

**BEFORE INDEPENDENT HEARING COMMISSIONERS APPOINTED BY THE
KAIKOURA DISTRICT COUNCIL**

IN THE MATTER OF

The Resource Management Act 1991 (**RMA** or
the Act)

AND

IN THE MATTER OF

Proposed Plan Change 4 (**PC4**) to the Kaikoura
District Plan (**KDP** or **the Plan**) brought by
Kaikoura Business Park Limited (**KBP**)

AND

IN THE MATTER OF

The Hearing of Submissions and Further
Submissions on PC4

**EVIDENCE OF JEREMY TREVATHAN FOR THE APPLICANT
KAIKOURA BUSINESS PARK LIMITED**

Dated: 12 March 2024

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INTRODUCTION

- 1 My full name is Jeremy William Trevathan.
- 2 I am the Principal Acoustic Engineer and Managing Director of Acoustic Engineering Services Limited (AES), an acoustic engineering consultancy with offices in Auckland, Wellington and Christchurch.
- 3 I hold the degrees of Bachelor of Engineering with Honours and Doctor of Philosophy in Mechanical Engineering from the University of Canterbury. I am an Associate of the New Zealand Planning Institute, and a Member of the Acoustical Society of New Zealand (ASNZ). I am the AES Member Representative for the Association of Australasian Acoustical Consultants (AAAC), a judge for the Association of Consulting Engineers of New Zealand (ACE NZ) Innovate Awards, and a member of the MBIE College of Assessors. I was a member of the ASNZ working group advising the Ministry for the Environment (MfE) regarding the National Planning Standards (2019).
- 4 I have more than seventeen years' experience in the field of acoustic engineering consultancy and have been involved with environmental noise assessment projects throughout New Zealand. My experience includes assessing noise from industrial activities which have rural and residential interfaces. I have provided expert evidence before Council Hearing Panels, the Environment Court and Boards of Inquiry.
- 5 I have read the Environment Court's Code of Conduct and agree to comply with it. My qualifications as an expert are set out above. The matters addressed in my evidence are within my area of expertise, however where I make statements on issues that are not in my area of expertise, I will state whose evidence I have relied upon. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in my evidence.

SCOPE OF EVIDENCE

- 6 I have been engaged by Kaikoura Business Park Limited to provide expert acoustic evidence for a proposed Private Plan Change for a site near the corner of State Highway 1 and the Inland Kaikoura Road, at Peketa. The proposal is to allow light industrial activities on the site in a new Light Industrial zone.

- 7 My evidence covers the following:
- (a) Appropriate noise limits for the new zone;
 - (b) Likely noise emissions from the new zone; and
 - (c) Discussion of noise related relief sought by submitters in opposition (submissions now withdrawn).

BACKGROUND

- 8 In May 2022, my company was engaged to undertake an assessment of the proposed Private Plan Change. My colleague Rewa Satory prepared an Assessment of Environmental Noise Effects report dated 21 October 2022 which accompanied the Application.
- 9 I provided oversight of that process and can confirm that I agree with the content of the noise assessment report submitted with the Application. I am satisfied that I can adopt the conclusions as my own.
- 10 In preparing this evidence I have reviewed the Application, the submissions that relate to noise (now withdrawn), and the updated Revision B Outline Development Plan dated the 4th of December 2023. In my evidence I will confine my comments to key points of the noise emission assessment, and address issues which were initially raised by submitters.

SITE AND PROPOSAL

- 11 The site is currently zoned Rural and was previously used for farming. The surrounding sites are also zoned Rural, including those on the other side of State Highway 1, and the Inland Kaikoura Road. To the east, on the other side of the Inland Kaikoura Road is the Kowhai River. The ocean is approximately 350 metres to the south of the site.
- 12 An area of land to the north, west and south of the site has recently been subdivided into residential sections. The sections are approximately two hectares in size. Some already contain completed dwellings, with dwellings on other sites at various stages of the Building Consent and construction process.

- 13 The size and shape of individual sites within the new zone have not been finalised; however, the Applicant has provided an Outline Development Plan which also shows the realignment of the Inland Kaikoura Road.
- 14 There will be internal roading within the site to access individual sites. The sites within the new Light Industrial Zone could be any size and the location of the internal roading has not been finalised; however, sites may typically be in the range of 0.2 – 2.0 hectares.
- 15 The zone anticipates light industrial activities, with commercial and retail activities also permitted and expected in the zone.

APPROPRIATE NOISE LIMITS

- 16 Noise from new activities established within the Plan Change area will be required to comply with the District Plan noise limits.
- 17 The operative District Plan noise limits are structured so that they are specific to both the zone in which the noise is generated, and the zone of the receiving site. This means that a new set of noise limits would be required for the new Light Industrial zone.
- 18 To determine an appropriate set of noise limits for this new zone, I have considered both the existing provisions in the District Plan, wider national and international guidance, and the existing noise environment.
- 19 Kaikoura District Council is also undertaking a rolling review of their District Plan. While I understand this does not yet have legal effect, I have also reviewed the Noise Chapter of the *District Plan Updated Consolidated Version 2022* to understand the likely structure of future rules. At this stage they appear similar to the operative Plan limits.

District Plan noise limits

- 20 The operative District Plan includes two Business zones. Business A has an intra-zonal limit and Business B has a zone boundary limit only. A limit also applies to noise from Business zones received at the notional boundary of sensitive activities in the Rural zone.

- 21 The following limits apply within a Business A Zone, or at the boundary of any Business B or Business A Zones, excluding a boundary shared with a Residential Zone:

On any day 0700 to 2300 hours *65 dB LAeq 85 dB LAmax*

All other times *55 dB LAeq 75 dB LAmax*

- 22 The following noise limits also apply to activities in Business zones measured at the notional boundary of any residential site in the Rural Zone:

Monday to Saturday 0700 to 2300 hours *55 dB LAeq*

At all other times *40 dB LAeq*

On any day between 2300 and 0700 hours the following day 70 dB LAFmax

- 23 The noise limits for activities in the Rural zones when assessed at any point within any other site in the same zone are as follows:

Monday to Saturday 0700 to 2300 hours *50 dB LAeq*

At all other times *40 dB LAeq*

On any day between 2300 and 0700 hours the following day 70 dB LAFmax

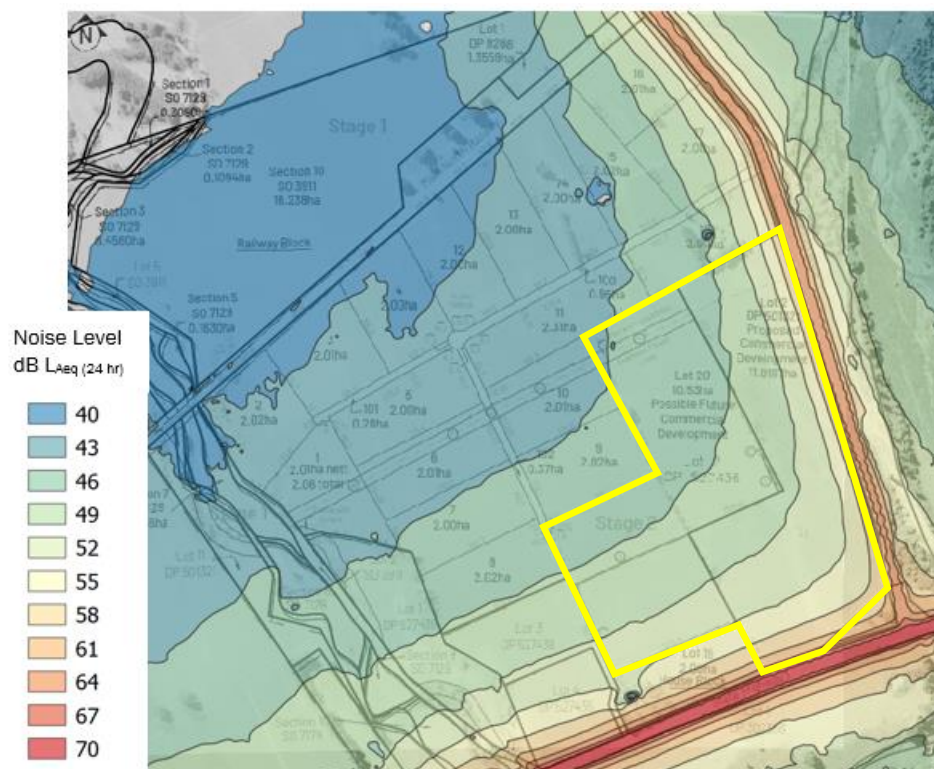
- 24 The Residential Zone limits are the same, except they have a higher daytime limit of 55 dB LAeq for noise received at other residential sites.

Existing noise environment

- 25 The noise limits for the Rural Zone do not necessarily provide an indication of the actual noise in the area. Existing and future residential dwellings in this area are exposed to noise from State Highway 1 (SH1) and the Inland Kaikoura Road. There is also noise from the Main North Railway Line, nearby airport and from the ocean.

- 26 Traffic noise modelling based on pre-pandemic volumes, provides an indication of noise levels received from road traffic at residences near the proposed Light Industrial Zone.

- 27 Expected 24-hour average noise levels due to traffic on SH1 and Inland Kaikoura Road are shown in the figure below (Light Industrial zone boundary shown in yellow). Since these are 24-hour average levels, noise levels will be higher at peak times and lower during the night-time.



- 28 This demonstrates that areas of the proposed zone that are close to SH1 and the Inland Kaikoura Road already receive noise from road traffic that is above 55 dB LAeq (24-hour average). This modelling suggests that road traffic noise will be audible on all Rural residential sites that adjoin the Light Industrial zone.
- 29 To confirm this, my colleague measured ambient noise levels in the vicinity of the site in May 2022. Along with general traffic noise, other sources observed included distant wave noise from the coast, bird and insect noise, small whale watching aircraft, "clunking" noise as vehicles travel over joints of the Kowhai River Bridge, and noise from an HVAC unit at 69 Inland Kaikoura Road.
- 30 Afternoon measurements confirmed that at locations near SH1, traffic noise levels are elevated during the daytime. An average of three cars per minute and one heavy vehicle every two minutes were observed during the measurement period. Noise measured in line with the roadside boundary of properties on

SH1 was 65 dB LAeq (15 min) and a maximum noise level of 83 dB LAFmax was measured when a large heavy vehicle passed.

- 31 In the same period, there was an average of one car per minute on the Inland Kaikoura Road and one heavy vehicle in the entire measurement period. This level of activity would generate a noise level at the notional boundary of the dwelling at 69 Inland Kaikoura Road of approximately 43 dB LAeq (15 min).
- 32 At locations removed from SH1, background noise levels are lower, with noise from traffic and the ocean measured at 38 dB LA90 (the level exceeded for 90% of the measurement period).
- 33 Between 10 and 11 pm, traffic volumes on SH1 had reduced to an average of 1 car every three minutes, and 1 heavy vehicle every minute. At 1 am, there were no cars observed over a thirty-minute period, with an average of one heavy vehicle every 6 minutes. At these times, the contribution from ocean sound had increased compared to the daytime measurements. At 600 metres from SH1, background noise levels of 45 – 48 dB LA90 were observed, primarily from the ocean.
- 34 These measurements indicate that properties adjacent to SH1 will still receive loud traffic noise events well into the night-time period, and that the contribution from ocean sound can vary, but may often dominate the background environment in the area at night.

Other guidance

- 35 NZS 6802:2008 *Acoustics – Environmental noise* outlines a guideline daytime limit of 55 dB LAeq (15 min) and a night-time noise limit of 45 dB LAeq (15 min) for “the reasonable protection of health and amenity associated with the use of land for residential purposes”. The Standard also recommends a night-time maximum noise limit of 75 dB LAFmax to prevent sleep disturbance.
- 36 The Standard explicitly states that a maximum (Lmax) noise limit should be set where sleep protection is required and should only be set for night-time hours.
- 37 I note that the Standard provides guidelines in section 8.3 regarding ‘daytime’ and ‘night-time’ for use in situations where these are not specified. The

timeframe recommended is 0700 to 2200 hours for daytime, and 2200 hours to 0700 hours for night-time on any day of the week.

- 38 Guidelines for Community Noise, a document produced by the World Health Organisation (WHO) based on extensive international research recommends a guideline limit of 55 dB LAeq (16 hours) to ensure few people are seriously annoyed in residential situations. A guideline limit of 50 dB LAeq (16 hours) is recommended to prevent moderate annoyance.
- 39 A guideline night-time limit of 45 dB LAeq (8 hours) and 60 dB LAmax at the façade of a dwelling is recommended to allow occupants to sleep with windows open. The document also offers a guideline limit of 30 dB LAeq within bedrooms to avoid sleep disturbance.
- 40 Both NZS 6802:2008 and the WHO guidelines discuss intrazonal limits for industrial areas of between 70 – 75 dB LAeq for compatible activities. NZS 6802 mentions that if residential accommodation is permitted separate sound isolation rules should apply to achieve adequate isolation of habitable rooms.

Appropriate noise limits for the zone

- 41 The current 55 dB LAeq daytime noise limit for Business zoned activities measured at the notional boundary of any residence in the Rural Zone is consistent with the upper guideline limits for the protection of residential amenity outlined in NZS 6802:2008 and by the WHO.
- 42 The night-time limit of 40 dB LAeq is 5 dB more stringent than the upper guideline limits from this guidance, and is lower than the background noise levels that appear to be received in the area at times from the ocean.
- 43 Therefore, where noise from new Light Industrial sites received at any notional boundary of a noise sensitive activity in the Rural Zone complies with the following levels, I consider that effects will be acceptable:
- | | |
|--------------------------------------|----------------------------------|
| <i>0700 to 2200 hours on any day</i> | <i>55 dB LAeq</i> |
| <i>2200 to 0700 hours on any day</i> | <i>45 dB LAeq / 70 dB LAFmax</i> |
- 44 To maintain a level of consistency with the District Plan Business A and B zone limits, the following limits are also proposed at the boundary of the Rural zone:

0700 to 2200 hours on any day *65 dB LAeq*

2200 to 0700 hours on any day *55 dB LAeq / 80 dB LAFmax*

45 Given the location of current and likely future dwellings, the notional boundary limit will be the more stringent control for this site.

46 Some nuances of the KDP noise limits have not been carried over into this new framework, as follows:

- (a) The night-time period commences at 10 pm instead of the later 11 pm onset of night-time in the KDP.
- (b) Sunday is not included in the night-time limits.
- (c) There is no daytime LAFmax noise limit, consistent with the commentary in NZS 6802:2008 that a LAFmax noise limit is primarily a sleep disturbance control.

47 These aspects are a less common feature of new District Plans, which often adopt a framework broadly similar to that described in NZS 6802 (which is referred to in the National Planning Standards).

48 Since the zone will have a boundary limit, I have not proposed an intrazonal noise limit between sites within the new Light Industrial Zone. This is consistent with the approach in the Business B zone.

POTENTIAL NOISE EMISSIONS FROM THE NEW LIGHT INDUSTRIAL ZONE

49 I have considered whether it is realistic for activities establishing within the new Light Industrial Zone to comply with the above limits, along with any potential cumulative noise issues such as from traffic on roads within the new zone.

50 Typically, an industrial zone would have a mix of moderate and high noise activities including contractors' yards, metal and wood workshops and the like, and lower noise activities such as storage / warehousing that might only have limited light vehicle movements producing noise. I understand there is the provision for other commercial and retail activities in this zone which will produce less noise.

- 51 In the table below, I have provided some examples of the typical noise levels produced by a range of sources, and the measures which may be required to ensure compliance with the noise limits proposed above.

Activity	Sound Level	Typical mitigation - Daytime	Typical mitigation - Night-time
Handheld metal-grinder, metal forming press	110 – 120 dB L_{WA}	Located indoors, or behind a barrier and set back in the order of 100 metres from any dwelling.	Located inside a fully enclosed space and set back in the order of 50 – 100 metres from any dwelling.
Waterblaster	100 – 110 dB L_{WA}	Set back in the order of 100 metres from any dwelling or 50 metres from a dwelling if orientated away from boundary or behind a barrier.	Closed doors at night and in the order of 50 metres from any dwelling.
Compressor, small forklift, loading excavator onto a truck	95 - 100 dB L_{WA}	Enclosed or behind a barrier or set back in the order of 50 metres from any dwelling.	Located indoors and at least 30 metres from a dwelling or set back in the order of 50 metres from any dwelling and behind a barrier.
Pneumatic ratchet - small	90 - 95 dB L_{WA}	Set back in the order of 40 metres from any dwelling or behind a barrier.	Set back in the order of 40 metres from any dwelling and behind a barrier.
Workshop – typical	85 dBA internal reverberant level	Set back in the order of 30 metres from any dwelling or orientated away from dwelling.	Closed doors at night and in the order of 30 metres from any dwelling.

- 52 This indicates that a range of higher noise activities could operate in the daytime with minimal mitigation - for example, a large forklift could operate behind a warehouse with very little set back. Metal forming equipment or a metal grinder could operate inside a building with the doors closed.
- 53 For activity occurring during the night-time additional attention to mitigation will be required, such as locating activities indoors or locating activities that are expected to produce higher levels further from the Rural Zone boundary. Work

in workshops during the night-time would also likely need to typically be undertaken with doors closed. Overall, I expect it will be practical for new industrial activities to comply with the proposed night-time noise limits, especially where the activity is located on sites that are in the second row back from the zone boundary and shielded by buildings.

- 54 Since the sites surrounding the proposed new Light Industrial Zone have recently been sub-divided and residential dwellings are permitted on all these sites, future occupiers of the Light Industrial Zone would need to be mindful of both the boundary limit, and the notional boundary limit, which would apply at existing and new dwellings. However, as the construction of dwellings on many of the adjoining sites is complete or well progressed, potential industrial operators will have the opportunity to understand the likely form and location of residential dwellings, and make decisions accordingly.

Cumulative noise

- 55 I have considered a hypothetical scenario where several smaller noise generating sites are developed in the Light Industrial Zone, along two boundaries of a small Rural lot.
- 56 I have also included noise from traffic on a hypothetical internal road close to the Rural boundary (separated by one lot from the boundary). While noise from public roads is not covered by the District Plan noise limits; noise from vehicles travelling on the internal roads of the zone is relevant when considering the overall possible noise effects on nearby properties.
- 57 My analysis confirmed that since activities will need to comply with both a zone boundary limit, and a notional boundary limit, in typical configurations noise levels are unlikely to be able to combine meaningfully to result in noise levels higher than the noise limits being received on adjoining Rural lots.

RESPONSE TO MATTERS RAISED BY SUBMITTERS

- 58 I have reviewed the submissions from Hopkins and Paul at 392B State Highway 1, which specifically mention noise pollution, and request that industrial use of the land is moved 200 metres away from their boundary. I understand that Hopkins and Paul have since withdrawn their submissions, as have all further submitters in support of Hopkins' and Paul's submissions.

- 59 Activities establishing will be required to comply with the noise limits for the zone. The notional boundary limits I have proposed above would ensure that noise levels are reasonable and protect residential amenity for nearby current and future dwellings. This is the primary method of noise management.
- 60 I recognise that there are pleasant aspects to the soundscape in this environment, including the dominance of ocean sound at certain locations, and times of the day. However, given the proximity to major roads, there is also a notable amount of traffic noise, especially for sites near SH1. In this context, I consider the proposed noise limits to be reasonable.
- 61 I have demonstrated above that it will be practical for new activities to comply with these limits, with appropriate attention to layout and screening. Louder activities will require larger setbacks from the boundary – although this is unlikely to need to be as large as 200 metres.
- 62 I recognise that increasing the separation between activities in the Light Industrial zone and Rural lots will make it easier for some sites to comply with the proposed limits without requiring specific attention to layout or design. This does not necessarily guarantee a better outcome – as the noise limit is the same either way. Including boundary screening would have a similar outcome.
- 63 My experience has been that many activities that establish in Industrial Zones do not generate particularly high noise levels. This means that a large buffer distance is typically not required to achieve reasonable noise outcomes.

SECTION 42A REPORT

- 64 I have reviewed the section 42A report dated 7 March 2024. That report does not discuss noise directly. However, I note the following with regard to Appendix Six / Seven '*Recommended Amendment to Rules Package*' of the section 42A report:
- (a) Rule LIZ-S8 1.b records a night time notional boundary limit of 35 dB LAeq, which I understand has been carried through from the Notified Rules Package. As I have discussed above, I consider a night time notional boundary limit of 45 dB LAeq to be reasonable and appropriate in this environment – so a limit of 35 dB LAeq represents a very high level of amenity protection. This limit will mean any industrial

- 68 Rule LIZ-S8 1.b records a night time notional boundary limit of 35 dB LAeq. This represents a very high level of amenity protection and will mean any industrial activities operating at night time will need to carefully manage their noise emissions.

Jeremy William Trevathan

Dated: 12 March 2024