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Hearings Administrator
Porirua City Council

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Ref: 042271958/1860549.3

To the Proposed Porirua District Plan Hearings Panel

1 We act for Radio New Zealand Limited (*RNZ*).

2 This letter sets out RNZ's response to Minute 47 – Stream 6 Follow Up (2) dated 4 August 2022 (the *Minute*), issued by Mr Trevor Robinson on behalf of the Proposed Porirua District Plan Hearings Panel (the *Panel*). The Minute requested that RNZ advise why proposed Designation RNZ-01 (the *Designation*) should cover the existing site in its entirety and whether RNZ's objectives might be met by designation of a smaller area.

3 In short, RNZ requires the full geographic extent of the Designation for the reasons set out below, and appreciates the opportunity to engage with the Panel on this issue.

RNZ BACKGROUND

4 RNZ is a Crown entity established under the Radio New Zealand Act 1995 and is designated as a Lifeline Utility under the Civil Defence Emergency Act 2002. RNZ was approved as a Requiring Authority in 2001 (and its predecessor was granted requiring authority status in 1994) for the purposes of radiocommunication and telecommunication operations, and has required designations for a number of sites across New Zealand.

5 RNZ owns and operates radio transmission facilities at Whitireia Park, Porirua (the *Site*), which has been functioning for over 80 years. The current designation for the Site is for radiocommunication activities, and has been in place since 1999.

6 RNZ own all of the land covered by the Designation. RNZ's activities on the Site have changed over the 80 years that it has been in use as the need and utility of the Site for radiocommunications has changed. Although RNZ does not currently use the northern portion of the Site, RNZ strongly considers the full Designation is needed to provide for possible future radiocommunication activities and to prevent incompatible development.

STANDING TO REQUEST AMENDMENT TO RNZ'S DESIGNATION

7 The Designation is recommended to be rolled over into the Proposed Plan. By way of background:

7.1 In January 2019, Porirua City Council (*Council*) requested that RNZ confirm rollover of the Designation, with or without modification, into the proposed Porirua District Plan (the *Proposed Plan*).

7.2 In April 2019, RNZ advised Council that it sought to rollover the Designation with the following modifications:

(a) An update to the names of the requiring authorities;

(b) Alteration of the designation purpose, to: "Radio-communication, telecommunication and ancillary purposes and land uses";

(c) Inclusion of a note clarifying that RNZ has primary financial responsibility for the Designation.

7.3 In August 2020 Council provided the draft Designation, which would be included in the Proposed Plan, and sought RNZ's feedback. RNZ confirmed the Designation details were correct (aside from a minor typo).

8 The modifications outlined above were for clarification and did not change the purpose, function or location of the Designation in any way. RNZ considered the previous wording created uncertainty for plan users. Council then notified the Designation with minor modifications in the Proposed Plan. The Council has not raised concerns about the geographical extent of the Designation. Nor did any submitters to the Proposed Plan request changes to the size of the Designation.

RNZ'S OPERATIONS AT THE PORIRUA SITE

9 It is important that the continued operation, maintenance and improvement of RNZ's national transmission network can occur unimpeded. Transmission facilities at the Site are an integral and important part of RNZ's communication network nationwide and perform an important role in, among other things, providing news and information to the public and performing a civil defence role.

10 As a lifeline utility, it is critically important that RNZ is not unduly restricted from carrying out activities that are fundamental to the ongoing operation of its transmission activities.

11 We attach as **Appendix 1** a document explaining constraints and considerations for the development of land around the Site and summarise these matters below. The Designation provides protection for RNZ's transmission facilities. It is important that the Designation cover the entire site to ensure public safety, and to maintain a sufficient buffer between the transmission facilities and potential inappropriate land use.

12 The nearby residential development to the south of the current transmitter location has been of significant concern to RNZ for many years, and is the reason for RNZ's active participation in Porirua District planning processes. The sections below outline some of the problems associated with development located near large radiocommunication equipment.

Facilities at Porirua

13 RNZ's Facilities at Porirua include:

13.1 a main concrete block building containing four AM radio transmitters, an emergency generator and ancillary equipment;

13.2 a free standing fuel tank; and

13.3 a 137 metre guyed aerial mast, at the base of which there is a reinforced concrete building containing aerial coupling unit components.

14 These facilities broadcast multiple radio programmes (and carry out civil defence functions) to the lower third of the North Island and the upper South Island, and surrounding areas.

15 The rest of the facility consists of underground wires and cables. There are 120 copper wires buried approximately 300mm deep in the earth surrounding the mast out to a distance of at least 212m from the mast. These are essential to operation of the mast and all structures on the Site are designed to ensure the integrity of the earthmat.

16 Existing AM transmission sites around New Zealand were selected (and often designated) when it was possible to obtain the optimum locations from a coverage point of view. RNZ's Facilities at Porirua are a good example of this, using the sea water path up the west coast of the North Island and across to the South Island to maximise regional coverage to central New Zealand.

Future activities

17 While there are no current plans for installation of new radiocommunication equipment in the northern portion of the designated area, RNZ's experience over the last 80 years is that technical and operational demands and requirements change. AM transmission in particular requires large areas of land, and optimal locations that are positioned to provide coverage to population centres are now very difficult to secure.

18 The site comprises three areas that RNZ can operate masts from, although only one of these currently has a mast. There is other infrastructure including the underground earthmat, RF feeder cables and power and control feeds located on the remainder of the site in the event RNZ requires them in the future. Furthermore, on the northern site, an aerial hut is still in place in each location. RNZ needs to retain and maintain the equipment and capacity throughout the site to leverage these as required.

Land use compatibility

19 The land subject to the Designation is currently used for recreational use by the Titahi Bay Golf Club and the Wellington Regional Council under sublease from the Department of Conservation. The land is also an actively managed conservation area, with unique flora, fauna and wildlife, overseen by the Whitireia Park Board. RNZ has a constructive and collaborative relationship with these parties on the use

of RNZ land, and is not aware of any issues associated with the Designation that has hampered activities and the use of land by these parties.

Electromagnetic radiation (EMR)

20 RNZ requires the Designation as a matter of public safety. The transmitter mast emanates a large electro-magnetic radio signal, which induces a very small signal in the receiving aerial, or any metallic object. At a distance, this induced signal is very small however, within approximately 1km of the mast, the induced voltage can be high.

21 The effects of EMR from RNZ's transmitter masts are not well understood across New Zealand. Radiation from masts can induce dangerous EMR levels into nearby tall metallic objects through EMR coupling. There are two types of physical effects which can arise from EMR exposure:

21.1 Thermal effects, which are tissue heating and heat stress; and

21.2 Athermal effects, which describes electro-stimulation of the nervous system, acoustical sensations, and electrical shocks and burns.

22 RNZ consider both of these effects when determining the Radiofrequency Fields and General Public exclusion zone. It manages the very high EMR levels close to the mast in line with current New Zealand and international radiation standards. The attached document explains the five 'zones' around RNZ's transmission facilities at Porirua. RNZ controls and manages EMR risks in each zone as appropriate.

23 RNZ have and continue to engage with Council on Variation 1 to the Proposed Plan (the *Variation*) to enable urban intensification as required by the Resource Management (Enabling Housing Supply and Other Matters) Act 2021 (*Enabling Housing Act*). Residential development up to 11 metres in height (as provided for in the Enabling Act) is inappropriate within ~500m and ~1km of RNZ's radiocommunication infrastructure due to the risk of EMR. RNZ provided feedback to Council on 6 May 2022 seeking recognition as a "qualifying matter" justifying tighter height controls within these radii.

24 We observe that the Minute acknowledges the need to maintain tight control around RNZ's transmitters. However structures outside RNZ's immediate control, but nevertheless in close proximity to the masts, must also be managed. Unfortunately these health and safety issues are not commonly realised or understood. Retaining the Designation over the entire Site assists RNZ with actively managing EMR safety risks. Although there is currently no planned development in the designated area north of the current transmitter that would be considered incompatible, RNZ considers retaining the full designation is a prudent planning measure that will assist in managing any potential future developments.

Reverse sensitivity

25 In addition, outside of the Site boundary, RNZ seek appropriate planning frameworks to manage the risk of buildings / structures of inappropriate heights and materials. This is also the area where reverse sensitivity issues can arise.

26 Reverse sensitivity effects are adverse effects that new (or intensified) "sensitive" land use can have on existing activities. For example:

26.1 Residents may be unhappy if they can see large radio masts from their houses.

26.2 Nearby residents may be unhappy that, on the occasions it is used, RNZ's back up-generator makes a certain amount of noise.

26.3 RNZ has had direct experience of people, who live near some of its sites, complaining about the interference to their electronic devices after they have purchased land and built a house near a transmitter (television reception and, potentially, broadband, telephone signals, burglar alarms and intercom units can be adversely affected hear a transmitter).

26.4 Residential developers of adjacent properties, in RNZ's experience, do not widely understand the importance of compliance with relevant EMR regulations. There is a risk structures will be constructed that do not meet these regulations, which can be dangerous to both construction staff and occupants of those structures.

27 RNZ has in the past had to relocate transmitter facilities as a result of increased complaints from new residents moving near its facilities. This is a last resort for RNZ and is extremely disruptive and costly.

28 Where possible, RNZ select and develop sites in rural areas at a significant distance from residential or other incompatible activity. However, it also needs to obtain optimum locations from a coverage point of view, and undeveloped sites near urban centres which are suitable for AM transmission are difficult to find.

29 RNZ acquires a conservative amount of land to designate, in order to provide for (occasionally unanticipated) radiocommunication activities that may be required in the future, and to manage reverse sensitivity effects appropriately.

RNZ submission on Proposed Plan

30 RNZ's submission on the Proposed Plan (Submitter 121) primarily sought recognition of reverse sensitivity effects associated with network utilities, which often cannot be avoided but can undermine the operation of those facilities as explained at paragraph 26 above.

31 RNZ's submission prioritised provisions concerning subdivision and development to the south of the Site as the risk of reverse sensitivity effects are greater (in light of the existing residential activity in the area). The more development that occurs in close proximity to the Site, the greater the operational risk to RNZ.

32 Radiocommunication activities on the Site are not incompatible with the proposed Significant Natural Area (*SNA*) and Outstanding Natural Features and Landscapes (*ONFL*) overlays. There has been significant radiocommunication infrastructure located on the Site for at least 80 years, and it therefore an established part of the

landscape. RNZ's activities on the Site pose no additional risk to values sought to be protected by the SNA and ONFL overlays.

Legal issues

33 RNZ has endeavoured to engage with the substance of the Panel's concerns above. If, despite the material presented, the Panel is minded to recommend a change in the geographic extent of RNZ's designations, RNZ wishes to note a potential legal issue.

34 Under Clause 9 of Schedule 1 of the RMA, the Panel may not recommend a change to a designation that is rolled over without modification. In circumstances where only minor modifications to the Designation is made that do not change the function or size of the designation (and no submissions are received), RNZ considers an issue of scope of powers arises if the Panel then seeks to recommend a change in the geographic extent of the Designation.

35 RNZ's legal representatives are happy to further engage on this issue, including with any legal advisor to the Panel, if the Panel seeks its own legal advice.

CONCLUSION

36 For the reasons above RNZ does not consider any reduction in the Designation to be necessary or desirable, and any change would not help achieve the purpose of the RMA. A reduction should particularly not be considered where there has been no identified problem or unjustified restraint on other activities arising from the Designation.

37 We are happy to discuss the contents of this letter with the Panel.

Yours faithfully

Ben Williams / Annabelle Lee
Partner / Solicitor

APPENDIX 1

RNZ Transmission

Constraints and Considerations for the Development of land around the RNZ Titahi Bay Transmission Site

Version	1.0
Status	RELEASE for consultation with Porirua City Council
Author	Michael Wilson, Steve White, RNZ Transmission Group
Effective Date	05 May 2022
Classification	IN CONFIDENCE: RNZ and Porirua City Council

Contents

Introduction

Background

This document provides the RNZ and Porirua City Council (PCC) a view of the constraints and considerations required when developing any land on or around the RNZ Titahi Bay AM transmission site.

Context

RNZ has operated a high power AM transmission site from Titahi Bay for over 80 years. As the Porirua region has grown over that time, housing and other developments have been located right up to the boundary of the Titahi Bay site.

While there are opportunities for further development around the Titahi Bay, the presence of a high power AM transmission site places some constraints on the use of the land, and also presents some risks for both the design, construction and occupancy of building structures near the site.

Constraints and Considerations

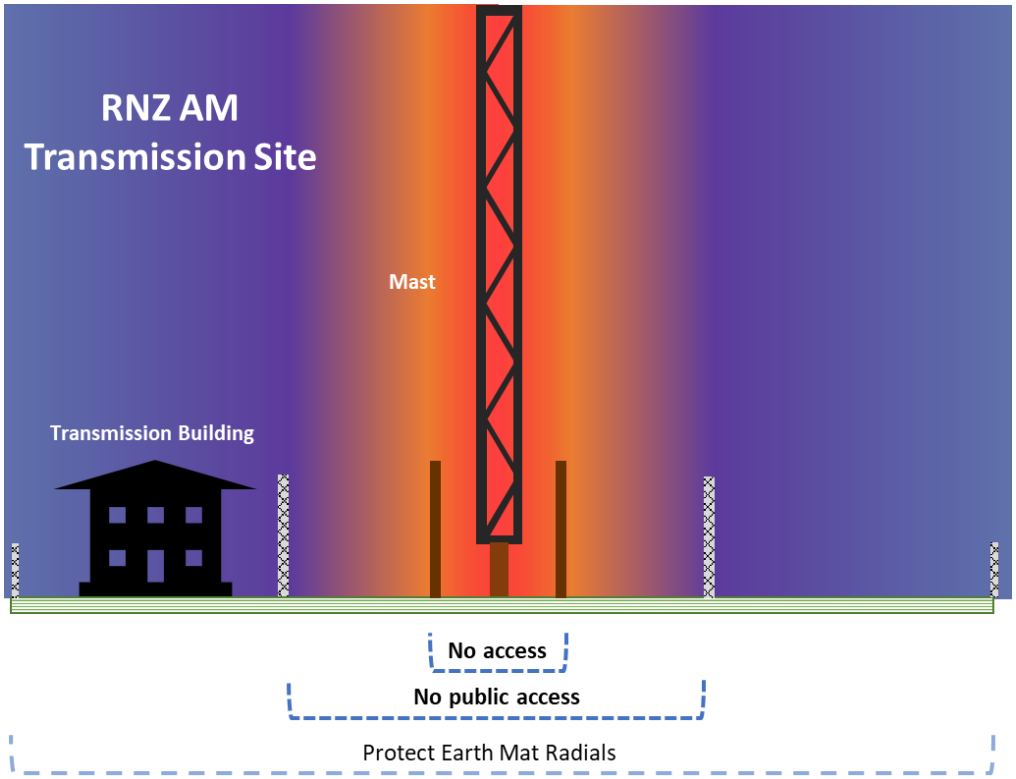
A high-power AM transmission site has several key characteristics that need to be considered when looking to develop land adjacent to the site:

Dimension	Considerations	Type
Visual	• The AM transmission mast is a 137m high steel guyed mast, which is prominent on the peninsular. The mast also has *low intensity* aviation beacons attached at 45m, 90m and a flashing *medium intensity* beacon on top of the mast at 137m.	Reverse sensitivity: RNZ has permission to install and operate the mast, and while seen by many as a landmark in the Wellington region, others may consider it an eyesore, particularly those living in proximity to the mast.
Audible	• The AM transmission mast and guy wires generate audible noise in the wind. A detailed analysis was undertaken of the old mast, and the new mast is quieter than the old one • In order to ensure continuity of service, RNZ has a large power generator on site that produces noise when operating.	Reverse sensitivity: While RNZ has permission to install and operate the mast, there is potential objection from people living close to the mast to the noise it generates, particularly in high winds. Reverse sensitivity: While RNZ has a dispensation to operate the generator and to exceed standard noise limits while doing so, people living close to the mast may still not agree with the noise and/or RNZ's dispensation from normal noise limits.
Earth Mat	• There are 120 copper wires buried ~300mm deep in the earth surrounding the mast out to a distance of at least 212m from the mast. These are required for the correct operation of the mast.	Land use: As the radials are buried 300mm deep, the land surrounding the mast cannot be used for any non-transmission structures. All current structures on the site are designed to ensure the integrity of the earth mat.
Electro-Magnetic Radiation (EMR)	• The mast transmits medium frequency (0.5-1.5Mhz) radio waves at high power. While this radiation is non-ionising and not harmful to humans at a cellular level, it can induce dangerous voltages / EMR levels into tall metallic objects such as building framing, wiring, plumbing and roof structures. • RNZ manage the very high EMR levels present close to the mast, and protect the public and workers from these, in line with current NZ and international radiation standards. • However, structures outside RNZ's immediate control are also potentially subject to EMR coupling	Compliance with EMR regulations. While actively observed and managed on RNZ sites, EMR risk from transmission sites are not widely understood outside of the industry. Developers of adjacent properties may unknowingly design and build structures which do not meet NZ EMR regulations and are dangerous to both construction staff and occupants of those structures. Reverse Sensitivity: High RF levels can cause issues with the correct operation of household technology, such as remote door openers, radio and TV signals, wifi signals and electronic devices. While the EMR levels may be within regulations, poorly designed home technology devices may not operate correctly, leading to frustration.

EMR Constraints and Considerations

As EMR constraints and considerations are the least well understood, this section details what they are and where they apply in and around the Titahi Bay site.

The AM site mast emits non-ionising EMR radiation, which diminishes rapidly the further it travels from the mast. Around the mast, RNZ manages the EMR from the mast, in line with NZ and International standards:



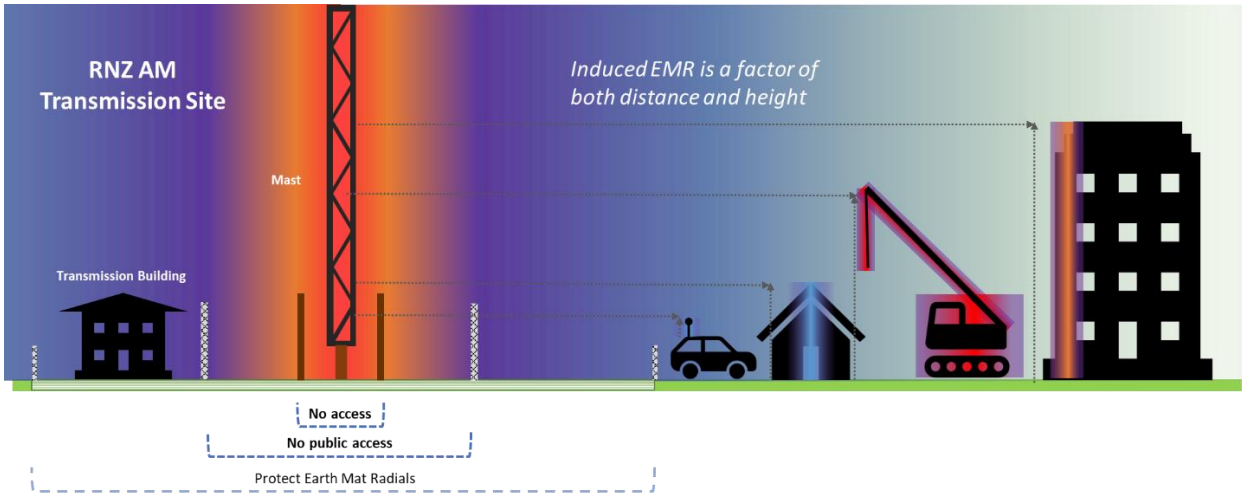
This radio transmission works by the transmitter mast emanating a large Electro-Magnetic radio signal, which induces a very small signal in the receiving aerial, or any metallic object. At a distance this induced signal is very small (e.g. 0.010V/m in urban areas, 0.0005V/m in rural areas) and causes no issue, even when a person directly contacts the receiving aerial or metallic object.

However, very “close” to the mast, within a kilometre or so, this can cause issues as the induced voltage can be high.

In structures, these metallic objects can include:

- Electrical wires
- Copper water pipes
- Metallic downpipes
- Telephone and computer cables
- Reinforcing rod in concrete

The induced EMR is related to how far the object is from the mast, and the vertical length of the object, and is concentrated around these metallic objects:



In terms of the RNZ Titahi Bay site, there are five zones around the mast, the last two of which are relevant to developments outside RNZ's boundary:

Zone	Responsibility for Managing EMR Risks	Risks Present	Other Concerns
Immediate area around the mast <5m from the mast	**RNZ** – this area is protected with a high vertical timber fence, barbed wire and is locked shut, with signage to denote the risk of shock and radiation exposure	Severe burns or death if a person were to come in contact with the mast EMR exceeds internationally agreed levels for trained RF workers at this distance from the mast.	When in operation, no persons are permitted in this area.
Mast compound <45m from the mast	**RNZ** – this area is protected with a mesh wire fence, barbed wire and is locked shut. There is also signage advising of the non-ionising radiation risk inside the compound.	EMR exceeds internationally agreed levels for members of the public inside this distance from the mast.	Only trained RF workers are permitted in this area when the mast is in operation.
Mast earth mat / RNZ transmission site ≤212m from the mast	**RNZ** – this area is not protected from the public, other than for general site security reasons, as EMR levels are below public limits.	Risk of EMR exceeding levels when aircraft, tall structures or machinery are used. RNZ manages this risk on a case-by-case basis.	The earth mat must be protected as this ensure the effective propagation of the mast.
In the local vicinity of the site, outside of the RNZ site boundary ≤528m from the mast **(≤1 Wavelength Zone)**	Current Council District Plan implicitly manages the risk by limiting building structures to 10m or less	Structures >10m **will mostly likely** result in EMR levels exceeding public limits. Shocks / burns from contact with large metallic objects, including temporary structures like cranes.	This is also an area where "nuisance" issues can cause reverse sensitivity issues. **Note that new government initiative to permit three storey housing will put occupants at risk if structures >10m are erected.**

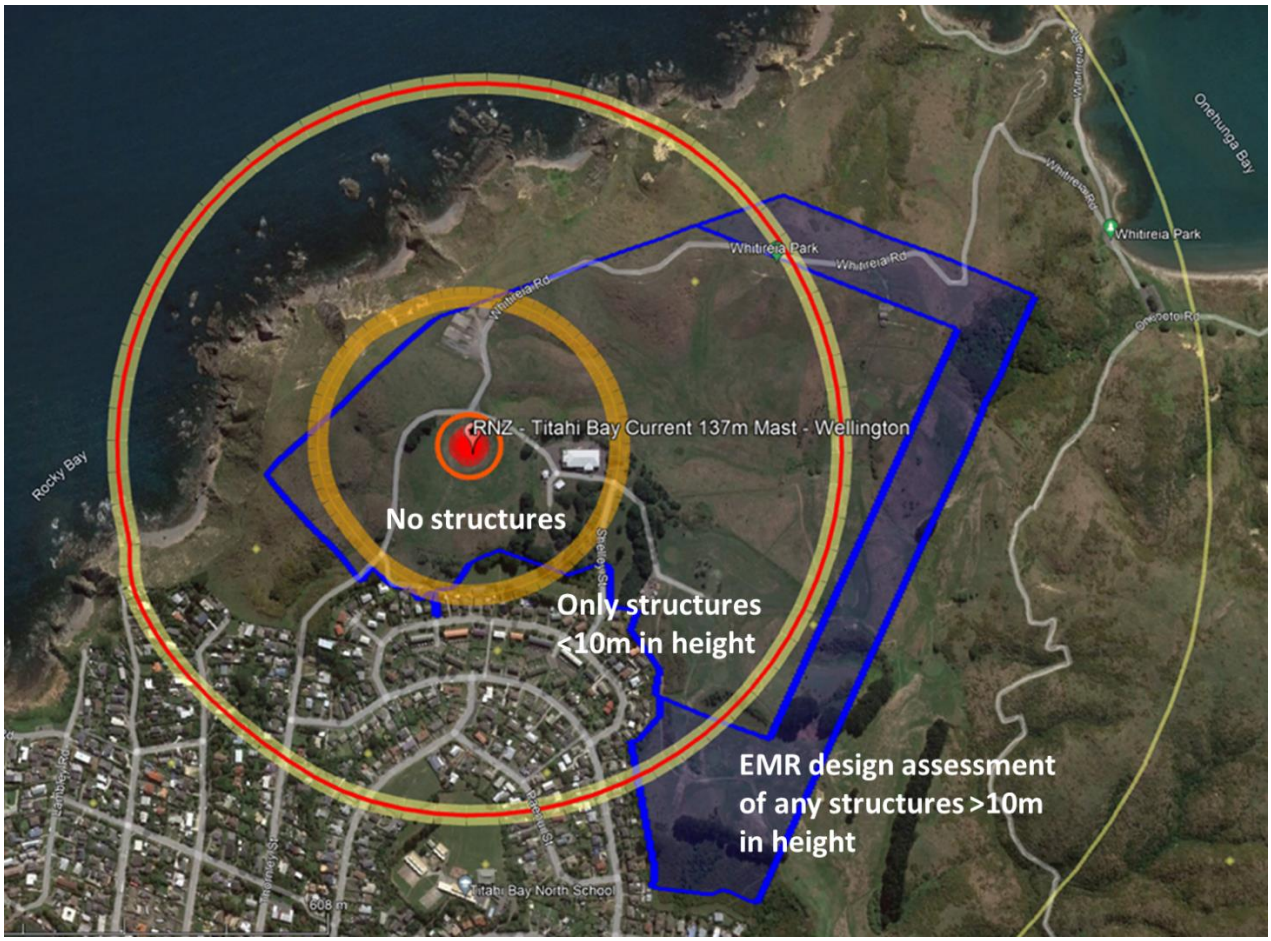
Within ~1km of the mast >528m and ≤1057m from the mast **(1-2 Wavelength Zone)**	Current Council District Plan implicitly manages the risk by limiting building structures to 10m or less	Structures >10m **may** result in EMR levels exceeding public limits. Shocks / burns from contact with large metallic objects, including temporary structures like cranes.	This is also an area where "nuisance" issues can cause reverse sensitivity issues. **Note that new government initiative to permit three storey housing may put occupants at risk if structures >10m are erected.**

At distances greater than 1km from the mast, the EMR risks are sufficiently small to not require active mitigation.

Implications for Development of Sites Adjacent to the RNZ AM Transmission Site

Zone	Permanent Structures	Construction Methods / Temporary Structures / Cranes
In the local vicinity of the site, outside of the RNZ site boundary ≤528m from the mast **(≤1 Wavelength Zone)**	**No structures above 10m (~2 storeys)** in height, **no exceptions**. To be enforced through local council district plan and building consent process. Individual EMR assessments of structures not required.	**All temporary structures and use of cranes with a vertical height greater than 10m to be subject to a site and equipment-specific EMR assessment and specific work practices to mitigate EMR risks.** The need for the assessment must(?) be specified in building consent and PCBU managing construction site must ensure it is undertaken.
Within ~1km of the mast >528m and ≤1057m from the mast **(1-2 Wavelength Zone)**	**The design of any structure above 10m (~2 storeys) in height must include a site-specific and construction materials-specific EMR assessment to** ensure the structure does not affect transmission propagation nor expose construction workers or occupants to EMR above NZ standards. To be enforced through local council regulations and building consent process.(?)	**All temporary structures and use of cranes with a vertical height greater than 10m to be subject to a site and equipment-specific EMR assessment and specific work practices to mitigate EMR risks.** The need for the assessment must be specified in building consent and PCBU managing construction site must ensure it is undertaken.
Outside of the ~1km radius	Assumes construction of any significant infrastructure e.g. Power pylons / cell towers will have an EMR assessment conducted as a matter of course / current council policy.	Relies on major infrastructure industries to be aware of and manage their own EMR risks, as they already do.

For Titahi Bay development adjacent to the RNZ site, the following map indicates those areas:



Example: Shelley Street Sections

For example, if sections are made available in Shelley street, the sections are no closer to the mast than other sections, but they will be significantly closer to the transmission building than previous occupied / residential sites.

Our two primary concerns for the Shelley Street sites are:

1. EMR concerns, structures on these sites must be restricted to no more than 10m in height
2. Noise concerns from the diesel generator. This can be quantified with an acoustic analysis, similar to the process used previously for measuring mast acoustic noise.

Management / Mitigation of Issues / Risks

The EMR concerns are manageable as long as the height restrictions are adhered to both during construction and of the final structures.

The Noise concerns from the diesel generator can be mitigated by retrofitting acoustic treatment to the generator, generator hall and the exhaust. This would have to be negotiated as part of any development plan for the area.

Document Control

Version history

Date	Version	Changes	Author
20 October 2021	0.1	Initial Draft	Michael Wilson
21 October 2021	0.2	Updates from technical review by Steve White	Michael Wilson
05 May 2022	1.0	Minor updates for release to response document for draft Porirua District Plan	Michael Wilson