



Burra Foods Pty Ltd
Korumburra Milk Processing Plant
Buffer Assessment

December 2013

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Appendices

Appendix A – Amendment C70

1. Introduction

GHD was engaged by Burra Foods Pty Ltd (Burra Foods) to conduct a buffer assessment at the Korumburra Milk Processing Plant located on Station Street, Korumburra, Victoria.

Burra Foods has concerns in relation to the new Structure Plan introduced by Amendment C70 to the South Gippsland Planning Scheme (sub clause 21.04-5). The amendment changes the zoning of land east of the Burra Foods site from Low Density Residential to Future Urban Residential. This rezoning would intensify future residential development in close proximity to the Burra Foods facility.

Milk processing plants are likely to have occasional offsite amenity impacts, principally related to odour and noise. Once released, odour cannot be constrained to eliminate impacts on adjoining land. Consequently there will be impacts from time to time due to fugitive emissions under normal operations, or significant odour releases under upset or malfunction scenarios.

Burra Foods are concerned that these amenity impacts may affect the land zoned for Future Urban Residential, given its close proximity to industrial operations and the evidence of existing odour complaints. If this land is densely developed for residential uses then the amenity issues and complaints currently experienced would be potentially escalated. Burra Foods contend that these issues should have been dealt with in the planning process i.e in the Structure Plan. At present the rezoning in C70 does not make provision for an appropriate buffer distance to deal with known existing amenity issues.

The purpose of an amenity buffer distance is to provide sufficient separation between sensitive land uses (such as residences) and industries that have the potential to generate emissions of dust and/or odour that can, on the occasion of an upset or malfunction, cause disamenity off-site.

Recommended buffer distances are specified by Environment Protection Authority Victoria (EPA) for a range of industry categories.

Where there is an industrial use **proposed** on a land parcel, then the provisions of Clause 52.10¹ in the State section of planning schemes apply. The Table to that Clause lists 'threshold distances' for a range of industry categories that generally follow those used in the EPA buffer guidelines. A threshold distance for the 'Manufacture of milk products' is listed. In effect, if the industry is specified in the Table to the Clause, then the corresponding threshold distance to the nearest Residential Zone must be met, otherwise a planning permit must be sought.

In the case of an **existing** industrial use, the EPA recommended buffer² (now termed separation) distance should be considered when preparing a planning scheme or planning scheme amendment (by means of an overlay for example) in order to minimise amenity impacts.

South Gippsland Shire Council (Council) in a letter dated 30 April 2013 addressed to Burra Foods responded to Burra Foods' letter dated 7 March 2013 regarding the management of the amenity interface between the milk factory and surrounding land. To inform their response Council sought advice from the Department of Planning and Community Development (DPCD) and the EPA. Council investigated the potential of applying the Clause 52.12 threshold distance to the site – as drawn at a fixed (ie. radial) radius from the spray dryer. The consequent buffer was envisaged to be enacted by applying an Environmental Significance Overlay (ESO) to the

¹ Victorian Planning Provisions, Clause 52.10 "Uses with Adverse Amenity Potential"

² EPA Recommended Separation Distances for Industrial Residual Air Emissions, Publication 1518, March 2013

land encompassed by the buffer. The ESO would trigger the need for a planning permit for all new sensitive land uses and subdivisions and require referral of such applications to Burra Foods and to the EPA for consideration.

However, a radial buffer is a simplistic approach which does not account for site specific factors such as the local meteorology. Thus to support the ESO preparation Council has requested Burra Foods undertake some modelling to determine the extent of land currently and (in the light of plant expansions) in the future likely to be affected by the milk plant operations.

Thus this report considers the type and scale of operations of the Burra Foods plant and examines the industry categories in the buffer guidelines and Victorian Planning Provision (VPP) separation distances. The local meteorological conditions are also considered to assess whether, and to what extent, the buffer distance could be made to be directionally dependant in order to give a more equal risk of exposure to disamenity in the event of a process upset at this site.

The directional buffer adapts the default radial buffer to take account of the directions of good and poor dispersion – found from the meteorological data representative of local conditions. In the directions of poor dispersion the buffer is extended and in the directions of good dispersion the buffer can be retracted. The effect is to ensure that the degree of protection from exposure to impact (deposition of milk powder or odour from the plant) in the event of a process upset is independent of the direction of the residences from the plant.

The findings, conclusions and recommendations of this buffer assessment should be read in conjunction with the Limitations presented in Section 8.

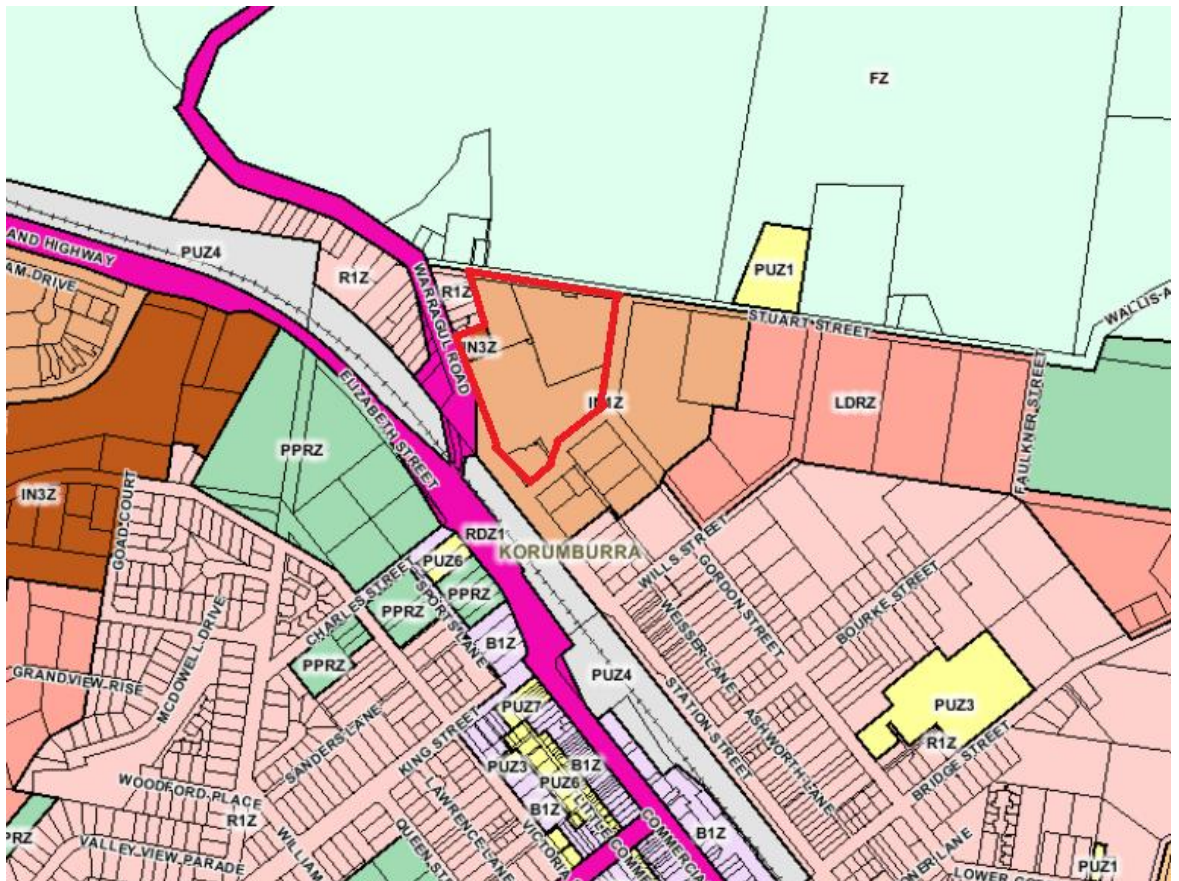
2. Project Description

2.1 Location and Land Use

The Korumburra Milk Processing Plant is located at 47 Station Street, Korumburra, Victoria, and is subject to the provisions of the Planning Scheme operated by South Gippsland Shire Council. Korumburra Butter Factory / Burra Foods have been operating in Korumburra for over 113 years with operations re-commencing in 1991 after suspension of activity in 1974. An aerial photograph of the site is provided in Figure 1.

The milk processing plant, as shown below, is located on land zoned for Industrial 1, and is in turn surrounded by: (i) Farming (FZ) directly north of the site, (ii) Low Density Residential (LDRZ) to the east, Residential 1 (R1Z) to the southeast, (iv) Public Park and Recreation Zone to the southwest and (v) a mixture of Residential 1 (R1Z) and Industrial 3 (IN3Z) to the west.

The LDRZ provides for low density residential development, a dwelling per minimum of 0.4 hectares.



Source: <http://www.dpcd.vic.gov.au/planning>

2.1.1 Proposed New Zones

On 1 July 2013, the Minister for Planning introduced three new residential zones to replace the existing residential zones (R1Z, R2Z and R3Z) in all planning schemes in Victoria. Councils will have 12 months to replace the existing residential zones with the new zones in their respective planning schemes.

The three new zones are the Neighbourhood Residential Zone (NRZ), the General Residential Zone (GRZ) and the Residential Growth Zone (RGZ).

The purpose of the NRZ is to limit housing growth and density. It allows for predominantly single dwellings with some dual-occupancies. It includes a mandatory maximum building height for residential buildings of 8 m although a higher or lower building height can be set by Council.

The purpose of the GRZ is to allow modest housing growth and diversity, with a mixture of single dwellings, dual occupancies and town houses. It includes a discretionary maximum building height for residential buildings of 9 m although a higher or lower maximum mandatory building height can be set by Council.

The purpose of the RGZ is to support housing growth and diversity. The zone proposes a diverse mix of dwellings including town houses and apartments. It includes a discretionary maximum building height for residential buildings of 13.5 m although a higher or lower maximum mandatory building height can be set.

It is likely that the GRZ may be applied to the current LDRZ. It would require provisions in schedules to deal with limiting the density of residential development, only allowing low density development, and suitable overlays would be required.

2.2 Nearest Sensitive Land Uses

Sensitive land uses are now defined³ to include residential premises, child care centres, pre-schools, primary schools, education centres or informal outdoor recreation sites. The nearest current sensitive land uses in relation to the milk processing plant are residences located directly south and west of the facility; just outside the site boundary within the land zoned R1Z. The nearest residence on the land currently zoned LDRZ is located 170 m from the eastern site boundary of the Burra Foods plant.

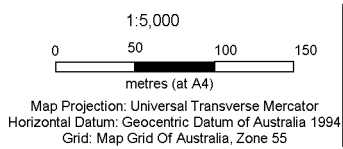
2.3 Amendment C70

Amendment C70 replaces the existing Korumburra Planning Scheme provisions with new provisions to implement the Korumburra Structure Plan July 2010. In particular subclause 21.04-05 is replaced (see Appendix A).

The new Structure Plan introduced by Amendment C70 changes the intended future zoning for land east of the Burra Foods site from Low Density Residential to Future Urban Residential. This change would introduce Residential 1 type land directly east of the site boundary increasing the number of residents within close proximity of the milk processing plant.

Burra Foods wish to maintain a buffer between the industry and future residential development to minimise potential for future land conflicts.

³ EPA Recommended Separation Distances for Industrial Residual Air Emissions, Publication 1518, March 2013 – section 13



LEGEND

 Site Boundary



Burra Foods
Buffer Assessment

Job Number | 3130792
Revision | A
Date | 02/10/13

Site Location

Figure 1

3. Manufacturing Process

3.1 Key Operating Processes

Burra Foods have established a milk processing plant capable of handling 1.4 million litres of milk per day. The products currently being produced are cream cheese, milk powders, domestic industrial ingredients and ice cream base. The general process activities (inputs and outputs) for the current and proposed operations are provided below, with a site layout (current and proposed) shown in Figure 2.

Milk and Cream Receival and Storage

Milk and cream are received daily in road tankers ranging in volume from 25,000 – 40,000 litres. These tankers are unloaded via flexible hoses and stored in silos. In the peak season (October – December) up to 1.4 million litres of milk and 50,000 litres of cream are received daily.

Milk and Cream Pasteurisation and Separation

Pasteurisation and separation of milk products involves heating to a temperature above 72 °C (up to 125 °C), cooling to 5 -6 °C and then centrifugal separation of fat (cream) from skim milk. The product streams are then cooled to 4- 6 °C using heat regeneration with the incoming milk stream and with chilled water. Pathogenic bacteria are destroyed in this process.

Evaporation

Evaporation of milk products increases the solids content from about 9-13% to 50 to 55%. A vacuum is generated within the evaporator to lower the boiling point. As part of the evaporation process the outgoing product is cooled using the incoming milk stream. As part of the evaporation process there is a condensate stream generated (35-42 m³/hour). This is cooled to approximately 20 °C via a cooling tower and discharged to trade waste. The condensate is typically a low BOD and conductivity waste stream, suitable for treatment at the wastewater treatment plant (WWTP) and/or discharge to the creek.

Ammonia Compressor Plant

Expansion of ammonia liquid requires heat and this heat sink is used to chill water and create ice as a source of chilled water. Ammonia expansion is also used to refrigerate air forced through evaporators in freezer cells. The ammonia compressor plant receives and re-compresses ammonia gas to liquid. Heat generated in the compression is removed via two cooling towers located on the roof of the boiler house.

Steam Boiler

The two steam boilers are a water tube design using natural gas. The plant has a capacity of 10 tonnes per hour system and will soon grow to 18 tonnes per hour.

General Storage

There can be as much as 500,000 litres of milk or milk concentrates stored on site at any one time.

Waste Water Treatment Plant (WWTP)

The WWTP consists of a high solids divert system, a 500 kL upfront waste buffer tank, a 50 kL anoxic pre-selector, three 500 kL aerobic bioreactors, four 50 kL gravity-settling tanks, two sand filters, a 250 kL final storage tank, a 250 kL aerobic digester, a 250 kL clean water tank and a 2 ML emergency storage tank.

The high solids divert system protects the reactors from food overloading. Diverted solids are recycled as pig food.

The average flow of effluent directly through the treatment plant for the last 12 months has been 510 kL per day, which can range from 320 kL/day to 850 kL/day.

The average COD loading into the plant is 450 - 600 kg per day. The BOD/COD ratio for milk effluent is approximately 0.65, so this equates to an average BOD loading of 292 - 390 kg per day.

Several hundred kL per day of evaporator condensate water is discharged directly through the clean water monitoring system and to the local creek.

The code of practice for small WWTP's⁴ states that one person is equivalent to 50 gBOD/day which allows for the calculation of the equivalent population (e.p). Thus the current e.p of the plant (up to 390 kgBOD/day) is equivalent to 7,800 people.

The new production process to be commissioned in April 2014 will increase the BOD loading to 455 kg/day which equates to an e.p of 9,100 people.

3.2 Future Upgrades

Burra Foods expect to continue to grow and envisage an increase of future daily processing. This most recent initiative is designed to supply not only the commodity milk powder products but also to specialise in dairy nutritionals.

Burra Foods' objective is to supply infant formula for the growing market in China. The product is to be a high quality milk powder, nutritional formulations and functional dairy ingredients with exceptional standard of products and flexibility.

The immediate plans include establishment of a wet mix plant (stage 1 currently being built) and new twin evaporators and a dryer, with canning capability for infant formula (stage 2) as part of a new specialty power mixing and hydration process. Stage 2 is currently being planned for as part of a site master plan but is not confirmed to be built, however if it does go ahead Burra Foods envisage it could be built and operational by 2016.

New production processes and water recovery systems will see the volume and BOD loading to the WWTP increase by approximately 300-400 kL per day extra volume and by 80-100 kg of COD per day for stage 1.

The future (current plus stage 1 plus stage 2) flow and COD load into Burra Foods WWTP are estimated to increase significantly to be 2612 kg/day +/- 20%. To account for the 20% margin of error, GHD has estimated an upper amount of COD load into the WWTP of 3135 kg/day, which equates to a BOD loading of 2038 kg per day, equating to an e.p of 40,755 people.

3.3 Potential Air Emissions

3.3.1 Particulates and General Constituents

Milk Dryer

The primary source of particulates (PM_{2.5})⁵ would be from the existing milk dryer and proposed new dryer which have a 32.5 m stack fitted with a baghouse control system.

A possible upset scenario that could lead to off-site dust impact is to be a failure of one or more of the filter bags – leading to an unmitigated emission of dust from the milk drying process.

⁴ EPA Victoria - Code of practice for small WWTP's June 1997

⁵ Particulate matter with an equivalent aerodynamic diameter of 2.5 micrometres or less

Boilers

Emissions from the natural gas boilers include oxides of Nitrogen (NOx) and Carbon Monoxide (CO).

3.3.2 Odour

WWTP

The predominant source of odour generation is from the on-site WWTP providing treatment to waste streams prior to discharge to the local creek.

Possible upset scenarios that would generate increased odour impact include: anaerobic conditions, emergency tank being used, failure of aerators and overloading of the plant in peak season.

Odour control includes a biofilter but this is only used in emergency situations should there be an overload of the plant.

3.4 Noise Emissions

The identified noise sources at the facility include blowers, pumps in the WWTP area and at the ammonia compressor plant.

The other major noise source onsite is from the delivery trucks. Trucks deliver milk to the plant on a 24 hour basis. The general plant operations are all enclosed within buildings which mitigates most noise.

3.5 EPA Licence

Burra Foods' EPA licence (#46572) for Milk processing (D07) allows for the discharge of treated process water and condensate to Coalition Creek via the existing wetlands. The licence does not include any discharge to air conditions. However, the licence does stipulate general amenity conditions. The three amenity conditions are as follows:

- Offensive odours must not be discharged beyond the boundaries of the premises;
- Unacceptable noise (including vibration) must not be emitted beyond the boundaries of the premises; and
- Nuisance airborne particles must not be discharged beyond the boundaries of the premises.

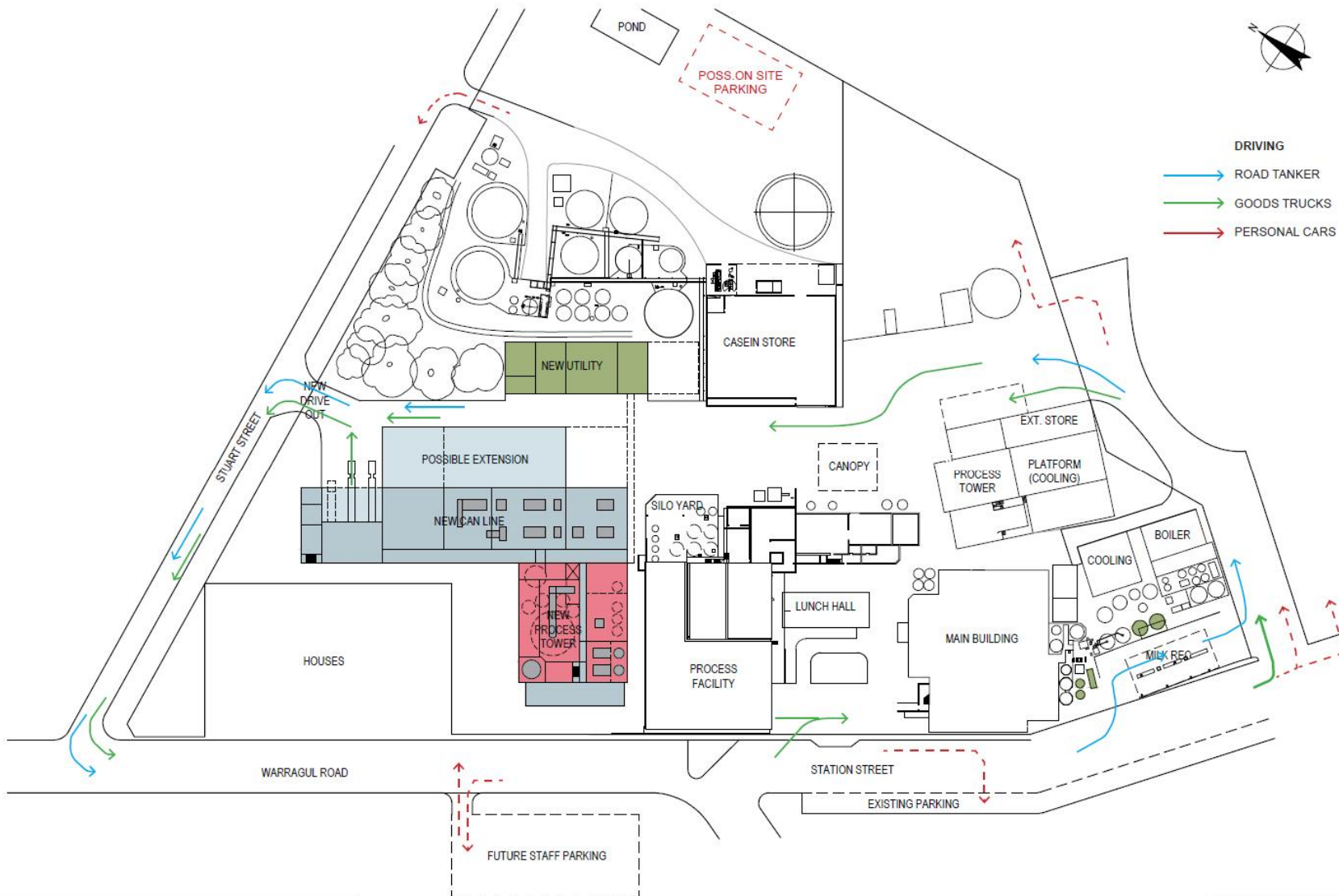
3.6 Complaint History

Burra Foods have supplied odour complaint data from the past 3 years which indicate that 55 complaints were received in 2011 due to the commencement of the plant upgrade installation of the milk dryer and boilers. Some of these complaints have been determined to be sewer related and not connected with Burra Foods WWTP. Upset overloading occurred at the WWTP resulting in detectable odour off-site. Over the last 12 months the complaints have reduced significantly down to only three due to the optimisation of onsite processes. A number of odour complaints have been made by the resident located 170 m east from the eastern site boundary.

There have been no complaints regarding dust or particulates and there have been some noise complaints but none of these have been sourced to Burra Foods.

However, to the extent that existing residents are within the zone of potential odour impact, it may be the case that they have acclimatised to the occasional exposure – for these residents, in effect it has become part of the background palette of ambient odour. This situation may not be

replicated with the development of new residential areas within the land zoned currently LDRZ – new residents may find odour from the milk plant unusual and objectionable and this may result in an increased number of complaints.



4. Meteorology

No observational meteorological data of sufficient quality was available for Korumburra. The characterisation of local wind patterns requires accurate site-representative hourly recordings of wind direction and speed over a period of at least a year. There is a substantial distance to the nearest meteorological observation data sites. These are located in the Latrobe Valley, Pakenham in outer Melbourne, Rhyll (Phillip Island) and Pond Creek (Wonthaggi) to the south. Given that the terrain is complex between the plant and each of these sites, it is unlikely that any of the sites will be representative of wind conditions at the process plant. Therefore, to undertake the buffer distance assessment, a synthetic data set, representative of the local meteorological conditions at the processing plant was constructed using the 3D prognostic modelling package TAPM, according to the EPA Victoria meteorological data file construction procedure.⁶

4.1 TAPM Modelling

A TAPM simulation to synthesise meteorological data at the Korumburra milk processing plant was created and the site meteorology was determined for the selected year 2008, based on synoptic observations, local terrain and land use information with a resolution of 300 m. The TAPM model parameters are summarised in Table 1. All TAPM parameters were selected to comply with EPAV (2012) meteorological data file construction guidelines.

Table 1 TAPM model parameters

Parameter	Value
Modelled Year	2008
Domain centre	UTM: 55 H 397,435 m E, 5,746,380 m N Latitude = 38° 25' 30" Longitude = 145° 49' 30"
Number of vertical levels	25
Number of Easting Grid Points	41
Number of Northing Grid Points	41
Outer Grid Spacing	10,000 m x 10,000 m
Number of Grid Levels	4
Grid Level Spacing	Level 2 – 3,000 x 3,000 m Level 3 – 1,000 x 1,000 m Level 4 – 300 x 300 m
Total Inner Grid Size	12.3 km x 12.3 km

4.2 Regional Climate and Prevailing Meteorology

The local climate at the Korumburra milk processing plant is affected by broader regional patterns of synoptic pressure and wind with embedded weather systems. Synoptic features vary in intensity and location according to the season. For instance, during summer a high-pressure belt is usually found over or just to the south of Australia, bringing warm weather while the subtropical easterlies cover most of the continent. In winter, the subtropical high-pressure belt is

⁶ EPAV, 2012. Construction of Input Meteorological Data Files for AUSPLUME. EPA Victoria, Publication 1459, April 2012.

usually located further north over the continent, allowing westerly winds and occasional frequent strong cold fronts to affect southern Australia.

4.3 Wind Pattern

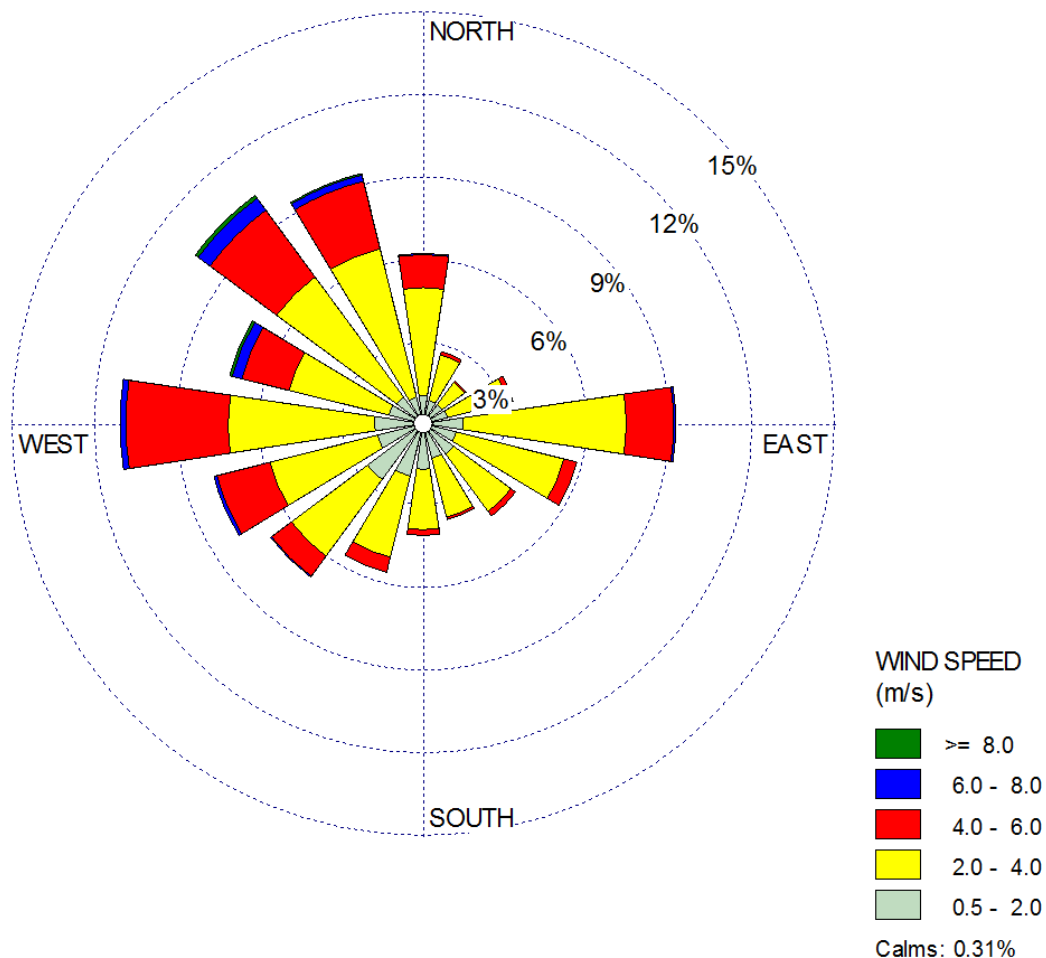
The effect of wind on odour dispersion patterns can be examined using the general wind climate and atmospheric stability class distributions. The general wind climate at a site is most readily displayed by means of wind rose plots, giving the incidence of winds from different directions for various wind speed ranges.

The features of particular interest in this assessment are: (i) the prevailing wind directions and (ii) the relative incidence of more stable light wind conditions (defines peak impacts from ground-based sources).

Annual and seasonal variation in wind

The average wind rose for the entire data period is shown in Figure 3 and indicates that predominant annual average wind directions are from the west (WSW to NNW) comprising of 46 per cent of incident winds, with lesser extents from the east comprising of 9 per cent of incident winds. The annual average wind speed measured was 3.0 m/s. The observed wind speed distribution indicates that the largest proportion of high wind speeds (> 6 m/s) are from the northwest and the largest proportion of light winds (< 2 m/s) are from the southwest.

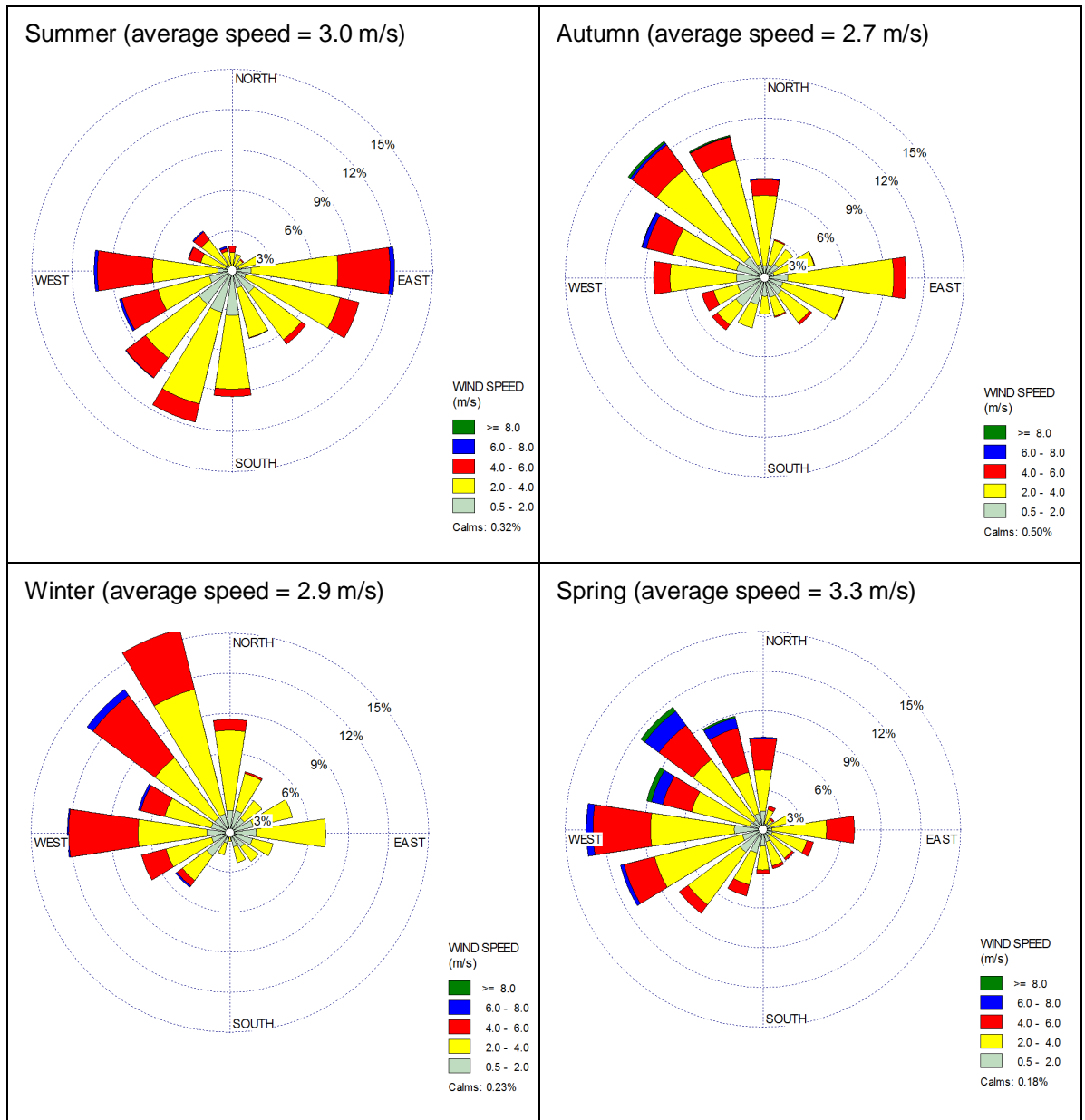
Figure 3 Annual wind rose for Korumburra



The seasonal wind roses in Figure 4 below show that:

- In winter the winds are predominantly from the west to north-northwest; this observation reflects a combination of cool air drainage flows from the surrounding hills and the broader synoptic scale westerly winds during winter.
- In summer the winds are equally divided between the west-southwest and east primarily due to the summer sea breezes, alignment of the local valley and synoptic scale winds with regular cold fronts.
- Autumn and spring are transitional seasons with a mixture of both winter and summer observations.

Figure 4 Seasonal wind roses for Korumburra



4.4 Pattern of Atmospheric Stability

In the Pasquill/Gifford atmospheric stability scheme, stability is classified into six classes, namely A through F. A, B and C stability classes represent strongly, moderately and slightly unstable atmospheres respectively. Under unstable conditions dispersion of emissions from near-ground sources is good due to convectively vertical turbulent mixing. The stability category D denotes neutral atmospheric conditions (strong winds in moderate temperatures or lighter winds on overcast to partly cloudy days). Categories E and F denote slightly and moderately stable atmospheres when dispersion is poorest, as vertical mixing of air is suppressed. Stable atmospheric conditions occur in the absence of strong gradient winds, and mostly on nights with clear skies. They are often associated with ground-based radiation forced temperature inversions, sometimes with fog, mist or frost.

Neutral stability (D class) conditions occur most frequently and along with the prevailing wind direction can indicate the most common direction for potential odour impact. Under night-time E and F class conditions, odour emissions from ground based sources; result in a downwind

plume that is detectable to a greater distance than during the day. It is commonly these conditions that result in odour complaints at maximum range.

Figure 5 shows the stability rose for the entire data period. Neutral (D), unstable (A, B and C classes) and stable (E and F) atmospheric conditions all occur in approximately equal portions of 33 per cent. Figure 5 shows that the majority of stable winds are from the north-northwest and east.

Figure 5 Annual stability rose for Korumburra

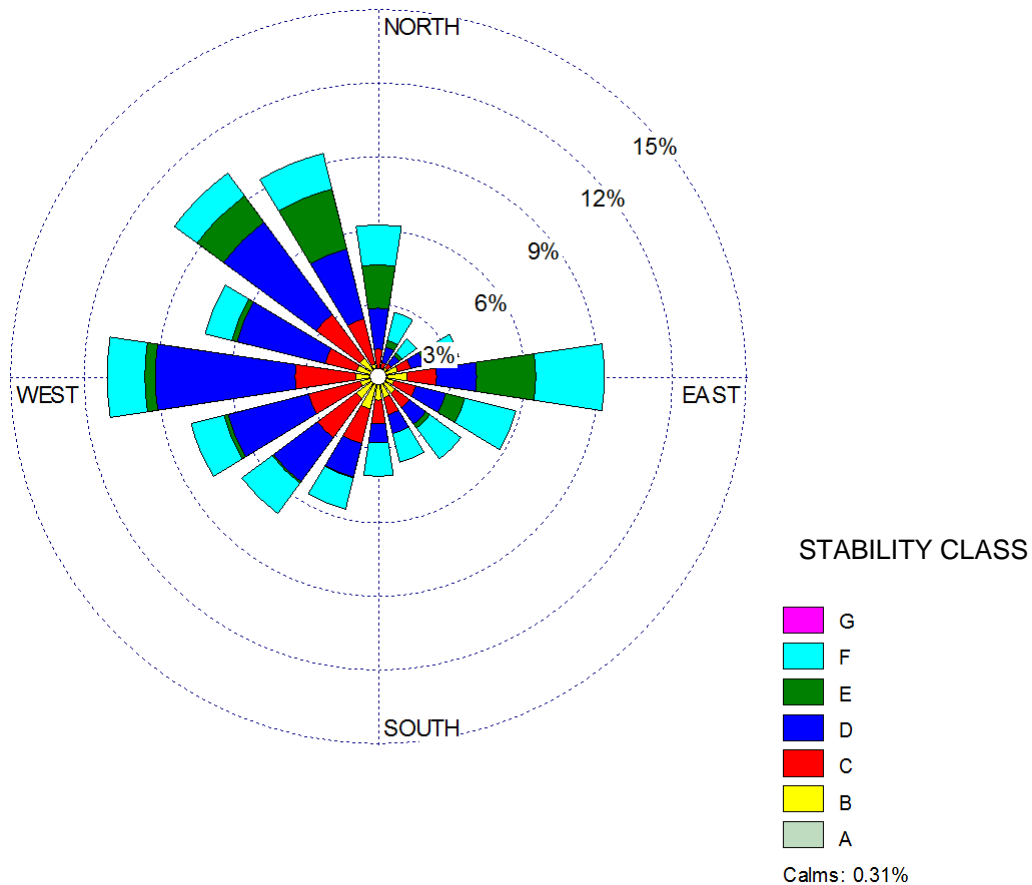
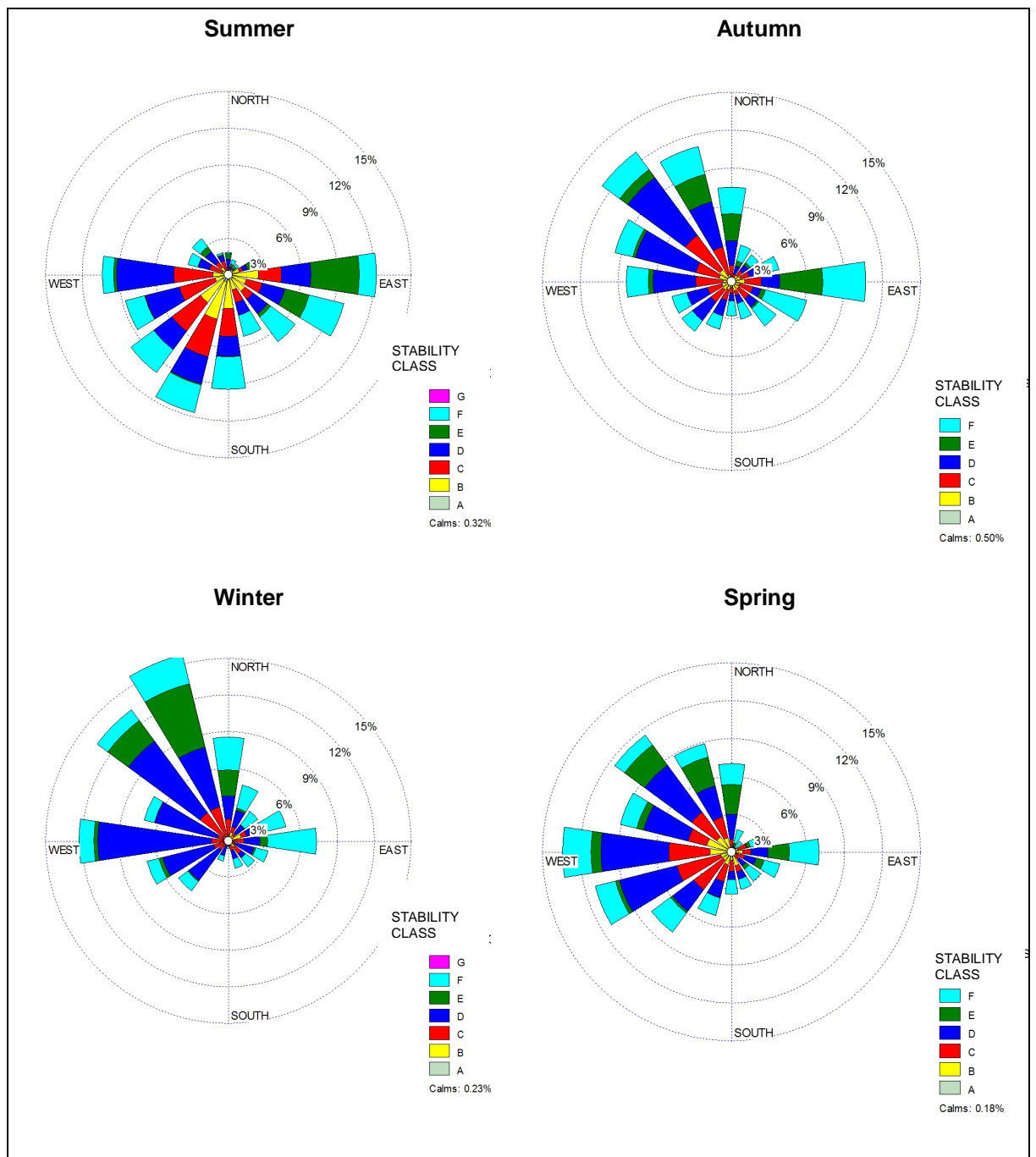


Figure 6 shows the following seasonal variation trends in atmospheric stability:

- In summer, the peak occurrence of stable winds is from east and southerly winds;
- In winter, stable winds predominate from the north-northwest;
- In autumn, stable winds are split between east and north-northwest directions; and
- In spring, stable winds predominate from the northwest, but there is reasonable degree of variability.

Figure 6 Seasonal stability roses for Korumburra



5. Relevant Buffer Guidelines

Two classes of buffer /separation distance guidelines are relevant in the context of planning in Victoria. Where an industrial use is proposed on a land parcel, then the provisions of Clause 52.10⁷ in the State section of planning schemes apply. In effect, if the industry is specified in the Table to the Clause, then the corresponding threshold distance to the nearest Residential Zone, Business 5 Zone, Capital City Zone or Docklands Zone must be met, otherwise a planning permit must be sought.

In the case of an existing industrial use, then EPA recommend buffer distances should be considered when preparing a planning scheme or planning scheme amendment. A buffer distance is a planning instrument used to provide separation of sensitive land uses (i.e. residential, schools, hospitals) from existing premises with the potential for off-site emissions (odour or dust) that can cause disamenity in the event of an upset/malfunction. Under routine operations, odour impact is to be confined on-site so that an external buffer should not be required.

Council investigated the potential of applying the Clause 52.12 threshold distance to the site – as drawn at a fixed radius from the spray dryer. The consequent buffer was envisaged to be enacted by applying an Environmental Significance Overlay (ESO) to the land encompassed by the buffer. The ESO would trigger the need for a planning permit for all new sensitive land uses and subdivisions and require referral of such applications to Burra Foods and to the EPA for consideration.

However, a radial buffer is a simplistic approach which does not account for site specific factors such as the local meteorology. Thus to support the ESO preparation Council has requested Burra Foods undertake some modelling to determine the extent of land currently and (in the light of plant expansions) in the future likely to be affected by the milk plant operations.

5.1 Threshold Separation Distances

The table to Clause 52.10 does include an entry for the 'manufacture of milk products' requiring a buffer distance of 300 m.

Clause 52.10 provides the minimum separation distance required from any part of land in a residential zone. The purpose of the Clause is to require a permit to be sought before milk processing activities can be established within 300 m of a residential zone, based on the adverse amenity impacts of such industries. However, as the industry is already established in this case it is therefore not appropriate to apply the 300 m buffer to the milk processing plant (milk dryer stack) for air emissions.

Generally the threshold distances for a given industry are the same as the corresponding separation distance for that industry as specified by the EPA guideline. However, in this case (as also for concrete batching) the threshold distance is triple that of the separation distance. Though there is no documented reason for this discrepancy, it is considered that it relates to the wider ambit of off-site impact considered in Clause 52.10. 'Adverse Amenity' appears not to be defined in the Victorian Planning Provisions (VPPs), however, it may include considerations of traffic noise from vehicles entering and exiting the premises, noise from plant operations on-site and light spill impacts that are outside the scope of the EPA guideline.

⁷ Victorian Planning Provisions, Clause 52.10 "Uses with Adverse Amenity Potential"

5.2 EPA Buffer Guidelines

EPA publish⁸ recommended buffer distances for selected industry categories (EPA Guidelines). Buffer distances can define zones of land off-site from the industry premises which are constrained from development for sensitive land uses. Sensitive land uses include residences, hospitals, schools, caravan parks and informal recreation sites.

The EPA Guidelines recommend a buffer distance of 100 m for 'milk processing'. This buffer is to protect against an amenity impact from an upset occurring at the spray dryer i.e. dust and particulates. The WWTP at Burra Foods would also require a buffer in the event of an upset or malfunction to protect against offsite odour impact. The EPA recommended separation distances includes a category for sewage treatment plants (STPs). The separation distance is linked to the type of plant and the size of the population that they serve.

Application to Burra Foods WWTP

The plant at Burra Foods can be considered to be a mechanical/biological wastewater plant. Although this WWTP is treating milk waste rather than domestic waste, the separation distances for the latter can be adopted for Burra Foods provided it is 'normalised' by the BOD loading. This was done in section 3.1 and the consequent e.p. equivalent to a STP is given below and used with the formula given in Table 6 of the guideline to determine a separation distance.

Thus the separation distance required for the current operations with an e.p of 7,800 is 200 m while the separation distance required for the future upgrade stage 1 with an e.p of 9,100 is 210 m and stage 2 with an e.p of 40,755 is 345 m. Given that the increase in capacity is likely to occur in the near future, GHD recommend that the 345 m buffer apply to the WWTP.

GHD has applied the 100 m buffer distance to the two milk dryer stacks (existing and proposed) and the 345 m buffer distance to the WWTP and is shown in Figure 7. The two buffer distances have been scribed from the envelope of potential sources as required in the EPA separation guidelines (indicated by the dark blue line around the WWTP sources). From the figure it can be seen that the 100 m buffers from the spray dryer stacks are mostly confined within the site boundary with a marginal extension across the eastern site boundary and a larger extension across the western boundary to encompass ~4 existing residential premises. The 345 m buffer from the WWTP extends well outside the site boundary to encompass a number of existing residences including the residence east of the site which has lodged a number of odour complaints. The 345 m buffer extends east (up to ~320 m) to encompass a portion of the land in question to be rezoned from Low Density Residential to Future Urban Residential. It also extends some 320 m north into land zoned for Farming.

5.3 Appropriate Buffer for Burra Foods

In assessing buffer requirements for the facility, GHD understands that the plant has the following features:

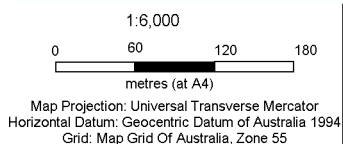
- A baghouse on the spray drying stack to capture particulates – preventing them from being released into the atmosphere; and
- A biofilter within the WWTP to be used in emergency situation should there be an overload of the plant.

On the basis of the above features, GHD concludes that a buffer of 100 m would be appropriate for the spray dryers and that a buffer of 345 m is required for the WWTP.

⁸ EPA Recommended Separation Distances for Industrial Residual Air Emissions, Publication 1518, March 2013

However, the above buffers in the EPA guidelines refer only to air emissions not noise. There are no specific buffer guidelines for noise. The most relevant guideline would be Clause 52.10 which is to protect existing residents from adverse amenity when a new industry is proposed to be located nearby. As discussed earlier a milk processing facility in Clause 52.10 has a recommended buffer distance of 300 m. Thus 300 m could be used in the absence of any other specific guideline to protect the existing residents from any off-site noise impact. The 300 m distance would apply to any of the identified noise sources in Section 3.4. Figure 7 also shows the default 300 m when applied to the envelope of potential noise sources. The 300 m buffer encompasses a number of existing residents and portion of land under question to be rezoned from low density to future urban residential.

Any land encompassed by the three default buffer zones (100 m, 300 m and 345 m) outside of the site boundary should, as a minimum, be included in the Environmental Significance Overlay (ESO). The ESO would trigger the need for a planning permit for all new sensitive land uses and subdivisions and require referral of such applications to Burra Foods and the EPA for consideration with these buffers. GHD recommends that any land within these buffers is not rezoned to urban residential as it would increase the possibility of further odour and noise complaints.



LEGEND

	Site Boundary
	EPA Buffers

	Dryer Stack
	Odour Source Envelope
	Noise Source Envelope
	52.10 Threshold Distance



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 Buffer Assessment

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Default Buffers

Figure 7

6. Directionally-Dependant Buffer

Where site-representative meteorological data is available, the directions of good and poor dispersion can be identified as shown in Section 4. Further, if the 12 month dataset is configured to the approved dispersion model Ausplume format (deriving atmospheric stability category), then dispersion modelling can be conducted using a nominal odour source emission rate to assess the directional change in extent from a default radial buffer⁹.

The buffer so formed is sized to have the same enclosed area as the radial default buffer and is termed a directional buffer. A directional buffer has the advantage that the protection afforded by its separation is independent of the direction from the source.

Directional buffers were formed for the 100 m and 345 m radial buffers using the Korumburra 2008 meteorological dataset (refer Section 4.1). It is these two buffers that are required for air emissions. A nominal 10 m x 10 m area source with a nominal constant emission rate was taken to represent the odour emissions in the event of a process upset. Dispersion modelling using Ausplume V6.0 was conducted, and the 99.5% contour level that gave the same enclosed area as a 100 m and a 345 m radius circle was selected.

From Table 2 it is seen that the extent of the contour is irregular, with distances greater than 100 m to the west, northeast and easterly directions (out to 140 m to the west). To the southwest, the extent of the contour is significantly less than 100 m, down to 56 m. This contour effectively gives the departure from the fixed 100 m radius that would be required if an equal exposure to disamenity was to be given in the event of an upset/malfunction at the Burra Foods site.

Table 3 shows the directional variation in the 345 m buffer in response to local meteorology. Again, it can be seen that the contour is irregular with distances greater than 345 m to the west, northeast and easterly directions (out to 483 m to the west). To the southwest, the extent of the contour is significantly less than 345 m, down to 193 m. This contour effectively gives the departure from the fixed 345 m radius that would be required if an equal exposure to disamenity was to be given in the event of an upset/malfunction at the Burra Foods site.

From Figure 8 it can be seen that the directional buffers extend further east and west compared to the default buffers shown in Figure 7, approximately 40 m east and 85 m west. A contraction is seen to the south with a small extension to the north. Note that the 100 m directional buffers for the spray dryers are contained within the 345 m WWTP directional buffer.

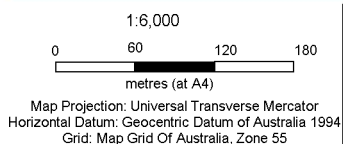
⁹ Clarey P, Pollock T "Integrating Separation Distances with Dispersion Modelling" Enviro 04, 28 Mar – 1 April, Darling harbour, Sydney

Table 2 Directional Variation in 100 m Buffer in Response to Local Meteorology

Direction		Range		Direction		Range	
Sector	deg.	m	% of mean range	Sector	deg.	m	% of mean range
N	0	95	95	S	180	95	95
	15	113	113		195	93	93
	30	97	97		210	69	69
NE	45	112	112	SW	225	56	56
	60	120	120		240	65	65
	75	93	93		255	93	93
E	90	116	116	W	270	140	140
	105	104	104		285	122	122
	120	81	81		300	126	126
SE	135	79	79	NW	315	84	84
	150	96	96		330	89	89
	165	93	93		345	93	93

Table 3 Directional Variation in 345 m Buffer in Response to Local Meteorology

Direction		Range		Direction		Range	
Sector	deg.	m	% of mean range	Sector	deg.	m	% of mean range
N	0	328	95	S	180	328	95
	15	390	113		195	321	93
	30	335	97		210	238	69
NE	45	386	112	SW	225	193	56
	60	414	120		240	224	65
	75	321	93		255	321	93
E	90	400	116	W	270	483	140
	105	359	104		285	421	122
	120	279	81		300	435	126
SE	135	272	79	NW	315	290	84
	150	331	96		330	307	89
	165	321	93		345	321	93



LEGEND	
	Site Boundary
	Directional Buffers
	Odour Source Envelope
	Dryer Stack
	Default 345 m Buffer



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Directional Buffers

Figure 8

7. Conclusions and Recommendations

7.1 Conclusions

The analyses provided in this report lead to the following conclusions. They should be read in conjunction with the Limitations of Section 8.

The Structure Plan introduced by Amendment C70 to the South Gippsland Planning Scheme (sub clause 21.04-5) changes the intended future zoning for land east of the Burra Foods site from Low Density Residential to Future Urban Residential. This change would intensify the residential development nearby to the Burra Foods Korumburra milk processing plant.

Based on GHD's knowledge of Burra Foods plant and relevant buffer guidelines, it is concluded that:

- All dust emissions generated in the milk drying process (milk spray dryers) will be captured and treated via a baghouse;
- Any potential odour upset at the WWTP will be treated with a biofilter;
- There have been a number of odour and noise complaints sourced to the plant;
- In the case of an existing industrial use, the EPA recommended buffers for residual air emissions are: (i) a 100 m buffer from the spray dryers and (ii) a 345 m buffer from the envelope of WWTP sources to cater for future growth of the Burra Foods plant;
- There are no specific buffer guidelines for noise. The most relevant guideline would be 300 m as specified in Clause 52.10 for milk processing facilities;
- The default 300 m and 345 m buffers extend east to encompass a portion of the land in question to be rezoned from Low Density Residential to Future Urban Residential. They also extend north into land zoned for Farming and encompass a number of existing residences surrounding the plant within residential zoned land;
- The effect of accounting for local meteorology is to develop a directional buffer that increases the default value of the buffers for residual air emissions to the east and west. This extension increases the amount of land encompassed to the east set to be rezoned from Low Density to Urban Residential.

7.2 Recommendations

The following recommendations are focussed on defining the extent of the ESO so that the operations of Burra Foods at the Korumburra plant are not constrained by inappropriate residential development in proximity to the plant.

- GHD recommends that the 100 m and 345 m directional buffers for the potential air emissions namely dust from the dryer stack and odour from the WWTP be included in the ESO rather than the default buffers for the two sources. This would give a more equal risk of exposure to disamenity in the event of a process upset at this site to cater for future growth of the Burra Foods facility;
- GHD also recommends that the 300 m default buffer for noise emissions be considered to be included in the ESO.

The ESO would trigger the need for a planning permit for all new sensitive land uses and subdivision and require referral of such applications to Burra Foods and the EPA for consideration with these buffers. GHD recommend that any land within these buffers does not get rezoned to urban residential as it would increase the possibility of further odour and noise

complaints. The new residents may find odour or noise from the milk plant unusual and objectionable and this may result in an increased percentage of complaints from these residents.

7.3 Implications

This assessment indicates that the plant may have offsite amenity impacts relating to odour and noise. Odour cannot always be controlled and occasional impacts on adjoining land will occur from time to time due to process upsets or malfunction.

8. Limitations

This Report has been prepared by GHD for Burra Foods and may only be used and relied on by Burra Foods for the purpose agreed between GHD and Burra Foods.

GHD otherwise disclaims responsibility to any person other than Burra Foods arising in connection with this Report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

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

The description of operations at Burra Foods has been based on information provided by Burra Foods.

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

The opinions, conclusions and any recommendations in this Report are based on assumptions made by GHD described in this Report. GHD disclaims liability arising from any of the assumptions being incorrect. The results of the analysis presented in this report are also subject to the limitations of the Ausplume modelling software package.

GHD has prepared this Report on the basis of information provided by Burra Foods, which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the Report which were caused by errors or omissions in that information.

Appendices

Appendix A – Amendment C70

Amendment C70

List of changes to the South Gippsland Planning Scheme

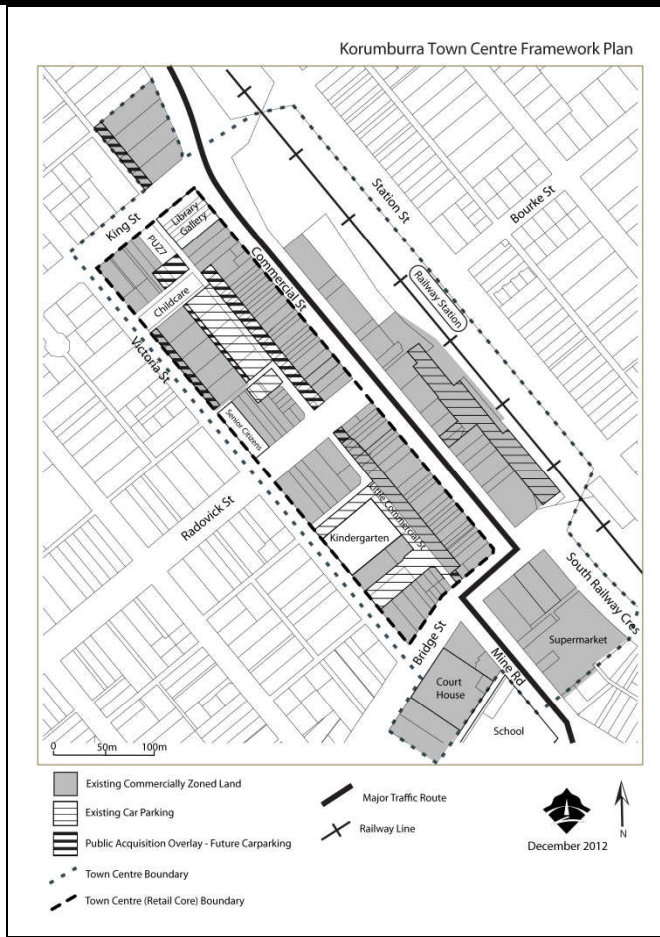
Clause / Map Numbers	Change	Comment
LOCAL PLANNING POLICY FRAMEWORK		
Clause 21.04	<p>Replace Subclause 21.04-5 with:</p> <p>Overview</p> <p>Situated on the South Gippsland Highway in a picturesque landscape of rolling hills, Korumburra is the second largest town in the municipality and a key service provider to the smaller towns and communities in the Shire's western region. Ongoing improvements to the highway and the development of the Pakenham Bypass make Korumburra increasingly accessible to metropolitan Melbourne and help underpin population and economic growth that will contribute to securing the town's growth into the future.</p> <p>Challenges for Korumburra include improving the retail offer, function and appearance of the Town Centre; responding to the existing highway traffic management problems; achieving appropriate redevelopment of the former Korumburra Saleyards site; planning new residential growth areas; and, continuing to define a role and character for Korumburra that distinguishes its place in the Shire's western region.</p> <p>Objectives</p> <ul style="list-style-type: none"> ▪ To maintain and promote Korumburra as a significant industrial, retail, service, residential and tourism centre in the Shire. ▪ To maintain the primacy of the Town Centre as the retail and service hub of the town. ▪ To actively support the establishment of new retail opportunities in the Town Centre Retail Core. ▪ To ensure that sufficient residential land, at a range of densities, is available to accommodate future township growth. ▪ To achieve sequential and staged residential development that integrates with existing infrastructure networks. ▪ To improve highway traffic movement through the town. 	Replaces the existing Korumburra provisions with new provisions to implement the Korumburra Structure Plan July 2010.

Clause / Map Numbers	Change	Comment
	<ul style="list-style-type: none"> ▪ To provide strong pedestrian and cycling connectivity to the Town Centre, key community assets and the schools. <p>Strategies</p> <ul style="list-style-type: none"> ▪ Promote the use and development of land in accordance with the strategic directions in the Korumburra Framework Plan and the Korumburra Town Centre Framework Plan maps. ▪ Maintain a compact, convenient and well connected Town Centre that is the primary activity hub of the town. ▪ Actively encourage major retail, office and community developments to concentrate in the Town Centre Retail Core, comprising the blocks bounded by Commercial Street, King Street, Victoria Street and Bridge Street. ▪ Encourage the consolidation of sites in the Town Centre Retail Core to accommodate new large floor space developments. ▪ Promote development in the Town Centre that improves pedestrian connectivity and the layout and operation of car parking, and enhances the amenity of the streetscape. ▪ Strongly discourage the development of new retail uses outside of the Town Centre Retail Core where such uses may weaken the principal role of the Town Centre. ▪ Monitor the availability and development of residential land and encourage the rezoning of appropriate areas identified in the Korumburra Framework Plan map to maintain an estimated 15-year residential land supply. ▪ Promote the development of new residential estates that establish appropriate integration with existing residential areas and infrastructure; provide pedestrian and cyclist connectivity to the Town Centre and key community features; and, protect the environmental values of the land, especially the waterways. ▪ Promote higher density residential development and retirement living on land within the inner township residential areas that can be provided with convenient pedestrian access to the Town Centre. ▪ Promote site responsive residential subdivision design (supported by geotechnical reports on land exceeding 15% slope) that allow for the creation of appropriately sized and configured lots that minimise the impact of earthworks. ▪ Ensure a high standard of building design, layout and landscaping for all new development, and particularly at the western highway entrances to the town. 	

Clause / Map Numbers	Change	Comment
	<ul style="list-style-type: none"> ▪ Focus industrial development within the established industrial areas, and at the site of the former Korumburra Saleyards. Development of the Saleyards land must have close regard to the amenity interface with the adjoining showgrounds and residential areas. ▪ Consider the potential adverse amenity impacts of the milk manufacturing operations in the Station Street Industrial Area on rezoning proposals that allow, or intensify, the establishment of sensitive land uses in the immediate area surrounding the manufacturing operations. ▪ Discourage land uses that may compromise the proposed highway realignment at the south east entry to the town. ▪ Support the protection of the town's heritage buildings and streetscapes in recognition of their central role in protecting the 'rural township' character and 'sense of place' of Korumburra. ▪ Support tourism developments that promote Korumburra as a tourist destination and plan for the provision of services and features that support highway tourism traffic. ▪ Ensure new development and road traffic improvements do not compromise the longer-term potential return of rail services to Melbourne. <p>Actions for implementation</p> <ul style="list-style-type: none"> ▪ Prepare an updated Town Centre Framework Plan to encourage major retail, office and community proposals to concentrate in the Town Centre Retail Core in accordance with the principles established in the Priority Development Panel (PDP) report May 2010. ▪ Investigate with VicRoads plans for traffic management, calming and pedestrian safety improvements along South Gippsland Highway and Radovick Street within the Town Centre in accordance with the PDP's recommendation. ▪ In consultation with affected landowners and the community, prepare Development Plans that respond to the requirements of the Development Plan Overlays for Korumburra's residential growth areas. ▪ Review the existing application of the Mixed Use Zone in response to the stated 'Objective' to maintain the primacy of the Town Centre for retail development. ▪ Investigate the implementation of a planning policy to assist long term management of the amenity interface issues between the Station Street milk manufacturing 	

Clause / Map Numbers	Change	Comment
	<p>operations and surrounding residential areas.</p> <ul style="list-style-type: none"> ▪ Investigate applying a Restructure Overlay over the old Crown Township to the south-east of the town. ▪ Continue implementation of the recommendations of the South Gippsland Heritage Study 2004 in consultation with affected landowners. <p>Reference Document</p> <p><i>Korumburra Structure Plan, July 2010 (as amended)</i> <i>South Gippsland Paths and Trails Strategy 2010 (as amended)</i></p>	

Clause / Map Numbers	Change	Comment
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LIST OF AMENDMENTS		
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List of Amendments	<p>Insert: Amendment number "C70", In operation from "28 FEB 2013", Brief description: "Amends the Municipal Strategic Statement at Clause 21.04-5 to introduce new township planning provisions and Framework Plan maps for Korumburra. The provisions introduce the recommendations of the Korumburra Structure Plan July 2010."</p>	<p>Updates the list of amendments in the South Gippsland Planning Scheme.</p>
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
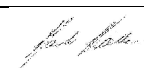
180 Lonsdale Street
Melbourne, Victoria 3000
T: (03) 8687 8000 F: (03) 8687 8111 E: melmail@ghd.com.au

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