Before the Hearing Panel

Under	the Resource Management Act 1991 (the Act)
In the matter of	Proposed Plan Change 1 to the Natural Resources Plan for the Wellington Region **Hearing Stream Three -** **Rural land use activities, Forestry, Vegetation clearance and Earthworks**
Between	**Greater Wellington Regional Council** Local authority
And	**Transpower New Zealand Limited** Submitter 177 and Further Submitter FS020

Statement of evidence of Julia Kennedy for Transpower New Zealand Limited

Dated 5 May 2025

Executive Summary

1. Transpower New Zealand Limited (**Transpower**) operates the National Grid, which transmits electricity throughout New Zealand. Within the Wellington region there are 12 substations and 25 high voltage National Grid transmission lines ranging from 110 kilovolts ("**kV**") to 350 kV. Transpower also has an interest in the West Wind Substation and has other facilities across the region such as communication assets. Three 350kV submarine cables across the Cook Strait, which transmit electricity between the North and South Islands (commonly known as 'The Cook Strait Cables'), connect into the Oteranga Bay cable termination station. National Grid assets in the Wellington region serve communities at local, regional and national levels.

2. Transpower wishes to see appropriate planning provisions included in Proposed Change 1 ("**PC1**") to the Natural Resources Plan ("**NRP**") to ensure that Transpower can operate, maintain, upgrade and develop the National Grid to enable a sustainable, secure and reliable supply of electricity to the Wellington region and nationally.

3. The topics of relevance within Hearing Stream 3 for Transpower are Earthworks and Vegetation works.

4. Managing the effects of vegetation on the National Grid is a continuous task for Transpower. Vegetation growing too close to existing National Grid transmission lines (including associated access tracks) can pose a potential hazard to life, property and the environment, and a threat to the security and reliability of the electricity supply system. While not over-riding RMA obligations and requirements, Transpower has a legal requirement to maintain its lines to minimise any tree-related interruptions to the supply of electricity. I support the Section 42A Report ("**s42A**") recommendations pertaining to vegetation clearing and trimming provisions.

5. Transpower undertakes earthworks activities both for its existing and any new assets. Typical earthworks are associated with development and maintenance at substations and transmission line support structure installation, foundation strengthening, upgrades and replacement works. Earthworks are also associated with work that enables these activities such as maintaining and forming new access tracks to provide access to the assets and creation of crane pads if needed.

6. **Ms Whitney's** evidence seeks a confined amendment to the earthwork policies WH.P29 and P.P27 (being amendment to the recommended new clause (e) in those policies which refers to the winter close down period), and amendments to earthwork rules WH.R23A and P.R22A (seeking an exemption from the 5m setback from surface water bodies, amendment to the 'nil' discharge condition, clarification on the default activity status, removal of the word 'minor' from the rule titles, and removal of 'and' from the activities to which the rules apply), with the majority of the officer recommendations on the Transpower submission points accepted or supported. I concur with the amendments recommended in **Ms Whitney**'s evidence.

Qualifications and experience

7. My full name is Julia Marianne Kennedy.

8. I am employed by Transpower as the Environmental Consents and Compliance Team Leader, based in Hamilton, where I manage a team of Environmental Advisors. The role of my team is to support the project and service delivery teams who carry out routine building and development work, maintenance and other routine activities on existing National Grid assets, including obtaining any necessary resource consents and associated monitoring and compliance.

9. I have a degree in Resource and Environmental Planning with honours from Massey University and have had 25 years' experience in planning and environmental management of which nearly 13 years have been with Transpower.

10. Before Transpower, my environmental and planning experience included working at Otago Regional Council as a Compliance Officer, a planning consultant with Kingett Mitchell Limited and Golder Associates as well as a Development Planning Officer at two boroughs in London.

11. I am generally familiar with the National Grid assets within the Wellington Region and specific to the topics of Hearing Stream 3, I am familiar with the earthwork and vegetation clearance activities necessary to ensure the National Grid assets within the region are maintained, replaced, upgraded or removed, as well as the construction of new assets.

Code of Conduct

12. I confirm that I have prepared this evidence in accordance with the Code of Conduct for Expert Witnesses contained in Part 7 of the Environment Court Practice Note 2023. The issues addressed in this statement of evidence are within my area of expertise except where I state that I am relying on the evidence or advice of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions I have expressed.

13. I confirm that I am authorised to give this evidence on behalf of Transpower.

Scope of Evidence

14. My evidence will address the following:

    a. Transpower and the National Grid

    b. Transpower's assets within the Wellington Region and the significant role these play locally, regionally and nationally

    c. Transpower's reasons for and approach to managing earthwork activities

    d. Transpower's reasons for and approach to managing vegetation clearance/trimming activities; and

    e. Conclusions.

Transpower and the National Grid

15. Transpower is a State-Owned Enterprise that plans, builds, maintains, owns and operates New Zealand's high voltage electricity transmission network – the National Grid. The National Grid links generators to distribution companies and major industrial users.

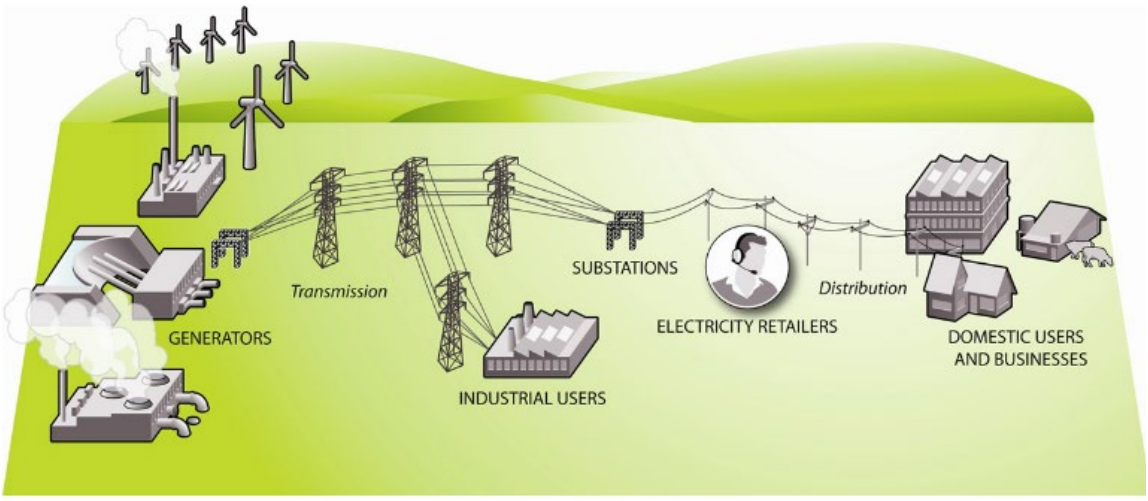
16. The National Grid comprises a high voltage backbone which runs the length of the country and links major generation (such as the geothermal power stations near Taupō) to major loads in the main cities. The bulk of the National Grid backbone was built around 60 years ago and comprises most of the 220 kilovolt (kV) lines throughout New Zealand, along with the High Voltage Direct Current (HVDC) link between the North and South Islands

17. New Zealand has become increasingly dependent on electricity. It is an intrinsic part of living and working in the 21st century. Electricity now accounts for about 26% of all energy used in New Zealand.[1] Transpower, whose main role is to ensure the delivery of a reliable and secure supply of electricity to New Zealand, has a fundamental role in the industry and in New Zealand's economy.

18. Transpower is not a generator of electricity. It can be considered to be a 'freight company' for electricity, in that it carries bulk electrical energy from where it is generated by companies such as Meridian Energy to where it is used, be that by large industrial 'direct connect' customers (such as Tiwai Point Aluminium Smelter and NZ Steel at Glenbrook) or local electricity distribution companies – which for the Wellington region includes Wellington Electricity, Electra and Powerco.

19. Transpower also manages New Zealand's power system in real time. In its role as System Operator, Transpower operates the electricity market to ensure electricity transmitted through the National Grid is delivered whenever and wherever it is needed, 24 hours a day, seven days a week.

20. Transpower's main role is to ensure the reliable supply of electricity to the country. Transpower plays a significant part in New Zealand's economy, with all major industries, cities and communities being reliant on a secure and reliable supply of electricity.



[1] Energy Balance Tables 1990-2023 | Energy statistics | Ministry of Business, Innovation & Employment (mbie.govt.nz)

Figure 1. Electricity Industry in New Zealand. Source MBIE

21. As a State-Owned Enterprise, Transpower's principal objective is to operate as a successful business. It must operate within certain legislative constraints and report regularly to its shareholding Ministers. Transpower is required to deliver and operate a National Grid that meets the needs of users now and into the future.

22. One of Transpower's key objectives therefore is to maintain and develop the National Grid, which contributes to New Zealand's economic and social aspirations. This objective is reflected in the single objective in the National Policy Statement on Electricity Transmission 2008 (NPSET).

23. Prudent investment in the National Grid (including for maintenance and access), long term transmission planning strategies, and developing technologies are crucial to ensure the most can be made from existing infrastructure. Proper maintenance and access to the Grid is essential to defer the need for new lines and substations and to create better options for when new build is required. This investment will, in turn, help to limit the cost and environmental footprint of the National Grid for future generations.

Transpower's assets and those within the Wellington Region

24. In general terms, the National Grid includes the following types of assets:

- **National Grid transmission lines.** These are the high-voltage transmission lines that are visible in many parts of the region that transmit electricity from where it is generated to local distribution networks. Transmission lines typically include the lines themselves (referred to as "conductors"), and structures such as towers (often referred to as 'pylons') and poles which carry the conductors. Transmission lines that are located below ground are referred to as "cables". Particularly, in rural areas, transmission lines are supported by access tracks that enable access to the lines for maintenance and upgrade activities.

- **National Grid substations.** Substations are the point where electricity transitions from or to National Grid transmission lines. The majority of substations in the Wellington region transfer electricity from the National Grid to local distribution networks owned and operated by local network utility operators (such as Wellington Electricity). Substations are industrial in nature,

and include features such as switchyards, buildings, hardstands, vehicle access, parking and loading facilities, fences and access control.

25. There are 12 substations, and 25 transmission lines operating at either 110kV, 220kV or 350kV within or traversing the Wellington region. Transpower also has equipment located at the West Wind Substation and has other assets across the region including seven communication sites, four links supporting the High Voltage Direct Current ("**HVDC**") transmission line, and five overhead fibre cables.

26. The Wellinton region is the main corridor for through-transmission between the North and South Islands, as the HVDC link between the Haywards substation in Lower Hutt and the Benmore substation in the Waitaki District allows for power to flow between the two islands. The HVDC link can transfer up to 850 megawatts (MW) to the South Island (depending on the load and generation in the Wellington region and Central North Island), and up to 1,200 MW from the South Island. As generation capacity in the region is much lower than local load, power is normally imported, either via the HVDC link (from the South Island) or from the Central North Island.

27. The submarine cables across the Cook Strait, which form part of the HVDC link, are critical infrastructure in enabling the transfer of electricity from the South and North Islands, as needed. It is likely that these cables will need to be replaced within the next 10 years and potentially an additional cable installed to increase the HVDC transfer capacity for future use.

28. A list and map showing National Grid substations and transmission lines within the Wellington region is included in **Appendix A** to this evidence.

Transpower's work within the Wellington Region

29. In terms of Transpower's upgrade and maintenance projects in the Wellington region, Transpower has recently completed the reconductoring (replacing the "wires") of its Bunnythorpe-Wilton A 220kV transmission line. This has been a staged reconductoring project carried out between Wilton substation and the Judgeford Tee over the last five years. The project involved replacing the conductors (wires) of the line and reducing the number of conductors on the line (from carrying 6 conductors to 3). The final sections of this project occurred over the past summer.

30. Transpower also has a role in supporting local electricity distribution networks to meet expected load growth on their networks and improve resilience, along with supporting new generation customers connecting to the National Grid. Transpower is undertaking various investigations across the network within the Wellington Region to assess these types of queries, including several relating to new solar or wind farm developments in the Wairarapa. These may require a connection to existing National Grid assets, or the construction of new assets.

31. Other than these projects and investigations, Transpower continues to carry out its business-as-usual inspection and maintenance works on its assets within Wellington (such as asset health and condition assessments, structure and insulator replacements, vegetation trimming and clearance around transmission lines, and maintenance to enable access to National Grid assets as needed). These activities require earthworks and vegetation works, activities relevant to Hearing Stream 3.

Earthwork activities

32. Earthworks activities typically undertaken on the National Grid include:

- **Earthworks along transmission lines:** earthworks can be necessary for many activities associated with maintaining and developing the National Grid. Some core routine activities include support structure foundation strengthening, replacement or removal of structures, levelling to accommodate crane pads, improvements and upgrades to access tracks, undergrounding of assets, creating staging areas for conductor stringing, earthworks associated with vegetation clearance and mid-span earthworks to rectify ground clearance violations.

- **Earthworks at substations:** this work would include accommodating extensions to switchyards to enable replacements, upgrades or new equipment such as transformers. Cable trenching and other minor earthworks activities associated with new or replacement equipment are also frequently carried out at substations.

33. Given the necessity for earthworks, I support the officer recommendation for a new permitted rule which specifically applies to the National Grid. However, I understand from **Ms Whitney's** evidence that one of the primary outstanding matters from the S42A Report recommendations is the permitted activity condition that earthworks be

set back 5m from any surface water body and the coastal marine area. Earthworks undertaken by Transpower within 5m of a waterbody can include foundation strengthening, access tracks next to and within riverbeds, and replacement or installation of structures to enable access such as bridges, culverts and fords. The 5m setback rule means that resource consent would be required for any earthworks of any scale within the 5m setback of a surface water body[2], with day to day 'routine' type activities captured. Examples of such typical 'routine' activities captured by the rule include:

- Condition assessments of structures to confirm asset health for example which involve minor excavations to check condition of structure foundations for corrosion and rot;
- Approximately 6m^3 of earthworks to replace a pole support structure, which typically would involve less than a days' construction;
- Approximately 100-200m^3 for crane pads to enable work on transmission lines, including for structure replacements or for mid span works such as joint testing where a levelled site may be required;
- Mid span earthworks to rectify ground clearance violations;
- Maintenance and minor upgrades of access tracks to transmission structures to enable access for inspection and to allow access to appropriate vehicles and equipment to maintain and upgrade the assets;
- Maintenance and replacement of bridges, culverts and fords that provide access to transmission structures (accepting there are also other rules in the NRP to manage these activities); and
- Maintenance and other work at substations such as cable trenching, fence installation and replacements, replacement equipment, replacing transformers, circuit breakers and other switchgear.

[2] Surface Water Body is defined in the NRP as "*Any river, lake, natural wetland, estuary outside of the coastal marine area, or water race, and their bed. For the purpose of the Plan, surface water body does not include ephemeral watercourses and bodies of water designed, installed and maintained for any of the following purposes: …Water Storage ponds and water treatment ponds.*"

34. Photographs of earthworks examples on the National Grid are included in **Appendix B** to this evidence.

35. To assist the panel in understanding the scale of the application of the 5m setback, an analysis of LINZ waterway data available to Transpower shows that there are approximately 15 to 20 transmission line support structures located within 5m of waterbodies, and there are approximately 35 bridges and 60 culverts/fords associated with National Grid access ways in the Greater Wellington region. The Cook Strait cables at Oteranga Bay are also located within 5m of the Coastal Marine Area ("**CMA**") as are the shore electrode at Te Hikowhenua and its access. I note that the review was undertaken at a high level and I am conscious that not all waterbodies have been identified.

36. It is noted that any earthworks (disturbance) within the CMA or the bed of a lake or river would be subject to Regulation 33(7) of the NESETA and require resource consent. Area limits[3] are provided under Regulation 33(2) of the NESETA for earthworks within a natural area (such as a SNA or ONFL) where there is a rule protecting that natural area, and if exceeded, triggers the need to obtain a resource consent.

37. Given the linear nature of the National Grid network and the continual need to maintain existing assets, earthwork activities are necessary to ensure the ongoing operation of the network. Given the regular nature of the activity, Transpower has procedures and adopts best practice to manage the effects, which relevant to this hearing, relate to sediment discharges into surface water bodies. Through various management plans and best practice tools, these measures/principles include:

    - Minimise Disturbance: Only work those areas required for construction to take place and disturbing the smallest area of land possible for the shortest time.

[3] Regulation 33(2) NESETA - Earthworks in a natural area must not, in a calendar year, exceed—

- (a)50 m³ per transmission line support structure; or
- (b)100 m³ per access track.

- Stage Construction: Carefully plan works to minimise the area of disturbance at any one time.
- Protect Steep Slopes: Steep slopes should be avoided where possible, and where disturbed, will be rapidly stabilised.
- Progressive and rapid stabilisation of exposed areas.
- Maintain vegetative cover.
- Use materials like straw mulch or geotextile.
- Use silt fences.
- Install Detention Devices (where necessary): Treat runoff by methods that allow sediment to settle out, where practicable.
- Experience and Training: Make sure experienced and trained person(s) are responsible for design, installing and maintaining erosion and sediment control practices.
- Monitor: Inspect, monitor and maintain control measures including weather monitoring and severe weather actions.
- Work in accordance with the Greater Wellington Regional Council guideline "Erosion and Sediment Control Guidelines for the Wellington Region 2002" (reprinted 2006) (GWRC Guideline).
- Accordance with the Environmental Handbook for Construction and Maintenance 2021[4] which has a specific section on *Water Quality (including erosion and sediment control).*

38. Given my experience and involvement in managing maintenance and other routine activities on National Grid assets, including obtaining any necessary resource consents and associated monitoring and compliance, I am comfortable and confident the effects of sediment discharge into surface water bodies associated

[4] TP Environmental Performance Handbook - 01 July'21.pdf

with earthworks activities for existing National Grid assets occurring within 5m of a surface water body can be managed outside the resource consent process.

39. Transpower has extensive experience in managing potential adverse effects and the regulatory framework recommended in the evidence of **Ms Whitney** in my opinion provides an effective and efficient regime in which to manage these effects. I do not consider requiring resource consent would have any additional benefit or change the processes adopted by Transpower. Rather it would only impose additional processing and compliance costs. I am comfortable with the recommended condition provided within the evidence of **Ms Whitney** that notice be provided to the regional council and consider this provides the opportunity for awareness and dialogue between Transpower and the Council as to the nature of the proposed activity. Transpower follows the same notification process under the National Environmental Standards for Freshwater as detailed in **Ms Whitney's** evidence.

Vegetation trimming and clearance activities

40. Transpower carries out a range of maintenance activities to ensure the efficient operation of the National Grid. Managing the effects of vegetation on the National Grid is a continuous task for Transpower and its Service Providers. Any type of vegetation (indigenous or exotic) growing too close to the National Grid can pose a potential hazard to life, property and the environment, and a threat to the security and reliability of the electricity supply system. Whether this is from inappropriately planted vegetation, or just poorly maintained trees, the risks for Transpower are significant.

41. Sitting outside the resource management framework, Transpower also has a legal requirement to maintain its transmission lines to minimise any tree-related interruptions to the supply of electricity. The Electricity (Hazards from Trees) Regulations 2003 (the "**Tree Regulations**") impose mandatory compliance obligations on Transpower and tree owners to avoid or mitigate hazards from trees on transmission lines. I understand any trimming or clearance works required under the Tree Regulations are not considered tree clearance under the NRP (as the works are excluded from the definition of 'vegetation clearance').

42. It is important to note that while the Trees Regulations contain some restrictions on tree growth, they do not address fall distance trees, nor do they ensure that the right tree is planted in the right place from the outset. The Tree Regulations are reactive,

and require a resource-intensive inspection and management regime. Often the minimum clearance distances required under the Tree Regulations are not sufficient for Transpower to ensure its assets are not compromised. This means that an exclusion of work to be done under the Tree Regulations within the NRP, although supported, will not address all necessary vegetation works to ensure security of supply.

43. At the time of preparing this evidence, I am aware that the government announced changes to the Trees Regulations to deal with fall distance trees and other matters. It remains uncertain how the proposed changes will be implemented within the Regulations themselves and the impact that this might have on Transpower's activities.

44. Currently, approximately 6000km of Transpower overhead lines are at risk from inappropriately located trees. Of this 6000km, some 900km of lines have plantation forestry within 40m (this is generally the "fall distance" – the distance where a tree could fall into a line and cause damage).

45. Inappropriately planted vegetation and trees growing too close to transmission lines creates risks to the assets, people, stock and other property. The main risks include:

i. Vegetation causing a flashover[5] resulting in wildfire. Due to the high voltages involved the flashover can cause the tree to ignite, and under the right conditions cause a wider fire hazard if the tree is near buildings or forests;

ii. Vegetation causing loss of supply, either by vegetation being blown into overhead lines, or too close to them, and a flashover occurring;

iii. Vegetation causing asset damage by trees and branches falling into transmission lines causing damage to the conductors, poles and towers;

iv. Additional risks of trees striking lines occurs when forestry is felled. Slash is also causing asset damage;

[5] A flashover is caused when an object, or vegetation comes into contact with the conductors the electricity arcs from a conductor onto an object such as a tree branch.

v. Access is restricted and/or made more difficult due to the location of planting or slash.

46. Ultimately these risks can result in a “lights out” scenario for communities, especially smaller regional communities with limited redundancy in the network.

47. It is therefore vital that trees and all other vegetation is trimmed or removed so that it complies with the Tree Regulations, and to avoid damage to transmission lines including fires and loss of supply, as well as maintaining access to transmission lines.

48. Transpower approach to managing the necessary vegetation works typically involves:

a. Onsite or desk top assessment (influenced by the scale of the works) to determine what is required, i.e. trimming only or full removal;

b. Assessment by a planner to determine the need for resource consent and whether involvement of an ecologist is required; and

c. Should consent and habitat management be required, engagement of an ecologist to determine the level of ecological effects and make recommendations to avoid, minimise, or remedy any adverse or potential adverse ecological effects of the activity. Mitigation could include altering designs or work methods and undertaking restoration/rehabilitation e.g. replanting and avoiding periods of significance to certain species.

49. I understand that **Ms Whitney** supports the Section 42A Report recommendations pertaining to vegetation clearing and trimming provisions.

Conclusions

50. The National Grid is critical to the social and economic wellbeing of the Wellington region and our nation generally. It will also play a critical role in New Zealand’s carbon zero commitment and mitigating the effects of climate change. This will necessitate the upgrade of existing, and construction of new, National Grid assets. As an infrastructure asset of national significance, the NPSET requires that the National Grid be recognised and provided for in Proposed Change 1 to the NRP.

51. Transpower has a consistent approach to assessing and managing the impact of vegetation works and earthworks across its different workstreams, including when establishing new National Grid assets. While it is recognised it is not always practicable to avoid all adverse effects, there are appropriate steps taken to ensure that any adverse or potential adverse effects of the activity are minimised or remedied.

52. Transpower's relief will ensure that the National Grid is able to be operated, maintained, upgraded and developed in a manner that will ensure security of supply while managing the adverse effects of its activities. The amendments sought in **Ms Whitney's** evidence will give effect to both the NPS-FM and the NPSET, and in my opinion, provide a pragmatic and considered approach. I support the majority of the officer recommendations pertaining to Hearing Stream 3 and concur with the confined amendments outlined in **Ms Whitney's** recommendations.

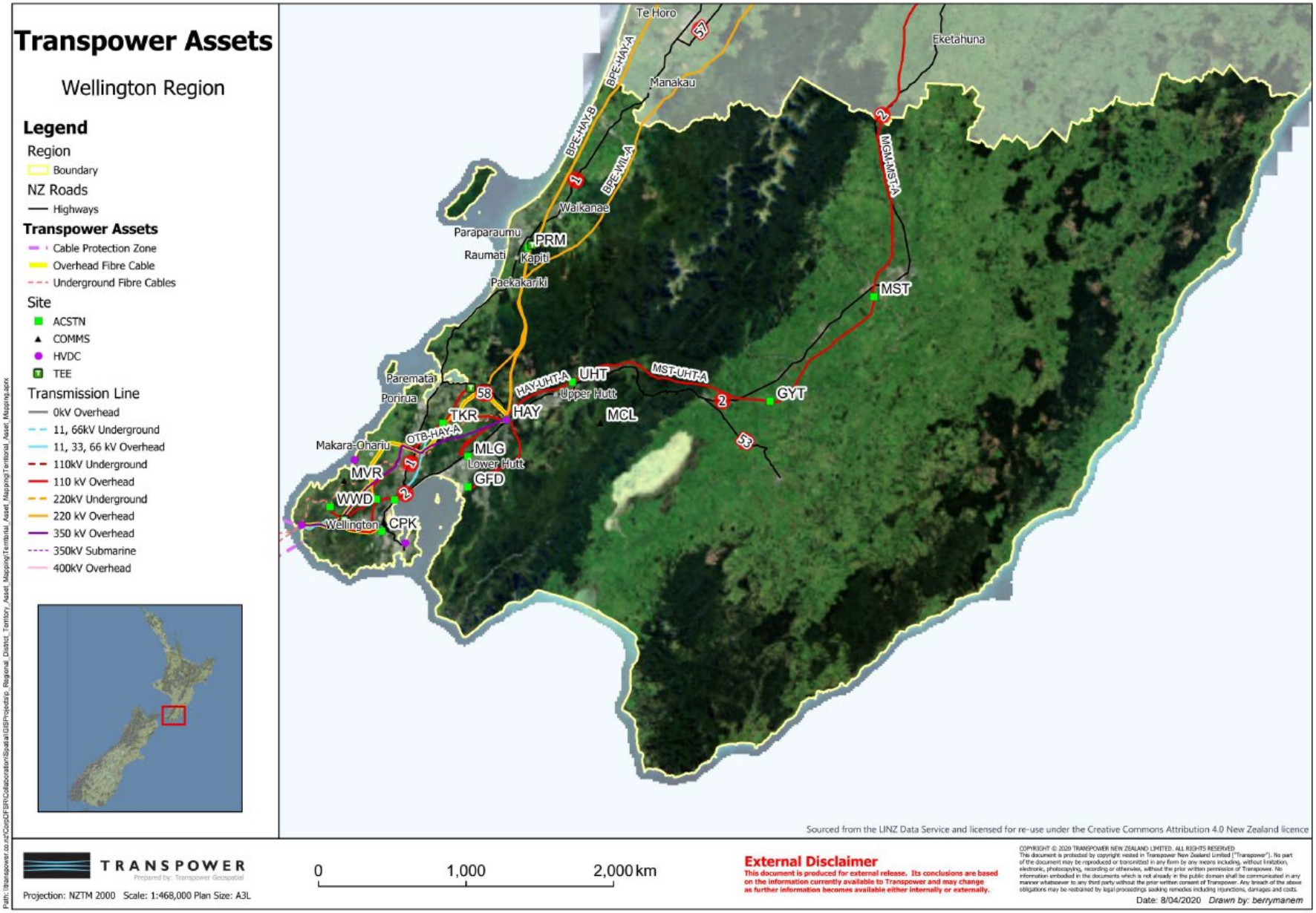
Julia Kennedy
5 May 2025

Appendix A – National Grid Assets within the Wellington Region

The following National Grid assets are within or traverse the Greater Wellington Region:

- National Grid Transmission Lines (25 lines in total)
  - Bunnythorpe-Haywards A (BPE-HAY A) 220 kV single circuit line on steel towers.
  - Bunnythorpe-Haywards B (BPE-HAY B), 220kV single circuit line on steel towers.
  - Bunnythorpe-Wilton A (BPE-WIL A), 220kV double circuit line on steel towers.
  - Central Park-Wilton A (CPK- WIL A), 110kV double circuit line on steel towers.
  - Central Park-Wilton B (CPK-WIL B), 220kV double circuit line on steel towers.
  - Gracefield-Haywards A (GFD-HAY A), 110KV double circuit line on steel towers.
  - Haywards-Judgeford A (HAY-JFD A), 220kV double circuit line on steel towers.
  - Haywards-Melling A (HAY-MLG A), 100kV double circuit lines on steel towers.
  - Haywards-Melling B (HAY-MLG B), 110kV double circuit lines on steel towers.
  - Haywards-Takapu Road (HAY-TKR A), 110kV double circuit lines on steel towers.
  - Haywards-Upper Hutt A (HAY-UHT A), 110kV double circuit lines on steel towers.
  - Khandallah-Takapu Road A (KHD-TKR A), 110kV double circuit lines on steel towers.
  - Kaiwharawhara-Wilton A (KWA-WIL A), 110kV double circuit lines on steel towers.
  - Mangamaire-Masterton A (MGM-MST A), 110kV single circuit lines on poles.
  - Masterton-Upper Hutt A (MST-UHT A), 110kV double circuit lines on steel towers.
  - Oteranga Bay-Haywards A (OTB-HAY A), 350kV double circuit lines on steel towers.
  - Paraparaumu Tee A (PRM-TEE A), 220kV single circuit lines on pi poles.
  - Paraparaumu Tee B (PRM-TEE B), 220kV single circuit lines on pi poles.

    - South Markara Road to Oteranga Bay A (SMK-OTB A), 110kV single circuit lines on poles.
    - Te Hikowhenua Deviation A (THW-DEV-A), single circuit lines on steel towers and poles
    - Takapu Road-Wilton A (TKR-WIL-A), 110kV double circuit lines on steel towers.
    - West Wind Tee (WWD-TEE-A), 110kV double circuit lines on poles.
- Three submarine cables across the Cook Strait; South Markara Road-Oteranga Bay A, poles 1A to 1B (SMK-OTB-A1-CBL-1A-1B), which transmits electricity between the North and South Islands (commonly known as 'The Cook Strait Cables').
- High Voltage Direct Current (HVDC) links (four in total); Haywards DC (HAY-DC), Miramar Cable Store (MCS), Oteranga Bay (OTB), and Te Hikowhenua Electrode (THW).
- Overhead fibre cables (five in total); Bunnythorpe-Wilton A, Central Park-Wilton B, Haywards-Judgeford A, Haywards-Takapu Road, Oteranga Bay-Haywards A.
- Substations (12 in total):
    - Within Wellington City; Central Park Substation (CPK), Kaiwharawhara substation (KWA), Wilton substation (WIL), Takapu Road substation (TKR), West Wind substation (WWD).
    - Within Hutt City; Gracefield Substation (GFD), Melling substation (MLG), Haywards substation (HAY).
    - Within Upper Hutt City; Upper Hutt Substation (UHT).
    - Within the South Wairarapa District, Greytown substation (GYT).
    - Within the Porirua City, Pauatahanui Substation (PNI).
    - Within the Kapiti Coast District; Paraparaumu Substation (PRM).
    - Within the Carterton District; Masterton Substation (MST).
- Communications sites (seven in total); Axa House, Kaukau, Makara Village Repeater, Transpower House, Rangitumau, Mt Climie, Mt Bruce.


Transpower Assets
Wellington Region
Legend
Region
Boundary
NZ Roads
Highways
Transpower Assets
Cable Protection Zone
Overhead Fibre Cable
Underground Fibre Cables
Site
ACSTN
COMMS
HVDC
TEE
Transmission Line
0kV Overhead
11, 66kV Underground
11, 33, 66 kV Overhead
110kV Underground
110 kV Overhead
220kV Underground
220 kV Overhead
350 kV Overhead
350kV Submarine
400kV Overhead
Te Horo
Manakau
Eketahuna
BPE-HAY-A
BPE-HAY-B
BPE-WIL-A
MGM-MST-A
Waikanae
Paraparaumu
PRM
Raumati
Kapiti
Paekakariki
MST
Paremata
Porirua
HAY-UHT-A
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Appendix B – Examples of work on the National Grid

Access to the Te Hikowhenua Electrode (within 5m of the CMA, red arrow) and bridge across the same access of which the approaches would require maintenance within 5m of a waterbody (green arrow)

Example of foundation strengthening work on a tower. Approximately 5-10m^3 of earthworks per tower leg. Soil is managed and later backfilled, spread and stabilised or removed from site. These works are temporary and involve minimal earthworks. Note this example is not within 5m of a waterbody

BPE-WIL-A0256 ford showing the access track approaches that will require maintenance

Example of completed foundation strengthening work demonstrating a fully clean and stabilised site. Note this example is from outside the Wellington region

Example of earthworks carried out to re-expose tower foundations for refurbishment. Note this example is from outside the Wellington region

Post foundation work, stabilised with coconut matting and sediment control fence in place. Note this example is from outside the Wellington region

Example of pole replacement also showing levelling works for crane pad. Typically pole replacements take one day to complete with all exposed earth backfilled, spread, stabilised and rehabilitated on completion. Note this example is from outside the Wellington region

Example of pole replacement showing temporary stockpile of earth which is backfilled, spread, stabilised and rehabilitated on completion. Note this example is from outside the Wellington region