Land Use Conflict Risk Assessment
Prepared in support of a Development Application for
Residential Rezoning
on a property at 30 Blue Hills Avenue Goonellabah

Background

The NSW Dept. of Primary Industries has published guidelines for identifying and managing land use conflict issues on the NSW North Coast.

The publication entitled '*Living and Working in Rural Areas A handbook for managing land use conflict issues on the NSW North Coast'* includes 'land use conflict resolution assessment' guidelines (LUCRA guidelines).

Particular Chapter 6 Development Control, of the publication *Living and Working in Rural Areas*, provides detailed guidance in the assessment and mitigation of potential land use conflict matters. Chapter 6's guidelines have been used as a resource for this Land Use Conflict Risk Assessment (LUCRA).

This LUCRA has been prepared to assist Council in assessing potential land use conflicts between the proposed development at the subject site and the neighbouring agricultural developments.

When considering potential land use conflict between residential and agricultural activities it is important to recognise that all agricultural activities:

- should incorporate reasonable and practicable measures to protect the environment in accord with the Protection of the Environment Operations Act (POEO);
- Should abide by relevant industry specific guidelines; and
- Must be conducted in a manner as required by other legislation eg workplace health and safety, and the use and handling of agricultural chemicals.

Despite this, no matter how careful an farmer is, and no matter how strict the operator adheres to rules and regulations, certain activities may result in a nuisance to adjacent residential areas through, for example, odour drift and noise impacts.

The LUCRA guidelines are aimed at:

- identifying a range of common rural issues and situations that can result in rural conflicts;

- recommending buffer separation distances between primary industries and proposed developments; and include
- a process of land use conflict risk assessment.

The guidelines recognise that in certain circumstances variations from the minimum buffer separation distances may be justified for reasons such as (in the subject case):

- the scale of the proposed development;
- the rural residential estate to the north;
- the residential estate to north west of the property;
- small lot rural subdivision to the south west;
- topographic conditions;
- operational considerations and arrangements;
- the educational establishment to the south of the site; and
- sensitivity of the proposed land uses.

The development of the subject lands will result in a Subdivision being developed adjoining an existing residential and rural residential area.

The potential land use conflict issues are identified and considered in the following land use conflict risk assessment (LUCRA) of the proposed development.

The LUCRA guidelines recommend consideration of a variation to the buffer criteria in *Living and Working in Rural Areas*, to be in accord with that included in Council's DCP's Chapter 11. A variation can be entertained if the circumstance of the proposed development warrant a variation to the recommended minimum buffer separation distances.

The actual width of the any buffer should depend on the impact/activity that will require the widest buffer. Once established, all other factors are capable of being adequately addressed.

Conflict between residential development and agriculture is likely to occur where residential land uses are sufficiently close to farmland that they are likely to be affected by agricultural activities eg. the use of agricultural chemicals, noise, dust and odour.

The land use conflict risk assessment (LUCRA) is essentially an appraisal system to identify compatibility of land uses and potential for conflict between adjoining land use.

Methodology

This assessment has been undertaken to determine the potential land use conflicts between the future owners/occupiers of the Proposed Rezoning on the subject property (ie Lot 7 DP 255203 at 30 Blue Hills Avenue Goonellabah) and the farming activities on the adjoining lots to the south and south east. Land to the south west comprises a small lot rural area and to the north and north west a residential/rural residential development both of which should pose no 'risk' to the Proposed Rezoning.

Living and Working in Rural Areas recommends that the LUCRA should include the following steps.

Step 1: Gather information

- Determine the nature of the land use change and development proposed.
- Assess the nature of the precinct where the land use change and development is proposed.
- Appraise the topography, climate and natural features of the site and broader locality
- Conduct a site inspection
- Describe and record the main activities of the surrounding agricultural land use and their regularity, including periodic and seasonal activities that have the potential to be a source of complaint or conflict

Step 2: Evaluate the risk level of each activity

- Record each activity on the risk assessment matrix, and identify the level of risk of a land use conflict arising from the activity.

Step 3: Identify the management strategies and responses that could help lower the risk of the issue resulting in a dispute and conflict

- Identify management strategies for each activity
- Prioritise Strategies
- Provide Performance targets for each activity

Step 4: Record the results of the LUCRA

- Summarise the key issues, their risk level, and the recommended management strategies

The steps described above are analysed in more detail as follows.

Step 1 — Gather information

Living and Working in Rural Areas recommends that the LUCRA should gather the following information consideration and/or address the following factors:

1. Determine the nature of the land use change and development proposed.

The existing and proposed use of the subject land and the adjacent lands are described as:

- Rural residential to the north;
- Suburban residential to the north west;
- Small lot rural subdivision to the south west; and
- Rural land to the east and south.

The existing use of the subject land is a dwelling with the lot being fallow but maintained (slashed/mowed) by the owner. The proposed use is described as a residential rezoning. The use of adjoining land to the north and east is cattle grazing and macadamia orchard respectively, and to the 'intermediate' south is Blue Hills College.

2. Assess the nature of the precinct where the land use change and development is proposed.

The use of adjoining land and land in the locality could be described as comprising small and large rural allotments reflecting the past minimum lot sizes of previous LEP's.

3. Appraise the topography, climate and land uses of the land and broader locality.

The topography of the land is typical of the Goonellabah area ie undulating terrain that has been largely cleared, with creek flats and gullies that are predominantly wooded and mostly infested with weeds eg Camphor laurel.

.A review of available historical aerial photographs from 1958 and recent Google Earth images indicate a recent, but prolonged, use of the site for livestock grazing. Given the generic history of the area, it is likely the site was cleared around 100 - 150 years ago with principal uses being subsistence farming along with dairy cattle grazing. Around 1950/60, dairy farming declined in the area with a change to beef cattle grazing.

Rural residential developments appear in the locality from the mid 1990's onwards. Horticultural enterprises in the Goonellabah area (to the site's east) are dominant ie macadamia orchards. However, none are located within 150m of the subject land.

Annual wind roses for the times of 9am and 3pm are shown in **Figure 1**. The wind roses are based on records from 1957 to 2003. The annual wind roses indicate that light to moderate winds are generally experienced from all directions.

The wind roses also indicate the following:

- winds in the mornings are typically light winds from the south-west, west or south and to a lesser extent from the north;
- winds in the afternoon are typically more moderate winds from the south-east and north-east; and
- Calm conditions are experienced 24% of the time in the morning and 6% of the time in the afternoon.

The wind frequency from the adjacent horticultural land use to the subject site is less than:

- 10% if two quadrants are added together in the morning (9am) (e.g. north-east + east);
- 30% if two quadrants are added together in the afternoon (3pm) (e.g. north-east + east).

4. The typical industries and land use in the area of the development

The area to the east contains macadamia orchards. The other rural land to the south east is lightly grazed.

5. The land uses and potential land uses in the vicinity of the development

To the north west the land is developed for suburban living and land to the north comprises existing rural residential lots. Land to the east and north east comprises rural farmland that is dominated by macadamia orchards. Importantly, an educational establishment is located to the south of the site (see **Figure 2**).

6. Describe the activities of the proposed land use

Subject to rezoning, a portion of the subject site will be developed for Residential lots with a minium area of 400m^2. The remainder of the site will be rural zone.

7. Describe the activities of the adjoining and surrounding land uses

The surrounding land uses are primarily residential or rural residential, with macadamias to the east.

8. Compare and contrast the proposed and surrounding land uses for compatibility

The historic use of the land is described above ie the site is most likely to have been cleared over 100 years ago with the site most likely used initially for grazing dairy cattle. A review of available historical aerial photographs from 1958 and recent Google Earth images indicate a recent, but prolonged, use of the site for livestock grazing.

Rural residential developments appear in the locality from the mid 1990's onwards. Horticultural enterprises in the Goonellabah area are located to the land's east more than 150m distant.

Step 2 — evaluate the risk level of each activity

Living and Working in Rural Areas indicates that; *'it is necessary to differentiate between an environmental hazard' and an 'environmental risk'. 'Hazard' indicates the potential for harm, while 'risk' refers to the probability of that harm occurring'.*

Consequently, a risk assessment matrix is used to rank the potential Land Use Conflicts in terms of significance. The matrix assesses the environmental/public health and amenity impacts according to the probability of occurrence and severity of any impact.

The procedure of environmental (including health & amenity) hazard identification and risk control is performed in four stages.

1. Environmental (as well as health & amenity) hazard identification,
2. Risk assessment and ranking,
3. Risk control development,
4. Assessment of 'controlled' risk.

Procedure:

1. Identify all hazards associated with each activity.
2. Assess and rank the risk arising from each hazard 'before controls' are applied

3. Re-rank each risk after the control is in place to ensure that the risk has been reduced to an acceptable level.
4. Finally, if the 'controlled' risk ranking is not deemed acceptable, consider if the proposed activity should be allowed to proceed.

In any determination of risk consequence and probability, the following table shows the measurement of the consequence of the environmental hazard/risks used for a LUCRA.

Level	Descriptor	Description	Examples/Implications
1	Severe	• Severe and/or permanent damage to the environment • Irreversible with management • Severe impact on the community • Neighbours are in prolonged dispute and legal action involved.	• Damage or death to animals, fish, birds or plants • Long term damage to soil or water • Odours so offensive some people are evacuated or leave voluntarily • Many public complaints and serious damage to Council's reputation • Contravenes Protection of the Environment & Operations Act and the conditions of Council's licences and permits. Almost certain prosecution under the POEO Act
2	Major	• Serious and/or long-term impact to the environment • Long-term management implications. • Serious impact on the community. • Neighbours are in serious dispute	• Water, soil or air impacted, possibly in the long term • Damage to animals, fish or birds or plants • Public complaints. Neighbour disputes occur. Impacts pass quickly • Contravenes the conditions of Council's licences, permits and the POEO Act • Likely prosecution
3	Moderate	• Moderate and/or medium-term impact to the environment and community. • Some ongoing management implications. • Neighbour disputes occur.	• Water, soil or air known to be affected, probably in the short term • No serious damage to plants or animals • Public largely unaware and few complaints to Council • May contravene the conditions of Council's Licences and the POEO Act • Unlikely to result in prosecution
4	Minor	• Minor and/or short-term impact to the environment and community. • Can be effectively managed as part of normal operations. • Infrequent disputes between	• Theoretically could affect the environment or people but no impacts noticed • No complaints to Council • Does not affect the legal compliance status of Council

		neighbours	
5	Negligible	• Very minor impact to the environment and community • Can be effectively managed as part of normal operations. • Neighbour disputes unlikely.	• No measurable or identifiable impact on the environment. • No measurable impact on the community or impact is generally acceptable.

Living and Working in Rural Areas identifies that the magnitude of risk can be reduced where certain physical circumstances, procedures, technologies, scientific and environmental controls might lower probability values.

Step 3 — identify the management strategies and responses that could help lower the risk of the issue resulting in a dispute and conflict

Living and Working in Rural Areas identifies that the magnitude of risk can be reduced where certain circumstances exist or can be implemented.

The key factors which mitigate the potential for land use conflict in the subject development are as follows:

- The nature of the adjoining land uses. None of the grazing that may occur on the large rural lot generates off−site impacts which might be described as severe, major or even moderate;
- The unsuitable undulating topographic land features for horticulture on the large rural lot to the south;
- The educational establishment to the south;
- The rural residential to the north;
- The suburban residential development to the north west;
- Activities (such as the application of chemicals) that are undertaken on adjoining land are regulated by legislation and subject to operational application controls and procedures;
- The small lot rural area to the south west.

Measure of Consequence

The core activities of agricultural uses and environmental control on adjoining lands have the potential to generate offsite environmental impact/s and be a possible source of land use conflict between the proposed development and existing agricultural uses/proposed environmental control.

Each evaluated activity is rated by nominating a 'probability' score (see Table below) and a 'consequence' score (see Table following). *Living and Working in Rural Areas* provides a 'risk ranking' table to identify the risk of environmental impact.

The risk is ranked from a score of 25 to 1 for each 'probability' and 'consequence'. A rank of 25 represents the highest magnitude of risk that is highly likely and a serious event. A rank of 1 represents the lowest magnitude of risk, an almost impossible very low consequence event. A risk ranking of 25−11 is deemed to be an unacceptable risk and a risk ranking of 10−1 is deemed to be an acceptable risk.

The following Table shows the 'risk ranking' table as adopted in *Living and Working in Rural Areas*. The list below shows the measure of the likelihood or probability of the environmental hazard/risks occurring, as adopted in *Living and Working in Rural Areas,* and as used in the table below.

Five levels (A−E) of probability are provided for ie.

A Almost certain - Common or repeating occurrence
B Likely - Known to occur, or 'it has happened'
C Possible - Could occur, or 'I've heard of it happening'
D Unlikely - Could occur in some circumstances, but not likely to occur
E Rare - Practically impossible

Probability	A	B	C	D	E
Consequence					
1	**25**	**24**	**22**	**19**	**15**
2	**23**	**21**	**18**	**14**	10
3	**20**	**17**	**13**	9	6
4	**16**	**12**	8	5	3
5	**11**	7	3	2	1

- A risk ranking of 25-11 is deemed to be an unacceptable risk.
- A risk ranking of 10-1 is deemed to be an acceptable risk.

Impact of Housing encroaching onto Agricultural Activities and Environmental Works

Activity	**Identified Hazard**	**Uncontrolled Risk Ranking**	**Method of Control**	**Controlled Risk Ranking**
Cattle Grazing	Noise	D4, 5	Neighbourly discussion, if needed	E4, 3
Weed Spraying	Spray Drift	B3, 17	Spray in	C4, 8

			appropriate weather conditions	
Slashing	Noise	E5, 1	Cattle grazing negates slashing	E5, 1
Mechanical/agricultural operations	Noise/dust	C3, 13	Operate during 'normal' agricultural hours	D3, 9

Step 4— result of the LUCRA

The above LUCRA identifies and considers the risk of land use conflict from the adjacent land.

The low risk rankings shown in the table (above) demonstrate that the risk of land use conflict between the agricultural use on land to the west and north and proposed development is acceptable. This acceptable low risk is supported by the lack of any historical complaints from the northern rural residential estate or the school to the south.

There are no activities generated by the Proposed Rezoning that might have the potential to impact on the adjoining agricultural enterprises.

The most evident potential agricultural use of the adjoining land is for grazing. The educational establishment, size, slope and soil attributes of the large rural lot to the south is a limitation on any agricultural intensification, and/or any horticultural activities.

The educational establishment is only 180m south of the subject land's southern boundary. The *Living and Working in Rural Areas* publication has a minimum buffer to educational establishments of 200m for all horticulture (except rabbits and bananas), so it is highly unlikely that any horticulture will occur on the adjacent property.

It is noted that the Proposed Rezoning is sufficiently large to accommodate a 150m distance from future dwellings to any intensive agriculture on the adjoining lots to the east (see **Figure 2**).

Conclusion

Having regard to the above LUCRA assessment, it is submitted that the potential for land use conflict between the Proposed Rezoning and the existing and potential use of adjoining land is low and acceptable.

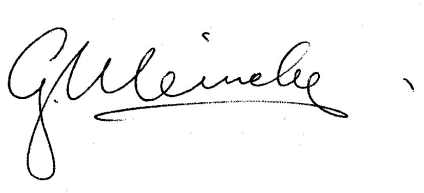
The proposed development can proceed as described in the Rezoning Application due to the unsuitability of adjoining lands for large scale horticultural activity that will in turn minimise instances of incompatibility.

When considering potential land use conflict between rural dwelling and agricultural activities it is important to recognise that all agricultural activities:

- Should incorporate reasonable and practicable measures to protect the environment in accord with the Protection of the Environment Operations Act (POEO) and associated industry specific guidelines;
- Should abide by relevant industry specific guidelines; and
- Are legally conducted as required by other legislation covering workplace health and safety, and the use and handling of agricultural chemicals.

The Proposed Rezoning will be, and subsequent proposed lots will also be greater than 150m distant from the existing horticulture to the east (required by Council's DCP Chapter 11). The educational establishment is only 180m south of the subject land's southern boundary. The *Living and Working in Rural Areas* publication has a minimum buffer to educational establishments of 200m for all horticulture (except rabbits and bananas), so it is highly unlikely that any horticulture will occur on the adjacent property.

Nevertheless, certain activities practised by even the most careful and responsible farmer may result in a nuisance to adjacent residential areas through aspects such as unavoidable odour drift impacts.



Graham Meineke

December 2018

Figure 1 – Wind Roses for Lismore 9am and 3pm

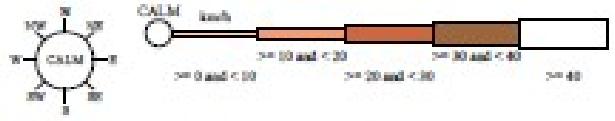
Rose of Wind direction versus Wind speed in km/h (01 Jan 1957 to 31 Dec 2003)

Custom times selected, refer to attached note for details

LISMORE (CENTRE STREET)

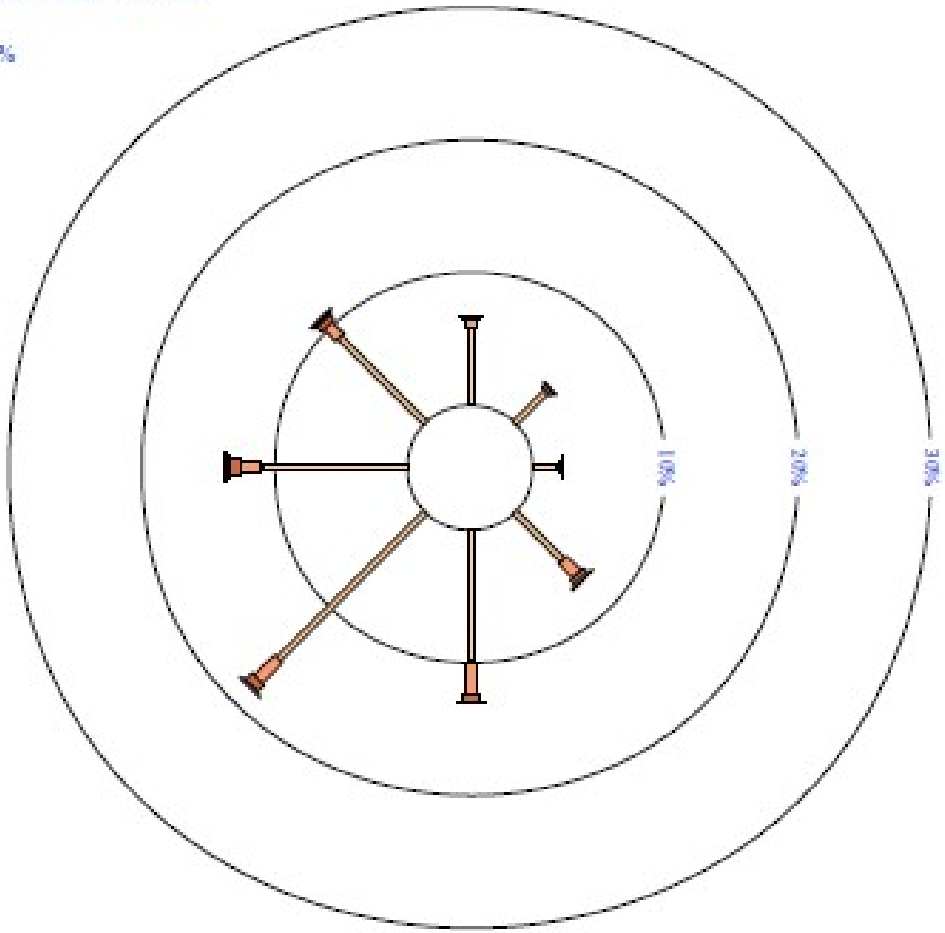
Site No: 058037 - Opened Jan 1964 - Closed Dec 2003 - Latitude: -28.807° - Longitude: 153.2828° - Elevation 11m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



9 am
16850 Total Observations

Calm 24%



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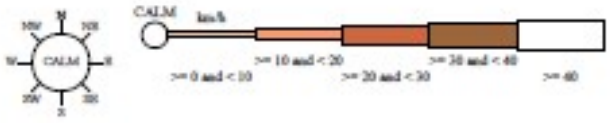
Rose of Wind direction versus Wind speed in km/h (01 Jan 1957 to 31 Dec 2003)

Custom times selected, refer to attached note for details

LISMORE (CENTRE STREET)

Site No: 058037 • Opened Jan 1884 • Closed Dec 2003 • Latitude: -28.807° • Longitude: 153.2620° • Elevation 11m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



3 pm
16772 Total Observations

Calm 6%

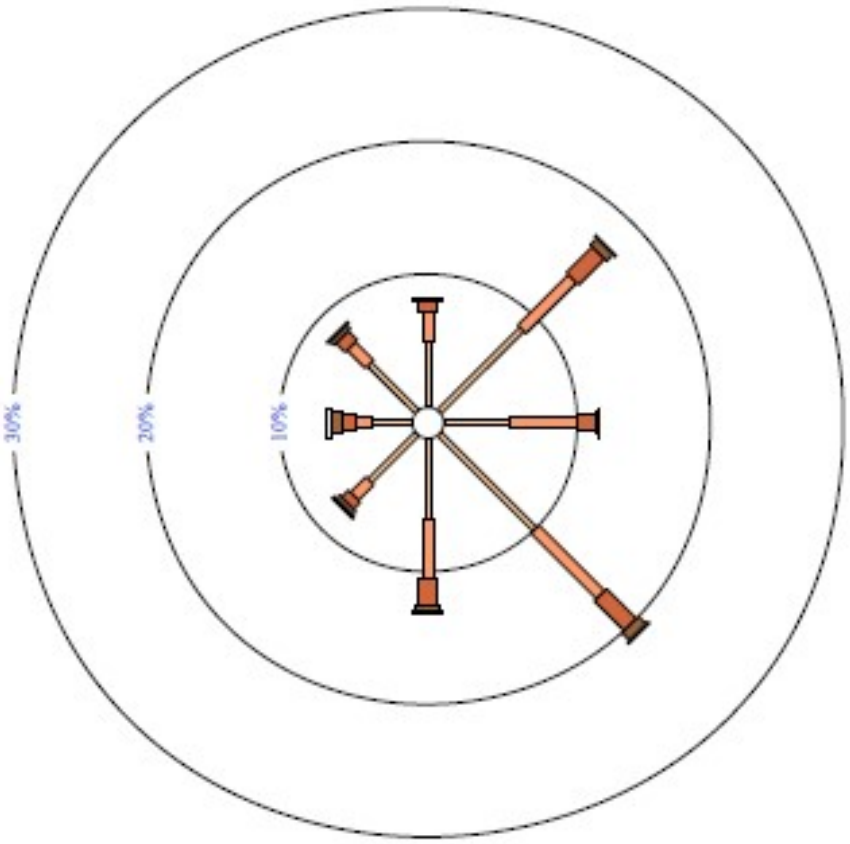


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Figure 2 – Land in Local Context


N
0 20 40 60 80 m
CROWN ROAD
≥150m
Land to be rezoned
200m
BLUE HILLS AVE
BLUE HILLS AVE
NAPIER ST
BRISTOL CCT
BRISTOL CCT
Sources: Department Finance, Services & Innovation 2018