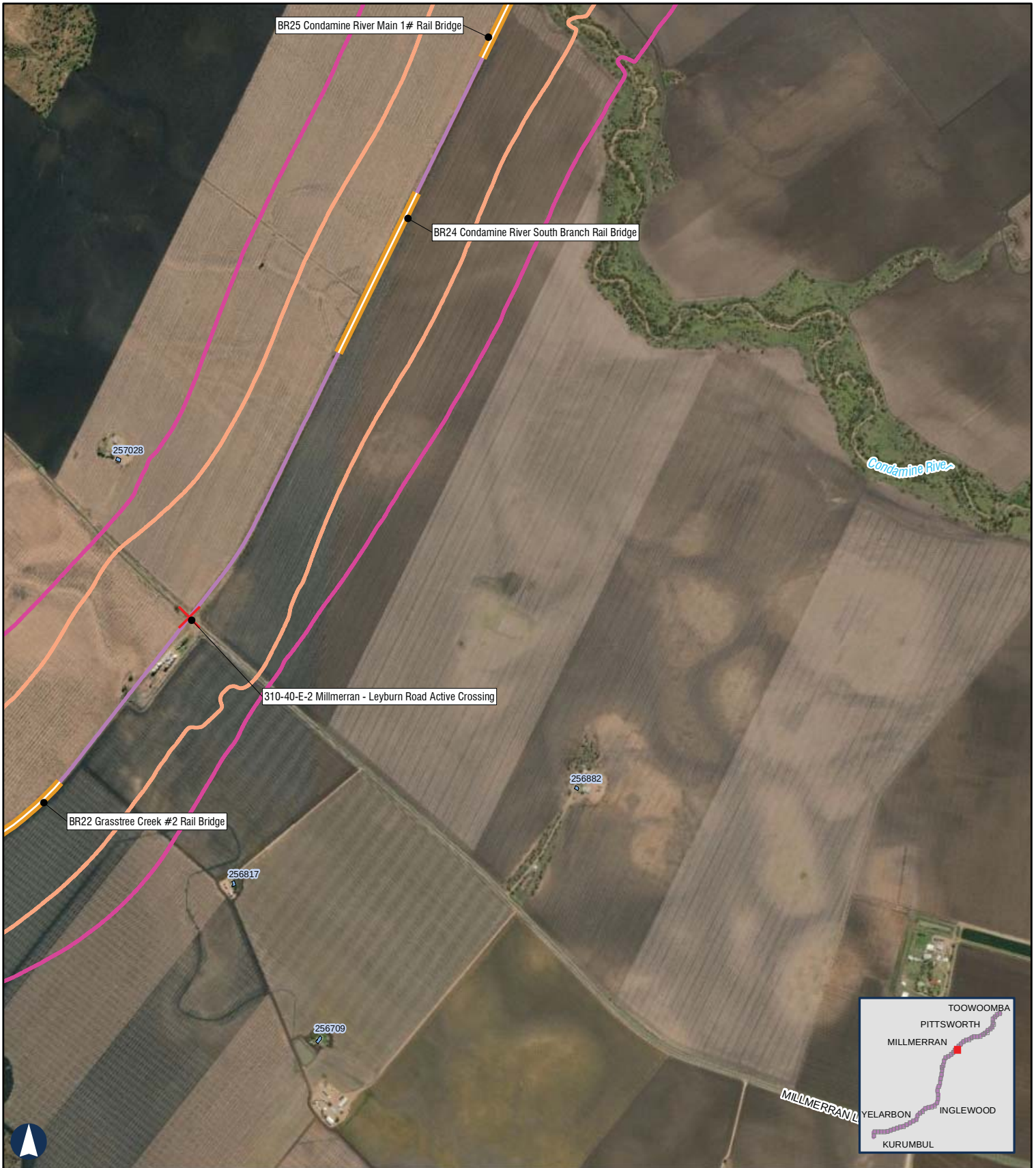
- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 40 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

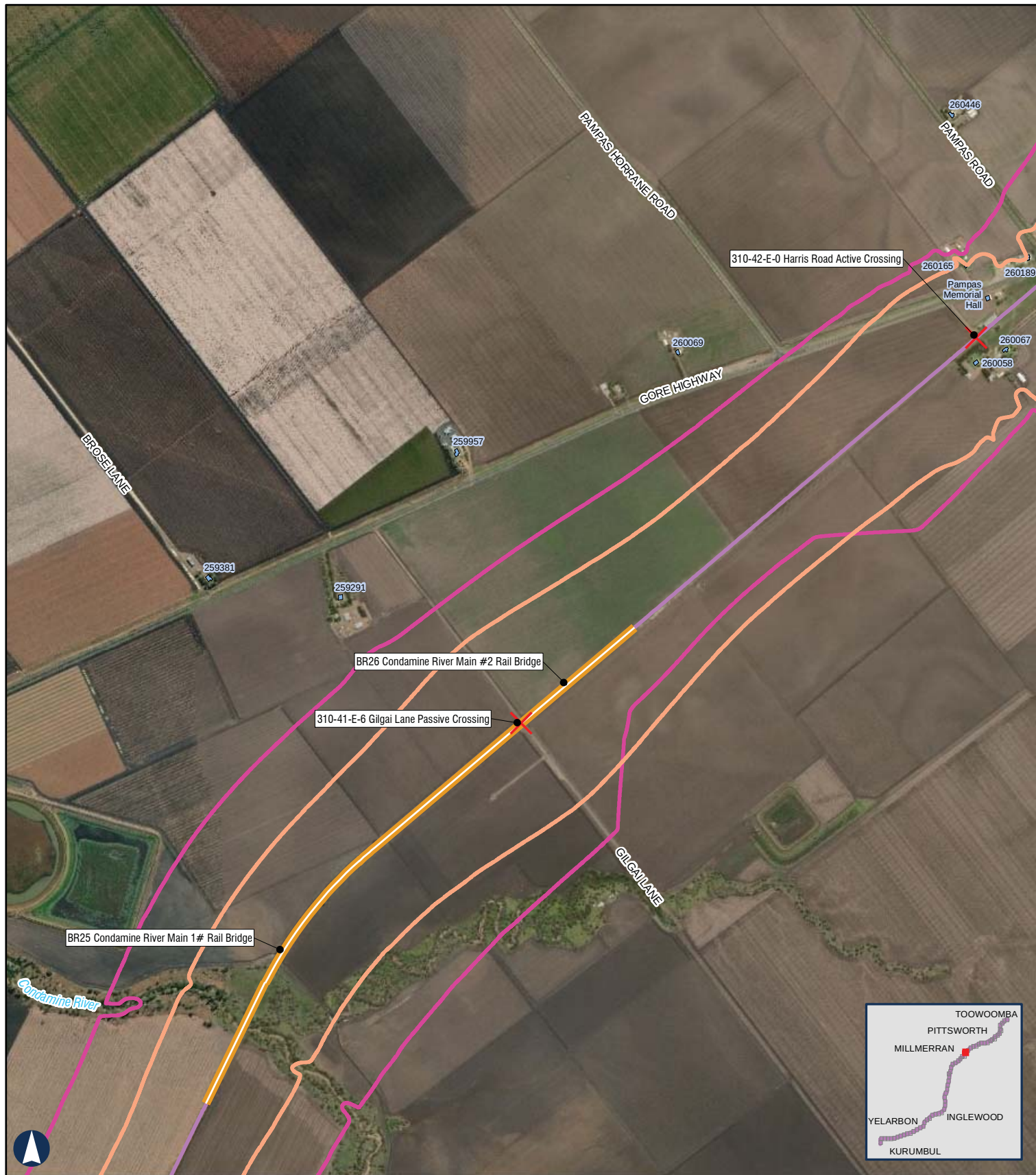
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 41 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

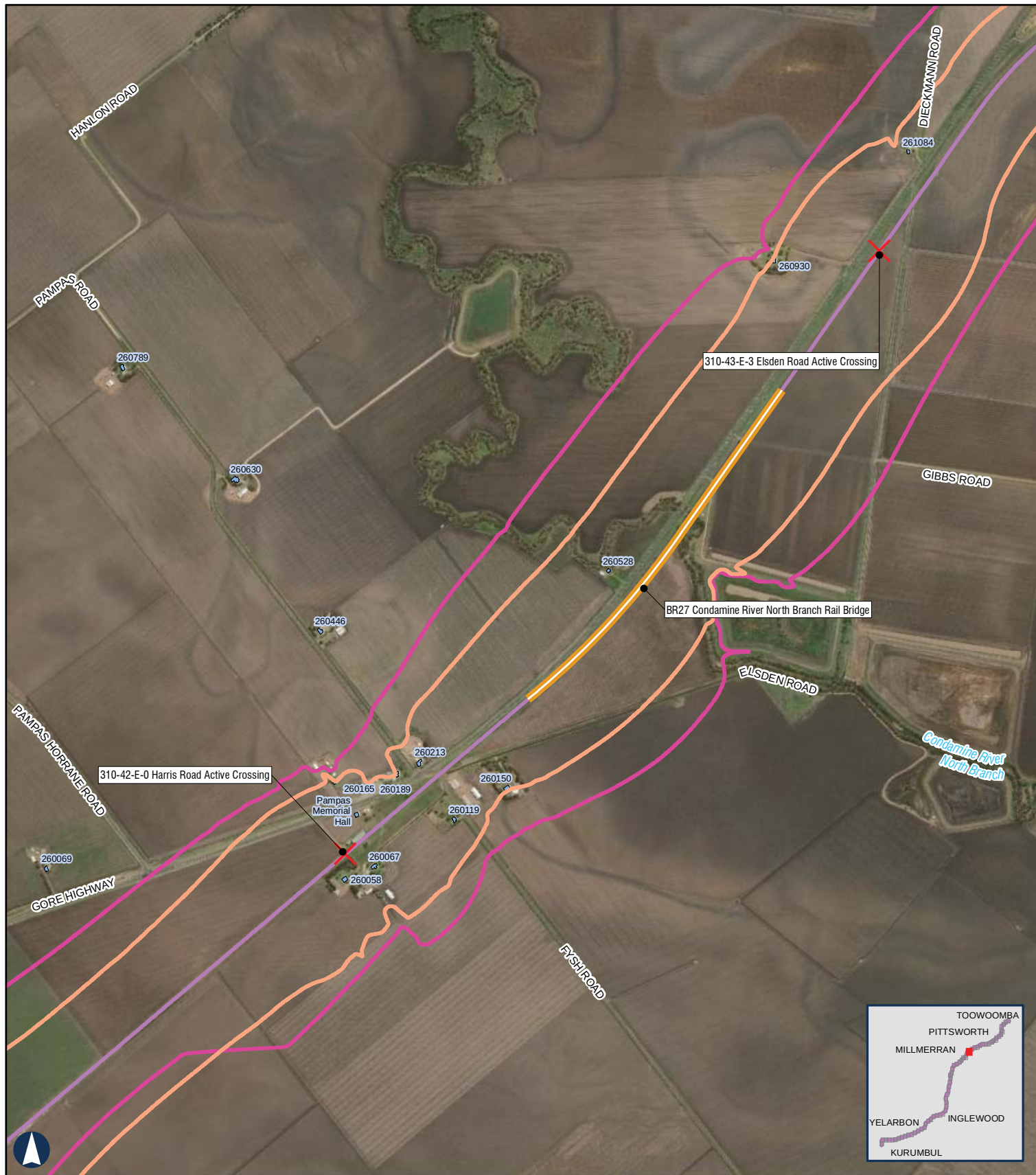
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 42 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

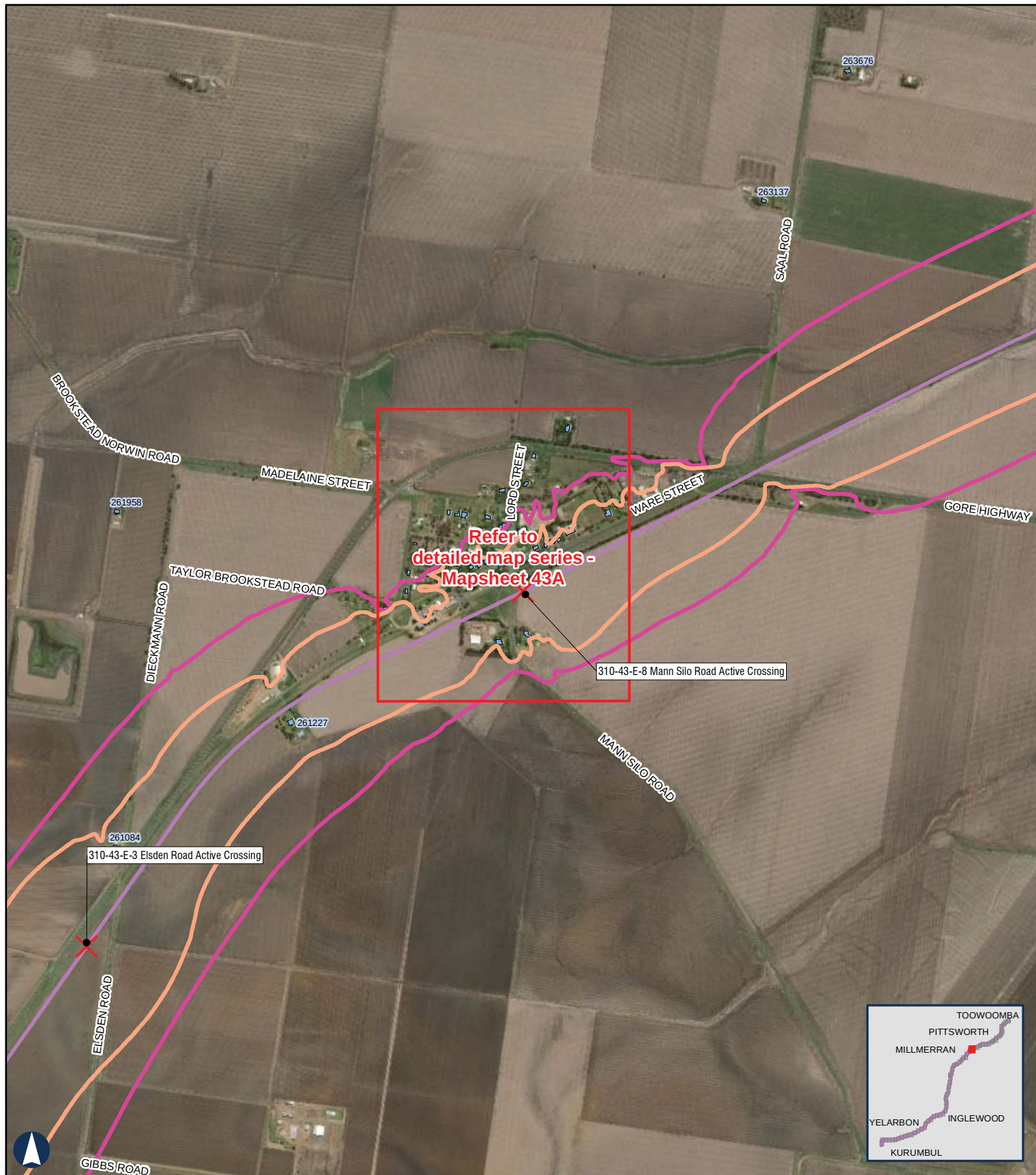
- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 43 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

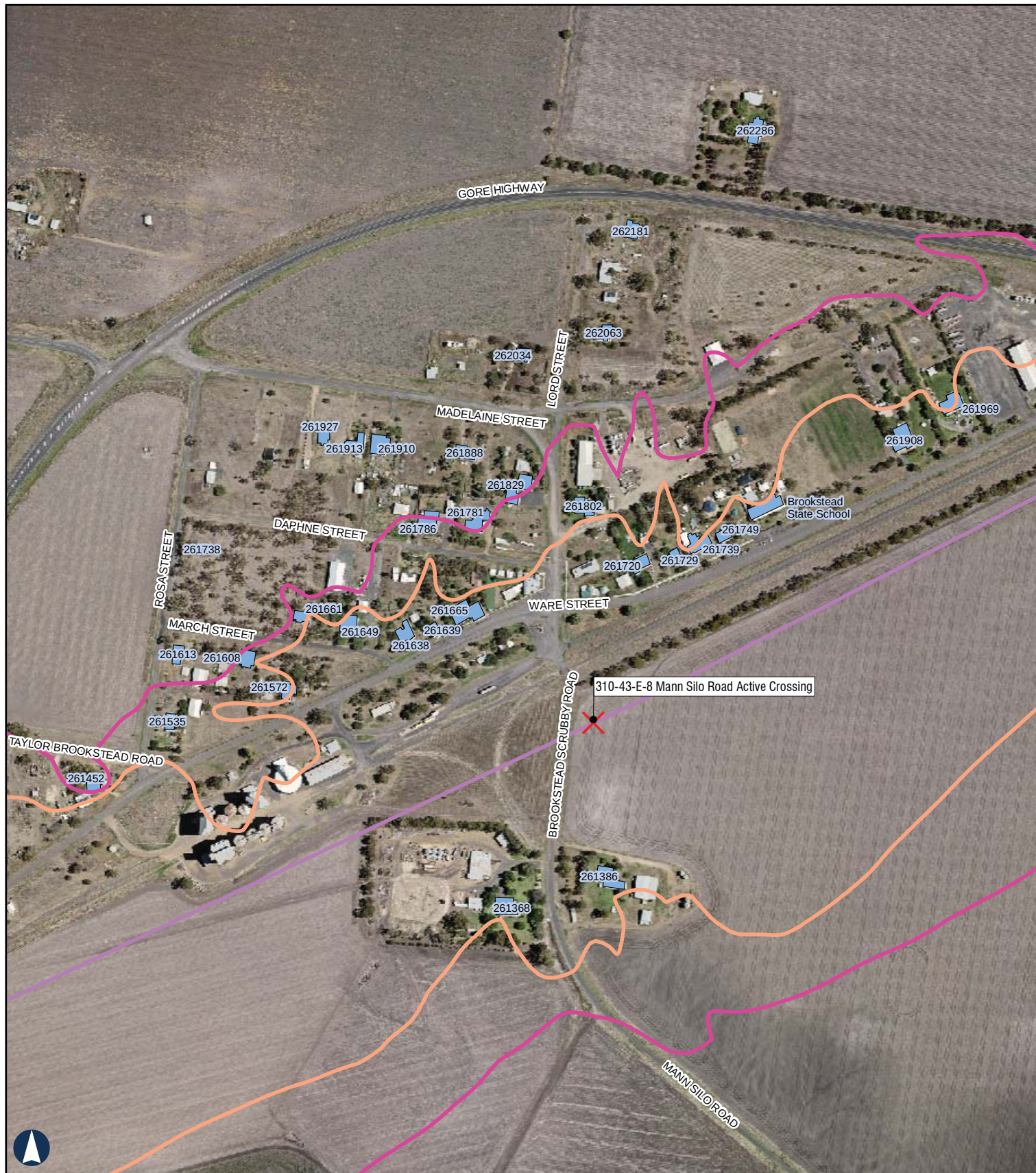
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC *InlandRail*

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE Year 2026 Night-time rail noise levels - Detailed

APPENDIX D - Mapsheet 43A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:5,500

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

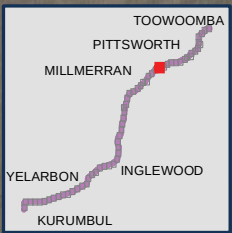
Noise contours are based on a set distance above the local terrain level of 2.4m.

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LAeq9hr 60dBA upgrading existing rail



ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 44 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.



The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 45 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

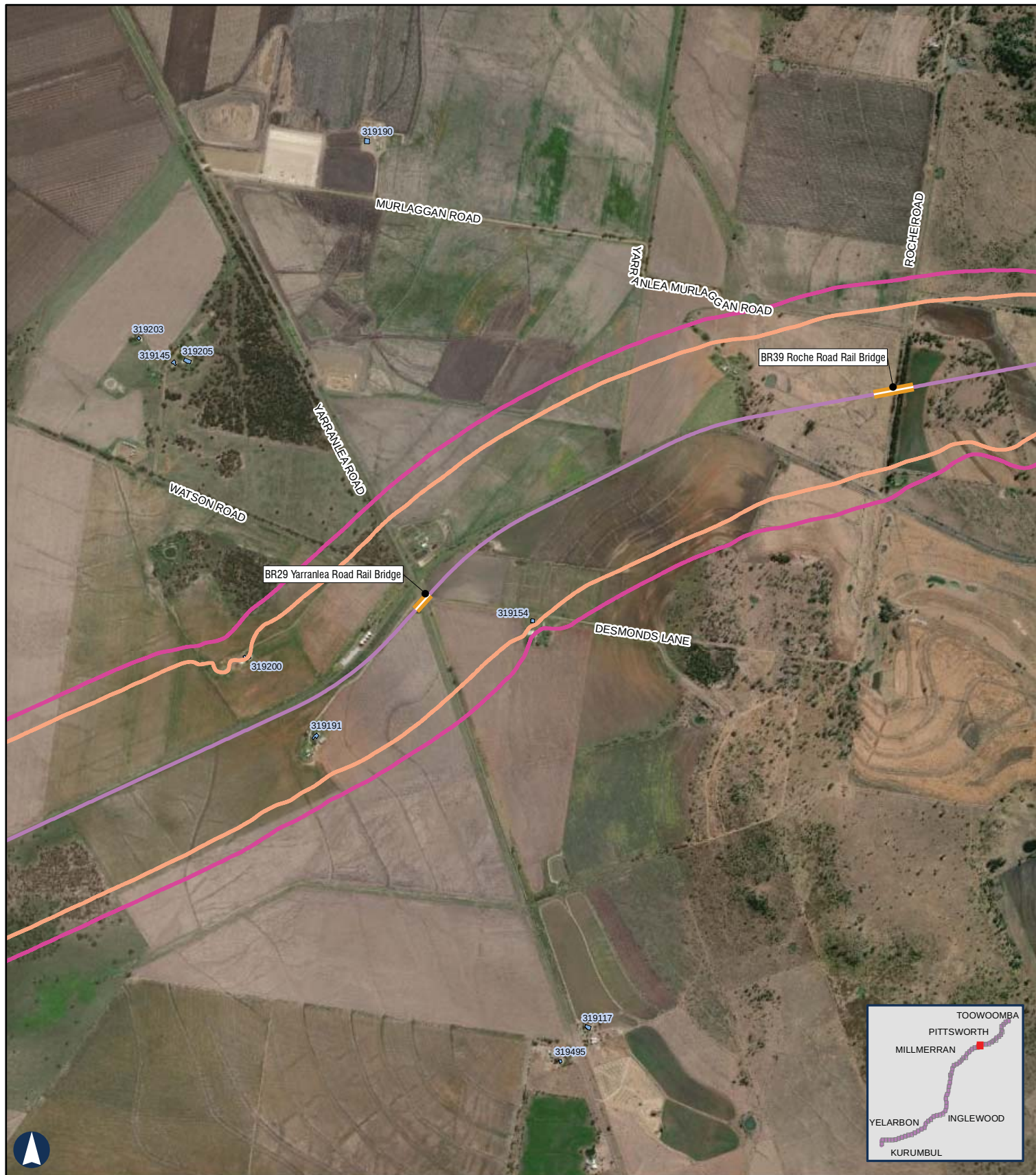
- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 46 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

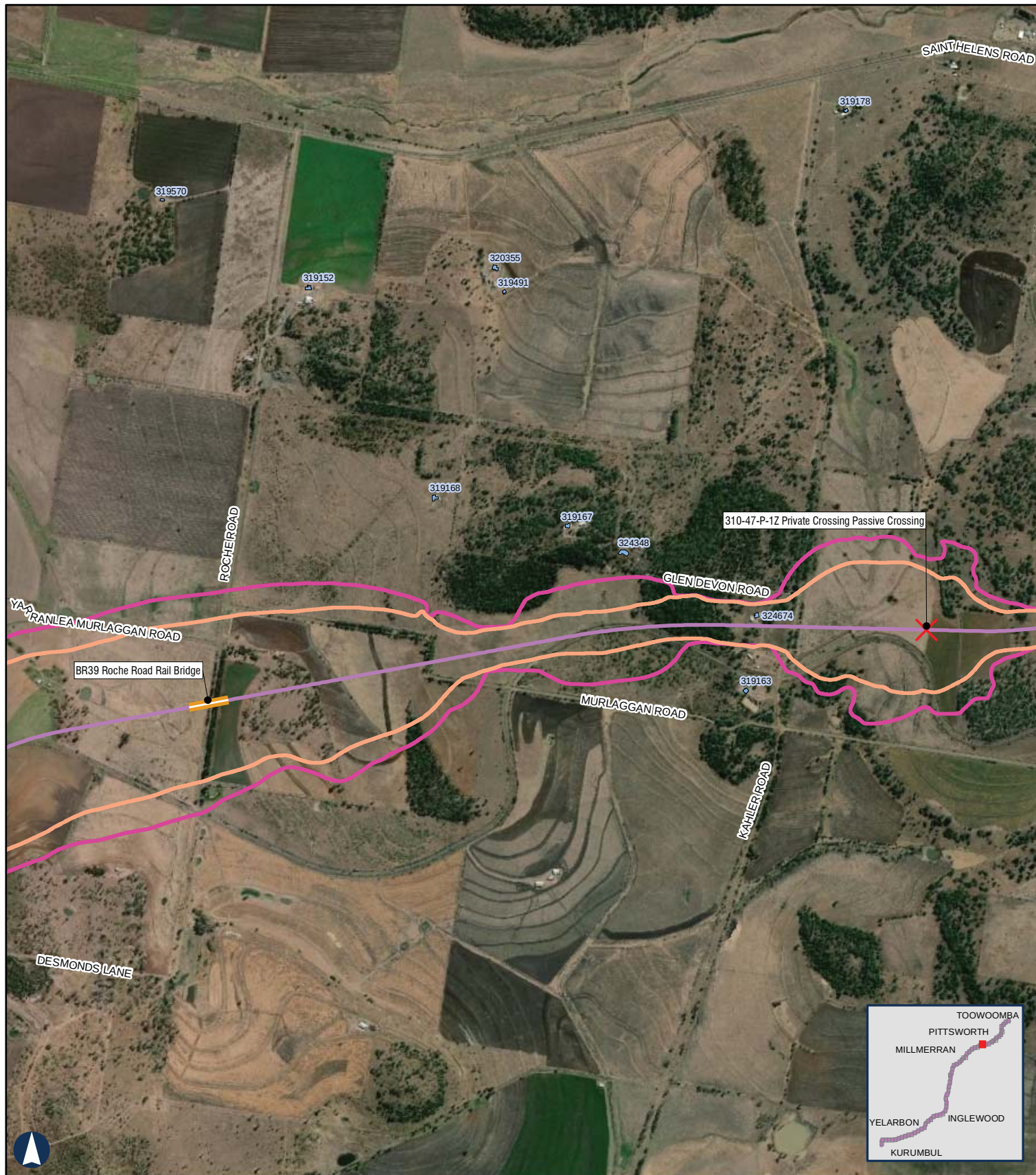
Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 47 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

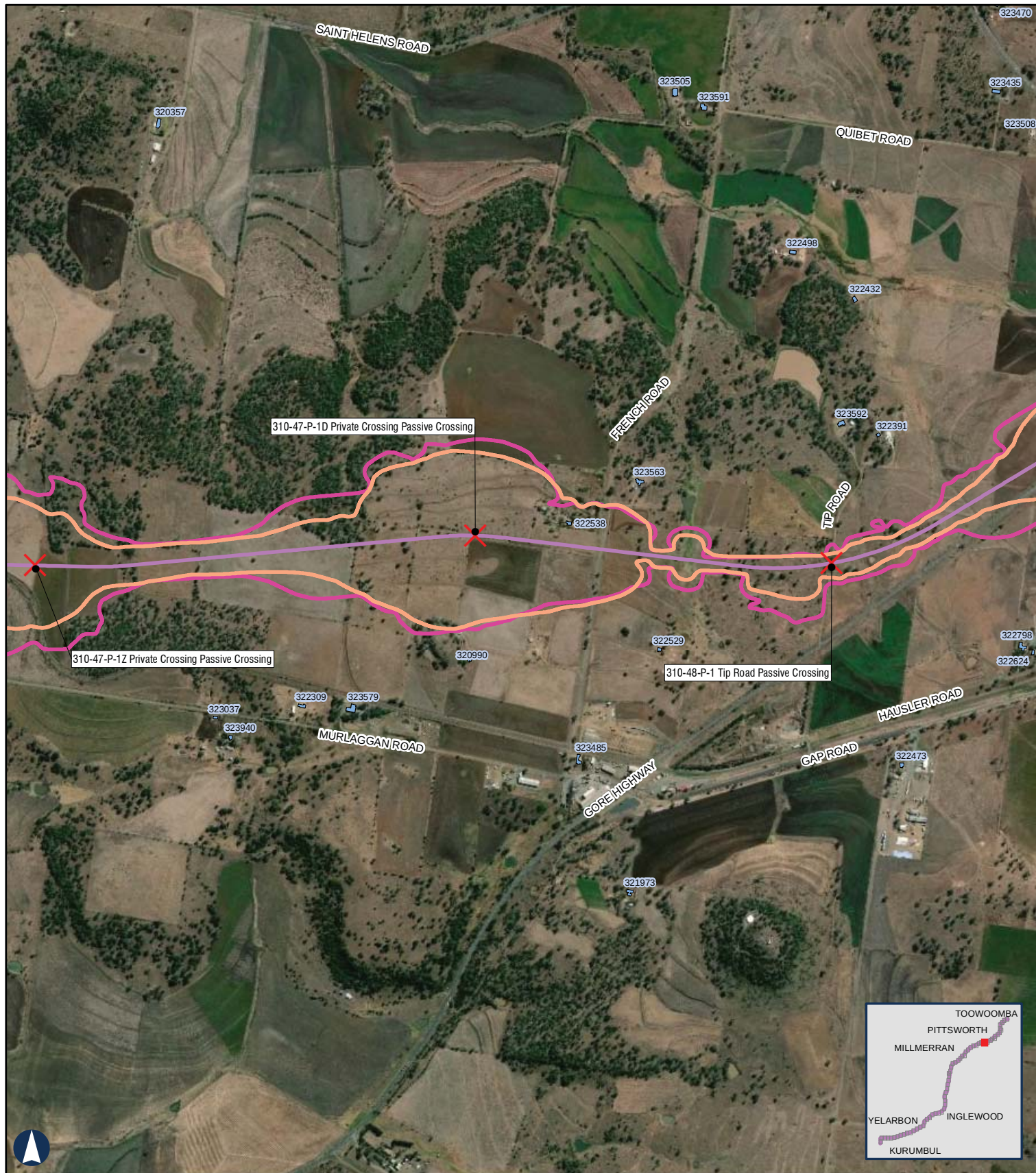
— Night-time noise criteria LA max
80dBA new rail corridor

Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 48 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

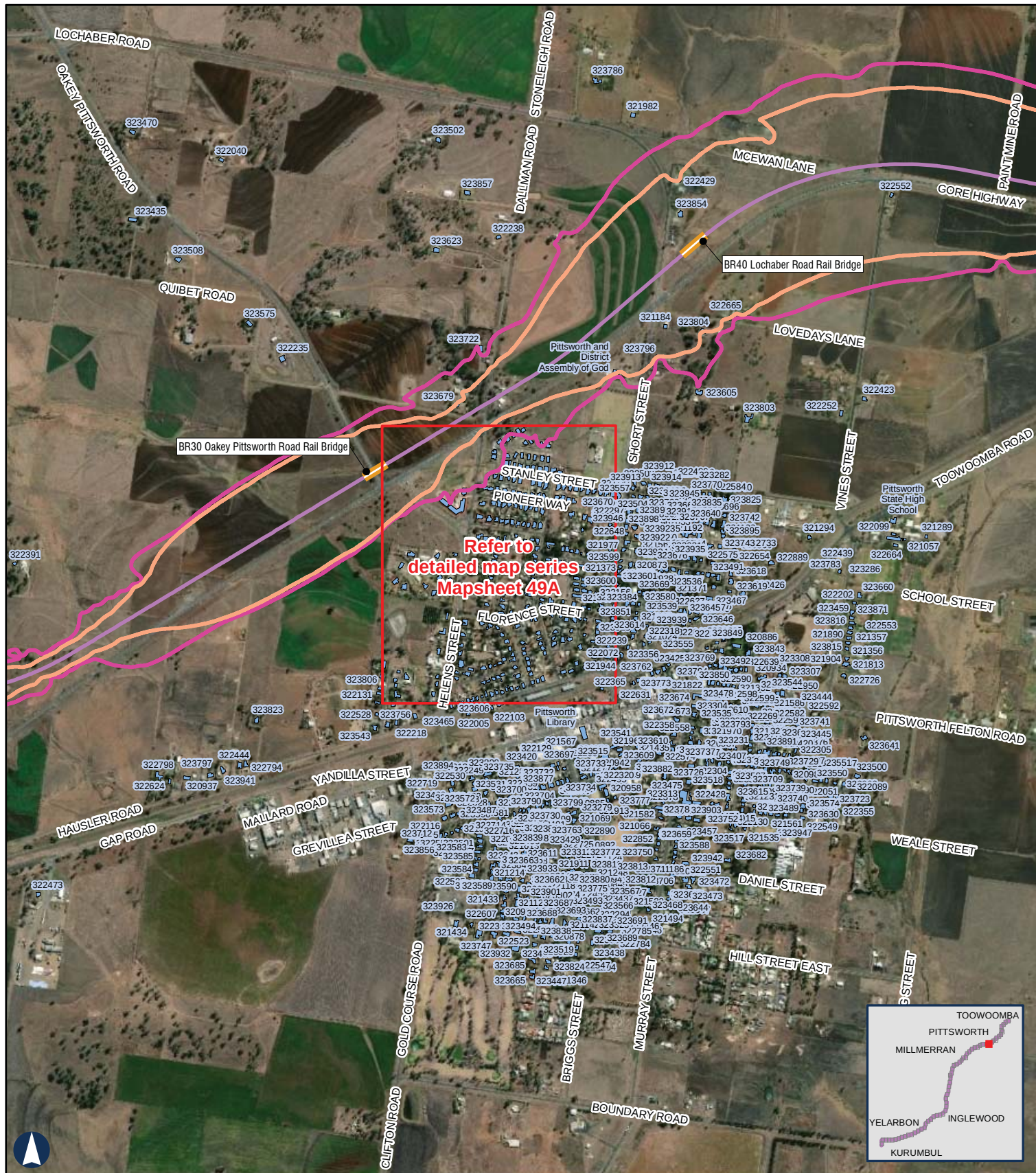
— Night-time noise criteria LA max
80dBA new rail corridor

● Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 49 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels - Detailed

APPENDIX D - Mapsheet 49A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:5,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

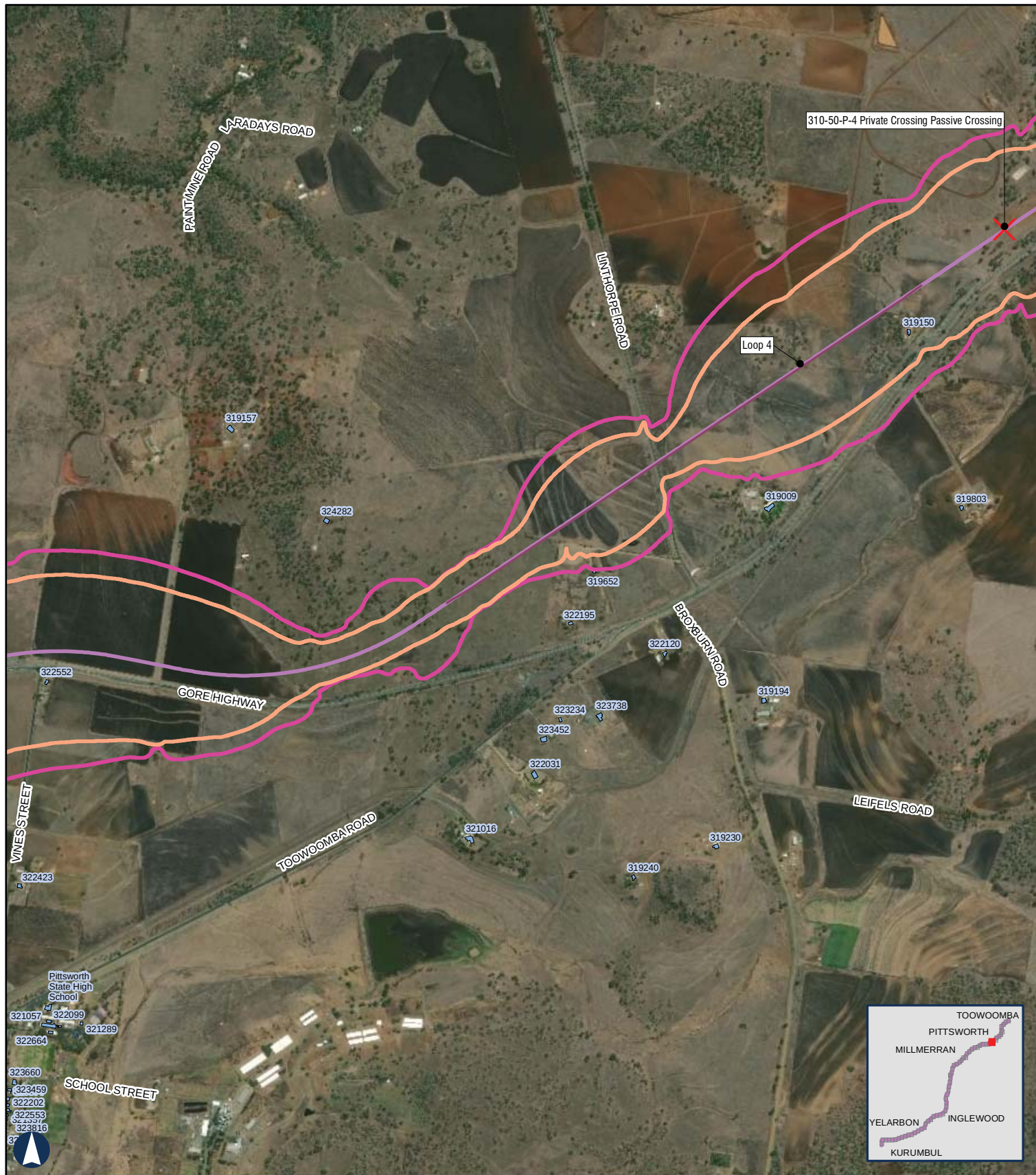
Noise contours are based on a set distance above the local terrain level of 2.4m.

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LAeq9hr 60dBA upgrading existing rail



ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 50 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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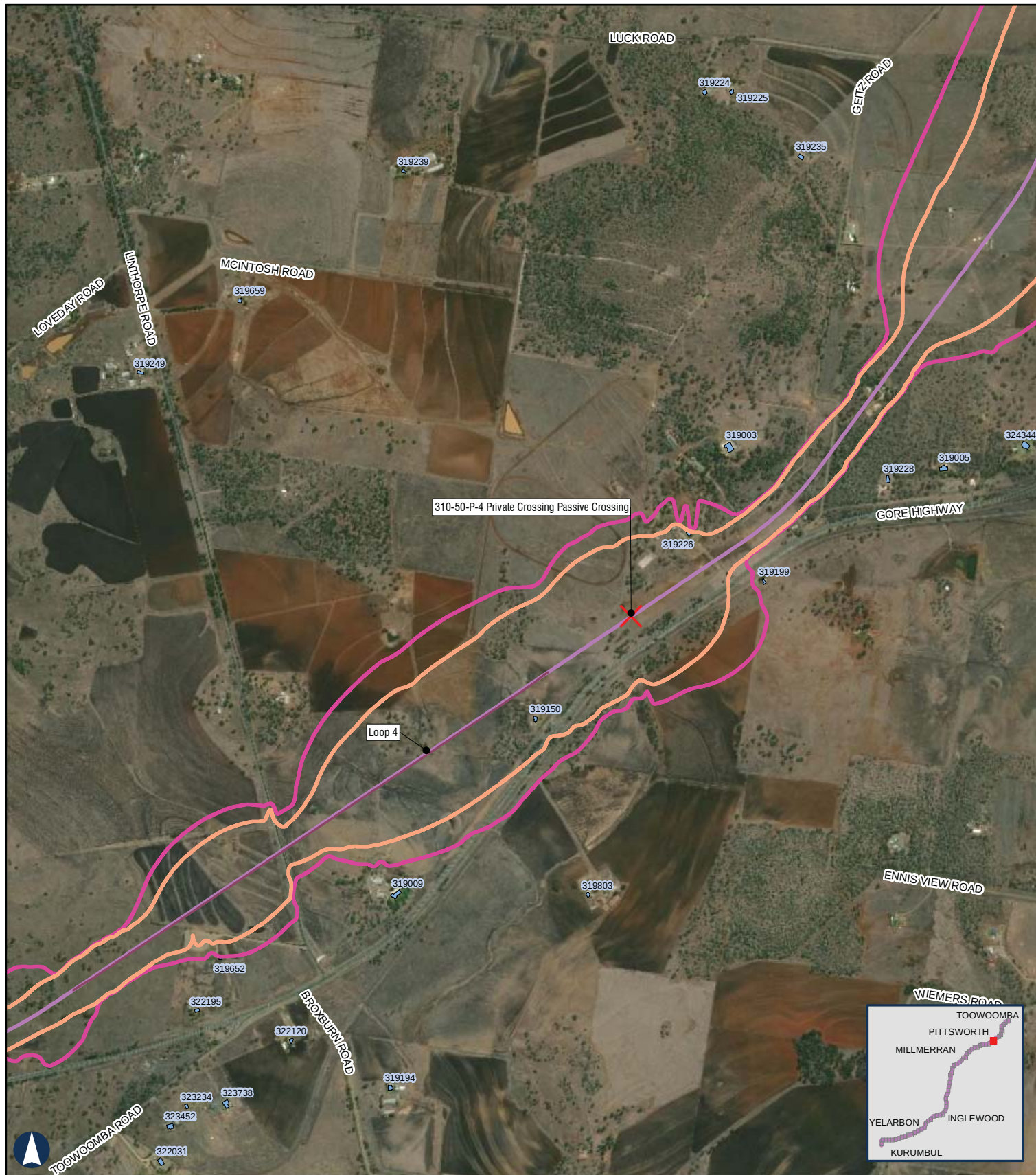
Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 51 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

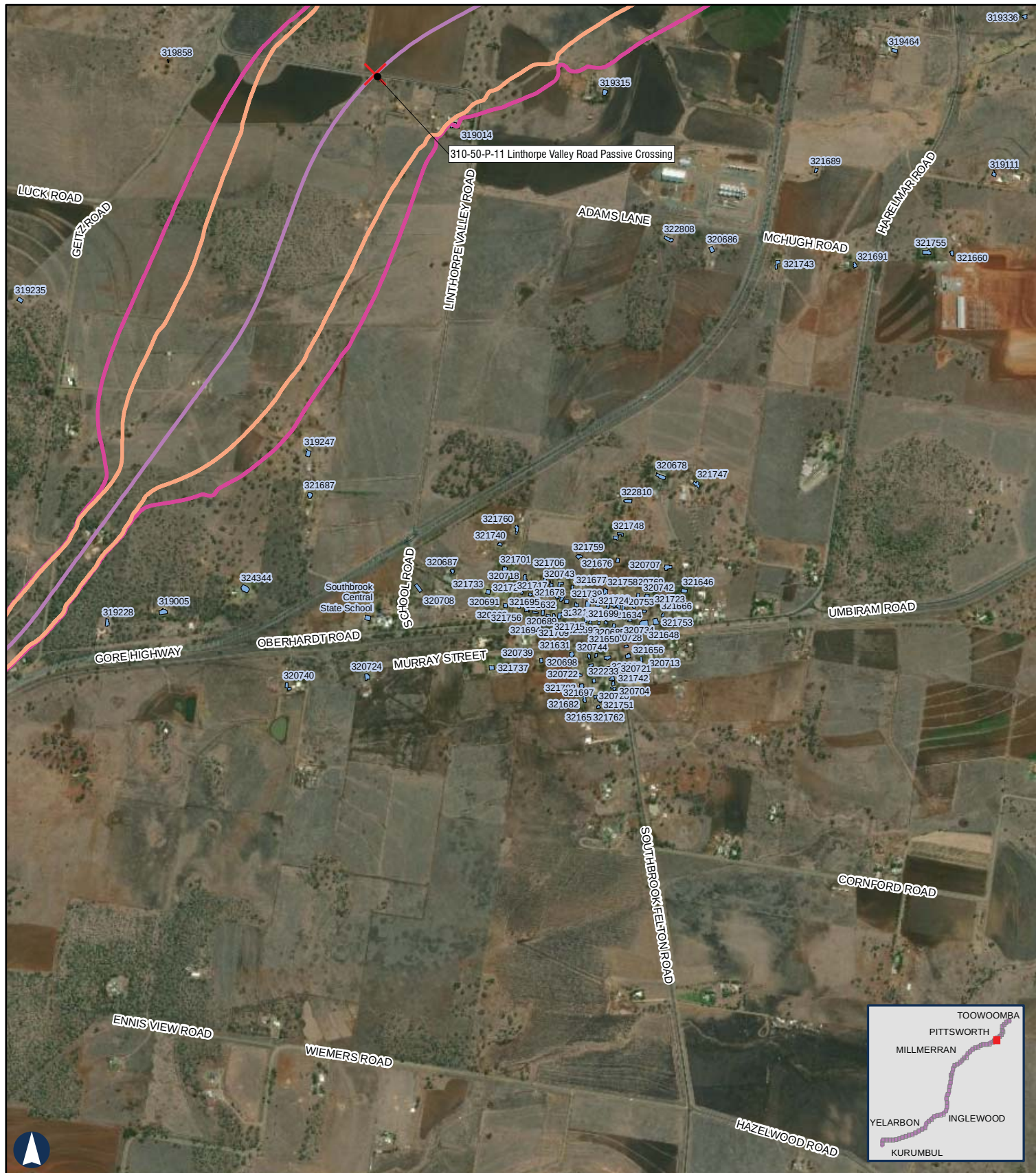
- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 52 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

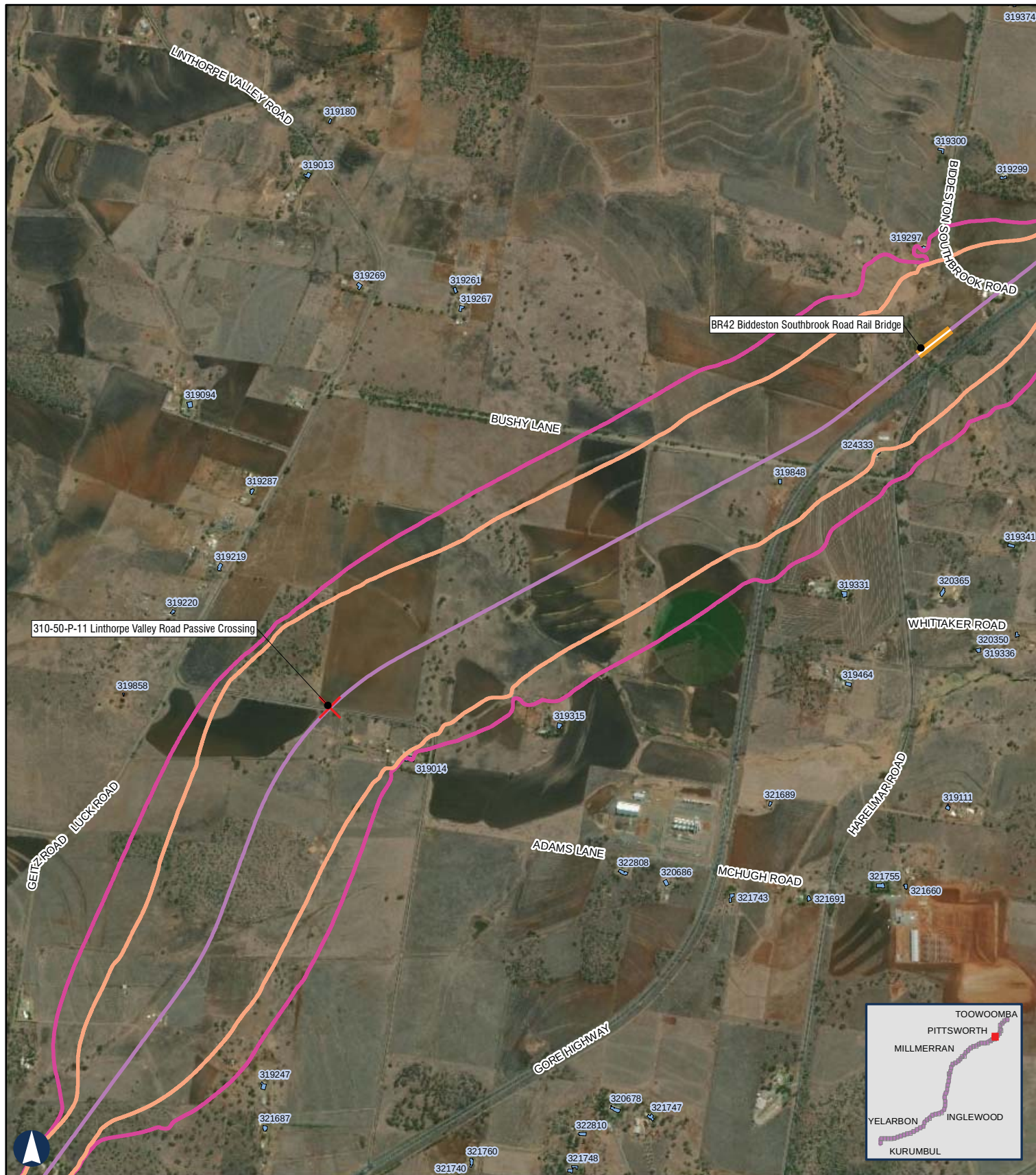
- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 53 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

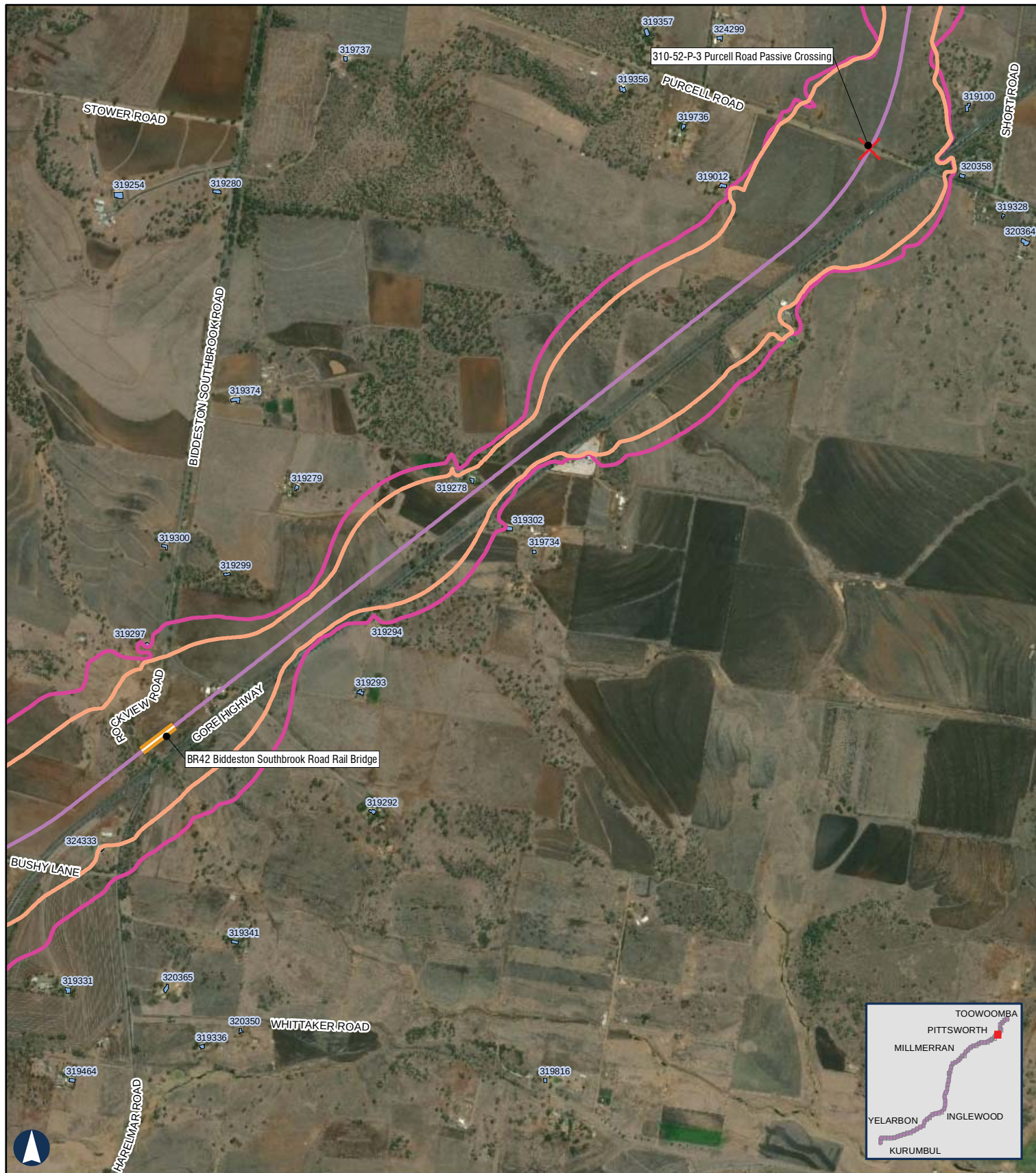
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 54 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

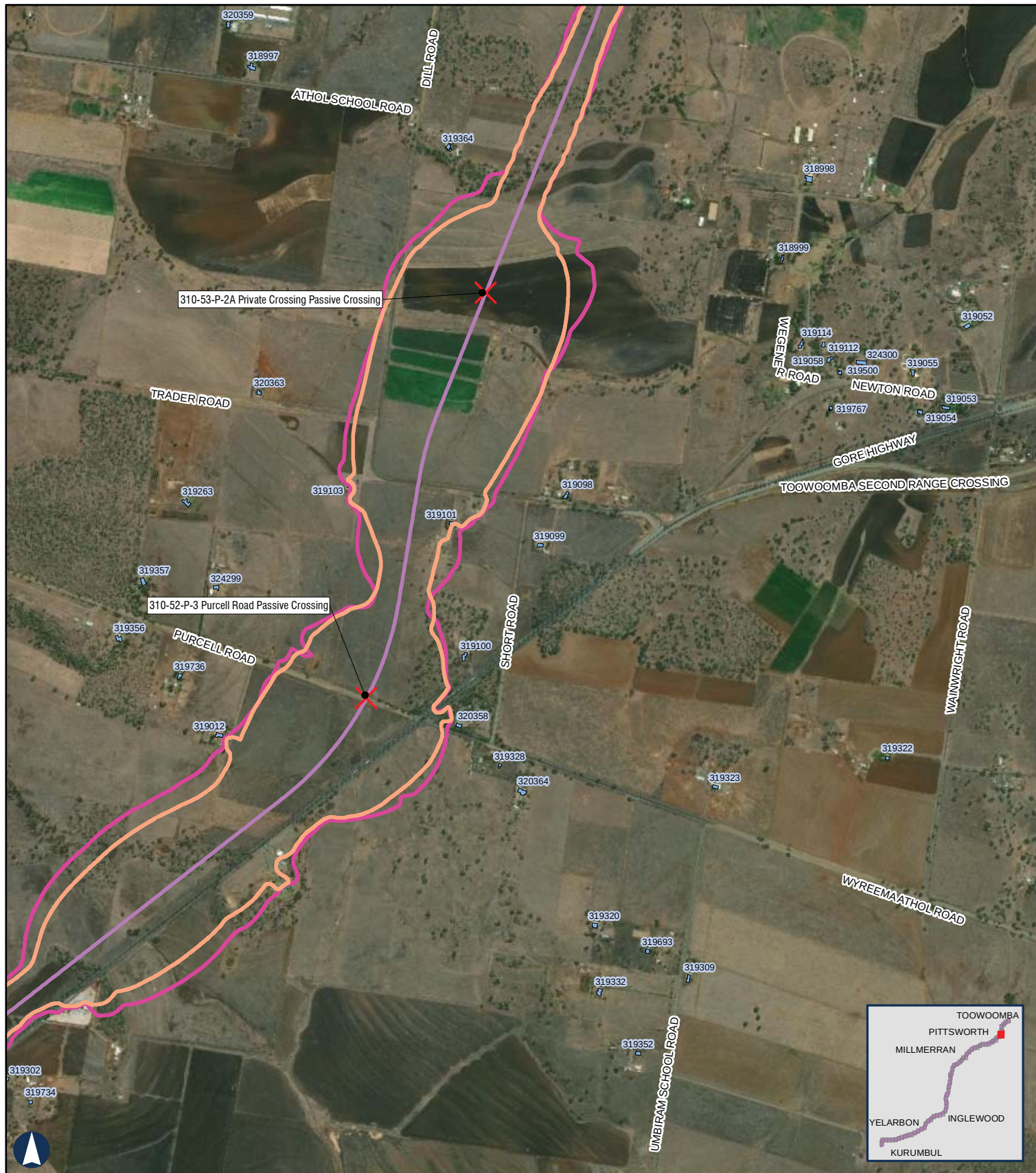
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 55 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

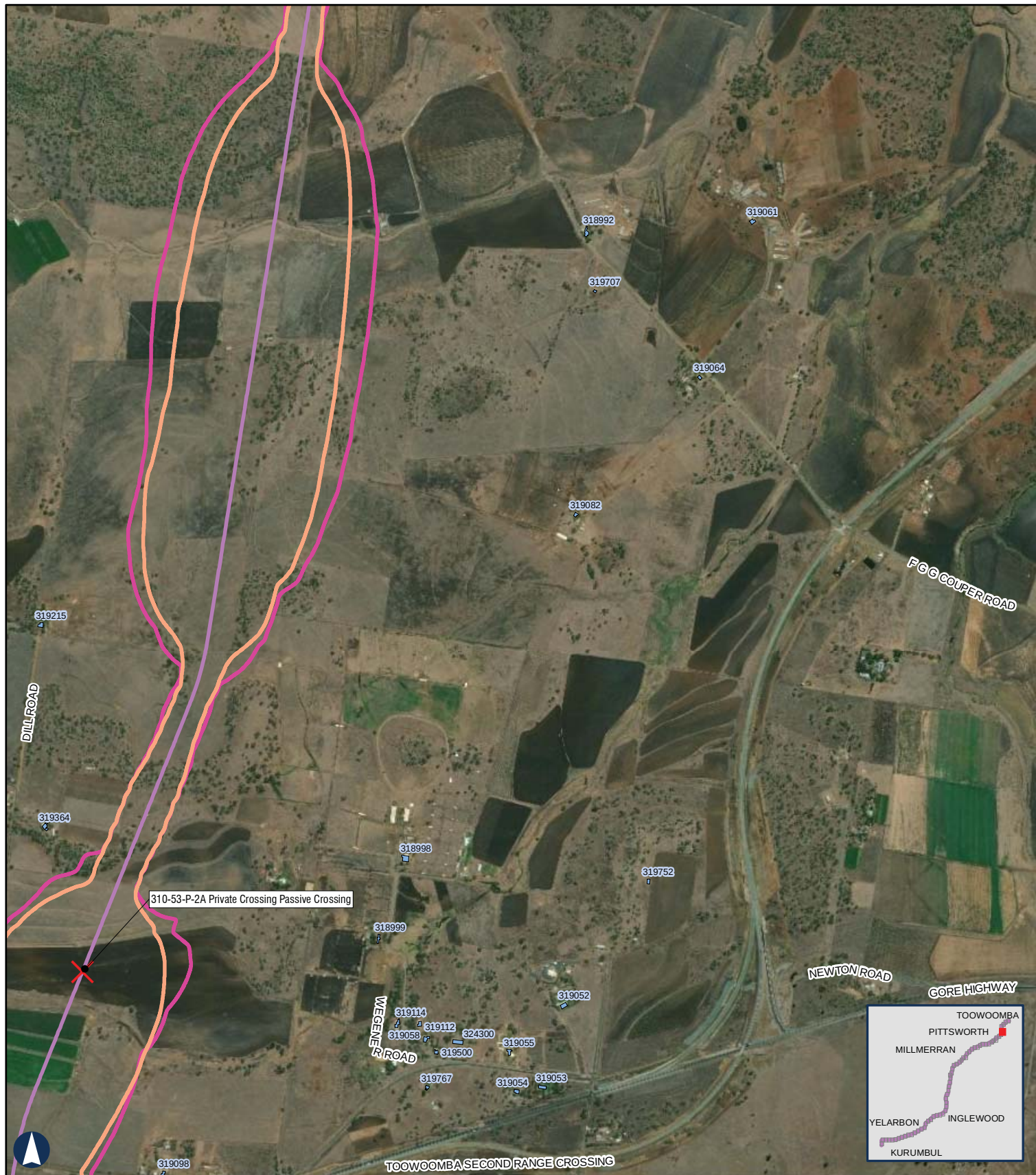
- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 56 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

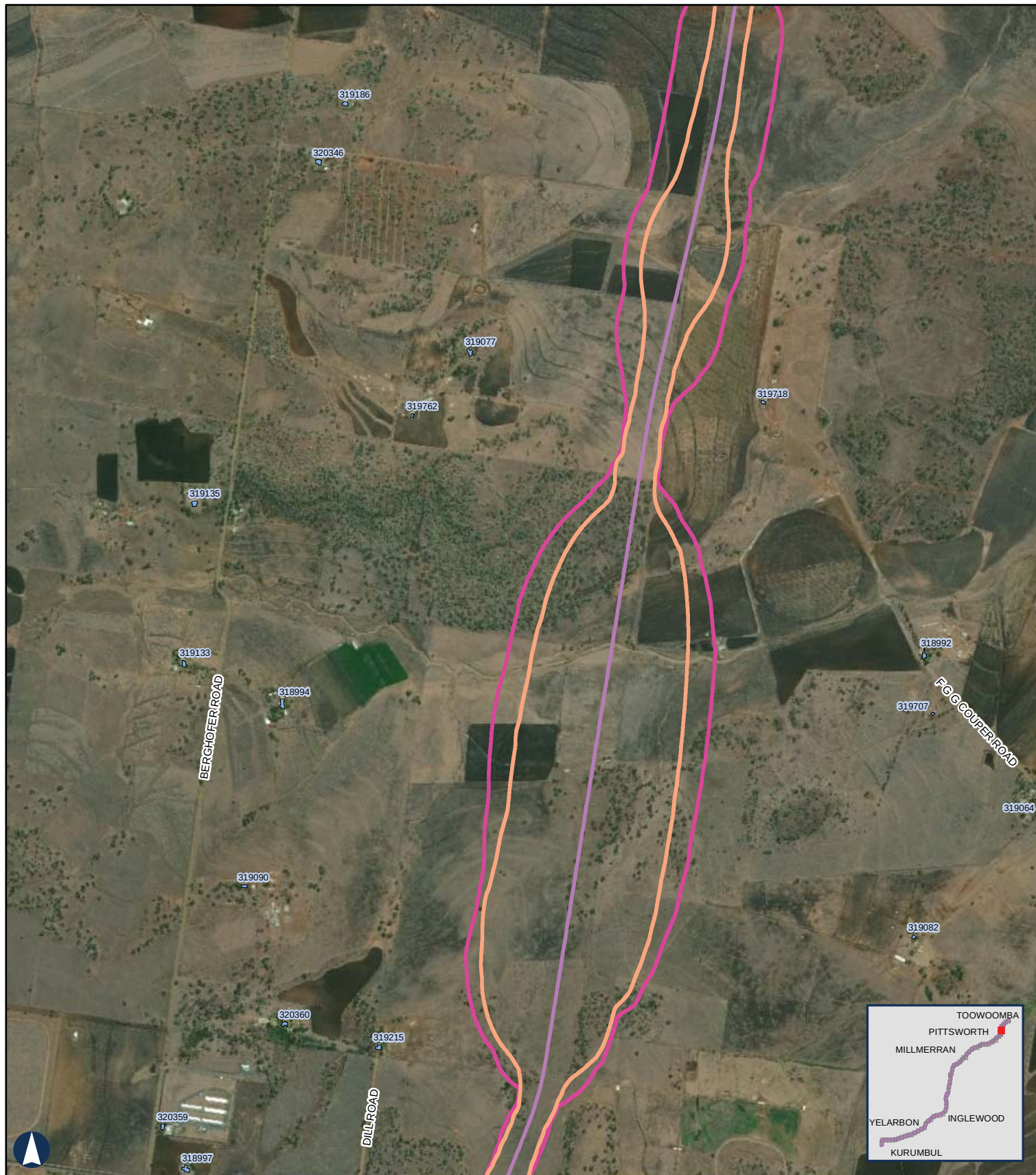
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 57 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

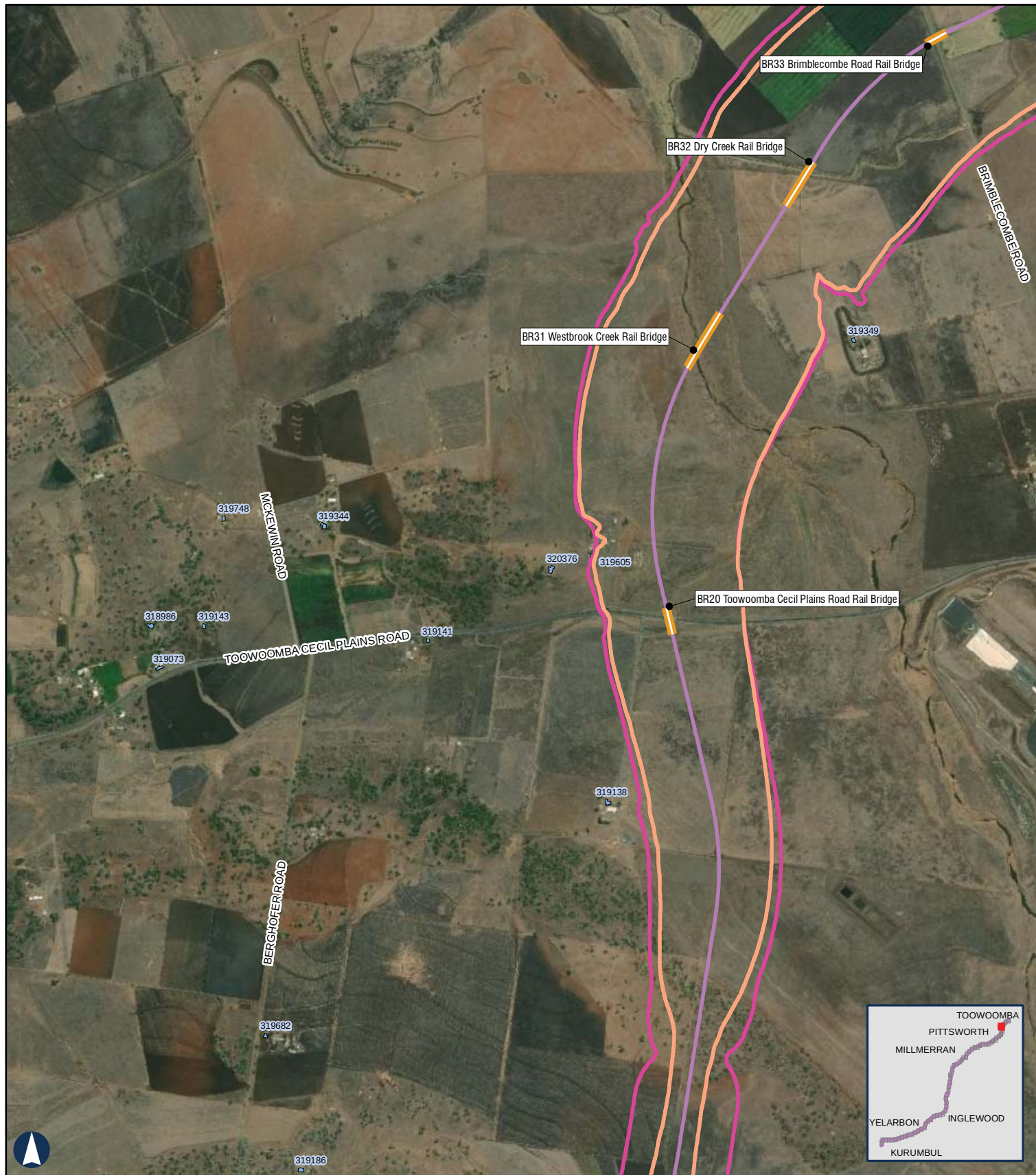
— Night-time noise criteria LA max 80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 58 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

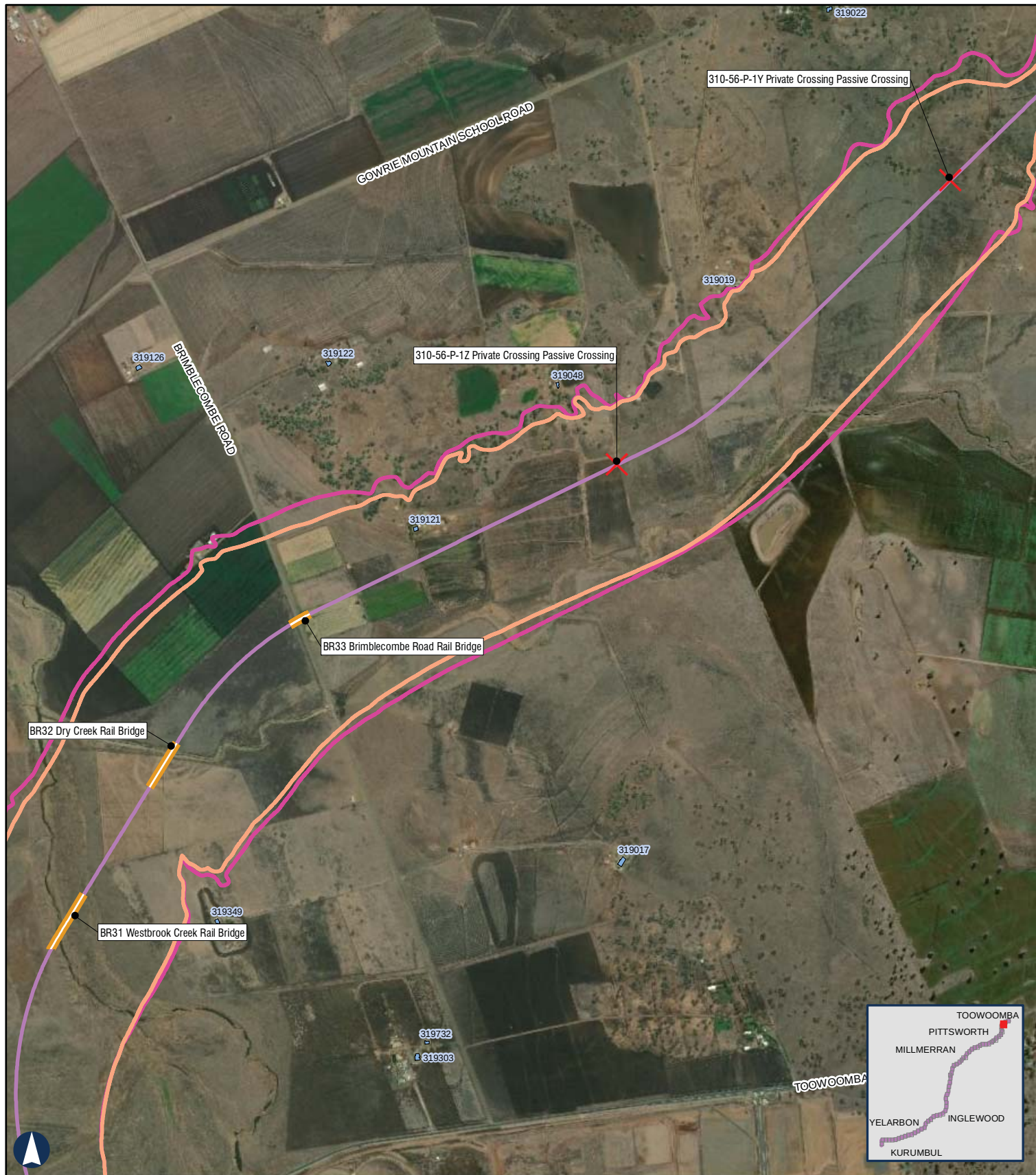
— Night-time noise criteria LA max 80dBA new rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 59 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

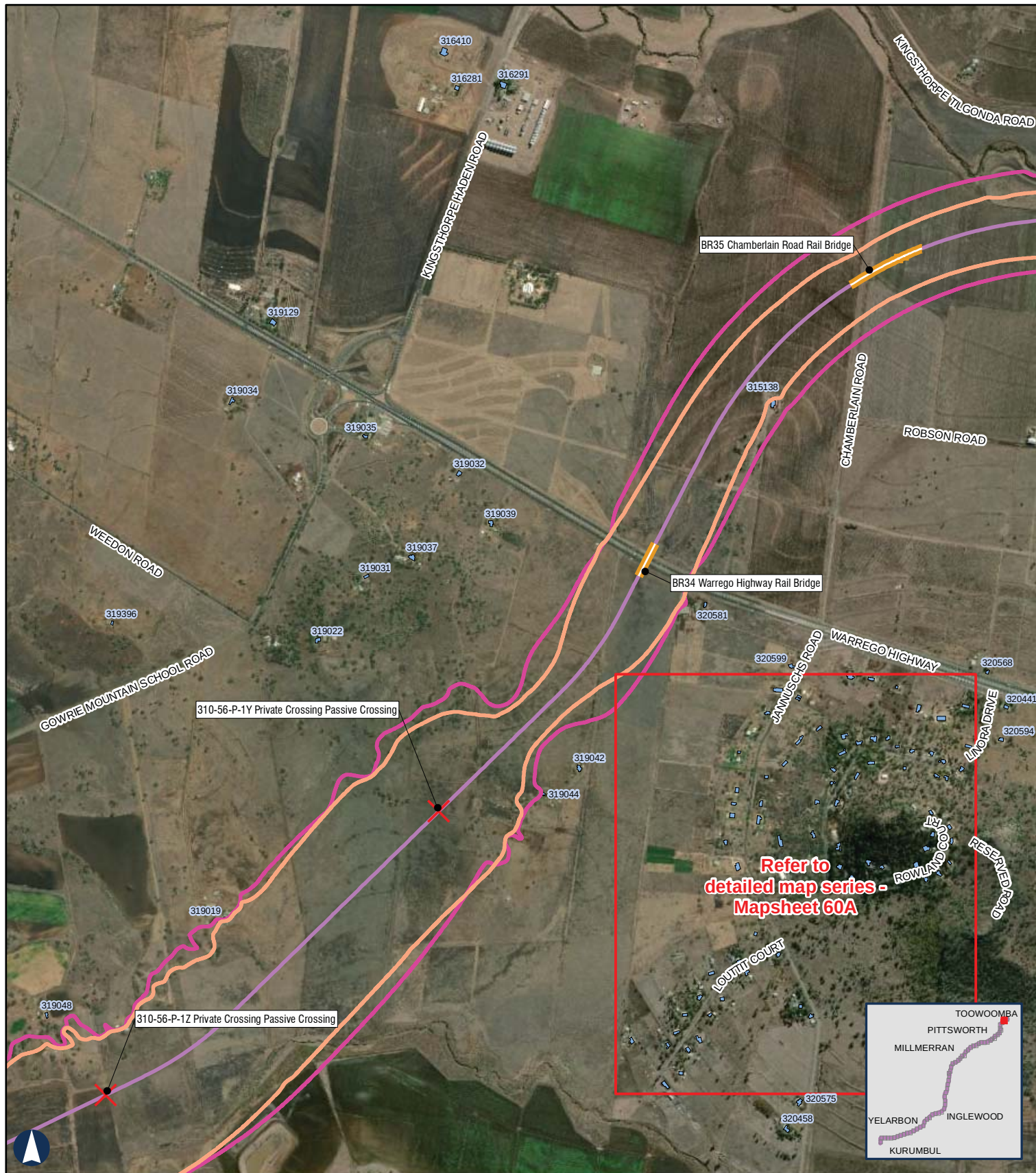
— Night-time noise criteria LA max 80dBA new rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 60 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

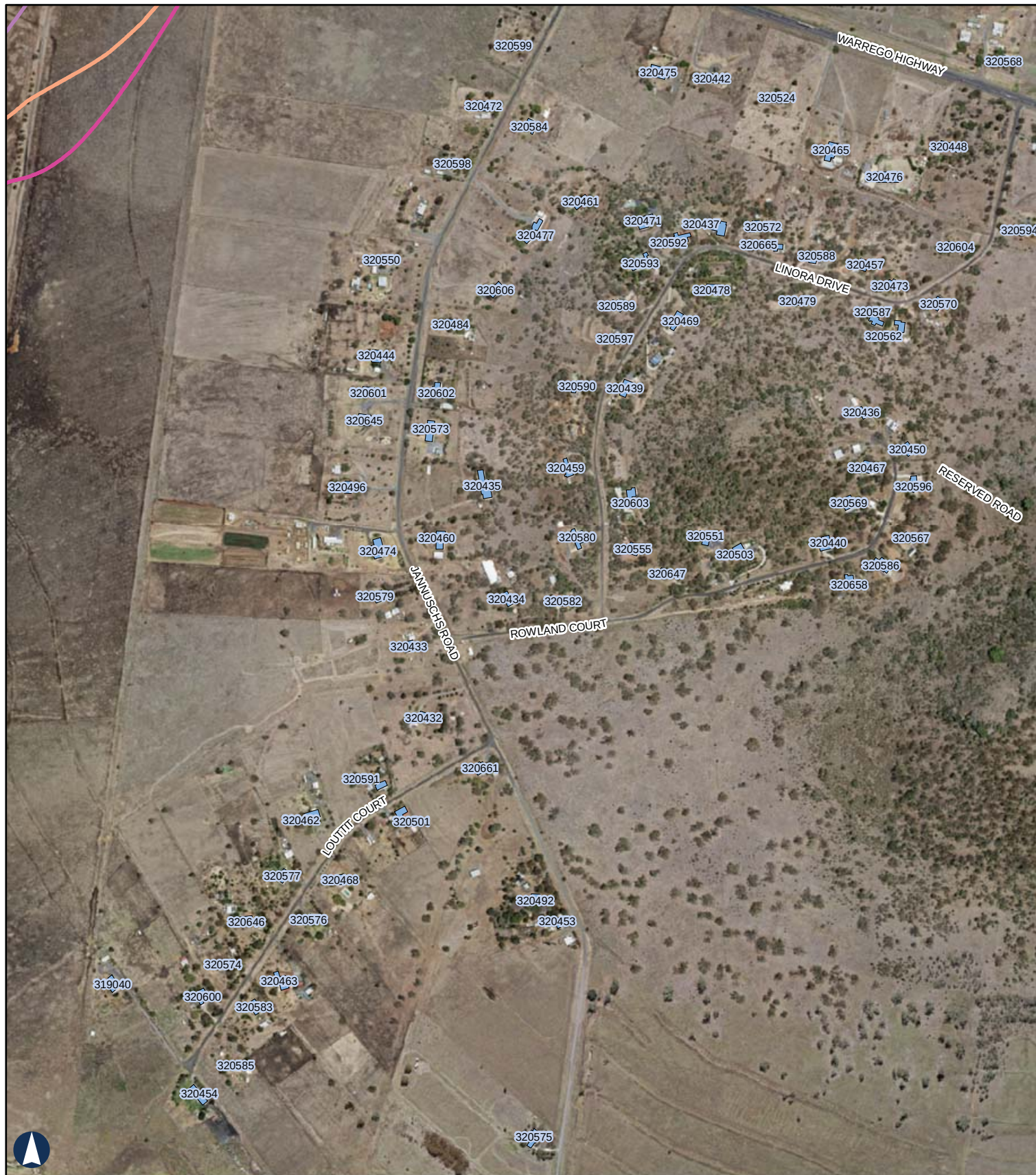
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE Year 2026 Night-time rail noise levels - Detailed

APPENDIX D - Mapsheet 60A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:8,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

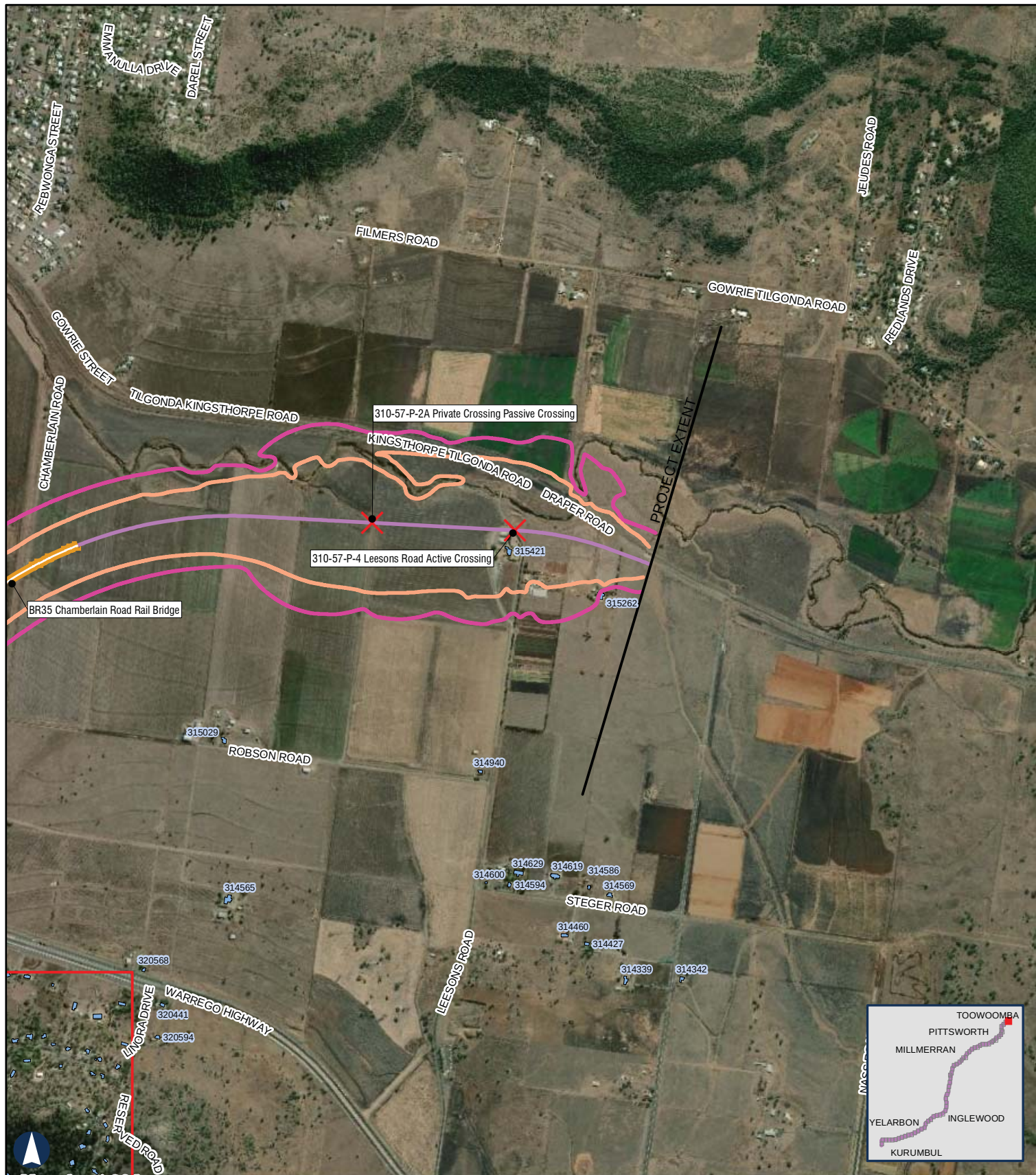
Noise contours are based on a set distance above the local terrain level of 2.4m.

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LAeq9hr 60dBA upgrading existing rail



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BORDER TO GOWRIE Year 2026 Night-time rail noise levels

APPENDIX D - Map 61 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 02-Jun-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

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APPENDIX

T

Operational Railway Noise and Vibration Technical Report

Appendix E Predicted Airborne Railway Noise Levels—Year 2040 Design Year

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

The predicted railway noise levels for the future railway operations in 2040 are detailed in the following table and noise contour maps.

The predicted noise levels are provided for the identified sensitive receptors within the 2 km study area. This includes all sensitive receptors where the predicted noise levels triggered an investigation of noise mitigation.

The symbol (-) in the table denotes there was not a prediction of future rail noise as the sensitive receptor was located more than 2 km from the source of noise.

Following the tabulated results are the predicted noise contour maps for the daytime and night-time railway operations at the project design year 2040. The noise contours have been presented as the daytime and night-time assessment criteria applied by ARTC on the Project. All noise contours are predicted at 2.4 m above ground level including where there are bridges and viaducts.

The noise contours are calculated from the interpolation of thousands of calculation points and provide an overview of the railway noise levels to assist the interpretation of the assessment and its outcomes. The tabulated noise levels at the individual sensitive receptors should be referenced when assessing railway noise levels against the criteria.

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmix
254161	New	60	55	80	67	66	92
254164	New	60	55	80	66	65	91
254170	New	60	55	80	67	65	92
254179	New	60	55	80	64	63	87
254181	New	60	55	80	63	62	87
254188	New	60	55	80	56	56	80
254193	New	60	55	80	57	56	81
254219	New	60	55	80	56	55	80
254221	New	60	55	80	53	53	77
254250	New	60	55	80	68	66	91
254255	New	60	55	80	60	59	83
254261	New	60	55	80	46	46	71
254276	New	60	55	80	63	62	87
254295	New	60	55	80	40	39	64
254300	New	60	55	80	51	50	74
254307	New	60	55	80	49	49	73
254308	New	60	55	80	49	48	71
254312	New	60	55	80	50	49	74
254313	New	60	55	80	49	48	72
254315	New	60	55	80	48	48	71
254318	New	60	55	80	50	50	75
254319	New	60	55	80	53	52	78
254320	New	60	55	80	50	49	75
254324	New	60	55	80	48	48	71
254325	New	60	55	80	48	47	72
254332	New	60	55	80	50	49	73
254336	New	60	55	80	48	47	72
254340	New	60	55	80	56	54	79
254344	New	60	55	80	53	53	76
254346	New	60	55	80	54	52	76
254347	New	60	55	80	64	63	89
254348	New	60	55	80	53	52	76
254354	New	60	55	80	48	48	71
254357	New	60	55	80	47	46	70
254358	New	60	55	80	52	51	75
254365	New	60	55	80	50	49	73
254367	New	60	55	80	49	48	72
254370	New	60	55	80	50	50	74
254372	New	60	55	80	49	48	72
254377	New	60	55	80	50	49	74
254378	New	60	55	80	50	49	73
254381	New	60	55	80	46	46	70
254383	New	60	55	80	47	47	72
254388	New	60	55	80	51	50	74
254389	New	60	55	80	51	50	75
254396	New	60	55	80	51	50	74
254401	New	60	55	80	49	49	74
254402	New	60	55	80	50	49	74
254403	New	60	55	80	51	50	75
254406	New	60	55	80	49	48	72
254408	New	60	55	80	51	50	75
254410	New	60	55	80	51	51	76
254411	New	60	55	80	51	51	75
254412	New	60	55	80	55	54	78
254419	New	60	55	80	51	51	75
254421	New	60	55	80	55	54	78

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	Lamax
254422	New	60	55	80	49	49	73
254425	New	60	55	80	51	51	76
254427	New	60	55	80	51	51	76
254431	New	60	55	80	50	50	74
254433	New	60	55	80	56	55	79
254437	New	60	55	80	53	52	76
254441	New	60	55	80	53	52	76
254442	New	60	55	80	51	50	74
254444	New	60	55	80	54	52	76
254448	New	60	55	80	51	51	74
254453	New	60	55	80	54	54	78
254456	New	60	55	80	52	51	76
254458	New	60	55	80	52	52	76
254460	New	60	55	80	50	49	74
254462	New	60	55	80	50	50	74
254465	New	60	55	80	51	50	76
254468	New	60	55	80	51	50	75
254469	New	60	55	80	53	52	77
254470	New	60	55	80	52	52	76
254476	New	60	55	80	58	57	82
254478	New	60	55	80	49	49	73
254484	New	60	55	80	53	53	78
254486	New	60	55	80	54	54	79
254490	New	60	55	80	52	52	76
254493	New	60	55	80	51	51	76
254500	New	60	55	80	54	53	78
254501	New	60	55	80	53	52	77
254502	New	60	55	80	57	56	81
254507	New	60	55	80	52	52	77
254508	New	60	55	80	54	54	78
254516	New	60	55	80	56	56	81
254517	New	60	55	80	54	53	78
254521	New	60	55	80	56	55	81
254526	New	60	55	80	57	56	82
254529	New	60	55	80	56	56	81
254531	New	60	55	80	56	56	81
254532	New	60	55	80	54	54	78
254533	New	60	55	80	55	54	79
254534	New	60	55	80	58	58	83
254536	New	60	55	80	56	56	81
254537	New	60	55	80	56	55	81
254539	New	60	55	80	58	57	82
254540	New	60	55	80	57	57	82
254542	New	60	55	80	56	56	81
254546	New	60	55	80	57	57	82
254549	New	60	55	80	57	57	82
254550	New	60	55	80	56	56	81
254558	New	60	55	80	66	65	91
254559	New	60	55	80	66	65	91
254560	New	60	55	80	53	52	78
254562	New	60	55	80	66	66	91
254568	New	60	55	80	57	57	82
254569	New	60	55	80	57	57	82
254571	New	60	55	80	61	60	86
254573	New	60	55	80	58	57	83
254576	New	60	55	80	65	64	90

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
254587	New	60	55	80	59	58	84
254589	New	60	55	80	66	65	91
254595	New	60	55	80	67	67	93
254598	New	60	55	80	66	65	91
254603	New	60	55	80	66	66	91
254609	New	60	55	80	70	70	95
254614	New	60	55	80	71	71	97
254656	New	60	55	80	52	52	77
254657	New	60	55	80	45	45	70
254681	New	60	55	80	50	50	75
254682	New	60	55	80	48	48	73
254691	New	60	55	80	50	50	75
254705	New	60	55	80	50	49	74
254720	New	60	55	80	44	44	68
254736	New	60	55	80	46	45	69
254747	New	60	55	80	48	47	73
254757	New	60	55	80	48	48	74
254762	New	60	55	80	46	46	71
254783	New	60	55	80	52	51	76
254787	New	60	55	80	57	57	82
254810	New	60	55	80	37	36	62
254828	New	60	55	80	62	61	87
254837	New	60	55	80	41	40	66
254892	New	60	55	80	39	38	64
255054	New	60	55	80	41	41	66
255080	New	60	55	80	47	46	71
255091	New	60	55	80	41	41	66
255093	New	60	55	80	44	43	68
255097	New	60	55	80	45	45	69
255114	New	60	55	80	42	42	67
255143	New	60	55	80	47	47	71
255158	New	60	55	80	47	47	72
255159	New	60	55	80	42	41	66
255169	New	60	55	80	52	52	77
255192	New	60	55	80	47	46	71
255220	New	60	55	80	42	42	67
255223	New	60	55	80	47	47	71
255240	New	60	55	80	49	49	73
255277	New	60	55	80	53	52	77
255282	New	60	55	80	51	50	77
255295	New	60	55	80	47	46	72
255309	New	60	55	80	42	41	66
255318	New	60	55	80	56	56	82
255333	New	60	55	80	58	58	84
255346	New	60	55	80	61	61	87
255349	New	60	55	80	55	55	80
255350	New	60	55	80	61	61	87
255377	New	60	55	80	52	51	76
255387	New	60	55	80	52	51	75
255394	New	60	55	80	54	53	78
255395	New	60	55	80	49	48	73
255402	New	60	55	80	49	48	73
255412	New	60	55	80	47	47	71
255433	New	60	55	80	58	57	82
255453	New	60	55	80	51	51	76
255455	New	60	55	80	53	52	77

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
255487	New	60	55	80	53	53	77
255511	New	60	55	80	56	55	79
255514	New	60	55	80	57	56	80
255518	New	60	55	80	39	38	62
255520	New	60	55	80	39	39	63
255558	New	60	55	80	43	43	67
255595	New	60	55	80	48	47	71
255601	New	60	55	80	48	48	72
255605	New	60	55	80	53	52	77
255617	New	60	55	80	45	45	70
255621	New	60	55	80	40	40	65
255630	New	60	55	80	52	52	77
255640	New	60	55	80	39	39	64
255641	New	60	55	80	53	53	78
255691	New	60	55	80	53	53	77
255777	New	60	55	80	56	55	80
255835	New	60	55	80	50	49	74
255861	New	60	55	80	48	47	72
255865	New	60	55	80	46	45	70
255892	New	60	55	80	47	47	72
255934	New	60	55	80	49	48	72
256019	New	60	55	80	66	64	92
256057	New	60	55	80	56	55	80
256166	New	60	55	80	60	60	85
256191	New	60	55	80	56	55	81
256213	New	60	55	80	56	56	81
256248	New	60	55	80	58	57	82
256284	New	60	55	80	50	50	74
256289	New	60	55	80	57	56	81
256408	New	60	55	80	55	55	79
256574	New	60	55	80	60	60	85
256649	New	60	55	80	48	48	73
256675	New	60	55	80	48	48	73
256698	New	60	55	80	55	54	79
256709	New	60	55	80	47	47	73
256719	New	60	55	80	58	57	82
256813	New	60	55	80	45	45	70
256817	New	60	55	80	51	51	78
256882	New	60	55	80	46	45	72
256926	New	60	55	80	50	49	74
256951	New	60	55	80	47	47	72
257009	New	60	55	80	48	47	75
257028	New	60	55	80	54	53	79
257039	New	60	55	80	48	47	72
257128	New	60	55	80	47	46	72
259291	New	60	55	80	50	49	76
259381	New	60	55	80	49	48	76
259957	New	60	55	80	52	51	78
260058	New	60	55	80	68	66	95
260067	New	60	55	80	67	65	95
260069	New	60	55	80	52	52	78
260119	New	60	55	80	60	59	86
260150	New	60	55	80	58	58	84
260165	New	60	55	80	58	57	82
260189	New	60	55	80	63	62	89
260213	New	60	55	80	64	63	90

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
260446	New	60	55	80	51	50	76
260528	New	60	55	80	62	61	88
260630	New	60	55	80	48	47	74
260789	New	60	55	80	43	43	70
260930	New	60	55	80	58	56	82
261084	New	60	55	80	61	60	86
261227	New	60	55	80	64	64	92
261368	New	60	55	80	62	60	87
261386	New	60	55	80	62	60	88
261419	New	60	55	80	48	48	74
261452	New	60	55	80	58	57	84
261535	New	60	55	80	56	55	82
261542	New	60	55	80	44	44	70
261572	New	60	55	80	60	58	87
261608	New	60	55	80	57	56	81
261613	New	60	55	80	53	51	78
261633	New	60	55	80	47	46	72
261638	New	60	55	80	61	59	88
261639	New	60	55	80	63	61	90
261649	New	60	55	80	59	57	85
261661	New	60	55	80	59	57	86
261665	New	60	55	80	62	60	87
261720	New	60	55	80	65	63	92
261729	New	60	55	80	63	62	89
261738	New	60	55	80	54	53	80
261739	New	60	55	80	64	62	90
261749	New	60	55	80	62	61	87
261781	New	60	55	80	57	55	84
261786	New	60	55	80	57	55	83
261802	New	60	55	80	60	58	85
261829	New	60	55	80	57	55	81
261888	New	60	55	80	51	49	78
261908	New	60	55	80	61	60	88
261910	New	60	55	80	53	51	79
261913	New	60	55	80	47	47	73
261927	New	60	55	80	52	51	77
261958	New	60	55	80	47	47	74
261969	New	60	55	80	60	59	87
261999	New	60	55	80	46	46	72
262034	New	60	55	80	53	51	77
262063	New	60	55	80	54	52	78
262181	New	60	55	80	52	51	77
262286	New	60	55	80	53	52	79
263137	New	60	55	80	51	50	77
263676	New	60	55	80	47	46	73
263929	New	60	55	80	45	45	71
314339	New	60	55	80	37	36	58
314342	New	60	55	80	36	35	58
314427	New	60	55	80	42	41	63
314460	New	60	55	80	43	42	65
314565	New	60	55	80	47	47	68
314569	New	60	55	80	44	43	65
314586	New	60	55	80	44	43	66
314594	New	60	55	80	43	42	65
314600	New	60	55	80	44	44	65
314619	New	60	55	80	47	46	67

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
314629	New	60	55	80	44	43	65
314940	New	60	55	80	48	47	71
315029	New	60	55	80	48	47	70
315138	New	60	55	80	56	56	85
315262	New	60	55	80	56	55	81
315421	New	60	55	80	64	62	92
316281	New	60	55	80	37	38	62
316291	New	60	55	80	35	35	61
316410	New	60	55	80	37	37	63
318986	New	60	55	80	36	36	61
318992	New	60	55	80	48	47	73
318994	New	60	55	80	48	48	73
318997	New	60	55	80	47	47	70
318998	New	60	55	80	41	40	64
318999	New	60	55	80	43	42	67
319003	New	60	55	80	54	53	78
319005	New	60	55	80	43	42	66
319009	New	60	55	80	53	53	79
319012	New	60	55	80	56	55	79
319013	New	60	55	80	44	44	70
319014	New	60	55	80	56	55	80
319017	New	60	55	80	49	49	72
319019	New	60	55	80	56	56	81
319022	New	60	55	80	51	51	75
319031	New	60	55	80	44	43	68
319032	New	60	55	80	47	47	70
319034	New	60	55	80	39	39	63
319035	New	60	55	80	39	39	65
319037	New	60	55	80	49	49	72
319039	New	60	55	80	51	50	74
319040	New	60	55	80	49	48	73
319042	New	60	55	80	53	52	77
319044	New	60	55	80	55	53	81
319048	New	60	55	80	55	54	79
319052	New	60	55	80	40	39	64
319053	New	60	55	80	39	38	63
319054	New	60	55	80	42	42	67
319055	New	60	55	80	43	43	68
319058	New	60	55	80	47	46	71
319061	New	60	55	80	35	34	61
319064	New	60	55	80	41	41	67
319073	New	60	55	80	37	37	61
319077	New	60	55	80	47	46	73
319082	New	60	55	80	41	41	66
319090	New	60	55	80	47	46	72
319094	New	60	55	80	46	46	71
319098	New	60	55	80	55	54	78
319099	New	60	55	80	52	52	76
319100	New	60	55	80	53	52	77
319101	New	60	55	80	58	58	83
319103	New	60	55	80	58	58	83
319111	New	60	55	80	45	45	71
319112	New	60	55	80	48	47	71
319114	New	60	55	80	48	47	72
319117	New	60	55	80	45	45	71
319121	New	60	55	80	62	62	87

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
319122	New	60	55	80	38	38	61
319126	New	60	55	80	48	48	73
319129	New	60	55	80	39	39	64
319133	New	60	55	80	46	46	71
319135	New	60	55	80	46	46	71
319138	New	60	55	80	55	55	79
319141	New	60	55	80	48	47	72
319143	New	60	55	80	42	42	67
319145	New	60	55	80	49	49	74
319150	New	60	55	80	61	61	87
319152	New	60	55	80	31	31	57
319154	New	60	55	80	57	56	82
319157	New	60	55	80	46	46	72
319163	New	60	55	80	53	52	76
319167	New	60	55	80	45	44	67
319168	New	60	55	80	50	50	76
319174	New	60	55	80	48	47	72
319175	New	60	55	80	51	50	75
319178	New	60	55	80	32	30	55
319180	New	60	55	80	32	32	59
319183	New	60	55	80	45	45	71
319186	New	60	55	80	41	40	66
319190	New	60	55	80	46	46	71
319191	New	60	55	80	61	61	87
319194	New	60	55	80	45	45	71
319199	New	60	55	80	55	53	80
319200	New	60	55	80	57	56	82
319203	New	60	55	80	46	46	72
319205	New	60	55	80	49	48	74
319210	New	60	55	80	42	42	68
319212	New	60	55	80	41	41	68
319215	New	60	55	80	49	49	74
319219	New	60	55	80	52	51	77
319220	New	60	55	80	52	52	77
319224	New	60	55	80	45	45	71
319225	New	60	55	80	48	48	75
319226	New	60	55	80	58	56	84
319228	New	60	55	80	43	42	67
319230	New	60	55	80	41	41	67
319235	New	60	55	80	49	49	75
319239	New	60	55	80	32	30	55
319240	New	60	55	80	40	40	65
319247	New	60	55	80	52	52	78
319249	New	60	55	80	30	30	56
319254	New	60	55	80	42	42	67
319261	New	60	55	80	46	46	71
319263	New	60	55	80	50	50	74
319267	New	60	55	80	48	48	74
319269	New	60	55	80	46	46	73
319275	New	60	55	80	49	49	74
319278	New	60	55	80	66	66	92
319279	New	60	55	80	52	52	78
319280	New	60	55	80	44	44	69
319283	New	60	55	80	49	49	74
319287	New	60	55	80	50	50	75
319292	New	60	55	80	49	49	75

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
319293	New	60	55	80	52	52	78
319294	New	60	55	80	57	57	83
319297	New	60	55	80	54	55	81
319299	New	60	55	80	52	52	78
319300	New	60	55	80	50	50	77
319302	New	60	55	80	53	53	79
319303	New	60	55	80	50	50	74
319309	New	60	55	80	39	39	63
319315	New	60	55	80	53	53	79
319317	New	60	55	80	42	42	65
319318	New	60	55	80	41	41	65
319320	New	60	55	80	45	44	70
319322	New	60	55	80	30	29	54
319323	New	60	55	80	37	36	60
319328	New	60	55	80	51	50	74
319331	New	60	55	80	51	51	78
319332	New	60	55	80	44	44	70
319336	New	60	55	80	42	42	69
319341	New	60	55	80	49	49	75
319344	New	60	55	80	43	42	66
319349	New	60	55	80	53	53	78
319352	New	60	55	80	43	43	68
319356	New	60	55	80	50	50	75
319357	New	60	55	80	50	49	73
319364	New	60	55	80	53	51	75
319374	New	60	55	80	48	48	73
319396	New	60	55	80	40	39	62
319420	New	60	55	80	44	44	70
319464	New	60	55	80	45	45	70
319491	New	60	55	80	32	31	55
319495	New	60	55	80	43	43	69
319500	New	60	55	80	46	45	70
319570	New	60	55	80	40	40	66
319605	New	60	55	80	57	56	81
319652	New	60	55	80	54	54	80
319659	New	60	55	80	32	31	57
319682	New	60	55	80	41	41	65
319693	New	60	55	80	42	41	67
319707	New	60	55	80	44	44	70
319718	New	60	55	80	50	49	75
319732	New	60	55	80	49	49	72
319734	New	60	55	80	51	51	77
319736	New	60	55	80	53	52	77
319737	New	60	55	80	43	43	69
319748	New	60	55	80	39	39	63
319752	New	60	55	80	26	26	55
319762	New	60	55	80	44	44	67
319767	New	60	55	80	47	46	71
319803	New	60	55	80	51	51	77
319816	New	60	55	80	36	36	63
319848	New	60	55	80	59	59	86
319858	New	60	55	80	52	52	77
320346	New	60	55	80	38	38	62
320350	New	60	55	80	45	45	72
320355	New	60	55	80	32	32	56
320357	New	60	55	80	43	43	66

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
320358	New	60	55	80	56	55	80
320359	New	60	55	80	41	40	65
320360	New	60	55	80	47	47	72
320363	New	60	55	80	53	52	77
320364	New	60	55	80	50	50	75
320365	New	60	55	80	50	50	76
320376	New	60	55	80	54	54	78
320432	New	60	55	80	46	45	70
320433	New	60	55	80	48	47	72
320434	New	60	55	80	45	44	68
320435	New	60	55	80	47	47	70
320436	New	60	55	80	40	41	66
320437	New	60	55	80	48	48	71
320439	New	60	55	80	47	47	69
320440	New	60	55	80	30	28	55
320441	New	60	55	80	44	44	66
320442	New	60	55	80	48	47	71
320444	New	60	55	80	49	48	71
320448	New	60	55	80	45	45	67
320450	New	60	55	80	30	30	56
320453	New	60	55	80	42	42	67
320454	New	60	55	80	47	46	71
320457	New	60	55	80	46	46	69
320458	New	60	55	80	43	42	68
320459	New	60	55	80	49	48	71
320460	New	60	55	80	47	46	69
320461	New	60	55	80	48	48	70
320462	New	60	55	80	48	47	72
320463	New	60	55	80	46	45	70
320465	New	60	55	80	46	46	68
320467	New	60	55	80	27	26	50
320468	New	60	55	80	45	44	69
320469	New	60	55	80	48	48	71
320471	New	60	55	80	47	46	70
320472	New	60	55	80	50	50	72
320473	New	60	55	80	44	44	67
320474	New	60	55	80	49	49	73
320475	New	60	55	80	48	47	70
320476	New	60	55	80	44	44	68
320477	New	60	55	80	50	50	72
320478	New	60	55	80	47	47	69
320479	New	60	55	80	45	45	67
320484	New	60	55	80	49	48	71
320492	New	60	55	80	41	41	66
320496	New	60	55	80	50	49	73
320501	New	60	55	80	45	45	70
320503	New	60	55	80	35	33	59
320524	New	60	55	80	46	46	69
320550	New	60	55	80	50	50	73
320551	New	60	55	80	45	44	69
320555	New	60	55	80	45	45	70
320562	New	60	55	80	42	42	66
320567	New	60	55	80	35	34	58
320568	New	60	55	80	44	43	65
320569	New	60	55	80	32	32	59
320570	New	60	55	80	42	42	65

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
320572	New	60	55	80	47	47	70
320573	New	60	55	80	48	47	70
320574	New	60	55	80	48	47	72
320575	New	60	55	80	44	44	69
320576	New	60	55	80	46	46	71
320577	New	60	55	80	49	49	74
320579	New	60	55	80	47	46	70
320580	New	60	55	80	46	45	69
320581	New	60	55	80	54	53	78
320582	New	60	55	80	43	42	65
320583	New	60	55	80	46	45	70
320584	New	60	55	80	50	50	73
320585	New	60	55	80	46	45	70
320586	New	60	55	80	37	36	61
320587	New	60	55	80	43	43	66
320588	New	60	55	80	46	46	69
320589	New	60	55	80	48	48	71
320590	New	60	55	80	48	47	70
320591	New	60	55	80	44	43	67
320592	New	60	55	80	48	47	70
320593	New	60	55	80	50	49	72
320594	New	60	55	80	44	44	67
320596	New	60	55	80	26	25	50
320597	New	60	55	80	49	49	72
320598	New	60	55	80	51	50	74
320599	New	60	55	80	50	50	72
320600	New	60	55	80	47	47	72
320601	New	60	55	80	48	48	70
320602	New	60	55	80	50	50	72
320603	New	60	55	80	48	47	71
320604	New	60	55	80	43	43	65
320606	New	60	55	80	49	48	71
320612	New	60	55	80	45	44	71
320645	New	60	55	80	49	48	71
320646	New	60	55	80	47	46	71
320647	New	60	55	80	42	42	66
320658	New	60	55	80	38	37	62
320661	New	60	55	80	48	47	72
320665	New	60	55	80	43	43	65
320678	New	60	55	80	45	45	71
320685	New	60	55	80	31	32	58
320686	New	60	55	80	49	49	73
320687	New	60	55	80	47	47	73
320688	New	60	55	80	30	30	57
320689	New	60	55	80	35	35	61
320691	New	60	55	80	43	44	70
320692	New	60	55	80	41	41	67
320695	New	60	55	80	32	32	58
320698	New	60	55	80	30	30	57
320704	New	60	55	80	28	28	55
320707	New	60	55	80	41	41	67
320708	New	60	55	80	43	43	70
320709	New	60	55	80	36	36	63
320713	New	60	55	80	30	30	57
320716	New	60	55	80	46	46	71
320718	New	60	55	80	44	44	70

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
320720	New	60	55	80	30	30	56
320721	New	60	55	80	27	28	54
320722	New	60	55	80	28	28	55
320724	New	60	55	80	36	35	61
320728	New	60	55	80	30	30	56
320734	New	60	55	80	31	31	58
320739	New	60	55	80	30	30	57
320740	New	60	55	80	38	37	62
320742	New	60	55	80	39	39	65
320743	New	60	55	80	42	42	69
320744	New	60	55	80	33	33	60
320753	New	60	55	80	34	34	62
320769	New	60	55	80	37	37	64
320844	New	60	55	80	40	40	64
320845	New	60	55	80	33	33	57
320846	New	60	55	80	40	40	64
320847	New	60	55	80	37	37	63
320850	New	60	55	80	42	42	66
320851	New	60	55	80	41	40	64
320859	New	60	55	80	49	49	76
320860	New	60	55	80	48	48	77
320863	New	60	55	80	39	39	63
320864	New	60	55	80	41	41	66
320867	New	60	55	80	40	40	64
320870	New	60	55	80	40	40	63
320871	New	60	55	80	39	39	62
320872	New	60	55	80	39	39	62
320873	New	60	55	80	40	40	64
320874	New	60	55	80	41	40	65
320877	New	60	55	80	33	33	57
320878	New	60	55	80	35	35	59
320885	New	60	55	80	36	36	60
320886	New	60	55	80	41	41	66
320889	New	60	55	80	54	54	82
320890	New	60	55	80	49	49	79
320892	New	60	55	80	35	35	59
320896	New	60	55	80	42	42	66
320897	New	60	55	80	41	41	65
320899	New	60	55	80	38	38	63
320900	New	60	55	80	34	34	58
320934	New	60	55	80	41	41	66
320937	New	60	55	80	49	49	74
320939	New	60	55	80	46	46	72
320940	New	60	55	80	38	38	62
320941	New	60	55	80	33	33	57
320942	New	60	55	80	38	38	63
320943	New	60	55	80	38	38	61
320946	New	60	55	80	50	50	74
320947	New	60	55	80	42	42	67
320951	New	60	55	80	50	50	75
320954	New	60	55	80	41	41	66
320955	New	60	55	80	42	42	67
320957	New	60	55	80	43	43	68
320958	New	60	55	80	30	30	55
320967	New	60	55	80	37	37	61
320977	New	60	55	80	50	50	80

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
320985	New	60	55	80	42	42	65
320987	New	60	55	80	39	39	64
320988	New	60	55	80	36	36	61
320990	New	60	55	80	54	53	77
320991	New	60	55	80	35	35	60
320992	New	60	55	80	34	34	59
320994	New	60	55	80	35	35	60
320996	New	60	55	80	38	38	62
320997	New	60	55	80	40	40	64
321001	New	60	55	80	41	41	66
321016	New	60	55	80	44	44	69
321017	New	60	55	80	40	40	64
321019	New	60	55	80	45	46	70
321020	New	60	55	80	51	51	76
321021	New	60	55	80	40	40	65
321024	New	60	55	80	39	39	63
321025	New	60	55	80	38	38	62
321031	New	60	55	80	40	40	64
321032	New	60	55	80	48	48	75
321033	New	60	55	80	47	47	76
321034	New	60	55	80	48	48	73
321057	New	60	55	80	42	42	68
321061	New	60	55	80	39	39	64
321062	New	60	55	80	35	35	60
321064	New	60	55	80	40	40	65
321065	New	60	55	80	39	39	64
321066	New	60	55	80	35	35	60
321067	New	60	55	80	37	37	62
321068	New	60	55	80	37	37	61
321069	New	60	55	80	36	36	60
321073	New	60	55	80	42	42	66
321075	New	60	55	80	44	44	69
321100	New	60	55	80	42	42	68
321104	New	60	55	80	43	43	68
321111	New	60	55	80	39	39	63
321118	New	60	55	80	42	42	67
321123	New	60	55	80	35	35	59
321124	New	60	55	80	45	45	70
321135	New	60	55	80	40	40	64
321141	New	60	55	80	47	47	72
321142	New	60	55	80	34	34	58
321144	New	60	55	80	38	38	61
321147	New	60	55	80	44	44	72
321155	New	60	55	80	36	36	61
321182	New	60	55	80	37	37	61
321184	New	60	55	80	58	58	84
321185	New	60	55	80	36	36	60
321186	New	60	55	80	31	32	56
321192	New	60	55	80	43	43	68
321199	New	60	55	80	36	36	60
321200	New	60	55	80	36	37	61
321205	New	60	55	80	32	32	58
321206	New	60	55	80	36	37	62
321207	New	60	55	80	37	37	63
321208	New	60	55	80	37	37	62
321209	New	60	55	80	40	40	65

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
321210	New	60	55	80	41	41	65
321214	New	60	55	80	36	36	60
321231	New	60	55	80	38	38	63
321237	New	60	55	80	40	40	65
321246	New	60	55	80	45	46	70
321247	New	60	55	80	38	39	64
321248	New	60	55	80	34	34	58
321249	New	60	55	80	45	45	73
321250	New	60	55	80	41	41	65
321252	New	60	55	80	38	38	63
321254	New	60	55	80	46	46	70
321256	New	60	55	80	43	43	68
321258	New	60	55	80	44	44	68
321277	New	60	55	80	36	36	60
321281	New	60	55	80	39	39	66
321282	New	60	55	80	38	38	63
321283	New	60	55	80	39	39	63
321284	New	60	55	80	47	47	71
321286	New	60	55	80	42	42	68
321289	New	60	55	80	45	45	71
321292	New	60	55	80	43	43	66
321294	New	60	55	80	42	42	67
321296	New	60	55	80	48	49	75
321297	New	60	55	80	46	46	71
321300	New	60	55	80	41	41	66
321301	New	60	55	80	40	40	64
321303	New	60	55	80	39	39	64
321305	New	60	55	80	39	39	63
321332	New	60	55	80	49	49	77
321339	New	60	55	80	39	38	64
321343	New	60	55	80	40	40	65
321344	New	60	55	80	38	38	61
321346	New	60	55	80	30	30	54
321352	New	60	55	80	41	41	66
321353	New	60	55	80	39	39	63
321354	New	60	55	80	41	41	65
321356	New	60	55	80	40	40	65
321357	New	60	55	80	40	40	65
321358	New	60	55	80	42	42	68
321370	New	60	55	80	43	44	71
321371	New	60	55	80	41	41	65
321372	New	60	55	80	42	42	66
321373	New	60	55	80	42	42	67
321375	New	60	55	80	37	37	63
321376	New	60	55	80	38	38	63
321379	New	60	55	80	41	41	67
321383	New	60	55	80	39	39	62
321391	New	60	55	80	37	37	63
321394	New	60	55	80	40	40	65
321417	New	60	55	80	35	35	59
321422	New	60	55	80	36	36	61
321429	New	60	55	80	47	47	74
321431	New	60	55	80	35	35	59
321433	New	60	55	80	34	34	58
321434	New	60	55	80	36	36	60
321435	New	60	55	80	37	38	61

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
321436	New	60	55	80	39	39	64
321437	New	60	55	80	35	35	60
321438	New	60	55	80	41	41	65
321439	New	60	55	80	41	41	66
321440	New	60	55	80	41	41	66
321448	New	60	55	80	40	40	64
321452	New	60	55	80	39	40	65
321457	New	60	55	80	55	55	86
321458	New	60	55	80	54	54	86
321485	New	60	55	80	42	42	67
321486	New	60	55	80	38	38	62
321489	New	60	55	80	44	44	68
321490	New	60	55	80	40	40	65
321491	New	60	55	80	39	39	63
321492	New	60	55	80	41	41	67
321494	New	60	55	80	28	28	53
321502	New	60	55	80	35	35	60
321533	New	60	55	80	40	40	64
321535	New	60	55	80	35	35	61
321539	New	60	55	80	50	50	75
321540	New	60	55	80	42	42	65
321541	New	60	55	80	40	40	65
321543	New	60	55	80	36	36	62
321544	New	60	55	80	40	40	66
321548	New	60	55	80	48	48	73
321549	New	60	55	80	49	49	74
321551	New	60	55	80	41	41	66
321555	New	60	55	80	48	48	72
321561	New	60	55	80	37	37	62
321562	New	60	55	80	38	38	63
321563	New	60	55	80	41	41	65
321564	New	60	55	80	40	40	65
321566	New	60	55	80	34	34	59
321567	New	60	55	80	37	37	61
321568	New	60	55	80	43	43	67
321569	New	60	55	80	42	42	68
321581	New	60	55	80	39	39	65
321582	New	60	55	80	36	36	61
321583	New	60	55	80	37	37	62
321585	New	60	55	80	48	48	73
321586	New	60	55	80	39	39	64
321589	New	60	55	80	35	35	59
321590	New	60	55	80	34	35	59
321612	New	60	55	80	35	35	59
321613	New	60	55	80	38	38	62
321631	New	60	55	80	31	31	58
321632	New	60	55	80	34	34	60
321633	New	60	55	80	37	37	63
321634	New	60	55	80	39	39	66
321646	New	60	55	80	30	31	58
321648	New	60	55	80	31	31	58
321650	New	60	55	80	31	31	58
321655	New	60	55	80	28	29	55
321656	New	60	55	80	31	31	58
321657	New	60	55	80	40	40	67
321660	New	60	55	80	47	47	73

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
321666	New	60	55	80	33	33	60
321676	New	60	55	80	42	42	69
321677	New	60	55	80	40	40	66
321678	New	60	55	80	37	37	63
321679	New	60	55	80	36	36	63
321682	New	60	55	80	31	31	58
321687	New	60	55	80	46	46	71
321689	New	60	55	80	48	48	73
321690	New	60	55	80	33	33	59
321691	New	60	55	80	46	46	73
321694	New	60	55	80	36	36	62
321695	New	60	55	80	34	35	61
321697	New	60	55	80	30	30	56
321699	New	60	55	80	32	32	58
321701	New	60	55	80	45	45	71
321702	New	60	55	80	30	30	56
321706	New	60	55	80	41	42	68
321708	New	60	55	80	49	49	73
321709	New	60	55	80	34	34	61
321715	New	60	55	80	32	32	58
321716	New	60	55	80	32	32	59
321717	New	60	55	80	36	36	62
321723	New	60	55	80	34	34	60
321724	New	60	55	80	35	35	61
321726	New	60	55	80	40	41	67
321727	New	60	55	80	41	41	67
321733	New	60	55	80	43	43	70
321737	New	60	55	80	30	30	56
321739	New	60	55	80	39	39	66
321740	New	60	55	80	47	47	74
321742	New	60	55	80	28	28	55
321743	New	60	55	80	48	48	73
321747	New	60	55	80	44	44	70
321748	New	60	55	80	46	46	72
321751	New	60	55	80	27	27	54
321752	New	60	55	80	37	37	64
321753	New	60	55	80	30	30	57
321755	New	60	55	80	45	45	71
321756	New	60	55	80	38	38	64
321758	New	60	55	80	41	41	68
321759	New	60	55	80	46	46	72
321760	New	60	55	80	46	46	72
321762	New	60	55	80	30	30	57
321813	New	60	55	80	41	41	66
321819	New	60	55	80	40	40	65
321821	New	60	55	80	48	48	72
321822	New	60	55	80	43	43	68
321890	New	60	55	80	40	40	65
321903	New	60	55	80	41	42	67
321904	New	60	55	80	40	39	65
321907	New	60	55	80	47	47	72
321908	New	60	55	80	39	39	62
321909	New	60	55	80	45	45	72
321910	New	60	55	80	46	46	70
321911	New	60	55	80	36	36	60
321913	New	60	55	80	33	33	58

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
321915	New	60	55	80	36	36	61
321920	New	60	55	80	48	48	77
321935	New	60	55	80	34	34	59
321944	New	60	55	80	40	40	65
321947	New	60	55	80	39	39	64
321957	New	60	55	80	43	43	67
321961	New	60	55	80	39	39	63
321963	New	60	55	80	38	38	63
321964	New	60	55	80	35	36	59
321965	New	60	55	80	40	40	63
321968	New	60	55	80	42	42	67
321970	New	60	55	80	40	40	65
321971	New	60	55	80	43	43	68
321973	New	60	55	80	39	38	61
321974	New	60	55	80	50	50	78
321975	New	60	55	80	54	54	82
321977	New	60	55	80	44	44	69
321978	New	60	55	80	40	40	65
321979	New	60	55	80	36	36	60
321980	New	60	55	80	37	37	62
321982	New	60	55	80	53	53	78
321987	New	60	55	80	41	41	66
321996	New	60	55	80	41	40	66
321999	New	60	55	80	41	41	65
322005	New	60	55	80	40	40	64
322011	New	60	55	80	41	41	65
322013	New	60	55	80	42	42	66
322021	New	60	55	80	38	38	63
322031	New	60	55	80	46	46	71
322032	New	60	55	80	39	39	63
322033	New	60	55	80	40	40	64
322034	New	60	55	80	46	46	70
322036	New	60	55	80	48	49	74
322037	New	60	55	80	46	46	75
322038	New	60	55	80	39	39	65
322039	New	60	55	80	37	37	63
322040	New	60	55	80	37	37	61
322041	New	60	55	80	46	46	71
322042	New	60	55	80	48	48	72
322043	New	60	55	80	47	47	71
322044	New	60	55	80	51	51	76
322046	New	60	55	80	49	49	73
322047	New	60	55	80	51	51	80
322048	New	60	55	80	49	49	77
322049	New	60	55	80	37	37	62
322050	New	60	55	80	45	45	70
322051	New	60	55	80	36	36	61
322052	New	60	55	80	41	41	65
322053	New	60	55	80	43	43	68
322072	New	60	55	80	40	40	65
322073	New	60	55	80	40	40	64
322074	New	60	55	80	32	32	56
322076	New	60	55	80	41	41	65
322077	New	60	55	80	46	46	71
322078	New	60	55	80	39	39	63
322083	New	60	55	80	36	36	60

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
322089	New	60	55	80	32	32	58
322096	New	60	55	80	47	47	72
322099	New	60	55	80	34	34	58
322103	New	60	55	80	40	40	63
322104	New	60	55	80	43	43	68
322111	New	60	55	80	41	41	66
322112	New	60	55	80	35	35	60
322115	New	60	55	80	51	51	76
322116	New	60	55	80	42	42	65
322117	New	60	55	80	48	48	79
322118	New	60	55	80	36	36	60
322119	New	60	55	80	38	38	61
322120	New	60	55	80	47	47	73
322122	New	60	55	80	41	41	66
322123	New	60	55	80	43	43	68
322124	New	60	55	80	35	35	59
322125	New	60	55	80	50	50	75
322127	New	60	55	80	33	33	58
322128	New	60	55	80	47	47	72
322129	New	60	55	80	35	35	59
322130	New	60	55	80	38	38	63
322131	New	60	55	80	49	49	73
322134	New	60	55	80	52	52	81
322135	New	60	55	80	53	53	82
322136	New	60	55	80	50	50	78
322139	New	60	55	80	49	49	77
322142	New	60	55	80	45	45	69
322156	New	60	55	80	39	39	64
322166	New	60	55	80	43	43	68
322169	New	60	55	80	38	38	63
322170	New	60	55	80	36	36	61
322173	New	60	55	80	34	35	59
322180	New	60	55	80	40	40	65
322190	New	60	55	80	39	39	63
322194	New	60	55	80	47	48	72
322195	New	60	55	80	50	50	76
322197	New	60	55	80	37	37	62
322198	New	60	55	80	39	39	62
322199	New	60	55	80	38	39	64
322202	New	60	55	80	42	42	68
322204	New	60	55	80	27	27	52
322205	New	60	55	80	36	36	61
322207	New	60	55	80	44	44	69
322208	New	60	55	80	41	41	66
322214	New	60	55	80	48	48	72
322215	New	60	55	80	42	42	67
322218	New	60	55	80	48	48	72
322233	New	60	55	80	28	28	55
322235	New	60	55	80	50	50	75
322236	New	60	55	80	35	35	59
322237	New	60	55	80	38	38	63
322238	New	60	55	80	42	42	66
322239	New	60	55	80	38	38	62
322241	New	60	55	80	44	44	68
322242	New	60	55	80	46	46	70
322243	New	60	55	80	39	39	63

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
322245	New	60	55	80	40	40	64
322246	New	60	55	80	49	49	79
322249	New	60	55	80	41	42	65
322252	New	60	55	80	46	46	72
322255	New	60	55	80	37	37	61
322258	New	60	55	80	39	39	63
322259	New	60	55	80	41	41	65
322262	New	60	55	80	33	33	58
322267	New	60	55	80	39	39	64
322269	New	60	55	80	42	42	66
322278	New	60	55	80	40	40	65
322281	New	60	55	80	41	41	66
322292	New	60	55	80	41	41	66
322293	New	60	55	80	32	32	57
322294	New	60	55	80	32	32	57
322295	New	60	55	80	43	43	67
322296	New	60	55	80	43	43	67
322297	New	60	55	80	45	45	70
322298	New	60	55	80	39	39	63
322302	New	60	55	80	46	46	73
322303	New	60	55	80	43	43	68
322304	New	60	55	80	40	40	65
322305	New	60	55	80	37	37	62
322306	New	60	55	80	35	35	60
322307	New	60	55	80	41	42	65
322308	New	60	55	80	34	35	59
322309	New	60	55	80	47	46	71
322318	New	60	55	80	40	40	65
322320	New	60	55	80	38	38	63
322323	New	60	55	80	34	35	59
322328	New	60	55	80	39	39	63
322350	New	60	55	80	49	49	74
322353	New	60	55	80	36	36	61
322354	New	60	55	80	40	40	66
322355	New	60	55	80	27	27	55
322356	New	60	55	80	42	42	68
322358	New	60	55	80	42	42	67
322359	New	60	55	80	38	38	62
322365	New	60	55	80	41	41	65
322367	New	60	55	80	30	30	54
322368	New	60	55	80	36	36	61
322371	New	60	55	80	36	36	60
322375	New	60	55	80	39	39	64
322378	New	60	55	80	37	37	62
322379	New	60	55	80	37	37	62
322384	New	60	55	80	41	41	65
322386	New	60	55	80	42	42	67
322389	New	60	55	80	41	41	66
322391	New	60	55	80	48	47	71
322420	New	60	55	80	38	38	63
322421	New	60	55	80	39	39	63
322423	New	60	55	80	47	47	73
322426	New	60	55	80	42	42	67
322428	New	60	55	80	36	36	61
322429	New	60	55	80	58	58	84
322430	New	60	55	80	39	39	63

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	Lamax
322432	New	60	55	80	45	45	69
322435	New	60	55	80	48	48	74
322436	New	60	55	80	38	39	62
322439	New	60	55	80	44	44	70
322443	New	60	55	80	40	40	65
322444	New	60	55	80	48	48	72
322445	New	60	55	80	40	40	65
322446	New	60	55	80	29	30	54
322448	New	60	55	80	44	44	68
322449	New	60	55	80	41	41	64
322450	New	60	55	80	43	43	67
322453	New	60	55	80	54	54	82
322456	New	60	55	80	34	35	59
322458	New	60	55	80	38	38	62
322460	New	60	55	80	43	43	67
322462	New	60	55	80	47	47	72
322470	New	60	55	80	31	31	56
322473	New	60	55	80	45	44	66
322478	New	60	55	80	36	36	60
322486	New	60	55	80	37	38	63
322489	New	60	55	80	48	48	72
322490	New	60	55	80	51	51	76
322491	New	60	55	80	38	38	62
322492	New	60	55	80	52	52	76
322493	New	60	55	80	46	46	71
322494	New	60	55	80	51	51	80
322495	New	60	55	80	36	36	60
322496	New	60	55	80	46	46	71
322498	New	60	55	80	47	47	69
322500	New	60	55	80	39	39	64
322501	New	60	55	80	39	39	64
322511	New	60	55	80	38	38	63
322515	New	60	55	80	37	37	61
322518	New	60	55	80	38	38	62
322522	New	60	55	80	32	33	57
322523	New	60	55	80	35	35	59
322525	New	60	55	80	38	38	62
322526	New	60	55	80	37	37	61
322528	New	60	55	80	48	49	73
322529	New	60	55	80	52	52	75
322530	New	60	55	80	40	40	65
322531	New	60	55	80	38	38	62
322532	New	60	55	80	38	38	62
322533	New	60	55	80	36	36	61
322534	New	60	55	80	38	38	64
322538	New	60	55	80	62	62	86
322542	New	60	55	80	39	39	65
322543	New	60	55	80	49	49	74
322546	New	60	55	80	32	32	57
322547	New	60	55	80	29	29	54
322549	New	60	55	80	30	30	57
322550	New	60	55	80	41	41	64
322551	New	60	55	80	33	33	58
322552	New	60	55	80	62	62	87
322553	New	60	55	80	40	40	65
322554	New	60	55	80	34	34	58

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
322557	New	60	55	80	37	37	61
322558	New	60	55	80	41	41	66
322559	New	60	55	80	40	40	64
322561	New	60	55	80	40	40	66
322562	New	60	55	80	46	46	70
322566	New	60	55	80	39	39	63
322567	New	60	55	80	49	49	73
322568	New	60	55	80	41	41	66
322574	New	60	55	80	40	40	65
322575	New	60	55	80	42	41	67
322577	New	60	55	80	41	41	64
322578	New	60	55	80	42	42	67
322580	New	60	55	80	37	37	62
322581	New	60	55	80	39	39	62
322582	New	60	55	80	40	40	65
322583	New	60	55	80	41	41	65
322584	New	60	55	80	46	46	70
322589	New	60	55	80	41	41	64
322590	New	60	55	80	41	41	66
322592	New	60	55	80	38	38	64
322593	New	60	55	80	40	40	64
322598	New	60	55	80	39	39	64
322599	New	60	55	80	40	40	64
322602	New	60	55	80	40	40	66
322603	New	60	55	80	46	46	71
322605	New	60	55	80	47	47	71
322606	New	60	55	80	45	45	70
322607	New	60	55	80	35	35	59
322608	New	60	55	80	37	37	61
322609	New	60	55	80	40	40	65
322610	New	60	55	80	39	39	64
322615	New	60	55	80	45	45	70
322617	New	60	55	80	42	42	65
322624	New	60	55	80	47	47	73
322625	New	60	55	80	52	52	79
322627	New	60	55	80	37	37	62
322629	New	60	55	80	40	40	63
322630	New	60	55	80	44	44	70
322631	New	60	55	80	40	40	65
322635	New	60	55	80	35	35	59
322636	New	60	55	80	39	39	64
322637	New	60	55	80	39	39	63
322639	New	60	55	80	39	39	64
322643	New	60	55	80	37	37	61
322644	New	60	55	80	39	39	64
322646	New	60	55	80	49	49	75
322648	New	60	55	80	42	42	65
322649	New	60	55	80	45	45	70
322650	New	60	55	80	40	40	64
322651	New	60	55	80	44	44	69
322652	New	60	55	80	40	40	64
322654	New	60	55	80	41	41	66
322656	New	60	55	80	39	39	63
322660	New	60	55	80	49	49	74
322662	New	60	55	80	32	33	56
322663	New	60	55	80	34	34	58

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
322664	New	60	55	80	33	33	57
322665	New	60	55	80	56	56	82
322666	New	60	55	80	40	40	64
322668	New	60	55	80	44	44	69
322672	New	60	55	80	40	40	63
322673	New	60	55	80	39	39	63
322679	New	60	55	80	41	41	65
322681	New	60	55	80	40	40	66
322687	New	60	55	80	44	45	69
322714	New	60	55	80	40	40	64
322716	New	60	55	80	40	40	63
322719	New	60	55	80	44	44	68
322723	New	60	55	80	32	32	57
322724	New	60	55	80	36	36	60
322725	New	60	55	80	37	37	61
322726	New	60	55	80	39	39	64
322729	New	60	55	80	46	46	71
322730	New	60	55	80	46	46	70
322732	New	60	55	80	51	51	75
322733	New	60	55	80	44	44	70
322735	New	60	55	80	38	38	63
322781	New	60	55	80	41	41	66
322784	New	60	55	80	29	29	54
322785	New	60	55	80	32	32	56
322786	New	60	55	80	44	44	69
322787	New	60	55	80	38	38	62
322788	New	60	55	80	38	38	61
322789	New	60	55	80	36	36	60
322792	New	60	55	80	48	48	75
322794	New	60	55	80	47	47	72
322798	New	60	55	80	50	50	73
322808	New	60	55	80	50	50	74
322810	New	60	55	80	46	46	71
322850	New	60	55	80	42	42	67
322851	New	60	55	80	42	42	66
322852	New	60	55	80	32	32	57
322889	New	60	55	80	41	41	67
322890	New	60	55	80	36	36	60
322894	New	60	55	80	37	38	61
322950	New	60	55	80	37	37	63
322996	New	60	55	80	37	37	62
322997	New	60	55	80	33	33	58
323037	New	60	55	80	43	41	69
323066	New	60	55	80	41	41	64
323100	New	60	55	80	34	34	58
323105	New	60	55	80	48	48	73
323149	New	60	55	80	41	41	66
323153	New	60	55	80	40	40	65
323154	New	60	55	80	38	38	63
323156	New	60	55	80	41	41	66
323159	New	60	55	80	44	44	69
323221	New	60	55	80	37	37	62
323222	New	60	55	80	41	41	66
323225	New	60	55	80	39	39	64
323226	New	60	55	80	42	42	67
323227	New	60	55	80	40	40	64

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323231	New	60	55	80	38	38	63
323234	New	60	55	80	45	45	69
323279	New	60	55	80	36	36	59
323281	New	60	55	80	42	42	66
323282	New	60	55	80	47	47	71
323286	New	60	55	80	44	44	69
323288	New	60	55	80	39	39	64
323290	New	60	55	80	39	39	65
323304	New	60	55	80	39	39	64
323307	New	60	55	80	37	37	62
323308	New	60	55	80	39	39	64
323309	New	60	55	80	40	40	64
323311	New	60	55	80	35	35	59
323312	New	60	55	80	37	37	61
323313	New	60	55	80	38	38	63
323325	New	60	55	80	31	31	56
323351	New	60	55	80	42	42	66
323355	New	60	55	80	39	39	63
323356	New	60	55	80	38	39	63
323384	New	60	55	80	38	38	62
323397	New	60	55	80	45	45	72
323399	New	60	55	80	38	38	61
323401	New	60	55	80	36	36	60
323402	New	60	55	80	36	36	60
323403	New	60	55	80	43	43	68
323404	New	60	55	80	38	38	62
323407	New	60	55	80	39	39	64
323408	New	60	55	80	49	49	73
323409	New	60	55	80	39	39	64
323414	New	60	55	80	50	50	75
323415	New	60	55	80	48	49	74
323416	New	60	55	80	48	48	76
323417	New	60	55	80	48	48	75
323419	New	60	55	80	46	46	71
323420	New	60	55	80	39	39	64
323421	New	60	55	80	46	46	73
323423	New	60	55	80	39	39	64
323424	New	60	55	80	38	38	63
323425	New	60	55	80	39	39	63
323428	New	60	55	80	37	37	61
323429	New	60	55	80	37	38	61
323432	New	60	55	80	38	38	63
323434	New	60	55	80	49	49	75
323435	New	60	55	80	43	43	68
323437	New	60	55	80	33	33	57
323438	New	60	55	80	29	29	54
323439	New	60	55	80	34	34	58
323440	New	60	55	80	37	37	61
323441	New	60	55	80	34	34	59
323442	New	60	55	80	32	32	57
323443	New	60	55	80	40	40	65
323444	New	60	55	80	36	36	60
323445	New	60	55	80	36	36	60
323446	New	60	55	80	43	43	69
323447	New	60	55	80	33	33	57
323452	New	60	55	80	45	45	70

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323453	New	60	55	80	48	48	74
323456	New	60	55	80	36	36	61
323457	New	60	55	80	36	36	60
323458	New	60	55	80	52	52	77
323459	New	60	55	80	42	42	68
323461	New	60	55	80	48	48	77
323462	New	60	55	80	40	40	65
323463	New	60	55	80	42	42	67
323464	New	60	55	80	42	42	67
323465	New	60	55	80	46	47	71
323466	New	60	55	80	49	49	73
323467	New	60	55	80	41	41	66
323468	New	60	55	80	34	34	58
323470	New	60	55	80	38	38	63
323472	New	60	55	80	32	32	57
323473	New	60	55	80	28	28	53
323474	New	60	55	80	35	35	61
323475	New	60	55	80	40	40	65
323476	New	60	55	80	49	49	73
323478	New	60	55	80	41	41	66
323480	New	60	55	80	42	42	65
323485	New	60	55	80	45	44	67
323487	New	60	55	80	39	39	63
323488	New	60	55	80	41	41	67
323489	New	60	55	80	36	36	61
323490	New	60	55	80	35	35	61
323491	New	60	55	80	42	42	67
323492	New	60	55	80	42	42	67
323493	New	60	55	80	34	34	58
323494	New	60	55	80	34	35	59
323495	New	60	55	80	34	34	59
323496	New	60	55	80	36	36	62
323497	New	60	55	80	37	37	62
323500	New	60	55	80	29	29	56
323501	New	60	55	80	40	40	63
323502	New	60	55	80	47	46	71
323503	New	60	55	80	51	51	76
323504	New	60	55	80	49	49	74
323505	New	60	55	80	43	42	67
323507	New	60	55	80	39	39	64
323508	New	60	55	80	45	45	69
323510	New	60	55	80	45	45	69
323511	New	60	55	80	44	44	71
323512	New	60	55	80	42	42	66
323513	New	60	55	80	42	42	65
323515	New	60	55	80	37	37	62
323517	New	60	55	80	36	36	62
323518	New	60	55	80	37	37	62
323519	New	60	55	80	32	32	57
323520	New	60	55	80	32	32	57
323522	New	60	55	80	49	49	73
323524	New	60	55	80	39	39	63
323525	New	60	55	80	53	53	79
323527	New	60	55	80	37	37	60
323528	New	60	55	80	41	41	65
323529	New	60	55	80	40	40	64

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323530	New	60	55	80	46	46	71
323531	New	60	55	80	40	40	65
323533	New	60	55	80	40	40	64
323535	New	60	55	80	39	39	63
323536	New	60	55	80	42	42	66
323539	New	60	55	80	37	37	61
323541	New	60	55	80	37	37	61
323543	New	60	55	80	48	48	72
323544	New	60	55	80	37	37	61
323545	New	60	55	80	38	38	62
323546	New	60	55	80	37	37	62
323547	New	60	55	80	37	37	63
323549	New	60	55	80	50	50	77
323550	New	60	55	80	34	34	59
323551	New	60	55	80	35	35	60
323552	New	60	55	80	33	33	58
323553	New	60	55	80	39	39	63
323554	New	60	55	80	40	40	66
323555	New	60	55	80	39	39	63
323556	New	60	55	80	47	47	73
323557	New	60	55	80	47	47	71
323558	New	60	55	80	40	40	65
323561	New	60	55	80	41	41	65
323562	New	60	55	80	41	41	65
323563	New	60	55	80	54	54	78
323564	New	60	55	80	50	50	78
323566	New	60	55	80	33	34	58
323567	New	60	55	80	32	32	58
323568	New	60	55	80	41	41	65
323569	New	60	55	80	52	52	77
323570	New	60	55	80	49	49	76
323572	New	60	55	80	41	41	65
323573	New	60	55	80	37	37	62
323574	New	60	55	80	31	31	57
323575	New	60	55	80	48	48	73
323576	New	60	55	80	49	50	76
323577	New	60	55	80	50	50	74
323578	New	60	55	80	41	41	64
323579	New	60	55	80	47	45	71
323580	New	60	55	80	39	39	63
323581	New	60	55	80	40	41	64
323582	New	60	55	80	34	34	58
323583	New	60	55	80	38	39	62
323584	New	60	55	80	38	38	62
323585	New	60	55	80	39	39	62
323586	New	60	55	80	38	38	61
323587	New	60	55	80	37	37	61
323588	New	60	55	80	35	35	61
323589	New	60	55	80	36	36	60
323590	New	60	55	80	36	36	60
323591	New	60	55	80	44	44	68
323592	New	60	55	80	44	44	68
323593	New	60	55	80	45	45	69
323594	New	60	55	80	47	47	73
323595	New	60	55	80	46	46	71
323596	New	60	55	80	39	39	63

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323597	New	60	55	80	42	43	69
323598	New	60	55	80	52	52	77
323599	New	60	55	80	40	40	64
323600	New	60	55	80	42	42	66
323601	New	60	55	80	44	44	70
323602	New	60	55	80	42	42	66
323603	New	60	55	80	42	42	66
323605	New	60	55	80	54	54	80
323606	New	60	55	80	43	43	67
323607	New	60	55	80	40	40	63
323609	New	60	55	80	38	38	63
323610	New	60	55	80	38	38	62
323611	New	60	55	80	36	36	59
323612	New	60	55	80	36	36	61
323613	New	60	55	80	38	38	63
323614	New	60	55	80	37	37	61
323615	New	60	55	80	38	38	63
323618	New	60	55	80	41	41	65
323619	New	60	55	80	41	41	66
323620	New	60	55	80	47	47	71
323621	New	60	55	80	39	39	63
323622	New	60	55	80	48	48	75
323623	New	60	55	80	45	45	69
323625	New	60	55	80	41	41	68
323626	New	60	55	80	40	40	65
323627	New	60	55	80	49	49	74
323628	New	60	55	80	50	50	75
323630	New	60	55	80	37	37	63
323631	New	60	55	80	35	35	60
323635	New	60	55	80	51	51	75
323636	New	60	55	80	49	49	77
323638	New	60	55	80	42	42	67
323639	New	60	55	80	43	43	67
323640	New	60	55	80	42	42	66
323641	New	60	55	80	39	39	63
323642	New	60	55	80	39	39	63
323643	New	60	55	80	31	31	57
323644	New	60	55	80	29	29	54
323645	New	60	55	80	36	36	60
323646	New	60	55	80	39	38	63
323647	New	60	55	80	38	38	62
323648	New	60	55	80	40	40	66
323650	New	60	55	80	41	41	69
323651	New	60	55	80	53	53	79
323652	New	60	55	80	42	43	66
323653	New	60	55	80	37	37	61
323654	New	60	55	80	50	50	74
323655	New	60	55	80	48	48	73
323656	New	60	55	80	49	49	74
323657	New	60	55	80	51	51	76
323658	New	60	55	80	48	48	76
323659	New	60	55	80	37	37	62
323660	New	60	55	80	43	43	68
323662	New	60	55	80	36	36	60
323663	New	60	55	80	38	38	62
323665	New	60	55	80	30	30	54

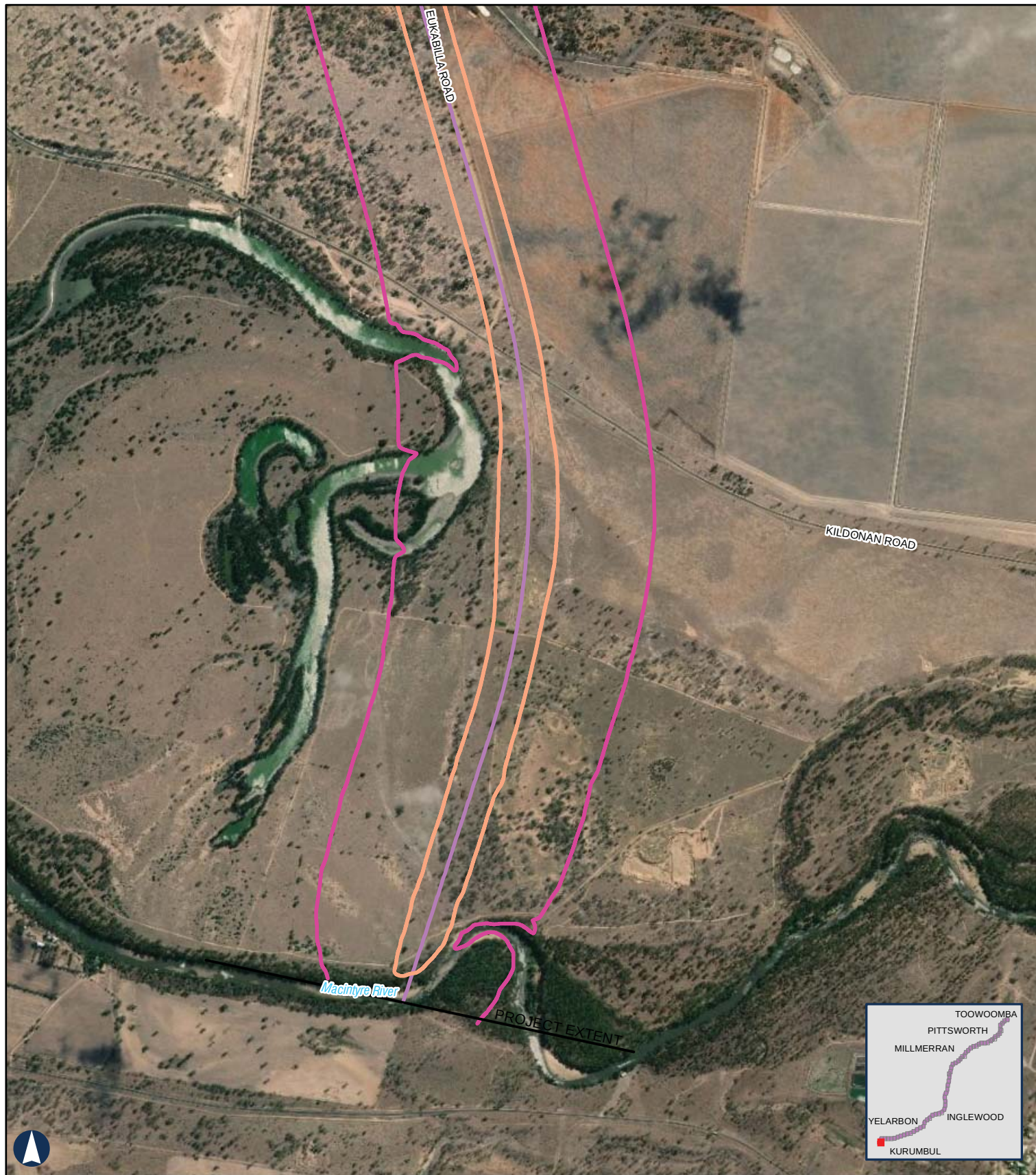
Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323666	New	60	55	80	38	38	64
323667	New	60	55	80	43	43	68
323668	New	60	55	80	40	40	65
323669	New	60	55	80	41	41	65
323670	New	60	55	80	51	51	76
323671	New	60	55	80	47	47	73
323672	New	60	55	80	42	42	68
323673	New	60	55	80	42	42	67
323674	New	60	55	80	41	41	66
323675	New	60	55	80	44	44	68
323676	New	60	55	80	42	42	66
323678	New	60	55	80	54	54	82
323679	New	60	55	80	55	55	90
323680	New	60	55	80	53	53	83
323681	New	60	55	80	42	42	65
323682	New	60	55	80	35	35	60
323683	New	60	55	80	51	51	75
323685	New	60	55	80	32	32	57
323686	New	60	55	80	35	35	59
323687	New	60	55	80	35	35	59
323688	New	60	55	80	34	34	59
323689	New	60	55	80	31	31	55
323690	New	60	55	80	32	32	57
323691	New	60	55	80	34	34	58
323693	New	60	55	80	36	36	60
323695	New	60	55	80	40	40	65
323696	New	60	55	80	42	42	68
323697	New	60	55	80	36	36	61
323698	New	60	55	80	40	40	64
323699	New	60	55	80	44	44	68
323700	New	60	55	80	39	39	63
323701	New	60	55	80	39	39	62
323702	New	60	55	80	46	46	71
323703	New	60	55	80	45	45	70
323704	New	60	55	80	38	38	62
323705	New	60	55	80	37	37	61
323706	New	60	55	80	33	33	57
323708	New	60	55	80	38	38	63
323709	New	60	55	80	36	36	62
323710	New	60	55	80	53	53	80
323711	New	60	55	80	49	49	75
323712	New	60	55	80	41	41	65
323714	New	60	55	80	47	47	78
323716	New	60	55	80	39	39	64
323718	New	60	55	80	41	41	66
323720	New	60	55	80	54	54	83
323722	New	60	55	80	51	51	79
323723	New	60	55	80	33	33	58
323724	New	60	55	80	33	33	58
323726	New	60	55	80	39	39	64
323729	New	60	55	80	38	38	63
323730	New	60	55	80	37	37	61
323731	New	60	55	80	37	37	62
323732	New	60	55	80	35	35	60
323733	New	60	55	80	36	36	60
323734	New	60	55	80	37	37	61

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323735	New	60	55	80	38	39	64
323736	New	60	55	80	39	39	63
323737	New	60	55	80	43	43	68
323738	New	60	55	80	46	46	72
323739	New	60	55	80	36	36	61
323740	New	60	55	80	38	38	64
323741	New	60	55	80	37	37	63
323742	New	60	55	80	45	45	70
323743	New	60	55	80	41	41	66
323744	New	60	55	80	43	43	66
323745	New	60	55	80	51	51	76
323746	New	60	55	80	48	49	77
323747	New	60	55	80	35	35	59
323748	New	60	55	80	46	46	71
323749	New	60	55	80	39	39	65
323750	New	60	55	80	35	35	60
323751	New	60	55	80	34	34	59
323752	New	60	55	80	34	34	60
323756	New	60	55	80	48	48	72
323757	New	60	55	80	42	42	65
323758	New	60	55	80	40	40	64
323759	New	60	55	80	47	47	71
323760	New	60	55	80	44	44	68
323761	New	60	55	80	45	45	70
323762	New	60	55	80	43	43	68
323763	New	60	55	80	38	38	61
323767	New	60	55	80	42	42	67
323768	New	60	55	80	42	42	66
323769	New	60	55	80	41	41	66
323770	New	60	55	80	47	47	72
323771	New	60	55	80	42	42	69
323772	New	60	55	80	34	34	58
323773	New	60	55	80	40	40	65
323774	New	60	55	80	35	35	59
323775	New	60	55	80	33	34	58
323777	New	60	55	80	38	38	63
323780	New	60	55	80	51	51	79
323783	New	60	55	80	45	44	70
323784	New	60	55	80	36	36	61
323785	New	60	55	80	38	38	62
323786	New	60	55	80	51	51	77
323788	New	60	55	80	44	44	69
323789	New	60	55	80	49	50	74
323790	New	60	55	80	38	38	62
323791	New	60	55	80	45	45	70
323792	New	60	55	80	42	42	67
323793	New	60	55	80	39	39	64
323794	New	60	55	80	42	42	67
323795	New	60	55	80	46	46	71
323796	New	60	55	80	57	57	83
323797	New	60	55	80	48	48	71
323798	New	60	55	80	51	51	76
323799	New	60	55	80	36	36	59
323800	New	60	55	80	37	37	61
323801	New	60	55	80	46	46	71
323803	New	60	55	80	51	51	76

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323804	New	60	55	80	57	57	83
323805	New	60	55	80	49	49	74
323806	New	60	55	80	50	50	74
323808	New	60	55	80	46	46	70
323809	New	60	55	80	50	50	75
323811	New	60	55	80	36	36	59
323812	New	60	55	80	32	32	57
323813	New	60	55	80	36	36	60
323815	New	60	55	80	40	40	65
323816	New	60	55	80	40	39	64
323817	New	60	55	80	42	42	67
323818	New	60	55	80	40	40	65
323819	New	60	55	80	48	48	78
323823	New	60	55	80	50	50	74
323824	New	60	55	80	31	31	55
323825	New	60	55	80	46	46	72
323828	New	60	55	80	31	31	56
323829	New	60	55	80	42	41	67
323830	New	60	55	80	42	42	69
323831	New	60	55	80	46	46	70
323832	New	60	55	80	48	48	76
323833	New	60	55	80	46	46	70
323835	New	60	55	80	41	41	67
323837	New	60	55	80	34	34	59
323838	New	60	55	80	34	34	58
323839	New	60	55	80	39	39	63
323840	New	60	55	80	38	38	62
323841	New	60	55	80	41	41	65
323843	New	60	55	80	41	41	66
323844	New	60	55	80	48	48	78
323845	New	60	55	80	48	48	72
323846	New	60	55	80	48	48	78
323847	New	60	55	80	47	47	74
323848	New	60	55	80	48	49	76
323849	New	60	55	80	40	40	65
323850	New	60	55	80	41	41	66
323851	New	60	55	80	38	38	62
323852	New	60	55	80	40	40	64
323853	New	60	55	80	39	39	62
323854	New	60	55	80	60	60	86
323856	New	60	55	80	45	45	69
323857	New	60	55	80	48	48	73
323862	New	60	55	80	40	40	64
323863	New	60	55	80	39	39	64
323866	New	60	55	80	45	45	70
323867	New	60	55	80	48	48	75
323868	New	60	55	80	50	50	80
323871	New	60	55	80	40	40	65
323877	New	60	55	80	38	38	64
323878	New	60	55	80	36	36	60
323879	New	60	55	80	35	35	59
323880	New	60	55	80	33	33	58
323882	New	60	55	80	39	39	64
323883	New	60	55	80	38	38	62
323884	New	-	-	-	39	39	63
323885	New	60	55	80	43	43	69

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
323891	New	60	55	80	41	41	66
323893	New	60	55	80	48	48	76
323894	New	60	55	80	45	45	70
323895	New	60	55	80	43	43	68
323896	New	60	55	80	44	44	69
323897	New	60	55	80	43	43	68
323898	New	60	55	80	42	42	67
323899	New	60	55	80	43	43	68
323901	New	60	55	80	34	34	58
323902	New	60	55	80	36	36	60
323903	New	60	55	80	34	34	60
323904	New	60	55	80	41	41	66
323905	New	60	55	80	41	41	65
323906	New	60	55	80	40	40	66
323907	New	60	55	80	41	41	65
323908	New	60	55	80	45	45	69
323910	New	60	55	80	42	42	66
323911	New	60	55	80	40	40	64
323912	New	60	55	80	49	49	75
323913	New	60	55	80	49	49	74
323914	New	60	55	80	49	49	73
323915	New	60	55	80	44	44	68
323916	New	60	55	80	41	41	65
323917	New	60	55	80	41	41	66
323918	New	60	55	80	42	42	66
323919	New	60	55	80	42	42	66
323920	New	60	55	80	44	44	69
323921	New	60	55	80	44	43	68
323922	New	60	55	80	43	43	67
323923	New	60	55	80	43	43	68
323925	New	60	55	80	51	51	75
323926	New	60	55	80	34	35	59
323927	New	60	55	80	46	46	72
323928	New	60	55	80	38	38	63
323929	New	60	55	80	38	38	62
323930	New	60	55	80	50	50	75
323931	New	60	55	80	34	34	59
323932	New	60	55	80	34	34	59
323933	New	60	55	80	37	37	61
323934	New	60	55	80	41	41	65
323935	New	60	55	80	42	42	66
323936	New	60	55	80	42	42	66
323937	New	60	55	80	38	38	63
323938	New	60	55	80	42	42	67
323939	New	60	55	80	38	38	62
323940	New	60	55	80	41	39	66
323941	New	60	55	80	49	49	74
323942	New	60	55	80	33	33	58
323943	New	60	55	80	46	46	71
323944	New	60	55	80	44	44	69
323945	New	60	55	80	45	45	70
323946	New	60	55	80	47	47	72
323947	New	60	55	80	34	34	60
324270	New	60	55	80	66	64	91
324277	New	60	55	80	50	50	74
324282	New	60	55	80	49	49	75

Receptor ID	Railway infrastructure	Rail noise criteria		Lamax	Project rail noise levels dBA		
		LAeq Day	LAeq Night		LAeq,15hr	LAeq,9hr	LAmaz
324299	New	60	55	80	53	52	76
324300	New	60	55	80	42	42	66
324333	New	60	55	80	57	57	84
324344	New	60	55	80	44	44	70
324347	New	60	55	80	49	49	79



BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 1 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr 60dBA New rail corridor

— Daytime noise criteria LA max 80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 2 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

— Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 3 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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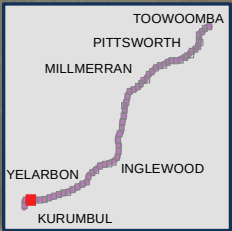
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.



ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 4 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

— Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 5 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

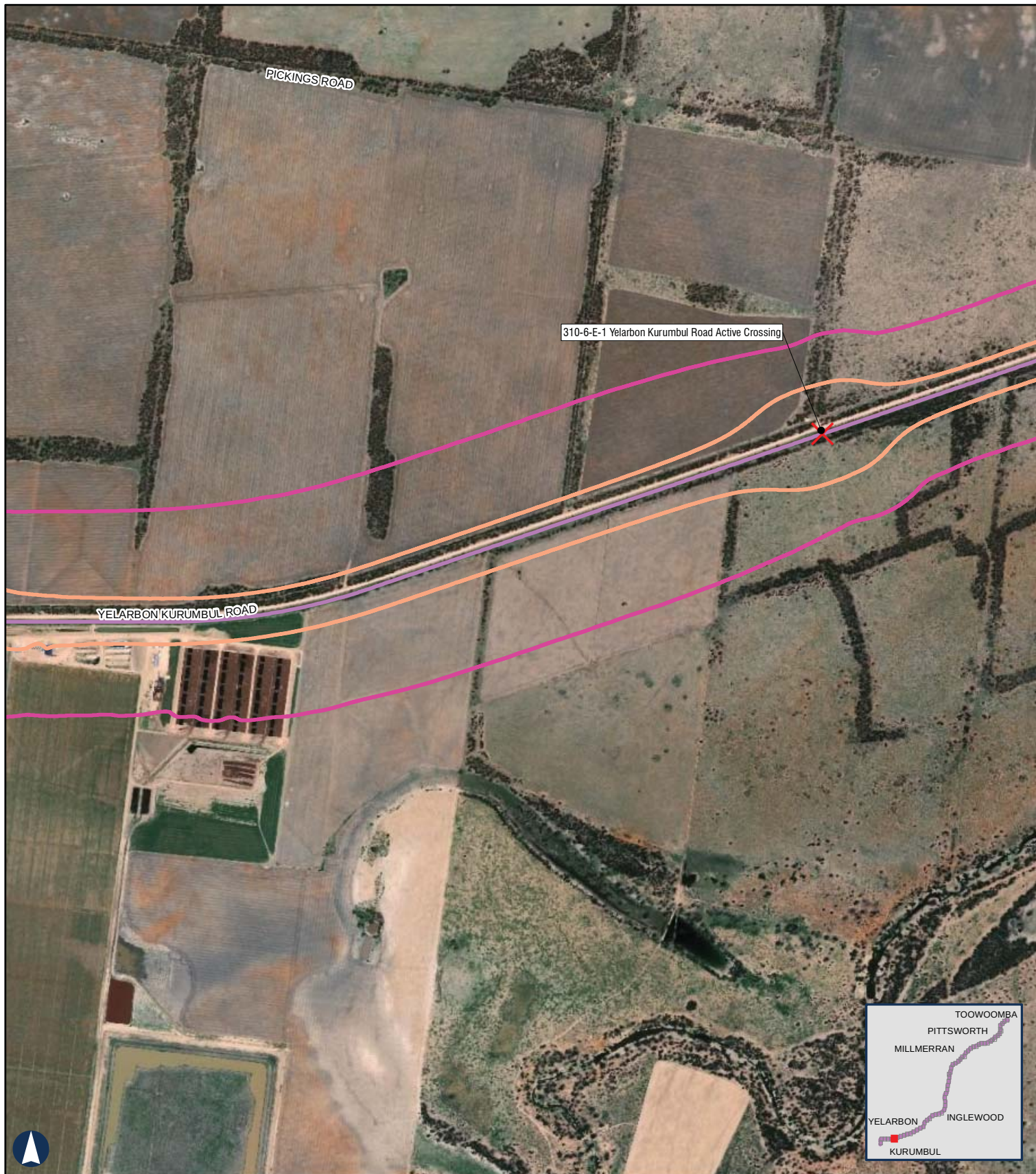
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 6 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

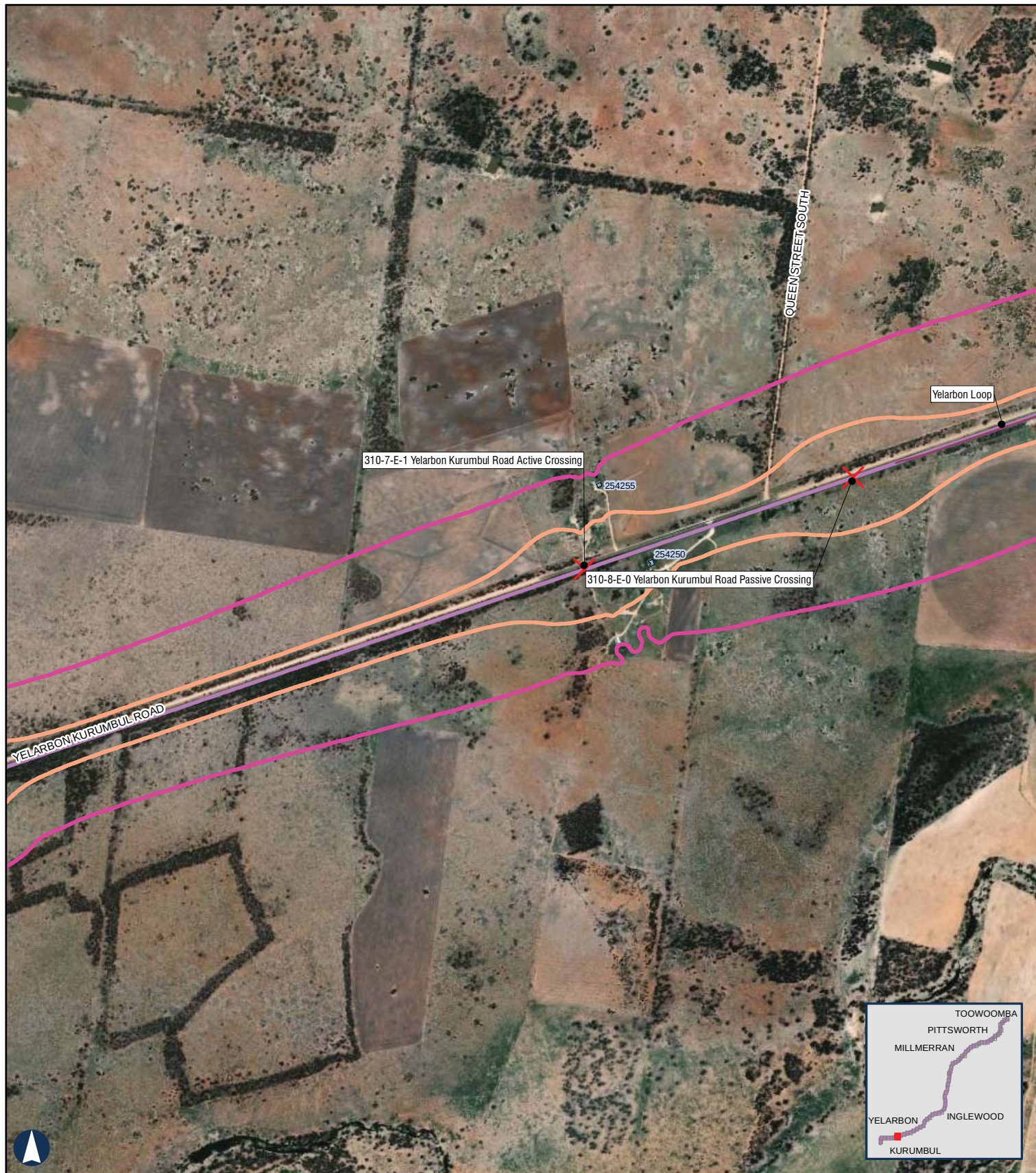
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 7 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor
- Receptors

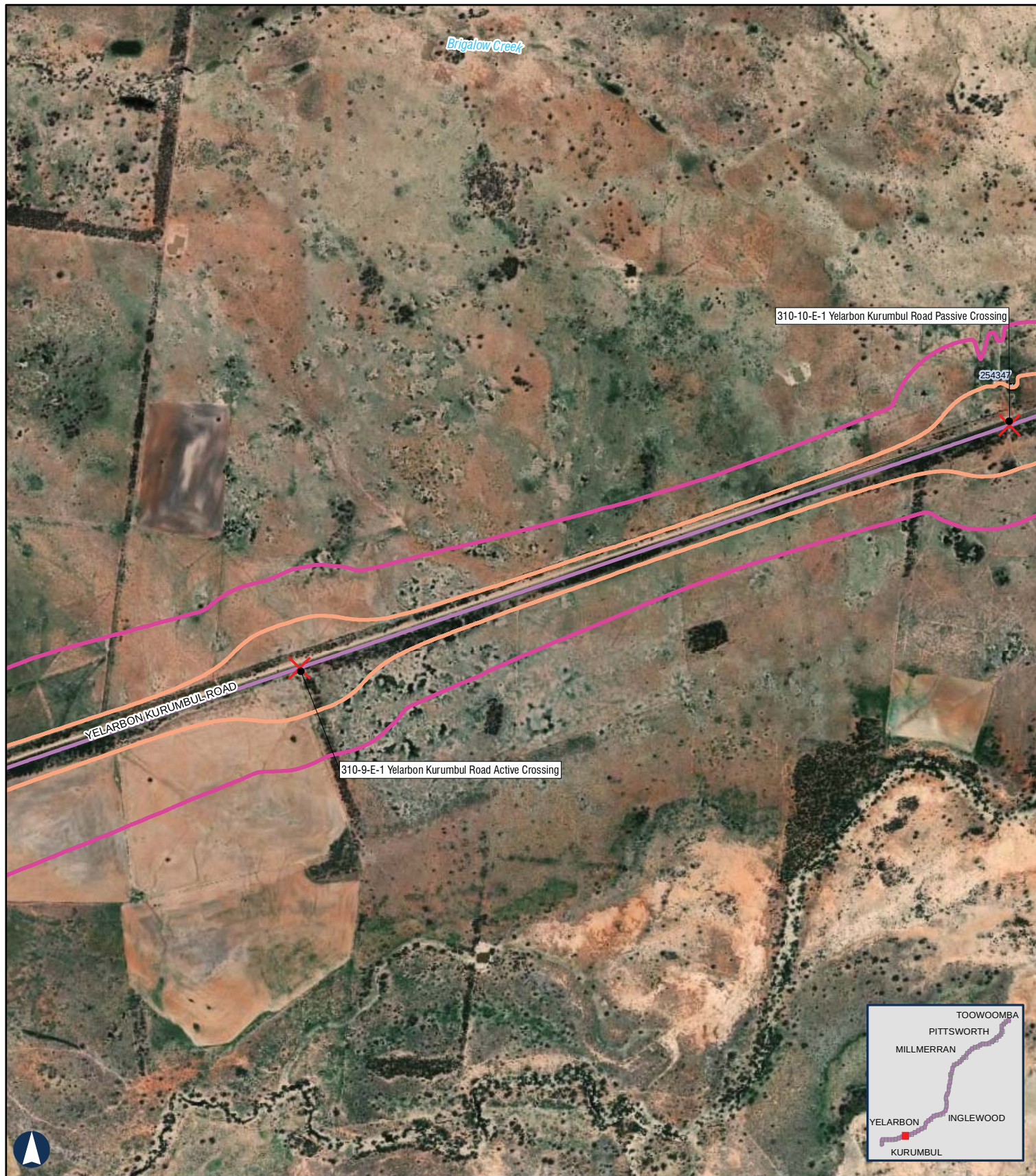
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 9 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

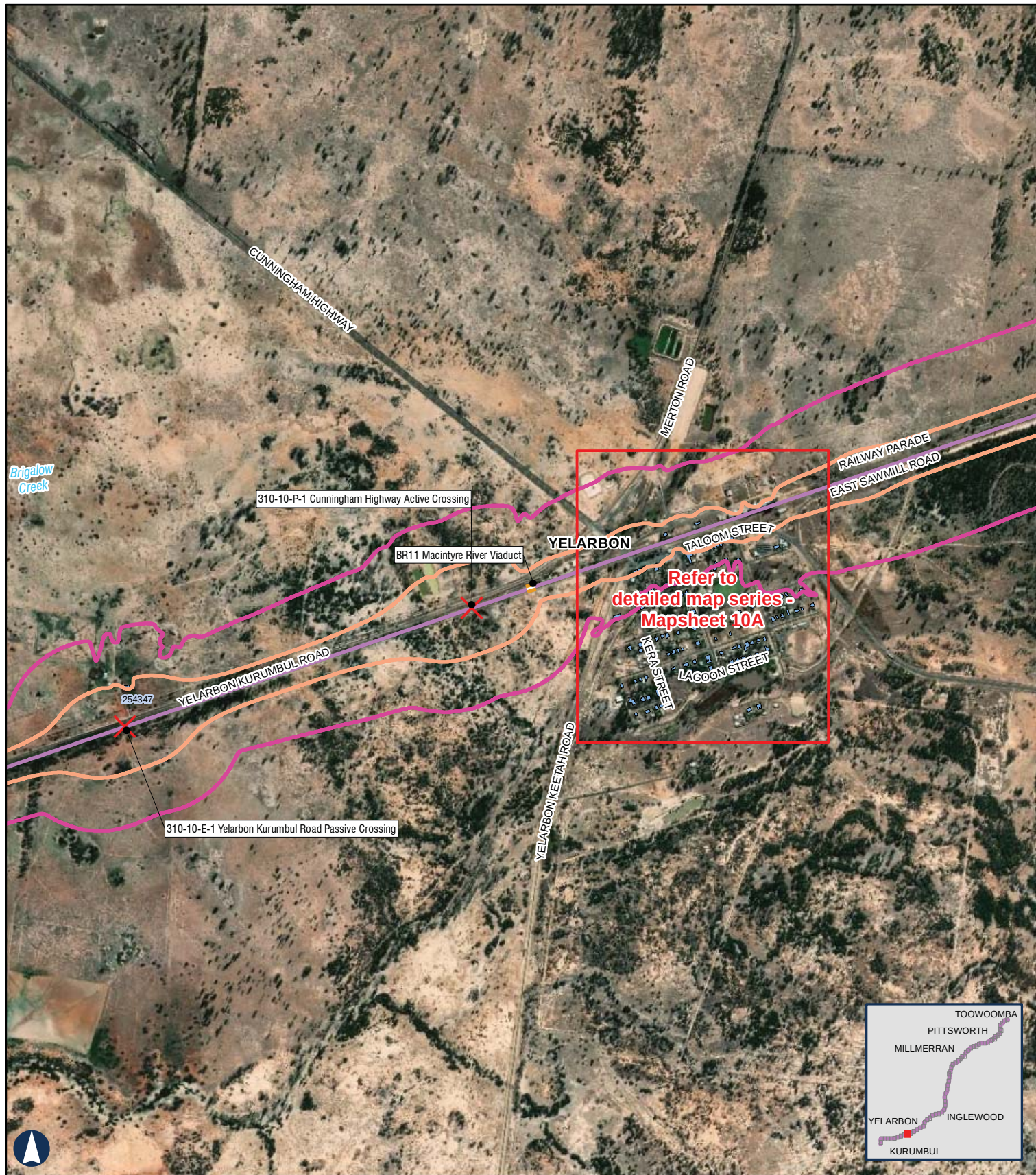
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 10 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

Daytime noise criteria LAeq15hr
60dBA New rail corridor

Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels - Detailed

APPENDIX E - Mapsheet 10A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:5,500

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

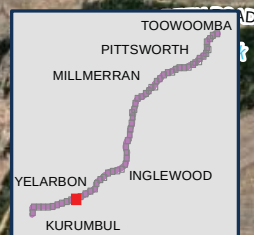
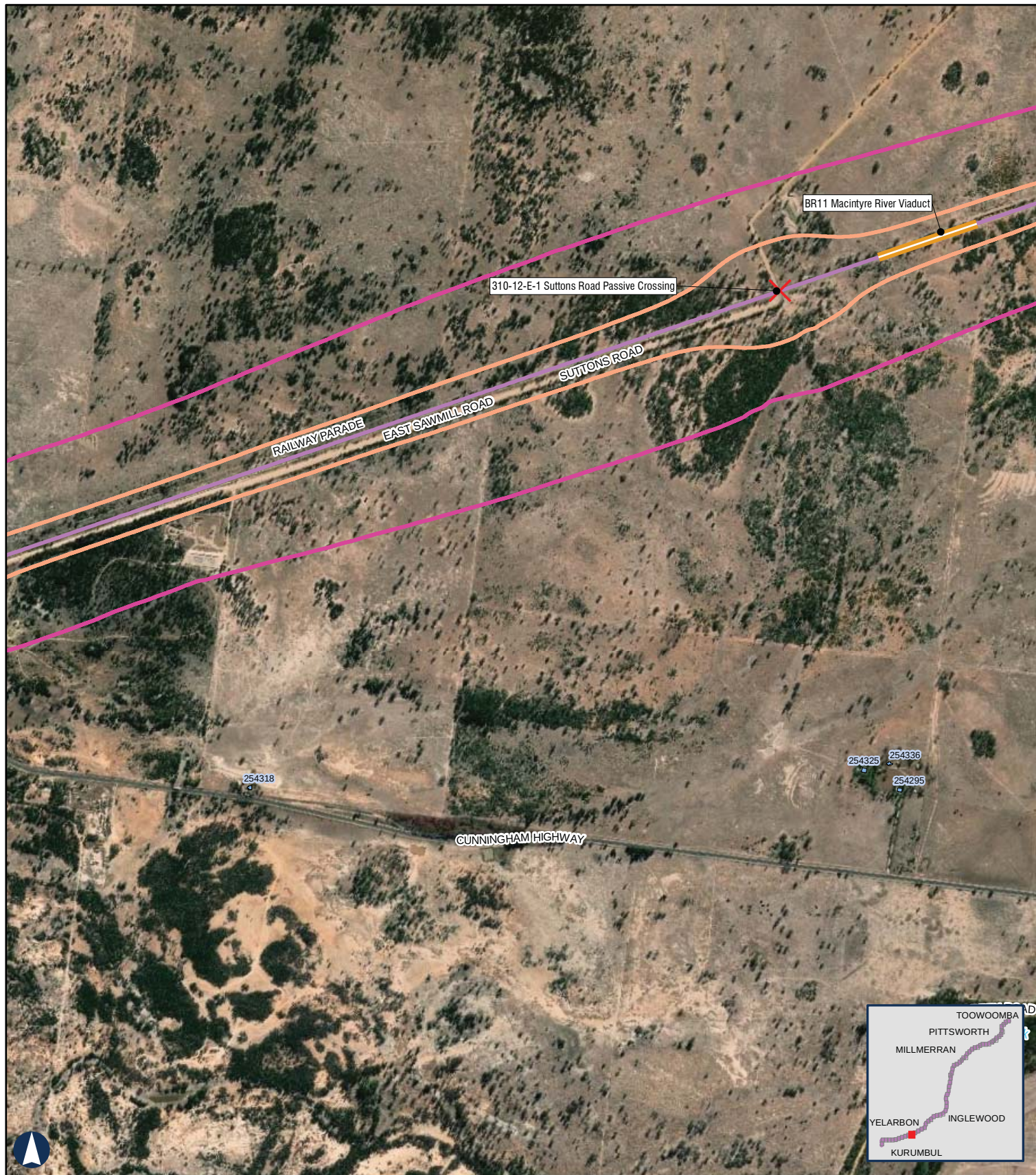
Noise contours are based on a set distance above the local terrain level of 2.4m.

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor



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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 11 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

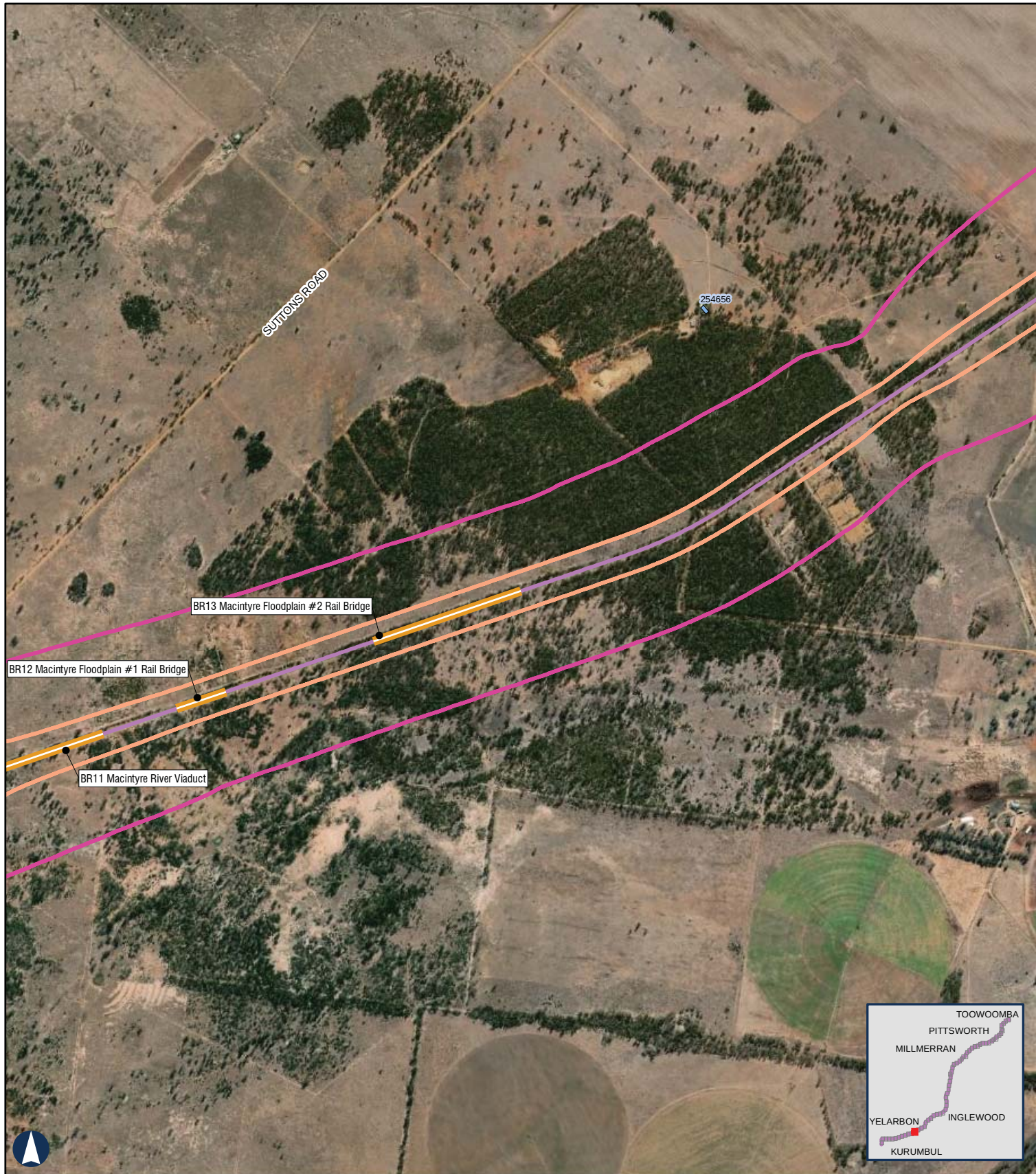
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 12 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 13 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dB New rail corridor

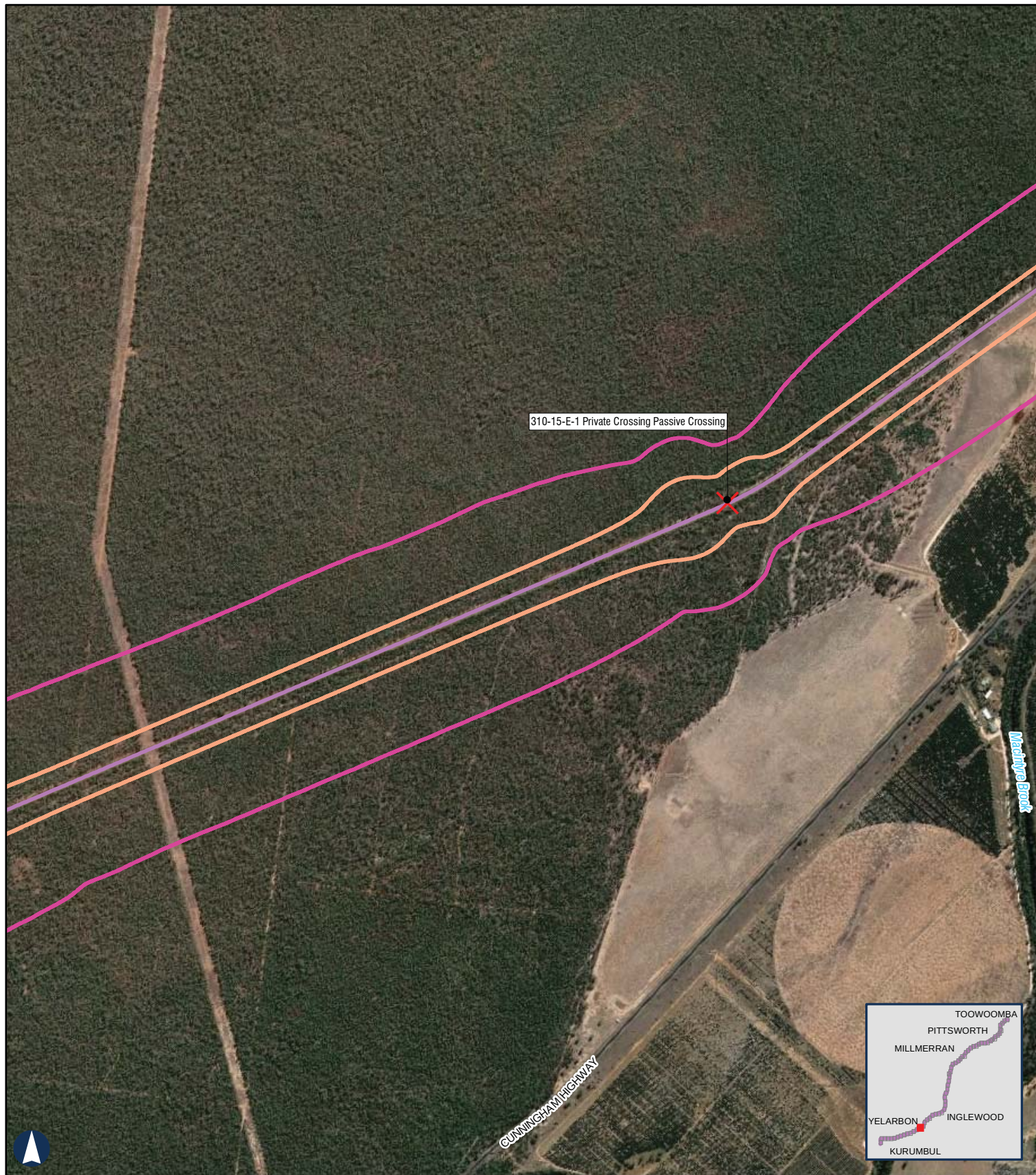
— Daytime noise criteria LA max
80dB New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 14 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

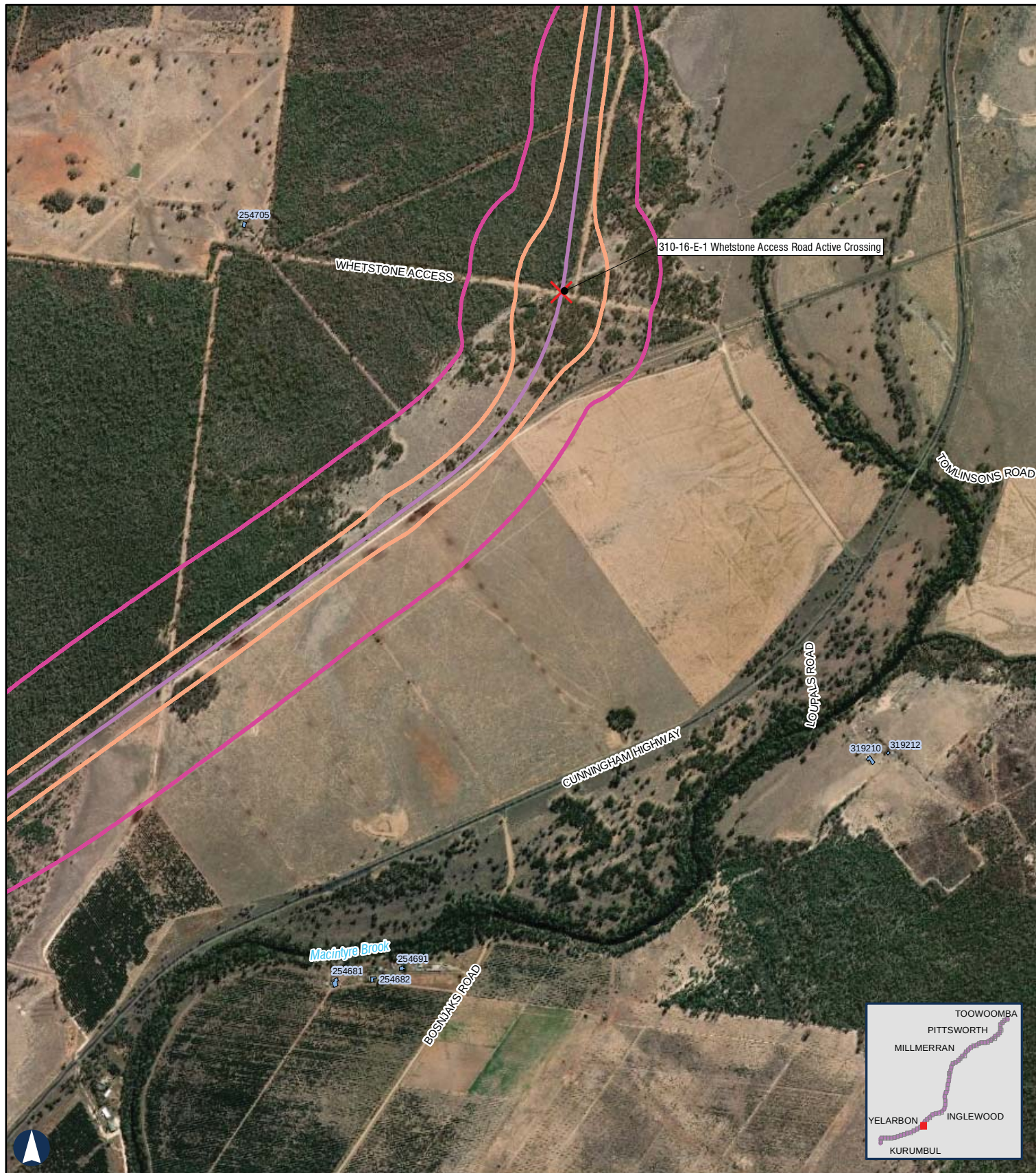
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 15 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

— Daytime noise criteria LA max
80dBA New rail corridor

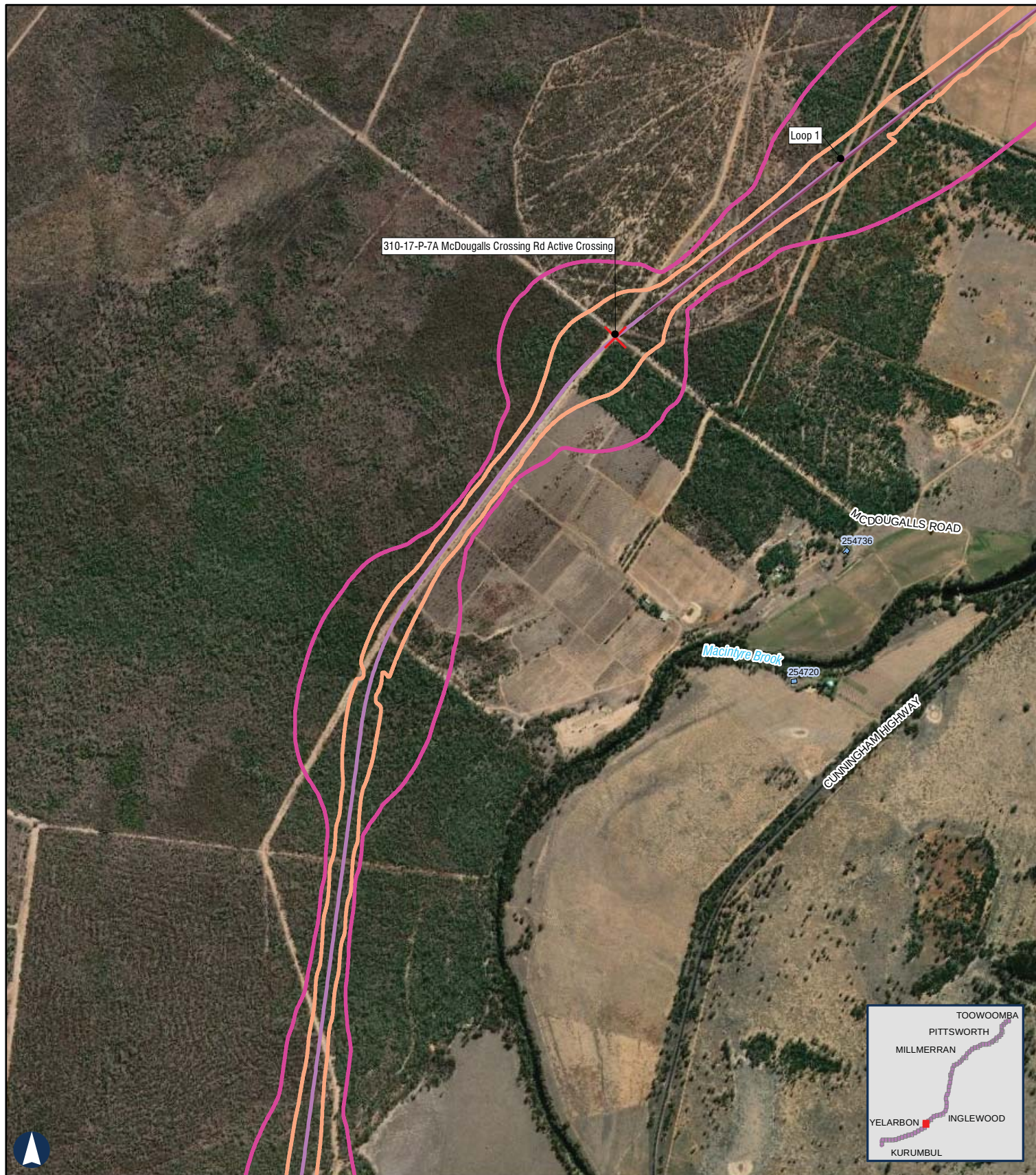
■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.



ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 16 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

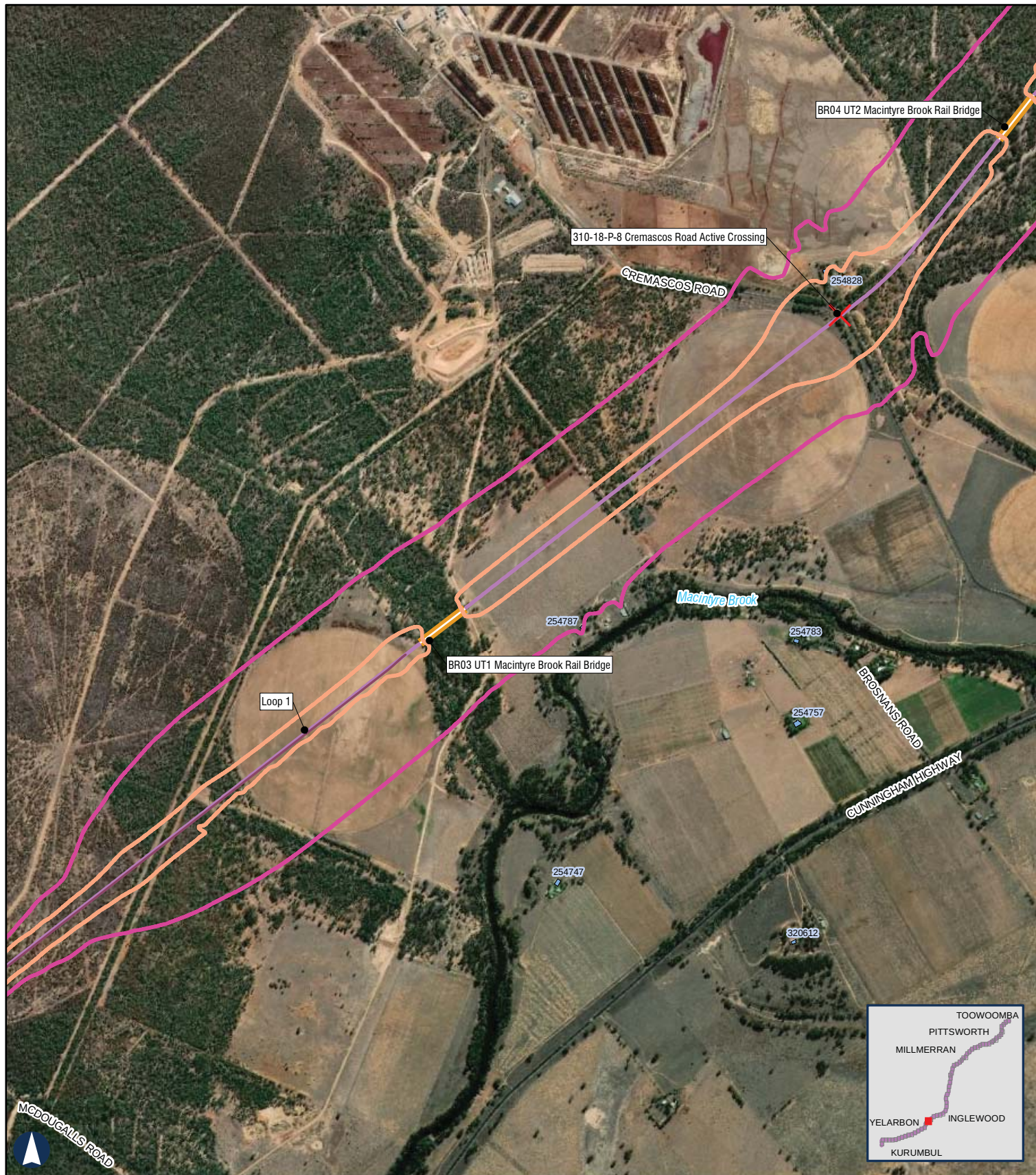
— Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 17 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

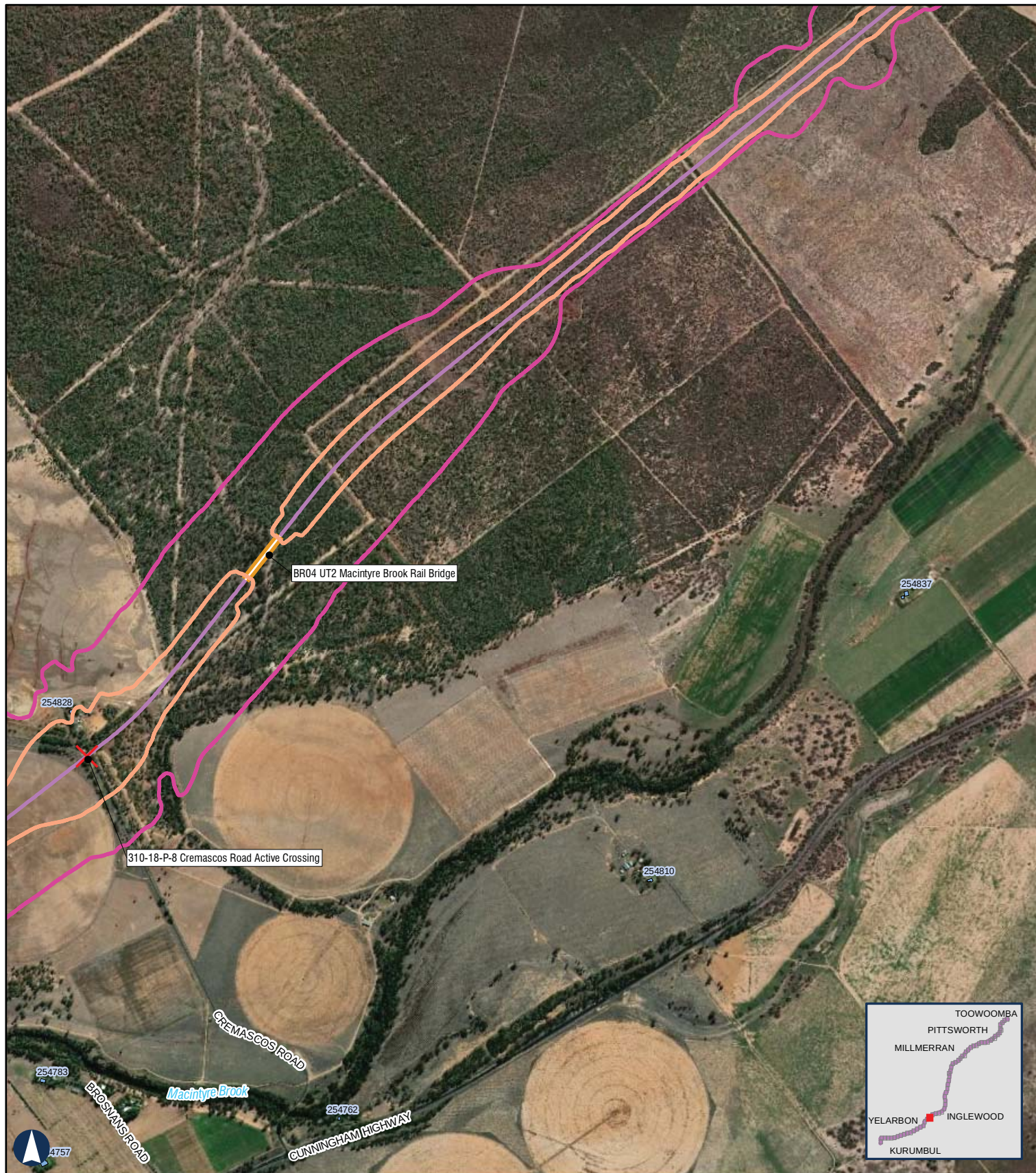
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 18 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

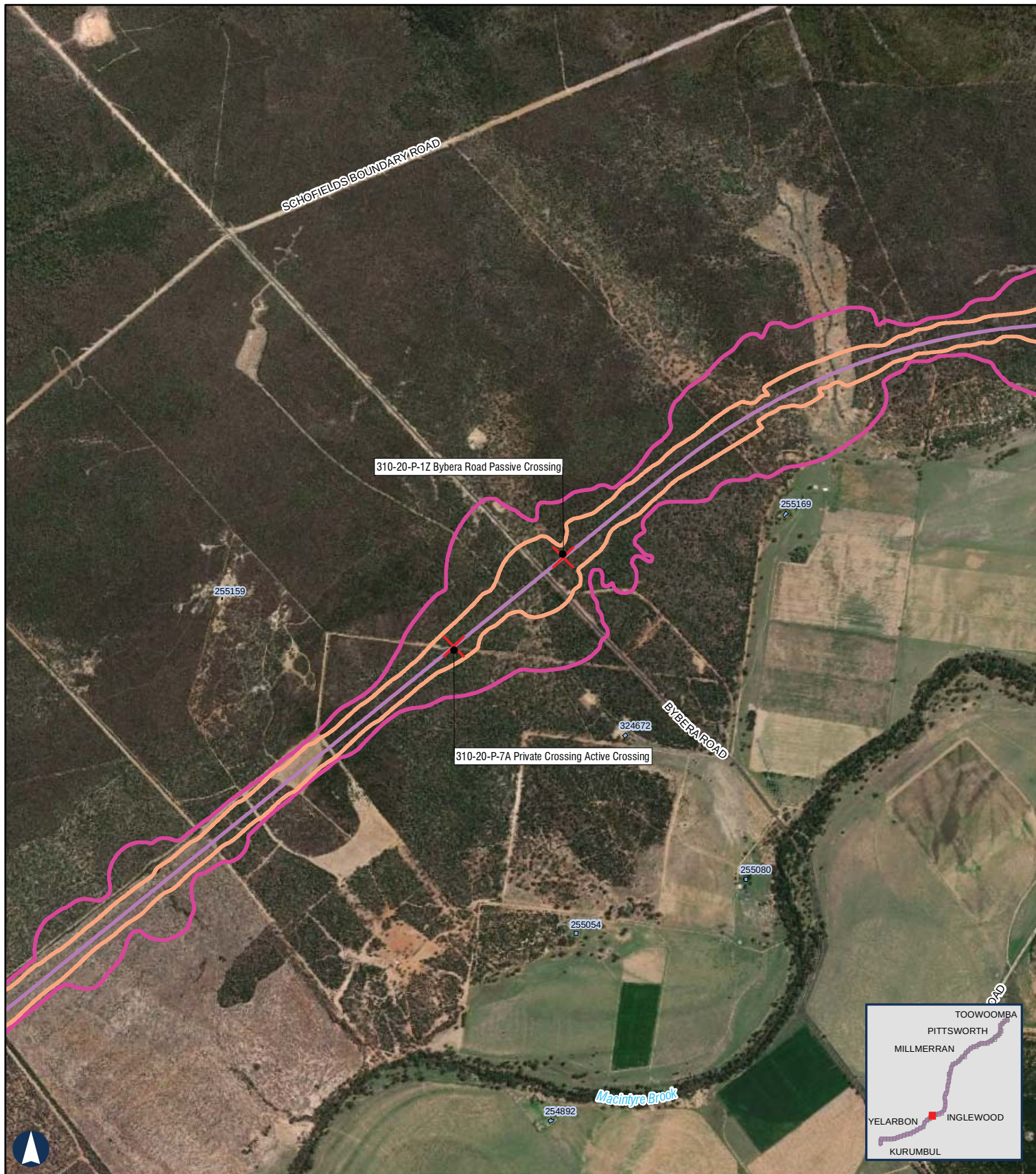
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 19 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dB New rail corridor

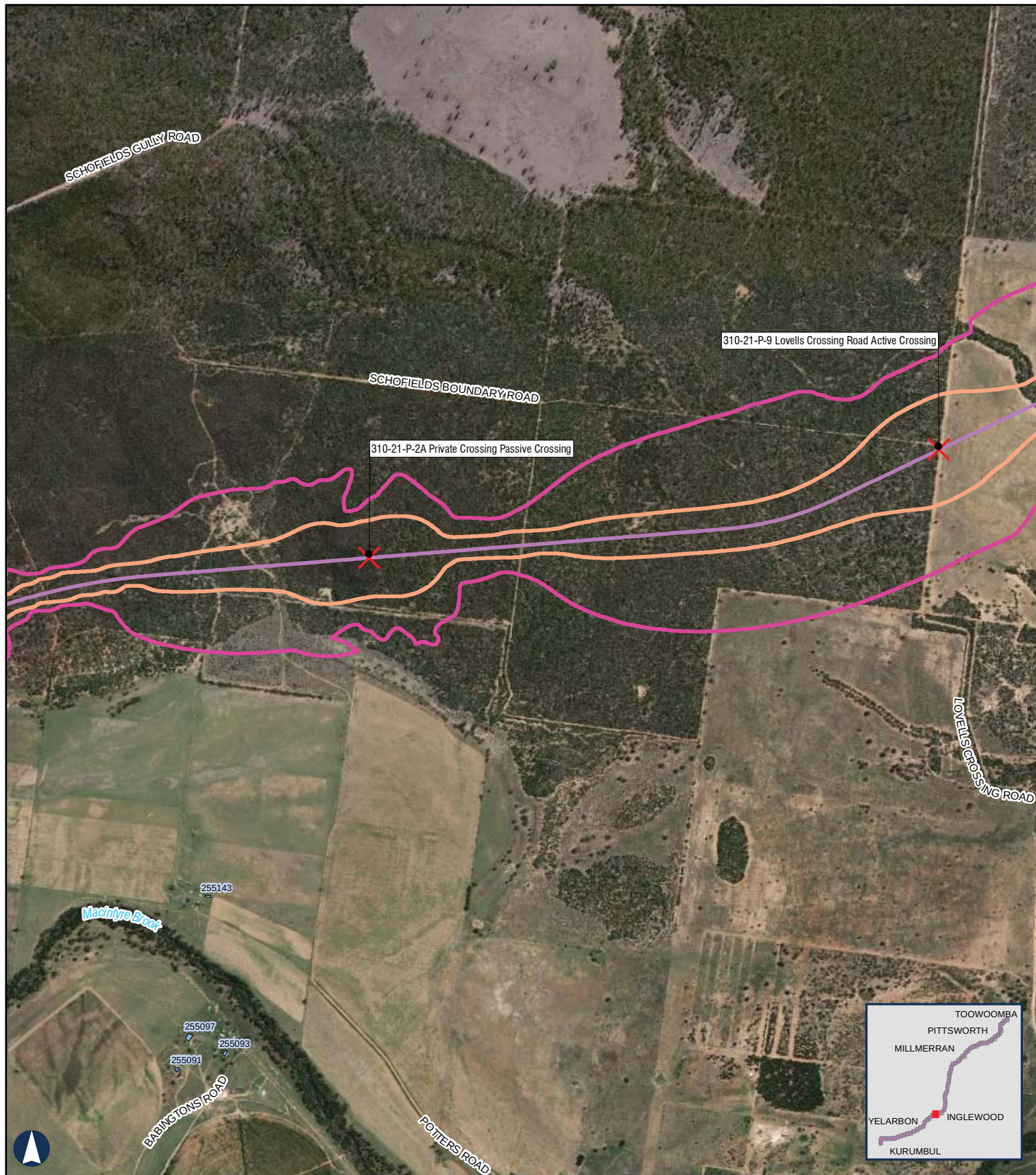
— Daytime noise criteria LA max
80dB New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 20 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

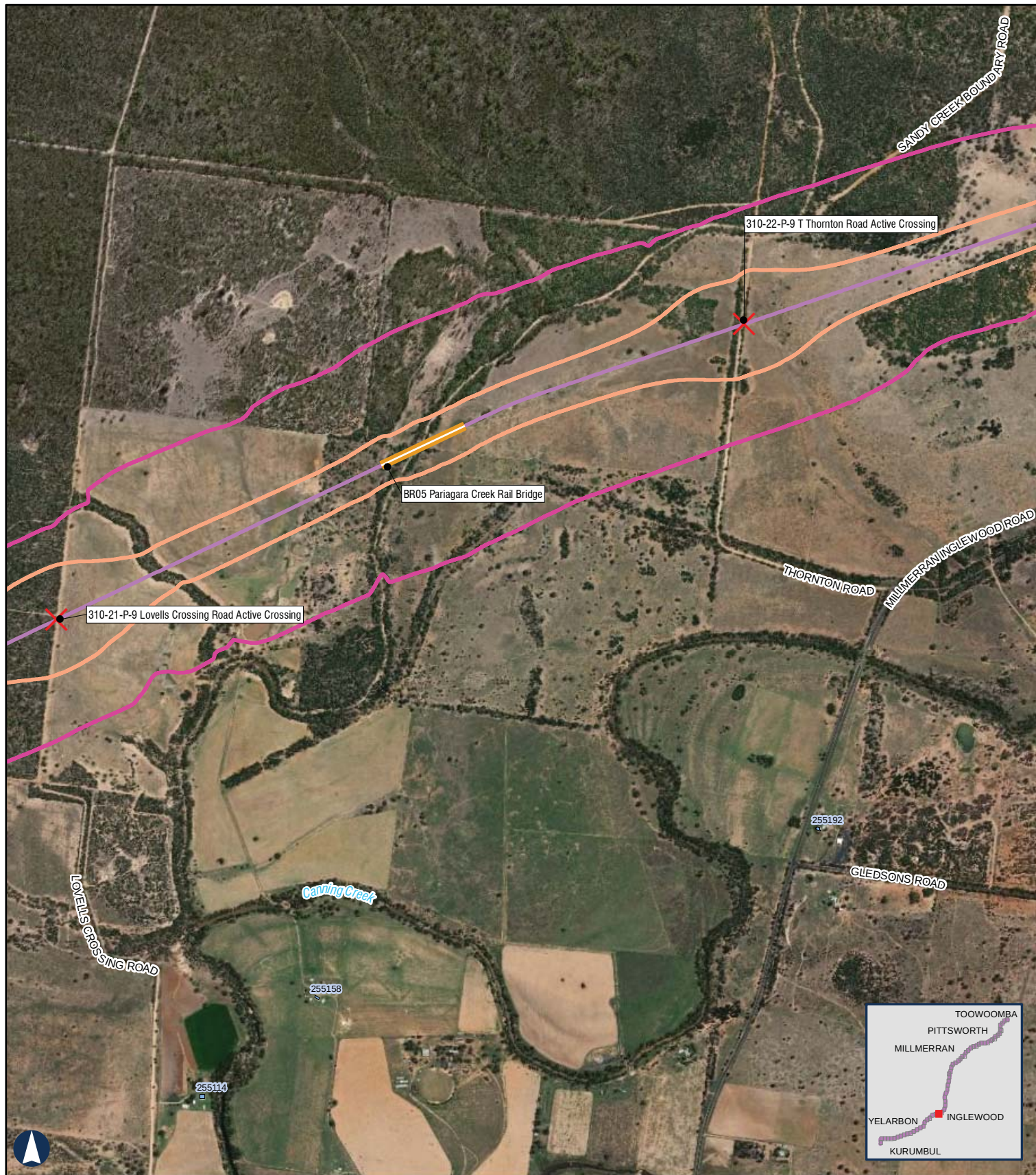
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 21 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

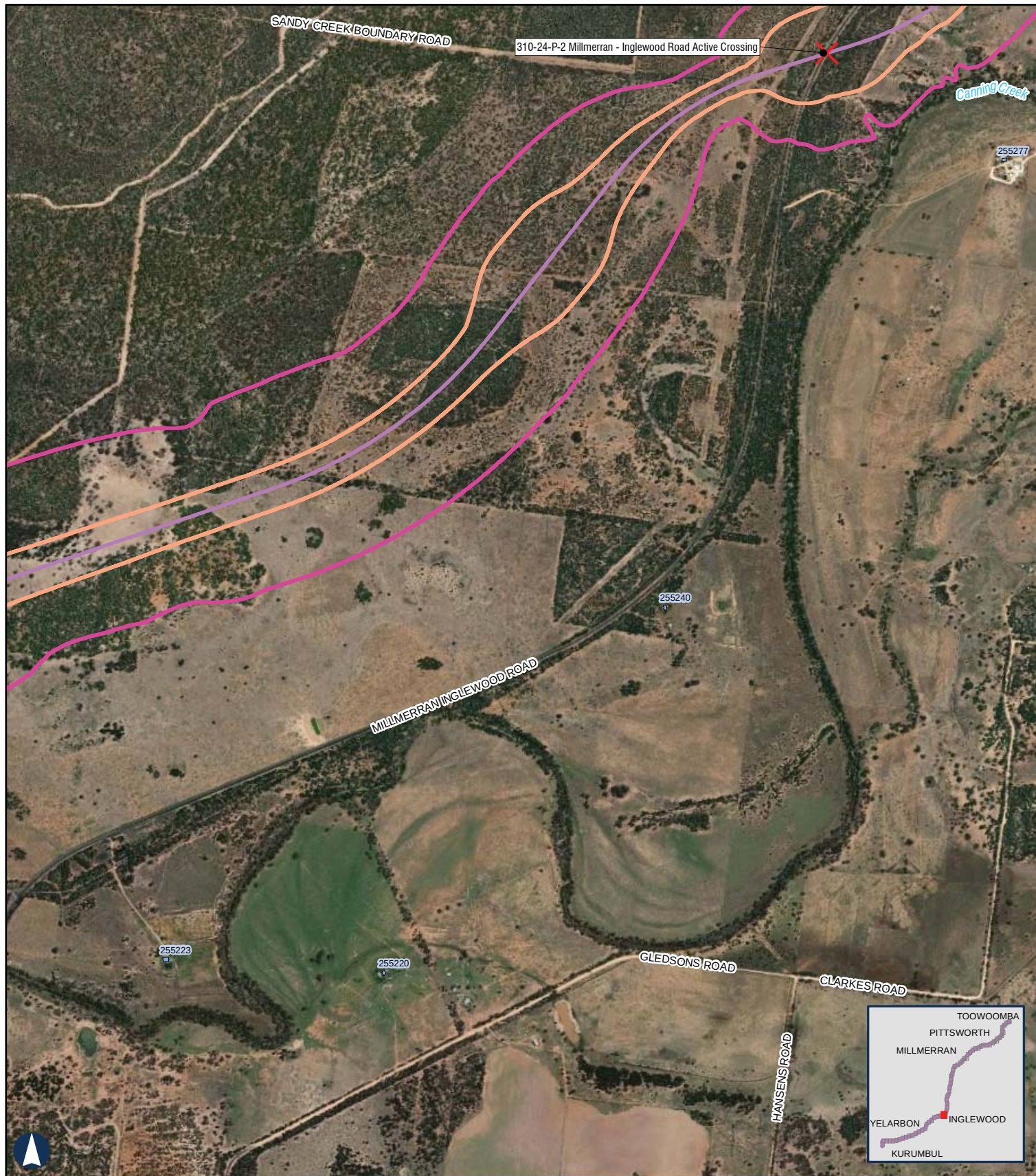
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 22 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

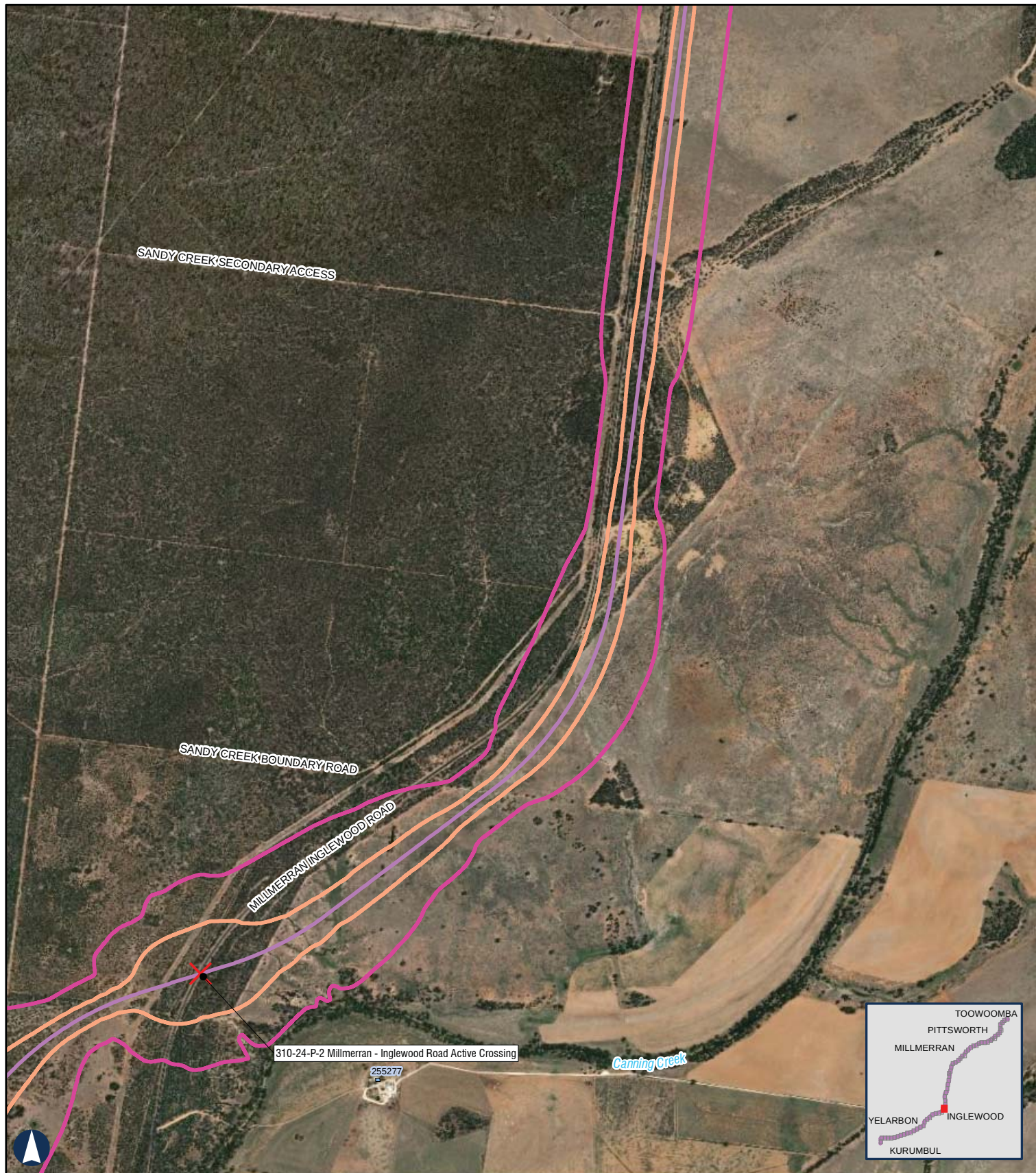
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 23 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

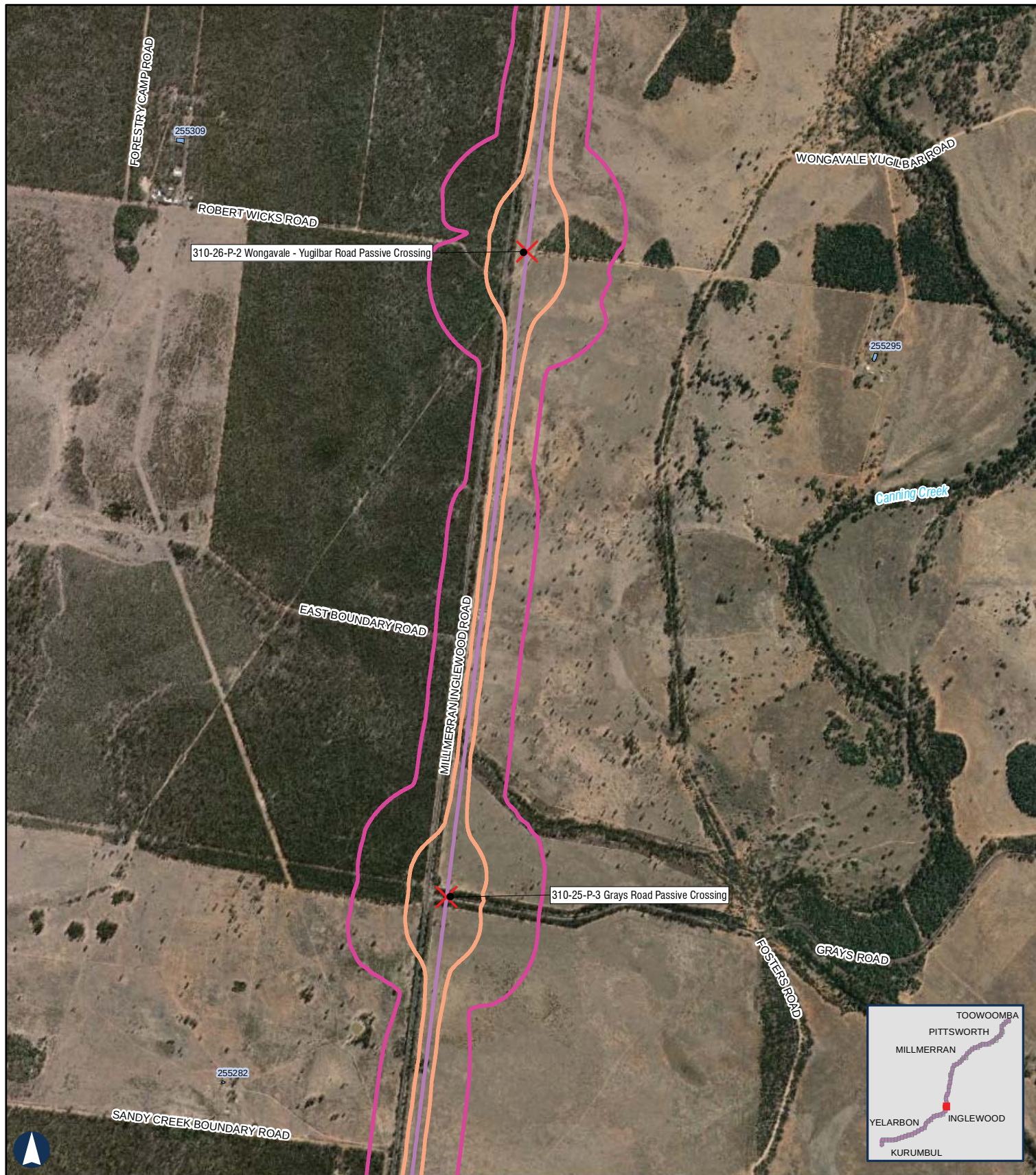
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 24 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

Daytime noise criteria LAeq15hr
60dBA New rail corridor

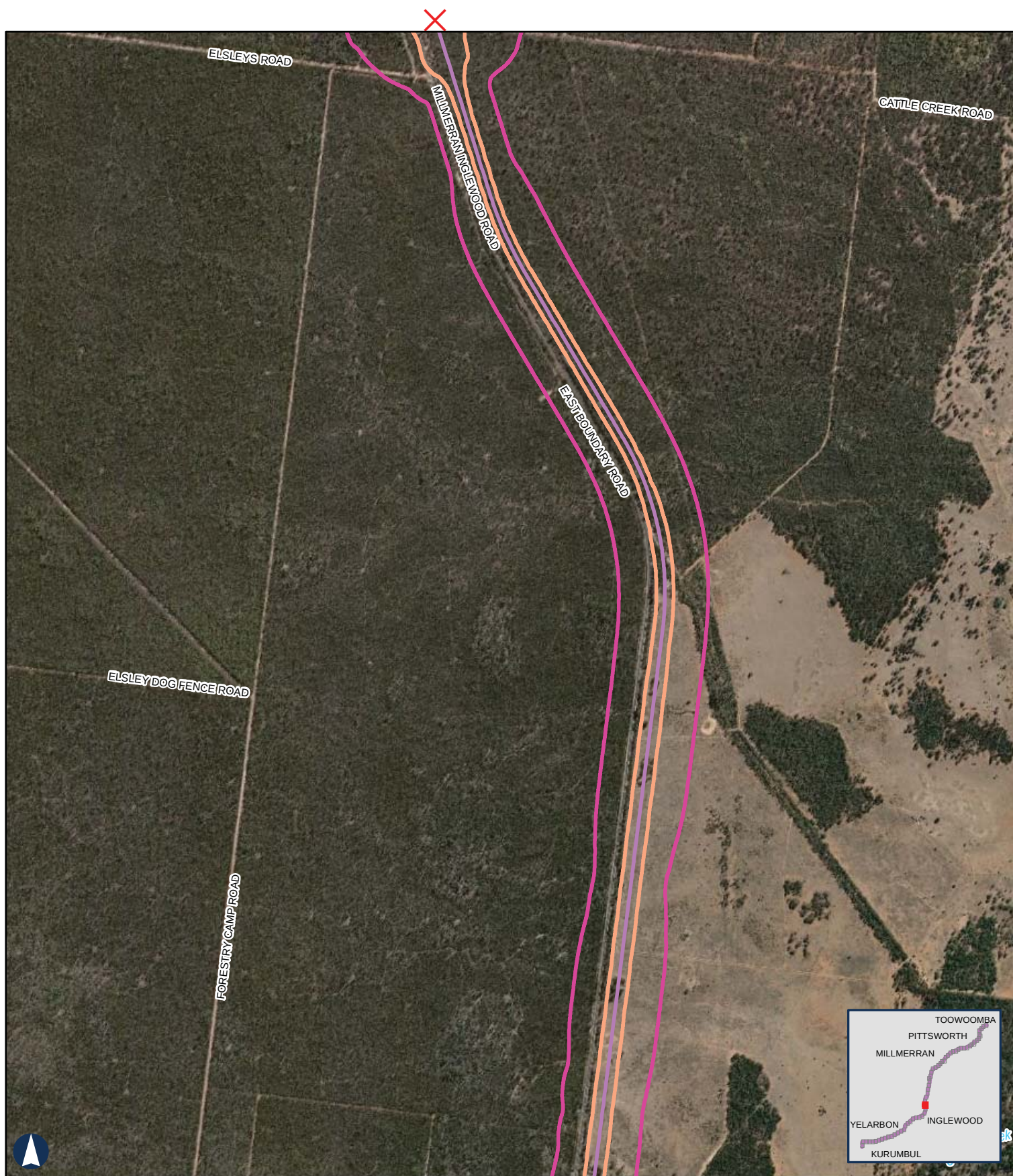
Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 25 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr 60dBA New rail corridor

— Daytime noise criteria LA max 80dBA New rail corridor

■ Receptors

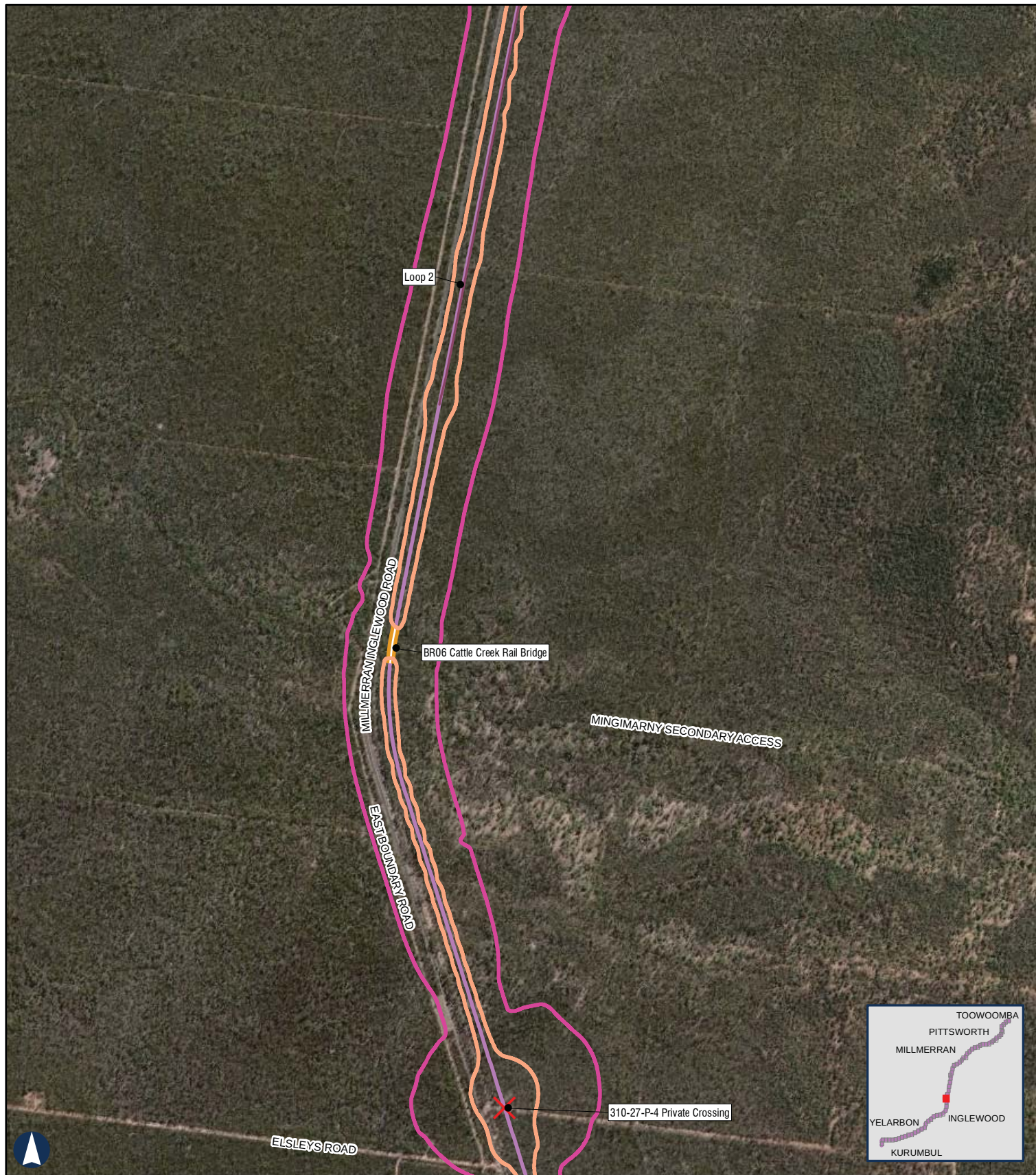
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 26 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

Daytime noise criteria LAeq15hr
60dBA New rail corridor

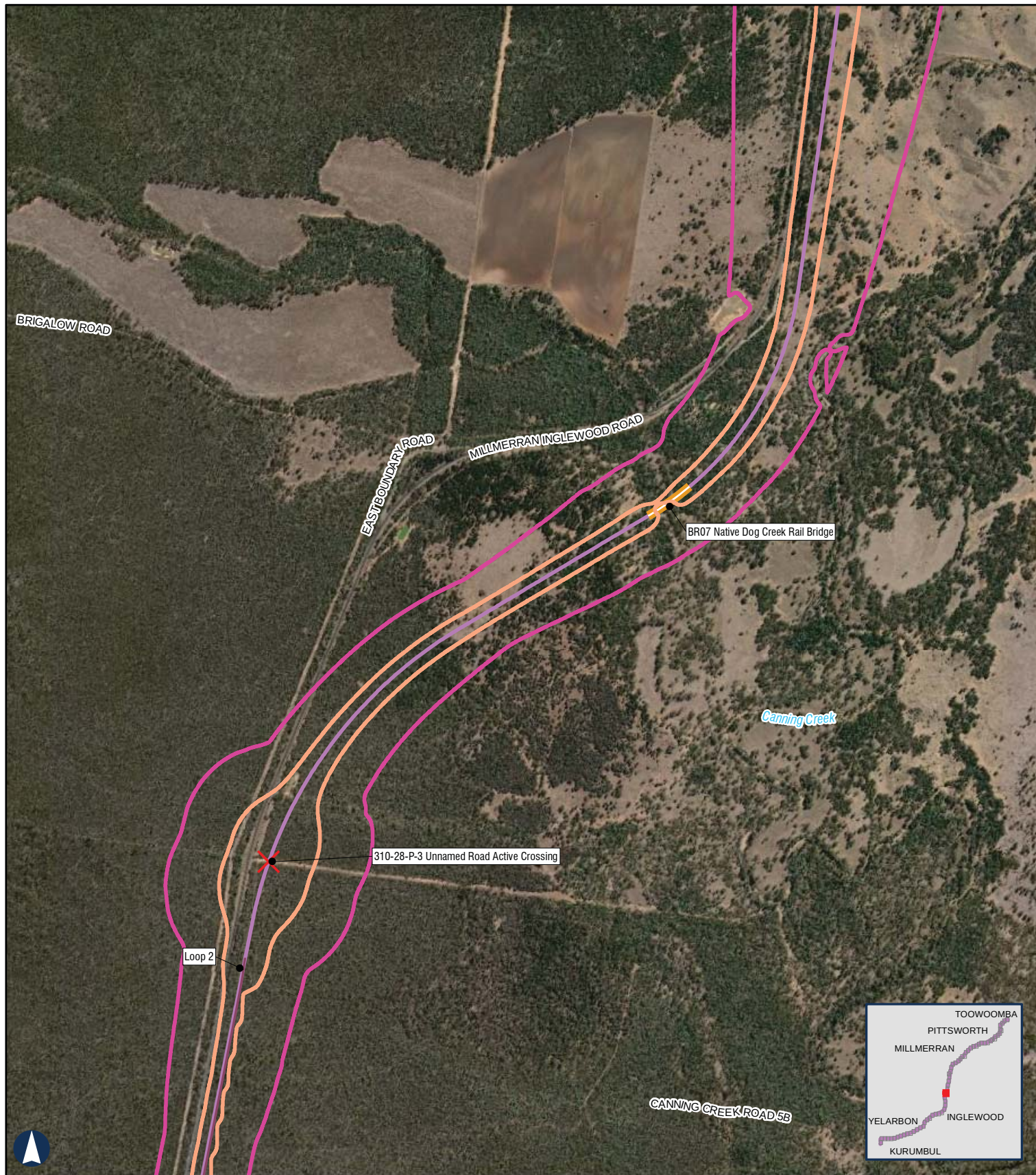
Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 27 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

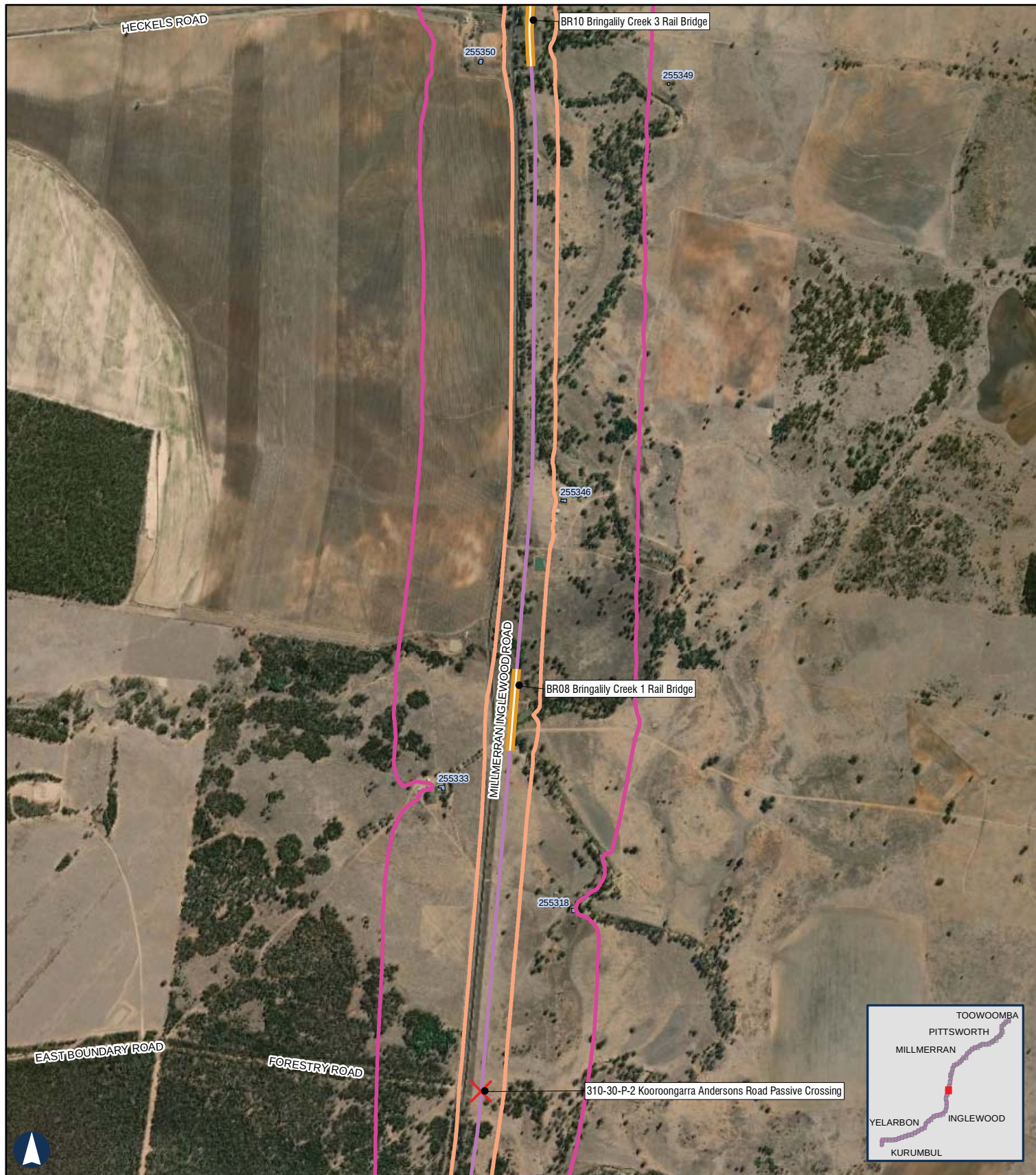
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 28 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

Daytime noise criteria LAeq15hr
60dBA New rail corridor

Daytime noise criteria LA max
80dBA New rail corridor

Receptors

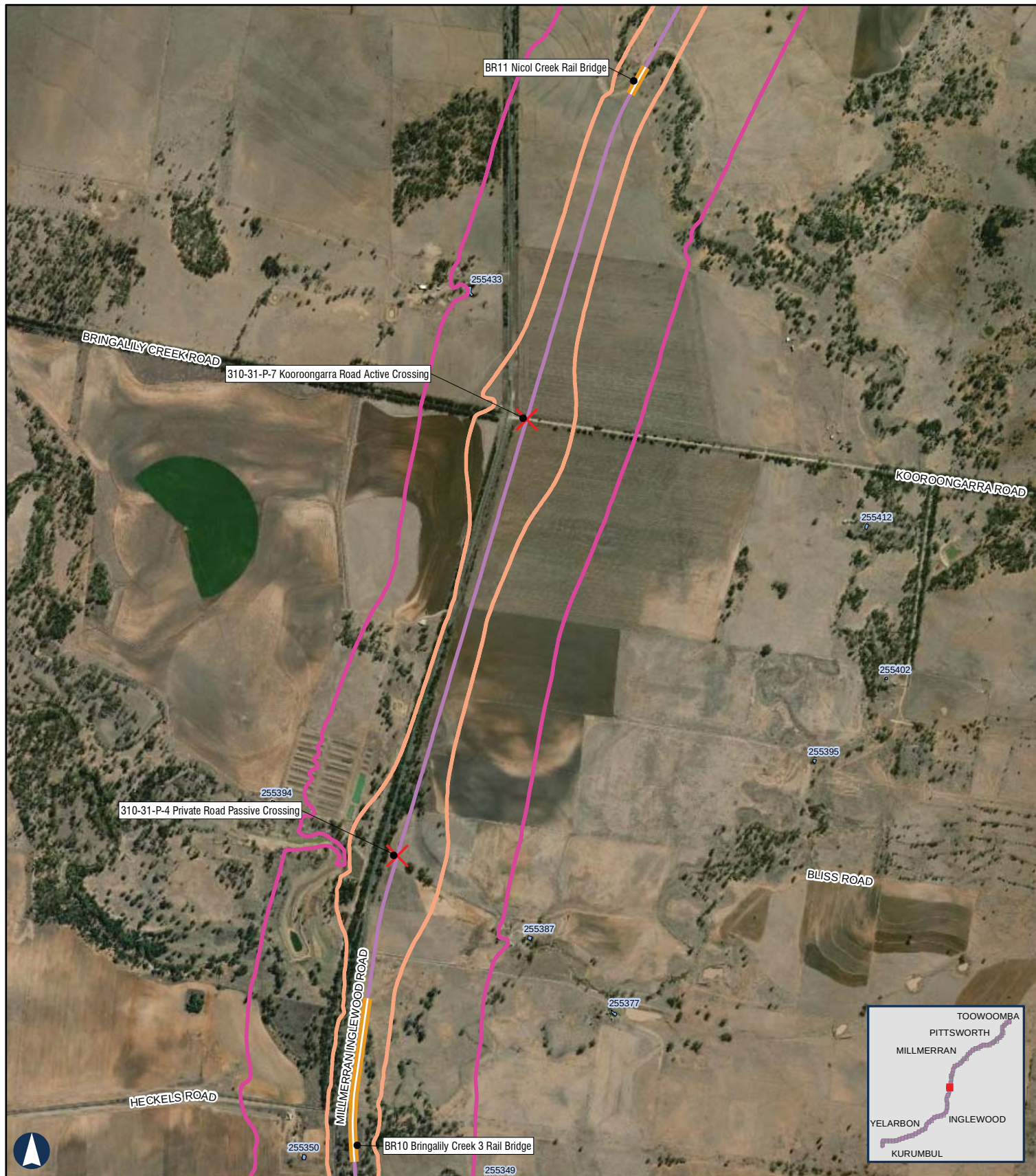
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Date: 08-May-2020
Author: JG

Scale: 1:20,000

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 29 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

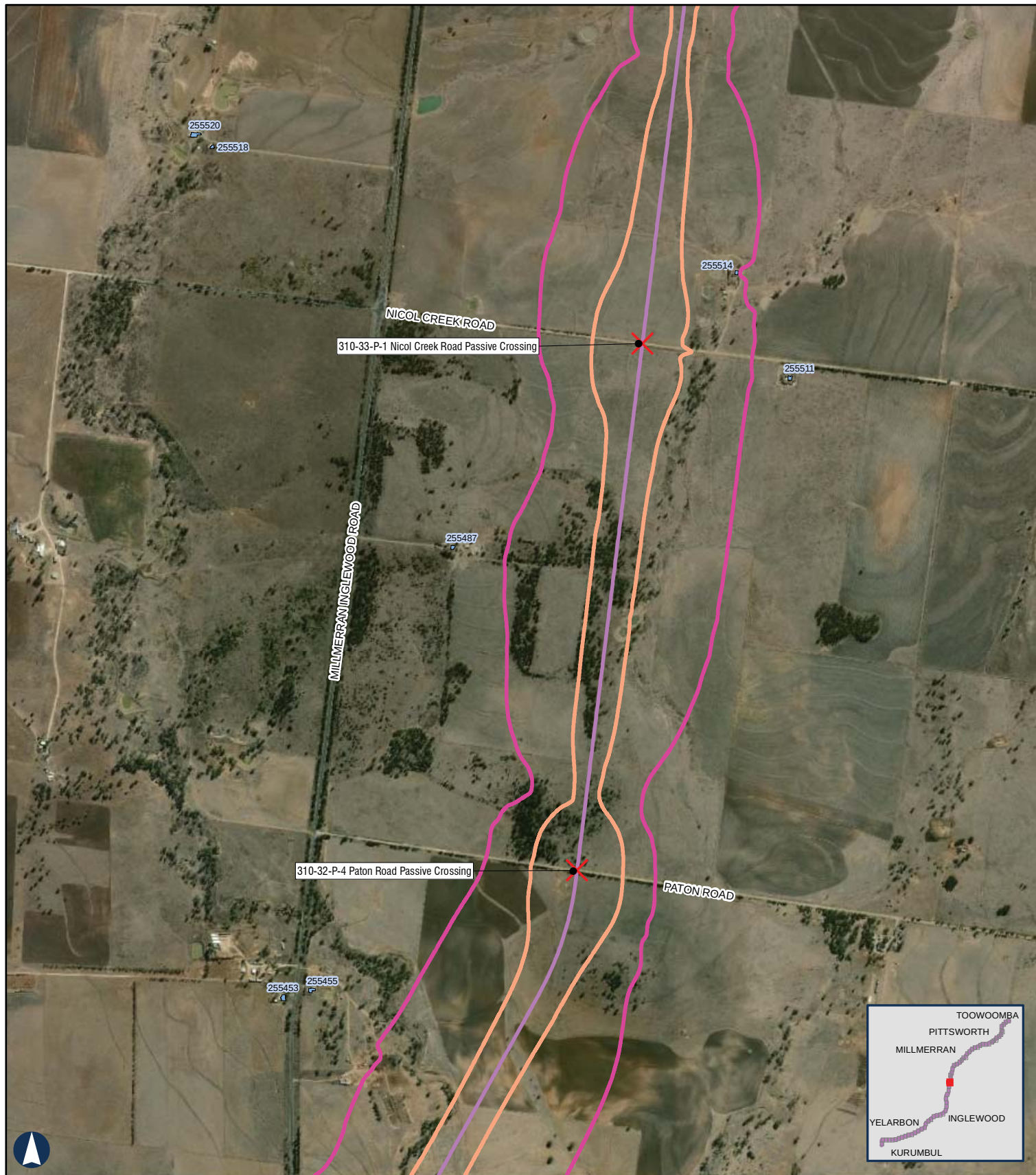
— Daytime noise criteria LA max
80dBA New rail corridor

● Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 30 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

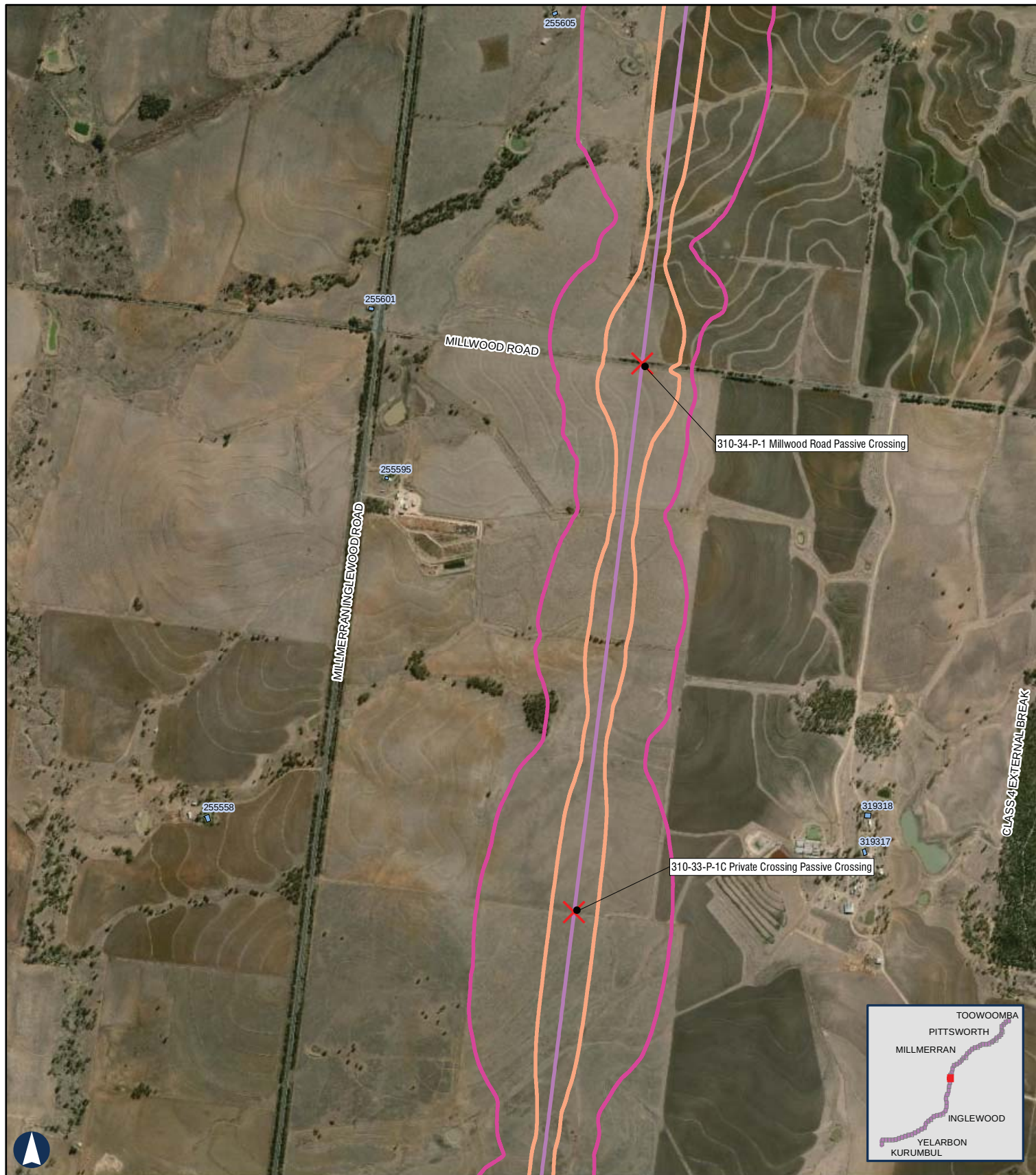
— Daytime noise criteria LA max
80dBA New rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 31 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

— Daytime noise criteria LA max
80dBA New rail corridor

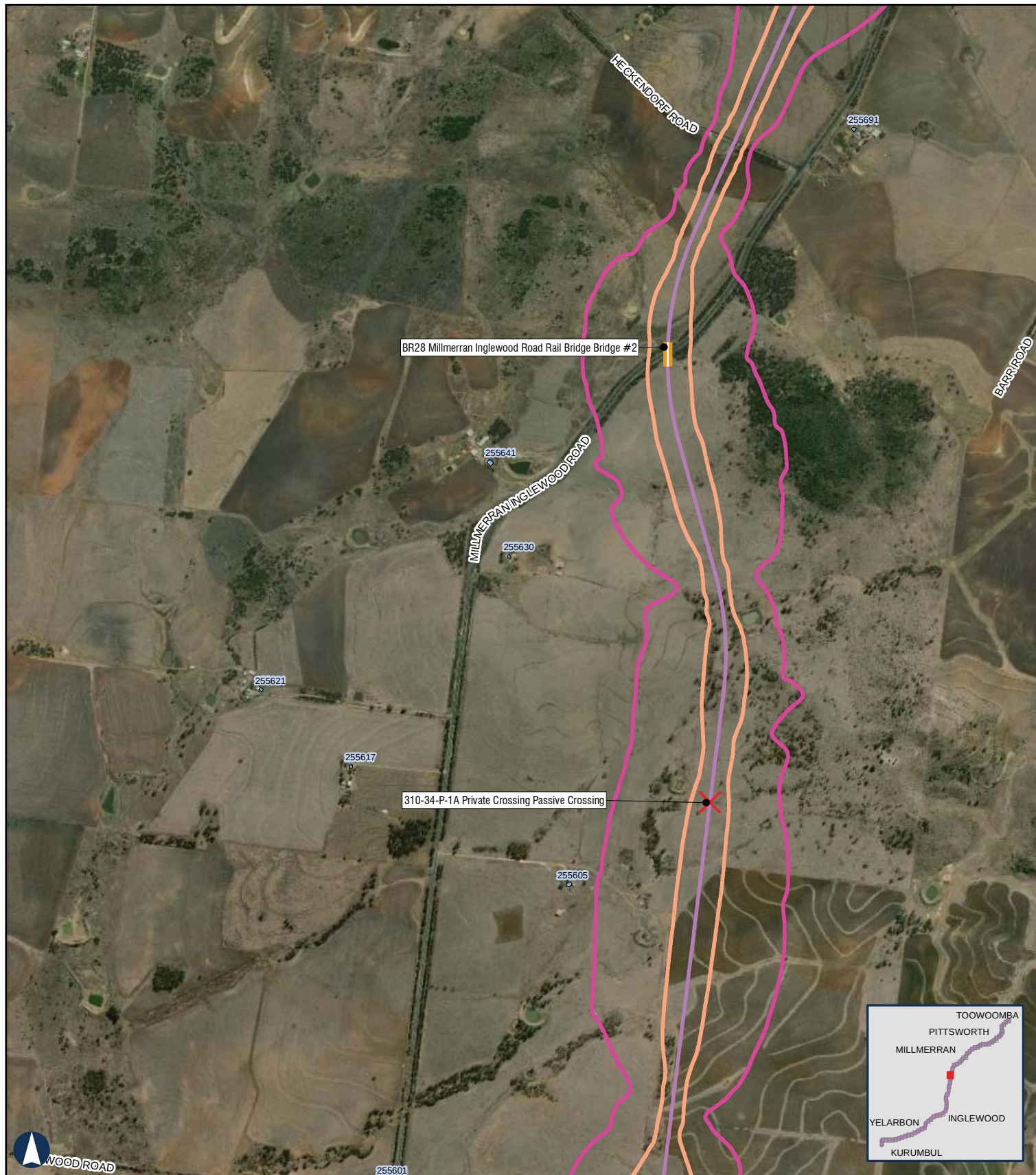
● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.



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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 32 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

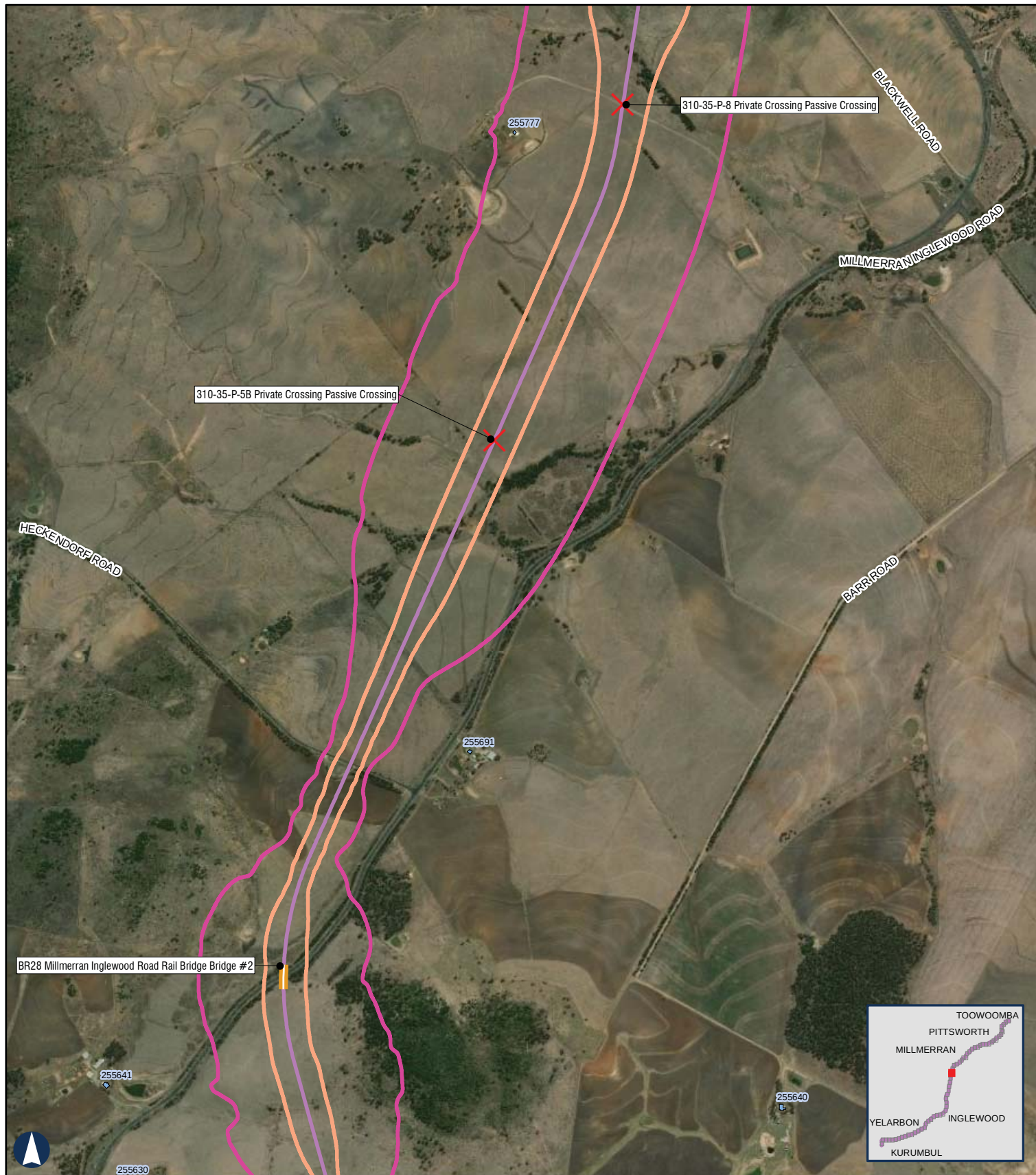
— Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 33 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- ▬ Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

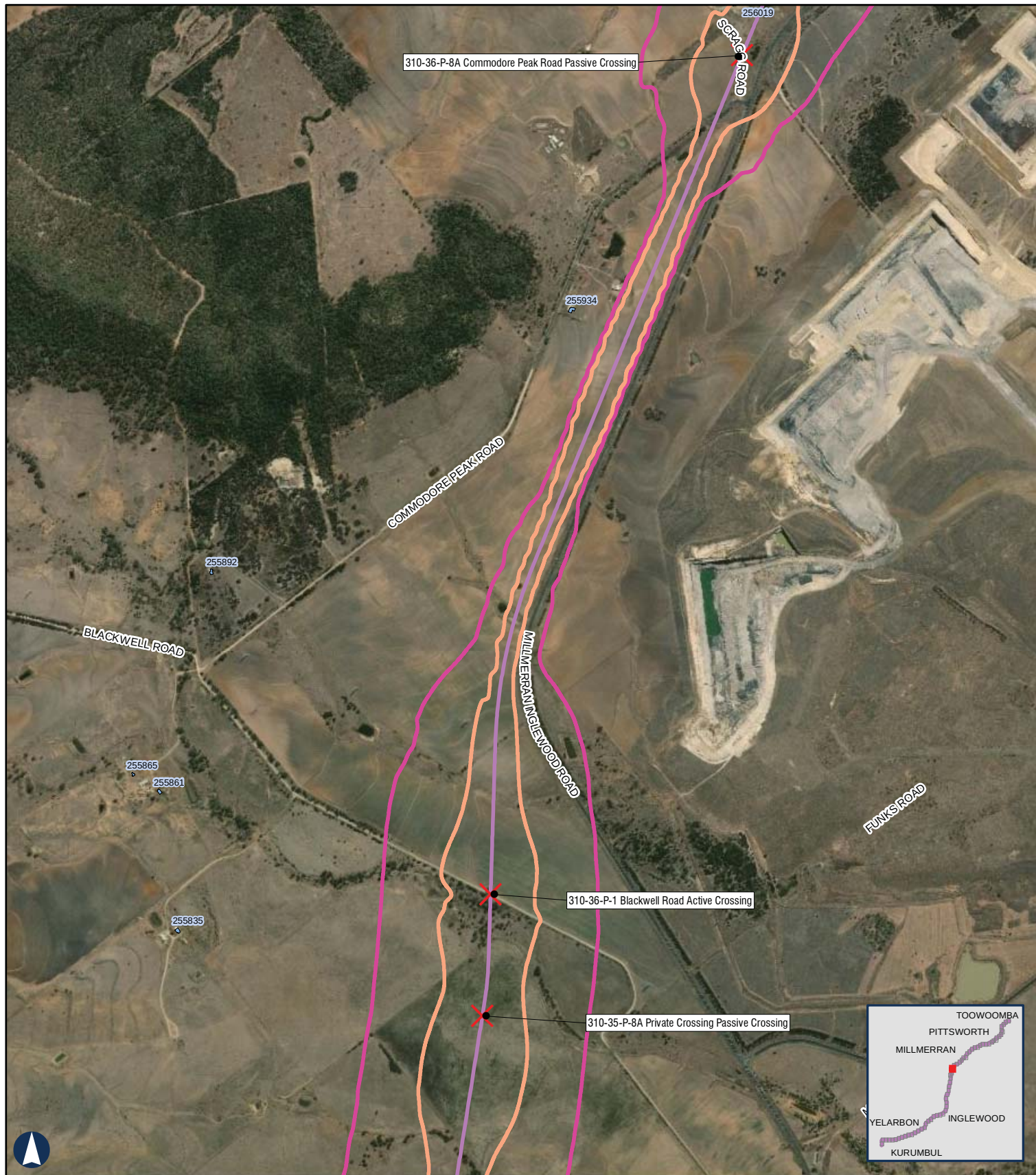
— Daytime noise criteria LA max
80dBA New rail corridor

● Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 34 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr 60dBA New rail corridor

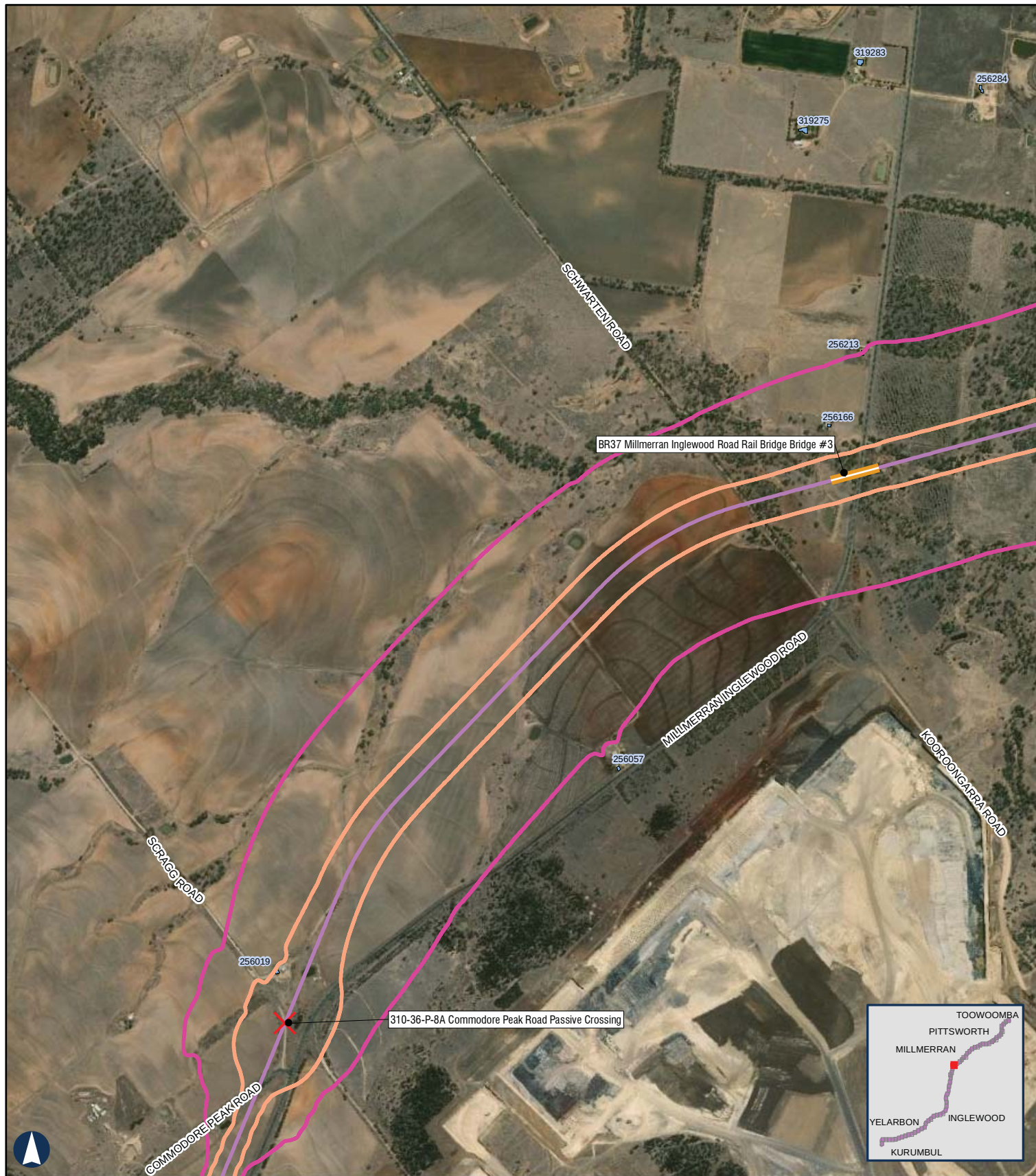
— Daytime noise criteria LA max 80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 35 of 61

500 m

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Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

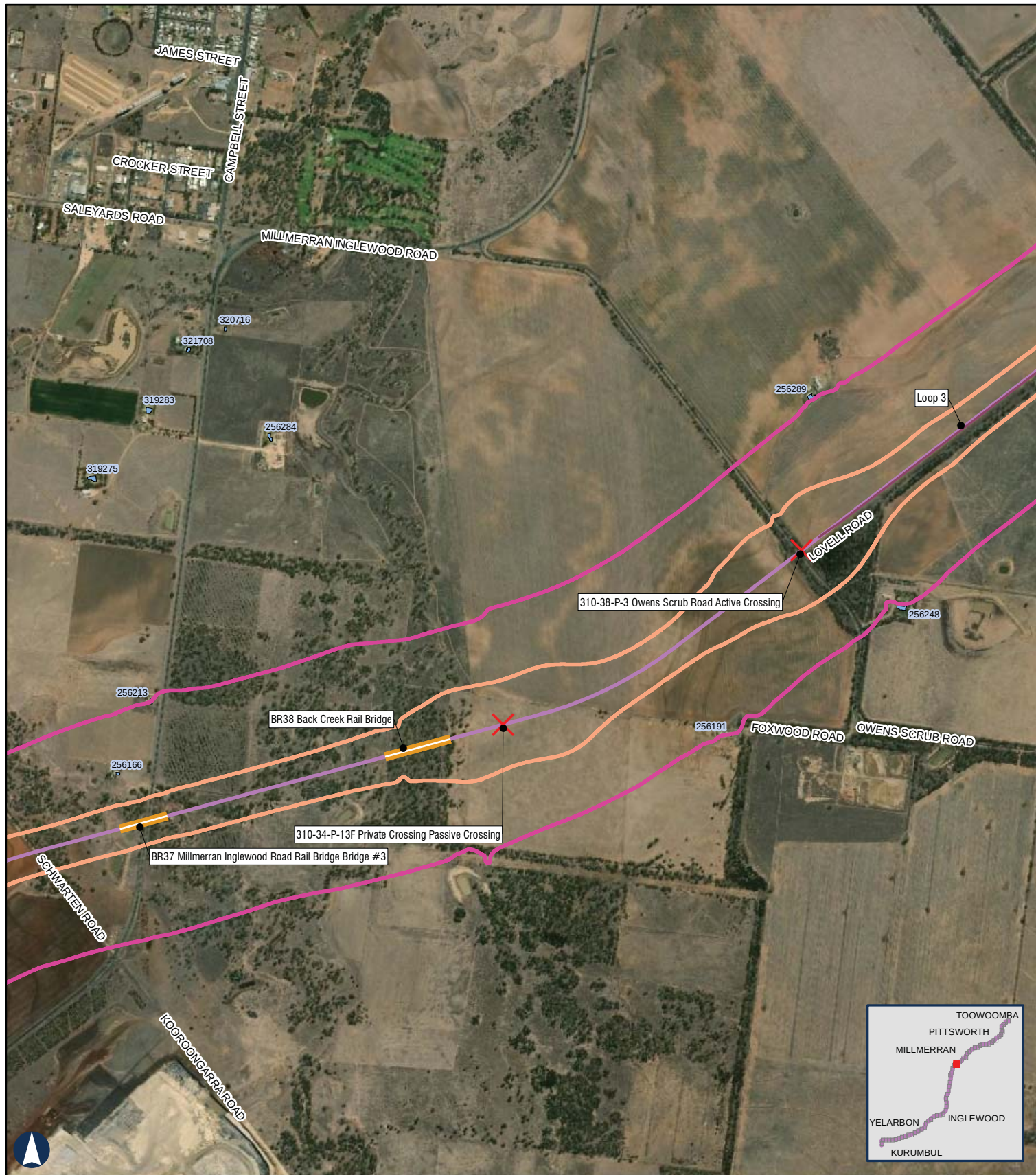
— Daytime noise criteria LA max
80dBA New rail corridor

— Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 36 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

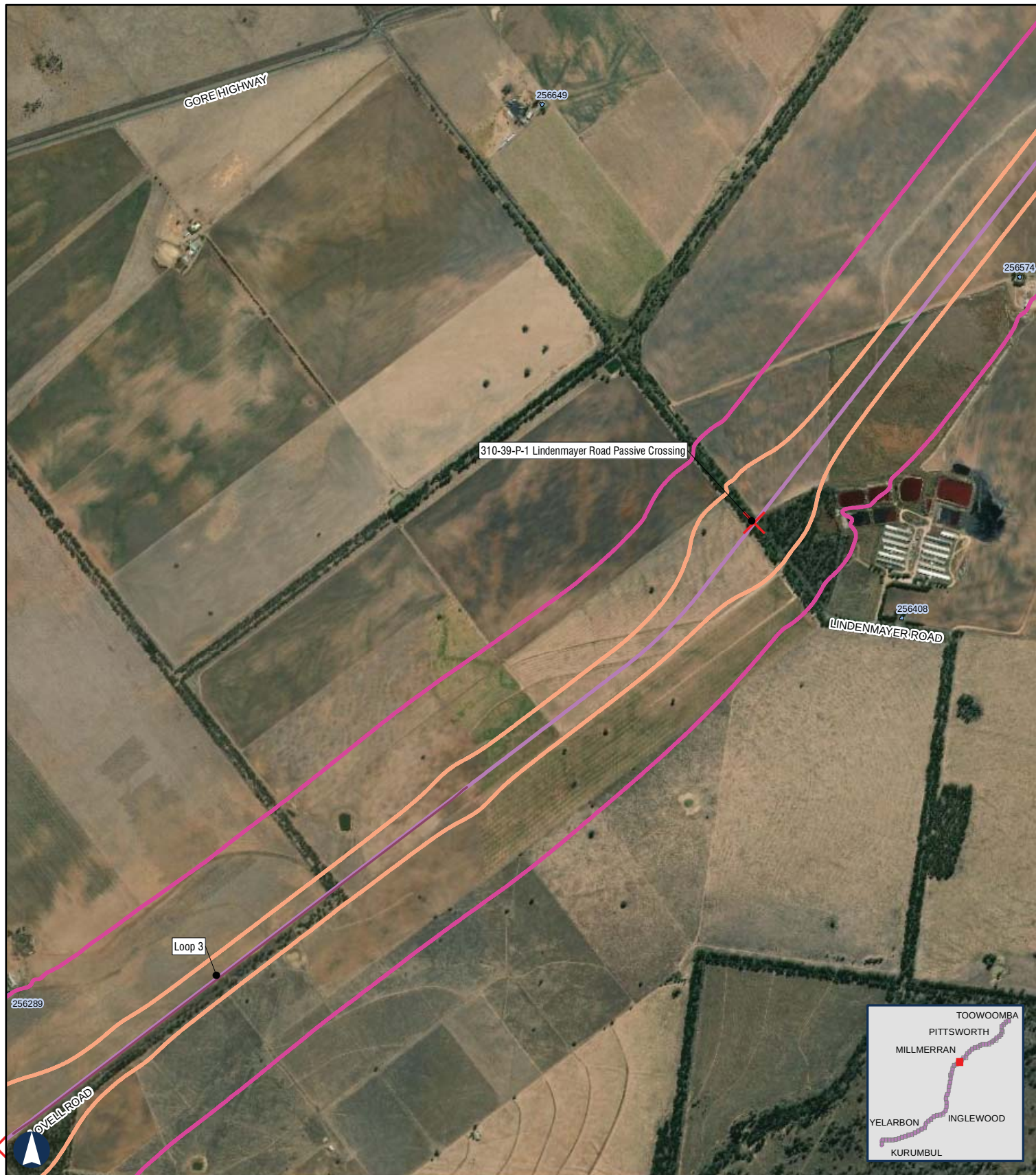
— Daytime noise criteria LA max
80dBA New rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 37 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

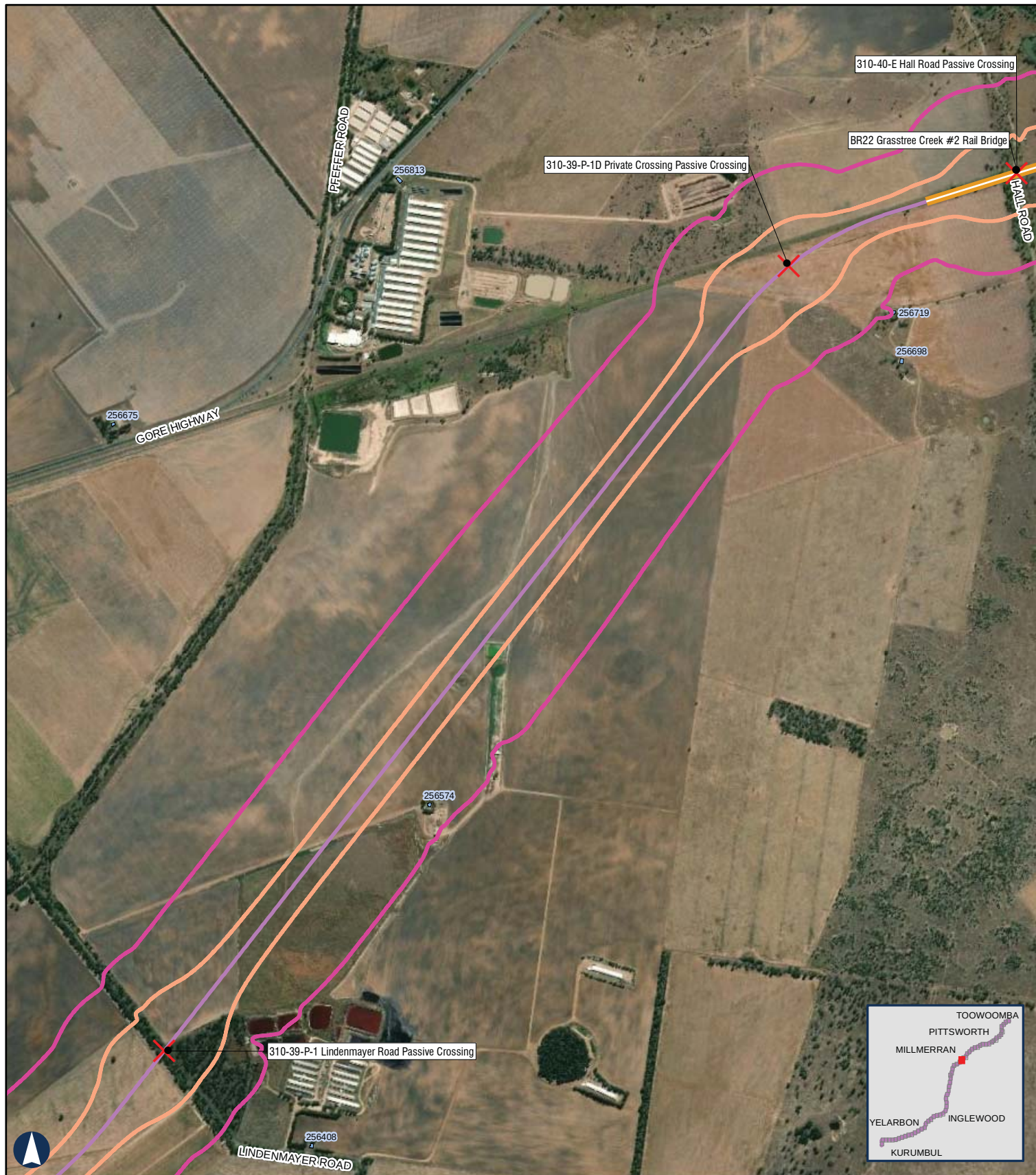
— Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 38 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

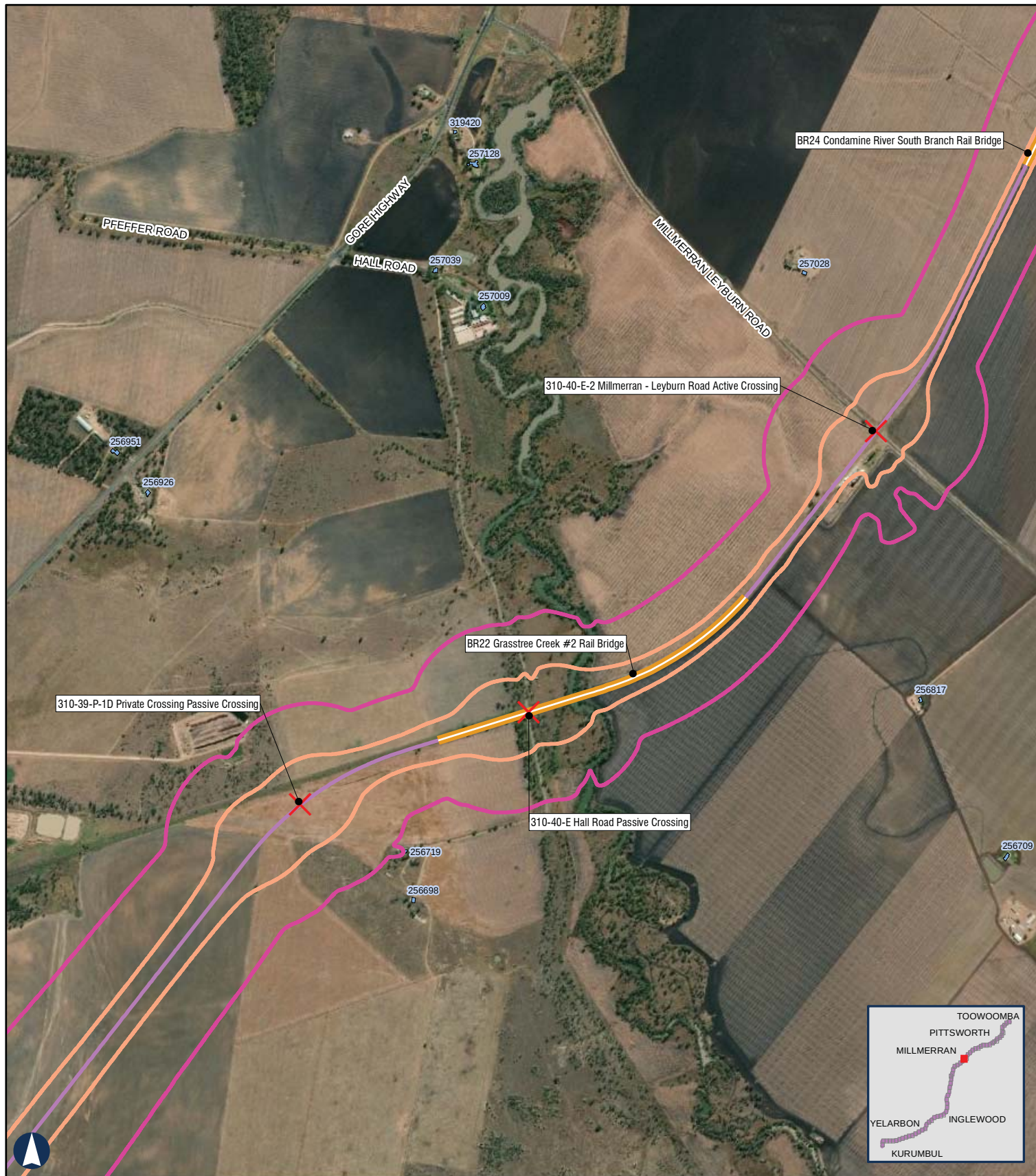
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 39 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

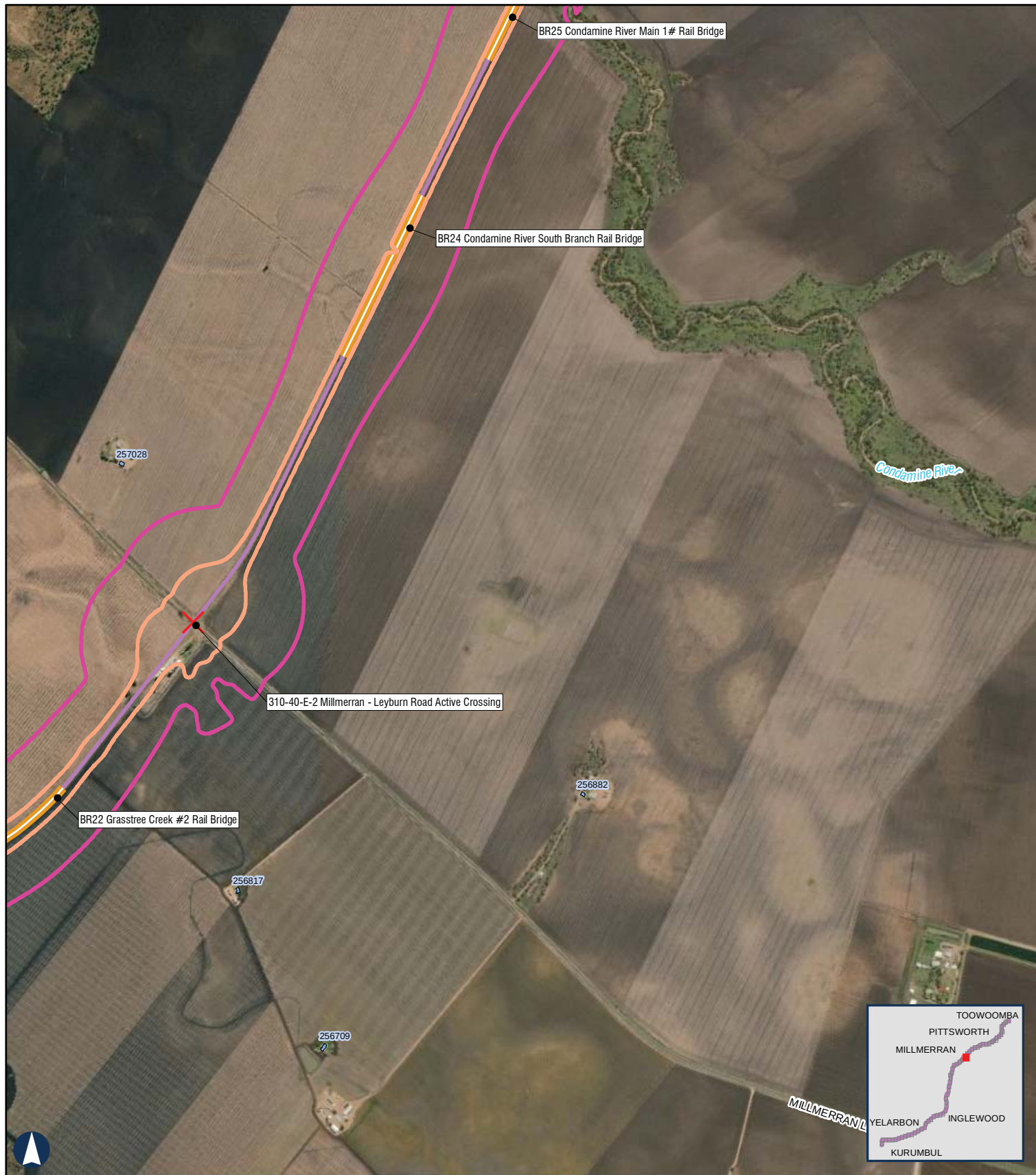
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 40 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

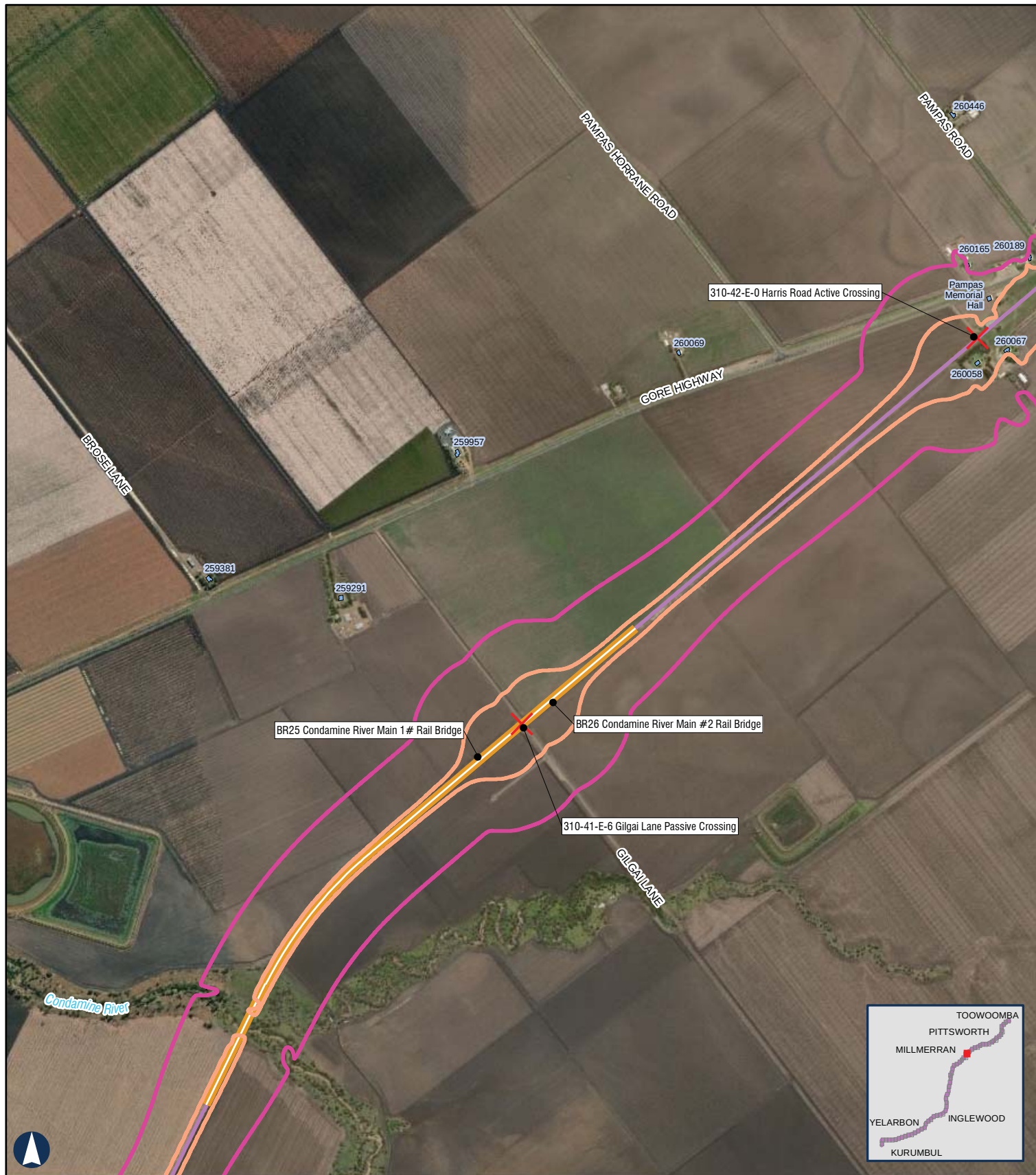
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 41 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

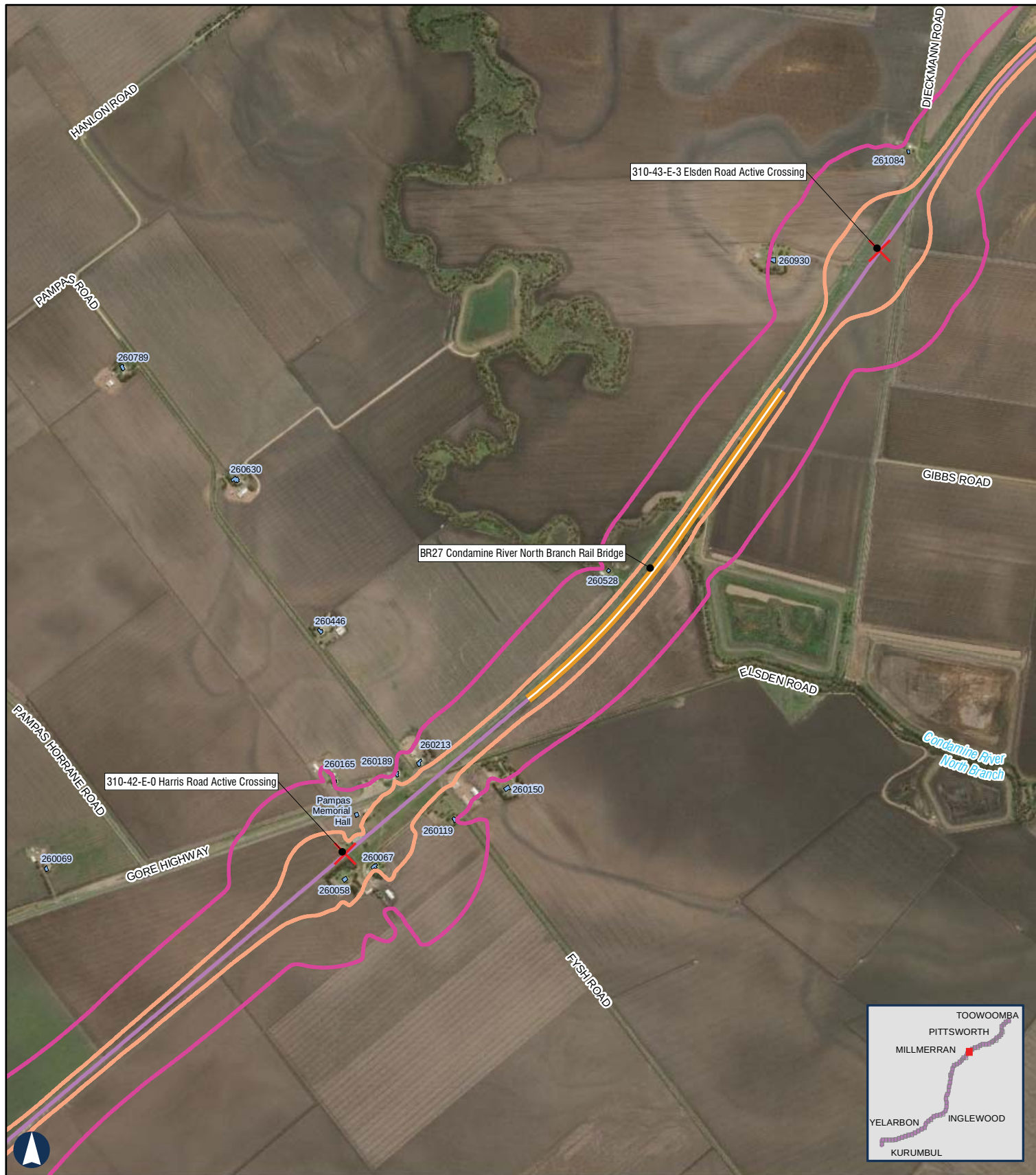
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 42 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

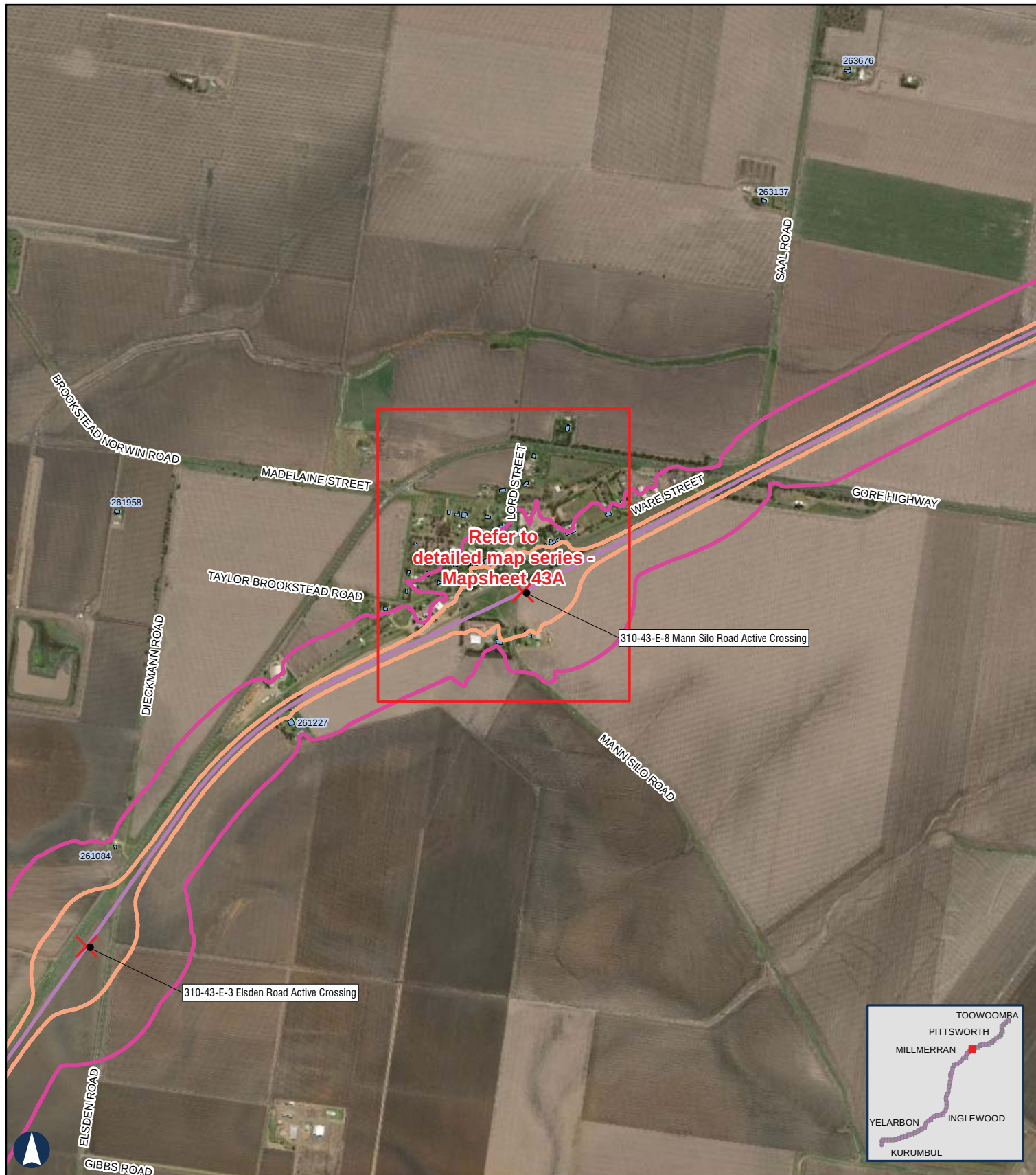
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 43 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

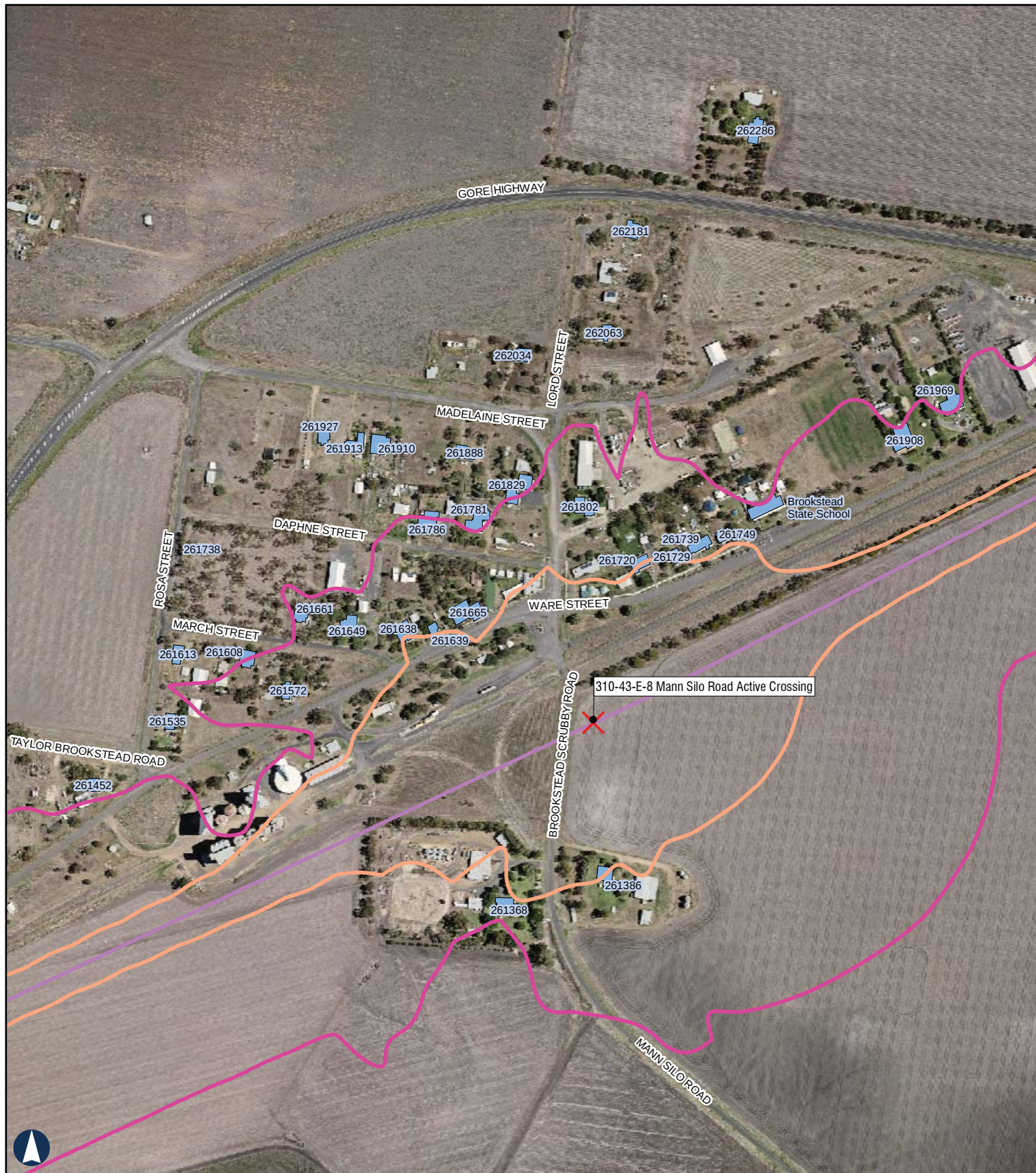
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Year 2040 Daytime rail noise levels - Detailed

APPENDIX E - Mapsheet 43A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:5,500

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor



ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 44 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

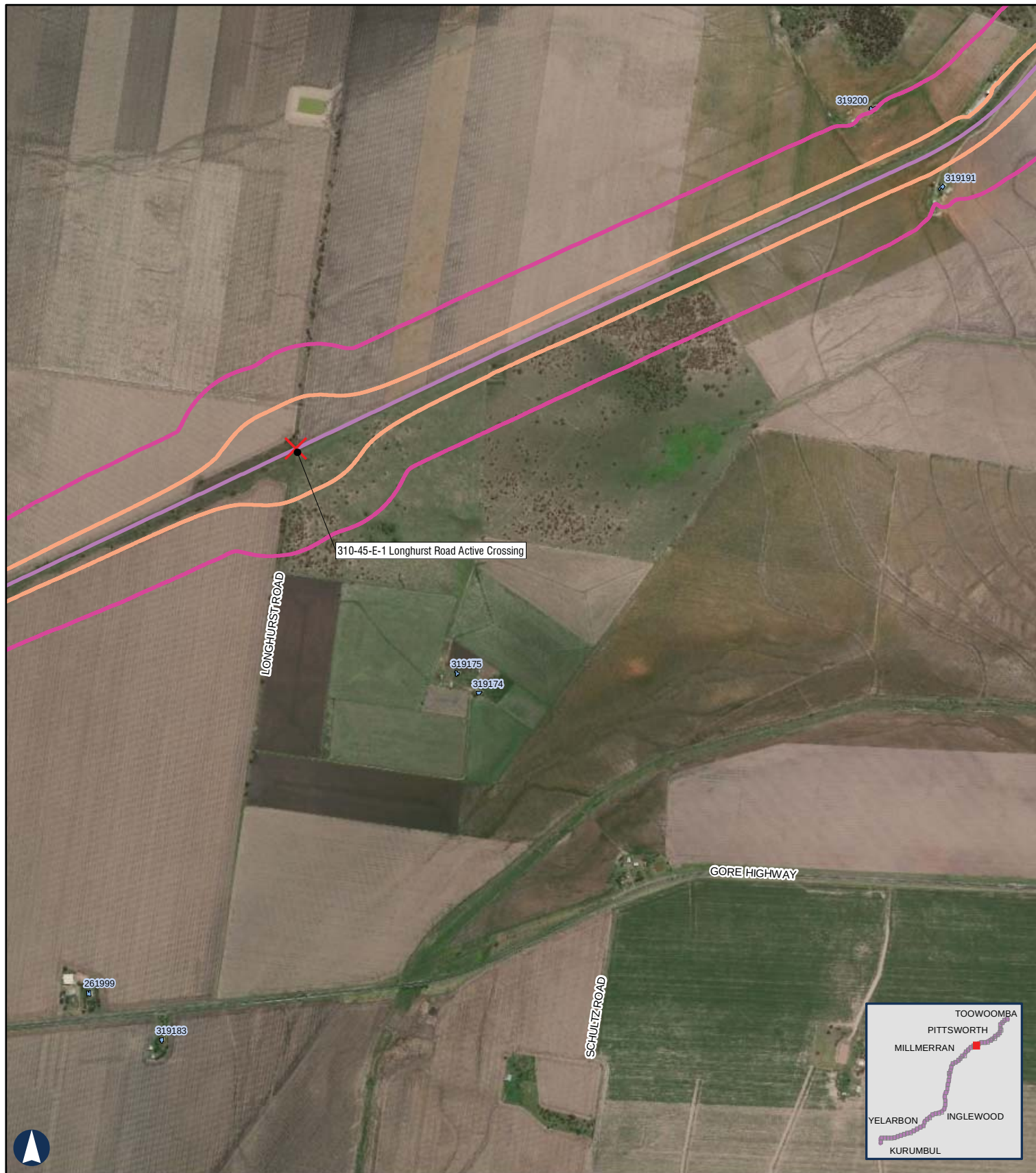
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 45 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

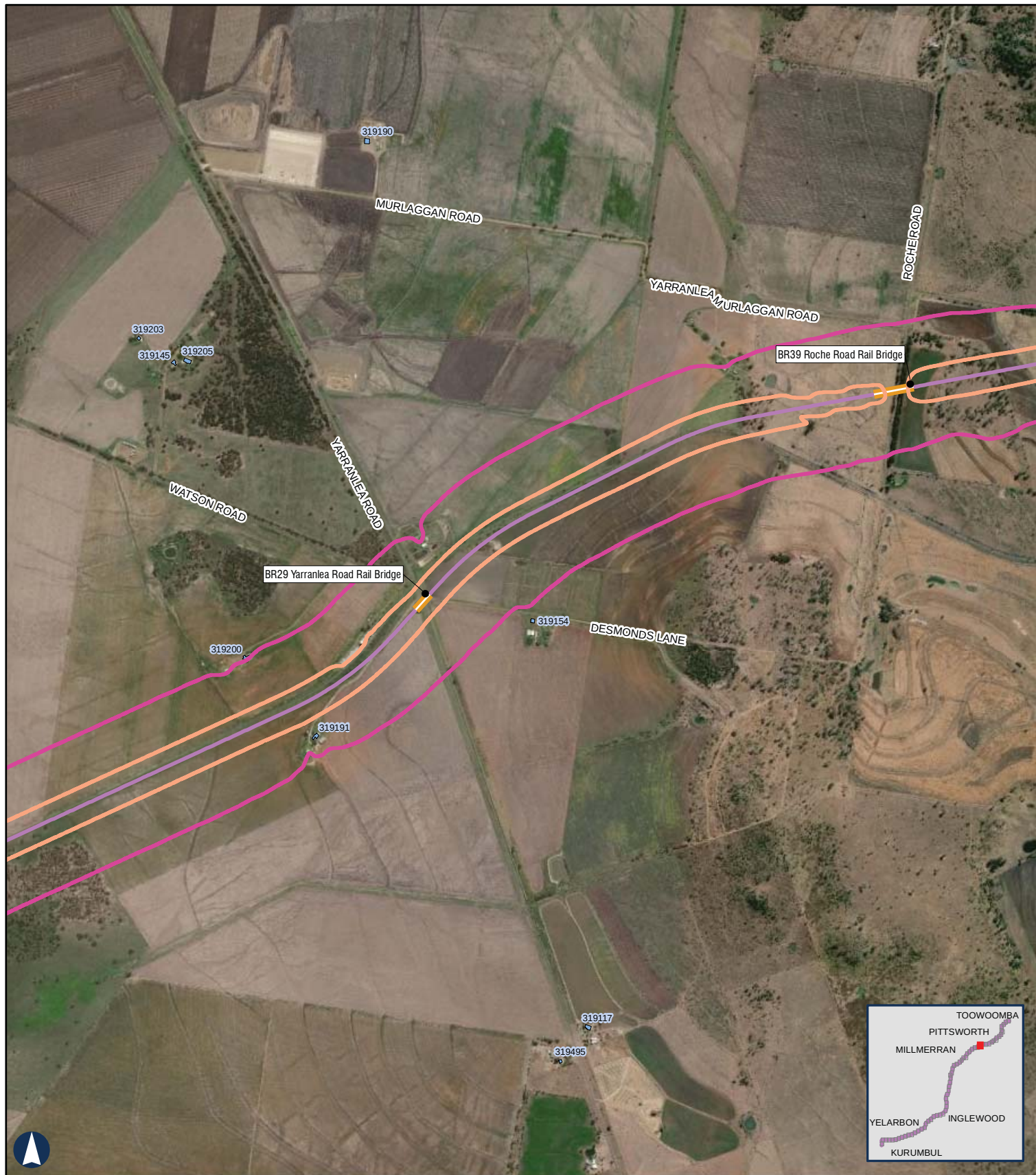
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 46 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

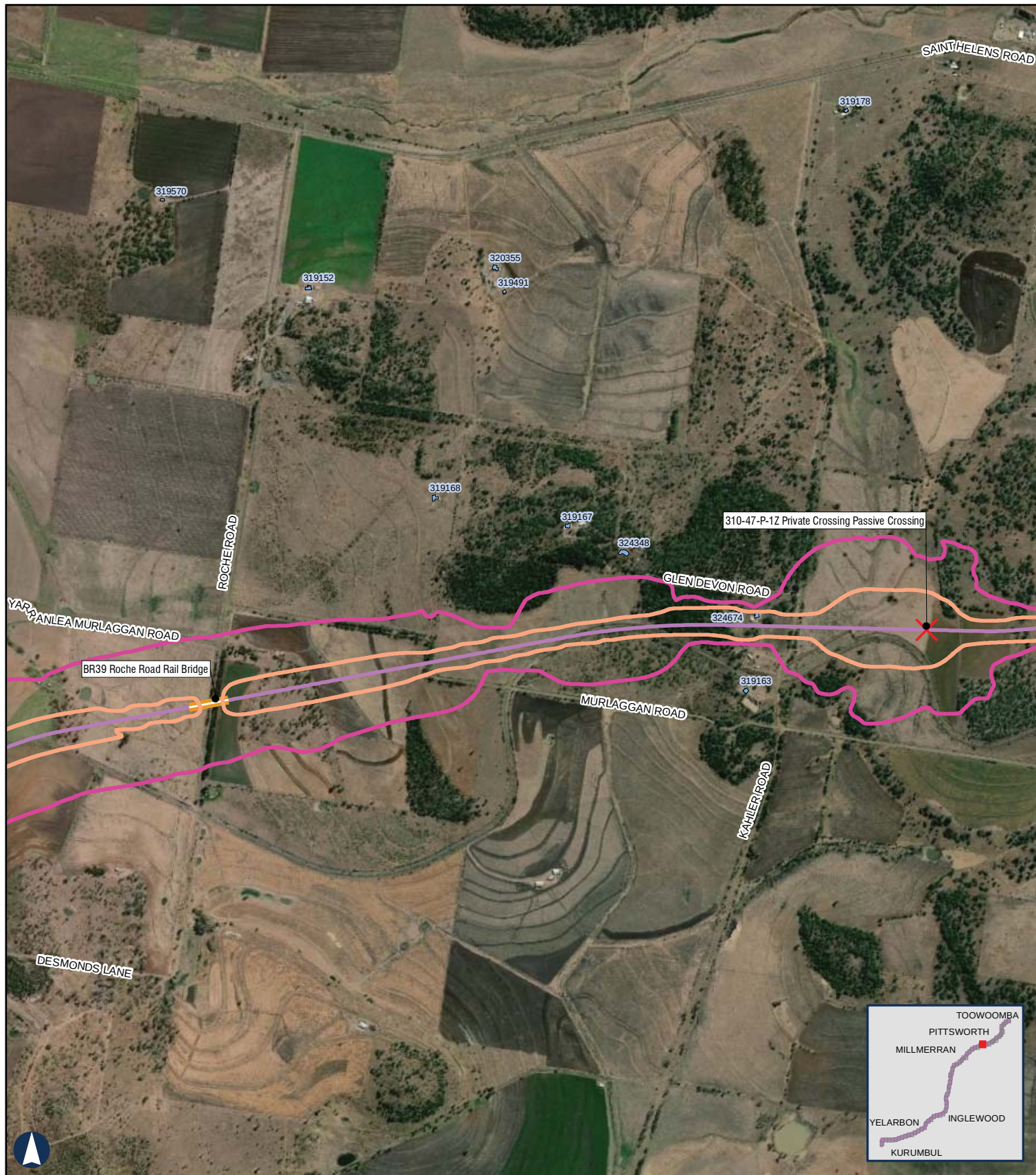
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 47 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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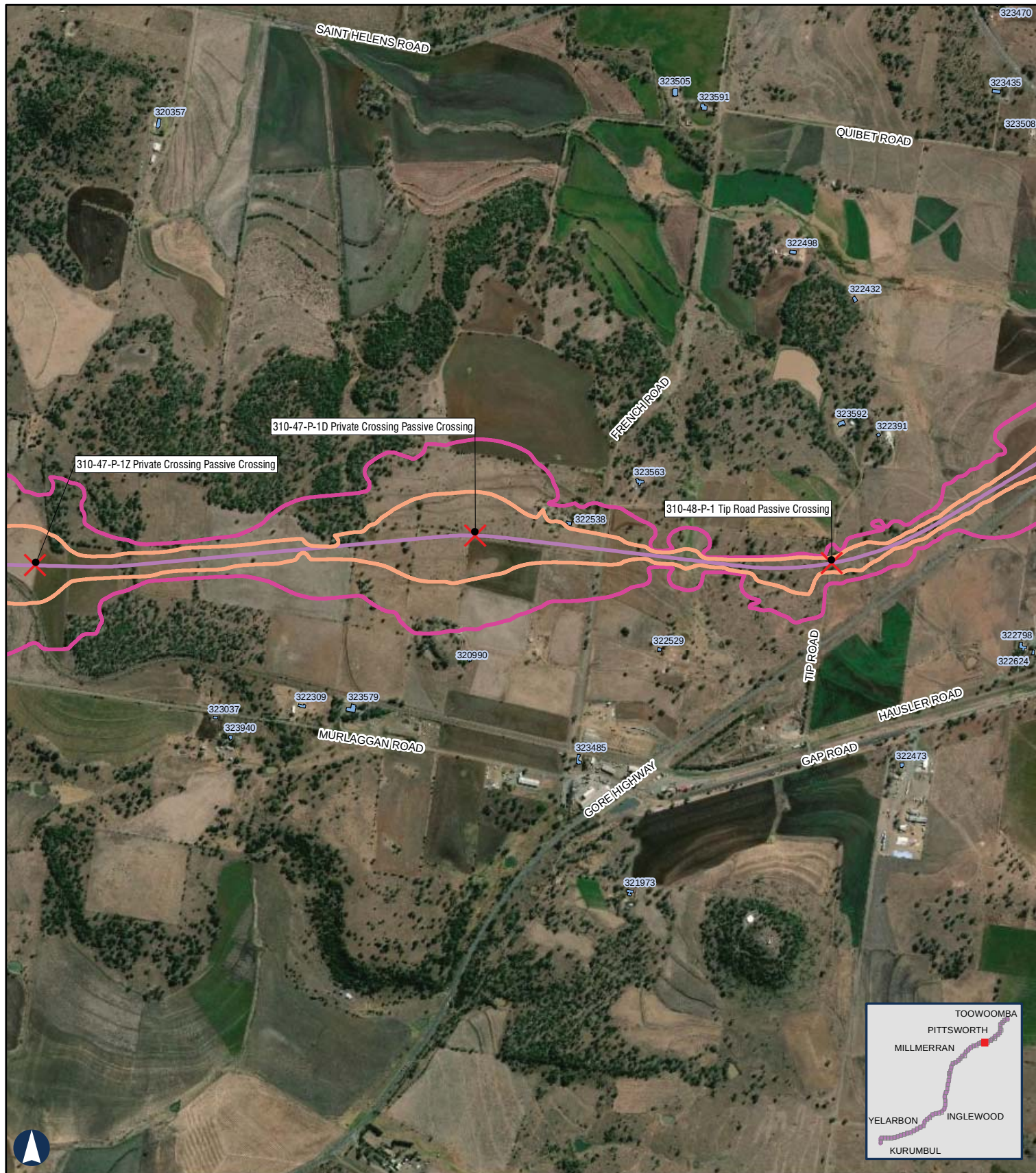
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 48 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

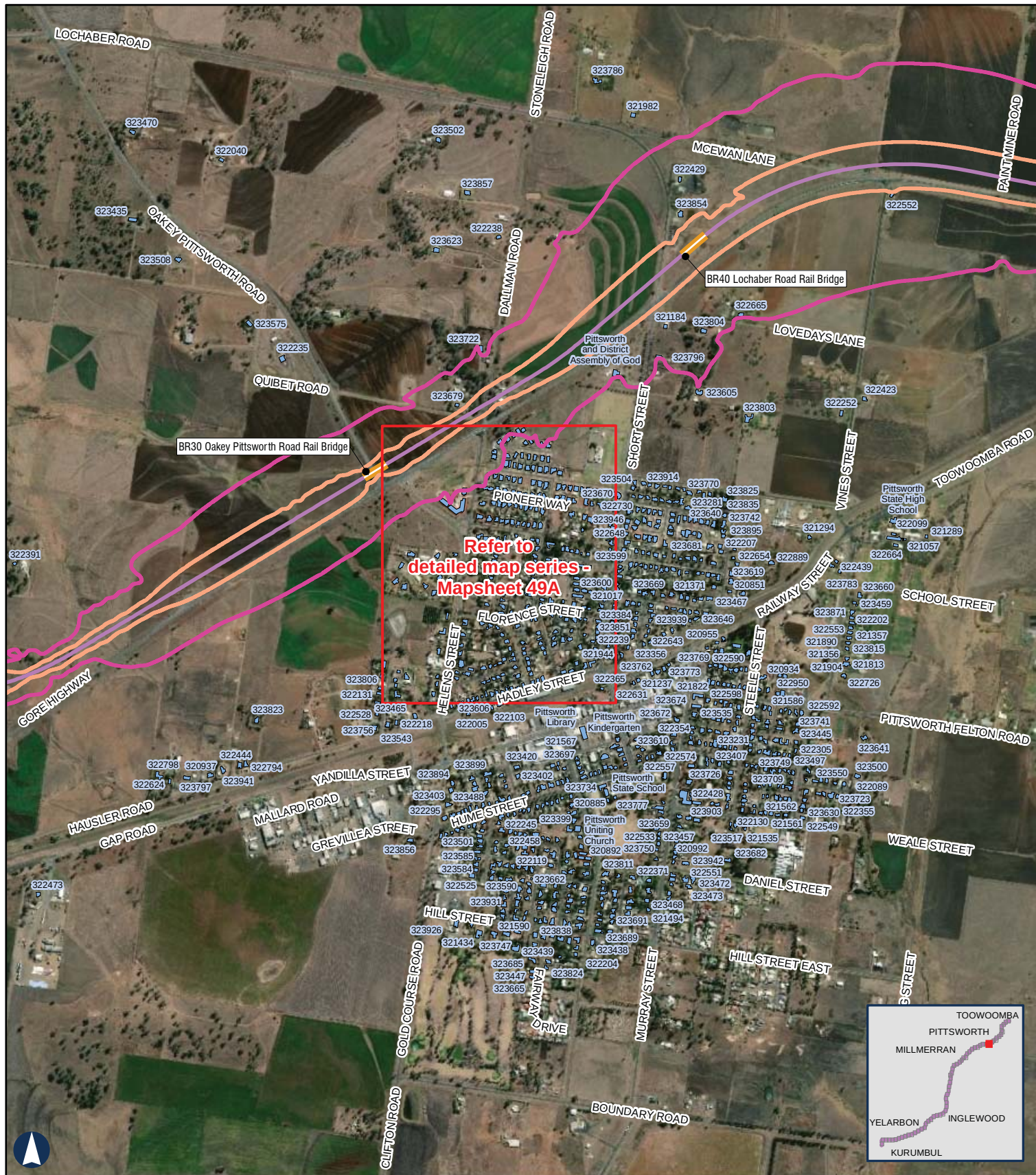
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 49 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels - Detailed

APPENDIX E - Mapsheet 49A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:5,000

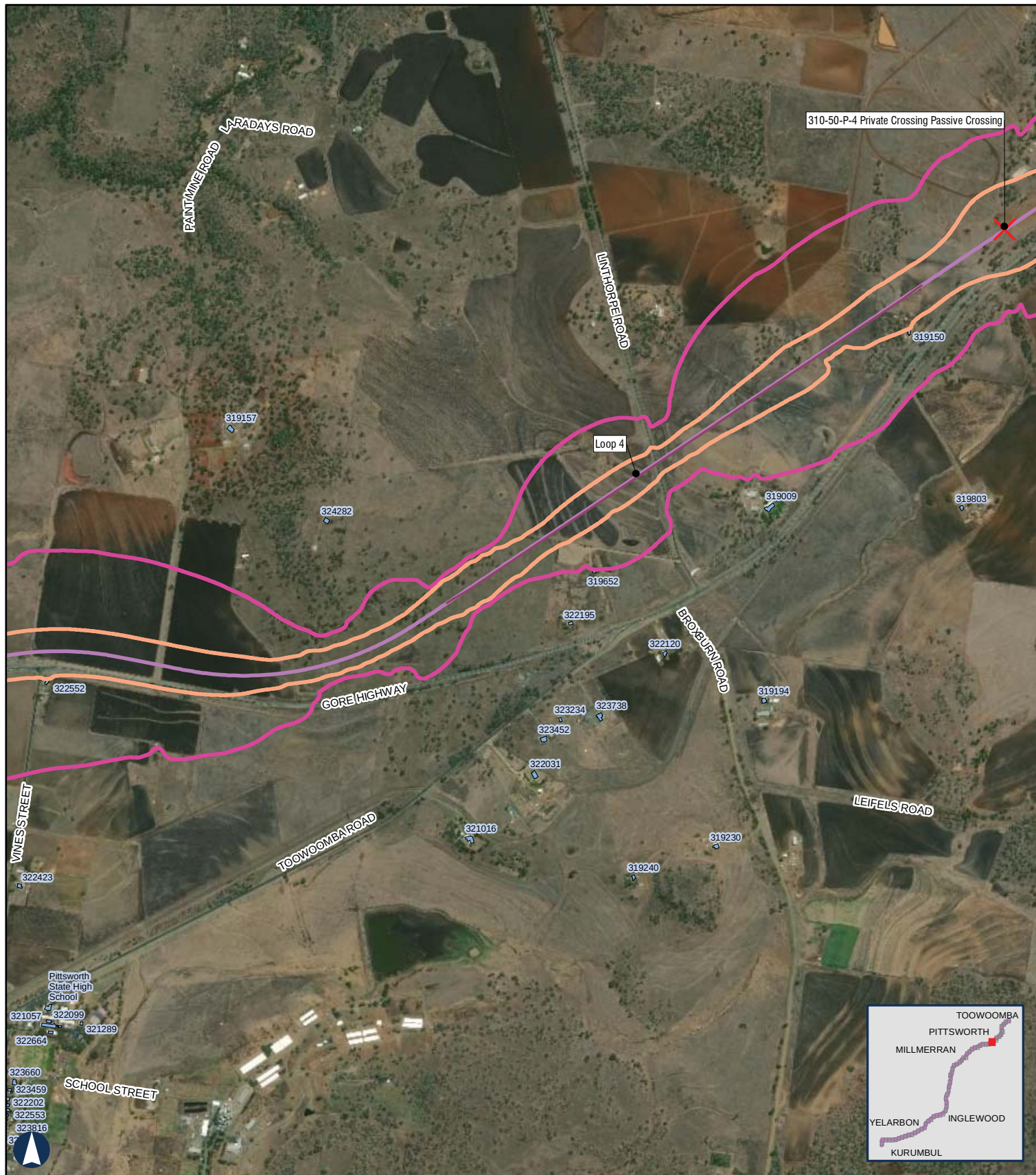
- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

- Daytime noise criteria LAeq15hr 60dBA New rail corridor
- Daytime noise criteria LA max 80dBA New rail corridor

Noise contours are based on a set distance above the local terrain level of 2.4m.



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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 50 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

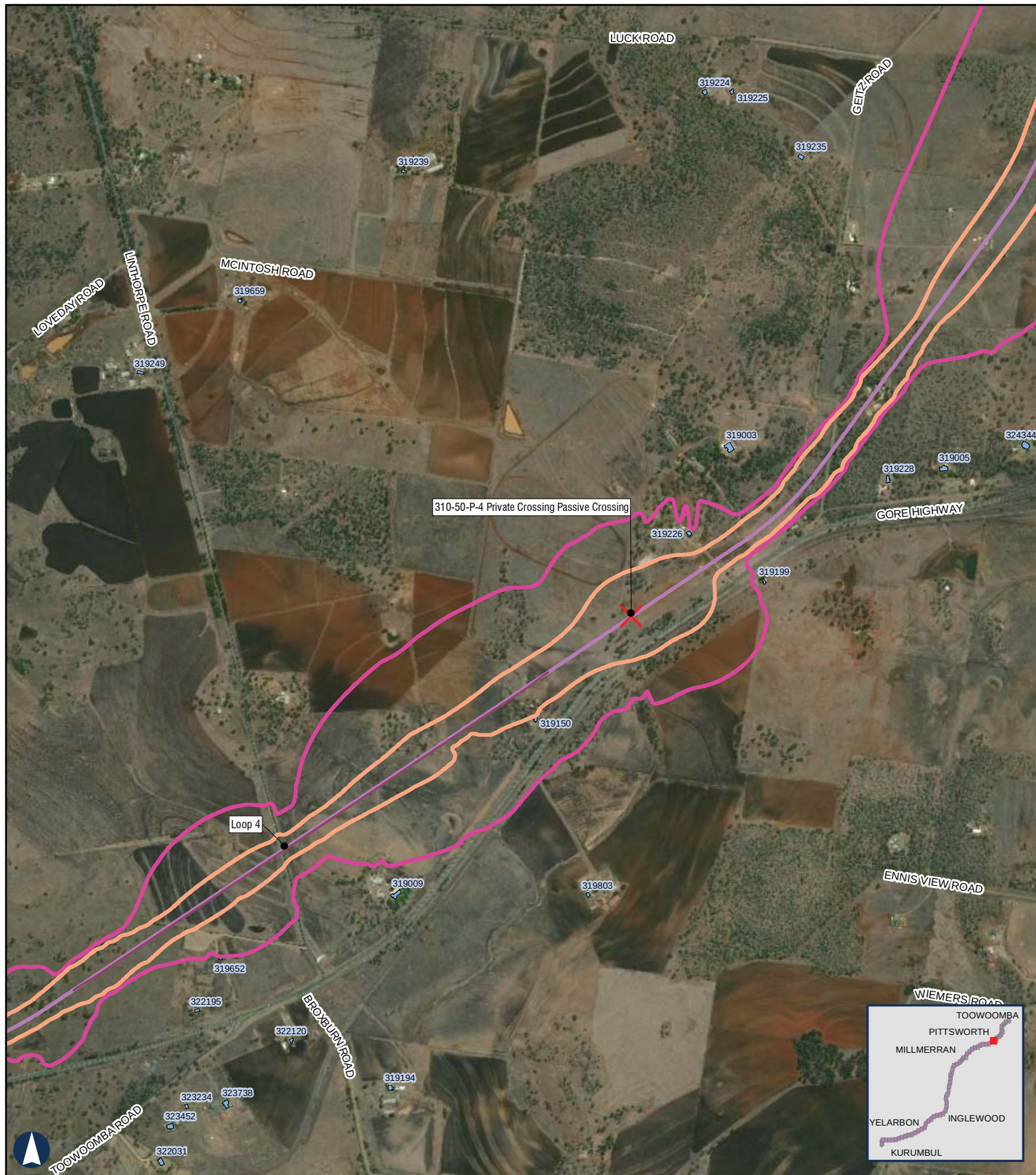
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 51 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

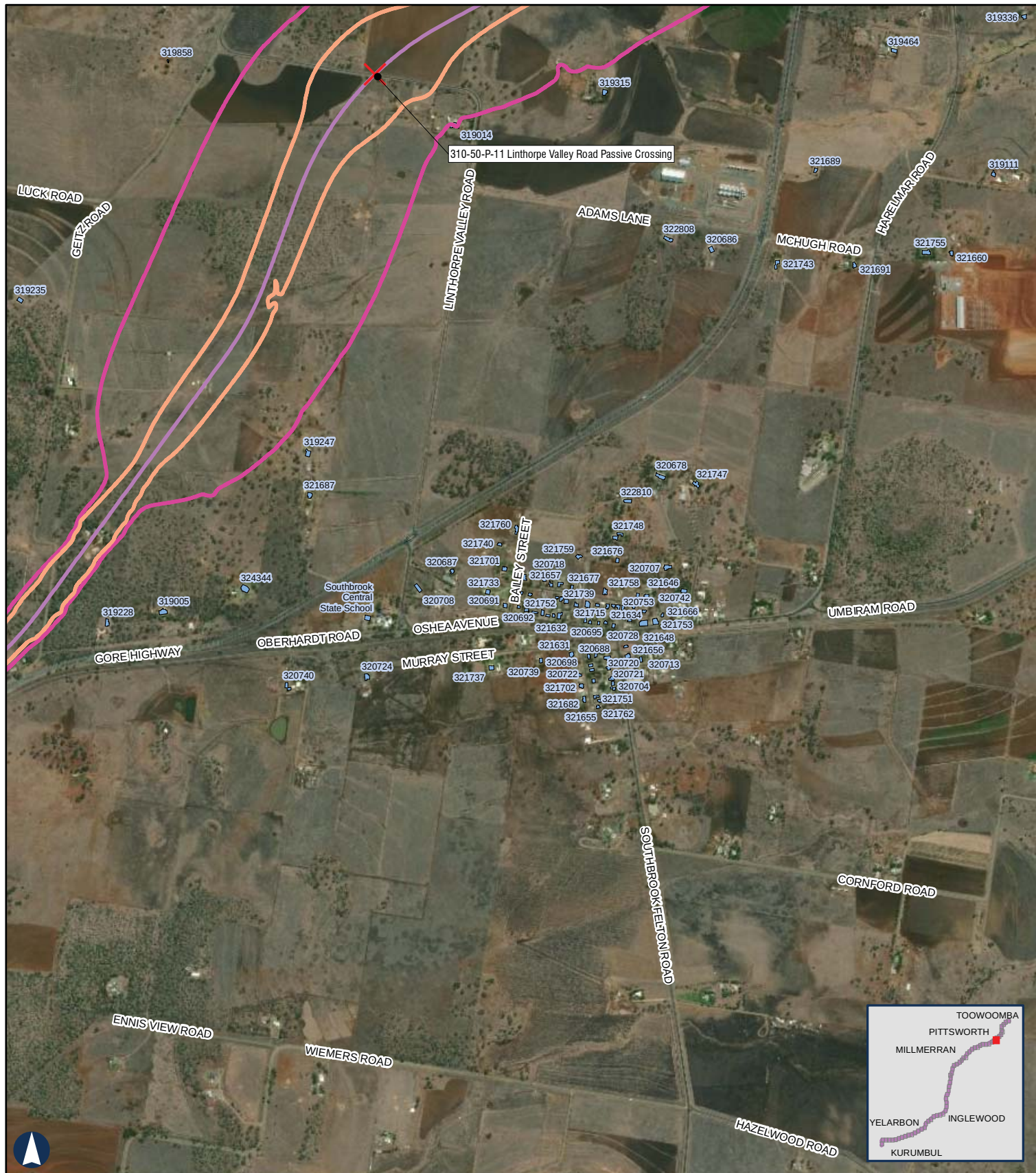
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 52 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

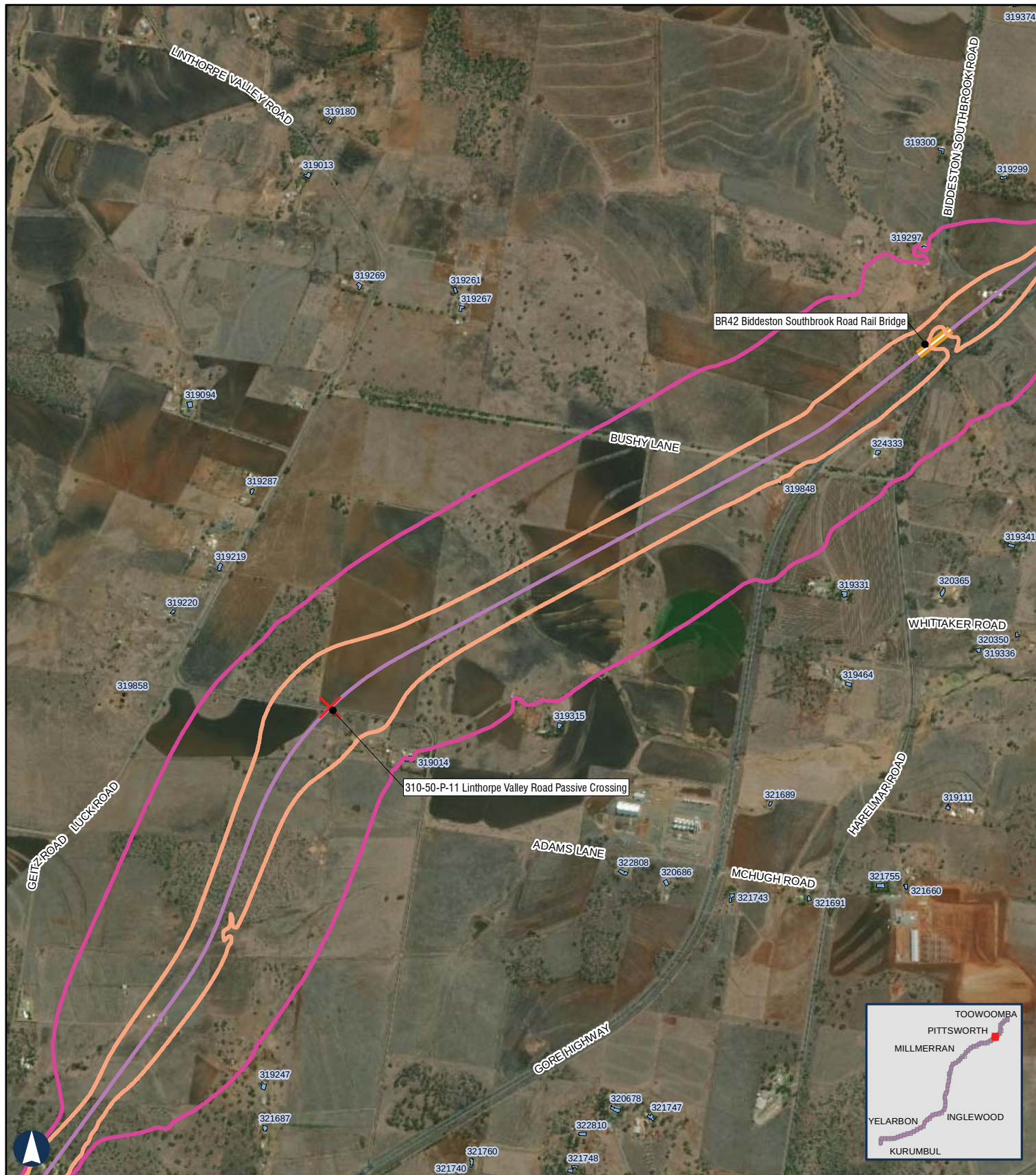
— Daytime noise criteria LA max
80dBA New rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 53 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

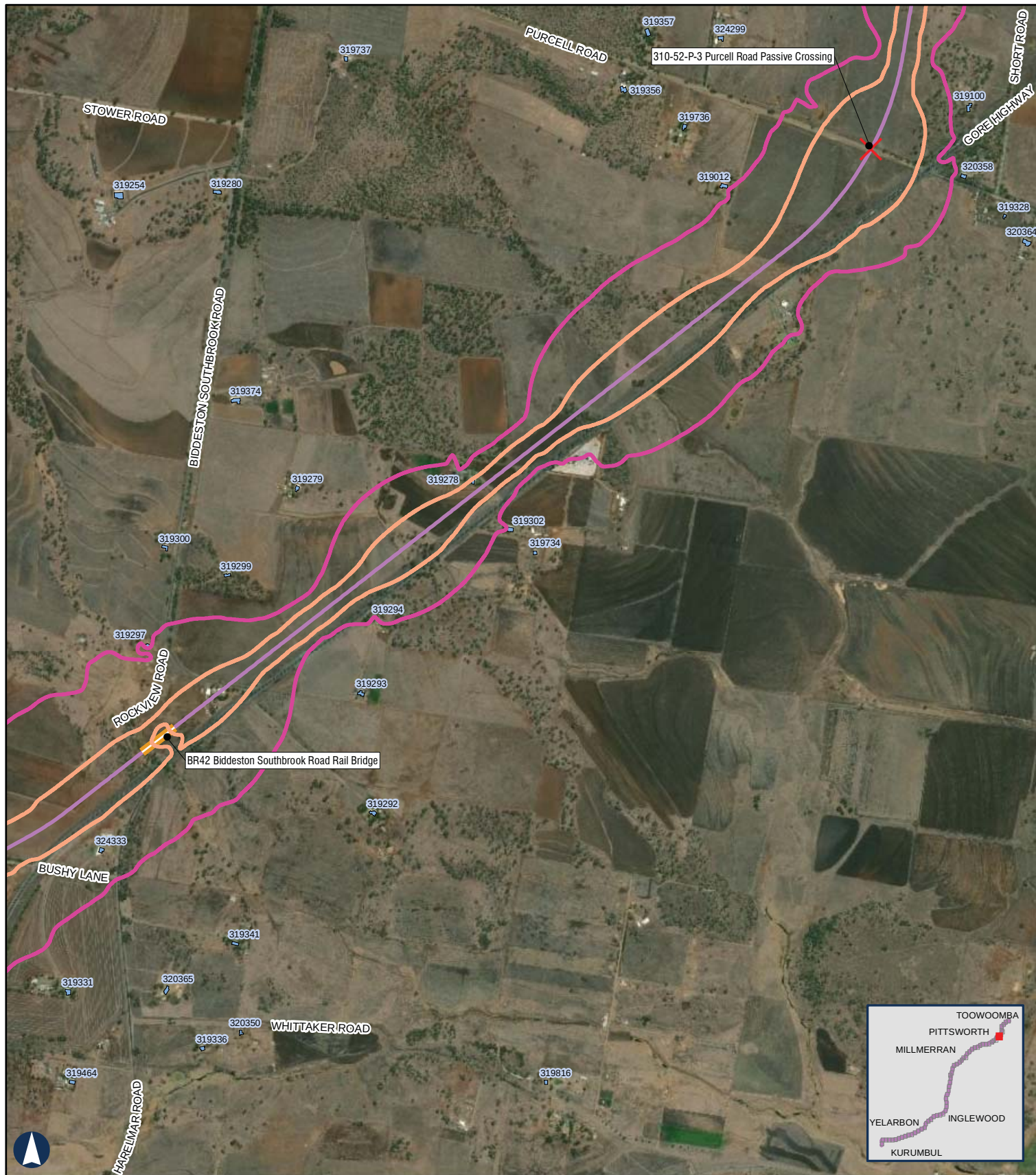
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 54 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

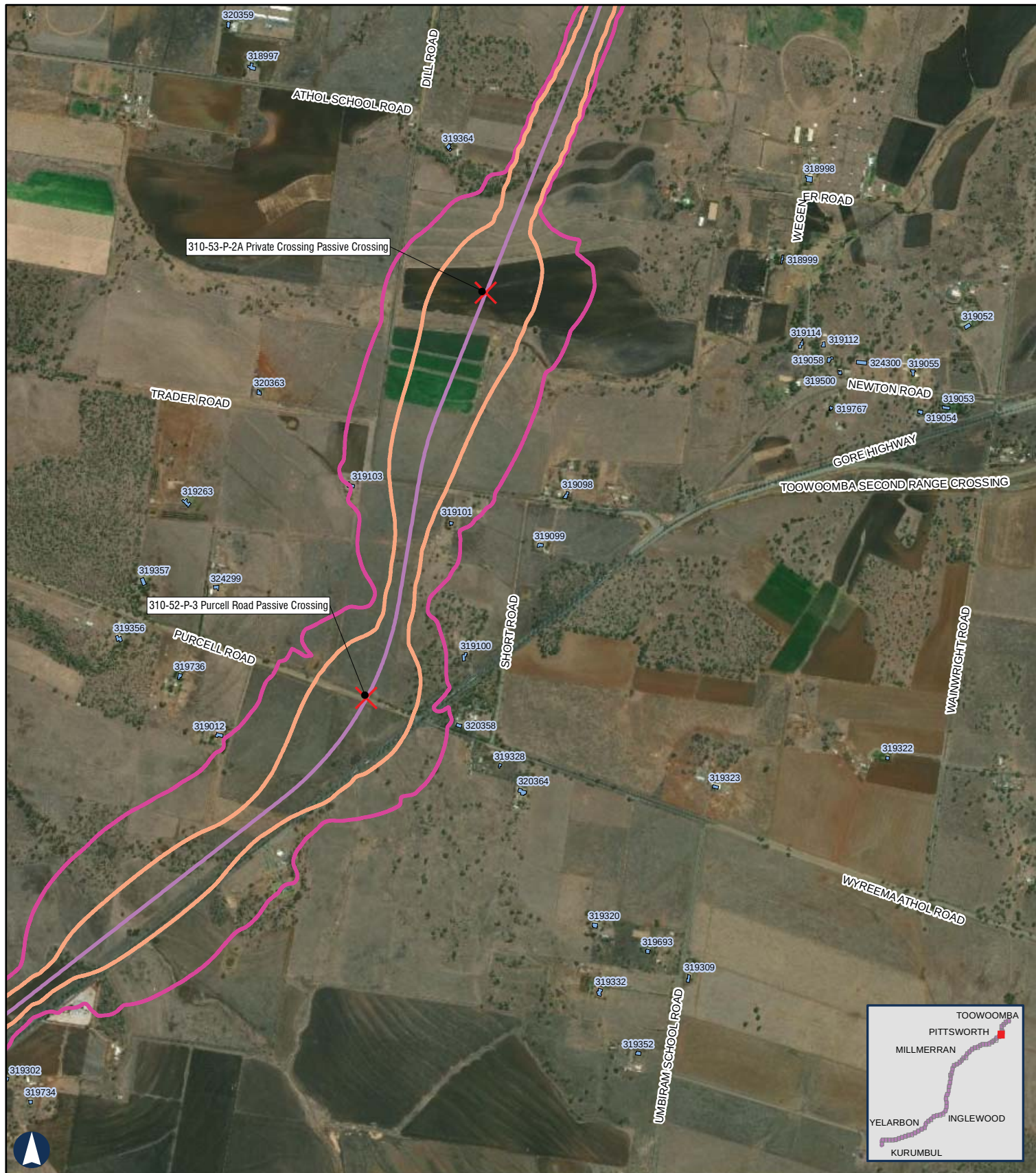
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 55 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4

Scale: 1:20,000

Date: 08-May-2020

Author: JG

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

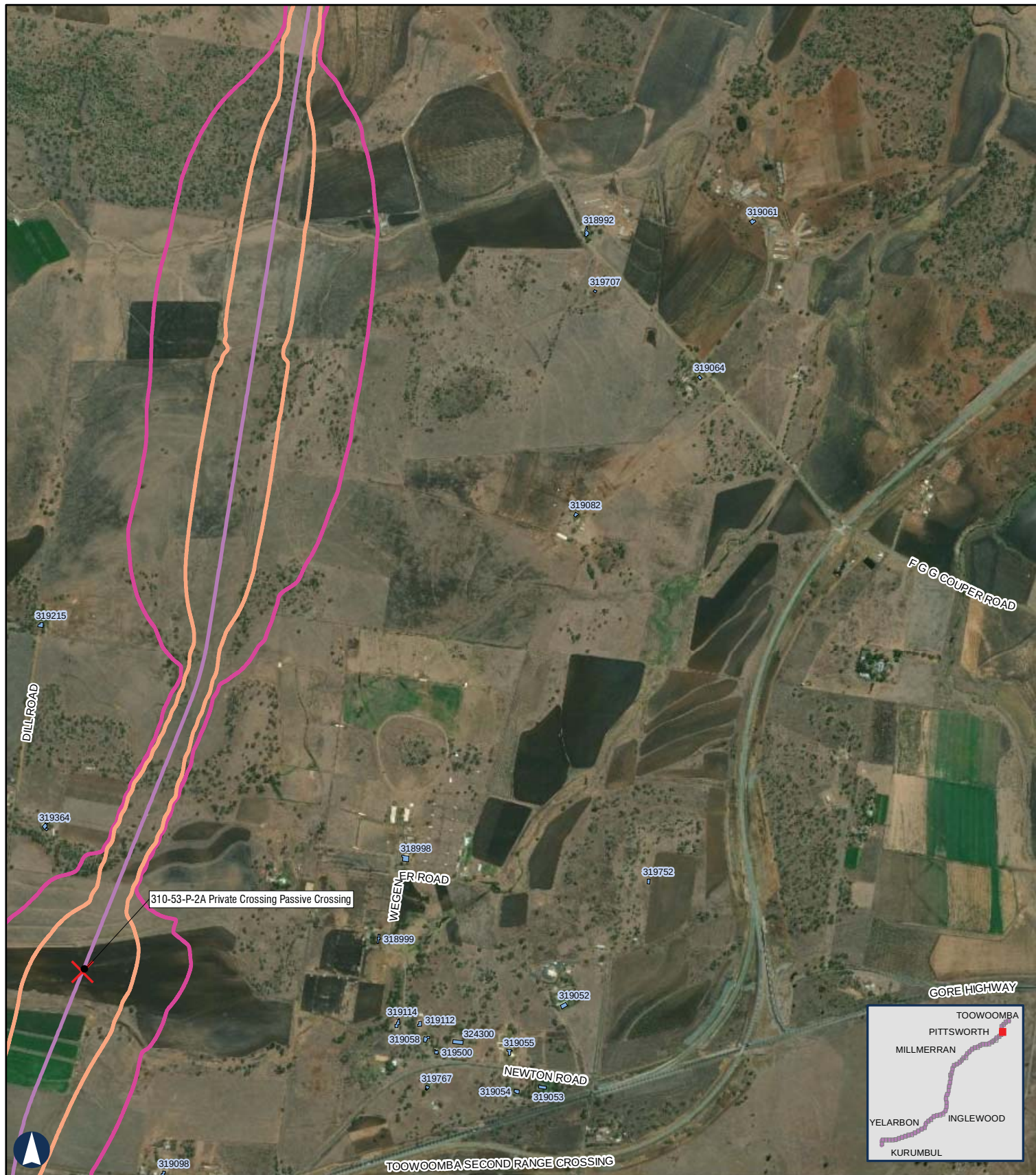
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 56 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

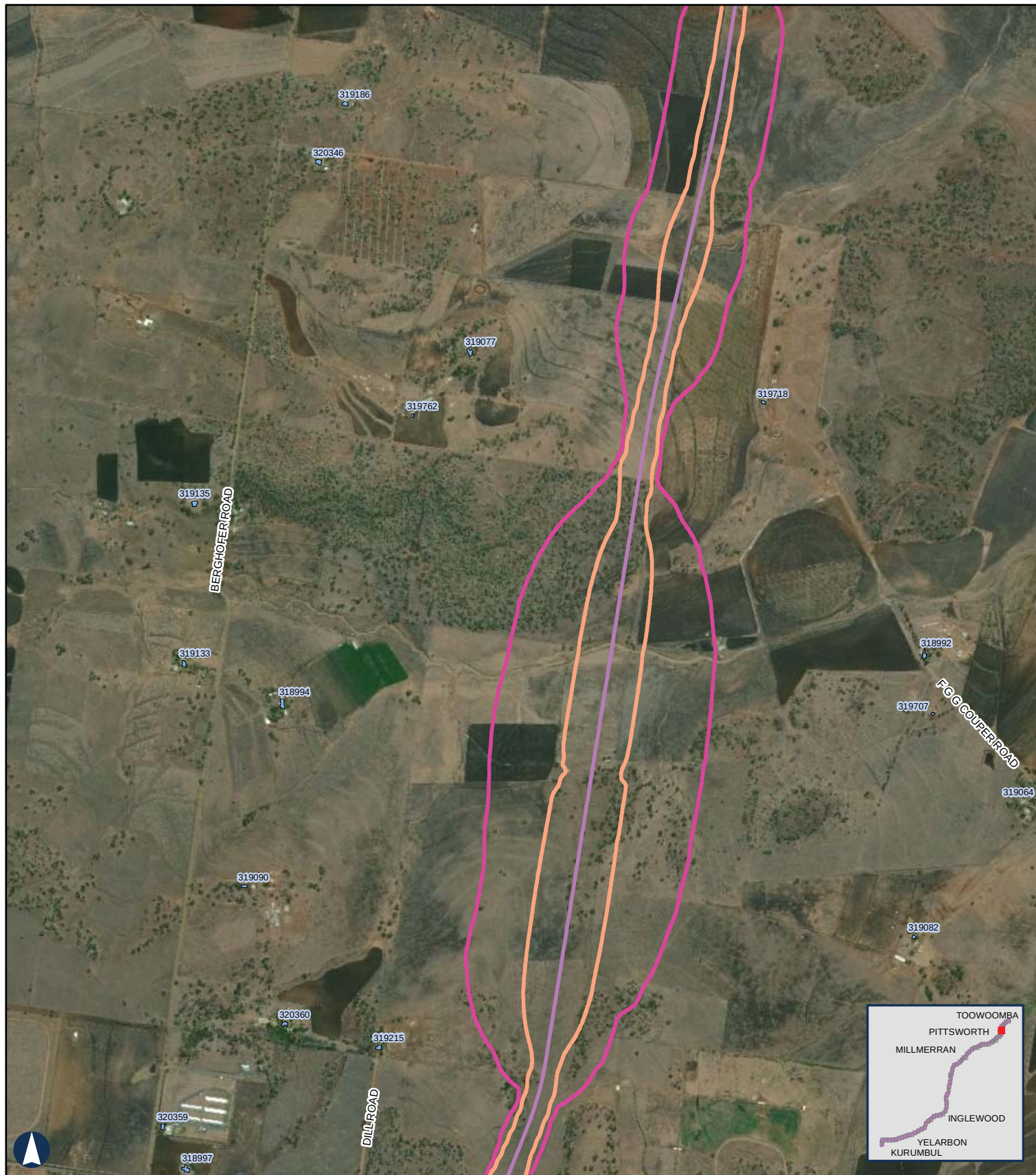
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 57 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

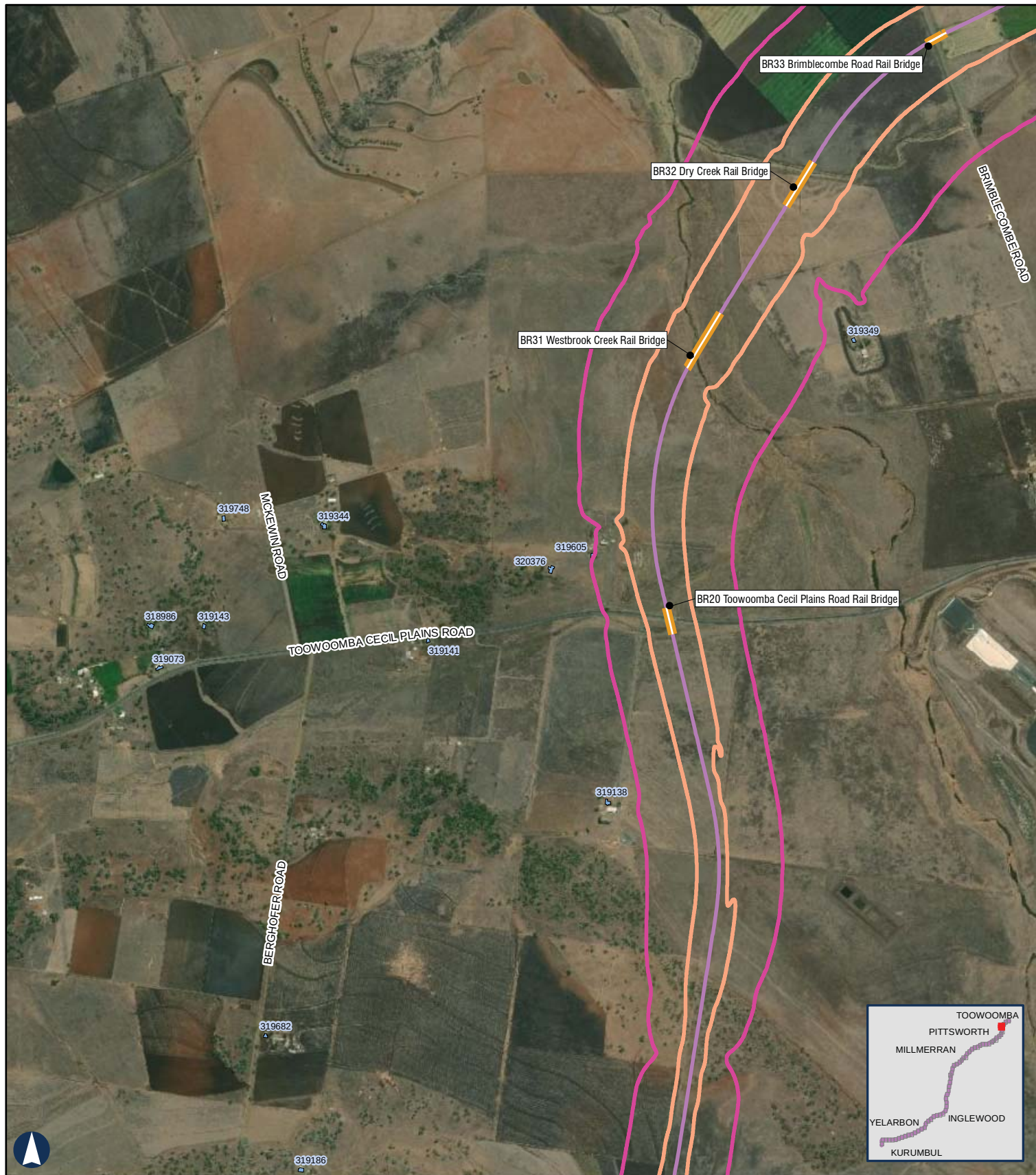
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 58 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

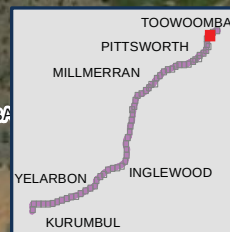
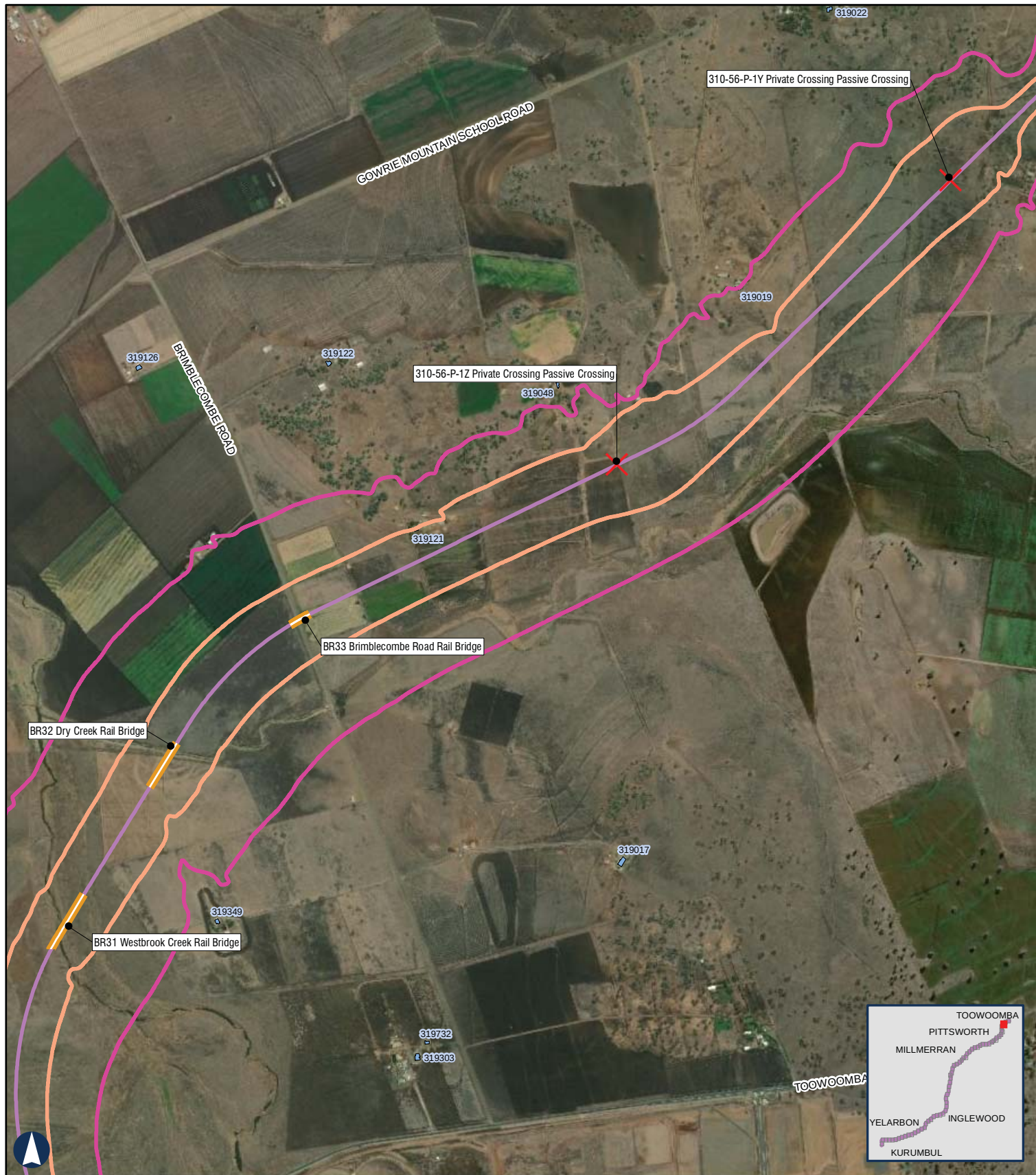
— Daytime noise criteria LA max
80dBA New rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 59 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

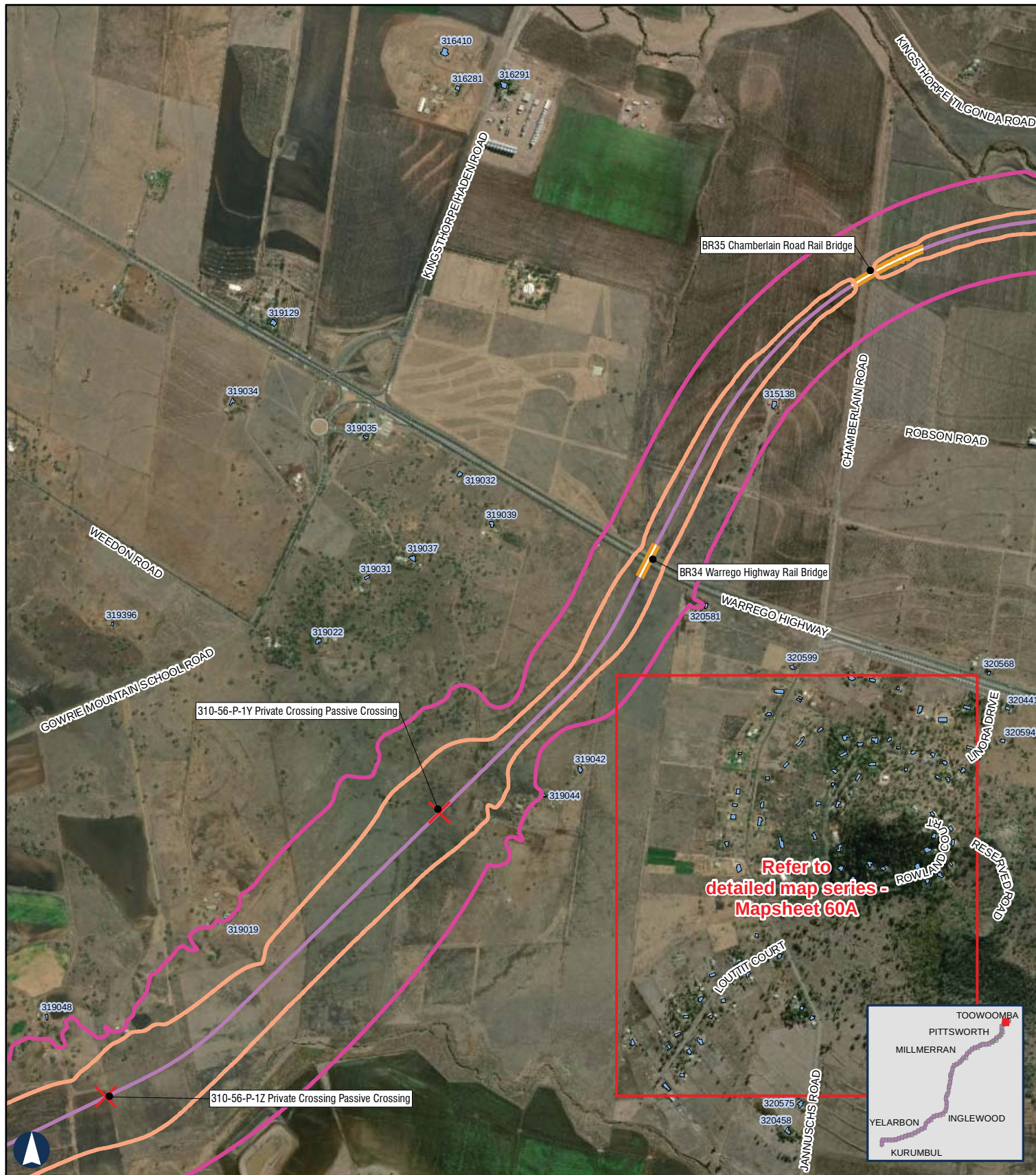
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 60 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Daytime noise criteria LAeq15hr
60dBA New rail corridor

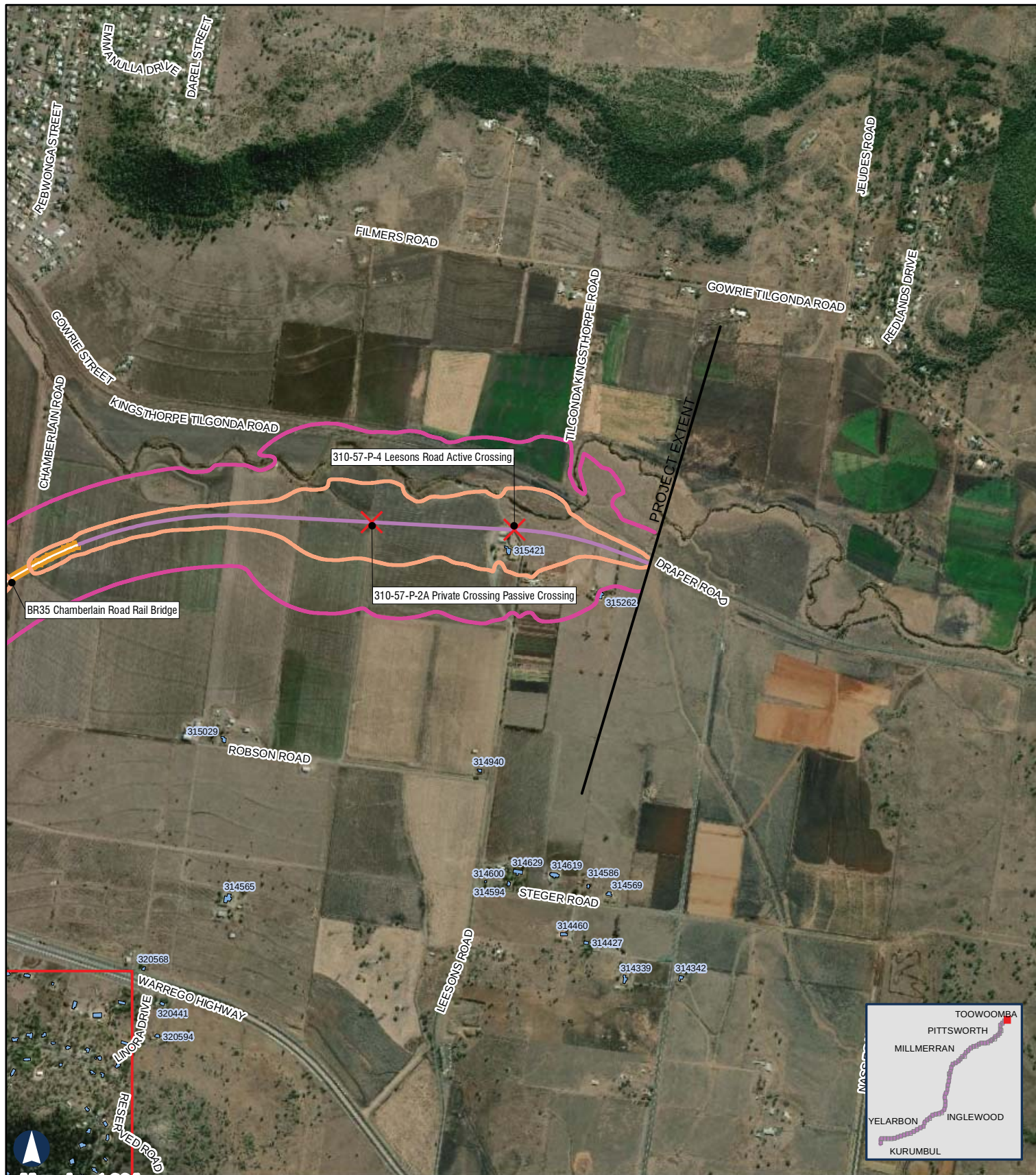
— Daytime noise criteria LA max
80dBA New rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE

Year 2040 Daytime rail noise levels

APPENDIX E - Map 61 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

Daytime noise criteria LAeq15hr
60dBA New rail corridor

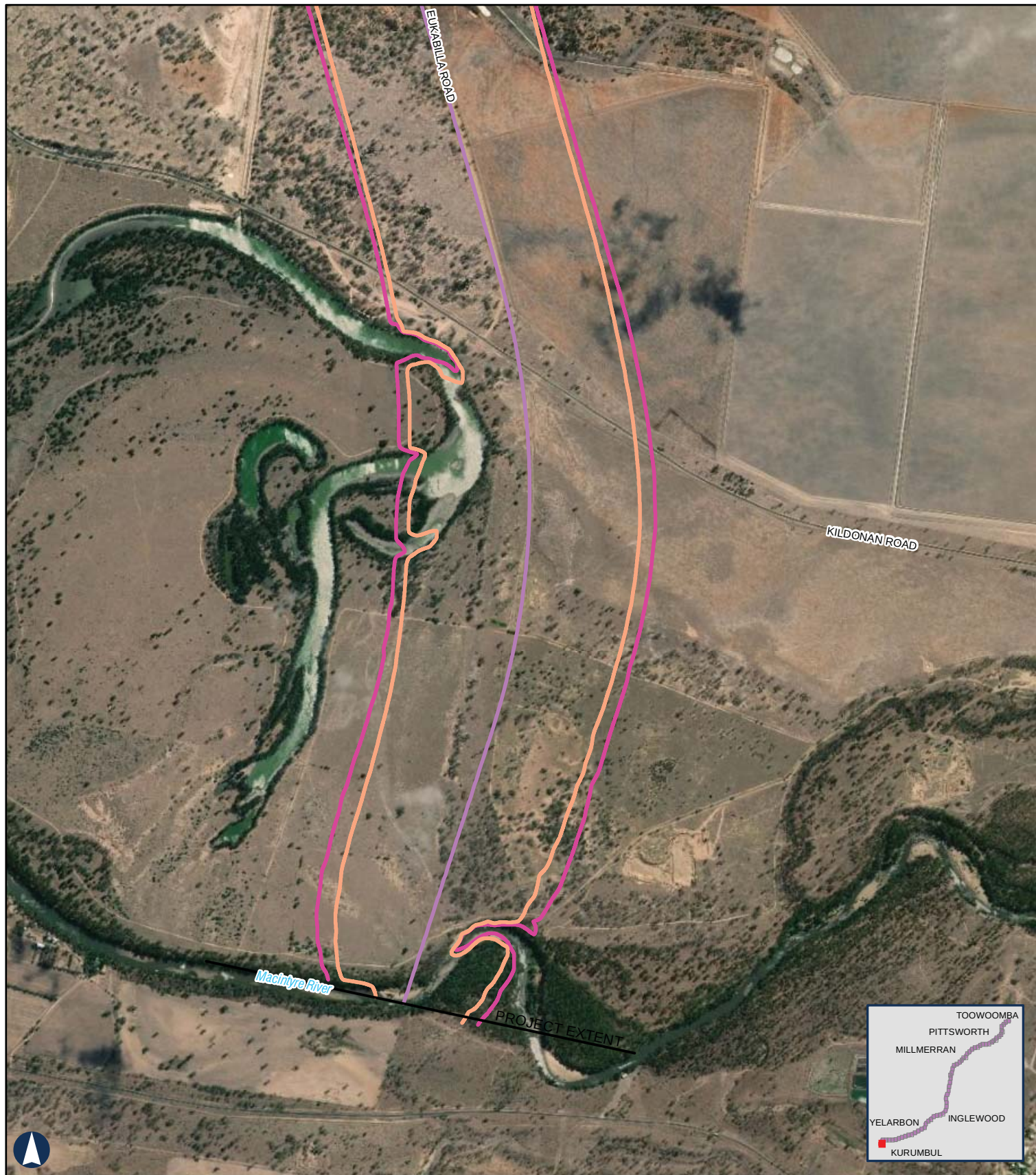
Daytime noise criteria LA max
80dBA New rail corridor

Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 1 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 2 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC *InlandRail*

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 3 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

— Night-time noise criteria LA max
80dBA new rail corridor

Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 4 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

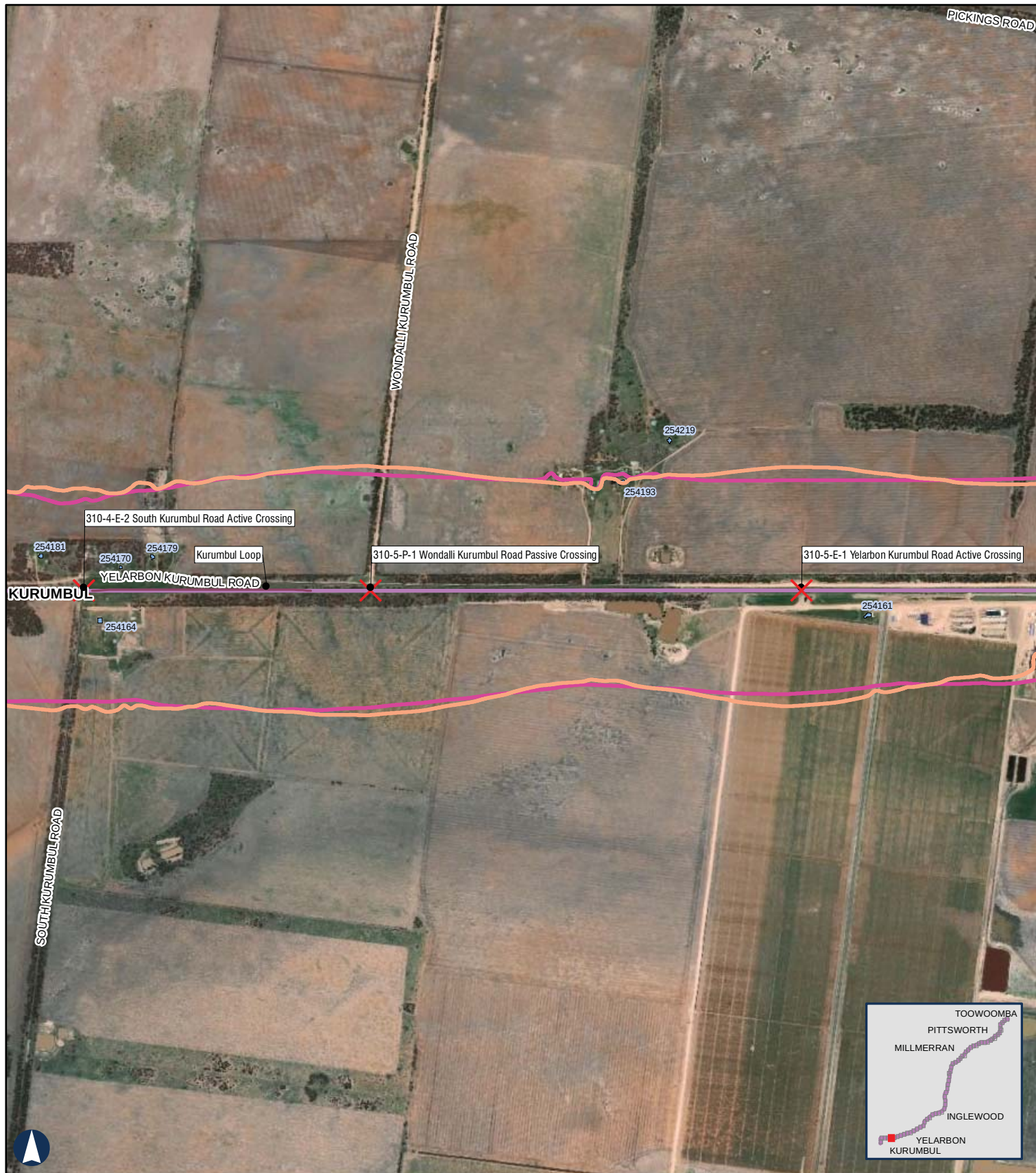
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 5 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

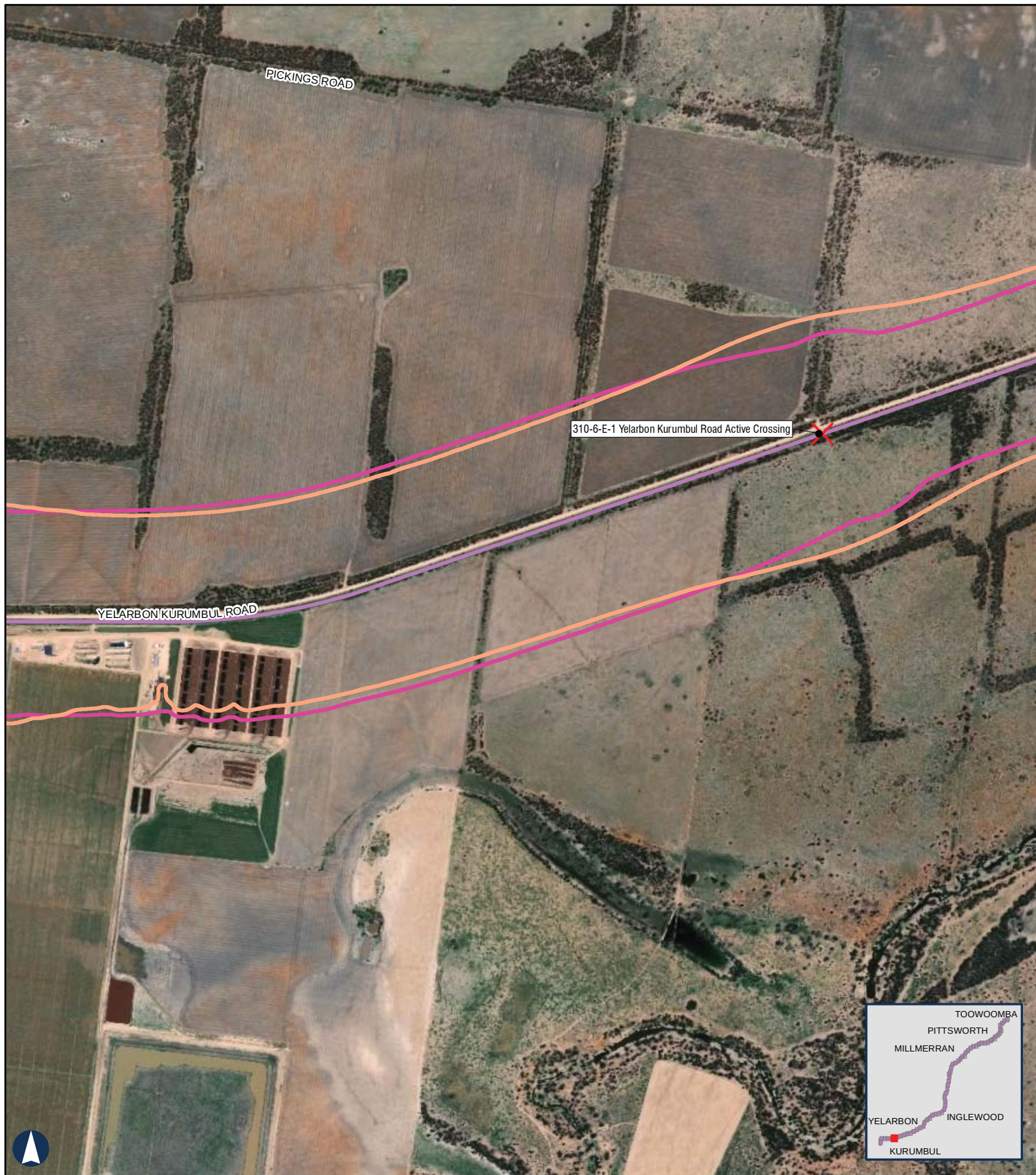
- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC *InlandRail*

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 6 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

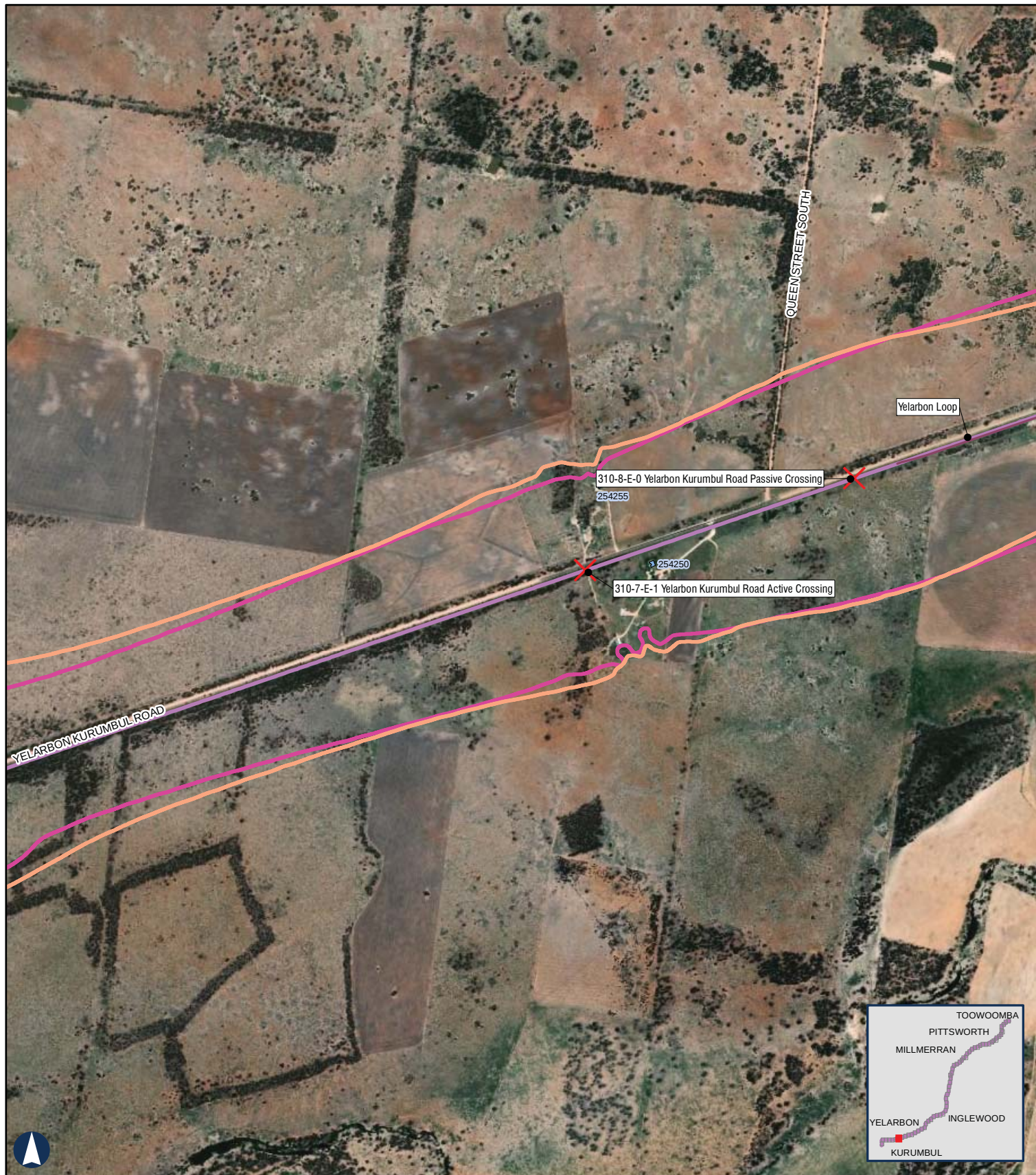
— Night-time noise criteria LA max 80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC *InlandRail*

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 7 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

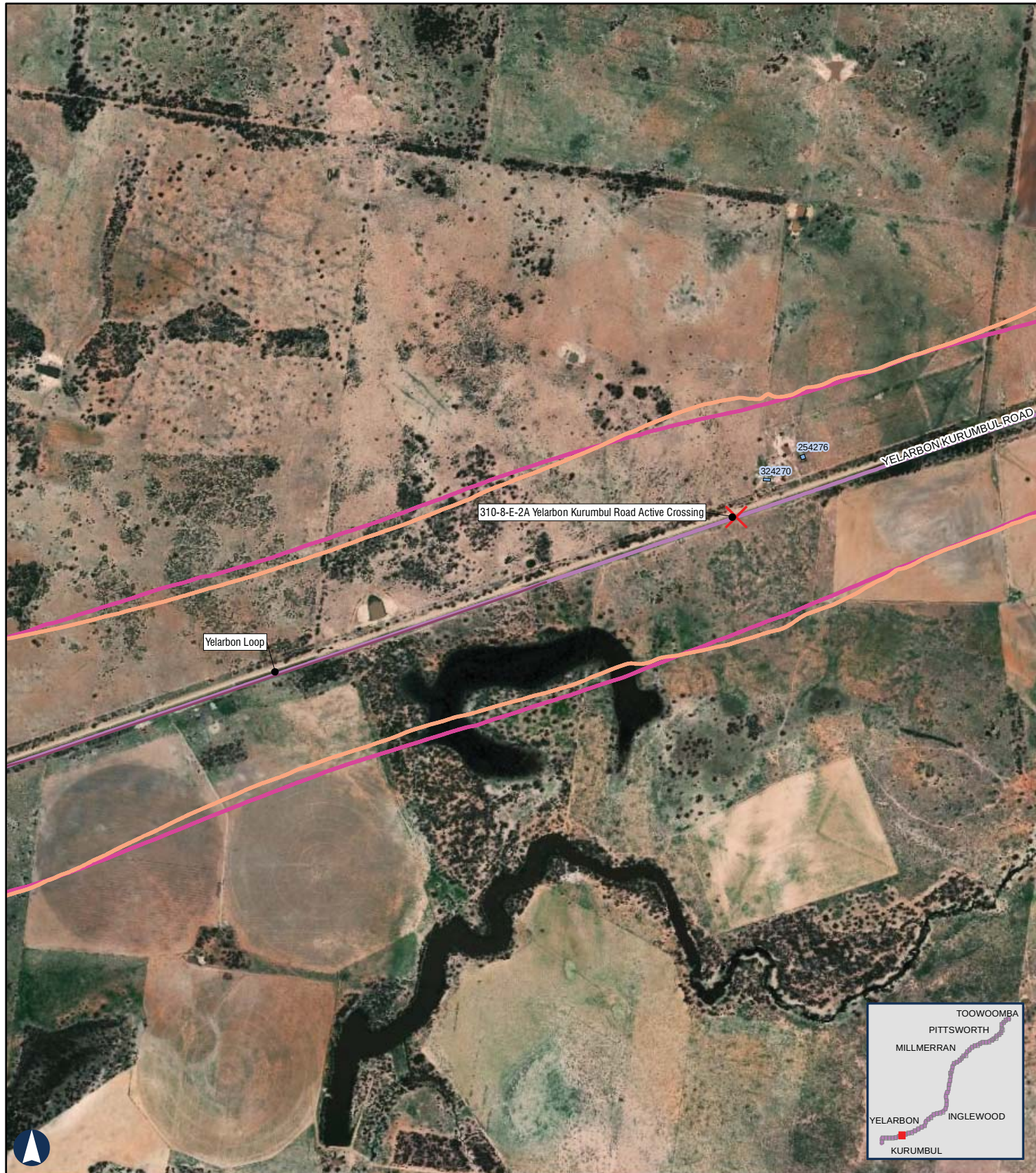
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 8 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

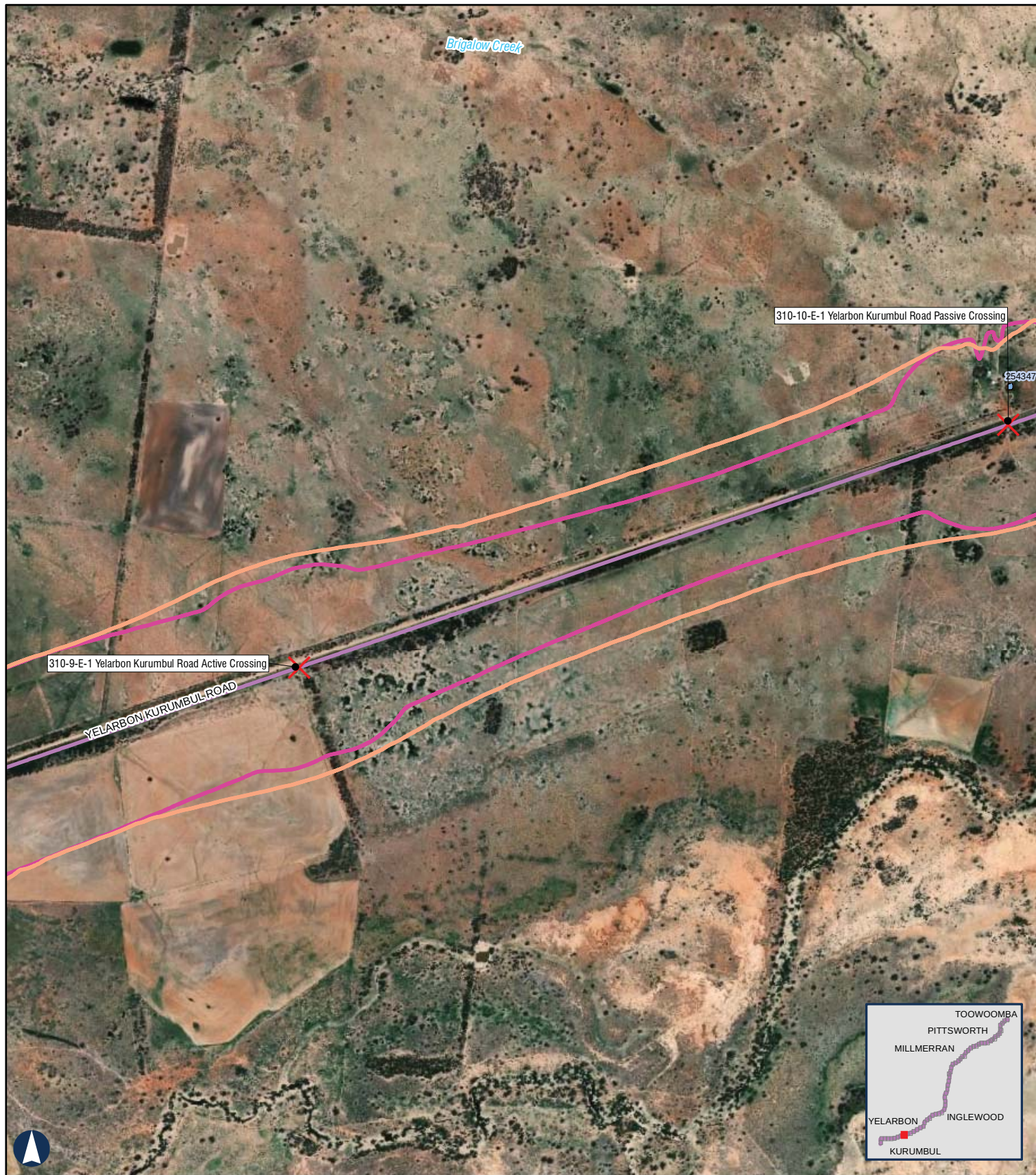
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 9 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

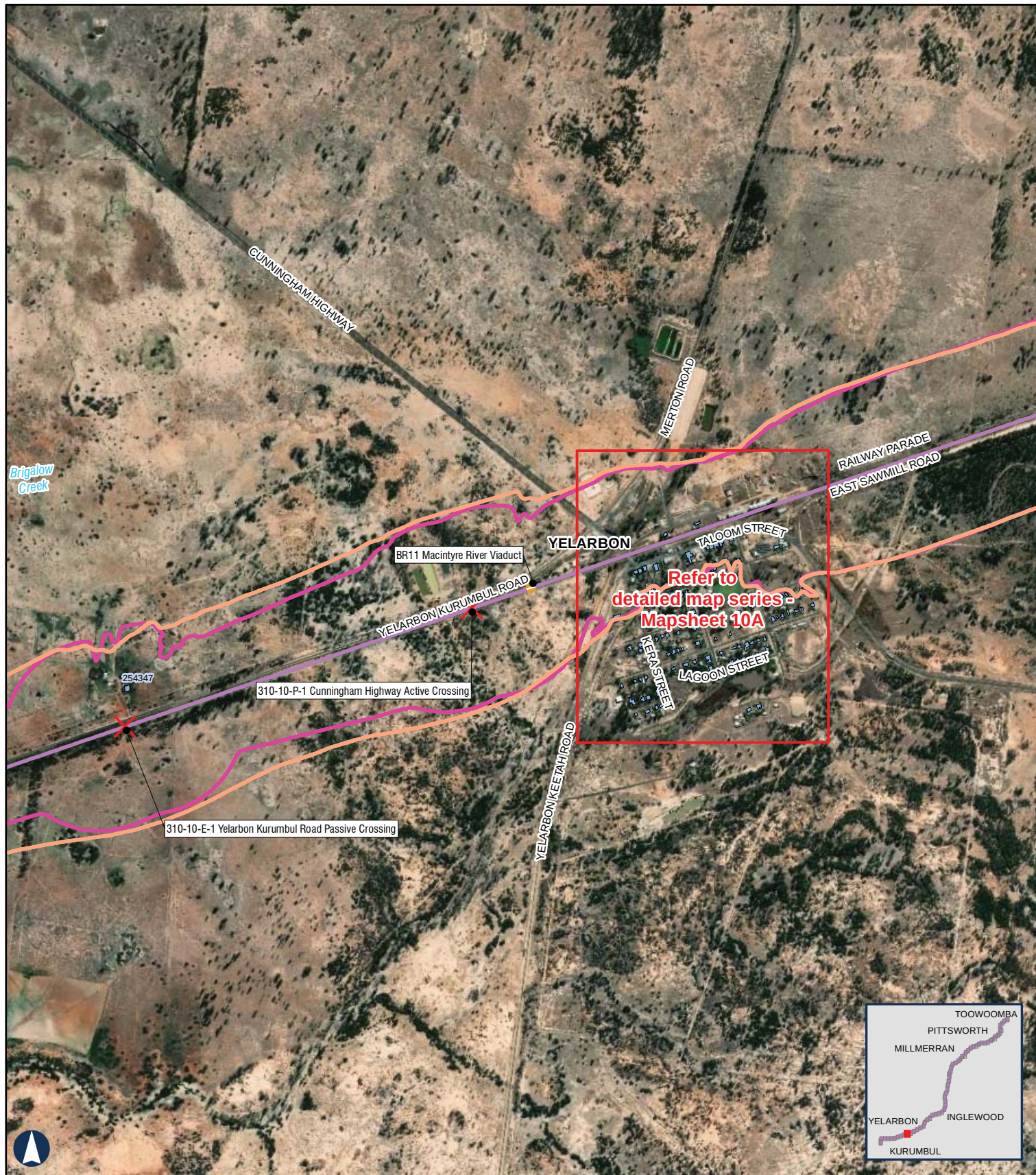
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 10 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels - Detailed

APPENDIX E - Mapsheet 10A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:5,500

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

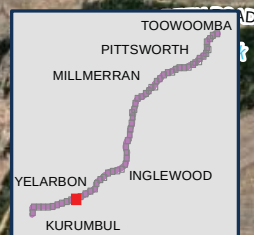
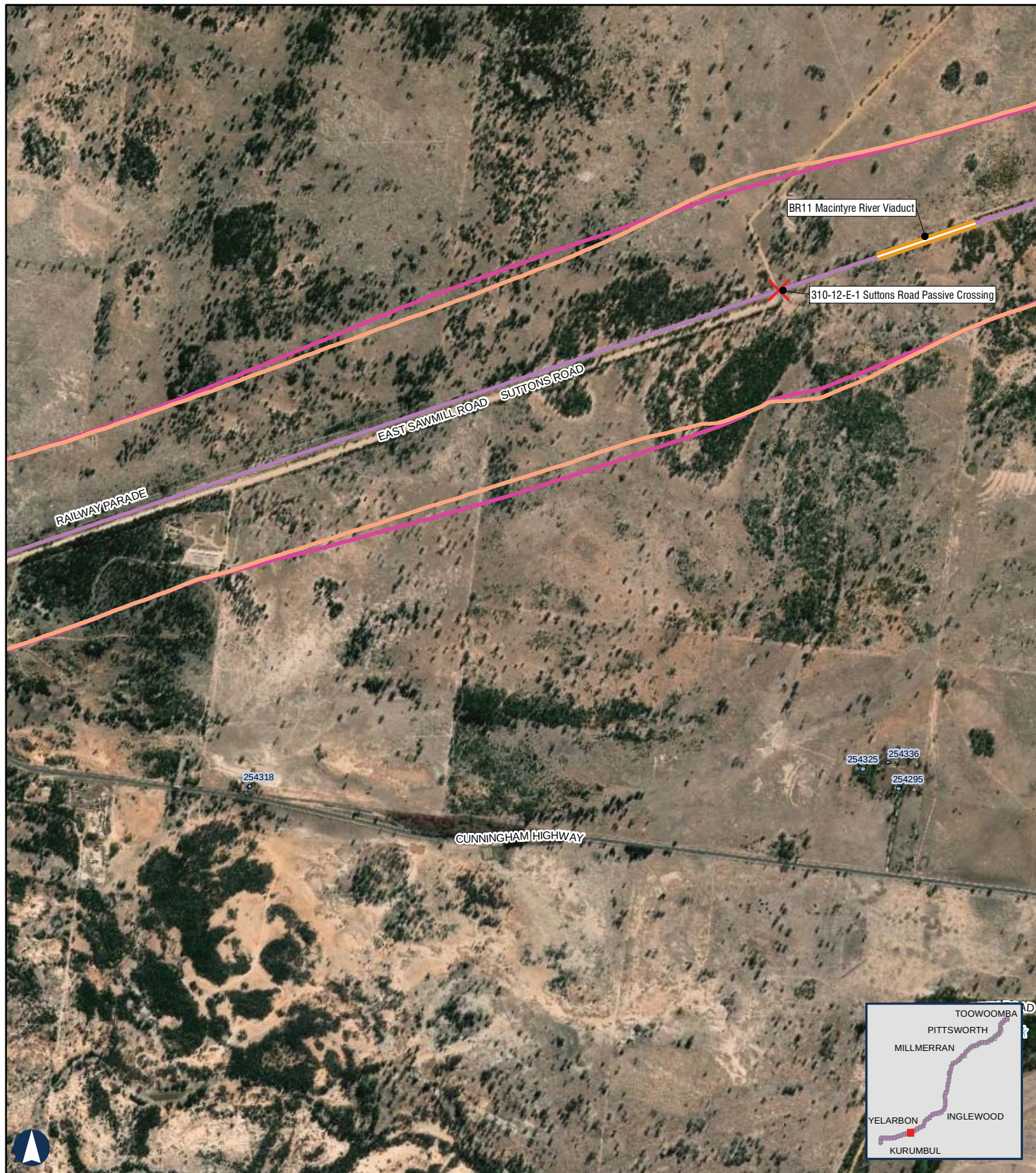
Noise contours are based on a set distance above the local terrain level of 2.4m.

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LAeq9hr 60dBA upgrading existing rail



ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 11 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

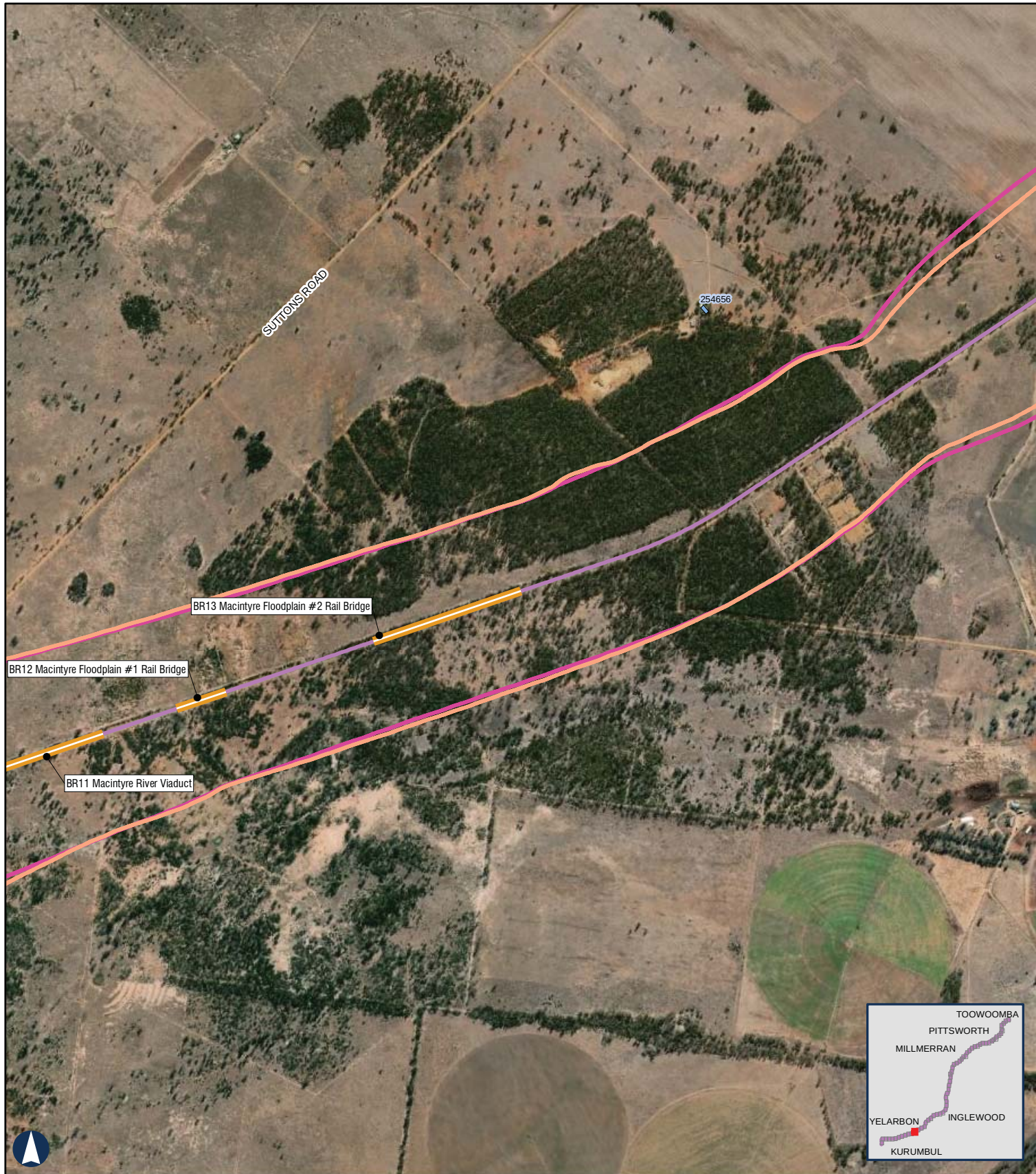
Paper: A4 Scale: 1:20,000

Date: 08-May-2020
Author: JG

Noise contours are based on a set distance
above the local terrain level of 2.4m.

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 12 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

— Night-time noise criteria LA max
80dBA new rail corridor

Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 13 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

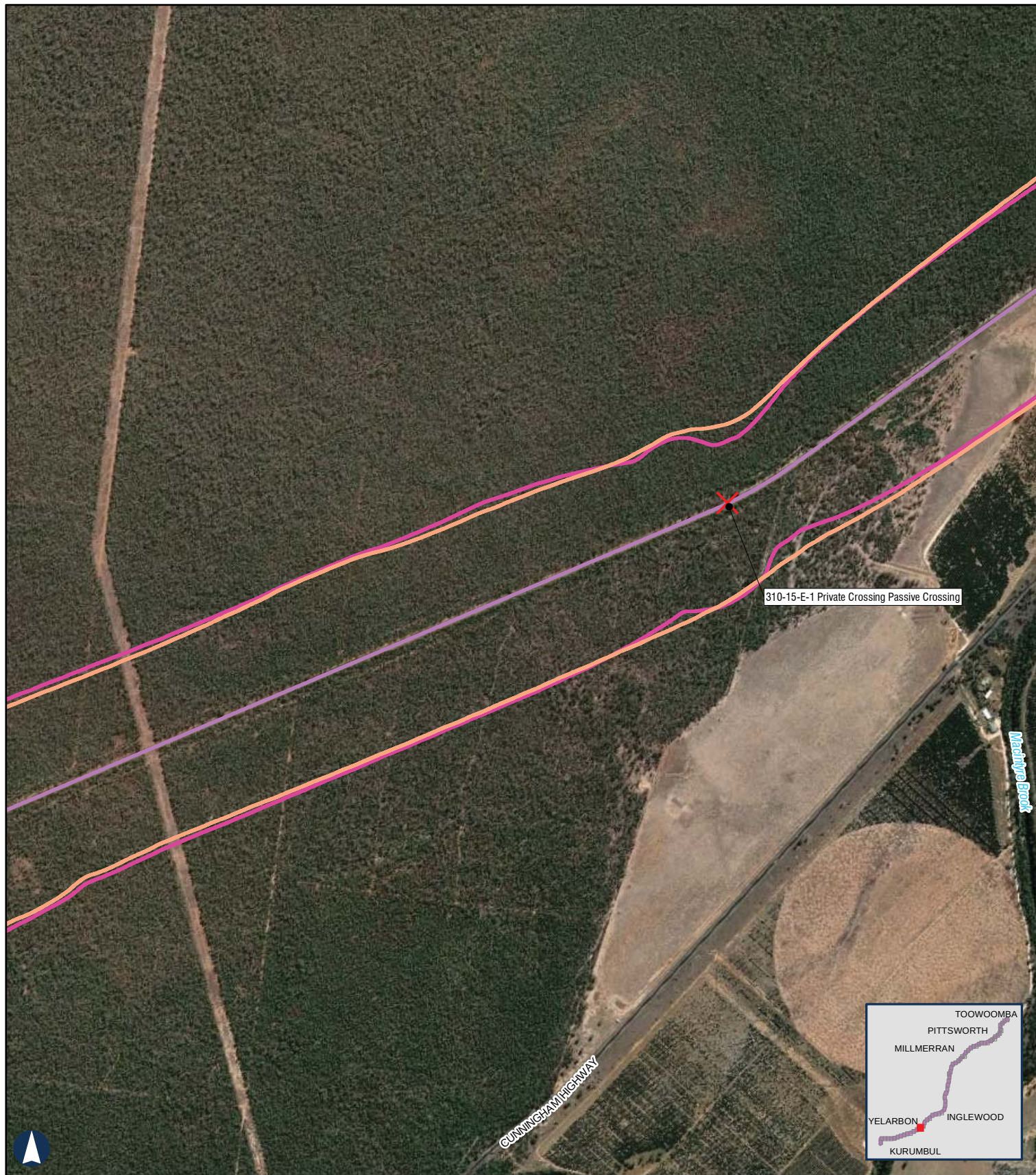
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 14 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

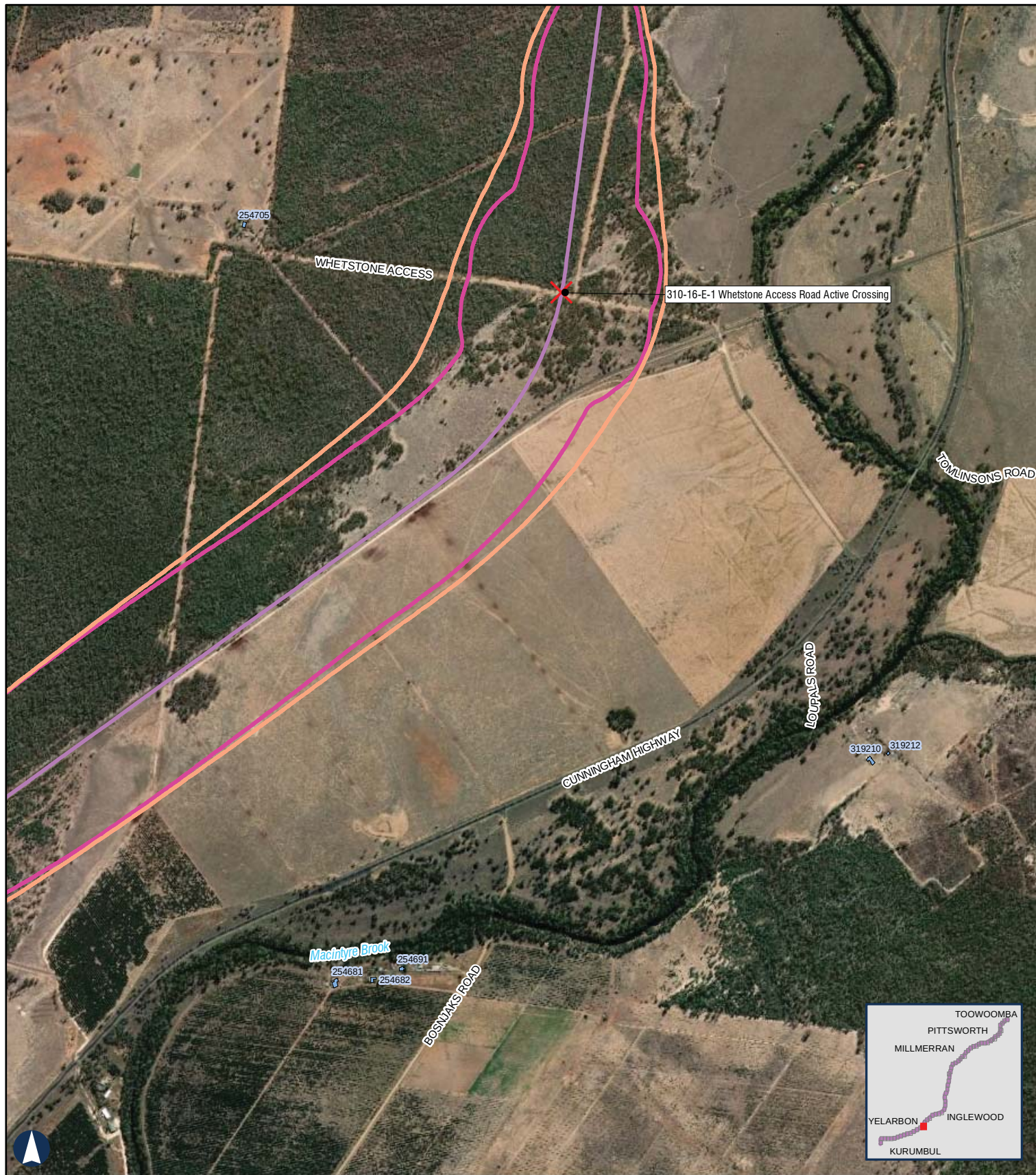
- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 15 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

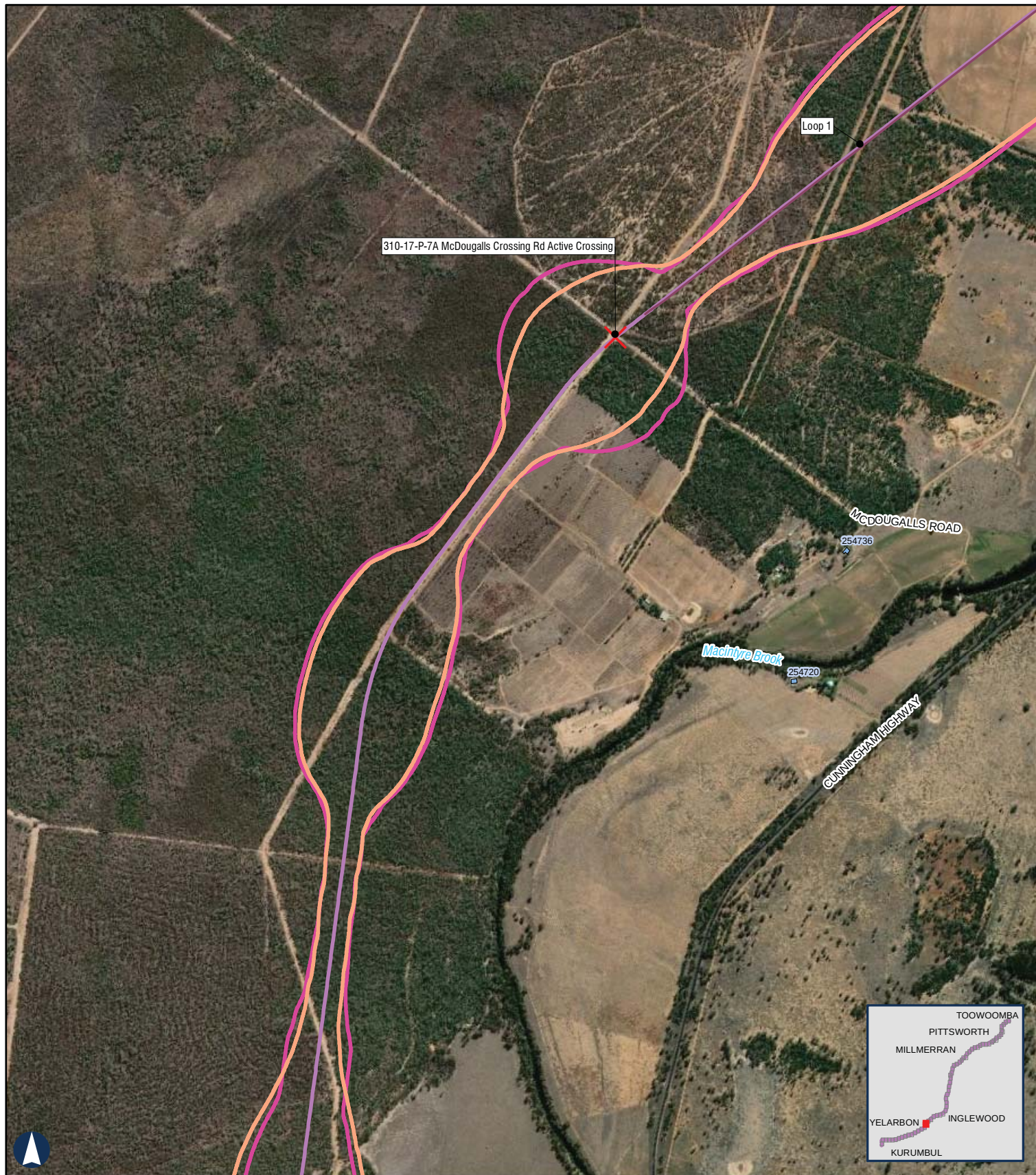
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 16 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

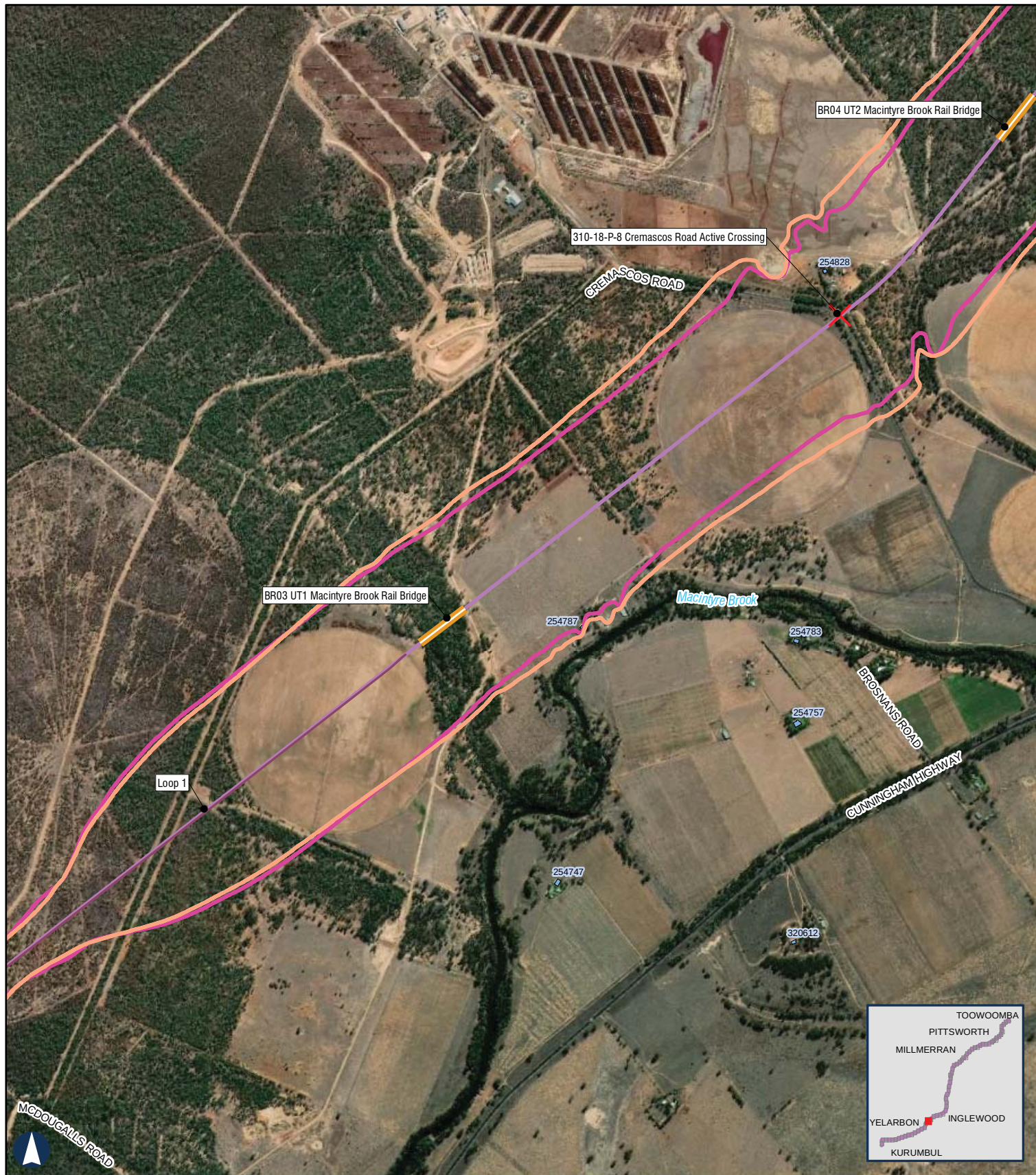
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 17 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

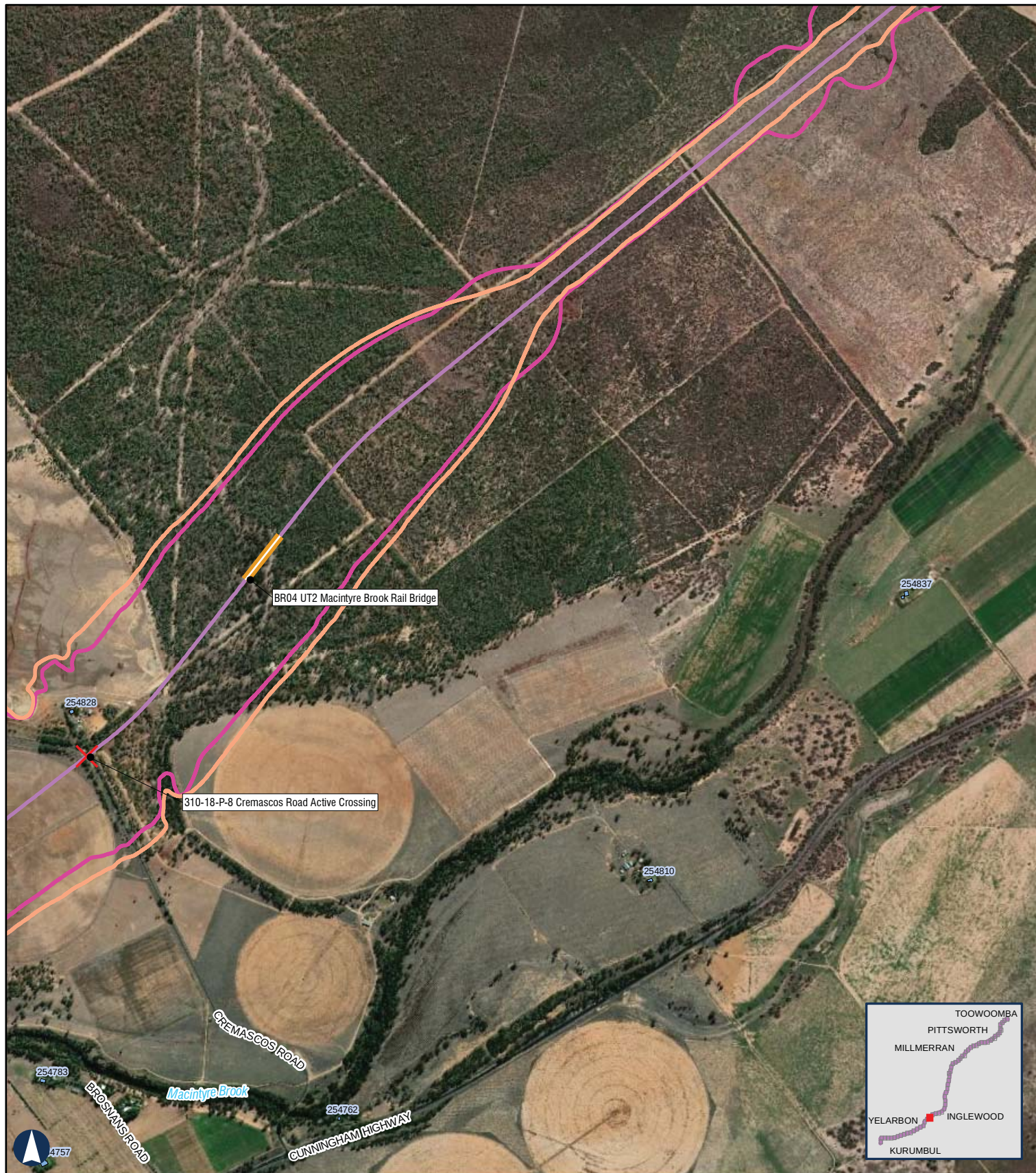
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 18 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

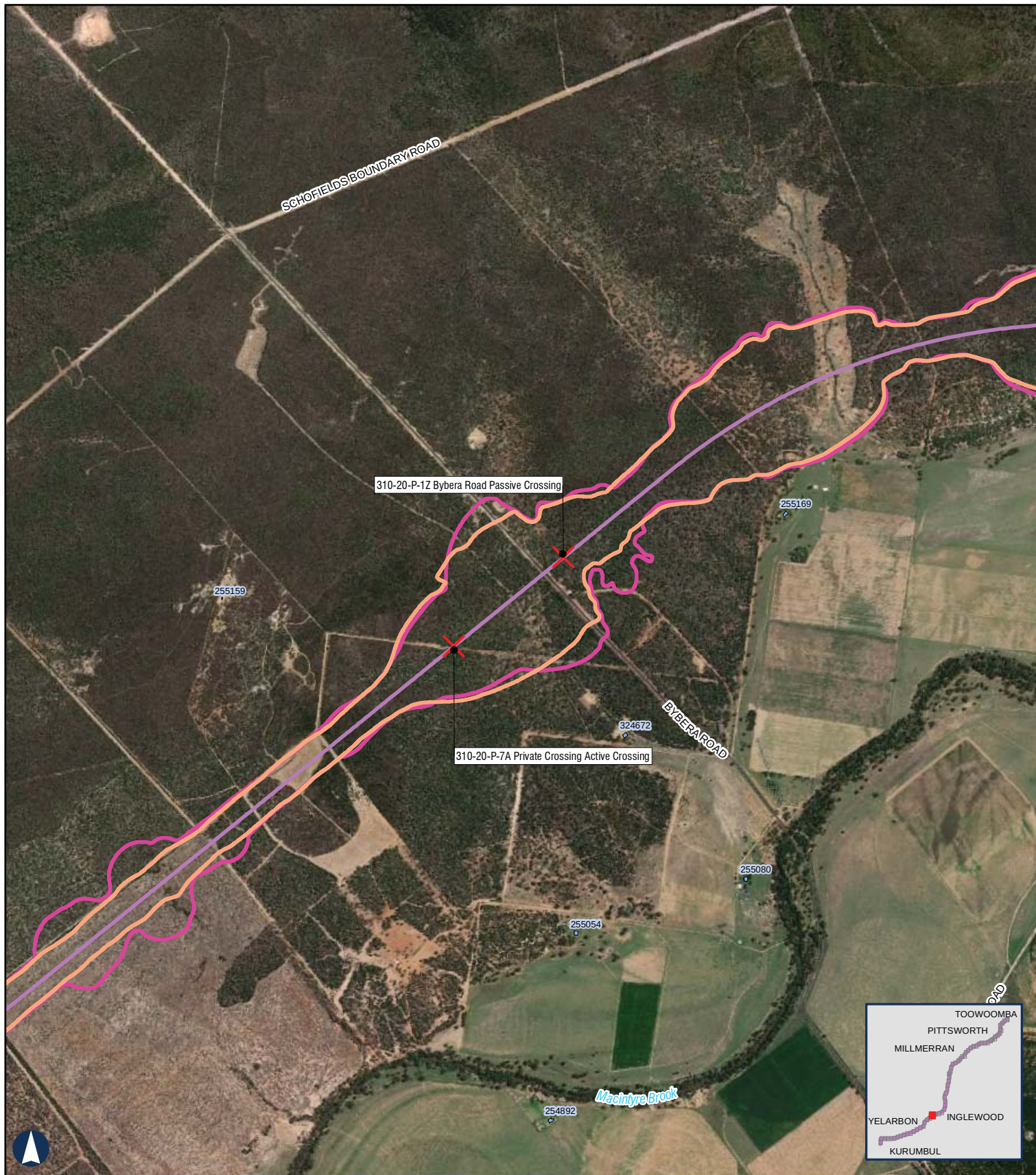
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 19 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

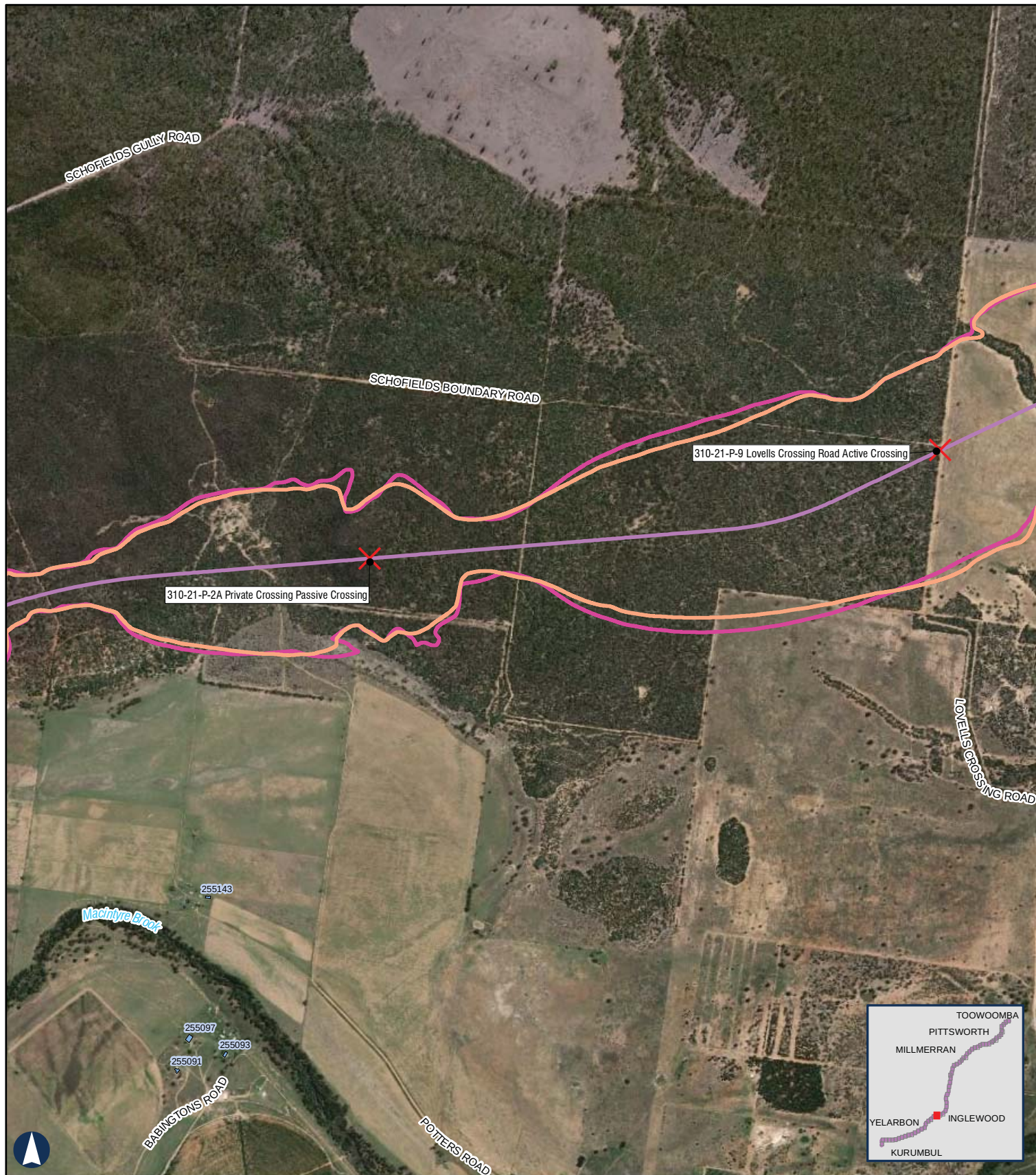
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 20 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

— Night-time noise criteria LA max
80dBA new rail corridor

● Receptors

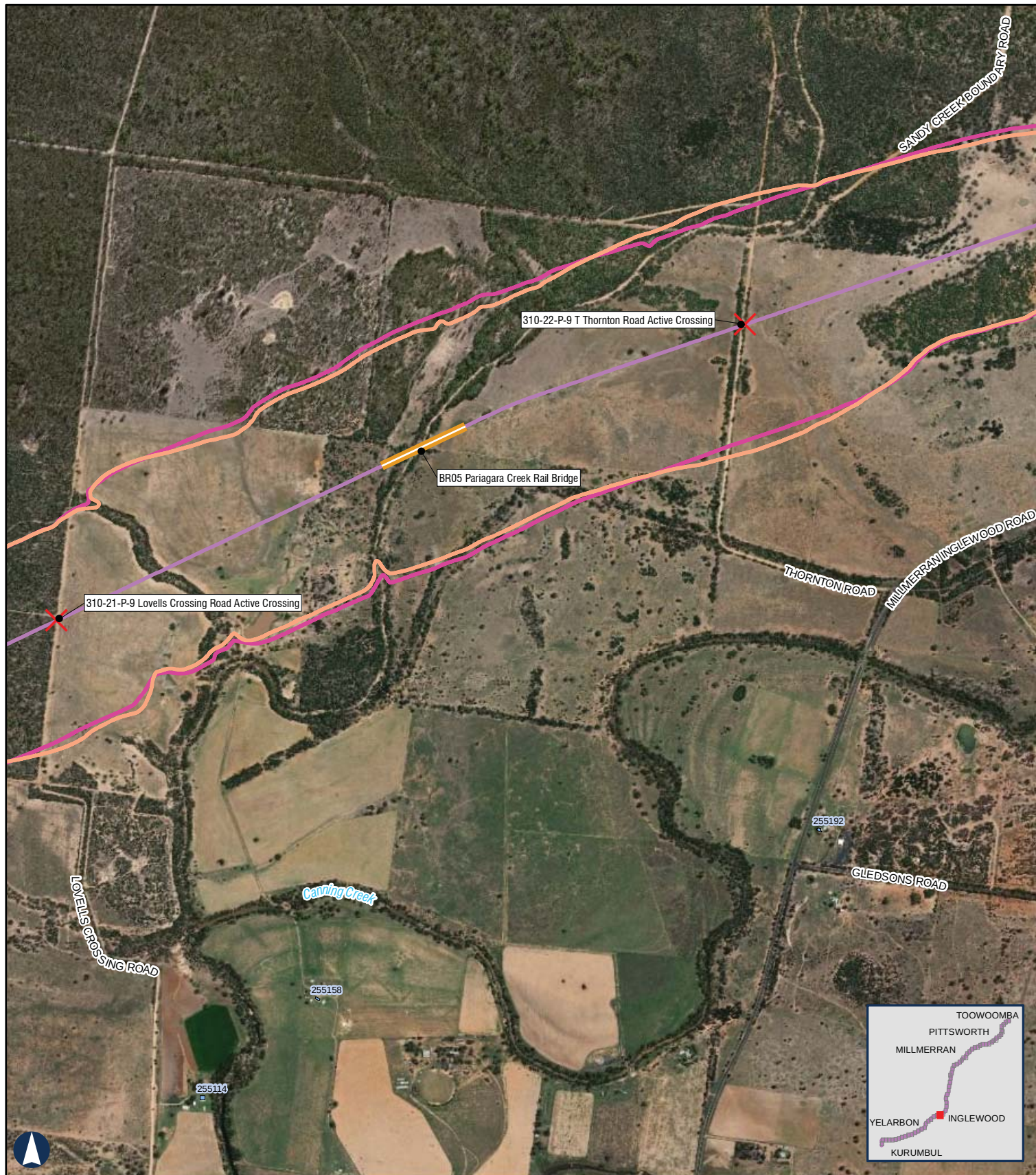
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

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ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 21 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

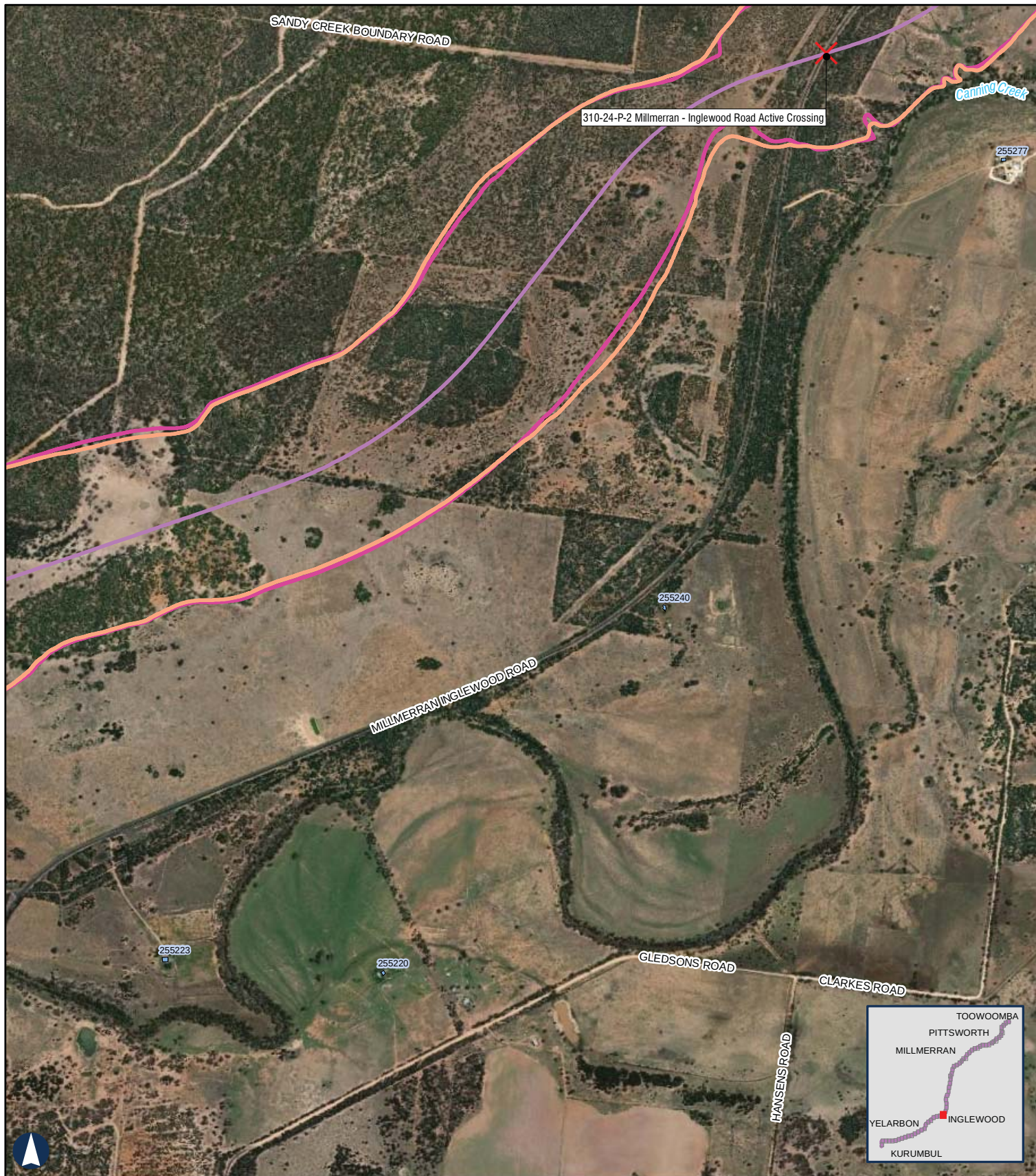
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 22 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

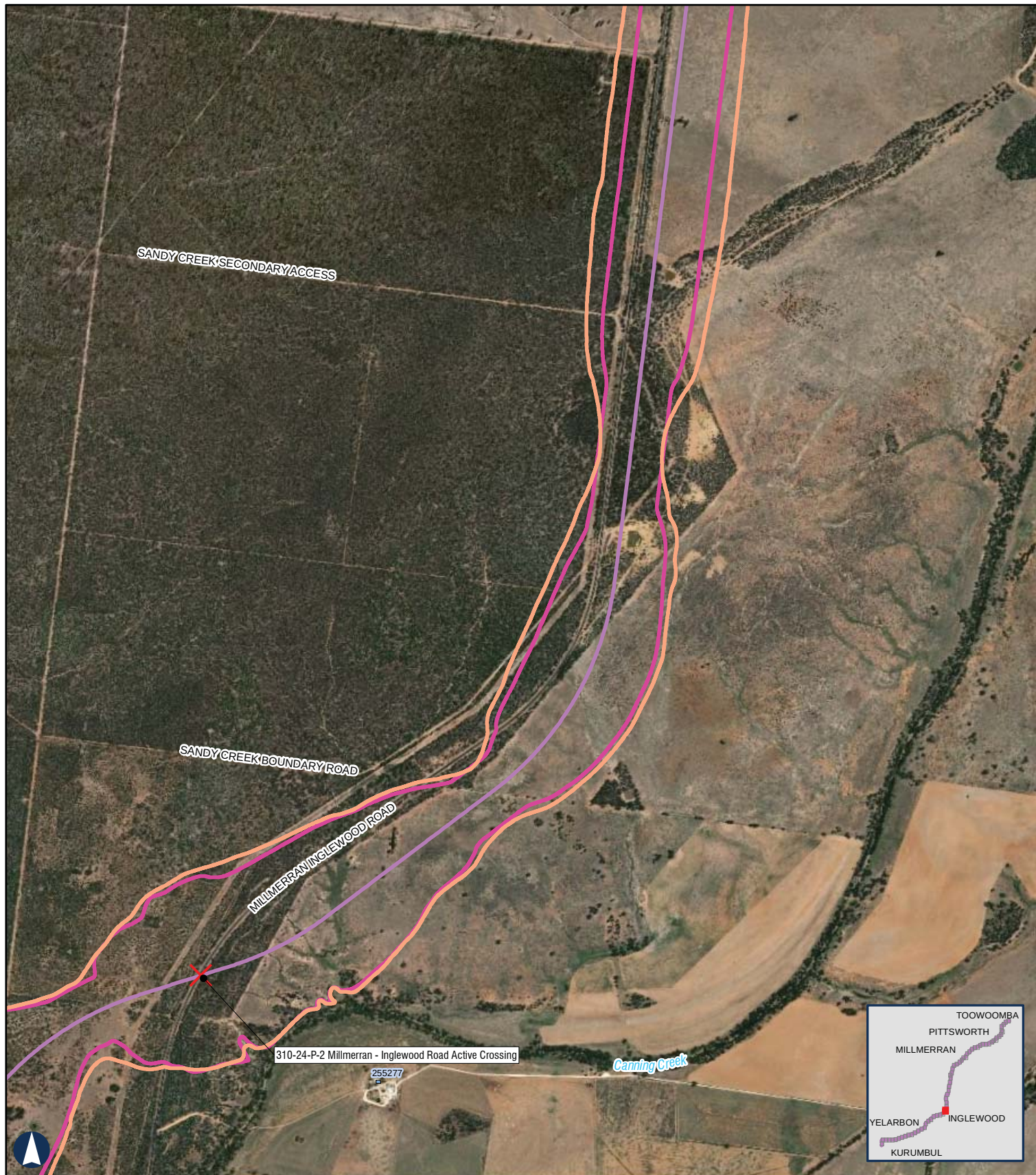
— Night-time noise criteria LA max
80dBA new rail corridor

● Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 23 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

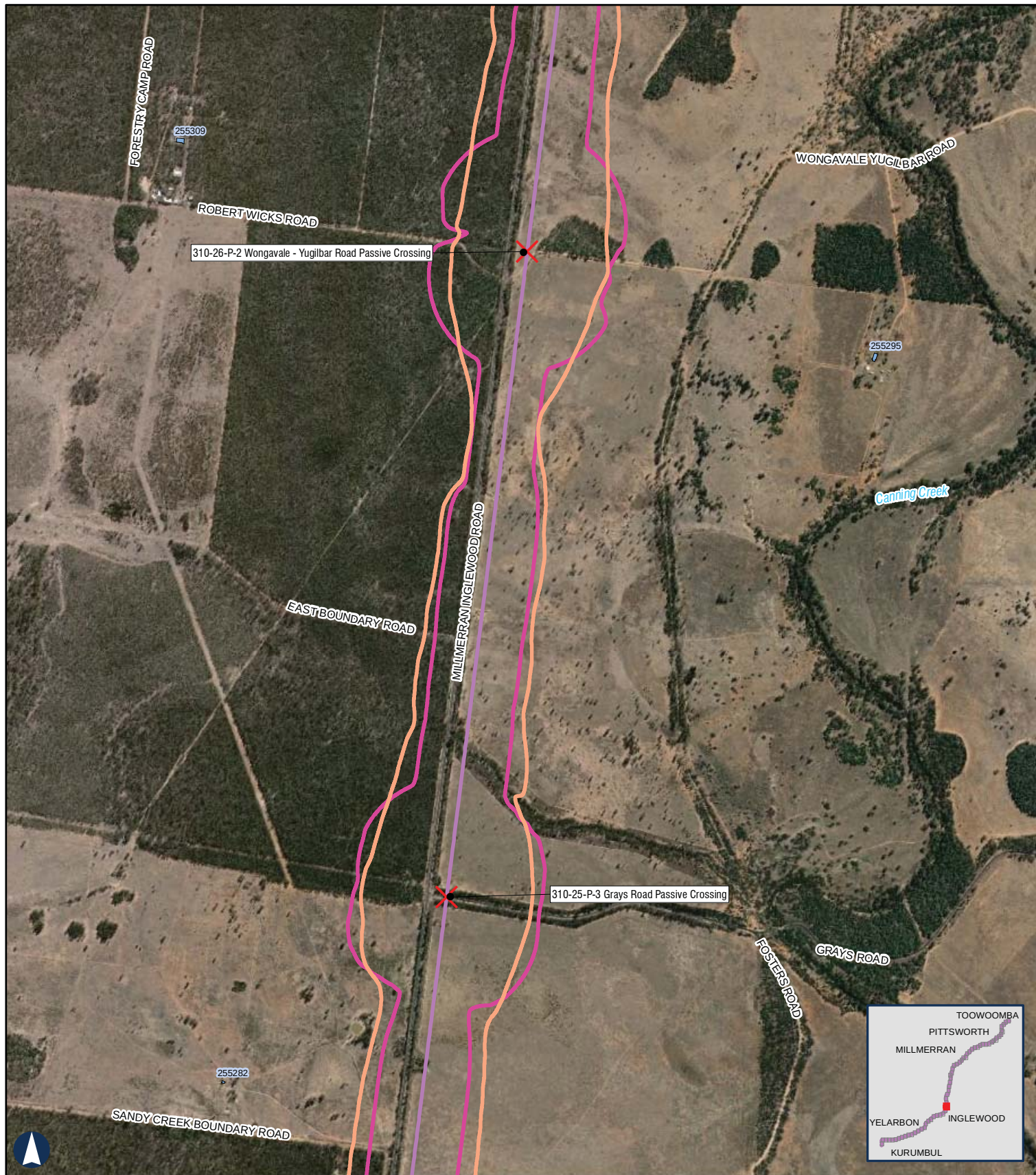
— Night-time noise criteria LA max 80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 24 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

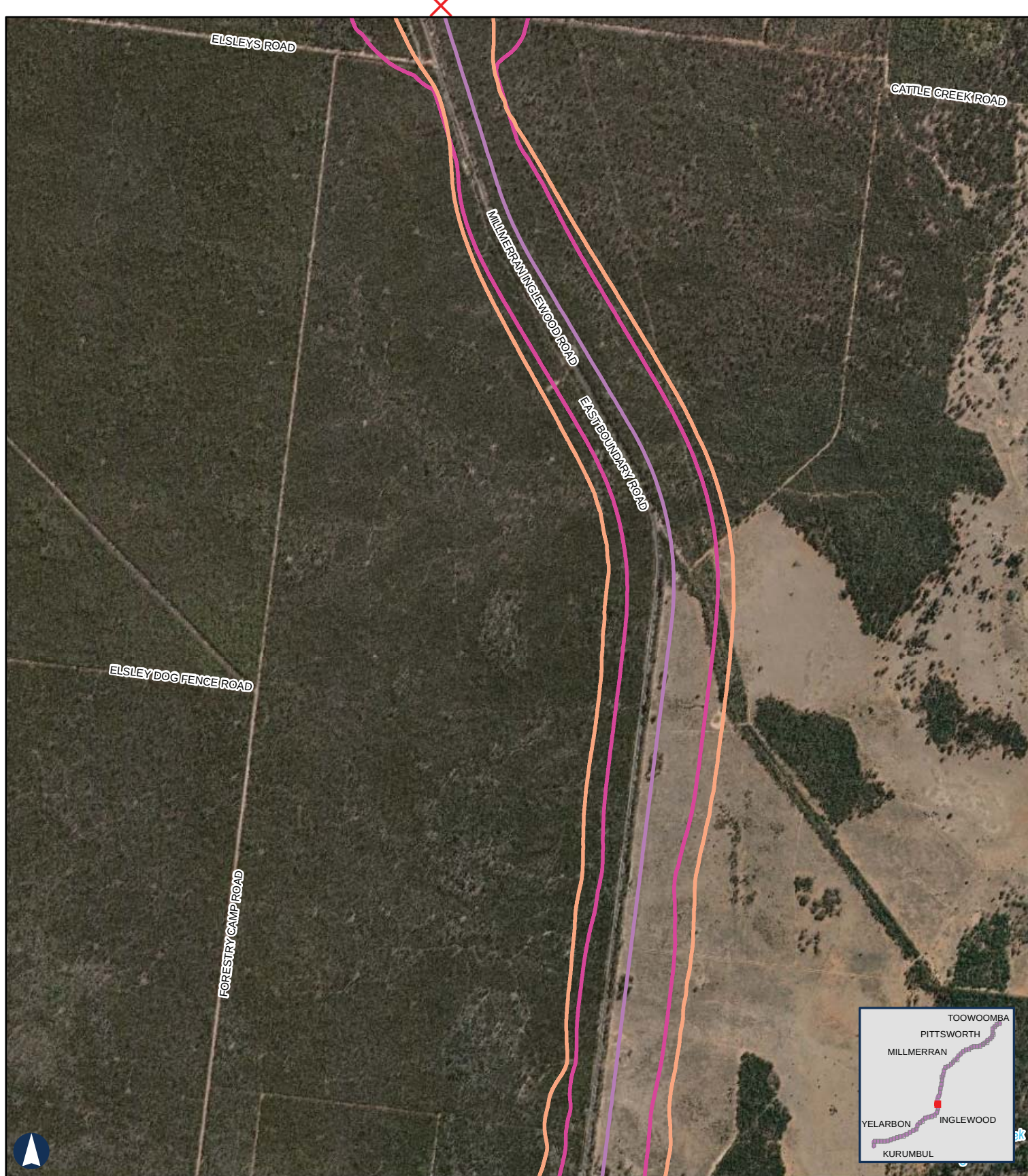
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 25 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

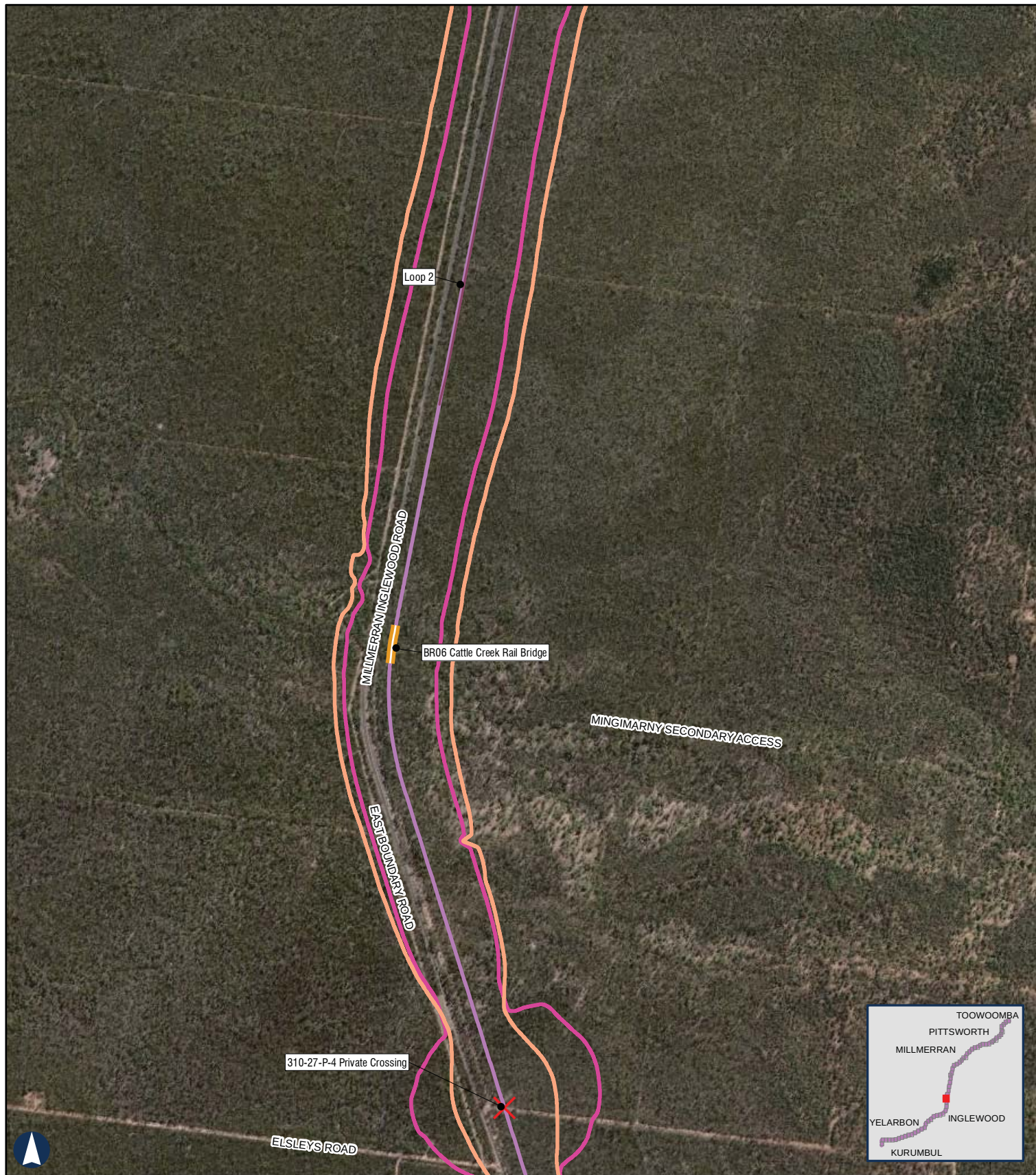
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 26 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

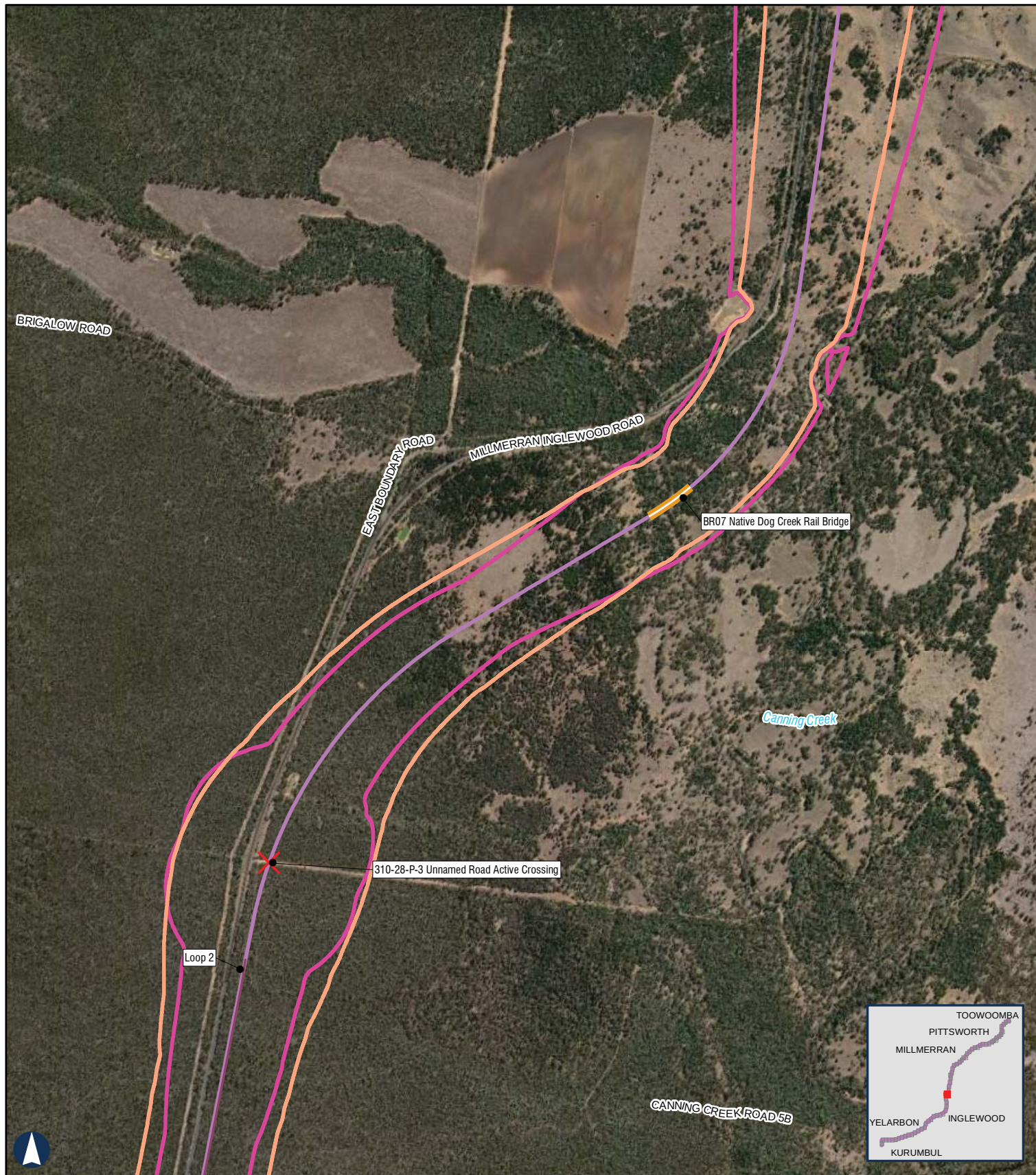
— Night-time noise criteria LA max
80dBA new rail corridor

— Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 27 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

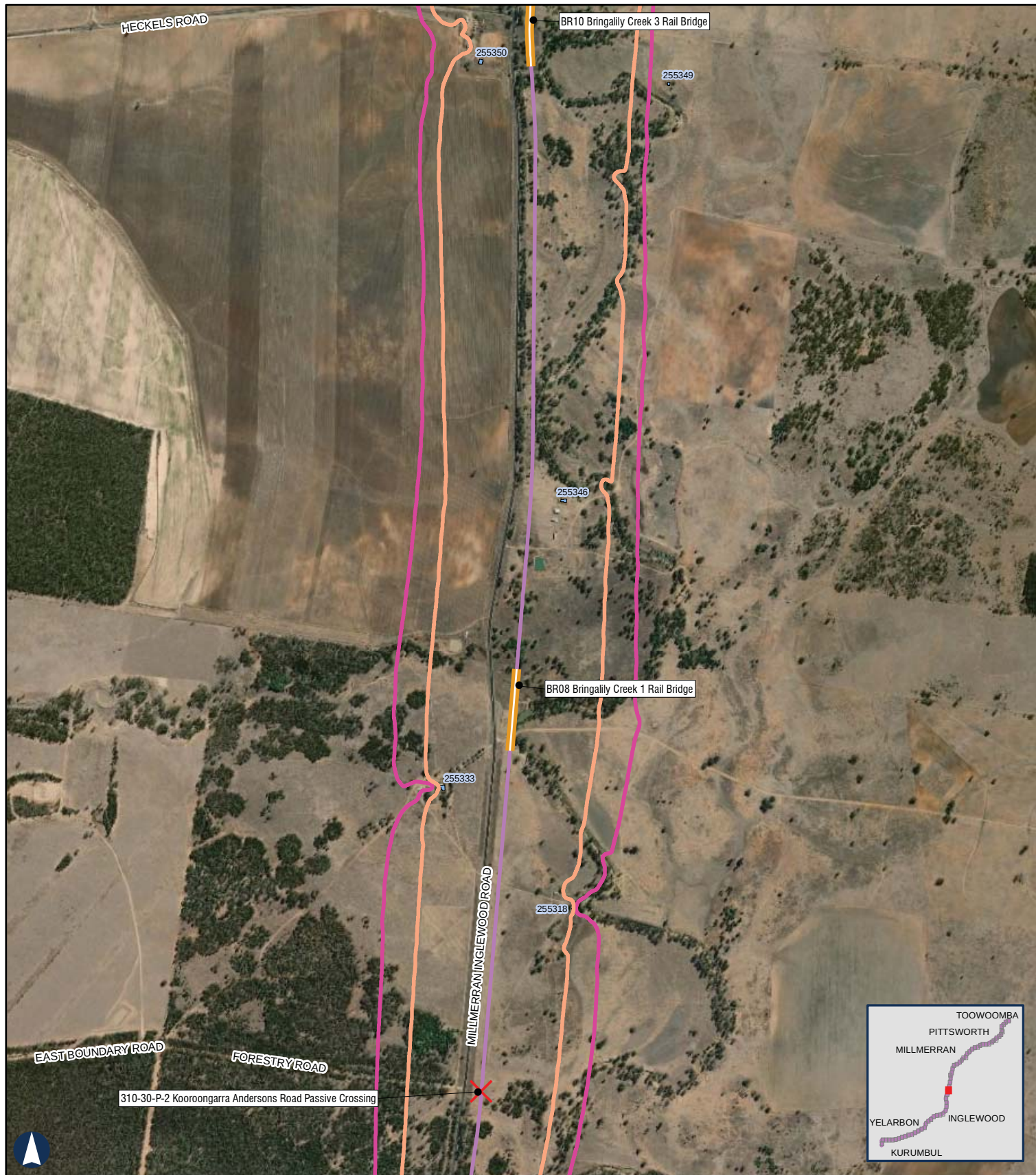
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 28 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

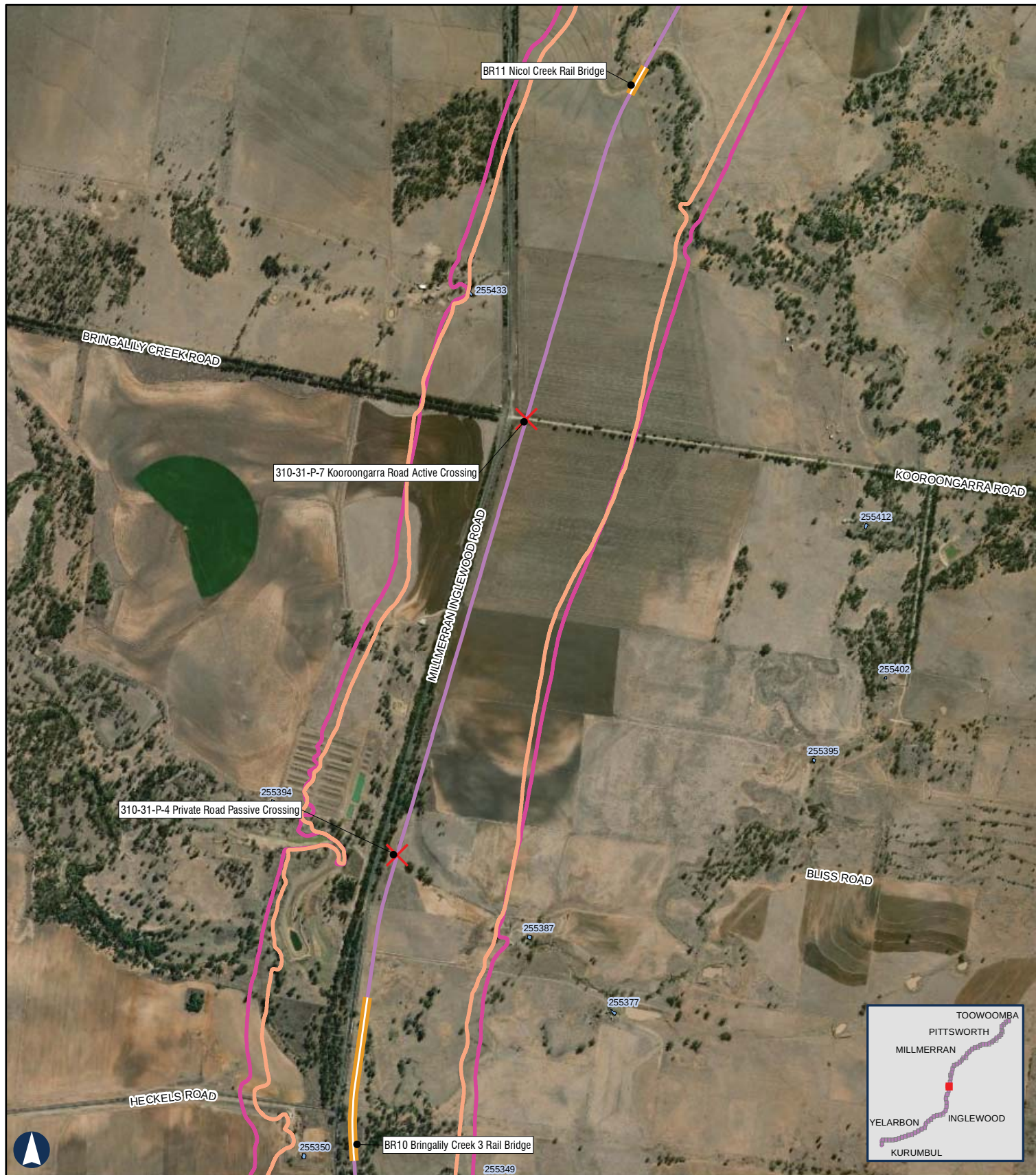
— Night-time noise criteria LA max 80dBA new rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC *InlandRail*

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 29 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

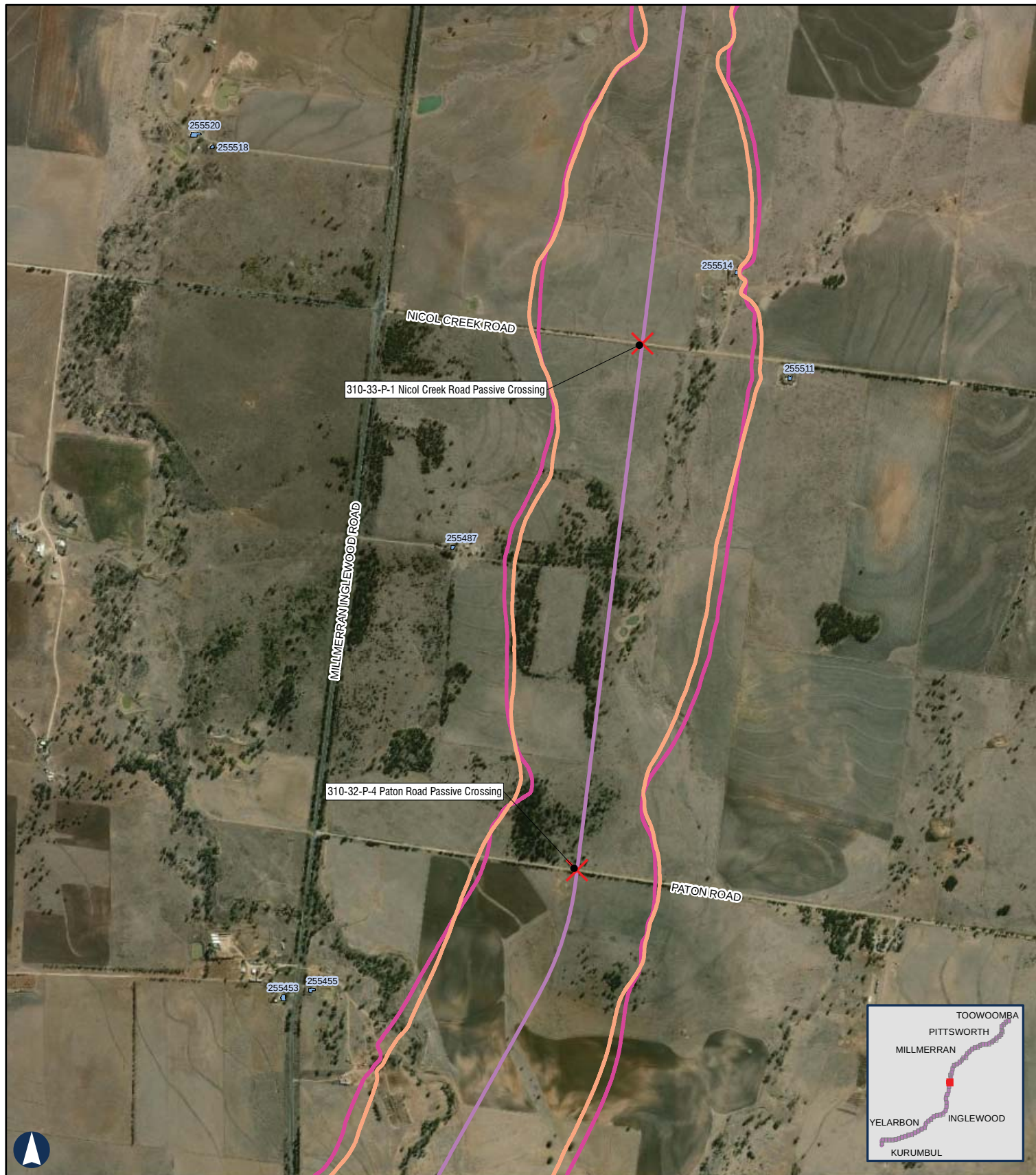
— Night-time noise criteria LA max 80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 30 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

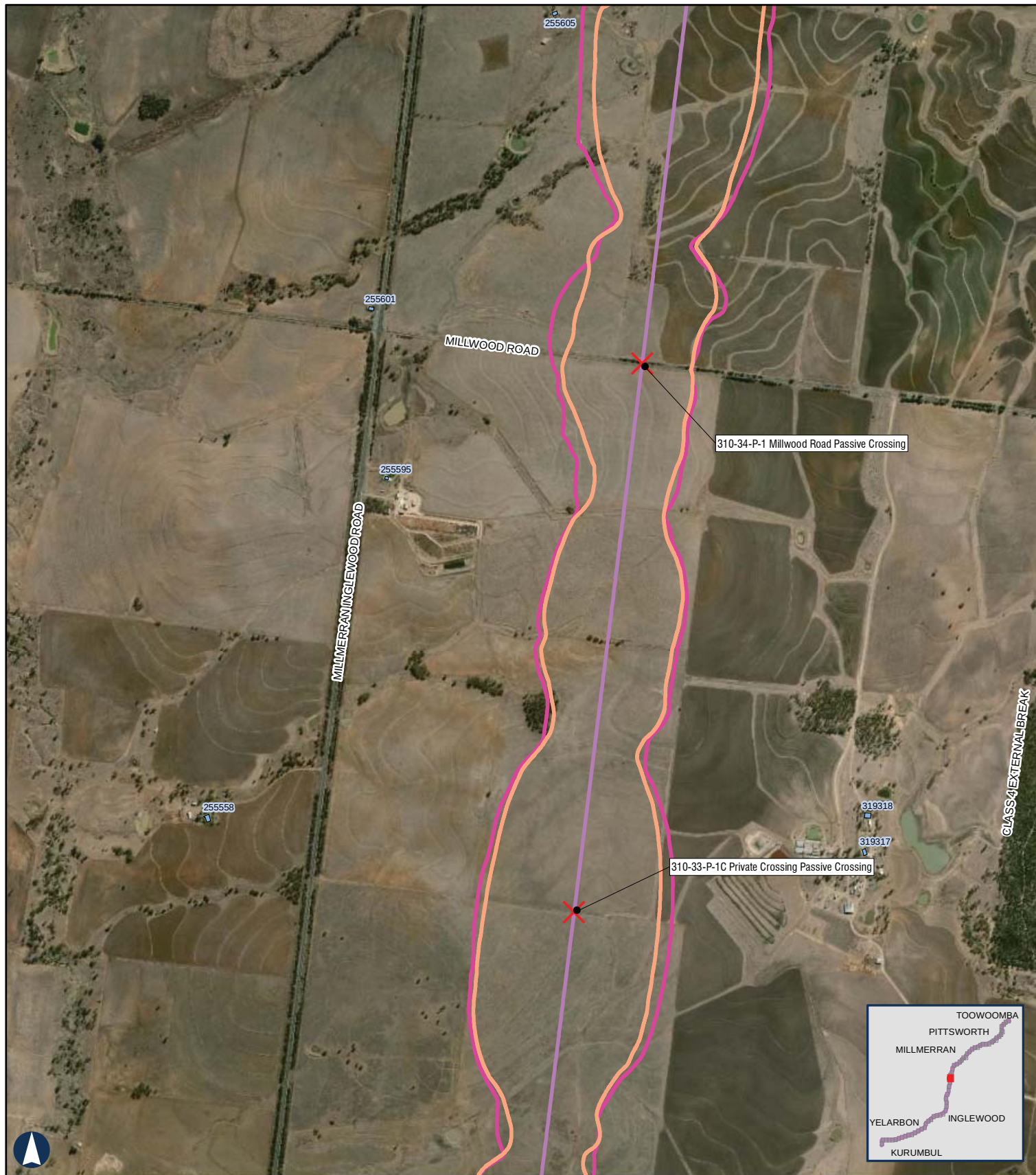
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 31 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Scale: 1:20,000

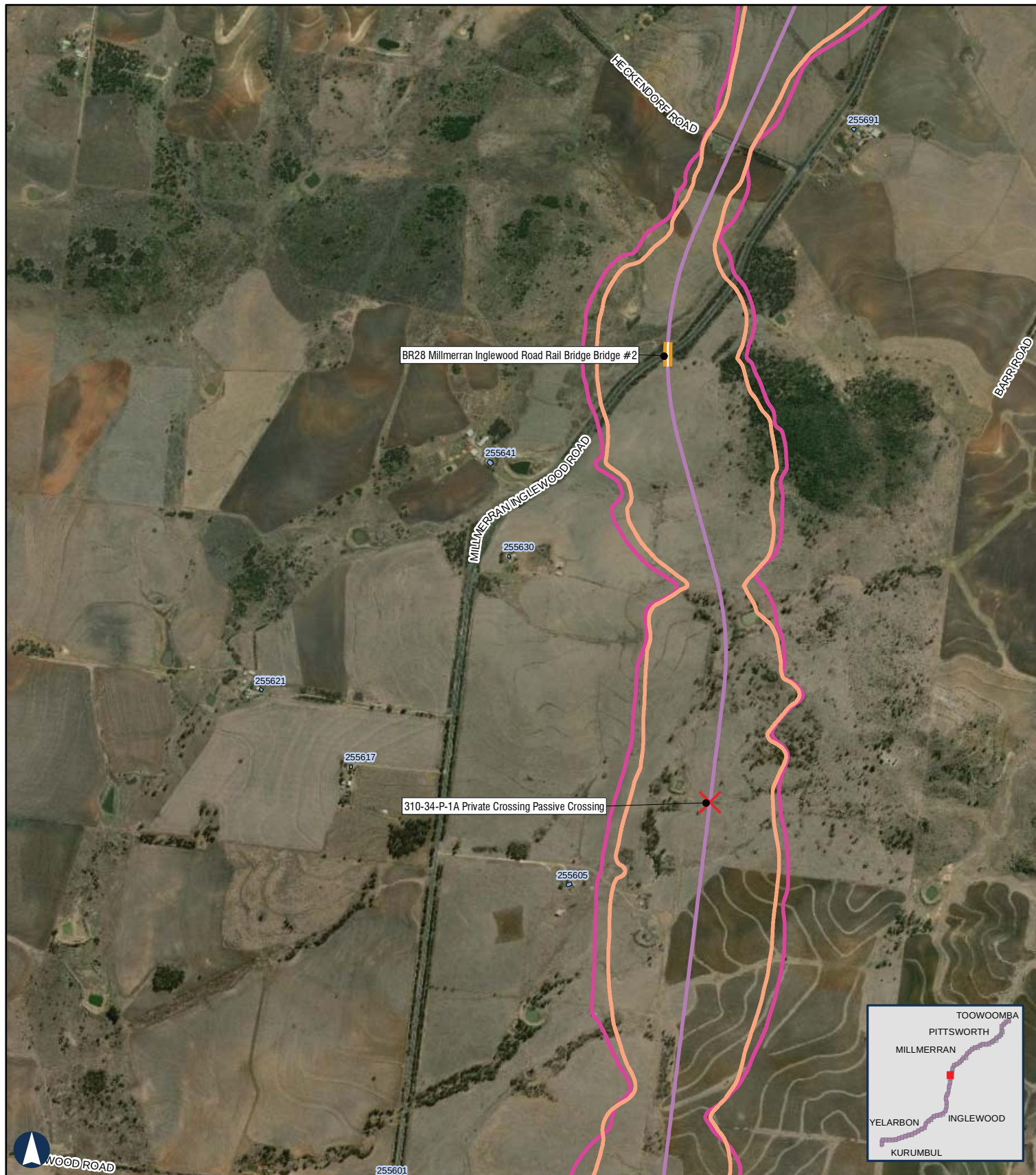
- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 32 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

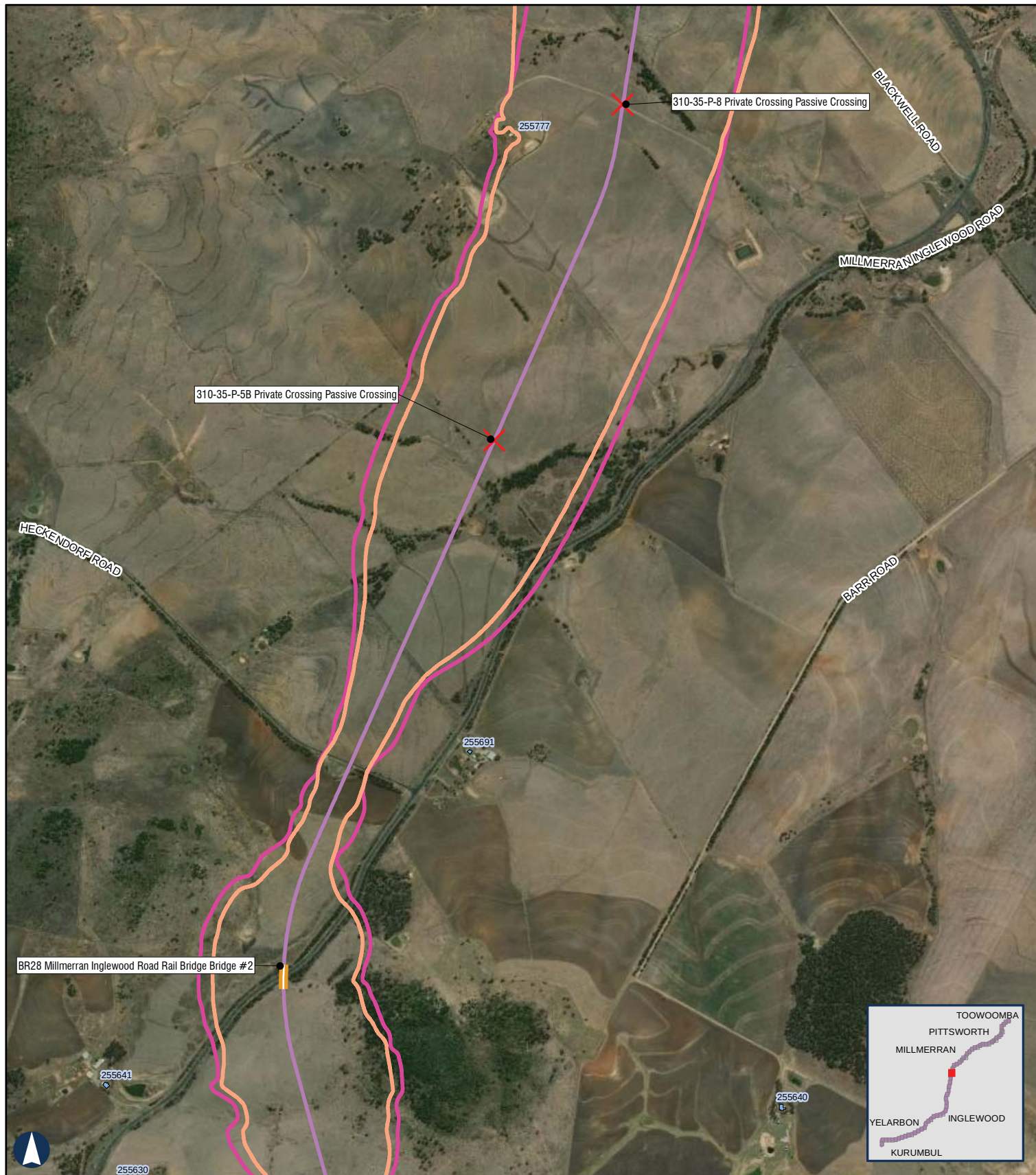
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 33 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

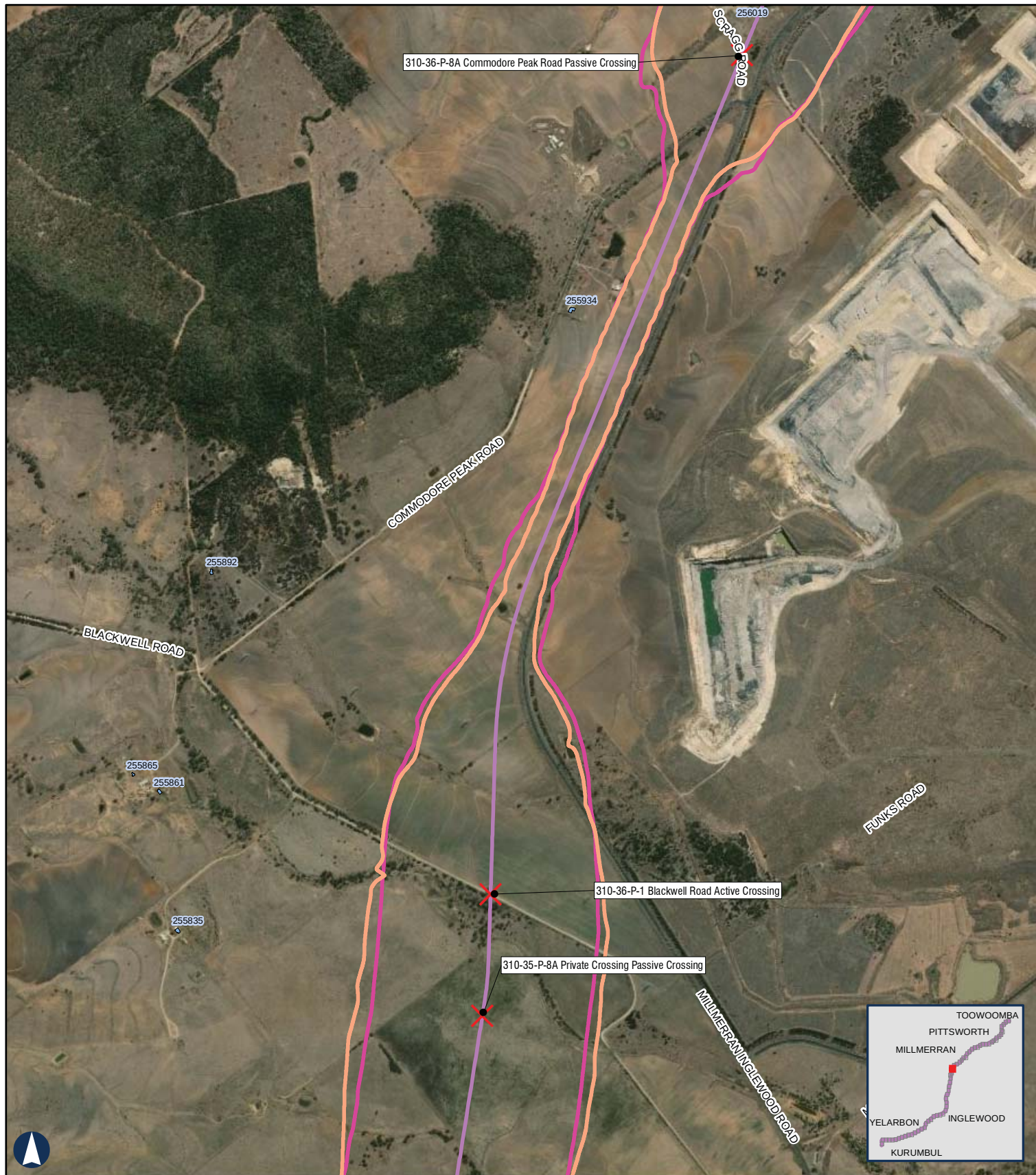
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 34 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Author: JG

Scale: 1:20,000

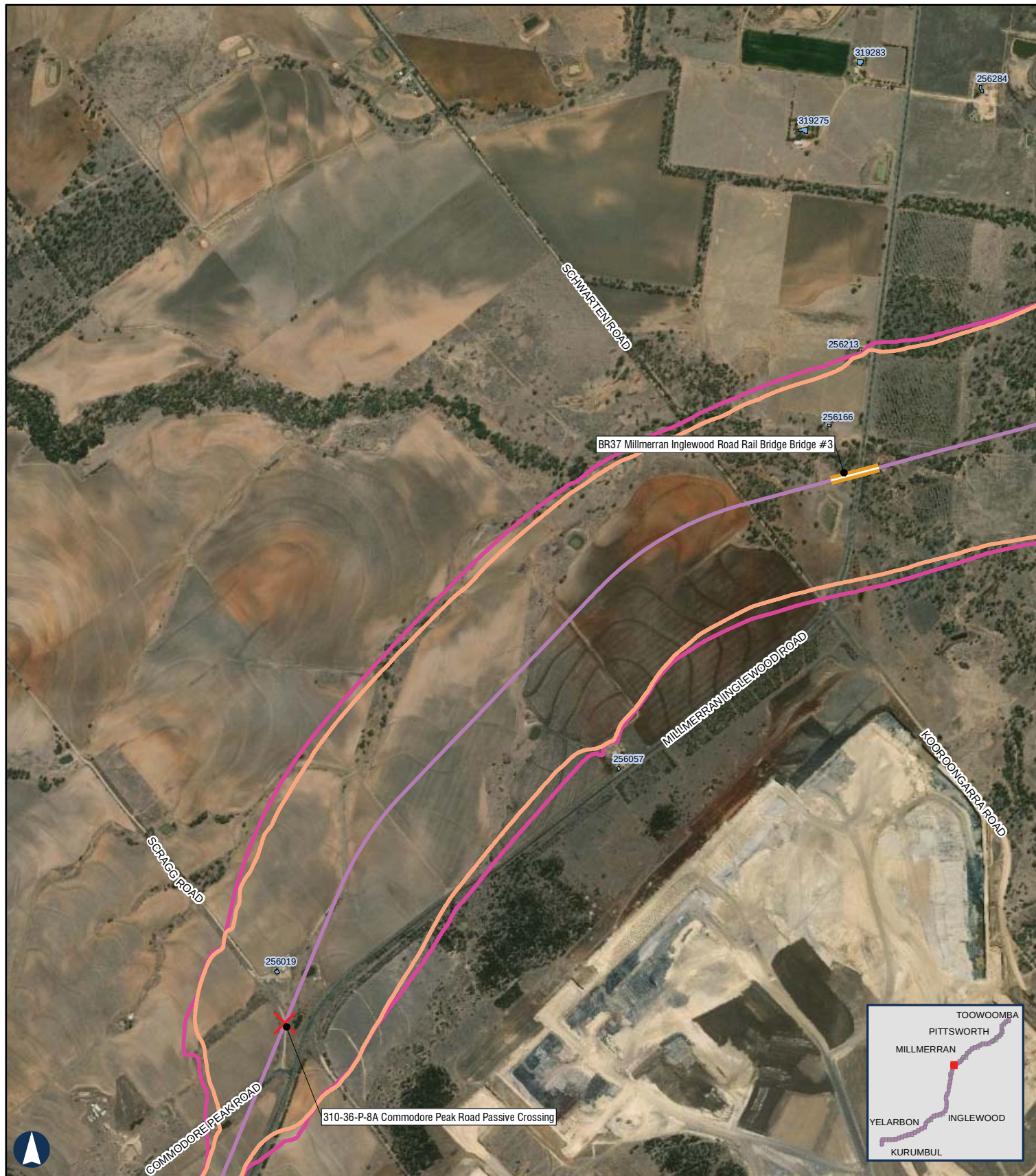
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 35 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

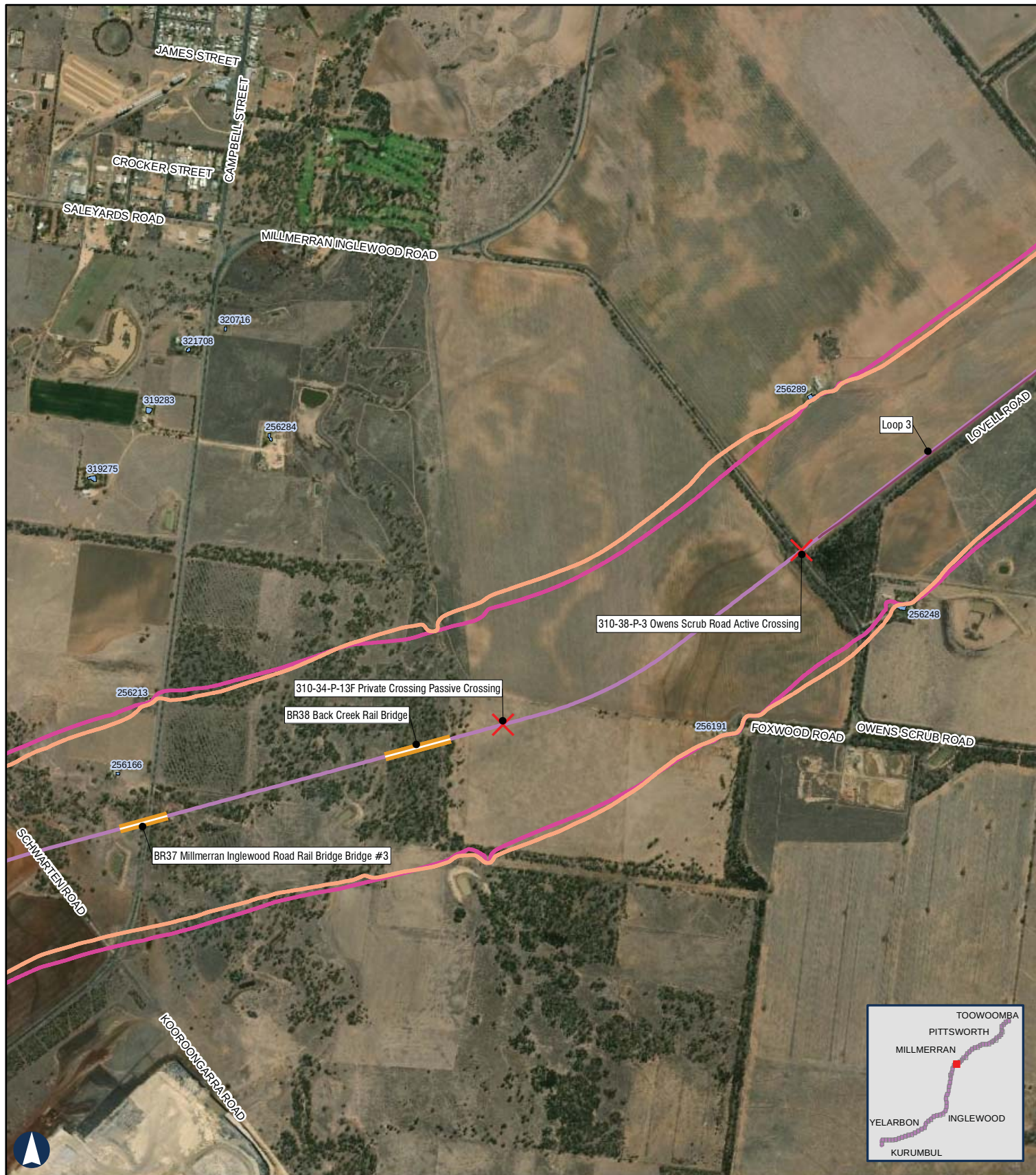
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 36 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

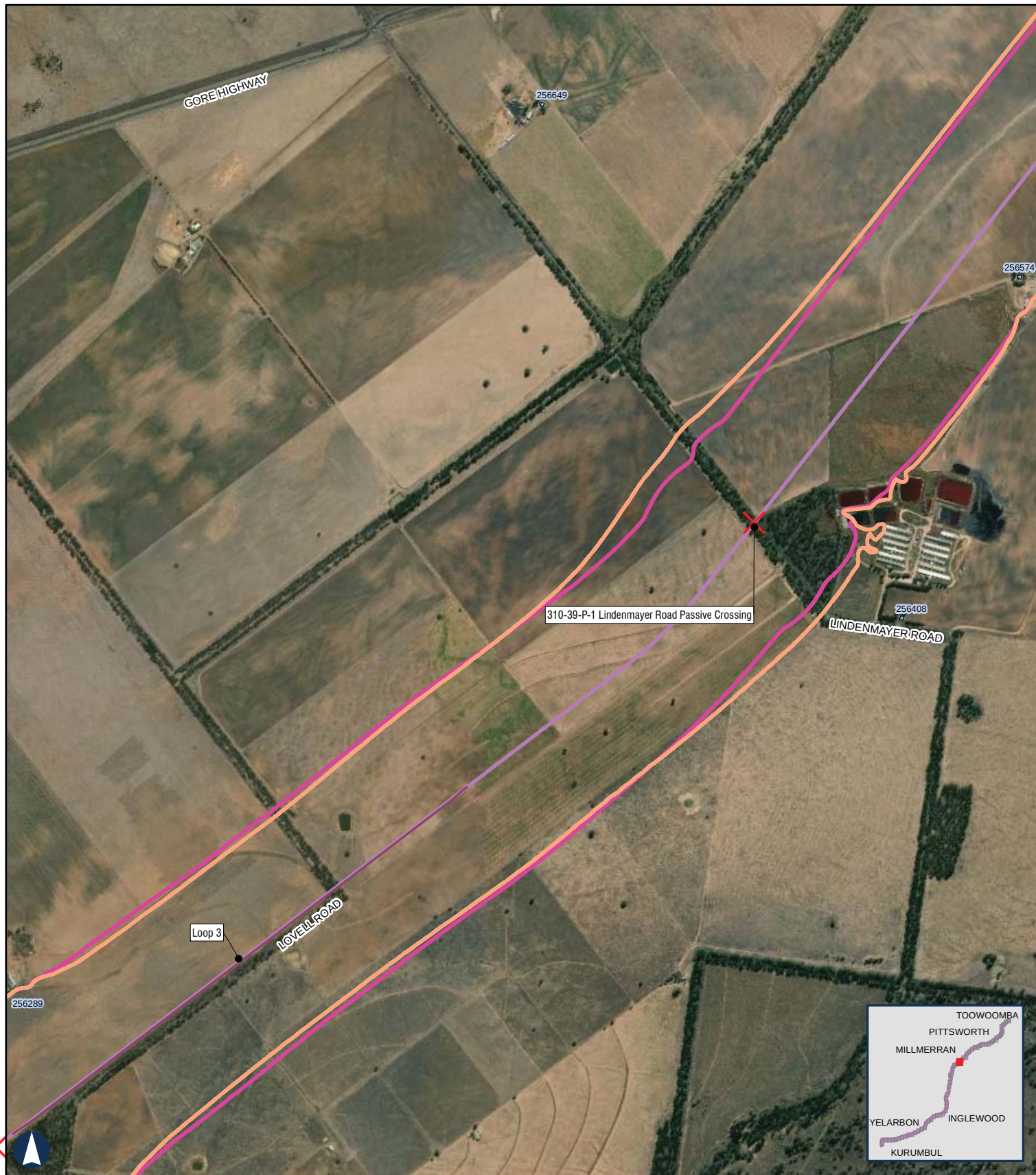
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 37 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

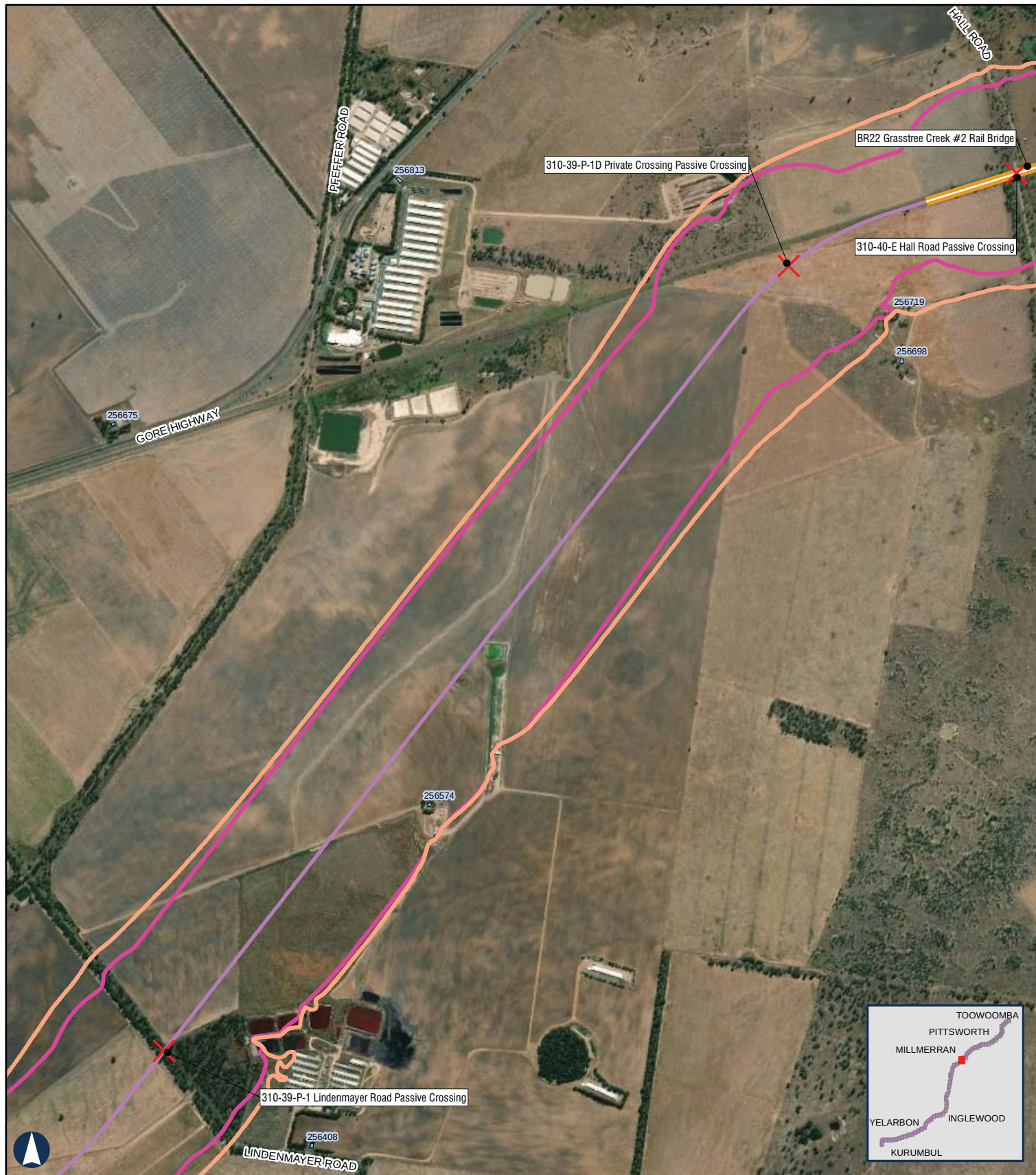
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 38 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

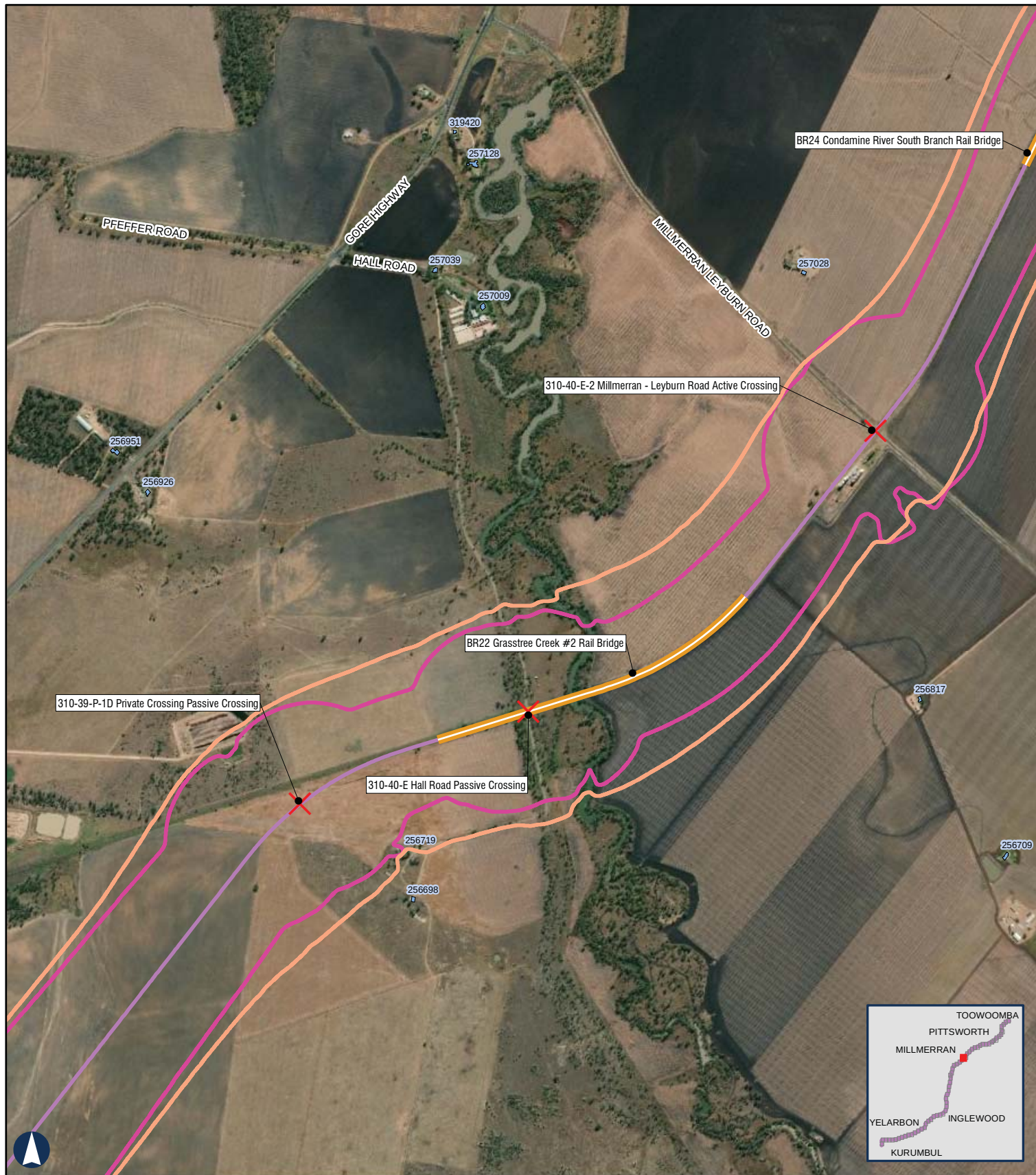
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 39 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

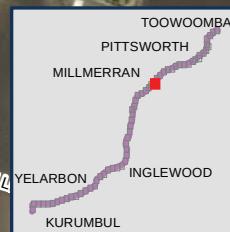
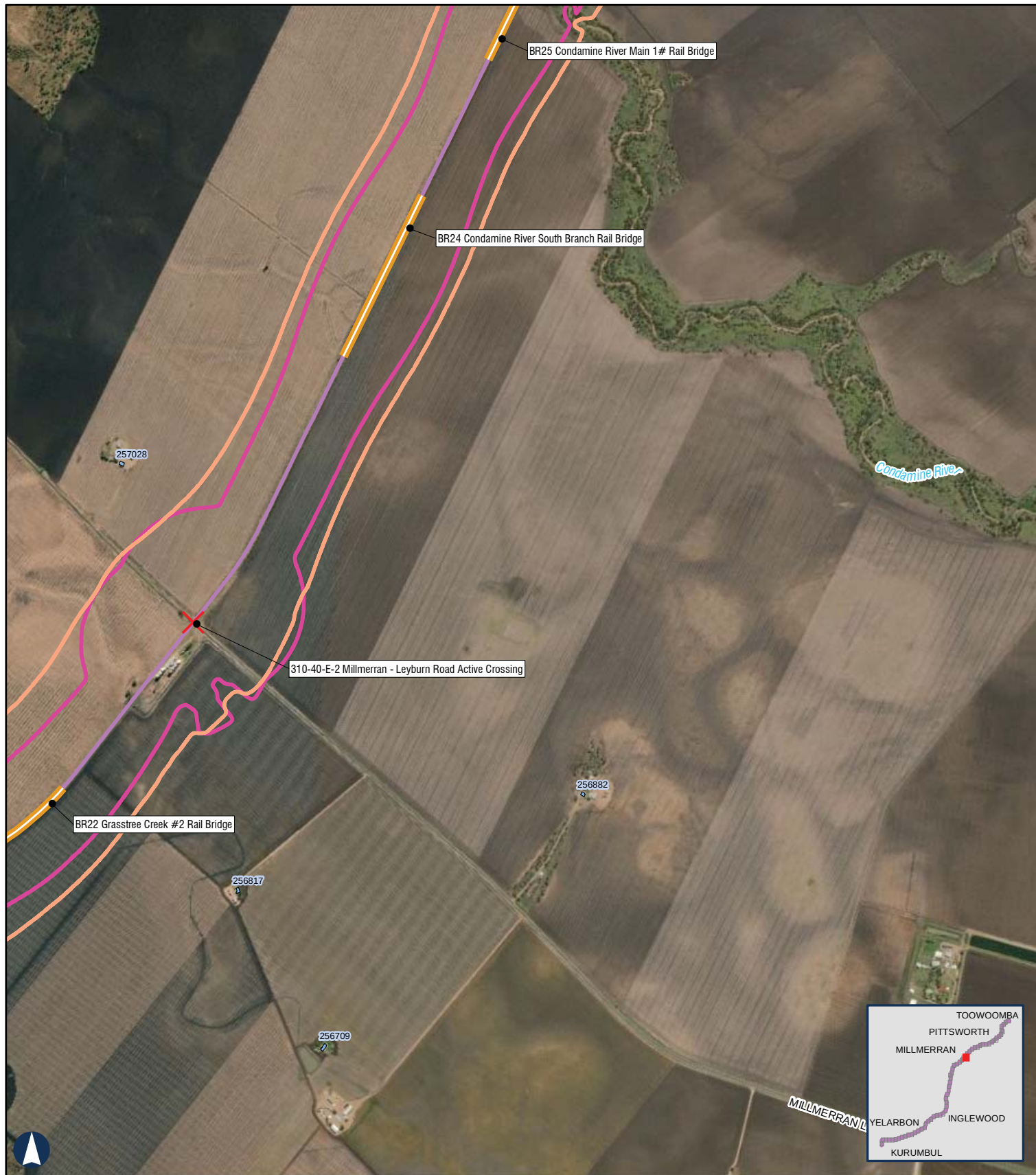
— Night-time noise criteria LA max
80dBA new rail corridor

● Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 40 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

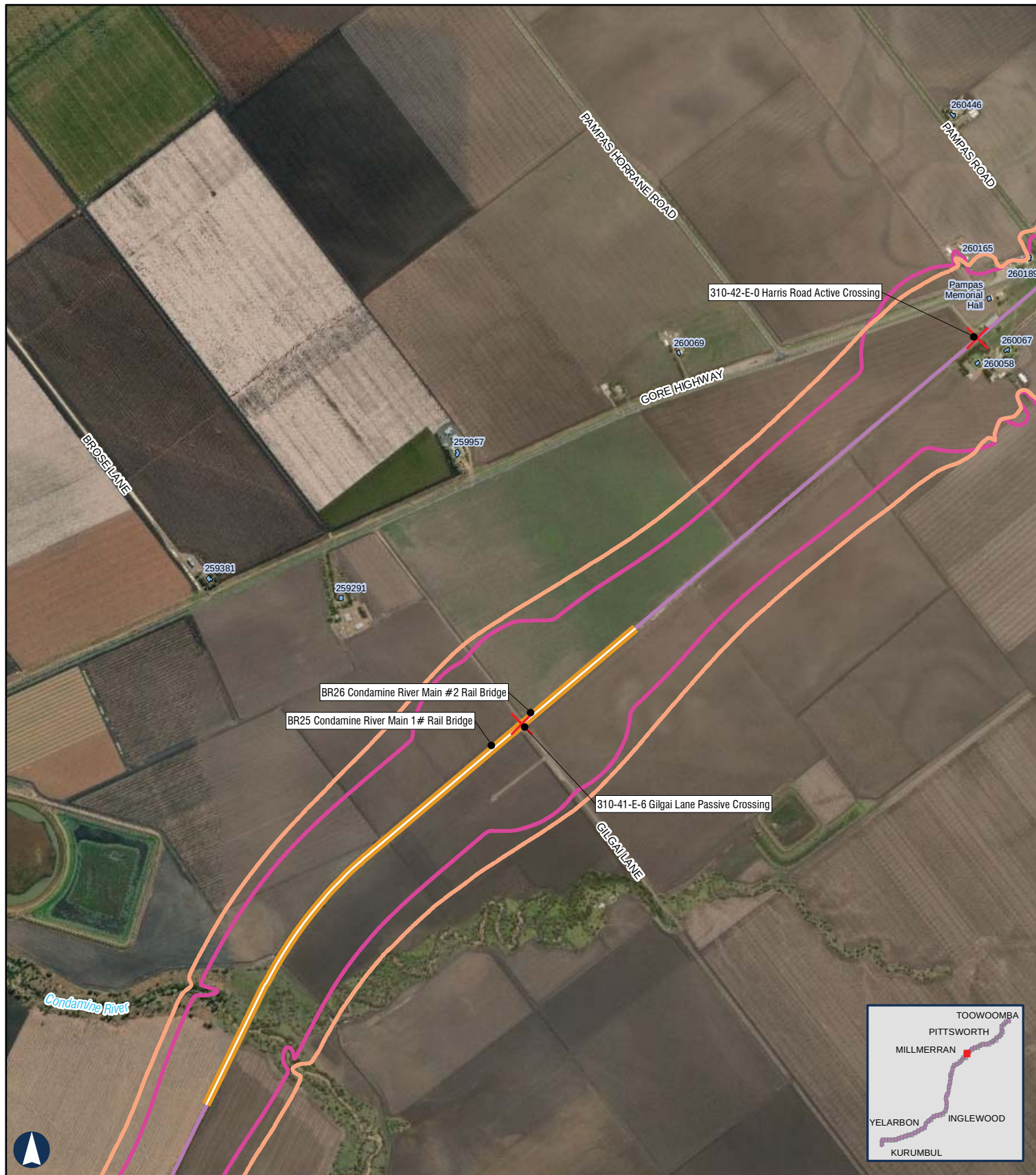
- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 41 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

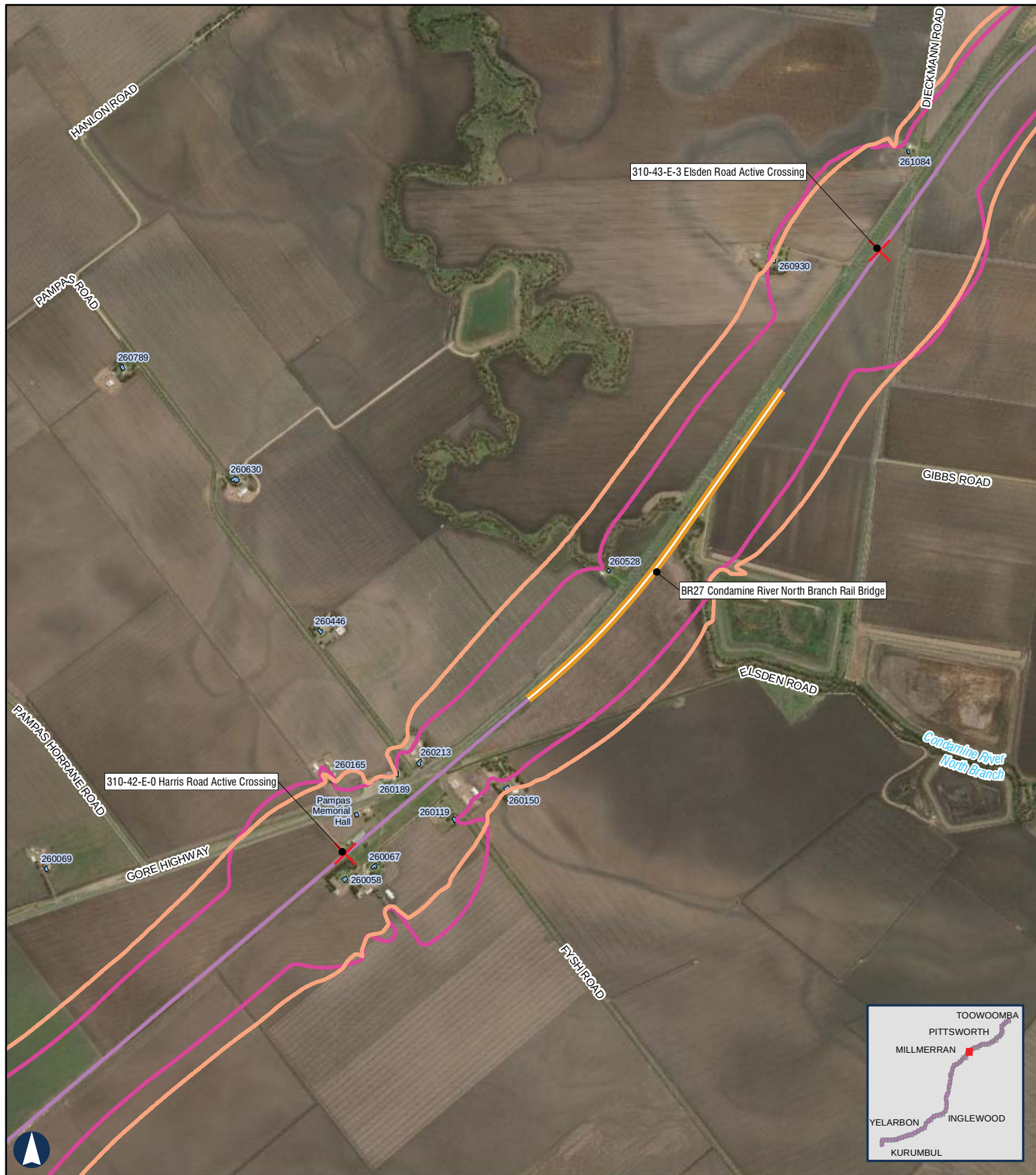
Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 42 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

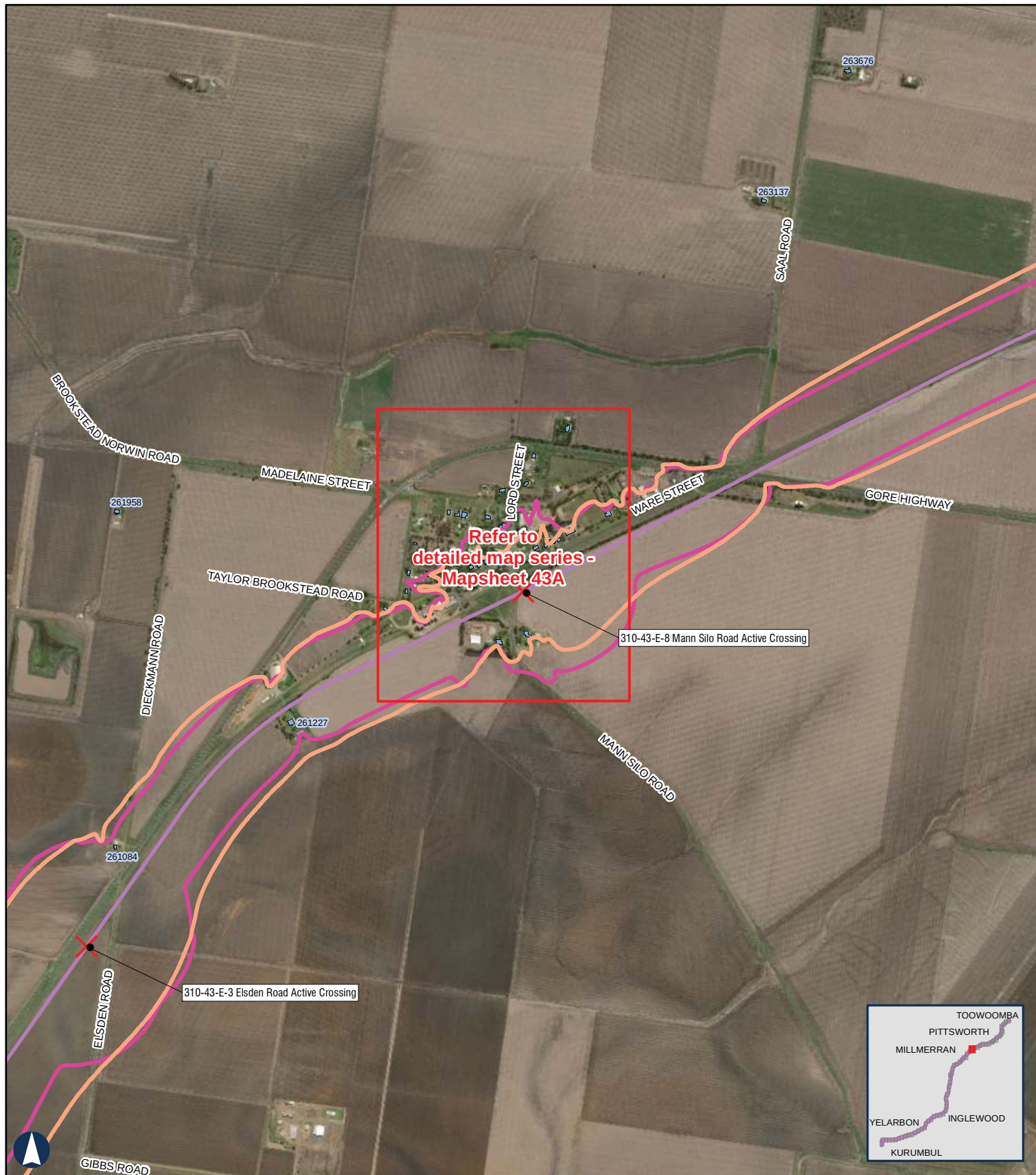
- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 43 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

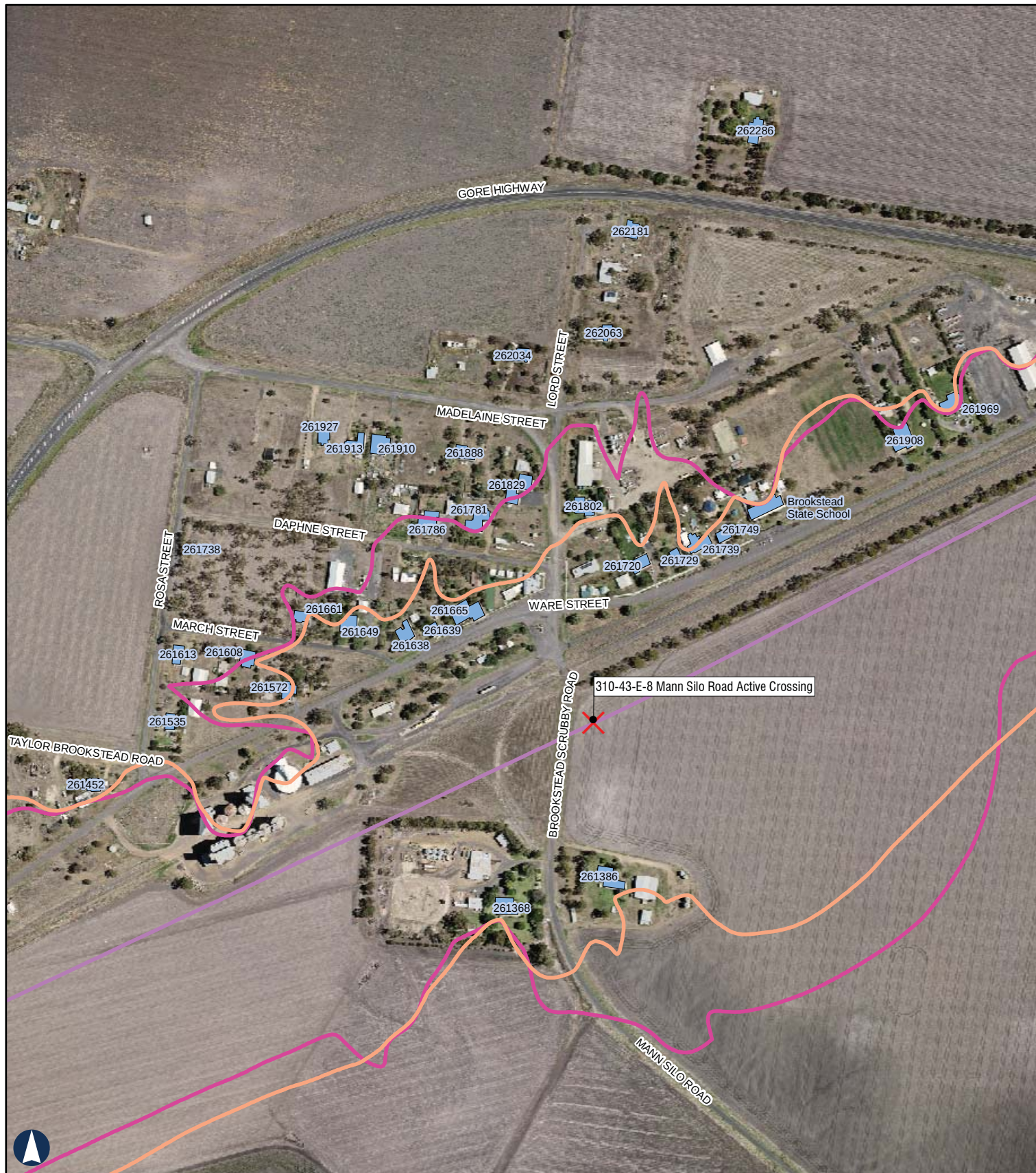
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels - Detailed

APPENDIX E - Mapsheet 43A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:5,500

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LAeq9hr 60dBA upgrading existing rail



ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 44 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

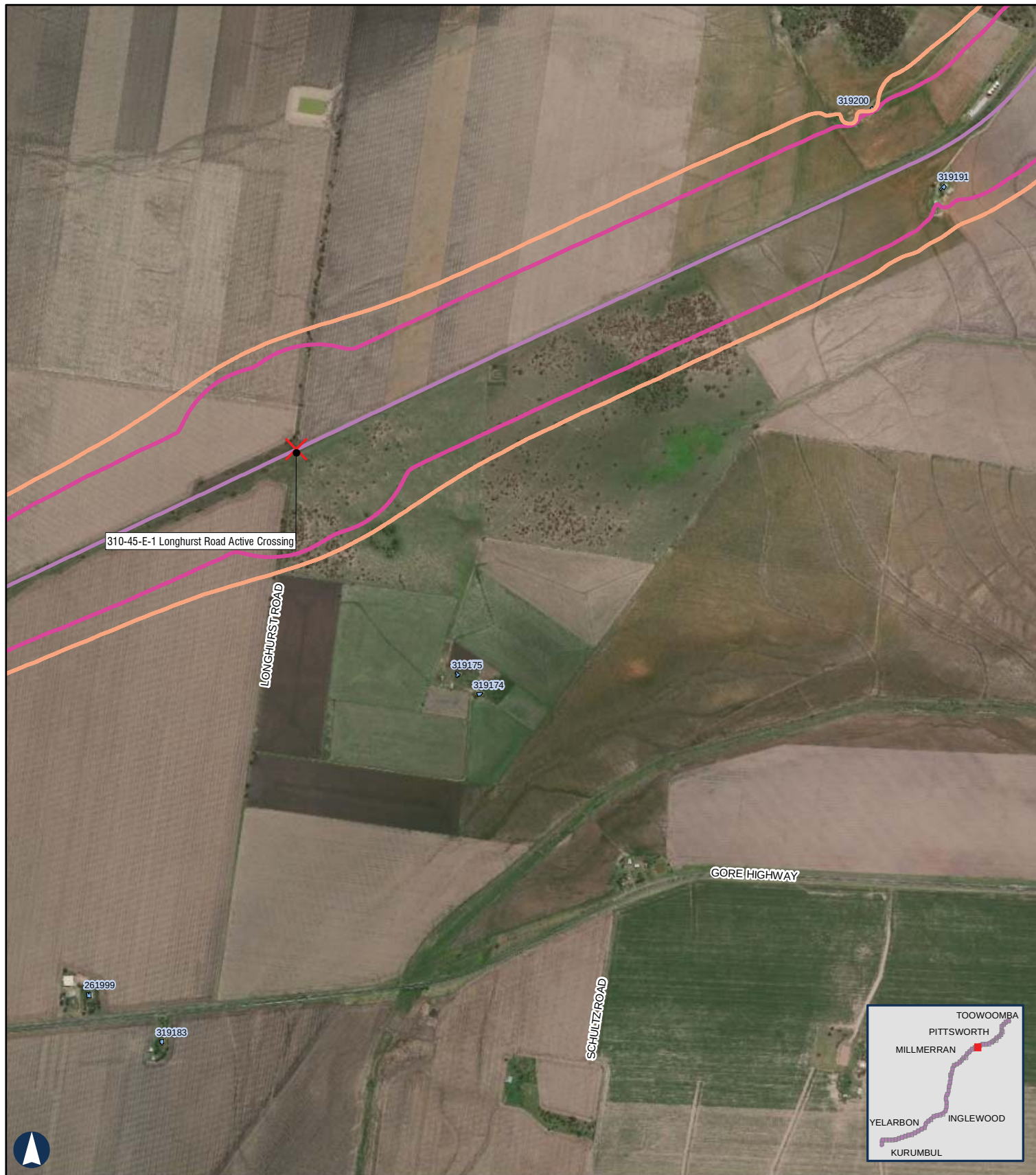
— Night-time noise criteria LA max
80dBA new rail corridor

● Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC *InlandRail*

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 45 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

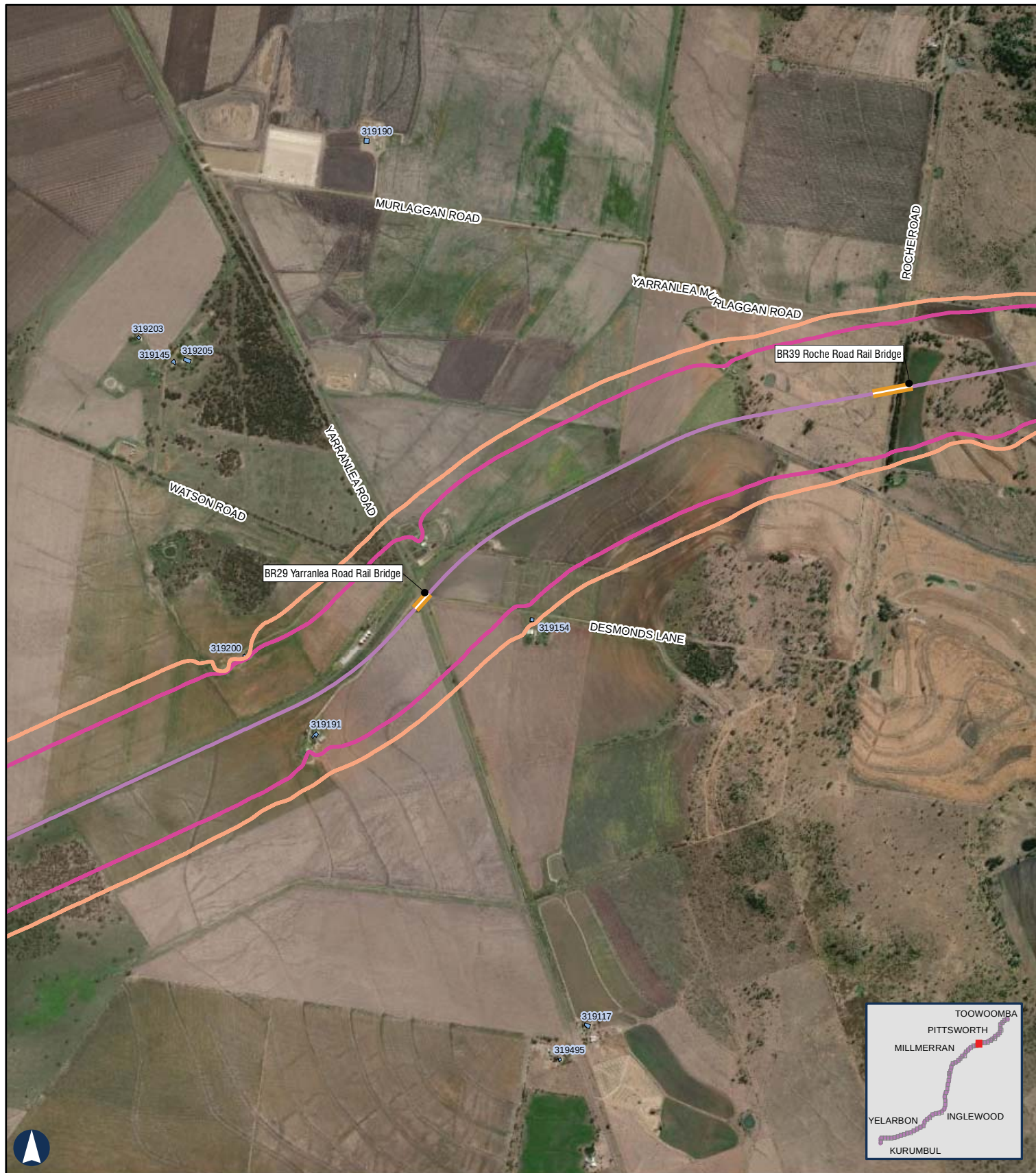
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC *InlandRail*

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 46 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

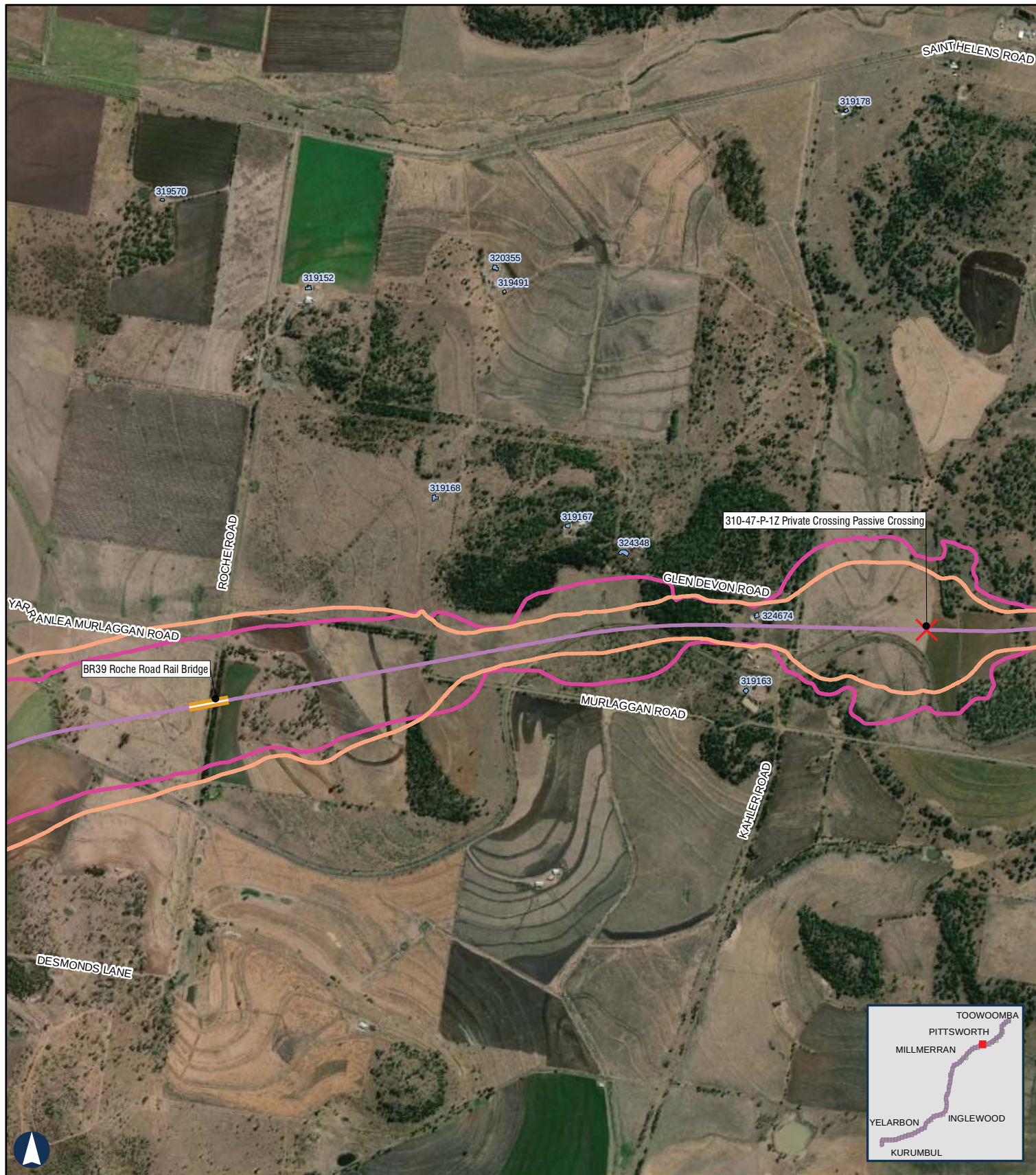
- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 47 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

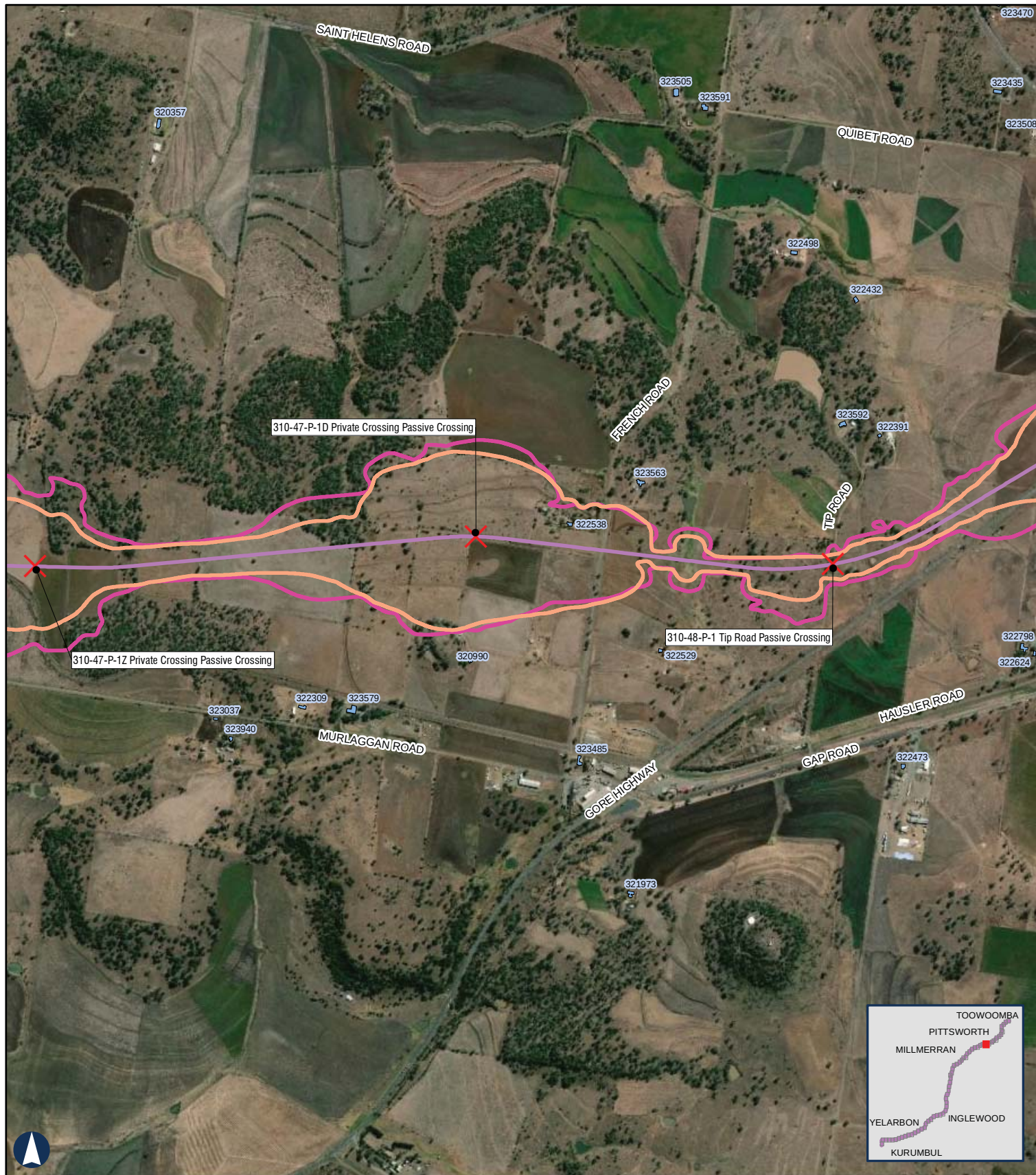
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 48 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

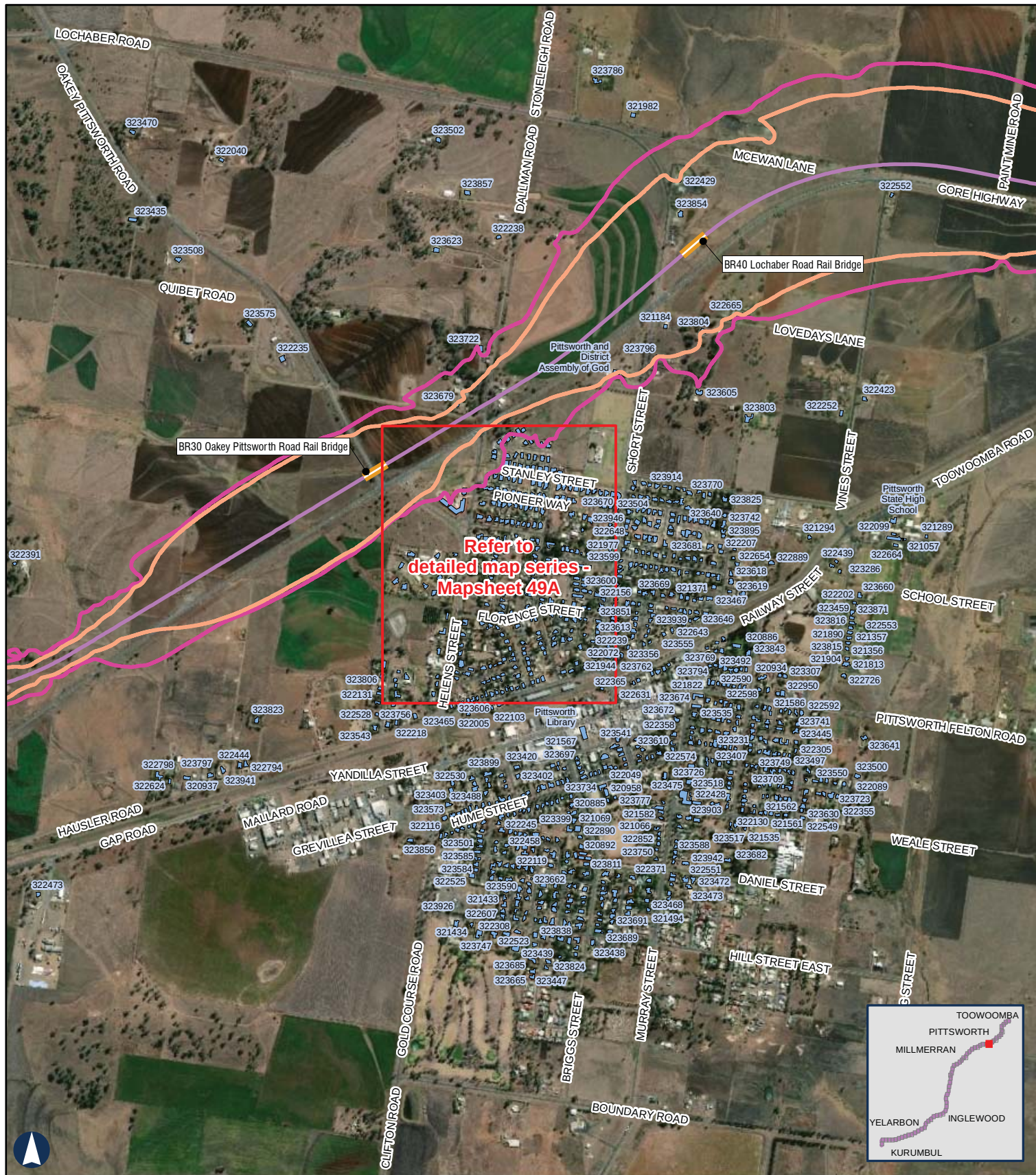
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 49 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4 Scale: 1:20,000

Date: 08-May-2020

Author: JG

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels - Detailed

APPENDIX E - Mapsheet 49A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:5,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

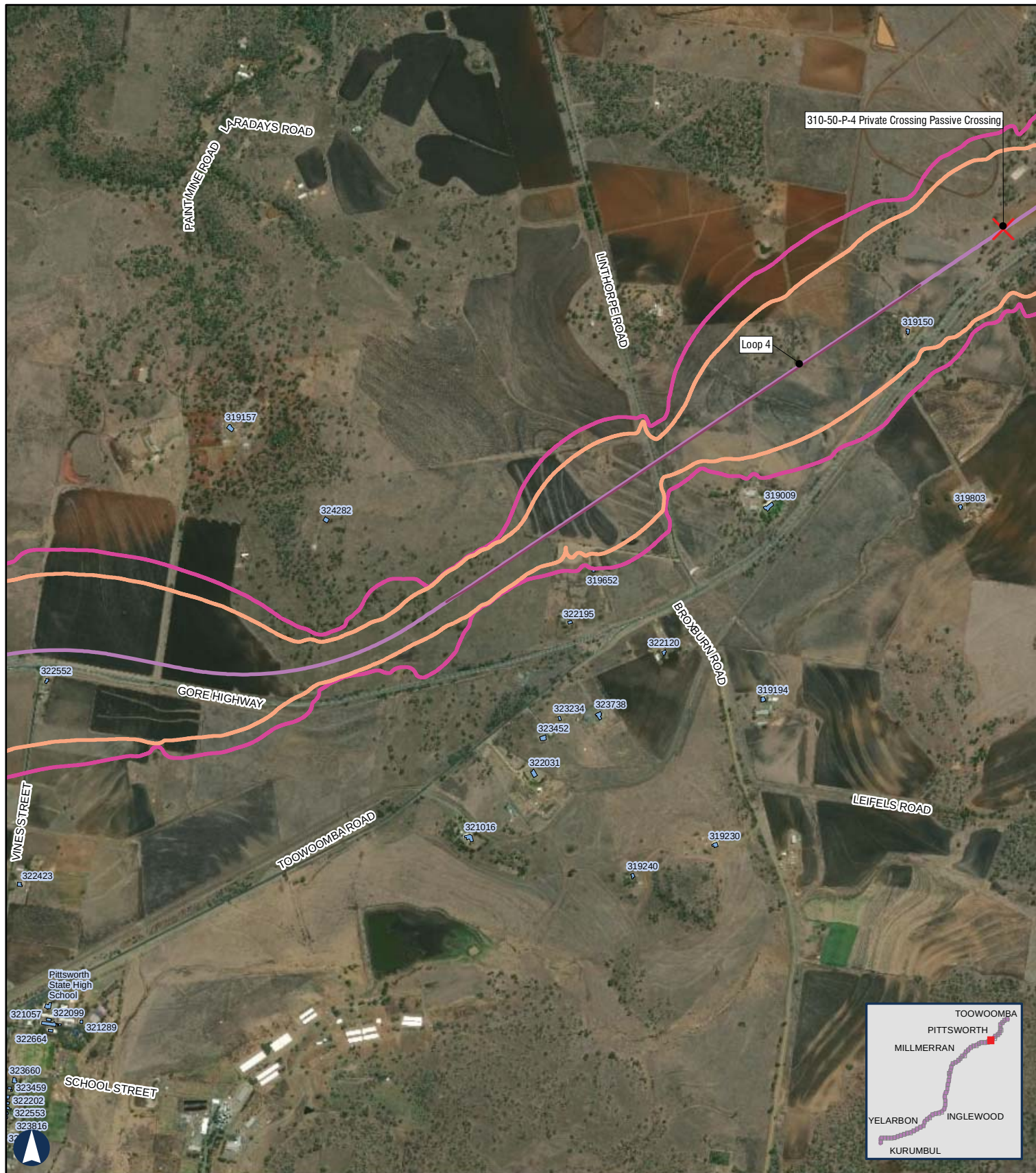
- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LAeq9hr 60dBA upgrading existing rail

Noise contours are based on a set distance above the local terrain level of 2.4m.



ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 50 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

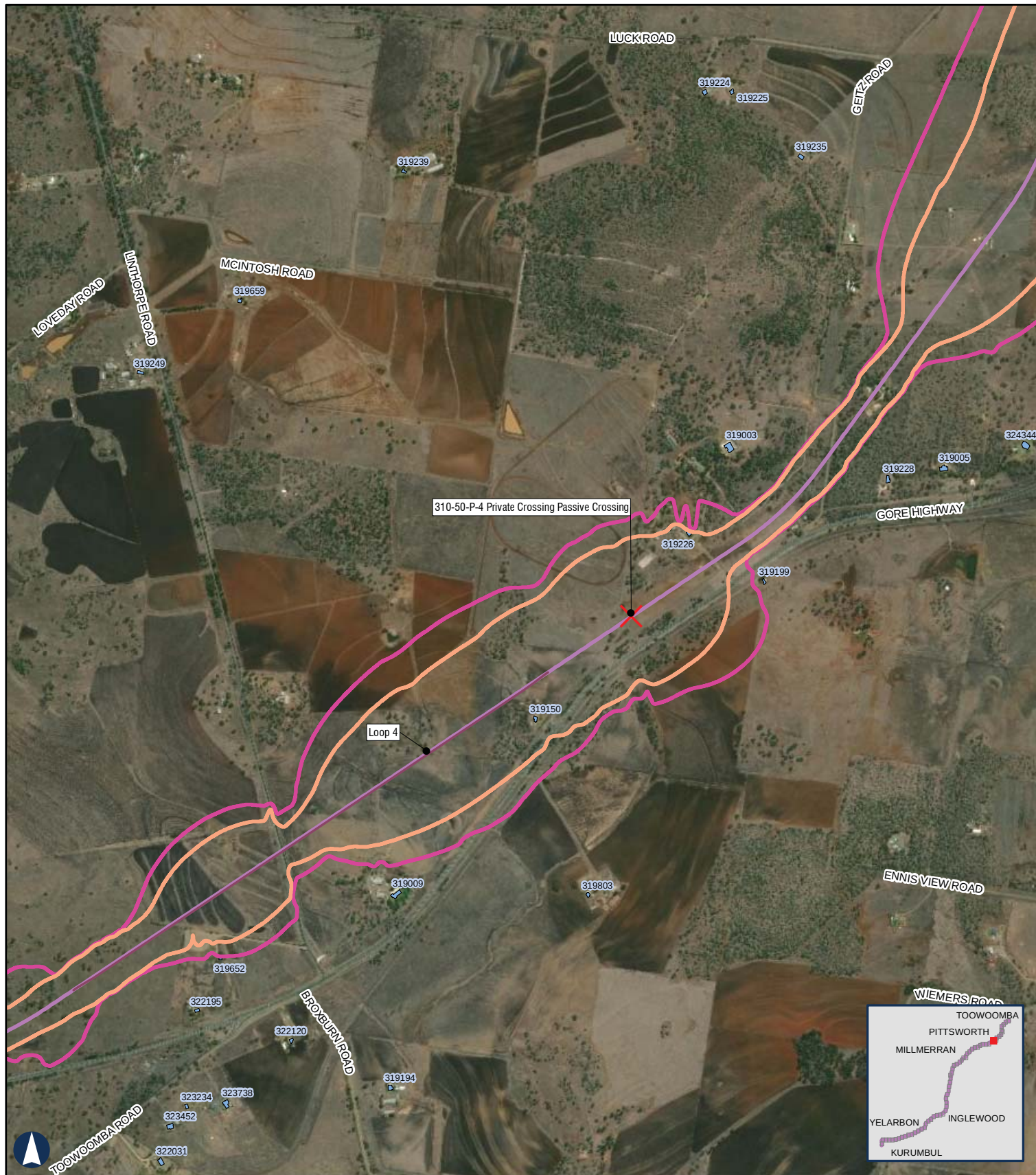
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 51 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

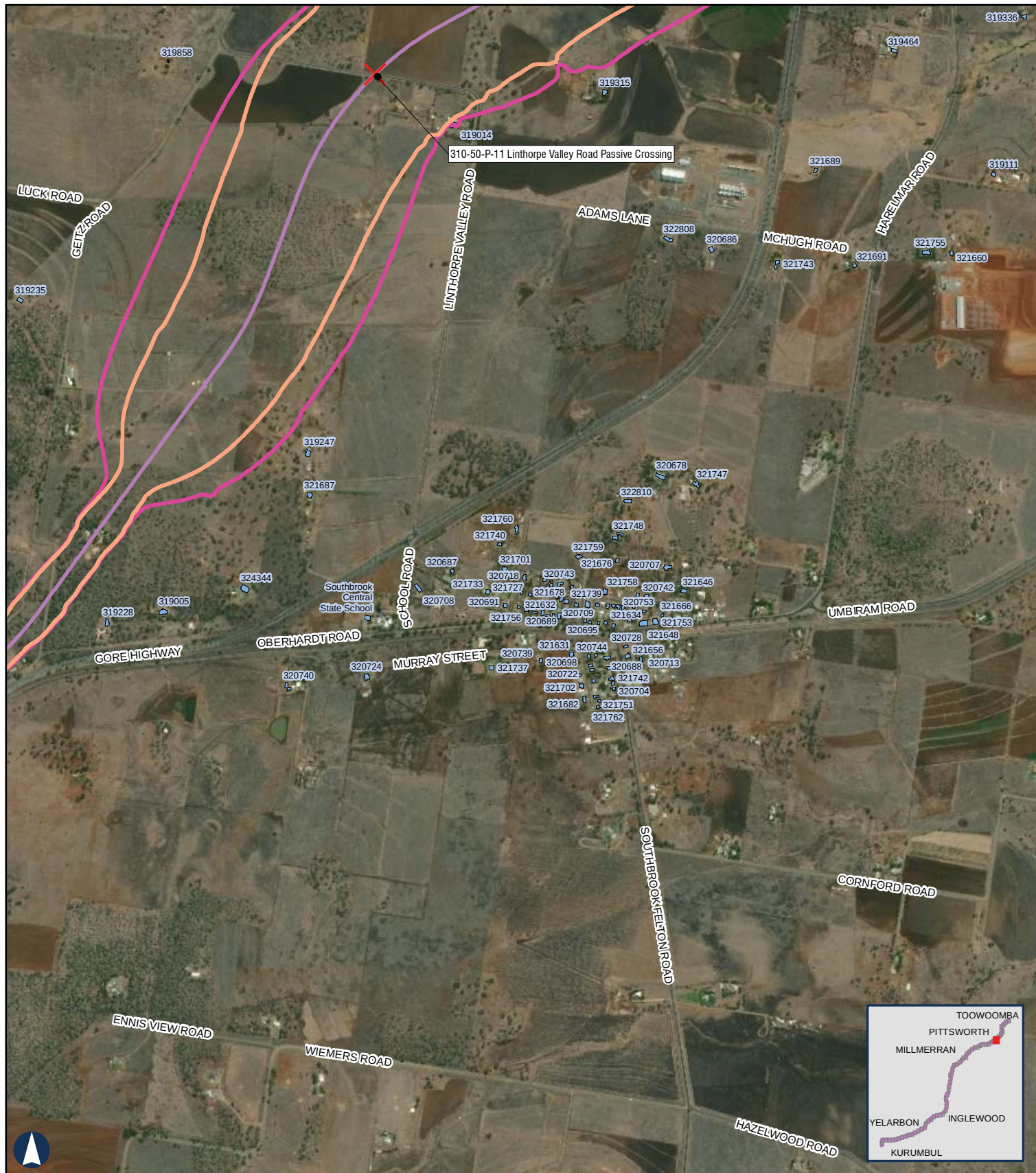
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.



BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 52 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- X Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

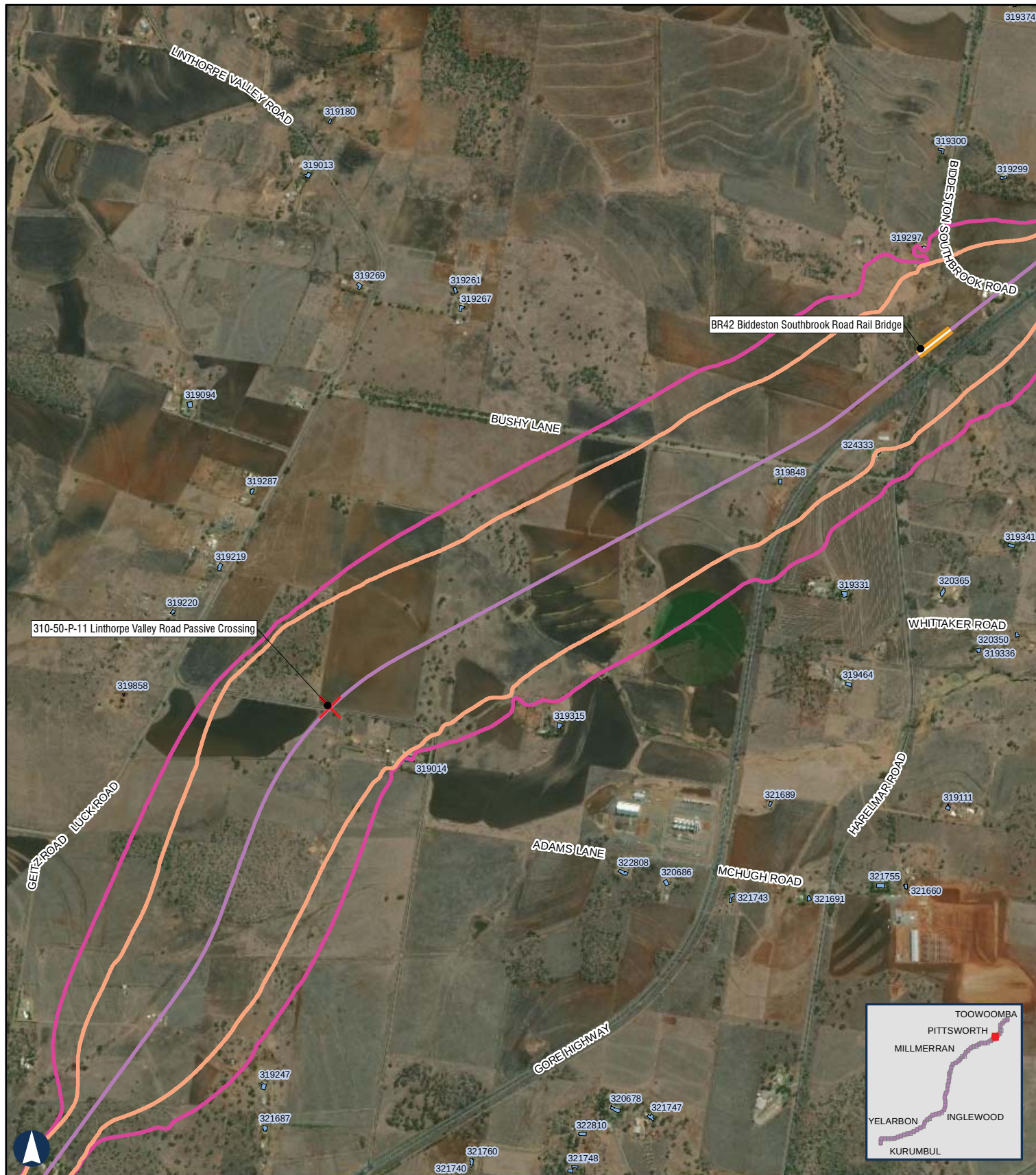
— Night-time noise criteria LA max
80dBA new rail corridor

● Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 53 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

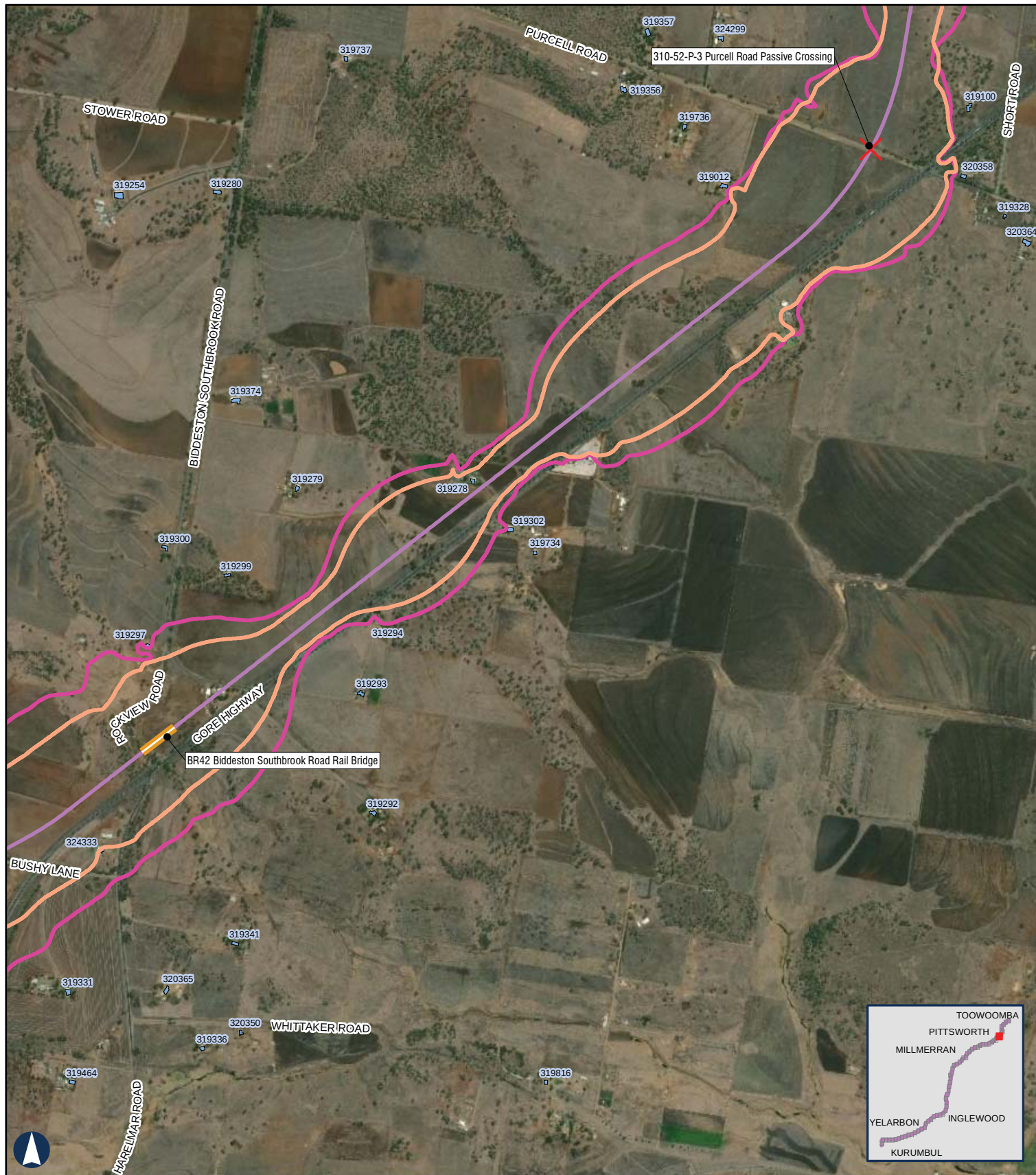
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 54 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

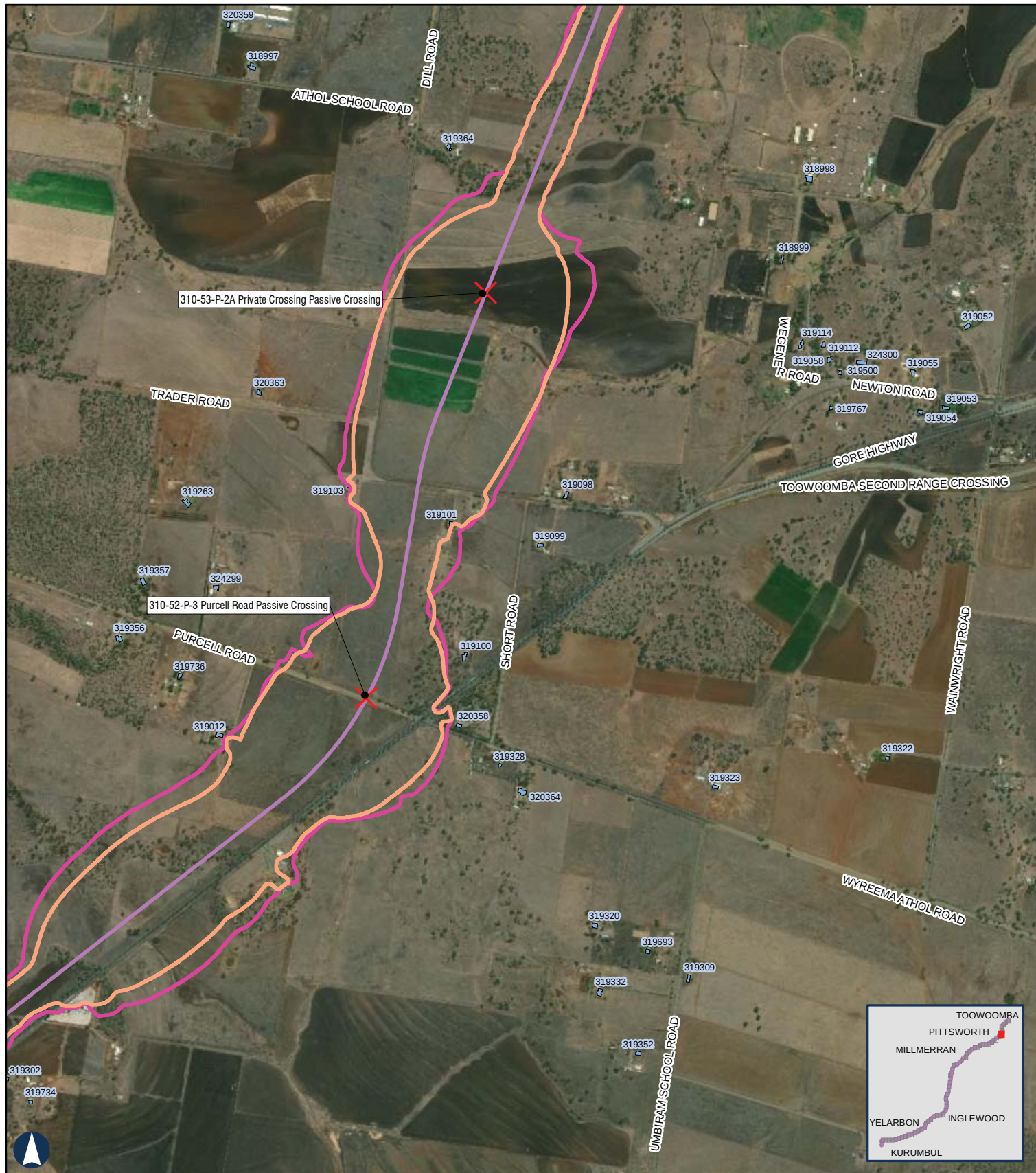
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 55 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

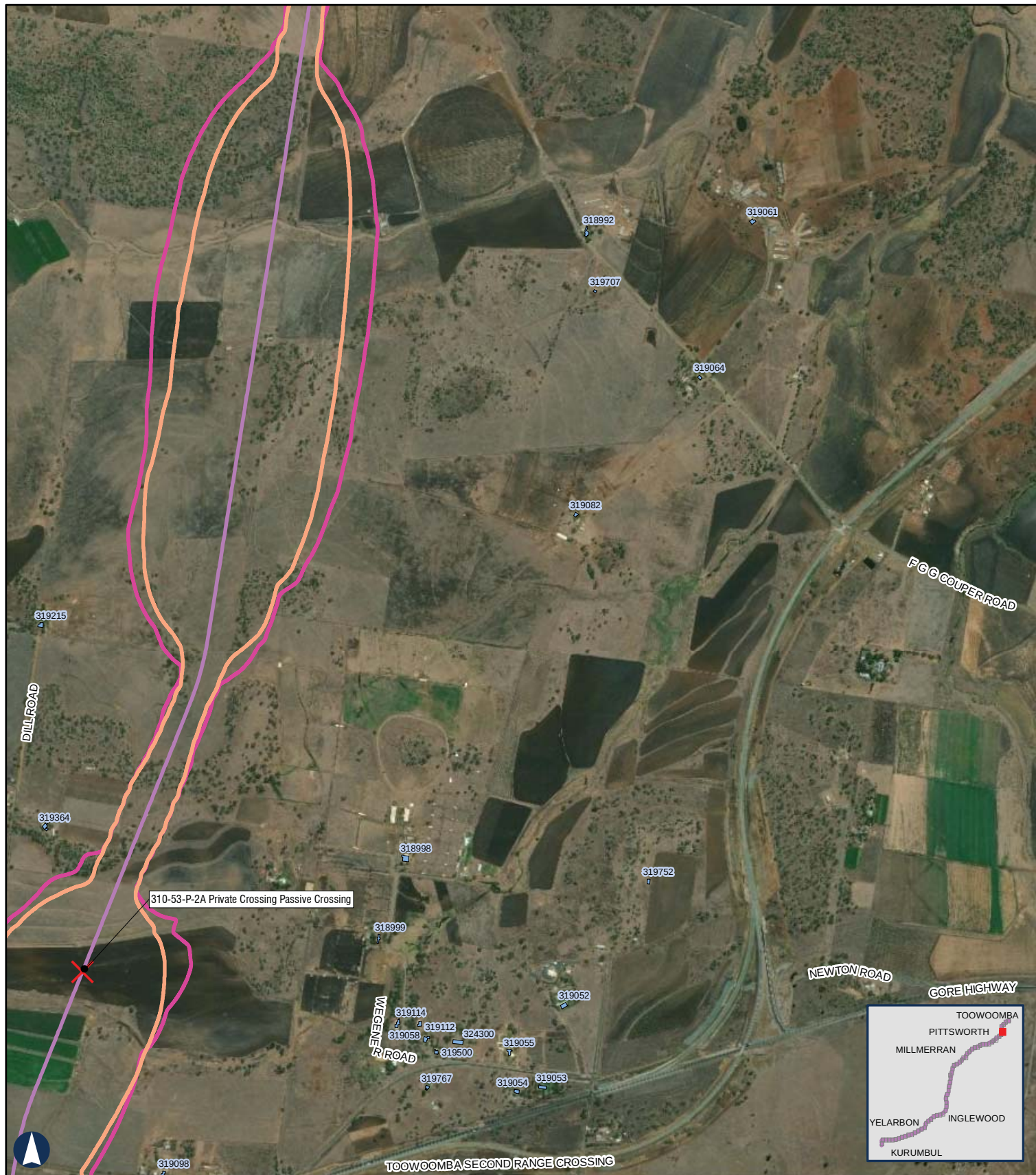
- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 56 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

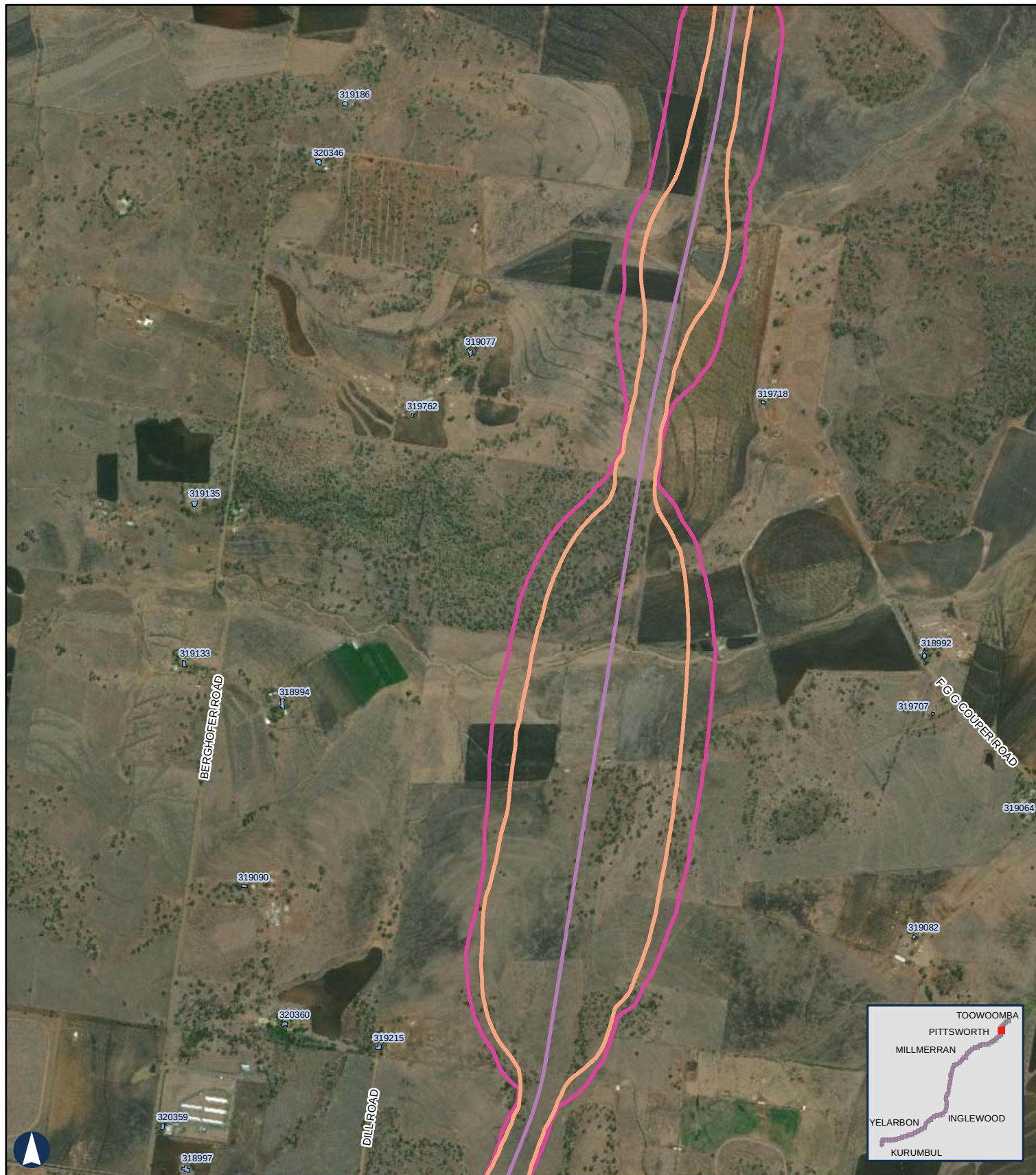
— Night-time noise criteria LA max 80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 57 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr 55dBA new rail corridor

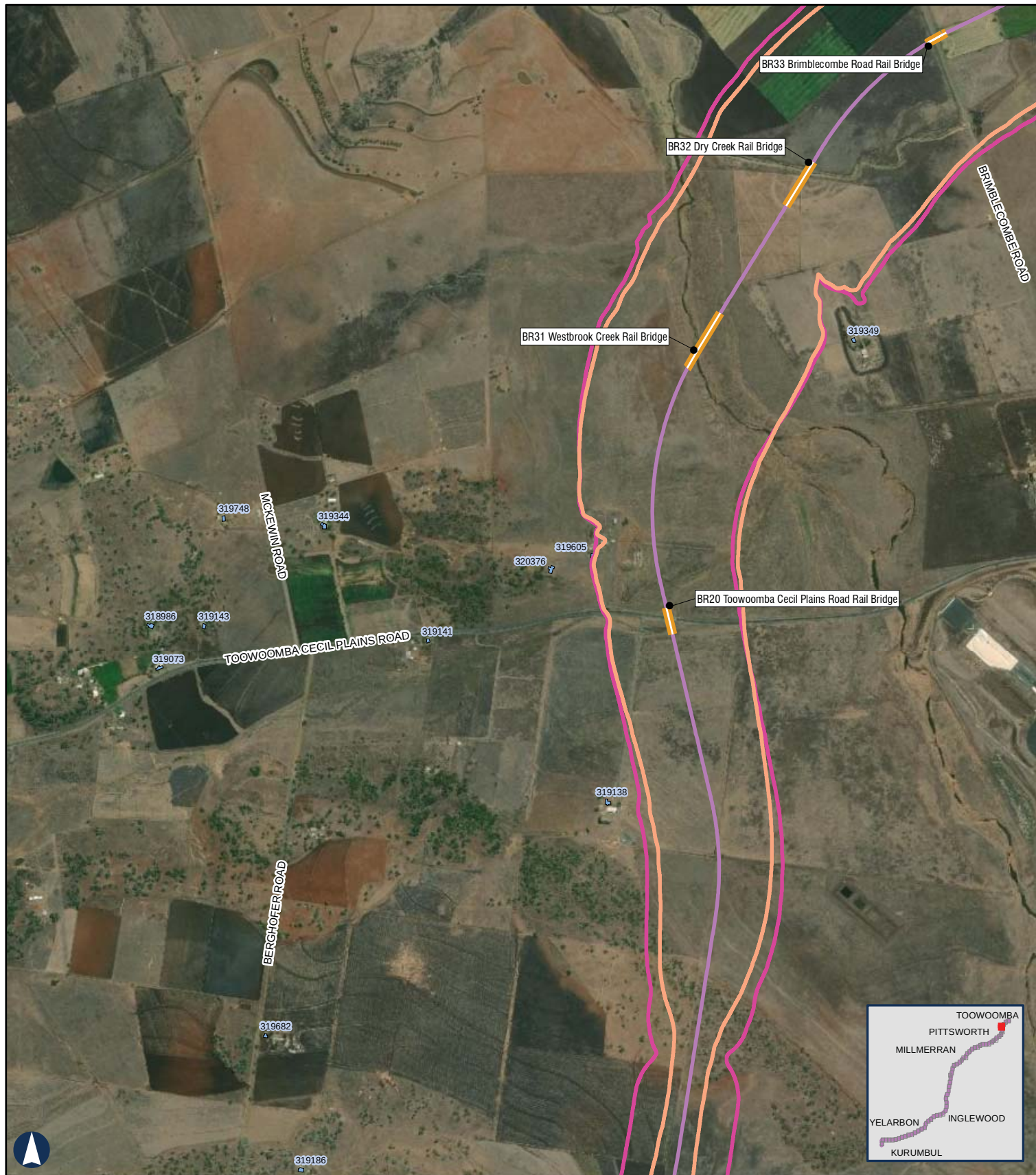
— Night-time noise criteria LA max 80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 58 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- ▬ Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

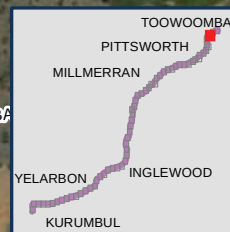
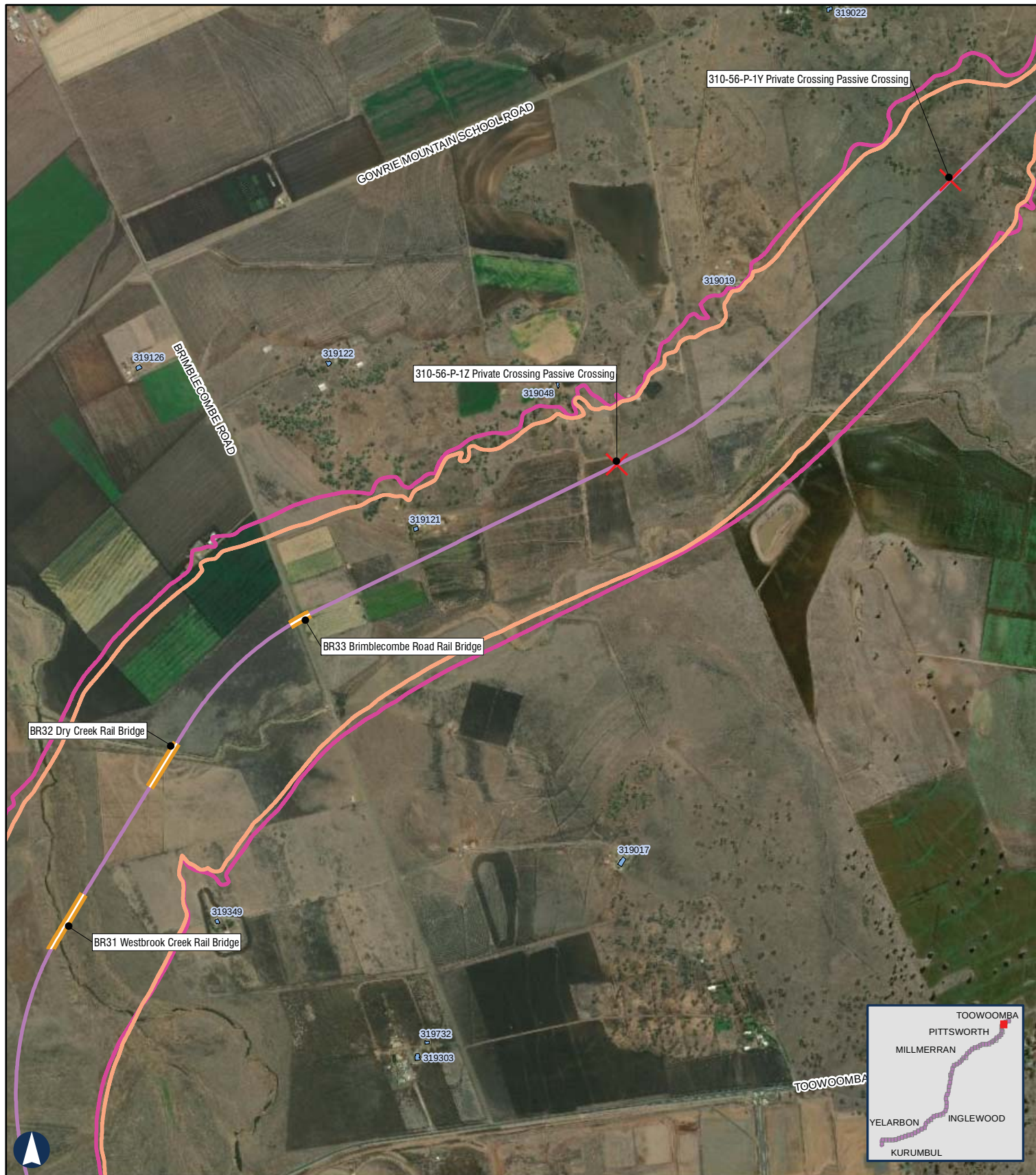
— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance
above the local terrain level of 2.4m.

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 59 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

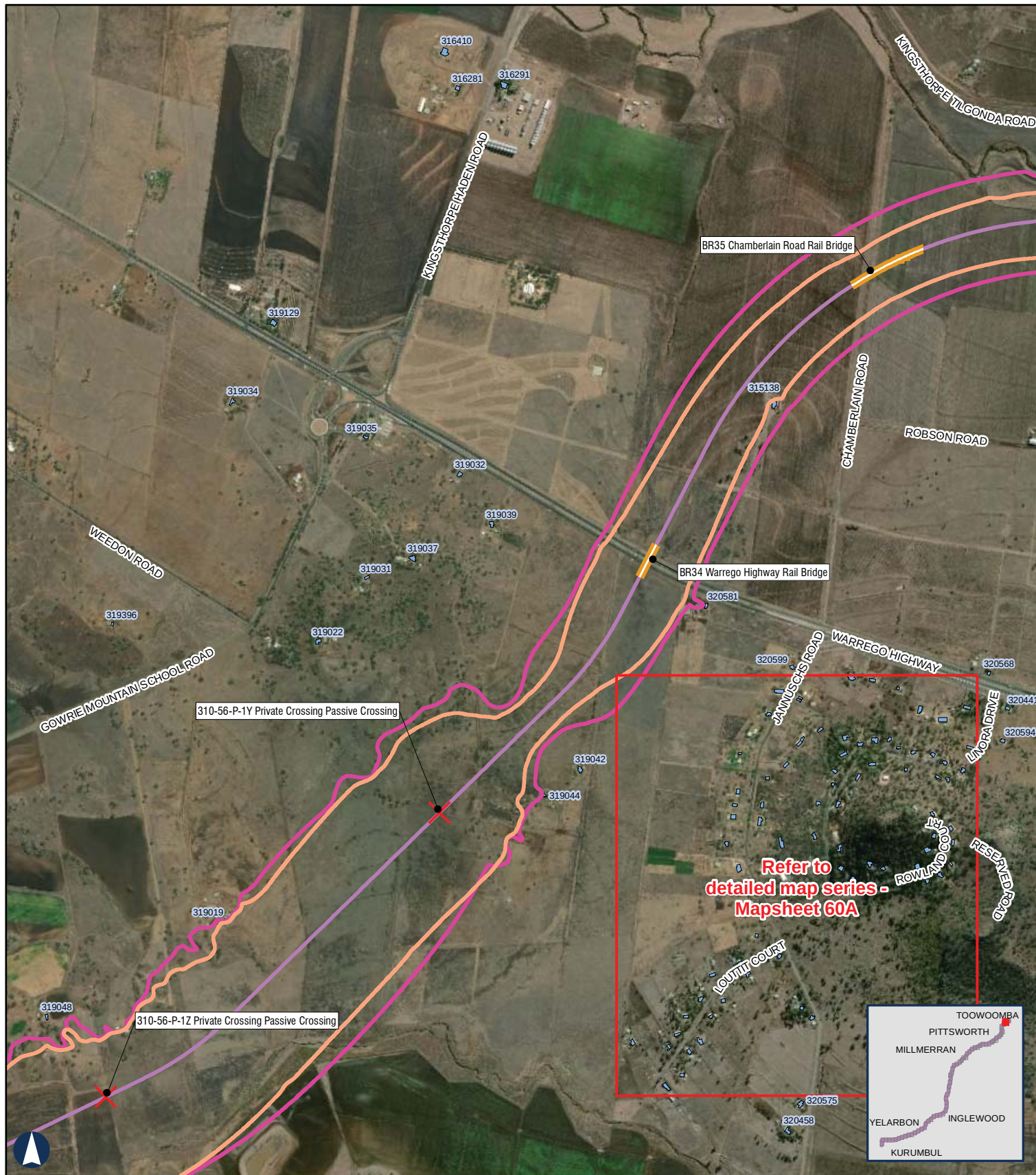
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels

APPENDIX E - Map 60 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Paper: A4
Date: 08-May-2020
Author: JG

Scale: 1:20,000

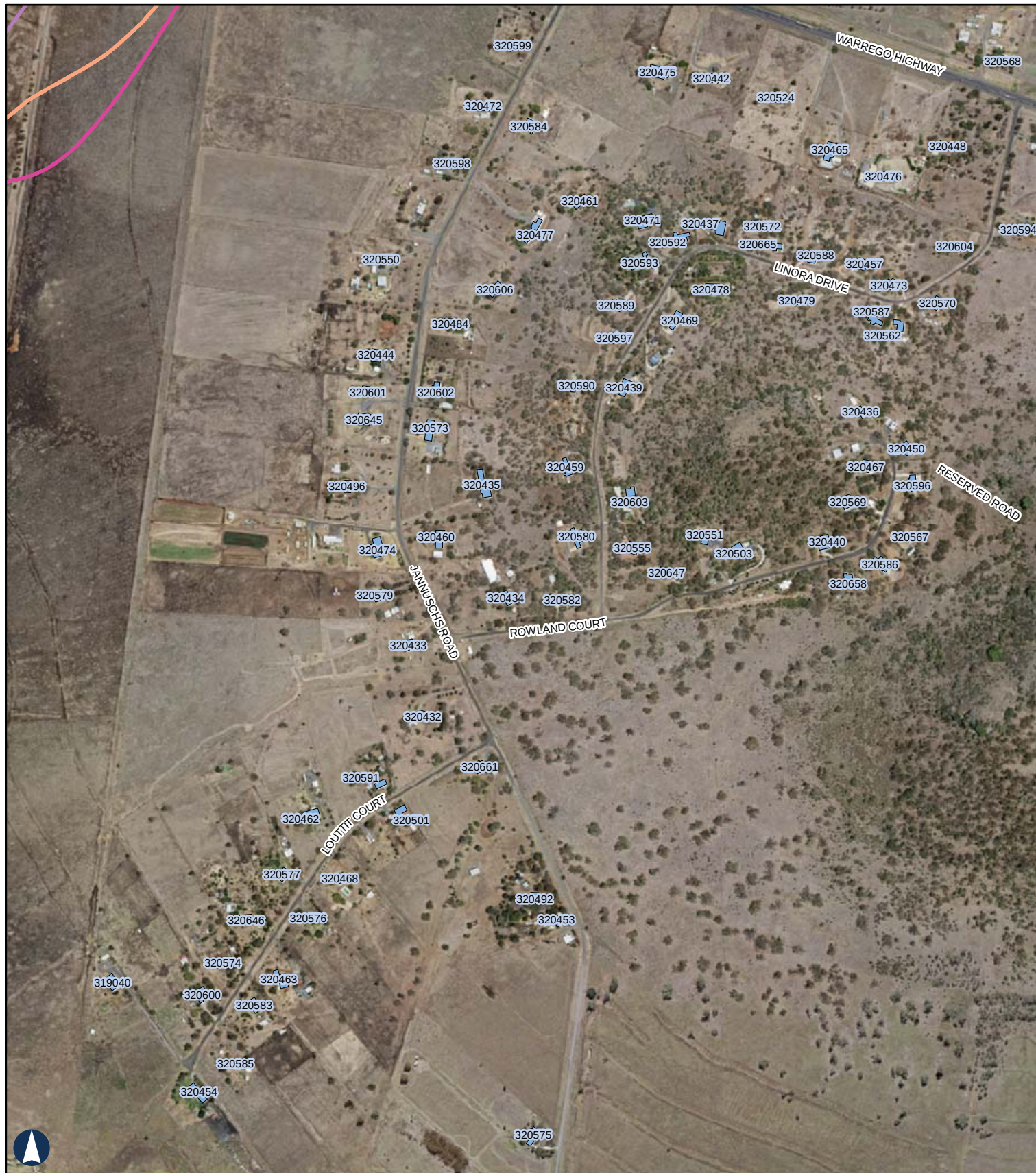
- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LA max 80dBA new rail corridor
- Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

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BORDER TO GOWRIE Year 2040 Night-time rail noise levels - Detailed

APPENDIX E - Mapsheet 60A

100 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:8,000

- ✕ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts
- Receptors

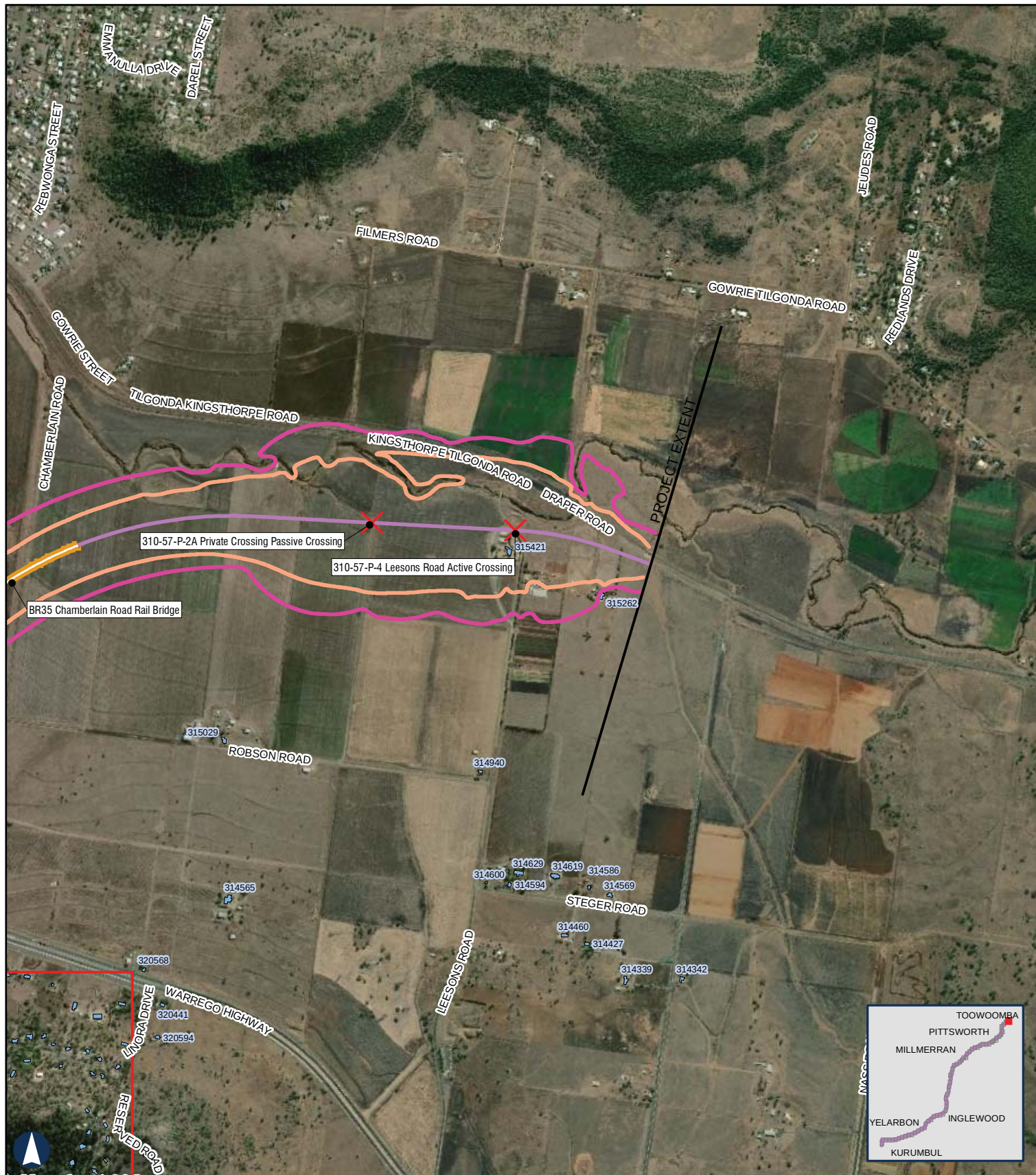
Noise contours are based on a set distance above the local terrain level of 2.4m.

- Night-time noise criteria LAeq9hr 55dBA new rail corridor
- Night-time noise criteria LAeq9hr 60dBA upgrading existing rail



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BORDER TO GOWRIE

Year 2040 Night-time rail noise levels

APPENDIX E - Map 61 of 61

500 m

Coordinate System: GDA 1994 MGA Zone 56

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Date: 08-May-2020
Author: JG

Scale: 1:20,000

- ✗ Level Crossings
- Project Extent
- Crossing Loops
- Rail Alignment/Centreline
- Bridges and Viaducts

— Night-time noise criteria LAeq9hr
55dBA new rail corridor

— Night-time noise criteria LA max
80dBA new rail corridor

■ Receptors

Noise contours are based on a set distance above the local terrain level of 2.4m.

ARTC **InlandRail**

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