

Attachment C

Noise Evidence

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of proposed Plan Change 10 to the
Selwyn District Plan

EVIDENCE OF STEPHEN GORDON CHILES

Introduction

1. My name is Doctor Stephen Gordon Chiles. I am a Principal, Acoustics Engineer, with URS New Zealand Limited. I hold a First Class Honours Bachelor of Engineering degree in Electroacoustics from the University of Salford and a higher degree of Doctor of Philosophy in Acoustics from the University of Bath. I am a Chartered Professional Engineer in New Zealand and a Chartered Engineer in the United Kingdom. I am a Fellow of the UK Institute of Acoustics. I have worked in the field of acoustics since 1996. I have previously worked: as a consultant for the international firms Arup and WSP; as a consultant for the specialist acoustic firms Marshall Day Acoustics and Fleming & Barron; and as an acoustics research officer at the University of Bath.
2. I represented the New Zealand Acoustical Society on the Standards New Zealand committee responsible for the 2008 revisions of the general environmental noise standards NZS 6801¹ and NZS 6802², and I am chairman of the committee that has just published the revision of the wind farm noise standard NZS 6808³. I am the independent professional advisor for noise and vibration to the NZ Transport Agency. I am accredited by the Ministry for the Environment and have acted as an independent commissioner.
3. I have been involved with a large number of environmental noise assessment projects in New Zealand, Australia, Ireland, Hong Kong, Indonesia, Fiji and the United Kingdom. My recent experience includes acoustic assessment for numerous large infrastructure projects and plan changes, including advice to the Queenstown Lakes District Council, Christchurch City Council (Banks Peninsula) and Auckland City Council on acoustics rules.
4. On this occasion, I have been engaged by the Selwyn District Council to assess potential noise effects resulting from the expansion of the Izone business park in Rolleston, as proposed by Plan Change 10.
5. In preparing my evidence, I have reviewed:
 - a) The Selwyn District Plan, Section 22.4 'Activities and Noise' (Business Zones),
 - b) Report 41934-002, 'Proposed Plan Change 10, Business 2A Zone at Rolleston' dated 30 October 2009, Revision 3,
 - c) Public submissions and further submissions on Proposed Plan Change 10,
 - d) Legal opinion by Adderley Head regarding rail noise, dated 2 March 2010, and
 - e) Noise testing at Westland Milk memo, Food and Health Standards, 8 March 2010.

¹ New Zealand Standard NZS 6801:2008 Acoustics – Measurement of environmental sound

² New Zealand Standard NZS 6802:2008 Acoustics – Environmental noise

³ New Zealand Standard NZS 6808:2010 Acoustics – Wind farm noise

6. I have also made reference to noise measurements conducted by URS on 22 and 23 September and 28 October 2009. I conducted a site visit on 9 March 2010.
7. I have read the code of conduct for expert witnesses set out in the Environment Court practice note, and confirm that I have complied with the code in the preparation of my evidence. In particular, this evidence is within my sphere of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express. I am not aware of any acoustics experts appointed by other parties.
8. The Plan Change 10 report dated 30 October 2009 gives full details of the proposal. In terms of potential noise effects there are two main elements:
 - a) Expansion of Izone to encompass another 49 hectares currently zoned rural; and
 - b) Creation of a new zone category called 'Business 2A' to include both existing and proposed new parts of Izone.

Selwyn District Plan

9. Rule 22.4.1.1 of the district plan sets noise limits from activities in Izone, applying at the boundary with the adjacent rural zone. There are no limits between sites within Izone. The noise limits at the rural boundary are:
 - a) 7.30 am – 8.00 pm 60 dBA L10
 - b) 8.00 pm – 7.30 am 40 dBA L10
 - c) 7.30 am – 8.00 pm 80 dBA Lmax
 - d) 8.00 pm – 7.30 am 65 dBA Lmax
10. L10 is the level exceeded for 10% of the time, and is essentially a form of average sound for an activity. Lmax is the maximum sound level. I will also refer in my evidence to $L_{Aeq(15\ min)}$ and L_{AFmax} , which are new parameters superseding L10 and Lmax respectively; although not in the Selwyn District Plan.
11. The night-time limits (40 dBA L10 and 65 dBA Lmax) are relatively stringent for a business park. In fact, the L10 limit is the same, and the Lmax limit is 5 dB lower, than the general rural zone noise limits in the Selwyn District. The Izone noise limits are also below the guideline residential noise limits, given in NZS 6802, of 45 dB $L_{Aeq(15\ min)}$ and 75 dB L_{AFmax} . The Izone limits also apply for an extended night timeframe compared to the NZS 6802 guidelines of 2200 h to 0700 h. As such, the Izone noise limits should protect neighbouring residents in the rural zone from sleep disturbance and maintain good night-time amenity.
12. The daytime noise limits (60 dBA L10 and 80 dBA Lmax) for Izone are typical of a business park. Again, the L10 limit is the same, and the Lmax limit is 5 dB lower, than

general rural zone noise limits in the Selwyn District. NZS 6802 gives a guideline daytime residential noise limit of 55 dB $L_{Aeq(15\text{ min})}$. The 60 dB L10 Izone noise limit at the rural boundary will generally result in compliance with 55 dB $L_{Aeq(15\text{ min})}$ at the nearest residences, although the exact numbers will depend on specific sound sources. Therefore, I consider that the existing noise limits will result in reasonable daytime amenity at the nearest residences.

13. Rule 22.4.1.1 states that the noise limits discussed above apply *“at the boundary of any site adjoining the Rural zone”*. This wording is not in accordance with current best practice. I consider that the assessment point should not be on the Izone boundary, as in places this is adjacent to road, waterway and rail reserves within which adverse noise effects would generally not be experienced. Best practice would be for the noise limits to apply at any point within the rural zone, excluding the road, waterway and rail reserves. The current wording also creates a potential loophole for sites in Izone not directly adjacent to the rural zone, including if there were intervening designations. All these problems exist regardless of whether Plan Change 10 proceeds. However, to provide a solution, I recommend that as part of Plan Change 10 the introductory wording to rule 22.4.1.1 should be changed to:

“Applying at any point within the boundary of any site in the Rural zone, excluding road, waterway and railway reserves:”

14. On the basis of the sound surveys conducted by URS, I consider that the existing acoustic environment in the rural area around Izone does not have any unusual features, and is typical of a rural area with relatively low sound levels at times. However, in places the sound levels are significantly affected by traffic on Wards Road, State Highway 1 and the railway line. Within this context, I consider that the existing noise limits for Izone are appropriate as they maintain a level of amenity comparable with general rural zones.
15. For the reasons given above, I consider that the existing noise limits are also appropriate for the new area of Izone proposed by Plan Change 10. While this new area is closer to residences on Armack Drive, I note again that the L10 noise limits are the same as the general rural zone noise limits already applying at these residences, and the Lmax noise limits will become 5 dB more stringent.
16. Under proposed Plan Change 10, all of the provisions in rule 22.4.1.1 discussed above are replaced by identical provisions in a new rule 22.4.1.5. Other than the change required to the introductory wording that I have detailed, I consider that these limits are appropriate to protect residential health and amenity.
17. In reviewing the noise limits in the district plan, I found a number of anomalies:

- a) There is no reference made to the measurement and assessment standard (e.g. NZS 6801 and NZS 6802),
 - b) Use of daytime Lmax noise limits is generally not appropriate,
 - c) There is no provision for construction sound such as by reference to NZS 6803⁴,
 - d) The acoustics parameters have been superseded, and
 - e) Vibration limits are missing.
18. All of these anomalies are beyond the scope of Plan Change 10 to address, and exist regardless of whether or not Plan Change 10 proceeds. However, I understand that following my review in connection with Plan Change 10, the Selwyn District Council is now looking to rectify these matters as part of a separate process.

Sound surveys

19. In the course of preparing this plan change, the Selwyn District Council became aware of noise complaints about existing activity in Izone. URS was commissioned to investigate sound of night-time construction and sound from reversing alarms on the straddle carriers moving containers at the Warehouse site.
20. URS measured construction sound on 22 and 23 September 2009, during a concrete pour for the Westland Dairy building. The construction activity during the daytime complied with the Izone noise limits. The night-time construction activity exceeded the noise limits at the Izone boundary, but complied at the nearest residences. I have already discussed how I do not consider the immediate site boundary to be the appropriate assessment position. In my opinion, it is unlikely that residents would complain about construction sound at the levels measured during the survey. However, I understand that it was the same activity of pouring concrete that had previously caused the complaints. A difference that may have occurred is that during the survey the concrete trucks were screened behind a wall while queuing, but this wall might not have existed during previous pours. If this were the case then it indicates that construction sound could be controlled by good management as, for example, there should be flexibility as to the waiting position for concrete trucks.
21. I have already noted that I consider there to be a general deficiency in the district plan with respect to the lack of provisions specifically addressing construction sound. In the interim, the existing Izone noise limits are more stringent than normal construction noise limits and therefore provide good protection for neighbours. To ensure compliance with these limits, I recommend that construction activity in Izone should be subject to management plans that

⁴ NZS 6803:1999 Acoustics – Construction noise

include community liaison and sound monitoring procedures. This may be outside the scope of Plan Change 10, so would need to be introduced as part of a separate process.

22. During the daytime and night-time sound surveys conducted by URS all operational sound from the existing Izone activities was fully compliant with the district plan noise limits. At Armack Drive there was no operational sound from Izone audible. Some sound may be audible during quieter times. The levels would also increase if Izone expands and becomes fully occupied but would not be unduly intrusive in the existing environment.
23. URS has specifically investigated the Warehouse straddle carriers. These usually operate between the hours of 0700 h and 1630 h, and are not operational after 2000 h. The dominant sound of the straddle carriers is the engine. Reversing alarms are not dominant, and there is minimal impact sound from containers. Sound from the straddle carriers, including reversing alarms, was not audible at residential properties on Armack Drive. Although sound from the straddle carriers and reversing alarms might become more prominent during quieter periods, the levels are within the district plan limits and I do not consider that the sound would be unreasonable at the nearest neighbours.
24. Following the URS surveys for construction sound and straddle carrier sound, complaints were made about railway sound associated with the Westland Dairy site in the existing part of Izone. The Environmental Health Officer, David Shovel, has investigated the railway sound for the Selwyn District Council, and I will discuss this later in my evidence.

Submissions

25. A number of submissions on Plan Change 10 raise noise issues as a reason for opposition. Many of these submissions raise noise in general terms or refer to the specific sources of construction and reversing alarms that I have already discussed. For the reasons I have already given, I consider that compliance with the existing Izone noise limits would result in reasonable sound levels. However, I also consider that it is important that the Selwyn District Council monitors and enforces these noise limits to ensure ongoing compliance.
26. Most of the submissions raising noise as a concern do so in relation to the new rail facility for Westland Dairy. Any activity associated with the Westland Dairy site is unaffected by Plan Change 10 as it is in the existing part of Izone and beyond the scope of this assessment. The key factor for Plan Change 10 is the potential for another similar rail siding in the proposed new area of Izone, for which the Westland Dairy situation provides a useful reference.

Railway sound

27. To service the Westland Dairy site in Izone, Ontrack has constructed two new loop lines parallel to the main line, within the railway reserve outside Izone. There is a spur from these loop lines to the Westland Dairy site. This spur or another new spur could service other sites in Izone in future, including sites in the new area proposed by Plan Change 10. I have attached an annotated photograph to my evidence marked as "A", showing the existing railway lines outside Izone.
28. Adderley Head has advised that sound from railway activity generated by Izone is a potential noise effect that should be assessed, even when the activity is outside Izone and in the railway reserve. Trains would also pass through a road and waterway reserve between the railway reserve and Izone. However, I consider that this brief transition is not significant compared to potential effects from the railway reserve and in Izone.
29. All railway activity on the existing and any future spur lines within Izone is automatically subject to the general noise limits for Izone that I have already discussed. These limits would ensure that railway sound remains at a reasonable level which would protect health and maintain appropriate amenity at neighbouring properties. To achieve these noise limits, train movements within Izone would be restricted at night, and daytime movements might require screening from neighbouring properties.
30. The recent investigation of sound from railway activity at the Westland Dairy site found that railway activity in the Izone site at night (before 0730 h) significantly exceeded the district plan noise limit immediately on the Izone boundary. On the basis of the relative distances from the siding, it is likely that the noise limit would also be exceeded on the opposite side of the road and railway reserves, where I consider the assessment position should be located. I understand that the Selwyn District Council is acting to address this issue with Westland Dairy.
31. For the Westland Dairy rail movements, complaints also relate to activity on the loop lines outside Izone within the railway reserve. While these movements are not subject to any noise limits in the district plan, to a large extent noise from these movements outside Izone will be controlled by restrictions on activity inside Izone. If rail operations inside Izone only occur during the day then this will prevent shunting of wagons at night from the loop lines into Izone and vice versa. This just leaves activity between the main line and loop lines that is not directly or indirectly controlled.
32. The movement of wagons from the main line to the loop line and vice versa would not be restricted by controls within Izone. I have considered the potential noise effect from this

activity using the current Westland Dairy operation as an example. Ontrack has advised that there are usually nineteen or twenty train movements on the main line adjacent to Izone over a twenty-four hour period, although these numbers fluctuate. One of these movements is a train from the Westland Dairy factory in Hokitika, which passes Izone at around 0200 h. The new rail activity generated by the Westland Dairy facility in Izone is that the existing 0200 h train now leaves wagons with shipping containers on the loop lines outside Izone as it is passing, and collects the wagons with empty containers on the return trip later in the morning.

33. I have not observed the rail activity on the loop lines and I have not conducted a quantitative analysis. Based on the activity described above, leaving wagons on the loop lines has not created an entirely new noise event at night as there was already a train passing. The noise event will be longer as the train stops and starts, and will include new sound such as from couplings. However, in the context of a railway reserve which already has regular twenty-four hour activity I consider that this variation to an existing noise event would not represent a significant adverse noise effect.
34. Sites in the new part of Izone proposed by Plan Change 10 could create demand for additional train movements between the main line and loop lines during the day or night. Unlike the Westland Dairy situation, this could include generation of completely new train movements on the main line. However, the number of additional train movements should be limited, by the number of sites in Izone that might be serviced by rail, to no more than a few additional trains. On this basis, I do not consider that Plan Change 10 would cause a significant adverse noise effect from train movements between the main line and loop lines within the railway reserve.

Conclusions

35. The existing noise rules for Izone provide reasonable protection of residential health and amenity for the nearest neighbours. These same rules would be appropriate for the proposed new area of Izone.
36. The noise rules in the Selwyn District Plan contain several anomalies which are beyond the scope of Plan Change 10. I understand these are being addressed by the Selwyn District Council in a separate process.
37. Existing operational and construction sound levels from Izone have been measured and found to comply with the noise limits at the nearest residential neighbours. The construction sound exceeded the night-time noise limits at the immediate site boundary.

Effective management of construction sound in particular is required to ensure ongoing compliance.

38. Rail activity within Izone will be controlled by the general noise limits for Izone. The noise limits are likely to restrict rail activity in Izone at night. Rail activity between spur lines in Izone and the loop lines in the railway reserve will be indirectly controlled by limitations within Izone. Rail activity between the loop lines and main line in the railway reserve will not be controlled. However, in the context of existing twenty-four hour rail activity in the railway reserve I do not consider that this will generate a significant adverse noise effect.

Dr Stephen Chiles
March 2010

Attachment A

Photograph of railway lines outside Izone

