



Witness Statement - Planning Panel Hearings Whittlesea Planning Scheme, Amendment C241

1. Name and Address

Mr Michael Asimakis

c/- GHD 180 Lonsdale Street Melbourne

2. Qualifications and Experience

- BSc Melbourne 2008
- Certified Air Quality Professional, CASANZ
 - Professional Experience
 - 2009 – 2020: Senior Air Quality Scientist, GHD

3. Areas of Expertise

I specialise in meteorological/air dispersion modelling and reporting. In the last 12 years, I have conducted many odour and air quality impact assessments for existing and proposed industries with potential off-site odour or dust impact. I have assisted with the development of buffer methodologies where meteorology and throughput is taken into account and have applied them to a range of industries.

4. Expertise to Prepare Report

I have reported on odour impact assessments on many cases for Planning Panel and VCAT proceedings and have conducted such assessments for a range of industries with off-site odour impact. I have applied the EPA Victoria buffer guidelines for numerous projects including for landfills, waste water treatment plants and green waste composting facilities.

5. Instructions which defined Scope of Report

I received instructions from Harwood Andrews acting for the Victorian Planning Authority (VPA) to prepare supplementary expert evidence in relation to the upcoming panel hearing for Amendment C241 with regard to odour and buffers regarding the proposed Yarra Valley Water (YVW) Wollert Recycled Water Treatment Plant (Wollert RWTP). I have previously (2017-2019) been instructed by The City of Whittlesea (CoW) and the VPA to prepare an Impact Assessment Report for the Shenstone Park Precinct Structure Plan (PSP) and associated investigation area to the south and east of the PSP boundary considering air quality impacts.

6. Facts, Matters and Assumptions Relied Upon

- Site inspections
- Review of information provided by CoW, VPA and EPA Victoria
- Review of documents supplied in the brief by Harwood Andrews
- My experience relevant to buffer and odour impact assessments
- My experience relevant to recommended separation distances for industrial residual air emissions

7. Documents to be taken into Account

- GHD December 2017 report #51460 (available at <https://vpa-web.s3.amazonaws.com/wp-content/uploads/2019/10/Quarry-Impact-Assessment-GHD-December-2017.pdf>)
- GHD letter November 2020 #12540645-49622-12

8. Identity of Persons Undertaking Work

- Michael Asimakis, and other GHD specialist staff: Craig McVie, Jayne Mooney, Tim Pollock, Simon Ritchie, Alastair McKenzie, Barry Cook

9. Summary of Opinions

- The substantive portion of my statement is given in the GHD reports #51460, and #12540645-49622-12

10. My opinions are not provisional except where specifically qualified.

11. The analysis presented in this report is within my area of expertise.

12. I declare that I have made all enquiries that I believe are desirable and appropriate, and that no matters of significance have been withheld from the Panel.

Regards

Michael Asimakis

Senior Air Quality Scientist

6 November 2020

Attachments:

GHD letter November 2020 #12540645-49622-12



06 November 2020

Our ref: 12540645-49622-12
Your ref:

Amendment C241wsea Whittlesea Planning Scheme - Shenstone Park PSP - Air Quality Expert Witness Odour Expert Witness Letter

1 Introduction

This letter has been prepared for the upcoming panel hearing for Amendment C241 (the Amendment) to the Whittlesea Planning Scheme Shenstone Park Precinct Structure Plan (PSP). The Amendment seeks to incorporate the PSP into the Whittlesea Planning Scheme. I understand that the VPA has prepared a draft PSP, including Buffers, Noise, Amenity and Measurement Length Plan and a draft Future Urban Structure (FUS).

Further to my expert evidence regarding quarry buffers, I have been further instructed by Harwood Andrews acting for the VPA to provide supplementary expert evidence in relation to odour and buffers regarding the proposed Yarra Valley Water (YVW) Wollert Recycled Water Treatment Plant (Wollert RWTP).

In relation to expert evidence, I, Michael Asimakis, have been instructed by Harwood Andrews acting for the VPA to:

1. Review the exhibited amendment and background materials (as relevant to odour) including the YVW 21 August 2020 correspondence¹.
2. Prepare an expert witness statement which considers the material and provides any opinions, provisional or otherwise on the appropriateness of the buffer depicted in the PSP and the 21 August correspondence;
3. Provide a short statement updating as necessary the GHD report based on the information provided and provide opinion on the appropriate odour buffer for the proposed treatment plant.

2 Review of exhibited amendment and background materials

I have reviewed the relevant exhibited amendment and background material including the following:

- Impact Assessment Report for the Shenstone Park Precinct Structure Plan (GHD, December 2017)
- Exhibited Shenstone Park Precinct Structure Plan (October 2019)
- YVW letter response to the VPA regarding Amendment C241 (21 August 2020)

¹ YVW response to the VPA regarding the Amendment C241 (dated 21 August 2020)

2.1 Impact Assessment Report for the Shenstone Park Precinct Structure Plan (GHD, December 2017)

GHD was engaged by City of Whittlesea (CoW) to prepare an Impact Assessment Report for the Shenstone Park Precinct Structure Plan (PSP) and associated investigation area to the south and east of the PSP boundary. I, Michael Asimakis, was the technical lead and author of the air quality chapters. In relation to odour, the assessment considered impacts from the proposed YVW Wollert RWTP located immediately south of the PSP. The assessment was to be used by City of Whittlesea (CoW) to inform a detailed precinct-based design that will respond to the constraints on future land use posed by the operations at the RWTP.

From information provided to me by YVW², I understood that planning for the RWTP was at the conceptual stage with the following noted:

- YVW expected that some form of mechanised biological process will be used with only indicative layouts being provided to GHD – refer to Appendix A of GHD December 2017
- There was no specific information available regarding the type of equipment or process the plant would utilise
- The size (equivalent populations at defined time horizons) were provided to GHD (Table 2 of GHD December 2017 repeated below as Figure 1)

Table 2 → Size of Wollert STP

Year		2028	2033
Without Large industrial Customer	EP	70,000	120,000
	ML/day	10	18
With Large industrial Customer	EP	190,000	230,000
	ML/day	30	38

Figure 1 Size of Wollert RWTP

Using the EPA Victoria recommended separation distance guideline in relation to sewage treatment plants (Table 6 of Publication 1518), I assessed the RWTP to be a mechanical/ biological plant requiring the following default buffer distances based on the various future projected sizes of the plant (Table 13 of GHD December 2017 repeated below as Figure 2).

² Email dated 21 July 2017 from Simon Newbery Manager Sewer Growth Planning

Table 13 → **Separation distances for Wollert STP**

Year	Equivalent Population (ep)	Mechanical/biological wastewater plants separation distance (m)
2028 (without large industrial customer)	70,000	412
2028 (with large industrial customer)	190,000	575
2033 (without large industrial customer)	120,000	493
2033 (with large industrial customer)	230,000	613

Figure 2 Default Buffers for the Wollert RWTP

Given the various sizes projected, I concluded that the largest possible configuration proposed by YVW (38ML/day), the 613 m separation distance should apply to the proposed plant to protect the plant's operations into the future and the amenity of future sensitive uses within the PSP.

It is my understanding that there are EPA Victoria site-specific criteria to vary a default buffer distance as detailed in Publication 1518. The six criteria identified in Table 4 of the separation distance guideline was considered. It was deemed likely that some of the factors listed in that table could vary the default buffer, if specific operational details about the industry is known.

It is my opinion that two criteria that allow for site specific variations that have the largest impact in varying the default buffers are generally size of the facility (de-rating a default buffer) and local meteorology (directional buffer). Given the buffers for sewage treatment plants already account for size, derating did not apply. However, I considered that the local meteorological effects would apply to the default 613 m buffer given that odour from the sewage plant will be subject to meteorological influences.

The directional buffer assessment showed that the default 613 m buffer can be retracted and extended in the directions of good and poor dispersion. An extension of the default buffer occurred to the east and northeast into the PSP, while the default buffer retracted in the west due to anticipated meteorology conditions. I have longstanding knowledge as to the rarity of easterly component winds over the northern suburbs of Melbourne. Thus, the 613 m directional buffer from the envelope of potential odour sources is considered a conservative approach when informing future land uses and protecting future sensitive uses from odour amenity impacts,

The intent of the buffer from the RWTP is to restrict sensitive land use intensification in this buffer area due to the risks from odour amenity impacts.

Upon review of GHD December 2017, I still consider as valid the technical findings of the assessment.

2.2 Exhibited Shenstone Park Precinct Structure Plan (October 2019)

I have reviewed the exhibited Shenstone Park PSP with particular focus given to Plan 15 relating to Buffers, Noise Amenity and Measurement Length. From review, the buffer distance specified for the RWTP appears to be in line with the GHD December 2017 recommendation. The 613 m directional buffer has been included with sensitive uses prohibited within the buffer.

2.3 YVW letter response to the VPA regarding Amendment C241 (21 August 2020)

To assist me in the preparation of this supplementary expert evidence in relation to odour from the YVW RWTP, Harwood Andrews provided me a letter dated 21 August 2020 from YVW to the VPA regarding Amendment C241.

2.3.1 Review of YVW letter

Upon review of the document, I make the following observations:

- YVW have completed additional concept studies to understand the impacts of odours from the Treatment Plant on surrounding areas. This includes both the land on which the Treatment Plant will be located and land within the Shenstone Park PSP
- YVW have completed conceptual treatment plant arrangements for a 20ML/d RWTP for purposes of determining land area requirements.
- Appendix D of the YVW letter provides a proposed site layout for the RWTP with the main plant to be located south of the Woody Hill Quarry with water storage basins located to the west of the Woody Hill Quarry on the Langley Park Drive site
- YVW have undertaken Odour modelling for the Treatment plant based on typical odour modelling parameters for new Treatment Plants.
- YVW note that the odour buffer that was exhibited was not provided by YVW and was not based on modelling of treatment plant odour emissions. The resulting Odour buffer is included in Attachment E of the YVW letter.
- No buffer is nominated for the treated water storage ponds at the Langley Park Drive site.

2.3.2 My opinion on the buffer outlined in the YVW letter

In relation to the above observations, I make the following opinion:

- YVW have not provided an updated buffer figure using EPA Publication 1518 Table 6 to calculate a revised default buffer for the plant.
- The buffer provided is based on odour modelling of typical odour modelling parameters (and emission rates) for new treatment plants. I question the validity of this approach as separation distances seek to avoid the consequence of upset industrial residual air emissions.
- It is noted that the separation distances outlined in the EPA buffer guideline are for upset/malfunction conditions only, and emissions to air occurring under routine operations should not be used to determine separation distances. EPA Victoria publication 1518 states that (EPA Victoria. 2013, p 5):

- ‘It needs to be recognised that where there are industrial air emissions from premises, even with good pollution control technology and practice, there may still be unintended emissions which must be anticipated and allowed for. While it is an objective of SEPP (AQM) that such emissions should be eliminated it is recognised that even ‘state of the art facilities are not always guaranteed to achieve this goal 100 per cent of the time. Equipment failure, accidents and abnormal weather conditions are among the causes that can lead to emissions affecting sensitive land uses beyond the boundary of the source premises. Unlike routine emissions, unintended emissions -- industrial residual air emissions (IRAEs) -- are often intermittent or episodic and may originate at or near ground level. Separation distances seek to avoid the consequence of IRAEs. An adequate separation distance should allow IRAEs to dissipate without adverse impacts on sensitive land uses. However, the recommended separation distances are not an alternative to source control’.
- It is my understanding and experience that EPA Victoria does not condone uncontrolled off-site air emissions in contravention of SEPP (AQM) requirements, rather, the guideline acknowledges that SEPP (AQM) objectives might not always be met, and the beneficial uses specified in the SEPP (AQM) might not always be protected in the vicinity of a premises with non-routine (residual) emissions.
- Under routine operations, the State environment protection policy (Air Quality Management) (SEPP (AQM)) and any relevant licence conditions (if the industry is a scheduled premises) should be met and odour should be confined on-site by the implementation of environmental management practices. The EPA criterion for odour is given in Schedule A to SEPP AQM as 1 odour unit (OU) at the 99.9 percentile.
- Odour modelling of routine operations is not useful in determining a separation distance, which is required for upset conditions. Routine odour modelling results cannot be translated to a process-specific separation distance without also characterising: (i) the factor of increase of the emission above routine levels during the upset, (ii) the likely duration of the upset, and (iii) the upset event ‘return interval’.
- I note however, that the buffer presented in Attachment E is of a very similar size and nature to 613 m directional buffer recommended by GHD. The local meteorological effects from the odour modelling can be seen to affect the shape of the buffer which aligns with the meteorological effects shown by the directional buffer i.e. a lack of easterly winds resulting in a contraction to the west and a larger extension to the east.
- I do agree that no buffer will be required for the treated water storage ponds at the Langley Park site, as my understanding is this water will be treated and will not have any amenity impacts.

2.3.3 Implications to GHD December 2017

I can detail the following implications to the GHD assessment upon my review of the above information in section 2.3.1 pertaining to the RWTP:

- Given separation distances for sewage treatment plants are given as a function of the size of the population they serve and the type of treatment process in EPA Publication 1518 the updated

information regarding size of plant is a key factor in calculating the default buffer distance for the plant.

- 20ML/day is significantly smaller than the largest projected size (38 ML/day) adopted by GHD to calculate the default buffer for the RWTP.
- A 20ML/day size is equivalent to an equivalent population³ (ep) of 117,650.
- Using the formula set out in Table 6 of Publication 1518 for a mechanical/ biological plant, I calculate the default buffer for a capacity of 20ML/day to be approximately 490 m. This default buffer is less than the 613 m default buffer previously calculated in GHD December 2017.
- The envelope of potential odour sources appear to be in a similar location to that presented in GHD December 2017.
- Once local meteorological effects are taken into account via a directional buffer, the 490 m directional buffer will be smaller than 613 m directional buffer presented in GHD December 2017.

2.3.4 Implications to FUS

It is my understanding that the main implication to the FUS from the provided material regarding the RWTP are changes to the capacity of the plant to 20ML/day. Application of EPA Publication 1518 results in a 490 m buffer which would reduce the size of the directional buffer presented in the FUS (Plan 15). The reduced directional buffer will be contained within the industrial/commercial and conservation area with no constraints to the proposed sensitive uses as per the existing FUS.

3 Updated odour buffer advice

3.1 EPA Victoria buffer guideline

It is my experience and understanding that in the case of an existing industrial use, EPA Victoria recommends that buffer distances should be considered when preparing a planning scheme, planning scheme amendment or planning permit application. EPA Victoria are of the opinion, via their guideline document, that 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 or malfunction. It is my understanding that under routine operations, any adverse impact is to be confined on-site so that an external buffer should not be required. I understand that it is the opinion of EPA Victoria (section 6 of Publication 1518) that unlike routine emissions, unintended emissions are often intermittent or episodic and may originate at or near ground level. Separation distances seek to avoid the consequence of upset industrial residual air emissions.

The purpose of the EPA separation distance guidelines (Section 2 of Publication 1518) is to provide recommended minimum separation distances between odour or dust emitting industrial land uses and sensitive land uses.

³ Based on assumption of 170 L/person/day

Publication 1518 has a preference for using “the term ‘separation distance’ to mean the space between industrial land uses and sensitive land uses” (EPA Victoria, 2013, p 2). Separation distances can be interchangeably called, as in the past, buffers (ibid.).

3.2 Buffer distance for sewage treatment plants

The separation distances for sewage treatment plants are given as a function of the size of the population they serve and the type of treatment process. The equations in (Table 6 of publication 1518 repeated below as Figure 3) are recommended when considering proposals for new and existing sewage treatment plants.

Type of installation	Separation distance (n= equivalent population)
Mechanical/ biological wastewater plants	$=10n^{1/3}$
Aerobic pondage systems	$=5n^{1/2}$
Facultative Ponds	$=10n^{1/2}$
Disposal areas for secondary treated effluent by spray irrigation	200 m
Disposal areas for secondary treated effluent by flood irrigation	50 m

Figure 3 Separation distances for sewage treatment plants (in metres)

3.3 Starting point for the measurement of the buffer distance

As per Publication 1518 “*Separation distances should be measured from the ‘activity boundary’ of the industrial activity to the nearest sensitive land use. The activity boundary of the industrial activity is the area (within a convex polygon) that includes all current or proposed industrial activities (including the plants, buildings or other sources) from which IRAEs may arise (including stockpiles, windrows, leachate ponds and odour-control equipment)*” (EPA Victoria, 1518, p 12).

Therefore, it follows that the ‘activity boundary’ be the envelope of potential sources of odour from the Wollert RWTP.

The method to measure the separation distance from the RWTP is as per Method 1 – Activity boundary to property boundary (the urban method) in Publication 1518. Method 1 is recommended to be used when (ibid.) “the nearest sensitive land use is either:

- In an urban area or township
- On a site less than 0.4 hectares, or in a zone allowing subdivision to be less than 0.4 hectares.”

It is my opinion that since the Shenstone Park PSP FUS proposes sensitive use in an urban area context, then Method 1 is applicable.

3.4 The type of factors which influence the buffer distance

It is my understanding that a number of factors are identified by EPA Victoria, which may influence a buffer distance. Publication 1518 allows for site-specific variation to the default buffer distance for a given industry and identifies six criteria to consider in Table 4 of the guideline. These criteria are listed below with my interpretation and opinion on a definition (based on Publication 1518 and experience):

- Transitioning of the industry – If the industry has any plans to transition out of the area a reduced buffer may be negotiated for those industries
- Plant equipment and operation – If the plant has a high standard of emission technology or has evidence of no upset or malfunctions occurring then a reduced buffer may be appropriate
- Environmental risk assessment (ERA) – An ERA would require specific knowledge of process operations, emission rates and modelling. While a quantitative assessment may indicate routine operational impacts, the results cannot be translated to a process-specific separation distance without also characterising: (i) the factor of increase of the emission above routine levels during the upset, (ii) the likely duration of the upset, and (iii) the upset event ‘return interval’. An ERA could also involve odour surveillance.
- Size of the plant – If the throughput is small for the particular industry compared to large examples within their industry, then it may be possible to de-rate the buffers based on throughput
- Topography or meteorology – Site-representative meteorology may be used to assess the impacts of local meteorological effects on dispersion of emissions
- Likelihood of IRAEs – The likelihood of residual emissions from the identified industries would need to be assessed once specific operational information was obtained regarding their operations including how frequently upset conditions occur, and the assessment could rely on a detailed complaint history from a residential area encompassed within a default buffer.

Further to the above six criteria, Publication 1518 also states (page 15) that wind regimes, topography, waste-loading, treatment/disposal methods and design capacity should be taken into account when determining the buffer distance for a sewage treatment plant.

Most buffers in the Publication 1518 guideline are not specified as a function of the operation’s size (with the exceptions of sewage treatment plants) and none explicitly takes into account the effect of site-specific meteorological conditions. It is my opinion that these two factors greatly affect emissions and subsequent dilution, respectively, and can vary significantly between premises in the same industry category. Emissions during an upset/malfunction can thus extend beyond the buffer boundary, at levels that could cause disamenity.

It is my understanding and experience that the default EPA buffers are applied as a radial distance scribed from the envelope of potential odour sources at the premises whilst in reality impacts are rarely distributed evenly. In effect, a radial buffer distance is used in situations where there is no information on the local meteorology, i.e. the directions of good and poor dispersion are unknown. I am of the opinion that when site-representative meteorology are available, then these directions of good and poor dispersion can be assessed, and the default buffer can respectively be retracted and extended.

Section 9.2 and section 11 of Publication 1518 allows for site-specific variation based on topographical or meteorological features (i.e. wind regimes), which will affect dispersion of industrial residual air emissions. Based on many years of experience, GHD staff have developed an approach to provide directionally dependent buffers based on the dispersive ability of the atmosphere, as assessed using atmospheric dispersion modelling (Clarey & Pollock, 2004⁷). Where site-representative meteorological data is available, the directions of good and poor dispersion can be identified. Further, if the 12-month dataset is configured to a dispersion model format (deriving atmospheric stability category), then dispersion modelling can be conducted using a nominal source emission rate to assess the directional change in extent from a default radial buffer⁴.

The buffer so formed is sized to have the same enclosed area as the radial default buffer and is termed a directional buffer. So, the directional buffer will have the same enclosed area as the default buffer.

In this case, north of Melbourne where easterly winds are rare, why should a sensitive receptor located west of an odour source be afforded the same protection as a receptor to the east of an odour source when the prevailing winds are rare from the east. The directional buffer analysis indicates that the default buffer is reduced to 40% of the default value to the west while to the east it extends 22% beyond the default buffer.

4 Recommended buffer for the Wollert RWTP

In the absence of a detailed design, the buffer specified by the EPA buffer guideline based on the estimated equivalent population (ep) is the appropriate tool to be used for planning around the RWTP. For a sewage treatment plant with a capacity of 20 ML/day (ep of approximately 117, 650), the buffer distance for a mechanical/biological plant of that size is 490 m. I recommend this buffer apply to the Wollert RWTP based on the information made available to me. In accordance with Table 4 of EPA Publication 1518, I recommend that the effects of local meteorology also be taken into account in the form of a directional buffer. The updated directional 490 m buffer will have the same shape as the earlier 613 m directional buffer (i.e. extend and contract in the same directions) but will be reduced in all directions by approximately 20%.

I also note that no buffer will be required for the treated water storage ponds at the Langley Park site, as my understanding is this water will be treated and will not have any amenity impacts.

Should additional information be made available relating to plant capacity, type and location then the buffer should be re-calculated in accordance with the EPA separation distance guideline. Further, any variation to the default buffer should be conducted in accordance with Table 4 of EPA Publication 1518.

⁴ Clarey P, Pollock T "Integrating Separation Distances with Dispersion Modelling" Enviro 04, 28 Mar – 1 April, Darling harbour, Sydney

5 Limitations

This report has been prepared by GHD Pty Ltd (GHD) for the Victorian Planning Authority and may only be used and relied on by the Victorian Planning Authority for the purpose agreed between GHD and the Victorian Planning Authority as set out in section 1 of this report. GHD otherwise disclaims responsibility to any person other than the Victorian Planning Authority arising in connection with this report.

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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.

This letter report must be read in conjunction with the previous GHD assessments namely:

- Impact Assessment Report for the Shenstone Park Precinct Structure Plan (GHD, December 2017)

Sincerely



Michael Asimakis

Senior Air Quality Scientist

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