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NZ Transport Agency and Porirua City Council

Transmission Gully Project

Technical Report 5: Landscape and Visual Effects Assessment

Final

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1 EXECUTIVE SUMMMARY

1.1.1. This report assesses the landscape and visual effects of the proposed 'Transmission Gully' Project' ('Project'), an alternative State Highway 1 (SH1) route on a 27km 'green-fields' alignment north of Wellington between Linden and MacKays Crossing.

Potential Effects

1.1.2. The main potential landscape and visual effects are:

i) Effects on the **natural character** of **wetlands and rivers and their margins** (s6(a)),

ii) Effects on **outstanding natural features and landscapes** (s6(b)),

iii) Effects on landscape aspects of **amenity** values (s7(c)) including:

a. Effects on **landscape character** & **aesthetics**, and **recreational use**

b. Effects on historical associations

c. Visual effects from **private properties** and **public viewpoints**

d. Experience for **future road users**

iv) Effects on **natural components**[1] of the landscape (landforms, streams, vegetation) (s7(f)),

v) Landscape effects during construction (s7(c) & s7(f)).

Effects on Natural Components of the Landscape[2]

1.1.3. There will be substantial earthworks, as one would expect for a project of this size in such terrain, and some inevitable adverse effects on landforms, streams and natural vegetation. There is overlap between such landscape effects and those relating to other disciplines, particularly ecology, which are addressed in other reports. The most significant effects in landscape terms will be in Te Puka Stream and at Lanes Flat. The alignment and the design parameters (including earthworks design) has been fine-tuned to avoid or reduce such effects as far as possible, and the remaining effects will be adequately remedied and mitigated by the substantial measures proposed.

[1] i.e. 'Biophysical' or 'natural science' factors

[2] The effects are addressed in reverse order, from the more general to the specific.

Landscape Amenity Effects

1.1.4. Similarly, as one would expect from a green-fields alignment through mostly rural landscapes, the Project will introduce significant change to the existing landscape character. The greatest adverse landscape effects will be in the more natural sections of the route: Te Puka Stream, Horokiri Stream (including Battle Hill Farm Forest Park), and Duck Creek (including Belmont Regional Park). At the same time these parts of the route will have the highest amenity for future travellers because of what will be a dramatic juxtaposition of road with natural landscape.

1.1.5. The alignment has been fine-tuned to improve the 'fit' with the landscape, and landscape measures (earthwork design and planting) have been designed to further help integrate the alignment into the landscape.

1.1.6. The Project will reduce landscape amenity in parts of both Battle Hill Farm Forest Park and Belmont Hills Regional Park. In both cases the Project will have relatively low adverse landscape effects on the most significant parts of each park: from the headquarters, farmland, bush remnants and historic sites in the western part of Battle Hill Farm Forest Park, and from the hill tops of Belmont Regional Park. The adverse effects will be mitigated by retaining physical connections for existing trails in both parks, and by restoration planting in the vicinity of points where trails approach the Main Alignment.

1.1.7. There will be adverse effects ranging between 'moderate' and 'very high'[3] on some properties adjacent to the alignment, including those in urban areas at the southern end of the route (Linden) and on rural / lifestyle properties mainly in the middle sections of the route. However the overall effects will be less than might be expected for a project of this scale for several reasons:

i) Urban areas make up a relatively small proportion of the route, and the effects from Porirua East and Cannons Creek will be moderated by reasonable distance separation (typically greater than 200m); the extent to which the alignment is contained within box cuts; and by the extent of screening by landform, existing vegetation and houses.

ii) There are substantial sections of the route with no, or very few, dwellings.

[3] i.e. between 3 and 5 on a 5 point scale

iii) Recently developed properties in the lifestyle areas have been developed in anticipation of a major highway,[4] the alignment tends to follow 'rear' boundaries between such properties, views of the Project will typically be restricted by the rolling topography and rural vegetation patterns (e.g. woodlots, shelter belts, native re-vegetation and amenity planting) in such areas.

iv) Mitigation is proposed for properties adjoining the alignment, including noise walls and planting in urban areas, and planting adjacent to the alignment in rural areas.

1.1.8. The visual experience for future road users will be largely positive, characterised by the bold topography, a sequence of enclosure and openness, and a contrasting sequence of landscapes from urban to natural. Measures have been taken to reduce the adverse visual effects of earthworks, particularly to reduce the visual impact of the benched cut batters, and to reduce the visual clutter of structures and barriers typical of such roads. This will cumulatively help to enhance amenity for future road users.

1.1.9. For these reasons, it is considered the Project will maintain and enhance landscape amenity as far as practicable given its nature and that the remaining adverse amenity effects will be adequately avoided, remedied or mitigated.

Landscape Effects during Construction

1.1.10. Biophysical landscape effects during construction include potential sedimentation on waterways, direct impacts on streams during construction of culverts and diversions, in particular in Te Puka Stream, and clearance of natural vegetation clearance. Such effects, and the measures proposed to avoid, remedy and mitigate them, are addressed in Technical Reports 11, 14 & 15.

1.1.11. Landscape amenity effects will typically be amplified during construction as a result of exposed earthworks and the construction activity itself including noise and temporary lighting. The works will be temporary and will be remediated progressively as each part of the Project is completed.

1.1.12. The Project Compound Site at Lanes Flat will have adverse visual amenity effects throughout the construction period. To address this mitigation planting will be carried out at the commencement of the Project, and will form part of the long term landscape measures for Lanes Flat.

[4] Given the existing designation that has been in place since 1997 for a highway on a very similar alignment

Landscape Aspects of Natural Character of …Wetlands, Rivers and Margins

1.1.13. The main potential natural character effects will occur on the six main streams[5] crossed by the Project, four of which flow toward the sensitive Pauatahanui Inlet. Works will affect both biophysical and visual components[6] of natural character. There will be 'very high' effects on natural character of Te Puka Stream, and 'moderate' to 'high' effects on natural character on the remaining five streams. Best practice measures are proposed to avoid or minimise the degree of effects as far as practicable and to mitigate the remaining effects.[7] Mitigation measures include reconstruction of Te Puka Stream, extensive offset riparian replanting of the streams and tributaries and retirement of catchment areas (described in Technical Report 11, Assessment of Ecological Effects) and rehabilitation of Lanes Flat at Pauatahanui. The Project can be considered appropriate taking into account the existing modification of stream catchments, the measures to preserve natural character as far as possible given the nature of the Project, and the measures to offset the effects.

Outstanding Natural Features and Landscapes

1.1.14. The only ONF/ONL classified in a District Plan that is affected by the alignment is the 'Foothills of the Tararua Ranges'. While the Project will have some adverse landscape effects on the ONL, such effects will be modest given the robust character of the hills, the small proportion of the ONL affected by the Project, the low elevation at which the alignment traverses the escarpment, and the extent of existing modification in the vicinity of where the Project crosses the ONL. The escarpment hills will remain visually dominant. For these reasons the Project is considered appropriate.

1.1.15. Because the other relevant District Plans and Regional Policy Statement do not attempt to identify any ONF/ONLs, the landscapes with the Study Area were assessed for this purpose.

1.1.16. The valleys of Te Puka Stream, Horokiri Stream and Duck Creek each have relatively high landscape values, but are not sufficiently 'eminent' to be ONLs.[8] The Paekakariki Coastal

[5] Te Puka Stream, Horokiri Stream, Ration Stream, Pauatahanui Stream, Duck Creek, Cannons Creek

[6] For instance by the introduction of a road into the stream's natural landscape setting

[7] For instance through soil erosion and sediment controls, 'fish-friendly' culvert design, and restoration of riparian vegetation

[8] The relevant matters in these areas include effects on natural character (s6a) and amenity (s7c) rather than ONF/ONL matters

Hills and Pauatahanui Inlet / Backdrop Hills have sufficient landscape values to be considered ONLs, but they will not be affected by the proposed alignment.

1.1.17. In summary, the only ONF/ONL affected by the Project will be the Tararua Foothills. While there will be some effects on landscape values, they will be confined in extent and degree for the reasons set out above and the visual dominance of the natural escarpment will be retained. The proposed project can therefore considered 'appropriate' with regards to s6(b) of the RMA.

Landscape Measures to Avoid, Remedy and Mitigate

1.1.18. A 'best practice' approach was taken to landscape measures:

i) The priorities were avoidance, remediation and mitigation in that order.

ii) Landscape measures were designed in conjunction with other work streams to maximise cross-over benefits. [9]

iii) While measures were designed to mitigate specific adverse landscape effects, opportunities were sought to achieve multiple benefits from each mitigation measure.

iv) Attention was focused on improving each element of the Project to cumulatively enhance the design.

v) Alternative refinements to alignment, structures and remediation measures were investigated in those locations with potentially significant effects.

1.1.19. Comprehensive landscape design measures are set out in the landscape plans which form part of the recommended conditions, and in the Urban and Landscape Design Framework (Beca/Isthmus et al, 2011). The measures dovetail with other mitigation measures, particularly those carried out for ecological purposes.

1.1.20. In summary, while a project of this nature and scale will inevitably have adverse landscape effects, a best practice approach has been taken to avoid effects as far as practicable and the proposed measures will adequately remedy and mitigate the remaining adverse effects.

[9] For instance the ecological and landscape measures are complementary and reinforce each other.

2 INTRODUCTION

2.1.1. This report assesses the landscape and visual effects of the proposed 'Transmission Gully Project' ('Project'), an alternative State Highway 1 (SH1) alignment on a 27km green-fields route north of Wellington.

2.1.2. The Project consists of three components:

i) Construction and operation of a 27km State highway (the 'Main Alignment') formed to expressway standard from Linden in the south to MacKays Crossing in the north;

ii) Construction and operation of a State highway (the 'Kenepuru Link Road') from the Kenepuru Interchange to Kenepuru Drive; and

iii) Construction and operation of two local roads (the "Porirua Link Roads') which connect the Main Alignment to the existing eastern Porirua street network at Waitangirua and James Cook Drive.

3 PURPOSE AND SCOPE

3.1.1. The purpose of this assessment was "to ensure that NZTA, other project work stream consultants and any future consent documents fully acknowledge potential landscape and visual effects and opportunities to remedy or mitigate any unavoidable effects."[10] In other words the purpose has been to both assess the actual and potential effects, and also to promote a design that reduces or remedies adverse effects.

3.1.2. This report forms part of the overall environmental assessment of the Project. Where there is overlap between landscape matters and other disciplines, this report relies on the information contained in specialised reports.

3.1.3. This report forms part of Volume III of the application documents prepared for the Notices of Requirement (NoR) and resource consent applications for the Project, which comprise:

Volume I	Assessment of Effects on the Environment
Volume II	Resource Management Act 1991 forms
Volume III	Technical Reports

[10] NZTA Transmission Gully Stage I – Scope Development Report. (2009). Isthmus.

Volume IV Plan Set

4 PROJECT DESCRIPTION

4.1.1. The Assessment is based on the description of the Project contained in the Design Philosophy Statement: Roading Design, (Technical Report 1), the Design Philosophy Statement: Bridges and Retaining Walls (Technical Report 2) and Plans provided as Volume 4 of the AEE. In summary the following elements are relevant to the landscape and visual assessment:

4.1.2. The Main Alignment comprises a new route for State Highway 1 (SH1) between Linden in the south and MacKays Crossing in the north. It will follow a green-fields route, although it has been anticipated for many years and there is an existing 1997 designation for a similar alignment to that now proposed.

4.1.3. The Main Alignment will have a dual carriageway separated by a median barrier and constructed to a 100kph design speed. It will typically contain two lanes in either direction, with additional crawler lanes in the steep Te Puka Stream valley and additional merging lanes adjacent to the interchanges.

4.1.4. There will be four grade-separated interchanges:

i) 'MacKays Crossing Interchange' in the north where the Main Alignment connects with existing SH1;

ii) 'State Highway 58 (SH58) Interchange' in the middle of the route where the Main Alignment will connect with the existing SH58 adjacent to the Pauatahanui Stream at Lanes Flat;

iii) 'James Cook Interchange' approximately 2km south of the SH58 Interchange where the Main Alignment will connect with the Porirua Link Roads to Waitangirua (Warspite Avenue) and Whitby (James Cook Drive); and

iv) 'Kenepuru Interchange' at the southern end of the route where it will connect with the Kenepuru Link Road to Kenepuru Drive.

4.1.5. The project will entail substantial earthworks because of the steep terrain. As outlined in the AEE there will be approximately 6.3 million m^3 of cut, of which 5.8 million m^3 will be used in structural fill and the remainder placed in surplus fill sites. There will be a number of large side-cut batters up to 65m high (mainly at the north end of the route in

Te Puka and upper Horokiri Valleys) and deep box cuts with batters up to 55m high (mainly at the south end near Linden and Cannons Creek). Cut batters will be benched at typically 10m intervals. Likewise there will be large side-fill and embankment batters, also benched typically at 10m intervals. Approximately 8.2km[11] of stream bed will be lost due to culverts , and 6.1km will be modified through stream diversion, the most substantial being that of Te Puka Stream.

4.1.6. Further details of Project elements are described in the relevant sections of this report and its appendices.

5 METHODOLOGY

5.1.1. The landscape assessment methodology is described in **Appendix 5A**.

5.1.2. A scoping report was prepared during an early phase of the Project in order to scope the required Landscape Architectural input, the proposed assessment methodology, and cross-over with other disciplines. An external technical review of the scoping report was carried out by Mr Clive Anstey on behalf of the Regulatory Authorities Technical Advisory Group (RATAG).

6 STATUTORY CONTEXT

6.1.1. Four Notices of Requirement (NoR) are being sought by the N.Z. Transport Agency (NZTA) with respect to the four local authorities traversed by the Project.

6.1.2. Two additional NoRs are being sought by Porirua City Council (PCC) with respect to the Kenepuru Link Road and Porirua Link Roads in Porirua City.

6.1.3. The NZTA and PCC are also seeking all necessary resource consents from the Greater Wellington Regional Council.

Resource Management Act

6.1.4. Provisions of Part 2 of the RMA most relevant to assessing landscape and visual effects are summarised below:

6.1.5. **Section 5** sets out the purpose of the RMA.

[11] Ecological Impact Report, p.ii

Purpose

6.1.6. *(1)* The purpose of this Act is to promote the sustainable management of natural and physical resources.

6.1.7. (2) In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—

(a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and

(b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and

(c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.

6.1.8. **Section 6** of the RMA sets out matters of national importance which must be recognised and provided for, including;

6.1.9. s6(a) – The preservation of the natural character of the coastal environment…wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use and development

6.1.10. s6(b) – The protection of outstanding natural features and landscape from inappropriate subdivision, use and development

6.1.11. **Section 7** of the RMA sets out matters to which particular regard shall be given including:

6.1.12. s7(c) – the maintenance and enhancement of amenity values,

6.1.13. s7(f) – the maintenance and enhancement of the quality of the environment

Statutory Plans

6.1.14. Statutory plans relevant to the landscape and visual assessment include:

i) Wellington Regional Policy Statement (1995), Proposed Wellington Regional Policy Statement (2009);

ii) Wellington Regional Freshwater Plan (1999);

iii) Kapiti Coast District Plan (1999);

iv) Porirua City District Plan (1999);

v) Upper Hutt City District Plan (2004); and

vi) Wellington City District Plan (2000).

6.1.15. Provisions most relevant to landscape and visual matters are summarised in **Appendix 5B.**

Other Matters

6.1.16. Other relevant reports or management plans, the provisions of which are also summarised in **Appendix 5B**, include:

i) Wellington Conservation Management Strategy;

ii) Belmont Regional Park and Battle Hill Farm Forest Park have Management Plans prepared in 1996 and 2009 respectively under the Reserves Act 1977. The Regional Parks Network Management Plan (2003) also has some relevance although it is an overarching and general document;

iii) Belmont and Battle Hill Farm Forest Park Sustainable Management (Action) Plans;

iv) Porirua Development Framework; and

v) *'Future Focus: A Framework for Pauatahanui Village (2009)'* a document prepared through community consultation under the auspices of Porirua City Council.

7 EXISTING LANDSCAPE

Natural Landscape Components[12]

Geomorphology (Landforms and Streams)

7.1.1. Wellington's regional landscapes are characterised by parallel ranges of steep hills oriented on a NE-SW alignment, separated by the region's main faults.[13] [14] The ranges are tilted so that they typically have steep escarpments on their south-eastern flanks and more gradually dipping slopes on their north-western flanks creating something of a saw-tooth pattern. [15] There is a secondary pattern of splinter faults and folds on a north-south axis, which results in secondary north-south valleys and basins such as those occupied by Horokiri Stream, Porirua Harbour and Pauatahanui Inlet.

GA03 and GA04

Landform and Slope

7.1.2. The proposed Main Alignment responds to this geomorphic pattern. The alignment picks up the Ohariu Fault at MacKays Crossing, which is followed to the north along the base of the Tararua foothills by the existing (SH1), and continues to follow the fault up the Te Puka Stream valley and over the Wainui Saddle. South of the Wainui Saddle the route parallels a north-south splinter fault along valleys of the Horokiri and Ration Streams as far as the James Cook Interchange east of Whitby. From the James Cook Interchange the route parallels the NE-SW Moonshine Fault along the Duck Creek valley to the vicinity of the Takapu Substation, where it swings 90^{o} to the north-west around the southern perimeter of the Porirua Basin. The route rejoins SH1 at Linden where it picks up the north-south Tawa valley which parallels the Ngauranga Fault. In summary the route follows a series of valleys paralleling steep fault escarpments.

[12] 'Biophysical' or 'Natural Science' factors

[13] Begg, J.G., Johnston, M.R, (compilers) 2000: Geology of the Wellington area. Institute of Geological and Nuclear Sciences 1:250 000 geological map 10

[14] Stevens, Graeme R, 1974, 'Rugged Landscape, the Geology of Central New Zealand', page 61

[15] For example the range of hills on which the Belmont Regional Park is located are bounded by an escarpment along the Wellington Fault on the south-western side (followed by the Hutt Motorway) and more gradual slope on the north-west side. The pattern is repeated with the Moonshine and Ohariu Faults. In both cases the ranges of hills have steep escarpments on their south-eastern flanks, and more gradually dipping surfaces on their north-western flanks

7.1.3. Streams in the area also respond to the tectonic pattern. The main streams (Te Puka Stream, Horokiri Stream and Duck Creek) generally follow the alignments of faults and splinter faults and consequently have relatively straight valleys on NE-SW or north-south alignments. The tributary streams on the fault escarpments (such as the western tributaries of Te Puka Stream, Horokiri Stream and Duck Creek) are short and steep while the eastern tributaries on the more gentle back slopes are typically longer, have larger catchments, and tend to follow more meandering courses between inter-leaved spurs.

7.1.4. Two thirds of the route traverses catchments that converge on Pauatahanui Inlet, including the catchments of Horokiri Stream, Ration Stream, Pauatahanui Stream and Duck Creek. Most of the rest of the route is within catchments that flow into the southern arm (Onepoto Arm) of Porirua Harbour by way of Kenepuru Stream or Porirua Stream. Only the northernmost 5km encompassing Te Puka /Wainui Stream catchment does not drain toward Porirua Harbour / Pauatahanui Inlet, but instead flows across the narrow coastal plain to a mouth north of Paekakariki.

GA06

Catchments

Vegetation Patterns and Land Use

7.1.5. Almost all the Project falls within the Wellington Ecological District, which is characterised by steep, strongly faulted hills and ranges, and the Wellington and Porirua Harbours. The ecological district is windy with frequent NW gales, warm summers, mild winters, and rainfall typically between 900mm and 1400mm p.a.

7.1.6. Natural vegetation and ecological patterns are covered in detail in the Ecology Report.[16] The area would naturally have been mostly forested.[17] The area would likely have naturally supported coastal kohekohe, rata, rimu forest in the warmer lower valleys; kahikatea, totara, matai forest on stream terraces and lower slopes; a mixture of riparian vegetation and native grasslands along streams; salt marsh and swamp forest around the Pauatahanui Inlet; and tawa, miro, rimu forest on higher slopes.

[16] Technical Report 11: Ecological Impact Assessment,

[17] Technical Report 11, Ecological Impact Assessment, p.ii

7.1.7. The area surrounding the route has mostly been cleared and converted to exotic pasture and pine plantation. There are occasional remnant pockets of indigenous vegetation (such as the pockets of kohekohe forest in Te Puka Stream valley), areas of regenerating forest (such as at Cannons Creek and Porirua Park Reserve), and areas of former pasture that are in early stages of regeneration with gorse, tauhinu and some more advanced areas of kanuka and mahoe.

7.1.8. The area surrounding the route is characterised by the following land use patterns:

i) ***Pasture:*** Areas of extensive grazing land are located on the steeper hill country in Te Puka Stream and Horokiri Stream and the Duck Creek Catchment south of SH58. Such areas include Belmont Regional Park and the central part of Battle Hill Regional Farm Forest Park.

ii) ***Indigenous Bush and Scrub:***[18] There are remnant patches of indigenous bush, including areas in Te Puka Stream, upper Horokiri Stream and Duck Creek tributaries. There are areas of regenerating second growth bush, notably in the Cannons Creek catchment and Porirua Park Reserve. The other notable indigenous vegetation is the wetland area (wildlife refuge) at the head of Pauatahanui Inlet adjacent to Pauatahanui village. There are also extensive areas of former pasture that are reverting to natural vegetation largely characterised by gorse, tauhinu and other small leafed species such as twiggy coprosma, manuka and kanuka.

iii) ***Exotic Plantation:*** There is an extensive area of commercial pine plantation on the hills east of Horokiri Stream (Akatarawa Forest), smaller areas on the hills east of the lower Te Puka Stream and west side of Ration Stream, and small plantations scattered through the remainder of the corridor.

iv) ***Rural lifestyle:*** Areas of lifestyle properties are mostly located in the middle part of the route and are accessed from Flightys Road, Paekakariki Hill Road, and Bradey Road. This area has a more rolling topography and is characterised by a closer settlement pattern with lots of between 10ha-100ha; a patchwork pattern of boundary shelter planting and differing land management; a wide variety of vegetation including exotic shelter trees, small plantations, amenity trees, and areas of native re-vegetation.

[18] As discussed above, natural vegetation patterns are covered in more detail in the Ecology Assessment Report

v) ***Rural Village:*** Pauatahanui is located near the head of Pauatahanui Inlet at the former intersection between the Haywards Road, Paremata Road and Paekakariki Hill Road. There are a number of historic buildings / sites. (Further discussion on the history of the settlement is included below).

vi) ***Urban Periphery:*** The area in the vicinity of Cannons Creek and Porirua East comprises an urban basin back-dropped by rural hills. The hills comprise a mosaic of former pasture that has reverted to gorse and mahoe shrubland; rough pasture on the ridgelines; small pine plantations; and areas of remnant or regenerating indigenous forest. A similar land use occupies the land traversed by the Porirua Link Roads.

vii) ***Urban Areas:*** Only the southernmost connections to the existing SH1 at Linden and the Kenepuru Link Road traverse urban areas with lot sizes below 2000m^2.

viii) ***Peri-urban Activities:*** The area is also characterised by activities typically found on the outskirts of urban areas, including the Pauatahanui Golf Course, the two regional parks (Battle Hill and Belmont), the Porirua Gun Club, a regional electricity substation at Takapu Road, a smaller substation at Pauatahanui, and such commercial activities as a garden centre, fruit and vegetable shop, and former car storage facility.

Plan GA07 and GA08

Land cover and Parcel Size

Perceptual and Associative Factors

Legibility (Character Areas, Edges/Lines, Landmarks/Nodes)

7.1.9. Legibility as used in this context[19] refers to the elements used to visually organise and orient the landscape. Typical legibility elements include character areas; lines / edges (such as streams, skylines, edges between hills and plains); and memorable nodes / landmarks. They include both natural and human elements as listed in Table 5.1 below. The character areas do not fit neatly within the nine sections into which the route has been divided, so a cross-reference to Route Section is provided. Both landscape character area and route section boundaries are illustrated in plans LA01 – LA21, Volume 4 of the AEE.

[19] 'Legibility' is also used to describe the extent to which geomorphic processes are able to be 'read' in landforms.

Table 5.1: Legibility Elements

Landscape Character Areas		Route Section
1 Kapiti Coastal Plains:	The area is characterised by the sharp contrast between the coastal plains and the backdrop escarpment of the Tararua foothills. The existing SH1 follows the toe of the escarpment parallel to the Ohariu Fault. The plains in the vicinity of the route are characterised by a mix of pastoral farming, cropping, some peri-urban activities such as the former '*Car Haulaways*' site and a nursery, and infrastructure including the existing SH1, the North Island Main Trunk railway, and transmission lines. Further west is the relatively natural dune fields of Queen Elizabeth Park. There is a prominent terrace on the edge of the plains east of the alignment.	1
2 Te Puka Stream – Wainui Saddle – Upper Horokiri Stream:	The area has a wilderness character typified by the steep narrow valley and 'mountain' stream; steep hill faces; and lack of human settlement. Land use comprises low intensity stock grazing, exotic pine forest, remnant native forest and fragmented native and exotic scrub. Existing transmission line.	1,2,3
3 Battle Hill Farm Forest Park:	The lower valley of the Horokiri Stream within the Battle Hill Regional Park has a softer rural character compared to the 'Transmission Gully' to the north. The valley is wider and has more rolling topography and higher quality pasture. The Horokiri Stream follows a more meandering course along its small flood plain which is used for crops such as hay. The land use patterns are expansive comprising broad scale pasture on the west bank of Horokiri Stream and extensive plantation forest on the steeper backdrop hills on the east bank.	3,4,5
4 Pauatahanui Rolling Hill Country (Flightys Road Lifestyle Area):	The area between Battle Hill Regional Farm Park and SH58 comprises a lifestyle landscape character including lifestyle properties and the Pauatahanui Golf Course. It has a more complex rolling topography and a patchwork of property boundaries; diversity of rural land uses; wider range of trees	5, 6

	including a high proportion of exotic trees; and a relatively close settlement pattern. There is a plantation forest on the hills west of Ration Stream. It is a semi-enclosed landscape.	
5 Lanes Flat (Pauatahanui Stream)	Formerly the inland extent of the Pauatahanui Inlet, the valley forms a flood plain for an extensive catchment of the Belmont and Akatarawa hills. Pauatahanui Village is located adjacent to the Pauatahanui Stream bridge 1km downstream from the proposed alignment. Otherwise the valley floor has an open pasture character with some artificial drains. The enclosing hills include a regenerating kanuka forest, lifestyle properties, and the suburban fringes of Whitby.	6
6 Bradey Road Lifestyle Area	The area between Lanes Flat and the proposed James Cook Interchange comprises a lifestyle character. As with the Flightys Road area, it is characterised by rolling topography and a complex patchwork of property boundaries; diversity of rural land uses; wide range of trees; and a relatively close settlement pattern clustered along Bradey Road and Belmont Road. The main difference is that the edge of the Whitby suburban area (e.g. '*Silverwood*' subdivision) overlooks the route from the west.	6,7
7 Eastern Whitby	The area comprises a suburbanised valley with development within the valley and on the ridges on either side. It is the lower part of the Duck Creek catchment, although the stream is modified through the suburb, including some artificial lakes. The backdrop hills to the south, which would be traversed by the proposed Porirua Link Roads, are steeper and have more natural or rural character comprising low intensity pasture and pine shelter belts/woodlots.	6,7
8 Duck Creek Valley (Belmont Hill Country):	The valley has a remote character, despite its proximity to urban Porirua. It is characterised by the strong topographic patterns of the Moonshine Fault escarpment on west bank and the bold Belmont Hills to the east; steep gullies, rounded spurs and foot slopes; simple land use pattern of low intensity grazing, and the absence of human settlement. As with Te Puka Stream / upper Horokiri Stream, the area has a relatively dramatic natural	7,8

	character. Forms part of Belmont Regional Park. The most prominent structures are transmission lines converging on the Takapu Road substation.	
9 Porirua East Basin	The area west of the proposed Cannons Creek bridge comprises a backdrop to the urban basin (Porirua East, Canons Creek, Waitangarua). It is characterised by reasonably bold topography and a mosaic of pine plantation, rough pasture, and areas of reverting gorse/mahoe shrubland. While the floor of the basin is heavily urbanised, structures on the backdrop hills are limited to occasional buildings (e.g. the Porirua Gun Club) and transmission lines.	8,9
10 Linden	The short area between the Kenepuru Interchange and the connection to the existing SH1 at Linden is an 'urban' section of the route. Aside from a pine plantation forming a backdrop to Ranui Heights, the area is characterised by its residential suburban character and the existing motorway and rail corridor.	9
Lines and Edges		
Natural lines and edges	The main natural linear patterns in the landscape include the fault line valleys , escarpments and long skyline ridges discussed above under the heading 'geomorphology'. The main natural edges are the coastline (including the shoreline of Pauatahanui Inlet), and the junction between the Kapiti Coast coastal plain and the hills.	
Human (cultural) lines and edges	Human lines traversed by the route include SH58 which follows the Pauatahanui Stream valley, bisecting the Project corridor at its mid-point. Human edges include the edges of urban areas.	
Landmarks		
Kapiti Island	Kapiti Island is the iconic landmark for the Kapiti Coast, and is glimpsed from northern parts of Te Puka Stream valley.	
Wainui Saddle: and the upper Te Puka and Horokiri Streams	The 'V' of the saddle is a distinctive landmark glimpsed in the distance from such elevated locations as Battle Hill Farm Forest Park and parts of Whitby. It is a relatively minor landmark at present but will form a distinctive 'watershed' for future travellers	

	on the route, forming a boundary between Wellington and the Kapiti Coast, and providing elevated views in both directions.
Lanes Flat and Pauatahanui Inlet	The Lanes Flat valley will be a landmark on the proposed alignment because it is the only major valley that crosses the alignment at right angles, and because it is marked by SH58. Its openness is distinctive in contrast to the enclosed valleys of the Horokiri Stream and Duck Creek. . Although Pauatahanui Inlet itself may only be glimpsed from the route, its presence is implied by the openness of views in the direction of the inlet and by the backdrop Paekakariki Hills.
Belmont Hills	The hills to the east of the Duck Creek section of the route are memorable landmarks because of their bold scale and the sculptural qualities of the valleys on the open hillsides. The highest part of the range including 'Round Knob' will be in the centre of the 'view shaft' for northbound travellers on the proposed alignment in the vicinity of Cannons Creek.
Cannons Creek	Even though the road only clips the upper section of the Cannons Creek valley, it is a widely recognised landscape feature associated with the suburb of the same name. It is the location of the largest proposed bridge along the route.

LA107

Landscape Legibility Elements (Character Areas, Landmarks, Edges)

LA108 to LA120

Landscape Context Photos

7.1.10. Overall, the strongest aesthetic characteristics of the area traversed by the route are the expressive landforms (bold hills, sharp escarpments, straight valleys), and areas of relatively natural landscape. These characteristics are emblematic of Wellington's broad landscape setting, and are most evident in the Te Puka Stream, Horokiri Stream and Duck Creek sections of the route.

7.1.11. It is also important to highlight the sharp boundary between the steep hill country traversed by the Project and the open, settled coastal plains immediately to the north.

The contrast between these landscapes will influence the 'gateway' experience which is discussed below.

Transient Aspects

7.1.12. Transient factors are those things that are changeable or may be present only on occasion, such as the presence of wildlife or weather patterns. Transient factors within the area traversed by the route include the mist / cloud that sometimes hangs over the Wainui Saddle and high ridges surrounding the route, and the extent to which low sunlight sometimes accentuates the topographic 'bones' of the hills such as on the north side of Pauatahanui Inlet and the Belmont Hills. Pauatahanui Inlet is also recognised as an important bird habitat which contributes to transient aspects of the wider landscape.

Recognition by Community

7.1.13. Features that have high recognition by the community include the following:

i) 'Transmission Gully' itself: The route has high name recognition in the region due to long-standing anticipation of a highway.

ii) Battle Hill and Belmont Regional Parks: There is community protectiveness of both regional parks, evidenced for instance by opposition to proposals for wind farms within them.

iii) Pauatahanui Inlet: The inlet is a natural focus for areas such as Whitby and Paremata, and there is community interest in protecting its quality as evidenced by groups such as 'Friends of the Inlet'.

iv) However there is limited recognition of landscape features in the District Plans apart from the classification of the hills at the northern end of the route as an outstanding natural landscape in the Kapiti Coast District Plan.[20]

v) Porirua City, Hutt City and Wellington City have not attempted to identify outstanding natural landscapes in their respective District Plans.

vi) Wellington City District Plan, though, has identified a number of 'hill tops and ridgelines' including the ridges south and east of Porirua East and Tawa above the proposed route, which will not be affected by the Project.

[20] Addressed below under separate heading 'Outstanding Natural Features and Landscapes'

vii) Porirua City District Plan identifies 'Landscape Protection Areas' including some areas adjacent to the route. However there are shortcomings with this classification: The landscape values associated with these areas are not well documented, their mapping was influenced by ownership boundaries rather than landscape values, and substantial development has been undertaken in some of the identified areas (e.g. *'Silverwood'* subdivision and the Judgeford Hills Plan Change). Porirua City has started a review of the District Plan provisions relating to rural areas which includes an assessment of landscape values. The findings of this study were not available when this report was written.

Value to Tangata Whenua

7.1.14. Value to tangata whenua is recognised as a factor to take into account when assessing landscapes. It is understood the route falls within the rohe of Ngati Toa Rangatira. This landscape assessment principally relies on the Cultural Impact Assessment report[21] prepared on behalf of the iwi.

7.1.15. The coast and Porirua Harbour (including Pauatahanui Inlet) was a focus of pre-European settlement for Ngati Ira, who were subsequently displaced in the 1820s by Ngati Toa Rangatira, a Tainui iwi who had migrated from Kawhia under the leadership of Te Rauparaha. Ngati Toa's rohe was centred on Porirua Harbour and Mana / Kapiti Islands, which commanded the strategically and economically important Cook Strait as well as providing abundant food resources. A number of kainga and pa were located around the harbour. The area traversed by the Transmission Gully route, however, was not an area of settlement but was frequented to gather food and other resources from the forests and streams. The CIA identifies the following landscape features in the vicinity of the route as having cultural significance:

i) Whareroa Farm (Queen Elizabeth Park area and the prominent terrace east of MacKays Crossing), which was an area of settlement at the north end of the route, containing Whareoa Pa, urupa and other waahi tapu.

ii) Battle Hill, which was the location of Te Rangihaeata's last battle, with several casualties of the battle buried on the site.

iii) Pauatahanui Inlet which has significance as a focus of settlement, as an important food resource, and because it was seen as a memory of Kawhia Harbour which was

[21] Technical Report 18: Cultural Impact Assessment

the iwi's traditional homeland. The CIA makes particular reference to Pauatahanui Wildlife Reserve, Motukaraka Point,[22] and Mataitaua (former pa on the St Albans Church site in Pauatahanui village).

iv) Porirua (Onepoto) Harbour which has significance as a focus of settlement, as an important food resource, and as a strategic location commanding Cook Strait. The CIA makes particular reference to a number of settlements and pa around the harbour. Takapuwahia on the western side of Porirua Harbour is considered the iwi's most important kainga.

Historical Associations

7.1.16. Historical associations are a recognised factor to take into account when assessing landscapes. Historic Heritage is addressed in the Archaeology report,[23] Cultural Impact Assessment,[16] and Built Heritage report.[24] The following historical associations contribute to route's landscape values:

i) A U.S. Marines Corp military camp was located at MacKays Crossing at the northern end of the route during the Second World War. The camp was divided into three sections, one of which was located on a terrace above and to the east of SH1, one on the land now within Queen Elizabeth Park on the opposite side of SH1, and the third on the northern outskirts of Paekakariki.[25] There is little physical evidence of the camp; however a circular brick storage structure associated with the camp is located in the terrace at the foot of Te Puka Stream. It is understood that the structure was used to house a fuel tank, and it was located away from the camp for camouflage reasons and to protect against possible explosions.

ii) Battle Hill was the last engagement fought in the Wellington Region during 1846 as part of the New Zealand Wars. Ngati Toa chief Te Rangihaeata built a pa, Mataitaua, at Pauatahanui commanding the Pauatahanui Inlet. However it was vulnerable to overland attack from the rear and was abandoned following an advance by British Imperial troops from both the west and east. [26] Te Rangihaeata

[22] Horokiri Wildlife Reserve

[23] Technical Report 20: Assessment of Archaeological Effects

[24] Technical Report 19: Assessment of Built Heritage Effects

[25] Respectively Camp MacKay, Camp Russell, and Camp Paekakariki

[26] From the Hutt Valley by way of the Haywards Road route, and from Paremata by way of Paremata Road.

retreated up the Horokiri Stream valley and built fortifications on a spur from where he fought a rear-guard action over several days before abandoning the site and withdrawing to the north.[27] The battle site is on a ridge within Battle Hill Regional Farm Forest Park approximately 1km west of the proposed alignment, and the site of the British camp (including graves of two British casualties) is at the base of the ridge north of the park headquarters.

iii) Pauatahanui[28] was subsequently established as a garrison settlement on the site of Te Rangihaeata's pa immediately following the action in 1846.[29] Troops then constructed the Paekakariki Hill Road for military purposes, after which Pauatahanui became a coaching and staging settlement on the main road north from Wellington (the route north was by way of the Tawa valley, Paremata Road around the southern shores of the inlet and the Paekakariki Hill Road). The heyday of the village was during the 1870s and 1880s when it supported a range of businesses, the settlement gradually declining after it was bypassed first by the railway (1886) and eventually by the coastal main road route (1939). As well as its garrison and staging history, Pauatahanui was a service centre for surrounding rural areas. It supported early sawmilling, experienced a very minor gold rush,[30] and was a service centre for military camps located in the surrounding area during the Second World War. There are a number of historic buildings and sites, most of which are within the village precinct west of the proposed alignment.[31] St Joseph's Catholic Church and historic cemetery is on a hill immediately east of the proposed SH58 interchange approximately 1km east of the village.

iv) Whitby is a comprehensively planned suburb designed in the 1970s to an innovative and high quality approach. The suburb has a high level of amenity, extensive walkways and bush and open space reserves. A feature of its identity is the street naming derived from a nautical theme associated with Cook's voyages.

[27] Belich, James, 1986, The New Zealand Wars, p.74

[28] See Porirua City Council, 2009, Future Focus: A framework for the development of Pauatahanui Village

[29] St Alban's Church was subsequently built on the site of the pa. Stores were shipped to 'Ration Point' just north of the settlement.

[30] A brief period of quartz mining in the late 1860s early 1870s at Mt Welcome on the Paekakariki Hill Road

[31] Porirua City Council, 2009, Future Focus: A framework for the development of Pauatahanui Village. The document lists 8 houses, 2 churches and the store as heritage buildings, and a number of sites including the site of the pa and garrison, connections to Battle Hill and the Paekakariki Hill Road, and an 'Old Mill Railway' in Duck Creek.

v) Porirua is a planned post World War II urban development at the southern end of the route. The proposed alignment encircles part of the Porirua basin (i.e. south of Ranui Heights, Porirua East, Cannons Creek and Waitangirua) which was developed as a state housing area.

8 LANDSCAPE AND VISUAL EFFECTS

Potential Effects

8.1.1. The main potential landscape and visual effects are:

i) Effects on the natural character of the…wetlands and rivers and their margins (s6(a)),

ii) Effects on outstanding natural features and landscapes (s6(b)).

iii) Effects on landscape amenity (s7(c)) including:

a. Effects on landscape character & aesthetics, recreational users, and the 'fit' of the road to topography

b. Effects on historical landscape associations

c. Visual effects from surrounding properties and representative viewpoints

d. Experience for future road users

iv) Effects on natural components (biophysical aspects) of the landscape (s7(f)),

v) Landscape effects during construction (s7(c) & s7(f))

8.1.2. The following sections of the report address these matters from the more general to the more specific, summarising a detailed section-by-section analysis of the route which is attached as **Appendix 5C**, and the analysis of effects from properties which is attached as **Appendix 5D**.

8.1.3. Measures to avoid, remedy or mitigate effects are also summarised in relation to specific effects. Section 9 of this report also provides an overview of mitigation measures. A table listing mitigation measures correlated to effects is also attached as **Appendix 5E.** However, while measures are discussed in relation to specific effects, the following points are made:

i) Measures to mitigate specific effects should be seen in the context of the overall landscape plan which is designed to integrate the Project into the broad scale landscape rather than simply mitigate separate effects in a reductionist manner;

ii) Regard needs to be had to overlap between measures undertaken by different disciplines. For instance landscape and ecological mitigation measures overlap (ecological measures typically have landscape benefit and vice versa). The intent is to maximise the potential overlaps and associated benefits.

iii) Measures often mitigate effects in combination. For instance proposed planting will collectively enhance amenity and environmental quality by reinforcing broad scale patterns and processes. Similarly the guidelines to reduce visual clutter of highway furniture[32] seek to enhance amenity in a collective manner rather than the appearance of any single element.

Effects on the Landscape's Natural Components[33]

8.1.4. Potential effects on natural landscape components include effects on landforms, streams and natural vegetation. To the extent to which there is overlap, the landscape assessment relies on the more specialist assessments of ecology, hydrology and sedimentation which are contained within several reports.[34] Effects on natural landscape components are considered under the following headings:

i) Te Puka and Horokiri Streams.

ii) Pauatahanui Stream and Lanes Flat (SH58 Interchange).

iii) Cannons Creek – Linden.

iv) Biophysical Landscape Effects on Other Parts of the Route.

v) Surplus Fill Sites.

Te Puka and Horokiri Streams

8.1.5. The most significant adverse effects will occur in the valley of Te Puka Stream, (and to a lesser extent the upper Horokiri Stream) where there will be a sequence of side cuts up to approximately 55m – 65m in height on the uphill side, and large mechanically

[32] Included in the Urban and Landscape Design Framework (Beca / Isthmus et al)

[33] 'Biophysical' effects

[34] Including Technical Reports 11: Ecological Impact Assessment and Report 15: Assessment of Water Quality.

stabilised slope (MSS) fill batters on the downhill side that will encroach over the course of Te Puka Stream and (in places) the upper Horokiri Stream. Te Puka Stream in particular will need to be diverted or piped during construction and the stream subsequently reconstructed adjacent to the toe of the MSS fill batters. There will be associated loss of riparian vegetation and partial clearance of remnant native bush in the upper Te Puka Stream valley.

8.1.6. Such effects are unavoidable given the constraints of the narrow and steep-sided valley. The extent of the works is also exacerbated by the need for additional crawler lanes in either direction[35] because of the valley's steep grade.

8.1.7. The works will also have a 'high' effect on landform. However the cut batters will be relatively shallow, their height being a consequence of the steep existing slopes (In other words the cut batters in the Te Puka and upper Horokiri valleys will be 'chasing' the underlying slopes, and will effectively truncate spurs that have already been truncated by faulting and stream erosion) so that the impact will be mainly visual, and will be accentuated by the benching which will create a more engineered and un-natural appearance. While mono-slope batters would be visually preferable, benches are considered essential in the fractured rock for safety and route security reasons. The alternative of shallower cut batter slopes would be impracticable because it would result in much more extensive modification of the steep hill faces and also because of geotechnical constraints.

8.1.8. Alternative construction methods using bridges and half-bridges were initially preferred to reduce the degree of encroachment into the streams but were considered unacceptable for route security reasons: It is understood that earthwork formations are considered more resilient to landslide than structures in such a setting. However the use of steep MSS batters (at 45^{o} approximately twice as steep as fill batters elsewhere on the route) will reduce the potential footprint of the Main Alignment in the valley.

8.1.9. Alternative alignments were explored during the SAR phase. The western side of Te Puka and Horokiri valleys was preferred to the eastern alignment of the existing 1997 designation. An alignment on the eastern side of the valley would encroach on greater areas of indigenous bush and traverse tributaries fed by larger catchments. By

[35] In other words the Main Alignment will comprise three lanes in either direction in Te Puka Stream valley.

comparison the western side has small catchments, short ephemeral watercourses, and less valuable vegetation.

8.1.10. The effects of cut batters will be mitigated by several techniques:

i) Using horizontal benches which are considered aesthetically preferable compared with the alternative benching parallel with the carriageway.

ii) Reducing the number of benches by increasing the lowest batters to 15m (rather than the standard 10m) and avoiding the top benches where possible by using a slightly shallower slope for top batters and running them into the adjacent terrain.

iii) Rounding the bench edges, and the batter side and top edges to visually soften the earthworks and reduce frittering, and

iv) Using re-vegetation techniques including hydro-seed and hydro-moss application in which native shrub species are including along with quick cover species such as annual grasses and mosses. Such measures will have a soil stabilisation benefit as well as a visual benefit. Conditions will require that revegetation is undertaken sequentially as works progress.

8.1.11. Effects on Te Puka Stream will be mitigated by reconstruction of a naturalistic bed adjacent to the alignment following construction in a manner that replicates existing stream bed conditions as described in the Ecology Report,[36] and riparian planting carried out. The reconstructed stream is likely to have a naturalistic appearance, albeit the course will be straighter and it will be closely aligned to the toe of the earthworks.

8.1.12. Effects on the stream and the vegetation clearance will be remedied by retiring the western side of Te Puka Stream valley and part of the eastern side of the Horokiri Stream valley to allow for natural regeneration of vegetation, augmented by riparian planting of watercourses and additional enrichment planting as described in the Ecology report. Such works will have significant landscape benefits in addition to ecological benefits.

Pauatahanui Stream and Lanes Flat

8.1.13. There will be 'high' effects on natural landscape features at the SH58 Interchange on Lanes Flat, Pauatahanui. Modification will include construction of the Main Alignment embankment across the valley, and occupation of part of the flood plain by the

[36] Technical Report 11, Assessment of Ecological Effects

interchange and the main Construction Compound Site. Pauatahanui Stream itself will be bridged, although a diversion of the stream bed will still be required beneath the bridge.

8.1.14. The floodplain above the tidal inlet is a relatively rare landform type in the area and relatively sensitive to modification. The floodplain is significant for natural processes associated with the stream and inlet. Visually it is a subtle landform which would be easily overwhelmed by development. However the existing landscape is already modified: Lanes Flat has been drained and affected by farming, it contains the existing SH58 along its northern edge, a former nursery site, and is overlooked by lifestyle properties and suburban development on the surrounding hills.

8.1.15. While the proposed works will further encroach on the floodplain and visually dominate the head of Lanes Flat, the effects will be mitigated by proposed rehabilitation of the balance of Lanes Flat as follows:

i) It is proposed to restore the balance of Lanes Flat to a continuous wetland between the proposed interchange / Main Alignment and Pauatahanui. The existing drains will be removed and sedge / reed / native grass wetland re-established interspersed with areas of open water. Stormwater ponds would be integrated within the wetland.

ii) It is proposed to restore native riparian and margin vegetation along the Pauatahanui Stream, and to plant the existing gaps between the stream and existing hillside kanuka on the south side of the valley. The stream will form the boundary between the Lanes Flat wetland and the regenerating bush backdrop. The kanuka vegetation type would also continue on either side of the Main Alignment to the north of SH58 and between Pauatahanui Stream and the Duck Creek catchment in the vicinity of James Cook Interchange. Such planting will have multiple benefits: It will help screen or soften the Project from nearby residential and lifestyle properties, mitigate the effects of large cut batters, reduce the effect of lighting (this is one of the few section of the route that will be lit), and have ecological benefit in connecting Pauatahanui Stream and Duck Creek.

iii) It is also proposed to plant kahikatea-mix vegetation along the north side of the valley to frame the opposite side of Lanes Flat. Kahikatea will be planted around the perimeter of the construction compound (together with faster growing

screening species such as karamu and flax), within the interchange roundabout, and between the interchange and Bradey Road.

iv) The Lanes Flat wetland would lend itself to paths and boardwalks connecting with the proposed footpath/cycleway under the Main Alignment at the Pauatahanui Stream Bridge.

Cannons Creek – Linden

8.1.16. Deep cuttings with batters 20m / 40m and 35m / 50m will be required near the south end of the route, in conjunction with substantial surplus spoil disposal sites. In this instance the potential effects on natural landscape features will be limited by the modified vegetation cover, and the fact that the valleys in which spoil disposal is proposed are short, have small catchments and are substantially modified (Further discussion is included below under the heading 'Surplus Spoil Disposal Sites'). Effects are therefore likely to be only 'moderate'. Native planting proposed adjacent to the corridor in this area to mitigate visual effects from the eastern Porirua urban area, and soften the impact of the large earthworks will also provide some ecological benefit by connecting the existing natural vegetation in Cannons Creek with that in Porirua Park.

Effects on Natural Landscape Features in Other Parts of the Route

8.1.17. In addition to the specific areas discussed above, there will be 'moderate' effects on natural landforms, minor streams and vegetation along the remainder of the route, as one would expect with any road project of this scale.[37]

8.1.18. The alluvial river terraces on Horokiri Stream in Battle Hill Farm Forest Park are listed as a noteworthy feature in the Park's Management Plan. The detailed alignment avoids or reduces effects on these features by tending to follow the 'inland' margins of the terraces; following the toe of adjacent hills and swapping sides of the valley in a way that mirrors the Horokiri Stream.

8.1.19. Apart from the clearance of remnant native vegetation discussed above, (in the upper Te Puka Stream and parts of the regenerating kanuka forest south of the Pauatahanui) the vegetation cover along almost all the route is modified, comprising mostly pasture and regenerating scrubland.

[37] Technical Report 11, Ecological Impact Assessment (Technical Report 9. Freshwater Habitat and Species: Description and Values)

8.1.20. Clearance of small areas of regenerating scrubland will be more than offset by the proposed planting described in the 'Landscape Plan' which is intended to mitigate visual effects of the Project, to integrate the road into the broader landscape, and have ecological benefit. As discussed, a detailed list of landscape mitigation measures correlated with effects is tabulated in **Appendix 5E**.

Surplus Fill Sites

8.1.21. Cut and fill will be largely balanced over the Project as a whole.[38] Those fill surpluses that will occur will be concentrated near the south end of the route if the most likely construction sequence is followed. The five potential surplus fill disposal sites are therefore located between Cannons Creek and the Kenepuru Interchange.

8.1.22. Potential effects of surplus fill sites include encroachment into natural waterways and natural vegetation, and visual effects.

8.1.23. Effects on waterways and vegetation have been largely avoided or minimised through the selection of fill sites:

i) All sites are located in areas of pasture or pine plantation;

ii) Two sites near Cannons Creek are located on broad ridges or hilltop areas to maximise the separation from watercourses;

iii) Two sites near Ranui Heights at the south end of the route are located in gullies impounded behind the Main Alignment. While these works will have some adverse effects on natural landform and watercourses, the watercourses are short, the catchments small, the gullies would already be compromised by the adjacent embankments, and the land is already modified by the existing forestry. It is considered these sites are the most sensible in the vicinity;

iv) The fifth site is on the valley side above the existing SH1 at Linden. The natural drainage is modified, and the land cover comprises pine plantation;

v) Effects on natural landform will be mitigated by contouring in a manner that echoes the underlying natural landforms. A proposed condition of consent requires the finished contours of fill disposal sites be designed by a suitably qualified and experienced landscape architect and certified that they achieve the principle of echoing natural landforms. In addition, the disposal site in the triangle

[38] The ratio of cut to structural fill is approximately 6.3 million m^3 to 5.8 million m^3

between the new alignment, the Kenepuru Link Road and the existing SH1 motorway has been earmarked as a potential large scale earth sculpture which would help landmark the interchange.

8.1.24. In summary, the adverse landscape effects relating to surplus fill disposal sites will be moderate and acceptable. The sites were selected to avoid and minimise adverse landscape effects, and the proposed conditions relating to contouring (including the opportunity to provide a positive landmark at the Kenepuru Interchange) and revegetation of the completed earthworks will mitigate any adverse effects.

Summary of Effects on Natural Landscape Components ('Biophysical Effects')

8.1.25. There will be substantial earthworks, as one would expect taking into account the project scale and bold topography, and some inevitable adverse effects on landforms, streams and vegetation: There will be 'very high' adverse effects in Te Puka Stream, 'high effects' at Pauatahanui Stream/Lanes Flat, and more 'moderate' effects in other sections of the route. However the Project has been refined in an iterative manner to avoid or reduce such effects as far as possible, and the adverse effects that will inevitably remain will be adequately remedied and mitigated by the measures proposed. For these reasons the remaining effects will be acceptable.

Effects on Landscape Amenity

Landscape Character and Aesthetics

8.1.26. The Project will result in significant change to existing landscape character as one would expect from such a major new road on a green-fields alignment.

8.1.27. At the broad scale the route follows fault-line valleys, parallel to streams and fault scarps. In other words it follows the landscape 'grain'. And while the route mostly traverses rural landscapes, it skirts the urban periphery.

8.1.28. The nature of amenity effects will vary between different parts of the route:

i) In the more natural parts of the route (such as Te Puka Stream, Horokiri Stream and Duck Creek) the alignment will affect natural landscape values but have relatively small effects on private properties. At the same time those 'natural' landscapes will provide positive amenity effects for future road users.

ii) In the more modified parts of the route (such as the lifestyle areas and backdrops to the urban basin) the change in the intrinsic landscape character will be less significant but conversely there will be greater direct effects on adjacent private properties.

8.1.29. The following paragraphs summarise the landscape amenity effects for the route's different landscape character areas:

Te Puka – Wainui Saddle – Upper Horokiri Stream

8.1.30. This section of the route has a relatively natural character, even though it has a modified land cover. The road will appear shoe-horned into a rugged, steep and narrow valley, with continuous steep MSS embankment batters on the downhill side and a sequence of very high batters on the uphill side. While the ruggedness of the landscape will remain as a bold setting, the road will be a defining feature of the valley. It will fundamentally change the valley's existing remote character, but at the same time will provide a dramatic experience for future travellers into and out of the region.[39]

Lower Horokiri – Battle Hill

8.1.31. The lower Horokiri valley within Battle Hill Farm Forest Park has a gentler and more managed rural character. The valley is wider,[40] has rolling hills on its western side, and small flood plain terraces. The road will fit more easily into the topography and the earthworks will be less dramatic: All but one of the side cut batters will be less than 15m in height, thereby avoiding the need for benching. Future travellers will experience a picturesque curvilinear alignment that sweeps from one side of the valley to the other in a mirror pattern to that of the stream.

8.1.32. The main adverse landscape amenity effect will be for recreational users of the Regional Park. While the alignment will be on the opposite side of a ridge (and therefore screened) from the most heavily used parts of the Park, it will sever the main part of the Park from the forested trails in the hills east of the Horokiri Stream (although access will be maintained by means of underpass) and will substantially compromise the existing landscape values within the Horokiri Stream valley itself.

[39] This section of the route traversing Te Puka valley, Wainui Saddle and the upper Horokiri valley will provide a 'gateway' experience.

[40] Compared to Te Puka and the upper Horokiri valleys.

8.1.33. **Viewpoints 2A and 2B** (LA29 to LA40) are views from a promontory on Gas Line Ridge in Battle Hill Farm Forest park looking north and south respectively along the Main Alignment. The photomontages illustrate that although there are few structures and the landscape is dominated by natural landform, it is nevertheless modified by pastoral farming and plantation forestry. They illustrate the extent to which the Project will change the character of the valley, but also that the alignment sits comfortably with the topography, following the edges of the flood plain or valley, and maintaining separation from the stream.

8.1.34. **Viewpoint 3** (LA41 to 46) is also a view from Gas Line Ridge, but on the Gas Line Ridge / Restoration Trail near the southern end of the park looking north along the Main Alignment. The photomontage similarly illustrates the extent to which the Project will change the existing quiet rural character of the valley. It illustrates that the Main Alignment follows the edge of the flood plain, maintaining separation from the stream. The underpass for the 'Transmission Gully-Puketiro Loop' is in the centre of the view. Amenity planting on the approaches to the underpass will reduce the visual impact on trail users.

Lifestyle Areas –Paekakariki Hill Road, Flightys Road, Bradey Road

8.1.35. This part of the route is a relatively modified and complex landscape that can more readily accommodate a major new road alignment.[41] It has rolling topography and a patchwork pattern of lifestyle subdivision, shelter belts and small plantations. There are higher backdrop hills to the east.

8.1.36. The alignment will sit relatively comfortably in this landscape: The pattern of box cuts and embankments mean the road will appear embedded in the topography. The existing shelter belts and plantations will also help integrate the alignment and reduce visibility. The alignment tends to follow the 'rear' boundaries of properties which are accessed from Paekakariki Hill Road and Flightys Road respectively. It also appears that a number of new dwellings built in recent years have been located in such a way to minimise effects from the future construction of a motorway (the proposed alignment in this area is similar to that envisaged by the existing 1997 designation).

[41] Compared to the relatively natural sections of the route such as Te Puka Stream, Horokiri Stream and Duck Creek.

Lanes Flat - Pauatahanui

8.1.37. As in other parts of the route, there is overlap between biophysical and aesthetic aspects. Although Lanes Flat has already been significantly modified it is nevertheless a relatively sensitive landscape because:

i) It is a small, simple and open landform with a low capability to visually absorb development;

ii) It plays an important role in the natural systems of the stream and inlet; and

iii) It is a relatively rare landform type within the Study Area.

8.1.38. The SH58 interchange, Main Alignment embankment and the construction compound will be discordant elements within the floodplain. However the potential effects will be reduced by the location of the Main Alignment at the head of Lanes Flat where the flood plain transitions to the winding Pauatahanui Stream valley. The adverse landscape amenity effects will also be mitigated by the significant enhancement that will result from re-establishing a wetland on the balance of Lanes Flat, including planting of kanuka and kahikatea at either side of Lanes Flat to more strongly define the valley.

8.1.39. **Viewpoint 4** (LA47 to LA52) is from the existing SH58 roundabout in Lanes Flat near Pauatahanui. The photomontage illustrates the extent to which the existing landscape has been modified by infrastructure and land management, but also the extent to which the Project would be a prominent feature at the head of Lanes Flat.

8.1.40. **Viewpoint 5** (LA54 to LA56) is SH58 at the intersection with Bradey Road[42] looking west toward the SH58 interchange. It illustrates that the Main Alignment on an embankment will truncate the views or sense of an open valley that motorists begin to have where Pauatahanui Stream valley meets Lanes Flat. Instead, views over Lanes Flat will open up for motorists after the underpass beneath the Main Alignment.

8.1.41. **Viewpoint 6** (LA57 to LA62) is an elevated view from the '*Silverwood*' subdivision (Whitby). It illustrates that the interchange will be a dominant feature for properties overlooking Lanes Flat from such viewpoints, although it also illustrates the extent to which the Main Alignment is 'embedded' in the rolling topography to the north, and the extent to which foreground topography screens the section of the Main Alignment between the SH58 and James Cook interchanges from such viewpoints.

[42] Immediately below St Josephs Church.

Duck Creek

8.1.42. This section of the route (in common with Te Puka and upper Horokiri valleys) has a relatively natural rural character. The alignment is parallel to Duck Creek and the steep fault-line escarpment on the west side of the Duck Creek, but is on the easier terrain above the stream's east bank (it traverses the toes of tributary spurs).

8.1.43. The main adverse landscape amenity effects will be for recreational users of Belmont Regional Park. Clearly the proposed alignment will have a 'high' effect on the natural rural qualities of the immediate valley. However the following factors restrict the potential extent of such effects:

i) The low elevation of the alignment (approximately 40m lower than the ridge on the western side of Duck Creek, and approximately 140m lower than the Belmont Hills) will reduce its potential prominence;

ii) The alignment near the western margins of the park will reduce effects on the Belmont Hills themselves. As one climbs higher on the Belmont Hills the alignment will appear at a relatively low elevation and will be viewed in the context of the nearby Porirua urban area;

iii) The sequence of cuttings and embankment/bridges means the road will appear embedded in the terrain; and

8.1.44. Proposed planting will soften views of the road and further help 'embed' it in the landscape, including planting along the margins of the road, extensive riparian revegetation of the tributary streams,[43] and the existing 'early retirement' revegetation. **Viewpoint 7** (LA63 to LA68) is from an elevated location in Cleat Street looking across eastern Whitby toward the James Cook Interchange and the Waitangirua Link Road and the lower Duck Creek catchment. It illustrates that although the Project is comprises large earthworks and is relatively elevated, the topography is such that it visually absorbs the works. For instance, although James Cook Interchange is on a ridge, from this viewpoint it will be viewed beyond foreground ridges, and against a backdrop of hills.

8.1.45. **Viewpoint 9** (LA75 to LA80) is on a lower spur of the Cannons Knob Track looking north along Duck Creek valley with the Moonshine Fault scarp on the left side of the photo. **Viewpoint 10** (LA81 to LA86) is higher on Cannons Knob Track looking down one of Duck

[43] Refer Plans 11g and 11h in the Assessment of Ecological Effects

Creek's main tributaries. Both photomontages illustrate the effect on the natural or rural qualities of Duck Creek. They illustrate the large cuttings through the toes of the spurs, but also the extent to which such an alignment helps to embed the highway in the topography provide some separation from Duck Creek itself. **Viewpoint 13** illustrates that from higher viewpoints the highway is viewed in the context of the Porirua urban area.

Porirua Basin

8.1.46. South of Duck Creek the alignment swings 90^{o} to the west by way of a box cut through the watershed ridge between Duck Creek and Cannons Creek and traverses the backdrop hill slopes behind the urban Porirua Basin. While the alignment has potential high visibility because of its location on the hill face behind the urban area, its prominence will be reduced by the following factors:

i) The alignment is sufficiently low on the hill face that the highway will visually be more closely associated with the urban fabric than the more natural hill tops.

ii) The sequence of box cuts (predominantly) and embankments mean the alignment will appear embedded in the terrain. For instance it will be visible as a series of short embankments/bridges between cuttings rather than a continuous carriageway.

iii) The area has a modified character comprising urban development in the basin merging with a patchwork of vegetation on the hillside.

iv) The adjacent suburban areas in general are oriented to the north so that the alignment will be 'behind' the suburbs.

v) Although the Cannons Creek viaduct will be a high structure, it will have relatively low visibility from the urban area.

8.1.47. The landscape and visual effects will be further mitigated by proposed planting within the corridor. Such planting will help 'embed' the road within the regenerating vegetation on the lower hill slopes (visually associating the road with the lower slopes in comparison to the open upper slopes), will reduce visibility of the carriageway and the profiles of cuttings, and will also have ecological benefit in connecting the native vegetation at Cannons Creek with that in Porirua Park.

8.1.48. **Viewpoint 11** (LA87 to LA92) is from an elevated location on the north side of the eastern Porirua basin, looking across Porirua East toward the Project. The photomontage illustrates that although the Main Alignment is above the urban areas on the hillside, it is nevertheless more closely associated with the urban landscape than the open backdrop hills, the integrity of which are retained. It also illustrates the extent to which the Main Alignment is screened by the topography, although upper portions of the cut faces are visible.

8.1.49. **Viewpoint 12** (LA93 to LA98) is from Porirua Station looking toward Ranui Heights and the Project. The southbound view from the existing SH1 motorway (south of Mungavin Avenue) would be from a similar angle. The photomontage shows cut faces adjacent to the Kenepuru Interchange, the large embankment, surplus fill disposal site, and sections of carriageway above and behind Ranui Heights. It illustrates that large scale earthworks will be prominent from such viewpoints, but also the extent to which foreground topography partially screens the Main Alignment and 'embeds' it within the terrain. It highlights the importance of retaining some of the foreground pine plantation to soften the impact of the works.

8.1.50. **Viewpoint 13** (LA100 to LA102) is from an elevated location in Tawa looking across the Linden area to the Kenepuru Interchange and connection of the Project with existing SH1. It illustrates the Main Alignment will be more elevated and prominent compared to the existing SH1 motorway, and in particular the prominence of the benched cut face north of the interchange.

Effects on Historical Landscape Associations

8.1.51. Historical associations are recognised as an aspect of landscape amenity. There is also overlap with section 6(f) of the RMA which requires the protection of historic heritage from inappropriate subdivision, use and development. While section 6(f) matters are principally matters for historians (including archaeologists, built heritage experts and iwi) there is overlap to the extent that the landscape context might be part of a site's historic values.

8.1.52. The three areas where potential effects on landscape historical associations were identified are:

i) MacKays Crossing

ii) Battle Hill

iii) Pauatahanui

MacKays Crossing

8.1.53. The landscape context for the MacKays Crossing World War II American Marines Corps camps is the presence of flat open land astride the transport corridor of SH1 and the North Island Main Trunk (NIMT) railway. The proposed alignment will maintain this context by following the existing SH1 route (more-or-less) between the former camp sites.

8.1.54. There are potential effects on the circular brick storage structure in Te Puka valley. The structure constructed within an excavation into the side of the terrace in the lower valley so that the top of the structure is just below the terrace ground level. It was located away from the military camp so as to camouflage it from aerial attack and to contain any potential explosions. The proposed highway alignment was re-designed to enable the structure to be retained. While there will be some effect on its landscape context because of proximity, such effects will be minimised because the highway will be in a cutting within the terrace behind the structure, so there will be visual separation or screening between the road and structure. The structure also opens in the opposite direction toward Te Puka stream and this connection will not be affected.

Battle Hill

8.1.55. While the Project will be visible from the battle site ridge at a distance of approximately 1km, it will be sufficiently distant to not affect the landscape context in relation to the battle. The primary landscape context is the positions taken by the defenders and attackers, and these are well separated from the Project. The wider context includes the routes taken by the defenders and attackers along the lower Horokiri valley between the Mataitaua Pa at Pauatahanui and the Battle Site. This landscape connection is likewise well separated from the Main Alignment.

Pauatahanui Village

8.1.56. As discussed above, Pauatahanui's landscape context includes the village's relationship to Pauatahanui Inlet and its location at the junction of the Paremata Road, Paekakariki

Hill Road and Haywards Road (SH58).[44] The proposed Main Alignment is inland (i.e. 'behind') the village and the 1km distance is sufficient separation so as not to compromise Pauatahanui's essential landscape context.

8.1.57. The one exception is St Joseph's Catholic Church and Cemetery which is on the opposite side of the alignment, so that the Project will result in severance of the church from Pauatahanui village. The church was always an outlier to the village (in contrast to St Alban's Anglican Church which is located on the hill in the middle of the village) so that the proposed alignment will merely accentuate an existing separation between the church and village. The Project will, however, have moderate visual amenity effects on the church resulting from the proximity of the highway to the church. The Main Alignment will be approximately 170m from the church and elevated on an embankment at roughly the same elevation as the church. The Built Heritage Report proposes planting along the boundary of the church property to mitigate such effects.[45]

Landscape Effects on Recreation

8.1.58. The main recreation resources affected, in landscape terms, are the Battle Hill Farm Forest Park and the Belmont Regional Park.

Battle Hill Farm Forest Park

8.1.59. Battle Hill Farm Forest Park offers a quiet rural setting within a productive farm and plantation landscape.

8.1.60. The main alignment is separated by 'Gas Line Ridge' from the most heavily used parts of the Park including the Park headquarters, Ken Gray Education Centre, adjacent picnic areas, horse riding paddocks and most of the Park's six trails. Apart from views from a part of Restoration Trail overlooking the alignment from 'Gas Line Ridge' and distant views from the trails on the 'Battle Site' ridge, the main affected trail will be the 'Transmission Gully – Puketiro Loop' which will be bisected by the alignment. Overall there will be 'low' landscape effects on the most heavily used parts of the Park.

[44] The intersection has been relocated from the centre of the village to its outskirts, which has partly weakened the historical context. In other words the intersection is no longer the focus of the village.

[45] Technical Report 19, Built Heritage

8.1.61. The main adverse landscape effects will be experienced within the Horokiri Stream valley. At present this valley has a remote and quiet character which will be fundamentally changed by the proposed road, which will also separate the farm park area and headquarters from the trail in the pine forest[46] on the opposite side of Horokiri Stream (i.e. the 'Transmission Gully – Puketiro Loop'). However the 'Transmission Gully' road has been anticipated for some time[47] and the park development appears to have taken it into account by avoiding trails and facilities in the Horokiri Stream valley. The connection to the 'Transmission Gully – Puketiro Loop' trail will be maintained by means of underpass. Views of the Project will be largely screened from trails within the pine plantation, although users will still be aware of its presence, if only from traffic noise.

8.1.62. It is worth noting that the refined alignment will have less adverse effects on the park compared to the existing 1997 designation. The latter is elevated on the hill slopes on the eastern side of Horokiri Stream where a road would be more visible from western parts of the park, would have greater impact on the plantation trails, and greater impacts on the tributary streams on the east side of the Horokiri valley.

8.1.63. Photomontages from **Viewpoint 2A, 2B and 3** (discussed above) illustrate views of the Project in Battle Hill Farm Forest Park.

Belmont Regional Park

8.1.64. Belmont Regional Park provides experience of high hills with elevated views over the region's urban areas (Wellington, Hutt Valley, and Porirua). The hills are mostly in expansive pasture, but there are areas of regenerating vegetation, mainly on the opposite (south) side of the hills from the Project. The trail network comprises a 'spine' along the main Belmont Hills ridge with connections down spurs and valleys on both sides of the range. The landscape experience offers views over urban areas from natural lookouts. The viewpoints provide a sense of separateness from the city, at the same time as providing an overview of the city in its broad natural context. The Belmont Hills also provide a natural backdrop from within the urban areas.

8.1.65. On the Porirua side of the Belmont Hills there are two spur trails leading up from Duck Creek to the main ridge, and two connecting trails between Duck Creek and the Park access at Cannons Creek Lake Reserve in Waitangirua: One is by way of 'Takapu Trail'

[46] 'Transmission Gully-Puketiro Loop'

[47] For instance the Management Plan acknowledges the presence of the designated highway route.

following the upper part of Cannons Creek.[48] The other takes a more direct route over the intervening ridge.

8.1.66. Physical access will be maintained along the current trails by passing beneath bridges on the Main Alignment.

8.1.67. The main adverse landscape effect of the Project on the park will be the effects on the naturalness and quiet rural character of Duck Creek valley. There will be a 'high' degree of effect within the vicinity of the road. However the sense of naturalness will remain from the upper parts of the Belmont Hills from where the Project will appear relatively low in the landscape and viewed in the context of the Porirua urban backdrop effects from the hill top area will be 'low'.

8.1.68. Photomontages from **Viewpoints 9 and 10** (discussed above) illustrate the Project from Cannons Knob Track within Belmont Regional Park.

Other Recreational Use

8.1.69. A short section of cycleway will be constructed parallel to the north-bound onramp near MacKays Crossing as part of a long distance cycleway following the coastal route from Paekakariki through Pukerua Bay and the Taupo Swamp. The landscape amenity of the coastal route is likely to improve for cyclists as a result of the substantial drop of traffic.

8.1.70. A cycleway and footpath underpass will be constructed adjacent to the Pauatahanui Stream. The proposed restoration of Lanes Flat provides the opportunity to connect these through the restored natural area which would add to recreational amenity.

Visual Effects from Nearby Properties

8.1.71. **Appendix 5D** tabulates assessments from nearby properties. Properties within rural areas (within approximately 1km of the route) were assessed separately, while those in urban areas were assessed from 'representative viewpoints' selected to represent the views from a particular area. Appendix 4 describes the factors influencing effects from each viewpoint, and assigns a relative degree of effect from 'nil' or 'very low' to 'very high'. The assessments were made primarily from road-side observations supported by desk-top analysis, although visits were made to some individual properties. The purpose of the assessments was to provide an overall indication of the nature and degree of

[48] There is also an access point to the Takapu Trail from the end of Takapu Road.

effect, and to identify parts of the Project where mitigation may be required. The following paragraphs summarise this work.

Individual Properties and Representative Locations

Urban Areas

8.1.72. The most significant visual amenity effects from properties will be within the urban areas which occupy a relatively small proportion of the route. The greatest degree of effects will be on properties in the Linden area in the vicinity of the connection with existing SH1, particularly those on properties immediately adjacent to the Main Alignment. The effects on those properties immediately adjacent are typically 'high', although in most instances they will be incremental or cumulative on effects currently existing because of the existing SH1 motorway.

8.1.73. Properties closest to the alignment in urban areas typically provide a buffer to other properties so that degree of visual effect usually diminishes quickly with increasing distance from the alignment. The effects are typically 'low' to 'moderate' within two properties of the alignment, although there can be 'moderate' effects from greater distances where properties have elevated views or there are 'view-shafts' along streets.

8.1.74. Proposed measures to mitigate such effects include comprehensive boundary planting parallel to the alignment through urban areas to soften or screen views of the alignment. Noise mitigation walls are also proposed for some properties nearest the alignment. Such walls will typically reduce adverse visual effects from those properties, although the noise walls can have adverse visual effects by reducing outlook and creating shading. Amenity planting is proposed to soften both sides of all noise mitigation walls (and to reduce the potential for graffiti) subject to sufficient space. A balancing exercise between visual effects and noise effects was undertaken in deciding the location and height of noise mitigation walls. Greater weight was placed on mitigating effects of road noise on adjacent properties than on maintaining amenity for road users; however planting and other measures are also proposed to mitigate the visual effects.

8.1.75. There are longer distance views from some urban areas, such as from parts of Tawa, which have elevated views of the 'Linden Interchange' and a large cutting and from within Porirua. While the Project will detract from the amenity from these areas, it will

be part of the middle-ground viewed beyond an intervening foreground urban landscape.

8.1.76. Photomontages from **Viewpoints 7, 8, 11, 12 and 13** (discussed above) illustrate the Project from representative urban viewpoints.

Rural and Lifestyle Properties

8.1.77. Lifestyle properties are mostly concentrated in the Flightys Road / Paekakariki Hill Road area and at Bradey Road.[49] Effects from these areas will be moderated because:

i) The rolling topography and extent to which the alignment is within cuttings will help to restrict visibility: For instance most views of the Project will be restricted to only parts of the alignment because of screening by topography.

ii) Substantial existing vegetation including shelter belts, plantations, and some areas of regenerating scrub will reduce visibility.

iii) The lifestyle areas have largely been subdivided and developed in anticipation of a highway so that dwellings constructed in recent years are generally set back from the designation.

8.1.78. Despite these factors there will be adverse visual effects from lifestyle properties ranging from 'moderate' to 'very high' **(see LA117 to LA120)**. Proposed measures to mitigate such amenity effects include planting within the designation boundary at strategic locations to intercept views from houses, or to soften particular elements of the project such as the profile of cut batters.

Night-time Amenity Effects

8.1.79. Lighting within the Project is limited to (i) each of the interchanges, (ii) the short section of the Main Alignment between the SH58 and James Cook Interchanges, and (iii) the connections between the Main Alignment and the existing SH1 at each end of the route:

i) The SH58 and James Cook Interchanges, and the short section of Main Alignment between them, are on rural fringes with the potential to detract from the darkness characteristic of rural areas. However both interchanges will be seen against a backdrop of urban development, reducing the potential effect on landscape

[49] There are other scattered lifestyle properties, such as near MacKays Crossing, and more distant properties such as in the Judgeford area.

character. The extent of box cut on this section of the route and the proposed kanuka revegetation along both sides of the corridor between the two interchanges will further reduce and mitigate landscape effects of the lights.

ii) Lighting of the Kenepuru Interchange and connection with the existing SH1 will be in keeping with the surrounding urban context at that location.

iii) There is existing lighting at the MacKays Crossing interchange. Additional lighting will result in a relatively minor change in landscape effects at this location.

8.1.80. In each instance the effects will be 'moderate' or 'low' in landscape terms. There is also potential light spill / glare which is outside the expertise of this Report, but is a type of effect normally controlled through conditions.

Amenity for Future Road Users

8.1.81. The experience of travelling the new highway will be characterised by:

i) Large constructed earthworks (including deep box cuts, high side cuts, over-steepened fill batters) traversing bold topography.

ii) Natural landmarks including the steep Te Puka Stream and the Wainui Saddle summit, Battle Hill Farm Forest Park, Lanes Flat, Duck Creek, and Cannons Creek.

iii) A sequence of enclosure within box cuts, narrow valleys, and areas of vegetation (both existing and proposed as part of mitigation measures), interspersed with open views from embankments and wider valleys (e.g. Lanes Flat, lower Horokiri), and areas of pasture.

8.1.82. Transmission Gully will also become a 'gateway'. State highway 1 traverses coastal plains and open landscapes through the Manawatu, Horowhenua and Kapiti Coast, gradually converging with the Tararua Ranges escarpment as the highway travels south. At Transmission Gully, the highway will plunge into the wall of hills, and the experience will dramatically change from a flat, open and settled landscape to a steep, enclosed and natural landscape. Wainui Saddle will be a landmark where views open to the south toward the Porirua Basin. The gateway experience will continue further south through the Duck Creek area, and particularly south of Cannons Creek where there will be elevated views over urban Porirua.

8.1.83. Similarly in a north-bound direction there will be some similarity in experience between Ngauranga Gorge and Transmission Gully, and a distinct departure / gateway experience where motorists emerge from Transmission Gully to the Kapiti Coast plains.

8.1.84. While the route will be less picturesque than the existing 'Centennial Highway' coastal route between Paekakariki and Pukerua Bay, the experience will nevertheless be largely positive, traversing rural and 'natural' landscapes typifying Wellington's bold fault-line landforms.

8.1.85. The scars caused by the benched cut batters will detract from amenity for future users, but mitigation measures discussed above[50] will ameliorate such effects.

8.1.86. While the highway will have central barriers, it will not have a wide median nor split alignments.[51] Both alternatives may have resulted in higher amenity than the proposed configuration and both were investigated: However the topography means widening of the carriageway to accommodate these measures would result in much greater earthworks. While a median, or split alignments, would be possible in some of the more gentle topography, such as at Battle Hill, such an alternative design over a relatively short distance would appear out-of-place in comparison to the rest of the route.

8.1.87. The road will include the range of structures, or 'furniture', typical of expressways (including barriers, guard rails, signs, gantries, lights) which collectively can erode visual amenity. The Urban Design and Landscape Framework[52] contains measures intended to enhance the collective appearance of these fixtures to enhance amenity for future road users.[53] Principles included in the Urban Design and Landscape Framework include reducing the range of barrier and guard rail types, rationalising the variety and location of signs, using a coherent design theme amongst road furniture, and using contoured bunds where feasible to reduce the extent of barriers along shoulders.

Summary of Landscape Amenity Effects

8.1.88. The Project will become a new defining landscape element and will have some adverse effects on existing landscape amenity ranging from 'moderate' to 'high' in different

[50] Including increasing lowest bench to 15m, grading out top batters to avoid short benches, rounding bench edges, and revegetation.

[51] i.e. carriageways at different elevations and slightly different alignments.

[52] Technical Report 23. Urban Design and Landscape Framework.

[53] As part of a gateway/departure experience for the Wellington region

sections of the route. Conversely, the Project will also provide some positive amenity effects for future road users and will provide a dramatic gateway experience between Wellington's steep hill-enclosed landscape and the open coastal plains of the Kapiti Coast. The greatest degree of adverse effect on existing character will be in the more natural sections of the route: Te Puka Stream, Horokiri Stream (including Battle Hill Farm Forest Park), and Duck Creek (including Belmont Regional Park). At the same time it is these sections of the route that will provide the highest amenity for future travellers because of the juxtaposition of road with bold natural landform. A comprehensive landscape plan is proposed to mitigate the adverse effects, integrate the Project with the landscape, and enhance amenity.

8.1.89. There will be significant adverse landscape and visual effects (ranging between 'moderate' to 'very high') on some properties near the alignment, including urban properties at the southern end of the route (Linden) and on rural / lifestyle properties mainly in the middle sections of the route. However the effects will be less than might be expected for a project of this scale for the following reasons:

i) Urban sections make up a relatively small proportion of the route, and the effects from Porirua East and Cannons Creek will be moderated by reasonable distance separation (greater than 200m), the extent to which the alignment is screened within box cuts, and by the extent of existing screening vegetation.

ii) There are substantial sections of the route with no, or very few, dwellings.

iii) Recently developed lifestyle properties have been developed in anticipation of a major highway on the existing designation, the alignment tends to follow 'rear' boundaries between properties accessed from Flightys Road and Paekakariki Road, and views will be restricted by the rolling topography, rural trees, and extent to which the alignment is embedded in the terrain.

iv) Proposed planting (including screen planting adjacent to the alignment and planting to soften noise walls in some places) will also mitigate potential effects.

8.1.90. The visual experience for future road users will be largely positive, dominated by the bold topography and more natural sections of the route. The alignment has been fine-tuned to improve the 'fit' with the landscape, and mitigation measures designed to help integrate the alignment into the landscape, soften the effects of cut and fill batters, and reduce the visual clutter of the furniture typical of such roads.

8.1.91. In summary, although it is inevitable that there will be significant adverse landscape amenity effects from a project of this nature and scale, the alignment has been fine-tuned to avoid or reduce potential effects as far as possible, and the remaining potential effects will be remedied and mitigated through comprehensive measures. The overall amenity effects following mitigation are considered acceptable.

Effects during Construction

8.1.92. There will clearly be significant potential adverse effects on natural landscape components and visual amenity during construction.

8.1.93. The main potential construction effects on the natural components (effects on stream beds, sedimentation on waterways, and effects on natural vegetation) overlap with and are addressed in other Technical Reports. Mitigation of such effects will also be addressed in the Environmental Management Plan, and Supplementary Environmental Management Plans.

8.1.94. The main visual amenity effects during construction will arise from removal of vegetation (including harvesting of pine plantations), exposed 'raw' earthworks, and from the construction activity itself.

8.1.95. In general, the degree of effect from any viewpoint will be amplified during construction. However such effects will be temporary in nature. While the overall construction period spans six years, the likely construction programme would see works start from three separate locations and continue sequentially in sections of a few kilometres at a time, so that activities such as vegetation clearance and bulk earthworks will be limited to a much shorter period from any one viewpoint. Earthworks will also typically be stabilised with grass in a sequential manner as soon as possible following completion of bulk earthworks (or each stage of bulk earthworks) in any particular location. Timely revegetation (for soil stabilisation) is included in conditions addressing erosion and sediment control. Similarly the Landscape Plan specifies that rehabilitation planting is carried out sequentially as soon as practicable (for instance in the next planting season) following construction of each stage.

8.1.96. The Project Site Compound at Lanes Flat will have high visibility throughout the construction period because of its location adjacent to SH58. Visual effects of the compound will be mitigated by planting at the start of the Project on the southern

perimeter and at either end of the site as illustrated on the Landscape Plans. Planting will comprise a 'kahikatea mix' incorporating fast growing screening species (such as karamu and flax) to screen views from the adjacent road (in particular of the ground surface within the yard) and kahikatea which will form long term enhancement of Lanes Flat.

8.1.97. In summary, visual effects during construction will be significant in degree (i.e. 'moderate' to 'very high' depending on location), but will be temporary in nature, will occur sequentially for limited duration in different parts of the route, and measures will be undertaken sequentially to rehabilitate works as construction is being undertaken. Therefore the construction effects will be acceptable for a project of this nature.

Effects of Modifications to Existing Transmission Line

8.1.98. It is proposed to modify parts of the existing Paekakariki-Takapu Road A (PKK-TKR A) transmission line to accommodate the Project. In summary it is proposed to relocate 24 existing towers, strengthen 10 towers, and remove one tower. The most significant modification to the line entails a four-span bypass deviation of 3 towers at Wainui Saddle. A description of the proposed transmission line relocation and an assessment of landscape and visual effects are provided under **Section 5 of Technical Report 5A – Addendum to Landscape and Visual Assessment.**

8.1.99. In summary, the adverse effects of the changes compared to the existing transmission line will be minor in most instances. For the most part only small changes in alignment and tower location and height are proposed. The main exception is the four-span deviation at Wainui Saddle. The deviation (including Towers 8A – 12A) will result in three towers on spurs above the saddle and within an Outstanding Natural Landscape (ONL) identified in the Kapiti Coast District Plan. In this case the bypass is considered appropriate because the ONL is already traversed by the transmission line, the bypass deviation is the best of the options considered, the bypass was aligned to reduce potential adverse effects as far as possible, and the degree of adverse effects will be moderate in degree.[54]

8.1.100. There will also be moderate effects as a result of changes to tower 24A and the section between towers 31A and 33A, and moderate visual effects on two houses as a result of

[54] Techincal Report 5A – Addendum to Landscape and Visual Assessment. Paragraphs 5.28 – 5.30.

changes to Tower 40A. In other instances the degree of effect associated with the relocated line will be low.

8.1.101. The question of **cumulative effects** of the Project in conjunction with the transmission line has been considered. Appendix 5D, which assesses visual effects from dwellings and representative viewpoints, takes into account the cumulative effects of changes to the transmission line in conjunction with the effects of the highway Project.

8.1.102. Overall, though, the highway Project is different in nature and scale compared to both the existing transmission line and the proposed changes to the line. The adverse effects of the Project are likely to overshadow the effects of the transmission line.

8.1.103. There will be some adverse visual effects of the transmission line on future road users: An inevitable consequence of the alignment of the highway along the valley occupied by the existing transmission line. Changes to the alignment were designed to reduce such adverse effects, in particular by reducing the number of road crossings and angle changes, and increasing the separation distance between the road and transmission line where possible. Further planting is also proposed at certain locations (outlined in the Addendum Report) to reduce the prominence of the line from particular dwellings and from the proposed highway.

Natural Character of the Coastal Environment, Wetlands, Rivers and their Margins

8.1.104. Section 6 (a) of the RMA requires as a matter of national importance the "preservation of the natural character of the coastal environment (including the coastal marine area) **wetlands, rivers and their margins**, and the protection of them from inappropriate subdivision, use and development." (emphasis added)

8.1.105. The main landscape features to which s6(a) applies include:

i) Te Puka Stream

ii) Horokiri Stream

iii) Ration Stream

iv) Pauatahanui Stream and Inlet

v) Duck Creek

vi) Cannons Creek

Definition of Natural Character

8.1.106. Natural character is not defined in the RMA, but an understanding has developed through practice and case law that natural character includes both biophysical and perceptual aspects.[55] There is therefore overlap between landscape and other disciplines such as ecology. The following definition is widely used, particularly when considering ecological aspects of natural character:

8.1.107. "Natural character is a term used to describe the naturalness of all coastal environments.[56] The degree or level of natural character within an area depends on:

8.1.108. The extent to which natural elements, patterns and processes occur;

8.1.109. The nature and extent of modifications to the ecosystems and landscape/seascape;[57]

8.1.110. The highest degree of natural character (greatest naturalness) occurs where there is least modification;

8.1.111. The extent of different types of modification upon the natural character of an area varies with the context and may be perceived differently by parts of the community."[58]

8.1.112. The following definition of *'natural'* derived from the 'Harrison decision' is also widely used when considering 'landscape' aspects of natural character and has been repeated a number of times in case law;

8.1.113. "The word 'natural' does not necessarily equate with the word 'pristine' except in so far as landscape in a pristine state is probably rarer and of more value than landscape in a natural state. The word 'natural' is a word indicating a product of nature and can include such things as pasture, exotic tree species (pine), wildlife …and many other things of that ilk as opposed to manmade structures, roads, machinery."[59]

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[55] For instance Dr Vaughn Keesing defines natural character as having "both landscape and ecological connotations" and goes on to note that an 'ecological' approach places higher value on the intactness of endemic ecosystems than a 'landscape' approach.

[56] By extension the same principles apply to naturalness of lakes, wetlands, rivers and their margins.

[57] By extension this would apply to 'riverscape'

[58] Ministry for the Environment, 2002, Environmental Indicators Programme: Landscape Aspects of Natural Character Stage 1 –Initial Findings. Report prepared for MfE by Boffa Miskell Ltd. This definition was also referenced in Environment Court decision Kuku Mara v Marlborough District Council, W37/05, paragraph 26.

[59] Wakatipu Environmental Society Inc v Queenstown-Lakes District Council, C180/99, paragraph 88

8.1.114. The following criteria to assess 'naturalness' were further elaborated in the 'Long Bay decision':

"…the list of criteria of naturalness under section 6(b) of the RMA then includes:

- *relatively unmodified and legible physical landform and relief;*
- *the landscape being uncluttered by structures and/or obvious human influence;*
- *the presence of water (lake, river, sea);*
- *the presence of vegetation (especially native vegetation) and other ecological patterns.*

The absence or compromised presence of one or more of these criteria does not mean that the landscape or coastal environment is non-natural, just that it is less natural. There is a spectrum of naturalness from a pristine natural landscape to a cityscape…"[60]

Effects of Project on Natural Character

8.1.115. The Project will **directly** affect streams through such works as culverts and stream diversions, and will **indirectly** affect the perceptual (or visual aspects) of natural character by construction of the road in proximity to streams. To the extent that biophysical aspects of landscape overlap with other disciplines (ecology, water quality), this Landscape Report defers to the other technical reports. The following paragraphs primarily address the perceptual aspects of natural character (i.e. sometimes referred to as 'landscape' or 'visual' aspects of natural character).

8.1.116.

Te Puka Stream

8.1.117. Te Puka Stream has relatively high existing natural character: Although the land cover in the valley has been modified (mostly a mixture of pasture and plantation), its character is defined by the natural landform, the stream has a natural appearance, and there is a lack of human structures apart from the existing 100kV transmission line.

8.1.118. The existing natural character of Te Puka Stream will obviously not be preserved. Te Puka Stream will be piped or diverted during construction of the road and re-formed in a realigned course following construction. While natural stream patterns and processes will be reconstructed (as outlined in the Ecological Impact Assessment), the stream's

[60] Long Bay-Okura Great Park Society Inc v Auckland Regional Council, A078/2008, paragraph 135

immediate landscape context will be fundamentally changed by the presence of of a major highway with large engineered fill slopes and benched cut batters. There will therefore be 'very high' adverse effects on natural character in landscape terms. Such effects are an inevitable consequence of the route alignment along a narrow steep-sided valley.

8.1.119. The effects on natural character within the valley will be remedied to an extent by the reconstruction of the stream in a naturalistic manner,[61] and offset to a degree by the proposed retirement of land on the west side of the valley and the proposed riparian revegetation of tributary streams and enrichment planting of natural regeneration.

Horokiri Stream

8.1.120. Horokiri Stream similarly has a relatively high natural character for similar reasons to those listed for Te Puka Stream.[62] The land is nevertheless modified, containing a mixture of pasture and pine plantation, with patches of regenerating scrub.

8.1.121. Direct effects on the stream bed will be avoided to a large extent by the fine-tuned alignment, which locates the road on slopes above the stream, swapping from the west side to the more generous eastern bank in the lower part of the valley. There will be two culverts and sections of diversion which are addressed in the other technical reports. As above, the biophysical effects will be reduced compared to the existing designation which is on the east side of the valley.

8.1.122. Nevertheless the Horokiri Stream's landscape context will be fundamentally changed by the presence of a major highway within the valley, an inevitable consequence of the Transmission Gully route. As above, effects on natural character within the valley will be mitigated or offset by the proposed retirement of land on the east side of the valley allowing the slopes to regenerate from pasture to natural vegetation, and proposed restoration of riparian vegetation along tributary streams and sections of the Horokiri Stream itself.

[61] As described in Technical Report 11, Ecological Impact Assessment.

[62] Although the land cover has been modified to mainly pastoral and plantation land use, the valley is dominated by natural landform, the stream has a natural appearance, and there is a lack of human structures with the exception of the existing 110kV transmission line.

Ration Stream

8.1.123. Ration Stream flows through a relatively modified rural and lifestyle landscape (in comparison to Te Puka Stream and Horokiri Stream): Land use patterns are relatively complex and tend to mask natural landforms to a greater degree, and there is a relatively closer pattern of settlement. The degree of existing natural character is 'moderate' at best.

8.1.124. The road is aligned so that it will have a relatively small direct effect on Ration Stream and the change to the naturalness of the stream's setting will also be relatively low.

8.1.125. Such effects as will occur will be mitigated by measures proposed at the location where the Main Alignment crosses the main headwaters of Ration Stream. Planting that was previously carried out in this vicinity as a condition of the existing designation has now become established. It is proposed to extend the planting along the stream to the north-east to connect with an area of existing native vegetation. As well as natural character benefits, such measures will also have benefits for landscape amenity and ecology.

Pauatahanui Stream and Inlet

8.1.126. Pauatahanui Stream's landscape context is relatively modified: Lanes Flat has been drained and converted to pasture, and surrounding hill slopes variously developed as lifestyle properties or suburban development. Roads around one side of Lanes Flat (SH58), and the substation and transmission lines further reduce natural character. Nevertheless, Pauatahanui Stream itself still follows a naturalistic meandering course and Lanes Flat is legible as an open flood plain.

8.1.127. There will be direct physical alteration of Pauatahanui Stream where it is crossed by the Main Alignment, and the flood plain will also be significantly modified by the Main Alignment embankment across the valley, the SH58 Interchange, and formation of the terrace for the Project Site Compound. Effects on biophysical aspects of natural character are covered in the Ecological Impact Assessment and Technical Reports 14 and 15 covering facets of hydrology, water quality and sedimentation.

8.1.128. Potential effects on perceptual aspects of natural character will be partly avoided by the location of the Main Alignment near the head of Lanes Flat, and the significance of such effects reduced to some extent because of the degree of existing modification of the

landscape. However Lanes Flat has high visibility from surrounding residential areas and passers-by is a landform type that has low ability to absorb further development in landscape terms[63] and the Project effects would be cumulative on the previous modification of the flood plain. It is considered the area is at a 'tipping point' in landscape terms where the remaining landscape qualities could be lost.

8.1.129. The proposed restoration of the whole of Lanes Flat with wetland and natural vegetation and the native planting on either side of the valley would represent a significant enhancement and restoration of the natural character of Pauatahanui Stream and its margins.

8.1.130. It would also represent an enhancement to the broader Pauatahanui Inlet because of the connection between Lanes Flat and the nearby wetland reserve at the head of the Inlet. In landscape terms such enhancement will effectively remedy, mitigate and offset the adverse effects of the Project on Pauatahanui Stream's natural character.

Duck Creek (Waiohata Stream)

8.1.131. Duck Creek has a relatively high degree of natural character in landscape terms. The stream follows a naturalistic course; there is a dominance of natural landform, and relative absence of human structures. Nevertheless the natural character is reduced by the modified land management (mostly extensive pasture) and such elements as the farm roads and nearby transmission lines.

8.1.132. The Main Alignment avoids direct effects on Duck Creek by traversing a benched alignment above the east bank. While the culverts/ embankments traverse several of the smaller tributaries, the two more significant tributaries and the headwaters of Duck Creek itself are crossed by bridges.

8.1.133. Natural character effects in landscape terms will arise from the presence of the highway within the valley parallel to the stream. The degree of potential effects will be less than for Te Puka Stream and Horokiri Stream because in the Duck Creek valley the Main Alignment is set further back from the stream and is embedded in cuts through tributary spurs.

[63] It has low visual absorption capability: The landform is relatively small scale, has a simple open land use, and lacks topography or vegetation that might otherwise help absorb development.

8.1.134. The proposed removal of perched culverts and restoration of native riparian vegetation along Duck Creek and tributaries will enhance the existing biophysical aspects of natural character and mitigate the effects on perceptual aspects of natural character.

8.1.135. The Porirua Link Road will affect the natural character of the lower part of Duck Creek valley, traversing the stream on a short but high embankment, but the degree of natural character in this area is already substantially reduced by adjacent urban development, and proximity to urbanised lower portion of the stream.

Cannons Creek

8.1.136. While the proposed alignment will have some effects on natural character, the use of a bridge to span the Creek will substantially reduce potential effects on biophysical aspects of natural character. Visually the bridge will be an appropriate structure carrying the road high above the vegetated stream.

Summary of Natural Character Effects

8.1.137. In summary, there will be reductions in natural character, in landscape terms, ranging in degree between 'moderate' to 'very high' for Te Puka Stream, Horokiri Stream, Ration Stream, Pauatahanui Stream and Duck Creek. The effects will arise from both the direct modifications by culverts and stream diversions, and changes to the landscape context for each of the streams.

8.1.138. Measures have been taken to avoid or reduce direct effects through fine-tuning the road alignment. For instance the refined alignment will have less direct effects than would have resulted from constructing the road on the existing designation in the upper Horokiri Stream – Te Puka Stream area. Likewise measures have been designed to mitigate / offset the direct biophysical effects on the streams as described in the Assessment of Ecological Effects. Proposed measures will also mitigate adverse effects on landscape aspects of natural character in each of the stream valleys including the retirement of the western slopes of Te Puka valley and eastern slopes of the upper Horokiri valley together with riparian planting of tributary streams, extension of riparian and margin vegetation along Ration Stream, restoration of Lanes Flat, riparian revegetation of Duck Creek tributaries, and riparian revegetation of shorter sections of several tributary streams where they intersect the Main Alignment.

8.1.139. Adverse effects on the natural character of the streams are an inevitable consequence of constructing a new road along such rural valleys. However, the effects have been avoided or reduced as far as practicable, and a best practice approach taken to mitigating the remaining effects. But, to avoid any doubt, the effects on landscape aspects of natural character following mitigation will remain more than minor.

Outstanding Natural Features and Landscapes

8.1.140. Section 6 (b) of the RMA requires as a matter of national importance "the protection of outstanding natural features and landscapes from inappropriate subdivision, use and development."

8.1.141. The only 'outstanding natural feature and landscape' (ONF/ONL) identified in District Plans in the vicinity of the route are 'the foothills of the Tararua Ranges' which are listed and mapped in the Kapiti Coast District Plan. The mapped area includes Te Puka Stream valley and framing hills.

8.1.142. The other District Plans do not identify ONF/ONLs[64] so the absence of such a notation should not necessarily be taken as an indication that ONF/ONLs do not exist in the vicinity of the Project.

8.1.143. Similarly neither the operative nor proposed Regional Policy Statements (RPS) identify regionally outstanding landscape and/ or features[65] although the proposed RPS includes a recommended methodology to assess ONF/ONLs. The method used in this report is consistent with that methodology.

8.1.144. For completeness, an appraisal was carried out to determine if any features and landscapes in the vicinity of the proposed route might warrant classification as

[64] The Porirua District Plan does include 'Landscape Protection Areas' and the limitations of these have been discussed above. Other technical landscape assessments of the City were based on a catchment management approach and did not seek to identify ONF/ONLs. A landscape strategy is currently being prepared as part of a review of Porirua City's District Plan provisions relating to rural areas, but was not available when this report was written and it is understood it also does not seek to identify ONF/ONLs

[65] The proposed Landscape Plan (Wellington Regional Council, 1998) identified Outstanding Natural Features and Landscapes, as well as Regionally Significant Landscapes. While the Proposed Plan was withdrawn following consultation, and therefore has no status, it is worth noting that the Pauatahanui Inlet was proposed as a regionally 'Outstanding Natural Landscape'. See discussion below in relation to this feature.

ONF/ONLs and to identify their landscape values. The most obvious candidates from north to south are as follows:

i) Tararua Foothills (already classified as ONL in the Kapiti Coast District Plan)

ii) Paekakariki Coastal Hills

iii) Horokiri Stream

iv) Pauatahanui Inlet and Backdrop Hills

v) Duck Creek and backdrop Belmont Hills.

Tararua Foothills

8.1.145. As discussed, the 'Tararua Foothills' are already identified in the Kapiti Coast District Plan as an outstanding natural landscape. The ONL covers an extensive area of hills that form the backdrop to the coastal plains. The following discussion focuses on that part of the hills relevant to the Project south of MacKays Crossing. The hills have moderate natural science values: The landforms are essentially intact, but land cover comprises modified pastureland and pine plantation with only occasional remnants of natural vegetation. Remnants include areas of bush within Te Puka Stream valley, particularly on the eastern side of the valley. The hills are expressive of the Ohariu Fault, the NE/SW trend of which controls the inland edge of the coastal plains. Aesthetically the hills are prominent as the steep escarpment backdrop to the coastal plains, although their naturalness is reduced by the lifestyle properties located on the lower slopes and the patterns of pine plantation in contrast to pasture. The hills will have reasonably high recognition amongst the community because of their prominence from SH1 and their strategic location at the southern end of the Kapiti Coast, although they would be known only in a general sense as part of the Tararua Foothills. The area at the southern end of the plains (Queen Elizabeth Park and Whareroa Farm) was a significant settlement area for Ngati Toa Rangatira containing Whareroa Pa,[66] kainga, urupa and other waahi tapu.[67] There are historical values associated with the WWII US Marines Corps camps at MacKays Crossing in the shadow of the hills. The escarpment as a whole might reasonably be considered outstanding: i.e. *"conspicuous, eminent, especially because of excellence,*

[66] Located at mouth of Whareroa Stream

[67] Cultural Impact Assessment, Te Runanga o Toa Rangatira Inc, July 2010, page 18-19

remarkable" [68] It is considered they would be of district rather than regional significance.

8.1.146. The effects of the Project on the landscape values of the hill backdrop to the plains will be relatively small. The works within Te Puka valley will be visually recessive from the plains because of their low elevation and the confined nature of the valley. The hills framing the entrance to Te Puka Stream are already modified by such features as the pipeline route, an access track and a prominent water tank on the ridge immediately west of Te Puka Stream valley, plantation forestry on the ridge immediately east of Te Puka Stream valley, and the existing 110kV transmission line which follows the valley. The CIA report concludes that the works will not directly affect sites of significance to Ngati Toa Rangatira, and there will be no adverse effects on the WWII camps in landscape terms, with the exception of minor effects on the setting of the circular brick structure in the Te Puka valley.

8.1.147. **Viewpoint 1** (LA22 to LA28) is from north of MacKay Crossing looking south along State highway 1 to where the Main Alignment will traverse the Tararua Foothills and enter Te Puka Stream (a.k.a. 'Transmission Gully'). The photomontage illustrates that the works are within an area of exotic trees and pine plantation low on the toe-slopes, the Project does not impact on the bold open hilltops that epitomise the outstanding natural landscape, and from this angle the Main Alignment within Te Puka Stream is screened by topography.

8.1.148. There will be significant landscape effects within the confines of Te Puka Stream valley, although these are more closely related to effects on natural character as discussed above, rather than the value of the hills as a backdrop to the coastal plains.

8.1.149. In summary the Project can be considered an 'appropriate development' because the degree of effect will be modest in terms of the reasons why the Tararua foothills are 'outstanding'. Note that the alternative coastal route also traverses an ONL as discussed below.

8.1.150. Part of the proposed transmission line deviation at Wainui Saddle will also be within the area identified as an ONL. This matter is discussed in more detail in Technical Report 5A: Addendum to Landscape and Visual Effects Assessment. In summary the deviation is appropriate because the ONL is already traversed by the transmission line, the bypass

[68] Wakatipu Environmental Society Incorporated v Queenstown-Lakes District Council, C180/99, paragraph 82

deviation is the best of the options considered, the bypass was aligned to reduce potential adverse effects as far as possible, and the degree of adverse effects will be modest in degree.[69]

Paekakariki Coastal Hills

8.1.151. The hills define the coastal escarpment south of Paekakariki and logically extend to include the coastal escarpment between Pukerua Bay and the north head of Porirua Harbour. The area has reasonably high natural science values, although much of it is rough pasture there are areas of remnant and regenerating vegetation. The escarpment is expressive of the underlying tectonic processes, tracing the Pukerua Fault. The hills have high aesthetic value as a steep escarpment rising directly from an exposed coastline, and because they are strategically located to form the northern headland to Porirua Harbour and the southern headland to the Kapiti Coast coastal plains. The coastal route has high scenic attributes and the Paekakariki Hill Road is also a recognised scenic route with expansive views. There are historical associations with the military history of the Paekakariki Hill Road and the Paekakariki settlement in the shadow of the escarpment. Although there is a degree of modification including the presence of SH1 and the hill road, and the adjacent presence of the Paekakariki and Pukerua Bay settlements, the escarpment is sufficiently natural and 'eminent' to be classified an outstanding natural feature. The hills are strategically located in a regional sense.

8.1.152. While the proposed alignment route is relatively close to the Paekakariki Hills (approximately 250m) at the MacKays Crossing end, it is located inland of the escarpment so that there will be no adverse effects. The proposed alignment also avoids the obvious alternative of the existing coastal route which would traverse this potential ONL[70]. One of the reasons given in the CIA in support of the Transmission Gully route is that it avoids the coastal route which has greater significance to Ngati Toa Rangatira.

Horokiri Stream Valley.

8.1.153. The upper Horokiri Stream valley has relatively high natural science values because of the natural landforms, and patches of remnant bush, although most of the land cover is modified. The valley is expressive of tectonic processes which characterise the

[69] Technical Report 5A – Addendum to Landscape and Visual Assessment. Paragraphs 5.28 – 5.30.

[70] It would also obviously traverse the coastal environment.

Wellington region, in particular the Ohariu Fault Line. The valley has moderately high aesthetic value because of the strong topography and relative naturalness (despite the presence of transmission lines), although it is also typical of such valleys in the Wellington region and is not particularly distinctive or memorable. There are some transient values associated with extreme weather conditions in the higher hills, but once again these are typical of such country. The main community associations are likely to be with the name 'Transmission Gully' which is associated with a long anticipated alternative SH1 route. The area was not a settlement area for Ngati Toa Rangatira, the streams and forests being visited from time to time for food and other resources.[71] There are no known historical values of any significance. While the valley has high landscape amenity it is not sufficiently 'eminent' to warrant classification as an outstanding natural landscape.

8.1.154. As discussed above, the Project will fundamentally change the existing character of the upper Horikiri and Te Puka valleys, although the existing steep and rugged qualities will become part of its new character, juxtaposed against the new road.

Pauatahanui Inlet

8.1.155. Pauatahanui Inlet might be considered an ONF and together with the backdrop hills north of the inlet might be considered as a potential ONL. Pauatahanui Inlet, including the wetland wildlife refuge at the head of the inlet, has high natural values because of its ecological significance. The inlet and the backdrop hills on the northern shore have high aesthetic value, and the roads around the inlet are recognised scenic routes. The backdrop hills are bold and relatively natural, although there is some settlement along the northern shoreline of the inlet.[72] The basin and range landforms are expressive of the tectonic forces that characterise the area's landforms. Pauatahanui Inlet has recognition amongst the community, evidenced for instance by the 'Friends of the Inlet'. Pauatahanui Inlet, as part of the broader Porirua Harbour, was a focus of pre-European Maori settlement, the location of battles fought during the Musket Wars and settlement by Ngati Toa Rangatira, and the location of fighting in 1861 during the New Zealand Wars. There are historical associations with Pauatahanui Village described above. Although the landscape around much of the inlet is modified, the inlet itself and the backdrop hills to the north have sufficient naturalness to warrant classification as an

[71] Technical Report 18: Cultural Impact Assessment, page 15

[72] along Grays Road

outstanding natural landscape. The inlet is strategically located and has sufficient value to be regionally significant.

8.1.156. The Pauatahanui Inlet was proposed as a 'Regionally Outstanding Landscape' in the Proposed Regional Landscape Plan (1998), encompassing the inlet itself, its margins, immediately adjoining land and backdrop hills to the north. While the Plan was withdrawn following consultation and therefore has no status, it is worth noting that the assessment carried out as part of this Project is consistent with that earlier assessment.

8.1.157. The proposed Transmission Gully route is inland of the Pauatahanui Inlet and is unlikely to have any visual effect on the Inlet itself, although there are potential biophysical effects through sediment discharge to streams feeding into the inlet. The recommended rehabilitation of Lanes Flat discussed above would enhance the ecological values of the inlet and act as a filter for sediment. For these reasons the Project is appropriate in terms of s6(b).

Duck Creek

8.1.158. Duck Creek has moderately high natural science values because of its largely intact landforms, and remnant patches of natural vegetation in the streams, although the land-cover is mostly modified. The area has relatively high aesthetic value because of the bold landforms including the escarpment on the west side of Duck Creek, the high Belmont hills to the south, and the strong 'ribbed' pattern of spurs on the lower Belmont Hills. The area has relatively high expressiveness of the Moonshine Fault and the tectonic processes typical of Wellington Region. Although the area is on the fringe of Belmont Regional Park, it is not considered that it would have high recognition amongst the community. Duck Creek (Waiohata) was not a focus of settlement for Ngati Toa Rangatira, but was visited for resource harvesting. There may be some local history associated with sawmilling but otherwise no significant historical values. Overall, while the valley and backdrop has high landscape amenity, it is not sufficiently 'eminent' to warrant classification as an outstanding natural landscape.

8.1.159. As discussed above, while the Project will fundamentally change the existing character within Duck Creek, the existing natural features will remain an essential aspect of its new character, juxtaposed with the road.

Summary of Effects on Outstanding Natural Features and Landscapes

8.1.160. The only recognised 'outstanding natural feature or landscape' affected by the alignment is the 'Foothills of the Tararua Ranges' that are classified as an ONL in the Kapiti Coast District Plan. The Project will have some adverse landscape effects on part of this ONL south of MacKays Crossing, but such effects will be modest given the alignment will traverse the escarpment at a relatively low elevation at a location that has already been modified.

8.1.161. Although the valleys of Te Puka Stream, Horokiri Stream and Duck Creek each have relatively high landscape values, they are not sufficiently 'eminent' to be ONLs. While the character of the valleys will fundamentally change, the existing topographic features will remain a defining aspect of the new character.

8.1.162. The Paekakariki Coastal Hills and Pauatahanui Inlet and Backdrop Hills have sufficient landscape values to classify as ONLs, but will not be affected by the proposed alignment.

8.1.163. For the reasons discussed above, the proposed project can therefore considered 'appropriate' with regards to s6(b) of the RMA.

9 LANDSCAPE PLAN

9.1.1. Mitigation measures have been discussed throughout the Report above as they relate to specific adverse effects. Further detail is provided in the section-by-section analysis under **Appendix 5C**. Measures are also tabulated in **Appendix 5E** (where they are correlated with specific effects) and illustrated on the **Landscape Plans** (LA01 to LA21). This section of the Report provides an overview of the Landscape Plans which are designed at the scale of the whole landscape with the intent of remedying and mitigating adverse effects, and enhancing amenity and landscape quality.

Best Practice

9.1.2. The proposed measures represent a 'best practice' approach as follows:

i) The priorities were avoidance, remediation and mitigation in that order.

ii) Measures have been designed in conjunction with other work streams to maximise cross-over between different disciplines.

iii) While measures were designed to mitigate specific adverse landscape effects, opportunities were sought to achieve multiple benefits from each mitigation measure.

iv) Attention also focused on improving each element of the Project to cumulatively enhance the design and reduce effects.

v) Alternative alignments, structures and remediation measures were investigated in those locations with potentially significant effects.

9.1.3. Landscape mitigation measures fall into those relating to the alignment corridor itself and those relating to the surrounding landscape. The main principles are:

i) To reduce the visual clutter within the highway corridor.

ii) To strengthen the patterns of the surrounding landscape and its natural processes.

iii) To directly address specific landscape and visual effects.

Highway Corridor

Batters

9.1.4. The cut batters are one of the significant issues because of their size, (particularly at Te Puka Stream / Horokiri Stream in the north and Porirua East / Linden in the south), and the fact that benching is required to maintain route security. The underlying rock is not stable enough to enable steep rock faces[73] and benching is also considered beneficial in arresting rock fall onto the road. Alternatively, to avoid benching by adopting a shallower batter slope angle is not desirable given the very steep hill faces in parts of the route.

9.1.5. The following measures are recommended to reduce the visual impact of the batters:

i) Minimising the number of benches: Typically benches are required at 10m lifts. In this case it is recommended the lowest bench nearest the carriageway be 15m, and the design of the top batters be tailored (for instance by adopting a shallower slope angle for the top batter) to avoid short benches high on the batter face.

ii) Rounding the top and side edges of cuttings to avoid sharp angles and reduce edge frittering. Rounding the batter edges will also promote a softer transition of vegetation between batter and natural ground.

[73] i.e. 'mono-slopes'

iii) Rounding the outer edges of benches to soften their appearance.

iv) Aligning all benches horizontally rather than parallel to the carriageway surface.[74]

v) Promoting re-vegetation of batters with techniques including hydro-moss and hydro-seeding. Where appropriate implement a staged re-vegetation by establishing a grass cover initially, followed by longer term plants once a biological layer is established.

Structures (Lights, Signs, Gantries, Barriers)

9.1.6. Reduce visual clutter of highway structures:

i) Limit the variety for each type of element (for instance by limiting types of safety barrier).

ii) Limit the materials and colours for the range of elements.

iii) Use recessive colours.

iv) Avoid unnecessary ornamentation.

v) Configure elements such as signs and barriers to a consistent spatial pattern (for instance the location of sign posts relative to the carriageway).

vi) Use earth contouring and run-off zones where practicable to reduce the extent of barriers.

vii) Avoid short lengths of barrier (for instance by use of bunds or refining the layout of road-side elements), and pay attention to the aesthetics of transition between barrier types.

Landscape Planting

LA01 to LA21

Landscape Plans

9.1.7. Landscape rehabilitation measures illustrated by the landscape plans were designed in conjunction with other work streams, in particular ecological and stormwater experts, to achieve multiple benefits from the overlaps between these works.

[74] It is critical that this be consistent throughout the route

9.1.8. In total approximately 570ha mitigation / restoration is planned, spread between both ecological and landscape work streams, and including a range of restoration methods:

i) Retiring land from grazing to enable it to regenerate naturally.

ii) Restoring riparian vegetation along the full length of significant tributary streams (particularly in Te Puka Stream, upper Horokiri Stream, and Duck Creek catchments) and restoring riparian vegetation over shorter distances for more minor streams where they intersect the Project.

iii) Enrichment planting of retirement areas.

iv) Large scale re-vegetation (using planting and hydro-seeding techniques) of highway batters and slopes within the designation. In particular including major revegetation of kanuka forest within the designation between the Pauatahanui Stream and Duck Creek catchments, and a revegetation corridor between Porirua Park Reserve and Cannons Creek.

v) Establishment of wetland areas to treat stormwater run-off, with margin and riparian planting.

vi) Restoration of Lanes Flat as a major wetland, with restored riparian vegetation along Pauatahanui Stream, and revegetation of adjacent valley edges.

vii) Amenity planting with faster growing exotic trees in and adjacent to the road corridor to soften the overall appearance of the road and mitigate visual effects from adjacent properties.

9.1.9. The principles adopted include:

i) Restore vegetation in bold patterns using limited species palettes in response to the broad scale landscape.

ii) Design re-vegetation to be contiguous with vegetation patterns beyond the corridor.

iii) Emphasise the underlying topography, for instance by establishing native riparian vegetation along streams and retaining intervening spurs in pasture or groups of exotic trees.

9.1.10. The proposed planting is covered in more detail in the section-by-section part of the Assessment and in table provided as **Appendix 5D**. Planting associated with the

Landscape work stream is illustrated on the **Landscape Plans** (LA01 to LA21) which should be read in conjunction with the Ecology mitigation measures.[75]

Connection between Highway and Landscape

9.1.11. Limit the 'in-between' space between the highway and adjacent landscape, and strengthen the extent to which the highway sits within the landscape.

i) Create a sharp edge between the shoulder and adjacent vegetation, limiting the in-between strip of ground and reducing the need for herbicide maintenance.

ii) Extend adjacent land use and vegetation patterns as close to the highway shoulder as possible consistent with safety and sensible on-going land management.

iii) Continue underlying landscape patterns on both sides of the highway so that the highway is not a boundary between different landscape patterns. For instance extending groups of planting along spurs on either sides of the road. This will also help reduce the prominence of large cuttings in the landscape.

iv) Restore riparian vegetation along streams on both sides of culverts. Such planting will help screen the culverts (the pipe structures, debris screens and maintenance tracks); soften the junction between stream and embankment; reinforce the natural landform pattern perpendicular to the road; and contribute to water quality and ecological value.

Summary of Mitigation Measures

9.1.12. While a project of this nature and scale will inevitably have adverse landscape effects, it is considered a best practice approach has been taken to avoid effects and that the proposed measures will adequately remedy and mitigate the remaining adverse effects.

[75] Technical Report 11, Assessment of Ecological Effects, Plans 11a – 11i

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11 APPENDIX 5A: LANDSCAPE AND VISUAL ASSESSMENT METHODOLOGY

Familiarisation and Site Visits

11.1.1. Initial familiarisation with the project was undertaken by reviewing the preliminary Engineering Plans and undertaking site visits along the route and surrounding areas (the Study Area). Subsequent visits were undertaken during the design refinement and assessment processes.

Table 5.2 Site Visits

11.1.2.

Date	*Personnel*	*Tasks*
	Gavin Lister Wade Robertson	Preliminary visit along whole route with project team
26 January 2010	Wade Robertson	Site visit along whole route with NZTA
27 January	Wade Robertson	Structures site visit to Te Puka and Horokiri Stream Valleys
28 January	Gavin Lister Wade Robertson	Inspection of Te Puka Stream, Horokiri Stream, Battle Hill, SH58 interchange.
9 February	Gavin Lister Wade Robertson	Inspection of Linden interchange and connections. Inspection of whole route in conjunction with other professions (excluding Golf Course – Flightys Road section)
18 February	Gavin Lister Wade Robertson	Inspection of Flightys Road and Bradey Road areas, Golf Course section, Whitby, Waitangirua, Ranui Heights.
26 February	Wade Robertson	Visit to Northern Gateway Project (Auckland) with NZTA reps and project Urban Design reps.
11 March	Gavin Lister Wade Robertson	Fill site scoping site visit with project engineer and ecologist.
17 June	Wade Robertson	Housing Inventory – Flightys Road
21 June	Wade Robertson	Site visit to Otira Viaduct to investigate structures and barriers
24 June	Wade Robertson	Housing Inventory – Flightys Road & Pauatahanui
13 July	Wade Robertson	Housing Inventory – Pauatahanui & Grays Road
15 July	Wade Robertson	Housing Inventory – Paekakariki Hill Road
27 July	Wade Robertson	Housing Inventory – Paekakariki Hill Road; Belmont Road; Bradey Road; Whitby; MacKays Crossing and Paekakariki township.

Date	*Personnel*	*Tasks*
28 July	Wade Robertson	Housing Inventory – Cannons Creek
13 August	Wade Robertson Nathan Young	Housing Inventory – Cannons Creek & Waitangirua
18 August	Wade Robertson	Housing Inventory – Whitby
20 August	Wade Robertson	Housing Inventory – Whitby; Aotea & Waitangirua
23 August	Wade Robertson	Housing Inventory – Ranui Heights
24 August	Wade Robertson	Housing Inventory – Tawa
25 August	Gavin Lister Wade Robertson Brad Coombs	Route wide site visit & Muldoons Corner (SH2/ Rimutaka Hill) to investigate cut batter profiles.
23 September	Gavin Lister	Site visit transmission line inspection
27 October	Gavin Lister Wade Robertson	Site visit, transmission line constraints
18 November	Wade Robertson Alan England Grace He	Visual Simulation Photos
2 December	Wade Robertson	Property owner visits
7 December	Wade Robertson	Site visit, transmission line constraints
15 February 2011	Wade Robertson	Property owner visit
10 March	Wade Robertson	Visual Simulation Photos
18 March	Gavin Lister	Transmission Line Alternative Routes
22 June	Wade Robertson	Confirm tower locations, update housing inventory

Research

11.1.3. The following research tasks were undertaken:

i) Documents relating to Scheme Assessment phase of the project were reviewed, including the landscape, urban design, geo-technical and ecology reports.

ii) NZTA's relevant policy documents (including the NZTA Urban Design Policy, NZTA Landscape Guidelines, and related documents including the NZ Urban Design Protocol) were reviewed and summarised.

iii) General material relating to landscape and urban design and assessment of highways were researched, including internet searches, a search of a landscape database, and discussion with NZTA staff. Relevant material is listed in the Bibliography.

iv) Documents providing background to the existing landscape were researched covering both the natural history and human history of the area. Documents are listed in the bibliography.

v) Statutory provisions relevant to a landscape and visual assessment were reviewed and summarised as **Appendix 5B**. The purpose of this review is to provide a context for the landscape and visual assessment and to identify specific landscape issues. It is not a definitive assessment of statutory planning provisions which is covered by the specialist Planning Assessments.

vi) Documents relating to 'other matters' relevant to landscape matters were reviewed and summarised. These included the following:

vii) Site visits were made to inspect examples of other highway works including Northern Gateway (SH1 / Auckland); Muldoons Corner (SH2 / Rimuataka Hill, Wellington); and Otira Viaduct (SH78 / Otira, West Coast).

Analysis and Appraisal of Existing Landscape

11.1.4. The existing landscape was analysed in terms of its physical and perceptual/associative attributes including consideration of the factors listed in the 'Pigeon Bay criteria':

i) natural science factors (landforms, vegetation, water-bodies, ecology); [76]

ii) aesthetics (legibility, distinctiveness);

iii) expressiveness (geomorphology);

iv) transient values;

v) recognition by the community, (District Plan recognitions, recreation, identity);

vi) value to tangata whenua;

vii) historical associations.

11.1.5. Assessing landscape in terms of these factors is in line with definitions of landscape accepted by practitioners and the Environment Court. It is not definitive, nor a formula, but it maps out the broad scope of factors to take into account.

11.1.6. Reference was made to other existing documents (e.g. NZ Geopreservation Inventory, general texts) as well as specialist reports prepared for the project (e.g. Ecology,

[76] Also referred to as 'biophysical' factors, or natural landscape components.

Hydrology, Archaeology, Built Heritage, Cultural Impact Assessment) where relevant to landscape matters.

11.1.7. An appraisal of significance was made to determine whether there are outstanding natural features or landscapes in terms of s6(b).[77]

Input to Design

11.1.8. Separate sections of the route were examined and design refinements proposed during a series of half-day 'urban design' workshops. The designs were worked up and reviewed at subsequent workshops in an iterative manner. Professions represented in the workshops included Structures Design, Civil Engineering, Stormwater Hydrology, Ecology, Urban Design and Landscape.

11.1.9. Landscape input included the following:

i) Input to refinements to the alignment.

ii) Input to design of global elements such as cut and fill batters.

iii) Input to the comprehensive design at specific locations, specifically MacKays Crossing, Te Puka Stream, Battle Hill Farm Forest Park, SH58 Interchange, Duck Creek, Kenepuru Interchange and Kenepuru Link Road, and connection the existing SH1 at Linden.

iv) Preparation of design principles covering landscape design matters such as treatment of cut and fill batters, earthworks contouring, broad-scale planting design, visual screening, wetland and riparian planting of storm-water devices. The principles will become part of the recommended conditions by way of a Landscape Management Plan, providing measurable criteria lending themselves to certification.

v) Site visits to select surplus fill sites.

[77] To qualify under s6(b) a landscape or feature must be both natural and outstanding. To be outstanding it must be 'pre-eminent' taking into account the Pigeon Bay factors.

Assessment of Landscape and Visual Effects

Biophysical Effects

11.1.10. An assessment was made on biophysical landscape effects taking into account the extent and significance of modifications to landforms, watercourses, and vegetation. Reference was made to specialist Ecology report where appropriate.

Aesthetic and Perceptual Effects

11.1.11. An assessment was made on perceptual/associative landscape effects, taking into account the extent to which the project will fit the topography, effects on natural, rural or urban character. Aspects considered included effects on landscape character and identity; on legibility (effects on key landmarks, routes, or edges), on historical associations, and on aspects that are understood to be significant to tangata whenua. Reference was made to specialist reports including the Heritage Report and the Cultural Values Assessment. It also included an assessment of the effects on the experience for future users.

Visual Effects

11.1.12. Visual effects are a subset of landscape effects that entails identifying visibility and assessing the effects for 'viewing audiences'. Assessment was carried out for both public and private 'audiences' as follows:

11.1.13. Visibility of the project was firstly determined by use of a 'Zone of Theoretical Visibility' (ZTV) analysis, which identifies potential (or hypothetical) visibility followed by field work to determine the extent of screening by vegetation and other obstructions, and to identify affected 'audiences' from both private properties and public places.

11.1.14. Potentially affected properties and dwellings near the route were identified and visual effects assessed. Individual assessments were made for separate properties/dwellings in rural areas, while representative assessments were made for those in urban areas. Assessments are tabulated in **Appendix 5D** and both individual and representative locations are illustrated in plans **LA117 to LA120.** Each assessment analysed such factors as distance, orientation of outlook, degree of screening, complexity of intervening landscape, and the nature of the backdrop, and an appraisal of the degree of effect against a five point scale (Table 5.3). While particular attention was paid to the dwellings, effects from other parts of properties were also taken into account. Such

assessments in most instances are based on road-side observations and desk-top analysis, with visits made to some properties to confirm effects.

Table 5.3: Visual Effects Five Point Scale

very low	low	moderate	high	very high
1	2	3	4	5

11.1.15. Public audiences were identified, including views from public roads, reserves and recreational land. Assessments were made with respect to these audiences.

Photomontages

11.1.16. Photomontages were prepared from representative public viewpoints. Isthmus selected the viewpoints and took the photos. Opus International Consultants provided the required 3D digital elevation model. Photos were taken with a Nikon D700 digital camera with a 50mm lens (and 35mm lens in one instance) and stitched manually to provide panoramas. Viewpoints were fixed by hand-held GPS. Photos were matched with 3D digital elevation model of the terrain and project elements derived from the Road Layout and Landscape Plans attached to the AEE as GM01 – GM21 and LA01 – LA21 respectively.. The project elements were rendered using Photoshop software. Photomontages were re-produced at a size to represent correct scale at the specified reading distance of 400mm. All photomontages are reproduced at the same reading distance (or scale) to enable a consistent scale comparison between them. While best practice is followed to produce photomontages, it is noted that photos and photomontages cannot reproduce reality. There are unavoidable technical shortcomings in photography and printing compared to human sight, and differences in perception between photography and human experience.

Cumulative Effects

11.1.17. While consideration was given to the question of potential cumulative effects, this mode of assessment has peripheral relevance in this instance because the project is singular in nature and follows a green-fields route. The main locations in which cumulative effects will occur are at either end where the project merges with existing SH1.

11.1.18. Consideration was also given to the cumulative effects of the Project in conjunction with the existing 110kV (PKK – TKR A) transmission line.

Temporary Construction Effects

11.1.19. An assessment was made of construction effects taking into account the nature of the works and activity, their visibility, duration, and measures to mitigate those effects.

Landscape Mitigation

11.1.20. In addition to input to the design process discussed above, specific landscape design mitigation measures were designed. These are described in the Landscape and Visual Assessment (the Report); are detailed in **Appendix 5E;** and are incorporated into the Landscape and Urban Design Framework. The design is tailored to remedy or mitigate the following aspects:

i) Biophysical factors, including such measures as restoration of riparian vegetation along streams, re-establishment of the Lanes Flat wetlands, and large scale natural re-vegetation.

ii) Aesthetic factors, including overlaps with items listed above, plus fine-tuning the design of cut and fill batters, rehabilitation of batters, screening of particular views.

Alternatives

11.1.21. The route selection process and specifically the consideration of alternative routes was carried out as part of the previous SAR phase of the Transmission Gully project. The further consideration of route selection is beyond the scope of this report. Consideration of alternatives in the current context concerns more detailed matters such as fine-tuning of the alignment and its elements, and consideration of alternative detail design and mitigation options. Such alternatives were explored through the iterative design process.

References and Bibliography

11.1.22. As discussed above, background documents and specialist reports that are relied upon are referenced through the assessment and listed in the bibliography.

External Technical Review

11.1.23. The methodology was technically reviewed by Mr Clive Anstey FNZILA on behalf of the Regulatory Authorities Advisory Group (RATAG).

12 APPENDIX 5B: STATUTORY PROVISIONS RELEVANT TO LANDSCAPE

12.1.1. Statutory provisions and documents relevant to the landscape and visual assessment include Part 2 of the Resource Management Act (RMA); Wellington Regional Policy Statement (WRPC); and the operative and proposed district plans for the four local authorities traversed by the route: Kapiti Coast, Porirua City, Hutt City and Wellington City.

12.1.2. Provisions most relevant to the landscape and visual assessment are summarised below. This is not an appraisal of the project against the relevant provisions, nor a comprehensive list of all provisions. The purpose is to identify issues and matters to be addressed by the assessment of landscape and visual effects, and to be taken into account in the project design and mitigation measures.

RMA Part 2

12.1.3. Section 5 sets out the purpose and principles of the RMA.

(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.

(2) In this Act, sustainable management means managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural wellbeing and for their health and safety while

(a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
(b) Safeguarding the life-supporting capacity of air, water, soil and ecosystems; and
(c) Avoiding, remedying or mitigating adverse effects of activities on the environment.

12.1.4. Section 6 sets out matters of national importance which should be recognised and provide for, including:

*(a) The preservation of the **natural character** of the coastal environment (including the coastal marine area), **wetlands,** and lakes and **rivers and their margins,** and the protection of them from inappropriate subdivision, use and development:*
*(b) The protection of **outstanding natural features and landscapes** from inappropriate subdivision, use and development:*

12.1.5. Section 7 sets out other matters to which particular regard shall be had, including:

*(c) The maintenance and enhancement of **amenity values**:*

(f) *Maintenance and enhancement of the **quality of the environment**:(all emphasis in this Appendix added)*

Wellington Regional Policy Statement (1995) and Proposed Wellington Regional Policy Statement (2009)

12.1.6. The operative Wellington Regional Policy Statement contains provisions relating to landscape under the heading '**Landscape and Heritage'**. These generally restate the provisions of Part 2 of the RMA. The RPS does not identify or map any outstanding natural features or landscapes.

Landscape and Heritage

Objective 1: *Nationally and regionally **outstanding geological features, landforms, soil sites** and **other natural features** of the Region are protected from inappropriate subdivision, use and development.*

Objective 2: *Adverse effects of human activities on the Region's natural and physical resources are **avoided, remedied or mitigated** so that the quality of any **regionally outstanding landscapes** which those resources contribute to is maintained.*

Objective 3: *The **cultural heritage** of the Region which is of regional significance is:*

(1) Recognised as being of importance to the Region;
(2) Managed in an integrated manner with other resources; and
(3) Conserved and sustained for present and future generations.

Objective 4: *The attributes of natural and physical resources which provide for regional **recreational opportunity**, and for the appreciation and enjoyment of those resources by the regional community, are maintained or enhanced.*

Policy 1: *To manage the use, development, and protection of natural and physical resources in ways which recognise and respect their contribution as elements of **regionally outstanding landscapes**.*

Policy 2: *To **avoid, remedy, or mitigate** the adverse effects of subdivision, use, and development on regionally outstanding landscapes, and nationally and regionally outstanding landforms, geological features, soil sites, and other natural features.*

Policy 3: *To manage the use, development and protection of outstanding **landscapes of significance to the tangata whenua**.*

Policy 4: *To promote the maintenance and enhancement of the **amenity and intrinsic values of regionally outstanding landscapes,** and of nationally and regionally outstanding landforms, geological features, soil sites, and other natural features.*

Policy 6: *To **avoid, remedy or mitigate** the adverse effects of subdivision, use and development on **regionally significant cultural heritage resources**.*

12.1.7. The provisions of the proposed WRPS remain similar but also include:

Objective 17: *The region's **outstanding natural features, landscapes and significant amenity landscapes,** are identified and their values protected, maintained or enhanced. (all emphasis added)*

Wellington Regional Freshwater Plan (1999)

12.1.8. Provisions of the Wellington Regional Freshwater Plan most relevant to landscape and visual issues include:

Objective 4.1.7 *The **amenity** and **recreational values** of wetlands, lakes, and rivers are **maintained** and, where appropriate, **enhanced**.*

Policy 4.2.10 *To avoid adverse effects on wetlands, and lakes and rivers and their margins, identified in Appendix 2 (Parts A and B), when considering the protection of their **natural character** from the adverse effects of subdivision, use, and development.*

Policy 6.2.15 *To allow the damming or diversion of water in any river, lake, or wetland, provided:*

*(1) adverse effects are **avoided, remedied or mitigated**; and*
(2) significant adverse affects, which cannot be adequately offset, are avoided on:

• *natural or amenity values; (all emphasis added)*

Kapiti Coast District Plan

12.1.9. Chapter B11 –Landscape Issues identifies the effects of earthworks and landform modification, and the effects of buildings, structures and services on significant landscape features of the district and their associated amenity values.

12.1.10. The most specific objectives are in Chapter C10 – Landscape.

*Objective C10.1 That the District's **outstanding landscapes** are identified and protected from the adverse environmental effects of subdivision, use and development.*

*Policy C10.1.1: Ensure new **buildings, structures, services** and **earthworks** within **outstanding landscapes** are located so they will **not be visually dominant**. (e.g. below the dominant ridgeline where practicable).*

*Policy C10.1.3: Ensure no dune or **landform modification** takes place **within outstanding landscapes** of the open space, rural and residential zones, except to the minimum necessary for roading, access, provision of services, building site and farming purposes.*

Policy C10.1.4 Ensure the following outstanding landscapes are protected from inappropriate subdivision, use and development through controls on subdivision and land uses.

- *The foredune and consolidated sand dunes.*
- *The foothills of the Tararua Ranges including Pukehou hill.*
- *The wavecut escarpments behind Paraparaumu and Paekakariki.*
- *Kapiti Island and associated Islands.*
- *The river landscapes of the Otaki and Waikanae Rivers.*
- *Ecological areas shown on the Planning Maps.*

12.1.11. The hills forming the backdrop to the coastal plains in the vicinity of MacKays Crossing are mapped in the District Plan as an outstanding natural landscape. The Main Alignment will traverse part of the ONL in the lower Te Puka Stream.

12.1.12. The Landscape Assessment from which the District Plan provisions were derived was reviewed. This assessment was largely based on visual parameters and did not specifically identify ONL's but rather areas that expressed high visibility and additional

natural and cultural heritage values based on desk top analysis. The primary outcome of the assessment was to recommend macro level management focus for certain areas in the district. Those ONL's identified under Chapter 10, Policy 4 of the District Plan do not directly correspond to those landscape units and types identified under the study.

12.1.13. **Chapter C2 – Rural Zone** contains a number of objectives and policies relevant to landscape quality and amenity. They tend to be general and follow Part 2 of the RMA:

Objective C2.1: Ensure any effects of activities on the natural and physical environment or rural areas and of rural activities beyond this environment are avoided, remedied or mitigated with particular regard to sustaining the life supporting capacity of the resources of the land to meet the needs of future generations.

*Policy C2.1.1(A):Identify and protect areas of **significant indigenous vegetation** and significant habitats of indigenous fauna.*

*Policy C2.1.1(B):Ensure the adverse effects of rural use and development on the **natural environment** are avoided, remedied or mitigated.*

*Policy C2.1.2: Maintain, enhance and protect the district's **outstanding landscapes** in the Rural Zone from inappropriate subdivision, use and development.*

12.1.14. **Chapter C7.3 – Earthworks** contains more specific provisions relating to landforms.

*Objective C7.3.1: To maintain the District's **natural landforms** by ensuring any adverse effects of earthworks on the natural, physical and cultural environment are avoided, remedied or mitigated.*

*Policy C7.3.1.1: Ensure the adverse effects of earthworks on the environment are avoided, **remedied or mitigated** when considering applications for resource consents for earthworks by taking into account the following:*

- *The extent to which any earthworks may **impact on prominent or visually sensitive landforms**, including the coastal marine area, ridgelines, dunes, escarpments, native vegetation, wetlands and water bodies and the effects of earthworks on water quality;*
- *The extent to which any cut or fill can be restored or treated to **resemble natural landforms**. Council will seek to avoid the creation of unnatural scar faces;*
- *The extent of **screening by vegetation**;*

- *The extent to which any cut of fill will remove **existing vegetation**, alter **existing landforms**... or affect **existing natural features** such as water bodies;*

*Policy C7.3.1.2: Avoid, remedy or mitigate the **adverse effects of earthworks on outstanding landscapes**, and have regard to the extent to which the earthworks maintain and affect:*

*i. The **integrity and character of the underlying landform**;*
*ii. The **visual character**, including legibility (clear definition) and coherence (continuity of pattern which gives the landscape a sense of unity);*
*iv. **Indigenous vegetation, habitats and biological processes**;*
*vi. **Views** towards the landscape.*

12.1.15. **Chapter C8 – Heritage** addresses both natural and cultural heritage. The provisions are general and typically follow Part 2 of the RMA.

*Objective C8.1: To identify and protect **heritage features** of significance to the Kapiti District.*

*Policy C8.1.2: When considering the destruction, burning, cutting and/or removal of **native vegetation**, as defined in Part Q of this plan, and destruction, demolition, alteration, modification or removal of any heritage feature recorded in the heritage register, take into account the following:*

In respect of native vegetation (excluding individual trees – see below), ecological and biological sites and waahi tapu:

- *The necessity for carrying out the works.*
- *The degree to which the activity detracts from the **integrity/value of the heritage site**.*
- *Whether the proposal can be altered to preserve the integrity of the site.*
- *Assessment of actual, potential, seasonally significant or **cumulative effects on the environment** including flora, fauna, recreational water quality and animal and plant pests.*

- *An assessment of the species that can be transplanted and the risk/loss factor of the species where appropriate.*

*Objective C8.2 To recognise the relationship **a heritage resource may have with the land surrounding the resource.***

12.1.16. **Chapter C11 – Ecology** contains objectives and policies that are relevant to some landscape aspects, although they are general and typically follow Part 2 of the RMA.

*Objective C11.1: Protect and enhance the natural environment and ecological integrity of the District, including protection of **significant indigenous vegetation** and significant habitats for indigenous flora and fauna.*

*Policy C11.1.2: Ensure that potential or actual adverse effects on the **natural environment** from subdivision, use and development are **avoided, remedied or mitigated.***

*Policy C11.1.4: Ensure **significant native vegetation** is not removed and any disturbance is avoided, remedied or mitigated.*

*Policy C11.1.8: Encourage planting of locally sourced indigenous species adjacent to water bodies and other areas that will **restore linkages and ecological corridors.***

*Policy C11.1.9 Encourage **restoration of degraded habitats** with locally sourced (genetically appropriate) native vegetation.*

*Policy C11.1.11: Maintain and enhance the **natural landscape values** of the District.*

*Policy C11.1.12 Ensure that **appropriate buffer zones** are provided around areas of significant natural value and that **wider ecological processes** are considered when making decisions about significant sites.(all emphasis added)*

Porirua City District Plan

12.1.17. **Chapter 4 – Rural Zone** objectives and policies relate generally to maintaining the natural and rural character and quality of the environment, reflecting s7(c) and s7(f) of the RMA.

Objective 4.1 To identify a rural zone and continue its management so as to ensure, avoid, remedy or mitigate the effects of the activities within it.

*Policy 4.1.3: To ensure that activities within the Rural Zone do not detract from the **character or quality of the rural environment**.*

*Objective 4.2 To avoid or reduce the adverse effects of activities on ecosystems and the **character of the Rural Zone**.*

*Policy 4.2.4: To encourage the maintenance and enhancement of the ecological integrity and **natural character** of the Rural Zone.*

12.1.18. **Chapter 4A – Judgeford Hills Zone** relates to the area east of the alignment beyond Bradey Road. The provisions anticipate lifestyle development of the Judgeford Hills area and aim to minimise effects of development on landscape and natural character. The provisions anticipate the Transmission Gully alignment in a general sense.

*Objective 4A.3.5: To minimise any adverse **visual effects** of development on the surrounding **landscape and natural character**.*

*Policy 4A.3.5.2: To have regard to the effects of the **Transmission Gully Motorway** on landscape and natural character.*

12.1.19. **Chapter 8 – Heritage** has objectives and policies to identify and protect significant heritage features. Features within Porirua City that might potentially be affected include the battle site within Battle Hill Regional Farm and Forest Park, St Josephs Church at Pauatahanui, and Pauatahanui village itself.

12.1.20. **Chapter 9 – Landscape and Ecology** objectives and policies are mostly general and echo Part 2 of the RMA. However there is specific reference to protecting the '**Belmont scarp'** and **'Eastern Porirua Ridge'** from urban encroachment, and also protecting the landscape and ecological features of the **Whitby Landscape Protection Area** including **Duck Creek** and the **Resolution Ridge**.

*Objective 9.1: To manage in a sustainable manner the **landscape and ecological systems** within Porirua City.*

*Policy 9.1.1: To prevent urban encroachment into **sensitive ecological and landscape areas**.*

*Policy 9.1.4: To protect the **Belmont scarp and Eastern Porirua Ridge** from urban encroachment in order to **preserve the open space and rural edge** of Porirua City.*

Policy 9.1.5: *To protect the **visual and ecological character** of the Rural Zone.*

Policy 9.1.6: *To encourage the protection and preservation of areas of **significant native vegetation**.*

Policy 9.1.15: *To recognise, protect and enhance the **existing ecological and landscape features in the Whitby Landscape Protection Area, including Duck Creek and the Resolution Ridge**, through subdivision design, location, roads, low residential densities, allotment size and the management of earthworks and vegetation clearance.*

Upper Hutt City District Plan

12.1.21. Only a very small part of the designation, on the western edge of Akatarawa Forest (pine plantation) falls within Upper Hutt District. Provisions of the rural zone are general and follow the provisions of s7(c) and s7(f) of the RMA.

12.1.22. Relevant objectives and policies under '**Chapter 5 –Rural Zone'** cover such matters as maintaining or enhancing **amenity values**, **rural character** and **landscape values**.

12.1.23. Relevant objectives and policies under **Chapter 9 –Subdivision and Earthworks'** cover such matters as promoting development that is appropriate to or compatible with natural characteristics of the City including **landforms**, significant areas of **indigenous vegetation**, and **visual amenity**.

Wellington City District Plan

12.1.24. Similarly, only a relatively small part of the project falls within Wellington City, including the area at Linden where the alignment and existing SH1 merge, and backdrop hills at the southern end of the project.

12.1.25. **Chapter 4 – Residential Area** has general provisions to maintain and enhance amenity values.

12.1.26. **Chapter 14 – Rural Area** similarly has general provisions to maintain and enhance rural character, including the promotion of naturalistic earthworks and protection of vegetation. There are specific policies relating to development on identified **ridgelines and hilltops**, and acknowledgement of the landscape values of the **Belmont Hills**

*Policy 14.2.2.2 Control the construction and siting of new buildings, **structures** and **earthworks** on **identified ridgelines and hilltops** in ways that avoid, remedy or mitigate **adverse visual effects** and effects on any **natural, recreational or heritage values** that may exist in these identified areas.*

*Policy 14.2.3.3: Acknowledge the natural and cultural landscape of the **Belmont Hills** in recognition of their **scenic and recreational values**.*

*Policy 14.2.5.2 Ensure that any approved **earthworks** are designed and engineered to **reflect natural landforms**.*

12.1.27. There are a number of general **criteria** relating to works in the rural zone and a Rural Design Guide, although these are tailored toward controlling subdivision and rural land development and are less relevant to a large infrastructure project.

*Any new development should seek to endorse and enhance the existing **natural** and **rural character**. In rural areas there is a **blending of the functional and the aesthetic, the natural and the cultural**. Rural environments are most valued for their natural and open pastoral character and it is this character which new development can threaten. The challenge for developers is to **provide for a balance**, to ensure that development does not overwhelm the natural and rural character with geometric and fragmenting patterns and prominent built structures.*

3.0 Natural Features Ecosystems and Habitats Guidelines

Prominent natural landforms:

Prominent landforms contribute to local character. Landforms unique to Wellington and of particular interest and concern include the coastal escarpment and terraces, and all main hilltops, ridges and spurs.

*G6 Minimise the **intrusion** of 'cultural' elements into very natural/wilderness environments.*

*G7 Protect any **features of geological interest** such as terraces, escarpments, and rock outcrops.*

*G8 Minimise any earthworks disturbance to the **natural ground form**.*

4.0 Planting Guidelines

G1 *Use species and planting combinations characteristic of or indigenous to the local area. Take cues from existing species and patterns of vegetation associated with buildings, access-ways,* ***hilltops, ridges*** *and spurs, and remnant stands of indigenous vegetation.*

12.1.28. Proposed Plan Change 70 – Earthworks

Objective 29.2.1: To provide for the use, development and protection of land and physical resources while avoiding, remedying or mitigating any adverse effects of earthworks and associated structures on the environment.

Policy 29.2.1.7: Ensure that earthworks and associated structures are designed and landscaped (where appropriate) to reflect natural landforms and to reduce and soften their visual impact having regard to the character and visual amenity of the local area.

Other Matters

12.1.29. Other non-statutory documents relevant to assessing landscape and visual matters include the Wellington Conservation Management Strategy, the Management Plans for the Regional Parks traversed, Porirua Development Framework, and *'Future Focus: A Framework for Pauatahanui Village (2009)'*

Wellington Conservation Management Strategy

12.1.30. The Conservation Management Strategy has general provisions. Relevant objectives include:

Objective 5: *Protection of the intrinsic values of natural landscapes.*

Objective 2: *Provide facilities and services to enhance visitors' experiences.*

Regional Parks Network Management Plan (2003)

12.1.31. The Regional Parks Network Management Plan provides background information relevant to the parks network as a whole. Pertinent information includes values associated with the parks derived from community and Tangata Whenua consultation:

iii) *three-quarters of regional residents had visited one or more regional parks and forests in the past year*

iv) *people choose parks for their natural setting, good views and quiet or isolation*

v) *people appreciate the diversity of environments and experiences available in regional parks*

vi) *the main activities undertaken in the parks are walking or running (including walking the dog), tramping, swimming, cycling and picnicking*

vii) *maintaining the natural setting and continuing environmental protection are of great importance to the community*

viii) *the protection of heritage sites was also important to many people*

12.1.32. The key theme arising from consultation with tangata whenua is their interest in being involved in the care and protection of the environmental and heritage values of the parks.

12.1.33. Objectives and policies include protecting specific landscapes and geological features of particular significance within regional parks, and recognising the specific and different landscape values in the management of each of the regional parks.

12.1.34. Heritage values in the parks are covered in pages 44-47, including background information. It identifies the World War II US Marines Camp at MacKays Crossing in Queen Elizabeth Park, the battle site in Battle Hill Farm Forest Park and heritage values associated with Belmont Regional Park. The latter were important routes for Maori and later European settlers, the area was used for water collection and the Korokoro dam and weir built in 1903 still remain, there were flour and woollen mills in the 1800s, and the area was used extensively during World War II for defence purposes with ammunition magazines remaining.

Battle Hill Farm Forest Park Management Plan (2009)

12.1.35. The **Battle Hill Farm Forest Park Management Plan** addresses a wide range of land management issues. It should be read in conjunction with the **Battle Hill Farm Forest Park Resource Statement** which provides a broader and more detailed description of the Park's historical and natural context.

12.1.36. Provisions promote the environmental, cultural and landscape values, but also acknowledge the importance of the Transmission Gully designation.

- *Manage the environment and cultural heritage for the benefit of current and future generations by:*
    - *Protecting the park's landscape values including the combination of pastoral land, manage native vegetation and steep hills from excessive erosion or development.*
- *Use:*
    - *Providing recreational opportunities consistent with the primary recreational uses of experiencing a working productive farm, walking, tramping, picnicking, swimming, horse riding, mountain biking and camping.*
    - *Acknowledging the importance of existing or potential network utilities to the region, including Transmission Gully designation, and providing for their ongoing operation, maintenance and minor upgrading."* (*Pg 6 – text box 1)*

12.1.37. Section 2 – Battle Hill Management Plan Objectives and Policies contains a specific policy to provide access across the Transmission Gully designation and maintaining the cohesiveness of the Park.

1.26 *To provide for access across the Transmission Gully designation, negotiating with the New Zealand Transport Agency to ensure that the park remains cohesive."* (Pg 14)

12.1.38. Part B – Conserving our environment and cultural heritage contains useful information on natural heritage including:

The park is located within the catchment of the Pauatahanui Inlet. The inlet is defined as an Area of Significant Conservation Value (ASCV) in the regional Coastal Plan for the Wellington Region for reasons of its natural, conservation, geological, and scientific values.

Although Battle Hill's landscape has largely been modified there are still significant remnants of native vegetation which are good representations of the types of indigenous flora that would have once been typical in the Wellington Region.

A small costal forest remnant (35 hectare) can be found at the front of the park, as well as areas of low producing grassland and indigenous forest within the plantation forest and the back of the park.

...The bush is dominated by tawa and titoki, while the upper slopes are almost pure kohekohe. In swampy lower areas kahikatea, pukatea and swamp maire are present.

Most importantly, this remnant has the last remaining self-sustaining population of the rare plant Rhabdothamnus solandri. It is an orange flowered shrub, pollinated only by honeyeaters. Luckily two appropriate bird species (bellbird and tui) still use this remnant, ensuring that population can survive. Other plants of significance found within this remnant are referenced in the Battle Hill Farm Forest Park Resource Statement, available on the Regional Council web site.

Other areas of ecological significance include the restoration projects that various community groups, the rangers and volunteers have been restoring along the Horokiri Stream, the Horokiri Stream itself, which supports a number of rare native fish, and a small wetland area located in the Transmission Gully area.

Landscape and Geological Values

The landscape character of the park can be described as farmland, ranging from river flats, to undulating rolling hills leading to forested backcountry steeplands. These can be divided into three main landform groups - lowland, capland and slopeland in a primarily European style pastoral landscape. This perception is enhanced with the agricultural buildings located at the "front" of the property surrounded by a mixture of mature specimen trees, which are visible from most parts of the park.

Regional parks are places where sustainable activities will be encouraged. Some of these activities may have effects on the landscape, which need to be balanced against their other benefits, for example, the ***proposed alternate State Highway through Transmission Gully. (emphasis added)***

12.1.39. Objectives are mostly general, promoting protection of landscape values, but include specific reference to geological features including river flats and gravel alluvial deposits which are traversed by the designation.

"Battle Hill Farm Forest Park will contribute to the diverse range of landscapes within the region.

The park's landscape values are protected from inappropriate use and development.

Geological features, such as river flats and gravel alluvial deposits, are protected from inappropriate use and development"

12.1.40. Policies are general and include protecting landscape and amenity values.

2.22 To protect the park's key landscape features and values from inappropriate use and development. Key landscape features include:

- *European style pastoral character*
- *The combination of unbroken pasture river flat to forested steeplands*
- *The eastern hills*
- *Patchwork of mature specimen trees and native vegetation*
- *Native bush remnant*

2.24 To promote the maintenance and enhancement of the amenity and intrinsic values of the landscape and landforms of the park.

*2.25 To advocate for the protection of the park's key **geological features** and values from inappropriate use and development. To apply policies for "assessing activities and uses" to address effects on landscape and geological values and to ensure any adverse effects from developments or activities of those values, or cultural values, are **avoided, remedied or mitigated**."* (Pg 20 and 21)

Belmont Regional Park Management Plan (1996)

12.1.41. The Management Plan records that Belmont Regional Park was conceived in the 1970's to provide **recreational access** and to protect **important local landscapes**" (Pg 1 – Preface). Background information includes:

12.1.42. "There are five primary entry areas to the park (including Cannons Creek (Porirua). Several streams define and drain the park; Duck Creek to the north, Cannons Creek and Takapu Steam to the west. Most of the park is pasture land. Some of the steeper slopes and gullies are revegetating in gorse and native bush... Belmont Regional Park offers wide open spaces and panoramic hilltop views. A range of recreational activities occur in the park, including walking, running, hiking, orienteering, horse riding, mountain biking, picnicking, camping and swimming."

12.1.43. Part 2, Resource Statement contains further detailed information on the park including geology; soils; topography/ hydrology; climate; vegetation; landscape; history; and community values.

12.1.44. The area in the vicinity of the alignment falls within what is referred to as Management Zone 3: Waitangirua/ Kilmister. It records that the *"majority of Zone 3 is farmed by Landcorp Farming Ltd (Takapu Block, Waitangirua Farm and Kilmister Block).*

Designated walkways are being created across the zone to provide for public access, including access for horse riders and mountain bikers. The Regional Council manages recreation in Zone 3 as part of Belmont Regional Park.

12.1.45. The Management Plan notes that Boulder Hill (442m) is the highest point in the park, and that panoramic views can also be gained from Round Knob (408m) and the airstrip. It also notes that Cannons Creek Lake Reserve, owned by Porirua City Council, is a popular area for walking and picnicking.

12.1.46. The Aims and Objectives are general. Objectives most pertinent to the Landscape and Visual Assessment include:

"Heritage:

- *The natural and cultural heritage of the Belmont Hills within the park will be protected and enhanced in recognition of its scenic and recreational value.*
- *The **grassed open hill tops** of the park will be protected.*
- *The native plant and animal communities in the park will be conserved and enhanced.*
- *Significant wildlife habitats in the park will be conserved and enhanced.*

Recreation:

- *A wide range of outdoor recreation activities which are compatible with the park's heritage and farming values will be provided for in the park.*
- *The recreational activities of the park will be managed in a manner which protects the quality of experience for park users while providing maximum opportunity for recreation within the park.*

Farming/Forestry:

- *Farming and forestry will be provided for in the park as sustainable land management tools to enhance the landscape of the park."*

12.1.47. Policies most pertinent to the Landscape and Visual Assessment include:

1. Management

1.14 Public Access

Policy (5) The general public will have right of access across Zone 3 – Waitangirua/ Kilmister only along the designated walkways...

2. Development

2.2 Park Entry Areas

Policy (3) The following primary park entry areas will continue to serve as the main focal points for visitor activity.

- *Cannons Creek (Porirua)*

Policy (4) The following entrances are recognised as secondary park entry areas:

- *Takapu Road (Tawa)*

Policy (5) *The following potential entry areas will be considered for future development:*

- *Duck Creek (Whitby)*

3. Natural and Cultural Heritage

3.1 Landscape Management

Policy (1) *The Regional Council, in association with other relevant park landowners, will seek to recognise, manage and conserve landscapes and features which are significant to the landscape character and recreational experience of the park. These include:*

- *The grassed open hill tops (generally above the 250 metre contour).*
- *"fossil gullies' (filled with soil and associated materials from surrounding hills)*

Policy (2) *The Regional Council will promote the maintenance and enhancement of the amenity and intrinsic values of the landscape or landforms considered important to the character of the park.*

3.4 Protection and Enhancement of Indigenous Vegetation

Policy (1) *Park management will protect and enhance significant areas of indigenous vegetation. As identified in Section 8.3 of the Resource Statement, these are:*

- ***Cannons Creek***
- ***Duck Creek Bush Remnant A (part)***

3.5 Protection of Wildlife and Wildlife Habitats

Policy (2) *To prevent the isolation and fragmentation of wildlife habitats in and adjacent to the park, the Regional Council will promote linking corridors and buffer zones in and through the park.*

3.10 Geological Features

Policy (1) *Regionally or locally significant geological features identified in the park will be protected as far as practicable, and interpretation provided where necessary. These features are:*

- ***Peneplain remnants...Cannons Head (390m)****...*
- ***Fault related:...fault zones (e.g. Duck Creek, Takapu Valley)***

Battle Hill Farm Forest and Belmont Regional Parks – Sustainable Management Plans

12.1.48. Consultation with Greater Wellington Regional Council representatives involved discussions regarding the future development and use of both Regional Parks as a result of the Project. Following these discussion the partially completed sustainable management plans for Battle Hill Farm Forest and Belmont Regional Parks were provided by the Council.

12.1.49. Action plans have been prepared and consist of illustrative plans that identify future land use patterns and in the case of Battle Hill a table was provided that provided details for the areas identified for future planting.

12.1.50. The Council's general sentiment was that they would like to see future landscape treatment, planting in particular, to be consistent and/ or complimentary to the types of treatments outlined in the sustainable management plans.

12.1.51. The proposed landscape plans attached to the AEE as LA01 to LA21 denote those areas within Battle Hill Farm Forest Park that are to be planted and the proposed riparian and woodland planting proposed is consistent with the details provided in the Action Plan table. Whilst the plan for Belmont Regional Park does not contain the same level of detail as Battle Hill, conversations with the Council would suggest that the proposed riparian vegetation and largely pastoral treatment is entirely consistent with the Council's desire to retire/ stabilise gullies and continue grazing on the spurs and slopes of the lower park, adjacent to Duck Creek.

Porirua Development Framework

12.1.52. The document establishes a framework to guide future development of Porirua City on principles of sustainable development and good urban design.

12.1.53. Objectives relevant to this assessment include:

12.1.54. 5.6 Environmentally Sustainable

12.1.55. 5.6.5 Significant and defining landscapes must be identified and managed.

12.1.56. 6.7 Environment

12.1.57. Objective 15: Ensure the natural environment is sustainably managed, which includes:

- *Indigenous biodiversity is protected through effective management, which includes the protection of indigenous vegetation, important ecosites and habitats for indigenous fauna.*
- *Strengthen the city's green and leafy appearance.*
- *Improve water quality in the Pauatahanui Inlet, Porirua Harbour and waterways, by ensuring effective management of sediment discharges, pollutants, excess nutrients and other contaminants. This may be achieved through explicit management and advocacy.*

- *Managing development in the coastal environment through explicit management and advocacy.*
- *Identify significant landscapes, and ensure they are appropriately managed and protected*.

12.1.58. 6.8 Planning Places

12.1.59. Objective 20: Maintain the open and natural countryside of the rural area, where appropriate.

12.1.60. The Framework contains a development framework map (page 17) that identifies areas of the District that require landscape assessment work. This work is currently being undertaken by Council. Relevant PCC staff and external consultants have been consulted to ensure that any potentially significant landscapes and features were adequately considered in the Project design and landscape mitigation.

12.1.61. The Framework also identifies potential rural residential growth areas. Those areas north and south of Lanes Flat in and around Flightys Road and Bradey Road are identified as 'Pauatahanui'and 'Judgeford' growth areas (but not including Lanes Flat).

Future Focus. A Framework for Pauatahanui Village (2009)

12.1.62. The framework was prepared by Porirua City through a community workshop process. It records detailed information on natural and particularly human history of the area and identifies heritage sites. It identifies aspects that the community values regarding the village and its setting. It also sets out a number of projects to enhance the amenity of the village.

12.1.63. The framework maps a 'village zone' which extends from the existing SH58 roundabout to Grays Road. Lanes Flat, along with the enclosing hills, is identified as part of a 'buffer zone'.

12.1.64. The document promotes the protection of that part of Lanes Flat not required for the 'Transmission Gully Motorway' as public space / reserve and as a 'filter' for Pauatahanui Inlet.

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13 APPENDIX 5C: SECTION-BY-SECTION ANALYSIS

Section 1: MacKays Crossing (000m to 3500m)

Description

13.1.1. The proposed Main Alignment will follow the existing SH1 alignment for approximately 1km south of the MacKays Crossing interchange before diverging onto a ramped embankment in order to climb into Te Puka Stream valley. The road will transition from a ramped embankment to a box cut in an alluvial terrace in the lower part of Te Puka Stream valley. A 2m high safety bund will be constructed on the outside curve of the proposed Main Alignment's northbound lanes at the point where they transition from box cut to ramped embankment, which will curtail some potential views from the road.

13.1.2. On and off-ramps will connect the new Main Alignment with the 'coastal route' (i.e. the existing SH1 alignment) the southbound carriageway passing in an underpass under the ramped embankment of the new alignment in the vicinity of the former 'Car Haulaways' yard. A cycleway between MacKays Crossing and 'Sang Sue Corner' will also be constructed parallel to new alignment's western side, separated from the road by low contouring mounds.

13.1.3. The main landform features are the coastal plain (including the wetland between SH1 and the NIMT railway and the sand dunes east of the NIMT railway) and the steep backdrop hills (the 'Tararua Foothills)'. There is a prominent terrace at the toe of the foothills immediately east of MacKays Crossing which is bounded by a former sea-cliff adjacent to SH1 (although it has been damaged by earlier road construction), and a further terrace at the base of Te Puka Stream valley. The land use in the vicinity of the route is a mix of pastoral farming and plantation forest on the backdrop hills, and horticulture, a nursery, and the former 'Car Haulaways' yard on the coastal plain. A water extraction plant is located immediately to the west of the new alignment. Queen Elizabeth Park is located west of the North Island Main Trunk (NIMT) Railway on the coastal plain.

13.1.4. The hills are classified as an 'Outstanding Natural Landscape' in the Kapiti Coast District Plan. The effects on these as an ONL are assessed separately in the main body of the report.

Landscape and Visual Effects

Biophysical Effects

13.1.5. The Project will have reasonably significant effects on landforms in this section: The earthworks will be imposed on the sharp junction between hills and coastal plain, including effects on part of the area mapped as an outstanding natural landscape. The box cut through the terrace at the entrance to Te Puka Stream valley and the ramped embankment across the junction with the adjacent coastal plain will result in alteration to relatively subtle landforms. Three streams will require culverts under the Main Alignment, and a section of Te Puka Stream will require substantial diversion. Likewise there will be clearance of natural vegetation along the margins of Te Puka Stream. Effects on vegetation and freshwater ecology are addressed in the Ecology Report.[78]

Landscape Character – Fit with Landscape

13.1.6. Whereas the existing SH1 hugs the toe of the hills around the perimeter of the coastal plan, the proposed new alignment 'cuts the corner' of the coastal plain and the ramped embankment will be more imposing. At the same time the area is already modified by the existing SH1 coastal route and the NIMT railway. The former sea-cliff on the edge of the coastal plain has already been modified by the existing SH1 and will not be further impacted on.

13.1.7. The historic relationship between the former WWII Marine Corps camp sites and the transport routes which bisected them (SH1 and the NIMT railway) will remain intact. The Main Alignment will pass close to an historic circular brick structure associated with the camps which is built into the side of the terrace at the entrance to Te Puka Stream valley. The structure was built to contain a fuel tank. It was located in the valley away from the camps and excavated into the terrace apparently for camouflage reasons and to mitigate any explosion. The Main Alignment was shifted so the structure can be retained. Although the road will be very close it will be in box cut in the terrace behind the structure, so that it will be screened from the structure which opens in the opposite direction to Te Puka Stream.

[78] Technical Report 11: Ecological Impact Assessment

Visual Effects from Surrounding Areas

13.1.8. There are some 8 dwellings within 200m of this section of the Main Alignment:

i) Two houses and farm properties are located in the area between the proposed Main Alignment embankment and the hills. Both dwellings are oriented north toward the alignment. Established vegetation partially screens views. The existing road which passes close in front of these houses will be moved further away, and SH1 with its considerable traffic volumes will be moved still further away to the new Main Alignment. The outlook from these houses will be toward the new embankment which will partially truncate views to the north-west although these views are largely obscured by existing vegetation. The degree of effect is considered 'moderate'. Planting on the new embankments will screen the road and mitigate the visual effects.

ii) There will be visual effects on two other dwellings west of the proposed new alignment. Both dwellings are oriented away and there is established vegetation screening views to the south and east toward the proposed route. Dwelling No 257 will be approximately 130m from the proposed Main Alignment. While an established pine plantation separates the house and proposed alignment, it will be potentially dominated by the new ramped embankment.

iii) In addition there are 4 houses located on the hill slopes to the east overlooking the route. The houses are nestled within exotic and native vegetation which will partially screen foreground views of the road. The houses are built to enjoy views across the coastal plain to the sea, so that the proposed alignment will be part of a broader panorama.

13.1.9. Potential views of the Project from the wider area include those from residential properties and public places at the north end of Paekakariki. Most views from this area will be screened by intervening topography and vegetation. There are some views toward the lower Te Puka Stream valley from the public walkway adjacent to the Paekakariki Camp Ground. The project will have some effect on amenity from this area, although from a distance of approximately 700m, and viewed across the intervening railway and existing road. Given the steep, narrow and curving nature of the Te Puka Stream valley, views from the wider landscape will be confined to relatively few places. The Project will not be visually dominant relative to the bold hills framing the valley.

13.1.10. Overall the amenity for motorists who choose to follow the coastal route through Paekakariki will improve. On the one hand motorists will have to negotiate an interchange with its attendant under-pass, embankments, lighting and signage - although the area is already modified by the existing MacKays Crossing interchange. These effects will be offset by the sense of leaving the main State Highway 1 for what will seem a somewhat more local and picturesque alternative route.

Experience from the proposed Road

13.1.11. *Southbound:* There will be a sudden transition from the flat open coastal plain to the steep confined Te Puka Stream valley, forming one of the route's landmarks and natural milestones. It will contrast sharply with the coastal plain of Kapiti Coast, Horowhenua and Manawatu to the north, and form a 'gateway' to the steep hills of the Wellington region.

13.1.12. *Northbound:* Similarly in a northbound direction there will be a dramatic transition from the steep descent within the narrowly confined Te Puka Stream valley (i.e. 'Transmission Gully') to the coastal plain, forming a memorable gateway to the Kapiti Coast. There will be glimpses of the sea and coastal plain as one descends the valley, and the embankment will also provide elevated views to Kapiti Island. However the traffic safety bund will curtail some potential views.

Effects of transmission line relocation

13.1.13. Only one tower will be relocated in this section with tower 2A shifting 20m east of its current position. The replacement tower will be 33m high, approximately 10m higher than the current tower. However the location is confined within the valley and is overshadowed by hills on both sides. Adverse effects of the changes to the existing transmission line in this section will be minor.

13.1.14. The line will be prominent from the proposed highway, particularly tower 2A which will be in the centre of a 'viewshaft' on the outside of a bend in the highway. As discussed above, such effects are an inevitable consequence of alignment the proposed highway along the valleys occupied by the existing transmission line.

Mitigation

13.1.15. Recommended mitigation in this section includes:

i) Planting of fill embankments to soften their overall appearance including trees on the south facing embankment to screen the road from adjacent houses;

ii) Planting of fill embankments and medians between the main alignment and on/off ramps to enhance amenity for road users;

iii) Planting between the pedestrian/ cycleway and the northbound on-ramp to enhance amenity for path users.

Section 2: Wainui Saddle (3500m to 6500m)

Description

13.1.16. The proposed Main Alignment will be benched on the west sides of Te Puka Stream valley and the head of the upper Horokiri Stream valley, with a box cut through the Wainui saddle.

13.1.17. The Main Alignment will be increased to 3 lanes in each direction to provide additional crawler lanes because of the long steep grade (8 %).

13.1.18. The valley is narrow and steep sided. The Project will require side cuts in the spurs on the uphill side of the road with some 9 major cuttings approximately 55m – 65m in height. Similarly the downhill side will comprise steep mechanically stabilised earth (MSE) fill batters with a slope of 45^{o} and which will extend to the valley floor, in a number of places encroaching over the bed of Te Puka and upper Horokiri Streams. In Te Puka Stream valley the MSE batters will extend for nearly 2km and up to a maximum height of approximately 45m. The Wainui Saddle itself will comprise a box cut with batters approximately 25m high.

13.1.19. The land use comprises rough pasture with areas of regenerating tauhinu scrubland, with some patches of remnant kohekohe bush and indigenous riparian vegetation along the stream banks. The steep hillsides are also characterised by small debris screes of loose greywacke. Although it comprises mostly modified vegetation cover the area has a relatively high natural character because of the bold natural landforms and the absence of human structures apart from the 110 kV transmission line (from which 'Transmission Gully' takes its name) and the parallel farm track.

Landscape and Visual Effects

Biophysical Effects

13.1.20. The most significant biophysical landscape effects of the Project will occur in this section of the route, mainly through the widespread modification required to Te Puka Stream and parts of the upper Horokiri Stream, and through partial clearance of a remnant stand of bush north of the Wainui Saddle. The constraints imposed by the topography mean that Te Puka Stream will be covered during construction of the Project and subsequently reconstructed adjacent to the toe of the fill batters. In other words the stream will be fundamentally disrupted during construction. The re-constructed stream will be straightened, thereby steepening its course and reducing the extent of small meanders. The lower west side of the valley will be completely modified. The works will require clearance of part of an area of remnant kohekohe bush.

13.1.21. The biophysical landscape effects on the stream will be remedied to an extent by plans to reconstruct the stream course in a naturalistic manner that restores natural values (as described in the Ecology report). The effects will be offset by the proposal to retire the hill faces on the west side of Te Puka Stream and east side of the upper Horokiri Stream to enable regeneration of natural vegetation, and proposed riparian planting of the tributaries and other enrichment planting in these areas.

13.1.22. The freshwater ecology and natural vegetation effects, and the proposed stream reconstruction, are addressed in the range of ecology and hydrology Reports.[79] [80] [81]

13.1.23. The proposed alignment on the west side of the valley is preferable in landscape terms to the alternative alignment provided for by the existing (1997) designation on the opposite side of the valley. The alternative route on the east side of the valley would have resulted in a greater clearance of natural vegetation and would have cut across tributary streams serving much larger and more significant catchments. By contrast the western side of the valley has very short and mostly ephemeral tributary watercourses, and is mostly rough pasture.

[79] Technical Report 11: Ecological Impact Assessment, Boffa Miskell, 2010

[80] Technical Report 15: Construction Erosion and Sediment Control, SKM, 2010

[81] Technical Report 14: Stormwater Management Devices, SkM, 2010

13.1.24. An alternative design using viaducts and half viaducts, which was explored in earlier plans, would have been preferable in landscape terms. However the proposed design using MSE fill embankments is preferred for route security reasons.

Aesthetic and Perceptual

13.1.25. The road itself will fundamentally change the landscape character by introducing a large scale road within a relatively natural landscape.

13.1.26. The cut batters will be particularly high. To some extent their steepness and height will echo the existing steep hill faces on the west side of the valley which typically have slopes of between 1V:3H and 1V:4H. However they will clearly be human elements and the required benching will detract from their appearance.

13.1.27. The visual effects of benching will be mitigated as far as possible by several techniques:

i) use of horizontal benches which are considered aesthetically preferable compared with the alternative benching parallel with the carriageway,

ii) increasing the height of the lowest batters nearest the road to 15m from the standard 10m,

iii) extending the top batters into the adjacent slope, using a slightly shallower batter slope to avoid benches near the top of the batters,

iv) rounding the edges of the benches, and the side and top edges of the batters, to visually soften the earthworks and reduce frittering, and

v) promoting re-vegetation of batters by techniques including hydro-seed and hydro-moss application. An initial cover will be established, followed by native shrub species.

13.1.28. The fill batters will likewise be high and long. However the MSE construction method means they will appear different from fill batters typically found on highways. The MSE batters will be twice as steep as typical fill batters (IV:1H compared with 1V:2H) and will not be benched. The faces will be re-grassed using hydro-seed techniques. The batters will appear green, 'engineered' and relatively sculptural. Their steepness will contribute to the impression of the alignment being 'shoe-horned' into the valley.

Visual Effects from Surrounding Areas

13.1.29. Apart from future road users, this section of the route has low visibility: The surrounding valley is low intensity pasture and forest and contains no dwellings.

13.1.30. There are some long distance views of the Wainui Saddle from the south, for instance from some locations on the hills east of Whitby. There will also be views along the valley from some places in the coastal plain, although from acute angles. However any visual effects from such distances would be very low.

Experience from the Road

13.1.31. This section will provide a dramatic experience because of its steep grades, rugged topography, and degree of enclosure within the valley: The alignment will appear shoe-horned into the valley, with steep hillsides high above the road, over-steepened batters on the downhill side, and the reconstructed Te Puka Stream squeezed parallel with the road.

13.1.32. Other sections of State Highway in New Zealand are similarly 'shoe-horned' into narrow valleys, such as the Manawatu Gorge (SH3) and the Otira Gorge (SH73), and such places provide positive experiences for road users. The main difference from such examples, though, is that the proposed Main Alignment will have a larger scale including its four to six lanes (plus brake check areas).

13.1.33. Wainui Saddle itself will be a landmark at the apex of the route. Views will open up from the saddle down the Horokiri Stream valley in a southbound direction, while there will be views down the valley over the Kapiti Coast and Tasman Sea in a northbound direction.

13.1.34. The extent of the batters will detract from visual amenity of the route to some extent, giving it a hard engineered appearance.

Effects of transmission line relocation

13.1.35. The most significant change to the existing transmission line alignment will be through the Wainui Saddle area, where three strain towers (9A, 10A, 11A) will be relocated to spurs above the saddle, and heavier angle towers will be required for towers 8A and 12A. The deviation is required because of the space constraints within the saddle

imposed by the saddle's narrowness and steep sides, and the native bush on the eastern slopes.

13.1.36. Within its immediate environs the Wainui Saddle deviation will be more obtrusive than the existing alignment. It will be higher on the hills, will contain sharp horizontal and vertical angles, and two of the towers (9A & 10A) will be visible on the skyline from parts of the coastal plain in Kapiti Coast District. However the potential effects will be reduced for the following reasons:

i) The towers visible will be a long way inland from the coastal plain, for instance greater than 4km from Queen Elizabeth Park / MacKays Crossing area. Lattice towers tend to fade in prominence relatively quickly at such a distance.

ii) The landscape effects of earthworks will be limited because access will be provided by the existing gas pipeline road along the main ridge. Tracks will be constructed down spurs from the main ridge, in some places following existing farm tracks. No clearance of native vegetation will be required.

iii) Apart from towers in the by-pass deviation, the remainder of this section will mostly have a backdrop of hills.

13.1.37. The line will also be prominent from the proposed highway, although the deviation will remove the line from the landmark location at the Wainui Saddle itself.

13.1.38. In summary there will be moderate landscape effects resulting from the transmission line bypass deviation around the Wainui Saddle.

Mitigation

13.1.39. Recommended landscape mitigation in this section includes:

i) Retiring the western hill face in Te Puka Stream valley and the eastern face in the upper Horokiri Stream to enable regeneration of indigenous vegetation, together with restoration of riparian vegetation on tributary streams and other enrichment planting,

ii) Applying the specific measures to cut batters outlined above,

iii) Reconstructing Te Puka Stream and parts of the upper Horokiri Stream as outlined in the Ecology Report, and restoring riparian vegetation along both streams,

iv) Vegetating the continuous MSE walls fill batter as a sculptural 'green wall'.

Section 3: Horokiri Stream (6500m to 9500m)

Description

13.1.40. This section of the route is similar in nature to the Section 2 above, but the topography is somewhat less constricted, the Main Alignment will revert to two lanes in either direction (there are no crawler lanes as in Te Puka Stream valley), and the size of the cut and fill batters will be reduced. The western side of the valley comprises rough pasture and (more extensive) regenerating tauhinu scrubland, while the eastern side comprises patches of remnant bush, and extensive plantation forest.

13.1.41. Between 6500m and 8500m the alignment will be benched on the west side of the valley with a sequence of side cuts on the uphill side, and extensive fill batters on the downhill side. The cut batters will be typically up to 25m – 35m high, with the exception of one batter up to 65m (at 7000m). The fill batters will be up to approximately 25m high, will use MSE wall construction (as in Te Puka Stream) with batter slopes of 1V:1H.The Main Alignment will be largely benched on the hill face.

13.1.42. Between 8500m and 9500m the Main Alignment crosses to the east side of the Horokiri Stream valley and descends onto a narrow flood plain. A bridge (8540m) will be used to cross the stream but there are three short sections of stream diversion required downstream of the bridge where fill batters encroach into loops of the stream. There are two side cut batters up to 30m – 35m high on the east side of the valley. In other respects the earthworks in this section are comparatively small.

Landscape and Visual Effects

Biophysical Effects

13.1.43. The biophysical landscape effects will be moderate: While there will be extensive earthworks, the works will follow the topography, and the landforms are robust and do not have any particular significance. Vegetation clearance will be limited to regenerating tauhinu scrubland, which will be rehabilitated following construction. The most significant potential effects will be on the Horokiri Stream as a result of the bridge and diversions, but these are limited in extent and for the most part the alignment

avoids encroaching on the stream. Effects on the stream are addressed principally in the Ecology and Hydrology[82] reports.

Aesthetic and Perceptual

13.1.44. As with the previous section (Section 2, Te Puka Stream), the proposed road will result in a fundamental change to the existing character by introducing a large scale road into a relatively natural landscape. Such effects will be moderated to an extent by the existing transmission line and productive land use.

13.1.45. The cut and fill batters will have significant visual effects, although less than the previous section because of their smaller size and potential to avoid multiple benches:

i) With the exception of the 65m batter at 7000m (at the north end of the section) it should be possible to limit each cut batter to a single bench. Although a number of the batters are 30m-35m high which would normally require two benches, the upper bench might be avoided by laying the top batter back at a slightly less steep angle and feathering the edges into the slope. Other mitigation measures for the cut batters are described above for Section 2 of the route.

ii) Likewise the fill batters will be less prominent compared with Section 2 because they are not continuous and for the most part they do not extend to the valley floor. Instead they will be a sequence of separate batters contained between shallow spurs.

Visual Effects from Surrounding Areas

13.1.46. This section of the route also has low visibility, the surrounding valley being rural land which is low intensity pasture and forest.[83]

13.1.47. There is a consented 7-lot subdivision located to the west of the alignment. No dwellings have yet been built. Although building locations are not fixed by the consent, five (5) indicative building platforms were included on the subdivision layout plan.

13.1.48. Three are located on slopes west of the proposed Main Alignment with views to the Akatarawa Range. The road will be lower in the valley than the dwellings in the

[82] Technical Report 14: Assessment of Hydrology and Stormwater Effects and Technical Report 15: Assessment of Water Quality Effects.

[83] There are some longer distance views of this section of the route from viewpoints within Battle Hill Farm Forest Park, for instance from 'Gas Line Ridge'. However a spur at approximately 8000m will screen views of much of Section 3. From such viewpoints Section 4 of the route would be the dominant feature and is addressed in the next section of the report.

middleground views. Views will be essentially restricted to approximately 700m of the Main Alignment between chainages 9200 – 9900m. [84] A road constructed on the existing 1997 designation would have been higher on the hillside opposite the subdivision and would have had greater visual effects. The effects are considered 'low'.

Experience from the Road

13.1.49. This section of the route will be less dramatic, but more picturesque, compared with Te Puka Stream valley. The alignment sits more lightly within the terrain, and follows an attractive curving alignment changing from one side of the valley to the other.

Effects of transmission line relocation

13.1.50. Six of the nine towers (16A, 17A, 18A, 22A, 24A and 25A) within this section will be replaced with new towers higher on the hill slope east of the existing alignment. Some towers will be taller and heavier, and some further earthworks will be required to create access and tower platforms. Three of the towers (19, 20 and 21) will remain on the existing alignment, and one tower (23) will be removed. The most significant change will be tower 24 which will be a 33m strain tower on a spur some 40m higher than the existing tower location and 100m to the east.

13.1.51. Overall the proposed changes will have minor adverse effects compared with the present line. While some towers will be taller, heavier, and at a higher elevation, the majority of changes in alignment are relatively small, there will be one less tower, and the proposed alignment is fairly linear.

13.1.52. While the line will be prominent from the proposed highway, the realignment means that road crossings are avoided, and the line will be seen against a hill backdrop.

Mitigation

13.1.53. Recommended landscape mitigation in this section includes:

i) Applying the specific measures to cut batters listed above to reduce the numbers of benches, and otherwise applying the general measures devised for all cut batters;

[84] There will be distant views of the road to the south within Section 5.

ii) Retiring the eastern hill face in the upper Horokiri Stream valley to enable regeneration of indigenous vegetation, and carrying out restoration of riparian vegetation and enrichment planting (as described in the Ecology Report),

iii) Revegetation of Horokiri Stream margins between 6500m and 8700m which includes the three short diversions. (see Ecology Report).

Section 4: Battle Hill (9500m to 12500m)

Description

13.1.54. **9500m to 11500m**. This section of alignment follows the valley floor parallel to Horokiri Stream through Battle Hill Farm Forest Park. The alignment re-crosses to the west side of the valley and follows the edge of a small alluvial flood plain at the base of a low rolling hill referred to as 'Gas Line Ridge'. The stream crossing is by means of a bridge. The alignment will be slightly built up above the floodplain. There are two side cuts: one up to 35m high into the side of a distinctive small hill (the north end of Gas Line Ridge) at 10000m, and the other approximately 25m high into rolling hill face further south at 11000m. There is a box cut approximately 15m-25m deep through the ridge at the southern end of the Park at 11500m, in the vicinity of the Dwelling No 355.[85]

13.1.55. This part of the route traverses part of the Battle Hill Farm Forest Park. It has relatively high quality pasture (compared to Sections 2 & 3), rolling topography, and a somewhat manicured appearance. There is some hay cropping on the alluvial terraces with some riparian vegetation along the stream banks. The backdrop hills east of the stream are clothed in a very extensive pine plantation (Akatarawa Forest) part of which is incorporated into the Regional Park.

13.1.56. **11500 to 12500**. South of Dwelling No 355 the road follows the edge between rolling hills to the west and steeper hills to the east. The Main Alignment is benched around the base of the steeper hills with several side cuts up to 15m to 35m high. It re-crosses the Horokiri Stream for the third time at 11750, a short distance south of Dwelling No 355, this time by means of a bridge.

13.1.57. The land west of the Main Alignment comprises small farms and lifestyle properties with mostly pastoral land uses, while the steeper land to the east is part of the extensive Akatarawa Forest pine plantation.

[85] Property owned by NZTA

Landscape and Visual Effects

Biophysical Effects

13.1.58. The effects on natural components of the landscape will be relatively low: The alignment is within pasture so there is no vegetation clearance of any significance, and the alignment follows the topography –although there are some relatively large side cuts and one large cutting. The main potential biophysical effects will be the two crossings of the Horokiri Stream, although both crossings will be by means of a bridge rather than culvert. Effects on the stream are addressed in the Ecology report.

Aesthetic and Perceptual

13.1.59. As with the sections to the north, the proposed road will result in a fundamental change to the existing character by introducing a major road into a reasonably natural rural landscape. However, the area has more obvious human management patterns compared with the wilder and more natural character of the upper Horokiri and Te Puka Stream valleys.

13.1.60. The cut and fill batters will have significant visual effects, but it should be possible to limit each cut batter to a single bench, with the possible exception of the batter on the side of Gas Line Ridge (10000m). The latter cut will have relatively high visual amenity effects because of its height and because the reasonably distinctive knoll is a localised landmark within the valley. The alignment was fine-tuned to minimise such effects as far as possible the alignment cannot be shifted further east without encroaching into Horokiri Stream. It is recommended that detail design explore means to further soften the earthworks by reducing the slope at the top of the batter in order to avoid the need for a top bench and to round the batter into the adjacent knoll.

13.1.61. A number of the other batters are approximately 30m high which would normally require two benches, but the upper bench can be avoided by laying the top batter back at a slightly less steep angle and feathering the edges into the slopes.

Visual Effects from Surrounding Areas

13.1.62. This section of the route has a reasonably high public visibility because it traverses Battle Hill Farm Forest Park. The Main Alignment will be screened by an intervening ridge (Gas Line Ridge) from the Park headquarters, visitor facilities, and nearby heavily used picnic areas and farmland. Gas Line Ridge will also screen the Main Alignment from most of

the shared paths that traverse the park.[86] The main exceptions are 'Restoration Trail', part of which traverses Gas Line Ridge with views over the Horokiri Stream valley and the Main Alignment, and the Transmission Gully – Puketiro Loop which crosses the Horokiri Stream and enters the pine forest east of the stream. Access will be maintained under the Main Alignment by way of an underpass. The Project will obviously impact on that part of the park within the Horokiri Stream valley, compromising its quiet rural character and sense of remoteness. Views are almost entirely screened from sections of the Transmission Gully – Puketiro Loop track within pine plantation, although users will be aware of the road's presence if only from its noise.

13.1.63. There are no dwellings in this section north of 11750m, but some 11 dwellings between 11750m and 12500m. The effects from 1 dwelling was assessed as 'very high', 1 dwelling was assessed as falling in the 'high' category, and from 4 as falling in the 'moderate' category. The alignment is 'behind' most of these dwellings in the sense that they are accessed from, and tend to be located closer to, Paekakariki Hill Road. The alignment is at the toe of steeper hills to the east which are clothed in pine plantation and extensive pasture. The alignment is also within box cut for much of the distance in the vicinity of these properties, which will reduce the prominence and visibility of the road itself. The most prominent elements are likely to be the upper faces of the cut batters on the east side of the alignment.

Experience from the Road

13.1.64. In contrast to Sections 2 and 3, this section of the route will be almost flat and traverse a relatively manicured rural landscape. It will follow a picturesque curvilinear alignment parallel with the Horokiri Stream and include two further crossings of the stream in addition to the crossing in Section 3 of the route.

13.1.65. ***Southbound:*** Gas Line Ridge will be a local landmark which the road will swing around. The cutting into the side of the hill will be prominent and will detract from the amenity of the route to a small extent. Measures to mitigate this are discussed above.

13.1.66. ***Northbound:*** North of Gas Line Ridge important views will be revealed of the alignment snaking up the Horokiri Stream valley toward the Wainui Saddle, including the prominent earthworks associated with the steeper section of the route.

[86] Recreational use of parts of the park is restricted at times, particularly during lambing.

Effects of Transmission Line Relocation

13.1.67. There will be little change, and only minor effects, to most of this section of line with the exception of the realignment between towers 31A – 33A. Towers 31A and 33A will be replaced with heavier angle towers and tower 32A will be relocated approximately 80m to the east and at 20m higher elevation compared to the existing tower, introducing an angle in the alignment. There will be moderate landscape / visual effects associated with this short section of the realignment.

13.1.68. The line will be prominent from the proposed highway, with the most prominent towers being 31A – 33A. Planting is proposed on the flanks of cut batters to reduce prominence and mitigate such effects.

Mitigation

13.1.69. Recommended mitigation along this section of the route includes:

i) Fine-tuning the batter design on Gas Line Ridge in order to eliminate the need for the top bench, and to round the batter into the adjacent landform, and to maximise the proportion of the batter that can be restored to pasture grass.

ii) Fine-tuning all the batter design and carrying out the general batter mitigation measures discussed earlier.

iii) Providing access under the alignment for the Transmission Gully – Puketiro Loop trail in Battle Hill Farm Forest Park, and planting along the trail approaches to soften the road's prominence.

iv) Carrying out riparian restoration planting along Horokiri Stream consistent in composition and location with planting proposed in the 'Battle Hill Sustainable Management Plan (Action Plan)'.

v) Using low bunds and overfilling the batters of the short embankments between 12000m and 12500m (and also to the south in Section 5 of the route) in order to further reduce prominence of the carriageway and traffic from adjacent farm properties.

vi) Strategic planting of exotic rural trees to screen or soften views of the alignment from houses between 11700m and 12500m and for recreational users.

Section 5: Golf Course (12500m to 15500m)

Description

13.1.70. This section continues to traverse rolling topography with a backdrop of steeper hills to the east. The earthworks typically comprise a sequence of box cuts and embankments through the rolling terrain. Two of the cut batters near 12600m are approximately 20m and 30m high respectively, while for the remainder of the section they are less than 15m high therefore avoiding the need for benching.

13.1.71. The area comprises small farms and lifestyle properties, mainly in pastoral land use with exotic shelter belts and woodlots and some areas of regenerating scrubland. There is a larger pine plantation on hills west of Ration Stream (west of the alignment). There is a corridor of remnant natural vegetation along part of the Ration Stream headwaters (13500m) and an adjacent area that has had restoration planting implemented as a condition of the existing designation (13700m). The route traverses one end of the Pauatahanui Golf Course. The backdrop hills to the east are clothed in large scale plantation forestry (Akatarawa Forest) with lifestyle properties on the lower slopes.

Landscape and Visual Effects

Biophysical Effects

13.1.72. The main effects on natural components of the landscape effects will result from changes to landforms and changes to streams from the frequent culverts and associated diversions. However the complex rolling topography means the landforms have no particular significance, and the watercourses are typically small.

13.1.73. Effects on natural vegetation will be limited because the area is mostly modified farmland with exotic vegetation. However some clearance of the restoration planting that has already been carried out will be unavoidable because the planting was carried out across the full width of the existing designation. This will be remedied by a greater extent of restoration planting to be carried out following construction with the intention of reinforcing and extending the natural corridor along the stream for both biophysical and aesthetic reasons.

Aesthetic and Perceptual

13.1.74. While there will be a fundamental change to the existing character as a consequence of constructing a major road on a green-field alignment, a number of factors mean the road can be readily accommodated within the landscape.

i) The rolling topography and sequence of box cuts will reduce the extent of road visible from any one location and means the road will appear embedded in the terrain.

ii) The extent of shelter belts and small plantations will also reduce the road's prominence and visibility.

iii) The landscape is more modified compared to sections 2-4 and sections 7-8 of the route, with complex patterns of land use that can more readily absorb such a feature.

iv) The alignment is approximately mid-way between Paekakariki Hill Road and Flightys Road and generally follows 'rear' boundaries of properties accessed from either road. An exception is those properties located on a private right of way at the end of Flightys Road.

v) The topography restricts wider visibility -for instance hills prevent views from Paekakariki Hill Road to the west.

Visual Effects from Surrounding Areas

13.1.75. While this section of the route has low public visibility, there will be significant effects on the adjoining farms and lifestyle properties. The area has a reasonably close pattern of rural settlement which increases the number of potentially affected properties.

13.1.76. The assessment tabulated in **Appendix 5D** estimates that the effects on 2 dwellings will be in the 'high' category and 1 dwelling in the 'moderate' category. In addition there will be adverse effects from the farmland on such properties. However such effects will be moderated by a number of factors:

i) The rolling topography means that views of the road will typically be restricted to short sections from each property. For instance a typical view will be of an embankment across a small valley between two box cuts, although this is not universal as the section of road between 13400 and 14000 is either on embankment or side-cut which will be visible from properties on the higher land to the east (at the end of Flightys Road).

ii) The degree of shelter planting, private woodlots and amenity planting also restricts views.

iii) In recent years houses will have been built in anticipation of a 'highway' on the existing designation (which the proposed alignment closely follows through this area) and it appears that such houses have been located in a way that reduces potential visual effects.

13.1.77. There will be moderate visual amenity effects on the golf course. The Main Alignment encroaches across the eastern end of the course and is likely to require adjustments to the course layout. The road will be elevated on an embankment, although also partly concealed behind ridges north and south of the course. In other words the road will be prominent, but also visually anchored within the topography. The road will be more visible from the club house, which is elevated on the hill at the opposite (west) end of the course, than from much of the golf course itself because of the extent to which trees in the course restrict views. Views at the golf course's eastern end could be mitigated by planting large trees similar to those elsewhere on the course between the course and the road.

Experience from the Road

13.1.78. This section of the route will comprise a reasonably attractive but unremarkable rural landscape. It will contrast with sections of the route further north and south because of the more complex topography and rural settlement patterns.

13.1.79. Views of the immediate surroundings will typically be fleeting because of the topography and planting, and views along the road will unfold continuously because of the curvilinear alignment and sequence of cuts and embankments. The backdrop hills to the east and north will provide a slower changing visual reference. The two relatively high batters in the vicinity of 12500m are part of a sequence that straddles the boundary with Section 4 of the route to the north. They are on the inside of a curve where the alignment skirts the base of steeper hill slopes. It is recommended that these earthworks be fine-tuned to avoid the need for the top benches, thereby restricting them to a single bench.

13.1.80. With those two exceptions, the cut batters in this section will not require benching so that they will appear less obtrusive. The gentler topography also provides opportunities

to use gentler slopes in some places for both cut and fill batters[87] with the intention that the earthworks merge more readily with the terrain.

Effects of transmission line relocation

13.1.81. There will be relatively small changes to this section of line. It will be relatively straight, and for the most part will follow the base of a backdrop hill. Any effects on the existing environment of changes to this section of the transmission line will be minor. The changes are small, and significant earthworks are unlikely given the gently rolling terrain.

13.1.82. The exception will be two houses located east of proposed tower 40A[88] where the increased elevation and tower height mean approximately the top one-third of the tower will be seen above the skyline[89] resulting in moderate visual effects.

Mitigation

13.1.83. Recommended landscape mitigation along this section of the route includes:

i) Fine-tuning the batter designs in the vicinity of 12500m in order to avoid the top benches, and carrying out the generic mitigation measures for batters discussed earlier.

ii) Using low bunds and overfilling batters on the embankments in order to further reduce prominence of the carriageway and traffic from adjacent properties.

iii) Restoration of riparian vegetation within the designation of some of the small streams, in order to soften the appearance of culverts and associated debris screen and access tracks, to reinforce the natural watercourse patterns perpendicular to the road. Such riparian restoration is also likely to have benefit in terms of ecology and water quality.

iv) Carrying out strategic planting of exotic rural trees within the designation to screen or soften views of the alignment from houses particularly in the vicinity of the northern end of Flightys Road. Such groups will be most effective planting on low ridges adjacent to box cuts, and should be planting on both sides of such cuts to reduce visibility of the batters and reinforce natural landscape patterns perpendicular to the road.

[87] In other words 'over-filling' or 'over-cutting'
[88] 247c and 317 Flightys Road.
[89] The current tower does not 'cut' the skyline.

Section 6: SH58 (15500m to 18500m)

13.1.84. Section 6 is most usefully assessed in two parts:

15500 to 17000: (North of SH58 Interchange)

Description

13.1.85. The stretch of the route between 15500m and 17000m continues the patterns of Section 5 above: The landscape has a similar rolling topography, and the Main Alignment follows a sweeping curvilinear path through rolling topography, with a sequence of box cuts and embankments. All of the cuts are less than 15m high and therefore do not require benching.

13.1.86. The landscape continues the pattern of small farms and lifestyle properties with exotic shelter belts, small pine plantations, and some areas of former pasture now regenerating into scrub.

Landscape and Visual Effects

Biophysical Effects

13.1.87. As with Section 5, the main effects on natural components of the landscape will result from culverts and associated stream diversions; although in this section of the route most of the watercourses traversed are small, heavily modified and near the heads of their catchments. Nevertheless, the tributaries flow into Ration Stream and Pauatahanui Inlet. Effects on freshwater and terrestrial ecology are addressed in more detail in the ecology and hydrology reports.

13.1.88. The rolling landforms have no particular significance. Likewise, effects on natural vegetation will be limited because the area is mostly modified farmland with exotic pasture and trees.

Aesthetic and Perceptual

13.1.89. While the proposed road will introduce a fundamental change to the existing character, the area (as with Section 5) is a modified and relatively complex landscape with reasonably high capacity to absorb the road. The alignment will appear embedded in the rolling terrain in the series of box cuts and embankments, and the extent of shelter belts and trees will further reduce visibility and integrate the road. The alignment also

generally follows 'rear' boundaries of those properties accessed from Paekakariki Hill Road, Flightys Road and SH58 respectively.

Visual Effects from Surrounding Areas

13.1.90. Similarly, this part of the route will have low visibility beyond adjoining farms and lifestyle properties, although there will be some longer distance views from elevated places to the south, such as parts of the Silverwood subdivision in Whitby.

13.1.91. There will be adverse effects from farmland and dwellings on properties in the vicinity of the proposed Main Alignment. Such effects will be moderated by the rolling topography and existing shelter planting which will reduce the extent of the road visible in any particular view, and the fact that in recent years houses will have been built in anticipation of a major road being constructed on the existing designation. In many cases it appears that new houses have been situated in a way that reduces potential visual effects of the alignment by orientation or by using local landform or vegetation to provide screening.

13.1.92. The assessment tabulated in **Appendix 5D** estimates that the adverse visual amenity effects will be 'low' on two existing dwellings on properties adjoining the Main Alignment. However, there are several properties that have not been assessed due to not having access.

13.1.93. There is also a consented 2-lot subdivision located on hill slopes west of the proposed road. Fixed building locations are not part of the consent, but 2 indicative building platforms were shown on the subdivision layout plan. There will be views from such locations over the proposed road, but the road will be at a lower elevation, embedded in a sequence of cuts and embankments, and further softened by existing vegetation. In this location the proposed alignment is similar to that of the existing 1997 designation. The visual effects are considered to be 'low'.

Experience from the Road

13.1.94. Similarly, future users will experience a reasonably attractive, if unremarkable, rural landscape. Views will typically be continually unfolding because of the sequence of box cuts and embankments, vegetation, and curvilinear alignment. The cut batters on this part of the route are less than 15m high so no benching is required, which will improve visual amenity from the road.

Effects of transmission line relocation

13.1.95. Changes to this section of the existing transmission line will be very small. One tower will increase in height and one other will be strengthened. Any adverse effects will be negligible.

13.1.96. This section of the transmission line will not be prominent from the proposed highway because of distance separation, rolling terrain and the extent to which the highway will be in cut.

Mitigation

13.1.97. Proposed mitigation along this section of the route includes:

i) Using low bunds and overfilling batters on the embankments in order to further reduce prominence of the carriageway and traffic from adjacent properties.

ii) Revegetation of cut and fill batters with indigenous species.

iii) Restoration of riparian vegetation within the designation of some of the small streams, in order to soften the appearance of culverts and associated debris screen and access tracks, to reinforce the natural watercourse patterns perpendicular to the road. Such riparian restoration is also likely to have benefit in terms of ecology and water quality.

iv) Planting groups of exotic trees within the designation to soften and partially screen views from farmland and particularly dwellings. Such groups will be most effective planting on low ridges adjacent to box cuts, and should be planting on both sides of such cuts to reduce visibility of the batters and reinforce natural landscape patterns perpendicular to the road.

17000 to 18500: SH58 Interchange

Description

13.1.98. The Main Alignment will cross the Pauatahanui Stream approximately 1km inland from the head of Pauatahanui Inlet and near the head of 'Lanes Flat', a flood plain that appears to have formerly been part of the tidal inlet. The Pauatahanui Stream valley tapers to a narrow, winding valley a short distance east of the alignment.

13.1.99. The Main Alignment will cross the head of Lanes Flat on an embankment, with the SH58 interchange roundabout occupying a major portion (110m diameter) of the valley floor width at that location. Pauatahanui Stream will be bridged by the Main Alignment and by flanking on and off ramps, but the stream will nevertheless require realignment beneath the bridges. The Main Alignment will enter a small tributary valley on the south side of Lanes Flat, climbing the hill face above Bradey Road, which is a short no-exit road providing access to a cluster of lifestyle properties.

13.1.100. The Main Alignment will have three lanes in both directions between the SH58 Interchange and James Cook Interchange approximately 1km to the south. Unlike most parts of the route, this stretch between the two interchanges will also have lighting, and is likely to contain a relative concentration of signage.

13.1.101. SH58 currently traces the north side of Lanes Flat. It will be realigned to a low embankment further out into the flood plain, the area between its new alignment and existing alignment being filled in order to provide a platform for the Project's main Construction Compound. The filled area will resemble a low terrace occupying up to approximately 40% the width of the Lanes Flat flood plain at that location.

13.1.102. While this is one of the more modified landscapes traversed by the route, it is also among the more sensitive. On the one hand it is modified by the existing SH58, peri-urban activities such as the transmission substation and former garden supplies depot, lifestyle properties to the north-east and south-east, and suburban development overlooking the valley from the west. On the other hand Lanes Flat is a simple, open landform with a low ability to absorb development. It is part of the landscape context for the ecologically sensitive Pauatahanui Inlet and for the historic Pauatahanui village.

Landscape and Visual Effects

Biophysical Effects

13.1.103. With the exception of Te Puka Stream, this part of the route will result in the most significant effects on natural components of the landscape. The works will significantly modify Lanes Flat which is a relatively rare landform type in the Study Area. While Pauatahanui Stream will be bridged, the stream bed will nevertheless require realignment beneath the bridge, and the natural flooding patterns of the flood plain will

be modified. The effects on freshwater / terrestrial ecology and sedimentation / flooding are addressed in the Ecology and Hydrology reports respectively.

13.1.104. Extensive restoration work of Lanes Flat, discussed in more detail below, is recommended in order to mitigate the biophysical and visual effects.

13.1.105. Initially a large culvert was proposed in order to cross Pauatahanui Stream. The alternative bridging option is preferred. It divides the Main Alignment and the ramps into three separate bridges, thereby maintaining light access between the bridges, improving stream conditions and also improving amenity for a footpath / cycleway that is proposed beneath the bridge.

13.1.106. The works will require removal of part of an area of regenerating kanuka vegetation on the hill face on the south side of the valley, but this will be more than remedied by the proposed expansion of this vegetation type along the Main Alignment corridor between the SH58 and James Cook Interchanges.

Aesthetic and Perceptual

13.1.107. There will be significant aesthetic effects in conjunction with biophysical effects. This part of the route has high public visibility because of the openness of Lanes Flat, the presence of lifestyle and suburban areas overlooking the valley, and the intersection with SH58. The works will be prominent and discordant because the Main Alignment' will be elevated on embankment across the valley and because of Lanes Flat openness and simple form. Measures to mitigate these effects are discussed below.

13.1.108. While the storm-water ponds adjacent to the interchange will improve water quality, they will also potentially extend the visual footprint of the Project in Lanes Flat. The proposed restoration of Lanes Flat would visually absorb the ponds and remedy such potential effects.

13.1.109. The Project will have relatively low effects on Pauatahanui village itself. The village is historically oriented in the opposite direction toward Pauatahanui Inlet and around the former road junction.[90] The Main Alignment will be largely screened by the hills behind the village and by the curvature of the valley, and it is far enough inland (approximately 1km) to provide sufficient sense of separation. The one exception is that the road will isolate St Joseph's Catholic Church. This church was always an outlier, being out-of-sight

[90] Paekakariki Hill Road, Paremata Road, Haywards Road

and 1km to the east of the village, but the proposed alignment will further accentuate its separateness. The Project will also have 'moderate' effects on the amenity of the church, being some 170m from the church to the Main Alignment. Planting on the western boundary of the church property has been offered to mitigate such effects.

Visual Effects from Surrounding Areas

13.1.110. There will be significant visual effects from a small number of lifestyle properties overlooking the interchange from the north-east and south-east, and from the nearest suburban properties on the hills to the west (Silverwoods subdivision).

i) The assessment tabulated in **Appendix 5D** estimates the effects will be 'very high' from 2 dwellings on lifestyle blocks in the vicinity of the interchange. The effects were estimated as 'high' from 3 dwellings, and 'moderate' from a further 3 dwellings. The effects will be moderated to some extent by the fact that the area is not 'green-fields' but contains SH58 and other existing infrastructure. Houses tend to be surrounded by well established amenity and woodlot planting. More recent houses will also have been built in anticipation of the construction of a road along the route.

ii) The assessment tabulated in **Appendix 5D** also estimates the effects will be 'very high' from 2 properties and 'high' from several other properties on the perimeter of the Silverwood subdivision and further to the west in suburban Whitby (e.g. Young Nicks Lane; Lodestar Lane and Scoresby Grove). In general the perimeter houses in such suburban areas will tend to screen most of the Project from other houses in the subdivision. This is particularly the case for the closest parts of the Silverwood subdivision. The effects will also be moderated to some extent by the tendency of houses in this area to be oriented toward views of Pauatahanui Inlet to the north-west, rather than to the north toward the Project. The existing kanuka forest on the hill slopes below these subdivisions also helps reduce visibility (or increase the visual separation) from properties on the southern hills above Lanes Flat.

Experience from the Road

13.1.111. The SH58 Interchange will be one of the milestones for future road users. It is the lowest landscape elevation in the middle of the route, and the openness along Lanes Flat will contrast with the enclosure that characterises most of the route. There will be brief

but distinctive views across Lanes Flat toward Pauatahanui Inlet. While the water might only be glimpsed, the space occupied by the inlet and defined by the backdrop hills will be readily apparent.

13.1.112. Landscape rehabilitation measures discussed below are designed to accentuate this node, in particular to maintain open views to the west and to re-establish the connection between Pauatahanui Inlet and the restored wetland of Lanes Flat (in other words to visually draw Pauatahanui Inlet to the interchange).

Mitigation

13.1.113. Landscape measures designed to remedy and mitigate both biophysical and aesthetic effects aspects include:

i) Rehabilitating the entire Lanes Flat wetland between the Main Alignment and Pauatahanui village. The wetland will include open areas of water which will incorporate the permanent treatment devices for road runoff, and could include paths and boardwalks connecting with the pedestrian / cycle underpass at the Pauatahanui Stream bridge. It is envisaged the area could become a 'wetland park'.

ii) Restoring the riparian vegetation along Pauatahanui Stream and replanting the gaps between the stream and the kanuka forest on the southern hill face. The stream will form the boundary between wetland and regenerating bush backdrop.

iii) Planting kahikatea-dominant vegetation along the north side of the valley including (a) between the interchange and Bradey Road, (b) within the interchange roundabout, and (c) along SH58 around the perimeter of the Construction Compound.

iv) Extending the existing kanuka forest on the southern hill face above Lanes Flat along both sides of the Main Alignment up to the start of the Duck Creek (22000m). This will serve to reinforce a spatial enclosure on this section of the Main Alignment, reduce visibility of the road (and associated lights and structures) from nearby lifestyle and suburban areas, and reinforce the existing kanuka bush above the Pauatahanui Stream.

Section 7: James Cook (18500 to 21500)

Description

13.1.114. **18500 to 19500:** The Main Alignment crosses the minor ridge ('Resolution Ridge') west of Bradey Road by way of a long box cut with batters up to 25m/35m high.

13.1.115. The 'James Cook Interchange' (19000m) is on the west side of the ridge in a shallow hill-top basin. The Main Alignment passes over the dumbbell-shaped roundabouts which connect the interchange with the Link Roads. The roundabouts and ramps are within box cut on three sides (NW, NE and SE).

13.1.116. The Main Alignment is benched on the west facing hill-slope on the approaches to the interchange, and short distance below the ridge. The approaches comprise almost continuous cut batter (less than 15m high) on the uphill side and intermittent fill batters across the heads of narrow gullies on the downhill side.

13.1.117. The Main Alignment will comprise three lanes in either direction between the SH58 and James Cook Interchanges (as discussed in relation to the previous section), and will have merging lanes south of the James Cook interchange. This part of the alignment will have lighting, and there is likely to be a greater concentration of signage on the approaches to the two interchanges.

13.1.118. **19500 to 21500:** South of the James Cook interchange the Main Alignment is benched on the upper slopes between 19500 and 20500, continuing the pattern of extensive cut batters on the uphill side and more intermittent fill batters into gullies on the downhill side. There is an extensive fill batter that 'chases' the slope between the main carriageway and the Warspite Drive Link Road. The Main Alignment then transitions to a sequence of box cuts and embankments above Duck Creek, a pattern which continues in Section 8.

13.1.119. The land use along the alignment is a mosaic of rough pasture, regenerating vegetation, and areas of recently logged pine plantation. However adjacent land uses include:

i) Lifestyle properties north-east of the interchange on Bradey Road and properties further away accessed from Belmont Road,

ii) Suburban properties in Whitby to the west, and

iii) Land currently being subdivided and developed on the hill to the north-west.

Landscape and Visual Effects

Biophysical Effects

13.1.120. Effects on the landscape's natural components will be moderately low in this section: The landforms are rolling topography typical of the area and without significant features. The area has been modified by earthworks associated with logging of the former plantation forest. The vegetation is mostly modified and the required clearance of patches of regenerating shrub-land[91] will be more than remedied by proposed planting. The hilltop alignment means that between 18500m and 20500m there will be only small encroachments into the heads of small gullies. South of 20500m the road embankments will cross four larger tributaries of Duck Creek, although even these tributaries are short (extending up to 0.5km to the east) and have only moderate catchments.

Aesthetic and Perceptual

13.1.121. The aesthetic and perceptual effects will similarly be moderately low in this section. The interchange will be prominent from the eastern part of Whitby. However, despite the elevation, the interchange is in a broad saddle framed by higher hills to the north and south. A prominent knoll to the west with a telecommunication tower and large water tank will screen the interchange from some locations and more importantly will create a sense of perspective-depth for houses in the area. The ridge behind the interchange and the more distant backdrop hills will also help visually anchor the alignment and interchange.

13.1.122. The interchange will appear in context with the adjacent urban landscape.

13.1.123. The large fill batters on the downhill side of the Main Alignment north of 20000m, including the very large batter between the alignment and the Warspite Avenue Link Road, will be shallow fills chasing steep underlying hill slopes so that they will not be prominent once they have been re-vegetated. The embankments across the tributary watercourses south of 20000m, on the other hand, will cut across the grain of the landscape and be more prominent.

13.1.124. The large box-cut north of the interchange will likewise be a prominent feature, although its visibility is restricted by the adjacent topography. It is recommended that

[91] At 20000m

the detail design seek to round out the top batter and possibly restrict the cutting to a single bench on either side. Similarly it is recommended that the detail design seek to avoid the need for the short benches on the two batters higher than 15m south of the interchange.

Visual Effects from Surrounding Areas

13.1.125. Although this section of the route has reasonably high visibility, the degree of visual amenity effects will be relatively moderate:

i) Lifestyle properties close to and east of the alignment are limited to a small number accessed from Bradey Road, with occasional distant views from lifestyle properties at the end of Belmont Road. There will be significant visual amenity effects from parts of those properties nearest the alignment. The assessment set out in **Appendix 5D** assessed the effects from 2 dwellings as falling within the 'very high' and 'high' categories respectively. The views from this area are typically oblique views along the alignment to the north towards the SH58 Interchange, while the nearest part of the alignment to the west is either in box cut or on the opposite side of the low ridge, although light standards, signage gantries, and the top of the cut batter between 18000m and approximately 18500m will be potentially visible. Parts of the James Cook Interchange to the south will also be potentially visible from such properties, although houses tend to have shelter vegetation that will screen views in this direction.

ii) The James Cook Interchange will be prominent from some parts of Whitby to the west. However the intervening topography, including the hill with the telecommunication mast/water tank will screen the interchange from much of the nearer parts of Whitby, for instance from the James Cook Drive area. The clearest views are likely to be from land currently being subdivided and developed on the hill to the north-west. The perimeter properties within this area are likely to screen most views from the remainder of the area, and it might reasonably be anticipated that future dwellings would be oriented to the north in the opposite direction to take advantage of sun and views of Pauatahanui Inlet. There will also be longer distance views from the ridge on the opposite side of the valley, such as properties in Cleat Street and Stemhead Lane. Some houses in this area are oriented to enjoy a view across the valley to a distant rural backdrop. The Interchange and Main Alignment will be reasonably prominent part of the middle-

ground of these views, but also reasonably distant and beyond an intervening suburban foreground. The Main Alignment will be more visually associated with the urban area than the more distant rural landscape. The photomontage from **Viewpoint 7** (LA63 to LA68) illustrates such a view.

13.1.126. Perhaps one of the main visual effects for both the lifestyle properties and nearest suburban areas will arise from lights which will extend between the James Cook Interchange and the SH58 Interchange. The light structures may be more visible than the alignment itself, and will be additionally prominent at night. However the potential effects of the lights will be reduced by the adjacency of the urban area: From the lifestyle area on Bradey Road the lights will be elevated on a ridge and will be prominent, but will nevertheless be seen against backdrop lighting from suburban Whitby, in particular from the new development on the hill north-west of the interchange which means that there will be lights on the hill above the interchange and Main Alignment. From within Whitby the lights will be viewed beyond foreground and middle-ground urban lights.

Experience from the Road

13.1.127. The experience of this Section of the route will be dominated by the interchange itself.

13.1.128. ***Northbound:*** From the main northbound carriageway there will be views of suburban Whitby and potential glimpses of Pauatahanui Inlet from the interchange itself. By contrast, north of the interchange views will be confined within box cut and hills. . The high benched batters in this area will potentially detract from visual amenity, and mitigation measures are described below. The sense of enclosure will be strengthened by the kanuka re-vegetation proposed along both sides of the Main Alignment.
Southbound: South of the interchange there will be long views along Duck Creek, with the Moonshine fault escarpment forming a wall on the west side. On the east side a series of 'rib-like' spurs will lead the eye to the high backdrop Belmont Hills including Round Knob.

Mitigation

13.1.129. Recommended landscape measures for this section of the route include:

i) Fine-tuning the batter on the eastern side of the box cut at 18900m and the two shorter cut batters at 20400m, with a view to avoiding the need for the top benches.

ii) Applying the general mitigation techniques for cut batters discussed earlier.

iii) Extending the existing kanuka belt from the southern hill face at Lanes Flat along both sides of the Main Alignment to Duck Creek (22000m) (as discussed in the previous section). This will serve to reinforce a spatial enclosure on this section, reduce visibility of the alignment (and associated lights and structures) from nearby lifestyle and suburban areas, reinforce the existing kanuka forest above the Pauatahanui Stream, and establish an ecological connection between the Pauatahanui Stream and Duck Creek catchments.

Section 8: Cannons Creek (21500 to 24900)

13.1.130. Section 8 is most usefully assessed in two parts from a landscape perspective:

21500 to 23500: Duck Creek

Description

13.1.131. This stretch of the route continues the pattern that commences at 20500m described above: The alignment is elevated above the east bank of Duck Creek, and crosses tributary streams and spurs in a regular sequence of box cuts and embankments / bridges. The cuttings are typically 10m – 15m deep, but the long cutting between 22000m and 22500m has batters on the eastern side up to 25m high which will require benching. There is one embankment at 22700m with a relatively wide footprint, but bridges will be used to span the three larger tributaries.

13.1.132. A surplus fill disposal site has been selected near 23300m, on a plateau-like area between Duck Creek and Cannons Creek.

13.1.133. The land use along the alignment is extensive pasture with some small plantations, and two areas of restoration planting that have been established in order to satisfy conditions of the existing designation. The land east of the road comprises Belmont Regional Park which rises to a main ridge approximately 360m – 410m asl to the south-

east and which has relatively deeply incised tributary streams. In contrast, the west bank of Duck Creek is a steep fault escarpment with only short tributary watercourses and drifts of regenerating tauhinu scrub.

Landscape and Visual Effects

Biophysical Effects

13.1.134. There will be some effect on the geomorphic legibility of the spurs and streams given the strong and simple pattern of these landforms. Similarly two of the tributary streams will be modified as a result of embankments. However the two embankments within this section of the route are across short tributaries with small catchments, the three most significant tributary streams will be spanned by bridges. (Bridge No. 17 -19)[92] It is noted that existing perched culverts on Duck Creek and tributaries will be replaced with 'fish friendly' culverts as detailed in the Ecology Report.

13.1.135. Effects on vegetation will be low because of the mainly pastoral land use. The small amount of clearance required of the already established rehabilitation planting, as a consequence of alignment fine-tuning, will be more than remedied by the much more extensive proposed riparian planting of the major tributaries east of o Duck Creek, as outlined in the Ecology Report.

13.1.136. The effects of the fill site at 23300m will be low: The site is at the catchment watershed, thereby avoiding streams, is within pasture, and situated on hummocky terrain with generally low visibility.

Aesthetic and Perceptual

13.1.137. As with the sections in Te Puka and Horokiri Streams, the Project will result in a fundamental change to the existing character by introducing a major road into a reasonably natural and rural landscape. Such effects will have additional significance because of the use of the hills as a Regional Park.

13.1.138. However there are several factors that will help accommodate the alignment within the landscape and reduce the potential degree of effect:

[92] As discussed above under Section 6, there are a further 5 embankments across Duck Creek tributaries between 20000 and 21500 and these are similarly across short tributaries with small catchments.

i) The alignment is relatively low in elevation: While it is situated above Duck Creek (and has a degree of separation from the stream itself) it is lower than the parallel ridge on the opposite side of the stream,[93] and much lower than the bold hills to the east.[94]

ii) The alignment will be embedded in box cuts and bridges / embankments which will reduce its prominence relative to the dominant landscape pattern of spurs and valleys.

iii) With the exception of the long cutting at 22000m – 22500m the cuttings will be less than 15m high and will therefore avoid the requirement for benching.

iv) It is not intended that this section will have lights and it is likely to have relatively few signage structures given its remoteness from interchanges.

Visual Effects from Surrounding Areas

13.1.139. There are no houses in this section of the route, and it will be screened from urban Porirua by the intervening ridge. Visibility to all intents and purposes is limited to the Belmont Regional Park.

13.1.140. Although recreational use is generally unrestricted the public utilise shared paths due to the working nature of the farm. On the Porirua side of the Belmont Hills there are two spur trails leading up from Duck Creek to the Belmont Hills main ridge, and two connecting trails between Duck Creek and the Park access at Cannons Creek Lake Reserve in Waitangirua: One is by way of 'Takapu Trail' following the upper part of Cannons Creek, with an intermediate access point at Takapu Road.[95] The other takes a more direct route over the intervening ridge. Physical access will be maintained along the trails by passing beneath bridges on the Main Alignment. The main adverse landscape effect will be on the quiet natural character and sense of remoteness within the Duck Creek valley area. There will be more elevated views from Cannons Head Track and the main Belmont track although these views will be more obscured by the rolling topography and location of the main alignment low down in Duck Creek.

13.1.141. While the viewer numbers will be relatively small, their sensitivity will be high. However the degree of effect will be moderated by a number of factors:

[93] Approximately 60m – 80m lower than the ridge

[94] Approximately 240-260m lower than the Belmont Hills

[95] There is also an access point to the Takapu Trail from the end of Takapu Road.

i) The alignment is low in the landscape and toward the western edge of the park.

ii) As one climbs higher on the Belmont Hillsthe alignment will be viewed in the context of the Porirua urban backdrop.

iii) The hill tops also fundamentally provide a view of urban Wellington juxtaposed against the bold natural landforms of its setting.

Experience from the Road

13.1.142. Duck Creek will be one of the more dramatic sections of the route because of its bold topography, simple land use patterns, and relatively high natural character compared with the urban and lifestyle rural areas. Travellers will experience a strong engagement with the landscape because of the pattern of cuttings and bridges / embankments, and because the alignment parallels the fault-line escarpment above Duck Creek.

13.1.143. ***Northbound***: There will be a memorable view down Duck Creek and fault escarpment from the bridge at 22900m, the point at which the alignment emerges from a long box cut separating the Porirua basin from Duck Creek.

13.1.144. ***Southbound:*** There will be oblique views along the tributary streams toward the high backdrop Belmont Hills.

Mitigation

13.1.145. Recommended landscape measures for this section of the route include:

i) Fine-tuning the detail design of the batters on the east side of the long box cut at 22300m with a view to avoiding or reducing the extent of the bench required.

ii) Adopting the general mitigation techniques for cut batters discussed earlier.

iii) Re-vegetating the larger tributaries east of Duck Creek as described in the Ecology Report.

iv) Contouring the surplus fill disposal site to create a naturalistic rolling landform, and ensuring the western edge of the site is set back from the edge of the landform to minimise any visibility from the urban basin.

23500 to 24900: Cannons Creek

Description

13.1.146. At the top of Duck Creek (i.e. at Bridge No.19, 22780m) the alignment changes direction by almost 90^{o} and cuts to the west through the watershed ridge into the Porirua basin.

13.1.147. The alignment includes a long box cut through the ridge, a 'viaduct' over the headwaters of Cannons Creek (Bridge No.20), and a series of moderate box cuts and embankments across the hill face behind urban Porirua. All the cut batters are less than 15m, avoiding the need for benching.

13.1.148. A small surplus fill disposal site is located at 24100m within a small hilltop depression.

13.1.149. Land use along the alignment is a mix of low-intensity pastoral farmland, and a mosaic of rough pasture, regenerating scrub, and pine shelter belts. The vegetation in the Cannons Creek valley is in a more advanced state of regeneration and contains areas of more advanced second growth forest, including areas that have been enriched through community restoration projects.

13.1.150. The hill face across which the alignment is located is the backdrop to urban Porirua -the suburbs of Porirua East and Cannons Creek. The vegetation pattern typically consists of regenerating scrub and wilding pines on the lower slopes, merging into more open pasture toward the ridge.

Landscape and Visual Effects

Biophysical Effects

13.1.151. Effects on natural components of the landscape will be moderate. The hill landforms affected by earthworks are unremarkable in themselves, although they have visual significance as an urban backdrop. The vegetation that will be cleared is essentially scrub in early stages of regeneration so that any effects can be relatively quickly remedied by the proposed rehabilitation planting. The more significant riparian vegetation within the Cannons Creek valley will be spanned by viaduct so that any permanent effects will be low, although there will be some clearance required in order to construct the piers. With the exception of Cannons Creek, the watercourses traversed by this stretch of the alignment are short and have small catchments.

13.1.152. The effects of the surplus fill disposal site at 24200m will be low. The site is near the catchment watershed so that it avoids watercourses, is within pasture, is located in a small depression with low visibility, and is also currently enclosed by a pine shelter belt on two sides which further restricts visibility.

Aesthetic and Perceptual

13.1.153. The alignment will have high visibility because of its elevated location on the hill face behind urban Porirua. However its potential prominence will be reduced by several factors:

i) The alignment is reasonably low on the hill face: It will be visually associated with the urban fabric rather than the more natural hill tops forming the urban backdrop.

ii) The sequence of cuttings and embankments mean the road will be embedded in the topography. For instance it will not be visible as a continuous benched line across the hill face; rather it will be visible on short embankments separated by longer box cuts.

iii) The suburban areas of Cannons Creek and Porirua East that are in close proximity (i.e. the south side of the basin) are generally oriented in the opposite direction to the north because of topography and sun so that the alignment will be 'behind' the suburbs.

iv) Although the Cannons Creek viaduct will be a high structure, it will have relatively low visibility from within suburban Cannons Creek because it will be located in a narrow part of the valley well upstream from the urban area.

Visual Effects from Surrounding Areas

13.1.154. Visual effects from the urban area will fall into two categories -close views and distant views:

13.1.155. ***Close Views:*** The properties potentially most affected are those on the perimeter of the urban area in Carnarvon Place, Cardiff Crescent and Sievers Grove. The alignment is potentially prominent from this area because of its proximity and higher relative elevation. However the actual effects will be relatively low for the following reasons:

i) There is a reasonable distance separation: The nearest houses are more than 200m away, separated from the alignment by Cardiff Park which has open sports fields and some shelter trees.

ii) Houses are typically oriented to the north in the opposite direction.

iii) Existing vegetation and adjacent dwellings obscure/ screen views and provide a sense of perspective depth. While some of the trees are old pines and might be expected to be removed in the future, there is sufficient room to provide replacement trees in Cardiff Park.

iv) The alignment in box cut across the larger proportion of this part of the hill face will help reduce prominence. There are three reasonably short stretches where it will be on embankment, the longest and most prominent at 24800m. Although some of the cuttings are very shallow they can be augmented with contoured earth mounding and planting to reduce the road's prominence.

13.1.156. **Distant views:** There are distant views from elevated parts of the broader Porirua East Basin. These locations are east and west of Champion Street on the northern side of the basin and Bedford Street on the southern side of the basin. The actual effects of the Project from such viewpoints will be relatively low for the following reasons:

i) Such elevated views are typically more than 1km away and are across the intervening suburban landscape of the Porirua East basin.

ii) Many views are obscured/ screened by adjacent houses and intervening landform and vegetation.

iii) Views tend to be 'diffuse' so the Project will be viewed as a part of a complex urban landscape.

Experience from the Road

13.1.157. This stretch of the route will be enclosed as a consequence of the cuttings and the proposed restoration planting, and views will be further confined by the curvilinear alignment. There will be views for northbound travellers to the higher hills to the east (i.e. Round Knob and the Belmont Hills) which will be a skyline landmark. The main incident will be the Cannons Creek viaduct, framed by cuttings at either end, which will provide brief views over the forested valley toward suburban Cannons Creek.

Mitigation

13.1.158. Recommended landscape measures for this section of the route include:

i) Applying the general mitigation techniques for cut batters discussed earlier.

ii) Extensive re-vegetation parallel to the alignment in order to reduce the road's prominence and also to create a natural connection between bush in Cannons Creek and Porirua Park Reserve (in Section 9 further to the west). The overall concept is to reinforce a pattern that is already developing of regenerating vegetation on the lower hill slopes (across which the Main Alignment is located) contrasting with open pasture on the hill tops.

Section 9: Linden (24900 to 27700)

13.1.159. Section 9 is also most usefully assessed in two parts from a landscape perspective:

24900 – 26200 'Porirua East'

Description

13.1.160. This stretch of the alignment continues the pattern described above between 23500 – 24900 entailing a series of cuttings and embankments across the backdrop hills of urbanised Cannons Creek and Porirua East.

13.1.161. The road is mostly in box cuts; two of which are large: The cutting at 25000 has batters up to approximately 25m / 35m high, and the very large cutting at 25600 has batters up to 30m / 55m. By contrast the embankments are short and located across steep gullies. There are two bridges across short valleys.

13.1.162. The land use along the alignment is a mosaic of rough pasture, regenerating scrub, and pine shelter belts, merging with more open hilltops. The only notable vegetation is an area of remnant indigenous bush in Porirua Park Bush which adjoins the route. The Ecology report describes the bush as a "regionally representative example of lowland tawa-kohekohe forest remnant" with high natural value.

13.1.163. The alignment also traverses the site of the Porirua Gun Club which is to be relocated to an as yet unconfirmed destination.

Landscape and Visual Effects

Biophysical Effects

13.1.164. Effects on natural components of the landscape will be moderate. Despite the size of the cuttings the affected landforms are unremarkable, although they have value as part of the urban backdrop. The watercourses traversed by embankments are short and have small catchments, and the two larger watercourses will be spanned by bridges. The vegetation that will be cleared is essentially scrub in early stages of regeneration so that any effects can be relatively quickly remedied. The works will encroach into the edge of vegetation in Porirua Park Bush.

13.1.165. The rehabilitation proposals for this stretch include restoration and enrichment planting in a continuous corridor parallel to the Main Alignment, as discussed above, in order to connect the areas of bush in Cannons Creek and Porirua Park, and specific protection and enrichment planting in Porirua Park Bush as described in the Ecology Report.

Aesthetic and Perceptual

13.1.166. The alignment has high potential visibility because it will be elevated on the hill face behind the Cannons Creek and Porirua East suburban area. However, as with the stretch 23500 – 24900 described above in Section 8, the alignment will be reasonably low on the hill face and visually more closely associated with the urban fabric than with the more natural hill tops.

13.1.167. Most of this stretch will be in cutting so that the alignment will be embedded in the topography. The tops of the up-hill cut batters will be visible from some parts of the urban area, but the carriageway itself will be largely screened. The two exceptions are the bridges, although visibility of these will be limited by their location in relatively narrow valleys, and by the extent of vegetation on the spurs. The nearer parts of suburban Cannons Creek and Porirua East are also generally oriented in the opposite direction so that the alignment will be 'behind' the suburb.

Visual Effects from Surrounding Areas

13.1.168. Effects from private properties will largely be low for this stretch, despite the alignment's proximity to the urban area and its relative elevation: The alignment will be mostly in cutting, there is a good separation between the alignment and the nearest houses (the nearest houses are more than 200m away), houses are typically oriented to

the north in the opposite direction from the alignment and tend to 'back in' to the north facing slopes, and there is extensive intervening vegetation on the hill slopes below the alignment. There are two areas where effects will be greater than that of the wider area:

i) Those houses located along the mid to upper reaches of Sievers Grove are located on a long low spur that extends from the box cut at 25000m. There are unobstructed views from some of these houses toward the Main Alignment to the south and southwest, including views into the box cut at 25600m. The effects were assessed as 'moderate'.

ii) There is also a small pocket of houses located at the top of Ernest Street/ Gillies Place some of which have views toward the large box cut at 25600m from a distance of approximately 300m. The visual effects from some of these dwellings was assessed as 'high' based on the position of the cutting on the skyline; orientation and framing of views; and extent of the Main Alignment likely to be seen.

13.1.169. The proposed native re-vegetation planting will further reduce visibility. In particular the proposed re-vegetation above the cut batters on the north side of the alignment will help to reduce the visibility of the very large cut batters on the uphill side. The most notable public open space in the area is Trust Porirua Park located in the basin floor between 25000m – 25600m. Effects from the middle and upper portions of the park are considered 'low' because of the extent of screening by the steep adjacent topography and established vegetation. Views from the upper playing fields also tend to be oriented to the north down the basin. Effects from the lower portion of the park will be 'moderate' due to views being framed and oriented towards the box cut at 25600m and adjacent stretch of alignment on embankment. Over time the cutting with be softened by proposed re-vegetation.

Experience from the Road

13.1.170. As with the adjoining stretch to the east, this stretch of the alignment will be enclosed in a sequence of deep cuttings, the enclosure reinforced by proposed re-vegetation planting on either side, and views further confined by the curvilinear alignment.

13.1.171. The cutting at 25600m will be a landmark because of its depth, with up to four benches on the uphill side.

13.1.172. There will be brief glimpses of urban Porirua, mostly for southbound road users, from the two short bridges (Bridges No. 21 & 22) and from the embankment behind Ranui Heights.

Mitigation

13.1.173. Recommended landscape measures for this section of the route include:

i) Refining the detail design of the large cut batters with a view to avoiding the top benches by easing the slopes of the top batters.

ii) Applying the general mitigation techniques for cut batters discussed earlier.

iii) Planting on the embankment and slopes above Ranui Heights in order to screen the carriageway from the residential area.

iv) Extensive native re-vegetation parallel to the alignment in order to reduce the alignment's prominence (including the prominence of the cut batters) and to create a natural connection between the bush in Cannons Creek (Section 8) and Porirua Park Bush.

v) Retaining a buffer of pine trees (for instance to a depth of 30m+) adjacent to the southern end of Ernest Street / Gillies Place and Ash Grove to help screen the Project, particularly during construction.

26200-27700 'Kenepuru Interchange and Connection with SH1 at Linden'

Description

13.1.174. South of the leading ridge at 26200m, the alignment emerges into the Linden and Tawa visual catchment.[96] The alignment will be within a deep box cut through the ridge with batters up to 20m / 40m high.

13.1.175. This part of the route comprises the Kenepuru Interchange with the Kenepuru Link Road which connects to western Porirua, and the connection with the existing SH1 at Linden.

13.1.176. The Kenepuru Interchange is located on the hill above Linden at 26700. The Interchange is located in a small valley so that the Main Alignment will pass over the roundabout and Kenepuru Link Road.

[96] There will be some slight views of this section from elevated south-facing locations at the western end of the Porirua Basin

13.1.177. The Main Alignment will descend the hill between the Kenepuru Interchange and the connection with the existing SH1 by means of relatively shallow cuttings and embankments. It will merge with the existing SH1 along the Tawa Straight. The southbound Main Alignment lanes will merge from the left with existing SH1. Traffic joining the Main Alignment in a northbound direction will be elevated on a curving flyover bridge above the existing SH1 southbound carriageway. Traffic continuing to Porirua will take a left lane exit.

13.1.178. The connection with the existing SH1 at Linden will require widening of the existing corridor along the Tawa straight, mostly on the eastern side and including doubling the width of the bridge over Collins Avenue.

13.1.179. Surplus fill disposal sites are located as follows:

i) The gully uphill and downhill of the embankment at 26300m.

ii) The valley and spur to the NW of the box cut at 26500m, between the Kenepuru Interchange and Ranui Heights.

iii) The triangle of land on the hillside between the Kenepuru Link Road and existing SH1.

13.1.180. The **Kenepuru Link Road** will descend across the hillside north-west of the Kenepuru Interchange with large side cut and fill batters. The road will pass under the existing SH1 which will be raised approximately 4m to accommodate an underpass. The Link Road will transition from the underpass to a small box cut and cross a bridge spanning the Porirua Stream and NIMT Railway. It will intersect with Kenepuru Drive in western Porirua. In addition to being raised in the vicinity of the proposed underpass, the existing SH1 alignment will be fine-tuned to ease the curve opposite Ranui Heights resulting in the road being moved a little further away from adjacent properties in Apple Terrace and Japonica Crescent.

13.1.181. The land use along the Main Alignment itself comprises mostly pine plantation, with a swathe of scrubland beneath existing 110kV transmission lines. However the surrounding land is part of urban Porirua and Tawa. Ranui Heights is a small residential enclave north of, and below, the Main Alignment. The area where the Main Alignment merges with the existing SH1 is close to established suburban development in Linden. Properties adjoining the designation boundary include residential properties, two schools (Linden Primary School and Linden Intermediate School), and a reserve (Arthur

Carman Park). The bridge over Collins Avenue will be doubled in width to accommodate the merging lanes, which will increase the length of the Collins Avenue underpass which provides the only connection with a residential area east of the existing motorway, including pedestrian traffic associated with the school.

Landscape and Visual Effects

13.1.182. The effects within this part of the route associated with the Main Alignment, Kenepuru Interchange and Kenepuru Link Road are difficult to separate. They are within the same visual catchment and will be experienced together.

Biophysical Effects

13.1.183. Effects on natural components of the landscape will be moderately low. Despite the extensive earthworks required, the landforms do not have any particular significance and the affected watercourses are reasonably short, have small catchments, and have been modified by the pine plantation. The existing plantation vegetation also has no natural significance, and will be replaced with indigenous re-vegetation along the corridor.

13.1.184. Similarly, two of the fill sites are within valleys with short watercourses, small catchments, and are currently occupied by pine plantation. The third site is on the hillside above the existing SH1 motorway, also partly occupied by pine plantation.

Aesthetic and Perceptual

13.1.185. The Kenepuru interchange works will be substantial in scale, in a prominent elevated hill-side location, and very visible because of the urban setting. The Kenepuru Interchange and the nearby connection with the existing SH1 at Linden will be a prominent urban landmark. In particular the large cutting at 26500m will be a prominent visual scar through the ridge, accentuated by the benching required. Similarly the Kenepuru Link Road will be reasonably prominent traversing the open hill face and spanning the Kenepuru valley.

13.1.186. At the same time, the urban setting and presence of the existing transport infrastructure provide a context that can absorb such development. While the new works will detract from amenity, they will not look out-of-place in a general sense. These comments do

not take away from the fact there will be significant effects on adjoining properties discussed below.

Visual Effects from Surrounding Areas

13.1.187. Visual amenity effects from properties in the area fall into two types: Properties immediately adjoining the proposed alignment / designation which typically will have significant adverse effects, and properties with more distant views where the effects are moderated by distance.

13.1.188. ***Close Views.*** Properties adjacent or very close to the proposed designation include properties in Tremewan Street, Rangatira Road, Collins Avenue, Raroa Terrace and Mahoe Street. The inventory in **Appendix 5D** assessed effects as 'very high' from four representative viewpoints in this area, and 'high' or 'moderate' from a further six representative viewpoints. Effects on such locations can be characterised as follows:

i) The highest effects are likely to be experienced by those properties along Rangatira Road that have views to the Project (including the Kenepuru Interchange, Main Alignment, connection with existing SH1, the Kenepuru Link Road, and the surplus fill disposal sites). There are also likely to be 'very high' effects from several properties on the eastern side of Tremewan Street where houses below the road and behind a 2m high noise bund. Those properties adjacent to the east side of the SH1 corridor south of Collins Avenue are likely to experience moderate visual effects.

ii) In such situations, adverse visual effects are typically absorbed by the immediately adjoining properties, with effects falling away quickly. Properties adjoining the alignment typically provide a degree of screening and sense of separation (perspective depth) for those properties further away.

iii) The situation is complicated by the removal of houses in some locations, mostly on Tremewan Street, which means some properties that are currently separated from the motorway by intervening properties will now become the 'front row' exposed to the proposed alignment.

iv) Most of the affected properties are already affected by the existing SH1 motorway so that the proposed works will result in incremental or cumulative effects, rather than introducing new effects (in contrast to the majority 'green-fields' parts of the route).

v) Noise walls are proposed for a number of the adjoining properties. A 2-3m wall is proposed along the western boundary of houses between Little Collins Avenue (27500m) and Allen Terrace (28100m). Noise walls on the opposite side of the road are in the range of 2m in addition to 0.85m rigid safety barriers. On the one hand these will screen the alignment and reduce noise. On the other hand the walls themselves can be large and have the potential to reduce amenity by reducing outlook, casting shadow and through physical dominance. Recommended mitigation includes planting to soften both sides of such walls.

13.1.189. ***More Distant Views:*** Suburban areas exposed to longer distance views include the hillsides on the opposite side of the valley such as properties on Fyvie Avenue, Katarina Grove and Turriff Crescent. Factors which increase the likely degree of effect from these areas include the elevated and clear views across the valley, the orientation of properties across the valley in the direction of the Project (because of the topography), and the fact that views from parts of this area will be semi-parallel with the large cutting behind the Kenepuru Interchange. However effects will be moderated by distance and the fact the Interchange will be in the middle-ground of an urban context. From more elevated viewpoints the backdrop hills will also be more apparent, placing the new alignments lower in the landscape. **Appendix 5D** sets out assessments from representative viewpoints in this area. Effects were typically assessed in the low to moderate range.

13.1.190. The effects of the encroachment into the eastern edge of Arthur Carman Park will be moderate in degree. The existing SH1 already adjoins the park so that amenity effects on the park will be incremental rather than introducing new effects. The extent of encroachment will be small.[97] Screen planting that has already been carried out near the park's perimeter with existing SH1 will not be affected so to most intents and purposes the useable park space will remain as it currently exists. The main encroachment is adjacent to the northern entrance to the park where space is already constrained, and from where the new Main Alignment will be prominent on a curving bridge, although at that point the realigned existing SH1 road will be in a cutting below the park.

13.1.191. While there will be some widening of the shoulder along the boundary with Linden School, most of the widening will be carried out on the opposite side of the existing

[97] Most of the required widening will occur on the opposite side of the existing SH1 motorway.

motorway. The main visual amenity effect on the school will be from the noise barriers proposed along this boundary. Planting is proposed in front of the noise walls in order to soften their appearance and to avoid a potential canvas for graffiti.

Experience from the Road

13.1.192. ***Northbound:*** The transition into the proposed new Main Alignment will be a relatively distinctive node on the new route. In contrast to the approach along the 'Tawa Straight', which is a relatively non-descript part of the existing motorway, the start of the new alignment will change direction by some 90^{o}, climbing out of the valley and plunging into the first of a sequence of deep cuttings on a strongly curvilinear alignment.

13.1.193. ***Southbound:*** The experience from the road will be less distinctive for south-bound traffic. However the cutting immediately prior to the Kenepuru Interchange will act like a 'gateway' framing views into Linden and Tawa as the Main Alignment descends to the 'Tawa Straight'.

13.1.194. Potential adverse visual amenity effects for future travellers will arise from the proposed noise walls, and the benched nature of the cutting through the ridge adjacent to the Kenepuru Interchange. Mitigation measures are discussed below.

Mitigation

13.1.195. Recommended landscape measures for this section of the route include:

i) Refining the detail design of the large cut batters east of the Kenepuru Interchange with a view to avoiding the top benches by easing the slopes of the top batters.

ii) Applying the general mitigation techniques for cut batters discussed earlier.

iii) Implementing a contoured earth sculpture in the triangular area between the Kenepuru Link Road, Main Alignment and the existing SH1 motorway to provide a landmark, enhance amenity of the Project, and counter the prominence of the large box cut east of the Interchange.

iv) Refining the detailed design of planting throughout the Linden area to mitigate adverse visual effects from adjacent properties.

v) Refining the detailed design of noise mitigation walls / structures to ensure high quality visual character and / or planting in front of noise walls in order to soften the walls and discourage graffiti.

vi) Retaining a buffer of pine trees adjacent to the southern end of Apple Terrace and Japonica Crescent to ensure that adverse visual and general amenity effects are avoided, particularly during construction.

Kenepuru Link Road (Porirua City Council)

Description

13.1.196. The Kenepuru Link Road comprises a single lane in either direction. It will descend across the hillside north-west of the Kenepuru Interchange with large cut and fill side batters on the uphill and downhill sides respectively. The road will pass under the existing SH1 which will be elevated approximately 4m to accommodate the underpass. The road will transition from the underpass to a small box cut and cross a bridge spanning the Porirua Stream and NIMT Railway. It will intersect with Kenepuru Drive in western Porirua.

13.1.197. The existing SH1 will be raised by up to approximately 4m in order to provide sufficient space to construct the underpass. The existing SH1 alignment will also be fine-tuned in order to ease the curve opposite Ranui Heights resulting in the road being moved a little further away from adjacent properties in Apple Terrace and Japonica Crescent.

13.1.198. The hill on the east side of the existing SH1 comprises pine plantation, with a cleared swathe along the two 110kV pole transmission lines. On the west side of the existing SH1 motorway the terrain drops steeply to the Porirua Stream which is incised in a deep channel. The NIMT railway is benched above the stream and below the motorway. There are large footprint industrial buildings on Kenepuru Drive on the western bank of the stream. Kenepuru Drive is an arterial road that follows the base of the hills along the western side of the valley.

Landscape and Visual Effects

13.1.199. As discussed above, it is difficult to isolate the effects of the Kenepuru Link Road from those of the Main Alignment / Kenepuru Interchange and changes to the existing SH1. They are within the same Tawa-Linden visual catchment and will be seen as part-and-parcel of a single project.

Biophysical Effects

13.1.200. Effects on natural components of the landscape will be moderately low. Despite the extensive earthworks required the landforms do not have any particular significance, and the Link Road spans the Kenepuru Stream on a bridge. The existing plantation vegetation also has no particular significance, and will be replaced with indigenous species re-vegetation.

Aesthetic and Perceptual

13.1.201. The Kenepuru Link Road will be prominent traversing the open hill face in an elevated location. The Link Road will be seen as an integral part of the wider Kenepuru Interchange and the connection of the Main Alignment to the existing SH1.

Visual Effects from Surrounding Areas

13.1.202. There are no visual amenity effects on immediately adjoining residential properties from the Kenepuru Link Road.

13.1.203. The properties on Kenepuru Drive immediately adjacent to the proposed Link Road are commercial properties so that, although the road will be a prominent feature, the sensitivity of such sites will be less than residential properties.

13.1.204. The nearest residential properties are those in Ranui Heights. These properties are on the opposite side of the ridge from the Interchange and Kenepuru Link Road.

13.1.205. The properties in Ranui Heights will be affected by works required to realign the existing SH1. However the net result of these works will be to move the existing motorway a little further away.

13.1.206. There will be longer distance views of the Kenepuru Link Road from properties and public viewpoints within the Linden area. Factors which increase the likely degree of effect from these areas include the elevated and clear views across the valley and the orientation of outlook toward the Project. However from such viewpoints the Kenepuru Link Road will be seen in a wider context and will appear part-and-parcel of the rest of the Project elements. The effects will be moderated by distance and the urban character of the context.

Experience from the Road

13.1.207. In terms of 'way-finding' the Kenepuru Link Road alignment will be some-what counter-intuitive because the interchange is on the east side of the existing SH1, whereas the destination is on the opposite side of the valley west of the existing SH1. However there will be some slightly elevated views over the urban area as the Link Road descends from the Kenepuru Interchange.

13.1.208. To strengthen the identity of this gateway it is recommended that surplus spoil be sculpted into 'earth-art' landform in the triangle between the Main Alignment, the Kenepuru Link Road and the existing SH1.

Mitigation

13.1.209. Recommended landscape measures for this section of the route include:

i) Implement a sculptured earth form in the triangular area between the Kenepuru Link Road, Main Alignment and the existing SH1 motorway to provide a landmark.

ii) Re-vegetating the uphill slopes above the Link Road to provide a contrasting backdrop to a grassed earth-sculpture on the downhill side.

Porirua Link Roads (Porirua City Council)

Description

13.1.210. The Porirua Link Roads will connect the James Cook Interchange with Waitangirua and James Cook Drive in eastern Whitby. Both roads will comprise a single lane in either direction and will be designed to 50 kph speed standards.

13.1.211. The alignment for both roads is across steep hill country on the urban fringes. The existing land use along the alignment of both roads comprises a mosaic of rough pasture, recently logged pine plantation, pine shelter belts and regenerating scrub. The hills have a rural character in themselves but are the backdrop to urbanised landscapes in Whitby and Waitangirua.

13.1.212. ***Waitangirua Link:*** The road is approximately 2.5km long, and generally follows the contours around the steep hills behind southern Whitby in a sequence of deep box cuts and high embankments. The two largest embankments will have fill batters up to 15m and 20m high respectively, including one across Duck Creek. The two largest box cuts have batters up to 20m and 30m respectively, including a long 'S'-shaped box cut

through the spur behind Waitangirua. At the western end the Link Road descends the hill face behind Waitangirua to Warspite Avenue, forming a four-way intersection with Niagara Street opposite the Waitangirua Shopping Centre and adjacent to Maraeroa Marae.

13.1.213. ***James Cook Link:*** The road is approximately 900m long and benched within the head of a small valley[98] east of a distinctive hill that is surmounted with a telecommunications tower and large water tank. The earthworks include embankments and cuttings of short to medium length. The road is aligned on the western side of the small valley so that earthworks will be visible mainly from the east.

Landscape and Visual Effects

Biophysical Effects

13.1.214. The most significant natural landscape feature is Duck Creek which is one of the main streams discharging into Pauatahanui Inlet. Although the lower stretches of the stream through Whitby have been urbanised, the upper stretches of the stream are relatively natural, albeit within a modified pastoral landscape. The Waitangirua Link Road will cross Duck Creek at a narrow gorge-like location on a short embankment approximately 15m high and with a footprint approximately 70m wide at the stream bed. As a consequence there will be moderately high effects on natural character of the stream at this location. The effects will be moderated by the fact that the crossing is only a short distance above stretches of the stream that have already been heavily modified. The effects on freshwater ecology are addressed in the ecology reports.

13.1.215. In other regards the landforms traversed do not have particular significance apart from their visual significance as the backdrop for adjacent suburban areas. Other valleys traversed are the heads of small tributary catchments. The James Cook Link Road avoids the watercourse in the valley along which it is aligned; the proposed alignment being preferred to an alternative alignment on the opposite side of the valley that would have encroached into the watercourse.

13.1.216. Apart from some riparian vegetation within Duck Creek, the area traversed is pasture or regenerating scrub and a small eucalyptus plantation, so that any adverse effects will quickly be remedied by proposed restoration planting.

[98] A tributary of Duck Creek

Aesthetic and Perceptual

13.1.217. ***James Cook Link:*** The alignment follows the topography, is contained within a reasonably small valley, and will require relatively modest earthworks. Its visibility will also be reduced by the hill on its west (the hill with the telecommunications tower). Some properties on the hill currently being subdivided and developed to the north-east will overlook the road, but from such locations it will appear to fit the landscape and will be a minor feature compared with the James Cook Interchange and even the Waitangirua Link Road.

13.1.218. ***Waitangirua Link:*** The alignment will have high visibility because of its elevated location on the hill face and proximity to some dwellings in both Whitby and, to a lesser extent, Waitangirua. In general, the road will form a harder boundary to the urban fabric, and will be a new constructed element on otherwise 'undeveloped' backdrop. At the same time its potential prominence will be reduced by several factors:

i) The alignment is reasonably low on the hill face behind eastern Whitby: The road will be more closely associated with the urban fabric than with the higher hills backdrop.

ii) The large cuttings mean the road will be embedded in the topography. For instance it will not be visible as a continuous benched line across the hill face; rather it will be visible as a series of short sections on embankments separated by longer box cuts.

iii) Eastern Whitby is generally oriented to the north towards Pauatahanui Inlet so that the alignment will be 'behind' the suburb.

Visual Effects from Surrounding Areas

13.1.219. As with other urban areas, visual effects from the urban area will fall into two categories – close views and distant views:

13.1.220. ***Close Views:*** Any visual effects of the James Cook Link Road will be 'low' because of its discrete location within a valley and the modest nature of its earthworks.

13.1.221. The properties potentially most affected by the Waitangirua Link Road are those on the perimeter of the urban area at the end of Exploration Way and Cleat Street / Stemhead Lane. The alignment will be a prominent feature from these houses due to its elevation on the hill side and its proximity to both low lying and elevated dwellings. The effects

will be moderated by the typical house orientation in the opposite direction toward the north and northeast, the extent to which the road will be in box cut, and by the extent of intervening trees. The proposed planting will further reduce the road's prominence.

13.1.222. The house likely to be most affected in the Whitby basin is 67 Exploration Way (No. 363 in Appendix 5D). Although an assessment form the house itself was not undertaken due to access restrictions it is the closest to the road at approximately 120m, the nearest section of which is on an embankment in the valley above the house. Observations from adjacent properties and the local landscape suggest that effects will be reduced by the trees in the intervening valley. Other houses in the area are more than 200m away and the nearest parts of the road will be in cutting and / or considerably obscured by intervening vegetation.

13.1.223. The properties most affected in Waitangirua will be the Marae which will be immediately adjacent to the new intersection and will have the Link Road on a side boundary. The Link Road will be slightly elevated on a ramp adjacent to the rear of the Marae property, increasing potential adverse amenity effects. However adverse amenity effects will be moderated by the context:

i) The stretch of road adjacent to these properties will be within a 50kph speed zone, and within an urban context.

ii) The properties are already located opposite a busy 'T' intersection, so the new road will have a cumulative or incremental effect rather than introducing a new type of effect.

iii) The alignment on the hill behind the area will be largely in box cut, which will help embed the road and reduce its prominence. The cut batters themselves will scar the hillside, but the planting treatment will tie in with adjoining vegetation patterns and will mitigate such effects.

iv) It is recommended that the Link Road be designed to an urban street typology adjacent to the Marae with footpaths and wide berms that can accommodate street trees on both sides. As well as creating an urban gateway, such an approach would create a second 'frontage' to the Marae and accentuate its significance.

13.1.224. There will also be adverse effects on some houses in Corrina Street south of the Marae. These properties are elevated slightly higher than the Marae land and will see the Link

Road against a hill backdrop as it passes over the ridgeline from the Whitby basin. Visual effects were assessed as 'high' due to proximity (approximately 100m), elevation (5-10m above the Link Road), views into the deep box cut through the ridge, and apparent orientation of living areas towards the Link Road. The effects will be moderated by the suburban context and will be mitigated by the proposed planting.

13.1.225. ***Distant Views:*** More distant views to the Porirua Link Roads will include properties in elevated locations, such as Aotea and Ascot Park, with views across the valley toward the Link Roads, and from other places within Whitby and eastern Porirua where there are glimpses along streets and between houses. Effects from such places will be reduced by distance and the fact that views are across an extensive foreground of urban development.

Experience from the Road

13.1.226. The Link Roads will form the gateways to the respective parts of Porirua.

13.1.227. ***Waitangirua Link:*** The Link road will have the character of a 'drive'. That is, it will be relatively narrow (one lane in each direction, no parking lanes), have limited access, follow a curvilinear alignment through the topography, and be designed to a slower speed environment compared with the Main Alignment. While the deep cuttings will detract from visual amenity to some extent, they will also help accentuate the gateway experience. It is recommended that the final 200m of the Link Road adjacent to the Maraeroa Marae be designed to high quality urban street standards in order to also accentuate the gateway, and make the transition to suburban streets.

13.1.228. ***James Cook Link:*** Although shorter and less memorable than the Waitangirua Link, the James Cook Link Road will also have the character of a 'drive' (relatively narrow, curvilinear, limited access, restricted speed) which will create a transition from the Main Alignment to suburban Whitby. It is recommended that an avenue be established along the drive to create a gateway and reinforce the transition from high speed expressway to urban setting.

Mitigation

13.1.229. ***Waitangirua Link:*** Recommended landscape measures for this section of the route include:

i) Applying the general mitigation techniques for cut batters discussed earlier.

ii) Extensive re-planting parallel to the alignment in order to reduce the road's prominence, but designed in a sculptural manner in order to accentuate the 'drive-like' character of the road.

iii) Designing the western-most 200m of the road as a high quality urban street with footpaths and statuesque street trees in order to create a gateway and transition to urban street. The link road should provide the opportunity for a second frontage to the Marae.

13.1.230. ***James Cook Link:*** Recommended landscape measures for this section of the route include:

i) Establishing native vegetation on cut and fill batters to tie the road margins in with adjoining vegetation patterns and reduce visual prominence.

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14 APPENDIX 5D: INVENTORY OF VISUAL EFFECTS FROM INDIVIDUAL PROPERTIES AND REPRESENTATIVE LOCATIONS

The inventory is an estimate of likely effects on both individual houses and representative viewpoints within 3km (more or less) of the centreline of the main alignment. A three stage process was used to prepare the inventory:

i) On site observations during initial site visits were used to scope the extent of the potential viewing catchment;

ii) A desktop analysis of aerial photos, road maps, topographic maps, and google earth maps was carried out and both individual properties and representative viewpoints were mapped to be used as a basis for subsequent site visits;

iii) Site visits were undertaken to assess and record those visual effects that were associated with all identified locations. These observations were made from public roads and open space in the first instance and from private properties where access was possible. Where access to private properties weren't available an assessment was made from the nearest public road.

iv) The degree of effects was assessed taking into account distance; amount of the main alignment, cut / fill batters, fill sites and road elements (e.g. lights) visible; orientation of house; the extent of screening vegetation; the complexity of the intervening landscape (complex foreground landscapes tend to increase the sense of separation); and any other relevant factors specific to a particular location.

v) Those properties and locations that were assessed as having a degree of effect of 'Moderate', 'High' or 'Very High' are documented below with the intention of emphasising those properties and locations that experienced notable effects and could subsequently benefit from some form of visual mitigation, whether it be in- designation or on individual properties. A secondary intention was to rationalise the amount of information that was associated with the assessment of over 650 locations. The maps attached as **LA121 to LA124** of Volume 4 of the AEE illustrates the full extent of this inventory. All viewing locations are marked with an emphasis on those with an estimated degree of visual effects of moderate or higher.

LVA Ref No.	Project Ref No.	Rapid No.	Building type	X	Y	Z	Distance to centre line	Description of property/ dwelling (location; features; orientation; extent of outlook; screening; and complexity)	Estimated degree of visual effect	Comments
		FLIGHTYS ROAD								
L018(a)	0447	340 Flightys Road	House	1762867	5449585	80	115m	Brown roof with light brown cladding. Views oriented North. No immediately surrounding vegetation.	Moderate.	House will be approximately level with the proposed road. Views currently blocked by pine trees adjacent to the house. Potential for effects to be higher if vegetation removed, otherwise views form end of driveway only.

L021	0348	317 Flightys Road	House + sheds	1762652	5449392	79	90m	Single storey house with cream cladding and green roof. Oriented to the south. Existing views are of rolling pasture and existing TG ecological mitigation planting in the foreground and to the west. Backdrop of woodlot pines on opposite side of the valley. Several existing transmission towers are visible with one directly adjacent to the west.	High.	House is located approximately 80m from centre of main alignment and is elevated well above finished road level. Top of cut batter to the NW approximately 30m from property boundary but road will be considerably lower and away from primary views. Position of house will provide a 'gun barrel' view along the alignment from approximately 14600m – 16200m. Adverse visual effects associated with the proposed road are high. T40 will be located approximately 30m further to the north and will sit higher on the existing hill top. The majority of the tower will be visible compared to the existing top 1/3. The current pine tree hill backdrop will be maintained and the tower will not 'cut' the skyline. T41 is also clearly visible from this location. The tower will be relocated further down the low middle ground ridge and the existing pine tree backdrop will be retained. Adverse visual effects associated with the relocated transmission line are moderate. Mitigating factors include the presence of the existing transmission lines, rural residential development and proposed mitigation ting.

L025(a)	0347	247c Flightys Road	House	1762517	5449077	62	130m	Single storey house (white cladding) and implementation shed. House is oriented north with lounge and outdoor decking to the north. Views are to the north and are confined by adjacent landform and vegetation. This view is of foreground vegetation (existing TG ecological mitigation) and middle ground rolling hill slopes. Distant views are to the Pauatahanui backdrop hills several kilometres to the NW.	High.	House located significantly lower down the hill face than 0453 with crest of spur blocking views from dwelling to the west and south. Less than 100m of road and fill batters visible within close proximity to the north of the house. Adverse visual effects associated with the proposed road are moderate. T40 is prominent and located on the crest of a middle ground spur directly to the north. The proposed relocation will mean this tower sits 'proud' on the crest of the hill and the top portion of the tower will 'cut' the skyline. T38 and T39 are also visible to the north with the top 1/3 and ¼ being visible (respectively). The prominence of T38 will not change but the amount of T39 that is visible will increase due to the proposed box cut at chainage 14500. Adverse visual effects associated with the relocated transmission line are moderate. Mitigating factors include intervening landform and proposed mitigation planting. Proximity, degree of visibility and prominence of the road and relocated towers will result in a high degree of effect.

L033	0345	207 Flightys Road	TBC	1762292	5448322	78	160m	Dark grey roof. Long, rectangular house oriented north-south. Pond to the south.	TBC	Access to property was not obtained. No views obtainable from Flightys Rd. Relocated transmission tower (T43) is being moved further away from dwelling and likely to be further obscured and back dropped by existing vegetation.
L047	0472	129d Flightys Road	House + Shed	1762259	5447581	60	365m	Dark grey roof. Rectangular house orientated north-south. Shed to north, water tanks to south.	TBC	Access to property was not obtained. Located on top of small spur. Views restricted to approximately 250m of road and fill batters by stream gully to the west. Will appear Low down in foreground. Surrounding houses, transmission lines & towers and the Pauatahanui Inlet are all visible from this location.
L050	0475	129c Flightys Road	House + Shed	1762117	5447321	79	365m	Dark grey roof. Broadly 'U' shaped house orientated north-south. Asphalt turning area. Pond to SW.	TBC	Access to property was not obtained. Need to check broader views towards Lanes Flat and SH58 interchange. Views from house to TGM confined by east-west gully and side spurs. Allows views down to approximately 300m of the road.

L052	0477	84b Flightys Road	House + Shed	1762752	5447080	53	1050m	Dark grey roof. Rectangular house orientated north-south. Shed to SE. Large asphalt turning area. Trees to west and south.	TBC	Access to property was not obtained. Need to check extent of views. House is elevated to a similar height as houses on opposite side of valley.
L060	0485	39 Flightys Road	House	1762151	5447024	82	584m	Dark Grey roof. 'T' shaped house generally orientated NE-SW.	TBC	Access to property was not obtained. Need to check extent of views towards Bradey Road. Fence and vegetation along western boundary. Views oriented towards Belmont Hills.
		RoW OFF SH58								
L063	0250	85 Paremata Haywards Rd	St Josephs Catholic Church	1761206	5446852	17	180m (to interchange)	Brown roof. White/ cream weatherboard. Oriented east-west.	Moderate.	Views to Lanes flat obscured by adjacent Macrocarpa trees. Users will be able to see SH58 interchange and ramps and main alignment to the south.
L064	0276	75f (Private RoW)	House	1761447	5446771	58	387m	Orange pitched roof. Peach cladding. Elevated with views along Lanes Flat to Pauatahanui Inlet and Silverwoods. 35m above road.	Moderate.	Unobstructed views to SH58 interchange and ramps and main alignment to the south. Viewed in the context of existing SH58 and Whitby residential development.

L065	0488	75e (Private RoW)	House	1761646	5446782	89	484m	Green roof. 'L' shaped building located at end of RoW. Elevated and expansive views across Pauatahanui Inlet and hills beyond. 60m above road.	Moderate.	Unobstructed views to SH58 interchange and ramps and main alignment to the south. Also potential views of James Cook Interchange. Viewed in the context of existing SH58 and Whitby residential development.
L066	0489	75b (Private RoW)	House	1761542	5446872	65	356m	Grey roof. Tan coloured cladding. Various mono-pitched roof lines. Long driveway with pond to south of house. 40m above road.	Moderate.	Views down to SH58 and along to James Cook Interchange. Unlikely to see box cuts to north of SH58 but will get small glimpses of main alignment to the north. Viewed in the context of existing SH58 in foreground and Whitby residential development in mid ground. Views from house oriented to wider landscape.
L066b	0490	XXXX	House + shed	1761411	5447042	44	140m	Dark grey roof. Large multi-section building. Light green cladding. Large shed to south. Views to Pauatahanui Inlet and beyond. 20m above road.	Very High	Existing views are oriented across Pauatahanui Inlet to hill beyond. Framed by landform and vegetation. main alignment will be at base of hill in foreground and will be partially obscured by vegetation and landform.
		BRADEY ROAD								

L067	0491	17 Bradey Road	House	1761120	5446598	42	230m (slip lane) 255m (centre line)	1st house on eastern side of Brady Rd. Large 2 storey, light brown house with outdoor area. Views oriented towards Pauatahanui Inlet. Well established vegetation to north.	High.	Views of road and SH58 interchange from upper storey and driveway. Clear views to Silverwood subdivision and large white house to the south (111a Bradey Road). Road will be visible above intervening spur (gas pipeline) and night time lighting between SH58 and JC interchange will be a factor.
L071	0495	105 Bradey Road	House 'Brylin Retreat B&B'	1761110	5445695	46	411m	Grey roof brown timber cladding. Multi wing 'U' shaped house with swimming pool. Oriented north and in to central turning area.	TBC	Access to property was not obtained. Vegetation to the west of the house – unable to define views from road.
L074	0338	111a Bradey Road	House	1760229	5445619	140	134m	Large 'L' shaped house. Grey roof with white cladding. Large asphalt turning area.	Very High	Access to property was not obtained.
L075	0339	111b Bradey Road	House + shed	1760508	5445999	94	150m	Dark grey roof, 2 storey house with white and black cladding. Asphalt turning area and 2 water tanks.	High	Views oriented down valley with views to west blocked by landform. Pines block views to north but road will be visible along gully to the immediate west of the house and to the east of Silverwood subdivision.

L077	0340	44 Bradey Road	House + shed	1760851	5446401	32	100m (slip lane) 112m centre line)	Grey roof. 'U' shaped house. 2 storey with light brown cladding.	High.	House has vegetation surrounding and is located mid-spur. Very limited to no views of adjacent road but will have views to north along valley towards SH58 interchange.
		SH 58/ PAREMATA HAYWARDS ROAD								
L078	0252	51 Paremata Haywards Rd	House + shed	1761109	5447204	8	130m (to slip lane and new SH58 link road)	Light brown roof. Rectangular house located to east of substation.	Very High.	House is set down Low. on property with boundary vegetation surrounding. Views form driveway towards SH58 Interchange and realigned road will be obstructed following construction. Site compound located adjacent to house during construction.
		PAEKAKARIKI HILL ROAD (Pt 1 – from SH58 to Grays Road)								
										Views from houses accessed from Paekakariki Hill Road road were either nonexistent or significantly screened by intervening vegetation and landform.
		GRAYS ROAD								

										Views from houses accessed from Grays road were either nonexistent or significantly screened by intervening vegetation and landform.
		MOTUKARAKA POINT								
										Views from houses accessed from Grays road were either none existent or significantly screened by intervening vegetation and landform.
		PAEKAKARIKI HILL ROAD (Pt 2)								

L220	0643	XXXX	Pauatahanui Golf Club House	1762243	5450409	77	837m	Red. Brown roof. 'L' shaped building oriented north-south. Open views to the east towards golf course.	Moderate.	Power lines clearly visible in middle ground view. Pastoral hills and pine plantation provide backdrop. Lifestyle development visible in distance. Views oriented toward road. Intervening vegetation within golf course. Will get glimpses of fill batters at end of course as well as fill disposal sites to the north located Low down in middle ground. Transmission line relocation will not affect views from the golf course outside of those described above.

L244	0355	548 Paekakariki Hill Rd	House	1763248	5452182	50	60m	Brown roof. Long 'T' shaped building oriented north-south. Swimming pool and tennis court to immediate east.	Very High.	10m+ fill batters approximately 35m to east of house. Mitigation planting is proposed for fill batters but proximity to house will result in significant effects particularly during construction. In addition, clear views of proposed transmission tower 32A will exist. Existing tower T31 (to the north) is also being relocated but it will end up lower down the existing slope – reducing visual effects. Mitigation planting is proposed for both sides of the proposed road to the south of this property. This planting will mitigate the effects of relocated tower 31A and 32A. Adverse visual effects associated with the relocated transmission line are moderate. Degree of effect remains very high due to proximity to the road and fill batters. House is owned by NZTA.

L245	0669	XXXX	House + sheds 'Birds Paradiso'	1762980	5452014	45	250m	Dark grey roof and yellow/crème cladding. Square 2 storey building located next to road. Shelter planting to north and east.	High.	Elevated views from second storey screened by boundary planting and intervening vegetation. May see tops of cut faces and glimpses of fill batters from Toomey property to Poppe property (approx 700m). Adverse visual effects associated with the proposed road are high. Clear views of proposed tower 32A located high on the eastern hill slope. Will also see across the tower 31A in the north. Adverse visual effects associated with the relocated transmission line are moderate. Additional mitigation planting is proposed in this area to address the relocated tower and road – the elevation of the tower and required vegetation setbacks will mean at least the upper ½ of towers 31A and 32A will be clearly visible.

L248	0354	516 Paekakariki Hill Rd	Shed/ house 'Barrys Saddlery'	1763011	5451934	46	205m	Iron roof. Large rectangular building oriented east-west. Living quarters above saddlery shed Location of living areas is difficult from outside but appears to be to the rear (east) of the building. Views are to the east across paddock to pine tree hill backdrop. Existing transmission tower T32 is largely obscured by existing vegetation with glimpses of the top ¼ of the tower and lines.	High.	Living area above saddlery shed elevated above limited intervening vegetation. Will have: • largely unobstructed views of works (approx 350m) to immediate south of Toomey property, including fill batters and underpass. • Top ¼ of cuts to east/SE behind small spur. • Compound at Toomey property • Clear views of proposed tower 32A located high on the eastern hill slope. This tower will be located well above existing vegetation that serves to mitigate the road to the east. Adverse visual effects associated with the proposed road are high. Adverse visual effects associated with the relocated transmission line are moderate. Additional mitigation planting is proposed in this area to address the relocated tower and road – the elevation of the tower and required vegetation setbacks will mean at least the upper ½ of towers 31A and 32A will be clearly visible.

L248a	0354	516 Paekakariki Hill Rd	House	1763032	5451911	47	180m	2 x 'T' shaped buildings. Green roofs. Outdoor riding arena to immediate south.	Moderate.	Similar views to L248 but dwelling lower down so intervening vegetation has more of a mitigating effect. Will see less of cut faces behind small spur due to elevation. Adverse visual effects associated with the proposed road are moderate. Adverse visual effects associated with the relocated transmission line are moderate Additional mitigation planting is proposed in this area to address the relocated tower and road – the elevation of the tower and required vegetation setbacks will mean at least the upper 1/3 of tower 32A will be clearly visible.

L249	N353	510 Paekakariki Hill Rd	House	1763000	5451836	46	200m	Red/ orange roof. Large multi section house with swimming pool to north, shed to south and outdoor riding arena to the east.	Moderate.	House located close to road. Extensive well established vegetation surrounding house and pines adjacent to cut faces behind small spur (see L247 notes). Top of cut faces may be visible but only partial/ fleeting. Adverse visual effects associated with the proposed road are moderate. Proposed transmission tower 32A will be clearly visible to the east against the vegetated (pine tree) hill backdrop. The tower will not protrude through the skyline and existing vegetation will serve to obscure views. However, existing views of lines and the very top of tower T32 will be replaced by a clearly visible tower. Adverse visual effects associated with the relocated transmission line are moderate Mitigation planting has been proposed to reduce visual effects to a moderate degree.

L251	N351	504 Paekakariki Hill Rd	House + shed	1762987	5451605	60	180m	Two storey. Dark grey roof and shed to the SE. House oriented east with living areas at ground level and bedrooms above. Outdoor living area and swimming pool on eastern side of house. Large vehicle turning area and well established vegetation to the north and east. Views to the wider landscape are to the west with views to the adjacent hills to the east being largely obscured by existing vegetation. Existing tower T33 is located approximately 130m from the dwelling and sits 'proud' above the skyline on the adjacent hill to the SE. The southern end the Akatarawa Forest is visible from the dwelling and its immediate surrounds.	Moderate	House is elevated but its orientation and intervening vegetation mean that views to the east are screened/ largely obscured. The proposed road will be located low down behind the existing vegetation and landform to the east – the tops of the benched cut batters to the east will be visible. Adverse visual effects associated with the proposed road are moderate. In addition the replacement of tower T32 with tower 32A high on the hill face to the east will increase visibility from this location despite the tower having vegetated (pine trees) hill backdrop. T33 is current located approximately 130m on a hilltop to the SE of the house. It is highly visible and 'cuts' the skyline. Proposed tower 33A will be la heavier strain tower and will be located approximately 10m to the north of the existing T33 . The tower will be 2m shorter than existing T33 resulting in an overall low degree of effect associated with transmission line relocation.

L253	675	436e Paekakariki Hill Rd	House	1762878	5451263	60	260m	Dark grey gable roof and brown cladding. 'L' shaped house oriented NW-SE. Large trees to immediate east.	Moderate.	Living areas and views to north and west. Shed to immediate east blocks views. Road is elevated approx 20m above house site. Will see glimpses of cut and fill batters along approx 500m of the route. Mitigation planting has been proposed to reduce visual effects to a moderate degree.
		MACKAYS CROSSING (incl SANG SUE)								
L277	0257	324 SH1 Paraparaumu-Paekakariki	House	1765445	5461256	23	128m	Red roof with white timber cladding. Views oriented to the north with well established native vegetation to the south and woodlot to the immediate east. Existing SH1 passes to the north and is clearly visible.	Moderate.	Views are funnelled to the north by existing vegetation and large terrace to the south of the dwelling. The box cut to the south will not be visible. However, the fill batters to the east may be partially visible through the adjacent woodlot although this only relates to the toe of the slope as the upper reaches and road will be screened by tree foliage. There is also the potential for additional light spill, over and above that which currently exists, to be generated by the new road.
L278	0357	366 SH1 Paraparaumu-Paekakariki	House	1765527	5461033	63	77m		TBC	Access to property was not obtained.
L279	0356	370 SH1 Paraparaumu-Paekakariki	House	1765550	5460687	119	200m		TBC	Access to property was not obtained.

L280	0688	XXXX	House	1765678	5460844	92	297m		TBC	Access to property was not obtained.
L281	0358	330 SH1 Paraparaumu-Paekakariki	House	1765727	5461174	30	128m		TBC	Access to property was not obtained. House surrounded by well established pine plantation. Need to check land profile to the west to establish whether the land drops away from house allowing views of large box cut and Lower Te Puka Stream Valley.
L282	N255	378 SH1 Paraparaumu-Paekakariki	House	1765962	5461293	22	128m	Iron roof with white cladding. House located against toe of remnant terrace with backdrop of well established vegetation on three sides of house. Views to the north are partially obscured by existing vegetation.	Moderate.	Views are funnelled to the NW by existing vegetation. There will be views of TG in the vicinity of the former Car Haulaways site including main alignment, slip lane and associated fill batter. Although views will be confined and obscured by existing vegetation and within the context of the existing SH1, the proximity to the proposed road will result in moderate degree of effect. There is opportunity for additional vegetation to be introduced adjacent to the new carriageway to mitigate any visual effects that may result.

L284	N360	394 SH1 Paraparaumu-Paekakariki	House	1766136	5461424	15	95m	Two storey house with green roof and white cladding. Located against remnant terrace, elevated slightly above and approximately 60m to the SE of the existing SH1. House is oriented north towards SH1 and is surrounded by well established vegetation which screens views.	Moderate.	TG main alignment will be elevated approximately 10m above existing SH1 restricted existing views beyond SH1. The main traffic flow will be approximately 20-30m further away from the house and lighting already exists. Visual effects need to consider existing level of screening and existence of SH1. The proximity to the proposed road will result in moderate degree of effect. There is opportunity for additional vegetation to be introduced adjacent to the new carriageway to mitigate any visual effects that may result.
L285	0362	528 SH1 Paraparaumu-Paekakariki	House	1766573	5461800	51	185m		TBC	Access to property was not obtained.
L286	0689	XXXX	House	1766848	5462447	19	56m		TBC	Access to property was not obtained.
		PAEKAKARIKI TOWNSHIP (representative viewpoints)								

L293	0695	Paekakariki Holiday Park/ Walkway	Public walkway and Holiday Park	1765388	5461950	15	715m	QE walkway passes along the eastern edge of the Paekakariki Holiday Park from the end of Tilley Street to the wider QE park to the north.	Moderate.	There are views directly up Te Puka Valley from the walkway (Wainui Stream Bridge) that are currently seen within a natural pasture/ vegetated hill backdrop. Middle ground views consist of pines and remnant native vegetation forming a green framework with houses, buildings, power lines and SH1 throughout. Fore ground is pasture and horticultural land. There will be views of the cut faces at the bottom of Te Puka Stream with the large fill batters being screened by the stand of pine trees on L277 property. Night time lighting will increase but needs to be considered against existing SH1 situation.
		WHITBY								
L294	0696	92 Joseph Banks Drive	House + joined shed 'Garrison House'	1760795	5447556	18	634m (main Alignment) 239m (realigned SH58)	2 storey house. Grey roof and light grey cladding. Extensive vegetation surrounding.	Moderate.	Ground level views to Lanes Flat and SH58 Interchange screened/ blocked by surrounding vegetation. Potential views from upper levels although bedrooms etc appear to be oriented to the north towards Pauatahanui Inlet.

L295	0697	90 Joseph Banks Drive	House + shed	1760766	5447529	18	640m (main Alignment) 230m (realigned SH58)	2 storey 'A' frame house. Grey roof with white cladding.	Moderate.	Ground level views to Lanes Flat and SH58 Interchange screened/ blocked by surrounding vegetation. Potential views from upper levels although bedrooms etc appear to be oriented to the north towards Pauatahanui Inlet.
L296	0698	88 Joseph Banks Drive	House	1760741	5447504	18	620m (main Alignment) 250m (realigned SH58)	Large house with grey roof and swimming pool.	TBC	Access to property was not obtained.
L297	0699	84 Joseph Banks Drive	House + joined shed	1760682	5447472	19	620m (main Alignment) 290m (realigned SH58)	Single storey 'lockwood' house. Creme/ Tan cladding.	Moderate.	Views from lounge to Lanes Flat framed by garage and trees. Elevation slightly above Lanes Flat will see northern slip lanes and part of interchange and site compound. Narrow complex view shed: transmission lines; Lanes Flat; substation; houses; existing road.
L298	0700	82 Joseph Banks Drive	House	1760627	5447427	19	630m (main Alignment) 340m (realigned SH58	Large 'U' shaped house with grey roof and swimming pool.	TBC	Access to property was not obtained.
L299	0701	86 Joseph Banks Drive	House + out buildings	1760718	5447357	18	520m (main Alignment) 240m (realigned SH58	2 storey, dark brown roof and red/brown brick. Long driveway.	TBC	Access to property was not obtained.

L310	0708	11Scoresby Grove	House + joined shed	1760622	5447298	19	550m (main Alignment) 340m (realigned SH58		TBC	Access to property was not obtained.
L311	0709	13 Scoresby Grove	House 'Scoresby Manor'	1760685	5447298	19	500m (main Alignment) 270m (realigned SH58		TBC	Access to property was not obtained.
L312	0710	15 Scoresby Grove	House + tennis court	1760654	5447253	19	500m (main Alignment) 310m (realigned SH58	2 storey, multi wing house. Dark grey tile roof with light grey cladding. Magnolia trees and clipped hedges. Views oriented from NE to SE with views to the north partially obscured by 0702.	High.	House is located on elevated knob and has largely unobscured views across Lanes Flat. There are well established kanuka trees to the NE and toe of spur below Young Nicks Lane. Clear views across to houses above lanes flat to NE which form the backdrop to this view – fragmented with houses, pasture, shelter belts and woodlots. Will see across to SH58 Interchange as well as realigned road and works associated with SH58 realignment and site compound. Slip lanes and main alignment to the north of Interchange will be visible.

L316	0714	5 Lodestar Lane	House + joined shed	1760684	5447080	21	410m (main Alignment) 310m (realigned SH58	Elevated above and to the south of houses below on Young Nicks Lane. Views over Lanes Flat; Pauatahanui Village and surrounding rural-residential development.	High.	Will see large portion of Lanes Flat development including realigned SH58; site compound; Interchange and northbound slip lanes. Viewed against a rural residential back drop and distant Akatarawa Hills.
L322	0721	9 Lodestar Lane	House + joined shed	1760713	5447000	33	370m (main Alignment) 310m (realigned SH58	Grey roof with clay/ brown cladding patch of kanuka to immediate east blocking views to SH58 interchange. Unobstructed views to the north.	High.	Views to SH58 Interchange blocked by kanuka trees but remainder of Lanes Flat and SH58 realignment will be visible. Due to proximity and elevation these features will be viewed in the context of the existing road; substation and residential development.
L322b	0722	10 Lodestar Lane	House + joined shed	1760675	5446931	45	390m (main Alignment) 370m (realigned SH58	Series of mono pitched roofs. Light grey cladding with High. number of windows. Views oriented towards inlet. Power lines in front of house.	Very high.	Highest elevation of all the surrounding houses so assume greater effects. Should be the same as 0709 – Silverwood.
L323	0723	7 Lodestar Lane		1760699	5447047	27	370m (main Alignment) 300m (realigned SH58	Square/ geometric 2 storey building. Cream cladding with large windows and views oriented north. Relatively unobstructed views to the Inlet.	High.	Will see large portion of Lanes Flat development including realigned SH58; site compound; Interchange and northbound slip lanes. Viewed against a rural residential back drop and distant Akatarawa Hills.

L326	0726	10 Scoresby Grove	House + joined shed	1760599	5447214	19	550m (main Alignment) 370m (realigned SH58	Single storey house with split level garage at eastern end. Pitched roof with dark grey/ black cladding and timber exterior. House and views oriented NE towards Lanes Flat with partial views north to Pauatahanui Inlet.	High.	Views are directly across towards SH58 Interchange being framed by spur and kanuka to the east and 15 Scorseby Way to the west. The Interchange will dominate foreground view and will be viewed in the context of scattered rural-residential houses and pines in middle ground. Balance of view will shift from green space and sporadic development to large scale infrastructure.
L356	0739	68 Exploration Way		1758917	5445582	106	1050m (James Cook Interchange) 330m (Waitangirua Link Road)	Large 2 storey house with dark green tile roof and brown timber cladding. Views to north and west. Extensive vegetation to east and south.	TBC	Access to property was not obtained
L358	0363	67 Exploration Way		1758700	5445470	78	180m (Waitangirua Link Road)		TBC	Access to property was not obtained.

L359	0364	66 Exploration Way		1758652	5445595	79	300m	Large 2 storey, 'U' shaped house with central courtyard. Views down valley and to north and south from upper levels.	Moderate.	Extensive well established vegetation surrounding house will obscure/ screen views of Waitangirua Link Road. Views of upper portions of the box cut and large fill batters to south of house at head of valley will be visible. The fill batters in particular will be Low down the hill face and viewed against a 'natural' hill backdrop. The upper portions of the box cut may also be visible as it cuts through the ridgeline and existing pine trees.
L373	0746	30 Adventure Drive		1758262	5446188	141	1860m	Brown 2 storey house at the end of Adventure Drive. Views oriented east over Whitby basin Foreground views dominated by suburban context; middle ground pine/pasture/Silverwood and transmission lines; distant views to Belmont backdrop hills.	Moderate.	Clear views to Silverwood subdivision. Southern ½ of James Cook Interchange will be visible along with section of road to the south heading along Duck Creek. Section to the north of SH58 Interchange will also be visible in more distant views. No views to Waitangirua Link Road.

L376	0749	51 Cleat Street		1758366	5445929	123	1650m	2 storey house with brown roof and timber cladding.	Moderate.	House and views oriented east with views towards James Cook Interchange and section of main alignment to the south. Views of Waitangirua Link Road will also exist. Foreground views limited due to elevation and vegetation; middle ground views of mixed cover hill slopes; distant views to Belmont Hills. Will also see section of main alignment to north of SH58 Interchange. Views obscured by surrounding vegetation.
L376b	0750	53 Cleat Street		1758327	5445891	133	1700m (James Cook Interchange) 730m (Waitangirua Link Road)	2 storey house stepped into side of hill. Dark brown roof and timber cladding. Views oriented east with landform; vegetation; and 0737 blocking views to the west, south and north respectively.	Moderate.	Unobstructed views across southern Whitby basin. Will have similar views as 0737 but less obscured by vegetation and clearer due to High.er elevation. Waitangirua Link Road box cut will be an identifiable feature in the foreground amongst vegetation/ pasture setting. James Cook Interchange will be visible on the middle ground horizon line.

L378	0752	55 Cleat Street		1758339	5445767	139	1670m (James Cook Interchange) 210m (Waitangirua Link Road)	White 2 storey house with dark grey/ black roof located on top of spur at end of right of way. Rectangular dwelling oriented east-west with expansive views to surrounding area in all directions.	High.	Suburban Whitby; mixed cover hills and Belmont Hills in foreground, middle ground and distance. Will have clear views to James Cook Interchange on middle ground ridgeline and Waitangirua Link Road in mid/ foreground to the south. Interchange structures and Waintangirua Link Road box cut will be notable features. Proximity of upper end of link road
		PORIRUA EAST BASIN								
L452	0754	Cardiff park	Public Open Space & 18 – 22 Cardiff Crescent	1756306	5442767	99	320m	Park and houses are accessed of rise in Cardiff Crescent. TG is elevated approximately 25m above road and will be visible ½ way up existing 'natural' hill backdrop. Views south are framed by well established stands of 'old crop' macrocarpa pines to east and west of park. Views of TG are limited to between 24700m and the box cut at 25000m.	Moderate.	Houses on the southern side of Cardiff Crescent back onto the toe of the hill slope and extensive, well established vegetation in close proximity will screen views of the Houses with views to the southern natural hill backdrop will view the road 'mid slope', increasing its prominence. In addition, fill face at 23500m will be Highly visible particularly during construction. These elements are in relatively close proximity and will change the nature of the hill backdrop road.

L453b	0756	Trust Porirua Park (south/ upper)	N/A	1755949	5443076	93	300m	Open playing fields. Surrounded by well established vegetation and limited views oriented to the north along gully	Moderate.	Views from playing fields to hill slopes above are partially obscured by vegetation and hill slopes to the west of the PCC Nursery. Views of box cut to SW will be obtainable particularly the upper portions of the southern cut face, they will be partially obscured by intervening landform and vegetation. These portions of the cut face will be seen in the context of an undeveloped, 'natural' hill face and will be approximately 30m above viewing position.
L476	0757	Trust Porirua Park (north/ Lower)	Carpark to 'Northern United Rugby Club'	1755813	5443574	57	650m	Flat, open playing fields with clubrooms and stands to the west of basin. Views to the south framed by landform and vegetation on either side of playing fields.	Moderate.	Section of TG between 25000m – 25500m (Gun Club – benched box cut) will be visible ½ way up the vegetated 'natural' hill backdrop. Fill batters and tops of cut faces will be visible in a relatively undeveloped context.
L633	1026	Waitangirua Marae		1757926	5445229	83	30m	Marae and adjacent buildings oriented east-west located in close proximity and below the Link Road	High.	Proposed Link Road will pass along northern boundary of the Marae property with outdoor grass area being immediately adjacent. The surrounding suburban context is a mitigating factor but the proximity to the road and it's elevation above the buildings has the potential to result in very high effects.

		WHITBY (representative viewpoints)								
L333	0761	Upper Endeavour Way	Houses.	1760639	5446619	101	180m (Main Alignment) 580m (SH58 Interchange)	Subdivided properties to the north of natural rise in ridgeline. Properties aligned parallel to Endeavour Way and reducing in elevation to the north.	Very High.	Views from these properties are similar to L333b however views to Pauatahanui Inlet and hills beyond are obtainable and unobscured. Views down to Lanes Flat are also obtainable – increasingly so from the northern-most sections. Views to James Cook Interchange and box cuts to the immediate north are obscured by the rise in landform. Views from these properties will include the SH58 Interchange and slip lanes to the north and south. Properties will also have views of main alignment to the north of Interchange between 17500m – 14600m. Site compound and realigned SH58 clearly visible.

L333b	0762	Upper Endeavour Way	Houses.	1760654	5446473	88	90m (Main Alignment) 670m (SH58 Interchange)	Vacant properties at Silverwood Subdivision to south of natural rise in ridgeline and to the east of Endeavour Way. Properties are relatively flat adjacent to Endeavour Way and drop away steeply towards Bradey Road in the east. Properties aligned north-south parallel to Endeavour Way.	High.	Views from these properties are expansive and extend from Wainui Saddle in the distant north to Belmont Hills in the south. Due to sloping nature of the sites views tend to be to middle ground and distant views beyond and including rural hill country, transmission lines and rural-residential development. Views of main alignment will include box cuts to immediate north and James Cook Interchange (19000m – 18500m) and to the north of SH58 Interchange (17500m – 14600m) at the southern end of Flightys Road adjacent to 110kV transmission lines and gorse filled gully. Views down to SH58 interchange and southern slip lanes obscured by steep landform.

L339	0768	Lanyon Place Reserve	Houses and Public Reserve.	1760575	5447622	19	820m (SH58 Interchange)	Representative of views from houses at the end of Voyager Way and rear sections along eastern side of Lanyon Place.	Moderate.	Houses adjacent to Lanyon Place on both sides of the road have no views due to adjacent houses. Rear houses have no views – being screened by adjacent houses. Rear houses have views oriented to east and look out over lanes flat. Given the density of surrounding residential development these views are likely to be valued. These houses will see the SH58 Interchange from a broadside position as well as the realigned SH58; site compound and slip lanes to the north of the Interchange. Views of the main alignment to the south of SH58 obscured by intervening ridgeline. View shed is complex with fire – mid ground consisting of residential development rural-residential development; substation; transmission lines; mixed vegetation patterns; existing SH58 and Belmont Hills beyond. The interchange will be a dominant feature – particularly at night.

L345	0224	James Cook Drive/ Spyglass Lane	Houses.	1759632	5446324	57	130m	Houses located on a slight rise in road in vicinity of James Cook Drive/ Spyglass lane. Mixture of 1 and 2 storey houses with variable orientation.	Moderate.	View shed is either across Whitby Basin to the SW or to the James Cook Interchange in the SE. Top of interchange may be visible along with the fill batters to the north. These features viewed within the context of pine covered slopes; skyline; native vegetation; transmission lines and suburban development. The very top of James Cook Link Road may also be visible as will the Lower end where it links with James Cook Drive round about.

L346	0775	Spyglass Lane (southern end)	Houses.	1759346	5445973	62	820m (James Cook Interchange)		Moderate.	Houses at the beginning and middle sections of Spyglass Lane have no views due to elevation; orientation and adjacent dwellings. Properties at the end of Spyglass Lane have views to the south up Duck Creek and will have glimpses of top of cut faces along main alignment but carriageway itself sits low down in valley. Will also have distant views to fill site up Duck Creek and Waitangirua Link Road crossing end of golf course. All works will be viewed in a confined viewshed with pine/ native vegetation in middle ground; golf course in foreground; and Belmont Hills beyond. Large tracts of existing vegetation to be retained will reduce visual effects
		PORIRUA EAST BASIN (representative viewpoints)								

L385	0796	6 Naigara Street	Houses.	1757788	5445251	80	45m	Houses adjacent to Waitangirua Mall carpark.	Moderate.	Views to Waitangirua Link Road include upper section, box cut, central sidling cuts and Lower section adjacent to Marae linking with Warspite Avenue. Views to upper and middle sections of link road obscured by intervening buildings and vegetation. Viewed within suburban development context and constrained field of view.
L386	0797	8 Loongana Street	Houses.	1757696	5445313	78	470m	Houses oriented inwards to street. Houses on eastern side of street back towards Waitangirua Link Road.	Moderate.	Views from western houses partially obscured by houses to east as well as intervening vegetation. View of top of link road and box cut possible but obscured. No views to bottom of link road next to Marae. Middle section of link road visible and in relatively close proximity.
L400	0810	116 Corrina Street	Houses.	1757987	5445152		112m	Cluster of houses on Corrina Street that back onto Marae property.	High.	Houses located in close proximity to Waitangirua Link Road with a confined view shed towards road. Proximity, orientation and elevation of road above houses contributing factors.

L444	0852	18 Northumberland Street	Northumberland Street and upper Durham Street	1756465	5443195	105	750m	Houses and road sidling upper hill side in a north-south direction. Largely unobstructed views of TG (between 24700m – 25500m) obtainable from houses on both sides of the road.	Moderate.	The vast majority of houses will experience a 'gun barrel' view along the carriageway, which sidles across the southern hill faces. The carriageway and cut & fill faces will be visible but will be partially obscured by intervening houses and spurs and vegetation along the southern hill backdrop. The benched box cut at 25500m will be clearly visible on the western middle ground skyline accentuating its prominence and geometric form.
L446	0852	Durham Street/ Norfolk Grove	8 Durham Street – Sievers Crescent and Norfolk Grove	1756358	5443283	87	740m	Elevation of road drops significantly at the southern (Sievers Grove) end and down Norfolk Grove. Both front and rear houses on the eastern side of the road above Durhan Street have unobstructed views across to TG.	Moderate.	Houses are at a slightly Lower elevation to TG which means that intervening vegetation and landform tends to fragment views. Adjacent houses also block views in some instances. The large box cut to the west (25500m) is Highly visible and will be a prominent feature as will the majority of cut & fill faces due to houses being broadside to the alignment of TG.

L451	0860	Sievers Grove/ Swansea Street (Upper)	Houses from 124 – 78 Sievers Grove	1756047	5443160	101	430m	Houses on both sides of road up to entry to Porirua Park. Houses elevated along crest of spur that falls away to the west behind the houses. Houses have largely unobstructed views towards TG in the west. Houses to the south tend to be Lower down with adjacent well established vegetation.	Moderate.	Views form houses on the eastern side of the road are towards the undeveloped hills and TG will pass along. Although the houses on the western side of the road are primarily oriented away from TG, their back yards are to the west and provide largely unobstructed views and will see the upper ½ of the southern cut face. These houses are located broadside to the alignment and the large box cut at 25500m in particular. This feature is located on the middle ground skyline that frames the Porirua Basin and views from these elevated properties.
L451b	0861	6 Swansea Street	From Sievers Street to 14 Swansea Street	1756136	5443143	100	480m	Houses at the top end of Swansea Street are elevated High.er and those on the northern side of the road are oriented towards TG. The houses on the southern side of the road are oriented north away from TG and serve to obscure views from adjacent houses.	Moderate.	Houses with clear views to TG will see section 24100m – 25000m including large cut faces although the western end of this viewshed will be screened by established pines to east of PCC Plant Nursery. There will be views of the fill batters to the south/ SE of Cardiff Park. TG will appear as a linear element aligned horizontally across the hill backdrop at the edge of the suburban/ hill interface. Adjacent vegetation will fragment views of the road and the complex suburban middle ground view also establishes a scattered clearly developed character.

L454	0862	54 Sievers Grove	Houses.	1756033	5443464	72	700m	Road oriented north-south. Houses on both sides oriented towards street. Buildings elevated along spur.	Moderate.	Houses to the east have view from rear across Porirua Basin. Houses to the west back onto vegetation along the edge of Porirua Park which screens views to cut faces to north of park but still visible in context of vegetated backdrop and middle ground.
L467	0875	Mungavin Avenue/ Bedford Street	Houses.	1756402	5443903	60	1250m	1 and 2 storey houses with mixed orientation around intersection. Houses to the east generally higher than those to the west.	Moderate.	Houses are at a slightly Lower elevation to TG which means that intervening vegetation and landform tends to fragment views. Adjacent houses also block views in some instances. The large box cut to the west (25500m) is visible and will be a prominent feature as will the majority of cut & fill faces due to houses being broadside to the alignment of TG.
L472b	0881	62 Bedford Street (Middle)	Houses from 56 – 74 Bedford Street	1756364	5443450	81	860m	Bedford Street runs along top edge of spur so landform drops away steeply to the west providing relatively unobstructed views from houses on the western side of road. Houses on the eastern side of the road also have views to TG as well as Waitangirua Link Road in the distance.	Moderate.	Houses are at a slightly Lower elevation to TG which means that intervening vegetation and landform tends to fragment views. Adjacent houses also block views in some instances. The large box cut to the west (25500m) is Highly visible and will be a prominent feature as will the majority of cut & fill faces due to houses being broadside to the alignment of TG.

L473	0882	22 Leicester Street	Houses from 4 – 40 Leicester	1756534	5443550	82	1000m	Road sidles along hill face dropping away towards Bedford Street (west). Houses on the west side of the street have unobstructed views to TG. Houses on both sides of the road have views to Waitangirua Link Road	Moderate.	Houses are at a slightly Lower elevation to TG which means that intervening vegetation and landform tends to fragment views. Adjacent houses also block views in some instances. The large box cut to the west (25500m) is Highly visible and will be a prominent feature as will the majority of cut & fill faces due to houses being broadside to the alignment of TG.
L480	0888	McKillop Street/ Mayer Place	Houses.	1755537	5444192	39	1190m	Houses aligned parallel to street in a NW-SE direction. Views to the south relatively unobstructed due to falling topography and adjacent houses being Lower in elevation.	Moderate.	Hills to south of Ranui heights provides backdrop to views from properties – currently consisting of pasture; reverting native vegetation; gorse; and existing pine plantation. Foreground views across suburban development. Extent of main alignment that will be visible from box cut at 25500m to box cut at Linden Interchange. Carriageway itself will be Low down on backdrop hills. Extent of views from 24250m to 26000m and houses tend to be at an acute angle providing views into box cuts. Main alignment will appear Low down of hill face.

L483	0890	Windley Street/ Mitchell Grove	Houses.	1755408	5444431	34	1430m	Houses aligned north-south along Windley Street and east-west along Mitchell Grove. Houses located on crest of ridge and down south facing slope. Mix of 1 and 2 storey houses.	Moderate.	Hills to south of Ranui heights provides backdrop to views from properties – currently consisting of pasture; reverting native vegetation; gorse; and existing pine plantation. Foreground views across suburban development. Extent of main alignment that will be visible from box cut at 25500m to box cut at Linden Interchange. Carriageway itself will be low down on backdrop hills. Orientation of dwellings varies significantly. The box cut at 25500m will be broadside so only upper portion of southern cut face will be visible. The large box cut at Linden Interchange will be visible as will the fill disposal sites.
L493	0900	64 Gear Terrace	Houses.	1755663	5443605	60	630m	Houses similar in orientation to 0887. Elevation being Higher and views less obscured.	Moderate.	Views will include top of cut batters to the NE of 25500m box cut and cut/ fill batters and bridges to the south. Houses are broadside to 25500m box cut so will only have glimpses of top of southern cut face. Views of the carriageway itself will be extremely limited. Clear human intervention in the landscape.

L498	0903	Ernest Street/ Gillies Place	Houses.	1755220	5443291	81	320m	Pocket of houses located at top of spur. Views tend to be oriented north-NW towards Porirua Harbour and Aotea Hills.	High.	Views to main alignment are framed by pine trees to the south and adjacent houses but some dwellings have clear framed views to the box cut at 25500m and section of main alignment to the SW. The spur that the box cut passes through provides the southern skyline to these properties and due to its proximity it will be a significant structure during construction and into the future.

L529	0931	Porirua CBD (Railway Station)	Railway station and Porirua CBD.	1754686	5444135	19	1300m	Various viewpoints.	Moderate.	Views from CBD will depend on location and screening effects of adjacent buildings. The most unobscured views of the main alignment are from the vicinity of the railway station which span from the box cut at 25500m to the Interchange box cut at 26500m. In both cases the upper ¼ to 1/3 of the southern cut face will be visible from what are generally broadside positions. The bridge at 26100m will be visible as will the fill batters to the north of the Interchange. All road elements will be viewed against the hill backdrop with extensive suburban and town centre development in the foreground and middle ground views. Considerable change to existing outlook.
		TAWA (representative viewpoints)								

L597	0996	292 Main Road.	Road	1753330	5441697	29	1550m (Linden Interchange)	Views from Main Road.	Moderate.	Road elevated slightly above land to the east. Views to Linden Interchange obscured by road side vegetation. Frame of reference limited to pine plantation on skyline. Box cut, slip lanes and Kenepuru Link Road will be visible also.
L598	0997	312 Main Road	Houses and road.	1753390	5442047	19	1330m (Linden Interchange)	Houses located slightly lower the road with access to rear of houses from Main Road. Largely single storey houses oriented east.	Moderate.	Similar 0984 with road elevated higher again and less intervening vegetation. Frame of reference wider due to additional elevation. Extensive suburban vegetation in middle ground.
L599	0998	348 Main Road	Houses and road.	1753559	5442369	23	1060m (Linden Interchange)	Houses located slightly lower the road with access to rear of houses from Main Road. Largely single storey houses oriented east.	Moderate.	Similar viewing angle to the Linden Interchange as 0987 and 0988 but significantly lower placing it well below the interchange and intervening houses on opposite side of Tawa basin.
L600	0999	28 Turriff Crescent	Houses.	1753389	5442409	53	1220m (Linden Interchange)	1 and 2 storey houses elevated on east facing hill side. Houses on east side of street will obscure views from those to the west.	Moderate	The existing pine plantation at Linden is central to the existing outlook from these houses and forms the skyline view. All elements at Linden will be visible from this location including slip lanes; interchange; box cuts; fill sites; Link Road and bridges and lights. Portions of the existing SH1 realignment will also be visible in the context of the hill backdrop and suburban Tawa basin. Will see interchange in 'plan view'.

L602	1001	48 Fyvie Avenue	Houses.	1753265	5442014	63	1450m (Linden Interchange)	Houses aligned North-south trending street that falls away steeply to the north. Views from houses to the west obscured by those to the east.	Moderate.	Similar outlook to 0987 but slightly lower elevation and viewing angle results in less of a 'plan view'.
L603	1002	55 Davidson Crescent	Houses.	1753220	5441594	63	1700m (Linden Interchange)	Houses aligned North-south trending street that falls away steeply to the north. Views from houses to the west obscured by those to the east.	Moderate.	Similar outlook to 0992 but lower elevation.
L606	1004	20 Turkington Street.	Houses.	1753120	5441525	66	1830m (Linden Interchange)	Predominantly single storey houses located on crest of spur. Street aligned north-south and drops away steeply to the south.	Moderate.	Views from houses on the western side of street obscured/ blocked by those to the east. Houses on the eastern side of street are oriented directly towards Linden Interchange and backdrop hills to the east. The Interchange and box cut will be visible on the middle ground horizon line. Fill sites and general excavation will be clearly visible. Existing SH1 and suburban Tawa basin clearly visible in the foreground.
L607	1005	Victory Crecent/ Chastudon Place/ Ordley Grove	Houses	1753061	5441933	100	1520m (Linden Interchange)	Houses generally aligned north-south along street with houses to the east backing to the east.	Moderate.	Similar outlook to 0987 but higher elevation and viewing angle results in more of a 'plan view' means the full extent of works will be visible. Distance is a mitigating factor along with extensive suburban development below.

L612	1008	22 St Aidans Way	Houses.	1753154	5441894	86	1520m (Linden Interchange)	1 and 2 storey houses located adjacent to winding and descending street which opens views from north to south.	Moderate.	Similar outlook to 0987 but slightly lower elevation and viewing angle results in less of a 'plan view' and greater distance is a mitigating factor.
L613	1009	Main Road/ Gee Street Intersection.	Main Road and adjacent playing fields.	1753688	5442618	19	930m (Linden Interchange)	Views from Main Road.	Moderate.	Similar outlook to 0986 with lower elevation meaning that interchange and cutting will be the more prominent features viewed in the context of the suburban Tawa basin.
L613b	1010	26 Rembrandt Avenue	Main Road and adjacent playing fields.	1753653	5442751	26	930m (Linden Interchange)	Houses aligned on both sides of north-south oriented street. Houses have views oriented to east.	Moderate.	Houses elevated above Main Road with views oriented to east towards Linden Interchange. Due to proximity to the route the frame of reference is primarily those pine trees to east of Linden. Box cut at interchange; Kenepuru Link Road; box cut at 25500m; slip lanes to SH1 and fill sites all visible across this backdrop view.

L616	1012	Beauchamp Street/ Rawson Street	Houses.	1753569	5441882	19	1270m (Linden Interchange)	Houses aligned north-south parallel to street with views oriented inwards. Mixture of 1 and 2 storey houses.	Moderate.	Some views to Lindale Interchange do exist from 2 storey houses mostly. The box cut at the interchange will be the most notable feature located on the skyline. Glimpses of the Kenepuru Link Road and SH1 off ramps may also exist.
L637	1030	2 South Street	Houses	1753930	5441572	42	40m	Mix of 1 and 2 storey houses located to the west of the southern end of the project.	Moderate.	Houses situated low down on their properties with extensive vegetation surrounding. Existing road side planting and presence of existing SH1 both mitigating factors. Works will be seen from street and elevated properties.
L638	1031	2 Matai Street	Houses and He Huaraki Tamariki	1754009	5441786	39	40m	Houses and larger buildings located adjacent to SH1.	Moderate.	Majority of houses located well below SH1 with houses and buildings immediately adjacent to SH1 oriented to west away from road. Boundary planting between SH1 and buildings also significant mitigating along with presence of existing road.

L640	1033	18 Tremewan Street	Houses	1754224	5442346	44	190m	Largely single storey houses located adjacent to existing SH1.	Very High.	Front and rear properties oriented to west away from SH1 and houses on western side of street have views to existing SH1 blocked by those to the east. Removal of these buildings will open views. Proposed earthworks and cut batters in very close proximity to existing dwellings (many owned by NZTA) and vegetation removal will see clear views to SH1 realignment; interchange and link road.
L641	1034	60 Tremewan Street	Houses	1754335	5442754	38	90m	Majority 2 storey state house blocks. Located adjacent to existing SH1. Generally lower elevation to those houses to south.	Very High.	There is less intervening vegetation than to the south and rear yards and building orientation tends to be to the east towards the existing SH1. Will have relatively unobstructed views to SH1 realignment; interchange and link road. The link road will elevated above the houses on the opposite side of the SH and will be a highly visible structure. Mitigation planting along edge of properties will reduce visibility of SH1 realignment but not the link road.
L642	1035	54 Roberts Street	Houses	1754214	5442762	40	210m	1 ans 2 storey houses with mixed orientation and elevation due to undulating landform.	High.	Houses in elevated positions will have clear views similar to those in Tremewan Street. In general views are more obscured; proximity is less; and orientation mixed.

L643	1036	52 Bell Street	Houses.	1754053	5442589	34	380m	1 and 2 storey houses with mixed orientation and elevation due to undulating landform.	Moderate.	Some houses have no views while others will see a combination of the link road; connection with Kenepuru Drive; Kenepuru Interchange; and SH1 realignment. These extensive views are limited to isolated elevated positions.
L645	1038	Mexted Terrace/ Coates Street	Houses.	1754087	5442303	49	200m	1 and 2 storey houses withy mixed orientation.	Moderate.	Some houses are low down with no views whilst others are elevated and experience relatively clear views to the interchange and link road. Intervening vegetation and houses mean that views are of elevated sections of the project including the interchange and associated box cuts.
L649	1041	Rangatira Road	Houses.	1754351	5442011	91	170m	Houses located on large lots to east of existing SH1. 1 and 2 storey houses predominantly to the west across Tawa basin.	High.	The elevation of houses means that views to Kenepuru Interchange and Link Road do exist to varying degrees. Views to realigned section of SH1 are low at toe of hill slope so largely nonexistent. Views to north including fill sites will be obscured from some houses but relatively unobstructed from those to the north.

L650	1042	11 Rangatira Road	House.	1754390	5442283	59	50m	Stand alone 2 storey house at the end of Rangatira Road.	Very High.	House located in close proximity to SH1 on ramps below Kenepuru Interchange. Vegetation surrounding houses will go some way to mitigating visual effects but proximity to proposed works and visibility of Kenepuru Interchange; Link Road; fill sites; and realigned SH1 will result in a very high degree of visual effect.
L651	1043	Little Collins Avenue	Houses.	1754184	5441968	37	20m	1 and 2 storey houses located adjacent to SH1 to the north of Collins Avenue Bridge.	Very High.	Existing vegetation will be removed to allow for road widening resulting in highly visible adjacent works, particularly during construction. These works will be in very close proximity with little to no opportunities for effective visual mitigation.
L652	1044	Raroa Terrace	Houses.	1754125	5441833	40	30m	Houses located at the end of Raroa Terrace to the east of existing SH1. Views oriented to the west over SH1 and Tawa Basin.	Moderate.	Realigned SH1 will move closer to the western most properties but will be located at the toe of a cut face. Nature of outlook from these properties is unlikely to change a great deal aside from seeing 'more road'. Degree of visual effect decreases as one moves to the east and views to Kenepuru Interchange and immediate surrounds are very limited.

L653	1045	38 Mahoe Street	Houses and small park.	1754077	5441700	40	30m	1 and 2 storey houses elevated slightly above or level with existing SH1. Views oriented SW towards small park.	Moderate.	Proximity to road is a contributing factor however the existing SH1; adjacent vegetation; and relatively confined views are mitigating factors. Greatest degree of effect likely to be during construction period.

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15 APPENDIX 5E: SCHEDULE OF PROPOSED LANDSCAPE MITIGATION MEASURES REFERENCED TO EFFECTS.

Treatment Type	Treatment detail	Location (Route Section)		Approximate Chainage (m)	Effect Summary (see main report for detail)	Primary Mitigation Purpose (see main report for detail)	Secondary/ associated benefits
CUT AND FILL FACES	**Generic mitigation of all earthworks:** Increase height of lowest bench to 15m, eliminate short top benches by modifying gradient, round-out edges of cut faces, consistent horizontal alignment of benches. Adopt shallower cut face angles in rolling country in order to avoid benching. Hydroseed with mixture tailored to orientation and substrate, including annual grasses, hydro-moss and hydro-lichen, native shrub species including kanuka, koromiko.	Multiple locations - see plan set		See plan set	**Biophysical Effects**: (effects on natural aspects including landforms, vegetation, watercourses) Modification of natural landforms (more particularly truncating of spurs), removal of native vegetation in some locations, and encroachment into watercourses and streams. **Visual Effects:** (visual effects from private properties and public places, effects on landscape character including natural character) Large cut faces with un-natural benching will result in prominent scars that will be visible from nearby properties / dwellings, from recreational parkland,	Restore vegetative cover to reduce prominence of earth-works, in particular to soften the un-natural appearance of benching. Reduce the number of benches. Integrate with natural vegetation patterns (i.e. maintain aspects of natural character elements and patterns) Soften the edges of benches and cut faces.	Vegetative cover will reduce soil erosion (sediment generation), reduce extent of rock fall onto road, and may have some habitat value.

					and from nearby streets and public places. Effects will also be experienced by future road users.		
SURPLUS FILL SITES	Contouring of finished surplus fill to tie in with adjacent topography. Re-vegetation with hydroseeded grass pasture species to blend with adjacent pasture.	Cannons Creek		23200 to 23400	Selection of fill site minimises effects: Site in in pasture, has relatively low visibility, and avoids watercourses. Temporary effects on existing pasture will be remedied by contouring and re-establishing pasture.	Tie the contoured fill profiles in with adjacent terrain and re-establish pasture cover to blend with surrounding farmland.	Vegetative cover and location will minimise sediment entrainment to watercourses.
	As above	Cannons Creek		24100 to 24150	Selection of fill site minimises effects: Site is in pasture, is screened by pine shelter belt, and avoids watercourses. Temporary effects will be remedied by contouring and establishing grass cover.	Tie the contoured fill profiles in with adjacent terrain and establish native vegetation cover to tie in with adjacent Cannons Creek natural area.	Native vegetation cover will have some ecological benefit.
	Contouring of finished surplus fill to tie in with adjacent topography. Re-vegetation with native pioneer canopy species at 1m centres, 30mm straw mulch	Linden		26300 to 26400	Filling of natural gully and waterway, although gully is only short, will be affected anyway by highway earthworks (concentrates effects in single area), and is already modified by pine plantation. Potential visual effects	Tie contoured fill profile with adjacent terrain, and establish native vegetation cover to reduce prominence of earthworks. Retain some existing pines to screen earthworks during	Native vegetation cover will have some ecological benefit by extending adjacent regenerating bush.

					from Ranui Heights and longer views.	construction.	
	As above	Linden		26500 to 26600	As above	As above	As above
	Contouring of suplus spoil to merge with natural landforms or alternatively contouring in order to create an earth sculpture. Revegetation - PB5 native trees in groups (200stp ave) with under-storey PB2/3 shrubs@0.75m cntrs, 30mm pea straw mulch	Linden*		26700 to 27000	Highly visible site on hillside adjacent to proposed interchange, visible from wider Linden area. Potential for adverse visual amenity effects. (minimal biophysical effects).	Contour the fill profiles to create a naturalistic landform and plant groups of native trees in grassland. **Or** construct an earth sculpture as a grassed landmark feature without tree planting. *Treatment should link with amenity planting outlined below.	Constructing a landmark earth sculpture from the fill may increase the amount of fill that could be accommodated on the site, contribute a legacy amenity project, and avoid the need for some amenity tree planting.
AMENITY PLANTING	Vegetation of fill batters with native pioneer species characterisitic of coastal plain (pb 2/3 @ 0.75m centres, straw mulch).	MacKays Crossing	Fill batters on west side of proposed highway.	750 to 2550	**Visual effects:** Highway will be prominent on embankment across corner of plains.	Reduce the highway's prominence and soften its effect on amenity.	
	Vegetation of fill batters with native pioneer species characterisitic of flood plain margins (pb 2/3 @ 0.75m centres, straw mulch).	Pauatahanui (Lanes Flat/SH58)	Fill batters on both sides of proposed road and batters between main alignment and on/off ramps	17200 to 18075	**Biophysical and visual effects:** Highway interchange will be a dominant feature, and will compromise the natural landform of the head of Lanes Flat. Some visual effects also from properties on hills overlooking the valley (including	Reduce the highway's prominence and soften its effect on amenity. Tie the planting into broad scale restoration of balance of Lanes Flat.	Planting with native species will have some ecological benefits in conjunction with restoration of adjacent Lanes Flat.

					Whitby).		
	Vegetation of fill batters with native pioneer species characteristic of hill sides in the area (kanuka dominant) (pb 2/3 @ 0.75m centres, straw mulch).	James Cook Interchange	Fill batters between main alignment and on/off ramps	19150 to 19650	**Visual effects:** Highway interchange and associated earthworks will be prominent. Visual effects from suburban properties in eastern Whitby and lifestyle properties on Brady Road.	Reduce the highway's prominence and soften its effect on amenity. Tie the planting visually into the broad scale regenerating kanuka hillsides in the vicinity.	Planting with native species will have some ecological benefits in conjunction with nearby regenerating kanuka.
	Vegetation of fill batters with native pioneer species characteristic of hill sides in the area (kanuka dominant) (pb 2/3 @ 0.75m centres, straw mulch).	Linden*	Edges of large cut batters and southern perimeter of earthworks adjacent to interchange.	26500 to 27500	**Visual effects:** The outline edges of the large cutting and adjacent interchange earthworks are in visually prominent location on hillside visible from Linden area and in viewshafts from Porirua.	Reduce the visibility of the profile of the cutting. Tie the revegetation on the cut faces into broader scale regenerating vegetation. *Treatment should link with amenity planting outlined below	
VISUAL MITIGATION	**Vegetation -** 2 - 3 rows of PB40 native and exotic trees @ 1600sph, wool mat square+ staked	MacKays Crossing	SE of SH1 between main alignment and off ramp, south of MacKays Crossing	1300 to 2000	**Visual effects:** from adjacent properties south-east of highway which will be prominent on embankment in northern outlook from the properties.	Soften and partially screen views of highway from nearby properties.	
	As above	Battle Hill	W of main alignment in the Paekakariki Hill Road area	11650 to 12375	**Visual effects:** from adjacent properties (which are accessed from Paekakariki Hill Road). Carriageway, bridge, and large cut	Soften and partially screen views of highway and cut faces from nearby properties.	

					faces will be prominent benched around toe slope of hills.		
	As above	Battle Hill	E of main alignment	11800 to 11900	As above	As above	
	As above: Plant exotic trees in pasture outside of designation on Christiansen property.	Golf Course	W of main alignment	12725 to 12790	**Visual effects:** from adjacent property. Large cut face will be visible from Christiansen property west of alignment (carriageway will be partially screened within cuttings).	Soften and partially screen views of highway from Christiansen property.	
	As above: Plant exotic trees adjacent to limit of earthworks.	Golf Course	E of main alignment	13140 to 15320	**Visual effects:** from properties east of alignment (accessed from Flightys Road). Highway will be prominent, particularly where elevated on embankments. Edges of cuttings will be visible in other places.	Soften and partially screen views of highway and cut faces from nearby properties. (The final sitting and extent of this vegetation would include locating clumps of trees on opposite sides of the highway located on the ridges at the deepest parts of cuttings to reinforce the underlying topography and make it seem as if the highway was transecting the landscape - as well as helping soften the linear line of the highway and helping	

						to screen long views along the highway.	
	Plant exotic trees adjacent to limit of earthworks.	Golf Course	W of main alignment	13375 to 13650	**Visual effects:** from Pauatahanui Golf Course. Highway will be prominent on embankment at golf course's eastern end. To a lesser extent the cutting through ridge north of golf course will also be visible.	Soften and partially screen views of highway from golf course.	
	Plant shelter belt of exotic trees along southern boundary of Schofield property (outside of designation).	SH58	E of main alignment	17450	**Visual effects:** The SH58 interchange will be prominent feature from the elevated Schofield property. Night time visual effects from lighting.	Soften and partially screen the interchange.	
	Vegetation of fill batters with native pioneer species characterisitic of flood plain margins (pb 2/3 @ 0.75m centres, straw mulch).	Pauatahanui (Lanes Flat/SH58)	Fill batters on both sides of proposed road and batters between main alignment and on/off ramps	17200 to 18075	**Biophysical and visual effects:** Highway interchange will be a dominant feature, and will compromise the natural landform of the head of Lanes Flat. Some visual effects also from properties on hills overlooking the valley (including Whitby).	Reduce the highway's prominence and soften its effect on amenity. Tie the planting into broadscale restoration of balance of Lanes Flat.	Planting with native species will have some ecological benefits in conjunction with restoration of adjacent Lanes Flat.
KANUKA CORRIDOR (Landscape amenity and visual	Re-vegetation with kanuka dominant native pioneer species. RT kanuka @1600sph	SH58 / James Cook	Between SH58 interchange and James Cook Interchange		**Visual effects:** Interchanges and adjacent sections of highway will be visible from large number of properties including	Soften and partially screen the highway, the interchanges (including lighting effects), and the profiles of large	Additional ecological benefit by extending existing kanuka vegetation, particularly in conjunction with

mitigation)					suburban areas in eastern Whitby, lifestyle properties in Bradey Road (and future Judgeford Hills area), lifestyle properties in SH58, Flightys Road area. Effects will be increased by night lighting and the concentration of signage gantries in this area. Also **biophysical effects** on landforms through large scale earthworks, and clearance of some regenerating vegetation.	cuttings from properties in the area. Tie the mitigation planting into broad-scale existing patterns of kanuka in the area.	proposed restoration of Lanes Flat, and creation of an ecological connection between Pauatahanui Stream and Duck Creek catchments. The planting will also reinforce the sequential landscape experience for future road users.
WETLAND	**Vegetation -** Planting of native margin species within pond (reeds & sedges at 300mm c's). Riparian native species characteristic of coastal plain around pond. (PB2/3 native species @1m cntrs, 50mm compost blanket)	MacKays Crossing	W of main alignment	500	**Biophysical and visual effects:** Encroachment into existing revegetation area (within the 'DOC Conservation Unit) resulting from construction of artifial stormwater pond.	Soften and naturalise the artificial appearance of the wetland, repair edges with existing vegetation, and tie the pond into broader vegetation patterns.	Some additional ecological benefit through creation of edge habitat, and protection of existing native regenerating vegetation. Margin planting will reduce pond edge erosion and assist water quality treatment.
	Vegetation - Planting of native margin species within pond (reeds & sedges at 300mm c's). Riparian native species characteristic of valley	Horokiri Stream	E of main alignment	7700	**Biophysical and visual effects:** from excavation and construction of an artificial stormwater pond.	Soften and naturalise the artificial appearance of the pond.	Some additional ecological benefit through creation of edge habitat. Margin planting will reduce pond edge erosion and assist

	terraces around pond. (PB2/3 native species @1m cntrs, 50mm compost blanket)						water quality treatment.
	As above	Battle Hill	W of main alignment (below N end of Gas Line Ridge)	9600	**Biophysical and visual effects:** from excavation and construction of an artificial stormwater pond.	Soften and naturalise the artificial appearance of the pond. Tie planting into broader landscape pattern that will result from riparian restoration of Horokiri Stream through Battle Hill Farm Forest Park.	Some additional ecological benefit through creation of edge habitat. Margin planting will reduce pond edge erosion and assist water quality treatment.
	As above	Battle Hill	E of main alignment (below S end of Gas Line Ridge)	11200	As above	As above	
	As above	SH58	NW of SH58 Interchange at Lanes Flat	17600	**Biophysical and visual effects:** from excavation and construction of an artificial stormwater pond. The pond is in a very visible location adjacent to the interchange, with elevated views from the highway. Potential for pond to appear part of the engineered infrastructure and 'stick out' in contrast to natural landform of Lanes Flat.	Soften and naturalise the artificial appearance of the pond. Integrate the pond within the broad restoration of Lanes Flat.	Ecological benefit through creation of edge habitat. Opportunity to contribute to restoration of Lanes Flat as a whole.

RIPARIAN STREAM PLANTING	Planting of native riparian and margin vegetation characteristic of natural streams in the area, upstream and downstream of highway crossing points.	Multiple locations - see plan set		See plan set	**Biophysical (natural character) and visual effects:** The highway will interrupt the natural landscape patterns established by the stream network, and the fill batters across stream gullies, the culvert structures, debris screens and access tracks will have visual and natural character effects.	Reduce the natural character effects by softening the visual interruption of streams (disguising the point at which fill batters interrupt streams), emphasising the streams' continuity on both sides of the highway, and screening (or partially screening) views of culvert structures, debris screens, and access tracks.	Will have additional ecological mitigation benefit by creating edge habitat and shading streams, and helping to stabilise stream beds immediately upstream and downstream from culvert disturbances.
		Battle Hill		9600-11400	**Biophysical (natural character), visual and effects on recreational use** of the Horokiri Stream. In particular the highway will dominate the Horokiri Stream valley through Battle Hill Farm Forest Park, reduce the natural character of the nearby Horokiri Stream, and compromise recreational use.	Restore riparian vegetation along the stream to reinforce its natural character, and to help visually separate the stream from the highway, and screen the highway for park users who may use the stream in the future.	Will tie in with the Reserve Management Plan objective of revegetating the valley terraces as a 'Sustainable Management Area', which would help confine the visibility of the highway from park users.
KAHIKATEA	**Vegetation -** PB5 kahikatea @1000sph. Around the construction compound the	SH58	Planting located in traffic island and to SE and NW of interchange	17470 to 17540	**Biophysical and visual effects:** The highway, interchange, and construction yard will encroach onto the	Soften the appearance of the elevated highway and interchange by enclosing it within	Ecological benefits as part of the comprehensive restoration of Lanes

	planting will comprise kahikatea with a dense margin / understorey flax for screening purposes. with understory PB2/3@1m cntrs, 100mm compost blanket mulch				Lanes Flat flood plain and significantly impact on the visual character of the valley. The effects will be amplified by the relative rarity of this landform type in the region, its proximity and integral relationship with the Pauatahanui Inlet, its high visibility (from the proposed highway, SH58, and from residential areas overlooking the valley), and its proximity to Pauatahanui village. The construction yard will have particular amenity effects during the construction period because of the low amenity associated with such sites.	kahikatea forest. Soften and partially screen the construction yard activities, and help disguise the encroachment of the construction yard into the flood plain by perimeter kahikatea and dense flax understorey / edge planting. The planting is also integral to the overall restoration of the valley, by restoring the balance area of Lanes Flat floodplain as a 'wetland' framed by consistent kahikatea on the north side of the valley, and framed by the proposed restoration of Pauatahanui Stream and the existing kanuka forest on the south side of the valley.	Flat (see below).
LANES FLAT MARSH	**Vegetation -** RT wetland species@500mm cntrs	SH58	W of main alignment	See plan set	**As above:** The highway interchange and construction yard will impact on the Lanes Flat valley as a whole. It will have biophyscial effects by reducing the extent of	As above. The comprehensive rehabilitation of Lanes Flat (both the floodplain and the framing planting) is essential to mitigate and offset the	The wetland rehabilitation will have ecological benefits (particularly in conjunction with adjacent regenerating hillsides, planned

					the foodplain, effects on the integrity of the floodplain as a distinctive landform, and visual effects arising from the dominance of the highway and interchange across the upper part of Lanes Flat.	effects of the project on this location. The purpose is to enhance natural character processes (improve floodwater quality and habitat), and to accentuate the floodplain as a natural landform to offset the encroachments. The wetland will also help integrate the artificial stormwater pond and prevent it 'sticking out' in contrast to the adjacent paddocks.	restoration of the stream margins, and in conjunction with adjacent Pauatahanui Inlet), and will help improve floodwater quality. The wetland would also lend itself for recreational use (for instance by construction of boardwalks and paths) as a legacy project. It would be in keeping with the objectives of the Pauatahanui vision document.
BATTLE HILL WOODLAND PLANTING	**Vegetation** - Exotic trees planted in clumps on the foodplain, and planted to enclose the approaches of the 'Transmission Gully Puketiro Track' to the underpass beneath the highway.	Battle Hill	E and W of main alignment	10400 to 11000	**Visual and recreational effects:** The highway will dominate the Horokiri Stream valley and will visually separate the Park's headquarters and farming area from the forest trails on the east side of Horokiri Stream.	Reduce the visual dominance of the road on the valley and increase the visual separation between the highway and the Horokiri Stream by planting intervening groups of trees. Reduce the visual impact on people using the 'Transmission Gully - Puketiro Track' by enclosing the track within woodland on the approaches to the highway under-pass. Such planting would be	

						appropriate in terms of existing land use, and also is in keeping with long term plans outlined in the GWRC Sustainable Management Plan.	