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Our ref: 12651564

09 October 2024

[redacted]
Wagstaff
1500 Thompsons Road
Cranbourne East VIC 3977

Wagstaff Abattoir Separation Distance Assessment

Dear [redacted]

GHD has been engaged by The Trustee for Wagstaff Trust (Wagstaff) to undertake a separation distance assessment in relation to Wagstaff Abattoir (the site) located at 1500 Thompsons Road, Cranbourne East.

1. Introduction

GHD understands that a proposed Precinct Structure Plan has outlined a separation distance for the site in relation to abattoir activities and associated effluent treatment systems. With the recent publication of the EPA Victoria Separation Distance Guideline (August 2024), GHD has undertaken a separation distance assessment to assess the required separation distances for the site.

GHD has undertaken this assessment in accordance with the EPA Victoria odour risk assessment framework which requires industries in the first instance to be assessed through EPA Victoria Separation Distance Guideline August 2024, which provides a methodology for assessing applicability and suitability of separation distances. Based on the outcome of the separation distance assessment, further assessment may be required based on the methodology outlined in EPA Publication 1883 Guidance for Assessing Odour.

2. Background

Wagstaff Abattoir and Wagstaff's pre-treatment wastewater treatment system is located at 1500 Thompsons Road. As part of the Cranbourne North Development Plan[1], separation distances were identified from the site as outlined in Figure 1. A 500 m separation distance was identified from the abattoir and a 700 m separation distance was identified from the wastewater treatment system. This is also consistent with those adopted in the Cranbourne East Development Plan which identified a 700 m buffer from the wastewater treatment system.

[1] City of Casey. Cranbourne North Development Plan (August 2018)

Plan 3: Separation Distances

Figure 1 Identified separation distances (extracted from Cranbourne North Development Plan 2018)

A Land Capability Assessment Report[2] has been prepared for the Croskell (Employment) Precinct Structure Plan in which separation distances have been identified for the site in July 2024. This assessment was based on EPA Victoria publication 1518 - Recommended separation distances for industrial residual air emissions (2013), since the publication of the Land Capability Assessment the EPA Victoria Separation Distance Guideline August 2024 has been finalised.

GHD notes the following extract from the Land Capability Assessment Report prepared for the VPA which seeks to address the required buffer distances from the Wagstaff Abattoir:

'In addition to the effluent storage lagoon, based on a review of aerial photographs, there are two smaller ponds to the north of the effluent storage lagoon, one of which appears to contain a mechanical aerator in the centre (mechanical/biological treatment). Details of the effluent/wastewater treatment system are unclear on the EPA license. As an interim measure, a 500 m separation distances have been applied to the wastewater treatment area. The interim measure is based on the historical information available which suggest that EPA's historical interpretation and agreed buffer distance between the stakeholders was 700 m from the abattoir plant. Given the uncertainty about the nature of wastewater treatment, location of treatment ponds at the southeastern boundary, potential future expansion of the abattoir and lack of air/odour quality data the buffer distance of 500m from the central effluent plant was considered appropriate. Based on review of recent aerial photography (Nearmap images from November 2021 and April 2022), it appears that livestock are held in pens to the east of the abattoir building. On this basis, this part of the operations can be considered a 'stock saleyard' where pigs, cattle or other stock are temporarily confined for sale, transport or processing,(emphasis added) as per EPA Victoria publication 1518 and requires a separation distance of 500 m. This assumes >500 head of livestock. EPA Victoria publication 1518 provides no separation distances for <500 head of livestock.

[2] Kleinfelder. Land Capability Assessment Report – Croskell (Employment) Precinct Structure (July 2024)

The above separation distance advice has been adopted by the VPA in the form of a preliminary Place Based Plan for the Croskell (Employment) PSP shown in Figure 2.

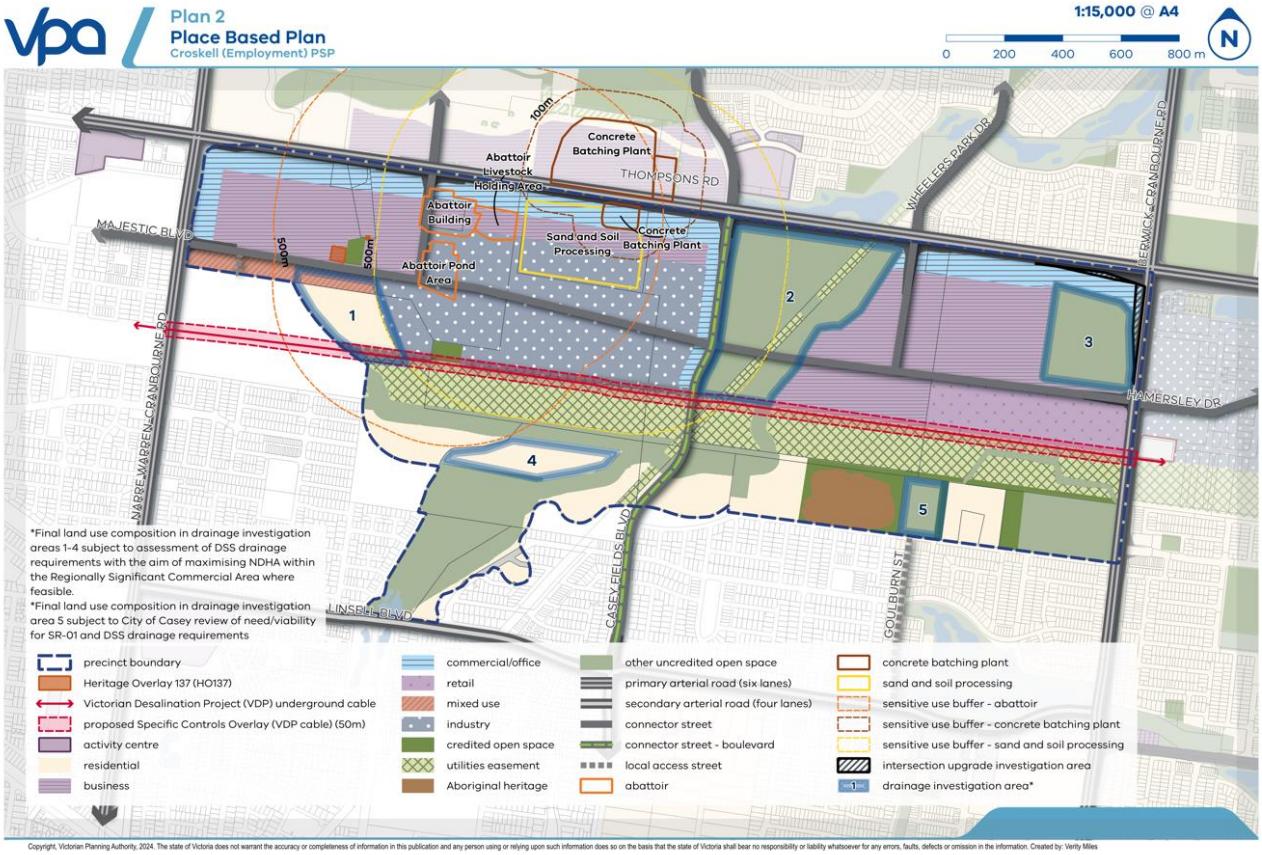

Figure 2 *Preliminary Place Based Plan (Source: VPA Croskell Employment PSP)*

3. EPA Separation distance guideline (August 2024)

3.1 Overview

The EPA Victoria *Separation Distance Guideline*, August 2024, provides advice on recommended separation distances between industrial land uses that emit odour or dust, and sensitive land uses.

The purpose of this guideline is to support land use and development decisions that:

– Protect the community from human health and amenity risks associated with unintended offsite odour and dust generated by industry/activity

– Protect industry/activities from inappropriate land use and development nearby that may constrain operations

This guideline is intended for planning authorities, responsible authorities, industry, developers, the community and EPA. It provides guidance on what to consider when preparing and assessing planning scheme amendments, precinct structure plans, planning permits and EPA permissions applications.

3.2 Why separation distances are necessary

Separation distances are intended to accommodate both routine emissions and unintended offsite emissions. Where there are routine emissions from an industry, there may still be unintended offsite emissions experienced at or beyond the boundary of the source. Unlike routine emissions, unintended emissions are in addition to routine emissions and are often intermittent or episodic. They may occur due to:

– The nature of the operation
– Minor changes in weather conditions
– Minor accidents
– Minor equipment failure

Unintended offsite emissions may still occur even when an industry is operating in accordance with all relevant statutory obligations, including minimising the risk of harm to human health or the environment from pollution and waste so far as reasonably practicable.

Separation distances are intended to allow unintended emissions to disperse, and in doing so, minimise human health and amenity risks for any nearby sensitive land uses.

The use of separation distances can:

– Prevent land use conflict
– Help protect the health and amenity of sensitive land uses
– Minimise risks and mitigate odour and dust impacts from certain industries and activities
– Help protect industrial and commercial land uses and activities
– Provide local government, industry, developers and the community with some certainty about future land use

3.3 What is a sensitive land use

The definition of a sensitive land use is provided the Separation Distance Guideline, August 2024 as follows:

Any land use that requires a focus on protecting human health and wellbeing, local amenity and aesthetic enjoyment. Examples of such sensitive land uses include, but are not limited to:

– *dwellings and private open space (including detached dwellings, multiple dwellings, flat/apartment buildings, row dwellings and semi-detached dwellings, and excluding dwellings on properties in the same ownership in the Farming Zone)*
– *accommodation (excluding caretaker's residence, rural worker accommodation and dwellings on properties in the same ownership in the Farming Zone)*
– *child care centres*
– *education centres*
– *informal outdoor recreation that is adjacent to residential zones*
– *camping and caravan parks*
– *indoor recreation facility*
– *medical centres*
– *hospitals*
– *residential aged care facilities and retirement villages*
– *outdoor recreation facilities, open sports grounds, (regular public use, for example, sporting fields) adjacent to residential zones.*

3.4 Agent of change principle and variation of recommended separation distances for odour

The agent of change principle requires the person or entity proposing a land use or development (new or expanding, modified or varied) that may result in conflicting land uses to provide evidence to the decision maker that variation from a specified separation distance is appropriate. The agent of change has the responsibility to:

– Consider their obligations under the GED, including minimising the risks of harm to human health or the environment from pollution or waste from the proposed activity
– Avoid land use conflict
– Ensure potential impacts on nearby land uses are appropriately mitigated and managed

The agent of change principle applies to both individual applications and strategic planning matters.

If a proponent wishes to seek a variation of a recommended separation distance for odour from a decision maker, they are required to complete a risk assessment in support of their application. EPA recommends that a proponent only seeks to vary a recommended separation distance for odour if a risk assessment determines that an alternate separation distance is appropriate, based on the factors detailed in the decision-making process (Figures 5 and 6 of EPA Separation Distance Guideline, August 2024) and the relevant EPA guidance for assessing odour (EPA publication 1883).

3.5 How to measure separation distances

As defined by the Separation Distance Guideline, August 2024, separation distances for odour and dust are determined by measuring from the activity boundary of the industrial land use to the nearest sensitive land use. The activity boundary is the area that includes all current or proposed industrial activities (including plants, buildings or other sources) that may produce odour or dust emissions (including stockpiles, windrows, leachate ponds, unsealed surfaces and pollution control equipment).

If a business changes its use or moves an activity within the property boundary, the requirement for a planning permit or development licence may trigger a reassessment of adequate separation distances.

Two methods (urban and rural) to measure separation distances for odour and dust are provided in the Separation Distance Guideline, August 2024 to allow consideration of sensitive land uses in different geographical contexts. These methods differ in the measurement point for the nearest sensitive land use.

3.5.1 Method 1: the urban method

Method 1 measures the separation distance from the activity boundary of the industry/activity to the property boundary of the nearest sensitive land use, as illustrated in Figure 3.

Method 1 should be applied where the nearest sensitive land use is either:

– In an urban area or township, or
– On a site less than 4,000 m^2; or in a zone allowing subdivision to less than 4,000 m^2

Based on the above, the urban method is the relevant form of measurement for the site and has therefore been applied to this assessment.

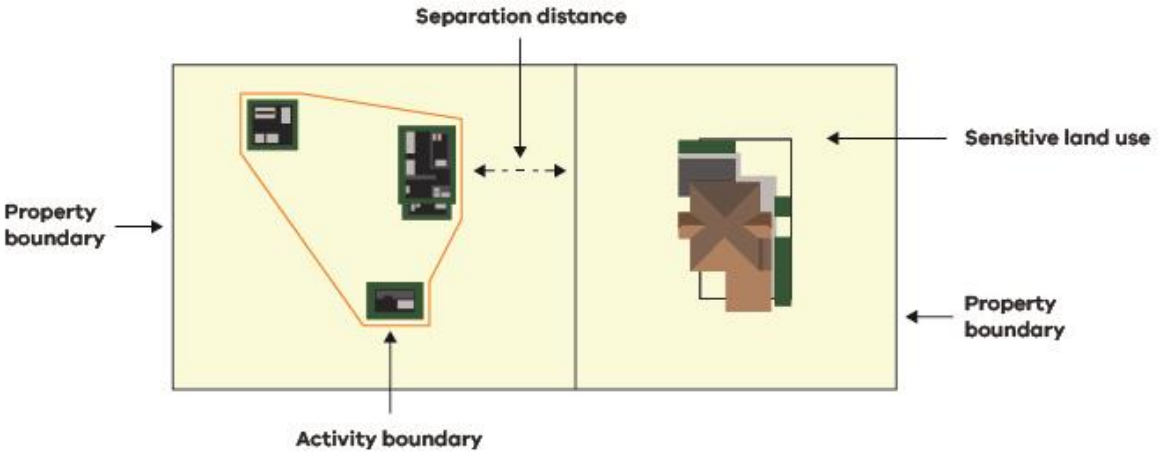

Figure 3 Measuring separation distances using Method 1: the urban method

3.6 Applicable separation distances to the site

3.6.1 Site overview

There are two main site activities requiring a separation distance at the site, namely the abattoir activities inclusive of animal holding areas and the wastewater treatment system. A site layout plan is shown in Figure 4.

Legend

- Abattoir activity boundary
- WWTP Aerobic Pond
- WWTP Anaerobic Pond
- WWTP Storage Lagoon

Paper Size ISO A4

0 0.05 0.1 km

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

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Wagstaff Abattoir Separation Distance Assessment

Site layout

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FIGURE 4

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3.6.2 Abattoir and animal holding area

The EPA separation distance guideline includes a default separation distance for 'Abattoir – no rendering', which consist of sites 'with outdoor or exposed animal holding and loading areas' (EPA Victoria, 2024, p. 23). The two separations distances have been listed based on head/day of animals expected on site as follows:

– >500 standard animal units/day: 500 m separation distance
– >10,000 standard animal units/day: 1000 m separation distance

GHD understands Wagstaff operate with a total number of 6,000 standard animal units per shift. These generally comprise of "small" animals such as sheep, lamb and week old cattle. However, from advice provided by Wagstaff it is noted that in drought seasons, there may be a requirement to process two shifts which will exceed 10,000 standard animal units/day (up to 12,000 standard animal units/day) . As this is the maximum worst case scenario, GHD have applied a 1000 m separation distance for the abattoir. GHD has plotted the default separation distance from the envelope of sources in Figure 7. It is noted that the envelope of sources includes the abattoir building and the outdoor animal holding areas (which is roofed with no walls).

If only one shift is to be considered i.e. 6000 standard animal units/day, then the distance for the abattoir component would reduce to 790 metres (based on a linear interpolation of the EPA categories).

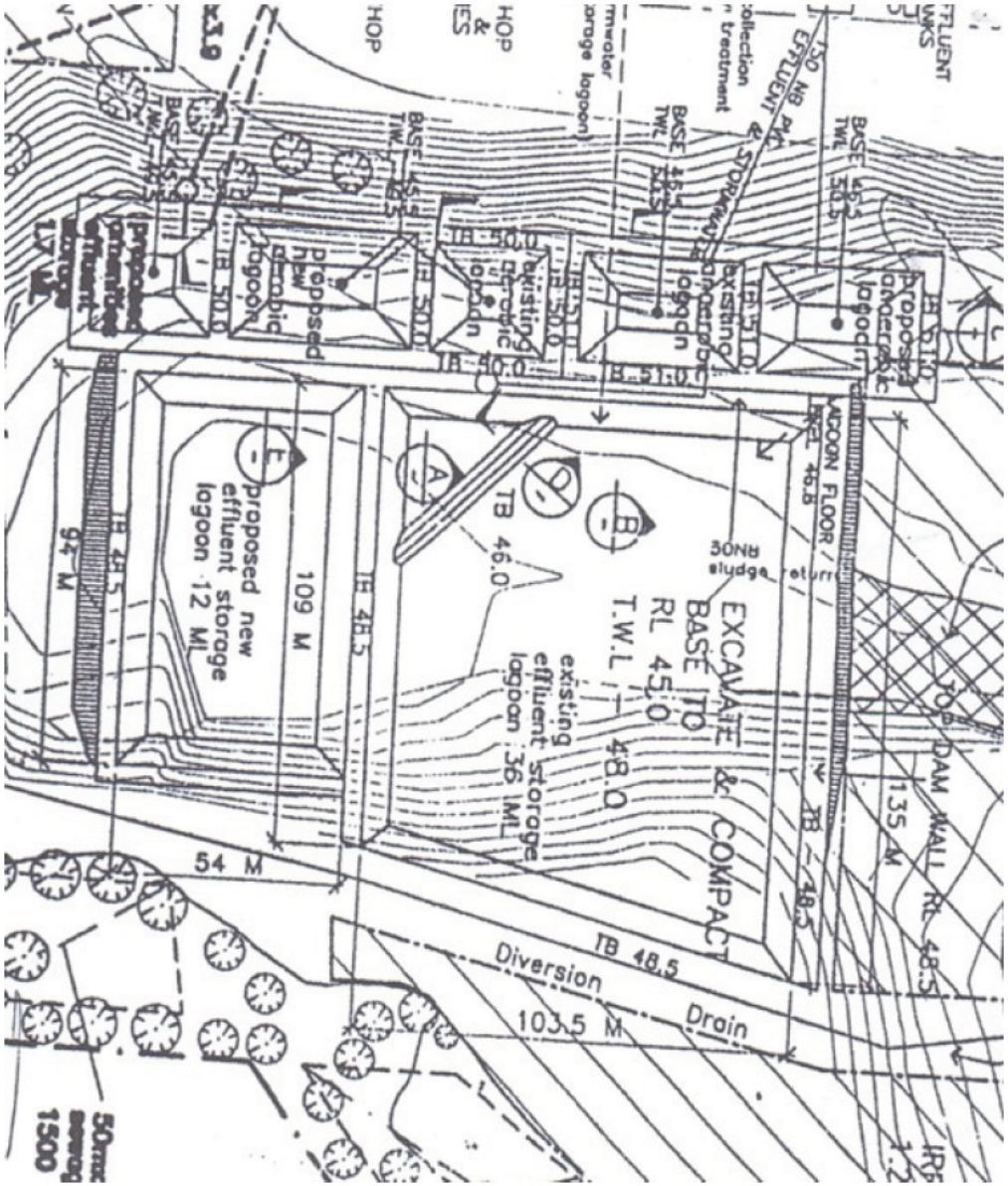
3.6.3 Wastewater Treatment System

Appendix B of the Separation Distance Guideline August 2024, the separation distance for Wastewater Treatment Plants have been identified based on the classifications of WWTP. Figure 5 outlines the relevant calculation of separation distances for each WWTP category.

Three ponds are located on site south of the abattoir buildings. Based on proposed sketches and aerial imagery, the aerobic pond outlined in green has been classified as "Aerobic Pondage System", while both the storage lagoon and anaerobic ponds does not fall under any specific category. Figure 6 displays the provided sketches of the proposed wastewater treatment system as well as an aerial imagery of the current site.

Type of installation	Separation distance in m (n = equivalent population) [2]
Mechanical/biological wastewater plants	= 10n1/3
Aerobic pondage systems (designed for wastewater treatment, not for storage of treated effluent)	= 5n1/2
Facultative ponds	= 10n1/2
Disposal areas for secondary treated effluent by spray irrigation	200
Disposal areas for secondary treated effluent by flood irrigation	50

Figure 5 Table 5 of EPA Separation Distance Guideline



Legend

- WWTP Aerobic Pond
- WWTP Aerobic Pond
- WWTP Storage Lagoon

Paper Size ISO A4

0 0.01 0.02 km

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

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Wagstaff Abattoir Separation Distance Assessment

Wastewater Treatment Plant Layout

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FIGURE 6

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From Figure 5 the size of the wastewater treatment system (the population it serves) is critical in order to undertake a separation distance assessment. The equivalent population for the site is 20,000 persons which has been provided by Wagstaff.

Wastewater generated from abattoir washing processes contain various amounts of contaminants from dissolved solids, blood, gut contents and urine. Wagstaff has provided sampling analysis of the wastewater effluent[3] over a five day period undertaken from the 14 August 2024. The samples have been taken from the outlet of the pump shed which draws the wastewater from the main settling pond. The provided BOD values therefore have not been utilised as it is not based on samples from the inlet of the aerobic pond and are lower than the values expected from the abattoir leading into the aerobic pond.

The typical Biochemical oxygen demand (BOD) from abattoir wastewater is expected to be 2000 mg/L[4] with a range from 700 to 4000 mg/L. GHD has based the assumptions for equivalent population (EP) on this value and calculated EP with the variation limit flow rate of 561.6 KL/day (provided by Wagstaff).

Ultimate flow to effluent treatment:	561.6 KL/day
Effluent concentration of BOD:	2000 mg/L
BOD loading = 561.6*2000 =	1123.2 kg/day
BOD per person loading to per EP	50 g BOD/d

Equivalent human population generating same BOD load = $\frac{1123200}{50}$= 22464 people. This value of equivalent population is similar to the equivalent population provided by Wagstaff of 20000 EP, thus GHD has adopted 20000 equivalent population value to calculate separation distances.

Aerobic Pondage

The following calculation was then made for the aerobic pondage system:

Separation Distance = $5n^{1/2}$

Where n = 20,000

Distance = $5(20{,}000)^{1/2}$

Separation distance = 707 m

Thus, the separation distance applied to the envelope of the Aerobic Pond was 707 m.

The default separation distance has been plotted in Figure 7.

GHD notes that the trade waste agreement for the site allows pre-treated water to be discharged to sewer. This is required to provide for flexibility in the volume of animals which are processed and the required protection from potential off-site effects. Variation in the number of animals processed is an unavoidable requirement of a rural-related and export-oriented industry. Advice provided by Wagstaff indicates that if the effluent was discharged directly to sewer, it would be a cost constraint on the effective operation of the plant. Thus, the separation distance is required for the existing aerobic pond and wastewater treatment system as it is still operational and it provides for security of future operations of the site.

[3] Sampling and Analysis of Trade Wastewater Effluent – Wagstaff Cranbourne provided to GHD by Wagstaff on 29 August 2024. Attached as

[4] Meat & Livestock Australia Limited (2012) Report on Covered Anaerobic Lagoons Review of Design and Operational Aspects for Red Meat Industry Applications.

Legend

Boundary	Separation Distance
Abattoir	Abattoir buffer (1000 m)
WWTP Aerobic Pond	WWTP Aerobic Pond buffer (707 m)

Paper Size ISO A4

0 0.25 0.5 km

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

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Wagstaff Abattoir Separation Distance Assessment

Default Separation Distance

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FIGURE 7

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4. Summary

Based on the EPA Separation Distance Guideline August 2024, the separation distances have been scribed for the Wagstaff Abattoir and associated wastewater treatment system located at 1500 Thompsons Road, Cranbourne East. The following can be concluded:

Abattoir and animal holding areas

– 1000 m default separation distance for the abattoir activities based on operating capacity of greater than 10,000 standard animal units

Wastewater treatment system

– 707 m default separation distance for the aerobic pond based on an equivalent population of 20,000

GHD notes that the 1000 m separation distance for the abattoir and animal holding areas extends to encompass a significant number of existing sensitive uses to the northwest, west, southwest and northeast of the site. While the 707 m separation distance for the wastewater treatment system marginally extends to encompass some existing sensitive uses to the southwest of the site.

GHD understands based on information provided by Wagstaff, that there have been no complaints regarding odour made to the EPA in the past 12 months in relation to the site.

In conclusion, GHD recommends the separation distances summarised above be applied to Wagstaff abattoir and associated activities as they provide appropriate separation distances to protect the local surrounding community from human health and amenity risks and prevents new sensitive land uses from impacting and constraining the existing industrial land use in accordance with the EPA Separation Distance Guideline August 2024.

5. Limitations

This report has been prepared by GHD for Wagstaff and may only be used and relied on by Wagstaff for the purpose agreed between GHD and Wagstaff as set out in section 1 of this report.

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

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

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

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 6 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

6. Assumptions

The following assumptions were utilised in the preparation of this report:

– Odour is the primary emission of concern from the abattoir
– GHD relied on EPA Separation Distance guideline to undertake the separation distance assessment
– All information provided is correct and representative of the operations and capacity at the site

Regards