

Land Use Conflict Risk Assessment

Planning Proposal to Byron Shire Council to
enable certain land uses to be undertaken at Lot
1 DP780234 Woodford Lane and Lot 5
DP848222, 11 Ewingsdale Road, Ewingsdale



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1. Introduction

Tim Fitzroy & Associates (TFA) has been engaged by *The Farm at Byron Bay Pty Ltd* to undertake a Land Use Conflict Risk Assessment (LUCRA) to accompany a *Planning Proposal* to Byron Shire Council to enable certain land uses to be undertaken at Lot 1 DP780234 Woodford Lane and Lot 5 DP848222, 11 Ewingsdale Road, Ewingsdale (see Locality Plan **Illustration 1.1**). The purpose of this report is to review the relationship of existing land uses on the site with development on surrounding land.

The land is presently zoned *RU1 Primary Production* in accordance with the provisions of Byron Local Environmental Plan 2014 (BLEP14). The Planning Proposal seeks to include additional permissible land uses on part of the site. Following the reporting of the draft Planning Proposal to Council's Ordinary Meeting of 26 October 2017, Council resolved that the Planning Proposal be amended to deal only with the following land uses on the site:

- Wholesale bakery;
- Agricultural training/education facilities;
- Administration offices; and
- Small-scale Information Centre

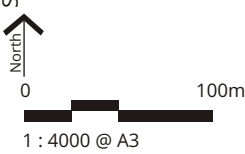
The subject site is described in real property terms as Lot 1 DP780234 Woodford Lane and Lot 5 DP848222 11 Ewingsdale Road, Ewingsdale. The site has 610 metres frontage to Woodford Lane; a boundary of approximately 860 metres to Ewingsdale Road; and 150 metres frontage to Quarry Lane. The site has an area of approximately 32 hectares.

Existing development on the site is accessed from Woodford Lane. The current commercial land uses are clustered in an area adjacent to the intersection of Woodford Lane and Ewingsdale Road at about RL20m AHD. The land falls to the east and west towards branches of Simpsons Creek. The locality of the site is a mixed use precinct with an existing concrete batching plant immediately southward of the subject site. To the east of the batching plant, directly opposite the site, is the Central Byron District Hospital facility. This Central Byron District Hospital site is immediately adjacent to the ambulance station fronting Ewingsdale Road. Also in the vicinity is Ewingsdale Public Hall and the rural residential enclave of Ewingsdale is further south east of The Farm. Land to the immediate north of the site comprises agricultural land presently used for the growing and processing of macadamias and beef cattle grazing.


A number of Development Applications have been approved in relation to The Farm, including a cheese making facility and farm café, agricultural training facility, plant nursery and farm produce kitchen. The area outside the commercial cluster is used for agricultural purposes including horticulture and the keeping of cattle, pigs, chickens and bees.



Source: WADE Engineering & Surveying, Plan No. 13/1329 Amend. A 21.05.14



Legend

 Subject site

Plan 2.1
THE
SITE

A site inspection coupled with a review of aerial photography (see **Site Plan Appendix A**) has confirmed:

1. The distance between the commercial area of *The Farm* and the existing macadamia plantation to the immediate north (Lot 7 DP 7189, Quarry Lane Ewingsdale) is more than 350 metres.
2. The existing Macadamia de-husking shed (Lot 7 DP 7189, Quarry Lane Ewingsdale) is located more than 620 metres from the restaurant of *The Farm*.

The actual width of the any buffer should in practice be dependent on the most limiting factor involved (i.e. the factor that will require the widest buffer). In theory, this would lead to all other factors being adequately addressed.

The Planning Proposal for *The Farm* should be designed to minimise instances of incompatibility such that normal farming practice are not inhibited and natural ecosystems and attributes are enhanced where possible. Where such instances do arise, measures to ameliorate potential conflicts should be devised wherever possible.

It is important to note that in the case of the subject Planning Proposal, the majority of *The Farm* site is used for agricultural purposes and therefore any issues of incompatibility in terms of potential land use conflict with surrounding agricultural land uses are markedly reduced.

When considering potential land use conflict 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; and
- are legally conducted as required by other legislation covering workplace health and safety, and the use and handling of agricultural chemicals.

Nevertheless, certain activities practised by even the most careful and responsible farmer may result in a nuisance to adjacent areas through, for example, unavoidable odour drift and noise impacts. Typical conflicts between cropping and residential development as provided in Table 1 below:

Table 1 Typical Conflicts between cropping and adjoining residential areas

Noise	<ul style="list-style-type: none"> • Farming equipment, pumps, spray machines, transport. • Ancillary equipment associated with on-farm processing.
Odour	<ul style="list-style-type: none"> • Fertilisers and chemicals.
Health concerns	<ul style="list-style-type: none"> • Chemicals. • Spray drift.
Water	<ul style="list-style-type: none"> • Access. • Pumping. • Quantity. • Runoff, sedimentation
Smoke and ash	<ul style="list-style-type: none"> • Burning of pasture, stubble or 'rubbish'.

The *Living and Working in Rural Areas Handbook* (NSW DPI et. al 2007), in particular Chapter 6 Development Control, provides guidance in the assessment and mitigation of potential land use conflict matters and has 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.

It is important to note that the *Living and Working in Rural Areas Handbook* does not include reference to separation distances between agriculture and commercial activity such as those approved on the site.

In assessing the potential risk of land use conflict associated with the existing land uses undertaken on The Farm, two key documents are relevant, namely, *Living and Working in Rural Areas – A handbook for managing land use conflict issues on the New South Wales North Coast, produced by NSW Department of Primary Industries 2007*, and Byron Shire Development Control Plan 2014 *Chapter B6 Buffers and Minimising Land Use Conflict*. The key provisions of these documents are addressed as follows:

Living and Working in Rural Areas

This publication presents a consolidation of best practices and strategies arising from managing land use conflict on the North Coast. The publication addresses land use conflicts and interface issues arising between agricultural practices and neighbouring residents. It is important to note that in the case of the subject Planning Proposal, the majority of The Farm site is used for agricultural purposes and therefore does not raise any issues in terms of potential land use conflict with surrounding agricultural land uses.

In the case of the subject site, it is understood that the issue of perceived potential conflict is associated with the macadamia farm to the immediate north and that no issues have been identified by the concrete plant, hospital or ambulance station to the south. In terms of quantifying the potential land use conflict the publication provides recommended minimum buffers for primary industries. These buffers represent a separation and distance which is considered to constitute best practice and a level of separation that will assist and minimise rural land use conflict. The minimum separation distance recommended for rural dwellings and education facilities from surrounding agricultural land uses is 50 metres for grazing, 200 metres for horticulture and 300 for Macadamia de-husking. As indicated on the plan accompanying this document, the minimum separation distance between the commercial cluster of uses and the area used for grazing is greater than 200 metres. The distance between the commercial area and the existing macadamia plantation to the immediate north is more than 350 metres. The existing Macadamia de-husking shed is located more than 620 metres from the restaurant.

It is evident that the separation distances provided in the site planning exceed the minimum best practice recommendations and are sufficient to address the potential for land use conflict between the uses. It is also noted that the table does not include reference to separation distances between agriculture and commercial activity such as those approved on the site.

Byron Shire Development Control Plan 2014 Chapter B6 Buffers and Minimising Land Use Conflict

This Chapter of the DCP aims to provide planning principals to avoid or minimise land use conflicts and ensure that development proposals are designed to minimise land use conflicts. The Chapter refers to the *North Coast Living and Working in Rural Areas handbook*. The development standards contained in B6.2.1 Responsibility for Managing Land Use Conflict notes that separation between conflicting land uses are an effective means of preventing conflict.

B6.2.2 Conflict Risk Assessment (CRA)

Objectives

1. To ensure that potential for land use conflict is identified and addressed systematically in the early stages of the development application process.

Performance Criteria

1. All development applications must identify any potential for land use conflicts and the means proposed to address those conflicts. In cases where potential for conflict is evident, development applications must be accompanied by a formal Conflict Risk Assessment (CRA) and associated mapping that defines and addresses at least the following:
 - a) The nature, intensity, extent and operational characteristics of any intended activities or uses within the proposed development that may create potential for land use conflicts in the locality.
 - b) Details of all geographical, topographical, vegetation, meteorological and other factors in the surrounding environment that may influence the potential for land use conflict.
 - c) Location, separation distances and use of all adjoining and other lands likely to create or influence potential for conflict between the proposed development and existing or proposed land uses.
 - d) The nature, intensity, extent and operational characteristics of activities or land uses within the adjoining and nearby lands that may create potential for land use conflicts with the proposed development.

- e) An assessment of the external effects and impacts likely to be generated by both the proposed development and the adjoining land uses and their potential to cause conflict.
 - f) Details of the proposed management measures, buffers and other planning or operational strategies to be incorporated in the proposed development to manage potential land use conflicts, together with an evaluation of the nature, extent and quantum of mitigation expected to be achieved.
2. The format, level of detail and assessment criteria for each CRA will vary depending on factors such as the nature and scale of the proposed development, the likely intensity and significance of potential conflicts, local environment and circumstances.

Consequently no prescriptive format is specified for a CRA, however valuable guidance can be found in the 'North Coast Living and Working in Rural Areas Handbook'.

Prescriptive Measures

There are no Performance Criteria.

Comment:

Whilst it is not conceded by the proponent that the activities undertaken at the Farm result in potential land use conflict with the macadamia undertaking to the immediate north, given representations made by the owner of the subject land in relation to perceived land use conflict, an assessment has been undertaken to assist Council's consideration of this matter.

The existing approved uses on the land have been assessed and determined as satisfactory in relation to their relationship with surrounding land uses. In relation to the potential land uses conflict resulting from the additional uses identified in the Planning Proposal, it is submitted that the risk of conflict is very low, given the separation distances between the land uses and the nature of the land uses proposed. The additional land uses envisaged by the Planning Proposal include agricultural produce industry (bakery), information and education associated with people visiting the Farm and agricultural related training. The separation distances provided well exceed the recommendations of 50 metres for grazing, 200 metres for horticulture and 300metres for macadamia de-husking, contained in Table B 6.1. These distances represent the desirable buffers for conflict avoidance.

B6.2.3 Planning Principles to Minimise Land use conflict

Objectives

- 1. To ensure that development applications are designed to avoid land use conflicts.
- 2. To define planning principles to be applied to proposed development to minimise the risk of land use conflicts.

Byron Shire Development Control Plan 2014 – Chapter B6 – Buffers and Minimising Land Use Conflict

Adopted 26 June 2014 Effective 21 July 2014 7

Performance Criteria

When considering development applications and associated CRAs where potential for land use conflict arises, Council will apply the following principles adapted from 'North Coast Living and Working in Rural Areas Handbook'. Development applications involving potential land use conflict must demonstrate how the proposed development addresses each principle and achieves the above Objectives.

1. General

- a) Decisions about new development should ensure that the natural and built resources of importance to the local, regional or State economy are not unreasonably constrained, impacted or sterilised by the location of incompatible land uses.
- b) Buffers between incompatible land uses do not take the place of sound strategic planning though they do offer an added level of conflict risk avoidance in land use planning and development.
- c) It is the responsibility of the encroaching development to provide the necessary setback and buffer to incompatible land uses. The extent of a buffer should not extend beyond the boundary of the property required to provide the buffer except via negotiation and agreement.
- d) The most effective means of preventing conflict is to plan for adequate separation between conflicting land uses.
- e) Potential risks of conflict created by residential expansion towards rural lands should be systematically assessed as early as possible in the planning process.
- f) New development next to or near to farmland, extractive resources, waterways, wetlands, and areas of high biodiversity value should incorporate buffers to avoid land use conflict.

2. Environmental Protection

- a) New urban development, rural settlement and other development should be sited and designed to protect key environmental assets and, where possible, enhance environmental assets including high conservation value vegetation and habitats and ecosystems, ecosystem corridors, waterways, endangered ecological communities and key habitat.
- b) The potential for land use conflict and development of mitigation measures should be assessed as part of any proposed intensification of use, in particular proposed residential development at the urban/rural interface and within the rural areas.
- c) Natural resources and environmental assets should not be damaged, constrained or sterilised by the location of incompatible land uses.

3. Community engagement

- a) Community engagement, including consultation with adjoining landowners and operators of 'scheduled activities' (as defined by the Protection of the Environment Operations Act), should be part of the development planning process to identify and avoid land use conflict.

4. Protection of resource access and use

- a) New urban development, rural settlement and other development in rural areas should be sited and designed so they do not interfere with legitimate and routine rural land uses on adjoining lands.
- b) Landscape values of rural lands should be protected.
- c) The different values of rural lands should be co-managed.
- d) Rural land uses should be protected from conflict with residential uses.
- e) The compatibility of proposed development in rural areas with the rural land uses currently or expected to take place in the locality and on adjoining lands should be documented and assessed before determining an application for new development in rural areas.
- f) Current best practice and the most likely intensive rural land use should be adopted in assessing the compatibility of adjoining land uses.
- g) Agricultural farmland should remain available in large contiguous areas for future rural industry activities. Lack of current viability of a property or farming areas is not enough justification to convert rural land to non-rural uses.
- h) The potential for land use conflict and development of mitigation measures should be assessed as part of any proposed residential development at the urban/rural interface and within rural areas.

- i) In rural zones, rural land uses should generally take precedence over non rural land uses in order to protect resource access and use.
- 5. Cultural heritage recognition
 - a) Aboriginal cultural heritage should be taken into account in the planning, siting, design and management of developments where there is a threat or perceived threat to Aboriginal cultural values including significant sites and places.
 - b) Early consultation with Aboriginal communities in a culturally appropriate manner is a fundamental prerequisite of any development application where these sensitivities require consideration. Consult the local council's Aboriginal liaison officer or Local Aboriginal Land Council community support officer.

Prescriptive Measures

There are no Prescriptive Measures.

Comment:

The proposed development adopts the most effective means of preventing conflict. That is, site planning including the provision of adequate separation between potentially conflicting land uses.

The land owner has consulted with adjoining land owners in order to identify perceived land use conflicts and address them.

The underlying premise on which The Farm operates is to 'grow, feed & educate' and the operation focuses on the agricultural activity on the subject site. This land use is entirely consistent with the agricultural undertakings to the immediate north.

B6.2.4 Buffers

Objectives

1. To avoid land use conflicts between proposed new development and existing, legitimate land uses.
2. To outline controls for buffers aimed at reducing land use conflicts between proposed new development and existing, legitimate land uses where development design and siting cannot deal satisfactorily with land use conflict.
3. To provide for existing, legitimate agricultural and associated rural industry uses to take precedence over other rural land uses within primary production rural zones and where appropriate in other rural zones.
4. To protect significant environmental and natural resources through incorporation of buffers into developments.

Performance Criteria

Where development design and siting cannot deal satisfactorily with potential for land use conflict between a proposed development and existing or proposed developments or land uses, Council will apply the following requirements and principles for the establishment of buffers. Much of the following has been adapted from Chapter 6 of 'North Coast Living and Working in Rural Areas Handbook'. Measures to ensure that buffers are maintained for the life of the proposed development should be nominated in the development application. Development applications involving such potential for land use conflicts must demonstrate how the proposed development addresses each of the following criteria and achieves the above Objectives:

1. The Role of Buffers

Defining minimum buffer distances between incompatible land uses and key natural resource assets is a useful mechanism for reducing and avoiding the threat of land use conflict issues between incompatible land uses. However, buffers have their limitations

and need to be used with caution and in combination with other strategies to reduce land use conflict risks and manage interface issues.

Complying with prescribed buffer setbacks will help decrease the potential for conflict, though it cannot guarantee that land use conflict and interface issues will be totally removed. Variables such as changes in ownership of adjoining lands, changes in land use and management practices and variable climatic conditions can affect the success of land use buffers.

Similarly, complying with a buffer setback does not guarantee that Council will grant consent to a development application. Equally, where a buffer is found to not be suitable for the subject site Council may reduce the width of the buffer. Mitigation of land use conflict and the application of land use buffers are part of a broader consideration of environmental, social and economic factors which Council must take into account in determining the merits of a given land use proposal.

In circumstances where the use of a buffer does not deal satisfactorily with conflicts or impacts (e.g. in cases where farm machinery, crop spraying or other agricultural practices are used on an adjoining property) it will be necessary for the proposed development to incorporate further design or management measures to address those impacts.

2. Types of Buffers

Different types of buffers may be used to deal with differing land-use conflicts and planning scenarios, including the following:

- a) Separation buffers are the most common and involve establishing a physical separation between land uses where conflict could arise. The aim of doing this is to reduce the impacts of the uses solely by distance separation, rather than by any physical means such as earthworks or vegetation planting. These can be fixed separation distances or variable. Fixed separation distances generally apply in the absence of evidence that an alternate lesser buffer will be effective in the circumstances. Variable separation distances are calculated based on the site specific circumstances given factors such as the scale of the development, risk of conflict and risk to the adjoining environment having regard to accepted procedures for assessing these risks.
- b) Biological and vegetated buffers are buffers created by vegetation planting and physical landscaping works. They are most commonly designed to reduce visual impact and reduce the potential for airborne-created conflict such as chemical spray drift and dust. They can help provide environmental protection through vegetated filter strips and riparian plantings.
- c) Landscape and ecological buffers refer to the use of vegetation to help reduce the ecological impacts from development. They are mostly used to protect a sensitive environment by maintaining or enhancing existing habitat and wildlife corridors.
- d) Riparian buffers are a particular form of separation, biological and ecological buffers. They are designed to protect the biophysical and geophysical integrity of riparian environments.
- e) Property management buffers refer to the use of alternative or specialised management practices or actions at the interface between uses where the potential for conflict is high. The aim of these buffers is to reduce the potential of conflict arising in the first place. Examples include siting cattle yards well away from a nearby residence to reduce potential nuisance issues, and adopting a specialised chemical application regime for crops close to a residence or waterways with the aim of minimising off-site impacts on neighbours and the environment.

- f) Other buffers: There are other statutory and recommended buffers that can apply to a specific sites and situations. These include:
- i) Bushfire protection buffers.
 - ii) Mosquito buffers.
 - iii) Airport buffers.
 - iv) Power line buffers.
 - v) Rifle range buffers.
 - vi) Railway line buffers.
 - vii) Cultural heritage buffers.

Prescriptive Measures

1. The buffer distances in Tables B6.1, B6.2 and B6.3 (adapted from 'North Coast Living and Working in Rural Areas Handbook') apply generally to development. Because each case will be different depending on the nature of the local environment and the extent and intensity of existing and proposed land uses, Council may vary the buffer distances specified herein following consideration of a formal Land Use Conflict Risk Assessment, planning principles and resultant management measures as referred to in Sections B6.2.2 and B6.2.3.
2. In circumstances where the proposed buffer does not satisfactorily deal with conflicts or impacts the proposed development must incorporate further management measures to ensure that those impacts are addressed.

Table B6.1 – Recommended minimum buffers (metres) for primary industries
(Note: The desirable buffer in the circumstances will be the separation distance and conflict avoidance strategy that protects: community amenity, environmental assets, the carrying out of legitimate rural activities in rural areas and the use of important natural resources.)

	Residential areas & urban development	Rural dwellings	Education facilities & pre-schools	Rural tourist accommodation	Watercourses & wetlands	Bores & wells	Potable water supply/catchment	Property boundary	Roads
Piggeries ¹ Housing & waste storage (9) Waste utilisation area	1000	500	1000	500	100	SSD	800	100	100
	500	250	250	250	100	SSD	800	20	20
Feedlots ² Yards & waste storage (9) Waste utilisation area	1000	500	1000	1000	100	SSD	800	100	100
	500	250	250	250	100	SSD	800	20	20
Poultry ³ Sheds & waste storage (9) Waste utilisation area	1000	500	1000	500	100	SSD	800	100	100
	500	250	250	250	100	SSD	800	20	20
Dairies ⁴ Sheds & waste storage (9) Waste utilisation area	500	250	250	250	100	SSD	800	100	100
	500	250	250	250	100	SSD	800	20	20
Rabbits ⁵ Wet shed, ponds & irrigation. Dry shed	300	150	150	150	100	SSD	800	50	50
	120	60	120	60	100	SSD	800	20	20
Other intensive livestock operations ⁶	500	300	500	300	100	SSD	800	100	100
Grazing of stock	50	NAI	50	50	BMP	SSD	BMP	NAI	BMP
Sugar cane, cropping & horticulture	300	200	200	200	BMP	SSD	BMP	NAI	BMP

Greenhouse & controlled environment horticulture	200	200	200	200	50	SSD	SSD	50	50
Macadamia de-husking	300	300	300	300	50	SSD	SSD	50	50
Forestry & plantations	SSD	SSD	SSD	SSD	STRC	SSD	SSD	BMP	STR C
Bananas	150	150	150	150	BMP	SSD	SSD	BMP	BMP
Turf farms ⁸	300	200	200	200	50	SSD	SSD	BMP	SSD
Rural industries (incl. feed mills and sawmills)	1000	500	500	500	50	SSD	SSD	SSD	50
Abattoirs	1000	1000	1000	1000	100	SSD	800	100	100
Potentially hazardous or offensive industry	1000	1000	1000	1000	100	SSD	800	100	100
Mining, petroleum, production & extractive industries	500 1000*	500 1000*	500 1000*	500 1000*	SSD	SSD	SSD	SSD	SSD

* Recommended minimum buffer distance for operations involving blasting

Comment:

As previously noted, the proposed development meets the best practice buffers identified as appropriate separation distances between dwellings and grazing, horticulture and macadamia de-husking.

It is evident from a review of the applicable policies and controls that the additional land uses proposed in accordance with the subject Planning Proposal are not likely to result in land use conflict, particularly having regard for the separation distances provided. Notwithstanding this, consultation with the neighbours to the immediate north has identified a number of issues that they have with the present and proposed continued operation of The Farm. Again, it must be emphasised that a number of the existing commercial land uses on the site are subject to existing development approvals.

1.1 Scope of Works

The purpose of this report is to review the relationship of existing land uses on the site with development on surrounding land. The land is presently zoned RU1 Primary Production in accordance with the provisions of Byron Local Environmental Plan 2014 (BLEP14). The Planning Proposal seeks to include additional permissible land uses on part of the site. Following the reporting of the draft Planning Proposal to Council's Ordinary Meeting of 26 October 2017, Council resolved that the Planning Proposal be amended to deal only with the following land uses on the site:

- Wholesale bakery;
- Agricultural training/education facilities;
- Administration offices; and
- Small-scale Information Centre

A site layout plan for the Planning Proposal is provided in **Appendix A**. The actual width of the buffer should in practice be dependent on the most limiting factor involved (i.e. the factor that will require the widest buffer). In theory, this would lead to all other factors being adequately addressed.

The tasks involved in undertaking this assessment were to:

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

2. Gather Information

2.1 Nature of the land use change and development proposed

The subject site is described in real property terms as Lot 1 DP780234 Woodford Lane and Lot 5 DP848222 11 Ewingsdale Road, Ewingsdale. The site has 610 metres frontage to Woodford Lane; a boundary of approximately 860 metres to Ewingsdale Road; and 150 metres frontage to Quarry Lane. The site has an area of approximately 32 hectares.

Existing development on the site is accessed from Woodford Lane. The current commercial land uses are clustered in an area adjacent to the intersection of Woodford Lane and Ewingsdale Road at about RL20mAHD. The land falls to the east and west towards branches of Simpsons Creek. The locality of the site is a mixed use precinct with an existing concrete batching plant immediately southward of the subject site. To the east of the batching plant, directly opposite the site, is the Central Byron District Hospital facility. This Central Byron District Hospital site is immediately adjacent to the ambulance station fronting Ewingsdale Road. Also in the vicinity is Ewingsdale Public Hall and the rural residential enclave of Ewingsdale is further south east of The Farm. Land to the immediate north of the site comprises agricultural land presently used for the growing and processing of macadamias and beef cattle grazing.

A number of Development Applications have been approved in relation to The Farm, including a cheese making facility and farm café, agricultural training facility, plant nursery and farm produce kitchen. The area outside the commercial cluster is used for agricultural purposes including horticulture and the keeping of cattle, pigs, chickens and bees.

2.2 Nature of the precinct where the land use change and development is proposed

2.2.1 Topography, Climate and Natural Features

The current commercial land uses are clustered in an area adjacent to the intersection of Woodford Lane and Ewingsdale Road at about RL20mAHD. The land falls to the east and west towards branches of Simpsons Creek.

The soils within the subject site are generally red basaltic – landscape variant. They are generally deep well drained alluvial kransozerm, described as the Wollongbar soil landscape group by Morand (1992).

Due to its latitude and proximity to the coast, Byron Shire has a coastal sub-tropical climate. As a result, daily temperatures are in the warm to very warm range during summer months (19.5 - 27.5°C) and are milder during winter months (11.7 - 20.3°C). Rainfall is mainly distributed throughout December to June with 1260 mm (72%) of the mean annual rainfall of 1747 mm falling during this period. The highest monthly

rainfall occurs in February/March while the months July-September are much drier, generally receiving less than 100 mm each.

Evaporation levels between September and January often exceed rainfall levels. However, as evaporation rates are low during the winter months, rainfall exceeds evaporation on an annual basis (see **Table 2.1**).

2.2.2 Wind Regime

The wind regime for the site is based on annual wind roses for Ballina Airport AWS. Cape Byron Weather Station has not been used as the wind experienced on the exposed headland whilst closer to the subject site does not reflect conditions at Ewingsdale. The Ballina Airport Wind regime is more closely aligned to the subject site.

Annual wind roses for the times of 9am and 3pm are shown in **Illustration 2.1**. The wind roses are based on records from 1992 to 2010. 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 west and south-west and to a lesser extent from the north;
- winds in the afternoon are typically more moderate winds from the south, north-east, south-east and east; and
- Calm conditions are experienced 8% of the time in the morning and only 1% of the time in the afternoons.

The wind frequency towards any of the sensitive receptors is less than 35% if three quadrants are added together (e.g. south east + south-east + south).

Table 2.1 Monthly Climate Statistics –BALLINA AIRPORT AWS)

Statistics	Month												Annual
	J	F	M	A	M	J	J	A	S	O	N	D	
Mean Max. Temp. (°C)	27.8	27.5	26.4	23.9	21.2	19.3	18.6	20	22	23.6	25.1	26.4	23.5
Mean Min. Temp. (°C)	21.1	21	19.9	17.6	14.9	13.1	12	13.1	15.2	16.9	18.6	19.8	16.9
Mean Rain (mm)	164.4	166.6	127.7	183.5	99.4	164.9	96.3	75.4	47	95.8	93.4	139.3	1509.2
Mean no. rain days	10.8	12	11.6	12.6	10.3	11.5	9.2	5.5	5.5	8.3	8.3	10.6	116.2
9 am conditions													
Mean Temp. (°C)	24.5	23.9	22.5	21.1	18.1	15.5	15.0	16.5	19.7	21.5	22.3	23.9	20.4
Mean Rel. Humid. (%)	74	78	80	75	75	75	72	66	63	66	72	70	72
Mean Wind Spd. (km/h)	13.3	12.8	12.5	13.2	13.5	12.7	13.3	13.3	14.5	15.7	14.2	14.2	13.6
Dominant Direction ¹	SW	SW	SW	SW	W	W	W	W	N & SW	N	N	N	W

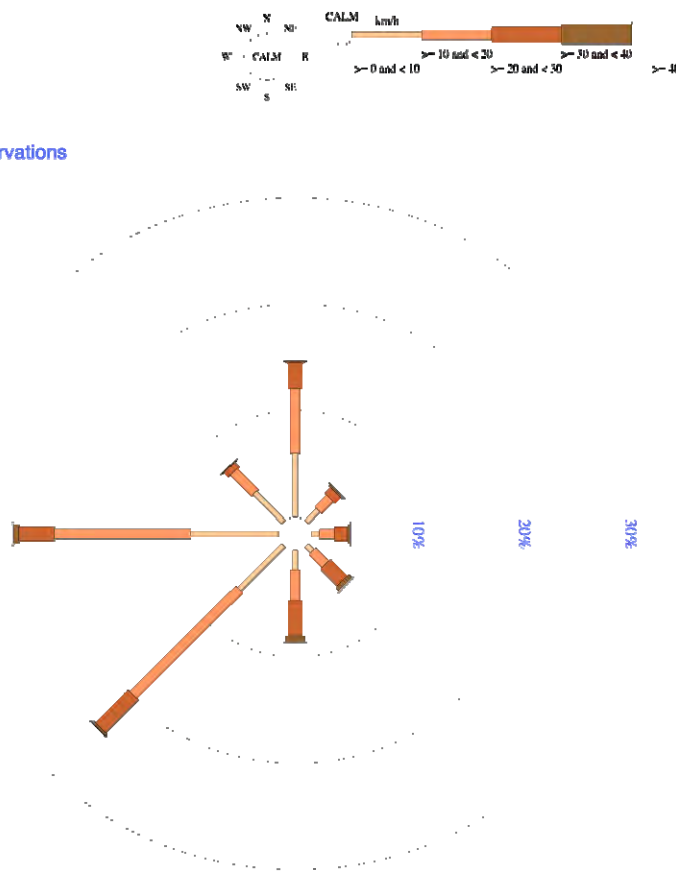
Statistics	Month												Annual
	J	F	M	A	M	J	J	A	S	O	N	D	
3 pm conditions													
Mean Temp. (°C)	26.7	26.5	25.4	23.4	21.0	19.0	18.7	19.8	21.6	22.8	24.4	25.9	22.9
Mean Rel. Humid. (%)	67	68	67	65	64	62	59	55	59	62	65	64	63
Mean Wind Spd. (km/h)	24.4	23.0	21.5	18.9	16.8	15.9	18.1	19.9	23.7	24.8	24.8	24.7	21.4
Dominant Direction ¹	NE	NE	SE	S	S	S	S	S	NE	NE	NE	NE	S

Table 2.2 Annual Wind Directions and Strength

Direction	9am	9am Wind Speed	3pm	3pm Wind Speed
N	15%	light	9%	moderate
NE	3%	light	21%	moderate
E	3%	light-moderate	14%	light-moderate
SE	5%	light-moderate	18%	light-moderate
S	9%	light-moderate	24%	light-moderate
SW	24%	light	5%	light
W	25%	light	5%	light-moderate
NW	8%	light	3%	light
Calm	8%	-	1%	-

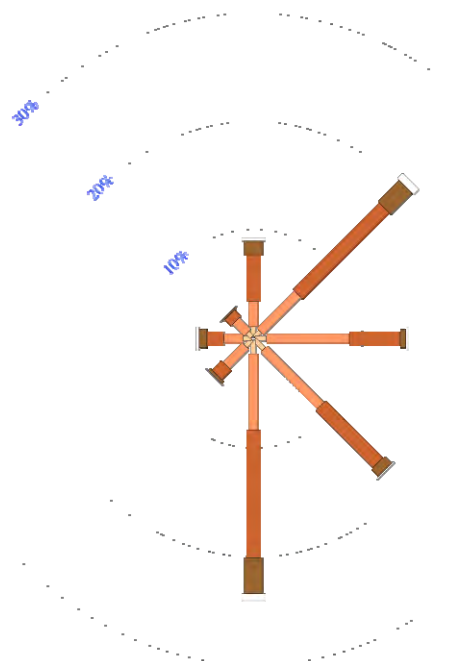
9 am
6359 Total Observations

Calm 8%



3 pm
6356 Total Observations

Calm 1%



Source: Bureau of Meteorology

Illustration 2.1 Annual Wind Roses (9am and 3pm) for Ballina Airport

2.3 Site Inspection

A site assessment was undertaken on the 20 November 2017 by Tim Fitzroy. On the day of the site assessment the weather was overcast with intermittent showers. The site is undulating consisting of pasture, limited cropping (macadamias) on the northern boundary, a series of vegetable patches on the southern boundary, clusters of commercial buildings, carpark, onsite wastewater system, fencing, and accessways. The land falls to the east and west towards branches of Simpsons Creek.

Discussions were undertaken with the property manager, Johnson Hunter as well as inspection of the property. Photographs of the site subject and surrounds were taken (see **Appendix B**).

2.4 Meeting with Mr Tony Flick

On 20 November 2017 Tim Fitzroy held a meeting with Mr Tony Flick, the owner and operator of the adjoining Macadamia and Beef Cattle grazing property (Lot 7 DP 7189) to the immediate north of the subject site. The purpose of the meeting was to confirm the current and potential future uses of Mr Flick's property and to identify any potential land use conflicts between the continued operation of Flick's property and the Planning Proposal at The Farm, 11 Ewingsdale Road Ewingsdale.

Mr Flick nominated the following potential land use conflicts between his operation and that of *The Farm*:

1. Mr Flick does not believe that *The Farm* should be allowed to operate in a RU1 zone operating as a tourist facility;
2. Future expansion of the farm and potential impacts on his farm operation;
3. Mr Flick wishes to plant more macadamias (approximately 4,000 trees) along the southern boundary of his property adjacent to *The Farm* and has delayed installation due to concerns about future possible expansion of *The Farm* and potential land use conflicts;
4. Spray drift and potential impacts on visitors to the farm, especially to the macadamia plantation on *The Farm*;
5. The two cells of the Subsurface Irrigation Area for the Onsite Sewage Management System which drain towards his property may be contaminating his property. He has been advised by Site Auditor for *Farm Fresh* that trees adjacent to the SSI should not be harvested until the land application area draining towards Mr Flick's land from the septic tank is relocated;
6. Biosecurity: Mr Flick is concerned with cross contamination from visitors to The Farm
7. Privacy: Mr Flick is concerned with Visitors to The Farm immediately adjacent to his property taking photos
8. Lack of monitoring and spraying at The Farm may cause disease in his plants
9. Noise from Weddings associated with The Farm activities
10. The Farm's restaurant scraps being dumped in the paddock attracting large flocks of crow's and ibis. These birds have been and continue to roost on Mr Flick's young trees, snapping off the grafts and destroying the structure of these trees.

2.5 Potential Land Use Conflicts

The following key items have been identified as potential land use conflicts as a result of the proposed development.

2.5.1 Agricultural Chemical Spray Drift

The off-target movement of agricultural chemicals can be a cause for concern to residents in proximity to farming areas. These concerns are largely based on fears of exposure to agricultural chemicals but also due to detection of odours associated with the chemical.

Mr Flick uses agricultural sprays to help manage insects and fungi. In addition fertilisers are applied to assist the growth of trees.

On macadamia plantations insecticides and fungicides are commonly applied using an Air Blast Sprayer while herbicides are normally applied with a boom spray and wand. Fertilisers are generally feed into the ground around the roots of trees via mechanical spreaders.

As per the Protection of the Environment Operation Regulation spraying is restricted to calm conditions to ensure that spray drift is restricted to the target trees.

No aerial agricultural spraying is known to occur in the area. Given the use of ground cropping chemical application it is assumed that spray drift would be limited.

Very fine or fine droplets pose the highest risk of spray drift; it is the single most important factor controlling drift potential. The selection of applicators and nozzles that give the correct droplet size range is important.

The higher droplets are released, the greater potential for drift. Given the adjacent land use consists of ground vegetable cropping and the relatively low height at which spray released the risk of spray drift is reduced.

A variety of insecticides, rodenticides, fungicides and fertilisers are used each year on commercial Macadamia plantations (see **Table 2.3** below). In addition the average frequency and method of application for chemicals utilised on macadamia plantations is provided.

Table 2.3 Chemicals (pesticides, herbicides and fertilisers) used on Commercial Macadamia Plantations

Chemicals	Type	Frequency Average	Application	Timing
Insecticides	Bulldock (beta-cyfluthrin) Supracide Carbaryl	3 times a year Aug, Oct, Dec	Air Blast Sprayer	Day
Rodenticides	Tomcat	As required	Bait Stations	Day
Fungicides	Carbendazim Howsat	3 times a year Aug, Oct, Dec	Air Blast Sprayer	Day
	Spin (carbendazim)*	3 times a year Aug, Oct, Dec	Air Blast Sprayer	Day
Fertilisers	North Coast Maca Mix	August	Spreader	Day
	Maca Husks	August	Spreader	Day

Herbicides	Roundup	As required	Hand gun/Wand	Day
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The greatest risk of drift potential relates to the use of the Air Blast Sprayer. It is important that all protocols are maintained to minimise drift.

2.5.2 Odour

Odour from cropping and horticulture can arise from use of chemical sprays, fertilisers (inorganic and organic), effluent disposal and composting. Such detrimental odours can impact on residential amenity and have the potential to affect public health.

Odour is often a major factor in many complaints about off-site chemical spray drift where there is sometimes no objective evidence of toxic exposure. Some agricultural chemicals contain 'markers' (strong odours) to allow easy identification and these markers or mixing agents are sometimes detected at a distance from the target area and cause concern even though in some circumstances extremely low levels of the active ingredients may be present.

Receptor's association of the odour with the chemical is sufficient to raise fears of exposure. In addition perceptions of an odour's acceptability and individual capacity to detect particular odours can vary greatly.

Factors affecting complaints from odour are influenced by the frequency, intensity, duration and offensiveness of the odour. An objectionable odour may be tolerated if it occurs infrequently at a high intensity, however a similar odour may not be tolerated at lower levels if it persists for a longer duration.

2.5.3 Noise

2.5.3.1 Noise Impacts from Flicks Macadamia Farm

Noise from macadamia dehusking and general farming operations (tractor use, spraying, collection of fallen nuts), vehicle movements, pruning of trees and general farm activities is a normal part of macadamia farming.

In June 2017 TFA prepared a Noise Impact Assessment (NIA) in response to an RFI request from Byron Shire Council. The RFI related to potential noise impacts from a macadamia processing in a shed located on an adjoining property between 350-400m north east of the proposed dwelling as described in DA 10.2017.3.1 at *The Farm*, Lot 1 DP780234 Woodford Lane and Lot 5 DP848222, 11 Ewingsdale Road, Ewingsdale

The purpose of the NIA was to:

1. Establish existing background noise levels across the subject site;
2. Examine the likely impacts of the adjoining macadamia processing operations on the proposed development in accordance with the NSW EPA Industrial Noise Policy (2000); and
3. Report on noise levels and provide recommendations to ensure that the noise impacts from the adjoining macadamia processing operations on the proposed development will comply as far as practicable with the intent of the NSW EPA Noise Guidelines.

The NIA concluded as follows:

A noise model has been constructed to predict the propagation of noise from Macadamia De-husking and drying at 25 Quarry Lane to the proposed dwelling at 11 Ewingsdale Road. The model includes shielding effects from surrounding buildings and topography. Topography information included in the model was sourced from the NSW Six Maps service (10m contours) and from dwelling site-plan (2m contours surrounding the dwelling).

Noise levels from Macadamia De-husking and Drying Silos are predicted to be within the day-time PSNC at all receptors.

Minor exceedances of the evening PSNC are predicted at the northern façade of the proposed dwelling. Advice from Mark Keen the former Manager of Summerland House Macadamia Processing Facility, Alstonville indicates that dehusking would rarely if ever occur at night. Exceptions would apply where:

- there was a mechanical breakdown; or
- the processing plant was accepting nuts from other farms and acting as a catchment or regional based processing plant.

Noise levels from the Drying Silos are predicted to be within the night-time PSNC at all receptors.

Note: The proposed dwelling was to be located significantly closer to the Flicks macadamia dehusking shed than the existing commercial infrastructure at *The Farm*. The noise impacts from dehusking activities on the Flicks Farm would be significantly reduced at the location of the commercial infrastructure

Any potential conflict related to noise impacts from the macadamia processing activities will be mitigated by noise decay over distance.

The macadamia harvest period generally runs from the end of March to the end of August, however the duration is subject to changeable weather conditions.

A number of routine macadamia farm operations generate noise. These noises are common to macadamia plantations.

The activities are summarised below:

- Mowing (all year round)

Mowing between macadamia tress occurs throughout the year. Mowing machinery includes either small tyro mowers or tractor with slasher.

- Fertilising (4 times a year (August to March))

Fertiliser is applied via a tractor mounted spreader along side the trees. One pass per row is required.

- Spraying of Insecticides/fungicides (3 times a year (Sept/Oct/Nov))

An Air Blast sprayer is utilised to apply insecticides to trees. The initial application each year usually occurs at daytime at pre flowering stage to ensure that non-target species (i.e. bees) are not impacted.

- Spraying of Herbicides (3 times a year (Jan-March-June))
A hand wand (low to ground) or wand is used to apply herbicides.

- Pruning

Trees (depending on their age) are generally pruned on an occasional basis (not regularly).

- Mulching (Once a year (September))

Following pruning limbs are collected and passed through a mechanical mulcher.

- Truck and Vehicle Movements

Harvested nuts will be collected for offsite de-husking and cracking from April to August. It is estimated that when there are approximately 2-3 heavy vehicle movements per season per farm.

2.5.3.2 Noise Impacts from Weddings at *The Farm*

In February 2016 TFA prepared a Noise Impact Assessment for a 'small event' venue for about 400 people at The Farm, Lot 1 DP780234 Woodford Lane and Lot 5 DP848222, 11 Ewingsdale Road, Ewingsdale. This report provides details on the noise assessment and modelling carried out by *Tim Fitzroy & Associates* and *Noise Measurement Services, Brisbane* to establish existing noise levels at the subject site and investigate potential noise impacts on surrounding residences.

The purpose of this noise assessment is to:

1. Establish existing background noise levels across the subject site;
2. Examine the likely impacts of the proposed development on the existing surrounding residences in accordance with the NSW EPA Industrial Noise Policy (2000); and
3. Report on noise levels and provide recommendations to ensure that restaurant complies as far as practicable with the intent of the NSW EPA Noise Guidelines.

A noise model has been constructed to predict the propagation of noise from wedding ceremonies and associated vehicle movements at the proposed venue. Noise levels have been predicted for ceremonies at three specific locations and for truck movements along the driveway. The model includes noise from patrons and amplified speech and entertainment, as well as shielding effects from buildings and topography.

Noise levels from each ceremony location and from vehicle movements are predicted to be within the Intrusiveness Criteria of 42 dB(A) L_{eq} at all sensitive receptors under all weather conditions, provided that the noise level at the ceremony location does not exceed the noise limits presented in **Table 2.4** below.

Each ceremony location has been modelled separately, therefore ceremonies should not be held at more than one location simultaneously.

Table 2.4 Noise limit at each Small Event Stage

Stage Location	Noise Limit as measured 3m from source (dB(A))
A	75
B	81
C	80

2.5.4 On site wastewater Management

In 2015 The Farm Byron Bay Pty Ltd engaged TFA to conduct a review of the system and prepare a report recommending upgrades or modifications to achieve a satisfactory effluent quality for on-site irrigation.

The OSMS review made the following recommendations in order of priority:

- Install five new 10 kL septic tanks (5 x 10 kL) and one new 6kL septic tank (1 x 6 kL) to provide total volume of 56 kL to achieve an 80-90% BOD reduction
- Install a new 5000 L pump well to pump effluent from new anaerobic/septic tanks to the existing 7000L tank. Pump well to include two float-switch operated pumps that alternate in duty/standby mode. Pump well to include: high level alarm with flashing light and audible alarm; secondary back-up measure with overflow pipe near top of well to direct flows to existing absorption trench
- Undertake regular monitoring and record in log book
- Following the above modification monitor:
 - influent and effluent to new anaerobic tanks to assess performance
 - influent and effluent to Kubota aeration system to determine if modifications are required
- Increase area for scullery and dishwashing in the restaurant in combination with other internal changes to reduce organic loading in wastewater
- Visually monitor grease traps to assess performance
- Inspect / monitor flows from Bare Bite kitchen to assess need for grease trap
- Continue to monitor flow volumes and compare with capacities of individual treatment / disposal units to determine timing of upgrades.
- Fit all sinks in food service areas with a dry basket arrestor with a fixed screen and a removable mesh basket and clean daily. The arrestor captures solids and fibrous material from the wastewater. Screened wastewater may then pass through to the grease trap prior to discharge to the OSMS. There are arrestors with a mechanism that does not allow flow to the OSMS when the basket is removed which are worthy of consideration.

The OSMS is a tertiary treatment system including:

- Grease Arrestors;
- Anaerobic digestion;
- Aerated Wastewater Treatment;
- Inline Chlorination; and
- Subsurface Irrigation.

On 1 August 2017 TFA provided a letter report to Byron Shire Council entitled *The Farm – Revised Performance of the On-site Sewage Management System*.

In summary, the effluent results from 2016 to 2017 show a gradual and significant improvement towards the compliance criteria because of various enhancements and upgrades. Disinfection of the irrigation water is now consistently being achieved as indicated by compliance with thermotolerant coliforms in 2017. The OSMS treatment process is currently performing at the higher end of levels typical of on-site aeration systems in terms of BOD and SS. Compliance criteria were consistently met in 2017 for BOD and SS over a five-week period. Some exceedances have occurred in recent months but the quality remains largely improved from 2016 and is returning to the compliance criteria.

The improvement in the quality of the irrigation water over the past year has been achieved by a combination of enhancements and upgrades to both business operations and the on-site treatment process. Enhancements to the treatment process have included:

- Changing the disinfection system from tablets to a more efficient dosing system
- Installing additional anaerobic tanks for improved pre-treatment prior to the Kubota aerated system
- Improving flow distribution to the Kubota system to equally balance flows between the three units.

The effluent results from 2018 continue to show a gradual and significant improvement towards the compliance criteria because of various enhancements and upgrades. Disinfection of the irrigation water is now consistently being achieved including the required chlorine residual in the irrigation field. The OSMS treatment process is generally meeting compliance criteria for BOD and SS.

The irrigation water has met the compliance criteria for thermotolerant coliforms for all sampling events par one in 2018. The general compliance has been achieved by the upgraded disinfection system and subsequent refinements to the dosing rate in combination with other general treatment improvements.

The Farm has undertaken significant steps and improvements to optimise the performance of the approved system. The system in 2018 is generally achieving compliance criteria with some exceedances which, while typical of on-site aeration systems, are being monitored with corrective action taken as appropriate. Therefore, it is considered appropriate to continue operation of the current OSMS system and associated management processes.

The Farm has undertaken soil testing at the irrigation fields to assess any residual public health risk associated with the irrigation scheme. The results show no contamination of soils from operations.

In addition to addressing the treatment process of the on-site sewage management system (OSMS), measures have been undertaken to modify kitchen practices such as:

- Increase areas for scullery and dishwasher to prevent residual food being washed into the OSMS because of hurried practices due to insufficient space
- Increase personnel dedicated to dishwashing in combination with training to assist with above issue
- Using biodegradable chemicals

- Fitting sinks in with a dry basket arrestor, screen and removable mesh basket in combination with frequent cleaning.
- Regularly checking grease traps and cleaning as required.

It is noted that the oil and grease levels in the effluent are of a relatively high quality regarding commercial waste effluent.

It is noted that odour emissions associated with the OSMS have been drastically improved since commencement of the operations because of the various upgrades and enhancements.

2.5.5 Biosecurity

Concerns have been raised by Mr Flick with respect to potential biosecurity issues from visitors potentially trespassing on his property, the spreading of soils and spores and insects from poorly maintained horticulture at *The Farm*. Mr Flick believes that these activities could affect the efficacy of his farming operations.

2.5.6 Privacy

Mr Flick is concerned with visitors at *The Farm* impacting on privacy and potentially operations at the Flicks property due to their ability to access the existing macadamia plantation at *The Farm* which shares the common southern boundary of the Flicks property.

2.5.7 Restaurant Food Waste

Mr Flicks claims that The Farm's restaurant scraps are deposited in the paddock attracting large flocks of crow's and ibis. According to Mr Flick these birds have been and continue to roost on Mr Flick's young trees, snapping off the grafts and destroying the structure of these trees.

2.5.8 Dust

The main sources of dust from cropping include cultivation prior to planting, tractor and transport movements. Contemporary farming practices incorporate measures to minimise loss of soil, but at times it is necessary to leave land unplanted for extended periods, which can lead to the movement of dust. Local conditions, including wind strength and direction, rainfall, humidity and ambient temperatures, soil type, vegetative cover and type of on site activity determine the extent of the nuisance.

2.5.9 Pests

Pests primarily include flies and rodents. Practices that minimise breeding on farm are necessary since pest's impact directly on community amenity and increase the risk of disease transfer. All pest control materials need to be used in strict adherence with labelling directions. They must be correctly stored away from children and domestic animals. Records of pesticide use should also be maintained.

2.5.10 Operating Times

General farm operations are usually during daylight hours. The macadamia harvest period generally runs from the end of March to the end of August, however the duration is subject to changeable weather conditions.

The current Development Approval allow The Farm to operate from 7am to 10-pm, 7 days per week.

2.5.11 Chemical Use

Volatile components of chemicals sprayed may affect neighbours if not used in accordance with manufacturer and workplace health and safety requirements. Spraying should also be avoided during adverse weather conditions that may impact on neighbours.

2.5.12 Surface Water and Sediment Runoff

The Farm will not result in any surface runoff impacting on the adjoining farmland due to the relatively small building footprint, distance attenuation and existing drainage conditions.

3. Land Use Conflict Risk Assessment

3.1 Introduction

In this report, 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 impact.

The procedure of environmental/public health & amenity hazard identification and risk control is performed in three stages.

1. Environmental/public health & amenity hazard identification,
2. Risk assessment and ranking,
3. Risk control development.

Procedure:

1. Prepare LUCRA Hazard Identification and Risk Control form.
2. List all hazards associated with each activity.
3. Assess and rank the risk arising from each hazard before “controls” are applied on the LUCRA form.
4. Develop controls that minimise the probability and consequence of each risk using the five level methods. Record these controls on the form.
5. Re-rank each risk with the control in place to ensure that the risk has been reduced to an acceptable level. If the risk ranking is not deemed to be acceptable consideration should be given to whether the proposed activity should be allowed to proceed.

3.2 Risk Assessment and Risk Ranking

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. For example, the presence of chemicals stored in a building is a hazard, but while the chemicals are stored appropriately, the risk is negligible. **Table 3.1** defines the hazard risks used in this report.

The Risk Ratings (severity of the risks) have been established by assessing the consequences of the risks and the likelihood of the risks occurring.

Table 3.1 Measure of Consequence

Level	Descriptor	Description	Examples/Implications
1	Severe	<ul style="list-style-type: none"> Severe and/or permanent damage to the environment Irreversible with management 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Serious and/or long-term impact to the environment Long-term management implications 	<ul style="list-style-type: none"> Water, soil or air impacted badly, possibly in the long term. Limited damage to animals, fish or birds or plants Some public complaints Impacts pass quickly Contravenes the conditions of Council's licences, permits and the POEO Act Likely prosecution
3	Moderate	<ul style="list-style-type: none"> Moderate and/or medium-term impact to the environment Some ongoing management implications 	<ul style="list-style-type: none"> Water, soil or air known to be affected, probably in the short term No damage to plants or animals Public unaware and no complaints to Council May contravene the conditions of Council's Licences and the POEO Act Unlikely to result in prosecution
4	Minor	<ul style="list-style-type: none"> Minor and/or short-term impact to the environment Can be effectively managed as part of normal operations 	<ul style="list-style-type: none"> Theoretically could affect the environment or people but no impacts noticed No complaints to Council Does not affect the legal compliance status of Council

Level	Descriptor	Description	Examples/Implications
5	Negligible	<ul style="list-style-type: none"> • Very minor impact to the environment • Can be effectively managed as part of normal operations 	<ul style="list-style-type: none"> • No measurable or identifiable impact on the environment

This report utilises an enhanced measure of likelihood of risk approach¹ which provides for 5 levels of probability (A-E). The 5 levels of probability are set out below in **Table 3.2**.

Table 3.2 Probability Table

Level	Descriptor	Description
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

3.3 Risk Ranking Method

For each event, the appropriate 'probability' (i.e. a letter A to E) and 'consequence' (i.e. a number 1 to 5) is selected.

The consequences (environmental impacts) are combined with a 'probability' (of those outcomes) in the Risk Ranking Table (Table 3.3) to identify the risk rank of each environmental impact (e.g. a 'consequence' 3 with 'probability' D yields a risk rank 9).

The table yields a risk rank from 25 to 1 for each set of 'probabilities' and 'consequences'. A rank of 25 is the highest magnitude of risk that is a highly likely, very serious event.

A rank of 1 represents the lowest magnitude or risk, an almost impossible, very low consequence event.

Table 3.3 Risk Ranking Table

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	4	2	1

NOTE

A risk ranking of 25-11 is deemed as an unacceptable risk.

A risk ranking of 10-1 is deemed as an acceptable risk.

Thus, the objective is to endeavour to identify and define controls to lower risk to a ranking of 10 or below.

3.4 Risk Reduction Controls

The process of risk reduction is one of looking at controls that have and affect on probability such as the implementation of certain procedures; new technology or scientific controls that might lower the risk probability values.

It is also appropriate to look at controls which affect consequences e.g. staff supply with a mechanism to change impacts or better communications established. Such matters can sometimes lead to the lowering of the consequences.

Table 3.4 LUCRA Site Assessment

Site Feature	Condition/Comments	Potential Conflict
Site Location: Vehicular Access	The subject site has access from Woodford Lane. It is unlikely that the existing farm will be significantly impacted by vehicle movements on the subject site.	Negligible
Operating Times	Based on the current configuration intensive horticulture and macadamia dehusking occurs in excess of 200m and 300m from the common property boundary therefore the impacts on patrons during operating hours would be limited. The Farm has development consent to operate 7 days a week from 7am until 10pm. Based on distance attenuation, the implementation of noise limitations and restricted hours of operations the resultant impacts are deemed to be acceptable	Minor
Aspect	North	Negligible
Exposure	The wind roses also indicate the following:	

	<ul style="list-style-type: none"> winds in the mornings are typically light winds from the west and south-west and to a lesser extent from the north winds in the afternoon are typically more moderate winds from the south, north-east, south-east and east Calm conditions are experienced 8% of the time in the morning and only 1% of the time in the afternoons. 	Negligible
Run-on and Upslope Seepage Site Drainage and Water pollution	<p>Run-on or seepage from the development of the subject site on ongoing farm activities on the adjoining farmland will be negligible.</p> <p>Two cells of the existing Council approved subsurface irrigation area drain towards the common boundary with The Flicks property.</p> <p>Concerns have been raised by the Farm Fresh Auditor, Mr Anthony Peart during his audit of the Flick property in February 2016 with regard to potential contamination of crops from effluent dispersal from The Farm :</p> <p><i>Upon review of the situation with the neighbour who has installed a septic system close by to your property.</i></p> <p><i>There is major concern of pathogen carry over to your property from the septic system which has been installed</i></p> <p><i>The concern is that since the macadamia are harvested from ground level, there is the potential for pathogen uptake onto shell and risking a food borne outbreak</i></p> <p><i>The example would Salmonella sp.</i></p> <p><i>Since Salmonella can survive on dry surfaces like macadamia shell and since the carry over from the septic system would definitely carry Salmonella and other pathogens including E coli, Listeria and various virus including Noro and Norwalk virus, It is recommended that this situation be reviewed with the local council to ensure that the septic system is managed such that no carry over e.g. during high rainfall events or in times of heavy loading of the septic system effect your property in any way</i></p> <p><i>It would appear that there is high potential for this to occur as one large section of the transpiration bed falls directly into an area where</i></p>	Negligible to Moderate

	<p><i>you plan to have new macadamia trees</i></p> <p><i>This is a major issue that needs to be addressed as matter of urgency</i></p> <p><i>It is recommended that no macadamia is to be harvested from the affected area until such times as the situation is mitigated</i></p> <p>It appears that Mr Peart is of the opinion that the OSMS is a septic system which is a primary treatment system. The Farm OSMS is a tertiary treatment system. The level of treatment, maintenance and monitoring results affirm the efficacy of the OSMS</p>	
<p>Agricultural Chemical Spray Drift</p> <p>The off-target movement of agricultural chemicals can be a cause for concern to residents in proximity to farming areas. These concerns are largely based on fears of exposure to agricultural chemicals but also due to detection of odours associated with the chemical.</p>	<p>Based on the distance (>200m), the risk of spray drift impacting on the commercial precinct is deemed to be negligible and the risk acceptable. There is a perceptible risk if visitors are within 200m of the macadamia plantation when spraying s being undertaken.</p> <p>There is a moderate risk that agricultural spray drift from Lot 7 DP 7198 may impact on organic crops and potential future organic certification at The Farm.</p>	<p>Negligible to moderate</p> <p>Moderate</p>
<p>Odour</p>	<p>Odour from cropping and horticulture can arise from use of chemical sprays, fertilisers (inorganic and organic), effluent disposal and composting. Such detrimental odours can impact on residential amenity and have the potential to affect public health.</p>	<p>Minor to Moderate</p>
<p>Farm Noise</p>	<p>The adjacent farm on Lot 7 DP 7198 generates noise from macadamia dehusking, general farming operations (tractor use, spraying, mulching, collection of fallen nuts etc), vehicle movements, pruning and mulching of trees and general farm activities. Due to the distance from the macadamia dehusking shed and plantation to the commercial precinct of The Farm the likelihood of noise complaints would be negligible to minor.</p> <p>Conversely noise impacts from commercial activities at The Farm (particularly Weddings and Events) are deemed to be acceptable provided that the activities are restricted to approved hours and noise limits</p>	<p>Negligible to Minor</p>

Dust	The main sources of dust from a macadamia cropping include cultivation prior to planting, tractor and transport movements. Smother grass is grown between the rows of macadamia trees significantly reducing the area of exposed soil and potential for dust generation.	Negligible
Pests	Pests include rodents. Practices that minimise breeding on farm are necessary since pest's impact directly on nut production, community amenity and increase the risk of disease transfer. Measures to control pests differ across agricultural operations. The level of treatment is a matter for individual farmers. The impact of individual farmer pest control measures in an agricultural setting is not a matter for consideration in a LUCRA .	Minor
Waste	Where food waste from The Farm is treated onsite measures are required to ensure that the site does not become an attractant for pests including birds	Minor to moderate
Biosecurity	The translocation of soil and debris from visitors attending to The Farm to adjoining Lot 7 DP 7198 is deemed to be a low to minor risk.	Low to Minor

The areas of moderate potential conflict outlined in **Table 3.1** will be addressed through the following **Risk Reduction Controls**:

Table 3.5 Hazard Identification and Risk Control Sheet

Work undertaking				
Activity	Identified Hazard	Risk Ranking	Mitigation Measures	Controlled Ranking
Run-on and Upslope Seepage Site Drainage and Water pollution	Run on from Onsite wastewater Impact on use of adjacent land for commercial crop production	C3 = 13 Unacceptable	<p>The Farm Fresh Auditor has incorrectly referred to the existing OSMS at The Farm as a Septic Tank which equates to primary treated effluent. The OSMS at The Farm is a Tertiary Treated System incorporating: grease arrestors, anaerobic digestion, and Aerated Wastewater Management and inline chlorination. Tertiary treated effluent provides significantly higher quality of treatment as described below.</p> <p>Viral Die-Off - Key Points & Parameters:</p> <ul style="list-style-type: none"> • Viruses are smaller and more resistant to natural die-off than bacteria, so if viral numbers (in effluent/soil) are acceptably low, then it is considered that bacterial numbers are also low • For primary treated effluent it is recommended to use a viral reduction of 7, greywater a value of 5 and for secondary treated effluent a value of 3 • The order of magnitude values for wastewater treatment are: <ul style="list-style-type: none"> ○ Primary treatment - septic 7 order of magnitude 0.0000001 ○ Greywater 5 order of magnitude 0.00001 ○ Secondary treatment 3 order of magnitude 0.001 	Controlled Ranking D4= Acceptable

Work undertaking				
Activity	Identified Hazard	Risk Ranking	Mitigation Measures	Controlled Ranking
			<p>Method of Control Expected performance of a Septic Tank</p> <p>Septic tanks provide preliminary treatment for the entire wastewater stream by allowing solids to settle to the base of the tank, and oils and fats to float to the top to form a scum layer. Anaerobic (in the absence of oxygen) bacterial digestion of the stored solids produces sludge, which accumulates in the bottom of the tank. Partly treated odorous effluent flows from the septic tank to the soil absorption system.</p> <p>For primary treated effluent it is recommended to use a viral reduction of 7 (<i>Draft Onsite Sewage Technical Guidelines</i>, Ballina Shire Council, 2017).</p> <p>The order of magnitude values for wastewater treatment are:</p> <ul style="list-style-type: none"> • Primary treatment - septic 7 order of magnitude 0.0000001 <p>Septic tanks do not remove nutrients. The wastewater is not disinfected, and because it is highly infectious it must be applied to land below ground level. Typical water quality levels after partial treatment in a septic tank are listed in Table 11 (NSW Health et.al 1998).</p>	

Work undertaking																
Activity	Identified Hazard	Risk Ranking	Mitigation Measures	Controlled Ranking												
			<p>Table 11: Expected Quality of Wastewater after Treatment in a Septic Tank</p> <table><tr><th>Parameter</th><th>Concentration</th></tr><tr><td>Biochemical oxygen demand (BOD)</td><td>150 mg/L</td></tr><tr><td>Suspended Solids (SS)</td><td>50 mg/L</td></tr><tr><td>Total Nitrogen (N)</td><td>50 – 60 mg/L</td></tr><tr><td>Total Phosphorus (P)</td><td>10 – 15 mg/L</td></tr><tr><td>Faecal coliforms</td><td>10⁵ – 10⁷ cfu/100 mL</td></tr></table> <p>Method of Control for existing Approved OSMS at The Farm</p> <p>Details of the approved system (Approval No 70.2014.1034.4) are:</p> <ul style="list-style-type: none">• Two grease arrestors operating in parallel at restaurant / café / bakery (each 2000L capacity)• Anaerobic tank (or septic tank) with outlet filter (1 x 7000L capacity)• An aerated wastewater treatment system (AWTS) consisting of three Kubota HCB-25 Johkasou systems (3 x 5000L systems providing a total 15,000L/day capacity)	Parameter	Concentration	Biochemical oxygen demand (BOD)	150 mg/L	Suspended Solids (SS)	50 mg/L	Total Nitrogen (N)	50 – 60 mg/L	Total Phosphorus (P)	10 – 15 mg/L	Faecal coliforms	10 ⁵ – 10 ⁷ cfu/100 mL	
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Work undertaking																			
Activity	Identified Hazard	Risk Ranking	Mitigation Measures	Controlled Ranking															
			<ul style="list-style-type: none"> Two holding tank / pump wells associated with the AWTs One 30,000 L above ground holding tank with pump well (1 x 30,000L) 5784m² of sub-surface irrigation (comprising 6 zones). <p>The approved system is designed for a peak flow rate of 9,652.5 L/day.</p> <p>The Section 68 compliance criteria for effluent quality are shown in Table 2.1.</p> <p>The approval requires monitoring to be conducted weekly until three consecutive results in compliance with the criteria below have been recorded.</p> <p>Results in compliance with the criteria below have been recorded.</p> <p>Table 2.1 – Effluent quality criteria</p> <table> <tr> <th>Sub-surface Irrigation</th><th>Biochemical oxygen demand (BOD) (mg/L)</th><th>Suspended Solids (SS) (mg/L)</th><th>Thermotolerant Coliforms (cfu/100mL)</th><th>Free Chlorine (mg/L)</th></tr> <tr> <td>90% of all samples</td><td>BOD < 20</td><td>SS < 30</td><td>< 30</td><td>0.2 – 2.0</td></tr> <tr> <td>Maximum threshold</td><td>BOD < 30</td><td>SS < 45</td><td>< 100</td><td>< 2.0</td></tr> </table> <p>In 2015 TFA the OSMS was upgraded in accordance with the following recommendations in order of priority:</p>	Sub-surface Irrigation	Biochemical oxygen demand (BOD) (mg/L)	Suspended Solids (SS) (mg/L)	Thermotolerant Coliforms (cfu/100mL)	Free Chlorine (mg/L)	90% of all samples	BOD < 20	SS < 30	< 30	0.2 – 2.0	Maximum threshold	BOD < 30	SS < 45	< 100	< 2.0	
Sub-surface Irrigation	Biochemical oxygen demand (BOD) (mg/L)	Suspended Solids (SS) (mg/L)	Thermotolerant Coliforms (cfu/100mL)	Free Chlorine (mg/L)															
90% of all samples	BOD < 20	SS < 30	< 30	0.2 – 2.0															
Maximum threshold	BOD < 30	SS < 45	< 100	< 2.0															

Work undertaking				
Activity	Identified Hazard	Risk Ranking	Mitigation Measures	Controlled Ranking
			<ul style="list-style-type: none"> • Install five new 10 kL septic tanks (5 x 10 kL) and one new 6kL septic tank (1 x 6 kL) to provide total volume of 56 kL to achieve an 80-90% BOD reduction • Install a new 5000 L pump well to pump effluent from new anaerobic/septic tanks to the existing 7000L tank. Pump well to include two float-switch operated pumps that alternate in duty/standby mode. Pump well to include: high level alarm with flashing light and audible alarm; secondary back-up measure with overflow pipe near top of well to direct flows to existing absorption trench • Undertake regular monitoring and record in log book • Following the above modification monitor: <ul style="list-style-type: none"> ○ influent and effluent to new anaerobic tanks to assess performance ○ influent and effluent to Kubota aeration system to determine if modifications are required • Increase area for scullery and dishwashing in the restaurant in combination with other internal changes to reduce organic loading in wastewater • Visually monitor grease traps to assess performance • Inspect / monitor flows from Bare Bite kitchen to assess need for grease trap • Continue to monitor flow volumes and compare with capacities of individual treatment / disposal units to determine timing of upgrades. • Fit all sinks in food service areas with a dry basket 	

Work undertaking				
Activity	Identified Hazard	Risk Ranking	Mitigation Measures	Controlled Ranking
			<p>arrestor with a fixed screen and a removable mesh basket and clean daily. The arrestor captures solids and fibrous material from the wastewater. Screened wastewater may then pass through to the grease trap prior to discharge to the OSMS. There are arrestors with a mechanism that does not allow flow to the OSMS when the basket is removed which are worthy of consideration.</p> <p>The irrigation water has met the compliance criteria for thermotolerant coliforms for all sampling events par one in 2018. The general compliance has been achieved by the upgraded disinfection system and subsequent refinements to the dosing rate in combination with other general treatment improvements.</p> <p>The Farm has undertaken significant steps and improvements to optimise the performance of the approved system. The system in 2018 is generally achieving compliance criteria with some exceedances which, while typical of on-site aeration systems, are being monitored with corrective action taken as appropriate. Therefore, it is considered appropriate to continue operation of the current OSMS system and associated management processes.</p> <p>The Farm has undertaken soil testing at the irrigation fields to assess any residual public health risk associated with the irrigation scheme. The results show no contamination of soils from operations.</p>	

Work undertaking				
Activity	Identified Hazard	Risk Ranking	Mitigation Measures	Controlled Ranking
			The existing tertiary treatment system coupled with on going maintenance and regular independent monitoring and analysis of the OSMS provides a significant level of surety to reduce the risk of run-on from the subject site to any adjoining site.	
Chemical Storage & Uses	Health and Safety Spray drift and associated odours from an application of agricultural chemicals has the potential to adversely affect the health and safety of persons in non-targeted areas. Overspray; land, surface and groundwater contamination	C3 = 13 Unacceptable	Adopting the <i>precautionary principle</i> it is recommended that a vegetated buffer* (as per Appendix C) based on the following criteria be installed on the subject site along the northern boundary and the perimeter of the sub surface irrigation area: <ul style="list-style-type: none"> • contain random plantings of a variety of tree and shrub species of differing growth habits, at spacings of 1–2 m for a minimum width of 5 m. • include species with long, thin and rough foliage which facilitates the more efficient capture of spray droplets; • provide a permeable barrier which allows air to pass through the buffer. A porosity of 0.5 is acceptable (approximately 50% of the screen should be air space); • foliage is from the base to the crown; • include species which are fast growing and hardy; • have a mature tree height at least 3m; • include an area of at least 2m clear of northern boundary. 	C4 = 8 Acceptable
Waste Management	Health & Safety Attracting vermin	C3 = 13 Unacceptable	Concerns have been raised by the adjoining landowner with respect to the impacts of poorly managed food waste from	C4 = 8 Acceptable

Work undertaking				
Activity	Identified Hazard	Risk Ranking	Mitigation Measures	Controlled Ranking
	and birds, odours	le	<p>The Farm being disposed of onsite. Mr Flick claims that this practice has attracted scavenging birds which have consequently impacted on his newly grafted macadamia trees</p> <p>It is recommend that:</p> <ul style="list-style-type: none"> • A Waste Management Plan be developed to manage food and organic materials. <p>The WMP is to consider:</p> <ul style="list-style-type: none"> • location (to maximise separation distance to sensitive receivers); • manage stock feed to minimise odours and the attraction of vermin; • design system to minimise surface, water and ground contamination; and • management and monitoring components. <p>Subject to the development and implementation of a competent WMP the attraction of vermin and birds is expected to desist.</p>	

***Note 1:** The vegetated buffer:

- will also address concerns regarding biosecurity and privacy identified by Mr. Flick by offering a visual screen between bulk of The Farm and Lot 7 DP 7189.
- has not been designed to buffer the impacts of agricultural spray drift on organically grown crops at The Farm

4 Conclusions and Recommendations

This Land Use Conflict Risk Assessment is based on:

- a review of the Planning Proposal;
- discussions with Property Manager of The Farm, Johnson Hunter;
- discussions with Property Owner of Lot 7 DP 7189, Mr Tony Flick;
- a site inspection; and
- a review of surrounding landuses.

This LUCRA has concluded that the subject site is suitable for the proposed Planning Proposal subject to the recommendations provided below:

1. As a precautionary measure a **vegetated buffer** (as per **Appendix C**) based on the following criteria be installed on the subject site along the northern boundary and the perimeter of the sub surface irrigation area:
 - contain random plantings of a variety of tree and shrub species of differing growth habits, at spacing's of 1–2 m for a minimum width of 5 m.
 - include species with long, thin and rough foliage which facilitates the more efficient capture of spray droplets;
 - provide a permeable barrier which allows air to pass through the buffer. A porosity of 0.5 is acceptable (approximately 50% of the screen should be air space);
 - foliage is from the base to the crown;
 - include species which are fast growing and hardy;
 - have a mature tree height at least 3m; and
 - include an area of at least 2m clear of northern boundary.

The actual risk can be described as negligible however adopting the precautionary principle a risk of moderate has been applied in an attempt to address concerns of the adjoining neighbour to the north, Mr Flick. It should be noted that while the vegetated buffer will act as a visual screen and adequately address concerns related to privacy and biosecurity it has not been designed to address agricultural spray drift onto existing or future (certified) organic plantation/s at The Farm.

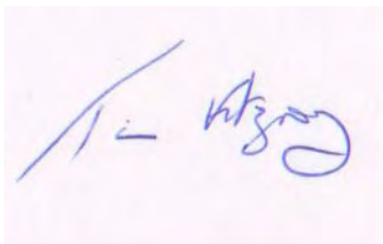
The Farm should be designed to minimise instances of incompatibility such that normal farming practice are not inhibited. Where such instances do arise, measures to ameliorate potential conflicts should be devised wherever possible.

When considering potential land use conflict between The Farm operations and adjoining 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; and
- are legally conducted as required by other legislation covering workplace health and safety, and the use and handling of agricultural chemicals.

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

This report has been prepared by Tim Fitzroy of *Tim Fitzroy & Associates*.



Tim Fitzroy
Environmental Health Scientist
Environmental Auditor

References

Department of Primary Industries et al 2007 Living and Working in Rural Areas-a handbook for managing land use conflicts on the NSW North Coast, NSW

Planning Guidelines Separating Agricultural and Residential Uses, Queensland Department of Natural Resources 1997.

Personal Communication Tony Flick November 2017

Personal Communication Johnson Hunter November 2017

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A Site Plan



THE FARM MASTERPLAN
THE FARM 11 EWINGSDALE ROAD, BYRON BAY

B Photographs



Photo A Looking South west from Flicks Dehusking Plant to *The Farm*



Photo B Looking East from The Farm towards Flicks Property

C Vegetated Buffer

