

**Before Independent Commissioners Appointed by the Canterbury Regional Council and Selwyn District Council**

**In the matter of**            The Resource Management Act 1991

**And**

**In the matter of**            Applications by **Fulton Hogan Limited** for all resource consents necessary to establish, operate, maintain and close an aggregate quarry (**Roydon Quarry**) between Curraghs, Dawsons, Maddisons and Jones Roads, Templeton

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**REBUTTAL EVIDENCE OF JON FARREN  
ON BEHALF OF FULTON HOGAN LIMITED**

**NOISE**

**DATED: 21 OCTOBER 2019**

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## **Introduction**

1. My name is Jon Farren. I am the manager and principal of the Christchurch office of Marshall Day Acoustics (**MDA**).
2. I have previously provided a written brief of evidence in relation to the Roydon Quarry Proposal. That evidence is dated 23 September 2019. I confirm my qualifications and experience as set out in paragraphs 4 to 7 of that evidence.
3. I also confirm I have read and agree to comply with those parts of the Environment Court Practice Note that bear on my role as an expert witness, in accordance with paragraph 7 of my earlier evidence.

## **Scope**

4. My rebuttal evidence addresses noise issues raised in the evidence filed by the following witnesses
  - (a) Dr Stephen Chiles on behalf of the Canterbury District Health Board (**CDHB**);
  - (b) Mr Michael Smith on behalf of Templeton Residents Association (**TRA**);
  - (c) Ms Jolene Eager on behalf of Templeton Residents Association (**TRA**);
  - (d) Mr Richard Jackett on behalf of New Zealand Motor Caravan Association (**NZMCA**);
  - (e) Ms Jane Cartwright on behalf of Brackenridge Services Ltd (**Brackenridge**);
  - (f) Mr Brian Reddington on behalf of Brackenridge Services Ltd (**Brackenridge**);
  - (g) Ms Susan Ruston on behalf of Christchurch City Council (**CCC**); and
  - (h) Ms Sara Harnett Kikstra on behalf of the Yaldhurst Rural Residents Association (**YRRA**).
5. I will discuss each statement of evidence in turn.

## **Dr Stephen Chiles (CDHB)**

6. Importantly, Dr Chiles agrees that both my noise predictions and proposed noise limits are appropriate to protect public health.

### ***Tonal Reversing Alarms***

7. Dr Chiles is concerned about neighbours' annoyance from tonal reversing alarms that may potentially be fitted to some vehicles.
8. I agree with this concern and, as I note in paragraphs 26 and 72 of my evidence-in-chief, all site-based vehicles will not have tonal reversing alarms. In my view the greatest potential for disturbance would be at night when ambient noise levels in the local environment are at their lowest and therefore tonal reversing alarms have the potential to be most noticeable.
9. However, night-time operations are proposed for only 60 nights per year. I understand only Fulton Hogan (or their contractors) will be able to access the site and all trucks will be required to have broadband reversing alarms fitted. Correspondingly, there will be no night-time noise disturbance from tonal reversing alarms.
10. During the day, the potential disturbance from tonal reversing alarms is less owing to the elevated ambient noise. However, I understand the proposed site will be configured for trucks to manoeuvre into position while moving forwards as it is undesirable to have trucks reversing from a safety perspective. As a result, I expect that if noise from tonal reversing alarms were to occur it would be atypical.
11. Based on my comments above, I do not agree with Dr Chiles' recommendation for a complete ban on tonal reversing alarms. I expect that if noise from tonal reversing alarms were to arise it would only occur on an infrequent basis and any adverse noise effects would be minimal.

### ***Off-site Trucks***

12. Dr Chiles recommends a number of additional measures to avoid "adverse noise effects" from quarry trucks on local roads. He recommends several additional measures including the prohibition of trucks on local roads at all times, speed restrictions between the site and SH1 and upgrades to the road surface. I note that Mr Andrew Metherell has also addressed Dr Chiles' comments in so far as they relate to traffic issues.
13. While I agree that the measures proposed by Dr Chiles will result in reduced noise levels from potential quarry-related traffic, I do not agree they are necessary. The analysis presented in my evidence-in-chief,<sup>1</sup> the *Requests*

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<sup>1</sup> Farren Evidence-in-chief paragraphs 32 to 34 and 63 to 70.

*for Information (RFI) and Environmental Noise Assessment*, confirm that residences adjacent to roads in the vicinity of the site are already subject to considerable traffic noise, including noise from heavy vehicles. Overall, traffic noise levels are not anticipated to perceptibly increase for residences on local roads with the addition of the proposed quarry truck movements.

14. In other words, even if Dr Chiles' proposed measures were to be included, there would be no material reduction in traffic noise effects for residents on local roads – the effect is already present.
15. Therefore, in contrast to Dr Chiles, I disagree that there will be any significant change in traffic noise effects as a result of the proposed quarry, provided that trucks do not use local roads between 2000 and 0600 hours as discussed in my evidence-in-chief.

### ***Engine Braking***

16. I agree with Dr Chiles that engine braking can cause noise disturbance. However, I understand that an estimated 1%<sup>2</sup> of all the entire NZ truck fleet are fitted with engine brakes that are considered noisy, and their use is entirely at the discretion of the truck driver. I understand that noisy engine brakes are primarily a feature of older style trucks that are gradually disappearing from NZ roads as the fleet is modernised.
17. Dr Chiles is recommending that all trucks with engine brakes be prohibited from the site but I understand this is likely to be impractical. I understand it will be more practical for Fulton Hogan to discourage truck drivers from using engine brakes as part of their driver induction, signage and a code of practice. With these measures in place it seems to me there would be a low likelihood of engine braking occurring and therefore a minimal potential adverse effect.

### **Mr Michael Smith (TRA)**

18. Mr Smith agrees that the proposed project noise limits are appropriate.
19. I disagree with Mr Smith's recommendation that the mobile processing plant should be located in the central processing area (his paragraph 13). My assessment shows that this is not necessary to comply with the proposed noise limits, which he agrees are appropriate. The Applicant has offered a

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<sup>2</sup> <https://www.nzta.govt.nz/commercial-driving/trucks-and-tow-trucks/engine-braking-noise-trial/>.

condition to restrict mobile processing plant from within 250 metres of the site boundary and I consider this to be appropriate.

20. In his paragraphs 17 to 19, Mr Smith has raised the audibility of tonal reversing alarms and considers it reasonable for the installation of broadband alternatives to all trucks to be a requirement of entry onto site.
21. As I have noted above in paragraphs 8 to 11, I agree with this general concern but I expect that in practice, if tonal reversing alarms were to be used, it would be atypical and any adverse noise effects would be minimal.
22. Mr Smith also raises the issue of noise from trucks travelling at night on Jones Road, east of Dawsons Road between 2000 and 0600 hrs. I agree this could be a potential issue and note that a condition has been drafted to preclude this occurring. (Condition 22 attached to Kevin Bligh's evidence-in-chief).
23. I disagree with Mr Smith that the stated objective of the Noise Management Plan (**NMP**) should be to minimise noise effects (his paragraph 28). In my opinion, a NMP's purpose is to ensure that noise effects remain appropriate for the receiving environment through adherence to the proposed noise limits.

#### **Ms Jolene Eager (TRA)**

24. I have read Ms Eager's submission on noise issues and also the Templeton resident survey feedback included as Attachment 8 to her evidence.
25. Whilst I understand the residents' apprehension and concern about noise, my assessment confirms the proposed quarry can operate whilst maintaining an appropriate degree of amenity for all adjacent residences.
26. I note that the TRA's noise expert, Mr Smith, agrees that noise level criteria are appropriate.

#### **Mr Richard Jackett (NZMCA)**

27. Mr Jackett's evidence is extensive and contains numerous comments and statements that I do not agree with. However, rather than provide a paragraph-by-paragraph response, I have provided comment on the statements of his that could be considered as outcome-determinative.

28. Mr Jackett has several points of agreement with both the *Environmental Noise Assessment* and my evidence, including:
- (a) Support for my proposed 0700 hrs commencement of daytime operations as opposed to 0730 hrs in the District Plan (his paragraph 4); and
  - (b) Agreement that my assessment methodology and noise limits are appropriate (his paragraph 6).

***Existing Noise Environment***

29. In his paragraph 2, Mr Jackett describes the existing noise environment:

*“...as typical of working-rural surroundings, with steady distant road traffic noise, occasionally punctuated by passing trains and aircraft”*

and goes on to say in his paragraph 3 that:

30. *“From speaking to members and observing their behaviour, it is clear they value the rural noise environment of NZMCA Weedons”.*
31. In my opinion, Mr Jackett’s description of the noise environment as “working-rural” (his paragraph 2) and “rural” (his paragraph 3) have different meanings in a noise context and cannot be used interchangeably.
32. I consider that whilst a “rural” noise environment can be experienced in many parts of the Selwyn District away from busy roads, train lines and airports, that is not the noise environment being experienced at NZMCA Weedons, which I describe in paragraph 34 of my evidence-in-chief as follows:
- “...The noise environment is typical of rural areas on the urban fringe that are close to transport infrastructure. The noise environment at the site is in contrast to other rural areas in Selwyn District away from busy roads, which will have lower ambient noise levels.”*
33. In my opinion, the elevated ambient noise environment, proximity to transport infrastructure and large setback distances to dwellings and the NZMCA site, makes it suitable for a quarry to operate with minimal adverse effects.

### ***Inappropriate Determination of Special Audible Character***

34. In Mr Jackett's opinion, the noise of a crusher and screen has "special audible character" (**SAC**) and, as such, predicted noise levels should attract a +5 dB penalty as outlined in NZS 6802:2008.<sup>3</sup> (His paragraphs 54 to 64).
35. I disagree both with this statement and the description of crusher noise provided by Mr Jackett. In my experience of over 25 quarries and mineral extraction sites across the South Island, crushers and screens, particularly those processing Canterbury gravels, broadly have a steady and unfluctuating character, and generate sound over a broad range of frequencies. They are neither repetitive nor impulsive in my opinion. When heard beyond the boundary of a typical quarrying site, I consider their character to be consistent with an unobtrusive "white noise".
36. As stated in the *Environmental Noise Assessment*, I do not consider the application of a SAC penalty to be appropriate for this project and I note that none of the other noise experts have disagreed with this position. My office has conducted over fifty quarry-related noise assessments over the last ten years and I am not aware of any comparable projects that have had a SAC correction applied to crusher noise.
37. Mr Jackett applies his description of the crusher noise character to claim a non-compliance with the proposed noise limits. Even if the SAC correction is not applied, Mr Jackett claims a 1 dB non-compliance. As I will discuss shortly, I consider these claims to be inappropriate and incorrect.
38. Mr Jackett also claims the crusher noise character is likely to result in annoyance as it will be easily recognisable. I disagree with these statements. In relation to the Roydon Quarry, the proposed central and portable crushing plant will be located more than 750 and 500 metres respectively from the closest part of the NZMCA site. In my experience of listening to operational quarries at similar distances, I consider that the crusher noise will be unobtrusive above the existing ambient noise at the NZMCA site, particularly the continuously audible traffic noise.

### ***Incorrect Claim of Noise Limit Breach***

39. In his paragraphs 74 to 78, Mr Jackett has interpreted a situation where normal site operations and mobile processing could combine to result in a

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<sup>3</sup> New Zealand Standard NZS 6802:2008 "*Acoustics - Environmental Noise*".

breach of the proposed daytime noise limits at the boundary of the site. I note that mobile processing is limited to 120 days per year and will be set back 250 metres from the site boundary.

40. In the example he describes, Mr Jackett has superimposed noise levels from mobile processing onto a part of the site boundary where backfilling is taking place. I do not consider this to be appropriate as, in practice, both backfilling and mobile processing will not occur simultaneously within the same part of the site (backfilling does not require the mobile crusher to be used).
41. In my analysis, the site will operate within the proposed noise limits at the site boundary for all operational scenarios that have been assessed.
42. Moreover, as a result of the noise level reduction from the substantial separation distance between the quarry and the NZCMA site (750 metres to the central quarry processing area), daytime quarry noise levels across the NZMCA site will be notably below the proposed 55 dB  $L_{Aeq}$  noise limit which I have applied at the quarry site boundary. As discussed in my evidence-in-chief and the *Environmental Noise Assessment*, the proposed noise limits, and therefore noise across the NZMCA site, will be considerably below the Selwyn District Plan permitted activity daytime noise limit of 60 dB  $L_{A10}$ .
43. In his paragraph 94, Mr Jackett indicates his claimed noise limit breach will result in adverse community response. As there will be no breach of the noise limit, I disagree there will be an adverse community response. Even if there was 1 dB breach in the noise limit as Mr Jackett claims, this would not be perceptible to the community and there would be no adverse response.

#### ***Wind direction and its effect on noise level***

44. In his paragraphs 29, 37, 40, 42 Mr Jackett makes reference to the effect of wind direction on ambient noise levels at the NZMCA site. In paragraph 42, he states that wind direction has a large influence on background noise levels, meaning that background noise could be “half as loud”. I note that this statement seems to be based on his single, 1-minute long noise measurement. I disagree with this statement as I do not consider this to be a representative measurement period.
45. I prefer the analysis set out in Section 3.4 of the *Environmental Noise Assessment* which comprehensively describes the effect of wind on background noise level based on noise data collected 24 hours a day over a continuous 3-week period. This data is representative of the background



noise level variation at the NZMCA and shows typically less than 2 dB variation in noise level across wind conditions. As a result I do not consider the variation in background noise in the area will be perceptible and Mr Jackett's claim that it will be "half as loud" is not justified and incorrect in my view.

46. In paragraph 69, Mr Jackett suggests that my noise level predictions are calculated under a north-easterly wind condition. This is not correct.
47. As explained in Section 5.1 of the *Environmental Noise Assessment*, the noise predictions are conducted in accordance with ISO 9613-2 which assumes that all receiver locations are downwind of the noise source. This, of course, cannot occur in practice which means that quarry noise levels will be less than predicted when the noise receiver is upwind of the noise source. The predicted quarrying noise levels presented in the *Environmental Noise Assessment* are therefore conservative and will not occur all the time.

#### ***Evening Noise Environment at NZCMA***

48. From his discussion on the NZMCA site, Mr Jackett notes that members might enjoy "happy hour" at outside tables in the early evening. In his paragraph 30, Mr Jackett states:

*"...In my view, maintaining amenity over the evening period, and in particular during the 'day-light' savings portion of the year, would help to maintain their [NZMCA Members] enjoyment of the park."*

49. This sentiment is echoed in the evidence of Mr James Imlach<sup>4</sup> on behalf of the NZMCA in his paragraph 20:

*"Members often congregate at social gatherings held inside and outside a gathering shed near the site entrance. The events, colloquially known as 'happy hours', usually start at 4pm and last for a few hours at a time. These social interactions help foster camaraderie and promote mental well-being amongst members, particularly older members who travel alone."*

50. Mr Jackett's own noise measurements indicate that the existing ambient noise environment at the NZMCA site during this period (between 1600 and 2000 hrs) is 46 to 57 dB  $L_{Aeq}$  (average) and 43 to 50 dB  $L_{A90}$  (background

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<sup>4</sup> Evidence of Alexander James Imlach on Behalf of the New Zealand Motor Caravan Association Inc., Dated: 14 October 2019.

sound). The noise sources affecting the NZMCA site at various times included traffic, aircraft, trains, construction noise, sheep bleating and birds singing.

51. The current proposal is for normal quarry operations including crusher noise to cease at 1800 hrs. On 150 days per year, crushing in the central processing area may continue until 2000 hrs.
52. In my analysis, noise levels from the proposed quarry during “happy hours” (between 1600 and 2000 hrs) will be no greater than the range of noise levels currently experienced. In my opinion, noise from the quarry will not affect the ability of NZMCA members to converse and interact socially. Because of the sound generated by the social gathering itself, NZMCA members are unlikely to be aware of the quarry sound during their social interaction. Mr Jackett notes that the NZCMA members’ own petrol generators were audible, but it is not clear if their noise contribution is included in Mr Jackett’s measurements. I understand that the resource consent conditions for the site permit generators between 0800 and 2100 hours. Furthermore, as Mr Jackett’s noise measurements were collected in September, it is unlikely that they include the conversational noise that would be generated during “happy hours”. In addition, the noise measurements do not appear to include noise from NZMCA vehicles that may be arriving in the late afternoon or early evening which I understand is a typical feature of these campgrounds.
53. If NZMCA’s own generator noise, conversation noise and vehicle noise were to be considered in my analysis, in addition to the existing ambient noise levels measured by Mr Jackett, I would have further assurance that quarrying activities will not affect NZMCA noise amenity. As I have stated in paragraph 38, my expectation is that the crusher noise will not be particularly discernible at NZMCA Weedons.

#### ***Draft Conditions of Consent***

54. Mr Jackett has proposed conditions of consent in addition to those proposed by Mr Henderson.
55. For the reasons I described in paragraphs 23 to 37, I do not agree with the rationale that leads to the proposed exclusion of crusher activity as proposed by Mr Jackett in his paragraph 116.

56. The proposed mobile processing plant setback recommended by Mr Jackett in paragraph 117 is not warranted in my opinion as there will be no substantial adverse effects at the NZMCA site.
57. In paragraphs 118 and 119, Mr Jackett raises the issue of reversing alarms and quarry trucks on Curraghs Road. I disagree with both of these recommendations. I have addressed the issue of reversing alarms in paragraphs 7 to 11 above. My evidence-in-chief discusses Curraghs Road traffic in paragraphs 61 to 70.

**Ms Jane Cartwright and Mr Brian Reddington (Brackenridge)**

58. Both Ms Cartwright and Mr Reddington express concerns regarding the effect of noise on their clients.
59. Whilst I have not been onto the Brackenridge property, I am familiar with the immediate area and, in February 2019, my company conducted a noise assessment on land immediately to the north of Brackenridge. I expect the existing noise environment within the property will include traffic noise from both Kirk and Maddisons Road as well as aircraft over flights. Environmental sounds such as leaf rustle and birdsong will also feature.
60. Based on noise measurements my company has conducted in the Templeton area, I estimate that existing ambient daytime noise levels will be broadly in the range 50 to 60 dB  $L_{Aeq}$  across the Brackenridge site.
61. Brackenridge is located more than 1 kilometre from the proposed quarry site boundary. Daytime noise levels from quarry activities will be less than 40 dB  $L_{Aeq}$  at Brackenridge, which is substantially below the existing noise environment. This means that the quarry will not add to the existing noise levels and it is very unlikely that any quarry noise will be audible.
62. In my opinion, the effects of noise from the proposed quarry will be negligible at this property. Similarly, I expect that there will be negligible traffic noise or vibration effects at Brackenridge as a result of the quarry.

**Ms Susan Ruston (CCC)**

63. Ms Ruston broadly agrees that the Applicant's proposed conditions of consent are appropriate. However, she recommends that the proposed commencement of "daytime" of 0700 hrs is changed to 0730 hrs to align with the District Plan (her paragraph 5.5).

64. I do not agree with Ms Ruston's recommendation. My rationale for proposing 0700 hrs as the onset of daytime is as a result of the elevated ambient noise level in the area as described in the *Environmental Noise Assessment*. The start of daytime at 0700 hrs also reflects current best practice as represented by NZS 6802.<sup>5</sup> As discussed previously, my approach has been supported by all four other noise experts involved in this Hearing.

**Ms Sara Harnett Kikstra (YRRA)**

65. I note Ms Harnett Kikstra's observation in her paragraph 15 that she is woken around 5.30 am, Monday to Saturday, "...by a convoy of quarry trucks." I am not aware of Ms Harnett Kikstra's address and so I cannot comment on the specifics of her situation.

66. However, as I have stated in my evidence-in-chief, all trucks associated with the proposed quarry will be prohibited from using local roads until 0600 hrs which is the time when the ambient noise levels on local roads are elevated sufficiently to permit quarry truck use without any notable adverse noise effects.

67. In other words, it is my view that no sleep disturbance will occur as a result of truck movements related to the proposed quarry.

**Jon Farren**

21 October 2019

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<sup>5</sup> New Zealand Standard NZS 6802:2008 "*Acoustics - Environmental Noise*"