Technical and Approvals Consultancy Services: Narrabri to North Star

Operational Noise and Vibration Review Report

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Prepared for

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Glossary

'A' Frequency Weighting	Frequency weighting applied to sound levels to approximate the relative loudness of different frequencies perceived by the human ear.
ARTC	Australian Rail Track Corporation
Decibel, dB	A logarithmic measurement scale. For sound pressure, is 20 times the logarithm (base 10) of the ratio of a given sound pressure to a reference pressure. The decibel scale is a logarithmic ratio, so higher decibel levels have exponentially more sound energy.
EIS	Environmental Impact Statement
Equivalent Continuous Sound Level, L_{Aeq}	Noise descriptor. L_{Aeq} is the A weighted single figure noise level which represents the same amount of energy as the time varying signal over a period of time.
'F' (Fast) Time Weighting	Standardised time-weighting constant of 0.125 seconds. Where time-weighting is not specified, the fast time weighting is typically applied.
IRDJV	Inland Rail Design Joint Venture (WSP|MM DJV legal entity)
Maximum Noise Level, L_{AFmax}	Noise descriptor. The maximum Root-Mean-Square sound pressure level measured with sound level meter using the 'A' frequency weighting and the 'F' (Fast) time weighting.
Maximum Noise Level, L_{ASmax}	Noise descriptor. The maximum Root-Mean-Square sound pressure level measured with sound level meter using the 'A' frequency weighting and the 'S' (Slow) time weighting.
N2NS	Narrabri to North Star
Peak Particle Velocity, PPV	Vibration descriptor. Highest instantaneous particle velocity during a given time interval, measured in mm per second.
Rating Background Level	Noise descriptor. The single number background noise descriptor representing each assessment period (day/evening/night) over the whole monitoring period. Defined in the NSW Noise Policy for Industry (NSW EPA, 2017).
'S' (Slow) Time Weighting	Standardised time weighting constant of 1 second.
Sound Exposure Level, SEL	Noise descriptor. The SEL value contains the same amount of acoustic energy over a 'normalised' 1-second period as the actual noise event under consideration.
Sound Pressure Level, SPL	Noise descriptor. The basic unit of air borne noise measurement is the Sound Pressure Level. The pressures are converted to a logarithmic scale and expressed in decibels (dB).
Statistical Noise Levels, L_n	Noise descriptors which numerically describe the temporal characteristics of time-varying sound. They can be used to estimate the noise level of steady background noise or of other time varying components of a noise signal.

	For example: The noise level, in decibels, exceeded for 10 % of the measurement time period, when 'A' frequency weighted and 'F' time weighted is reference to as $L_{AF10, T}$. The noise level, in decibels, exceeded for 90 % of the measurement time period, when 'A' frequency weighted and 'F' time weighted is reference to as $L_{AF90, T}$. It is often used to quantify the steady background noise level.
Vibration Dose Value, VDV	Vibration Descriptor. A vibration descriptor which considers frequency content, magnitude, duration, and total exposure time.
WSP|MM	WSP Australia | Mott MacDonald DJV trading as IRDJV

Executive Summary

The Narrabri to North Star Inland Rail Project is a section of the Inland Rail Programme which is proposed to be upgraded by Australian Rail Track Corporation (ARTC). The existing single bi-directional track was originally constructed for light traffic, running a variety of freight, grain and passenger trains. The upgrade of the existing railway forms part of the Inland Rail Programme, connecting Brisbane to Melbourne. The Inland Rail Programme is divided into multiple sections, each having their own approval process. The various sections are proposed to be constructed within different timeframes, commencing in 2019. The complete alignment is expected to be finalised in 2026, which is therefore the year of "through connection".

The Narrabri to North Star Inland Rail Project is a brownfield section in northwest NSW within the Inland Rail Programme, extending from Narrabri Junction at kilometrage 575.000 and terminating at North Star approximately 186 km north, at kilometrage 760.460, at stop boards at the end of existing brownfield railway. It crosses the three local government areas of Gwydir, Narrabri and Moree Plains.

Due to its scale and complexity, it's broken into two stages to enable first phase construction to begin while planning and environmental approvals are gained for the second phase.

- Phase 1 includes upgrading 171km of track along the existing rail corridor.
- Phase 2 includes upgrading 11.8km of track crossing the Mehi–Gwydir floodplain and building 1.7km of new track at Camurra, north of Moree.

The Conditions of Approval for Inland Rail – Narrabri to North Star Phase 1 (SSI 7474) have been issued by the Department of Planning, Industry and Environment on 13th August 2020. These identify four conditions E13 to E16 with regard to noise and vibration associated with the operation of the Project. Condition E13 details the requirement for an Operational Noise and Vibration Review.

This Operational Noise and Vibration Review assesses operational airborne rail noise, operational ground-borne rail noise and operational rail vibration. It outlines the predicted noise and vibration impacts upon the sensitive receivers and presents mitigation measures for receivers where the predicted, unmitigated noise levels exceed the relevant trigger levels.

Operational Rail Noise

Rail noise models were developed for existing alignment, the "through connection" year (2025), and the design year (2040), enabling noise mitigation design for the Project.

Predicted exceedances of the rail noise trigger levels were generally controlled by the L_{Aeq} noise descriptor, for the night time period:

- Noise predictions for year 2025 identified 39 exceedances of the night L_{Aeq} noise trigger level and one exceedance of the night L_{Amax} noise trigger level for residential sensitive receivers; and
- Noise predictions for year 2040 identified 77 exceedances of the night L_{Aeq} noise trigger level for residential sensitive receivers, and two exceedances for the non-residential sensitive receivers.

Two noise mitigation options were considered in designing mitigation for exceedances of the noise trigger levels: Noise barriers and at-property treatments.

Noise barriers of various heights and lengths were identified and are recommended for noise mitigation. They are located in areas such as townships where receivers are closely spaced together, i.e. Bellata, Moree (station) and North Star. Where receivers are sparsely located, it is not considered feasible to mitigate exceedances of the noise trigger levels with noise barriers. The proposed noise barrier design reduces the predicted number of receivers exceeding the trigger levels in 2040 by 19.

It is recommended that the remaining receivers with residual exceedances of the noise trigger levels for year 2025 (after noise barriers are built) are offered at-property treatments. A total of 11 receivers have been

identified in townships following the implementation of noise barriers in North Star and Bellata and 16 receivers have been identified outside townships to be eligible for at-property treatments.

A stakeholder engagement consultant, architect, builder and acoustic consultant should be engaged by ARTC to provide advice on at-property treatments for each individual dwelling. The efficacy of retrofitting an existing property to reduce noise impacts will depend on the existing structure and the condition of the property. These at-property treatments will likely involve a combination of architectural treatments and property fence upgrades.

Operational Rail Ground-Borne Noise and Vibration

Vibration levels from operation of the rail alignment are predicted to satisfy the relevant trigger levels for both structural damage and human comfort at vibration sensitive locations near the rail corridor without provision of additional rail vibration mitigation.

Ground-borne noise levels within dwellings adjacent to the corridor are predicted to satisfy the relevant trigger levels without provision of additional rail vibration mitigation.

1 Project Background

1.1 The Narrabri to North Star Inland Rail Project

The Narrabri to North Star Inland Rail Project is a brownfield section in northwest NSW within the Inland Rail Programme, extending from Narrabri Junction at kilometrage 575.000 and terminating at North Star approximately 186 km north, at kilometrage 760.460, at stop boards at the end of existing brownfield railway.

From Narrabri Junction, the existing track extends up to Moree South, running parallel to the Newell Highway for about 93 km, passing through the towns of Edgeroi, Bellata and Gurley. The track continues through the town of Moree and over the Mehi River, where there is a 1.7 km greenfield re-alignment to remove the existing Camurra Hairpin. The total distance of this section is 11.8 km. From Camurra, the track continues north within the existing corridor to North Star, a distance of approximately 80 km. The existing single bi-directional track was originally constructed for light traffic running a variety of freight, grain and passenger trains.

The key features of the Narrabri to North Star Inland Rail Project relevant to noise and vibration include:

- Upgrading approximately 186 km of track, track formation, and culverts within the existing rail corridor;
- Constructing a 1.7 km greenfield deviation at Camurra, to eliminate the existing hairpin curve;
- Constructing 5 new crossing loops at Bobbiwaa, Waterloo Creek, Tycannah Creek, Coolleearllee, and Murgo;
- Renewal/upgrade of existing turnouts on the main line. This includes 34 turnouts providing access to existing grain sidings etc.;
- Improvement works through Moree to minimise severance issues caused by the increased quantity and length of trains; and
- Upgrading, relocating or consolidating 86 level crossings on the existing brownfield alignment.

Due to its scale and complexity, the Narrabri to North Star Inland Rail Project is broken into two stages to enable first phase construction to begin while planning and environmental approvals are gained for the second phase.

- Phase 1 includes upgrading 171 km of track along the existing rail corridor; and
- Phase 2 includes upgrading 11.8 km of track crossing the Mehi–Gwydir floodplain and building 1.7 km of new track at Camurra, north of Moree.

1.2 The Project

The Project refers to Phase 1 of the overall Narrabri to North Star Inland Rail Project, i.e. Chainage 575 km through Chainage 666 km, and Chainage 681 km through Chainage 760 km.

1.3 Outcomes of the Environmental Impact Statement

Technical Report 5 – Noise and Vibration Assessment was previously prepared by GHD and formed part of the Environmental Impact Statement (EIS) for the Narrabri to North Star Inland Rail Project.

In Technical Report 5 – Noise and Vibration Assessment, the operational airborne noise modelling was undertaken using the *Nordic Prediction Method - TemaNord 1996:524*, as implemented in the computer prediction software CadnaA version 4.6. It is noted that Technical Report 5 – Noise and Vibration Assessment addressed both phases of the Narrabri to North Star Inland Rail Project.

Operational vibration levels were predicted using the methodology outlined in the *United States of America Department of Transportation Federal Transit Administration – Transit Noise and Vibration Impact Assessment Manual*. Predicted vibration levels using this methodology were compared to results of in-situ measurements

of rail vibration to confirm the consistency of predicted levels with those measured in local conditions. Operational vibration levels predicted with this method were then converted to vibration descriptors compatible with the human comfort trigger levels.

The main outcomes of Technical Report 5 – Noise and Vibration Assessment are as follows:

- Operational rail airborne noise levels were anticipated to exceed the relevant trigger levels for:
  - 152 residential receivers;
  - 3 educational receivers;
  - 3 worship receivers;
  - 2 passive recreation receivers; and
  - 1 active recreation receiver.
- Operational vibration impacts with consideration to structural damage were not considered likely;
- Operational vibration impacts with consideration to human comfort were expected for 3 receivers;
- Operational road traffic noise impacts were not expected to adversely impact any sensitive receiver; and
- A number of potential mitigation options may be effective to control operational airborne noise and operational vibration, subject to being shown to be reasonable and feasible for the Project.

1.4 Conditions of Approval

The Conditions of Approval for Inland Rail – Narrabri to North Star Phase 1 (SSI 7474) have been issued by the Department of Planning, Industry and Environment on 13th August 2020.

Conditions E13 to E16 are relevant to operational noise and vibration. Compliance with these conditions is detailed in Table 1.1.

Table 1.1 Conditions of Approval

Condition	Description	Section in report
E13	*The Proponent must prepare an Operational Noise and Vibration Review (ONVR) to confirm noise and vibration control measures that would be implemented for the operation of the CSSI. The ONVR and identification / selection of any noise mitigation measures must be prepared in consultation with the EPA and impacted sensitive receivers. Where barrier options (e.g. noise walls or mounds) are proposed to be implemented, consultation must also be undertaken with the relevant councils. The ONVR must:*	This report
E13 a)	*confirm the appropriate operational noise and vibration objectives and levels for adjoining development, including existing sensitive receivers;*	Section 3
E13 b)	*confirm the operational noise and vibration predictions based on the final design. Confirmation must be based on an appropriately calibrated noise model (which has incorporated additional noise monitoring, and concurrent traffic counting, where necessary for calibration purposes).*	Section 4.6 Section 5.3
E13 c)	*Identify / confirm sensitive receivers at which the criteria set out in the Rail Infrastructure Noise Guideline (EPA, 2013) are predicted to be exceeded once the CSSI is operational and in 2040;*	Section 4.6
E13 d)	*review the suitability of the operational noise mitigation measures identified in the documents listed in Condition A1 and, where necessary, investigate and identify additional noise and vibration mitigation measures required to achieve the noise criteria outlined in the Rail Infrastructure Noise Guideline once the CSSI is operational and in 2040. This review must consider local climate and impacts on existing cooling devices, and alternative at-property*	Section 4.7 Section 4.8

	mitigation measures where the physical condition of a receiver building would render acoustic glazing and seals ineffective;	
E13 e)	*describe the final suite of noise and vibration mitigation measures that will be implemented to achieve the noise criteria outlined in the Rail Infrastructure Noise Guideline once the CSSI is operational and in 2040, including the timing of implementation in accordance with Condition E14;*	Section 4.9
E13 f)	*include a consultation strategy to seek feedback from directly affected landowners on the noise and vibration mitigation measures; and*	Section 6
E13 g)	*procedures for the management of operational noise and vibration complaints.*	Section 7
E13	*The ONVR is to be verified by a suitably qualified and experienced noise and vibration expert. The ONVR is to be undertaken at the Proponent's expense and submitted to the Secretary for approval within three (3) months of construction commencing.*	Section 1.5
E14	*Operational noise mitigation measures identified in Condition E13 (such as at-property architectural treatments) that will not be affected by construction works, must be implemented:* *(a) within six (6) months of the commencement of construction affecting the impacted receiver/s;* *(b) in the case of at-property treatments, as agreed with the landowner; or* *(c) as agreed by the Planning Secretary.*	Not in this report
E15	*Where implementation of operational noise mitigation measures are not proposed in accordance with Conditions E13 and E14, the Proponent must submit to the Planning Secretary a report providing justification as to why, along with details of temporary measures that would be implemented to reduce construction noise impacts, until such time that the operational noise mitigation measures identified in Condition E13 are implemented. The report must be endorsed by the ER and submitted to the Planning Secretary prior to the commencement of construction which would affect the identified sensitive receivers.*	Not in this report
E16	*In 2026 and 2035, or as otherwise agreed with the Planning Secretary, the Proponent must undertake monitoring of operational noise to compare actual noise performance of the CSSI against the noise performance predicted in the review of noise mitigation measures required by Condition E13. The Proponent must prepare an Operational Noise Compliance Report (ONCR) to document this monitoring. The Report must include, but not necessarily be limited to:*	Not in this report
E16 a)	*noise monitoring to assess compliance with the operational noise levels predicted in the review of operational noise mitigation measures required under Condition E13;*	
E16 b)	*methodology, location and frequency of noise monitoring undertaken, including monitoring sites at which CSSI noise levels are ascertained, with specific reference to locations indicative of impacts on sensitive receivers;*	
E16 c)	*details of any complaints and enquiries received in relation to operational noise generated by the CSSI between the date of commencement of operation and the date the report was prepared;*	
E16 d)	*any required recalibrations of the noise model taking into consideration factors such as noise monitoring and actual train movements;*	
E16 e)	*an assessment of the performance and effectiveness of applied noise mitigation measures together with a review and if necessary, reassessment of mitigation measures; and*	
E16 f)	*identification of additional measures to those identified in the review of noise mitigation measures required by Condition E13, that would be implemented with the objective of meeting the criteria outlined in the Rail Infrastructure Noise Guideline, when these measures would be implemented and how their effectiveness would be measured and reported to the Secretary and the EPA.*	
E16	*The ONCR is to be verified by a suitably qualified and experienced noise and vibration expert. The ONCR must be submitted to the Secretary and the EPA for information within 90 days of completing the operational noise monitoring.*	

	Note: 2026 and 2035 are specified as representing 12 months and 10 years after the anticipated commencement of operation of the entire Inland Rail project. Should this timeframe change, the Proponent should seek the approval of the Planning Secretary to vary the timeframe in which to satisfy this condition.	

1.5 Operational Noise and Vibration Review

As per Condition E13 (refer Section 1.4), an Operational Noise and Vibration Review (ONVR) has been prepared to confirm the final mitigation measures for operational noise and vibration that would be implemented. This document is submitted to the NSW Department of Planning, Industry and Environment.

The present ONVR highlights the following:

- Changes to the predicted airborne rail noise levels identified in the EIS as a result of the re-modelling, in line with the methodology described in Sections 4.3 and 4.4;
- Changes to the predicted airborne rail noise levels identified in the EIS, as a result of the detailed design process;
- Changes to the vibration levels identified in the EIS, as a result of the detailed design process;
- Design of reasonable and feasible noise and vibration mitigation measures consistent with the NSW Environment Protection Authority – *Rail Infrastructure Noise Guideline*;
- Process to seek feedback from directly affected receivers on the final mitigation measures proposed in the review; and
- Procedures for the management of complaints regarding operational noise and vibration.

This ONVR was prepared by a suitably qualified and experienced noise and vibration engineer with over 19 years of experience in noise and vibration and Member of the Australian Acoustical Society. It has been internally peer reviewed by a suitably qualified and experienced noise and vibration engineer with over 15 years of experience in noise and vibration and Member of the Australian Acoustical Society. The Quality Management System employed conforms with the requirements of ISO 9001:2015. In addition, this ONVR has also been externally peer reviewed by a suitably qualified and experienced noise and vibration engineer engaged by ARTC as a Technical Advisor.

1.6 Standards and Guidelines

The following standards and guidelines were used to conduct this assessment:

- British Standard *BS 6472:1992 – Guide to evaluation of human exposure to vibration in buildings (1 Hz to 80 Hz)* (BS6472);
- British Standard *BS 7385-2:1993 – Evaluation and measurement for vibration in buildings - Guide to damage levels from groundborne vibration* (BS7385);
- *Nordic Rail Prediction Method – Kilde Report 130* (Ringheim), 1984;
- NSW Department of Environment and Conservation – *Assessing Vibration: A Technical Guideline*, 2006 (AVTG);
- NSW Environment Protection Authority – *Noise Policy for Industry*, 2017 (NPfI);
- NSW Environment Protection Authority – *Rail Infrastructure Noise Guideline*, 2013 (RING);
- *ARTC Inland Rail Technical Specification for Noise and Vibration Assessments (0-9000-ENV-00-SP-0001);* and
- *United States of America Department of Transportation Federal Transit Administration – Transit Noise and Vibration Impact Assessment Manual*, 2006 (TNVIAM).

2 Sensitive Receivers

The noise and vibration sensitive receivers situated along the rail alignment have been identified in Technical Report 5 – Noise and Vibration Assessment. The ONVR assessment only considers the receivers previously identified within 500 metres of the tracks. No noise and vibration impacts are expected further than this distance. This is consistent with the conclusions of Technical Report 5 – Noise and Vibration Assessment.

Residential sensitive receivers in townships, including Moree, consist of predominantly single storey dwellings which are closely spaced. Residential sensitive receivers outside of townships consist of predominantly single storey dwellings which are more rural and spaced. There are some small groups of receivers, however, the majority of residences are isolated.

Non-residential sensitive receivers have also been identified within 500 metres of the tracks as follows:

- NNS_EDUx0006 - North Star Public School
- NNS_EDUx0007 - Croppa Creek Public School
- NNS_REAx0001 - Squash courts
- NNS_REAx0008 - Tennis court
- NNS_REAx0019 - Sports courts and field
- NNS_REPx0002 - Park
- NNS_REPx0003 - Park
- NNS_REPx0005 - Railway park
- NNS_REPx0012 - Lions park
- NNS_REPx0014 - Sugars park
- NNS_REPx0015 - Bellata park
- NNS_WORx0002 - Place of worship
- NNS_WORx0003 - Place of worship
- NNS_WORx0007 - Catholic church
- NNS_WORx0008 - Anglican church

The location of the sensitive receivers is shown in Appendix A.

3 Project Criteria

The operational noise and vibration criteria relevant to the Project and used in this assessment are described in the following sections.

3.1 Operational Airborne Rail Noise Trigger Levels

The Project is an existing and operational rail corridor proposed to be upgraded. The upgraded alignment is located within the existing operational rail corridor, and as such, it is considered as a redevelopment of an existing rail line for the purpose of the operational noise assessment.

The RING defines rail airborne noise trigger levels for heavy rail. These trigger levels represent external levels of noise that trigger the need for an assessment of potential noise mitigation measures to reduce noise levels from a rail infrastructure project. Noise trigger levels are assessed for a height of 1.5 metres above ground, at a location 1 metre in front of the most affected building façade. Predicted noise levels are to include a façade correction factor of +2.5 dBA. It is noted that the standard façade correction in the proposed modelling algorithm is +3 dBA, and as such, this value was considered for all façade corrected predictions. This is a conservative assumption.

Triggers for residential sensitive receivers are provided in Table 3.1.

Table 3.1 Airborne noise trigger levels for residential land uses (RING)

Type of development	Noise trigger level, dBA (external)	
	Day 7am-10pm	Night 10pm-7am
Redevelopment of existing rail line	Development increases existing $L_{Aeq,}$ rail noise levels by 2 dB or more, or existing L_{Amax} rail noise levels by 3 dB or more and predicted rail noise levels exceed:	
	65 $L_{Aeq,15hr}$ or 85 L_{AFmax}	60 $L_{Aeq,9hr}$ or 85 L_{AFmax}

Triggers for non-residential sensitive receivers are provided in Table 3.2.

Table 3.2 Airborne noise trigger levels for sensitive land uses other than residential (RING)

Other sensitive land uses	Noise trigger level, dBA (when in use)
	Redevelopment of existing rail line
	Development increases existing rail noise levels by 2 dB or more in L_{Aeq} for that period and resulting rail noise levels exceed:
Schools, educational institutions and child care centres	45 $L_{Aeq,1hr}$ internal
Places of worship	45 $L_{Aeq,1hr}$ internal
Hospital wards	40 $L_{Aeq,1hr}$ internal
Hospitals other uses	65 $L_{Aeq,1hr}$ external

Open space – passive use (e.g. parkland, bush reserves)	65 $L_{Aeq,15hr}$ external
Open space – active use (e.g. sports field, golf course)	65 $L_{Aeq,15hr}$ external

The noise modelling undertaken in this assessment is based upon external noise levels. Where the noise trigger levels are provided as internal noise levels, the design has converted these to equivalent external noise levels assuming:

- A generic building envelope noise reduction of 10 dBA; and
- The + 3 dBA façade correction factor applied to external noise levels is excluded.

This accounts for noise reduction across a building façade, where windows are partially open and is in accordance with NSW methodology as detailed in Section 2.6 of the NPfI.

The noise trigger levels provided for each receiver, in the Appendix B tabulated results, are based upon external noise levels.

3.2 Operational Ground-Borne Rail Noise Trigger Levels

The RING defines ground-borne noise trigger levels for heavy rail for residential and sensitive land uses as per Table 3.3.

Table 3.3 Ground-borne noise trigger levels for residential and sensitive land uses (RING)

Sensitive land use	Time of day	Internal noise trigger level, dBA
		Development increases existing rail noise levels by 3 dBA or more and resulting rail noise levels exceed
Residential	Day 7am-10pm	40 L_{ASmax}
	Night 10pm-7am	35 L_{ASmax}
Schools, educational institutions, places of worship	When in use	40 – 45 L_{ASmax}

For schools, educational institutions and places of worship, the lower value of the range is most applicable where low internal noise levels are expected, such as in areas assigned to studying, listening and praying.

Ground-borne noise level values are relevant only where they are higher than the airborne noise from railways and where the ground-borne noise levels are expected to be, or are, audible within habitable rooms. The levels are to be assessed at the centre of the most affected habitable room.

3.3 Operational Vibration Trigger Levels

Operational vibration can lead to:

- Cosmetic and structural building damage; and
- Loss of amenity due to perceptible vibration, termed human comfort.

Importantly, cosmetic damage is regarded as minor in nature; as it is readily repairable and does not affect a building's structural integrity. Damage of this nature is typically described as hairline cracks on drywall surfaces, hairline cracks in mortar joints and cement render, enlargement of existing cracks, and separation of

partitions or intermediate walls from load bearing walls. If there is no significant risk of cosmetic damage, then structural damage is not considered a significant risk and is not further assessed.

3.3.1 Cosmetic Building Damage

The RING does not provide any trigger levels for the assessment of cosmetic building damage. There is also no Australian Standard that provides guidance for cosmetic damage, due to vibration. Therefore, the evaluation of vibration in relation to cosmetic damage to buildings from vibrational energy is proposed to be conducted in accordance with BS7385.

The guide values in BS7385 relate predominantly to transient vibration, which does not give rise to resonant responses in structures and to low-rise buildings. Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in BS7385 may need to be reduced by up to 50%.

Vibration from rail pass-byes is typically transient in nature. However, as the Project refers to rolling stock of significant length (1800 metres), IRDJV has elected to also compare vibration levels to adjusted trigger levels for continuous vibration to provide a conservative assessment. IRDJV is of the opinion that dynamic magnification and resonance is unlikely to occur due to train pass-byes from the Project and therefore, these trigger levels therefore represent a highly a conservative assessment of operational vibration. Values with a 50% reduction for continuous vibration are provided in Table 3.4.

Table 3.4 Vibration trigger levels for cosmetic damage – transient (BS7385)

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 – 15 Hz	15 Hz and above
Reinforced or framed structures Industrial and heavy commercial buildings	25 mm/s at 4 Hz and above	
Unreinforced or light framed structures Residential or light commercial type buildings	7.5 mm/s at 4 Hz increasing to 10 mm/s at 15 Hz	10 mm/s at 15 Hz increasing to 25 mm/s at 40 Hz and above

3.3.2 Human Comfort

Vibration in buildings associated with rail operations, can cause disturbance and complaints in a similar manner to noise. The RING refers to AVTG. AVTG defines preferred and maximum values of vibration dose for intermittent vibration. The preferred values are considered to be the triggers, which initiate an assessment of feasible and reasonable mitigation measures under the RING.

Table 3.5 Vibration trigger levels for human comfort (AVTG)

Location	Vibration dose values for intermittent vibration, $m/s^{1.75}$	
	Day 7am-10pm	Night 10pm-7am
Residences	0.20	0.13
Offices, schools, educational institutions and places of worship	0.40	0.40
Workshops	0.80	0.80

4 Airborne Rail Noise Impacts

4.1 Outcomes of the EIS

The outcomes of the EIS are detailed in the Technical Report 5 – Noise and Vibration Assessment. These are summarised below:

- The current EIS identified that the operational airborne rail noise levels were anticipated to exceed the relevant trigger levels for:
  - 152 residential receivers;
  - 3 educational receivers;
  - 3 worship receivers;
  - 2 passive recreation receivers; and
  - 1 active recreation receiver.

4.2 Summary of the Design Changes for the Detailed Design Process

The alignment and velocity profile have been updated for the detailed design of the Project; airborne noise levels are affected by the design changes. Therefore, the 3D noise model incorporates the following:

- Track realignment. The final alignment has optimised the distance between tracks and receivers, where feasible within the design constraints;
- Minimise change of grade. The final alignment has optimised the change of grade and minimised the track grade to less than 1.5% where feasible within the design constraints;
- Straighten curves. Most curves have been straightened where feasible to increase the radii above 500 m, which has a positive effect in terms of reducing wheel squeal and noise emissions; and
- Minimise rail/wheel roughness. It is assumed rail roughness will be managed by ARTC and rollingstock wheels will be maintained by train operators.

4.3 Modelling Methodology

The existing and proposed alignments were modelled in SoundPLAN Version 8.2 using the *Nordic Rail Prediction Method – Kilde Report 130*. The noise model was prepared with reference to the ARTC Inland Rail technical specifications for noise and vibration assessments.

A 3-dimensional representation of the physical environment within the proposal site was simulated. Modelling inputs included topography, ground and air absorption, locations of sensitive receivers, noise sources and buildings surrounding the proposal.

Meteorological conditions are modelled at zero wind speed, zero degrees Celsius per 100 metre atmospheric temperature gradient, 15 degrees Celsius and 70 per cent relative humidity.

The modelling parameters are shown in Table 4.1.

Table 4.1 Noise modelling inputs

Parameter	Modelling input
Ground absorption	0.5 in Moree, 1.0 outside of Moree
Receivers	Naming convention as per the EIS

Buildings	Building provided by ARTC
Assessment location	Noise levels were predicted as façade corrected levels at 1 metre of the most affected façade
Receiver height	1.5 metres above ground level

4.4 Modelling Scenarios and Inputs

4.4.1 Modelled Years

The RING states that noise trigger levels shall be assessed for the opening year and for a design year typically 10 years after opening. The construction of the proposal is expected to be finalised in 2022, which is the actual opening year for this section. However, the entire Inland Rail programme is divided into various sections, each having their own approval process. Construction of the various sections are proposed to occur through until 2025. Year 2025 is therefore the year of “through connection” where the overall traffic through the whole alignment will start to increase. It is representative of the opening year from a RING perspective, as no significant change in traffic is expected between 2020 and 2025. Year 2040 is the design year.

The following years have been included in rail noise modelling:

- 2020 - The “no build” scenario. The existing section is modelled with grain trains and no change to the rail alignment;
- 2025 – Represents the opening year when the whole of Inland Rail will be connected and open. The proposal is modelled with the proposed traffic and conditions for Year 2025; and
- 2040 – Design year. The proposal is modelled with the proposed traffic and conditions for Year 2040.

4.4.2 Rail Traffic

The proposed peak daily traffic flows and day / night split for year 2040 were provided by ARTC. These are detailed in Table 4.2.

Data for year 2025 were derived using typical average daily traffics for years 2025 and 2040 (i.e. 52.4% traffic increase between year 2025 and 2040). In addition, for each service type, it is assumed that 50% of trains are travelling northbound and 50% are travelling southbound.

Table 4.2 Daily peak train number per service

Train description	Train Type	CLASS	2040	Day / Night split
MB Express (Bromelton)	Inland Rail Express	NR	2.0	50%
MB Express (Acacia Ridge)	Inland Rail Express	NR	2.0	50%
MB Superfreighter (Bromelton)	Inland Rail Superfreighter	SCT	5.7	38%
MB Superfreighter (Acacia Ridge)	Inland Rail Superfreighter	SCT	1.1	50%
GB Superfreighter (Bromelton)	Inland Rail Superfreighter	SCT	3.1	41%
GB Superfreighter (Acacia Ridge)	Inland Rail Superfreighter	SCT	1.4	100%
Narrabri - PoB Grain	Grain	PR22L	3.4	25%
Moree - Narrabri Grain	Grain	PR22L	3.4	50%
Narrabri - PoB Export Cont	Freight	82	1.7	100%

Train description	Train Type	CLASS	2040	Day / Night split
Sydney - Moree Explorer	Passenger	XPT	2.0	100%

It is noted that although infrequent and seasonal, a total of 1 grain train was modelled during the day and night period for the year 2020 to allow for the assessment of the relative increase in noise levels generated by the Project.

4.4.3 Train Speeds

The forecasted speeds for each train type were provided by ARTC and account for train driver behaviour and rolling stock performance. The noise modelling has been based on these speeds, which range from 55 km/h to 105 km/h outside of Moree and include variations in speed to account for acceleration and deceleration for trains circulating on the main line and trains entering / departing loops, as well as differences in speed for trains travelling northbound and southbound.

It is noted that the exact speed profile for grain trains for year 2020 is unknown, and as such, these have been assumed to travel at low speed (30 km/h in Moree, 80 km/h outside Moree), which is a conservative assumption.

4.4.4 Train Consists Lengths and Types

The train consists lengths and types are detailed in Table 4.3.

Table 4.3 Consists lengths and types

Train type	Locomotive			Wagon
	Class	Number	Length	Length
Inland Rail Express	NR	3	22 m	1680 m
Inland Rail Superfreighter	SCT	2	22 m	1700 m
Grain	PR22L	3	18 m	560 m (NSW grain) 800 m (QLD grain)
Freight	82	2	22 m	580 m
Passenger	XPT	1	178 m total	

4.4.5 Locomotives and Wagons Noise Source Levels

The locomotives and wagons noise source levels are detailed in Table 4.4. Source levels are provided at 80 km/h, at 15 metres from the track centreline and at 1.5 metres above the top of the rail. L_{Amax} levels are 95th percentile levels. Downhill segments are considered to have a negative grade greater than 1 in 100. Uphill segments are considered to have a positive grade greater than 1 in 100.

Table 4.4 Locomotives and wagons noise source levels

Rollingstock category	Source elevation	Gradient	Source levels, dBA	
			SEL	L_{Amax}
NR	4 metres above top of the rail	Flat	85	90
		Downhill	84	90

		Uphill	90	94
SCT	4 metres above top of the rail	Flat	84	88
		Downhill	84	91
		Uphill	89	92
PR22L	4 metres above top of the rail	Flat	84	91
		Downhill	84	94
		Uphill	89	94
82	4 metres above top of the rail	Flat	83	89
		Downhill	84	94
		Uphill	88	94
XPT	Top of the rail	-	91	86
1000 m of wagons	Top of the rail	-	100	90

4.4.6 Track Features

All bridges are ballasted with concrete span and no side screens. No correction is considered for bridges as per the ARTC Inland Rail technical specifications for noise and vibration assessments.

All track types are continuously welded rail. No correction is considered for tracks as per the ARTC Inland Rail technical specifications for noise and vibration assessments.

4.4.7 Crossing Loops and Level Crossings

Train horn noise was modelled at 90 dBA at 100 metres. For L_{Aeq} calculations, horns are assumed to be used for a maximum duration of 1 second per pass-by at the public level crossings only, approximately 15 metres away from the level crossings.

Warning crossing bell noise was modelled at 105 dBA at 3 metres. For L_{Aeq} calculations, warning bells are assumed to operate 30 seconds prior to a train entering the level crossing and remain audible throughout the train pass-by.

Idling noise at crossing loops was modelled at 70 dBA at 15 metres. Loop usage per service range from 0 to 29% of trains depending on the loop under consideration. The loop usage per service is detailed in Table 4.5. For L_{Aeq} calculations, it is assumed trains are idling 20 minutes at each loop.

Table 4.5 Loop usage per service

Train description	Yelarbon Loop	Boonal Loop	Murgo Loop	Coollee-arllee Loop	Tycannah Creek Loop	Waterloo Creek Loop	Bobbiwaa Loop
MB Express (Bromelton)	0%	0%	0%	0%	0%	0%	0%
MB Express (Acacia Ridge)	0%	0%	0%	0%	0%	0%	0%
MB Superfreighter (Bromelton)	28%	26%	21%	20%	18%	22%	19%
MB Superfreighter (Acacia Ridge)	29%	27%	22%	21%	19%	22%	19%
GB Superfreighter (Bromelton)	29%	26%	21%	20%	19%	22%	19%

GB Superfreighter (Acacia Ridge)	29%	27%	21%	21%	19%	22%	19%
Narrabri - PoB Grain	29%	26%	21%	20%	19%	22%	19%
Moree - Narrabri Grain	0%	0%	0%	0%	19%	22%	19%
Narrabri - PoB Export Cont	29%	26%	21%	20%	19%	22%	19%
Sydney - Moree Explorer	0%	0%	0%	0%	18%	22%	19%

Bunching and stretching noise was modelled at 90 dBA at 15 metres. For L_{Aeq} calculations, it is assumed that trains idling at crossing loops generates bunching noise when decelerating and stretching noise when accelerating, for a duration of 1 second per wagon.

4.5 Validation of the Model

Pre-construction rail noise monitoring has not been undertaken as part of this operational noise and vibration impact assessment as the dominant noise sources, Inland Rail trains, are not operational and their contribution cannot be validated.

It is noted that the locomotives and wagons noise sources provided in Section 4.4.5 are based on the Transport for NSW Rollingstock Noise Emission Database. This database provides validated noise emission levels for locomotives and wagons for use in railway noise modelling and assessments.

In addition, and in accordance with Condition E16, operational noise will be monitored within 12 months of the commencement of Inland Rail service offering operations to compare actual noise performance with predicted levels detailed in this report. The model will be validated using these measurements and if calibration is required, outcomes will be detailed in an operational noise compliance report.

4.6 Predicted Noise Levels for Build Scenarios (Years 2025 and 2040)

Table 4.6 summarises the number of noise sensitive receivers in each land use category, which exceed the relevant noise trigger levels without noise mitigation in place. All predicted noise levels are detailed in Appendix B.

Table 4.6 Summary of exceedances of the noise trigger levels without mitigation

Receiver type	Year 2025	Year 2040
Residential	40	77
Educational	0	1
Worship	0	1
Passive recreation	0	0
Active recreation	0	0

The assessment outcome is typically driven by the L_{Aeq} descriptor. Only a single receiver is predicted to exceed the L_{Amax} trigger level for year 2025 whilst complying with the L_{Aeq} trigger level. Other L_{Amax} exceedances are predicted at a small number of locations, but in these cases, the L_{Aeq} exceedance is greater and so are driven by the L_{Aeq}.

Noise mitigation is designed with the goal of achieving compliance with the noise trigger levels for these receivers for the year 2040, to the extent which is reasonable and feasible.

4.7 Potential Mitigation Measures for Airborne Noise

The RING defines feasible and reasonable as follows:

A feasible mitigation measure is a noise mitigation measure that can be engineered and is practical to build, given project constraints such as safety, maintenance and reliability requirements. It may also include options such as amending operational practices (e.g. changing timetable schedules) to achieve noise reduction.

Selecting reasonable measures from those that are feasible, involves judging whether the overall noise benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the mitigation measure. To make such a judgement, the following should be considered:

- *Noise impact;*
- *Noise mitigation benefits;*
- *Cost effectiveness of noise mitigation; and*
- *Community views.*

The potential airborne noise mitigation measures and the associated impacts are discussed individually below.

- Track realignment:
  - The Narrabri to North Star section is a 186 km brownfield section, with limited opportunities to upgrade the track alignment. The proposed track layout represents an alignment where reasonable and feasible mitigation measures have already been implemented as part of the design and model;
- Minimise change of grade:
  - The Narrabri to North Star section is a 186 km brownfield section with limited opportunities to change the grade. The proposed track layout represents an alignment where reasonable and feasible mitigation measures have already been implemented as part of the design and model;
- Straighten curves:
  - Most curve radii are designed to be greater than 500 metres, which is expected to reduce the squealing noise and therefore, have a positive effect in terms of minimising the overall noise emissions. The proposed track layout represents an alignment where reasonable and feasible mitigation measure have already been implemented as part of the design and model;
- Reduce maximum operating speeds:
  - The purpose of the Project is to increase capacity and operating speed on the Narrabri to North Star section. Therefore, it is not considered reasonable to decrease the maximum operating speed;
- Reduce number of trains or trains lengths:
  - The purpose of the Project is to increase capacity on the Narrabri to North Star section. Therefore, it is not considered reasonable to decrease the number of trains or the train length;
- Restrict operating hours:
  - The purpose of the Project is to increase capacity on the Narrabri to North Star section. Therefore, it is not considered reasonable to restrict the operating hours;
- Track lubrication:
  - Track lubrication may be beneficial for curves with very tight radii. The alignment has been modified to increase the curve radius and therefore, track lubrification is therefore not likely to provide any significant noise reduction;
- Rail dampers:
  - Rail dampers are pre-formed elements attached to the sides of the rails. They improve the rails ability to decay noise-inducing vibrations resulting from the rolling contact between the wheel and rail. These are only efficient for reducing wagon noise, where it is dominated by the wheel / rail interaction.

The rail noise emission from trains on the Project will be comprised of multiple sources, including locomotive engines and exhausts, wheel/rail interactions, noise radiating from freight wagon bodies, braking noise, bunching noise, and horn noise. The limited effectiveness of rail dampers in mitigating noise sources beside wheel rail noise suggests that their implementation will provide limited benefit to mitigating noise from the Project. Furthermore, rail dampers require routine maintenance and may therefore result in significant maintenance cost over the lifetime of the rail track. For these reasons, the implementation of rail dampers has not been considered as a feasible noise mitigation in this assessment;

- Noise barriers:
  - Noise barriers are an effective noise mitigation option. However, noise barriers are relatively expensive and are therefore typically only considered reasonable where the noise barrier provides noise mitigation for groups of closely spaced receivers. Noise barriers can be constructed of various materials; some cheaper construction materials such as timber fences are likely to require more frequent maintenance compared to more expensive noise barriers such as steel and concrete. The implementation of noise barriers has been investigated in this assessment and is discussed further in Section 4.8.1; and
- At-property treatments:
  - At-property treatments are also an effective noise mitigation option, particularly where noise sensitive receivers are sparsely located, resulting in noise barriers being an unreasonable mitigation option. At-property treatments may consist of short sections of noise barriers installed adjacent to the building to provide shielding locally to the affected receiver, upgrades to the building façade such as retrofitted glazing, acoustically treated ventilation paths and installation of insulation, or a combination of both. Generally, at-property treatments are considered as a last resort once all other mitigation options have been exhausted. These are discussed further in Section 4.8.2.

4.8 Mitigation Options

As outlined in Section 4.7, two mitigation options have been considered. These mitigation options are discussed for receivers predicted to exceed the noise trigger levels for year 2025 but will be designed to best meet the noise trigger levels for year 2040 (i.e. the noise mitigation will be future-proofed) while remaining reasonable and feasible.

ARTC commits to reviewing the predicted noise levels in 2026 and 2035 and mitigation measures for receivers predicted to exceed the noise trigger levels for year 2040 (but not in 2025) will be investigated at a later stage. Particularly, operational noise monitoring in 2026 and 2035 will enable the tracking of noise impacts over time and the provision of mitigation that suits the conditions in 2040 and utilises any new available technologies.

4.8.1 Noise Barriers

Noise barriers are a form of mitigation which should be considered for reducing the number of exceedances, where receivers are not isolated. For example, where there are groups of closely spaced dwellings or other noise sensitive areas, typically in townships. Where isolated receivers are predicted to exceed the noise trigger levels, it is not typically cost-efficient to install barriers, when compared to the cost of at-property treatments.

Noise modelling identified that there are three locations along the N2NS alignment where noise barriers may provide effective, reasonable and feasible noise mitigation. These locations are typically in townships, namely:

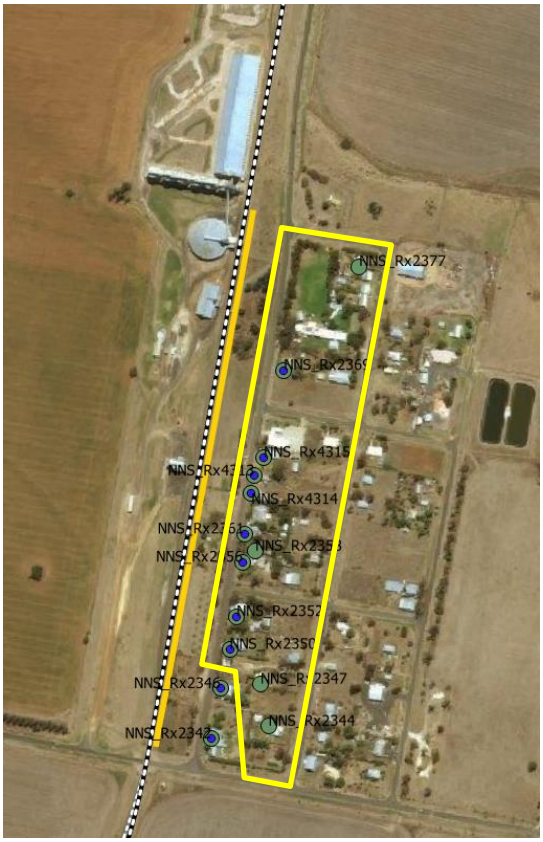
- Bellata;
- Moree (station); and
- North Star.

Wall locations were defined in consultation with the wider project team. The team has considered many non-acoustic matters, including utility services, constructability, sight lines, safety in design factors and access to station platforms. Once barrier locations were confirmed, each noise barrier extent and height were optimised. The following parameters were input to the optimisation:

- Minimum barrier segment length of 10 metres;
- Minimum barrier height of 2 metres (relative to ground surface);
- Maximum barrier height of 5 metres (relative to ground surface); and
- Barrier height increments of 0.5 metres.

Table 4.7 shows the potential noise barrier extent (minimum height and footprint) to best achieve compliance at the noise sensitive receivers eligible for noise mitigation for year 2040. IRDJV note that this barrier design may be subject to further rationalisation. Rationalisation of barriers may occur through review of the detailed design, finalisation of surface water management, the constructability assessment and community engagement on noise management and mitigation. Where barriers are removed for rationalisation purposes the relevant receivers will require at-property treatments. Receivers shown in Table 4.7 are predicted to exceed for year 2025 (blue) and 2040 (green) without noise barriers. Receivers circled in yellow are predicted to comply for year 2040 with the noise barriers as shown.

Table 4.7 Design noise barrier extent – Green: exceedances year 2040 – Blue: exceedances year 2025 – Yellow: compliances year 2040 with noise barrier

Township / Locality	Barrier footprint
North Star	5 metres, 1 section Two residual exceedances 
Moree: Station	The only receiver predicted to exceed for year 2025 (NNS_Rx1925) appears to have been demolished. As such, no receivers in the vicinity of the station are predicted to exceed for year 2025. A noise barrier will be investigated to protect the amenity of the other receivers in the vicinity of the station predicted to exceed for year 2040. This will be reviewed in 2026 and 2035 following the preparation of the Operational Noise Compliance Report.

Township / Locality	Barrier footprint	
Bellata	5 metres, 4 sections Option 1 – 11 residual exceedances	5 metres, 1 section Option 2 – 13 residual exceedances





The barrier in Bellata is positioned on the opposite side of arterial roads (Newell Highway) to noise sensitive receiver locations. The use of a noise barrier at this location will lead to a moderate increase in road traffic noise levels at the adjacent receivers, due to sound reflecting off the barrier. Calculations indicate that these increases will typically be of the order of 0.9 - 1.8 dB for the barrier positioning shown. This magnitude of increase it not likely to be perceptible to the typical receiver.

This barrier design does not achieve compliance with rail noise trigger levels at all noise sensitive receivers. This is due to limitations on barrier height and placement. Two residential receivers NNS_Rx2342 and NNS_Rx2346 will require additional at-property treatments in addition to the noise barrier in North Star. Depending on the barrier design selected, up to 13 residential receivers would also require additional at-property treatments in Bellata, including nine to comply for year 2025 and up to an additional four to comply for year 2040.

4.8.2 At-Property Treatments

At-property treatments have been considered for the noise sensitive receivers predicted to exceed the noise trigger levels for year 2025.

4.8.2.1 Typical Treatments

At-property treatments typically consists of upgrades to the building façades impacted by rail noise. At-property treatments may also include an upgrade of the property fence or increasing the height of an existing property fence.

Architectural acoustic treatment can generally be expected to provide between 3 and 20 dBA internal noise reduction, depending on the dominant type of railway noise source in that location and the existing type of building façade construction.

A determination on whether a treatment is feasible and reasonable/practicable should be made initially based on the condition of each building. Poorly maintained or dilapidated buildings (e.g. broken windows, holes in walls) or properties where internal access is restricted or unsafe (e.g. hoarding) may not be considered eligible for an architectural treatment. Where properties are deemed not eligible for an architectural treatment for the previous reasons, alternative measures will be agreed between each landowner and ARTC.

An acoustic consultant should be engaged by ARTC to provide advice on the specific treatment methodology in conjunction with consultation with the property owner for each individual dwelling. This is further discussed in Section 6.1.

4.8.2.2 Identified Receivers – Townships

As detailed in Section 4.8.1, noise barriers are considered reasonable and feasible in Bellata, Moree and North Star, but the proposed designs lead to residual exceedances at two receivers in North Star, and up to 13 in Bellata, including nine predicted to exceed for year 2025. These are listed in Table 4.8.

Table 4.8 Summary of receivers eligible for at-property treatments in townships – year 2025

Receiver	Maximum exceedance for year 2025	Maximum exceedance for year 2040	Description	Eligible (pending site inspection)
NNS_Rx0778	1	4	-	Yes
NNS_Rx0786	2	5	-	Yes
NNS_Rx0794	1	4	-	Yes
NNS_Rx0797	1	5	Police station with accommodation	Yes
NNS_Rx0800	1	5	Post office with accommodation	Yes
NNS_Rx0832	2	5	-	Yes
NNS_Rx0835	3	6	-	Yes
NNS_Rx0837	2	6	-	Yes
NNS_Rx0838	1	5	-	Yes
NNS_Rx2342	3	6	-	Yes
NNS_Rx2346	2	5	-	Yes

4.8.2.3 Identified Receivers – Outside Townships

Other receivers predicted to exceed the airborne rail noise trigger levels for year 2025 outside of Bellata, Moree (station) and North Star will be considered for at-property treatments. These are listed in Table 4.9. It is noted that three out of the 19 receivers are businesses, and as such, a total of 16 receivers is to be considered for at-property treatments.

It is noted that a cluster of properties at Burrington Road, Moree South are predicted to exceed noise trigger levels. Consideration has been given to noise walls at this location, however has been discounted due to Moree Plains Shire Council's strategic land use and road network planning for industrial development, associated with the Moree Special Activation Precinct. Therefore, at-property treatments would be implemented to these properties, pending the resolution of Council's planning and development activities.

Table 4.9 Summary of receivers eligible for at-property treatments outside townships – year 2025

Receiver	Maximum exceedance for year 2025	Maximum exceedance for year 2040	Description	Eligible (pending site inspection)
NNS_Rx0744	2	5	-	Yes
NNS_Rx0745	2	5	-	Yes
NNS_Rx0766	1	5	-	Yes
NNS_Rx0767	1	5	-	Yes
NNS_Rx0838	1	5	-	Yes
NNS_Rx0859	2	6	Business	No
NNS_Rx0860	2	6	Business	No
NNS_Rx0862	1	5	-	Yes
NNS_Rx0863	1	5	-	Yes
NNS_Rx0867	1	4	Business	No
NNS_Rx0892	1	5	-	Yes
NNS_Rx0897	2	5	-	Yes
NNS_Rx2267	5	7	-	Yes
NNS_Rx2287	4	6	-	Yes
NNS_Rx2299	4	6	-	Yes
NNS_Rx2302	3	5	-	Yes
NNS_Rx2306	2	5	-	Yes
NNS_Rx2311	4	6	-	Yes
NNS_Rx2320	3	5	-	Yes

4.9 Final Rail Noise Mitigation Measures

The following Table 4.10 summarises the rail noise mitigation measures considered for the Project and for the receivers eligible for noise mitigation for year 2025.

Table 4.10 Final mitigation measures

Mitigation option	Location	Feasible mitigation test	Reasonable mitigation test	Mitigation selected
Mitigation at the source				
Track realignment	Project	Limited opportunity	Yes	Yes (1)
Change of grades	Project	Limited opportunity	Yes	Yes (1)

Mitigation option	Location	Feasible mitigation test	Reasonable mitigation test	Mitigation selected
Straighten curves	Project	Limited opportunity	Yes	Yes (1)
Reduce operating speeds	Project	Yes	No	No
Reduce number of trains	Project	Yes	No	No
Reduce trains length	Project	Yes	No	No
Restrict operating hours	Project	Yes	No	No
Track lubrication	Project	Yes	No	No
Rail dampers	Project	No	Yes	No
Mitigation of the transmission path				
Noise barriers	Townships	Yes	Yes	Yes
Mitigation at receiver				
Architectural treatment	Exceeding receivers	Yes	Yes (2)	Yes
Upgrade of property fences	Exceeding receivers	Yes	Yes	Yes

Notes:
(1) Implemented during rail design
(2) Subject to case-by-case building condition assessment

5 Ground-Borne Noise and Vibration Impacts

5.1 Outcomes of the EIS

The outcomes of the ground-borne noise and vibration assessments conducted for the EIS are detailed in the Technical Report 5 – Noise and Vibration Assessment. These are summarised below:

- Operational vibration impacts with consideration to structural damage were not considered likely;
- Operational vibration impacts with consideration to human comfort were expected for 3 receivers.

5.2 Summary of the Design Changes for the Detailed Design Process

The alignment and velocity profile have been updated for the detailed design of the Project and ground-borne noise and vibration levels are affected by the design changes. Therefore, the assessment incorporates the following changes:

- Track realignment. The final alignment has optimised the distance between tracks and receivers where feasible within the design constraints; and
- Minimise rail/wheel roughness. It is assumed rail roughness will be managed by ARTC and rollingstock wheels will be maintained by train operators.

5.3 Ground-Borne Noise and Vibration Assessment

Ground-borne noise and vibration from the trains passing-by have been assessed using the general assessment methodology described in the TNVIAM. The approach for the assessment is to define a curve that predicts the overall ground-surface vibration as a function of distance from the source, then apply adjustments to these curves to account for factors such as vehicle speed, rail conditions, building type, and receiver location within the building.

5.3.1 Representative Most Affected Receivers

The permitted line speed for most of the Project is 105 km/h, with the following exceptions:

- Chainage 576 km through Chainage 582 km: 92 km/h
- Chainage 664 km through Chainage 665 km: 73 km/h
- Chainage 665 km through Chainage 666 km: 55km/h
- Chainage 706 km through Chainage 708 km: 96 km/h
- Chainage 746 km through Chainage 750 km: 92 km/h.

For the purpose of the vibration and ground-borne noise assessment, permitted line speeds and nearest receivers are considered, which is a conservative approach. Indeed, trains may travel slower than the permitted speed (when accelerating or decelerating), but will never exceed it, and where compliance is predicted at the nearest receiver, it is also expected at receivers further from the tracks.

The nearest receivers for the assessment are NNS_Rx1552, approximately 55 metres from the tracks in a section where posted speed is 55 km/h, and NNS_Rx2267, approximately 50 metres from the tracks in a section where posted speed is 105 km/h.

5.3.2 Ground Surface Vibration Level

The base curve for locomotive powered freight trains at 50 mph is provided in Figure 10-1 of the TNVIAM. It is reproduced in Figure 5.1.

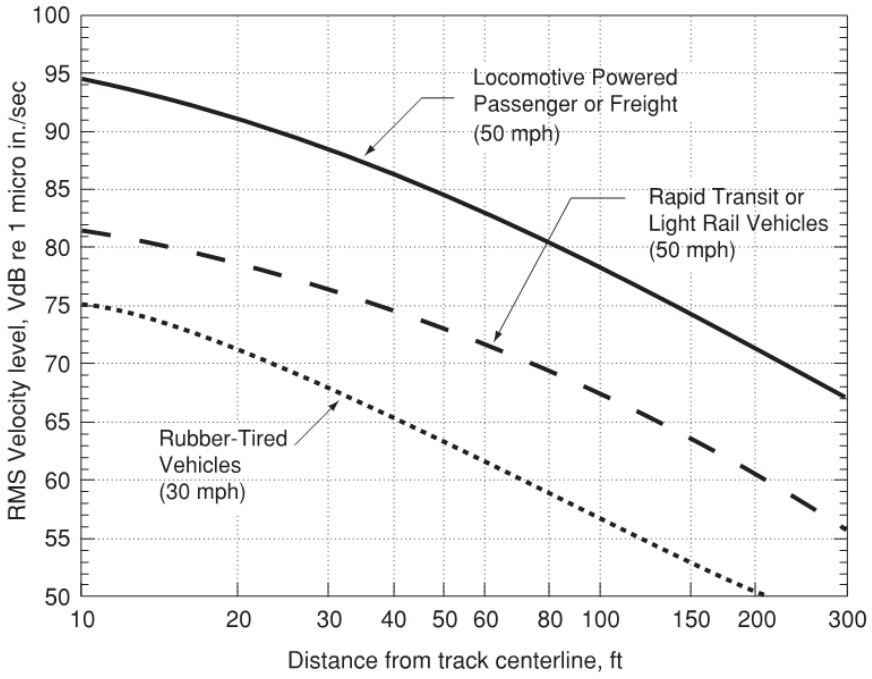


Figure 5.1 Generalised ground surface vibration curves

The following adjustments are made:

- Varying adjustment for train speeds up to 105 km/h (vibration level is proportional to 20 x log (speed / reference speed); at 55 and 105 km/h, this adjustment is -3.3 VdB and +2.4 VdB respectively);
- +8 VdB to account for stiff primary suspensions. Transit vehicles with stiff primary suspensions have been shown to create high vibration levels.; and
- -5 VdB to account for coupling to building foundation for timber framed houses.

Curves showing predicted vibration levels vs distance, for locomotive powered freight trains at 55 and 105 km/h, are provided in Figure 5.2 and Figure 5.3. Note that distance has been converted to metric units.

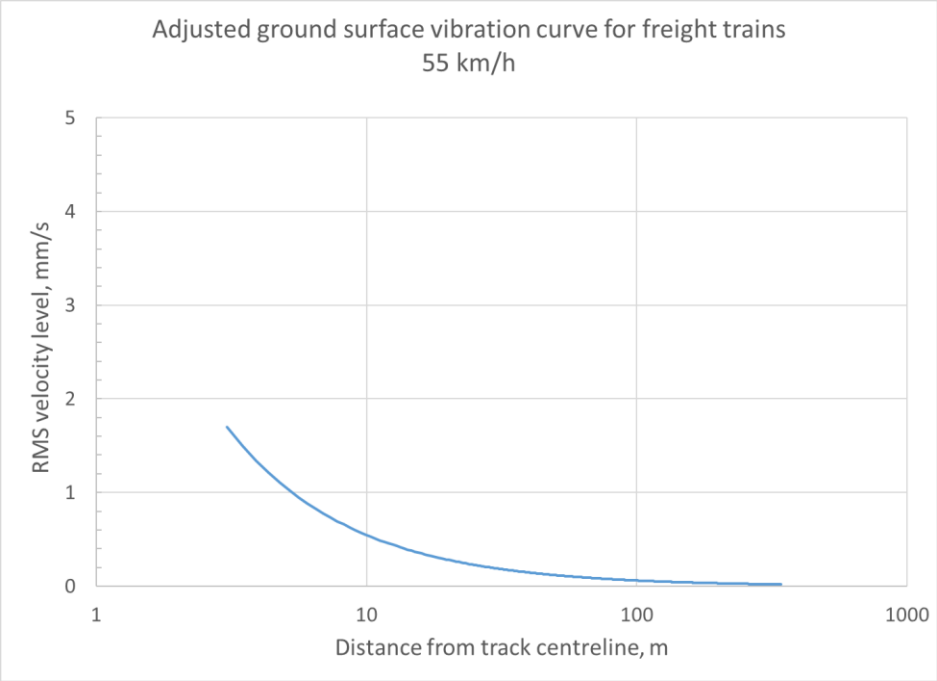


Figure 5.2 Adjusted ground surface vibration curve for freight train at 55 km/h

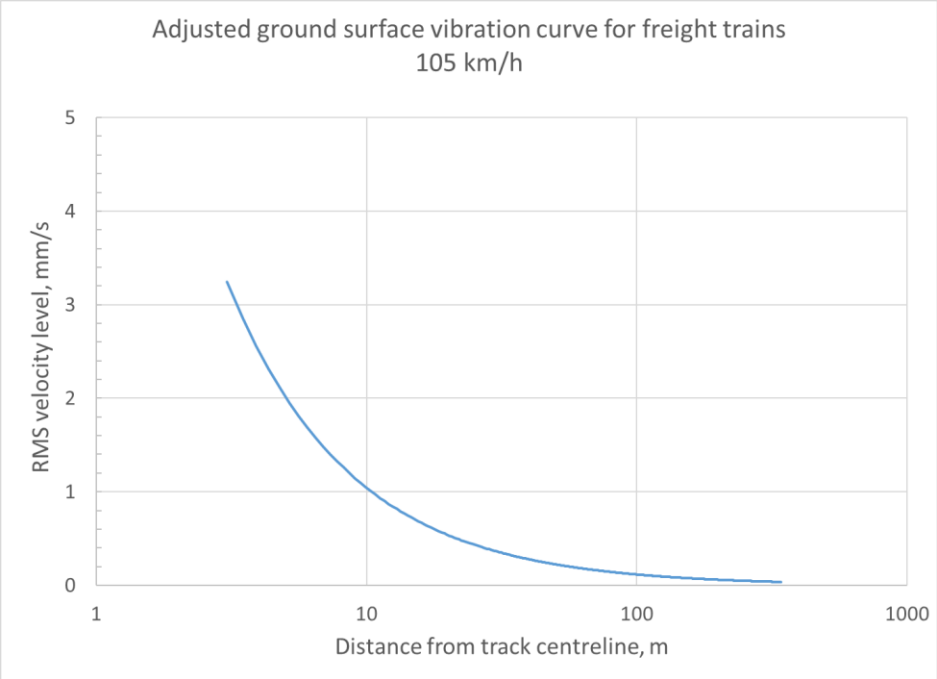


Figure 5.3 Adjusted ground surface vibration curve for freight train at 105 km/h

5.3.3 Ground-Borne Noise Levels

Ground-borne noise levels at the representative most affected receivers are predicted in line with the methodology outlined in the TNVIAM for heavy rail with peak frequency of ground vibration lower than 30 Hz. Predicted ground-borne noise levels are as follows:

- NNS_Rx1552: 23 dBA L_{ASmax}
- NNS_Rx2267: 29 dBA L_{ASmax}.

Ground-borne noise levels at the representative most affected receivers are predicted to comply with the most stringent internal noise trigger level listed in Table 3.3.

5.4 Vibration Levels for Cosmetic Building Damage

Predicted vibration levels for cosmetic building damage at the representative most affected receivers are as follows:

- NNS_Rx1552: 0.2 mm/s PPV
- NNS_Rx2267: 0.3 mm/s PPV.

Vibration levels for cosmetic building damage at the representative most affected receivers are predicted to comply with the most level listed in Table 3.4.

5.5 Vibration Levels for Human Comfort

The trigger levels for human comfort are expressed as a vibration dose value providing a cumulative descriptor of the vibration level received during a given period.

In accordance with Appendix B2 of AVTG, eVDV has been determined using the rms velocity value as follows:

$$eVDV = 0.07 \times V_{rms} \times t^{0.25} \text{ m/s}^{1.75}$$

With the train traffic volumes and lengths provided in Table 4.2 and Table 4.3, the eVDV at the representative most affected receivers are as follows:

- NNS_Rx1552: 5.6×10^{-5} m/s$^{1.75}$
- NNS_Rx2267: 9.9×10^{-5} m/s$^{1.75}$.

Vibration levels at the representative most affected receivers are predicted to comply with the most stringent vibration dose value listed in Table 3.5.

6 Consultation Strategy

6.1 Introduction

At-property treatments typically consist of upgrades to the building façades that are adversely impacted by rail noise and upgrades to the building ventilation. Façade upgrades may include, for instance, double glazing and acoustic seals for the windows and thicker doors with acoustic seals. Ventilation upgrades may include the provision of mechanical ventilation or air-conditioning for habitable spaces in order to permit doors or windows to remain closed. At-property treatments may also include an upgrade of the property fence. Other property specific treatments will be considered as appropriate.

Architectural acoustic treatments will provide a varying level of internal noise reduction, depending on the dominant type of railway noise source in that location and the existing type of building façade construction. Architectural acoustic treatment is most effective for rolling noise and wheel squeal noise whereas the effectiveness of architectural acoustic treatment is limited for low-frequency noise such as locomotive noise.

Retrofitting an existing property to reduce noise can be a difficult process. A determination on whether a treatment is feasible and reasonable/practicable should be made initially based on the condition of the building. Buildings in a state of disrepair (e.g. broken windows, holes in walls) or properties where internal access is restricted or unsafe (e.g. hoarding) may not be considered eligible for an architectural treatment.

This section describes the consultation requirements of the various stages of consultation undertaken during delivery of the project. Both a technical advisor and Stakeholder Engagement Lead will attend each meeting and be consulted on other channels of engagement.

The proposed engagement approach incorporates ARTC Inland Rail engagement principles and ‘best practice’ industry guidelines.

6.1.1 ARTC Approach to Engagement during COVID-19

The global COVID-19 crisis has introduced changes and challenges to the way engagement and communications activities are presently conducted. The N2NS engagement and environment teams will measure the best ways to communicate during the COVID-19 pandemic. All activities will be conducted subject to the latest public health information and take the concerns and needs of communities into account. A combination of proven traditional and digital channels will be used for maximum exposure and results.

6.1.2 Inland Rail and Engagement

Inland Rail’s values commit the organisation to active engagement with stakeholders and the community.

The primary purpose of the stakeholder engagement activities was to inform the community, landowners and key stakeholders of current hydrology and flood modelling findings and consult on proposed mitigation measures.

Inland Rail’s overarching strategy to communication and engagement is designed to:

- *Build Trust: through quality engagement and interactions with our primary stakeholders, including landowners and communities, providing them with meaningful avenues for input and accurate honest information that allows them to get some certainty about what is happening and what they can expect so that they can make appropriate plans and decisions.*
- *Build Credibility: through strong, timely engagement with key Government and organisational stakeholders and communications to the wider community, including an increased focus on the positive events and milestones and development of an ongoing program of support for Inland Rail by key community and business leaders.*

- *Build Visibility: through persistence of broader communications and marketing including active participation in, and/or support for, local and regional community events as well as broader industry conferences.*

Inland Rail is also committed to active engagement in accordance with the 'best practice' measures implemented by the International Association for Public Participation (IAP2).

6.2 Consultation Timing

Community consultation to organise initial site inspections is to be conducted by ARTC with an Acoustic Engineer.

Stage 1 - At-property treatments will be implemented as per Condition E14 (refer Table 1.1). It will inform landowners of how much noise to expect and if at-property mitigation is required. If it is required, options will be presented which consider the building type, construction and proximity to the railway.

- Conduct an initial site inspection at each of the affected properties eligible for at-property treatments and visually inspect the building construction and condition (e.g. walls and roof construction, glazing type, glazing dimensions) and the surroundings;
- Consult with the affected property owners on their preferences for building treatment or the upgrade of the property fence;
- Based on the outcome of the consultation with the property owners and the initial site visit:
  - Assess the practicality of providing treatment;
- Based on the practicability, the cost assessment and the property owners' preferences;
- Conduct a second site inspection at all affected properties eligible for at-property treatments with an architect and a builder;
- Provide acoustic specification Report to support the design of specific treatment for each property; and
- Conduct a preliminary cost assessment to determine whether upgrade of the property fence, building treatment or a combination of both might be offered.

Stage 2 - Identification / selection of any noise mitigation measures such as noise barriers must be prepared in consultation with the EPA and impacted sensitive receivers. Where barrier options (e.g. noise walls or mounds) are proposed to be implemented, consultation must also be undertaken with the relevant councils and will be implemented as per Condition E13 (refer Table 1.1).

- Conduct an initial site inspection at each of the affected communities and rationalised against project methodology and design;
- Consult with the affected communities on their preferences for building treatment or the upgrade of community infrastructure:
  - Bellatta, Moree South, Moree Burrington Rd, North Star;
- Consult with the affected Councils on their preferences for building treatment or the upgrade of community infrastructure:
  - Narrabri Shire Council (Belatta), Moree Plains Shire Council (Moree South and Burrington Road) and Gwydir Shire Council (North Star);
- Based on the outcome of the consultation with the stakeholders:
  - Assess the practicality of noise barrier; and
  - Conduct a preliminary cost and environmental assessment.

6.3 Implementation of Mitigation

Following owner consultation and definition of the architectural treatment scope of works, the implementation team will work with landholders to formalise the proposed architectural treatment scope of works and coordinate installations.

The key steps in the process will involve:

- Preparation of the proposed treatment scope of works;
- Appoint and arrange building consultant inspections at the sensitive receivers to verify installation requirements, materials and timeframes;
- Presentation of a formal Deed to capture the scope of works and ensure appropriate management of the building contractors and compliance with any necessary insurances;
- Coordinate times for the installation works to take place with landholders; and
- Arrange pre-construction site meetings and post installation inspections with landholders to ensure appropriate installation of the works.

6.4 Identifying Stakeholders

A differentiated and targeted engagement approach was undertaken in the delivery of noise and vibration consultation, as follows:

- Engaging with the broader community;
- Targeted engagement with affected N2NS landowners/stakeholder; and
- Engagement with Local Government and State Agencies**.**

Table 6.1 Stakeholders

Sector	Stakeholder	Level of Engagement	Engagement Activities
Landowners	Private landowners (including businesses) who have been identified sensitive receivers	ENGAGE	Individual meetings with impacted landowners, facilitated by N2NS Stakeholder Engagement Team (or PMA) and led by IR Environment Acoustic Specialist
NSW Government	Department of Planning, Industry and Environment	INFORM	Inform DPIE about preliminary discussions with landowners.
	Transport for NSW	INFORM	ARTC Project Team update TfNSW on mitigation options Stakeholder Engagement to provide support where risks are identified.
Local Government	Narrabri Shire Council	CONSULT	Briefing on the N2NS Noise and Vibration Consultation process.
	Moree Plains Shire Council	CONSULT	Briefing on the N2NS Noise and Vibration Consultation process.
	Gwydir Shire Council	CONSULT	Briefing on the N2NS Noise and Vibration Consultation process.
Members of Parliament	The Hon. Mark Coulton MP, Federal Member for Parkes	INFORM	Briefing with Federal Member for Parkes providing information on process and engagement strategy.

	The Hon. Adam Marshall MP, State Member for Northern Tablelands	INFORM	Briefing with Federal Member for Parkes providing information on process and engagement strategy.
	Mr Roy Butler MP, State Member for Barwon	INFORM	Briefing with Federal Member for Parkes providing information on process and engagement strategy.

6.5 Key Messaging

- Noise and vibration are a key consideration on the N2NS project. The contract for construction of the first portion of work was awarded in November 2020, with construction beginning early 2021.
- Inland Rail will be designed in accordance with ARTC's guidelines. The RING advises levels at which noise and vibration are deemed reasonable or unreasonable.
- These levels are external to buildings, and trigger when to assess potential mitigation measures.
- A rail redevelopment, the RING trigger levels are:
  - Increases of 2 dBA (average over the day and night periods) or 3 dBA (maximum increase); and
  - Predicted rail noise levels exceed 60 dBA night average and 65 dBA day average or 85 dBA maximum.
- Our engineering designs have sought to minimise noise and vibration at residence's, though this is not fully achievable in all instances.
- Extensive noise and vibration modelling have been completed. To build this modelling, a variety of information is considered such as; when and where noise sources are from and; current background noise levels and possible increase over time; train noise sources; proposed train frequency and speeds; and changes to landform and buildings.
- Our methods have been reviewed by the Office of Environment and Heritage and the Department of Planning, Industry and Environment. Where applicable, local feedback has also been fed into models to support the accuracy of our findings.
- Consultation has informed our design and we are appreciative of the cooperation of Local Government, landowners and communities along our alignment.

7 Management of Operational Noise and Vibration Complaints

Operational noise and vibration complaints will be managed as per the ARTC complaints process map provided in Figure 7.1, Figure 7.2 and Figure 7.3.

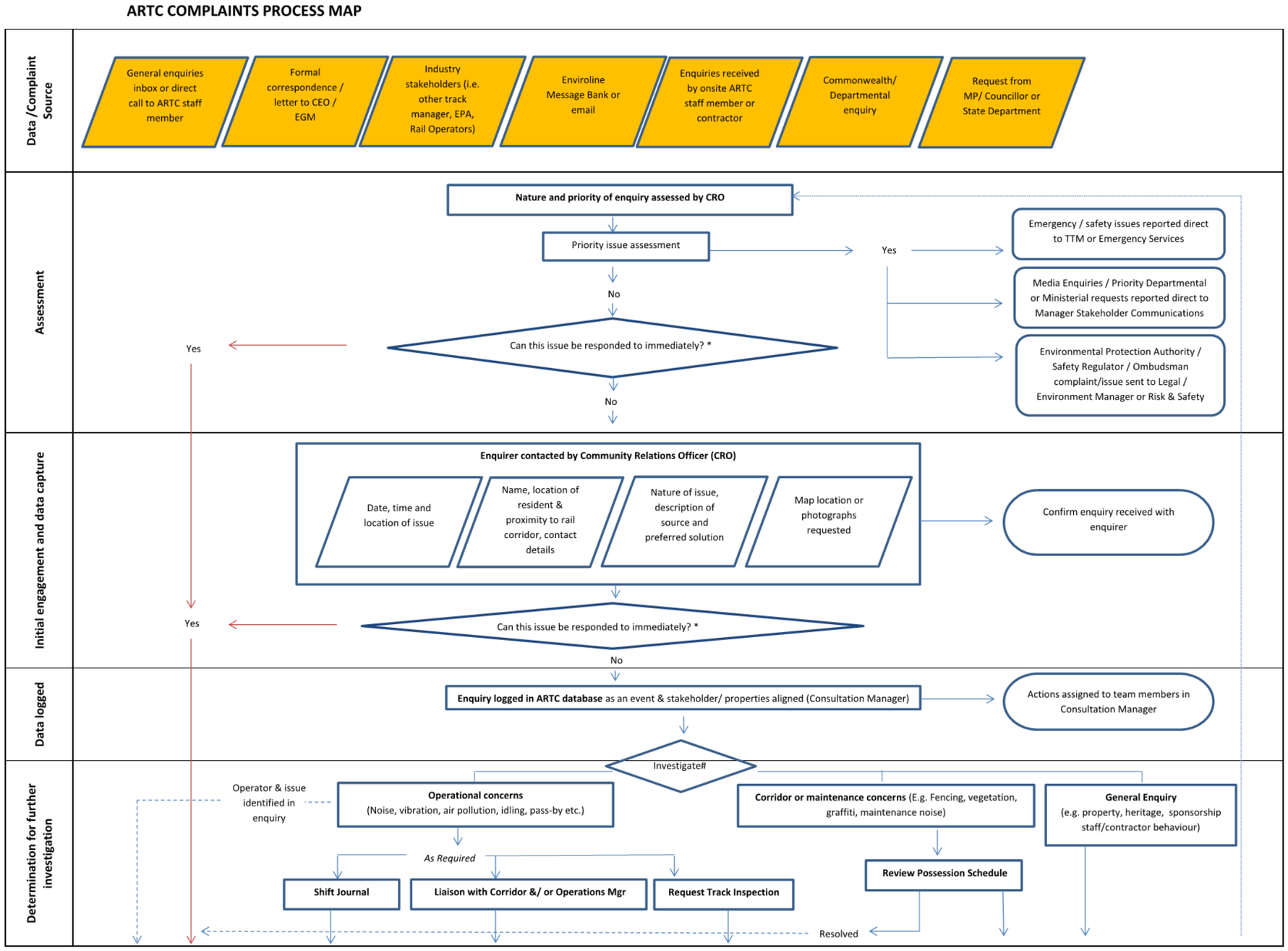


Figure 7.1 ARTC complaints process map (Part 1)

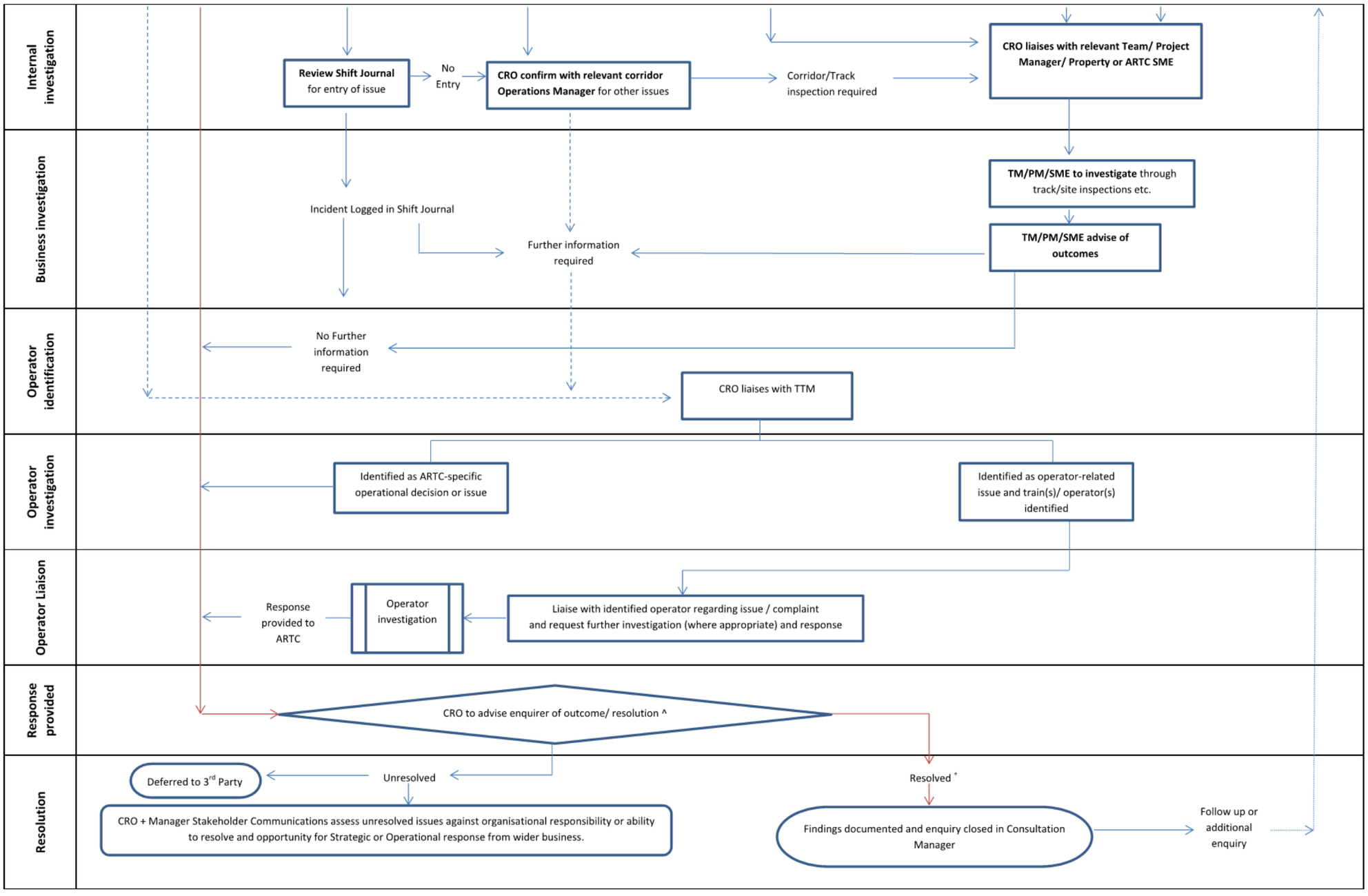


Figure 7.2 ARTC complaints process map (Part 2)

Notes to above

*Enquiries that can be immediately responded to without first stage investigation includes: not ARTC network related, issued already resolved, proforma response available, IT/employment/invoicing enquiry where automatic contact for these enquiries exist; if no contact details provided by the enquirer (e.g. in voicemail) the incident logged – investigation undertaken if required – but resolution will be the closure of the issue. Immediate response also often includes non-operational enquiries relating to ARTC website or a community group request.

As ARTC is licence holder for environmental concerns; operational reviews and track inspections receive priority over identification of train operators where the source of the complaint is unclear or where it may be a dual operational/corridor issue (e.g. wheel squeal)

^ CRO makes three attempts to contact enquirer (by phone/email or contact details provided and voicemails/or email are left). If no contact is able to be made, the item is noted and closed. Where incident not related to ARTC network or organisation, attempts are made to redirect the enquiry on the enquirers behalf, however ARTC does not take ownership of the enquiry and notes it as closed. For matters such as insurance claims, lease requests or issues relating to other sections of the business – the matter is logged and closed and deferred to relevant Business Group for further action / resolution.

+ Resolution is defined as ARTC identifying the source and detail of an issue reported to ARTC and providing a response to the enquirer including any action or steps ARTC can take with regards to the issue. This may or may not be to the satisfaction of the enquirer, but is in line with ARTC's responsibilities as an access holder or EPA licence condition.

→ Path of resolution

Acronyms CRO – Community Relations Officer TM – Team Manager PM – Project Manager
SME – Subject Matter Expert TTM – Train Transit Manager

Definitions

Term or acronym	Description
Complaint	A piece of feedback or comment received by ARTC outlining dissatisfaction in its actions, service, operations or impacts of operational activity on its network.
Contractor	External person, group, company or party engaged by ARTC to provide technical support, services, labour or work on ARTC's behalf.
Correspondence	A formal enquiry requesting information, seeking action or clarification – usually in written format, generally received from Ministers, official agencies, government departments
Enquiry	A piece of communication from a member of the community, on behalf of a group or a stakeholder – can include letters, emails, text messages, phone calls or verbally in-person.
Enquirer	Person who makes an enquiry, complaint or provides correspondence on behalf of themselves or another organisation.
Environmental Complaint	A concern relating to potential or known environmental incident including pollution, contamination, or damage to environmentally sensitive areas (common complaints include those relating to noise, dust and diesel emissions and vibration) –as defined by ARTC's requirements under EPL 3142.
Enviroline	The ARTC telephone line and email address that receives environmental complaints in accordance with ARTC's Environmental Protection Licence 3142 with NSW EPA. Phone Number: 1300 550 402 Email: enviroline@artc.com.au
Formal Enquiry or Correspondence	A formal piece of correspondence, usually written in a formal or official style that can be received from any individual or group, but are typically received from a legislative authority or body, Member of Parliament, Government Department or Agency (includes the Federal Department of Infrastructure and Transport).
Consultation Manager	The database for recording and managing general enquiries and Environmental complaints (including those received by Enviroline).
Government Agency or Department	Local, State or Commonwealth Government body or statutory authority, typically with legislative powers.
Informal enquiry	Enquiry received by an individual or individual on behalf of group often without set expectations around delivery or resolution and usually made verbally. Opposite to formal written correspondence that usually seeks explicit action.
Neighbour / Landowner	Landowner, tenant or property owner living near or adjacent to the ARTC rail corridor or ARTC premises or area of ARTC operations (such as provisioning centre or maintenance depot)
Priority or urgent request / complaint	Priority complaints generally come from three sources and are defined under two areas: 1. A complaint that has a high level of urgency required in response, that is driven by safety or reputational harm or has potential consequences that involve financial or legal liability or a non-compliance or legislative breach. Enquiries or requests by members of the Emergency Services should be considered as high priority in the first instance. 2. A request that has a pressing or immediate timeframe requiring information or response due to safety, operational, legislative, legal, media or Ministerial/Departmental requirements. The timeframes for providing a response or information to a priority request will be provided by the Community Relations Officer and will dependent on each individual request or enquiry.
Technical expert / Subject Matter Expert	Member of ARTC staff with specific skill set or technical expertise that they can provide in the event of an enquiry, complaint or receipt of formal correspondence which requires specialist information or advice
Unreasonable complainant or complaint	Challenging, vexatious, abusive or unreasonable enquiries or complaints from a single person or person(s) on behalf of a group.

Figure 7.3 ARTC complaints process map (Part 3)

8 Conclusion

An ONVR was undertaken for sensitive receivers adjacent the Phase 1 of the overall Narrabri to North Star Inland Rail Project.

The ONVR has considered operational rail noise, ground-borne noise and vibration generated by the operation of the Project.

A rail noise model was generated based upon a representative version of the IFC design. Noise predictions were undertaken for noise sensitive receivers identified within 500 metres of the railway alignment.

Predicted exceedances of the rail noise trigger levels were generally controlled by the L_{Aeq} noise descriptor, for the night time period:

- Noise predictions for year 2025 identified 39 exceedances of the night L_{Aeq} noise trigger level and one exceedance of the night L_{Amax} noise trigger level for residential sensitive receivers; and
- Noise predictions for year 2040 identified 77 exceedances of the night L_{Aeq} noise trigger level for residential sensitive receivers, and two exceedances for the non-residential sensitive receivers.

Two noise mitigation options were considered in designing mitigation for exceedances of the noise trigger levels: Noise barriers and at-property treatments.

Noise barriers of various heights and lengths were identified and are recommended for noise mitigation. They are located in areas such as townships where receivers are closely spaced together, i.e. Bellata, Moree and North Star. Where receivers are sparsely located, it is not considered feasible to mitigate exceedances of the noise trigger levels with noise barriers. The proposed noise barrier design reduces the predicted number of receivers exceeding the trigger levels in 2040. IRDJV notes that the barrier designs may be subject to further rationalisation. Rationalisation of barriers may occur through review of the design, finalisation of surface water management, the constructability assessment and community engagement on noise management and mitigation.

It is recommended that the remaining receivers with residual exceedances of the noise trigger levels for year 2025 (after noise barriers are built) are offered at-property treatments. A total of 11 receivers have been identified in townships following the implementation of noise barriers in North Star and Bellata and 16 receivers have been identified outside townships to be eligible for at-property treatments. A stakeholder engagement consultant as well as an architect, a builder and an acoustic consultant should be engaged by ARTC to provide advice on treatment for each individual dwelling, as retrofitting an existing property to reduce noise impacts will depend on the existing structure and the condition of the property. These at-property treatments will likely involve a combination of architectural treatments and property fence upgrades.

Vibration levels from operation of the rail alignment are predicted to satisfy the relevant trigger levels for both structural damage and human comfort at vibration sensitive locations near the rail corridor without provision of additional rail vibration mitigation.

Ground-borne noise levels within dwellings adjacent to the corridor are predicted to satisfy the relevant trigger levels without provision of additional rail vibration mitigation.

Appendix A

Noise Sensitive Receivers





Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

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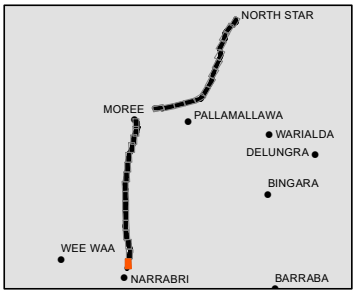
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

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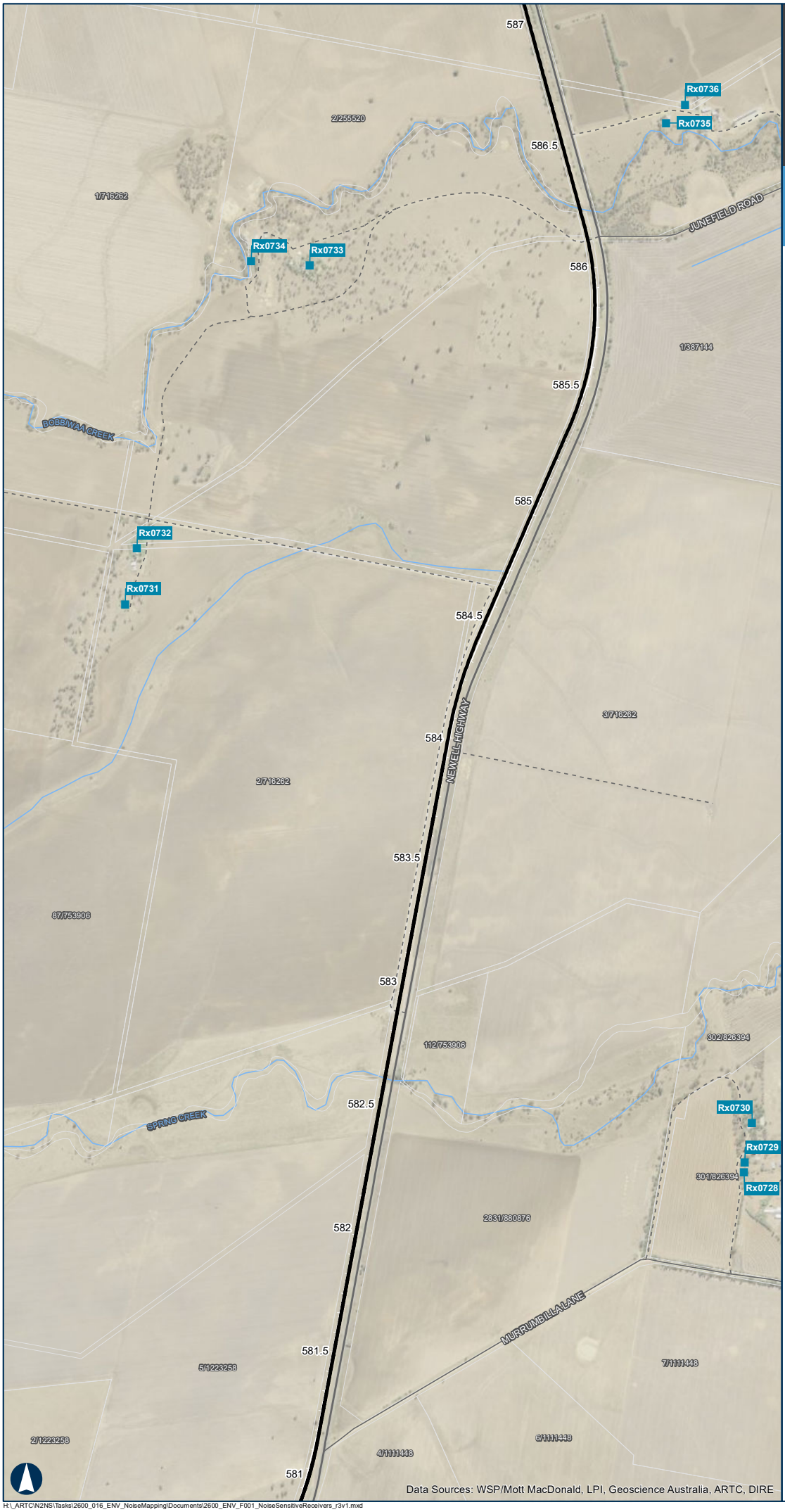
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Author: IRDJV

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Appendix A

Noise Sensitive Receivers

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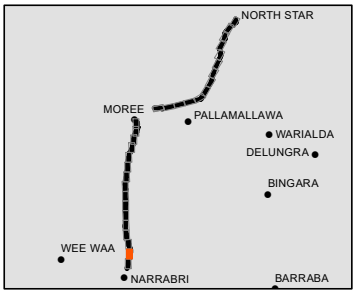
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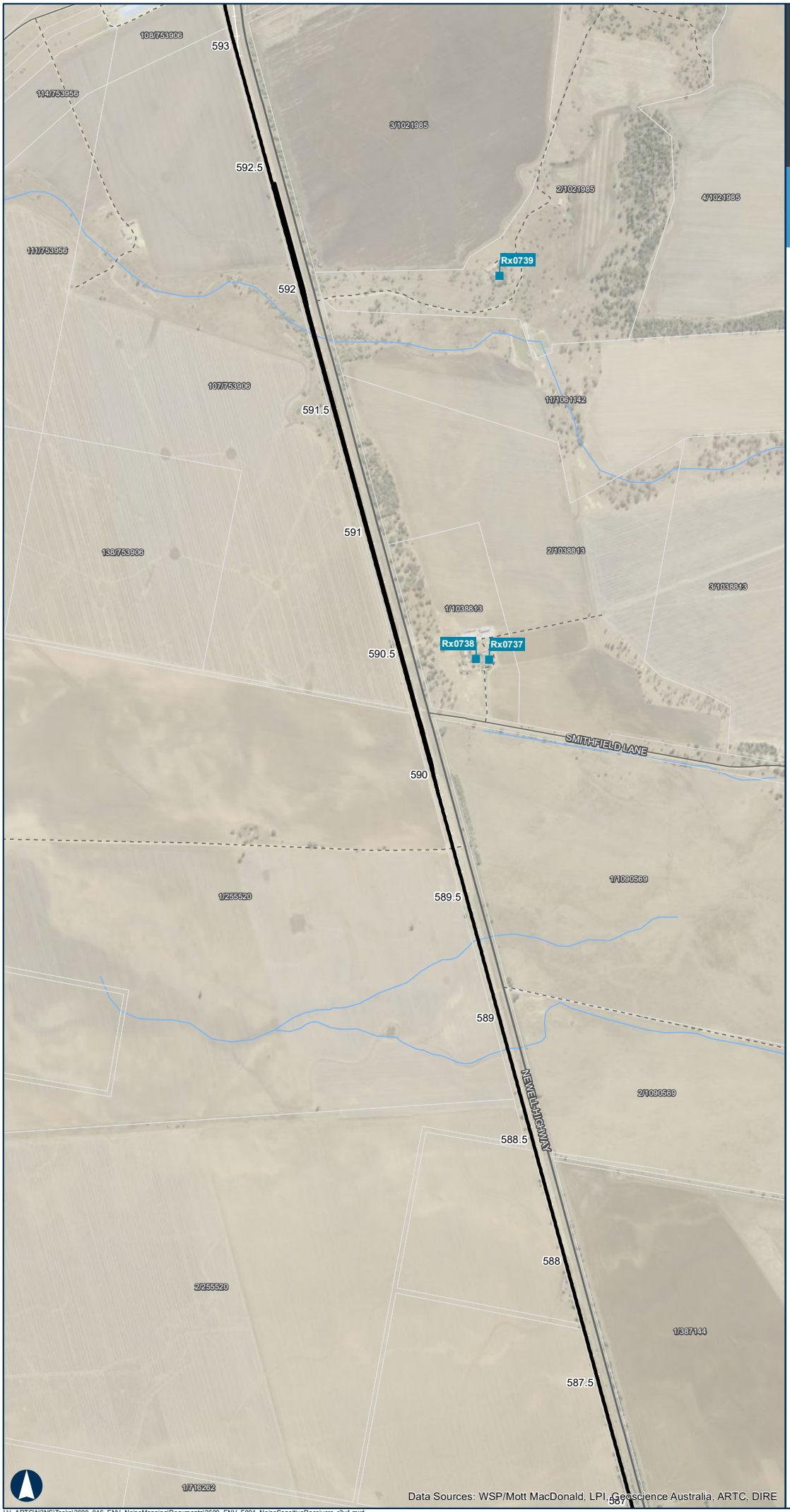
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Appendix A

Noise Sensitive Receivers

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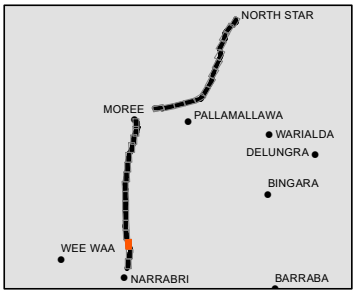
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Appendix A

Noise Sensitive Receivers

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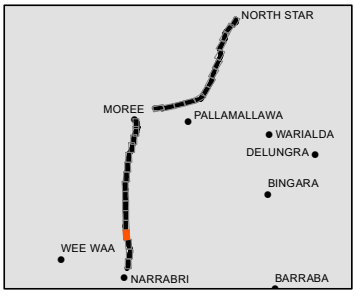
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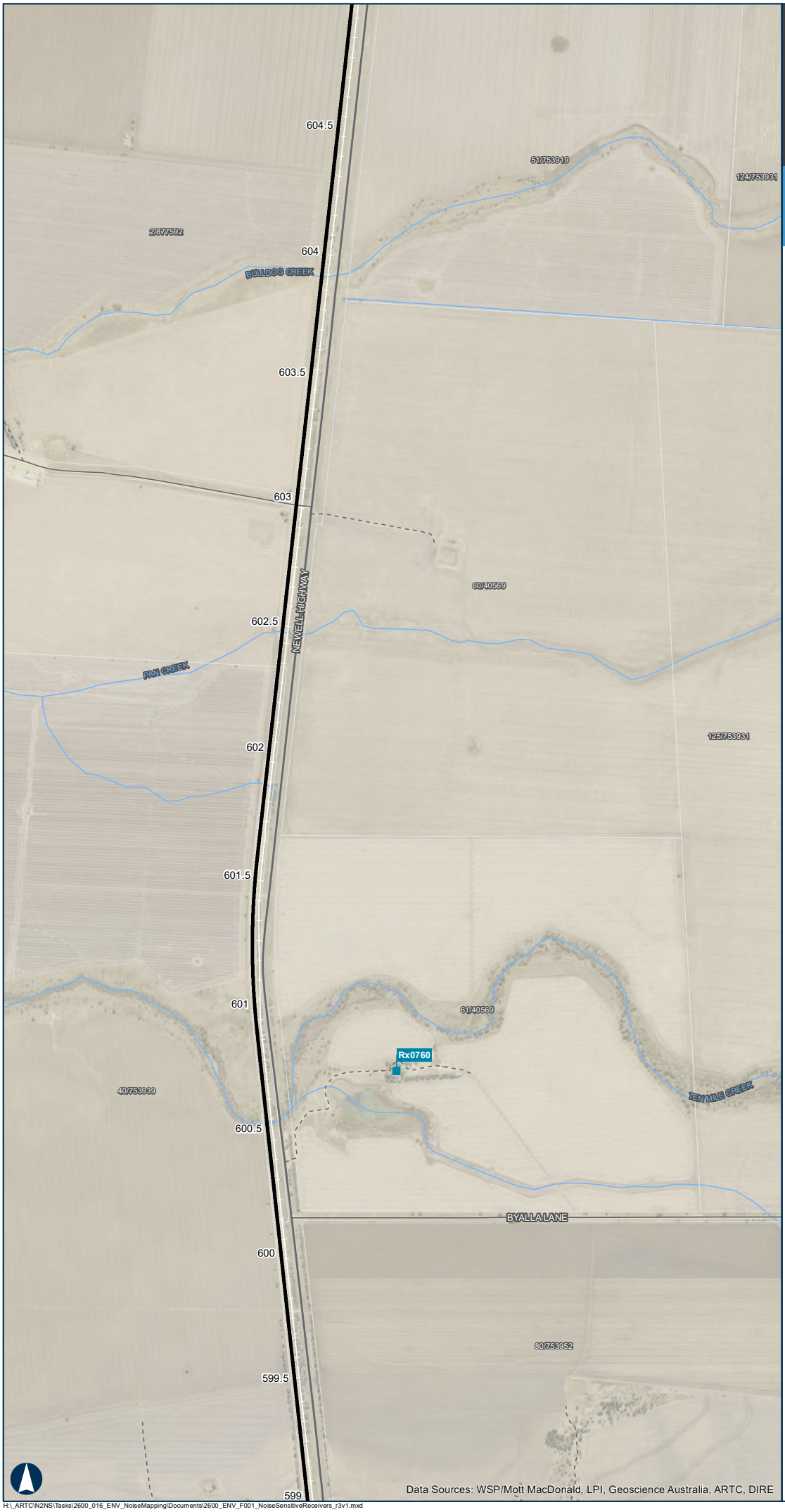
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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix A
Noise Sensitive Receivers

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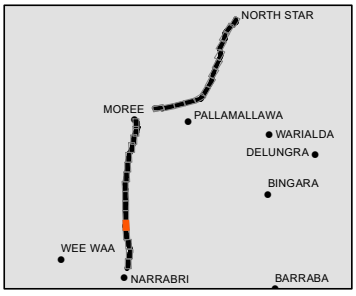
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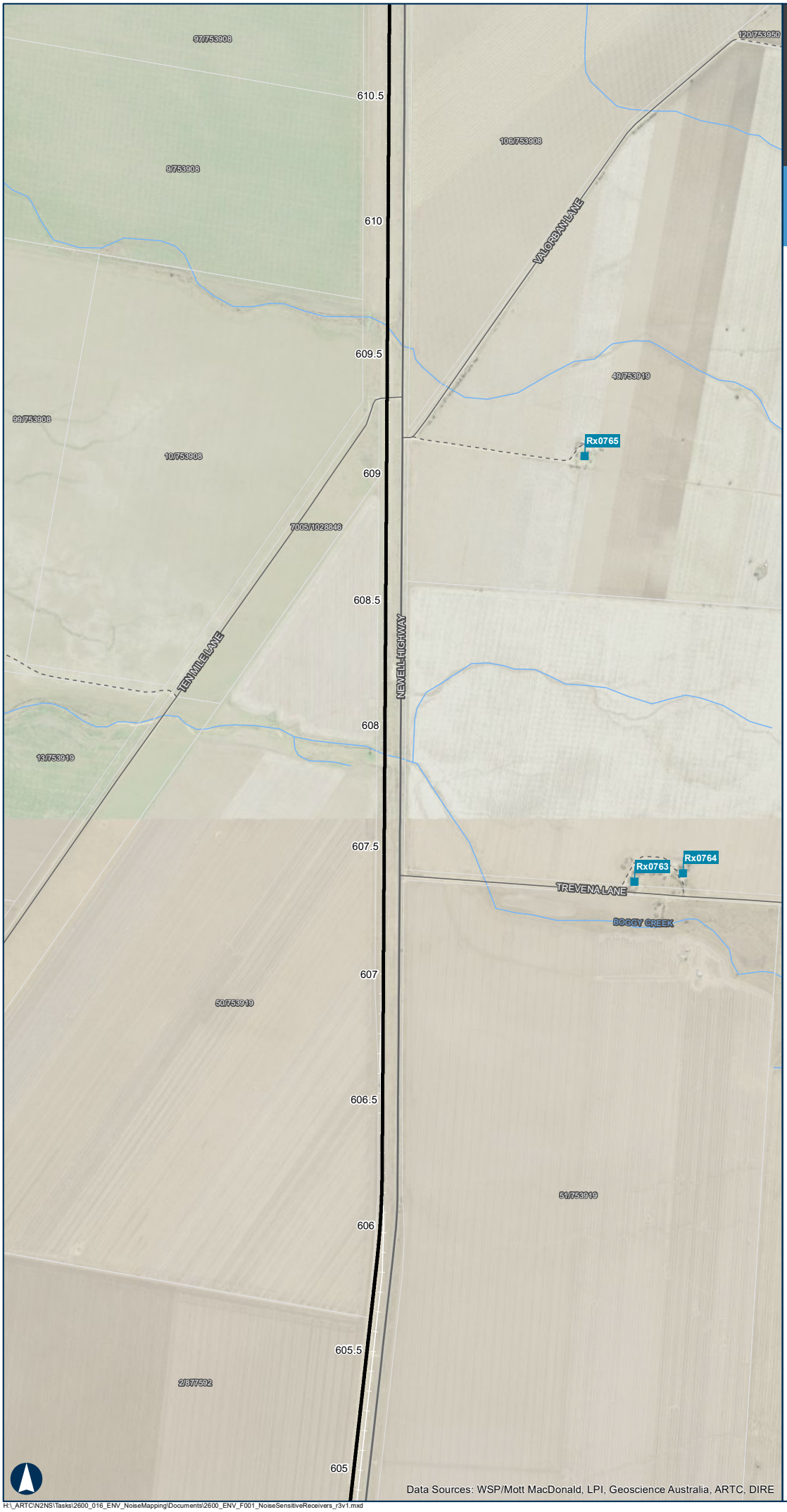


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Scale: 1:15,000
Date: 12-Aug-21
Author: IRDJV



INLAND RAIL

ARTC

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

NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

Sheet 6 of 31

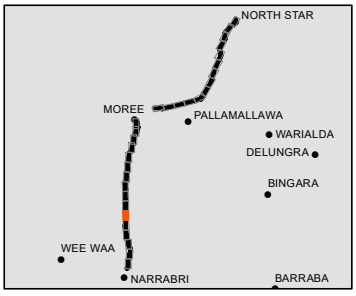
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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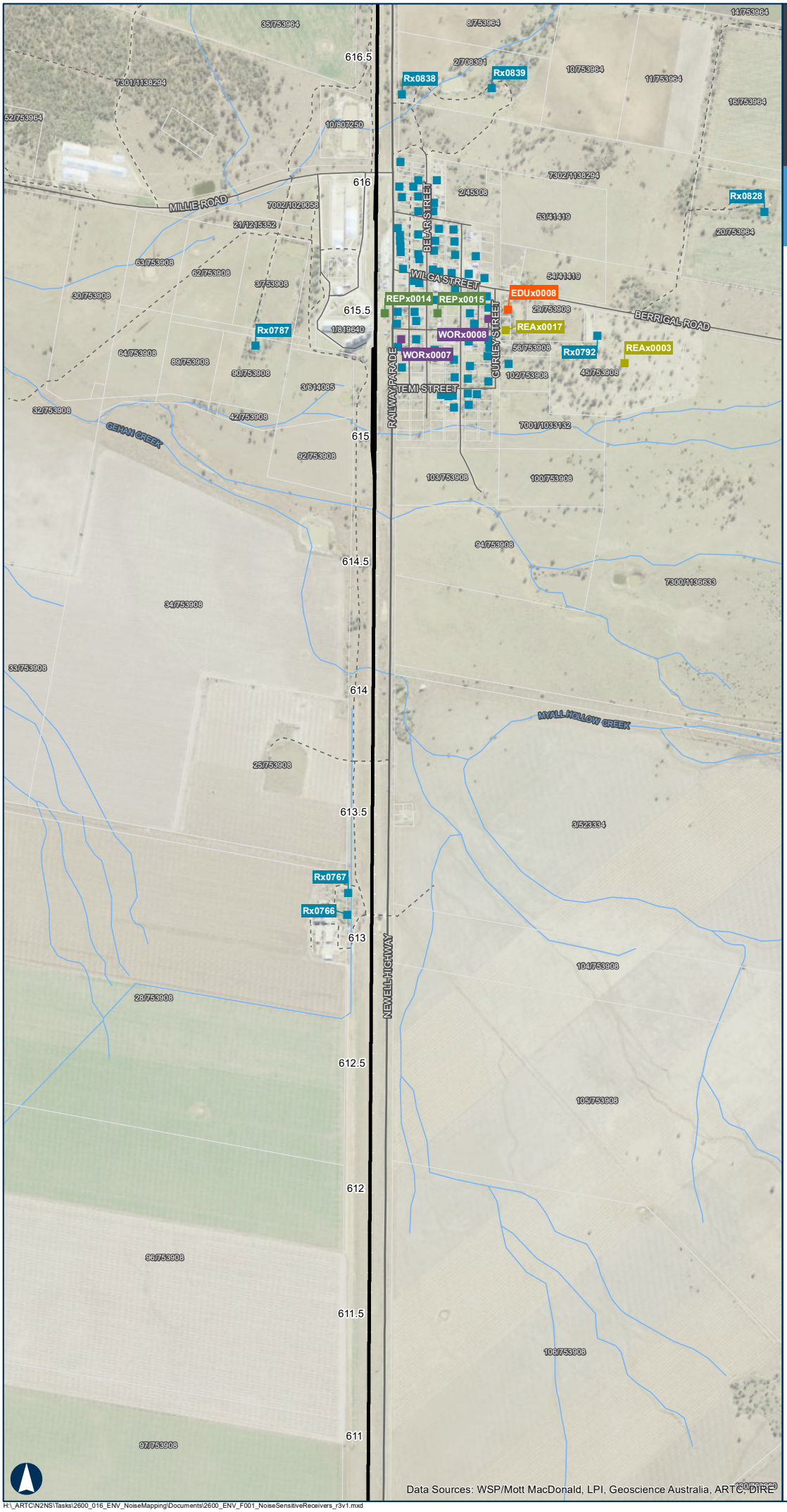
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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

INLAND RAIL

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

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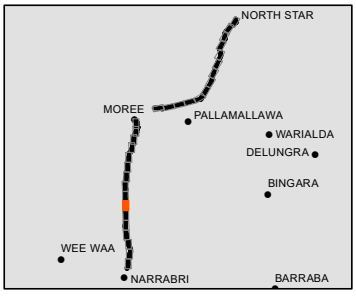
LEGEND

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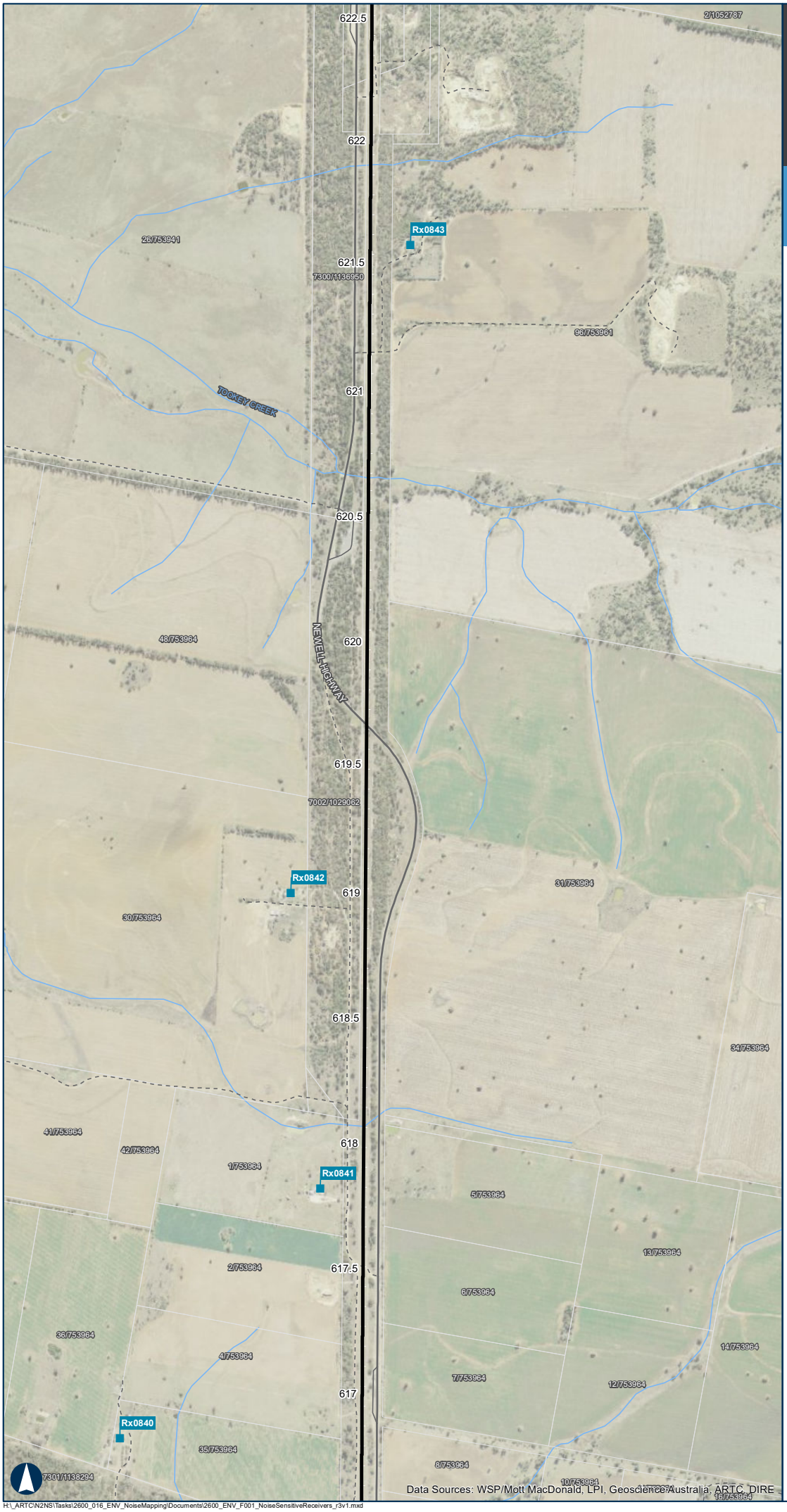
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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

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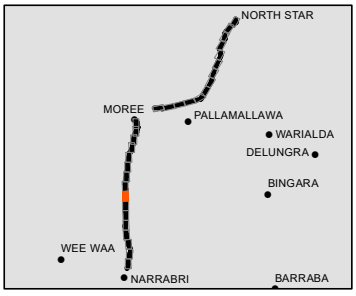
LEGEND

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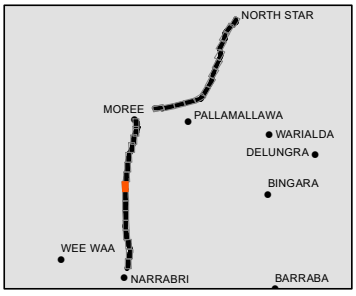
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Appendix A

Noise Sensitive Receivers

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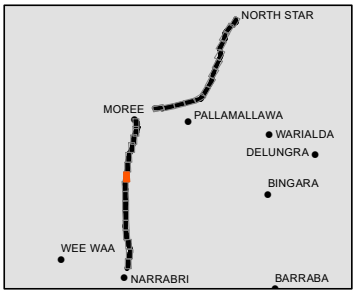
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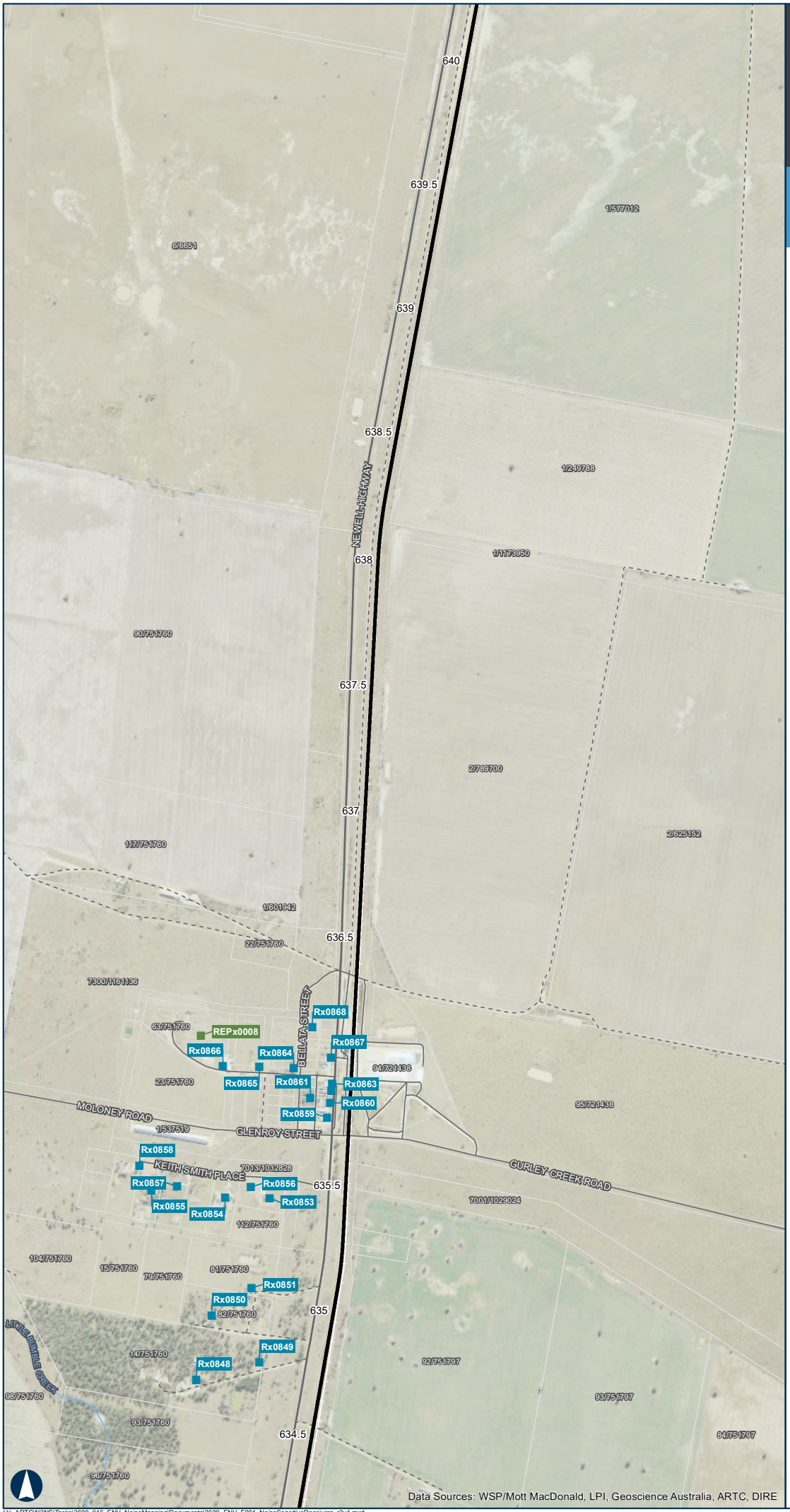
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NARRABRI TO NORTH STAR

Appendix A

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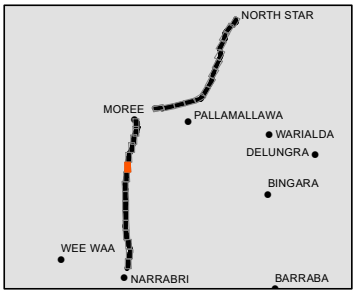
LEGEND

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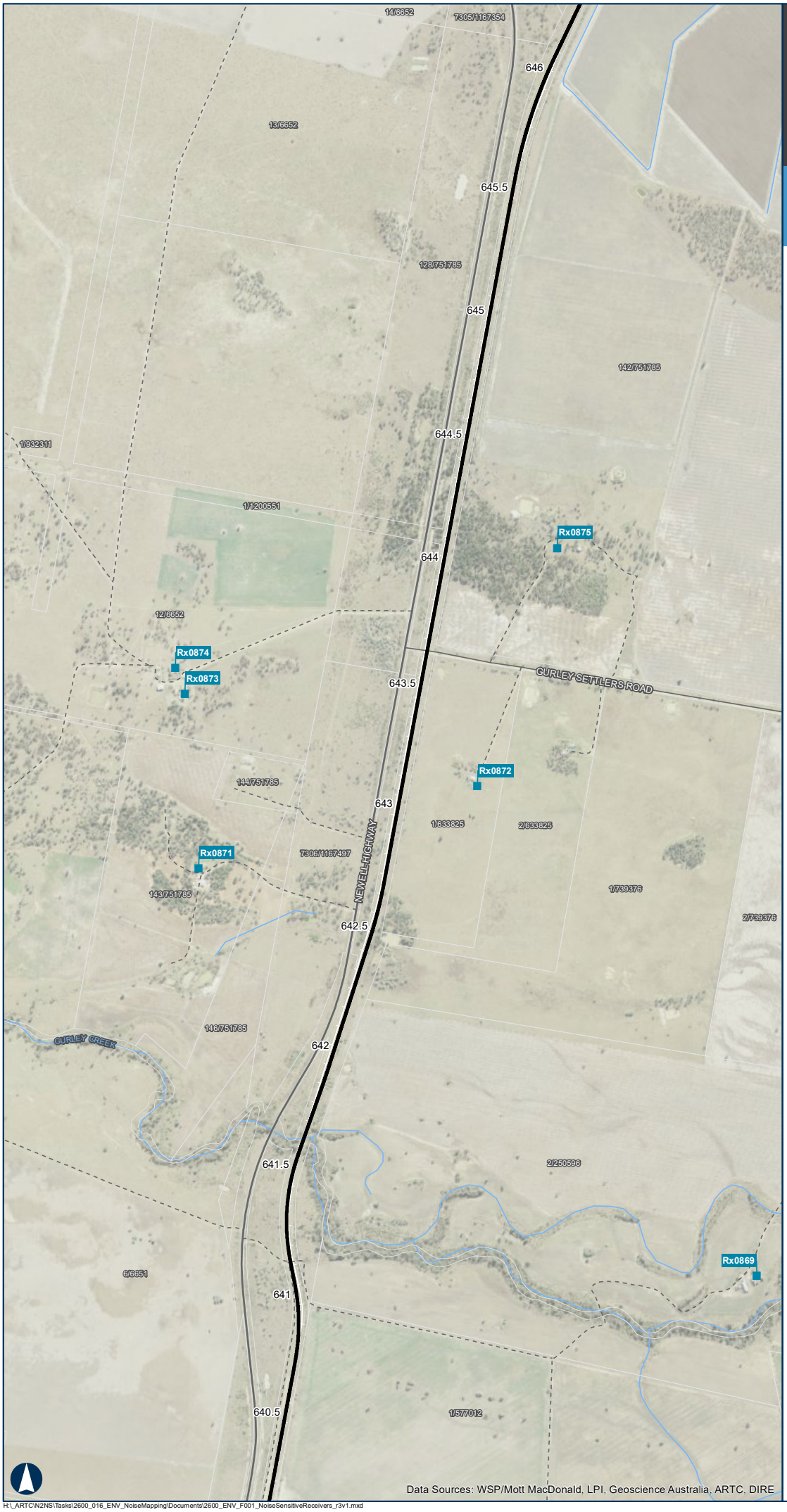
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INLAND RAIL

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Appendix A

Noise Sensitive Receivers

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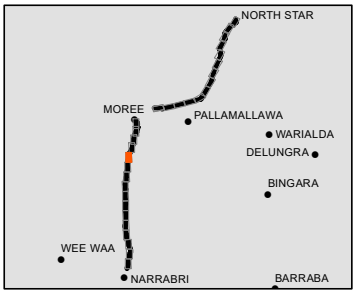
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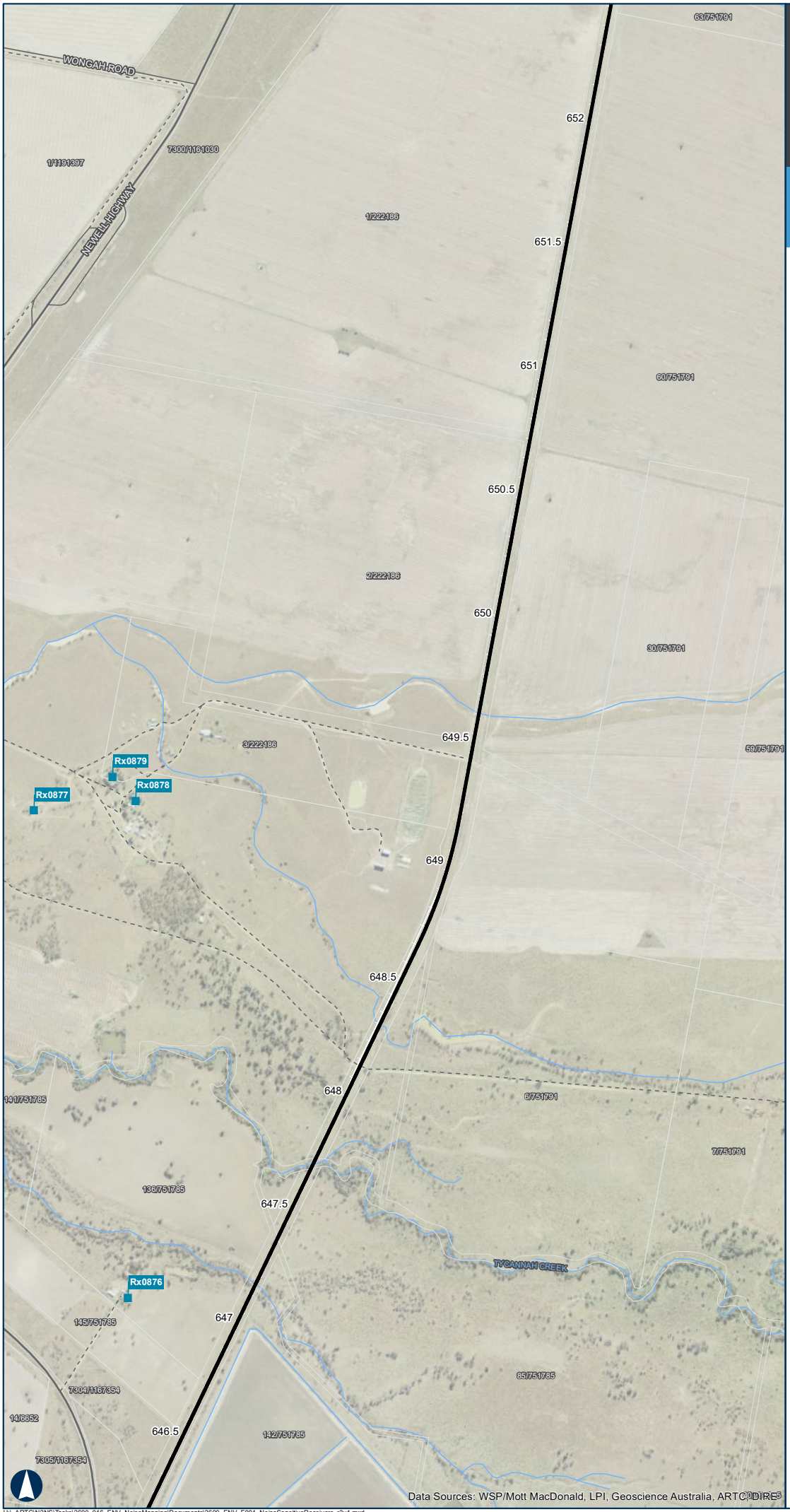
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INLAND RAIL

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Appendix A

Noise Sensitive Receivers

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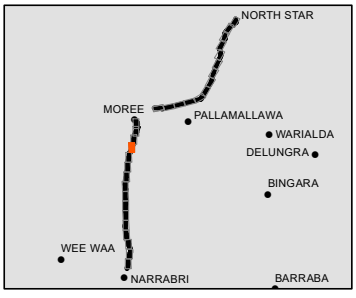
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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

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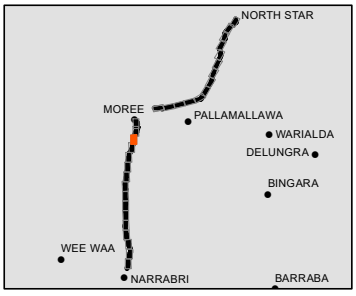
LEGEND

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Noise Sensitive Receivers

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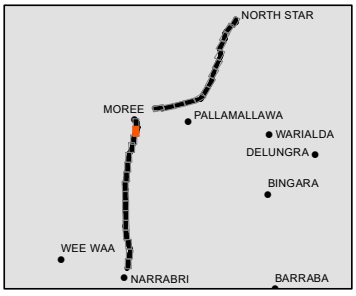
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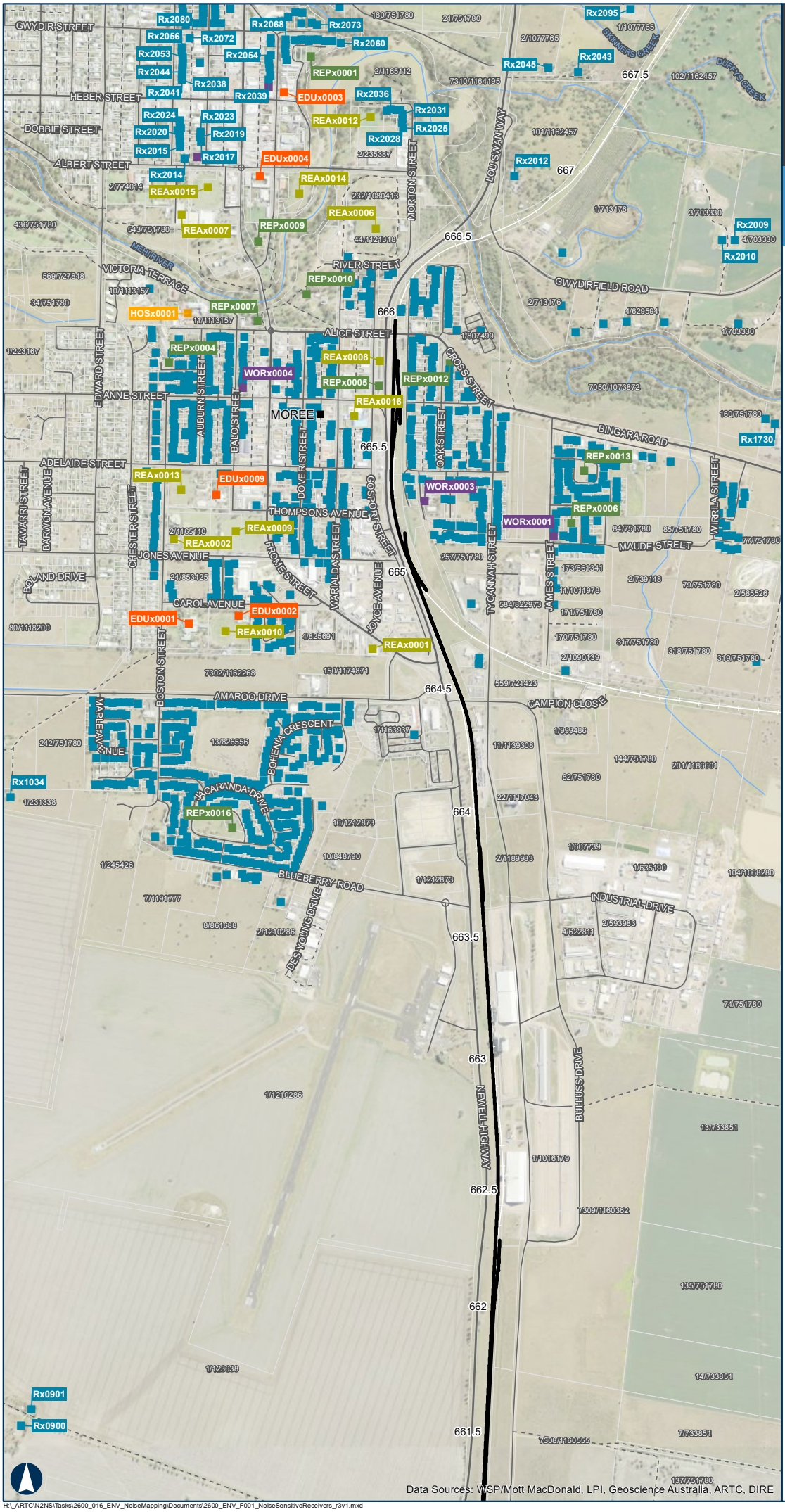
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Noise Sensitive Receivers

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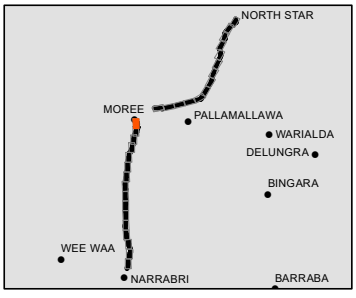
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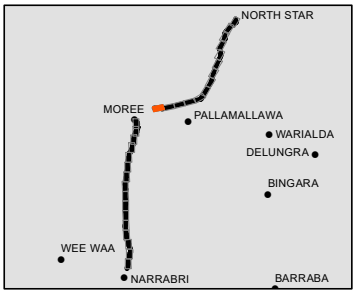
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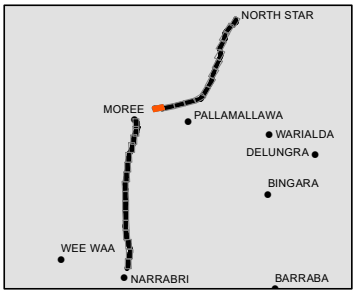
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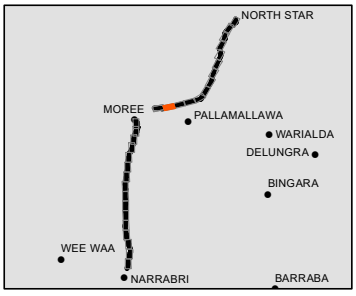
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Scale: 1:15,000

Date: 12-Aug-21

Author: IRDJV

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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

INLAND RAIL

ARTC

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

NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

Sheet 20 of 31

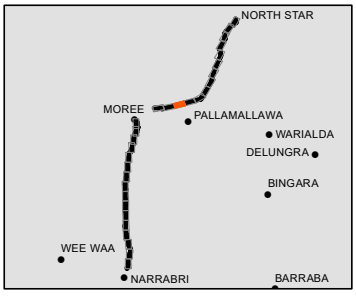
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

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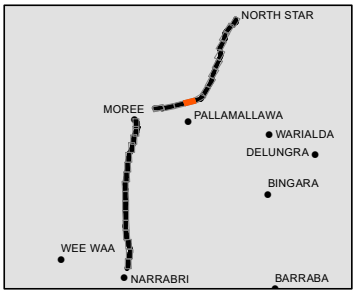
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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0.75 Km

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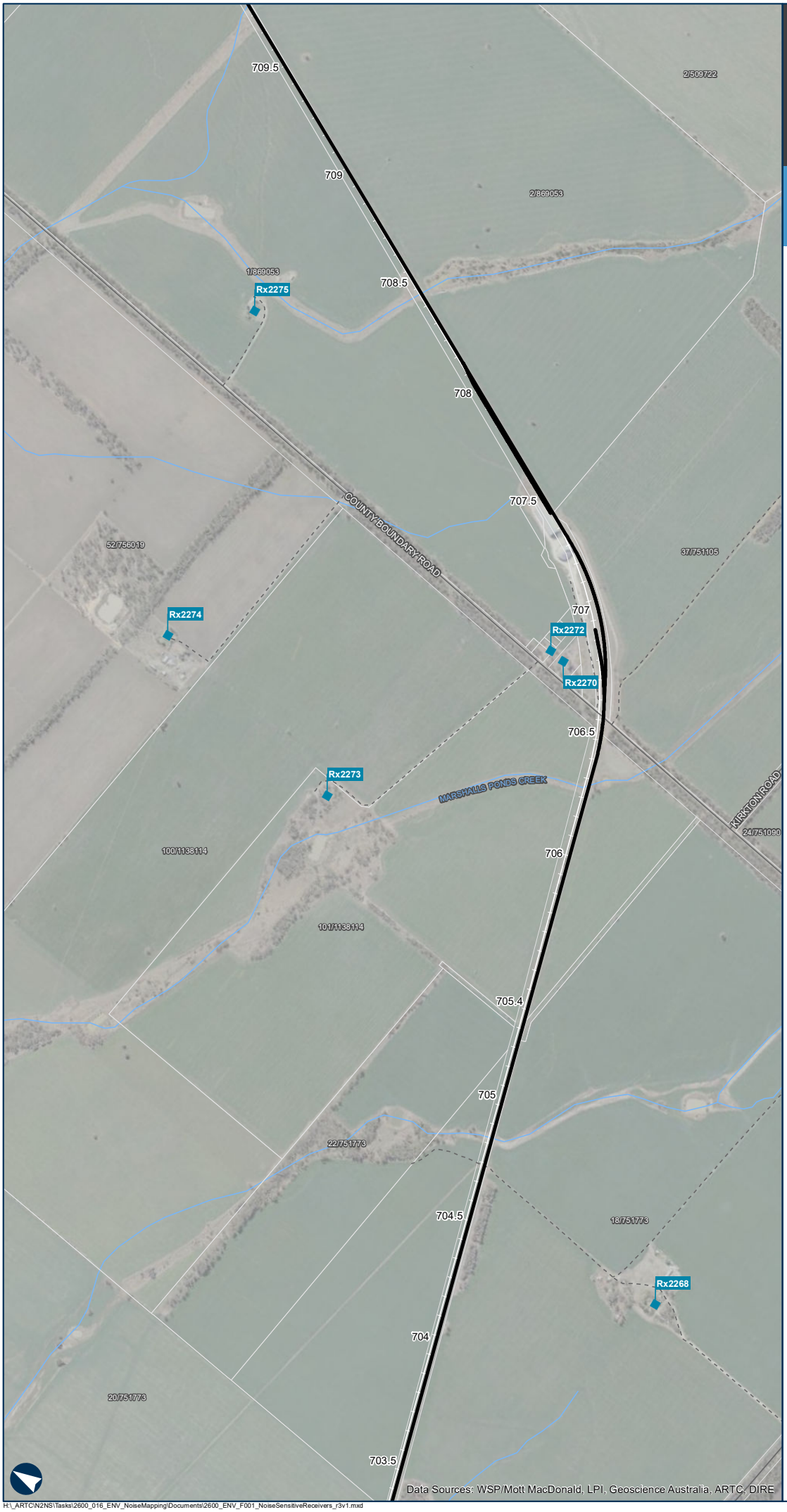
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Author: IRDJV

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INLAND RAIL ARTC

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NARRABRI TO NORTH STAR

Appendix A
Noise Sensitive Receivers

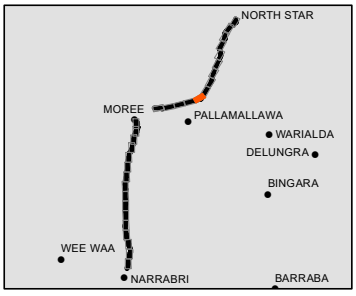
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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0.75 Km

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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

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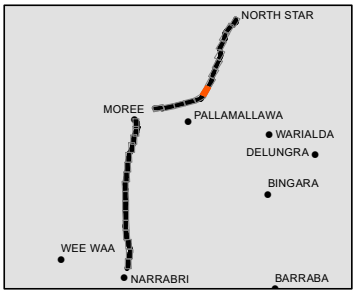
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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0.75 Km

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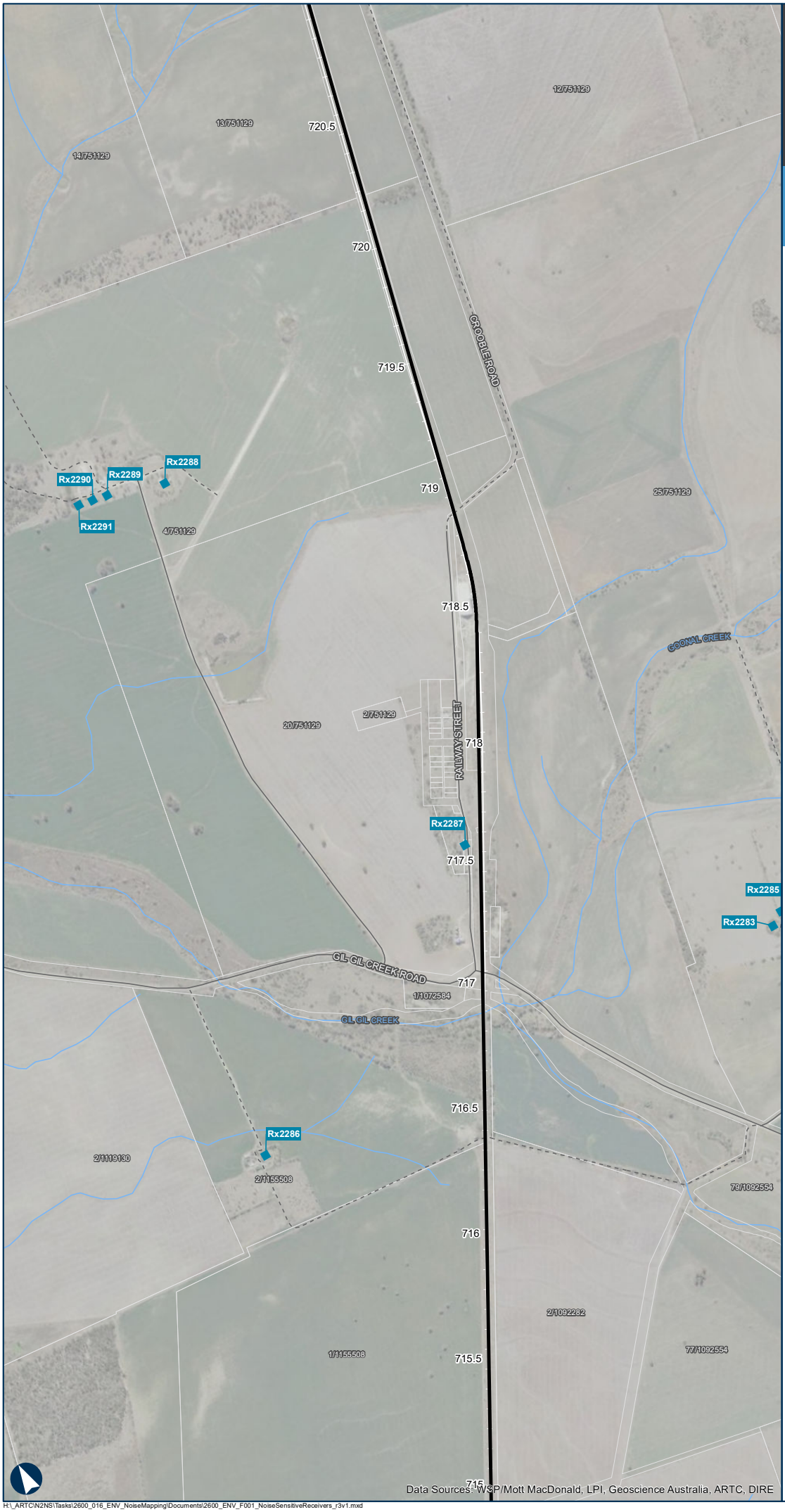
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INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

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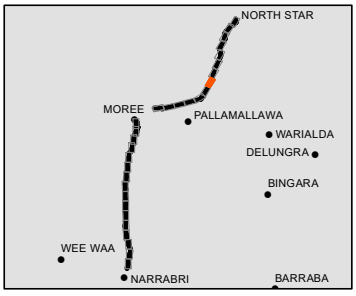
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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0.75 Km

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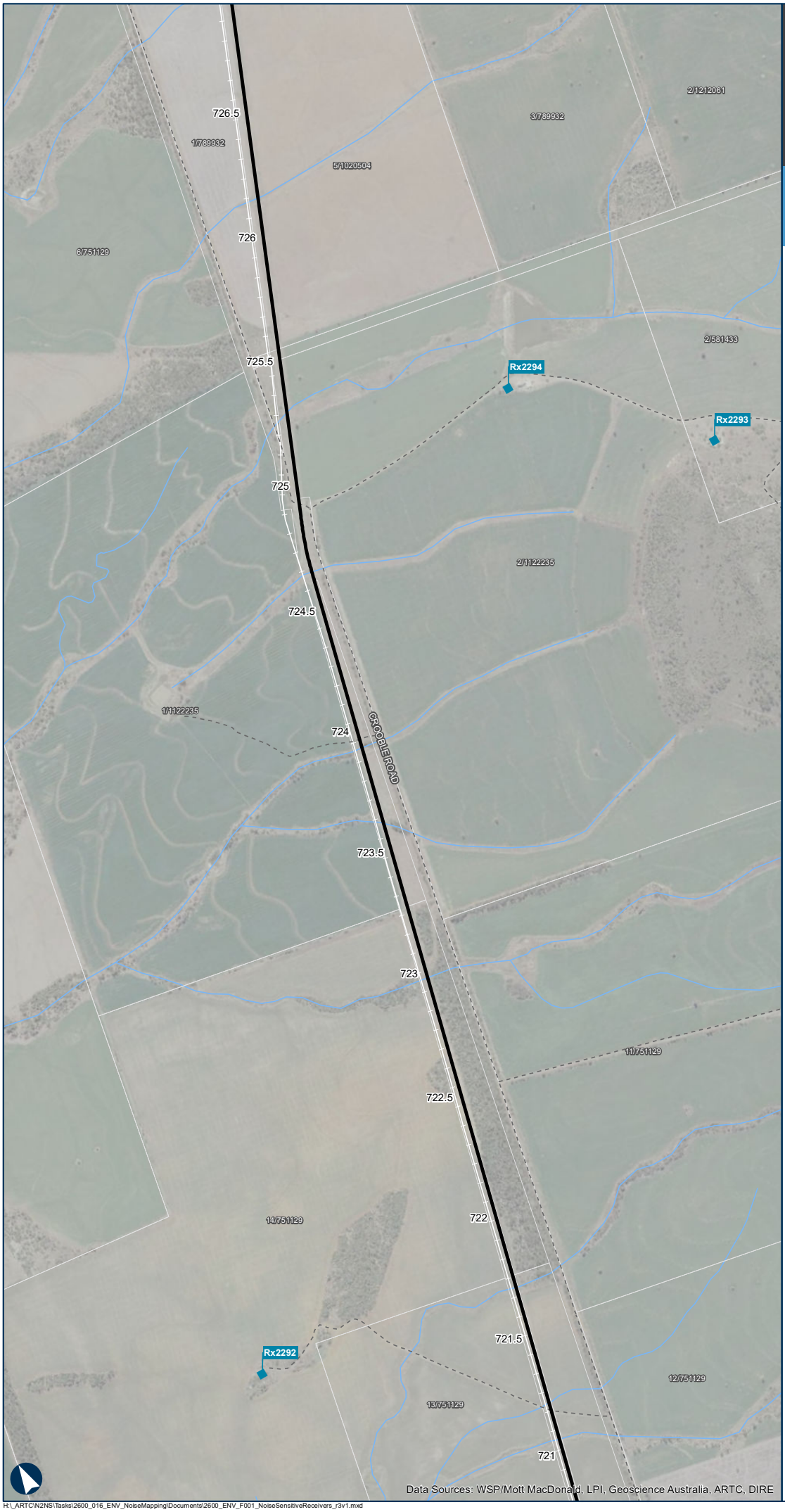
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Date: 12-Aug-21

Author: IRDJV

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INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

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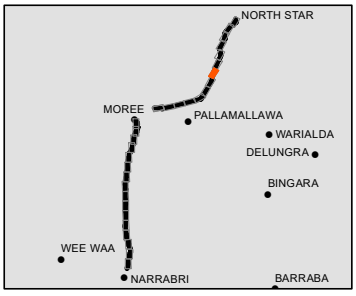
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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0.75 Km

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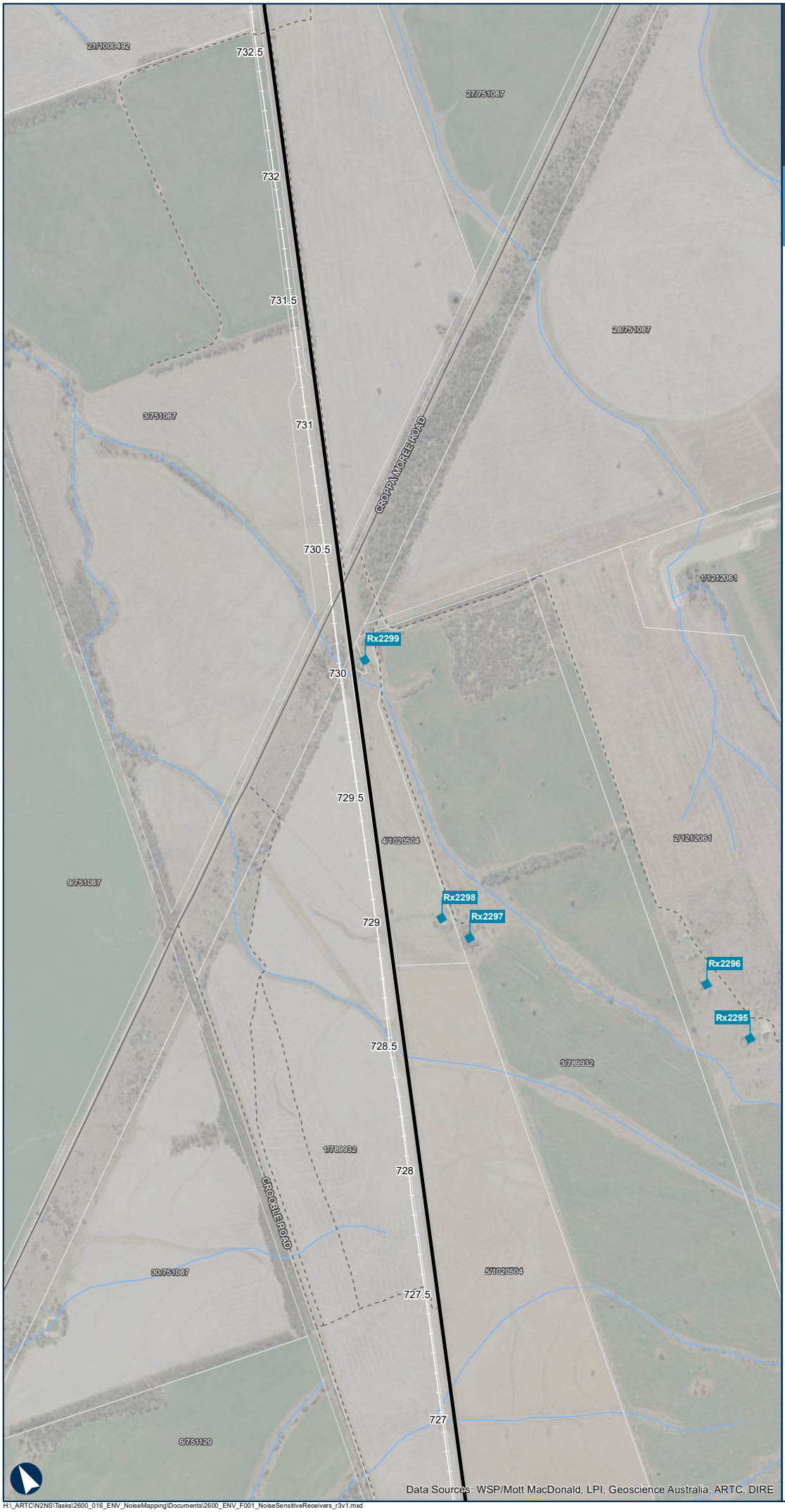
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INLAND RAIL ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

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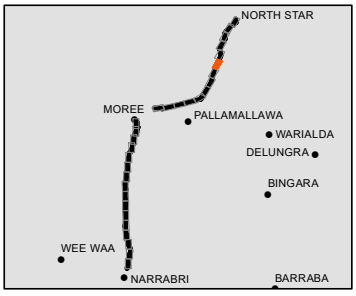
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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0.75 Km

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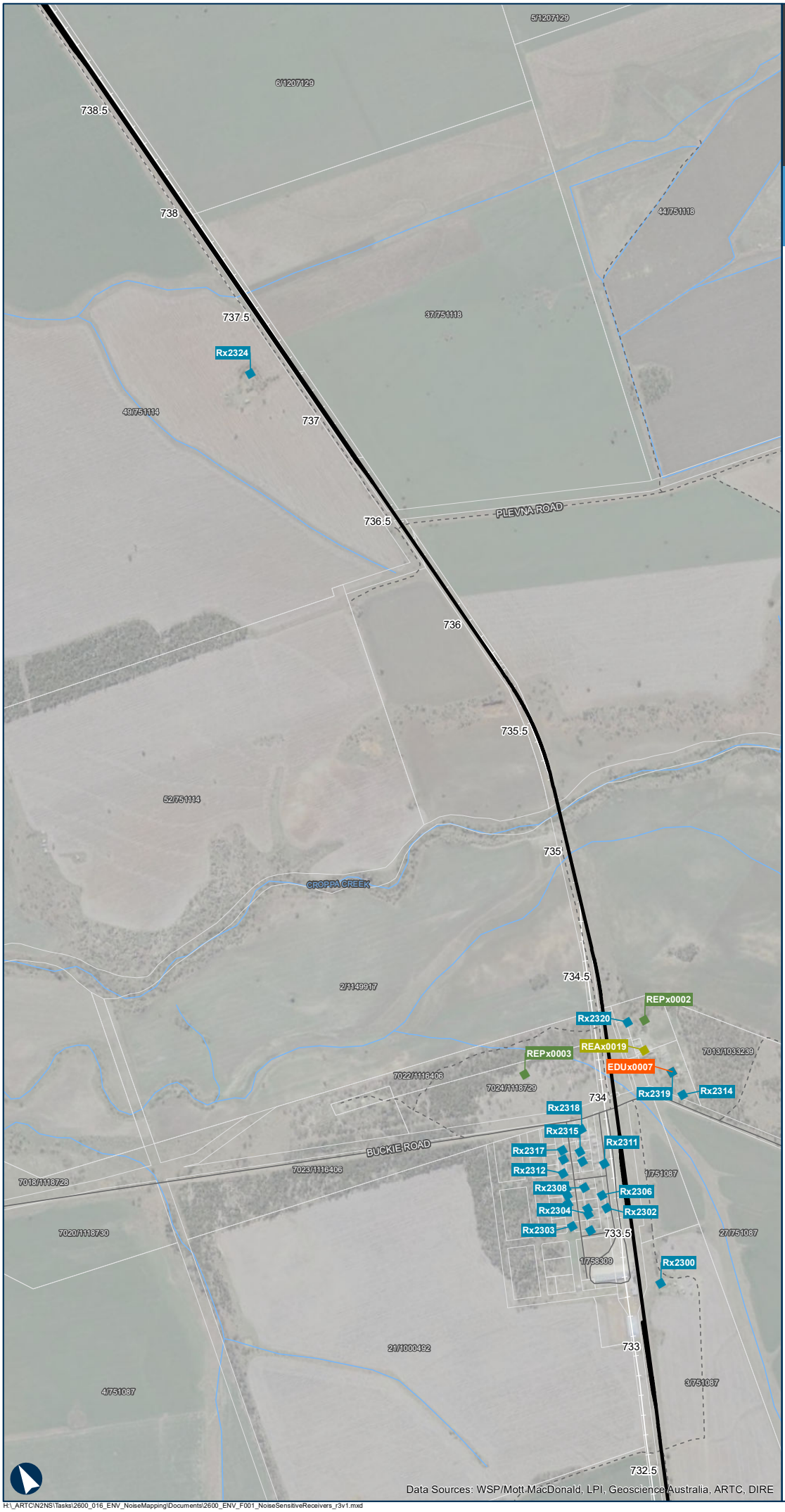
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Date: 12-Aug-21

Author: IRDJV

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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

Sheet 27 of 31

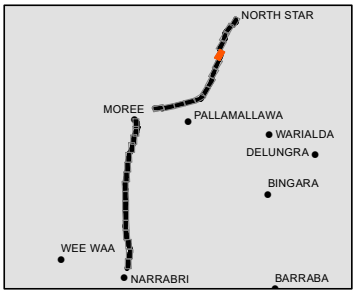
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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0.75 Km

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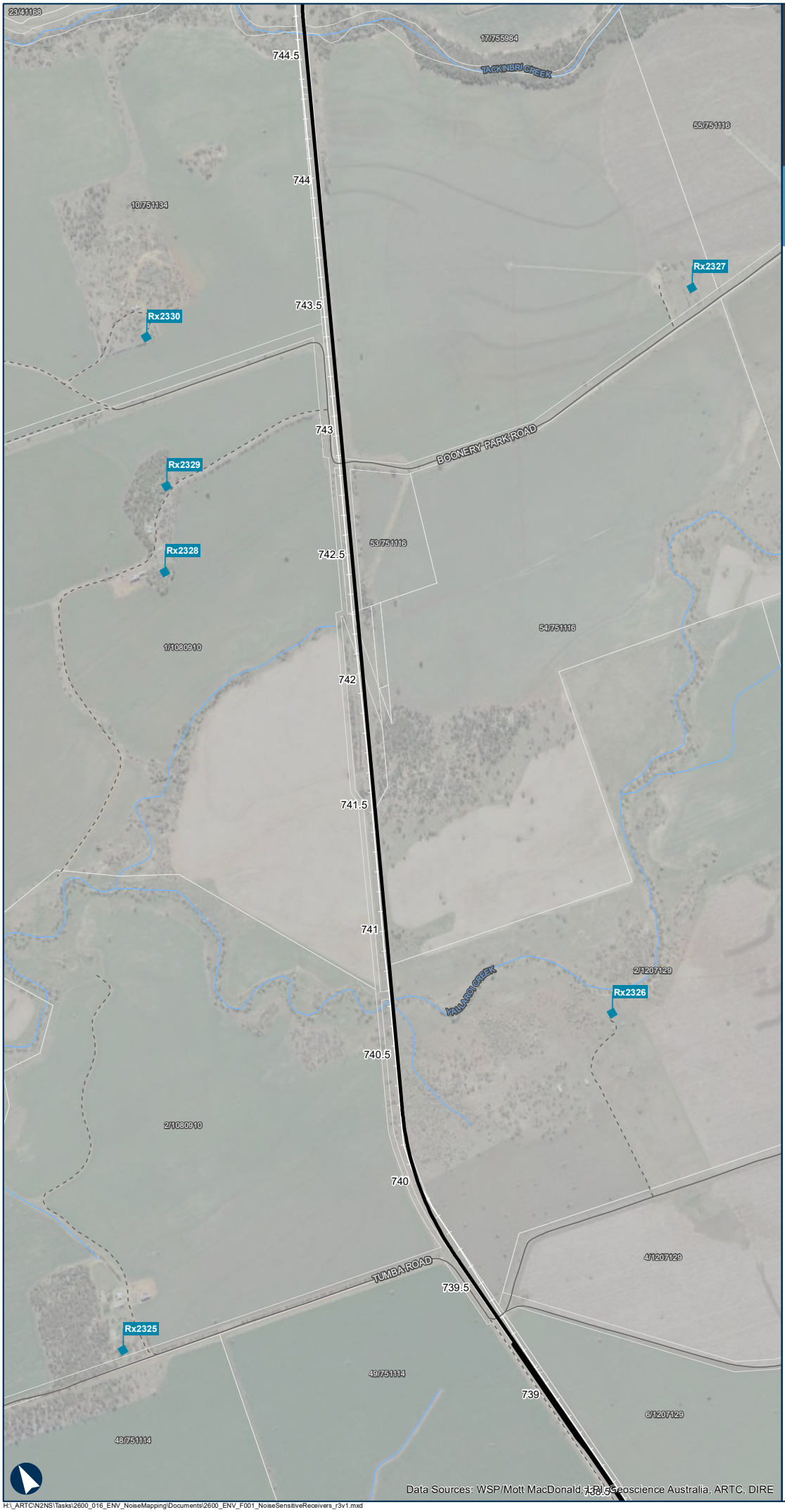
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Author: IRDJV



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NARRABRI TO NORTH STAR

Appendix A
Noise Sensitive Receivers

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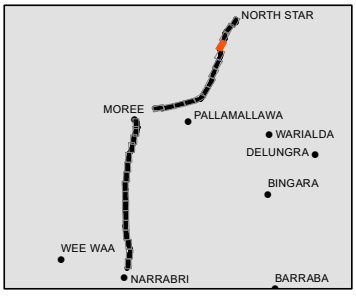
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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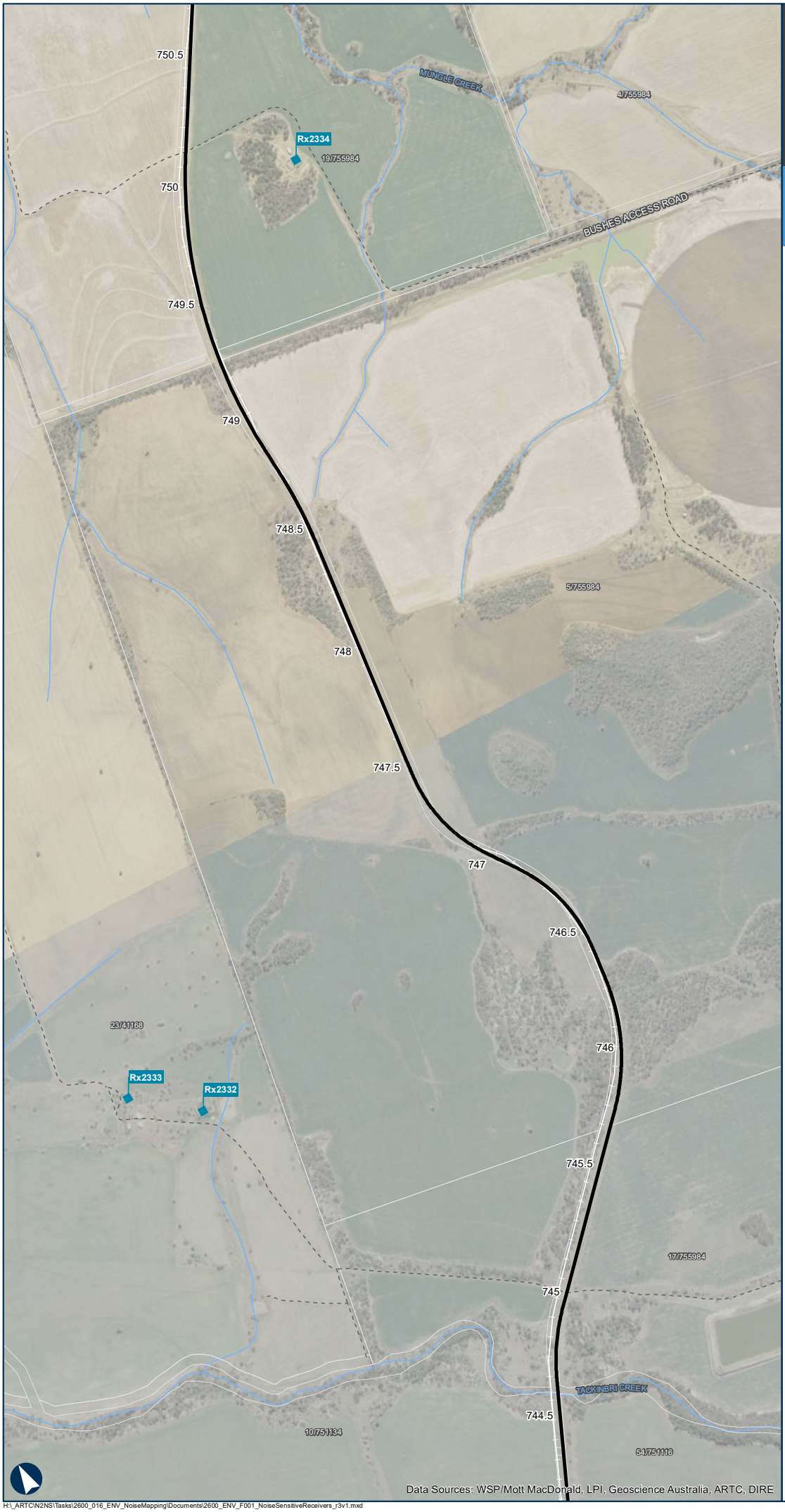
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Data Sources: WSP/Mott MacDonald, Geoscience Australia, ARTC, DIRE

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INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

Sheet 29 of 31

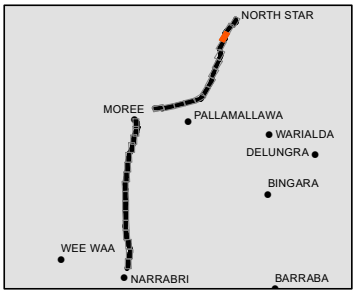
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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0.75 Km

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INLAND RAIL

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

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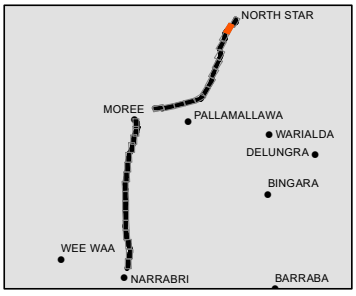
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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INLAND RAIL

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers

Sheet 31 of 31

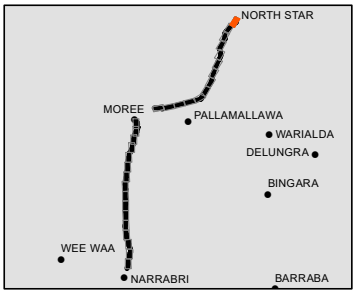
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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0.75 Km

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INLAND RAIL ARTC

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NARRABRI TO NORTH STAR

Appendix A
Noise Sensitive Receivers - North Star
Sheet 1 of 1

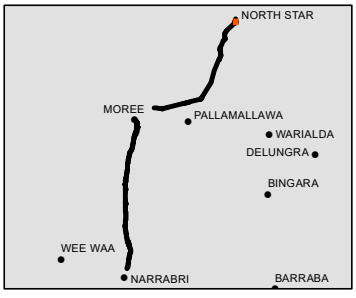
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Proposed Rail Separation
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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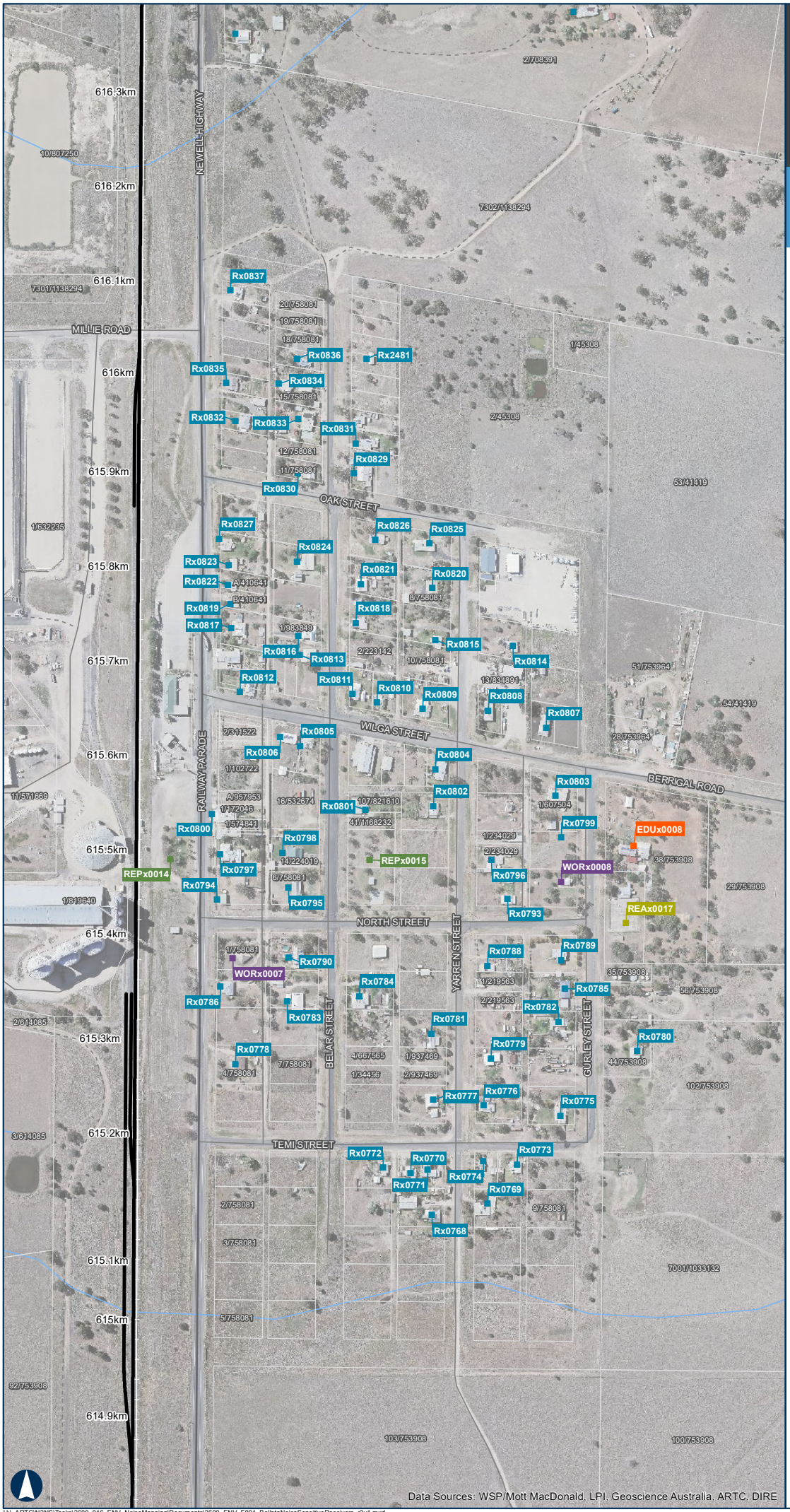
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Date: 12-Aug-21
Author: IRDJV

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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix A
Noise Sensitive Receivers - Bellata
Sheet 1 of 1

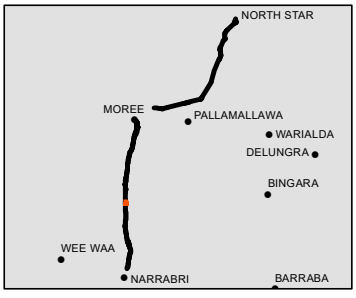
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Proposed Rail Separation
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

NOT FOR PUBLICATION. FOR CONSULTATION PURPOSES ONLY.



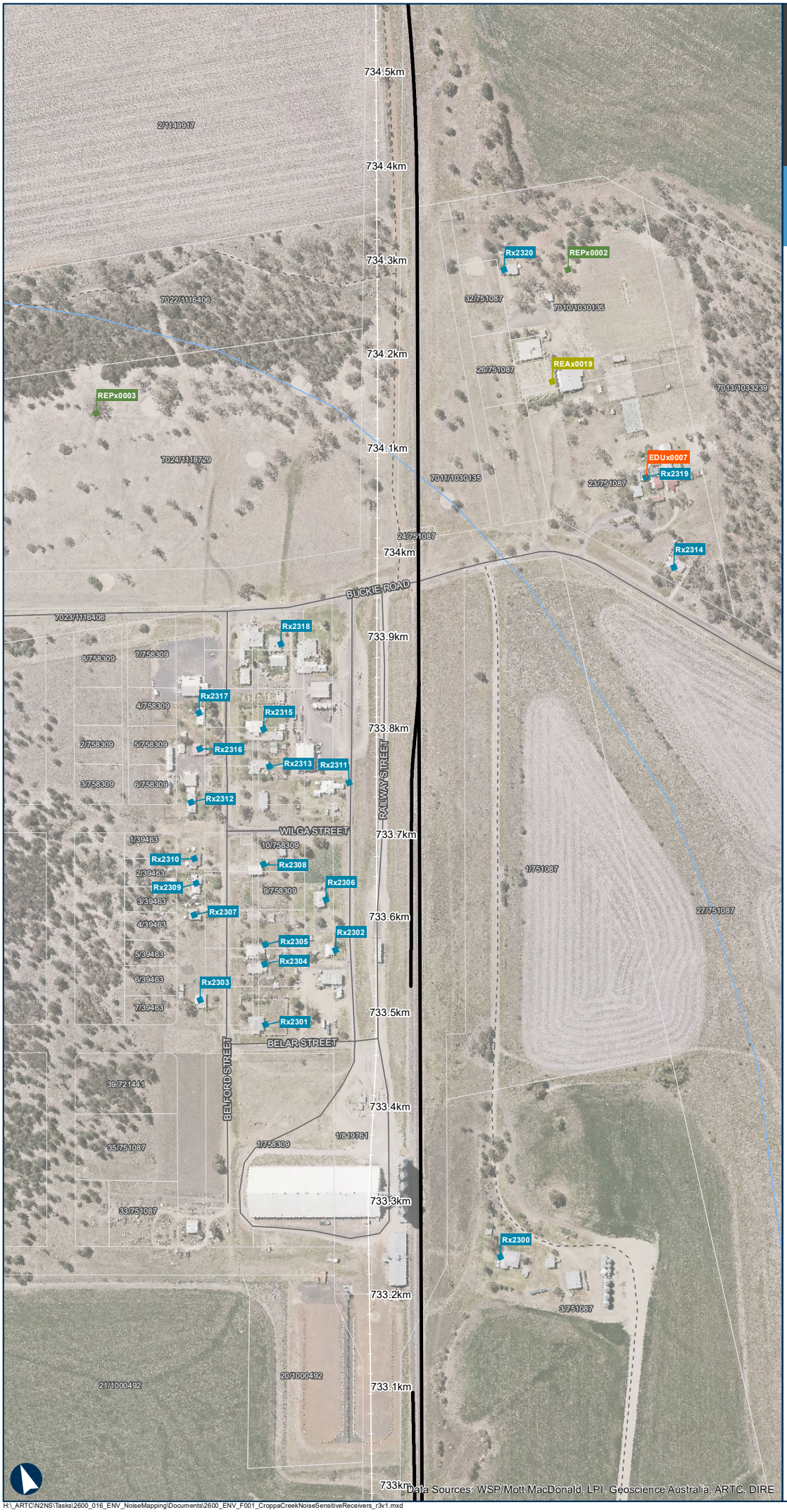
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Coordinate System: GDA 1994 MGA Zone 55

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Paper: A3
Scale: 1:4,000
Date: 12-Aug-21
Author: IRDJV

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INLAND RAIL

ARTC

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

NARRABRI TO NORTH STAR

Appendix A
Noise Sensitive Receivers - Croppa Creek
Sheet 1 of 1

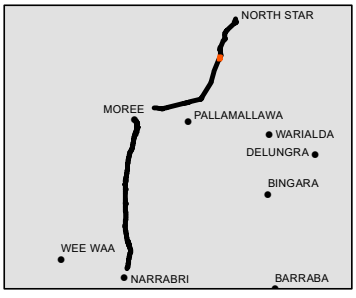
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Proposed Rail Separation
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
- Passive Recreation
- Residential
- Place of Worship

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0.3 Km

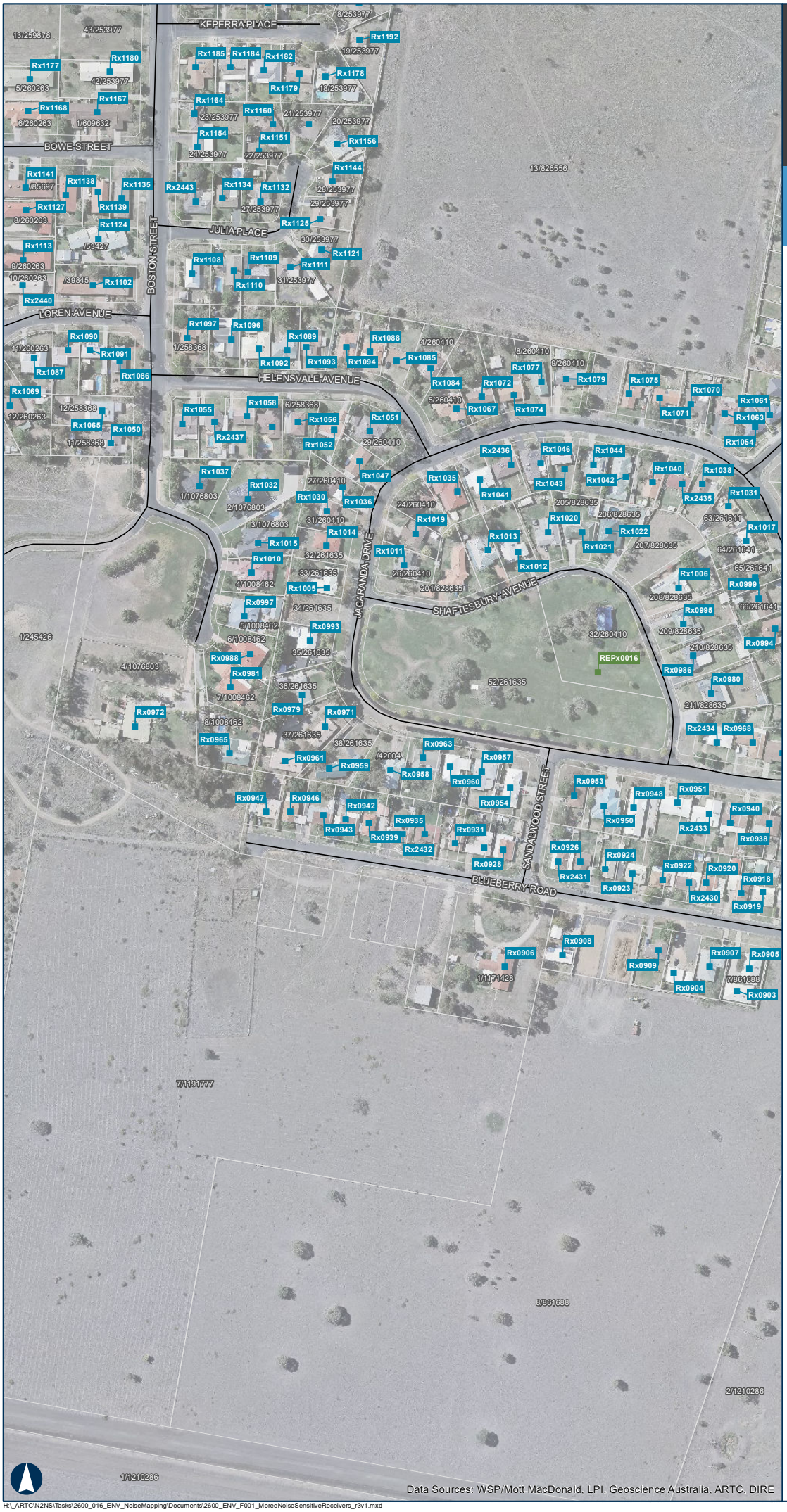
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Paper: A3
Scale: 1:4,000
Date: 12-Aug-21
Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers - Moree

Sheet 1 of 15

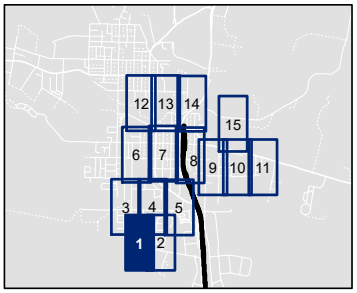
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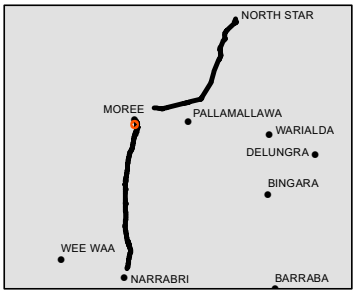
- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Proposed Rail Separation
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
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- Residential
- Place of Worship

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150 Meters

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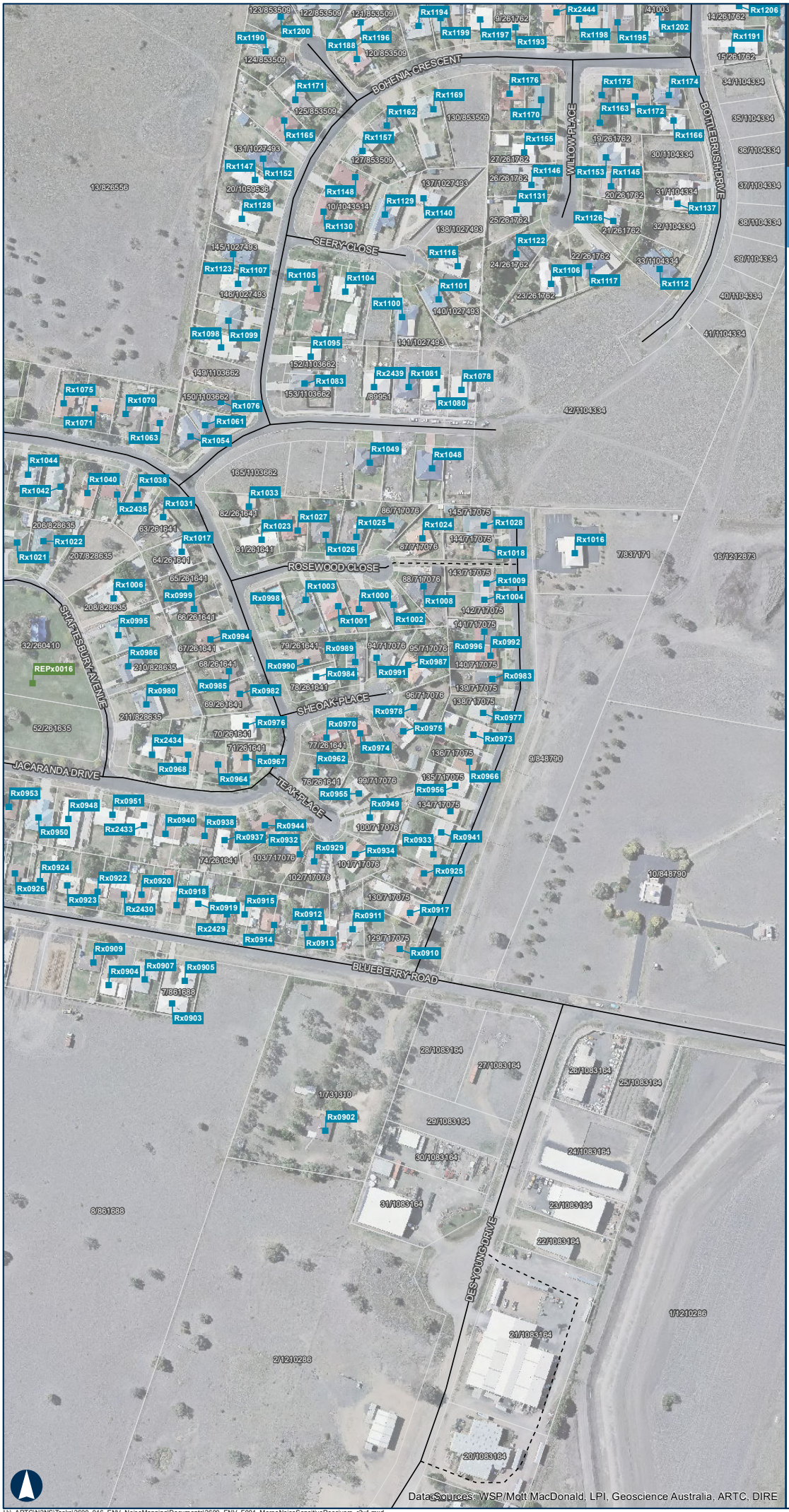
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Date: 12-Aug-21

Author: IRDJV

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INLAND RAIL ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers - Moree

Sheet 2 of 15

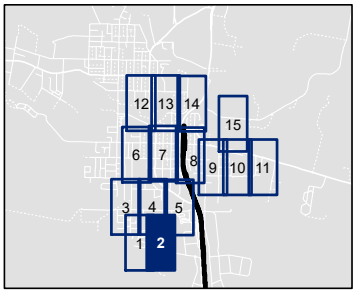
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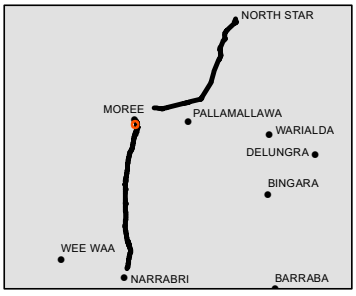
- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Proposed Rail Separation
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

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150 Meters

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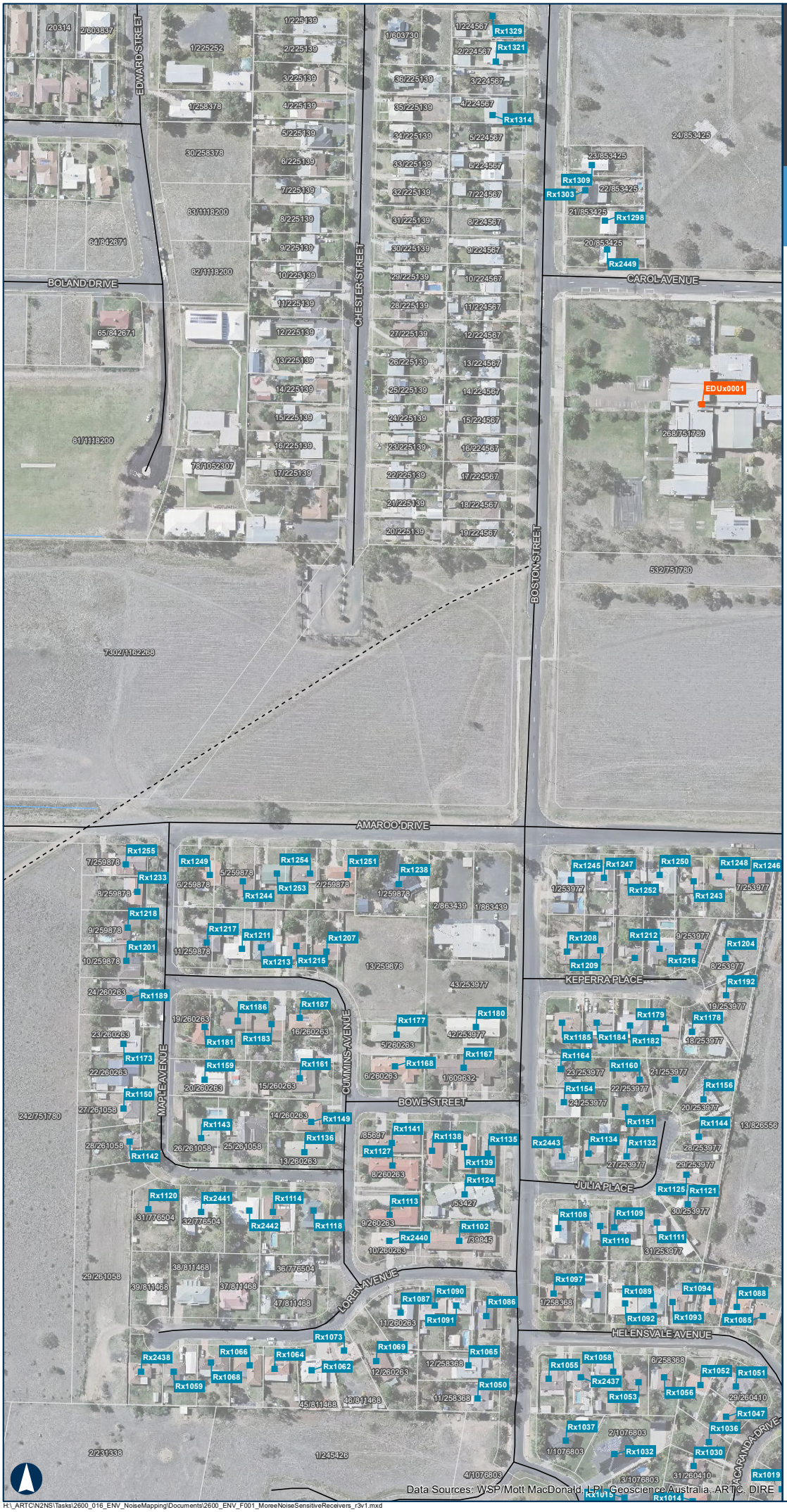
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Date: 12-Aug-21

Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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INLAND RAIL ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers - Moree

Sheet 3 of 15

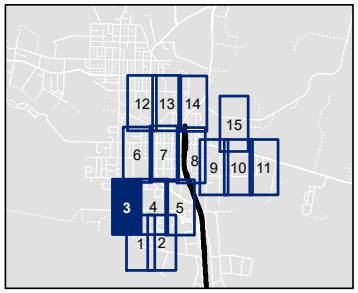
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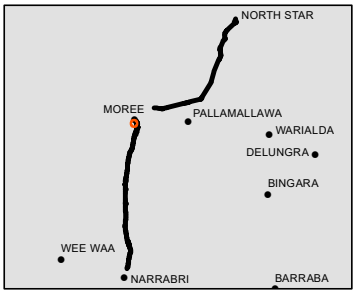
- Townships
- Highway
- Local Road
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- Existing Rail Network
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150 Meters

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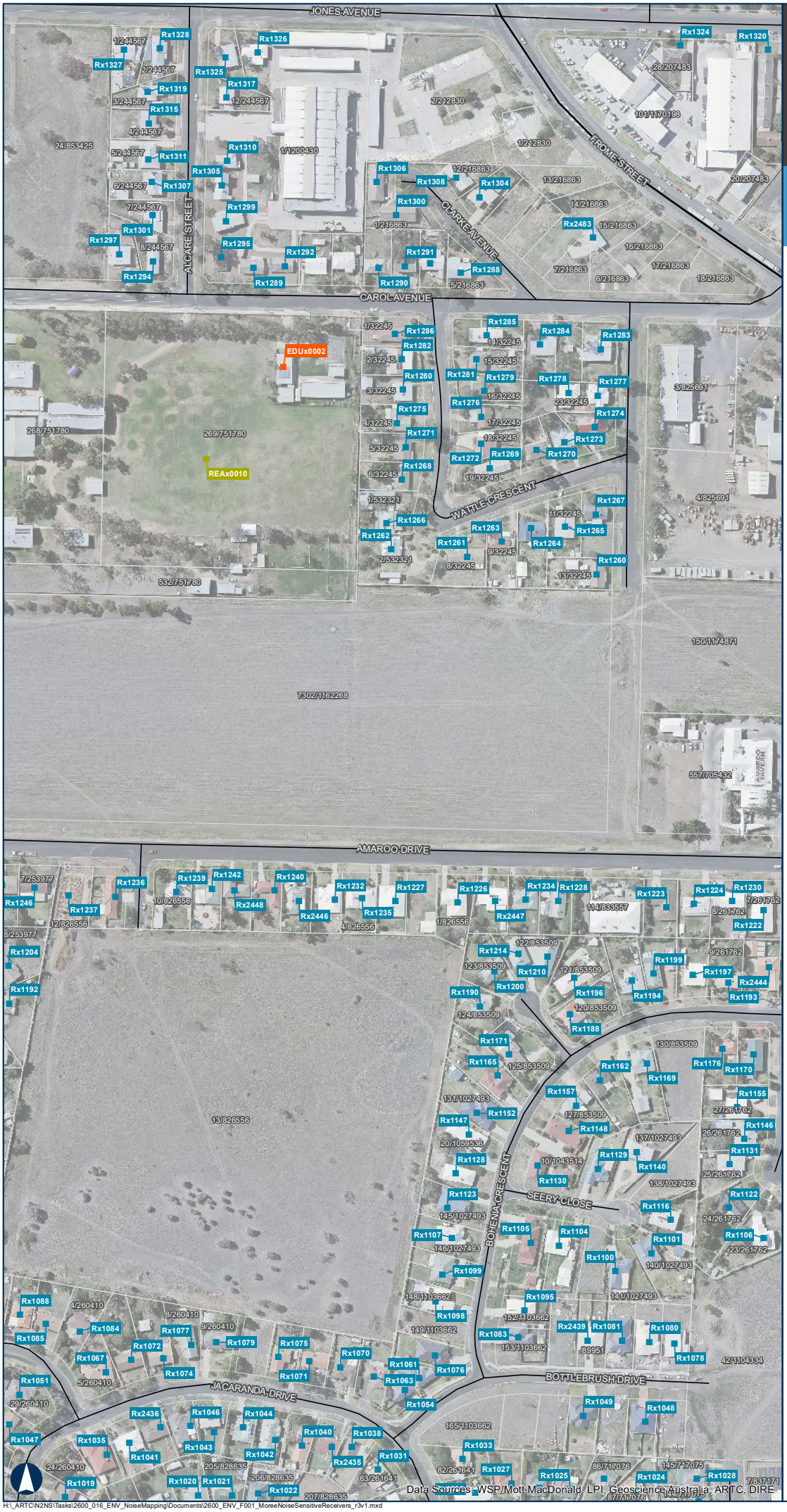
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Date: 12-Aug-21

Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers - Moree

Sheet 4 of 15

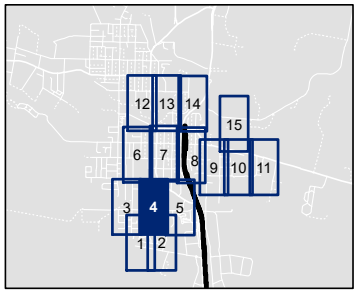
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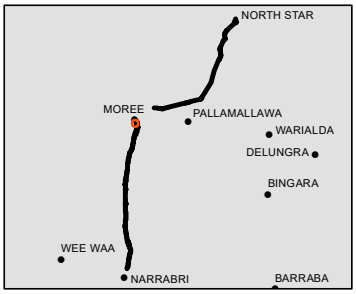
- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Proposed Rail Separation
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150 Meters

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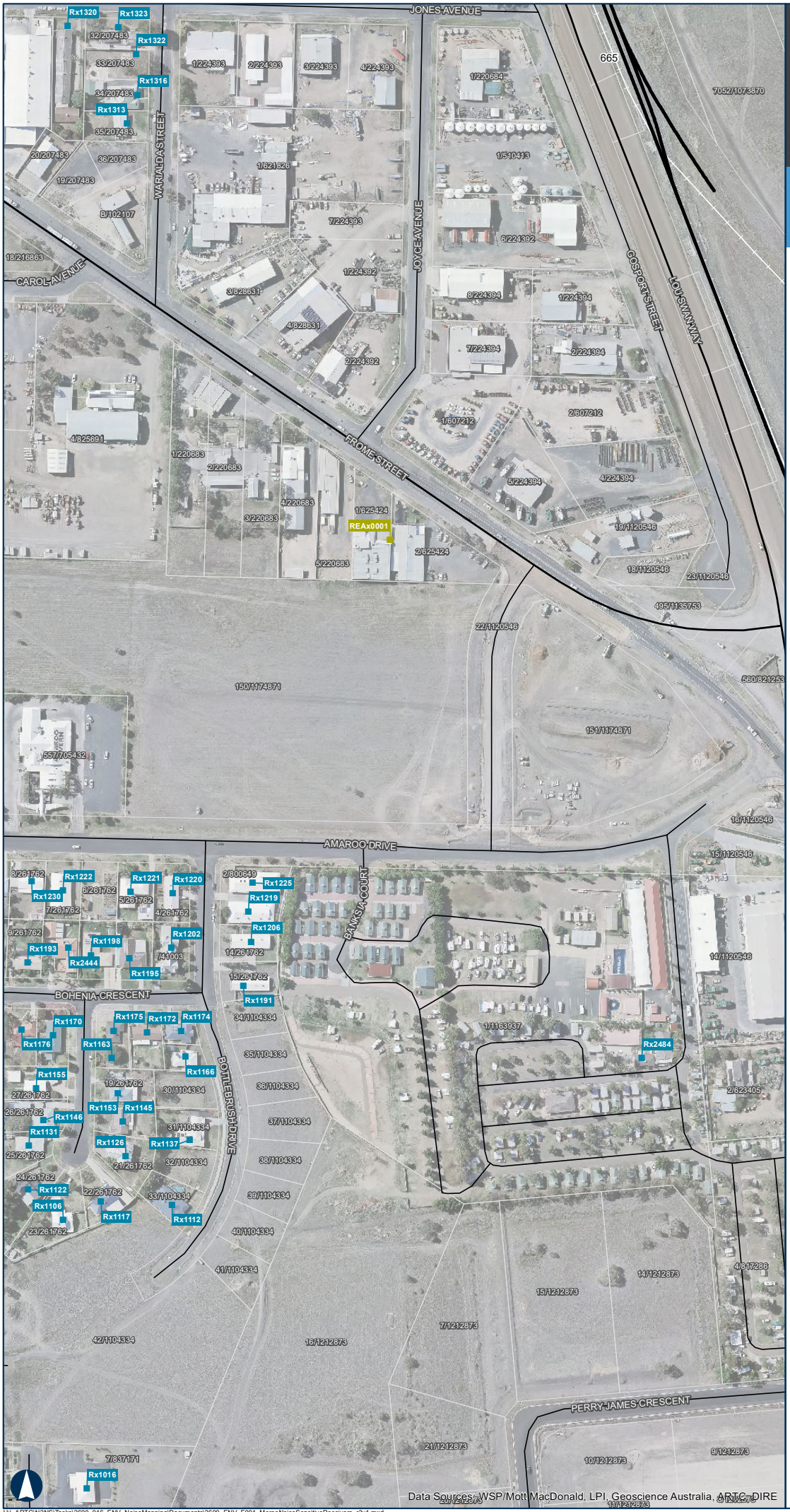
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Scale: 1:2,500

Date: 12-Aug-21

Author: IRDJV

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INLAND RAIL ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers - Moree

Sheet 5 of 15

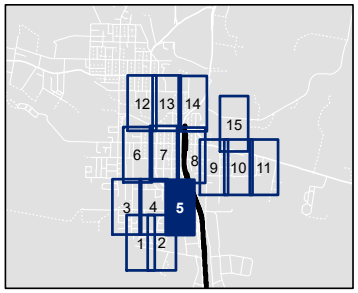
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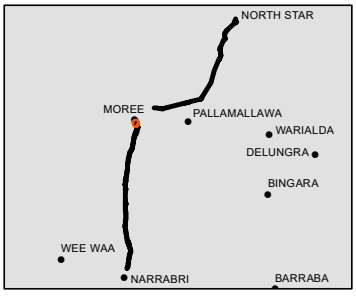
- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Proposed Rail Separation
- Watercourse
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- Cadastre

Rail Receivers

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150 Meters

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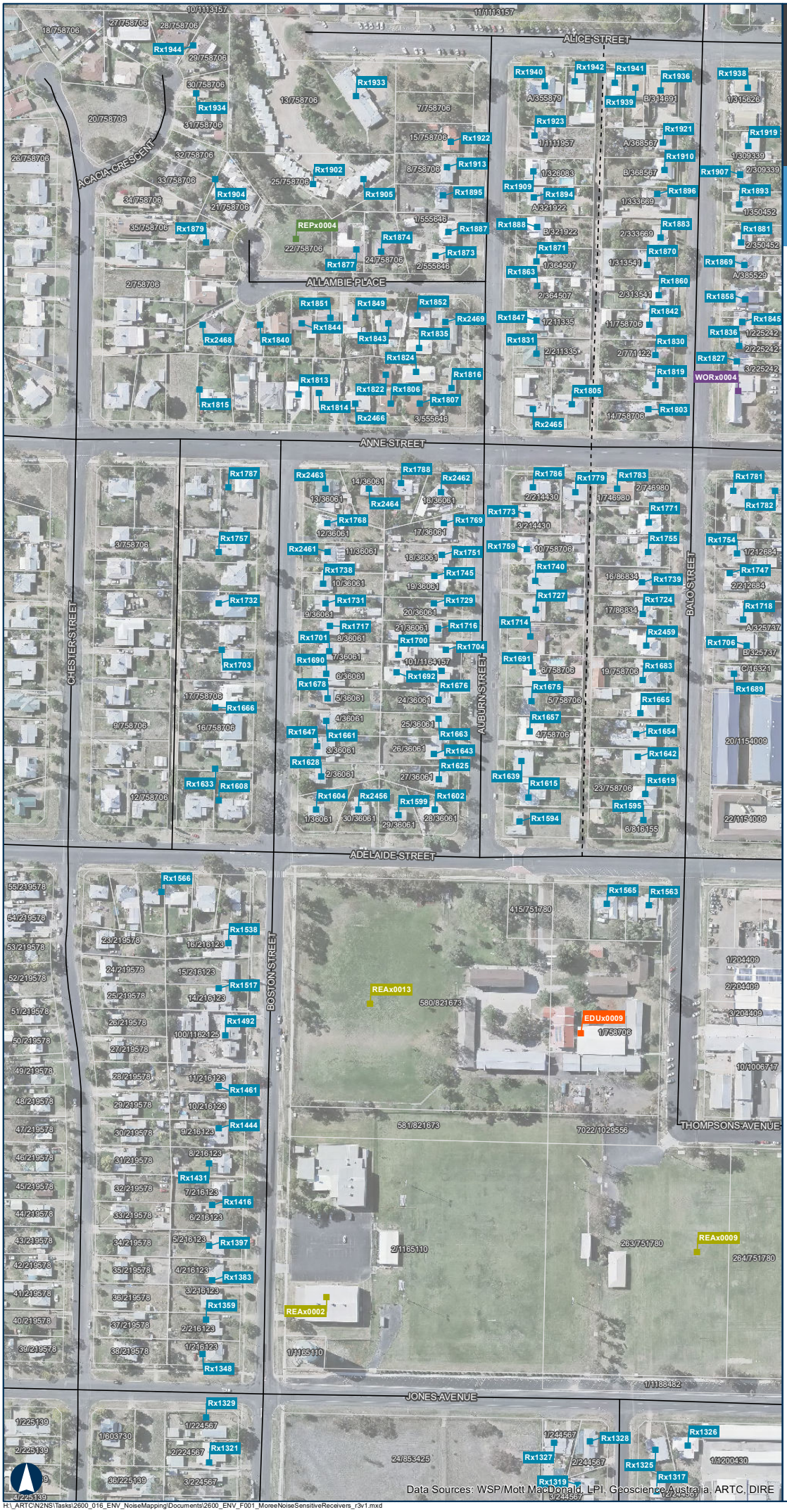
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Scale: 1:2,500

Date: 12-Aug-21

Author: IRDJV

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INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers - Moree

Sheet 6 of 15

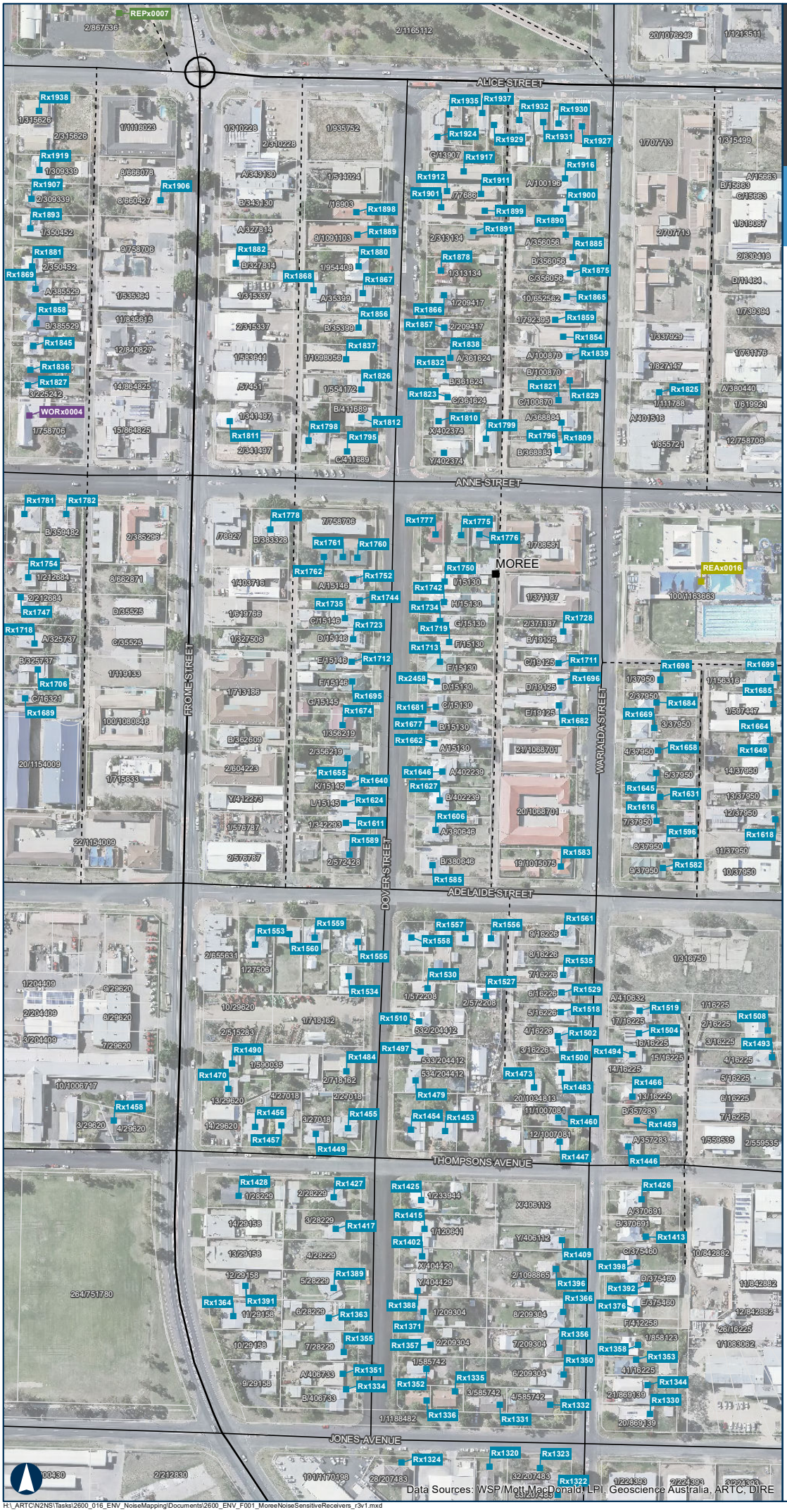
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Proposed Rail Separation
- Watercourse
- Track Alignment
- Cadastre

Rail Receivers

- Education
- Hospital Ward
- Active Recreation
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- Residential
- Place of Worship

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INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers - Moree

Sheet 7 of 15

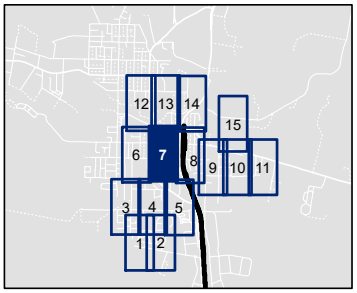
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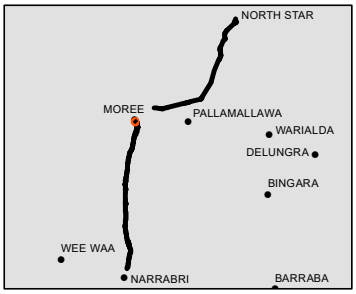
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150 Meters

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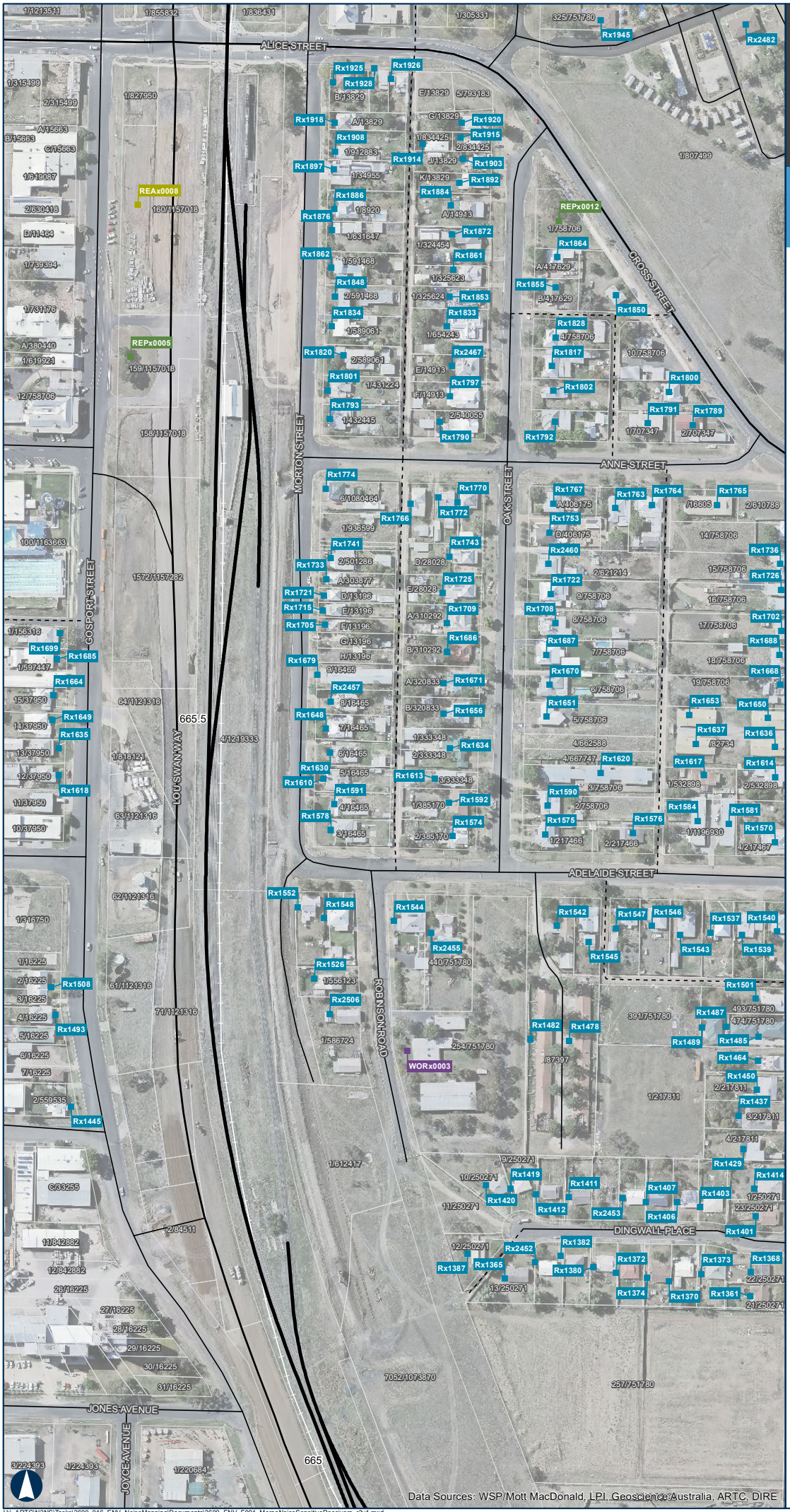
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Date: 12-Aug-21

Author: IRDJV

Data Sources: WSP/Mott MacDonald | LPI, Geoscience Australia, ARTC, DIRE

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INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers - Moree

Sheet 8 of 15

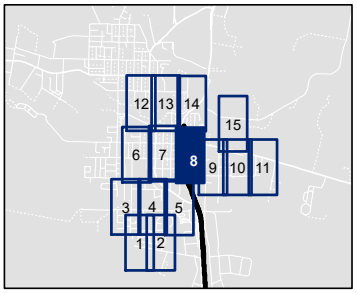
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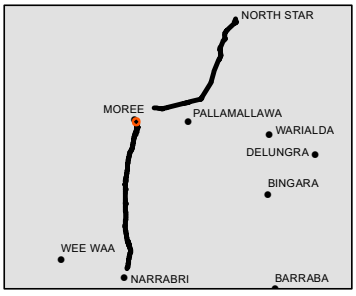
- Townships
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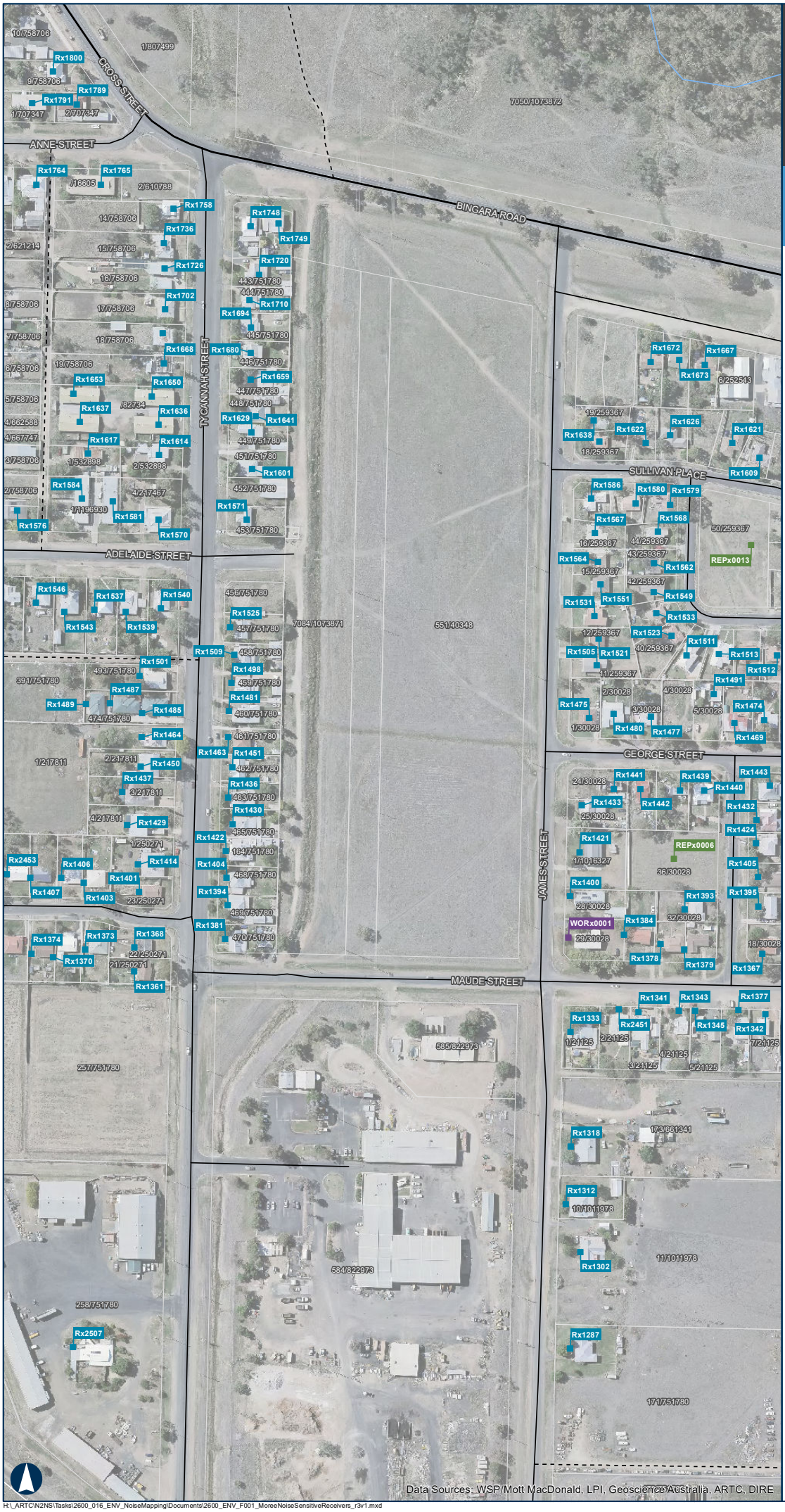
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Date: 12-Aug-21

Author: IRDJV

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INLAND RAIL — ARTC

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers - Moree

Sheet 9 of 15

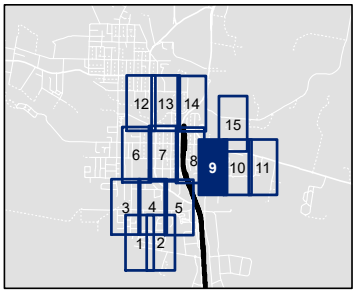
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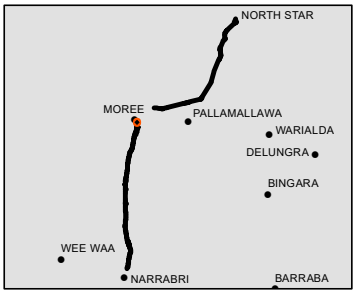
- Townships
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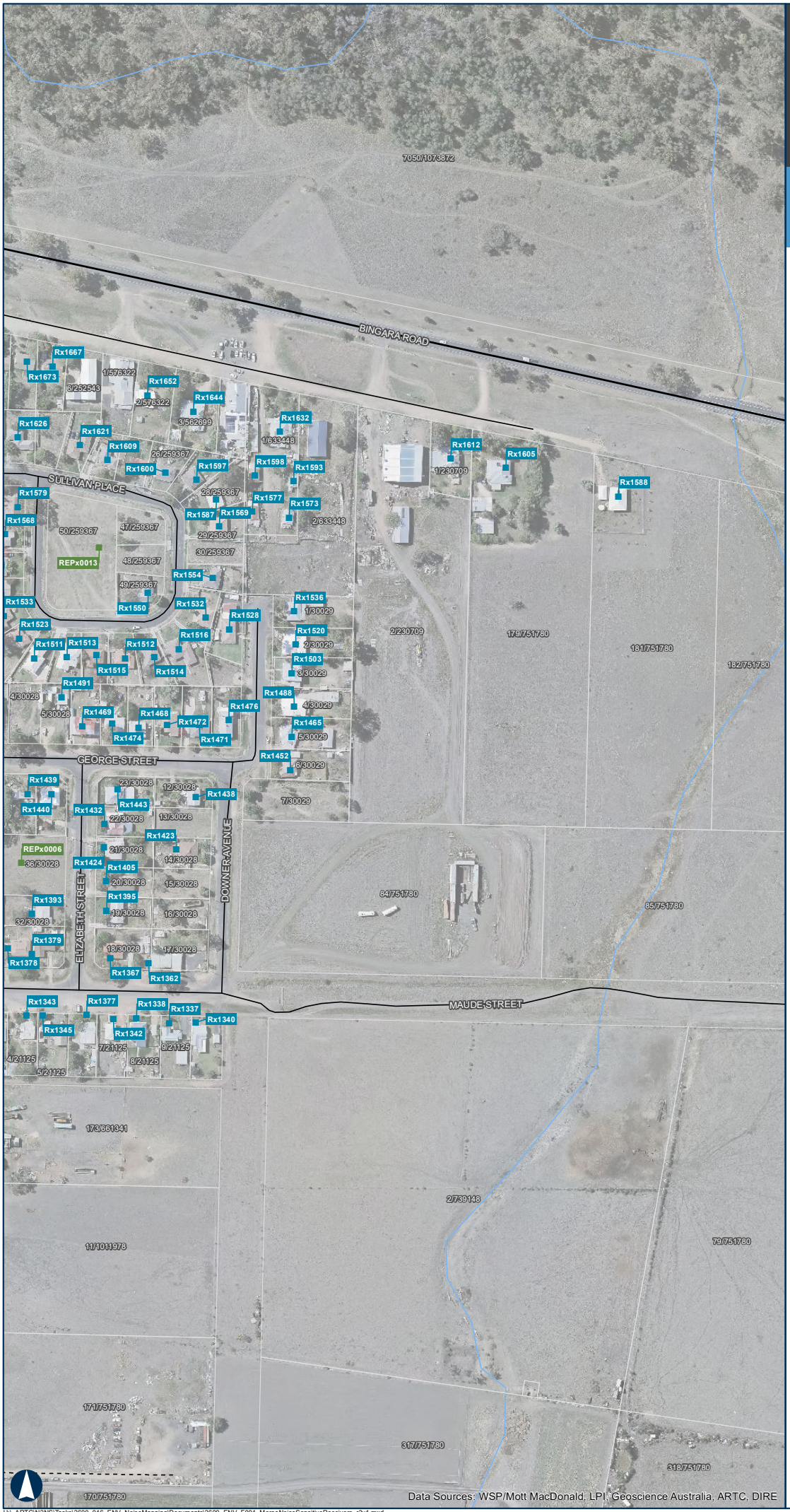
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Date: 12-Aug-21

Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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INLAND RAIL

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers - Moree

Sheet 10 of 15

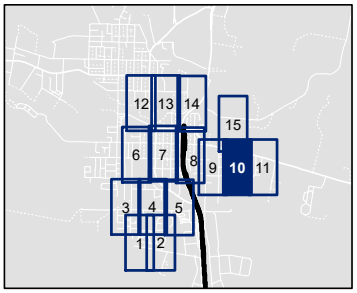
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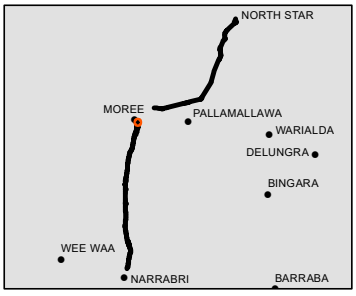
- Townships
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- Track
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Rail Receivers

- Education
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- Place of Worship

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Paper: A3

Scale: 1:2,500

Date: 12-Aug-21

Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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NARRABRI TO NORTH STAR

Appendix A

Noise Sensitive Receivers - Moree

Sheet 11 of 15

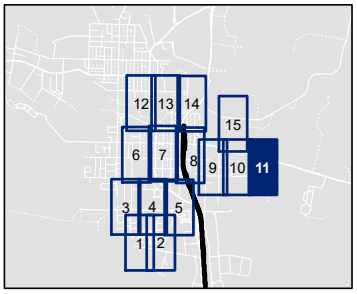
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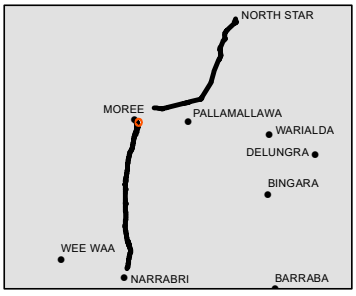
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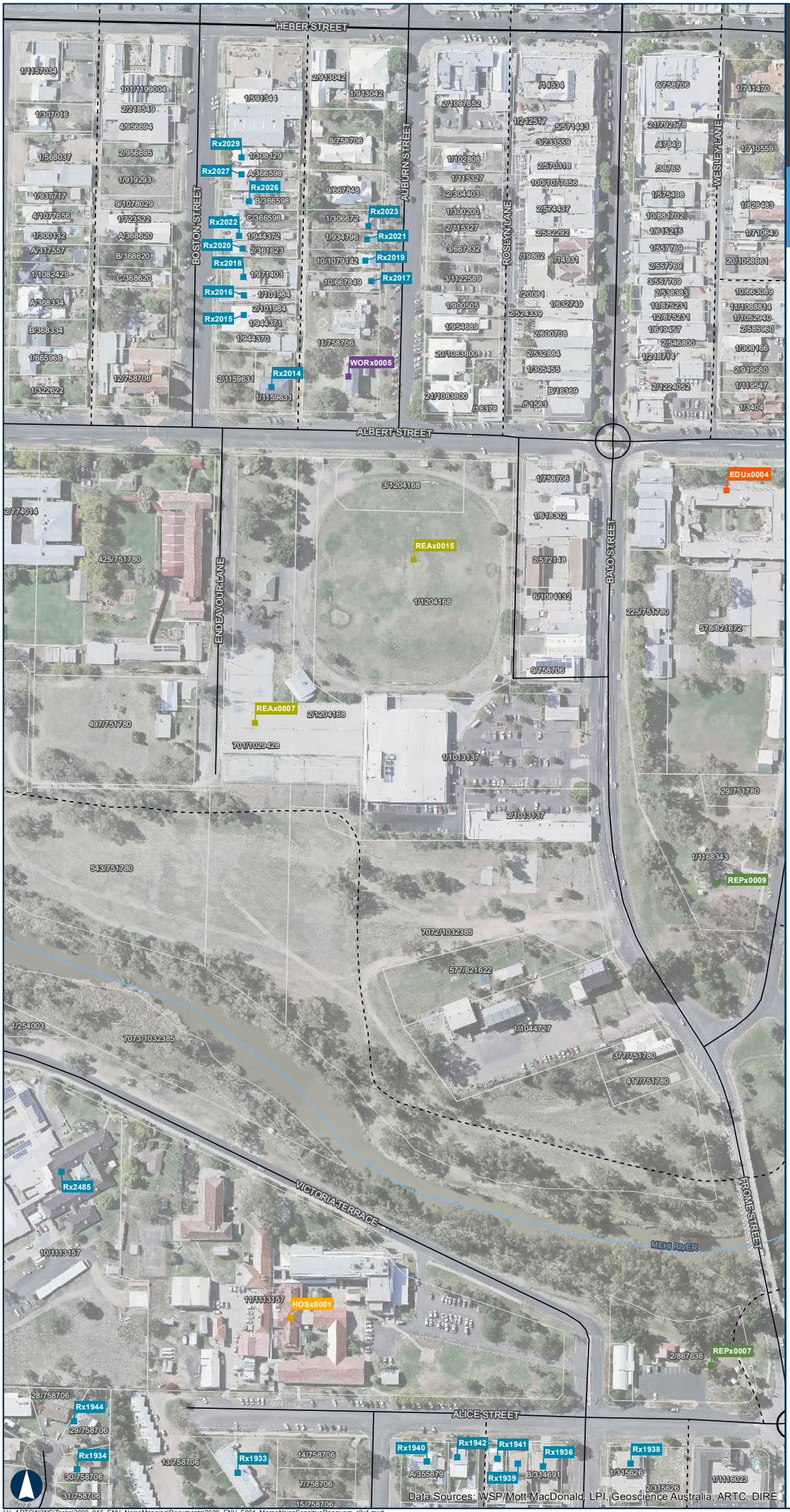
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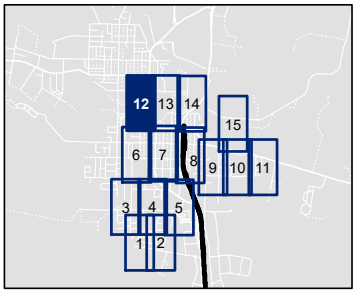
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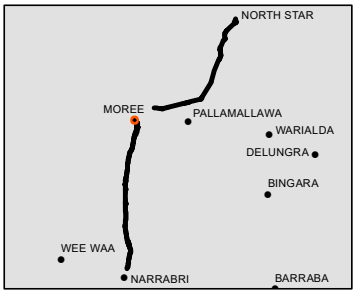
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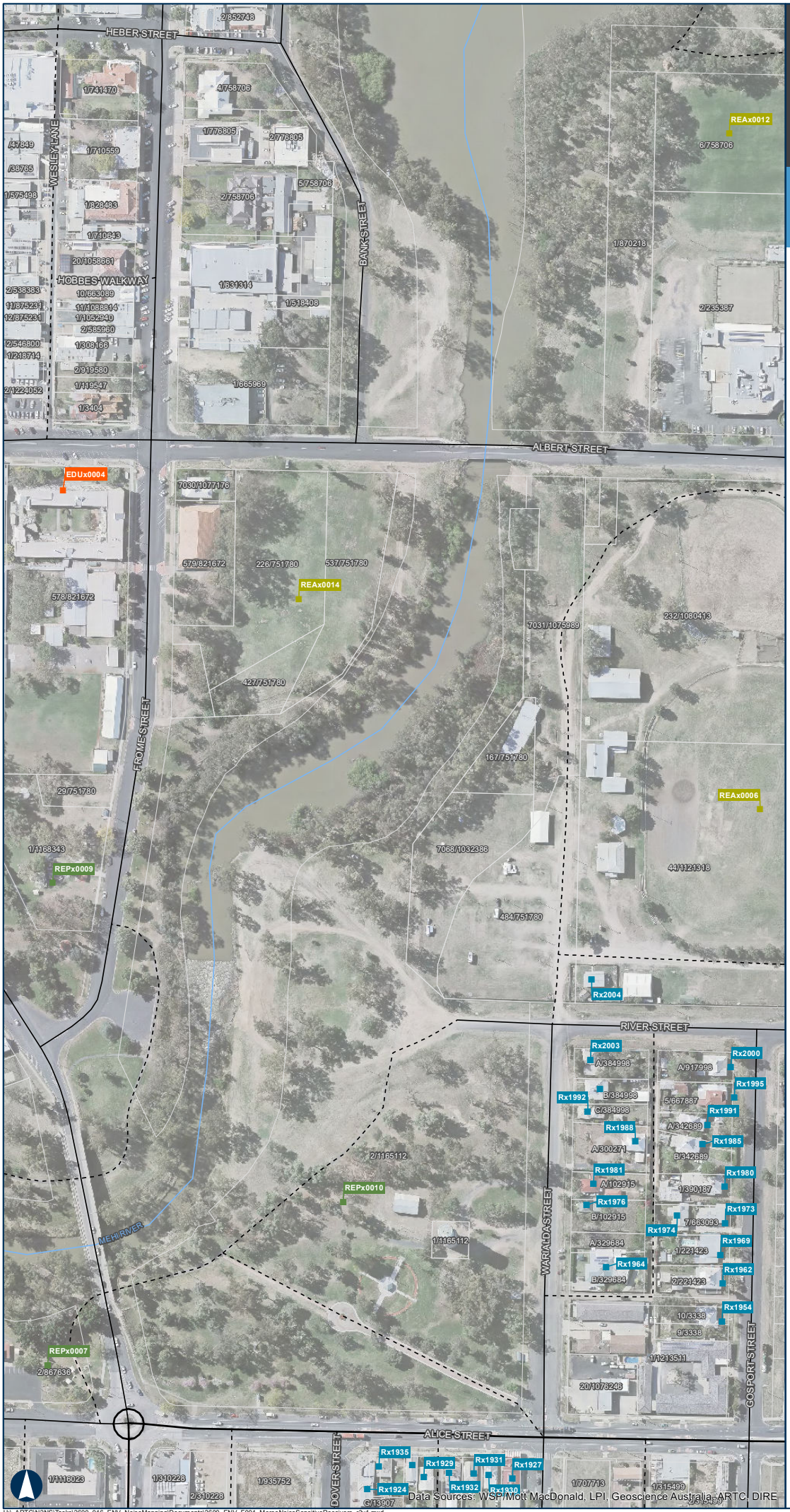
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Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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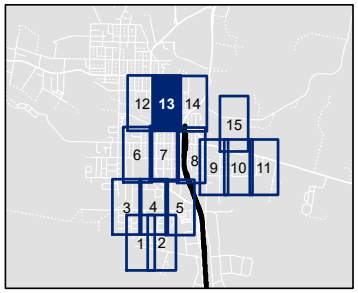
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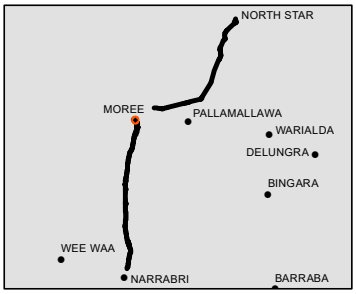
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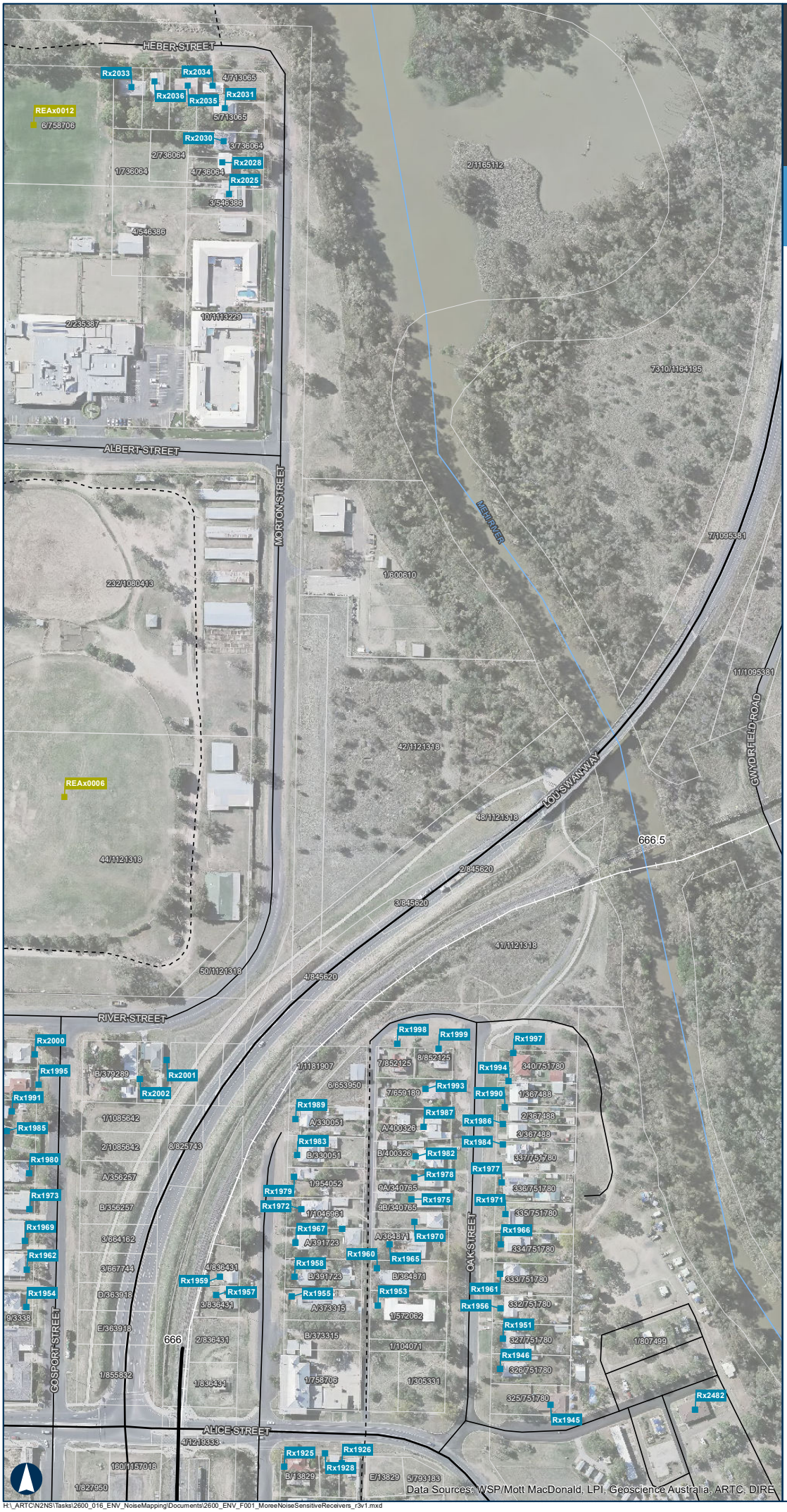
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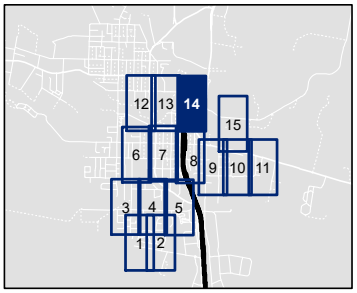
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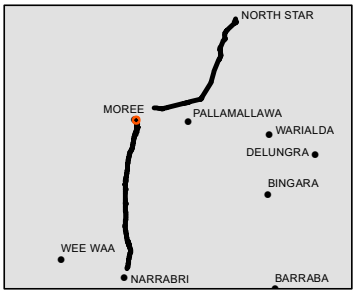
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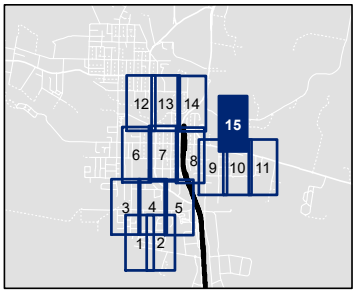
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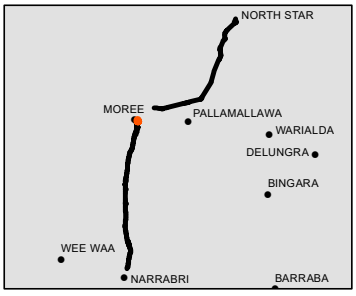
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Appendix B

Operational Rail Noise Modelling Results



Name	Noise trigger levels, dBA			Year 2020 - Predicted noise levels, dBA				Year 2025 - Predicted noise levels, dBA				Year 2040 - Predicted noise levels, dBA				Assessment Year 2025				Assessment Year 2040				Mitigation	
	Day	Night	Max	Day	Day	Night	Night	Day	Day	Night	Night	Day	Day	Night	Night	Day	Night	Max	Max (increase)	Day	Night	Max	Max (increase)	Year 2025	Year 2040
	$L_{Aeq,15h}$	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}										
NNS_EDUx0006	58	-	-	38	-	-	-	58	-	-	-	61	-	-	-	-	-	-	-	Yes	-	-	-	-	Yes
NNS_EDUx0007	58	-	-	37	-	-	-	48	-	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-
NNS_REAx0001	68	-	-	36	-	-	-	47	-	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-
NNS_REAx0008	68	-	-	49	-	-	-	58	-	-	-	59	-	-	-	-	-	-	-	-	-	-	-	-	-
NNS_REAx0019	68	-	-	45	-	-	-	56	-	-	-	59	-	-	-	-	-	-	-	-	-	-	-	-	-
NNS_REPx0002	68	-	-	40	-	-	-	53	-	-	-	56	-	-	-	-	-	-	-	-	-	-	-	-	-
NNS_REPx0003	68	-	-	39	-	-	-	50	-	-	-	53	-	-	-	-	-	-	-	-	-	-	-	-	-
NNS_REPx0005	68	-	-	44	-	-	-	55	-	-	-	57	-	-	-	-	-	-	-	-	-	-	-	-	-
NNS_REPx0012	68	-	-	40	-	-	-	49	-	-	-	51	-	-	-	-	-	-	-	-	-	-	-	-	-
NNS_REPx0014	68	-	-	50	-	-	-	59	-	-	-	62	-	-	-	-	-	-	-	-	-	-	-	-	-
NNS_REPx0015	68	-	-	40	-	-	-	49	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	-	-
NNS_Rx0719	65	60	85	40	71	40	71	50	78	52	78	53	78	56	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx0720	65	60	85	40	73	40	73	51	79	53	79	54	79	57	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx0722	65	60	85	40	72	40	72	51	78	53	78	54	78	56	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx0723	65	60	85	39	71	39	71	50	77	52	77	52	77	55	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx0724	65	60	85	38	71	38	71	48	76	50	76	51	76	54	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx0725	65	60	85	42	75	42	75	52	79	54	79	55	79	57	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx0726	65	60	85	39	70	39	70	49	76	51	76	52	76	54	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx0727	65	60	85	41	76	41	76	52	80	54	80	54	80	57	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx0735	65	60	85	41	74	41	74	52	79	54	79	54	79	57	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx0736	65	60	85	40	75	40	75	51	78	52	78	53	78	55	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx0737	65	60	85	41	77	41	77	52	79	53	79	54	79	57	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx0738	65	60	85	40	77	40	77	51	78	53	78	53	78	56	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx0741	65	60	85	44	79	44	79	54	82	56	82	56	82	60	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx0742	65	60	85	45	80	45	80	55	83	57	83	58	83	61	83	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0743	65	60	85	45	80	45	80	55	82	57	82	58	82	61	82	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0744	65	60	85	49	87	49	87	59	87	62	87	62	87	65	87	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0745	65	60	85	49	87	49	87	60	88	62	88	62	88	65	88	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0746	65	60	85	44	81	44	81	54	81	56	81	57	81	60	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx0747	65	60	85	44	81	44	81	54	82	56	82	57	82	60	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx0748	65	60	85	45	85	45	85	55	83	57	83	57	83	60	83	-	-	-	-	-	-	-	-	-	-
NNS_Rx0749	65	60	85	44	80	44	80	54	82	56	82	57	82	60	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx0752	65	60	85	43	78	43	78	53	81	55	81	56	81	59	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx0754	65	60	85	42	78	42	78	52	80	54	80	55	80	58	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx0757	65	60	85	43	78	43	78	53	81	55	81	56	81	59	81	-	-	-	-	-	-	-	-	-	-
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NNS_Rx0768	65	60	85	43	81	43	81	54	82	56	82	56	82	59	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx0769	65	60	85	41	76	41	76	51	79	53	79	54	79	56	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx0770	65	60	85	42	82	42	82	53	81	55	81	55	81	58	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx0771	65	60	85	40	78	40	78	50	78	52	78	53	78	55	78	-	-	-	-	-	-	-	-	-	-
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NNS_Rx0773	65	60	85	40	77	40	77	49	76	51	76	52	76	54	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx0774	65	60	85	41	77	41	77	51	79	53	79	54	79	57	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx0775	65	60	85	41	78	41	78	51	79	53	79	54	79	57	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx0776	65	60	85	41	76	41	76	52	79	53	79	54	79	57	79	-	-	-	-	-	-	-	-	-	-
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NNS_Rx0788	65	60	85	41	77	41	77	52	79	53	79	54	79	57	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx0790	65	60	85	44	83	44	83	54	82	56	82	57	82	60	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx0791	65	60	85	47	87	47	87	57	85	59	85	60	85	63	85	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0793	65	60	85	41	75	41	75	51	78	53	78	53	78	56	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx0794	65	60	85	49	88	49	88	59	86	61	86	61	86	64	86	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0795	65	60	85	44	83	44	83	54	82	56	82	57	82	60	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx0796	65	60	85	41	76	41	76	51	78	52	78	53	78	56	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx0797	65	60	85	49	88	49	88	59	87	61	87	62	87	65	87	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0798	65	60	85	43	82	43	82	54	81	56	81	56	81	59	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx0800	65	60	85	49	89	49	89	59	87	61	87	62	87	65	87	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0802	65	60	85	41	74	41	74	50	77	52	77	53	77	56	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx0803	65	60	85	39	74	39	74	49	75	50	75	51	75	54	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx0804	65	60	85	40	75	40	75	50	77	52	77	53	77	56	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx0805	65	60	85	43	80	43	80	53	80	54	80	55	80	58	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx0807	65	60	85	40	73	40	73	49	76	51	76	52	76	54	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx0808	65	60	85	40	72	40	72	49	75	51	75	52	75	54	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx0809	65	60	85	40	75	40	75	50	77	51	77	52	77	55	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx0810	65	60	85	39	75	39	75	49	76	50	76	51	76	55	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx0811	65	60	85	42	78	42	78	52	78	53	78	54	78	57	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx0812	65	60	85	46	84	46	84	56	83	58	83	58	83	62	83	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0813	65	60	85	43	78	43	78	53	79	54	79	55	79	58	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx0814	65	60	85	39	72	39	72	49	75	50	75	51	75	54	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx0815	65	60	85	40	74	40	74	50	77	52	77	52	77	55	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx0817	65	60	85	47	87	47	87	57	85	59	85	60	85	63	85	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0820	65	60	85	41	75	41	75	50	76	52	76	53	76	55	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx0821	65	60	85	42	78	42	78	52	79	54	79	55	79	58	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx0822	65	60	85	48	86	48	86	58	86	60	86	61	86	64	86	-	-	Yes	-	-	Yes	Yes	-	-	Yes
NNS_Rx0823	65	60	85	47	86	47	86	57	85	59	85	60	85	63	85	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0824	65	60	85	46	82	46	82	56	83	58	83	58	83	61	83	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0825	65	60	85	42	76	42	76	51	78	53	78	54	78	57	78	-	-	-	-	-	-	-	-	-	-

Name	Noise trigger levels, dBA			Year 2020 - Predicted noise levels, dBA				Year 2025 - Predicted noise levels, dBA				Year 2040 - Predicted noise levels, dBA				Assessment Year 2025				Assessment Year 2040				Mitigation	
	Day	Night	Max	Day	Day	Night	Night	Day	Day	Night	Night	Day	Day	Night	Night	Day	Night	Max	Max (increase)	Day	Night	Max	Max (increase)	Year 2025	Year 2040
	$L_{Aeq,15h}$	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}										
NNS_Rx0826	65	60	85	44	79	44	79	53	80	55	80	56	80	59	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx0827	65	60	85	49	88	49	88	59	87	61	87	62	87	65	87	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0829	65	60	85	43	80	43	80	53	79	54	79	55	79	58	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx0831	65	60	85	44	79	44	79	53	80	55	80	56	80	58	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx0832	65	60	85	50	87	50	87	60	87	62	87	62	87	65	87	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0833	65	60	85	46	82	46	82	55	82	57	82	58	82	60	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx0834	65	60	85	48	84	48	84	57	84	59	84	59	84	62	84	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0835	65	60	85	51	88	51	88	61	88	63	88	63	88	66	88	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0836	65	60	85	47	83	47	83	57	84	59	84	59	84	62	84	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0837	65	60	85	51	88	51	88	60	88	62	88	63	88	66	88	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0838	65	60	85	49	88	49	88	59	87	61	87	62	87	65	87	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0839	65	60	85	41	77	41	77	51	78	53	78	54	78	56	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx0841	65	60	85	46	84	46	84	55	83	58	83	58	83	61	83	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0842	65	60	85	43	79	43	79	51	79	53	79	54	79	57	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx0843	65	60	85	43	77	43	77	54	81	56	81	57	81	60	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx0848	65	60	85	40	78	40	78	52	80	54	80	54	80	57	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx0849	65	60	85	43	80	43	80	55	82	57	82	57	82	60	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx0850	65	60	85	39	77	39	77	51	79	53	79	53	79	56	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx0851	65	60	85	42	77	42	77	53	81	55	81	56	81	59	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx0853	65	60	85	43	79	43	79	54	81	56	81	56	81	59	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx0854	65	60	85	40	76	40	76	51	78	52	78	53	78	56	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx0856	65	60	85	41	76	41	76	52	79	54	79	55	79	57	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx0859	65	60	85	50	89	50	89	60	89	62	89	62	89	66	89	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0860	65	60	85	51	91	51	91	60	91	62	91	63	91	66	91	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0861	65	60	85	43	80	43	80	53	80	55	80	56	80	59	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx0862	65	60	85	49	86	49	86	59	87	61	87	62	87	65	87	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0863	65	60	85	49	86	49	86	59	87	61	87	62	87	65	87	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0865	65	60	85	41	73	41	73	51	78	53	78	54	78	57	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx0867	65	60	85	48	87	48	87	58	86	61	86	61	86	64	86	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0868	65	60	85	43	81	43	81	54	81	56	81	57	81	60	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx0872	65	60	85	43	78	43	78	53	81	55	81	56	81	58	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx0875	65	60	85	42	76	42	76	52	80	54	80	55	80	57	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx0876	65	60	85	42	76	42	76	52	80	54	80	55	80	58	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx0885	65	60	85	46	81	46	81	55	83	57	83	58	83	60	83	-	-	-	-	-	-	-	-	-	-
NNS_Rx0887	65	60	85	50	86	50	86	59	86	60	86	61	86	64	86	-	-	Yes	-	-	Yes	Yes	-	-	Yes
NNS_Rx0888	65	60	85	45	81	45	81	54	81	55	81	56	81	59	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx0889	65	60	85	47	83	47	83	55	83	57	83	58	83	61	83	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0890	65	60	85	47	84	47	84	56	84	58	84	58	84	61	84	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0891	65	60	85	48	83	48	83	56	84	58	84	59	84	62	84	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0892	65	60	85	51	86	51	86	59	87	61	87	62	87	65	87	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0893	65	60	85	45	82	45	82	54	82	56	82	57	82	60	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx0894	65	60	85	45	81	45	81	54	81	56	81	56	81	59	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx0895	65	60	85	47	83	47	83	56	83	58	83	58	83	61	83	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0896	65	60	85	48	84	48	84	56	84	58	84	59	84	62	84	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx0897	65	60	85	52	88	52	88	60	87	62	87	63	87	65	87	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx0898	65	60	85	48	87	48	87	56	87	58	87	59	87	63	87	-	-	Yes	-	-	Yes	Yes	-	-	Yes
NNS_Rx1174	65	60	85	37	71	37	71	46	73	48	73	49	73	52	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1191	65	60	85	37	71	37	71	45	72	48	72	49	72	52	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1202	65	60	85	36	73	36	73	45	73	47	73	48	73	51	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1206	65	60	85	35	71	35	71	44	71	45	71	47	71	49	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1219	65	60	85	35	72	35	72	43	72	45	72	47	72	49	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1220	65	60	85	36	71	36	71	44	71	47	71	48	71	50	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1221	65	60	85	35	71	35	71	43	71	46	71	47	71	49	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1225	65	60	85	36	73	36	73	45	73	47	73	48	73	51	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1256	65	60	85	37	72	37	72	45	72	48	72	49	72	52	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1257	65	60	85	48	87	48	87	54	87	58	87	58	87	61	87	-	-	Yes	-	-	Yes	Yes	-	-	Yes
NNS_Rx1259	65	60	85	44	84	44	84	50	84	54	84	55	84	57	84	-	-	-	-	-	-	-	-	-	-
NNS_Rx1313	65	60	85	34	68	34	68	44	68	46	68	47	68	49	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1320	65	60	85	34	70	34	70	45	70	46	70	47	70	50	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1322	65	60	85	35	68	35	68	45	69	47	69	48	69	50	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1323	65	60	85	34	68	34	68	45	69	47	69	48	69	50	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1330	65	60	85	36	68	36	68	46	71	49	71	49	71	52	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1334	65	60	85	33	66	33	66	43	67	45	67	46	67	48	67	-	-	-	-	-	-	-	-	-	-
NNS_Rx1335	65	60	85	34	66	34	66	44	68	46	68	47	68	50	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1336	65	60	85	32	66	32	66	42	67	44	67	45	67	48	67	-	-	-	-	-	-	-	-	-	-
NNS_Rx1344	65	60	85	35	68	35	68	46	71	48	71	49	71	52	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1351	65	60	85	33	65	33	65	43	66	44	66	46	66	48	66	-	-	-	-	-	-	-	-	-	-
NNS_Rx1353	65	60	85	35	67	35	67	46	71	48	71	49	71	52	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1355	65	60	85	33	70	33	70	43	70	45	70	46	70	49	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1356	65	60	85	35	69	35	69	46	70	47	70	49	70	51	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1357	65	60	85	35	67	35	67	46	68	47	68	48	68	51	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1358	65	60	85	35	69	35	69	47	71	48	71	49	71	52	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1361	65	60	85	38	72	38	72	48	73	50	73	51	73	54	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1365	65	60	85	39	74	39	74	51	76	53	76	54	76	56	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx1366	65	60	85	35	67	35	67	46	69	47	69	48	69	51	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1368	65	60	85	36	70	36	70	47	71	49	71	49	71	52	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1370	65	60	85	37	72	37	72	47	73	49	73	50	73	53	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1371	65	60	85	33	68	33	68	44	68	46	68	47	68	50	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1372	65	60	85	37	72	37	72	48	73	50	73	51	73	53	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1373	65	60	85	36	71	36	71	46	72	49	72	49	72	52	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1374	65	60	85	37	72	37	72	48	73	50	73	51	73	53	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1376	65	60	85	35	67	35	67	46	71	48	71	49	71	52	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1380	65	60	85	37	72	37	72	48	73	50	73	51	73	53	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1381	65	60	85	36	69	36	69	46	70	48	70	49	70	52	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1387	65	60	85	39	74	39	74	51	77	53	77	54	77	57	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx1388	65	60	85	33	66	33	66	44	68	46	68	47	68	49	68	-	-	-	-	-	-	-	-	-	-

Name	Noise trigger levels, dBA			Year 2020 - Predicted noise levels, dBA				Year 2025 - Predicted noise levels, dBA				Year 2040 - Predicted noise levels, dBA				Assessment Year 2025				Assessment Year 2040				Mitigation	
	Day	Night	Max	Day	Day	Night	Night	Day	Day	Night	Night	Day	Day	Night	Night	Day	Night	Max	Max (increase)	Day	Night	Max	Max (increase)	Year 2025	Year 2040
	$L_{Aeq,15h}$	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}										
NNS_Rx1391	65	60	85	32	67	32	67	42	67	43	67	45	67	47	67	-	-	-	-	-	-	-	-	-	-
NNS_Rx1392	65	60	85	34	68	34	68	45	70	48	70	48	70	51	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1396	65	60	85	35	67	35	67	46	69	47	69	49	69	51	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1398	65	60	85	34	67	34	67	45	70	47	70	48	70	51	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1401	65	60	85	35	69	35	69	46	70	48	70	49	70	51	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1402	65	60	85	34	68	34	68	45	69	47	69	48	69	51	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1403	65	60	85	34	69	34	69	45	70	47	70	48	70	51	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1406	65	60	85	36	69	36	69	46	71	49	71	49	71	52	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1407	65	60	85	35	69	35	69	47	72	49	72	50	72	52	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1409	65	60	85	34	70	34	70	46	70	47	70	48	70	51	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1411	65	60	85	36	70	36	70	48	73	50	73	51	73	53	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1412	65	60	85	38	71	38	71	49	74	51	74	52	74	54	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1414	65	60	85	35	68	35	68	45	70	48	70	48	70	51	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1415	65	60	85	35	67	35	67	45	68	47	68	48	68	50	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1417	65	60	85	34	66	34	66	44	67	46	67	47	67	49	67	-	-	-	-	-	-	-	-	-	-
NNS_Rx1420	65	60	85	38	72	38	72	51	76	53	76	54	76	56	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx1425	65	60	85	34	67	34	67	45	68	46	68	48	68	50	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1428	65	60	85	31	66	31	66	43	66	44	66	45	66	48	66	-	-	-	-	-	-	-	-	-	-
NNS_Rx1429	65	60	85	35	68	35	68	46	70	48	70	49	70	52	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1437	65	60	85	35	70	35	70	46	71	48	71	49	71	52	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1445	65	60	85	39	75	39	75	53	79	55	79	56	79	59	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx1447	65	60	85	35	68	35	68	46	70	48	70	49	70	51	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1450	65	60	85	35	72	35	72	46	71	48	71	49	71	52	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1451	65	60	85	35	67	35	67	45	69	47	69	48	69	51	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1454	65	60	85	32	68	32	68	44	68	46	68	47	68	49	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1456	65	60	85	33	66	33	66	44	67	45	67	46	67	49	67	-	-	-	-	-	-	-	-	-	-
NNS_Rx1457	65	60	85	32	67	32	67	43	67	45	67	46	67	48	67	-	-	-	-	-	-	-	-	-	-
NNS_Rx1459	65	60	85	36	69	36	69	47	71	49	71	50	71	53	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1460	65	60	85	35	69	35	69	46	70	48	70	49	70	52	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1463	65	60	85	34	67	34	67	45	68	47	68	48	68	51	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1464	65	60	85	34	68	34	68	46	70	48	70	48	70	51	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1466	65	60	85	36	69	36	69	47	71	49	71	50	71	53	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1470	65	60	85	32	63	32	63	43	67	45	67	46	67	49	67	-	-	-	-	-	-	-	-	-	-
NNS_Rx1473	65	60	85	33	69	33	69	45	69	47	69	48	69	50	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1478	65	60	85	36	69	36	69	47	72	49	72	50	72	53	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1479	65	60	85	33	67	33	67	44	67	45	67	47	67	49	67	-	-	-	-	-	-	-	-	-	-
NNS_Rx1481	65	60	85	34	67	34	67	45	68	47	68	48	68	51	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1482	65	60	85	36	70	36	70	48	73	50	73	51	73	54	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1483	65	60	85	35	69	35	69	47	71	48	71	49	71	52	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1484	65	60	85	34	70	34	70	45	70	46	70	47	70	49	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1485	65	60	85	33	64	33	64	44	68	46	68	47	68	50	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1487	65	60	85	35	68	35	68	45	69	47	69	48	69	51	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1489	65	60	85	36	68	36	68	47	71	49	71	49	71	52	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1490	65	60	85	33	68	33	68	44	68	45	68	46	68	48	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1493	65	60	85	39	75	39	75	53	78	55	78	55	78	58	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx1494	65	60	85	36	70	36	70	48	72	50	72	50	72	53	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1498	65	60	85	34	68	34	68	45	68	47	68	48	68	50	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1501	65	60	85	34	68	34	68	46	70	48	70	48	70	51	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1502	65	60	85	36	69	36	69	48	72	49	72	50	72	53	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1504	65	60	85	36	70	36	70	48	73	50	73	51	73	54	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1508	65	60	85	38	75	38	75	52	77	54	77	55	77	58	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx1510	65	60	85	33	68	33	68	44	68	46	68	47	68	49	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1518	65	60	85	35	69	35	69	48	72	49	72	50	72	53	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1519	65	60	85	37	72	37	72	49	74	51	74	52	74	55	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1525	65	60	85	34	68	34	68	45	68	47	68	48	68	51	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1527	65	60	85	35	69	35	69	47	71	48	71	49	71	51	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1529	65	60	85	36	70	36	70	48	72	50	72	51	72	53	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1530	65	60	85	34	69	34	69	45	69	46	69	48	69	50	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1534	65	60	85	34	68	34	68	45	68	46	68	47	68	50	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1535	65	60	85	36	70	36	70	48	73	50	73	51	73	53	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1537	65	60	85	35	69	35	69	46	69	47	69	48	69	51	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1539	65	60	85	35	69	35	69	45	69	47	69	48	69	51	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1540	65	60	85	34	69	34	69	45	69	47	69	48	69	50	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1543	65	60	85	35	69	35	69	45	69	47	69	48	69	51	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1545	65	60	85	35	70	35	70	47	71	48	71	49	71	52	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1546	65	60	85	36	70	36	70	46	70	48	70	49	70	52	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1548	65	60	85	37	81	37	81	52	79	54	79	55	79	58	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx1552	65	60	85	40	83	40	83	56	82	58	82	58	82	61	82	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx1553	65	60	85	34	70	34	70	44	70	45	70	46	70	49	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1555	65	60	85	34	68	34	68	45	69	47	69	48	69	50	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1556	65	60	85	36	70	36	70	47	71	49	71	50	71	52	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1557	65	60	85	34	70	34	70	46	70	48	70	48	70	51	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1559	65	60	85	35	70	35	70	45	70	47	70	48	70	50	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1560	65	60	85	32	68	32	68	43	68	44	68	45	68	48	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1570	65	60	85	35	70	35	70	46	70	48	70	48	70	51	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1571	65	60	85	35	71	35	71	46	71	47	71	48	71	51	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1575	65	60	85	37	74	37	74	49	74	51	74	52	74	55	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1576	65	60	85	35	71	35	71	46	71	48	71	49	71	51	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1581	65	60	85	33	70	33	70	44	69	47	69	47	69	51	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1582	65	60	85	37	73	37	73	48	73	50	73	51	73	54	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1584	65	60	85	36	70	36	70	47	70	48	70	49	70	52	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1589	65	60	85	34	69	34	69	45	69	47	69	48	69	50	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1590	65	60	85	37	72	37	72	49	74	50	74	51	74	54	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1596	65	60	85	35	72	35	72	48	74	50	74	51	74	54	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1601	65	60	85	34	69	34	69	45	69	47	69	48	69	51	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1606	65	60	85	34	67	34	67	46	70	48	70	49	70	51	70	-	-	-	-	-	-	-	-	-	-

Name	Noise trigger levels, dBA			Year 2020 - Predicted noise levels, dBA				Year 2025 - Predicted noise levels, dBA				Year 2040 - Predicted noise levels, dBA				Assessment Year 2025				Assessment Year 2040				Mitigation	
	Day	Night	Max	Day	Day	Night	Night	Day	Day	Night	Night	Day	Day	Night	Night	Day	Night	Max	Max (increase)	Day	Night	Max	Max (increase)	Year 2025	Year 2040
	$L_{Aeq,15h}$	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}										
NNS_Rx1613	65	60	85	37	73	37	73	49	75	52	75	52	75	55	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1616	65	60	85	37	75	37	75	49	75	51	75	51	75	54	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1617	65	60	85	34	71	34	71	45	71	46	71	47	71	50	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1618	65	60	85	39	76	39	76	53	79	56	79	56	79	59	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx1620	65	60	85	38	75	38	75	49	75	50	75	51	75	54	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1627	65	60	85	35	70	35	70	46	70	47	70	48	70	51	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1629	65	60	85	35	70	35	70	45	70	47	70	48	70	51	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1631	65	60	85	36	73	36	73	49	73	50	73	51	73	54	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1635	65	60	85	39	75	39	75	53	79	55	79	56	79	59	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx1637	65	60	85	36	71	36	71	47	71	48	71	49	71	52	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1640	65	60	85	34	70	34	70	45	70	46	70	47	70	50	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1641	65	60	85	35	72	35	72	45	72	47	72	48	72	51	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1645	65	60	85	37	73	37	73	49	74	51	74	52	74	54	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1648	65	60	85	39	79	39	79	54	80	57	80	57	80	60	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx1651	65	60	85	37	73	37	73	48	73	50	73	51	73	54	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1653	65	60	85	35	72	35	72	46	71	48	71	49	71	51	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1655	65	60	85	34	70	34	70	45	70	46	70	47	70	50	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1658	65	60	85	37	73	37	73	49	74	51	74	52	74	54	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1659	65	60	85	35	70	35	70	45	70	47	70	48	70	50	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1662	65	60	85	33	69	33	69	43	69	45	69	46	69	49	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1664	65	60	85	39	76	39	76	53	79	55	79	55	79	58	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx1669	65	60	85	39	76	39	76	50	76	52	76	53	76	55	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx1670	65	60	85	37	74	37	74	48	74	49	74	50	74	53	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1674	65	60	85	36	73	36	73	46	73	47	73	48	73	50	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1677	65	60	85	34	69	34	69	45	69	47	69	48	69	50	69	-	-	-	-	-	-	-	-	-	-
NNS_Rx1679	65	60	85	39	78	39	78	54	80	56	80	57	80	60	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx1680	65	60	85	34	70	34	70	45	70	47	70	48	70	50	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1681	65	60	85	35	72	35	72	45	71	47	71	48	71	50	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1682	65	60	85	36	72	36	72	47	72	49	72	50	72	53	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1684	65	60	85	38	74	38	74	50	74	51	74	52	74	55	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1687	65	60	85	37	74	37	74	48	74	50	74	50	74	53	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1688	65	60	85	34	71	34	71	45	71	47	71	48	71	50	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1694	65	60	85	35	71	35	71	45	70	47	70	48	70	50	70	-	-	-	-	-	-	-	-	-	-
NNS_Rx1695	65	60	85	35	71	35	71	45	71	47	71	48	71	50	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1696	65	60	85	36	72	36	72	47	72	49	72	50	72	53	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1698	65	60	85	38	74	38	74	50	74	51	74	52	74	55	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1702	65	60	85	33	71	33	71	45	71	47	71	48	71	50	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1705	65	60	85	39	78	39	78	54	80	56	80	57	80	60	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx1708	65	60	85	38	77	38	77	48	77	50	77	51	77	54	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx1709	65	60	85	38	75	38	75	50	75	52	75	52	75	55	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1711	65	60	85	36	71	36	71	48	72	50	72	50	72	53	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1712	65	60	85	35	71	35	71	45	71	47	71	48	71	50	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1715	65	60	85	39	78	39	78	55	80	57	80	57	80	60	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx1720	65	60	85	35	73	35	73	45	73	47	73	48	73	50	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1721	65	60	85	39	79	39	79	54	80	56	80	57	80	60	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx1722	65	60	85	37	75	37	75	48	75	50	75	51	75	53	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1725	65	60	85	38	76	38	76	50	76	52	76	52	76	55	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx1728	65	60	85	37	72	37	72	48	72	50	72	51	72	53	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1733	65	60	85	40	79	40	79	54	80	57	80	57	80	60	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx1736	65	60	85	35	72	35	72	47	72	49	72	49	72	52	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1741	65	60	85	41	80	41	80	54	80	56	80	57	80	60	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx1742	65	60	85	35	72	35	72	45	72	47	72	48	72	51	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1743	65	60	85	38	76	38	76	50	75	52	75	53	75	55	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1744	65	60	85	35	72	35	72	45	72	47	72	48	72	50	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1748	65	60	85	36	73	36	73	46	73	48	73	48	73	51	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1749	65	60	85	34	71	34	71	45	71	46	71	47	71	50	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1750	65	60	85	34	71	34	71	45	71	47	71	48	71	50	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1752	65	60	85	35	71	35	71	45	71	47	71	48	71	50	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1753	65	60	85	38	76	38	76	49	75	51	75	52	75	54	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1758	65	60	85	35	72	35	72	47	72	48	72	49	72	52	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1760	65	60	85	35	72	35	72	45	72	47	72	48	72	50	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1761	65	60	85	31	72	31	72	43	72	45	72	46	72	49	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1762	65	60	85	32	64	32	64	44	68	46	68	47	68	49	68	-	-	-	-	-	-	-	-	-	-
NNS_Rx1764	65	60	85	37	74	37	74	47	76	49	76	50	76	52	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx1766	65	60	85	40	78	40	78	51	78	53	78	54	78	56	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx1767	65	60	85	38	76	38	76	49	76	51	76	52	76	54	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx1770	65	60	85	39	78	39	78	50	77	52	77	52	77	55	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx1772	65	60	85	39	78	39	78	50	78	52	78	52	78	55	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx1775	65	60	85	35	73	35	73	45	73	46	73	47	73	50	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1776	65	60	85	38	76	38	76	47	76	49	76	49	76	51	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx1777	65	60	85	35	73	35	73	45	73	46	73	47	73	51	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1790	65	60	85	42	81	42	81	51	81	52	81	53	81	56	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx1791	65	60	85	38	75	38	75	48	75	50	75	51	75	53	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1792	65	60	85	39	77	39	77	50	77	51	77	52	77	55	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx1793	65	60	85	42	82	42	82	55	82	57	82	57	82	60	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx1794	65	60	85	35	72	35	72	45	72	47	72	48	72	50	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1797	65	60	85	40	80	40	80	51	79	52	79	53	79	56	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx1799	65	60	85	37	77	37	77	46	76	48	76	48	76	51	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx1800	65	60	85	36	75	36	75	47	75	49	75	49	75	52	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1801	65	60	85	43	84	43	84	55	83	57	83	57	83	60	83	-	-	-	-	-	-	-	-	-	-
NNS_Rx1802	65	60	85	39	77	39	77	50	77	51	77	52	77	55	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx1809	65	60	85	37	76	37	76	46	76	48	76	48	76	51	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx1810	65	60	85	35	73	35	73	45	73	46	73	47	73	50	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1811	65	60	85	34	71	34	71	44	71	45	71	47	71	49	71	-	-	-	-	-	-	-	-	-	-
NNS_Rx1812	65	60	85	36	73	36	73	46	72	47	72	48	72	51	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1817	65	60	85	39	78	39	78	50	78	51	78	52	78	55	78	-	-	-	-	-	-	-	-	-	-

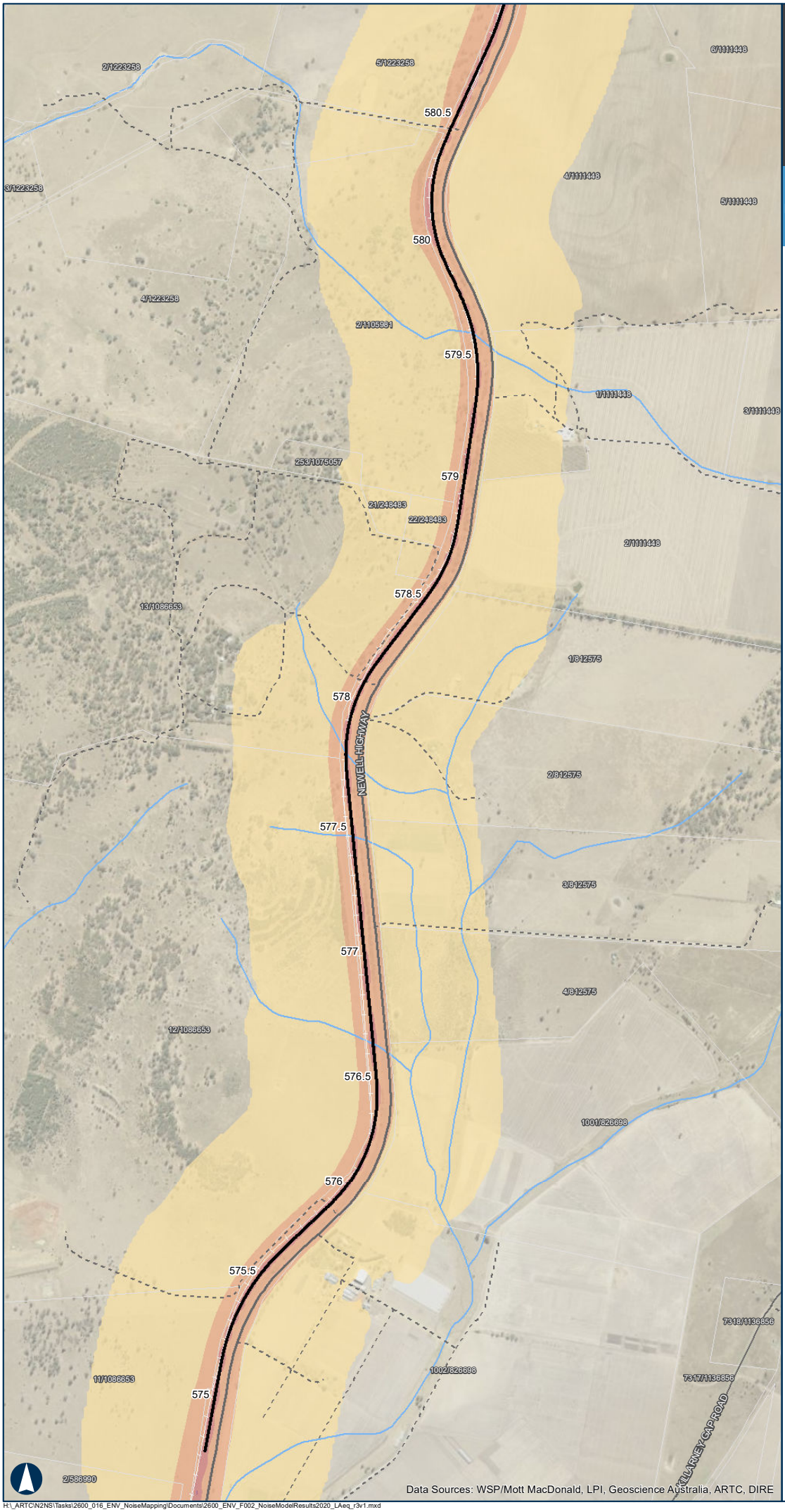
Name	Noise trigger levels, dBA			Year 2020 - Predicted noise levels, dBA				Year 2025 - Predicted noise levels, dBA				Year 2040 - Predicted noise levels, dBA				Assessment Year 2025				Assessment Year 2040				Mitigation	
	Day	Night	Max	Day	Day	Night	Night	Day	Day	Night	Night	Day	Day	Night	Night	Day	Night	Max	Max (increase)	Day	Night	Max	Max (increase)	Year 2025	Year 2040
	$L_{Aeq,15h}$	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}	$L_{Aeq,15h}$	L_{Amax}	$L_{Aeq,9h}$	L_{Amax}										
NNS_Rx1820	65	60	85	44	85	44	85	56	84	57	84	58	84	60	84	-	-	-	-	-	-	-	-	-	-
NNS_Rx1821	65	60	85	37	76	37	76	46	76	48	76	49	76	51	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx1823	65	60	85	38	77	38	77	47	77	48	77	49	77	51	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx1825	65	60	85	38	80	38	80	48	78	49	78	50	78	52	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx1826	65	60	85	36	73	36	73	45	73	47	73	48	73	50	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1828	65	60	85	39	78	39	78	49	78	51	78	52	78	54	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx1829	65	60	85	37	76	37	76	47	76	49	76	49	76	51	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx1832	65	60	85	36	74	36	74	45	74	47	74	48	74	50	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1833	65	60	85	41	81	41	81	51	81	53	81	54	81	56	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx1834	65	60	85	46	89	46	89	57	88	58	88	59	88	61	88	-	-	Yes	-	-	Yes	Yes	-	-	Yes
NNS_Rx1837	65	60	85	36	73	36	73	45	73	47	73	48	73	50	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1838	65	60	85	36	74	36	74	46	74	47	74	48	74	50	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1839	65	60	85	37	76	37	76	47	76	48	76	49	76	51	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx1848	65	60	85	45	87	45	87	56	87	58	87	58	87	61	87	-	-	Yes	-	-	Yes	Yes	-	-	Yes
NNS_Rx1850	65	60	85	39	77	39	77	48	77	50	77	51	77	53	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx1853	65	60	85	41	81	41	81	51	81	53	81	53	81	56	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx1855	65	60	85	40	79	40	79	49	79	51	79	52	79	54	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx1856	65	60	85	36	73	36	73	45	73	47	73	48	73	50	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1857	65	60	85	35	74	35	74	45	74	46	74	47	74	50	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1861	65	60	85	41	82	41	82	51	83	52	83	53	83	56	83	-	-	-	-	-	-	-	-	-	-
NNS_Rx1862	65	60	85	47	89	47	89	57	88	58	88	59	88	61	88	-	-	Yes	-	-	Yes	Yes	-	-	Yes
NNS_Rx1864	65	60	85	40	79	40	79	50	79	52	79	52	79	55	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx1865	65	60	85	36	75	36	75	46	77	47	77	48	77	51	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx1866	65	60	85	37	75	37	75	47	75	48	75	49	75	51	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1867	65	60	85	35	73	35	73	45	73	46	73	47	73	49	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1868	65	60	85	34	72	34	72	44	72	45	72	47	72	49	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1872	65	60	85	42	84	42	84	51	82	52	82	53	82	56	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx1875	65	60	85	35	75	35	75	45	75	47	75	48	75	51	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1876	65	60	85	48	89	48	89	57	90	59	90	59	90	61	90	-	-	Yes	-	-	Yes	Yes	-	-	Yes
NNS_Rx1878	65	60	85	37	76	37	76	46	75	48	75	49	75	51	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1880	65	60	85	36	73	36	73	45	73	46	73	47	73	49	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1882	65	60	85	35	73	35	73	43	74	45	74	46	74	49	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1884	65	60	85	43	81	43	81	52	81	54	81	54	81	56	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx1885	65	60	85	37	77	37	77	45	77	47	77	48	77	50	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx1889	65	60	85	34	73	34	73	44	73	45	73	46	73	48	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1890	65	60	85	37	77	37	77	46	77	48	77	48	77	51	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx1891	65	60	85	36	78	36	78	46	75	47	75	48	75	51	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1897	65	60	85	49	89	49	89	58	89	60	89	60	89	63	89	-	-	Yes	-	-	Yes	Yes	-	-	Yes
NNS_Rx1898	65	60	85	34	73	34	73	44	73	45	73	46	73	49	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1899	65	60	85	37	73	37	73	46	73	48	73	49	73	51	73	-	-	-	-	-	-	-	-	-	-
NNS_Rx1900	65	60	85	36	75	36	75	46	75	48	75	49	75	51	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1903	65	60	85	42	82	42	82	51	83	53	83	53	83	56	83	-	-	-	-	-	-	-	-	-	-
NNS_Rx1908	65	60	85	48	87	48	87	57	88	59	88	59	88	62	88	-	-	Yes	-	-	Yes	Yes	-	-	Yes
NNS_Rx1911	65	60	85	37	74	37	74	47	74	48	74	49	74	51	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1914	65	60	85	46	82	46	82	54	83	56	83	57	83	59	83	-	-	-	-	-	-	-	-	-	-
NNS_Rx1915	65	60	85	44	83	44	83	52	83	54	83	54	83	57	83	-	-	-	-	-	-	-	-	-	-
NNS_Rx1917	65	60	85	37	74	37	74	46	74	47	74	48	74	50	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1918	65	60	85	49	86	49	86	58	87	60	87	60	87	63	87	-	-	Yes	-	-	Yes	Yes	-	-	Yes
NNS_Rx1920	65	60	85	43	80	43	80	52	80	54	80	54	80	56	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx1925	65	60	85	50	85	50	85	59	86	61	86	61	86	63	86	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx1926	65	60	85	45	84	45	84	54	85	56	85	56	85	59	85	-	-	-	-	-	-	-	-	-	-
NNS_Rx1928	65	60	85	46	82	46	82	54	83	56	83	57	83	59	83	-	-	-	-	-	-	-	-	-	-
NNS_Rx1929	65	60	85	39	77	39	77	47	77	49	77	49	77	51	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx1930	65	60	85	35	72	35	72	45	72	46	72	47	72	50	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx1931	65	60	85	37	75	37	75	45	75	47	75	47	75	50	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1932	65	60	85	38	75	38	75	47	75	49	75	49	75	51	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx1935	65	60	85	35	74	35	74	45	74	46	74	47	74	49	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx1937	65	60	85	37	74	37	74	46	74	47	74	48	74	50	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx2266	65	60	85	42	79	42	79	55	83	56	83	57	83	60	83	-	-	-	-	-	-	-	-	-	-
NNS_Rx2267	65	60	85	47	85	47	85	61	90	63	90	64	90	67	90	-	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_Rx2270	65	60	85	42	79	42	79	54	82	56	82	57	82	60	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx2272	65	60	85	42	77	42	77	54	81	56	81	56	81	59	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx2287	65	60	85	45	83	45	83	60	89	62	89	63	89	66	89	-	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_Rx2297	65	60	85	38	75	38	75	52	81	54	81	55	81	58	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx2298	65	60	85	42	79	42	79	55	84	57	84	58	84	61	84	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx2299	65	60	85	47	86	47	86	60	89	62	89	63	89	66	89	-	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_Rx2301	65	60	85	41	79	41	79	55	83	57	83	58	83	61	83	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx2302	65	60	85	46	83	46	83	59	88	62	88	62	88	65	88	-	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_Rx2303	65	60	85	39	74	39	74	53	80	55	80	56	80	59	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx2304	65	60	85	41	78	41	78	55	83	57	83	58	83	60	83	-	-	-	-	-	-	-	-	-	-
NNS_Rx2305	65	60	85	41	78	41	78	55	83	57	83	58	83	60	83	-	-	-	-	-	-	-	-	-	-
NNS_Rx2306	65	60	85	45	82	45	82	59	87	61	87	62	87	65	87	-	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_Rx2307	65	60	85	41	77	41	77	54	82	56	82	56	82	59	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx2309	65	60	85	41	78	41	78	53	81	55	81	56	81	59	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx2310	65	60	85	40	75	40	75	53	80	55	80	56	80	59	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx2311	65	60	85	48	86	48	86	60	89	62	89	63	89	66	89	-	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_Rx2312	65	60	85	40	75	40	75	52	79	54	79	55	79	58	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx2313	65	60	85	40	78	40	78	54	82	56	82	57	82	60	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx2314	65	60	85	42	76	42	76	55	82	57	82	57	82	60	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx2315	65	60	85	42	81	42	81	52	80	54	80	55	80	58	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx2316	65	60	85	41	77	41	77	52	78	54	78	54	78	58	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx2317	65	60	85	40	78	40	78	52	79	54	79	55	79	57	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx2318	65	60	85	45	79	45	79	56	84	59	84	59	84	62	84	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx2319	65	60	85	43	80	43	80	55	83	57	83	58	83	61	83	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx2320	65	60	85	46	82	46	82	60	88	62	88	63	88	65	88	-	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_Rx2334	65	60	85	36	73	36	73	50	78	52	78	53	78	55	78	-	-	-	-	-	-	-	-	-	-

Name	Noise trigger levels, dBA			Year 2020 - Predicted noise levels, dBA				Year 2025 - Predicted noise levels, dBA				Year 2040 - Predicted noise levels, dBA				Assessment Year 2025				Assessment Year 2040				Mitigation	
	Day $L_{Aeq,15h}$	Night $L_{Aeq,9h}$	Max L_{Amax}	Day $L_{Aeq,15h}$	Day L_{Amax}	Night $L_{Aeq,9h}$	Night L_{Amax}	Day $L_{Aeq,15h}$	Day L_{Amax}	Night $L_{Aeq,9h}$	Night L_{Amax}	Day $L_{Aeq,15h}$	Day L_{Amax}	Night $L_{Aeq,9h}$	Night L_{Amax}	Day	Night	Max	Max (increase)	Day	Night	Max	Max (increase)	Year 2025	Year 2040
NNS_Rx2338	65	60	85	40	75	40	75	52	81	54	81	55	81	58	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx2339	65	60	85	40	75	40	75	52	80	54	80	55	80	58	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx2340	65	60	85	38	75	38	75	51	78	53	78	54	78	57	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx2341	65	60	85	38	75	38	75	50	77	52	77	53	77	56	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx2342	65	60	85	48	86	48	86	61	87	63	87	63	87	66	87	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx2343	65	60	85	41	78	41	78	53	80	55	80	56	80	59	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx2344	65	60	85	42	81	42	81	56	83	58	83	58	83	61	83	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx2345	65	60	85	38	78	38	78	52	79	54	79	55	79	58	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx2346	65	60	85	47	88	47	88	60	88	62	88	63	88	65	88	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx2347	65	60	85	42	84	42	84	55	84	57	84	58	84	61	84	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx2348	65	60	85	41	83	41	83	54	83	56	83	57	83	60	83	-	-	-	-	-	-	-	-	-	-
NNS_Rx2349	65	60	85	37	75	37	75	50	77	52	77	53	77	56	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx2350	65	60	85	44	86	44	86	59	88	61	88	62	88	65	88	-	Yes	Yes	-	-	Yes	Yes	-	Yes	Yes
NNS_Rx2351	65	60	85	40	79	40	79	53	80	55	80	55	80	58	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx2352	65	60	85	43	83	43	83	59	88	62	88	62	88	65	88	-	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_Rx2353	65	60	85	36	74	36	74	50	77	52	77	53	77	56	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx2354	65	60	85	32	74	32	74	47	75	49	75	50	75	53	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx2355	65	60	85	39	78	39	78	55	83	57	83	58	83	60	83	-	-	-	-	-	-	-	-	-	-
NNS_Rx2356	65	60	85	43	82	43	82	59	88	61	88	62	88	65	88	-	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_Rx2357	65	60	85	34	74	34	74	50	78	52	78	53	78	56	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx2358	65	60	85	39	79	39	79	58	86	60	86	61	86	64	86	-	-	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_Rx2360	65	60	85	35	72	35	72	49	77	51	77	52	77	56	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx2361	65	60	85	41	81	41	81	59	88	61	88	62	88	65	88	-	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_Rx2363	65	60	85	36	73	36	73	52	80	54	80	55	80	58	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx2365	65	60	85	36	73	36	73	51	79	53	79	54	79	57	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx2366	65	60	85	35	72	35	72	51	79	53	79	54	79	58	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx2367	65	60	85	36	73	36	73	54	82	56	82	57	82	60	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx2368	65	60	85	34	70	34	70	51	79	53	79	54	79	57	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx2369	65	60	85	39	78	39	78	59	88	61	88	62	88	65	88	-	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_Rx2370	65	60	85	34	70	34	70	51	79	53	79	54	79	57	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx2371	65	60	85	34	69	34	69	51	78	53	78	53	78	56	78	-	-	-	-	-	-	-	-	-	-
NNS_Rx2372	65	60	85	31	68	31	68	48	76	50	76	51	76	54	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx2373	65	60	85	34	72	34	72	53	81	55	81	56	81	59	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx2375	65	60	85	34	72	34	72	52	81	54	81	55	81	58	81	-	-	-	-	-	-	-	-	-	-
NNS_Rx2376	65	60	85	35	72	35	72	53	82	55	82	56	82	59	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx2377	65	60	85	36	72	36	72	56	85	58	85	59	85	62	85	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx2450	65	60	85	38	68	38	68	48	76	50	76	51	76	54	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx2452	65	60	85	38	73	38	73	49	75	51	75	52	75	55	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx2453	65	60	85	36	69	36	69	47	72	50	72	50	72	53	72	-	-	-	-	-	-	-	-	-	-
NNS_Rx2455	65	60	85	36	72	36	72	49	74	51	74	51	74	54	74	-	-	-	-	-	-	-	-	-	-
NNS_Rx2457	65	60	85	39	79	39	79	54	80	56	80	57	80	59	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx2460	65	60	85	38	75	38	75	48	75	50	75	51	75	54	75	-	-	-	-	-	-	-	-	-	-
NNS_Rx2467	65	60	85	40	82	40	82	51	82	53	82	53	82	56	82	-	-	-	-	-	-	-	-	-	-
NNS_Rx2544	65	60	85	41	75	41	75	51	79	53	79	54	79	57	79	-	-	-	-	-	-	-	-	-	-
NNS_Rx2545	65	60	85	47	84	47	84	56	85	59	85	59	85	62	85	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx2546	65	60	85	40	79	40	79	55	81	58	81	58	81	61	81	-	-	-	-	-	Yes	-	-	-	Yes
NNS_Rx2547	65	60	85	37	79	37	79	51	77	54	77	54	77	57	77	-	-	-	-	-	-	-	-	-	-
NNS_Rx2548	65	60	85	39	80	39	80	55	80	57	80	57	80	60	80	-	-	-	-	-	-	-	-	-	-
NNS_Rx2549	65	60	85	38	74	38	74	51	76	53	76	54	76	56	76	-	-	-	-	-	-	-	-	-	-
NNS_Rx4313	65	60	85	40	81	40	81	59	88	61	88	62	88	65	88	-	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_Rx4314	65	60	85	40	79	40	79	59	88	61	88	62	88	65	88	-	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_Rx4315	65	60	85	40	81	40	81	59	88	61	88	62	88	65	88	-	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
NNS_WORx0002	58	-	-	45	-	-	-	56	-	-	-	58	-	-	-	-	-	-	-	-	-	-	-	-	-
NNS_WORx0003	58	-	-	37	-	-	-	50	-	-	-	53	-	-	-	-	-	-	-	-	-	-	-	-	-
NNS_WORx0007	58	-	-	46	-	-	-	56	-	-	-	59	-	-	-	-	-	-	-	Yes	-	-	-	-	Yes
NNS_WORx0008	58	-	-	38	-	-	-	48	-	-	-	51	-	-	-	-	-	-	-	-	-	-	-	-	-
																								40	79

Appendix C

Operational Rail Noise Modelling Contours





INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 1 of 31

LEGEND

- Townships
- Highway
- Local Road
- Track

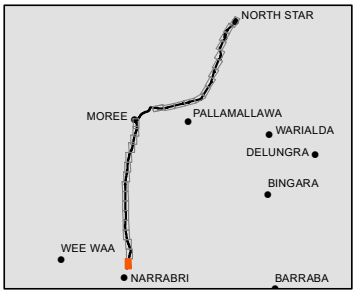
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

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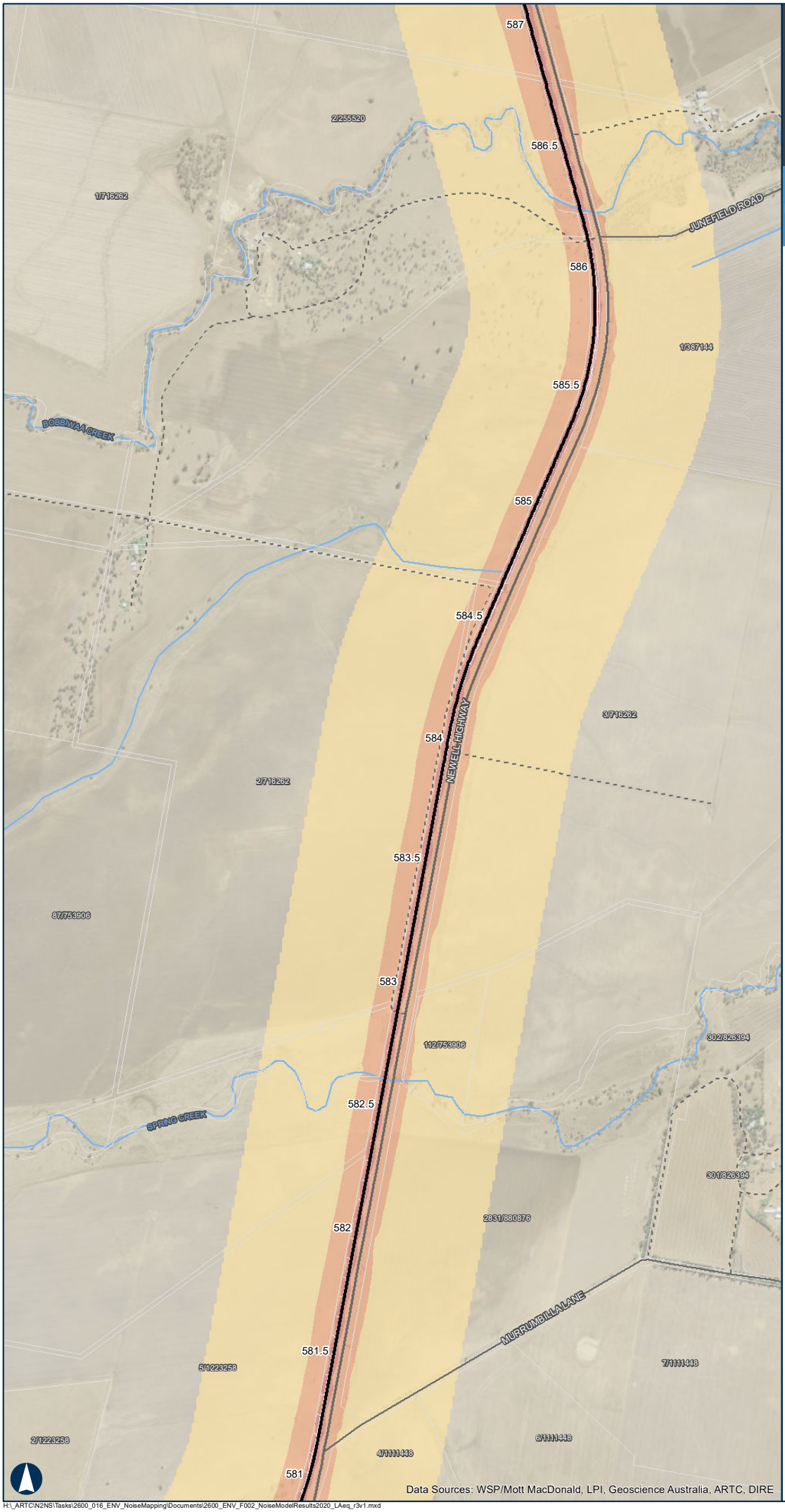
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 2 of 31

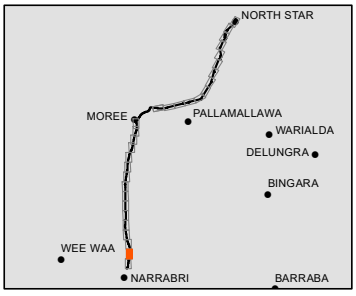
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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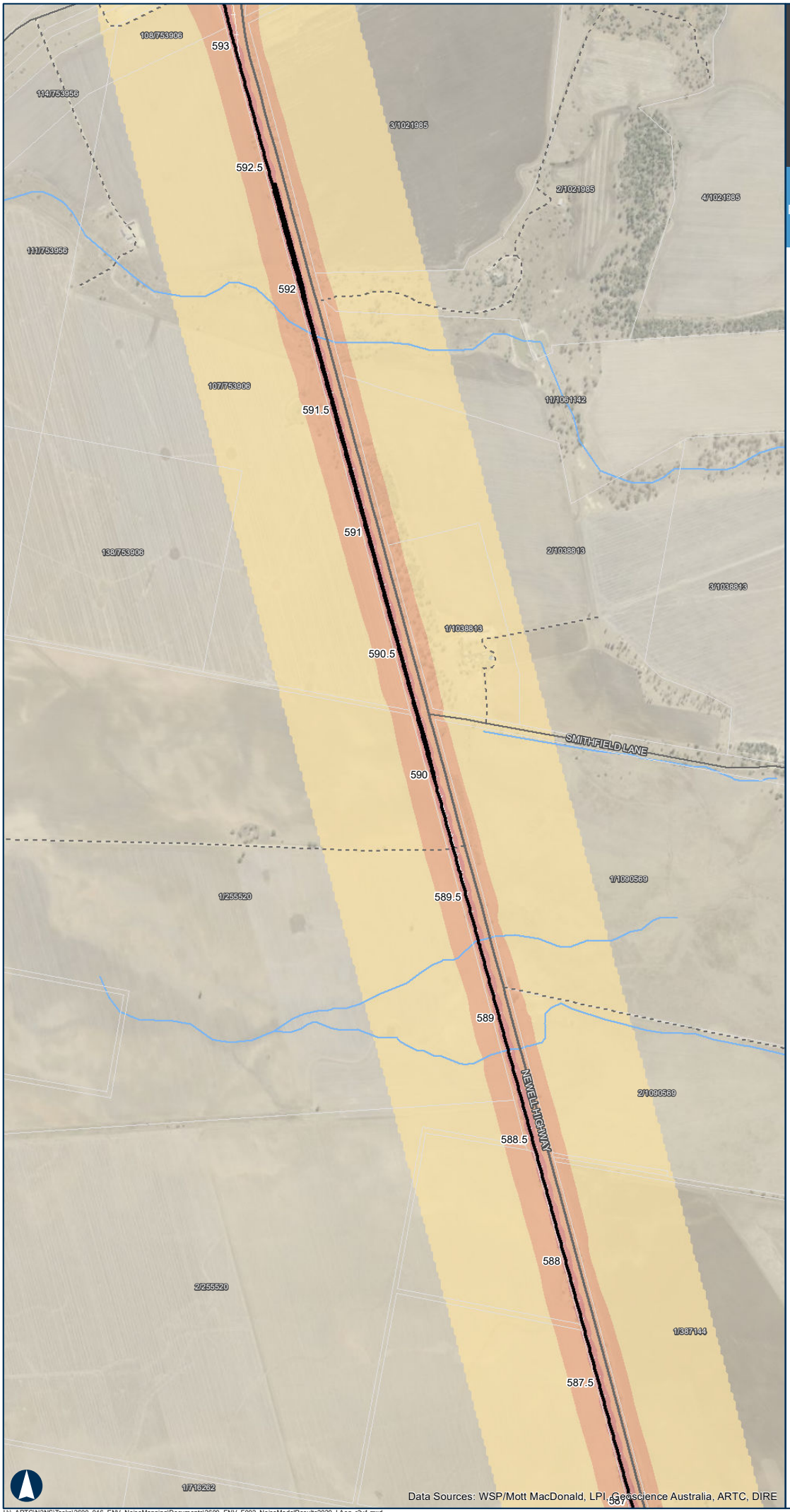
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Date: 13-Aug-21

Author: IRDJV

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 3 of 31

LEGEND

- Townships
- Highway
- Local Road
- Track

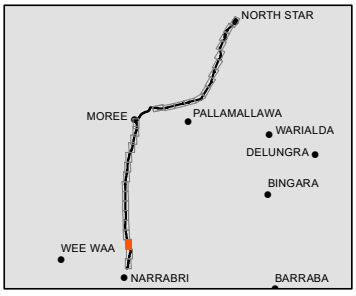
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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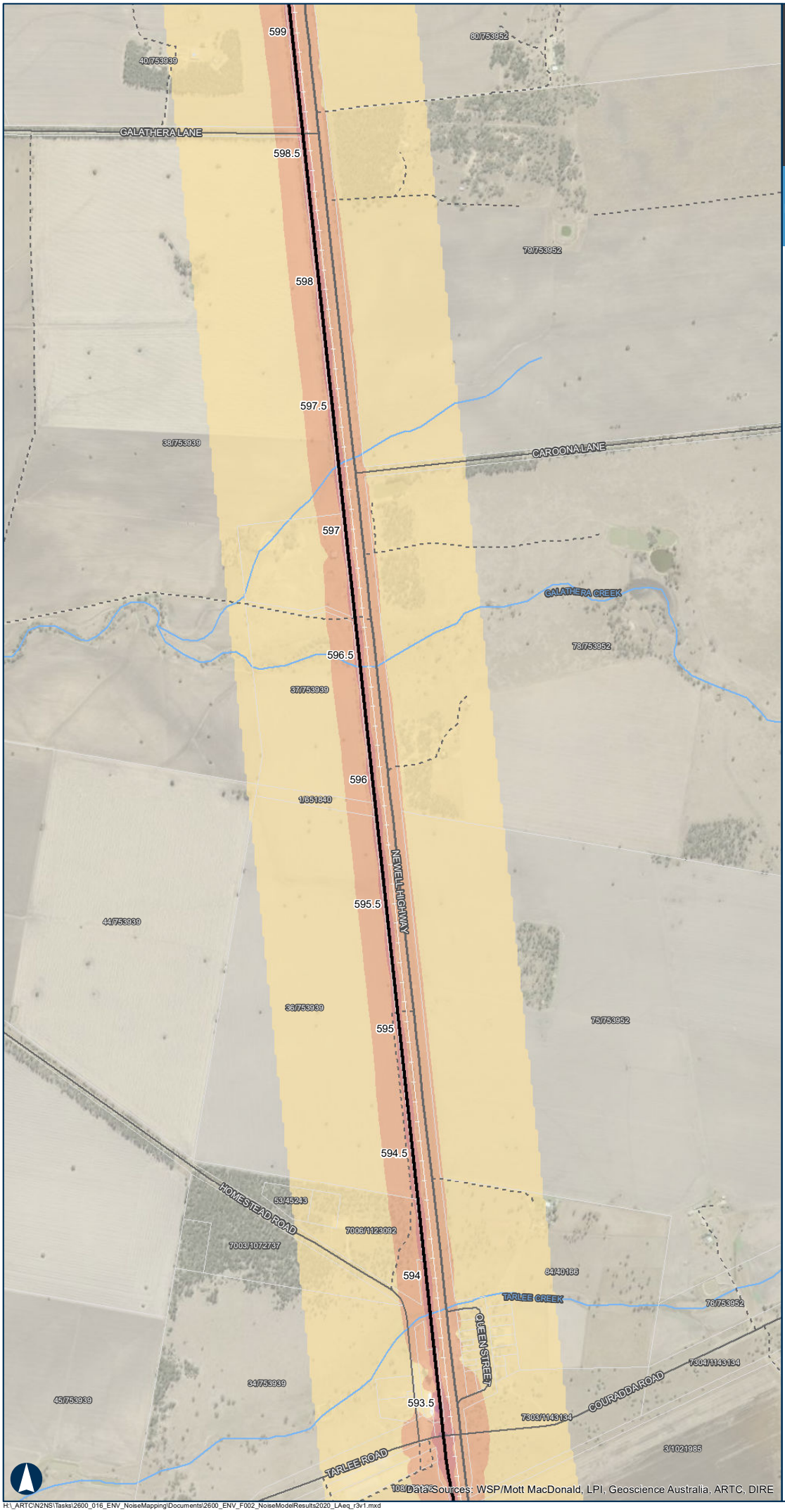
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Date: 13-Aug-21

Author: IRDJV

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 4 of 31

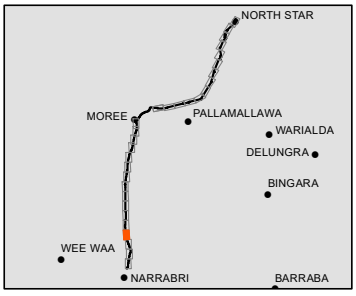
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 5 of 31

LEGEND

- Townships
- Highway
- Local Road
- Track

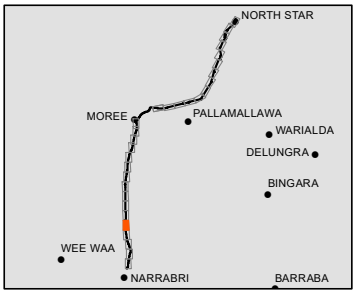
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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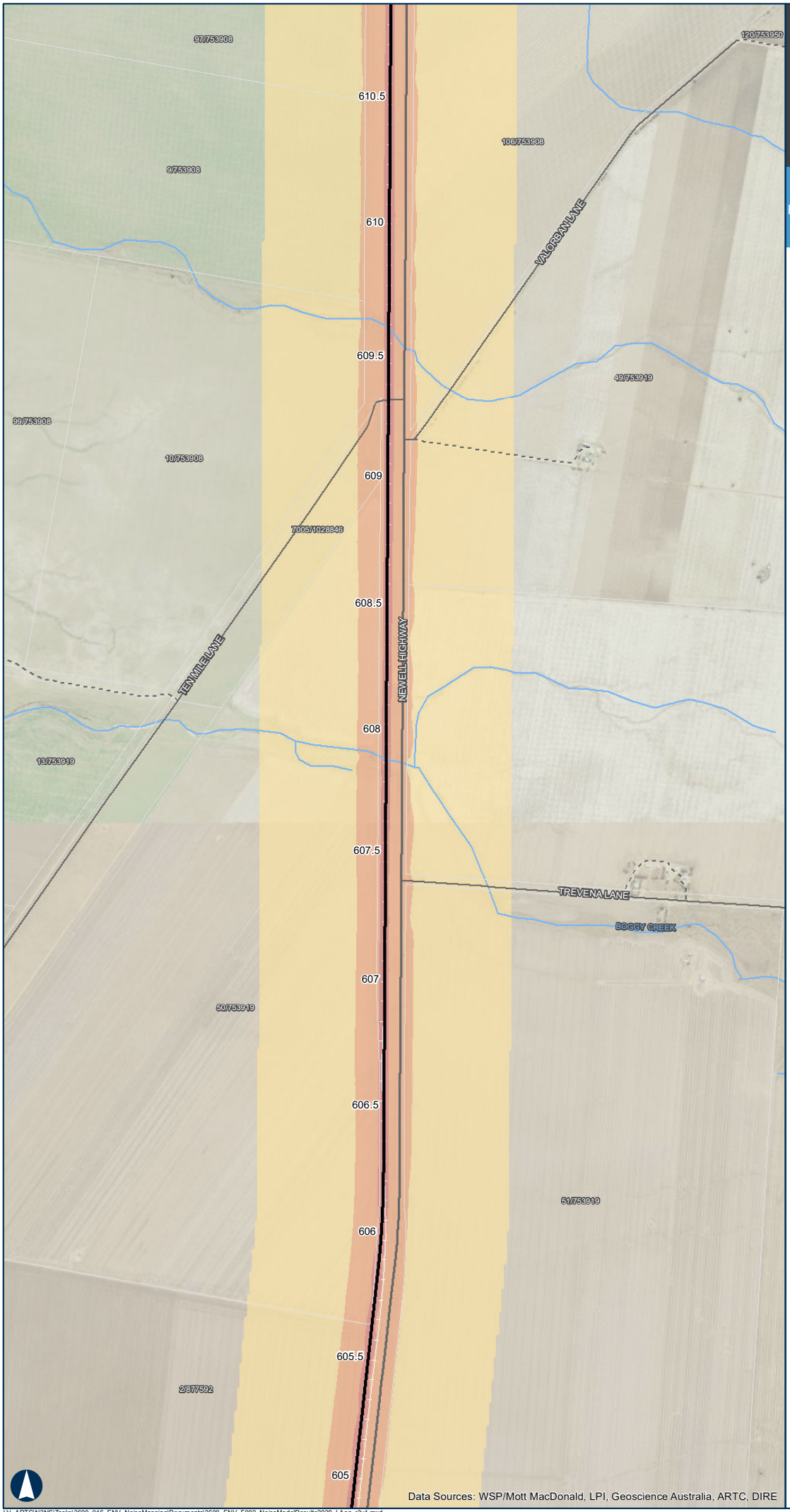
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Author: IRDJV

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 6 of 31

LEGEND

- Townships
- Highway
- Local Road
- Track

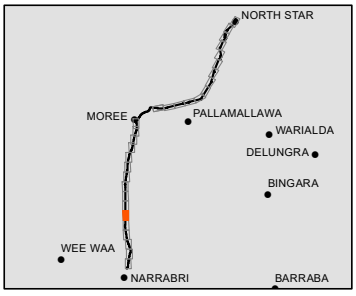
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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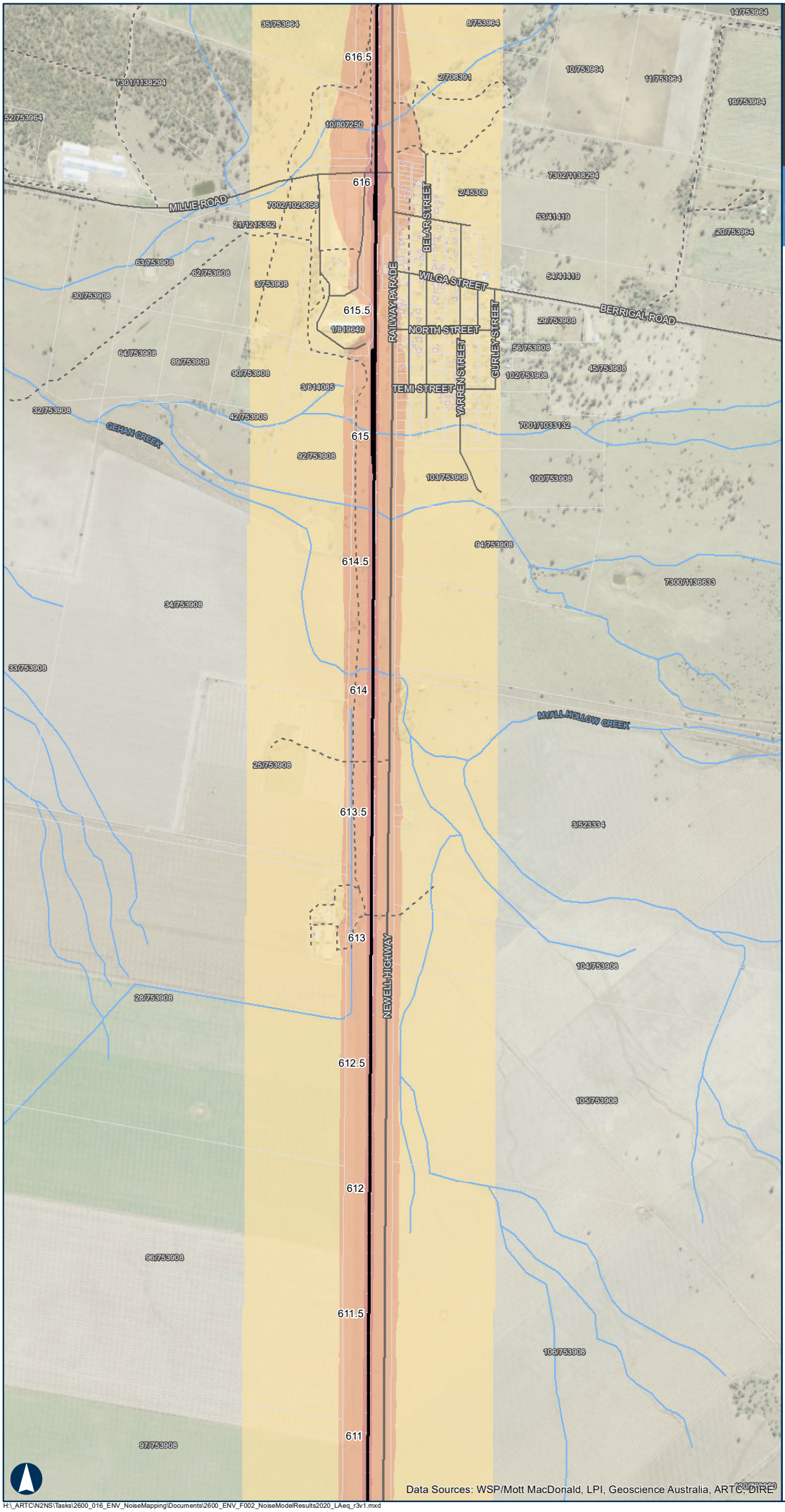
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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 7 of 31

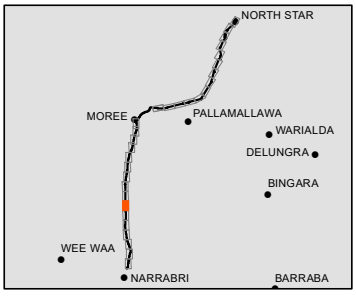
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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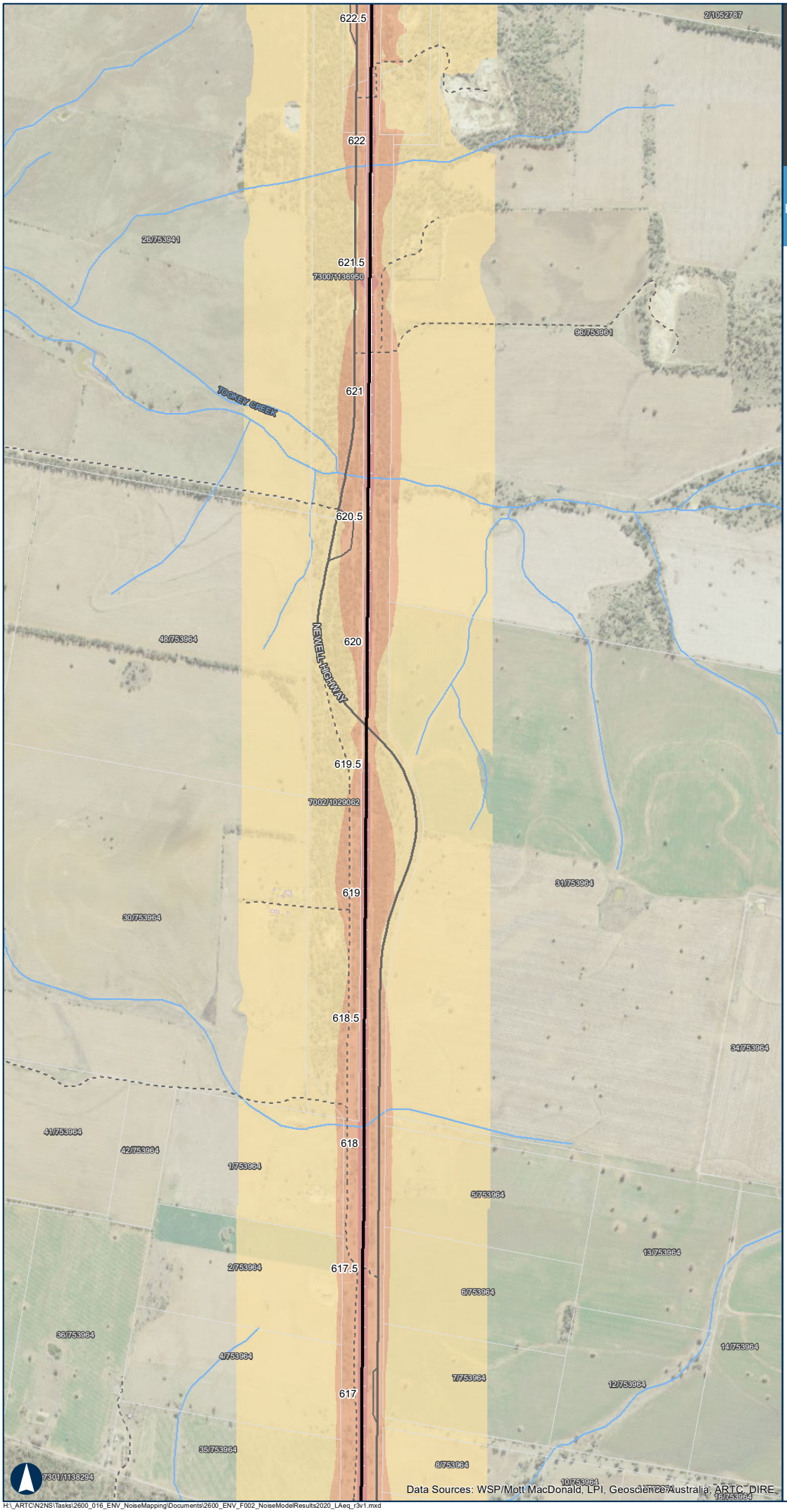
Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 8 of 31

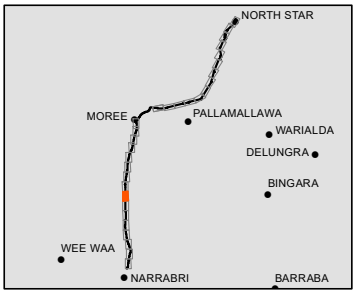
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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INLAND RAIL ARTC

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 9 of 31

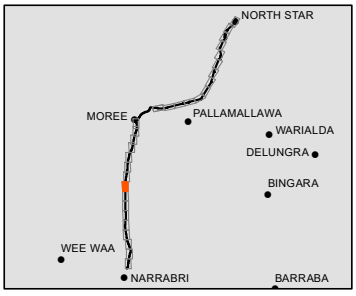
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
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- 65 - 70

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Author: IRDJV



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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 10 of 31

LEGEND

- Townships
- Highway
- Local Road
- Track

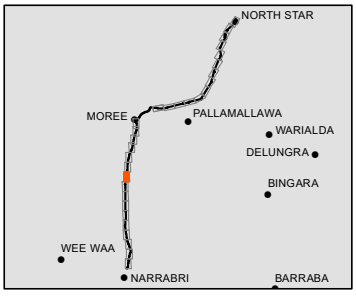
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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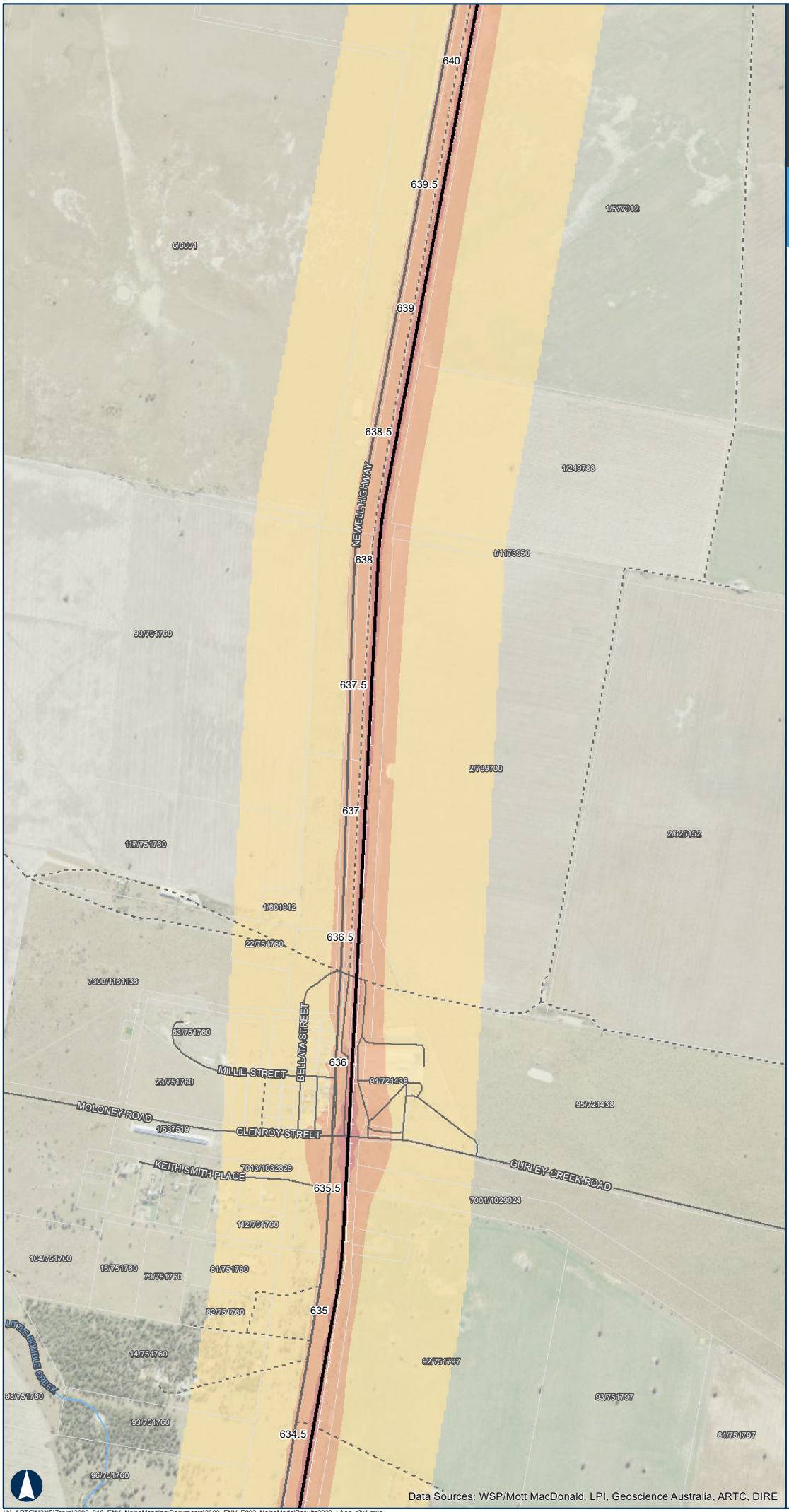
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Date: 13-Aug-21

Author: IRDJV

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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

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LEGEND

- Townships
- Highway
- Local Road
- Track

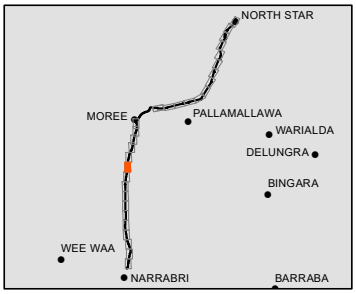
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

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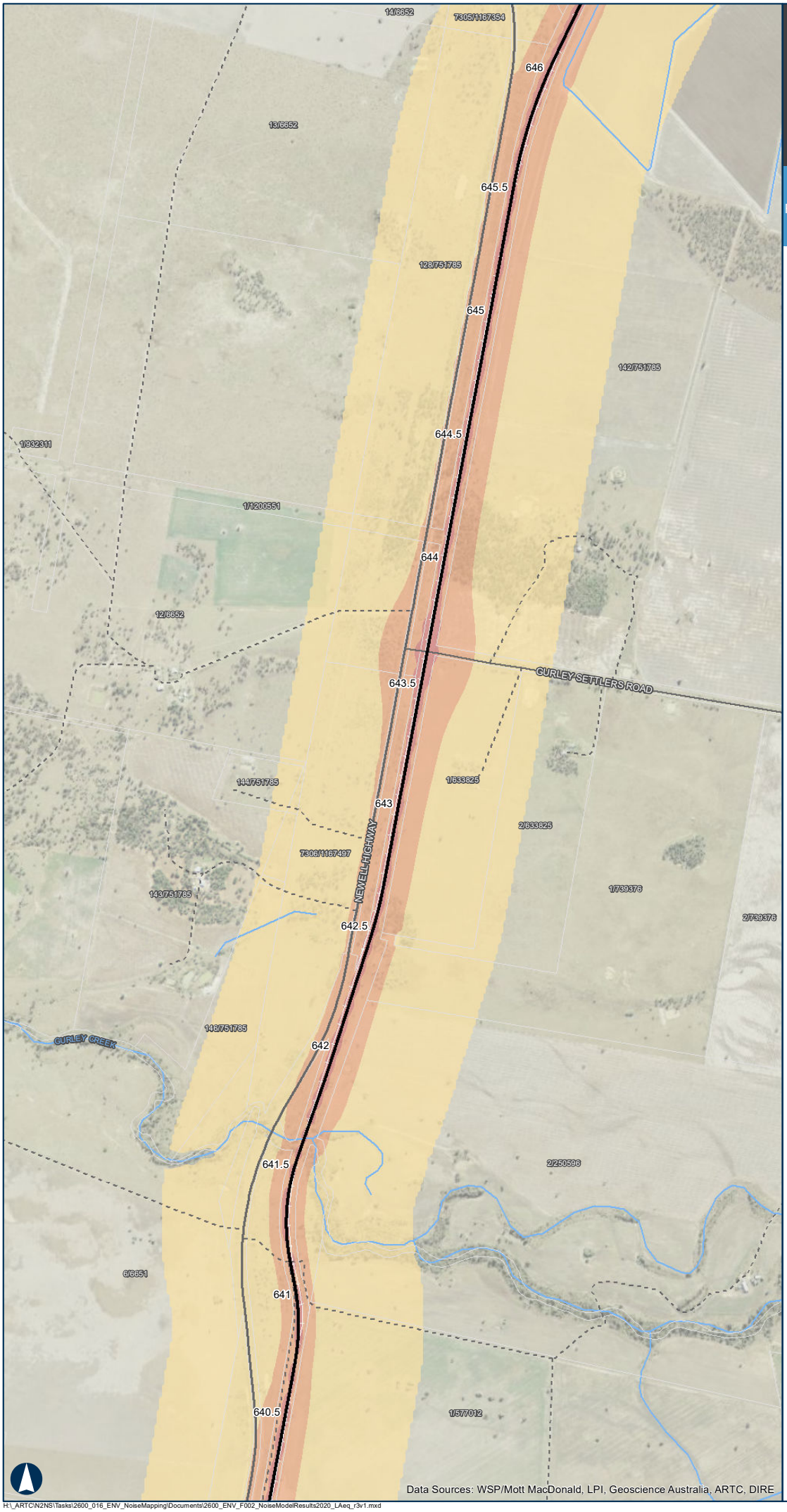
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 12 of 31

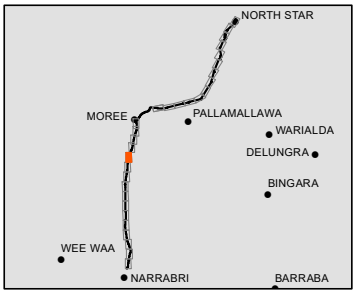
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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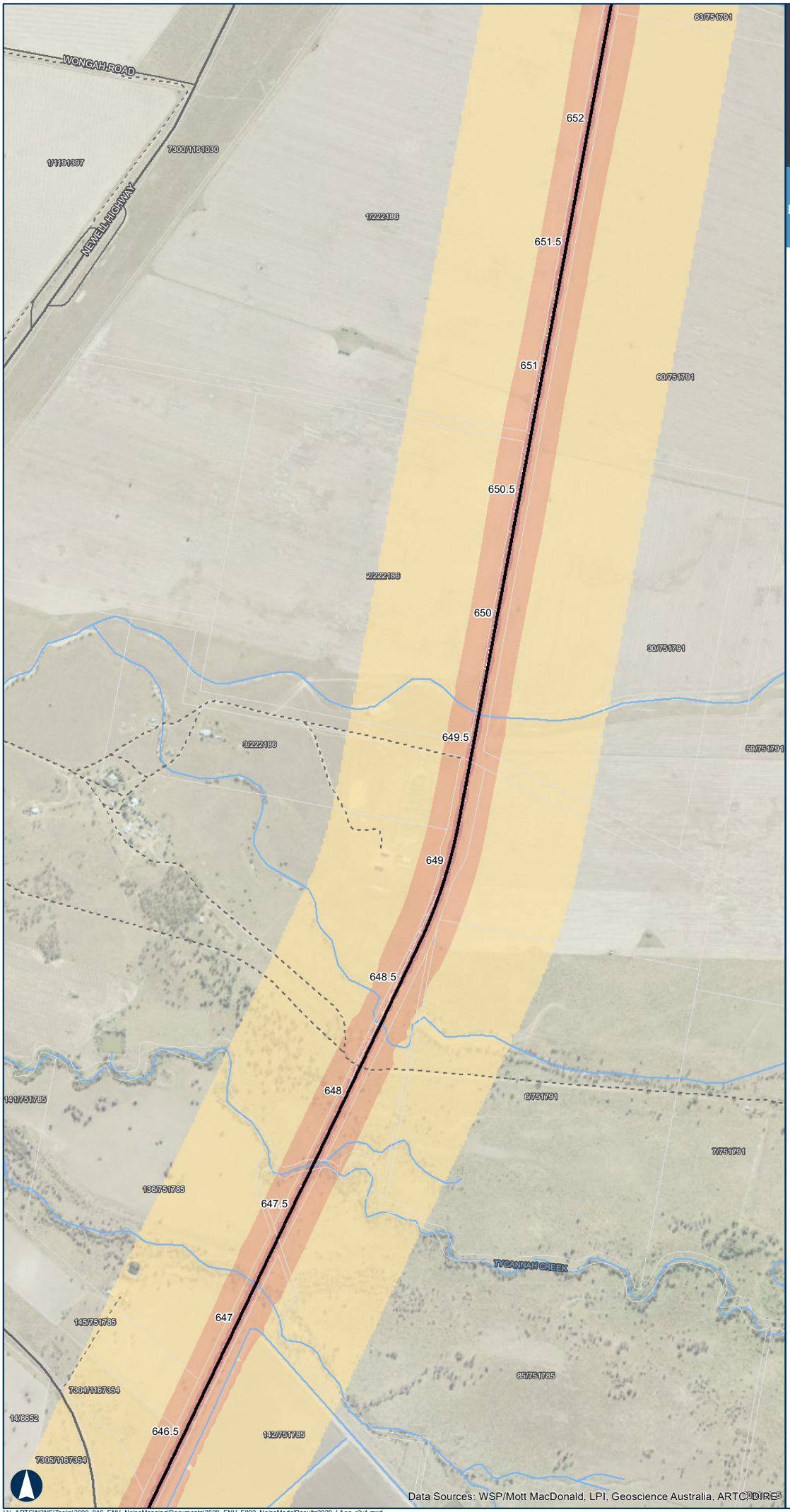
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 13 of 31

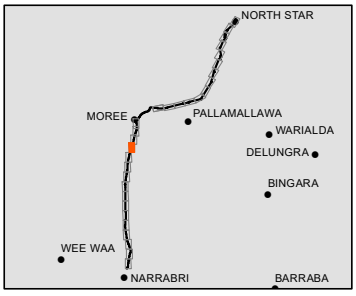
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

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LEGEND

- Townships
- Highway
- Local Road
- Track

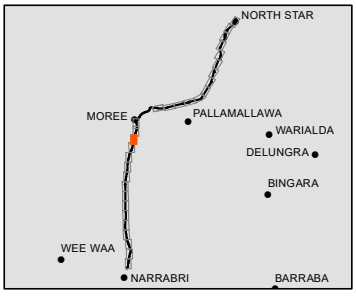
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

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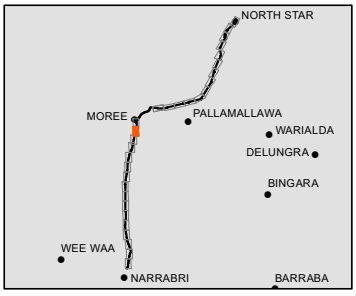
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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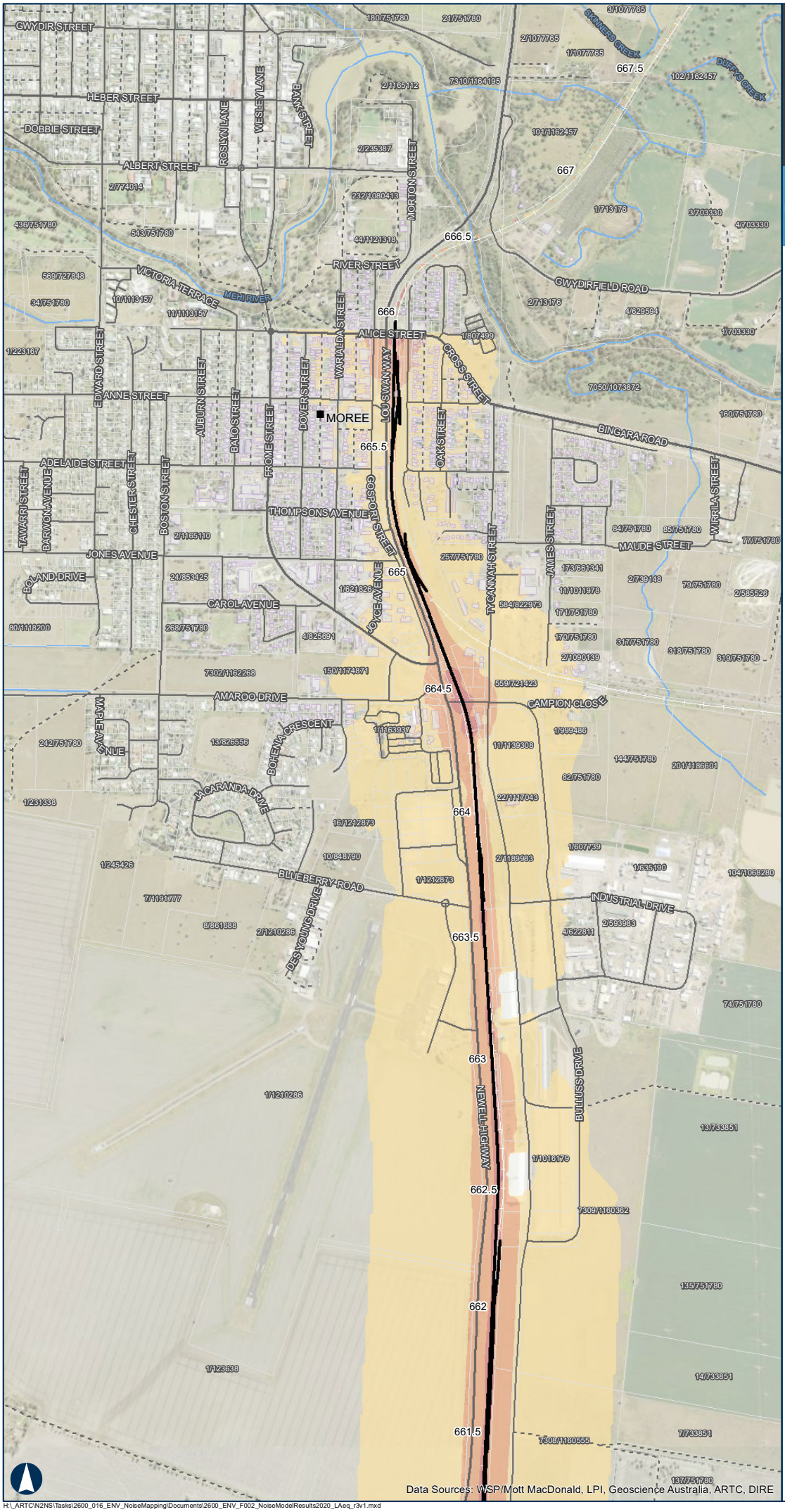
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 16 of 31

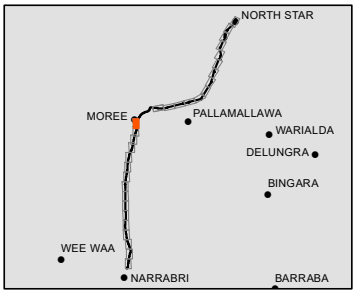
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

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LEGEND

- Townships
- Highway
- Local Road
- Track

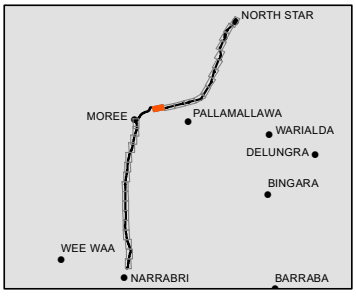
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 18 of 31

LEGEND

- Townships
- Highway
- Local Road
- Track

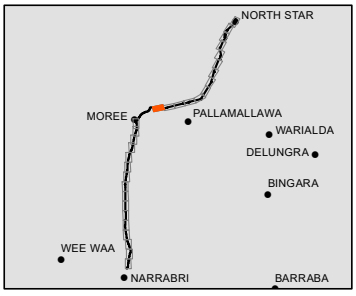
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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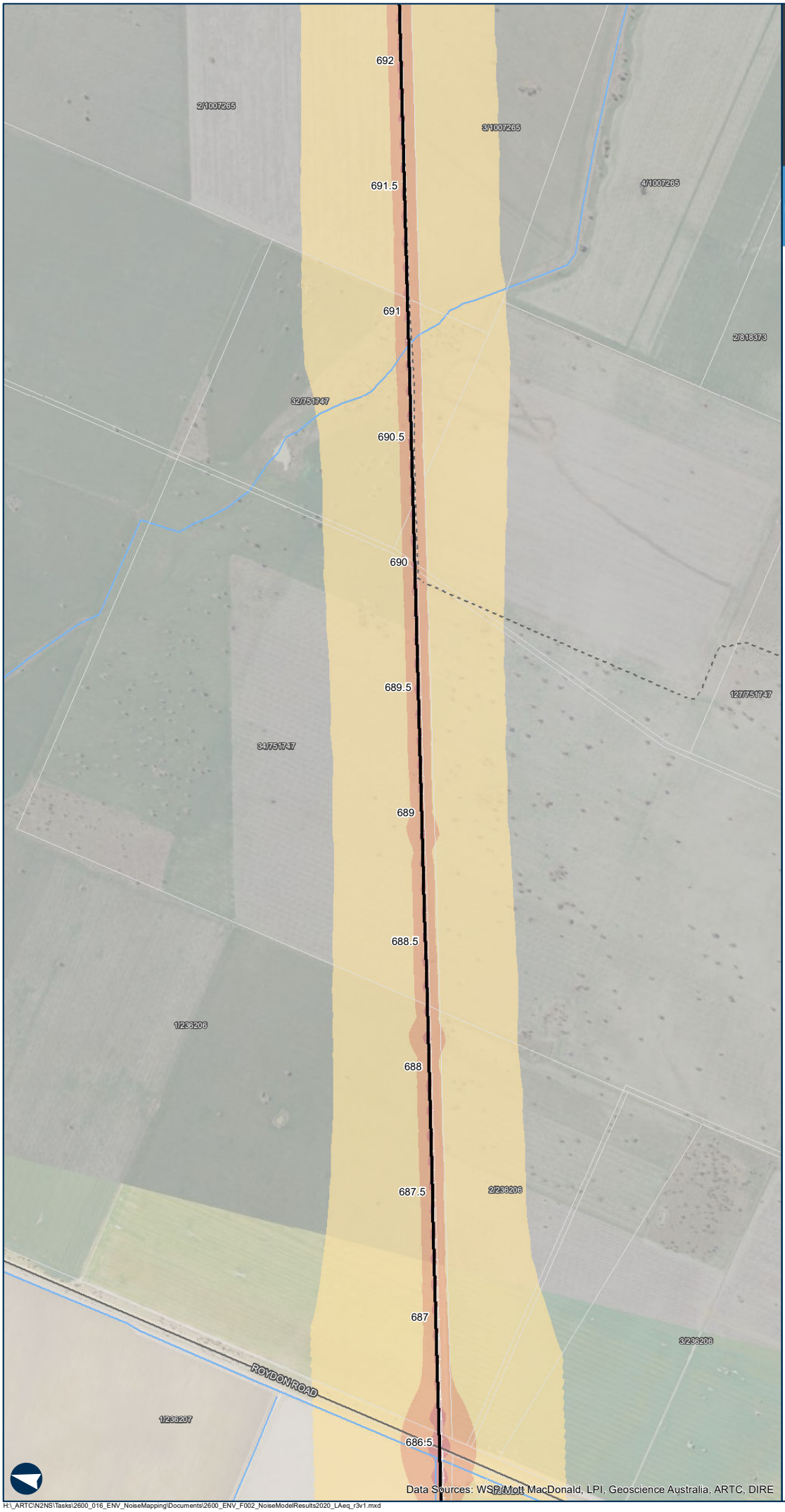
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

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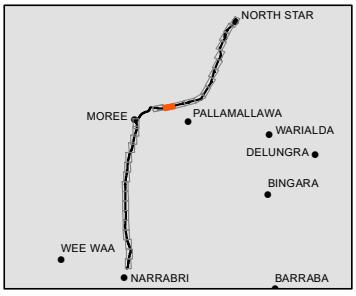
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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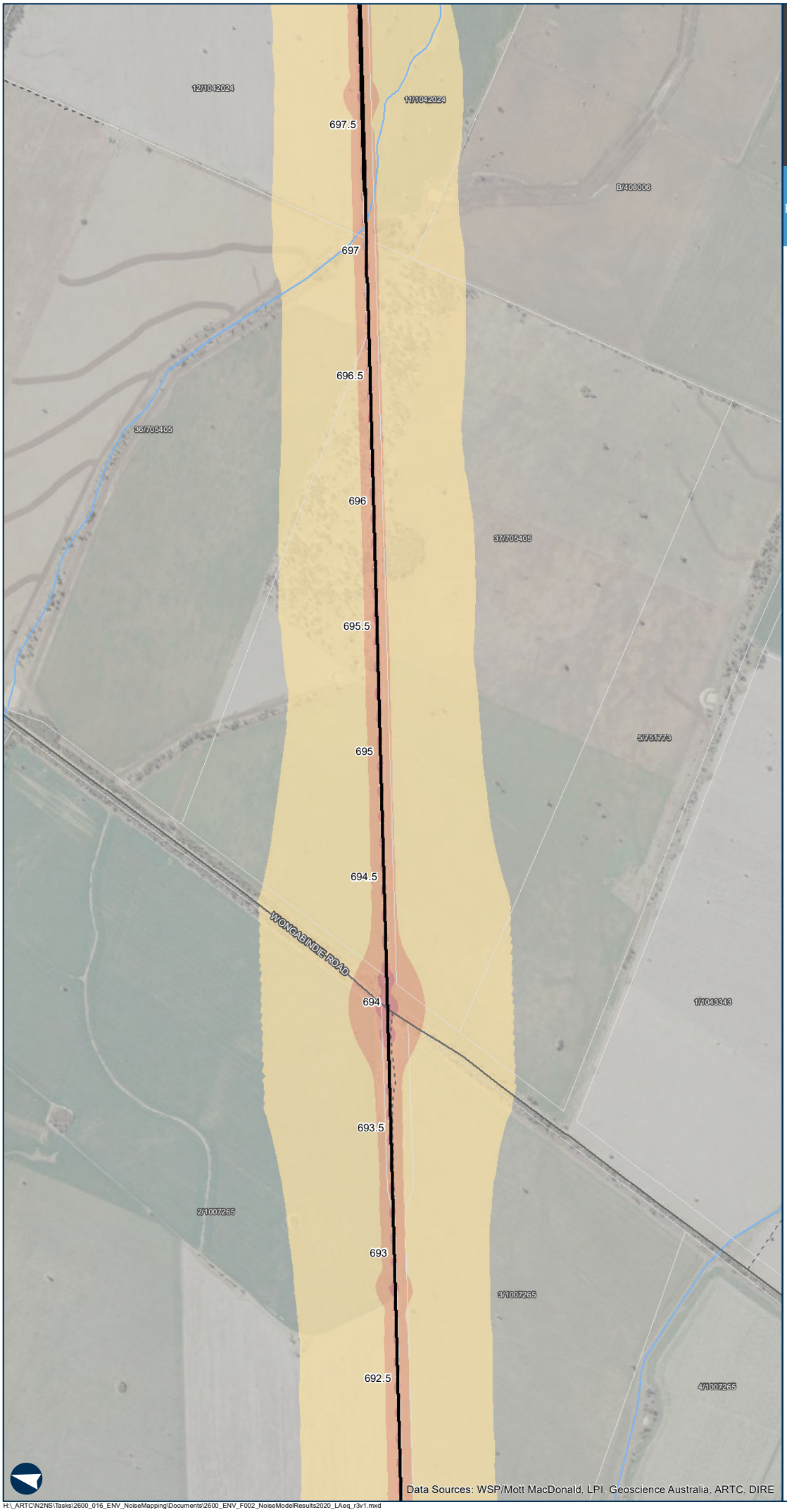
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

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LEGEND

- Townships
- Highway
- Local Road
- Track

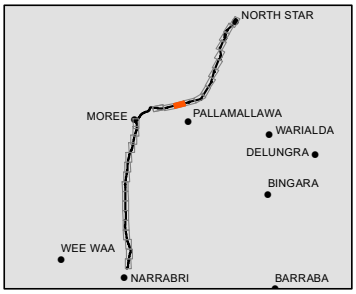
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

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LEGEND

- Townships
- Highway
- Local Road
- Track

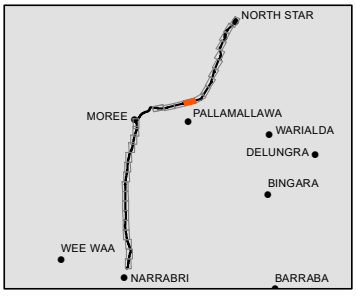
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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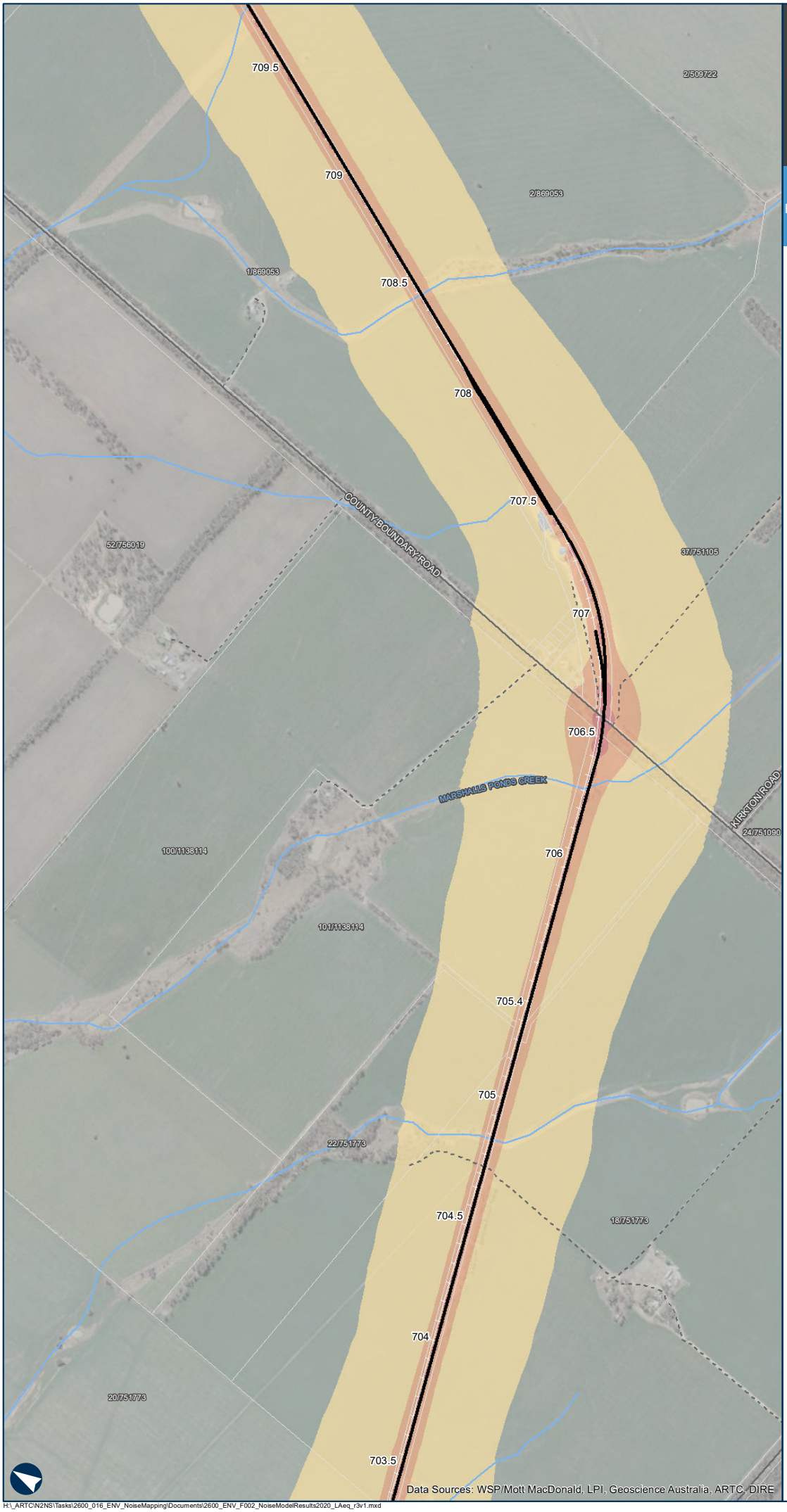
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Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

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LEGEND

- Townships
- Highway
- Local Road
- Track

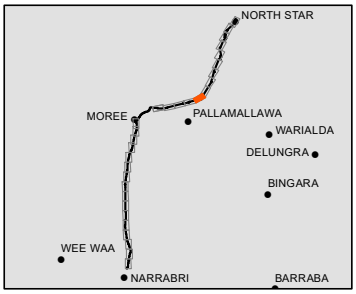
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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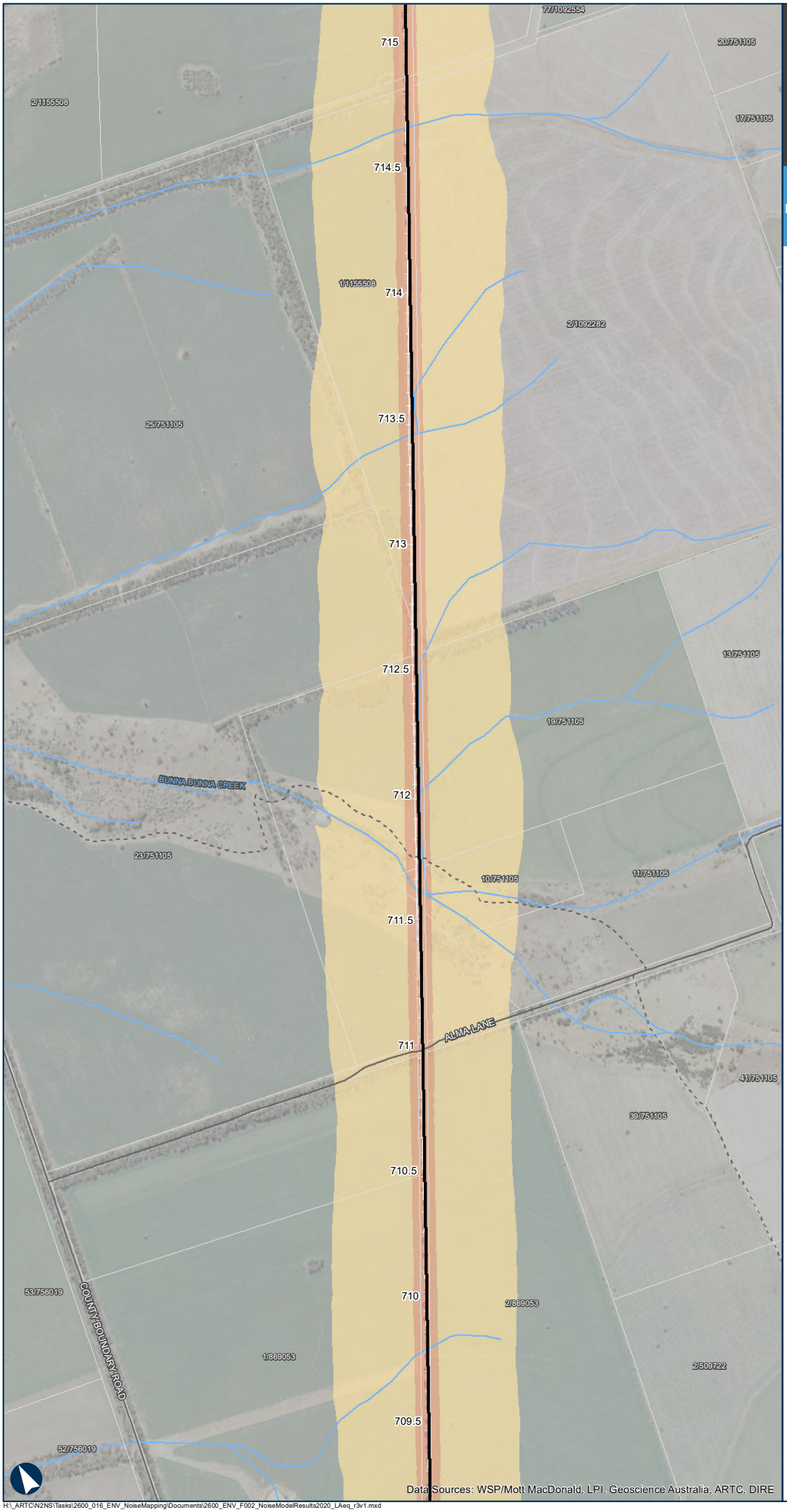
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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

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LEGEND

- Townships
- Highway
- Local Road
- Track

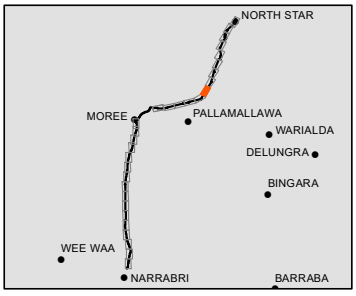
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60

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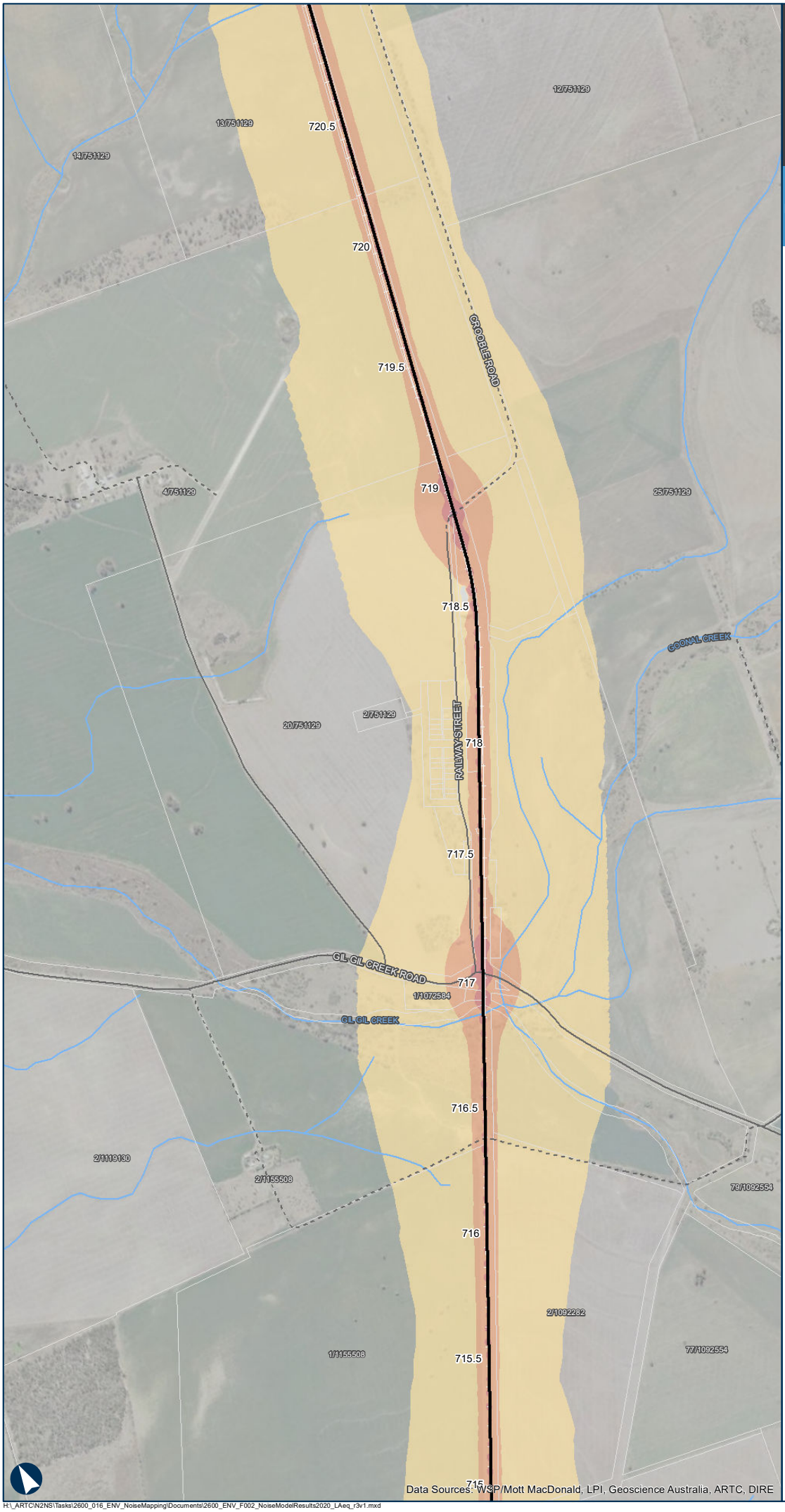
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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 24 of 31

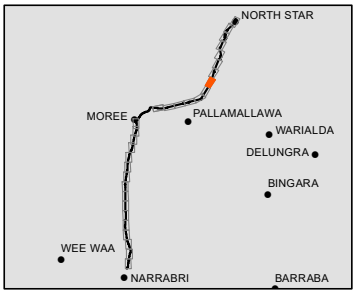
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

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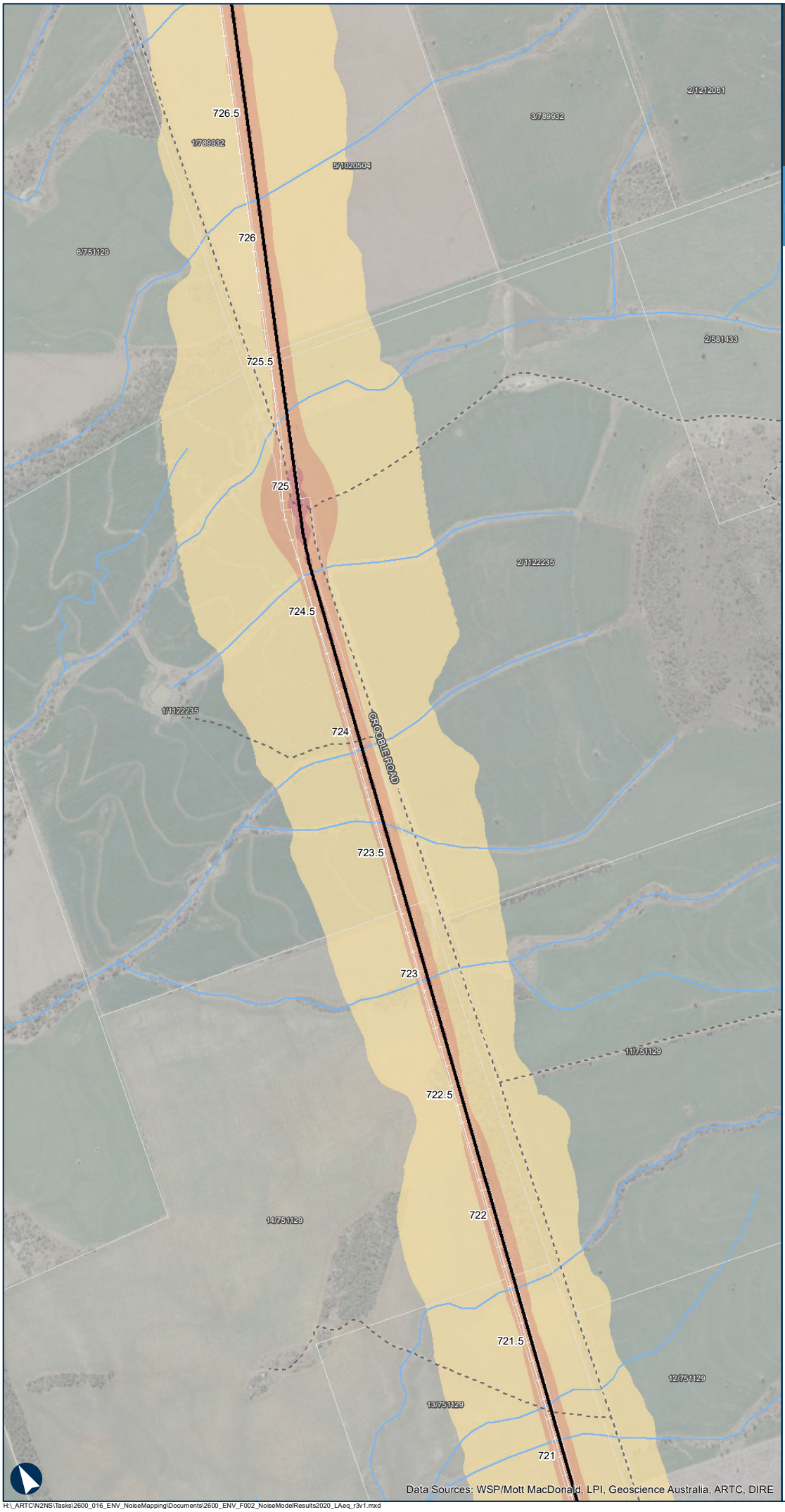
Paper: A3

Scale: 1:15,000

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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 25 of 31

LEGEND

- Townships
- Highway
- Local Road
- Track

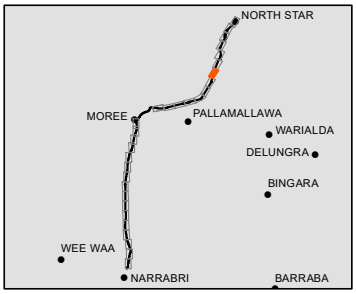
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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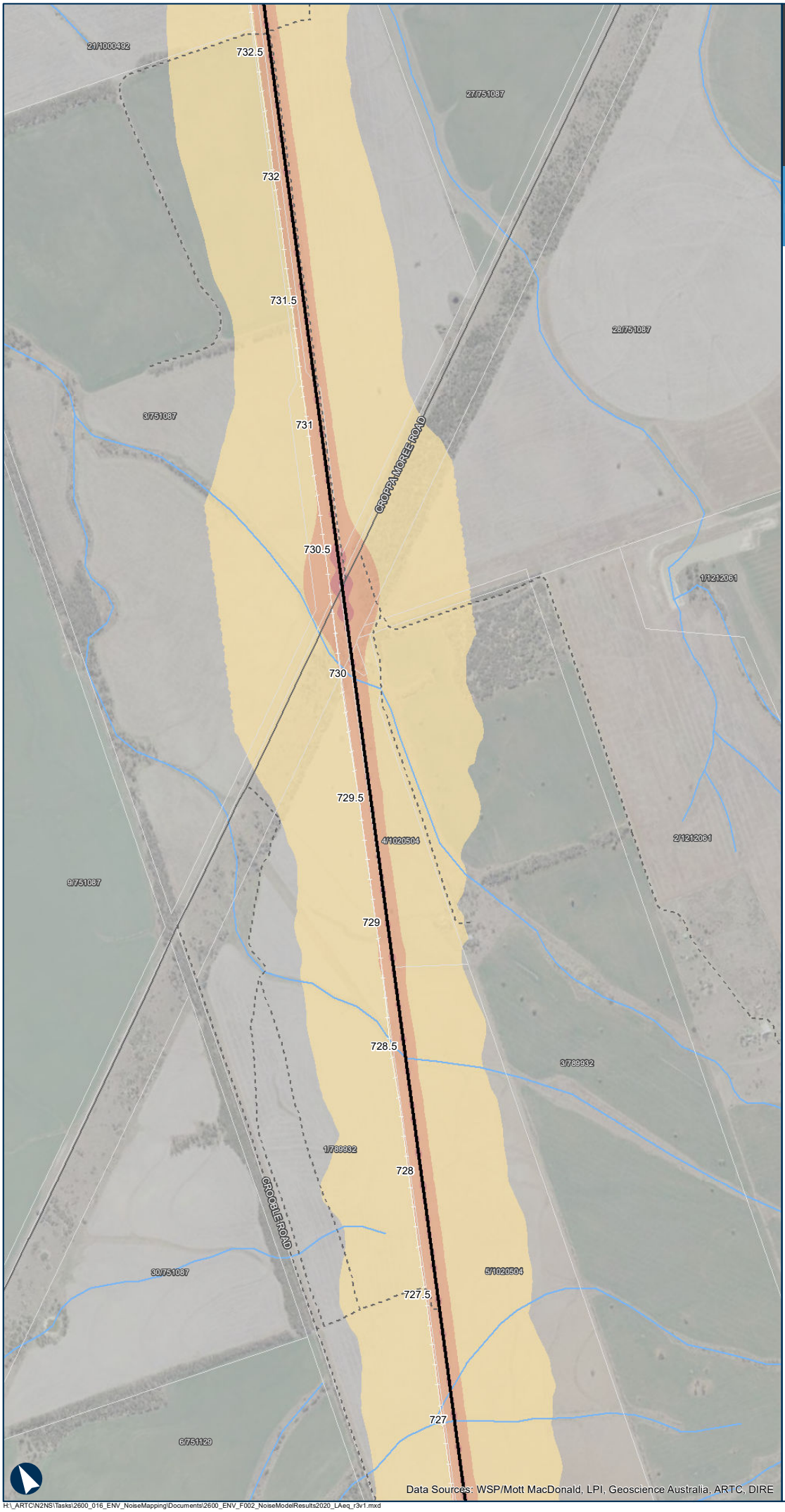
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 26 of 31

LEGEND

- Townships
- Highway
- Local Road
- Track

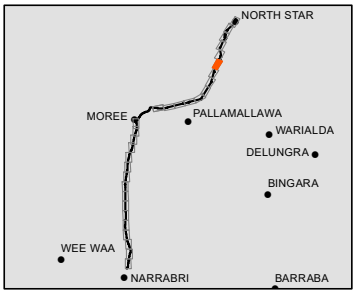
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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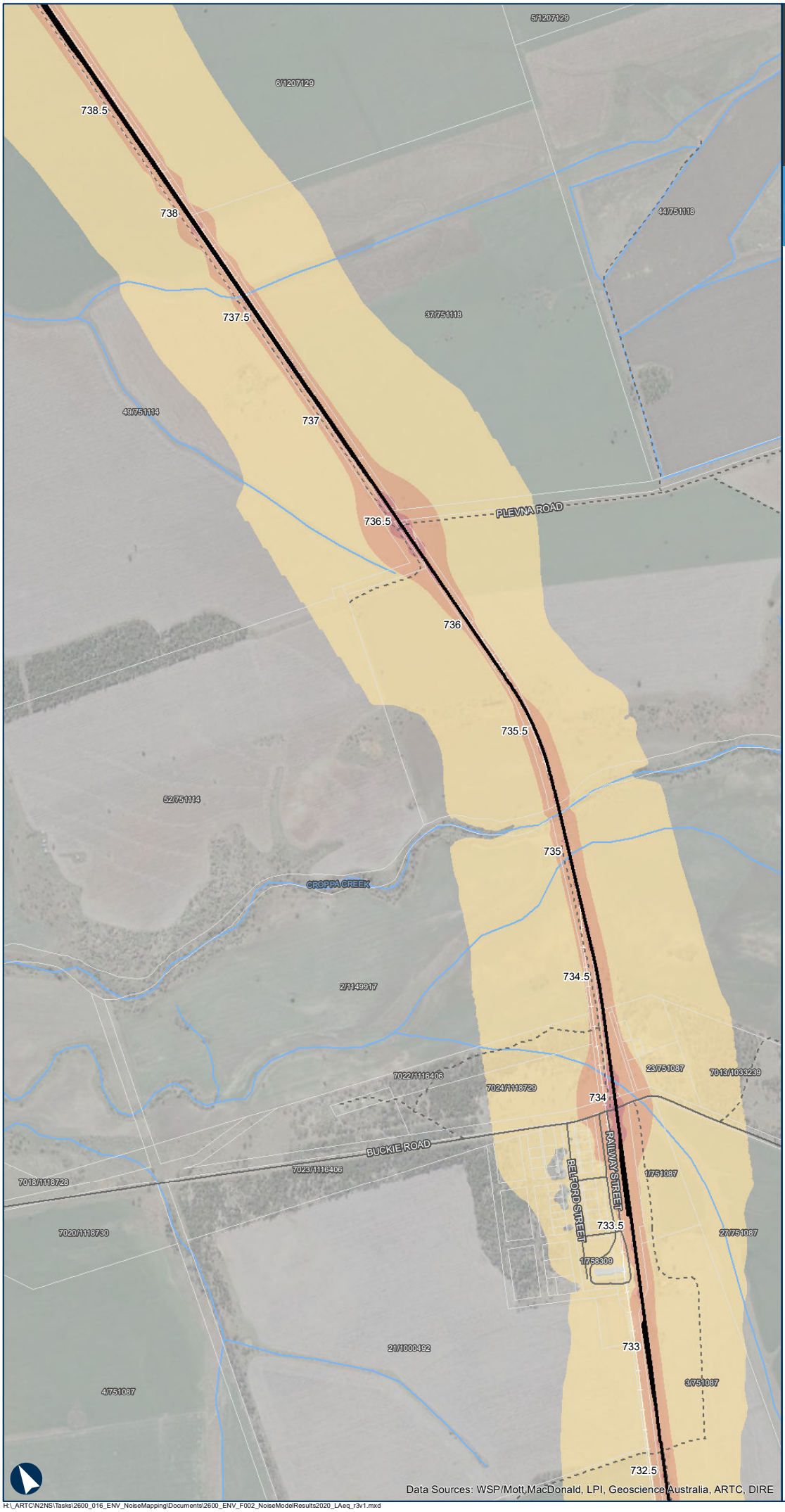
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

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LEGEND

- Townships
- Highway
- Local Road
- Track

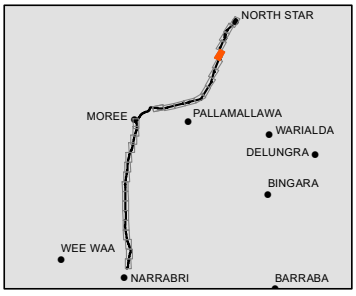
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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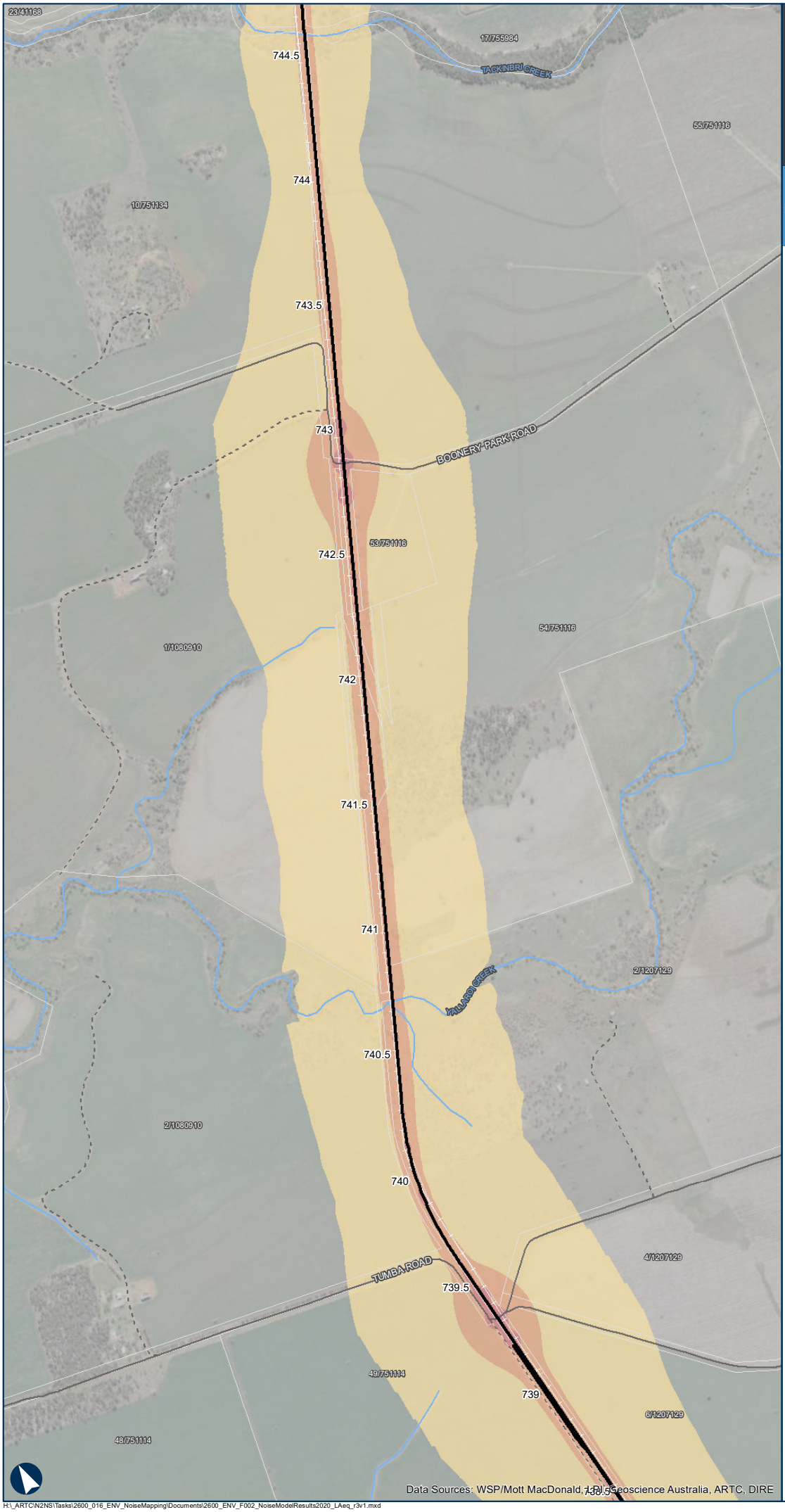
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

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LEGEND

- Townships
- Highway
- Local Road
- Track

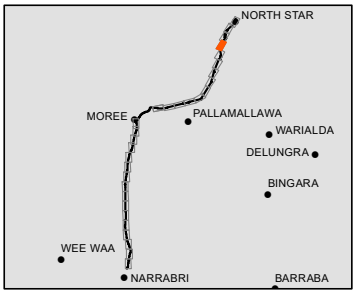
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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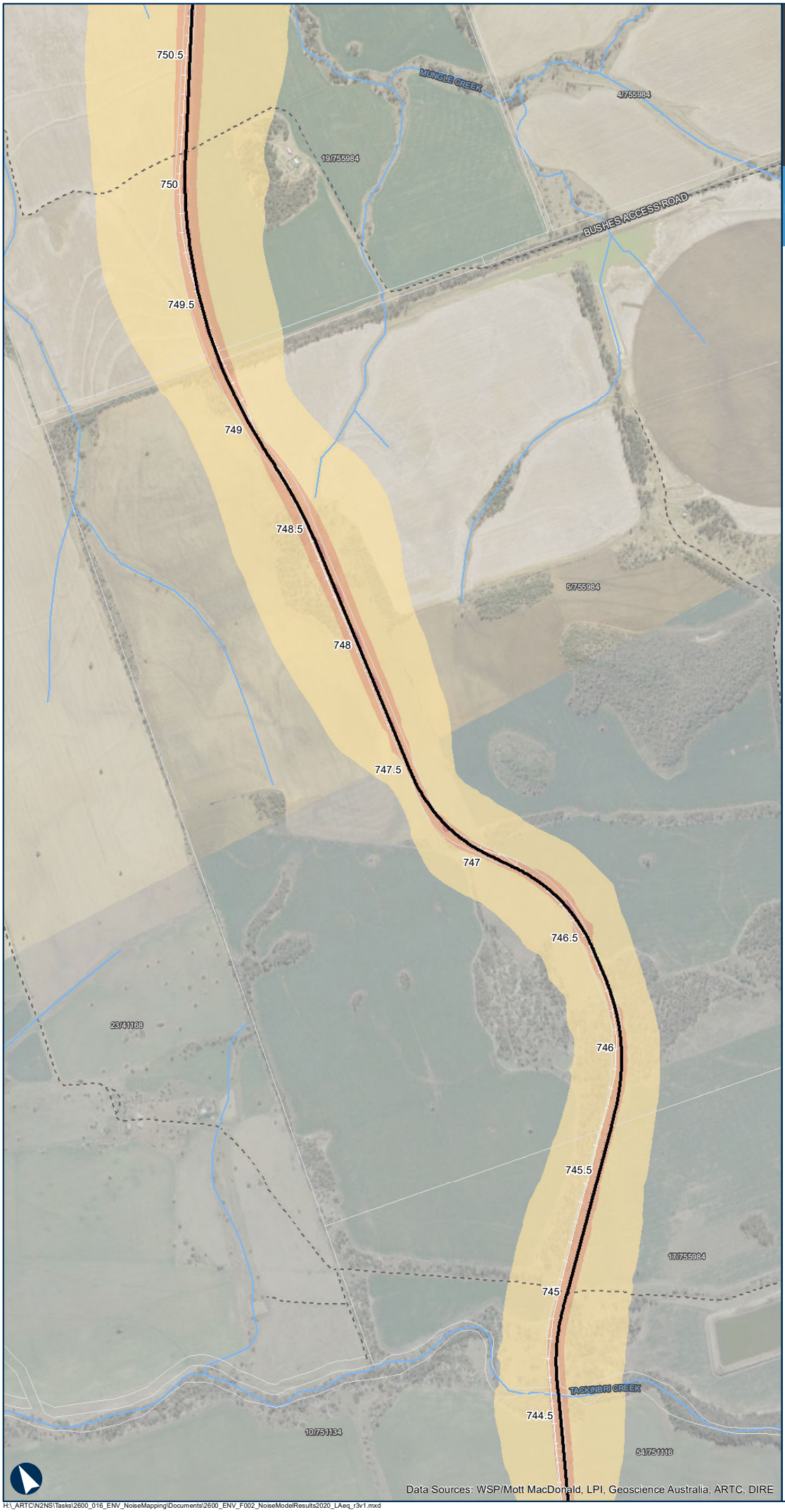
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Scale: 1:15,000

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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 29 of 31

LEGEND

- Townships
- Highway
- Local Road
- Track

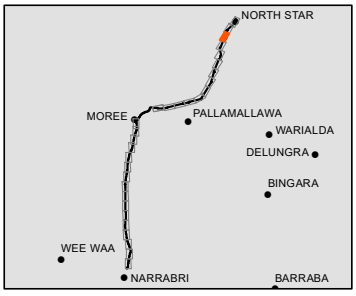
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60

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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

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LEGEND

- Townships
- Highway
- Local Road
- Track

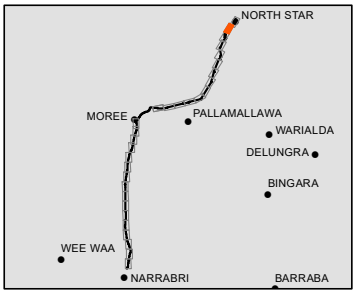
Existing Rail Network

- Track
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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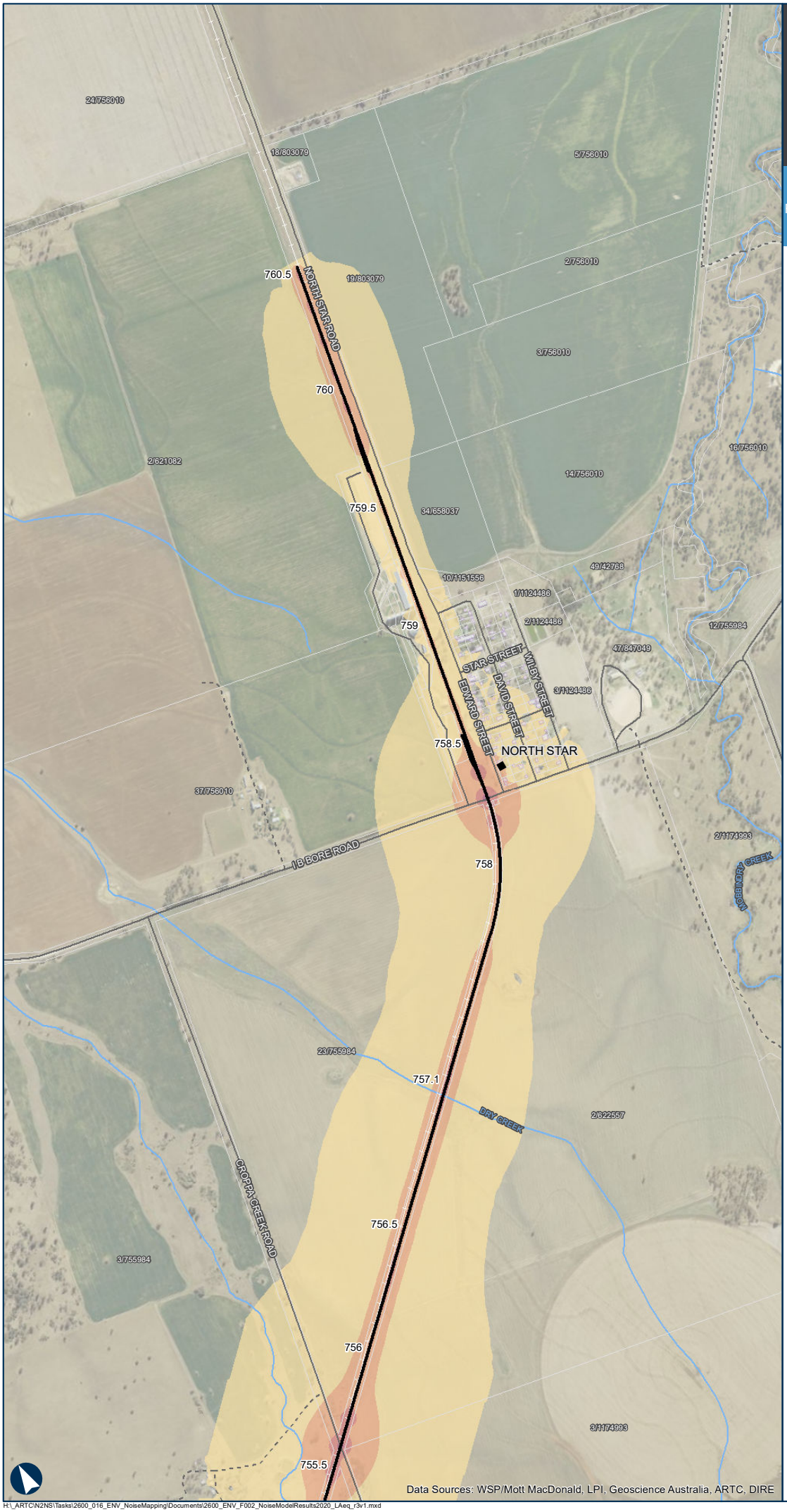
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAeq without mitigation

Sheet 31 of 31

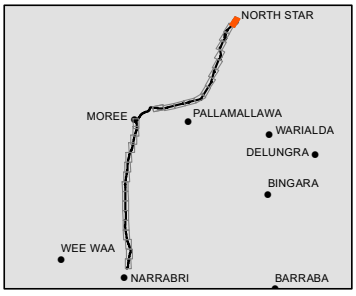
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70

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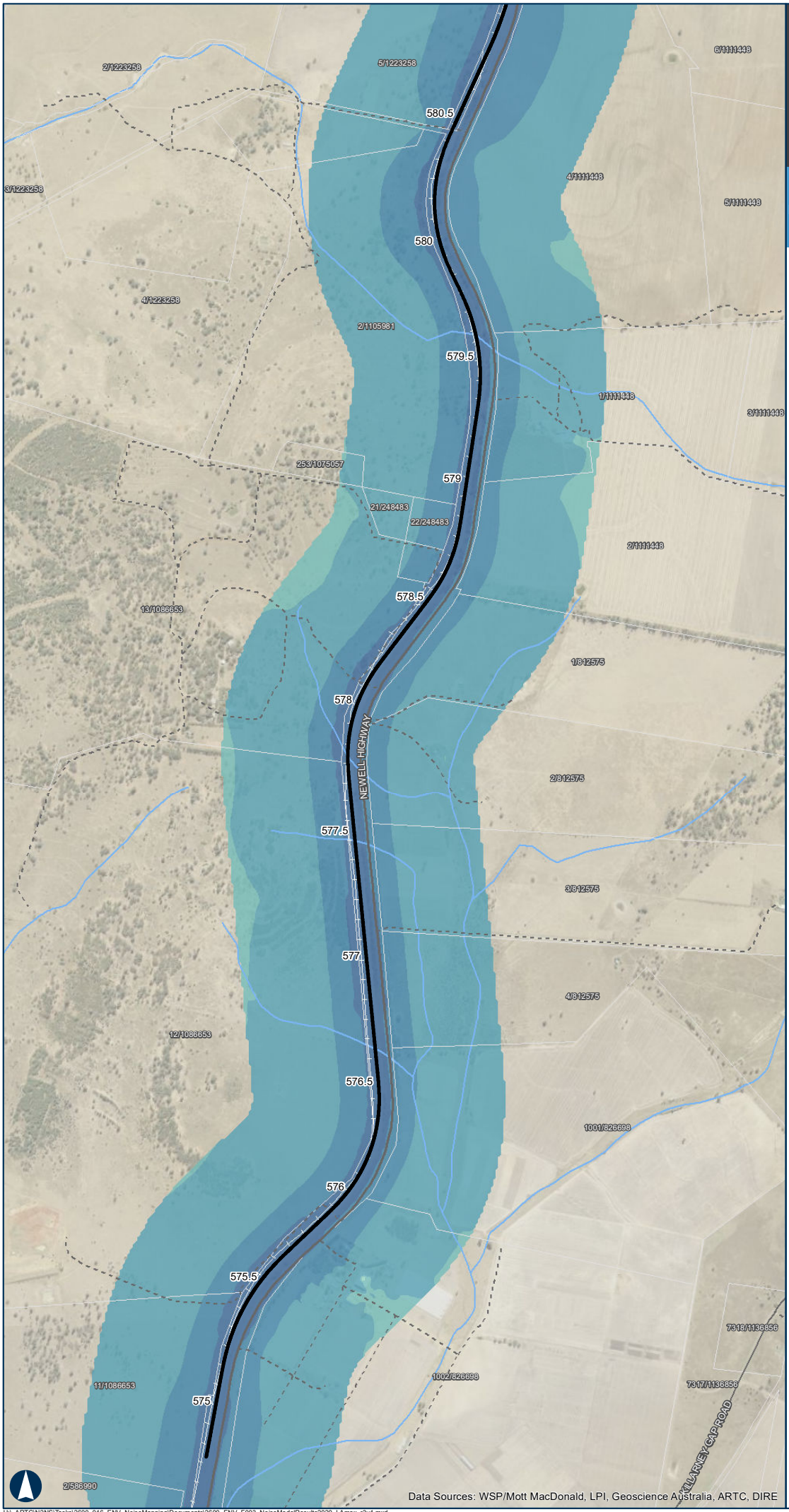
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 1 of 31

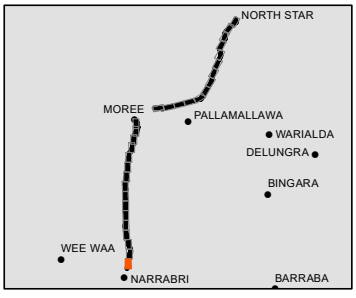
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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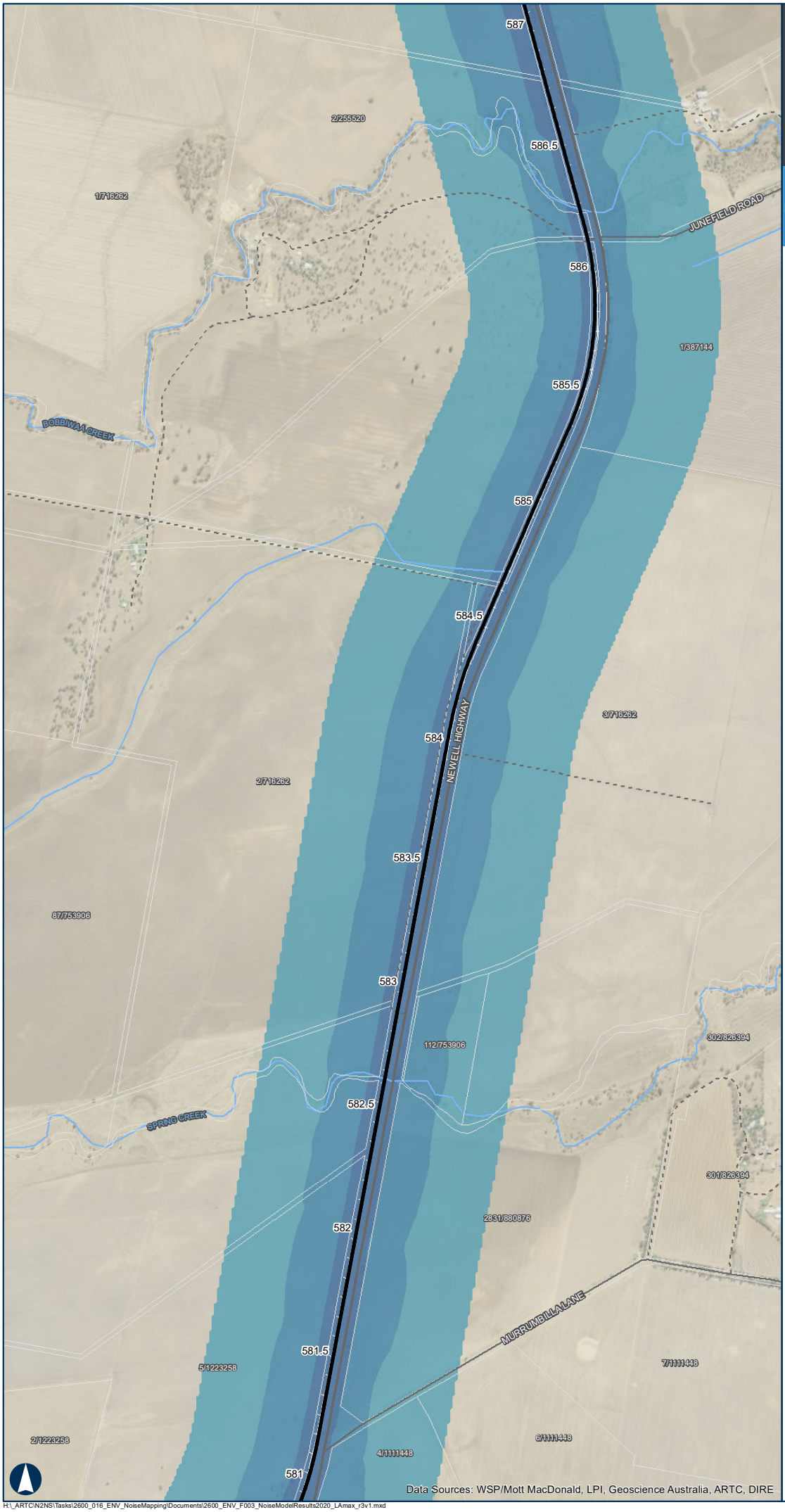
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 2 of 31

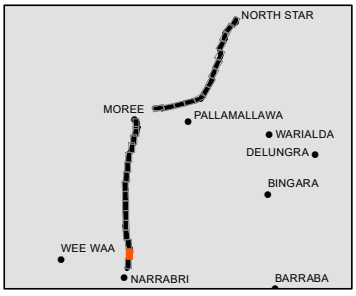
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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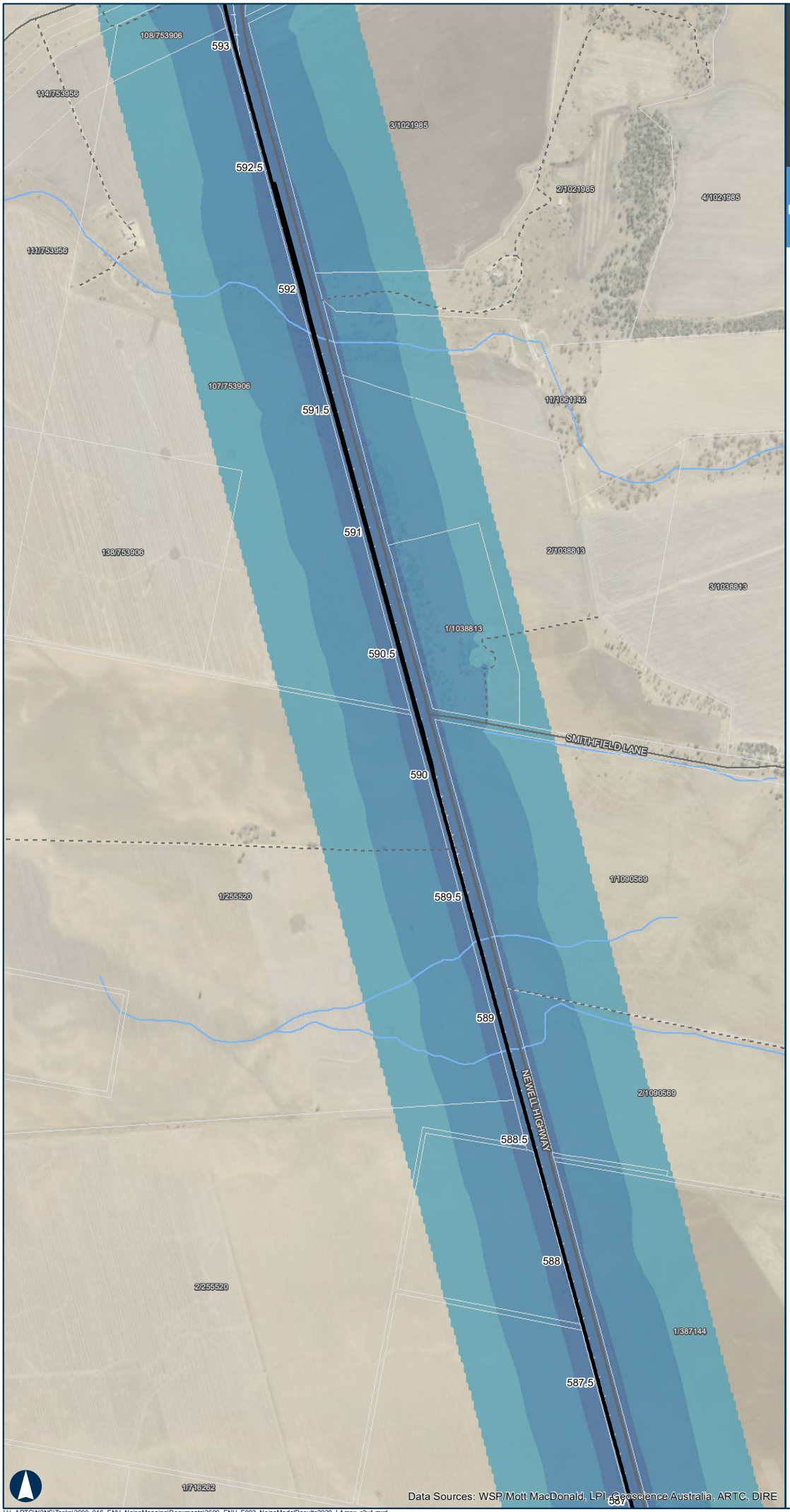
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 3 of 31

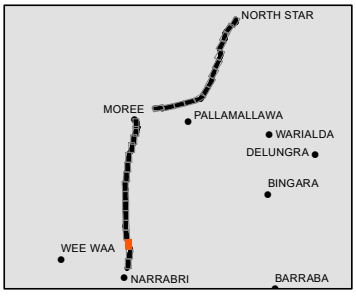
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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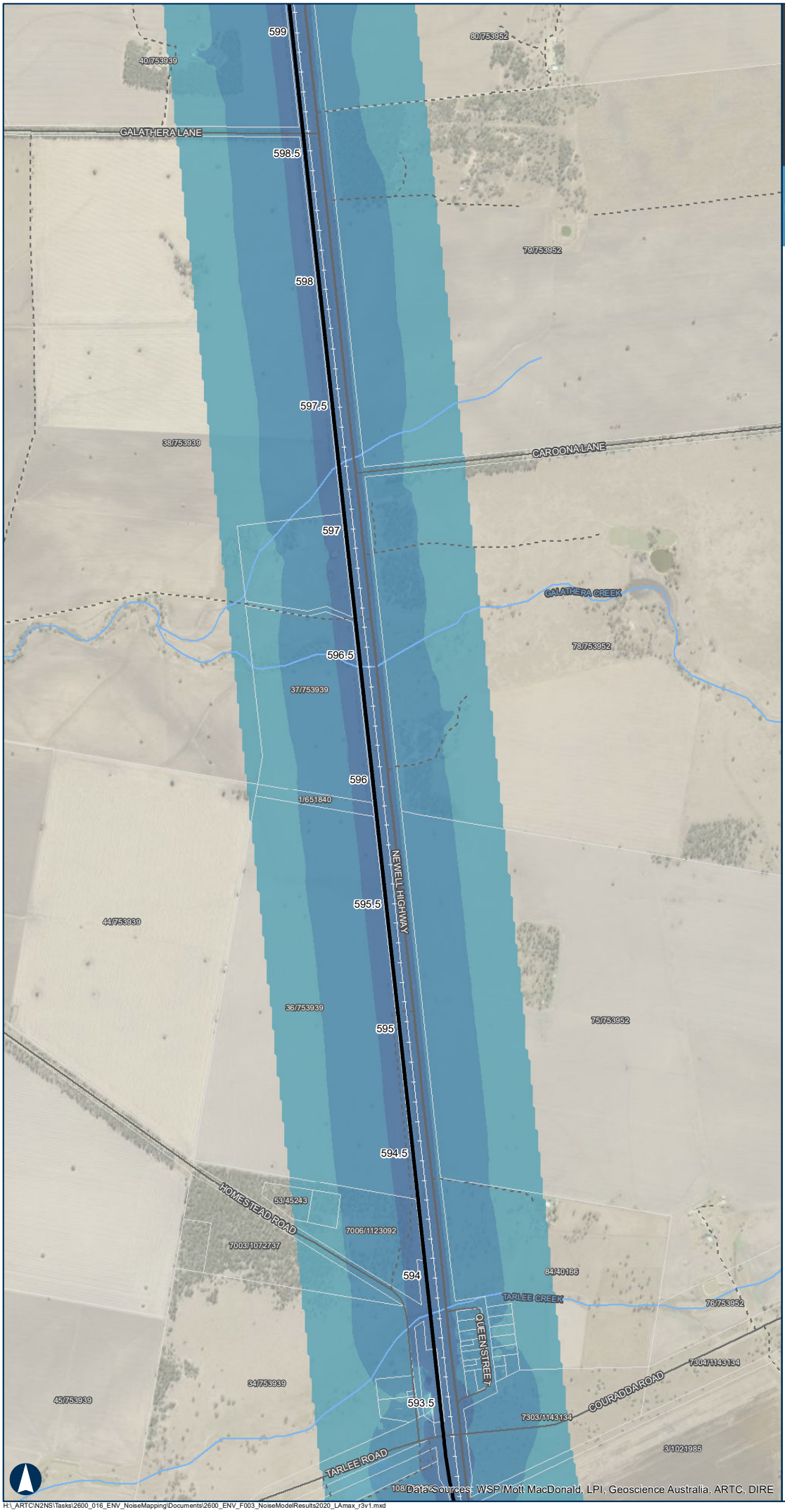
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 4 of 31

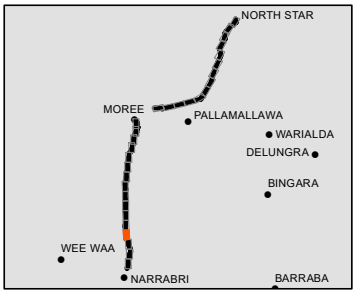
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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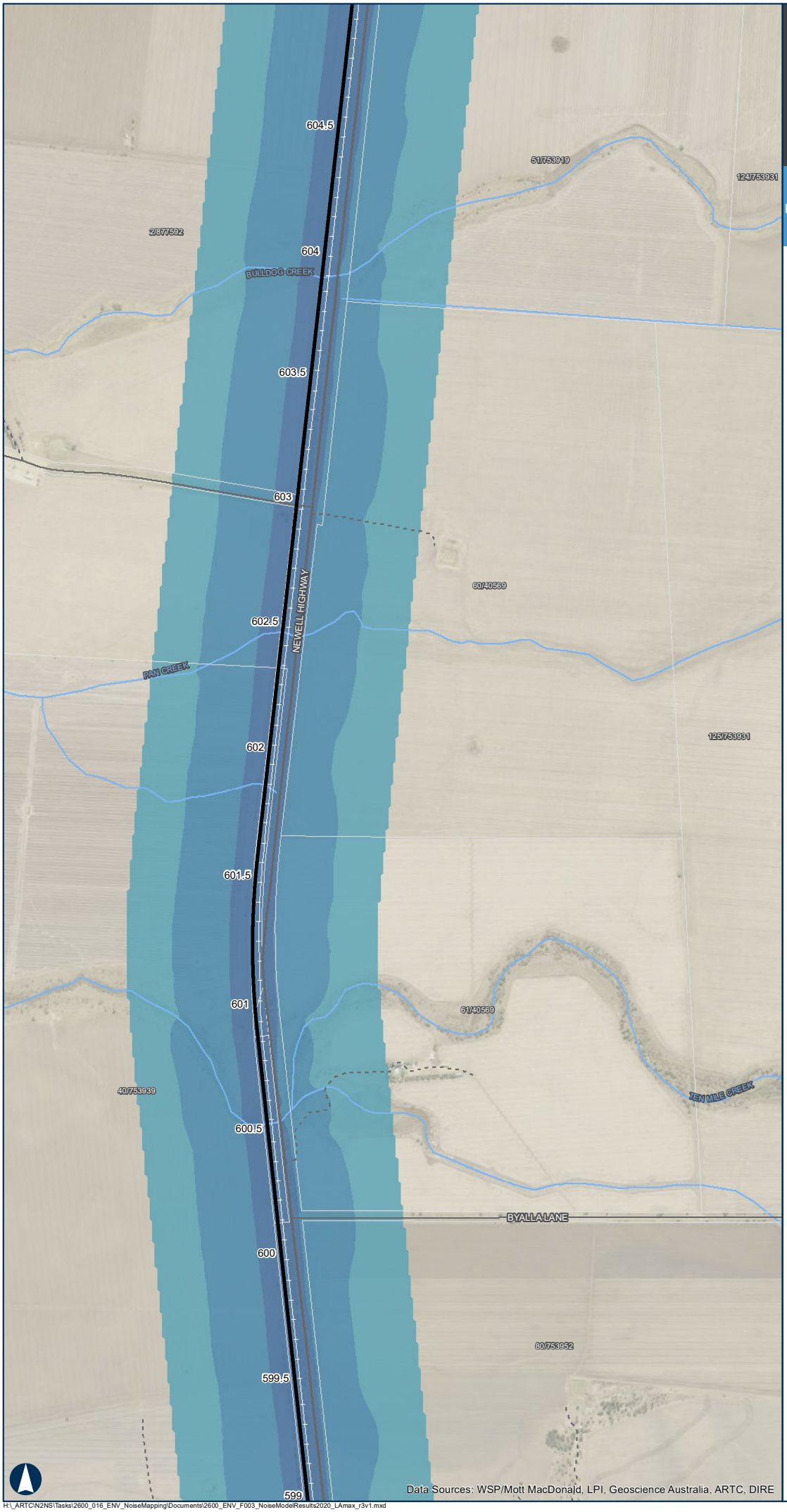
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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 5 of 31

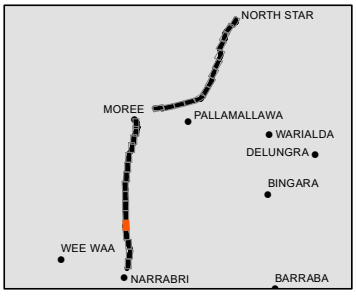
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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0.75 Km

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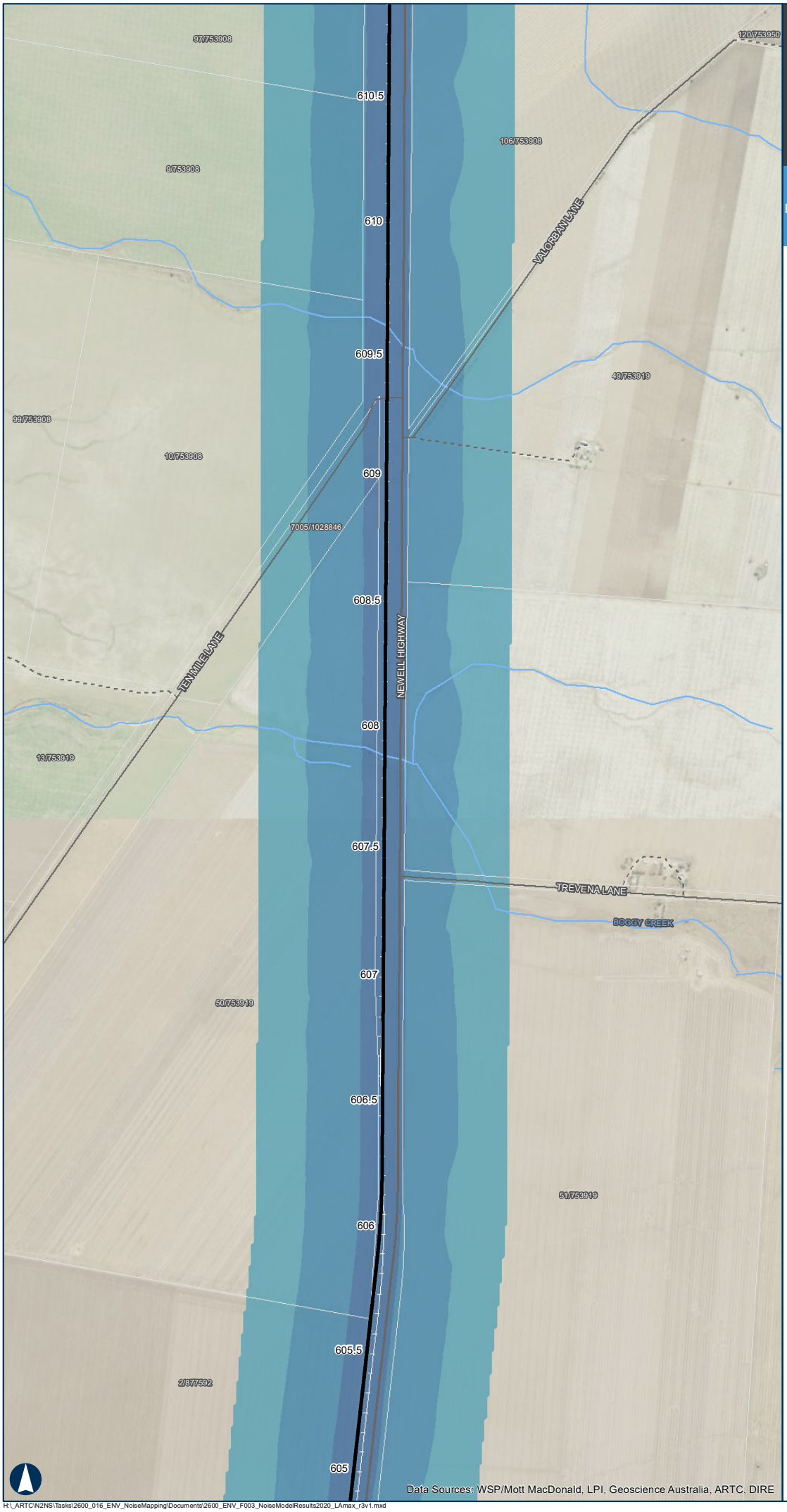
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 6 of 31

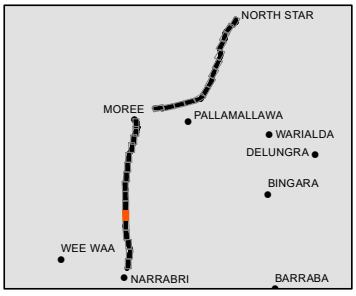
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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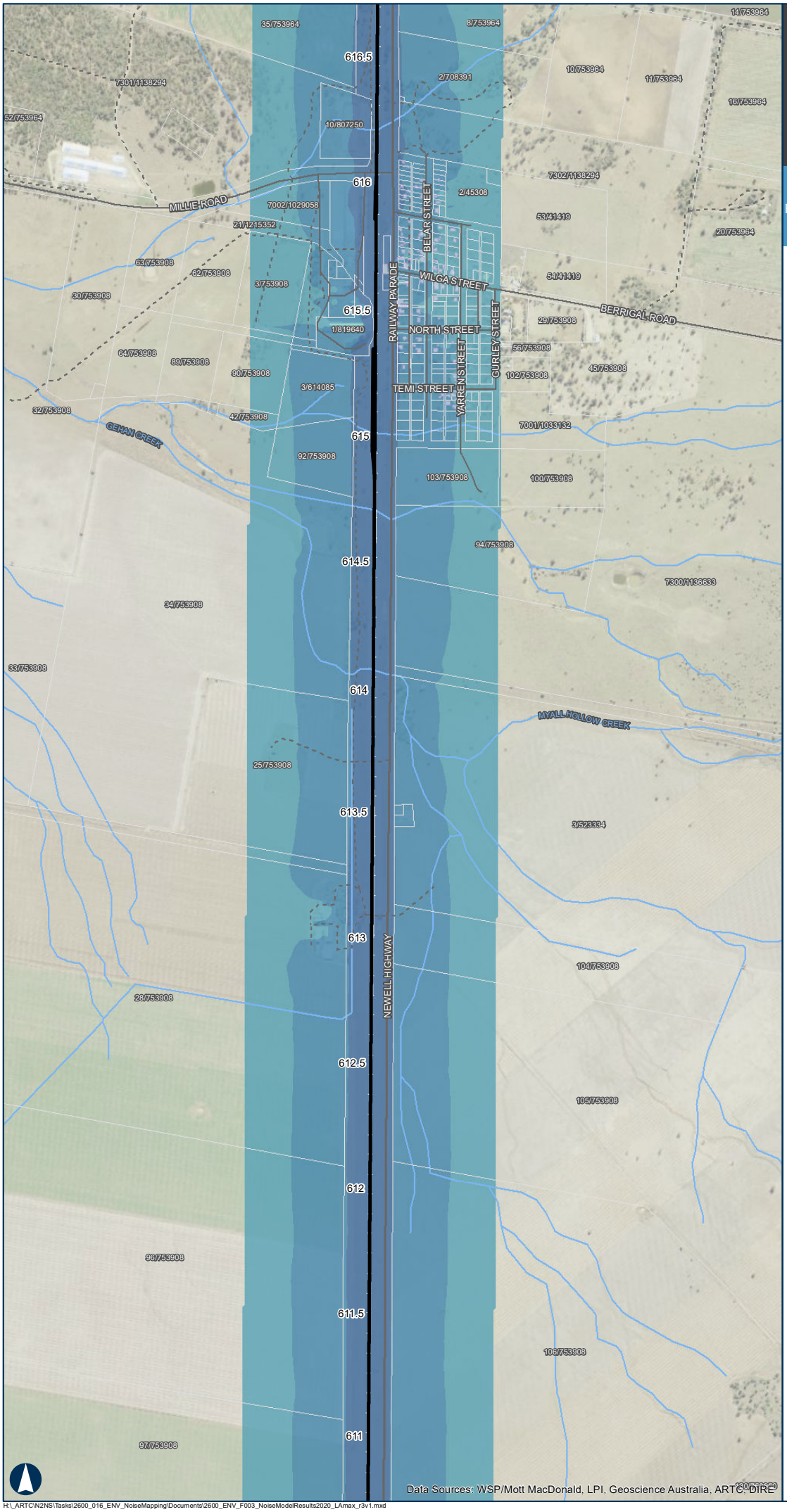
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 7 of 31

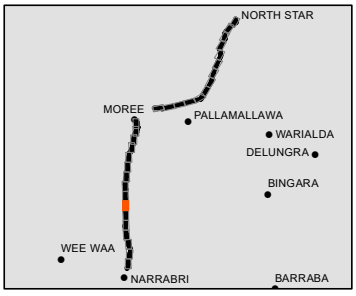
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

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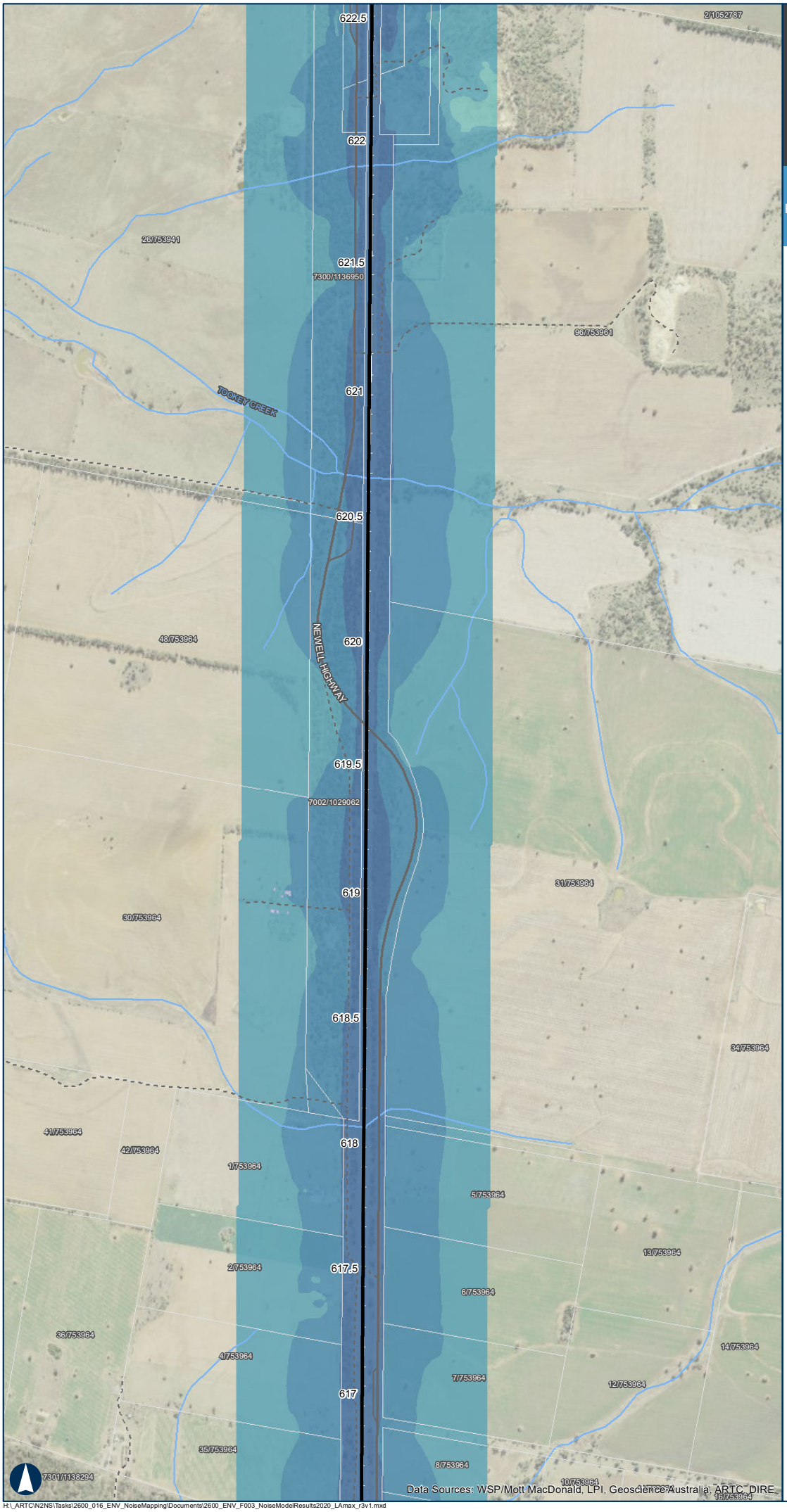
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Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 8 of 31

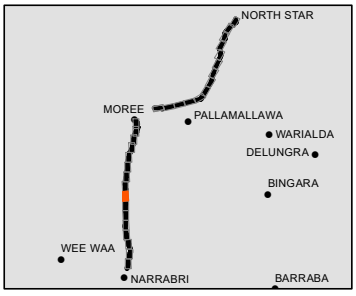
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
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Noise Contours (dB(A))

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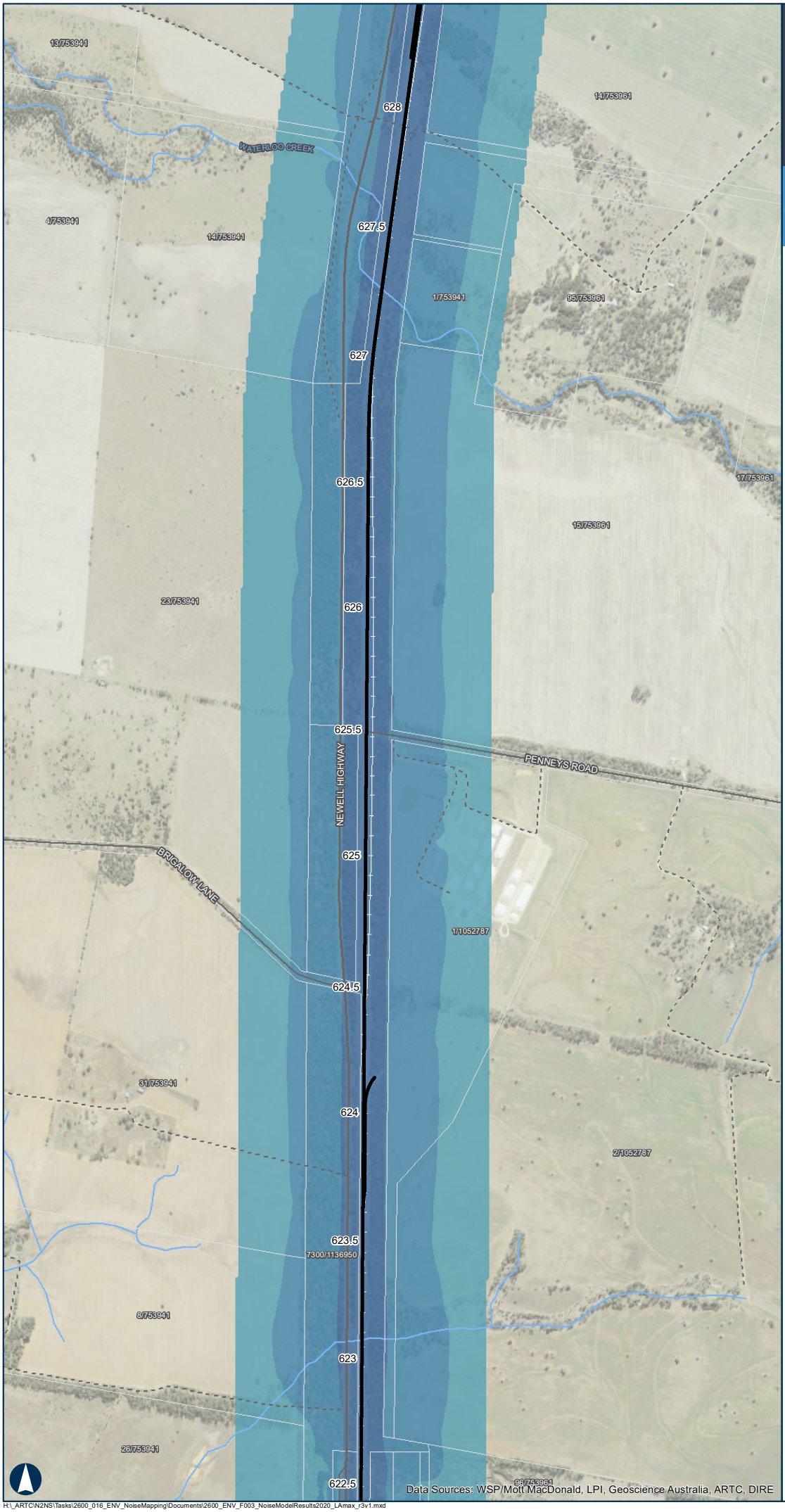
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

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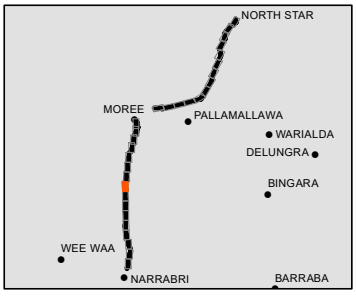
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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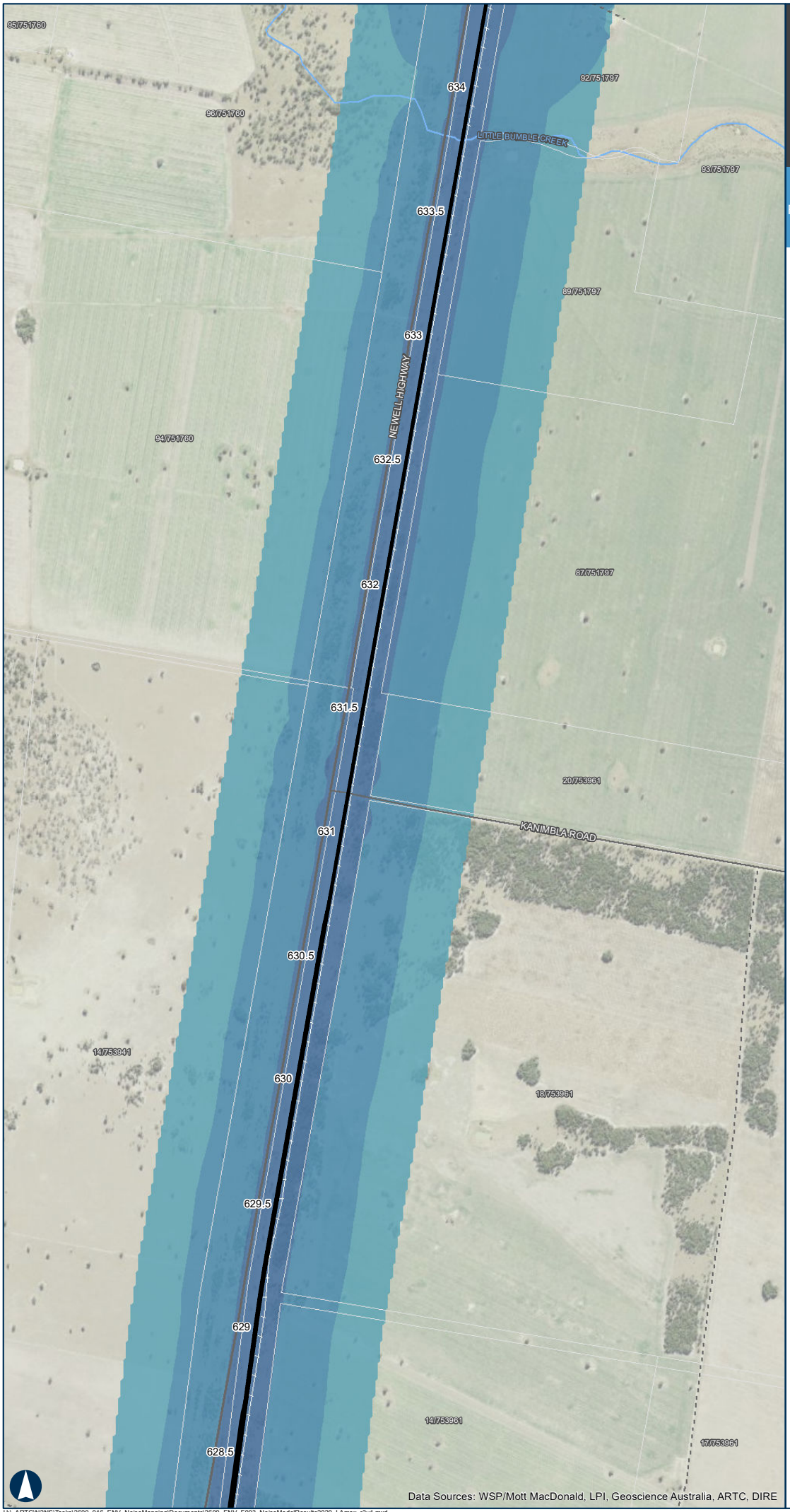
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

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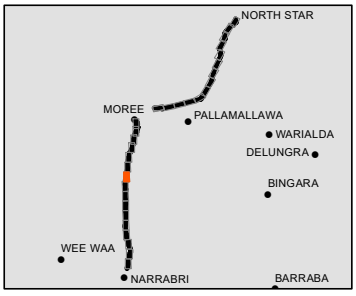
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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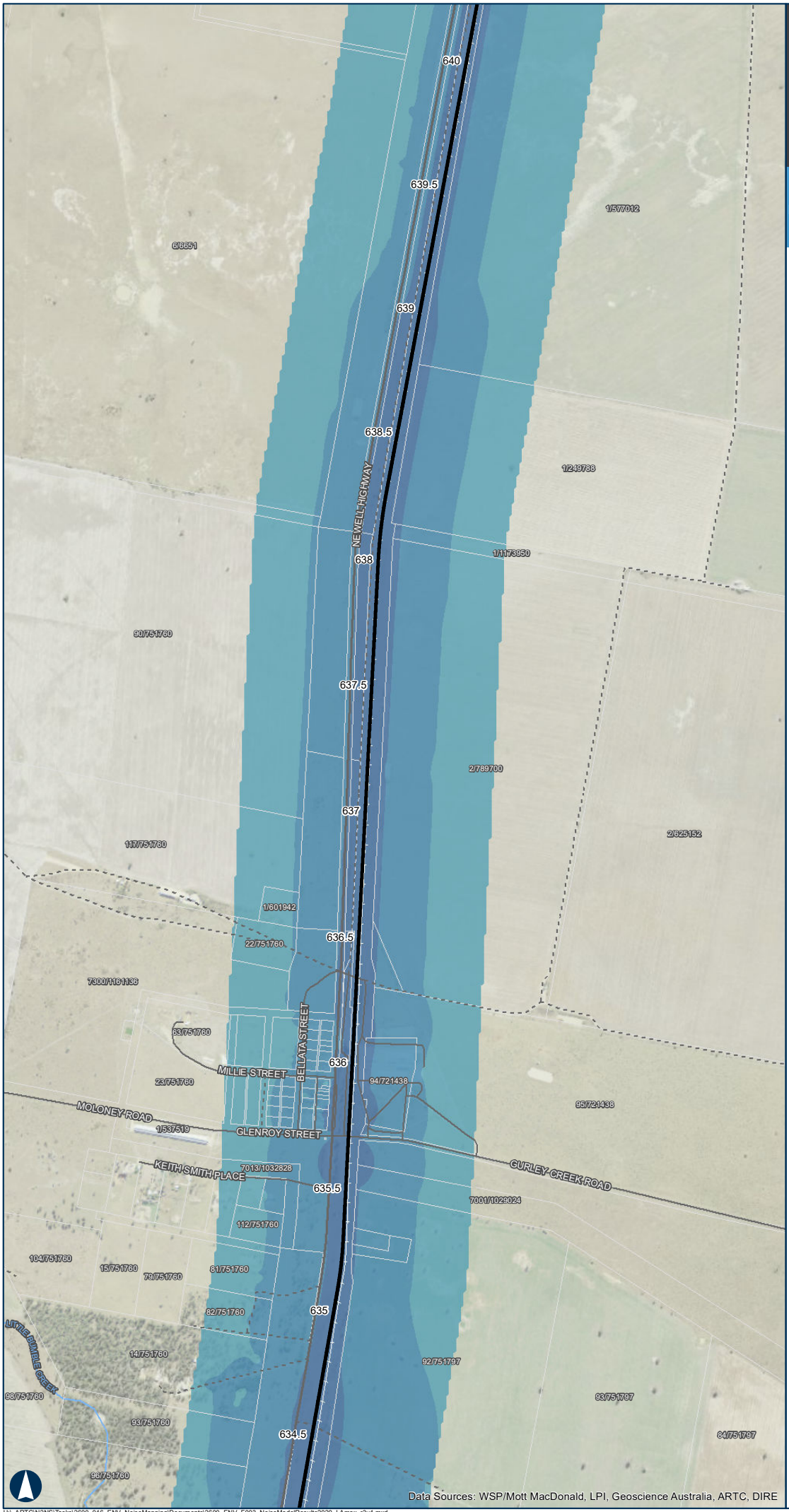
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

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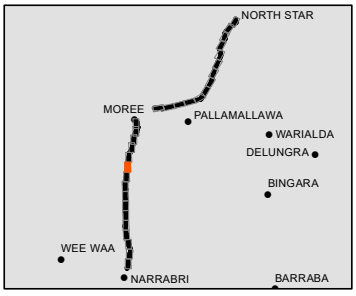
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
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Noise Contours (dB(A))

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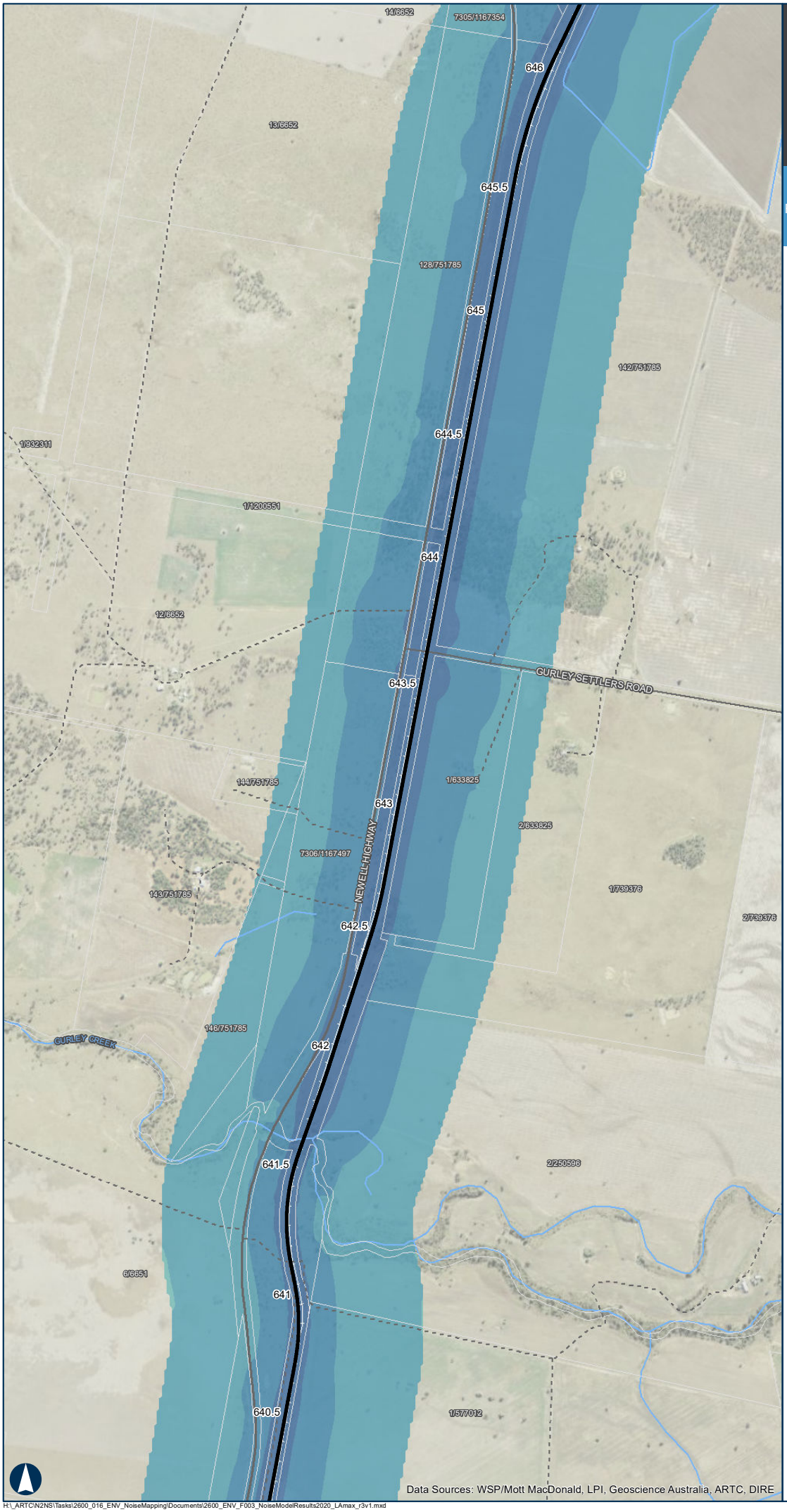
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 12 of 31

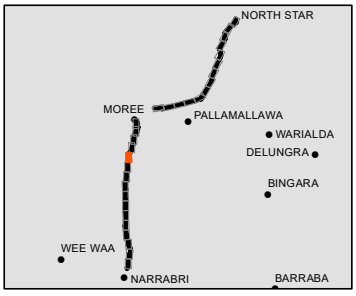
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
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Noise Contours (dB(A))

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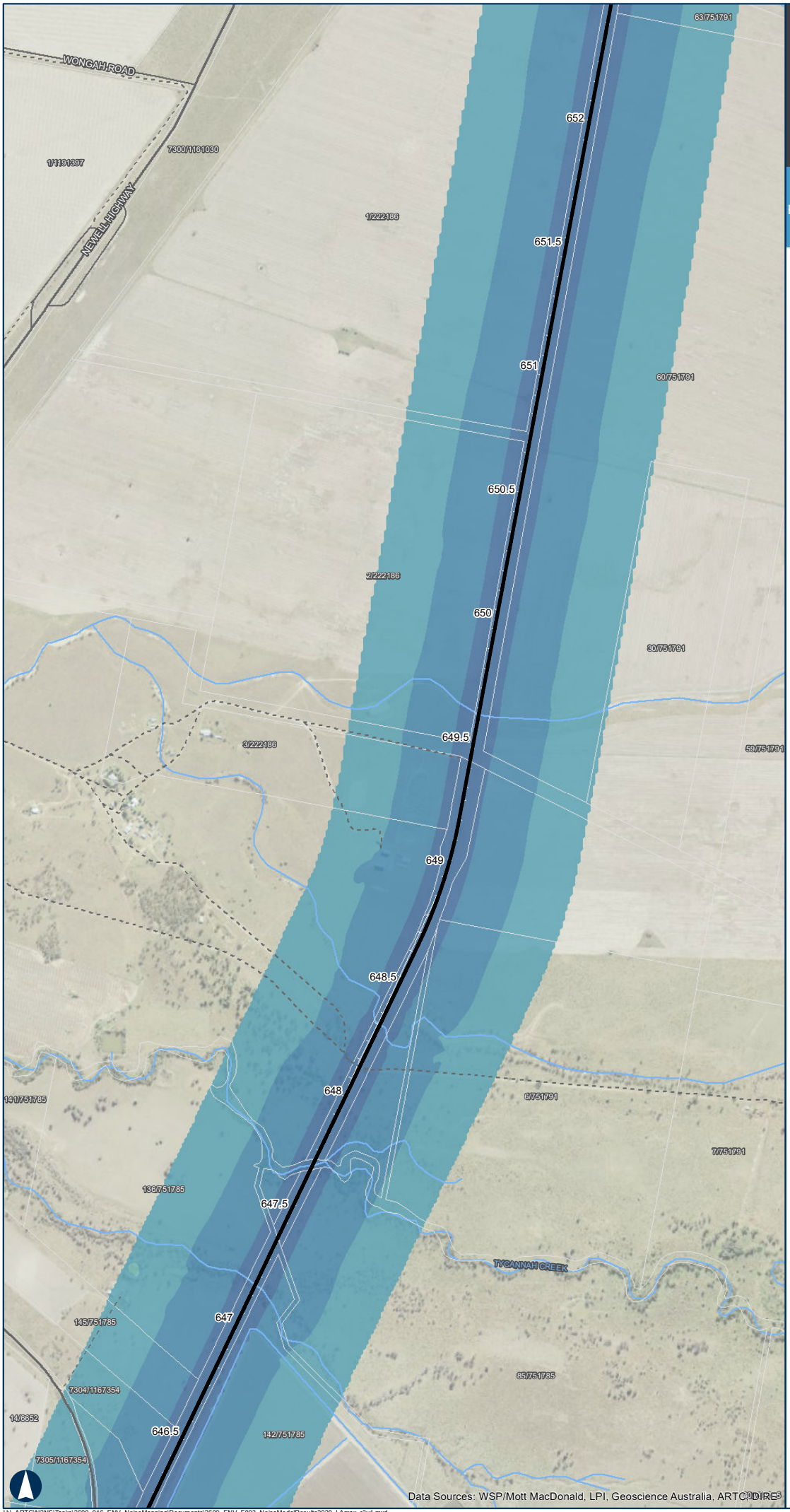
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 13 of 31

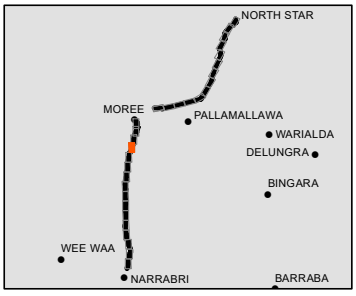
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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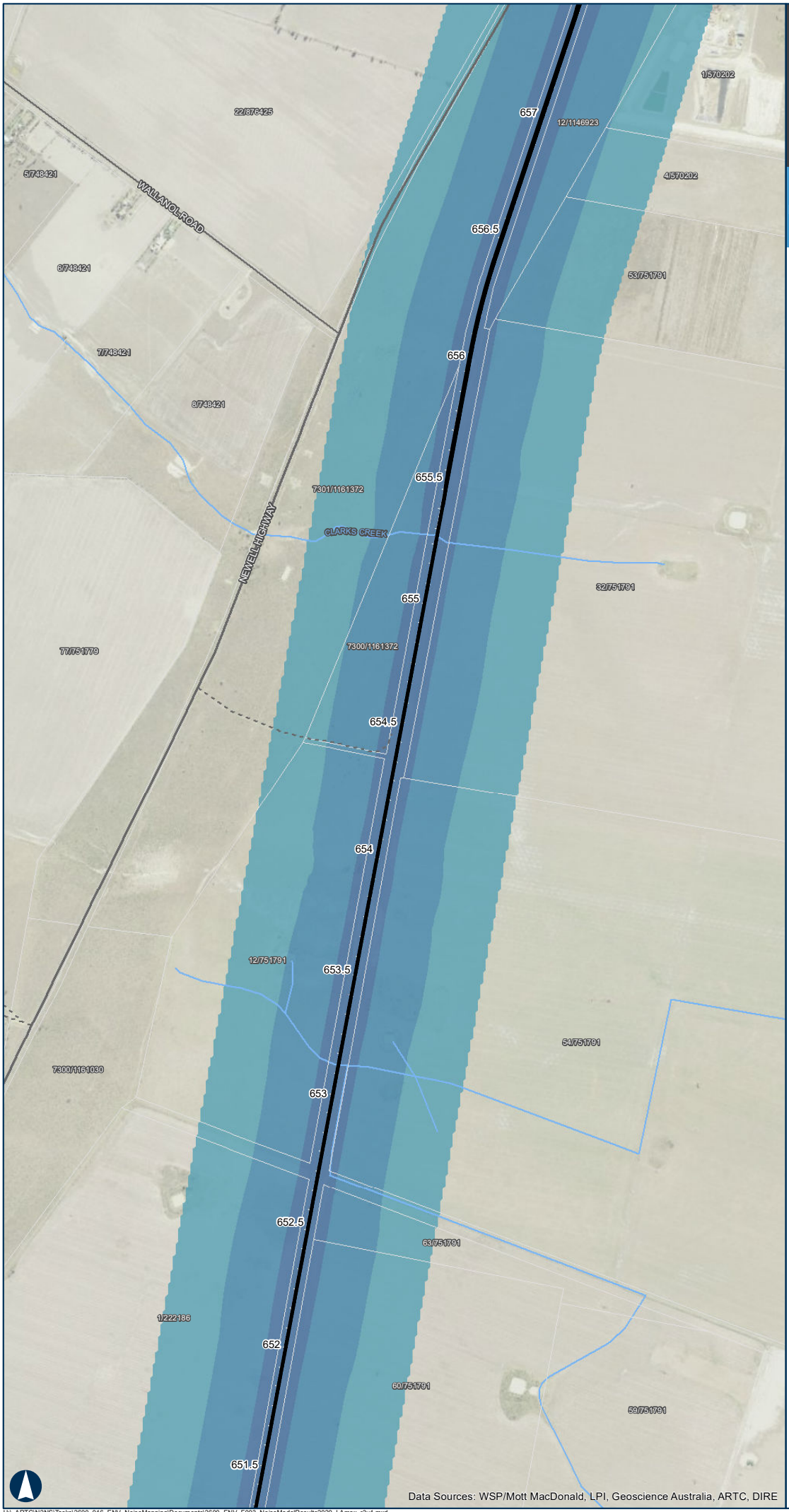
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Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 14 of 31

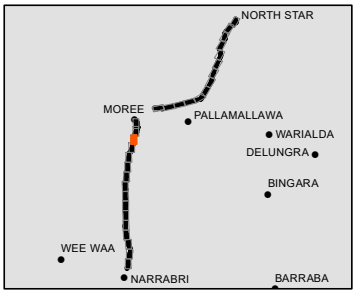
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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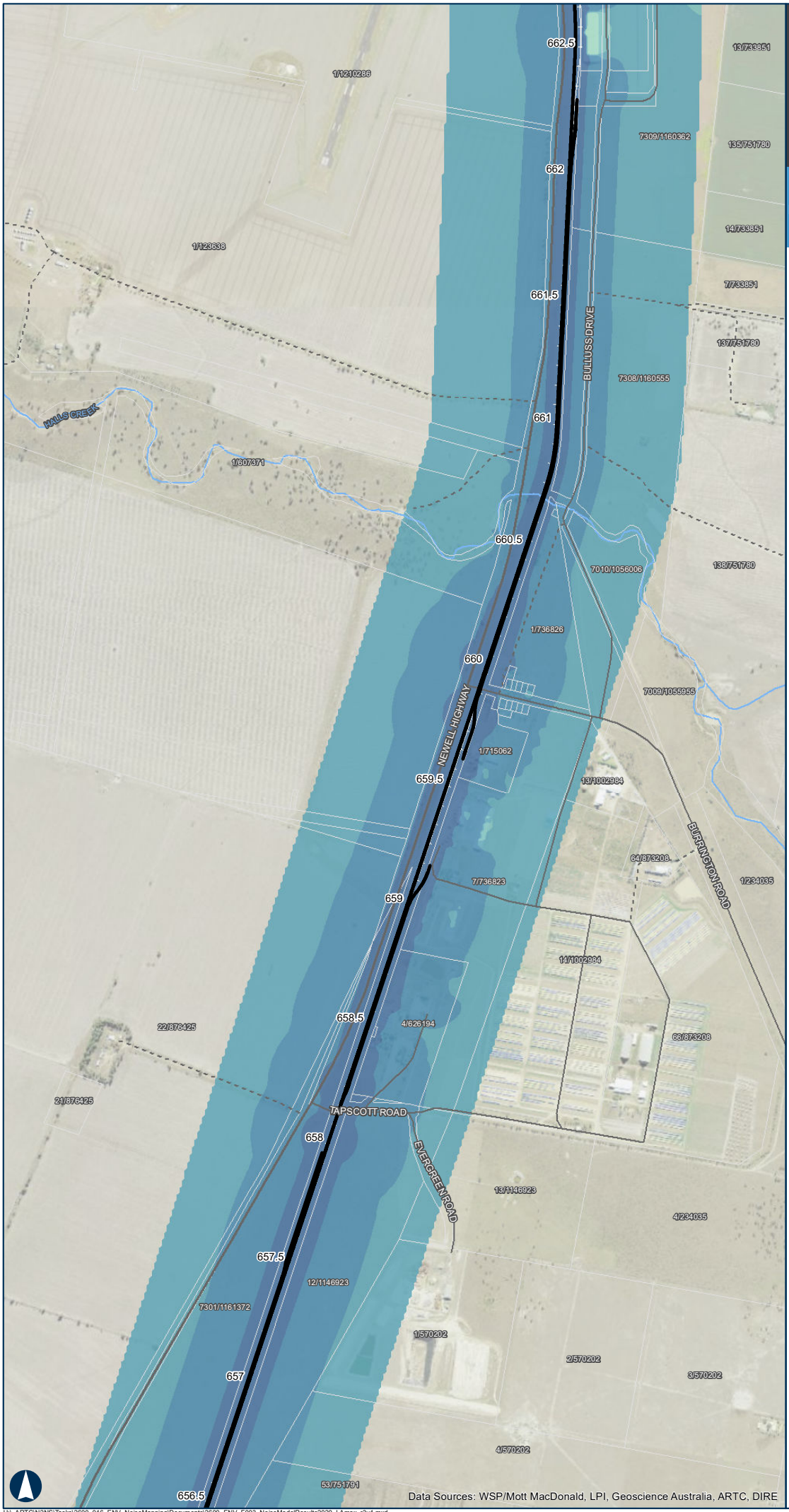
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Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 15 of 31

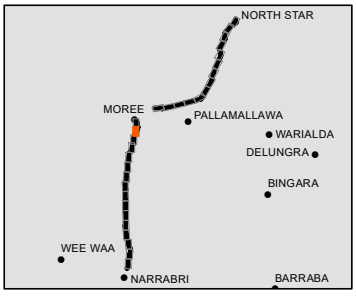
LEGEND

- Townships
- Highway
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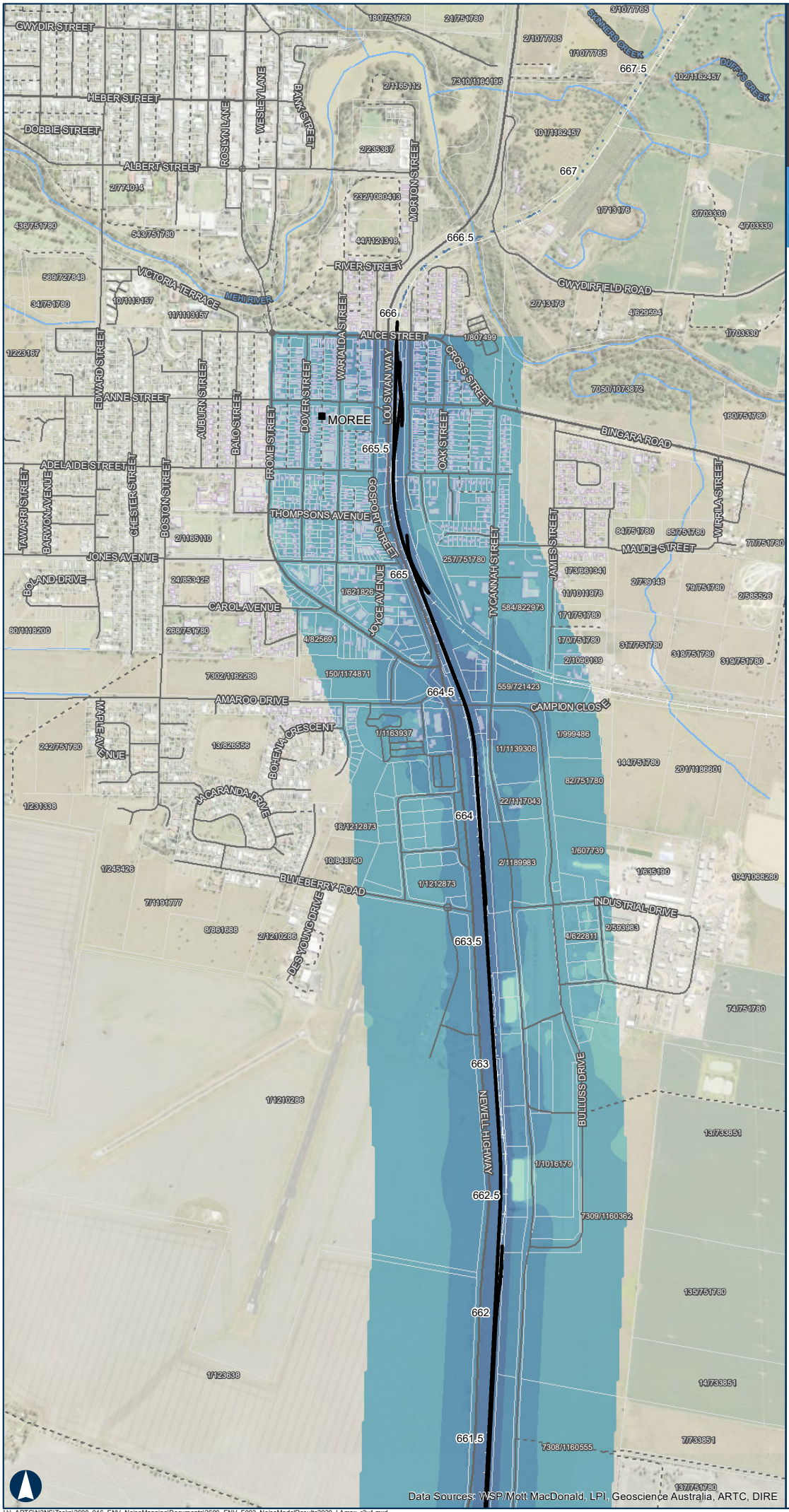
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Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

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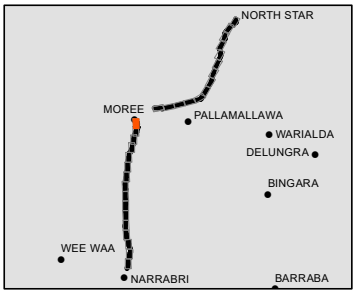
LEGEND

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- Building Footprints

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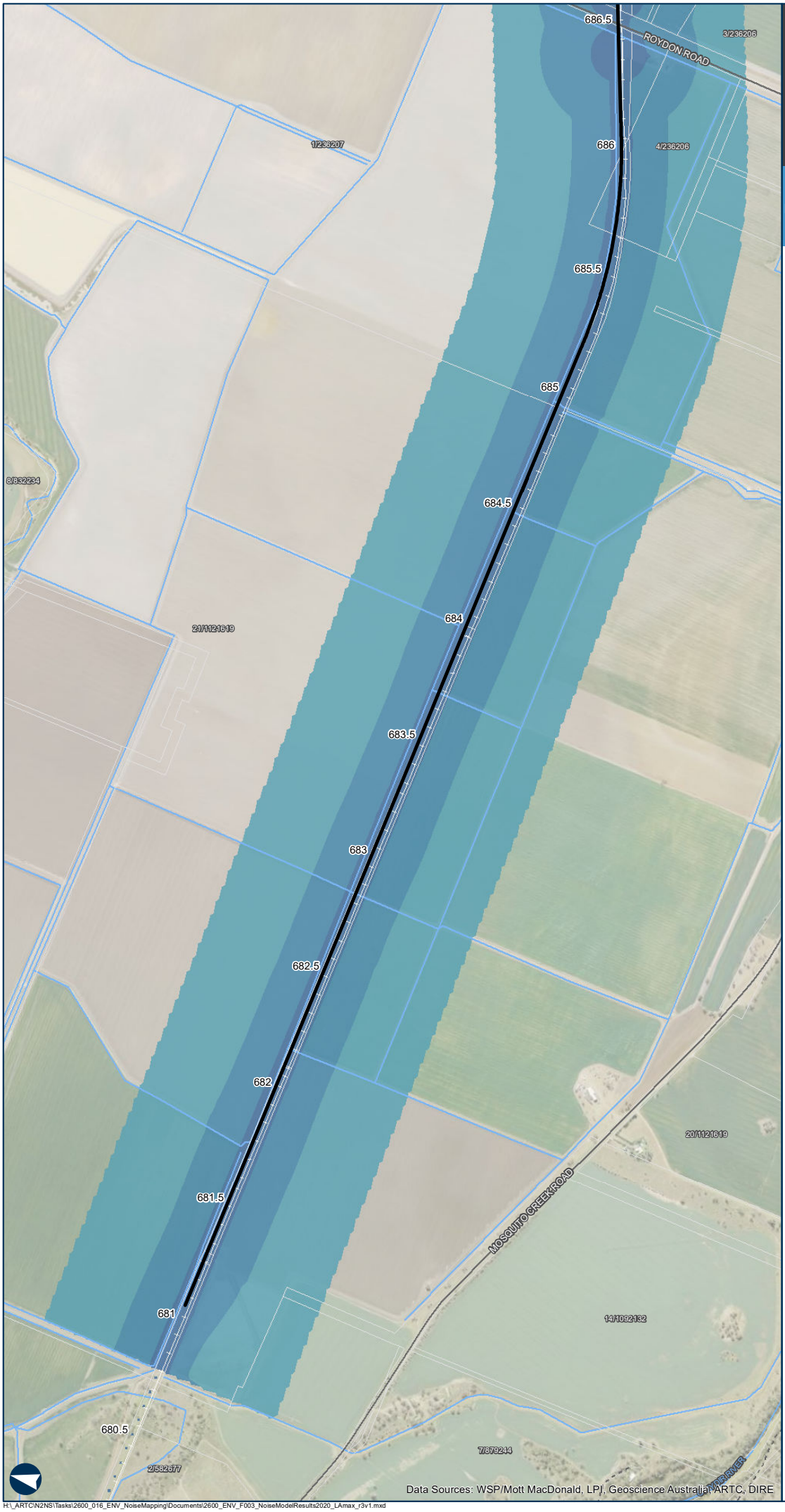
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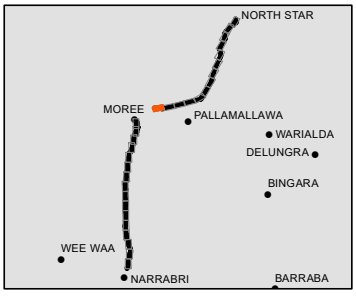
LEGEND

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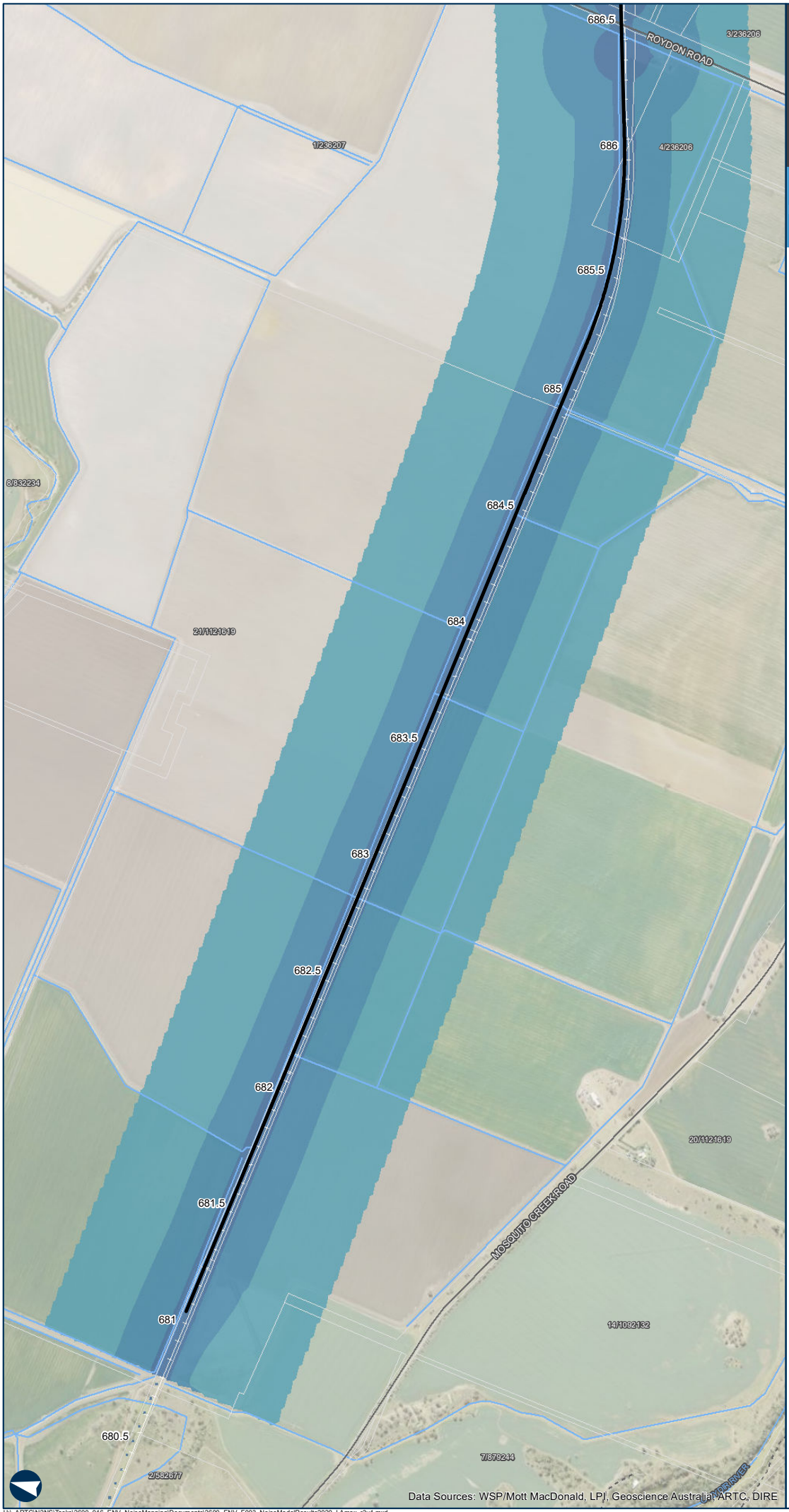
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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INLAND RAIL

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

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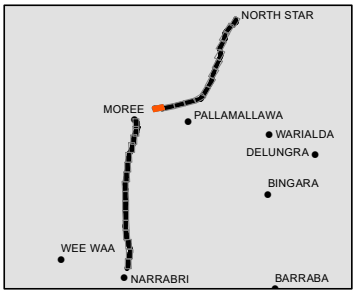
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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0.75 Km

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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 19 of 31

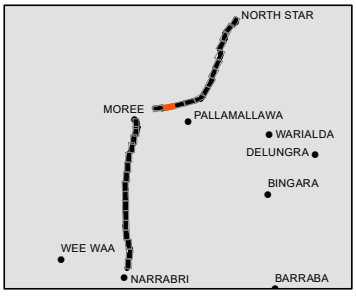
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
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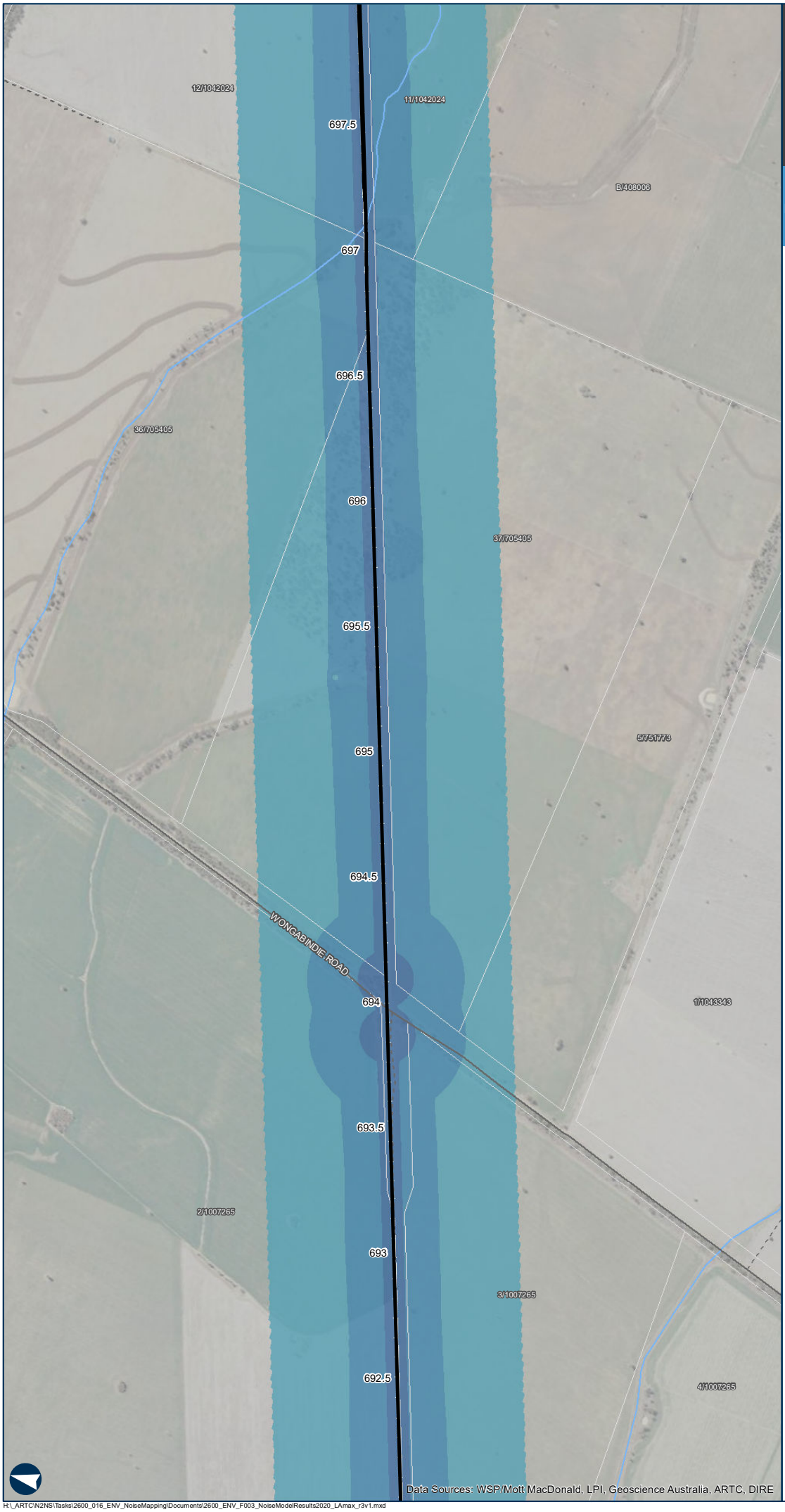
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

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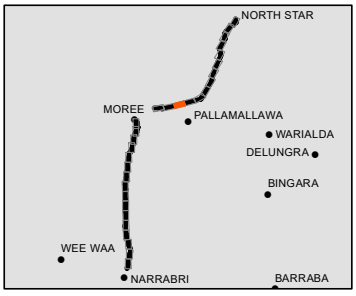
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
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- 75 - 80
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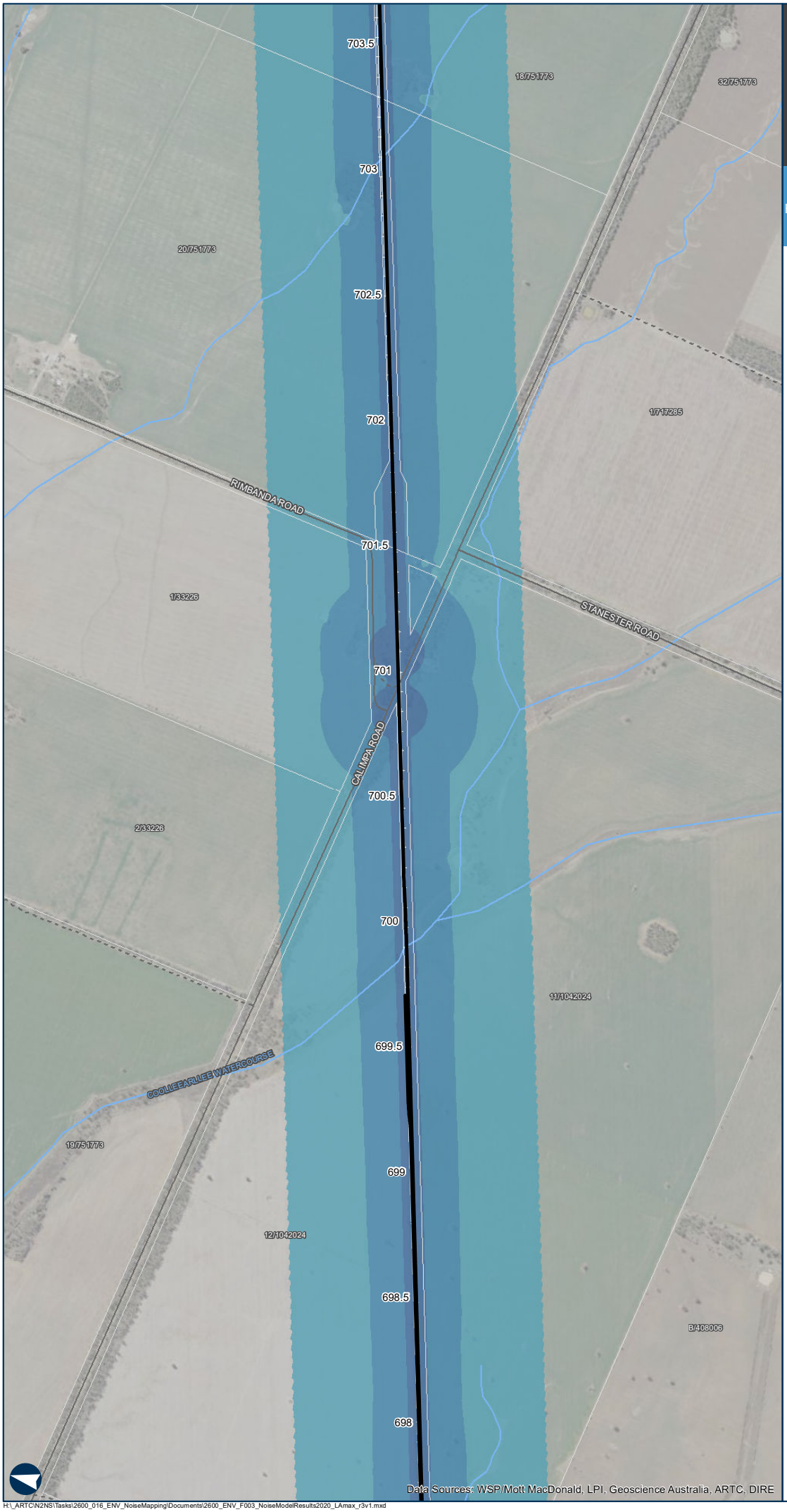
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

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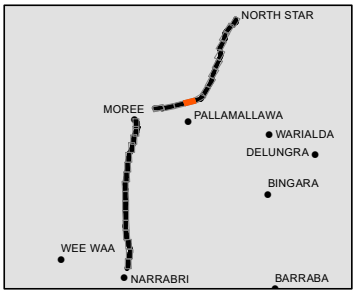
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
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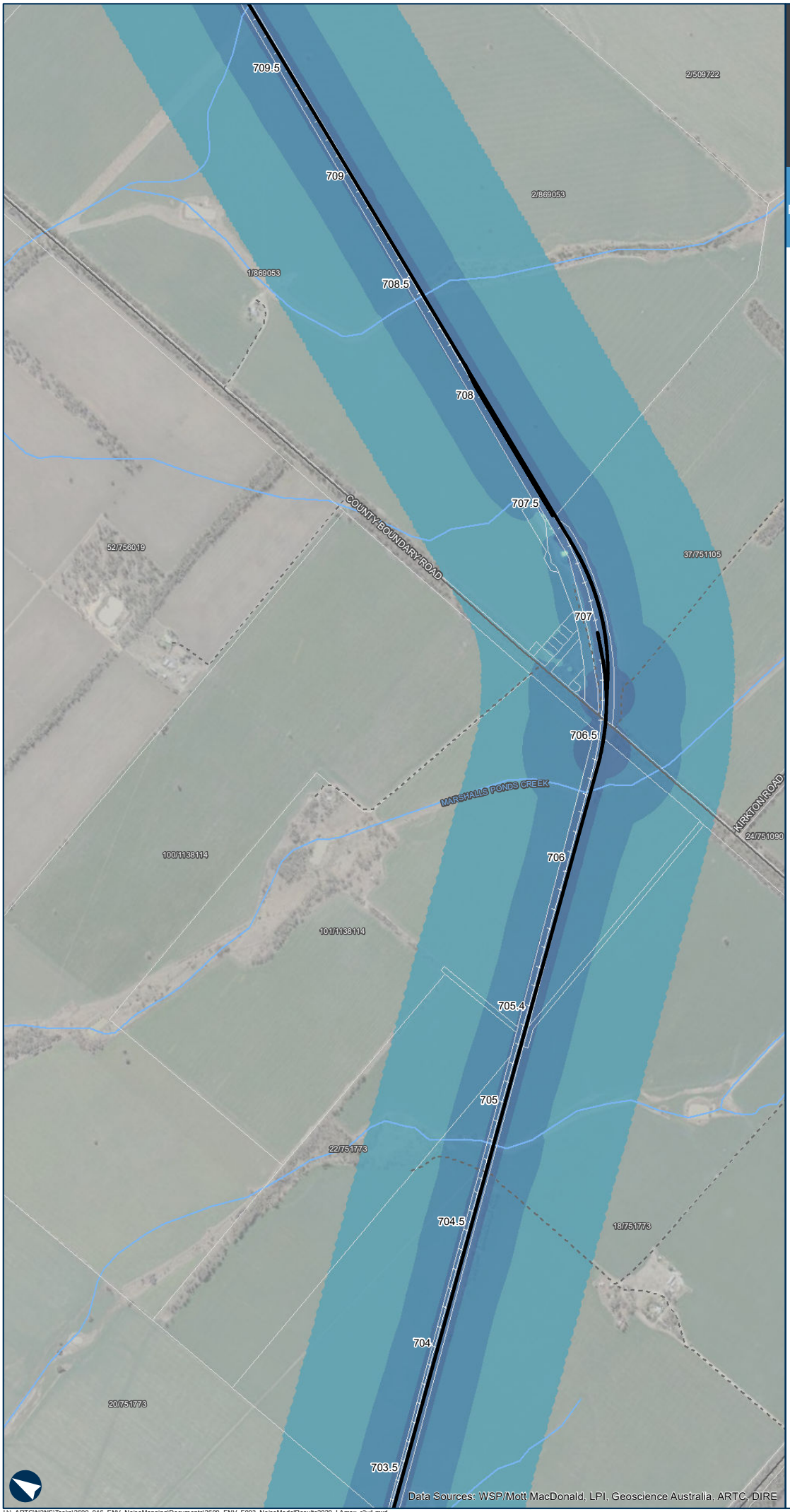
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

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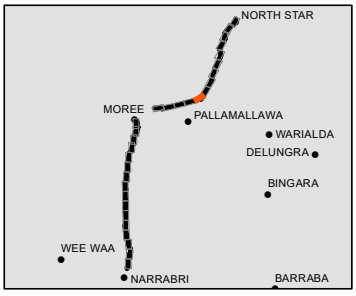
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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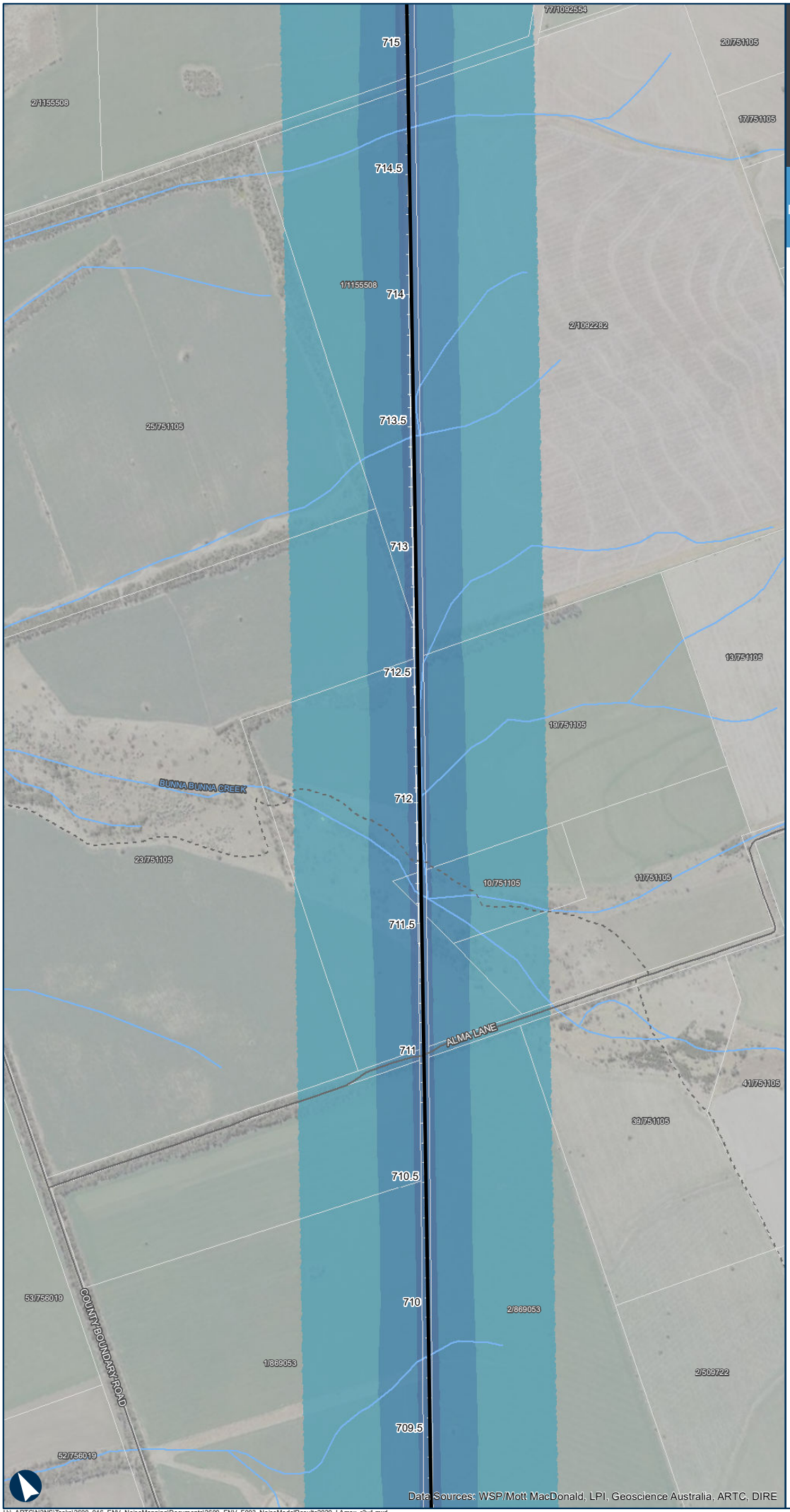
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

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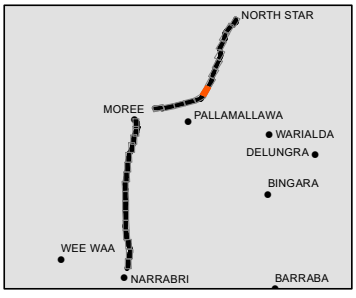
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
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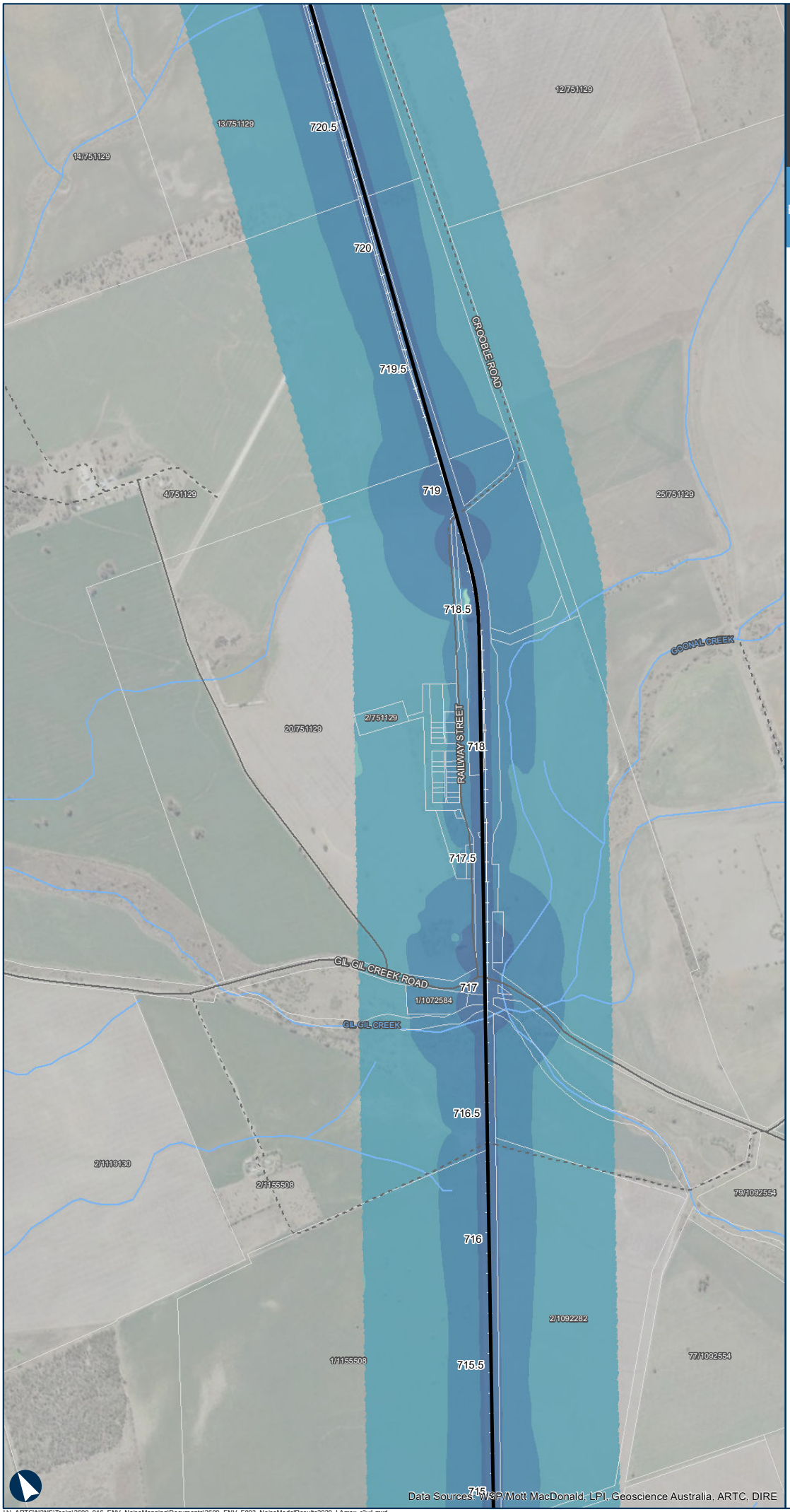
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

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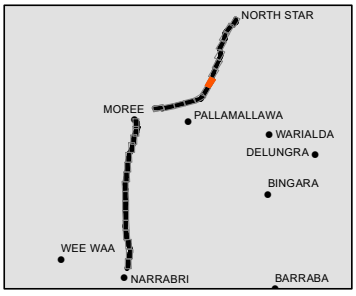
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
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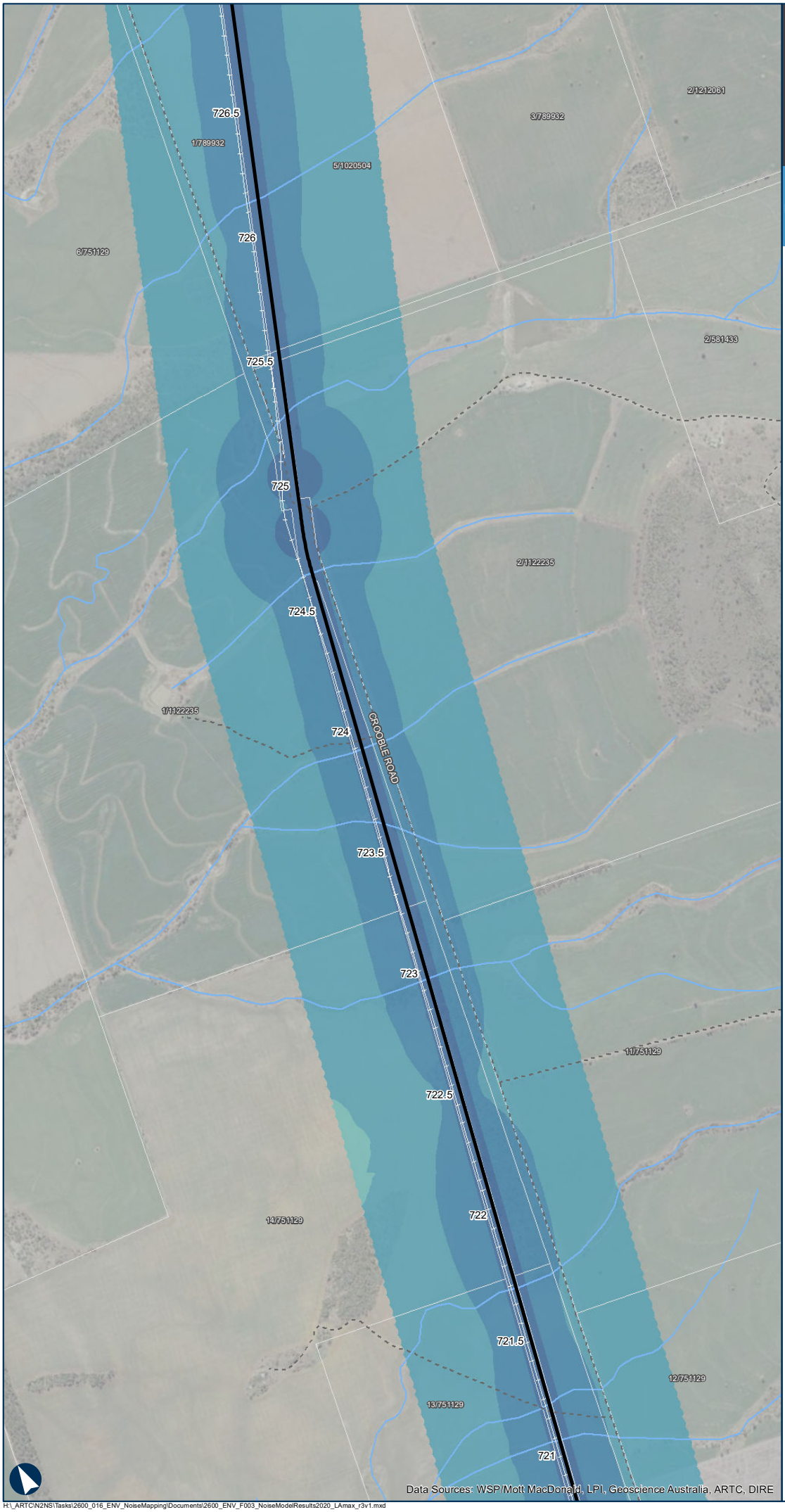
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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 25 of 31

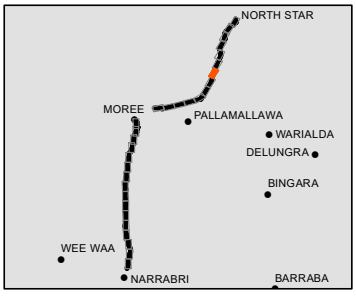
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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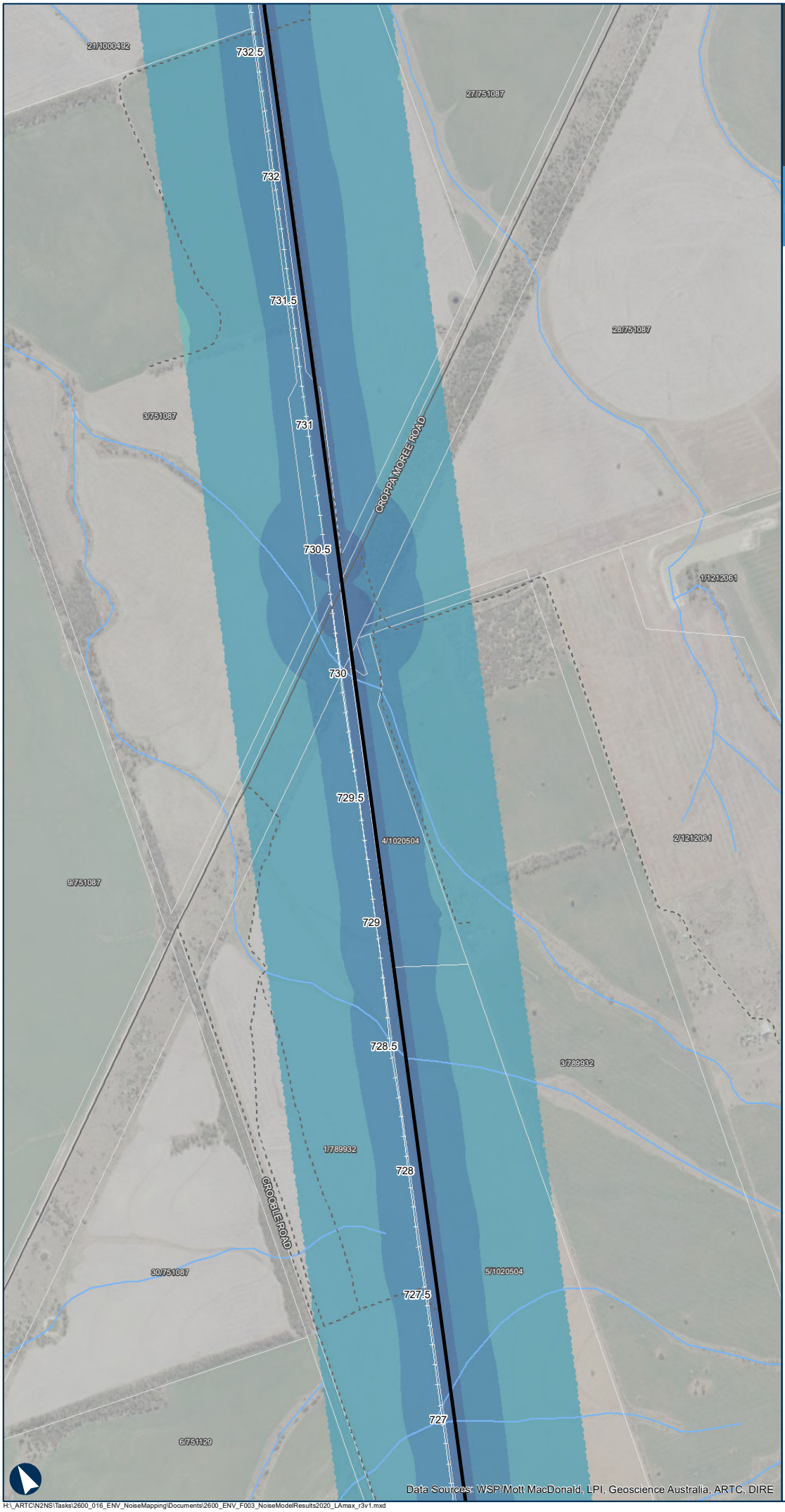
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

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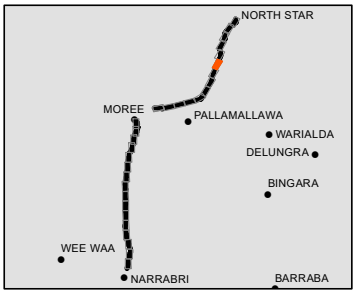
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
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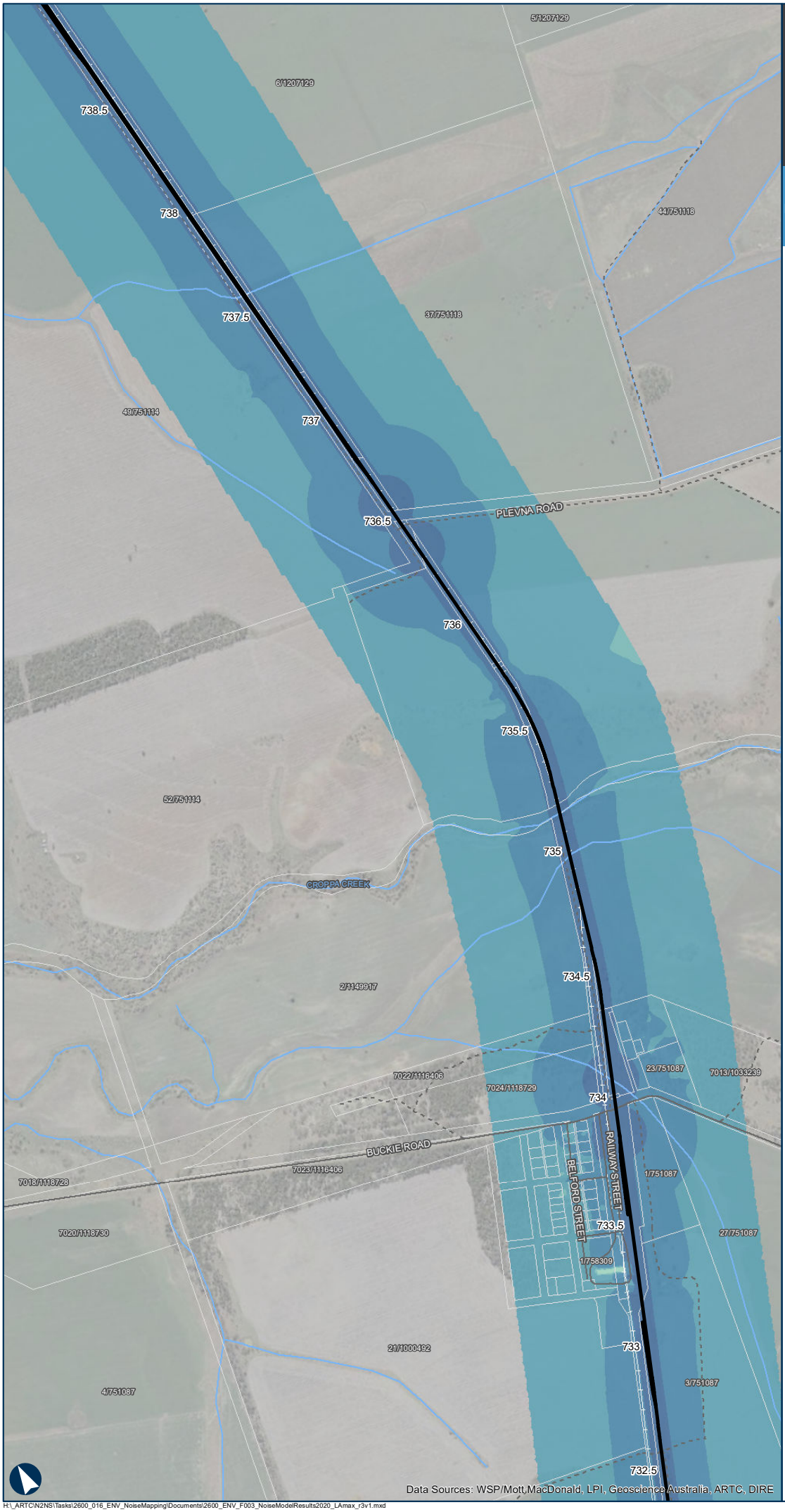
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 27 of 31

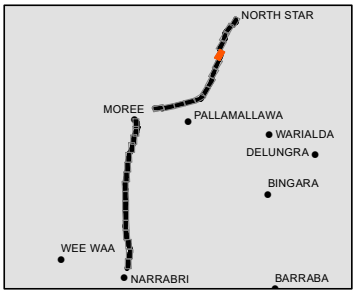
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
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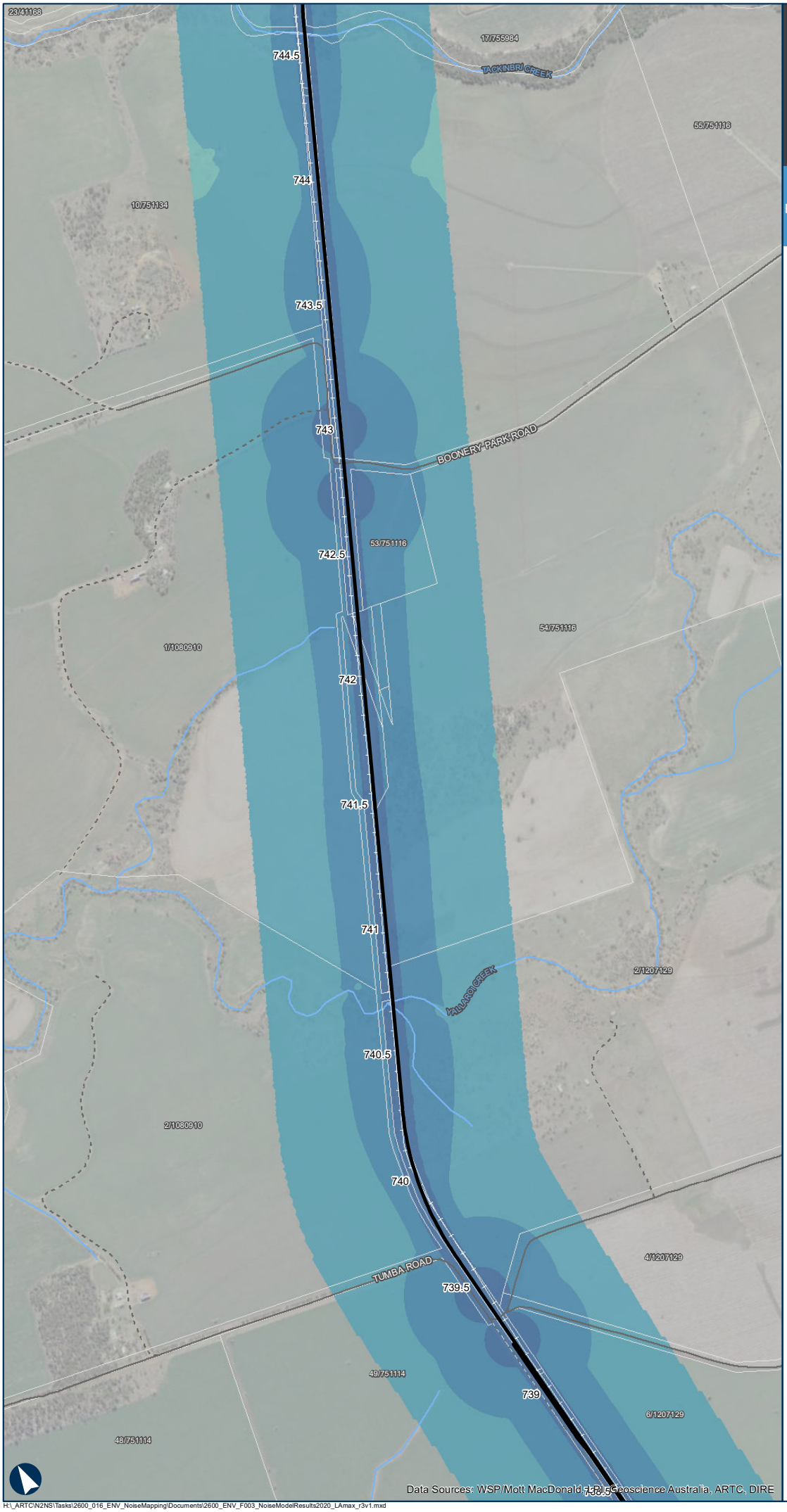
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

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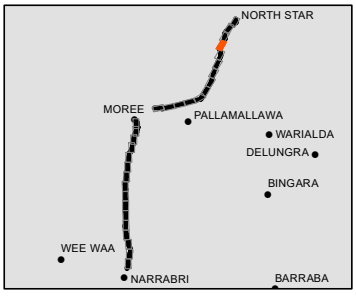
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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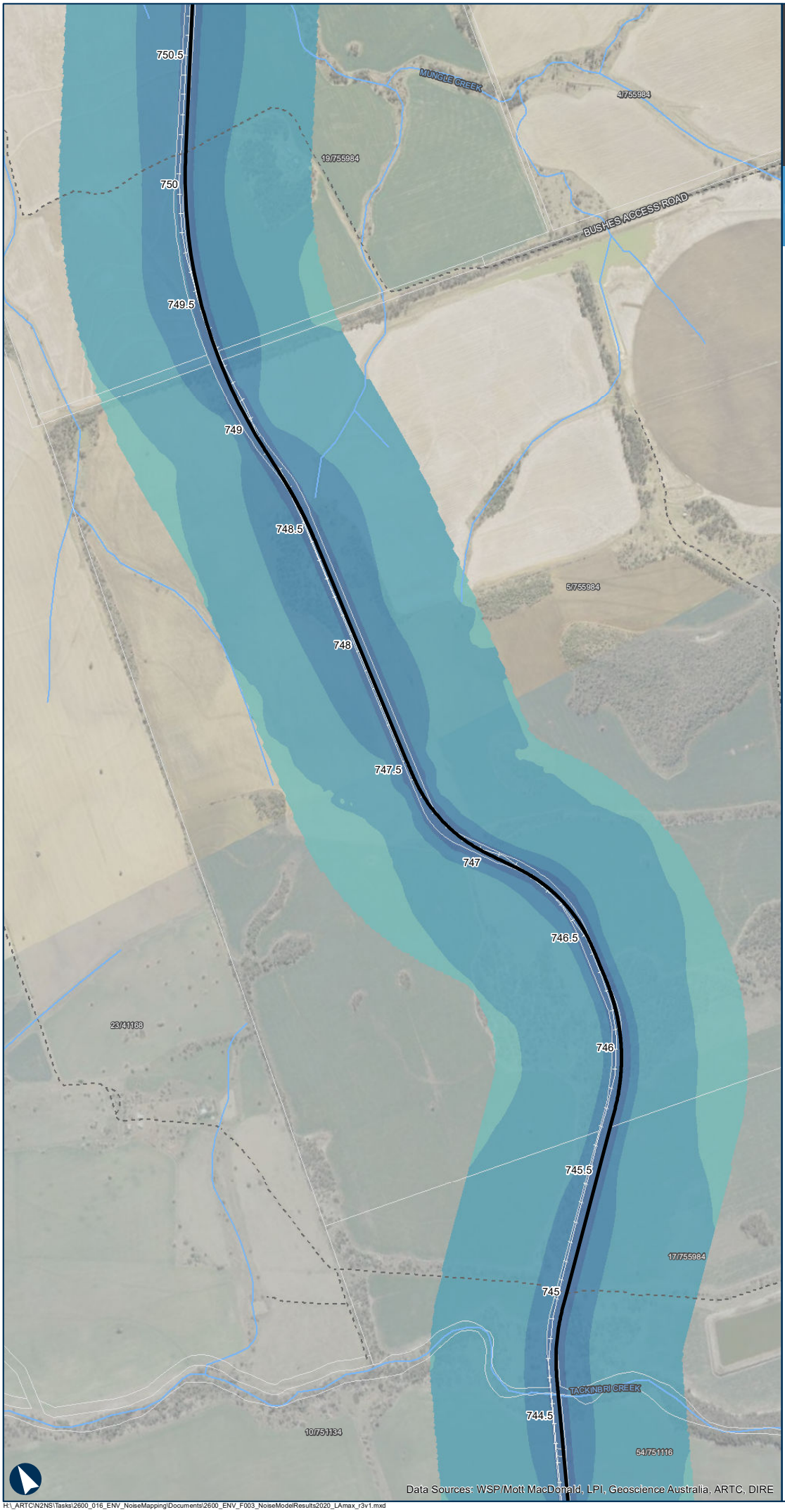
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Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

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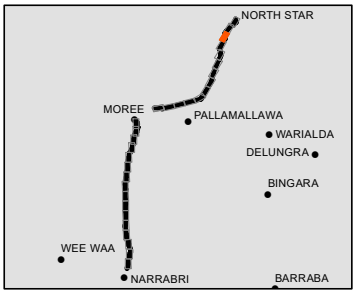
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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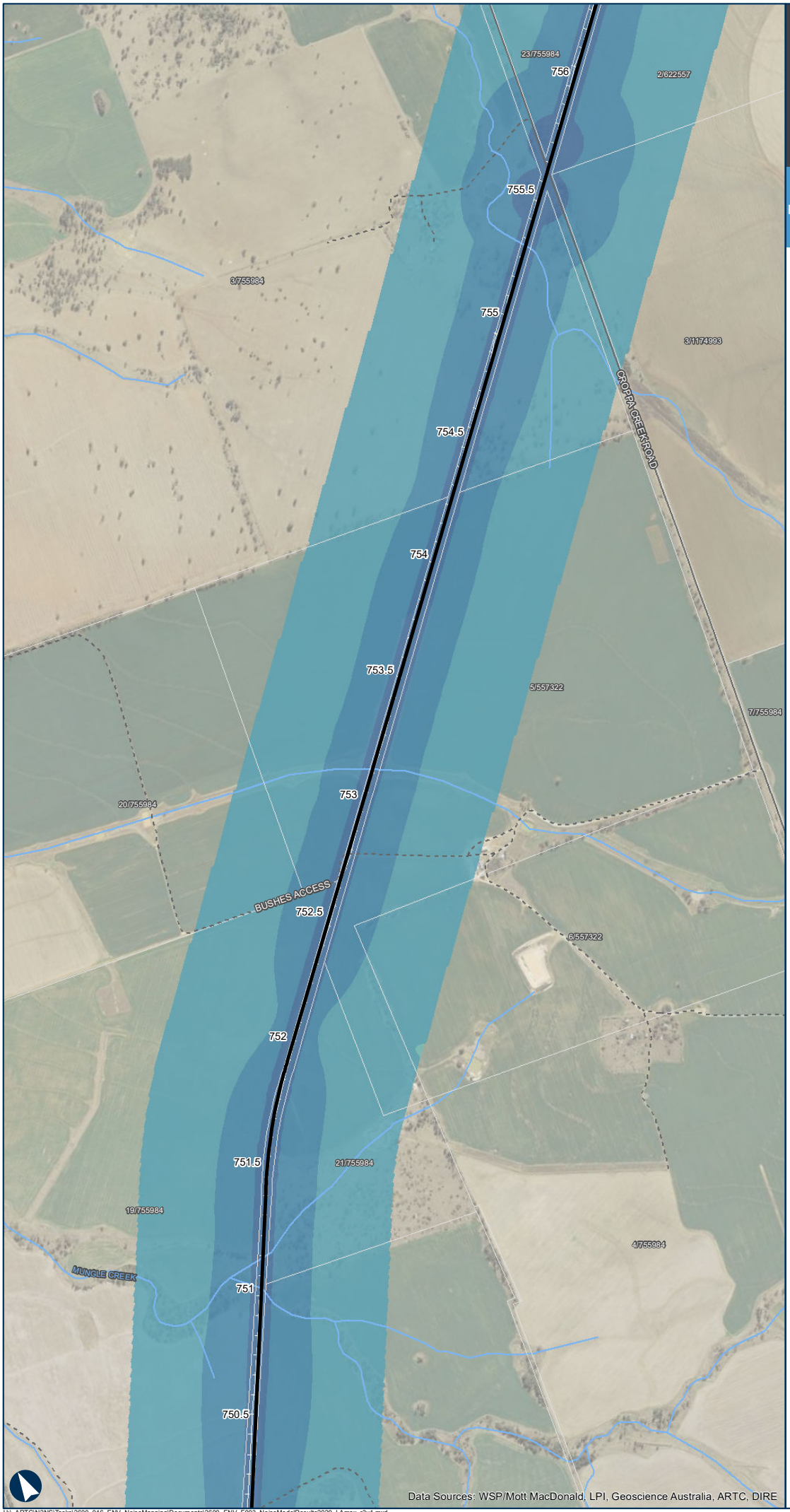
Paper: A3

Scale: 1:15,000

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 30 of 31

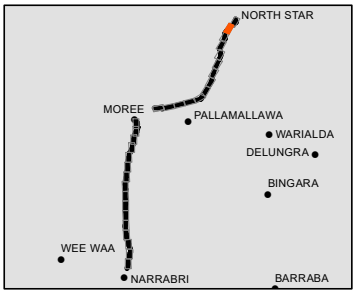
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

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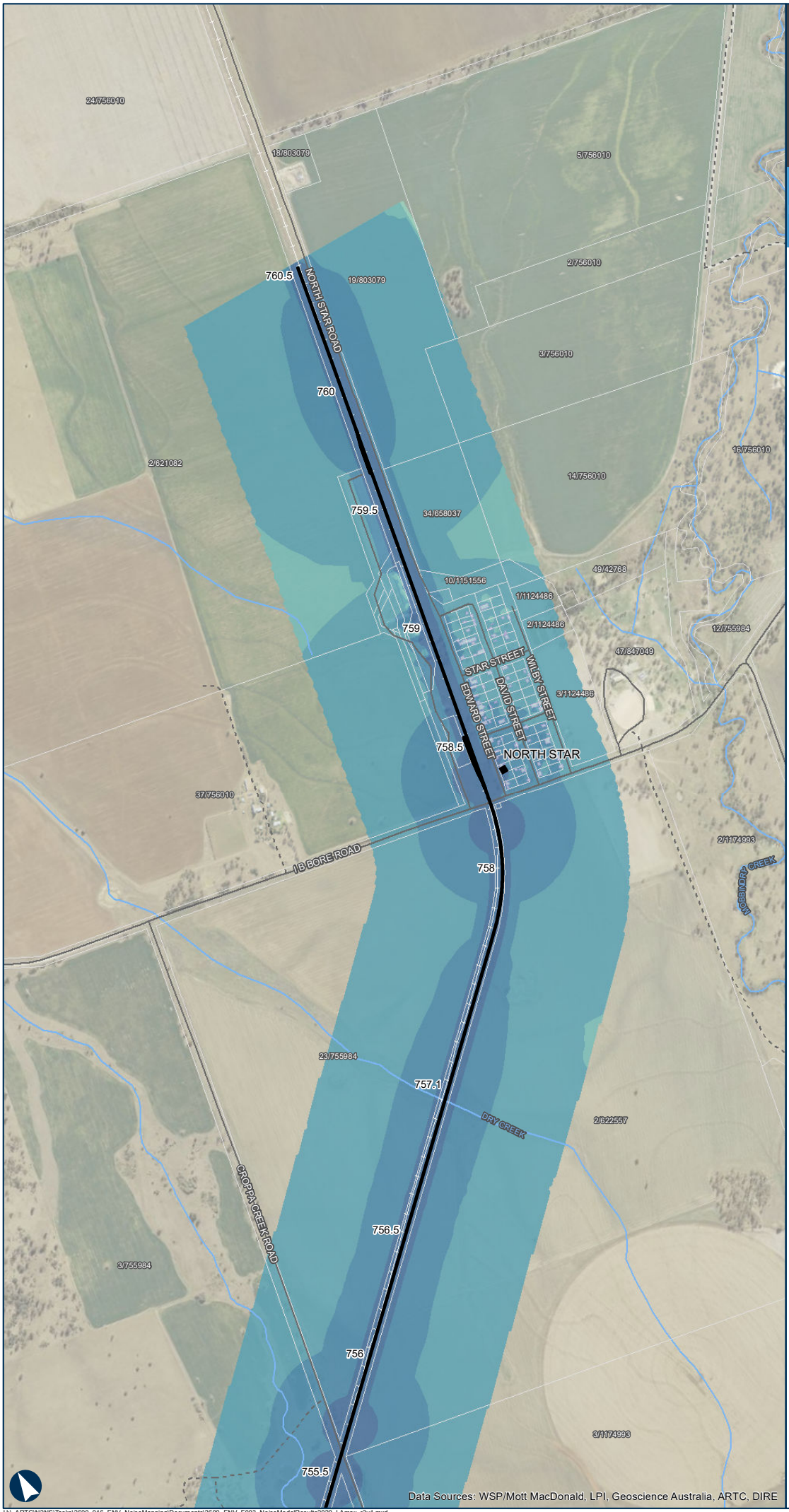
Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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INLAND RAIL

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2020 Noise Model Results - LAmax without mitigation

Sheet 31 of 31

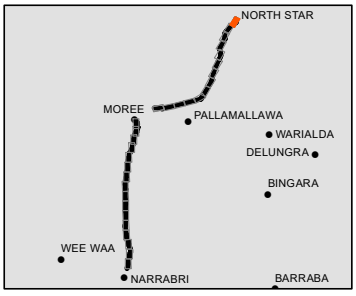
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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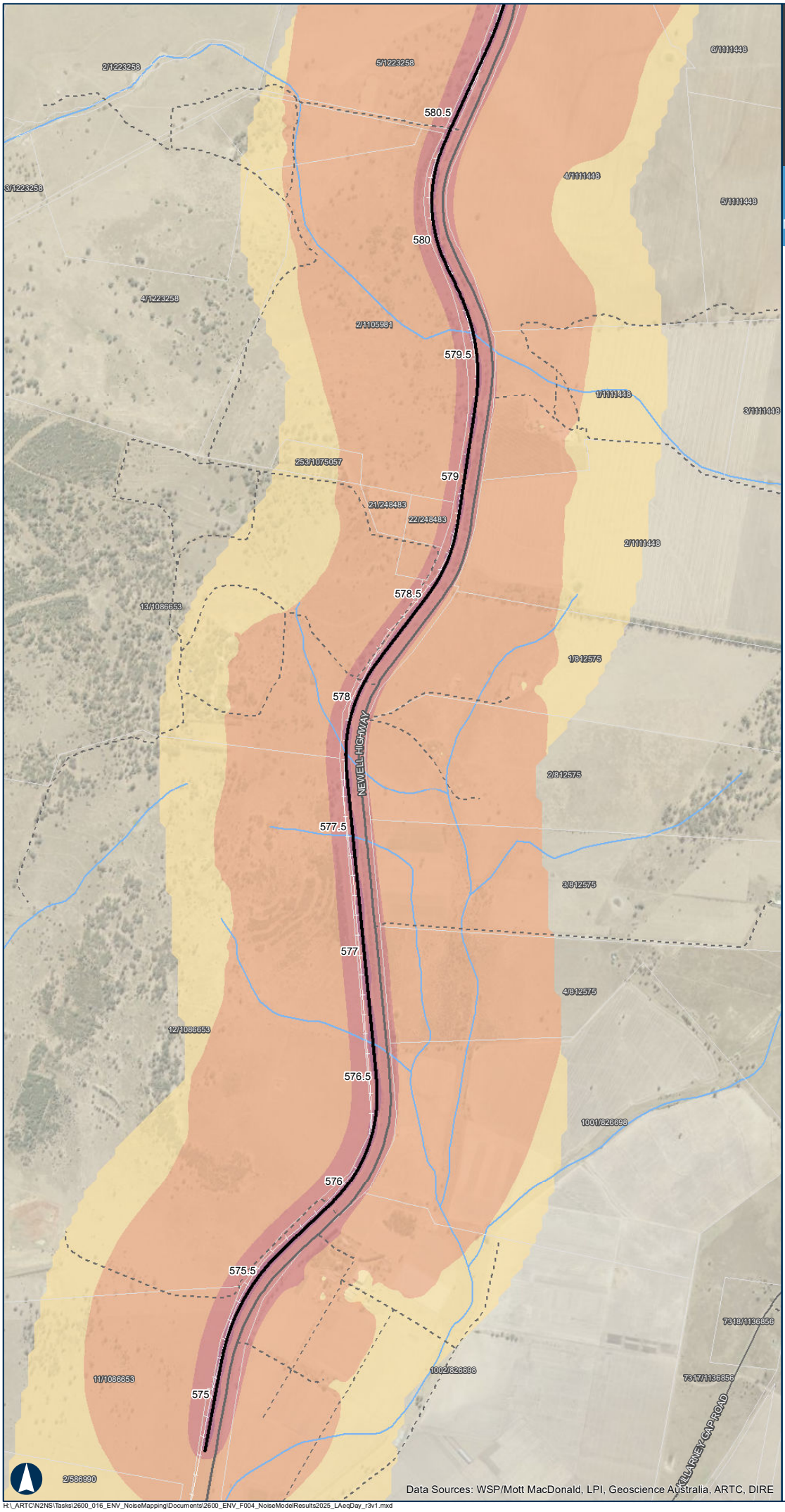
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Author: IRDJV

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 1 of 31

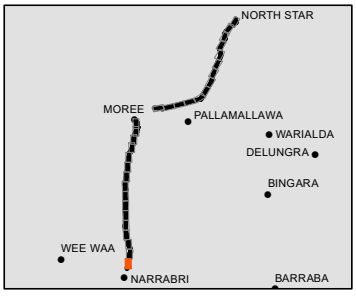
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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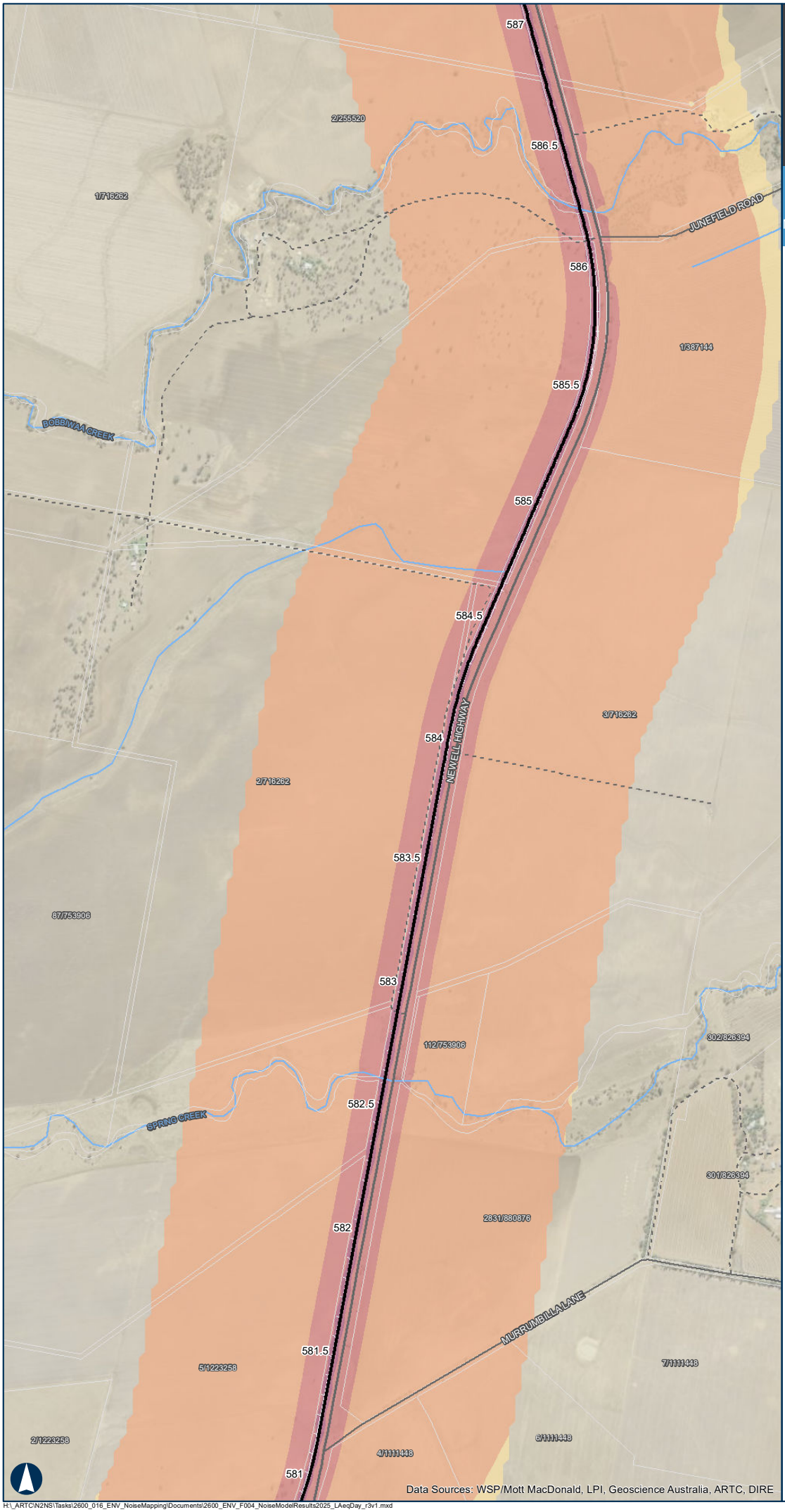
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Scale: 1:15,000

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Author: IRDJV

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 2 of 31

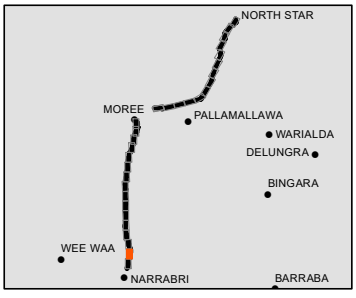
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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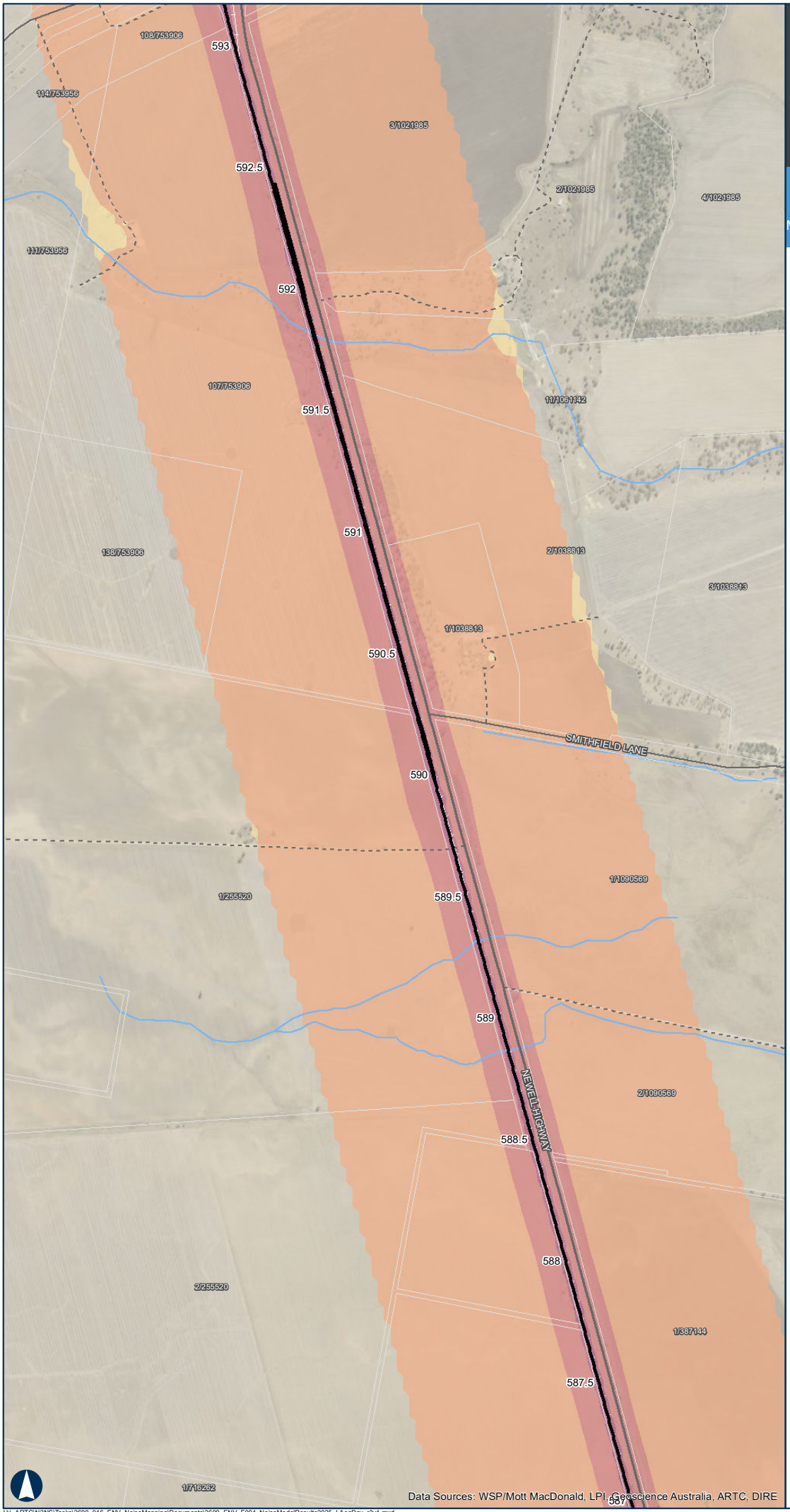
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Author: IRDJV

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 3 of 31

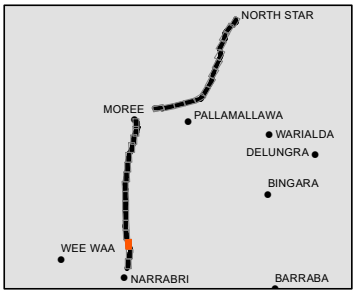
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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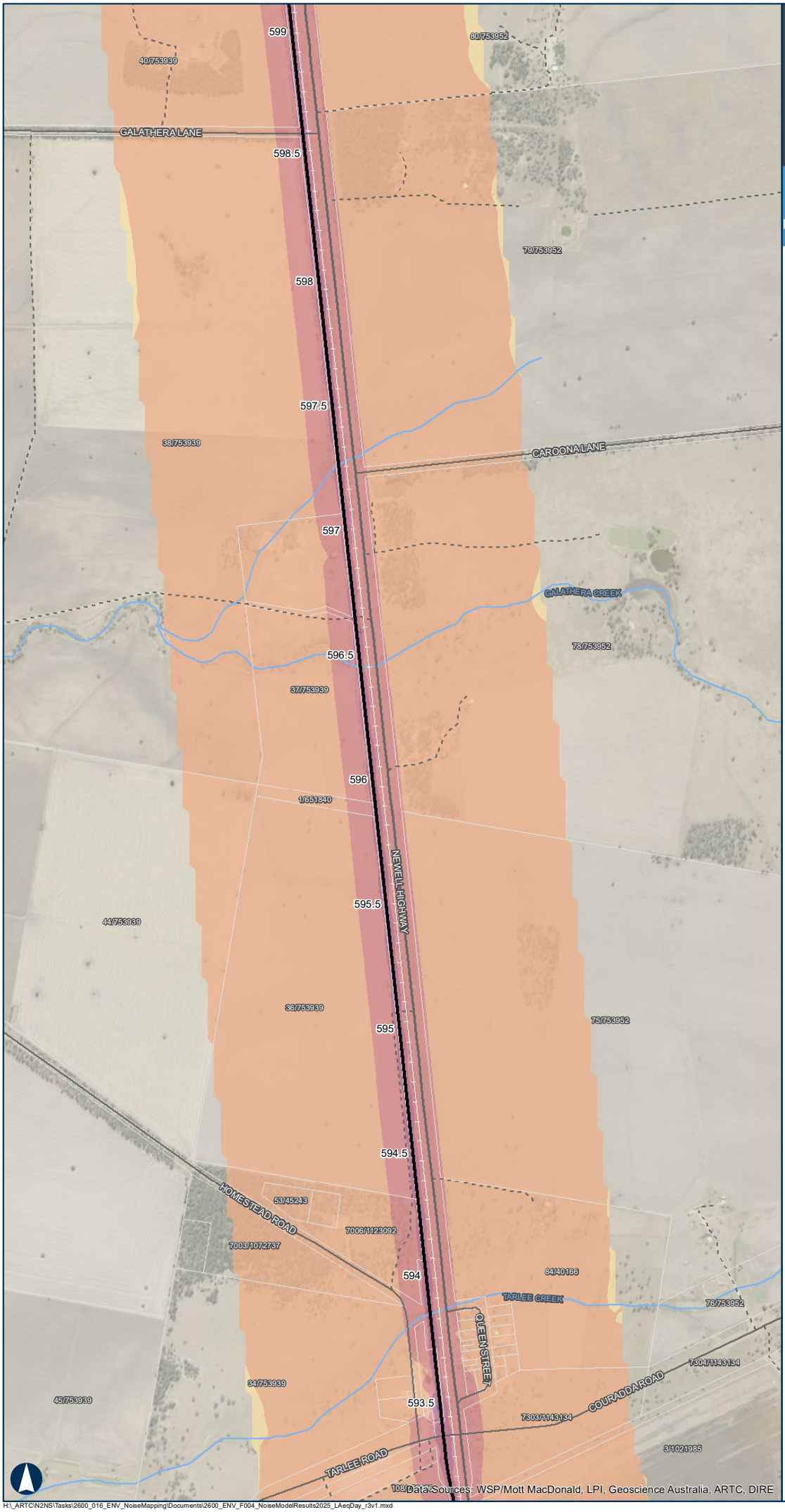
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Scale: 1:15,000

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Author: IRDJV

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 4 of 31

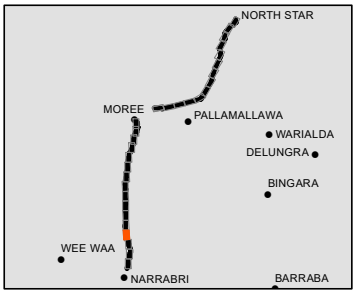
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
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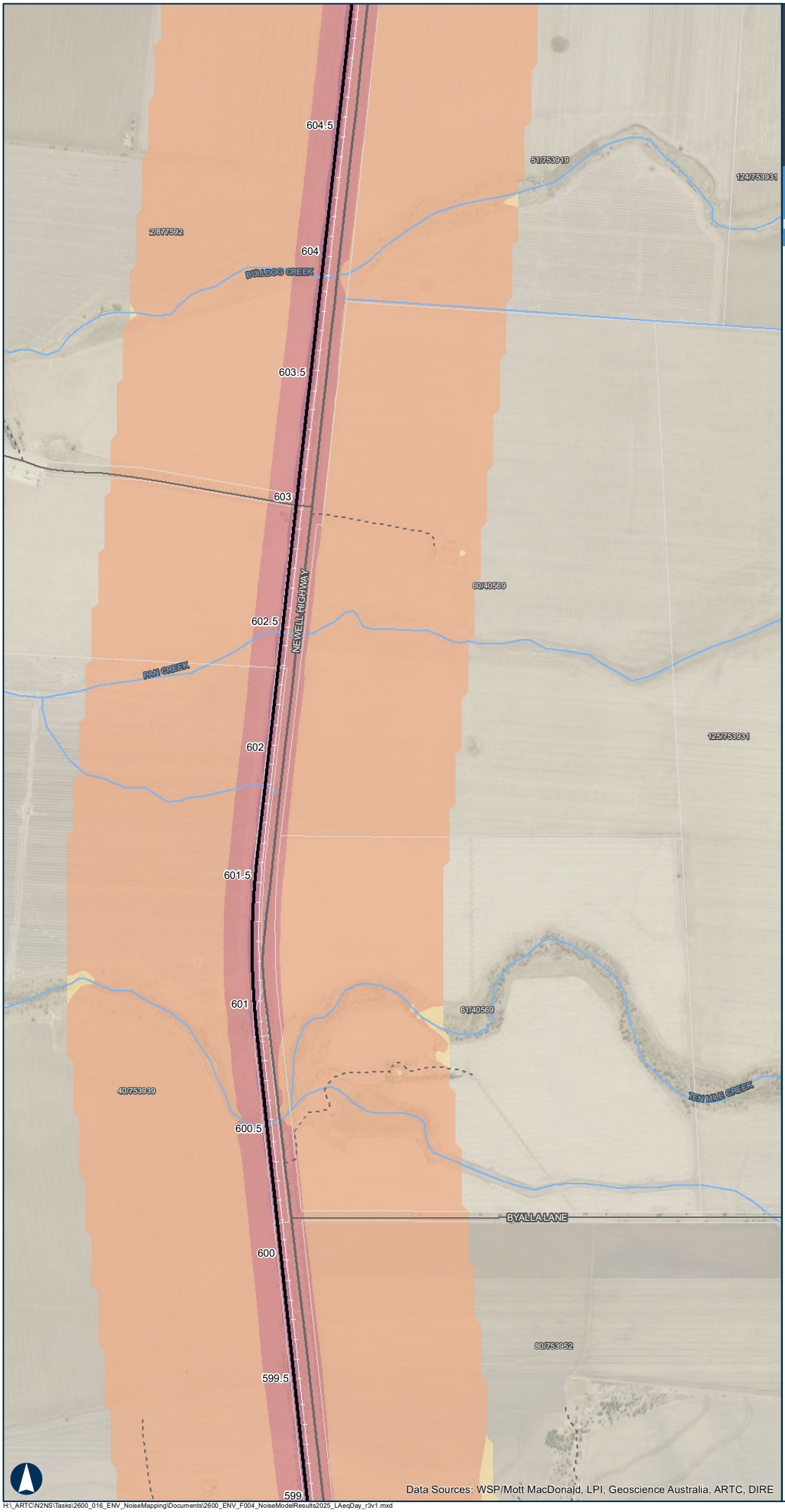
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 5 of 31

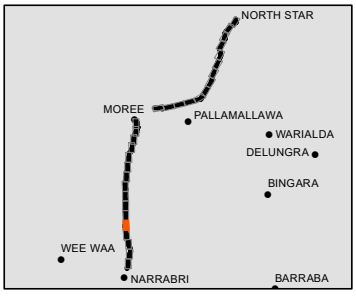
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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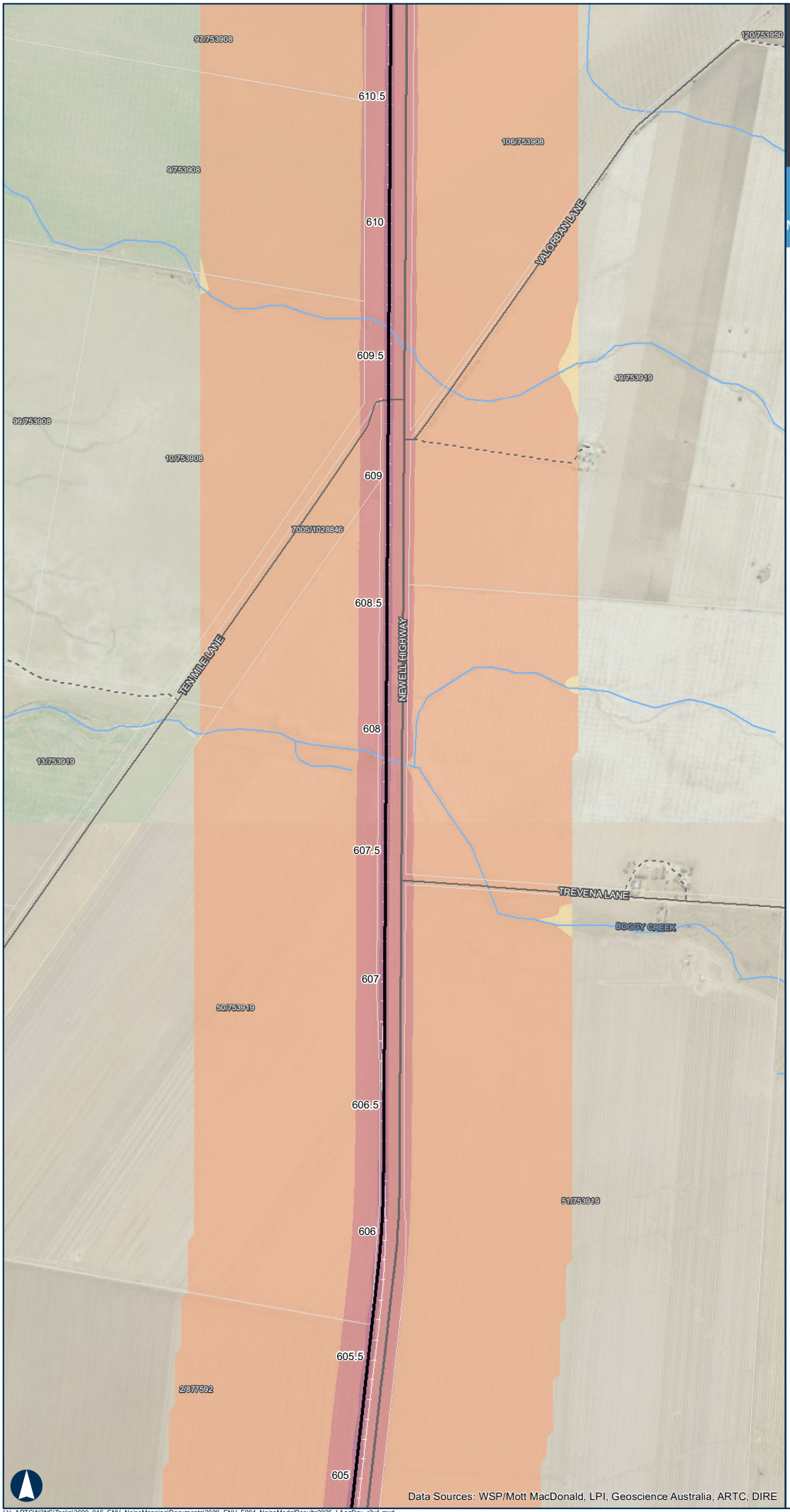
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 6 of 31

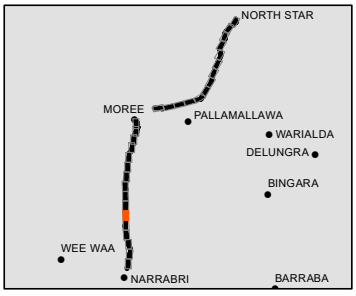
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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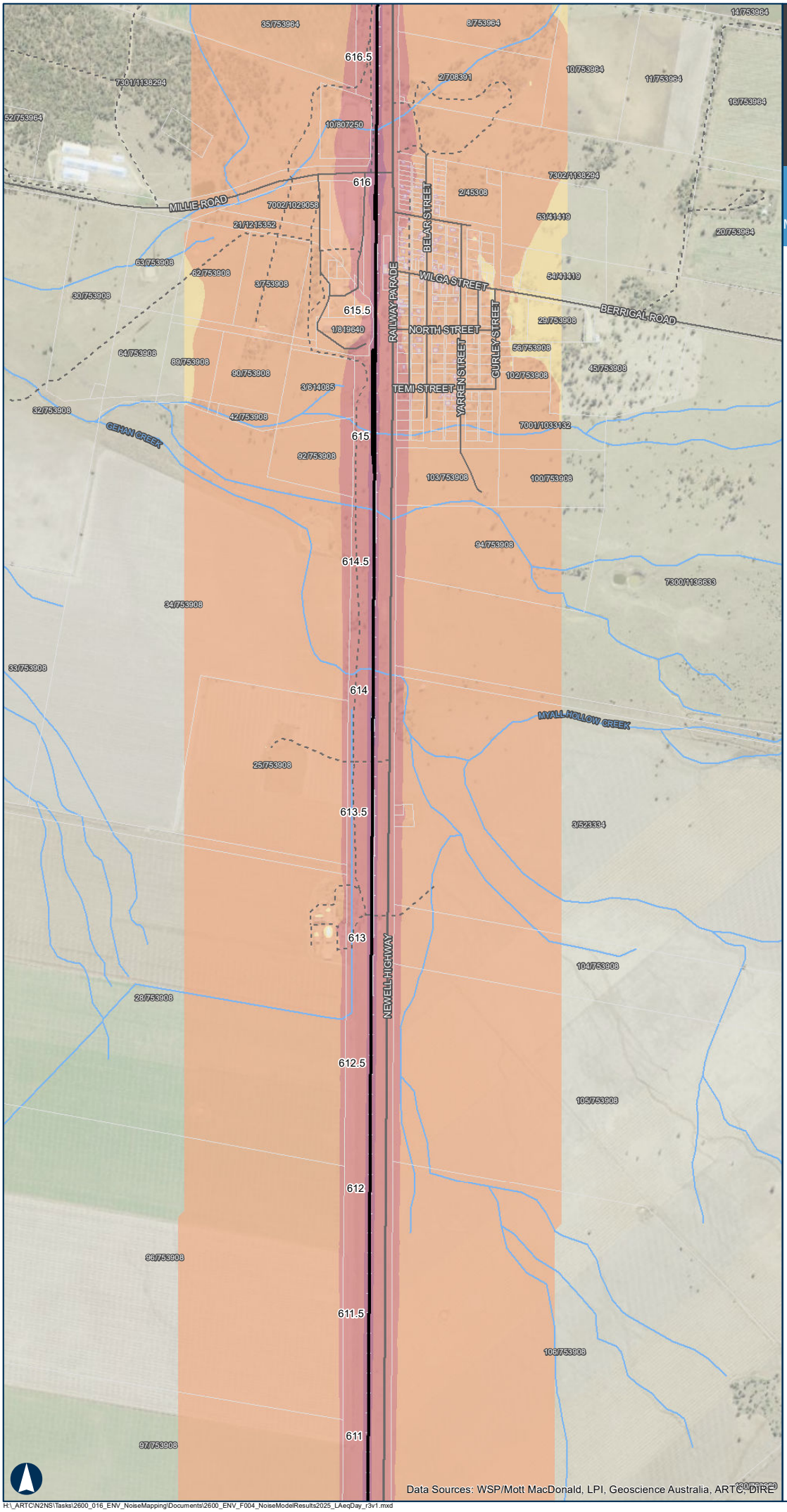
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Scale: 1:15,000

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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 7 of 31

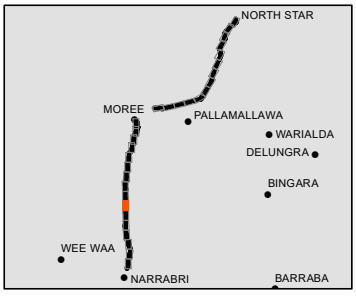
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
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- 65 - 70
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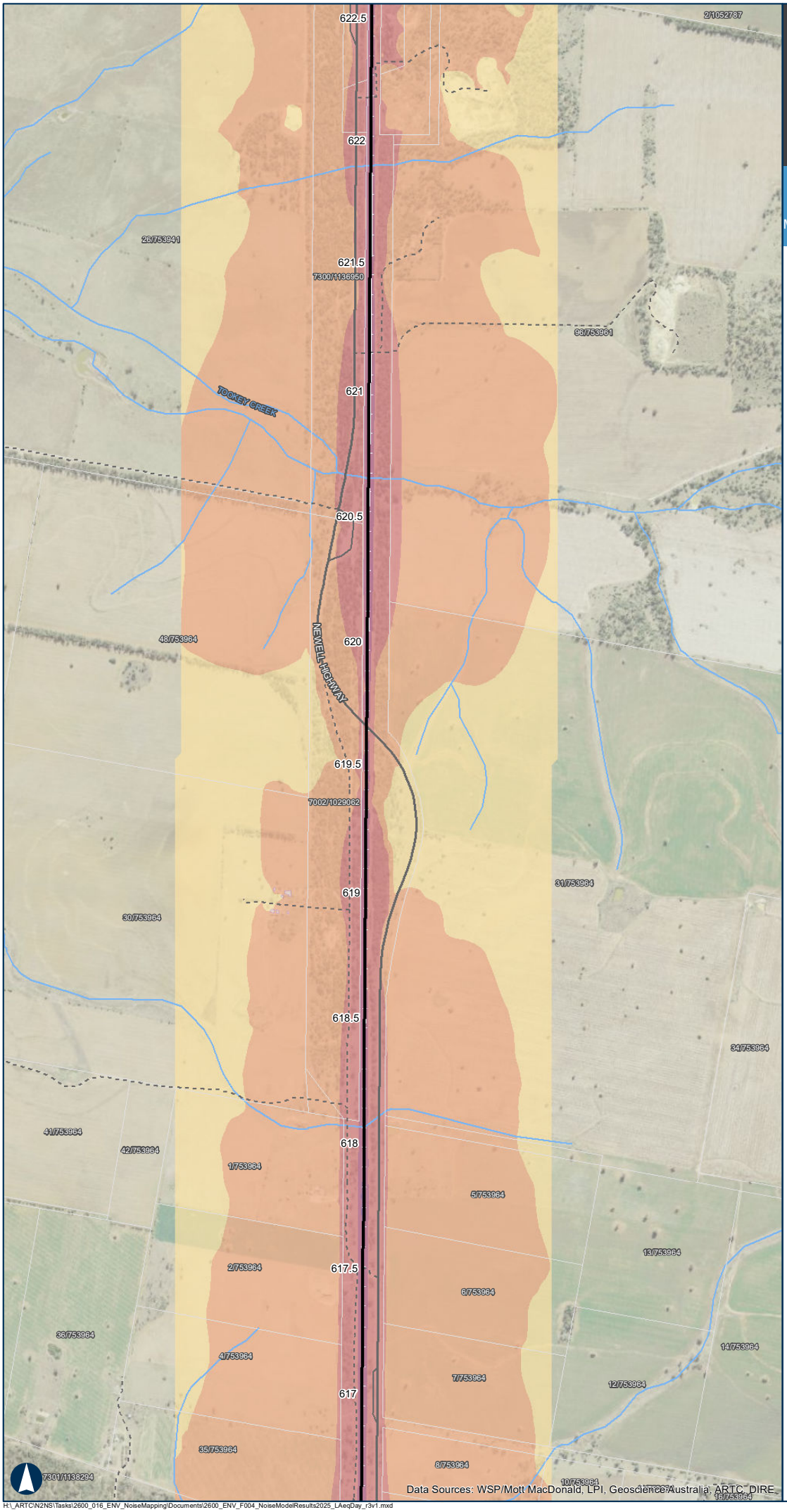
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Date: 13-Aug-21

Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 8 of 31

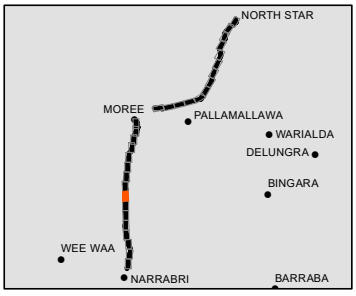
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

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- 65 - 70
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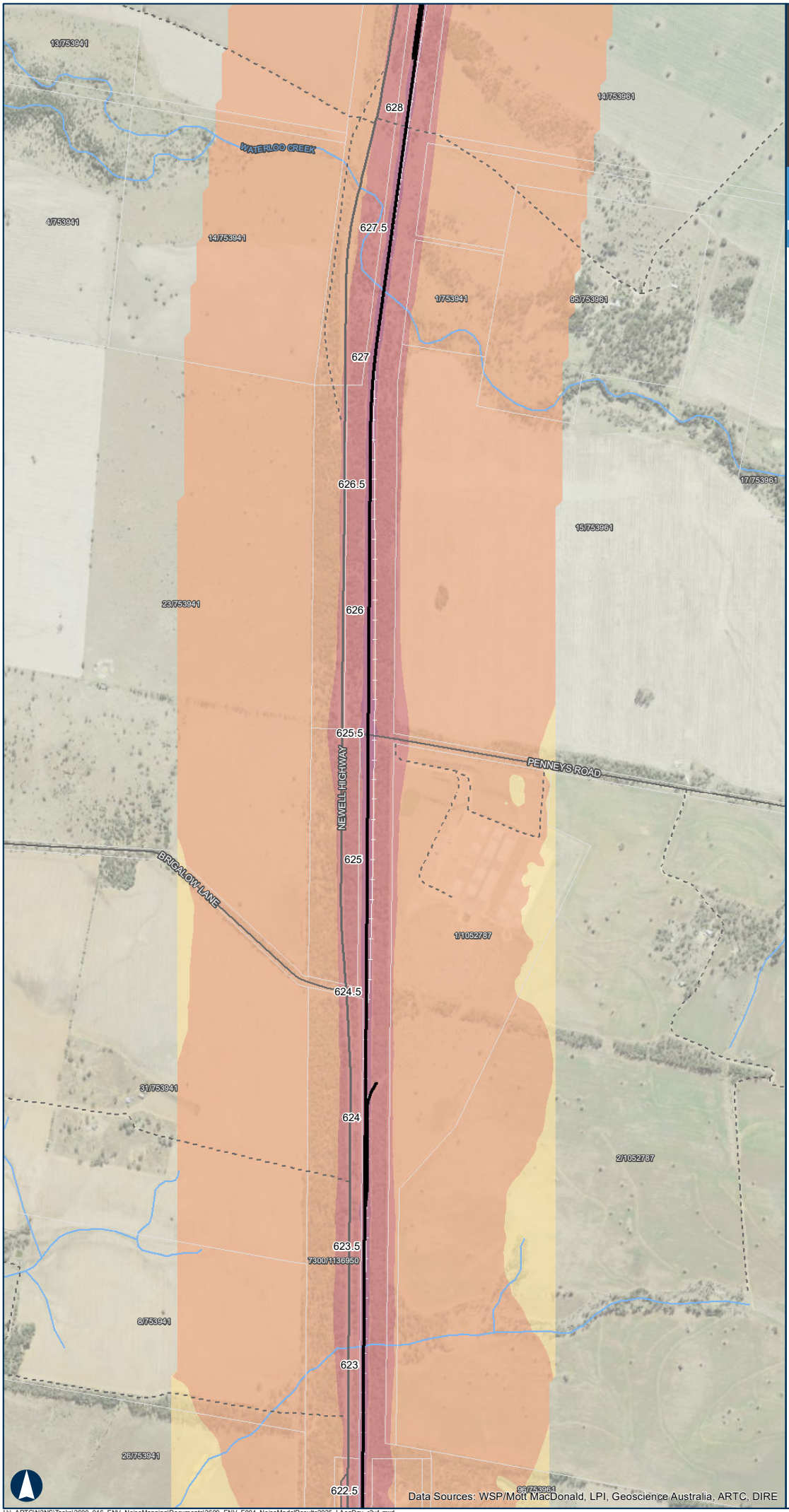
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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 9 of 31

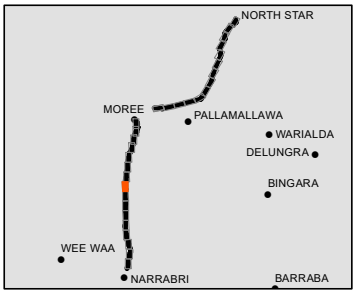
LEGEND

- Townships
- Highway
- Local Road
- Track
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Noise Contours (dB(A))

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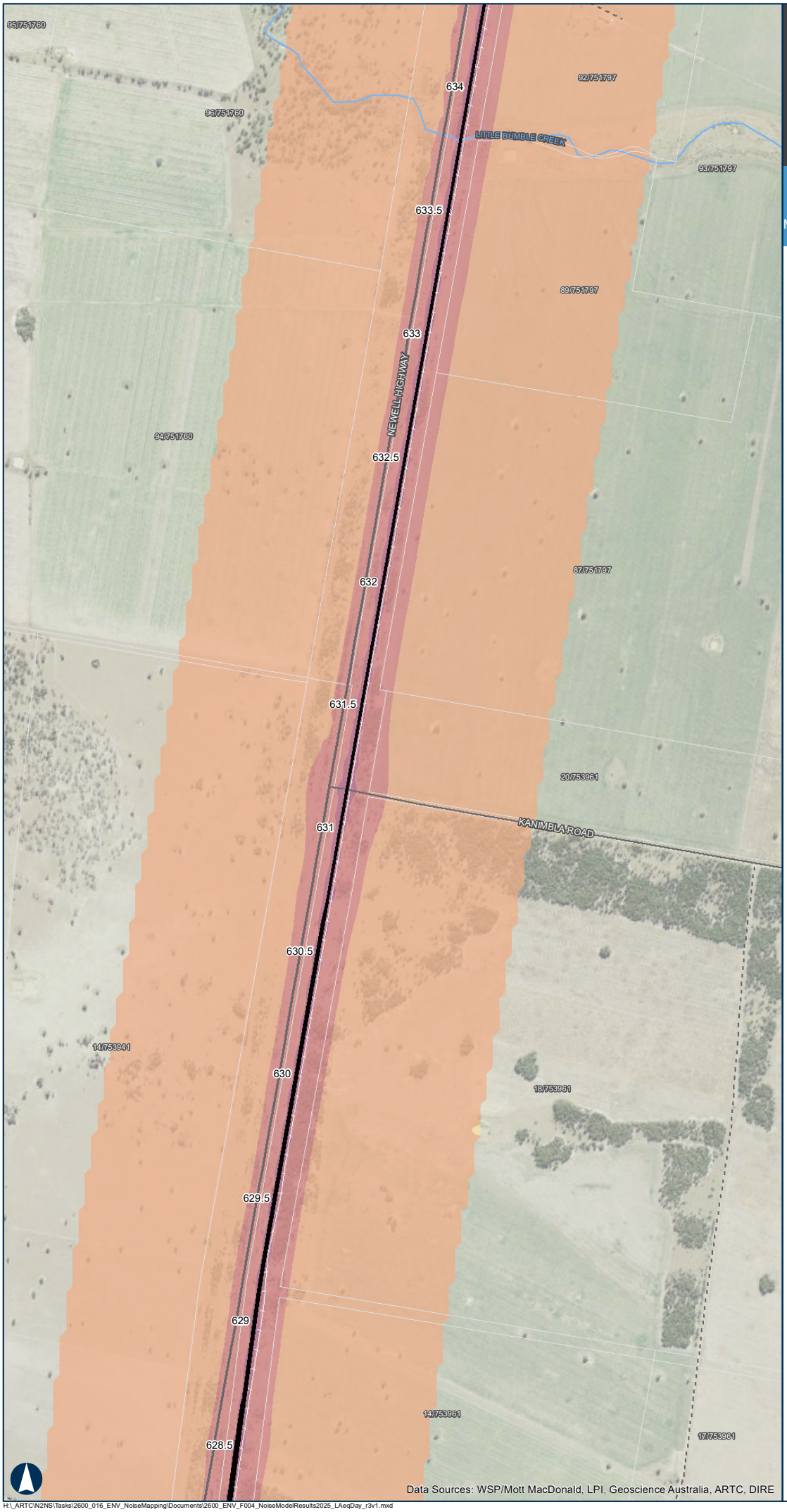
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Scale: 1:15,000

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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 10 of 31

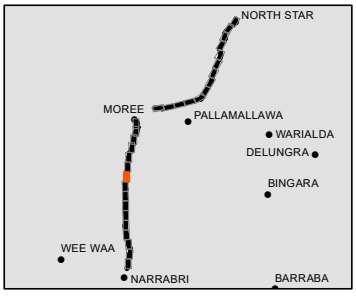
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

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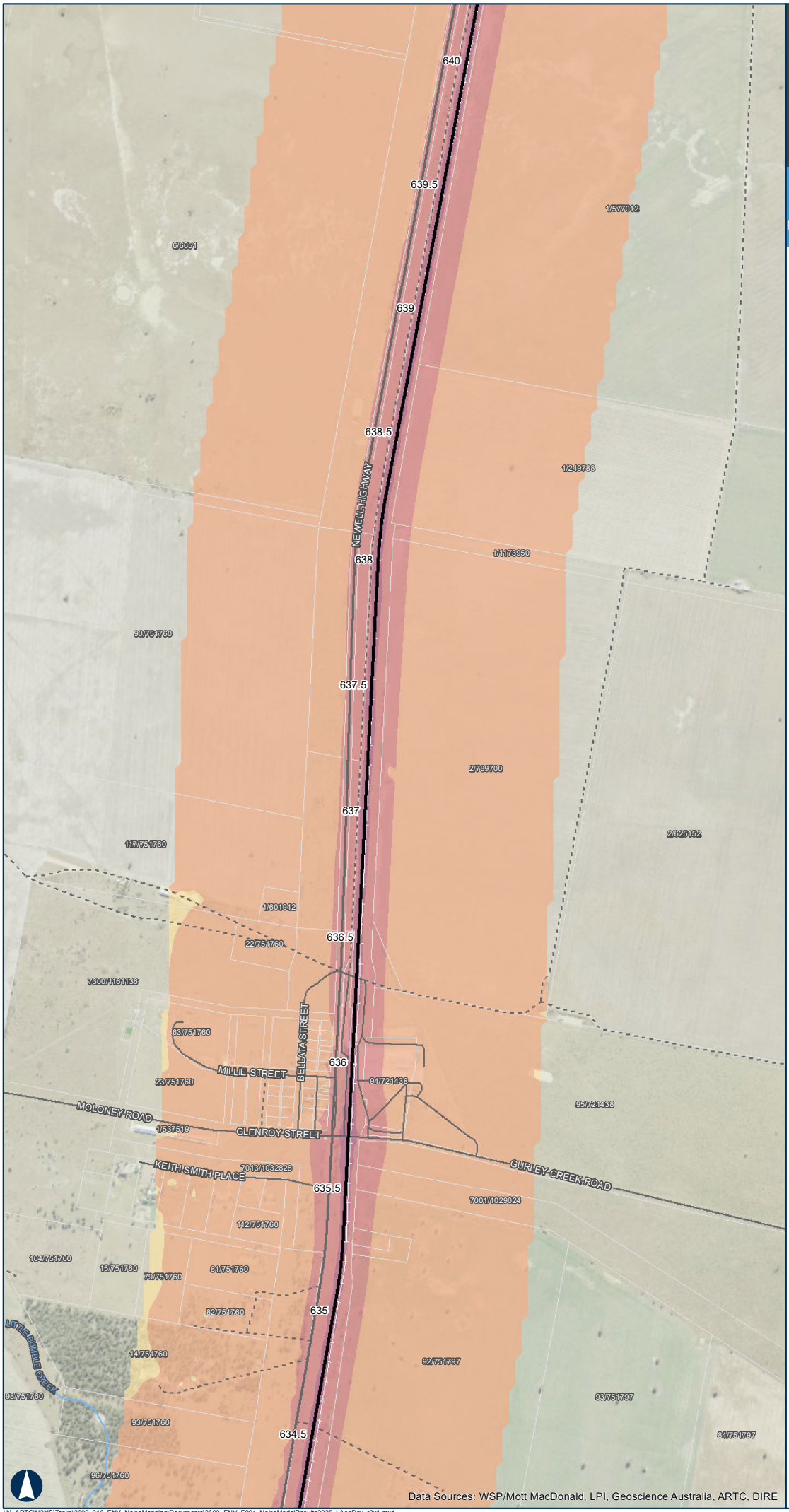
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Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 11 of 31

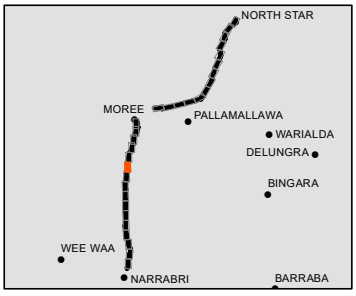
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

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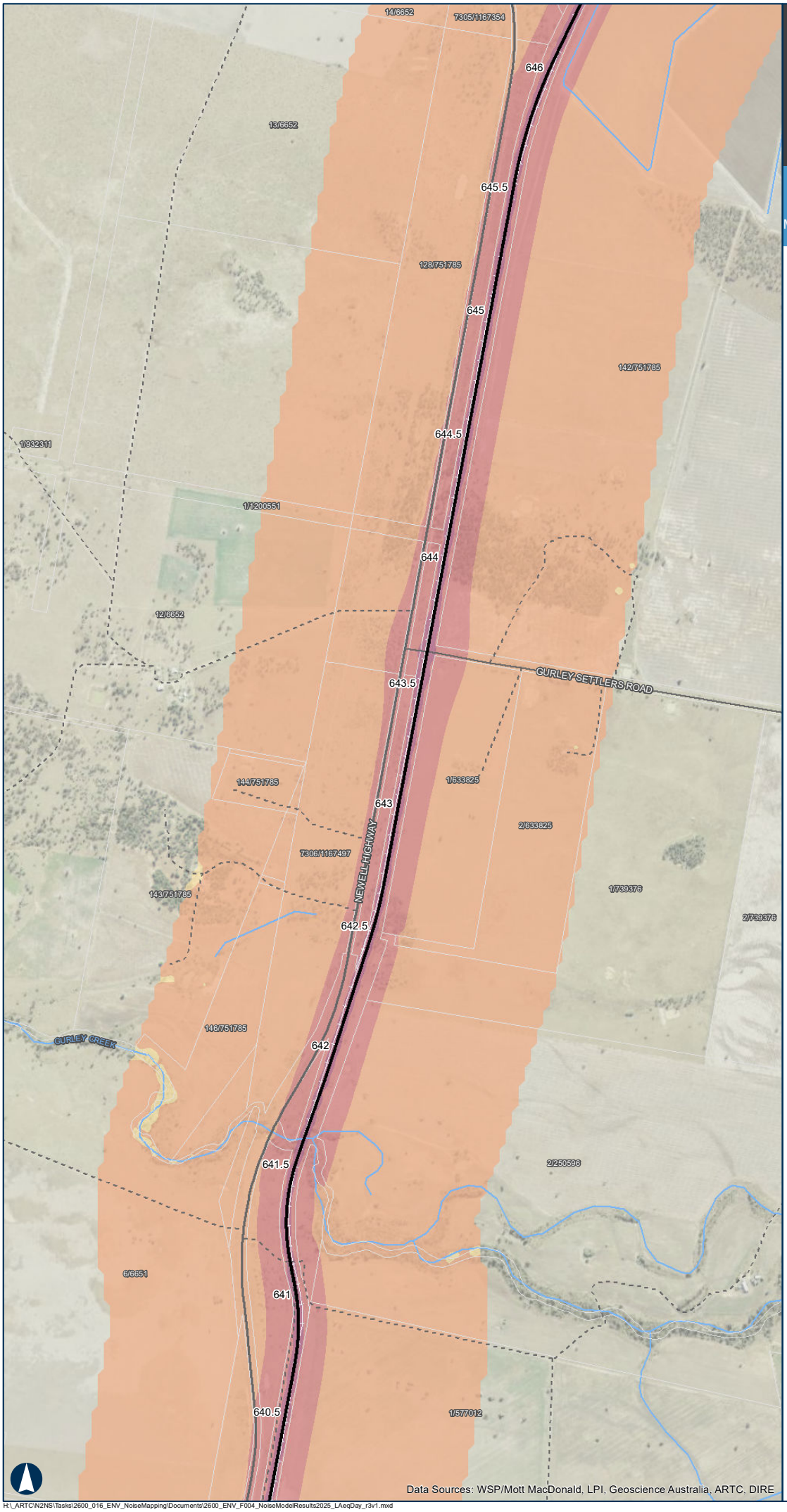
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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INLAND RAIL

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

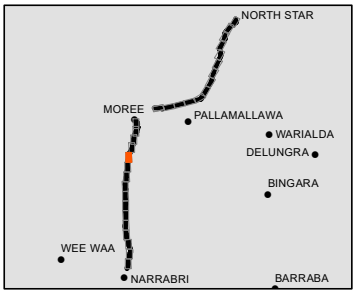
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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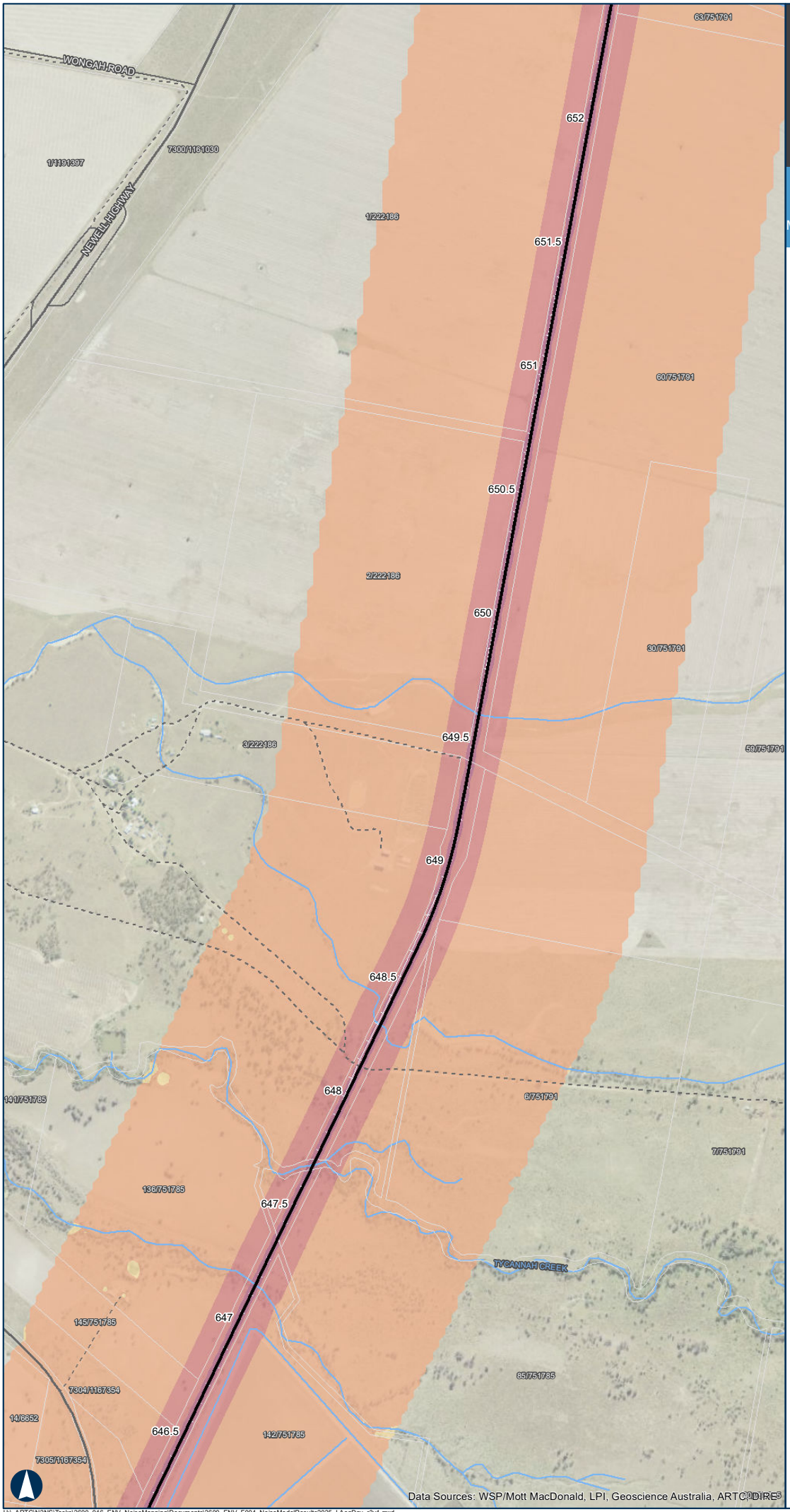
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

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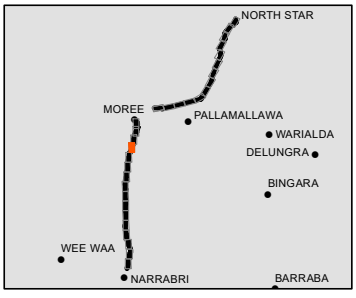
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

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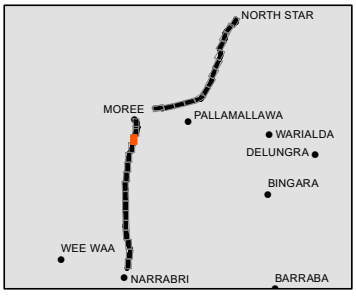
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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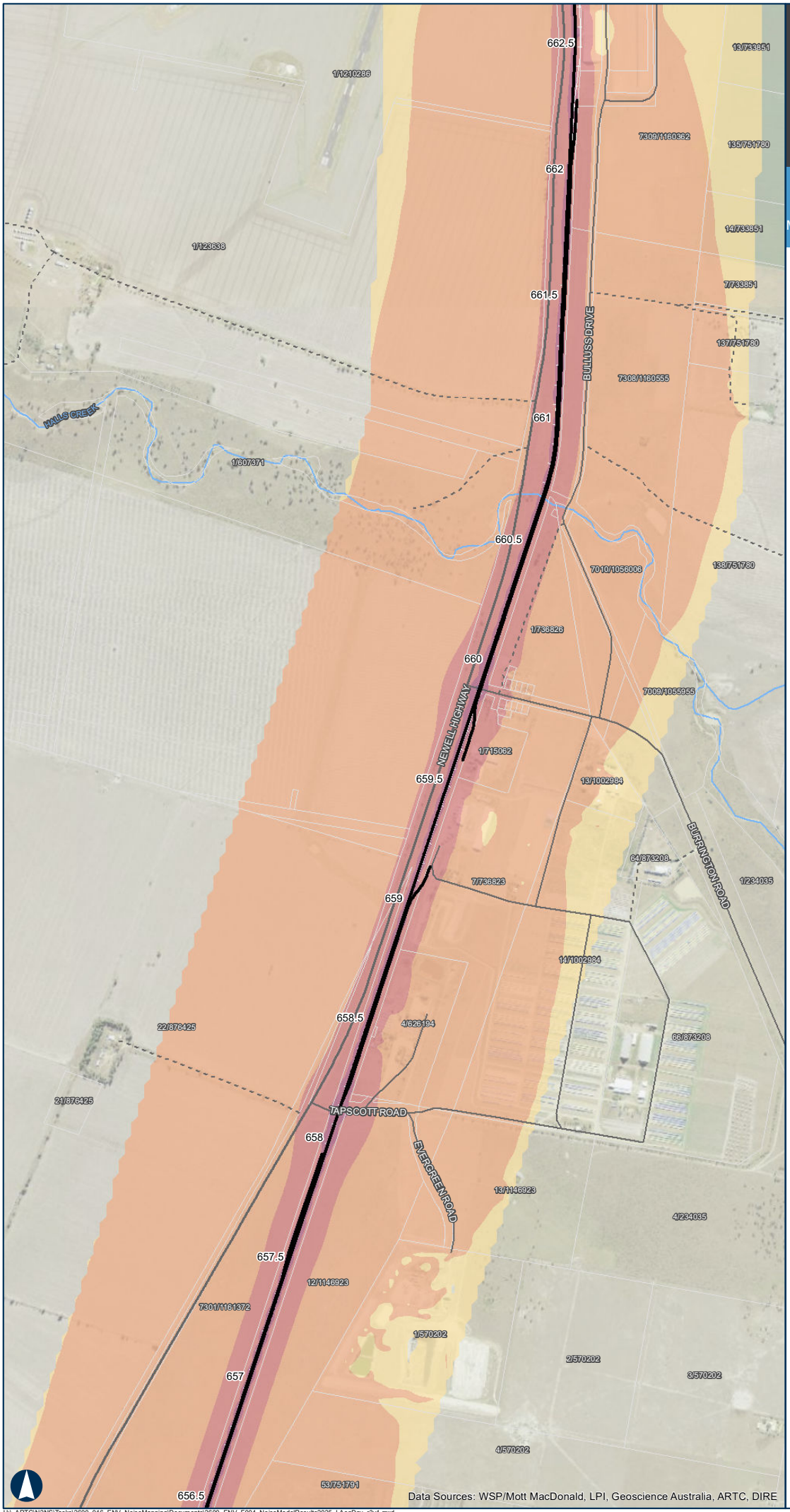
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 15 of 31

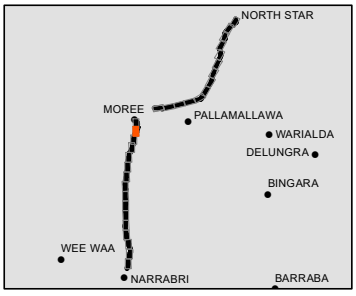
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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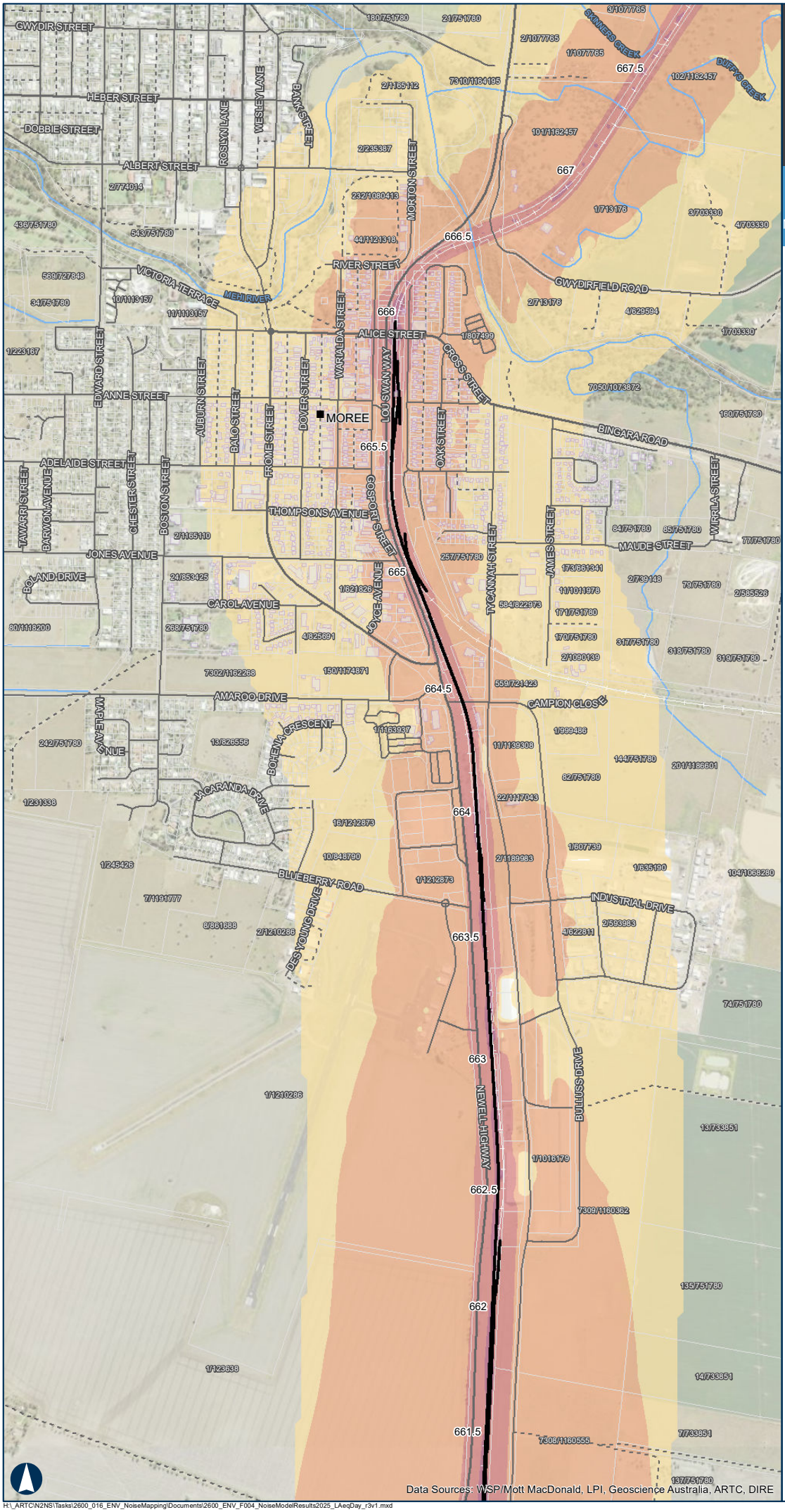
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

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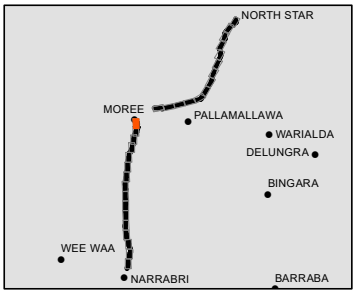
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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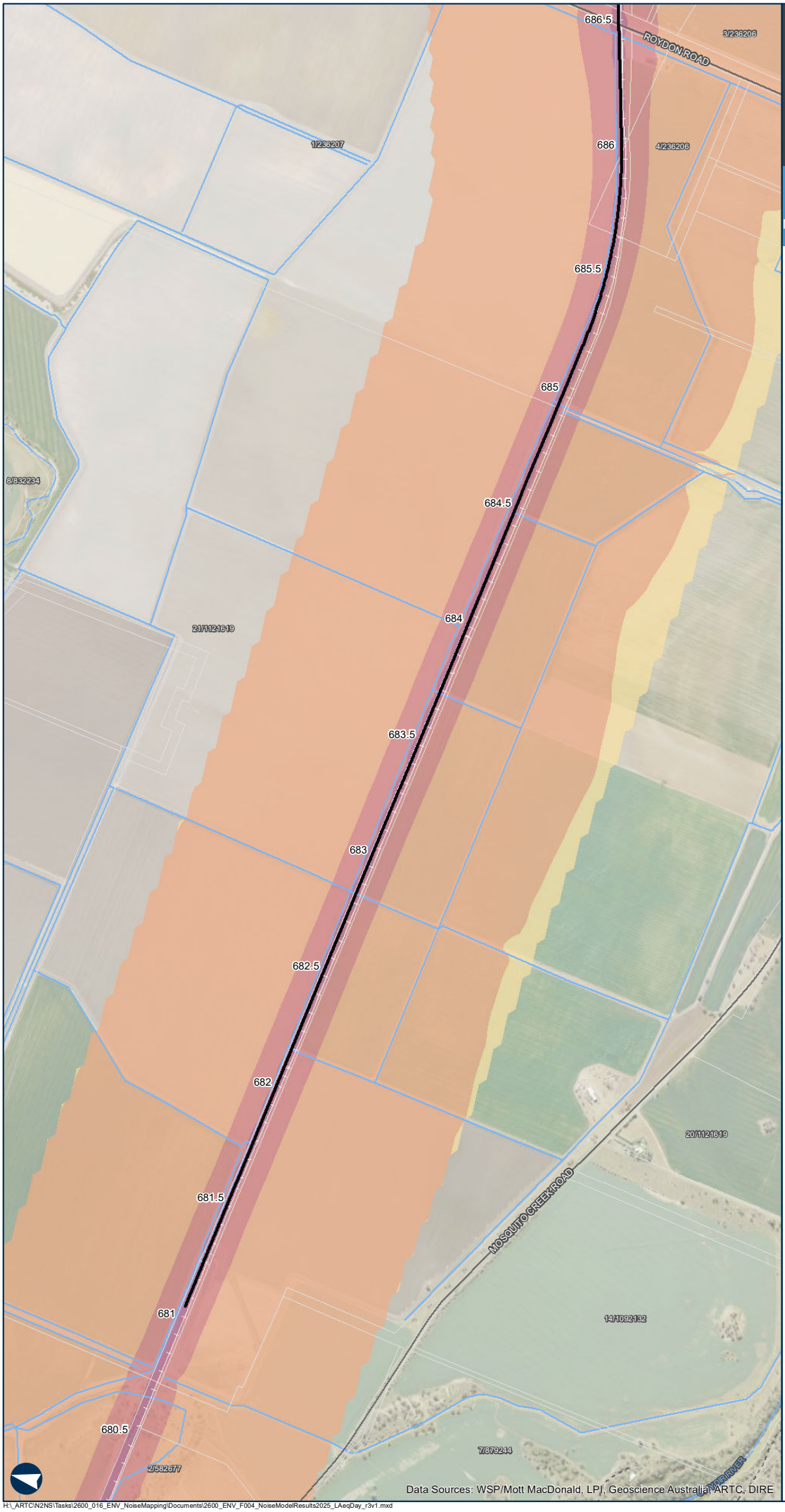
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

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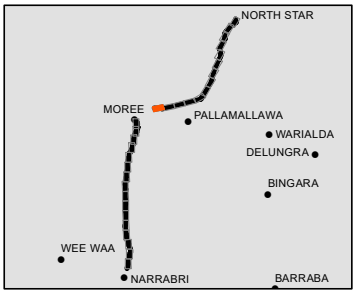
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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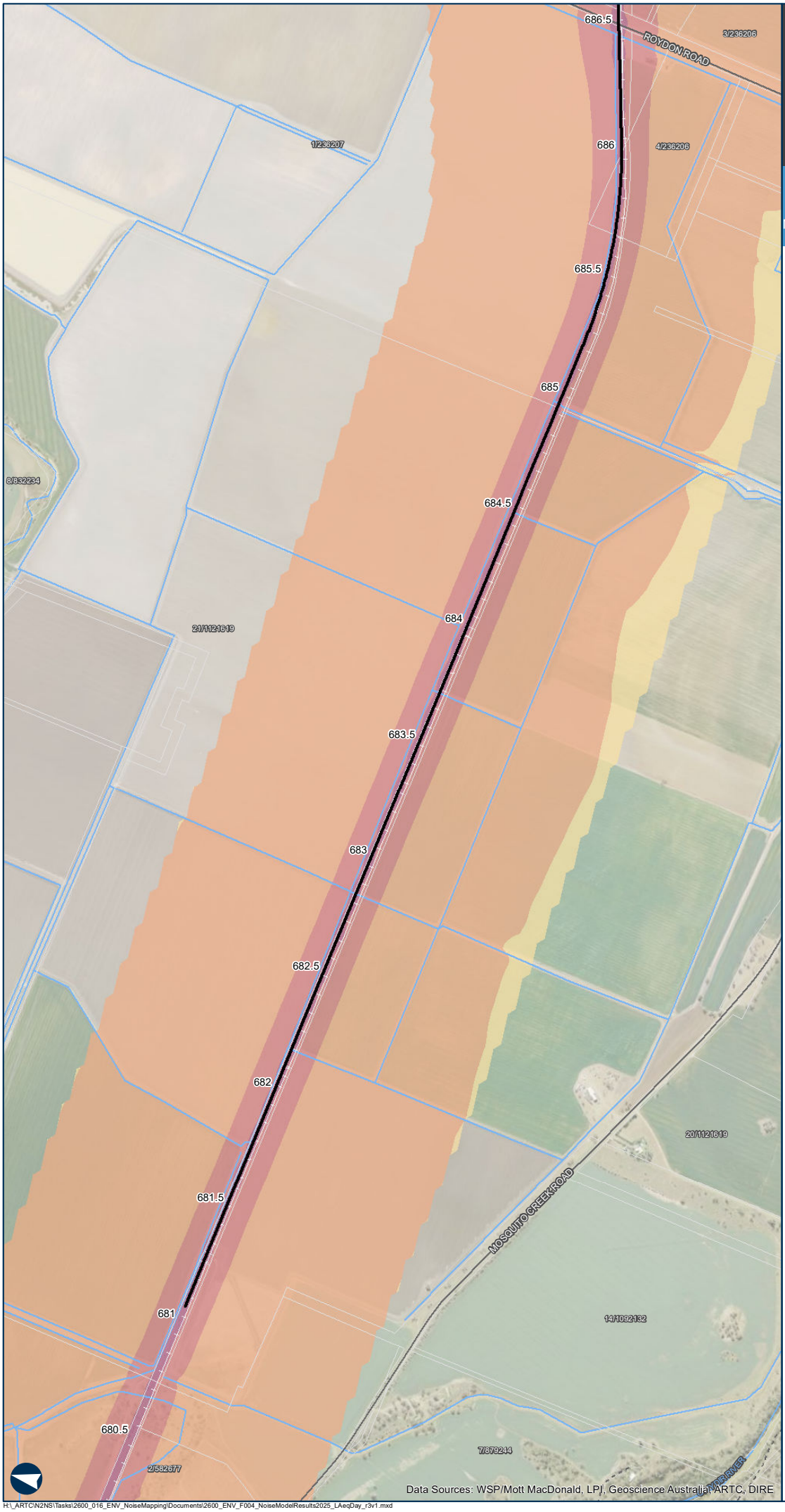
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

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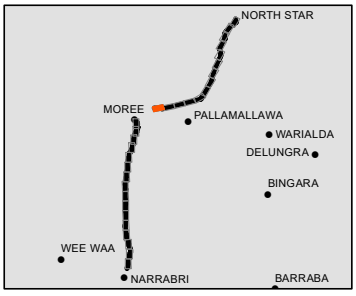
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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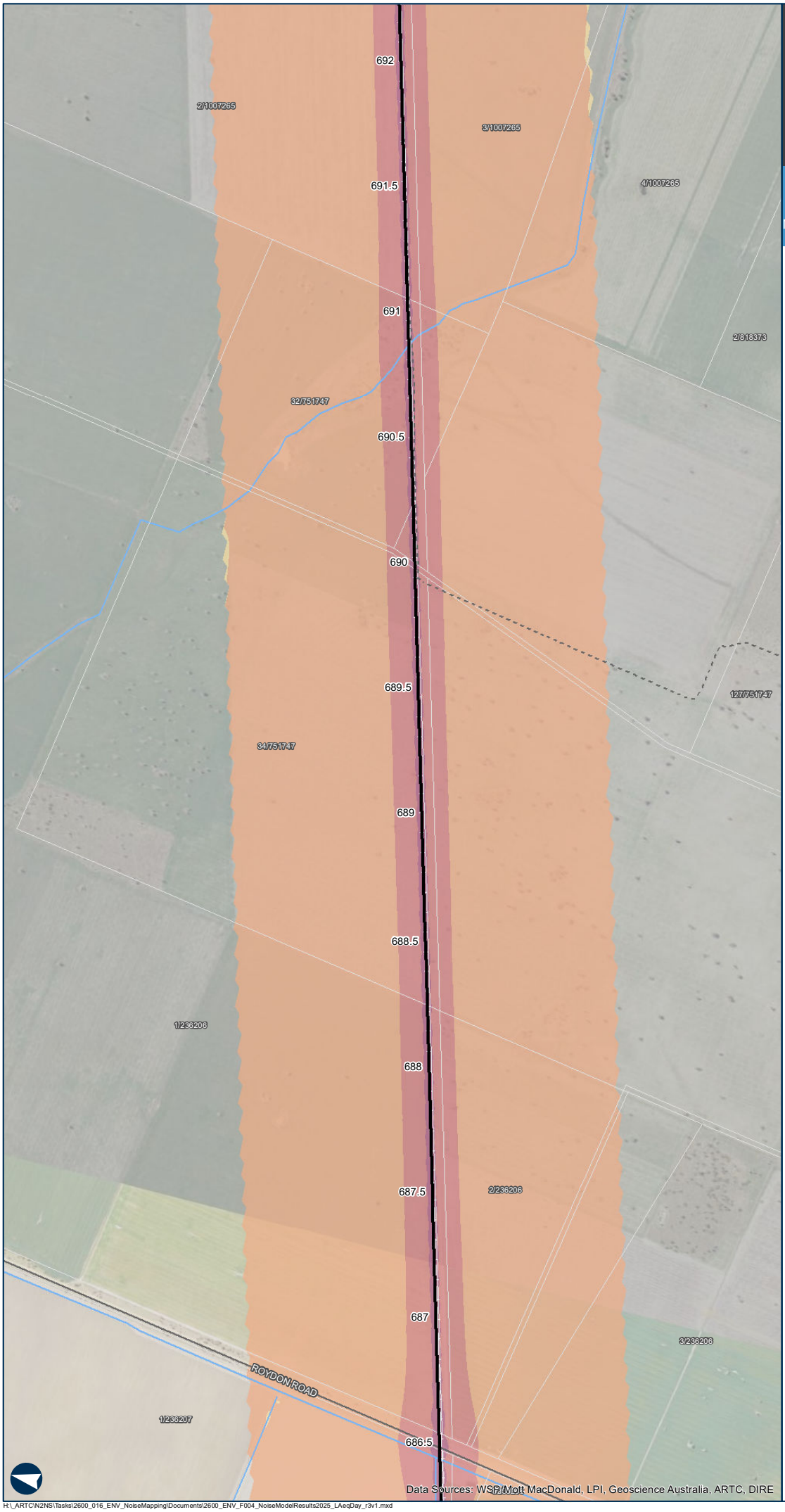
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 19 of 31

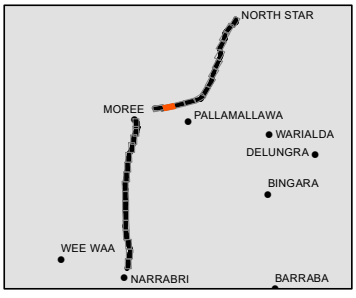
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

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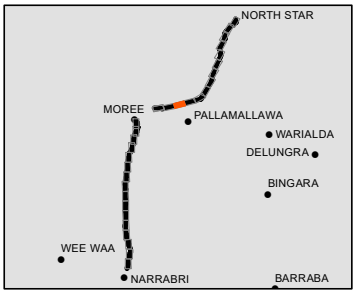
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

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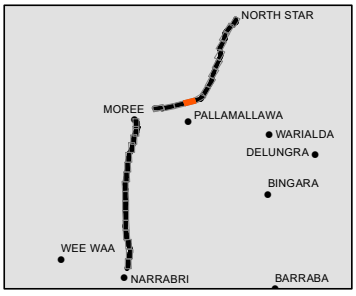
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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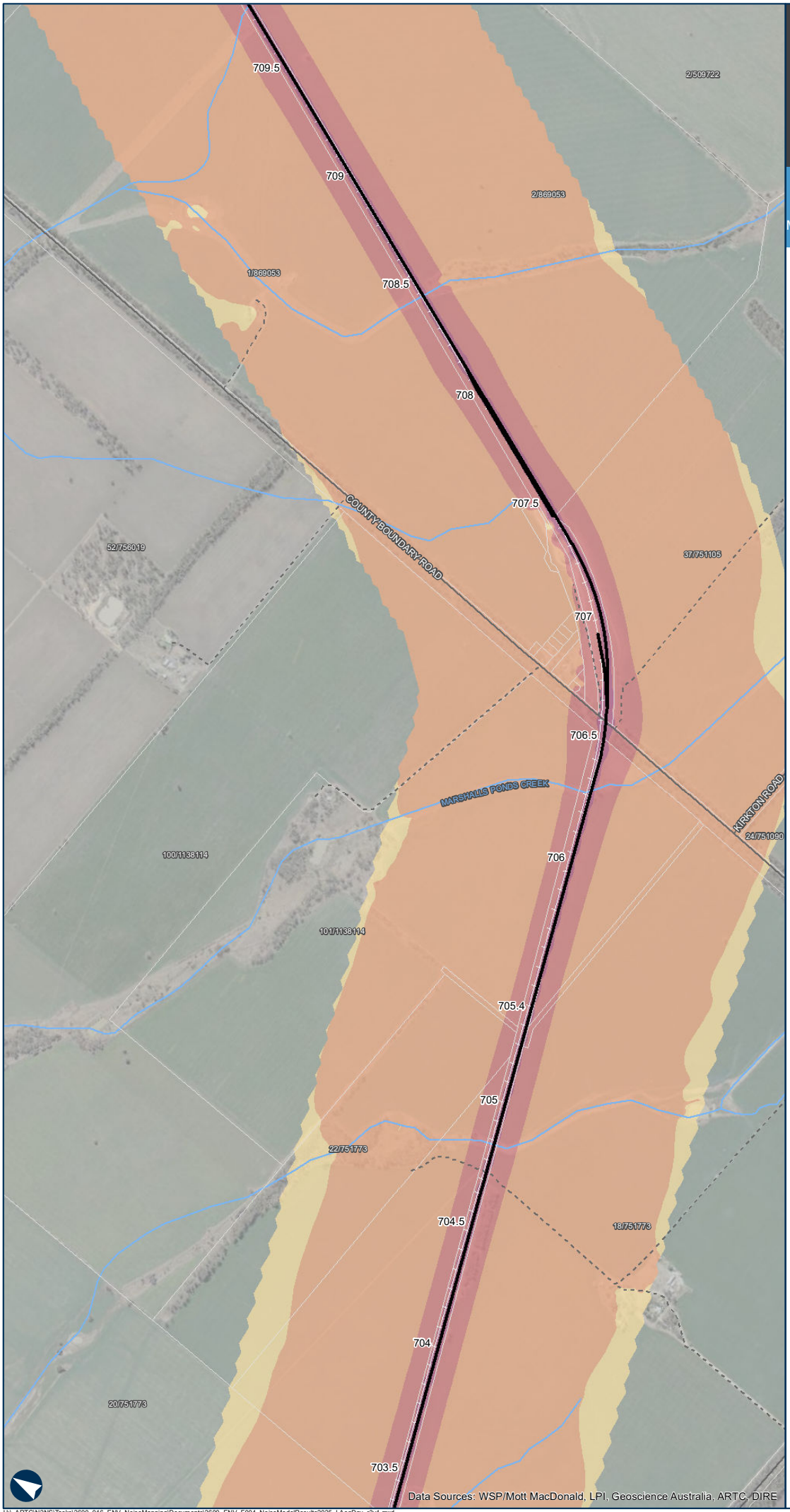
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Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

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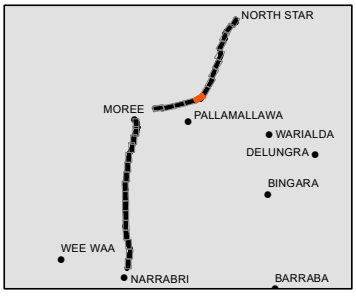
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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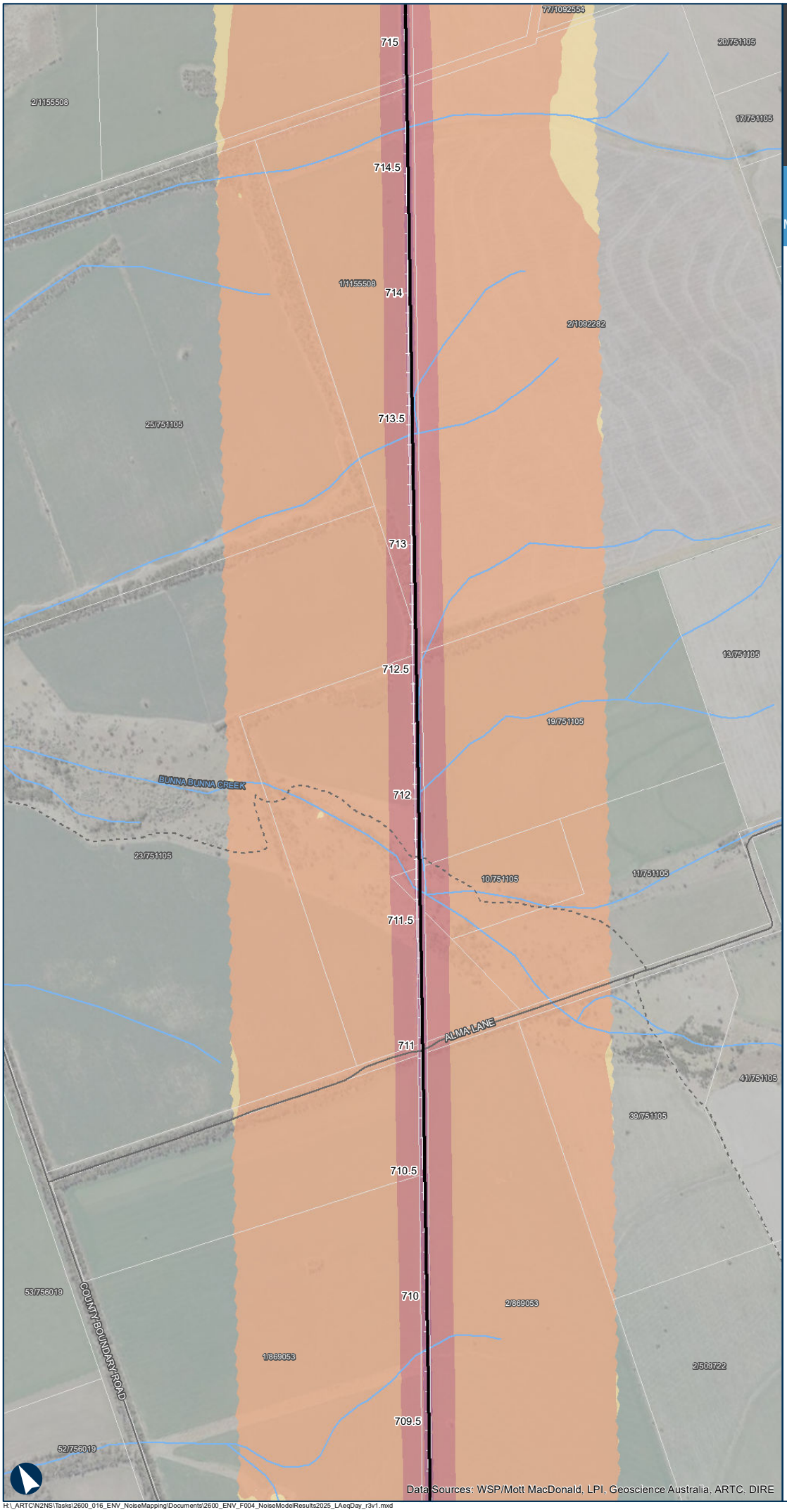
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Appendix C

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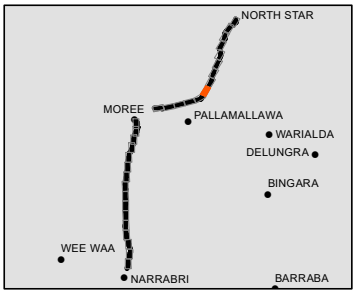
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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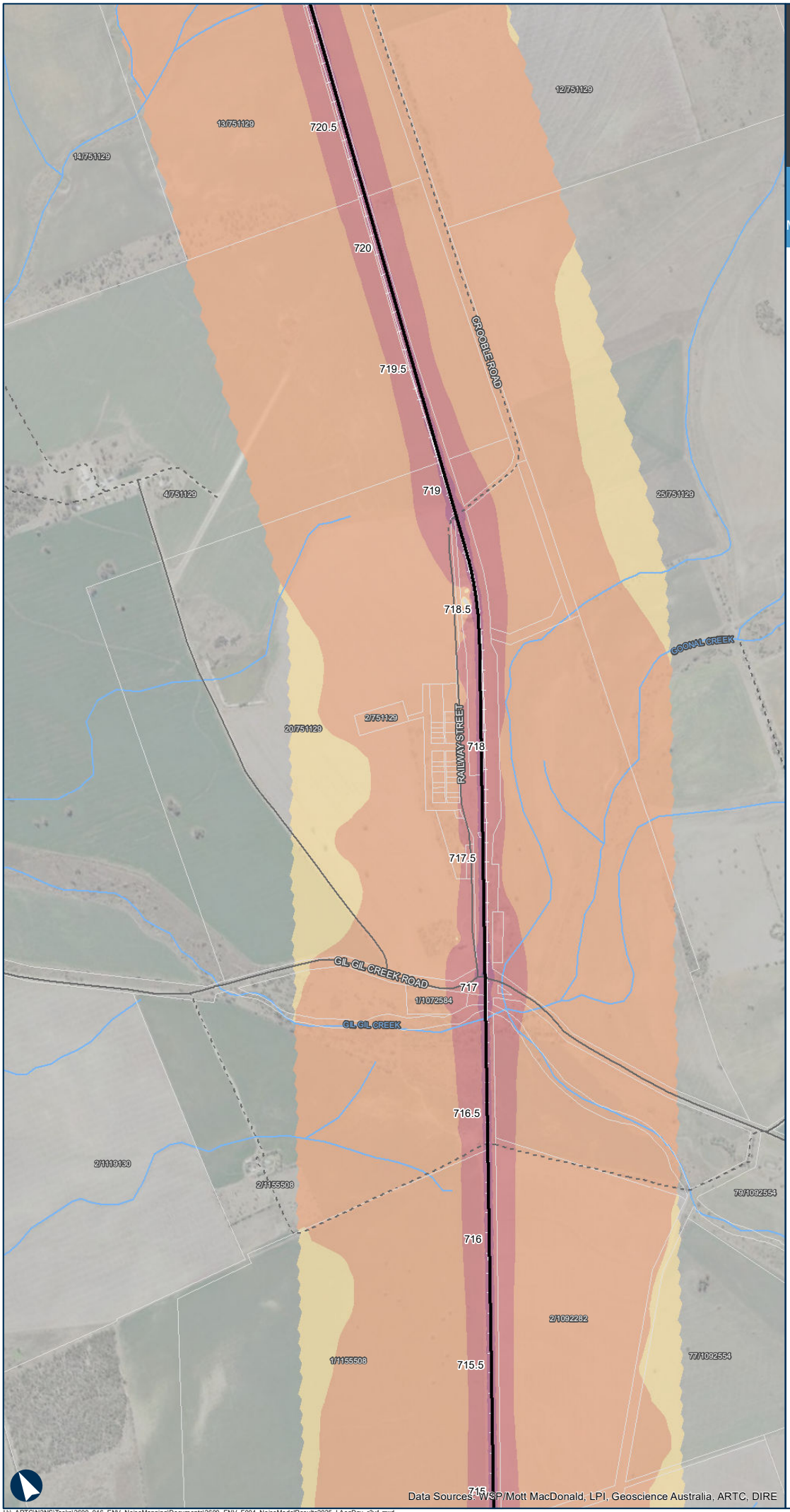
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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 24 of 31

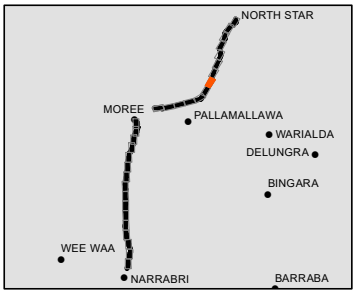
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

NOT FOR PUBLICATION. FOR CONSULTATION PURPOSES ONLY.



0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

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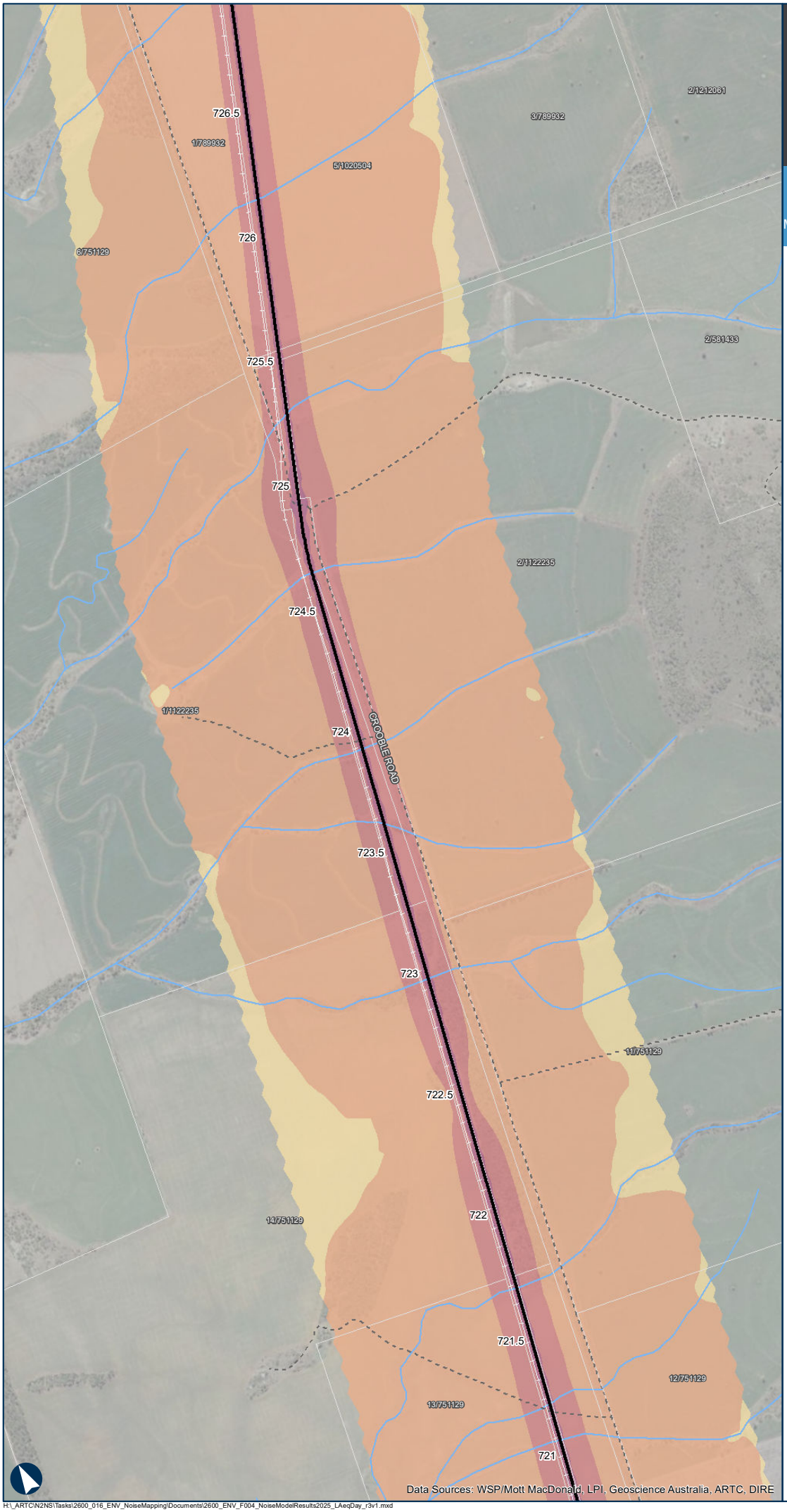
Paper: A3

Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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INLAND RAIL

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 25 of 31

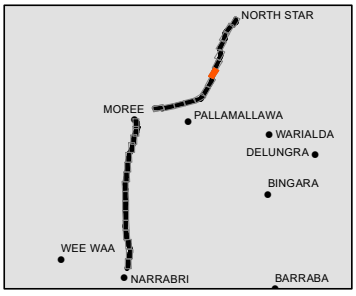
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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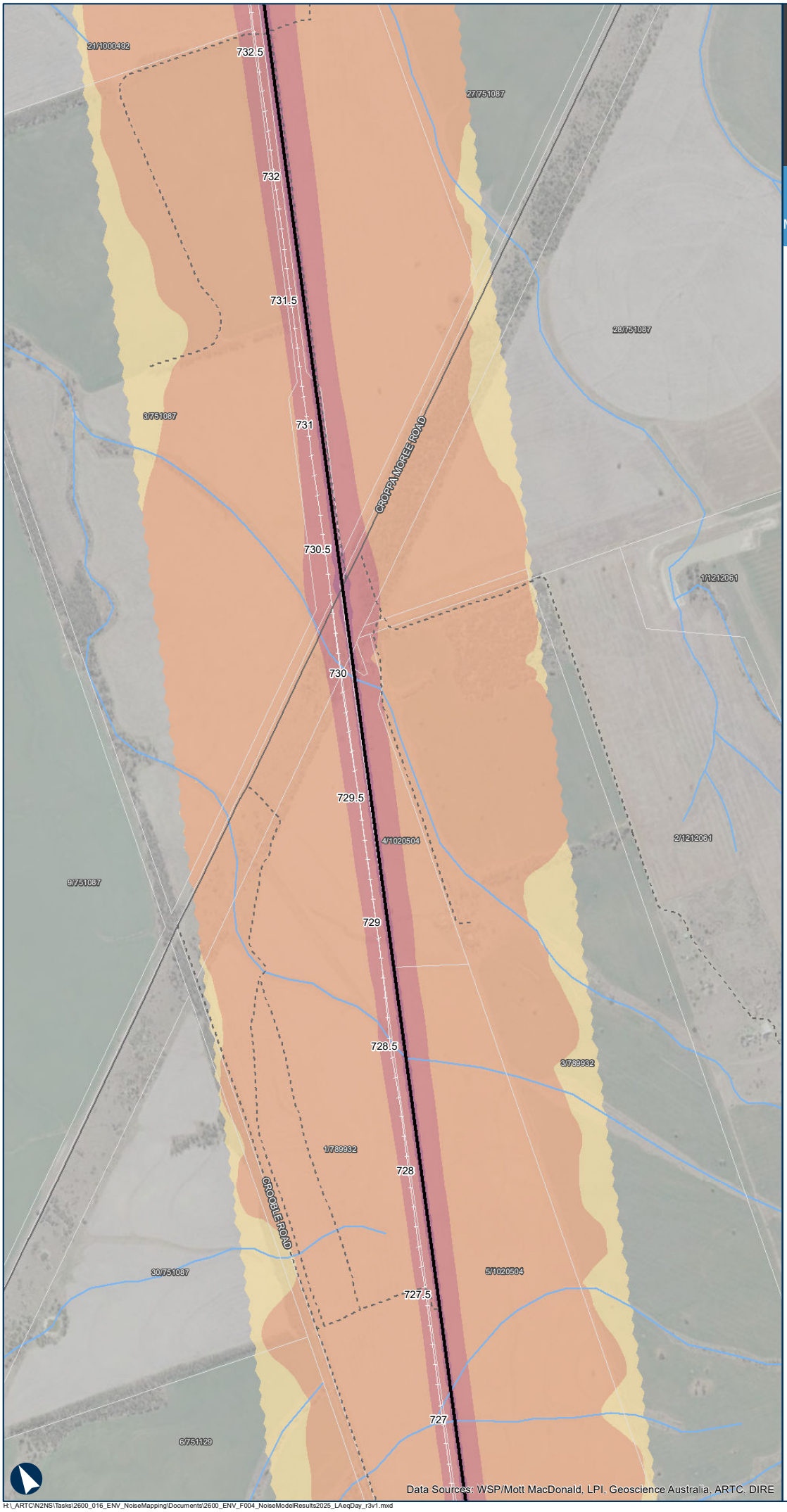
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Date: 13-Aug-21

Author: IRDJV

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 26 of 31

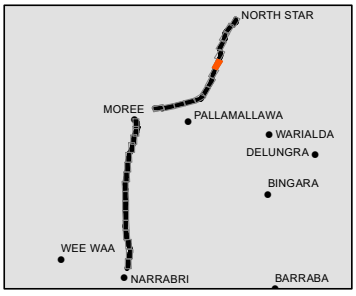
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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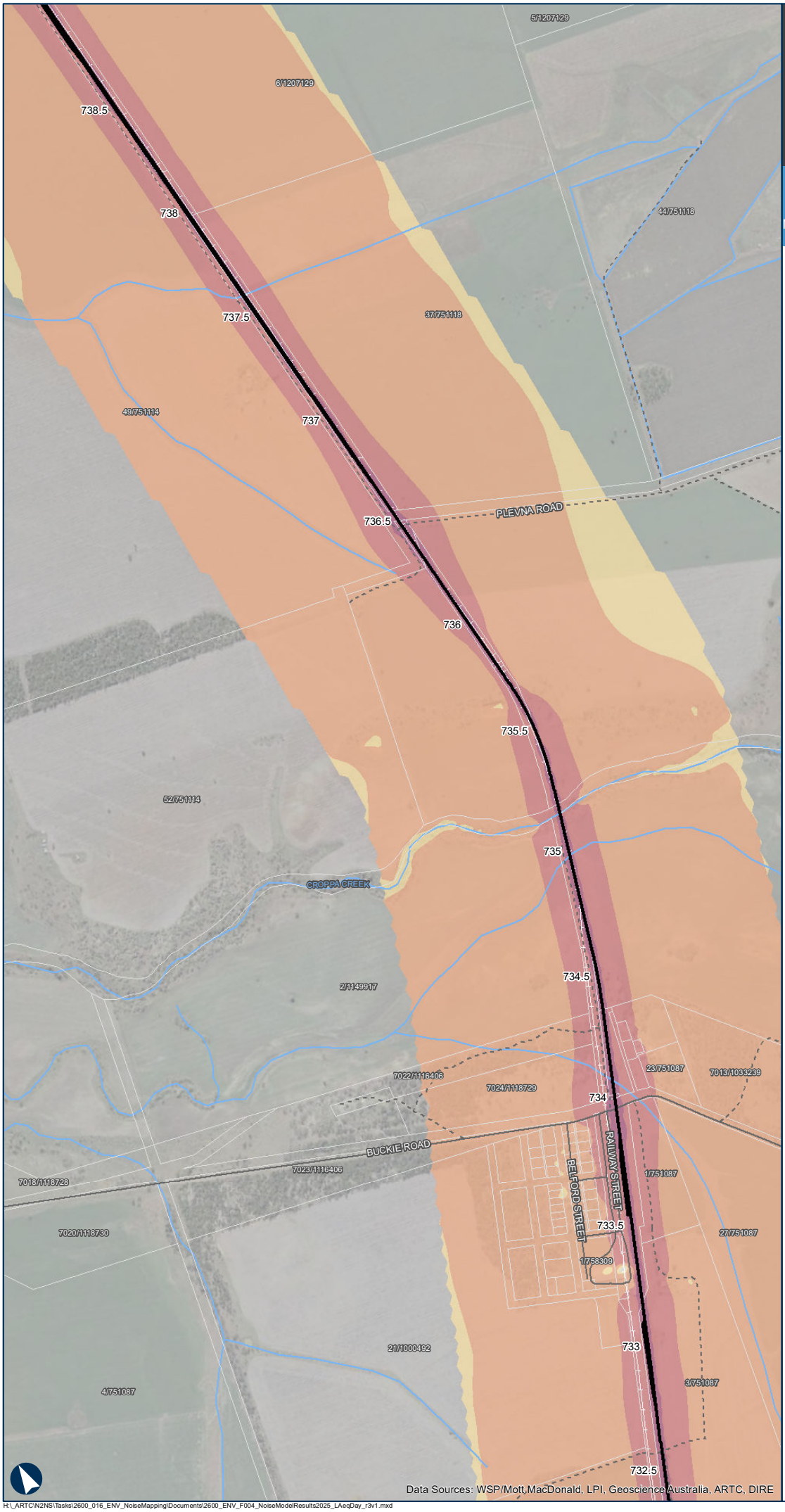
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 27 of 31

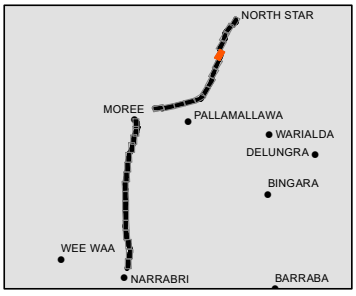
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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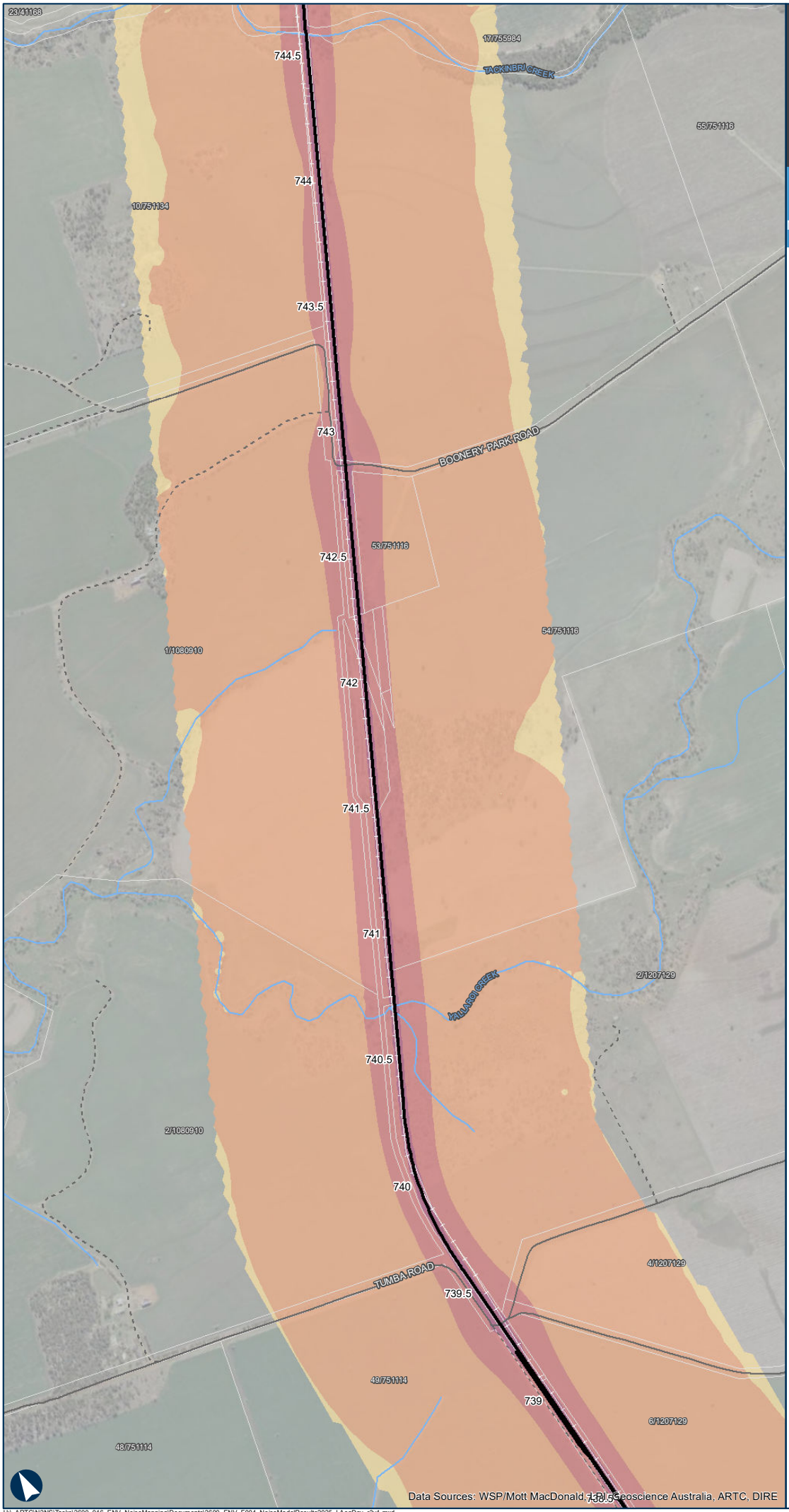
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 28 of 31

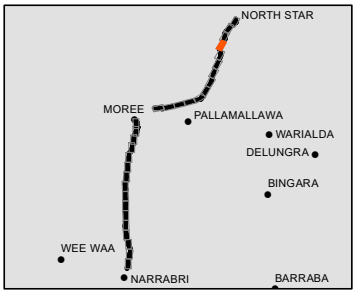
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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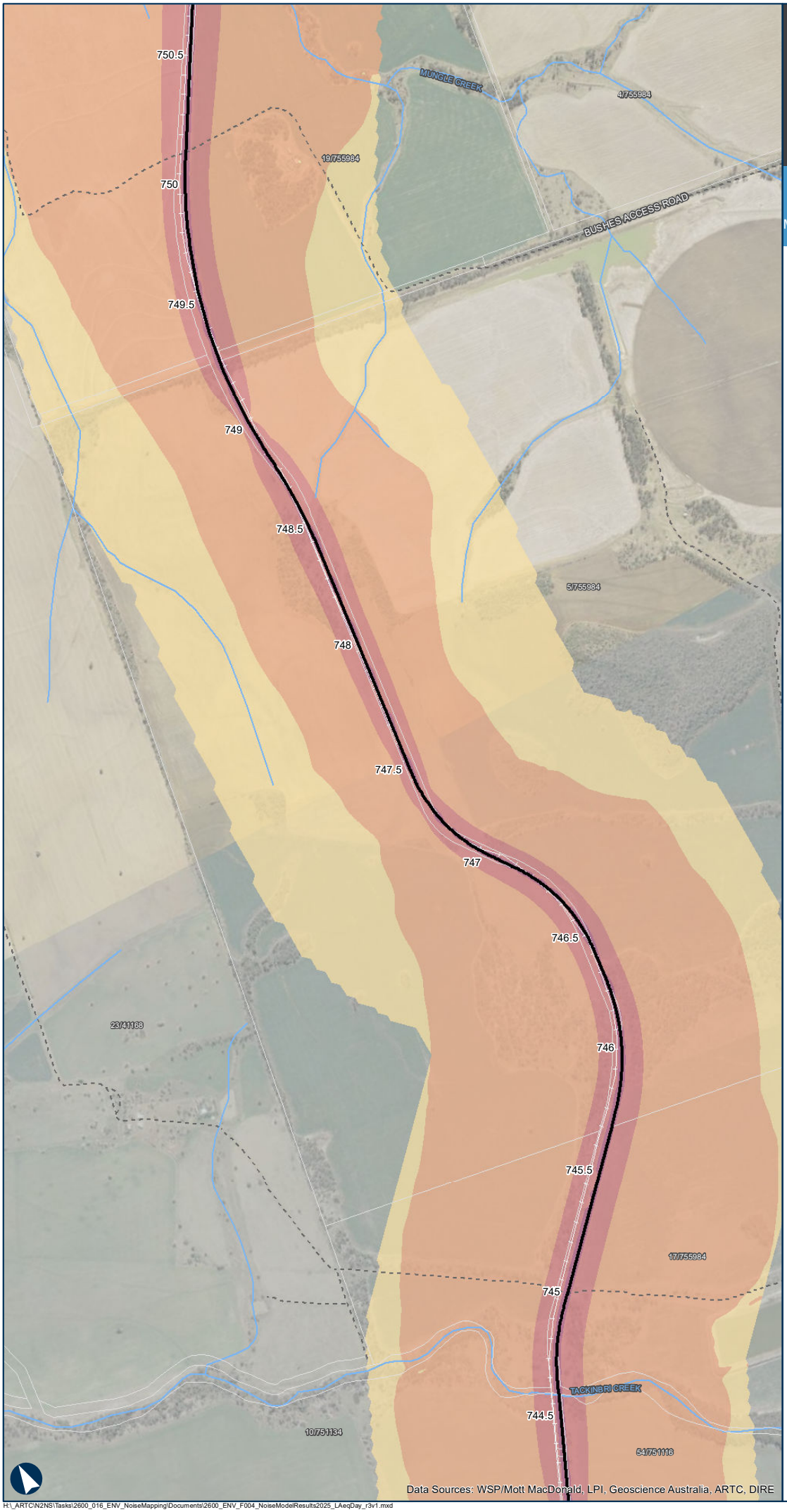
Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

Data Sources: WSP/Mott MacDonald, Geoscience Australia, ARTC, DIRE

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 29 of 31

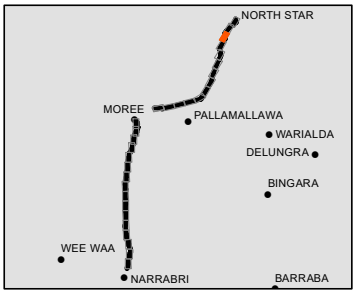
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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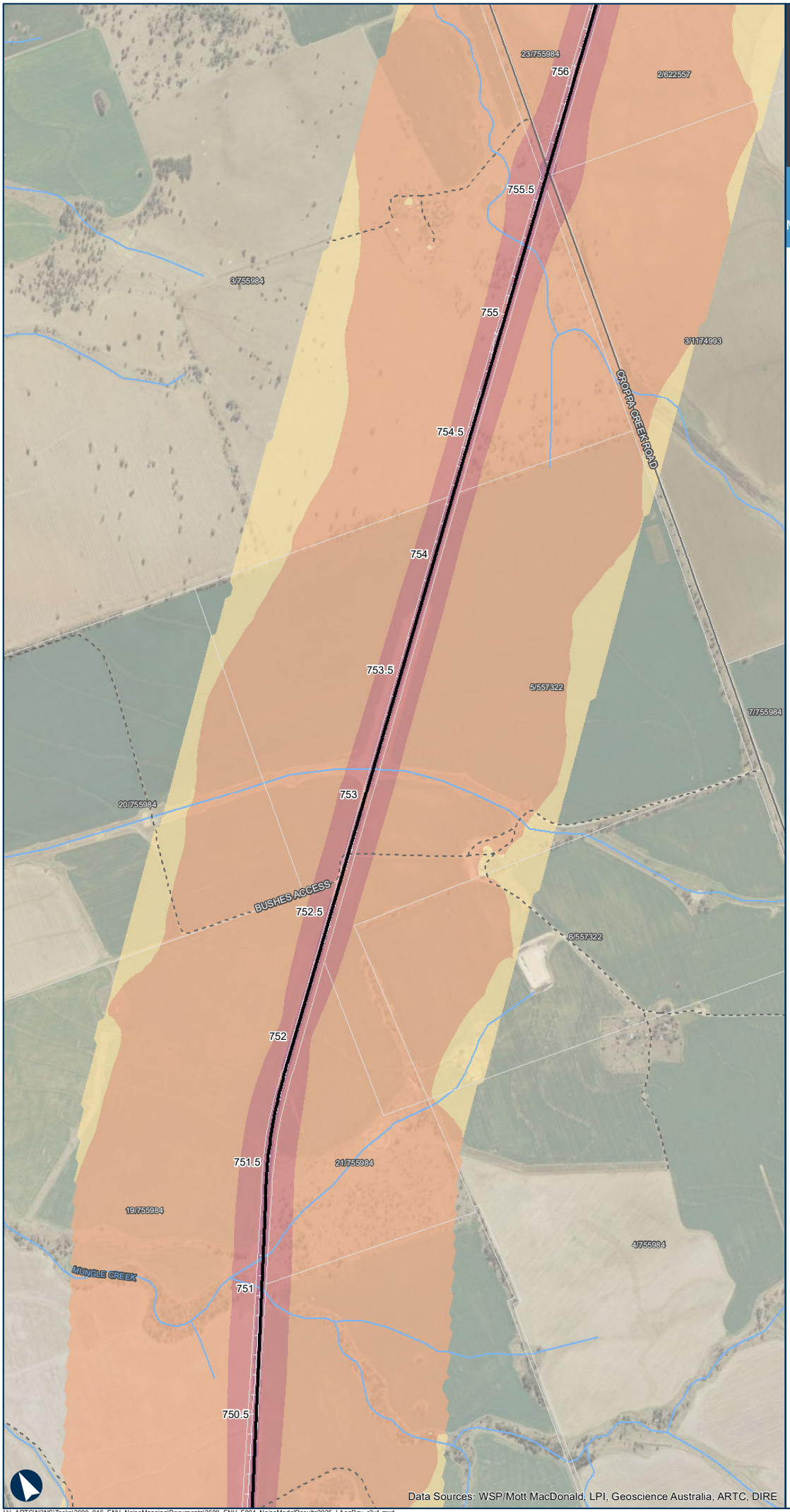
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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 30 of 31

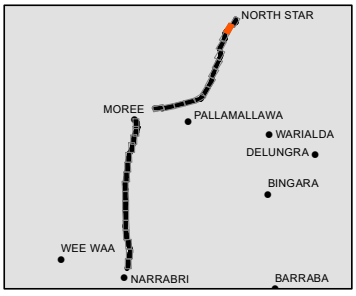
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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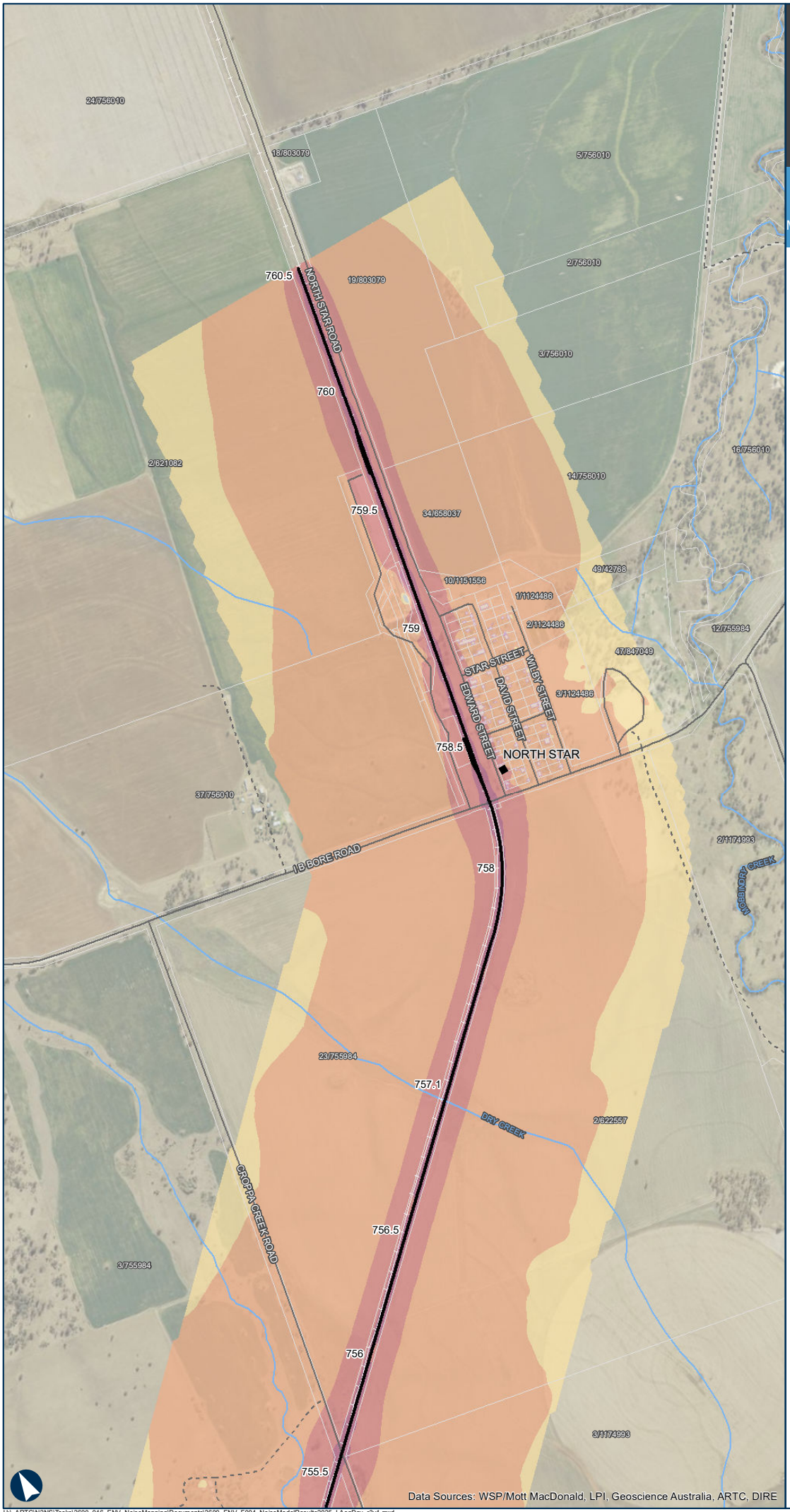
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Date: 13-Aug-21

Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Day without mitigation

Sheet 31 of 31

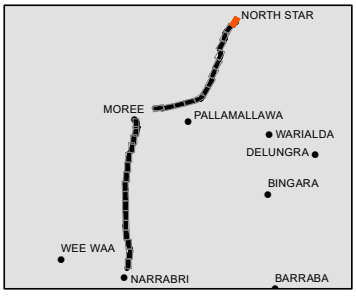
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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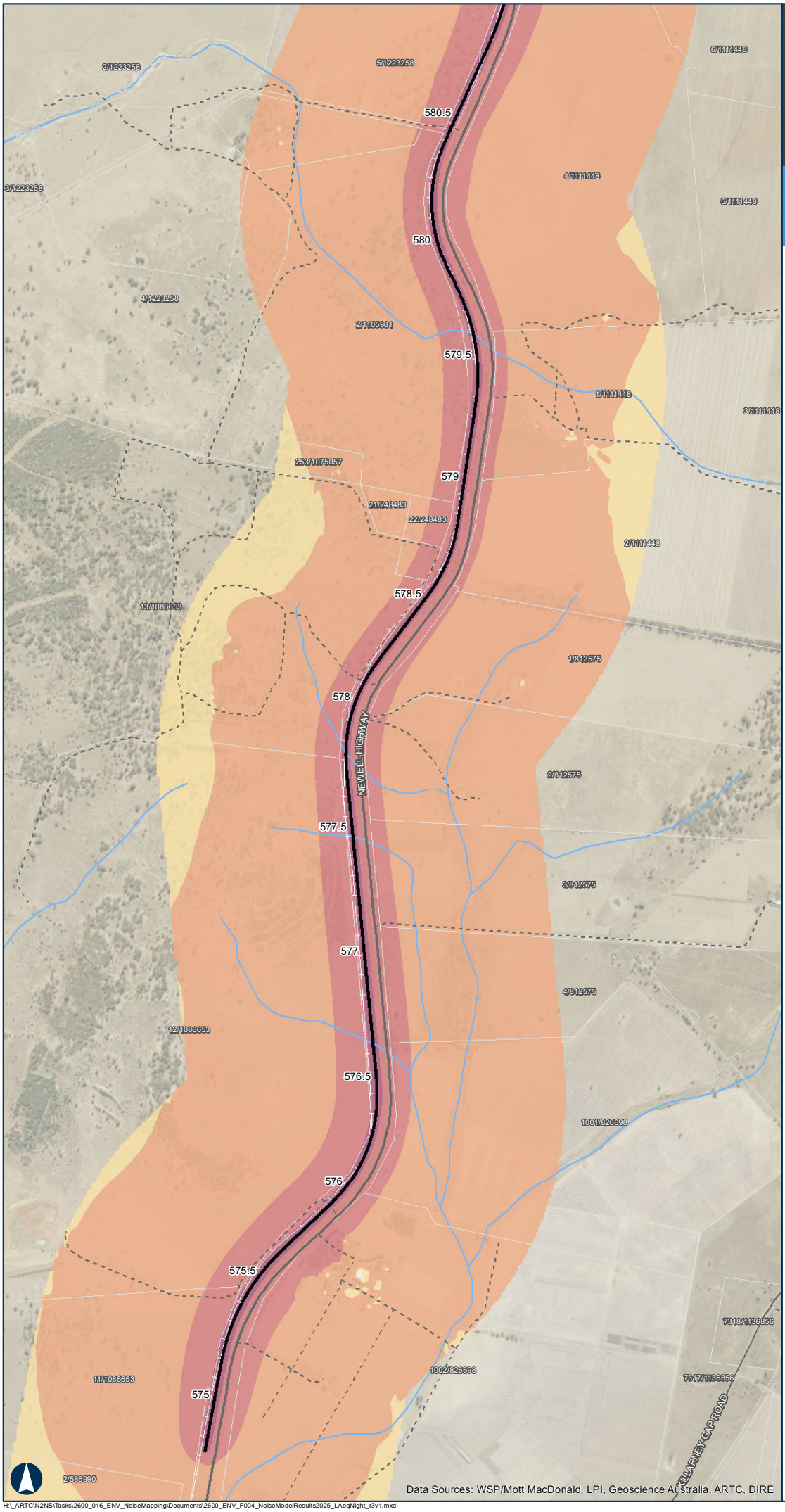
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Scale: 1:15,000

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Author: IRDJV

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 1 of 31

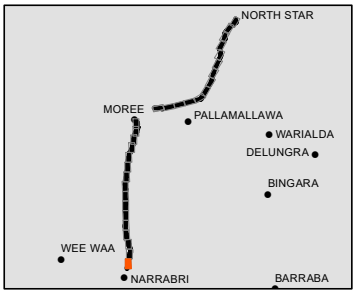
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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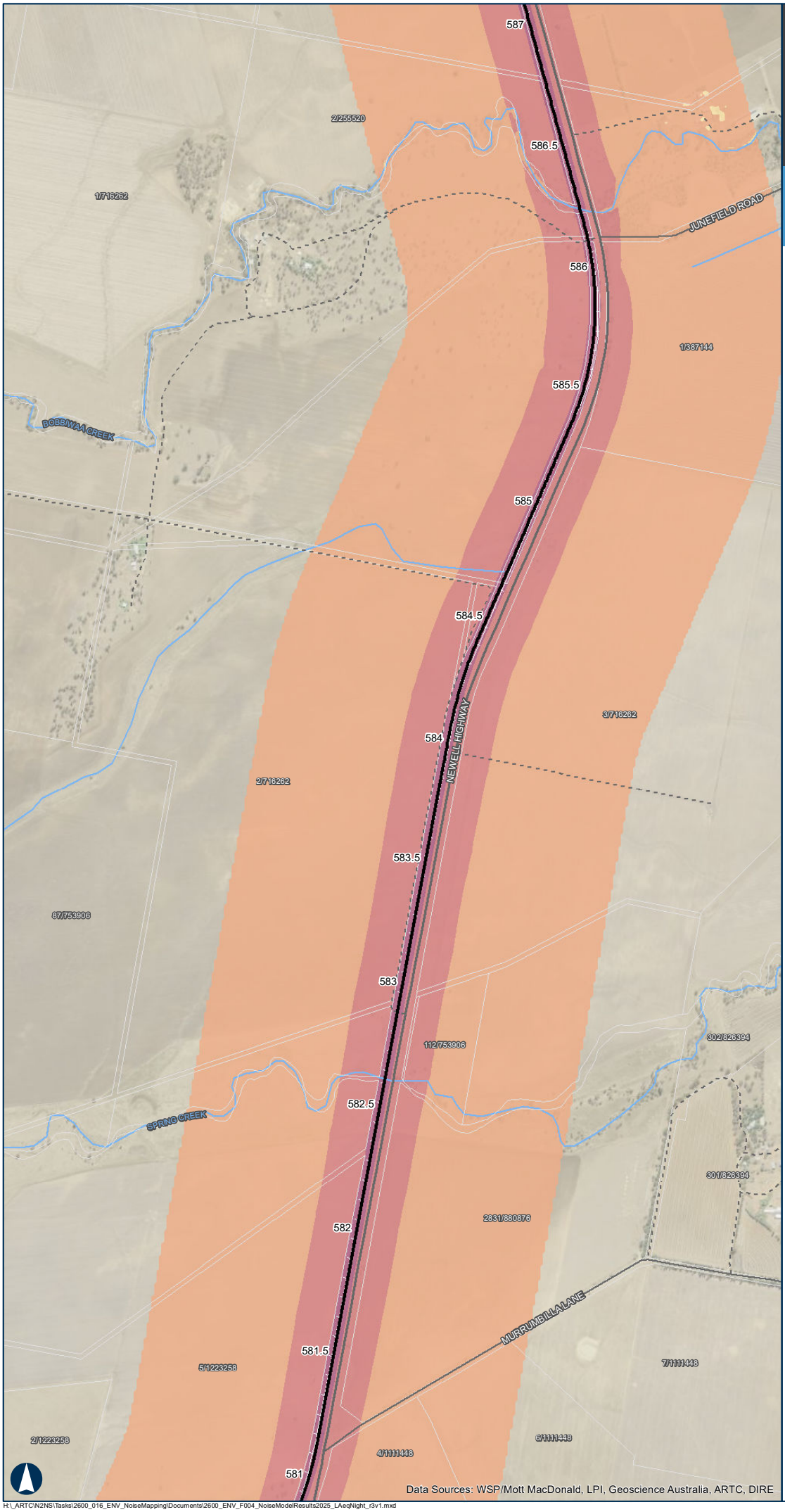
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Scale: 1:15,000

Date: 13-Aug-21

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 2 of 31

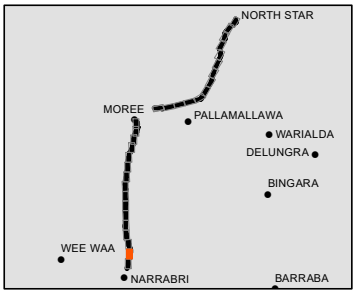
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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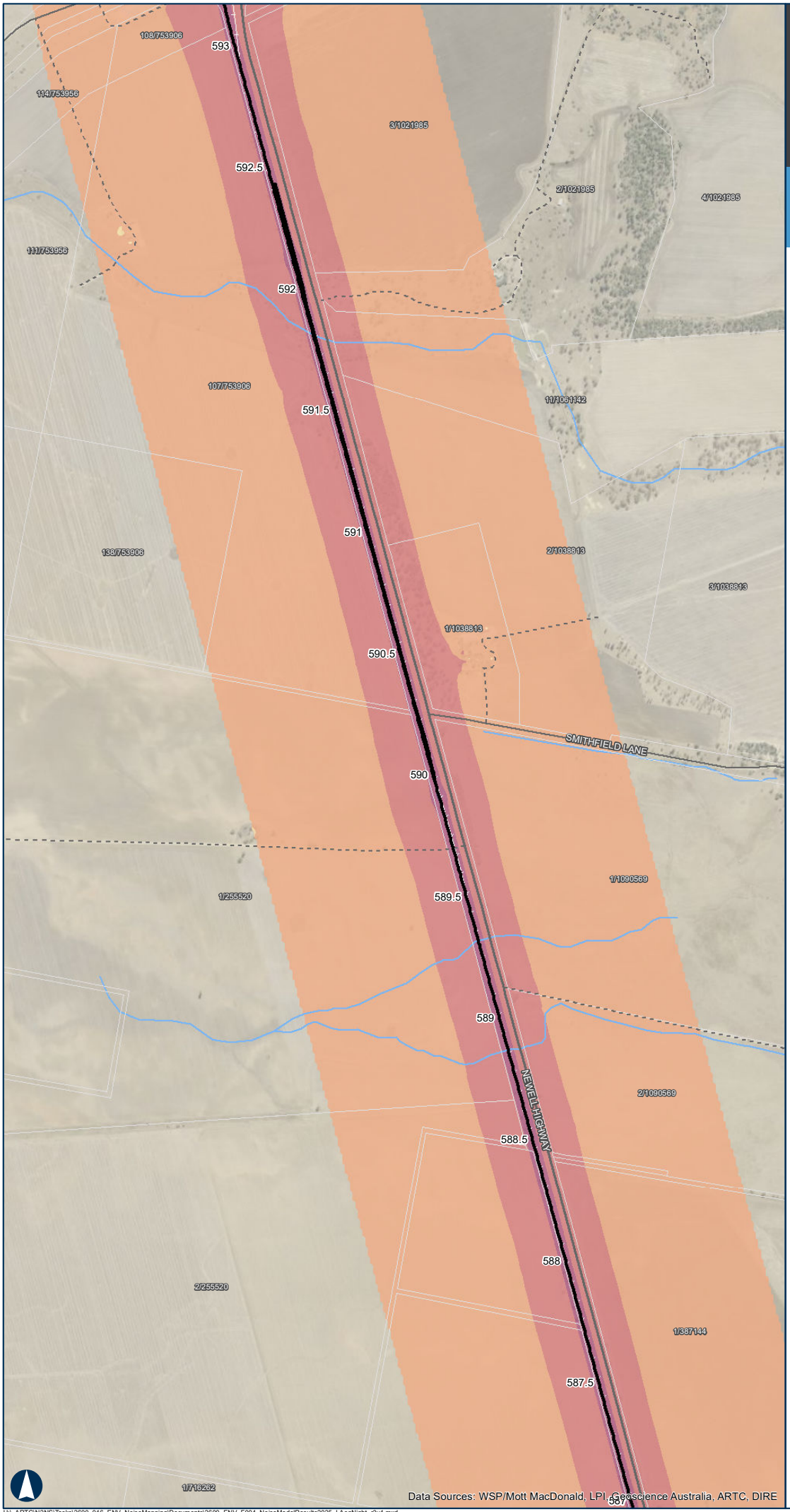
Paper: A3

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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 3 of 31

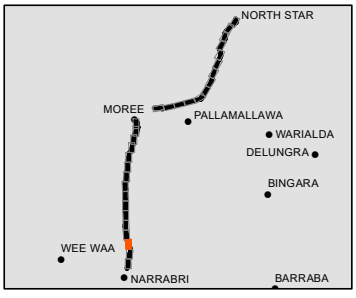
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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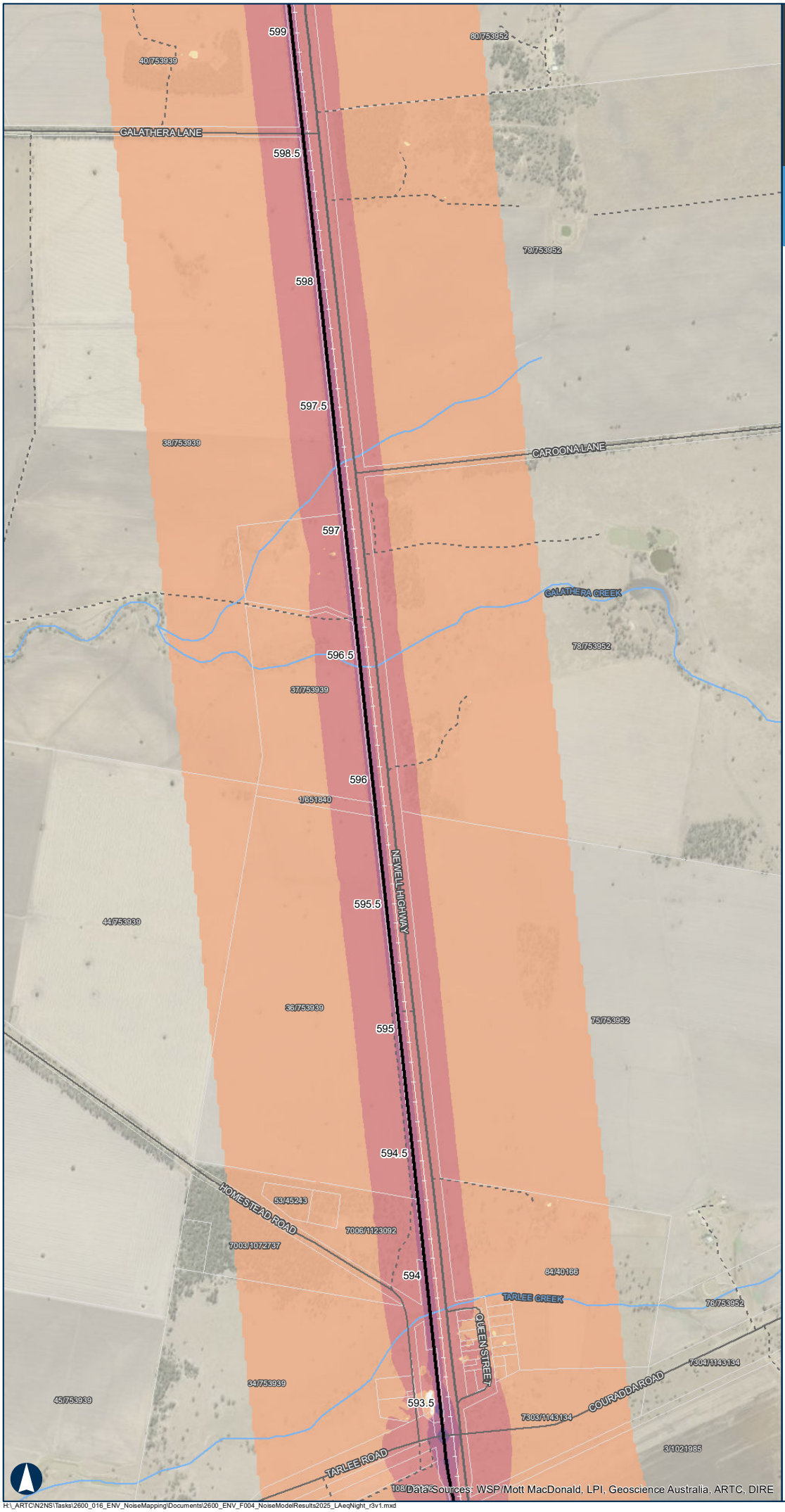
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 4 of 31

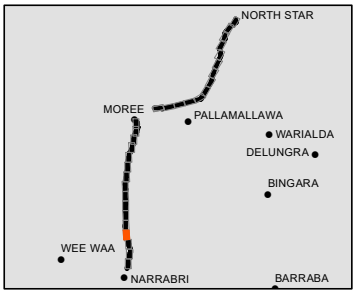
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
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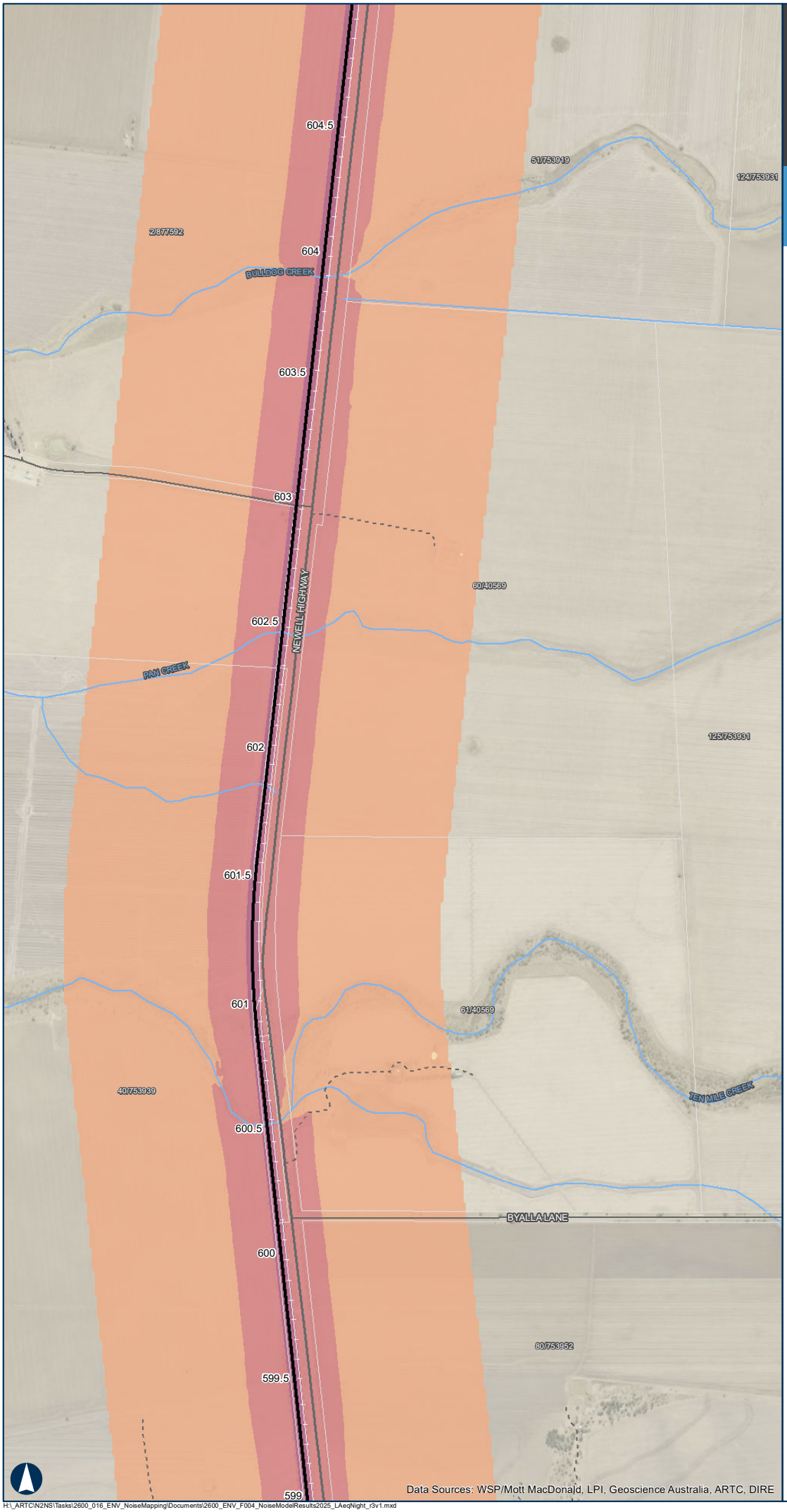
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Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 5 of 31

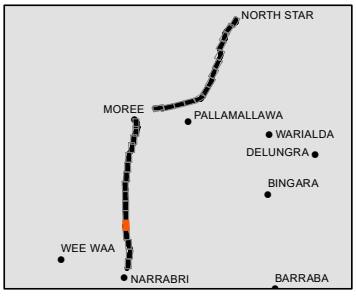
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

NOT FOR PUBLICATION. FOR CONSULTATION PURPOSES ONLY.



0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

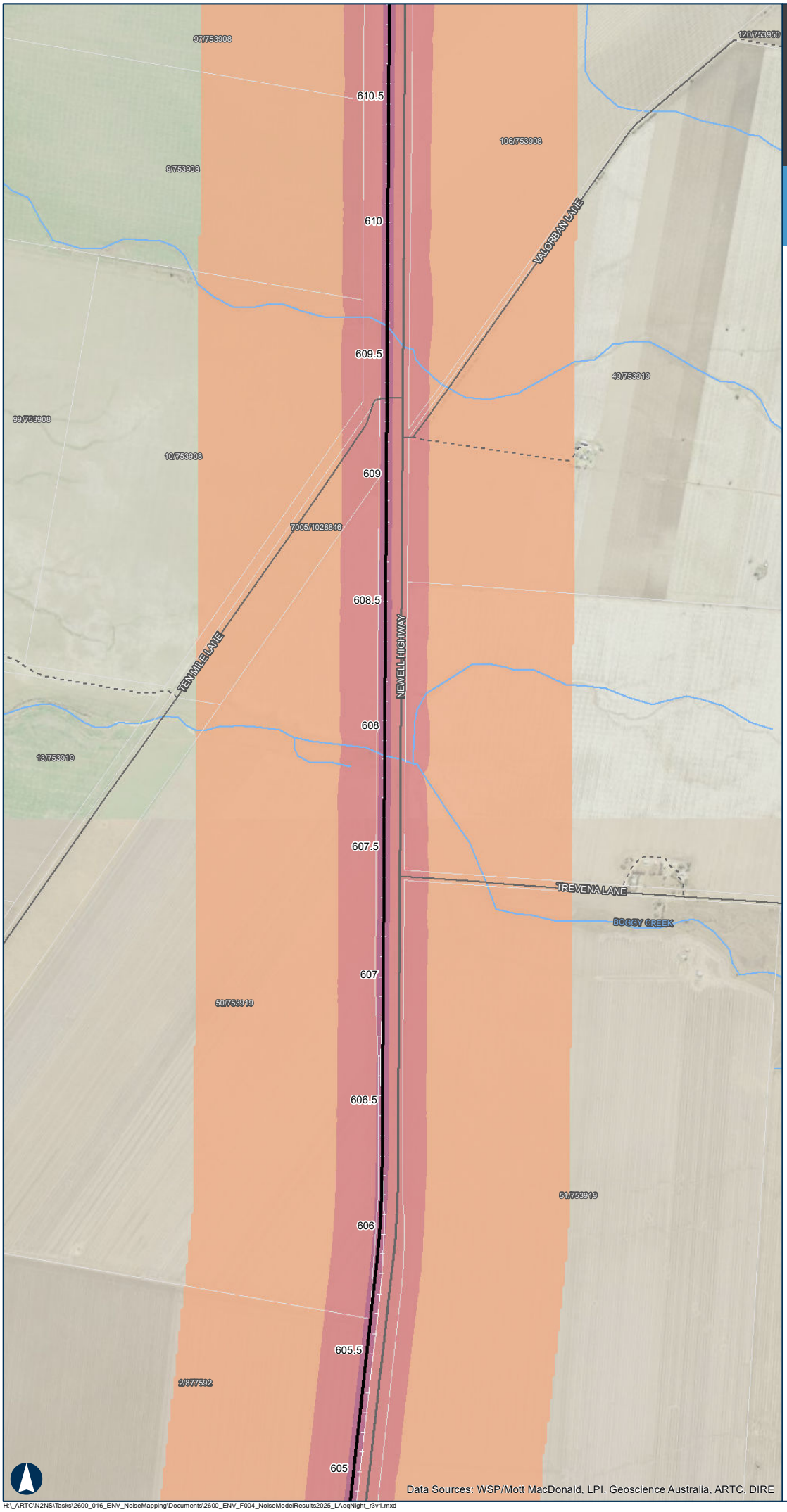
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Paper: A3

Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV



Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

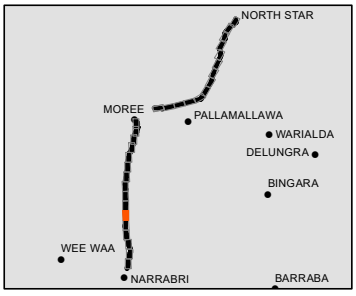
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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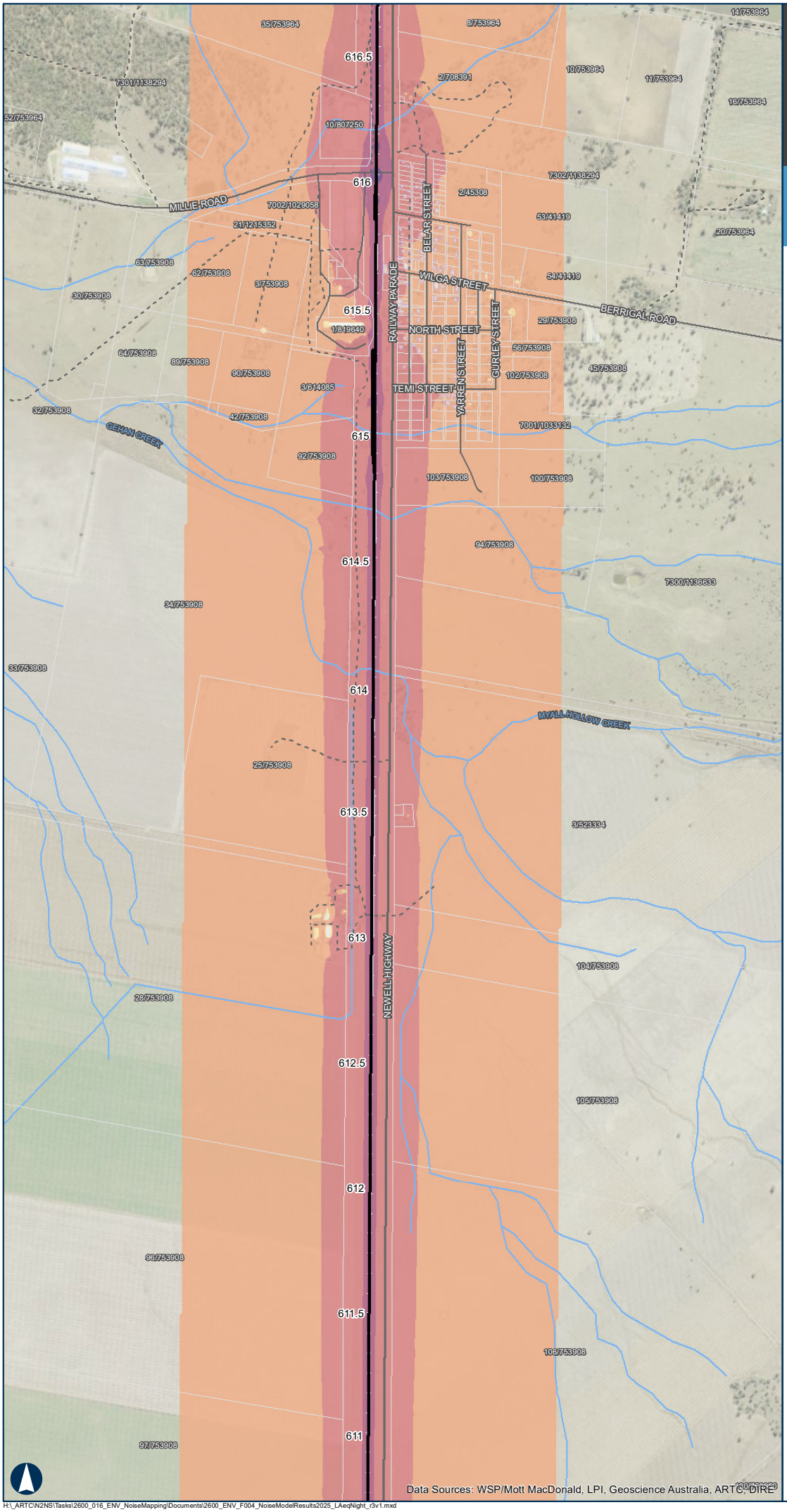
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 7 of 31

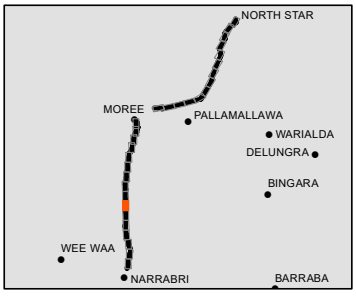
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

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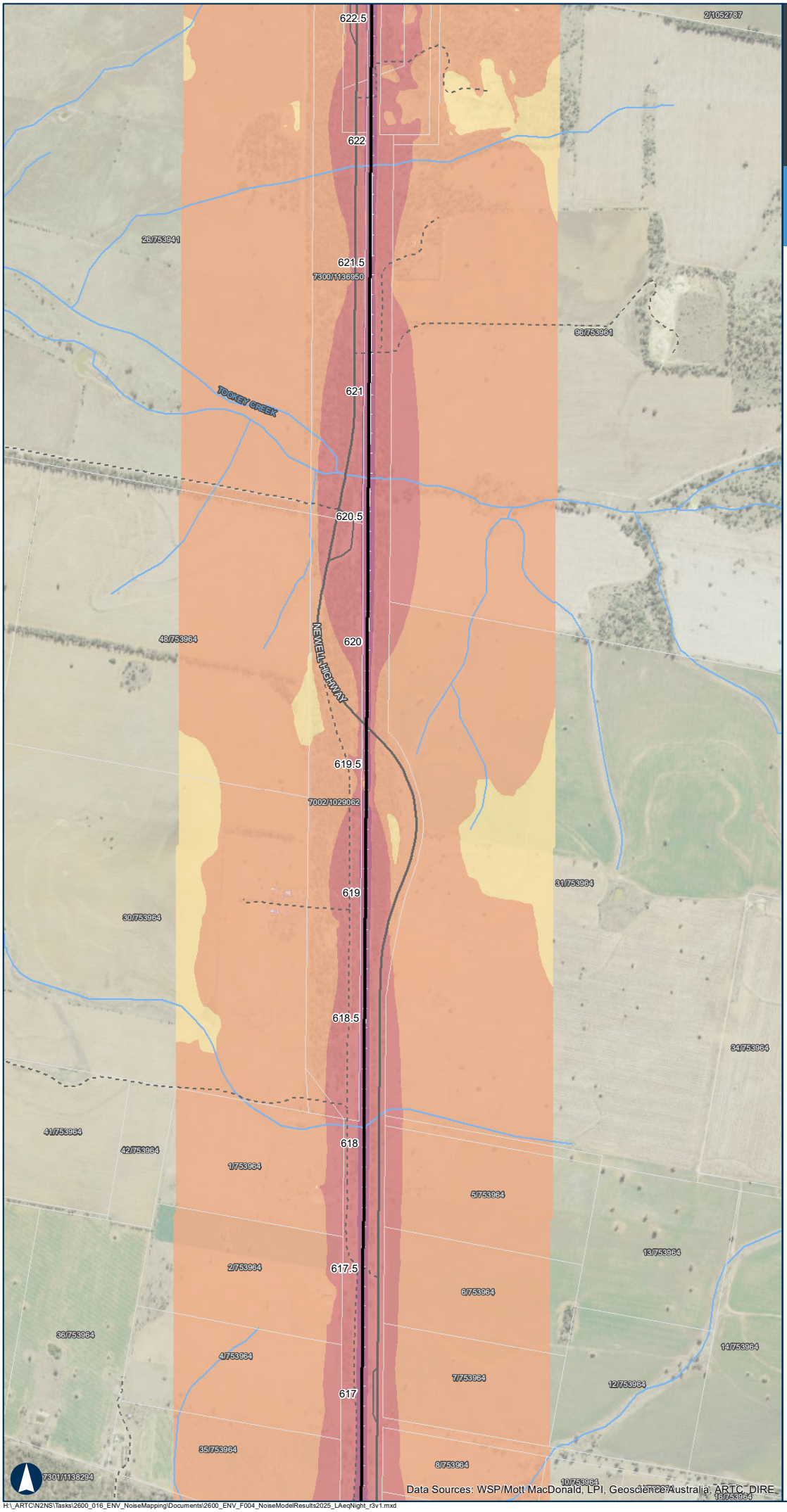
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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 8 of 31

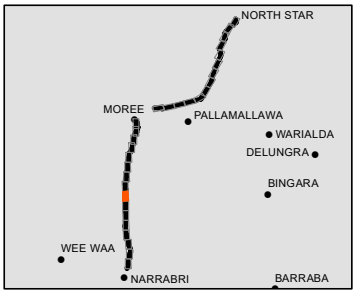
LEGEND

- Townships
- Highway
- Local Road
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- Track Alignment
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Noise Contours (dB(A))

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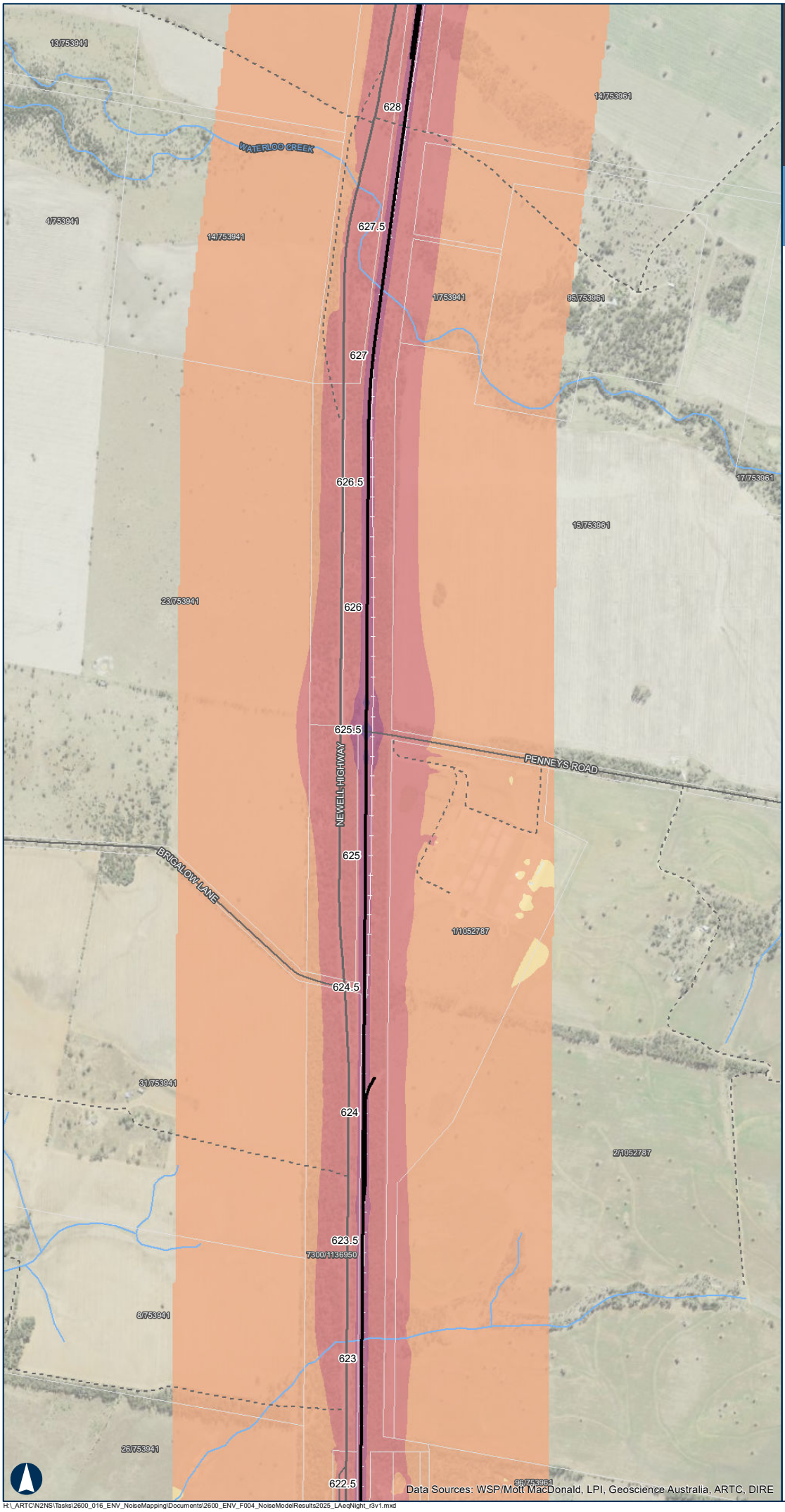
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 9 of 31

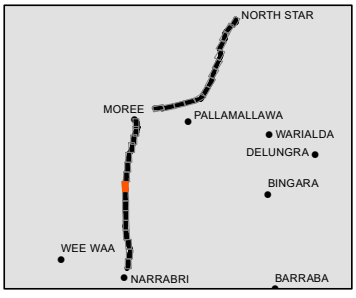
LEGEND

- Townships
- Highway
- Local Road
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- Track Alignment
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Noise Contours (dB(A))

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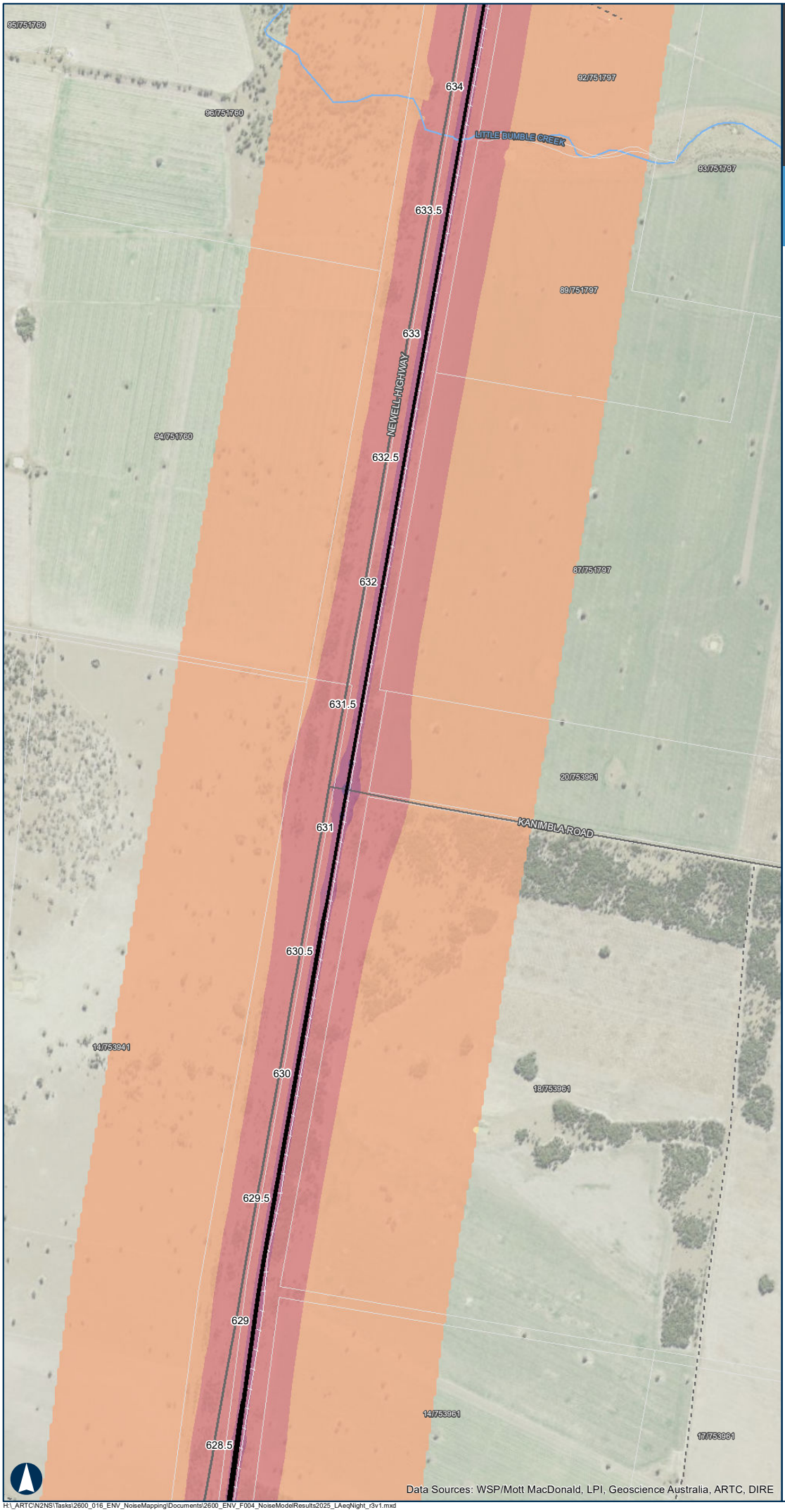
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

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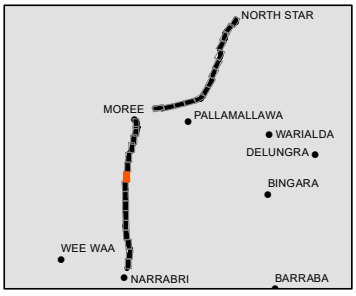
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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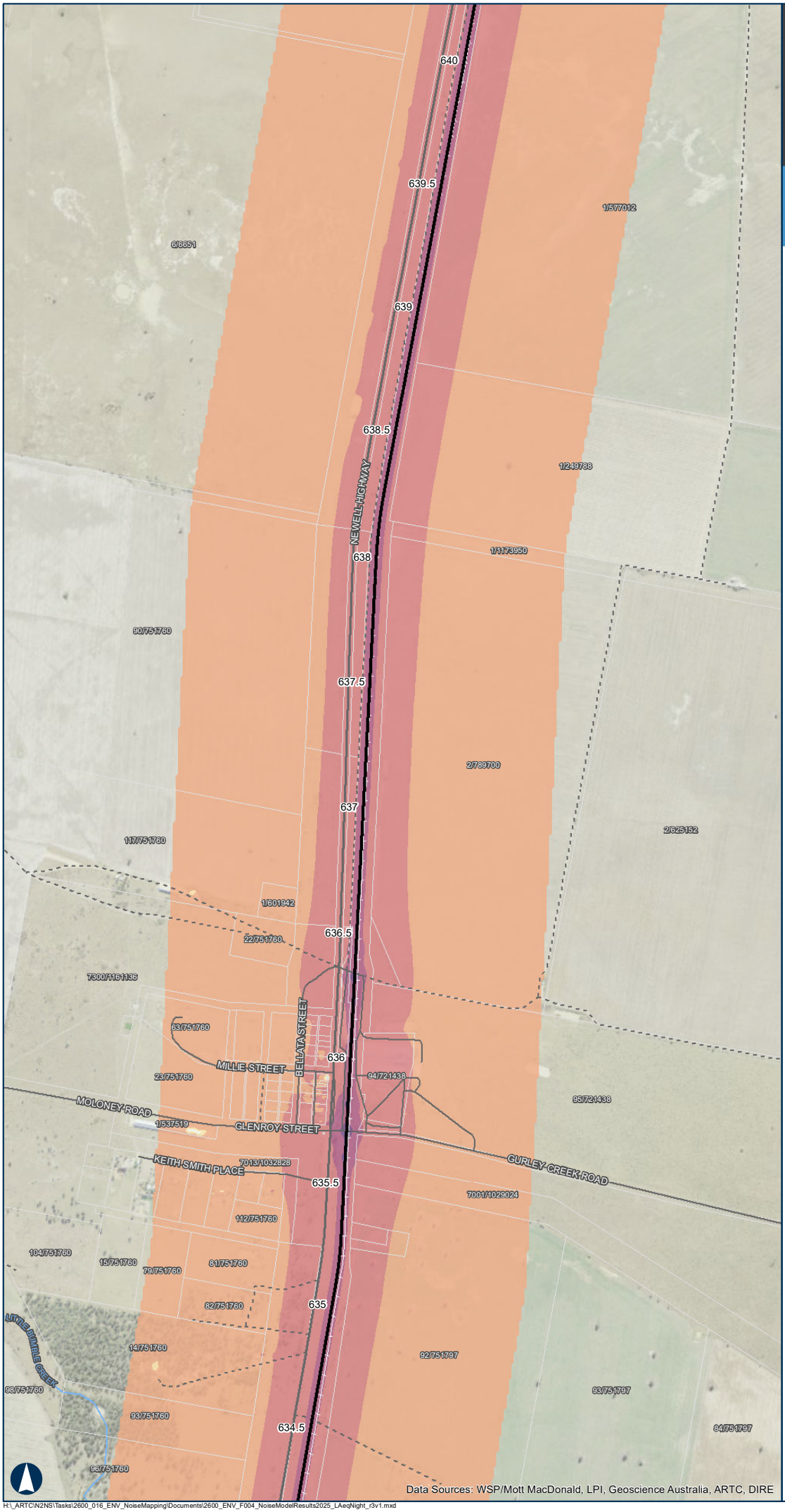
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 11 of 31

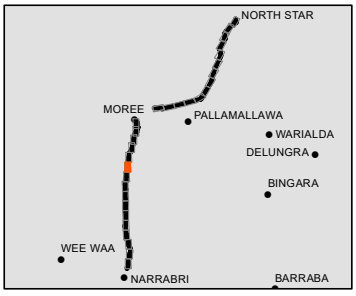
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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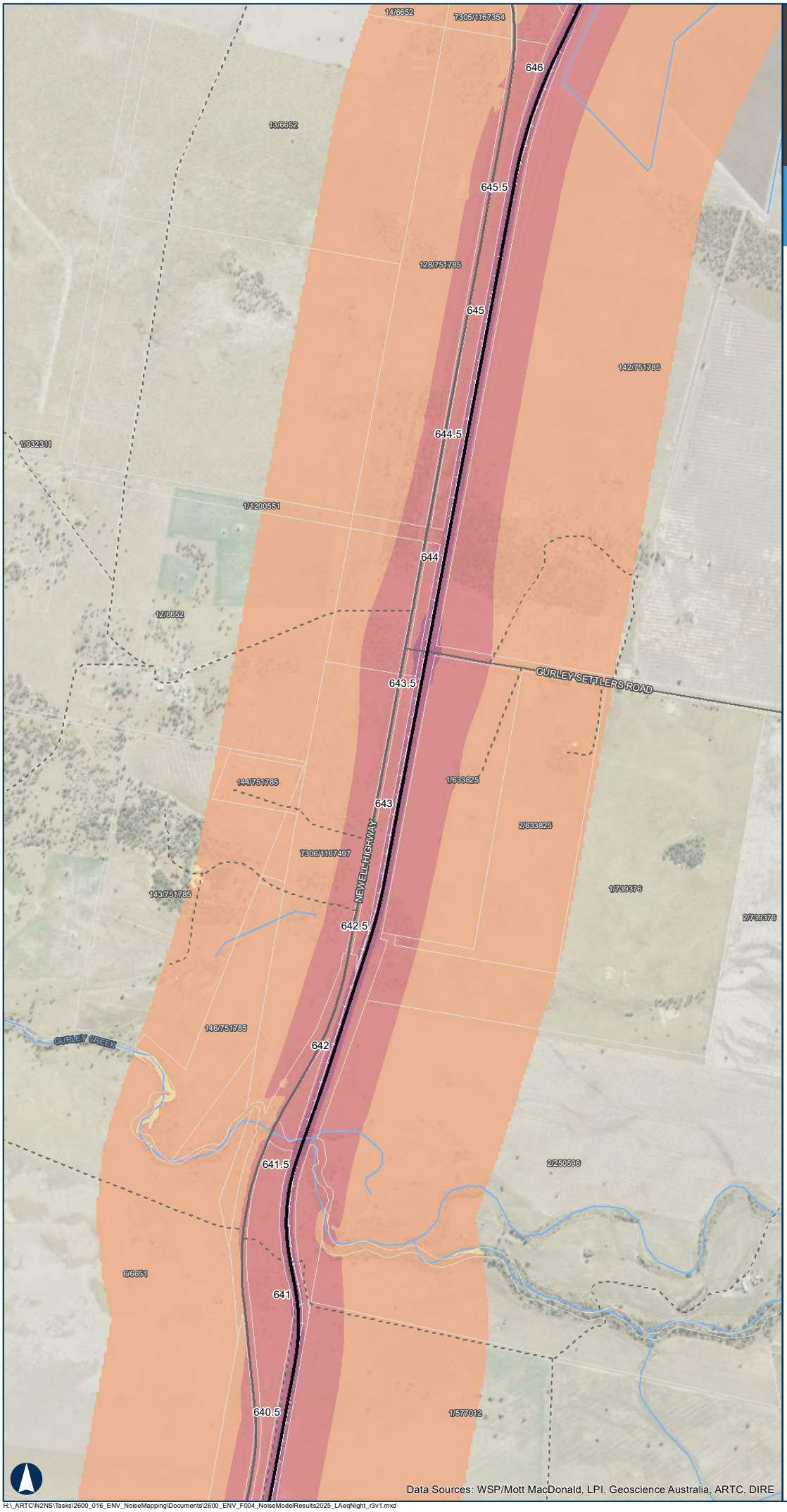
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 12 of 31

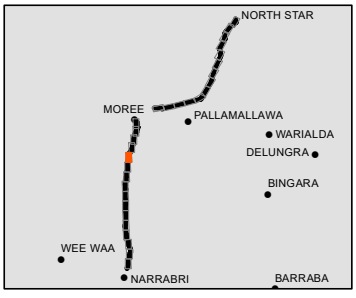
LEGEND

- Townships
- Highway
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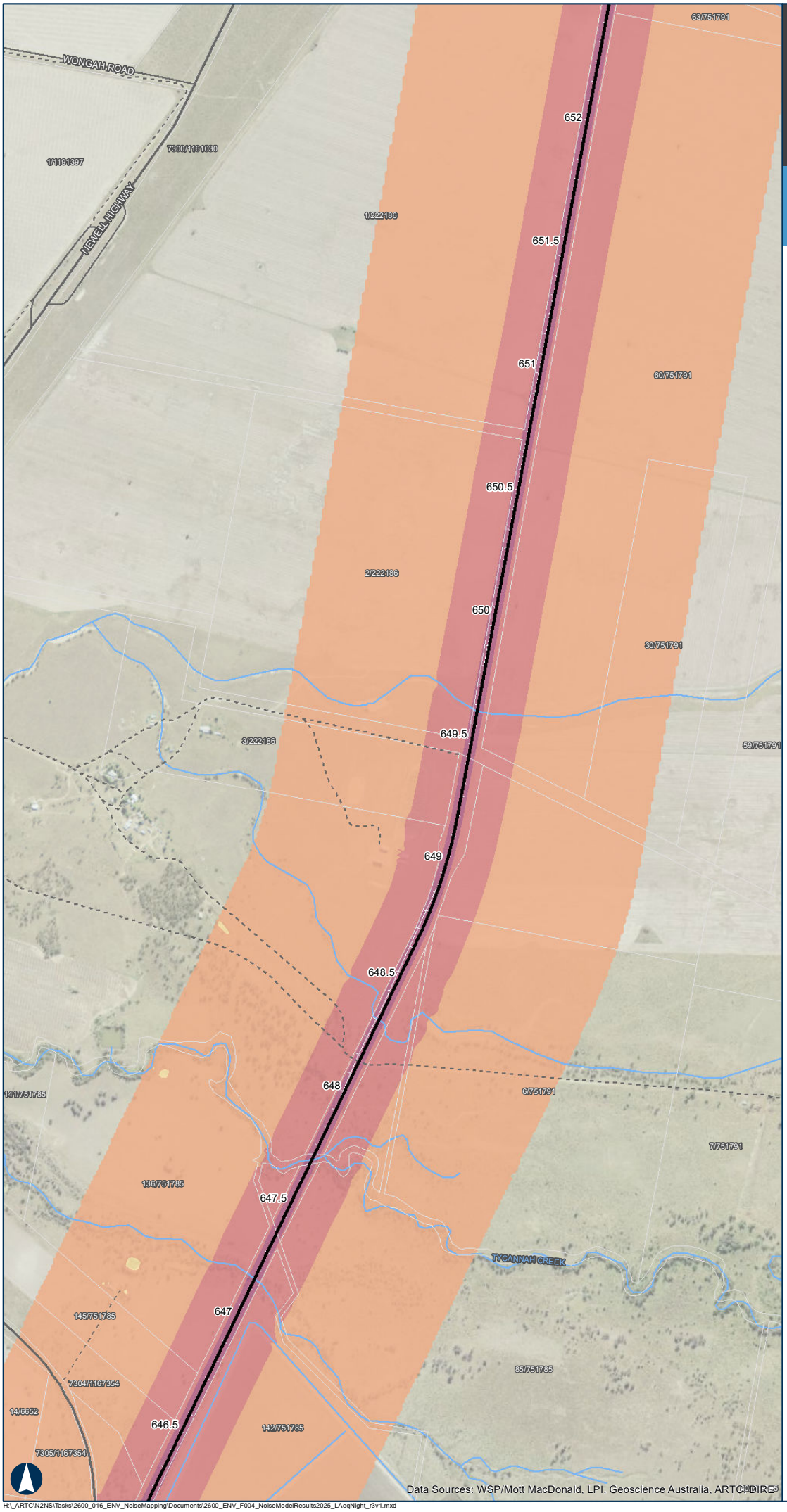
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 13 of 31

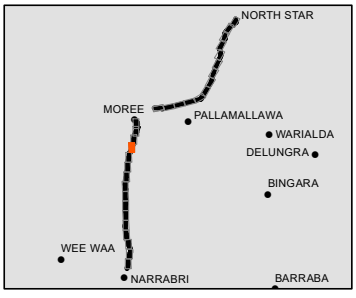
LEGEND

- Townships
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- Local Road
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- Track Alignment
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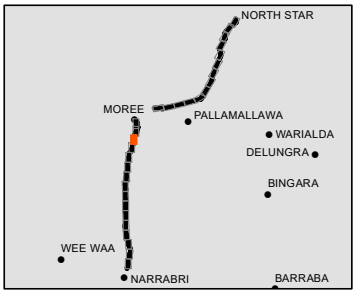
LEGEND

- Townships
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- Track
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Noise Contours (dB(A))

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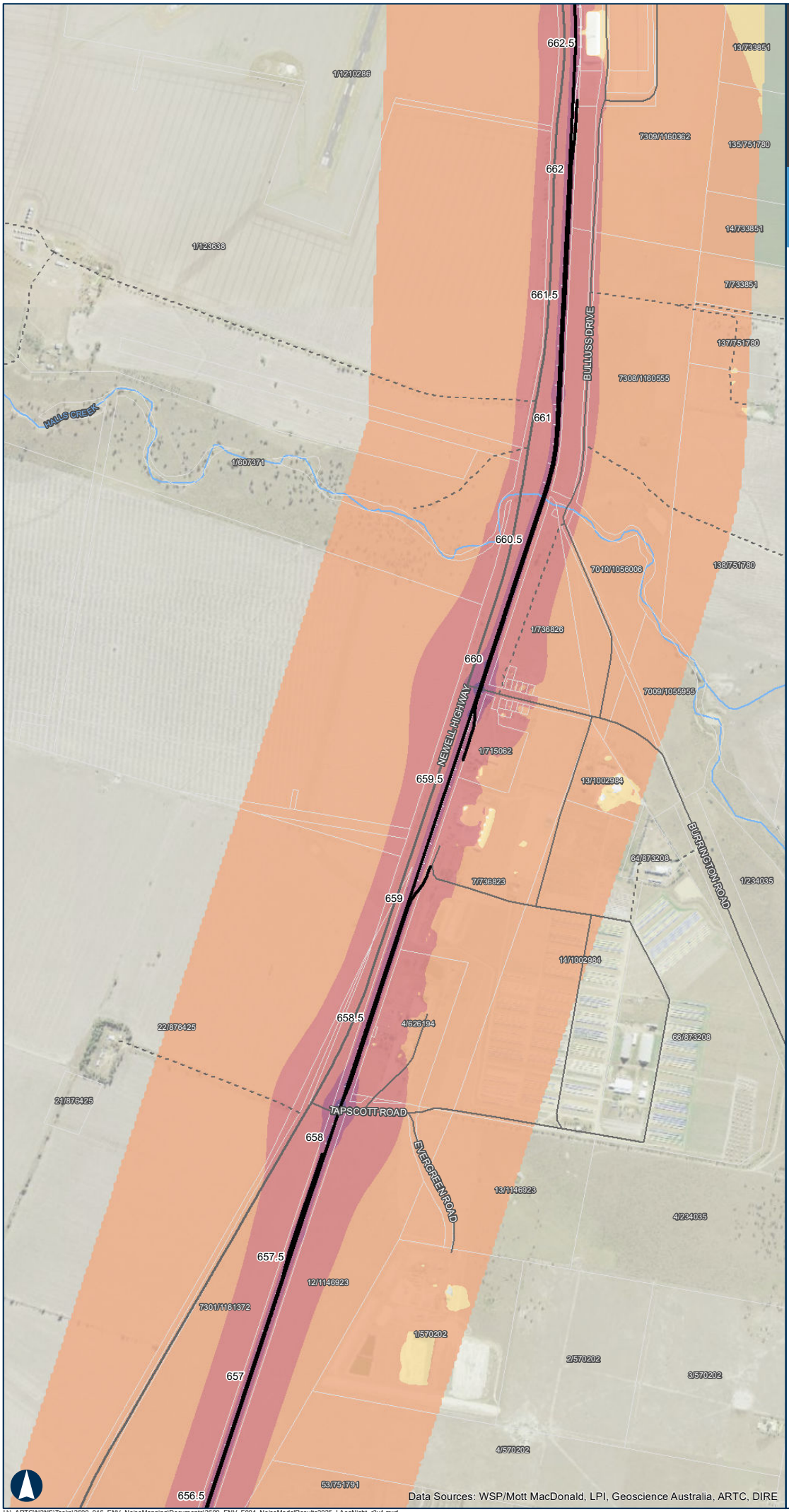
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 15 of 31

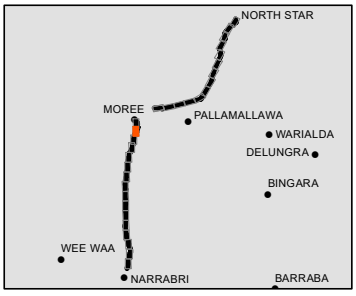
LEGEND

- Townships
- Highway
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- Track
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- Track Alignment
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Noise Contours (dB(A))

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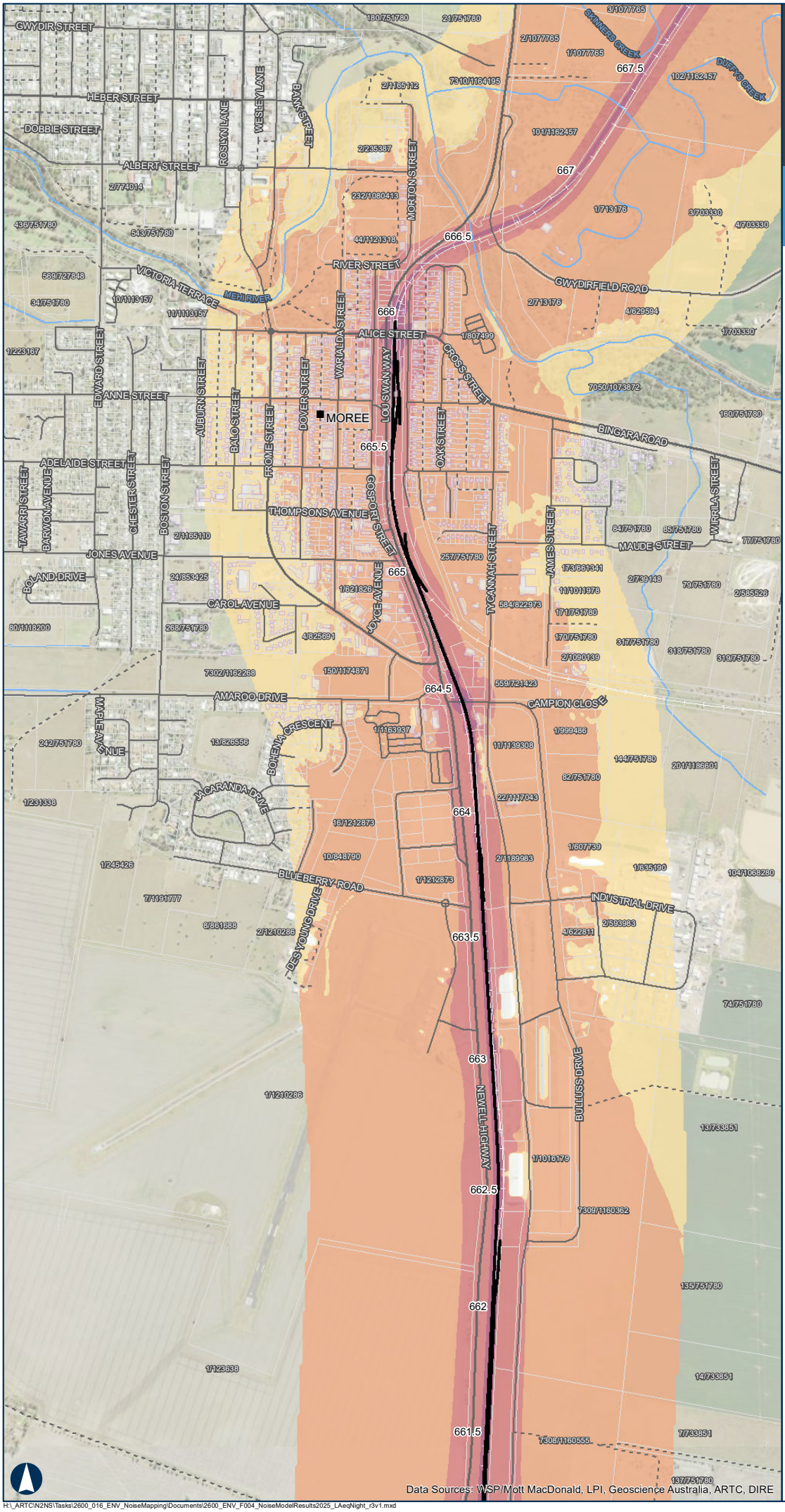
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

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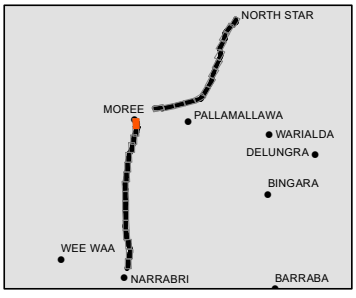
LEGEND

- Townships
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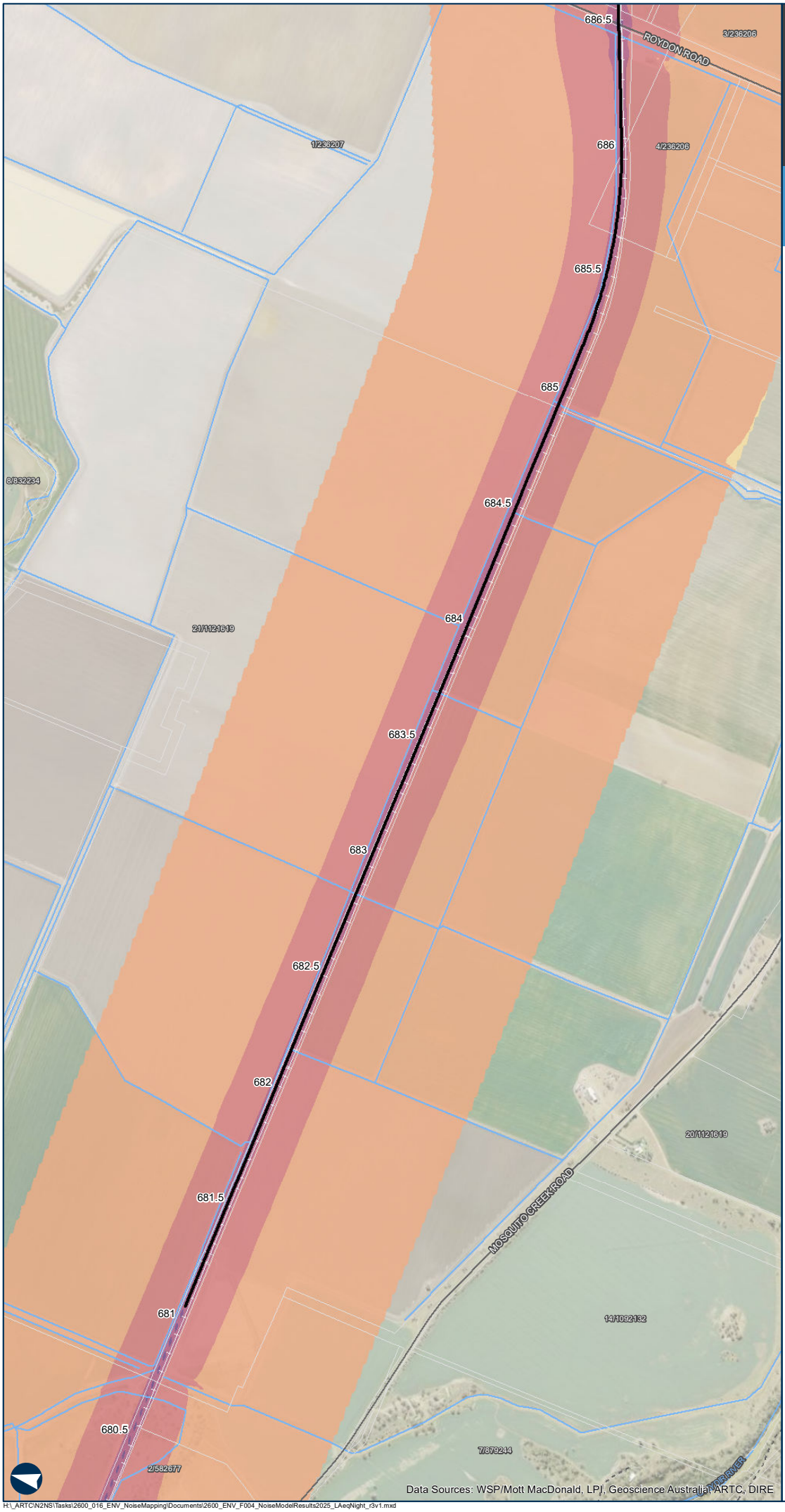
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Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

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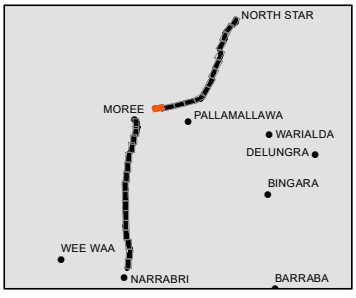
LEGEND

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- 55 - 60
- 65 - 70
- >75

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0.75 Km

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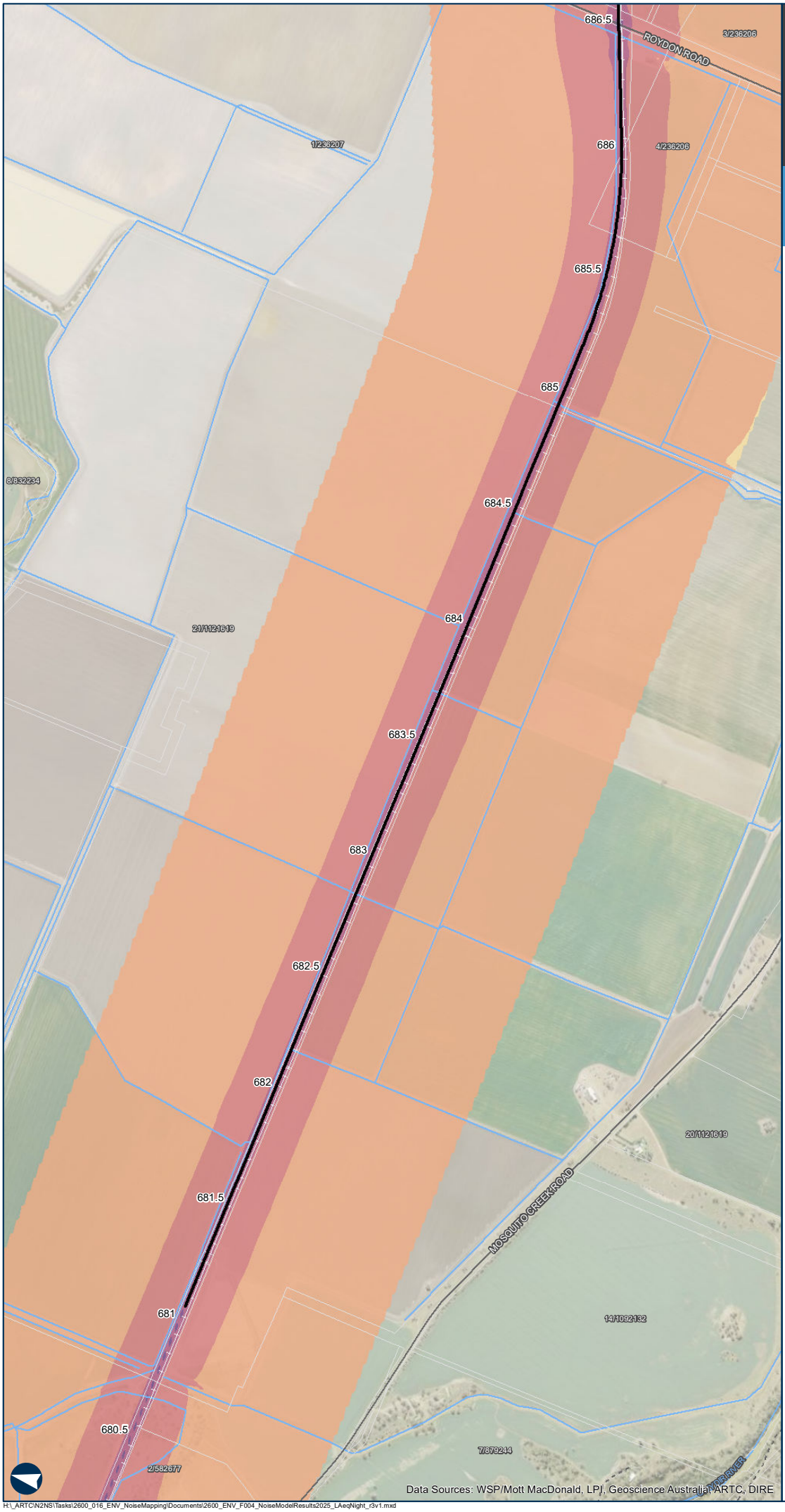
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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INLAND RAIL

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 18 of 31

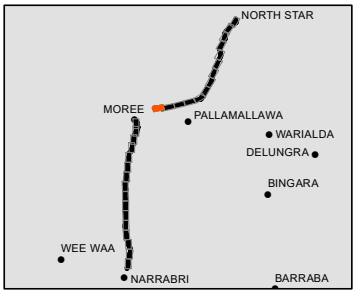
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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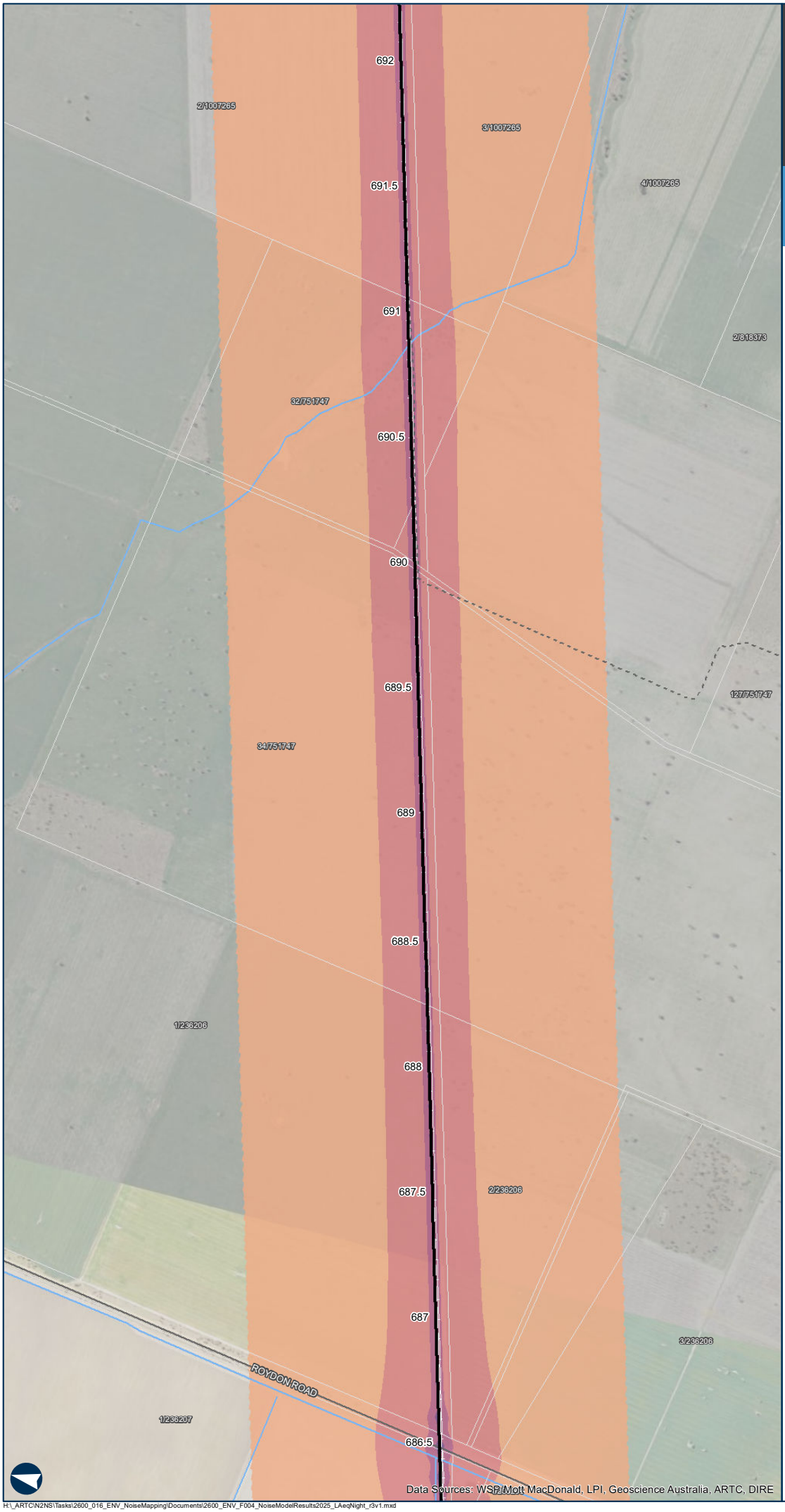
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 19 of 31

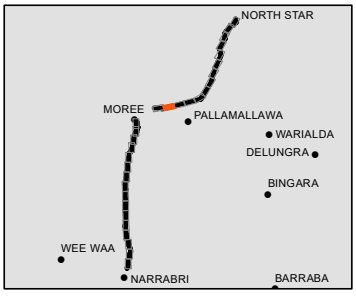
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 20 of 31

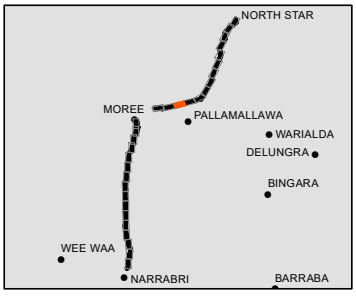
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 21 of 31

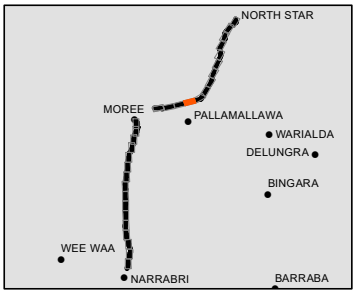
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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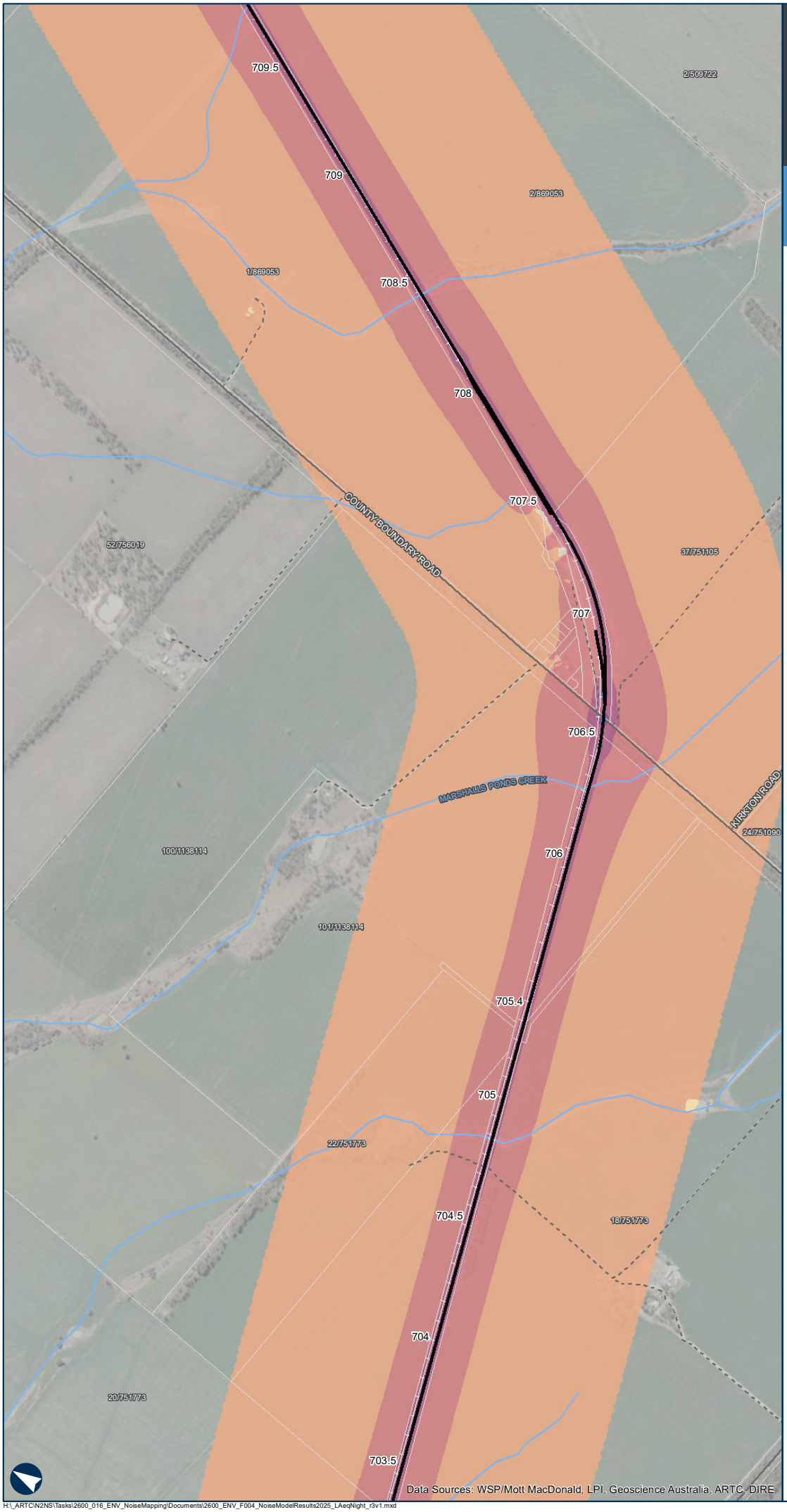
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 22 of 31

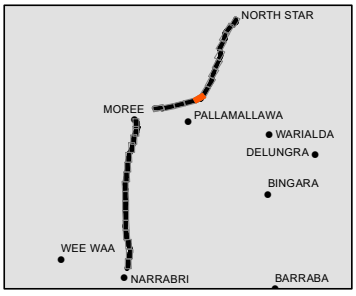
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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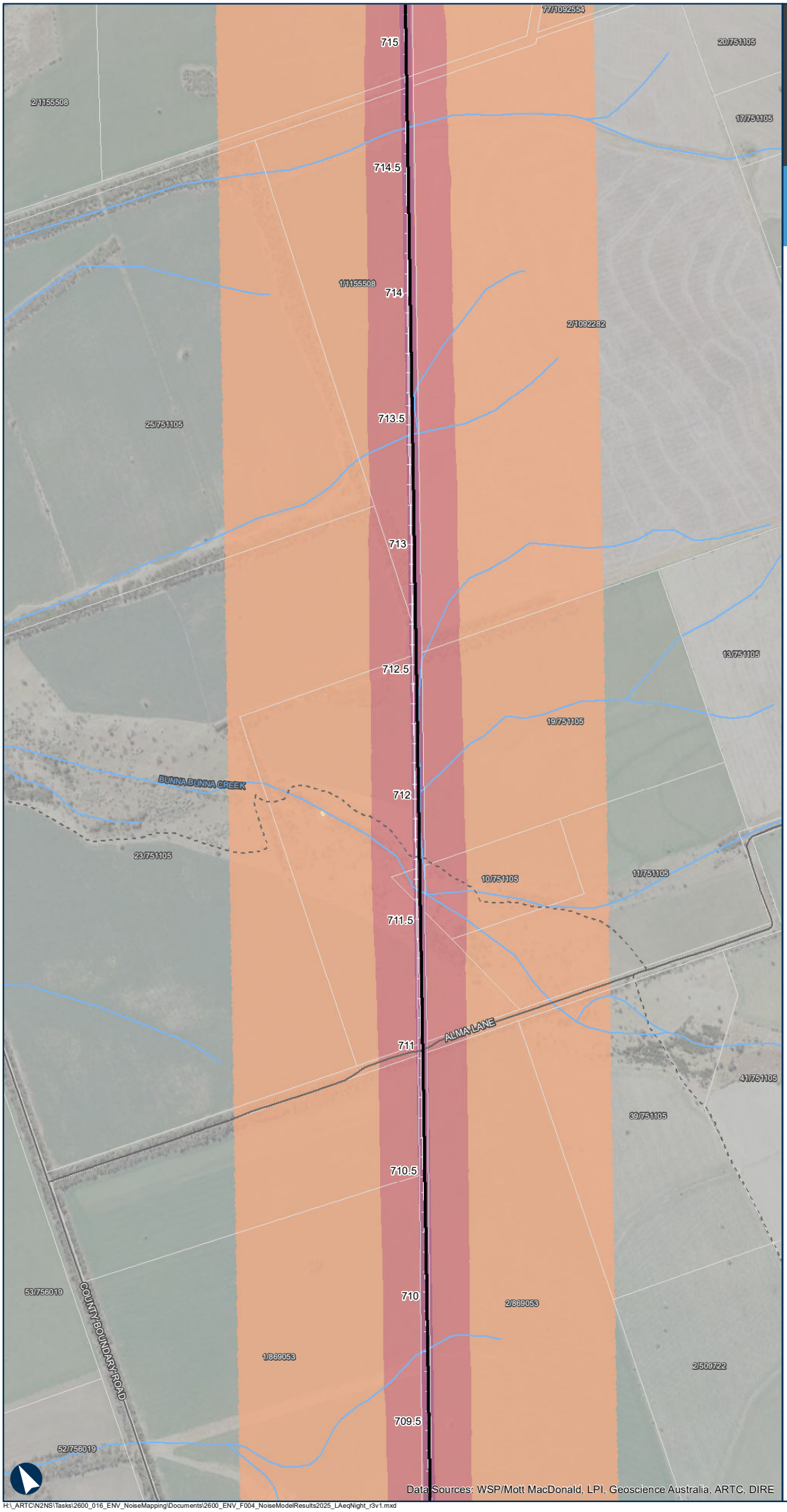
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 23 of 31

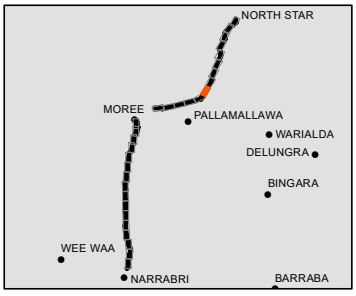
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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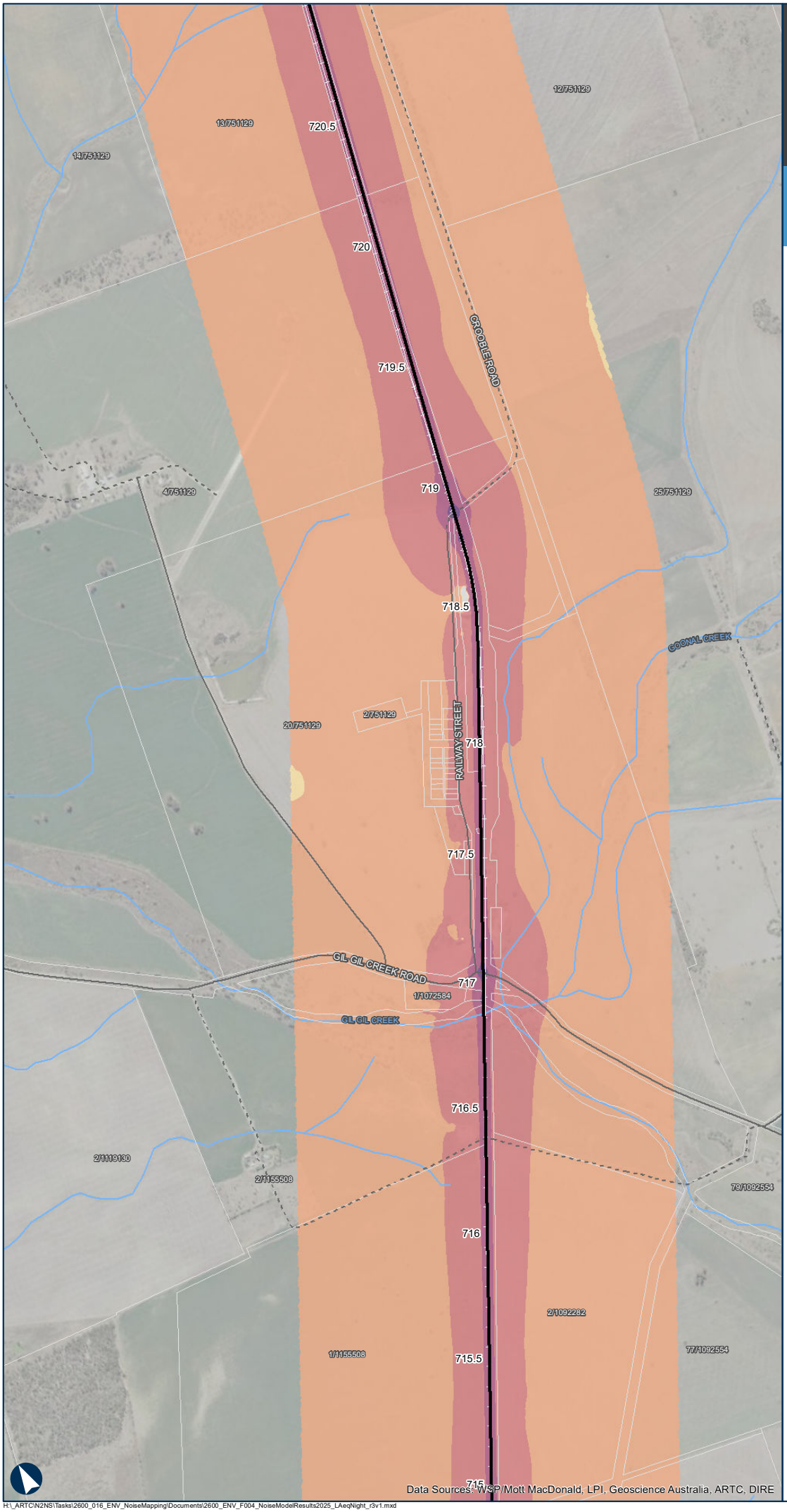
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

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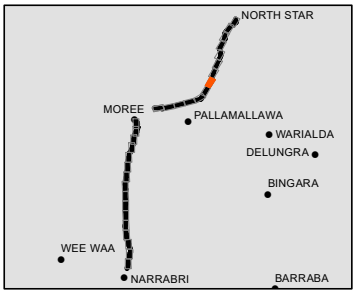
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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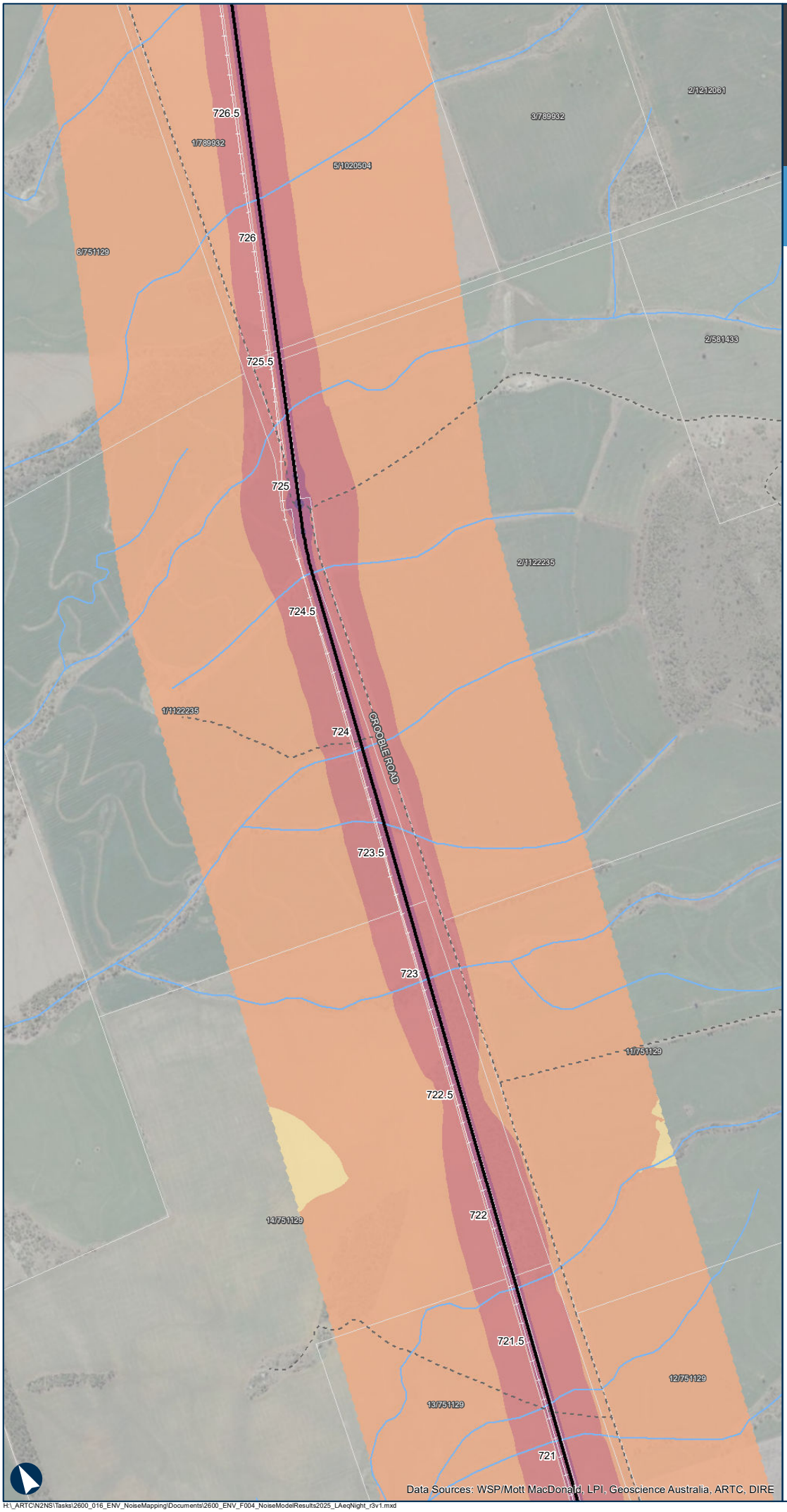
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

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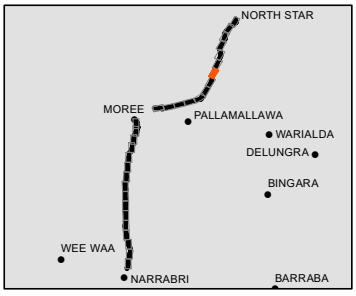
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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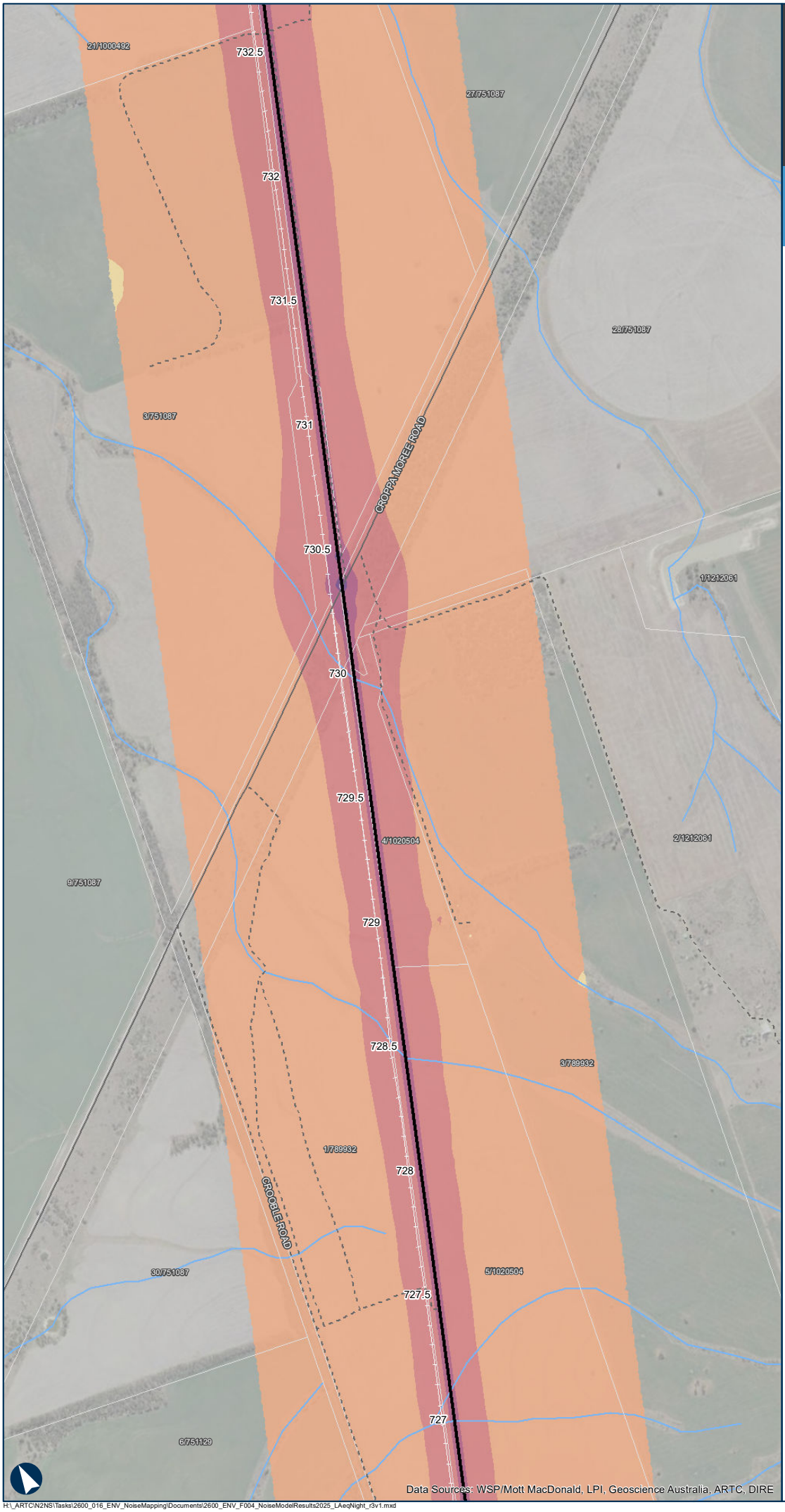
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

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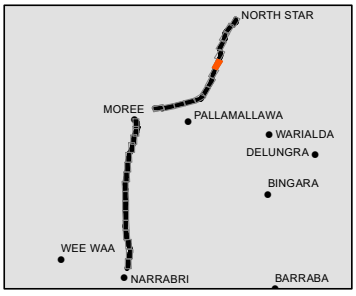
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
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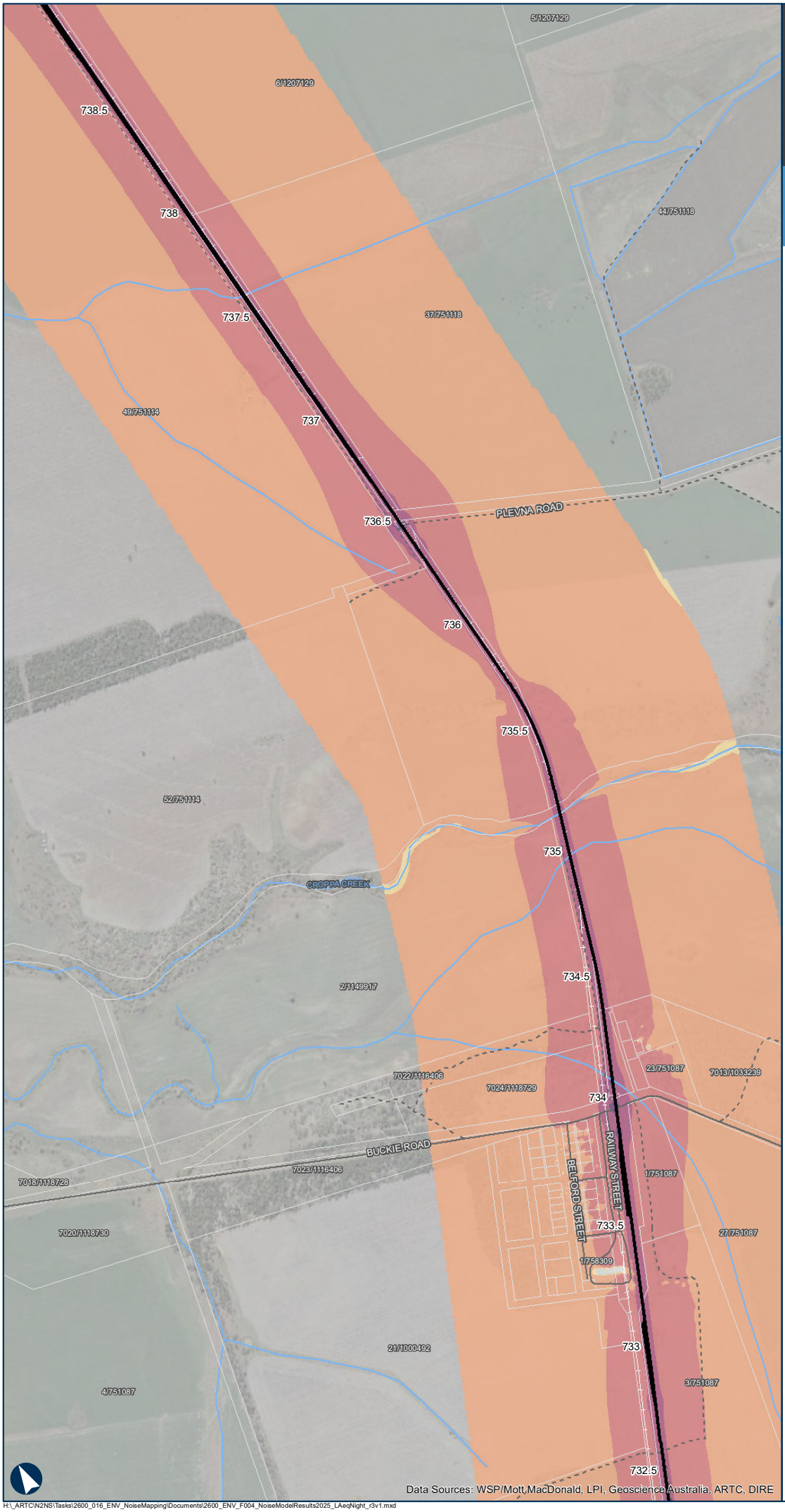
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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 27 of 31

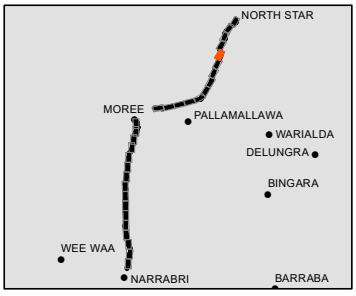
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
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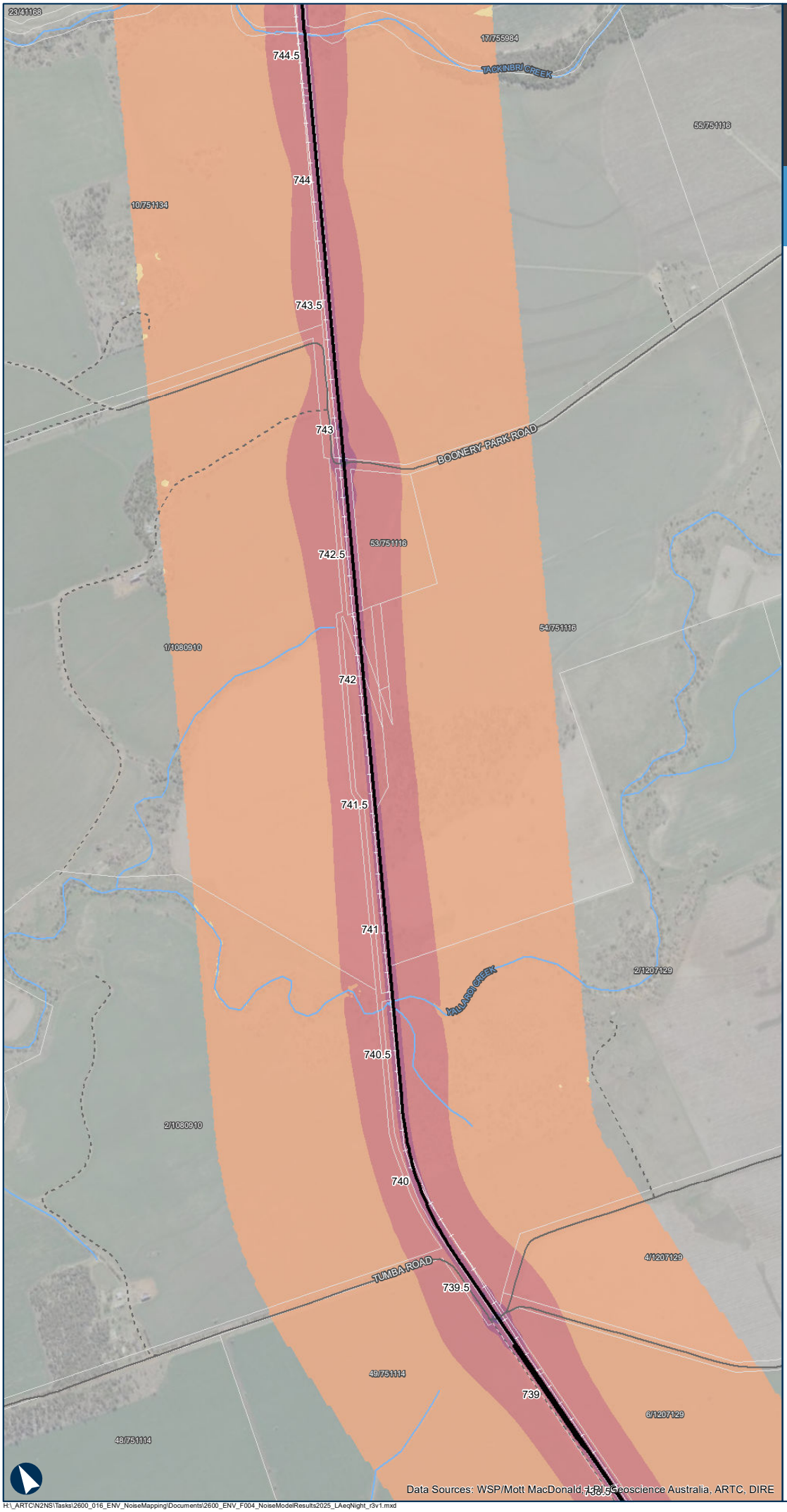
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Author: IRDJV

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Data Sources: WSP/Mott MacDonald, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 28 of 31

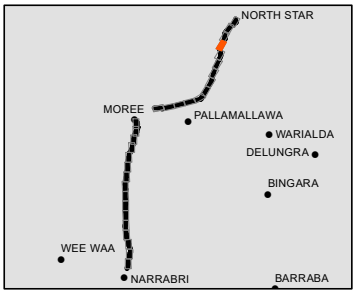
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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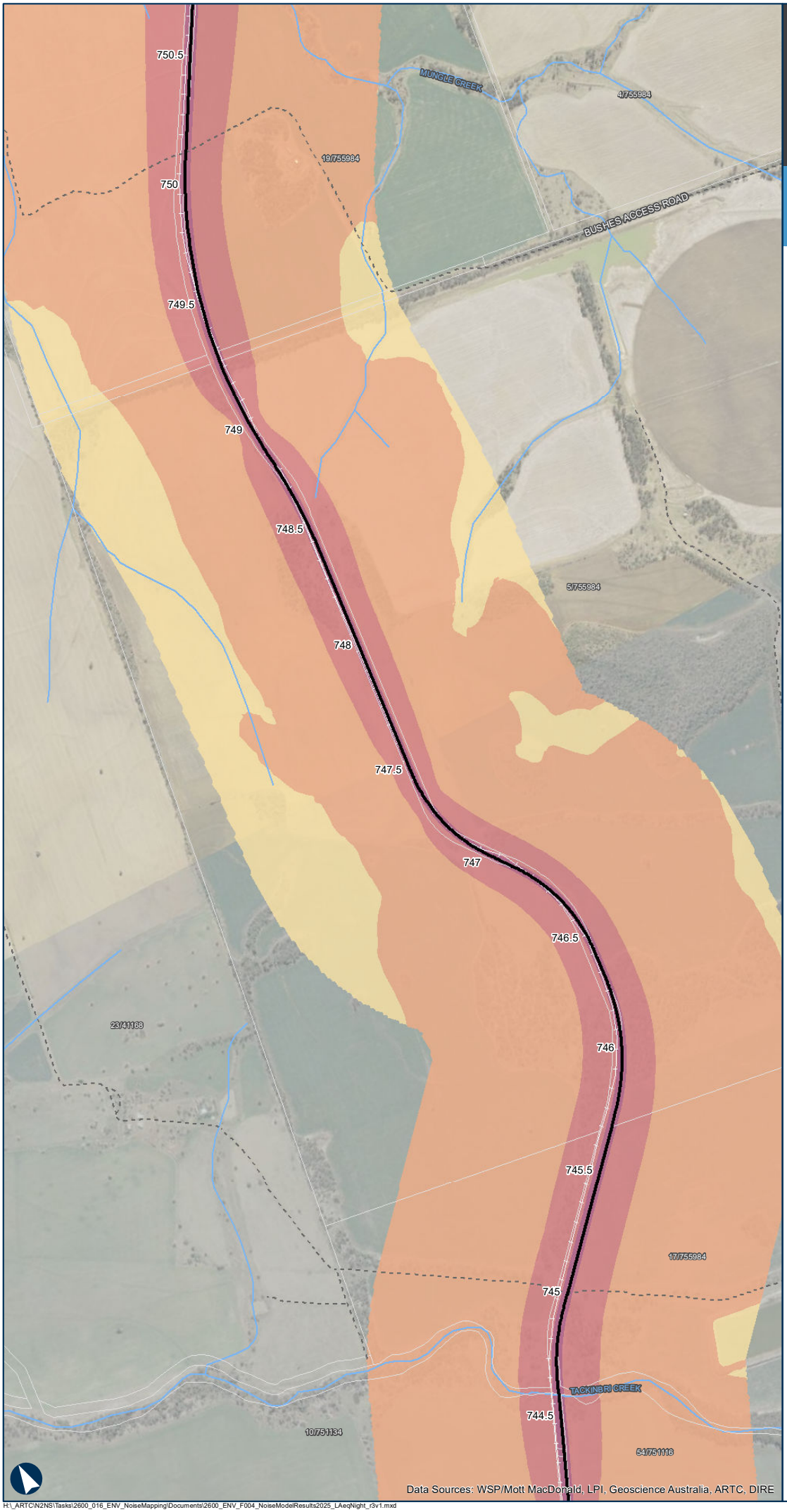
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

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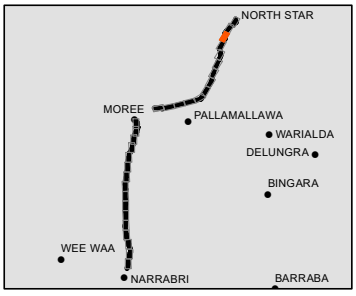
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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- 45 - 50
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- 65 - 70
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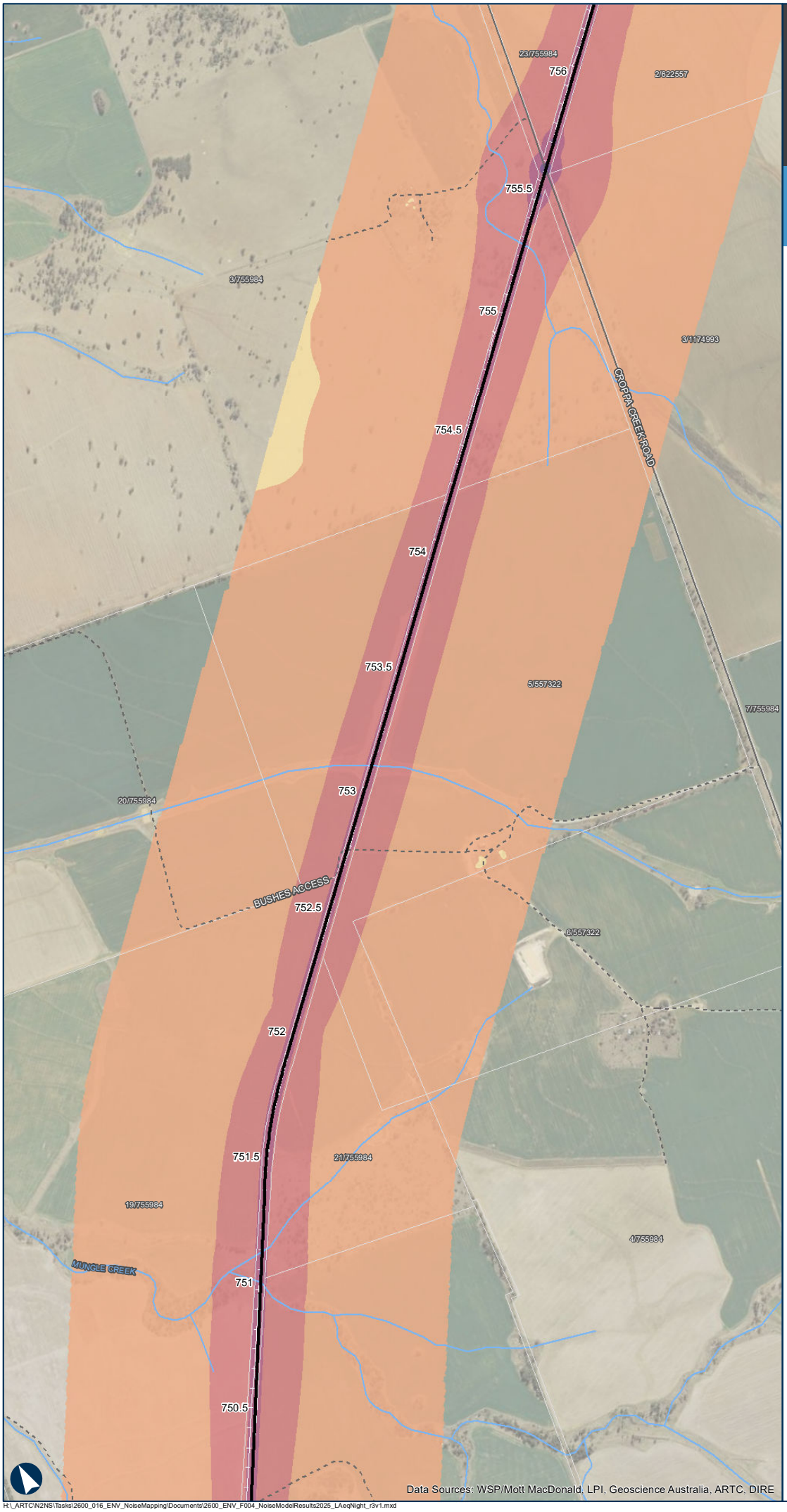
Paper: A3

Scale: 1:15,000

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 30 of 31

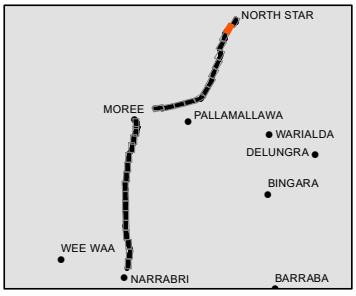
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

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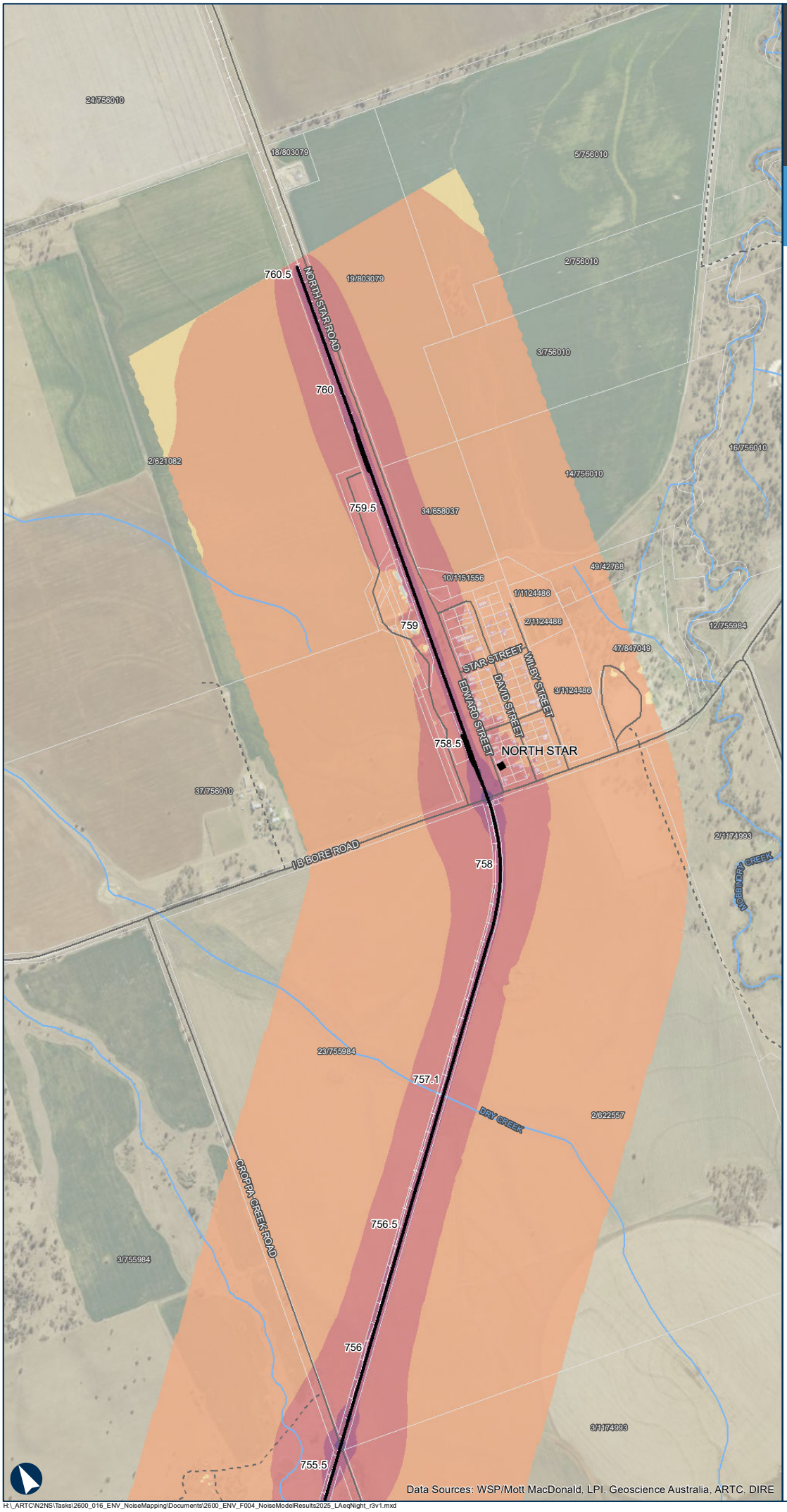
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAeq Night without mitigation

Sheet 31 of 31

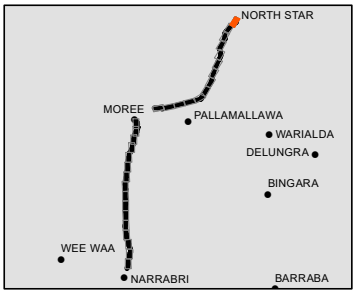
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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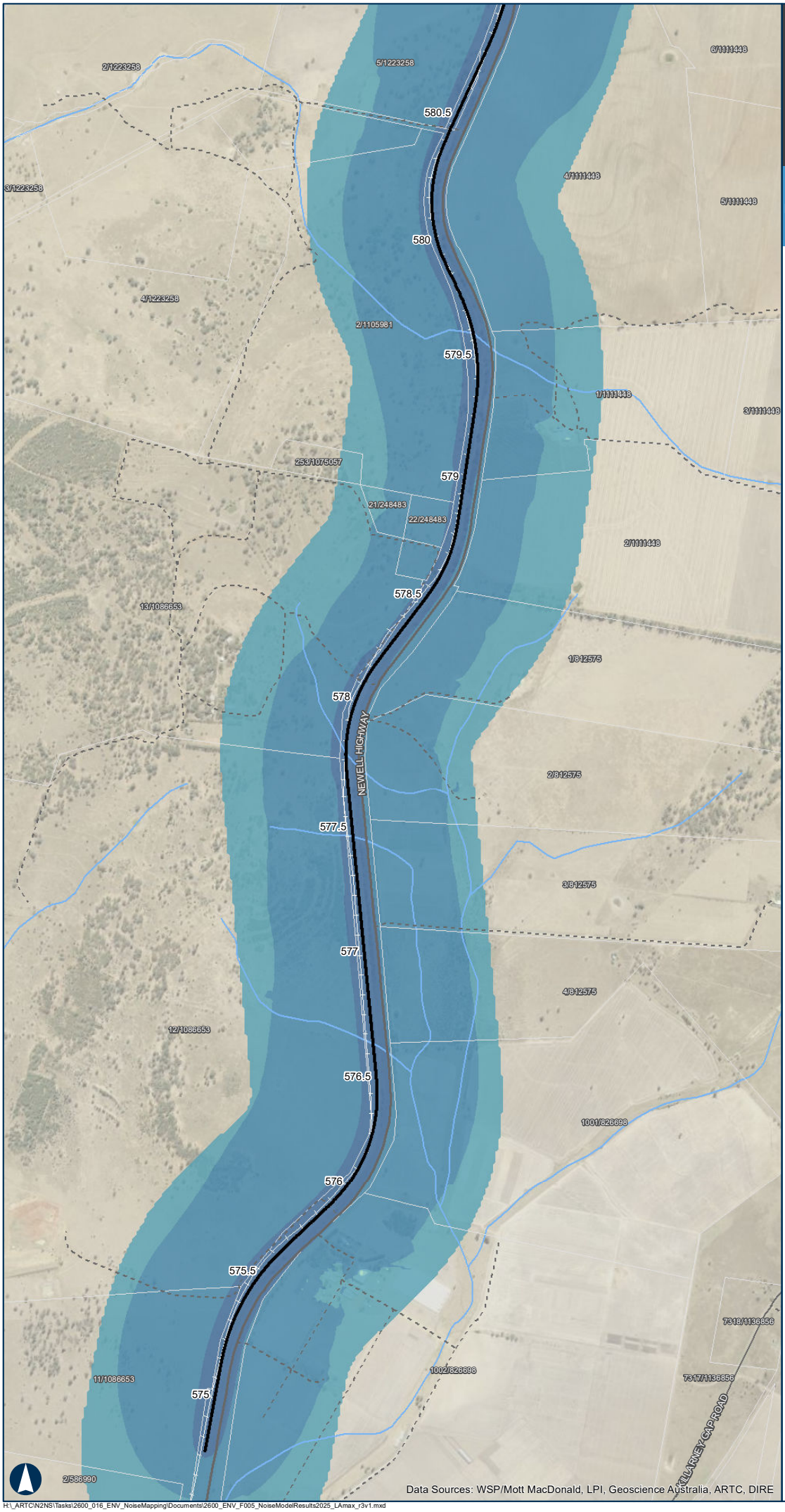
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Author: IRDJV

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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 1 of 31

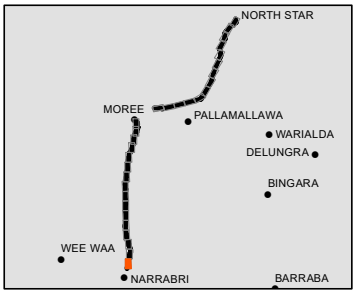
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

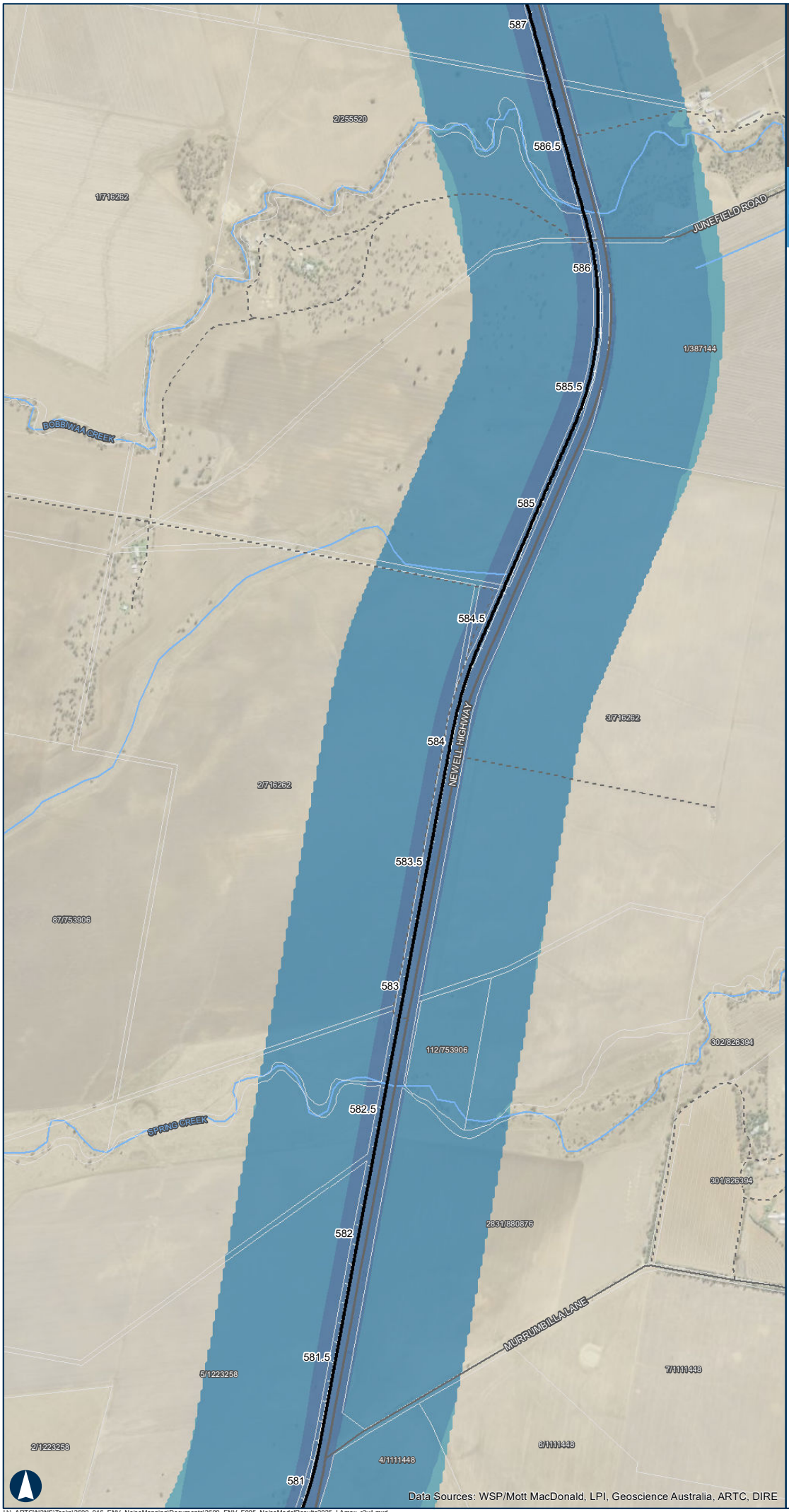
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 2 of 31

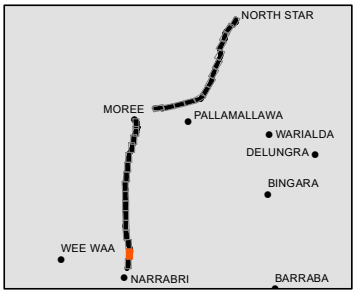
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
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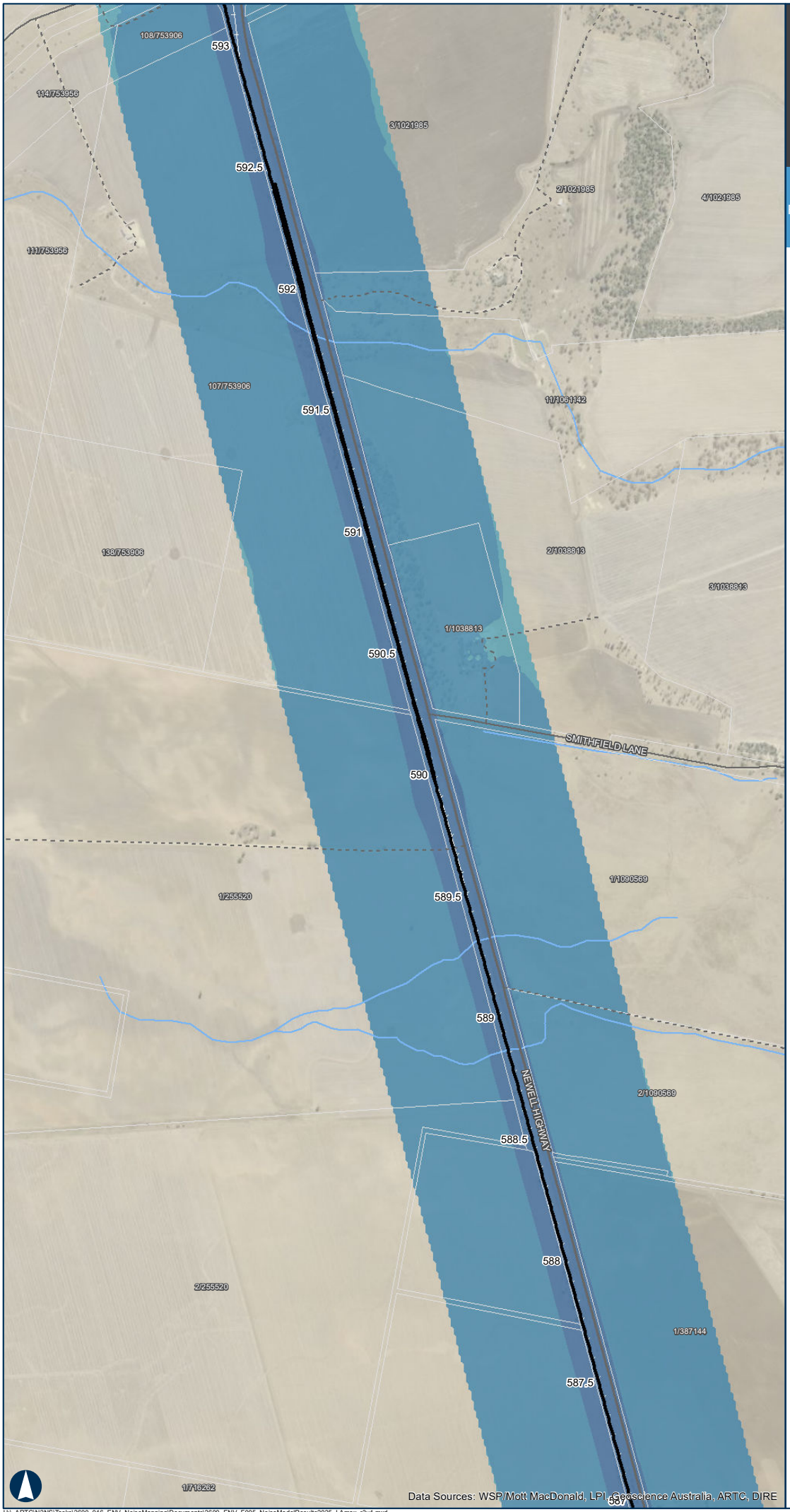
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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 3 of 31

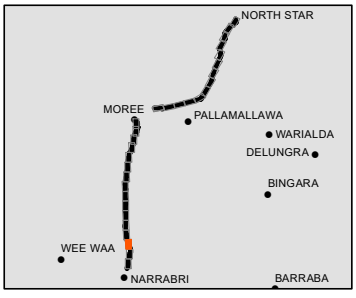
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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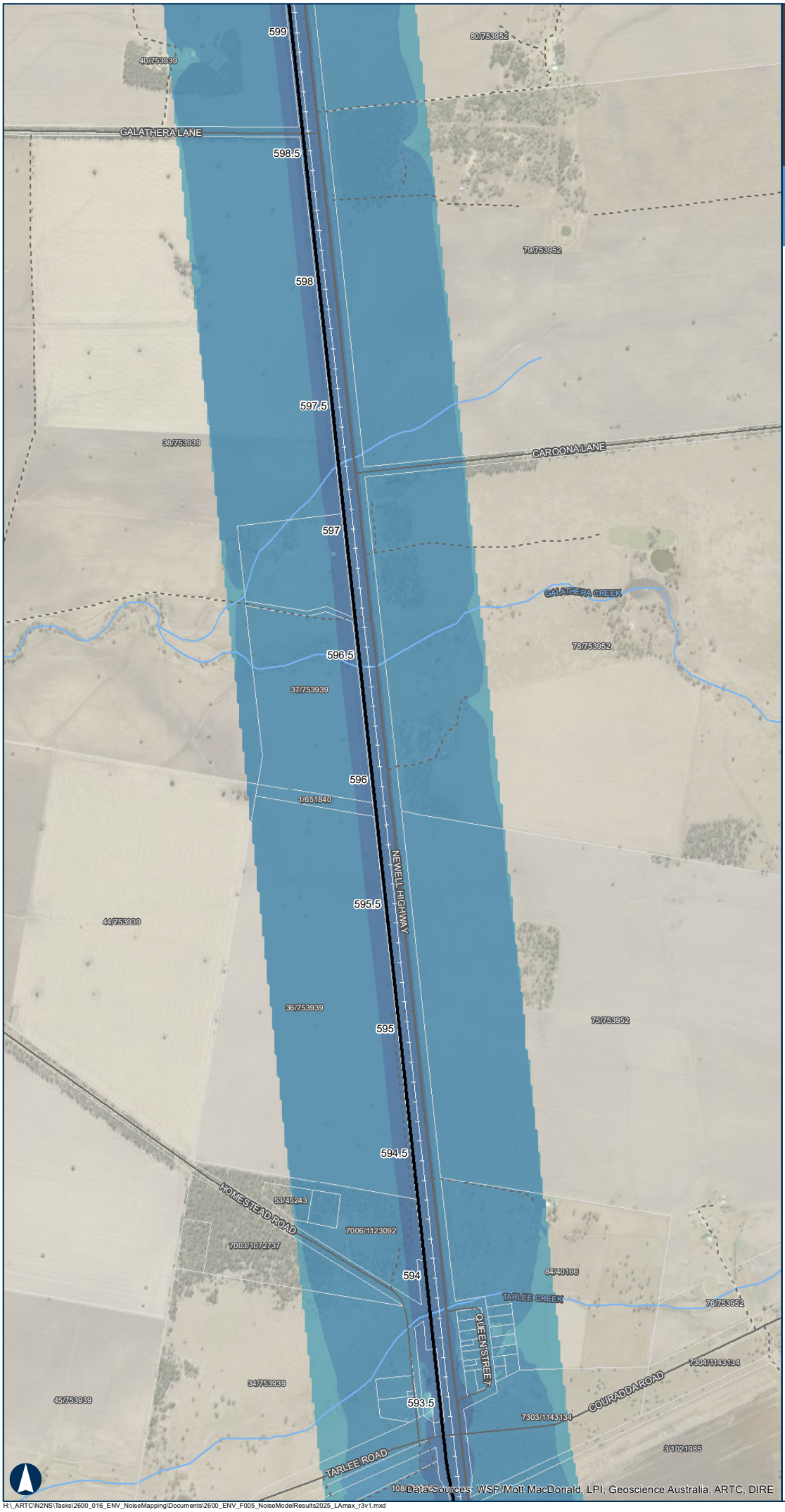
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Scale: 1:15,000

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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 4 of 31

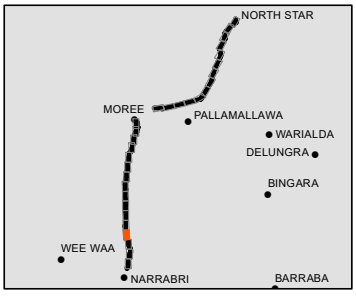
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 5 of 31

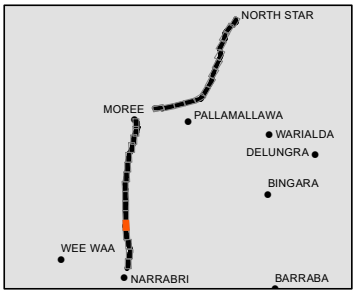
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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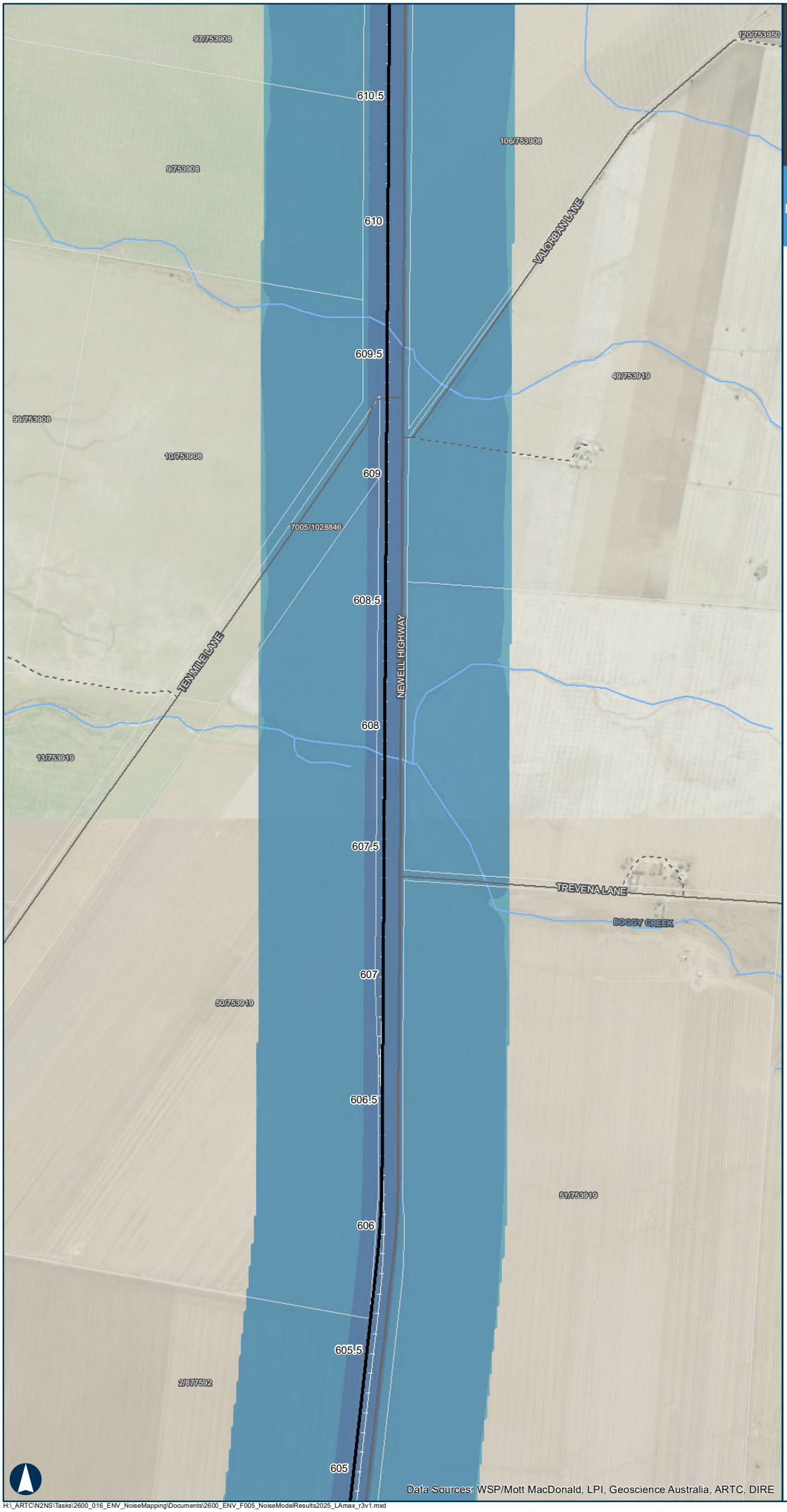
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 6 of 31

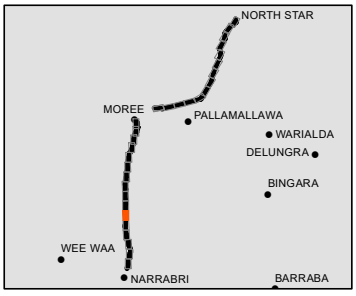
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
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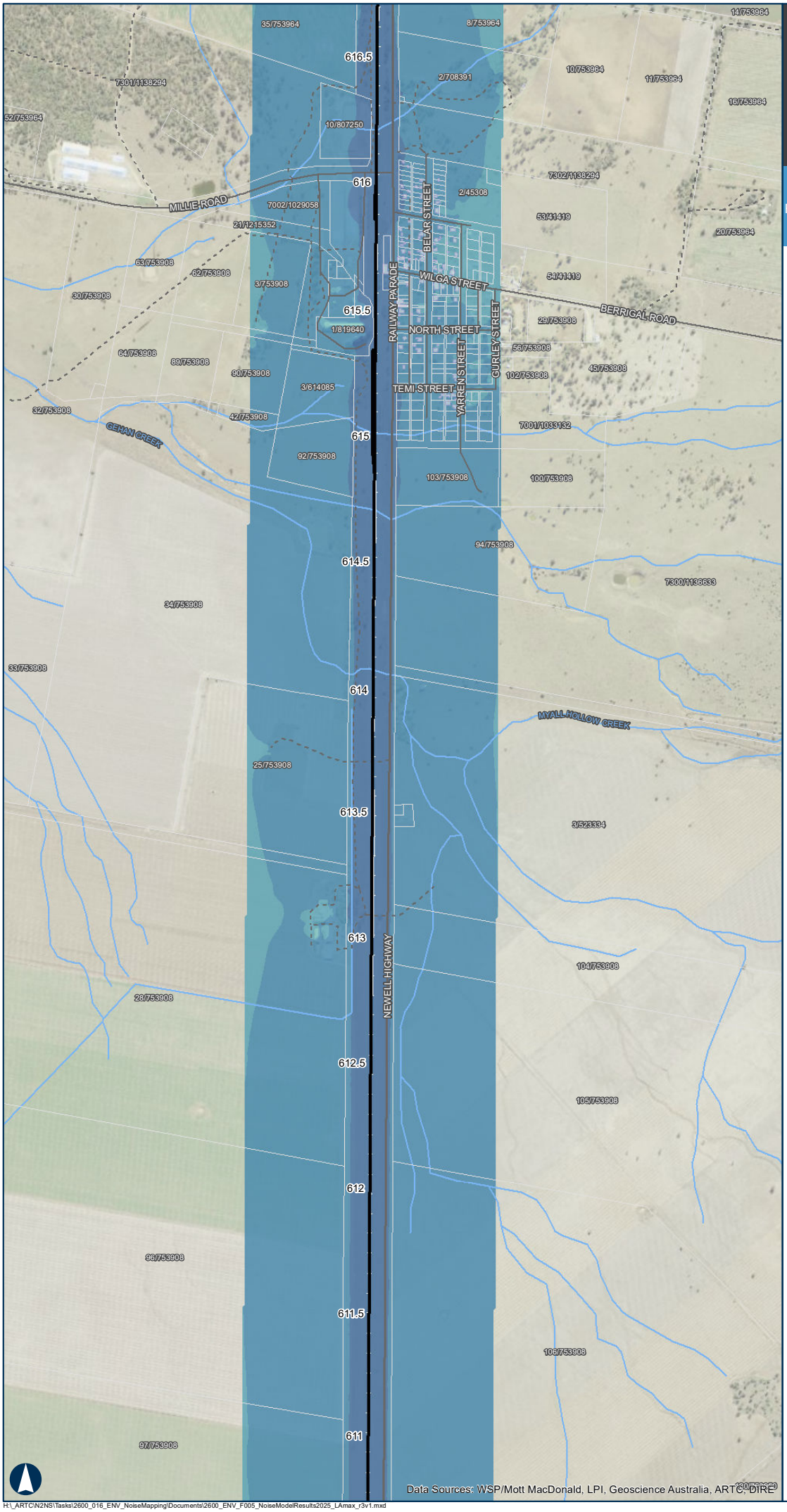
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 7 of 31

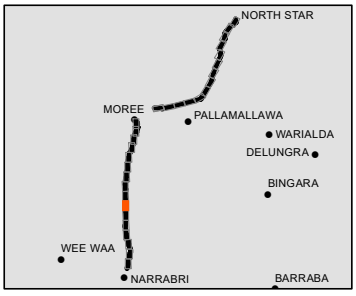
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
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- Building Footprints

Noise Contours (dB(A))

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- 55 - 60
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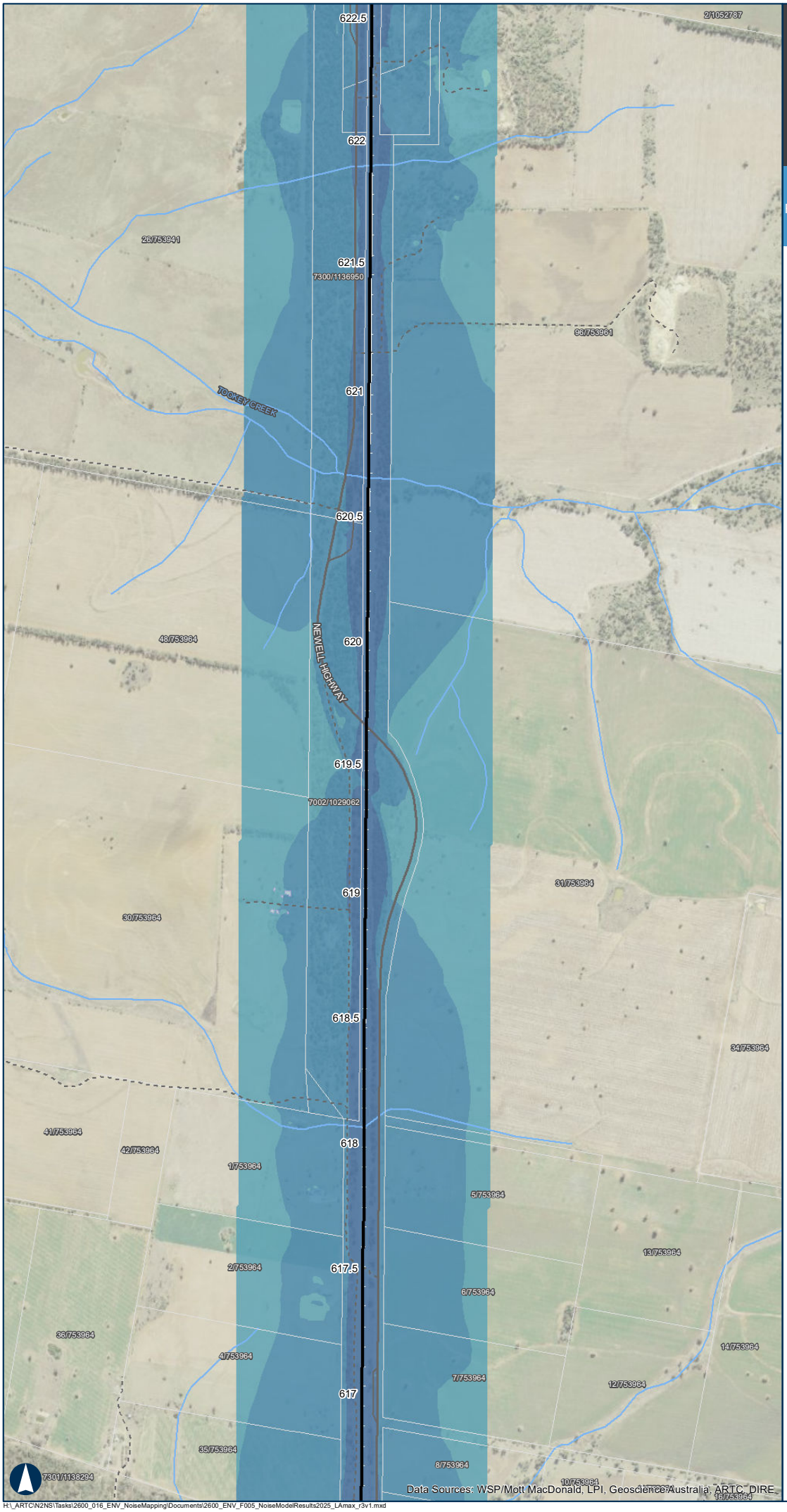
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Date: 13-Aug-21

Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 8 of 31

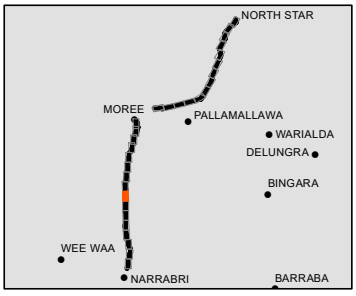
LEGEND

- Townships
- Highway
- Local Road
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- Track Alignment
- Watercourse
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- Building Footprints

Noise Contours (dB(A))

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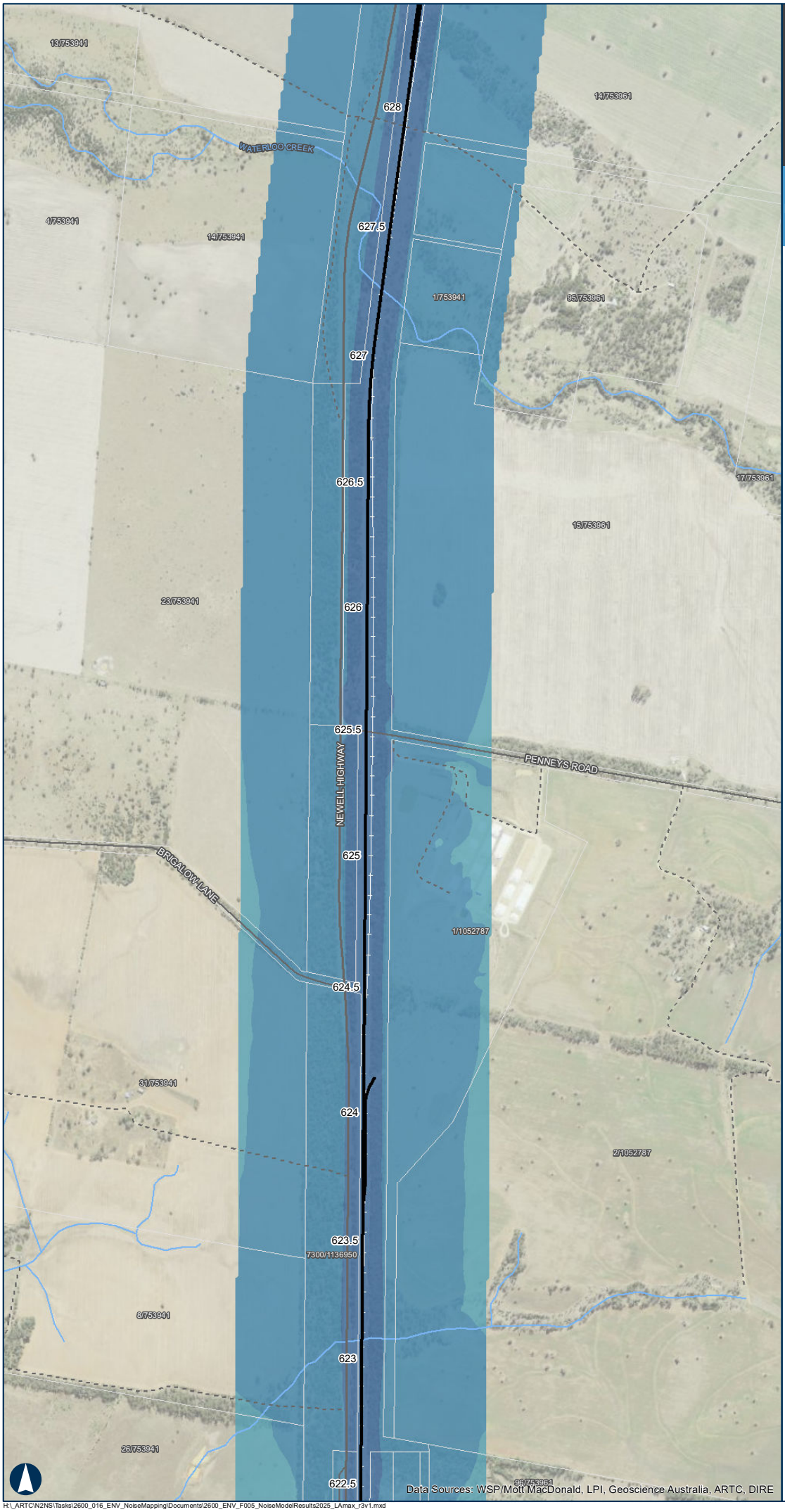
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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 9 of 31

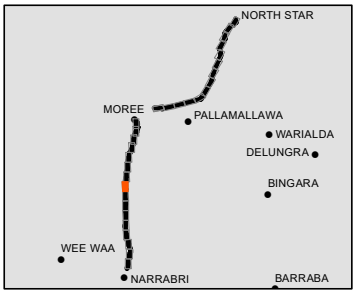
LEGEND

- Townships
- Highway
- Local Road
- Track
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Noise Contours (dB(A))

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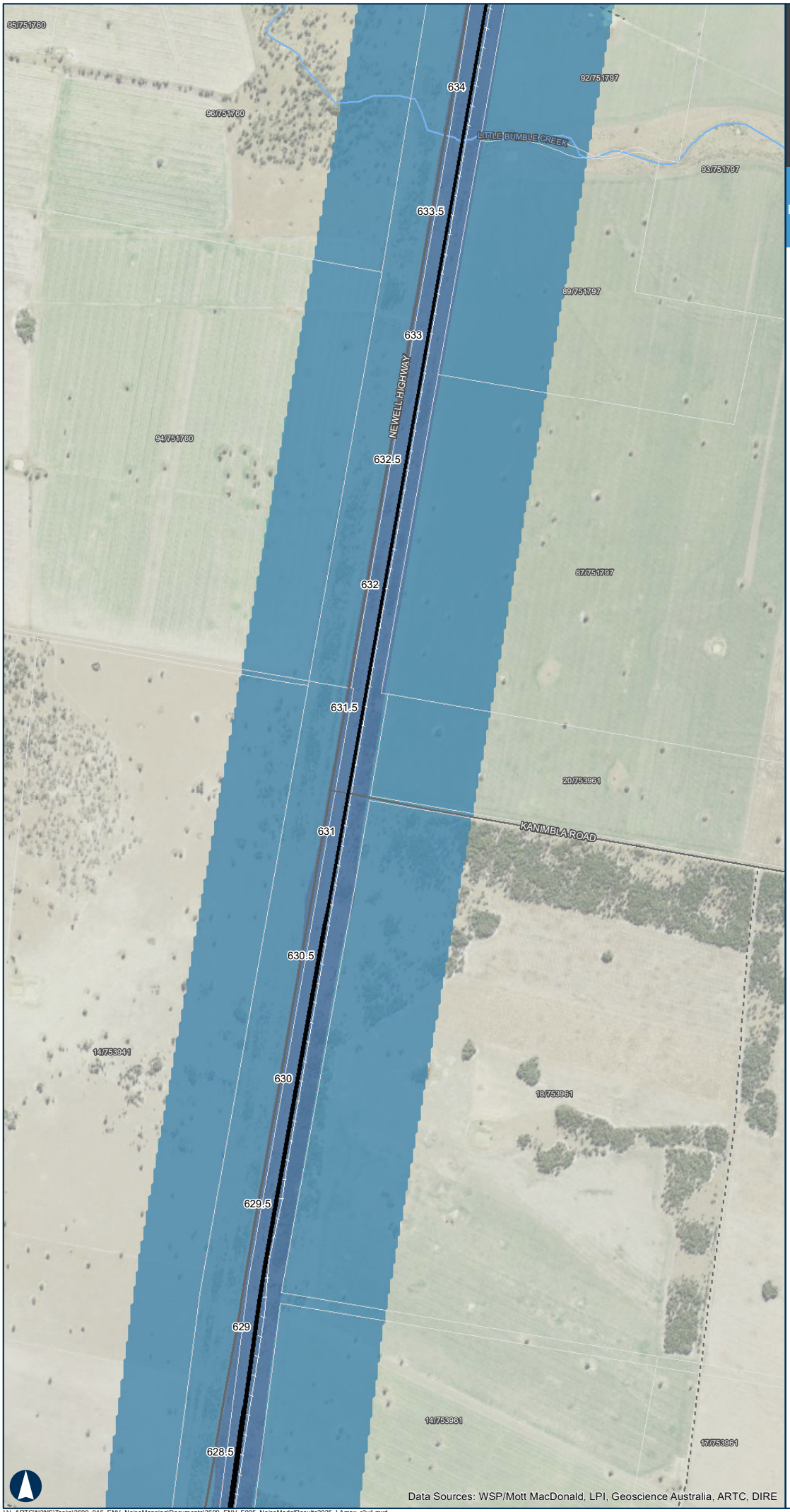
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 10 of 31

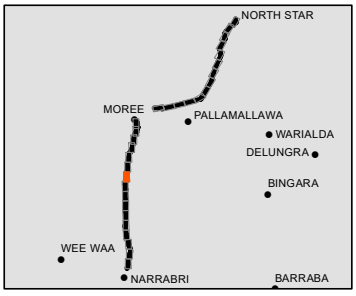
LEGEND

- Townships
- Highway
- Local Road
- Track
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- Track Alignment
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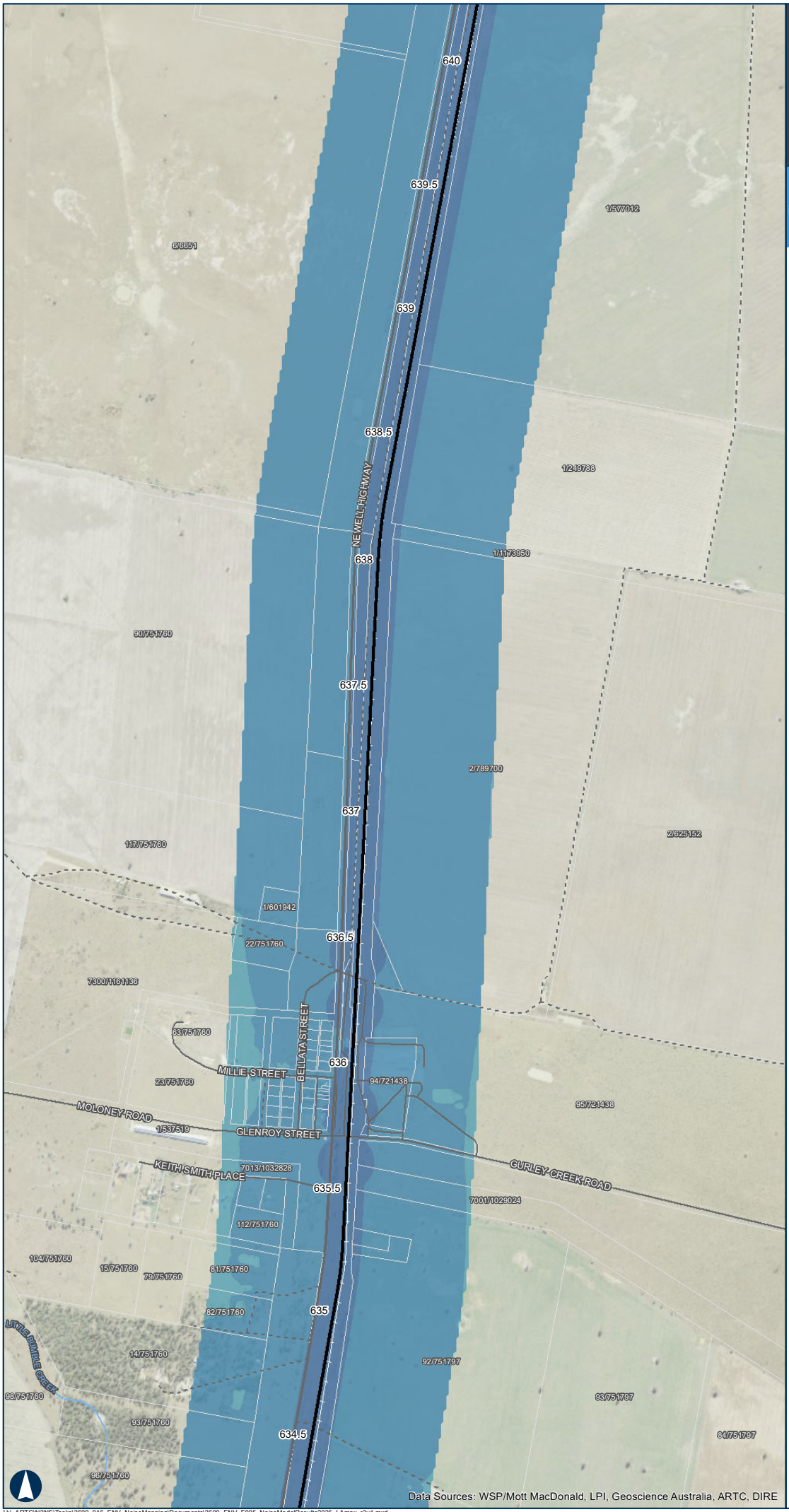
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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 11 of 31

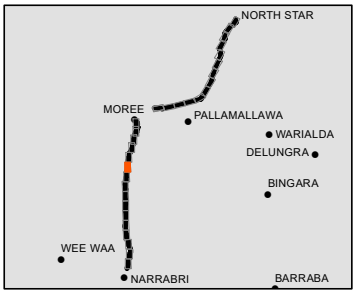
LEGEND

- Townships
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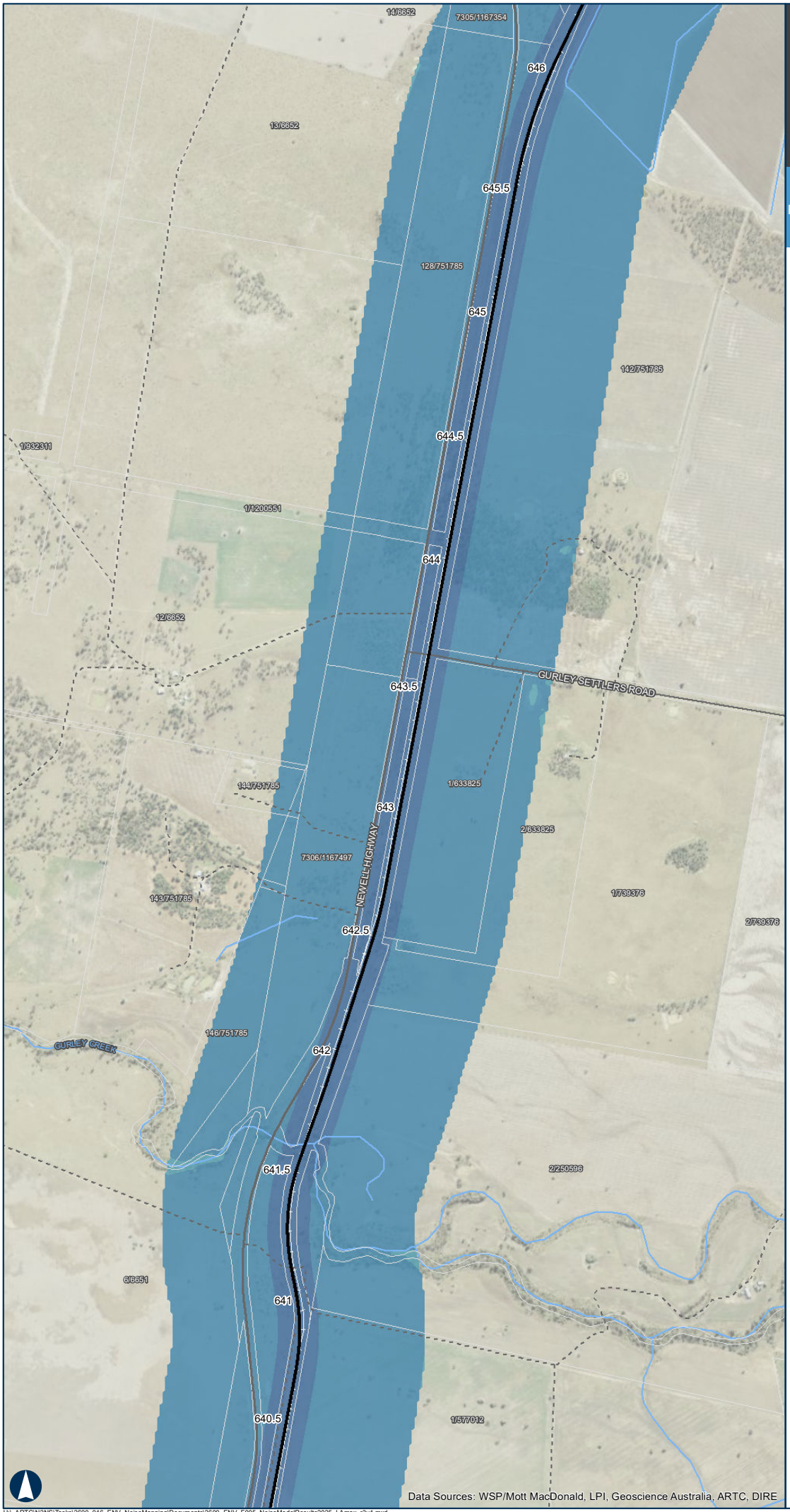
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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INLAND RAIL

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 12 of 31

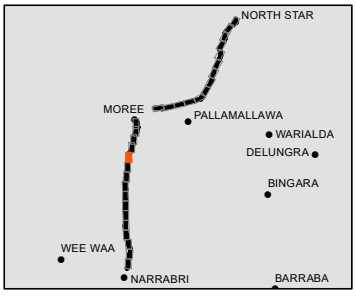
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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0.75 Km

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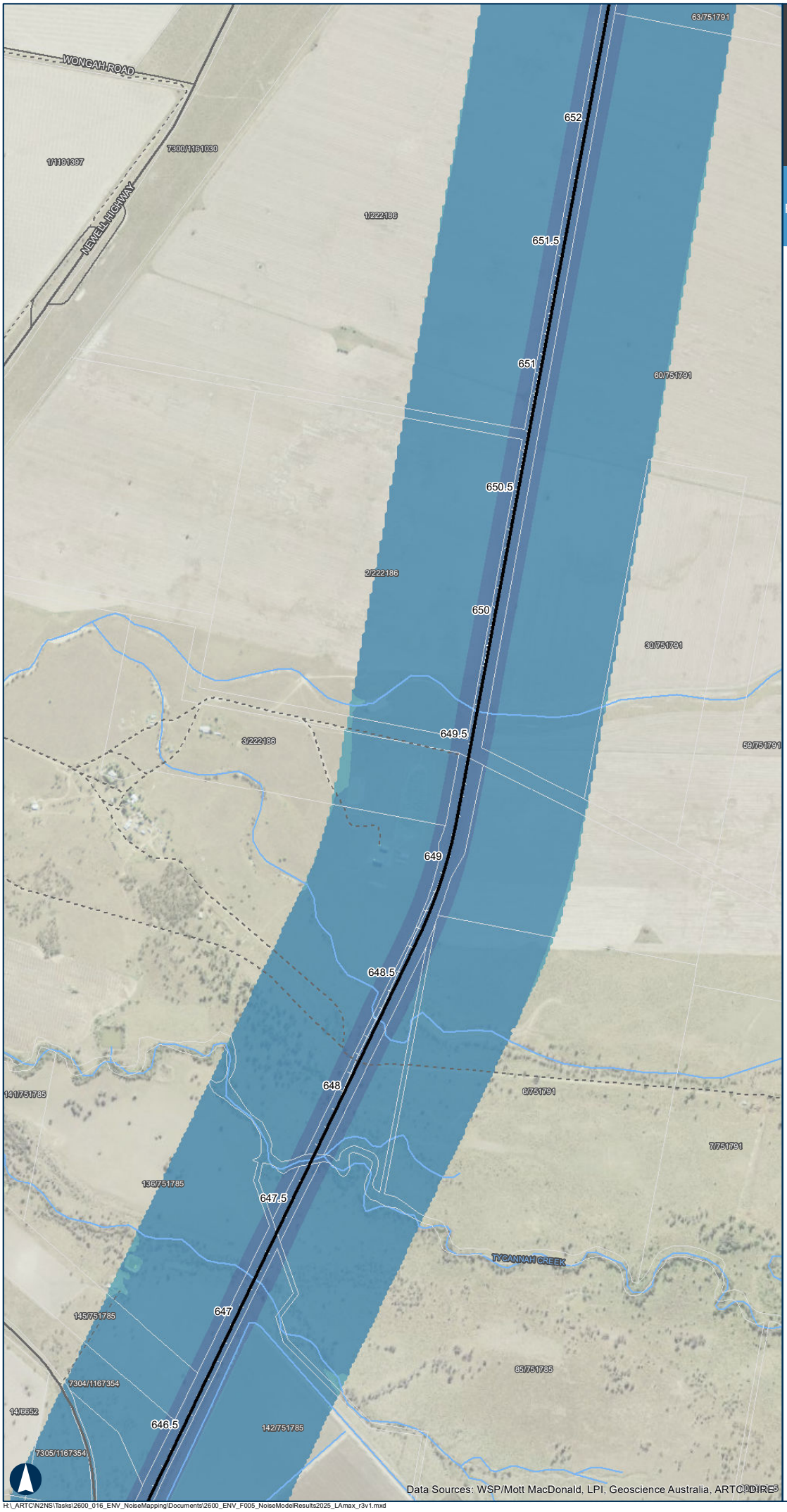
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 13 of 31

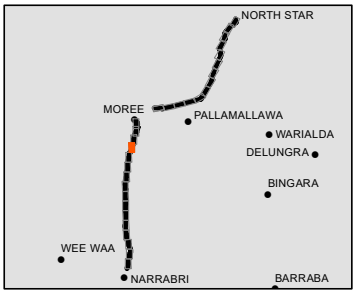
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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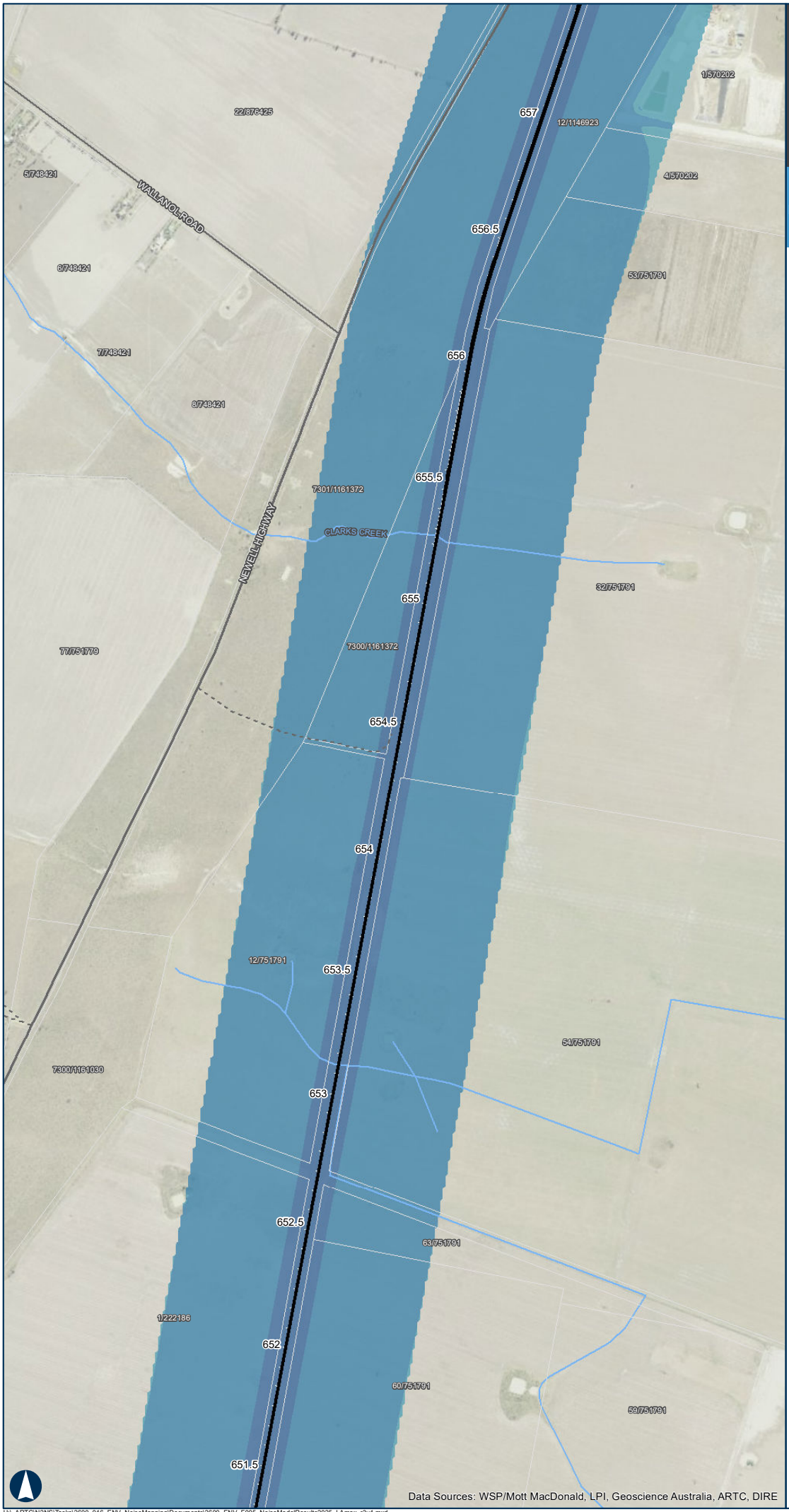
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 14 of 31

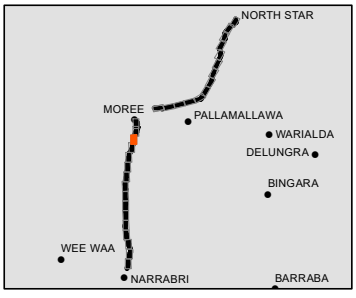
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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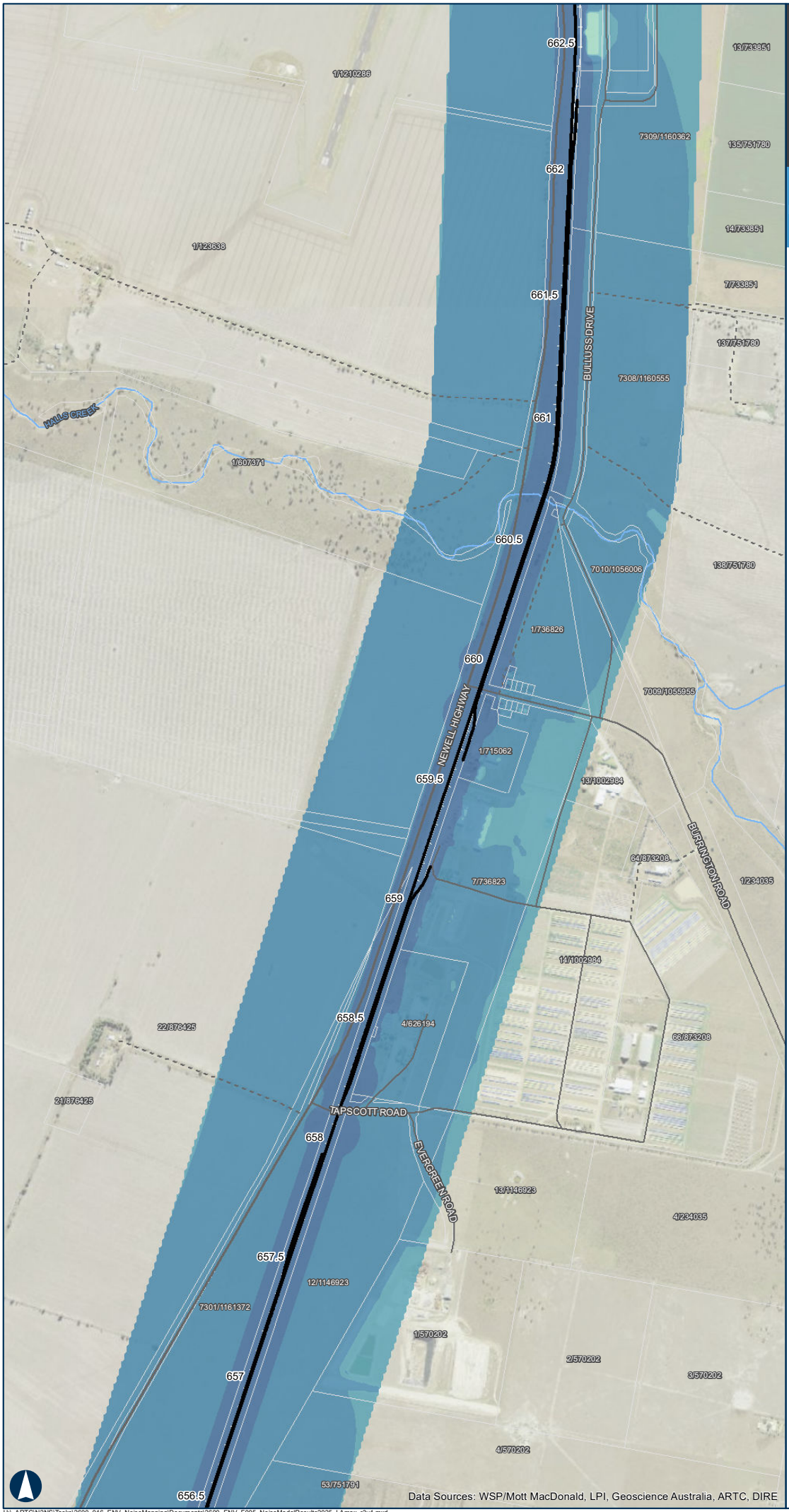
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 15 of 31

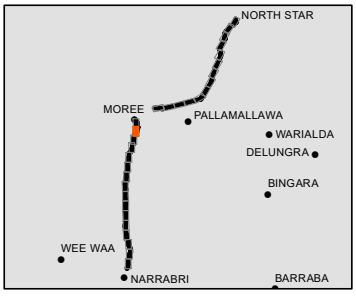
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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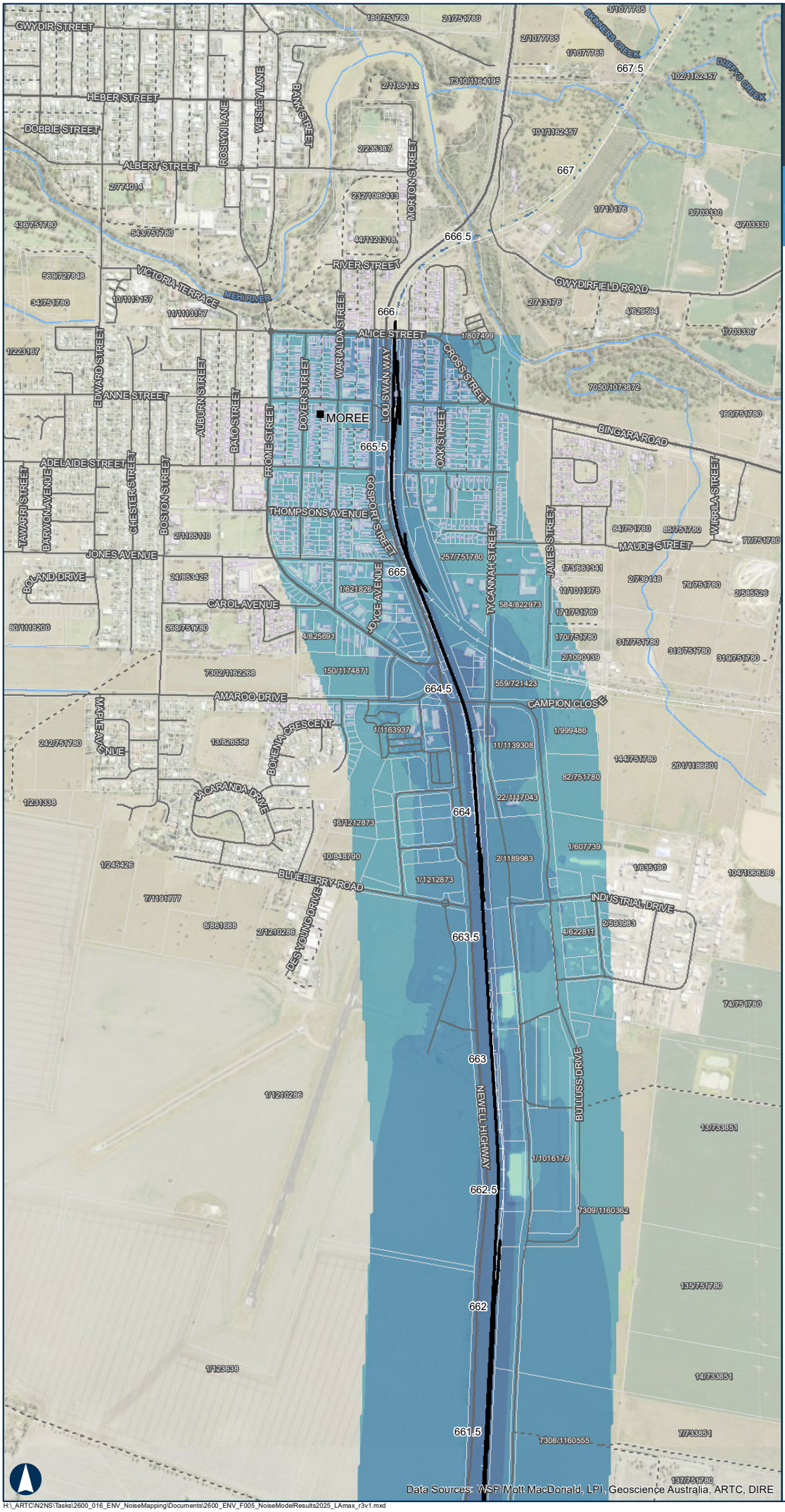
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

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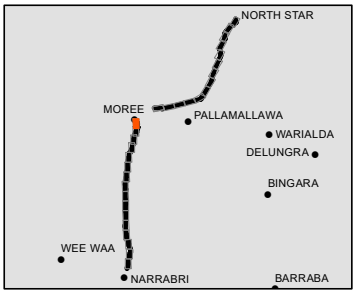
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

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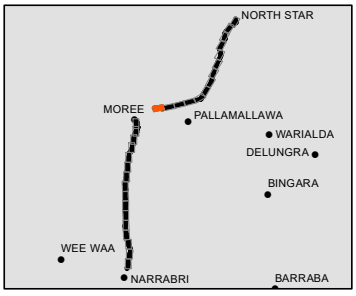
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

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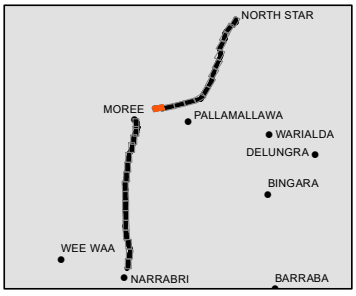
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

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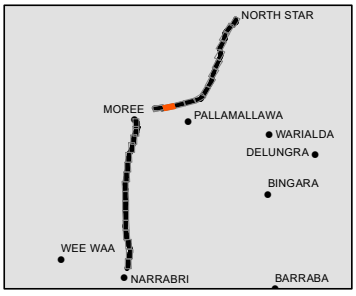
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

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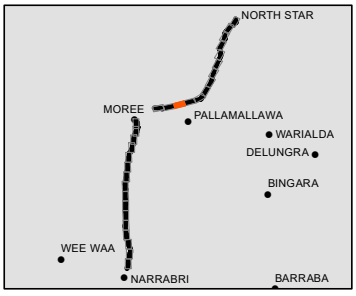
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
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- 85 - 90

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Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

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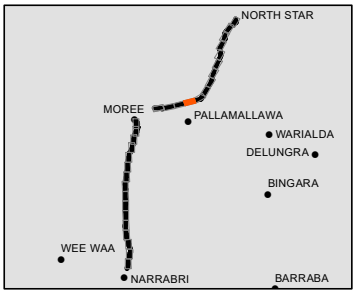
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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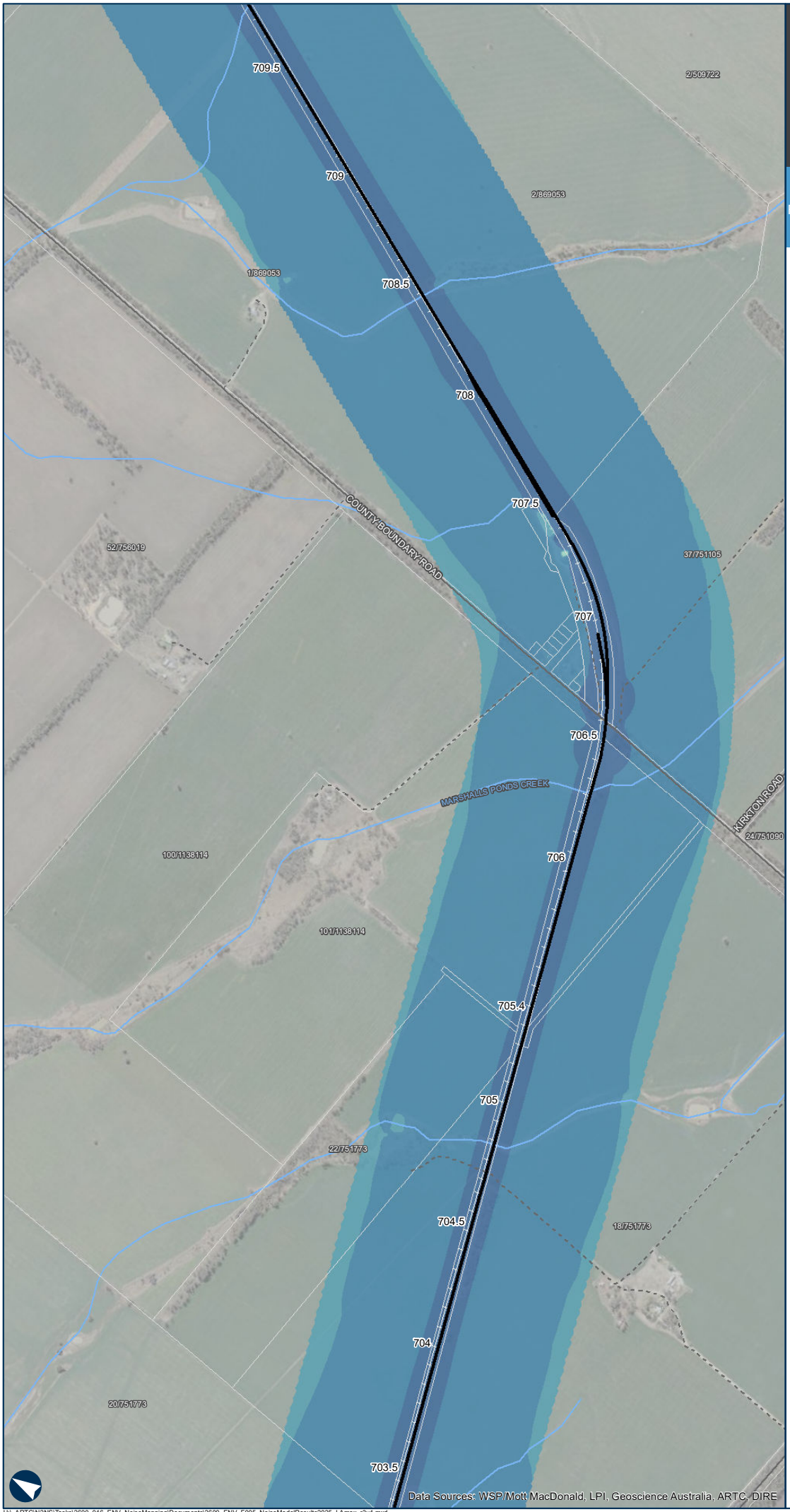
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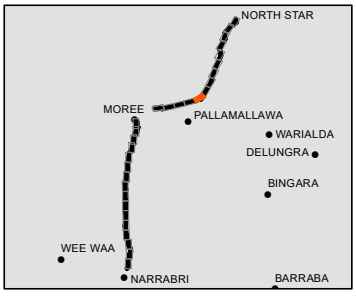
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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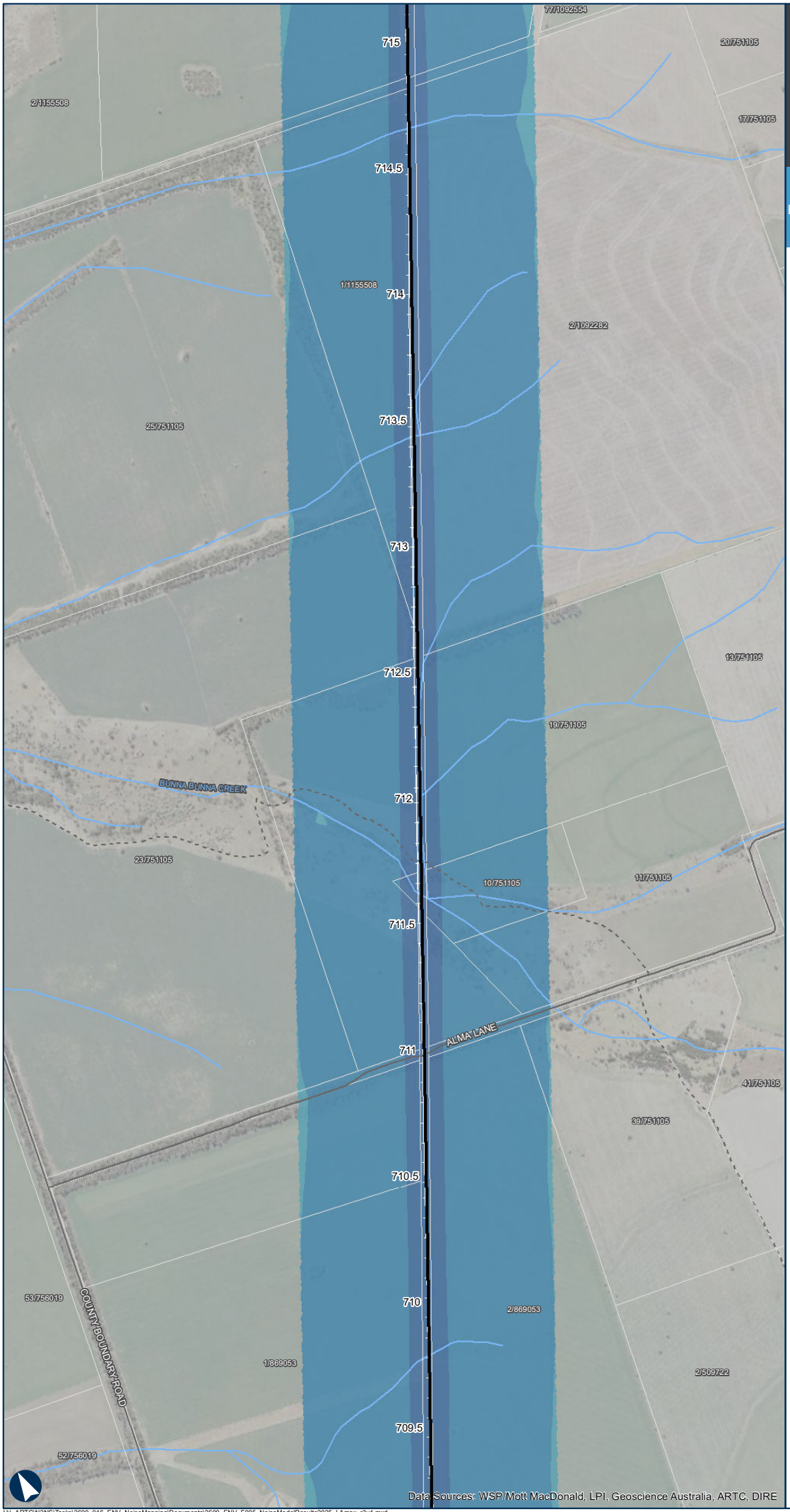
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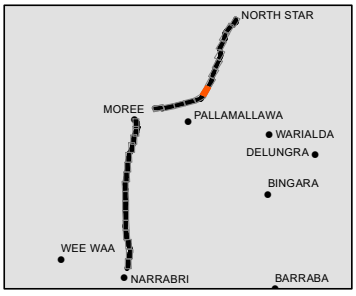
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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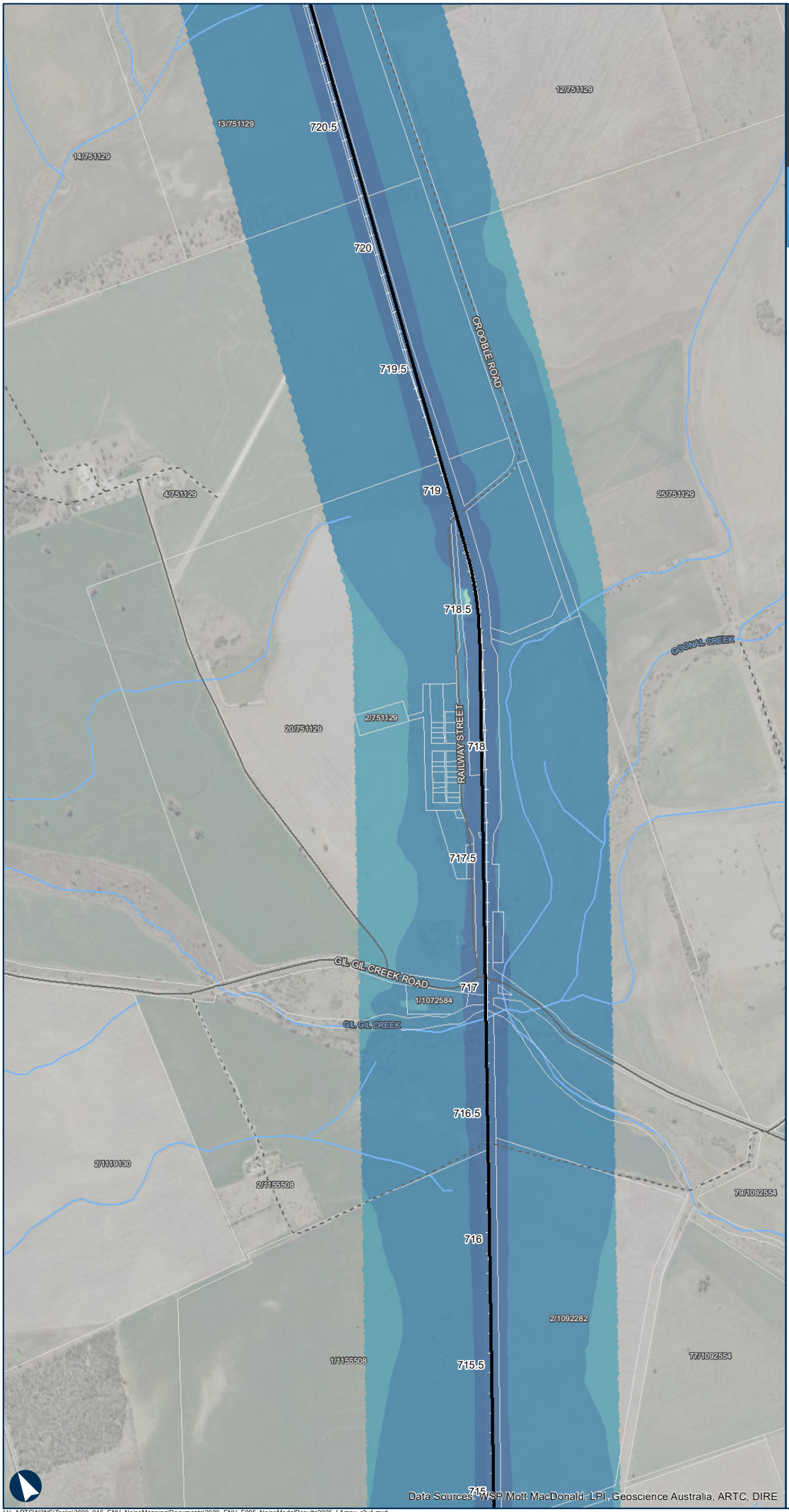
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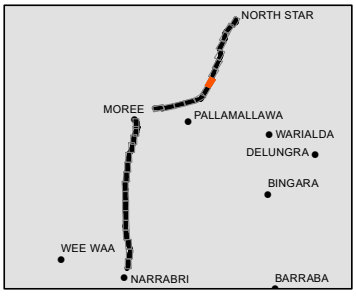
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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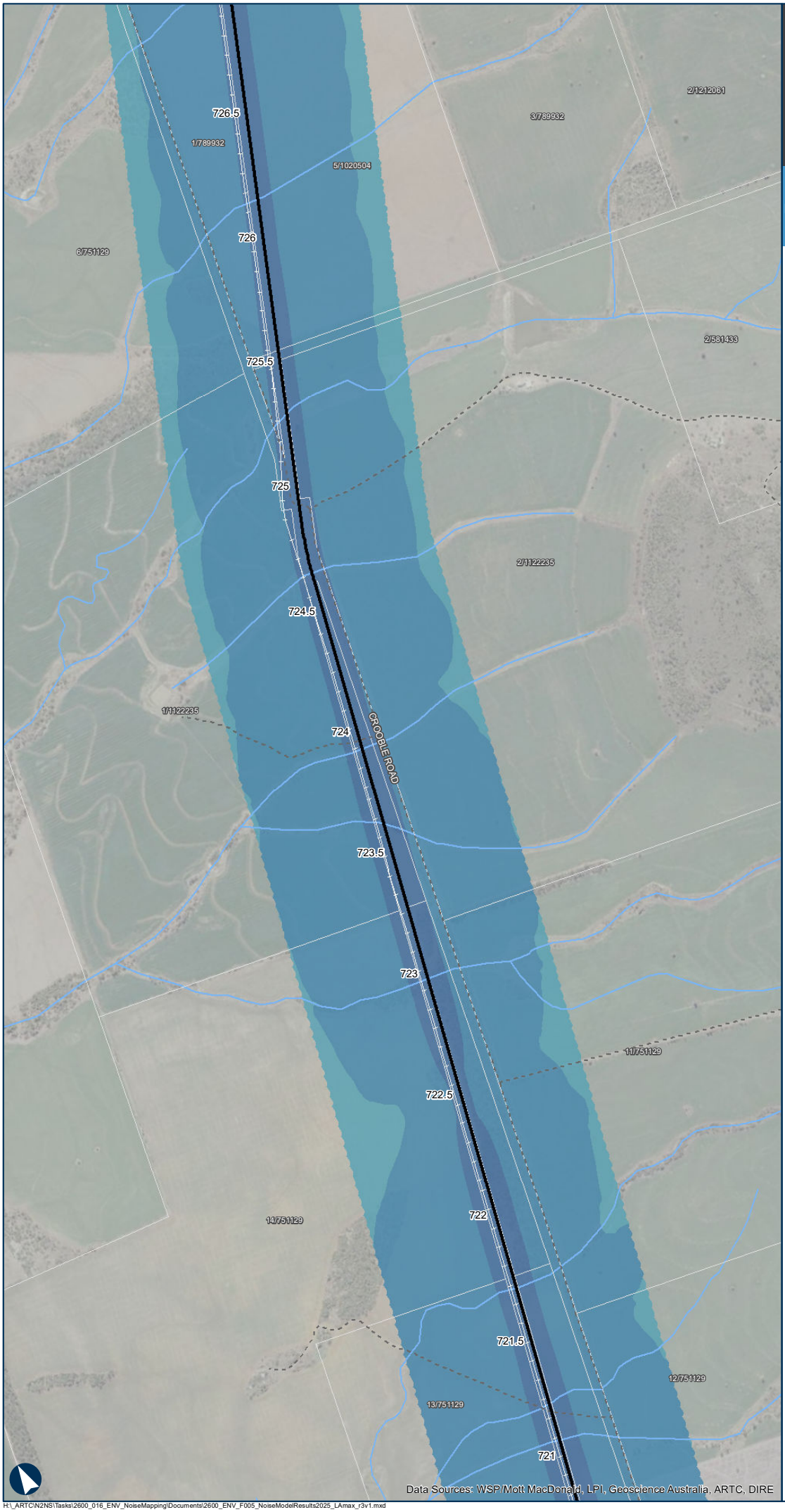
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 25 of 31

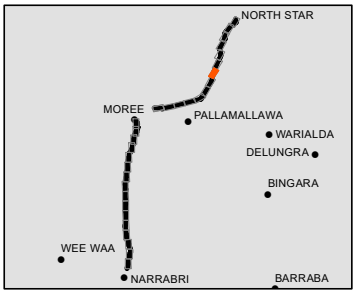
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

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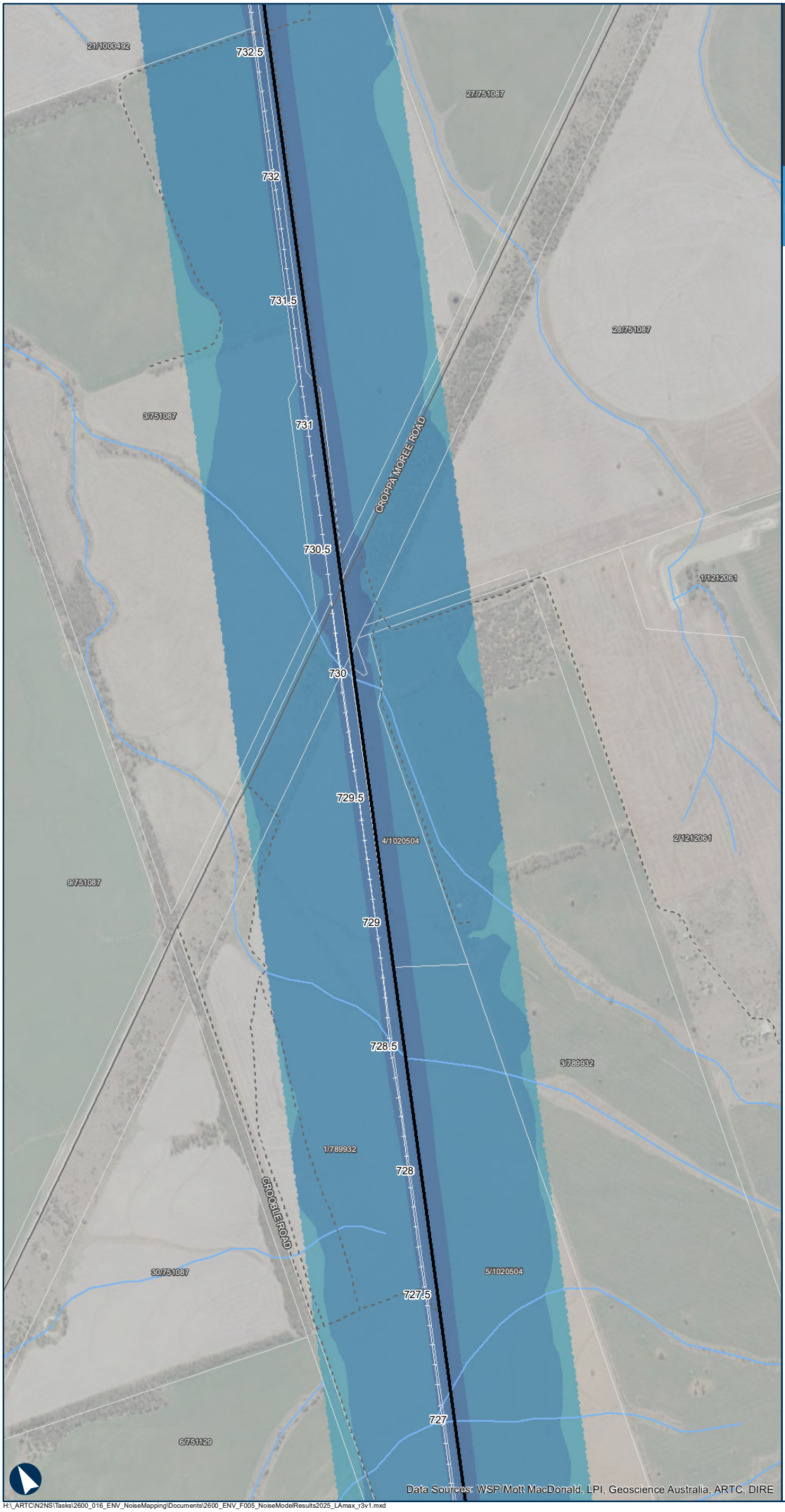
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 26 of 31

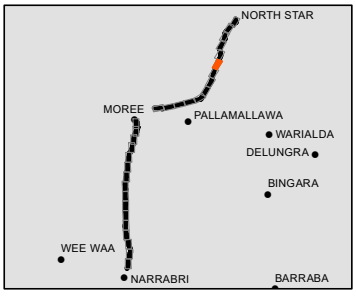
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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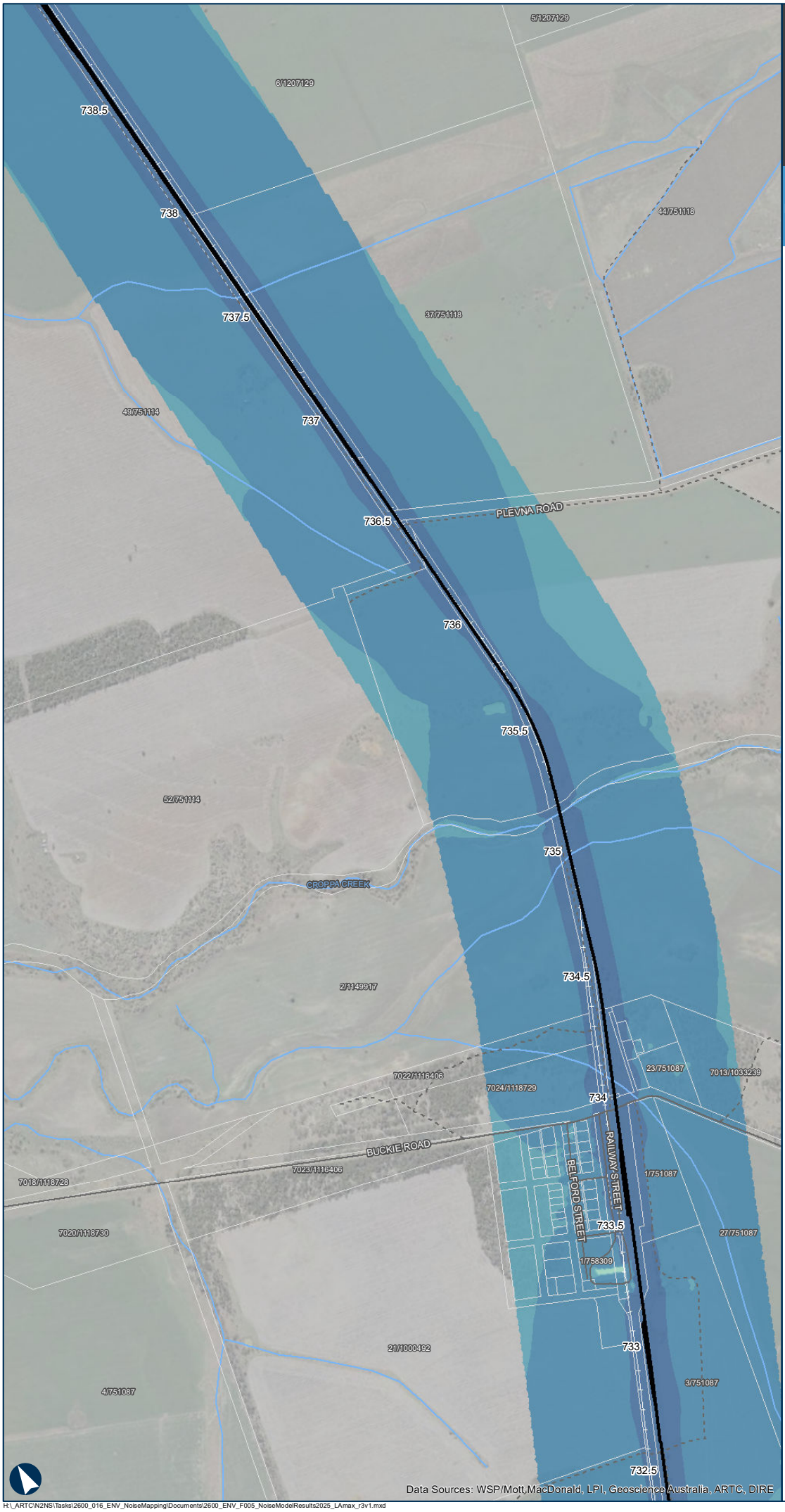
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 27 of 31

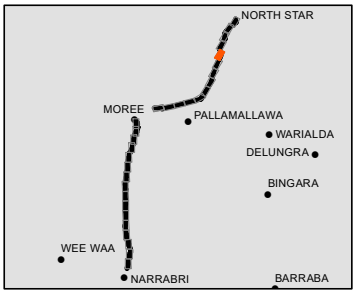
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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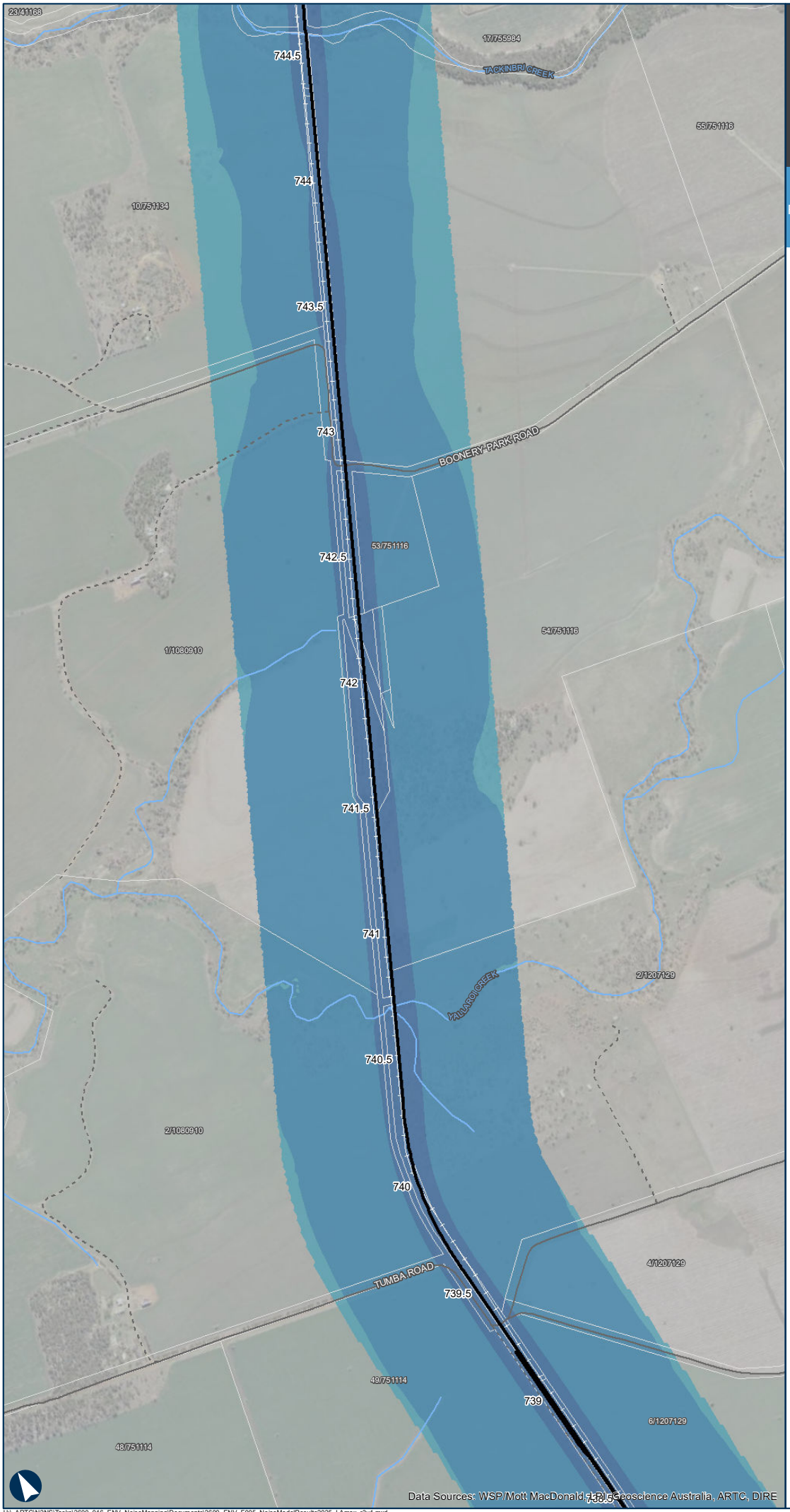
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 28 of 31

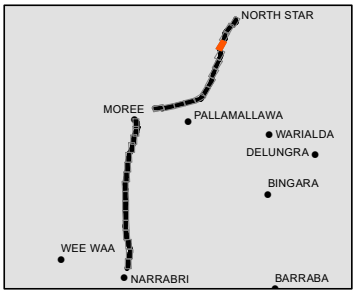
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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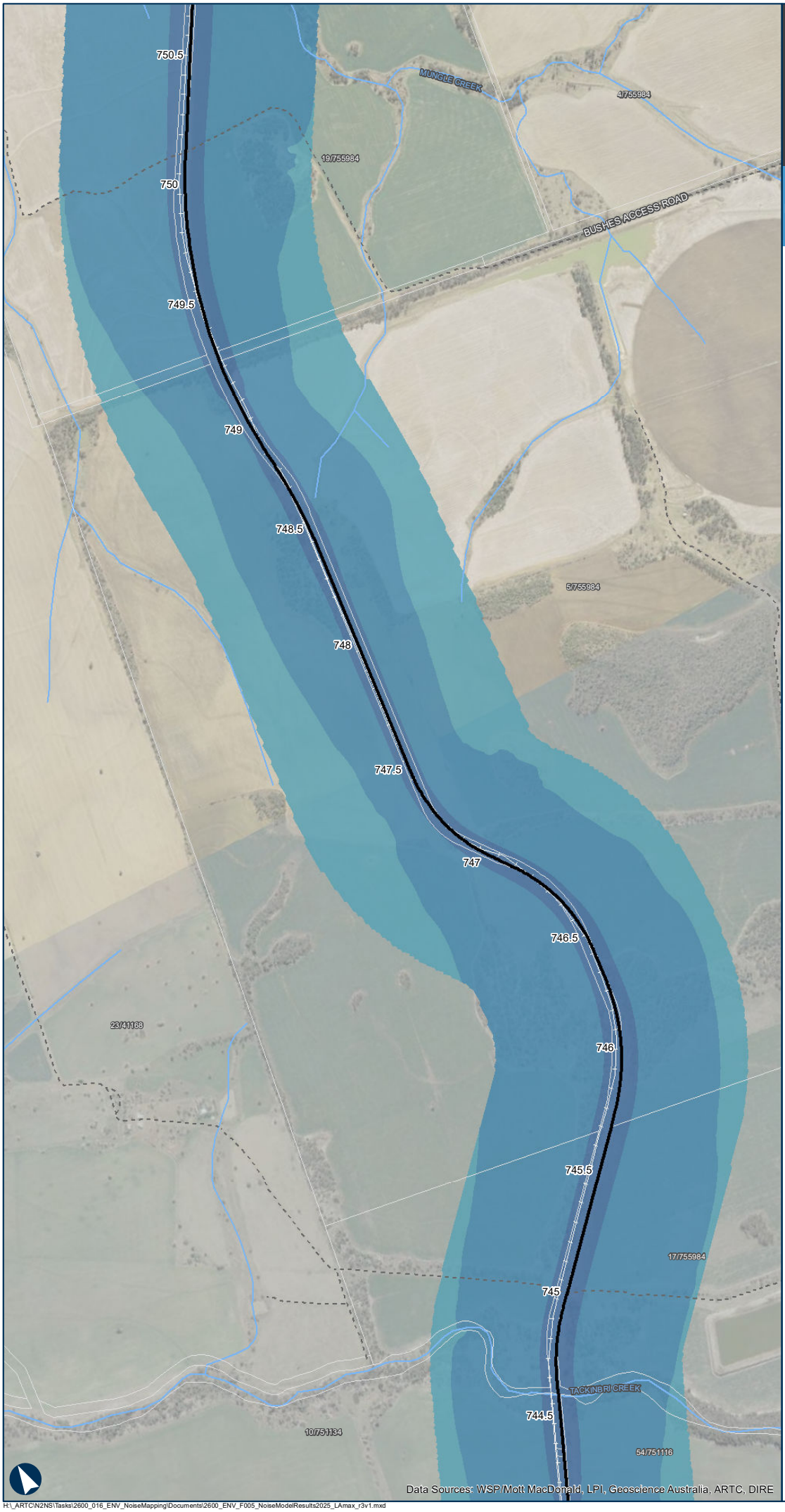
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 29 of 31

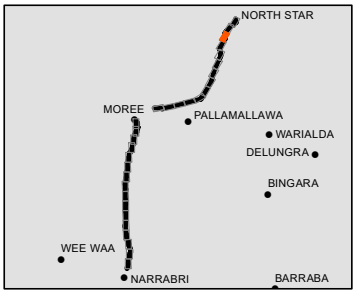
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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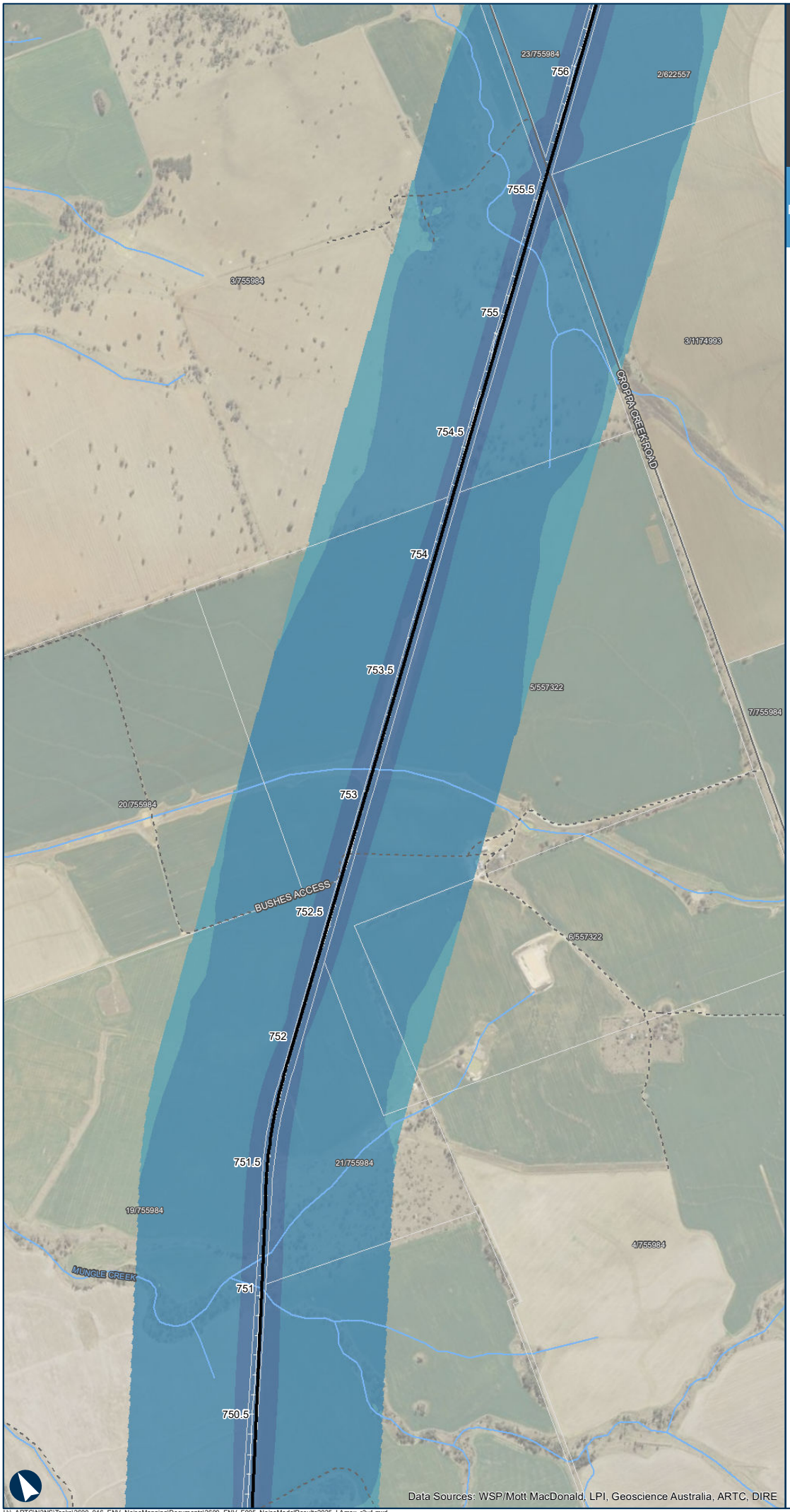
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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 30 of 31

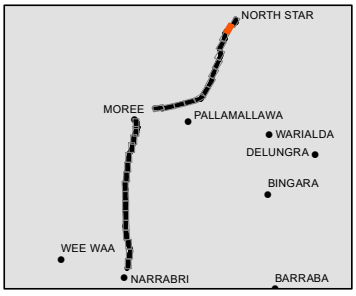
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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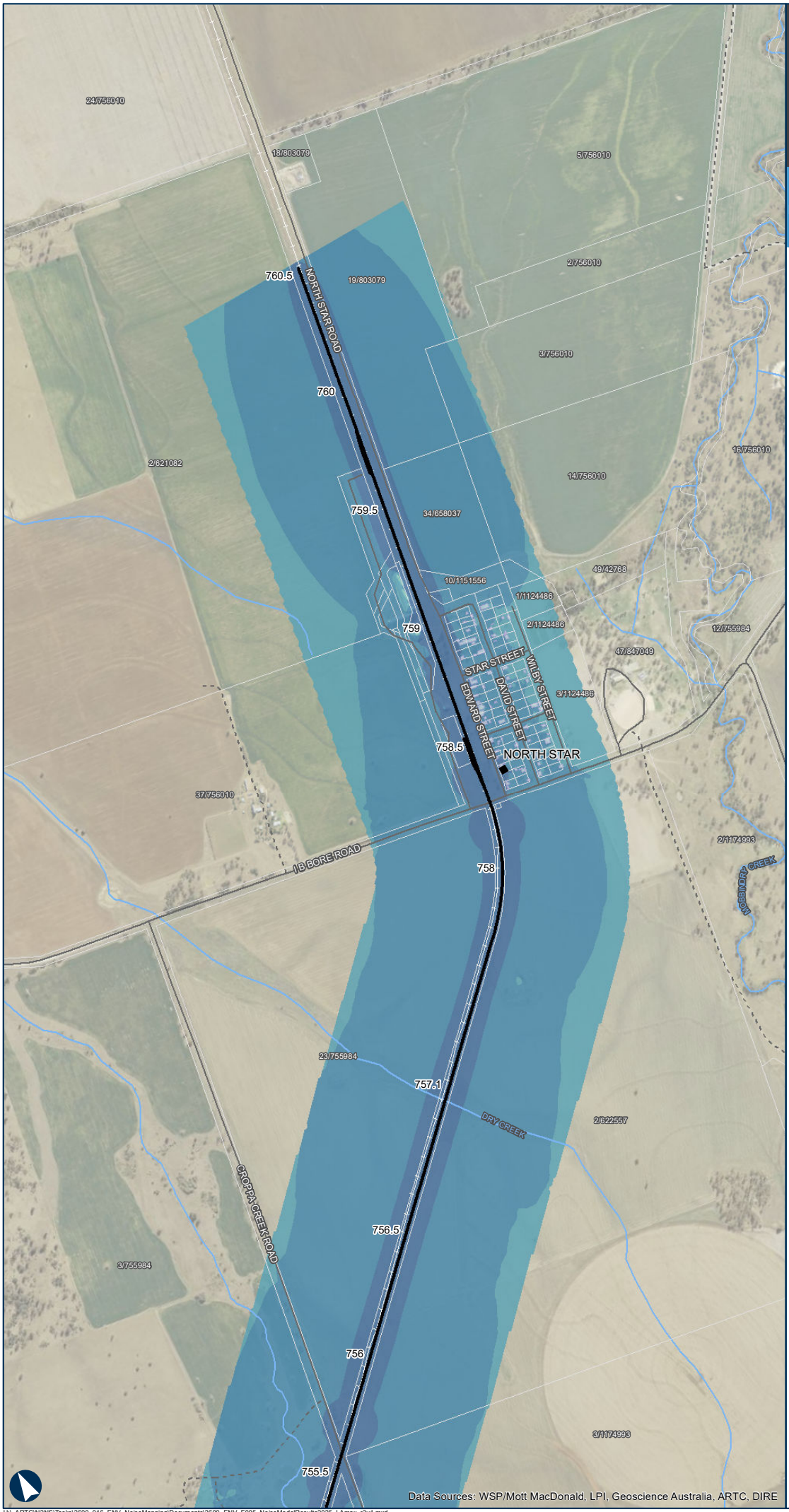
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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2025 Noise Model Results - LAmax without mitigation

Sheet 31 of 31

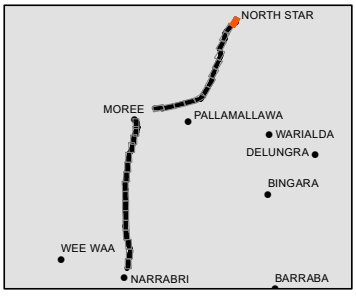
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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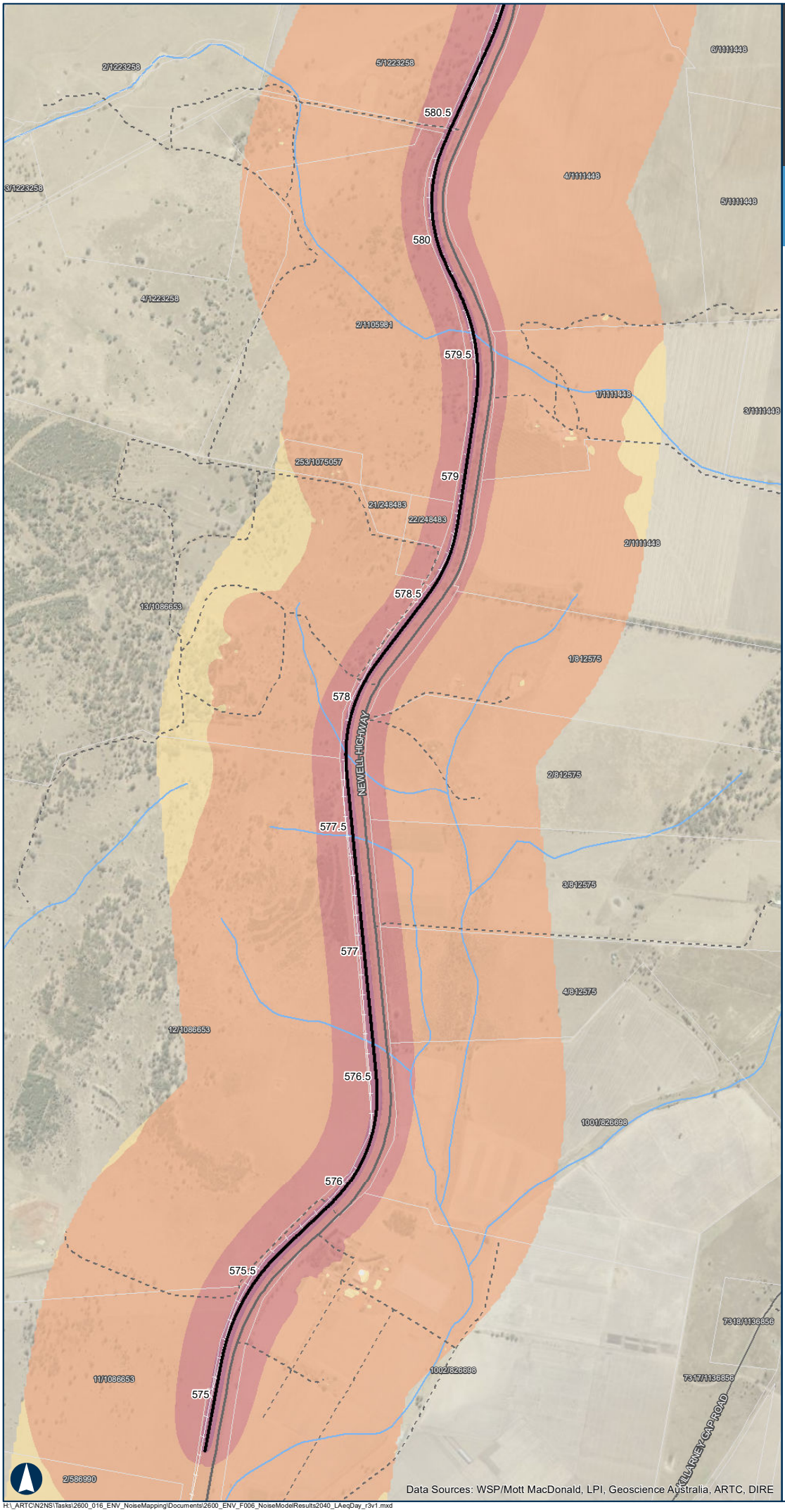
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 1 of 31

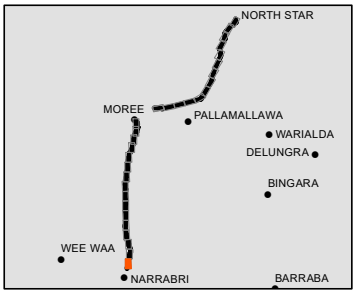
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
- >75

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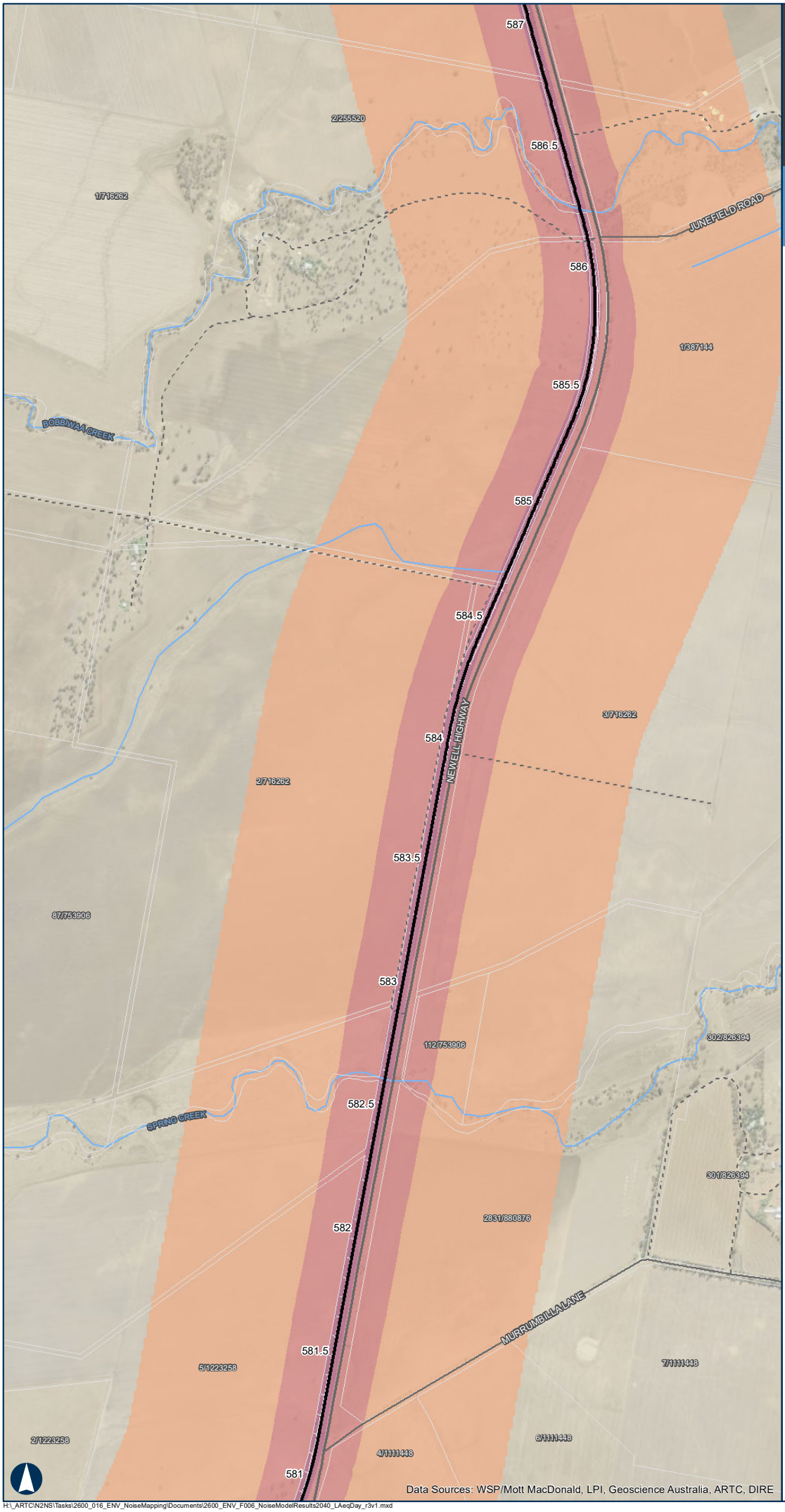
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 2 of 31

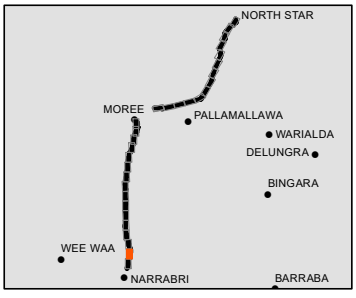
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
- >75

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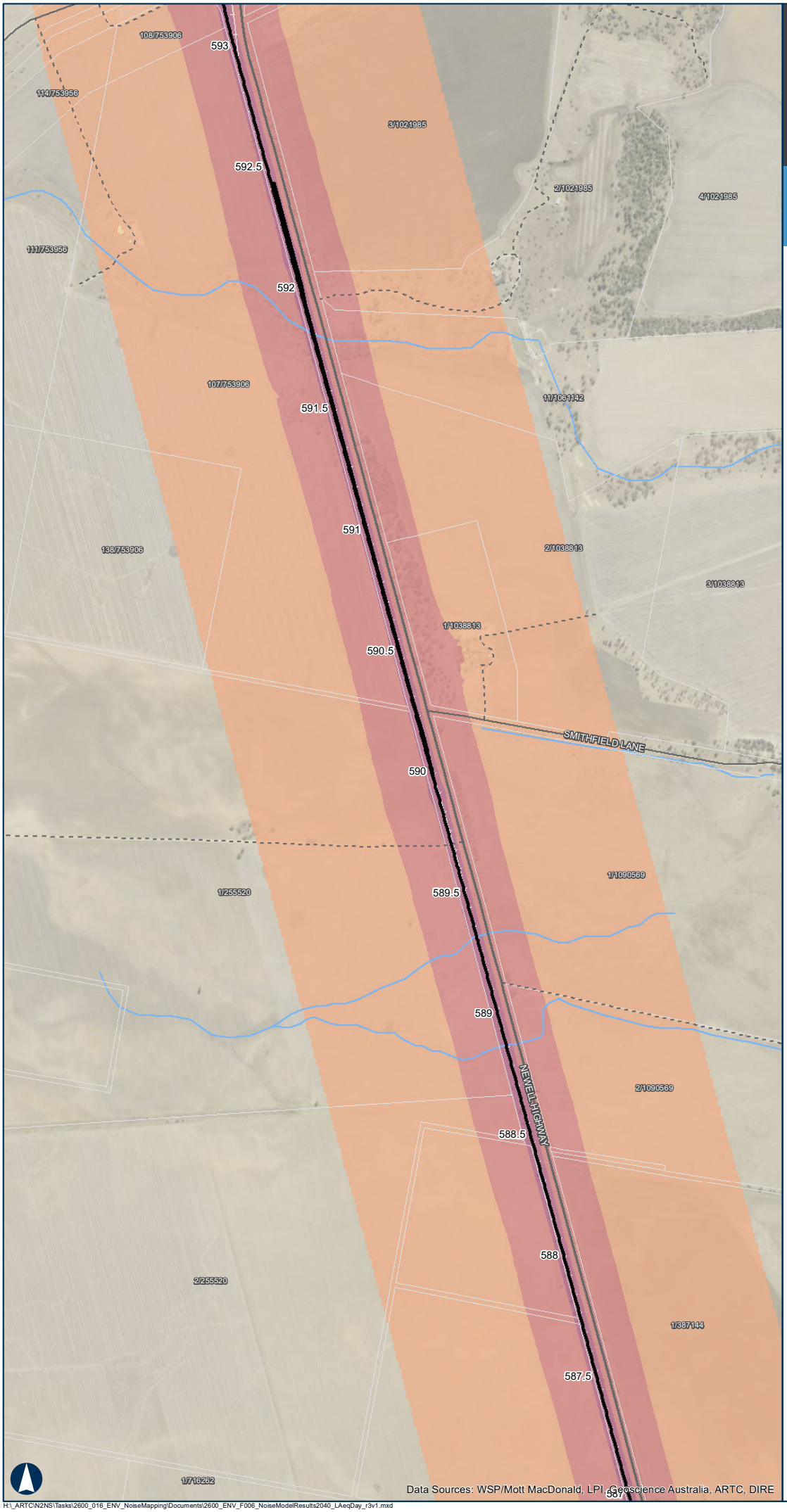
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Author: IRDJV

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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 3 of 31

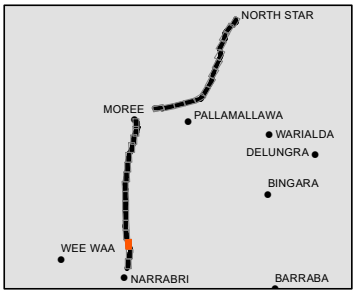
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
- >75

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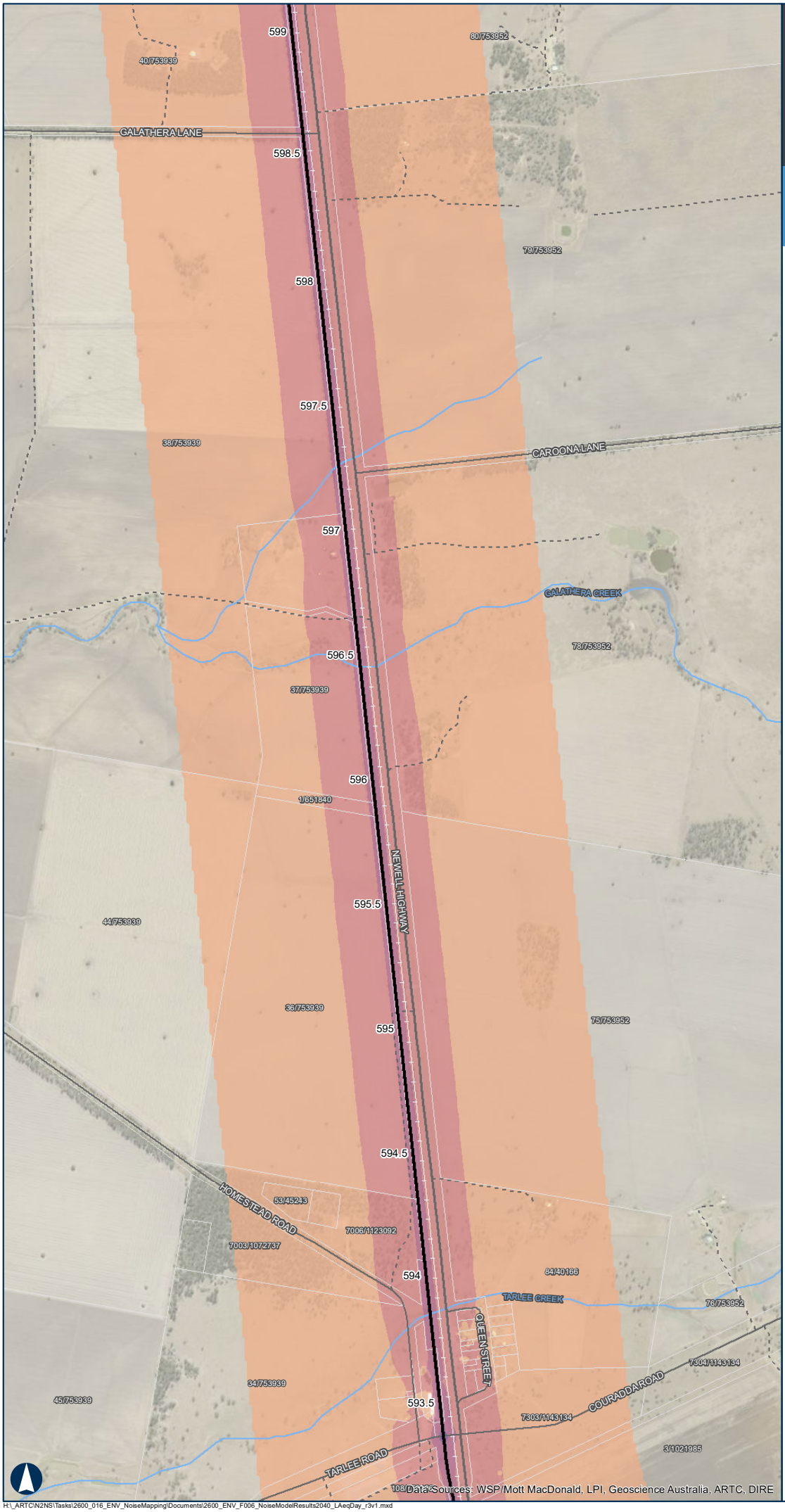
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 4 of 31

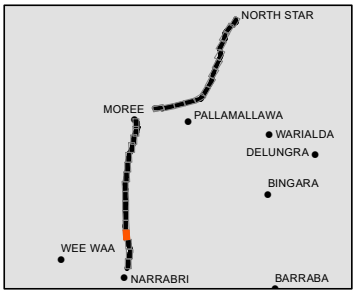
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
- >75

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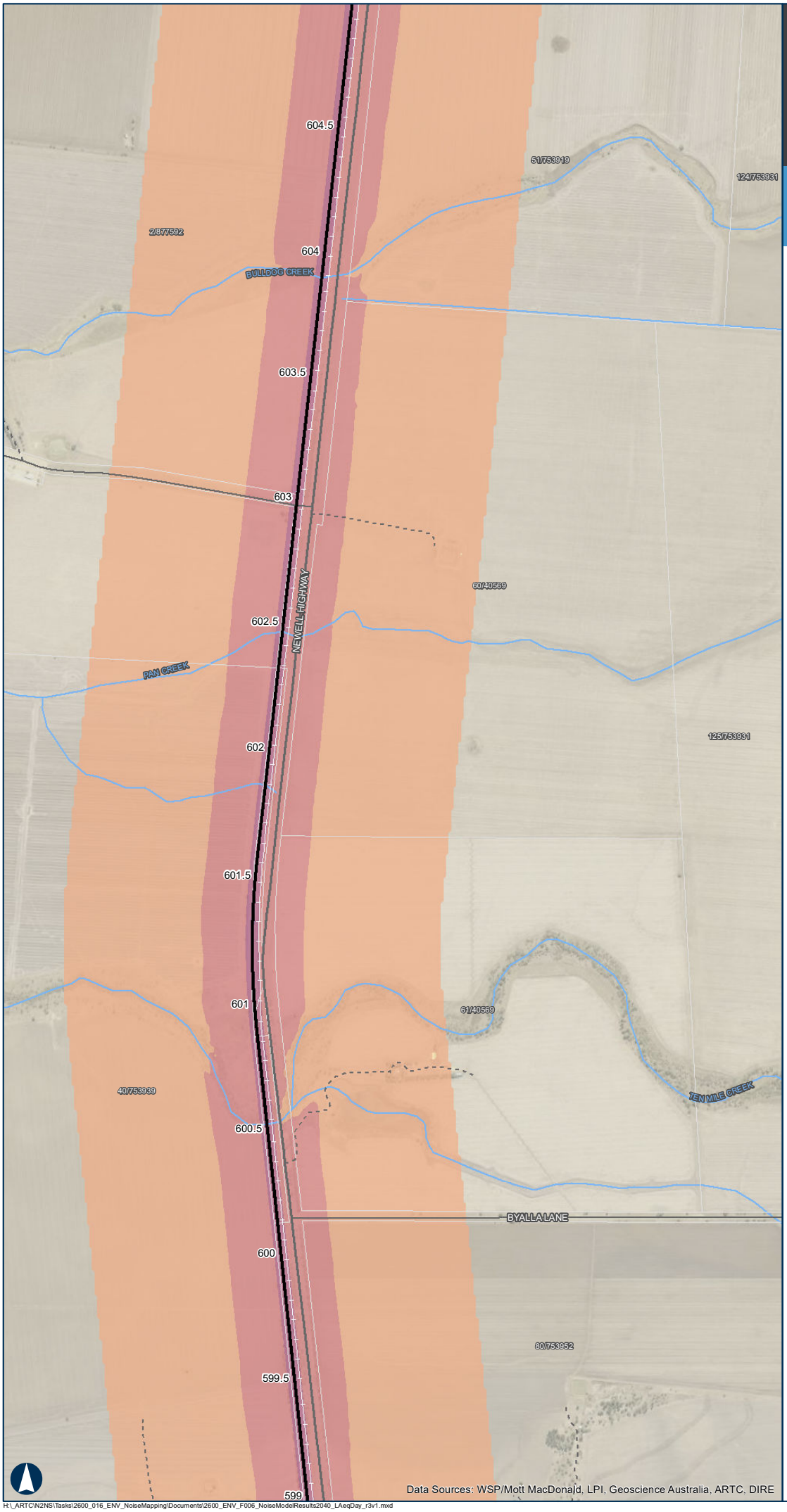
Paper: A3

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 5 of 31

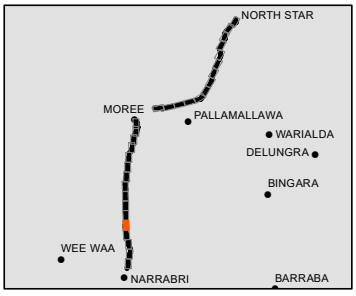
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
- >75

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

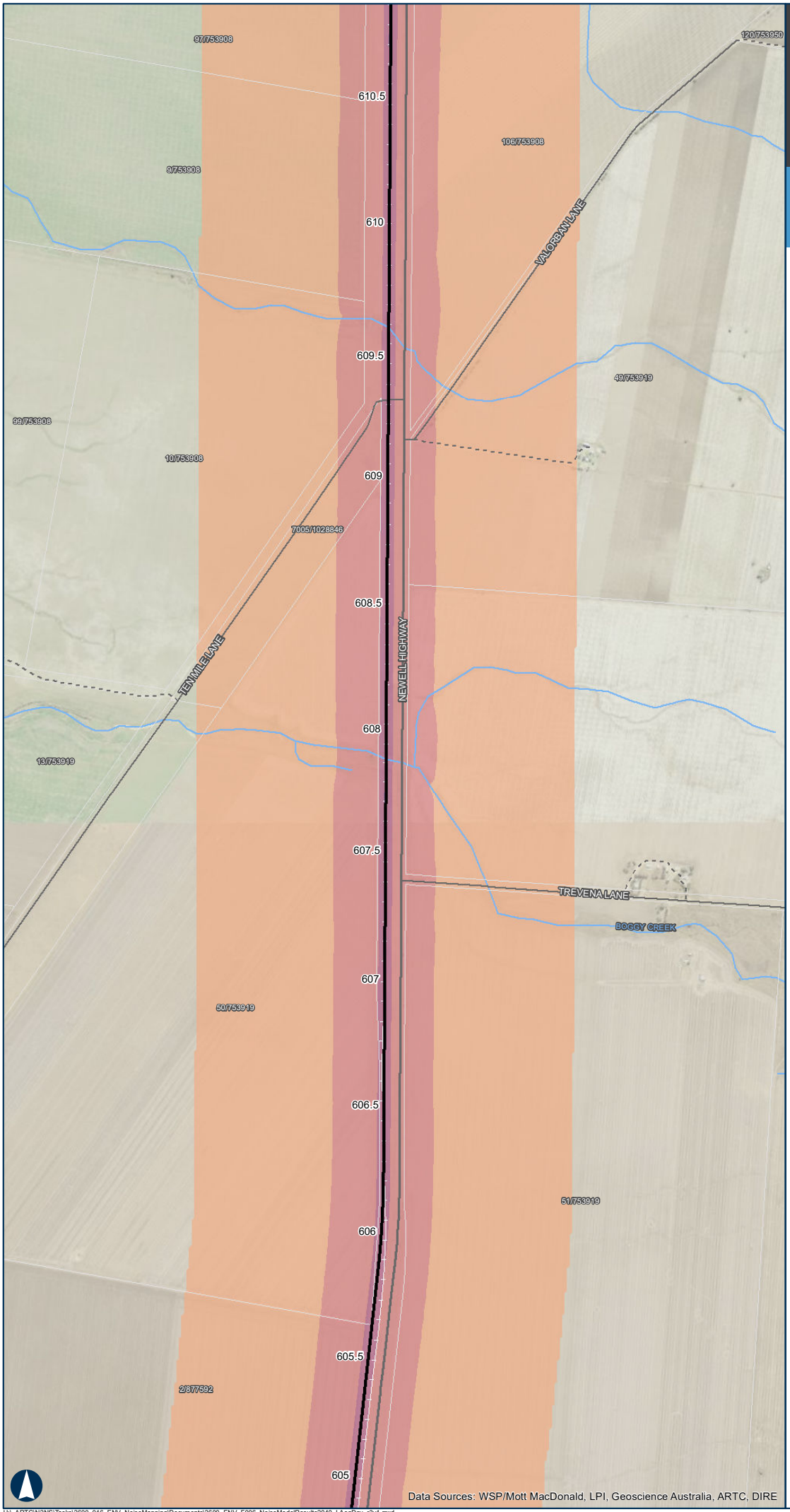
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV



INLAND RAIL

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 6 of 31

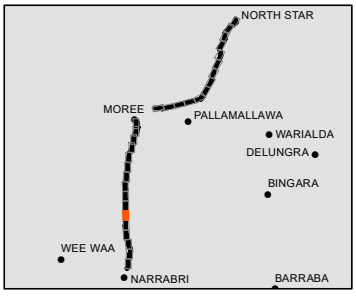
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
- >75

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0.75 Km

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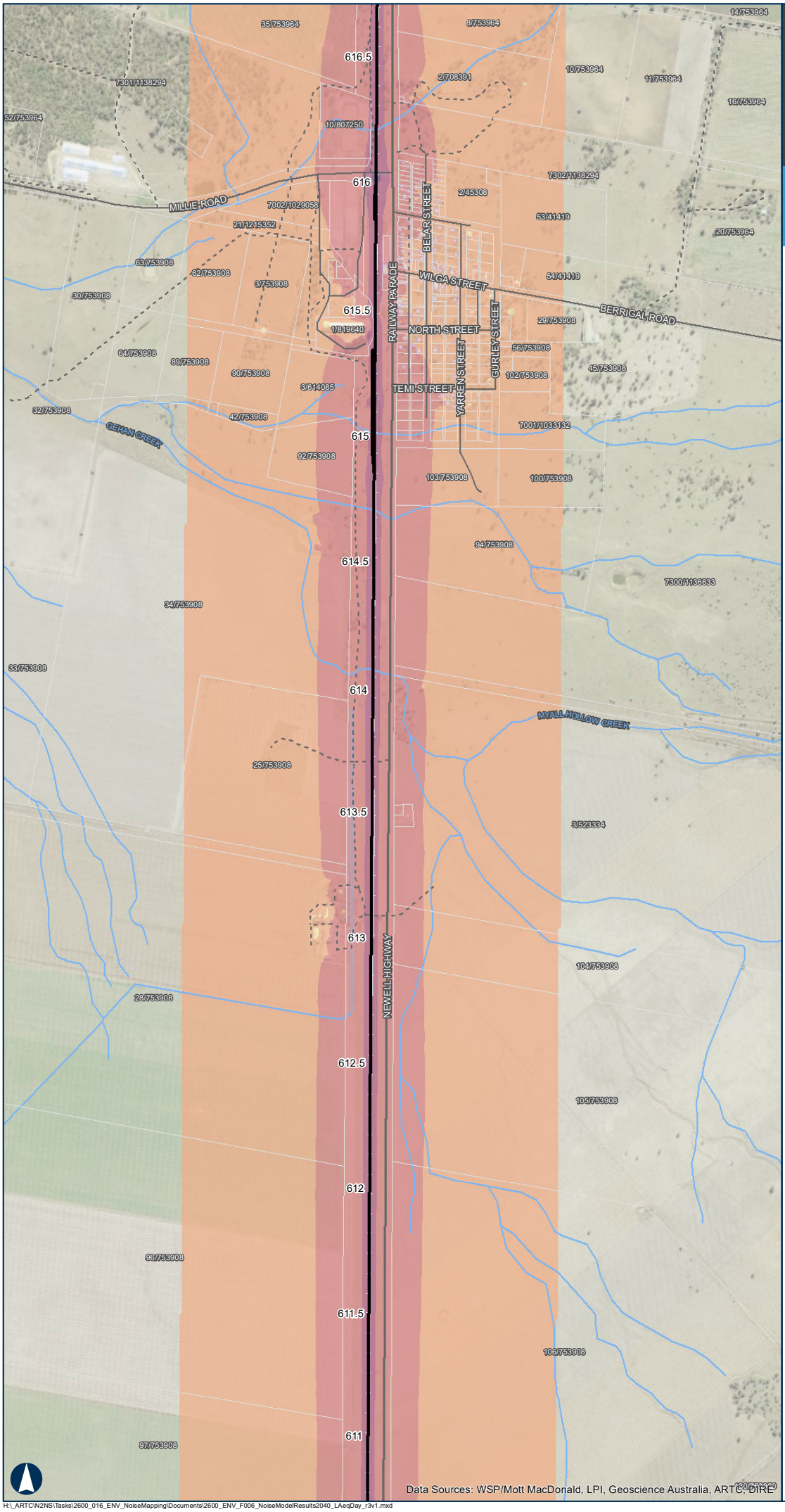
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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 7 of 31

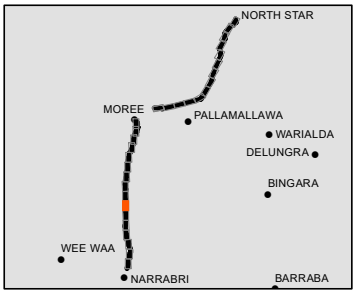
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
- >75

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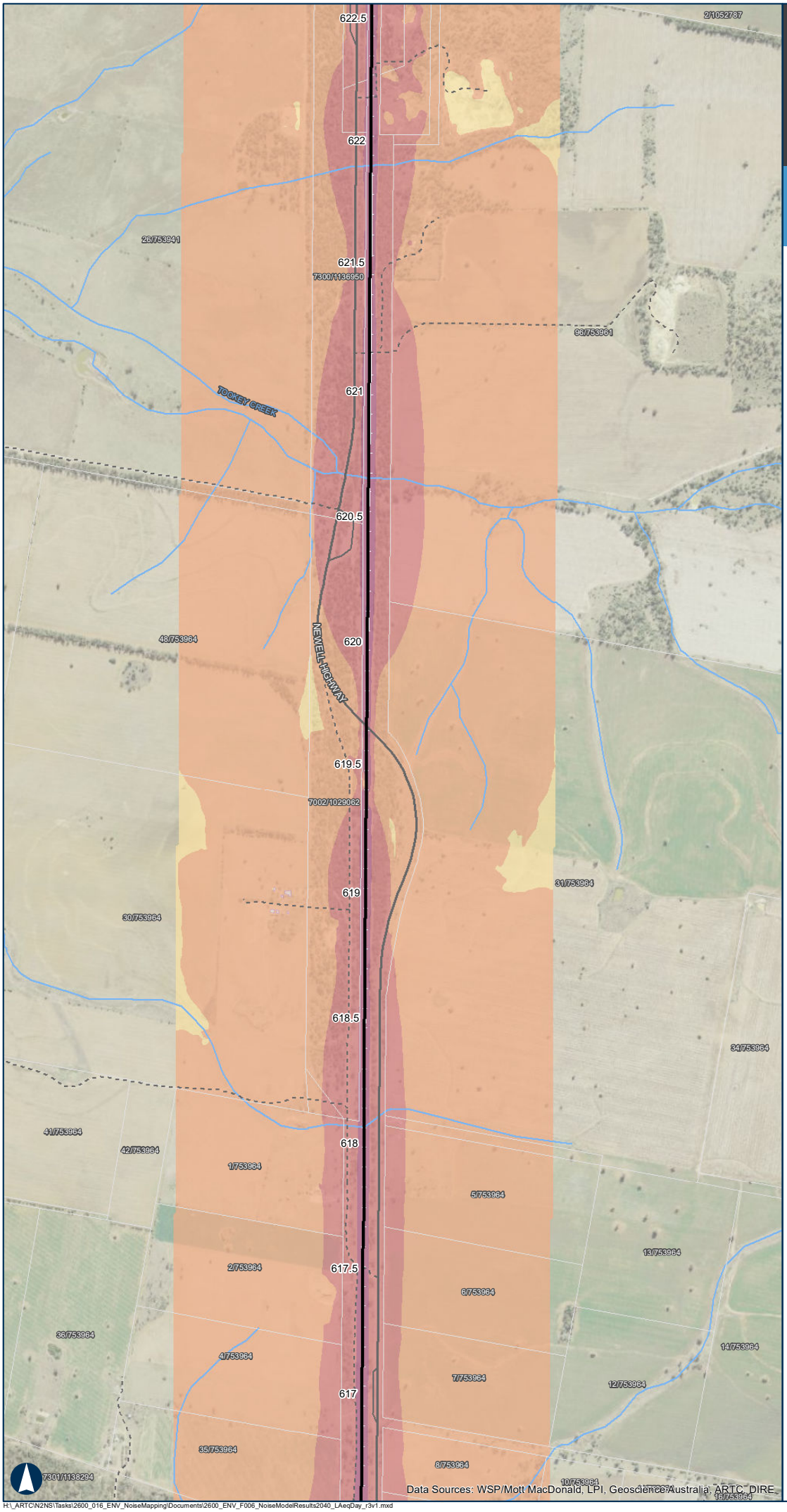
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Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 8 of 31

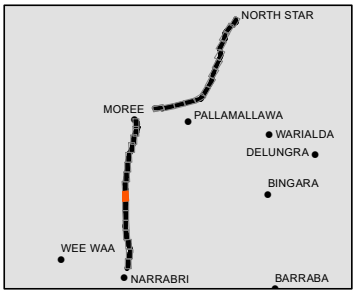
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

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- 60 - 70
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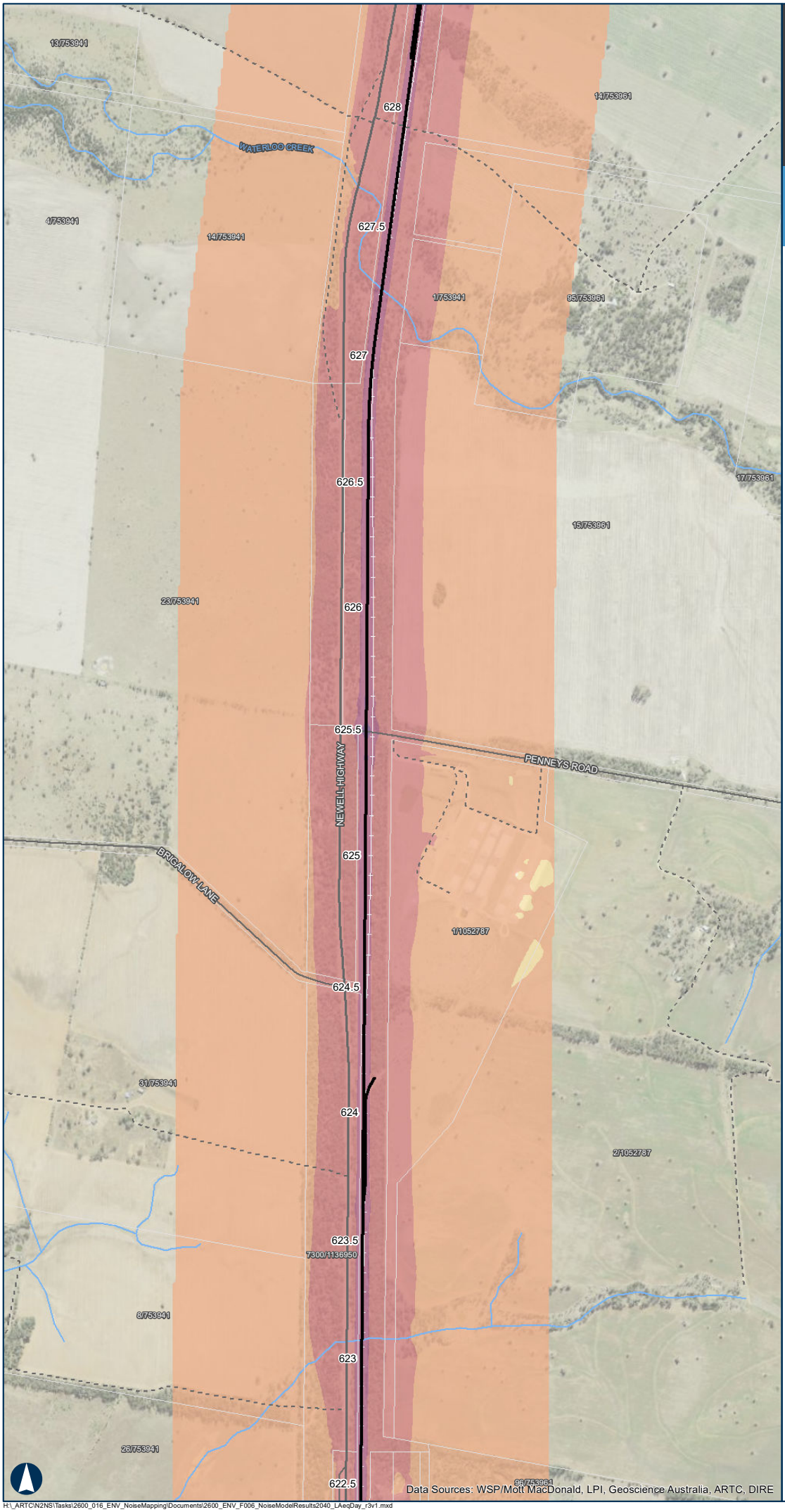
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 9 of 31

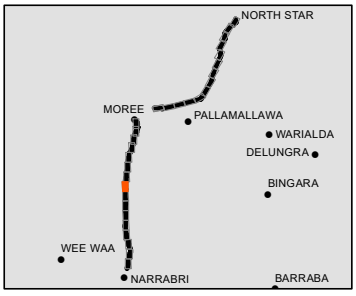
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
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- 55 - 60
- 60 - 70
- >75

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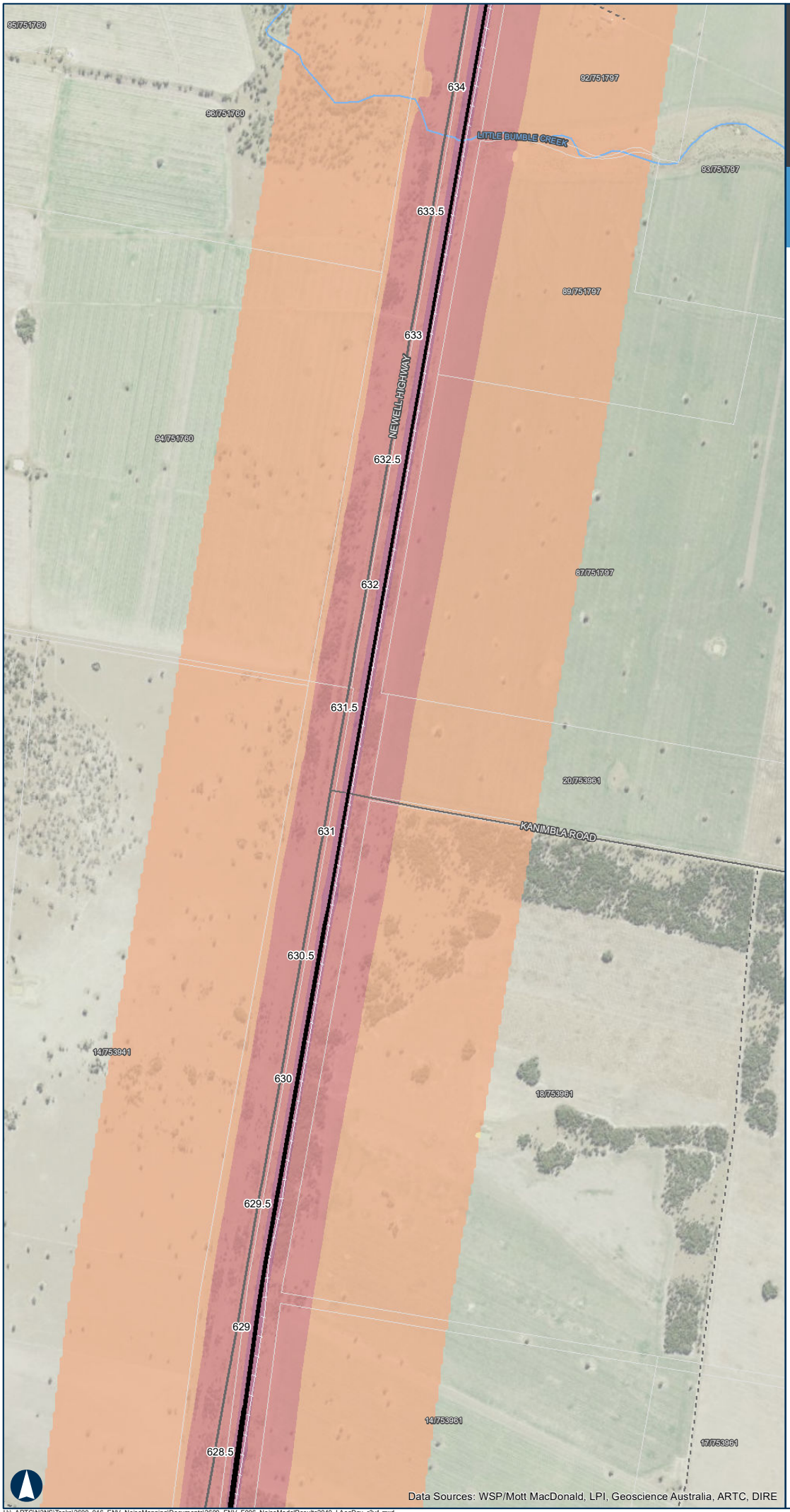
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 10 of 31

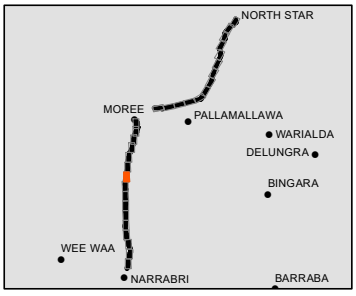
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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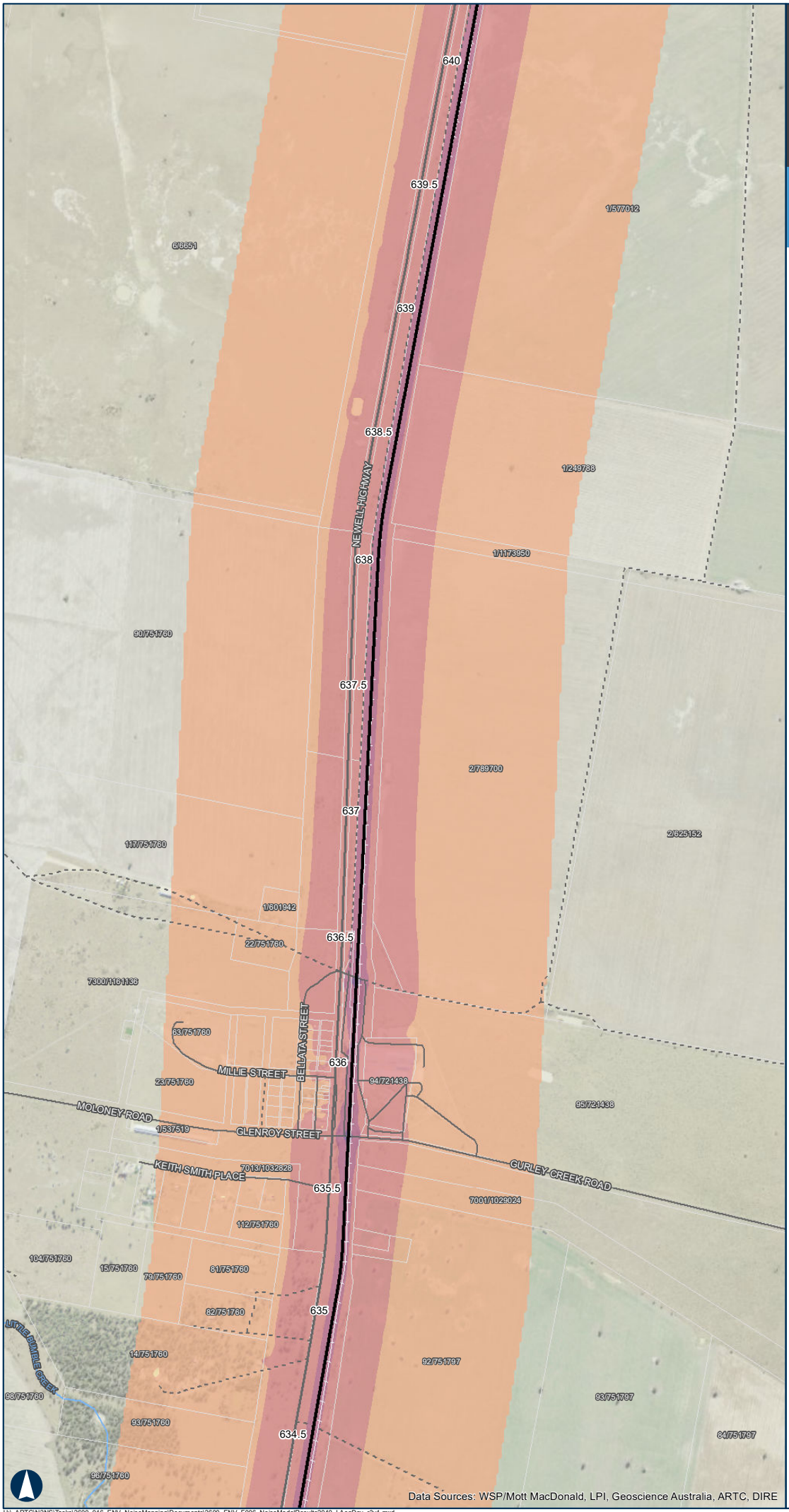
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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

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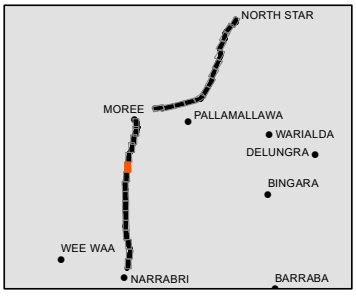
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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- 45 - 50
- 55 - 60
- 60 - 70
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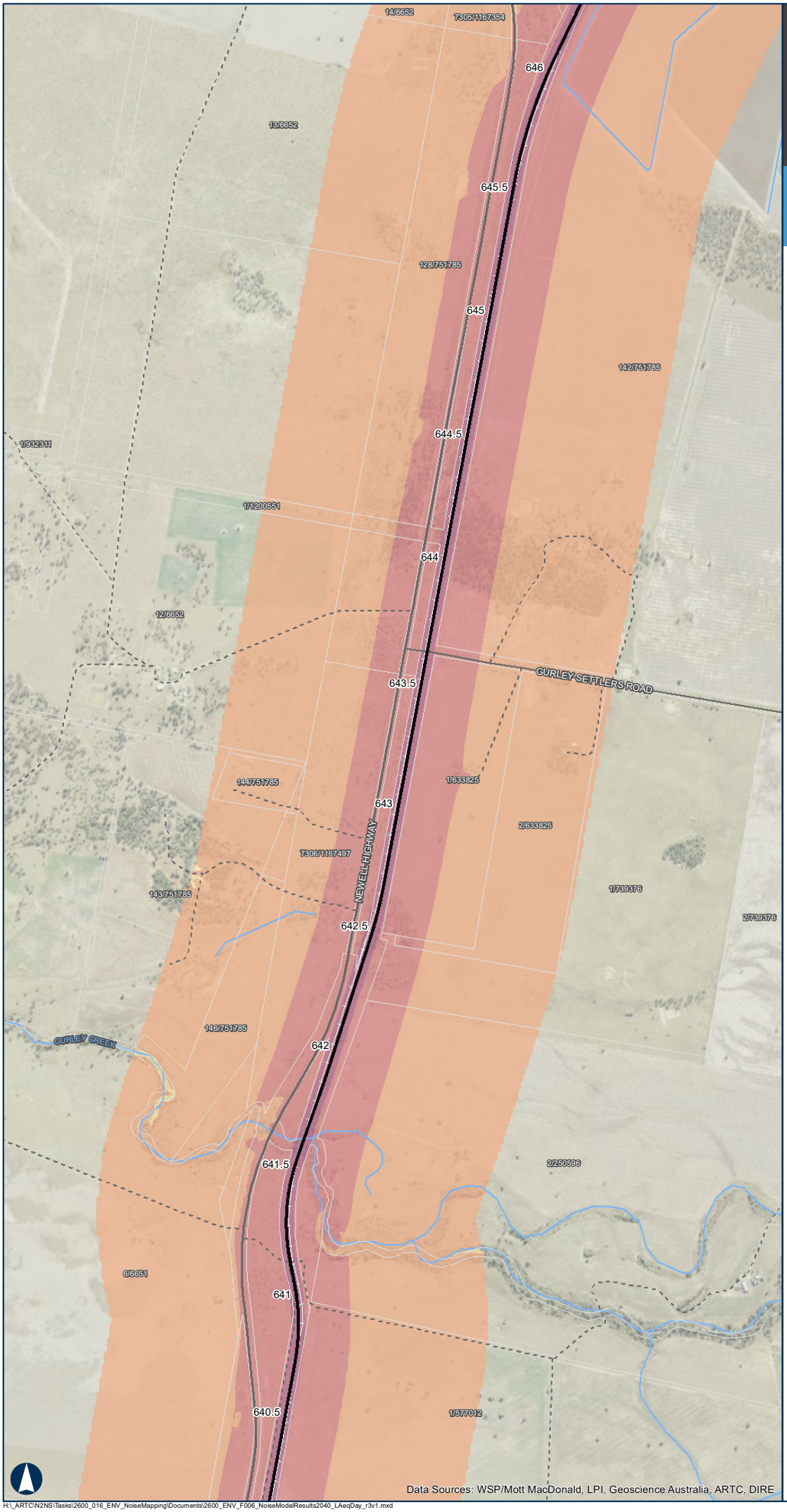
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

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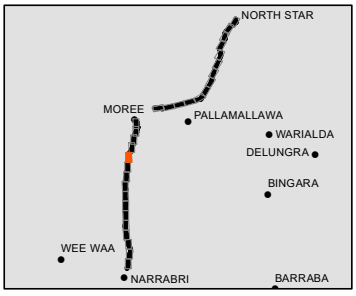
LEGEND

- Townships
- Highway
- Local Road
- Track
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- Track Alignment
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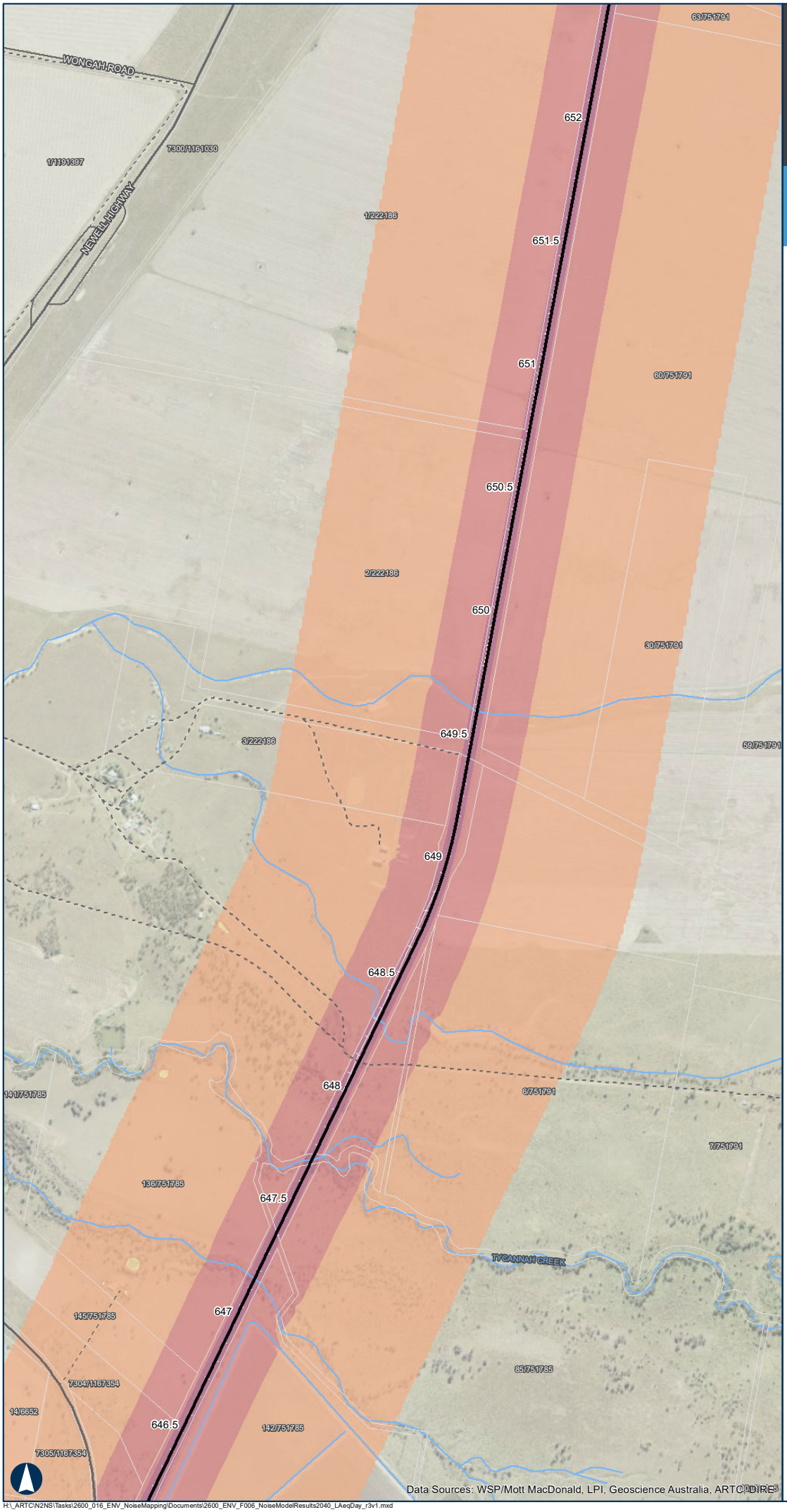
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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 13 of 31

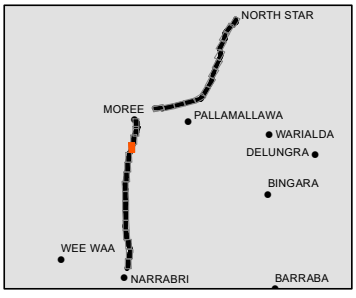
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

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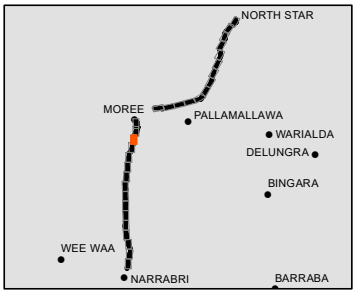
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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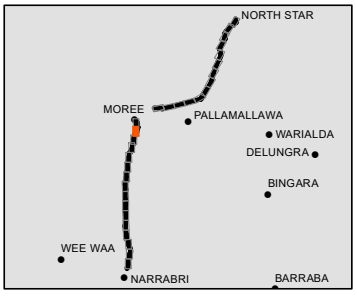
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
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Noise Contours (dB(A))

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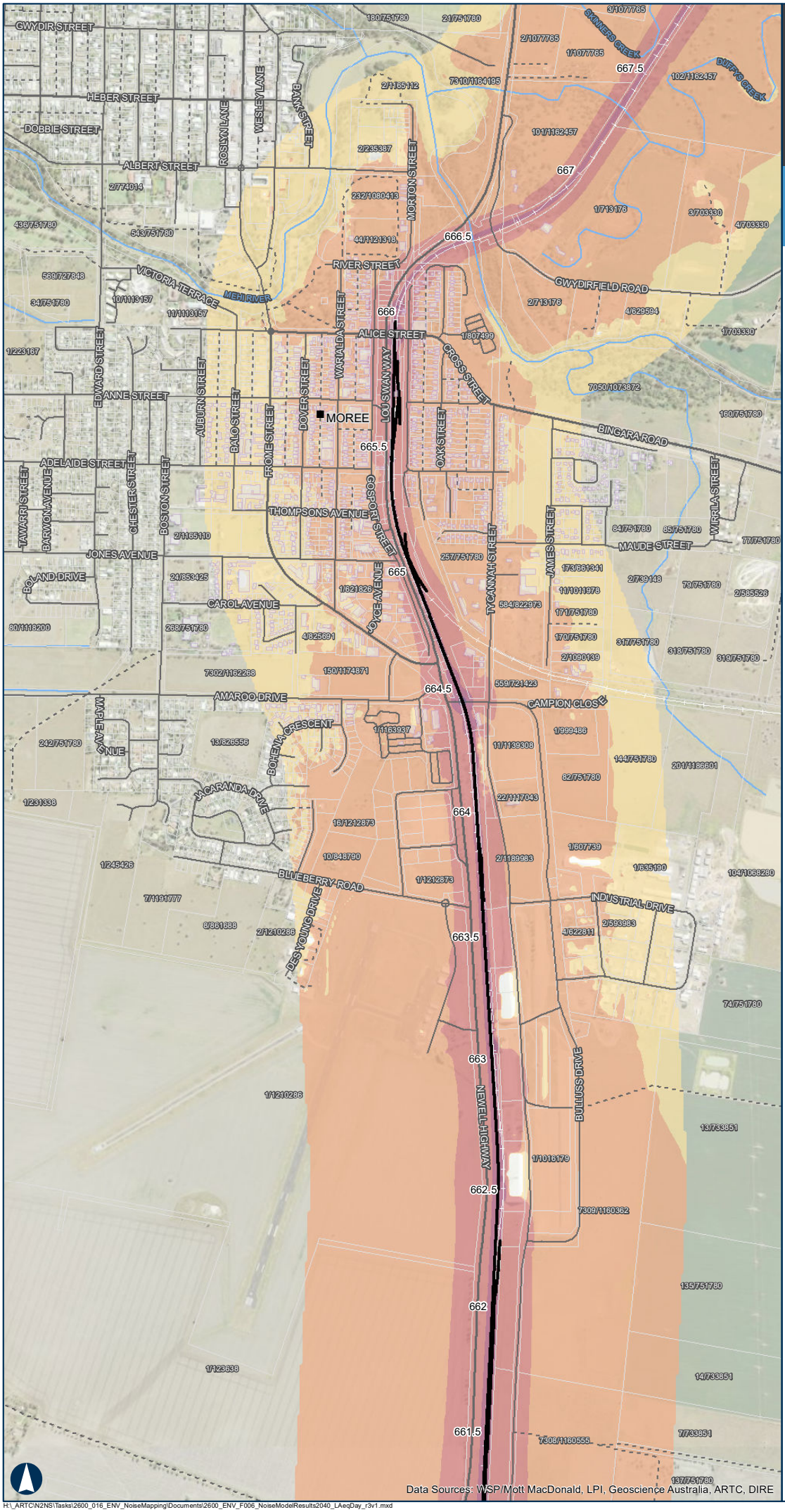
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Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

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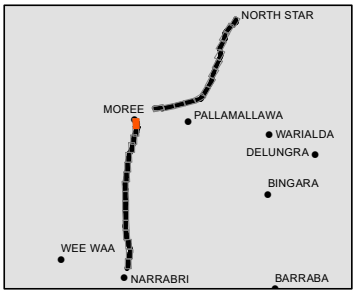
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

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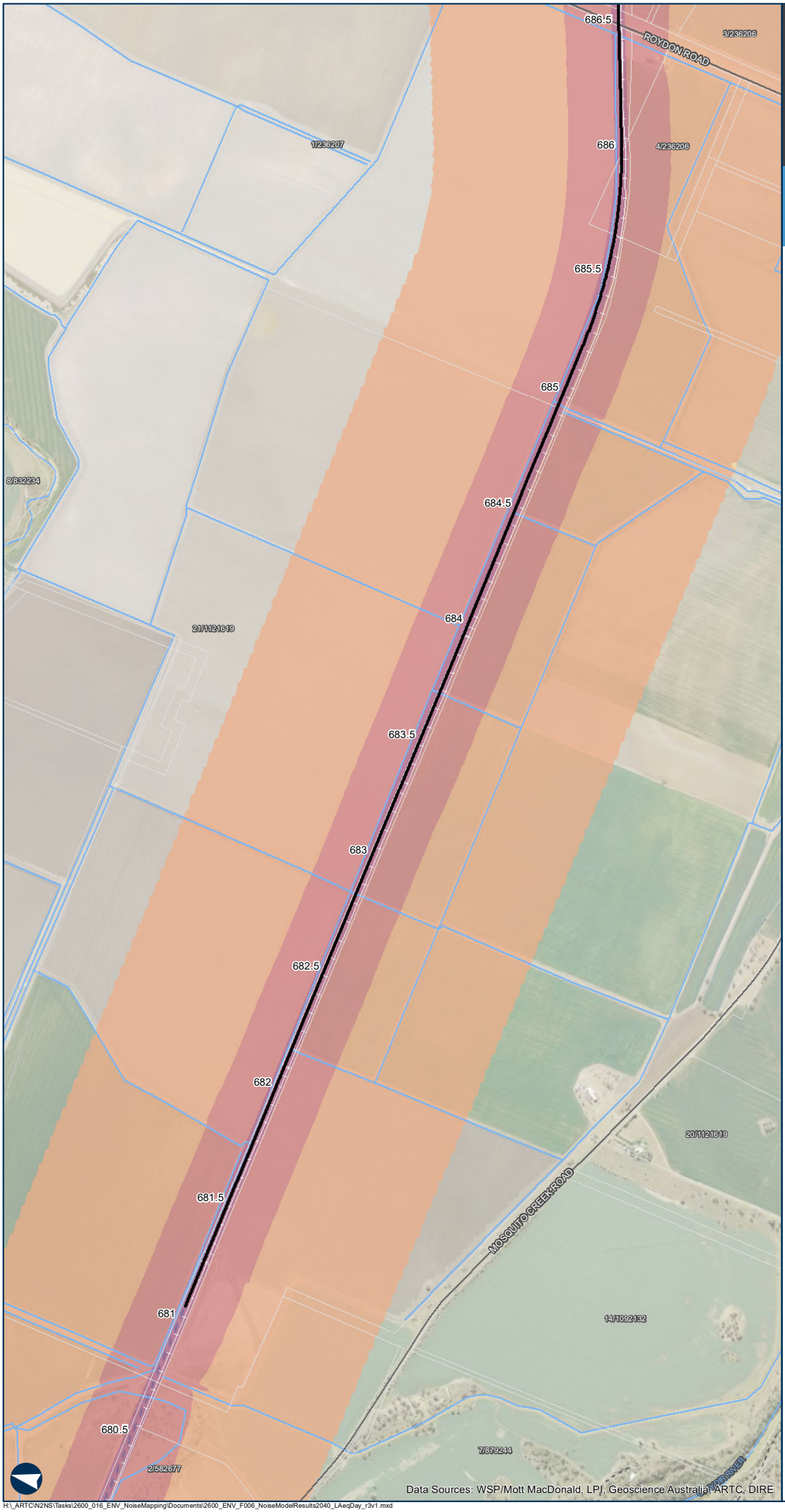
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

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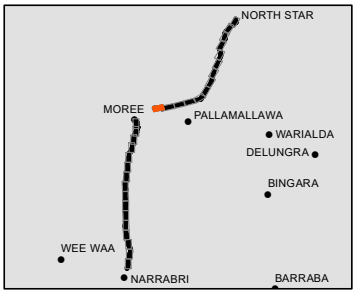
LEGEND

- Townships
- Highway
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- Track
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- Track Alignment
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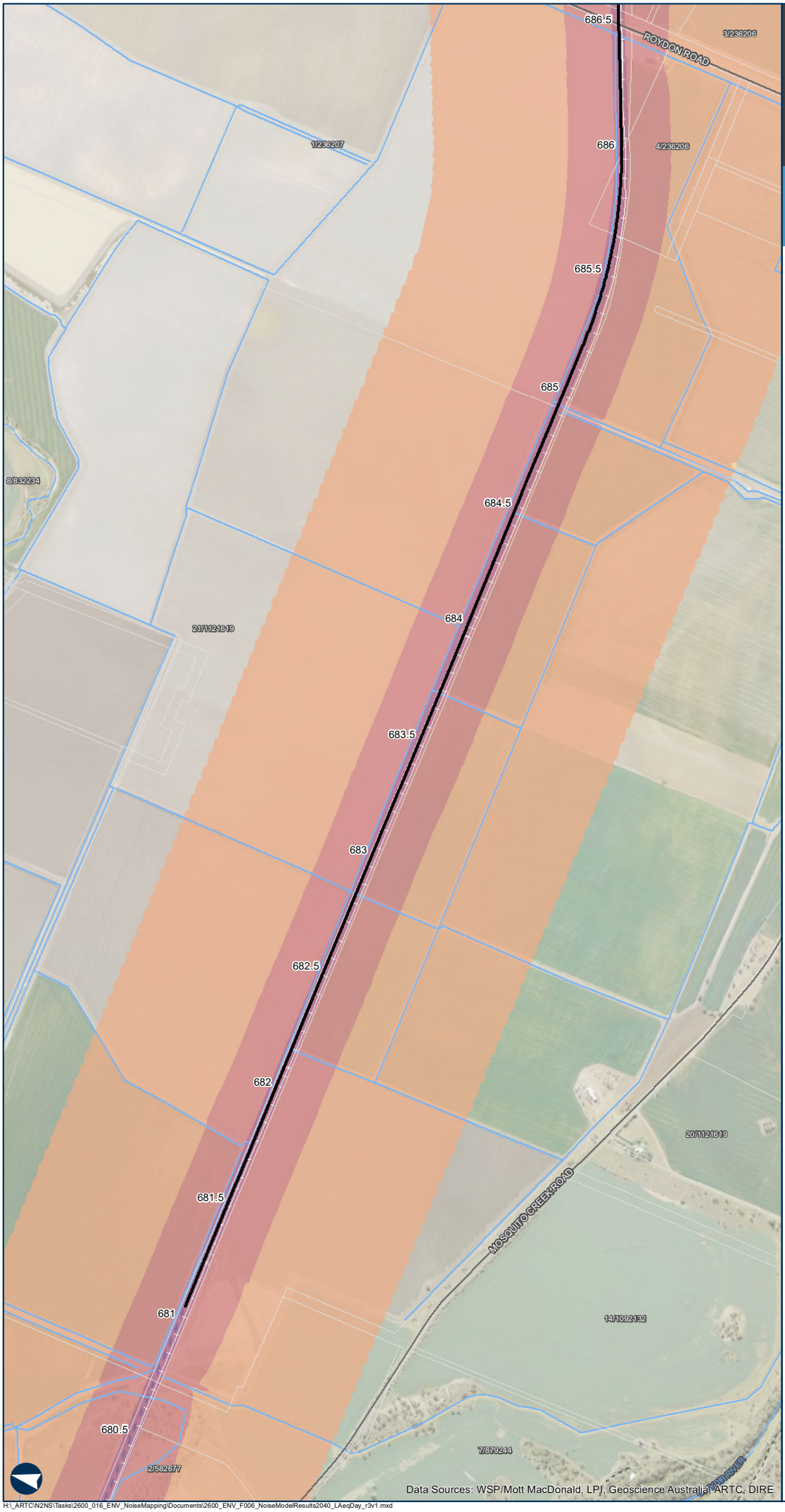
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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 18 of 31

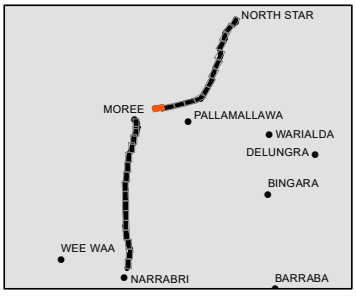
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
- >75

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

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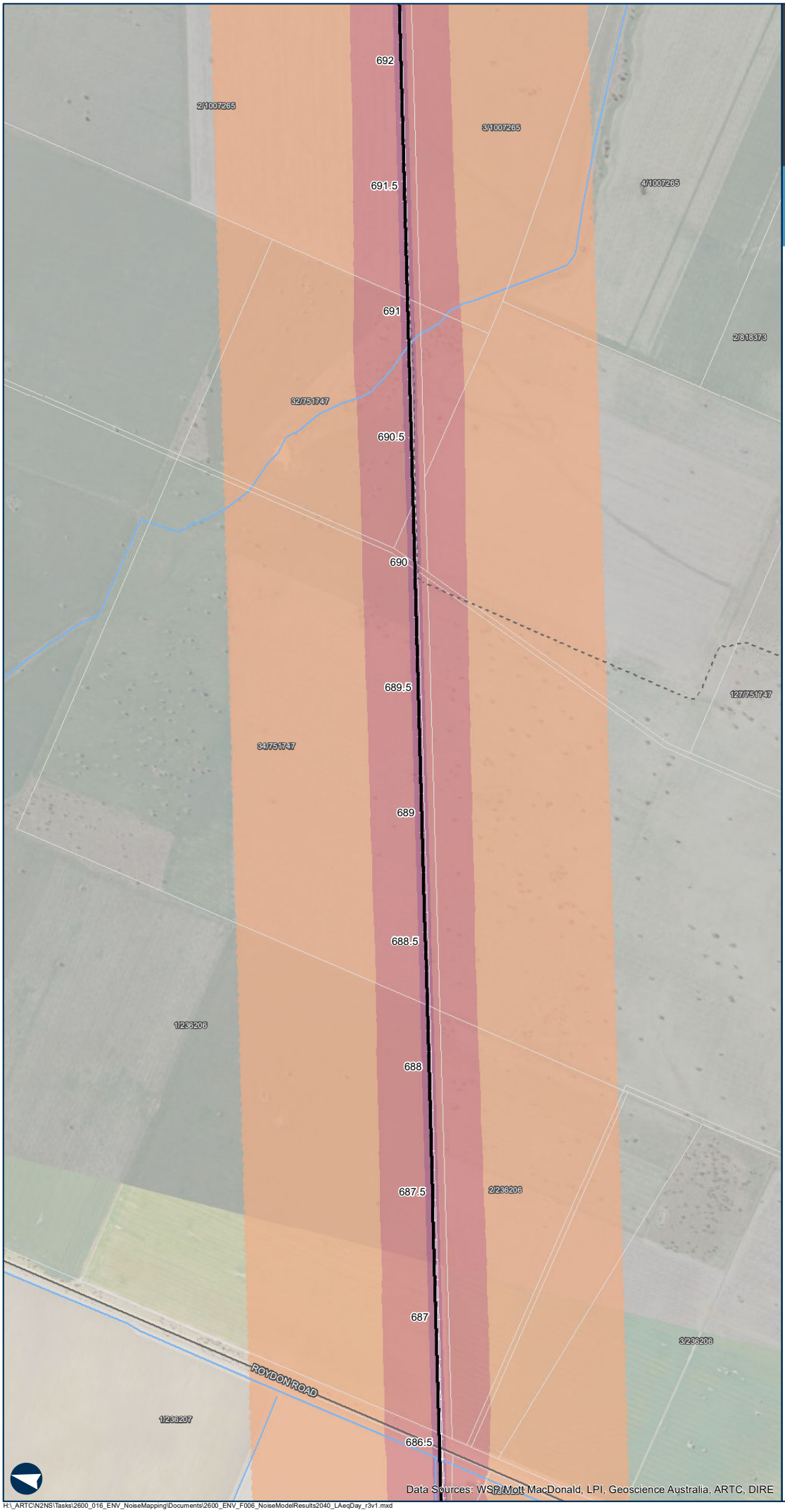
Paper: A3

Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 19 of 31

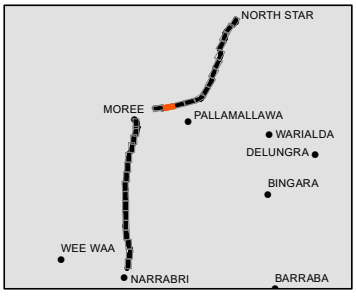
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
- >75

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 20 of 31

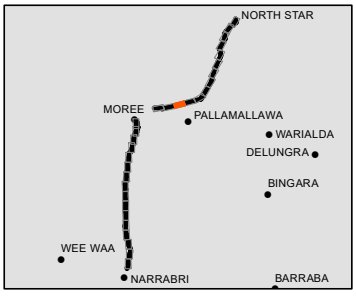
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
- >75

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 21 of 31

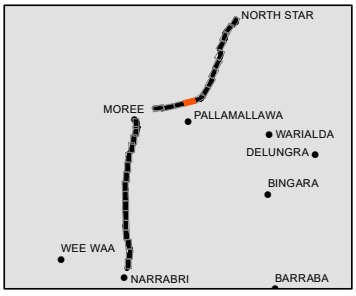
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
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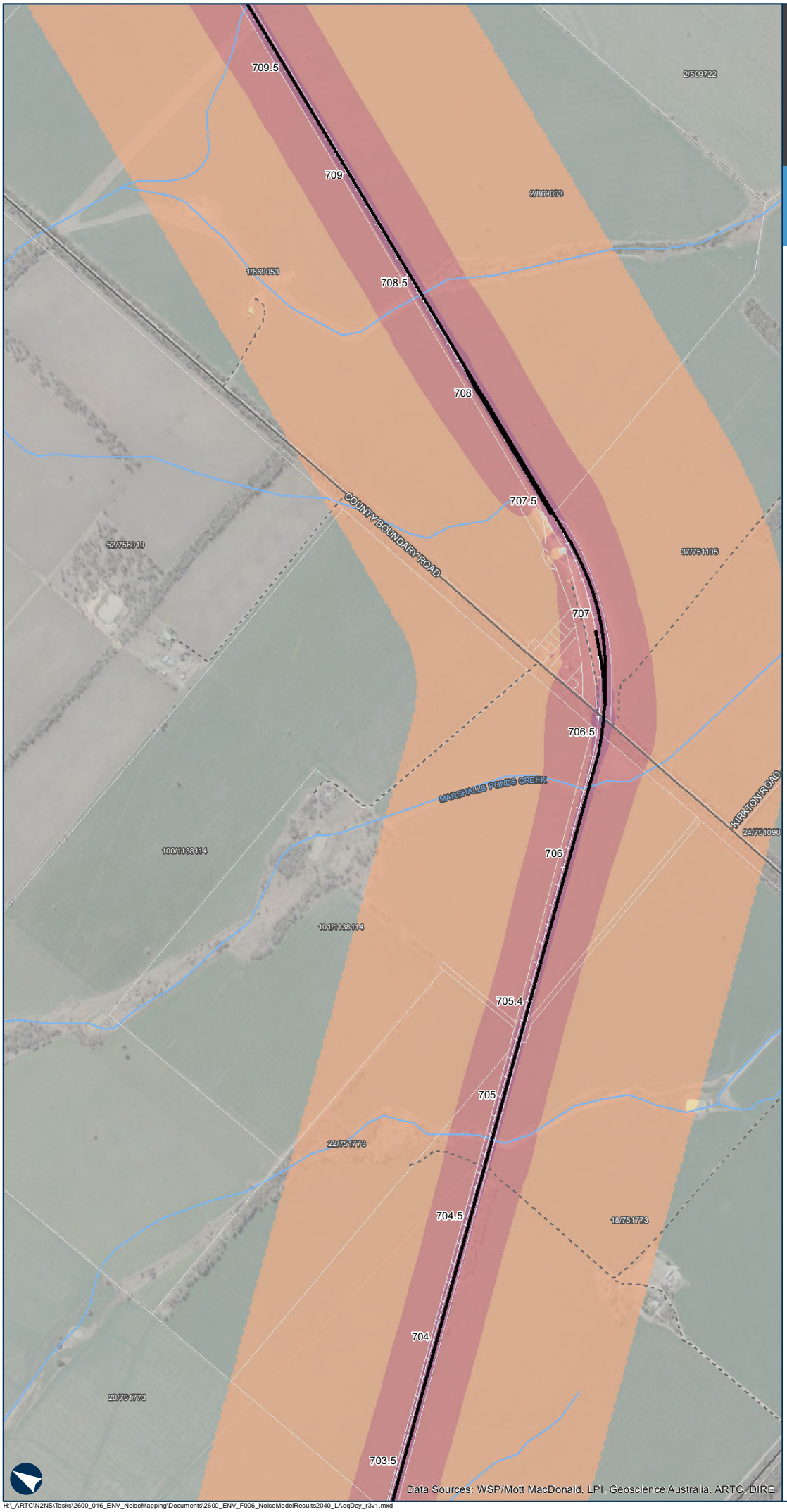
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 22 of 31

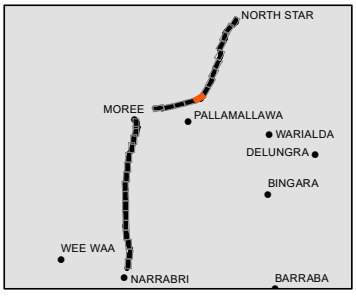
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
- >75

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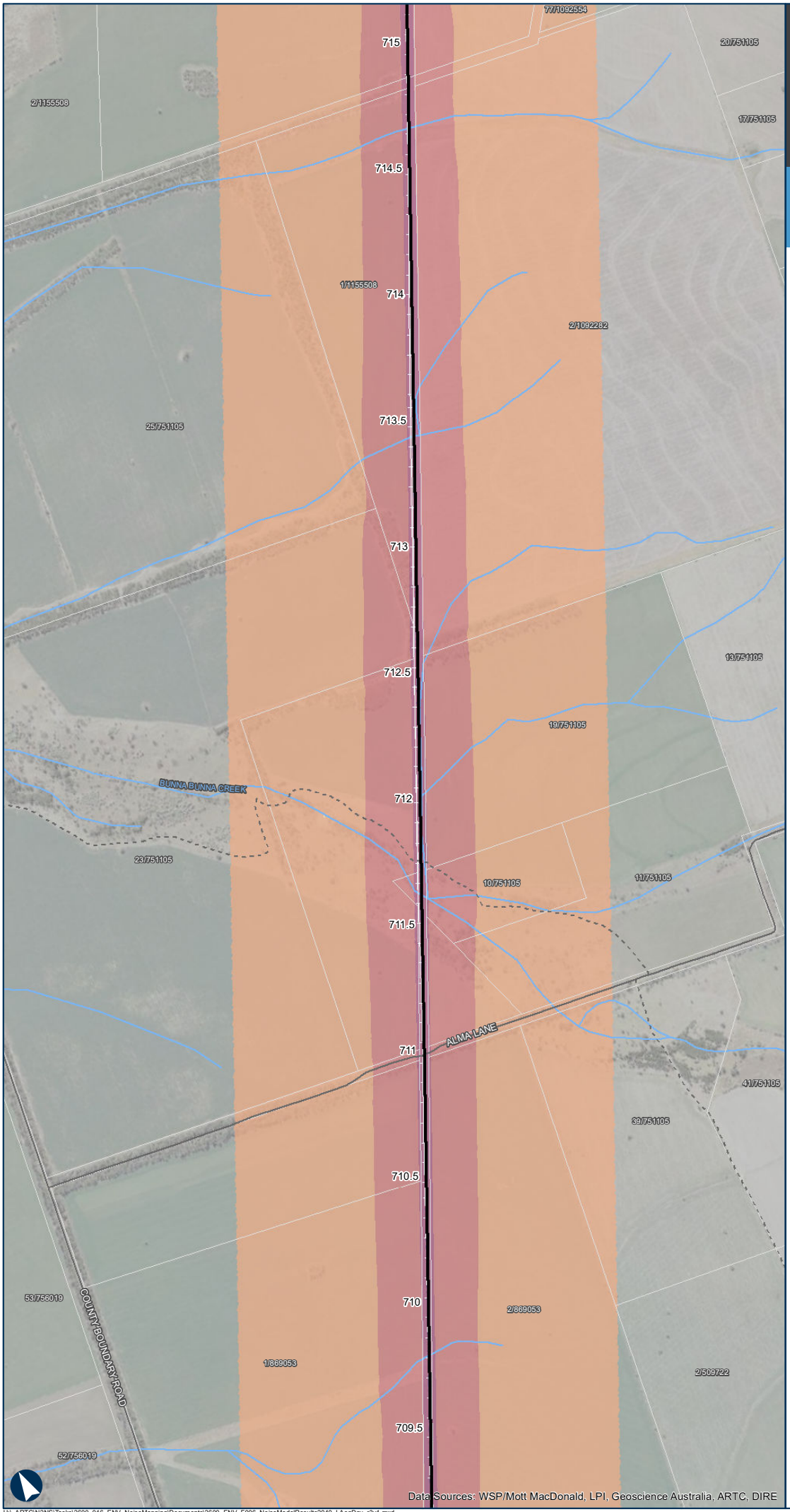
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 23 of 31

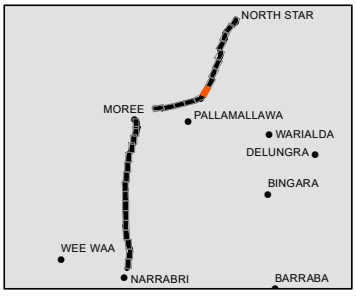
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
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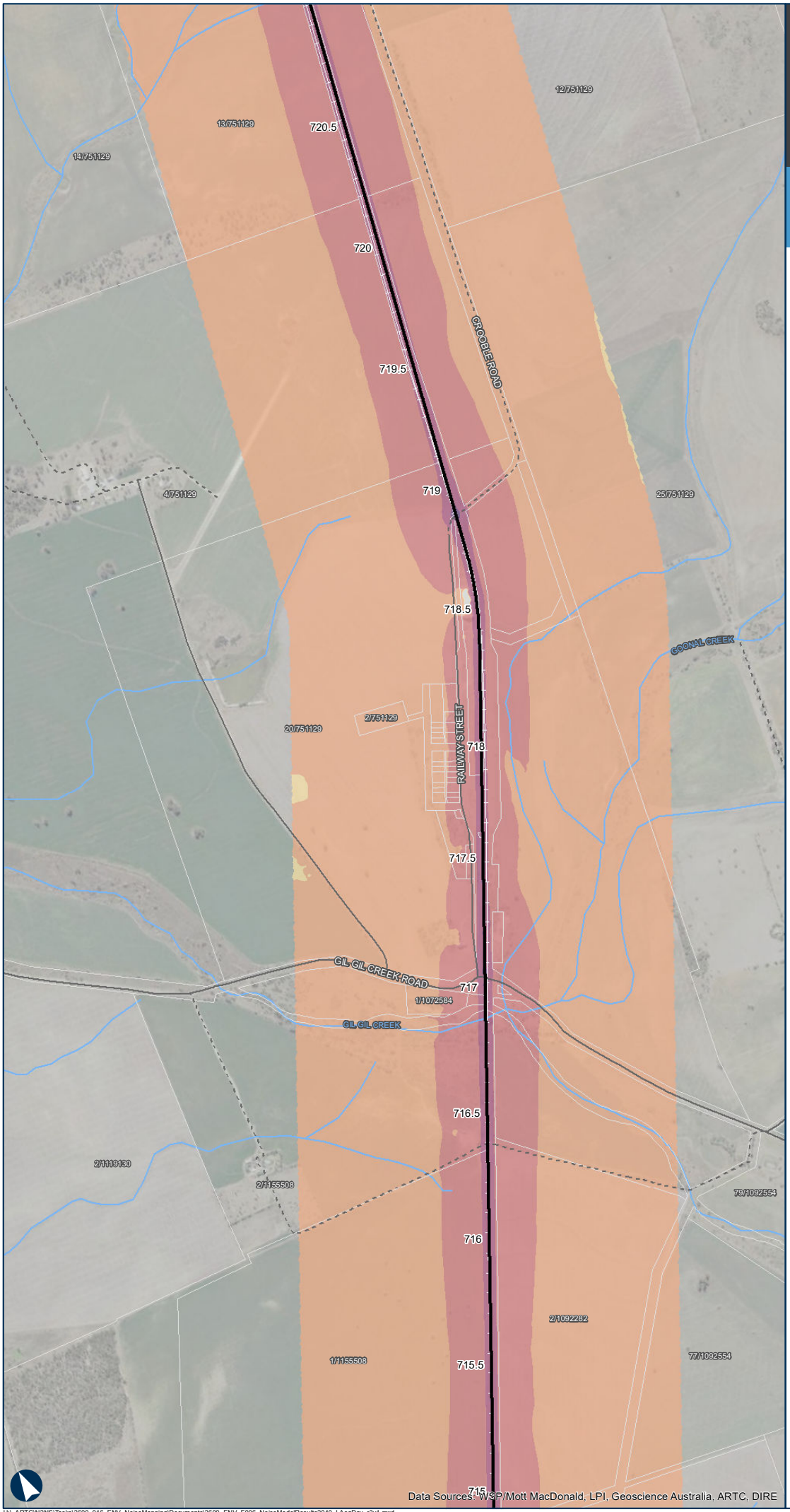
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 24 of 31

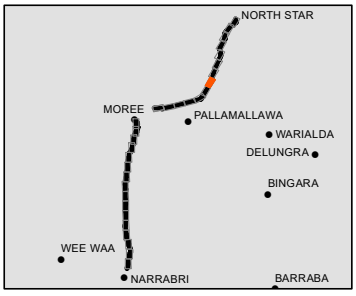
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
- >75

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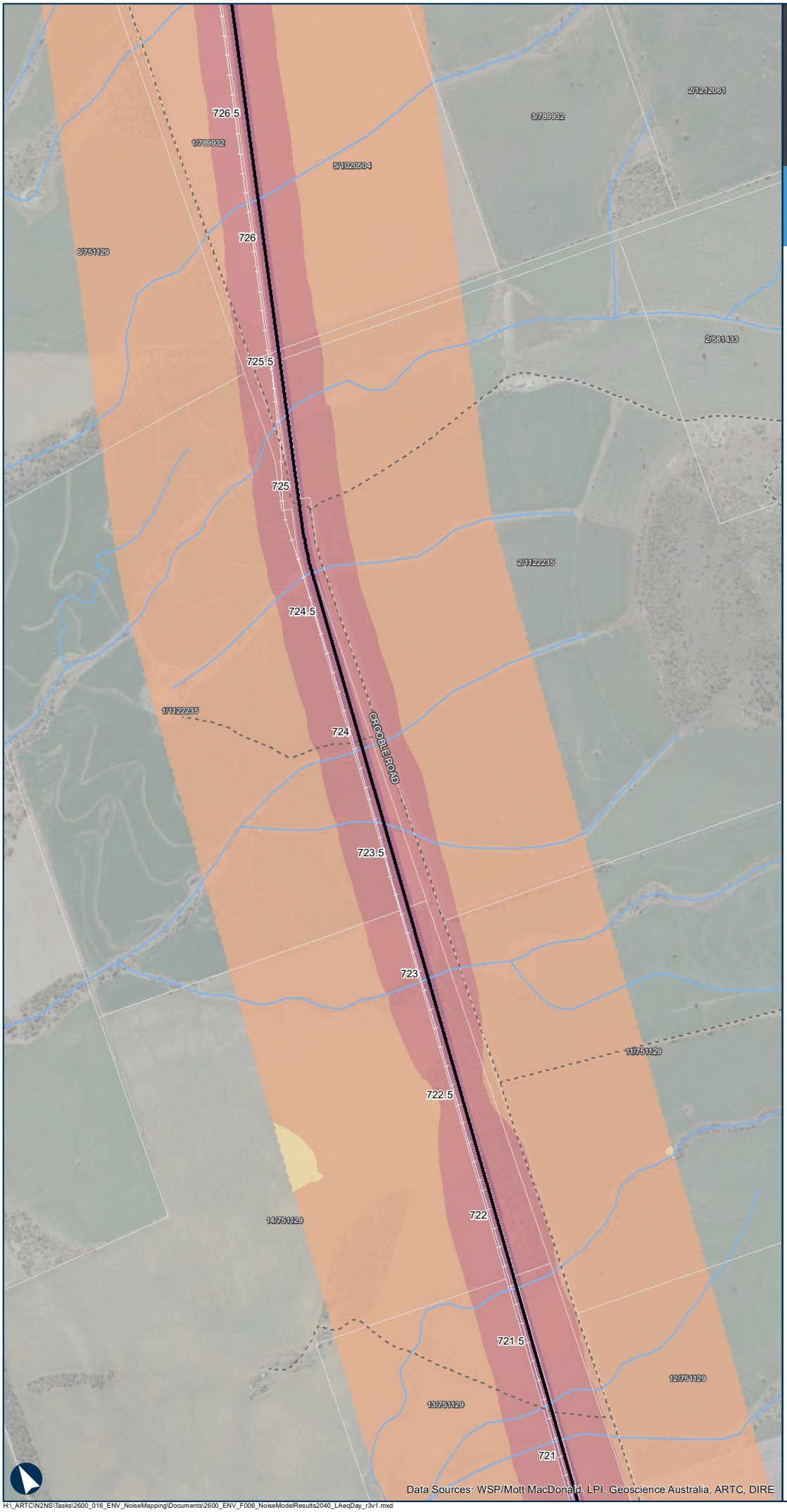
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 25 of 31

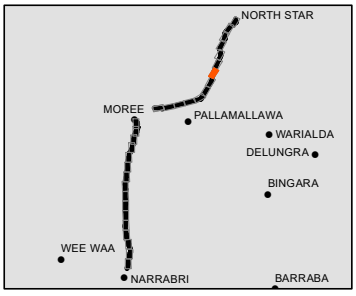
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
- >75

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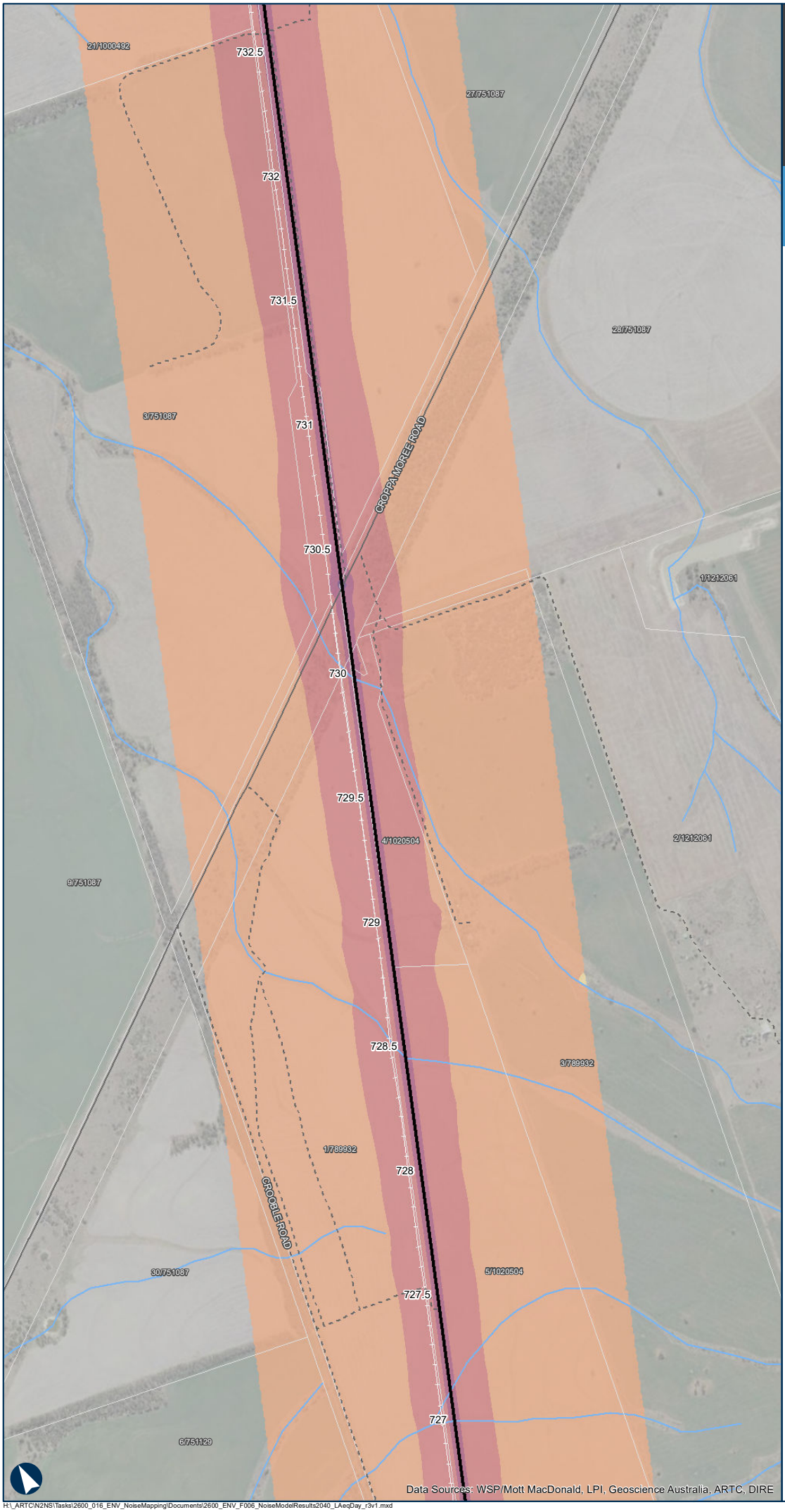
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 26 of 31

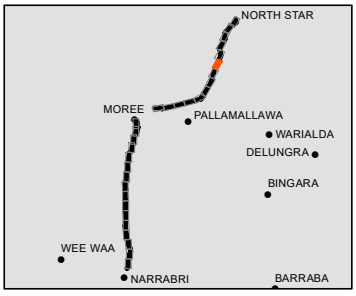
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
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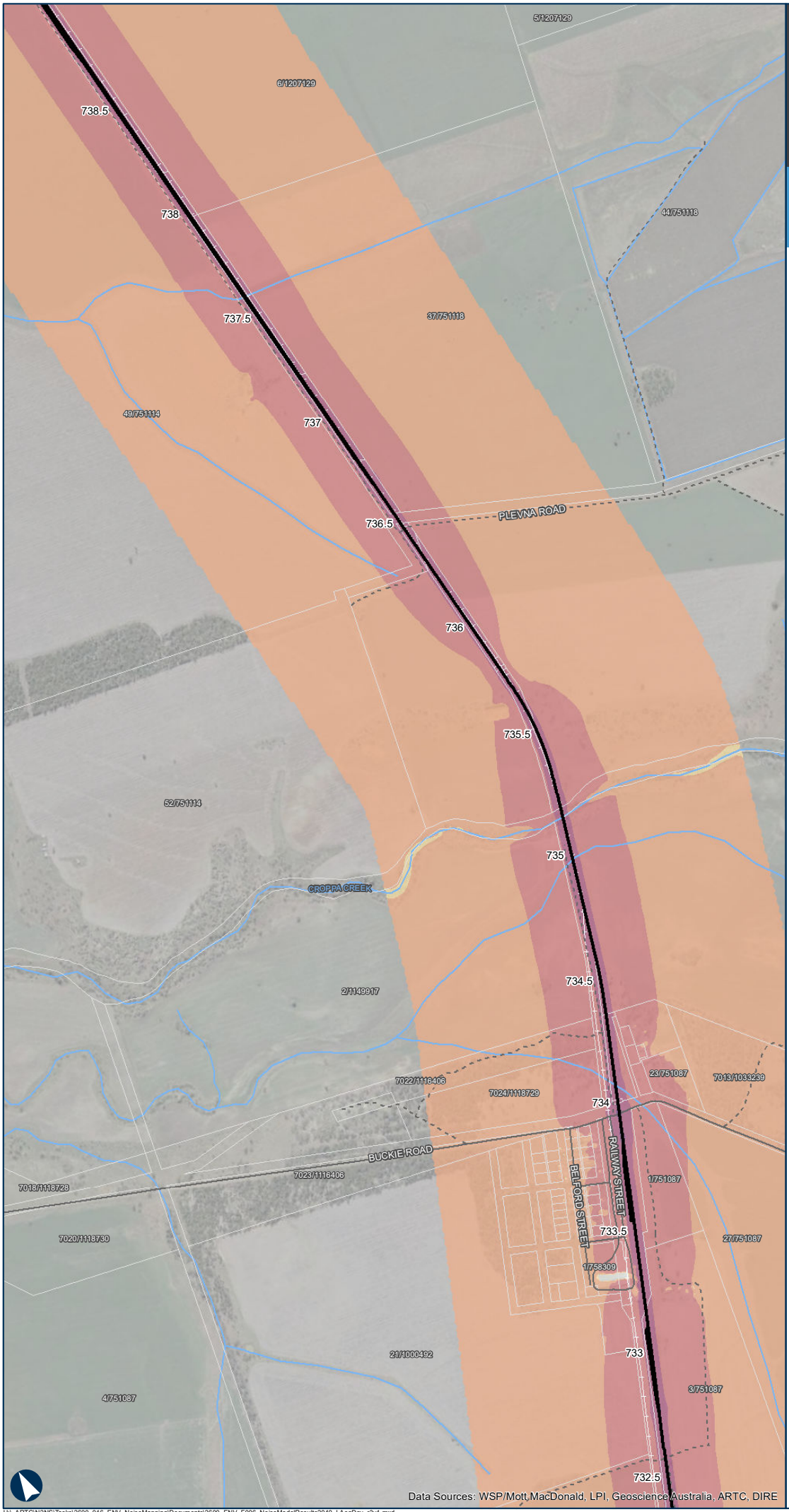
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Date: 13-Aug-21

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 27 of 31

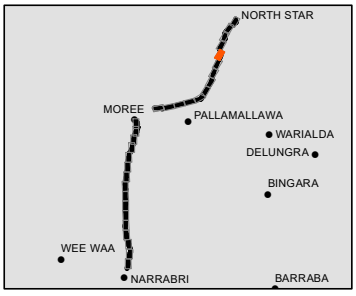
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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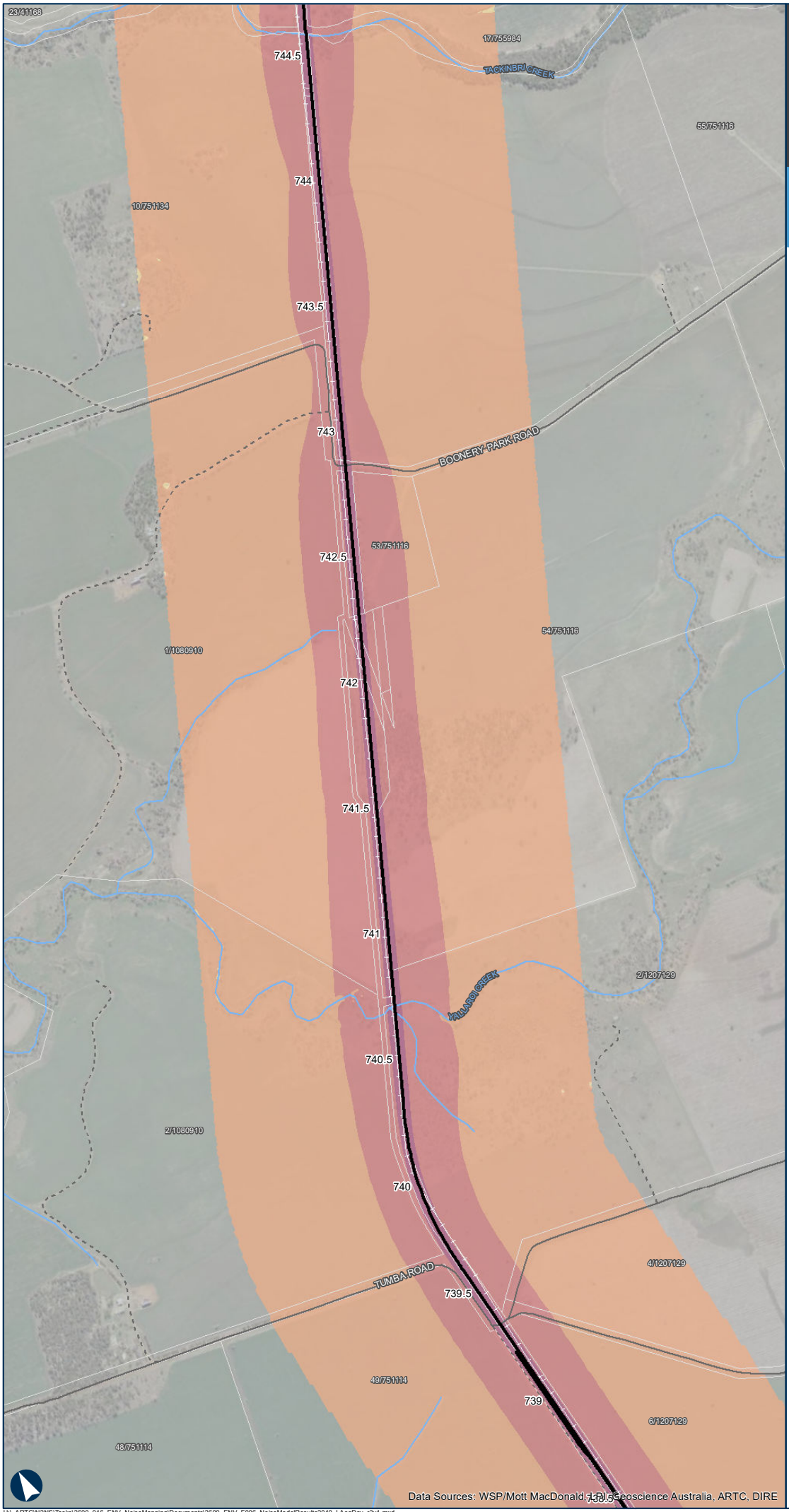
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

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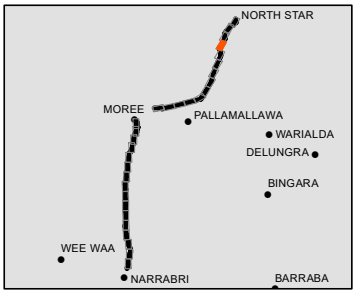
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
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Noise Contours (dB(A))

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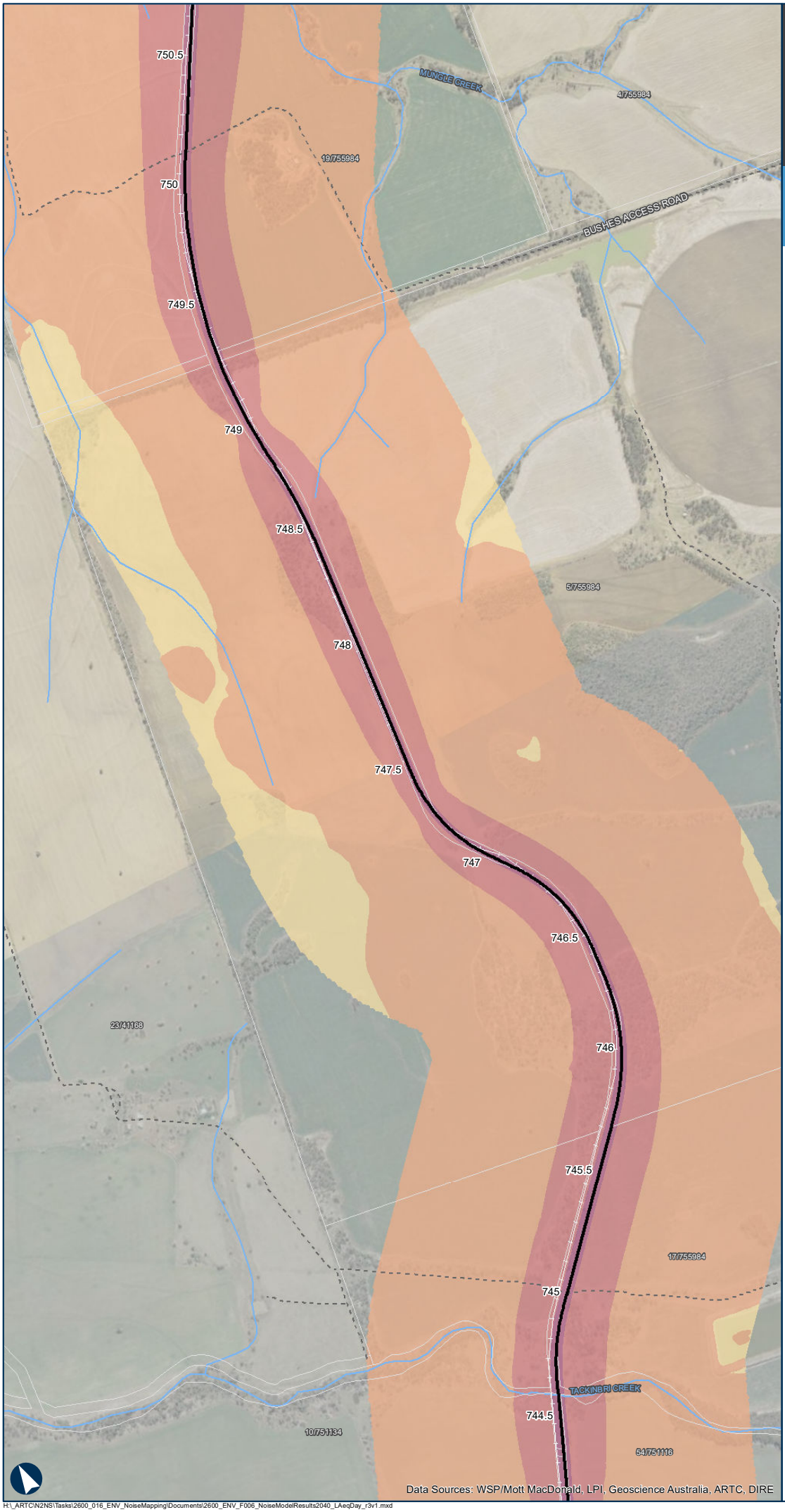
Paper: A3

Scale: 1:15,000

Date: 13-Aug-21

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Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 29 of 31

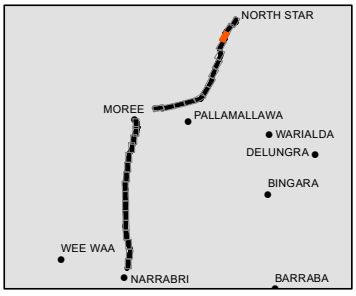
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
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Noise Contours (dB(A))

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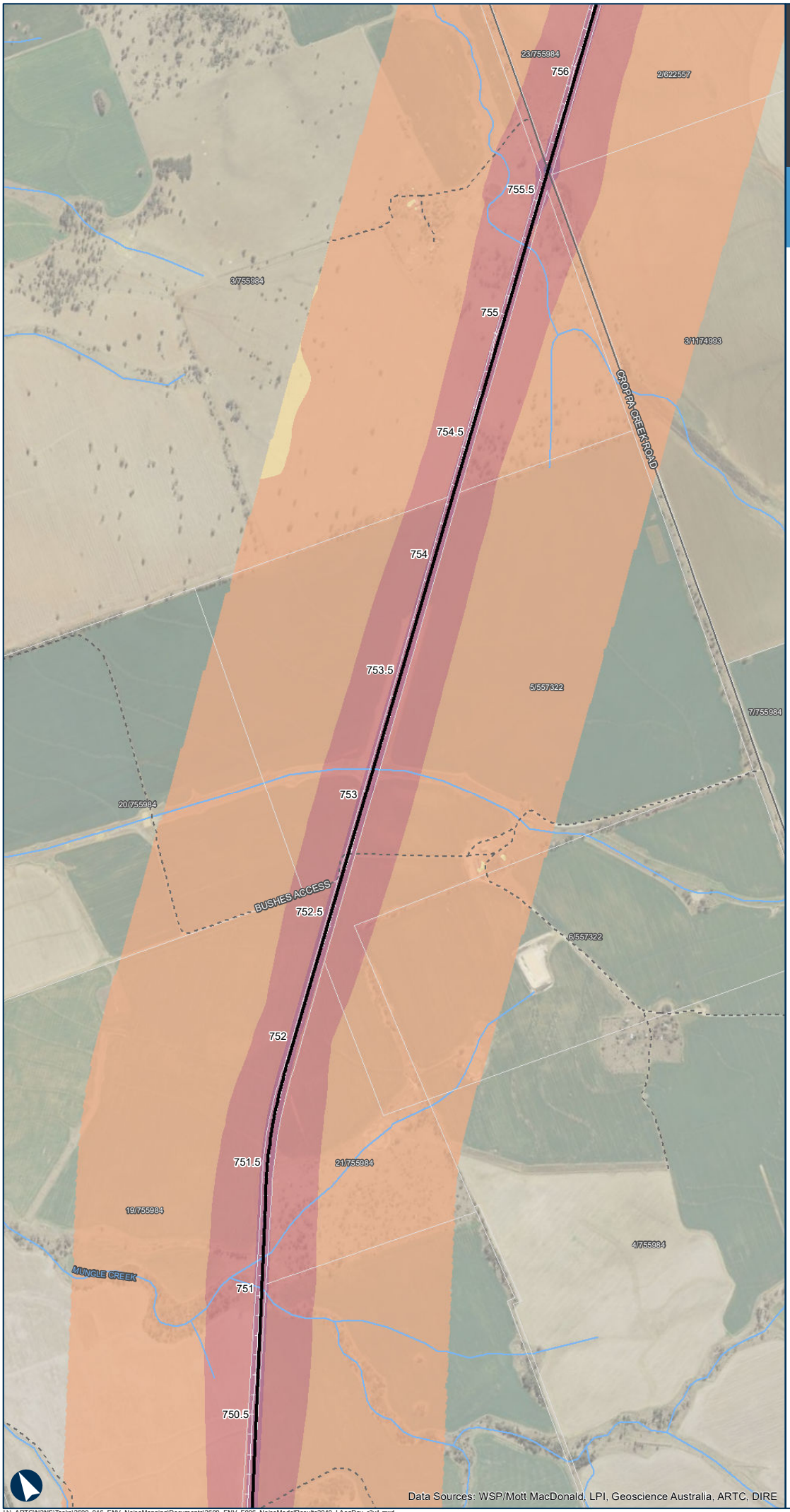
Paper: A3

Scale: 1:15,000

Date: 13-Aug-21

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

Sheet 30 of 31

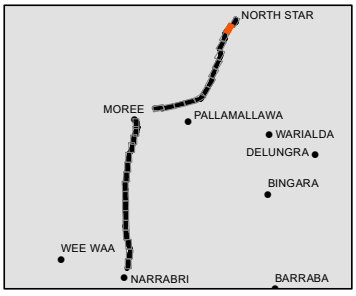
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
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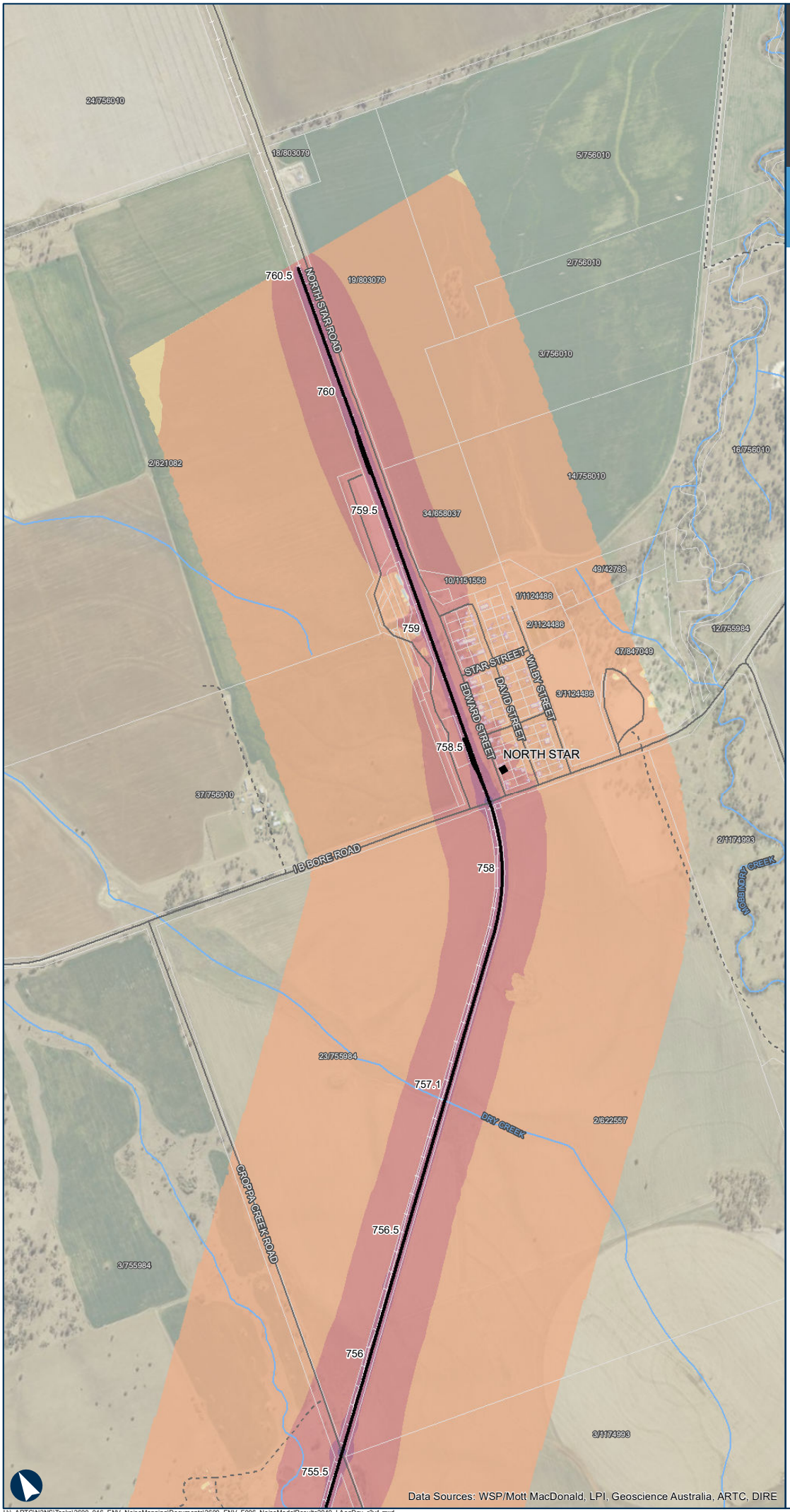
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Day without mitigation

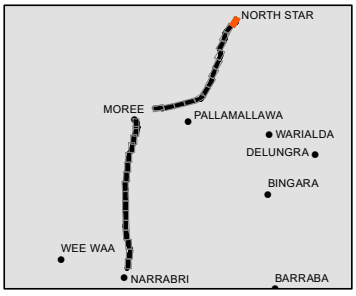
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 60 - 70
- >75

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0.75 Km

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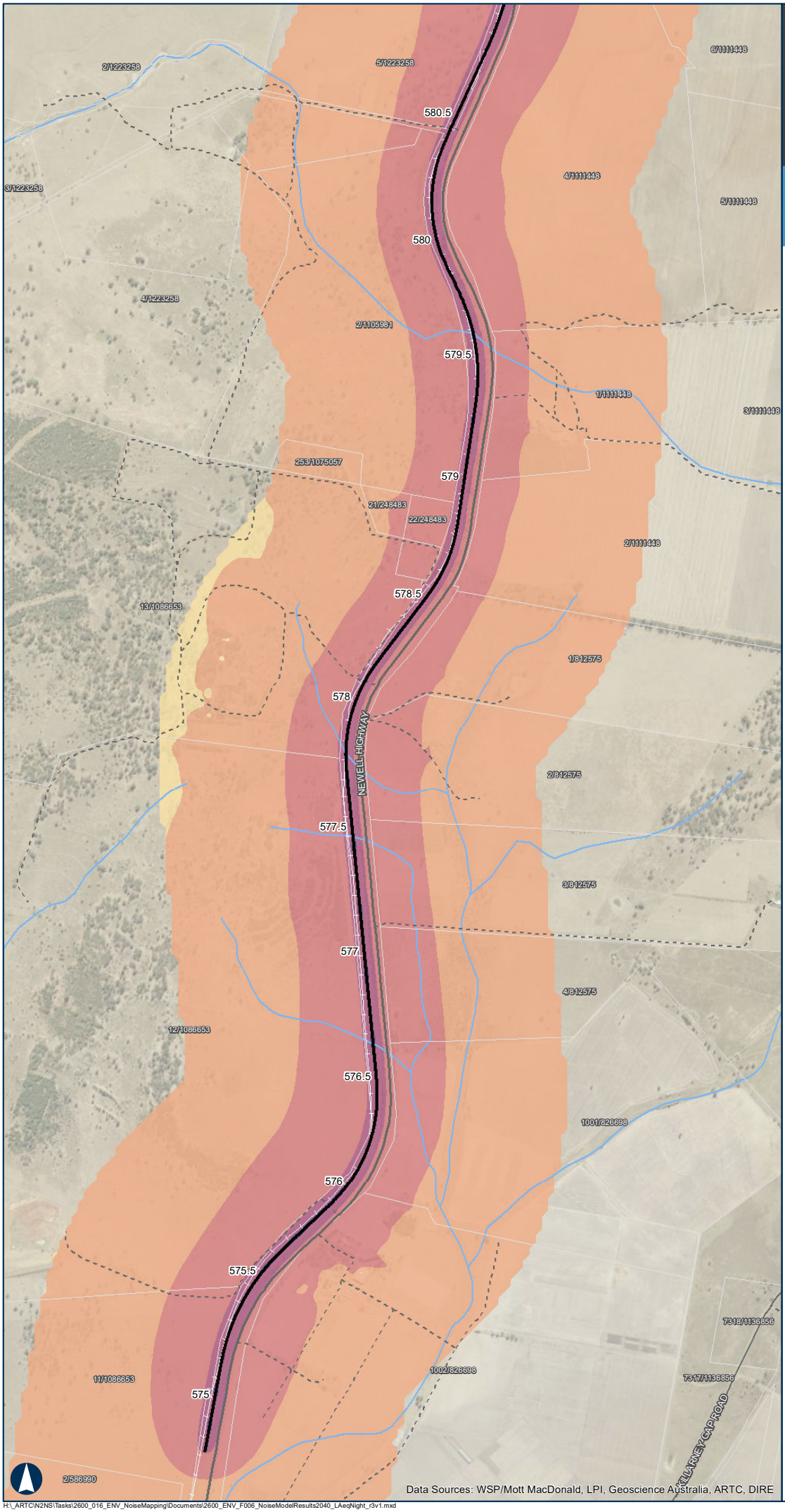
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 1 of 31

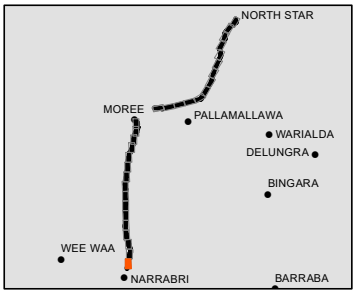
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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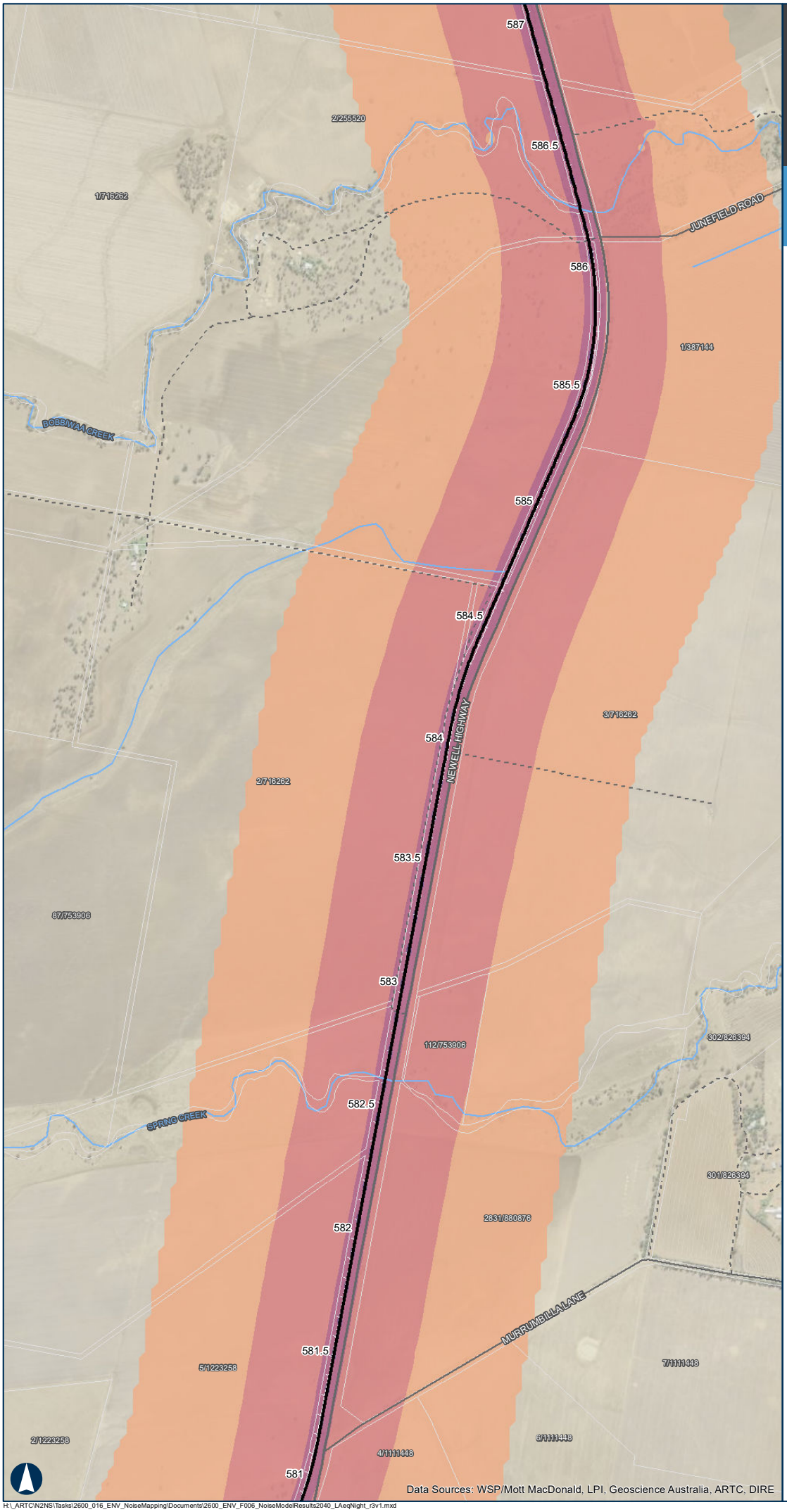
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 2 of 31

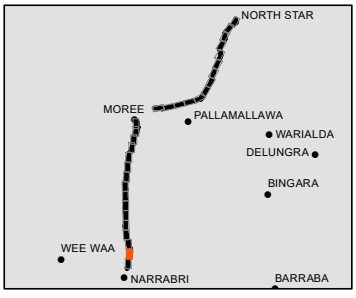
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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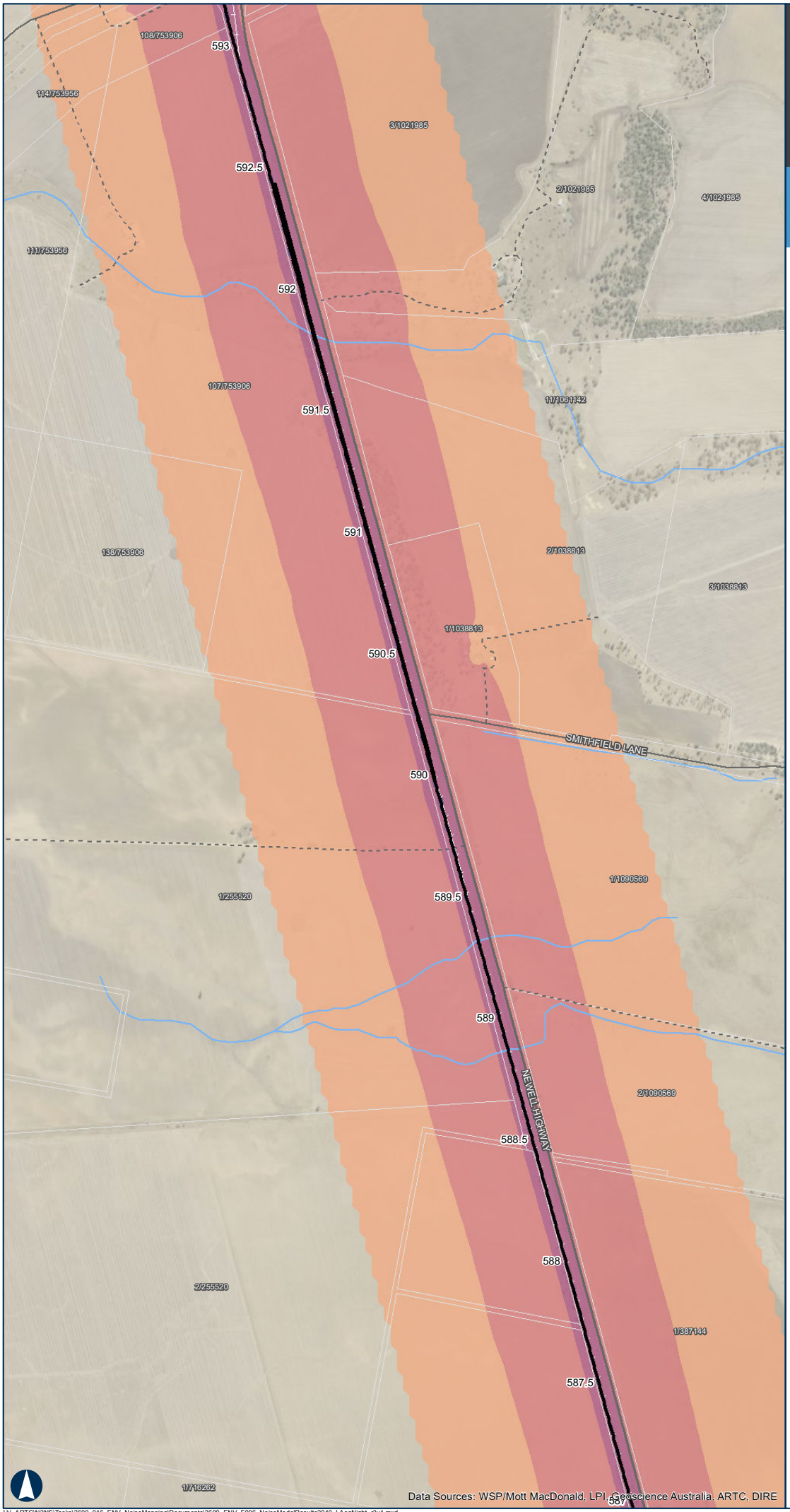
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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 3 of 31

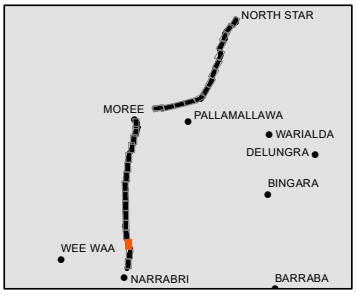
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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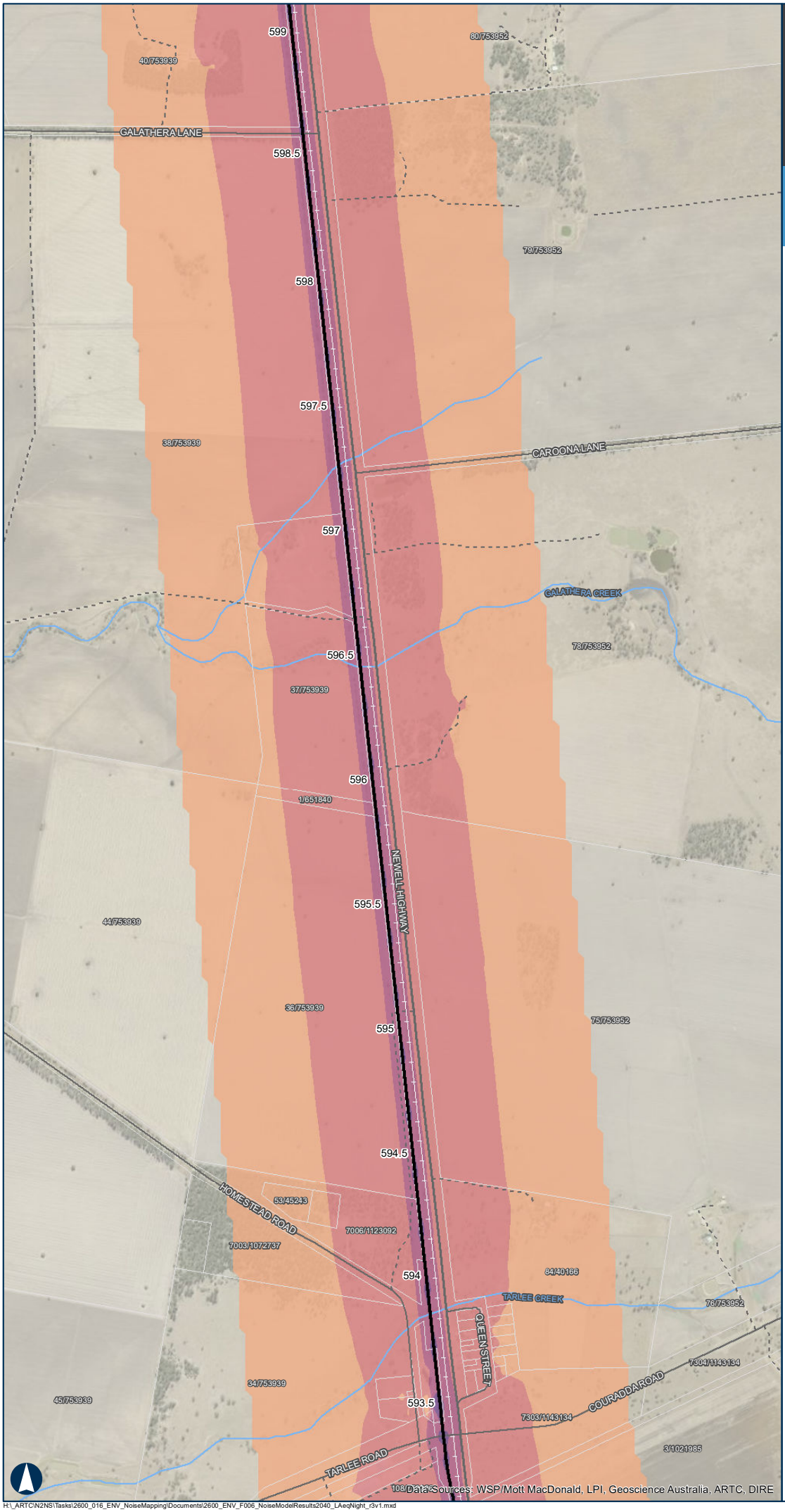
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 4 of 31

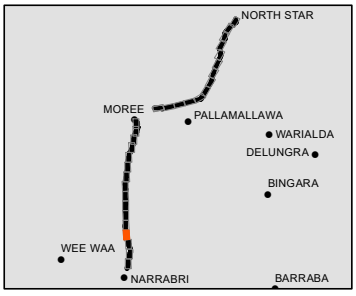
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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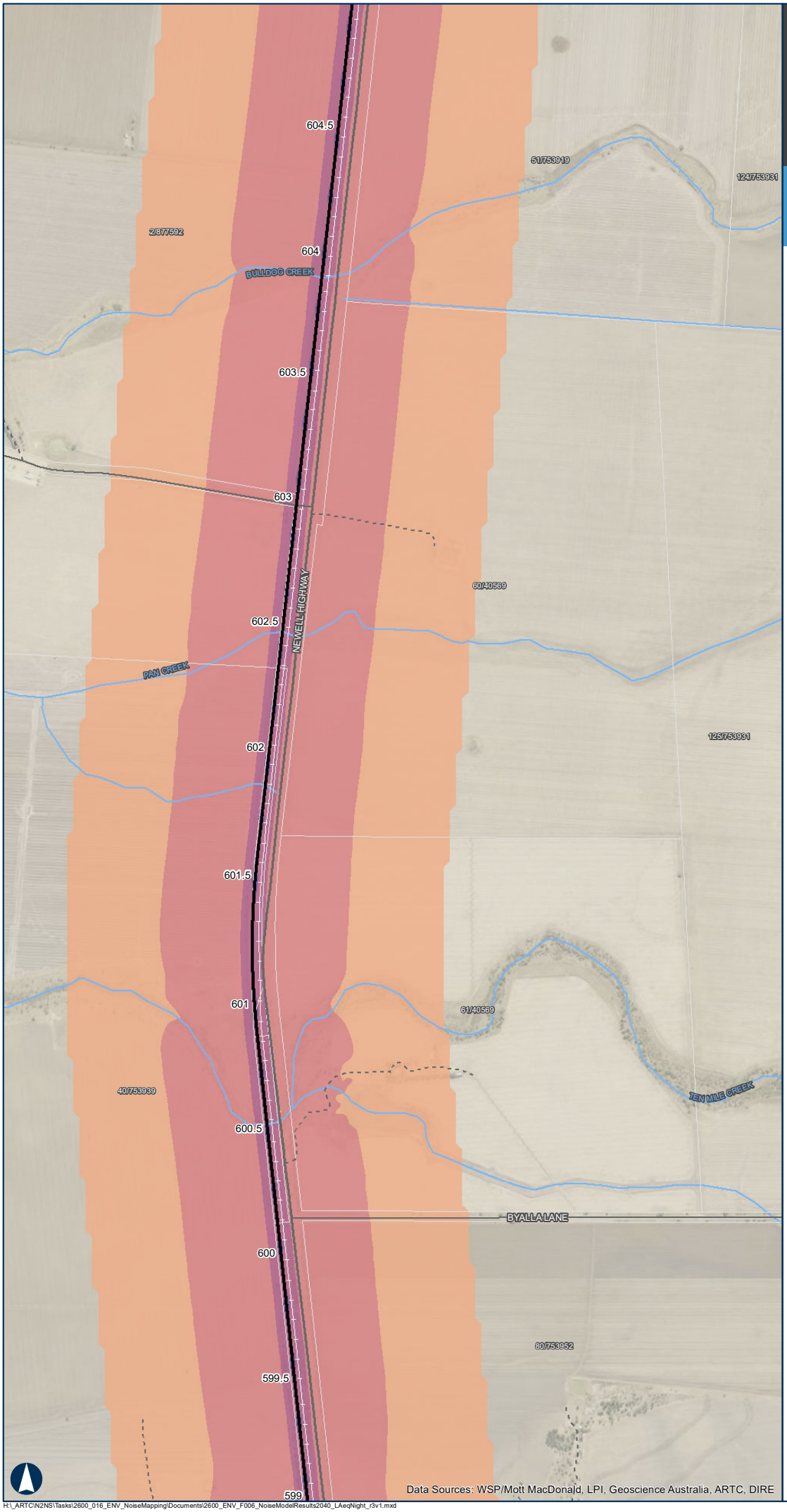
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Scale: 1:15,000

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Author: IRDJV

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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 5 of 31

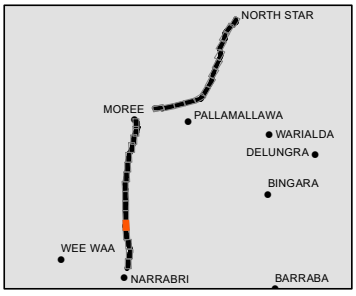
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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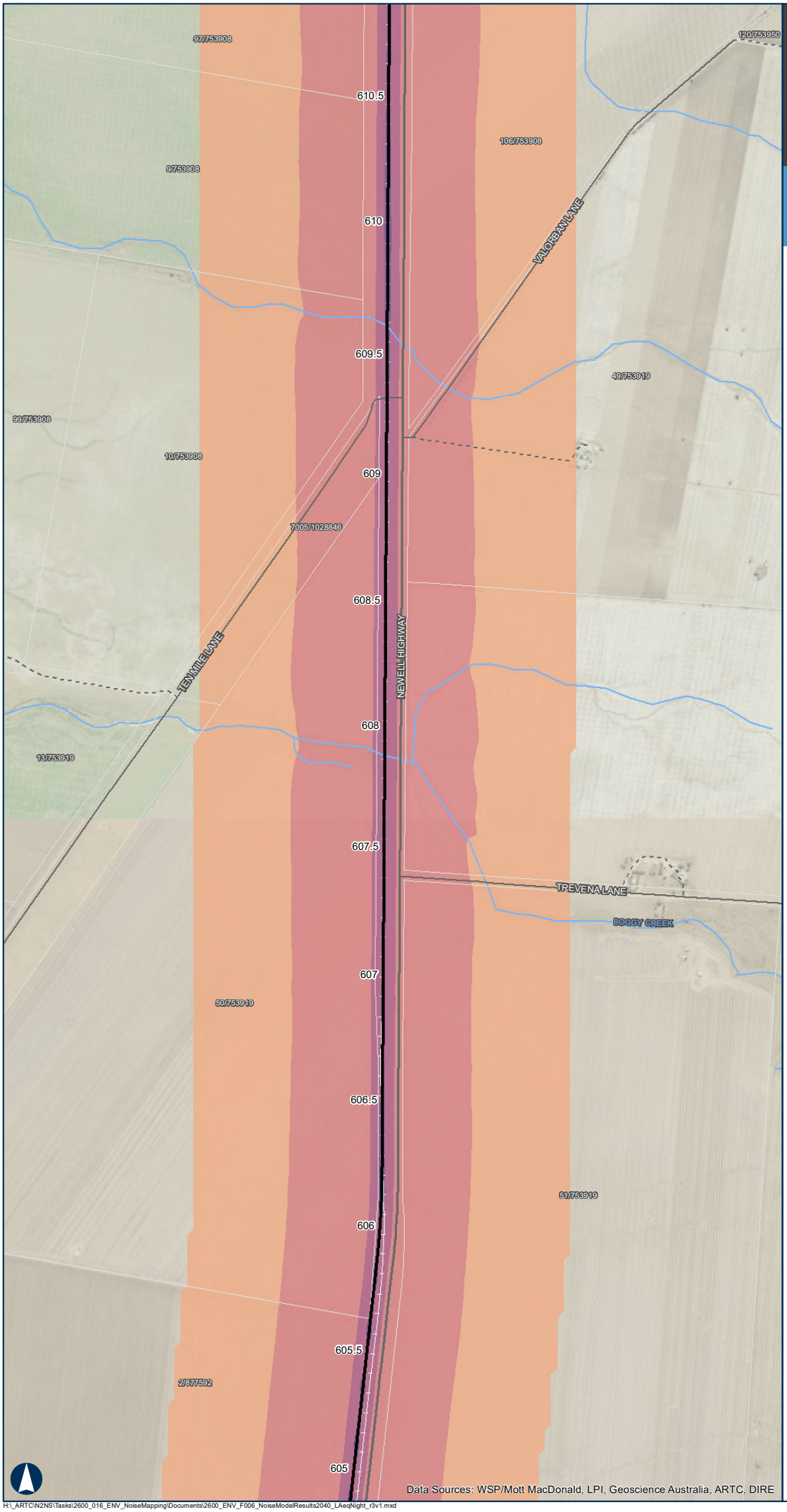
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

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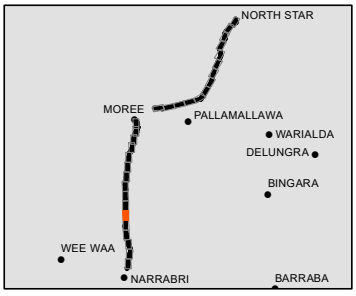
LEGEND

- Townships
- Highway
- Local Road
- Track
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- Track Alignment
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Noise Contours (dB(A))

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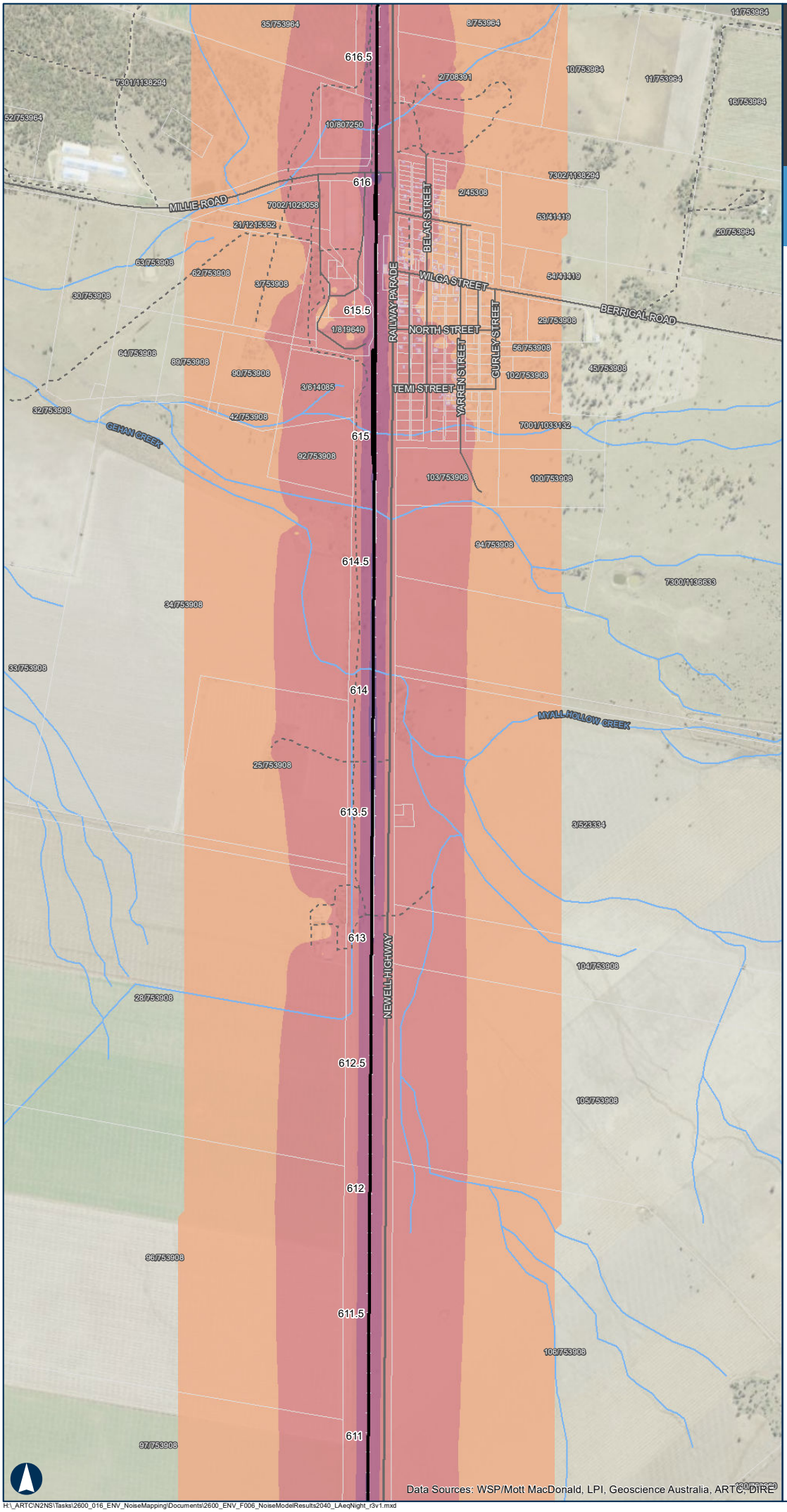
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 7 of 31

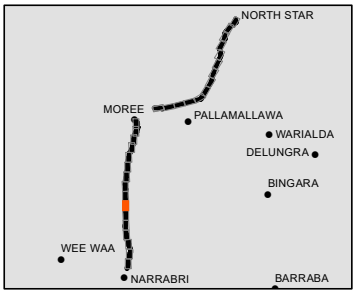
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

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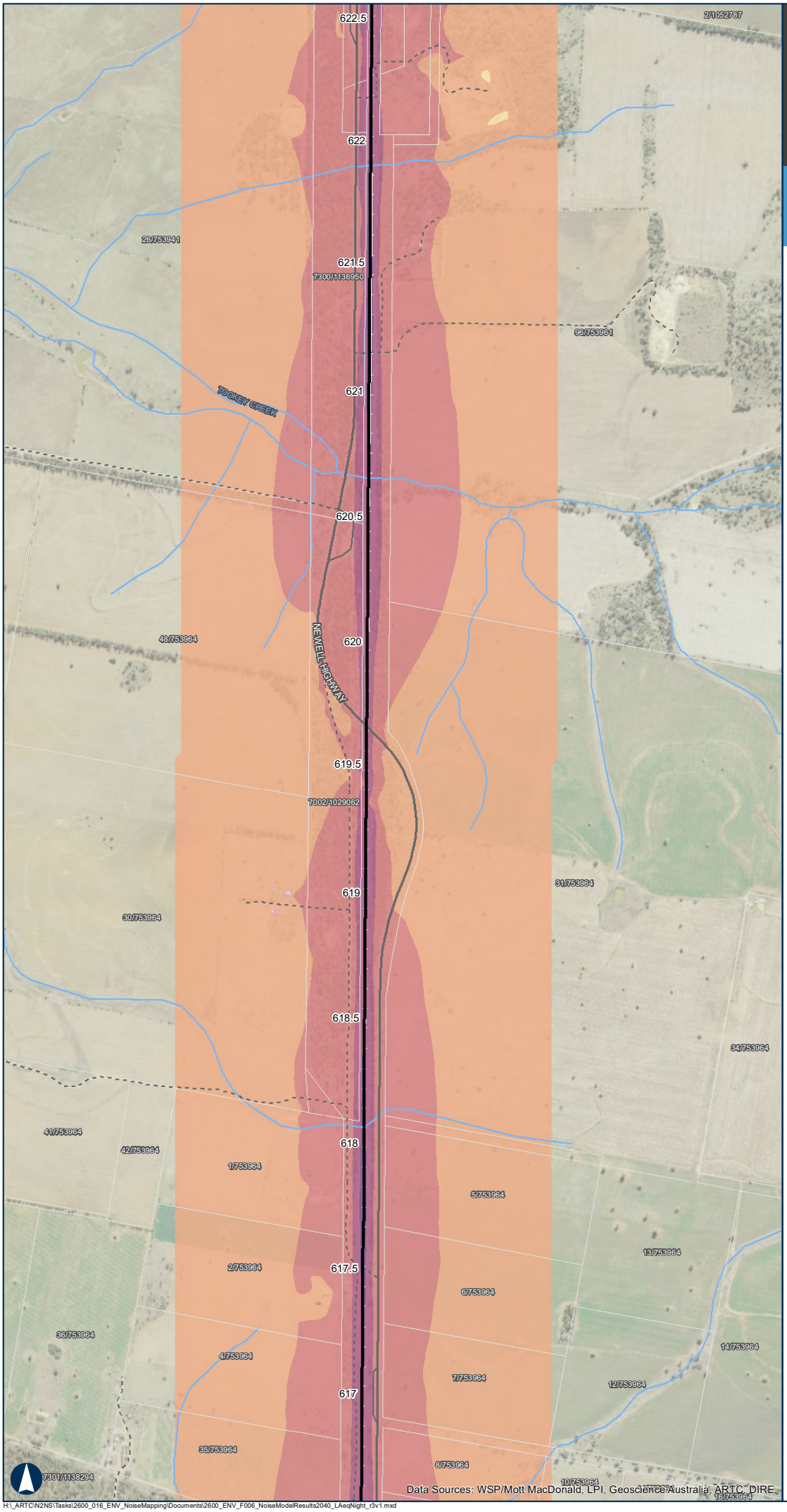
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Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 8 of 31

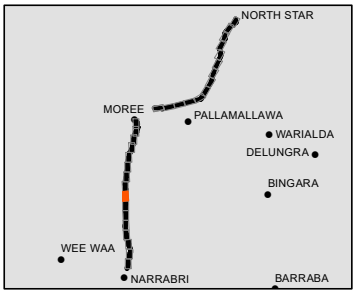
LEGEND

- Townships
- Highway
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- Existing Rail Network
- Track Alignment
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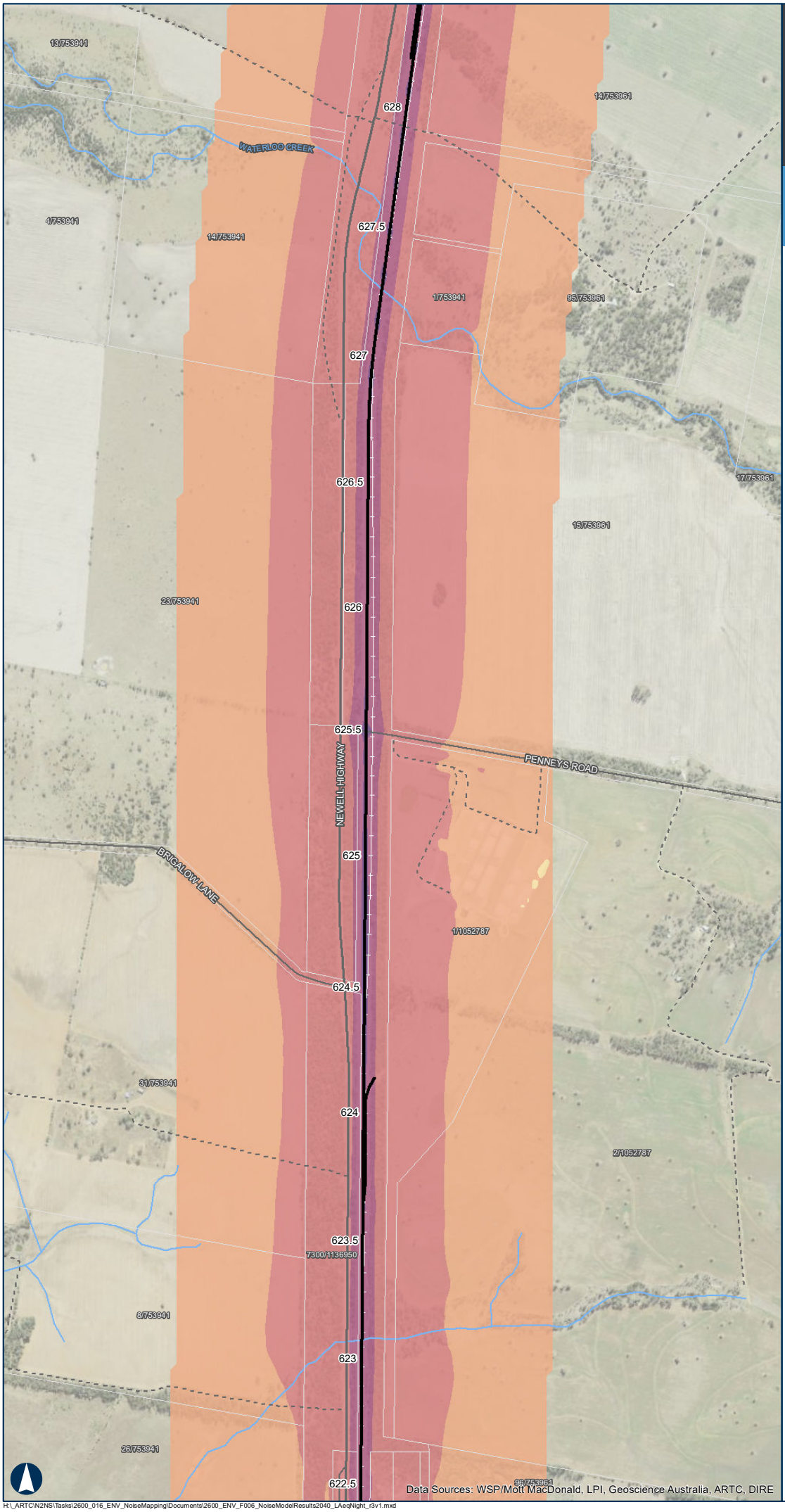
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 9 of 31

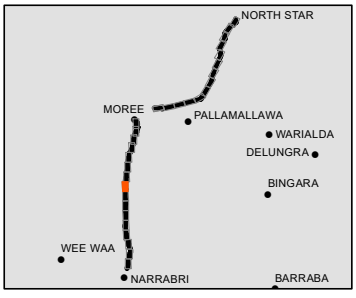
LEGEND

- Townships
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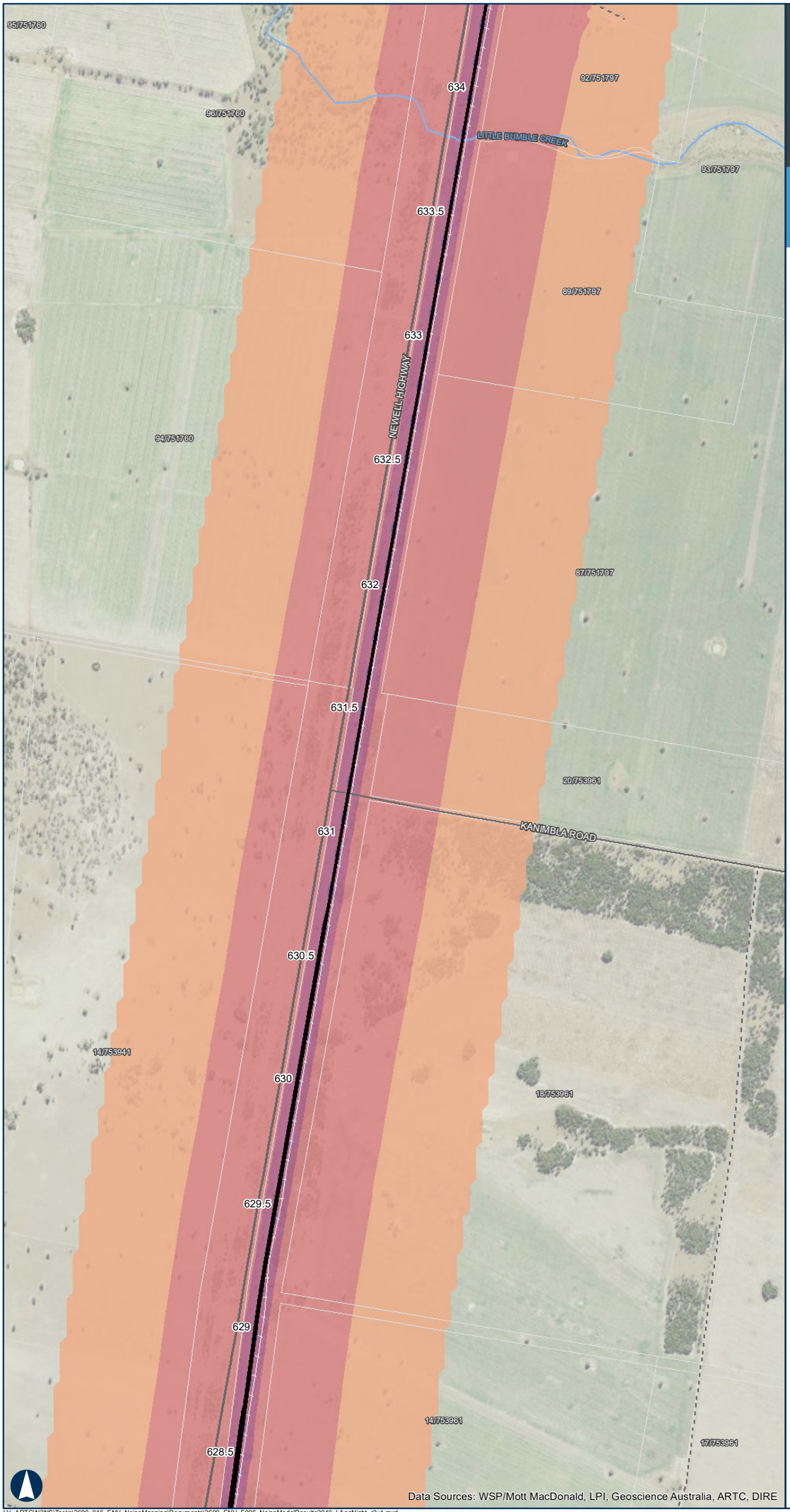
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 10 of 31

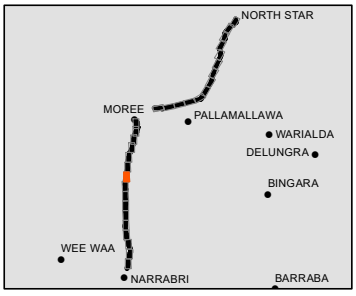
LEGEND

- Townships
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- Track Alignment
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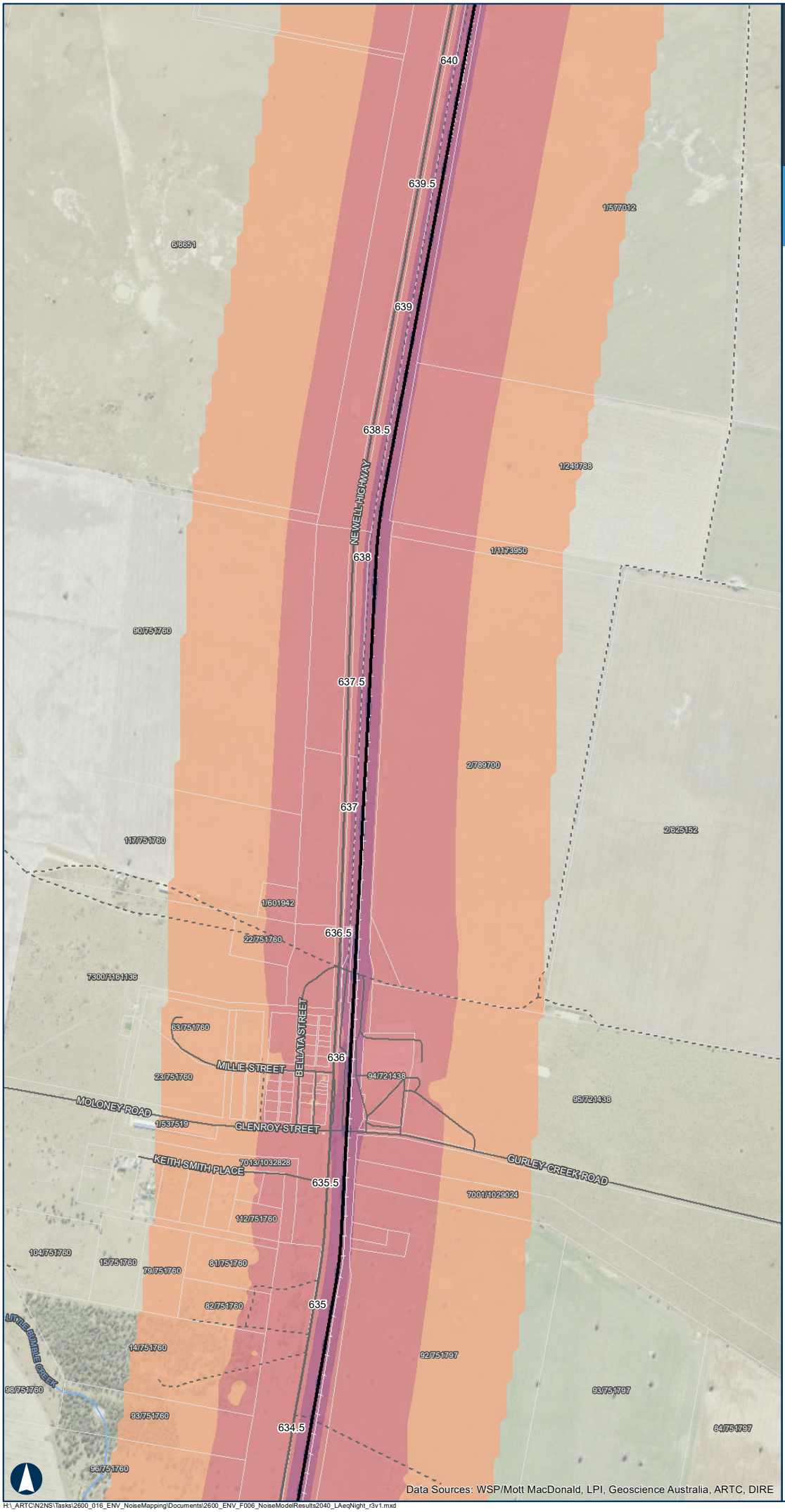
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Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 11 of 31

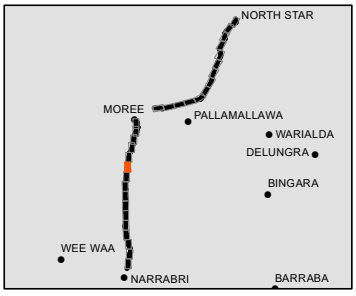
LEGEND

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

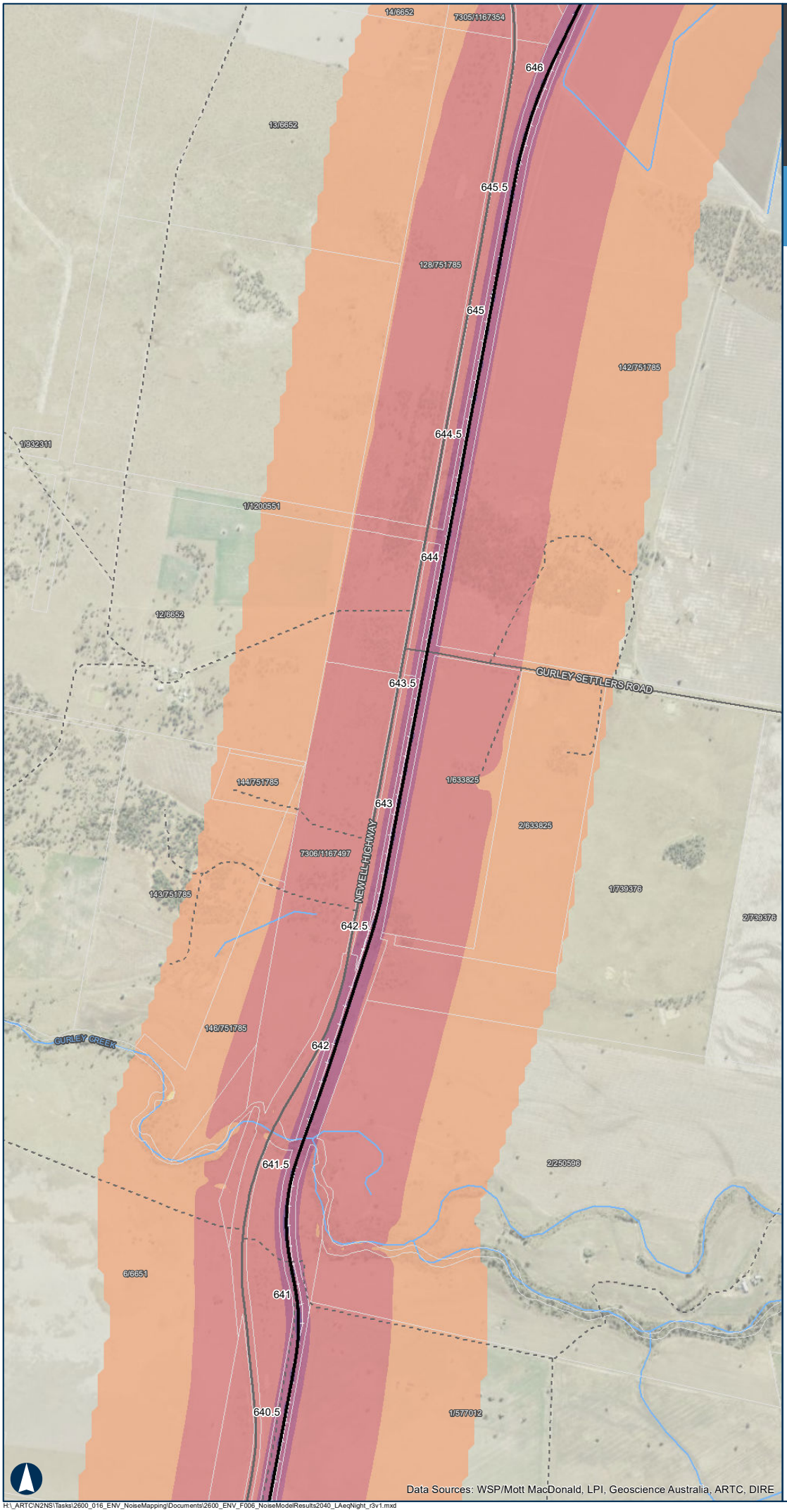
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV



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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 12 of 31

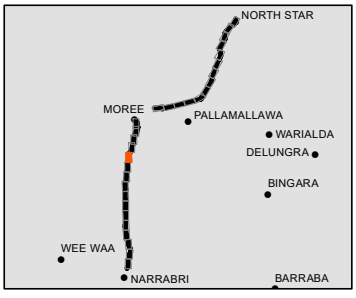
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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0.75 Km

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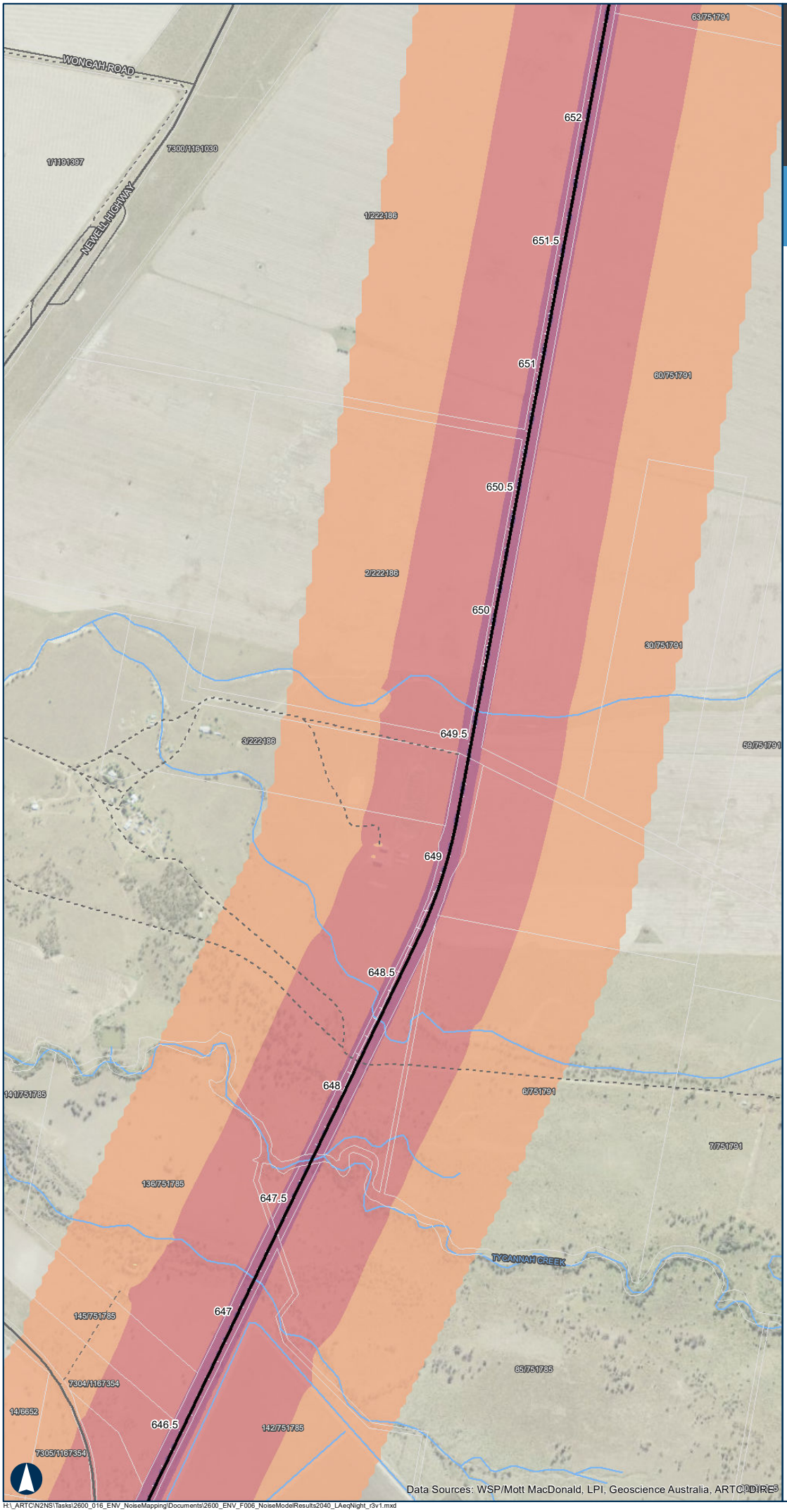
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Scale: 1:15,000

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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 13 of 31

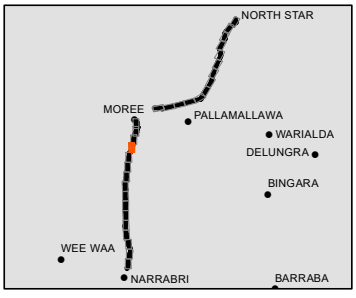
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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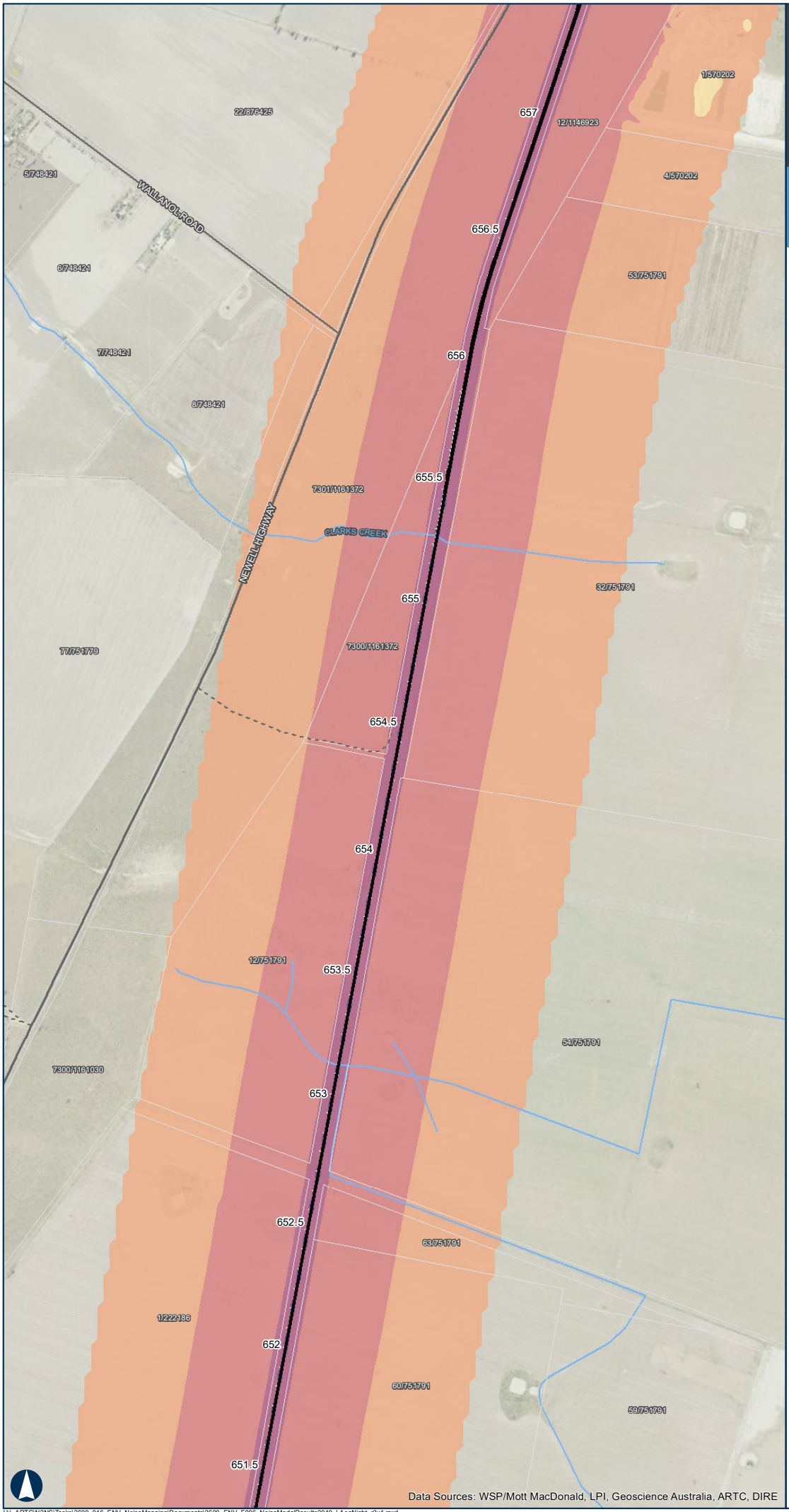
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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 14 of 31

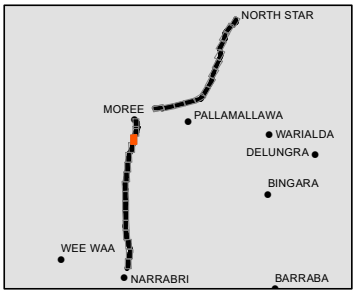
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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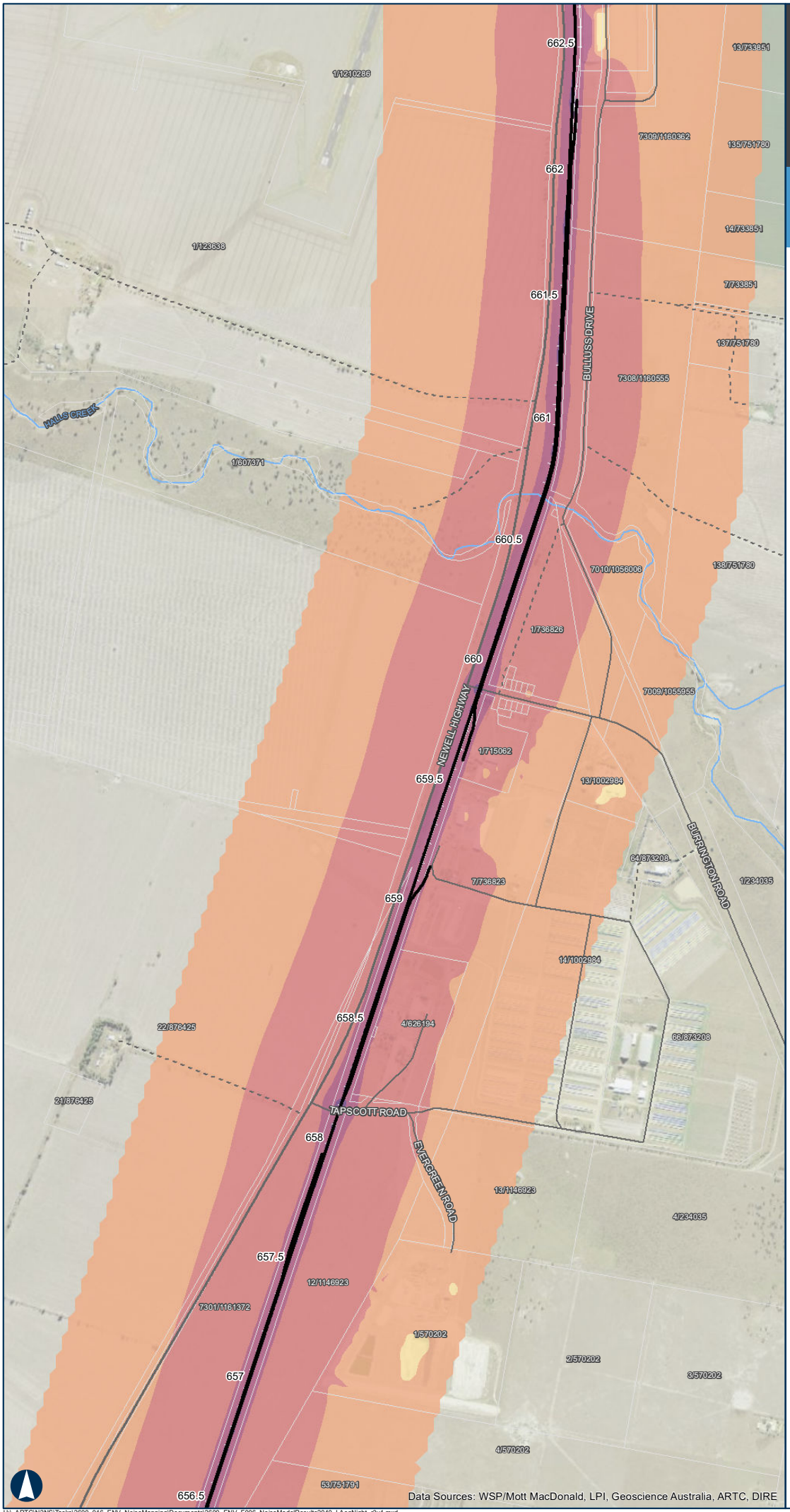
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 15 of 31

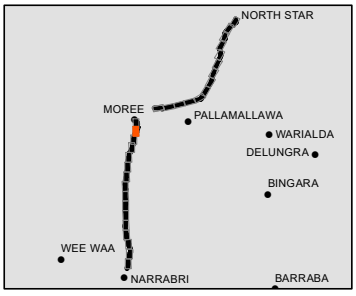
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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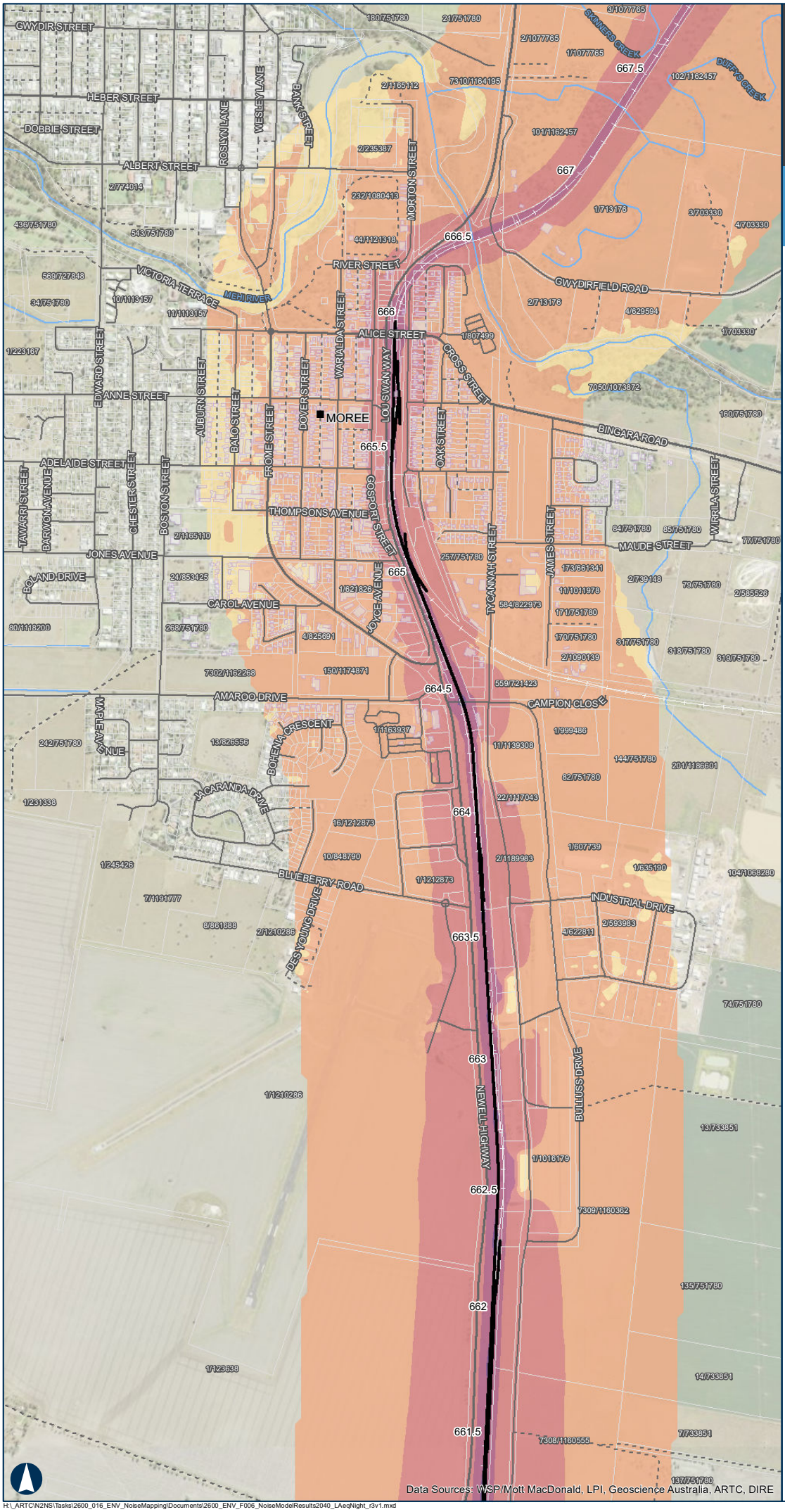
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 16 of 31

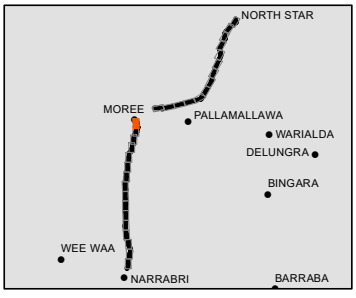
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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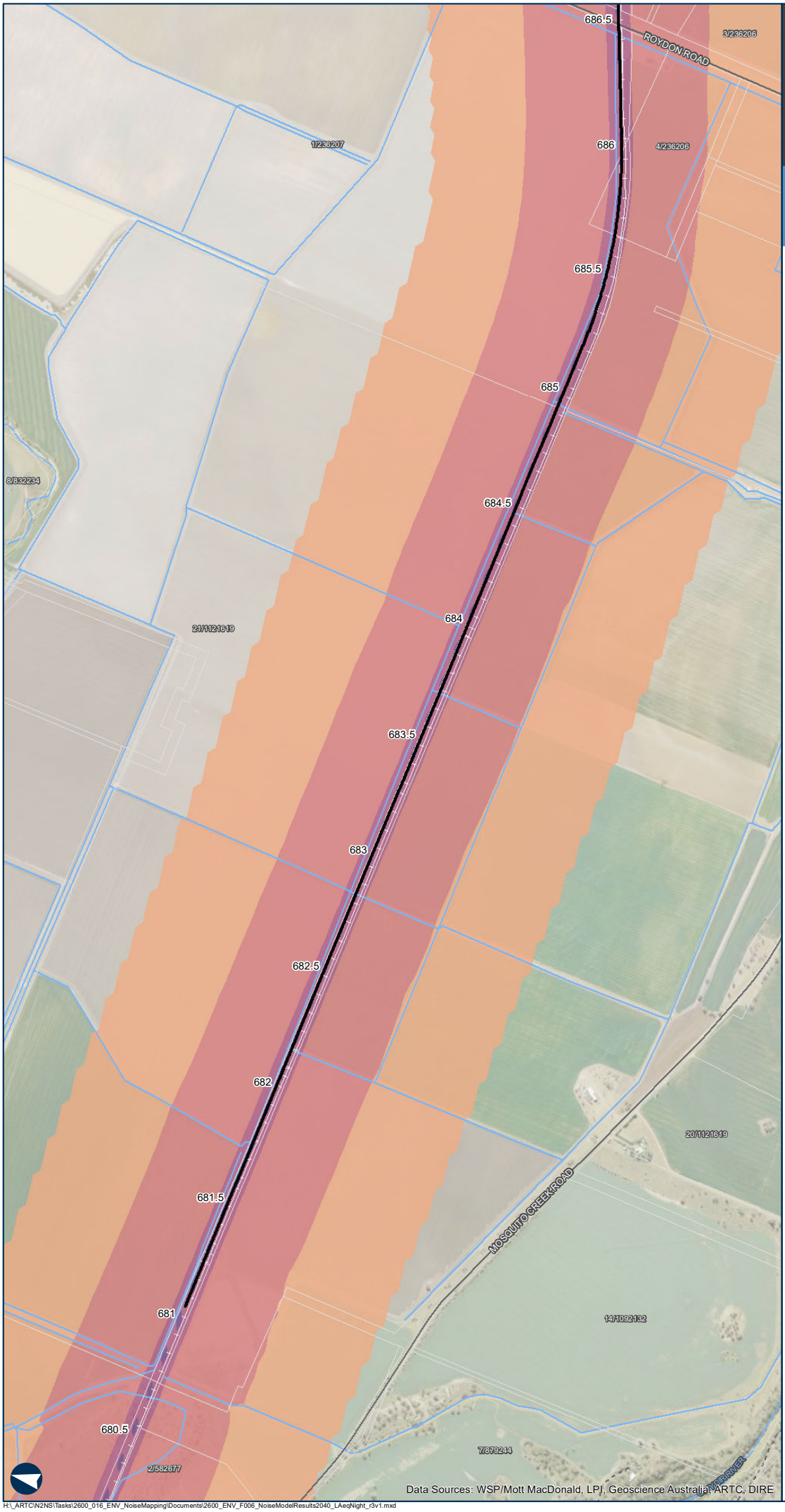
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 17 of 31

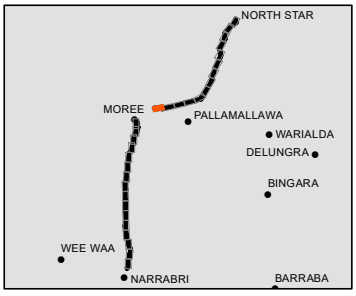
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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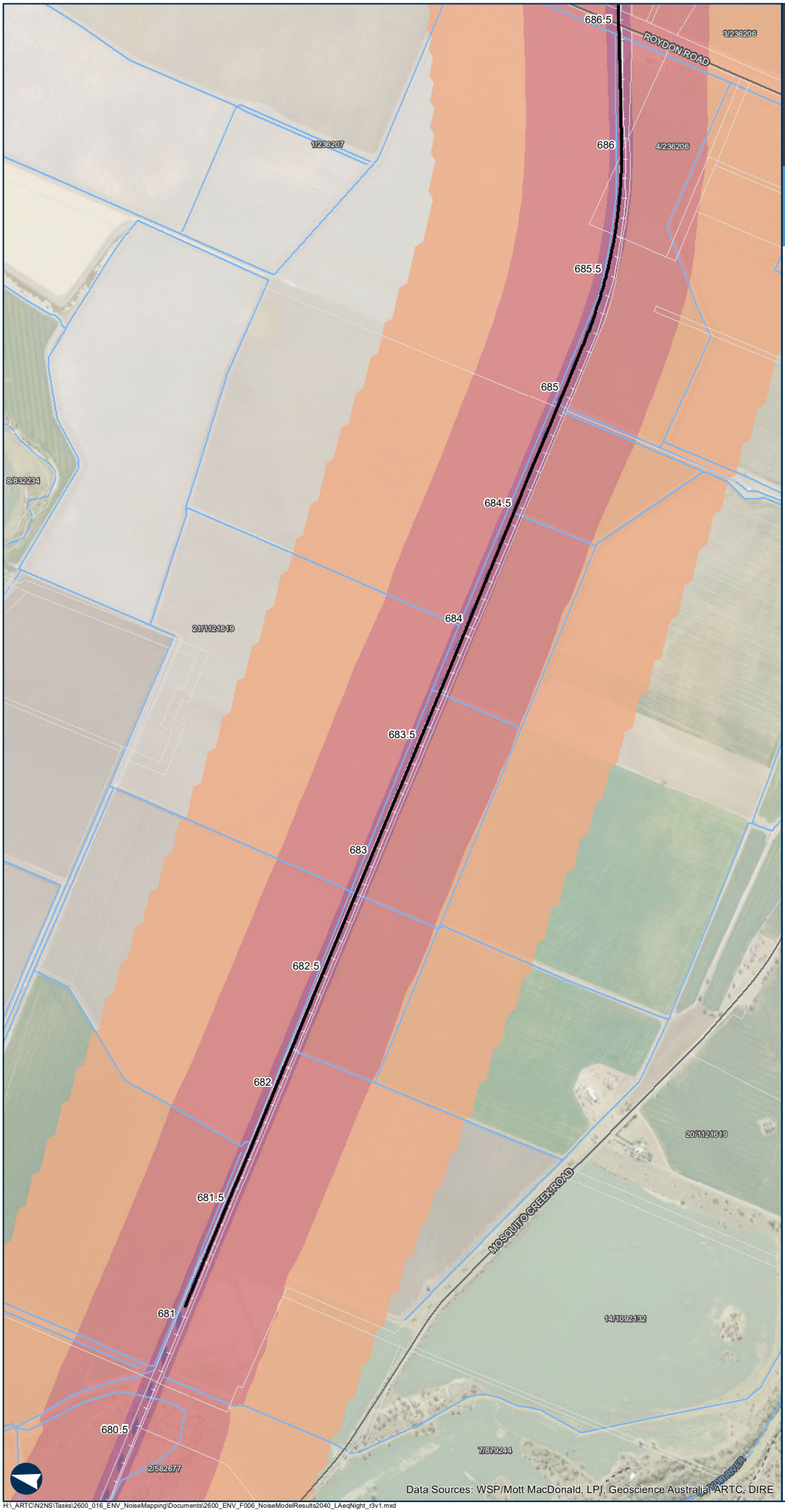
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 18 of 31

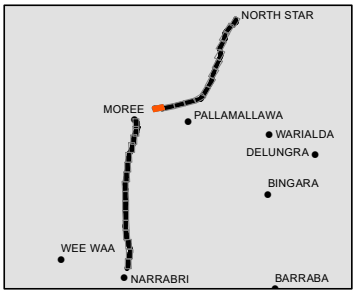
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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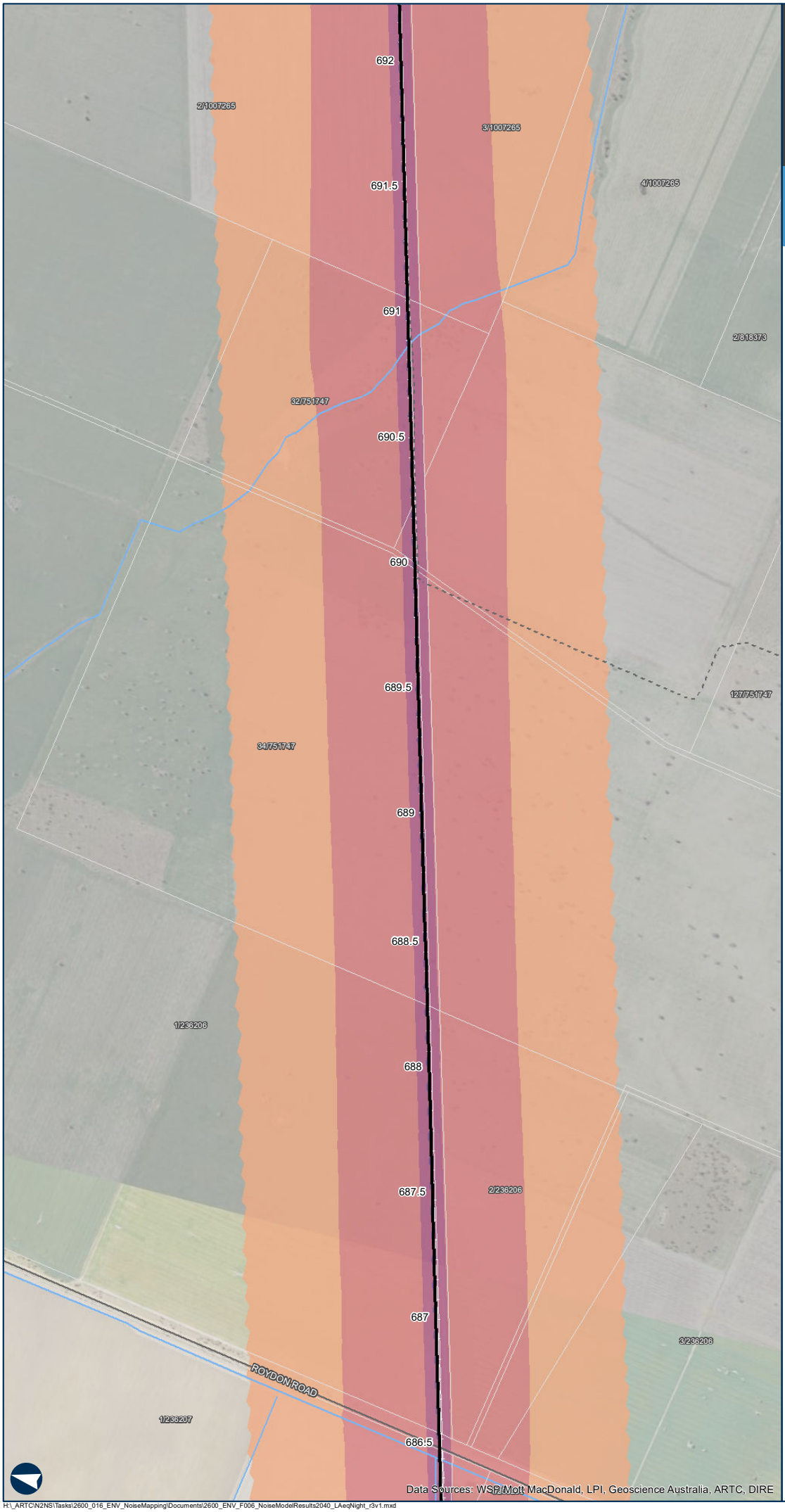
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

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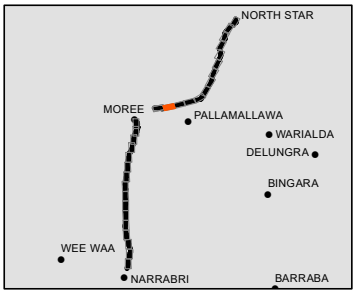
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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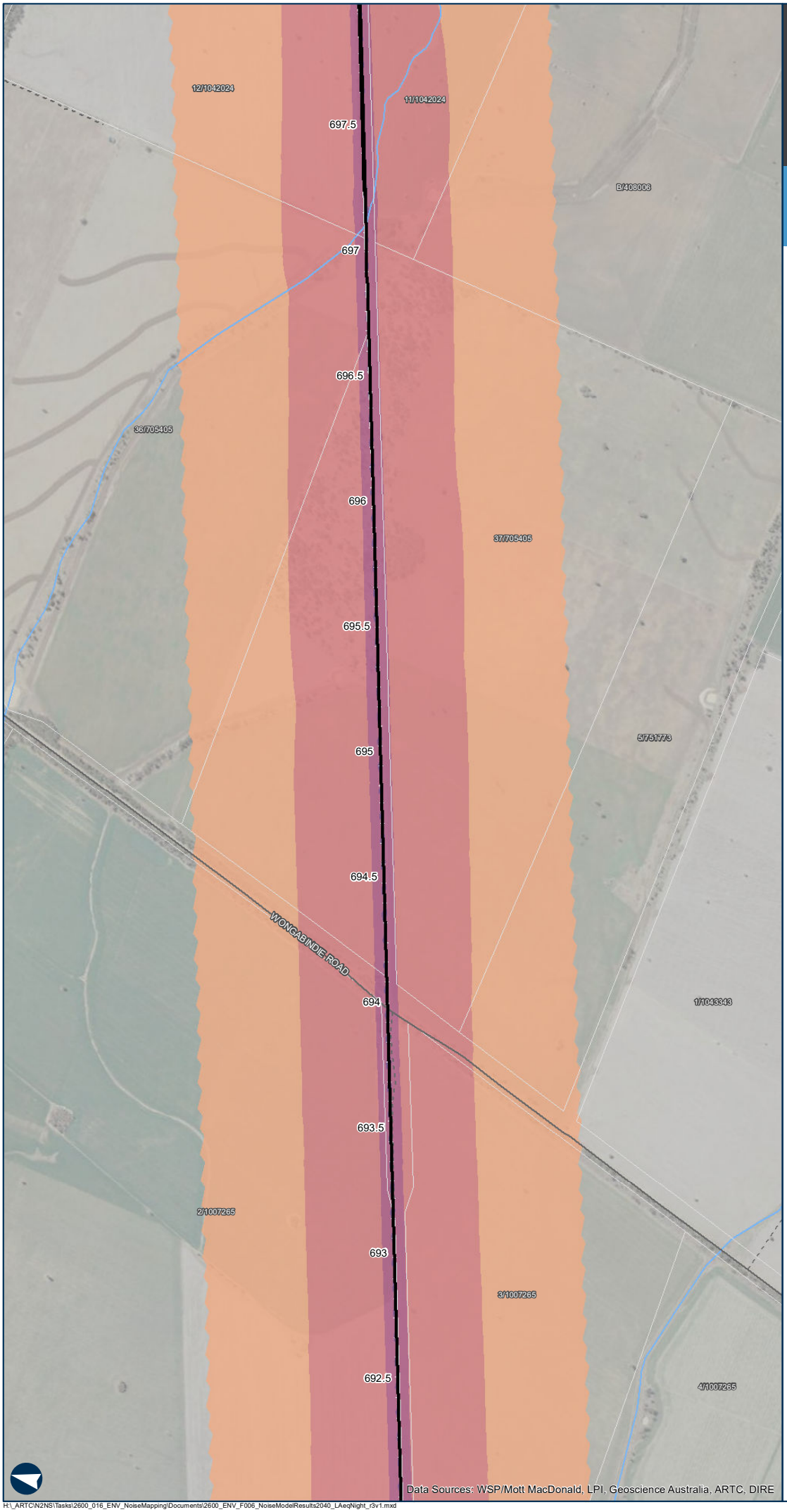
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 20 of 31

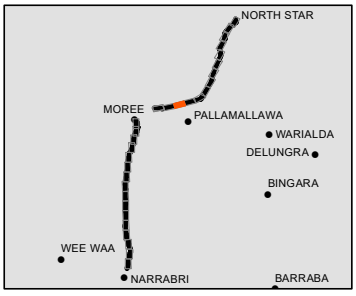
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 21 of 31

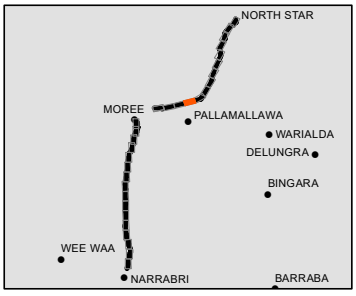
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
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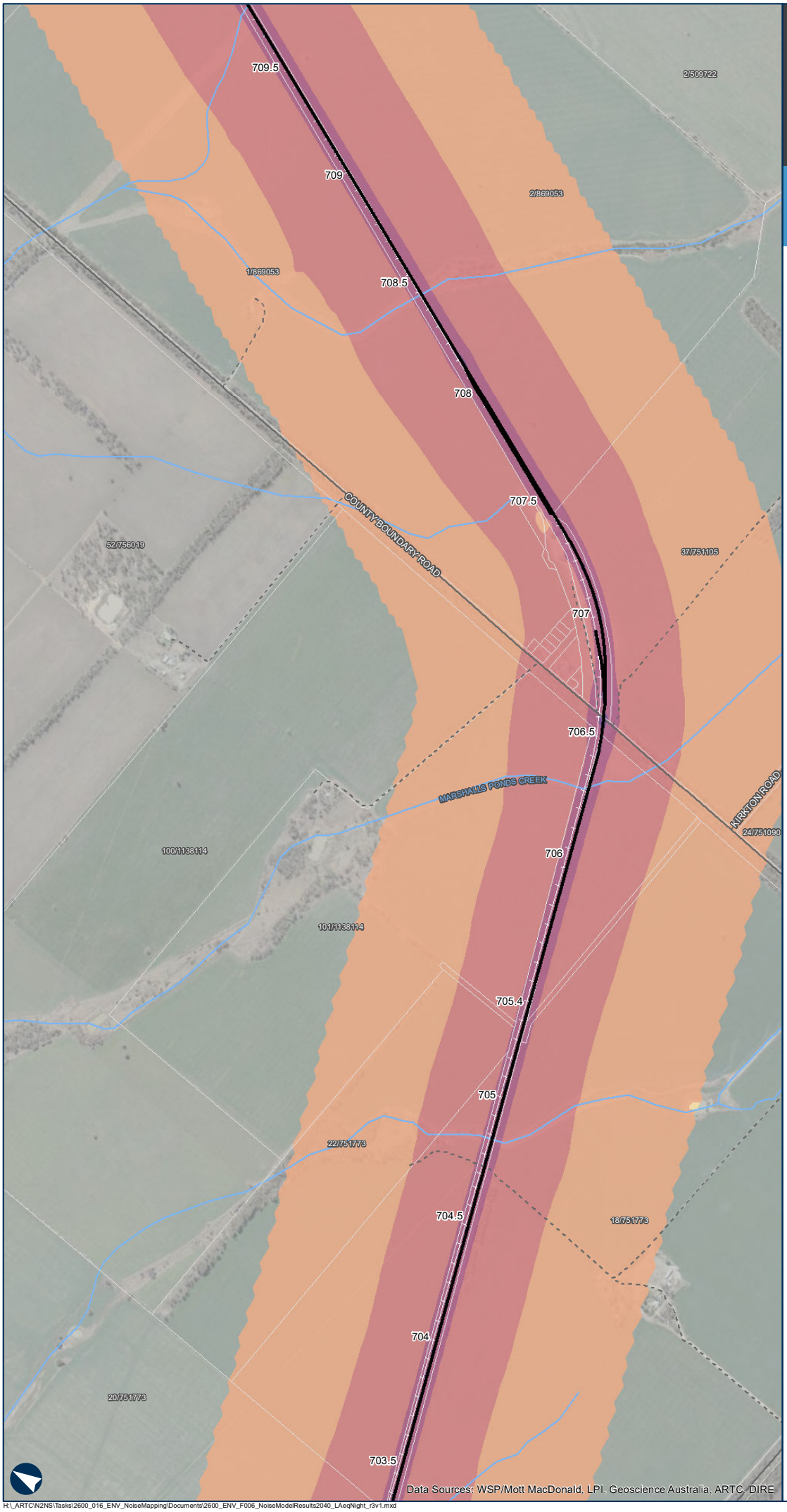
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 22 of 31

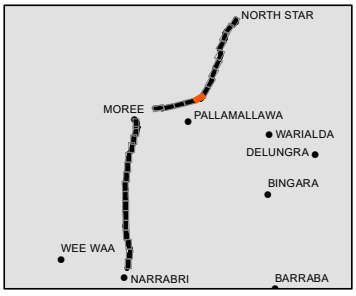
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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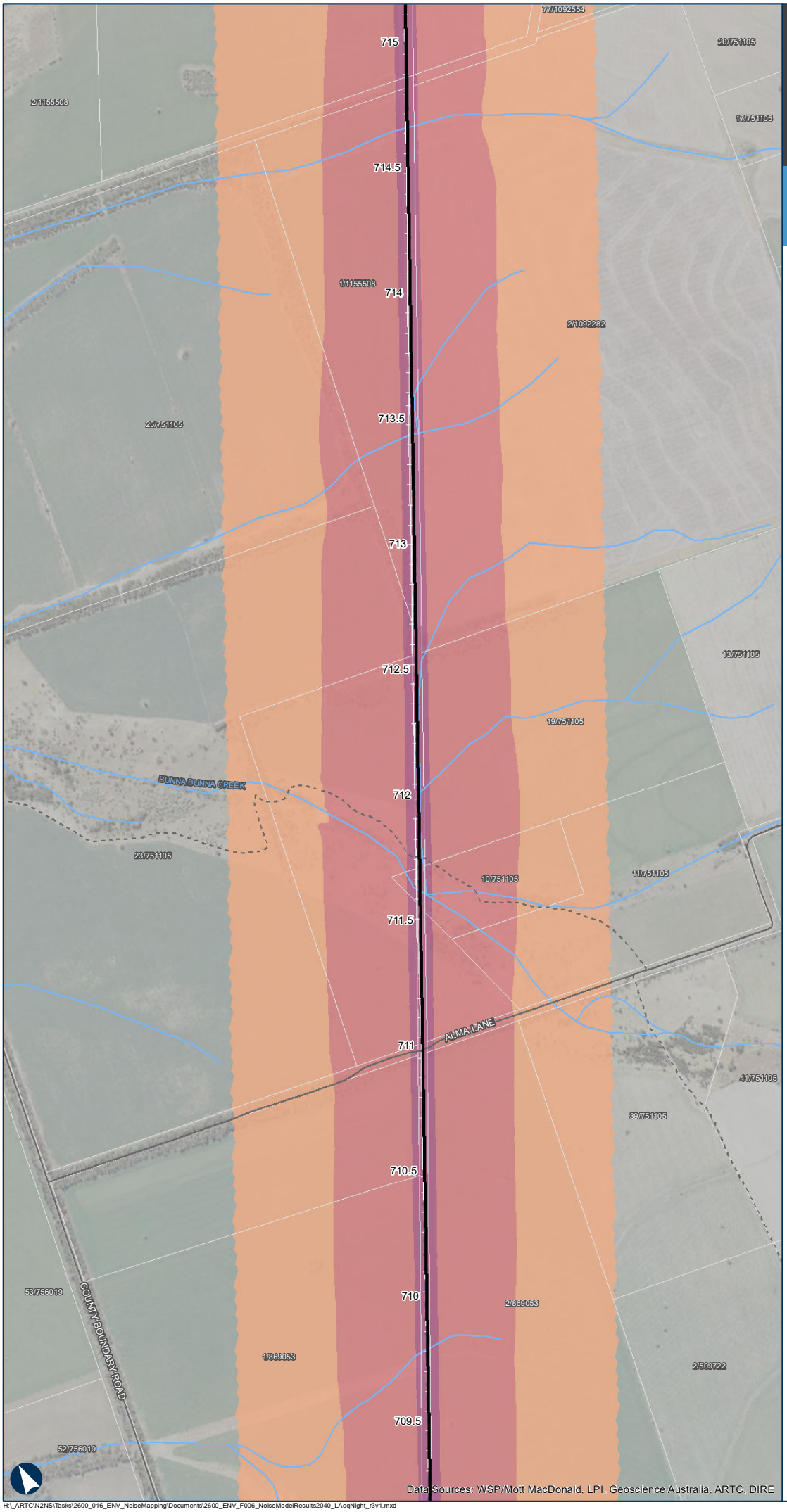
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

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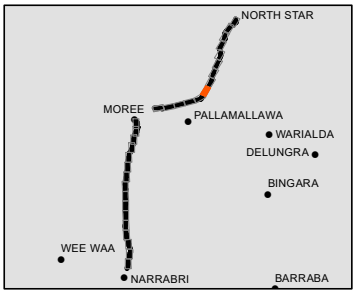
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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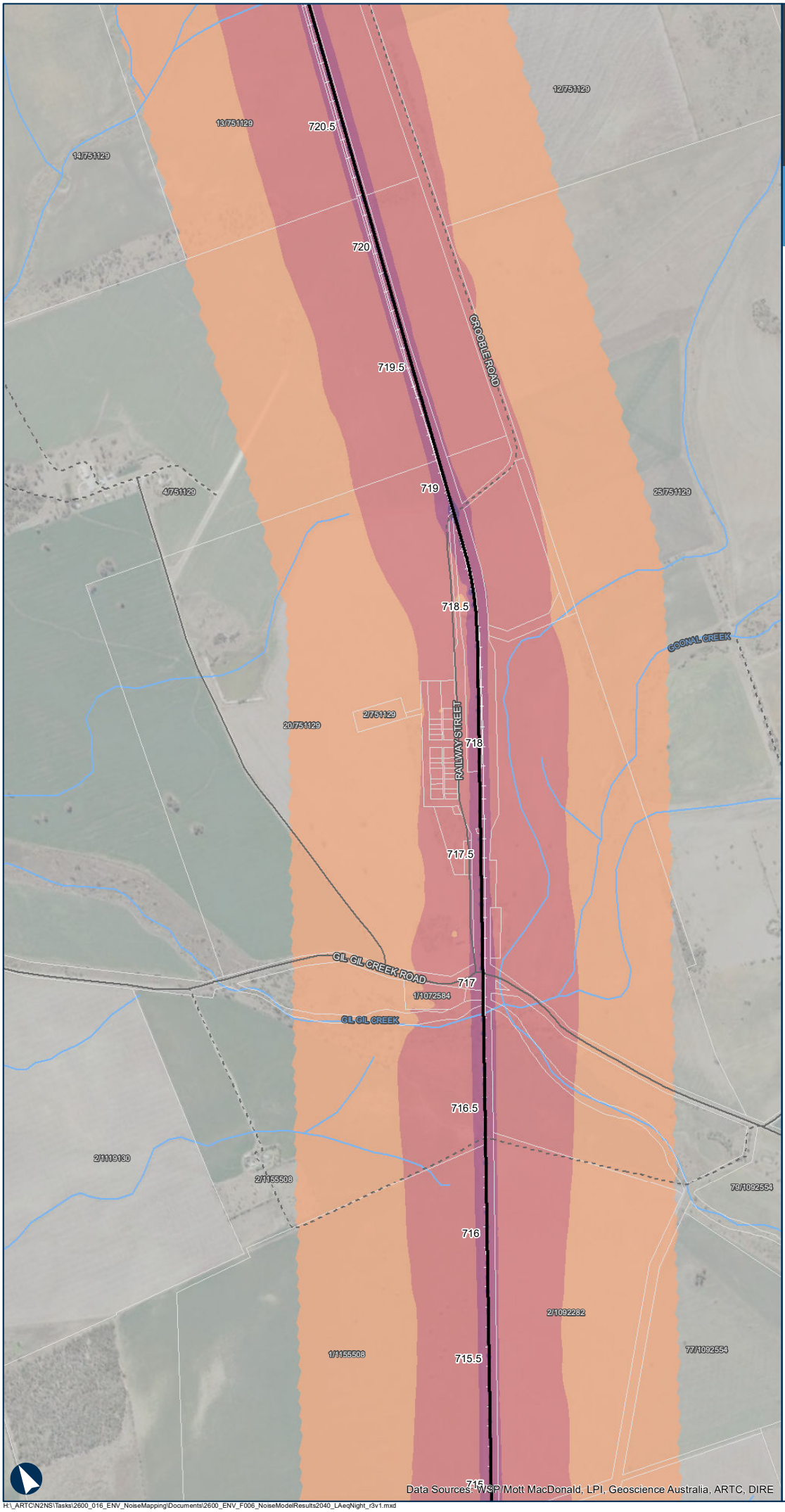
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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 24 of 31

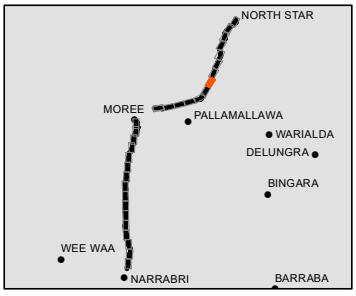
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

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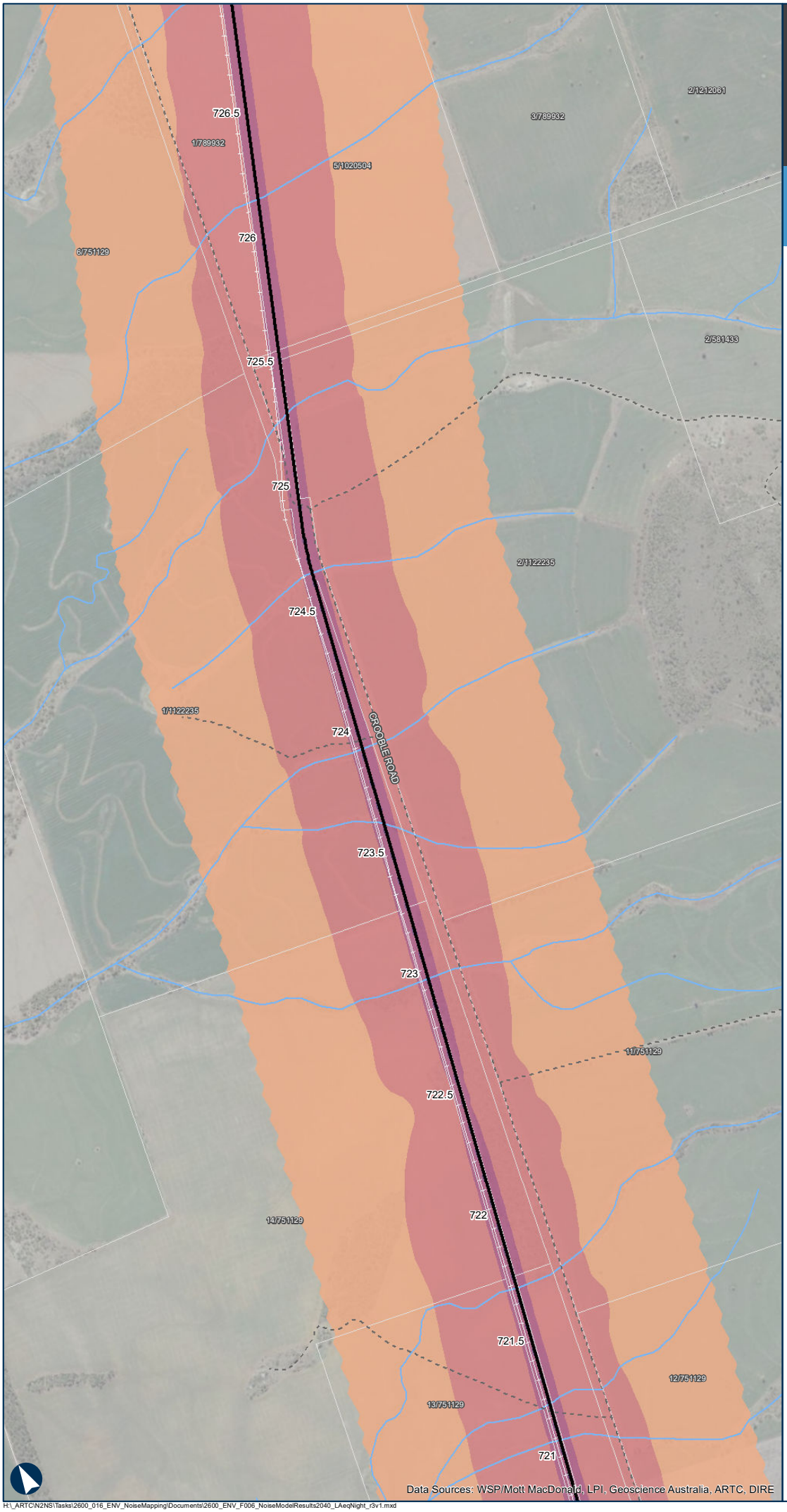
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Scale: 1:15,000

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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 25 of 31

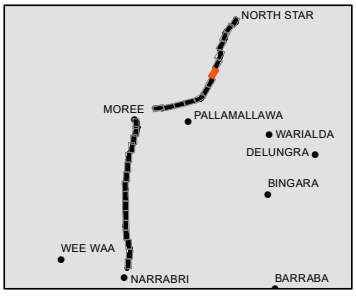
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 26 of 31

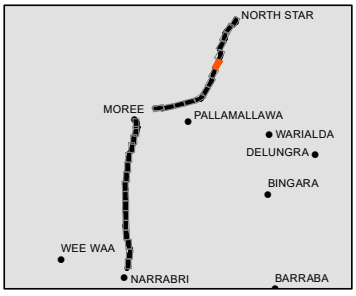
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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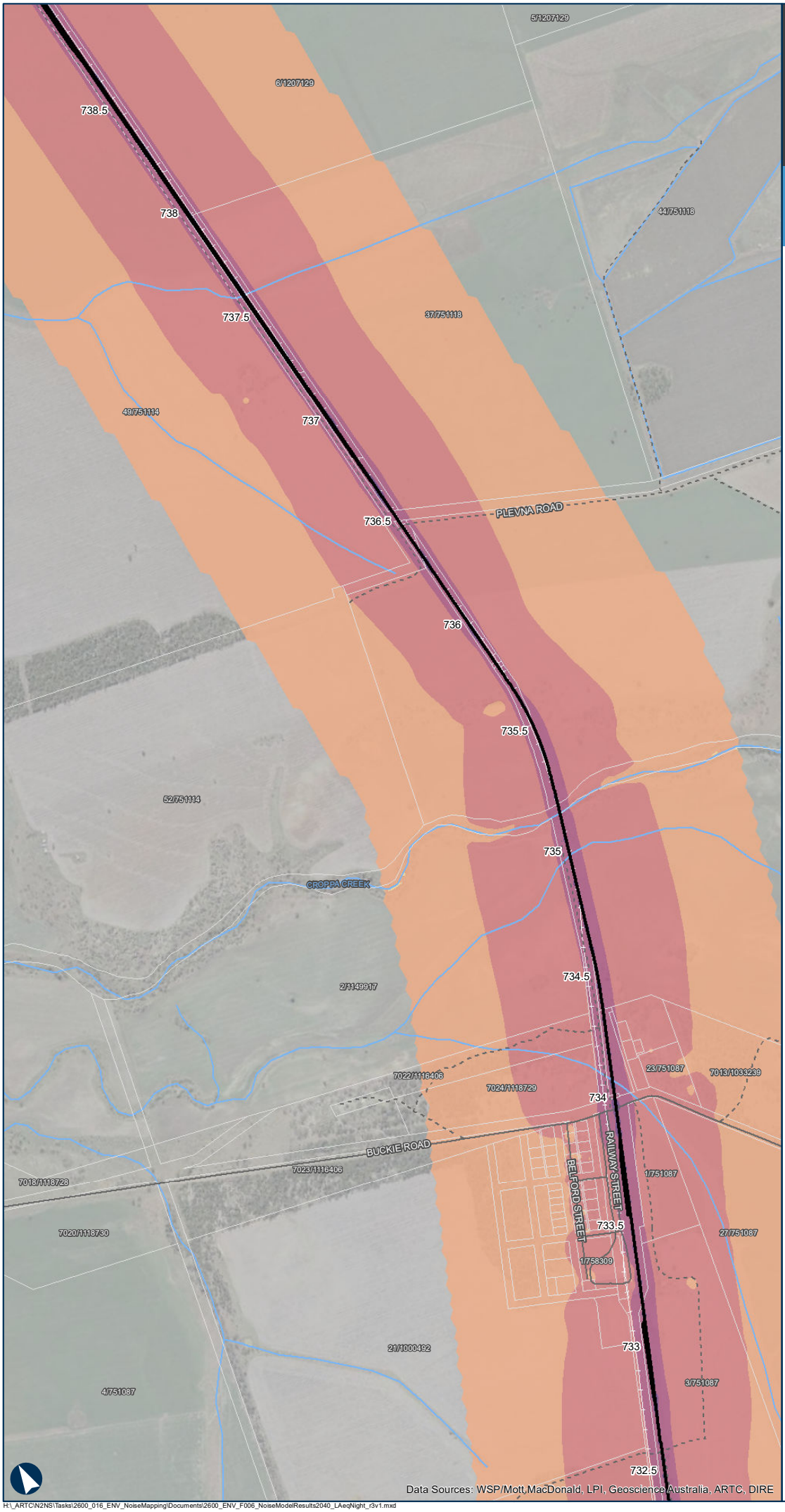
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 27 of 31

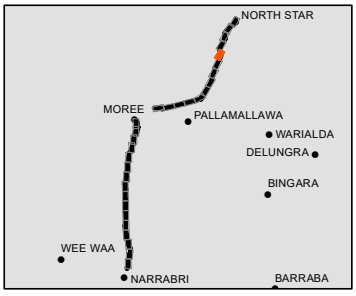
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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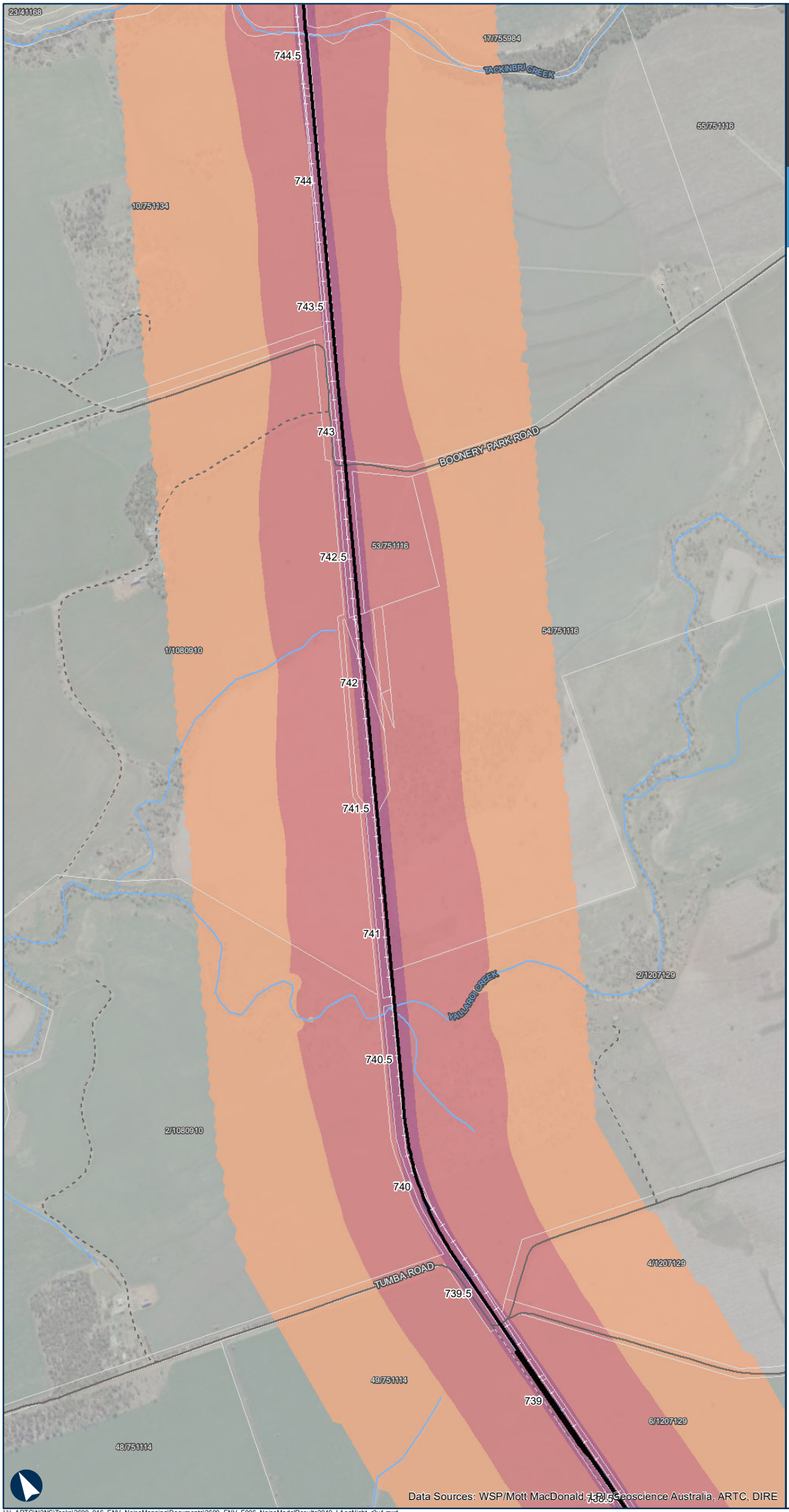
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 28 of 31

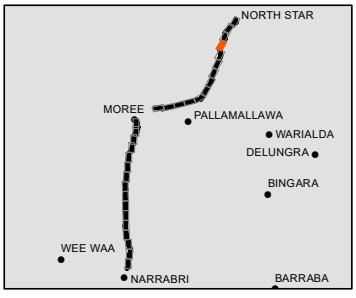
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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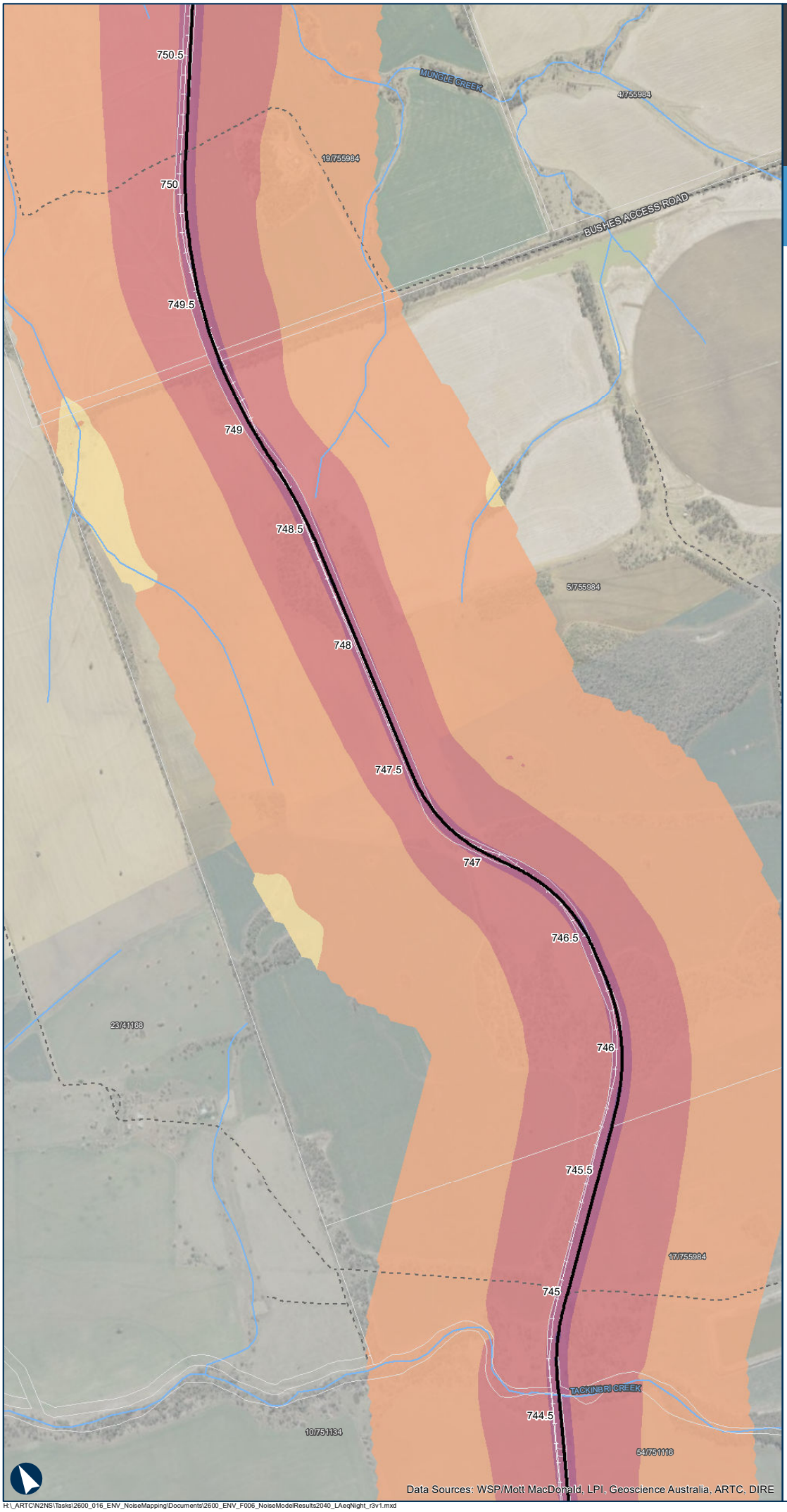
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 29 of 31

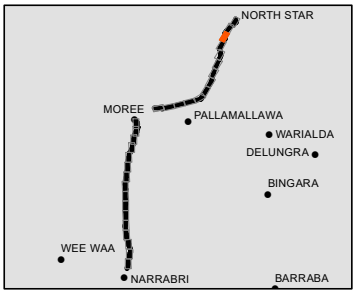
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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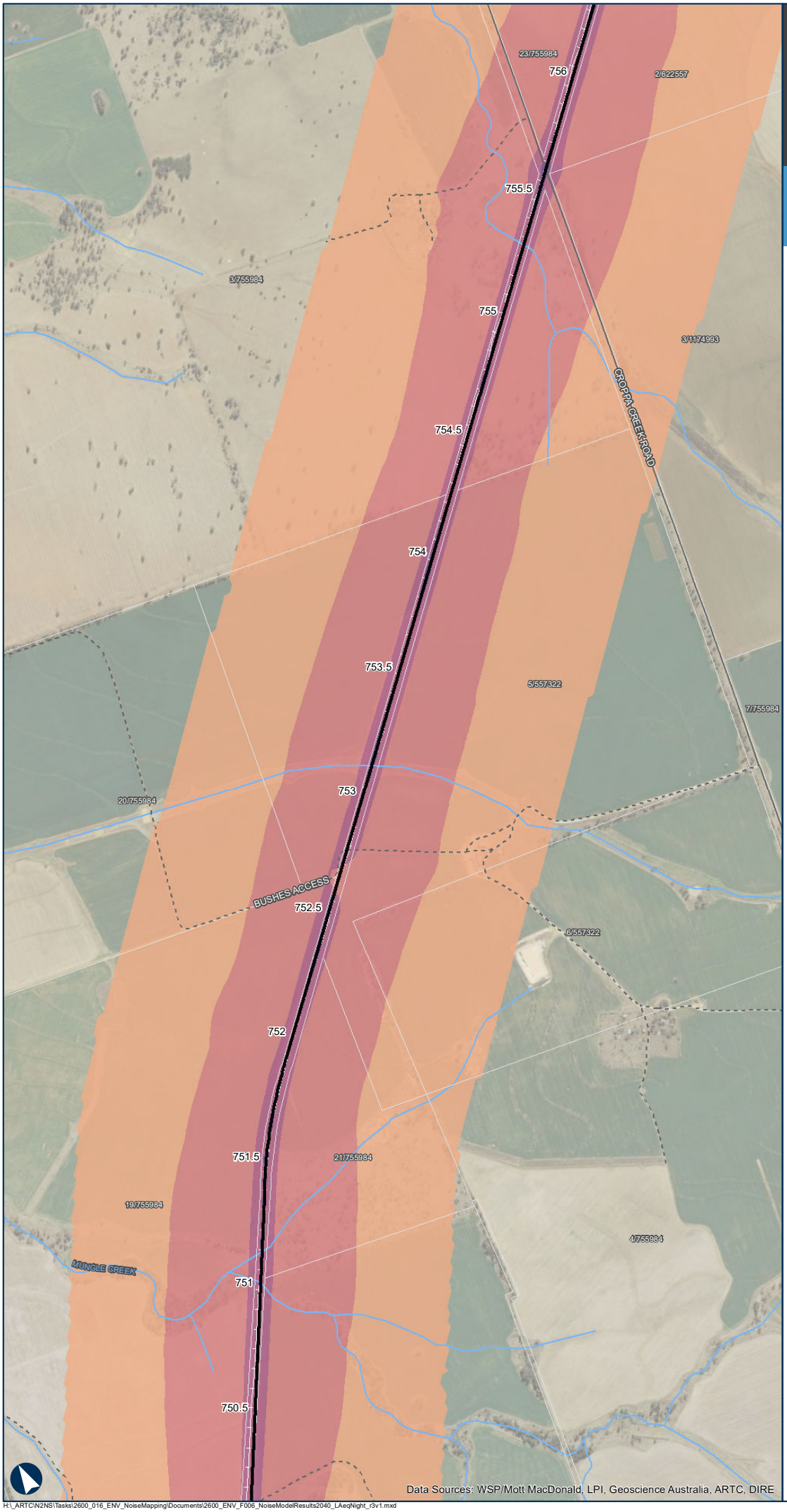
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 30 of 31

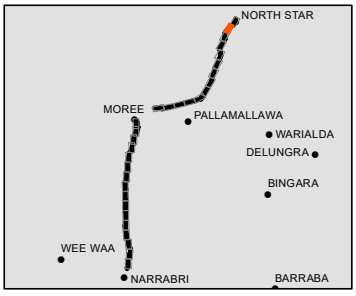
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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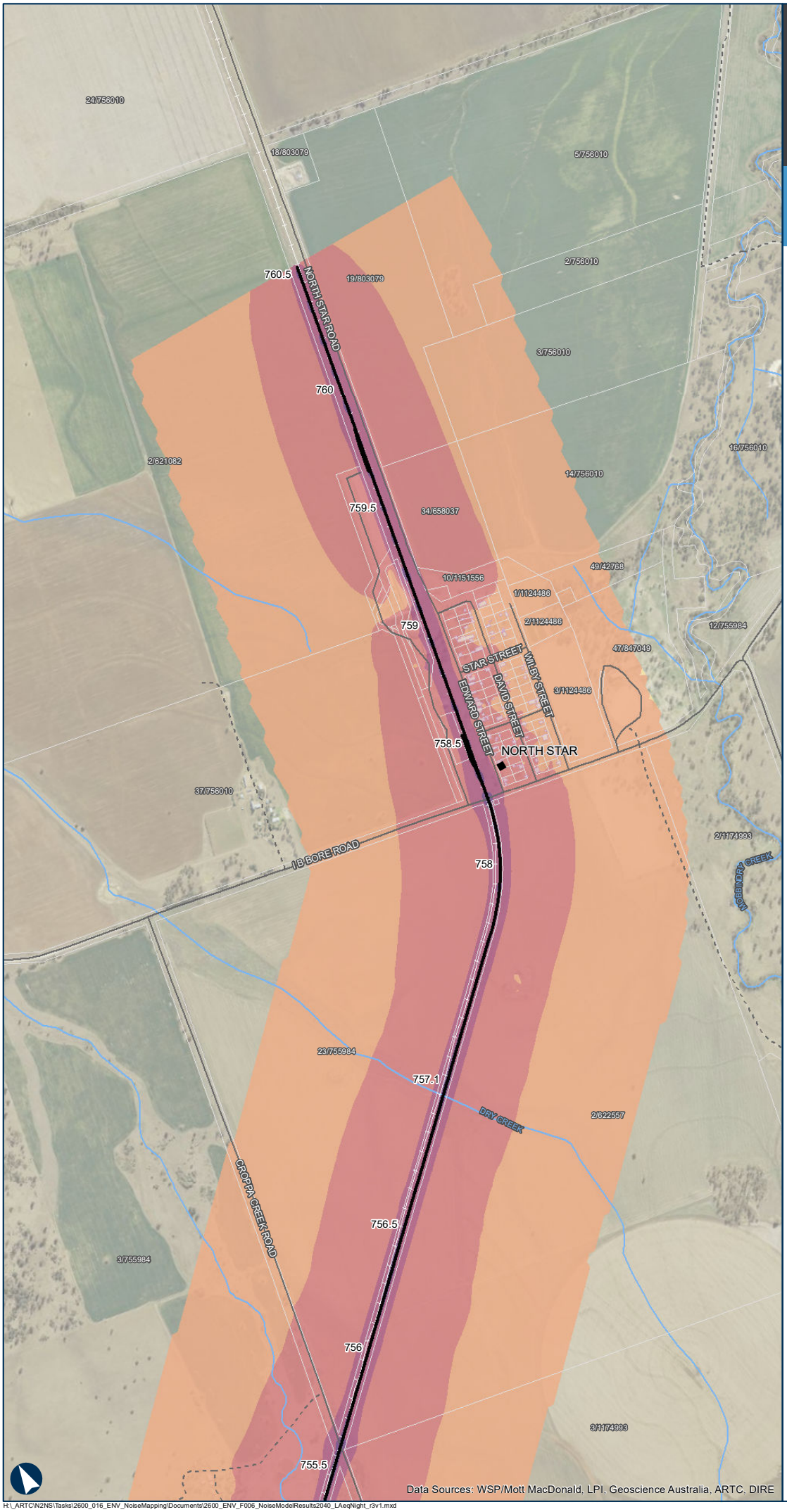
Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAeq Night without mitigation

Sheet 31 of 31

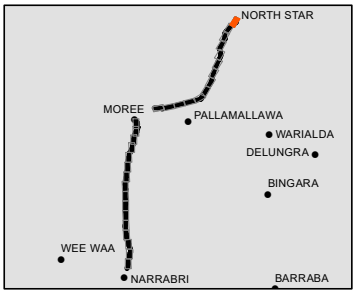
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- 35 - 40
- 45 - 50
- 55 - 60
- 65 - 70
- >75

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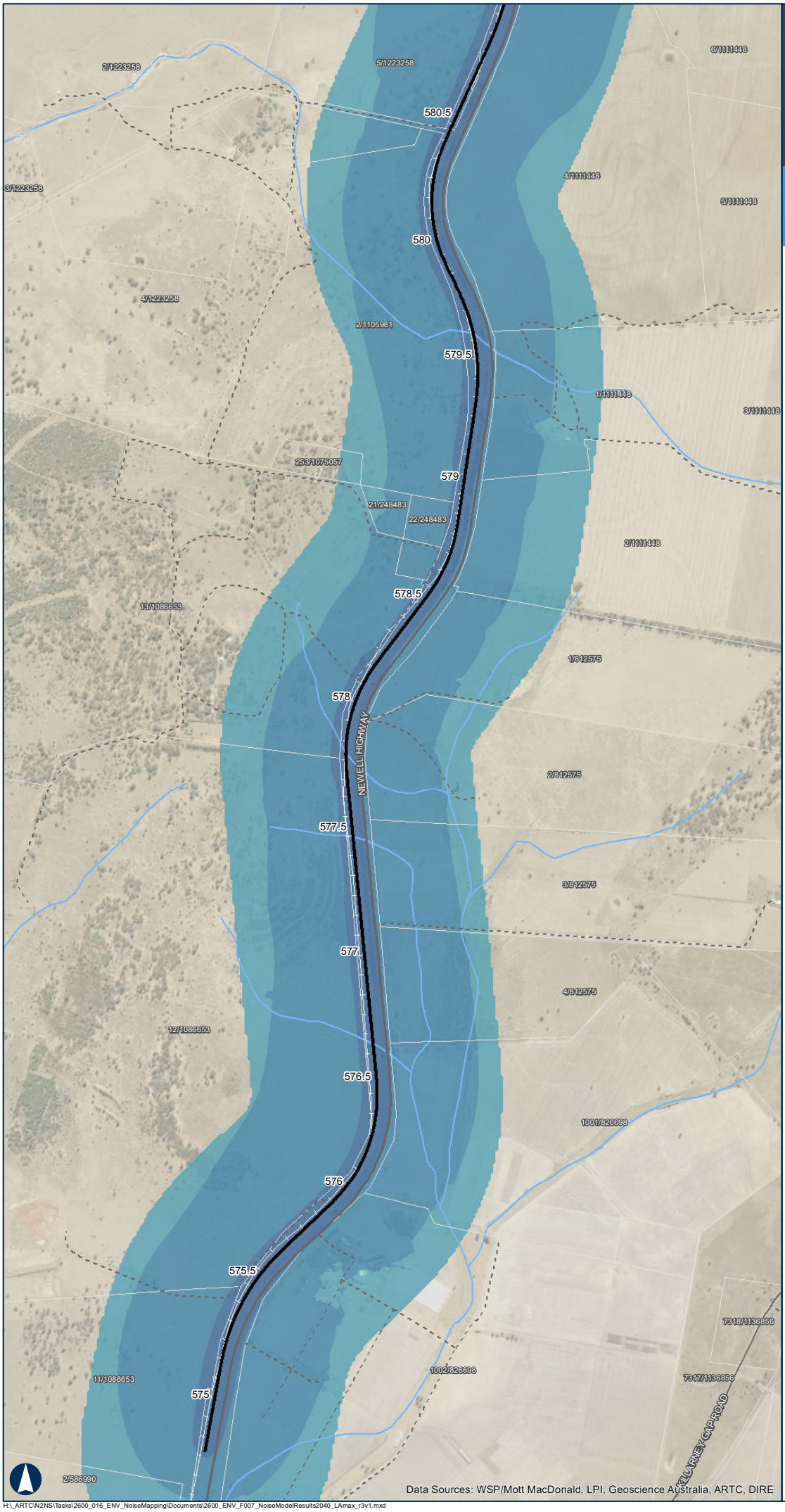
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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 1 of 31

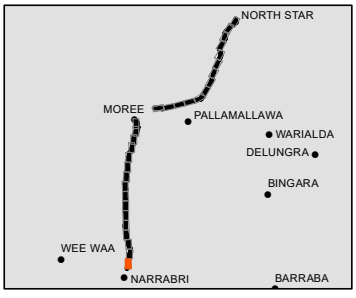
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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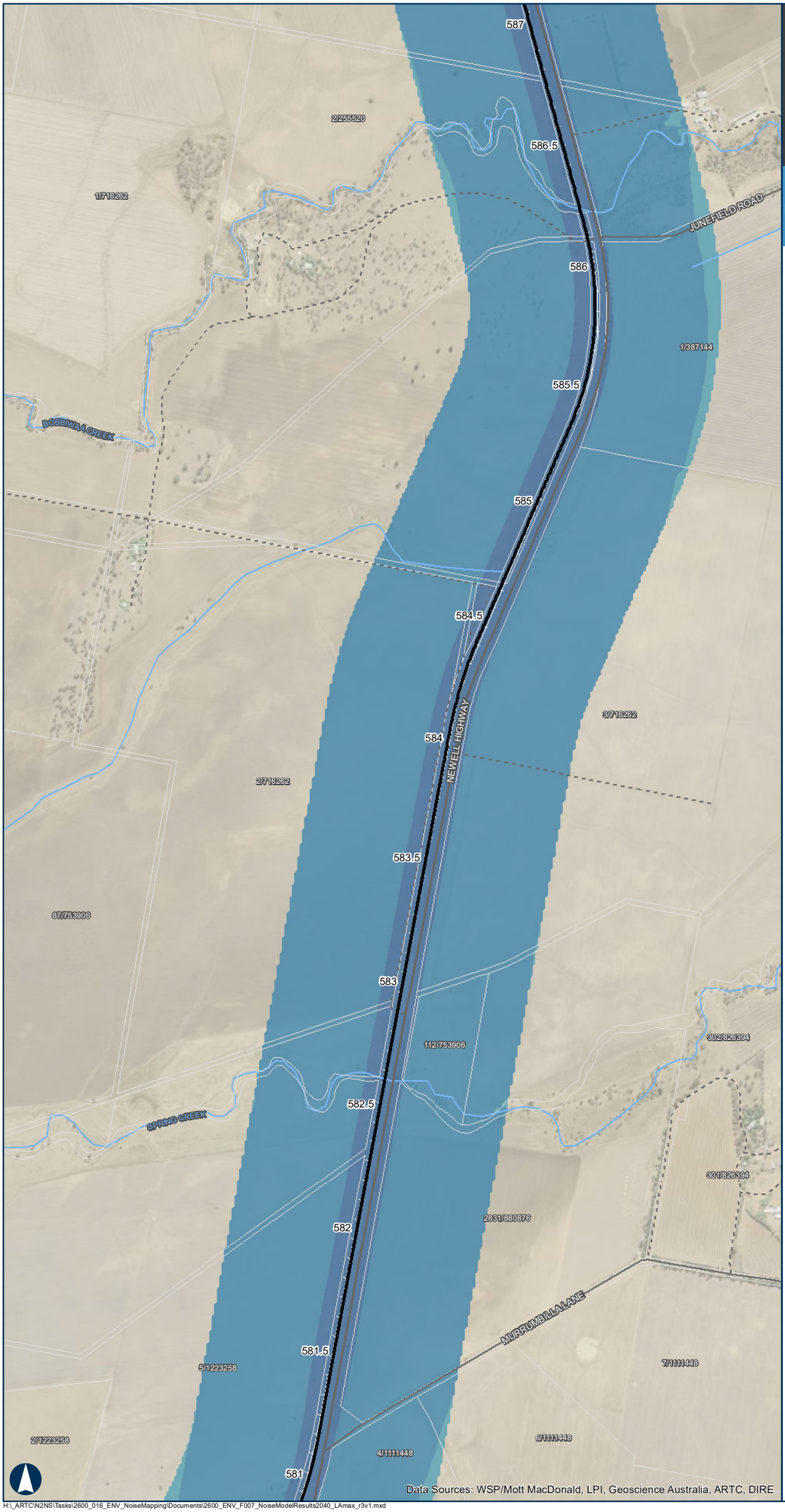
Paper: A3

Scale: 1:15,000

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Author: IRDJV

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 2 of 31

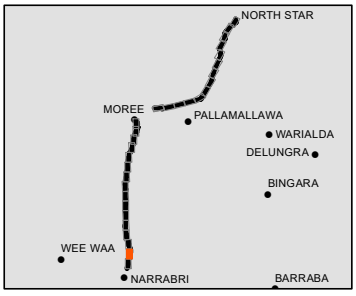
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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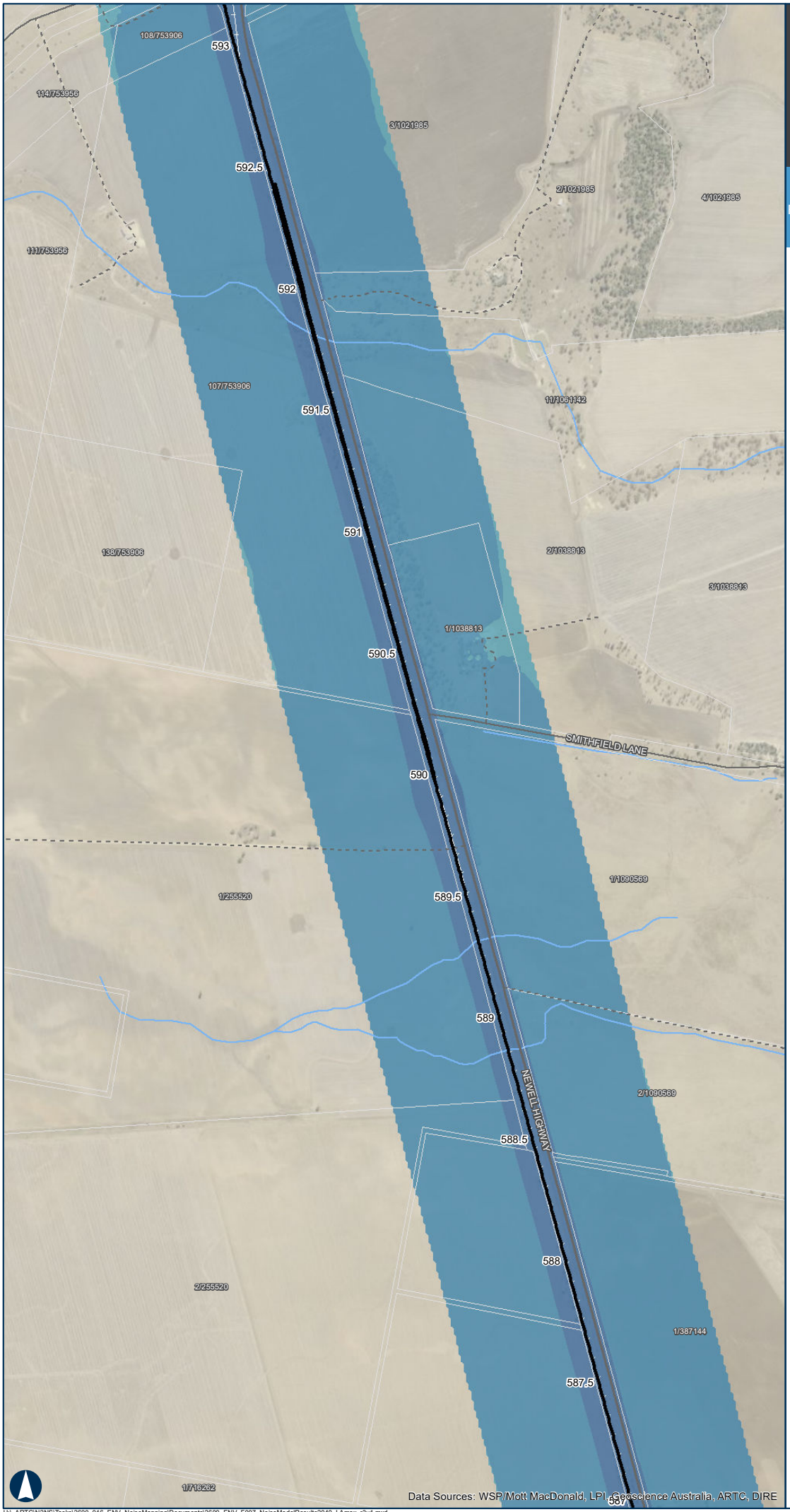
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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 3 of 31

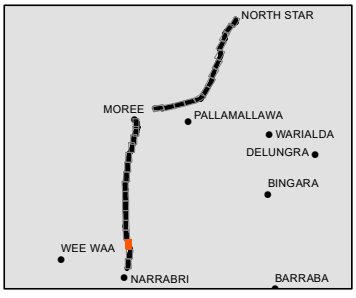
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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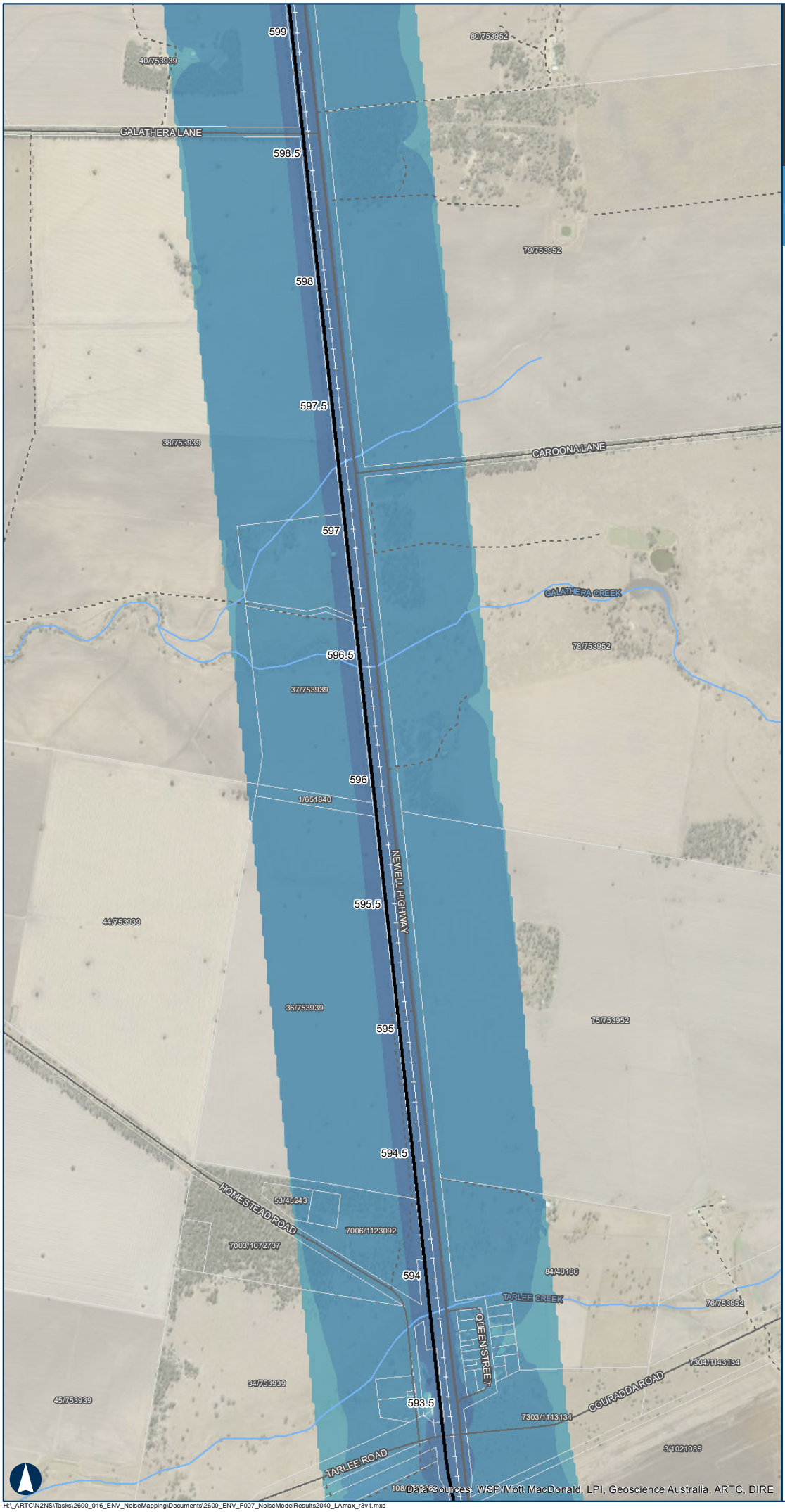
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 4 of 31

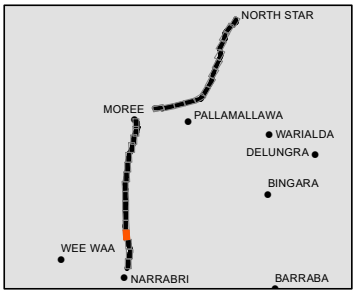
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 5 of 31

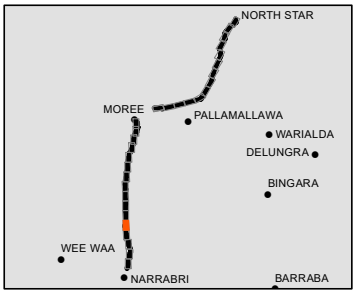
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
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0.75 Km

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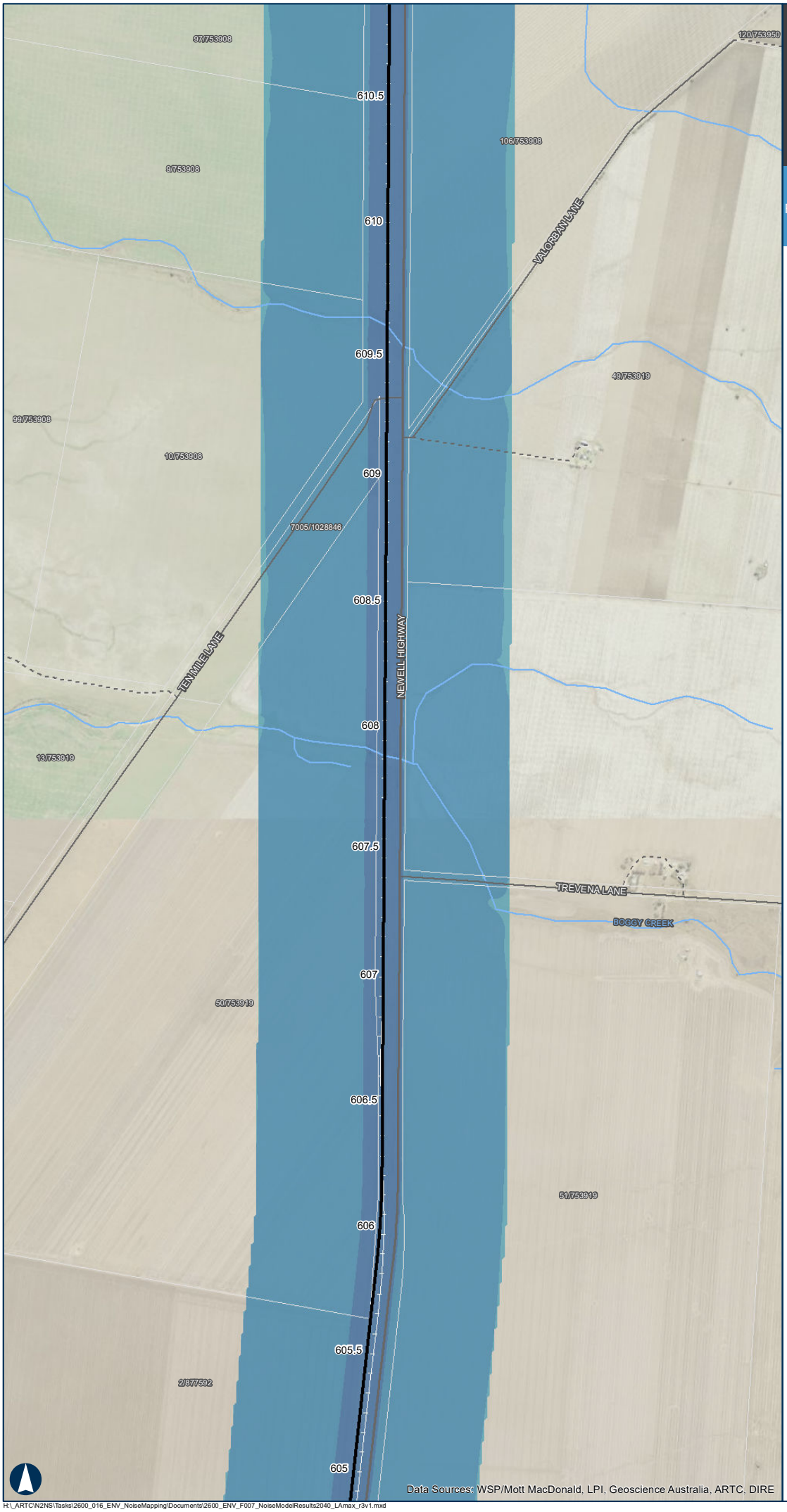
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Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 6 of 31

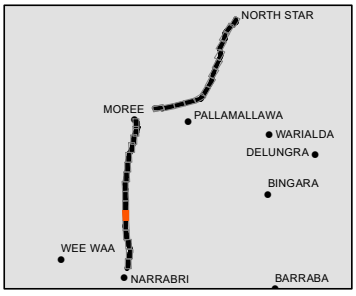
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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0.75 Km

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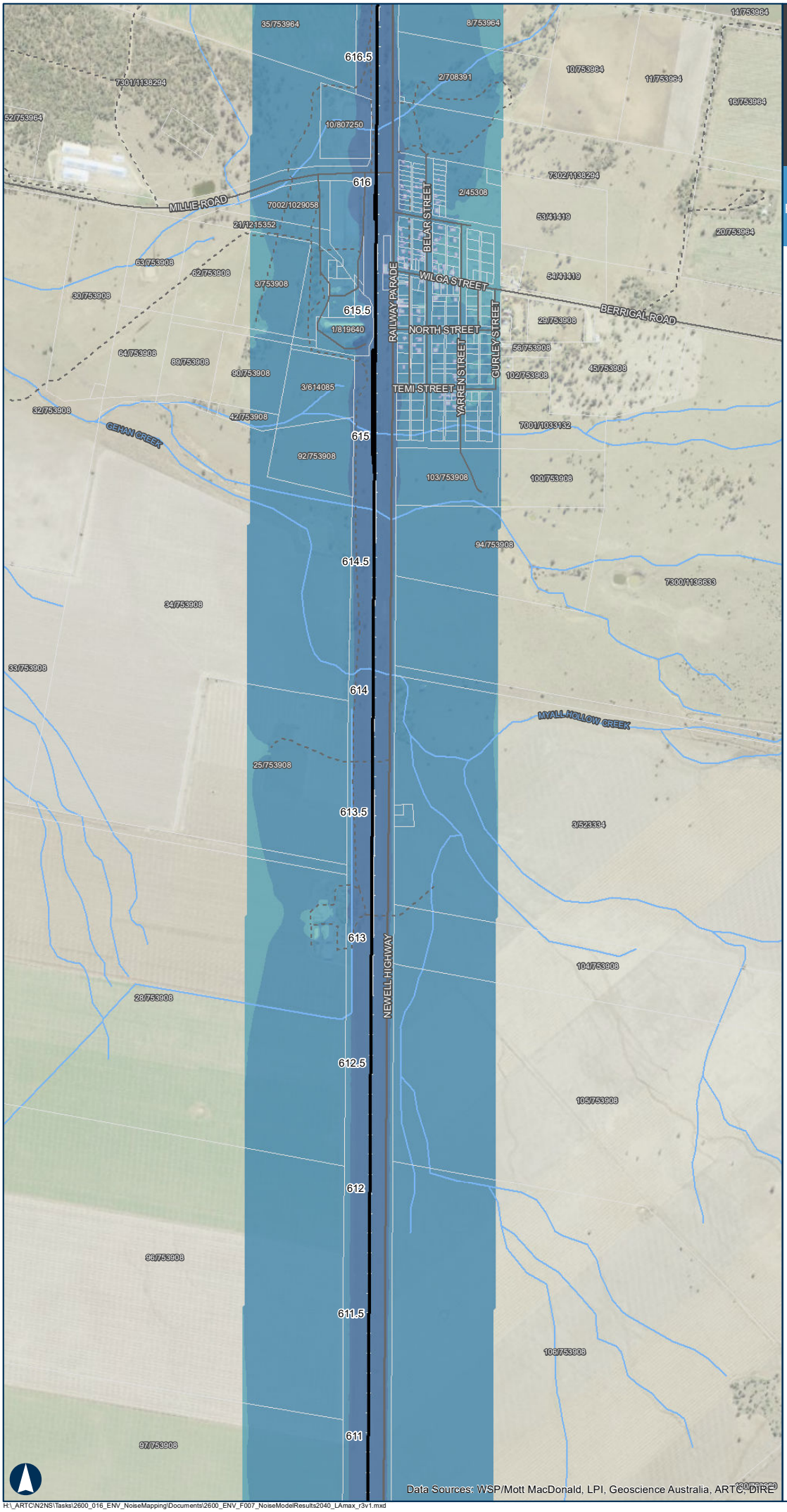
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 7 of 31

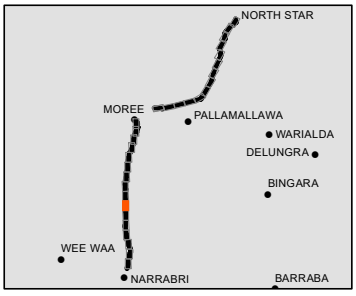
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- <50
- 55 - 60
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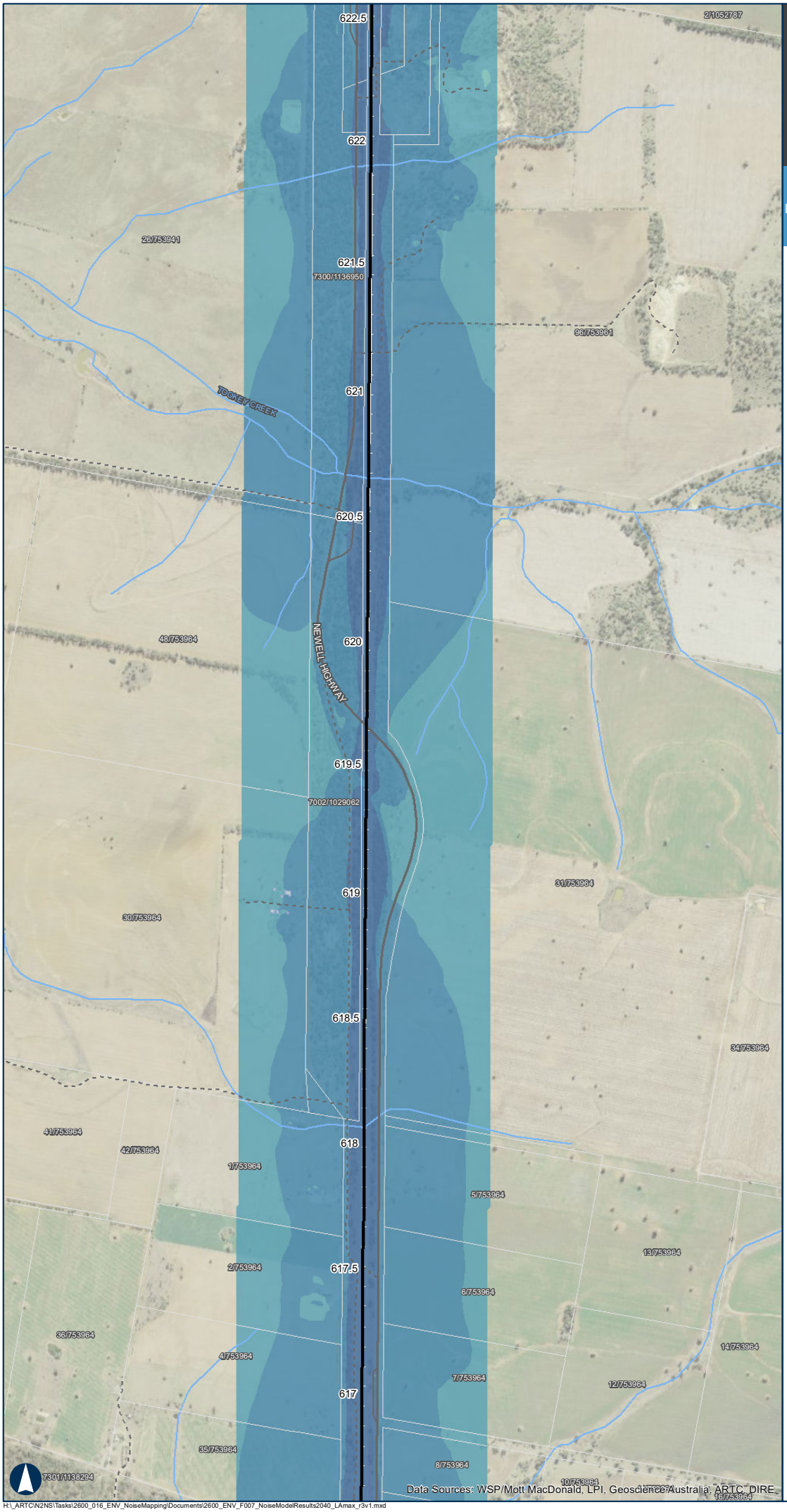
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Scale: 1:15,000

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 8 of 31

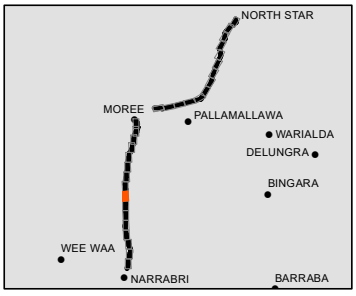
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- <50
- 55 - 60
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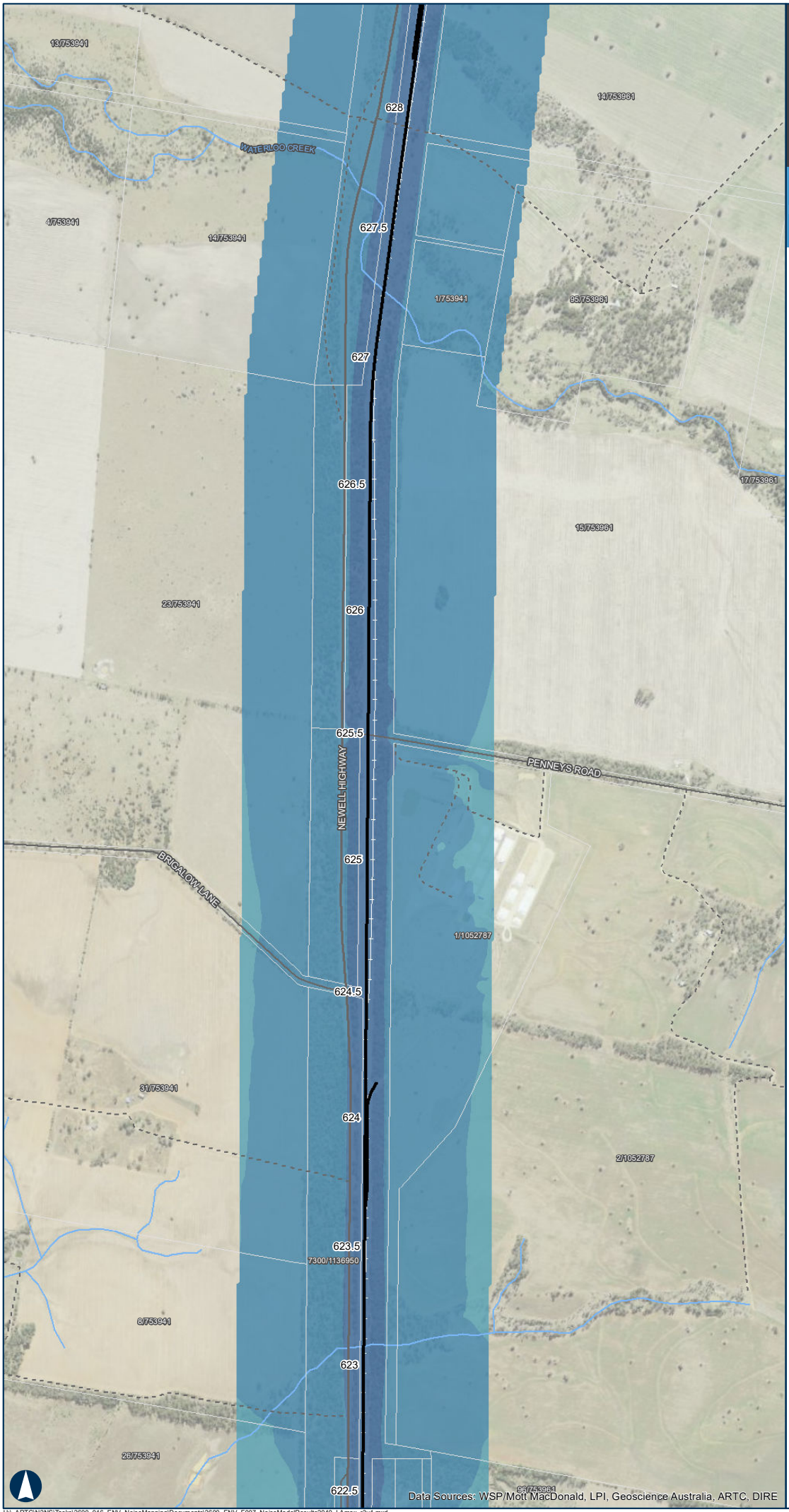
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 9 of 31

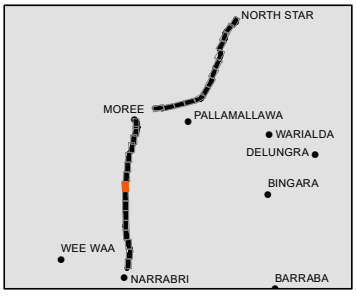
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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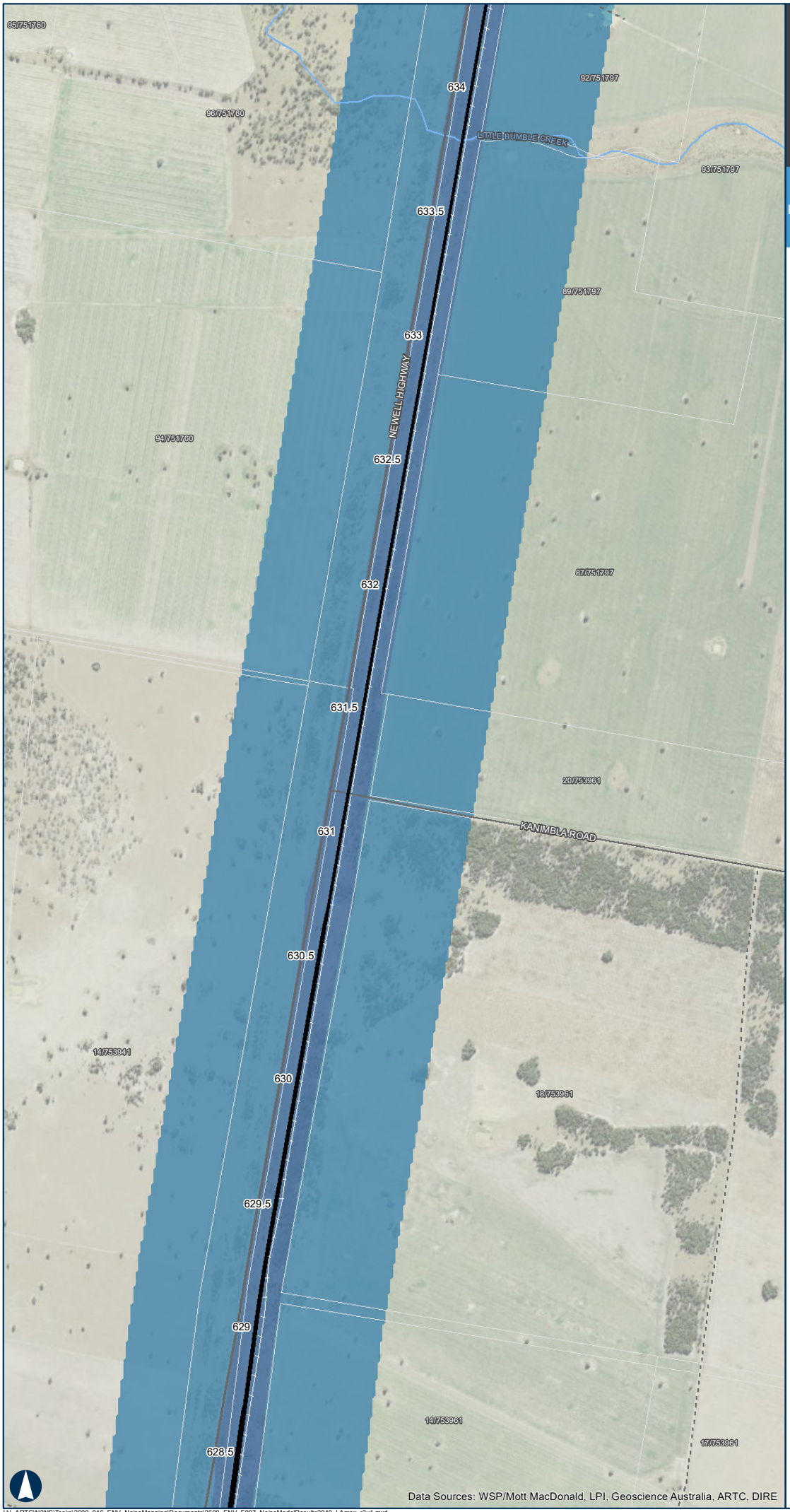
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 10 of 31

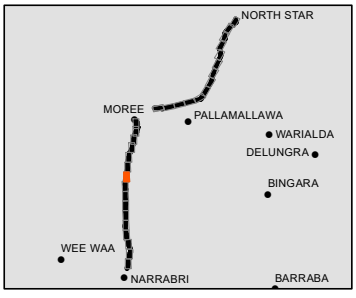
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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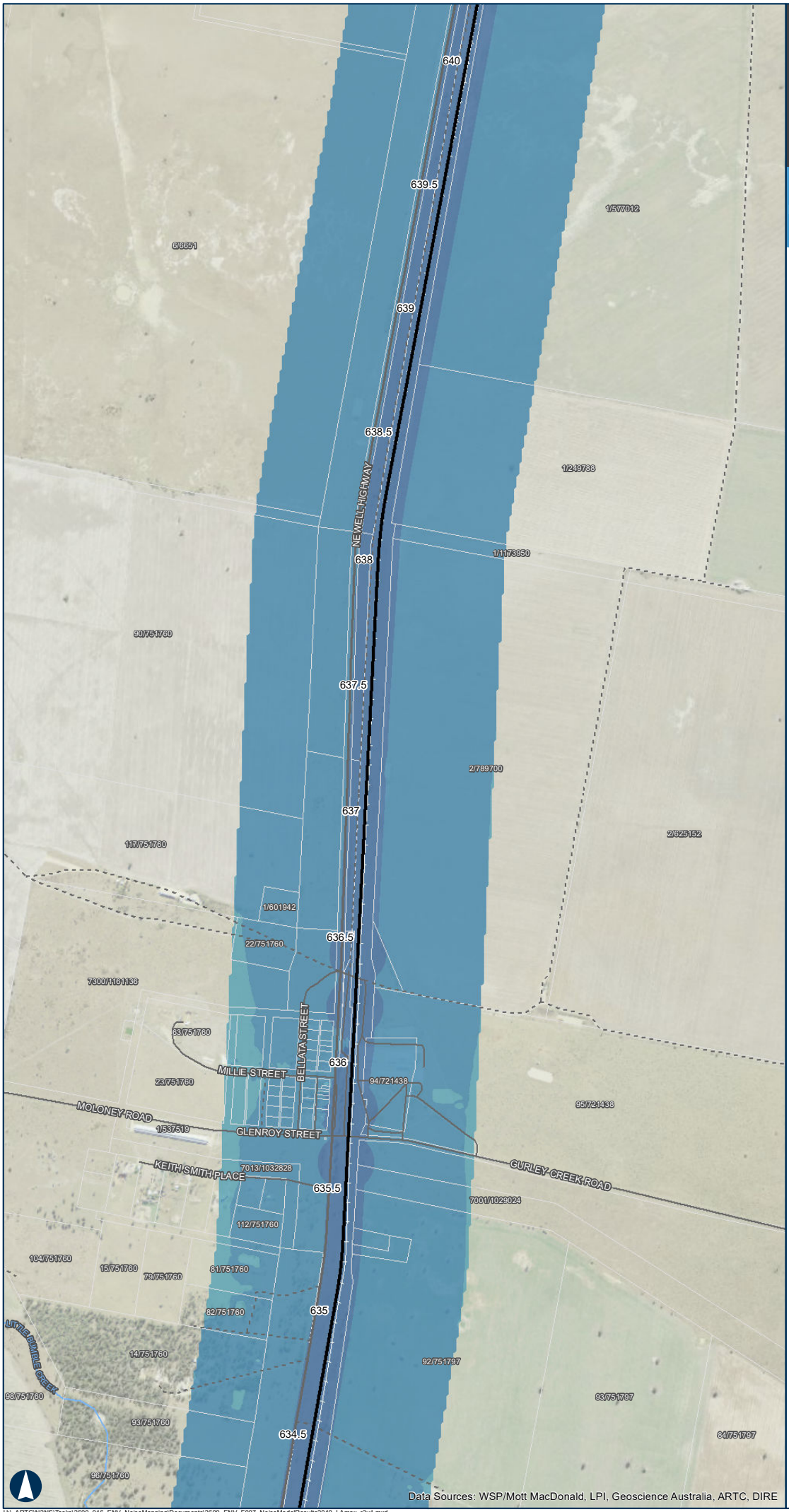
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 11 of 31

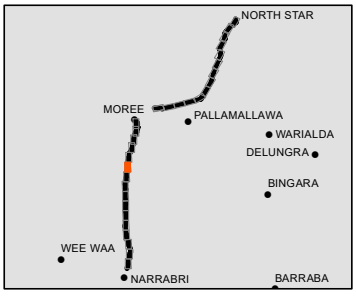
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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- 55 - 60
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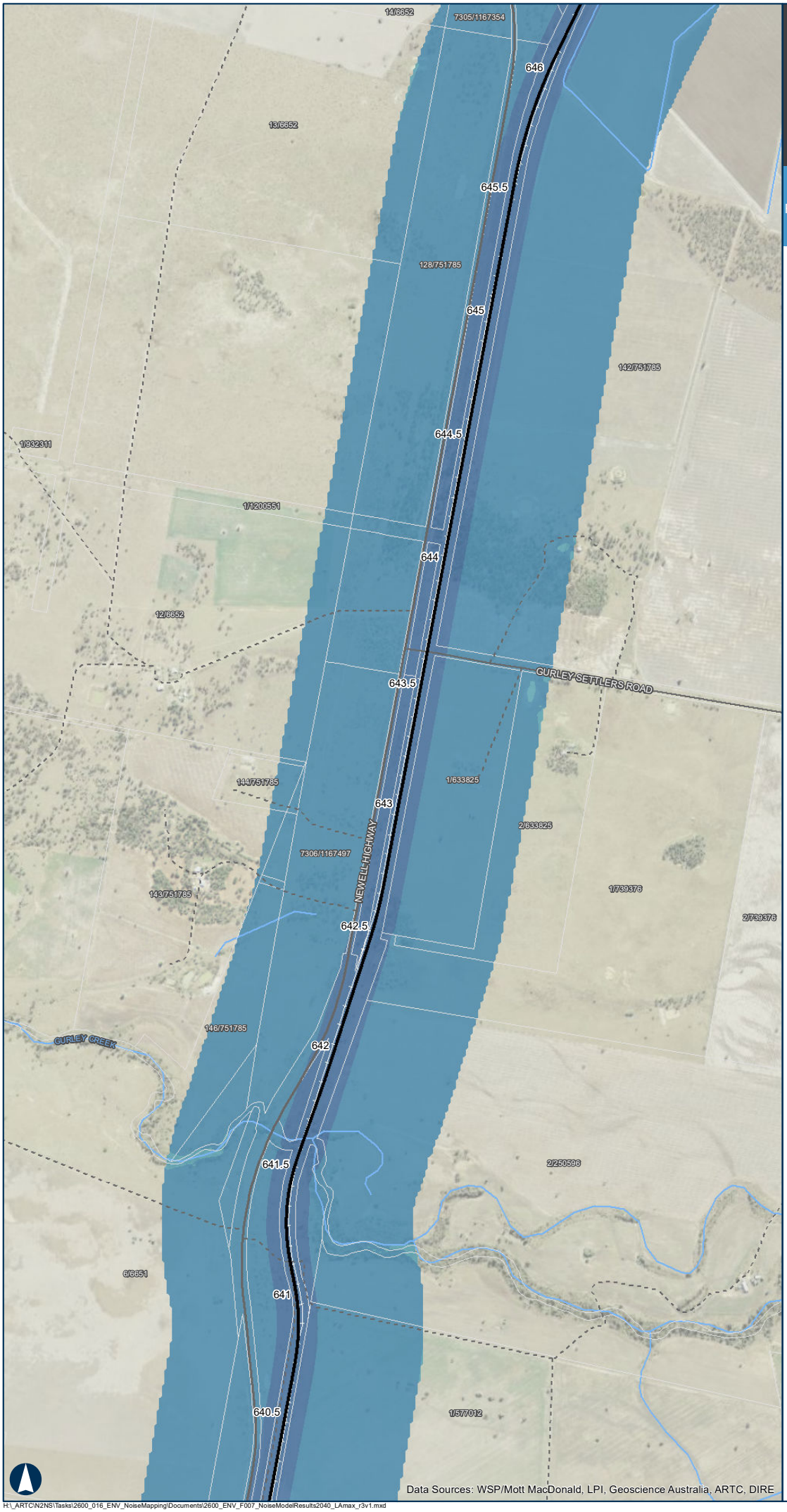
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

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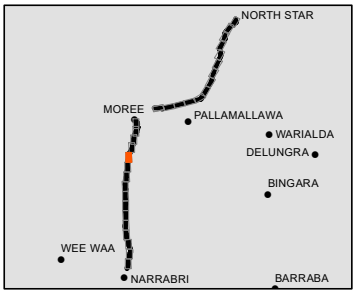
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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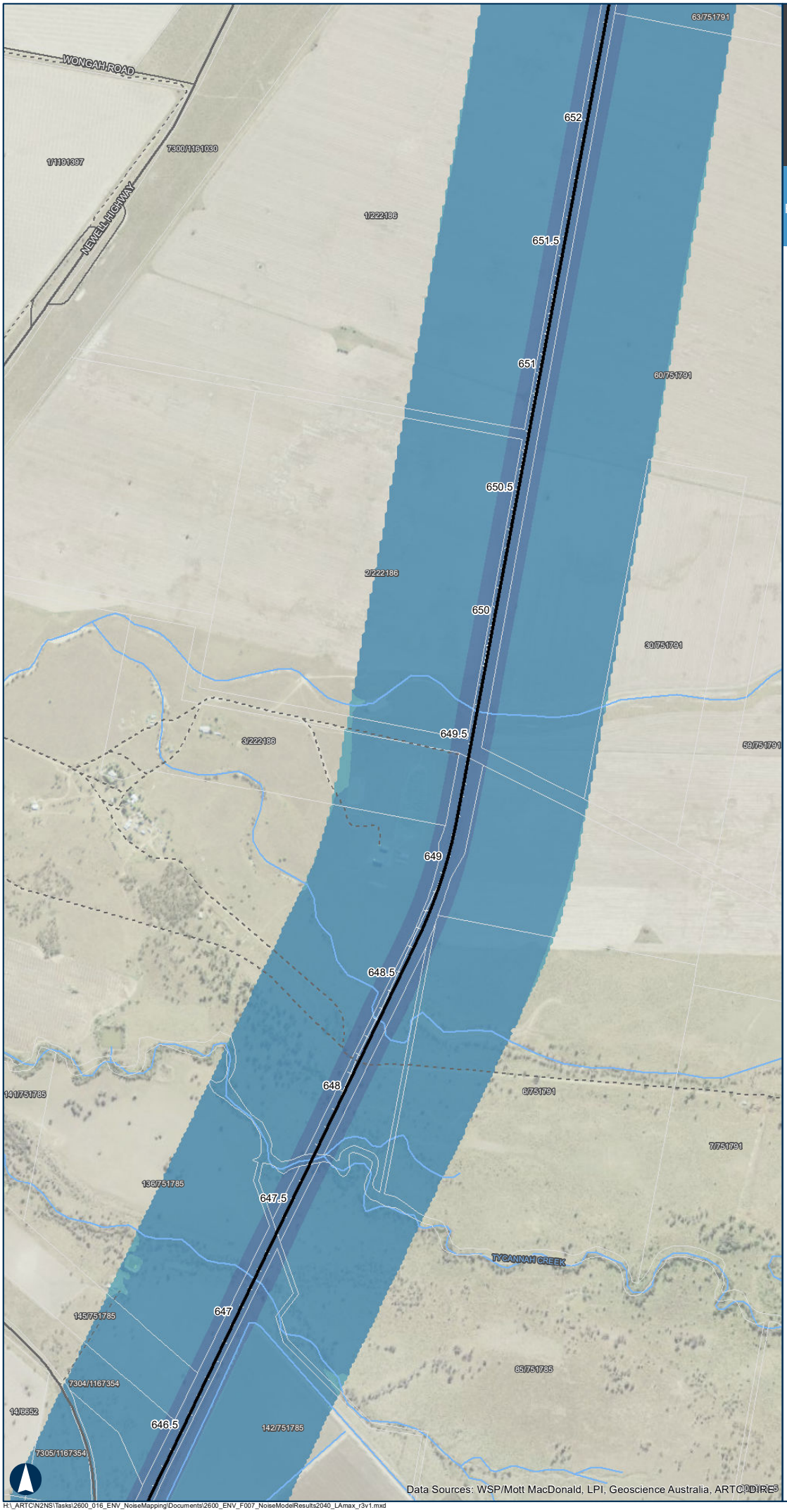
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 13 of 31

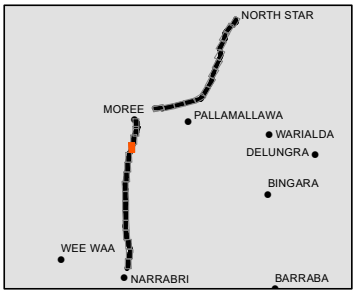
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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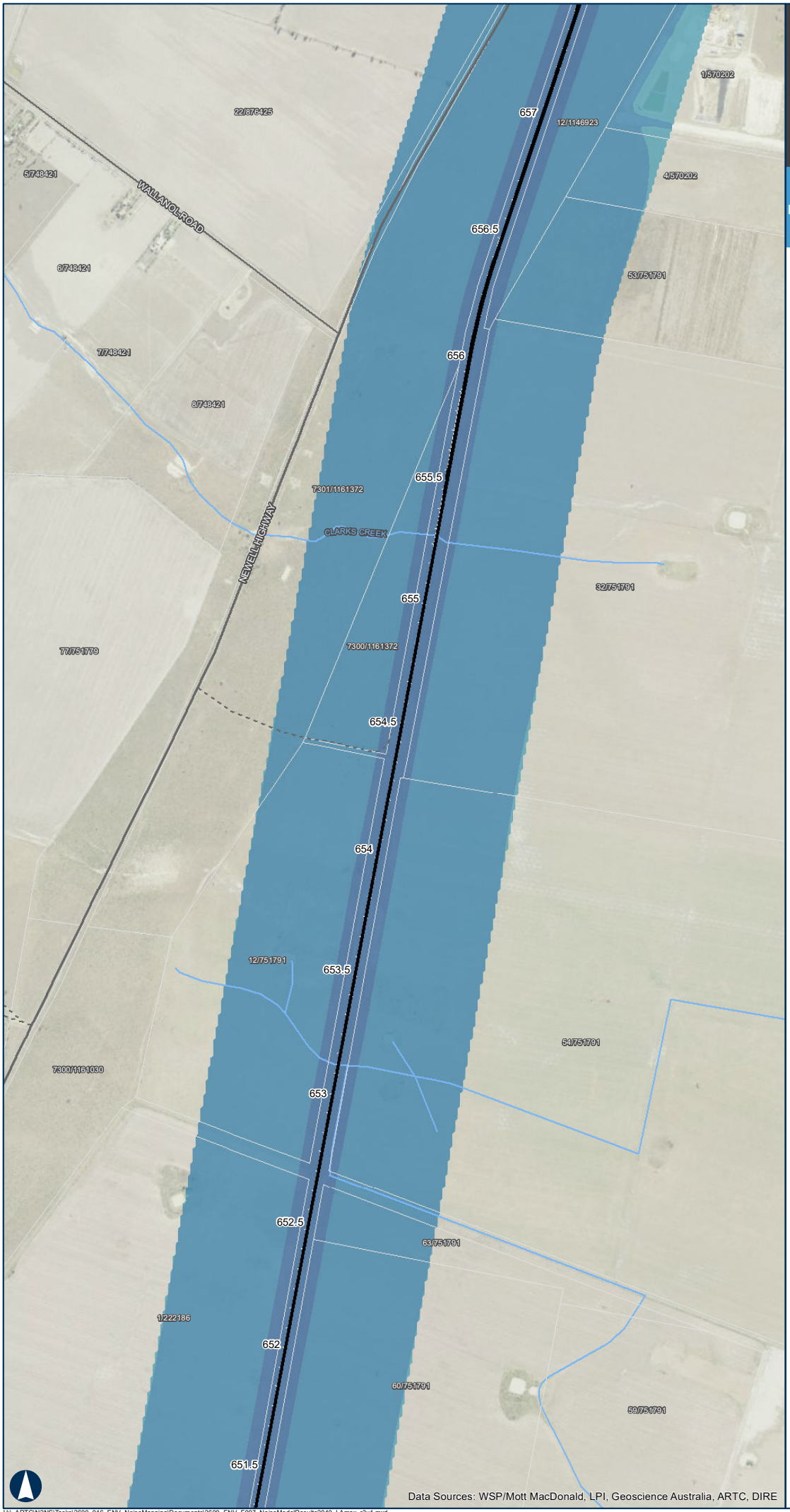
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Appendix C

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Sheet 14 of 31

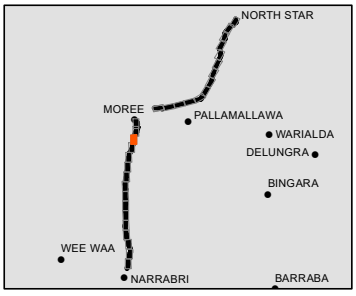
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
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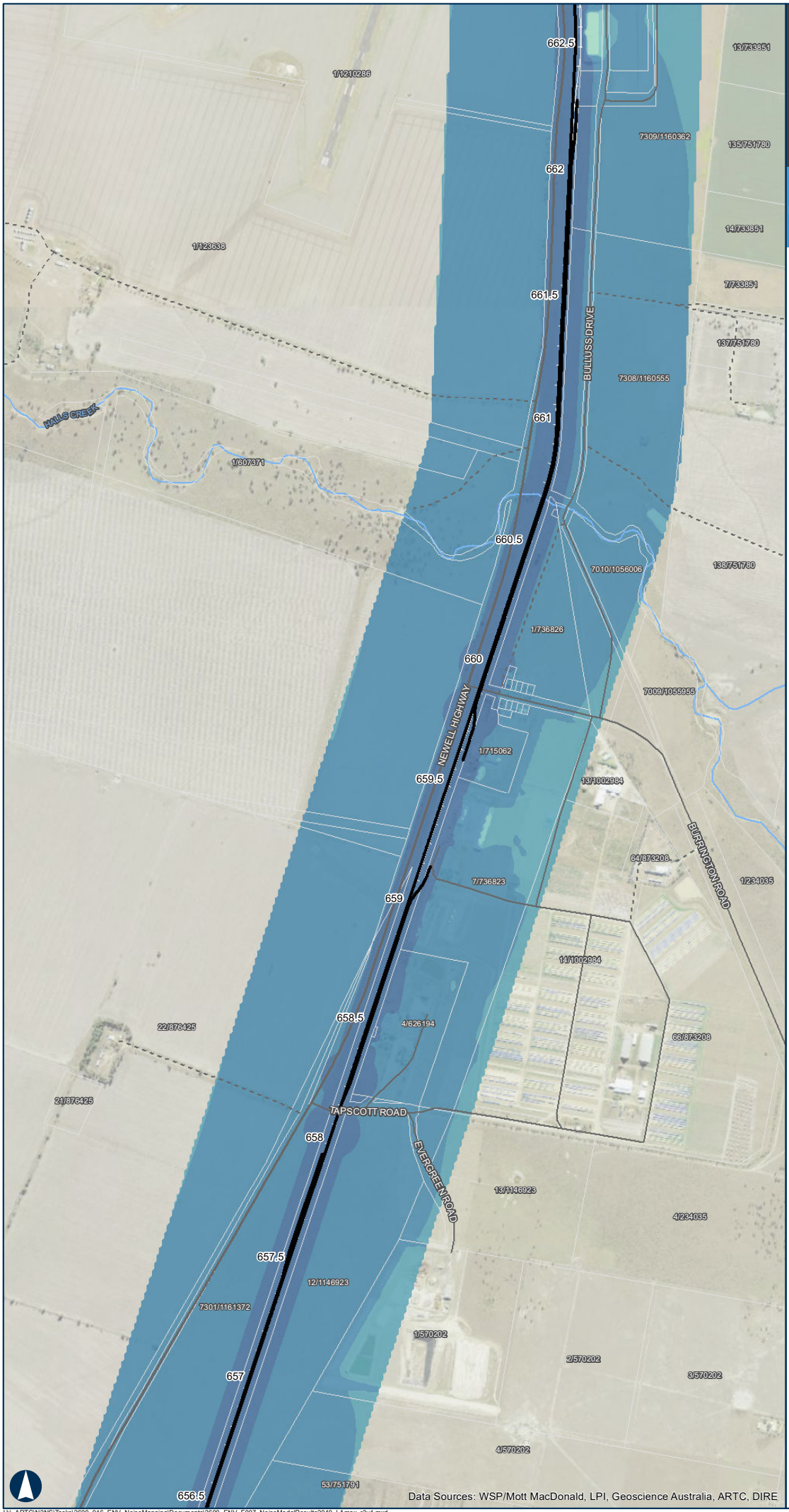
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Scale: 1:15,000

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Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 15 of 31

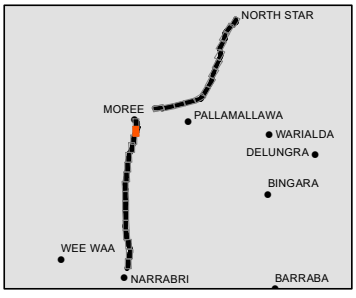
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

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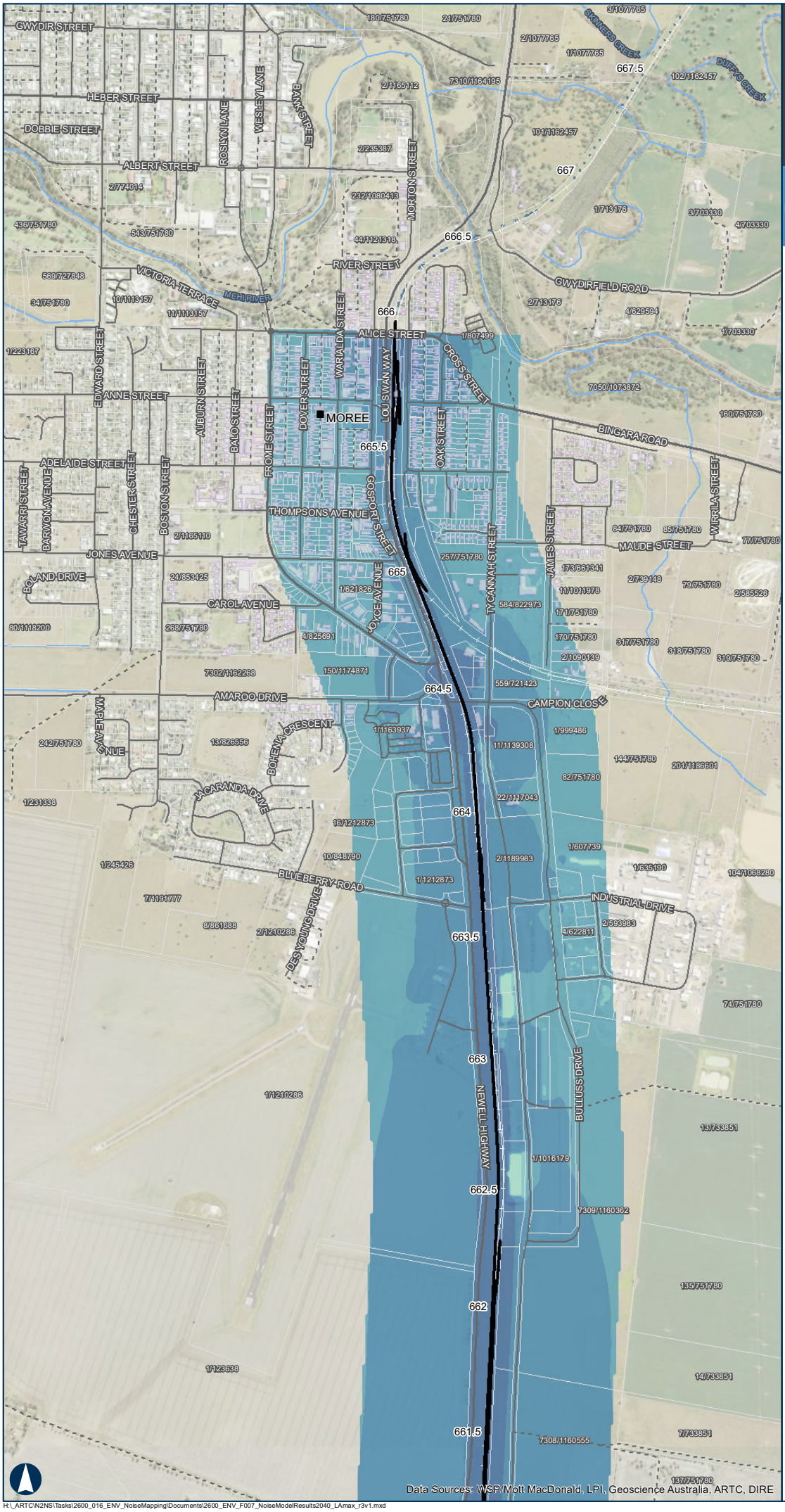
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Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

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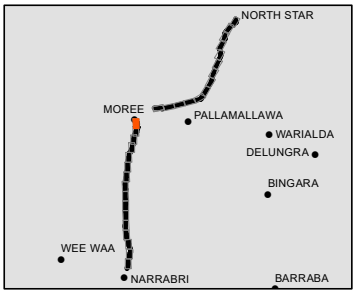
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

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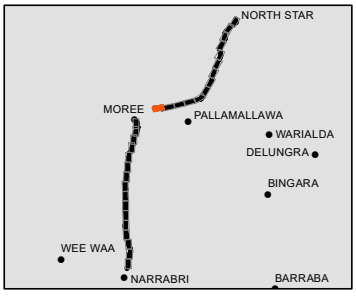
LEGEND

- Townships
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- Local Road
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- Track Alignment
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Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

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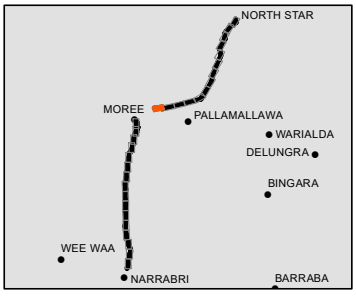
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

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0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

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Paper: A3

Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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INLAND RAIL

ARTC

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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 19 of 31

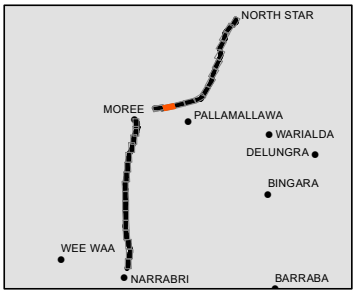
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
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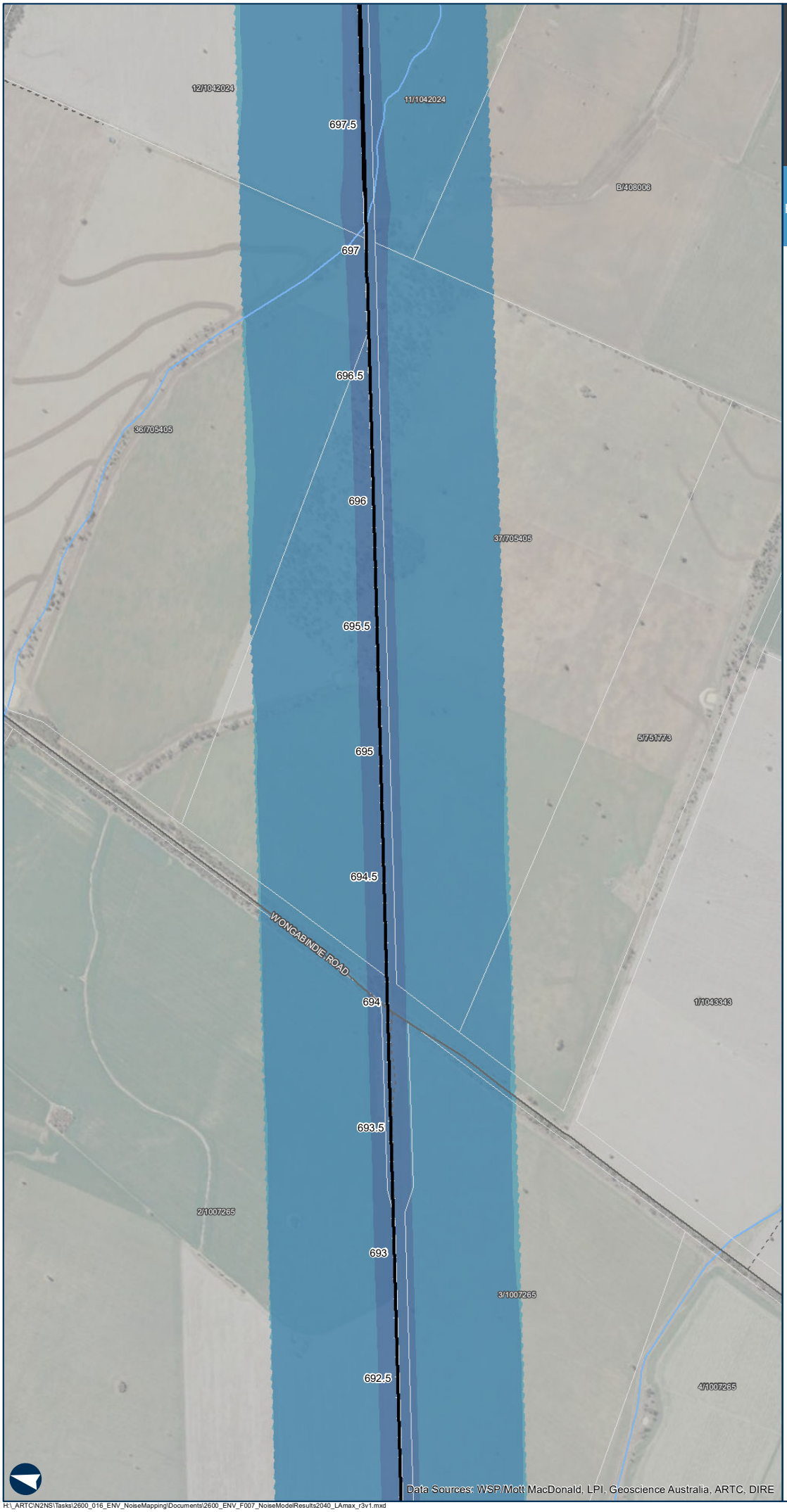
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Author: IRDJV

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 20 of 31

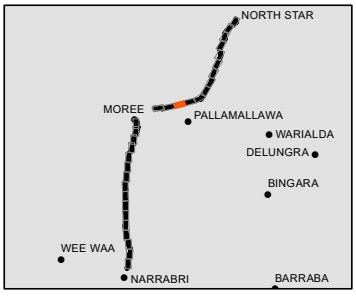
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 21 of 31

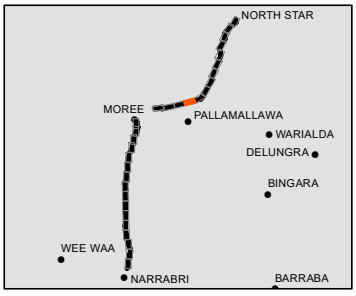
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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- 55 - 60
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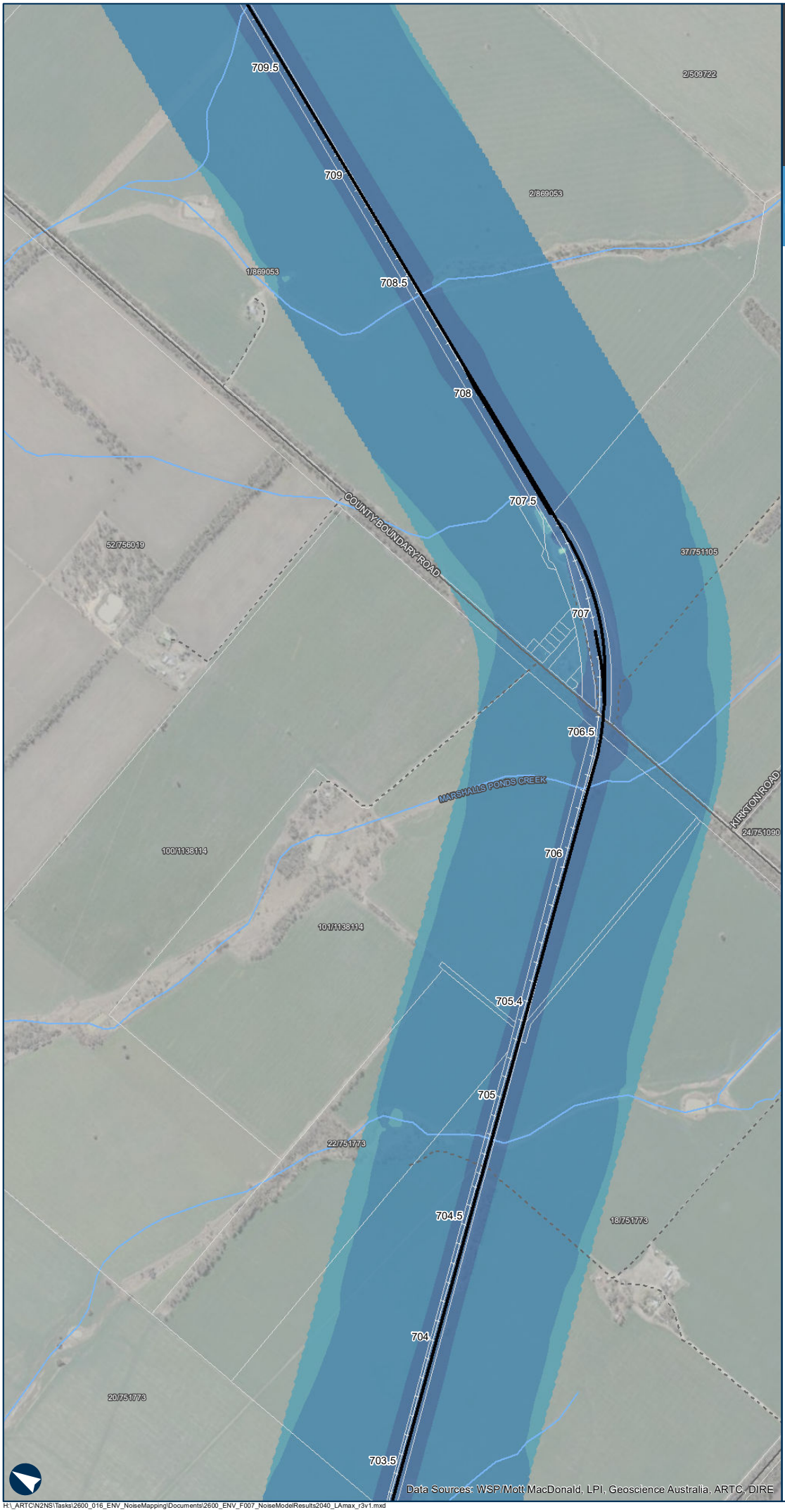
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 22 of 31

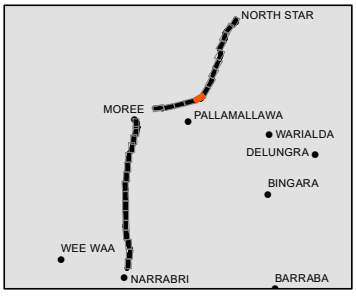
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
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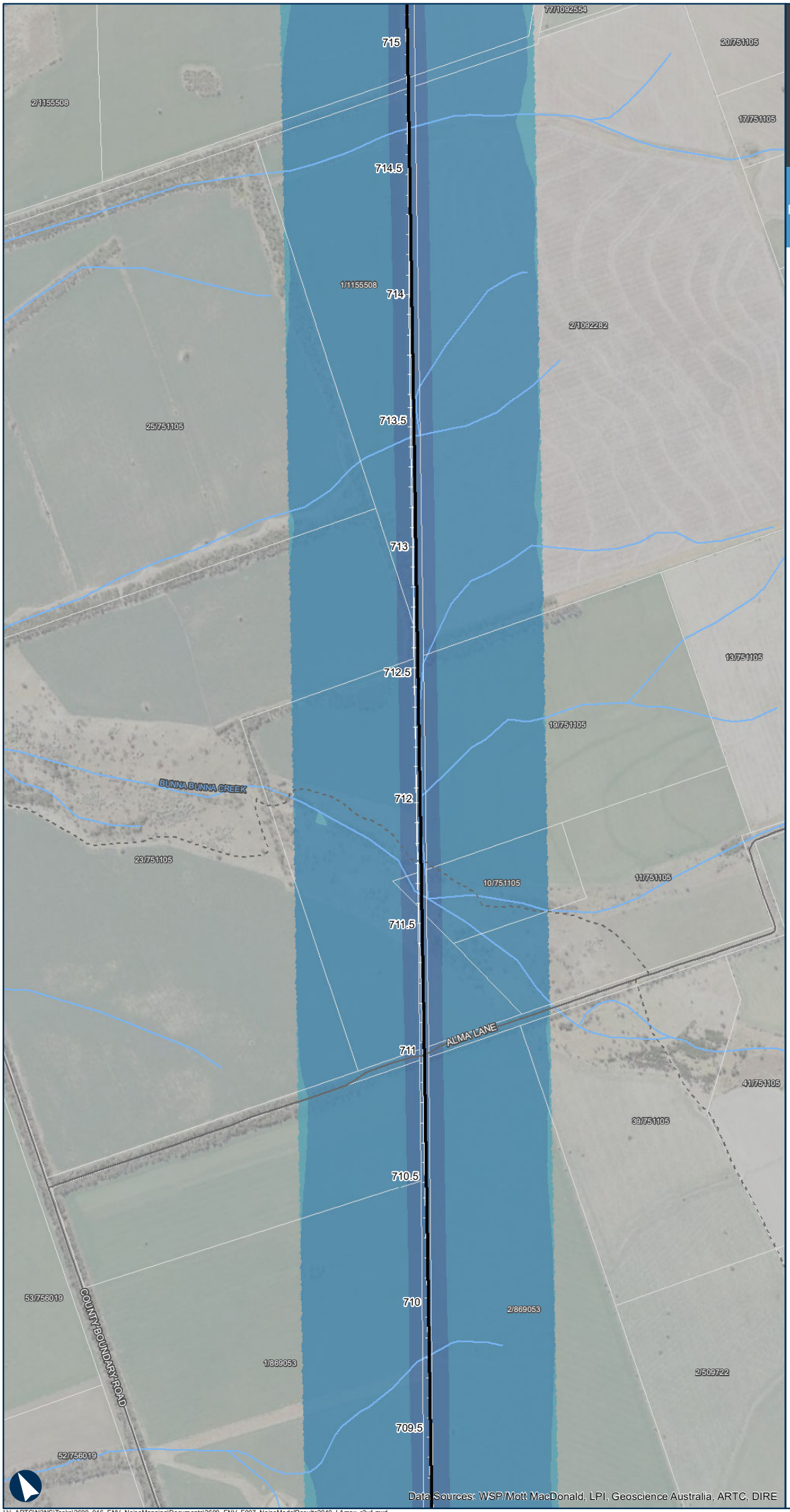
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 23 of 31

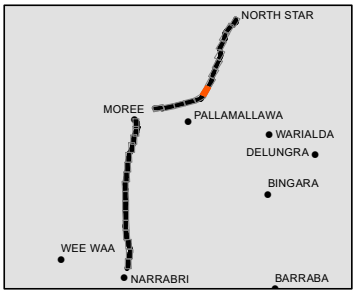
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
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- 75 - 80
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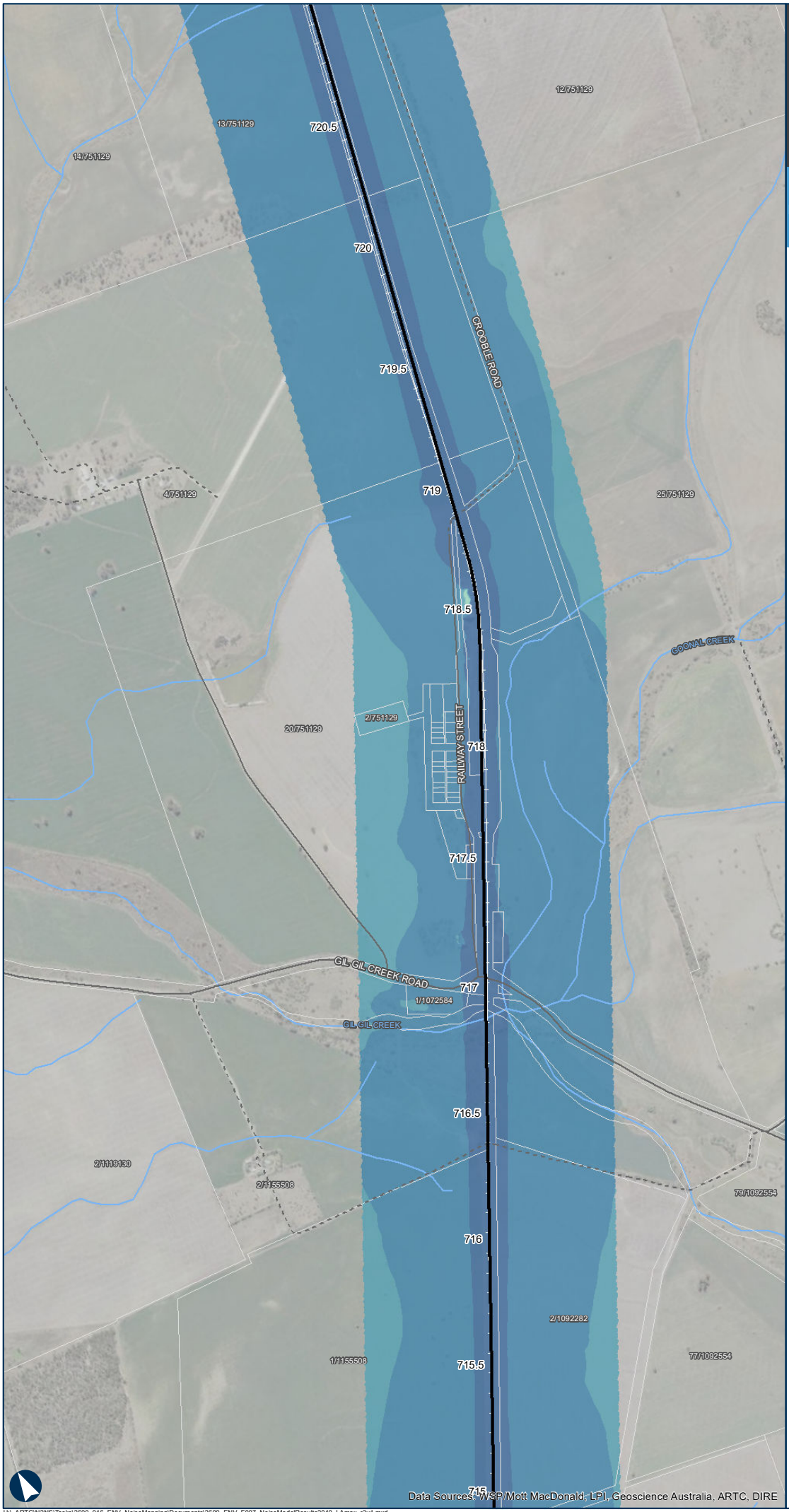
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NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 24 of 31

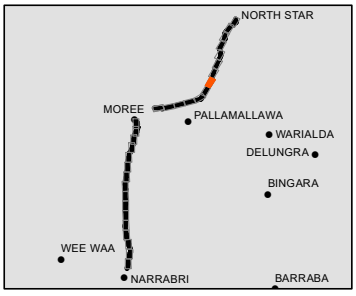
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
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- 75 - 80
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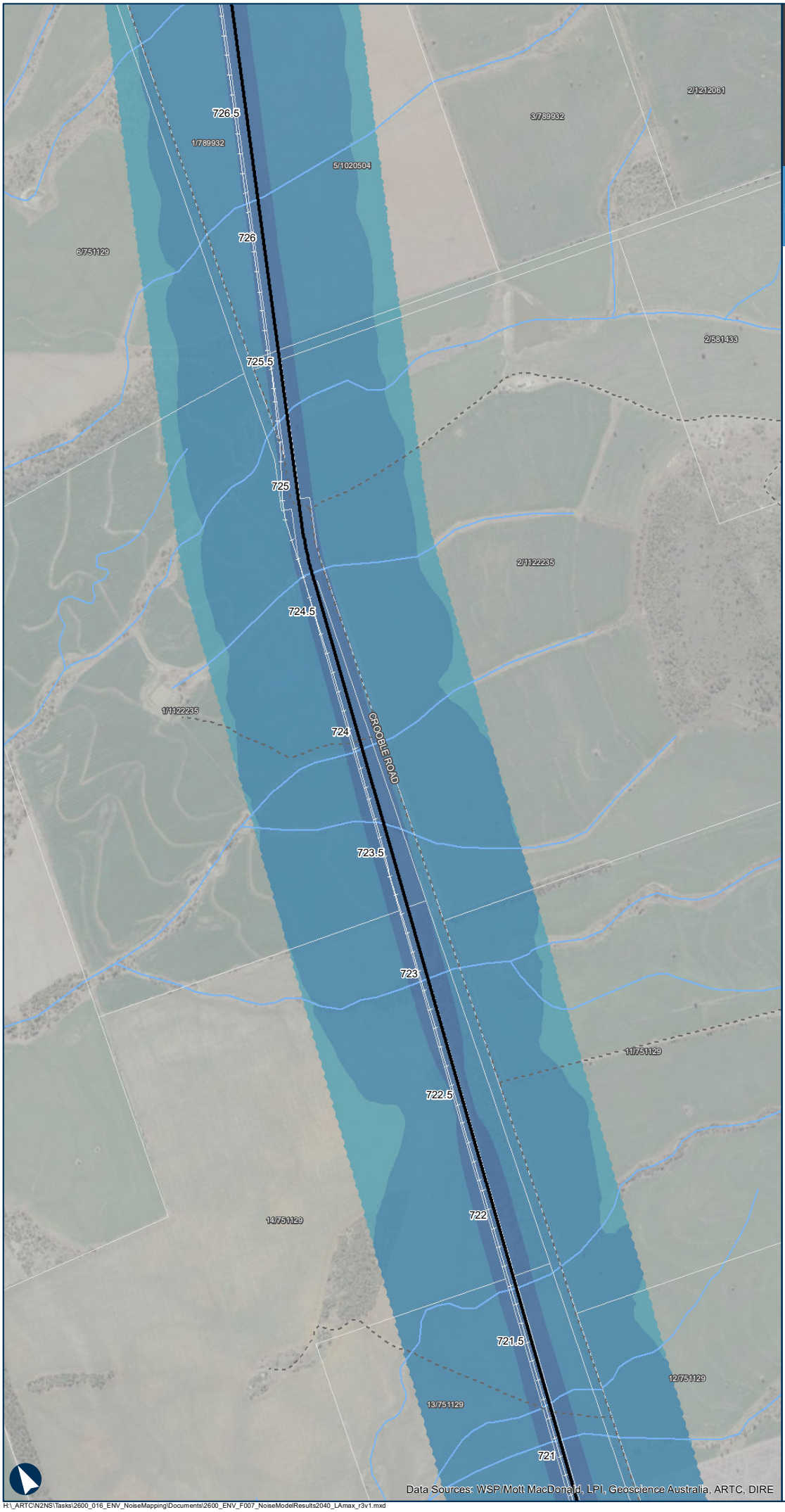
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 25 of 31

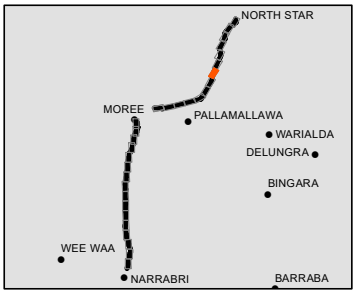
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
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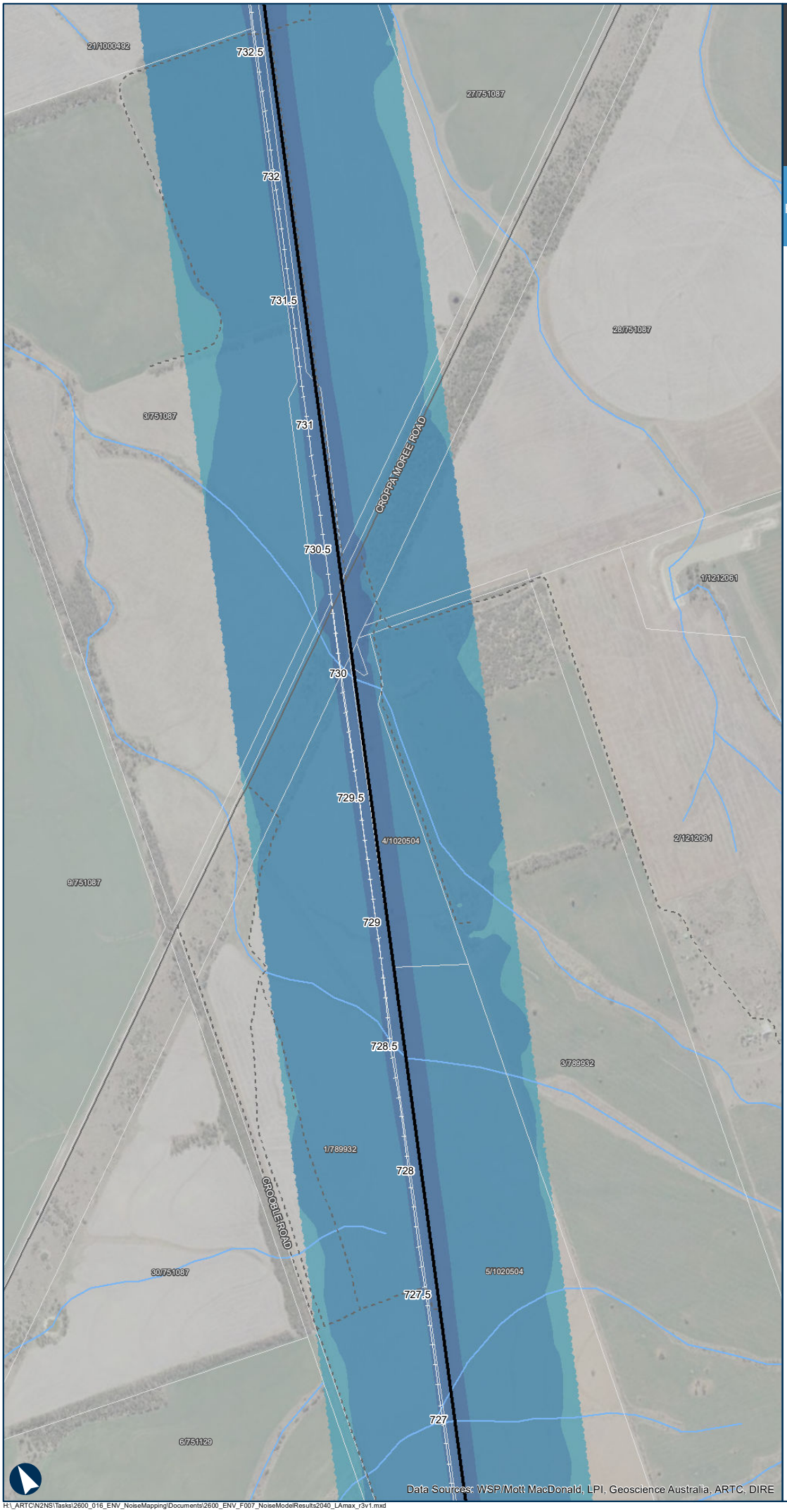
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Scale: 1:15,000

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 26 of 31

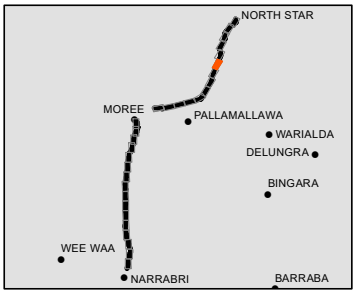
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
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Noise Contours (dB(A))

- <50
- 55 - 60
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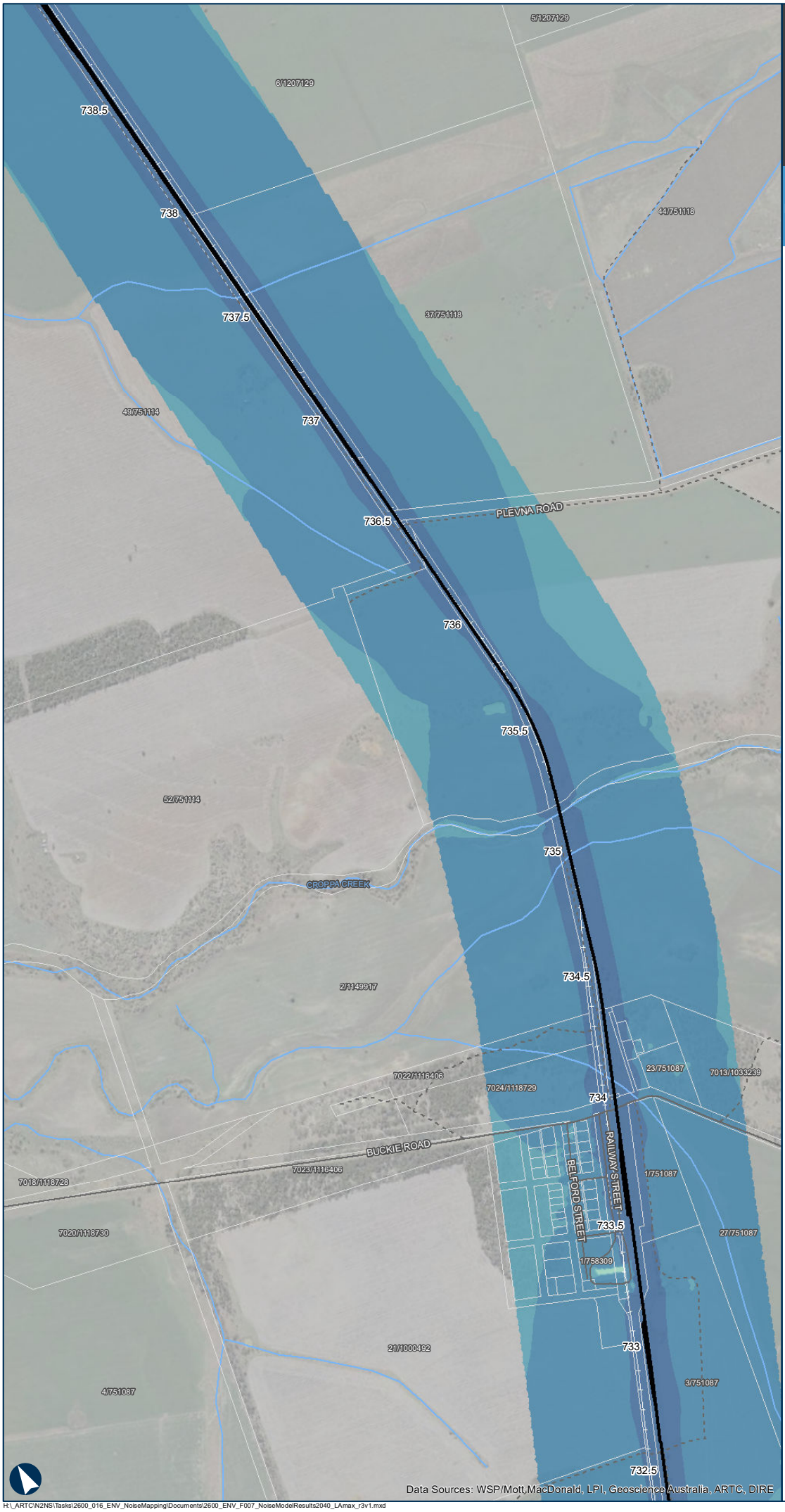
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Scale: 1:15,000

Date: 13-Aug-21

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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 27 of 31

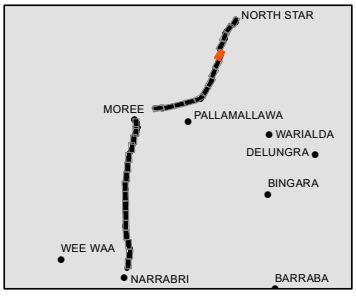
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre

Noise Contours (dB(A))

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Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

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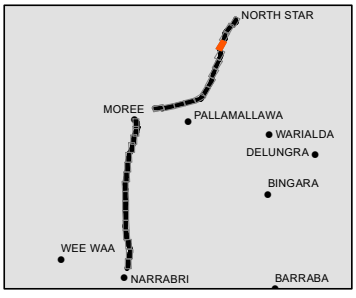
LEGEND

- Townships
- Highway
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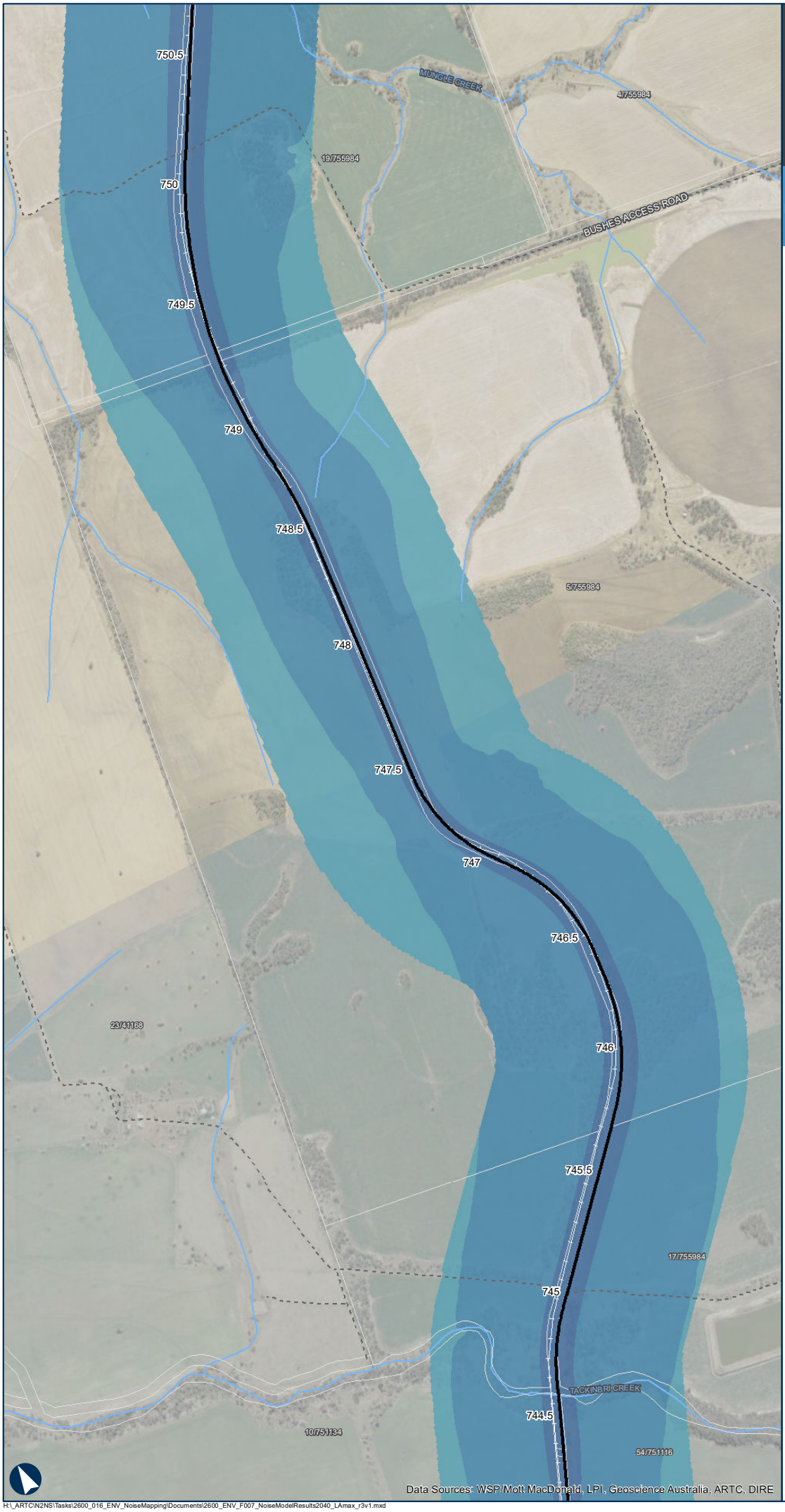
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Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

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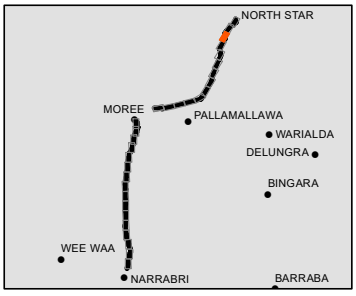
LEGEND

- Townships
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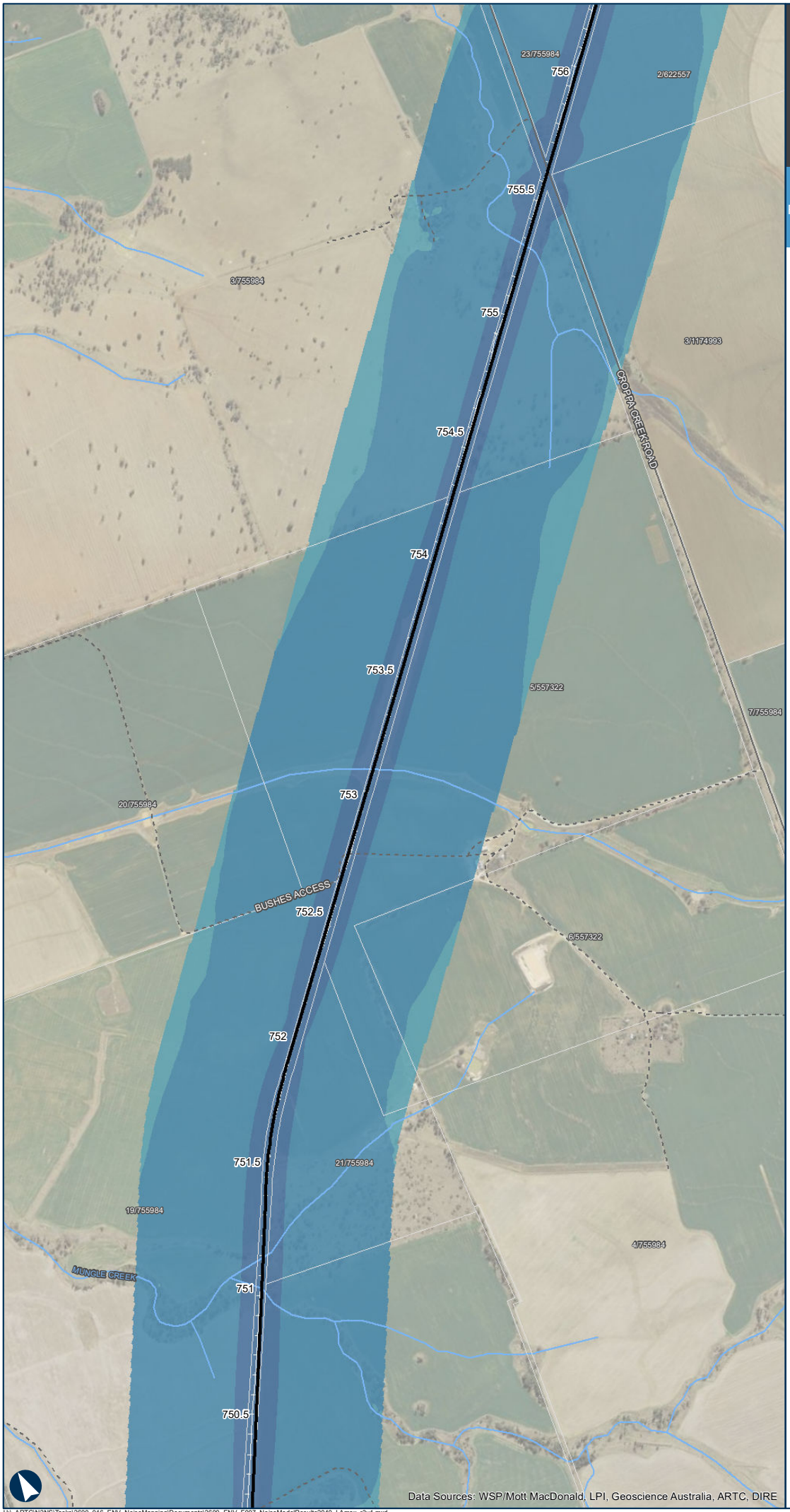
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Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 30 of 31

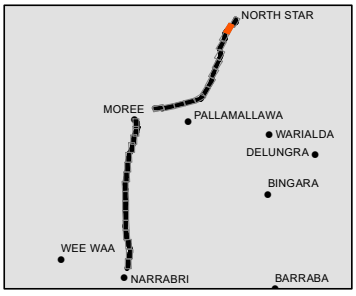
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
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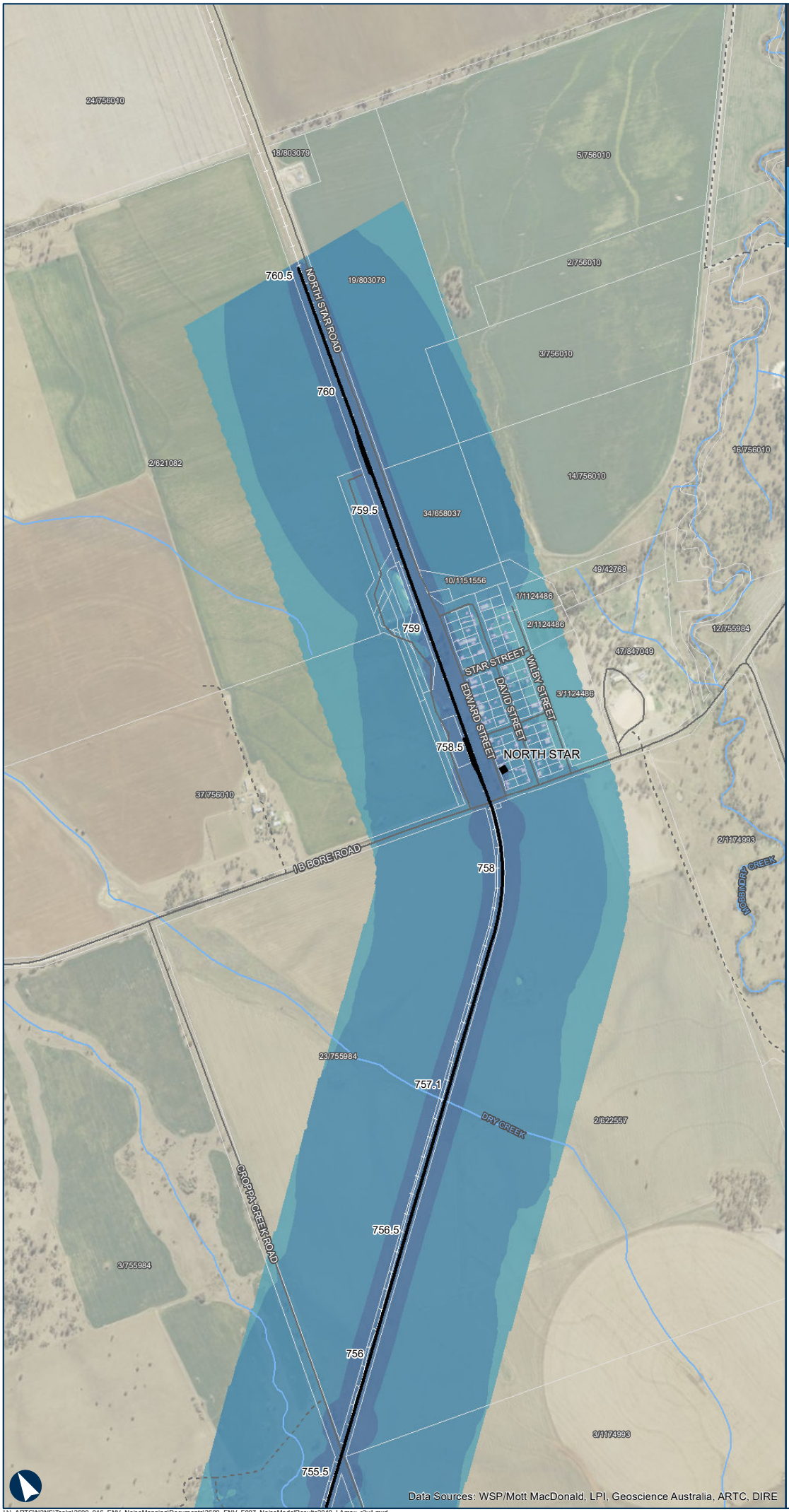
Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

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Data Sources: WSP/Mott MacDonald, LPI, Geoscience Australia, ARTC, DIRE

INLAND RAIL

ARTC

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

NARRABRI TO NORTH STAR

Appendix C

Rail Noise Modelling Contours: 2040 Noise Model Results - LAmax without mitigation

Sheet 31 of 31

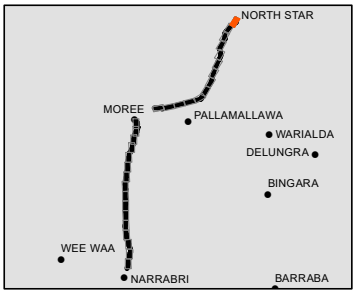
LEGEND

- Townships
- Highway
- Local Road
- Track
- Existing Rail Network
- Track Alignment
- Watercourse
- Cadastre
- Building Footprints

Noise Contours (dB(A))

- <50
- 55 - 60
- 65 - 70
- 75 - 80
- 85 - 90

NOT FOR PUBLICATION. FOR CONSULTATION PURPOSES ONLY.



0.75 Km

Coordinate System: GDA 1994 MGA Zone 55

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Paper: A3

Scale: 1:15,000

Date: 13-Aug-21

Author: IRDJV

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