BEFORE THE INDEPENDENT COMMISSIONERS

UNDER	the Resource Management Act 1991
IN THE MATTER OF	submissions and further submissions on the Proposed Canterbury Air Regional Plan

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EVIDENCE IN CHIEF OF RICHARD LESLIE CHILTON ON BEHALF OF THE CANTERBURY AGGREGATE PRODUCERS GROUP (SUBMITTER ID. 62784; FURTHER SUBMITTER ID: 104102)

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INTRODUCTION

1 My full name is Richard Leslie Chilton.

2 I am a Senior Air Quality Scientist employed by Golder Associates (NZ) Limited (**Golder**), a ground engineering and environmental consulting firm. I have been employed by Golder since January 2006 and have 16 years of experience in air quality management.

3 I hold the qualifications of a Bachelor of Science (Canterbury University) and a Master of Science degree (Honours) in Environmental Science (Canterbury University), specialising in air pollution meteorology.

4 I am a member of the Clean Air Society of Australia and New Zealand (CASANZ) and the Resource Management Law Association (RMLA).

5 In my current role at Golder, I manage air quality assessments for a wide range of industrial, agricultural, regulatory and transport sector clients. This includes evaluating effects related to odour, dust and hazardous air pollutants. It also includes recommending air contaminant control systems and management practices, and preparing air quality management plans. I have worked in both the New Zealand and United Kingdom regulatory sectors, being involved in consenting and compliance reviews of industrial air discharges, regional air quality policy development, regional emissions inventory preparation, and ambient air quality monitoring programmes.

6 I have managed a large number of air quality assessments for a range of industrial, agricultural, and transport related projects. These have included quarries and mines, manufacturing, printing, metallurgical, power generation, dairy industry, fertiliser manufacture, metal refining, mining, land-filling, composting, hazardous waste treatment, wastewater treatment, intensive agricultural and forestry sectors. Some examples include the numerous gravel quarries in Canterbury (Fulton Hogan, Winstone Aggregates, Road Metals, Selwyn District Council), the Mangatangi Coal Mine for Glencoal, a proposed open cast gold mine in Fiji, and more recently the first stage of the City Rail Link project.

7 A more detailed list of my experience in air quality management is contained in **Appendix A** to this evidence.

SCOPE OF EVIDENCE

8 I have been asked by the Canterbury Aggregates Producers Group (**CAPG**) to provide air quality evidence in relation to its submission on the proposed Canterbury Air Regional Plan (**pCARP**). The members of the CAPG are outlined in the evidence of Mr Kevin Bligh. I am familiar with the operations of many of the members of the CAPG, having carried out air discharge assessments for many of their sites.

9 The scope of my evidence relates to the following matters:

9.1 The definition of a sensitive activity to include non-target crops;

9.2 Rules 7.17 and 7.18 in terms of the management of localised air quality effects from industrial discharges;

9.3 Rule 7.37 and 7.38 with regarding to the threshold for handling capacities and dust management plans; and

9.4 Rule 7.55 relating to setback distances for and effects of cleanfill activities.

10 In preparing this evidence I have reviewed the pCARP and have considered the following:

10.1 the evidence of **Mr Kevin Bligh**; and

10.2 the section 42A Officer's Report as notified on 28 August (**Officer's Report**).

11 I have read the Expert Witness Code of Conduct set out in the Environment Court Practice Note 2014. I have complied with the code in preparing this evidence and I agree to comply with it while giving oral evidence. Except where I state that I am relying on the evidence of another person, this written evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this evidence.

DEFINITION – SENSITIVE ACTIVITY

12 The Officer's Report recommends an amendment to the definition of "Sensitive Activity" in response to a submission made by Horticulture New Zealand.

13 The Officer's Report notes that:

> *"it is appropriate that sensitive crops are protected from being adversely affected by discharges to air, but it is important that it is done in a way that is appropriate to ensure undue requirements are not imposed where there is no likely effect."*

14 Accordingly, the Officer has recommended the following additional text to the definition of a sensitive activity:

> *"any non-target crop that will actually or potentially be adversely effected by a discharge; or"*

15 In principal, I support the Officer's view that care is needed in such a definition to ensure *that "undue requirements are not imposed where there is no likely effect"*. However, I consider that the definition put forward by the Officer does little to address this, as it refers to any actual or potential adverse effect, regardless of whether they are less than minor, minor or more than minor. This distinction becomes particularly important when considering the wider receiving environment where a crop may be located.

16 I recognise that certain industrial activities can impact on vegetation, such as emissions of sulphur dioxide, fluoride, and dust.

17 Regarding dust impacts, crops of all varieties (cereal, horticultural etc.) are grown in rural areas which include many sources of dust typical of farming practices. Consequently rural areas are generally considered to have a relatively low sensitivity to dust effects. Indeed, cultivation of land for sowing crops and harvesting of cereal crops can result in significant dust emissions. Many rural areas also have shingle roads that are a significant source of dust.

18 Regarding dust effects on crops, such effects can include the soiling of produce or reduced yield rates due to impaired photosynthesis. However, in my experience, such effects only occur where there are very high levels of dust deposition. This is supported by the findings of McCrae[1] (1984) in his study of the effects of road dust on crops in New Zealand.

19 Given the wider low sensitivity of a rural receiving environment to dust, I consider that it is not reasonable to expect such a low threshold of any adverse effects, whether minor or not, in relation to impacts on crops as put forward by the Officer. Accordingly, I consider that the additional text recommended by the officer is

[1] McCrae P. R. 1884. An assessment of the effects of road dust on agricultural production systems. Research Report No. 156. Agricultural Economics Research Unit, Lincoln College, Canterbury, New Zealand

problematic and should be amended to reflect effects that are minor or more than minor, or deleted altogether.

RULES 7.17 AND 7.18

20 Rules 7.17 and 7.18 deal with management of localised air quality effects from industrial discharges and are closely related to one another and provide for the implementation of Policy 6.21 which states:

> *"Avoid the discharge of contaminants into air from any large scale burning device or industry or trade premise, where the discharge will result in the exceedance, or exacerbation of an existing exceedance, of the guideline values set out in the Ambient Air Quality Guidelines 2002 Update."*

21 Rule 7.18 prohibits discharges that will likely result in the Ambient Air Quality Guideline (**AAQG**) values being exceeded from new and existing discharges within a clean air zone, and new discharges outside of a clean air zone. Rule 7.17 imposes a non-complying activity status for existing the discharge will likely result in the AAQG being exceeded outside a clean air zone. The Rules, however, make no distinction regarding whether the exceedence of the guideline value will give rise to an adverse effect. For example, if a predicted exceedence occurs over land where no person will reasonably be exposed for the averaging period of the guideline, then an adverse effect is not expected to occur. I note that the concept of exposure is integral to both the National Environmental Standards (NES) and the AAQG.

22 Additionally, the AAQG are not intended as a simple "pass/fail" test at an industrial site boundary as envisaged by Rules 7.17 and 7.18. To this extent the MfE[2] (2002) stated that the guidelines *"are not designed to be used to assess the environmental and health impacts of individual discharges to air as required by the RMA, or a regional or district plan."* However, in the absence of industrial assessment criteria, direct comparison against the AAQG has routinely occurred. Notwithstanding this, where an exceedence of the AAQG values were predicted to occur, MfE (2002) indicates a more detailed effects assessment should be undertaken to better quantify the potential adverse effects.

23 While I appreciate that the Officer's report has recommended removing Rules 7.17 and 7.18 and replacing those rules with some alternative rules (albeit undefined), I am mindful that that the recommendation regarding Policy 6.21 does not address

[2] MfE 2002. Ambient Air Quality Guidelines – 2002 Update. Air Quality Report No. 32. Ministry for the Environment, Wellington, New Zealand, ISBN: 0-478-24064-3.

the matter of linking concentrations to exposure and whether adverse effects would potentially occur. Given this, it is my view that Rules 7.17 and 7.18 are not effects based and do not reasonably enable the effects of industrial air discharges to be assessed.

RULES 7.37 AND 7.38

24 With regards to Rules 7.37 and 7.38 I have been asked by the CAPG to comment on two aspects. The first relates to the threshold processing capacity of Rule 7.37. The second matter relates to the requirement for having a dust management plan as listed in the conditions of both rules. I address these matters in the following paragraphs.

Capacity Thresholds

25 In my experience it is appropriate to have activity thresholds that relate to the scale of dust generating activities, that differentiates between activities that are permitted (and as such should have minor effects if appropriately run) and activities that require consent. Emissions, and consequently the potential for adverse effects, increases with the scale of an activity. Having thresholds of this nature helps provide certainty for industry and the Council in clearly establishing whether an activity is permitted or requires a consent. In my experience, a useful distinction is often made between the scale of a mobile operation, with that of a fixed/permanent operation.

26 For example, mobile aggregate processing plant (such as crushers or screens) can have a processing capacity of up to 100 tonnes per hour and plant that has a greater processing rate tends to be fixed plant. While I stress that this is not an exact threshold between fixed and mobile plant, I consider it to be a useful threshold from which a distinction could be derived for whether an activity is permitted or requires consent.

27 Having reviewed the production / storage volumes given in Rules 7.37 and 7.38, I consider them to be appropriate and reflect what I would expect to be consistent with mobile or small scale activities and therefore appropriate for differentiating between permitted activities and those requiring consent.

Dust Management Plan Requirements

28 Rules 7.37 and 7.38 provide for handling and storage of bulk solid material as permitted activities subject to a number of conditions, one of which is a requirement for a dust management plan to be supplied to the CRC on request. I

note that this requirement is typical of permitted activities under the rules contained in "Other industrial and trade discharges of contaminants into air" section of the pCARP. While dust management plans can be a useful means for a company to establish the measures it will use to control dust from its activities, I would question the need to include this type of requirement for a permitted activity rule. This is especially the case where there is an overriding requirement to not cause an offensive or objectionable dust effect via Rule 7.3.

29 In my experience, dust management plans tend to be required of industrial consent holders where there are complexities associated with conditions of an air discharge consent that requires a management plan to set out how consent conditions will be implemented and who will have responsibility for those actions. If an activity is sufficiently complex with a wide range of sources and measures needed to mitigate those sources, in my view it would be inappropriate for such an activity to be given the permitted status. Conversely, in my view a permitted activity rule should not need to require a management plan as a condition. Therefore I recommend removing this condition from Rules 7.37 and 7.38.

RULE 7.55 CLEANFILLS – SEPERATION DISTANCES

30 Rule 7.55 permits the discharges of contaminants into air from cleanfilling activities and follows a similar rule structure that covers activities such as small quarries (i.e., Rule 7.37). However, I note that clause 1 in Rule 7.55 requires a separation distance of 300 m to sensitive activities compared to the 200 m separation distance required in Rule 7.37.

31 In my experience, small cleanfill operations give rise to dust emissions that are similar in character and are no worse, and in many cases better than small quarry operations. Furthermore, in my experience, a 200 m separation distance (as is required by Rule 7.37) is a useful separation distance for many dust generating activities, including cleanfills. As such, I see no reason why Rule 7.55 should impose a greater separation distance criteria over that of other dust generating activities (such as small quarries) that the pCARP seeks to permit.

32 On this matter, I note that the Officer's Report states that *"… these setbacks apply to a permitted activity status. If these setback distances cannot be complied with then an application for resource consent can be made as a discretionary activity. The setbacks provide a level of protection for these, from the effects of dust, for these activities when undertaken without the need for consent."* While I accept this position on a principled basis, I consider that it provides no rationale or scientific basis for the choice of the extent of a larger separation distance.

33 I also note that clause 5 of Rule 7.55 outlines conditions by which an odour or dust management plan is required. In my experience, cleanfill operations should not be a significant source of odour, and as such I am unclear why this clause relates to odour. I note that the definition of "cleanfill" in the pCARP specifically excludes material that may be putrescible, degradable or contain leachate components. In my view, these exclusions are principally aimed at avoiding odorous materials from being accepted. Notwithstanding this, as noted earlier in my evidence, I consider that a permitted activity rule should not need to require a management plan as a condition.

CONCLUSION

34 I conclude the following:

34.1 Including non-target crops in the definition of a sensitive activity is problematic.

34.2 Rules 7.17 and 7.18 are not effects based and do not reasonably enable the effects of industrial air discharges to be assessed.

34.3 The threshold production volumes and capacities in Rules 7.37 and 7.38 are appropriate.

34.4 Permitted activity rules, such as Rules 7.37, 7.38 and 7.55, should not require a management plan as a condition.

34.5 The separation distance criterion in Rule 7.55 should be changed form 300 m to 200 m to be in line with other dust generating activities (such as Rules 7.37 and 7.38).

34.6 Notwithstanding my earlier conclusion about management plans, clause 5 of Rule 7.55 should not relate to odour.

Richard Leslie Chilton
18 September 2015

APPENDIX A - EXPERIENCE

QUALIFICATIONS AND AFFILIATIONS

I hold a Bachelor of Science (Geography) gained from University of Canterbury in 1997

I hold a Masters of Environmental Science with honours gained from the University of Canterbury in 2000.

My professional affiliations include the following:

- Resource Management Law Association of NZ (RMLA)
- Clean Air Society of Australia and New Zealand (CASANZ)

EMPLOYMENT

Senior Air Quality Consultant
Golder Associates (NZ) Limited (Christchurch, NZ) – 2007 to present

Senior Air Quality Consultant
Kingett Mitchell Limited (Christchurch, NZ) – 2006 to 2007

Air Quality Consultant
Bureau Veritas (London, UK) – 2004 to 2005

Technical Officer – Air Quality
London Borough of Greenwich (London, UK) – 2004

Air Quality Officer
Auckland Regional Council (Auckland, NZ) – 1999 to 2004

REGULATORY SECTOR

In addition to being employed as an air quality officer for the Auckland Regional Council for several years, I have also undertaken a number of air quality management related projects and acted an expert advisor for the regulatory sector in New Zealand and the United Kingdom since the early 2000's. Examples are listed below.

Technical review of resource consent applications on behalf of Auckland, Wellington and Canterbury Regional Council: Astley Leathers (Auckland), New Zealand Breweries – East Tamaki plant (Auckland), Synlait Dairy Factory (Canterbury), Ministry of Justice Precinct earthworks (Canterbury), Computer Concepts (Canterbury), Unilever (Wellington), Southern Landfill (Wellington).

Revision of PARP:ALW poultry activity rules: Review of poultry activity rules in relation to odour discharges for the Proposed Auckland Regional Plan: Air, Land and Water. The project also sought to provide technical advice for council staff when processing air discharge consents for poultry farms. For the Auckland Regional Council. 2007 to 2008.

Revision of PARP:ALW combustion activity rules: Project manager. Revision of combustion rules for the Proposed Auckland Regional Plan: Air, Land and Water. This involved dispersion modelling of a wide range of boiler types and sizes to evaluate appropriate permitted activity thresholds and rule requirements. For the Auckland Regional Council, 2009-2012.

Auckland regional meteorological datasets: Joint project manager and author. Development of official Auckland Regional high-resolution three-dimensional CALMET meteorological datasets single-point steady state datasets (for Ausplume and CALINE) covering key industrial and transport routes for the Auckland Region. For the Auckland Regional Council and New Zealand Transport Agency, 2007-2009.

ASSESSMENTS OF EFFECTS ON THE ENVIRONMENT - AIR QUALITY

I have completed numerous assessments of effects on the environment (AEEs) in New Zealand, the United Kingdom, Fiji, Australia, Armenia, Bulgaria and Greenland, mainly in support of air discharge permit applications. The AEEs have covered a wide range of sectors including transport, industrial, manufacturing and mining sectors.

Example projects are listed below.

Gravel Quarry Dust Assessments in Canterbury: Preparation of dust impact assessments and presentation of expert evidence at council hearings and to the Environment Court for a number of gravel quarries in Canterbury, including for the expansion of the Winstone Aggregates Yaldhurst quarry, the expansion of the Road Metals Yaldhurst quarry (three separate expansions), Fulton Hogan (Roberts Road), and Selwyn District Council. From 2006 to 2015.

Air quality consent applications for Fonterra Co-operative Group Limited: Preparation of air discharge assessments and resource consent application for a various Fonterra sites, including the Clandeboye, Darfield, Pahiatua, Edendale, Kaikora, Hautapu, Waitoa, Te Awamutu, Takaka, Stirling and Studholme sites. These all included CALMET meteorological and CALPUFF dispersion modelling to predict potential air quality impacts, evaluating effects against relevant national guidelines and standards, and

included attending consultation meetings and presentation of expert evidence at Council Hearing. For Fonterra Limited (2006 to 2015).

City Rail Link- Britomart to Wyndham Section: Air Quality Technical Lead. Prepared the air technical assessment of construction dust and odour from the Britomart to Wyndham section of the City Rail Link project. Aurecon/Auckland Transport (2014-2015)

New Zealand Starch: Project Manager: Preparation of an air discharge assessment for the continued operation of the NZ Starch plant in Auckland. This included dispersion modelling using CALPUFF to predict contaminant ground level concentrations and the development of a probabilistic assessment approach using Monte Carlo simulations to establish the likelihood of contaminants exceeding national air quality standards. For NZ Starch, 2013.

Mahinerangi Coal Mine – Air Quality Assessment: Preparation of an air quality assessment relating to potential air quality impacts (dust, particulate matter, combustion emissions) associated with a proposed open cast coal mine in the Waikato Region. This involved CALMET meteorological modelling and probability analysis of exposure of sensitive locations to coal dust. It included a detailed air emission estimation and CALPUFF dispersion modelling to determine potential offsite contaminant impacts. The project involved presentations at a community consultation day, and providing expert evidence at the consent hearing. For Glencoal (subsidiary of Fonterra) (2012 - 2013).

Waisoi Gold Mine feasibility environmental and social impact assessment, Fiji: Assistant discipline project manager. Preparation of an air quality environmental impact assessment for the proposed Waisoi gold mine. This involved the preparation of CALMET meteorological dataset, detailed calculation of hour-varying emissions from mining operations, power generation and transport emissions. Dispersion modelling was used to model the potential impacts of mine site discharges on communities, including consideration of particulate matter, dust, sulphur dioxide, nitrogen dioxide and acid deposition. The project also included modelling of the impacts of non-tailpipe and tailpipe emissions on communities along the transport route to Suva. For Namosi Joint Venture (2011).

White City Development, London: Undertook a detailed monitoring programme for nitrogen dioxide and fine particulate matter (PM_{10}) to determine the air quality development constraints and advising on mitigation measures for an under-utilized area of White City, London. For Halical Bar Ltd (2004)