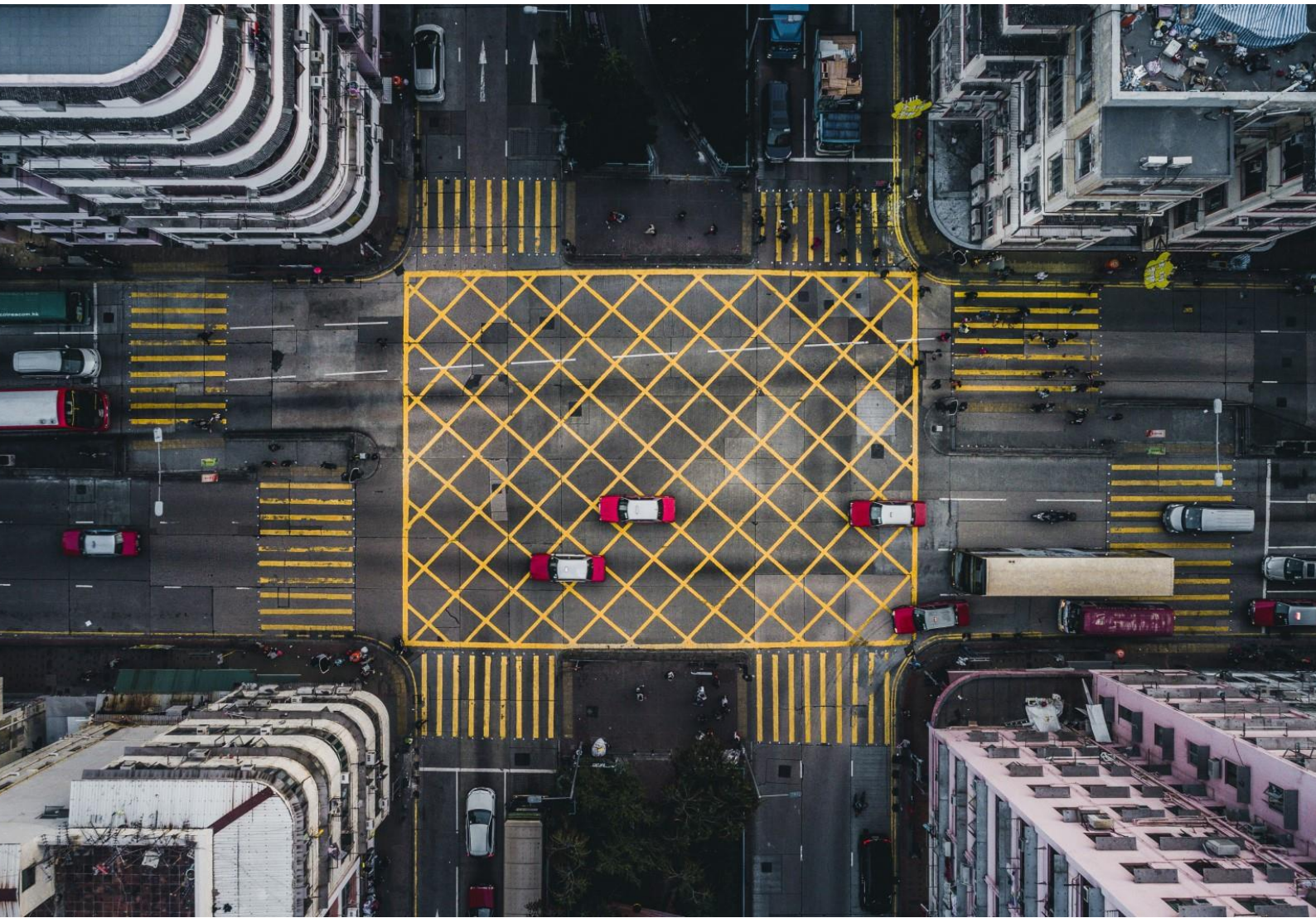
Shepparton South East Precinct Structure Plan

Noise Amenity Impact Assessment

Greater Shepparton City Council

6 April 2022

→ **The Power of Commitment**



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Executive summary

The Victorian Planning Authority (VPA), in consultation with Greater Shepparton City Council (GSCC) is preparing the Shepparton South East Precinct Structure Plan (PSP) to guide new urban development in Shepparton.

GHD has been engaged by GSCC to prepare a Noise Amenity Impact Assessment to assess potential sources of adverse amenity impacts in relation to noise and vibration emissions against relevant regulations to assist VPA and GSCC in their decision making regarding land use and built form requirements under the proposed structure plan. The assessment area included the Precinct itself and features within a 2 km radius of the Precinct boundary.

This report is subject to, and must be read in conjunction with, the limitations set out in Section 1.3 and the assumptions and qualifications contained throughout the Report.

Key findings

Key findings of this report are summarised below:

– Key noise and vibration sources with potential to impact the sensitive uses within the Precinct were identified as:
  - Industrial 1 Zone adjacent to the Precinct to the north, for which a 300 metre noise influence area applies in accordance with the provisions of the VPP Clauses 55.07 and 58.04, and Greater Shepparton Planning Scheme Clauses 55.07 and 58.04.
  - The two industries within the Precinct
    – Rendevski Transport, for which the following potential noise impact areas have been established:
      - 50 metre noise impact area should the Precinct remain as a Farming Zone
      - 140 metre noise impact area should the Precinct be rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol
    – JDK Cold Storage Warehouse, for which the following has been established:
      - Should JDK Cold Storage Warehouse pursue the facility upgrades as per Planning Permit 2020-7 and Planning Permit 2020-103, it is expected that they will fulfil their obligations and implement the recommendations outlined in Marshall Day Acoustics' acoustic report submitted as part of the permit application to meet the relevant environmental noise criteria. As such, no noise impact area would apply.
      - Should JDK Cold Storage Warehouse not pursue the facility upgrades, the following has been established:
        – No noise impact area should the Precinct remain as a Farming Zone
        – A noise impact area as per Figure 8 should the Precinct be rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol.
  - Traffic noise from the existing Doyles Road (and subsequently traffic noise from future Doyles Road duplication), for which a potential traffic noise impact area of 70 metres from Doyles Road has been established.
  - Agriculture noise sources including frost fans and scare guns, for which the following potential noise impact areas have been established:
    – Noise sensitive uses should not be located within 300 metres of any agricultural land where scare guns are likely to be used.
    – Residential dwellings within 1,000 metres of any agricultural land where frost fans are likely to be used should be required to undertake a detailed noise impact and risk assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the proposed design meets the EPA Guideline 1043.1 recommended noise levels as presented in Section 3.9.

    - Diesel water pumps for irrigation channel groundwater flow
- A high level noise assessment of the existing industrial sites within the Precinct has been conducted for which a noise impact area has been established for noise sensitive uses in close proximity to these industries.
- Zoning and potential rezoning of the Precinct may have a significant effect on the applicable Noise Protocol noise limits within the Precinct. While it may improve the general acoustic environment and noise amenity in the area by managing commercial/industrial noise to lower limits, it may lead to significant additional noise mitigation works for existing commercial/industrial premises to enable compliance with environmental noise limits.

Recommendations

The following recommendations are provided within this report:

- Careful strategic planning to manage land use interface and minimise noise impact on sensitive land uses including but not limited to consideration of in-principle noise mitigation strategies outlined in this report.
- Where rezoning is expected, it is recommended that a further study is undertaken to identify such commercial and industrial premises and relevant consultation be made with stakeholders including EPA to assess potential impacts and mitigation strategies moving forward.
- The implementation of planning controls within the Greater Shepparton Planning Scheme and where appropriate development approval process to:
    - Place specific planning requirements as part of planning scheme amendments or planning permit conditions (i.e. control of noise emissions) on proposed sensitive land use and developments in particular areas.
    - Require any proposed sensitive land uses within the 300 metre Industrial 1 Zone noise influence area to undertake a detailed external noise intrusion assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that internal noise levels achieve recommended noise amenity targets outlined in VPP Clauses 55.07-7 and 58.04-3, Greater Shepparton Clauses 55.07-7 and 58.04-3, and sleep disturbance criteria as defined by World Health Organisation from external noise sources.
    - Require any proposed sensitive land uses within the noise impact areas determined for both Rendevski Transport and JDK Cold Storage Warehouse to undertake a detailed noise assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that noise emissions from the commercial premises achieves the Noise Protocol noise limits at the proposed site.
        - Noise impact areas for Rendevski Transport include:
            - 50 metre noise impact area should the Precinct remain as a Farming Zone
            - 140 metre noise impact area should the Precinct be rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol
        - Noise impact areas for JDK Cold Storage Warehouse include:
            - A noise impact area as per Figure 8 should JDK Cold Storage Warehouse choose not to pursue any facility upgrades and the Precinct is rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol.
    - Require any proposed sensitive land uses close to Doyles Road within the established 70 metre noise impact area to undertake an external noise intrusion assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the development is designed and constructed to achieve recommended noise amenity targets outlined in VPP Clauses 55.07-7 and 58.04-3, Greater Shepparton Clauses 55.07-7 and 58.04-3, and sleep disturbance criteria as defined by World Health Organisation from external noise sources.
    - Do not locate any sensitive land uses within 300 metres of any agricultural land where scare guns are likely to be used.

- Require any proposed sensitive land uses within 1,000 metres of any agricultural land where frost fans are likely to be used to undertake a detailed noise risk assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the proposed design meets the EPA Guideline 1043.1 recommended noise levels.
- Any noise sensitive use proposed to be located closer to a diesel water pump than an existing noise sensitive use is recommended to be required to undertake a detailed noise assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the development is designed and constructed to achieve the recommended internal noise limits outlined in VPP Clauses 55.07-7 and 58.04-3, Greater Shepparton Clauses 55.07-7 and 58.04-3 and sleep disturbance criteria as defined by World Health Organisation.
- Require developments with potential to generate noise to undertake further acoustic assessment to demonstrate that the development is designed and construction to comply with the Noise Protocol requirements at surrounding sensitive uses (including within the Precinct).

– Consider staging the development of the land to provide the opportunity to consider the changing (transitioning) industrial context for the surrounding Precincts.
– Locate complimentary commercial and other businesses uses close to other industrial developments and adjacent to arterial roads. The commercial and business land uses would act as a physical buffer between industrial activities and more sensitive land uses.

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1. Introduction

The Victorian Planning Authority (VPA), in consultation with Greater Shepparton City Council (GSCC) is preparing the Shepparton South East Precinct Structure Plan (PSP) to guide new urban development in Shepparton.

GHD has been engaged by Greater Shepparton City Council (GSCC) to prepare a Noise Amenity Impact Assessment, to assess potential sources of adverse amenity impacts, in relation to noise and vibration, at the location proposed by the Shepparton South East PSP (location hereafter referred to as the Precinct). The assessment is aimed to assist VPA and GSCC in their decision making regarding land use and built form requirements under the proposed structure plan. The noise assessment area for this report included the Precinct itself and features within a 2 km radius of the Precinct boundary. Potential vibration impacts have also been considered in this report.

1.1 Purpose of this report

The purpose of this report is to assess the potential for adverse amenity impacts from noise and vibration emissions to future sensitive land uses within the Precinct. The assessment in this report has been conducted in accordance with the scope of works presented in Section 1.2 of this report.

The findings, conclusions and recommendations of this assessment should be read in conjunction with the limitations presented in Section 1.3 and assumptions presented in Section 1.4 of this report.

1.2 Scope of works

This assessment includes the following scope of works:

– An inception meeting was held with GSCC and VPA to clarify and confirm objectives, reporting, program and discuss any outstanding issues or queries.
– A site visit was undertaken to inspect the areas surrounding the Precinct and identify potential industries within the Precinct and within a 2 km catchment area (surrounding area) which may attract a separation distance and/or be a potential noise or vibration source which may have the potential to result in adverse amenity impact to the Precinct. The site visit was also supplemented by desktop searches using publicly available information and review of aerial imagery.
– Undertake a review of the relevant noise and vibration guidelines and standards potentially applicable to the Precinct.
– Identify and map existing features that have the potential to create noise or vibration impacts at the Precinct.
– Undertake a review of potential impacts associated with the identified sources.
– Provide potential strategies for mitigation of noise and vibration impacts, where required.
– Identify the requirements for further assessment work at the subject site.
– Present the findings of the assessment in a written report.

1.3 Limitations

This report has been prepared by GHD for Greater Shepparton City Council and may only be used and relied on by Greater Shepparton City Council for the purpose agreed between GHD and Greater Shepparton City Council as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Greater Shepparton City Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 1.4 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

The opinions, conclusions and any recommendations in this report are based on an onsite inspection undertaken by GHD in February 2022, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the ambient noise environment, location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions (including ambient noise environment and the presence of noise emissions) may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

1.4 Assumptions

The following assumptions have been made in this assessment:

– The ambient environment on the day of the site visit is representative of typical conditions in the area.
– The most site representative available meteorological data is from the Bureau of Meteorology (BoM) automatic weather station (AWS) located at Shepparton Airport.
– The surrounding industries site boundaries are based off publicly available information provided by the Victorian State Government Department of Environment, Land, Water and Planning (DELWP).
– Information on the operations and throughput of the identified industries are from publicly available information, site visits, planning permit data and information (where available) and not through direct contact with local industry or industry bodies.

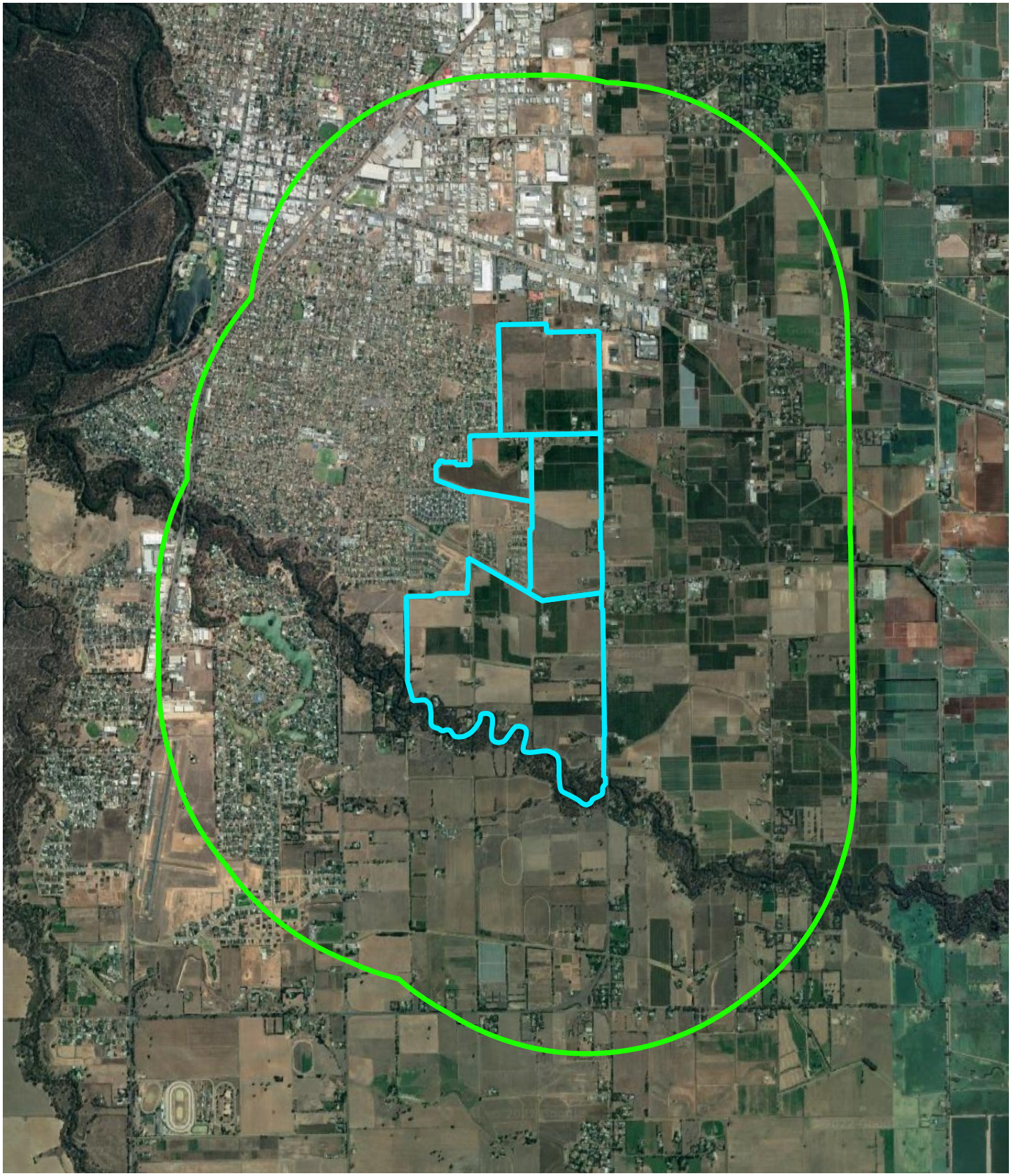
2. Project description

2.1 Location and land use

The Precinct is located in the southeast of Shepparton and encompasses the land bordered by Doyles Road to the east, Broken River to the south and is located within Archer Road and Midland Highway. The Precinct is currently zoned under Farming Zone 1 (FZ1).

Currently, land uses within the Precinct are predominantly of farming nature. Land uses and infrastructure include sheds, pasture, farming land and orchards. A handful of residential premises and industries are currently present within the Precinct.

The Precinct site boundary and 2 km radius are shown in Figure 1.



Legend

- 2km radius
- Precinct boundary

Paper Size ISO A4

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Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

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Greater Shepparton City Council

Noise Amenity Impact Assessment

Site Overview

Project No. **12556721**
Revision No. **0**
Date. **06/04/2022**

FIGURE 1

Document Path: N:\AU\Melbourne\Projects\31\12556721\GIS\Maps\Working\12556721-QGIS_Site location - Noise Assessment.qgz
Print Date: 06/04/2022

Data Source: Google Earth Imagery 2021.
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2.2 Surrounding land use

The Precinct is surrounded by Grahamvale to the north, Shepparton to the west, Kialla to the south and Shepparton East to the east. The majority of land to the north of the precinct is zoned as Industrial Zone 1 (IN1Z), with some land zoned as Public Use Zone – Service and Utility (PUZ1) and Activity Centre Zone 1 (ACZ1). West of the Precinct is majority residential zoned General Residential Zone 1 (GRZ1) and south of the Precinct is zoned Urban Growth Zone (UGZ). East of the Precinct is zoned as Farming Zone 1 (FZ1), as shown in Figure 2.

Existing land uses surrounding the Precinct are as follows:

To the north of the Precinct:

– Is the Marketplace Shopping Centre, the Homemaker Centre and other associated commercial/ retailing uses are positioned along Midland Highway. North of Midland Highway is an industrial estate.

To the south of the Precinct (south of Broken River):

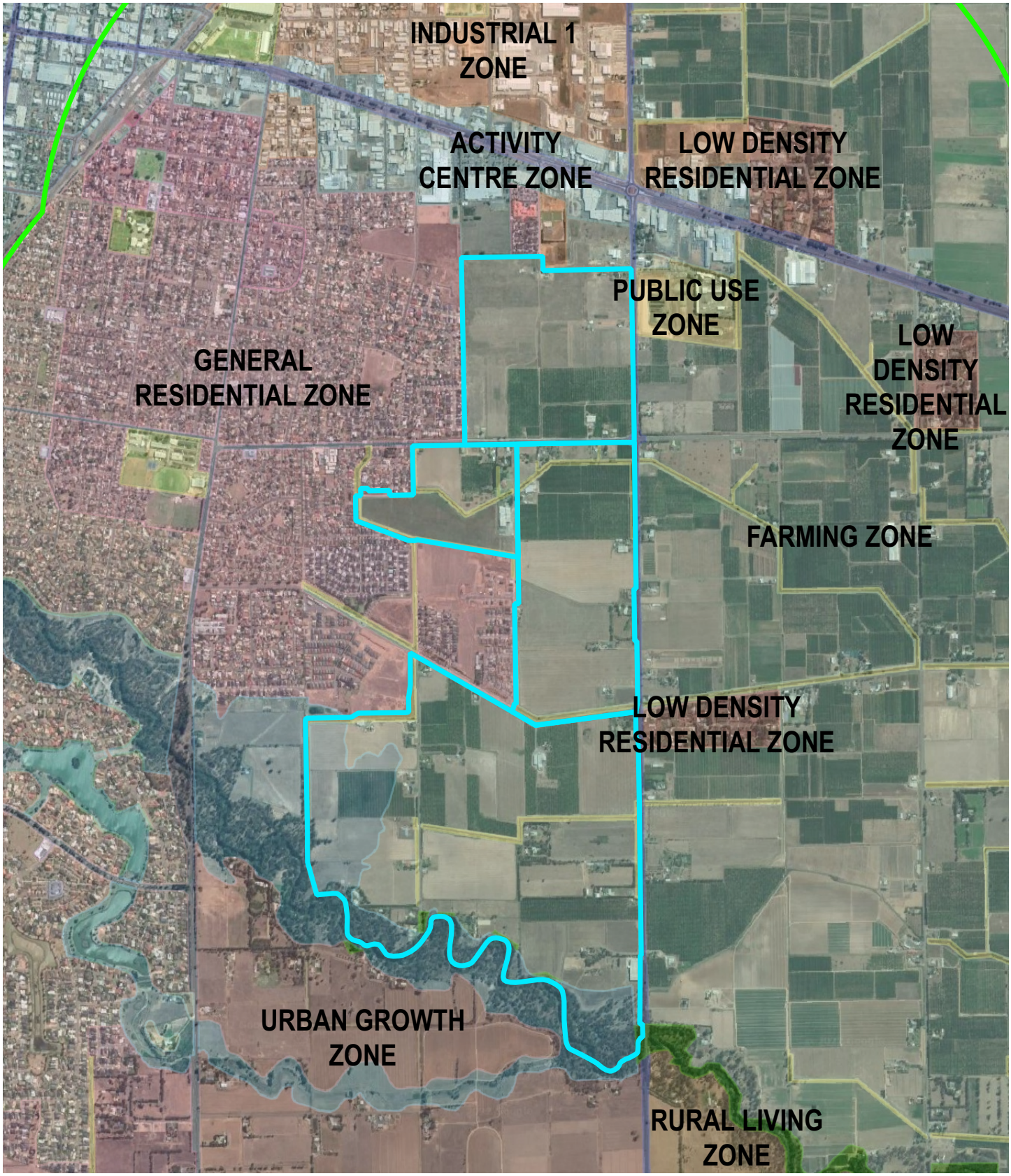
– Land use to the south and southwest consists of small to mid-sized rural landholdings predominantly used for cropping, grazing and/or small clusters of rural residential dwellings.
– Further to the southwest is the Kialla Lakes residential estate.

To the east of the Precinct (east of Doyles Road):

– Orchard farming is the predominant activity.
– A business/commercial strip is located at the intersection of Doyles Road and Midland Highway, with the Greater Shepparton Operations Centre (Council depot) located immediately to the south.
– A small cluster of residences are located to the south side of Channel Road extending east, which also includes Orrivale Primary School.

To the west of the Precinct:

The existing eastern residential edge of the Shepparton township, however some undeveloped rural land parcels are located to the southeast adjacent to Broken River.



Legend

- 2km radius
- Precinct boundary

Paper Size ISO A4

0 0.5 1 km

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

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Noise Amenity Impact Assessment

Planning Zones

Project No. **12556721**
Revision No. **0**
Date. **06/04/2022**

FIGURE 2

Document Path: N:\AU\Melbourne\Projects\31\12556721\GIS\Maps\Working\12556721-QGIS_Site location - Noise Assessment.qgz
Print Date: 06/04/2022

Data Source: Google Earth Imagery 2021.
Created By: jcheah

2.3 Noise sensitive areas

The definition of a noise sensitive area is defined in the Environment Protection Regulations 2021 (EPR 2021):

a) that part of the land within the boundary of a parcel of land that is—

i) within 10 metres of the outside of the external walls of any of the following buildings—

A) a dwelling (including a residential care facility but not including a caretaker's house)

B) a residential building

C) a noise sensitive residential use; or

ii) within 10 metres of the outside of the external walls of any dormitory, ward, bedroom or living room of one or more of the following buildings—

A) a caretaker's house

B) a hospital

C) a hotel

D) a residential hotel

E) a motel

F) a specialist disability accommodation

G) a corrective institution

H) a tourist establishment

I) a retirement village

J) a residential village; or

iii) within 10 metres of the outside of the external walls of a classroom or any room in which learning occurs in the following buildings (during their operating hours)—

A) a child care centre

B) a kindergarten

C) a primary school

D) a secondary school; or

b) subject to paragraph (c), in the case of a rural area only, that part of the land within the boundary of—

i) a tourist establishment; or

ii) a campground; or

iii) a caravan park; or

c) despite paragraph (b), in the case of a rural area only, where an outdoor entertainment event or outdoor entertainment venue is being operated, that part of the land within the boundary of the following are not noise sensitive areas for the purposes of that event or venue—

i) a tourist establishment

ii) a campground

iii) a caravan park

Current noise sensitive areas within the Precinct are isolated rural dwellings. Outside of the Precinct, noise sensitive areas include residential housing to the west and small clusters of rural residential type dwellings to the south and east.

Likely future noise sensitive areas within the Precinct include residential dwellings and the proposed primary school.

2.4 Proposed future urban structure

The key elements of the draft PSP relevant to this Noise Amenity Impact Assessment include:

– A residential area that will accommodate approximately 2,500 homes
– A local convenience centre that will accommodate small scale shopping opportunities
– A new community centre and a potential primary school

The draft PSP is provided in Figure 3.

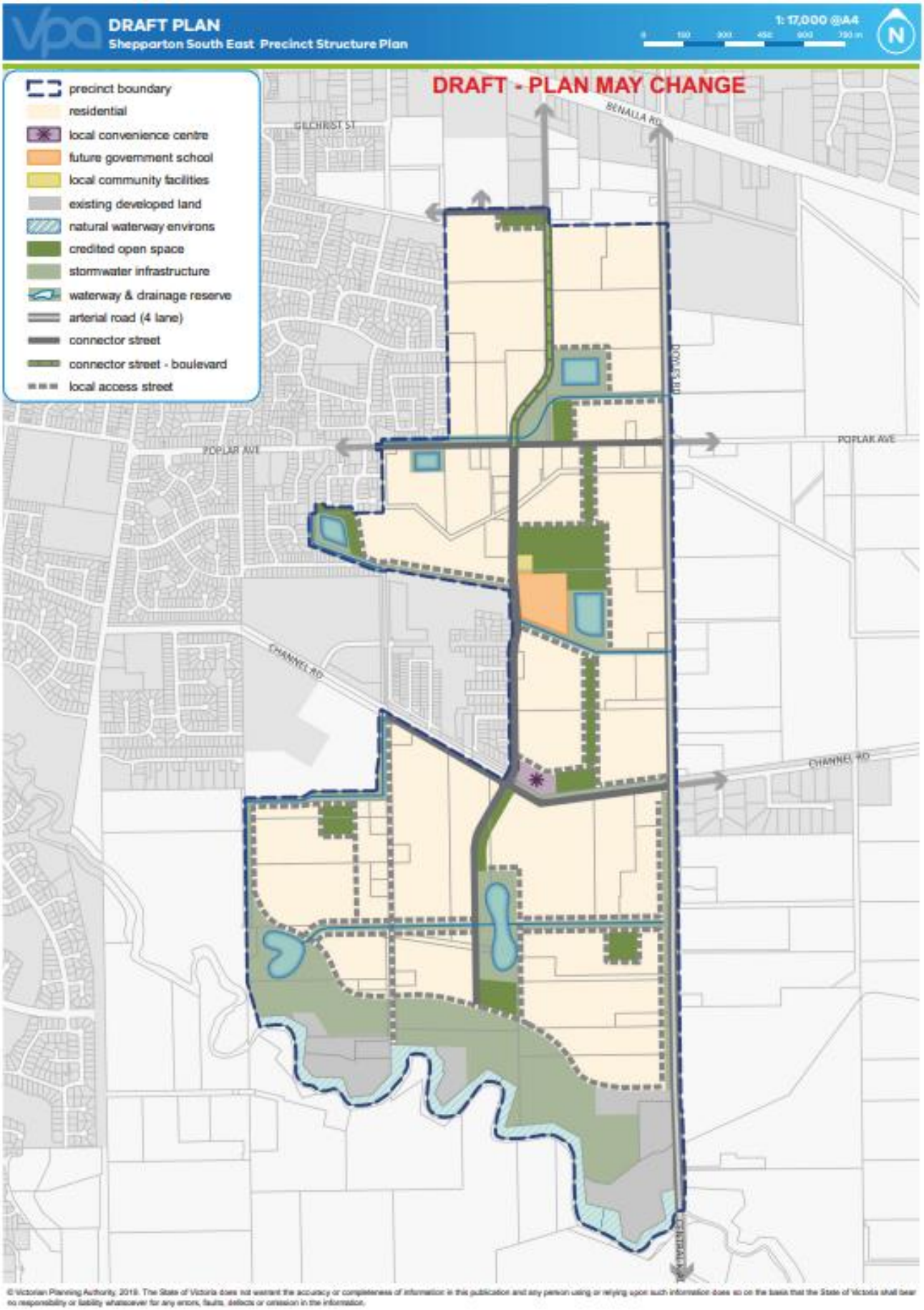


Figure 3 *Draft Shepparton South East PSP (VPA 2019)*

3. Relevant legislation and guidelines

The following guidelines and policies have been identified as relevant for the noise amenity impact assessment:

3.1 EPA Guideline 1826.4 Noise Protocol

Noise associated with commercial, industrial and entertainment premises is managed under the EPA Victoria Publication 1826.4 Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues (Noise Protocol) (EPA Victoria, 2021).

The Noise Protocol provisions have been incorporated into the Environment Protection Regulations 2021 (EPR 2021), which have come into effect with the commencement of the amended Environment Protection Act 2017 on 1 July 2021. The Noise Protocol provides a protocol for the purpose of determining noise limits for new and existing commercial, industrial and trade premises and entertainment venues as defined by the EP Regulations 2021. It sets the methodology for assessing the effective noise level to determine unreasonable noise under the provisions of EPR 2021.

The Noise Protocol supersedes the previous applicable requirements, including:

– State Environment Protection Policy – *Control of Noise from Commerce, Industry and Trade No. N-1* (SEPP N-1) (Victorian Government, 1989)
– Noise from Industry in Regional Victoria (NIRV): *Recommended maximum noise levels from commerce, industry and trade premises in regional Victoria* (EPA Publication 1411) (EPA Victoria, 2011)

The requirements of the former SEPP N-1 and NIRV are now consolidated into the Noise Protocol with some minor changes to the procedures for the assessment of noise.

The Noise Protocol prescribes the methodology to determine the maximum effective noise level allowed in a noise sensitive area from any commercial/industrial premises depending on the time of day, land use zoning and existing background noise levels. The applicable noise limits are established in accordance with Part I Section A of the Noise Protocol and are based on applicable zoning levels corrected for the outdoor background noise levels within the noise sensitive areas.

Potential environmental noise emissions from individual developments to and from the Precinct should be assessed in accordance with the requirements of the Noise Protocol during development approval stages and, where relevant, planning conditions incorporated to require individual developments to demonstrate compliance with the Noise Protocol noise limits at the surrounding noise sensitive areas.

3.2 Victoria Planning Provisions (VPP)

3.2.1 Clause 55.07 and 58.04 Amenity impacts

Clause 55.07-7 and Clause 58.04-3 of the planning scheme specifies indoor noise levels that should be met for apartments and where there are more than two dwellings on a lot within industrial areas or within a road or rail *noise influence area*. It is noted that there are no specific clauses related to single dwellings on a lot, however guidance is sought from Clause 55.07-7 and Clause 58.04-3 to provide a basis for appropriate noise amenity for these dwellings.

In 2017, DELWP released a practice note for *Assessing External Noise Impacts for Apartments – Planning Practice Note 83* (August 2017) (PPN 83) to provide guidance on application of the VPP Clause 55.07-7 and Clause 58.04-3 and is presented in Table 1.

Table 1 VPP Clause 55.07-7 Clause 58.04-3 Noise influence area and indoor design noise criteria

Noise Source	Noise influence area	Indoor noise criteria
Zone interface		Not greater than 35 dB(A) for bedrooms, assessed as a $L_{Aeq,8hr}$ from 10 pm to 6 am. Not greater than 40 dB(A) for living areas, assessed as a $L_{Aeq,16hr}$ from 6 am to 10 pm.
Industry	300 metres from the industrial 1, 2 and 3 zone boundary	
Roads		
Freeways, tollways and other roads carrying 40,000 Annual Average Daily Traffic (AADT) Volume	300 metres from the nearest trafficable lane	
Railways		
Railway servicing passengers in Victoria	80 metres from the centre of the nearest track	
Railway servicing freight outside Metropolitan Melbourne	80 metres from the centre of the nearest track	
Railway servicing freight in Metropolitan Melbourne	135 metres from the centre of the nearest track	
Note: 1. The *noise influence area* should be measured from the closest part of the building to the noise source.		

3.3 Local Planning Policy Framework (LPP)

The precinct and surrounding area are located within the Greater Shepparton local government area, for which the Greater Shepparton Planning Scheme applies. The following provisions within the Greater Shepparton Planning Scheme were identified to be applicable to this Noise Amenity Impact Assessment.

3.3.1 Clause 13.05-1S Noise Abatement

Objective:

To assist the control of noise effects on sensitive land uses.

Strategies:

Ensure that development is not prejudiced and community amenity and human health is not adversely impacted by noise emissions, using a range of building design, urban design and land use separation techniques as appropriate to the land use functions and character of the area.

Policy documents

Consider as relevant:

– Environment Protection Regulations under the Environment Protection Act 2017
– Noise Limit and Assessment Protocol for the Control of Noise from Commercial, Industrial and Trade Premises and Entertainment Venues (Publication 1826.2, Environment Protection Authority, March 2021)
    - It is noted that Publication 1826.4 (EPA, May 2021) as outlined in Section 3.1 supersedes Publication 1826.2.

3.3.2 Clause 13.07-3S Live music

Objective:

To encourage, create and protect opportunities for the enjoyment of live music.

Strategies

Identify areas where live music venues are encouraged or where there are high concentrations of licensed premises or clusters of live music venues.

Implement measures to ensure live music venues can co-exist with nearby residential and other noise sensitive land uses.

3.3.3 Clause 18.02-7S Airports and Airfields

Objective:

To strengthen the role of Victoria's airports and airfields within the state's economic and transport infrastructure, facilitate their siting and expansion, and protect their ongoing operation

Strategies:

Plan for areas around all airfields so:

– Any new use or development that could prejudice the safety or efficiency of an airfield is precluded.
– The detrimental effects of aircraft operations (such as noise) are taken into account in regulating and restricting the use and development of affected land.
– Any new use or development that could prejudice future extensions to an existing airfield or aeronautical operations, in accordance with an approved strategy or master plan for that airfield, is precluded.

Policy documents:

National Airports Safeguarding Framework (as agreed by Commonwealth, State and Territory Ministers at the meeting of the Standing Council on Transport and Infrastructure on 18 May 2012).

3.3.4 Clause 21.07-1 Transport

Notes of particular interest to the Precinct within this clause include:

– The potential relocation of the Shepparton aerodrome but only following detailed feasibility investigations in the demand for air services, the capacity of the existing facility, and potential locations for a new facility. This issue becomes more critical as the southern growth corridor develops, with implications for adjacent land use
– The development of the Goulburn Valley Highway Shepparton Bypass.
– Linkages between the Goulburn Valley Highway Shepparton Bypass and the surrounding arterial road network in order to reduce traffic intrusion to the central shopping areas.
– Road widening where required, particularly in areas where traffic is likely to increase as a result of the Goulburn Valley Highway Shepparton Bypass.
– The planning of freeways and highways and the planning and control of land use and development in the areas through which they pass should be coordinated and integrated especially on the Goulburn Valley Highway.

Objectives

– To minimise any adverse effects of noise from traffic using the Goulburn Valley Highway

Strategies

– Require an application for a noise sensitive use and development (including subdivision) to be accompanied by a report by a qualified acoustic consultant outlining the necessary noise control measures which should be undertaken

3.3.5 Clause 53.06 Live music entertainment venues

Requirements to be met

A noise sensitive residential use must be designed and constructed to include acoustic attenuation measures that will reduce noise levels from any:

– Indoor live music entertainment venue to below the noise limits specified in the Environment Protection Regulations under the *Environment Protection Act 2017* and the incorporated Noise Protocol (Publication 1826.2, Environment Protection Authority, November 2020).
    - It is noted that Publication 1826.4 (EPA, May 2021) as outlined in Section 3.1 supersedes Publication 1826.2.
– Outdoor live music entertainment venue to below 45 dB(A), assessed as an L_{eq} over 15 minutes.

For the purpose of assessing whether the above noise standards are met, the noise measurement point may be located inside a habitable room of a noise sensitive residential use with windows and doors closed (consistent with EPA Publication 1826.2).

3.3.6 Clause 55.07 and 58.04 Amenity impacts

Clause 55.07-7 and Clause 58.04-3 of the Greater Shepparton planning scheme specifies indoor noise levels that should be met for apartments and where there are more than two dwellings on a lot within industrial areas or within a road or rail *noise influence area*. It is noted that there are no specific clauses related to single dwellings on a lot, however guidance is sought from Clause 55.07-7 and Clause 58.04-3 to provide a basis for appropriate noise amenity for these dwellings.

It is noted that the requirements are the same as those in VPP Clause 55.07 and 58.04 as outlined in Section 3.2.1.

3.4 Indoor sound levels – AS/NZS 2107: 2016

It is recommended the indoor sound levels of any building comply with the Australian Standard AS/NZS 2107:2016 "*Acoustics – Recommended design sound levels and reverberation times for building interiors*" (AS/NZS 2107: 2016) in addition to the requirements of VPP Clauses 55.07-7 and 58.04-3, and Greater Shepparton Planning Scheme Clauses 55.07-7 and 58.04-3.

Table 1 of AS/NZS 2107: 2016 outlines recommended design sound levels and reverberation times for residential buildings, as reproduced in Table 2.

Table 2 Table 1 of AS/NZS 2107: 2016 Design sound levels for residential buildings

Type of occupancy/ activity	Design sound level ($LA_{eq,t}$) range
Houses and apartments in suburban areas or near minor roads	
Apartment common areas (e.g. foyer, lift lobby)	45 to 50
Living areas	30 to 40
Sleeping areas	30 to 35
Work areas	35 to 40

3.5 Victorian Passenger Rail Infrastructure Noise Policy

The Victoria *Passenger Rail Infrastructure Noise Policy* (PRINP 2013) provides guidance to the transport bodies and planning authorities in their consideration of the impact of rail noise from improved, new passenger rail infrastructure and from changes to land use near existing or planned rail corridors. The guidelines provide a set of investigation threshold to guide relevant authorities when assessing rail noise if further mitigation is required.

If an assessment shows the investigation threshold is not exceeded, noise impacts can be considered a secondary matter and no further actions are needed under the PRINP 2013.

The investigation threshold for the change in land use near an existing rail corridor is presented in Table 3. The noise levels shown in Table 3 are external noise levels.

Table 3 PRINP investigation threshold for land use change near existing rail

Time	Type of receiver	Investigation threshold(s)
Day (6 am – 10 pm)	Residential dwellings and other buildings where people sleep including aged person homes, hospitals, motels and caravan parks. Noise sensitive community buildings including schools, kindergartens, libraries.	L_{Aeq} 65 dB or L_{Amax} 85 dB
Night (10 pm – 6 am)	Residential dwellings and other buildings where people sleep including aged person homes, hospitals, motels and caravan parks	L_{Aeq} 60 dB or L_{Amax} 85 dB

3.6 Sleep disturbance

Impact of noise on sleep quality is greatly studied from long term effects perspective and sleep disturbance due to intermittent events is better correlated with maximum noise levels. Long term effects are typically addressed via design of average noise levels (such as $L_{Aeq,8hr}$), whereas sleep disturbance is better correlated to the maximum noise levels per event (i.e. L_{Amax}). Sleep disturbance can occur via changes in sleep state and awakening is more related to subjective assessments of sleep quality [NSW Road Noise Policy 2011 (NSW RNP)].

The World Health Organisation (WHO) *Guidelines for Community Noise* recommend a maximum internal noise level of L_{Amax} 45 dB(A) for sleeping areas and can be considered as equivalent to 60 dB(A) external noise level based on a 15 dB outside and inside conversion for partially open windows. It is noted that a level of L_{Amax} 45 dB(A) is based on the noise level at which effects of noise induced awakenings are observed.

Studies by the enHealth Council documented report titled *The health effects of environmental noise – other than hearing loss* dated May 2004 and also referenced in NSW RNP states that for short term events for good sleep over eight hours the indoor sound pressure level measured as a maximum instantaneous value should not exceed approximately L_{Amax} 45 dB(A) more than 10 or 15 times per night.

The NSW RNP also provides a summary of research in relation to noise induced sleep disturbance to date including the WHO and enHealth concluding the following:

– Maximum internal noise levels below 50–55 dB(A) are unlikely to awaken people from sleep
– One or two noise events per night, with maximum internal noise levels of 65–70 dB(A), are not likely to affect health and wellbeing significantly

A summary of the discussed sleep disturbance criteria is presented in Table 4. The NSW RNP approach has been previously accepted by Victorian Civil and Administrative Tribunal (VCAT) in relation to sleep disturbance.

Table 4 Summary of L_{max} criteria for sleep disturbance

Source	Recommended internal L_{Amax}	Equivalent recommended external level(1)	Comment
WHO	45 dB(A)	60 dB(A)	Level at which the effects of noise induced sleep disturbance are observed.
enHealth Council	45 dB(A)	60 dB(A)	Recommended maximum noise level not exceed more than 10 – 15 times per night for a good sleep over 8 hours.
NSW RNP	50 – 55 dB(A)	65 – 70 dB(A)	Level below unlikely to awaken people from sleep
	65 – 70 dB(A)	80 – 85 dB(A)	Level that not likely to affect health and wellbeing significantly if only occur one or two events per night.
Equivalent external level based on a typical outdoor to indoor conversion of 15 dB for partially open windows. This is adopted by WHO and other guidelines.			

3.7 Aircraft noise – AS 2021

Aircraft noise impact is assessed against the requirements of the Australian Standard AS 2021:2015 – *Acoustics – Aircraft Noise Intrusion – Building Siting and Construction*.

3.7.1 Aerodromes with ANEF charts

In accordance with the AS 2021, the acceptability of the location of building is dependent on the applicable ANEF (Australian Noise Exposure Forecast) from aircraft noise to the site as outlined in Table 5.

Table 5 AS2021 Building acceptability based on Aircraft noise exposure

Building type	Site ANEF		
	Acceptable	**Conditionally Acceptable**	**Unacceptable**
House, home unit, flat, caravan park	< 20 ANEF	20 – 25 ANEF	>25 ANEF
Hotel, motel, hostel	< 25 ANEF	25 – 30 ANEF	>30 ANEF
School, university	< 20 ANEF	20 – 25 ANEF	>25 ANEF
Hospital, nursing home	< 20 ANEF	20 – 25 ANEF	>25 ANEF
Public building	< 20 ANEF	20 – 30 ANEF	>30 ANEF
Commercial building	< 25 ANEF	25 – 35 ANEF	>35 ANEF
Light industrial	< 30 ANEF	30 – 40 ANEF	>40 ANEF
Other industrial	Acceptable in all ANEF Zones		

Acceptable sites

For a building site that is classified as 'acceptable', there is usually no need for the building design and construction to provide protection specifically against aircraft noise. However, it should not be inferred that aircraft noise will be unnoticeable in areas with ANEF 20 contour or lower.

Conditionally acceptable sites

For a building site that is classified as 'conditionally acceptable', the maximum aircraft noise levels for the relevant aircraft within the proposed development should achieve the recommended AS 2021 indoor design aircraft noise levels.

Unacceptable sites

For a building site that is classified as 'unacceptable', construction of the proposed building should not normally be considered. Where in the community interest redevelopment is to occur in such areas where the relevant planning authority determines that a development may be necessary within existing built-up areas designated as unacceptable, then constructions should consider attenuation measures to achieve the recommended AS 2021 indoor design aircraft noise levels.

3.7.2 Aerodromes without ANEF charts

In accordance with AS 2021, where aerodrome usage is confined to a small number of civil, non-jet aircraft movements the production of an ANEF chart may not be justified and is unlikely to occur. In these cases, the acceptability of a building site depends on both the maximum aircraft noise level and the average number of flights per day over the site.

Table 6 presents the building site acceptability based on aircraft noise levels, as per AS 2021.

Table 6 AS2021 Building acceptability based on Aircraft noise levels

Number of flights per day	Aircraft noise level expected at building site, dB(A)		
	Acceptable	**Conditionally Acceptable**	**Unacceptable**
House, home unit, flat, caravan park, school, university, hospital, nursing home			
>30	<70	70-75	>75
15 – 30	<80	80-85	>85
<15	<90	90-95	>95

Number of flights per day	Aircraft noise level expected at building site, dB(A)		
Hotel, motel, hostel, public building			
>30	<75	75-80	>80
15 – 30	<85	85-90	>90
<15	<95	95-100	>100
Commercial building			
>30	<80	80-85	>85
15 – 30	<90	90-95	>95
<15	<100	100-102	>105

Acceptable sites

For a building site that is classified as 'acceptable', there is usually no need for the building design and construction to provide protection specifically against aircraft noise.

Conditionally acceptable sites

For a building site that is classified as 'conditionally acceptable', the required noise reduction should be determined the maximum aircraft noise levels for the relevant aircraft within the proposed development should achieve the recommended AS 2021 indoor design aircraft noise levels.

Unacceptable sites

For a building site that is classified as 'unacceptable', construction of the proposed building should not normally be considered. Where in the community interest redevelopment is to occur in such areas where the relevant planning authority determines that a development may be necessary within existing built-up areas designated as unacceptable, then constructions should consider attenuation measures to achieve the recommended AS 2021 indoor design aircraft noise levels.

3.8 National Airport Safeguarding Framework

The *National Airports Safeguarding Framework* (NASF) developed by the Department of Infrastructure, Regional Development and Cities provides guidance on planning requirements for development that affects aviation operations. This includes building activities around the airport that might impact airport operations.

Guideline A of the NASF provides advice on the use of a supplementary suite of noise metrics, including the Australian Noise Exposure Forecast (ANEF) system and frequency-based noise metrics (N-contours), to inform strategic planning and provide communities with comprehensive and understandable information about aircraft noise.

3.9 EPA Guideline 1043.1 Guidelines on noise from frost fans

Noise from frost fans is managed under EPA Guideline 1043.1 *Guidelines on noise from frost fans* (EPA Victoria, 2012).

There is currently no legislative framework in Victoria for noise emissions from frost fans and it is also a noise source that is specifically excluded from the provisions of the EPR 2021. Therefore, guidance is sought from EPA Guideline 1043.1 to provide a benchmark of noise levels for which, if exceeded, may be considered unreasonable.

Table 7 provides the recommended noise levels for various planning zones as outlined in EPA Guideline 1043.1 for noise from frost fans.

Table 7 EPA Guideline 1043.1 Recommended noise levels for rural planning zones

Planning zone categories	Outdoor noise level, dB(A)[5]		Indoor noise level, dB(A)[5]
	< 12 likely frost events[6]	≥ 12 likely frost events[6]	
Residential / Rural Living[1,2]	40		25
Rural Activity[3]	45	40	30
Farming[4]	50	45	30

Notes:

1. Residential/Rural Living is land zoned in the planning scheme as 'Residential 1', 'Residential 2', 'Residential 3', 'Low Density Residential', 'Mixed Use', 'Township' or 'Rural Living'. The 'Rural Conservation', 'Green Wedge' or 'Green Wedge A' zones are also included in this category. Zones in this category are considered noise-sensitive areas.
2. The recommended noise levels for 'Rural Activity Zone' may be applied to specified areas of 'Green Wedge Zone' where:
    a. Current and future anticipated land use is acknowledged by the local council to be an intensive farming area in nature; and
    b. All allotments are fully utilised and it is not planned to develop land for residential purposes
3. Rural Activity Zone recognises those areas where farming and other rural lifestyle activities can coexist, as described in the Department of Sustainability and Environment's *New Zones for Rural Victoria*, published in June 2004.
4. Farming zone recognises those areas where farming is the predominant use. The aim of this zone is to cater for the full range of farming activities, as described in *New Zones for Rural Victoria.*
5. Indoor measurements are made with the window closed in a habitable room: any room other than a kitchen, storage area, bathroom, laundry, toilet or pantry. The predicted or measured noise levels are $L_{Aeq,15min}$ with all frost fans (proposed or actual) operating. Outdoor measurements are made at least 3.5 m from the external wall of the building.
6. 'Likely frost events' – the mean number of days per year with a minimum daily temperature less than 0˚C for the months of May to December (inclusive). This is recorded at the most relevant meteorological monitoring station and averaged over the number of years of recorded meteorological information (available from www.bom.gov.au).

For the assessment of frost fans, EPA Guideline 1043.1 recommends that noise levels be estimated at dwellings within 1,000 metres of the nearest fan.

3.10 EPA Guideline 1254.2 Noise Control Guidelines

EPA Guideline 1254.2 Noise Control Guidelines (EPA Victoria, 2021) provides guidelines intended to be used by municipal officers to assist in the resolution of complaints or to avert a possible noise nuisance. Many of the guidelines contained within EPA Guideline 1254.2 do not require an actual measurement of noise, however provides guidelines on what constitutes an activity to be unreasonable with regards to noise emissions. Of relevance to the precinct is the use of scare guns for orchard farming. Scare guns are used for the purpose of scaring away birds from crops and orchards by emitting an explosive noise. While this noise frightens birds away, it can also cause significant annoyance to neighbours living in the area.

EPA Guideline 1254.2 provides the following guidelines for the control of noise from scare guns:

– A scare gun must not be used if the distance between the scare gun and any complainant's house is less than 300 metres (See Note 2)
– The scare gun must not emit more than 70 blasts/day.
– The scare gun must not be used earlier than 7 am or later than sunset. Earlier starting times will be allowed if this is agreed to by the complainants.
– The total time of operation of a scare gun must not exceed 12 hours in any one day. However, the time of operation may be divided into two separate periods, provided the interval between blasts is not less than six minutes.
– The scare gun must be located as far away as possible from any complainant's house.
– Wherever possible, the shielding effects of natural features, buildings and so on shall be used to reduce the level of the blasts at the complainants' houses.
– Wherever possible, the use of the scare gun shall be minimised.

Notes:

1. These guidelines are based on an average maximum level of 100 dB LIN Peak of the loudest 20 per cent of blasts measured at the complainant's home when the weather favours noise propagation.
2. Where the level of the blast from a scare gun can be adjusted, then the distance between the scare gun and any complainant's house may be less than 300 metres. In this case, the adjusting mechanism must be permanently fixed such that the average maximum level of the blasts at the house does not exceed 100 dB LIN Peak.
3. Weather conditions affect the propagation of noise. Received levels are loudest when the wind blows from the source to the receiver. Temperature inversions, which often occur in the early mornings after a clear night, also increase noise propagation.

4. Identified noise sources and site survey

4.1 Identified industrial noise sources

A site inspection of the Precinct and surrounding area was conducted by GHD on 3 February 2022. This was supplemented by research using aerial imagery from Google Earth and Google Street View.

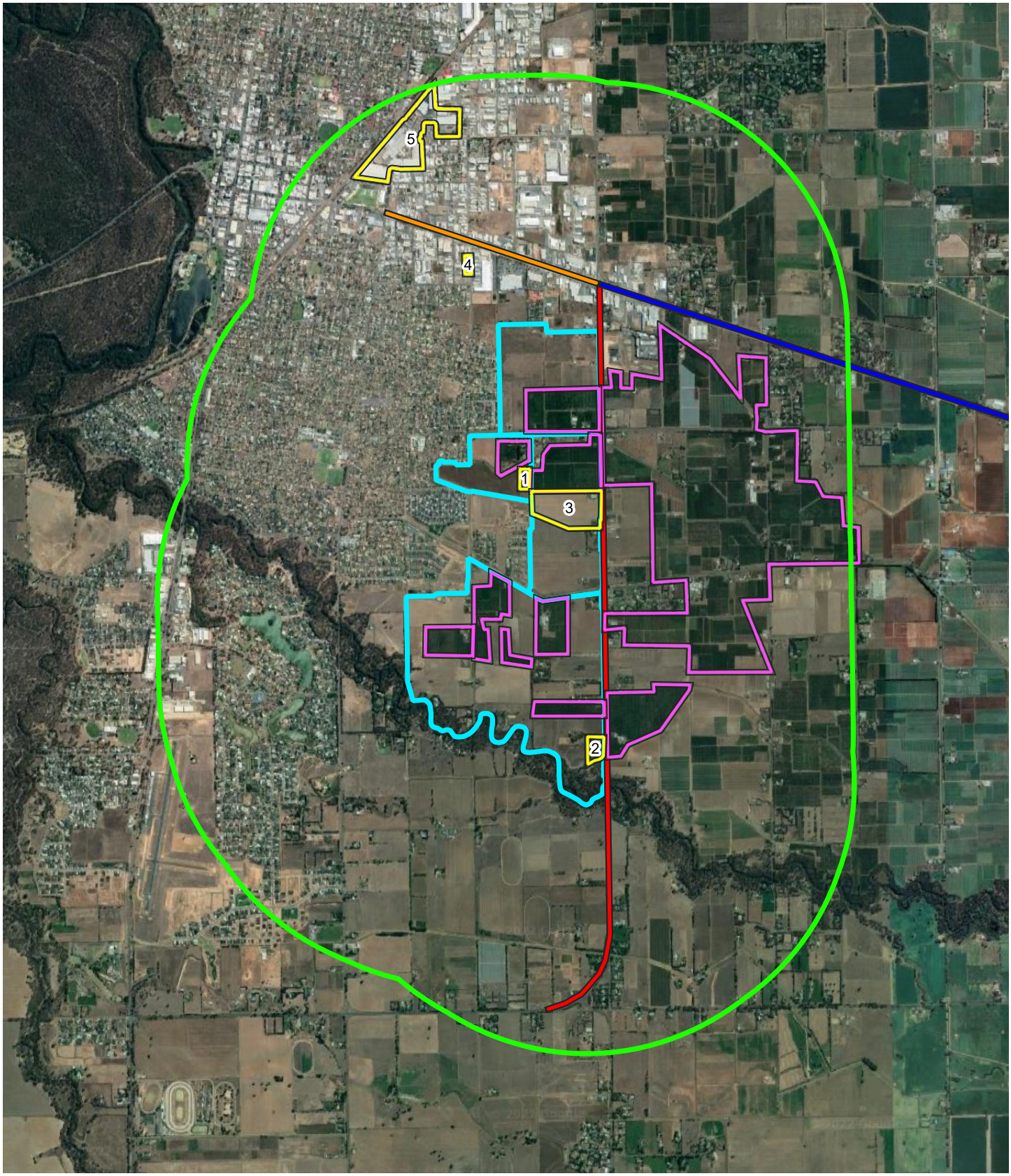
Following GHD's site visit, the industries listed in Table 8 were identified to have the potential to emit significant noise or vibration, within a 2 km radius of the Precinct.

For each identified industry, Table 8 shows the company, type of operation, street address, potential sources and location of the industry with respect to the Precinct. Refer to Figure 4 for locations of the industries that have been identified.

It is noted that the air amenity assessment report identified a number of additional industries. However, based on GHD's site visit, these additional industries were not noted to emit any significant noise or vibration and, therefore, have not been included in Table 8 below.

Table 8 Industrial / commercial noise and vibration sources

ID in Figure 4	Business name	Address	Operations	Potential sources of amenity impact	Operational hours
Within Precinct					
1	Rendevski Transport	32 Feiglin Road, Shepparton	Trucking company	Vehicle movements	Unknown
2	JDK cold storage warehouse	630B Doyles Road, Shepparton	Cold storage facility	External mechanical equipment	Unknown
3	KNM Shelving	420 Doyles Road, Shepparton	Shelving supplier	Storage and material handling	Mon – Fri: 9 am – 5 pm Sat: 9 am – 12:30 pm Sun: Closed
Outside Precinct					
4	Boral Concrete	74 Benalla Road, Shepparton	Concrete batching	Concrete batching and heavy vehicles	Mon – Fri: 7 am to 5 pm Sat: 7 am to 12 pm Sun: Closed
5	SPC Ardmona Limited	Andrew Fairley Avenue, Shepparton	Fruit and vegetable packaging and processing	Food processing activities	Mon – Fri: 9 am – 6 pm Sat – Sun: 9 am – 5 pm



Legend

- Identified Industries
- Agricultural Area
- 2km radius
- Precinct boundary

Roads

- Benella Road
- Doyles Road
- Midland Highway

Paper Size ISO A4

0 1 2 km

N

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

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Greater Shepparton City Council

Noise Amenity Impact Assessment

Identified industries

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Revision No. **0**
Date. **06/04/2022**

FIGURE 4

Document Path: N:\AU\Melbourne\Projects\31\12556721\GIS\Maps\Working\12556721-QGIS_Site location - Noise Assessment.qgz
Print Date: 06/04/2022

Data Source: Google Earth Imagery 2021.
Created By: jcheah

4.2 Site noise surveys

During the site visit, attended noise measurements were conducted of various identified major noise sources within and around the Precinct. Refer to Figure 5 for locations of the attended noise measurements.

Noise measurements were undertaken using a SVAN 977 (Class 1) sound level meter (serial number 69212). The microphone was mounted on a tripod at a height of approximately 1.5 m above local ground level. All noise monitoring instrumentation were in National Association of Testing Authorities (NATA) calibration at the time of use. All instruments were field checked and calibrated both before and after noise measurements with a SVAN SV30 field calibrator (serial number 44650). No discrepancies equal to or greater than 1 dB were noted throughout the measurements as required under Section 5.6 of Australian Standard AS 1055:2018 *Acoustics – Description and Measurement of Environmental Noise* (Standards Australia, 1997).

4.2.1 Background measurements

Background noise levels were measured at the locations shown in Figure 5. The measured background noise levels at the site are detailed in Table 9.

Table 9 Background noise measurements

Location	Time	Duration (mm:ss)	L_{90}, dB(A)	Noise sources
A1	2:42 PM	5:53	46	– Wind moving vegetation including grass and trees – Traffic noise in distance – Aircraft flyover – Crickets
A2	2:52 PM	5:46	46	– Wind moving vegetation including bushes and grass – Birds and insects – Traffic from nearby Doyles Road and Channel Road
A3	3:07 PM	5:20	51	– Wind moving vegetation including trees – Local traffic passby – Aircraft flyover – Birds and insects

4.2.2 Traffic noise

Traffic noise levels have been measured along Doyles Road at the locations shown in Figure 5. It is noted that during the site visit, traffic noise was noted to be the dominant noise source within the Precinct. The measured traffic noise levels are detailed in Table 10.

Table 10 Short term traffic noise measurements

Location	Time	Duration (mm:ss)	L_{eq}, dB(A)	L_{max}, dB(A)	Notes
A4	3:17 PM	5:16	74	88	Significant amount of heavy vehicles travelling along Doyles Road
A5	3:27 PM	5:12	71	84	
A6	3:38 PM	5:12	73	90	

Traffic noise along Doyles Road was noted to be loud, especially with a large number of heavy vehicles.

4.2.3 Industrial/Commercial activity noise

Attended measurements were undertaken for the identified industrial sources outlined in Table 8 at the locations shown in Figure 5. A summary of the measured industrial/commercial activity noise levels is detailed in Table 11.

Table 11 Industrial/Commercial noise measurements

Location	Time	Duration (mm:ss)	L_{eq}, dB(A)	Noise sources and notes
A7 (Boral Concrete)	1:24 PM	11:23	64	– Low rumble from site barely audible – Concrete trucks entering and exiting site – Traffic noise dominant from local roads
A8 (Rendevski Transport)	1:44 PM	10:07	63	– Traffic noise dominant from local roads – Wind moving vegetation including trees – Barely audible mechanical noise from ventilation system. Was not able to locate noise source from public land. – Vehicle/plant movement on site – dominant noise source from the site.
A9 (JDK cold storage warehouse)	2:04 PM	10:09	71	– Traffic noise dominant – No audible noise from factory/warehouse above traffic noise – Barely audible noise from fire water storage tanks to south of site

Boral concrete

Considering the noise measurements at Boral Concrete, the distance to the Precinct, and noise emissions from Boral Concrete not being audible within the Precinct, noise emissions from Boral Concrete will not affect the Precinct.

SPC Ardmona Limited

During GHD's site visit, noise emissions from SPC Ardmona Limited were audible at the surrounding streets that bound the factory. However, noise emissions from SPC Ardmona Limited was not audible within the Precinct and, therefore, will not affect the Precinct. Based on noise emissions from SPC Ardmona Limited not being a concern to the Precinct, no noise measurements were undertaken at this industry.

Rendevski Transport

It is noted that the main noise emissions from Rendevski Transport were vehicle and plant movements around site, with mechanical noise from the ventilation system barely audible during quiet periods. Traffic noise along Feiglin Road was noted to be the dominant noise source in the area.

JDK cold storage warehouse

It is noted that a hum from the water storage tanks to the south of the site was audible at the monitoring location. While it is expected that the refrigeration plant located to the north of the site would be the dominant noise source from the site, noise from the refrigeration plant was not audible during the site visit from publicly accessible land above traffic noise. Traffic noise along Doyles Road was the dominant noise source in the area during the site visit.

KNM Shelving

KNM Shelving is another commercial development located within the precinct. During GHD's site visit, it was noted that noise emissions from the property were not audible along Doyles Road in front of the store and, therefore, no noise measurements were undertaken at this property. Local traffic noise along Doyles Road was the dominant noise source in the area. Noise emissions from KNM Shelving is not expected to have any noise amenity impact on the Precinct.

4.3 Agriculture noise sources

To the east of the Precinct (east of Doyles Road), orchard farming is the predominant activity. The following noise sources associated with orchard farming have the potential to cause adverse noise amenity impacts to the Precinct:

Frost fans

Frost fans are large fans that are used to circulate air over a wide area where crops are grown. Noise from frost fans occur from the turning of the fan and the motor that drives the fan. The fans are used on occasions when there is a risk of frost damage to the crops. This typically occurs during the colder months of the year and typically occurs at night and in the early morning when frost risk is at its highest

Scare guns

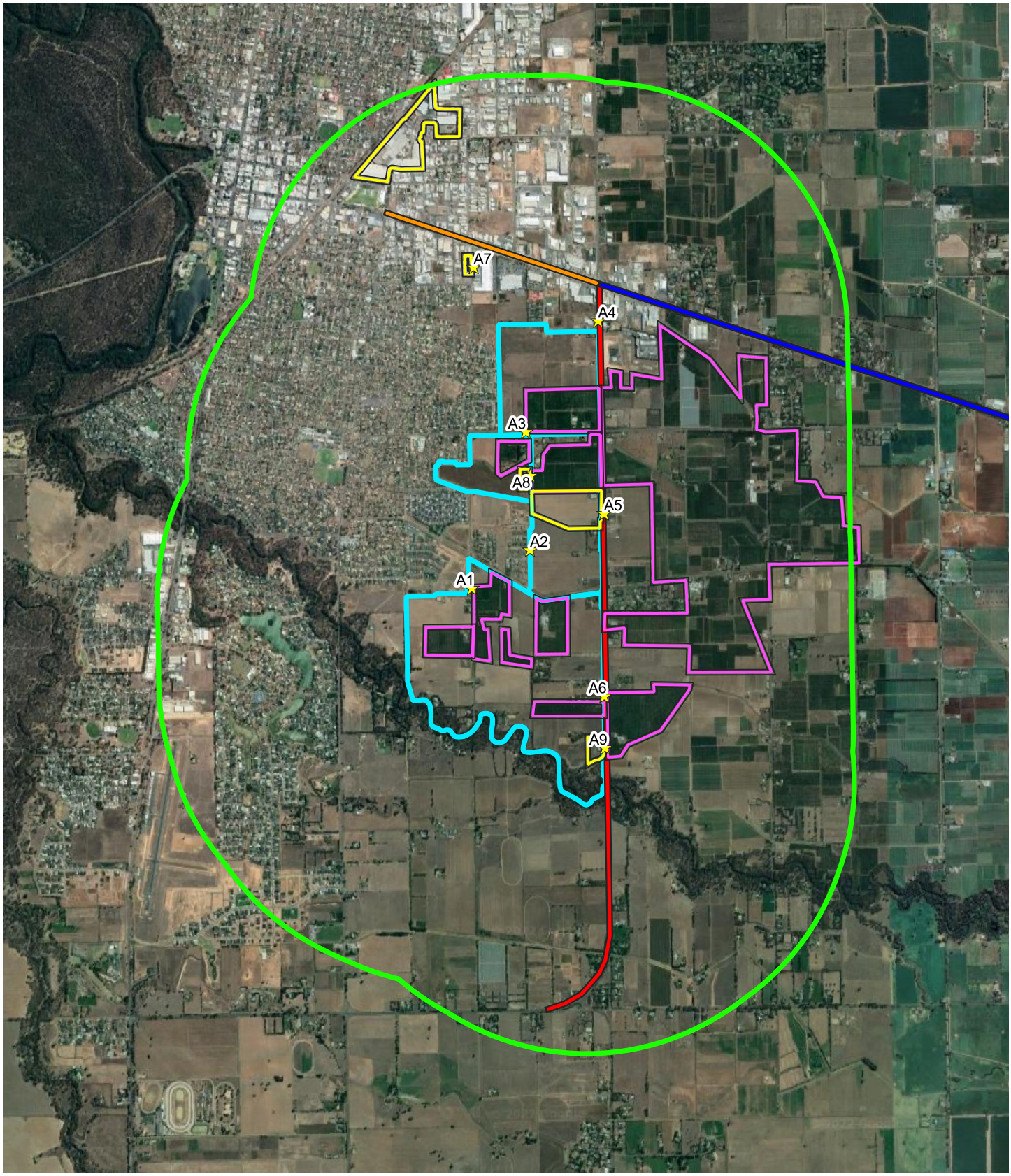
Scare guns are devices that produce a loud explosive sound for the purpose of scaring away birds from crops and orchards. Scare guns, also known as gas guns or scatter guns, produce an explosive noise by the ignition of a charge of gas and air. Some scare guns rotate after firing so that the next blast is emitted in a different direction, which is intended to increase the surprise effect on birds.

Mobile machinery

Various mobile machinery utilised within the orchard such as tractors and the like.

4.4 Irrigation noise sources

Various irrigation channels currently run through the Precinct area and are expected to remain as the Precinct is developed. To assist with groundwater flow, diesel water pumps at various locations along irrigation channels may be utilised. These diesel water pumps have the potential to emit noise and cause adverse noise amenity impacts to the Precinct.



Legend

- Identified Industries
- Agricultural Area
- 2km radius
- Precinct boundary
- Attended Measurement Locations

Roads

- Benella Road
- Doyles Road
- Midland Highway

Paper Size ISO A4

0 1 2 km

N

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

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Noise Amenity Impact Assessment

Attended measurement locations

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FIGURE 5

Document Path: N:\AU\Melbourne\Projects\31\12556721\GIS\Maps\Working\12556721-QGIS_Site location - Noise Assessment.qgz
Print Date: 06/04/2022

Data Source: Google Earth Imagery 2021.
Created By: jcheah

5. Complaint history

The past performance of surrounding industry is a good indicator of the level of off-site amenity protection needed. EPA Victoria has provided a list of all noise complaints within a 2 km radius of the Precinct between 1 July 2016 to 30 June 2021. 14 noise complaints were made during this period, two of which were attributed to large businesses, six attributed to small business. Five complaints were attributed to an unknown source and a residential location and one complaint attributed to a gas scare guns enquiry.

Furthermore, GHD requested Council to review if there have been any complaints for the identified noisy industries with potential to impact on the Precinct. Council confirmed that there were no complaints on file for these businesses.

6. Preliminary noise assessment

6.1 Commercial/Industry

6.1.1 Noise Protocol zoning levels

Currently, the proposed Precinct is located within a Farming Zone. Should the Precinct be rezoned, the Noise Protocol noise limits may change. It is noted that if the Precinct is rezoned to a General Residential Zone, or other Type 1 zone as per Annex A of the Noise Protocol, the Noise Protocol zoning levels for noise emissions from commercial and industry may become more stringent. This will also be dependent on background noise levels and the assessment location.

More stringent noise limits may result in noise mitigation measures being required to mitigate environmental noise emissions for existing commercial and industrial premises within or surrounding the precinct.

The Noise Protocol noise limits are dependent on the time of day, zoning levels and background noise levels at the assessment site. Table 12 outlines the indicative Noise Protocol zoning levels for an assessment site within the Precinct that is fully contained within the Farming Zone (more than 200 metres away from any Type 1 zone) and if the Precinct is rezoned to a General Residential Zone or similar Type 1 zone.

Table 12 Indicative Noise Protocol zoning levels within the Precinct

Precinct zone	Zoning Level, dB(A)		
	Day	Evening	Night
Farming Zone (Type 2)	59	53	48
General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol	50	44	39

Dependent on the assessment location, a difference in noise limits of up to 9 dB(A) may apply for noise emissions from commercial and industry, in accordance with the Noise Protocol.

Based on the above, it is expected that potential rezoning will improve the general acoustic environment and noise amenity in the area in relation to industrial/commercial noise by managing emissions to lower limits compared to that currently applicable under a Farming Zone.

A 9 dB reduction in noise levels for existing commercial/industrial sites, however, will potentially mean significant additional noise mitigation works for these premises to enable compliance with environmental noise limits.

Under the current EP Act, EPR and General Environmental Duty (GED) obligations, industrial and commercial premises are required to consider noise mitigation measures as far as reasonably practical to minimise noise impact even if compliant with relevant Noise Protocol limits. This, however, may have potential impact on operation of such existing commercial/industrial premises within and surrounding the precinct.

Accordingly, where such rezoning is expected, it is recommended that a further study is undertaken to identify such commercial and industrial premises and relevant consultation be made with stakeholders including EPA to assess potential impacts and mitigation strategies moving forward.

6.1.2 Commercial/industry outside of the precinct

During GHD's site visit, it was noted that noise emissions from the group of commercial premises to the north of the precinct along the Midland Highway were not audible above general traffic noise within the Precinct area. Additionally, as noted in Section 4.2.3, noise emissions from Boral Concrete and SPC Ardmona Limited is not expected to have any noise amenity impact to the Precinct.

An Industrial 1 Zone (IN1Z) is located adjacent to the Precinct boundary to the north, which contains the East Shepparton Bowling Club and other vacant land, for which a 300 metre noise influence area is applicable in accordance with the provisions of the VPP Clauses 55.07 and 58.04, and Greater Shepparton Planning Scheme Clauses 55.07 and 58.04. The industrial zones and applicable 300 metre noise influence area are shown in Figure 6.

Accordingly, any proposed noise sensitive development within the Precinct located within the noise influence area should be required to undertake a detailed noise intrusion assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the proposed design meets the following internal noise limits from external noise sources:

– Recommended indoor noise limits outlined in VPP Clauses 55.07-7 and 58.04-3 and Greater Shepparton Planning Scheme Clauses 55.07-7 and 58.04-3 as follows:
    - Not greater than 35 dB(A) for bedrooms, assessed as an $L_{Aeq,8h}$ from 10 pm to 6 am
    - Not greater than 40 dB(A) for living areas, assessed $L_{Aeq,16h}$ from 6 am to 10 pm
– Satisfaction of the sleep disturbance criteria in the bedrooms or sleeping areas in accordance with World Health Organisation (WHO) recommendations as follows:
    - Maximum internal noise levels (L_{Amax}) not exceeding 45 dB(A)

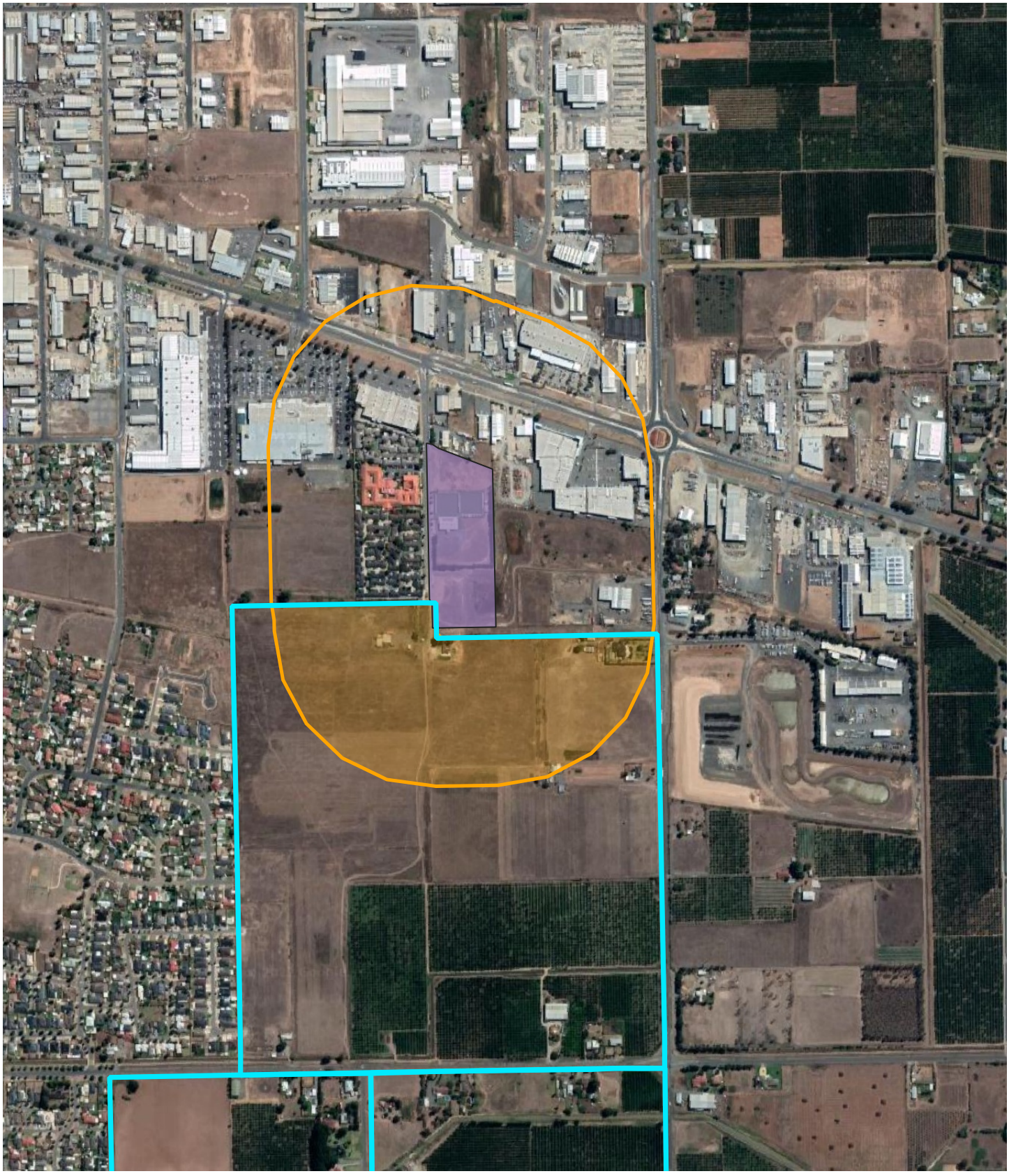
The Industrial 1 Zoning for containing the East Shepparton Bowling Club has been recognized to compromise long term intentions for the area, including the development of future residential dwellings (Industrial Land Review Revision C, City of Greater Shepparton, June 2011), and, therefore, has been proposed to be rezoned. However, it is noted that until this area is rezoned and remains an Industrial 1 Zone (IN1Z), the above recommendations should be considered to manage potential impact from the industrial uses that may be located in this area.

It is also noted that the 300 metre noise influence area for other Industrial 1 Zones on the northern side of Midland Highway does not encroach into the Precinct and, therefore, does not require any further consideration.

6.1.3 Future commercial tenancies on the site

Commercial tenancies could be located towards the centre of the precinct, close to residents along Feiglin Road.

As detailed layouts and specific area uses aren't confirmed at this stage, commercial tenancies are recommended to be assessed during the detailed design stage of the project. However, it is noted that it will be the responsibility of the future tenants to comply with the requirements of the Noise Protocol at the nearest existing and future approved noise sensitive receivers at the time.



Legend

- Precinct boundary
- IN1Z Noise Influence Area (300 m)
- Industrial 1 Zone (IN1Z)

Paper Size ISO A4

0 100 200 m

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

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Greater Shepparton City Council

Noise Amenity Impact Assessment

Shepparton South East - Noise Influence Area - Industrial Noise

Project No. **12556721**
Revision No. **0**
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FIGURE 6

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Print Date: 06/04/2022

Data Source: Google Earth Imagery 2021.
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6.1.4 Rendevski Transport

The main noise source noted at Rendevski Transport relates to vehicle (including B-double trucks) and plant movements around site with mechanical noise from the ventilation system barely audible during GHD's site visit and was not a significant component of the existing background noise environment.

The nearest existing noise sensitive receiver to Rendevski Transport is located at 26 Feiglin Road, located directly adjacent to the site on the north. Other nearby existing noise sensitive receivers include 27 and 27A Feiglin Road, approximately 35 metres from the eastern site boundary, noting that 27A Feiglin Road has a direct view of the site.

Noise Protocol zoning levels

Table 13 outlines the Noise Protocol zoning levels for future potential noise sensitive receivers at the site boundary for both current Farming Zone and if the Precinct is rezoned. Note that the Noise Protocol noise limits for the exact location will also be dependent on background noise monitoring.

Table 13 Rendevski Transport – nearest potential sensitive receivers Noise Protocol zoning levels

Receiver	Precinct zone	Zoning Level, dB(A)		
		Day	Evening	Night
Site boundary	Farming Zone (Type 2)	58	52	47
	General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol	50	44	39

Preliminary noise assessment

Based on aerial imagery and observations on site, there is a fence surrounding the site with an approximate height of 1.8 metres. It is also noted that there is a house connected to the site on the north that provides some shielding to the neighbouring resident at 26 Feiglin Road.

It is noted that noise emissions from the site will depend heavily on truck movements through the facility, which is highly variable.

A high level noise assessment was conducted with a noise model developed using Computer Aided Noise Abatement (CadnaA) 2021 noise prediction software implementing the ISO 9613-2 *"Acoustics – Attenuation of sound during propagation outdoors"* noise prediction algorithm to predict noise levels from the site.

The propagation calculations take into account sound intensity losses due to distance attenuation, atmospheric absorption and ground absorption.

As noise emissions from the site will depend heavily on truck movements through the facility, the following assumptions have been undertaken for the high level noise assessment:

– Truck movements at 10 km/h
– 12 truck movements per hour
– B-double truck movement sound power level of 105 dB(A)

In addition to the high level noise prediction, a secondary approach was also considered to examine likely noise impacts. It is generally expected that the existing industry would be compliant with relevant environmental limits at the existing nearest noise sensitive receivers. Assuming that Rendevski Transport meets its relevant environmental obligations in relation to noise, expected noise levels at the Precinct boundary have been established taking into account relative distance from the site to existing receivers and the site boundary.

Based on the developed computational noise model and supplementary assessment, noise emissions from the site have been predicted at future noise sensitive receivers within the Precinct boundary from which the following noise impact areas from Rendevski Transport have been established.

– Noise impact area of 50 metres should the Precinct remain as a Farming Zone
– Noise impact area of 140 metres should the Precinct be rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol.

Figure 7 presents the noise impact areas for both cases as described above.

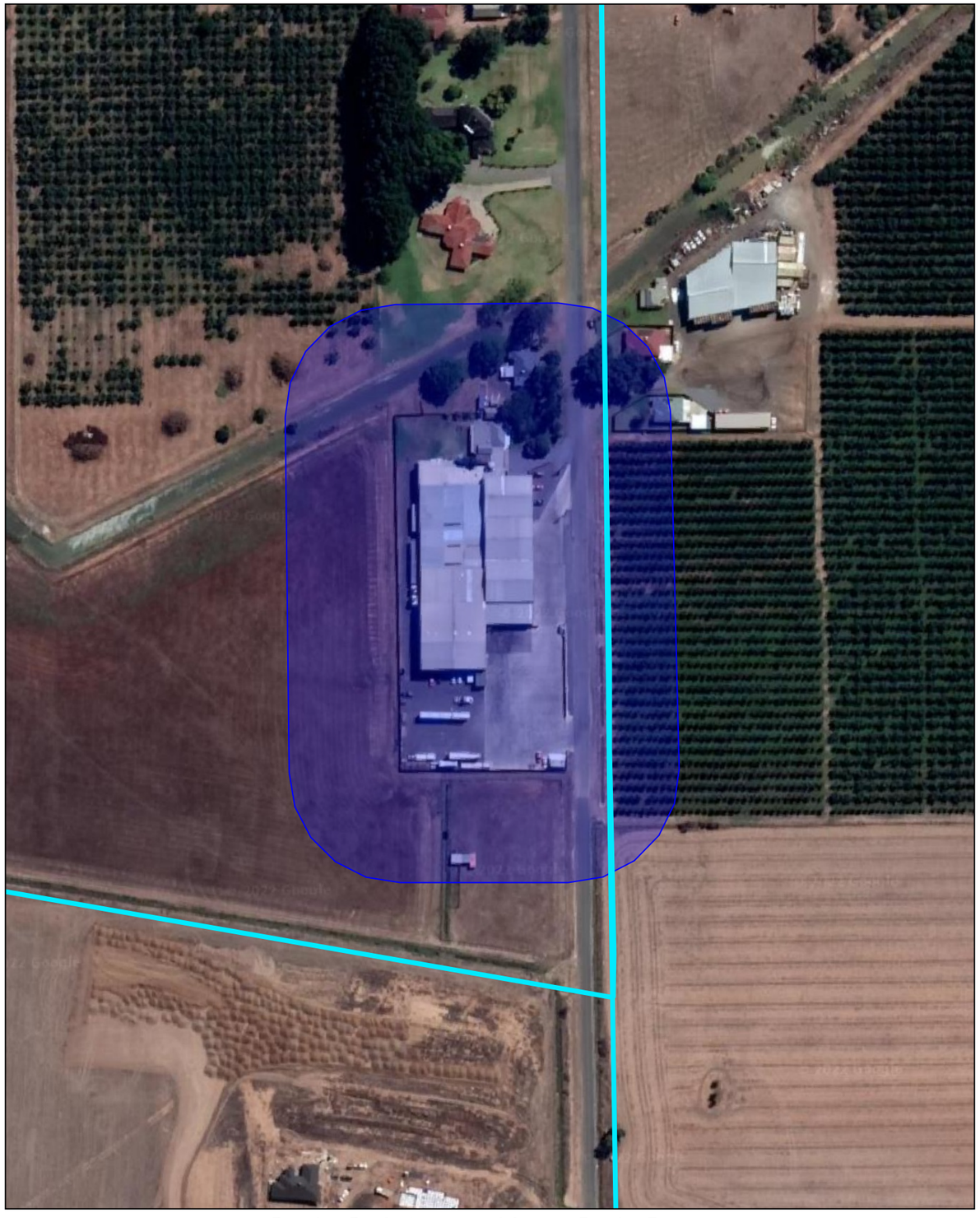
Any noise sensitive use proposed to be located within the established noise impact areas for Rendevski Transport is recommended to be required to undertake a detailed noise assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the proposed design meets the following internal noise limits from external noise sources:

– Recommended indoor noise limits outlined in VPP Clauses 55.07-7 and 58.04-3 and Greater Shepparton Planning Scheme Clauses 55.07-7 and 58.04-3 as follows:
  - Not greater than 35 dB(A) for bedrooms, assessed as an $L_{Aeq,8h}$ from 10 pm to 6 am
  - Not greater than 40 dB(A) for living areas, assessed $L_{Aeq,16h}$ from 6 am to 10 pm
– Satisfaction of the sleep disturbance criteria in the bedrooms or sleeping areas in accordance with World Health Organisation (WHO) recommendations as follows:
  - Maximum internal noise levels (L_{Amax}) not exceeding 45 dB(A)

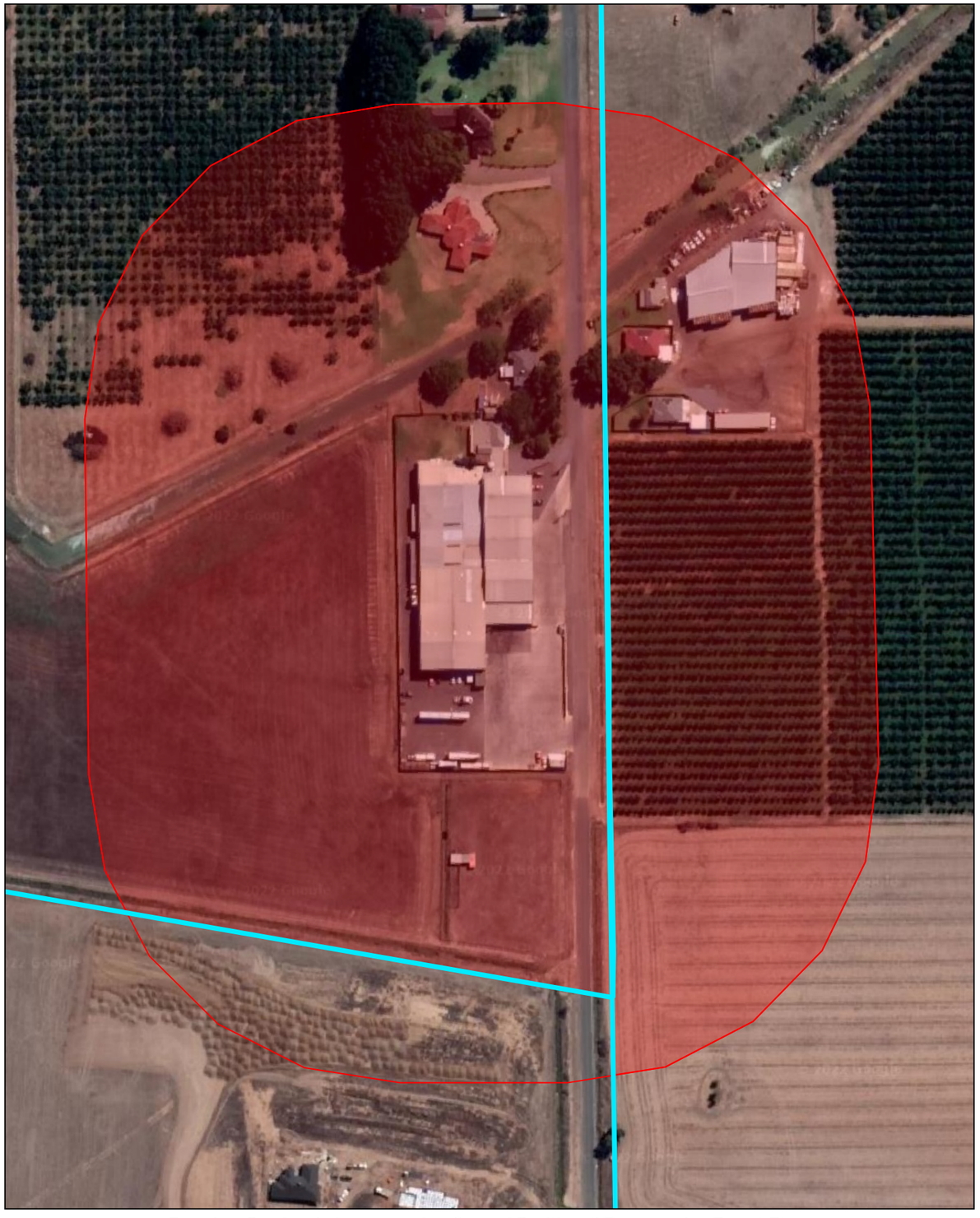
It is considered that there are a number of possible solutions to reducing noise from the operations of Rendevski Transport at future residential dwellings:

– Retain the buffer distances detailed in Figure 7.
– Develop the area within the buffer distances as light industry or local roads to provide a buffer between future residents and Rendevski Transport.

Should Rendevski Transport no longer be in operation, the above recommendations and buffer distances would not apply. Should a new industrial or commercial premises take over the site, it will be the responsibility of the future tenants to comply with the requirements of the Noise Protocol, as outlined in Section 6.1.3 at the nearest existing and future approved noise sensitive receivers at the time.



Based on Precinct zone remaining as a Farming Zone



Based on Precinct being rezoned to General Residental Zone or other Type 1 Zone

Paper Size A3

0 25 50 m

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid Of Australia, Zone 55

N

LEGEND

- Precinct Boundary
- Noise Impact Area - Rendevski Transport (50 m)
- Noise Impact Area - Rendevski Transport (140 m)

Greater Shepparton City Council

Noise Impact Area - Rendevski Transport

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Revision No. **0**
Date. **06/04/2022**

FIGURE 7

6.1.5 JDK Cold Storage Warehouse

During GHD's site visit, the only audible noise source identified at JDK Cold Storage Warehouse was a low hum from the water tanks to the south of the site. It is noted that the land directly adjacent to the south of the site (closest to the water tanks) is zoned as an Urban Floodway Zone and, as such, no noise sensitive uses are expected to be developed in this location.

Although noise levels from the refrigeration plant to the north of the site along the publicly accessible land was not audible above traffic noise during the site visit, it is expected that this equipment would be the dominant noise source from the facility, particularly at night.

The nearest existing receivers to the site are located at 625 Doyles Road, approximately 50 metres from the eastern site boundary, and 630 Doyles Road, approximately 50 metres from the western site boundary.

Noise Protocol zoning levels

Table 14 outlines the Noise Protocol zoning levels for future potential noise sensitive receivers at the site boundary for both current Farming Zone and if the Precinct is rezoned. Note that the Noise Protocol noise limits for the exact location will also be dependent on background noise monitoring.

Table 14 JDK Cold Storage Warehouse – nearest potential sensitive receivers Noise Protocol zoning levels

Receiver	Precinct zone	Zoning Level, dB(A)		
		Day	Evening	Night
Site boundary	Farming Zone (Type 2)	58	51	46
	General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol	50	44	39

Preliminary noise assessment

JDK Cold Storage Warehouse have proposed to upgrade their facility, which is understood to include the following works, which are subject to their own separate planning permit:

– Extend the cool room storage within the existing canopy area at the southern end of the structure
– Construct a new cool store structure on the west side of the existing cool store

Planning permits have been issued for the proposed upgrade to the facility (Permit 2020-7 and Permit 2020-103), which included specific conditions relating to noise for existing and approved noise sensitive receivers at the time. Greater Shepparton City Council also requested a follow up assessment of potential noise impacts from the proposed upgrades to the future dwellings as part of the Precinct to support the planning permit application.

Marshall Day Acoustics conducted an acoustic assessment of the noise emissions from the facility and the proposed upgrades to the future dwellings part of the Precinct in accordance with the relevant environmental noise legislation at the time, which was NIRV[1].

It is noted that the Noise Protocol has since superseded NIRV and, due to the minor changes in criteria establishment, the established noise limits at the nearest sensitive receiver locations have now changed. Table 15 provides a comparison of the established Noise Protocol zoning levels for future potential noise sensitive receivers against the NIRV Recommended Maximum Noise Levels (RMNLs) as determined by Marshall Day Acoustics.

Table 15 Comparison of Noise Protocol zoning levels against NIRV RMNLs

Relevant legislation	Precinct zone	Zoning Level / RMNL, dB(A)		
		Day	Evening	Night
Noise Protocol	Farming Zone (Type 2)	58	51	46
	General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol	50	44	39
NIRV	Farming Zone (Type 1)	50	41	36

[1] Marshall Day Acoustics, *640 Doyles Road, Shepparton—Cool Store Noise Assessment*, RP 001 20200560 Rev 0, dated 9 August 2020

It is noted that the relevant criteria under the Noise Protocol has generally increased from the RMNLs. As such, compliance with NIRV would result in compliance with the Noise Protocol, regardless of whether the precinct is rezoned from a Farming Zone to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol.

Therefore, incorporation of the recommended mitigation measures outlined within the Marshall Day Acoustics Report is expected to result in compliance with the Noise Protocol zoning levels at the nearest future noise sensitive receivers, and no restrictions would apply for any noise sensitive use proposed to be located in close proximity to JDK Cold Storage Warehouse.

It is expected that JDK Cold Storage Warehouse will fulfill their obligation and incorporate the recommended mitigation measures for the existing plant room outlined within the Marshall Day Report

Should JDK Cold Storage Warehouse choose not to pursue any upgrades to the facility, the following noise impact areas from JDK Cold Storage Warehouse have been established based on Marshall Day Acoustics' assessment of the existing noise emissions from the facility:

– No applicable noise impact area should the Precinct remain as a Farming Zone
– Noise impact area as outlined in Figure 8 should the Precinct be rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol, which has been established through noise modelling of the environmental noise emissions of the existing facility and the resultant noise contours.

Any noise sensitive use proposed to be located within the established noise impact areas for JDK Cold Storage Warehouse is recommended to be required to undertake a detailed noise assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the proposed design meets the following internal noise limits from external noise sources:

– Recommended indoor noise limits outlined in VPP Clauses 55.07-7 and 58.04-3 and Greater Shepparton Planning Scheme Clauses 55.07-7 and 58.04-3 as follows:
  - Not greater than 35 dB(A) for bedrooms, assessed as an $L_{Aeq,8h}$ from 10 pm to 6 am
  - Not greater than 40 dB(A) for living areas, assessed $L_{Aeq,16h}$ from 6 am to 10 pm
– Satisfaction of the sleep disturbance criteria in the bedrooms or sleeping areas in accordance with World Health Organisation (WHO) recommendations as follows:
  - Maximum internal noise levels (L_{Amax}) not exceeding 45 dB(A)

It is considered that there are a number of possible solutions to reducing noise from the operations of JDK Cold Storage Warehouse at future residential dwellings such as:

– Retain the buffer distances detailed in Figure 8
– Construct a boundary fence to the Precinct residential zone
– Develop the area within the buffer distances as light industry or local roads to provide a buffer between future residents and JDK Cold Storage Warehouse.

Should JDK Cold Storage Warehouse no longer be in operation and any new industrial or commercial premises take over the site, it will be the responsibility of the future tenants to comply with the requirements of the Noise Protocol, as outlined in Section 6.1.3 at the nearest existing and future approved noise sensitive receivers at the time.

Legend

- Precinct boundary
- Noise Impact Area - JDK Cold Storage
  Applicable if JDK Cold Storage does not pursue any facility upgrades and Precinct is rezoned to Type 1 zone

Paper Size ISO A4

0 25 50 m

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

GHD

Greater Shepparton City Council

Noise Amenity Impact Assessment

Noise Impact Area - JDK Cold Storage

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Revision No. **0**
Date. **06/04/2022**

FIGURE 8

Document Path: N:\AU\Melbourne\Projects\31\12556721\GIS\Maps\Working\12556721-QGIS_Site location - Noise Assessment.qgz
Print Date: 06/04/2022

Data Source: Google Earth Imagery 2021.
Created By: jcheah

6.2 Traffic noise

The main traffic noise sources likely to affect future sensitive uses within the Precinct is traffic along Doyles Road.

Doyles Road is a secondary arterial and heavy vehicle bypass of Shepparton, which forms the eastern boundary of the Precinct (refer to Figure 4). Doyles Road between Midland Highway and New Dookie Road currently carries 6,600 vehicles per day of which 26% are heavy vehicles. Its role as a freight route is set to increase with its future duplication. The duplication, which forms part of the Bypassing Shepparton – Shepparton Alternative Route Program, may extend approximately 35 m to 40 m into the eastern boundary of the Precinct.

As part of the PSP, residential housing is proposed to be located west of Doyles Road and, therefore, may be subject to noise impacts from local traffic.

The future two way traffic volumes along Doyles Road have been forecasted to be in the order of 13,000 vehicles per day, and a design speed limit of 80 km/hr[2].

In accordance with Clause 55 and 58 of the VPP and Clause 58 of the Greater Shepparton Planning Scheme, any noise sensitive use closer than 300 m of a road that carries 40,000 Annual Average Daily Traffic (AADT) Volume should be designed and constructed to achieve the following indoor noise limits:

– Not greater than 35 dB(A) for bedrooms, assessed as an $L_{Aeq,8h}$ from 10 pm to 6 am
– Not greater than 40 dB(A) for living areas, assessed $L_{Aeq,16h}$ from 6 am to 10 pm

As the forecasted two way future traffic volumes is below the 40,000 threshold for consideration of traffic noise, no restrictions in the use and development is required in relation to potential traffic noise exposure.

Although not specifically required by the VPP, given the high percentage of heavy vehicles along Doyles Road and the high measured noise levels during the site visit, it is recommended that the above indoor noise limits be targeted.

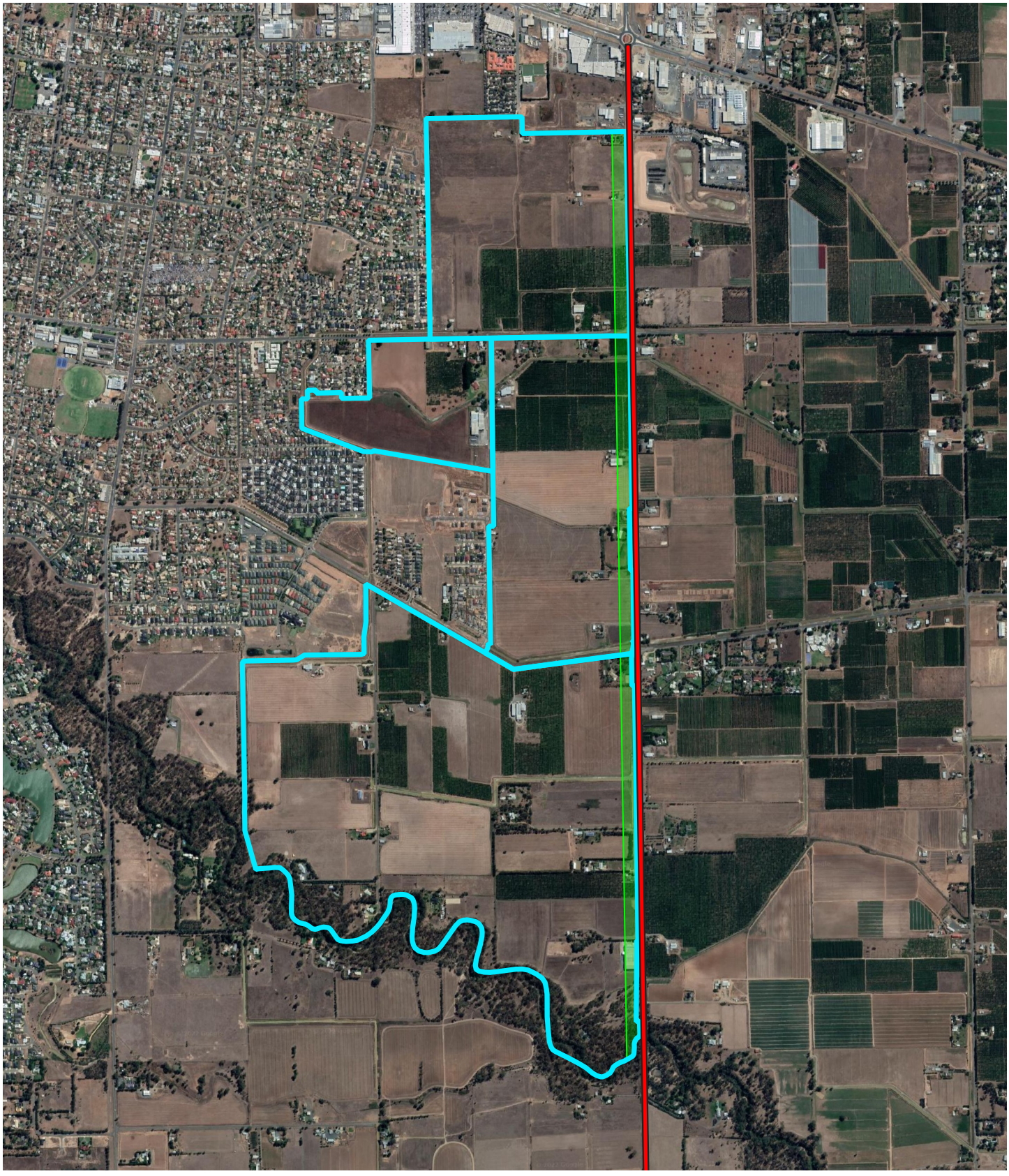
A review of expected traffic noise exposure based on guidance from Victoria Planning Practice Note 83 *Assessing external noise impacts for apartments* (PPN 83) (August 2017) and the forecasted 13,000 vehicles per day traffic volume and design speed limit of 80 km/hr indicates that developments within 70 metres from the nearest trafficable lane will likely require additional noise attenuation measured beyond standard construction to achieve appropriate internal noise amenity as per the VPP guidance.

Therefore, it is recommended that the indoor noise limits be targeted for noise sensitive uses within 70 metres from the nearest trafficable lane, with this potential noise impact area shown in Figure 9.

As such, any new noise sensitive land use within the established noise impact area is recommended to be required to undertake a detailed noise intrusion assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the proposed design meets the following internal noise limits from external noise sources:

– Recommended indoor noise limits outlined in VPP Clauses 55.07-7 and 58.04-3 and Greater Shepparton Planning Scheme Clauses 55.07-7 and 58.04-3 as follows:
    - Not greater than 35 dB(A) for bedrooms, assessed as an $L_{Aeq,8h}$ from 10 pm to 6 am
    - Not greater than 40 dB(A) for living areas, assessed $L_{Aeq,16h}$ from 6 am to 10 pm
– Satisfaction of the sleep disturbance criteria in the bedrooms or sleeping areas in accordance with World Health Organisation (WHO) recommendations as follows:
    - Maximum internal noise levels (L_{Amax}) not exceeding 45 dB(A)

[2] GTA Consultants (VIC) Pty Ltd, 27 July 2021, *Shepparton South East Growth Corridor – Precinct Structure Plan – Transport Impact Assessment*, V163490, Issue #D



Legend

Precinct boundary
Noise Impact Area - Doyles Road (70 m)
Doyles Road

Paper Size ISO A4

0 250 500 m

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

GHD

Greater Shepparton City Council

Noise Amenity Impact Assessment

Noise Impact Area - Doyles Road

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Revision No. **0**
Date. **06/04/2022**

FIGURE 9

Document Path: N:\AU\Melbourne\Projects\31\12556721\GIS\Maps\Working\12556721-QGIS_Site location - Noise Assessment.qgz
Print Date: 06/04/2022

Data Source: Google Earth Imagery 2021.
Created By: jcheah

6.3 Aircraft noise

Shepparton Aerodrome is located approximately 1.7 km southeast of the Precinct. This aerodrome features one runway and is located between a Big 4 Holiday Park and an existing residential area.

Shepparton Aerodrome currently serves as a transportation and business gateway to the Goulburn Valley Region and is typically used by emergency organisations, private aviators, private flight training and aviation-related businesses.

It is noted, however, that the Greater Shepparton Planning Scheme indicates that the aerodrome may be relocated in the future to accommodate residential or retail development in its current location and to expand the operational potential and development of aviation related industries in the Greater Shepparton region. Should this occur, it is envisaged that the relocation will take the future residents within the Precinct into consideration.

AS2021 Site Acceptability

An ANEF chart for the Shepparton Aerodrome is not available and, as such, site acceptability in accordance with AS2021 is determined on both the maximum aircraft noise level and the average number of flights per day over the site.

Due to the current sporadic use of Shepparton Aerodrome, no specific information can be found regarding number of flights per day or aircraft types utilised, except that it supports aircrafts below 5,700 kg maximum take-off weight.

However, during GHD's site visit, plane passbys were noted during background noise measurements at two locations (A1 and A3). At both of these locations, instantaneous plane passby noise levels (in conjunction with noise levels from other sources in the area) did not exceed 66 dB(A).

In accordance with AS2021, even with more than 30 flights per day, buildings developed within the Precinct would be considered acceptable for noise sensitive uses such as residential, accommodation, educational and health uses.

Greater Shepparton Planning Scheme Clause 18.02-7S Airports and Airfields

The Precinct is located outside of the Shepparton Aerodrome Airport Noise Environs overlay and therefore no restrictions in the use and development is applicable in relation to potential aircraft noise exposure.

Summary

No restriction in the use and development is applicable in relation to potential aircraft noise. However, it is noted that while the aerodrome is unlikely to cause noise or vibration impacts at the site, aircraft noise may still be audible at times.

6.4 Rail noise

Shepparton Railway Station is located approximately 1.6 km northwest from the northwest corner of the precinct. The V/Line railway line is a passenger train /public transport service and runs southwest to Mooroopna.

In accordance with Clauses 55 and 58 of the VPP and Clause 58 of the Greater Shepparton Planning Scheme, any noise sensitive use closer than 80 m of the track line should be designed and constructed to achieve the following indoor noise limits:

– Not greater than 35 dB(A) for bedrooms, assessed as an $L_{Aeq,8h}$ from 10 pm to 6 am
– Not greater than 40 dB(A) for living areas, assessed $L_{Aeq,16h}$ from 6 am to 10 pm

As the precinct is located further than 80 m from the rail line, no restrictions in the use and development is applicable in relation to potential rail noise exposure.

6.5 Music noise / licenced premises

A review of public information and aerial imagery has been undertaken, with only East Shepparton Bowls club identified as a licenced premises with possible music noise that is located in close proximity to the Precinct.

East Shepparton Bowls Club is located at 2 Zurcas Lane, to the north of the Precinct. The premises has a limited liquor licence (licence no. 36121202) valid until 31 December 2022. The licence allows the premises to supply liquor at a pre-booked function, with the following hours permitted:

– Monday to Thursday: Between 10 am and 11 pm
– Friday: Between 10 am and 11:30 pm
– Saturday: Between 10 am and 12 midnight
– Sunday: Between 2 pm and 9 pm
– Good Friday and Anzac Day: Between 12 noon and 11 pm

The licence contains the following amenity condition:

The licensee shall not cause or permit undue detriment to the amenity of the area to arise out of, or in connection with the use of the premises to which the licence relates during or immediately after the trading hours authorised by this licence.

It is noted that the East Shepparton Bowls Club is located adjacent to the Doutta Galla Harmony Village Aged Care Home, approximately 20 metres away on the opposite side of Zurcas Lane.

No noise complaints have been filed for the East Shepparton Bowls Club and given that the Precinct is located at a further distance to the Bowls Club than the Aged Care Home, music noise impacts to the Precinct in association with the Bowls Club is not expected to be an issue.

For future venues located within the Precinct which may play music, the following is recommended to be incorporated as part of their licence:

– Require the licensee to comply with the requirements of EPA Guideline 1826.4 (Noise Protocol) in relation to music noise emissions.
– Require the licensee to incorporate appropriate noise attenuation measures to comply with the requirements of EPA Guideline 1826.4 (Noise Protocol) as demonstrated by a detailed music noise assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority.

6.6 Agriculture noise sources

There are a number of orchard farms located within and to the east of the Precinct.

EPR 2021 specifically excludes the following noise sources when assessing noise from commercial, industrial and trade premises:

– Mobile farm machinery
– Scare and anti-hail guns
– Large fans used to circulate air over a wide area where crops such as citrus, stone fruit or vines are grown (frost fans)

As such, noise emissions from these sources are not required to comply with the provisions of the Noise Protocol. However, EPA Guideline 1043.1 and EPA Guideline 1254.2 provides a benchmark of noise levels and guidelines where, if exceeded or not complied with, may be considered unreasonable and lead to complaints. It is noted that both Guidelines 1043.1 and 1254.1 are not mandatory.

It is noted that these noise sources are highly variable and operate on an irregular basis. However, noise emissions from these sources have the potential to cause adverse amenity to nearby residential receivers when in operation.

Based on the recommendations outlined in EPA Guideline 1043.1 and EPA Guideline 1254.2, the following is recommended:

– Noise sensitive uses should not be located within 300 metres of a scare gun. As the location of scare guns are not known, it is therefore recommended that noise sensitive uses should not be located within 300 metres of any agricultural land where scare guns are likely to be used.
– Noise sensitive uses within 1,000 metres of a frost fan should be required to undertake a detailed noise impact and risk assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the proposed design meets the EPA Guideline 1043.1 recommended noise levels as presented in Section 3.9.
    - It is noted that the recommended noise levels are dependent on the planning zones, which may change as the Project progresses if the area is rezoned.
    - As the location of frost fans are not known, it is recommended that the 1,000 metre potential noise impact area be applied to any agricultural land where frost fans are likely to be used.

It is noted that the potential noise impact areas applied to agricultural farms located within the Precinct constrain the Precinct. However, these farms are likely to transition out of the Precinct based on the proposed PSP. Once they transition out, they will no longer pose a constraint. However, the agricultural farms located to the east of the Precinct are expected to still constrain the eastern side of the Precinct with consideration to agriculture noise.

Control of noise emissions from scare guns and frost fans are expected to adequately manage noise from mobile farm machinery.

Figure 10 presents both potential noise impact areas with the orchard farms within the Precinct still in operation (representing the existing scenario) as well as the potential noise impact areas with the orchard farms within the Precinct transitioned out of the Precinct and only the orchard farms to the east of the Precinct in operation.

It is important to note that these noise sources are highly variable and irregular. However, the above potential noise impact areas have been established based on guidance provided in EPA Guideline 1043.1 and EPA Guideline 1254.2 within which noise emissions from these sources may result in adverse community reaction.

Additionally, the noise impact areas are to be applied to the location of the scare guns and frost fans. Therefore, the recommended noise impact areas from agricultural land boundaries may be potentially revised following a more detailed noise impact and risk assessment.

6.7 Irrigation noise sources

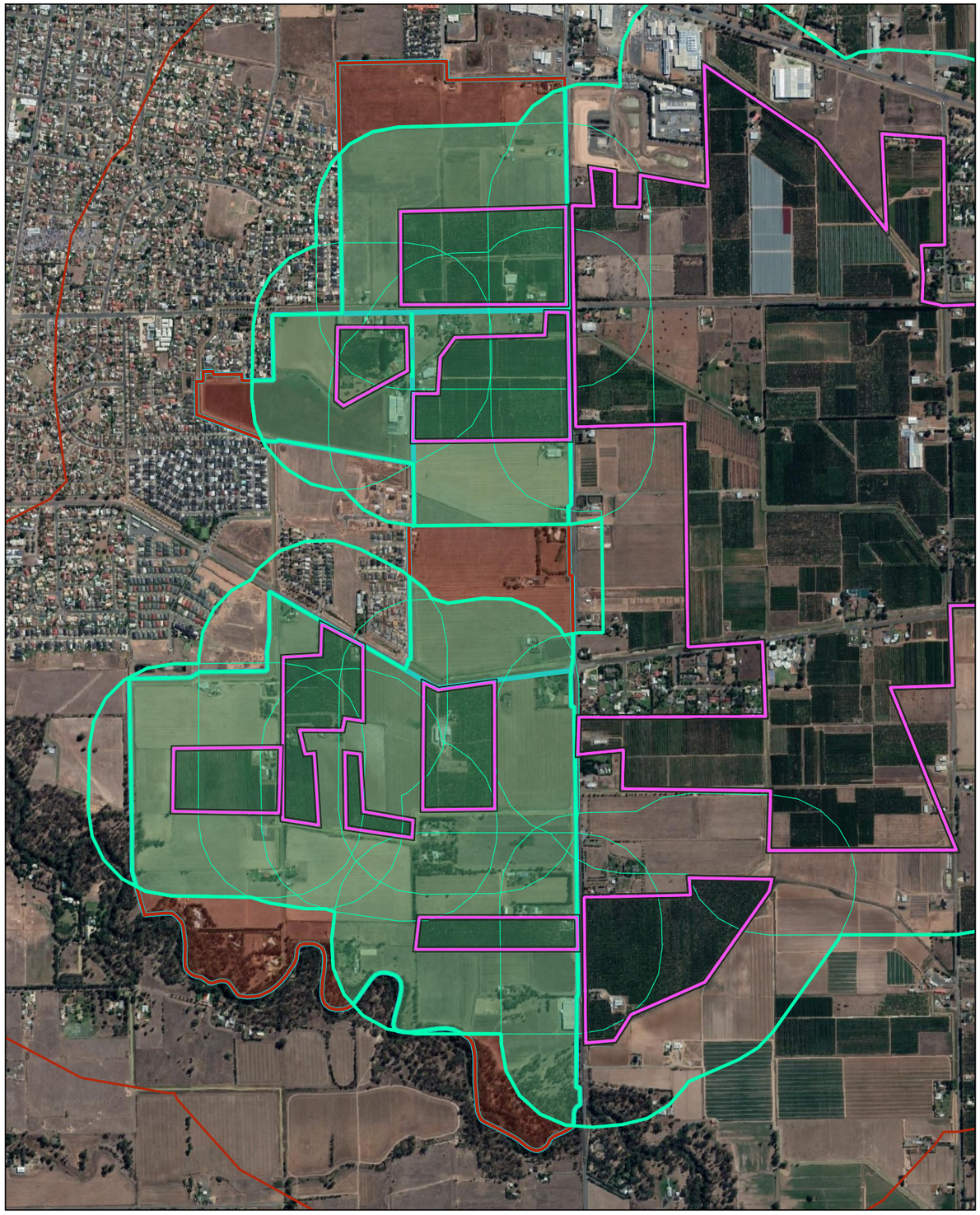
Diesel water pumps utilised to assist with groundwater flow through irrigation channels through the precinct have the potential to cause adverse noise amenity impact to the Precinct.

It is generally expected that the diesel water pumps would be compliant with relevant environmental noise limits at the existing nearest noise sensitive receivers. Assuming that the diesel water pumps meet the relevant environmental obligations in relation to noise, any noise sensitive receiver that is located closer to the specific diesel water pump than the nearest existing receiver may be subject to adverse noise amenity.

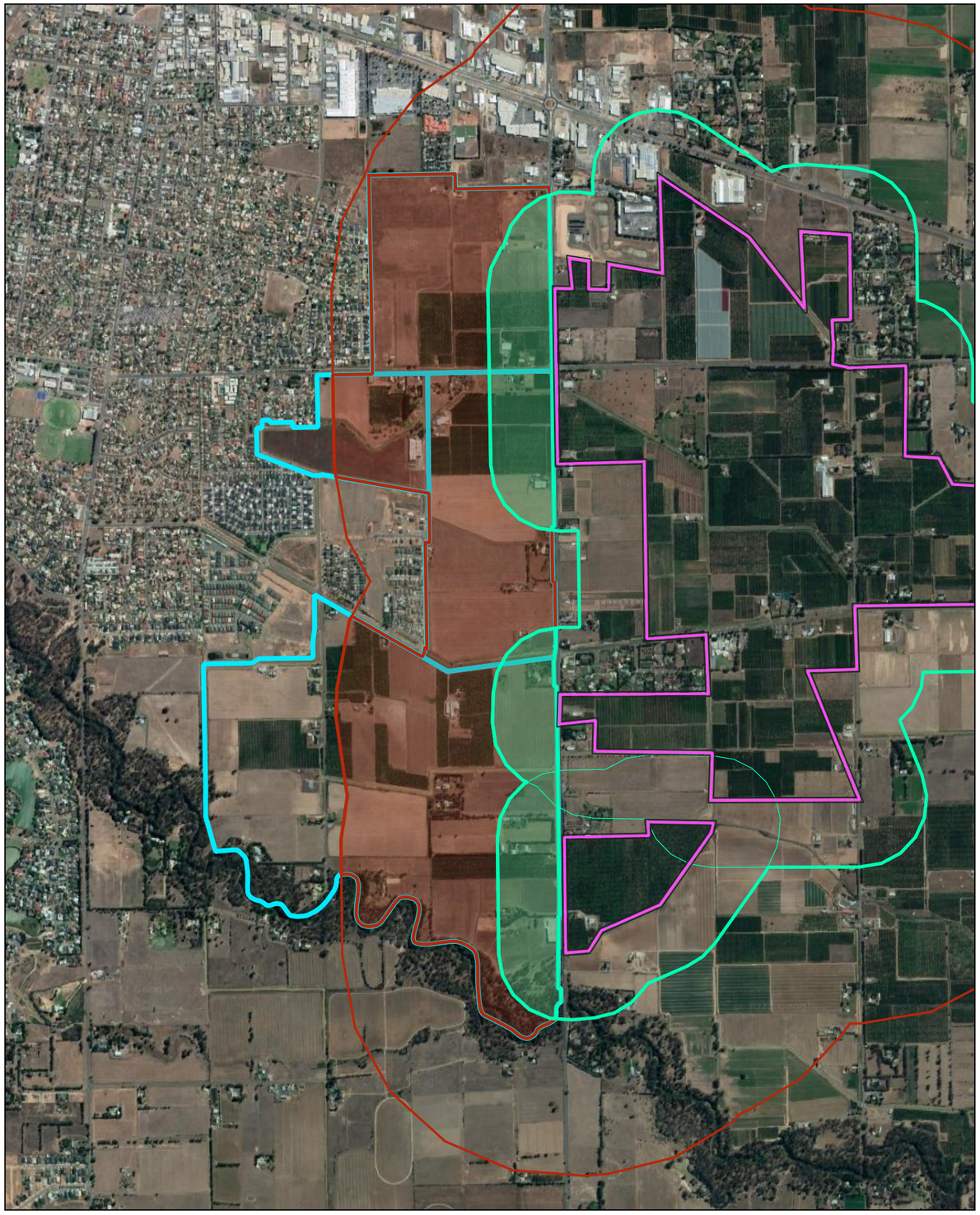
As such, it is recommended that any noise sensitive use proposed to be located closer to a diesel water pump than an existing noise sensitive use is required to undertake a detailed noise assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the proposed design meets the following internal noise limits from external noise sources:

– Recommended indoor noise limits outlined in VPP Clauses 55.07-7 and 58.04-3 and Greater Shepparton Planning Scheme Clauses 55.07-7 and 58.04-3 as follows:
    - Not greater than 35 dB(A) for bedrooms, assessed as an $L_{Aeq,8h}$ from 10 pm to 6 am
    - Not greater than 40 dB(A) for living areas, assessed $L_{Aeq,16h}$ from 6 am to 10 pm
– Satisfaction of the sleep disturbance criteria in the bedrooms or sleeping areas in accordance with World Health Organisation (WHO) recommendations as follows:
    - Maximum internal noise levels (L_{Amax}) not exceeding 45 dB(A)

Given the sporadic locations and unique environment of each diesel water pump, it is recommended that the above is undertaken on a case-by-case basis as the Precinct develops.



Based on existing scenario with agricultural areas within the Precinct still in operation



Based on future scenario with agricultural areas within the Precinct transitioned out of the Precinct

Paper Size A3

0 250 500 m

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid Of Australia, Zone 55

N

GHD

LEGEND

- Precinct Boundary
- Agricultural Area
- No noise sensitive use buffer - Gun Scare (300 m)
- Potential noise impact area - Frost Fan (1,000 m)

Greater Shepparton City Council

Noise Impact Area - Agriculture

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Date. **06/04/2022**

FIGURE 10

6.8 Summary

Based on the preliminary noise assessment, the following has been established:

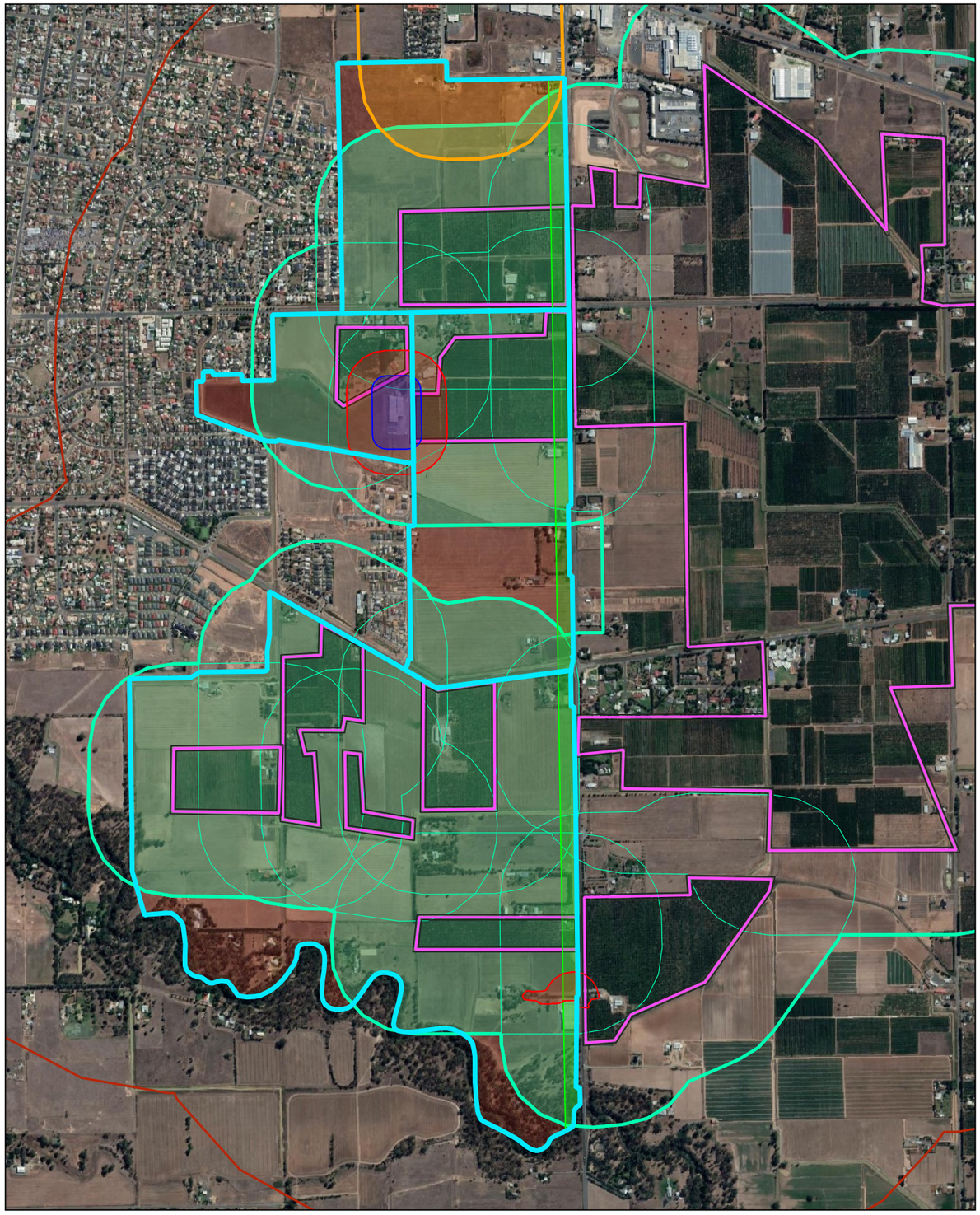
- A 300 metre Industrial 1 Zone noise influence area has been established in accordance with the provisions of VPP Clauses 55.07-7 and 58.04-3, and Greater Shepparton Planning Scheme Clauses 55.07-7 and 58.04-3 for the Industrial 1 Zone located to the north of the Precinct.
- Potential noise impact areas have been established for the following identified noise sources within the Precinct:
  - Rendevski Transport
    - 50 metre noise impact area should the Precinct remain as a Farming Zone
    - 140 metre noise impact area should the Precinct be rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol
  - JDK Cold Storage Warehouse
    - A noise impact area as per Figure 8 should JDK Cold Storage Warehouse choose not to pursue any facility upgrades and the Precinct is rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol.
  - Doyles Road and future Doyles Road Duplication
    - 70 metre noise impact area
- The following potential noise impact areas for agriculture noise sources including frost fans and scare guns have been established with guidance sought from EPA Guideline 1043.1 and EPA Guideline 1254.2
  - Noise sensitive uses should not be located within 300 metres of any agricultural land where scare guns are likely to be used.
  - 1,000 metre potential noise impact area from any agricultural land where frost fans are likely to be used.
- Any noise sensitive use proposed to be located closer to a diesel water pump than an existing noise sensitive use is recommended to be required to undertake a detailed noise assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the development is designed and constructed to achieve the recommended internal noise limits outlined in VPP Clauses 55.07-7 and 58.04-3, Greater Shepparton Clauses 55.07-7 and 58.04-3 and sleep disturbance criteria as defined by World Health Organisation.

It is noted that the zoning and potential rezoning of the Precinct may have a significant effect on the applicable Noise Protocol noise limits within the Precinct and the recommended noise levels from frost fans at nearby noise sensitive receivers. While it may improve the general acoustic environment and noise amenity in the area by managing commercial/industrial noise to lower limits, it may lead to significant additional noise mitigation works for existing commercial/industrial premises to enable compliance with environmental noise limits.

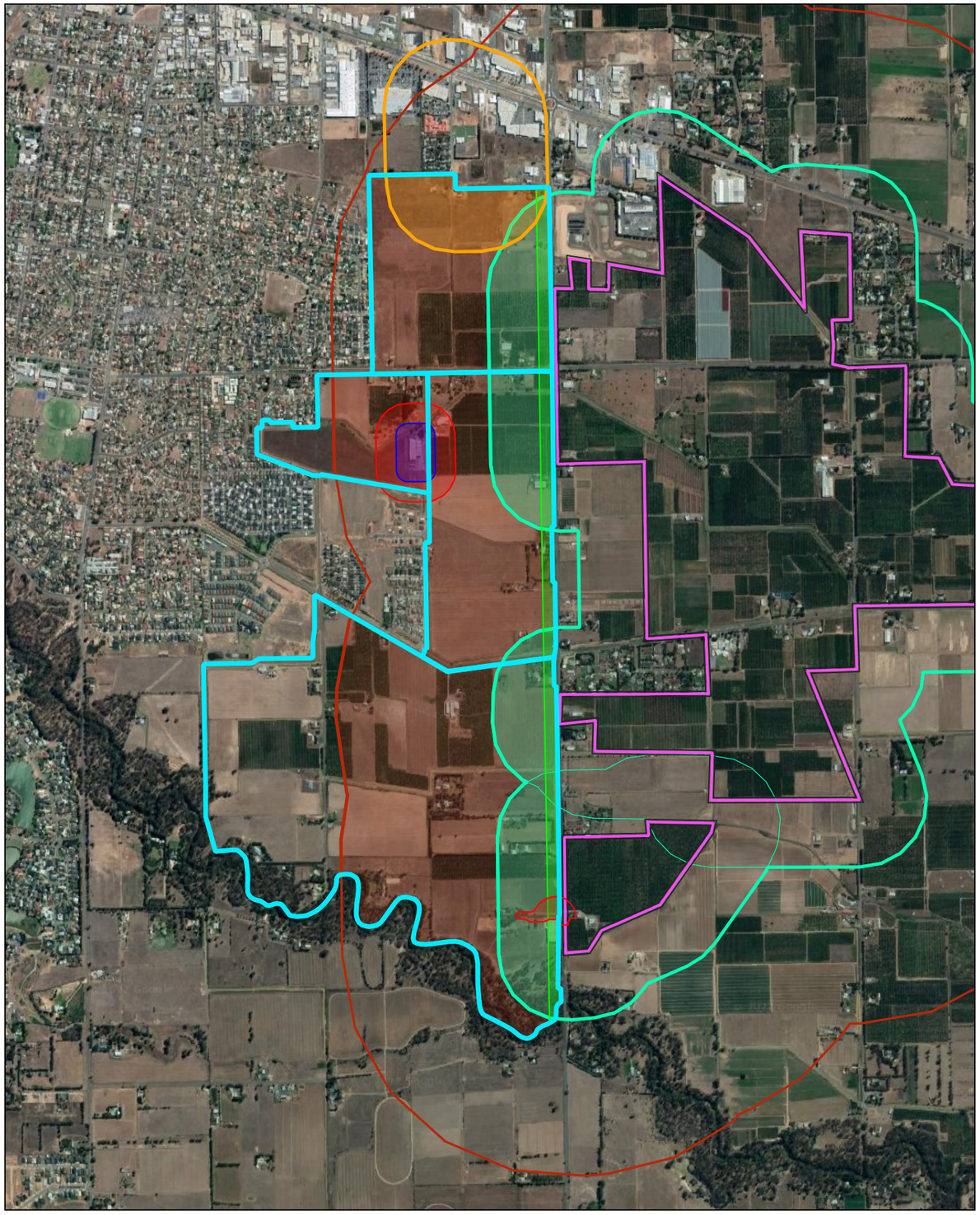
Additionally, under current EP Act, EPR and General Environmental Duty (GED) obligations, industrial and commercial premises are required to consider noise mitigation measures as far as reasonably practical to minimise noise impact even if compliant with relevant Noise Protocol limits. This, however, may have potential impact on operation of such existing commercial/industrial premises within and surrounding the Precinct.

Accordingly, where such rezoning is expected, it is recommended that a further study is undertaken to identify such commercial and industrial premises and relevant consultation be made with stakeholders including EPA to assess potential impacts and mitigation strategies moving forward.

Figure 11 presents the established potential noise impact areas for the Precinct.



Based on existing scenario with agricultural areas within the Precinct still in operation



Based on future scenario with agricultural areas within the Precinct transitioned out of the Precinct

Paper Size A3

0 250 500 m

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid Of Australia, Zone 55

N

GHD

LEGEND

- Precinct Boundary
- Agricultural Area

Noise Influence Area

- Industrial 1 Zone (300 m)

Noise Impact Area

- Rendevski Transport (140 m)
- Rendevski Transport (50 m)
- JDK Cold Storage
- Doyles Road (70 m)
- Frost Fan (1,000 m)

No Go Zone

- Gun Scare (300 m)

Greater Shepparton City Council

Shepparton South East - Noise Influence Areas and Noise Impact Areas

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Date. **06/04/2022**

FIGURE 11

Document Path: N:\AU\Melbourne\Projects\31\12556721\GIS\Maps\Working\12556721-QGIS_Site location - 2018. While GHD has taken care to ensure the accuracy of this product, GHD and DATA CUSTODIAN(S), make no representations or warranties about its accuracy, completeness or suitability for any particular purpose. GHD and DATA CUSTODIAN(S) cannot accept liability of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred as a result of the product being inaccurate, incomplete or unsuitable in any way and for any reason.

7. Discussion of potential noise emissions from the Precinct

Proposed industrial/commercial premises have the potential to emit noise which may impact the users within the Precinct.

As required by Clause 13.05-1S Noise abatement of the Greater Shepparton Planning Scheme, the following policy documents should be considered as relevant:

– Environment Protection Regulations under the Environment Protection Act 2017
– Noise Limit and Assessment Protocol for the Control of Noise from Commercial, Industrial and Trade Premises and Entertainment Venues (Publication 1826.2, Environment Protection Authority, March 2021)
    - It is noted that Publication 1826.4 (EPA, May 2021) as outlined in Section 3.1 supersedes Publication 1826.2 and as such, should be referenced instead.

Any proposed development within the Precinct should be designed and constructed such that the environmental noise emissions comply with the requirements of the Noise Protocol at the relevant surrounding noise sensitive receivers. This also includes new small commercial and industrial establishments such as auto facilities, workshops and the like.

Where relevant, the planning authority should ensure that appropriate planning conditions are imposed to require prospective developments to demonstrate compliance with the Noise Protocol at surrounding noise sensitive areas. This involves requiring an acoustic assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the proposed development complies with the requirements of the Noise Protocol.

It is noted that the Noise Protocol noise limits are depending on the zoning, and background noise levels at the assessment site. Should the Precinct be rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol, the Noise Protocol noise limits may be different than if the Precinct remains in a Farming Zone (see Section 6.1.1).

8. Discussion of potential vibration impacts

None of the identified existing industries within the assessment area are expected to generate noticeable vibration or cause vibration impacts at the Precinct.

The nearest major vibration-generating source is the railway line. Train passbys induce ground borne vibration transmitted through the subsoil which may cause intermittent vibration nuisance to surrounding sensitive receivers. Vibration impacts at sensitive receivers depend on various factors such as source type, distance to receivers and ground soil properties. It should be noted that Victoria's Passenger Rail Infrastructure Noise Policy 2013 does not contain ground borne vibration criteria.

The Railway station is located approximately 1.6 km from the Precinct and the trainline runs away from the direction of the Precinct. Given the distance between the railway and the Precinct, no vibration impacts are expected within the Precinct.

9. General noise and vibration mitigation strategies

This section provides general guidance on potential mitigation strategies that could be implemented to control noise within prospective noise sensitive developments within the Precinct and could be considered for control of external noise sources such as industrial noise, traffic and aircraft applicable to the proposed development.

Relevant in-principal noise mitigation strategies include:

– *Land use controls* (separating the location of noise-producing activities from sensitive areas)
– *Control in transmission* (reduce noise level at the receiver but not necessarily the environment surrounding the source, e.g. noise barrier, etc.)
– *Receiver control* (localised acoustic treatment at sensitive receptor)

9.1 Land use controls

There are several strategies involved in using the land use control measures, as follows:

– *Setback strategy* (e.g. open space design adjacent to noisy industries, busy roads and/or railway corridors to provide noise reduction through setback distances to residential uses).
– *Setback distances* between the noise source and the noise sensitive receptor may assist reducing the noise exposure level at the proposed Precinct development. A setback strategy would also be effective in mitigating ground-borne vibration impacts from nearby vibration sources.
– *Building locations and height controls*, could be adopted to provide noise shielding from noise sources to residential uses and the overall Precinct.
– *Expansion of cycle and pedestrian facilities* to discourage the use of motor vehicles and encourage the use of bicycles, scooters or walking, which would result in less noise emission within the area.
– *Impose acoustic control planning conditions on new developments* such as planning permit conditions for specific acoustic treatments to noise sensitive developments.

9.2 Control in transmission

The noise reduction strategy used to control in noise transmission generally involves the installation of noise barriers. Noise barriers may include an existing feature, such as:

– An elevated road or a natural slope (e.g. earth mound)
– A purpose designed feature such as a solid boundary fence
– A purpose designed feature of the building, such as a partially enclosed carport
– A purpose designed building which acts as a barrier block

Figure 12 and Figure 13 illustrate different noise barrier configurations, sourced from the NSW Department of Planning "*Development near Rail Corridors and Busy Roads – Interim Guideline*" (NSW DoP, 2008).

The barrier should be installed in a manner such that it covers the noise sources from direct line-of-sight to the sensitive receptors. In general, the barrier should provide sufficient screening to avoid direct line-of-sight between the shielded noise sources and the protected sensitive receptors.

Noise barriers would not be effective in reducing noise impacts if the line of sight from the noise source to the residence is not reduced. Hence, it may not be practical to install a noise barrier for elevated sensitive receptors.

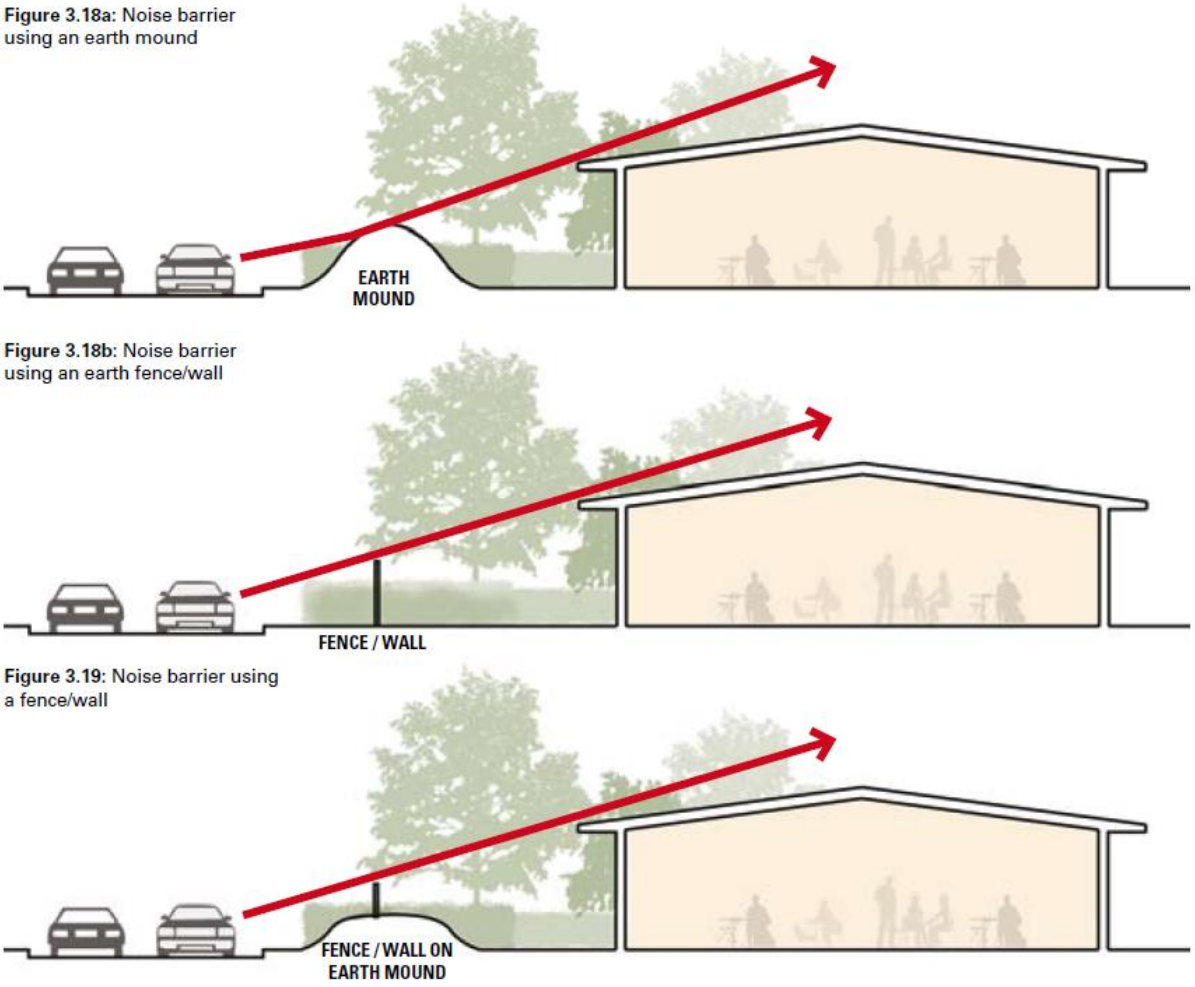

Figure 12 *Noise barrier features (NSW DoP 2008)*

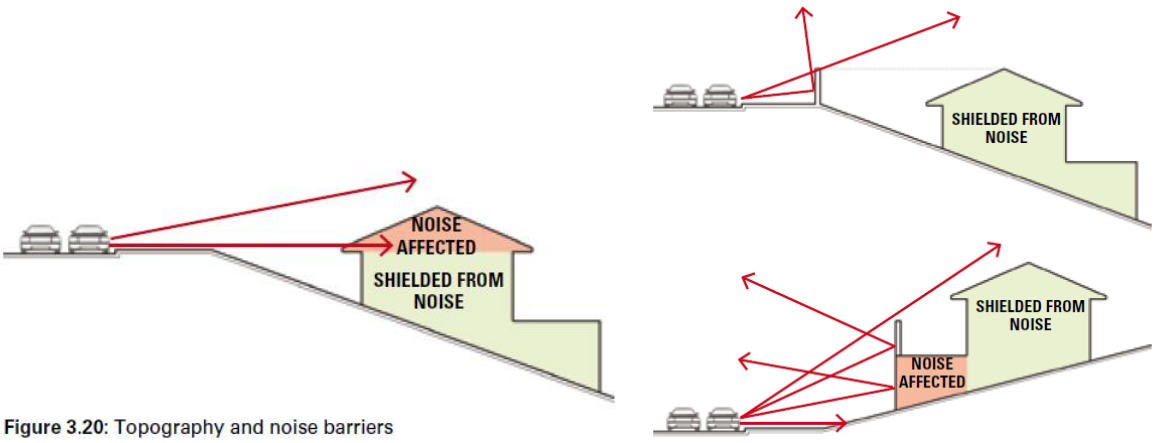

Figure 13 *Noise barrier topography and features (NSW DoP, 2008)*

9.3 Receiver control

There are several strategies that could be used to control noise at the receiver including:

– Building orientation
– Balustrade/balcony design/configuration
– Building façade acoustic treatment

9.3.1 Building orientation

The building orientation layout involves configuring the development's floor plan to have sleeping areas/habitable areas facing away from the noise sources. Figure 14 and Figure 15 illustrate samples of building orientation layout strategies to minimise local noise intrusion, which is sourced from NSW Department of Planning "*Development near rail corridors and busy roads – Interim guideline*" (NSW DoP, 2008).

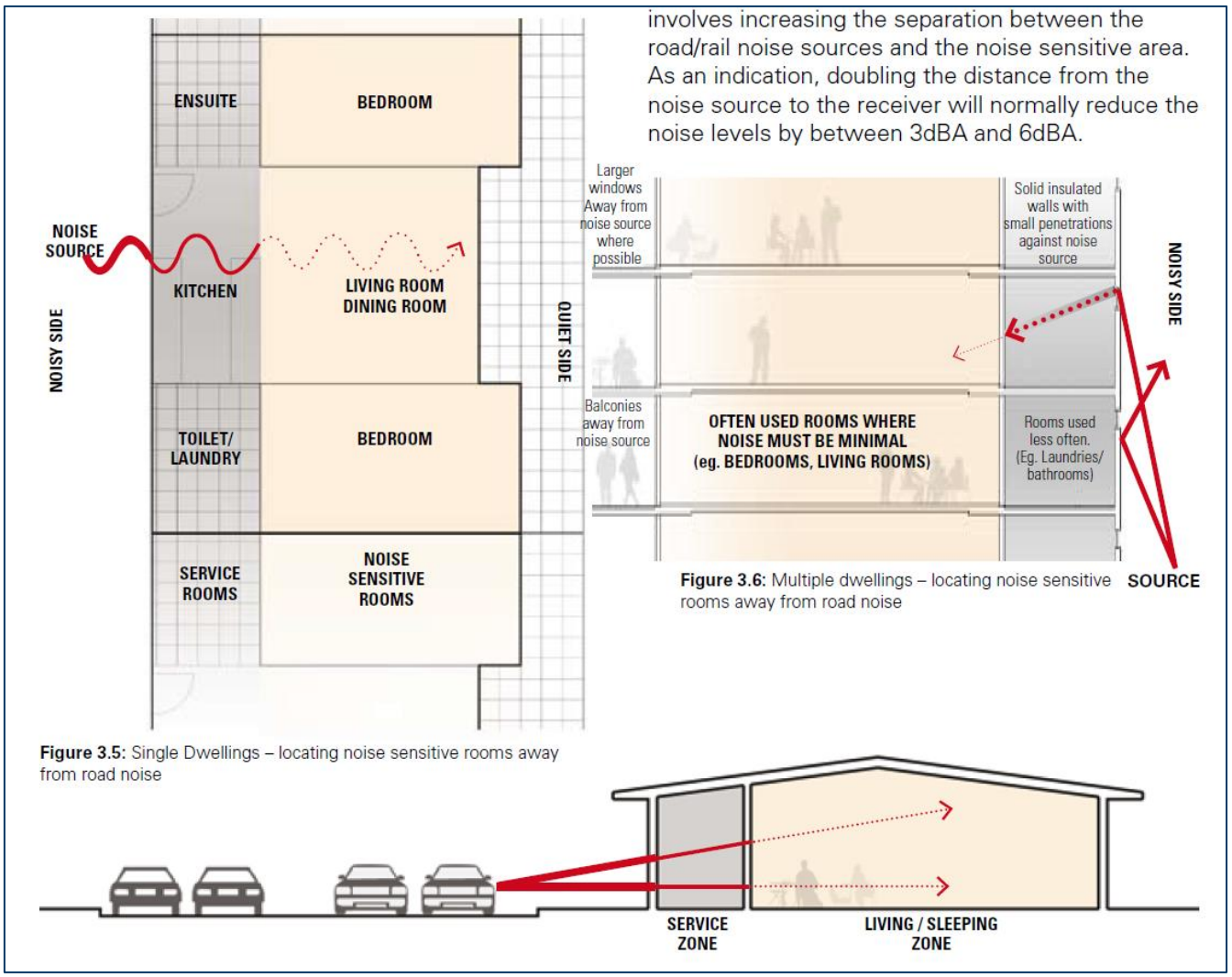

Figure 14 Sample of building strategies (NSW DoP, 2008)

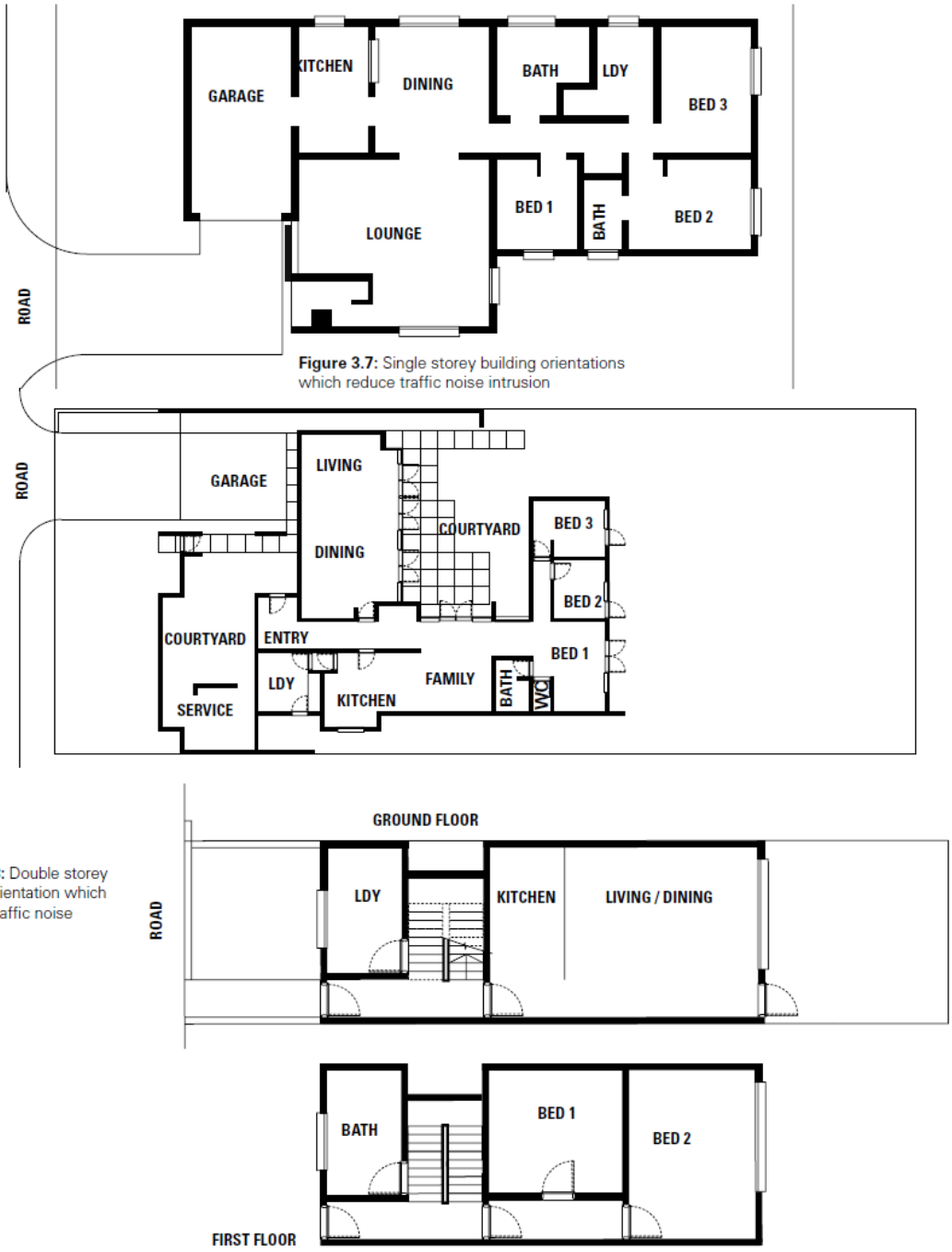

Figure 15 *Sample of building layout strategies 2 (NSW DoP, 2008)*

9.3.2 Building façade acoustic treatment

External noise intrusion due to different sources such as traffic, rail, aircraft, music or industrial noise is typically transmitted into the building via lightweight façade elements such as glass, doors, lightweight walls, lightweight roofs, as well as any grille openings. Subject to more detailed noise assessment of external noise intrusion, these lightweight façade elements may need to be acoustically treated to preserve indoor amenity of the building occupants, such as:

– Minimise lightweight external wall construction facing the dominating noise sources
– Thicken glazing construction for the window façade
– Minimise window size and maximise masonry on the external wall construction
– Minimise the use of openable window construction
– Configure any discharge/intake duct grill layout (above ceiling level) facing away from the noise sources

The purpose of treating the building envelope is to reduce the internal noise. In principle, noise inside a building can be reduced if the building envelope has a high sound reduction. Heavy, dense materials such as masonry or brick walls are better for low frequency sound reduction. However, lightweight solutions can also be effective in reducing noise. These include double-stud, staggered-stud or resilient-stud systems that have external layers of cement sheet or similar and internal layers of plasterboard with acoustic insulation in the cavity.

Noise from external noise sources may enter a room through the roof, external walls, windows and external doors. Windows and doors are often the weakest point in sound insulation. Measures such as thicker glass, laminated glass or double glazing and acoustically sealed windows (permanent or openable) are techniques for noise reduction. Louvre windows are less effective in noise reduction when compared to solid single and double glazed acoustically sealing windows. Depending on the noise reduction required, window size and effectiveness of acoustic seals, louvre windows can be considered as a construction component.

The internal noise design objectives in some cases can only be achieved when the windows remain closed. In such cases, maintaining internal design objectives at all times would require ventilation to rooms by means other than through openable windows. Alternative ventilation may include “borrowed” natural ventilation from other rooms with less exposure to external noise sources or a mechanically ventilated system.

9.4 Summary

Item	Assessment Item	Report Section	Summary	Recommendation for proposed uses to be located within the Precinct
1	EPA Guideline 1826.4 (the Noise Protocol)	3.1	Noise emissions from industrial / commercial premises should comply with the requirements of the Noise Protocol.	Appropriate planning permit conditions are imposed to require prospective developments to demonstrate compliance with the Noise Protocol at surrounding noise sensitive areas. Consideration of an acoustic assessment required by planning authority as part of the development approval process.
2	**Victorian Planning Provisions**			
2.1	Clause 55.07-7 and Clause 58.04-3	3.2.1	Part of the site falls within the Noise Influence Area for industrial noise towards the north of the Precinct. As such, a 300 m noise influence area has been established for part of the site. No other part of site falls within the Noise Influence Area for road or rail noise. However, based on guidance from PPN 83, the percentage of heavy vehicles travelling on Doyles Road, attended measurements along Doyles Road, and forecasted traffic volumes and design speed limit for the Doyles Road duplication as part of the Shepparton Bypass Project, it is recommended that a 70 metre noise impact area for road noise be incorporated, for which part of the Precinct would fall within.	Any noise sensitive use within the Precinct within 300 metres of the Industrial 1 Zone Noise Influence Area, and/or within the established 70 metres of Doyles Road should be designed and constructed to achieve the VPP indoor noise limits. Satisfaction of the sleep disturbance criteria in the bedrooms or sleeping areas of the noise sensitive development as defined by the World Health Organisation is also recommended.
3	**Greater Shepparton Planning Scheme**			
3.1	Clause 13.05-1S Noise abatement	3.3.1	Noise emissions associated with proposed developments within the Precinct (prospective industrial, commercial, residential, etc.) should comply with the requirements of the Noise Protocol	As for Item 1.
3.2	Clause 13.07-3S Live music	3.3.2	One premises identified within and surrounding the Precinct which is likely to emit music noise. No potential impact from the identified premises is expected.	Any noise sensitive residential development within the Precinct should be designed and constructed to mitigate music noise levels from any entertainment venues to the noise limits specified in the Noise Protocol
3.3	Clause 18.02-7S Airports and airfields	3.3.3	The Precinct is located outside of the airport environs overlay for Shepparton Aerodrome. Although aircraft noise may be audible at the Precinct, it is not expected to adversely impact on the amenity of sensitive land uses.	Although aircraft noise may be audible at the Precinct, it is not expected to adversely impact on the amenity of sensitive land uses. The relocation of the aerodrome will likely take into account impacts to nearby noise sensitive receivers in selecting the relocated site.

Item	Assessment Item	Report Section	Summary	Recommendation for proposed uses to be located within the Precinct
3.4	Clause 21.07-1 Transport	3.3.4	Noise emissions from the Doyles Road duplication as part of the Shepparton Bypass Project should be considered and noise sensitive land uses designed and constructed to mitigate transport noise.	As for Item 2.1
3.5	Clause 53.06 Live music entertainment venues	3.3.5	One premises identified within and surrounding the Precinct is likely to emit music noise. No potential impact from the identified premises is expected.	As for Item 3.2
3.6	Clause 55.07-7 and 58.04-3 Amenity impacts	3.3.6	Part of the site falls within the Noise Influence Area for industrial noise towards the north of the Precinct. As such, a 300 m noise influence area has been established for part of the site. No other part of site falls within the Noise Influence Area for road or rail noise. However, based on percentage of heavy vehicles travelling on Doyles Road and attended measurements along Doyles Road, it is recommended that a noise impact area for road noise be incorporated, for which part of the Precinct would fall within.	As for Item 2.1
4	**AS/NZS 2107 Indoor Sound Levels**	3.4	Recommended as supplementary design internal noise level for residential dwellings in addition to provisions of VPP Clauses 55.07-7 and 58.04-3, and Greater Shepparton Planning Scheme Clauses 55.04-8 and 58.04-3. .	
5	**Rail noise**	3.5	The Precinct is located sufficiently far away from the railway line that noise emissions from the railway line are not expected to have any effect on the Precinct.	*Nil*
6	**Sleep disturbance**	3.6	External sources such as traffic, rail passbys and industrial noise can generate high levels of short term noise events that could result in sleep disturbance at night.	Satisfaction of the sleep disturbance criteria recommended in the bedrooms or sleeping areas of the noise sensitive development as defined by the limits recommended by the World Health Organisation.
7	**AS 2021 Aircraft noise**	3.7	The Precinct is located outside of the airport environs overlay for Shepparton Aerodrome. Buildings developed within the Precinct are considered acceptable for noise sensitive uses such as residential, accommodation, educational and health uses in accordance with the AS 2021.	*Nil*
8	**NASF**	3.8	Refer to Item 3.3 above	Refer to Item 3.3 above
9	**Vibration impact**	8	Rail line identified as major vibration source. The Precinct is located sufficiently far away from the railway line and hence, vibration from the railway line is not expected to have any effect on the Precinct.	*Nil*

Item	Assessment Item	Report Section	Summary	Recommendation for proposed uses to be located within the Precinct
10	**EPA Guideline 1043.1 Guidelines on noise from frost fans**	3.9	Noise emissions from frost fans should not exceed the recommended noise levels as outlined in EPA Guideline 1043.1 at nearby noise sensitive receivers. As the location of frost fans are not known, a 1,000 metre potential noise impact area from any agricultural land where frost fans are likely to be used has been established.	Any noise sensitive use within the 1,000 metre potential noise impact area should be designed and constructed to achieve the EPA Guideline 1043.1 recommended external or internal noise levels.
11	**EPA Guideline 1254.2 Noise Control Guidelines**	3.10	As the location of scare guns are not known, noise sensitive uses should not be located within 300 metres of any agricultural land where scare guns are likely to be used.	Given the Precinct development has the potential to encroach within this 300 metre zone, noise sensitive uses should not be developed within 300 metres of any agricultural land where scare guns are likely to be used.

10. Future land use planning considerations

10.1 Key findings and development constraints

EPA complaint history indicates that noise impacts are not typically experienced in the Precinct area, with 14 noise complaints between the years 2017 and 2021 with only one noise complaint in 2021, which was related to a residential premises. During a site visit to the Precinct, it was observed that the ambient noise environment is predominantly affected by traffic noise, with significant transport activity along Doyles Road.

The key identified noise sources with potential to impact on the amenity of the Precinct included:

- Industrial 1 Zone located adjacent to the Precinct to the north, for which a 300 metre noise influence area applies in accordance with the provisions of the VPP Clauses 55.07 and 58.04, and Greater Shepparton Planning Scheme Clauses 55.07 and 58.04.
- Industrial and commercial premises on site, for which potential noise impact areas have been established, in particular:
  - Rendevski Transport
    - 50 metre noise impact area should the Precinct remain as a Farming Zone
    - 140 metre noise impact area should the Precinct be rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol
  - JDK Cold Storage Warehouse
    - Should JDK Cold Storage Warehouse pursue the facility upgrades as per Planning Permit 2020-7 and Planning Permit 2020-103, it is expected that they will fulfil their environmental noise obligation and implement the recommendations outlined in Marshall Day Acoustics' acoustic report submitted as part of the permit application to meet the relevant environmental noise criteria. As such, no noise impact area would apply.
    - Should JDK Cold Storage Warehouse not pursue the facility upgrades, the following has been established:
      - No noise impact area should the Precinct remain as a Farming Zone
      - A noise impact area as per Figure 8 should the Precinct be rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol.
- Traffic noise from existing Doyles Road (and subsequently traffic noise from future Doyles Road duplication), for which a potential traffic noise impact area of 70 metres from Doyles Road has been established.
- Agriculture noise sources including frost fans and scare guns, for which potential noise impact areas have been established:
  - Noise sensitive uses should not be located within 300 metres of any agricultural land where scare guns are likely to be used.
  - 1,000 metre potential noise impact area from any agricultural land where frost fans are likely to be used.
- Diesel water pumps for irrigation channel groundwater flow.

Accordingly, any proposed noise sensitive development within the noise influence area and/or established noise impact areas should be required to undertake a detailed noise intrusion assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the proposed design meets the relevant noise criteria.

Additionally, it is noted that the zoning and potential rezoning of the Precinct may have a significant effect on the applicable Noise Protocol noise limits within the Precinct. While it may improve the general acoustic environment and noise amenity in the area by managing commercial/industrial noise to lower limits, it may lead to significant additional noise mitigation works for existing commercial/industrial premises to enable compliance with environmental noise limits.

10.2 Recommended actions

Based on the above investigations, the following recommendations should be considered in the development of the Precinct:

- Careful strategic planning to manage land use interface and minimise noise impact on sensitive land uses including but not limited to consideration of in-principle noise mitigation strategies outlined in this report.
- Where rezoning is expected, it is recommended that a further study is undertaken to identify such commercial and industrial premises and relevant consultation be made with stakeholders including EPA to assess potential impacts and mitigation strategies moving forward.
- The implementation of planning controls within the Greater Shepparton Planning Scheme and where appropriate development approval process to:
  - Place specific planning requirements as part of planning scheme amendments or planning permit conditions (i.e. control of noise emissions) on proposed sensitive land use and developments in particular areas.
  - Require any proposed sensitive land uses within the 300 metre Industrial 1 Zone noise influence area to undertake a detailed external noise intrusion assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that internal noise levels achieve recommended noise amenity targets outlined in VPP Clauses 55.07-7 and 58.04-3, Greater Shepparton Clauses 55.07-7 and 58.04-3, and sleep disturbance criteria as defined by World Health Organisation from external noise sources.
  - Require any proposed sensitive land uses within the noise impact areas determined for both Rendevski Transport and JDK Cold Storage Warehouse to undertake a detailed noise assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that noise emissions from the commercial premises achieves the Noise Protocol noise limits at the proposed site.
    - Noise impact areas for Rendevski Transport include:
      - 50 metre noise impact area should the Precinct remain as a Farming Zone
      - 140 metre noise impact area should the Precinct be rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol
    - Noise impact areas for JDK Cold Storage Warehouse include:
      - A noise impact area as per Figure 8 should JDK Cold Storage Warehouse choose not to pursue any facility upgrades and the Precinct is rezoned to a General Residential Zone or other Type 1 zone as per Annex A of the Noise Protocol.
  - Require any proposed sensitive land uses close to Doyles Road within the established 70 metre noise impact area to undertake an external noise intrusion assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the development is designed and constructed to achieve recommended noise amenity targets outlined in VPP Clauses 55.07-7 and 58.04-3, Greater Shepparton Clauses 55.07-7 and 58.04-3, and sleep disturbance criteria as defined by World Health Organisation from external noise sources.
  - Do not locate any sensitive land uses within 300 metres of any agricultural land where scare guns are likely to be used.
  - Require any proposed sensitive land uses within 1,000 metres of any agricultural land where frost fans are likely to be used to undertake a detailed noise impact and risk assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the proposed design meets the EPA Guideline 1043.1 recommended noise levels as presented in Section 3.9.

- Any noise sensitive use proposed to be located closer to a diesel water pump than an existing noise sensitive use is recommended to be required to undertake a detailed noise assessment by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, to demonstrate that the development is designed and constructed to achieve the recommended internal noise limits outlined in VPP Clauses 55.07-7 and 58.04-3, Greater Shepparton Clauses 55.07-7 and 58.04-3 and sleep disturbance criteria as defined by World Health Organisation.
- Require developments with potential to generate noise to undertake further acoustic assessment to demonstrate that the development is designed and construction to comply with the Noise Protocol requirements at surrounding sensitive uses (including within the Precinct).

– Consider staging the development of the land to provide the opportunity to consider the changing (transitioning) industrial context for the surrounding Precincts.
– Locate complimentary commercial and other businesses uses close to other industrial developments and adjacent to arterial roads. The commercial and business land uses would act as a physical buffer between industrial activities and more sensitive land uses.

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