

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of Proposed Private Plan Change 2 to
the Hamilton City Operative District
Plan: Te Awa Lakes Private Plan
Change

**STATEMENT OF EVIDENCE OF STEVEN MITCHELL PEARCE FOR THE APPLICANT
(AIR QUALITY)
24 October 2019**

1. EXECUTIVE SUMMARY

- 1.1 The potential air quality related reverse sensitivity effects from the proposed Te Awa Lakes Development are those associated with odour discharges from nearby industrial land users.
- 1.2 The nearby sites that have the potential for odour discharge, and existing buffer distances to the proposed Te Awa Lakes Development, are the:
 - a) AFFCO Horotiu processing plant, with its boundary approximately 1,730 m to the northwest; and
 - b) Fonterra Te Rapa dairy factory site, with its boundary approximately 325 m to the south.
- 1.3 The primary mitigation employed to avoid reverse sensitivity effects between industry and land users with a higher sensitivity to odour, is the provision of an adequate buffer distance.
- 1.4 Industry is required, via the air quality provisions in the regional plan and/or resource consents, to ensure that there is no offensive or objectionable odour to the extent that it causes an adverse effect at or beyond the boundary of the site.
- 1.5 The role of buffer distances is to address unintended or accidental releases of odour, and/or any effects that cannot be internalised even with adoption of the best practicable option.
- 1.6 The AFFCO Horotiu processing plant's site boundary is located approximately 1,730 m from the proposed Te Awa Lakes Development. As such, it is considered that the proposed Te Awa Lakes Development will not create air quality-related reverse sensitivity effects on this industrial land user.
- 1.7 The Fonterra Te Rapa dairy factory site boundary is located approximately 325 m to the south of the proposed Te Awa Lakes Development with the primary existing source of odour (the wastewater treatment plant (WWTP)) being located approximately 550 m to the south of the proposed Te Awa Lakes Development.

1.8 I am of the opinion that any potential reverse sensitivity effects generated by the Te Awa Lakes development on the Fonterra Te Rapa site can be avoided and / or substantially mitigated via a separation distance of 350 m (as measured between the boundary of the Fonterra Te Rapa site to the nearest proposed dwellings at the Te Awa Lakes Development). This will require no dwellings to be constructed in the Te Awa Lakes Development within 25 m of Hutchinson Rd, which is achieved through the proposed additional rule in the Business zone at this part of the site.

2. QUALIFICATIONS AND EXPERIENCE

- 2.1 My full name is Steven Mitchell Pearce.
- 2.2 I hold the qualifications of Bachelor of Mechanical Engineering from the University of Canterbury and PhD in Mechanical Engineering, also from the University of Canterbury and have been working in the areas of combustion, gasification and air discharges since 2000. I have a 'calibrated' nose for the purposes of assessing odour having been tested to, and meeting, the requirements of AS/NZS 4323.3:2001 Section 9.7.2.
- 2.3 I am a member of the Clean Air Society of Australia and New Zealand (CASANZ).
- 2.4 I am employed as a Technical Director of Environmental Management with Pattle Delamore Partners Ltd (PDP) and have been employed in that capacity since December 2013. I provide technical advice on management of air discharges, measurement of discharges for compliance and to support consent applications, as well as assessing environmental effects for the consenting of air discharges.
- 2.5 I have particular experience in odour assessment and management from a number of sources including coal gasification, asphalt production, chicken farms, and wastewater irrigation.
- 2.6 In addition, I have undertaken air discharge assessments for a wide range of activities including diesel generators, gas boilers, coal boilers, biomass boilers, domestic wood burning appliances, construction dust and ammunition destructors.
- 2.7 I have been engaged by Perry Group Ltd (PGL) since October 2017 to assess the potential reverse sensitivity effects of the Te Awa Lakes Development on nearby industrial land users from odour generated on their land arising from Proposed Plan Change 2 to the Hamilton City District Plan: Te Awa Lakes (PPC2).
- 2.8 I am familiar with the project, having written or reviewed reverse sensitivity evaluations on the project from when PGL initially applied to Hamilton City Council (HCC) to have 51 ha of the site scheduled as a Special Housing Area (SHA) under the Housing Accords and Special Housing Areas Act 2013 (HASHAA).
- 2.9 I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and to the extent that I am giving expert evidence,

have complied with it in preparing this evidence. I confirm that the issues addressed in this evidence are within my area of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in my evidence.

3. SCOPE OF EVIDENCE

3.1 I have been engaged by PGL to provide evidence in relation to the potential reverse sensitivity effects on nearby industrial land users from the proposed Te Awa Lakes Development from odour generated on their land.

3.2 My evidence will cover the following matters:

- a) Plan change and Proposed Separation Distance;
- b) Assessment of Reverse Sensitivity: AFFCO Horotiu;
- c) Assessment of Reverse Sensitivity: Fonterra Te Rapa;
- d) Expert caucusing;
- e) Comments on the Section 42A Report;
- f) Comments on submissions;
- g) Proposed amendments to the plan change; and
- h) Conclusions.

4. PLAN CHANGE AND PROPOSED SEPARATION DISTANCE

4.1 In this statement of evidence, I do not repeat the description of the plan change and refer to the summary of the application in the evidence of John Olliver, planner of Bloxam Burnett & Olliver Ltd.

4.2 Paragraph 5.12.15 of the Assessment of Environmental Effects for PPC2 states that there is a separation distance of 500 m between the Fonterra Dairy Factory odour source

and the proposed Te Awa Lakes Development which is consistent with accepted practice and appropriate.

- 4.3 While the separation from the current odour source itself is approximately 550 m, the separation distance proposed from the boundary of the Fonterra site and the closest sensitive receptors (residential dwellings) is proposed to be 350 m (as measured between the boundary of the Fonterra Te Rapa site and any proposed dwellings at the Te Awa Lakes Development). This is addressed further below in paragraphs 6.8 to 6.18.

5. ASSESSMENT OF REVERSE SENSITIVITY: AFFCO HOROTIU

- 5.1 A previous report by PDP¹ had considered the potential reverse sensitivity effects on the AFFCO Horotiu processing plant which is located approximately 1,730 m to the northwest of the proposed Te Awa Lakes Development.
- 5.2 AFFCO Horotiu have had a number of odour complaints made concerning their operations with the location of the furthest complaint being 1,150 m from the plant.²
- 5.3 I also note that when the AFFCO Horotiu application to renew discharge consents for the site was lodged in 2015, the application was limited notified by WRC to a distance of 1km.
- 5.4 Based on the relevant PDP assessment and complaints records, I conclude that the separation distance of 1,730 m from the AFFCO Horotiu plant to the proposed Te Awa Lakes Development is sufficient to ensure that reverse sensitivity effects due to odour will not occur.

¹ Te Awa Lakes Air Quality Technical Assessment, PDP, October 2017.

² Review of an Application by AFFCO Horotiu for a Discharge to Air Consent, Terry Brady Consulting Limited, October 2015, pp 38 of 44.

6. ASSESSMENT OF REVERSE SENSITIVITY: FONTERRA TE RAPA

Local Meteorology

- 6.1 The proposed Te Awa Lakes Development is downwind of the Fonterra Te Rapa plant when winds blow from the south. Winds from the south occur approximately 6.2% of the time. The prevailing wind blows from the west/southwest (22.7%). North easterly winds blow 9.4% of the time (also see Figure 1 below).
- 6.2 This wind distribution matches the complaints record discussed below with all except one complaint location being to the east of the Fonterra Te Rapa site with the remaining one complainant location close to Fonterra's northern site boundary.

Odour Complaints

- 6.3 The primary source of odour on the Fonterra Te Rapa site is the wastewater treatment plant (WWTP)³ which is located in the middle of the site slightly toward the Waikato River.

In the period 2012 – 2015 there were 17 odour related complaints made to the Fonterra Te Rapa site as shown below in Figure 1 which is based on Figure 13 of BECA's report which was lodged as part of Fonterra's application to renew their air discharge consents which I discuss in paragraph 6.26 below.⁴

- 6.4 All but one odour complainant was located to the east of the Fonterra Te Rapa site on the opposite (eastern) bank of the Waikato River, downwind of the site in the prevailing west/southwest wind.
- 6.5 The complainant on the western bank of the Waikato River is located approximately 75 m to the north west of Fonterra's site boundary. This complainant is recorded as having made 5 of the 17 complaints. There are two other properties located between the complainant location and the proposed Te Awa Lakes Development that are not recorded as having made odour complaints.

³ Fonterra Te Rapa: Air Quality Impact Assessment, BECA, 23 March 2016, pp ii.

⁴ Fonterra Te Rapa: Air Quality Impact Assessment, BECA, 23 March 2016, pp 40.

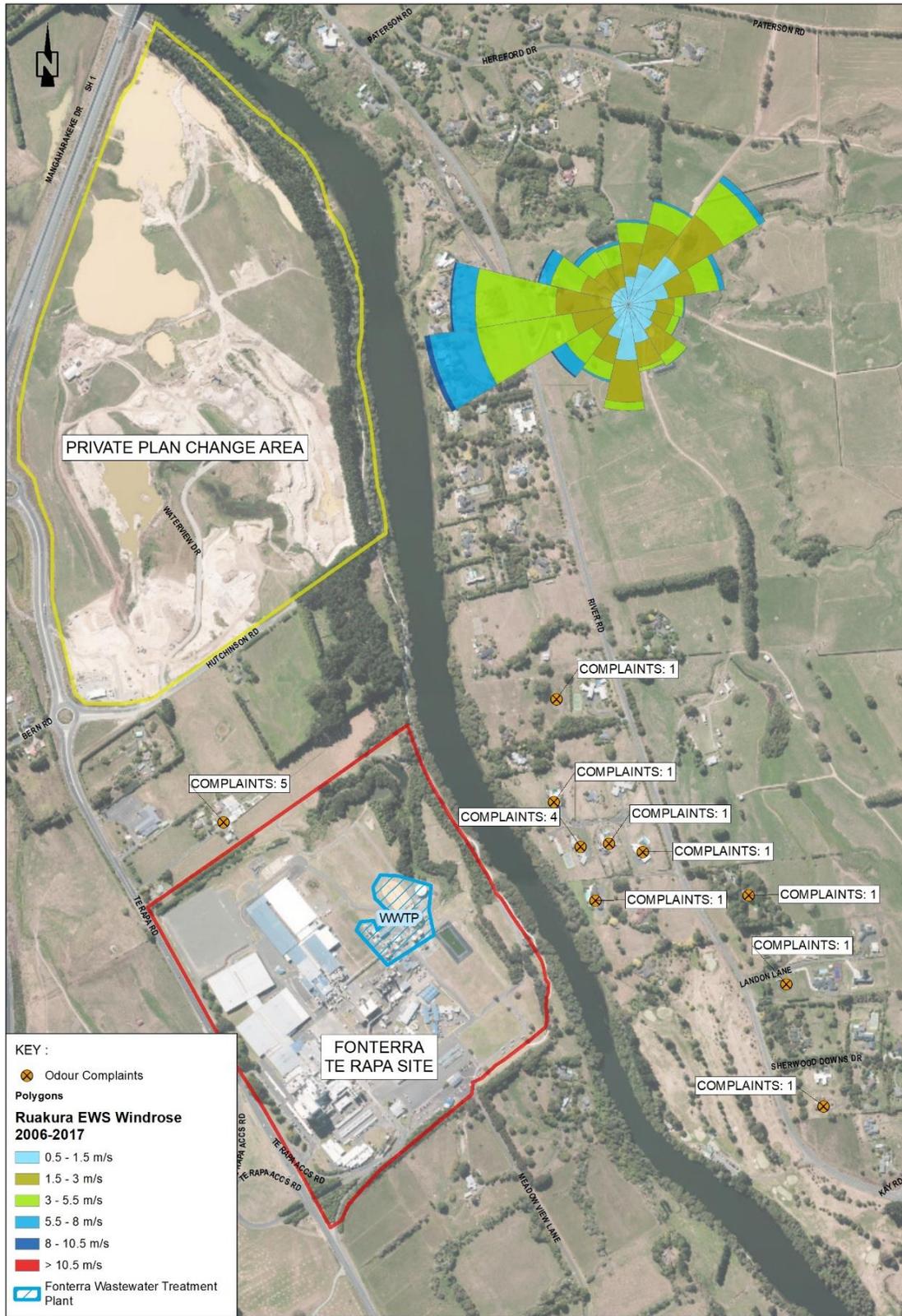
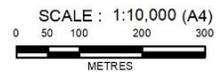


FIGURE 1 : LOCATION PLAN



- 6.6 BECA reported in 2016 that the WWTP was upgraded in 2015 to address the most significant sources of odour, with a corresponding reduction in complaints being made.⁵
- 6.7 In the Fonterra Te Rapa: Annual Environmental Report June 2016 to May 2017, two further odour complaints from a single complainant on the eastern bank of the Waikato River in the 2016 - 2017 dairy season were reported with the likely cause being displacement of air from within the anoxic tank. To address this source of odour, an upgrade of an existing inoperative biofilter was planned for Aug/Sept 2017.⁶

Odour Buffer Distance

- 6.8 The Ministry for the Environment's (MfE) 'Good Practice Guide for Assessing Discharges to Air from Industry' (the 'GPG for Industry') defines the term 'separation distance' as follows⁷:

"Distance between an industrial or odorous/dusty activity and a sensitive activity."

- 6.9 The GPG for Industry uses the terms 'separation distance' and 'buffer distance' interchangeably.
- 6.10 MfE's guidance document 'Good Practice Guide for Assessing and Managing Odour' ('the GPG for Odour') states that the EPA Victoria's guidance document 'Recommended Separation Distances for Industrial Residual Air Emissions'⁸ has:

"... the most up to date guidance considered appropriate for New Zealand."⁹

- 6.11 The GPGs for Industry and Odour both state:

"Relevant separation distances should be considered when assessing industrial/odorous discharges to air to address unintended or accidental releases, and/or any effects that cannot be internalised even with adoption of the best practicable option."

- 6.12 Using the EPA Victoria's guidance on the measurement of separation distance, the separation distance is defined as the distance from Fonterra Te Rapa's property boundary to the boundary of the nearest sensitive land use.

⁵ Fonterra Te Rapa: Air Quality Impact Assessment, BECA, 23 March 2016, pp 58.

⁶ Fonterra Te Rapa: Annual Environmental Report June 2016 to May 2017, Fonterra, 31 July 2017, pp 77.

⁷ Good Practice Guide for Assessing Discharges to Air from Industry, MfE, 2016 pp 97.

⁸ Recommended Separation Distances for Industrial Residual Air Emissions, EPA Victoria, 2013.

⁹ Good Practice Guide for Assessing and Managing Odour, MfE, 2016 pp 56.

- 6.13 This allows for the possibility that Fonterra may expand its existing WWTP (the principal source of odour) towards its northern site boundary, should it be required at some stage in the future.
- 6.14 Emission Impossible prepared a discussion document for Auckland Council on separation distances for industry¹⁰ which summarised guidance from Australian jurisdictions including the EPA Victoria.
- 6.15 In their discussion document, Emission Impossible provided a list of recommended minimum separation distances for a wide range of industries including WWTP's.
- 6.16 Specifically, for WWTP's, Emission Impossible refers to the South Australian EPA guidance document¹¹ which suggests a 200 m buffer distance for populations of between 1,000 and 5,000 people adjoining mechanical WWTP's (including aerated lagoons) such as that operated by Fonterra Te Rapa. For WWTP's incorporating non-mechanical treatment lagoons, the South Australian EPA suggested buffer distance increases to 350 m.
- 6.17 Based on PDP's analysis of historical census data, population growth and the Te Awa Lakes Development plans, there could be up to 5,000 people living in the vicinity of the Fonterra Te Rapa site in the future.
- 6.18 Based on my analysis of published separation distances I consider a minimum separation distance of 350 m to be appropriate to ensure Fonterra Te Rapa will not be impacted by reverse sensitivity effects from the proposed Te Awa Lakes Development. This separation distance is conservative as it assumes non-mechanical treatment lagoons (Fonterra operate a mechanically-aerated lagoon which has a suggested 200 m buffer distance) and allows for the possibility that Fonterra may expand its existing WWTP (the principal source of odour) towards its northern site boundary in the future.

Qualitative Odour Assessment

- 6.19 PDP carried out a qualitative odour risk assessment based on the UK's Institute of Air Quality Management (IAQM)'s 'Guidance on the Assessment of Odour for Planning'.¹²

¹⁰ Separation Distances for Industry – A discussion document, Emission Impossible, 2012.

¹¹ Evaluation distances for effective air quality and noise management, South Australia EPA, August 2016.

¹² Guidance on the Assessment of Odour for Planning', Institute of Air Quality Management (IAQM), 2014.

- 6.20 The risk assessment is based on a source-pathway-receptor (S-P-R) approach which assesses the hypothetical relationship between the source (s) of the odour, the pathway (P) by which exposure might occur and the receptor (R) that could be adversely affected.
- 6.21 The Fonterra WWTP odour source was assessed as having 'medium' potential considering the magnitude of a potential release from a WWTP of that size, the historical complaint record and the moderately offensive nature of the odours.
- 6.22 The pathway was assessed as being only 'moderately effective' considering the relatively low frequency of winds from source to receptor, and the proposed minimum distance from a potential source to nearest receptor of 350 m.
- 6.23 The receptor was assessed as being 'high' due to the potential for residential dwellings.
- 6.24 The risk of odour exposure (or impact) was assessed as being 'negligible' by considering the odour source potential and the pathway effectiveness together.
- 6.25 Finally, the magnitude of odour effect was assessed as being 'negligible' by considering the risk of odour exposure (or impact) and the sensitivity of the receptor together.

Fonterra Te Rapa Regional Consent Renewal Application

- 6.26 On the 19th of December 2016, Fonterra applied to the Waikato Regional Council for resource consents associated with its dairy manufacturing operations at Te Rapa including for a discharge permit to discharge contaminants into the air.¹³
- 6.27 With regards to odour, the Fonterra AEE summarised the conclusions of a BECA report¹⁴ lodged as part of the application, stating:¹³

"The site completed works in 2015 to minimise the potential for objectionable odours and the results of an odour survey and absence of any complaints indicates these projects have been successful. Managing and operating plant and equipment in accordance with the site's management plans and standard operating procedures will avoid objectionable odours."

¹³ Fonterra Limited – Te Rapa Reconsenting – Resource Consent Applications and AEE, Mitchell Daysh, 16 December 2016, p5.

¹⁴ Fonterra Te Rapa: Air Quality Impact Assessment, BECA, 23 March 2016.

6.28 It is my opinion that any future complaints around odour from the Fonterra site are more likely to come from residences on the eastern bank of the Waikato River rather than residents of the Te Awa Lakes Development as a result of:

- a) the prevailing west/southwest wind;
- b) the proposed 350 m separation distance between the Te Awa Lakes Development and the northern site boundary;
- c) historical odour complaints originating almost exclusively from residences on the eastern bank of the Waikato River; and
- d) Fonterra's current practices of avoiding the generation of objectionable odours through managing and operating plant and equipment in accordance with their site management plans and standard operating procedures.

Conclusion on Fonterra Te Rapa

6.29 Based on the odour complaint record, the wind direction analysis presented above in paragraphs 6.1 to 6.2 above, recent upgrades to the WWTP, the qualitative odour assessment undertaken, and the recommended 350 m buffer distance between Fonterra Te Rapa's site boundary and the nearest proposed sensitive receptors, it is my opinion that the Fonterra Te Rapa site will not be impacted by odour related reverse sensitivity effects from the proposed Te Awa Lakes Development.

7. EXPERT CAUCUSING

7.1 No air quality expert caucusing was required in relation to the proposed Te Awa Lakes Development.

8. COMMENTS ON THE SECTION 42A REPORT

8.1 I have read the Section 42A report on PPC2 prepared by Grant Eccles on behalf of Hamilton City Council.

8.2 I note that in paragraph 4.25, Mr Eccles concludes that:

“... the reverse sensitivity effects of PPC2 can be minimised to acceptable levels.”

8.3 Luke O’Dwyer, in his evidence in Appendix F on Strategic Land Use Planning prepared on behalf of Hamilton City Council, also addresses the issue of reverse sensitivity and states in paragraph 149 of his evidence:

“Reverse sensitivity effects have been assessed by both the applicant and HCC and can be mitigated through appropriate planning and design provisions which are proposed by the applicant.”

8.4 I agree with these conclusions as they pertain to potential odour reverse sensitivity effects.

9. COMMENTS ON SUBMISSIONS

9.1 Of the submissions made on the Plan Change, five submitters raised potential reverse sensitivity issues and/or the need for adequate buffer distances.

9.2 In their submission, Fonterra raised the issue of reverse sensitivity effects but did not specify the nature of these nor identify odour as specifically being a reverse sensitivity effect of concern.

9.3 It is my opinion that the proposed plan change addresses the submitters concerns from an air quality perspective by incorporating a 350 m separation (buffer) distance between Fonterra Te Rapa’s site boundary and any proposed dwellings within the Te Awa Lakes Development.

10. PROPOSED AMENDMENTS TO PLAN CHANGE

Based on my review of submissions on the plan change and the Section 42A report, I do not believe any amendments are required to the plan change to address potential odour related reverse sensitivity effects.

11. CONCLUSION

- 11.1 Based on the AFFCO Horotiu meat processing plant site boundary being approximately 1,730 m from the Te Awa Lakes Development, I am of the opinion that the Te Awa Lakes Development does not pose a reverse sensitivity effect on the AFFCO Horotiu meat processing plant due to odour.
- 11.2 Based on consideration of the local meteorology, review of historical odour complaints and their locations, recent upgrades to the WWTP and a qualitative odour assessment, I am of the opinion that any potential odour related reverse sensitivity effects of the Te Awa Lakes development on the Fonterra Te Rapa site can be avoided and / or substantially mitigated via a separation distance of 350 m (as measured between the boundary of the Fonterra Te Rapa site and any proposed dwellings at the Te Awa Lakes Development), as is proposed under PPC2.

Steven Mitchell Pearce

24 October 2019