

BEFORE INDEPENDENT HEARING COMMISSIONERS APPOINTED BY THE
TASMAN DISTRICT COUNCIL

IN THE MATTER OF

The Resource Management Act 1991

AND

IN THE MATTER OF

Application for resource consent by
Māpua Community Boat Ramp Trust

STATEMENT OF EVIDENCE OF JON FARREN

NOISE

Dated: 31 October 2024



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1 INTRODUCTION

- 1.1 My name is Jon Farren.
- 1.2 I am the Manager and Principal of the Christchurch office of Marshall Day Acoustics (MDA).
- 1.3 I hold a Bachelor of Engineering with Honours in Electroacoustics from the University of Salford in the United Kingdom. I hold full Membership of the Institute of Acoustics (UK), a requirement of membership being that I am active in the field of professional acoustics and satisfy the Institute's requirements regarding level of qualifications and experience.
- 1.4 I have been employed as an Acoustic Consultant for 30 years, approximately 25 of which have been with Marshall Day Acoustics (MDA). I have considerable experience in the areas of planning regarding noise, the assessment of noise and vibration, and noise control in relation to both environmental noise and building acoustics.
- 1.5 Of specific relevance to this proposal, I have assessed noise effects and performed compliance monitoring at over 100 land use activities that potentially impact adjacent residential areas
- 1.6 I am responsible for the technical content of the noise assessment that was submitted in support of the application dated 15 January 2024.

2 CODE OF CONDUCT

- 2.1 While this is not a Court process, I confirm I have read the Environment Court's Practice Note 2023, and I agree to comply with it. My qualifications as an expert are set out above. I confirm that the issues addressed in this brief of evidence are 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.

3 SCOPE OF EVIDENCE

- 3.1 My evidence will deal with the following:
- (a) key findings of my assessment of effects;
 - (b) acoustic-related matters raised in the peer review;
 - (c) matters raised in the s42A report.
- 3.2 My evidence includes an updated assessment of the changes to the proposed activity since my January 2024 noise report was prepared.
- 3.3 Whilst there is some uncertainty regarding the likely use of the proposed boat ramp, my review of the available information suggests that most activity occurs during the peak Christmas/New Year and other holiday periods. Outside this time, regular activity is mainly limited to weekends and public holidays throughout the year. In respect of potential noise effects, these usage patterns indicate that peak noise impacts would be concentrated over relatively short periods, followed by extended stretches of relatively low noise activity.
- 3.4 I note boat launching currently occurs at Grossi Point and traffic movements and noise from recreational craft form part of the existing noise environment for dwellings along Tahi Street. Dwellings fronting onto Tahi Street, south of the application site, currently experience elevated early morning traffic noise levels from vehicles and trailers accessing Grossi Point. They will also experience noise from recreational vessels motoring along the channel. Both these noise sources will diminish if the boat ramp becomes operational.
- 3.5 Early morning boat launches have the greatest potential for noise effects. The available usage data is not clear on how many launches may occur during the earlier morning period before 7am, which is considered as 'night-time' in the District Plan. I have predicted noise levels associated boat ramp use on a conservative basis – both in terms of the noise level used and the number of launches that could feasibly occur.

- 3.6 The only dwelling where an adverse noise effect may be experienced is 13 Tahi Street and the owner has provided affected person approval. Even if these high levels of boat ramp activity were to eventuate, and some information suggests this is unlikely, boat ramp noise levels at other dwellings will result in noise levels of 45 dB L_{Aeq} or less, which is a reasonable noise environment in the context of appropriate residential noise amenity. For the majority of the time, boat ramp noise levels will be less than 40 dB L_{Aeq} which is the District Plan permitted activity night-time noise limit.
- 3.7 Depending on where vehicles and trailers choose to park during the night-time period in the proposed Tahi St west car park, car parking noise levels have the potential to exceed the District Plan permitted activity night-time limits at 17 Tahi Street and 27 B/C/E Aranui Road. My assessment is based on peak boat ramp activity, which as I have already discussed, is not present at all times through the year. Noise control fences to the car parking area will reduce noise emissions to below the TRMP permitted activity noise levels.

4 NOISE LIMITS

- 4.1 The Tasman Resource Management Plan (TRMP) permitted activity noise limit for the adjacent Residential and Open Space zones are a 'daytime'¹ limit of 55 dB L_{Aeq} , except on Saturdays after 6pm, and all day on Sundays and public holidays when a lower noise limit of 40 dB L_{Aeq} applies. 40 dB L_{Aeq} and 70 dB L_{AFmax} are the night-time noise limits.
- 4.2 I do not consider a 40 dB L_{Aeq} noise limit is required during the day on Sundays and Public holidays in order to provide appropriate residential noise amenity. I would expect there to be very little difference in ambient noise level on Sundays and Public Holidays compared with any other day of the week. In my opinion, providing a 55 dB L_{Aeq} daytime noise limit on all days will provide appropriate residential amenity. This

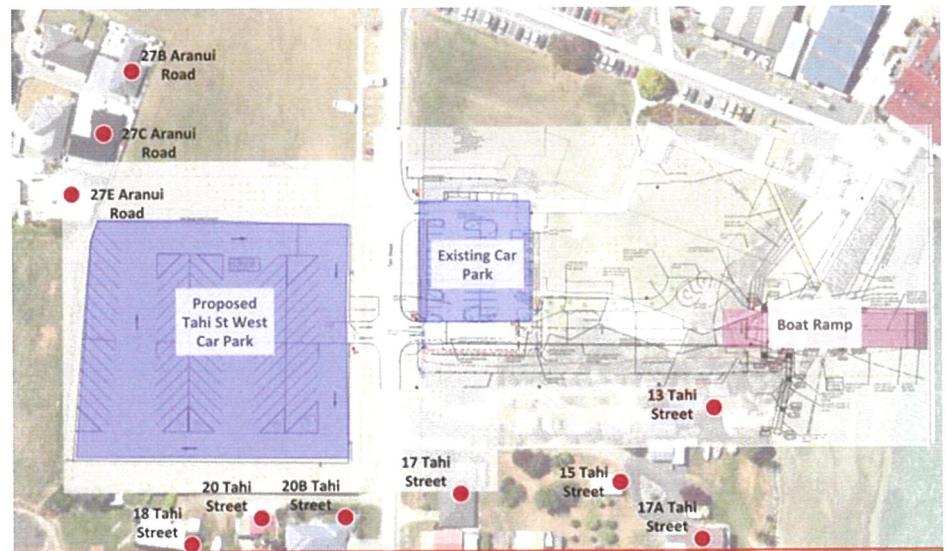
¹ 7.00 am to 9.00 pm Monday to Friday inclusive and 7.00 am to 6.00 pm Saturdays (but excluding public holidays).

is consistent with the TRMP's limit for other days of the week and guidance published by the World Health Organisation and NZS 6802².

5 NOISE ASSESSMENT

5.1 Since I prepared my January 2024 noise report, the Application has changed to remove the Scout Hall and a car park has been relocated. My evidence will discuss the potential noise emissions from the revised layout of the site, and will focus on the proposed use of the boat ramp and car parking areas as these aspects of the proposal have the greatest potential for adverse noise effects. The current layout of the site is shown in Figure 1.

Figure 1 – Boat ramp, car parks and adjacent dwellings



5.2 As the Sea Scout/Community building no longer forms part of the application, I do not discuss this aspect further in my evidence. No boat washing facilities will be provided at the ramp.

Boat ramp noise

5.3 I understand that, through use of a barrier arm, access to the boat ramp will be limited to the following times:

- (a) Summer (Daylight saving hours) 4.30 am to 10 pm

² New Zealand Standard NZS 6802:2008 *Acoustics - Environmental Noise*

(b) Winter (Non-Daylight-Saving hours) 5.30 am to 9 pm

5.4 As a result, I expect most activity would take place during daylight hours on weekends and holiday periods with daytime being defined as 7 am to 9 pm in the District Plan.

5.5 However, my assessment also considered the situation that that boat ramp would be used during the night-time period as defined in the District Plan (i.e. before 7am) when the more stringent noise limits of 40 dB L_{Aeq} and 70 L_{AFmax} apply.

5.6 The data I have used for my calculations (based on a source measurement from the activity of 44 dB $L_{Aeq (15 min)}$ at 33 metres) is representative of the loudest boat launch recorded during a series of noise measurements at other boat ramp sites. I consider the measurement data to be conservative as it included:

(a) A ute driving to the ramp

(b) The ute manoeuvring at the ramp (incl. arrival, reversal down ramp, boat taken off)

(c) The ute accelerating up the ramp

(d) The boat engine starting and leaving.

5.7 Other vehicle access and boat launches that were observed were in the order of 10 dB quieter.

5.8 Mr Tim Kelly's transportation RFI response dated 14 December 2023 indicates the operating capacity of the launch area will be 24 movements per hour. However, I understand this number to illustrate the engineering design capacity of the ramp and not the actual anticipated ramp usage numbers. Mr Chris Rossiter's transportation peer review indicates that 24 launches per hour will be unlikely to be achieved in practice³.

³ Section 3.1 Stantec's transportation peer review dated 24 September 2024

- 5.9 Mr Kelly estimates that during the peak summer holiday period, boat ramp use will be 40 users per day on average with a maximum of 70. This data is based a 25% uplift on actual daily use numbers collected at Grossi Point during the peak summer holiday period from 29 December to 30 January 2021. I have provided this data for reference in Attachment A.
- 5.10 The data show higher usage at weekends and public holidays compared with weekdays. I would expect the data to be considerably lower at other times of the year. I also note that not all of the existing Grossi Point launch activity will migrate to the proposed ramp. As such, I consider the calculations I describe below to be conservative, as actual boat launch activity could well be less.
- 5.11 I note Mr Kelly’s usage data does not provide the hourly breakdown of boat ramp activity. In my noise assessment, I predicted noise levels for one vehicle using the boat ramp every 15 minutes which is equivalent to four launches per hour. (15 minutes is the reference time interval required by the District Plan.) I consider this to conservatively represent typical usage over the year. During the peak summer period, my conservative estimate would be 30% of the entire day’s boat ramp activity would occur during the first hour of operation. In other words, my calculations are based on the conservative assumption that 75% of the total daily summertime boat ramp launches would occur in the 2.5 hour period between 4.30 to 7am. Based on the numbers provided by Mr Kelly, this would translate to the hourly use figures in Table 1.

Table 1 Boat ramp activity

Time of year	30% of day’s activity during first hour	
	Per hour	Per 15 minute period
Typical daily usage over calendar year	4	1
Summer Average (40 launches)	12	3
Summer Maximum (70 launches)	21	6 (5.25 rounded up)

- 5.12 Whilst I have used this data for my calculations, I note that my heavily weighting boat ramp activity to the pre 7 am period is at odds with the

hourly usage collected at other boat ramps in the region as described in *Tasman Boat Ramp Indicative Business Case – Item 2.6* which is provided as Attachment 6 to the Section 42A report. I have provided the relevant section as Attachment B to my evidence and the key graphic below with my additional text labels to assist legibility. This holiday period hourly data suggests that peak activity occurs during the middle of the day, not in the early morning. Motueka, the bottom grey line in the graph, has two boat lanes like the proposed Mapua ramp, the others have three.

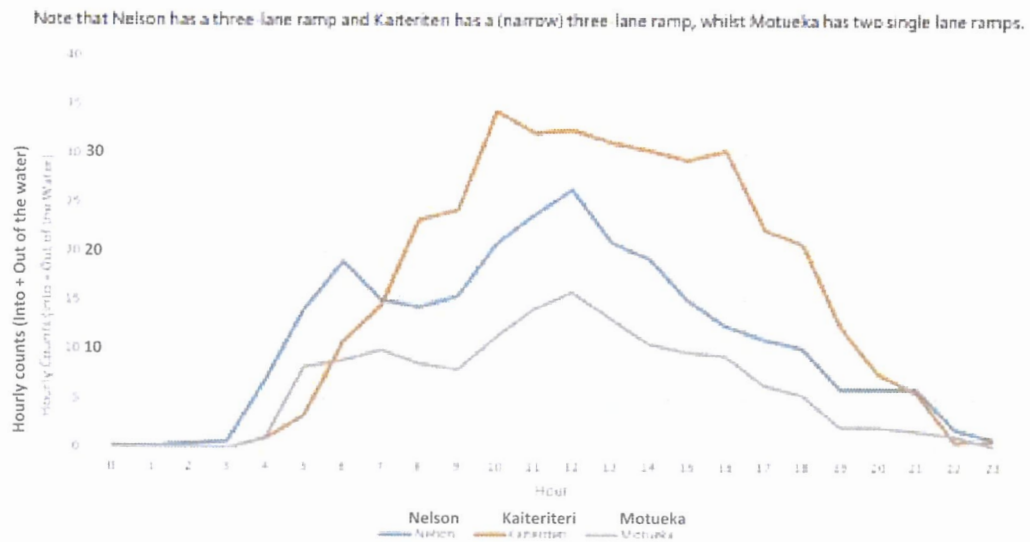


Figure 9: Boat Ramp Activity – Average Weekday/Holiday Activity
Figure 9 - Boat Ramp Activity - Average Weekday/Holiday Activity

- 5.13 I raise this issue to illustrate that, whilst I have assessed conservative levels of boat ramp and car park activity, the reality could feasibly be different with a much reduced noise impact.
- 5.14 The closest dwelling to the boat ramp will be 13 Tahi Street. Using the conservative noise level data referred to in Paragraph 5.6 that my company has collected at similar boat ramps, I have calculated a noise level of 50 dB L_{Aeq} at 13 Tahi Street for one launch in a 15 minute period. This level is 10 dB above the night-time permitted activity noise limit. I understand that the owner of 13 Tahi St has provided affected party approval. At the next adjacent properties, 15 and 17A Tahi Street, my calculations show the boat ramp noise will essentially be below the 40 dB L_{Aeq} permitted activity night-time noise limit. Figure 2 below provides noise contours showing the propagation of noise from the boat

ramp during use. A larger version of this image is provided as Attachment C.

5.15 I note that Figure 2 shows noise levels for one “launch” at the boat ramp over a 15 minute assessment period. With reference to Table 1, If three to six launches were to occur in a 15 minute period, noise levels would be approximately 5 to 8 dB higher. Figure 3 shows the noise contours for 21 launches per hour - modelled as 6 per fifteen minutes - noting that this is the stated ramp capacity of 24 launches per hour and unlikely to be possible according to Mr Rossiter’s peer review. Even at these high activity levels, my assessment indicates that noise levels at the dwellings at 15 and 17A Tahi Road would receive noise levels of approximately 40 to 45 dB L_{Aeq} respectively. 40 dB L_{Aeq} is the TRMP night-time permitted activity limit and 45 dB L_{Aeq} is the World Health Organisation recommended night-time noise limit to permit uninterrupted sleep with windows open for ventilation. As I discuss, below, I do not consider there to be any significant adverse noise effect at these levels.

Figure 2 – Noise contour plot for 1 launch per 15 minutes

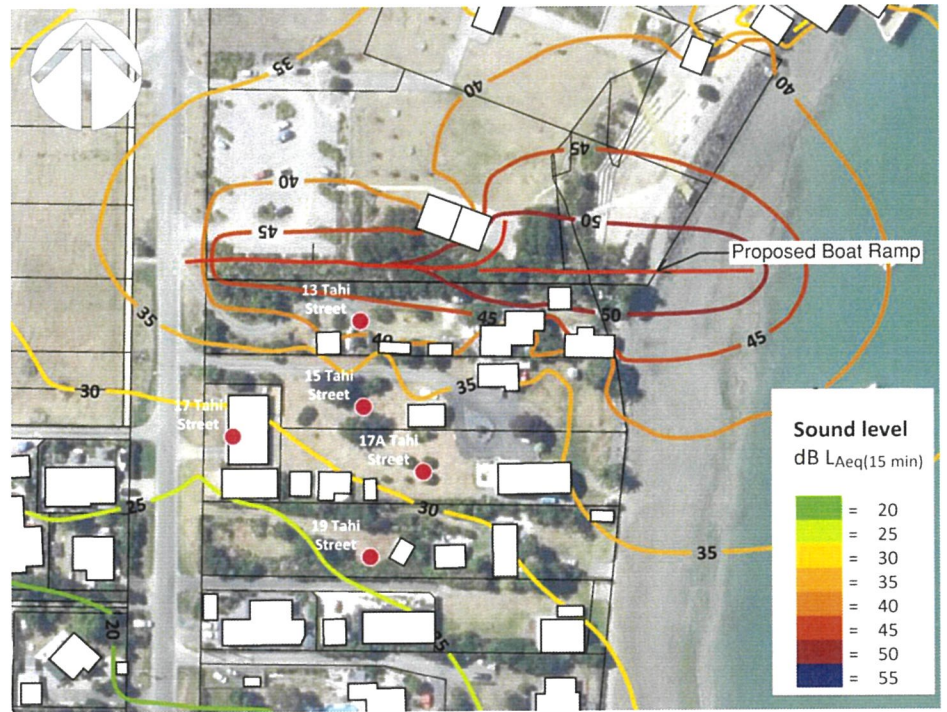
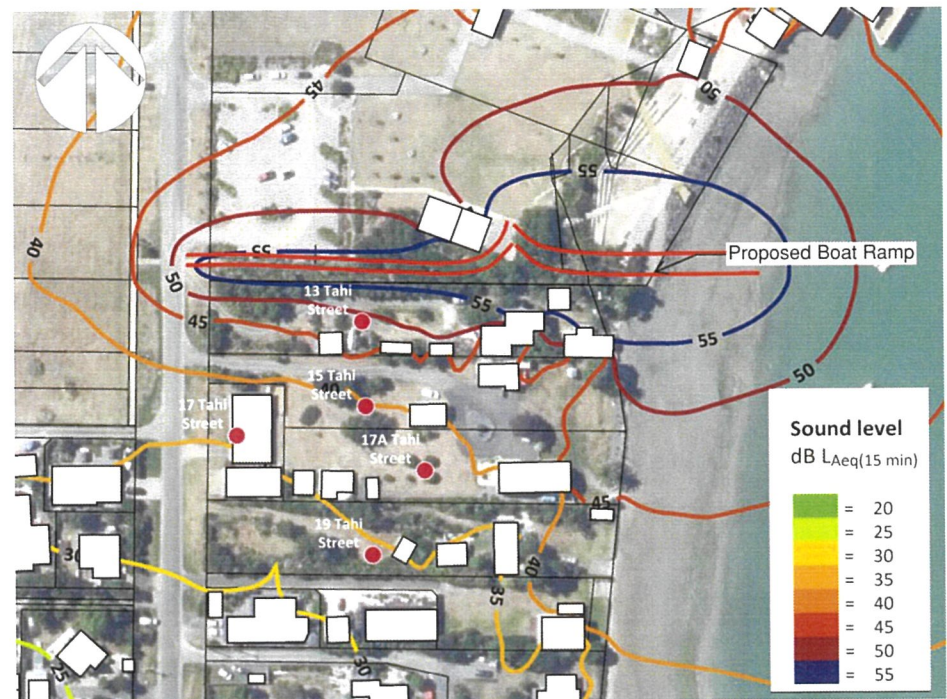


Figure 3 – Noise contour plot for 6 launches per 15 minutes



Proposed West Tahi Street Car Park

- 5.16 This proposed car park did not form part of the application during my initial noise assessment. The location of this car park is shown in Figure 1. Following on from the boat ramp noise predictions discussed above, I expect that vehicles and boat trailers will park in the west car park after the boat has been launched.
- 5.17 The nearest dwellings to the south of the car park are 18, 20 and 20B Tahi Street. The edge of the car park is approximately 12 metres from these dwellings' boundary and is separated by a timber fence. The nearest dwelling to the north is at 27E Tahi Street at the furthest corner from the car park entrance and this property does not have any fencing.
- 5.18 Car park usage and its noise generation will likely be directly related to the boat ramp activity. For example, car park noise levels will be relatively low for most of the year and have peak activity during the busiest days of summer. Logically, vacant parking spaces close to the entrance are likely to be occupied first and those furthest away occupied last. In Table 2, I have calculated car and trailer parking noise levels assuming the conservative situation that the closest parking bays to each dwelling will be occupied. Taking into account the distance to the car park entrance, I consider that dwellings will be unlikely to experience these levels of noise during the night-time period before 7am when spaces closer to the entrance are likely to be available. However, I have presented the data to illustrate the range of noise levels that could result. The predicted noise levels in Table 2 are based on a ute and boat trailer movement of 77 dB L_{AE} at 5 metres.

Table 2 – Ute and trailer parking noise levels at nearest dwellings.

Dwelling	Predicted noise level dB $L_{Aeq, (15mins)}$	
	1 ute + trailer	6 utes + trailer
18 Tahi Street	32	39
20 Tahi Street	32	39
20 B Tahi Street	32	39
17 Tahi Street	37	44
27 E Aranui Road	41	48

Dwelling	Predicted noise level dB L_{Aeq} , (15mins)	
	1 ute + trailer	6 utes + trailer
27 C Aranui Road	37	45
27 B Aranui Road	33	42

5.19 My calculations In Table 2 show that this level of parking activity can occur and comfortably comply with my proposed noise limit of 55 dB L_{Aeq} at the nearest dwellings. The TRMP 'Sunday and public holiday' daytime noise limit of 40 dB L_{Aeq} would be exceeded. If parking were to occur at the maximum anticipated activity levels prior to 7am, the permitted activity noise limit if 40 dB L_{Aeq} would be breached.

6 POTENTIAL ADVERSE NOISE EFFECTS

6.1 Based on my predicted boat launch noise levels, the only dwelling to experience a potential adverse noise effect is 13 Tahi Street. However, I understand the owner has provided affected party approval.

6.2 I do not expect adverse night-time or daytime boat ramp noise effects to extend to other properties beyond 13 Tahi Street, even in the maximum summer use scenarios that I have assessed. Night-time noise levels will remain consistent with the 45 dB L_{Aeq} noise level recommended in the WHO and NZS 6802 published guidance.

6.3 There will be a potential adverse night-time noise effect from car parking noise at 27 B/C/E Aranui Road and 17 Tahi Street if the worst-case parking situations I have assessed actually occur. However, these effects can be mitigated with the construction of noise control fences. I discuss this further in Paragraph 7.13.

7 STYLES GROUP REPORT

7.1 I have read the noise report prepared by Mr Daniel Winter of Styles Group dated 4 October 2024. Mr Winter reviewed my noise report that considered the earlier application and therefore he raises several issues that I have now addressed in my evidence.

7.2 Mr Winter's review traverses several areas but his 'conclusion' section provides a useful summary of the issues I would like to discuss as follows:

- (a) Noise criteria
- (b) Vehicles source noise levels and crew voices
- (c) Car parking noise levels
- (d) Boat ramp activity levels
- (e) The existing noise environment
- (f) Noise mitigation

Noise criteria

7.3 In my assessment, I have stated that it is not necessary to have a daytime noise limit of 40 dB L_{Aeq} on Sundays and public holidays to provide an appropriate daytime noise amenity. I consider 55 dB L_{Aeq} to be more appropriate. 55 dB L_{Aeq} is the TRMP permitted activity daytime noise limit across other days of the week and reflects the guidance limit in the World Health Organisation guidance and New Zealand Standard NZS 6802.

7.4 I disagree with Mr Winter when he considers the WHO guidance to be irrelevant stating that "*The WHO guidelines were prepared as part of an effort to drive down the exposure to noise levels that are high enough to have an adverse effect on the health of people.*" Whilst that may be the case, it is clear that WHO guideline noise levels are set at the point where adverse noise effects are considered acceptable. The WHO noise limits underpin the 55 dB L_{Aeq} noise limit in NZS 6802, and the 55 dB L_{Aeq}

limit that has been adopted by the TRMP and many other District Plans' noise standards.

Vehicle and crew noise

7.5 My paragraph 5.6 describes the noise level data I have used in my calculations, and I confirm this includes the conservatively high noise levels from a ute accessing and departing the boat ramp. I consider this will satisfy Mr Winter's request for 'diesel and SUV' vehicles.

7.6 I agree with Mr Winter that raised voices are occasionally used during boat launches, but it is not the norm in my experience. In any event, if raised voices are used, they tend to occur for a relatively short duration of a few seconds. As such, they tend to be inconsequential to the noise level metric L_{Aeq} which represents the 'energy average' sound level over a period of 15 minutes that is required by the TRMP. However, to Mr Winter's point, it is appropriate to use the maximum noise level metric, L_{AFmax} , to describe short bursts of higher noise level that may occur. If shouts⁴ were used during a boat launch, this will potentially generate maximum event noise levels of approximately 65 dB L_{AFmax} at the nearest dwelling, 13 Tahi Street, and will be even lower at other dwellings. The predicted level of 65 dB L_{AFmax} is below the District Plan permitted activity maximum noise limit of 70 dB L_{AFmax} .

Car Parking noise levels

7.7 My paragraphs 5.16 to 5.19 describe noise levels from conservative levels of ute and trailer parking activity in the revised car park location.

Boat ramp activity levels

7.8 I disagree with Mr Winter's assertion that one boat launch per fifteen minutes prior to 7 am is too low. Based on my discussion, that is likely to be a relatively common scenario at the boat ramp over the course of a year. In any event, I have presented further analysis of boat launch activity that could occur during summer, based on the available data,

⁴ Using a shouting sound pressure level of 89 dB L_{AFmax} at a distance of 1 metre

including a maximum frequency of six launches every 15 minutes. This analysis shows much higher levels of activity can occur and provide acceptable levels of night-time noise amenity at adjacent properties where affected party approval has not been provided.

The existing noise environment

- 7.9 Mr Winter is correct that I have not performed noise measurements of the existing noise environment. However, I expect that Mr Winter's estimates of 30 to 35 dB L_{Aeq} between 5 and 7 am increasing to 45 dB L_{Aeq} during the day are relatively representative of noise levels in the area during non-holiday periods. During the summer, when peak numbers of boat launches currently take place at Grossi Point, I would expect noise levels at dwellings fronting Tahī Road will be much higher between 5 and 7am – typically 45 to 55 dB $L_{Aeq(15\ min)}$. Should the proposed boat ramp be granted consent, a portion of this traffic will no longer use Tahī Road to access Grossi Point and therefore early morning traffic noise levels will reduce at the Tahī Road dwellings.
- 7.10 Moreover, I agree with Mr Winter⁵ that, if the proposed boat ramp is in use, there will be a reduction in recreational boat noise for Tahī Road waterfront dwellings that are located south of the proposed boat ramp. In other words, boats that previously launched at Grossi Point, would no longer have to navigate the channel past these dwellings.

Noise Mitigation

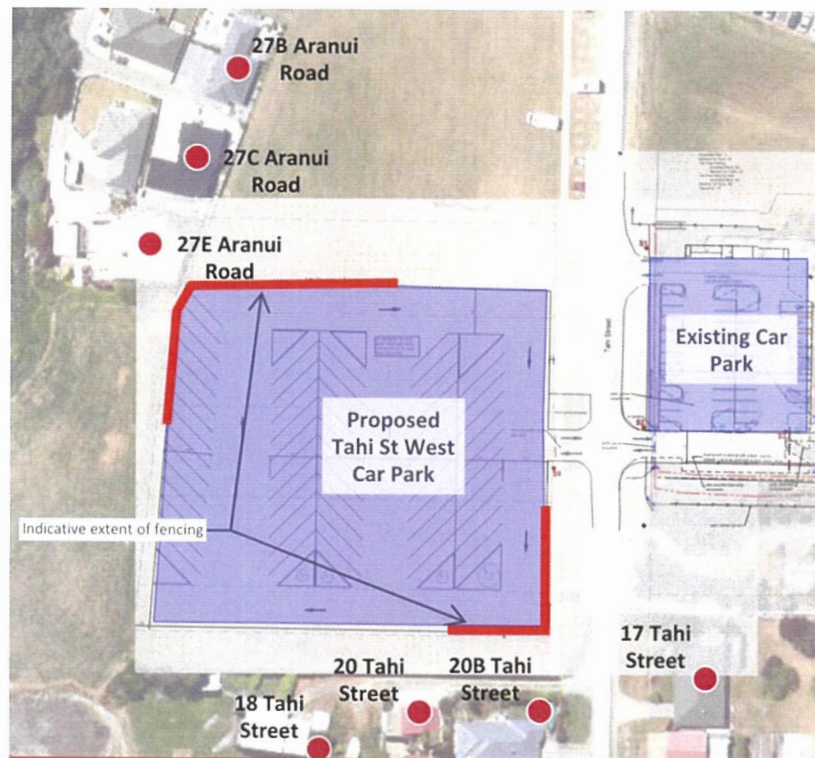
- 7.11 My assessment shows high levels of boat ramp activity can occur and result in reasonable noise levels for adjacent dwellings. Irrespective of this, I agree that noise mitigation should be considered to ensure that noise levels are controlled as far as practicable.
- 7.12 Mr Winter suggests 'acoustic screening'. I note that timber fencing currently exists along most of the boat ramp boundary with 13 Tahī Street. Whilst this will provide some mitigation, the fence height would have to be increased significantly in order to be of benefit for the

⁵ Mr Winter peer review Section 3.3, last para

adjacent two storey dwellings. This is unlikely to be practicable and ultimately, unnecessary in my opinion.

7.13 However, a noise control fence to selected portions of the proposed western car park boundary would provide useful noise reduction for 17 Tahi Street and the Aranui Road dwellings. (18, 20 and 20 B Tahi Street already have appropriate fences). As I've discussed in paragraph 5.19, fencing should only be considered if the if high levels of car park activity were to occur close to the dwellings prior to 7am. Based on the data I have reviewed, this would likely be a relatively infrequent occurrence. I would highlight that, to be effective, fencing would be solid and free of gaps to a height of approximately 1.8 metres. My estimate of the extent of fence to ensure noise levels are below 40 dB L_{Aeq} prior to 7am is shown in Figure 3.

Figure 3 – Indicative extent of noise control fence to car park



7.14 I agree that vehicle speed limits and other noise management techniques can reduce noise emissions but, in my experience too many signs and notices tend to get ignored over time. I have no objection to the suite of signage proposed in the draft consent conditions, but in my

opinion, the simpler the system, the more likely that this will be adhered to.

8 s42A REPORT

- 8.1 I have reviewed the noise-related comments in the officer's report prepared by Ms Victoria Woodbridge.
- 8.2 I have also reviewed the summary of submissions provided in the report. Many of the submissions mention noise as a general reference and several raise specific concerns which I have addressed in evidence.
- 8.3 The officer's report relies on Mr Winter's noise peer review and I have addressed many of the points raised in my earlier comments.
- 8.4 In her Paragraph 3.27, Ms Woodbridge discusses my proposal for an alternative means of assessing noise effects on Sundays and public holidays. To be clear, I accept that the TRMP noise limits are applicable for assessing compliance, and my noise report does this. However, to assess the potential adverse noise effects of the proposal, I consider 55 dB L_{Aeq} to be a more appropriate noise limit on Sundays and public holidays to provide an appropriate noise amenity.
- 8.5 The report provides draft conditions of consent and Conditions 10 to 15 address noise issues. I support the proposal for a Noise Management Plan but with reference to my Paragraph 7.14 above, any signage should be simple and effective.
- 8.6 I consider the NMP should include that all boat ramp access and car park surfaces should be maintained to be free of undulations and potholes and these can cause unnecessary rattling of vehicles and trailers.
- 8.7 Proposed Condition 14 requires a noise control fence along the boat ramp southern boundary and at 18 to 20 Tahi Street. I understand that fences already exist at these locations and therefore I question their requirements at these locations.



Jon Farren

31 October 2024

Attachment A – Figure1 from Mr Tim Kelly RFI traffic response dated 14 December 2023

TAHI ST BOAT RAMP - Vehicle with Boat Trailers only	
	Northbound
Wednesday, December 29, 2021	29
Thursday, December 30, 2021	32
Friday, December 31, 2021	36
Saturday, January 01, 2022	50
Sunday, January 02, 2022	47
Monday, January 03, 2022	54
Tuesday, January 04, 2022	40
Wednesday, January 05, 2022	28
Thursday, January 06, 2022	28
Friday, January 07, 2022	29
Saturday, January 08, 2022	35
Sunday, January 09, 2022	29
Monday, January 10, 2022	23
Tuesday, January 11, 2022	22
Wednesday, January 12, 2022	30
Thursday, January 13, 2022	25
Friday, January 14, 2022	39
Saturday, January 15, 2022	29
Sunday, January 16, 2022	53
Monday, January 17, 2022	24
Tuesday, January 18, 2022	25
Wednesday, January 19, 2022	26
Thursday, January 20, 2022	17
Friday, January 21, 2022	21
Saturday, January 22, 2022	31
Sunday, January 23, 2022	39
Monday, January 24, 2022	25
Tuesday, January 25, 2022	13
Wednesday, January 26, 2022	24
Thursday, January 27, 2022	18
Friday, January 28, 2022	19
Saturday, January 29, 2022	32
Sunday, January 30, 2022	24
average daily	30
MAX	54
MIN	13

Figure 1

Attachment B - Attachment 6 – Tasman Boat Ramp Indicative Business Case – Item 2.6

4.3 Boat Ramp Activity

To gain an appreciation of the level of boat ramp usage, TDC commissioned traffic (tube) counts on the existing ramps at Pohara, Nelson, Kaiteriti, Best Island and Motueka for January 2020. The data has been used in the following ways:

- To understand the relative differences in demand for boat ramps across the month.
- To understand how busy the major boat ramps are throughout the course of the day
- To gain an appreciation of peak day activity (2nd January)

Figure 8 shows the relative demand for boat ramps for each day during January 2020 (as a proportion of total monthly demand). The data captures the total for all boat ramps across the Tasman region (plus Nelson).

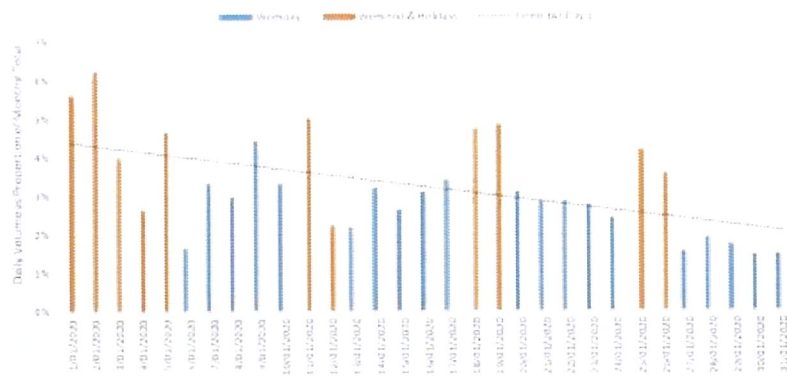


Figure 8: Boat Ramp Activity – January 2020⁶

The graph shows that, as would be expected, demand for boat ramp use was highest over the Christmas/New Year holiday period and then steadily declined as the month continued. Demand during weekends was also notably higher than weekdays.

Figure 9 focuses around the three major boat ramps (Nelson, Motueka and Kaiteriti) and level of activity recorded during a typical weekend/holiday on the boat ramps. The intent of this graph is help understand how sustained the levels of high demand are across the day, rather than specifically how many vehicles use the ramp (as the data is subject to some error in this respect?).

Note that Nelson has a three-lane ramp and Kaiteriti has a (narrow) three-lane ramp, whilst Motueka has two single lane ramps.

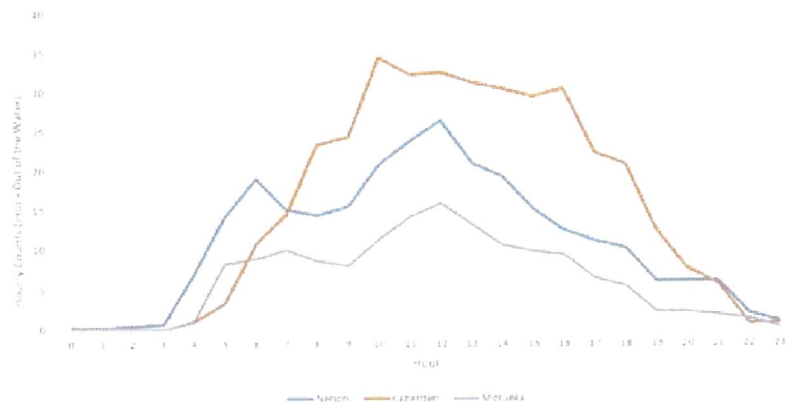
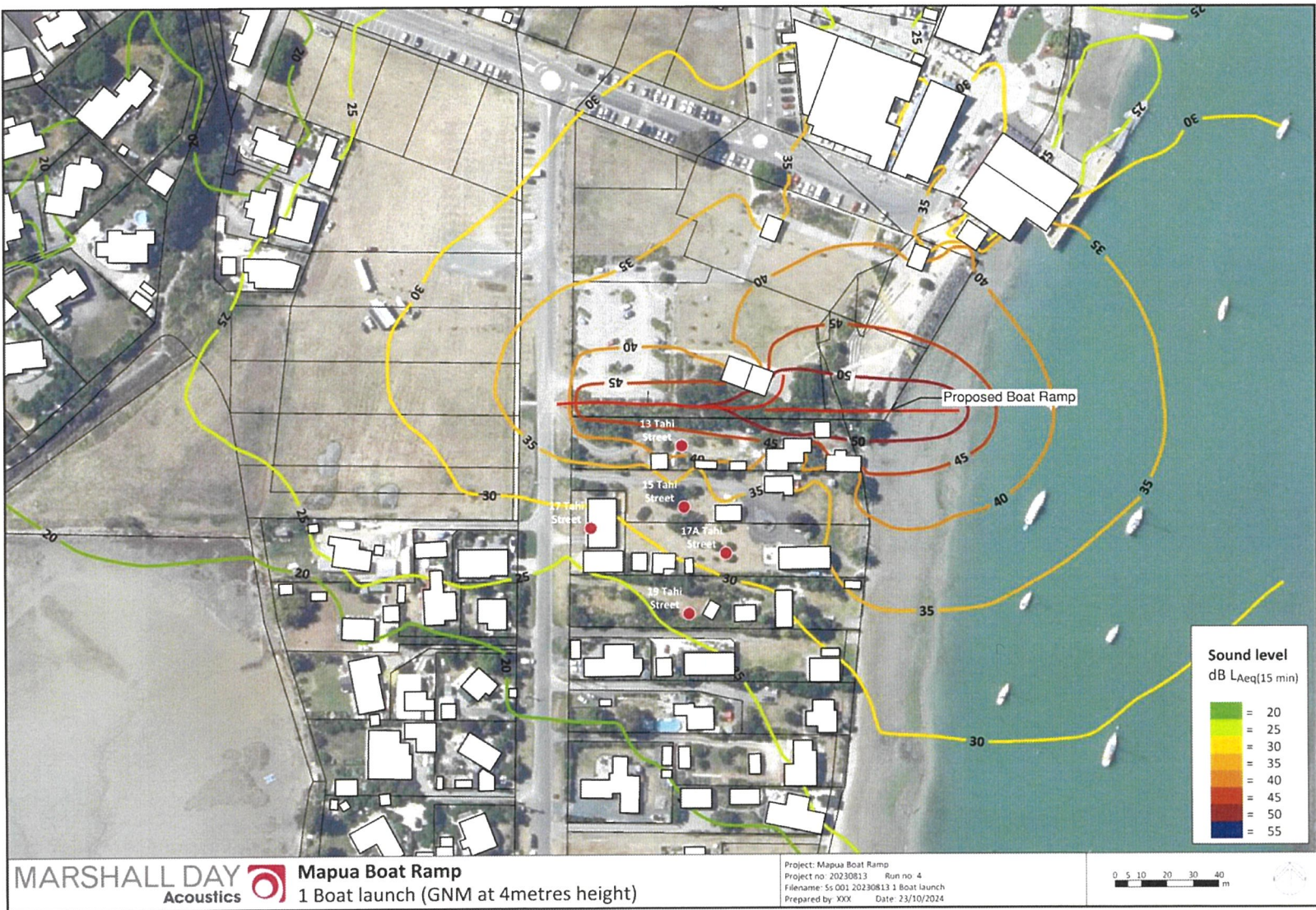


Figure 9: Boat Ramp Activity – Average Weekday/Holiday Activity

Attachment C – Boat ramp noise contour plot (1 launch per 15 minutes)



Attachment D – Boat ramp noise contour plot (6 launches per 15 minutes)

