BASELINEGROUP

Appendix 12: Transpower Consultation

TRANSPOWER

Keeping the energy flowing

30 April 2021

Baseline Group
PO Box 8177
Riccarton
Christchurch 8440
Via Email – sally@blg.nz

Attention: Sally Elford

Dear Sally,

RE: PROPOSED PRIVATE PLAN CHANGE AT 214A BIRCHS ROAD, PREBBLETON

This letter is in response to your Patai request (dated 20 April 2021) for Transpower New Zealand Limited (Transpower) comments on the proposed private plan change to Selwyn District Plan to rezone land from rural to residential at 214a Birchs Road, Prebbleton (the site).

Transpower's Christchurch – Twizel A (CHH-TWZ A) 220kV National Grid transmission line traverses the proposed development area, and Tower A0454 of the CHH-TWZ A line is situated on the same Lot. I have **attached** an aerial plan showing the site in relation to Transpower's assets.

We understand that you wish to rezone the land from rural to residential in order to allow for future residential development. Due to CHH-TWZ A traversing the site and other concerns outlined below, Transpower wishes to be involved throughout the process to ensure that its assets are not adversely affected as a result of rezoning.

There are several considerations from Transpower's perspective which the rezoning may impact upon, particularly regarding future development within close proximity to its National Grid transmission assets. Development is required to be consistent with the ***National Policy Statement on Electricity Transmission 2008*** *(NPSET)* and comply with the ***New Zealand Electrical Code of Practice for Electrical Safe Distances*** *(NZECP34:2001).*

The National Policy Statement on Electricity Transmission 2008

The National Policy Statement on Electricity Transmission 2008 (NPSET) confirms the need to operate, maintain, develop and upgrade the electricity transmission network as a matter of national significance, and the need to appropriately manage both the transmission network and activities and development under, and in close proximity, to it.

Policy 10 of the NPSET provides that to the extent reasonably possible, activities must be managed to avoid reverse sensitivity effects on the National Grid and to ensure that operation, maintenance, upgrading and development of the Grid is not compromised. It is important to ensure that any

development at this site does not compromise the ongoing operation and maintenance of the CHH-TWZ A line, including access to Tower A0454.

Policy 11 of the NPSET requires local authorities to consult with Transpower and identify an appropriate buffer corridor within which sensitive activities[1] (such as residential dwellings) will generally not be provided for in plans and/or given resource consent. Transpower refers to this corridor as the National Grid Yard, which in this instance is a corridor 12m either side of its transmission assets. I have marked up the National Grid Yard (red hashed areas) on the attached aerial plan (Note that the 26m buffer around line support structures incorporates the 12m NZECP 34 and National Grid Yard setbacks from visible tower foundation requirements.) Any new sensitive activities such as a residential dwelling needs to be located outside of the National Grid Yard and comply with the NZECP34:2001.

Giving effect to the NPSET

The Operative Selwyn District Plan 2016 does not give full effect to the NPSET, where there are currently no provisions which limit the development of sensitive activities within the National Grid Yard. However, the Proposed Selwyn District Plan (publicly notified 5 October 2020) does contain provisions which prevent new sensitive activities from being established within the National Grid Yard and would protect Transpower's CHH-TWZ A assets from future development at this site.

Therefore, in the interim of the Proposed District Plan becoming fully operative and the new provisions taking effect, Transpower would like to ensure that its assets are protected from future development at the site as a result of the rezoning form rural to residential.

Background and Reasons for the National Grid Yard

Underbuild

Transpower seeks to keep the National Grid Yard free of buildings and structures and to manage land use and activities that could pose a risk to the safety of people or property or to the safe and efficient operation of the National Grid. Any sensitive activities (such as residential dwellings) must be located outside the National Grid Yard.

Health and safety effects

There are a number of health and safety risks to people where development may be proposed within the National Grid 12m Yard. Section 3 of the RMA provides that the term 'effect' includes any potential effect of low probability which has a high potential impact. These include:

- *Conductor drop;*

  It is possible for the conductors (wires) of a transmission line to drop to the ground should a mechanical failure occur to the support structures, supporting insulators and hardware. When a conductor drop does occur, the consequences can be wide ranging for activities under the line.

- *Flashovers;*

  A flashover is a momentary, but major, electric arc, usually across an insulator string. Each flashover is accompanied by a brilliant flash and a loud bang and results in a short circuit, which may damage equipment at a substation and occasionally on private properties. Flashovers can also occur

[1] The NPSET defines *Sensitive Activities* as including schools, residential buildings and hospitals.

between two conductors or between a conductor and an object underneath the line, such as a tree or a crane jib. Objects do not need to touch the conductors to cause a flashover, as the arc can 'jump' (over a metre in some circumstances).

- *Earth potential rise;*

  Caused by an earth fault at a tower or pole which occurs when an energised conductor comes into contact with, or flashes over to, the tower, pole, or any earthed object. During an earth fault, there is significant current (2-20 times normal) flowing in the faulted line from the power source into the fault point. These fault currents are highest either near the electricity source (generator) or substation as the current returns through the ground. The return current causes momentarily high voltages to appear on both the tower and the ground around the base of the tower. The earth fault current creates EPR around the faulted tower, which in turn results in step and touch voltage hazards and induction voltage hazards as discussed below.

- *Step and touch voltages; and*

  Step and touch voltages can arise due to a fault at a tower or pole and momentarily raise the voltage at the tower or pole base and the surrounding ground. A step voltage hazard occurs when a person or animal takes a step in this area, or a person or animal is in contact with the tower or pole and standing on the ground, thus causing a voltage difference between the feet or between the feet and hands.

- *Induction voltages.*

  Induction voltages can cause irritation to a person or animal and nuisance from conductive materials such as fences, wires, or large industrial buildings. Induction is caused through a magnetic coupling between the conductors and any metallic wires or fences installed over long distances, generally those running parallel to the circuit itself. People may experience inductive shocks between the metallic wires and ground.

These risks are reduced by maintaining a corridor 12m either side of the centre line of a transmission line (the National Grid Yard). Compliance with NZECP 34:2001 does not address these risks.

Reverse sensitivity effects

Having residential activities within the National Grid Yard increases the potential for occupants to complain about various matters (as discussed below). This can result in reverse sensitivity effects on Transpower.

Transmission corridors minimise effects on landowners and occupiers from electrical interference. Interference from transmission lines usually comes in two forms – mechanical noise and electrical noise. Mechanical noise can come from vibration which causes a rattle of the line hardware or from environmental events such as high winds (wind whistling through conductors or over steel works). Electrical noise usually comes from some form of electrical discharge or leakage. This generally can be heard discharging down insulators when it starts raining after a long period of fine weather.

In other areas, landowners/occupiers have raised concerns about electric and magnetic fields (EMF) from transmission lines. Transpower's assets operate well within the limits in the International Commission on Non-ionising Radiation Protection Guidelines for limiting exposure to time varying electric magnetic fields (1Hz – 100kHz) (Health Physics, 2010, 99(6): 818-836 (known as the ICNIRP

Guidelines). These Guidelines are recognised by the Ministry of Health and World Health Organisation. Separation distances between lines and buildings help to manage the perceived risks of EMF.

Effects on operation, maintenance, and upgrading

Transpower has legal right to access the transmission lines and support structures on site (e.g. for maintenance, inspections and upgrading) under the Electricity Act 1992, however this does not guarantee that physical access is available. Transpower's requirements for vehicle access to the lines and towers need to be considered in the design of the development as part of the plan change, so as not to compromise Transpower's ability to access and maintain the existing National Grid assets. It is also important that during construction, ongoing access to the transmission lines and poles is maintained.

The National Grid has operational requirements and engineering constraints that both dictate and constrain the way it is managed. Maintaining the National Grid is a core part of Transpower's business and it is important that appropriate access to the National Grid is retained in order to allow maintenance activities to take place. Most of this work will occur on private land, and depending on the work required may involve the use of lifting machinery, stringing equipment, hurdles or temporary support structures, elevated work platforms or helicopters. Earth moving machinery, such as excavators or diggers, are required to expose or extract tower foundations or carry out tower refurbishment works.

Clear working space and good access is required particularly around the base of the towers or poles and in some cases under conductors, to move the plant and equipment in and set it up correctly. Cordons must be installed around the work site to minimise hazards and restrict access to everyone other than the trained work party. When work is carried out on a tower, the effective work area for health and safety purposes includes the spans of transmission line either side of that structure.

The extent of any encroachment of buildings, other physical barriers and natural obstacles (such as waterways, valleys, and undulating ground) will determine what access solutions are practical, and may limit the available options which can significantly increase the cost of undertaking any maintenance or upgrading work. Further intensive or sensitive development will add additional physical barriers, and thereby increase the costs and difficulties associated with access.

The New Zealand Electrical Code of Practice for Electrical Safe Distances 2001 (NZECP 34:2001)

NZECP specifies minimum safe separation distances for buildings/structures, earthworks and mobile plant from transmission lines and support structures. The minimum safe distances have been set primarily to protect persons, property, vehicles and mobile plant from harm or damage from electrical hazards.

It is important to note that the NZECP is a regulation under the Electricity Act and compliance with its provisions is mandatory. Please note that NZECP requirements are in addition to the National Grid Yard (noted above), although many of the safe clearance distances can overlap.

Regardless, Transpower wishes to emphasise that NZECP should not be solely relied upon to determine the adverse effects of any proposal on the transmission line. NZECP does not address the operation, maintenance and upgrading requirements of the National Grid, and reverse sensitivity and amenity issues (as previously discussed). The National Grid Yard and the NPSET do address these issues. The narrow focus of the NZECP on minimum safety distances means the Code cannot and is not intended to achieve the broader policy objectives sought by the NPSET, nor can it meet the wider

sustainable management purpose of the RMA. Therefore, it does not include a regime to manage development (including avoiding sensitive development) underneath or in close proximity to transmission lines that could compromise the operation and maintenance of the network, or provide any guidance for decision making on land use that may enable the establishment of such development. Nor does compliance with NZECP necessarily protect people from serious harm or potential death which can result from risks such as conductor drop.

Summary

In summary, for the reasons outlined above, Transpower does not object to the rezoning of the site in principle. However, it does hold significant concerns where the rezoning of the site from rural to residential may allow new sensitive activities to be established within the National Grid Yard, with actual and potential adverse effects on the future occupants of the dwelling, and the National Grid lines.

Transpower is happy to work through options with you to ensure rezoning of the site will not negatively impact its National Grid transmission assets. For example: the concept plan provided indicates a stormwater reserve which runs close to the CHH-TWZ A line. Extension of this reserve to match the 12m National Grid Yard is a method Transpower would be happy to discuss to prevent the establishment of sensitive activities within this area. If you think this is possible and would be happy to discuss options, please contact us and we can work through this with you.

Please contact me on 04 590 8687 or Andy.Eccleshall@transpower.co.nz should you wish to discuss this letter or require any further information or clarity regarding the matters discussed.

Thank you again for contacting Transpower.

Yours faithfully,

Andy Eccleshall
Environmental Planner
TRANSPOWER NZ LTD
(Authorised to sign on behalf of TRANSPOWER NZ LTD)

Attachments: Map of Transpower assets on 214A Birchs Rd, Prebbleton

Please note: *Transpower reserves it's right to revisit the abovementioned assessment should the proposal change or should a substantial amount of time pass following this assessment. This letter relates only to the proposed private plan change at 214a Birchs Rd, Prebbleton. This letter cannot be relied upon in the event that the Site details and/or nature of the development change from that indicated in this correspondence. This letter is not intended to be, and does not constitute, legal advice in relation to your legal obligations under New Zealand legislation, and in particular the provisions of the New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP34:2001).*

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Attachment 1: Map of Transpower assets on 214A Birchs Road, Prebbleton