

LAND USE CONFLICT RISK ASSESSMENT

IN SUPPORT OF PLANNING PROPOSAL TO AMEND
THE ORANGE LOCAL ENVIRONMENTAL PLAN
2011

CLERGATE HILLS

PREPARED FOR:

ROSEDALE GARDENS ESTATE PTY LTD

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POSTAL ADDRESS PO Box 1963
LOCATION 154 PEISLEY STREET
TELEPHONE 02 6393 5000
EMAIL ORANGE@GEOLYSE.COM

ORANGE NSW 2800
ORANGE NSW 2800
FACSIMILE 02 6393 5050
WEB SITE WWW.GEOLYSE.COM

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Introduction and Background

1.1 BACKGROUND

Rosedale Gardens Estate Pty Ltd owns land located at Leeds Parade Orange and seeks to subdivide for the purposes of large lot residential land use.

Geolyse has been commissioned to prepare a planning proposal including supporting reporting to seek the rezoning of the land to enable this subdivision.

The planning proposal has received endorsement from Orange City Council and an amended Gateway approval has been received from the Department of Planning & Environment. Condition 2 of the altered Gateway approval reads *inter alia*:

2. *The planning proposal is to be amended to include:*

(c) amended lot size map(s) to reflect recommended buffer distances to facilitate separation distances from identified contaminated land and zone RU1 Primary Production land.

Consultation with DP&E officers and staff from Department of Primary Industries indicated that preparation of a Land Use Conflict Risk Assessment (LUCRA) together with reference to the “Living and Working in Rural Areas” handbook (‘the Handbook’) (Learmonth et al. 2007) would provide the basis for determining appropriate buffers to adjacent primary production activities.

1.2 INTRODUCTION

This LUCRA is based on the “Living and Working in Rural Areas” handbook (‘the Handbook’) (Learmonth et al. 2007). It is one of several documents that identify and address potential land use conflicts, and should be read in conjunction with detailed reporting prepared by Geolyse and others to support the Clergate Hills planning proposal submission.

In general terms the purpose of the LUCRA is to identify land use compatibility and potential conflict between neighbouring land uses, and the identification of conflict avoidance or mitigation measures. LUCRA aims to:

- Objectively assess the effect and level of proposed land use on neighbouring land uses;
- Accurately identify the risk of conflict between neighbouring land uses;
- Complement development control and buffer requirements with an understanding of likely land use conflict;
- Proactively address land use issues and risks before a new land use proceeds or before a dispute arises; and
- Highlight or recommend strategies to help minimise conflict and contribute to the negotiation, proposal, implementation and evaluation of separation strategies.

In order to achieve those aims, a four-step assessment process is undertaken:

1. Information Gathering – The site’s geophysical characteristics, the nature of the development proposed and the surrounding land uses are described.
2. Risk Level Evaluation Risk Level Evaluation - Each proposed activity is recorded and potential land use conflict level is assessed. The higher the risk level, the more mitigation it will require.
3. Identification of Risk Mitigation Strategies – Management strategies are identified which can assist in lowering the risk of potential conflict.

4. Record Results – Key Issues, risk level and recommended management strategies are recorded and summarised.

Information gathering (Step 1)

2.1 SITE LOCATION, AREA AND ZONING

Refer to Section 1 of the Geolyse Planning Proposal (215322_PP_001B).

2.2 SITE HISTORY AND LAND USE

For site history refer to Section 3 of the Geolyse Stage 1 preliminary site investigation (215322_REP_001).

For land use information refer to Section 3.7 of the Geolyse Local Environmental Study.

2.3 SURROUNDING LAND USES

Existing land uses within about one kilometre of the site are depicted in **Figure 1** overleaf. They include:

- Residential
 - General residential zoned and developed land to the south-west, separated from the subject site by the Main Western Railway Line and Clergate Road;
- Rural residential and quasi rural residential
 - Small allotments to the north, east and west
- Education
 - Charles Sturt University to the south-east
- Business park
 - Zoned business park land to the south (inactive and note the land directly to the south is possibly in use as an active apple orchard - see below comment);
- Industrial
 - Vacant industrial zoned land to the south-west (immediately adjacent to the Main Western Railway Line)
 - Active industrial zoned land to the south and south-west
- Active primary production
 - Active apple orchard operation to the north and north-east
 - Possibly active apple orchard to the south (assumed to be active for the purposes of this assessment noting however it is zoned for business purposes;

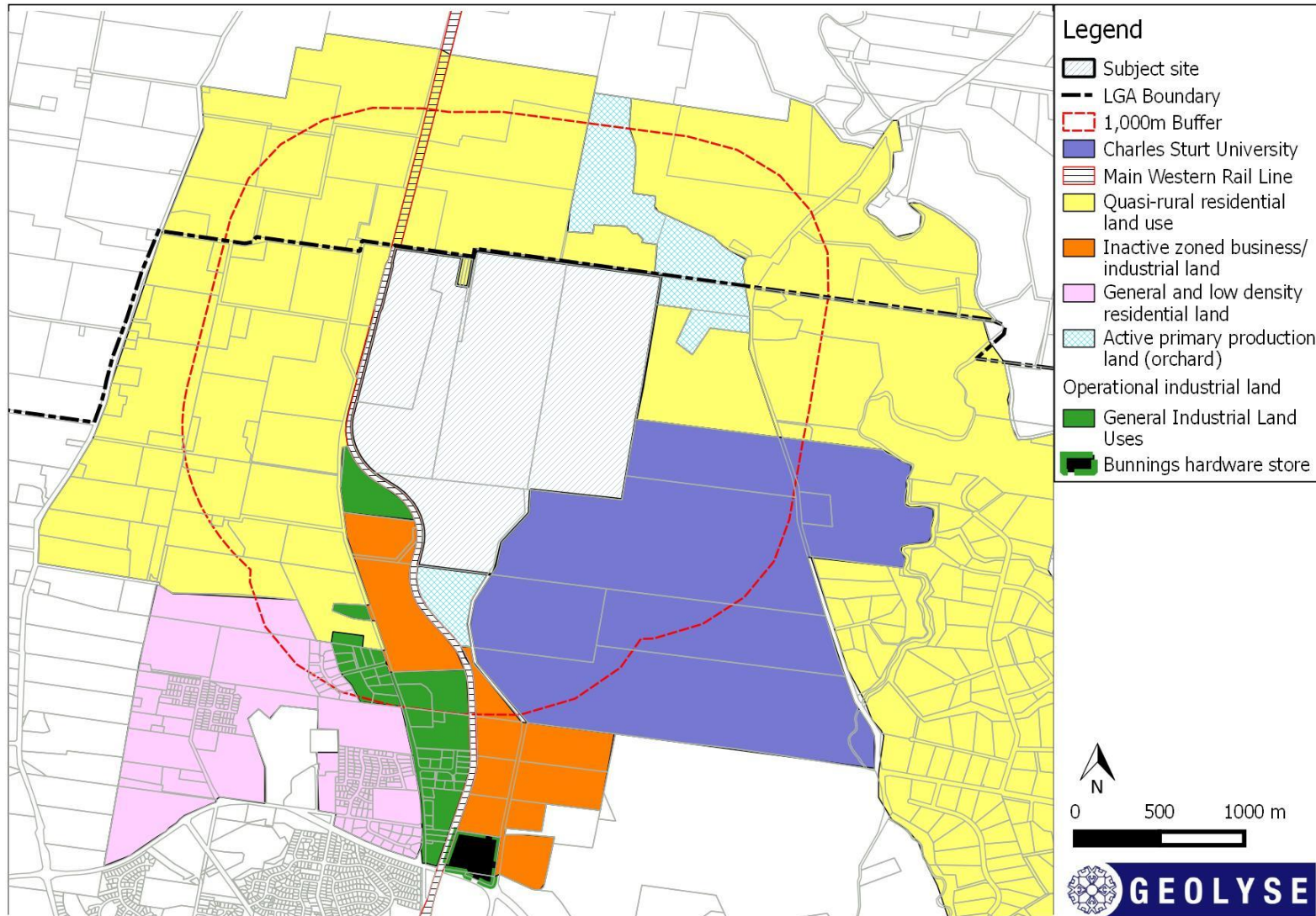


Figure 1: The surrounding locality

2.4 LAND USE SUMMARY AND PROPOSED ACTIVITIES

The nature of the precinct where the land use change & development is proposed:

The subject site is closely located to the developed northern extent of the City of Orange. Development in the last 10-15 years has seen increased residential land uses released together with the development of supporting commercial land uses including the North Orange Shopping Centre (recently given in-principle approval for expansion) and the new North Orange Bunnings. The Charles Sturt University is a considerable land holding to the east and south-east, held in trust or educational purposes only. The zoning to the south of the site reflects the Council's strategic vision for providing business uses aligned with the university.

Industrial land uses remain to the south along the rail corridor however take off of much of this land has been slow, possibly due to the rapid residential development to the immediate west of this area.

Land to the north, east and west is zoned for primary production but is largely fragmented and held in small land parcels with multiple owners.

Land to the north and north-east is utilised as an active apple orchard which has been in place for many years, and relies on water extraction from the Summer Hill Creek, also located to the east of the site.

Topography, climate & natural features:

The site is located in an undulating area with rolling slopes set around a central riparian zone. Slopes in the north-east of the site are steeper, stretching to the high point of the site which, at over 1,000 metres AHD, is one of the higher points in the area.

A small stand of trees representative of the Box-Gum Woodland vegetation community is located in the west of the site, north of the former abattoir buildings.

The climate is atypical of central western NSW with mild summers and cool winters.

The nature of the land use change & development proposed:

It is proposed to develop the subject site for large lot rural residential purposes, providing lots typically of 4,000 square metres in size. Larger lots are proposed in the steeper areas of the site to the east and north-east. All lots would be serviced by extensions to the Orange City Council reticulated water and sewer services. Road access would be provided via an extension of Leeds Parade, providing a direct linkage to the Northern Distributor Road, and good onward connections to central Orange to the south, the Mitchell Highway to the east,

The proposed zones and minimum lot sizes are shown in **Figure 2** and **Figure 3**.

The main activities of the proposed land use:

Urban development of the site can be expected to result in a range of physical works, human activities and environmental interactions including:

- Construction of roads, infrastructures and buildings;
- Removal of some vegetation;
- Earthworks; o Residential living
- Home-based businesses;
- Light industrial development;
- Vehicle traffic;
- Pedestrian and cycle traffic;

- Stormwater treatment and disposal;
- Conservation areas;
- Open space areas and activities; and
- Companion animal ownership.

Compare & contrast proposed and adjoining land uses for incompatibility:

Without mitigation or adaptations to master planning, the proposed large lot residential use of the subject site may conflict with surrounding land uses, activities or environments:

Active orchard to the north/north-east

Noise, dust, spray drift and light nuisance (during night work) from the active orchard has the potential to be intrusive to future residents of the proposed development. Complaints arising from residents about these activities has the potential to impact the capacity of the orchard to continue to operate.

Main Western Railway Line:

Noise from the railway line may impact upon proposed residents.

Industrial land uses

The use of land to the south-west for industrial purposes has the potential to impact future residents as a result of noise and other emissions.

Ecological impacts of development

In the absence of sensitive design or appropriate management measures, large lot rural residential development has the potential to result in adverse impacts on environmentally sensitive areas, such as the Box Gum Woodland EEC, the steeper slopes in the east of the site and the central riparian zone.

The FloraSearch ecological report, forming part of the Local Environmental Study (LES), provided the following recommendations to minimise impacts from the development:

Watercourse corridors

All the creeks and major drainage lines on the site would be protected by riparian corridors excluded from development (Figure 2). These corridors would be planted progressively with endemic native trees and shrubs appropriate to the specific sites. These would be predominantly species listed in Table 4. Planting of these riparian zones would provide wildlife habitat and corridors for wildlife movement between remnant woodlots on the site.

Reservation from development

The most significant remnant of Box-Gum Woodland is the large patch in the south west corner of the Project area immediately to the north west of the old abattoir. This patch has a relatively continuous tree canopy and is large enough to support viable local populations of some bird and other wildlife species. Although the ground cover is in low condition the tree density and good canopy health makes it an important remnant. Most of this area is proposed to be reserved from development (Figure 2).

E4 Environmental Living zoning

A second smaller Box-Gum Woodland remnant, to the north of the large one discussed above, also has value, although more fragmented. It is proposed that this remnant be protected through an E4 Environmental Living zoning and be linked to the above remnant via plantings of appropriate native tree and shrub species within the watercourse corridor connecting them (Figure 2). Appropriate tree species are those listed as naturally occurring on Lot 3 in Table 4. The scattered remnants of mainly Yellow Box trees south of Mendhams Creek are particularly healthy examples of the species and would provide prolific sources of nectar in good seasons. While these trees are too scattered to provide permanent habitat for most Box-Gum Woodland wildlife species, they would be an important resource for nomadic species. It is recommended they be protected under an E4 Environmental Living zoning.

The remnants of the Tablelands Snow Gum Grassy Woodland EEC are fragmented, patchy and occur on steep slopes in Lot 25. The exposed location means these trees suffer high winds and are in poorer condition than those on the lower areas of the site. Nevertheless, there are numbers of habitat trees with hollows that are worth protecting. It is recommended that an E4 zoning also be extended to these patches (Figure 2).

Bushfire hazard

Part of the site is mapped as bushfire prone however ground truthing demonstrates that the mapped vegetation (understood to consist of radiata pine trees) has been removed from the site.

Refer to the Geolyse bushfire assessment forming part of the LES for recommendations to ensure the development is designed to mitigate potential bushfire impacts.

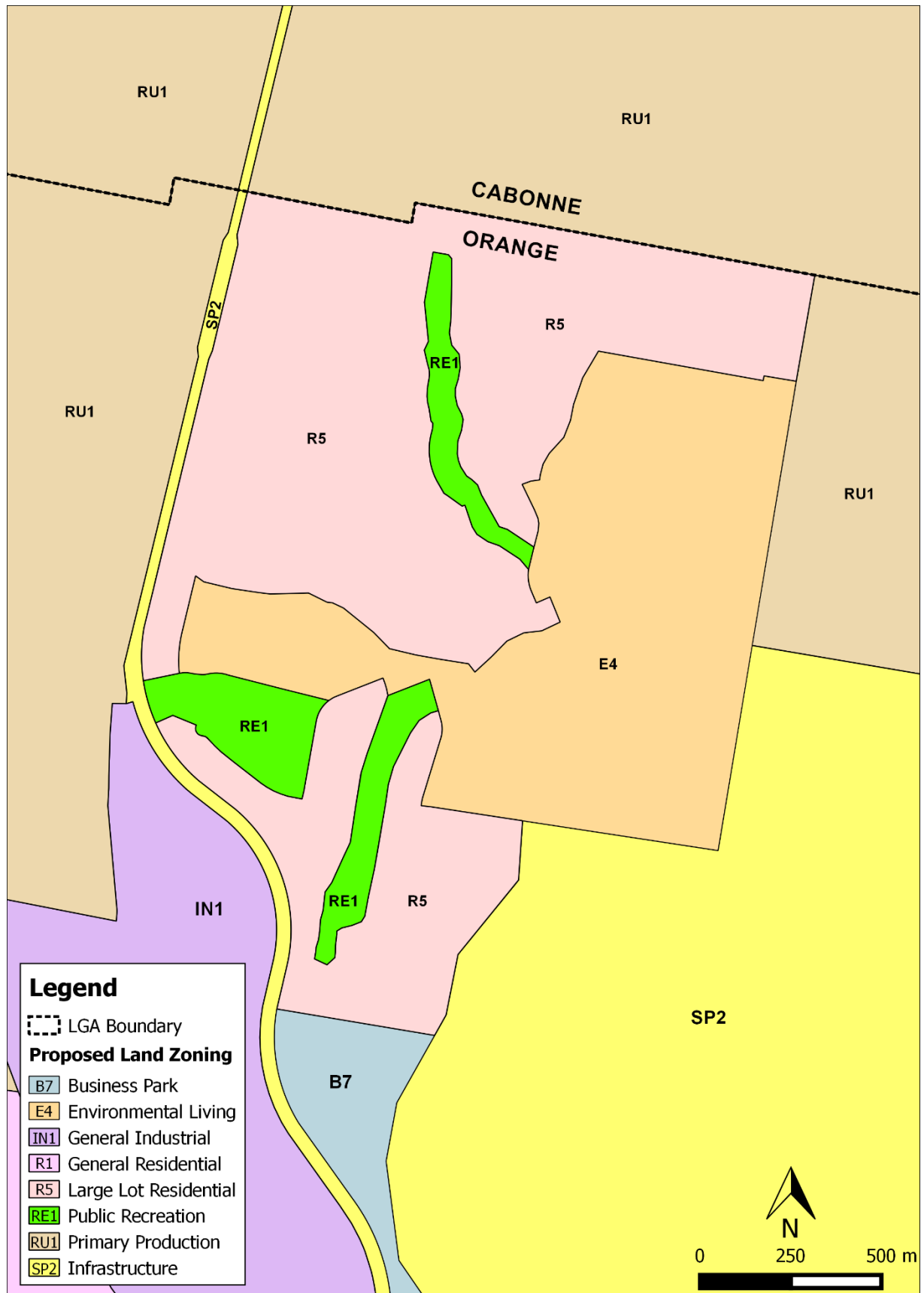


Figure 2: Proposed zoning plan

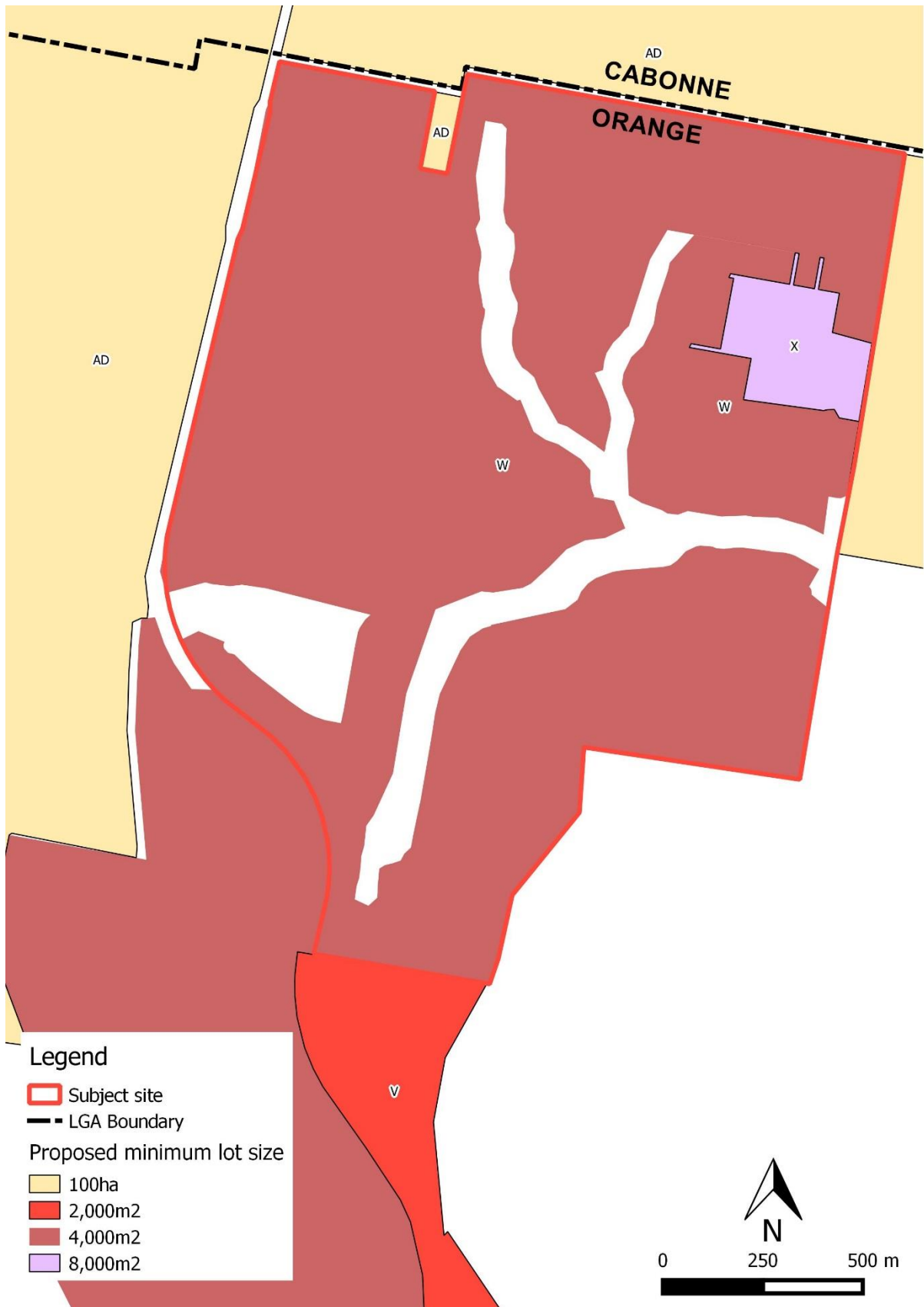


Figure 3: Proposed minimum lot size figure

Risk Level Evaluation (Step 2)

3.1 LUCRA MATRIX

The LUCRA process uses a “probability and consequence” matrix to estimate the potential for land use conflict. The LUCRA table from the *Living and Working in Rural areas Handbook* is reproduced below in **Figure 4**.

Likely consequences from a dispute or conflict arising over the land use or activity		Likelihood of a dispute or conflict arising over the land use or activity		
		Very Likely	Likely	Unlikely
	Major consequences and impacts likely	High	High	Medium
	Modest or periodic consequences and impacts likely	High	Medium	Low
	Minimal consequences and impacts likely	Medium	Low	Low

Figure 4: Land use conflict risk assessment matrix

3.1.1 RISK RATING

The LUCRA guidelines recommend determining a risk rating through determination of probability and the consequence of the occurrence of an impact of the development in the context the environment, public health and amenity. For this assessment probability and consequence have been determined by reference to the ranking matrix in **Figure 5** and the probability table in **Figure 6**.

Level	Descriptor	Description
1	Major	<ul style="list-style-type: none"> • Serious and/or long-term impact to the environment/public health and/or amenity • Long-term management implications
2	Moderate	<ul style="list-style-type: none"> • Moderate and/or medium-term impact to the environment/public health and/or amenity • Some ongoing management implications
3	Minor	<ul style="list-style-type: none"> • Very minor impact to the environment/public health and/or amenity • Can be effectively managed as part of normal operations

Figure 5: Measure of consequence (severity of environmental impact)

Level	Descriptor	Description
A	Very likely	<ul style="list-style-type: none"> • Common or repeating occurrence
B	Likely	<ul style="list-style-type: none"> • Known to occur or has occurred
C	Unlikely	<ul style="list-style-type: none"> • Could occur in some circumstances but is not likely to occur

Figure 6: Probability (measurement of likelihood of risk)

The result of the above assessment is a risk rating matrix as shown in **Figure 7**.

Consequence	Probability		
	Very likely	Likely	Unlikely
Major	High	High	Medium
Moderate	High	Medium	Low
Minor	Medium	Low	Low

Figure 7: Risk rating matrix

A rating is provided both before and after the implementation of proposed mitigating measures. Higher risk levels require greater amelioration than those with lower risk levels.

3.2 RISK EVALUATION

This section is arranged as a schedule, each section addressing a potential land use conflict source in terms of:

- Source of potential land use conflict
- Existing Risk – what potential risks exist, without any mitigating measures
- Risk Rating – what is the risk level, as per the land use conflict risk assessment matrix
- Mitigation measures – what can be done to reduce risks of land use conflict
- Controlled Rating – what is the risk level likely to be with mitigation measures in place

Table 2.1 – Risk evaluation

Source 1A:	Noise from orchard to the north/north-east
Potential Risk:	Noise from daytime and night time farm activities may impact on future large lot residential land holders
Risk Rating:	Medium
Source 1B:	Lighting impacts from orchard to the north/north-east
Potential Risk:	Night time farming operations utilising lights may impact on future large lot residential land holders
Risk Rating:	Medium
Source 1C:	Spray drift from orchard to the north/north-east
Potential Risk:	Residue spray from orchard operations have the potential to drift onto proposed large lot residential properties
Risk Rating:	High
Source 2:	Noise and vibration from trains using the Main Western Railway Line:
Potential Risk:	Noise and vibration from trains on the Main Western Railway Line have the potential to impact residents of dwellings on the future large lot residential lots
Risk Rating:	High
Source 3:	Noise and other emissions from Industrial land uses
Potential Risk:	Impact on future residential amenity from noise and other emissions associated with industrial use of land

Table 2.1 – Risk evaluation

Risk Rating:	Low
Source 4:	Ecological impacts of development
Potential Risk:	Impacts to ecological communities as a result of the development
Risk Rating:	High
Source 5:	Bushfire hazard
Potential Risk:	Risk to future occupants due to the bushfire hazard
Risk Rating:	Low
Source 6:	Environment interface of residential development
Potential Risk:	Pressure on environmental assets, eg, spread of weeds from gardens to natural environment, fly-tipping
Risk Rating:	High
Source 7:	Pets
Potential Risk:	Dogs & cats predating on native fauna
Risk Rating:	High
Source 8:	Urban water quality
Potential Risk:	Increased nutrient run-off to receiving environment
Risk Rating:	Medium

Risk management strategies (Step 3)

4.1 BUFFERS

Buffers are discussed in detail in the Handbook and are categorised in four main ways:

- Separation distance buffers
- Vegetation buffers
- Landscape/ecological buffers
- Property management buffers

It is possible that a number of buffer styles may be adopted to address a specific potential risk, such as the use of a combination of a separation distance buffer and a vegetation buffer.

There is the capacity to utilise a number of these buffers in relation to the Clergate Hills project.

By virtue of the physical characteristics of the site, some ready separation buffers already exist, for example in relation providing adequate separation between the proposed use and industrial land uses, generally located to the south-west and on the western side of both Clergate Road and the Main Western Railway Line.

The use of vegetation buffers in the north-west corner in combination with a physical separation would be an effective solution to the potential impacts of noise, lighting and spray drift from the neighbouring orchard. The topographical features of the site also to assist in ameliorating the potential impacts to residents, given the downslope position of the orchard and the buffer provided by the vegetated Pearce Lane road corridor.

4.2 LAND USE AND BUILT FORM CONTROL

This would incorporate measures such:

- Appropriate protective land use zones over those areas with some natural sensitivity with minimised permissible land use types and more protective objectives;
- Utilising natural levels for road construction to minimise impacts to steeper slopes;
- Adoption of larger minimum lot sizes in areas of steeper slopes to minimise the number of dwellings in more constrained areas;
- Careful placement of roads and building envelopes to ensure the retention of significant vegetation;
- Building construction in accordance with the provisions of AS3959:2009 (where applicable).

4.3 URBAN DESIGN

This could incorporate measures such as:

- Design of a permeable urban layout to allow for wildlife movement, such as linkages between the riparian areas and establishing linkages to the reserved
- Protection, retention and augmentation of significant vegetation to provide for continuing habitat;
- Measures via the DCP to provide for a high quality urban design outcome.

4.4 PUBLIC EDUCATION

This would be expected to consist of the education of new residents regarding nutrient loads (in relation to gardening activities) and responsible companion animal ownership.

This requires a multi-party approach including the developer, Council and community groups.

These mitigating measures have been incorporated into the preferred option for land use zones and would be fleshed out in the DCP prepared with respect to the land, by virtue of the urban release area designation. The specific measures for this would be addressed at DCP and DA preparation.

4.5 MITIGATED RISK RATINGS

Table 4.1 – Mitigated risk ratings

Source 1A:	Noise from orchard to the north/north-east
Identified Risk:	Noise from daytime and night time farm activities may impact on future large lot residential land holders
Risk Rating:	Medium
Mitigation measures:	<ul style="list-style-type: none"> • Implementation of a separation to ensure building envelopes are not less than 50 metres from shared property boundary • Establishment of an at least 30 metre deep vegetation buffer on property boundary providing coverage and density to limit impacts of drift; • Vegetation to be planted and maintained to ensure it meets required maturity before residential land development begins in the affected area
Controlled risk rating:	Low
Source 1B:	Lighting impacts from orchard to the north/north-east
Identified Risk:	Night time farming operations utilising lights may impact on future large lot residential land holders
Risk Rating:	Medium
Mitigation measures:	<ul style="list-style-type: none"> • Implementation of a separation to ensure building envelopes are not less than 50 metres from shared property boundary • Establishment of an at least 30 metre deep vegetation buffer on property boundary providing coverage and density to limit impacts of drift; • Vegetation to be planted and maintained to ensure it meets required maturity before residential land development begins in the affected area
Controlled risk rating:	Low
Source 1C:	Spray drift from orchard to the north/north-east
Identified Risk:	Residue spray from orchard operations have the potential to drift onto proposed large lot residential properties
Risk Rating:	High
Mitigation measures:	<ul style="list-style-type: none"> • Implementation of a separation to ensure building envelopes are not less than 50 metres from shared property boundary • Establishment of an at least 30 metre deep vegetation buffer on property boundary providing coverage and density to limit impacts of drift; • Vegetation to be planted and maintained to ensure it meets required maturity before residential land development begins in the affected area
Controlled risk rating:	Low
Source 2:	Noise and vibration from trains using the Main Western Railway Line:
Identified Risk:	Noise and vibration from trains on the Main Western Railway Line have the potential to impact residents of dwellings on the future large lot residential lots

Table 4.1 – Mitigated risk ratings

Risk Rating:	High
Mitigation measures:	<ul style="list-style-type: none"> • Implementation of a separation to ensure building envelopes are not less than 40 metres from shared property buffer • Building envelopes to be established on the title and not to be revoked without authorisation of Council • Any buildings between 40m and 80m from the rail boundary to be designed by reference to Road Noise Control Treatment Category 2 as per the Department of Planning <i>Development near Rail Corridors and Busy Roads – Interim Guideline</i>
Controlled risk rating:	Low
Source 3:	Noise and other emissions from Industrial land uses
Identified Risk:	Impact on future residential amenity from noise and other emissions associated with industrial use of land
Risk Rating:	Low
Mitigation measures:	Separation distances between noise sources and residential area
Controlled risk rating:	Low
Source 4:	Ecological impacts of development
Identified Risk:	Impacts to ecological communities as a result of the development
Risk Rating:	High
Mitigation measures:	<ul style="list-style-type: none"> • Areas of higher sensitivity to be identified for protection and zoned accordingly as per recommendations of ecological assessment • Areas of lower sensitivity to be zoned as E4 – Environmental Living, due to its more protective objectives and limited range of use
Controlled risk rating:	Low
Source 5:	Bushfire hazard
Identified Risk:	Risk to future occupants due to the bushfire hazard
Risk Rating:	Low
Mitigation measures:	Bushfire assessment prepared to support DA, recommendations implemented via detailed design and future dwellings to be designed to satisfy relevant requirements of AS3959:2009 (where applicable).
Controlled risk rating:	Low
Source 6:	Environment interface of residential development
Identified Risk:	Pressure on environmental assets, eg, spread of weeds from gardens to natural environment, fly-tipping
Risk Rating:	High
Mitigation measures:	<ul style="list-style-type: none"> • Environmentally sensitive areas separated from residential development by public thoroughfares – roads, streets, lanes, footpaths • Public education for future residents • Revegetation of riparian areas • Controlled pedestrian access (walkways) to riparian areas • Water sensitive urban design, effective water quality control prior to discharge into sensitive receiving environments • Community title management of ownership of dogs & cats in the most sensitive areas • Responsible companion animals ownership (in accordance with the Companion Animals Act 1998)
Controlled risk rating:	Low

Table 4.1 – Mitigated risk ratings

Source 7:	Pets
Identified Risk:	Dogs & cats predating on native fauna
Risk Rating:	High
Mitigation measures:	<ul style="list-style-type: none"> • Separation distances/low density development • Public education for future residents about local environmental sensitivities • Public areas and thoroughfares between private development and environmentally sensitive areas • Control of ownership by body corporate e.g. community title,
Controlled risk rating:	Low
Source 8:	Urban water quality
Identified Risk:	Increased nutrient run-off to receiving environment
Risk Rating:	Medium
Mitigation measures:	Water sensitive urban design incorporating nutrient control systems prior to discharge
Controlled risk rating:	Low

Results (Step 4)

5.1 CONCLUSION

This LUCRA has identified and assessed several potential instances of land use conflict between the subject development and those existing land uses that surround the site.

A number of the potential risks are already low due to intervening separation distances and the prevailing topography. In these cases, further mitigation is not required.

Where the potential for conflict is real, this can be significantly reduced through the implementation of a number of mitigation measures. All potential land use conflicts can be reduced to low through the implementation of the following measures:

- Noise, lighting and spray drift from the active orchard to the north can be reduced through the physical separation of land uses via the instatement of building envelopes and the installation of a vegetated buffer that is sufficiently mature as to be effective before the development reaches these areas. The specific requirements for this buffer would be contained within the proposed Development Control Plan to be prepared in respect of the land and would be consistent with the existing provisions contained within Section 6 of the Orange Development Control Plan 2004;
- Education of the community;
- Adoption of water sensitive urban design principles; and
- Legal controls through the community title management plan, relating to matters such as pet ownership and the like.
- Bushfire hazard can be addressed by complying with design and management practices contained in Planning for Bushfire Protection (2006).

The proposed mitigation measures are specific, easily understood, easily designed, and relatively easy to implement. With these measures in place the potential for land use conflict will be unlikely and of minimal consequence.

References

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