Pukekohe North Substation

Landscape and Visual Assessment

Prepared for Counties Energy

by Align Limited

October 2021

DOCUMENT DETAILS

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Submission	2.0		Tim Walton/ Nick Williamson

Contents

1 Introduction

This Landscape and Visual Impact Assessment (LVIA) report has been prepared for the client (Counties Energy) and can be relied upon as an attachment to the Notice of Requirement (NoR) application. The report has been prepared using the project documents (supplied by Ergo), as well as information gathered during the site visit carried out on 13th July 2021.

1.1 *Professional Role*

This assessment has been provided in accordance with 'Schedule 4 – Code of Conduct for Expert Witness' and the 'NZILA Code of Conduct'. The assessment has been carried out by Tim Walton, a Landscape Architect with a Bachelor of Landscape Architecture. It has been reviewed by registered Landscape Architects.

1.1.a.i Affiliated Documentation

This report is to be read in conjunction with;

- Appendix A – Concept Substation Layout
- Appendix B - Graphic Attachment

1.2 *Scope*

The scope of this report covers the landscape description, identification of viewing audience, and effects of the proposal. Relevant statutory context, landscape and visual effects, and design measures for mitigation are examined in the final sections of the report. The focus and project description are outlined below.

1.2.a Project description

The proposal is to designate land at 8 Whangapouri Road, Karaka (Lot 2 DP 473807), for the installation of an electricity substation.

1.2.b Infrastructure Proposal

Counties Energy require land for a new 110/22kV substation to meet the forecast electrical demand growth for the Pukekohe North area. Site-specific design for the substation will be prepared once site designation has been approved and other networks planning decisions are made. Counties Energy have provided a preliminary concept layout which will be further refined during Resource Consent preparation. The concept layout is included in Appendix A.

Counties Energy have confirmed the following components will need to be included in the 110kV substation proposal:

- 110kV outdoor air-insulated switchgear switchyard, including gantry structures in the middle of the site for incoming 110kV lines[1]
- 22kV concrete switch-room (19m long, 7.5m wide, 4.5m high)

[1] 110kV incoming lines coming into or distributed from the site may be above or below ground.

- 110/22kV Outdoor power transformers
- Longitudinal strung busbar, comprising 10m high gantry structures
- Sealed vehicle accessways
- 3m high steel mesh security fence around the perimeter

Substation components have been modelled and assessed in Section 6.1 Visual Effects, and the Graphic Attachment included in Appendix B.

1.2.c Location Description

The site adjoins State Highway 22 south of Karaka, approximately 3km west of the State Highway 1 turnoff. The site is approximately 8.5 kilometres north of Pukekohe township. The landscape surrounding the site is characterised by open pasture and lifestyle sections. There is a higher concentration of residential development surrounding the intersection of Karaka Road/State Highway 22, and Whangapouri/Bycroft Road, where the site is located. Development along the State Highway 22 road corridor is noticeable heading west, including a new residential subdivision 500m west of the site east of Karaka School at the intersection of Blackbridge Road. A description of the wider landscape has been included in Section 2.2.

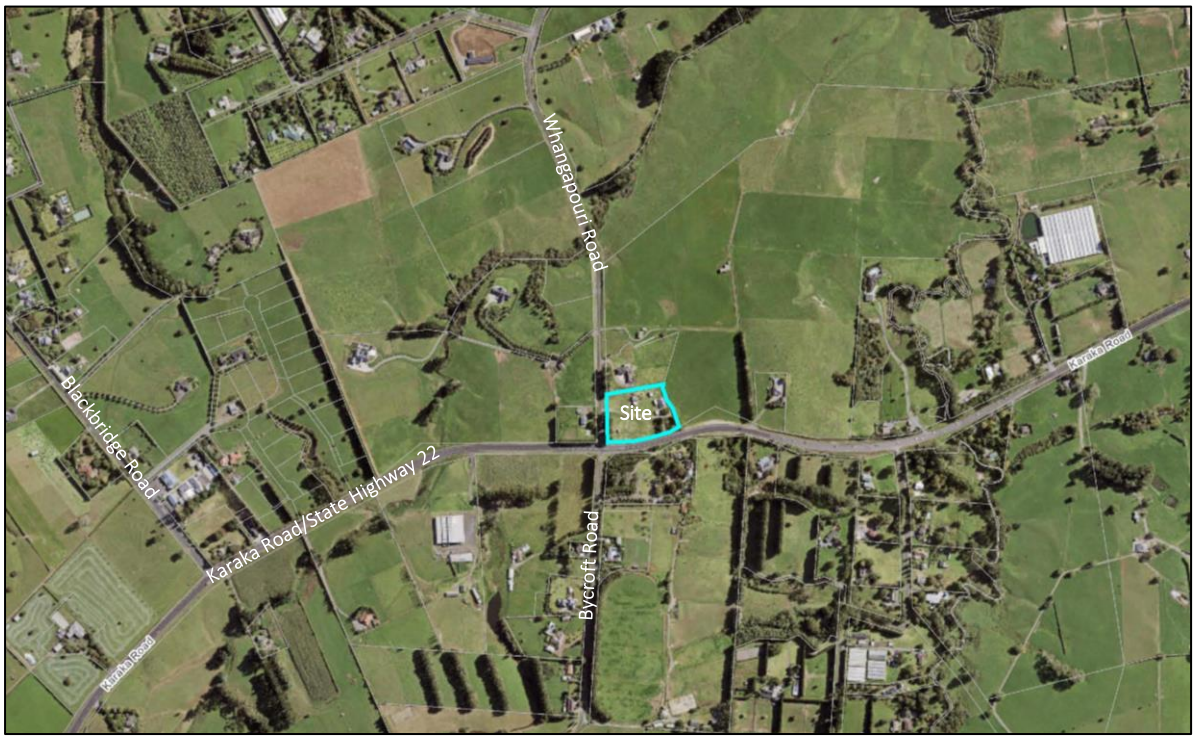

Figure 1 Site location in 1:8000 Context (Google Maps)

1.3 *Landscape and Visual Assessment Methodology*

The following section outlines the method in which this assessment was undertaken and the process that generated resulting assessment/rating.

1.3.a Proposal-driven assessment

The purpose of the LVIA is to assess the effects of the designation proposal. The report is focused on the receiving environment and on the values that might be potentially affected.

1.3.b Site visit/analysis

This report is informed by a site visit undertaken on the 13th July 2021. Prior to the site visit, research into the context and the proposal was undertaken through desktop analysis and a pre-application meeting with the client. Photos were taken on site from key points based on locations identified through desktop analysis, with additional views taken in response to site. The graphic attachment in Appendix B contains key photographs taken of the site.

1.3.c Visualisation

The plans and component dimensions provided by Counties Energy have been used to model the proposal in 3D and GPS coordinates place the proposal within the context of the photos taken.

Five key viewpoints were identified as being representative of effects on the surrounding landscape and on receiving audiences. The viewpoints include panoramic images which communicate the scale of the proposal at close and distant viewpoints.

The 3D model views were rendered for photorealism and presented to scale according to NZILA Best Practice Guide (BPG 10.2), with view location, view angle and distance identified in the Graphic Attachment in Appendix B. Photography was undertaken using a Canon EOS 3000D digital camera with an 18-55mm focal lens.

1.3.d Rating

The adverse effects of the proposal are measured against the 7-point scale in Table 1 below.

Table 1: Scale of effects (7 point)[2, 3]

The below seven-point scale is used to describe effects.

- Extreme: Total loss to the key attributes of the receiving environment and/or visual context amounting to a complete change of landscape character
- Very High: Major change to the characteristics or key attributes of the receiving environment and/or visual context within which it is seen; and/or a major effect (significant reduction) on the (perceived) amenity derived from it.
- High: Noticeable change to the existing character or distinctive features of the landscape or reduction in the perceived amenity or the addition of new but uncharacteristic features and elements
- Moderate Partial change to the existing character or distinctive features of the landscape and a small reduction in the perceived amenity

[2] http://content.aucklanddesignmanual.co.nz/resources/tools/landscapeandvisualeffectsassessment/Documents/Landscape%20and%20Visual%20Effects%20Assessment%20Requirements.pdf

[3] NZILA Best Practice Note Landscape Assessment and Sustainable Management 10.1

- Low: A slight loss to the existing character, features or landscape quality
- Very Low: The proposed development is barely discernible with little change to the existing character, features or landscape quality
- Negligible: The proposed development is barely discernible or there are no changes to the existing character, features or landscape quality

1.3.e Change management

Outlines the manner which the effects of the proposal influence the direction of the continual change of the surrounding landscape, and any opportunities to avoid/remedy/mitigate negative effects.

1.3.f Summary

The report considers the Landscape and Visual effects including those on the physical, perceptive, and associative landscape values as per the guidance outlined in the Auckland Design Manual[4]. The assessment is then summarised and rated accordingly to assist decision makers. Findings of the report are concluded in Section 8.

[4] https://content.aucklanddesignmanual.co.nz/resources/tools/landscapeandvisualeffectsassessment/Documents/Landscape%20and%20Visual%20Effects%20Assessment%20Requirements.pdf

2 Landscape Description

2.1 *Landscape*

The NZILA defines landscape as: "Landscape is the cumulative expression of natural and cultural features, patterns and processes in a geographical area, including human perceptions and associations." The following section describes the qualities of the landscape within the site and surrounding the site.

2.2 *Description*

The descriptive section comprises of two parts – the subject site and the wider landscape. The physical, perceptive, and associative values of the site and wider landscape are assessed further in the sections that follow.

Figure 2 Panoramic view above taken from the opposite of Whangapouri Road at the intersection with State Highway 22.

2.2.a Description of Site

The proposed site is currently a residential lifestyle block containing a residential dwelling, a minor household unit, garaging, several accessory buildings, and a greenhouse. The landform slopes evenly across the site, falling towards the south boundary at approximately 35m to 32m (Auckland 1946 datum) over approximately 100m. The site is in lawn/pasture and includes a grouping of mature trees in the southeast corner of the site, and small magnolia trees surrounding the minor dwelling near the center of the site.

The underlying land parcel includes an area of 1.0724 hectares; however, subdivision is proposed to allocate 0.68ha of the western portion of the site to be used for substation designation, and the remaining eastern portion of the site will be retained by the current landowner for residential purposes.

2.2.a.i Access

There is a 3-metre-wide gravel driveway through the centre of the site providing access to the dwellings from Whangapouri Road. New vehicle access locations have been included in the designation proposal. There is an ornamental boundary fence on the western boundary connected to a timber post and batten fence on the southern boundary adjoining Karaka Road/State Highway 22. A 5-metre road widening designation (Waka Kotahi) exists within the southern boundary of SH22 and is kept clear of development for road safety designation purposes.

There are no waterways or areas of significant vegetation on the site, the mature trees in the southeast corner are included with the proposed subdivision of the residential property. On the

north boundary there is a 4m high evergreen hedge extending 30m east which helps to screen the neighbouring property to the north.

The western side of the subject site where the proposal is designated is predominantly void of residential development, which is noticeable in the context of residential intensification surrounding the intersection of Whangapouri Road/Bycroft Road and State Highway 22.

2.2.a.ii Site Photos

Figure 3 above taken from the north boundary facing south across the site.

Figure 4 Photo above taken from the centre of the subject site facing east down the driveway towards the existing dwelling.

Figure 5 Photo above taken facing north within the site towards small magnolia trees in the foreground and the north boundary hedge line in the background.

Figure 6 Photo above taken southwest within the site towards the ornamental boundary fence adjoining Whangapouri road.

2.2.b Description of the Wider Landscape

The landscape surrounding the site maintains a relatively consistent elevation heading north towards the Pahurehue Inlet. To the south the ground level gradually rises on the opposite side of State Highway 22. The site is positioned on the crest of a low hill, and the land falls gradually to the east and west parallel with the State Highway 22 road corridor.

The landscape is primarily rural north of the site, characterised by rolling pasture broken up by mature vegetation established around watercourses and shelter belt plantings along fence lines (Figure 7). Northwest of the site the landscape contains greater variability of use, including residential lifestyle sections positioned along Manuwai Lane. The lifestyle sections include semi-rural landscape features such as water dams, specimen tree groves, and small lifestyle orchards.

To the West of the site, recent residential development has intensified surrounding Karaka School located at the intersection of Blackbridge Road and SH22. Blackbridge Road is a collector road for the Karaka township to the north and development at the intersection with SH22 is intensified to a greater extent compared with the wider landscape (Figure 8). This pattern of development is evident throughout Karaka and Drury, where development and growth are concentrated in locations with access to arterial routes connecting to larger centres.

To the south of the site there is variable rural, lifestyle and rural production areas on the opposite side of State Highway 22. SH22 is the main arterial route connecting Karaka and Pukekohe to State Highway 1. High volumes of traffic use this route throughout the day travelling at high speeds (100km/hr speed limit). Figure 9 below shows how SH22 road corridor divides the landscape, however, rural character is seen to be generally consistent on both sides of the highway.

A selection of panoramic images capturing the wider landscape surrounding the site have been included in the Graphic Attachment in Appendix B. Summary photos are provided in section 2.2.c.

2.2.c Photos of the Wider Landscape

Figure 7: Open Rural character viewed Northeast of the site.

Figure 8 above shows residential intensification viewed west beyond the site, concentrated near State Highway 22.

Figure 9 above show State Highway 22 dividing the rural landscape. Residential intensification is seen in the background surrounding the subject site.

2.2.d Physical qualities of the landscape

The wider landscape is relatively low-lying land which is productive for agriculture and horticulture uses. The site is located within the Pukekohe Kaawa Aquifer, a high-body water table contributing to multiple stream flows near to the site, including Whangapouri Creek and Oira Creek. The site is on a relatively raised landform which falls gradually towards Oira Creek approximately 300m to the North and West.

The soil in the area is fertile and suitable for various types of agriculture, including dairy farming and production horticulture. The landscape reflects agricultural uses through open, graded paddocks, divided by hedges and fences, as well as associated agricultural and horticulture structures, such as greenhouses. Increasing pressure from Auckland housing has been accelerating the development of this land into Residential subdivision (approximately 1km east of the site), identified in the neighbouring Drury West Structure Plan[5].

Due to the highly modified nature of the landscape, there is very little of the original ecology remaining in the area, with only the riparian areas of wetlands and waterways containing remnant indigenous species. The dominant vegetation in the area are exotic tree species, pasture and exotic weed species. The ecosystems that would have been present on the site according to the areas mapped in 'Indigenous terrestrial and wetland ecosystems of Auckland[6]', would have historically been broadleaf Puriri Forest, however there are minimal signs of these forests near the site.

2.2.e Perceptual qualities of the landscape

The surrounding landscape is primarily open rural character, with the degree of openness varying depending on the arrangement of vegetation patterns and the intensification of residential activities closer to the SH22 road corridor. As shown in Figure 7 above, there are wide open views north of the site in contrast to relatively built-up areas adjoining the highway, as shown in Figure 8.

Where there are views across the landscape, such as Figure 9, the Drury Hills/foothills of the Hunua Ranges to the East provide an important landmark for orientation. There is no visibility of the nearby Pahurehure Inlet, or the urban centres of Papakura and Drury to the east, and Pukekohe to the south. Therefore, the rural landscape appears continuous in all directions, with small concentrations of residential activity, such as subdivisions, schools, and businesses, having minor effects on the predominantly rural character of the environment.

The rural landscape is dominated by agricultural patterns, including pasture and shelter belt planting positioned along fence lines. Natural topography is still evident where the land slopes down to gullies containing watercourses surrounded by vegetation of native and exotic varieties.

2.2.f Associative qualities of the landscape

The Karaka/Drury area located east of the site has a rich history of Māori settlement which has particular significance to Ngāti Tamaoho, one of the first Iwi to make use of the resources of the

[5] https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/unitary-plan/auckland-unitary-plan-modifications/proposed-plan-changes/docspc6/pc6-drury-west-structure-plan-document-a4-printing.pdf

[6] https://knowledgeauckland.org.nz/media/1399/indigenous-terrestrial-and-wetland-ecosystems-of-auckland-web-print-mar-2017.pdf

fertile soils and wetlands surrounding the Pahekeheke awa (Drury Creek). The waterways connecting to the Manakau harbour were used for movements of waka, and headlands projecting into the harbour was where settlement had been focused[7]. Trade meant a number of tribal groups including Te Akitai, Ngai Tai and Ngāti Pou formed significant historical and cultural ties to the land around Drury and the waterways that linked to the Manukau Harbour[8]. The subject site is within the vicinity of the Pahekeheke awa (Drury Creek) which is just over a kilometre to the North.

While there are no recorded sites of heritage significance within the vicinity of the subject site, the area holds significant value to Ngāti Tamaoho Iwi, who have prepared a Cultural Impact Assessment in response to the designation.

2.3 *Evaluation*

The site is located within the rural environment, however, adjoining the intersection of Whangapouri/Bycroft Road and State Highway 22, the rural landscape has become intensified with smaller lots containing residential activities. There is a visible transition to smaller lots defined by tight groupings of buildings, plantings, and fences, which is reflective of the Mixed Rural Zoning provision covering the wider area. The wider landscape in comparison retains greater rural character defined by wide open pasture, mature shelter belt plantings, fence lines and watercourses within gullies. The site does not express the same rare or highly valued landscape features, forms, or systems of the wider rural environment; it is more closely characterised by the intensified development surrounding the State Highway 22 intersection.

The open pasture north of the site currently dominates the wider landscape, however the subject site is distinct from this open pastural environment due to its smaller lot size, and the collection of buildings and infrastructure surrounding the site separating it from the pastural environment. Sites such as this are more suited to development due to being fragmented from the rural landscape by prior subdivision.

It is worth noting that the landscape will continue to change over time, as the Drury Future Urban Zone is developed to the east of the site. As such the landscape characteristics which are valued will also change.

[7] https://www.aucklandcouncil.govt.nz/UnitaryPlanDocuments/15%20nor-6707-state-highway-22-ngati-tamaoho-historic-summary-drury.pdf

[8] https://www.auranga.co.nz/about/history/

3 Policy Context/Relevant Statutory Context

The site is in the Auckland Unitary Plan Mixed Rural Zone and is located approximately 500m east of the Rural and Coastal Settlement Zone and 700m west of the Drury West Future Urban Zone.

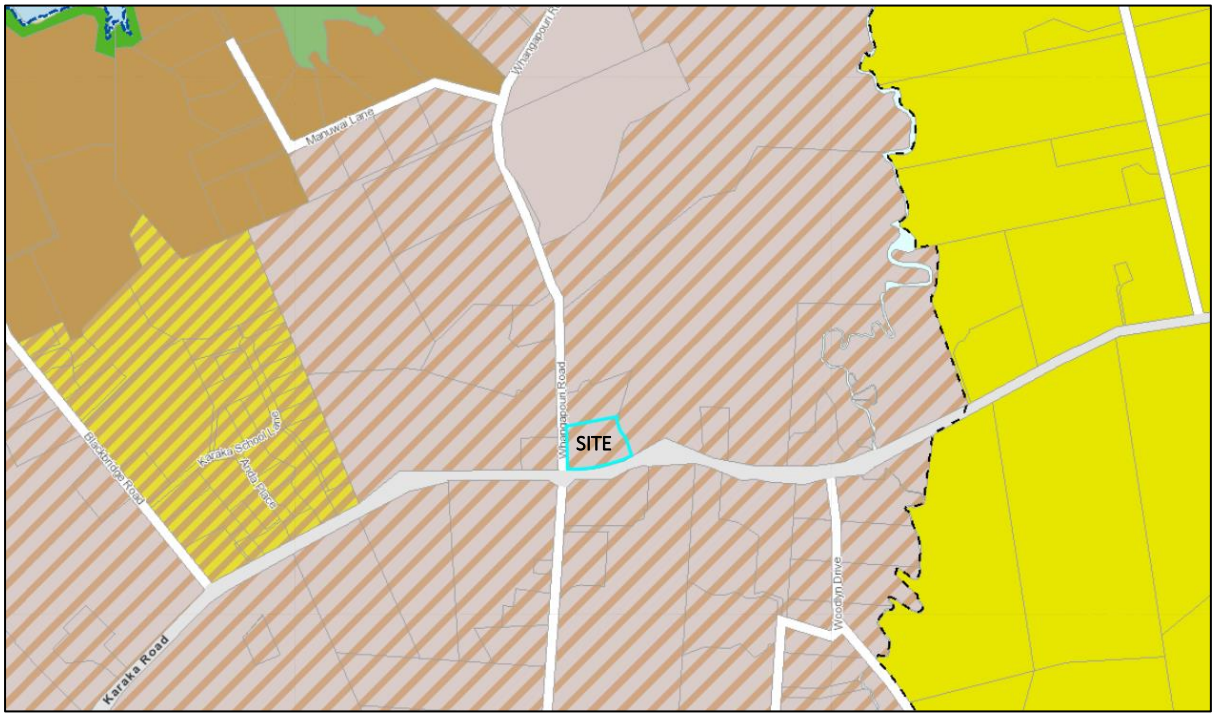

Figure 10 Auckland Unitary Plan Site Zoning and Overlays

Legend	
Residential - Rural and Coastal Settlement Zone	Rural - Mixed Rural Zone
Future Urban Zone	Rural - Rural Coastal Zone

The purpose of the Rural – Mixed Rural Zone is to provide for rural production, generally on smaller rural sites and non-residential activities of a scale compatible with smaller site sizes.

These areas often have a history of horticulture, viticulture, intensive farming, and equine-related activities. Sites in this zone provide flexibility to accommodate a range of rural production activities and associated non-residential activities while still ensuring good amenity levels for residents who use their land for rural lifestyle purposes.

3.1 *Statutory Provisions*

The following tables outline the statutory context issues associated with the proposal. An 'issue' is an effect in the context of a statutory provision, and each has been addressed in the Landscape and Visual Effects section unless otherwise specified.

3.1.a Auckland Unitary Plan Provisions

AUP Relevant Objectives and Policies	Section of the report where addressed
B9 Rural Environment	
B9.2.1. Objectives - Rural activities *(3) Rural production and other activities that support rural communities are enabled while the character, amenity, landscape, and biodiversity values of rural areas, including within the coastal environment, are maintained.*	The effects of the proposal on rural character, landscape and biodiversity values are assessed in Section 6.1.
B9.2.1. Policies - Rural activities *(3) Enable a diverse range of activities while avoiding significant adverse effects on and urbanisation of rural areas, including within the coastal environment, and avoiding, remedying, or mitigating other adverse effects on rural character, amenity, landscape, and biodiversity values.*	The proposal is an infrastructure activity that is not consistent with the wider rural environment. The landscape and visual effects have been assessed in Section 6.1.
H19.4 Rural – Mixed Rural Zone	
H19.4.2. Objectives (3) Rural character and amenity values of the zone are maintained while anticipating a mix of rural production, non-residential and rural lifestyle activities.	Infrastructure can be anticipated in the rural environment however there are effects on existing rural character and amenity of the location. These effects have been assessed in Section 6.1.
H19.4.3. Policies (2) Manage reverse sensitivity effects by: (a) limiting the size, scale and type of non-rural production activities;	The scale of the infrastructure proposal is assessed in Section 6.1 and mitigation is proposed in Section 4.1.b.
E26.2. Network utilities and electricity generation – All zones and roads	
E26.2.1. Objectives (7) The national significance of the National Grid is recognised and provided for and its effective	The importance of the proposed infrastructure is described in Section 4, the effects are

development, operation, maintenance, repairs, upgrading and removal is enabled. (9) The adverse effects of infrastructure are avoided, remedied or mitigated	assessed in Section 6.1 and mitigated in Section 4.1.b.
E26.2.2. Policies - Adverse effects of infrastructure (4) Require the development, operation, maintenance, repair, upgrading and removal of infrastructure to avoid, remedy or mitigate adverse effects, including, on the: c) amenity values of the streetscape and adjoining properties. (5) Consider the following matters when assessing the effects of infrastructure: a) the degree to which the environment has already been modified.	The effects of the proposed infrastructure on the streetscape and surrounding properties is addressed in assessed in Section 7.1.
E26.2.7.2. Assessment criteria *(1) The Council will consider the relevant assessment criteria below for restricted discretionary activities:* *b) visual effects* *(i) The extent to which the cumulative adverse visual effects of additional infrastructure on the amenity values of the streetscape and adjoining properties, are avoided, remedied or mitigated;*	The visual effects of the proposal are assessed in Section 6.1 and 7.1.

3.1.b Resource Management Act 1991 Provisions

RMA provision	Landscape Issues
s7(c) the maintenance and enhancement of amenity values	The effect the proposal has on amenity values are assessed in Section 6.1 and 7.1.
S7(f) the maintenance and enhancement of quality of the environment	The effect the proposal has on the quality of the environment are assessed in Section 6.1.

4 Proposal Description

Counties Energy require land for a new 110/22kV substation to meet the forecast electrical demand growth for the Pukekohe North area which includes residential developments in Paerata Rise, Wesley, and Karaka North. The designation will enable the construction of a new switch room and ancillary substation equipment shown on the conceptual plan below.

Figure 11 Concept substation layout provided by Counties Energy.

The layout above is subject to change once site-specific design is developed and confirmed by an Outline Plan of Works. Dimensions have been provided by Counties Energy for key elements of the substation proposal below. These have been modelled and assessed in Section 6.1 Visual Effects and the Graphic Attachment included in Appendix B.

The following maximum dimensions for substation components are confirmed by Counties Energy:

- A 19m long by 7.5m wide, 4.5m high, concrete switch room building along the front southern boundary.
- Gantry structures in the middle of the site for the incoming 110kV lines[9].
- 8-10m high busbar works and equipment structures in the on concrete foundations.
- 2-3 110kV transformers at the rear of the site on concrete foundations, with fire and bund walls.

[9] 110kV incoming lines coming into or distributed from the site may be above or below ground

The scale of the new switch room building will be consistent in character with previously consented substations within the rural environment, such as the Tuakau substation located in North Waikato, in Figure 12 below.

Figure 12 Example Tuakau substation, which includes a switch room, BUS structures and transformers on concrete plinths, with mitigation planting around the boundary.

4.1.a.i Site Access

The existing single access way from Whangapouri Road will be removed as part of the site development and new crossings will be installed. The crossings will be for:

Access to the Residential Site (8 Whangapouri Road)

Crossing will be installed to the northwest side of the site, for access to the two-house sites subdivided on the east side of the site. The volume of traffic for the crossing will be that of a two-household lot and will not be significant.

Substation Access

Crossing will be installed 18-25m from the intersection with SH22. During operation of the substation the crossing will only see 2-4 vehicles per week.

There will be a 3m high steel wire security fence installed around the perimeter of the substation, and mitigation planting will surround the fence exterior, planted within the boundaries of the site.

4.1.a.ii Earthworks

Earthworks are required to establish a level building platform for the substation, the volume of earthworks is preliminary at designation stage; the estimated cut-fill area equates to approximately 5150m^2 area at depths of less than 1m across the site as the existing gradient is relatively minor. Earthworks will be contained within the site and the effects will be minor disturbance to existing grass, compaction of sub-soil structure and changes to natural overland flow paths.

4.1.b Mitigation Measures

Key mitigation measures for the proposal include identifying a suitable site for designation which does not detract from existing landscape character, and mitigation measures implemented on site to offset the visual and landscape effects of the proposal.

Counties Energy require a substation located within the Karaka area to service the wider region. To integrate a substation within the rural environment is complicated as it creates urban infrastructure in contrast to the rural environment. Substation sites are deemed more appropriate in locations where pre-intensification already exists and will not result in the conversion of rural productive land. The subject site at 8 Whangapouri Road is located in a Mixed Rural Zone environment surrounded by established residential development adjoining State Highway 22. SH22 is a prominent road and infrastructure corridor passing through Karaka which provides suitable integration for development on the subject site.

Within the subject site, open space will be required between each of the substation components for safety purposes. Therefore, the site has to be primarily open aired, with opportunities for mitigation planting only available surrounding the security fence of the substation, within the boundary of the site. Exterior mitigation planting will provide screening, improve amenity and promote biodiversity, especially where (native) planting does not currently exist in this location.

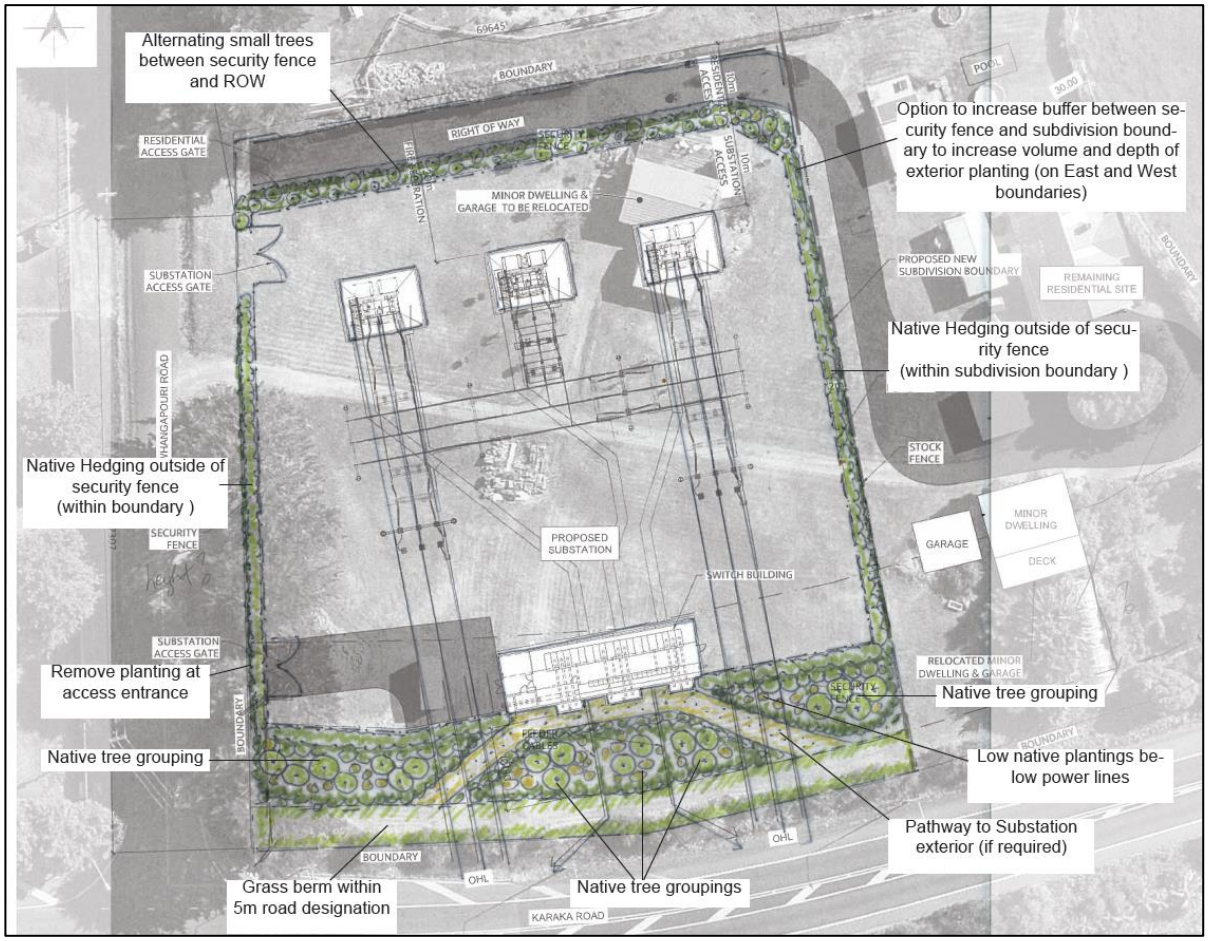

Figure 13 Indicative planting proposal accepted by Counties Energy for refinement once site-specific design is confirmed.

Figure 13 below shows a conceptual planting plan prepared by Align during June 2021, illustrating to Counties Energy how native screen planting can be used around the perimeter to screen the substation structure to reduce visual effects on the environment. Counties Energy have accepted the planting layout as a working draft, requesting the design is further refined into a planting plan during site-specific design for the Outline Plan of Works. The substation layout, access points, plant locations and species will be confirmed.

4.1.b.i Indicative Plant Schedule

Botanical Name	Common name	Grade at planting	Height (0-5 years)	Height at Maturity (10 years+)	Spread at maturity
Alectryon excelsus	Titoki	45 Litres	3 metres	8 metres	5 metres
Phormium tenax	Harakeke (flax)	2.5 Litres	2 metres	3 metres	2 metres

4.1.c Value enhancement

Alectryon excelsus (Titoki) is a broadleaf native hardwood tree sharing similar characteristics to the Puriri tree which is historically endemic to the region. Titoki is a hardy native species that is less susceptible to insect damage compared to the Puriri tree and therefore more suited to a low maintenance environment. It is evergreen and grows tall and wide enough to provide suitable screening of the substation at maturity. Harakeke will provide dense foliage beneath the canopy of the titoki tree to screen and restrict access to the security fence and partially screen the switch room building. These species have been modelled in the Graphic Attachment included in Appendix B. Additional species to improve biodiversity and amenity will be included in the planting plan at site-specific design stage.

4.1.d Avoid/Remedy/Mitigate

It is recommended that all built forms have a low reflective value to blend with the landscape and planting. Detail on the cladding and finish of the structures on site were not provided for this assessment and will be included at resource consent stage.

5 Identification of the Visual Catchment and Viewing Audience

Identification of the visual catchment is divided into private and public viewpoints at set catchment distances.

Figure 14 Visual catchment in 100m, 200m, and 500m intervals measured from the site.

5.1.a Private

The visual catchment image above shows the number of properties within 100m, 200m and 500m of the site. The undulating landscape surrounding the site restricts views from a number of the properties surrounding the site, particularly to the east and south, where changes in elevation and mature trees screen views. During the visit to the site and the surrounding area on the 13th July 2021, the following properties have been identified as receiving potential visual effects from the substation proposal.

5.1.a.i Within 100m

- 5 Whangapouri Road – Property opposite the site on Whangapouri Road
- 14 Whangapouri Road – Religious building adjoining the northern boundary of the site
- 383 Karaka Road – Residential property opposite the site on SH22

5.1.a.ii Within 500m

- Lot 3 DP 472268 – Residential property adjoining 5 Whangapouri Road west of the site
- 16 & 18 Karaka School Lane west of the site

5.1.a.iii Beyond 500m

- 65 & 72 Whangapouri Road - North of the site
- Properties on Karaka School Lane – West of the site.

5.1.b Public

There are opportunities for the public to view the road corridor, primarily State Highway 22 and to a lesser extent, Whangapouri Road and Bycroft Road. The site is visible to motorists travelling West to East along SH22 as shown in Figure 16 below.

The volume of traffic passing the site each day is high and the speed of the traffic will be averaging close to the speed limit which is 100km/h. Therefore, the visual effects of the site on the public are only momentary and the non-linear road corridor will restrict views of the site from a distance. Views from the road corridor have been further considered in Section 6.1 Visual Effects.

Figure 15 above taken from SH22, 400m from the site, partially obstructed by the dwelling at 5 Whangapouri Road.

Figure 16 above taken from SH22, 100m east of the site, obstructed elevation changes and existing planting.

6 Assessment of Visual and Landscape Effects

The following section analyses the way the landscape is likely to respond to change from the proposal, considering the landscape context outlined in the preceding chapters.

6.1 *Visual Effects*

The assessment of visual effects takes into consideration the subject site's visibility and potential effects on identified viewing audiences. Viewpoints 1-5 have been selected with particular focus on the receiving audiences' angle of view, whether audiences are typically permanent or transitional, and/or what activities they will be undertaking. The views are also assessed according to the nature and sensitivity of that viewing location (orientation of view; public or private locations) and that of the viewing audience (e.g., homeowners and recreationalists).

6.1.a Photo Montage Model

The 3D model illustrated in viewpoint images (VP01-05) below and in the Graphic Attachment in Appendix B, simulate the height and bulk of the substation proposal. Dimensions provided by Counties Energy are shown to scale in each viewpoint image.

The substation model includes 8-10m BUS work gantry structures and transformers to establish contextual features for visual assessment purposes. The internal design of the substation has not been determined at designation stage, therefore the visual assessment focuses on the external bulk of the proposed structure. Feeder lines connecting to the substation from the SH22 corridor will not be confirmed as above ground or below ground until the site-specific substation design is confirmed. However, 110kV lines conveyed within the road corridor are permitted activities and would be considered consistent with existing infrastructure in the road corridor should they included at site-specific design stage.

6.1.b Visual Effects below provides assessment of the simulated model in relation to the surrounding landscape. Each image is provided at A3 scale in the Graphic Attachment in Appendix B.

6.1.b Viewpoint 1 (VP01): 10 Bycroft Road, road edge

VP01 on the following page was taken from the intersection of Bycroft Road and SH22, 50 metres south of the site boundary. From this viewpoint, there will be increased infrastructure and complexity brought into the immediate environment surrounding the intersection, which is illustrated by 'After' viewpoints in Figure 18 & Figure 19.

Figure 17 VP01 Before Image, viewpoint from oncoming traffic on Bycroft Road opposite the site.

Viewpoint 1 (VP01) shows the scale of the proposal in context. The viewpoint presents one of few publicly accessible vantage points in proximity to the site unobstructed by existing features, including buildings and mature trees.

In the short term, construction of the substation will be highly visible prior to the establishment of screen planting around its perimeter. Viewpoints will be largely transient road users and adjoining neighbours. Within 0-5 years, mitigation planting is anticipated to take effect in screening the lower features of the proposal from the road as simulated in Figure 18 below.

Figure 18 VP01 After Image, 0-5 years planting maturity surrounding the proposal.

The switch room is nearest to SH22 road corridor and is setback approximately 20 metres from the SH22 in the simulation above. 6-8m high mature screen planting is anticipated to exceed the height of the switch room and screen a large portion of the gantry structures that are setback approximately 40 metres from SH22. 5–10-year mature planting is simulated in Figure 19 below.

Figure 19 VP01 After Image, 5-10 years planting maturity screening views of the substation from SH22.

The existing infrastructure within the road corridor includes 12-15m high streetlights and powerlines in the foreground which establish a baseline for development of tall infrastructure surrounding the intersection. This has been further examined in VP02 and VP03 below.

VP01 above does not represent views from resident dwellings; the nearest residence to this viewpoint is 383 Karaka Road (SH22) 50m to the east, which is heavily screened by the vegetation and is unaffected by the proposal. 10 Bycroft Road, directly behind this viewpoint, is farmland containing large trees which partially screen the proposal from dwellings several hundred metres to the south of this location and the effects are therefore negligible. The viewpoint from 5 Whangapouri Road, which has been purchased for future commercial purposes, has been further examined in VP05.

In summary, the largest viewing audience from this location will be the public approaching the site from SH22 and Bycroft Road. The views of the substation do not detract substantially from the existing environment. The site is adjacent to existing infrastructure within the road corridor that is comparable in scale to the substation proposal and provides a baseline for infrastructure development. Mature planting is relied upon for screening purposes and is shown to be effective in a simulated 5–10-year timeframe following implementation. Overall, the visual effects from Viewpoint 01 are considered **Moderate.**

6.1.b.i Viewpoint 2 (VP02): 72 Whangapouri Road, road edge

VP02 is approximately 500m North of the site on Whangapouri Road. The land is seen to fall and rise again with Oira creek in the gully floor. The location is representative of views from properties at 65 and 72 Whangapouri Road, and motorists approaching on Whangapouri Road. The landscape further to the East and West of VP02 is a continuation of rolling farmland similar to the scene below. There is infrastructure present, but not outstanding within the landscape, being concentrated around SH22 corridor adjoining the site.

Figure 20 VP02 Before Image, 500m North on Whangapouri Road.

Figure 21 VP02 After Image, 5-10 years planting maturity

The existing infrastructure within SH22 road corridor does not stand out against the vegetated backdrop, as shown in Figure 20 above. The density and variety of vegetation on the southern side of road corridor helps to reduce effects and prevents infrastructure from standing out against the skyline. The same mitigation effects can be anticipated for the substation proposal, shown in Figure 21, which similarly integrates between the existing hedge behind 14 Whangapouri Road and the vegetated backdrop on 383 Karaka Road.

The variation in landscape in the foreground of Viewpoint 02, including streams, fence line plantings and the road, draw attention away from additional infrastructure in the background. It is anticipated that Viewpoint 02 is comparable to the view from 65 & 72 Whangapouri Road, which are partially screened by mature plantings surrounding their dwellings, and groupings of trees along Oira Stream which including tall pine shelter belt trees further east of VP02. Photos from these properties could not be accessed. Views of the site from residential properties further north-west along Manuwai Lane would be south facing and have been largely screened by boundary hedges screening the site and south facing views.

Visual effects of from Viewpoint 02 are largely mitigated by distance, features of the landscape in the foreground, and the existing vegetation surrounding the site. The substation is shown to integrate with existing infrastructure within the SH22 road corridor and results in **Low** visual effects.

6.1.b.ii Viewpoint 3 (VP03): Karaka Road/State Highway 22, Road edge

VP03 is taken from the road berm on the Northern side of SH22, approximately 400 metres from the site. The road corridor is highly modified with infrastructure compared with the surrounding rural

landscape, notably the powerlines and streetlights obstructing the skyline. Residential intensification is noticeable surrounding the site. The Hunua ranges in the distance provide location context and backdrop to the view.

Figure 22 VP03 Before Image, 400m West of the site on SH22.

VP03 shows broad landscape views west of the proposal, and the prominence of SH22 which passes through the landscape. Vehicles travelling east on SH22 have visibility of the site several hundred metres before reaching it. There are no pedestrian footpaths along this section of SH22 and no residences in line with this elevation. A high volume of motorists view the site from this location every day.

In Figure 23 below, the substation integrates with the surrounding height of the infrastructure within the SH22 road corridor. Mature screen planting shown in Figure 24 may appear more prominent viewed from this location compared with additional infrastructure and buildings added to the environment as plantings do not currently exist in this location.

The Hunua ranges in the background help mitigate potential amenity effects resulting from the proposal as they absorb much of the visibility of potential built form before it.

Figure 23 VP03 After Image (0-5 years)

Figure 24 VP03 After Image (5-10 years)

In VP03, the proposal is partially obscured by the dwelling at 5 Whangapouri Road, however the prominent height of the proposal is visible yet comparable to the infrastructure within the adjoining road corridor. The proposal does not significantly alter the landscape viewed from this location and therefore the visual effects from VP03 are **Low.**

6.1.b.iii Viewpoint 4 (VP04): 5 Anda Place, Karaka School Lane

VP04 is taken from the roadside within a newly formed subdivision accessed from Karaka School Road. The residential lots are generously sized with outlook to the North, East and West. The subject site is viewed directly east of the subdivision, within the concentration of residential development at the foreground of the Hunua Ranges. The subject site is partially screened by the existing dwelling at 5 Whangapouri Road.

Figure 25 VP04 Before Image, 560m from the site, taken from Karaka School Lane.

Figure 26 VP04 After (0-5 years)

Figure 27 VP04 After (5-10 years)

VP04 is representative of views from slightly elevated properties west of the site, including Lot 3 DP 472268 (lifestyle section behind 5 Whangapouri Road), and the new subdivision at Karaka School Lane. This viewpoint includes broad views of the wider landscape, including the SH22 road corridor in the foreground and the Hunua Ranges in the background.

It is worth noting that the orientation of new dwellings within the subdivision will be primarily north- and north-west facing to maximise daylight hours. East-facing views towards the site may be utilised, however the main living areas will generally face north and the substation will be less visible and have low impact on the amenity of these environments.

The wider landscape includes rolling farmland, large eucalyptus trees to the south, and the hills leading into the Hunua Ranges. The site location is surrounded by concentrated development relative to the wider rural environment, it integrates well within this location and does not stand out or impact the character of the wider landscape when viewed from this location.

In summary, there are opportunities for the proposal to be seen from the residential development represented by this viewpoint, however, in the context of the wider landscape, the substation does not significantly detract from the amenity of the location. The visual effects from VP04 being rated as **Low.**

6.1.b.iv Viewpoint 5 (VP05): 5 Whangapouri Road, road boundary edge

VP05 is taken from opposite the site of 5 Whangapouri Road looking east towards the site. The property at 5 Whangapouri Road was recently purchased with the intention of becoming a storage yard for a commercial building firm. Residential amenity for current residents will not be affected by the designation as the proposed substation works are planned in several years' time.

Figure 28 VP05 Before Image, taken opposite the site at 5 Whangapouri Road.

Figure 29 VP05 After Image (0-5 years)

Figure 30 VP05 After Image (5-10 years)

VP05 represents close-range views of the proposal experienced by adjoining neighbours (residential and commercial), and motorists on Whangapouri Road. Whangapouri Road does not have a footpath, and there a very few pedestrian movements anticipated along this stretch of the road.

VP05 also shows the perspective from traffic approaching and leaving the intersection of Whangapouri Road and State Highway 22. Motorists are generally a transient audience experiencing intermittent views of the proposal. Initial visual effects of the proposal will be prominent without established mitigation planting on the road boundary. Established planting will eventually screen the proposal from Whangagpouri Road and enhance amenity within the road corridor after a 5–10-year timeframe.

In summary, the effects of the substation prior to established screen planting will be significant on amenity of the neighbouring properties, and to a lesser extent passing motorists. Once mature mitigation planting is established around the perimeter it will significantly reduce the visual impacts of the proposal on the immediate environment, however, as a 5–10-time frame is anticipated to reach maturity, the resultant effects are rated as **Moderate.**

6.1.b.v Other Neighbouring Properties

14 Whangapouri Road

14 Whangapouri Road adjoining the northern boundary is a converted residential dwelling operating as a Buddhist Temple. The proposal will have initial adverse effects on amenity for visitors approaching the temple from SH22 as it contrasts the open character of the site. Existing mitigation measures in place include the 4-metre-high hedge on the northern boundary, which restricts views from the temple and will screen the switch room, the lower portion of the gantry structures, security fences and any regular activity on site. The gantry structures will be setback approximately 40-50 metres from the north boundary and will only be partially visible above the hedge line. As the temple is not occupied as a residence full time it is not considered a highly sensitive receptor.

8 Whangapouri Road

The property owners of 8 Whangapouri Road are willing to subdivide the land and sell the subject site to Counties Energy for the purpose of designation. Residential amenity effects have been disregarded for their existing property; however, mitigation planting will be implemented around the entire perimeter fence which will provide screening for all neighbours.

6.1.c Summary of visual effects

The overall visual effects of the proposal are considered **Low to Moderate.** Viewpoints VP01 and VP05 from close up perspectives show greater visual impact of the proposal on the character of the environment and the neighbouring properties. Implementation of the substation without mature screen planting will appear initially stark in comparison to the existing landscape. However, mature mitigation planting around the perimeter will lessen the visual impact and enhance amenity over timeframe exceeding 5 years.

Viewpoints VP02-04 show the broader landscape, and the proposal is considered to have low visual effects as it is absorbed into the existing features of the landscape, including the vegetation, buildings and infrastructure surrounding the site. The substation only has minor effects on landscape amenity viewed from a distance, the vantage points of nearby residential properties represented in VP02 and VP04 show the visual effect to be rated as low.

6.2 *Landscape Effects*

Landscape is about the physical components; the way people perceive a place; and those key associations they have with a particular place. The combination of physical, perceptual, and associative aspects combines to form 'landscape character' and is assessed by analysing physical, perceptual, amenity, cultural/heritage, and other effects.

6.2.a *Physical Effects*

The physical effects are tangible effects on landforms resulting from the project. They also relate to the short term and long-term cumulative effects over time.

The proposal will increase hard surface area for the site, including building roofs and driveway surfaces will have effects on hydrology and stormwater discharge. Run off will be minor in the context of the rural environment however a stormwater and sediment management plan will be necessary for

the design and implementation of the substation. There is a stormwater channel on the boundary of the site adjoining Whangapouri Road which will collect overflow from the site as it falls Northeast towards the road. Boundary mitigation planting can have positive effects contributing to the mitigation of stormwater discharge effects. Mitigation planting using local species introduces habitat and food sources for native fauna in the environment and provides positive effects for stabilising soils and improving drainage through root growth.

6.2.b *Perceptual Effects*

Perceptual effects are those effects on people's perceptions of landscape including visual (described in 6.1 Visual Effects). The site-specific design of the substation is not confirmed, however, based on the simulated bulk model in the Visual Effects, there will be some change to the existing character of the intersection through increased built form and land use changes. In time, the changes will be positive once mitigation planting matures and reduces visibility of the built form and enhances biodiversity. The effects on the wider rural landscape are limited as the proposal is shown to integrate with the road corridor environment, and mature planting surrounding the periphery of the site helps to blend the tall features of the proposal when viewed from a distance.

6.2.c *Amenity Effects*

Amenity effects refers to "those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes" (s7 RMA). Amenity values attributed to the existing site include a sense of spaciousness in the open grass area adjoining the intersection. There is an absence of development and infrastructure within the boundaries of the site, and the addition of the substation structure will reduce open space and subsequently reduce amenity values for the location. However, the reduction in amenity can be considered temporary, once mitigation planting reaches a level of maturity to screen the proposal and promote biodiversity, it will enhance the amenity of the location experienced from the road corridor and from the neighbouring properties.

6.2.d *Cultural / Heritage Effect*

A cultural impact assessment was undertaken by Ngati Tamaoho out as part of the Notice of Requirement for the substation proposal. They have considered the cultural and biophysical heritage values of the site. Mitigation measures including native plant species have been chosen in consideration of cultural heritage values and recommendations identified by Ngati Tamaoho.

6.2.e Assessment against Auckland Unitary Plan Provisions

The following section examines the proposal in context of the relevant objectives and policies of the Auckland Unitary Plan.

6.2.e.i Rural Environment

B9.2.1. Objectives - Rural activities

(3) Rural production and other activities that support rural communities are enabled while the character, amenity, landscape, and biodiversity values of rural areas, including within the coastal environment, are maintained.

The subject site is positioned within a small area of residential intensification which provides suitable context for development and does not detract from the wider rural environment, as shown in the visual assessment VP02, VP03 & VP04. Mitigation planting is proposed which will improve amenity and biodiversity values immediately surrounding the site.

B9.2.1. Policies - Rural activities

(1) Enable a diverse range of activities while avoiding significant adverse effects on and urbanisation of rural areas, including within the coastal environment, and avoiding, remedying, or mitigating other adverse effects on rural character, amenity, landscape, and biodiversity values.

The immediate surroundings of the site contain a range of non-rural activities concentrated within the wider rural context, such as SH22 road corridor, the adjoining temple, and the designated commercial site at 5 Whangapouri Road. Diverse activities provide context for the substation at this location and intensification surrounding the intersection reduces sprawl that could result from the designation being in a purely rural environment. It is worth noting that the land is not currently utilised for rural activity and given its constrained nature it is unlikely to be a valuable piece of rural land. The finer grain nature of development around the subject site means the effects on the greater rural area of the site is low.

6.2.e.ii Mixed Rural Zone

H19.4.2. Objectives – Mixed Rural

(4) Rural character and amenity values of the zone are maintained while anticipating a mix of rural production, non-residential and rural lifestyle activities.

The wider landscape is primarily rural, the Mixed Rural Zone provides for this and some low-density development of non-rural activities. The substation will improve resilience in the existing electricity network to support the growth of non-rural activities within the Mixed Rural Zone and for residential growth in the wider region.

H19.4.3. Policies – Mixed Rural

(2) Manage reverse sensitivity effects by:

(a) limiting the size, scale and type of non-rural production activities;

The scale of the proposal is keeping with the height of existing infrastructure within the SH22 road corridor adjoining the site, and the switch room building is comparable in scale to surrounding residential dwellings. Mitigation planting is relied upon to screen the visual effects of the proposal and the visual effects have been assessed as low overall.

6.2.e.iii Adverse effects of infrastructure

E26.2.2. Policies - Adverse effects of infrastructure

(4) Require the development, operation, maintenance, repair, upgrading and removal of infrastructure to avoid, remedy or mitigate adverse effects, including, on the:

c) amenity values of the streetscape and adjoining properties.

The new substation provides for new developments currently occurring in the region, both residential and rural. This in turn contributes to the economy by allowing these homes to have a secure and reliable connection to the electricity network. The change in landscape character is experienced primarily by passing motorists and a limited number of residents and visitors to the buildings surrounding the Whangapouri Road intersection. The establishment of mitigation planting will help to improve the amenity of the streetscape once mature, which will contribute positively to the neighbouring properties regardless of their non-residential purposes.

(5) Consider the following matters when assessing the effects of infrastructure:

a) the degree to which the environment has already been modified.

The site is greatly modified from its original ecology (Puriri Forest), and the immediate surroundings of the site have been developed into residential intensification that is out of character with the broader rural landscape. The proposal intensifies pre-existing development surrounding the Whangapouri road intersection to a greater extent but overall, it is well-contained within its location and does not detract from the wider landscape character.

6.2.e.iv Assessment criteria

E26.2.7.2. Assessment criteria

(1) The Council will consider the relevant assessment criteria below for restricted discretionary activities:

b) visual effects

(i) The extent to which the cumulative adverse visual effects of additional infrastructure on the amenity values of the streetscape and adjoining properties, are avoided, remedied or mitigated;

(ii) the extent to which any adverse effects of the design, scale and height of the infrastructure can be internalised, modified or mitigated without compromising the functional requirements of the infrastructure;

The cumulative effects of the proposal on the adjoining properties and on the wider landscape have been assessed in Section 6.1 Visual Assessments and Section 6.2 Landscape Effects. In summary, the adverse effects on adjoining properties will be mitigated long term by mature mitigation planting (5-10 years), and the cumulative effects on the wider landscape are considered minor as the scale of the proposal has low visual impacts when viewed within the wider landscape context, as it is from residential properties represented by VP02, VP03 & VP04.

7 Review of Assessment of Landscape and Visual Effects

Section 7 summarises the magnitude of effects resulting from the proposal. As assessed in Section 6.1 Visual Effects and 6.2 Landscape Effects, there is some change proposed to the existing character of the site through increased built form and planting.

In the short term, substation implementation will be highly visible prior to mitigation planting reaching maturity around the perimeter of the site. The short-term visible effects contrast the existing character of the site which is largely devoid of development and currently present as a low-density residential site on the corner of a busy intersection. The addition of the substation will reduce open space and as a result, amenity values will be reduced for adjoining neighbours, and to a lesser extent, for passing traffic.

The reduction in amenity is considered only temporary within a 0–5-year time frame, as the maturing screen planting will add value to the site. Mitigation planting includes native species of Titoki and Harakeke and introduces habitat and food sources for native fauna and provides positive effects for stabilising soils and improving drainage. Within a 5–10-year time frame, site changes will be positive with the establishment of mature planting screening the visible built form and enhancing biodiversity.

The effects of the proposal on the wider rural landscape are limited by comparison to the immediate landscape. Within the wider rural landscape, the visual effects are shown to be absorbed into the pre-existing features of the landscape, including the existing vegetation, undulating landform, and the concentration of buildings and infrastructure surrounding the site. The visual effects on the wider rural landscape are low overall, and the magnitude of the effects are considered acceptable over a timeframe greater than 5 years when the screen planting has had time to mature.

8 Conclusion

This Landscape and Visual Impact Assessment assesses the potential effects of the substation designation located within the mixed rural/residential environment surrounding the intersection of Whangapouri Road, Bycroft Road and State Highway 22, located in Karaka.

The existing site has been described as an open low density semi residential site which does not express the same rare or highly valued landscape features, forms, or systems of the wider rural environment, and is more closely characterised by the residential development surrounding the site and intersection. The site is considered suitable for designation as it is fragmented from the rural landscape by prior subdivision and does significantly impact the wider rural landscape.

To assess the impact of the proposal, photo montages were prepared for viewpoints (VP01-05) representative of residences potentially impacted by the site. The viewpoints represented the site from close and distance locations, and the mitigation established over 0-5 year and 5–10-year timeframes. A conclusion of the assessment is that mature mitigation planting is highly relied upon for reducing visual impacts and enhancing amenity for the site. In addition, it was found that the scale of the proposal integrates with the features of the wider landscape, such as the surrounding vegetation and existing buildings and infrastructure. Modelling of the proposal does not appear to stand out within a wider landscape context however, modelling should be treated as indicative only at this stage, as the site-specific design is not yet confirmed for designation.

The visual assessment in Section 6.1 considered the overall effects of the proposal to be **Low to Moderate.** Close-up perspectives illustrate greater visual impact of the proposal on the immediate environment and the neighbouring properties. Broader landscape views absorbed the proposal within the existing features of the landscape. Mitigation planting around the perimeter will lessen the visual impact and enhance amenity of the site over a timeframe exceeding 5 years.

Overall, the magnitude of effects resulting from the proposal are considered acceptable for the site, which is not considered highly valued rural land. It is worth noting that as the landscape continues to change over time because of zoning provisions and with that, the landscape characteristics which are valued will also change. As the Mixed Rural Zone provides for integration of non-rural activities, the substation designation will provide the necessary infrastructure to facilitate changes from rural to residential character.