



## **Appendix Y**

### **Assessment of Noise Effects**

# **WAIRAKEI SOUTH URBAN DEVELOPMENT**

## **BELL ROAD, PAPAMOA BEACH**

### **ASSESSMENT OF NOISE EFFECTS**

**Report No 25050.2**

**Prepared for:**

*Bell Road Limited Partnership*

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## **1. INTRODUCTION**

The Wairakei South Fast Track project (the Proposal) seeks to develop a living and working environment on land on the southern side of the Tauranga Eastern Link (TEL) at Wairakei. The proposal is shown in Figure 1. Rather than applying for a plan change, the Proposal seeks resource consent to undertake the proposed activities.

This report provides an assessment of the noise effects from the proposed land uses to accompany the resource consent application to be made under the Fast Track Approvals Act 2024 (FTAA). The report recommends conditions to ensure that those effects will be reasonable. The assessment is reported in three parts:

1. An assessment of the effects on the surrounding environment from the construction of the Proposal;
2. An assessment of the effects that the activities intended for the various proposed land uses will have on the surrounding environment; and
3. An assessment of potential reverse sensitivity effects arising from the Proposal.

# 5.5 CONCEPT FRAMEWORK PLAN

28 OCTOBER 2025



- KEY**
1. New Connection to Papamoa East2 Interchange
  2. Bell Road (Existing)
  3. Main Central Boulevard
  4. Stormwater Reserve / Conveyance Swale
  5. Major Neighbourhood Reserve
  6. Stormwater Treatment Wetland Area
  7. Landscape Buffer/Ship / Development Extent (subject to LVA (TBC))
  8. Existing Power Sub-Station
  9. Existing Pathway Access Under TEL (via Large Box Culvert)
  10. Stormwater Wetland Outlet to Kopuarua Canal

- LEGEND**
- SITE BOUNDARY
  - RESIDENTIAL (MOR/ZONE)
  - EMPLOYMENT (INDUSTRIAL / COMMERCIAL)
  - SERVICE CENTRE
  - NEIGHBOURHOOD CENTRE
  - LOCAL CENTRE
  - PRIMARY SCHOOL
  - STORMWATER RESERVE
  - NEIGHBOURHOOD RESERVE
  - GREEN LINKS / POCKET PARKS / SERVICES CORRIDORS / STORMWATER CONNECTIONS
  - BUFFER RESERVE STRIP
  - SECONDARY ARTERIAL ROAD
  - POTENTIAL FUTURE ROAD CONNECTION TO TE PUKE (VIA SECTOR'S STREET)
  - KEY NETWORK SIGNALISED INTERSECTION
  - KEY NETWORK ROUNDABOUT

Figure 1. Site Plan

## 2. EXISTING DISTRICT PLAN PROVISIONS

The site is zoned rural under the Western Bay of Plenty (WBOP) District Plan (Figure 2) as is all surrounding land to the south of the TEL. To the north of the 90m wide TEL is Tauranga City. Due to this relatively large separation, the effect of noise from the activities of either side of the TEL are unlikely to have any noticeable effect on their neighbours. As such, potential noise effects between the two Councils are not considered in this report.

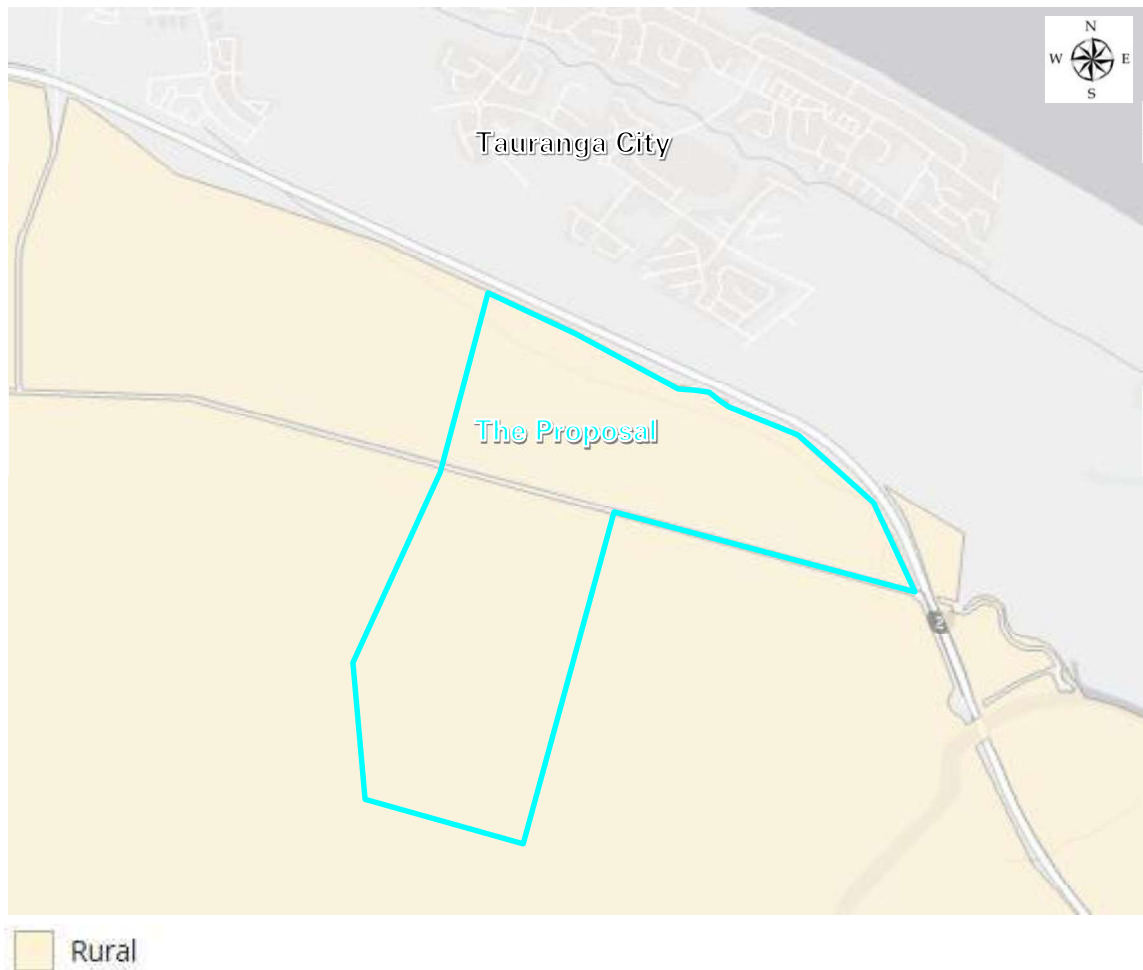


Figure 2. WBOP Zoning Map

The relevant noise provisions of the WBOP District Plan are:

#### **4C.1.3.2 Noise Limits**

##### **a. Noise limits for activities in ... Rural ... Zones**

- (i) *All activities located within these zones shall be so conducted as to ensure that noise from the site shall not exceed the following noise limits within the stated timeframes at any point within the notional boundary of any dwelling in a Rural, Lifestyle or Rural-Residential Zone, or at any point within the boundary of any property within a Residential, Medium Density Residential, Future Urban or Natural Open Space Zone (other than the site of the activity);*

| <b>Time Period</b>                        |              | <b>Sound Level not to be Exceeded</b> |                         |
|---|--------------|---------------------------------------|-------------------------|
| <b>Day</b>                                | <b>Hours</b> | <b>L<sub>Aeq</sub></b>                | <b>L<sub>Amax</sub></b> |
| Monday to Sunday                          | 7am to 10pm  | 50dB                                  | N/A                     |
| Sunday                                    | 7am to 6pm   | 50dB                                  | N/A                     |
| At all other times and on public holidays |              | 40dB                                  | 65dB                    |

#### **4C.1.3.4 Noise Measurement and Assessment**

- a. *For the purposes of Rule 4C.1.3.2, subject to the express provisions of these rules, sound levels should be measured in accordance with the requirements of NZS 6801:2008 Measurement of Environmental Sound, and assessed in accordance with the requirements of NZS 6802:2008 Assessment of Environmental Sound;*
- b. *The noise shall be measured with a sound level meter complying with the International Standard IEC 651 (1979): Sound Level Meters, Type 1.*

### **3. ASSESSMENT OF CONSTRUCTION EFFECTS**

This section addresses the noise and vibration effects from the construction of the Proposal on the neighbours within the Rural Zone.

#### **3.1. WBOP Construction Rules**

With respect to construction noise, the District Plan requires:

#### **4C.1.3.1 Construction Noise**

- a. *Construction noise shall not exceed the noise limits in, and shall be measured and assessed in accordance with the requirements of NZS 6803:1999 Acoustics – Construction Noise.*

During business hours (0730 – 1800 hours Monday to Saturday) NZS 6803:1999 Acoustics – Construction Noise (NZS 6803) requires construction noise from long term projects to comply with levels of 70dB  $L_{Aeq}$ /85dB  $L_{AFmax}$  when measured 1m from the most exposed façade of a residential dwelling. NZS 6803 does not preclude construction activities at other times of the day but, instead, provides relatively low levels to manage effects. In this manner, quiet activities, such as office work, could be undertaken outside of normal business hours.

The District Plan provides no limits for construction vibration. Based on the relatively large separation distance to neighbours, vibration from the construction activities is not expected to result in an issue. Nonetheless, vibration has been considered against the requirement of DIN 4150-3:1999 Structural vibration - Part 3: Effects of vibration on structures (DIN 4150). This standard recommends a range of vibration limits based on frequency, the lowest of which is 5mm/s PPV when measured on the foundation of the receiving building.

### **3.2. Construction Methodology**

The construction of the project is considered to include the earthworks and construction of the internal roads. The construction of the subsequent buildings within the Proposal is not specifically considered, noting that this activity will need to comply with the construction noise limits recommended for the project's resource consent, addressed below.

As it is too early in the development of the Proposal for an earthworks contractor to provide the exact machinery that will be required, the analysis has been based

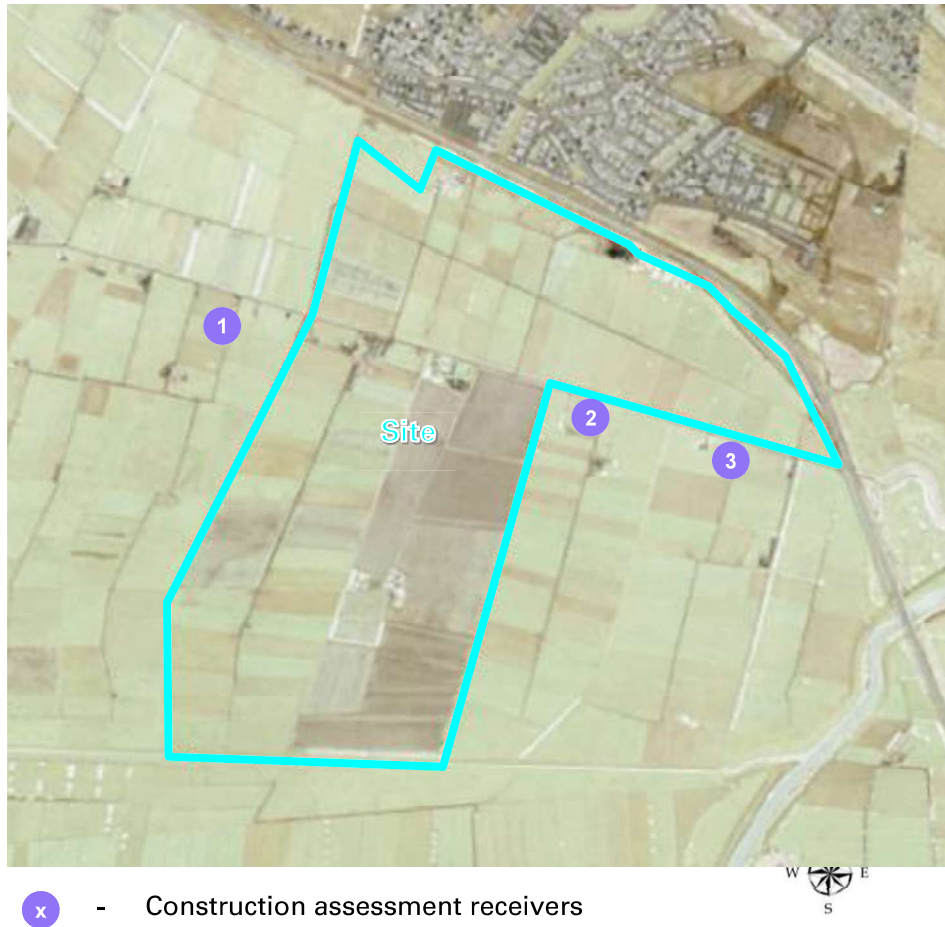
on generic earthmoving plant that is common to subdivision projects. Table 1 describes the earthmoving plant considered for the analysis and provides typical noise levels that have been taken from measurements of similar equipment.

**Table 1. Earthmoving Plant**

| <b>Construction Equipment</b> | <b>Sound Power Level, dBA</b> |
|-------------------------------|-------------------------------|
| Motor scraper                 | 110                           |
| 30t Excavator                 | 106                           |
| D8 Bulldozer                  | 112                           |
| Compactor                     | 100                           |
| Paving machine                | 100                           |
| Vibrating roller on asphalt   | 95                            |

### **3.3. Surrounding Receivers**

There are a number of dwellings built on the site of the Proposal. This assessment assumes that each of these dwellings will either be removed prior to the commencement of construction or that their owners will provide their written consent to the Proposal. As such, construction effects are only considered for dwellings outside of the site boundaries. These are identified in Figure 3 below.



**Figure 3. Assessment Sites Used for Construction Effects**

### 3.4. Construction Noise Levels

The noise levels from the construction activities identified in Table 3 have been calculated at the nearest neighbours and reported below.

**Table 3. Predicted Construction Noise Levels**

| Site, Fig 3                         |                  | 1           | 2           | 3           |
|-------------------------------------|------------------|-------------|-------------|-------------|
| Address                             |                  | 168 Bell Rd | 362 Bell Rd | 424 Bell Rd |
| Noise Level,<br>dB L <sub>Aeq</sub> | Motor scraper    | 58          | 63          | 61          |
|                                     | 30t Excavator    | 54          | 59          | 57          |
|                                     | D8 Bulldozer     | 60          | 65          | 63          |
|                                     | Compactor        | 48          | 53          | 51          |
|                                     | Paving machine   | 48          | 53          | 51          |
|                                     | Vibrating roller | 43          | 48          | 46          |

Table 3 reports the  $L_{Aeq}$  noise levels. On the basis that these comfortably comply with the 70dB  $L_{Aeq}$  limit of the District Plan, it is anticipated that the  $L_{AFmax}$  noise levels will also comply with the 85dB  $L_{AFmax}$  District Plan limit.

The predictions of Table 3 assume that the earthmoving plant is working on the site boundary closest to each receiver. Given that much of the Proposal is bordered by a stormwater reserve, conservation swale, the likelihood is that the plant will actually be further from the receivers than assumed, meaning the reported levels are likely conservative.

The reported levels are for a single piece of plant with the likelihood that construction will require multiple pieces of plant to operate at once. Given the margin by which each piece of plant complies with the District Plan limits, there is considered ample scope for the project to be constructed in accordance with the noise rules of the District Plan. For example, considering the uppermost level of 61dB  $L_{Aeq}$  to Site 3, up to 8 motor scrapers could operate in the most exposed location at once in compliance with the District Plan limits. When considering that the plant would be spread out over a large area, the factor of safety in compliance is apparent.

While compliance with the District Plan limits is predicted, it is considered best practice that neighbours are notified of the construction prior to its commencement and are provided with a point of contact for the duration of the works. The most appropriate method of managing this is through a Construction Noise and Vibration Management Plan (CNVMP), which is recommended as a condition of consent. A suitably worded condition(N3) is proposed in section 6 below.

### 3.5. Construction Vibration Levels

The level of vibration to the neighbouring properties will be a function of both the method in which the plant is used and the ground conditions, making it less accurate to predict than noise. To demonstrate the potential effects, measurements of a vibrating roller have been referred to, as this is likely to be one of the more intensive construction activities. From this, the anticipated levels of construction vibration to the neighbours have been calculated and are below.

**Table 4. Predicted Vibration Levels from Vibrating Roller**

| Site, Fig 3 | Address       | Vibration, mm/s PPV |
|-------------|---------------|---------------------|
| 1           | 168 Bell Road | 0.9                 |
| 2           | 362 Bell Road | 0.6                 |
| 3           | 424 Bell Road | 0.4                 |

The predicted levels of vibration would range from unlikely to be noticeable to just noticeable. Compliance with the 5mm/s threshold of DIN 4150 indicates that the work is not expected to result in any cosmetic damage to buildings. On this basis, effects are considered to be less than minor.

Best practice for managing potential adverse effects from vibration is considered to include consultation with neighbours. This can be managed through the CNVMP, which is recommended as a condition of any consent.

## 4. ASSESSMENT OF OPERATIONAL EFFECTS

The Proposal seeks to establish the following land uses within the Rural Zone:

- a. Residential;
- b. Employment, which is intended to be similar to the Industrial Zone of the District Plan;

- c. Neighbourhood Centre and Local Centres, which will provide for local shops and facilities;
- d. A primary school site which is to be set aside for future development. The school is not part of this resource consent and, should it eventuate, will be addressed through its own resource consent application; and
- e. Reserve areas. These will be informal outdoor areas.

To manage the potential conflicts within and between the future land uses and across the interface between the site and the surrounding Rural Zone, conditions are proposed that are based on the District Plan noise rules. This section provides a commentary on the various rules (which are summarised in Section 6) before addressing the potential effects of the Proposal.

This report has been prepared for a fast track consent. As such, when referring to one of the proposed land uses within the Proposal, the term Area is used instead of Zone.

#### **4.1. Proposed Noise Limits**

The following proposes noise limits between each of the proposed land uses.

##### *Construction Noise*

The District Plan rule for construction noise (4C.1.3.1) is considered best practice and has been adopted. It is addressed on proposed condition N1 in section 6.

The District Plan does not contain a construction vibration rule, and one is not considered necessary for the Proposal, given the relatively low levels of vibration from the construction projects anticipated within the Proposal.

*Residential Area and Rural Zone*

District Plan Rule 4C.1.3.2a provides typical limits for residential amenity and has been generally adopted for the activities of the Residential Area within the Proposal. Suggested condition N2 proposes minor grammatical amendments to the District Plan rule.

A suggested technical change is that currently, the District Plan rule requires night time limits of 40dB  $L_{Aeq}$  and 65dB  $L_{Amax}$  during the day time on public holidays. These levels are typically adopted for sleep protection meaning they are considered to be overly restrictive during the day time period. It is therefore proposed that the public holiday limits match those of a Sunday.

Considering noise to the adjacent Rural Zone, the proposed condition N2 requires noise limits to be achieved at the notional boundary of a rural dwelling. The notional boundary is defined by the District Plan as a line 20m from the house façade or, when closer, the site boundary. In this respect, the Rural Zone differs from all others in that the assessment of noise is based on the presence of a dwelling (as opposed to the site boundary, which applies irrespective of whether the site is developed or not). The issue this presents to the individual activities of the Proposal is one of certainty. While they may operate in a compliant manner initially, a new rural dwelling constructed at some point in the future may change this. To address this potential conflict, it is proposed that the noise limits to the adjacent Rural Zone apply only to dwellings that exist at the date the Proposal is granted consent. The effect of this approach on future Rural dwellings is addressed below. This issue is more likely to be an issue for activities within the Industrial/Commercial Area of the Proposal than the Residential Area, but a consistent approach is proposed for all Areas.

The current District Plan rules do not provide limits for a residential activity when measured at any site other than a residential or rural activity. While this is unlikely to be an issue for the Residential Area, condition N7 is proposed that

addresses all interface noise rules that are not addressed by the current District Plan rules. The proposed condition requires that, in the absence of a specific condition, the noise limit shall be that of the receiving Area.

#### *Industrial/Commercial Area*

Part i of District Plan Rule 4C.1.3.2bi provides what are considered to be the upper limits of residential amenity for residential and rural dwellings next to an Industrial Zone, which is considered appropriate for the Industrial/Commercial Area and are incorporated in suggested condition N5.

One change proposed is that the rule defines the day time as starting at 6am. This is relatively early for night time to end, and it is suggested that this threshold be changed to the more common 7am for sleep protection.

Part ii of the rule provides common noise limits between business sites, which have been adopted. However, the  $L_{Amax}$  metric is used for the protection of sleep. As accommodation will not be permitted within the Industrial/Commercial Area, it is suggested that the  $L_{Amax}$  criterion be removed from the rule.

#### *Neighbourhood Centre and Local Centre Areas*

These areas provide for local shops. In terms of noise limits, their needs are below those of the Industrial/Commercial Area, with lower levels being desirable given their location with respect to the Residential Area. As a compromise, suggested condition N6 proposes a level of 60dB  $L_{Aeq}$  between sites within these areas. An  $L_{Amax}$  level of 75dB is proposed on the basis that residential use is permitted in the area.

To sites within the Residential Area or the adjacent Rural Zone, the same approach as suggested for the Industrial/Commercial Area is proposed.

Neighbourhood and Local Centre Areas differ from the Industrial/Commercial Area in that residential use is permitted. For this to be successful, N6 c) is suggested for the proposed condition to address potential reverse sensitivity issues. The condition requires the building envelope of the residential unit to be designed to control the ingress of the anticipated levels of external noise to internal levels that are considered reasonable for residential amenity.

Such conditions often necessitate closed windows for the control of noise, which conflicts with Building Code ventilation requirement of open windows. The standard solution is the introduction of mechanical ventilation plant. In terms of a condition, the NZTA ventilation requirement (N8) is proposed.

#### *Reserve Areas*

The reserve areas are intended for informal use and, as such, noise conditions relating to their use are not considered necessary.

#### *Vibration*

District Plan rule 4C.1 states, "*Vibration from activities has not been an issue in the District. In many cases Council can manage vibration effects through the management of noise emissions or through the provisions of the Health Act. Specific standards to manage vibration are therefore not proposed*". This approach is considered a pragmatic one and has been adopted for the Proposal.

## **4.2. Assessment of Effects**

The effects of the Proposal are addressed below.

### **4.2.1. Effects within the Proposal**

Proposed conditions N4 – N7 suggest what are considered to be appropriate limits of protection for the respective land uses within the Proposal. They are consistent with the existing District Plan rules and, more generally, best practice. In this manner, the resulting effects of noise can be considered appropriate.

Any activity undertaken in the Rural Zone surrounding the Proposal would have to comply with noise limits of District Plan rule 4C.1.3.2 (section 2 above) when measured at the notional boundary of any site within the Proposal. These limits are considered appropriate for residential amenity (and are suggested for the Proposal in N4). As such, compliance with the existing District Plan rules would ensure appropriate effects on activities within the proposed Residential Areas from neighbouring Rural activities.

The District Plan definition of the notional boundary is tied to dwellings. As such, the District Plan provides no noise rules for Rural Zone activities to comply with at the likes of the proposed Industrial/Commercial Area. The reality is that this is unlikely to be an issue. Firstly, the Industrial/Commercial activities are, by their nature, not particularly noise sensitive. Secondly, the surrounding Rural Zone is occupied by dairy farms, meaning there is limited scope for noise generating activities. On balance, it is concluded that it would be improbable for the noise from the legitimate activities of the Rural Zone to result in an adverse effect on the activities of the Proposal.

#### **4.2.2. Effects on the Neighbouring Rural Zone**

Through the suggested conditions, the noise from the various activities intended for the Proposal will be limited to what the District Plan considers reasonable for the Rural Zone (Rule 4C.1.3.2, Section 2). In this respect, any noise from the activities within the Proposal when measured at the adjacent Rural zone can be considered reasonable.

The proposed conditions limit the above comment to existing dwellings in the Rural Zone. In theory, there is the possibility for a future dwelling to be constructed close to the common boundary with the Proposal. In this scenario, there would be no noise limit to this dwelling, meaning it could receive levels of

noise from the legitimate activities of the Proposal that were above what is considered reasonable for residential amenity.

In practice, the reality of this occurring is limited. In terms of the future activities that could cause a noise nuisance, these are limited to those in the Industrial/Commercial Area. Proposed condition N4 limits noise from the Residential Area to its internal neighbours to limits appropriate for residential amenity. By default, it does the same for the adjacent Rural Zone. N6 does the same for the Neighbourhood and Local Centre Areas, and negligible noise is expected from the Reserve Areas.

The Rural zoned land adjacent to the Industrial/Commercial Area is to the south east of the Proposal and comprises two sites. As shown in Figure 3, these two sites have already been developed with a single dwelling on each (Sites 2 and 3, Figure 3) and, therefore, to the extent permitted by the District Plan<sup>1</sup>. In other words, a new dwelling on either of these two sites would require either the demolition and rebuilding of the existing dwelling, or a resource consent for a second dwelling. Both seem unlikely, leading to the conclusion that the potential effects from the Proposal on the surrounding Rural Zone are considered reasonable.

## **5. REVERSE SENSITIVITY**

Two potential reverse sensitivity issues have been considered, being the legitimate activities of the adjacent TEL and of the more distant East Coast Main Trunk Railway (ECMTR). The District Plan does not consider reverse sensitivity effects from either but, for completeness, both are addressed below.

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<sup>1</sup> Rule 18.3.1D of the District Plan permits one dwelling per site in the rural zone.

## **5.1. TEL**

### **5.1.1. Assessment Methodology**

The NZ Transport Agency (NZTA) 'Guide to the management of effects on noise sensitive land use near to the state highway network'<sup>2</sup> (the Guidelines) suggest that, for the avoidance of reverse sensitivity effects, road traffic noise levels within habitable space of dwellings should not exceed 40dB  $L_{Aeq(24h)}$ . This level is commonly adopted for this purpose in District Plans throughout New Zealand and has been adopted as best practice.

It is generally accepted that, for windows open to ventilate in accordance with the New Zealand Building Code, a building envelope will provide a 15dB reduction. This reduction is independent of construction methods as it is the open windows that limit performance. The Guideline's requirement can therefore be expressed as an external level of  $40 + 15 = 55\text{dB } L_{Aeq(24h)}$ .

The approach taken for identifying reverse sensitivity has been to predict contours of the road traffic noise across the Proposal. Where Residential Areas are predicted to be exposed to less than 55dB  $L_{Aeq(24h)}$ , the conclusion is that reverse sensitivity effects will be adequately managed. Where higher levels are predicted, the effects will be mitigated through a consent condition requiring the building envelope to be acoustically designed to provide the mitigation necessary for an internal level of not more than 40dB  $L_{Aeq(24h)}$ .

### **5.1.2. Road Traffic Noise Prediction Method**

Noise from traffic using the TEL has been predicted across the Proposal using the Predictor computer program. Predictor is a three dimensional geometry modelling program that has been developed for the prediction of sound. Predictor uses the Calculation of Road Traffic Noise (CoRTN)<sup>3</sup> algorithms,

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<sup>2</sup> [chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://nzta.govt.nz/assets/resources/effects-on-noise-sensitive-land/effects-on-noise-sensitive-land-use.pdf](https://nzta.govt.nz/assets/resources/effects-on-noise-sensitive-land/effects-on-noise-sensitive-land-use.pdf)

<sup>3</sup> 'Calculation of Road Traffic Noise', Department of Transport Welsh Office, 1988.

corrected for New Zealand conditions<sup>4</sup> in accordance with best practice. Predictor produces a full scale computer generated model of the alignment that includes all variables that affect traffic noise.

- a. Terrain model: 3-dimensional ground contours from Council's GIS service were used to define the heights of the existing ground surface, the TEL and the existing TEL bund.
- b. Road alignment: From aerial photography.
- c. The Proposal: From a site plan. Analysis assumes no development within the Proposal, meaning no screening from buildings. This provides for a conservative analysis.
- d. TEL characteristics: From the Mobile Road website<sup>1</sup>.  
  - Westbound: 5853 vpd, 14% HCV, OGPA 10
  - Eastbound: 5912 vpd, 12% HCV, OGPA 10
- e. Ground surface: Ground absorption of 0.5 has been assumed within the Proposal.
- f. Mitigation: There is an existing bund on the TEL boundary with the Proposal, which has been included in the analysis.
- g. Receiver height: Contours were predicted at heights representative of a ground floor dwelling (1.5m)

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<sup>4</sup> 'Traffic Noise from Uninterrupted Traffic Flows', Transit New Zealand Research Report No. 28. 1994.

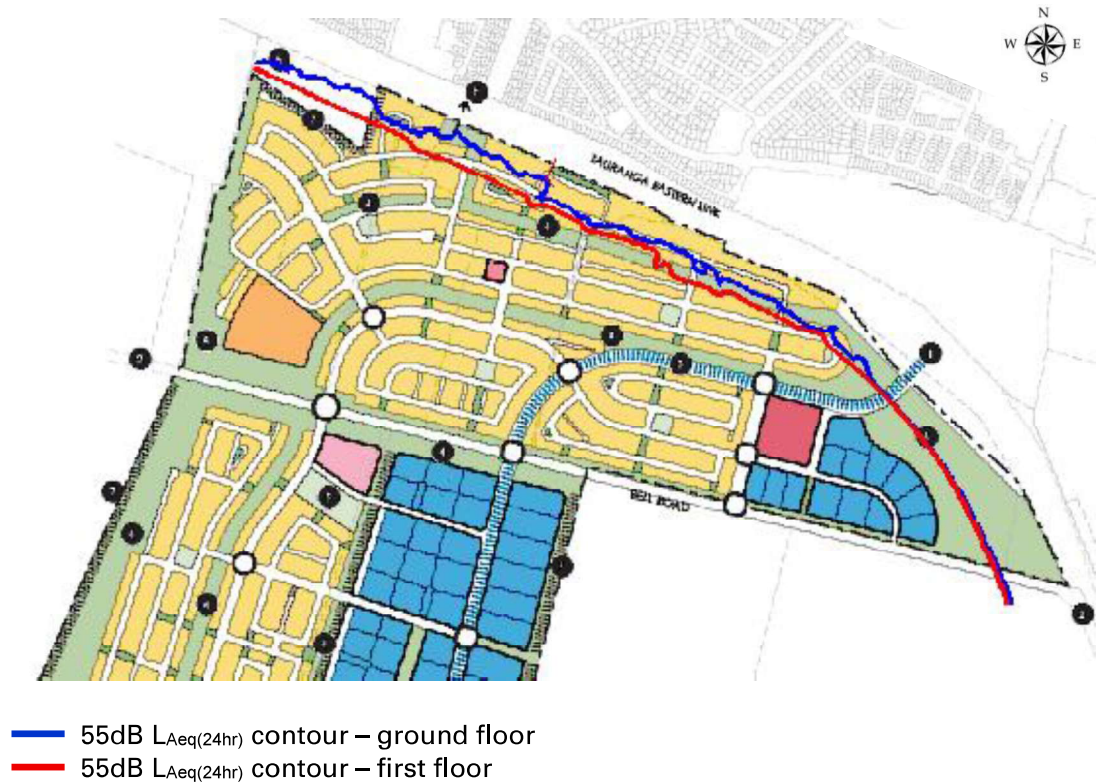
and a first floor dwelling (4.5m). The second floor of any dwelling would receive similar levels to the first floor.

- h. Contour Grid: Within 220m of the TEL, a 10m contour grid was adopted. Over the remainder of the Proposal, a 100m grid was used.
  - i. Factor of safety: In accordance with the Guidelines, a 3dB factor of safety has been added to all calculated levels.
1. Vpd = vehicle per day (in 2024), HCV = Heavy commercial vehicles, OGPA = Open Porous Asphaltic Concrete road surface.

### **5.1.3. Road Traffic Noise Levels**

Based on the above, the road traffic noise contours over the Proposal at ground and first floor height are shown in Figure 4. Analysis shows that the uppermost level to any future dwelling would be 68dB  $L_{Aeq(24h)}$ .

The site plan shown in Figure 4 is reasonably generic. As the Proposal progresses and Lot boundaries are available, they can be overlaid with the noise contours to identify the specific Lots that will require mitigation.



**Figure 4. Road Traffic Noise Contours**

#### 5.1.4. Assessment of Effects

Based on an external level of 68dB LAeq(24h), the maximum reduction required by the building envelope of any future dwelling would be 28dB. Such a reduction is achievable from typical building techniques with specific consideration given to the thickness of the glazing and the plasterboard wall and ceiling linings. In this manner, it is considered that any potential reverse sensitivity effects can be adequately mitigated.

Proposed condition N8 suggests a suitable condition. It is based on the example given in the Guidelines, modified for the calculated noise contours specific to the Proposal. The condition is also consistent the comparable rule in the Tauranga City Plan (4E.2.5).

### **5.1.5. Road Vibration**

The NZTA Guidelines identify vibration as a possible effect. A properly built and maintained road will not result in adverse levels of vibration, evidenced by the fact that there are multiple examples of residential activity coexisting adjacent to State Highways. Should the road maintenance result in excessive vibration, it should be the responsibility of the NTA to remedy this, not adjacent landowners. No vibration condition is, therefore, suggested.

### **5.2. ECMTR**

The ECMTR passes approximately 1,500m to the east of the Proposal. At such a distance, noise and/or vibration from passing trains is expected to be negligible. This is consistent with KiwiRail's approach to reverse sensitivity where, on previous projects, they suggest that consideration be limited to buildings within 100m of a rail corridor.

## **6. PROPOSED CONSENT CONDITIONS**

The following provides conditions that would be suitable for a resource consent for the project. The recommendations are based on the discussions provided in Sections 4 and 5 above and the relevant noise rules of the District Plan.

### **N1. Measurement and Assessment of Noise**

For the purposes of conditions N3 – N7, sound levels should be measured in accordance with the requirements of NZS 6801:2008 Measurement of Environmental Sound and assessed in accordance with the requirements of NZS 6802:2008 Assessment of Environmental Sound.

### **N2. Construction Noise**

Construction noise shall not exceed the noise limits in, and shall be measured and assessed in accordance with, the requirements of NZS 6803:1999 Acoustics – Construction Noise.

**N3. Construction Noise and Vibration Management Plan**

The consent holder must submit a Construction Noise and Vibration Management Plan (CNVMP) for certification prior to the commencement of works. The objective of the CNVMP is to set out the Best Practicable Option for the management of noise and vibration effects. The CNVMP must be prepared with reference to Annex E, New Zealand Standard NZS 6803:1999 Acoustics – Construction noise. The CNVMP must include the following information:

- a. Details for providing written advice of the works to neighbours.
- b. Neighbour consultation and engagement procedures.
- c. The construction noise and vibration limits for the project.
- d. The limitations on working days and hours.
- e. Details of practicable noise and vibration mitigation measures to be applied during the various stages of the construction project.
- f. Requirements and specifications for any mitigation proposed.
- g. Scheduling of noisy works at times to cause the least disturbance.
- h. A procedure for responding to any noise and vibration complaints.
- i. A procedure for noise monitoring during the works and applying any corrective actions that may be required.
- j. Procedures for ensuring that all contractors and operators on site are aware of the requirement to minimise noise and vibration effects as far as practicable on neighbouring sites.

The CNVMP must be submitted to the Council for certification a minimum of ten (10) working days prior to commencement of the works. Construction works must not commence until certification has been received in writing from the Council.

Any subsequent amendment of the certified CNVMP which comprises material changes to construction methodology must also be prepared by a suitably qualified and experienced acoustic specialist. The revised CNVMP submitted to the Council for certification.

The construction works must be carried out in accordance with the certified CNVMP, and a copy of the certified CNVMP must be made available to authorised Council staff during monitoring inspections.

#### **N4. Noise limits for activities in the Residential Area**

All activities located within the Residential Area shall be so conducted as to ensure that noise from the site shall not exceed the following noise limits at any point within the notional boundary of any dwelling in a Rural Zone in existence as of (date of consent), or at any point within the boundary of any property within a Residential Area (other than the site of the activity);

| <b>Time Period</b>          |              | <b>Sound Level not to be Exceeded</b> |                         |
|-----------------------------|--------------|---------------------------------------|-------------------------|
| <b>Day</b>                  | <b>Hours</b> | <b>L<sub>Aeq</sub></b>                | <b>L<sub>Amax</sub></b> |
| Monday to Saturday          | 7am to 10pm  | 50dB                                  | N/A                     |
| Sundays and public holidays | 7am to 6pm   | 50dB                                  | N/A                     |
| At all other times          |              | 40dB                                  | 65dB                    |

The above limits do not apply to temporary or short term activities associated with, residential land use, such as lawn mowing, provided that

the activity is undertaken in accordance with Section 16 of the Resource Management Act.

**N5. Noise limits for activities in the Industrial/Commercial Area**

- a. All activities located within the Industrial/Commercial Area shall be so conducted as to ensure that noise from the site shall not exceed the following noise limits at any point within the notional boundary of any dwelling in a neighbouring Rural Zone in existence as of (date of consent), or at any point within the boundary of any property within a Residential Area:

| Time Period                 |             | Sound Level not to be Exceeded |                   |
|-----------------------------|-------------|--------------------------------|-------------------|
| Day                         | Hours       | L <sub>Aeq</sub>               | L <sub>Amax</sub> |
| Monday to Saturday          | 7am to 10pm | 55dB                           | N/A               |
| Sundays and public holidays | 9am to 6pm  | 55dB                           | N/A               |
| At all other times          |             | 45dB                           | 70dB              |

- b. All activities located within the Industrial/Commercial Area shall be so conducted as to ensure that noise from the site shall not exceed the following noise limits at any point within the boundary of any other property within the Industrial/Commercial Area:

| Time Period  | Sound Level Not to be Exceeded |
|--------------|--------------------------------|
|              | L <sub>Aeq</sub>               |
| At all times | 65dB                           |

**N6. Noise limits for activities in the Neighbourhood Centre and Local Centre**

- a. All activities located within the Neighbourhood Centre or Local Centre Areas shall be so conducted as to ensure that noise from the site shall not

exceed the following noise limits at any point within the notional boundary of any dwelling in a neighbouring Rural Zone in existence as of (date of consent), or at any point within the boundary of any property within a Residential Area:

| <b>Time Period</b>          |              | <b>Sound Level not to be Exceeded</b> |                         |
|-----------------------------|--------------|---------------------------------------|-------------------------|
| <b>Day</b>                  | <b>Hours</b> | <b>L<sub>Aeq</sub></b>                | <b>L<sub>Amax</sub></b> |
| Monday to Saturday          | 7am to 10pm  | 55dB                                  | N/A                     |
| Sundays and public holidays | 9am to 6pm   | 55dB                                  | N/A                     |
| At all other times          |              | 45dB                                  | 70dB                    |

- b. All activities located within the Neighbourhood Centre or Local Centre Areas shall be so conducted as to ensure that noise from the site shall not exceed the following noise limits at any point within the boundary of any other property within the Neighbourhood Centre or Local Centre Areas:

| <b>Time Period</b>  | <b>Sound Level not to be Exceeded</b> |                         |
|---------------------|---------------------------------------|-------------------------|
|                     | <b>L<sub>Aeq</sub></b>                | <b>L<sub>Amax</sub></b> |
| Day time 10pm -7am  | 60dB                                  | N/A                     |
| Night time 10pm-7am | 60dB                                  | 75dB                    |

- c. The building envelope of any habitable room within the Neighbourhood Centre or Local Centre Area must be designed and constructed so that the internal noise levels do not exceed the levels in the table below. These levels shall be achieved assuming that the levels in part b. of this condition are incident on the building envelope.

| Time Period               | Sound Level not to be Exceeded<br>within Habitable Rooms |
|---------------------------|--|
|                           | $L_{Aeq}$  |
| Bedrooms                  | 35dB   |
| All other habitable rooms | 40dB   |

If windows must be closed to achieve the design noise levels in N6, the building must be designed, constructed and maintained with a ventilation and cooling system. For habitable spaces, a ventilation cooling system must achieve the following:

- i. Ventilation must be provided to meet clause G4 of the New Zealand Building Code. At the same time, the sound of the system must not exceed 30 dB  $L_{Aeq(30s)}$  when measured 1 m away from any grille or diffuser.
- ii. The occupant must be able to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour. At the same time, the sound of the system must not exceed 35 dB  $L_{Aeq(30s)}$  when measured 1 m away from any grille or diffuser.
- iii. The system must provide cooling that is controllable by the occupant and can maintain the temperature at no greater than 25°C. At the same time, the sound of the system must not exceed 35 dB  $L_{Aeq(30s)}$  when measured 1 m away from any grille or diffuser.

#### **N7. Interface Noise Limits**

Except as provided for in the conditions above, where noise generated by any activity on a site is received by any activity on a site in a different Area,

the activity generating the noise must comply with the noise limits of the Area at the receiving site.

**N8. Road Traffic Noise**

- a. Habitable rooms of new dwellings or alterations to existing dwellings within the 55dB  $L_{Aeq(24h)}$  road traffic noise contour of SH2 must be designed, constructed and maintained to achieve an indoor design noise level from road traffic of not more than 40dB  $L_{Aeq(24h)}$ .
- b. If windows must be closed to achieve the design noise levels in N7, the building must be designed, constructed and maintained with a ventilation and cooling system. For habitable spaces, a ventilation cooling system must achieve the following:
  - i. Ventilation must be provided to meet clause G4 of the New Zealand Building Code. At the same time, the sound of the system must not exceed 30 dB  $L_{Aeq(30s)}$  when measured 1 m away from any grille or diffuser.
  - ii. The occupant must be able to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour. At the same time, the sound of the system must not exceed 35 dB  $L_{Aeq(30s)}$  when measured 1 m away from any grille or diffuser.
  - iii. The system must provide cooling that is controllable by the occupant and can maintain the temperature at no greater than 25°C. At the same time, the sound of the system must not exceed 35 dB  $L_{Aeq(30s)}$  when measured 1 m away from any grille or diffuser.

- c. A design report prepared by a suitably qualified and experienced acoustics specialist must be submitted to the [Council officer] demonstrating noise compliance prior to the construction or alteration of any dwelling within the 55dB  $L_{Aeq(24h)}$  noise contour of SH2. The design must take into account the future permitted use of the state highway; for existing roads, this is achieved by the addition of 3 dB to existing measured or predicted noise levels.

## **7. CONCLUSIONS**

The Proposal is to develop the land for resident and business uses under the FTAA. Through the adoption of suitable noise conditions, it can be shown that effects from the Proposal on the surrounding environment can be appropriately remedied or mitigated.

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