Victorian Planning Authority

Officer PSP Buffer Assessment Review

August 2018

Table of contents

Table index

Figure index

1. Introduction

The Officer PSP was approved in 2011 and included guidance on appropriate locations for sensitive uses in relation to the HyGain feedmill facility. This guidance was informed by a GHD buffer assessment undertaken in 2011[1]. The 2011 buffer assessment comprised of the following works:

- Discussion of HyGain operations, including findings from a perimeter site inspection and dust incident in 2004.
- Establishment of 300 m default buffer based on operation of a grain elevator in the Victorian Planning Provisions Clause 52.10 separation distances and supported by the EPA buffer guidelines.
- De-rating of default buffer based on throughput of site.
- Assessment of local meteorology and pattern of dispersion in order to establish a directionally dependent buffer.
- Recommending that sensitive uses, namely residential development, not be established within this buffer.

The Officer PSP, approved in 2011, includes planning controls which prevent the establishment of sensitive uses within the buffer area.

Amendment C232 to the Cardinia Planning Scheme proposes that the existing 'Local Business' sub precinct in which the HyGain facility is located be designated as Commercial 1 Zone, with tailored planning controls to trigger the need for a planning permit (addressing health, wellbeing and amenity issues associated with the HyGain facility) for the following sensitive uses:

- Accommodation
- Child care centre
- Education centre
- Hospital
- Place of worship

In addition to proposed Planning Scheme amendments, since GHD's 2011 assessment, the HyGain facility has had planning permits granted, resulting in increased production capability, and a modified footprint of dust generating sources.

As a consequence of the modified operations at HyGain, the proposed amendments to the planning scheme and updates to buffer guidelines, the appropriateness of the 2011 buffer is required to be assessed.

1.1 Purpose of this report

The findings and recommendations outlined in this report will inform precinct planning relating to potential amenity impacts as a consequence of air emissions from the HyGain feed mill facility at Officer.

[1] GHD 2011, Report for Hygain Feeds Pty Ltd Hickson Rd, Officer. Buffer Assessment, Prepared for VicUrban, September 2011

1.2 Scope and limitations

The scope of works completed as part of this assessment are detailed below:

1. Review of past air quality (odour and dust) buffer distance prepared by GHD in 2011[2]
2. Conduct a site visit of the HyGain facility
3. Produce updated air quality buffer guidance
4. Assess the suitability of sensitive uses that may be permitted within the updated buffer
5. Provide recommendation relating to the assessment of noise impacts at proposed uses likely to be affected by the HyGain facility

This report has been prepared by GHD for Victorian Planning Authority and may only be used and relied on by Victorian Planning Authority for the purpose agreed between GHD and the Victorian Planning Authority as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Victorian Planning Authority 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 1.3 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Victorian Planning Authority and others who provided information to GHD (including Government authorities), 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.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

Site specific emission estimation, dispersion modelling and subsequent environmental risk assessment have not been completed as a part of this assessment.

[2] GHD 2011, Report for HyGain Feeds Pty Ltd Hickson Rd, Officer - Buffer Assessment, prepared for VicUrban, September 2011

1.3 Assumptions

GHD has made the following assumptions which should be considered whilst assessing the contents of this report:

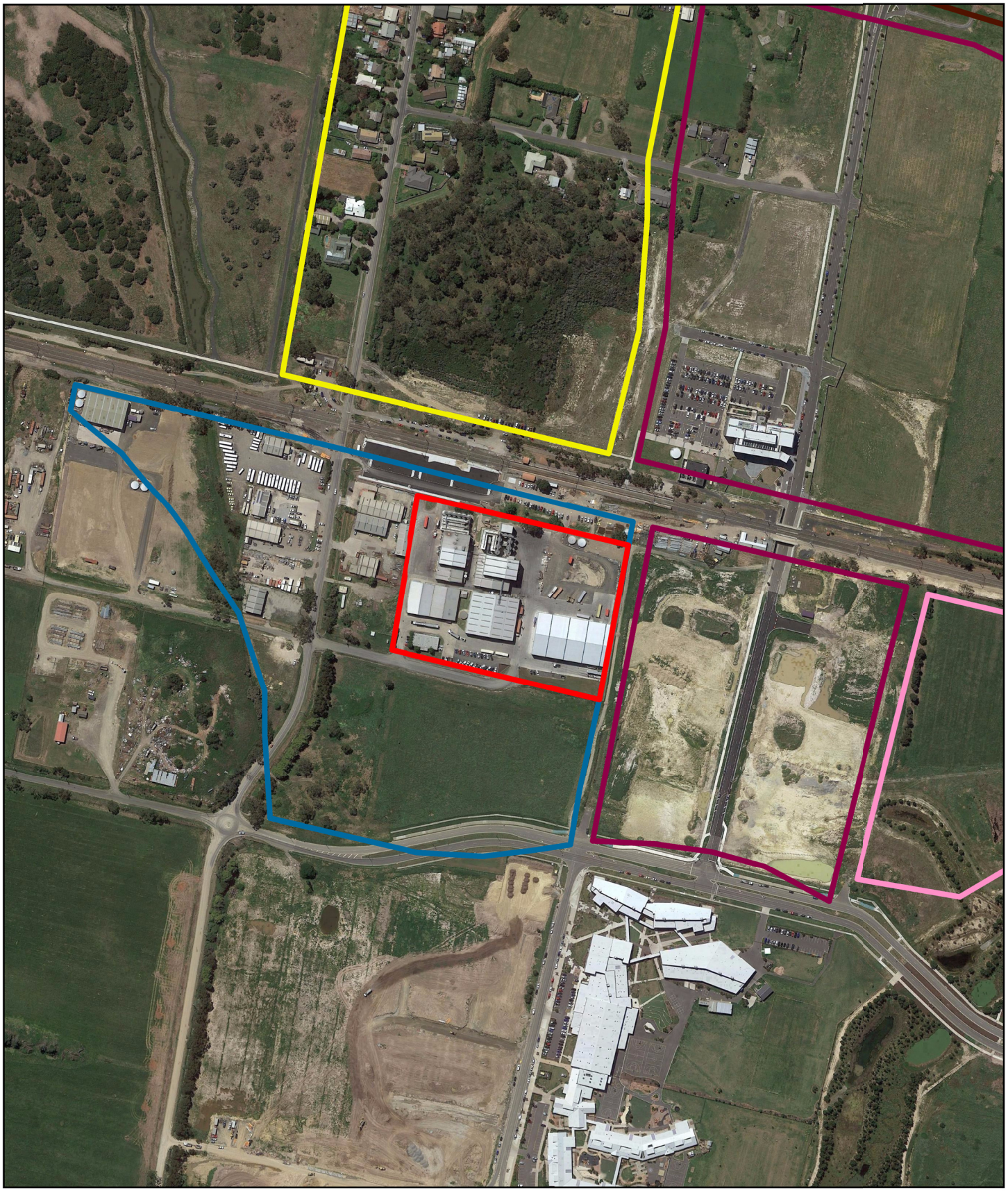
- Meteorological data sourced from the EPA Pakenham air quality monitoring station is broadly representative of meteorological environment at the subject site.
- Based on information gathered at the site inspection to the HyGain site, GHD assumes the following:
  - The primary sources of industrial residual air emissions are contained within the 'envelope' of sources, as presented in Figure 4.
  - The current throughput of the site is 60,000 tpa and the estimated maximum achievable throughput is 120,000 tpa, both of which are greater than the 20,000 tpa industry size as presented in EPA Publication 1518 for feedmills. As a consequence, the size of the default buffer would not increase further with any additional increases in throughput.
  - The emission control technology at the site cannot be considered as an 'exceptionally high standard of emission control technology'.
- The scope of works does not include the assessment of air quality sources other than those located at the HyGain feedmill.

2. Investigation extent

This investigation considers the potential impact on amenity for future uses within the Officer PSP as a consequence of air emissions from the existing HyGain feedmill facility.

Figure 1 outlines the relevant features relating to the investigation area including the following:

- Premises boundary for the existing HyGain feedmill facility, located at Hickson Road, Officer
- Sub precincts of the officer PSP, including:
  - Local business sub precinct, with zoning classification ‘Commercial 1 Zone’ in which the HyGain feedmill is currently situated
  - Residential sub precinct, with zoning classification ‘Residential Growth Zone’
  - Mixed use sub precinct, with zoning classification ‘Mixed Use Zone’
  - Core sub precinct, with zoning classification ‘Commercial 1 Zone’
  - Gateway, with zoning classification ‘Commercial 2 Zone’



LEGEND

- Indicative HyGain site boundary
- Local business sub precinct
- Mixed use sub precinct
- Core sub precinct
- Residential sub precinct
- Gateway sub precinct

1:5,000 (at A4)

0 50 100 150

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

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Victorian Planning Authority
Officer PSP Buffer Assessment Review

Investigation extent

Job Number | 31\12345
Revision | A
Date | 18 July 2018

Figure 1

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Data source: Google Earth 2018, 10/18/2018 Created by: DCraggs

3. Review of 2011 buffer assessment

The following review considers the methodology, findings and recommendations as outlined in GHD document number 31/26688/188370 September 2011.

3.1 Description of past operations

Site access was not granted to GHD during the 2011 assessment and consequently detail of the operations was reliant on a description provided in a third party report[3]. The following key details are relevant to the assessment report:

- The estimated maximum throughput of the facility was ~100,000 tonne per year.
- Bulk materials, including grains and oilseed, are delivered by truck and tipped to a hopper. Screw and bucket conveyors are used to send the product to fully enclosed enclosures.
- Weighing, blending and processing operations are carried out on bulk materials to ensure product specifications are met. Processing lines comprise of:
  - Grain cleaning line
  - Batching unit – to blend ingredients
  - Microniser line to flake grains
  - Steam Flaking lines where the feed is treated with steam
  - Cooling prior to bagging and palletising
- Dust emission control systems are installed at the site including:
  - Bag house with approximate dust collection efficiency of > 99.9% for grain cleaning, batching unit and microniser
  - Cyclone with approximate dust removal efficiencies of 85% and 65% for coarse and fine dust respectively for dust extracted from steam flaking processes

A failure of the bag house was recorded in late 2004, leading to complaints from a neighbouring auto salvage operation, relating to dust deposited on vehicles.

The 2011 assessment considered the greatest risk to loss of off-site amenity to be emissions of dust rather than odours. Odours observed during the perimeter site visit was not deemed offensive and therefore the likelihood of nuisance arising due to odours is reduced.

3.2 Perimeter inspection

A perimeter inspection was conducted by GHD staff and the following observations were made:

- The survey was conducted on 19 October 2010 from 10:40 am to 11:10 am during light (< 2 m/s) southerly winds
- A weak biscuit/grain dour was detected at the site boundary, and described as not offensive

[3] CEE 20006, Proposed Expansion of HyGain Feed Mill, Officer – Air Quality Assessment, Consulting Environmental Engineers, 2 March 2006

3.3 Development of buffers

3.3.1 Default buffer distance

The application of a default buffer for the site considered the following:

- The industry category 'feedmill' was not identified in either the then EPA buffer guidelines or Victorian Planning Provisions (VPP) Clause 52.10.
- In the absence of a more appropriate category, the VPP Clause 52.10 industry category 'Rural industry handling, processing or packaging agricultural produce' was applied, which requires a 300 m separation distance. This category is very broad and a feedmill is likely to qualify within this category.
- EPA Victoria response to HyGain permit application (#T060155) noted a threshold distance of 300 m for source type 'grain elevators' may be applicable. The source types present at the HyGain facility are similar in emission mechanism to grain elevators at larger facilities such as grain terminals.
- A default buffer distance is set at 300 m scribed (measured) from the envelope of potential sources (rather than the site boundary) in accordance with EPA Guideline AQ2/86[4]. This envelope of potential sources included areas of grain handling/processing and did not include storage areas or areas where truck movements occur.

3.3.2 De-rating of default buffer distance

The default buffer distance was de-rated based on the assumption that dust emission rate in the event of an upset (e.g. failure of the bag house) is proportional to the throughput of the operation leading to emissions. The methodology used for this de-rating exercise is detailed in a position paper[5] for EPA as part of an EPA revision of the buffer guidance. The de-rating of the default buffer distance considered the following:

- The buffer distance methodology assumes that unless explicitly stated otherwise, the EPA default buffer distances provide sufficient protection to amenity for large examples of the subject industry.
- During completion of the assessment, the Grainco wheat terminal at Corio, Geelong had an annual throughput of 1,000,000 tpa.
- For a throughput of 50,000 tpa a 65 m buffer was calculated.
- For the maximum capacity at time of assessment, 100,000 tpa, an 85 m buffer distance was calculated.

3.3.3 Development of directional buffer distance

The directions of good and poor dispersion were considered through analysis of local meteorology to develop a directional buffer distance. Development of this buffer distance considered the following:

- 12 month meteorological dataset from EPA Pakenham ambient air quality monitoring station.
- Dispersion modelling adopting a nominal 10 m x 10 m area source with nominal emission rate.

[4] EPA Victoria 1990, EPA Publication AQ 2/86 - Recommended Buffer Distances for Industrial Residual Air Emissions, July 1990

[5] Clarey P, Pollock T. Integrating Separation Distances with Dispersion Modelling, Enviro 04, 28 May – 1 April 2004, Darling Harbour, Sydney.

- The primary direction of poor dispersion is to the south, with the 85 m de-rated buffer distance increasing to ~120 m in this direction.
- The primary direction of good dispersion is to the north, with the 85 m de-rated buffer distance decreasing to ~ 60 m in this direction.

3.3.4 Revised 'upper limit' buffer distance

In 2006, a third party consultant acting for HyGain, produced an assessment report for the then proposed expansion[6] of the site. Importantly, this report outlined that a separation distance of 150 m to the nearest sensitive receptor was "more than sufficient" for the protection of amenity at these receptors.

Based on this report, GHD developed an 'upper limit' pro-rated 200 m directional buffer distance. This buffer distance considered the following:

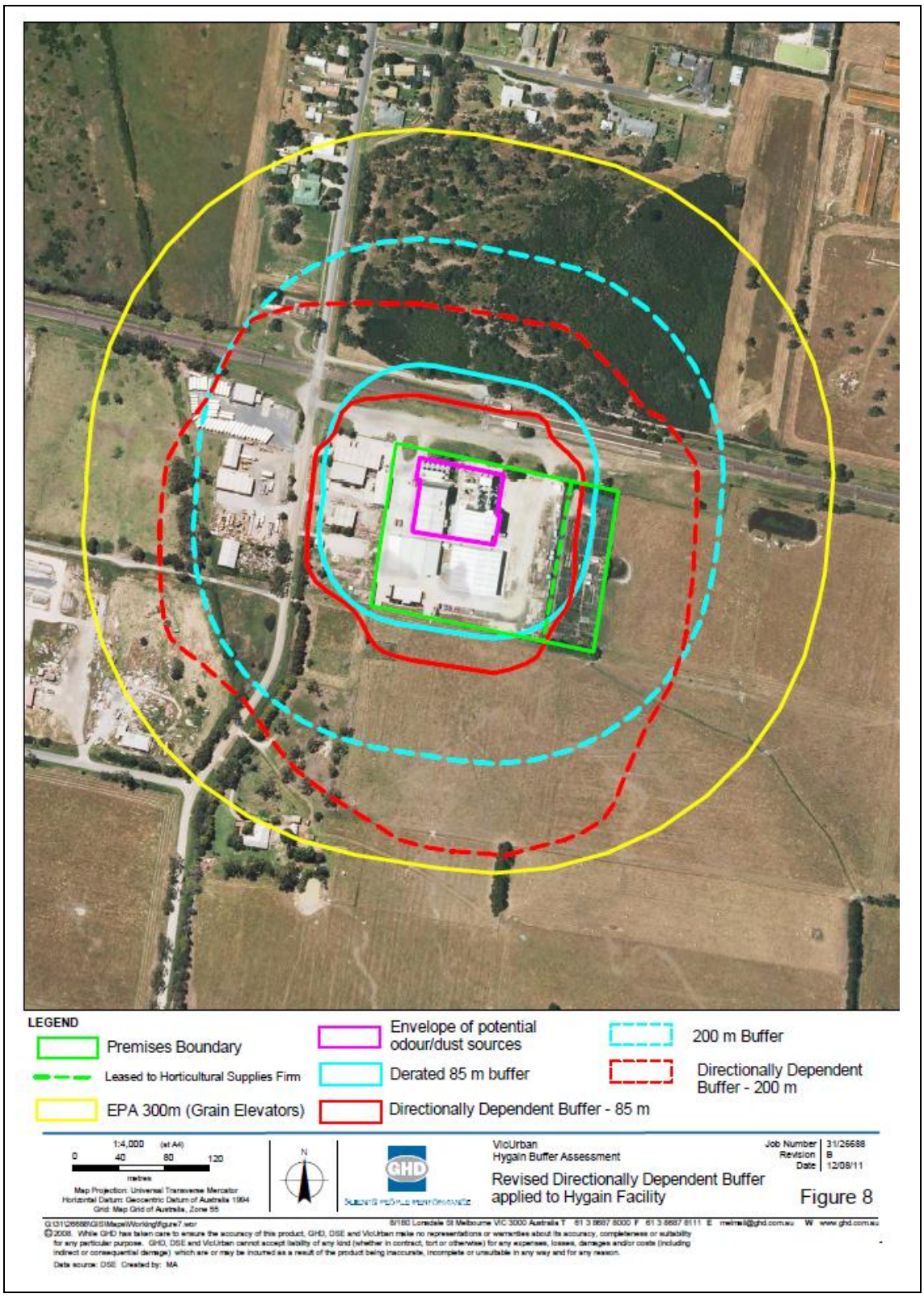
- The nearest sensitive receptor identified at 150 m northwest of the northwest corner of the site boundary.
- This 150 m is increased to 170 m when considering the envelope of potential dust sources from which the buffers are scribed.
- Considering the pattern of dispersion through development of a directional buffer distance, a 200 m default buffer is contracted to 170 m in the direction of the nearest sensitive receptor.

3.4 GHD recommendation

GHD recommended that for purposes of development planning, that the 'upper limit' directional buffer be applied.

[6] CEE 2009, Proposed Expansion of HyGain Feed Mill, Officer – Air Quality Assessment. Consulting Environmental Engineers, 2 March 2006

Figure 2 GHD 2011 Buffers



4. Updated buffer assessment

4.1 Existing conditions

GHD attended a site inspection on Thursday 12 July 2018 at approximately 10:00 am. GHD were accompanied by Kevin Bareira of HyGain during this inspection. As a result of the site inspection the following key information were gathered.

Site throughput

- Current throughput is approximately 60,000 tpa.
- HyGain staff indicated that the site could comfortably facilitate a doubling in throughput, and that based on market demand, this is a current goal for the site. An estimated maximum throughput of 120,000 tpa is then considered realistic.

Hours of Operation

- Current hours of operation are eight to 12 hours per day commencing at 5 am
- The current permit for the facility allows for 24 hour operations

Emission sources

- The primary dust emission sources are:
  - Above ground grain delivery area at northwest of site for domestic product. The rate of tipping of grain was observed to be low for this source, with a small plume of dust being generated. HyGain staff indicated that dust emissions can increase significantly depending on the type and moisture content of grain received, along with wind conditions.
  - Below ground grain delivery area at north of site for international product. No tipping was observed at this source. Tipping occurs within a large enclosure. GHD sighted a significant accumulation of grain residue within this enclosure and considers it likely that this is indicative of significant dust emissions during tipping.
  - Dust removal systems for process buildings. A number of dust removal systems were sighted for exhaust points. Dust control systems included:
    - Cyclones installed at the steam flaking process building.
    - Bag houses installed at other process buildings.
    - HyGain staff indicated that 'small holes' in bag house filters are a common occurrence (approximately once per year) resulting in higher potential for offsite dust impact. This event is determined through visual observation of dust emissions from the offending source. HyGain has procedures in place to allow for these issues to be rectified in a timely manner.

Nuisance dust[7] is the likely dust type to be emitted from the delivery area during an upset while nuisance and fine[8] dust particles would be the likely dust types to be emitted in the event of a bag house failure.

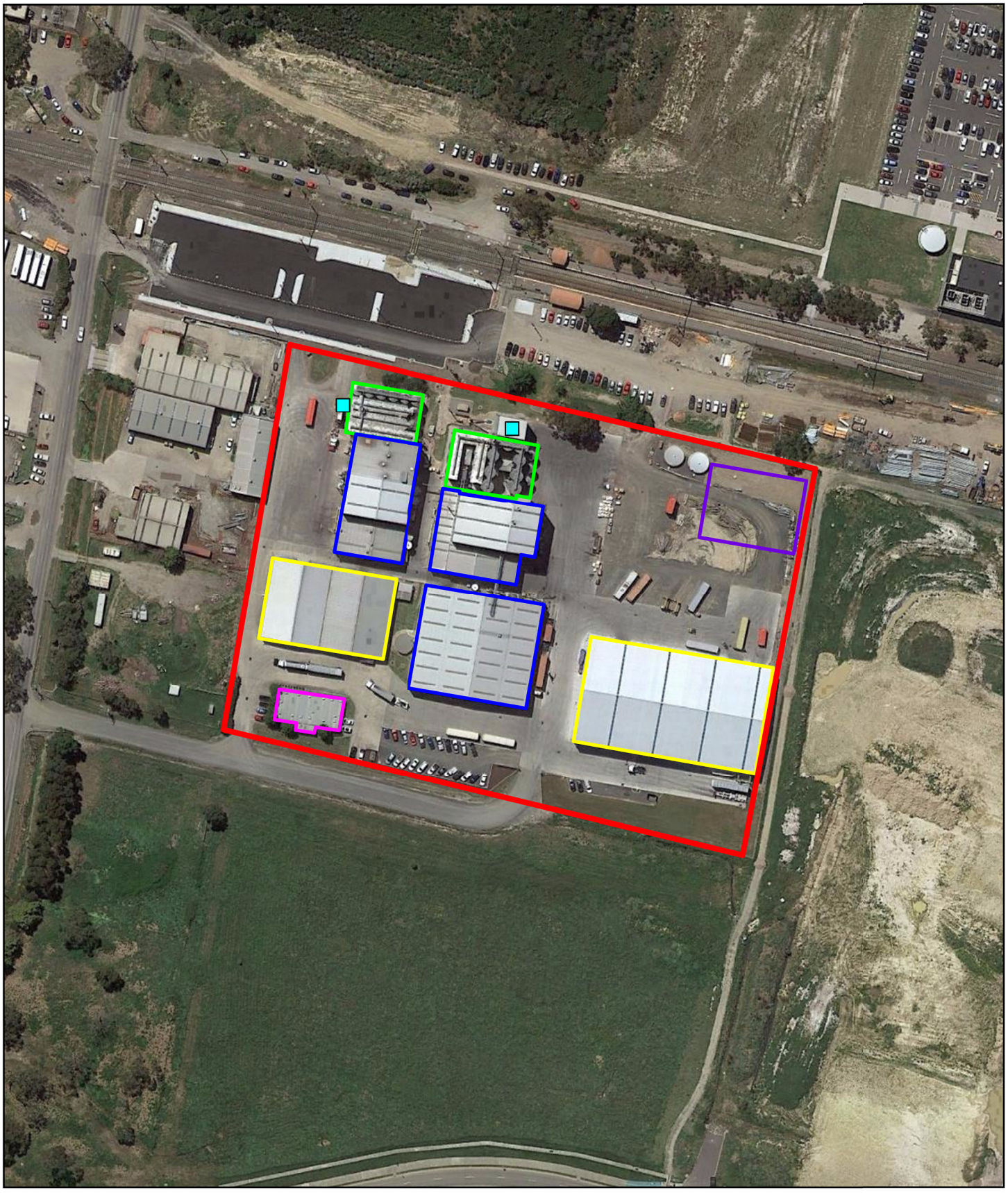
During the site visit odour was not deemed to be offensive, however the operators did note that certain types of product can be odorous during unloading/delivery which may be detected offsite under the right wind conditions.

[7] Particles generally larger than 40 microns able to drop out of the air column
[8] Dust particles less than 10 microns

4.2 Future works

HyGain were granted Planning Permit Number T160174 by Cardinia Shire Council on 23 February 2017. The permit allows for construction/installation of 10 silos in the north-eastern corner of the site. Discussions with HyGain have provided the following information:

- Trucks will dump grain at the silos similar to the current grain dumping locations at the site
- Grain will be transferred to processing units through either of the following methods:
  - Transfer direct from silos to trucks and dumping at existing locations
  - Conveyors
- Construction has not yet commenced



LEGEND

- Indicative HyGain site boundary
- Warehouse
- Silos
- Process building
- Site office
- Indicative footprint of future silo storage area
- Grain dumping site

1:2,000 (at A4)

0 20 40 60

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

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Officer PSP Buffer Assessment Review

Site layout

Job Number	31\12345
Revision	A
Date	30 July 2018

Figure 3

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4.3 Updates to buffer distance guidance

In March of 2013 EPA Victoria released an updated guideline for buffer distances titled the 'Recommended Separation Distances for Industrial Residual Air Emissions (IRAE's)'[9](Publication 1518). The guideline contains a table of recommended minimum separation distances that aim to minimise the off-site impacts on sensitive land uses[10] arising from unintended, industry generated odour and dust emissions. Accordingly, the relevant sections of the guideline for this assessment are to:

- Provide clear direction on which land uses require separation
- Inform and support strategic land use planning decisions
- Prevent new sensitive land uses from impacting on existing industrial uses
- Prevent new or expanded industrial land uses from impacting on existing sensitive land uses
- Identify compatible land uses that can be established within a separation distance area

IRAEs are defined by the EPA as unintended or accidental emissions (e.g. due to equipment failure, accidents, abnormal weather conditions, etc.) which are often intermittent or episodic in occurrence. IRAEs can be managed by minimum separation distances, whilst routine emissions are managed through operational measures to meet the State Environment Protection Policy (Air Quality Management)[11] (SEPP (AQM)).

The EPA guideline also states that when there is an inadequate separation distance between an industry and sensitive land uses, remedial action to alleviate off-site impacts may be uneconomic. As a consequence, the viability of the industry is jeopardised and the off-site effects are not alleviated. Provision of adequate separation distances seeks to avoid these potential lose/lose situations.

The buffers are to be scribed (measured) as per EPA Guidelines Method 1 (Urban method). This method requires that the separation distance be measured from the activity boundary of the industry to the property boundary of the sensitive land use, i.e. this activity boundary of the industry is a convex polygon containing the activities of the industry.

In addition to utilising EPA Guidelines Method 1 (Urban Method) the buffers will also be scribed from the HyGain property boundary. This method will allow VPA to understand the maximum possible extent of the buffer where:

- The use of the site remains the constant (i.e. industry classification does not change).
- HyGain wish to change their onsite operations resulting in new planning permits which lead to the increase in the footprint of the envelope of sources. Bearing in mind the change of footprint from the 2011 assessment to current, GHD recommends that this scenario be considered.

Table 1 of Publication 1518 lists the following industry type which GHD considers to be applicable to the HyGain facility at officer.

[9] EPA Victoria, March 2013, Publication 1518 – Recommended separation distances for industrial residual air emissions n
[10] Defined by EPA as any land use which require a particular focus on protecting the beneficial uses of the air environment relating to human health and wellbeing, local amenity and aesthetic enjoyment, for example residential premises, child care centres, pre-schools, primary school, education centres and informal outdoor recreation sites.
[11] Victoria Government Gazette, State Environment Protection Policy (Air Quality Management), December 2001.

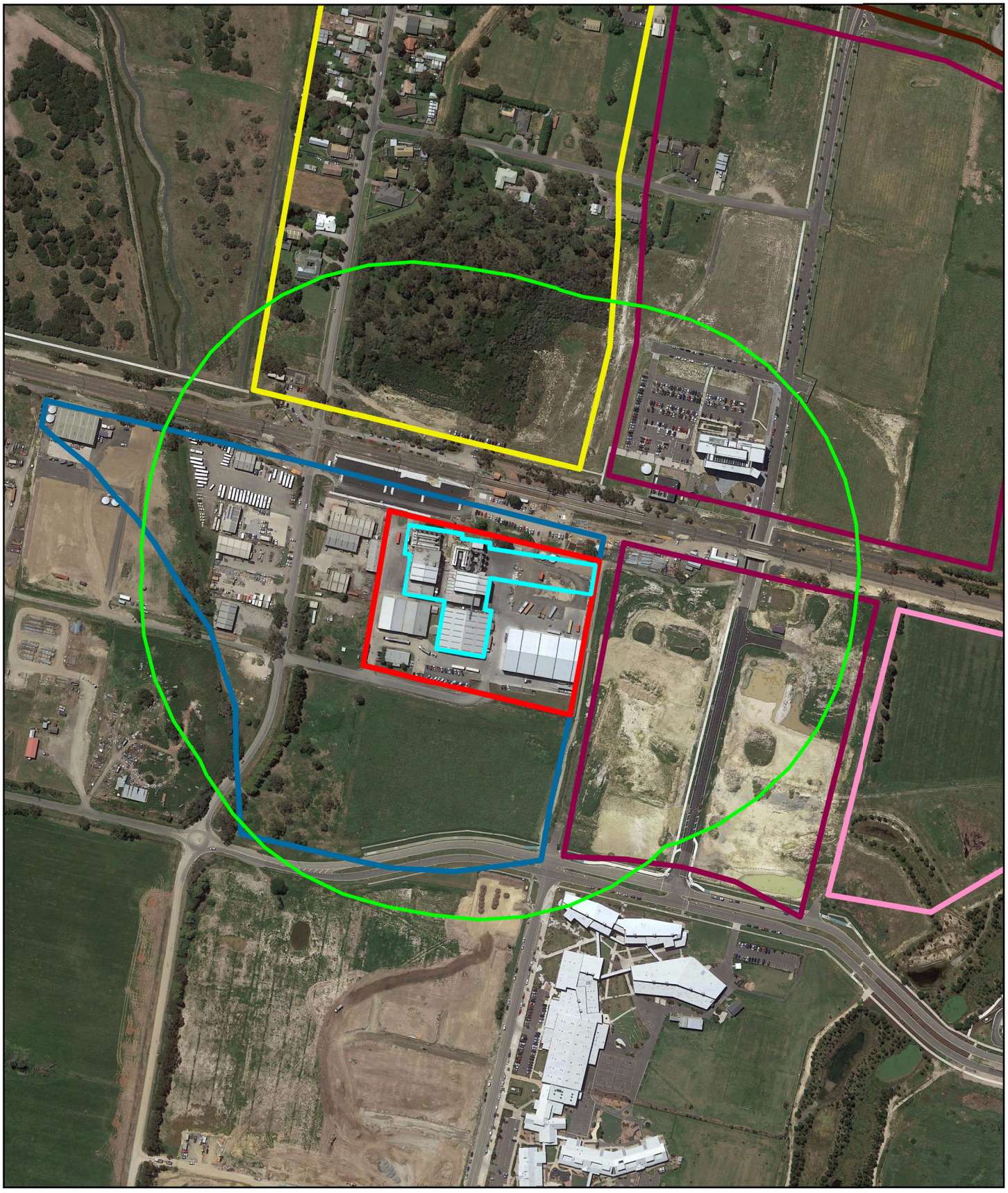
Table 1 Extract of Publication 1518 Table 1 - Applicable separation distance category for HyGain officer

Industry type	Industry description	Scale	Recommended separation distance (meters)
Grain and stockfeed mill and handling facility	Receiving, storing, fumigating, bagging, transporting and loading grain or stock feed	>20,000 tonnes per year	250

The default buffer, scribed from the envelope of sources with the potential for upset conditions is shown in Figure 4.

The default buffer, scribed from the site boundary is shown in Figure 5.

Note that clause 52.10 of the VPP is not applicable in this instance as the primary purpose of clause 52.10 is to prevent new industries from leading to impacts at existing sensitive receptors. The Officer application of buffers is the reverse of this (i.e. existing industry) therefore the relevant buffer guideline to apply is EPA 1518.



LEGEND

- Indicative HyGain site boundary
- Local business sub precinct
- Mixed use sub precinct
- Core sub precinct
- Residential sub precinct
- Gateway sub precinct
- Envelope of current and approved sources
- Default 250 m buffer scribed from envelope of sources

1:5,000 (at A4)

0 50 100 150

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

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Officer PSP Buffer Assessment Review

Default 250 m buffer
Scribed from envelope of sources

Job Number | 31\12345
Revision | A
Date | 31 July 2018

Figure 4

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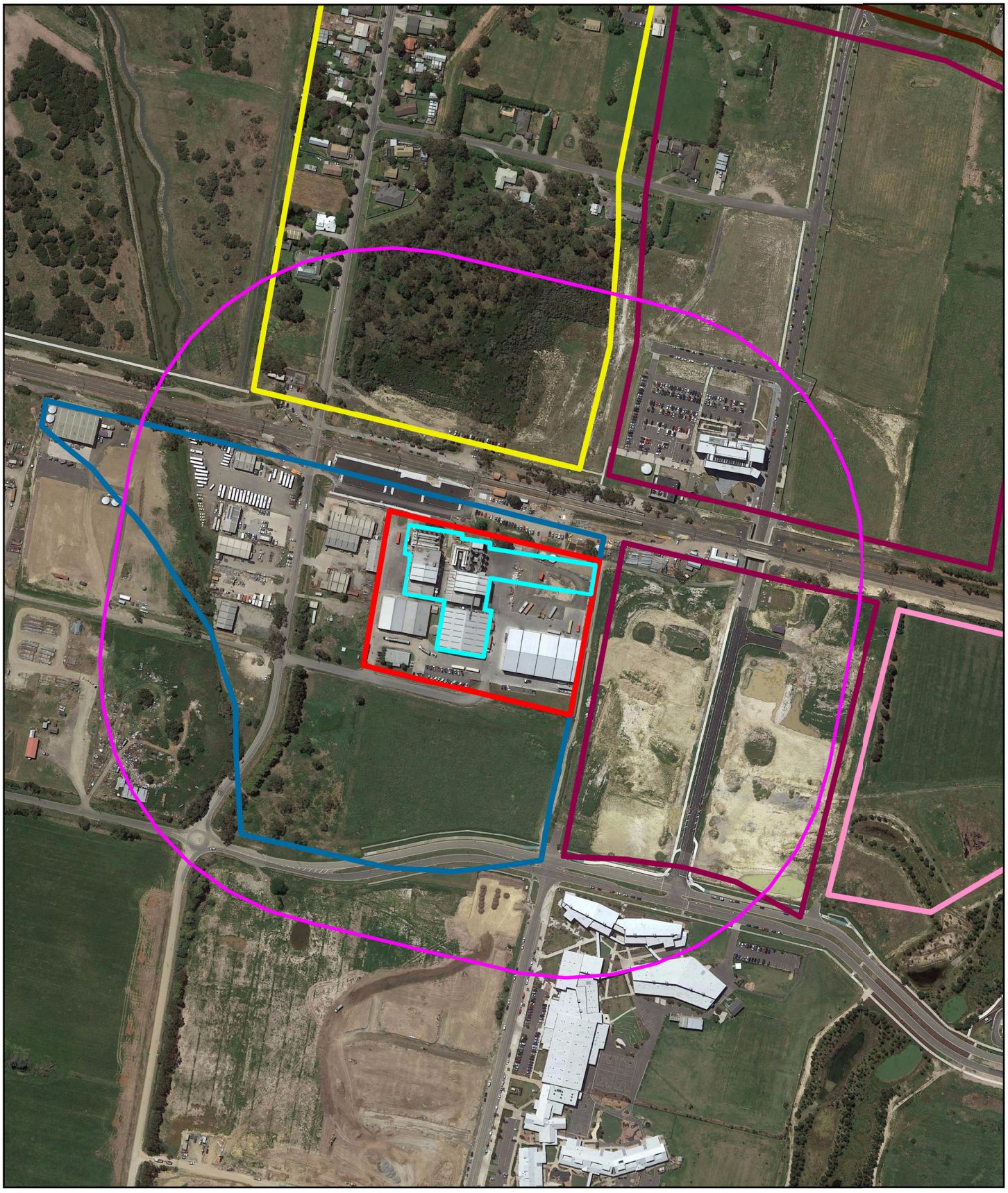

LEGEND

- Indicative HyGain site boundary
- Local business sub precinct
- Mixed use sub precinct
- Core sub precinct
- Residential sub precinct
- Gateway sub precinct
- Envelope of current and approved sources
- Default 250 m buffer scribed from site boundary

1:5,000 (at A4)

0 50 100 150

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

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Default 250 m buffer
Scribed from site boundary

Job Number | 31\12345
Revision | A
Date | 31 July 2018

Figure 5

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4.4 Variation to the default buffer distance

In practice, the applied separation distance may be varied as a result of site-specific operational or environmental conditions (Section 9.2, table 4 of the 1518 guideline). Where detailed site specific emission estimation is not available the primary mechanisms for a modification to the default buffer are generally:

- De-rating the default buffer based on the **size of the plant.**
- Developing a directional buffer which considers the influence of **topography or meteorology** on the dispersion of emissions.
- The **likelihood of residual emissions** could include an assessment on a detailed complaint history from a residential area encompassed within the default separation distance.

4.4.1 Size of the plant

The 2011 GHD assessment considered both of the above as appropriate variations to the default buffer. However, based on the updated guidance in Publication 1518, de-rating of the buffer based on site throughput is not possible. The recommended separation distance for the default buffer applied to HyGain is applicable to sites with a throughput of >20,000 tpa. As discussed in Section 4.1, HyGain's current operational rate is at approximately 60,000 tpa with the site having potential to produce at a rate of >100,000 tpa. Consequently, it is not deemed appropriate for the default buffer to be either de-rated or pro-rated based on site throughput.

4.4.2 Topography or meteorology

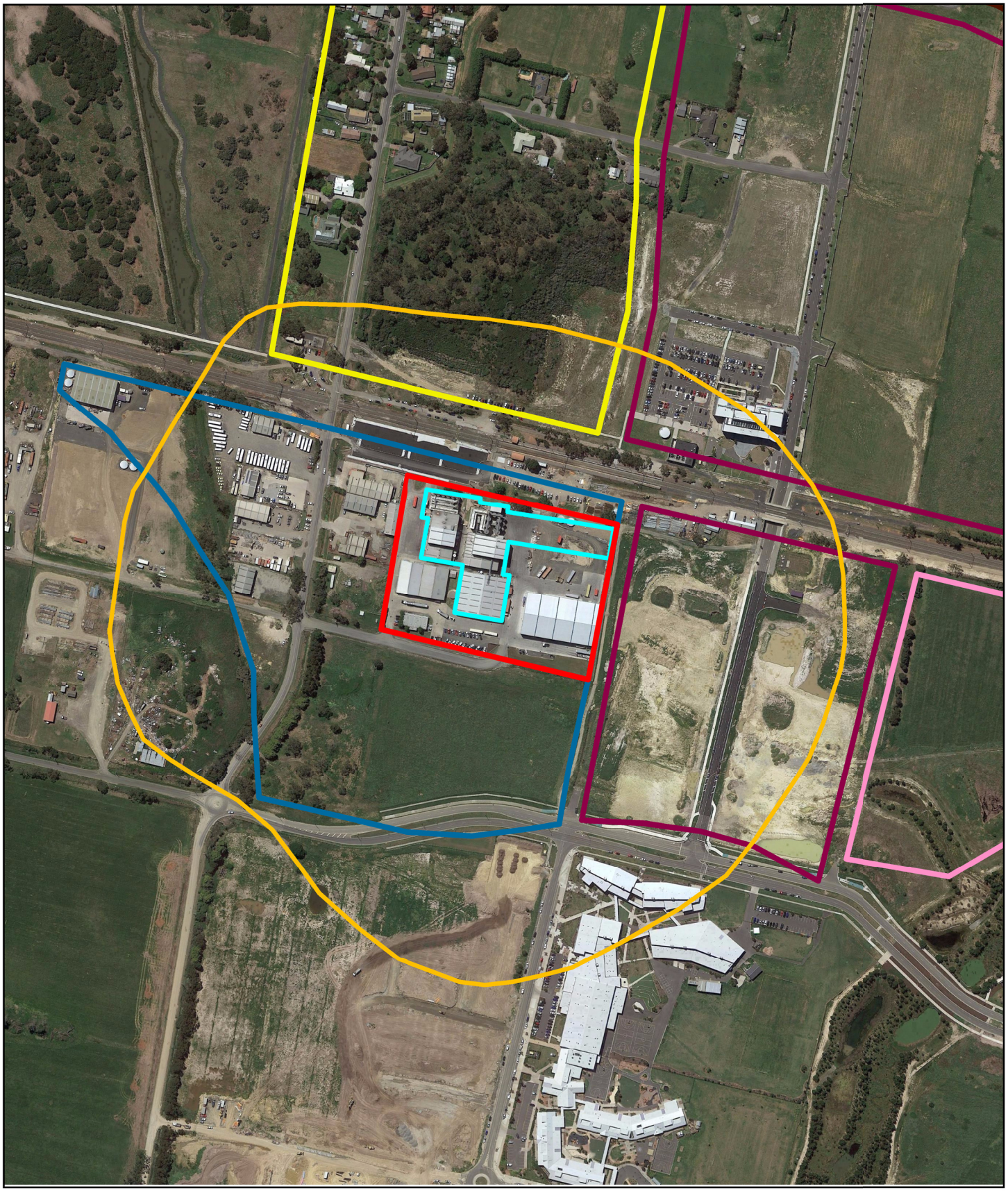
The default 250 m buffer for HyGain can be modified to account for the predicted directions of good and poor dispersion at the site. The 2011 GHD assessment predicted these directions using meteorology gathered at the nearby EPA Pakenham air quality monitoring station. These directions are shown below in Table 2 for a 250 m default buffer.

Table 2 Directional variation of 250 m default buffer in response to local meteorology

Direction Sector (Degrees)		Mean Range (m)	Percent (%) of mean range	Direction Sector (Degrees)		Mean Range (m)	Percent (%) of mean range
N	0	168	67	S	180	344	138
NNE	22.5	176	71	SSW	202.5	300	120
NE	45	165	66	SW	225	265	106
ENE	67.5	185	74	WSW	247.5	324	129
E	90	215	86	W	270	279	112
ESE	112.5	235	94	WNW	292.5	235	94
SE	135	265	106	NW	315	235	94
SSE	157.5	326	131	NNW	337.5	185	74

The directional buffer scribed from the envelope of sources is shown in Figure 6.

The directional buffer scribed from the site boundary is shown in Figure 7.



LEGEND

- Indicative HyGain site boundary
- Local business sub precinct
- Mixed use sub precinct
- Core sub precinct
- Residential sub precinct
- Gateway sub precinct
- Envelope of sources
- Directional 250 m buffer scribed from envelope of sources

1:5,000 (at A4)

0 50 100 150

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

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Officer PSP Buffer Assessment Review

Directional 250 m buffer
Scribed from envelope of sources

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Revision | A
Date | 31 July 2018

Figure 6

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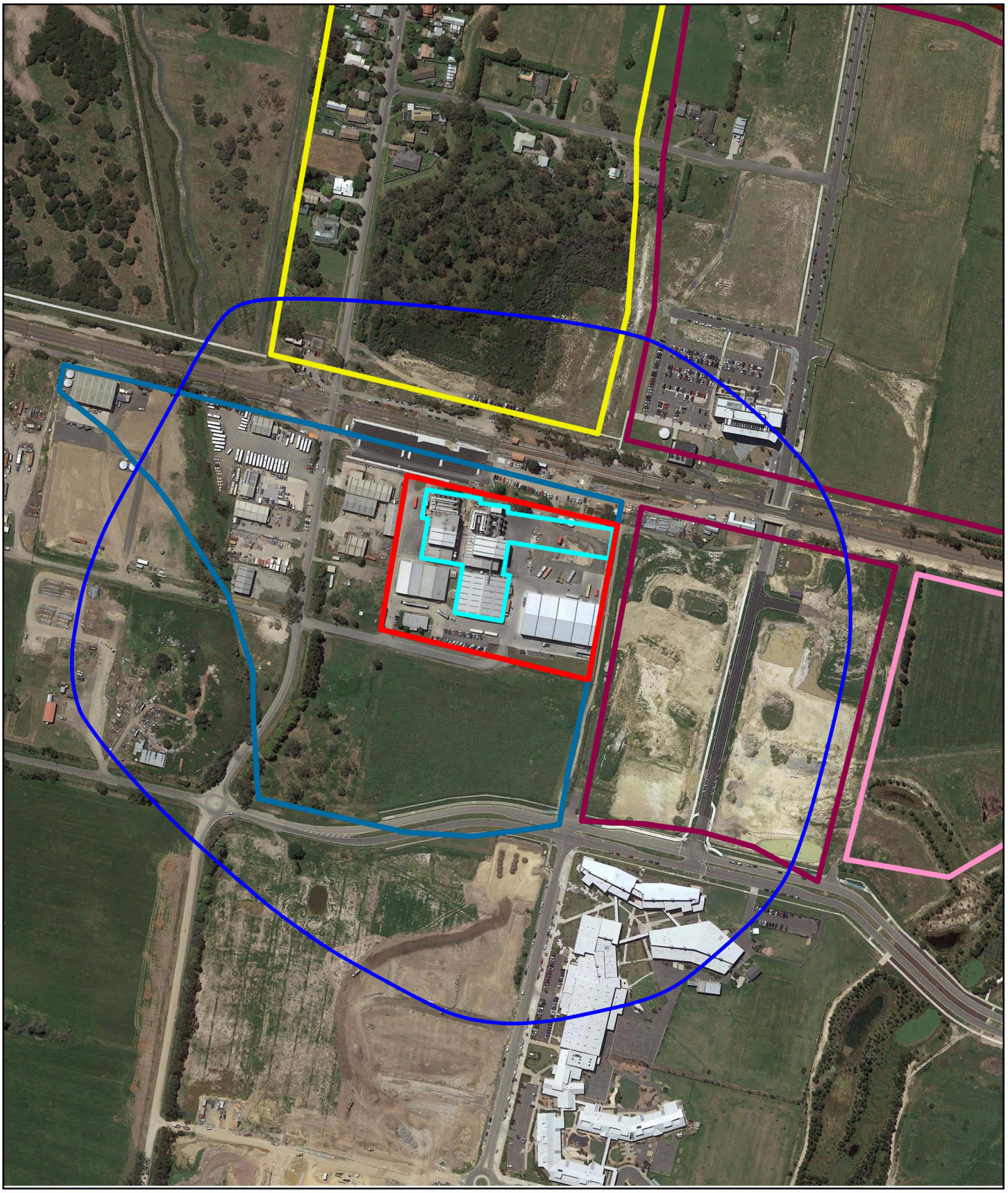

LEGEND

- Indicative HyGain site boundary
- Local business sub precinct
- Mixed use sub precinct
- Core sub precinct
- Residential sub precinct
- Gateway sub precinct
- Envelope of sources
- Directional 250 m buffer scribed from site boundary

1:5,000 (at A4)

0 50 100 150

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

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Directional 250 m buffer
Scribed from site boundary

Job Number | 31\12345
Revision | A
Date | 14 August 2018

Figure 7

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Data source: Google Earth 2018, 10/18/2018 Created by: DCraggs

4.4.3 Likelihood of IRAEs

Given that there are a limited number of existing sensitive uses within the default buffer the likelihood of residual emissions based on complaint history cannot be established.

5. Recommendations

5.1 Recommended buffer

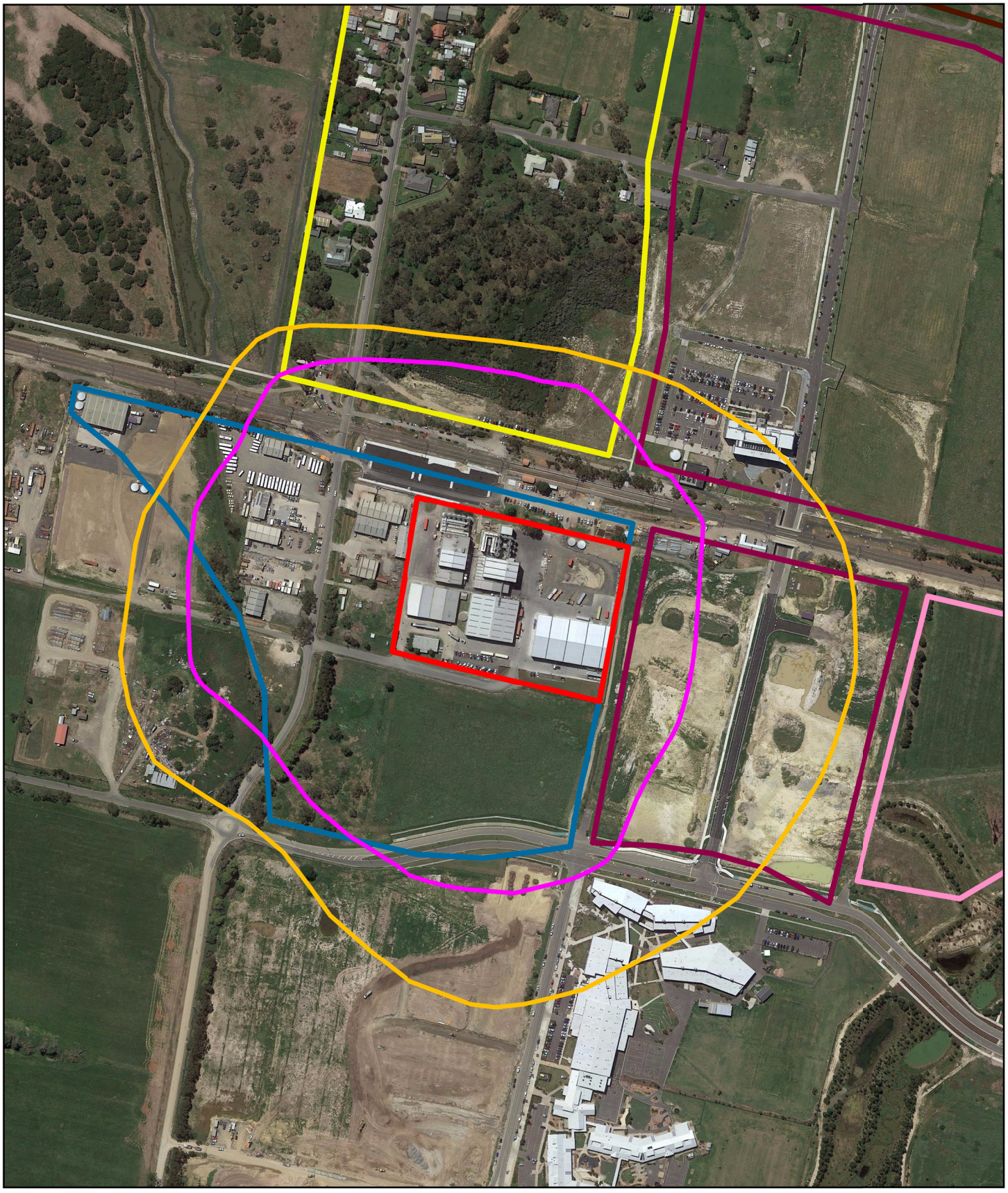
It is concluded that the buffer developed for the 2011 GHD assessment is no longer appropriate based on the following:

- Updated EPA guidance for separation distance for the protection of amenity from industrial residual air emissions.
- Changes in configuration of site with respect to sources with the potential to produce industrial residual air emissions, and consequently the boundary from which the buffer distance is scribed.

GHD recommends that VPA consider the updated 250 m directional buffer scribed from the envelope of sources for planning purposes in the Officer PSP. A comparison of the updated 250 m directional buffer with the previously recommended 200 m buffer is shown in Figure 8.

From Figure 8 the following are observed:

- The 250 m directional buffer calls for a greater separation distance from the HyGain facility in all directions.
- The Mixed Use sub precinct, with applied mixed use zone, is constrained by an additional ~30 meters to the north. Consequently, one residence falls within the directional buffer.
- The Local Business sub precinct, with applied Commercial 1 Zone, to the south of the HyGain facility falls entirely within the 250 m directional buffer.
- The Local Business sub precinct, with applied Commercial 1 Zone, to the west of the HyGain facility is almost entirely constrained by the 250 m directional buffer.
- Greater than 50% of the Core sub precinct, with applied Commercial 1 Zone, to the east of the HyGain facility falls within the directional buffer. Additionally, the existing buildings within the Core sub precinct to the north-east of HyGain fall within the buffer.
- The Officer Secondary College to the south-east, and residential land outside of the officer town centre to the south and south-west, also fall within the directional buffer.



LEGEND

- Indicative HyGain site boundary
- Local business sub precinct
- Mixed use sub precinct
- Core sub precinct
- Residential sub precinct
- Gateway sub precinct
- GHD 2011 directional buffer
- Reccomended directional 250 m buffer scribed from envelope of sources

1:5,000 (at A4)

0 50 100 150

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

N

GHD

CLIENTS | PEOPLE | PERFORMANCE

Victorian Planning Authority
Officer PSP Buffer Assessment Review

Comparison of 2011 and updated directional buffers

Job Number | 31\12345
Revision | A
Date | 31 July 2018

Figure 8

G:\31\36365\GIS\Maps\Working\Figure6.WOR
8/180 Lonsdale St Melbourne VIC 3000 Australia **T** 61 3 8687 8000 **F** 61 3 8687 8111 **E** melmail@ghd.com.au **W** www.ghd.com.au

Data source: Google Earth 2018, 10/18/2018 Created by: DCraggs

5.2 Recommended sensitive uses within buffer (odour and dust)

The application of the buffer to the HyGain facility is based on the guidance provided in EPA Publication 1518. The guidance outlined in this publication aims to achieve the following:

- Protect human health and wellbeing, local amenity and aesthetic enjoyment
- Protect existing industry from encroachment by sensitive uses
- Prevent land adjacent to industry from being underutilised

In relation to the protection of human health, wellbeing, local amenity and aesthetic enjoyment at sensitive receptor locations the document outlines that these are to be protected against industrial residual air emissions of odour and dust.

In relation to dust there are two aspects:

- Health impacts (inhalable and inspirable fine dust particles less than 10 microns)
- Amenity impacts (nuisance dust particles generally larger than 40 microns able to drop out of the air column)

A sensitive use is defined in Publication 1518 as the following:

"Any land uses which require a particular focus on protecting the beneficial uses of the air environment relating to human health and wellbeing, local amenity and aesthetic enjoyment, for example residential premises, child care centres, pre-schools, primary schools, education centres or informal outdoor recreation sites"

Based on the available information to GHD and guidance from EPA, GHD does not recommend establishment of sensitive uses within the nominated 250 m directional buffer. Instead GHD notes that zone appropriate uses, which are not deemed as sensitive, could be established within the buffer.

Given the transfer of dust emissions is based on a number of variables (e.g. wind speed and direction) and the fact that the occurrence of IRAEs is difficult to predict based on current operating processes (i.e. emissions are unintended, accidental or fugitive) the directional buffer is the best available tool to mitigate against an upset event. It would be difficult to impose controls at the sensitive receiver locations to reduce the effect of IRAEs (e.g. pollutants can travel in air above barriers, and built form cannot mitigate the exposure to IRAEs if people are outside). The opportunity therefore to mitigate air quality impacts is limited given that the proposed sensitive use types would most likely require openable windows and outdoor areas particularly schools and child care centres.

Should a further variation of the buffer be considered, the EPA guideline (Section 9.1) discusses the agent of change principle. Where a sensitive land use is proposed, the proponent of proposed development needs to ensure that local industry does not come under new obligations due to new sensitive uses entering into the area. It is the responsibility of the agent of change to provide evidence to the responsible authority that a variation from the recommended separation distance is appropriate. Publication 1518 states that the agent of change must take into account the principles contained within Publication 1518 and the SEPP (AQM) in conducting any variation of the buffer distance. This would likely include dispersion modelling and air quality monitoring. It is noted by the EPA that there are no statutory obligations on an industry to supply information about its operations to third parties in respect to separation distances and any refinement would need to be to the satisfaction the relevant authority in consultation with the EPA.

Any further variation of the 250 m directional buffer is likely to require the following:

- Co-operation from technical people at HyGain
- Plant equipment and operational information (which can be subject to commercial in confidence and unable to be provided)
- Plausible upset scenarios and their frequency and duration (i.e. unintended, accidental and fugitive emissions)
- Source characteristics
- Direct source measurements (routine and upsets including accidents)

Furthermore, the influence of future expansion of the HyGain facility on the recommended buffer should be considered by the relevant authority. The buffer as recommended in this report is applicable to current and approved operations at the HyGain site as of July 2018. Any further development or expansion at the HyGain site may lead to an increase in the envelope of sources and consequently increase the size of the required buffer. GHD recommends that this is considered by the relevant authority during future planning permit application processes.

5.3 Recommended sensitive uses within buffer (noise)

In relation to noise impacts from HyGain, there are no current guidelines for buffers. In order to establish the noise impact a detailed noise assessment would be required. In development areas such as the Officer Town Centre such an assessment will likely become redundant with the introduction of additional noise sources and structures that lead to localised blocking effects. GHD recommends that the amendment to the planning scheme require a planning permit with appropriate demonstration of compliance with noise criteria (i.e. an acoustic assessment) for any proposed sensitive uses within the Local Business sub precinct, with applied Commercial 1 Zone.

6. Conclusion

This assessment has considered previous work conducted by GHD in relation to buffer distances, current operations at the HyGain site and updates to separation distance guidance documentation. GHD recommends that a directional 250 m buffer be applied to the HyGain site. This buffer constrains the majority of the 'Local Business' sub precinct, within which VPA are considering the possibility of establishing sensitive uses. Based on current guidance relating to buffer distances and available information, GHD recommends that sensitive uses are not established within the applicable 250 m directional buffer distance.

Any further variation of the buffer would need to consider the agent of change principle.

GHD

180 Lonsdale Street
Melbourne VIC 3000
T: 61 3 8687 8000 F: 61 3 8687 8111 E: melmail@ghd.com

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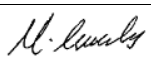
Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Draft A						19/07/18
0	D Craggs	M Asimakis		T Young		31/07/18
1	D Craggs	M Asimakis		T Young		15/08/18

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