

**BEFORE HEARING COMMISSIONERS  
APPOINTED BY TARANAKI REGIONAL COUNCIL**

**Consent No: 5262-3.0**

**IN THE MATTER** of the Resource  
Management Act 1991  
("Act")

**AND**

**IN THE MATTER** an application for resource  
consent discharge  
emissions into the air from  
a free-range poultry  
farming operation

**BETWEEN** **Airport Farm Trustee  
Limited**  
Applicant

**AND** **Taranaki Regional  
Council**  
Consent Authority

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**STATEMENT OF EVIDENCE OF  
DUNCAN BACKSHALL  
ON BEHALF OF VARIOUS SUBMITTERS  
(THE MCDONALDS, THE HIBELLS, THE BROWNS  
& POPPAS PEPPERS 2009 LTD)  
Dated: 8<sup>TH</sup> FEBRUARY 2022**

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1. **INTRODUCTION**

1.1 My full name is Duncan Backshall. I am currently a director of Air Quality NZ, a company that provides air quality consulting and technical services.

1.2 This evidence is given in respect of the application by Airport Farm Trustee Ltd to operate a poultry farm at 58 Airport Drive, New Plymouth Airport.

**Qualifications and experience**

1.3 I am an Air Quality Consultant and hold the qualification of Master of Science (Hons) from Auckland University in 1982.

1.4 I have 38 years' experience in environmental science and have been primarily involved in environmental air quality for 26 years. I have gained experience in many aspects of this field, including atmospheric dispersion modelling, assessment of effects of emissions to air, ambient air monitoring and source emission testing. I am a member of the Clean Air Society of Australia and New Zealand.

1.5 I have been involved in a variety of work regarding the effects of odour. These include odour monitoring, atmospheric dispersion modelling, assessment of effects and the provision of specialist advice to clients. This work has involved many different industries and operations including wastewater treatment plants, commercial composting, mushroom production, intensive poultry farming, carpet underlay manufacturing, packaging production and spray-painting operations.

**Involvement in project**

1.6 I was engaged during January 2022 by the eight submitters hereafter referred to as the Submitter Group to prepare air quality evidence to support their submissions in opposition to the air discharge consent application made by Airport Farm Trustee Limited (the Applicant, AFTL) for a proposed free range broiler farm at 58 Airport Drive, New Plymouth.

1.7 I have not visited the site of the poultry farm but would be willing to do so if permission was given prior to giving evidence. I would also visit the neighbouring properties if possible. I am familiar with the general area due to the location on Airport Drive and viewed the site and nearby properties from the roadside on 16 December 2021. There was a strong wind from the west at the time and no odour was expected or detected on Airport Drive.

### **Purpose and scope of evidence**

1.8 The principal purpose of my evidence is to outline the assessment I have undertaken in regard to effects from discharges to air of odour from the operations at the poultry farm site. I have reviewed the following material:

- The Assessment of Environmental Effects prepared by T + T to support the application.
- The section 42A report prepared by TRC.
- Statements of evidence by the applicant, including those prepared by Mr Pene, Ms Ryan, Mr McDean and Mr Whiting.
- Statements of evidence by the submitters' group.
- The statement of evidence prepared by Mr van Kekem.

1.9 My evidence is structured as follows:

- (a) Relevant planning context (Section 2);
- (b) Existing environment (Section 3);
- (c) Effects of emissions to air (Section 4);
- (d) Conclusions (Section 7);

### **Expert Witness Code of Conduct**

1.10 Although not required for Council hearings, I have been provided with a copy of the Code of Conduct for Expert Witnesses contained in the Environment Court's 2014 Practice Note. I have read and agree to comply with that Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

## 2. **RELEVANT PLANNING CONTEXT**

### **Taranaki Regional Air Quality Plan**

2.1 Intensive poultry farming is covered by Rules 51 to 54 of the Taranaki Regional Air Quality Plan (RAQP). Existing intensive poultry farming processes are covered by Rule 52, which covers existing farming operations where more than 30,000 poultry are kept at one time. This is classed as a Restricted Discretionary activity, with the following Matters of Discretion:

*a) Duration of consent*

*b) Monitoring*

*c) Effects relating to odour and dust and loss of amenity value of air*

*d) Imposition of limits on or relating to discharge or ambient*

*concentrations of contaminants, or on or relating to mass discharge rates*

*e) Best practicable option to prevent or minimise any adverse effects on the environment*

*f) Any matter contained in Appendix V*

*g) Review of the conditions of consent and the timing and purpose of the review*

2.2 Appendix V of the RAQP is titled "Good management practices for intensive poultry farming". It contains a comprehensive set of recommendations covering 29 issues including buffer distances, shed configuration, screening, etc.

### **NATIONAL ENVIRONMENTAL STANDARDS FOR AIR QUALITY**

2.3 PM10 particulate is the size fraction of dust with particle sizes of less than 10 micrometres ( $\mu\text{m}$ ). As PM10 has been shown to be discharged from intensive poultry farming operations, the applicable air quality criteria is the National Environmental Standard (NES) for this pollutant. This is set as a 24-hour average of  $50 \mu\text{g}/\text{m}^3$  with a single exceedance allowed per year. This is covered in section 4 of my evidence.

## 3. **EXISTING ENVIRONMENT**

3.1 Descriptions of the site and the existing environment are provided in the applicant's evidence and the Taranaki Regional Council (TRC) section 42A report. Information provided by the submitters in their statements of evidence has also been of value in understanding the nearby area.

- 3.2 The site is 1.82 ha and contains 4 sheds for the rearing of chickens. The sheds are close to the boundaries at distances varying from 10 to 30 m. I note that the side-mounted exhaust fans on all sheds discharge directly towards the boundaries. None of the sheds meet the 50 m separation distance to the boundary recommended in Appendix V (b), Table 1 of the RAQP.
- 3.3 The office in the south-west corner of the McDonald property at 62 Airport Drive is 40 m to the north-west of the closest exhaust fan and is downwind for the prevailing south-east winds.
- 3.4 Based on the information contained in evidence, including photograph 4 in the evidence of Glenis McDonald and aerial photographs, the site is currently surrounded by shelterbelts of varying height and thickness. Along the north boundary it is a hedge approximately 6 m high, with taller trees up to about 10 m along the eastern side. There are also trees along the south boundary which are less developed, especially to the west of shed 4 as noted in section 4 of the s.42A report.
- 3.5 Mr Whiting describes in his evidence the windbreaks of varying heights along the boundaries of the property. These are intended to control dust (paragraph 16), but I understand that a 3 m high windbreak has been installed along the northern boundary as part of the conversion to free range operation.
- 3.6 From my site visit and aerial photographs of the surrounding area, there are a number of shelter belts and orchards within 300 m of the site, apart from towards the south-east. These are likely to significantly reduce wind speeds compared to those measured at the weather station at New Plymouth airport, which is sited near the runway and is fully exposed to coastal weather conditions.

#### 4. **EFFECTS OF EMISSIONS TO AIR**

- 4.1 Activities at the site and the proposed change to a free-range operation are described in detail by the applicant and in the s.42A report. I note that many of the changes proposed are to meet the requirements for a free-range operation and improve the efficiency of operations at the site, although some of these will potentially reduce odour emissions and effects, for example the DACS ventilation system which includes the change from side-mounted to roof exhaust vents.

### **Sensitivity of the existing environment**

- 4.2 Table 1 of the s.42a report lists 16 residential properties within 300 m of the closest shed. Other sensitive activities within this distance, which is the recommended buffer distance<sup>1</sup> for size of the proposed free-range operation, include the Aviator Hotel at 33c Airport Drive.
- 4.3 Appendix V (d) notes: "*If sensitive land uses (refer policy 2.3 of the Plan) are located downwind under prevailing wind directions, or are located downslope, the preferred buffer distances above may be increased by up to 50%.*" If this were applied, then a number of other properties could be included as potentially affected.
- 4.4 Mr Pene in para. 22 of his evidence notes that "*The wider area is likely to occasionally be subject to common rural odours such as the handling of silage and spreading of agricultural production waste...*". However, odours from these activities are generally of short duration and occur occasionally, whereas odour emissions from the poultry farm will occur continuously over the growing cycle of the birds. I note that the spreading of chicken litter referred to by Mr Pene as a "background odour" was subsequently found to be in breach of Rule 45 of the RAQP by TRC. (s.42A report, para. 155)
- 4.5 The appropriate sensitivity of the surrounding area is discussed further by Mr Pene in paras. 23 to 25. While he concludes that the "The sensitivity of the receiving environment overall is higher than less populated rural environments", he does not state an opinion on the degree of sensitivity, that is whether it is high or medium as per Table 4 of the Odour GPG.
- 4.6 I note that the zoning for the land on either side of Airport Drive will change under the Proposed District Plan. Even if the sensitivity to odour is regarded as medium at present, it is likely to become high during the proposed Consent term of 16 years. However, given the number of sensitive activities within 300 m of the site, in my opinion the appropriate sensitivity at present is high.

### **Odour emissions from the poultry farm**

- 4.7 These are described in detail in the applicant's evidence and the s.42A report. I agree that the primary source of odour is from chicken manure deposited on the litter within the sheds. Odour emissions will increase during the growing cycle as the volume of manure increases.

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<sup>1</sup> Regional Air Quality Plan for Taranaki, Appendix V: Good management practices for intensive poultry farming.

- 4.8 In para. 19(b) of his evidence, Mr Pene notes that, based on his experience of free-range farms, *"the majority of manure generated by the birds is still deposited onto the litter in the sheds..."* The s.42A report agrees with this in para. 57, which suggests that any reduction in odour from the litter in the sheds will result primarily from reducing bird numbers, not manure in the free-range areas.
- 4.9 Figure 2 of the evidence of Mr Pene presents estimated reductions in odour emission rates resulting from the decrease in the stocking rate to 15 birds/m<sup>2</sup>. As expected, this predicts that odour should decrease in proportion to the reduction in bird numbers. I note that although the maximum odour emissions are predicted at the end of the growing cycle, emission rates remain above 70% of the peak for the second half of the cycle. It appears that odour estimates include the effect of bird removal, although this is not stated.
- 4.10 At present, the sheds are primarily ventilated using fans along a side wall, rather than the ends, to extract air, although these are being replaced with chimney roof vents as part of the DACS shed ventilation upgrade. Each shed has 5 or 6 fans, with the number in use depending on the ventilation requirements at the time. Photographs 7 and 8 of the s.42A report show that the side fans are mounted with the exhausts directed slightly downwards.
- 4.11 Given the proximity of the shed walls to the shelter belts on the north and east site boundaries, there is unlikely to be significant mixing of the exhaust fan plumes with ambient air within the site. This is confirmed by the observations of the odour experts and TRC officers made during site visits, which differentiate between the general ambient odour within the site and the odour in the exhaust fan plumes.
- 4.12 The shelter belts and windbreaks are likely to affect odour dispersion downwind of the site as they will decrease exhaust fan plume velocity as well as reducing wind speeds. I expect dispersion will be significantly reduced compared to what would be expected based on the fan discharge velocities and wind speeds measured at the New Plymouth airport weather station.

#### **Odour control and mitigation**

- 4.13 A factor to be considered regarding odour controls is the non-linear response of the human nose to changes in odour concentrations. This is a logarithmic relationship so that a 10-fold decrease in odour will result in a

lower perceived change in odour intensity. This means that while controls may reduce odour emissions significantly, odour effects in the community may not decrease in accordance with the degree of odour reduction.

- 4.14 Odour control of poultry farms in New Zealand is generally through management of conditions within the sheds to maintain moisture levels in the litter within an appropriate range. If the litter becomes too wet, then the rate of decomposition will increase; too dry and dust emissions can result. Quality of feed is another factor that requires careful control.
- 4.15 As active odour controls, such as scrubbers, are not used, good management is the critical factor in minimising odour emissions. I note that without active controls, it is not possible to eliminate odour emissions from intensive poultry farming.
- 4.16 The applicant's evidence and the s.42A report discuss possible reductions in odour emissions resulting from the installation of the DACS ventilation system in the sheds. This should result in improved control of conditions in the sheds, including temperature and humidity of the air, and improve the management of litter moisture levels. Mr Pene states that this should make substantial reductions in odour emissions, although I note that this will depend on the degree to which litter condition improves during the growing cycle. If litter condition is already well controlled, then the potential for further odour reduction may be limited.
- 4.17 The ventilation system upgrades include the installation of roof-mounted, chimney exhaust vents. This will eliminate the use of the side-mounted fans, apart from occasions when additional ventilation is required due to high temperatures inside the shed. As these discharge vertically instead of horizontally, and the exit will be 7 m above ground level, I expect dispersion of odour emissions from the sheds to be improved.
- 4.18 Mr Pene has carried out a dispersion modelling study to investigate the likely reduction in odour at the nearby sensitive receptors, as described in paras. 79 to 89 of his evidence. The contour plot in figure 3 shows that the greatest reductions will occur within the poultry farm site, with decreases between 35 and 55% beyond the site boundary. On the north and east boundaries of the site, the shelter belts are a similar height to the roof-mounted vents. It is unclear whether the effects of these obstacles have been allowed for in the dispersion model.
- 4.19 Table 1 presents the predicted percentage reduction at 5 of the nearby sensitive receptors, which vary from 37 – 50% for the current operational

peak stocking rate. I note that the model predictions include the reduction in stocking rate of 30% for the change from the current operational peak to free range operation as shown in figure 2. This indicates that the reduction in predicted odour concentrations due to the exhaust vent change is between 5 and 25%.

- 4.20 Mr Pene has not presented the odour concentrations predicted by the model, which would be of interest when assessing potential odour effects beyond the site boundary.

### **Odour monitoring**

- 4.21 Mr Pene, Ms Ryan and Mr van Kekem have carried out odour surveys at the site and at locations in the surrounding area. In addition, TRC officers have carried out many site visits, including odour surveys, during the period from August to December 2021. Some of these were to investigate odour complaints from nearby residents.
- 4.22 Most of the surveys by TRC officers were carried out at the site only and some included ammonia monitoring. Mr Pene and a colleague monitored odour at the site and on SH3, about 320 m downwind from the site.
- 4.23 Mr van Kekem carried out an odour survey downwind of the site boundary within the McDonald property at 62 Airport Drive.
- 4.24 The majority of visits by TRC officers occurred during bird capture or litter removal operations. In general, either no or weak odour was observed at the boundary. However, "noticeable" odour was observed downstream of exhaust fans at times during shed cleanout and bird capture. "Strong to intrusive" odour was observed on one occasion during calm weather conditions. I note that TRC uses its own odour scale to assess odour.
- 4.25 The results of Mr Pene's observations on 23 and 24 January 2022 are reported in para. 59 of his evidence. The birds were about one week from peak mass. Odour intensities at the site boundary were reported as either very weak to weak, or no odour. No odour was detected downwind of the site on Airport Drive or SH3.
- 4.26 A T + T colleague of Mr Pene carried out an odour survey downwind of the site on 21 and 22 September 2021, which is reported in the Appendix to Mr Pene's evidence. I note that this survey was reported in accordance with the recommended procedure in the Odour GPG.

- 4.27 The survey on 21 September was carried out during normal operation. The observations on the 22<sup>nd</sup> were made at about 2 AM during a catch operation, which indicates that the birds were towards the end of their growth cycle.
- 4.28 This found no odour during most of the 3 monitoring periods, although very weak to weak odours were detected for short periods. I note that it was raining during the observations on 22 September, which I would expect to reduce odour levels over the 320 m distance to the nearest shed. It is not stated which shed was used for the catch operation, so the distance from the shed doors could have been greater.
- 4.29 The wind direction during both monitoring periods was from the north and described as a moderate to fresh breeze on 21 September, and light to gentle during the catch operation. Light to gentle on the Beaufort scale is 2 – 5 m/s, which occurs at a very low frequency based on the airport wind rose in the T + T Assessment of Environmental Effects.
- 4.30 Ms Ryan undertook odour surveys within the site boundary on 28 and 29 December 2021 when the stocking density was near the maximum. Her findings are similar to Mr Pene, in that little or no odour was detected unless standing downstream of a fan.
- 4.31 However, Ms Ryan concluded that *“if undispersed the odour does have the potential to have a chronic odour effect from frequent exposure to low levels, particularly if at a dwelling.”*
- 4.32 Mr van Kekem carried out an odour survey on 21 January 2022 in accordance with the guidance in Appendix 3 of the Odour GPG. This was carried out on a warm, sunny day with a warm sunny day with a strong blustery west-northwest breeze as described in paras. 3.49 to 3.57 of his evidence.
- 4.33 Two surveys were conducted, one 30 m and the other 80 m downwind of the sheds in the paddocks on the McDonald property. The 80 m location was the furthest extent of the plume where an “intermittent weak – distinct mealy litter like odour” was observed 23% of the time. The odour was rated as mildly unpleasant, -1 on the hedonic tone scale.
- 4.34 The 30 m location was downwind of a side exhaust fan. The odour intensity was rated as strong, or 4 on the intensity scale, for 13% of the time, distinct (3) for 37% and weak (2) for the remainder of the time.

4.35 I note that this survey was taken under atmospheric conditions that should enhance dispersion of the odour. At lower wind speeds and more stable atmospheric conditions, higher odour intensities are likely.

#### **Odour effects on the community**

4.36 The application was initially notified on a limited notification basis to 5 owners of nearby properties, and submissions opposing the application were received from all parties. TRC and the applicant subsequently agreed to other landowners in the vicinity of the site providing evidence in support of these submissions.

4.37 The evidence of the residents generally describes significant effects from dust and odour resulting from operations at the site. Mr Donovan has also interviewed the McDonalds, Browns, and Hibells as discussed in his evidence.

4.38 TRC had not received complaints regarding adverse effects resulting from odour or dust emissions from the site since 2015 until after the application was notified in 2021. There has been a total of 6 complaints since August 2021 up to late January 2022, which is about one complaint per month.

4.39 The complaints and the outcomes of the investigations are not presented in a tabular format in the s.42A report. Based on the description of visits to the AFTL site in section 10.2.2 of the report, it appears that 3 of the complaints were made on 6 October and related to the spreading of used chicken litter on a nearby paddock. A complaint on 13 October was investigated and this was also found to be due to the spreading of chicken litter.

4.40 An incident on 24 November could not be investigated until the following day due to a delay in lodging the complaint, as discussed in 159 – 163 of the s.42A report. Para 220 mentions a complaint received during August 2021 but no details are given.

4.41 While complaint analysis can be a useful tool for odour assessment during consent renewal, the absence of complaints does not necessarily indicate the absence of effects, as discussed in section 4.1 of the Odour GPG. I note that many of the residents understood that that the expiration of the current consent in 2026 would signal the end of chicken farming on the site and were tolerating odour from the poultry farm in the meantime.

4.42 Other odour assessment tools are listed in Appendix 2 of the Odour GPG. Odour diaries can provide invaluable information on the odour experienced in the community, especially when either complaints are not made or cannot be verified by council officers as offensive and objectionable. Mr van Kekem has presented the results of community odour diaries as described in 3.45 to 3.48 of his evidence.

4.43 I consider it unfortunate that the applicant did not engage in consultation with the community before applying for the consent renewal, but note that further upgrades following the notification process, including the DACS ventilation system with chimney roof vents, may reduce odour effects.

#### **Chronic odour effects**

4.44 Offensive and objectionable effects can result from either chronic or acute exposure to odour as discussed in section 2.6 of the Odour GPG. Acute effects arise from short-term (a few minutes to an hour) exposure to intense and unpleasant odour. However, long-term exposure to lower levels of even moderately unpleasant odour can also result in a similar level of adverse effects.

4.45 The same assessment tools can be used to assess both acute and chronic odour exposure. Duration is included as a factor in a FIDOL assessment, although I note that there can be practical difficulties in determining the duration of a chronic odour event during a typical odour survey, such as an investigation by a Council officer. Odour diaries are therefore invaluable when assessing chronic odour.

4.46 Perception of odour can vary widely between individuals as discussed in section 2.2.1 of the Odour GPG. In addition, some people can become sensitised following repeated exposure to the same odour. As residents may have been exposed to chronic odour from the poultry farm over many years, I would expect that this has become a factor in the community response. Similarly, others may become desensitised and less affected by the same level of odour.

4.47 The growing cycle at a poultry farm generally lasts for about 6 weeks, and as shown by Mr Pene in Figure 2 of his evidence, odour emissions during the second half of the cycle are at least 70% of the maximum. Depending on the weather conditions, a residence may remain downwind of the poultry farm for many hours or even days, and a continuous odour at relatively low intensity may result in chronic odour effects, particularly if it has the unpleasant hedonic tone typical of poultry farm odour.

- 4.48 This is discussed by Ms Ryan in paragraph 16 of her evidence, where she concludes that there is the potential for chronic odour effects to be experienced off site with the current shed fan configuration. She also notes in paragraph 48 that the odour that she observed on site *“does have the potential to have a chronic odour effect from frequent exposure to low levels.”* Such effects are confirmed by the residents in their submissions and statements of evidence.
- 4.49 Another factor which may increase the likelihood of significant odour effects is the effect of the shelterbelts, trees, and orchards near the farm on wind speeds. I note that most of the reports of visits by TRC officers in section 10.2.2 of the s.42A report do not mention wind speed, although there are 6 occasions when winds were described as light or calm. This indicates that light winds may occur in the vicinity of the site more frequently than suggested by measured wind speeds at the airport weather station.
- 4.50 The atmospheric dispersion modelling study by Mr Pene predicts that the combination of the reduced stocking rate and change from side exhaust fans to roof chimney fans could reduce odour concentrations by 37 – 50% at the nearby, sensitive receptors. This may not reduce the perceived odour level by the same amount due to the non-linear response of the human nose.
- 4.51 I conclude that even with the reduced stocking rate for free-range operation and the change to roof chimney fans, the potential for chronic odour effects will remain, especially for properties downwind during prevailing winds and close to the site.

#### **Separation (buffer) distance**

- 4.52 Paragraphs 184 to 193 of the s.42A report discuss the applicability of the 300 m separation distance recommended in Appendix V of the RAQP. While the report discusses aspects of the Victorian Code for Broiler Farms, on which Appendix V is based, it does not suggest what an appropriate separation distance should be.

Para. 188 contains the following quote from the Victorian Code: *“separation distances provide sufficient space to minimise the risk of offensive odour and dust emissions under both routine and abnormal (or upset) conditions adversely impacting the amenity of existing sensitive uses.”*

- 4.53 Even if a reduced separation distance may be appropriate in some circumstances, there remains the risk of odour from abnormal operation.

This is a particular concern for intensive agriculture, where there is not the same capability to shut down a process and implement mitigation measures quickly as usually exists in industrial processes.

- 4.54 According to Table 1 in the s.42A report, there are 3 properties 100 m or less from the closest shed, with a further 6 between 100 and 200 m. At these distances, I would expect some odour effects downwind even from a well-managed poultry farm, which is the experience of the submitters according to their evidence. One of the matters for discretion in Rule 52 covers not only dust and odour effects, but also "loss of amenity value of air".

#### **PM10 emissions**

- 4.55 Health effects from PM10 emissions were not considered by T + T in their assessment or evidence, nor by Ms Ryan in her evidence, or TRC in the s.42A report.
- 4.56 This issue has only been considered in NZ in recent years, although it has been investigated overseas, including the EU, UK and Australia.
- 4.57 I would not expect PM10 emissions from an operation of the scale of the Airport Drive poultry farm to result in health effects. However, there are two factors in this case which suggest that this should be considered. First is the proximity of a number of residential properties to the poultry farm. The second issue is the use of side-mounted exhaust fans discharging directly towards the boundaries, although I note that these are to be replaced by roof-mounted vents.
- 4.58 The conversion to free range operation and the ventilation upgrades should reduce the effects of PM10 emissions as suggested by the CALPUFF dispersion modelling predictions presented by Mr Pene in his evidence. However, the low separation distances and poor dispersive conditions in the case of some neighbours may result in higher PM10 exposure than would otherwise be expected.

#### **Health effects from odour**

- 4.59 Effects of ongoing exposure to odour are described in section 2.3 of the Odour GPG. As well as the typical effects of odour as listed in the first paragraph of this section, some compounds can cause strong odours even when the exposure is well below that recognised to result in health effects. One example of this is ammonia, which has an odour threshold about 100

times lower than the acute exposure level below which health effects are unlikely.

- 4.60 In this case, physiological effects from odour can develop even when the exposure is lower than that typically required to result in direct health effects.

## 5. **SUMMARY AND CONCLUSIONS**

- 5.1 The applicant proposes to convert their existing poultry farm at 58 Airport Drive to a free-range operation and has applied to renew the current air consent, which expires in 2026. The Taranaki RAQP recommends a buffer distance of 300 m for the size of the proposed free-range operation, and there are currently 16 residential properties less than 300 m from the site, three of which are within 100 m.
- 5.2 Given the number of sensitive activities close to the site, in my opinion this warranted an in-depth study of the effects of odour on the community. The initial assessment by T + T considered only the complaint history. Despite the absence of complaints, submissions by nearby residents indicated that adverse effects from odour were being experienced.
- 5.3 Further investigations were carried out by T + T following a peer review, and additional odour mitigation measures are being implemented. While these additional measures, along with the reduction in stocking rate for free-range operation, should reduce odour effects in the community, in my opinion there remains doubt as to whether these measures will adequately mitigate the present level of odour effects.



**Duncan Backshall**  
**8 February 2022**